

REPORT

Vlaamse Overheid - Departement Mobiliteit en Openbare Werken

Afdeling Maritieme Toegang

Evaluation of the external effects on the siltation in Deurganckdok

Report 2.4: Through tide Sediview measurements during neap tide: Entrance Deurganckdok - Winter 2012

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IMDC
International Marine & Dredging Consultants

Deltares
Enabling Delta Life

GEMS
International

Colophon

International Marine & Dredging Consultants

Address: Coveliersstraat 15, 2600 Antwerp, Belgium

☎: + 32 3 270 92 95

🗐: + 32 3 235 67 11

Email: info@imdc.be

Website: www.imdc.be

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Table of Contents

0. SUMMARY 1
1. INTRODUCTION 2
1.1 THE ASSIGNMENT 2
1.2 AIM OF THE STUDY 2
1.3 OVERVIEW OF THE STUDY 2
2. THE MEASUREMENT CAMPAIGN 5
2.1 OVERVIEW OF THE PARAMETERS 5
2.2 DESCRIPTION OF THE MEASUREMENT CAMPAIGN 8
2.2.1 Purpose of the measurement campaign 8
2.2.2 Measurement procedure 8
2.3 THE EQUIPMENT 9
2.3.1 ADCP 9
2.3.2 CTD-OBS3A 9
2.3.3 Pump sampler 10
3. DESCRIPTION OF THE MEASUREMENTS 11
3.1 MEASUREMENT PERIODS 11
3.2 HYDRO-METEOROLOGICAL CONDITIONS DURING THE MEASUREMENT CAMPAIGN 11
3.2.1 Vertical tide during the measurements 11
3.2.2 Meteorological data 12
3.3 NAVIGATION INFORMATION 12
3.4 REMARKS ON DATA 12
4. PROCESSING OF DATASETS 13
4.1 CALIBRATION OF THE OBS TURBIDITY SENSOR 13
4.2 METHODOLOGY OF PROCESSING OF THE ADCP DATA WITH SEDIVIEW 13
4.2.1 Acoustic backscatter theory 13
4.2.2 Water sampling and transect sailing 14
4.2.3 Calibration for suspended sediment concentration within Sediview 14
4.2.4 Sediview configuration 14
4.2.5 Output 17
5. PRELIMINARY ANALYSIS OF THE DATA 18
5.1 MARCH 16TH 2012 SURVEY 18
5.2 INTERCOMPARISON WITH EARLIER SURVEYS AT DGD 20
5.2.1 Fresh water discharge 21
5.2.2 Sediment distributions and current pattern around HW 22
5.2.3 Water balance 31
5.2.4 Sediment balance 36

6. REFERENCES 50

Annexes

ANNEX A OVERVIEW OF MEASUREMENT 58

A.1 OVERVIEW OF THE MEASUREMENT LOCATIONS FOR THE WHOLE HCBS2 AND DEURGANCKDOK MEASUREMENT CAMPAIGNS 59

A.2 OVERVIEW OF ALL MEASUREMENT LOCATIONS HCBS AND DEURGANCKDOK MEASUREMENT CAMPAIGNS 63

A.3 MEASUREMENT OVERVIEW AT DGD ON 16/03/2012 64

ANNEX B TIDAL AND DISCHARGE DATA 67

B.1 TIDAL DATA 68

B.2 DISCHARGE DATA 69

ANNEX C NAVIGATION INFORMATION AS RECORDED ON SITE 71

ANNEX D UNESCO PPS-78 FORMULA FOR CALCULATING SALINITY 73

ANNEX E OVERVIEW OF SEDIVIEW SETTINGS 75

ANNEX F CONTOURPLOTS OF FLOW VELOCITIES, SEDIMENT CONCENTRATION AND SEDIMENT FLUX, PER SAILED TRANSECT 79

ANNEX G DISCHARGE, SEDIMENT FLUX AND AVERAGE SEDIMENT CONCENTRATION FOR THE TOTAL CROSS-SECTION 233

G.1 DISCHARGE DISTRIBUTION OVER THE CROSS SECTION: POSITIVE IS FROM DOCK TO RIVER 234

G.2 SEDIMENT FLUX DISTRIBUTION OVER THE CROSS SECTION: POSITIVE IS FROM DOCK TO RIVER 238

G.3 SEDIMENT CONCENTRATION DISTRIBUTION OVER THE CROSS SECTION 241

ANNEX H TEMPORAL VARIATION OF TOTAL FLUX, TOTAL DISCHARGE AND SUSPENDED SEDIMENT CONCENTRATION 245

ANNEX I CURRENT AND SSC PATTERNS - INTERCOMPARISON WITH EARLIER MEASUREMENT CAMPAIGNS AT DEURGANCKDOK 249

I.1 OVERVIEW OF THE DIFFERENT CAMPAIGNS 250

I.2 1 HOUR AFTER HW (DENSITY CURRENTS) 251

I.3 3 HOURS AFTER HW (DENSITY CURRENTS) 261

ANNEX J OVERVIEW OF HCBS2 AND AANSLIBBING DEURGANCKDOK REPORTS 271

List of Tables

TABLE 1-1: OVERVIEW OF THE EXTERNAL EFFECTS DEURGANCKDOK REPORTS 3

TABLE 2-1:TRANSECT OF THE FLOW MEASUREMENTS ON 16TH OF MARCH 2012 (UTM31 ED50) 9

TABLE 2-2: MAIN CONFIGURATION SETTINGS OF ADCP 9

TABLE 3-1: HIGH AND LOW TIDE AT LIEFKENSHOEK ON 16/03/2012 11

TABLE 3-2: COMPARISON OF THE TIDAL CHARACTERISTICS OF 16/03/2012 WITH THE AVERAGE TIDE, THE AVERAGE NEAP TIDE AND THE AVERAGE SPRING TIDE OVER THE DECADE 1991-2000 FOR LIEFKENSHOEK. 12

TABLE 4-1: EXTRAPOLATION METHODS FOR TOP AND BOTTOM VARIABLES 16
TABLE 5-1 AVERAGE SSC'S OVER THE SAILED TRANSECT 18
TABLE 5-2: HYDROLOGICAL CONDITIONS DURING THROUGH TIDE ADCP MEASUREMENTS AT THE ENTRANCE OF DGD 20
TABLE 5-3 TOTAL WATER EXCHANGE COMPARED TO TIDAL FILLING WATER EXCHANGE AT TRANSECT DGD DURING EBB, FLOOD AND THE COMPLETE MEASUREMENT DAY 31
TABLE 5-4 TOTAL RESIDUAL, INCOMING AND OUTGOING WATER VOLUMES IN DEURGANCKDOK DURING THE MEASUREMENT CAMPAIGN OF 16/03/2012 COMPARED TO TIDAL FILLING/EMPTYING VOLUMES 33
TABLE 5-5 THE DIFFERENCE BETWEEN MEASURED DATA AND INTEGRATED TIDE DATA DURING THE MEASUREMENT CAMPAIGN OF 06/10/2011 33
TABLE 5-6: WATER VOLUMES DURING EBB, FLOOD AND TOTAL MEASUREMENT CAMPAIGN, INCLUDING THEORETICAL EXPECTED VOLUMES. 34
TABLE 5-7 RANGE OF SEDIMENT DEPOSITION DURING EBB, FLOOD AND MEASUREMENT CAMPAIGN, CALCULATED WITH FORCED FITTING WATER BALANCES FOR THOSE DAYS. THE DURATION IS BASED ON ADCP MEASUREMENTS. 39

List of figures

FIGURE 2-1: ELEMENTS OF THE SEDIMENT BALANCE 5
FIGURE 2-2: DETERMINING A SEDIMENT BALANCE 6
FIGURE 2-3: TRANSPORT MECHANISMS 7
FIGURE 2-4: MAP OF SAILED TRANSECT DGD PERPENDICULAR TO DEURGANCKDOK (DGD) ON 16TH OF MARCH 2012 (ED50). 8
FIGURE 4-1: UNMEASURED REGIONS IN THE CROSS SECTION (FROM RD INSTRUMENTS, 2003) 15
FIGURE 4-2: MEASURED AND ESTIMATED DISCHARGES AND SEDIMENT FLUXES WITHIN SEDIVIEW (DRL, 2005) 15
FIGURE 4-3: PRINCIPAL OF BOTTOM ESTIMATE OF THE SEDIMENT CONCENTRATION IN SEDIVIEW 15
FIGURE 5-1 TOTAL IN/OUT/NET FLUX, TOTAL INCOMING/OUTGOING SSC, AVERAGE IN/OUT/NET DISCHARGE AND WATER LEVEL AT DGD ON MARCH 16TH 2012. 19
FIGURE 5-2: DAILY FRESH WATER DISCHARGE EVOLUTION AT SCHELLE BEFORE AND AFTER A MEASUREMENT DAY. 21
FIGURE 5-4: PERPENDICULAR CURRENT VELOCITY AT 3HRS BEFORE HIGH WATER 24
FIGURE 5-5: SUSPENDED SEDIMENT CONCENTRATION AT 3HRS BEFORE HIGH WATER 26
FIGURE 5-6: PERPENDICULAR CURRENT VELOCITY AT 1HR BEFORE HIGH WATER 28
FIGURE 5-7: SUSPENDED SEDIMENT CONCENTRATION AT 1HR BEFORE HIGH WATER 30
FIGURE 5-8: THE WATER DISCHARGE AT THE ENTRANCE OF DEURGANCKDOK OVER A TIDAL CURVE ON 16/03/2012. TOP: TOTAL INCOMING (QIN) AND OUTGOING (QOUT) DISCHARGE INCLUDING THE TOTAL WATER EN TIDAL EXCHANGE; CENTRAL: MEASURED RESIDUAL DISCHARGE (QTOT) VERSUS THEORETICAL RESIDUAL DISCHARGE (QVOLBAL) AND CORRECTION OFFSET (QERROR) INCLUDING RELATIVE ERROR; BELOW: TIDAL CURVE. 32
FIGURE 5-9: THE SEDIMENT FLUX AT THE ENTRANCE OF DEURGANCKDOK ON 16/03/2012 (NEGATIVE VALUES REPRESENT INCOMING SEDIMENT). TOP: TOTAL INCOMING (FLUX IN) AND OUTGOING SEDIMENT FLUX (FLUX OUT); CENTRAL: TOTAL SEDIMENT EXCHANGE VERSUS TOTAL SEDIMENT FLUX; BELOW: TIDAL CURVE 36

FIGURE 5-10 OVERVIEW OF MEASURED SEDIMENT DEPOSITION IN DEURGANCKDOCK PER TIDE BY MEANS OF SEDIVIEW TECHNIQUE 37

List of annex figures

ANNEX FIGURE 1: OVERVIEW OF THE MEASUREMENT LOCATIONS 59
ANNEX FIGURE 2: OVERVIEW OF THE MEASUREMENT LOCATIONS AT DEURGANCKDOK DURING PREVIOUS CAMPAIGNS 60
ANNEX FIGURE 3: TRANSECT S IN SCHELLE 61
ANNEX FIGURE 4: TRANSECT W IN WAARDE 62
ANNEX FIGURE 5: MEASURED TIDE IN MET ON 16 MARCH 2012 AT LIEFKENSHOEK 69
ANNEX FIGURE 6: PENTADE AVERAGE DISCHARGES OF THE RIVER SCHELDT IN SCHELLE OF THE MONTHS FEBRUARY AND MARCH 2012 69
ANNEX FIGURE 7: MEAN FRESH WATER DISCHARGE OVER A PERIOD OF 30 YEAR (1971-2000) WITH THE MONTHLY DISCHARGE OF 2008-2009 70
ANNEX FIGURE 8: TOTAL DISCHARGE THROUGH THE MEASURED CROSS SECTION, POSITIVE IS FROM DOCK TO RIVER 246
ANNEX FIGURE 9: TOTAL FLUX THROUGH THE MEASURED CROSS SECTION, POSITIVE IS FROM DOCK TO RIVER 247
ANNEX FIGURE 10: SUSPENDED SEDIMENT CONCENTRATION THROUGH THE MEASURED CROSS SECTION 248
ANNEX FIGURE 11: PERPENDICULAR CURRENT VELOCITY AT 3H AFTER HIGH WATER 265

0. SUMMARY

This report presents the factual data of a through tide measurement to determine the sediment influx in dock Deurganckdok during a complete tidal cycle with neap tide conditions. The flux is measured by an Acoustic Doppler Current Profiler (ADCP) where the backscatter intensity is calibrated to suspended sediment concentration (SSC). The SSC calibration was done in the Sediview software by using water samples which were taken during the measurement campaign.

The measurements took place on the 16th of March 2012 after completing a current deflecting wall (CDW) in August 2011 near the northern entrance of Deurganckdok. The results presented in this report will be used to evaluate the effect of a current deflecting wall on the sediment influx in the dock and to gain insight in these siltation mechanisms.

1. INTRODUCTION

1.1 THE ASSIGNMENT

This report is part of a set of reports concerning the project 'Evaluation of the external effects on the siltation in Deurganckdok'. The terms of reference were prepared by 'Departement Mobiliteit en Openbare Werken van de Vlaamse Overheid, Afdeling Maritieme Toegang (16EF/2009/14). The study was awarded to International Marine and Dredging Consultants NV in association with Deltares and Gems International on 8 December 2009.

This study is a follow-up study on the study 'Opvolging aanslibbing Deurganckdok' that ran from January 2006 till March 2009.

Waterbouwkundig Laboratorium– Cel Hydrometrie Schelde provided data on discharge, tide, salinity and turbidity along the river Scheldt and provided survey vessels for the long term and through tide measurements. Afdeling Maritieme Toegang provided maintenance dredging data. Agentschap voor Maritieme Dienstverlening en Kust – Afdeling Kust provided depth sounding measurements.

1.2 AIM OF THE STUDY

The purpose of this study entails evaluating the external effects on the siltation in the Deurganckdok. External effects are those effects caused by recent or near-future human operations near Deurganckdok:

- The construction of the Current Deflecting Wall downstream of the entrance of the Deurganckdok.
- The deepening and widening of the navigational channel in the Lower Sea Scheldt between the entrance of the Deurganckdok and the access channels to the locks of Zandvliet-Berendrecht.
- The deepening of the entrance to the Deurganckdok by removing the sill at the entrance.

1.3 OVERVIEW OF THE STUDY

This study constitutes of 3 parts:

- Reporting and analysis of existing documents and measurement data
- Execution of specific measurement campaigns to map the siltation and its environmental factors.
- Support in numerical modelling efforts

Reports of the project 'Evaluation of the external effects on the siltation in the Deurganckdok' are summarized in Table 1-1.

This report 2.4, is one of a set of reports that gains insight in sediment and water transport between Deurganckdok and the river Scheldt, which belongs to the second part of this project.

Table 1-1: Overview of the External Effects Deurganckdok Reports

Report	Description
I.	**Reporting**
I.1 Annual Sediment Balance: Bathymetry surveys, Density measurements, Maintenance and construction dredging activities	
1.1	Annual Sediment Balance: year 1: 1/4/2009-31/3/2010 (I/RA/11354/10.067/NZI)
1.2	Annual Sediment Balance: year 2: 1/4/2010-31/3/2011 (I/RA/11354/10.100/MBO/ANF)
1.3	Annual Sediment Balance: year 3: 1/4/2011-31/3/2012 (I/RA/11354/10.101/MBO/ANF)
I.2 Boundary Conditions: Upriver Discharge, Salt concentration Scheldt, Bathymetric evolution in access channels, dredging activities in Lower Sea Scheldt and access channels	
1.4	Boundary Conditions year 1: 01/04/2009 – 31/3/2010 (I/RA/11354/10.102/MBO/ANF)
1.5	Boundary Conditions year 2: 01/04/2010 – 31/3/2011 (I/RA/11354/10.103/MBO/ANF)
1.6	Boundary Conditions year 3: 01/04/2011 – 31/3/2012 (I/RA/11354/10.104/MBO/ANF)
I.3 Synthesis of CDW research	
1.7	Synthesis report of research on Current Deflecting Wall (I/RA/11354/10.063/MBO)
I.4 Analysis: evaluation of external effects on siltation in Deurganckdok	
1.8	Analysis of external effects on siltation processes and factors (I/RA/11354/10.105/MBO/ANF)
II.	**Measurement campaigns: Factors contributing to salt and sediment distribution in Deurganckdok: Salt-Silt (OBS3A) & Frame measurements, Through tide measurements (SiltProfiling & ADCP) & Calibrations**
II.1 Through tide measurements fixed transects	
2.1	Through tide Sediview measurement: Entrance DGD during spring tide Autumn 2011 (I/RA/11354/10.106/MBO/ANF)
2.2	Through tide Sediview measurement: Entrance DGD during neap tide Autumn 2011 (I/RA/11354/10.107/MBO/ANF)
2.3	Through tide Sediview measurement: Entrance DGD during spring tide Winter 2012 (I/RA/11354/10.108/MBO/ANF)
2.4	Through tide Sediview measurement: Entrance DGD during neap tide Winter 2012 (I/RA/11354/10.109/MBO/ANF)
II.2 Through tide measurements eddy currents	
2.5[2]	Through tide measurements: Eddy Currents DGD 02/03/2010 (I/RA/11283/10.051/MSA)
2.6	Through tide measurements: Eddy Currents DGD Autumn I/RA/11354/10.110/MBO/ANF)
2.7	Through tide measurements: Eddy Currents DGD winter 2012 (I/RA/11354/10.111/MBO/ANF)
II.3 Salt Silt Distribution entrance Deurganckdok	
2.8[3]	Salt-Silt distribution Deurganckdok 1/4/2009-31/3/2010 (I/RA/11354/10.068/NZI)
2.9	Sal-Silt distribution Deurganckdok 1/6/2011-30/05/2012 (I/RA/11354/10.112/MBO/ANF)
II.4 Current Salt Silt Distribution CDW Deurganckdok	
2.10	Salt Silt & Current Distribution entrance Deurganckdok: frame measurements and throughtide measurements: Autumn 2011 (I/RA/11354/11.131/BQU)
2.11	Salt Silt & Current Distribution entrance Deurganckdok: frame measurements and throughtide measurements: Spring 2012 (I/RA/11354/10.114/MBO/ANF)

Report	Description
II.5 Quality Control instruments	
2.12	Calibration stationary & mobile equipment 16/03/2011 (I/RA/11354/10.113/MBO/ANF)
2.13	Calibration stationary equipment 2012 (I/RA/11354/12.011/JCA)

[2]: this report is part of the project Siltation Deurganckdok (11283)

[3]: this report contains report 2.35 of project Siltation Deurganckdok (I/RA/11283/09.085/MSA)

2. THE MEASUREMENT CAMPAIGN

2.1 OVERVIEW OF THE PARAMETERS

The first part of the study aims at determining a sediment balance of Deurganckdok and the net influx of sediment. The sediment balance comprises a number of sediment transport modes: deposition, influx from capital dredging works, internal replacement and removal of sediments due to maintenance dredging (Figure 2-1).

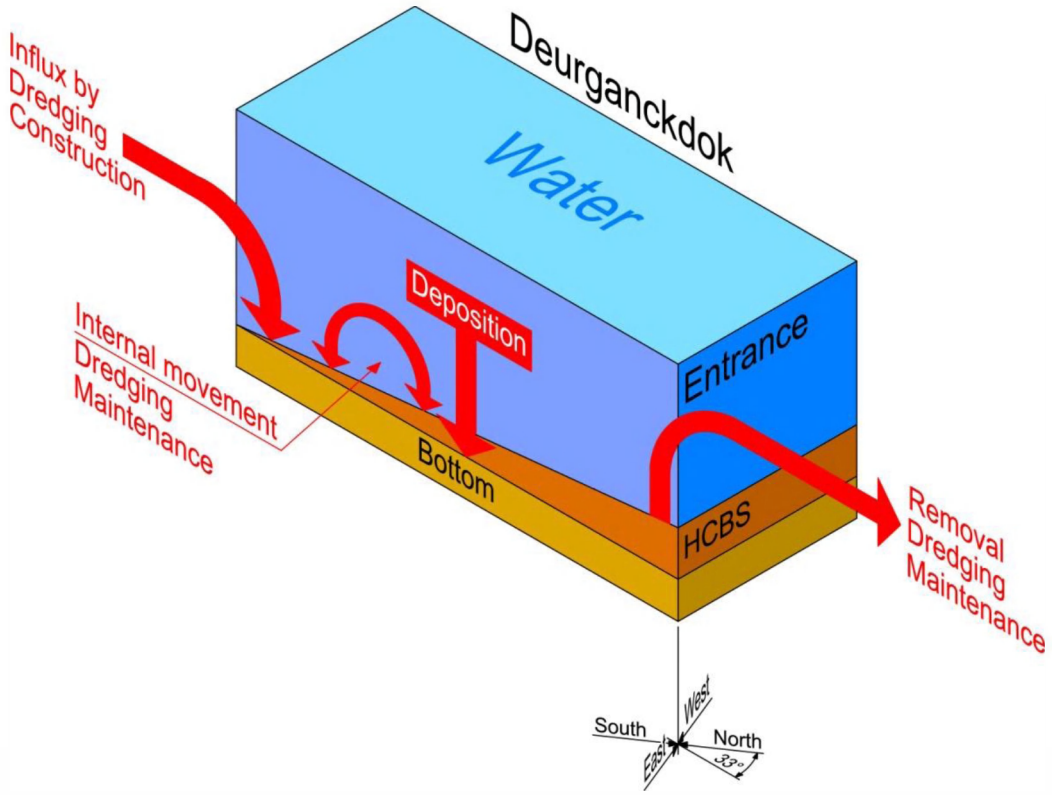


Figure 2-1: Elements of the sediment balance

A net deposition can be calculated from a comparison with a chosen initial condition t_0 (Figure 2-2). The mass of deposited sediment is determined from the integration of bed density profiles recorded at grid points covering the dock. Subtracting bed sediment mass at t_0 leads to the change in mass of sediments present in the dock (mass growth). Adding cumulated dry matter mass of dredged material removed since t_0 and subtracting any sediment influx due to capital dredging works leads to the total cumulated mass entered from the Scheldt river since t_0.

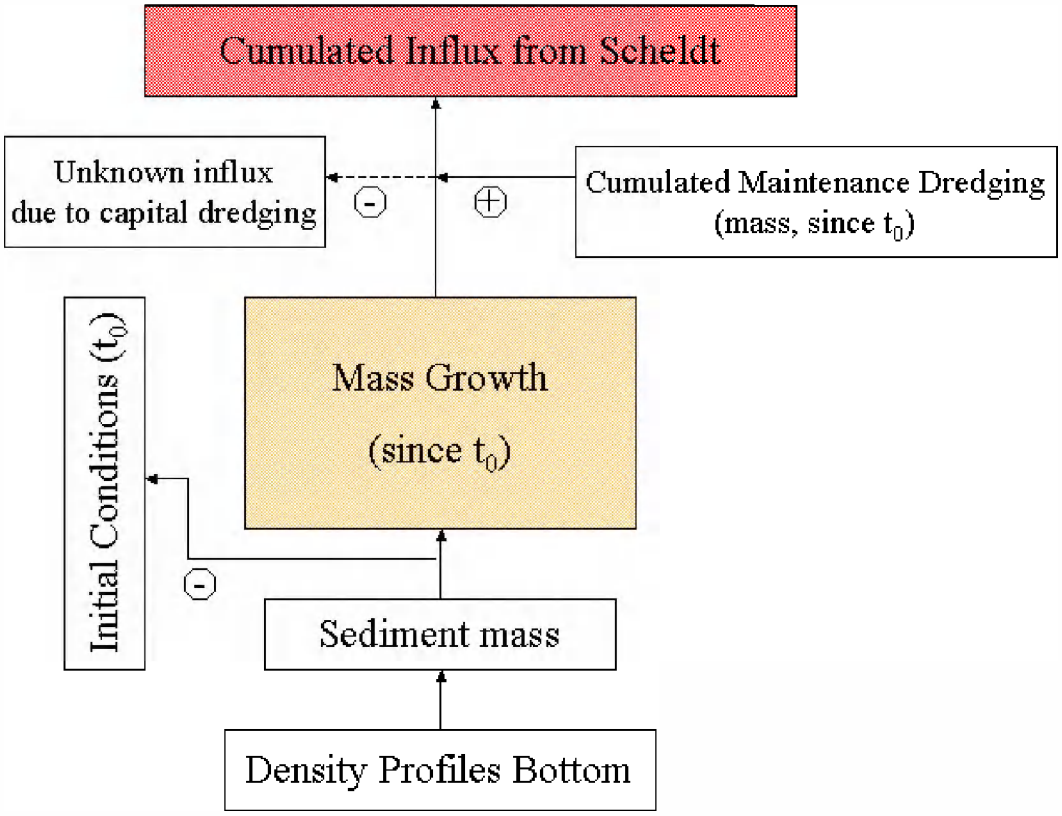


Figure 2-2: Determining a sediment balance

The main purpose of the second part of the study is to gain insight in the mechanisms causing siltation in Deurganckdok. The following mechanisms will be aimed at in this part of the study:

- Tidal prism, i.e. the extra volume in a water body due to high tide
- Vortex patterns due to passing tidal current
- Density currents due to salt gradient between the Scheldt river and the dock
- Density currents due to highly concentrated benthic suspensions

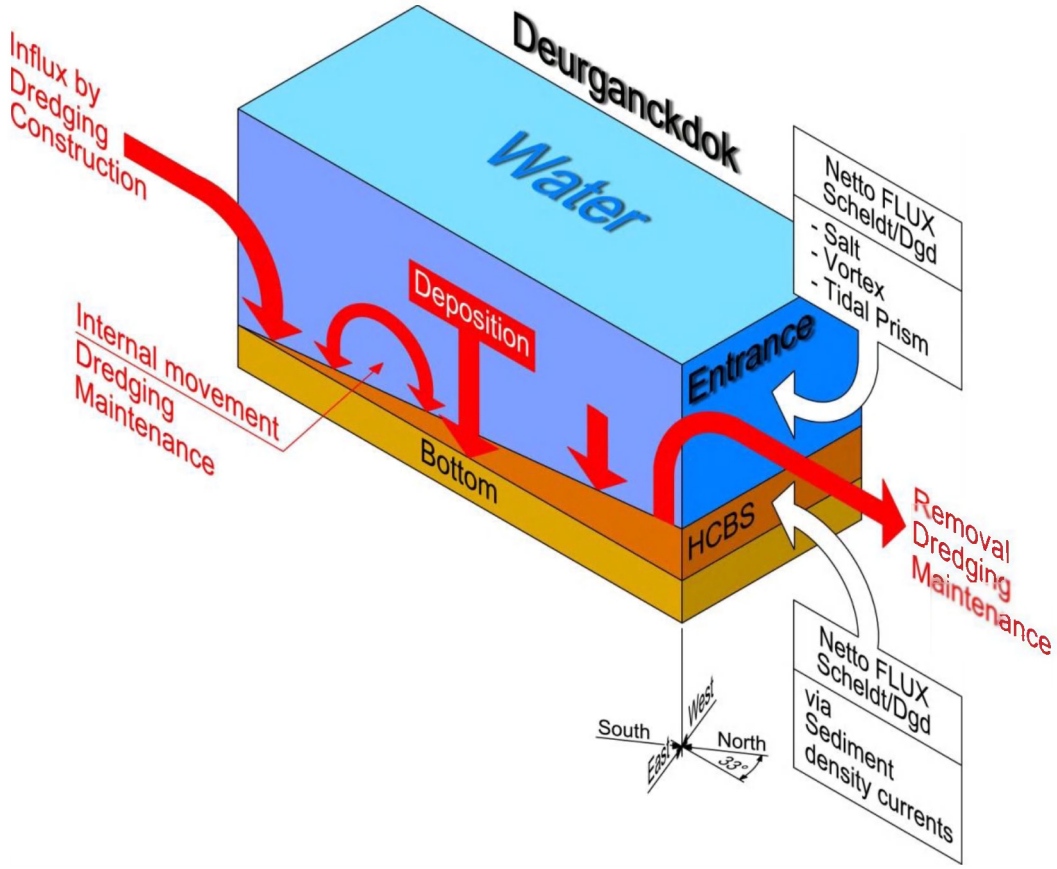


Figure 2-3: Transport mechanisms

These aspects of hydrodynamics and sediment transport have been landmark in determining the parameters to be measured during the project. Measurements will be focussed on three types of timescales: one tidal cycle, one neap-spring cycle and seasonal variation within one year.

Following data are being collected to understand these mechanisms:

- Monitoring the freshwater input (discharge) from the tributaries into the river Scheldt.
- Monitoring salinity and sediment concentration in the Lower Sea Scheldt at permanent measurement locations at Oosterweel, up- and downstream of the Deurganckdok.
- Long term measurement of salinity and suspended sediment distribution in Deurganckdok.
- Monitoring near-bed processes (current velocity, turbidity, and bed elevation variations) in the central trench in the dock, near the entrance as well as near the current deflecting wall location.
- Dynamic measurements of flow pattern, salinity and sediment transport at the entrance of Deurganckdok.
- Through tide measurements of vertical sediment concentration profiles -including near bed high concentrated benthic suspensions.
- Monitoring dredging activities at the entrance channels towards the Kallo, Zandvliet and Berendrecht locks as well as dredging and dumping activities in the Lower Sea Scheldt and Deurganckdok in particular.

In situ calibrations were conducted on several dates to calibrate all turbidity and conductivity sensors.

2.2 DESCRIPTION OF THE MEASUREMENT CAMPAIGN

2.2.1 Purpose of the measurement campaign

The purpose of the measurements was to determine the cross-section distribution of the suspended sediment concentration, the sediment flux and flow velocity during a complete tidal cycle.

Measurements were undertaken on the DGD transect (Figure 2-4), being the cross section between the river Scheldt and the dock itself.

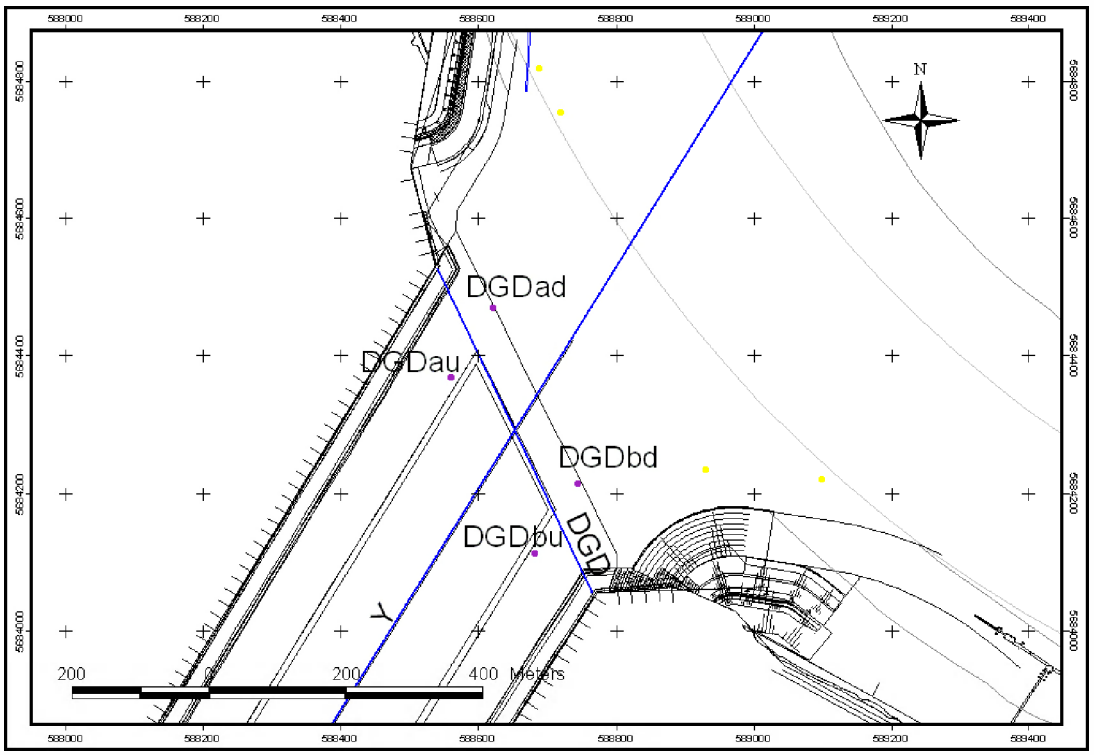


Figure 2-4: Map of sailed transect DGD perpendicular to Deurganckdok (DGD) on 16th of March 2012 (ED50).

2.2.2 Measurement procedure

Flow velocity, Turbidity, Salinity and Temperature measurements were conducted on the 16th of March 2012 from 8h45 MET until 20h58 MET. This transect was sailed throughout almost 12.5 hours to cover a complete tidal cycle. The vessel with a mounted ADCP sailed a fixed transect from the right bank to the left bank and vice versa as a backup transect (Table 2-1). Profiles were gathered to calibrate the ADCP transects for temperature, salinity and suspended sediment concentration to be used in Sediview. The profiles were taken close to the locations of the Long Term frames, situated north and south of the DGD-entrance (see IMDC, 2012d).

During these calibrations, a fish with a CTD-OBS was lowered to the bottom. The downcast was interrupted at two depths, one in the upper half of the water column (around 4 meters from the water surface) and one at 4 meters above the bottom and the last one at the water bottom (about 10

meters above water surface). At the two first depths samples were taken for calibration, and are used as 'ground truth' for all suspended sediment concentration measurements (OBS and Sediview). The other instruments logged continuously during the downcast. Conductivity, temperature and depth was logged by the CTD-probe, while turbidity was recorded by the OBS.

Table 2-1:Transect of the Flow Measurements on 16th of March 2012 (UTM31 ED50)

Measurement location	Left Bank Easting	Left Bank Northing	Right Bank Easting	Right Bank Northing	Length [m]	Course [degr.]
Transect DGD	588 541	5 684 527	588 765	5 684 056	522	336

2.3 THE EQUIPMENT

2.3.1 ADCP

The current measurements were conducted using a Teledyne RD Instruments ADCP 1200 kHz Workhorse with beam angle 20°. For positioning the GPS onboard the vessel Parel II was used. For the measurement of the heading a gyrocompass was installed.

This 1200 KHz ADCP system was mounted on a steel pole at the port side of the vessel. The transducer set was looking vertically downwards to the bottom. Transceiver unit and computer system were connected to peripherals such as the differential GPS-receiver, ADCP and the gyrocompass.

During the measurements the ADCP acquisition software of Winriver was used. The main settings are given in Table 2-2.

Table 2-2: Main Configuration Settings of ADCP

Main configuration settings of ADCP 1200kHz Worhhorse:
Cell depth: 0.5 m
Number of cells: 50
Number of Water pings per ensemble: 2
Number of Bottom Track pings per ensemble: 2
Time between ensembles: 0
Averaging: None
Speed of Sound: Fixed 1500 m/s
Salinity 0 psu
3-beam solution: enabled
Beam angle: 20°

2.3.2 CTD-OBS3A

A CTD Diver together with an OBS3A were used at two instances to measure the conductivity, turbitity and temperature profiles (together with the absolute pressure).

A D&A type OBS 3A was used to measure absolute pressure (m), temperature (°C) and turbidity (NTU) while the conductivity (mS/cm) was extracted from the CTD-diver.

On starboard side of Parel II, the OBS 3A device and CTD-Diver were mounted on a tow fish together with a water hose. The resulting record is filled-up with GPS-time, sample number, and planimetric position of the GPS-receiver. Sampling frequency is 1 reading per second.

The technical details on the OBS 3A and CTD-diver are given in the winter calibration Report of the HCBS 1 measurement campaign. (IMDC, 2006a)

2.3.3 Pump sampler

A water sampler was attached nearby the turbidity sensor taking water samples. Samples were collected in 1 liter sampling bottles. The pumping speed of the water sampler was tested at the start of the measurement campaign on board. Dye was used to time the duration between the intake of the dye and exit at the sampling end of the sampler on board. The duration between intake and exit at the end was 26 seconds.

3. DESCRIPTION OF THE MEASUREMENTS

3.1 MEASUREMENT PERIODS

At Deurganckdok ADCP tracks were sailed about every 10 minutes for 12.5 hours, in total 76 cross-sections or 28 cycles.

Calibration profiles were taken at 2 locations (left bank, right bank). Almost during every cycle, 1 calibration profile was taken, resulting in a total of 26 profiles.

Annex A gives the start and end points of the tracks, the sailed length and the course.

3.2 HYDRO-METEOROLOGICAL CONDITIONS DURING THE MEASUREMENT CAMPAIGN

3.2.1 Vertical tide during the measurements

The vertical tide was measured at the Liefkenshoek tidal gauge. Graphs of the tide at Liefkenshoek on the 16th of March 2012 can be found in Annex B. Table 3-1 gives the most important characteristics (high and low tide) of the tide at this gauge on the 16th of March 2012.

Table 3-1: High and low tide at Liefkenshoek on 16/03/2012

Liefkenshoek Tidal Gauge		
16 March 2012		
	Time [MET]	***Water level [m TAW]***
LW (1)	03:20	0.15
HW (2)	09:25	4.88
LW (3)	16:15	0.21
HW (4)	22:20	4.41

In Table 3-2 the tidal characteristics of the tide on the 16th of March 2012 are compared to the average tide over the decade 1991-2000 (AMT, 2003).

Table 3-2: Comparison of the tidal characteristics of 16/03/2012 with the average tide, the average neap tide and the average spring tide over the decade 1991-2000 for Liefkenshoek.

	Neap tide (1991 - 2000)	***Avg Tide (1991 - 2000)***	***Spring Tide (1991 - 2000)***	***Tide 16/03/2012***
Water level [m TAW]				
LW (1)	-	-	-	0.15
HW (2)	4.63	5.19	5.63	4.88
LW (3)	0.39	0.05	-0.18	0.21
HW (4)	-	-	-	4.41
Tidal difference [m]				
Rising (1 to 2)	4.24	5.14	5.81	4.73
Falling (2 to 3)	4.24	5.14	5.81	4.67
Rising (3 to 4)	4.24	5.14	5.81	4.20
Duration [hh:mm]				
Rising (1 to 2)	5:59	5:34	5:16	6:05
Falling (2 to 3)	6:40	6:50	7:02	6:50
Rising (3 to 4)	5:59	5:34	5:16	6:05
Tide (1 to 3)	12:39	12:24	12:18	12.55
Tide (2 to 4)	12:39	12:24	12:18	12:55
Tidal coefficient				
Rising (1 to 2)	0.82	1.00	1.13	0.92
Falling (2 to 3)	0.82	1.00	1.13	0.91
Rising (3 to 4)	0.82	1.00	1.13	0.82

The tidal coefficients from 0.82 up to 0.92 for the measured tide of the 16th of March 2012 indicate that this tide has a tidal range close to the average neap tide for the decade of 1991-2000, and therefore can be classified as neap tide.

3.2.2 Meteorological data

Meteorological data at Woensdrecht (NL) was obtained from the Weather Underground website (Wunderground, 2012). The weather on the 16th of March was dry. The wind blew all day from all directions at an average velocity of 2 km/h. The air temperature varied between 12 and 16°C. The sky was most of the time covered with no precipitation.

3.3 NAVIGATION INFORMATION

An overview of the relevant navigation at the measurement location is given in Annex C.

3.4 REMARKS ON DATA

No major problems occurred on board of the Parel II. At some transects the ADCP could not detect the bottom very well which resulted in false velocity data. The bottom track problem is related to the presence of a thicker mud layer compared to previous campaigns which is a result of deeper dredging activities in the winter of 2011-2012 (IMDC, 2012m). The faulty velocities and shipwakes were removed from the data. The removed data were interpolated to calculate the discharge and flux.

4. PROCESSING OF DATASETS

4.1 CALIBRATION OF THE OBS TURBIDITY SENSOR

A crucial aspect of the accuracy and reliability of the data concerns the calibration of the OBS turbidity sensor. The calibration of the OBS sensor is necessary to convert turbidity into Suspended Sediment Concentration (SSC). An in situ calibration of the OBS3A was performed. At some depths water samples were taken by the pump sampler and were analysed by a laboratory for SSC. These SSC were used as 'ground truth' to calibrate the OBS turbidity sensor.

4.2 METHODOLOGY OF PROCESSING OF THE ADCP DATA WITH SEDIVIEW

DRL Software's Sediview was used to process the ADCP data. Sediview is designed to derive estimates of suspended sediment concentration throughout the water column using acoustic backscatter data obtained by ADCP's manufactured by RD Instruments of San Diego, California.

4.2.1 Acoustic backscatter theory

The acoustic theory governing backscatter from particles suspended in the water column is complex, but the following simplified formula serves to introduce the main factors that are relevant:

$$E = SL + SV + Constant - 20\log(R) - 2\alpha_w R$$

Where:

E = echo intensity,
SL = transmitted power,
SV= backscatter intensity due to the particles suspended in the water column,
α_w = a coefficient describing the absorption of energy by the water,
R = the distance from the transducer to the measurement bin.

The term 20log(R) is a simple geometric function that accounts for the spherical spreading of the beam. The constant is required because each ADCP has specific performance characteristics.

In order to measure the suspended sediment concentration in the water column it is necessary to relate the backscattered sound intensity to the mass concentration in the water. For the purposes of measuring solids concentration on site, it can be shown that the relationship is as follows (derived from Thorne and Campbell, 1992 and Hay, 1991 in DRL (2003)):

$$Log_{10}M_r = \{dB + 2r(\alpha_w + \alpha_s) - K_s\}S^{-1}$$

Where:

M(r) = mass concentration per unit volume at range, *r*
S = relative backscatter coefficient
K_s = site and instrument constant
dB = the measured relative backscatter intensity (corrected for beam spreading)
α_w = water attenuation coefficient
α_s = sediment attenuation coefficient, which is a function of the effective particle size

In this expression there are four unknowns: *S*, *Ks*, α_w and α_s. These parameters are to be determined within Sediview (6.Annex E).

4.2.2 Water sampling and transect sailing

To calibrate Sediview for suspended sediment concentration, two water samples are taken at the beginning and at the end of each transect (see 3.1). Both samples are taken within the range of reliable data of the ADCP. For the near-surface sample this means in bin 3 or 4, for the near-bed sample this means at about one or two meter above the side lobe.

Water sampling is done together with CTD-OBS measurement in order to have two independent suspended sediment concentration measurements for each sample. OBS measurements were compared to the water samples and recalibrated as mentioned in §4.1. The water samples were used for Sediview calibration, while cross-calibrated OBS measurements were used as a backup check. The salinity and temperature was used to compute the acoustic water absorption (water attenuation coefficient). All water samples were analyzed as is described in 4.2.3.

4.2.3 Calibration for suspended sediment concentration within Sediview

4.2.3.1 Calibration workset

The calibration workset consists of ADCP-files, sampling times, sampling depths, SSC obtained from water samples and SSC, temperature and salinity obtained from CTD-OBS readings.

The suspended sediment concentration of the water samples was determined. One-litre samples were filtered over a preweighed desiccated 0.45 micron filter, after which the filter is dried in an oven at 105°C, cooled and weighted (NEN 6484).

4.2.3.2 SSC calibration per ensemble pair

In the Sediview calibration process the following parameters must be defined: the site and instrument constant (Ks), the relative backscatter coefficient (S) and the effective particle size per ensemble-pair (near-surface sample and near-bed sample) in order to fit the Sediview-estimate with the suspended sediment concentration of the water samples. These parameter sets may not differ too much from the previous parameter sets, as the environmental conditions will not change that much over a small time interval. To obtain a smooth progress in time of Ks, S and effective particle size an iterative approach is used (see Annex E).

4.2.4 Sediview configuration

4.2.4.1 Discharge and suspended sediment concentration estimates

The ADCP measures most of the water column from just in front of the ADCP to 6% above the bottom when the beam angle is 20°.The shallow layer of water near the bottom is not used to compute discharge and suspended sediment concentration due to side-lobe interference. When the ADCP sends out an acoustic pulse, a small amount of energy is transmitted in side lobes rather than in the direction of the ADCP beam. Side lobe reflection from the bottom can interfere with the water echoes and can give erroneous data. The thickness of the side lobe layer for the ADCP used during this campaign is 12% of the distance from the transducers to the bottom.

Near the banks the water depth is too shallow for the ADCP to profile.

For each of those unmeasured regions, an estimate of the discharges and suspended sediment concentration is made. The measured and unmeasured regions in the cross section are shown in Figure 4-1 and Figure 4-2.

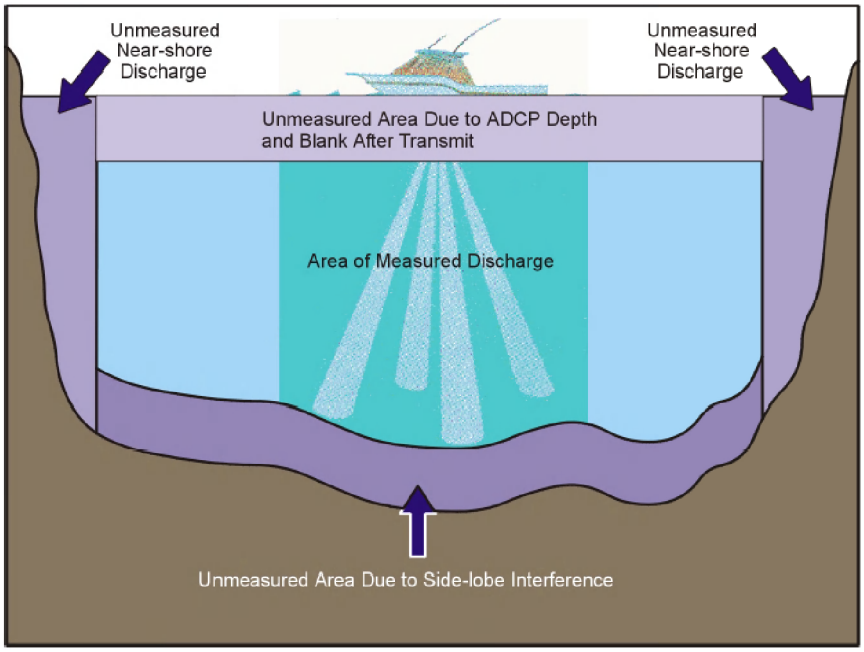


Figure 4-1: Unmeasured regions in the cross section (from RD Instruments, 2003)

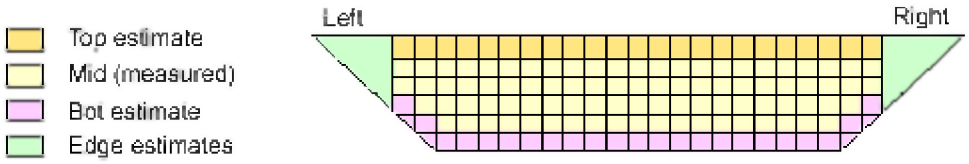


Figure 4-2: Measured and estimated discharges and sediment fluxes within Sediview (DRL, 2005)

4.2.4.1.1 Top/bottom estimates

The sediment concentration and discharge at the top of the water column is assumed to be the same as the concentration and discharge in the first measured bin.

The sediment concentration between the bottom and the lowest valid bin is assumed to be an increase of the lowest valid bin. As the concentration grows approximately linear from the lowest valid bin to the bottom, and as Sediview/Matlab uses a constant concentration factor for these deepest bins, we use a concentration factor of 125% (Figure 4-3).

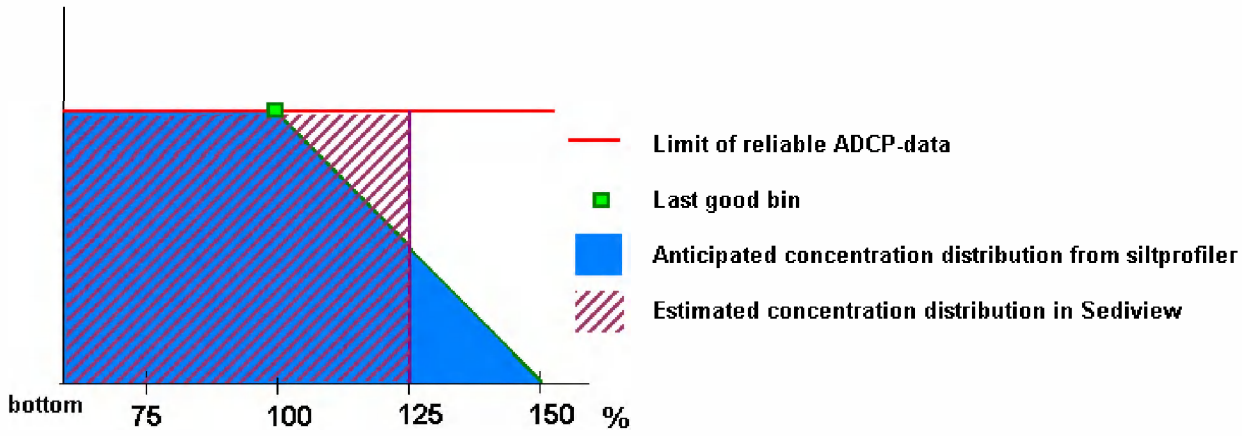


Figure 4-3: Principal of bottom estimate of the sediment concentration in Sediview

Table 4-1: Extrapolation methods for top and bottom variables

Variable	***Top***	***Bottom***
Discharge Method	Constant	Power
Concentration factor	100%	125%

The discharge for the bottom water layer is estimated by using the power method. Chen (1991) discusses the theory of power laws for flow resistance. Simpson and Oltmann (1990) discuss Chen's power law equivalent of Manning's formula for open channels (with b=1/6) (RD Instruments, 2003).

$$u/u^* = 9.5(z/z_0)^b$$

Where:

z = Distance to the channel bed [m]
u = Velocity at distance z from bed [m/s]
u* = Shear velocity [m/s]
z_0 = Bottom roughness height [m]
b = Exponent (1/6)

4.2.4.1.2 Edge estimates

The shape of the edges of the cross section is assumed to be near triangular due to the banks of the river Scheldt. Five data ensembles are to be averaged to determine the left and right bank mean velocities used for calculation of edge estimates.

The distance from start- and endpoint to the bank is calculated from the theoretical start- and endpoint at the bank to the effective start- and endpoint. The theoretical points are taken at the banks (see Table 2-1).

The formula for determining the near shore discharge is:

$$Q_{shore} = CV_m Ld_m \text{ [m³/s]}$$

Where:

C = Coefficient (0.35 for triangular, 0.91 for rectangular shape)
V_m = Mean water velocity in the first or the last segment [m/s]
L = Distance from the shore to the first or the last segment specified by the user [m]
d_m = Depth of the first or the last segment [m]

The coefficient (C) has been set to 0.91 (triangular shape of the banks).

4.2.4.2 Contour plots of the transects

All contour plots show perpendicular and parallel projected values on the straightened sailed transects. The heading of the straightened sailed transect is defined by picking 2 points in the straight part of the line after having corrected the heading of the ADCP compass. The compass offset is derived from a comparison of the ADCP's bottom track with the external GPS data.

4.2.5 Output

General transect information containing start-stop coordinates of each sailed transects with stop time, track length and heading is given in Annex A.

In Annex G, contourplots were generated for each transect showing the distribution of suspended sediment concentration & sediment flux as well as the flow velocity perpendicular and parallel to the transect. The following conventions were used:

- Distances on the X-axis were referenced to the starting point of the transect, the start of the sailed transect is always at distance equal to zero.
- Left bank is always shown left, right bank on the right side. For transect DGD, left bank was taken to be the western quay wall and the right bank to be the eastern quay wall considering the dock as being a tributuary to the Scheldt river.
- Perpendicular flow velocities and fluxes are positive for downstream flow (ebb, out of Deurganckdok), negative for upstream flow (flood, inbound).
- Parallel flow velocities are positive for flow going from the left bank to the right bank, and negative for flow going from the right bank to the left bank.
- Absolute Depth is given in meters above TAW.

Also a depth-averaged velocity plot was generated for the flow velocity perpendicular to the transect. (see Annex F).

Tables in Annex G) give the values for discharges, sediment fluxes and the average measured SSC for the total cross-section with:

- Mid = measured part of the cross-section
- Top = top part of the cross-section
- Bottom = bottom part underneath the sidelobe
- Edge (left, right) = edge estimates to left & right bank
- Total = Mid+Top+Bottom+ Edge values

The graph in Annex H gives the temporal variation of the total flux, total discharge and total measured SSC for the whole through tide measurement at Deurganckdok.

5. PRELIMINARY ANALYSIS OF THE DATA

5.1 MARCH 16TH 2012 SURVEY

As Deurganckdok is situated along the part of the river Scheldt under tidal influence, it is subject to complex current fields near its entrance. The measured current field shows a vortex pattern depending on the tidal phase. During ebbing tide the vortex at the entrance of the dock is a counter-clockwise one and during rising tide it is a clockwise one. This is shown in the contour plots by inflow (negative) on the western side (left) and outflow on the eastern side of the entrance during ebbing tide and vice versa for flooding tide. (Annex F).

During slack water we see a current field with opposing current directions in the upper part of the water column compared to the lower part of the water column. For high water, there is an inflow (negative) near the bottom and outflow (positive) near the surface. This particular pattern is the result of expected salinity density currents occurring near the entrance of Deurganckdok. The same event is seen at low water when the dock contains waters of higher salinity than the river; here we see an outflow near the bottom and inflow near the surface.

From the backscatter interpretation into suspended sediment concentration (SSC), one can notice in general a higher concentration during flood compared to during ebb (Table 5-1). The highest incoming SSC occur around HW (Figure 5-1). The incoming averaged suspended sediment concentrations range from 29 mg/l up to 120 mg/l during ebb and from 56mg/l to 234 mg/l during flood, whereas the outgoing concentrations range from 18 to 87 mg/l during ebb and from 46 to 104 mg/l during flood.

Table 5-1 Average SSC's over the sailed transect

	Concentration [mg/l]								
	overall SSC			***incoming SSC***			***outgoing SSC***		
Tide	***min***	***average***	***max***	***min***	***average***	***max***	***min***	***average***	***max***
Ebb	30	44	75	29	58	120	18	36	87
Flood	63	80	128	56	90	234	46	78	104

Considering the sediment fluxes, Figure 5-1 shows that residual incoming transport is dominating during flood and HW. During ebb the magnitude of the incoming and outgoing transport are both small. To visualize in- and outflow, the absolute values of the inflow have been used. If the measured total line is negative, it means that measured inflow is greater than measured outflow. Or a negative measured total value means a total inflow/influx, a positive measured total value means a total outflow/outflux.

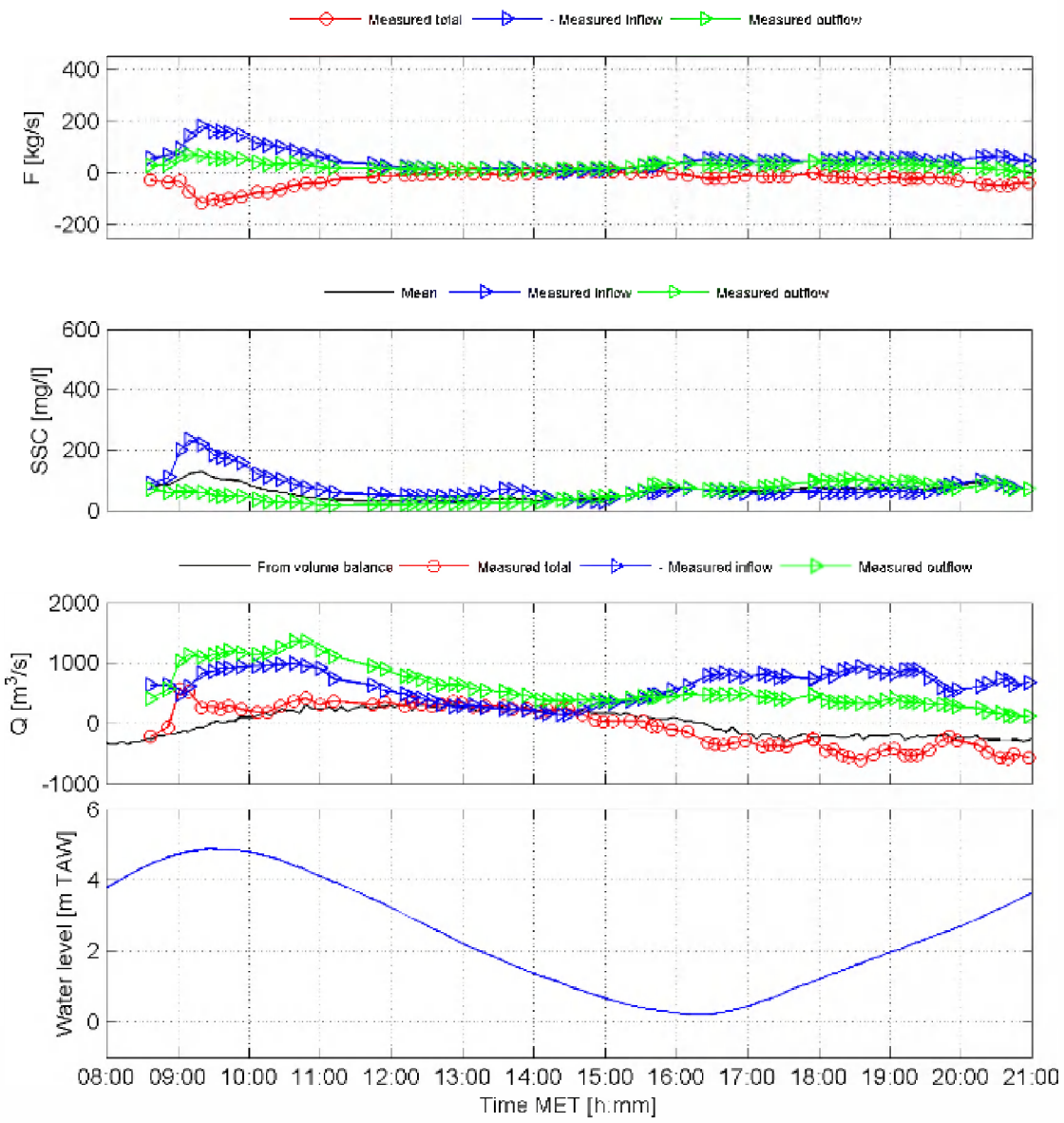


Figure 5-1 Total in/out/net flux, Total incoming/outgoing SSC, average in/out/net discharge and water level at DGD on March 16th 2012.

5.2 INTERCOMPARISON WITH EARLIER SURVEYS AT DGD

Since 2005, IMDC has organized several through tide measurement campaigns at the entrance of Deurganckdok. The course and results of the campaigns were described in IMDC rapports and are listed in Table 5-2. Table 5-2 gives also an overview of the tidal phase during the campaigns. Conditions near the entrance of Deurganckdok have been simulated in Delft3D and processed by IMDC (2006n) in order to compare simulation with observed data.

Since the first measurement campaign several human impacts took place in or near Deurganckdok which influenced the siltation processes. The impacts are also given in Table 5-2. Dredging activities took place in 2011-2012 between the months: March-May, September-October and December-January. During the dredging activities the bed level was deepened by around 1.0m (IMDC, 2012m).

Table 5-2: Hydrological conditions during through tide ADCP measurements at the entrance of DGD

Tidal Coefficient at tidal gauge: Liefkenshoek				
PROJECT (DESCRIPTION)	***Date***	***Tidal coefficient***	***Tidal phase***	***Fresh water discharge at Schelle [m³/s]***
HCBS 1 (IMDC, 2006m)	17/11/2005	1.10	Spring	91*
HCBS 2 (IMDC, 2006c)	22/03/2006	0.97	Average	94*
HCBS 2 (IMDC, 2007o)	27/09/2006	1.03	Average	33*
The dock is enlarged to 1.019 km² after completing the 3rd phase				
DGD 1 (IMDC, 2008a)	24/10/2007	1.02	Average	46*
DGD 2 (IMDC, 2008k)	11/03/2008	1.17	Spring	286*
DGD 3 (IMDC, 2008u)	19/06/2008	1.15	Spring	93*
DGD 3 (IMDC, 2008v)	26/06/2008	0.97	Average	69*
DGD3 (IMDC 2008x)	24/09/2008	0.81	Neap	75*
DGD 3 (IMDC, 2009a)	30/09/2008	1.08	Spring	82*
DGD 3 (IMDC, 2009e)	02/12/2008	0.98	Average	154*
DGD 3(IMDC,2009f)	10/12/2008	0.97	Average	222*
DGD 3(IMDC,2009i)	06/03/2009	0.82	Neap	99*
DGD 3(IMDC,2009n)	12/03/2009	1.24	Spring	129*
Since June 2010, the sill at the entrance is completely dredged and CDW construction is completed in August 2011.				
Eff DGD (IMDC, 2012a)	28/09/2011	1.06	Avg/Spring	40**
Eff DGD (IMDC, 2012b)	06/10/2011	0.83	Neap	55**
Eff DGD (IMDC, 2012a)	13/10/2011	1.17	Spring	60**
Eff DGD (IMDC, 2012g)	08/03/2012	1.16	Spring	305**
Eff DGD (IMDC, 2012h)	16/03/2012	0.88	neap	85**

* Daily fresh water discharge based on AZ (1974) and ** 5-day averaged water discharge based on FHR (2009).

5.2.1 Fresh water discharge

The fresh water discharges at Schelle were calculated from the tributaries, which were recorded during long term measurements campaigns by Flanders Hydraulics Research (FHR). The calculation procedure before this project is described in AZ (1974) and is based on the use of correction coefficients that take in account the surface of the hydrological basins. Since 2009 FHR is using a new calculation procedure where the discharges from the tributaries are averaged about 5 days. This procedure is described in FHR (2009) and the results about the measurement campaign are given in Annex B. The daily or 5-day averaged fresh water discharges at Schelle are listed in Table 5-2. The evolutions of the fresh water discharge at Schelle for all former campaigns are shown in Figure 5-2.

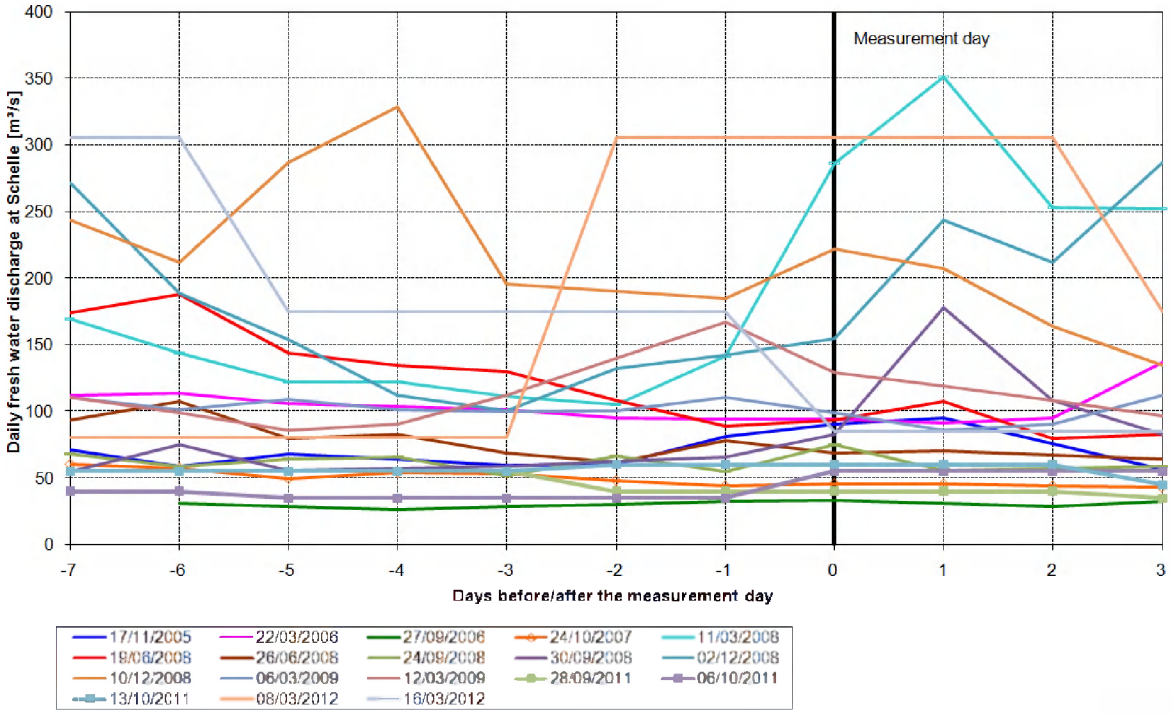


Figure 5-2: Daily fresh water discharge evolution at Schelle before and after a measurement day.

The results presented in Annex B are based on a long-term simulation over a period of 30 year (1971-2000) with the SIGMA-model for MKBA (IMDC, 2006r). The mean discharge is the annual average ten days' discharge, calculated with simulated long-term measurements. The high and low discharges are also annual ten days' discharges, and are calculated as mean discharge $+2\sigma$ and mean discharge -2σ.

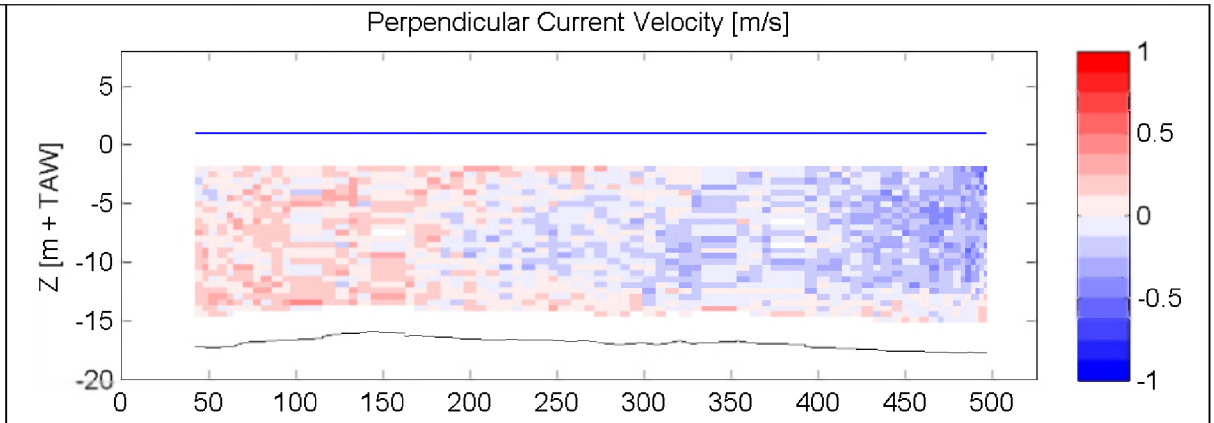
5.2.2 Sediment distributions and current pattern around HW

In Annex I the earlier measurement campaigns have been compared for about 3 hours after high water because it appeared that during the first campaigns the horizontal ebb eddy currents were clearly visible at 3 hrs after HW. Sediment distributions as well as current pattern in the cross section are similar for all campaigns. The western side of the dock is situated at the left of these figures, the eastern side at the right. The sediment distribution and current pattern of this neap tide measurement is less pronounced than the patterns during average and spring tide measurements.

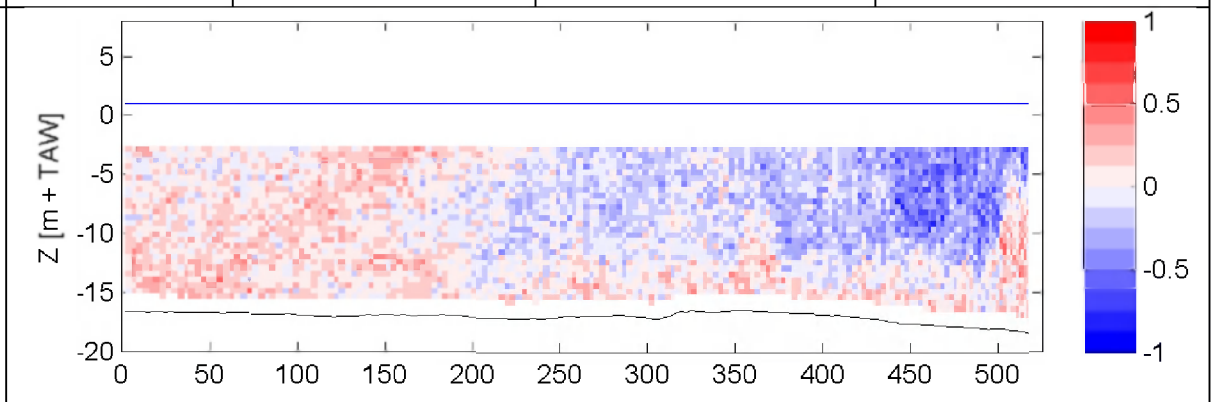
The circulation pattern and sediment concentration have been compared about 1h after HW because it appeared that during the first campaigns the density currents were clearly visible at 1h after HW. Again the current pattern is almost identical between the different days with a salinity wedge intruding near the bottom of the dock and compensatory outflow of fresher water near the surface. Except for the measurement on 02/12/2008, the sediment distributions are very similar between the different campaigns. The more turbid water of the River Scheldt flows near the bottom into the dock.

The current deflecting wall (CDW) construction at the North side of Deurganckdok should influence the horizontal eddy during flood. The CDW deflects the upper part of the water column into the dock. A near bed sill deflects the high concentration bottom layers towards the river Scheldt. Two moments during flood are selected to make an inter-comparison with earlier sailed measurement campaigns without CDW and with sill (Table 5-2): 3 and 1 hour before HW.

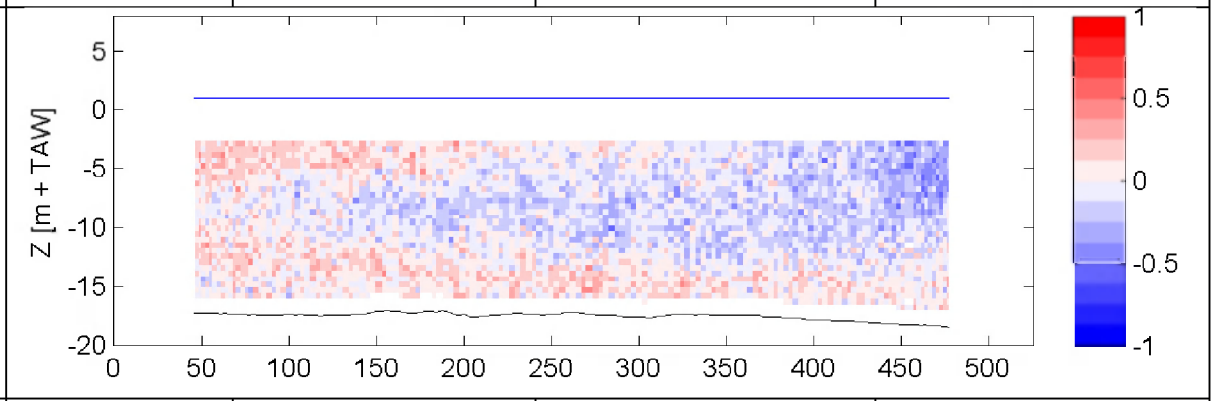
The flood horizontal eddy starts about 3 hours before HW and is finishing about HW. The current pattern at 3 hours before HW is a result of a combination of a horizontal eddy and a density current (**Error! Reference source not found.**). The current pattern of the last measurement campaign shows a more horizontal transition which suggests that the horizontal eddy is less strong and the density current is more dominating. At 1 hour before HW it can be seen that both mechanisms are present and in balance (Figure 5-5). It is difficult to observe a difference in current and SSC pattern between with and without CDW (Figure 5-3- Figure 5-6) as it depends largely on the momentary river discharge and seasonal conditions. An extensive analyses is needed and will be covered in analysis report.



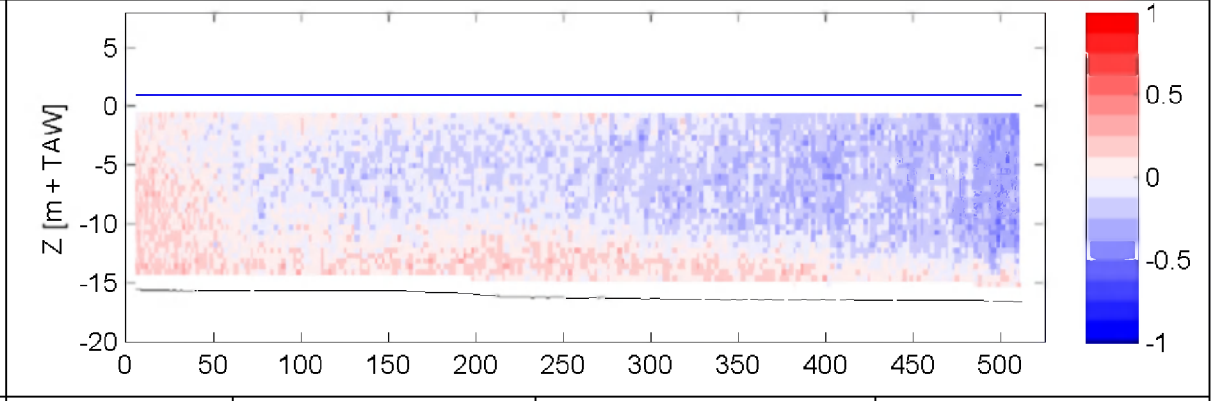
a)	24/09/2008	3 hrs before HW	Tidal coefficient: 0.81	Fresh water: 75 m³/s



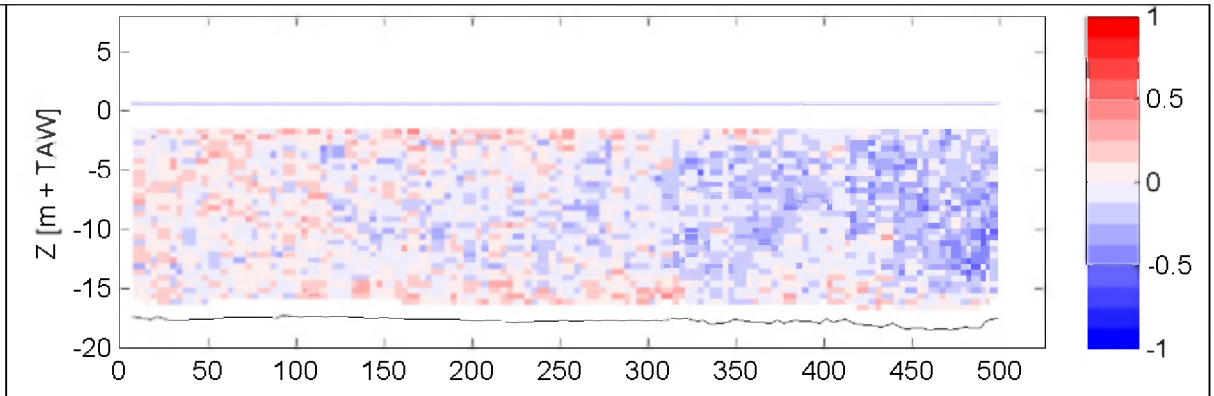
b)	02/12/2008	3 hrs before HW	Tidal coefficient: 0.98	Fresh water: 154 m³/s



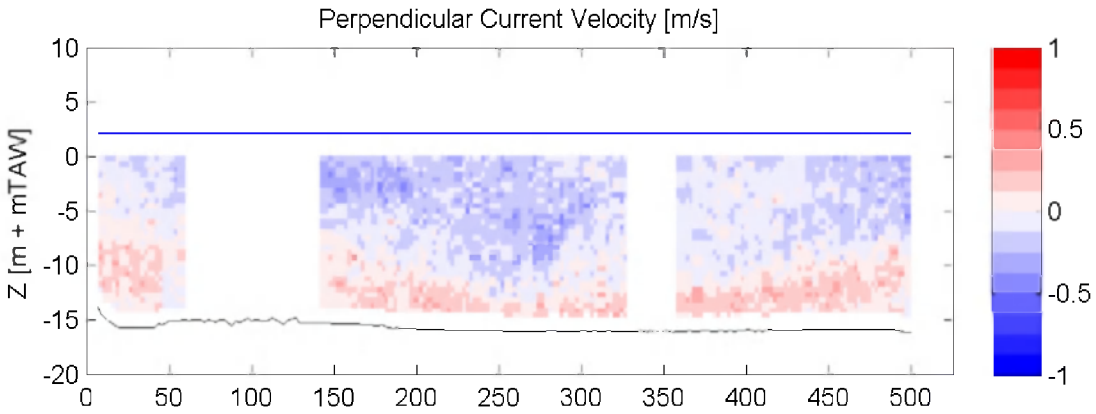
c)	10/12/2008	3 hrs before HW	Tidal coefficient: 0.97	Fresh water: 222m³/s



d)	06/03/2009	3 hrs before HW	Tidal coefficient: 0.82	Fresh water: 99m³/s

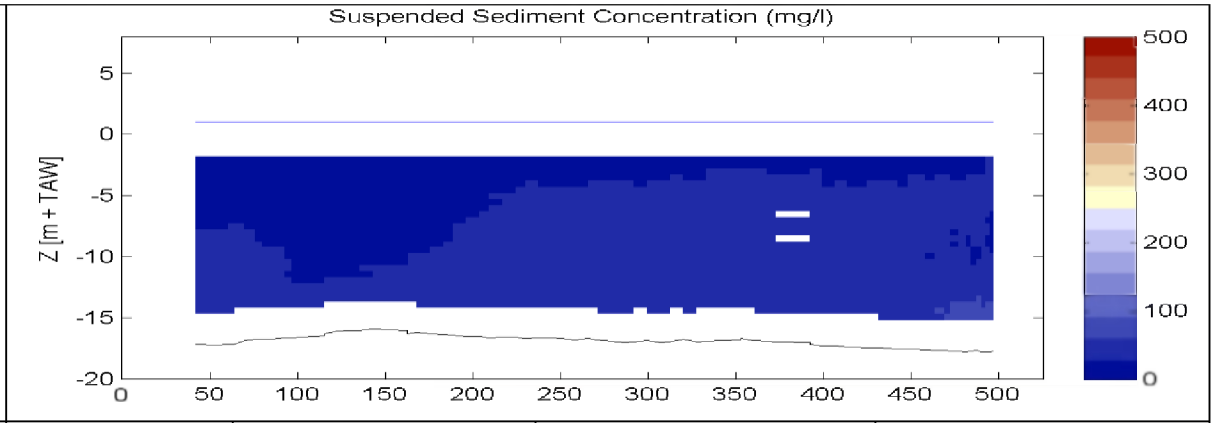


e)	06/10/2011	3 hrs before HW	Tidal coefficient: 0.83	Fresh water: 55 m³/s

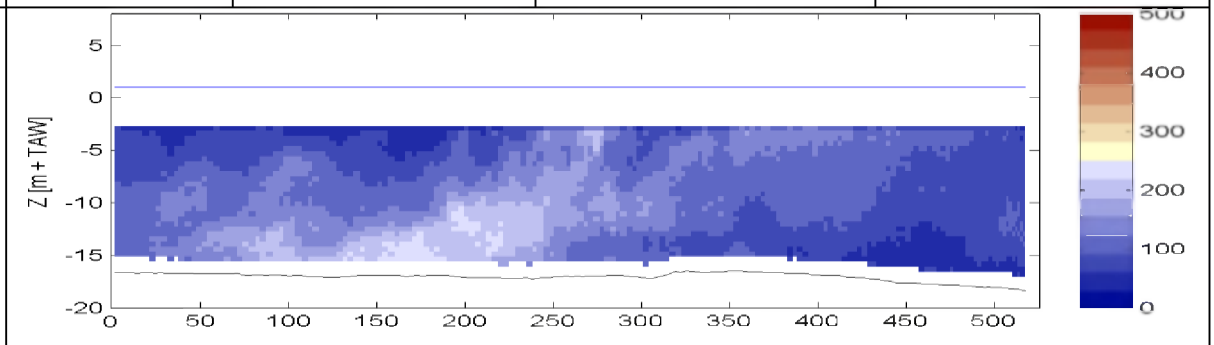


f)	16/03/2012	3 hrs before HW	Tidal coefficient: 0.88	Fresh water: 85 m³/s

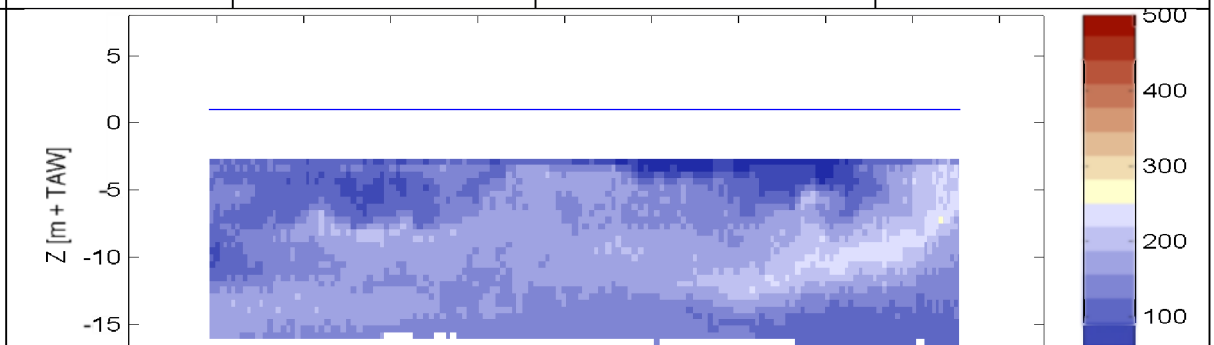
Figure 5-3: Perpendicular current velocity at 3hrs before high water



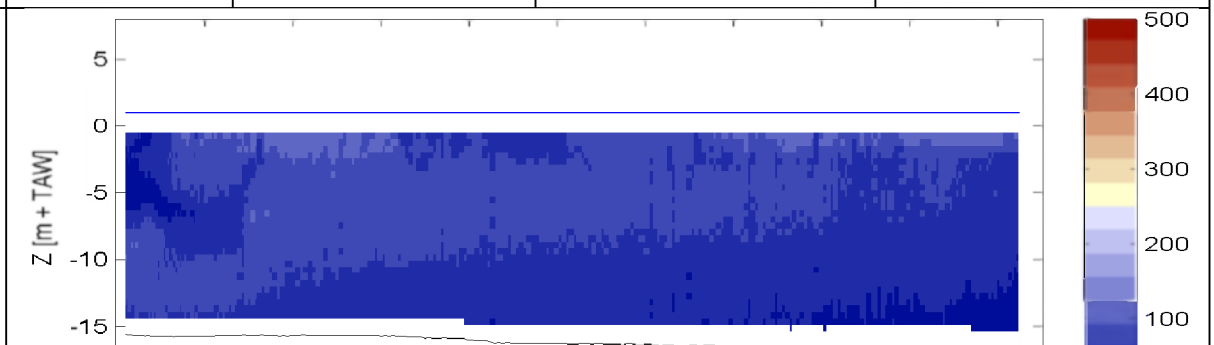
a)	24/09/2008	3 hrs before HW	Tidal coefficient: 0.81	Fresh water: 75 m³/s



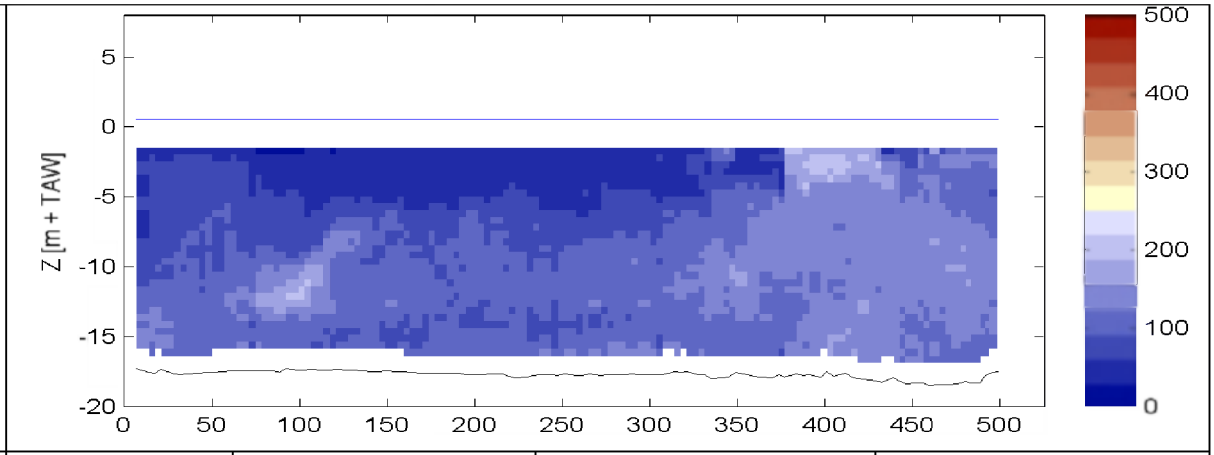
b)	02/12/2008	3 hrs before HW	Tidal coefficient: 0.98	Fresh water: 154 m³/s



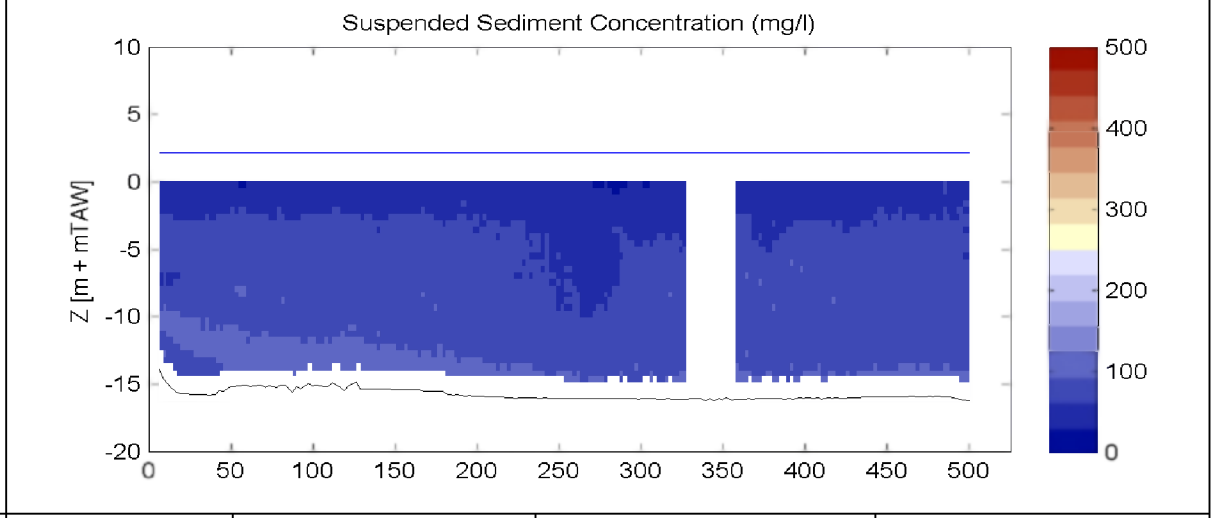
c)	10/12/2008	3 hrs before HW	Tidal coefficient: 0.97	Fresh water: 222m³/s



d)	06/03/2009	3 hrs before HW	Tidal coefficient: 0.82	Fresh water: 99m³/s

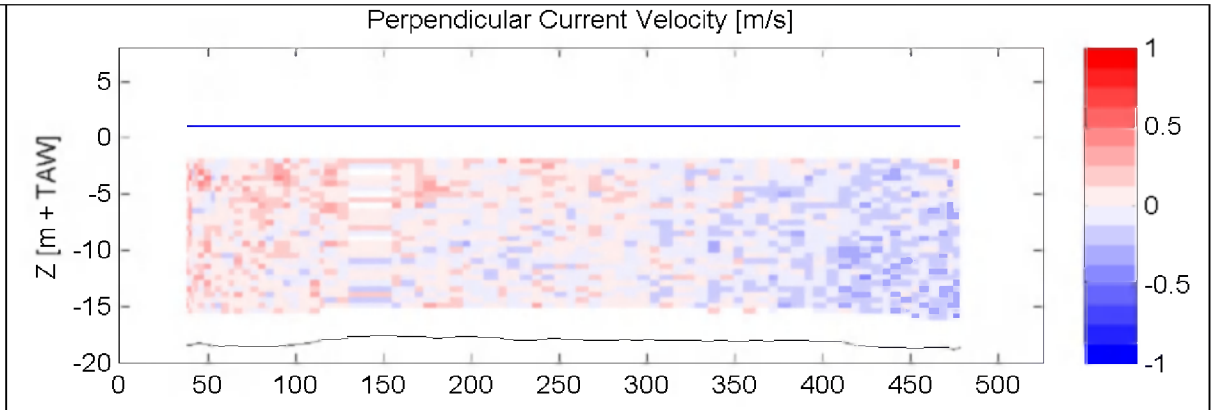


e)	06/10/2011	3 hrs before HW	Tidal coefficient: 0.83	Fresh water: 55 m³/s

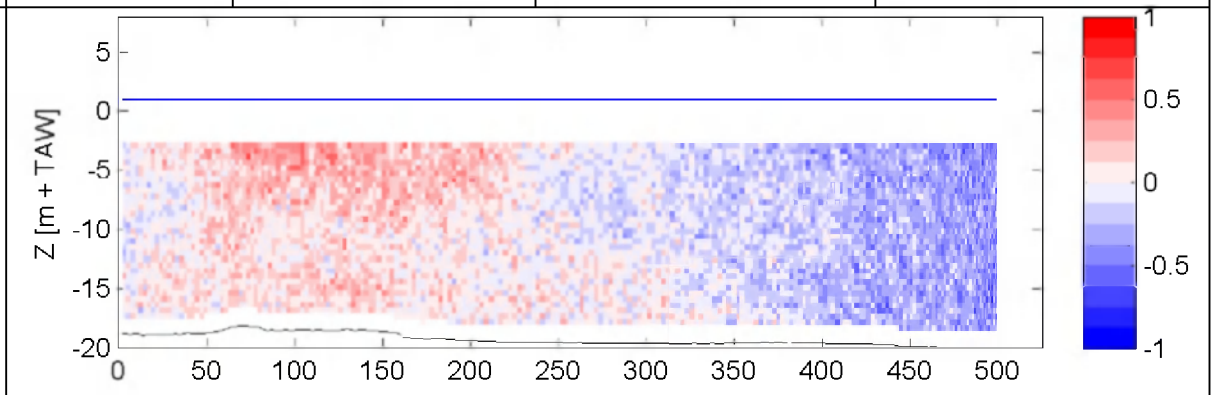


f)	16/03/2012	3 hrs before HW	Tidal coefficient: 0.88	Fresh water: 85 m³/s

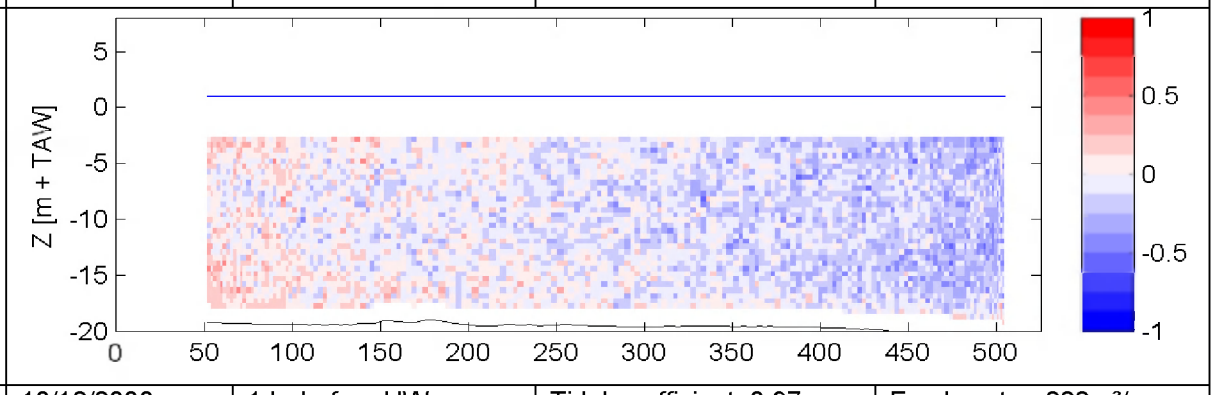
Figure 5-4: Suspended sediment concentration at 3hrs before high water



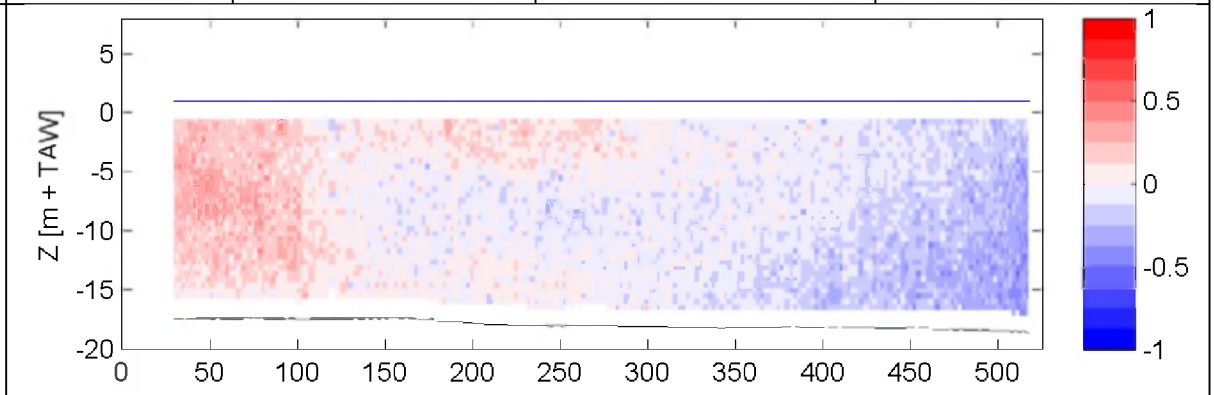
a)	24/09/2008	1 hr before HW	Tidal coefficient: 0.81	Fresh water: 75 m³/s



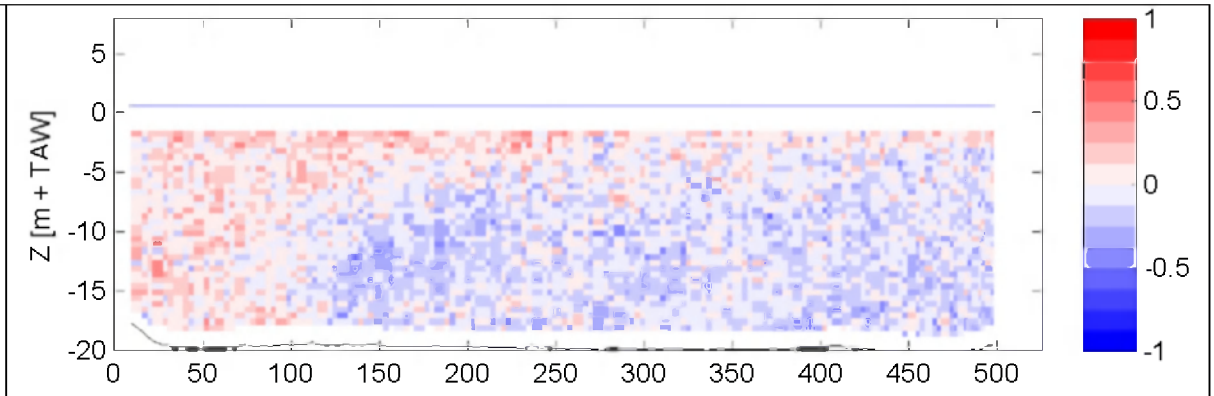
b)	02/12/2008	1 hr before HW	Tidal coefficient: 0.98	Fresh water: 154 m³/s



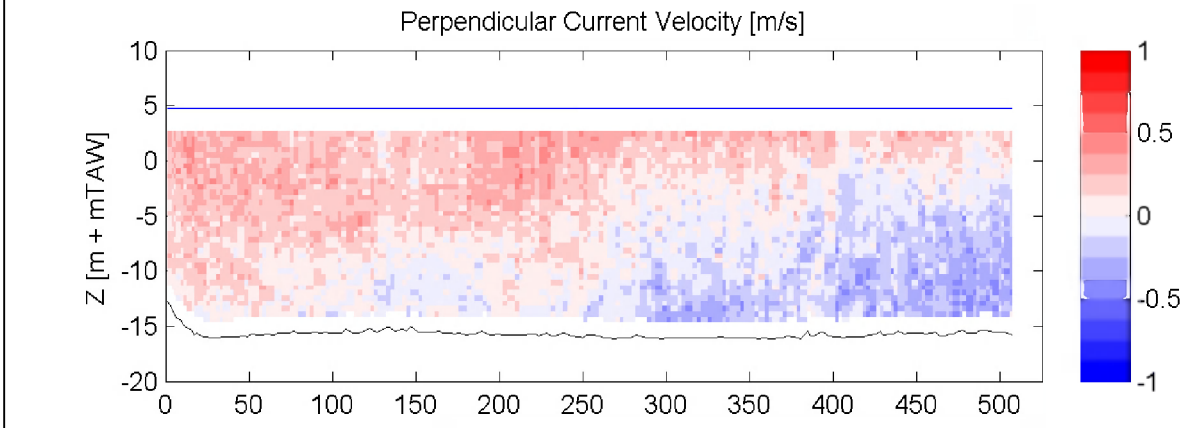
c)	10/12/2008	1 hr before HW	Tidal coefficient: 0.97	Fresh water: 222m³/s



d)	06/03/2009	1 hr before HW	Tidal coefficient: 0.82	Fresh water: 99m³/s

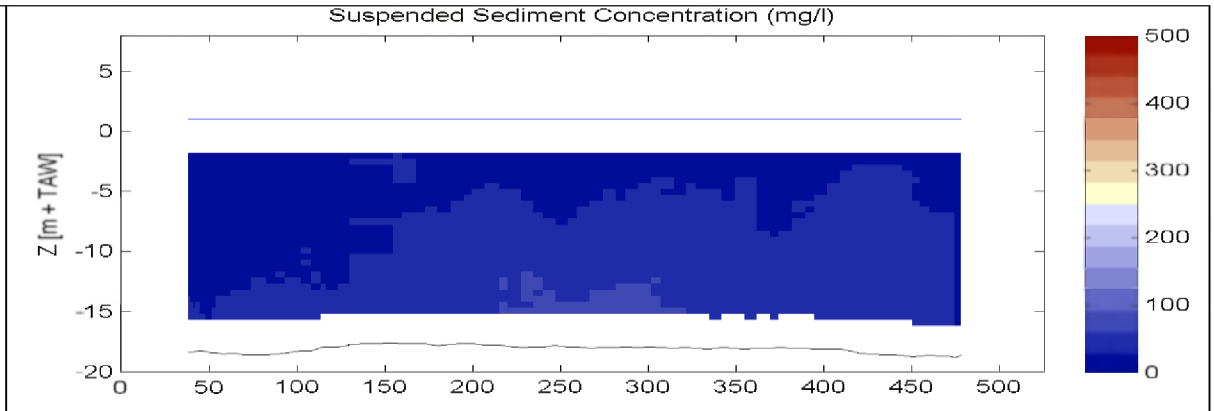


e)	06/10/2011	1 hr before HW	Tidal coefficient: 0.83	Fresh water: 55 m³/s

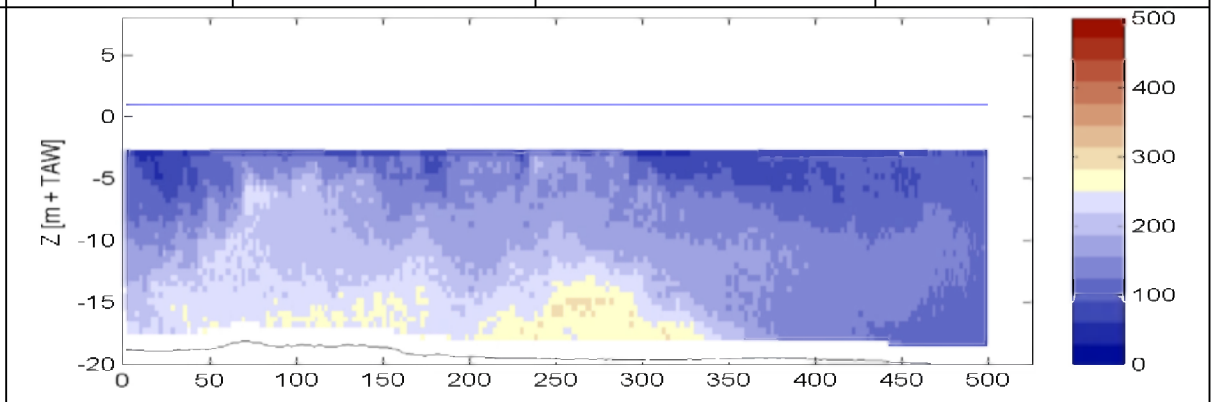


f)	16/03/2012	1 hr before HW	Tidal coefficient: 0.88	Fresh water: 85 m³/s

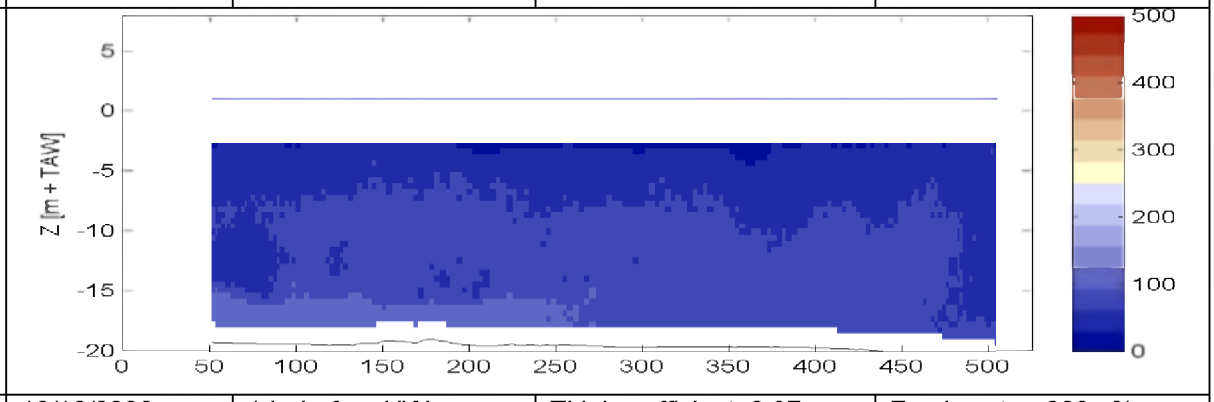
Figure 5-5: Perpendicular current velocity at 1hr before high water



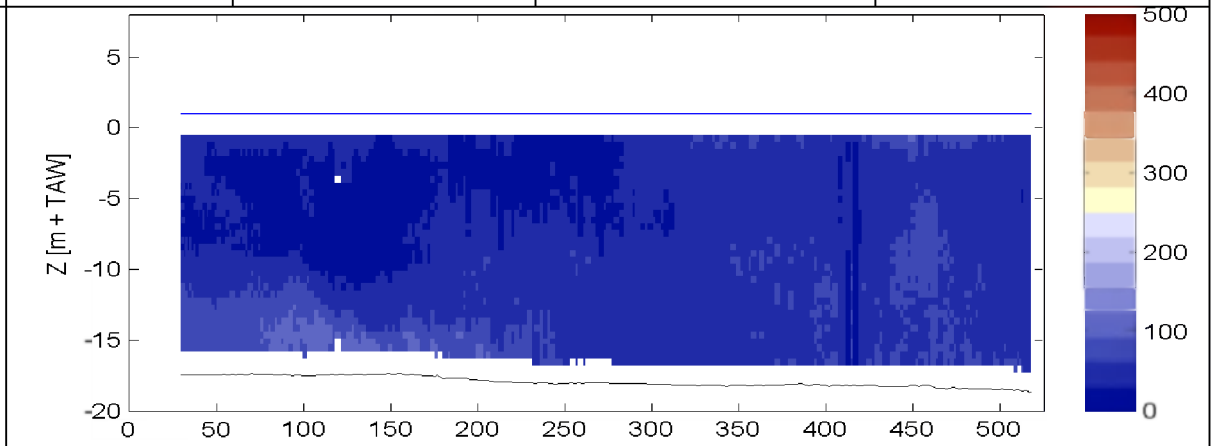
a)	24/09/2008	1 hr before HW	Tidal coefficient: 0.81	Fresh water: 75 m³/s



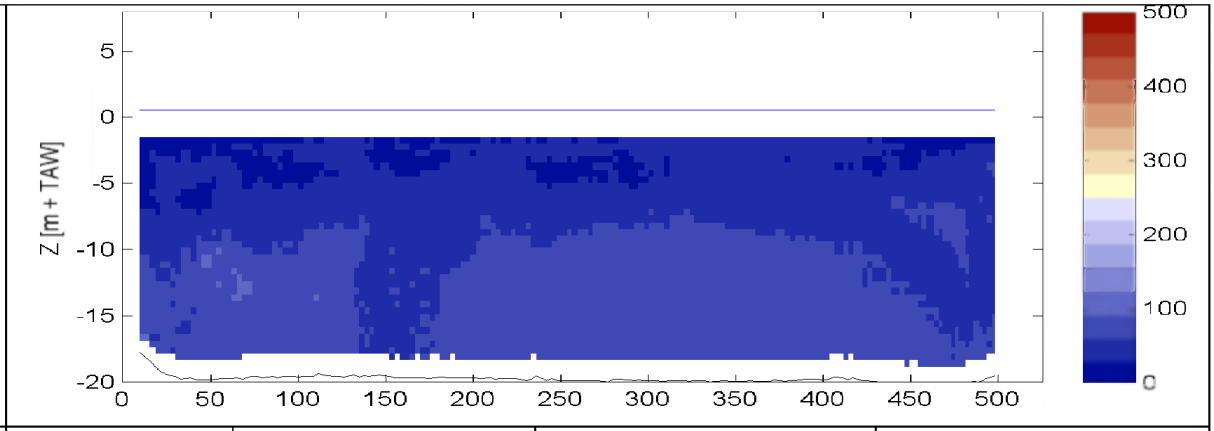
b)	02/12/2008	1 hr before HW	Tidal coefficient: 0.98	Fresh water: 154 m³/s



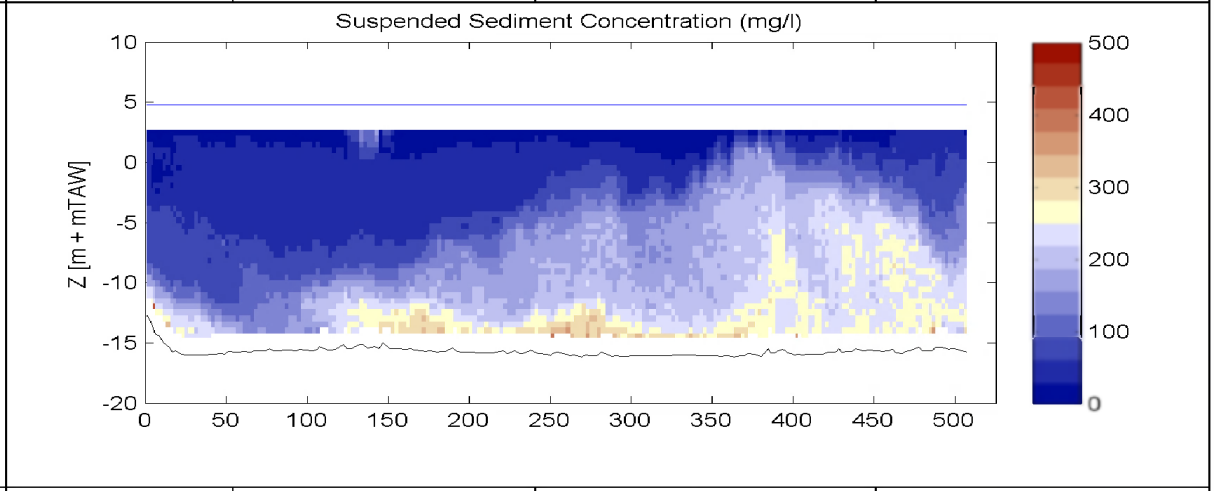
c)	10/12/2008	1 hr before HW	Tidal coefficient: 0.97	Fresh water: 222m³/s



d)	06/03/2009	1 hr before HW	Tidal coefficient: 0.82	Fresh water: 99m³/s



e)	06/10/2011	1 hr before HW	Tidal coefficient: 0.83	Fresh water: 55 m³/s



f)	16/03/2012	1 hr before HW	Tidal coefficient: 0.88	Fresh water: 85 m³/s

Figure 5-6: Suspended sediment concentration at 1hr before high water

5.2.3 Water balance

The volume of water, crossing the dock's entrance during the complete measurement day was calculated by integrating respectively total incoming and total outgoing discharge. The absolute values of both volumes were added up to know the total water exchange through the transect on the 16th of March 2012. Flood and ebb total water exchange were calculated with the same technique.

Next to the measured total water exchange, the theoretical exchanged water volume due to tidal filling was calculated by integrating tidal difference over time multiplied by the surface area of Deurganckdok.

Table 5-3 Total water exchange compared to tidal filling water exchange at transect DGD during ebb, flood and the complete measurement day

	Q Exchanged [m^3]	***source***
Measured Total Ebb	26 684 728	ADCP measurement
Tidal Emptying	4 632 111	Volume balance
Measured Total Flood	27 681 949	ADCP measurement
Tidal Filling	3 757 816	Volume balance
Measured Total	54 366 678	ADCP measurement
Tidal Filling/Emptying Total	8 389 927	Volume balance

During flood on the 16th of March 2012, 27.6 million m³ water crossed the entrance and during ebb it was 27.7 million m³ (see Figure 5-7). In total 54.3 million m³ water crossed the docks entrance, of which only 13% (7 million m³) can be contributed to tidal filling of Deurganckdok (see Figure 5-7). The other 87% of water displacement at the entrance must be caused by density and eddy currents.

A 3-D mathematical model was used to analyze the different exchange mechanisms between the river and the dock and to know the effect of CDW (WL Delft Hydraulics, 2004). By comparing the total amount of water leaving or entering the dock with the tidal volume, it was possible to identify that horizontal water exchange, due to density currents and eddy formation, is the dominant factor. The analysis led to the following conclusions:

- Without CDW, tidal filling is responsible for +/- 18% of the total water exchange, eddy currents for +/- 27% and density currents for +/-55%.
- With CDW the total water exchange will reduce with +/- 6% as a result of reduction in eddy currents of +/- 15% and in density currents of +/- 4%. The reduction will change the proportions of the total water exchange in: tidal filling +/- 19%, eddy currents +/- 25% and density currents +/- 56%.

In the total water exchange of the measurements is not possible to calculate the proportions of the eddy and density currents to evaluate the effect of the CDW. The expected difference of 1% in tidal filling (due to the difference in total volume exchanged) between with and without CDW is negligible in comparison to the total water exchange. The measured proportions of tidal filling over the previous campaigns (without CDW) are varying between 10% and 20% which can be explained by the different hydro-meteorological conditions on the campaigns. The variation in hydro-meteorological conditions has made it difficult to make a preliminary evaluation of CDW. An extensive evaluation will be covered in the analysis report.

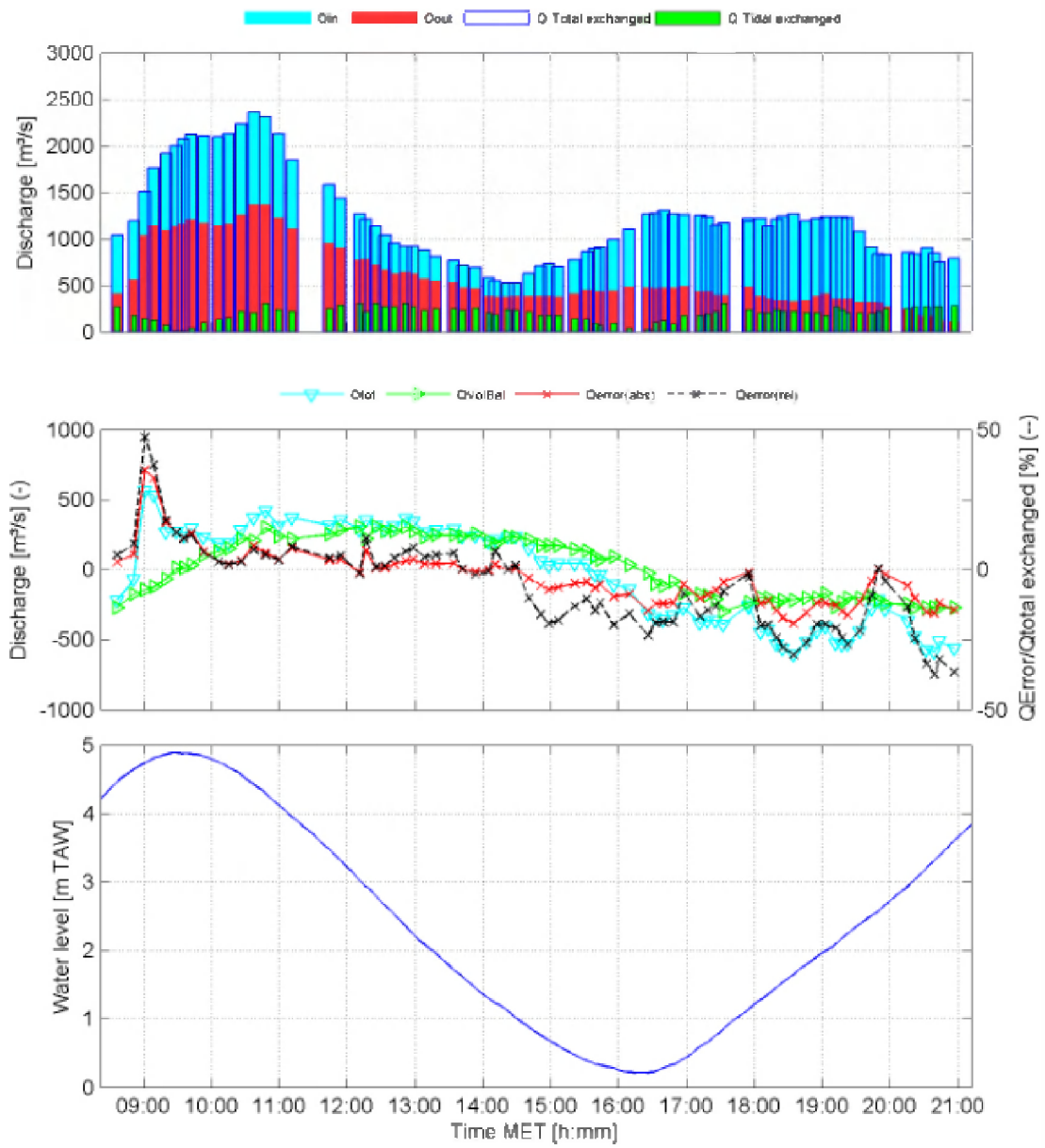


Figure 5-7: The water discharge at the entrance of Deurganckdok over a tidal curve on 16/03/2012. Top: Total incoming (Qin) and outgoing (Qout) discharge including the total water en tidal exchange; Central: Measured residual discharge (Qtot) versus theoretical residual discharge (QVolBal) and correction offset (Qerror) including relative error; Below: tidal curve.

The water balance almost matches during flood, as the measured filling of the dock is 5.6 million m³ over a period where tidal filling (calculated by integrating tide) is 3.8 million m³ (Table 5-4). The filling of the dock is thus overestimated by the measurements with 1.8 million m³. In comparison to the total water exchange during flood is the overestimation 3.4% (Table 5-5). During emptying the dock we determine an overestimation of 0.2%.

During ebb, the volume is overestimated by the measurements by 0.1 million m³. In comparison to the 8.4 million m³ of water exchanged by tidal filling/emptying, overestimation of 1 million m³ seems rather reasonable (Table 5-5), compared to the total exchange of 65 million m³, the underestimation error is small.

Table 5-4 Total residual, incoming and outgoing water volumes in Deurganckdok during the measurement campaign of 16/03/2012 compared to tidal filling/emptying volumes.

	Q Total Net [m^3]	Q Total In [m^3]	Q Total Out [m^3]
Measured Ebb*	4 744 437	10 970 146	15 714 583
Tidal Emptying**	4 632 111	-	-
Measured Flood*	5 627 593	16 654 771	11 027 178
Tidal Filling**	3 757 816	-	-
Measured Net*	883 157	27 624 917	26 741 761
Tidal Emptying Net**	874 295	-	-

(*: data from ADCP measurement, **: data derived from integration of tide)

Table 5-5 The difference between measured data and integrated tide data during the measurement campaign of 06/10/2011.

	Q error [m^3]	Q error/water exchange* [%]
Overestimated outgoing volume	112 326	0.2
Overestimated ingoing volume	1 869 778	3.4
Overestimated total volume	8 862	0.0

One of the reasons of the under/overestimation in Figure 5-7 can be found in the ship wakes, in the missing bottom track and in the estimations of the unmeasured regions (the bottom, top and edge estimations). An ADCP cannot measure a complete cross section. Near the banks, near the bottom and near the water surface, no measurements can be executed and the discharges in these unmeasured areas needs to be estimated (see 4.2.4.1).

The errors caused by estimations is minimized during these measurements to use a good vessel setup and appropriate ADCP. Compared to former campaigns, the effect of the top, bottom and edge estimates seems to be smaller. The uncertainty on the top estimated values is decreased since the transducer depth of the ADCP was reduced from 2.6 meter to 0.5 or 1 meter.

The uncertainty on the bottom estimated values for the measurements of 17/11/2005, 22/03/2006, 19/06/2008, 26/06/2008, 24/09/200 and 30/09/2008 was twice as big because of the beam angle of the used ADCP. In these measurements, the beam angle of the ADCP was 30°, therefore, the area near the bottom that is not be measured is 12% (see 4.2.4.1). During the other measurements, including this measurement, the ADCP had a beam angle of 20°, which implements a much smaller unmeasured area of 6%.

Compared to the first measurement campaigns the effect of estimations caused by interpolating between 2 successive transects is now minimized because the latest measurements were executed at a higher frequency, 5 to 6 measurements per hour, than the first measurements (2 measurements per hour).

As a conclusion, it appears that the water balance fit quite well (Figure 5-7). The main cause for the unbalanced balance is the uncertainty/accuracy of the estimations and the fact that the total exchanged volume of water at the entrance of DGD is approximately five times bigger the tidal volume.

Table 5-6: Water volumes during ebb, flood and total measurement campaign, including theoretical expected volumes.

Measurement Day		***22/03/2006***	***27/09/2006***	***24/10/2007***	***26/06/2008***	***24/09/2008***
DGD surface area [10^3 m^2]		750	750	1 019	1 019	1 019
Tidal coefficient		0.97	1.03	1.02	0.97	0.81
Duration of measurement [hh:mm]		12:52	12:42	12:24	12:20	12:38
Daily fresh water discharge at Schelle [m^3/s]		94	33	46	69	75
Ebb	exchanged volume [10^3 m^3]	33 831	33 339	25 668	25 792	23 298
	incoming volume [10^3 m^3]	14 716	14 974	8 246	9 556	8 579
	outgoing volume [10^3 m^3]	19 115	18 365	17 422	16 236	14 718
	residual outgoing volume [10^3 m^3]	4 399	3 391	9 176	6 680	6 139
	residual tidal emptying = theoretical residual outgoing volume	3 758	4 227	4 805	4 100	5 479
	overestimated outgoing volume [10^3 m^3]	641	-836	4 371	2 580	660
Flood	exchanged volume [10^3 m^3]	28 058	24 939	24 110	26 619	19 612
	incoming volume [10^3 m^3]	14 965	14 236	11 818	14 616	10 590
	outgoing volume [10^3 m^3]	13 093	10 703	12 292	12 004	9 022
	residual incoming volume [10^3 m^3]	1 872	3 533	474	2 612	1 568
	residual tidal filling = theoretical residual incoming volume	3 261	3 914	5 211	3 620	5 134
	overestimated incoming volume [10^3 m^3]	-1 389	-381	-4 737	-1 008	-3 565
Total	exchanged volume [10^3 m^3]	61 889	58 278	49 778	52 412	42 909
	incoming volume [10^3 m^3]	29 681	29 210	20 064	24 172	19 169
	outgoing volume [10^3 m^3]	32 208	29 067	29 714	28 240	23 740
	residual outgoing volume [10^3 m^3]	2 527	-143	9 650	4 068	4 571
	residual tidal emptying = theoretical residual outgoing volume	497	313	-406	480	345
	overestimated outgoing volume [10^3 m^3]	2 030	-456	10 056	3 588	4 225

The durations are based on ADCP measurement. Tidal data of gauge Liefkenshoek was used.

Measurement Day		***02/12/2008***	***10/12/2008***	***06/03/2009***	***06/10/2011***	***16/03/2012***
DGD surface area [10^3 m^2]		1 019	1 019	1 019	1 019	1 019
Tidal coefficient		0.98	0.97	0.82	0.83	0.88
Duration of measurement [hh:mm]		12:19	12:38	12:47	12:33	12:13
Daily fresh water discharge at Schelle [m^3/s]		154	222	99	55	88
Ebb	exchanged volume [10^3 m^3]	36 716	33 823	35 758	26 685	26 728
	incoming volume [10^3 m^3]	14 954	14 466	15 903	10 970	9 940
	outgoing volume [10^3 m^3]	21 762	19 358	19 855	15 715	16 788
	residual outgoing volume [10^3 m^3]	6 808	4 892	3 949	4 744	6 847
	residual tidal emptying = theoretical residual outgoing volume	5 225	5 166	4 151	4 632	4 339
	overestimated outgoing volume [10^3 m^3]	1 582	-274	-202	112	2 508
Flood	exchanged volume [10^3 m^3]	33 853	33 660	29 628	27 682	26 076
	incoming volume [10^3 m^3]	20 099	19 741	17 393	16 655	15 476
	outgoing volume [10^3 m^3]	13 754	13 919	12 235	11 027	10 599
	residual incoming volume [10^3 m^3]	6 345	5 822	5 158	5 628	4 877
	residual tidal filling = theoretical residual incoming volume	5 090	4 950	4 246	3 758	3 860
	overestimated incoming volume [10^3 m^3]	1 255	871	912	1 870	1 016
Total	exchanged volume [10^3 m^3]	70 569	67 483	65 389	54 367	52 804
	incoming volume [10^3 m^3]	35 053	34 207	33 299	27 624	25 417
	outgoing volume [10^3 m^3]	35 516	33 277	32 090	26 742	27 387
	residual outgoing volume [10^3 m^3]	463	-930	-1 209	883	1 971
	residual tidal emptying = theoretical residual outgoing volume	135	216	95	874	479
	overestimated outgoing volume [10^3 m^3]	328	-1 146	-1 114	9	1 492

5.2.4 Sediment balance

The mass of the SSC, crossing dock's entrance during flood or ebb on a measurement day, was calculated on a similar manner as the volume.

From Figure 5-8 it can be concluded that the residual sediment flux is less than a third of the total sediment exchange at the entrance of Deurganckdok and that incoming and outgoing flux are always in the same order of magnitude. If these two conclusions are considered together one can see that the water balance has to fit before the sediment balance can be acceptable. An underestimation of outgoing discharge will always lead to an overestimation of the incoming sediment mass and vice versa.

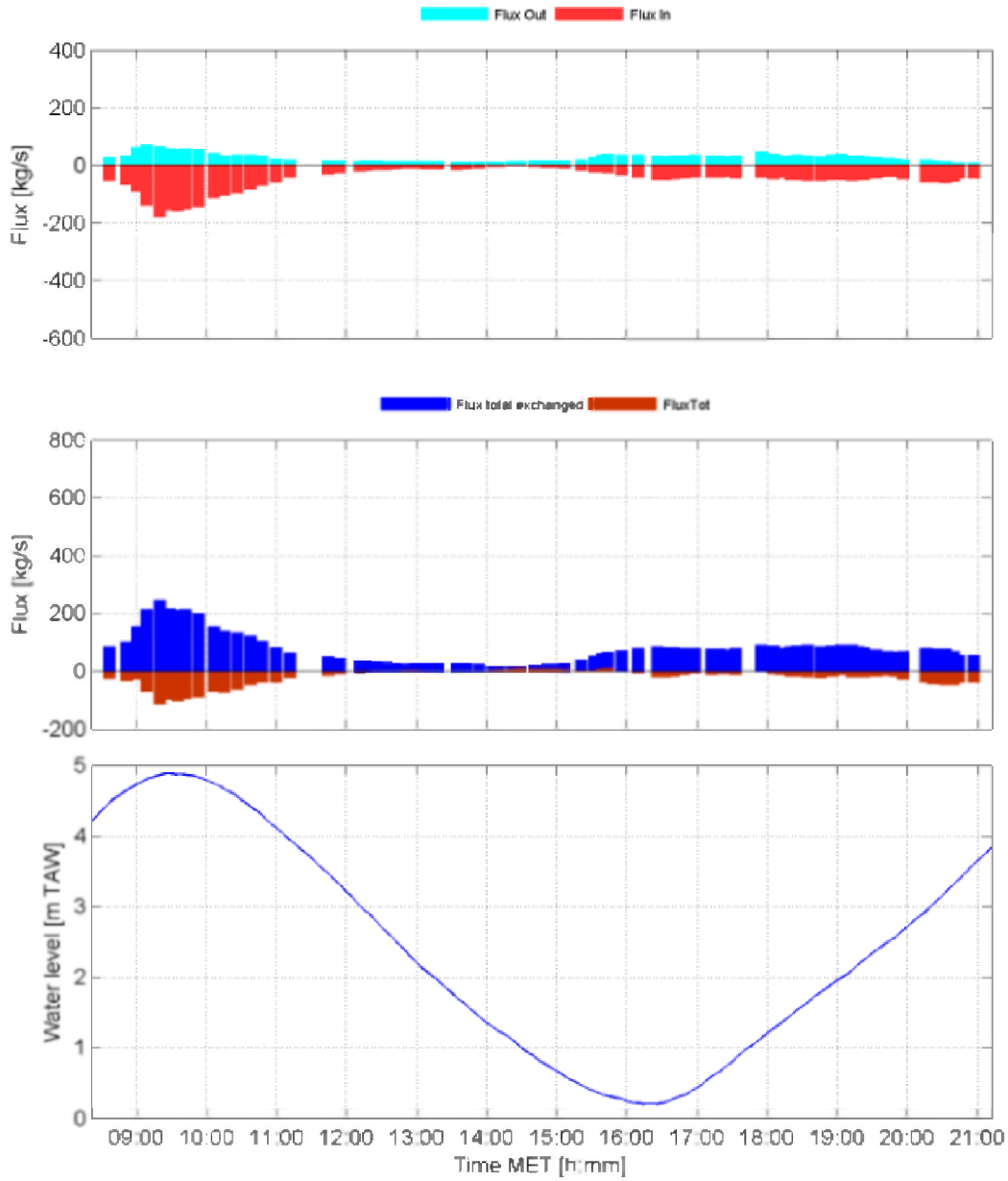


Figure 5-8: The sediment flux at the entrance of Deurganckdok on 16/03/2012 (negative values represent incoming sediment). Top: Total incoming (flux in) and outgoing sediment flux (flux out); Central: total sediment exchange versus total sediment flux; below: tidal curve

As the error in water discharge is known (difference between total residual discharge and discharge due to tidal filling of the dock), one can try to correct discharges in order to calculate a more realistic sediment deposition in DGD over a tidal cycle. For the correction of the total discharge the following methods were used; in the first worst case the total incoming measured discharge was retained and the total outgoing discharge was raised with 1.1 million m^3, in the second worst case the total outgoing discharge was retained and the total incoming discharge was reduced with 1.1 million m^3. Between this range the sediment mass will be situated. The settled sediment mass, calculated with corrected discharges, was estimated between 757 and 1079 tonnes over the measurement cycle on 16/03/2012 (Table 5-7). During ebb approximately 1200 tonnes of sediment passed the entrance of which about 250 tonnes stayed in the dock; during flood approximately 2400 tonnes passed the entrance of which about 600 tonnes stayed in the dock.

Figure 5-9 shows the relation between the amount of suspended sediments passing in the river Scheldt and the amount of sedimentation in the dock. Sediment data is obtained from the long term measurements at buoy 97 and buoy 84 (IMDC 2005l, 2006l, 2006p, 2007b, 2008p, 2008aa, 2009m). Since summer 2008, buoy97 is removed and the concentrations are only averaged between top and bottom of buoy84.

[Remark: The measurements at buoy 84 are not delivered yet by Flanders Hydraulics Research. In next version Figure 5-9 will be updated.]

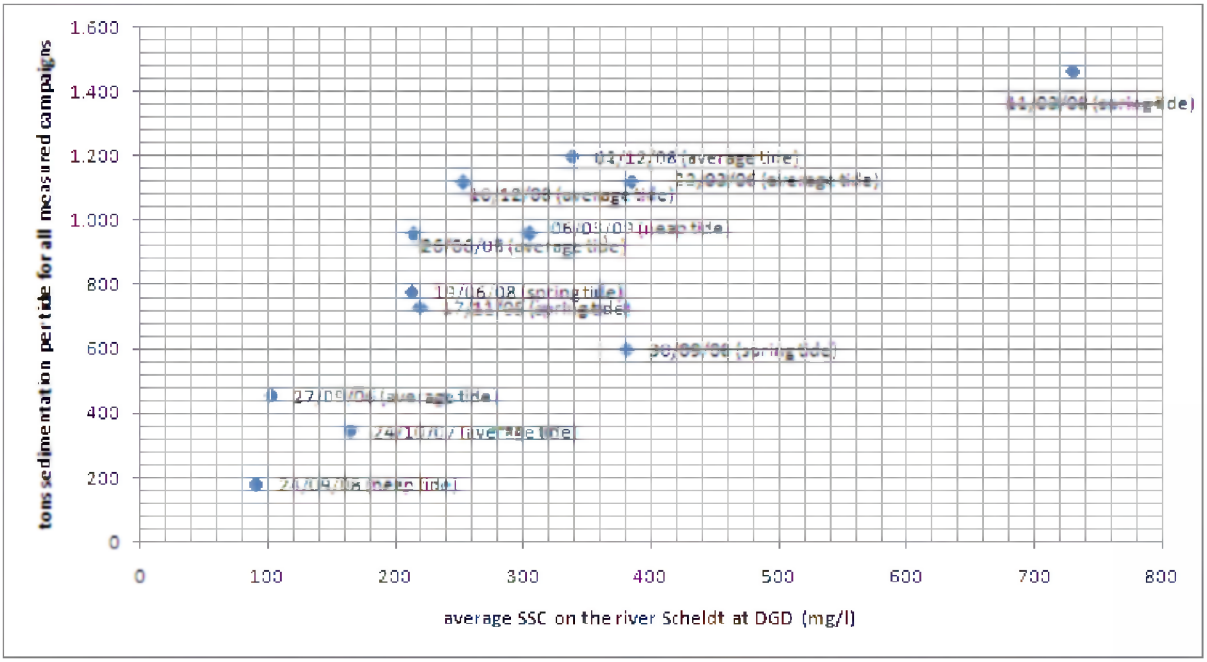


Figure 5-9 Overview of measured sediment deposition in Deurganckdock per tide by means of Sediview technique compared to average SSC on the river Scheldt.

In comparison to model results from the empirical model described in IMDC (2008s) and former measurement campaigns without CDW at transect DGD (Figure 5-10), this resulting deposition of 900 tonnes during neap tide is moderate. The model results from the empirical model described in IMDC (2008s) without CDW show net siltation rates from 400-800 tonnes per neap tide and 700-2000 tonnes spring tide, with a yearly average of 1000 tonnes per tide. Based on numerical model simulation is expected that the siltation rates with CDW will reduce between10% and 20%. The effect of the dredged sill at entrance will increase the siltation rate with 8% (IMDC,2011d).

In comparison to the previous campaigns there appears to be less deposition for this period (Figure 5-10). In the report of annual sediment balance 2011-2012 (IMDC, 2012m) has observed that the natural sedimentation rates during this period have increased and are twice as high as expected. The cause is most likely the deeper dredging during the dredging campaign of January 2012 where the bed level is reduced by about 1.0m. After the dredging campaign the system returns faster to the equilibrium and the sedimentation rates will be increase. No increase has been observed during this neap tide measurement. During the spring measurement a higher deposition result has been found (IMDC, 2012g).Deposition trends as a result of the CDW are difficult to establish due to variation of dredging activities and natural conditions. An extensive evaluation is necessary and will be covered in the analysis report.

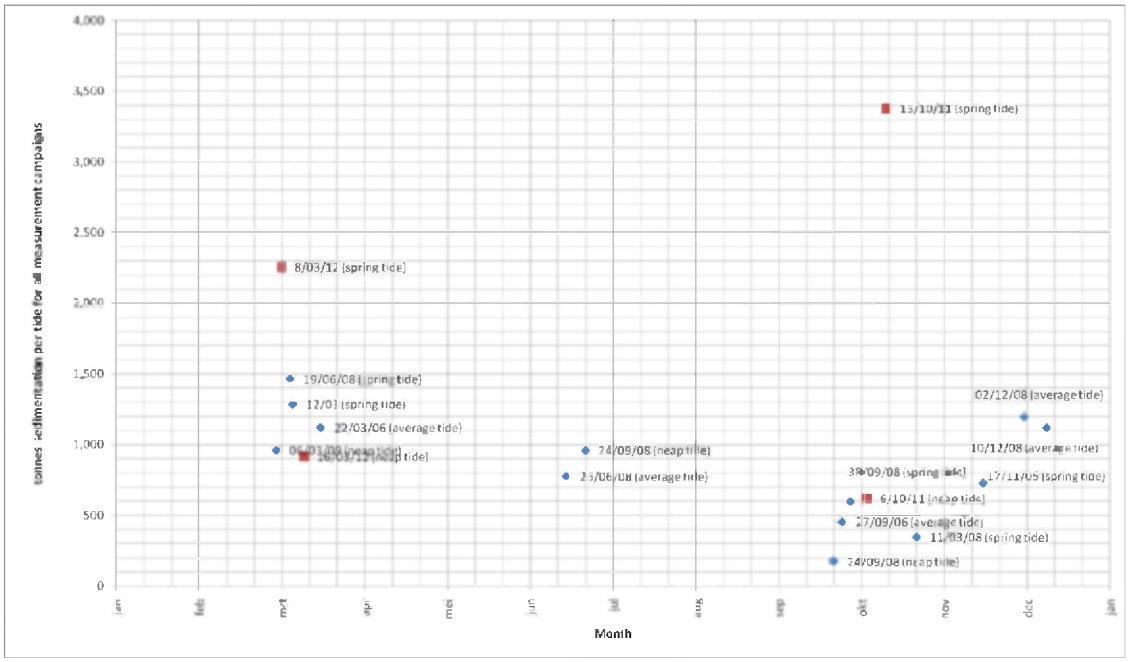


Figure 5-10: Evolution of the measured sediment deposition in Deurganckdock per tide by means of Sediview technique (blue dots: without CDW/with sill; red squares: with CDW/ without sill).

Table 5-7 Range of sediment deposition during ebb, flood and measurement campaign, calculated with forced fitting water balances for those days. The duration is based on ADCP measurements.

Measurement Day		***22/03/2006***		***27/09/2006***		***24/10/2007***	
DGD surface area [10^3 m^2]		750		750		1 019	
Tidal coefficient		0.97		1.03		1.02	
Duration of measurement [hh:mm]		12:52		12:42		12:24	
Daily fresh water discharge at Schelle [m^3/s]		94		33		46	
Ebb	exchanged mass [ton]	1 780	1 867	1 056	1 090	620	585
	incoming mass [ton]	1 160	1 218	635	656	336	317
	outgoing mass [ton]	620	650	421	434	284	268
	residual incoming mass [ton]	540	568	214	223	52	49
Flood	exchanged mass [ton]	2 092	2 329	684	664	1 015	714
	incoming mass [ton]	1 320	1 459	463	448	662	501
	outgoing mass [ton]	773	870	221	215	353	213
	residual incoming mass [ton]	547	589	242	233	308	288
Total	exchanged mass [ton]	3 873	4 196	1 740	1 754	1 635	1 299
	incoming mass [ton]	2 480	2 677	1 098	1 105	998	818
	outgoing mass [ton]	1 393	1 519	642	649	637	481
	residual incoming mass [ton]	1 087	1 158	456	456	360	336

Measurement Day		***26/06/2008***		***24/09/2008***		***02/12/2008***		***10/12/2008***	
DGD surface area [10^3 m^2]		1 019		1 019		1 019		1 019	
Tidal coefficient		0.97		0.81		0.98		0.97	
Duration of measurement [hh:mm]		12:20		12:38		12:19		12:38	
Daily fresh water discharge at Schelle [m^3/s]		69		75		154		222	
Ebb	exchanged mass [ton]	1 041	3 119	2 929	1 927	2 003	1 471	702	674
	incoming mass [ton]	695	1 854	1 724	1 144	1 194	1 008	402	316
	outgoing mass [ton]	346	1 265	1 205	783	809	463	299	358
	residual incoming mass [ton]	349	589	519	361	385	545	17	45
Flood	exchanged mass [ton]	1 173	4 152	4 500	3 402	3 573	1 884	993	991
	incoming mass [ton]	815	2 398	2 574	2 073	2 163	1 227	590	550
	outgoing mass [ton]	358	1 754	1 926	1 330	1 410	657	403	441
	residual incoming mass [ton]	457	645	648	743	753	569	147	149
Total	exchanged mass [ton]	2 214	7 270	7 429	5 329	5 577	3 356	1 695	1 666
	incoming mass [ton]	1 510	4 252	4 298	3 217	3 357	2 235	993	867
	outgoing mass [ton]	704	3 018	3 131	2 113	2 219	1 121	703	799
	residual incoming mass [ton]	806	1 233	1 167	1 104	1 138	1 114	164	194

Measurement Day		***6/03/2009***		***16/03/2012***		***06/10/2011***	
DGD surface area [10^3 m^2]		1 019		1 019		1 019	
Tidal coefficient		0.82		0.88		0.83	
Duration of measurement [hh:mm]		12:47		12:13		12:33	
Daily fresh water discharge at Schelle [m^3/s]		99		85		55	
Ebb	exchanged mass [ton]	1 212	1 232	3859	3007	1 373	1 205
	incoming mass [ton]	738	724	2735	2094	847	745
	outgoing mass [ton]	474	508	1124	913	526	461
	residual incoming mass [ton]	264	216	1611	1181	321	284
Flood	exchanged mass [ton]	2 349	2 482	2362	2355	1 736	1 927
	incoming mass [ton]	1 582	1 512	1625	1593	1 195	1 296
	outgoing mass [ton]	767	970	737	762	541	631
	residual incoming mass [ton]	815	541	888	830	655	665
Total	exchanged mass [ton]	3 561	3 714	6221	5361	3 109	3 132
	incoming mass [ton]	2 320	2 236	4360	3686	2 042	2 040
	outgoing mass [ton]	1 241	1 478	1861	1675	1 067	1 092
	residual incoming mass [ton]	1 079	757	2499	2011	975	948

6. REFERENCES

AMT (2003). Intern rapport, Getij-informatie Scheldebekken 1991-2000.

AWZ (2000): Baggerwerken 2000, Westerschelde en Zeeschelde.

Flanders Hydraulics Research (2009). MONEOS – jaarboek monitoring WL 2008: Overzicht monitoring hydrodynamiek en fysische parameters zoals door WL in 2008 in het Zeescheldebekken gemeten. Versie 4_0. WL rapporten, Projectnr 833_07.

IMDC (2002). Studie Densiteitsstroming in het kader van LTV Schelde, Stroom- en saliniteitsmeting t.h.v. Deurganckdok uitgevoerd op 12/06/202, I/RA/11216/02.042/CMA.

IMDC (2005a). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 1: Test survey 17/02/2005, I/RA/11265/05.008/MSA.

IMDC (2005b). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 2.1: Deurganckdok 17/02/2005, I/RA/11265/05.009/MSA.

IMDC (2005c). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 2.2: Zandvliet 17/02/2005, I/RA/11265/05.010/MSA.

IMDC (2005d). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 2.3: Liefkenshoek 17/02/2005, I/RA/11265/05.0011/MSA.

IMDC (2005e). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 2.4: Schelle 17/02/2005, I/RA/11265/05.0012/MSA.

IMDC (2005f). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 2.5: Deurganckdok 16/02/2005, I/RA/11265/05.013/MSA.

IMDC (2005g). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 2.6: Kallosluis 18/02/2005, I/RA/11265/05.014/MSA.

IMDC (2005h). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 2.7: Near bed continious monitoring: february 2005, I/RA/11265/05.015/MSA.

IMDC (2005i). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 3: Settling velocity INSSEV february 2005, I/RA/11265/05.016/MSA.

IMDC (2005j). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 4: Cohesive sediment properties february 2005, I/RA/11265/05.017/MSA

IMDC (2005k). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 5.1: Overview of ambient conditions in the river Scheldt January-June 2005, I/RA/11265/05.018/MSA.

IMDC (2005l). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 5.2: Overview of ambient conditions in the river Scheldt July-December 2005, I/RA/11265/05.019/MSA.

IMDC (2006a) Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 6.1 Calibration Winter 15 March & 14 April 2006? I/RA/11291/06.092/MSA.

IMDC (2006b) Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 7.1 21 March 2006 Scheldewacht – Deurganckdok, I/RA/11291/06.094/MSA.

IMDC (2006c) Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 7.2 22 March 2006 Parel 2 – Deurganckdok (downstream), I/RA/11291/06.095/MSA.

IMDC (2006d) Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 7.3 22 March 2006 Laure Marie – Liefkenshoek, I/RA/11291/06.096/MSA.

IMDC (2006e) Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 7.4 23 March 2006 Parel 2 – Schelle, I/RA/11291/06.097/MSA.

IMDC (2006f) Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 7.5 23 March 2006 Laure Marie – Deurganckdok (downstream), I/RA/11291/06.098/MSA.

IMDC (2006g) Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 7.6 23 March 2006 Veremans – Waarde, I/RA/11291/06.099/MSA.

IMDC (2006h) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.1 Opmeting stroming en zout- en sedimentbeweging aan de ingang van het Deurganckdok (SiltProfiler), I/RA/11283/06.087/WGO.

IMDC (2006i) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.3. Opmeting stroming en zout-en sedimentbeweging aan de ingang van het Deurganckdok (ADCP), I/RA/11283/06.110/BDC

IMDC (2006j). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 8.1: Vaste meetopstelling in zake bodemgedrag, I/RA/11291/06.100/MSA.

IMDC (2006k) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.6 Zout en slibverdeling Deurganckdok 17/03/2006 – 23/05/2006, I/RA/11283/06.121/MSA.

IMDC (2006l) Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 5.3 Overview of ambient conditions in the river Scheldt – January-June 2006 (I/RA/11291/06.089/MSA), in opdracht van AWZ.

IMDC (2006m): Studie van de stromingsvelden en sedimentuitwisseling aan de ingang van Deurganckdok. Current and Sediment flux measurements November 17th 2005 (I/RA/15030/06.021/BDC).

IMDC(2006n): Studie van de stromingsvelden en sedimentuitwisseling aan de ingang van Deurganckdok. Additional processing of ADCP and salinity data 17/11/2005 and 28/11/2005 (I/RA/15030/06.040/BDC).

IMDC (2006o). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 9: Valsnelheid slib – INSSEV, I/RA/11291/06.102/MSA, in opdracht van AWZ.

IMDC (2006p). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 2.7: Silt distribution and frame measurements 15/07/2006 – 31/10/2006. (I/RA/11291/06.122/MSA).

IMDC (2006q) Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 5.3 Overview of ambient conditions in the river Scheldt – Januari-June 2006 (I/RA/11291/06.089/MSA), in opdracht van AWZ.

IMDC (2006r) Mer verruiming Westerschelde, Nota Bovenafvoer Scheldebekken, I/NO/11282/06.104/FPE.

IMDC (2006s). Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.07 Zout en slibverdeling Deurganckdok 15/07/2006 – 31/10/2006, I/RA/11283/06.122/MSA.

IMDC (2007a) Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 6.2 Summer calibration and Final report, I/RA/11291/06.093/MSA.

IMDC (2007b). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 5.4 Overview of ambient conditions in the river Scheldt – July-December 2006 (I/RA/11291/06.089/MSA), in opdracht van AWZ.

IMDC (2007c). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 11.1 Through tide Measurement Sediview & Siltprofiler 27/9 Stream - Liefkenshoek (I/RA/11291/06.104/MSA), in opdracht van AWZ.

IMDC (2007d). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 11.2 Through tide Measurement Sediview 27/9 Veremans - Raai K (I/RA/11291/06.105/MSA), in opdracht van AWZ.

IMDC (2007e). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 11.3 Through tide Measurement Sediview & Siltprofiler 28/9 Stream - Raai K (I/RA/11291/06.106/MSA), in opdracht van AWZ.

IMDC (2007f). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 11.4 Through tide Measurement Sediview 28/9 Veremans - Waarde(I/RA/11291/06.107/MSA), in opdracht van AWZ.

IMDC (2007g). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 11.5 Through tide Measurement Sediview 28/9 Parel 2 - Schelle (I/RA/11291/06.108/MSA), in opdracht van AWZ.

IMDC (2007h). Uitbreiding studie densiteitsstromingen in de Beneden Zeeschelde in het kader van LTV Meetcampagne naar hooggeconcentreerde slibsuspensies Deelrapport 11.6 Through tide Measurement Salinity Distribution 26/9 Scheldewacht – Deurganckdok in opdracht van AWZ.

IMDC (2007i) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 1.1 Sediment Balance: Three monthly report 1/4/2006 – 30/06/2006 (I/RA/11283/06.113/MSA)

IMDC (2007j) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 1.2 Sediment Balance: Three monthly report 1/7/2006 – 30/09/2006 (I/RA/11283/06.114/MSA)

IMDC (2007k) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 1.3 Sediment Balance: Three monthly report 1/10/2006 – 31/12/2006 (I/RA/11283/06.115/MSA)

IMDC (2007l) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 1.4 Sediment Balance: Three monthly report 1/1/2007 – 31/03/2007 (I/RA/11283/06.116/MSA)

IMDC (2007m) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 1.5 Annual Sediment Balance (I/RA/11283/06.117/MSA)

IMDC (2007n) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.2 Through tide measurement SiltProfiler 26/09/2006 Stream (I/RA/11283/06.068/MSA)

IMDC (2007o) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.4 Through tide measurement Sediview spring tide 27/09/2006 Parel 2 (I/RA/11283/06.119/MSA)

IMDC (2007p) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.7 Salt-Silt distribution & Frame Measurements Deurganckdok 15/07/2006 – 31/10/2006 (I/RA/11283/06.122/MSA)

IMDC (2007q) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.8 Salt-Silt distribution & Frame Measurements Deurganckdok 15/01/2007 – 15/03/2007 (I/RA/11283/06.123/MSA)

IMDC (2007r) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 3.1 Boundary conditions: Three monthly report 1/1/2007 – 31/03/2007 (I/RA/11283/06.127/MSA)

IMDC (2007s) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing Deelrapport 1.10: Sediment Balance: Three monthly report 1/4/2007 – 30/06/2007 (I/RA/11283/07.081/MSA)

IMDC (2007t) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 1.11: Sediment Balance: Three monthly report 1/7/2007 – 30/09/2007 (I/RA/11283/07.082/MSA)

IMDC (2007v) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.16: Salt-Silt distribution Deurganckdok summer (21/6/2007 – 30/07/2007) (I/RA/11283/07.092/MSA)

IMDC (2007w) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 3.10: Boundary conditions: Three monthly report 1/04/2007 – 30/06/2007 (I/RA/11283/07.097/MSA)

IMDC (2007u) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 3.11: Boundary conditions: Two monthly report 1/07/2007 – 30/09/2007 (I/RA/11283/07.098/MSA)

IMDC (2008a) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.5: Through tide measurement Sediview average tide 24/10/2007 (I/RA/11283/06.120/MSA)

IMDC (2008b) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 4.1: Analysis of siltation Processes and Factors (I/RA/11283/06.129/MSA)

IMDC (2008c) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 1.12: Sediment Balance: Four monthly report 1/9/2007 – 31/12/2007 (I/RA/11283/07.083/MSA)

IMDC (2008d) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 1.13: Sediment Balance: Four monthly report 1/01/2007 – 31/03/2007 (I/RA/11283/07.084/MSA)

IMDC (2008e) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 1.14: Annual Sediment Balance. (I/RA/11283/07.085/MSA)

IMDC (2008f) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.09: Calibration stationary equipment autumn (I/RA/11283/07.095/MSA)

IMDC (2008g) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.10: Through tide measurement SiltProfiler 23 October 2007 (I/RA/11283/07.086/MSA)

IMDC (2008h) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.11: Through tide measurement Salinity Profiling winter 12 March 2008 (I/RA/11283/07.087/MSA)

IMDC (2008i) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.12: Through tide measurement Sediview winter 11 March 2008 – Transect I (I/RA/11283/07.088/MSA)

IMDC (2008j) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.13: Through tide measurement Sediview winter 11 March 2008 – Transect K (I/RA/11283/07.089/MSA)

IMDC (2008k) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.14: Through tide measurement Sediview winter 11 March 2008 – Transect DGD (I/RA/11283/07.090/MSA)

IMDC (2008l) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.15: Through tide measurement SiltProfiler winter 12 March 2008 (I/RA/11283/07.091/MSA)

IMDC (2008m) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.17: Salt-Silt distribution & Frame Measurements Deurganckdok autumn (17/9/2007-10/12/2007) (I/RA/11283/07.093/MSA)

IMDC (2008n) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.18: Salt-Silt distribution & Frame Measurements Deurganckdok winter (18/02/2007-31/03/2008) (I/RA/11283/07.094/MSA)

IMDC (2008o) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.19: Calibration stationary & mobile equipment winter (I/RA/11283/07.096/MSA)

IMDC (2008p) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 3.12: Boundary conditions: Three monthly report 1/9/2007 – 31/12/2007 (I/RA/11283/07.099/MSA)

IMDC (2008q) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 3.13: Boundary conditions: Three monthly report 1/1/2008 – 31/3/2007 (I/RA/11283/07.100/MSA)

IMDC (2008r) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 3.14: Boundary conditions: Annual report (I/RA/11283/07.101/MSA)

IMDC (2008s) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 4.10: Analysis of siltation Processes and Factors (I/RA/11283/07.102/MSA)

IMDC (2008t) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing Deelrapport 1.20: Sediment Balance: Three monthly report 1/4/2008 – 30/06/2008 (I/RA/11283/08.076/MSA)

IMDC (2008u) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.20: Through tide measurement Sediview during average tide Spring 2008 – 19 June 2008 (I/RA/11283/08.081/MSA)

IMDC (2008v) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.21: Through tide measurement Sediview during average tide Spring 2008 – 26 June 2008 (I/RA/11283/08.082/MSA)

IMDC (2008w) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing Deelrapport 1.21: Sediment Balance: Three monthly report 1/7/2008 – 30/09/2008 (I/RA/11283/08.077/MSA)

IMDC (2008x) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.22: Through tide measurement Sediview during neap tide Summer 2008 – 24 September 2008 (I/RA/11283/08.083/MSA)

IMDC (2008y) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.28: Through tide measurement ADCP eddy Summer 2008 – 1 October 2008 (I/RA/11283/08.089/MSA)

IMDC (2008z) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.32: Salt-Silt distribution Deurganckdok: six monthly report 1/4/2008 – 30/9/2008 (I/RA/11283/08.093/MSA)

IMDC (2008aa) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 3.20: Boundary conditions: Six monthly report 1/4/2008 – 30/09/2008 (I/RA/11283/08.096/MSA)

IMDC (2009a) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.23: Through tide measurement Sediview during spring tide Summer 2008 – 30 September 2008 (I/RA/11283/08.084/MSA)

IMDC (2009b) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.29: Through tide measurement SiltProfiler summer 2008 – 29 September 2008 (I/RA/11283/07.090/MSA)

IMDC (2009c) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.34: Calibration stationary & mobile equipment autumn 2008 (I/RA/11283/08.095/MSA)

IMDC (2009d) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing Deelrapport 1.22: Sediment Balance: Three monthly report 1/10/2008 – 31/12/2008 (I/RA/11283/08.078/MSA)

IMDC (2009e) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.24: Through tide measurement Sediview during neap tide Autumn 2008 (I/RA/11283/08.085/MSA)

IMDC (2009f) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.25: Through tide measurement Sediview during spring tide Autumn 2008 (I/RA/11283/08.086/MSA)

IMDC (2009g) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing Deelrapport 1.23: Sediment Balance: Three monthly report 1/01/2009 – 31/03/2009 (I/RA/11283/08.079/MSA)

IMDC (2009h) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing Deelrapport 1.24: Annual Sediment Balance (I/RA/11283/08.080/MSA)

IMDC (2009i) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.26: Through tide measurement Sediview during neap tide Winter 2009 (I/RA/11283/08.087/MSA)

IMDC (2009j) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.30: Through tide measurement SiltProfiler winter 2009 (I/RA/11283/08.091/MSA)

IMDC (2009k) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.31: Through tide measurement Salinity Profiling winter 2009 (I/RA/11283/08.092/MSA)

IMDC (2009l) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.33: Salt-Silt distribution Deurganckdok: six monthly report 1/10/2008 – 31/3/2009 (I/RA/11283/08.094/MSA)

IMDC (2009m) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 3.21: Boundary conditions: Six monthly report 1/10/2008 – 31/03/2009 (I/RA/11283/08.097/MSA)

IMDC (2009n) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.27: Through tide measurement Sediview during spring tide Winter 2009 (I/RA/11283/08.088/MSA)

IMDC (2009o) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 4.20: Analysis of siltation Processes and Factors (I/RA/11283/08.098/MSA)

IMDC (2009p) Langdurige metingen Deurganckdok: Opvolging en analyse aanslibbing. Deelrapport 2.35: Salt-Silt distribution Deurganckdok: nine monthly report 1/04/2009 – 31/12/2009 (I/RA/11283/09.085/MSA)

IMDC (2010a) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 2.5 Through Tide measurement: eddy currents DGD 02/03/2010 (I/RA/11283/10.051/MSA)

IMDC (2010b) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 2.8 Sal-Silt distribution Deurganckdok 01/04/2009 – 31/03/2010 (I/RA/11354/10.068/NZI)

IMDC (2011a) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 1.1 Annual Sediment Balance year 1: 1/04/2009 – 31/03/2010 (I/RA/11354/10.067/NZI)

IMDC (2011b) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 1.2 Annual Sediment Balance year 2: 1/04/2009 – 31/03/2010 (I/RA/11354/10.100/MBO/ANF)

IMDC (2011c) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 1.4 Boundary Conditions year 1: 01/04/2009 – 31/03/2010 (I/RA/11354/10.102/MBO/ANF)

IMDC (2011d) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 1.7 Synthesis report of research on Current Deflecting Wall (I/RA/11354/10.063/MBO)

IMDC (2012a) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 2.1 Through Tide Sediview measurement: entrance DGD during spring tide in Autumn 2011 (I/RA/11354/10.106/MBO/ANF)

IMDC (2012b) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 2.1 Through Tide Sediview measurement: entrance DGD during neap tide in Autumn 2011 (I/RA/11354/10.107/MBO/ANF)

IMDC (2012c) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 2.5 Through Tide measurement: eddy currents DGD Autumn 2011 (I/RA/11354/10.110/MBO/ANF)

IMDC (2012d) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 2.10 Salt-Silt & Current Distribution entrance Deurganckdok: Frame measurements and through tide measurements: Autumn 2011 (I/RA/11354/11.131/BQU)

IMDC (2012e) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 2.12 Calibration stationary & mobile equipment 16/03/2011 (I/RA/11354/11.113/MBO/ANF)

IMDC (2012f) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 1.5 Boundary conditions year 2: 01/04/2010 – 31/03/2011 (I/RA/11354/11.103/MBO/ANF)

IMDC (2012g) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 2.3 Through Tide Sediview measurement: entrance DGD during spring tide in Winter 2012 (I/RA/11354/10.108/MBO/ANF)

IMDC (2012h) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 2.4 Through Tide Sediview measurement: entrance DGD during neap tide in Winter 2012 (I/RA/11354/10.109/MBO/ANF)

IMDC (2012k) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 2.7 Through Tide measurement: eddy currents DGD Winter 2012 (I/RA/11354/10.111/MBO/ANF)

IMDC (2012l) Evaluatie externe effecten aanslibbing Deurganckdok Deelrapport 2.11 Salt-Silt & Current Distribution entrance Deurganckdok: Frame measurements and through tide measurements: Winter 2012 (I/RA/11354/11.114/MBO/ANF)

IMDC (2012m) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 1.3 Annual Sediment Balance year 3: 1/04/2011 – 31/03/2012 (I/RA/11354/10.101/MBO/ANF)

IMDC (2012n) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 2.9 Sal-Silt distribution Deurganckdok 01/04/2009 – 31/05/2010 (I/RA/11354/10.112/MBO/ANF)

IMDC (2012o) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 2.13 Calibration stationary & mobile equipment 01/06/2012 (I/RA/11354/12.011/JCA)

IMDC (2012p) Evaluatie externe effecten aanslibbing Deurganckdok. Deelrapport 1.6 Boundary conditions year 3: 01/04/2011 – 31/03/2012 (I/RA/11354/11.104/MBO/ANF)

TV SAM (2006a) Langdurige stationaire ADCP stroommetingen te Oosterweel dukdalf 01/2005-06/2005. 42SR S032PIB 2A.

TV SAM (2006b) Langdurige stationaire ADCP stroommetingen te Oosterweel dukdalf 07/2005-12/2005. 42SR S033PIB 2A.

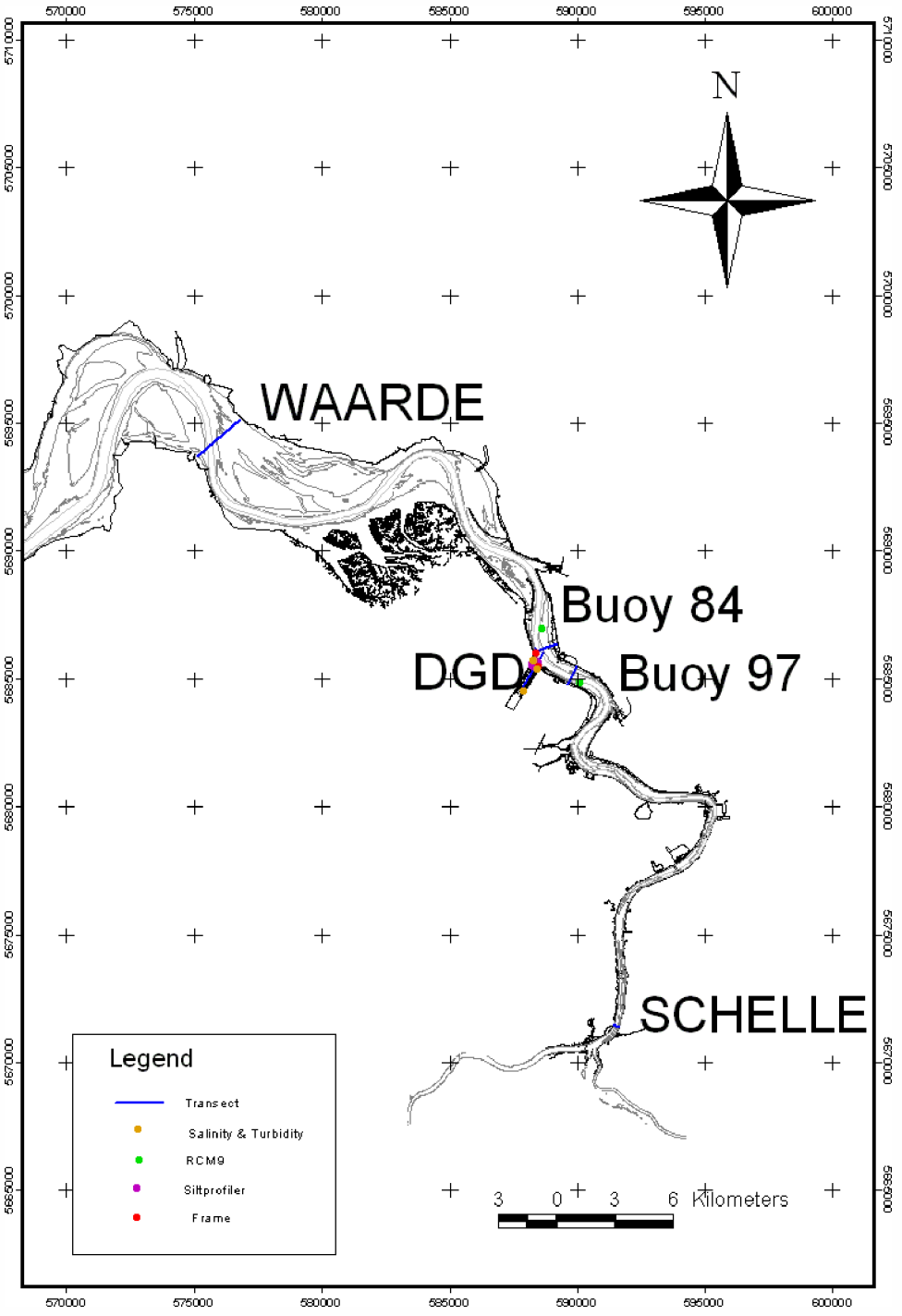
TV SAM (2006c) Langdurige stationaire ADCP stroommetingen te Oosterweel dukdalf 01/2006-06/2006. 42SR S032PIB 2A.

Unesco (1983). Algorithms for computation of fundamental properties of seawater, UNESCO Technical Papers in Marine Science, 44. UNESCO, France.

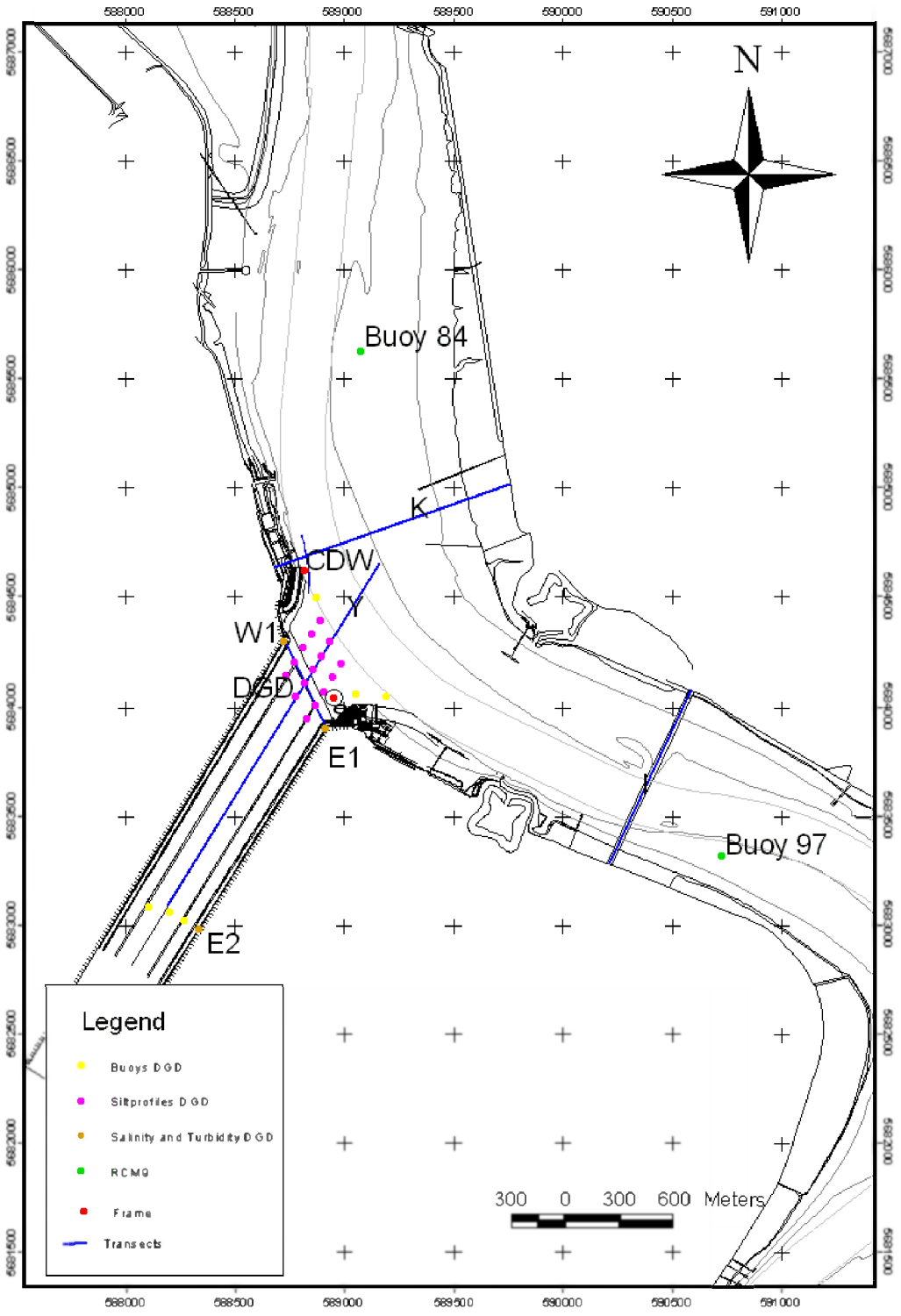
WL Delft Hydraulics (2004). Study of density currents in the framework of the LTV for the Scheldt Estuary. Executive summary. H3981-20.

Annex A Overview of measurement

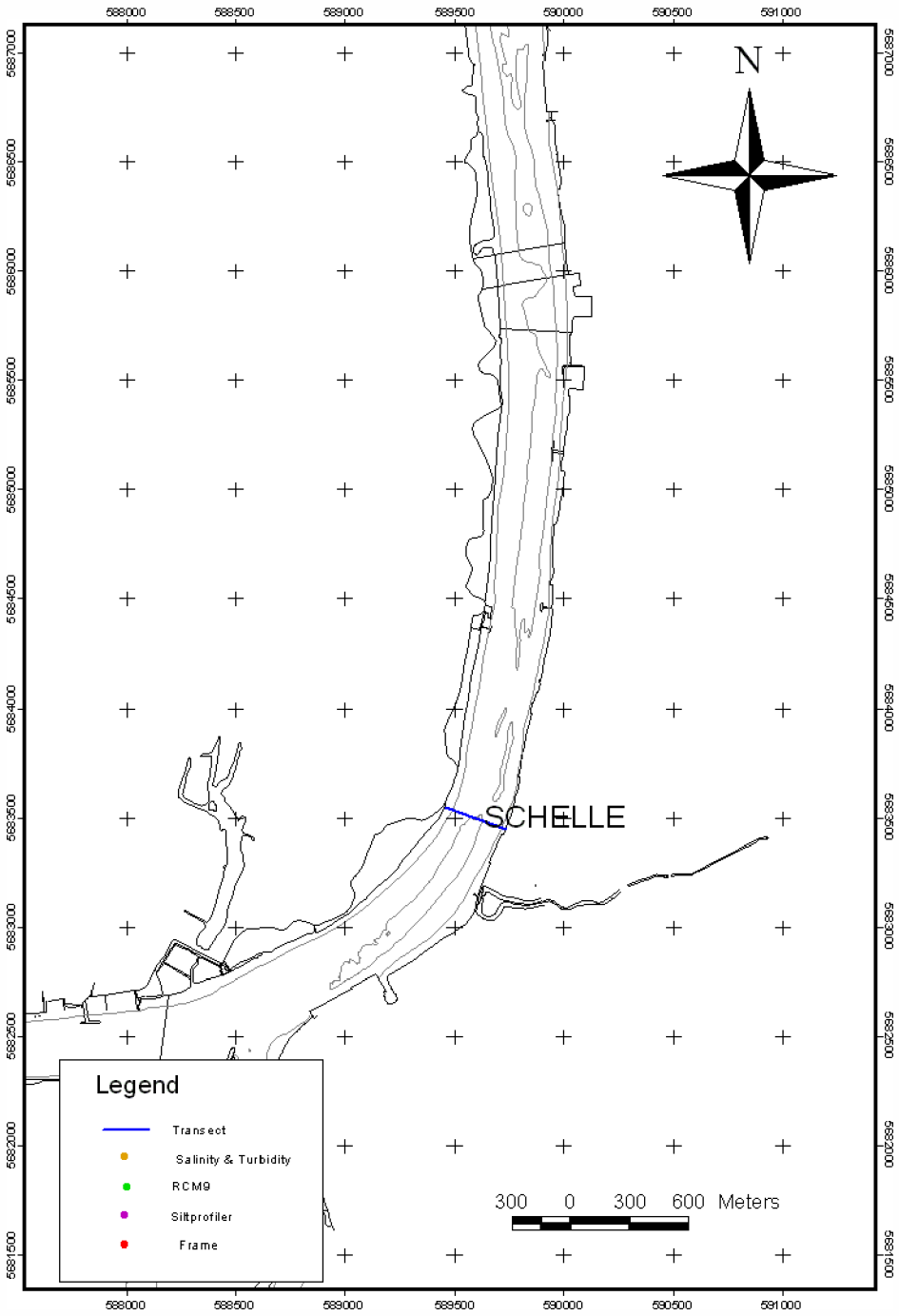
A.1 Overview of the measurement locations for the whole HCBS2 and Deurganckdok measurement campaigns



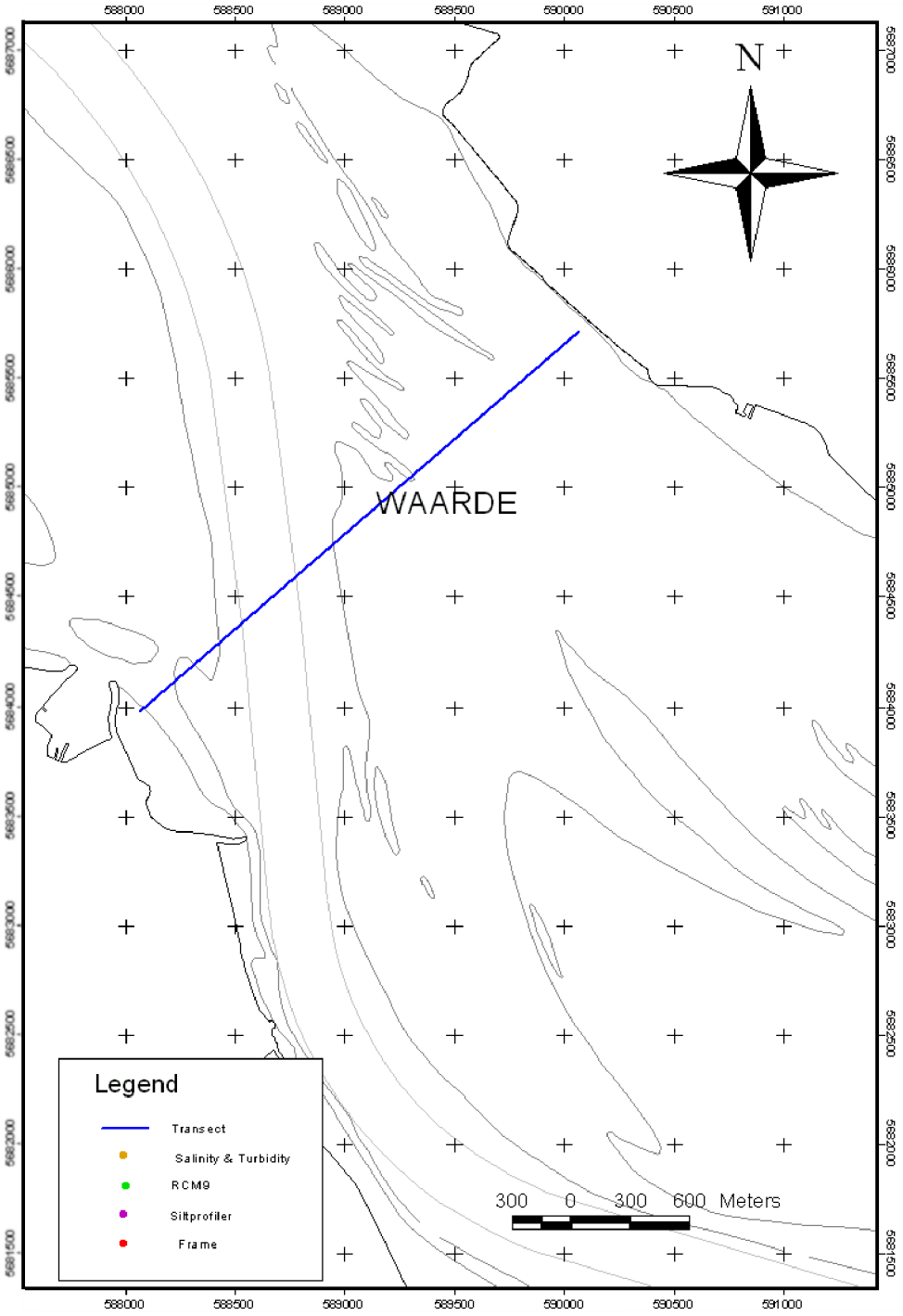
Annex Figure 1: Overview of the measurement locations



Annex Figure 2: Overview of the measurement locations at Deurganckdok during previous campaigns



Annex Figure 3: Transect S in Schelle



Annex Figure 4: Transect W in Waarde

A.2 Overview of all measurement locations HCBS and Deurganckdok measurement campaigns

Annex Table A-1: coordinates of theoretical transects

Transect	Start Easting	Start Northing	End Easting	End Northing
I	590318.00	5683302.00	590771.00	5684257.00
K	588484.00	5684924.00	589775.00	5685384.00
SCHELLE	592645.07	5665794.06	592952.68	5665682.28
DGD	588764.88	5684056.49	588540.95	5684526.94
Y	589059.09	5684948.36	587898.76	5683076.56
WAARDE	573541.00	5696848.20	571318.00	5694932.90

Annex Table A-2: coordinates of SiltProfiler gauging locations

SP	EASTING	NORTHING
1	588737	5684638
2	588690	5684562
3	588643	5684486
4	588596	5684411
5	588549	5684335
6	588606	5684217
7	588653	5684293
8	588700	5684368
9	588747	5684444
10	588793	5684520
11	588850	5684402
12	588803	5684326
13	588756	5684250
14	588709	5684174
15	588662	5684099

A.3 Measurement overview at DGD on 16/03/2012

FileName	Time [hh:mm MET]	Time after HW [hh:mm]	Easting Left (UTM31 WGS84)	Northing Left (UTM31 WGS84)	Easting Right (UTM31 WGS84)	Northing Right (UTM31 WGS84)	Transect length [m]	Transect heading [°]
9002_dgd_Tba_sub	07:38	-0:46	588448	5684315	588668	5683851	514	155
9004_dgd_Tab	07:53	-0:31	588447	5684316	588671	5683846	520	335
9005_dgd_Tba_sub	08:02	-0:22	588449	5684313	588667	5683854	509	155
9006_dgd_Tab_sub	08:11	-0:13	588448	5684316	588665	5683859	506	335
9008_dgd_Tba_sub	08:21	-0:03	588457	5684296	588655	5683879	462	155
9010_dgd_Tab_sub	08:31	0:06	588448	5684314	588668	5683852	512	335
9011_dgd_Tba_sub	08:36	0:11	588498	5684210	588662	5683865	382	155
9012_dgd_Tab_sub	08:44	0:19	588449	5684314	588664	5683860	502	335
9014_dgd_Tba_sub	08:54	0:29	588466	5684278	588662	5683865	457	155
9016_dgd_Tab_sub	09:08	0:43	588448	5684316	588666	5683856	509	335
9017_dgd_Tba_sub	09:16	0:51	588480	5684247	588664	5683861	427	155
9018_dgd_Tab_sub	09:28	1:03	588447	5684317	588668	5683853	514	335
9020_dgd_Tba_sub	09:39	1:14	588456	5684298	588664	5683860	485	155
9022_dgd_Tab_sub	09:50	1:25	588447	5684316	588667	5683855	510	335
9023_dgd_Tba_sub	10:01	1:36	588447	5684317	588664	5683861	505	155
9024_dgd_Tab_sub	10:13	1:48	588447	5684317	588668	5683853	513	335
9026_dgd_Tba_sub	10:45	2:20	588447	5684316	588663	5683864	501	155
9027_dgd_Tab_sub	10:55	2:30	588449	5684313	588665	5683858	504	335
9029_dgd_Tba_sub	11:13	2:48	588451	5684309	588668	5683853	505	155
9030_dgd_Tab_sub	11:18	2:53	588447	5684317	588666	5683857	509	335
9031_dgd_Tba_sub	11:26	3:01	588449	5684312	588666	5683857	503	155
9033_dgd_Tab_sub	11:35	3:10	588447	5684316	588664	5683860	505	335
9034_dgd_Tba_sub	11:43	3:18	588451	5684309	588664	5683860	496	155
9035_dgd_Tab_sub	11:53	3:28	588447	5684317	588664	5683860	505	335
9036_dgd_Tba	12:00	3:35	588447	5684317	588662	5683864	501	155
9038_dgd_Tab_sub	12:10	3:45	588447	5684316	588668	5683853	513	335
9040_dgd_Tba_sub	12:20	3:55	588447	5684316	588667	5683855	511	155
9041_dgd_Tab_sub	12:36	4:11	588448	5684316	588671	5683846	520	335
9042_dgd_Tba_sub	12:43	4:18	588448	5684315	588666	5683857	507	155

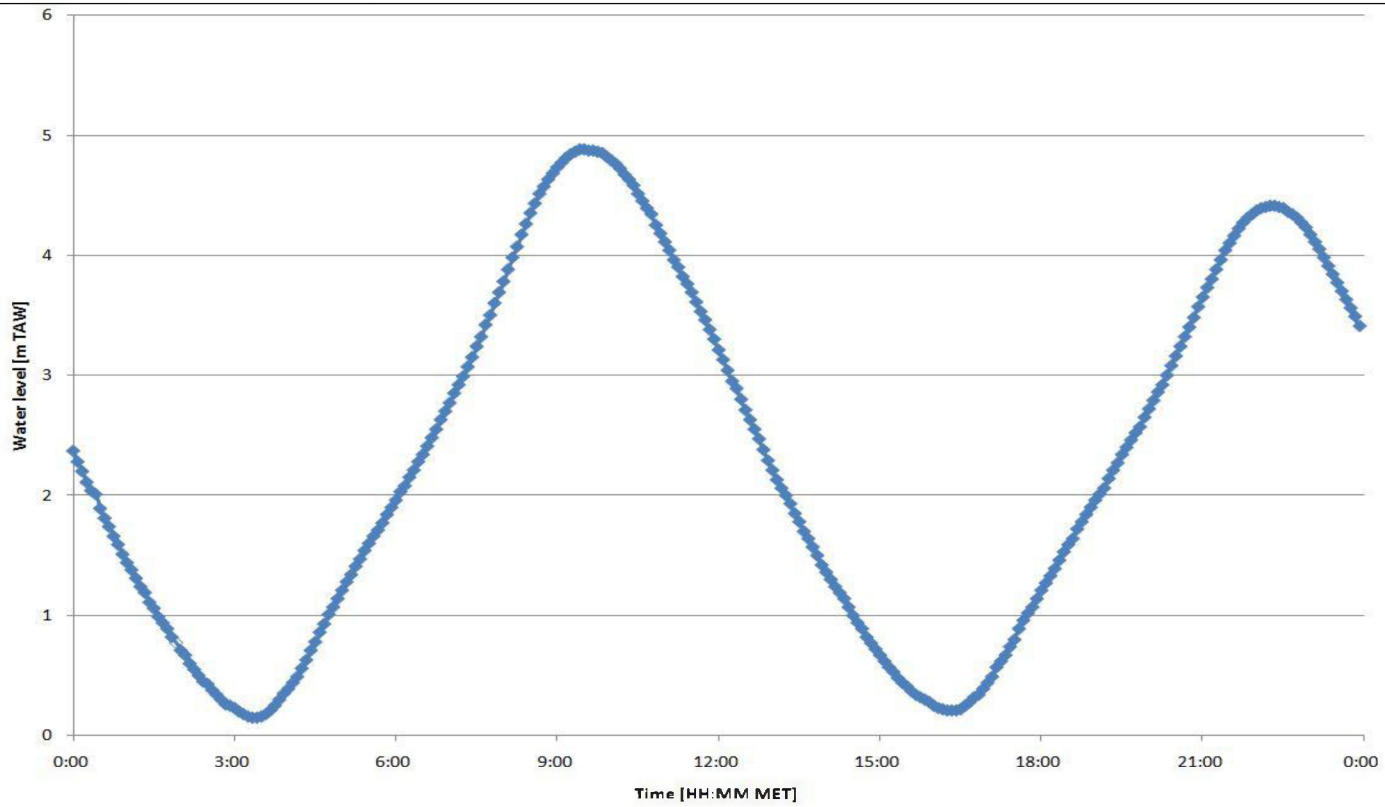
FileName	Time [hh:mm MET]	Time after HW [hh:mm]	Easting Left (UTM31 WGS84)	Northing Left (UTM31 WGS84)	Easting Right (UTM31 WGS84)	Northing Right (UTM31 WGS84)	Transect length [m]	Transect heading [°]
9044_dgd_Tab_sub	12:55	4:30	588449	5684314	588669	5683850	513	335
9046_dgd_Tba_sub	13:07	4:42	588451	5684308	588667	5683855	502	155
9047_dgd_Tab_sub	13:12	4:47	588457	5684297	588665	5683859	485	335
9048_dgd_Tba_sub	13:24	4:59	588452	5684307	588664	5683861	493	155
9049_dgd_Tab_sub	13:30	5:05	588452	5684307	588666	5683857	498	335
9051_dgd_Tba_sub	13:42	5:17	588447	5684316	588663	5683862	503	155
9053_dgd_Tab_sub	13:53	5:28	588447	5684317	588666	5683857	510	335
9054_dgd_Tba_sub	14:00	5:35	588450	5684311	588667	5683855	504	155
9055_dgd_Tab_sub	14:08	5:43	588448	5684314	588664	5683860	503	335
9057_dgd_Tba_sub	14:23	5:58	588456	5684298	588665	5683859	486	155
9059_dgd_Tab_sub	14:33	6:08	588451	5684308	588659	5683872	483	335
9060_dgd_Tba_sub	14:40	6:15	588448	5684315	588662	5683866	498	155
9061_dgd_Tab_sub	14:45	6:20	588456	5684299	588662	5683865	481	335
9062_dgd_Tba_sub	14:57	6:32	588459	5684292	588664	5683861	477	155
9064_dgd_Tab_sub	15:11	6:46	588456	5684299	588669	5683851	496	335
9066_dgd_Tba_sub	15:27	-5:52	588448	5684316	588630	5683932	425	155
9067_dgd_Tab_sub	15:34	-5:45	588459	5684292	588668	5683852	488	335
9068_dgd_Tba_sub	15:41	-5:38	588449	5684313	588667	5683855	508	155
9069_dgd_Tab_sub	15:50	-5:29	588450	5684310	588666	5683857	501	335
9071_dgd_Tba_sub	15:59	-5:20	588448	5684315	588666	5683856	508	155
9073_dgd_Tab_sub	16:14	-5:05	588449	5684313	588667	5683855	507	335
9074_dgd_Tba_sub	16:20	-4:59	588451	5684309	588661	5683868	489	155
9075_dgd_Tab_sub	16:28	-4:51	588447	5684317	588665	5683858	508	335
9076_dgd_Tba_sub	16:34	-4:45	588450	5684310	588662	5683864	494	155
9078_dgd_Tab_sub	16:56	-4:23	588465	5684280	588655	5683880	443	335
9080_dgd_Tba_sub	17:07	-4:12	588455	5684299	588656	5683877	468	155
9081_dgd_Tab_sub	17:14	-4:05	588453	5684305	588669	5683851	502	335
9082_dgd_Tba_sub	17:21	-3:58	588449	5684313	588660	5683870	490	155
9083_dgd_Tab_sub	17:27	-3:52	588454	5684303	588668	5683853	498	335
9085_dgd_Tba_sub	17:36	-3:43	588450	5684311	588663	5683864	495	155

FileName	*Time [hh:mm MET]*	*Time after HW [hh:mm]*	*Easting Left (UTM31 WGS84)*	*Northing Left (UTM31 WGS84)*	*Easting Right (UTM31 WGS84)*	*Northing Right (UTM31 WGS84)*	*Transect length [m]*	*Transect heading [°]*
9087_dgd_Tab_sub	17:47	-3:32	588447	5684317	588667	5683855	512	335
9088_dgd_Tba_sub2	17:57	-3:22	588447	5684316	588671	5683847	520	155
9089_dgd_Tab_sub	18:05	-3:14	588456	5684298	588665	5683859	486	335
9090_dgd_Tba_sub	18:13	-3:06	588497	5684212	588660	5683869	379	155
9091_dgd_Tba_sub	18:19	-3:00	588450	5684311	588662	5683866	493	335
9092_dgd_Tba_sub	18:24	-2:55	588448	5684315	588666	5683856	509	155
9094_dgd_Tab_sub	18:34	-2:45	588449	5684312	588660	5683868	491	335
9096_dgd_Tba_sub	18:45	-2:34	588449	5684312	588660	5683868	491	155
9097_dgd_Tab_sub	18:51	-2:28	588447	5684316	588664	5683861	504	335
9098_dgd_Tba_sub	18:57	-2:22	588448	5684314	588663	5683864	499	155
9101_dgd_Tab_sub	19:17	-2:02	588447	5684317	588669	5683849	518	335
9102_dgd_Tba_sub	19:23	-1:56	588450	5684312	588651	5683888	469	155
9104_dgd_Tab_sub	19:34	-1:45	588450	5684310	588662	5683865	492	335
9105_dgd_Tba_sub	19:40	-1:39	588449	5684312	588635	5683922	432	155
9106_dgd_Tab_sub	19:45	-1:34	588448	5684316	588663	5683863	502	335
9108_dgd_Tba_sub	19:58	-1:21	588458	5684295	588659	5683871	469	155

Annex B Tidal and discharge data

B.1 Tidal data

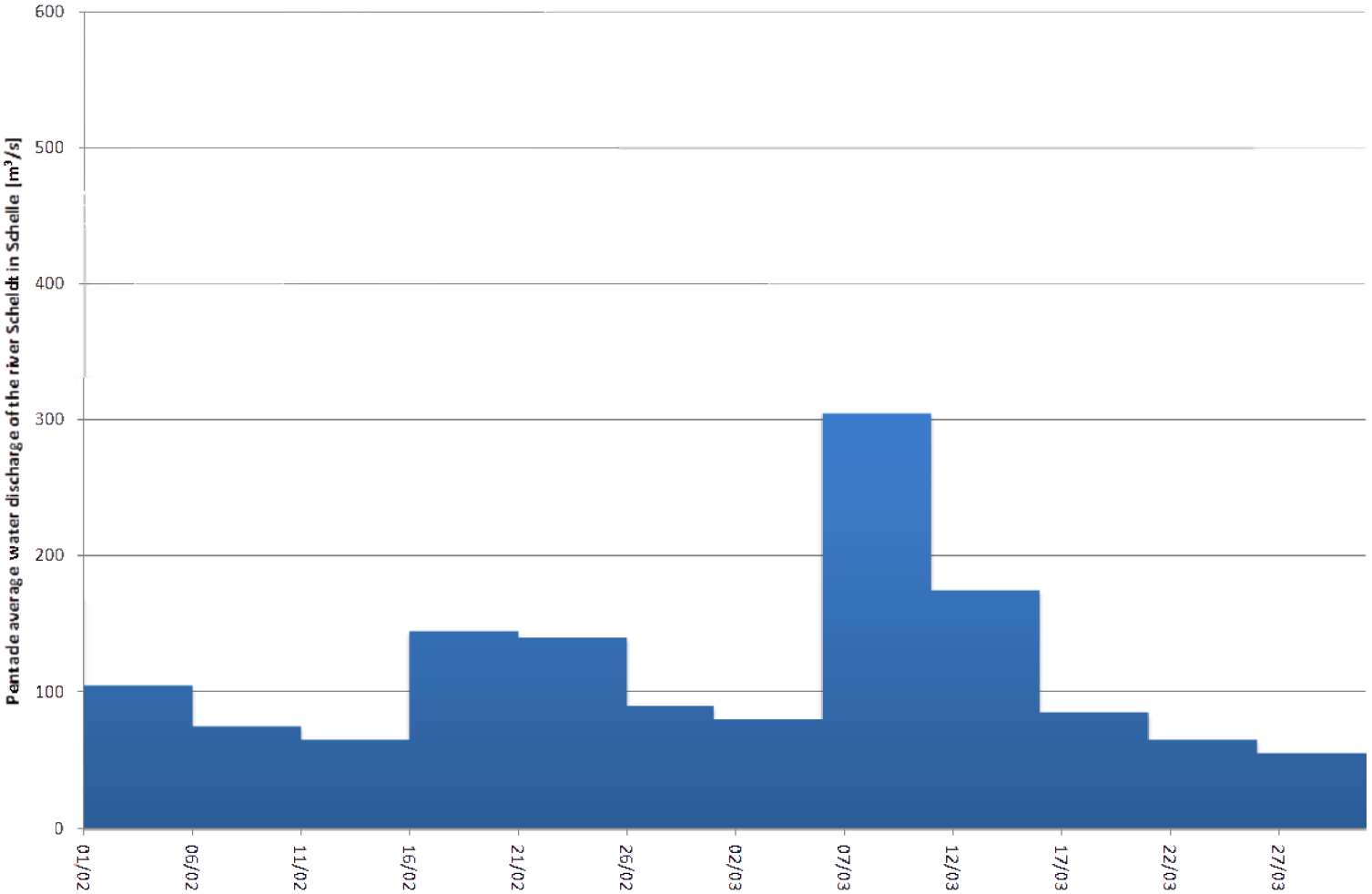
11354 – Spring 2012 SURVEY



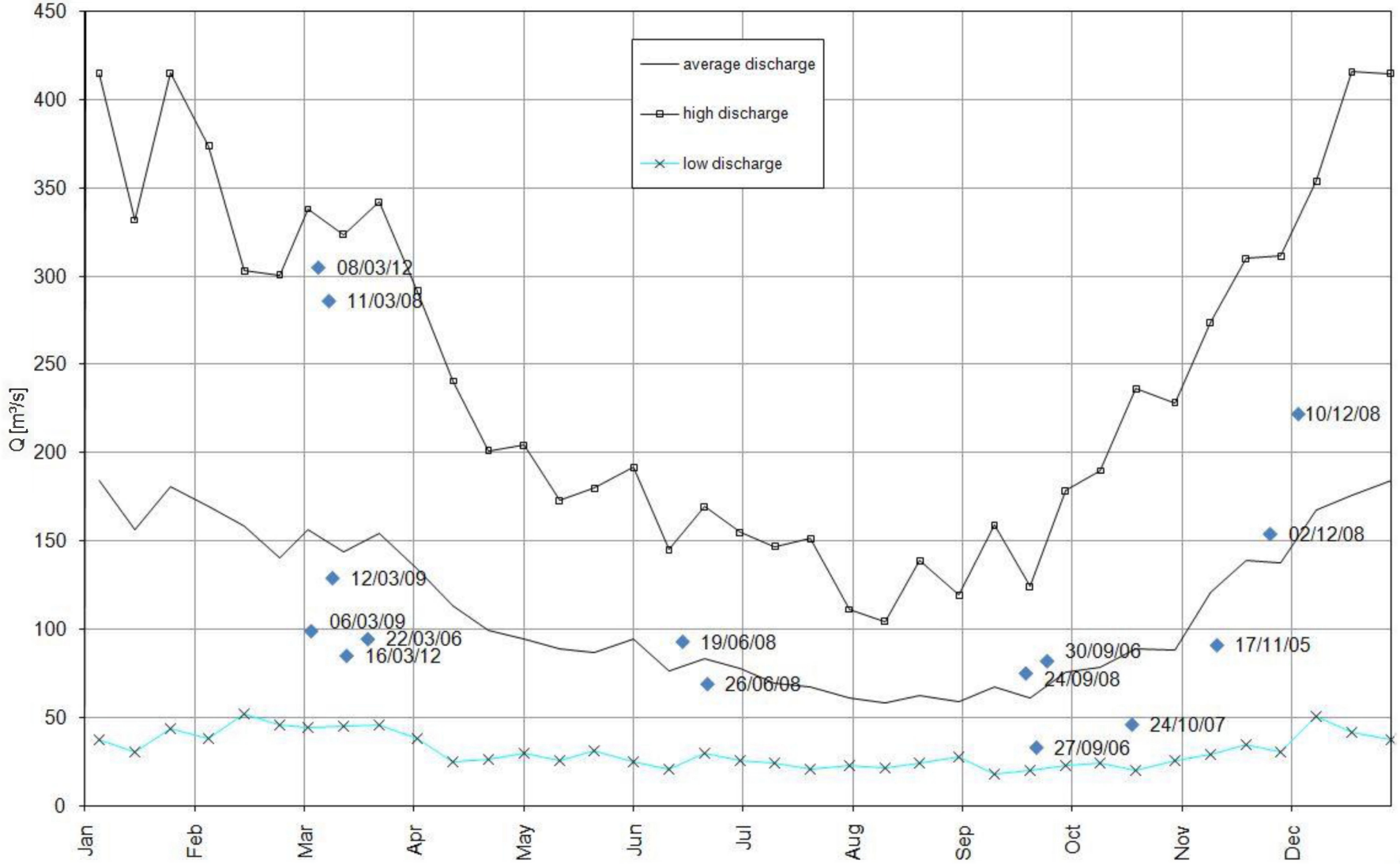
Measured tide on 16/03/2012 at Liefkenshoek		*Data processed by:* IMDC
Location: River Scheldt	Date: 16/03/2012	*In association with:* Deltares & GEMS International
		I/RA/11354/10.109/MBO/ANF

Annex Figure 5: Measured tide in MET on 16 March 2012 at Liefkenshoek

B.2 Discharge data



Annex Figure 6: Pentade average discharges of the river Scheldt in Schelle of the months February and March 2012



Annex Figure 7: Mean fresh water discharge over a period of 30 year (1971-2000) with the monthly discharge of 2008-2009

Annex C Navigation information as recorded on site

Ship:	***Parel II***
Location:	***Deurganckdok (transect DGD)***

Transect	***Remarks***
9022_dgd_Tab	golfslag ENS 2105
9048_dgd_Tba	schroefwater ENS 1660-1668
9053_dgd_Tab	schroefwater ENS 580-650 & 690-720
9055_dgd_Tab	schroefwater ENS 1352-1358
9057_dgd_Tba	schroefwater ENS 1935-1957
9075_dgd_Tab	schroefwater
9089_dgd_Tab	schroefwater: 2190-2206
9091_dgd_Tab	schroefwater: 2781-2792
9092_dgd_Tba	schroefwater: 2968-2974
9094_dgd_Tab	containerschip gepasseerd

Annex D unesco PPs-78 formula for calculating salinity

Practical Salinity Scale (PPS 78) Salinity in the range of 2 to 42

Constants from the 19th Edition of Standard Methods

R cond.ratio	0.0117	$R = \frac{C}{42.914 mS/cm}$
C Cond at t	**0.5**	**Input conductivity in mS/cm of sample**
t deg. C	**22.00**	**Input temperature of sample solution**
P dBar	**20**	**Input pressure at which sample is measured in decibars**
Rp	1.0020845	$R_p = 1 + \frac{p(e_1 + e_2 p + e_3 p^2)}{1 + d_1 t + d_2 t^2 + (d_3 + d_4 t)R}$
rt	1.1641102	$r_t = c_0 + c_1 t + c_2 t^2 + c_3 t^3 + c_4 t^4$
Rt	0.0099879	$R_t = \frac{R}{R_p \times r_t}$
Delta S	-0.0010	$\text{Delta } S = \frac{(t-15)}{1+k(t-15)}(b_0 + b_1 R_t^{1/2} + b_2 R_t + b_3 R_t^{3/2} + b_4 R_t^2 + b_5 R_t^{5/2})$
S = Salinity	**0.257**	$S = a_0 + a_1 R_t^{1/2} + a_2 R_t + a_3 R_t^{3/2} + a_4 R_t^2 + a_5 R_t^{5/2} + \text{delta } S$

a0	0.0080	b0	0.0005	c0	0.6766097	d1	3.426E-02	e1	2.070E-04
a1	-0.1692	b1	-0.0056	c1	2.00564E-02	d2	4.464E-04	e2	-6.370E-08
a2	25.3851	b2	-0.0066	c2	1.104259E-04	d3	4.215E-01	e3	3.989E-12
a3	14.0941	b3	-0.0375	c3	-6.9698E-07	d4	-3.107E-03		
a4	-7.0261	b4	0.0636	c4	1.0031E-09				
a5	2.7081	b5	-0.0144						
		k	0.0162						

R = ratio of measured conductivity to the conductivity of the Standard Seawater Solution

Conductivity Ratio R is a function of salinity, temperature, and hydraulic pressure. So that we can factor R into three parts i.e.

R = Rt x Rp x rt

R = C(S,t,p)/C(35,15,0)

C = 42.914 mS/cm at 15 deg C and 0 dbar pressure ie C(35,15,0) where 35 is the salinity

Ocean pressure is usually measured in decibars. 1 dbar = 10^-1 bar = 10^5 dyne/cm^2 = 10^4 Pascal.

Annex E Overview of sediview settings

Ship:		*Parel II*	
Location:		*Deurganckdok (transect DGD)*	
Date		*16/03/2012*	
Parameters	***Value***	***Parameters***	***Value***
Inst. Depth (m)	1.09	*Compass offset (°)*	-9
Force depth (m)	0	*Beam 3 misalignment (°)*	0
Velocity reference	BT	*Effective particle size (µm)*	20
Speed of sound algorithm	Urick	*Beam1 scale factor*	0.455
Error velocity	YES	*Beam2 scale factor*	0.42
External heading	NO	*Beam3 scale factor*	0.425
External Depth	NO	*Beam4 scale factor*	0.42
SSC factor top (%)	100	*Discharge factor top*	Constant
SSC factor bottom (%)	125	*Discharge factor bottom*	Power
Shape factor left bank	0.91	*Shape factor right bank*	0.91

Filename	***Calibration const (Ks)***	***Backscatter coefficient (S)***	***Distance to the left bank (m)***	***Distance to the right bank (m)***
9002_dgd_Tba_sub	48	19.5	2.04	5.89
9004_dgd_Tab	48	19.75	1.06	0.49
9005_dgd_Tba_sub	48	19.75	4.23	8.39
9006_dgd_Tab_sub	48	19.75	1.19	14.60
9008_dgd_Tba_sub	48	19.75	23.15	36.24
9010_dgd_Tab_sub	48	20.5	2.98	7.05
9011_dgd_Tba_sub	48	20.5	118.12	21.57
9012_dgd_Tab_sub	48	20.5	3.65	15.50
9014_dgd_Tba_sub	48	20.5	43.56	20.71
9016_dgd_Tab_sub	48	21.75	1.21	11.50
9017_dgd_Tba_sub	48	21.75	77.91	16.80
9018_dgd_Tab_sub	48	21.75	0.53	7.24
9020_dgd_Tba_sub	48	22.25	21.24	15.57
9022_dgd_Tab_sub	48	22.25	0.89	10.22
9023_dgd_Tba_sub	48	22.25	0.31	16.07
9024_dgd_Tab_sub	48	22.25	0.48	8.01

Filename	*Calibration const (Ks)*	*Backscatter coefficient (S)*	*Distance to the left bank (m)*	*Distance to the right bank (m)*
9026_dgd_Tba_sub	48	21.75	0.80	19.56
9027_dgd_Tab_sub	48	21.75	3.92	13.73
9029_dgd_Tba_sub	48	21.25	8.62	7.79
9030_dgd_Tab_sub	48	21.25	0.40	12.17
9031_dgd_Tba_sub	48	21.25	5.66	12.68
9033_dgd_Tab_sub	48	21.25	0.89	15.98
9034_dgd_Tba_sub	48	21.25	9.35	15.81
9035_dgd_Tab_sub	48	21.25	0.21	15.86
9036_dgd_Tba	48	21.25	0.06	20.30
9038_dgd_Tab_sub	48	21.25	0.98	7.75
9040_dgd_Tba_sub	48	21	0.80	9.69
9041_dgd_Tab_sub	48	21	1.27	0.26
9042_dgd_Tba_sub	48	21	2.22	12.29
9044_dgd_Tab_sub	48	21	3.80	4.81
9046_dgd_Tba_sub	48	21	9.65	10.22
9047_dgd_Tab_sub	48	21	22.41	14.57
9048_dgd_Tba_sub	48	21	11.56	17.06
9049_dgd_Tab_sub	48	21	11.08	12.31
9051_dgd_Tba_sub	48	21.25	0.75	18.20
9053_dgd_Tab_sub	48	21.75	0.40	11.64
9054_dgd_Tba_sub	48	21.75	6.93	10.44
9055_dgd_Tab_sub	48	21.75	3.04	15.51
9057_dgd_Tba_sub	48	21.75	21.29	14.71
9059_dgd_Tab_sub	48	21.5	9.80	28.96
9060_dgd_Tba_sub	48	21.5	1.90	22.11
9061_dgd_Tab_sub	48	21.5	20.46	20.54
9062_dgd_Tba_sub	48	21.5	28.04	16.98
9064_dgd_Tab_sub	48	21.25	20.23	5.40
9066_dgd_Tba_sub	48	21.75	1.62	95.39
9067_dgd_Tab_sub	48	21.75	27.29	6.58
9068_dgd_Tba_sub	48	21.75	4.01	9.97
9069_dgd_Tab_sub	48	21.75	8.06	12.29

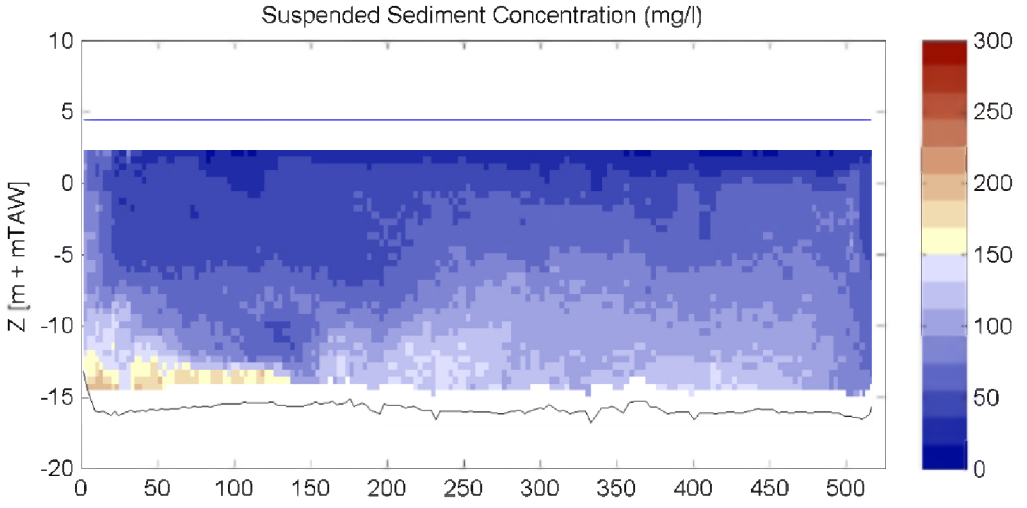
Filename	*Calibration const (Ks)*	*Backscatter coefficient (S)*	*Distance to the left bank (m)*	*Distance to the right bank (m)*
9071_dgd_Tba_sub	48	21.5	2.45	11.23
9073_dgd_Tab_sub	48	21.5	4.83	10.22
9074_dgd_Tba_sub	48	21.5	8.52	24.02
9075_dgd_Tab_sub	48	21.5	0.17	13.26
9076_dgd_Tba_sub	48	21.5	7.83	20.14
9078_dgd_Tab_sub	48	21.5	40.83	37.86
9080_dgd_Tba_sub	48	21.5	19.50	33.99
9081_dgd_Tab_sub	48	21.5	13.53	5.60
9082_dgd_Tba_sub	48	21.5	4.52	26.58
9083_dgd_Tab_sub	48	21.5	15.51	7.61
9085_dgd_Tba_sub	48	21.5	6.93	19.38
9087_dgd_Tab_sub	48	21.5	0.47	9.42
9088_dgd_Tba_sub2	48	21.5	0.61	0.87
9089_dgd_Tab_sub	48	21.5	20.73	14.79
9090_dgd_Tba_sub	48	21.5	116.52	25.81
9091_dgd_Tba_sub	48	21.5	7.03	21.95
9092_dgd_Tba_sub	48	21.5	1.79	10.55
9094_dgd_Tab_sub	48	21.5	5.66	24.49
9096_dgd_Tba_sub	48	21.25	5.63	24.80
9097_dgd_Tab_sub	48	21.25	0.97	16.26
9098_dgd_Tba_sub	48	21.25	3.47	19.40
9101_dgd_Tab_sub	48	20.75	0.08	3.78
9102_dgd_Tba_sub	48	20.75	5.99	46.86
9104_dgd_Tab_sub	48	21.5	8.05	21.11
9105_dgd_Tba_sub	48	21.5	5.68	83.76
9106_dgd_Tab_sub	48	21.5	1.33	18.68
9108_dgd_Tba_sub	48	21.5	24.83	27.54

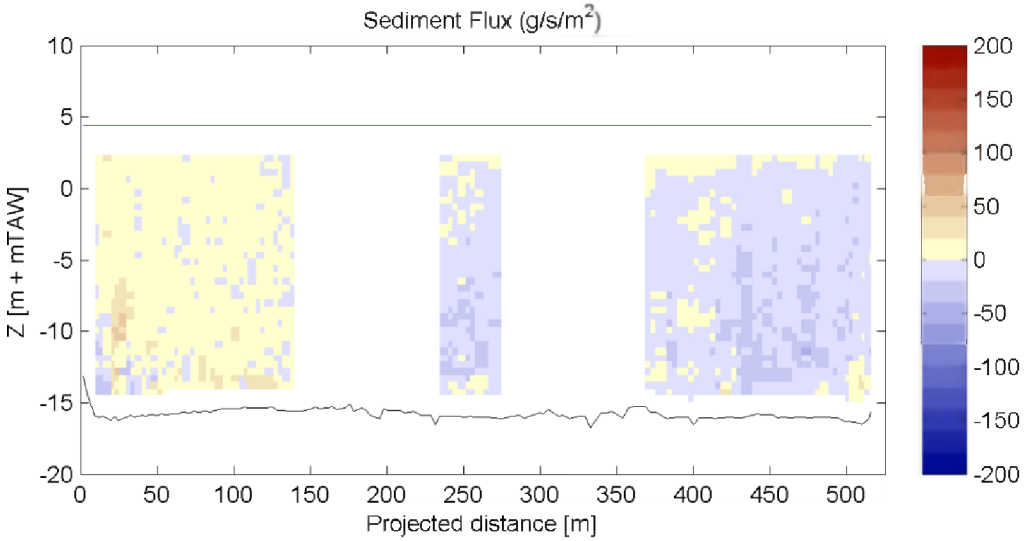
Annex F Contourplots of flow velocities, Sediment Concentration and Sediment Flux, per sailed transect

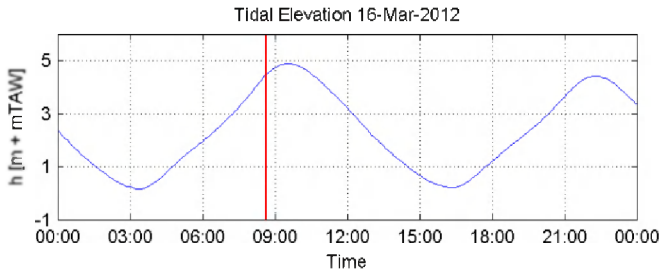
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Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9002_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
08:35 - 08:38

Time after HW [HH:MM]
-1:28

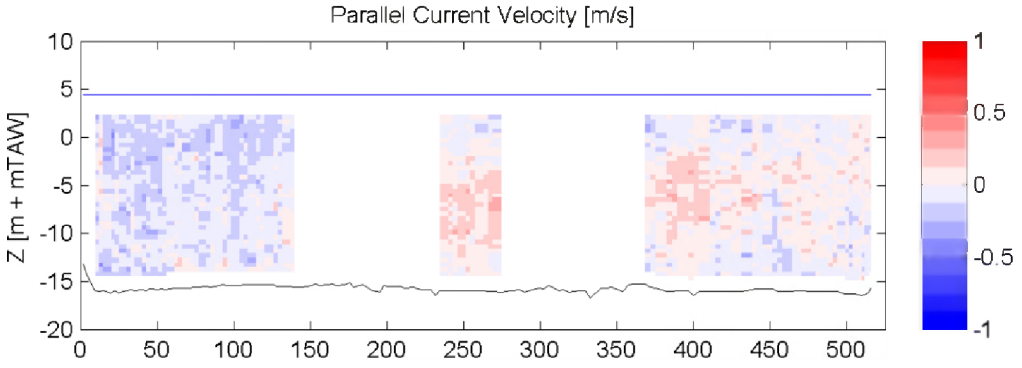
Data Processed by:

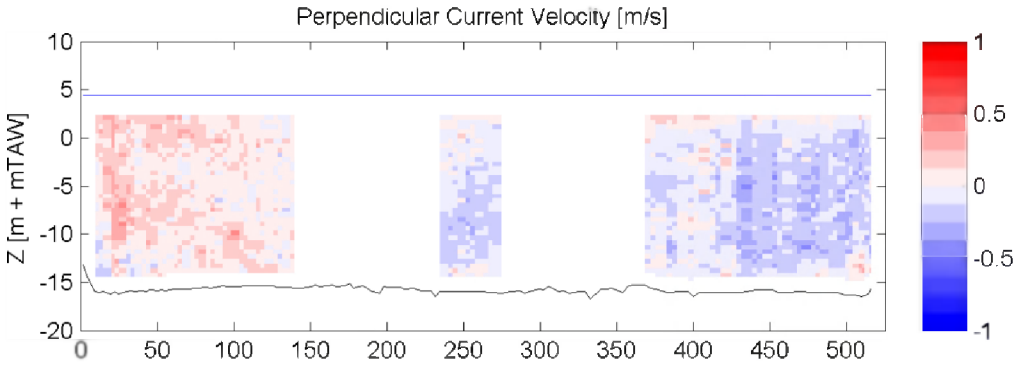
In association with :

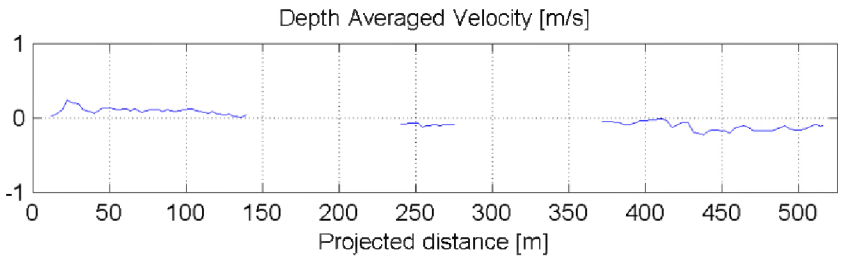
I/RA/11354/10.109/MBO/ANF

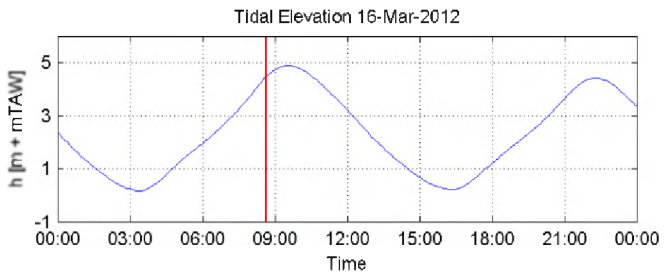
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9002_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

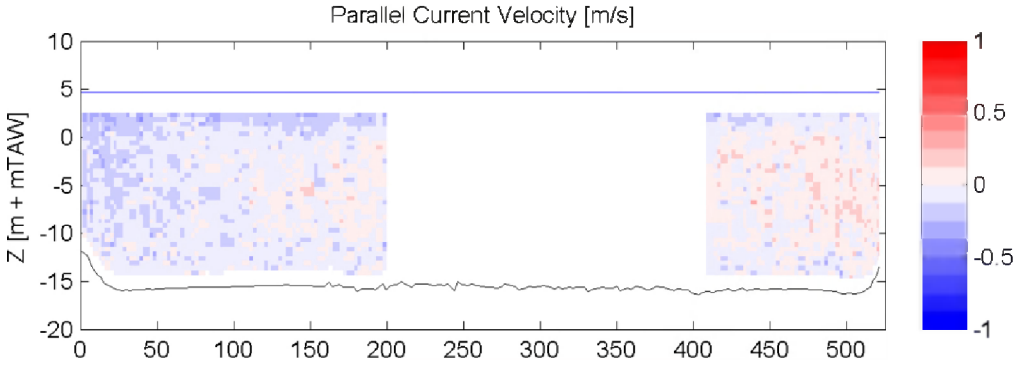
Date / Time [MET] :
16-Mar-2012
08:35 - 08:38

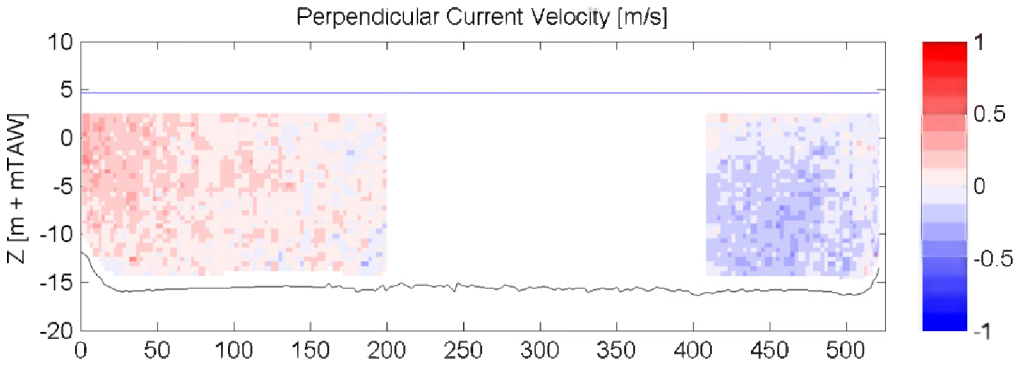
Time after HW [HH:MM]
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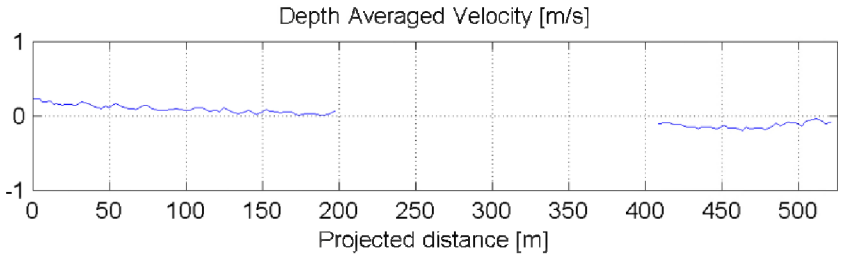
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

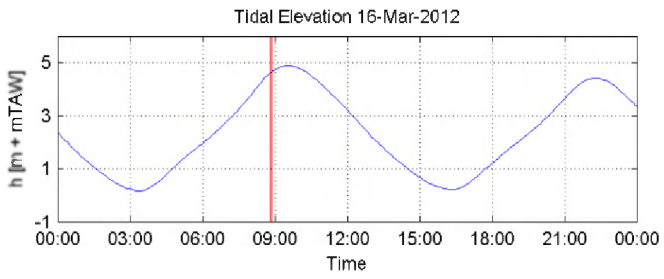
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9004_dgd_Tab.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

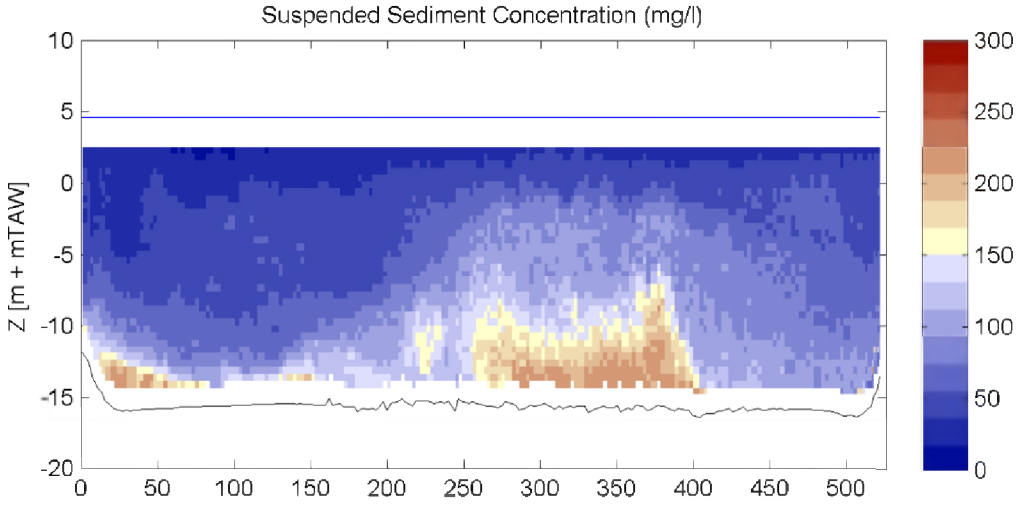
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16-Mar-2012
08:49 - 08:53

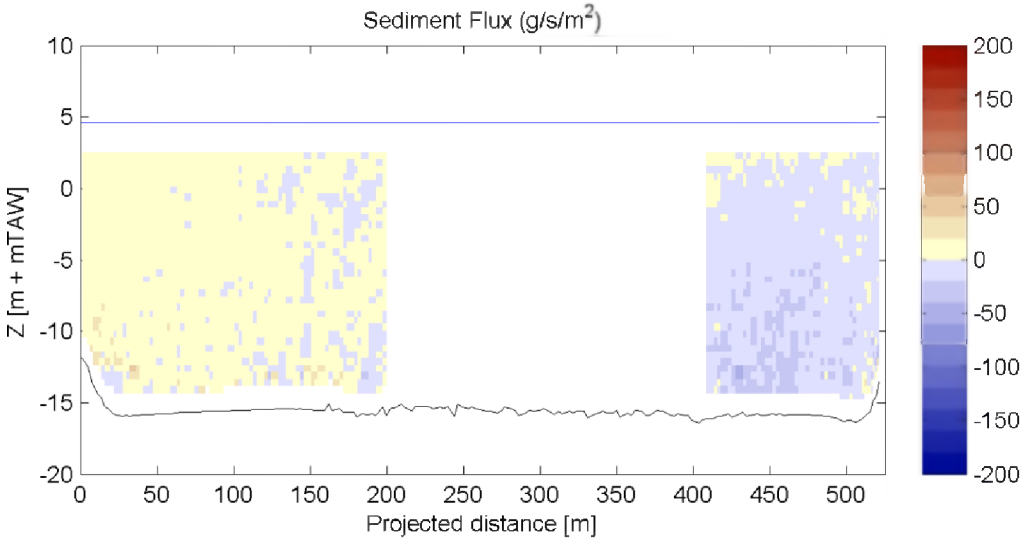
Time after HW [HH:MM]
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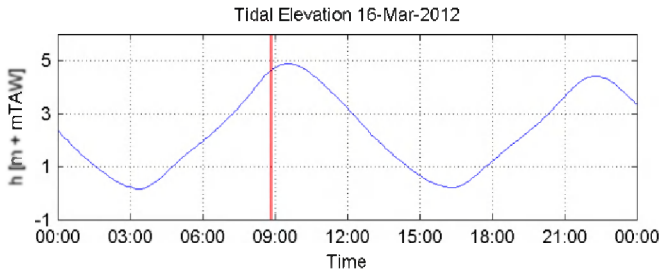
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9004_dgd_Tab.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

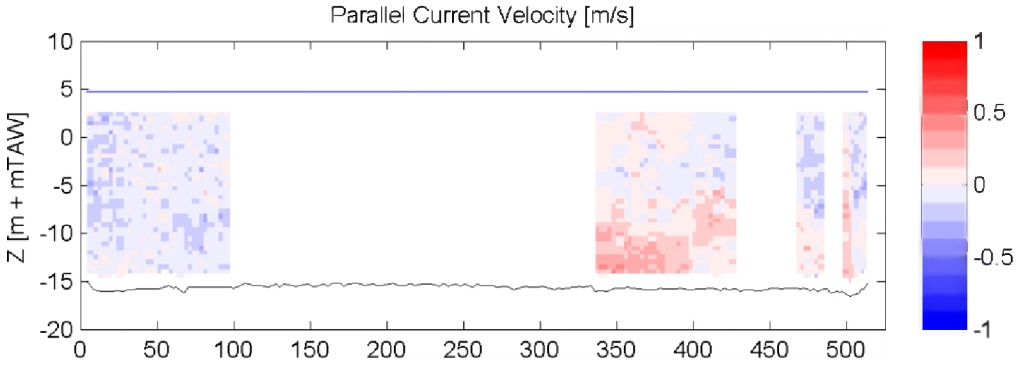
Date / Time [MET] :
16-Mar-2012
08:49 - 08:53

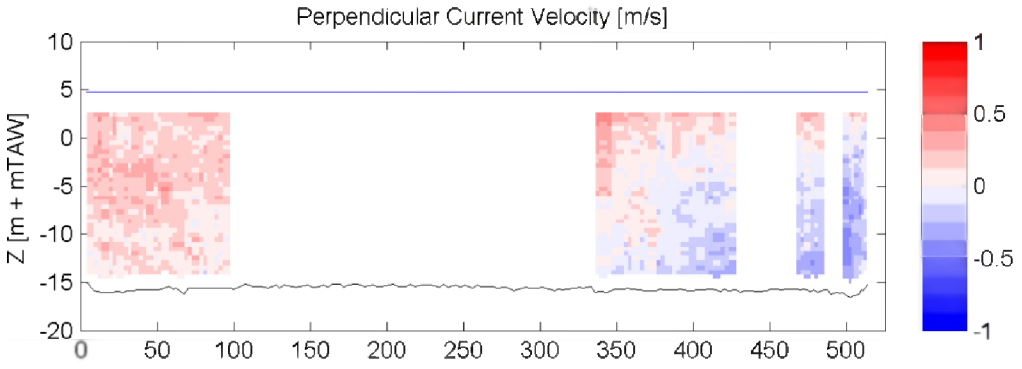
Time after HW [HH:MM]
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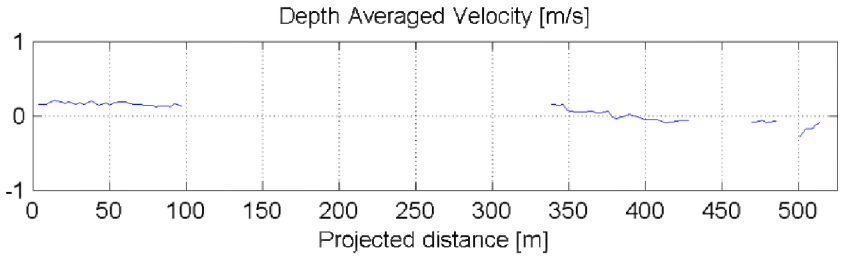
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

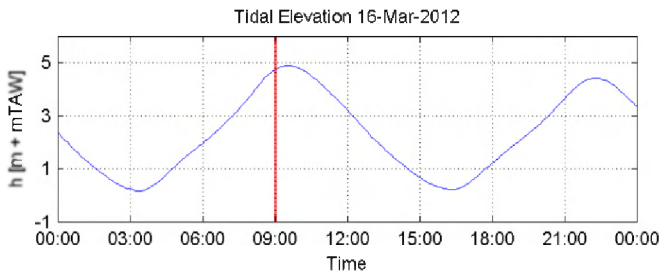
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9005_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

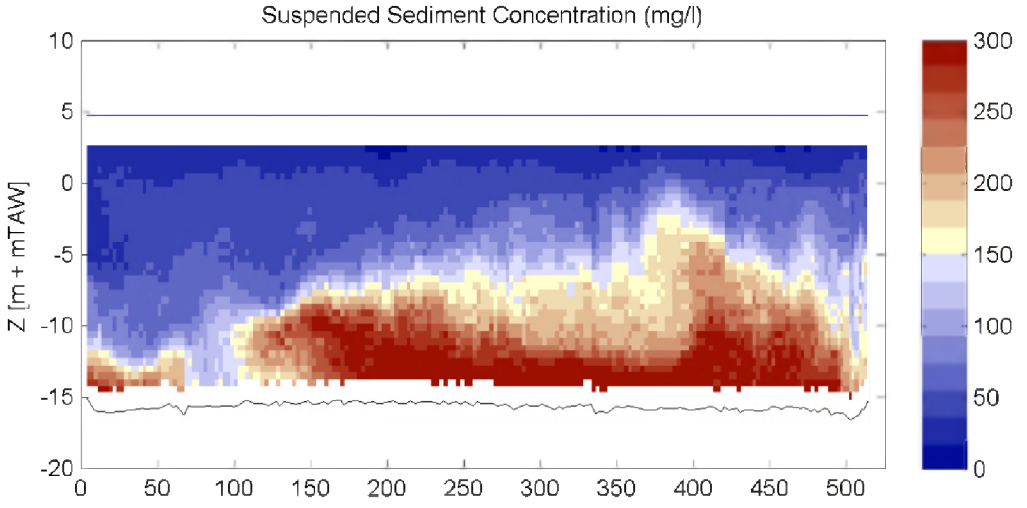
Date / Time [MET] :
16-Mar-2012
08:59 - 09:02

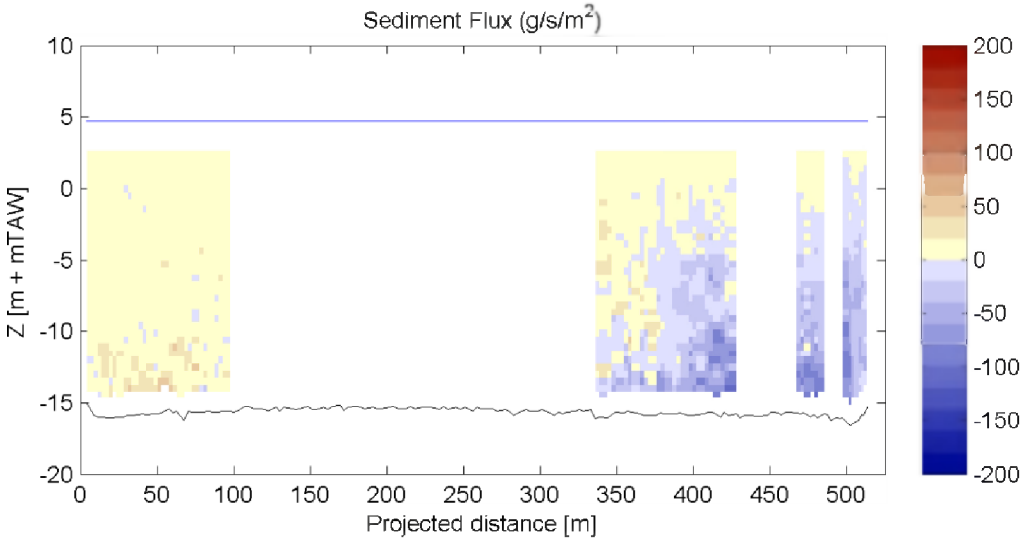
Time after HW [HH:MM]
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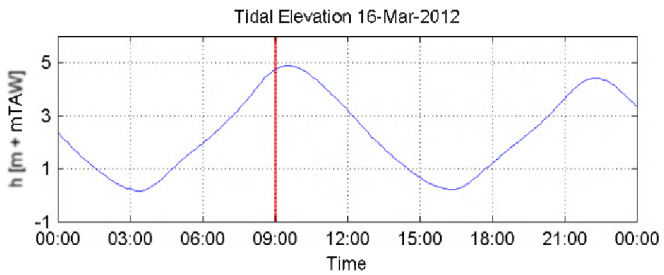
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9005_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

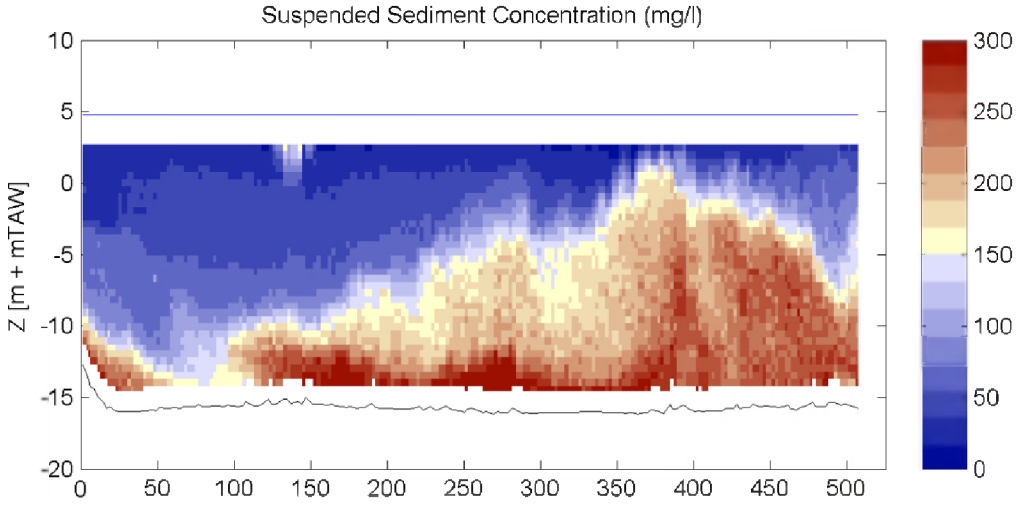
Date / Time [MET] :
16-Mar-2012
08:59 - 09:02

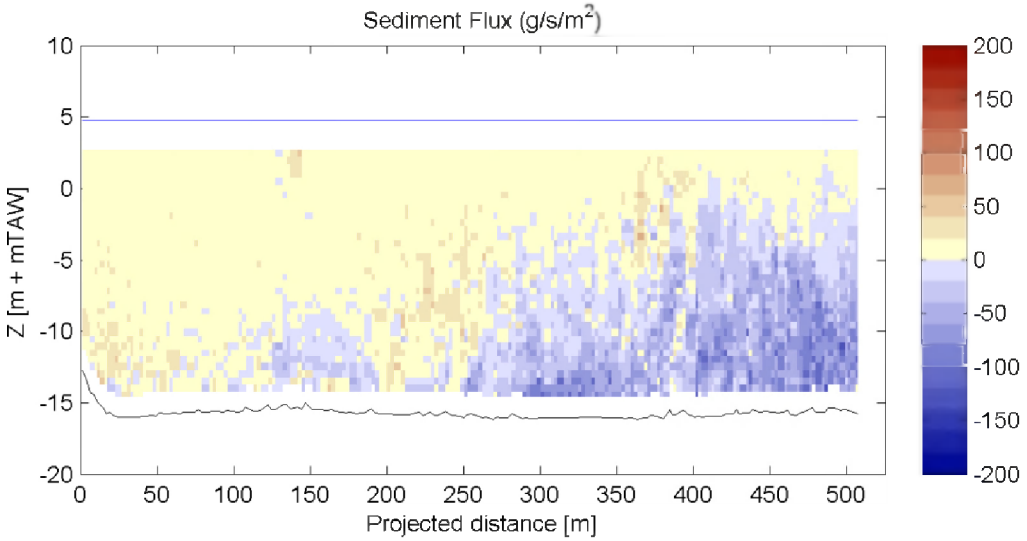
Time after HW [HH:MM]
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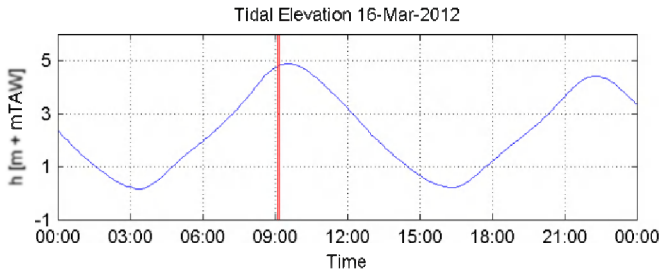
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9006_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

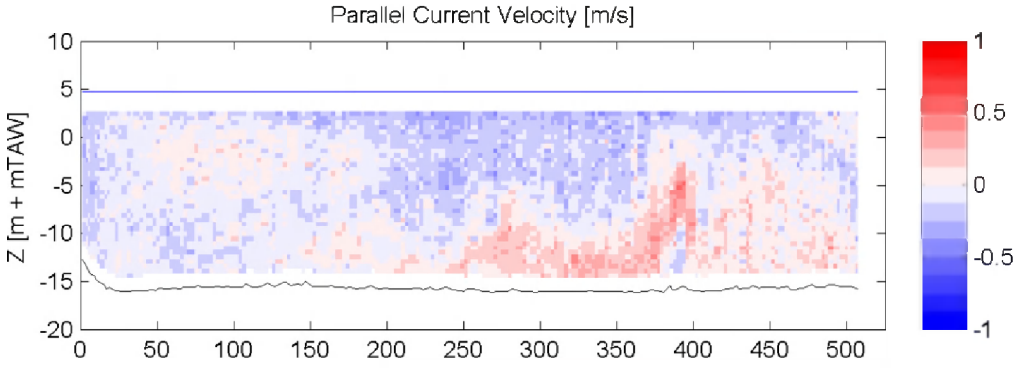
Date / Time [MET] :
16-Mar-2012
09:07 - 09:11

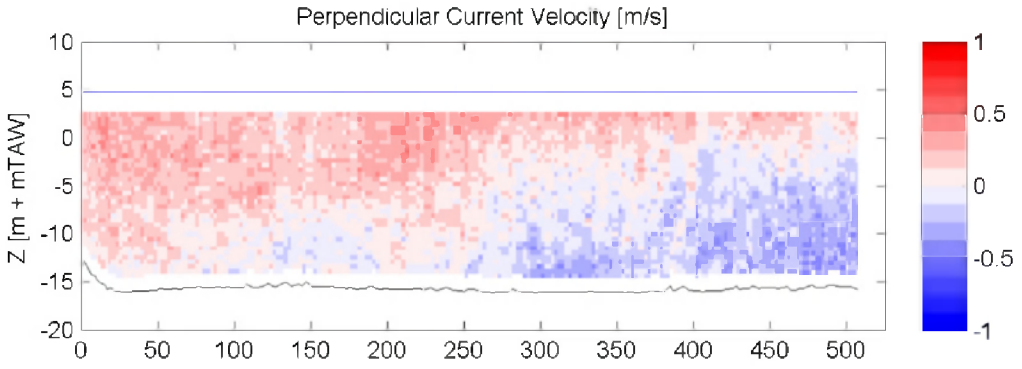
Time after HW [HH:MM]
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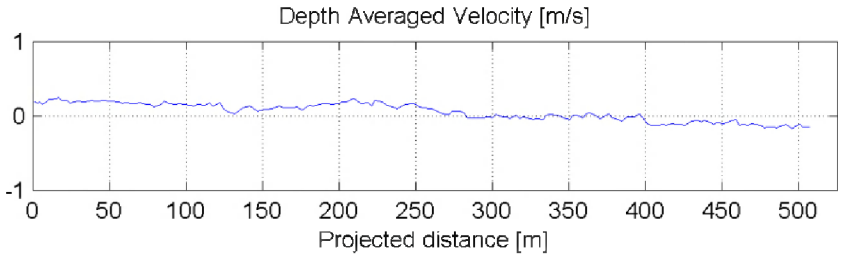
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

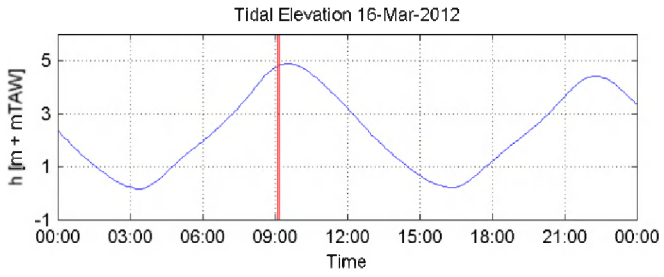
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9006_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

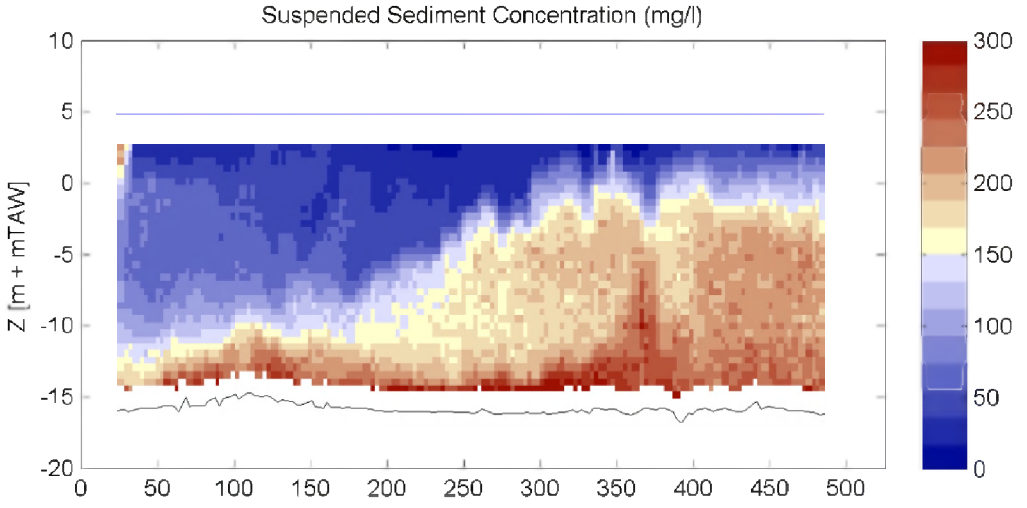
Date / Time [MET] :
16-Mar-2012
09:07 - 09:11

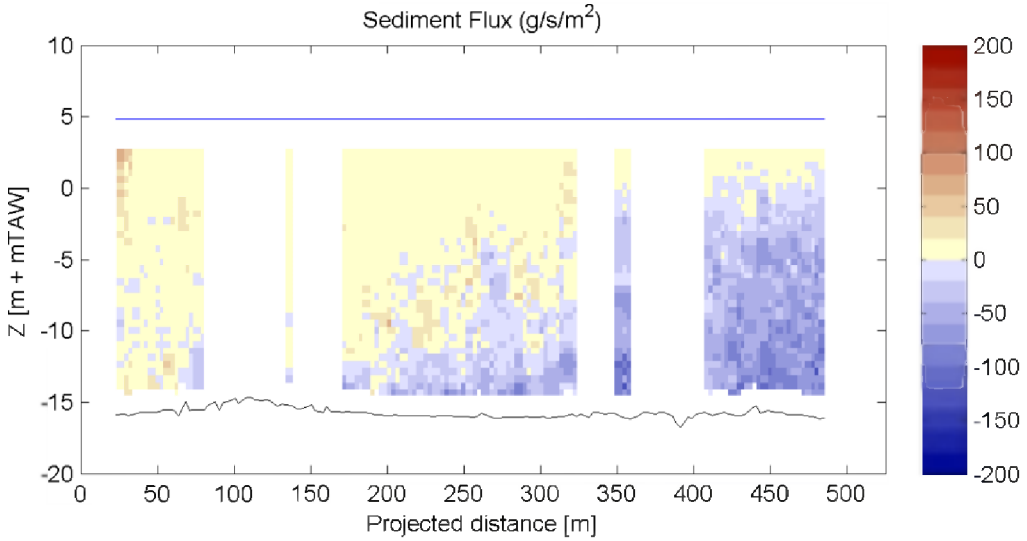
Time after HW [HH:MM]
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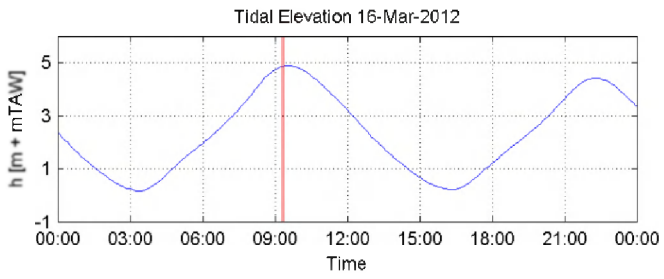
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9008_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

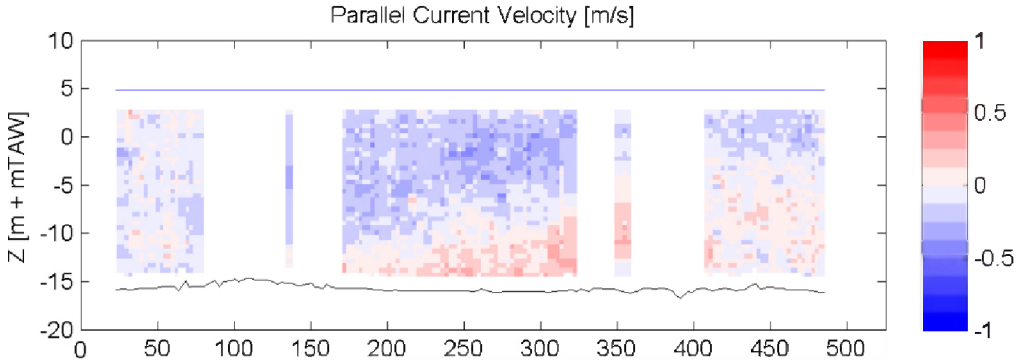
Date / Time [MET] :
16-Mar-2012
09:18 - 09:21

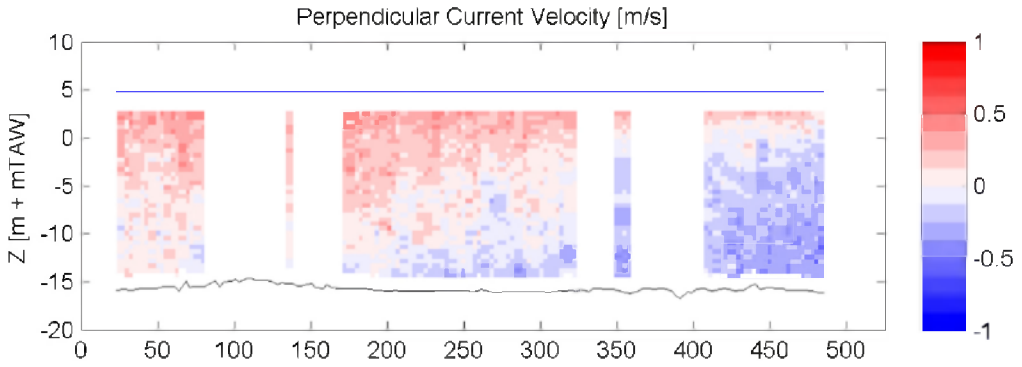
Time after HW [HH:MM]
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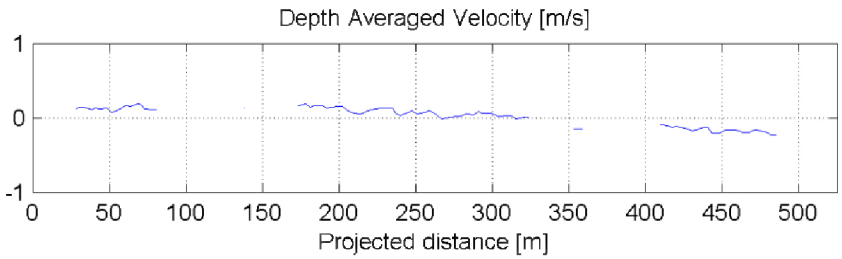
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

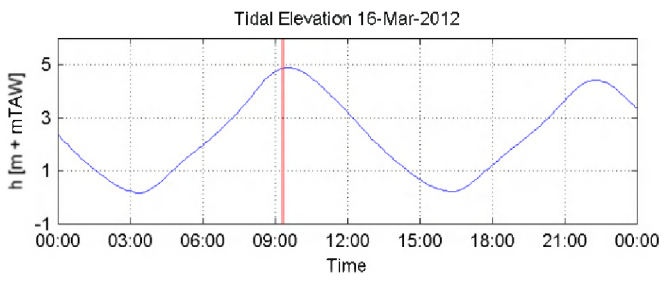
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9008_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
09:18 - 09:21

Time after HW [HH:MM]
-0:45

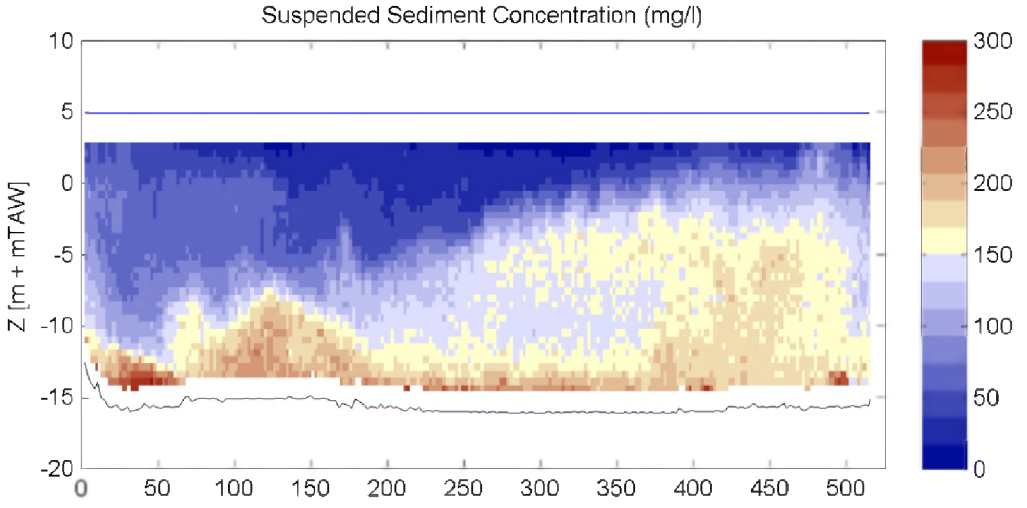
Data Processed by:

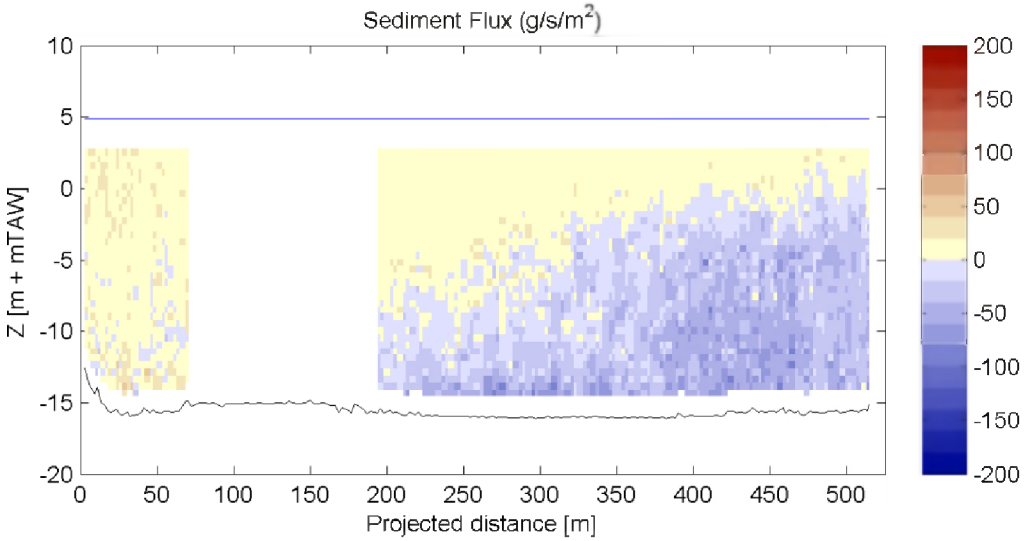
In association with :

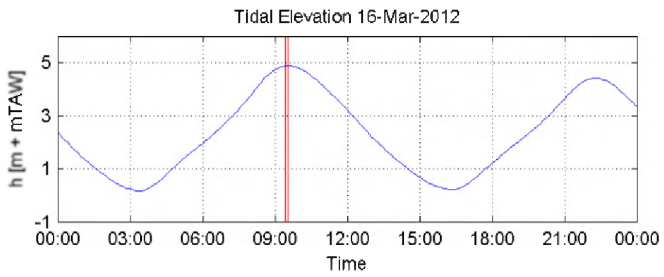
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9010_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
09:26 - 09:31

Time after HW [HH:MM]
-0:36

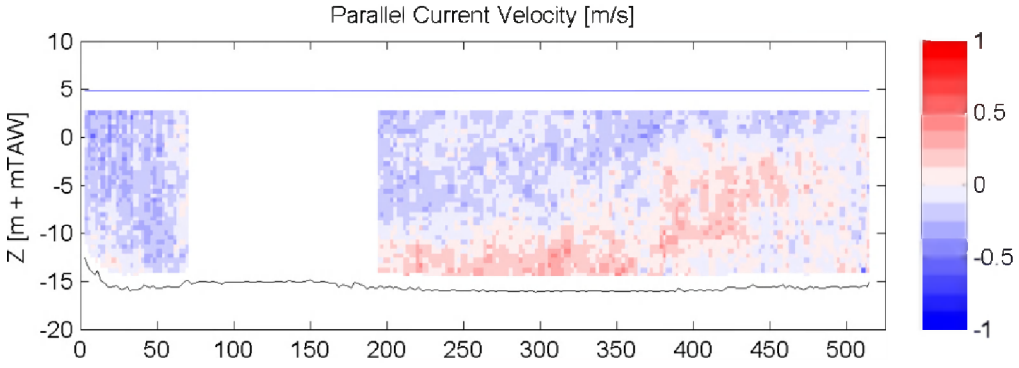
Data Processed by:

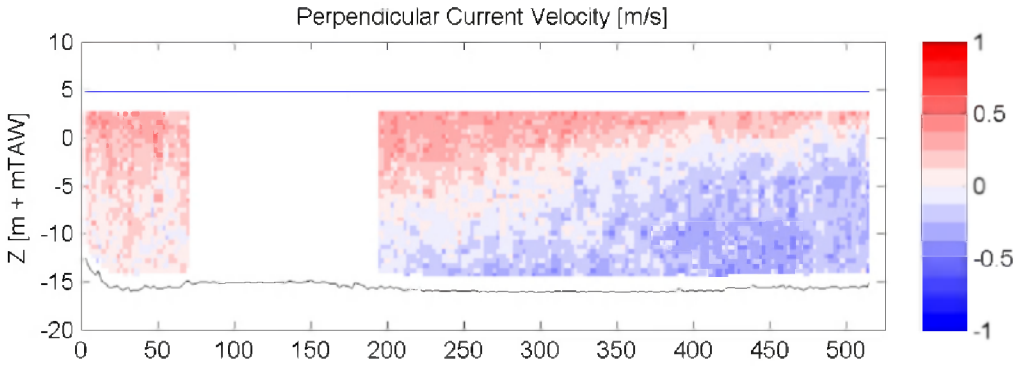
In association with :

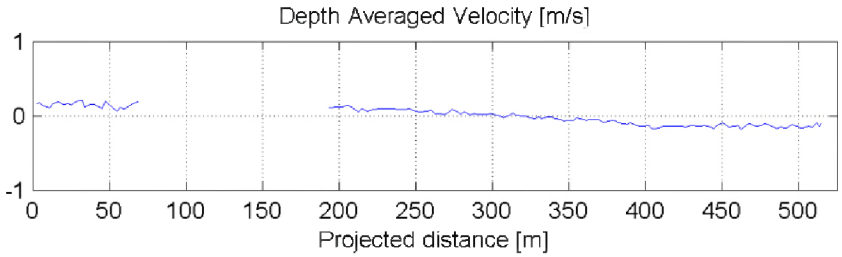
I/RA/11354/10.109/MBO/ANF

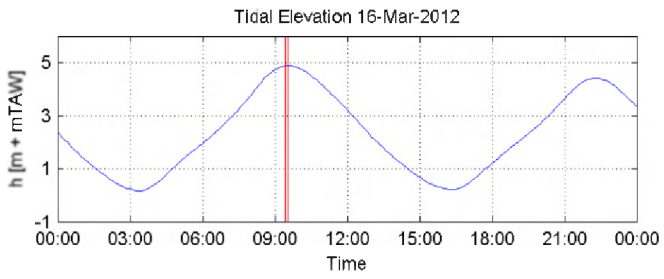
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9010_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

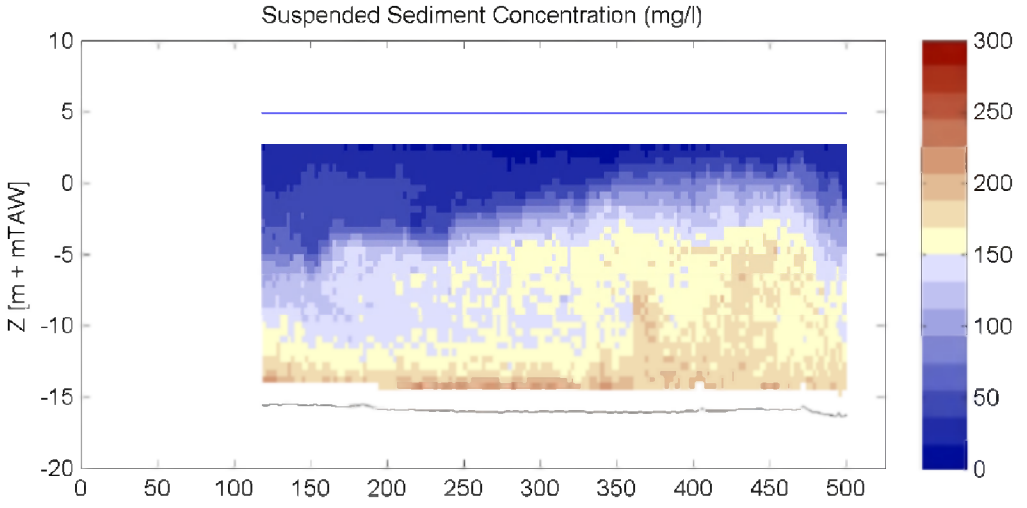
Date / Time [MET] :
16-Mar-2012
09:26 - 09:31

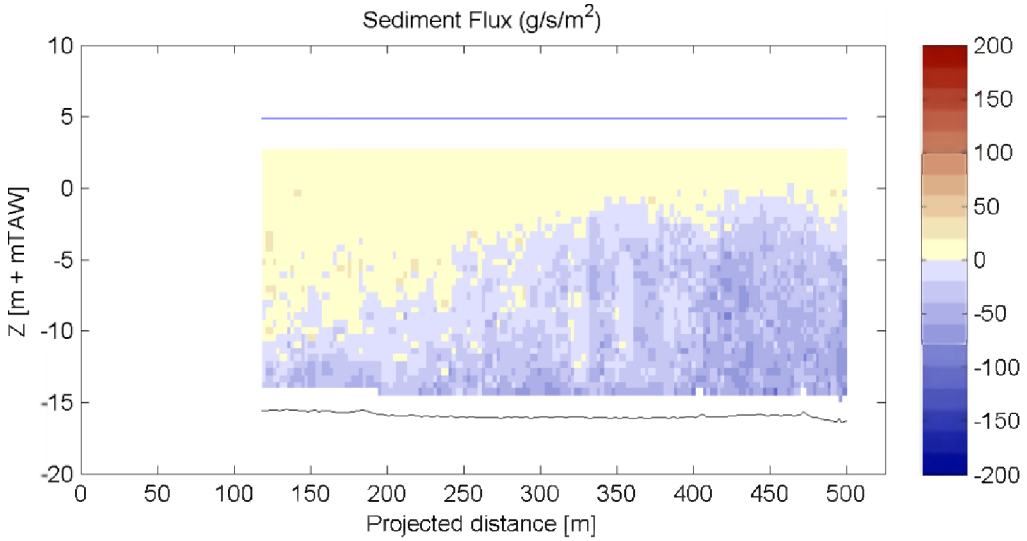
Time after HW [HH:MM]
-0:36

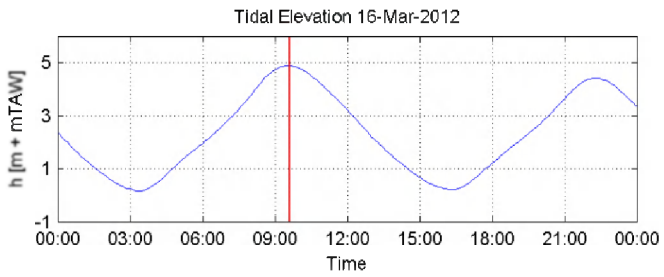
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9011_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

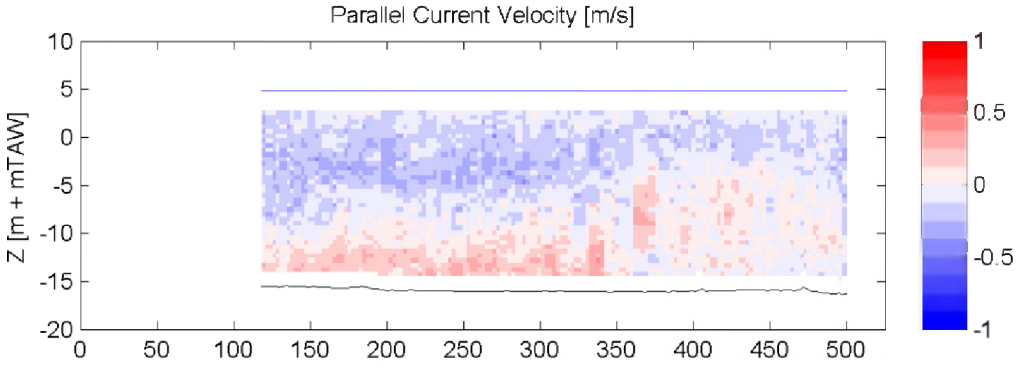
Date / Time [MET] :
16-Mar-2012
09:34 - 09:36

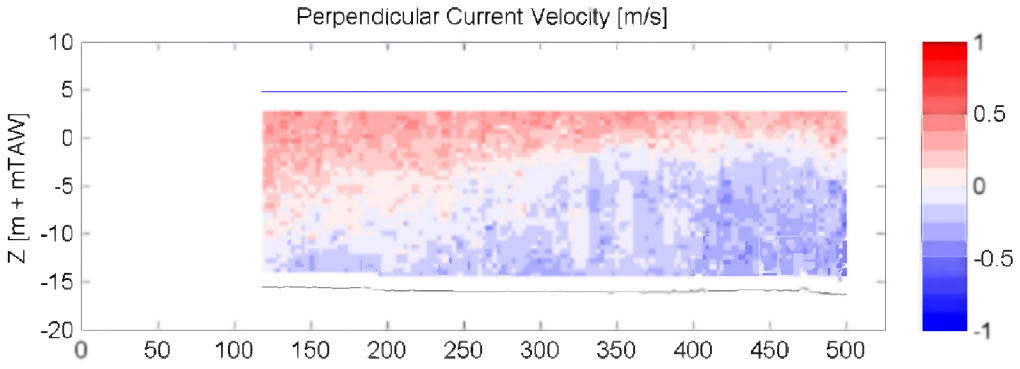
Time after HW [HH:MM]
-0:29

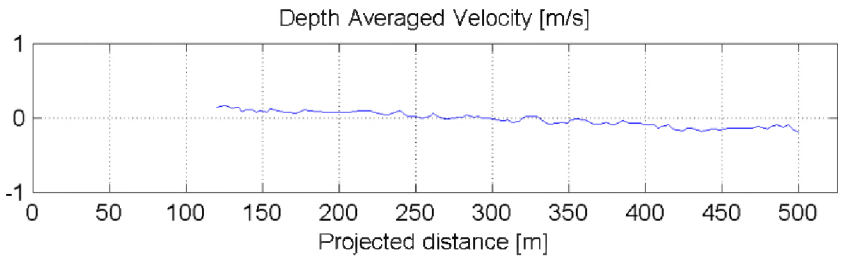
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

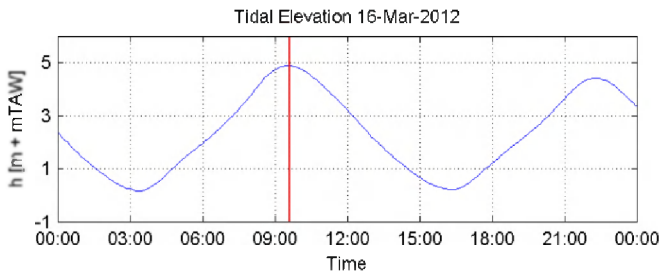
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9011_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
09:34 - 09:36

Time after HW [HH:MM]
-0:29

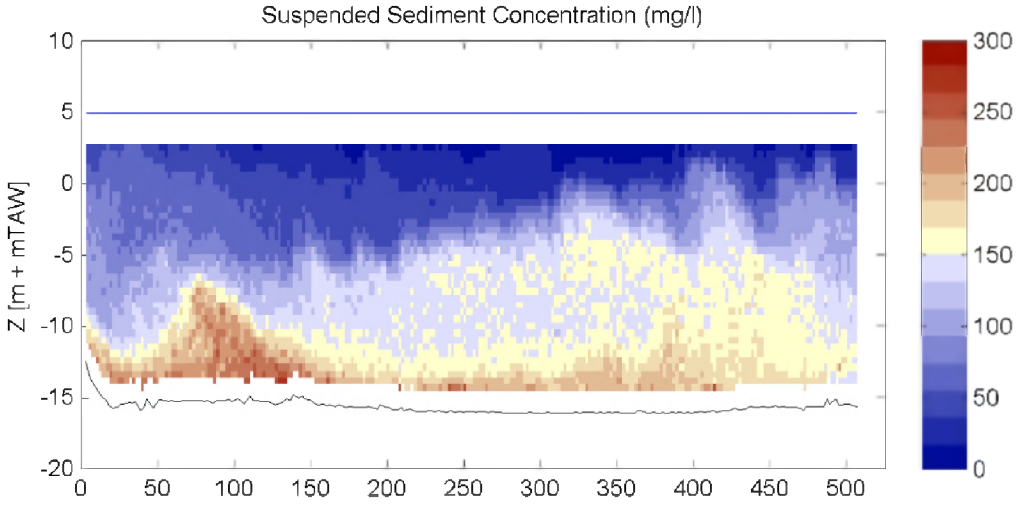
Data Processed by:

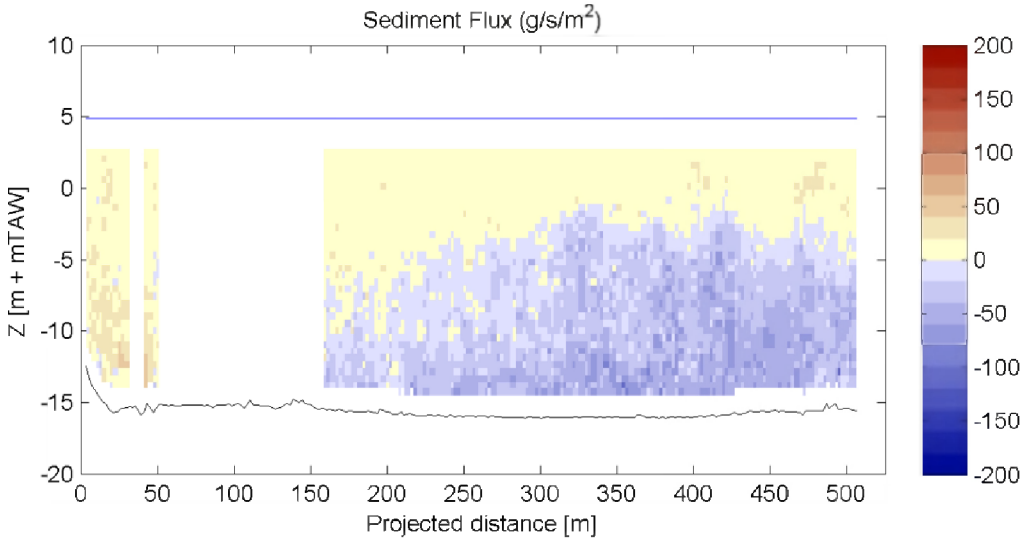
In association with :

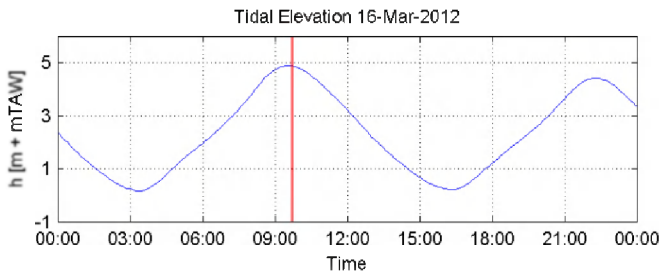
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9012_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

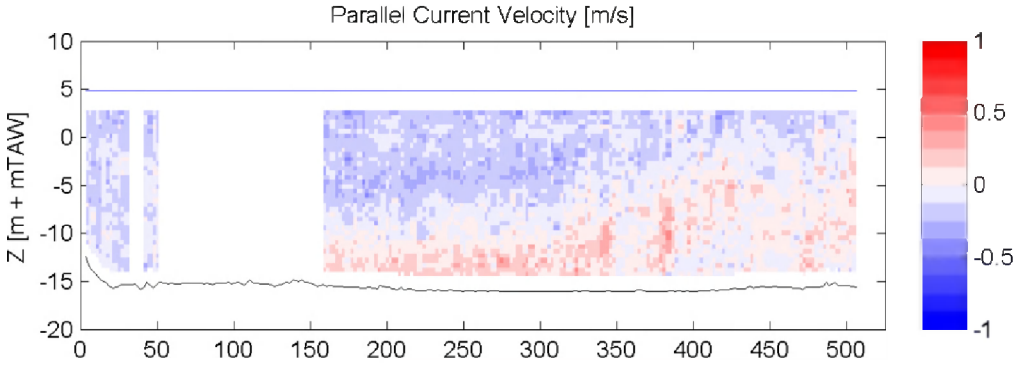
Date / Time [MET] :
16-Mar-2012
09:40 - 09:44

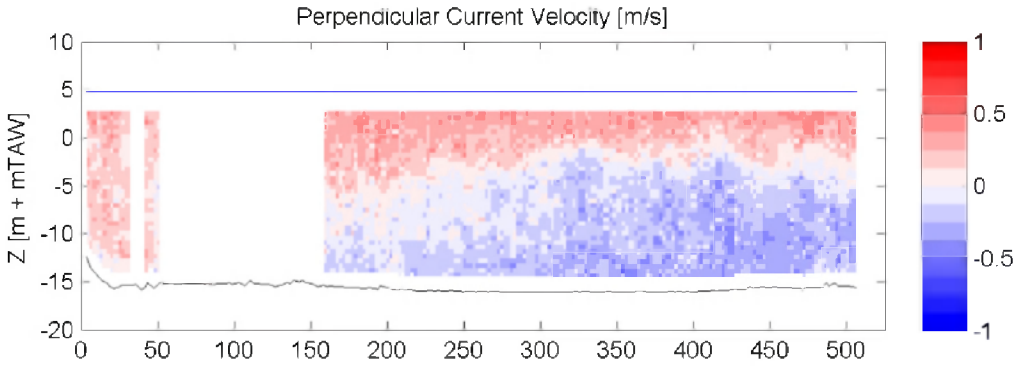
Time after HW [HH:MM]
-0:22

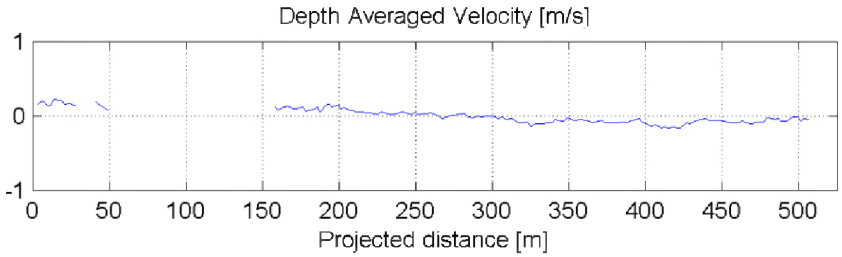
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

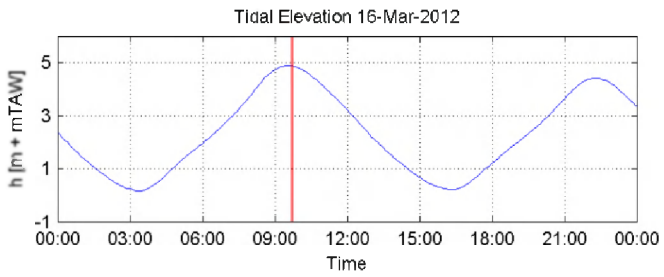
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9012_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET]:
16-Mar-2012
09:40 - 09:44

Time after HW [HH:MM]
-0:22

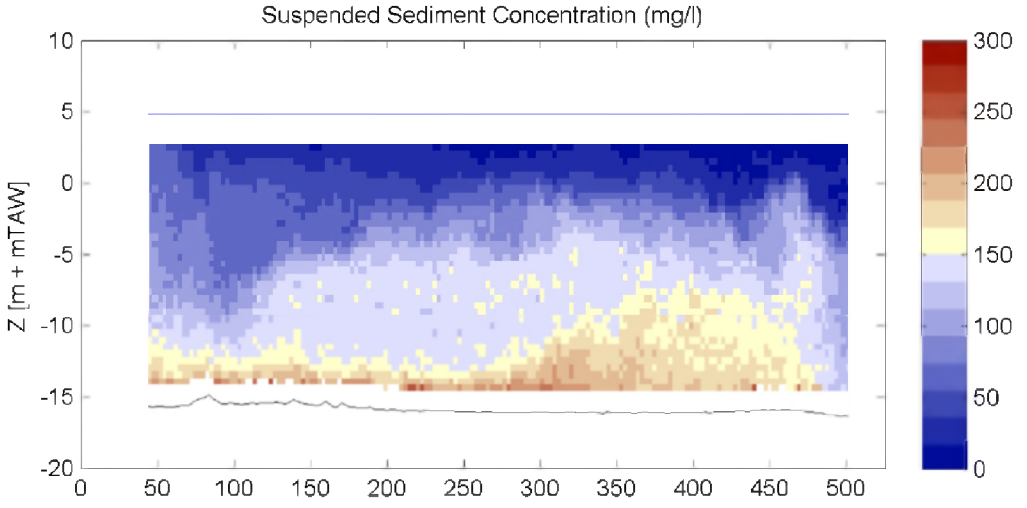
Data Processed by:

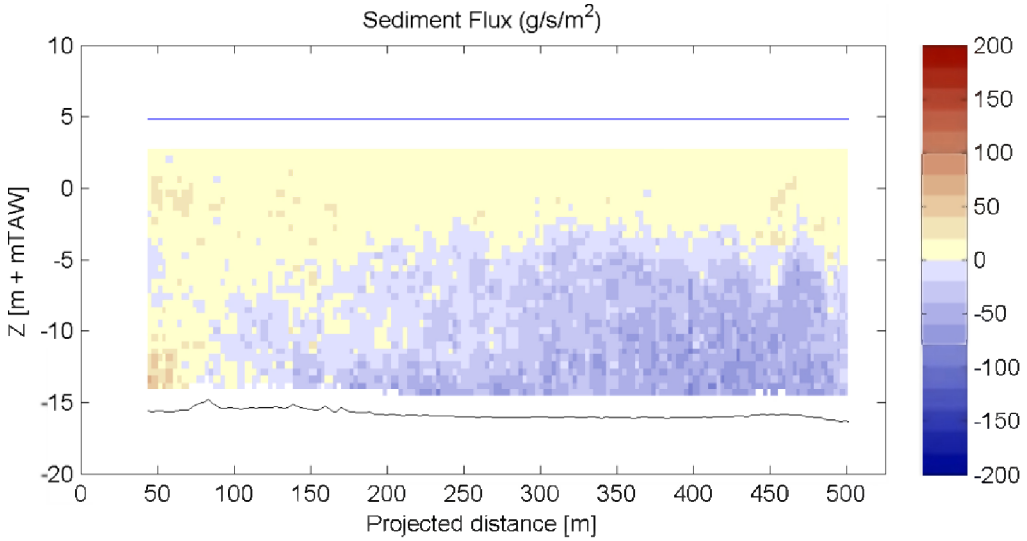
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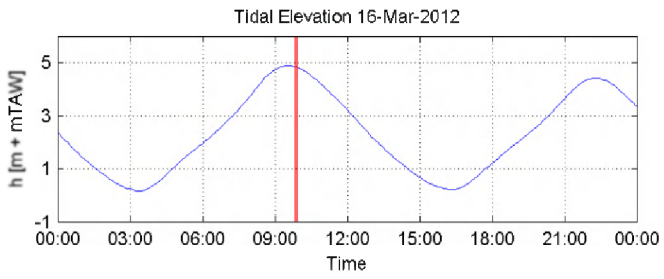
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9014_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

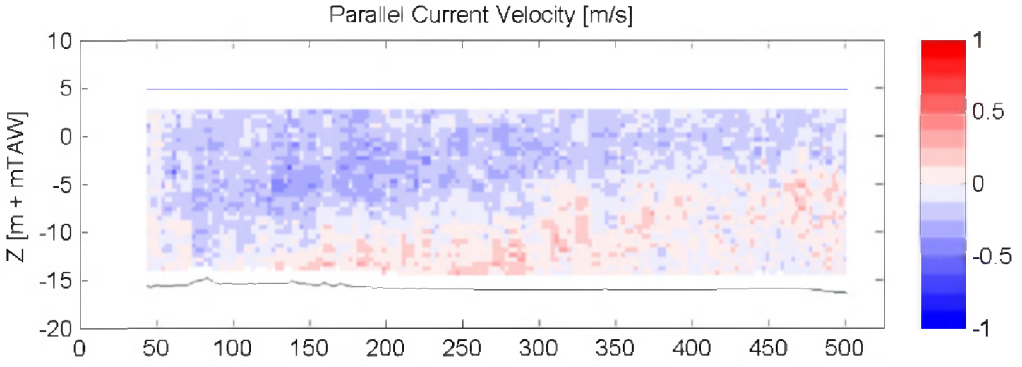
Date / Time [MET] :
16-Mar-2012
09:51 - 09:54

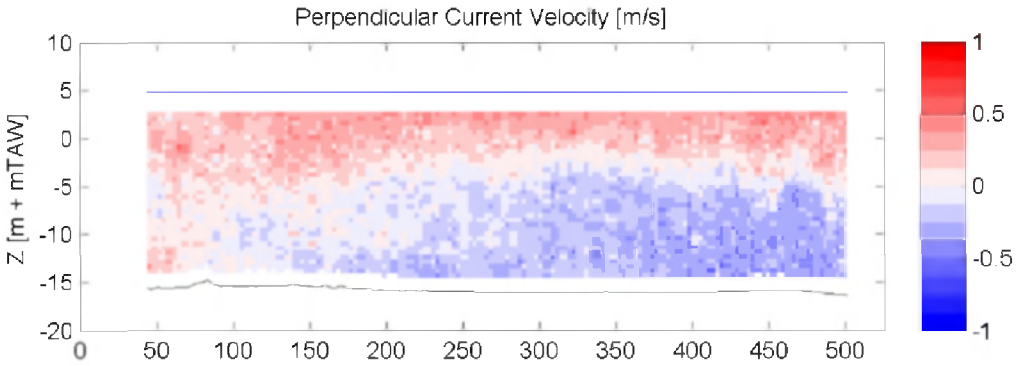
Time after HW [HH:MM]
-0:11

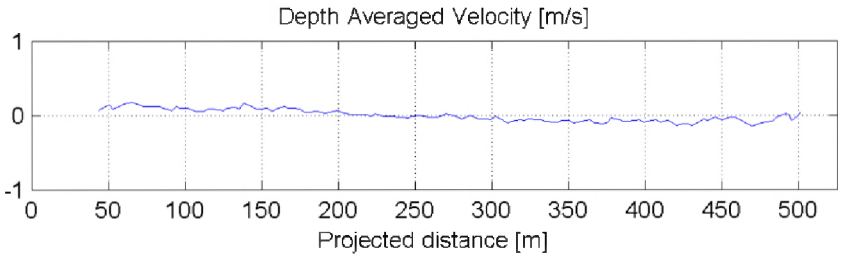
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

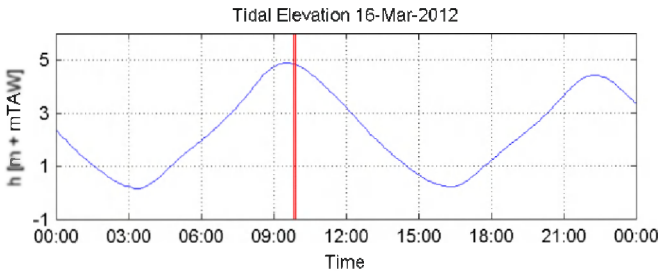
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9014_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

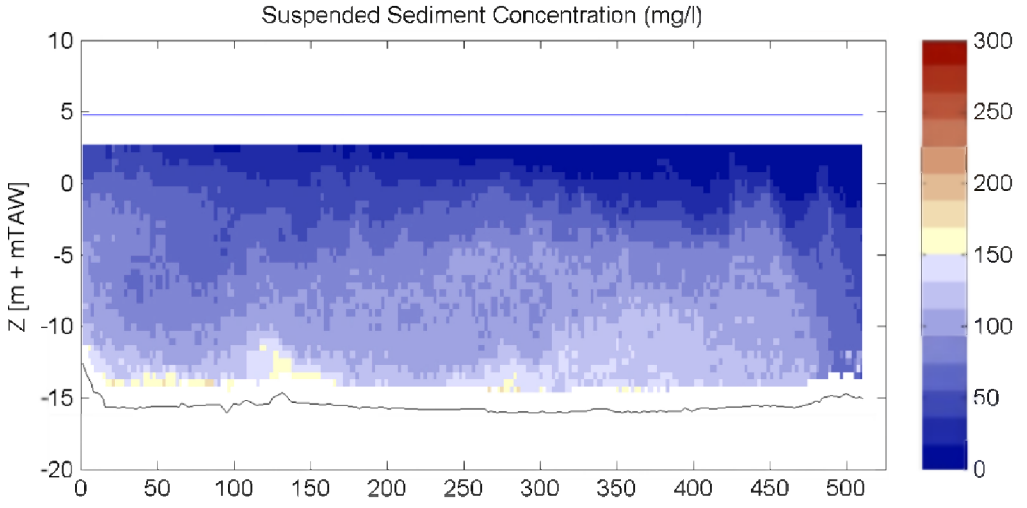
Date / Time [MET]:
16-Mar-2012
09:51 - 09:54

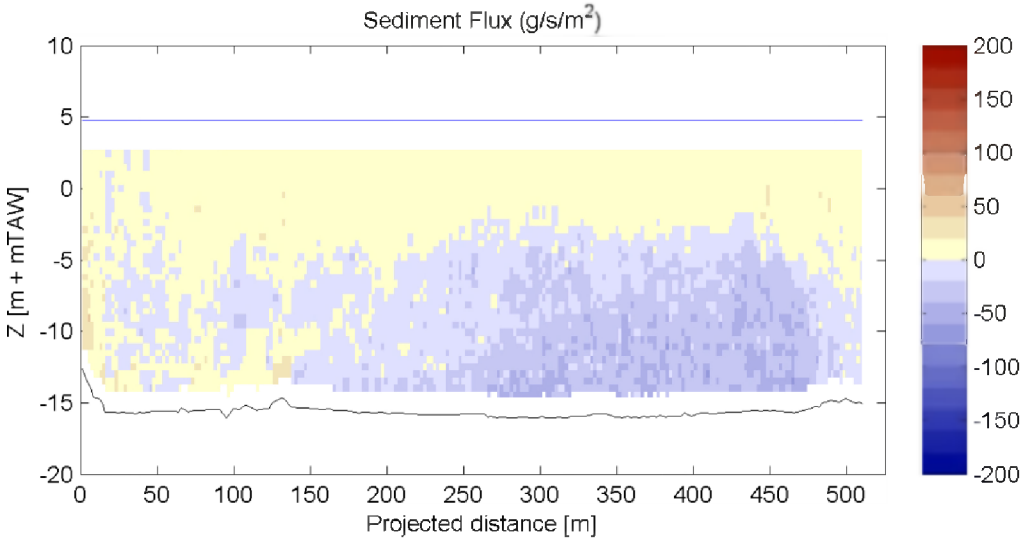
Time after HW [HH:MM]
-0:11

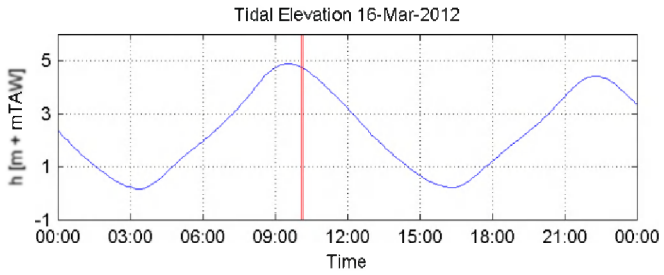
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9016_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

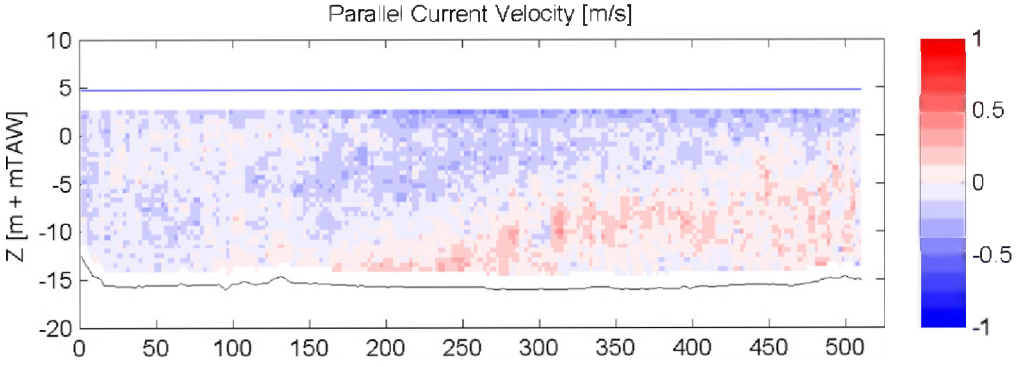
Date / Time [MET] :
16-Mar-2012
10:04 - 10:08

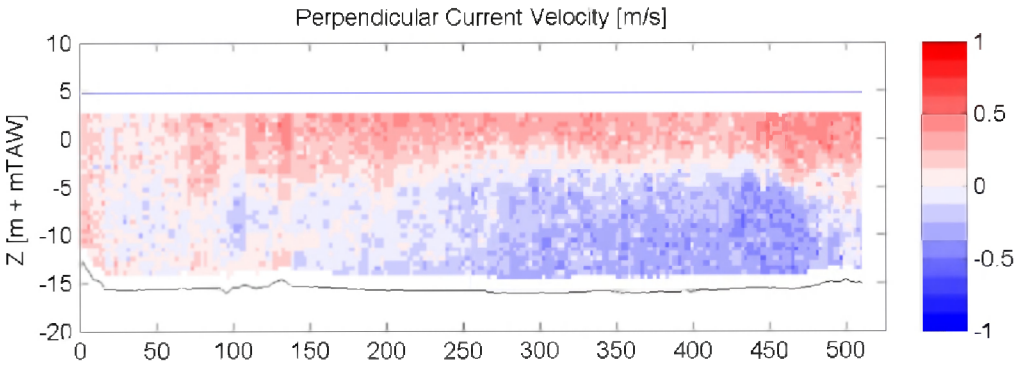
Time after HW [HH:MM]
0:01

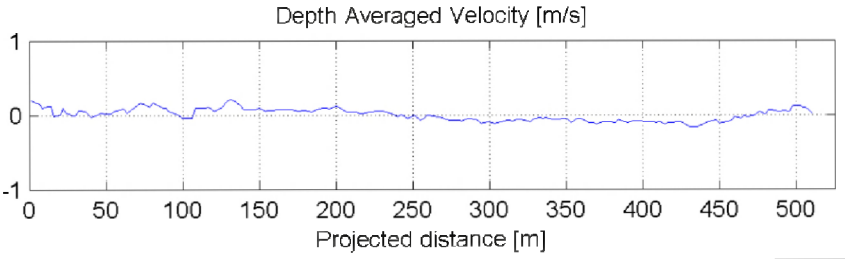
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

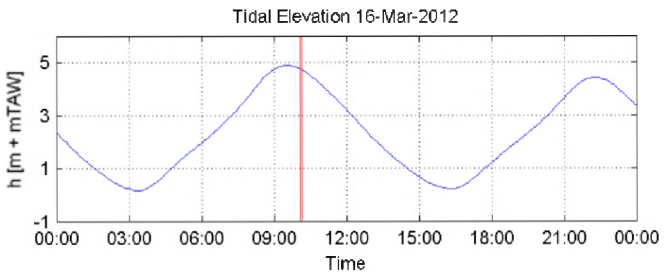
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9016_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

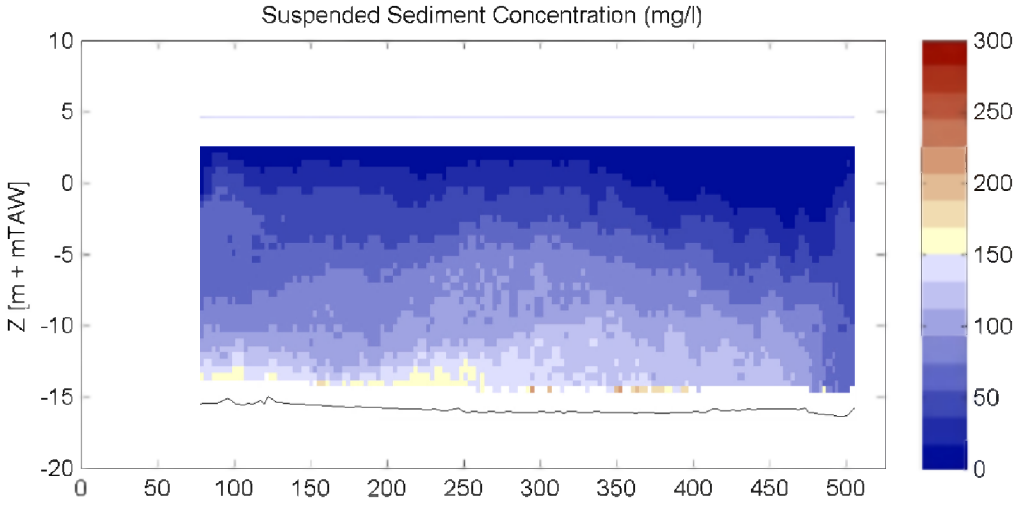
Date / Time [MET] :
16-Mar-2012
10:04 - 10:08

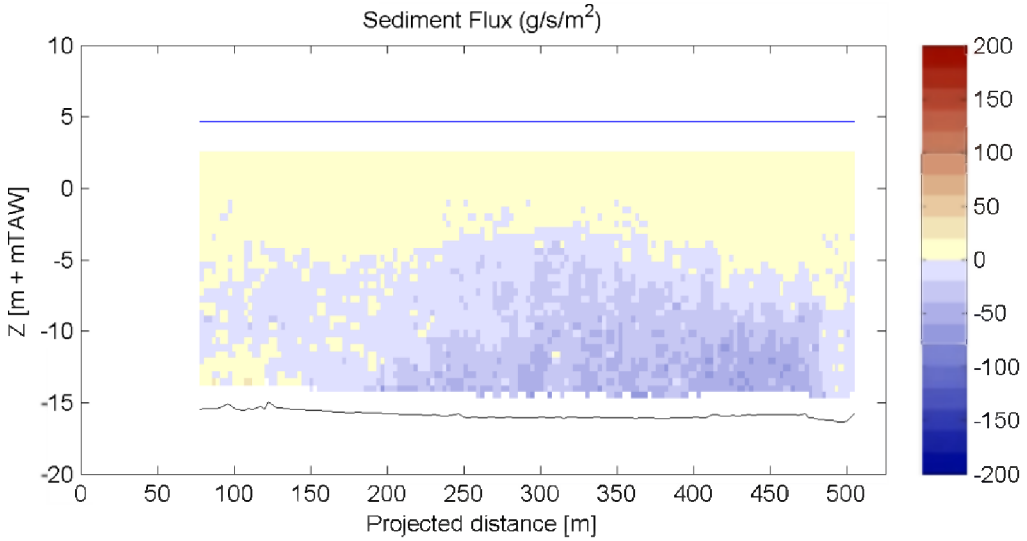
Time after HW [HH:MM]
0:01

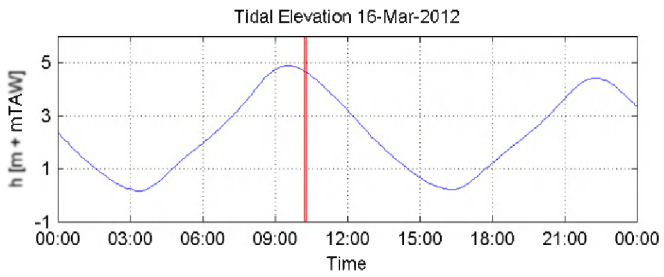
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9017_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

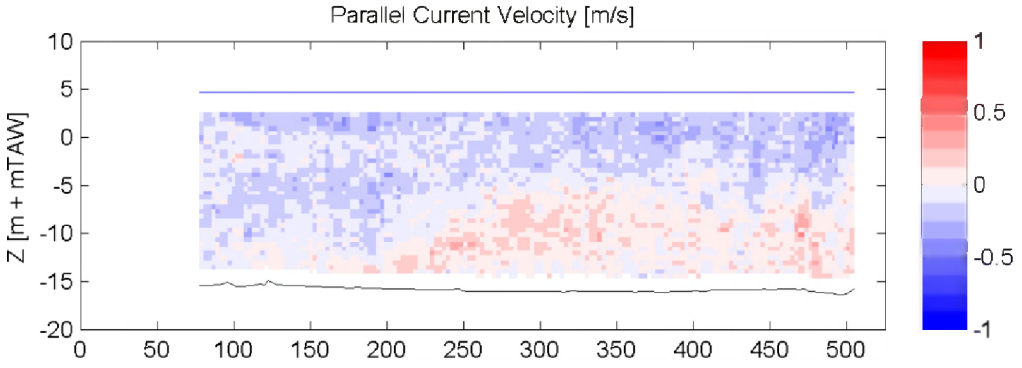
Date / Time [MET] :
16-Mar-2012
10:13 - 10:16

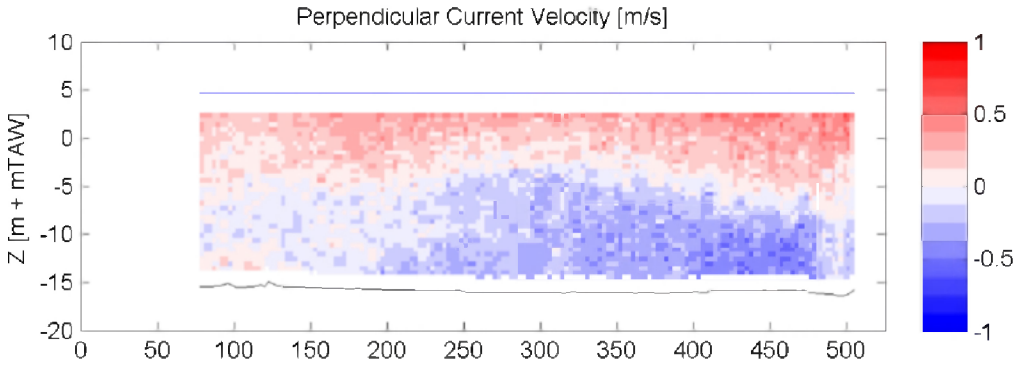
Time after HW [HH:MM]
0:10

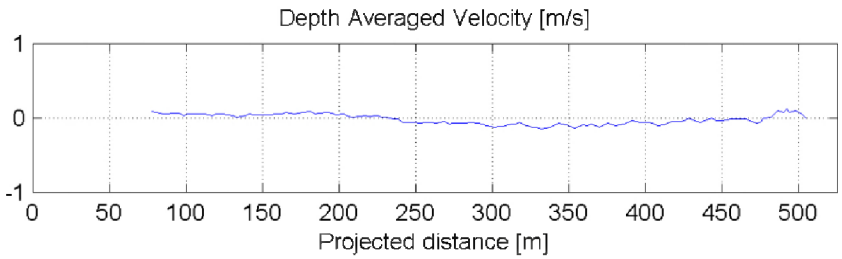
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

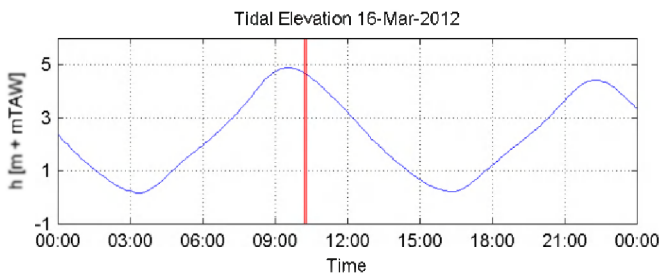
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9017_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

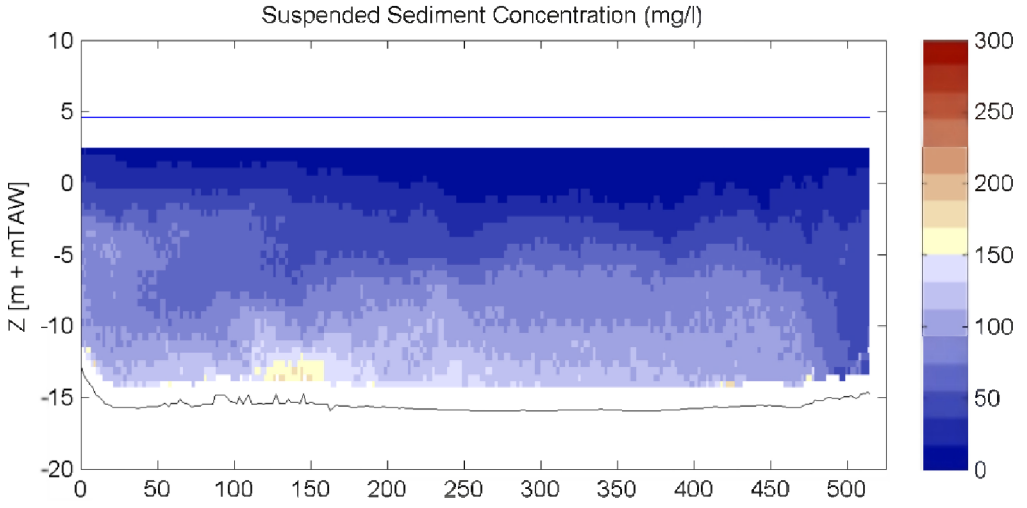
Date / Time [MET] :
16-Mar-2012
10:13 - 10:16

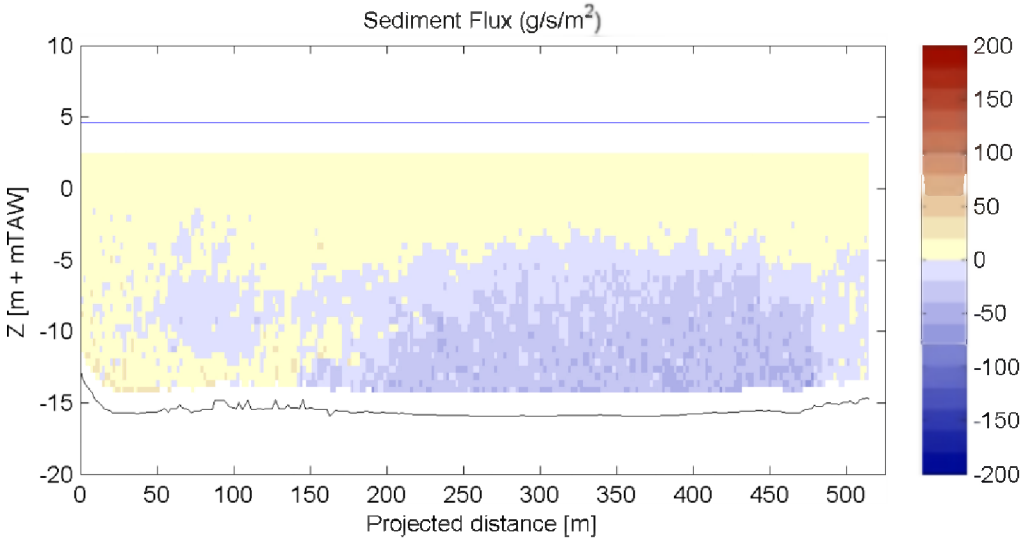
Time after HW [HH:MM]
0:10

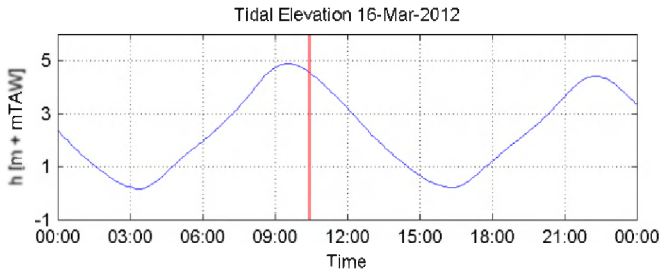
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9018_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

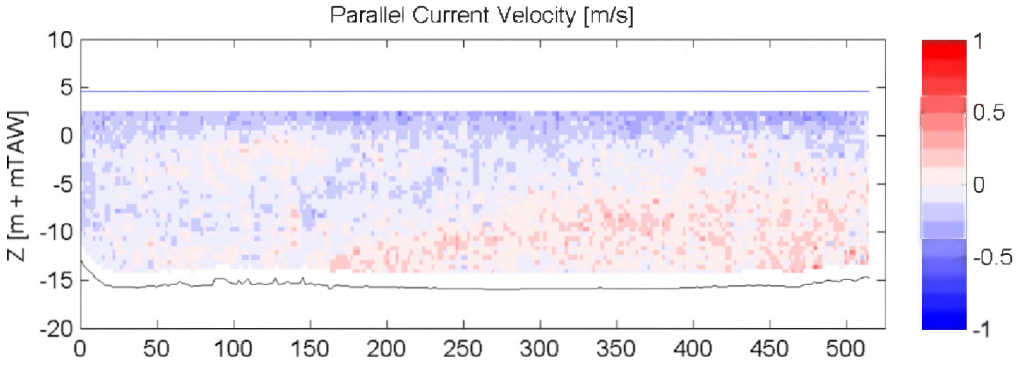
Date / Time [MET] :
16-Mar-2012
10:23 - 10:28

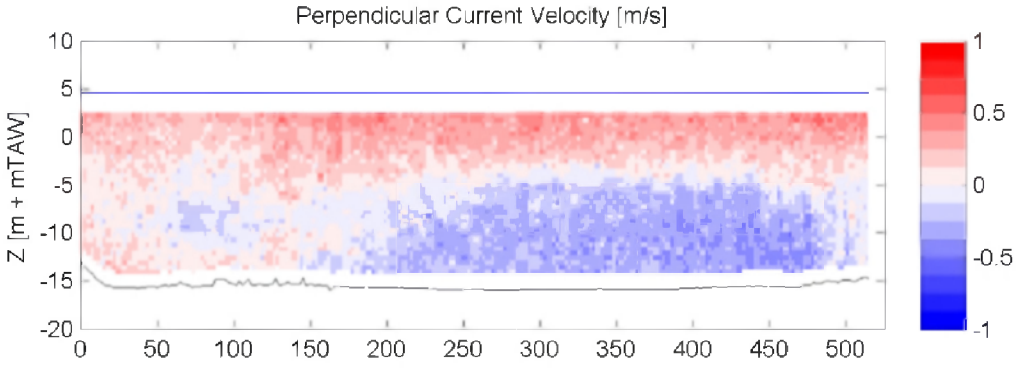
Time after HW [HH:MM]
0:21

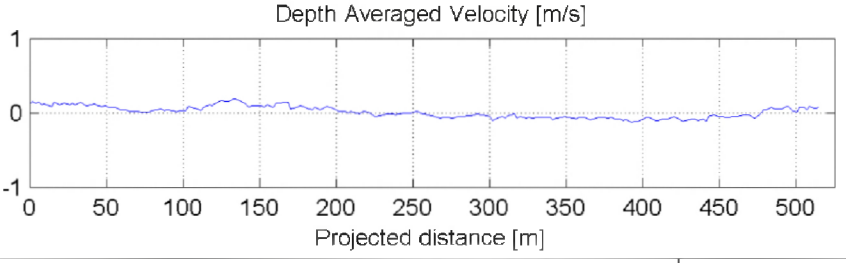
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

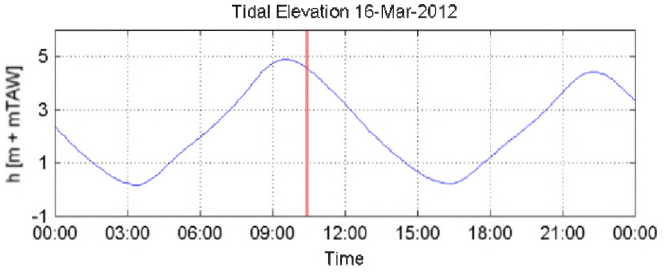
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9018_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

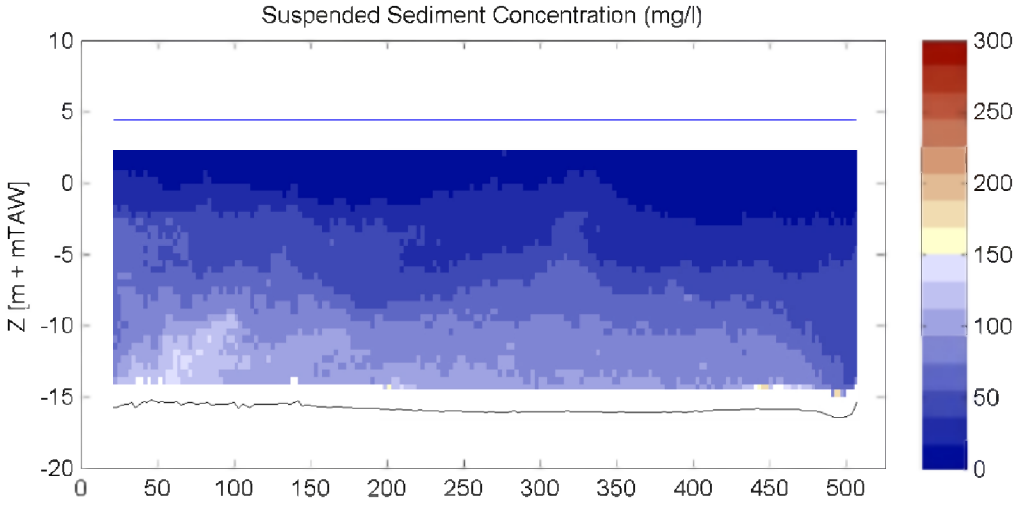
Date / Time [MET] :
16-Mar-2012
10:23 - 10:28

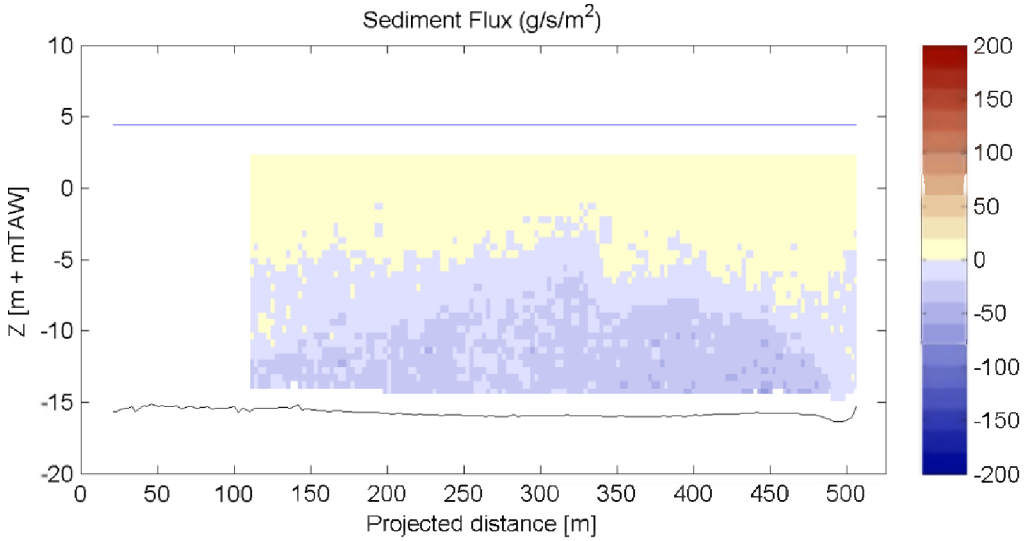
Time after HW [HH:MM]
0:21

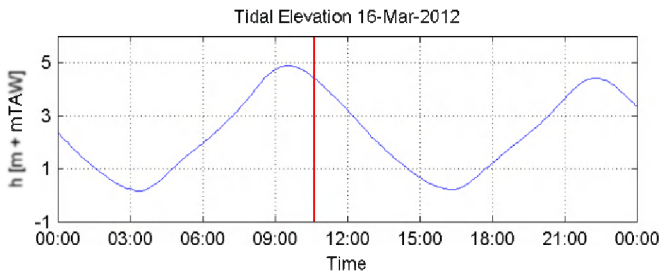
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9020_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

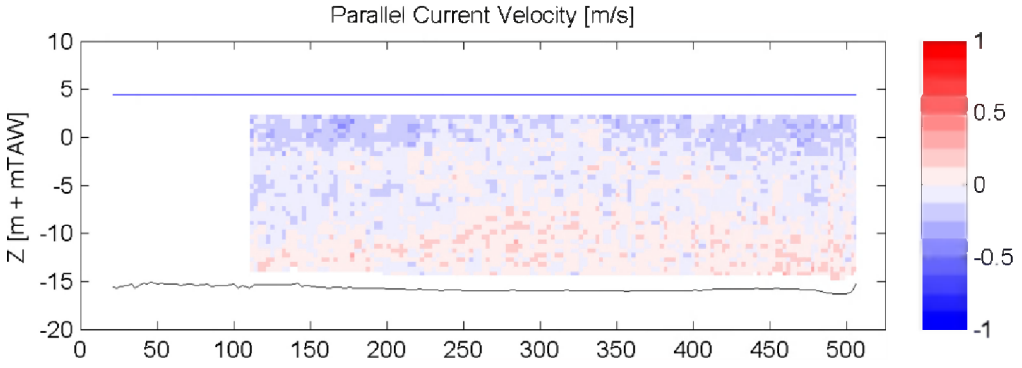
Date / Time [MET] :
16-Mar-2012
10:35 - 10:39

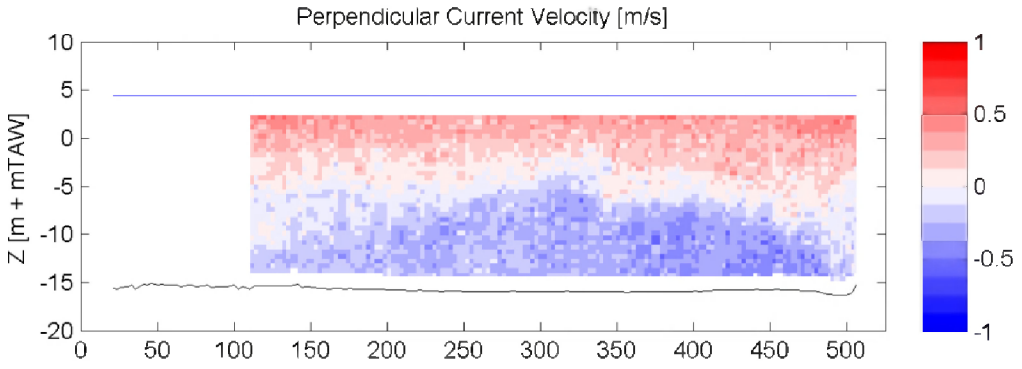
Time after HW [HH:MM]
0:32

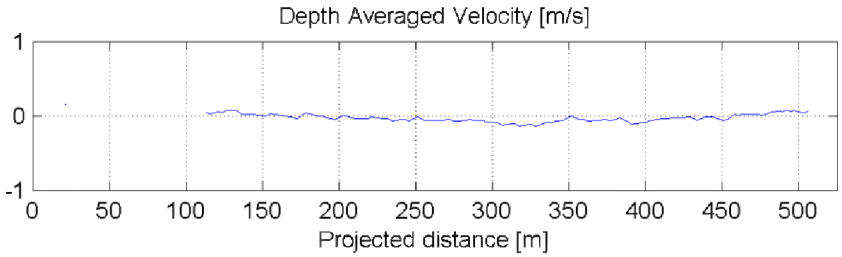
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

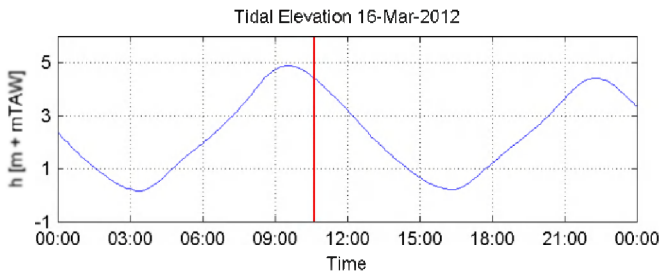
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9020_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

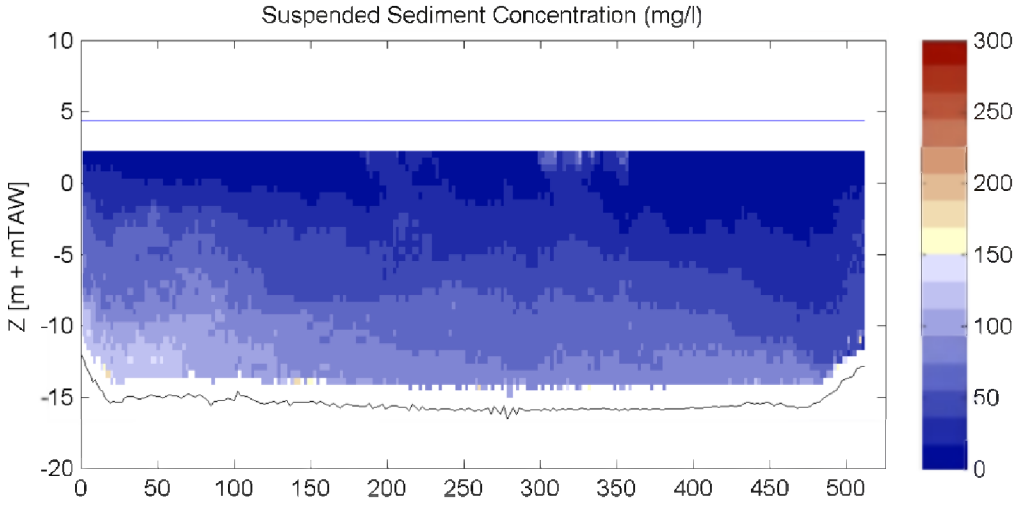
Date / Time [MET] :
16-Mar-2012
10:35 - 10:39

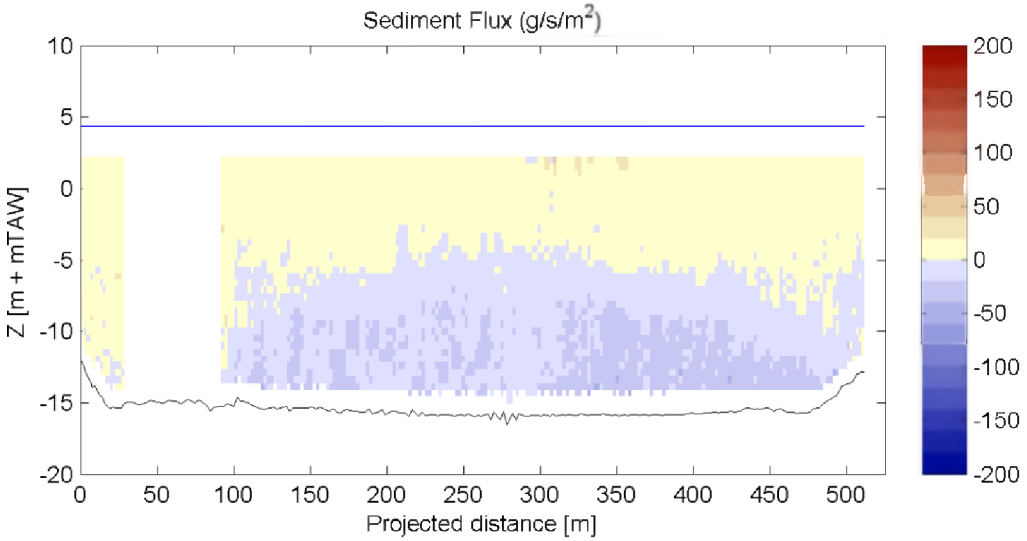
Time after HW [HH:MM]
0:32

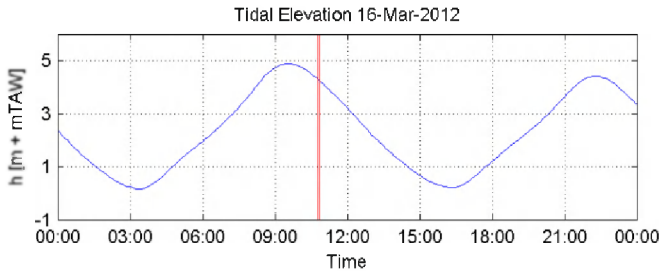
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9022_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

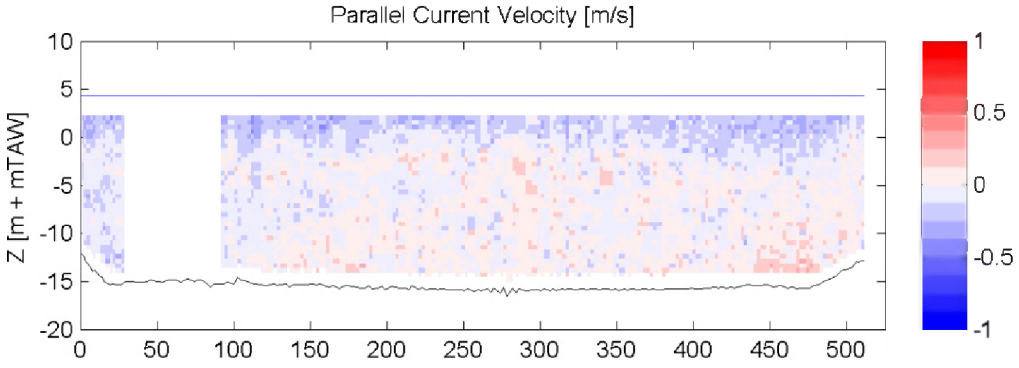
Date / Time [MET] :
16-Mar-2012
10:45 - 10:50

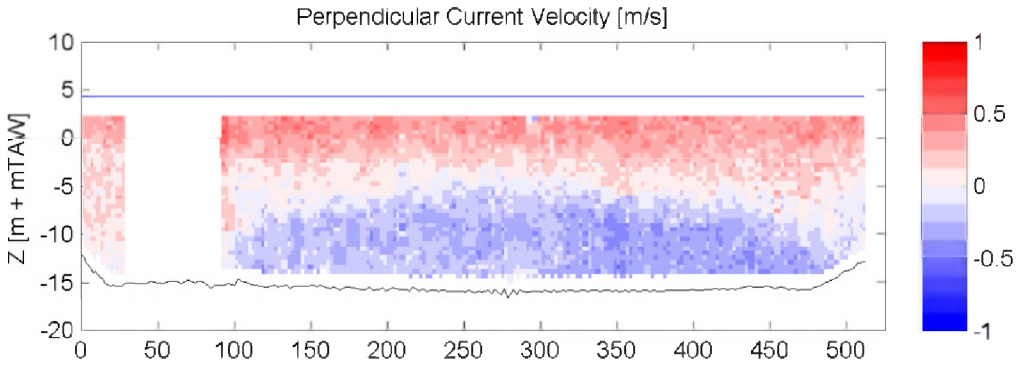
Time after HW [HH:MM]
0:42

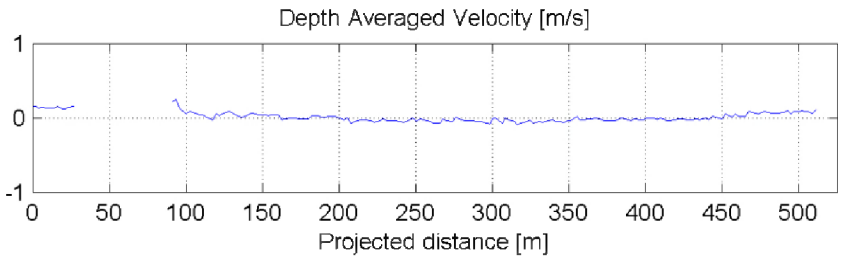
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

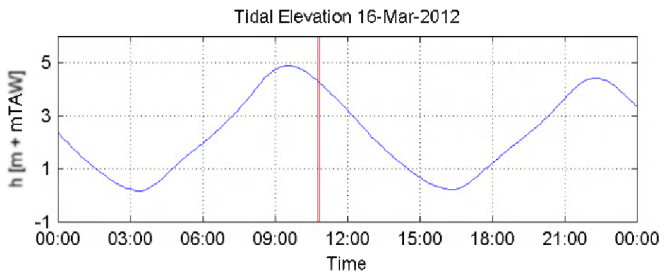
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9022_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
10:45 - 10:50

Time after HW [HH:MM]
0:42

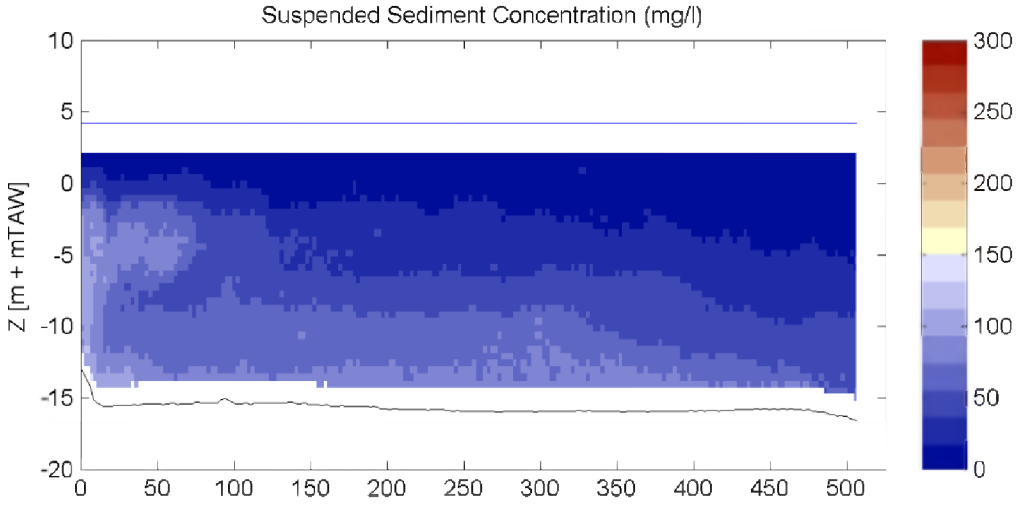
Data Processed by:

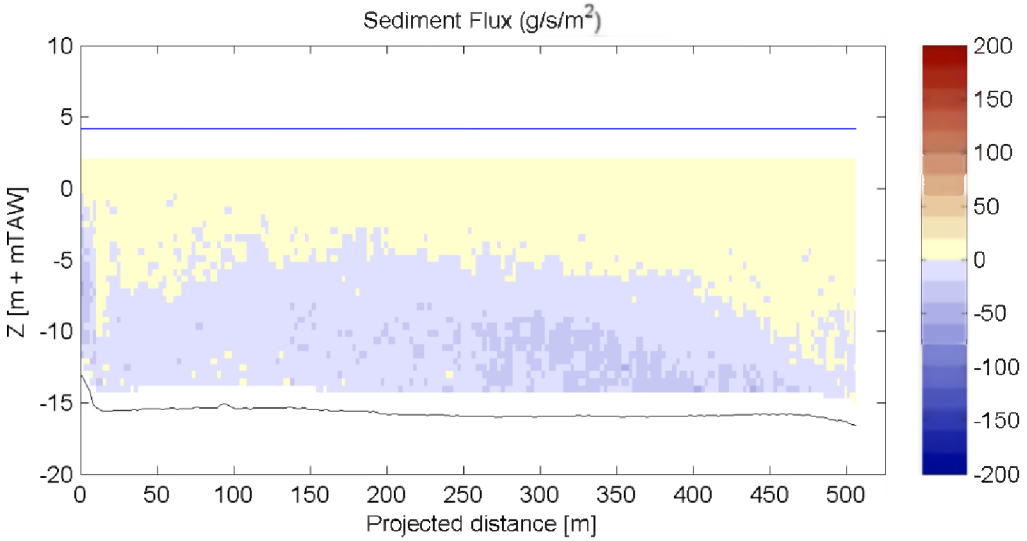
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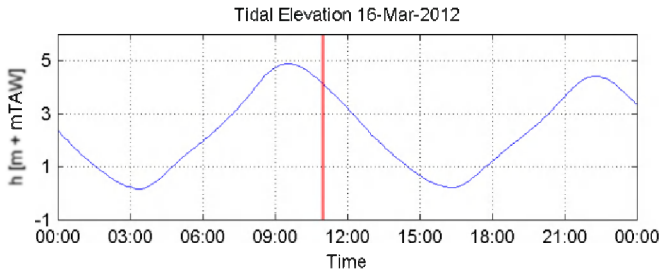
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9023_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
10:57 - 11:01

Time after HW [HH:MM]
0:54

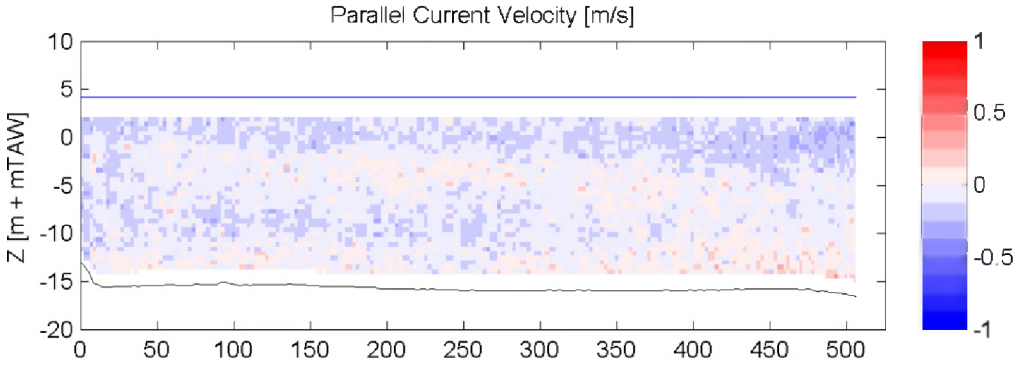
Data Processed by:

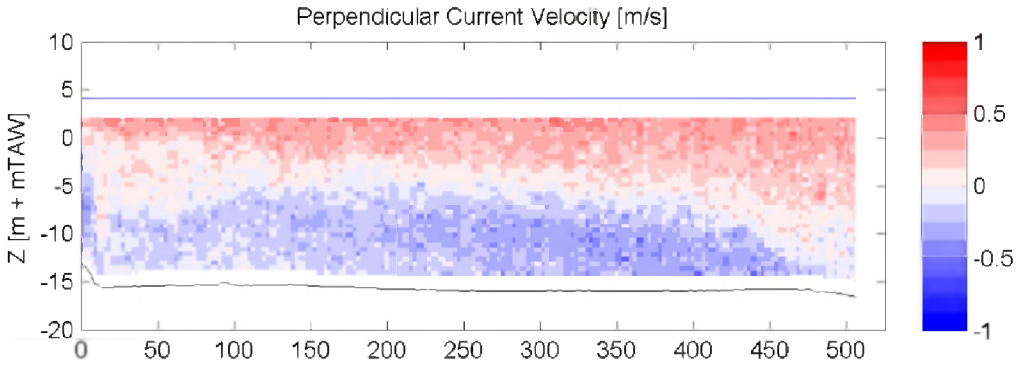
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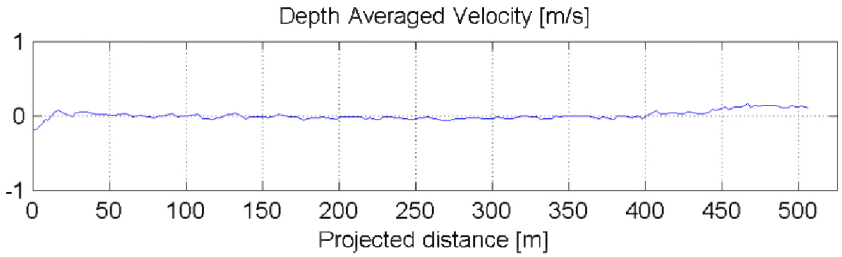
I/RA/11354/10.109/MBO/ANF

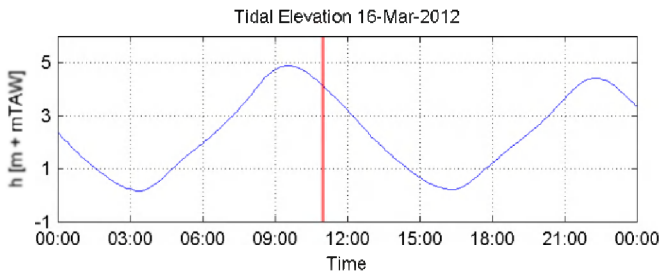
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9023_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

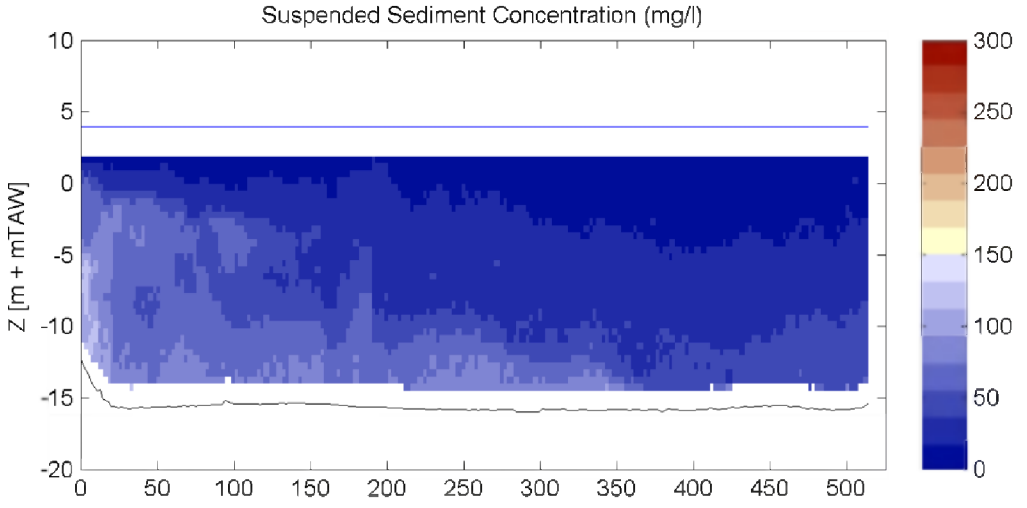
Date / Time [MET] :
16-Mar-2012
10:57 - 11:01

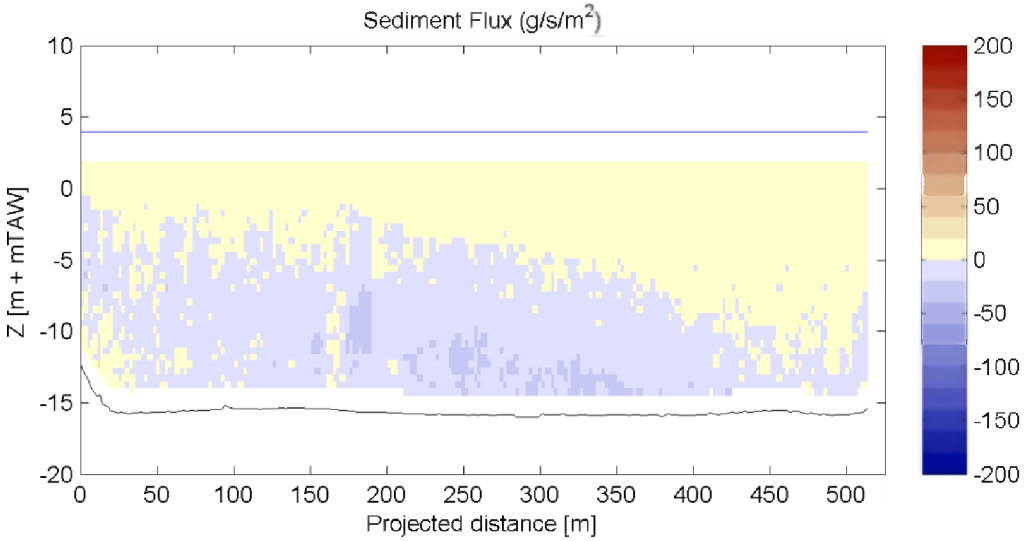
Time after HW [HH:MM]
0:54

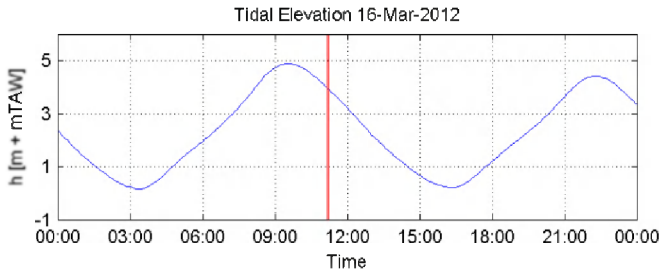
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9024_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

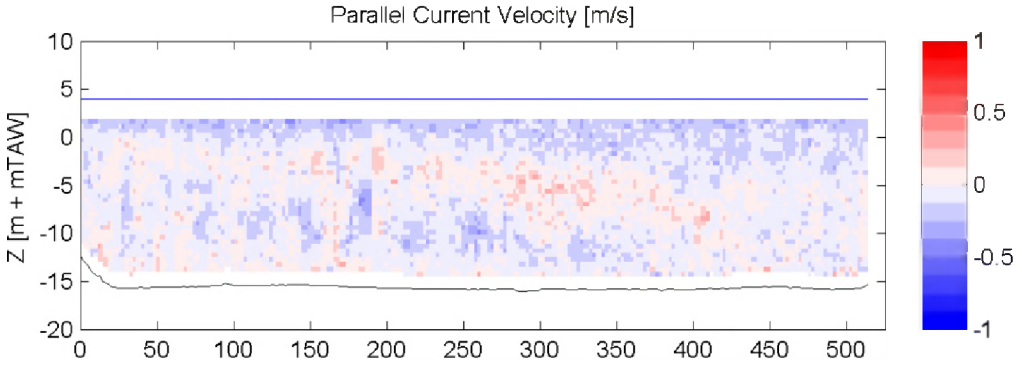
Date / Time [MET] :
16-Mar-2012
11:09 - 11:13

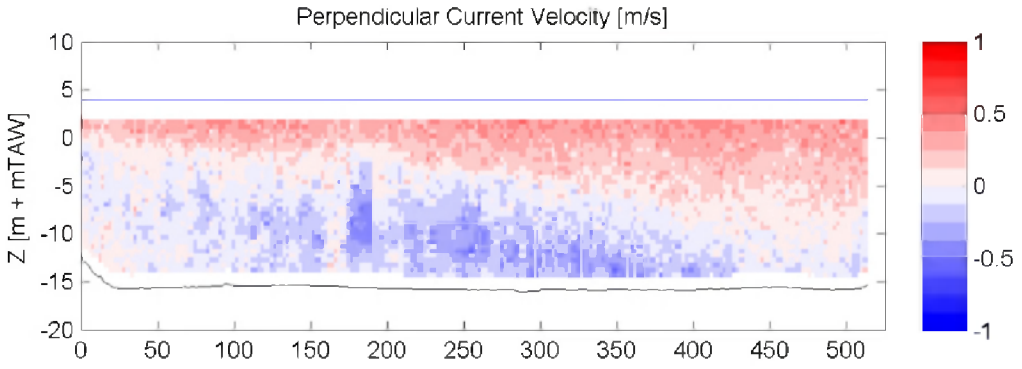
Time after HW [HH:MM]
1:06

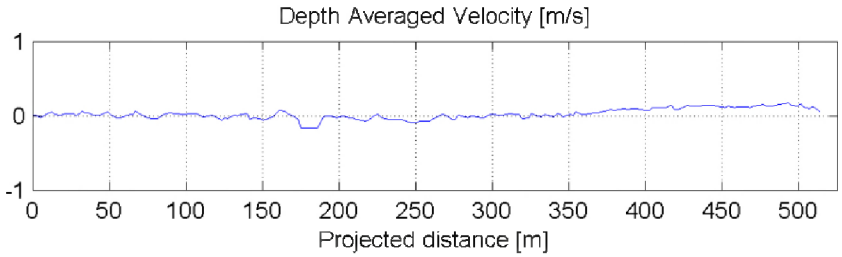
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

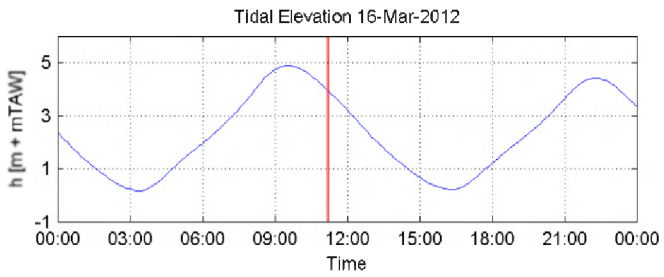
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9024_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

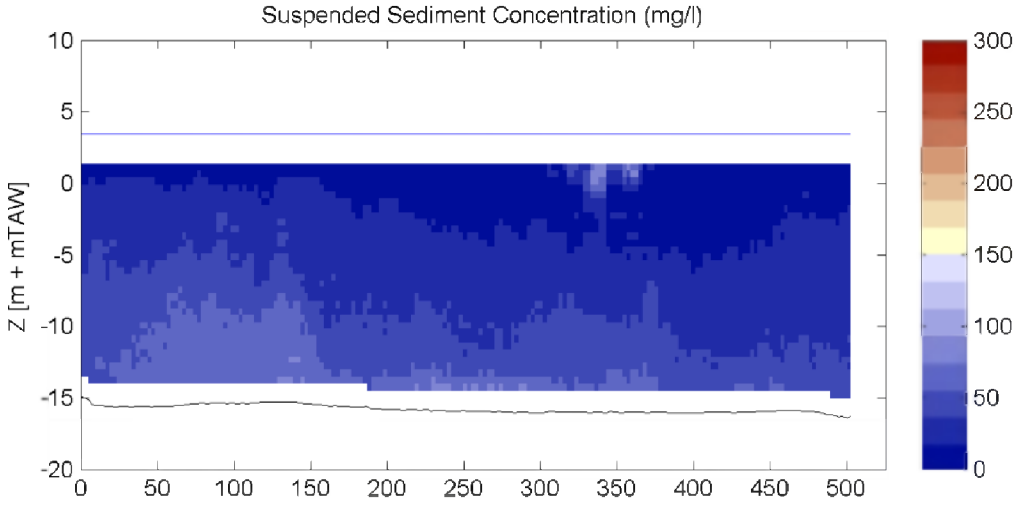
Date / Time [MET] :
16-Mar-2012
11:09 - 11:13

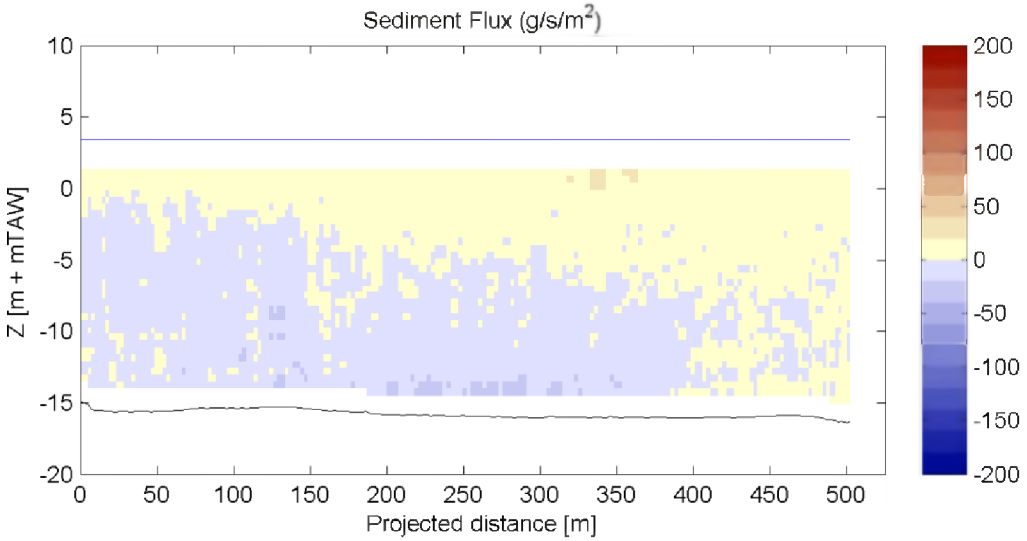
Time after HW [HH:MM]
1:06

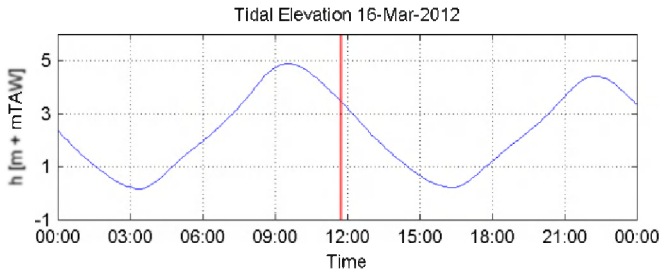
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9026_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

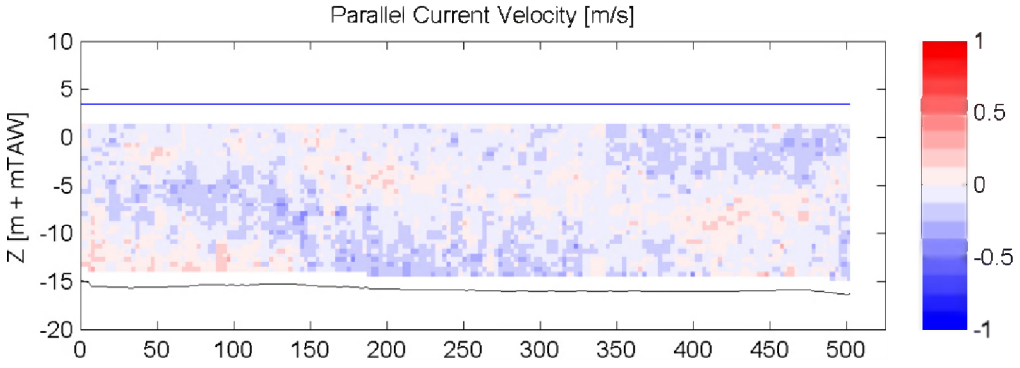
Date / Time [MET] :
16-Mar-2012
11:42 - 11:45

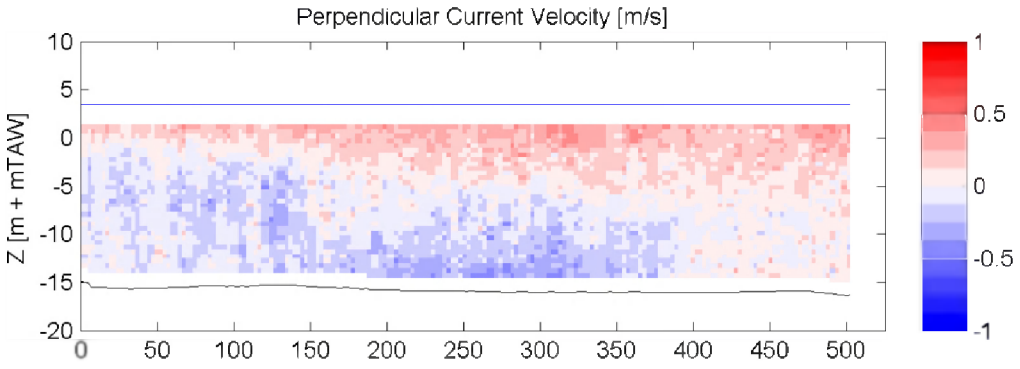
Time after HW [HH:MM]
1:39

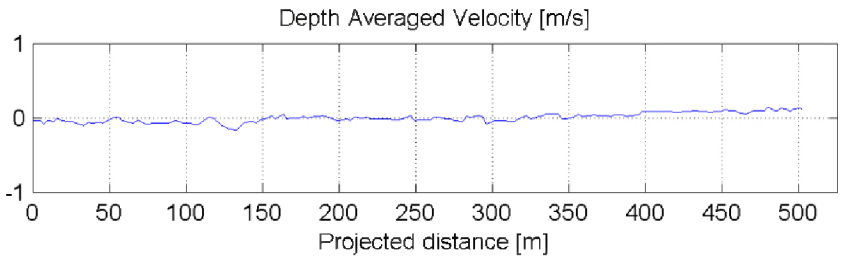
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

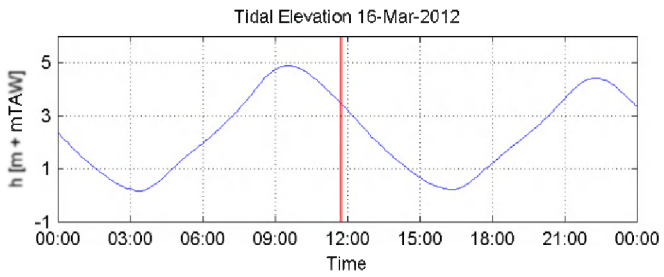
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9026_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

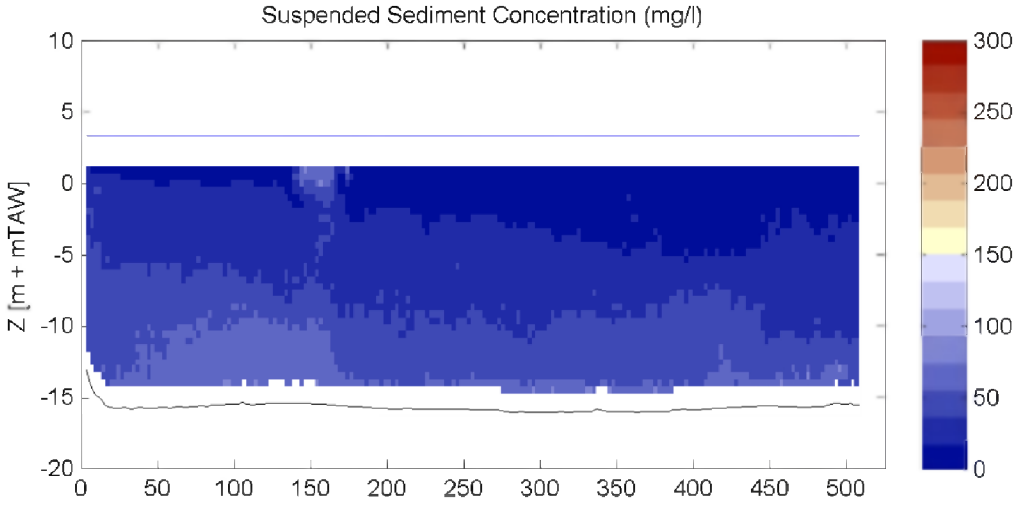
Date / Time [MET] :
16-Mar-2012
11:42 - 11:45

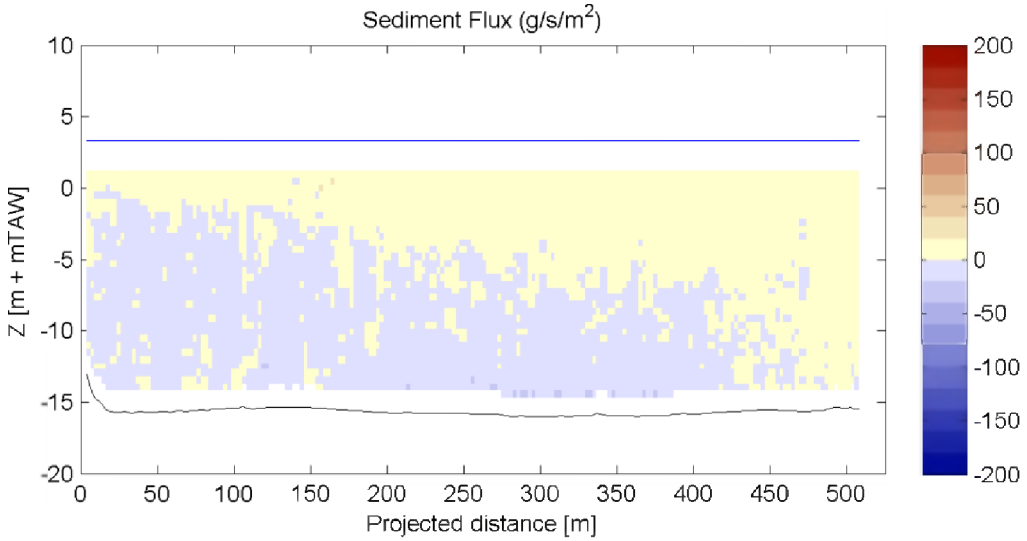
Time after HW [HH:MM]
1:39

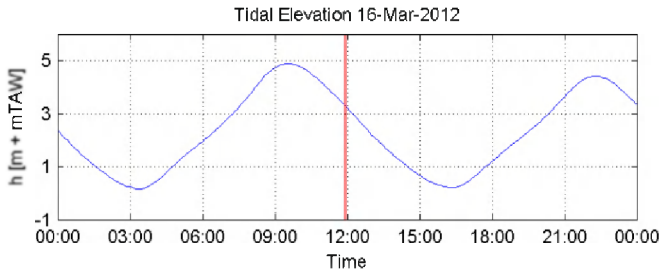
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9027_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

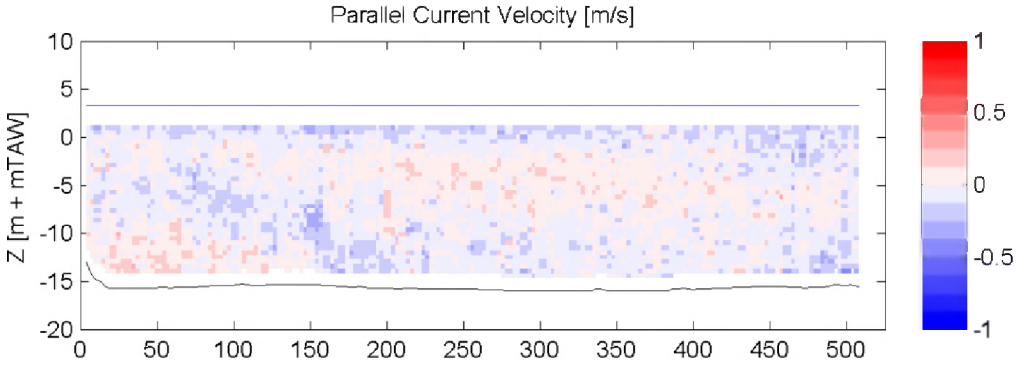
Date / Time [MET] :
16-Mar-2012
11:52 - 11:55

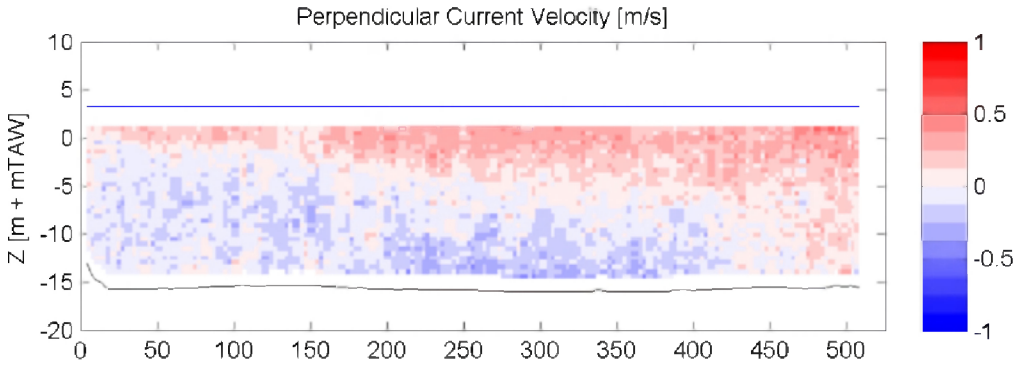
Time after HW [HH:MM]
1:49

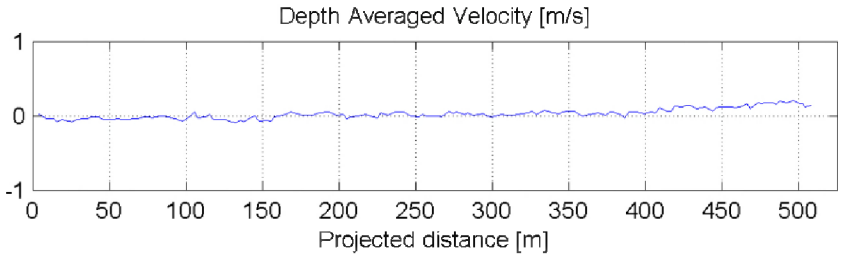
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

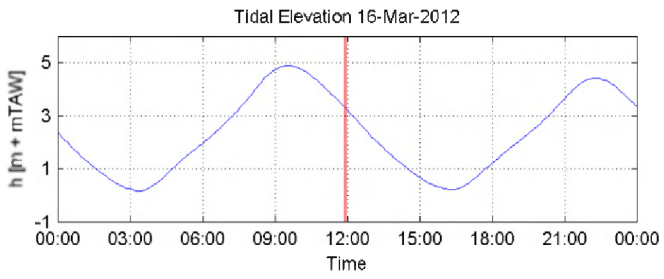
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9027_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

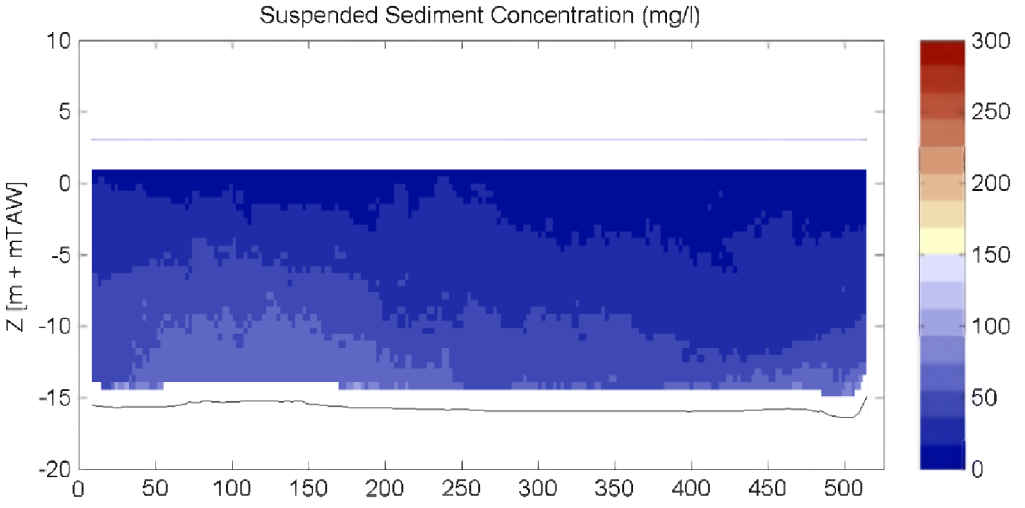
Date / Time [MET] :
16-Mar-2012
11:52 - 11:55

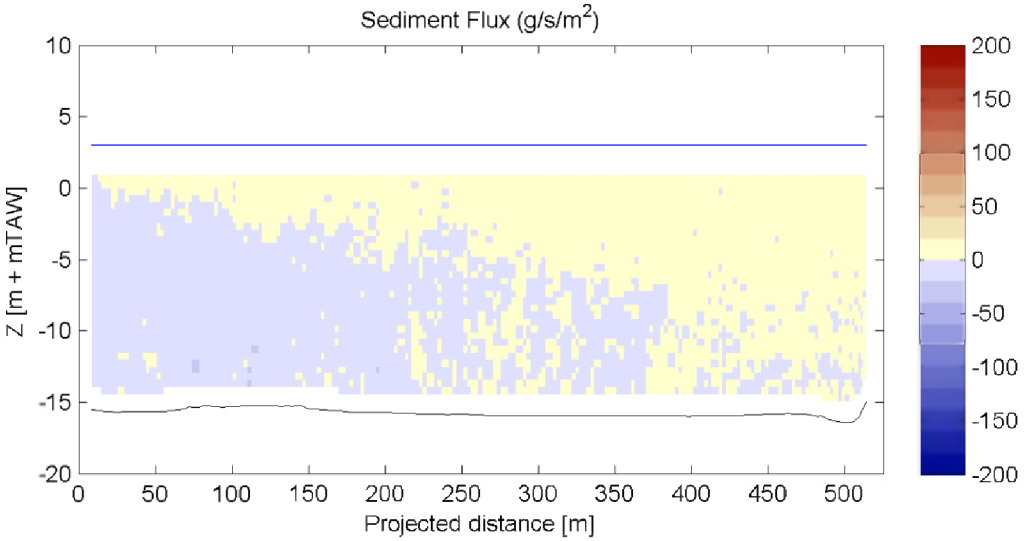
Time after HW [HH:MM]
1:49

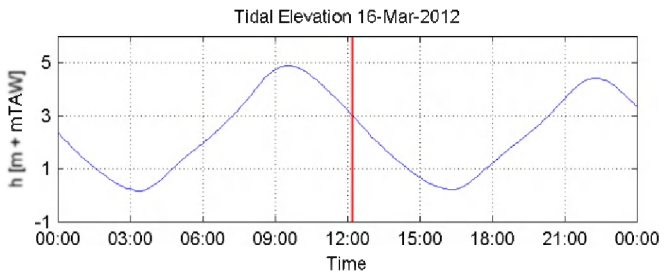
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9029_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

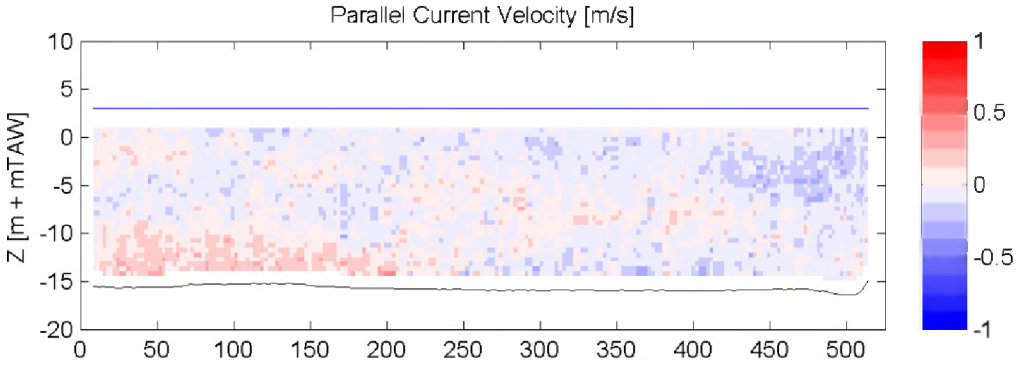
Date / Time [MET] :
16-Mar-2012
12:09 - 12:13

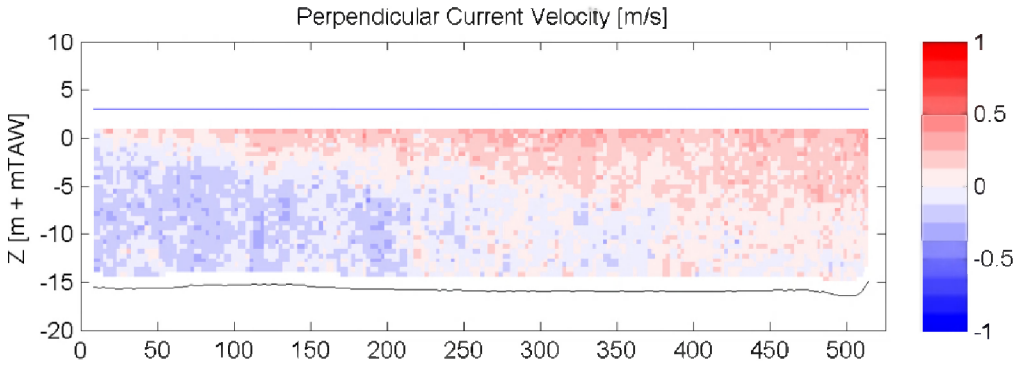
Time after HW [HH:MM]
2:06

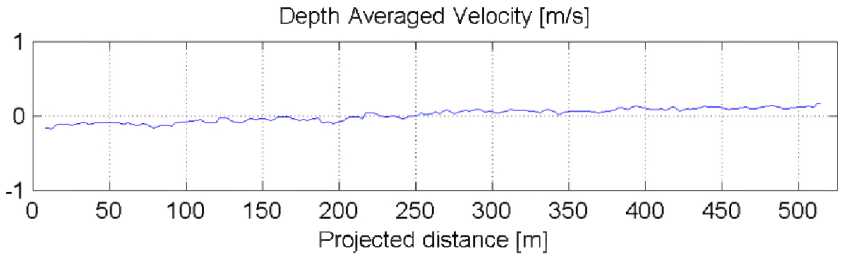
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

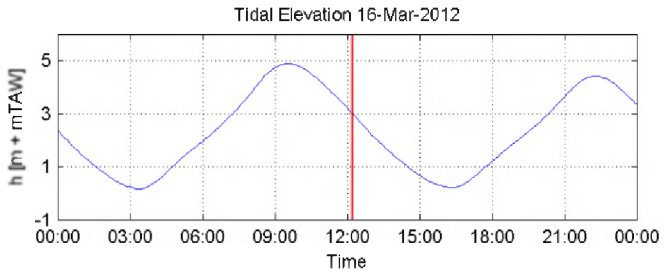
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9029_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

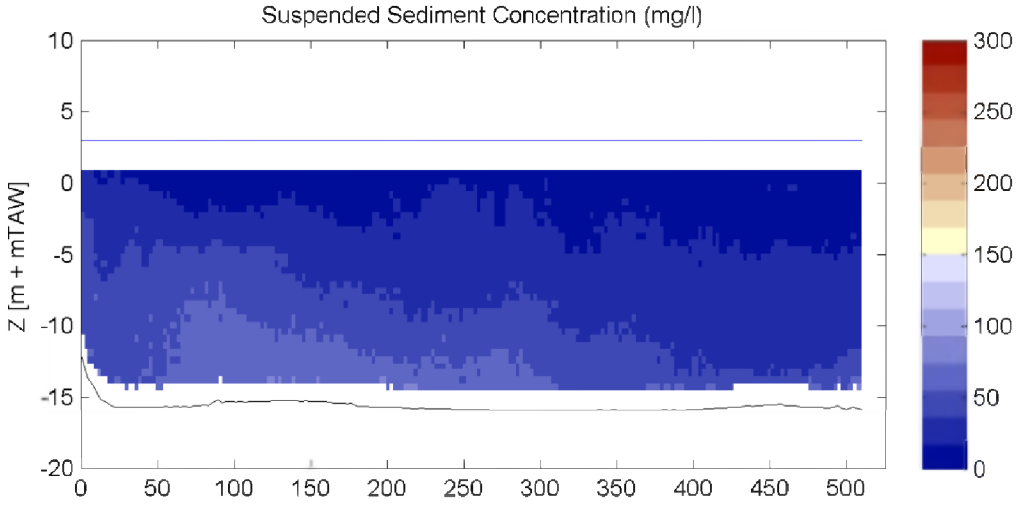
Date / Time [MET] :
16-Mar-2012
12:09 - 12:13

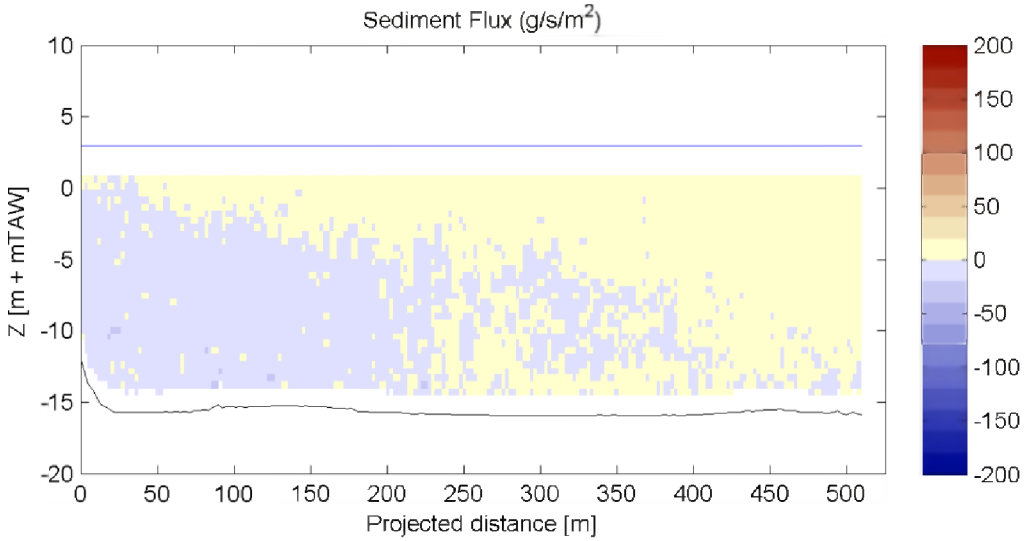
Time after HW [HH:MM]
2:06

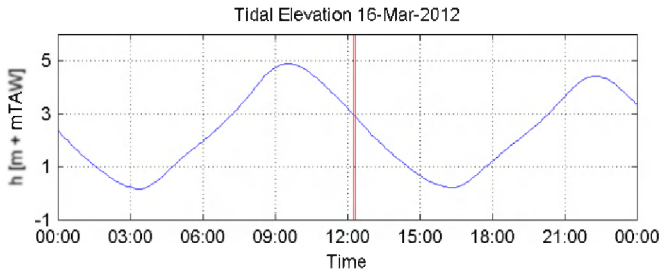
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9030_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

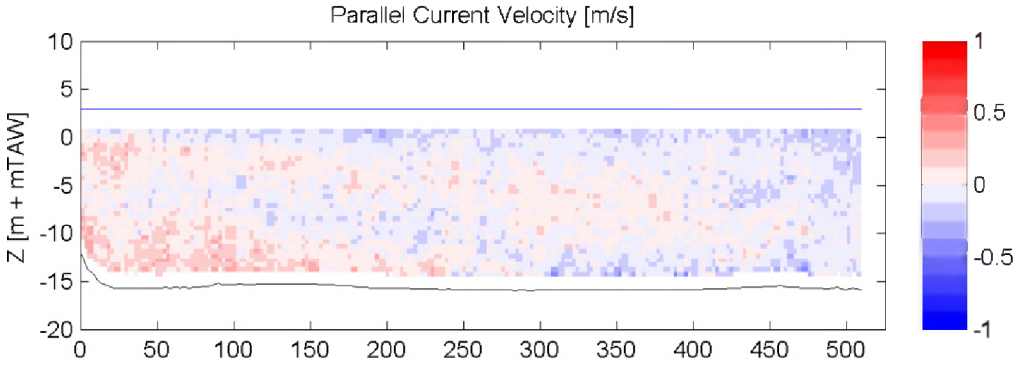
Date / Time [MET] :
16-Mar-2012
12:14 - 12:18

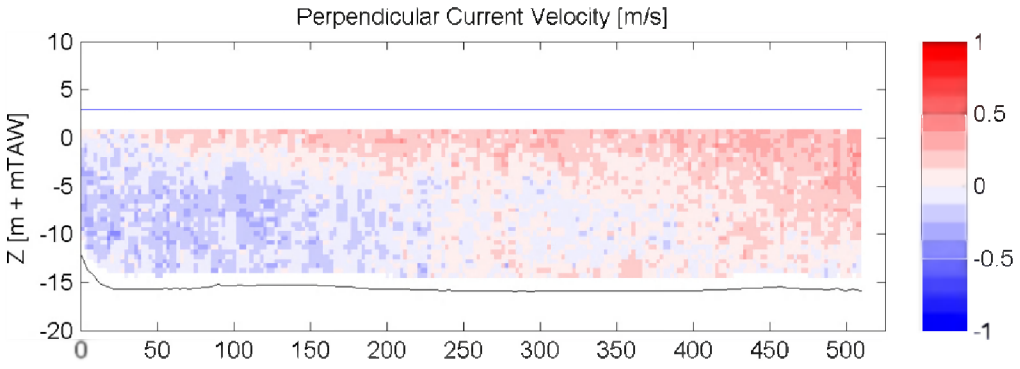
Time after HW [HH:MM]
2:11

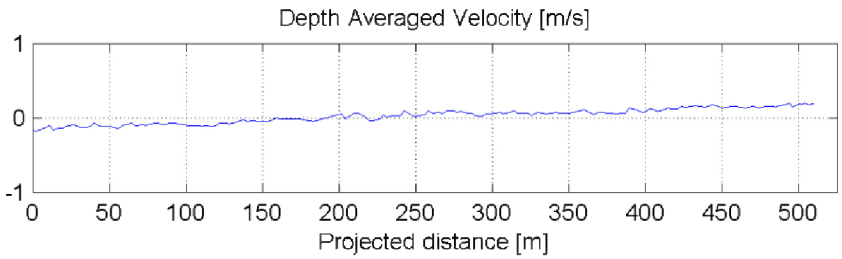
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

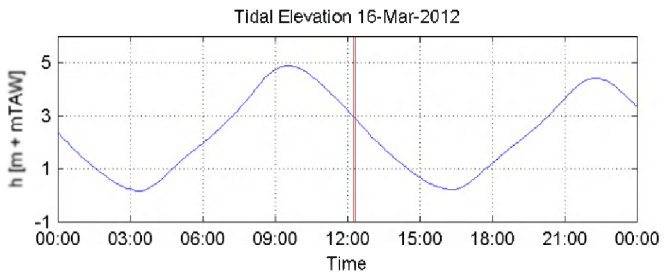
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9030_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

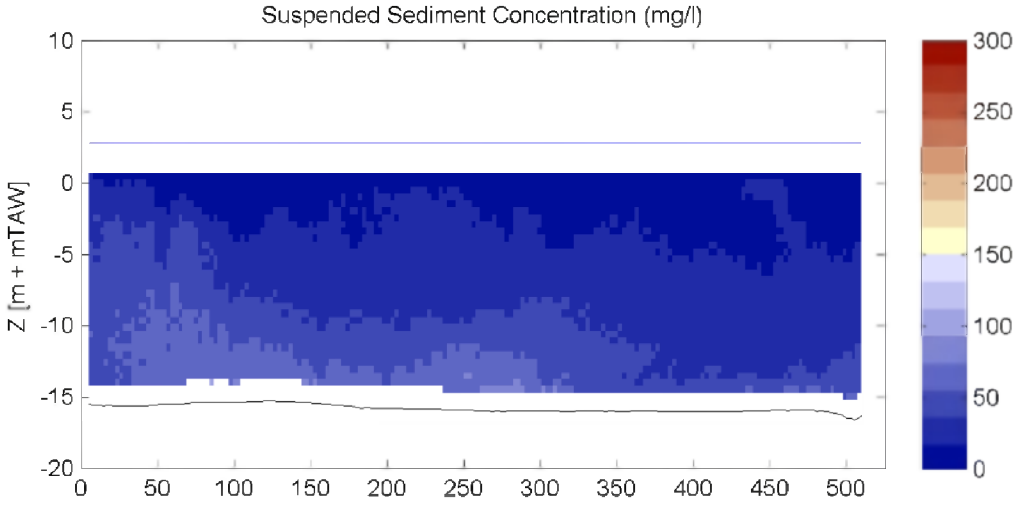
Date / Time [MET] :
16-Mar-2012
12:14 - 12:18

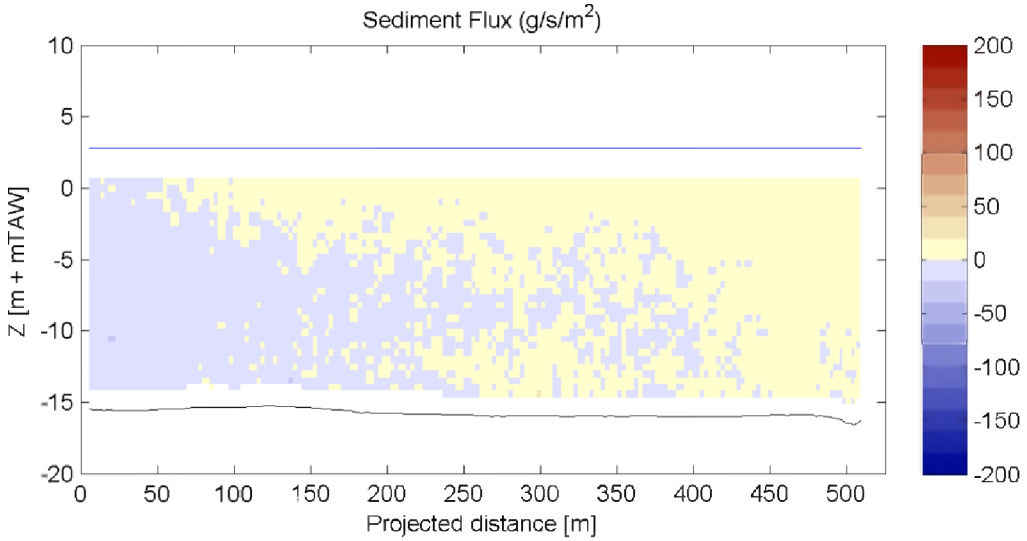
Time after HW [HH:MM]
2:11

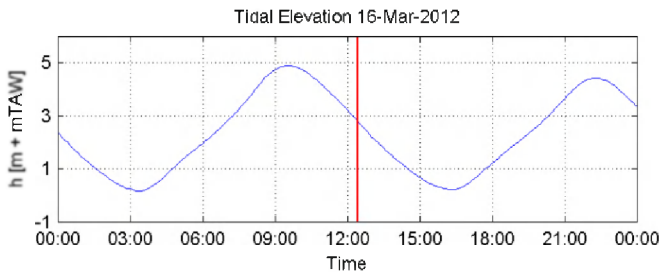
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9031_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

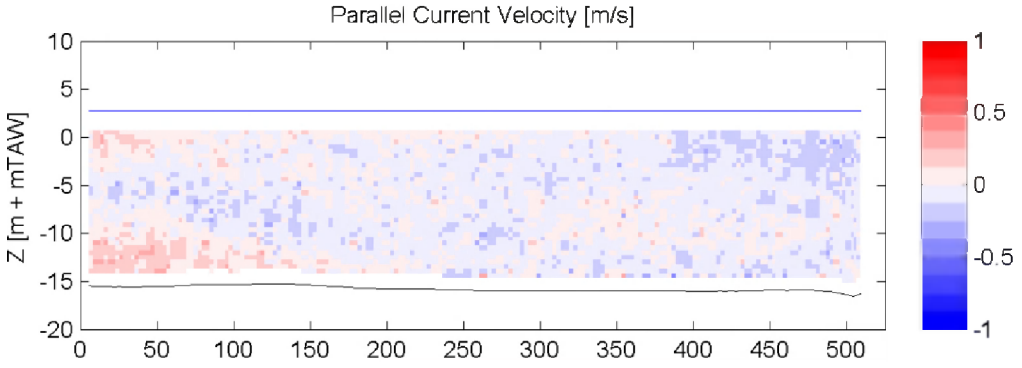
Date / Time [MET] :
16-Mar-2012
12:23 - 12:26

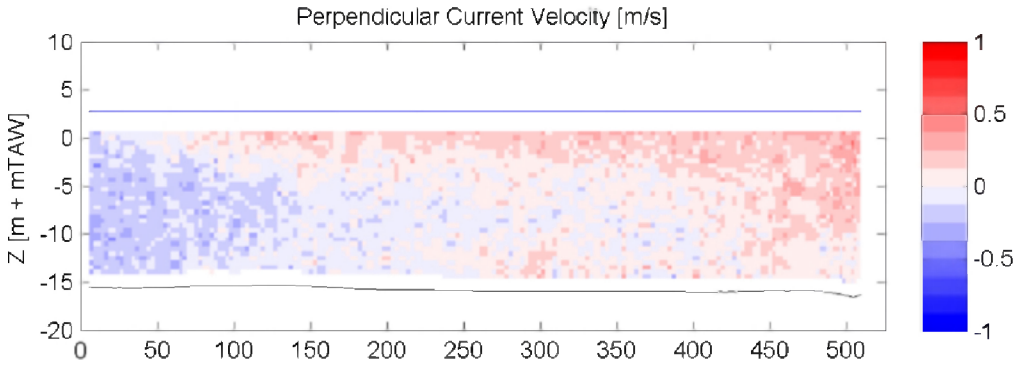
Time after HW [HH:MM]
2:20

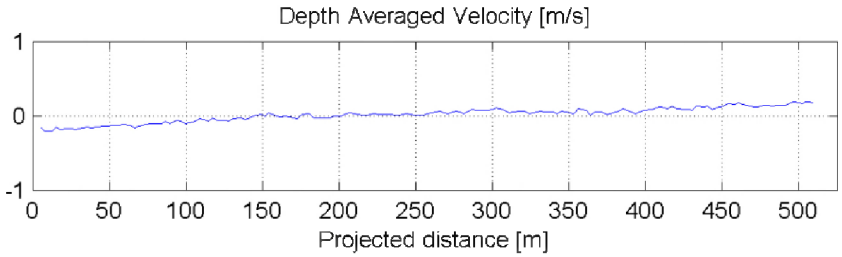
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

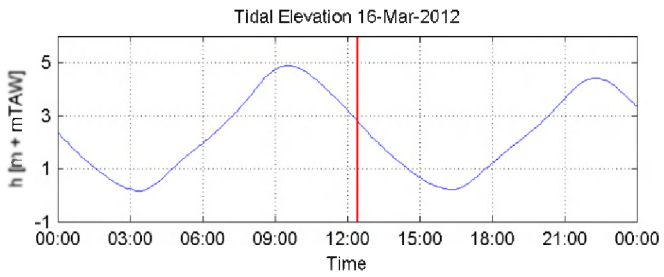
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9031_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

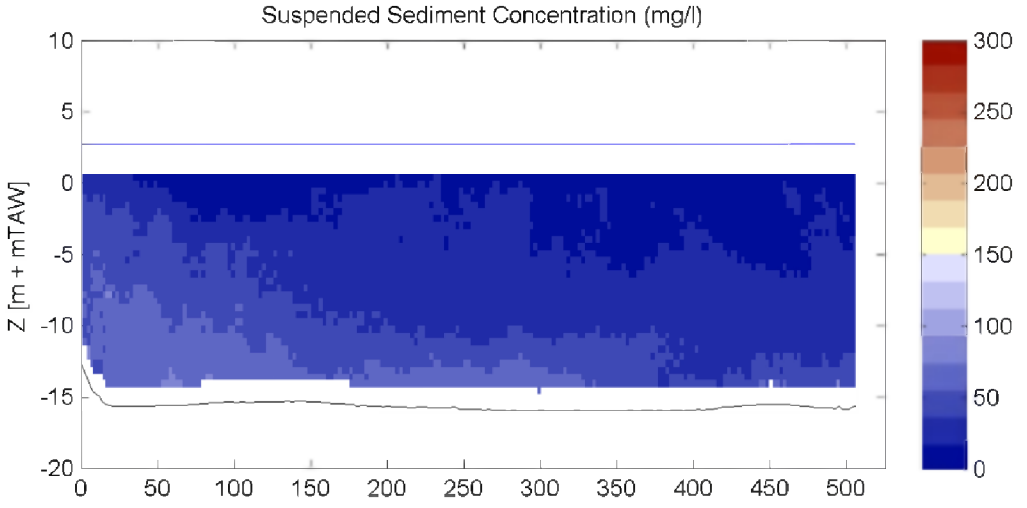
Date / Time [MET] :
16-Mar-2012
12:23 - 12:26

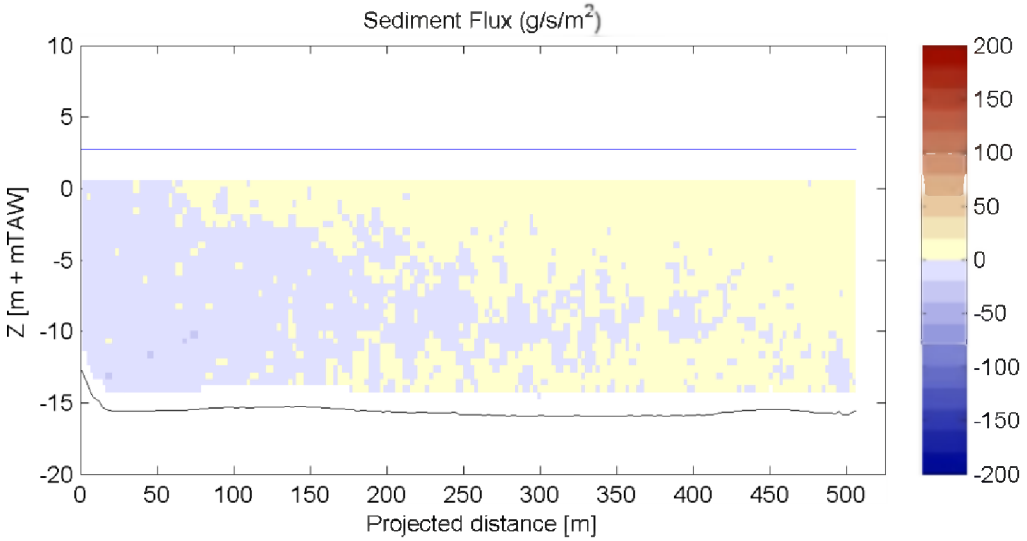
Time after HW [HH:MM]
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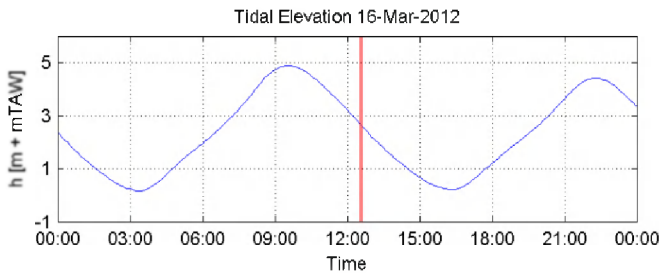
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9033_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

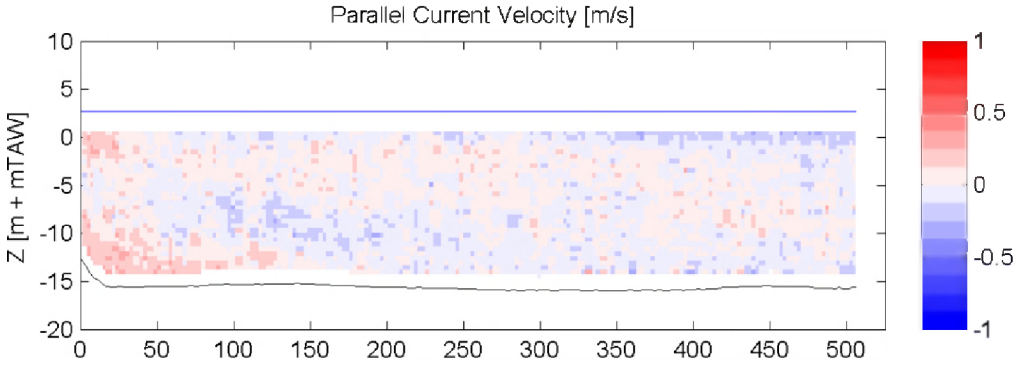
Date / Time [MET] :
16-Mar-2012
12:31 - 12:35

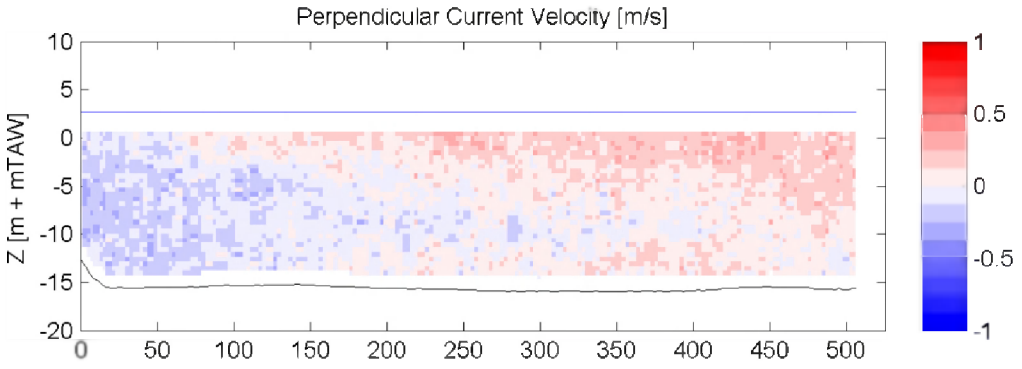
Time after HW [HH:MM]
2:28

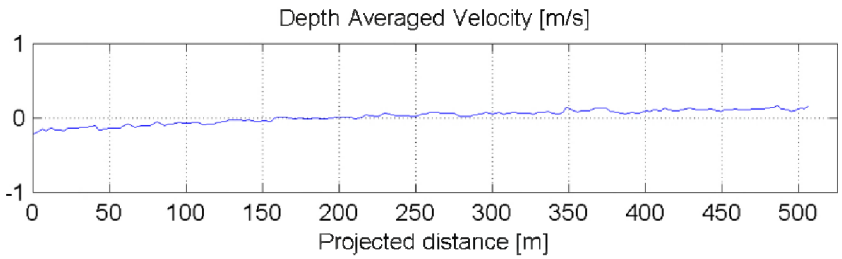
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

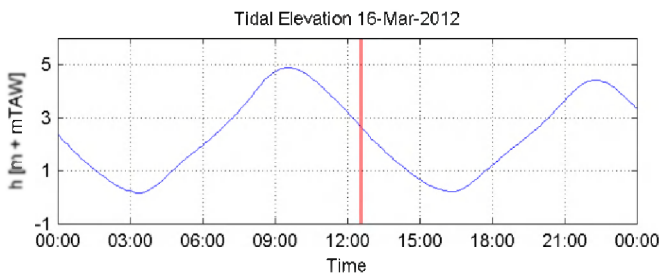
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9033_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

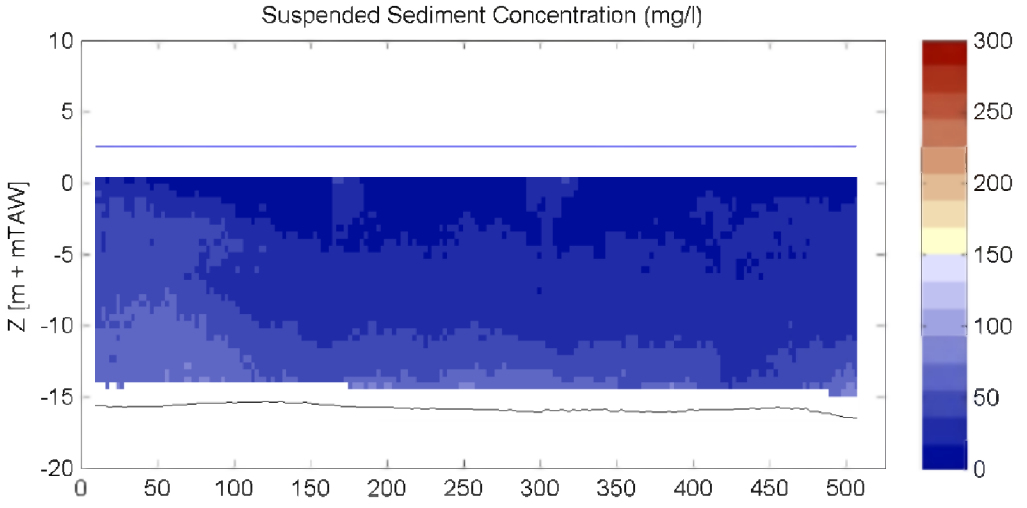
Date / Time [MET] :
16-Mar-2012
12:31 - 12:35

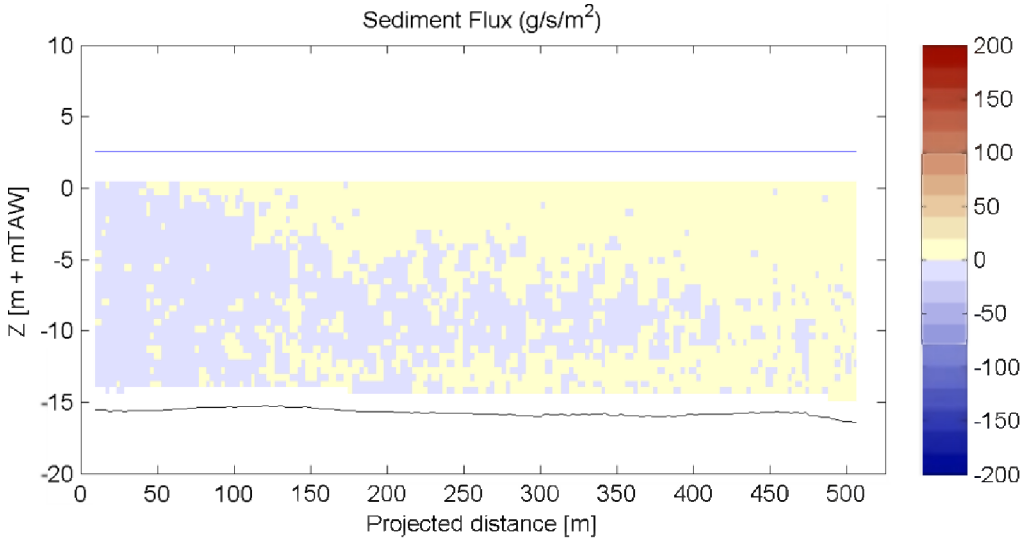
Time after HW [HH:MM]
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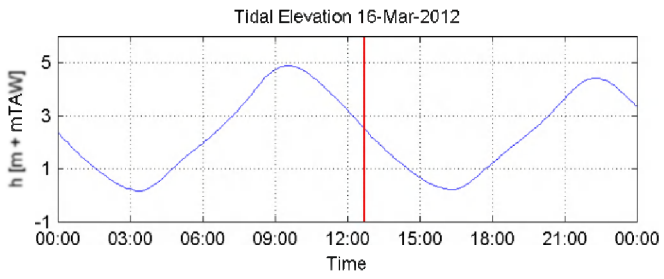
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9034_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

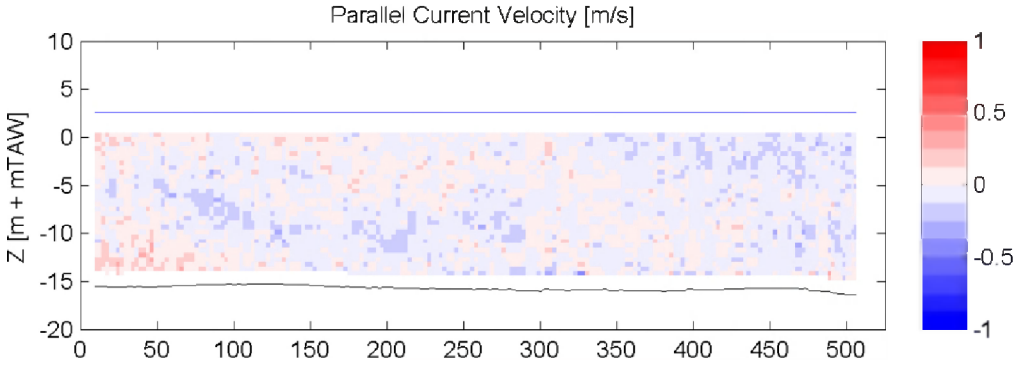
Date / Time [MET] :
16-Mar-2012
12:39 - 12:43

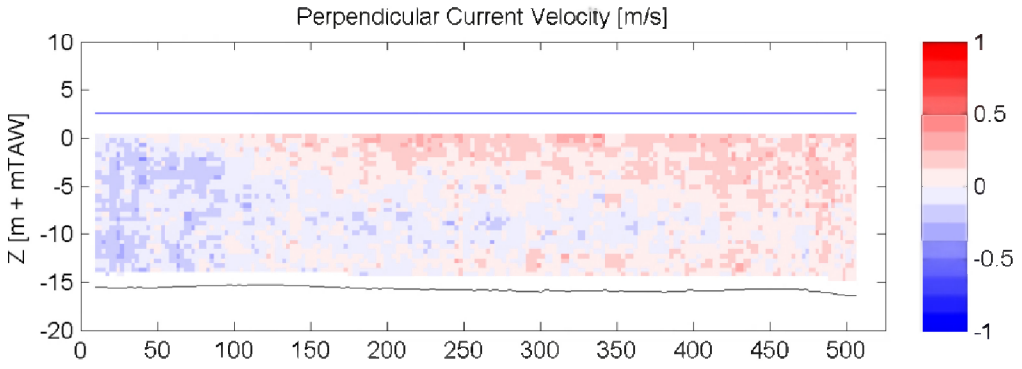
Time after HW [HH:MM]
2:36

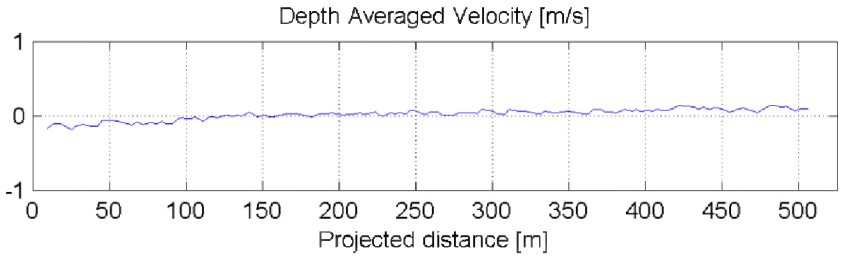
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

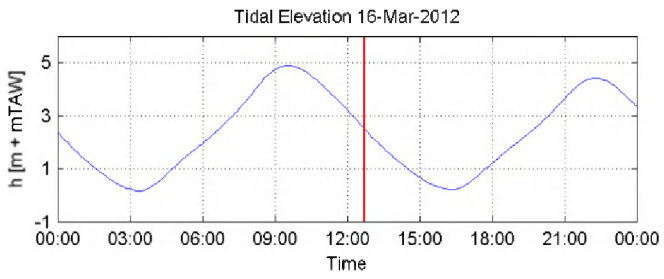
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9034_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

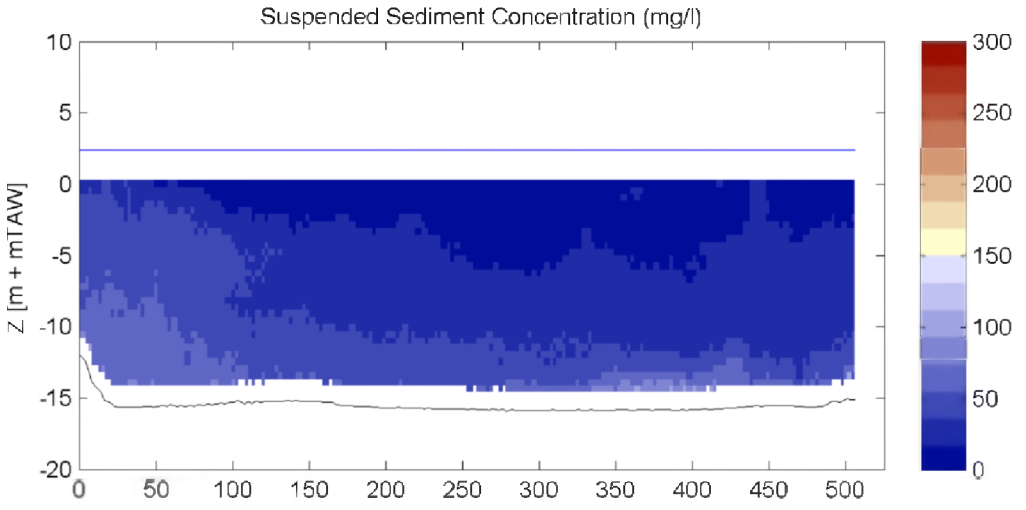
Date / Time [MET] :
16-Mar-2012
12:39 - 12:43

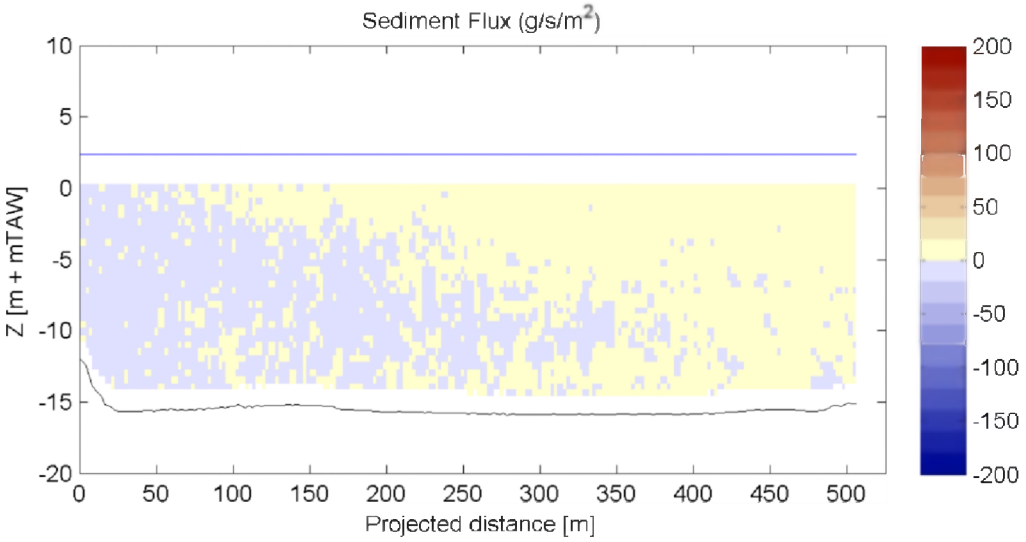
Time after HW [HH:MM]
2:36

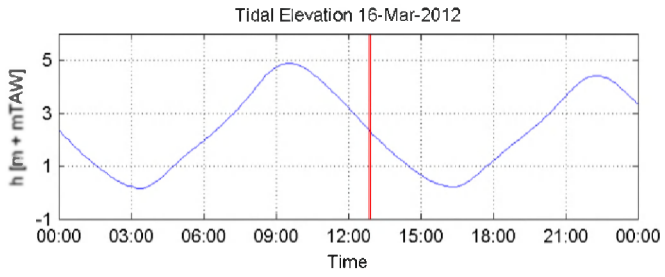
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9035_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

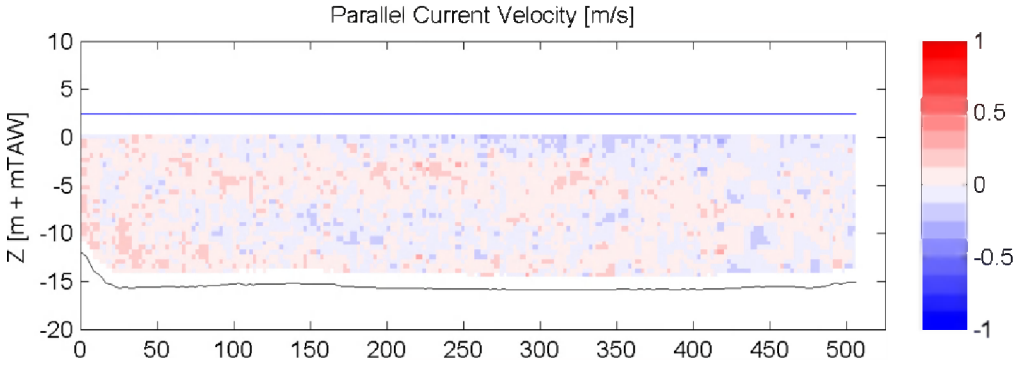
Date / Time [MET]:
16-Mar-2012
12:49 - 12:53

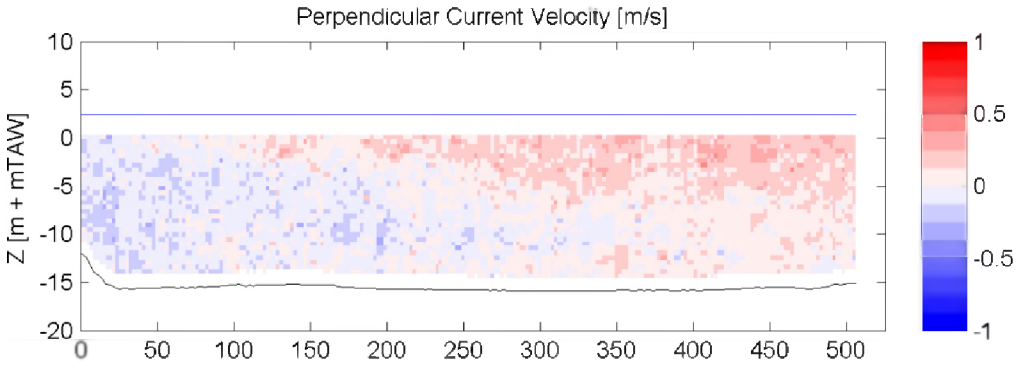
Time after HW [HH:MM]
2:46

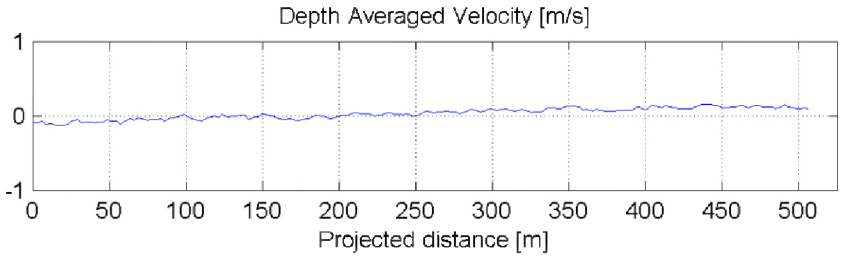
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

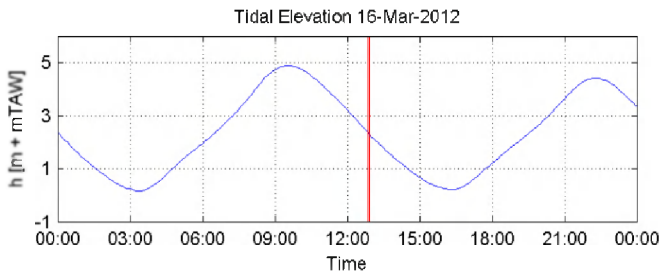
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9035_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
12:49 - 12:53

Time after HW [HH:MM]
2:46

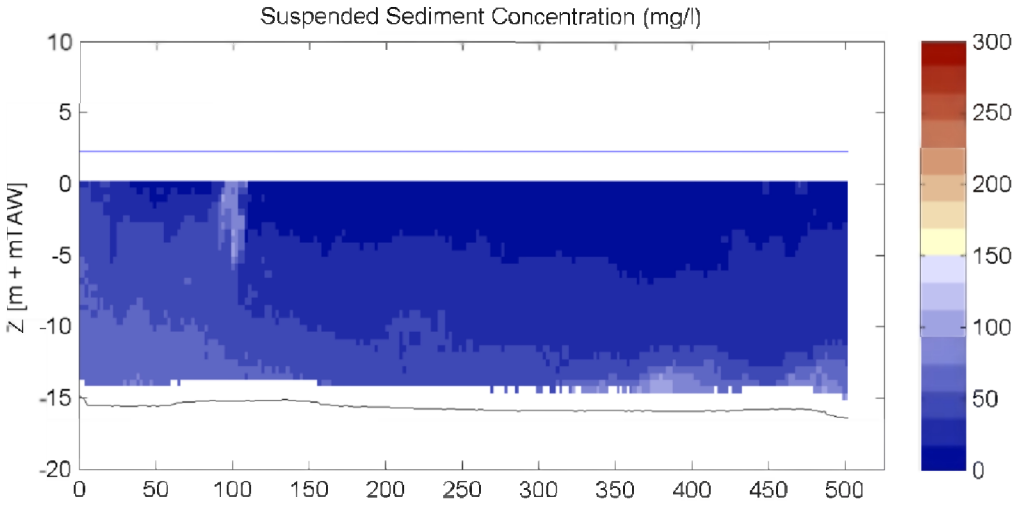
Data Processed by:

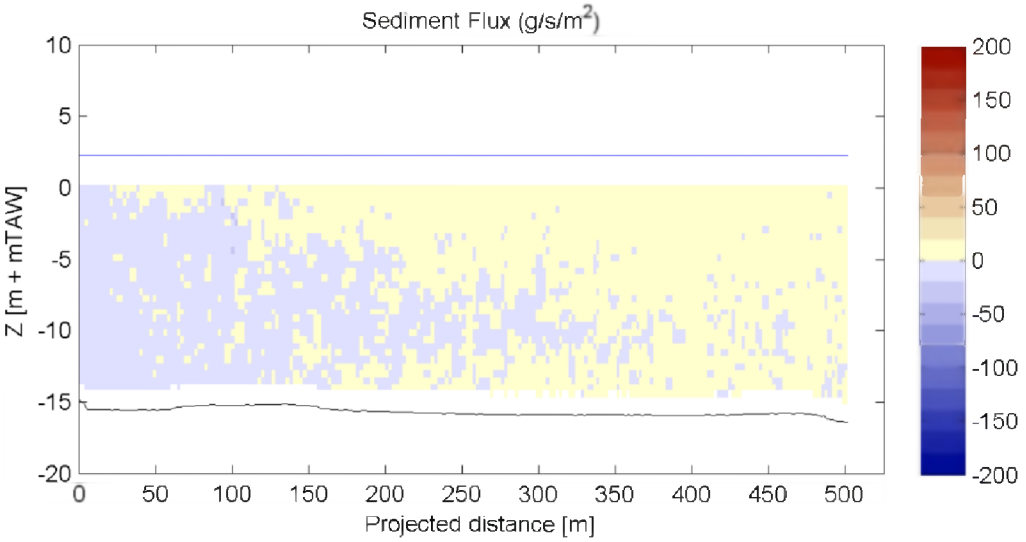
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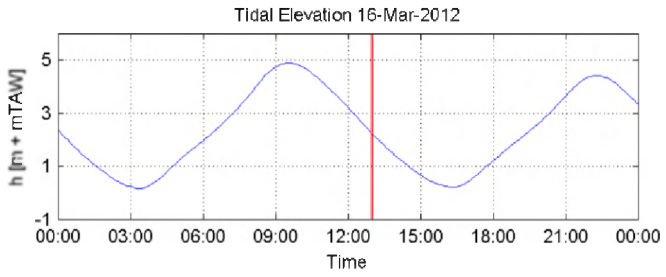
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9036_dgd_Tba.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

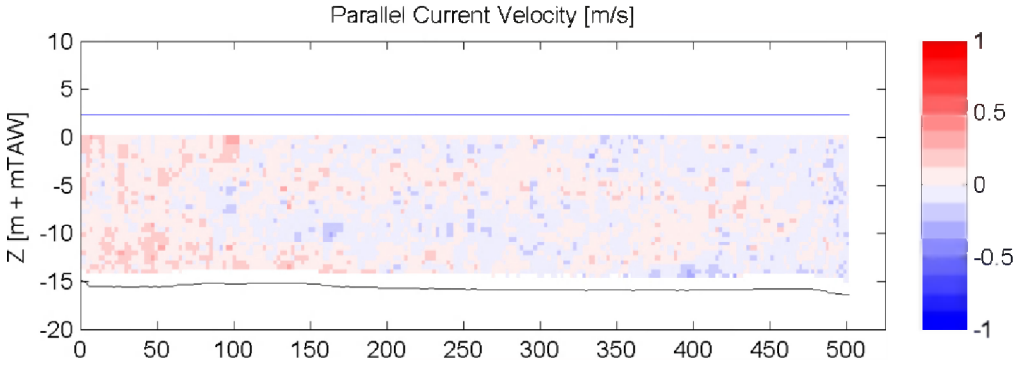
Date / Time [MET]:
16-Mar-2012
12:56 - 13:00

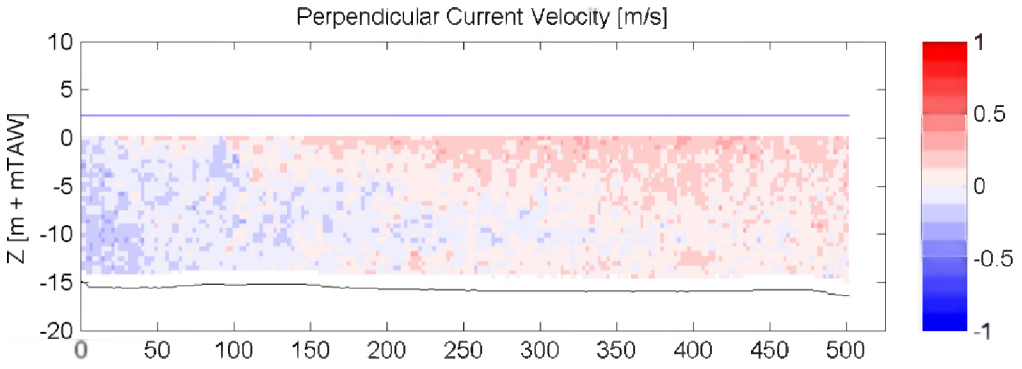
Time after HW [HH:MM]
2:53

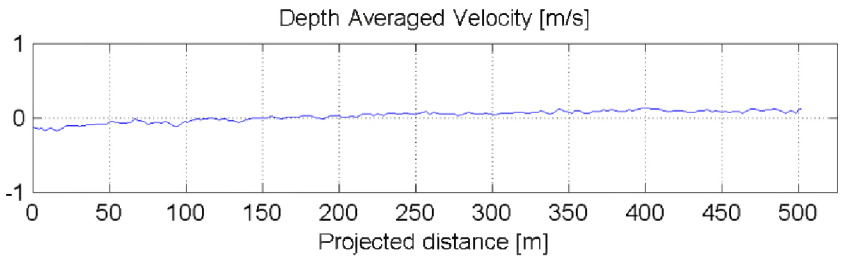
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

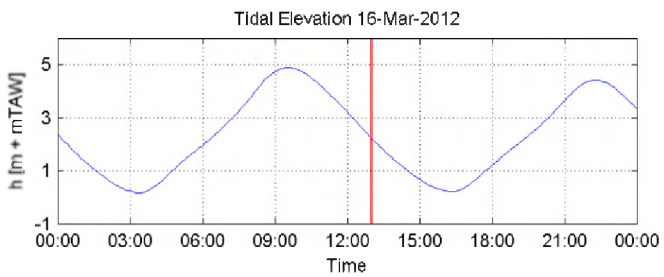
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9036_dgd_Tba.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

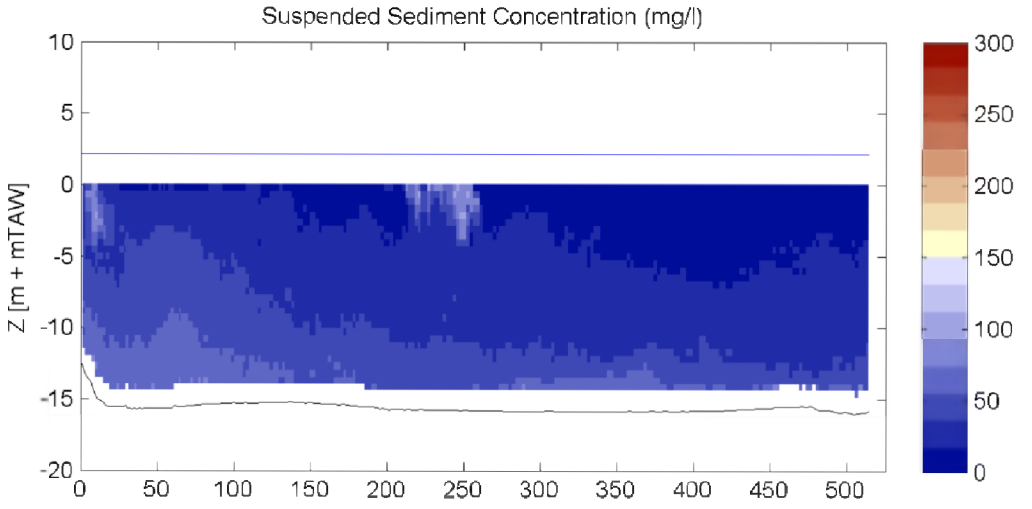
Date / Time [MET] :
16-Mar-2012
12:56 - 13:00

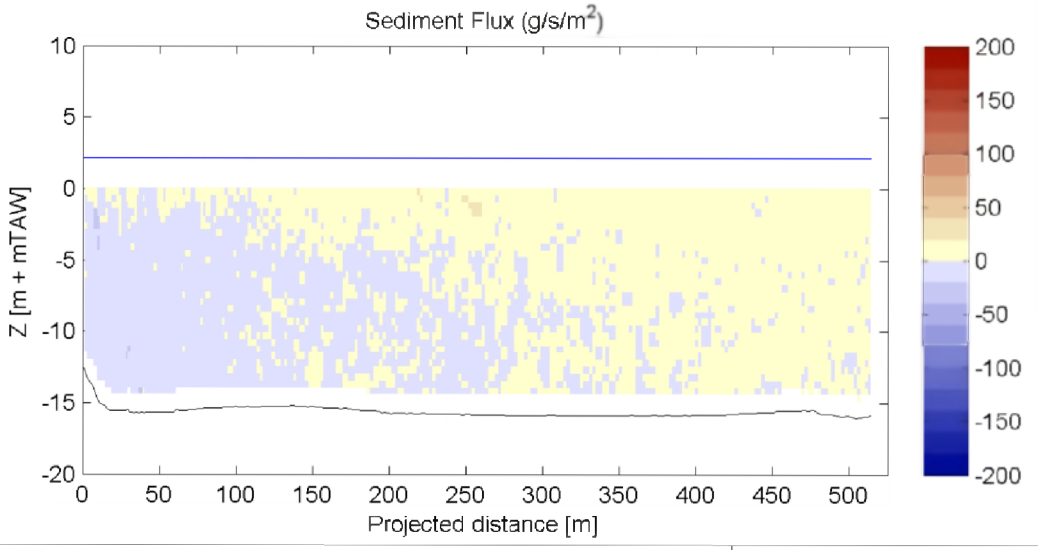
Time after HW [HH:MM]
2:53

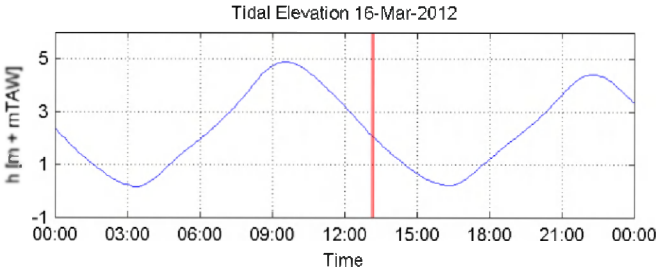
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9038_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

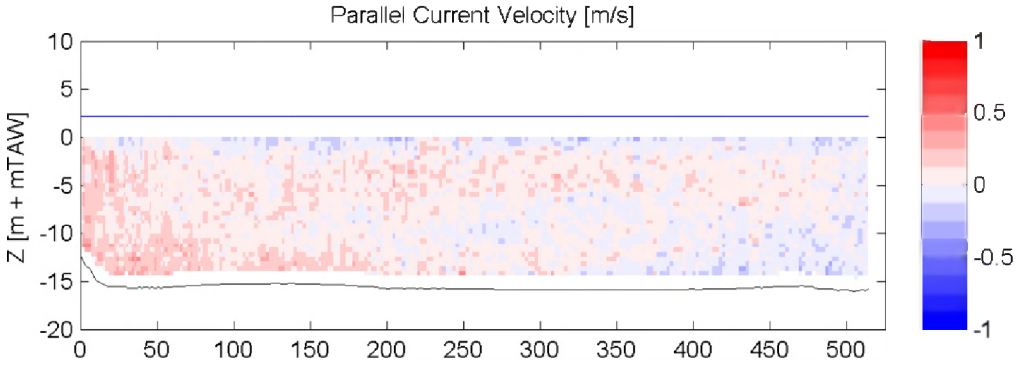
Date / Time [MET]:
16-Mar-2012
13:06 - 13:10

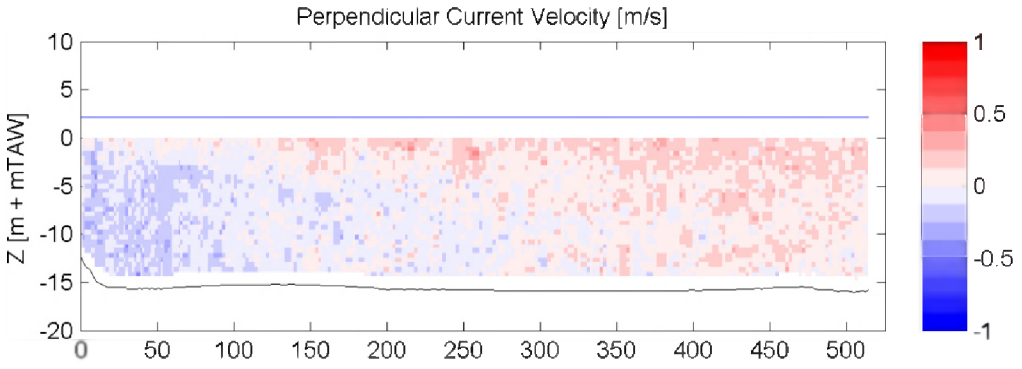
Time after HW [HH:MM]
3:03

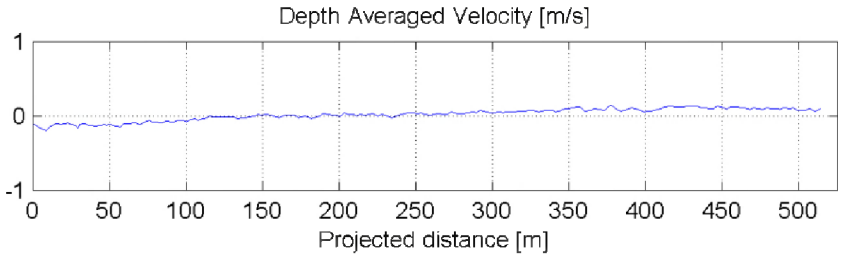
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

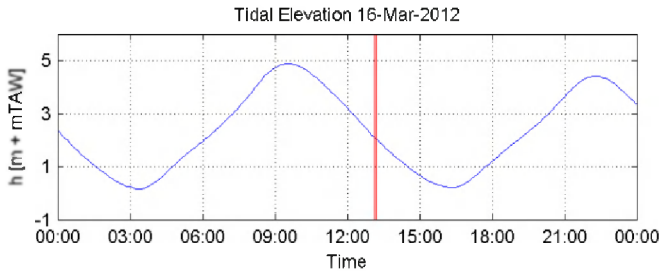
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9038_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

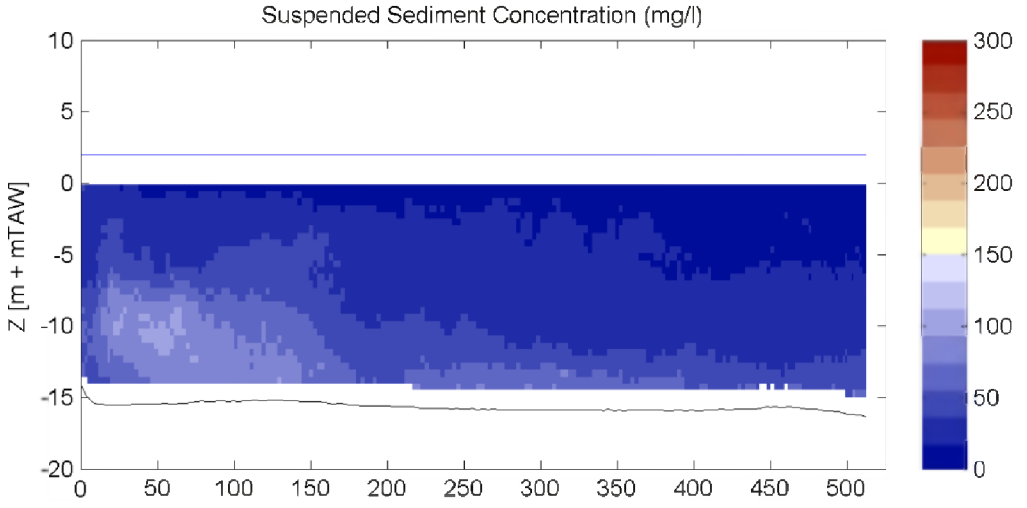
Date / Time [MET] :
16-Mar-2012
13:06 - 13:10

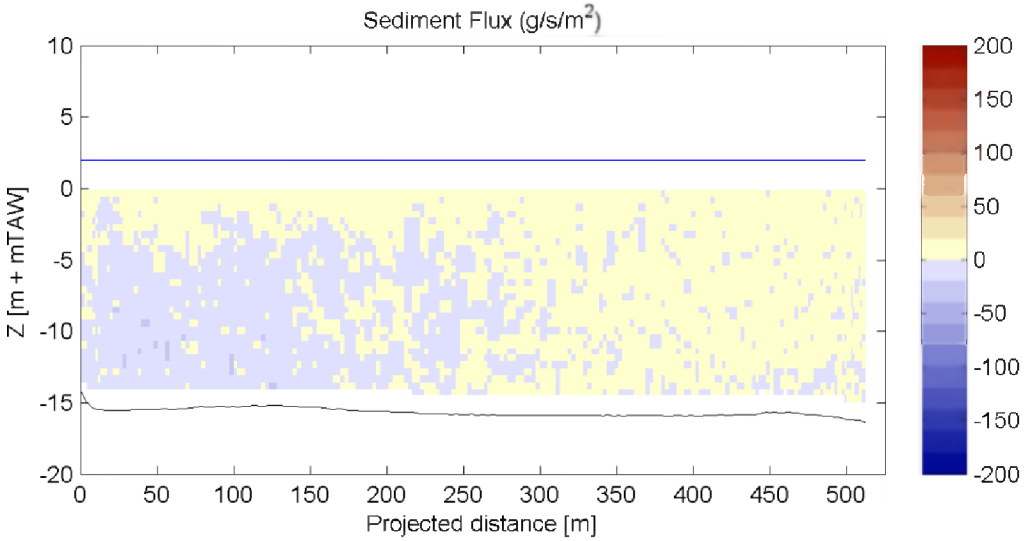
Time after HW [HH:MM]
3:03

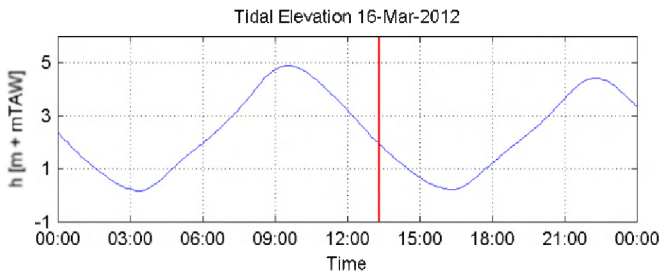
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9040_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
13:16 - 13:20

Time after HW [HH:MM]
3:13

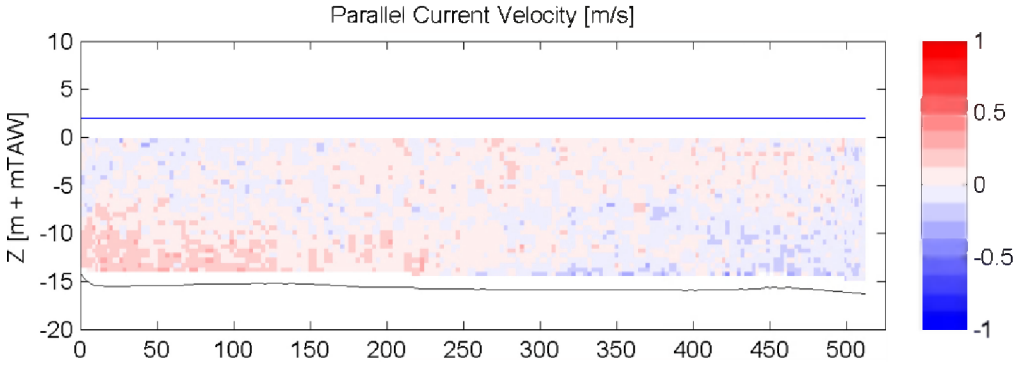
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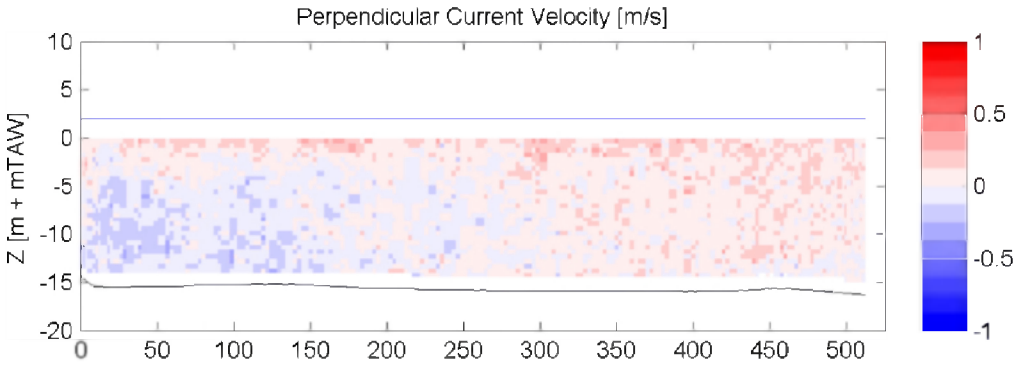
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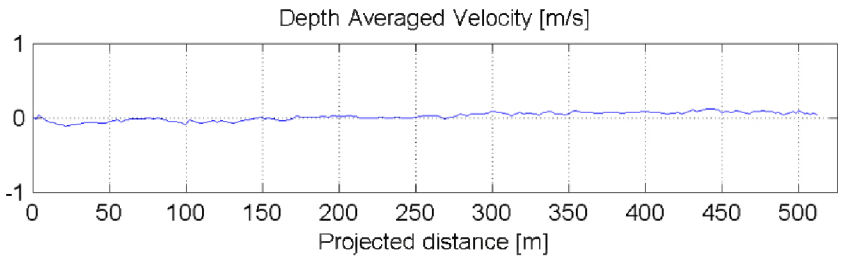
I/RA/11354/10.109/MBO/ANF

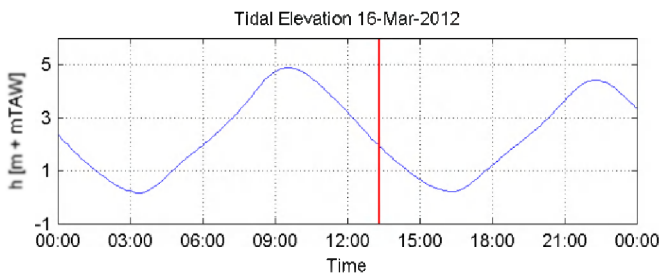
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9040_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
13:16 - 13:20

Time after HW [HH:MM]
3:13

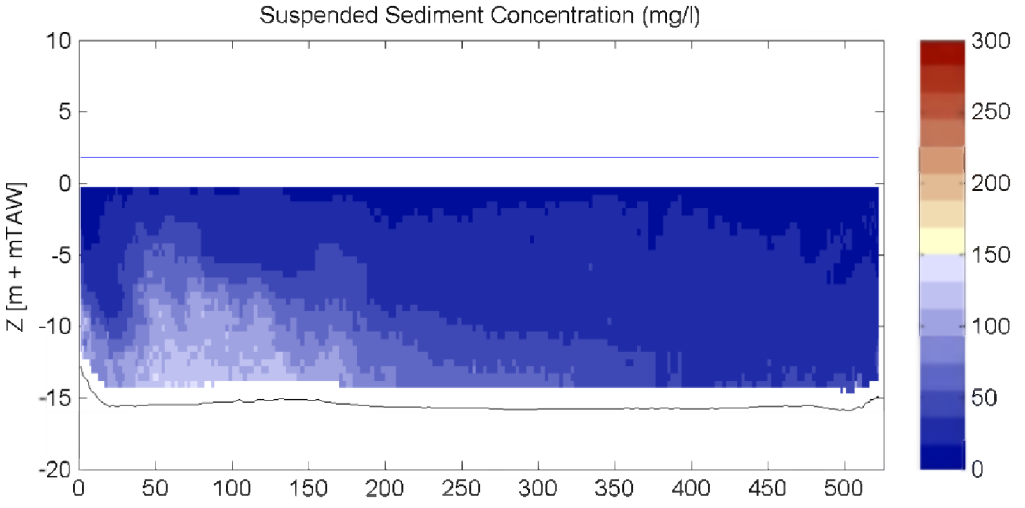
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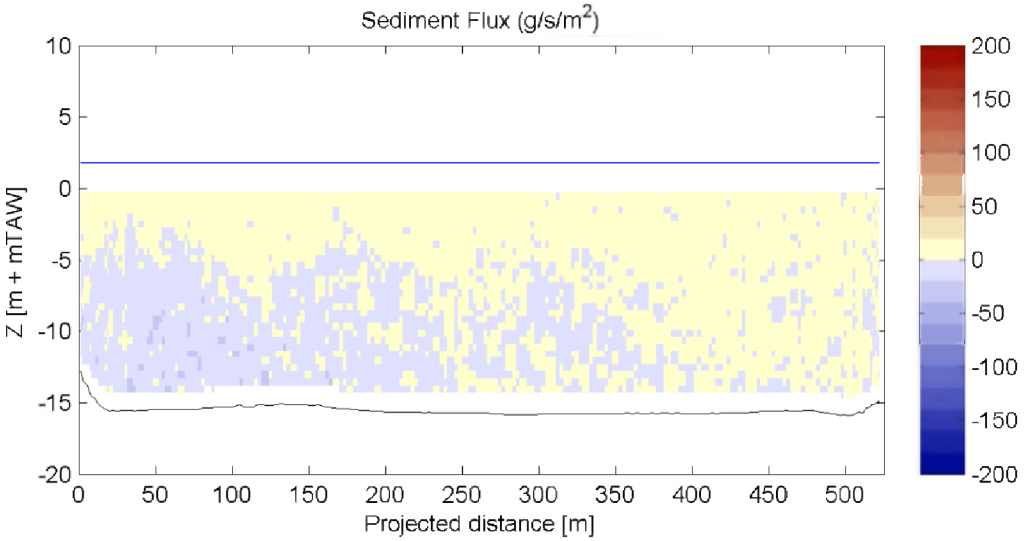
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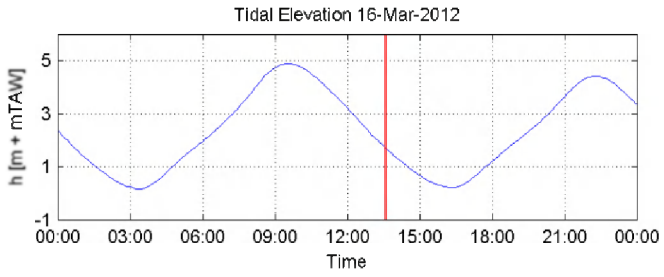
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9041_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

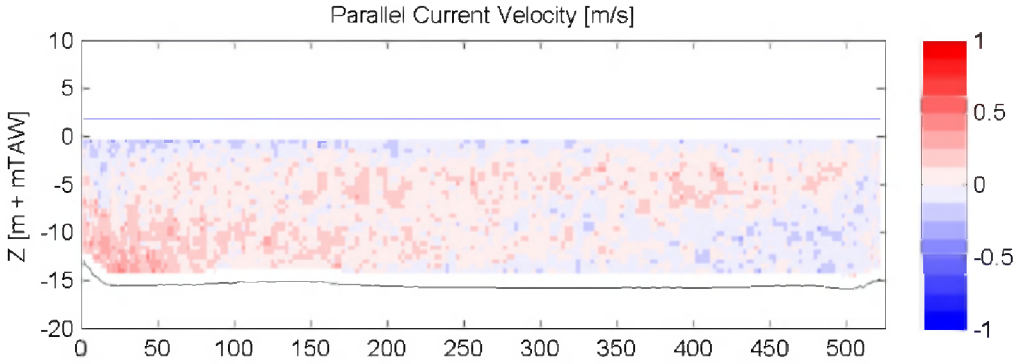
Date / Time [MET] :
16-Mar-2012
13:31 - 13:36

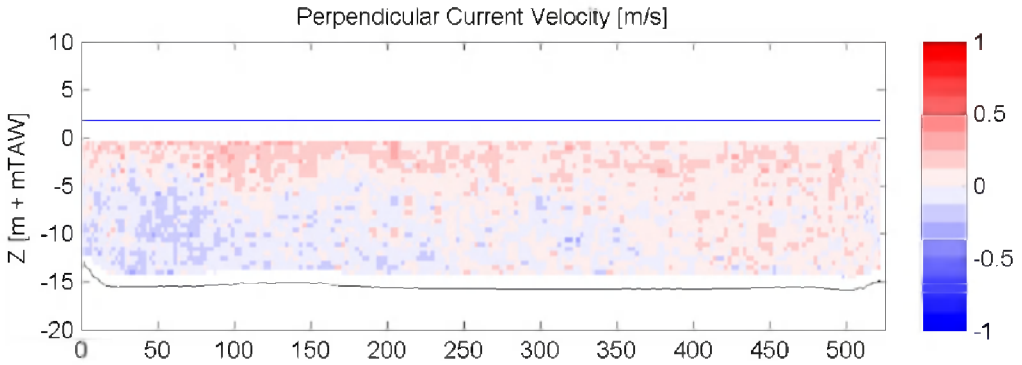
Time after HW [HH:MM]
3:29

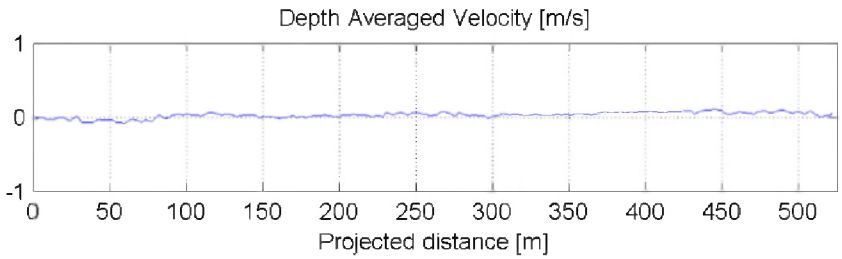
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

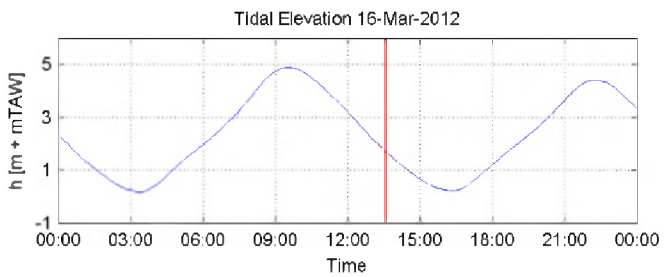
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9041_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET]:
16-Mar-2012
13:31 - 13:36

Time after HW [HH:MM]
3:29

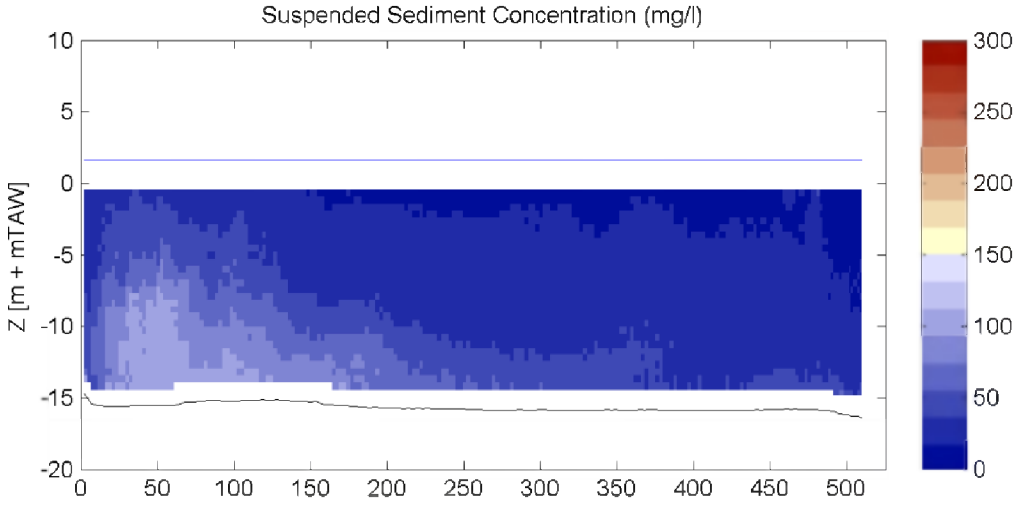
Data Processed by:

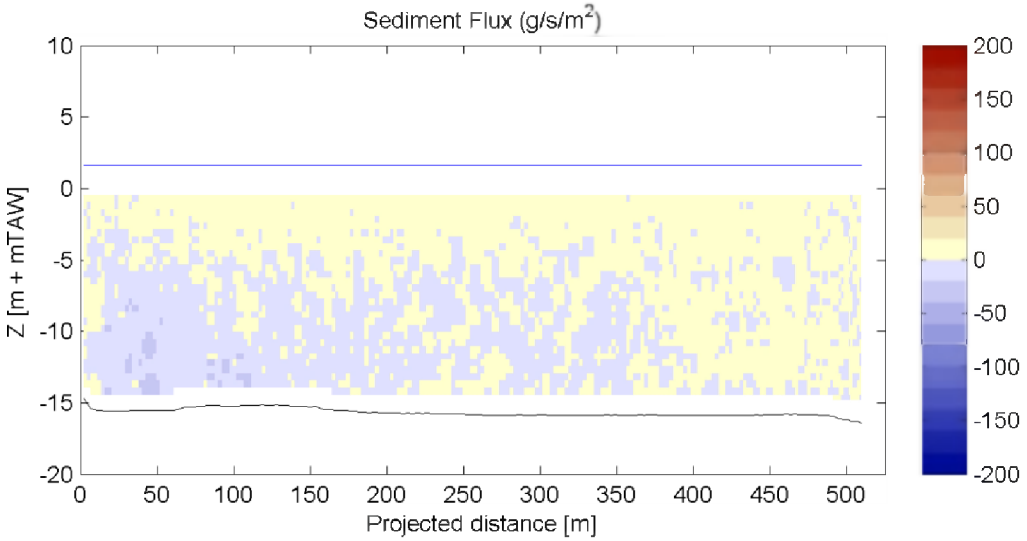
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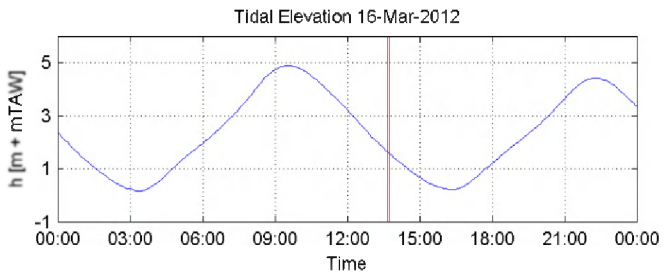
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9042_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

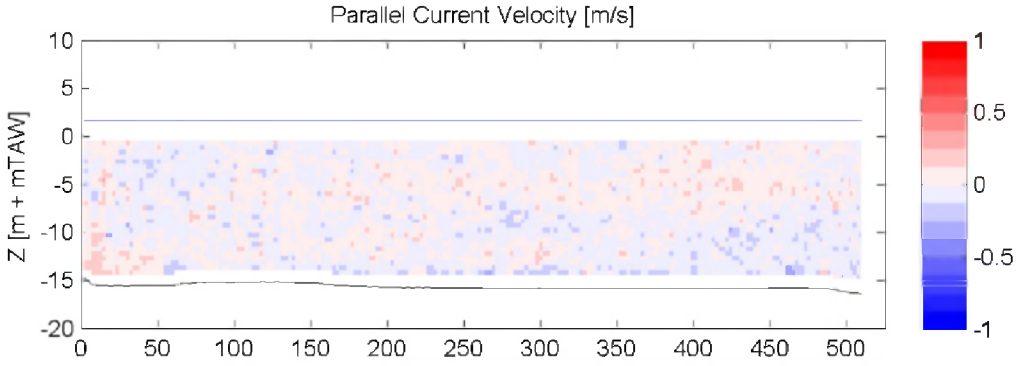
Date / Time [MET] :
16-Mar-2012
13:39 - 13:43

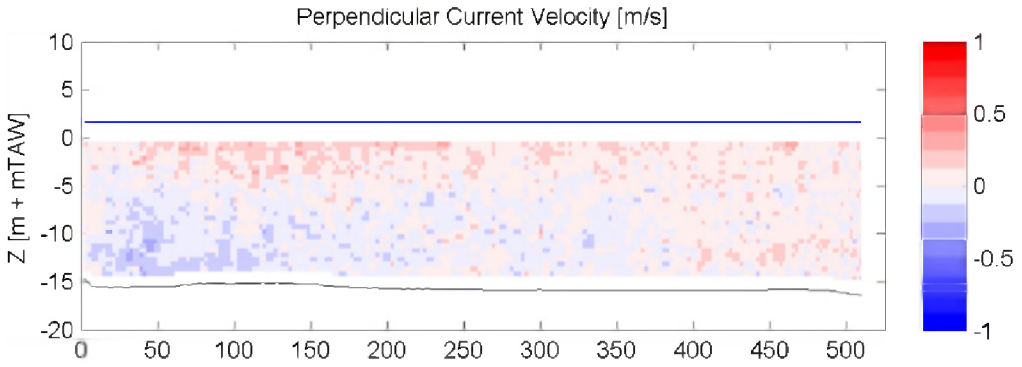
Time after HW [HH:MM]
3:36

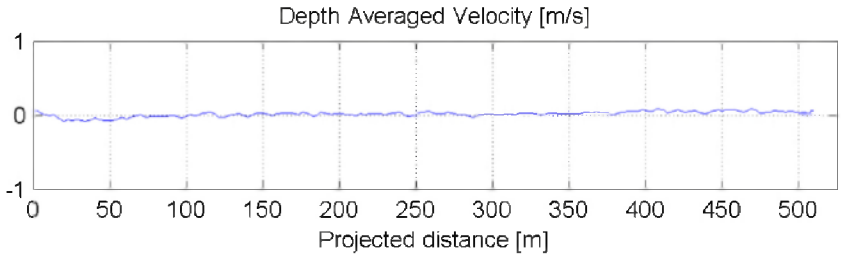
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

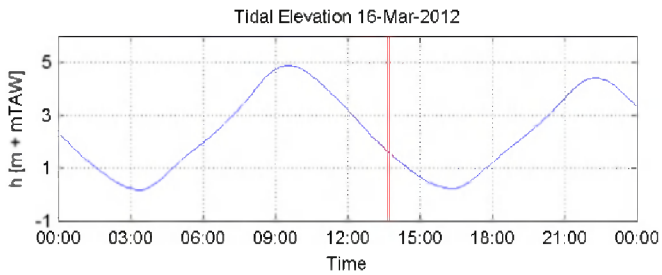
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9042_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

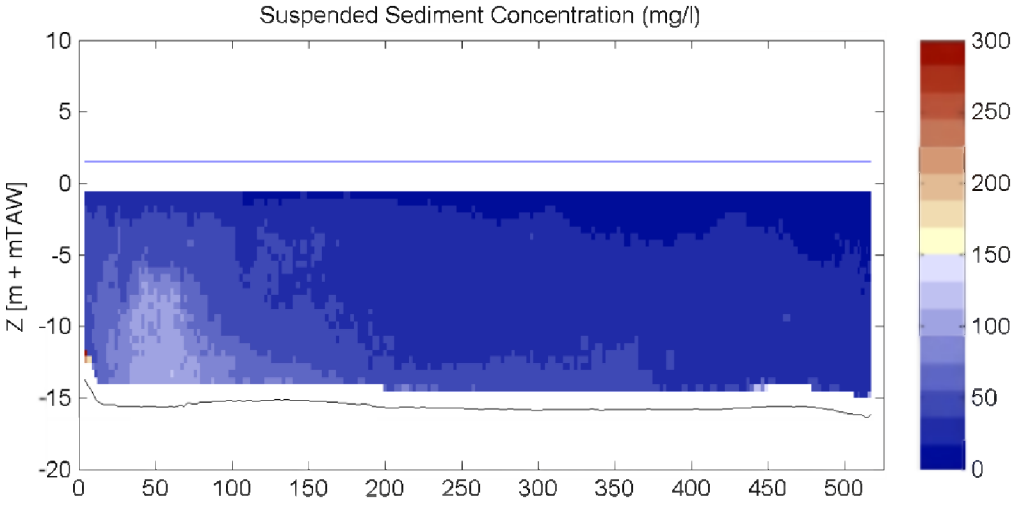
Date / Time [MET] :
16-Mar-2012
13:39 - 13:43

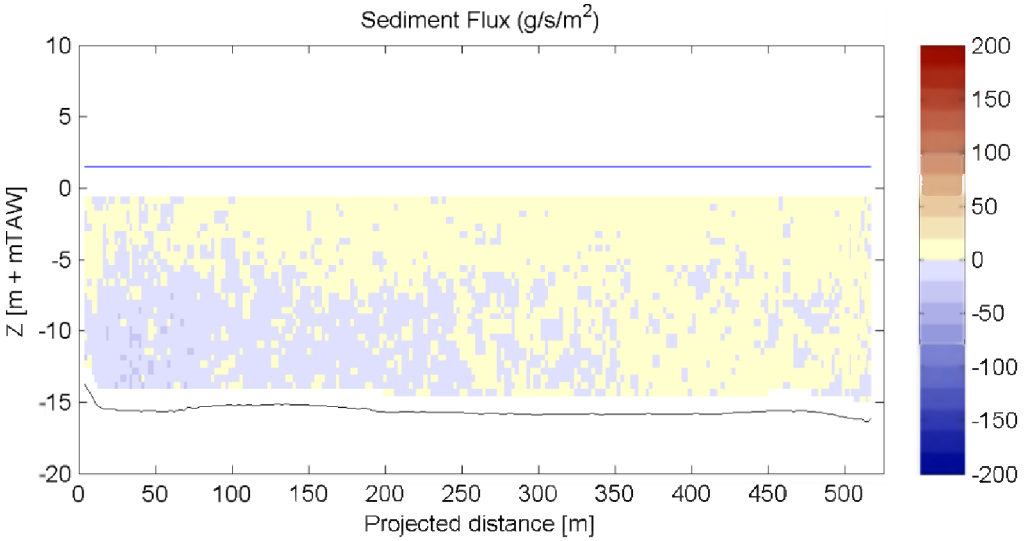
Time after HW [HH:MM]
3:36

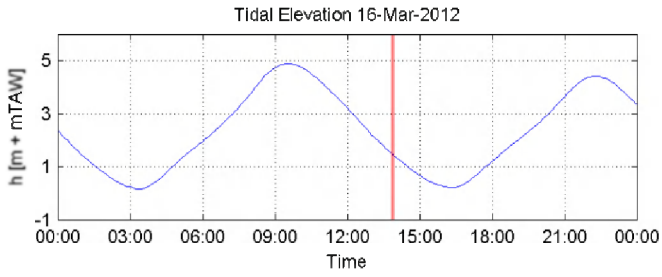
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9044_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

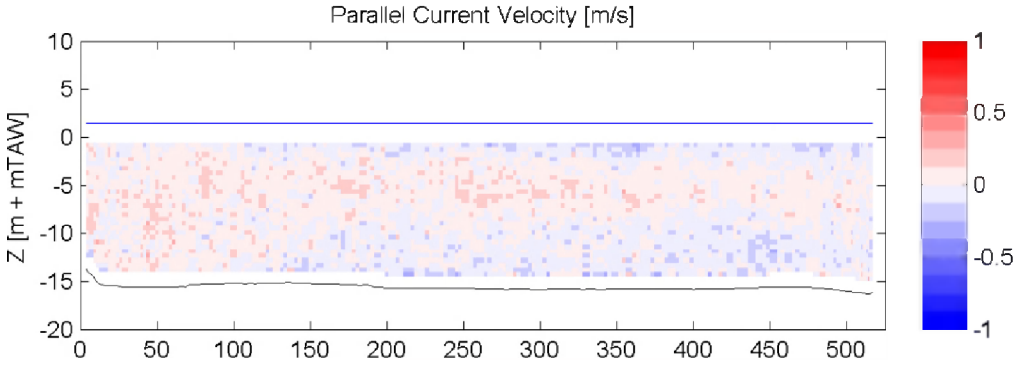
Date / Time [MET] :
16-Mar-2012
13:51 - 13:55

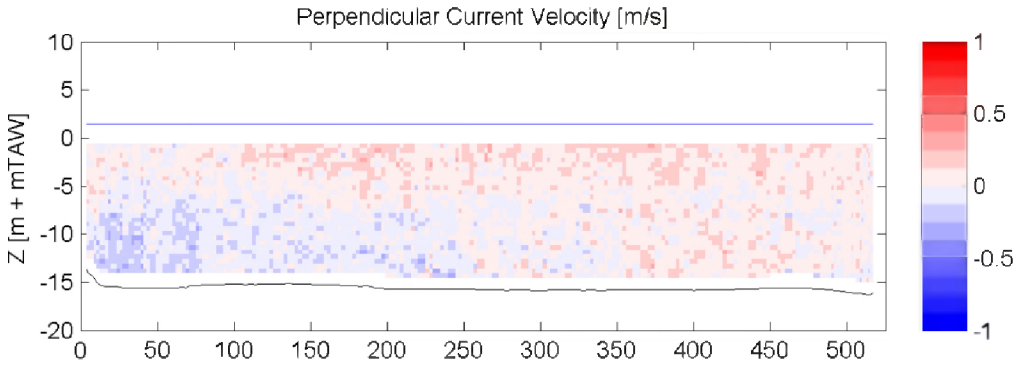
Time after HW [HH:MM]
3:48

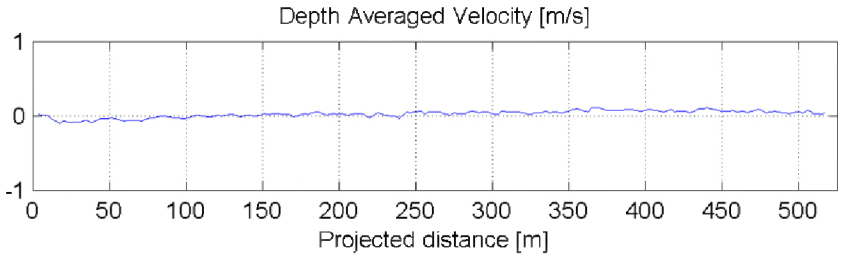
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

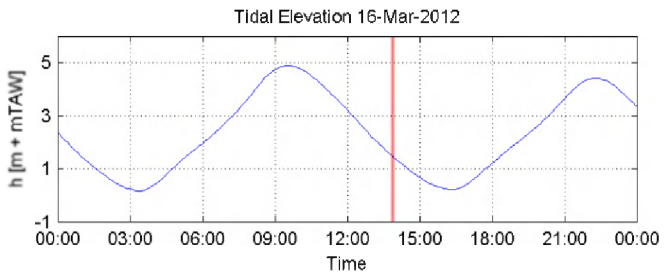
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9044_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
13:51 - 13:55

Time after HW [HH:MM]
3:48

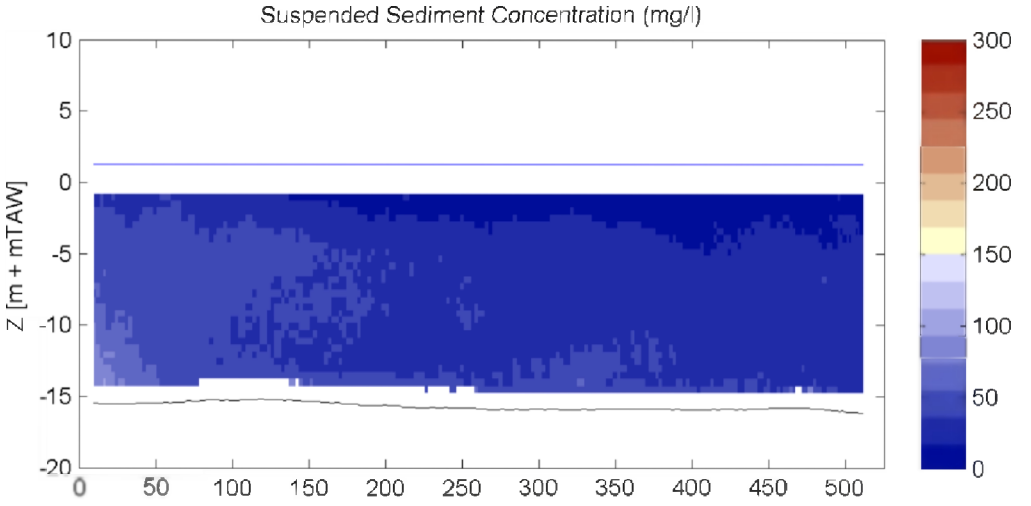
Data Processed by:

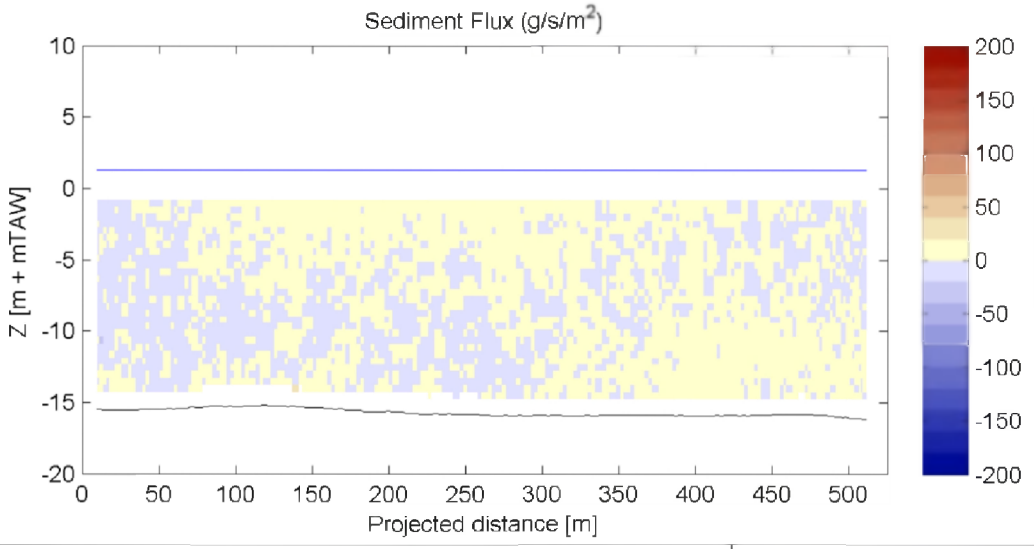
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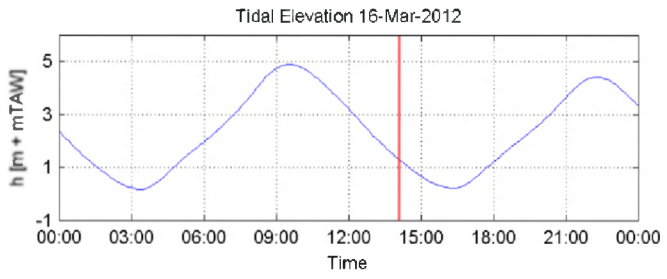
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9046_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

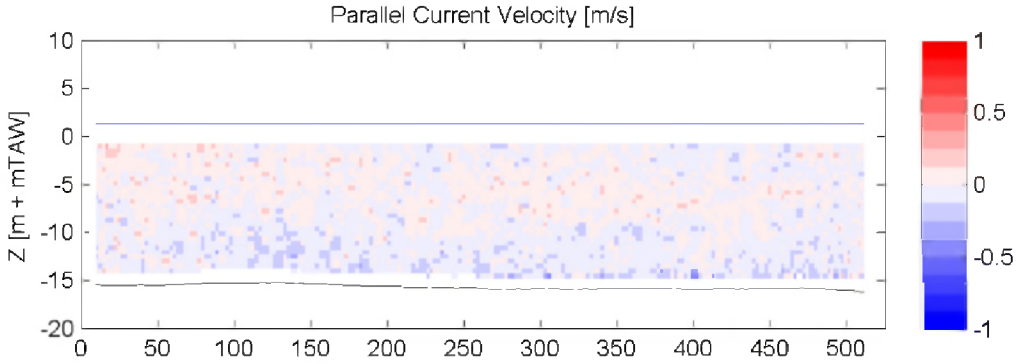
Date / Time [MET]:
16-Mar-2012
14:03 - 14:07

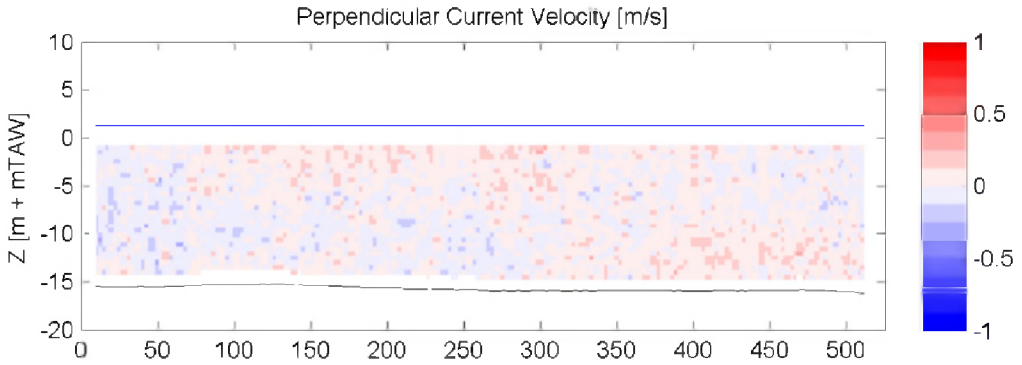
Time after HW [HH:MM]
4:00

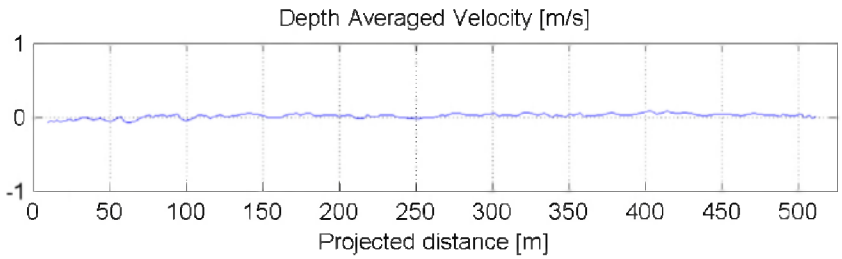
Data Processed by:
In association with:
I/RA/11354/10.109/MBO/ANF

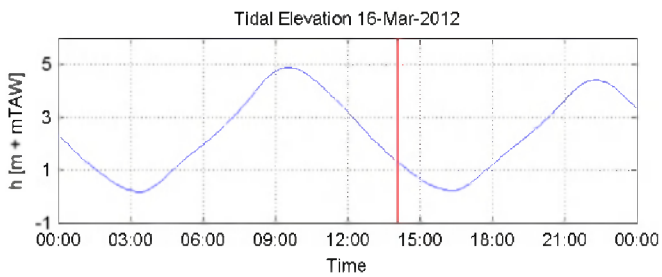
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9046_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

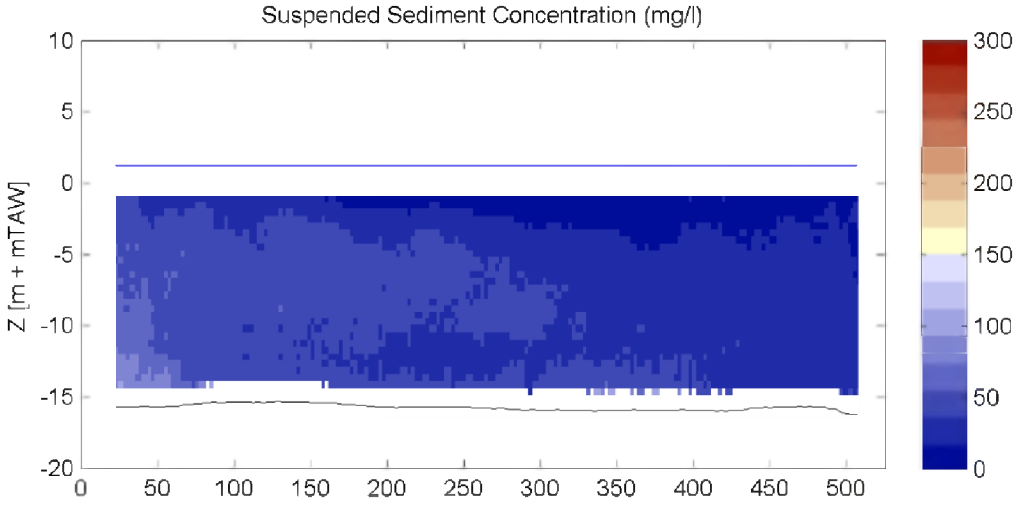
Date / Time [MET]:
16-Mar-2012
14:03 - 14:07

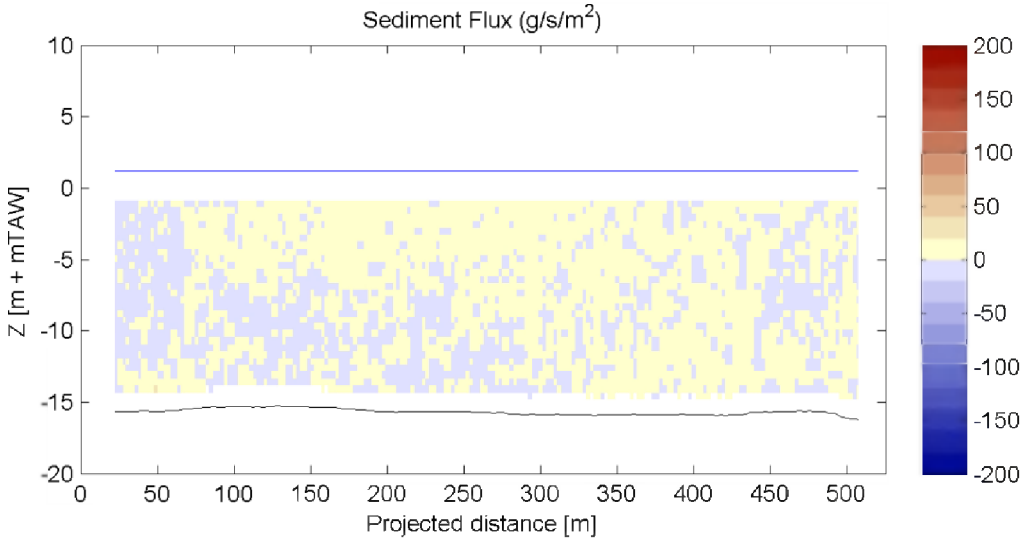
Time after HW [HH:MM]
4:00

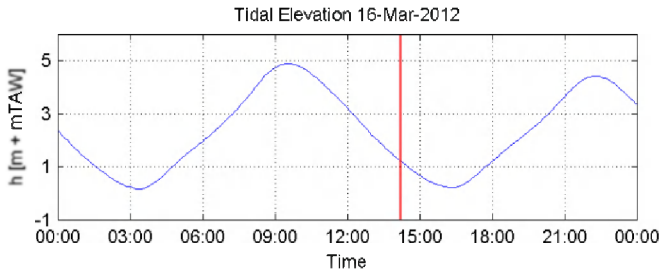
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9047_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

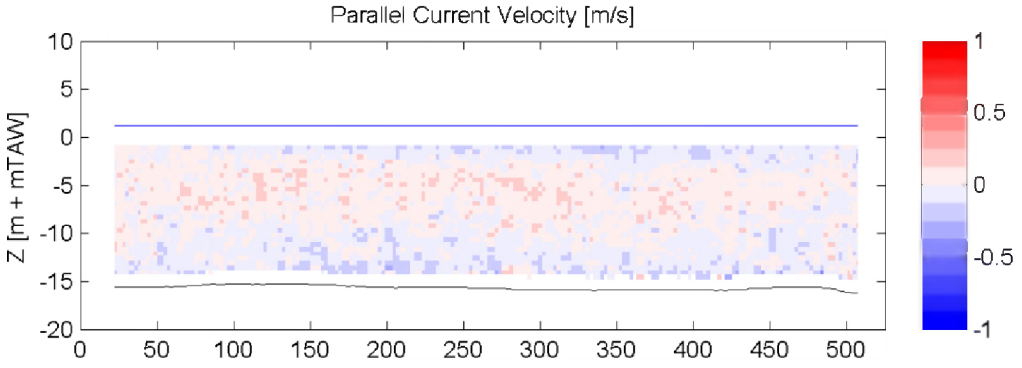
Date / Time [MET] :
16-Mar-2012
14:09 - 14:12

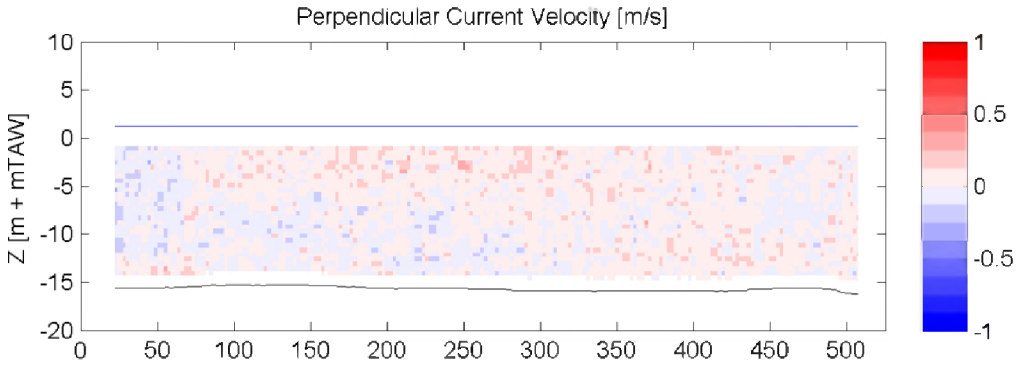
Time after HW [HH:MM]
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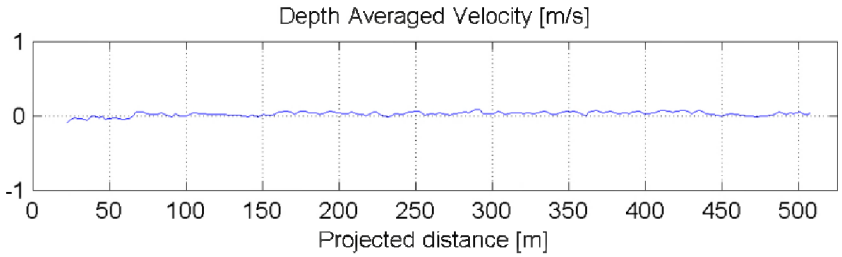
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

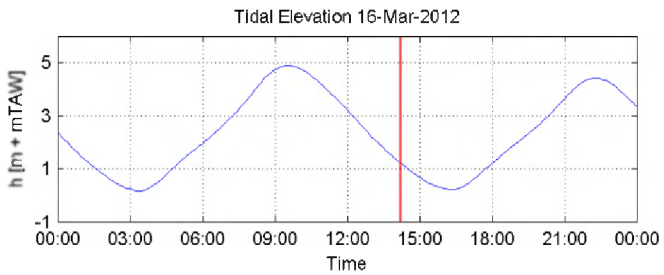
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9047_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

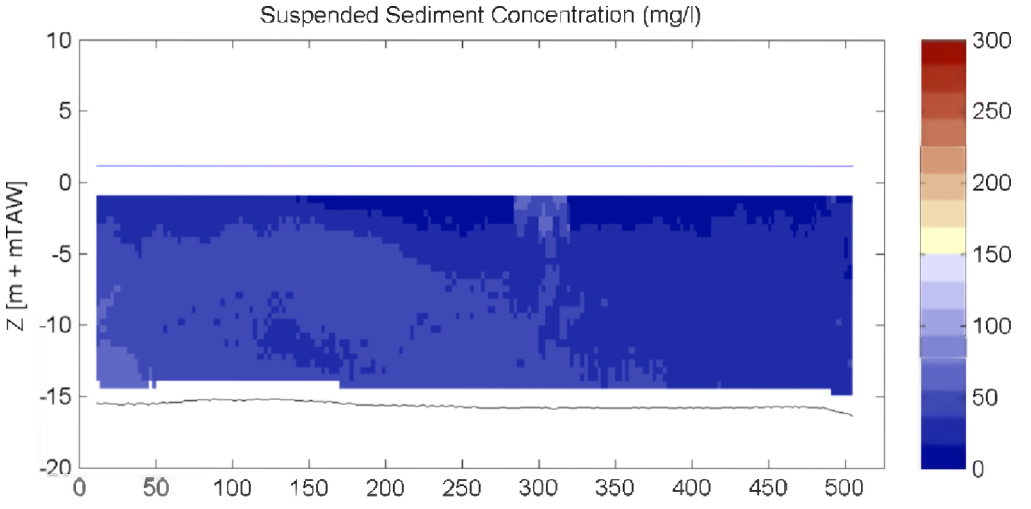
Date / Time [MET] :
16-Mar-2012
14:09 - 14:12

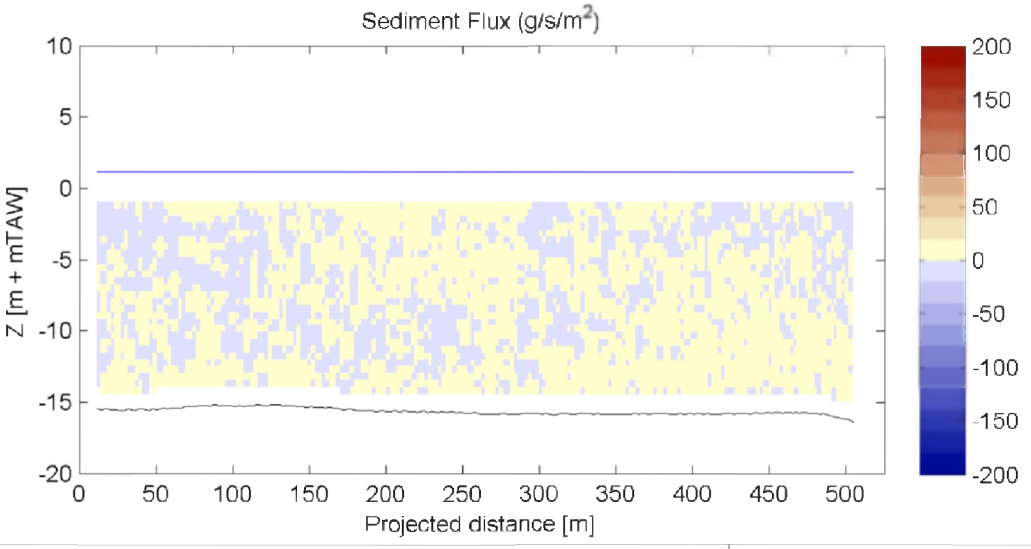
Time after HW [HH:MM]
4:05

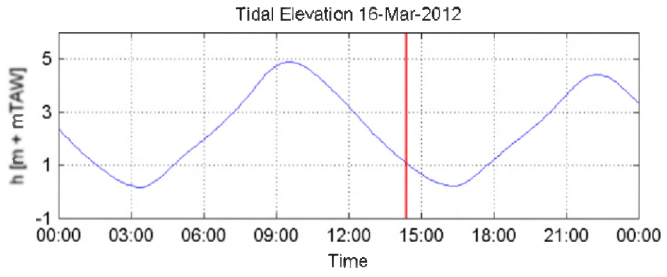
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9048_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

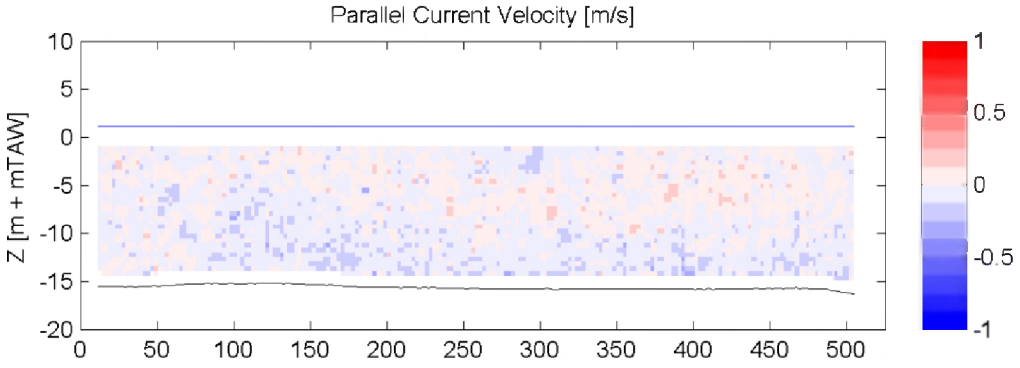
Date / Time [MET]:
16-Mar-2012
14:20 - 14:24

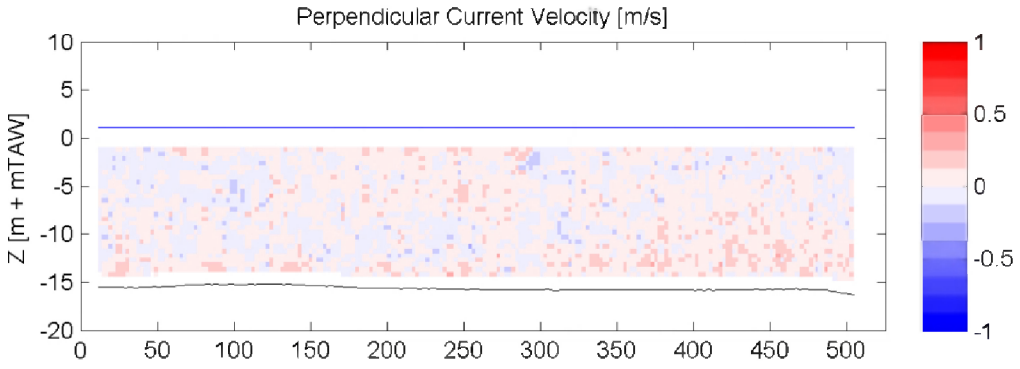
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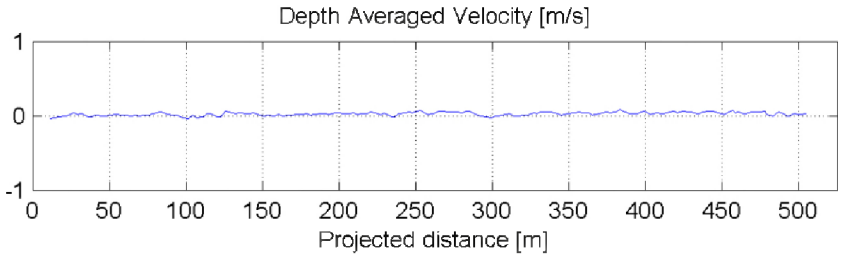
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In association with :
I/RA/11354/10.109/MBO/ANF

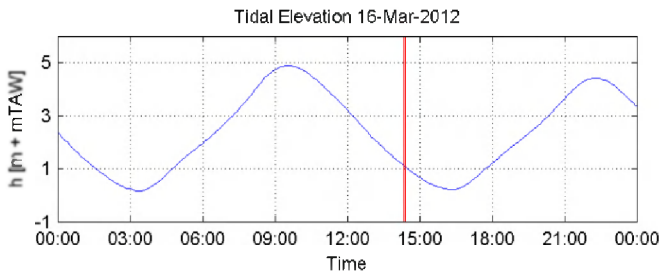
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9048_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

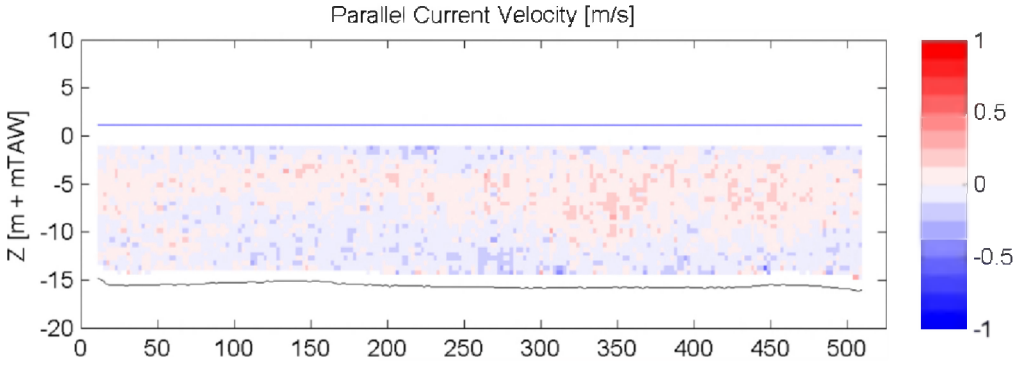
Date / Time [MET] :
16-Mar-2012
14:20 - 14:24

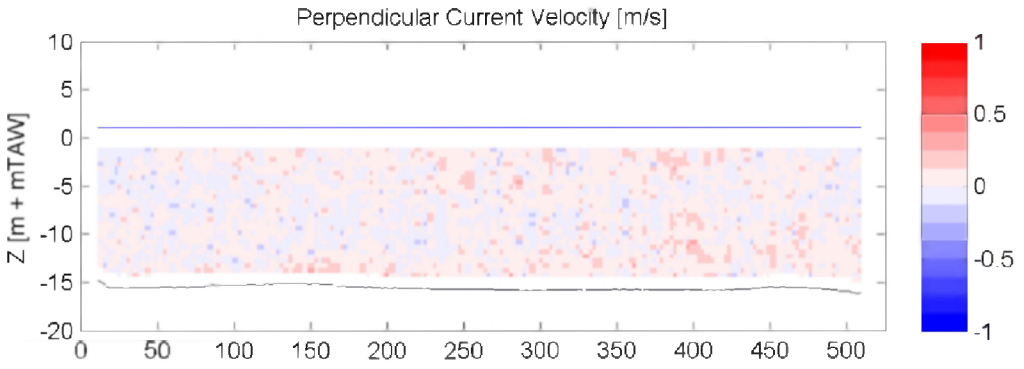
Time after HW [HH:MM]
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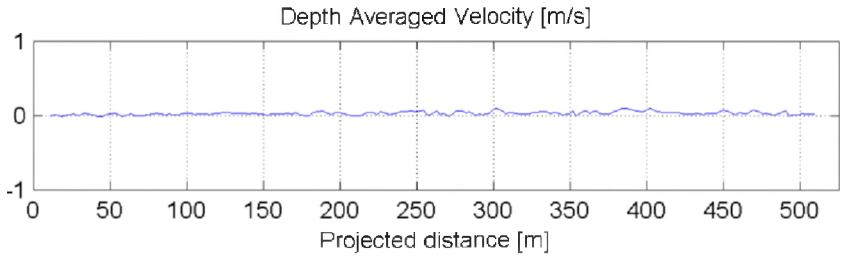
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

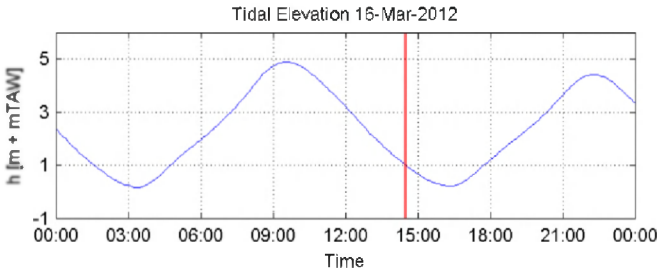
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9049_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

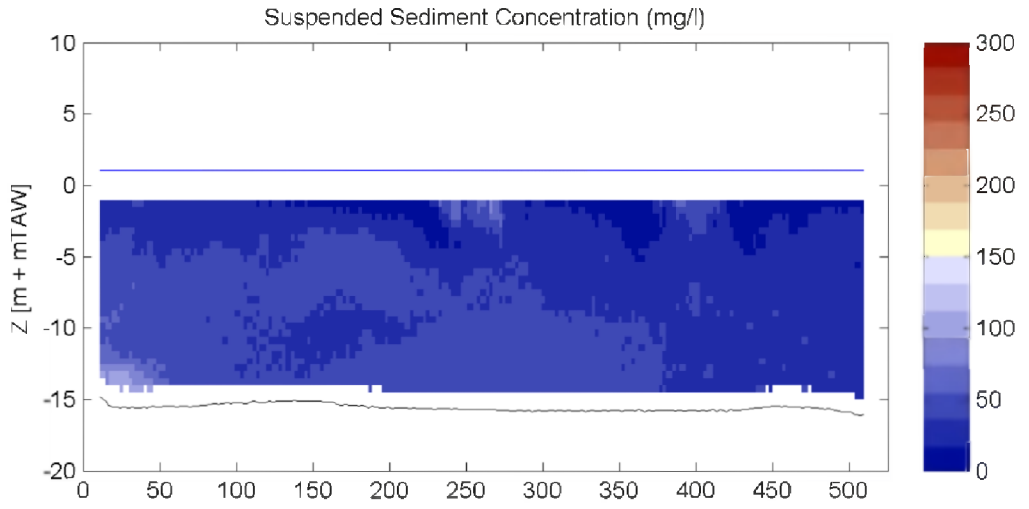
Date / Time [MET]:
16-Mar-2012
14:26 - 14:30

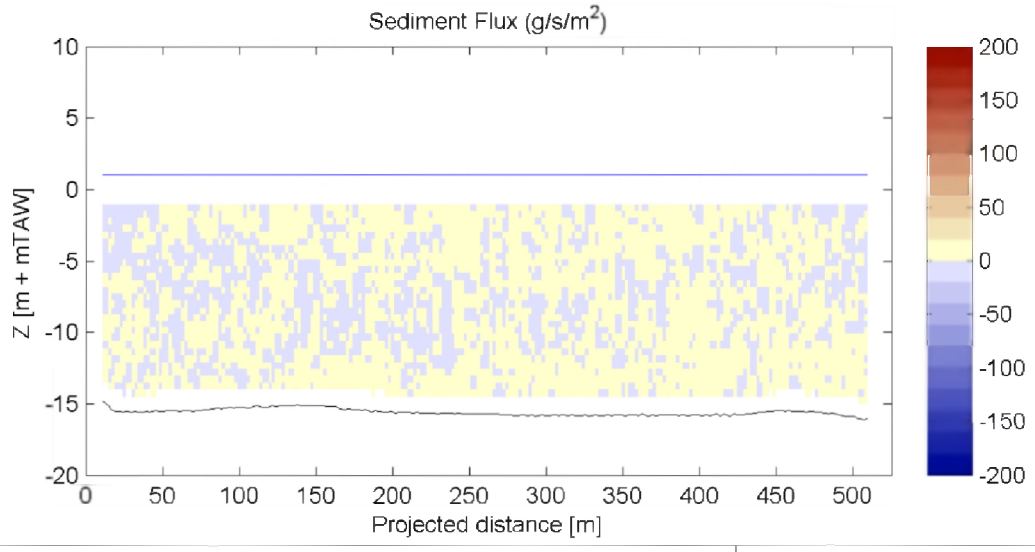
Time after HW [HH:MM]
4:23

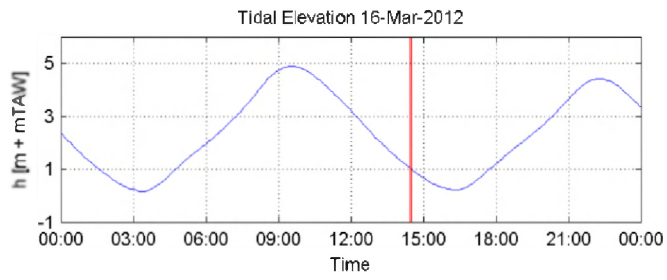
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9049_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

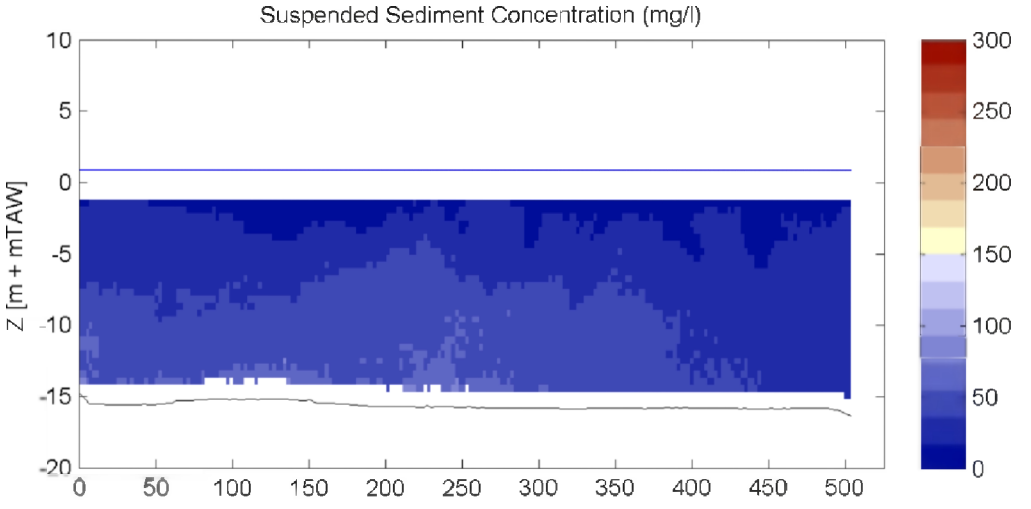
Date / Time [MET] :
16-Mar-2012
14:26 - 14:30

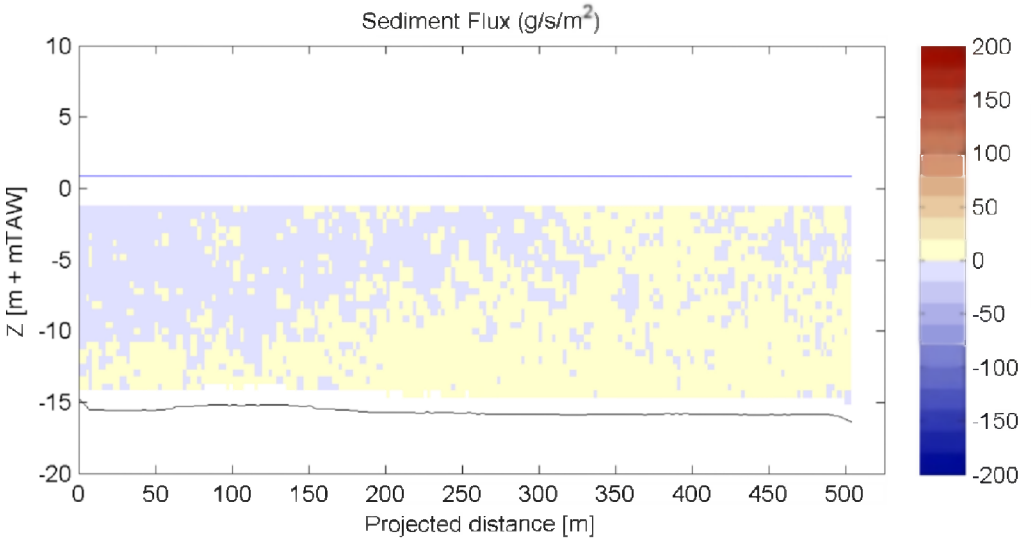
Time after HW [HH:MM]
4:23

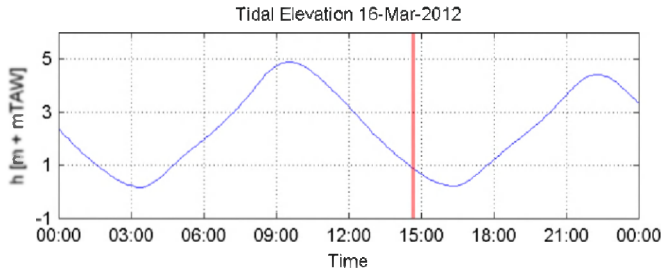
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9051_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

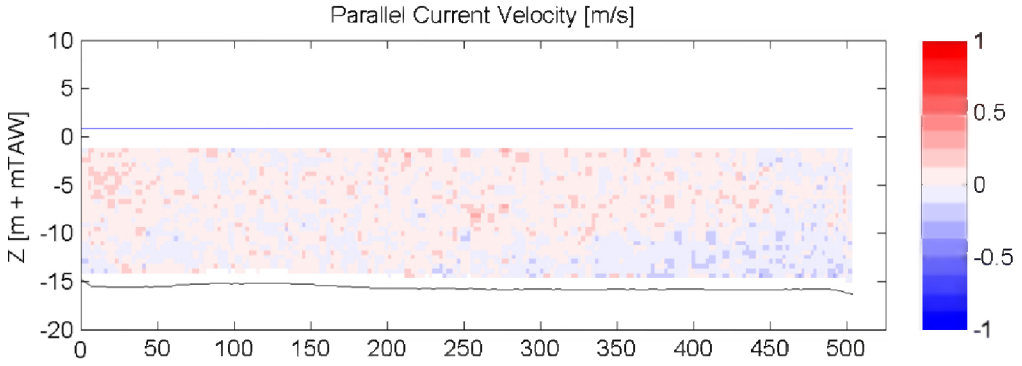
Date / Time [MET]:
16-Mar-2012
14:38 - 14:42

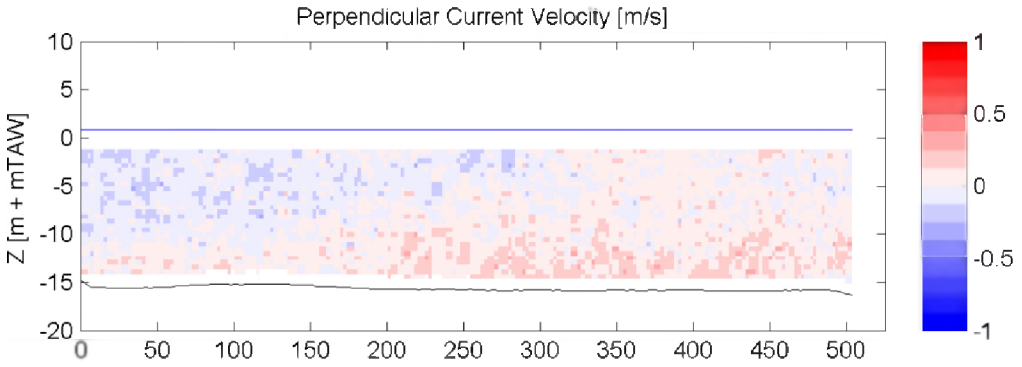
Time after HW [HH:MM]
4:35

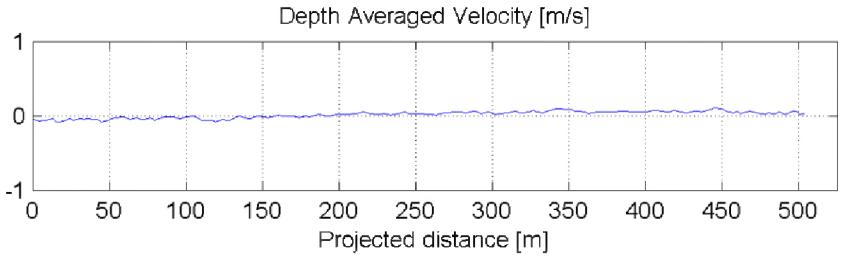
Data Processed by:
In association with:
I/RA/11354/10.109/MBO/ANF

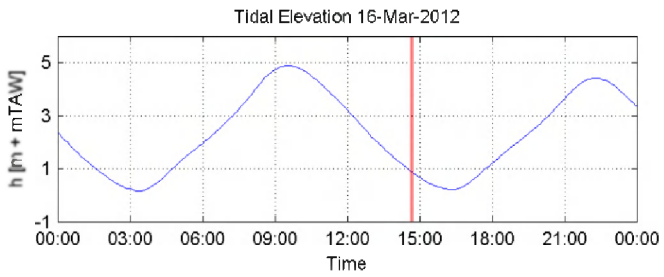
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9051_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
14:38 - 14:42

Time after HW [HH:MM]
4:35

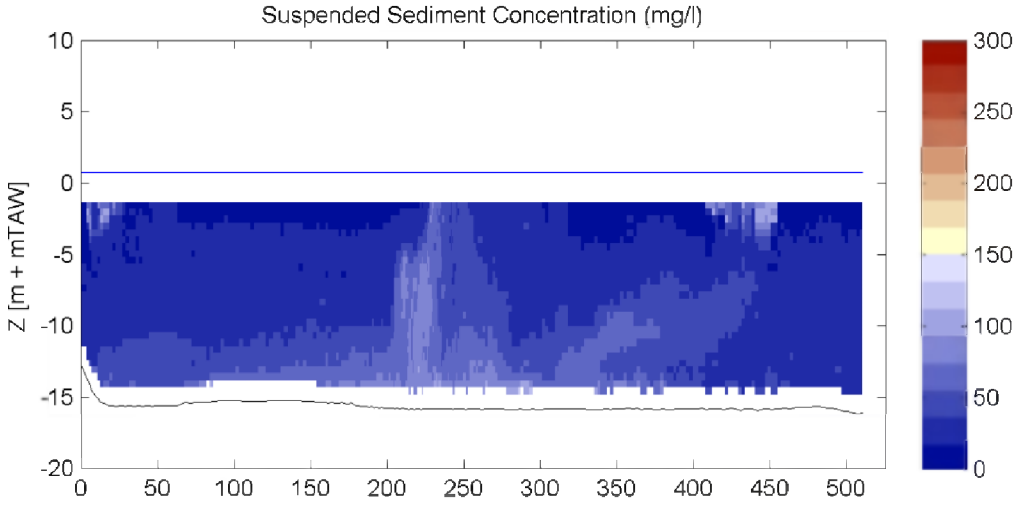
Data Processed by:

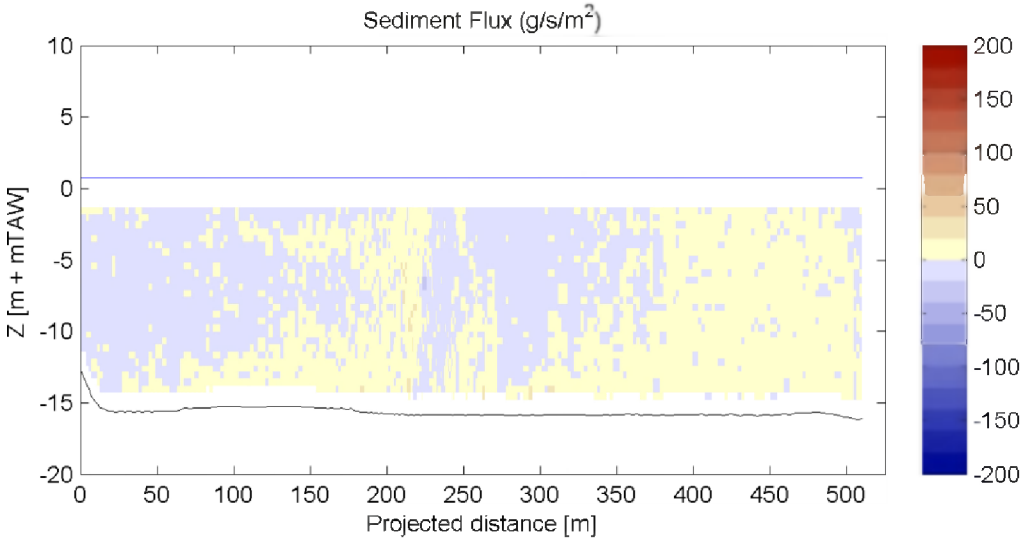
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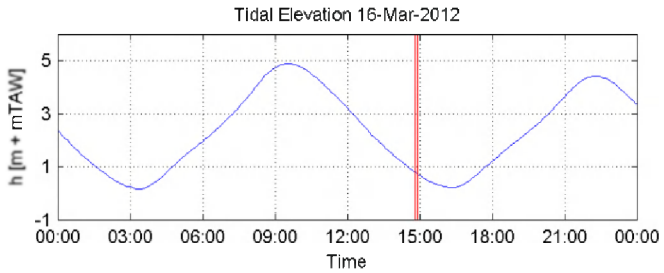
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9053_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

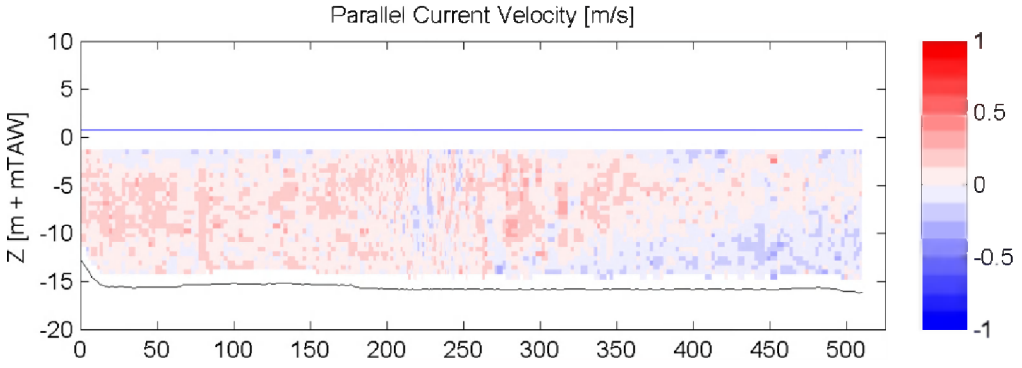
Date / Time [MET]:
16-Mar-2012
14:48 - 14:53

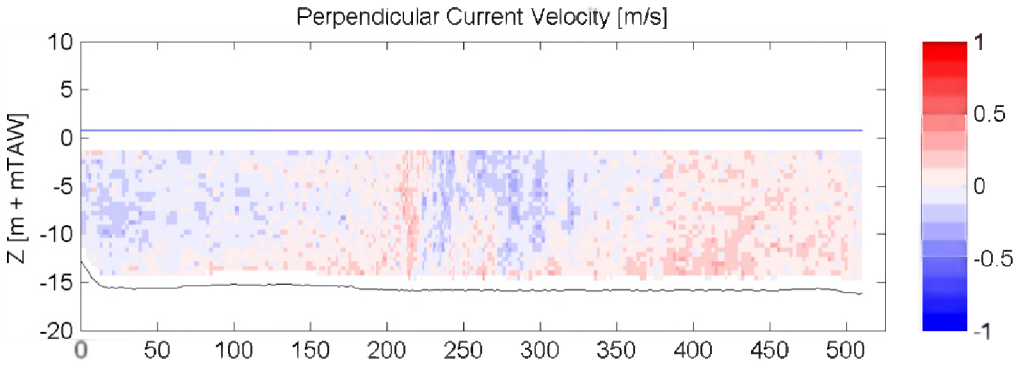
Time after HW [HH:MM]
4:46

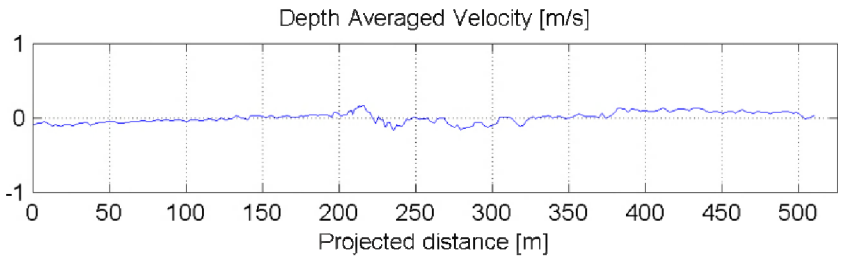
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

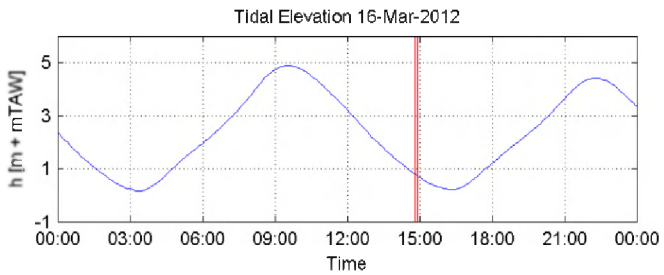
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9053_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

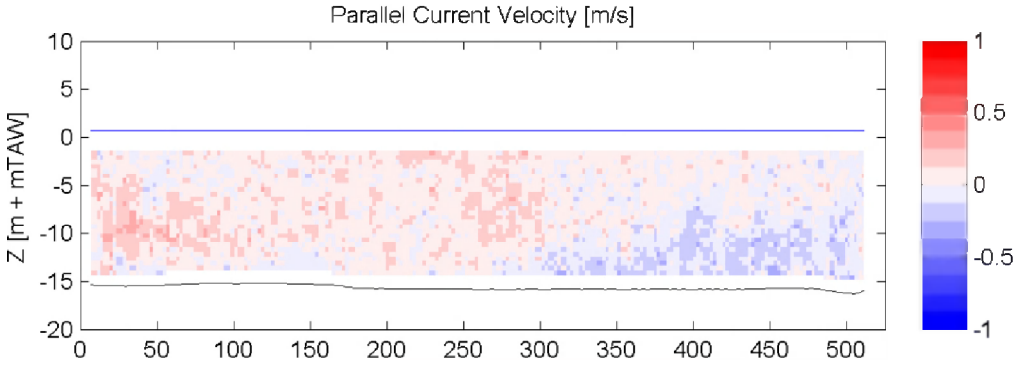
Date / Time [MET] :
16-Mar-2012
14:48 - 14:53

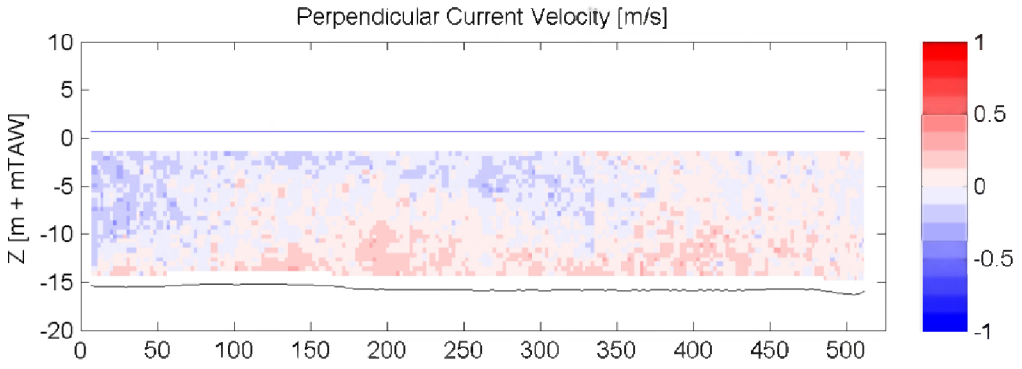
Time after HW [HH:MM]
4:46

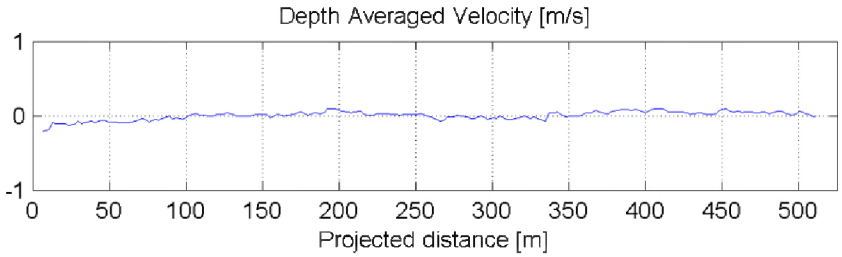
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

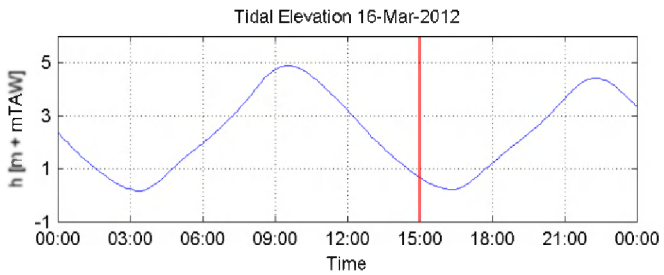
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9054_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
14:56 - 15:00

Time after HW [HH:MM]
4:53

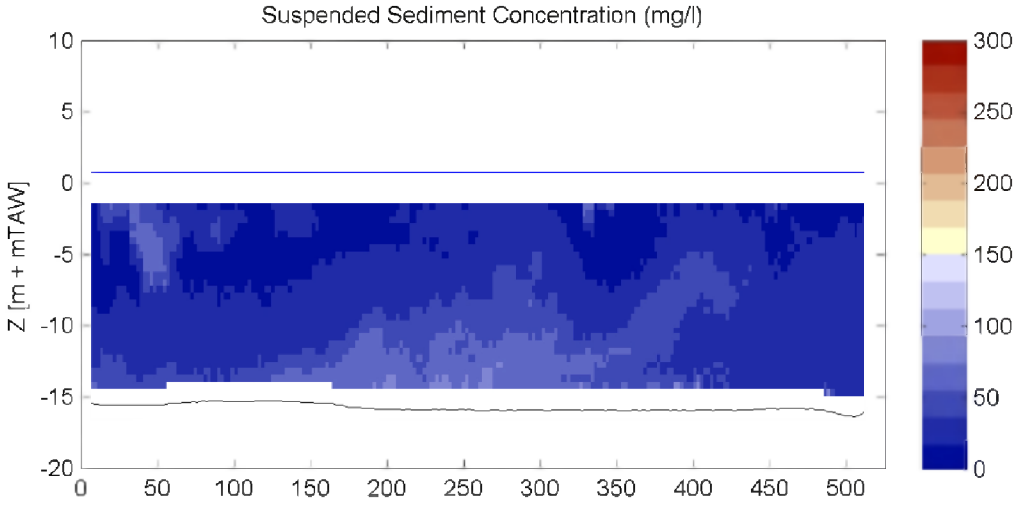
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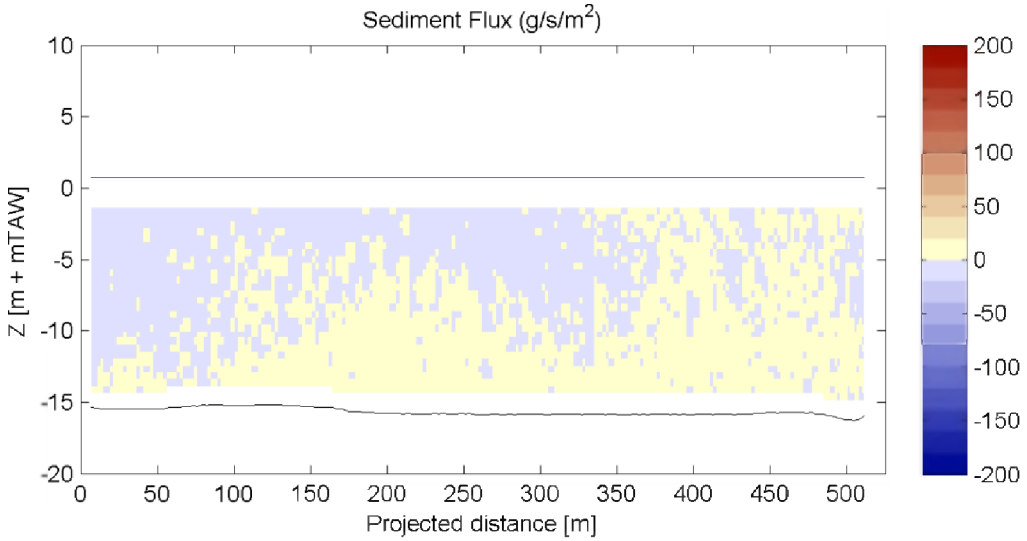
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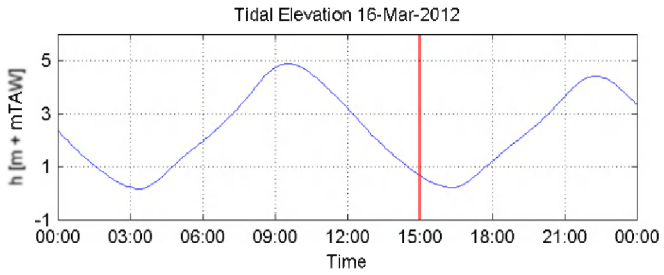
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9054_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

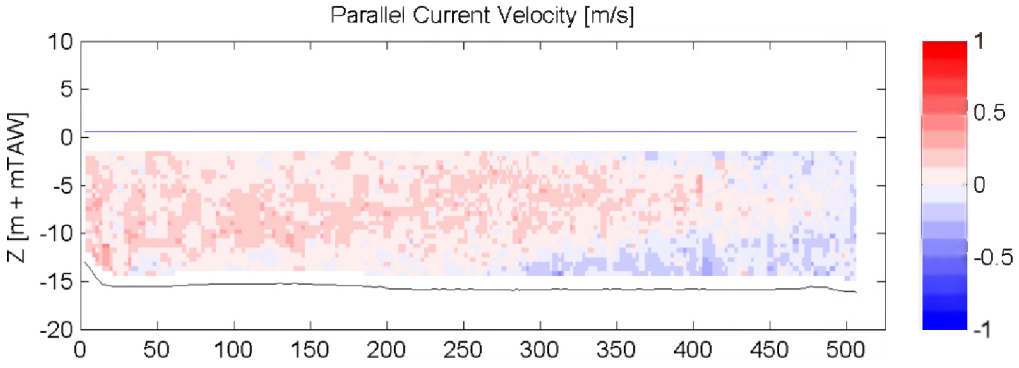
Date / Time [MET] :
16-Mar-2012
14:56 - 15:00

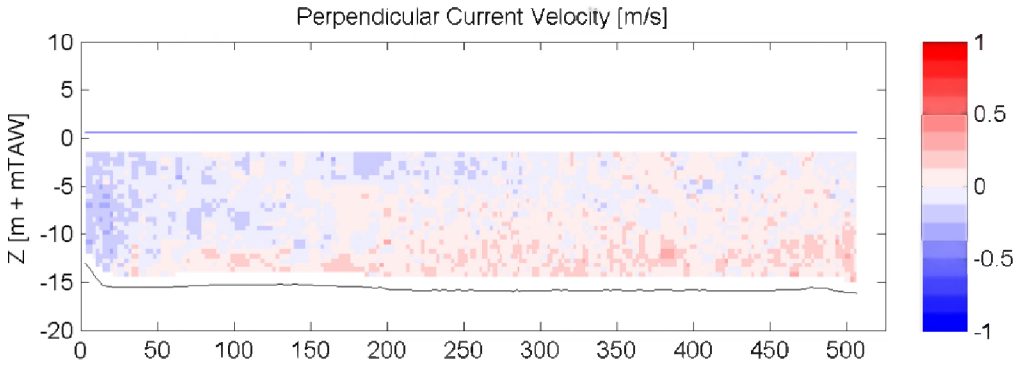
Time after HW [HH:MM]
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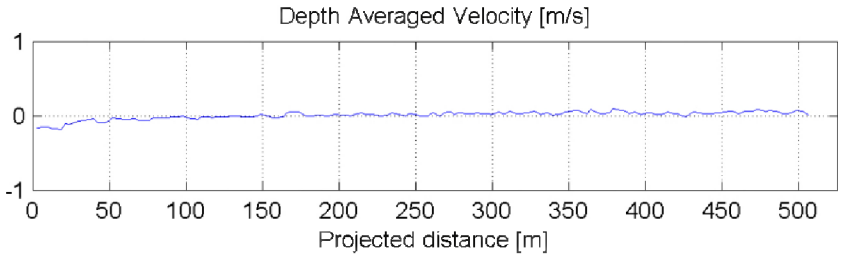
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

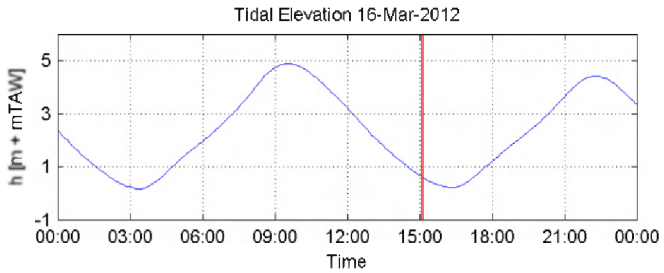
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9055_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

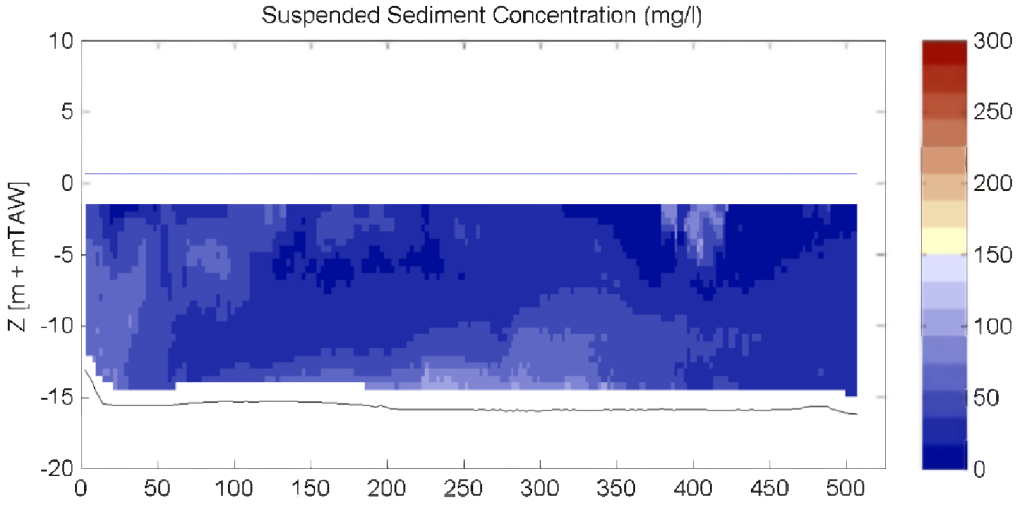
Date / Time [MET] :
16-Mar-2012
15:04 - 15:08

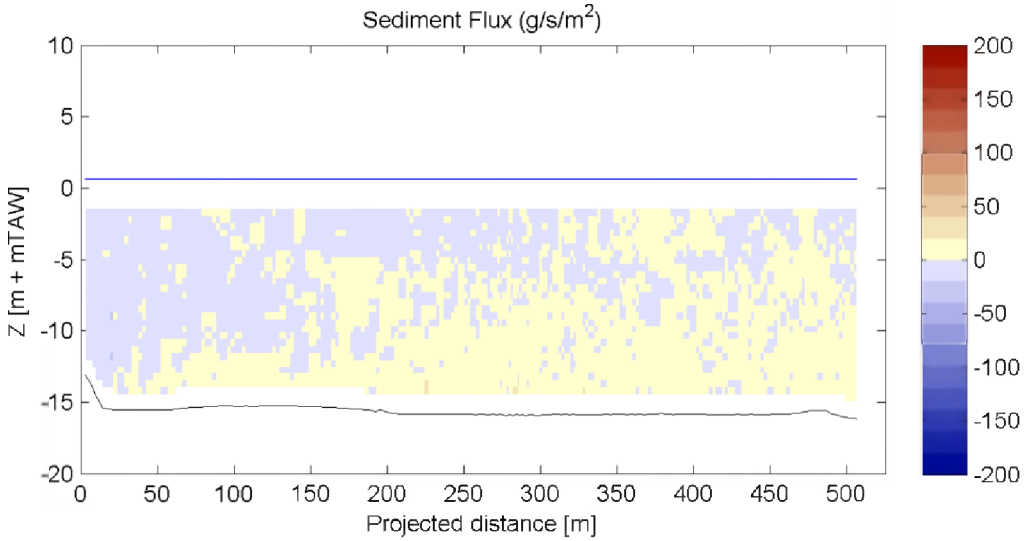
Time after HW [HH:MM]
5:01

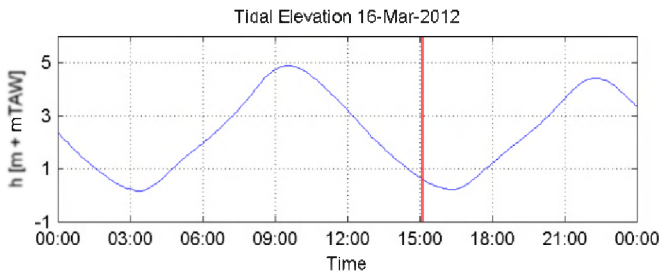
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9055_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

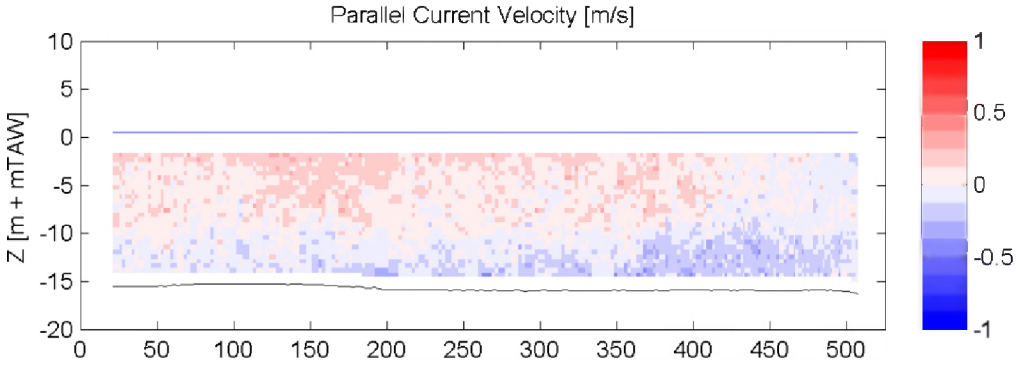
Date / Time [MET] :
16-Mar-2012
15:04 - 15:08

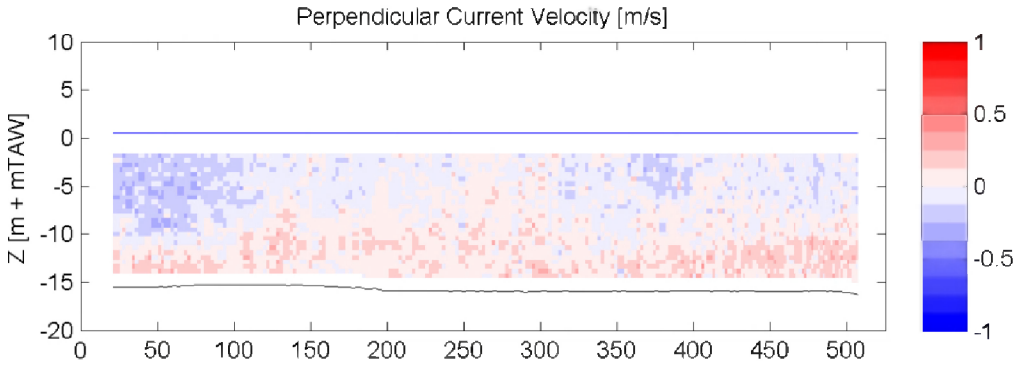
Time after HW [HH:MM]
5:01

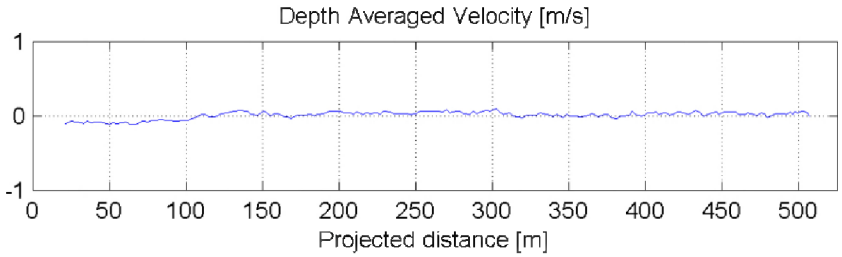
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

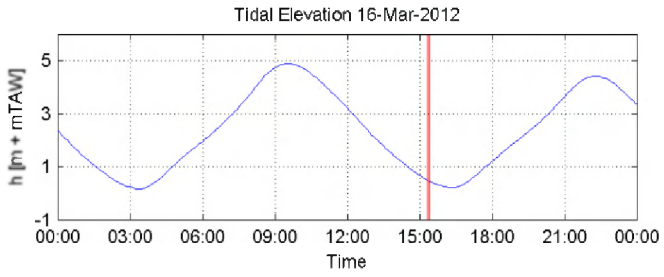
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9057_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

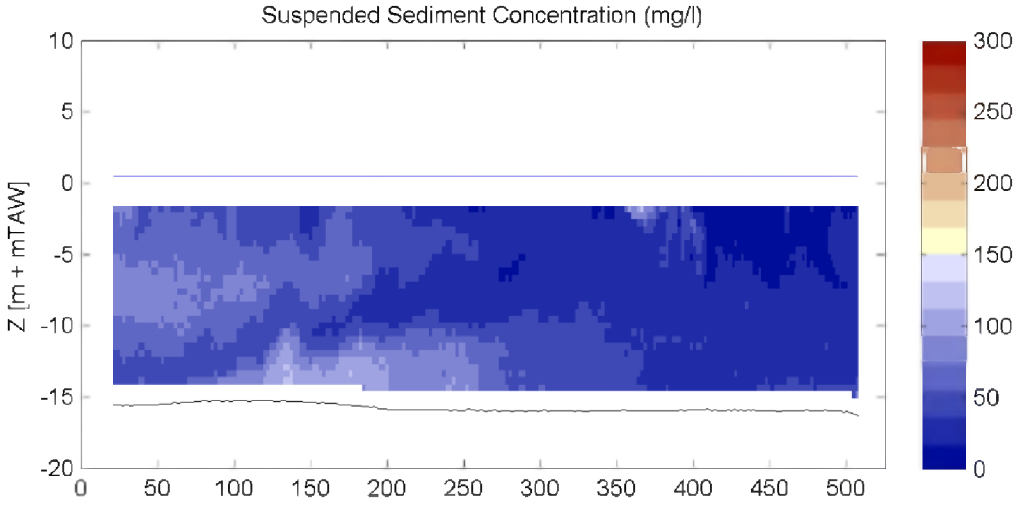
Date / Time [MET] :
16-Mar-2012
15:19 - 15:23

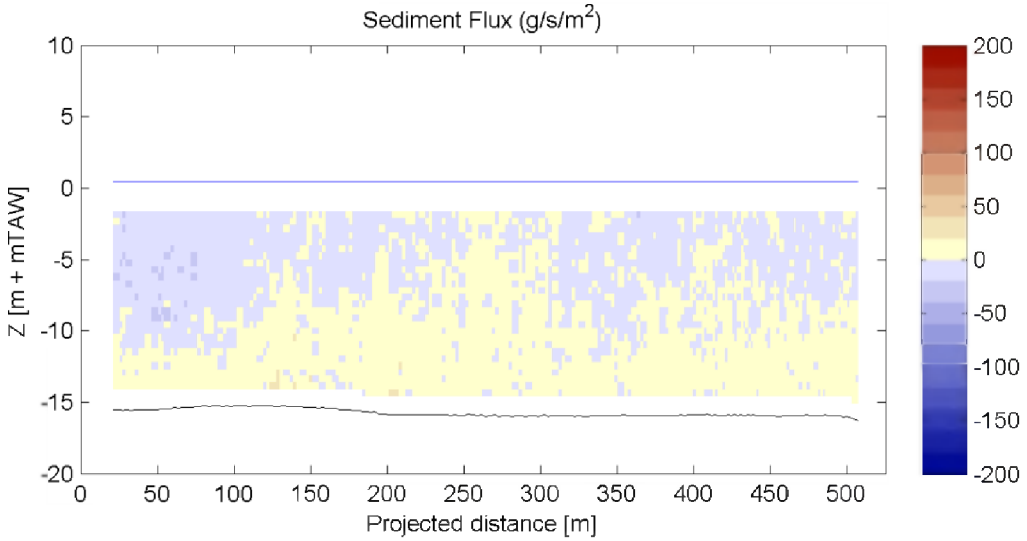
Time after HW [HH:MM]
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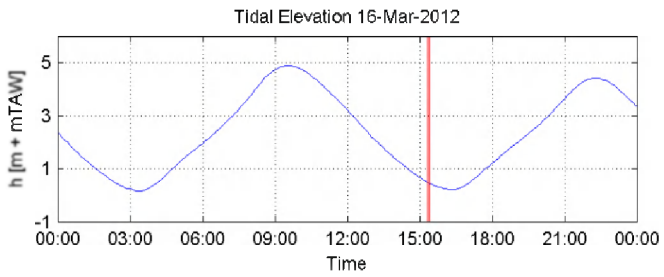
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9057_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

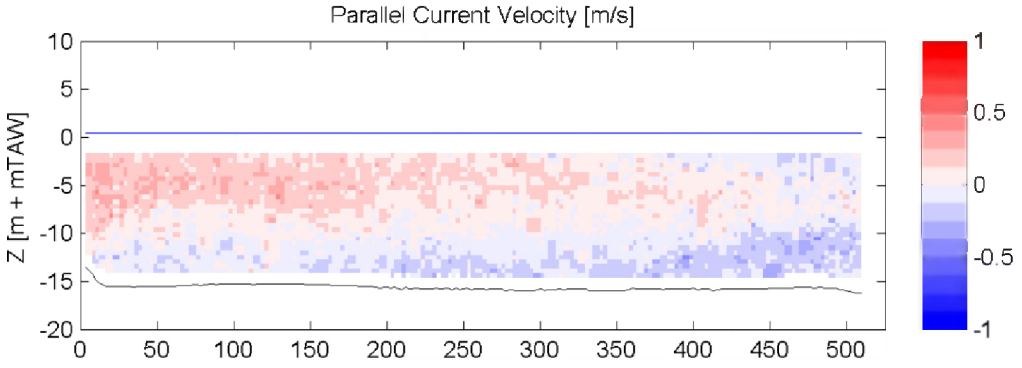
Date / Time [MET] :
16-Mar-2012
15:19 - 15:23

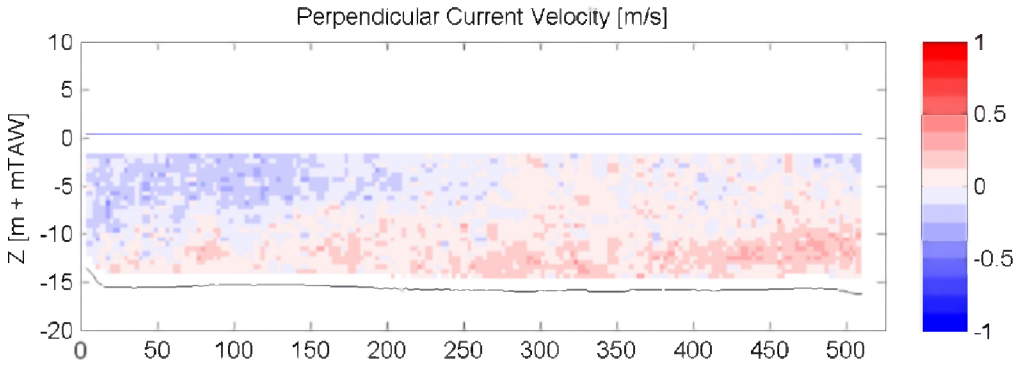
Time after HW [HH:MM]
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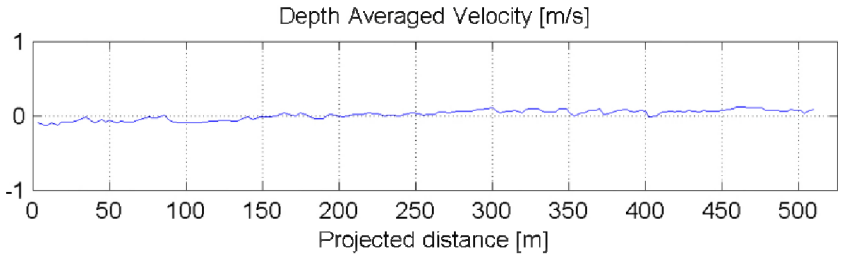
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

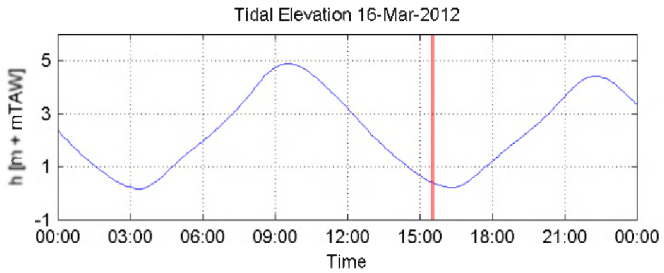
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9059_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
15:30 - 15:33

Time after HW [HH:MM]
5:27

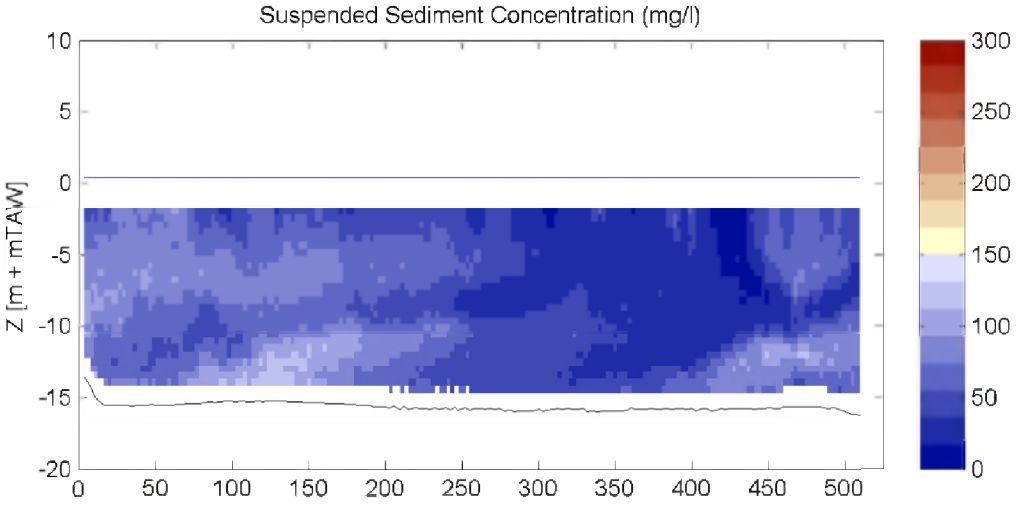
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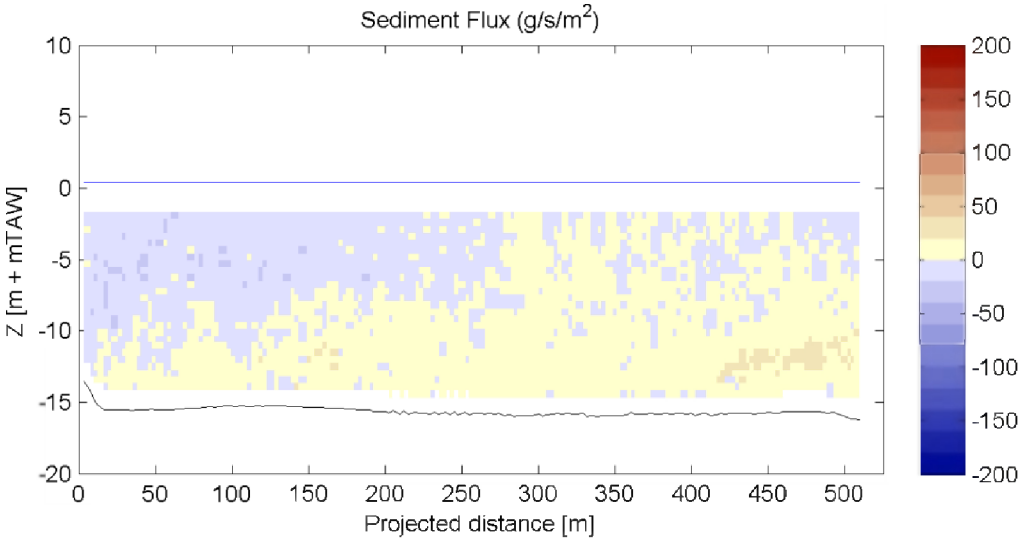
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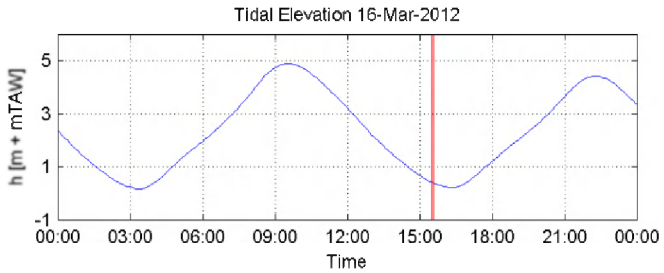
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9059_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
15:30 - 15:33

Time after HW [HH:MM]
5:27

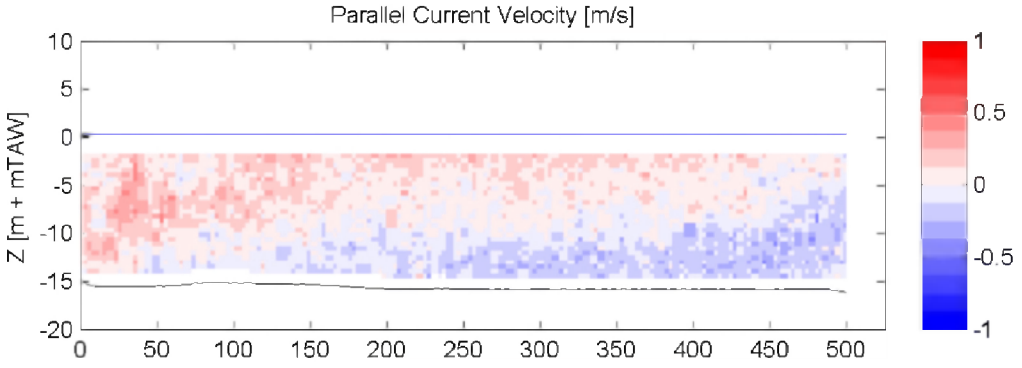
Data Processed by:

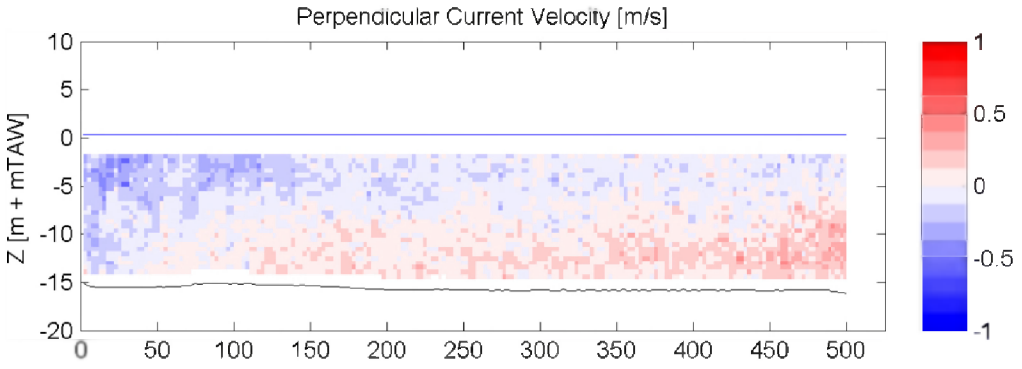
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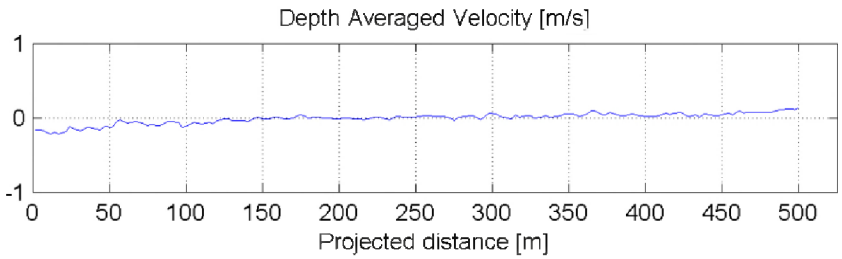
I/RA/11354/10.109/MBO/ANF

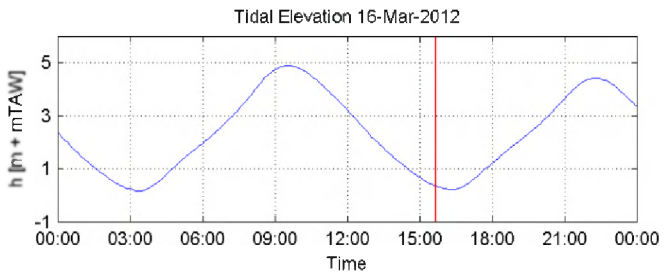
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9060_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

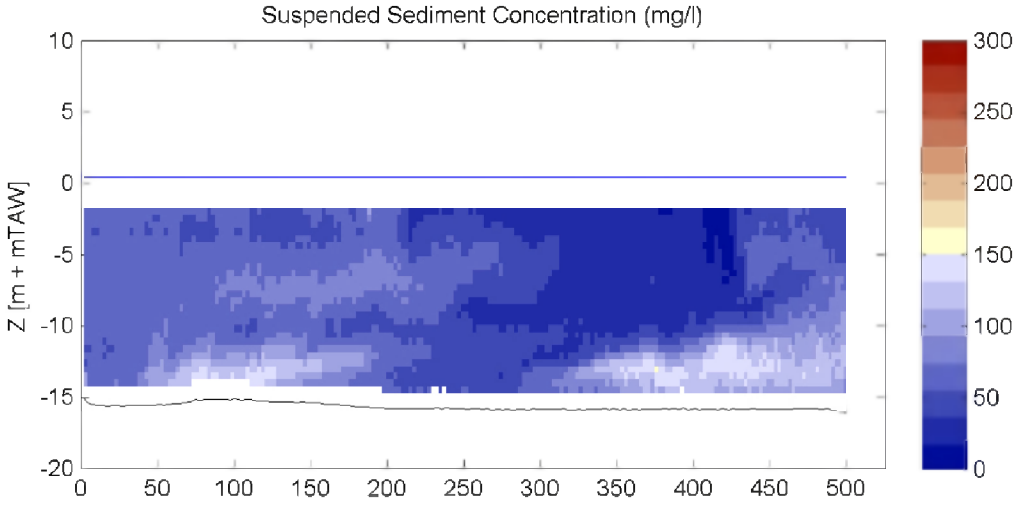
Date / Time [MET]:
16-Mar-2012
15:37 - 15:40

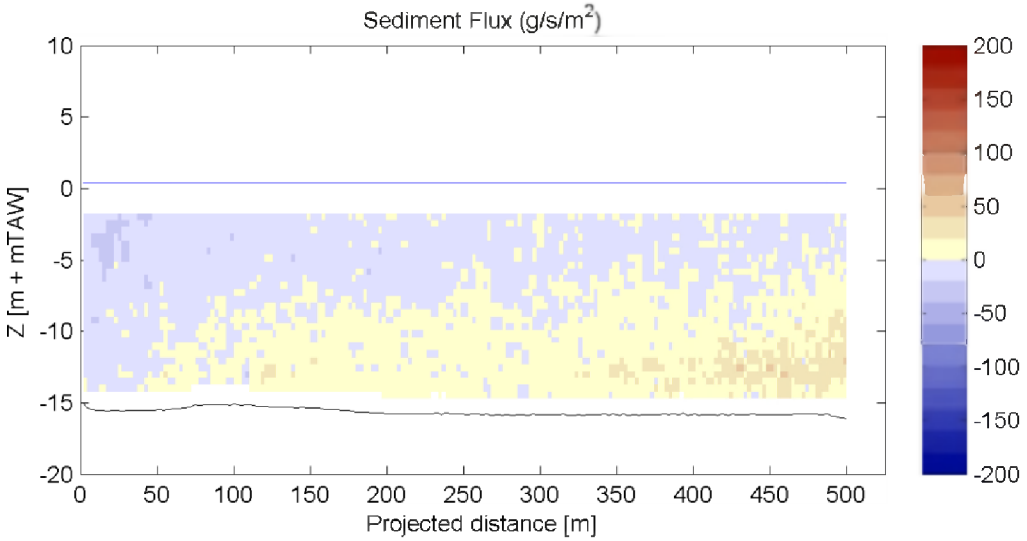
Time after HW [HH:MM]
5:34

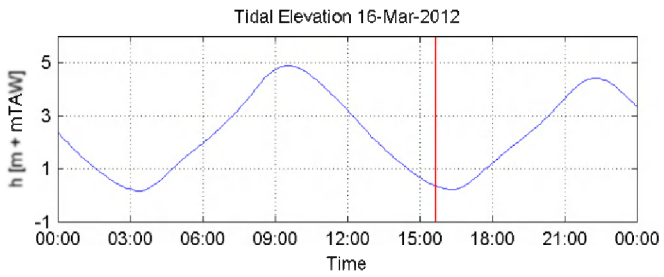
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9060_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

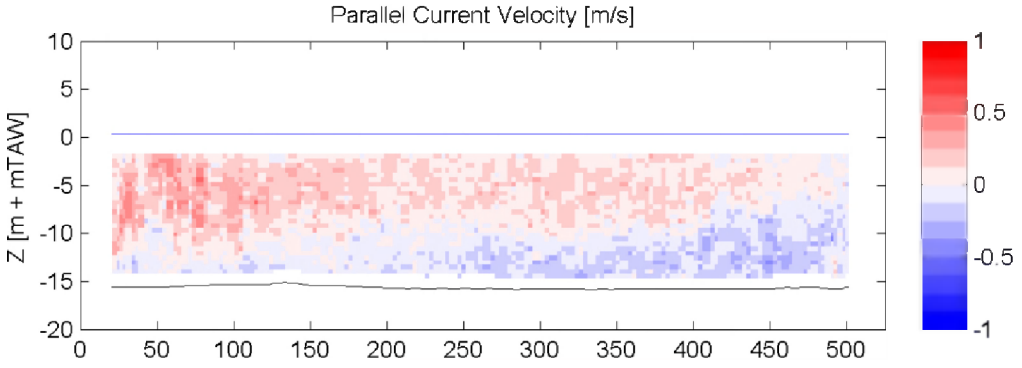
Date / Time [MET] :
16-Mar-2012
15:37 - 15:40

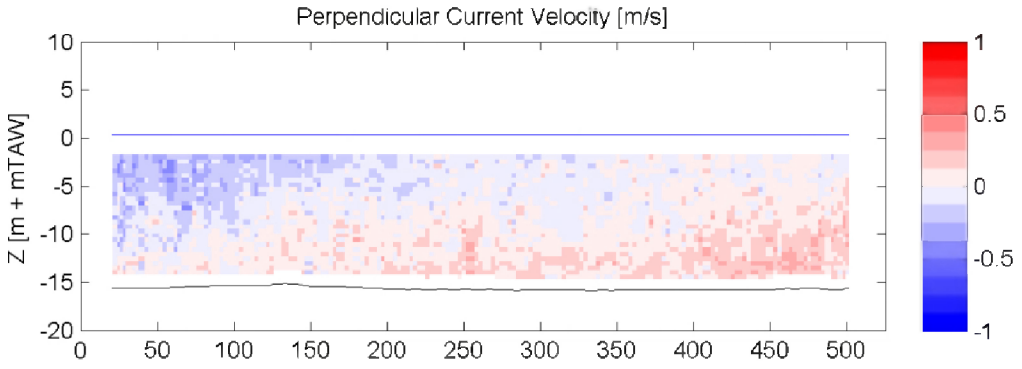
Time after HW [HH:MM]
5:34

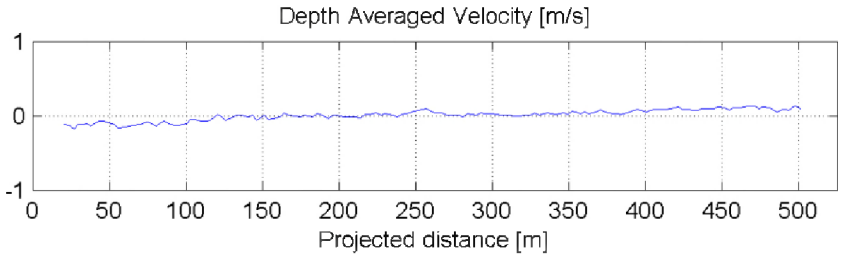
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

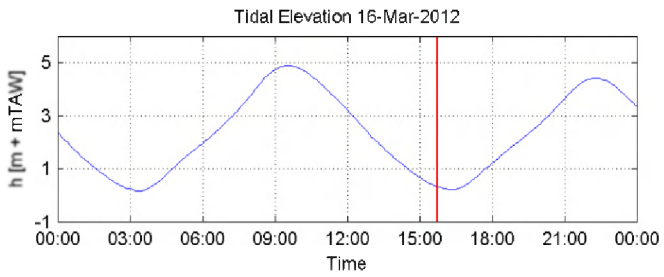
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9061_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
15:42 - 15:45

Time after HW [HH:MM]
5:38

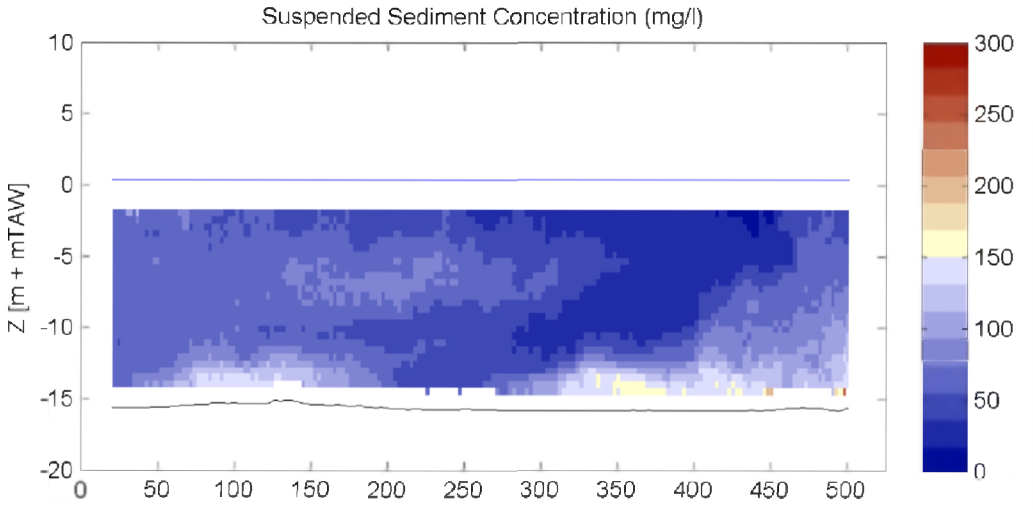
Data Processed by:

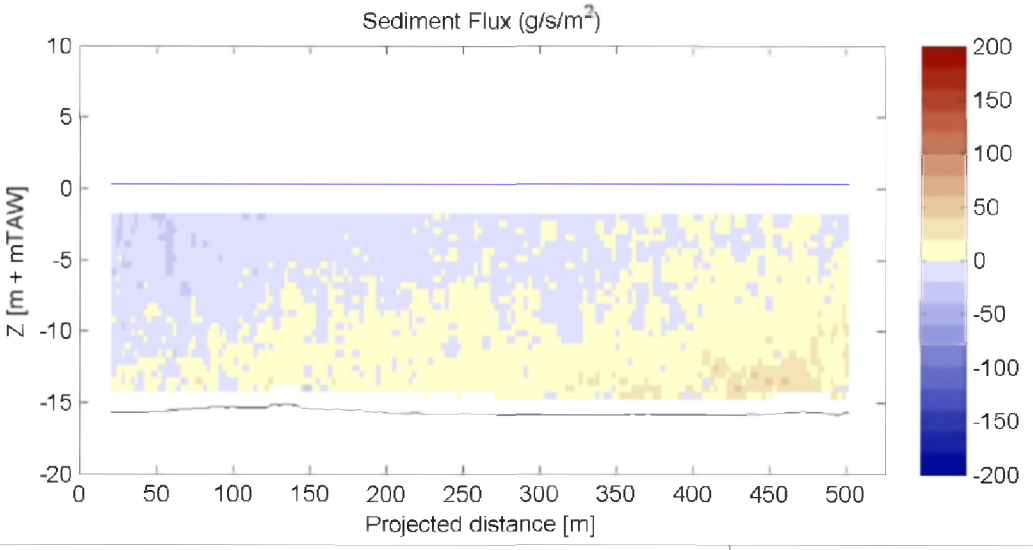
In association with :

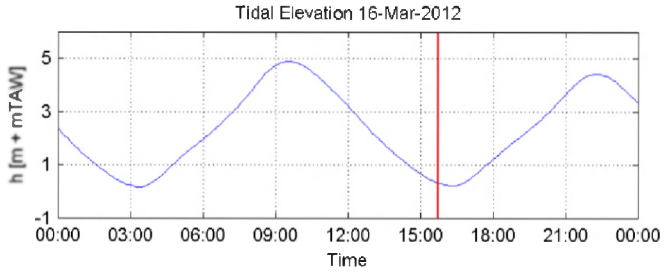
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9061_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

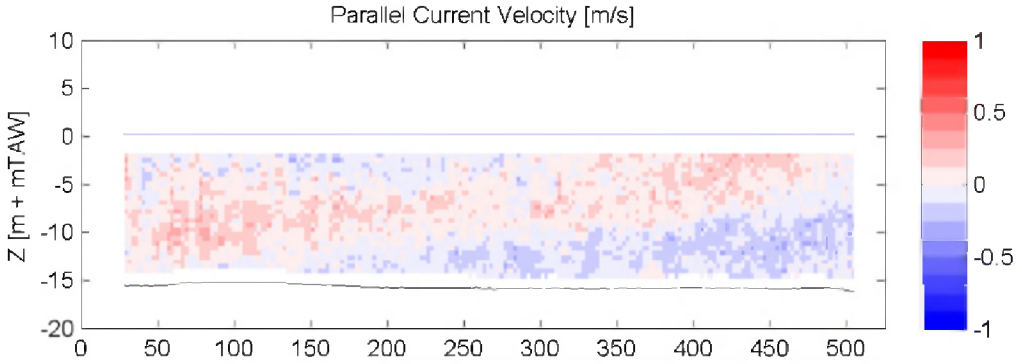
Date / Time [MET]:
16-Mar-2012
15:42 - 15:45

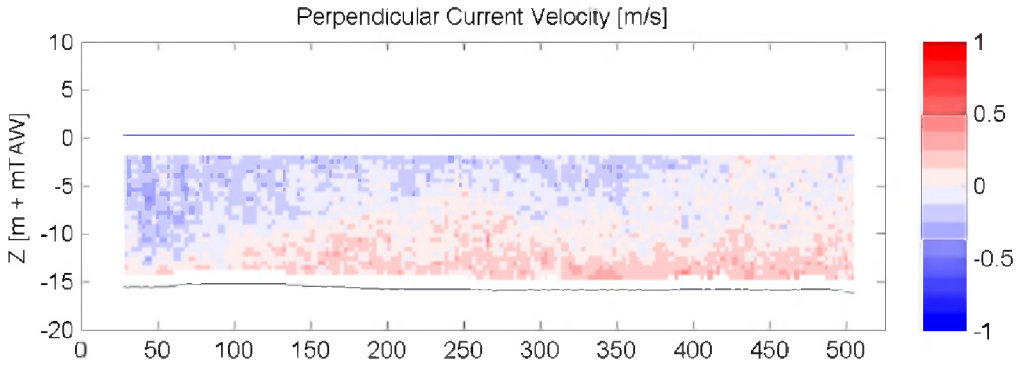
Time after HW [HH:MM]
5:38

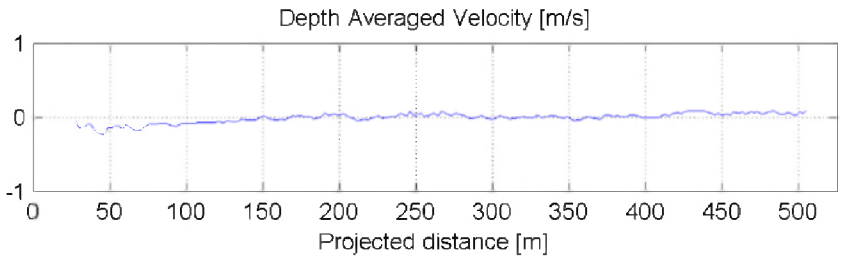
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

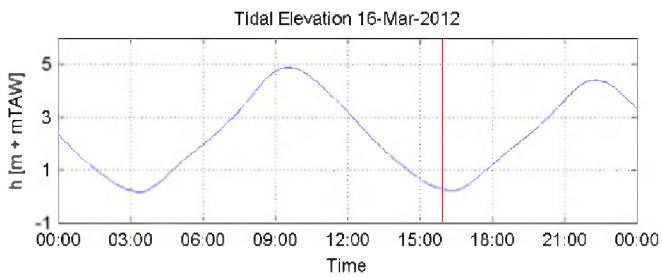
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9062_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
15:53 - 15:57

Time after HW [HH:MM]
5:50

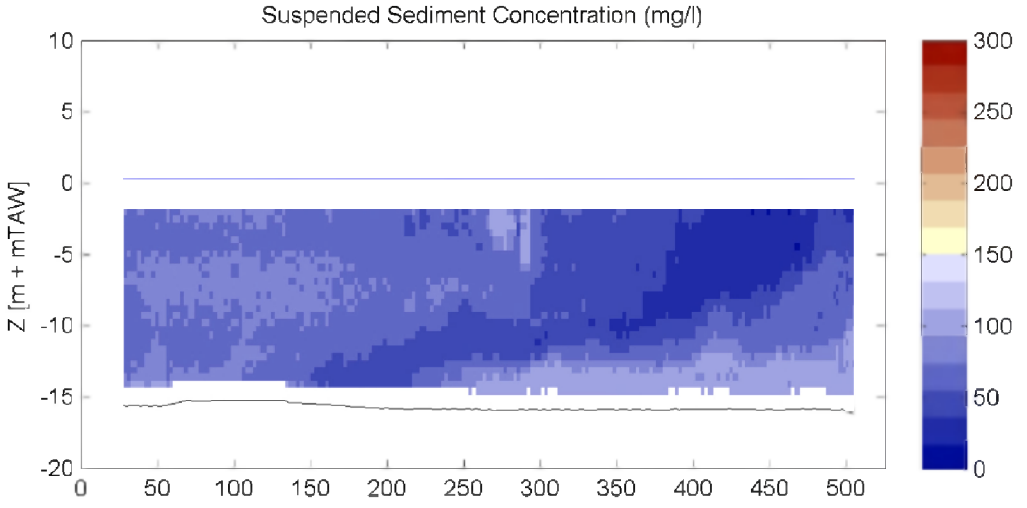
Data Processed by:

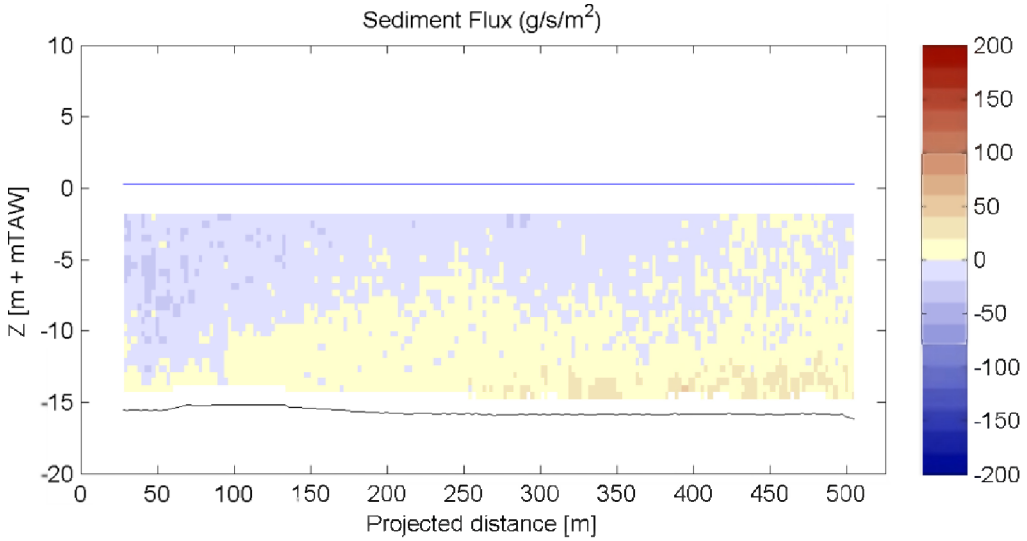
In association with :

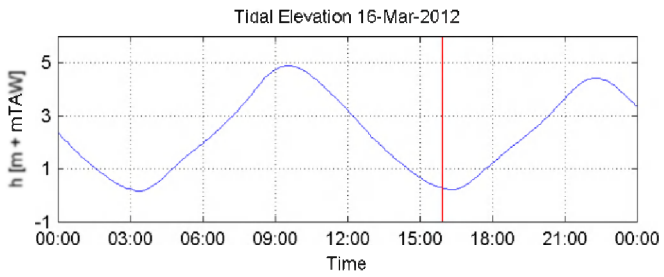
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9062_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

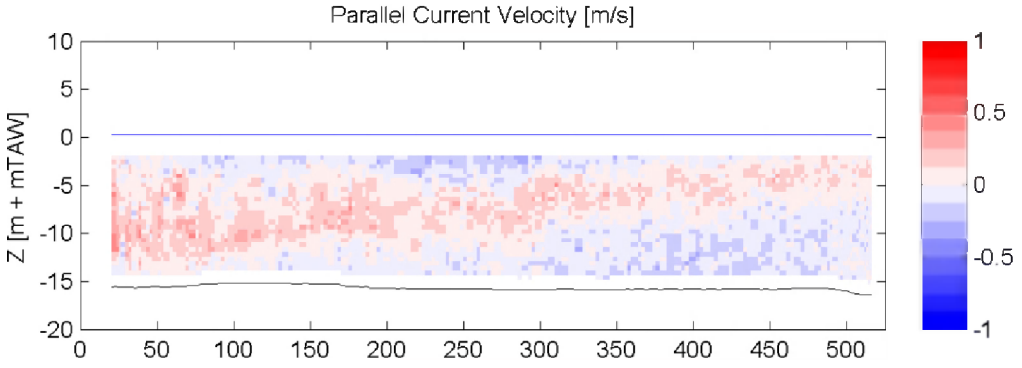
Date / Time [MET] :
16-Mar-2012
15:53 - 15:57

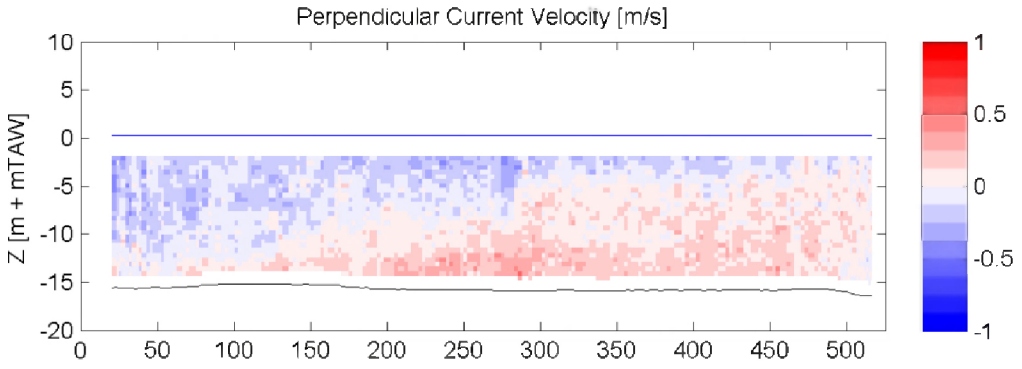
Time after HW [HH:MM]
5:50

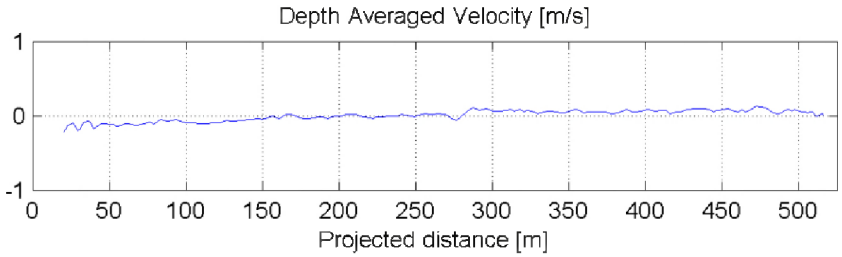
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

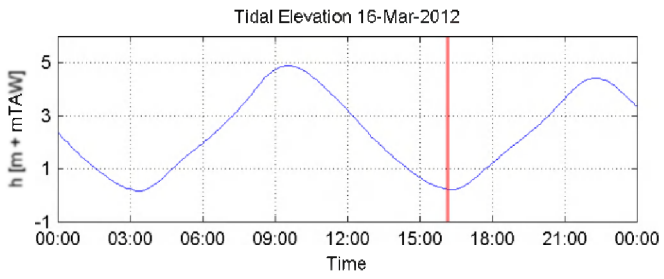
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9064_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
16:07 - 16:11

Time after HW [HH:MM]
6:04

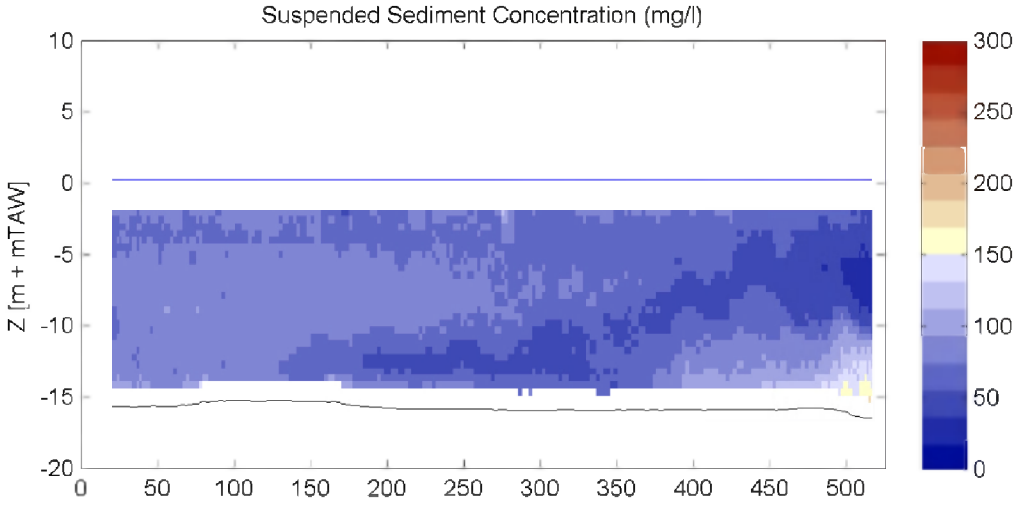
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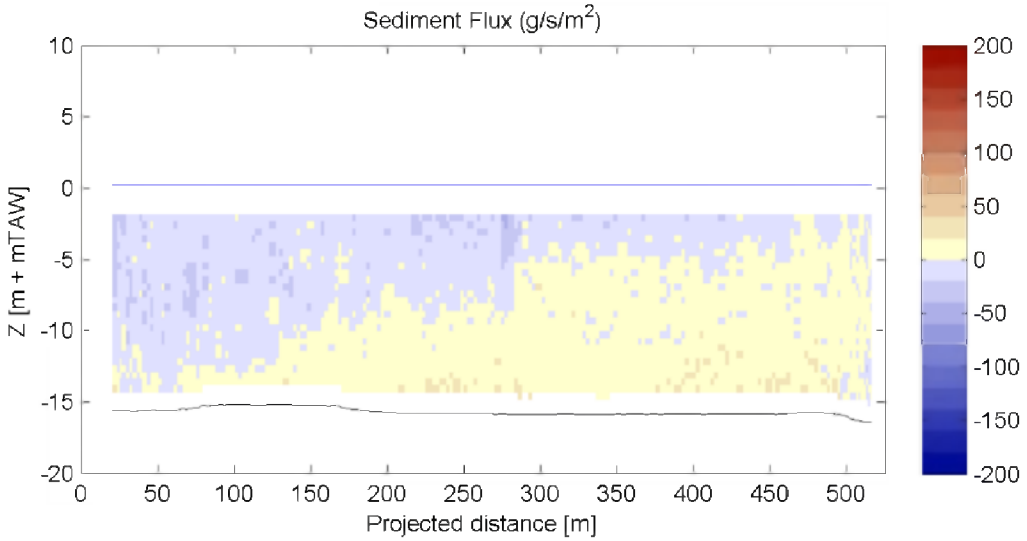
In association with :

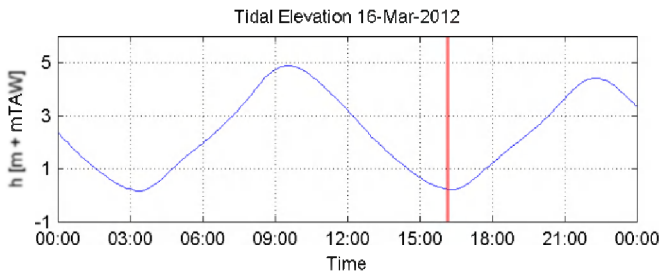
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9064_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

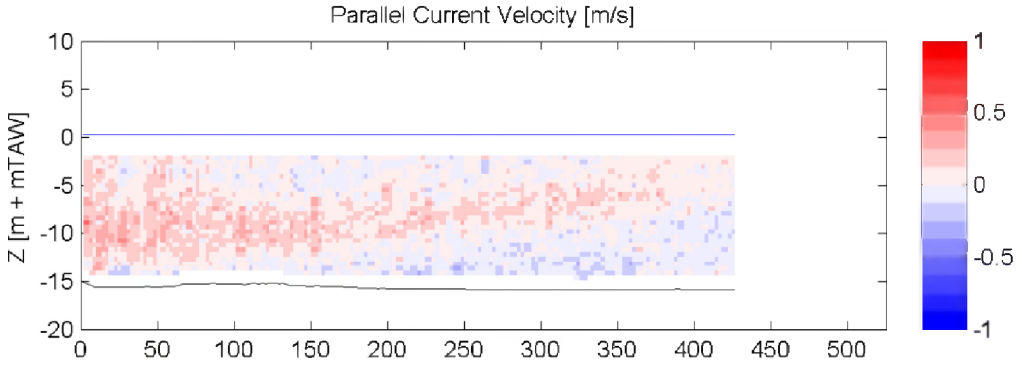
Date / Time [MET] :
16-Mar-2012
16:07 - 16:11

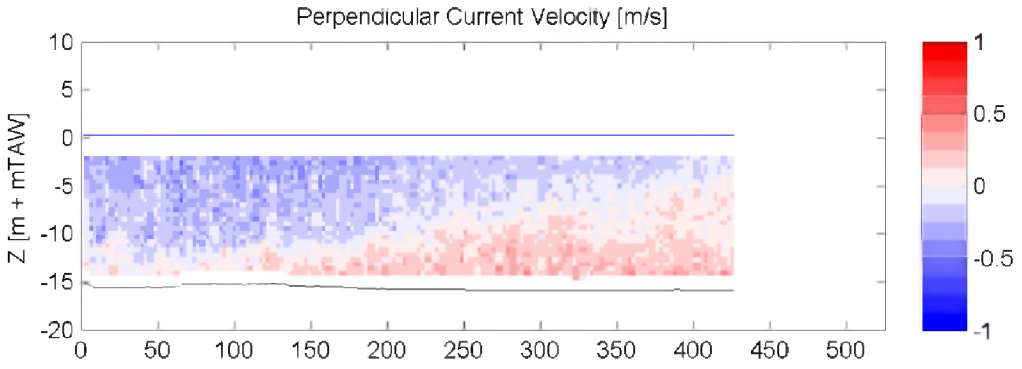
Time after HW [HH:MM]
6:04

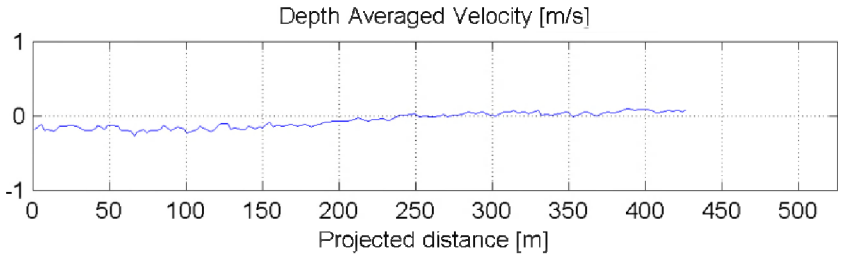
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

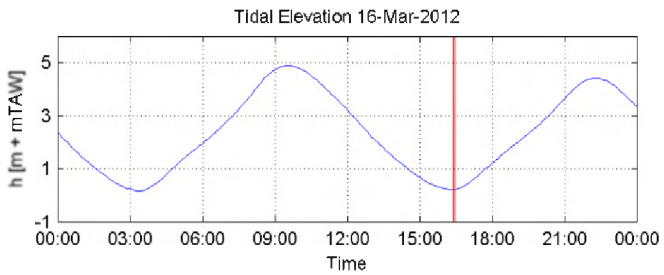
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9066_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

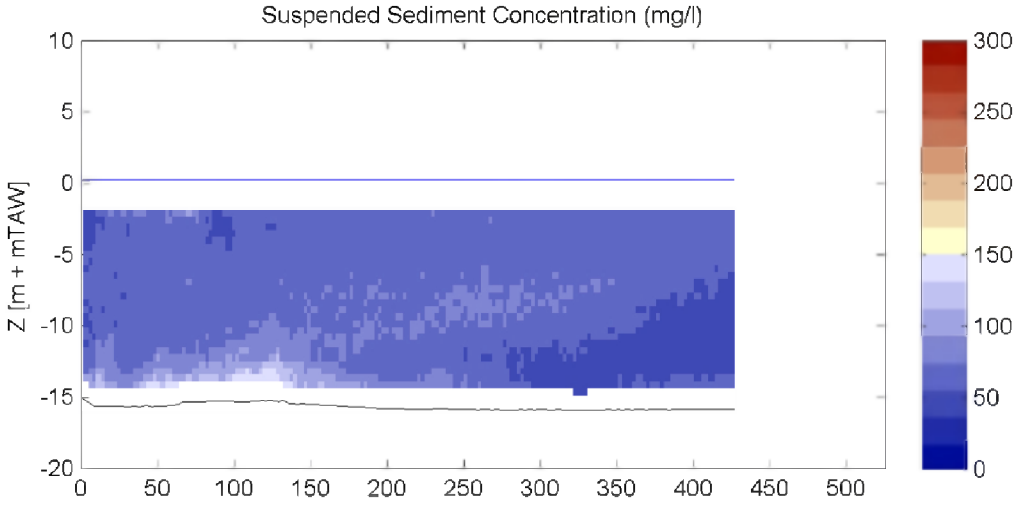
Date / Time [MET]:
16-Mar-2012
16:24 - 16:27

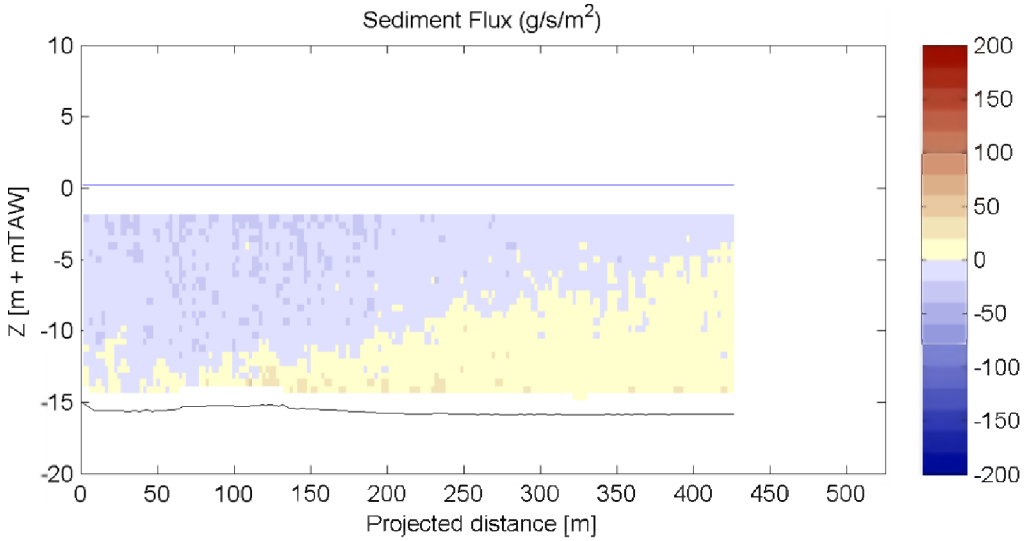
Time after HW [HH:MM]
-5:48

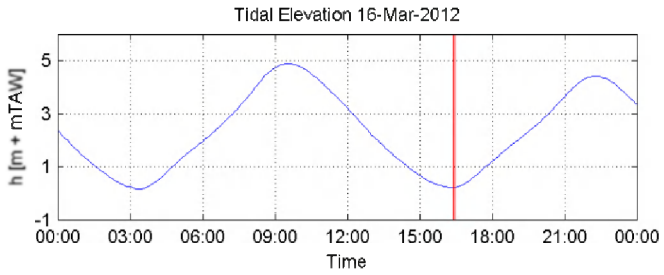
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9066_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

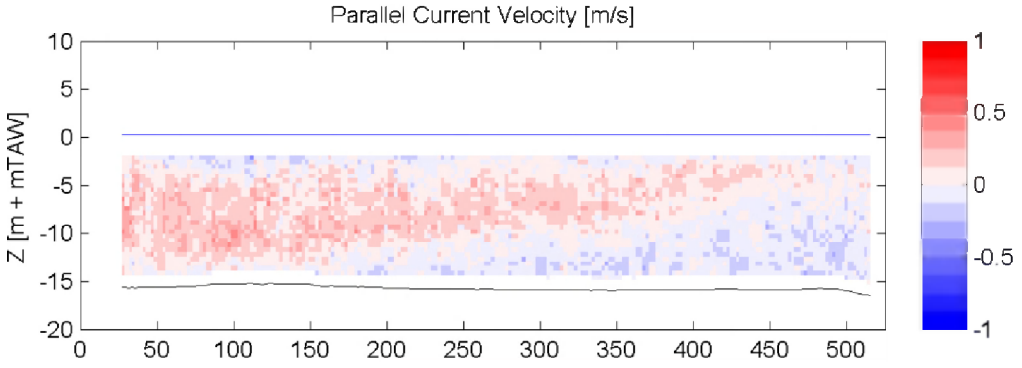
Date / Time [MET] :
16-Mar-2012
16:24 - 16:27

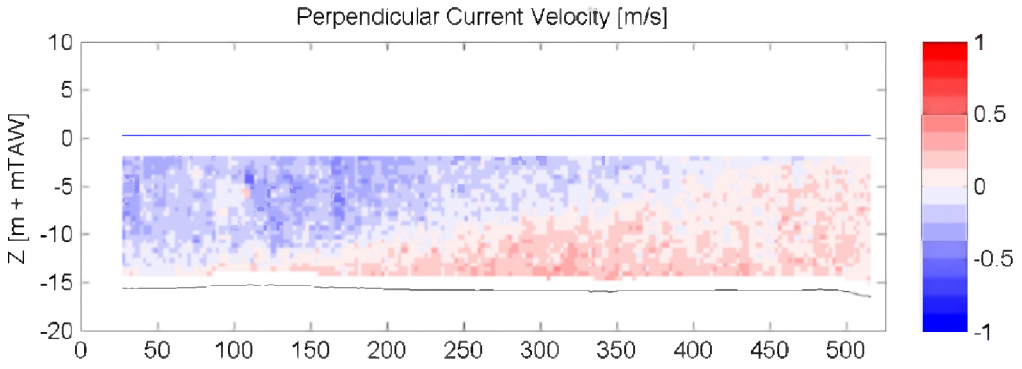
Time after HW [HH:MM]
-5:48

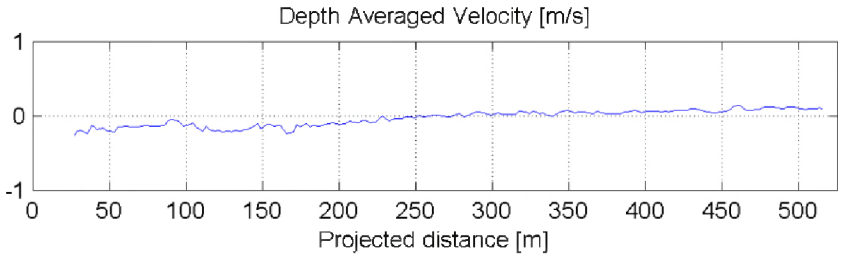
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

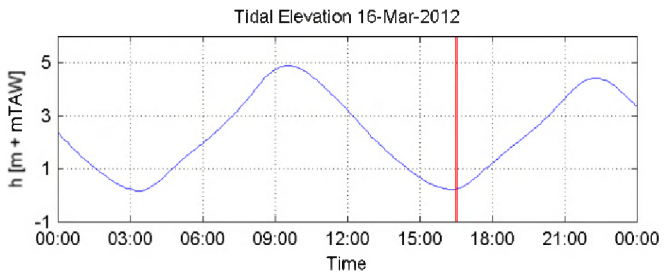
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9067_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
16:30 - 16:34

Time after HW [HH:MM]
-5:42

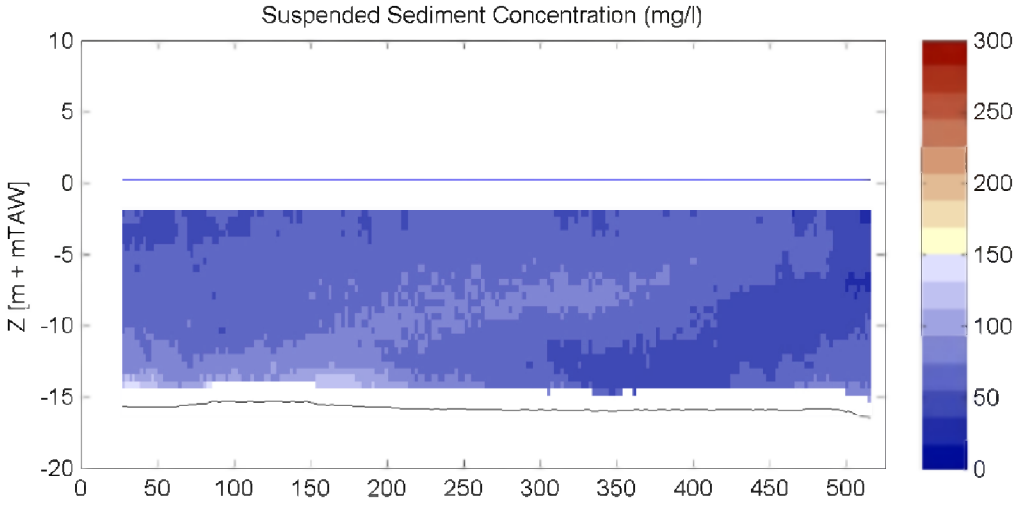
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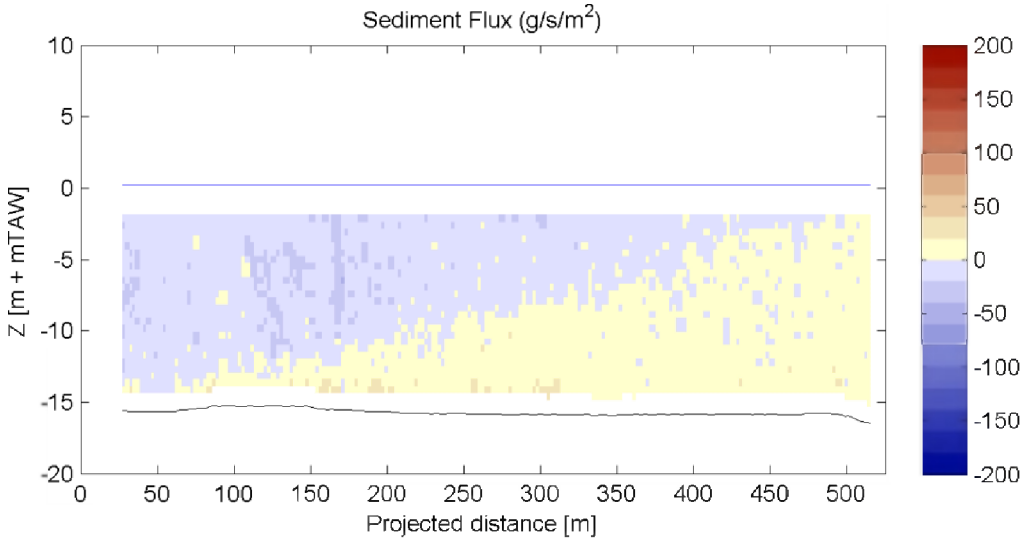
In association with :

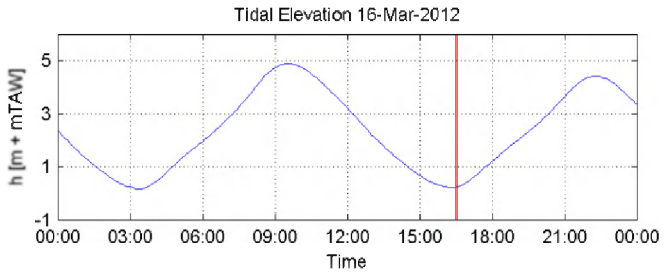
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9067_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

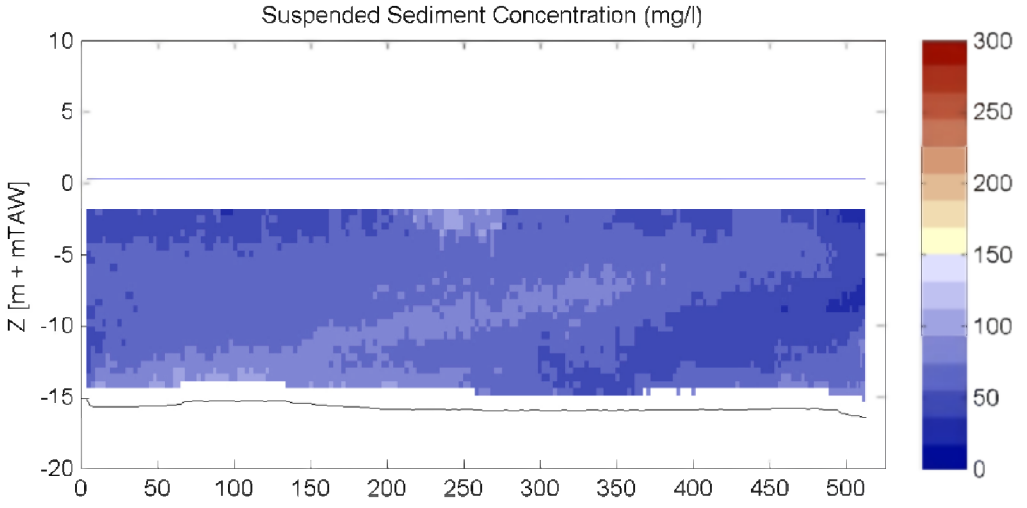
Date / Time [MET] :
16-Mar-2012
16:30 - 16:34

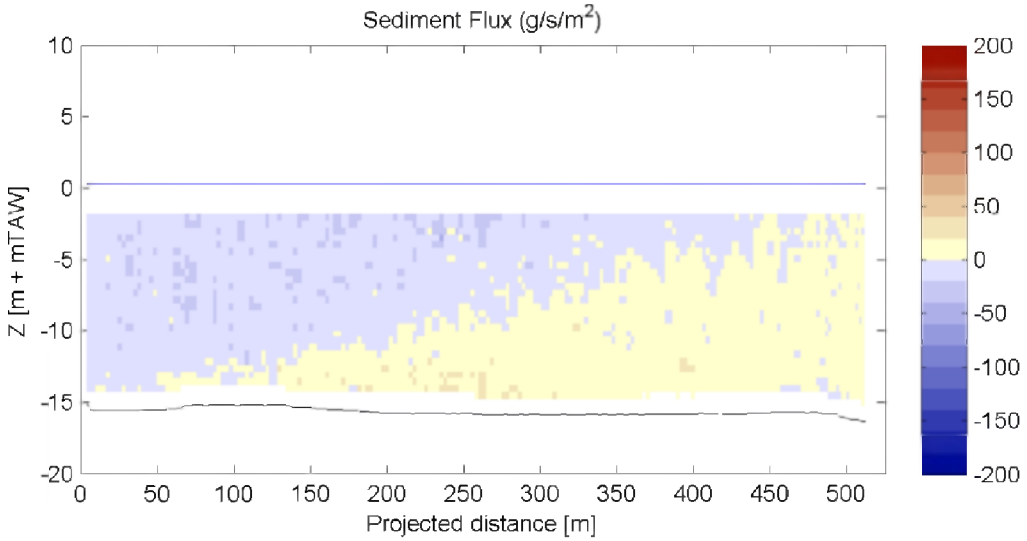
Time after HW [HH:MM]
-5:42

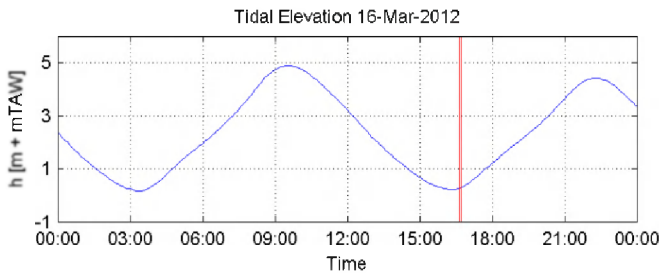
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9068_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

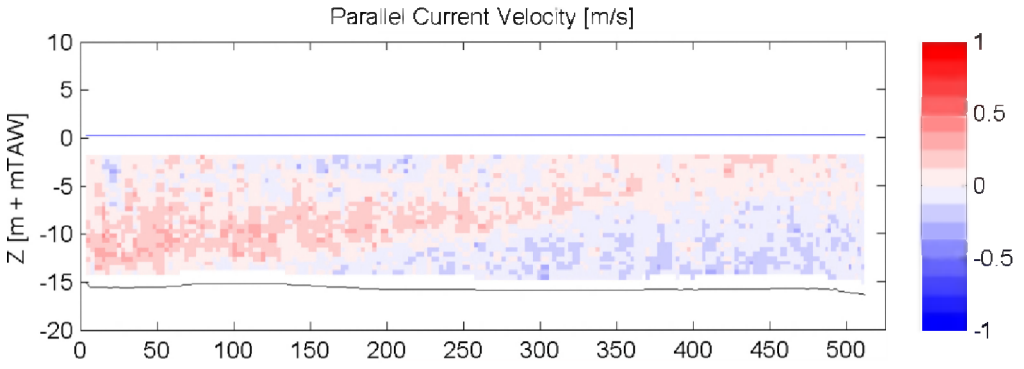
Date / Time [MET] :
16-Mar-2012
16:37 - 16:41

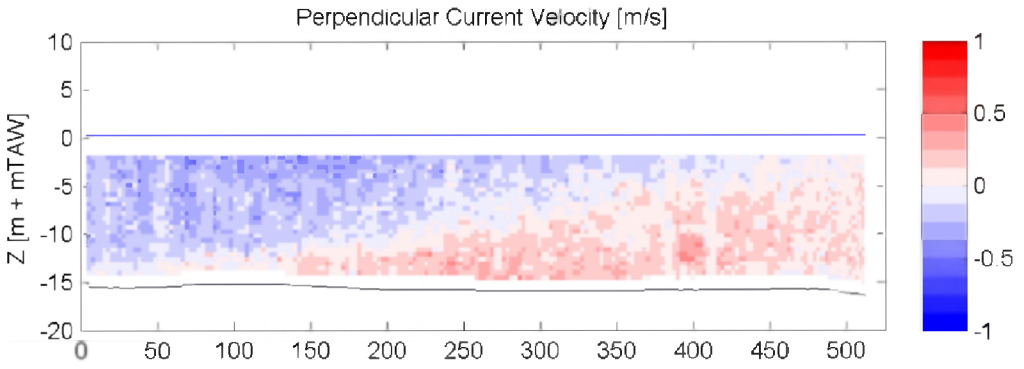
Time after HW [HH:MM]
-5:35

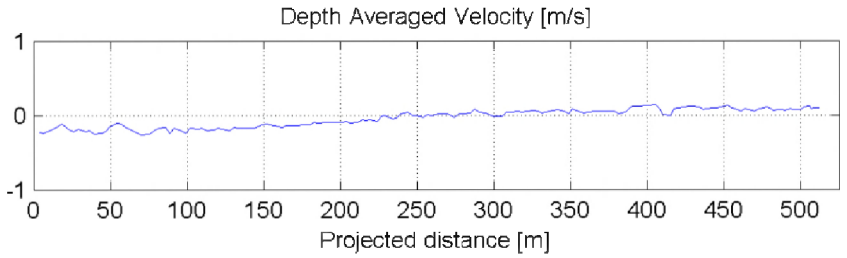
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

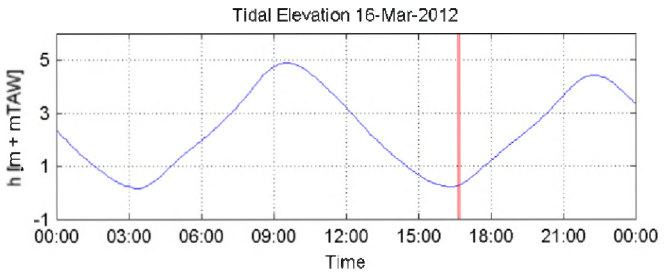
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9068_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

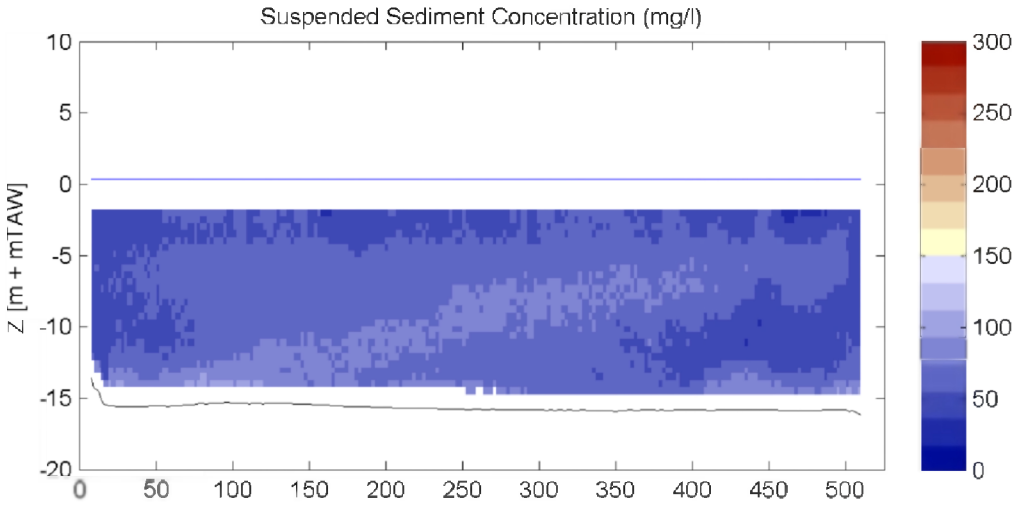
Date / Time [MET]:
16-Mar-2012
16:37 - 16:41

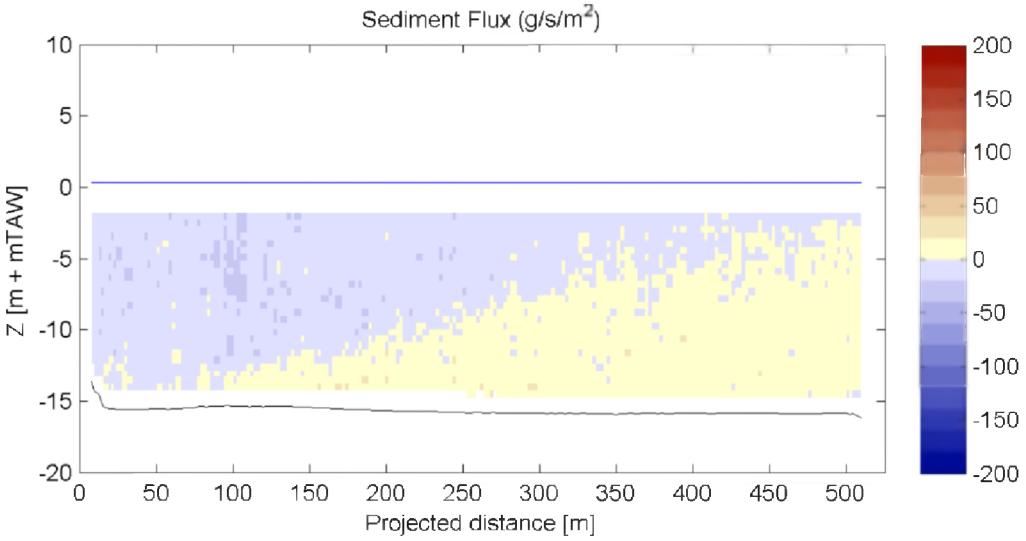
Time after HW [HH:MM]
-5:35

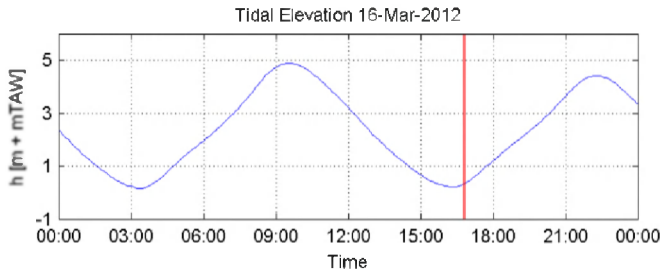
Data Processed by:
In association with:
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9069_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

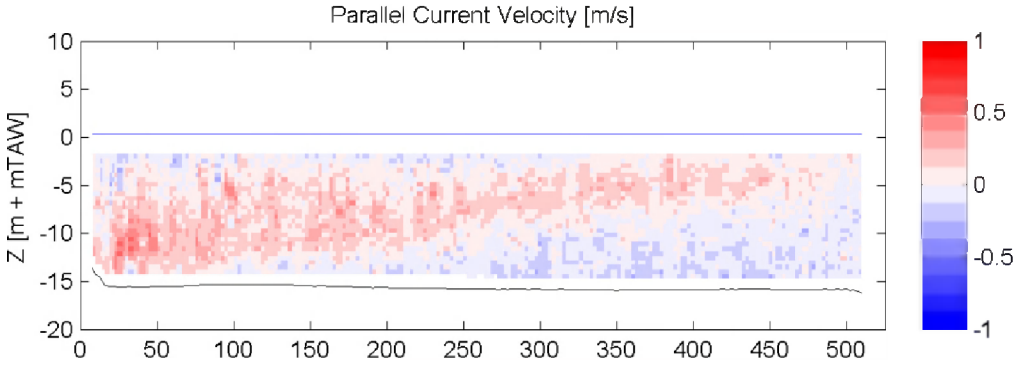
Date / Time [MET]:
16-Mar-2012
16:46 - 16:50

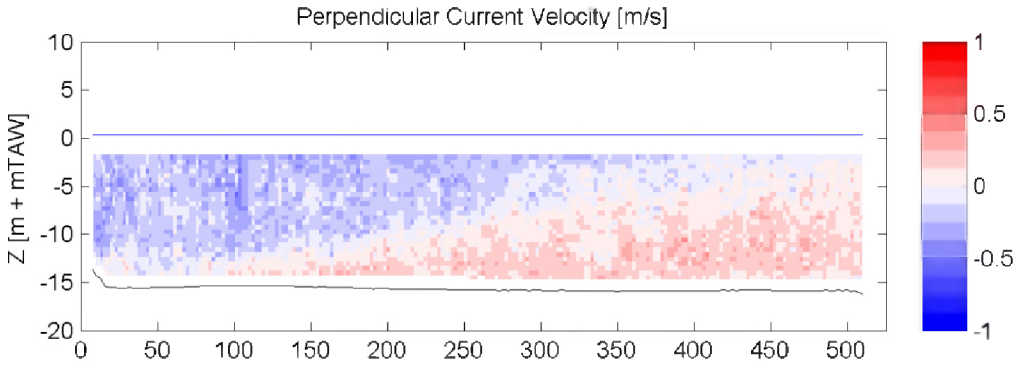
Time after HW [HH:MM]
-5:26

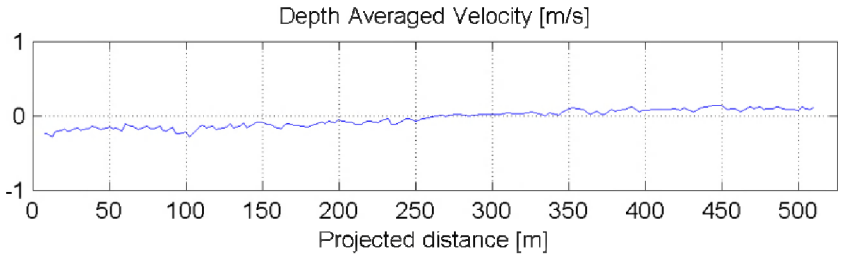
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

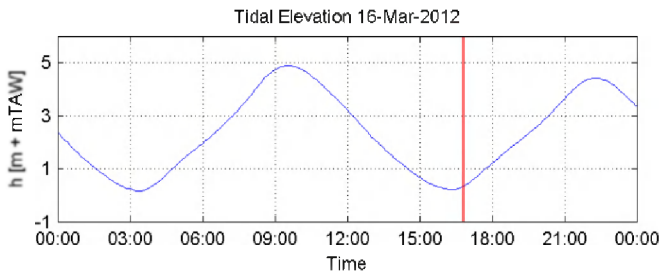
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9069_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
16:46 - 16:50

Time after HW [HH:MM]
-5:26

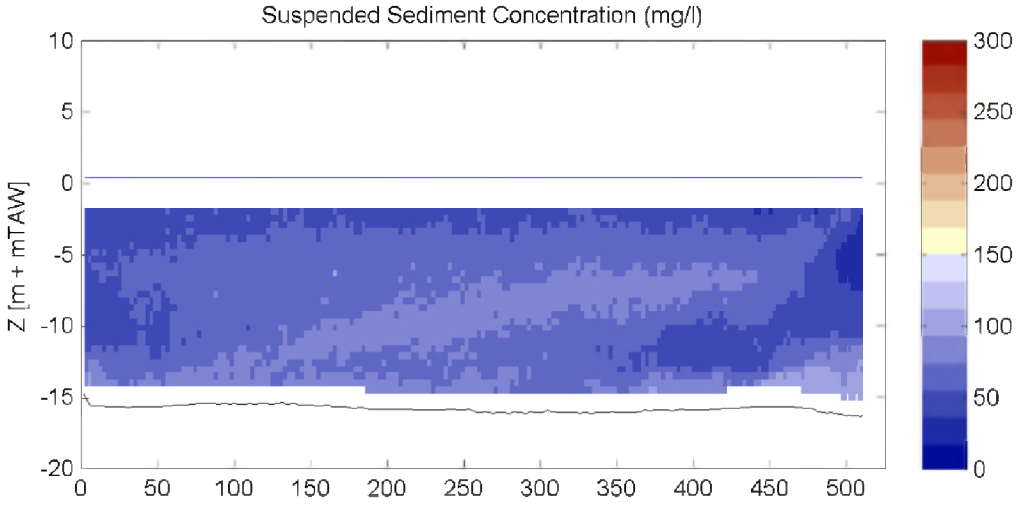
Data Processed by:

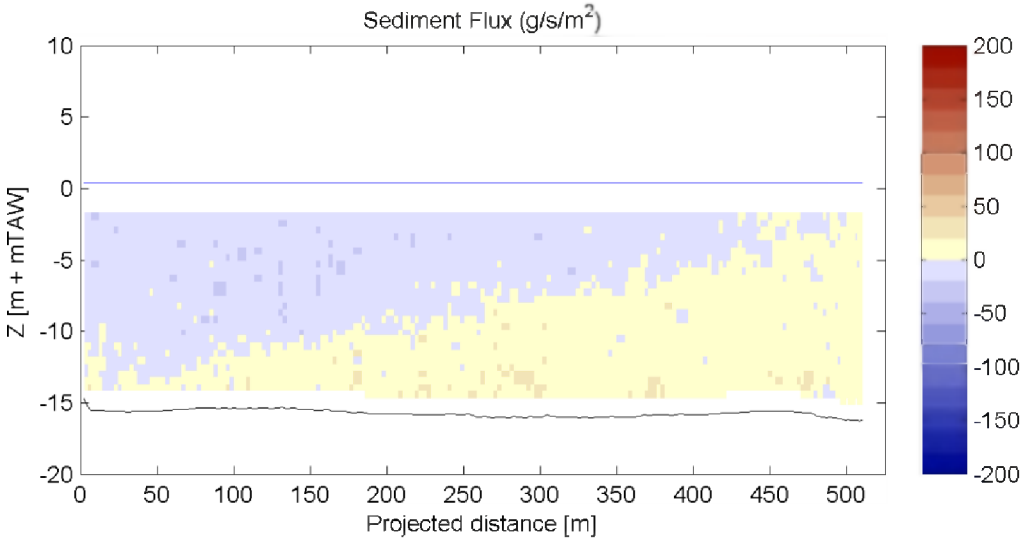
In association with :

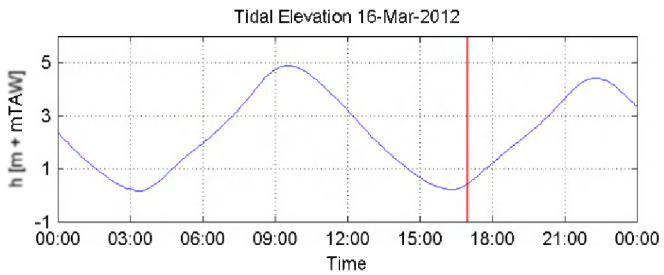
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9071_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

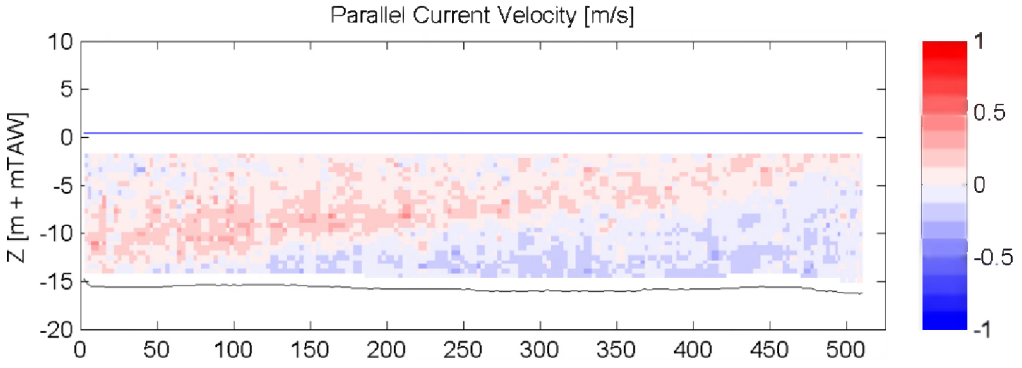
Date / Time [MET] :
16-Mar-2012
16:56 - 16:59

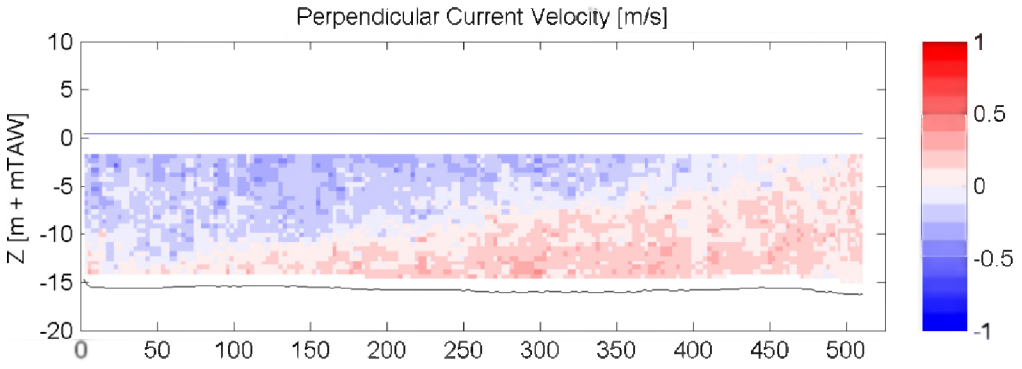
Time after HW [HH:MM]
-5:17

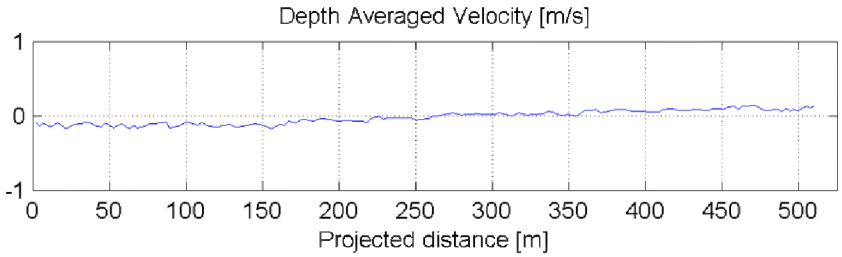
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

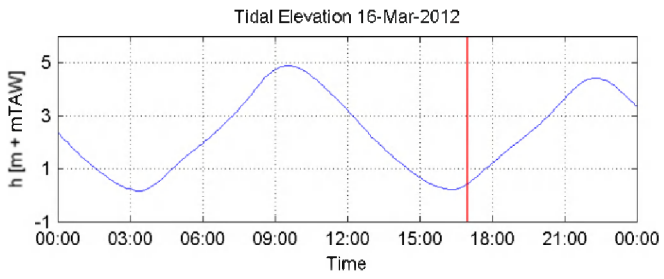
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9071_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
16:56 - 16:59

Time after HW [HH:MM]
-5:17

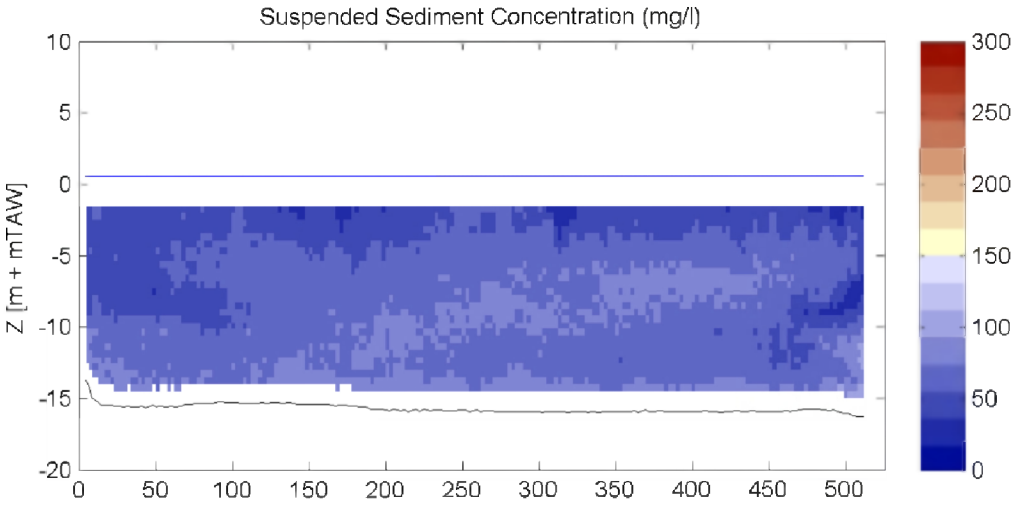
Data Processed by:

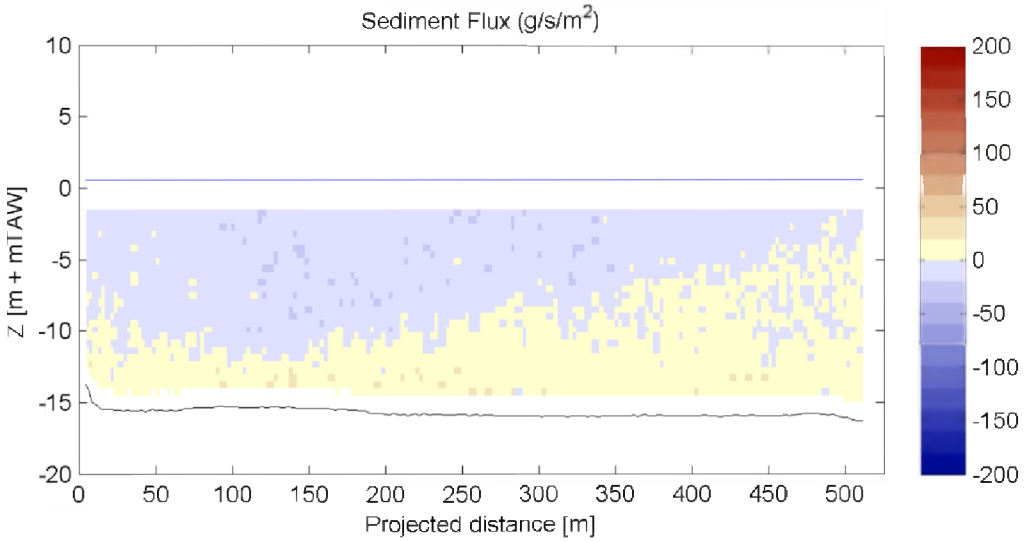
In association with :

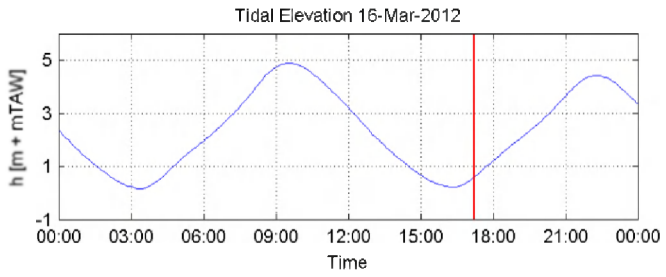
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9073_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

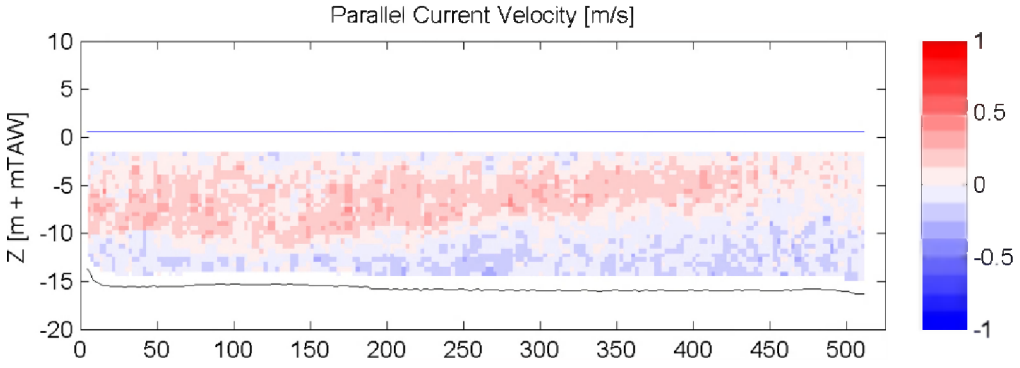
Date / Time [MET] :
16-Mar-2012
17:10 - 17:14

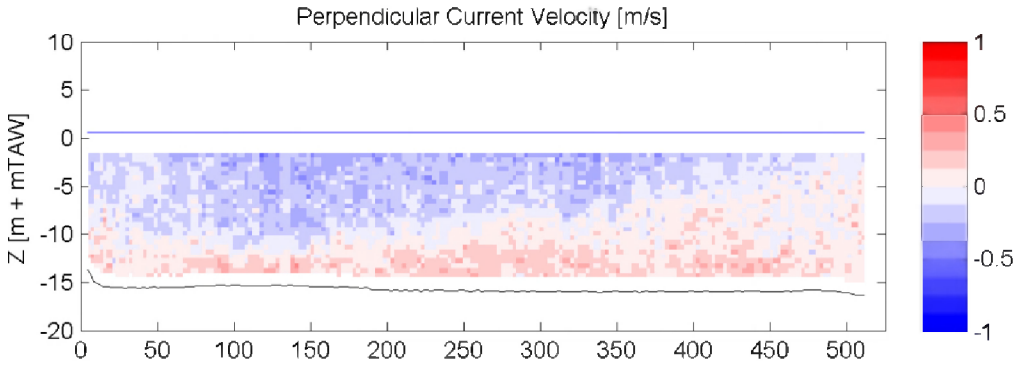
Time after HW [HH:MM]
-5:02

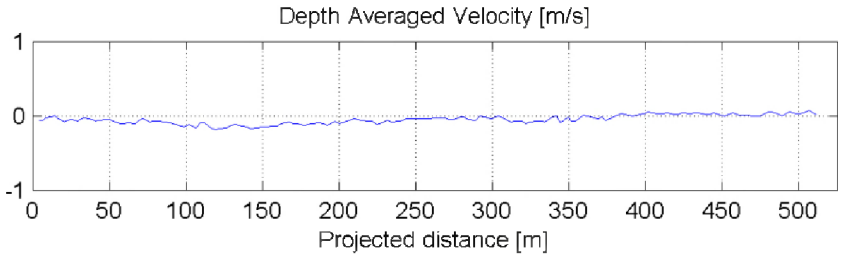
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

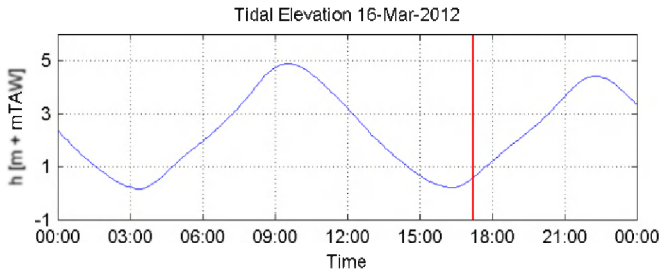
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9073_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

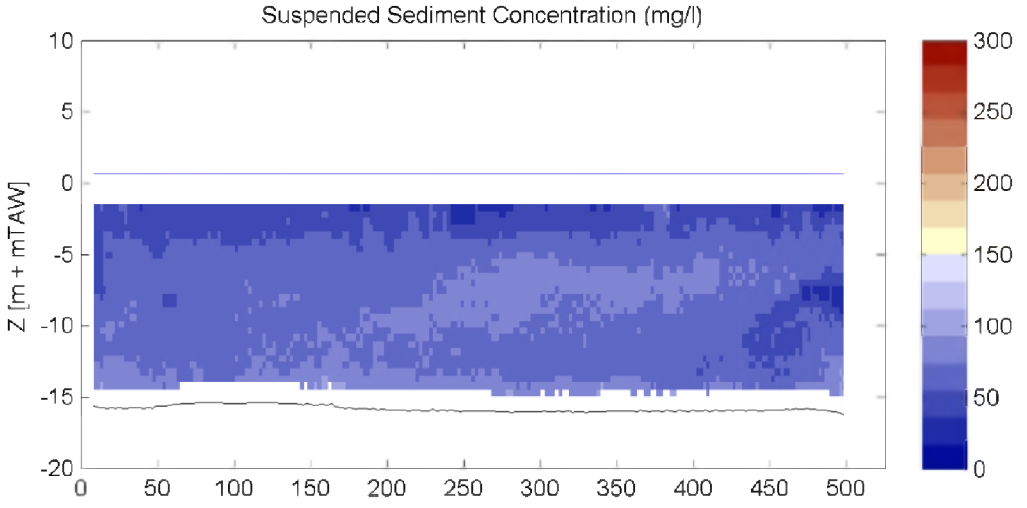
Date / Time [MET] :
16-Mar-2012
17:10 - 17:14

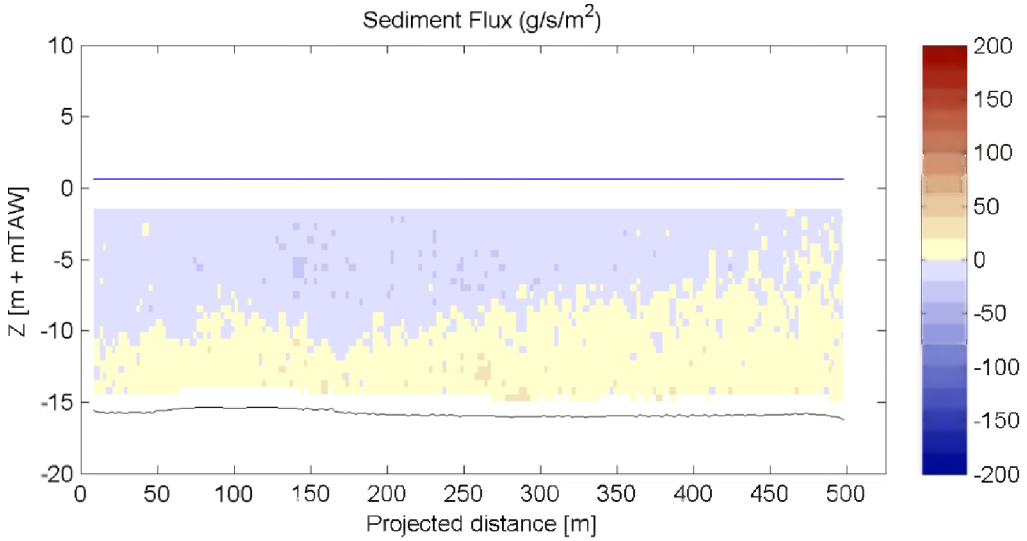
Time after HW [HH:MM]
-5:02

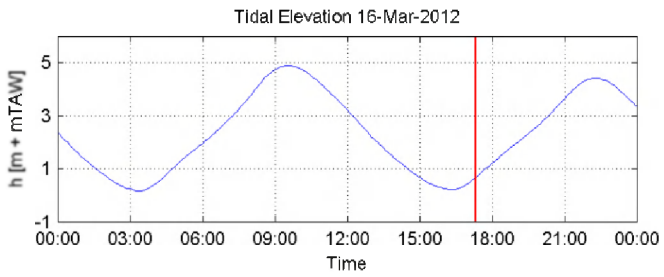
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9074_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

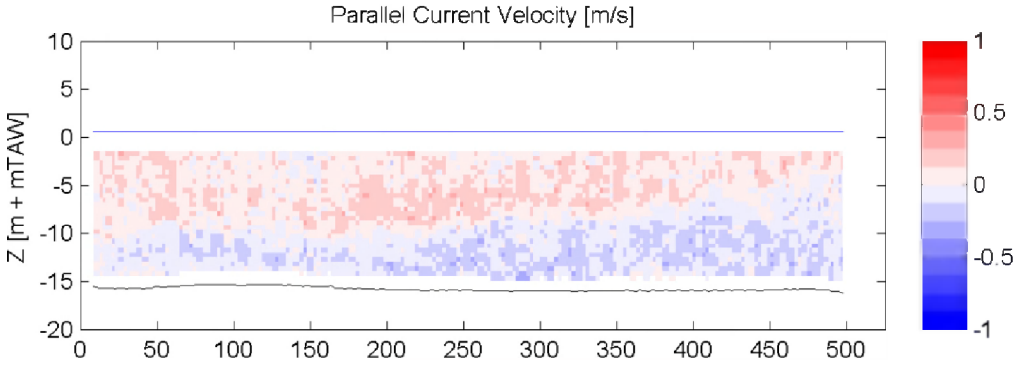
Date / Time [MET] :
16-Mar-2012
17:16 - 17:20

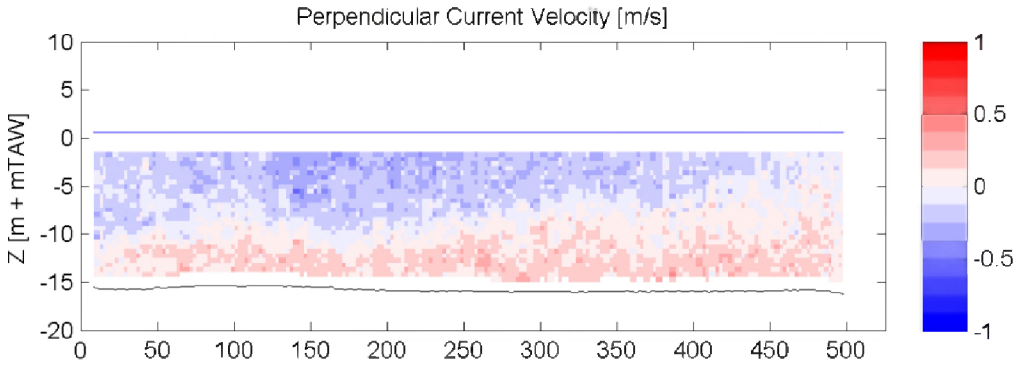
Time after HW [HH:MM]
-4:56

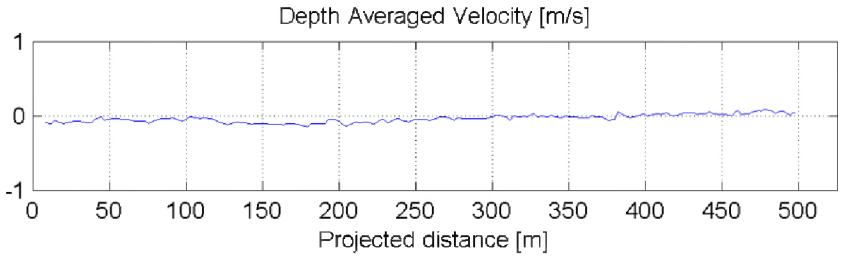
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

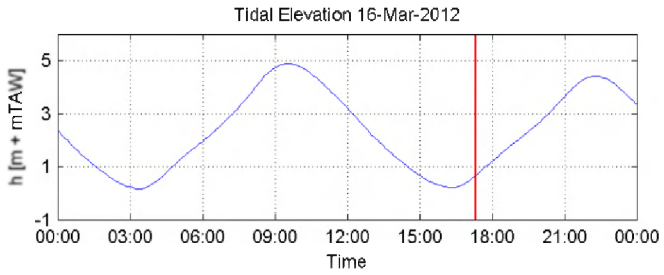
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9074_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

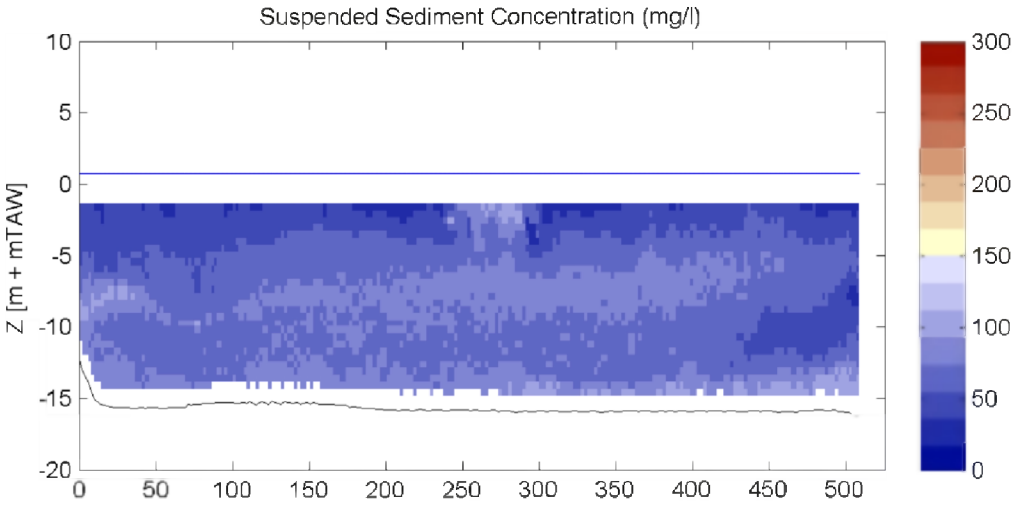
Date / Time [MET] :
16-Mar-2012
17:16 - 17:20

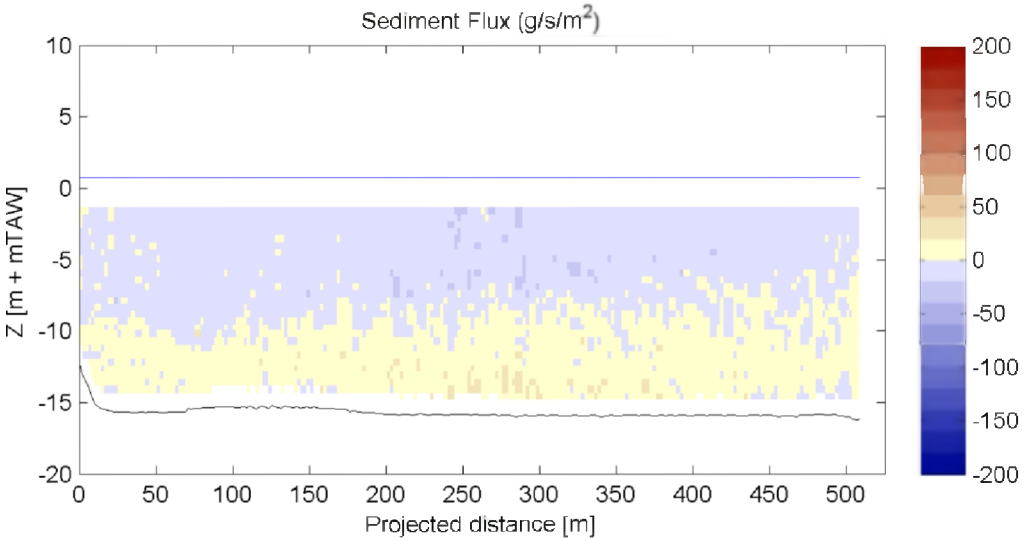
Time after HW [HH:MM]
-4:56

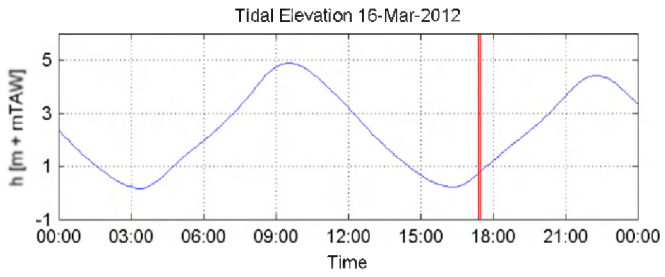
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9075_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

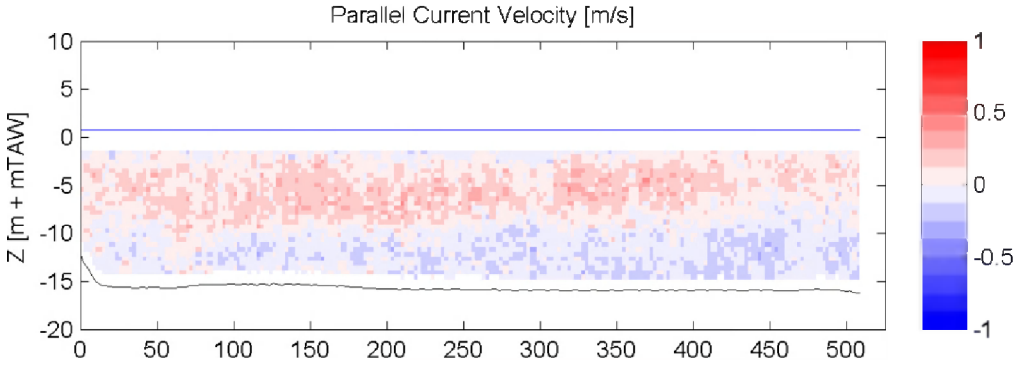
Date / Time [MET]:
16-Mar-2012
17:24 - 17:28

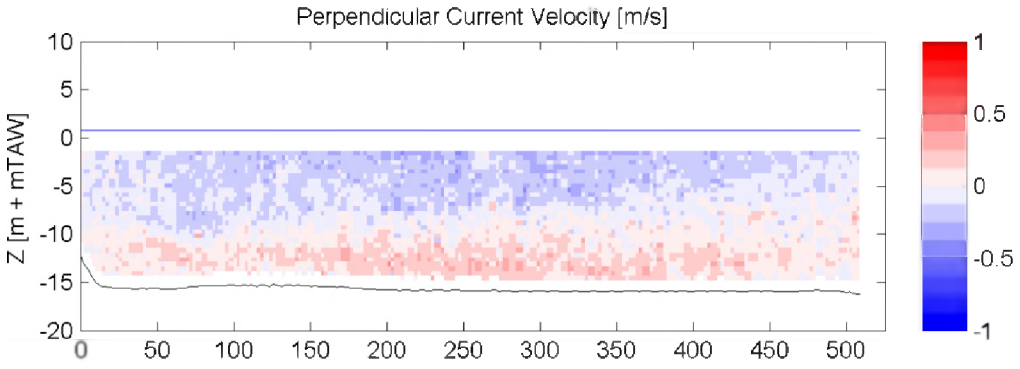
Time after HW [HH:MM]
-4:48

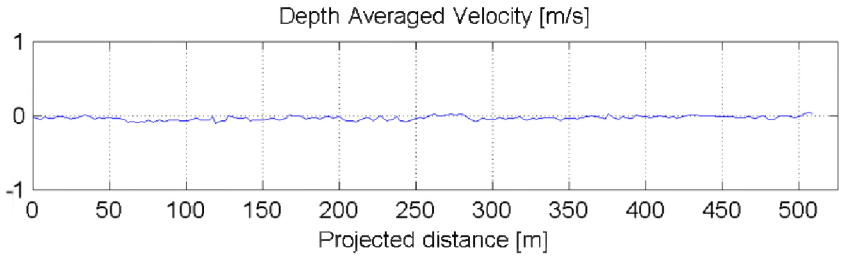
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

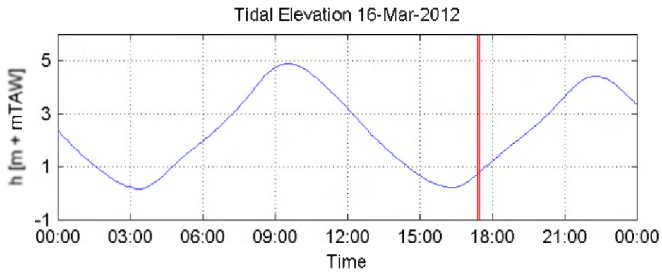
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9075_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

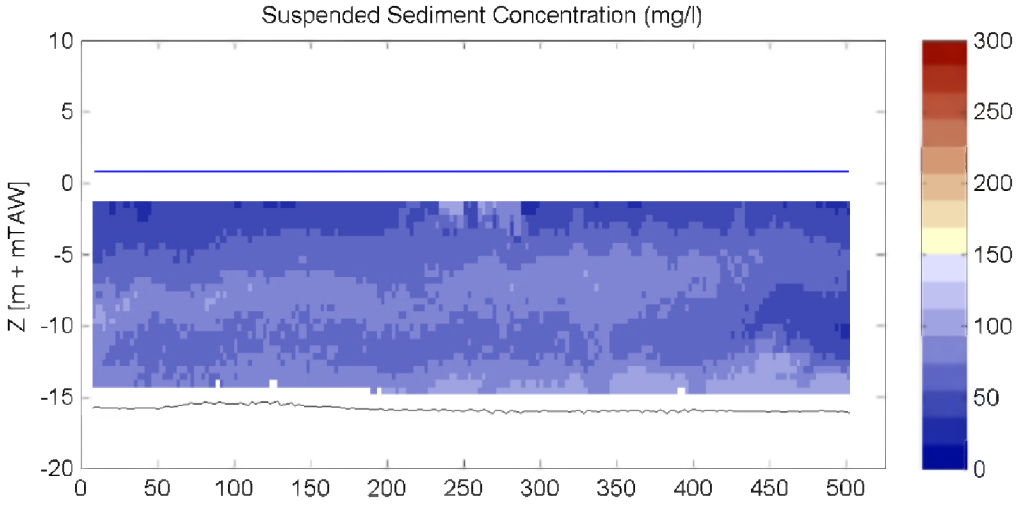
Date / Time [MET] :
16-Mar-2012
17:24 - 17:28

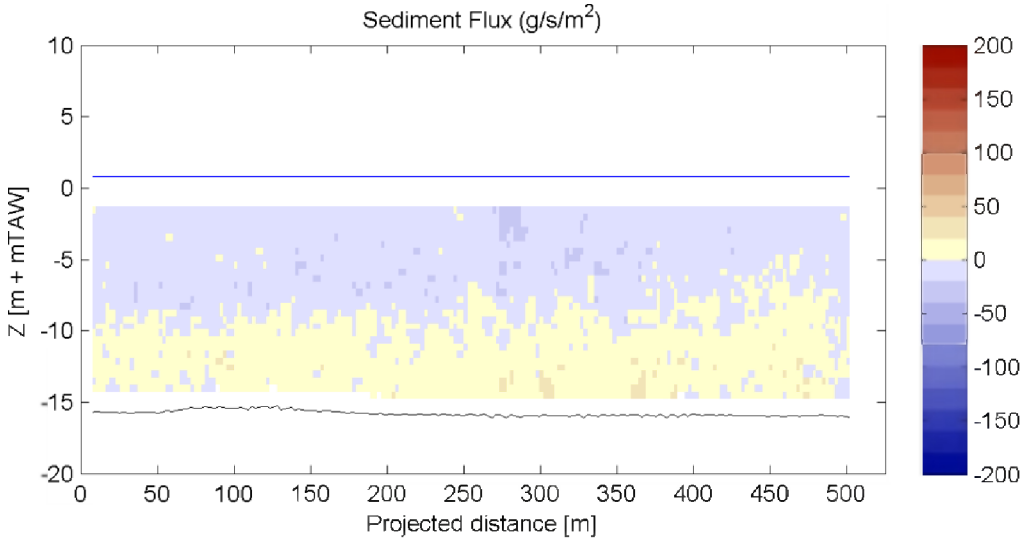
Time after HW [HH:MM]
-4:48

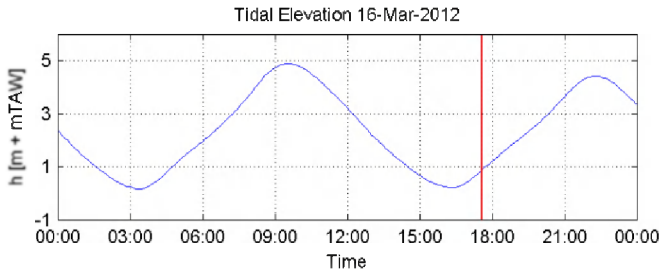
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9076_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

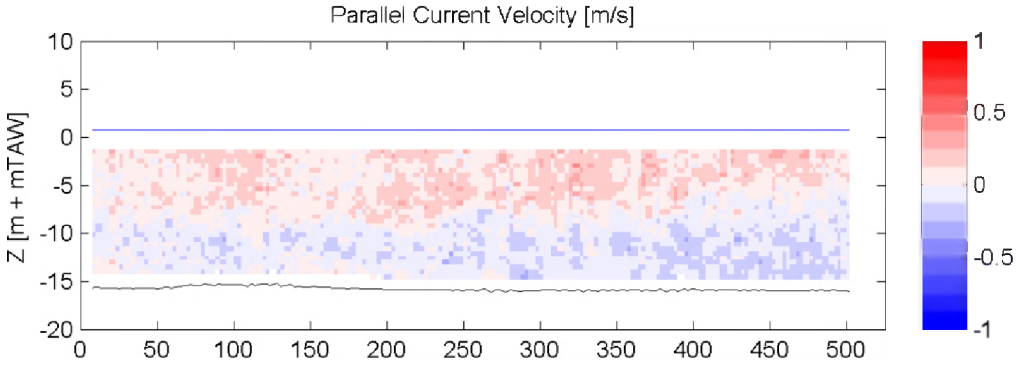
Date / Time [MET] :
16-Mar-2012
17:31 - 17:34

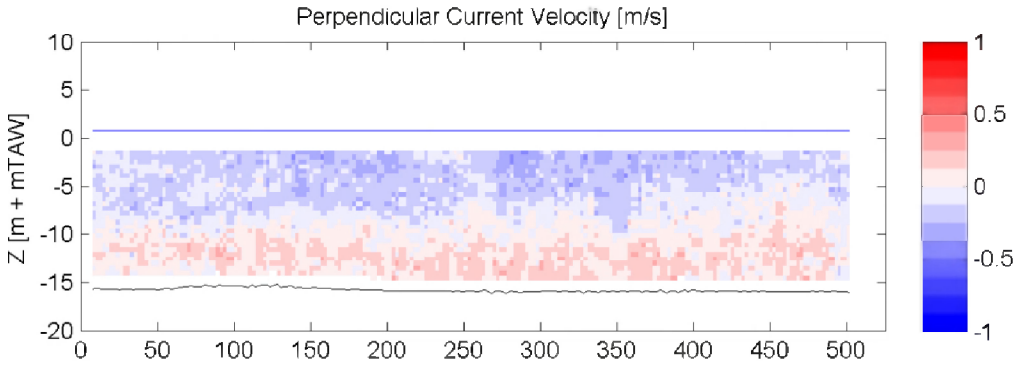
Time after HW [HH:MM]
-4:42

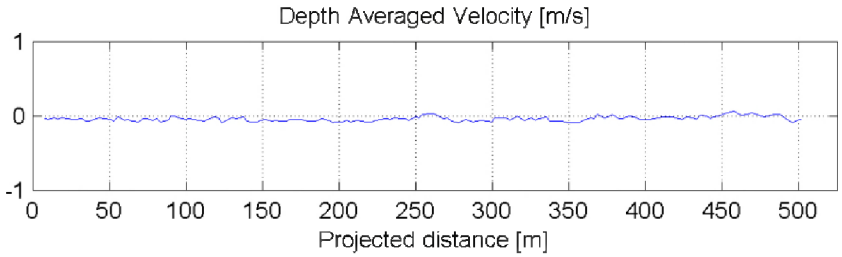
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

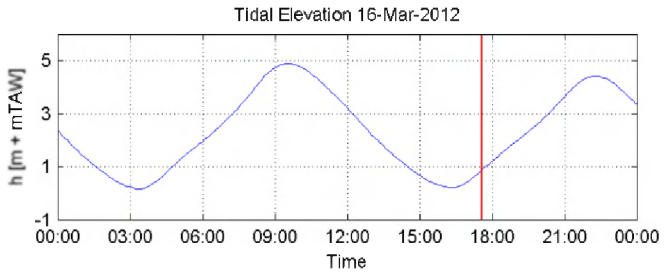
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9076_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

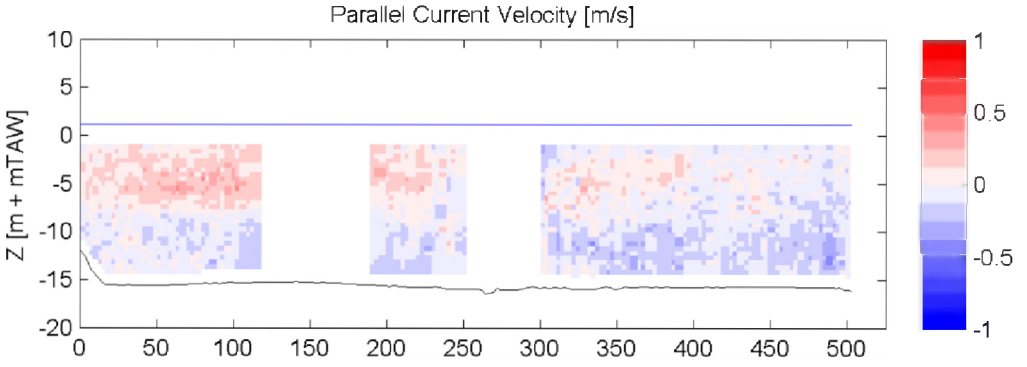
Date / Time [MET] :
16-Mar-2012
17:31 - 17:34

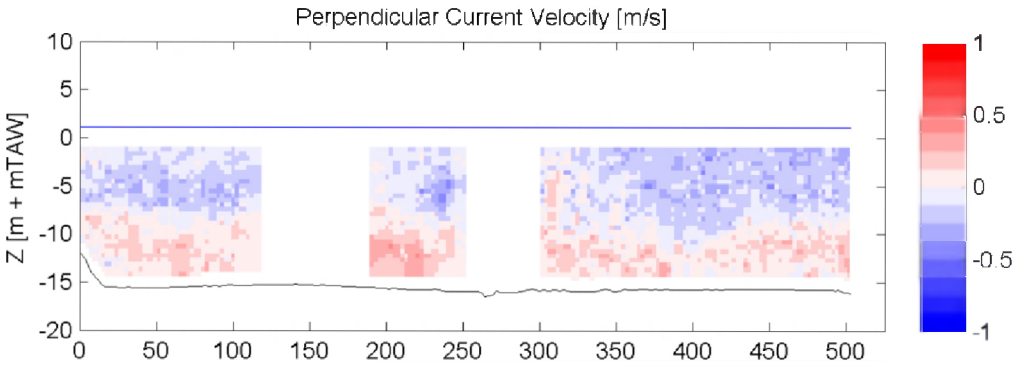
Time after HW [HH:MM]
-4:42

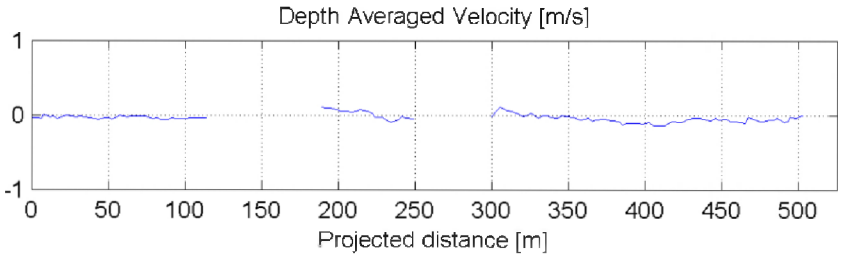
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

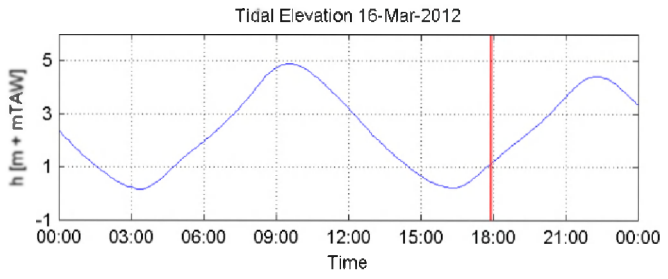
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9078_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

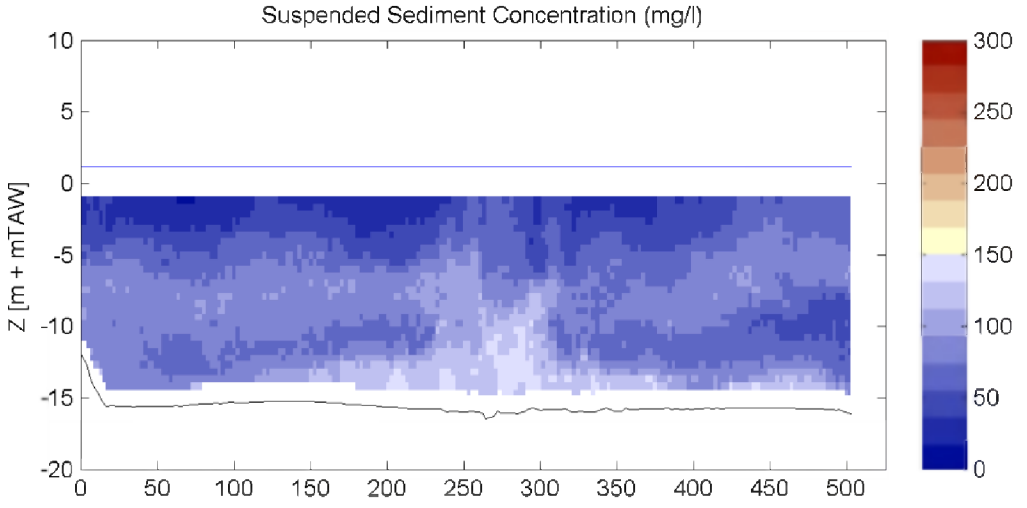
Date / Time [MET]:
16-Mar-2012
17:53 - 17:56

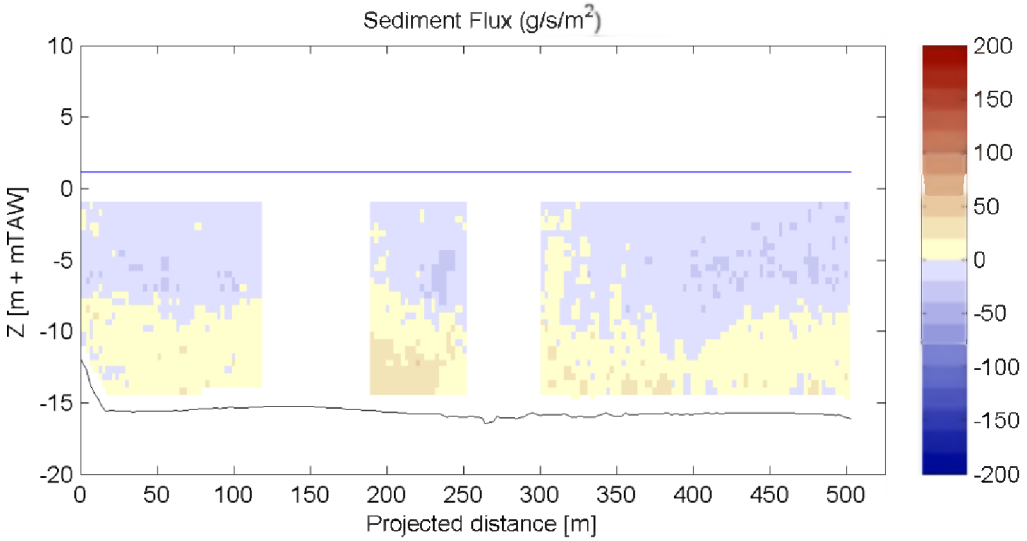
Time after HW [HH:MM]
-4:19

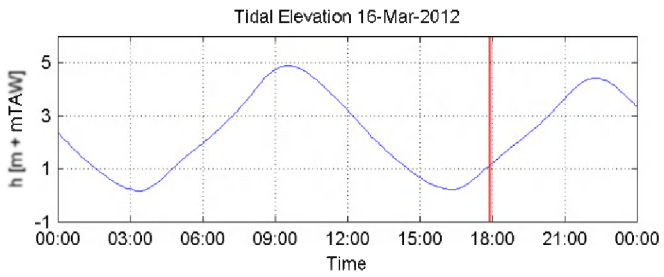
Data Processed by:
In association with:
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9078_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

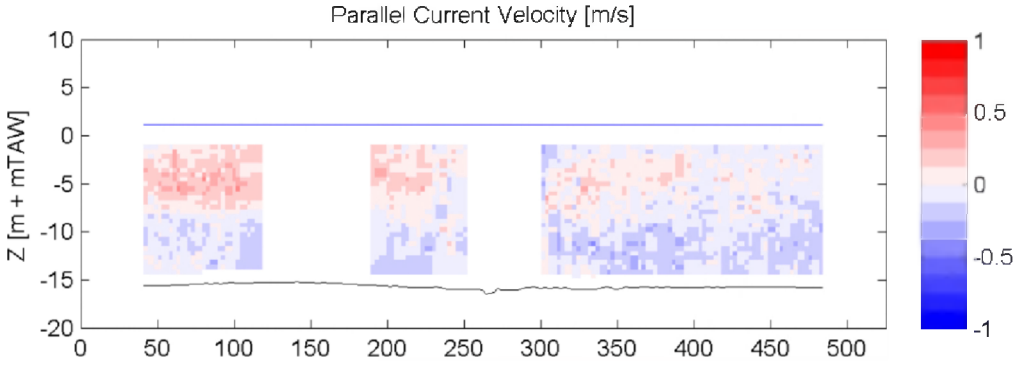
Date / Time [MET] :
16-Mar-2012
17:53 - 17:56

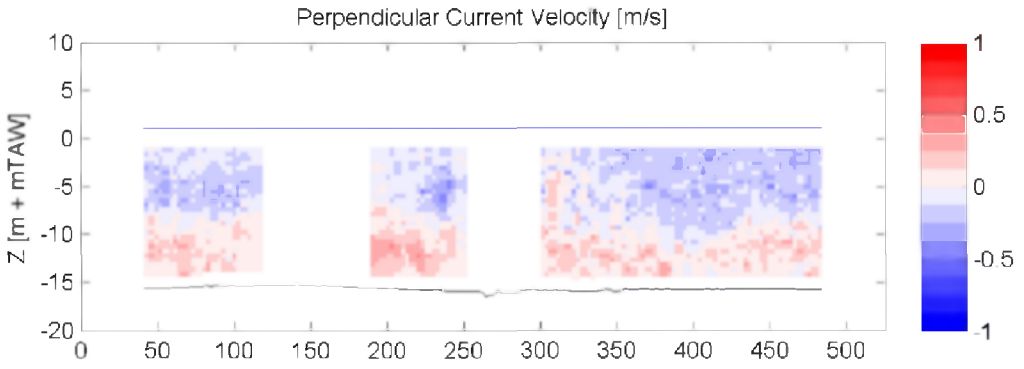
Time after HW [HH:MM]
-4:19

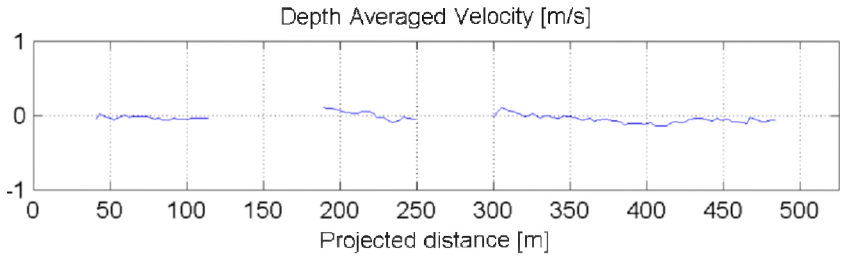
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

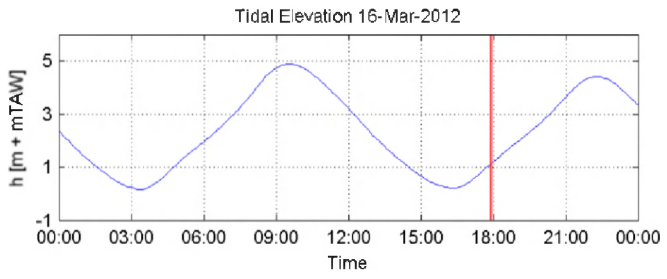
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9078_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

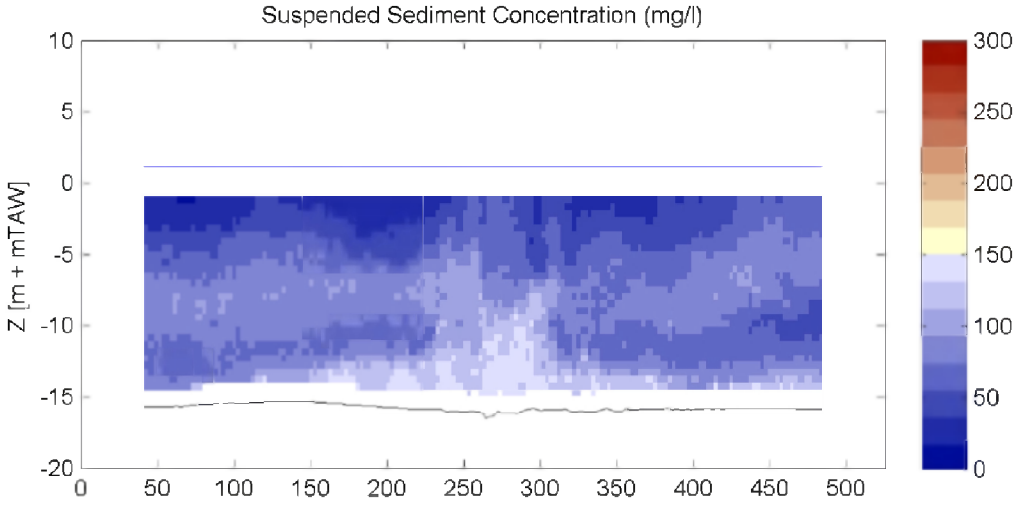
Date / Time [MET]
16-Mar-2012
17:53 - 17:56

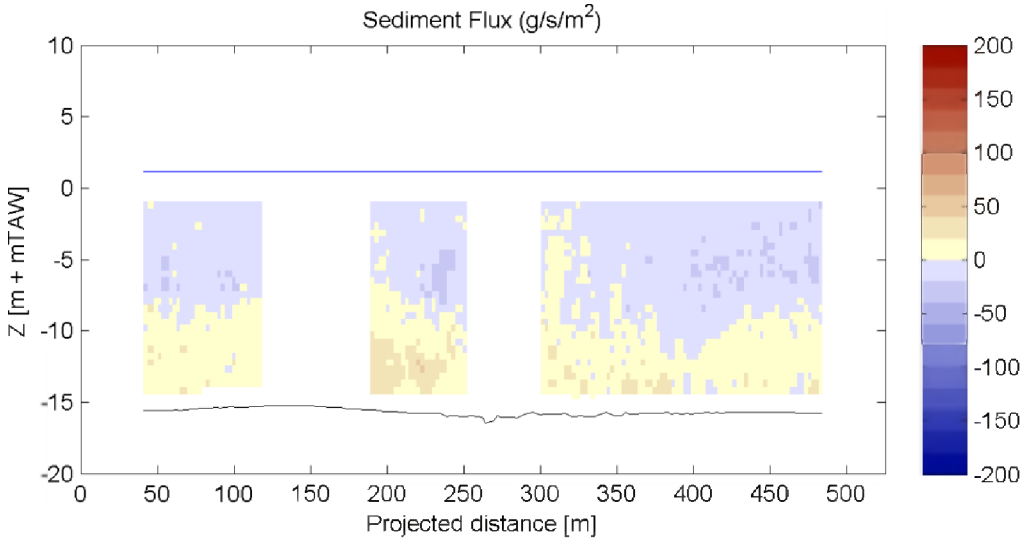
Time after HW [HH:MM]
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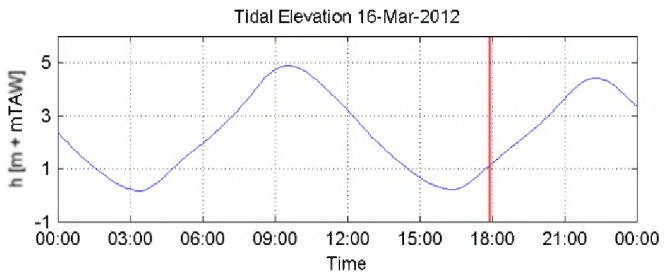
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9078_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

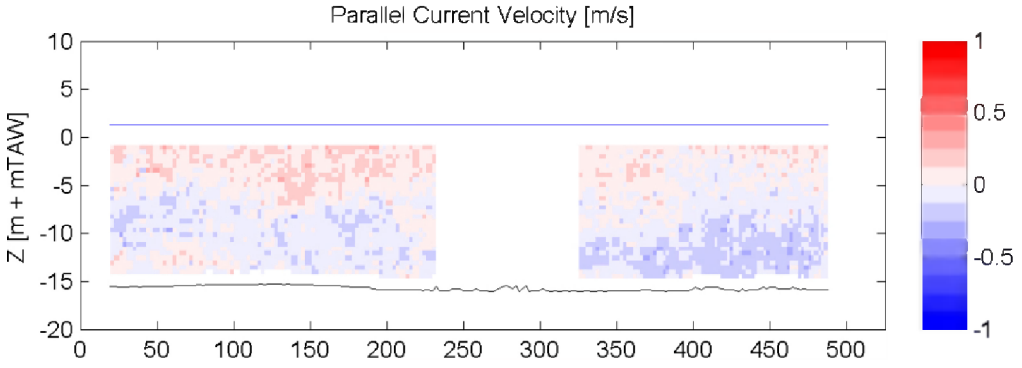
Date / Time [MET] :
16-Mar-2012
17:53 - 17:56

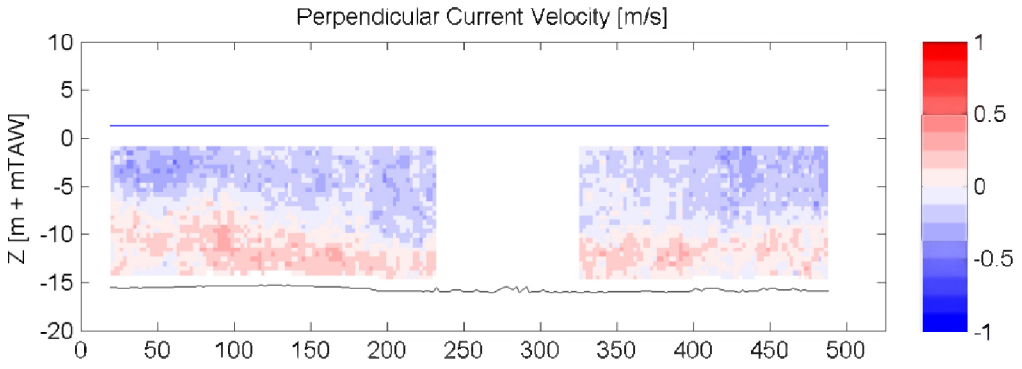
Time after HW [HH:MM]
-4:19

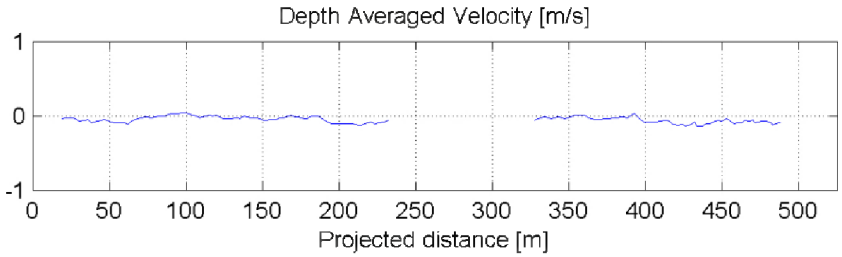
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

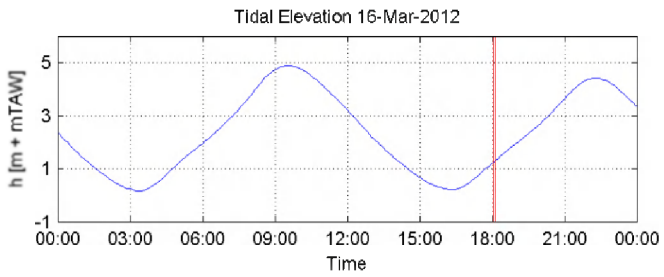
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9080_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

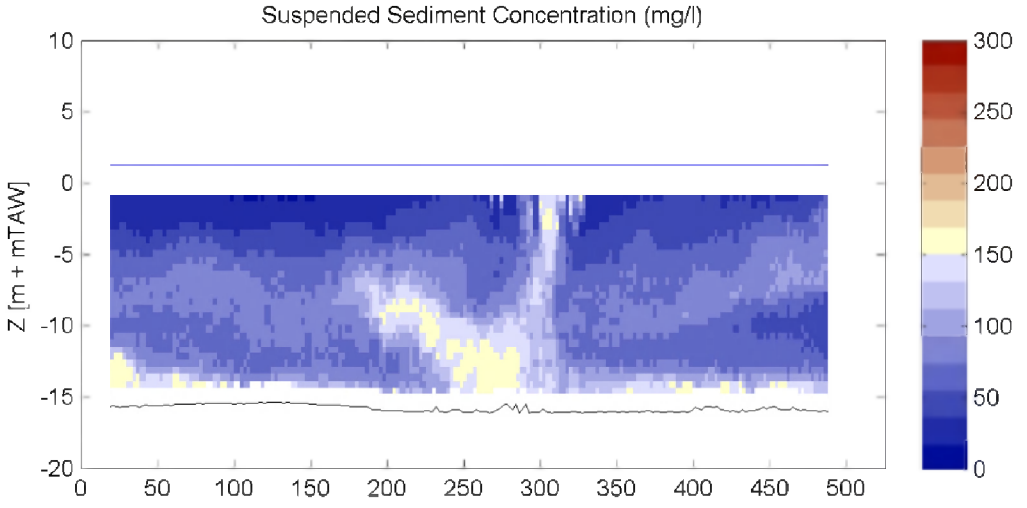
Date / Time [MET] :
16-Mar-2012
18:03 - 18:07

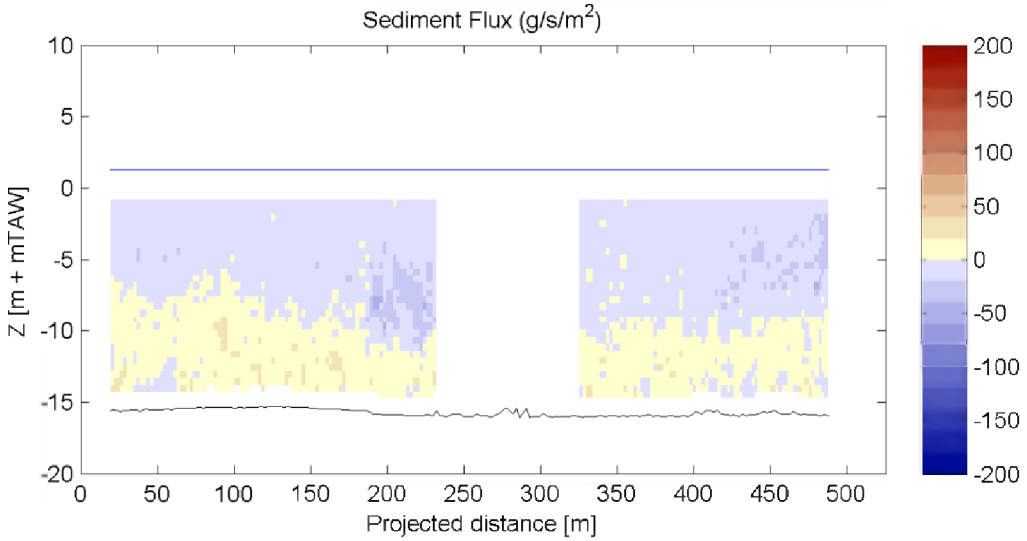
Time after HW [HH:MM]
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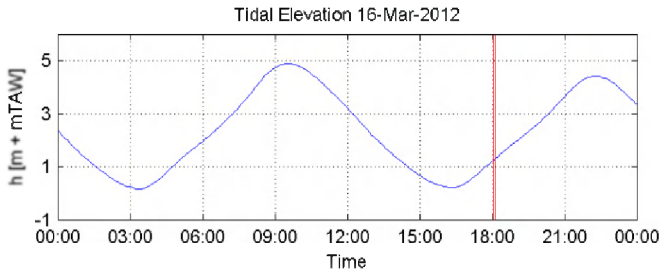
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9080_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

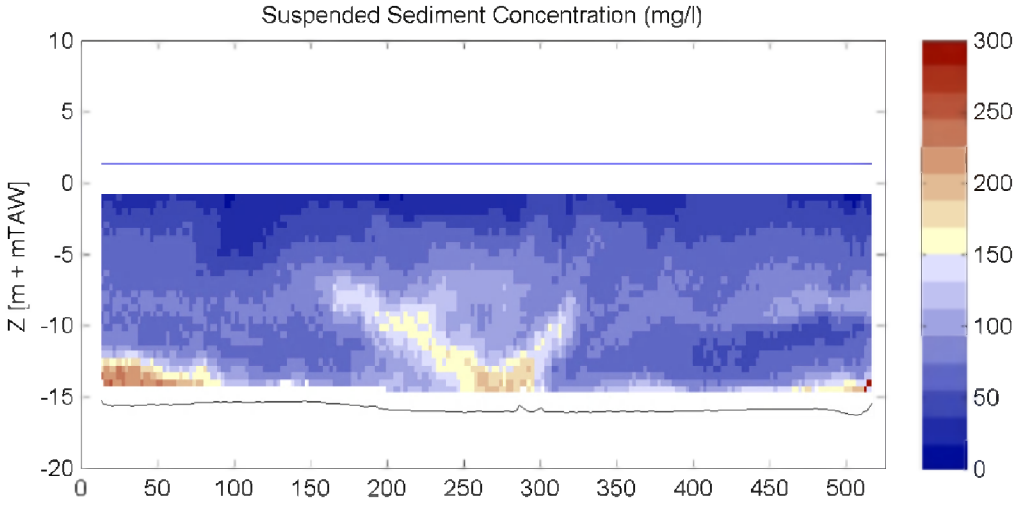
Date / Time [MET] :
16-Mar-2012
18:03 - 18:07

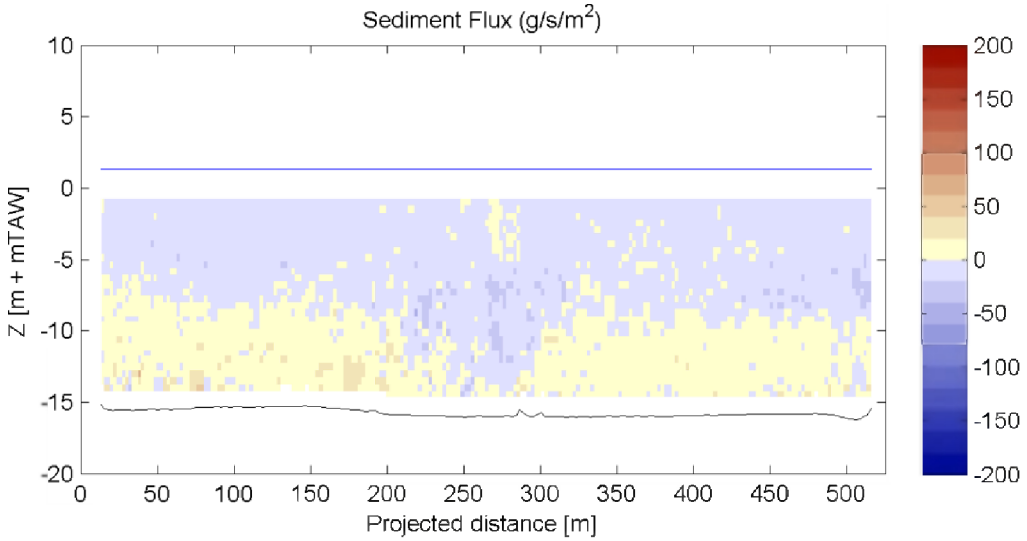
Time after HW [HH:MM]
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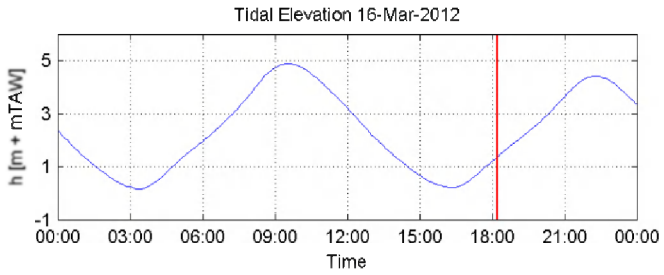
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9081_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

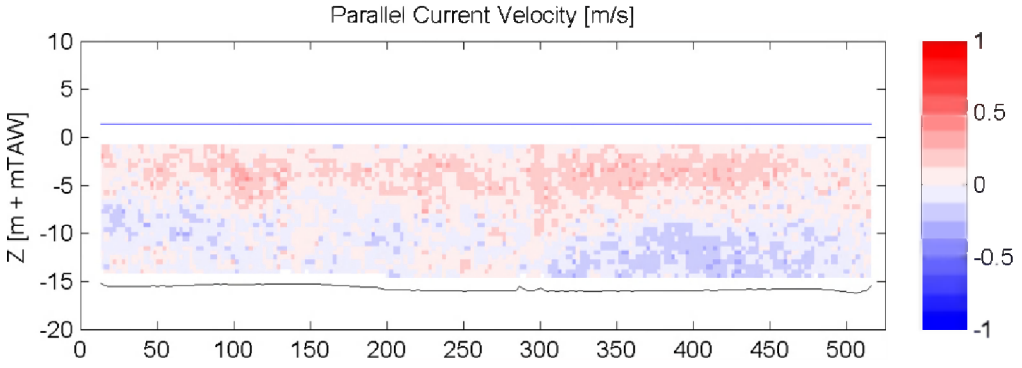
Date / Time [MET] :
16-Mar-2012
18:10 - 18:14

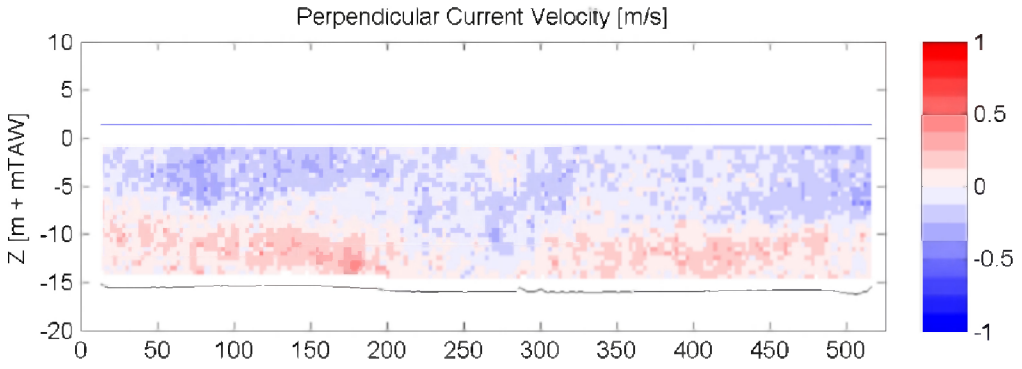
Time after HW [HH:MM]
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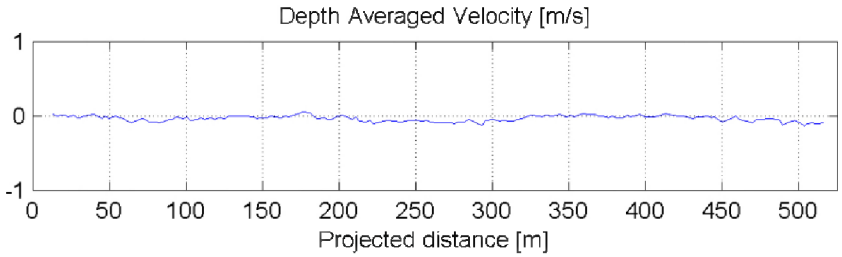
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

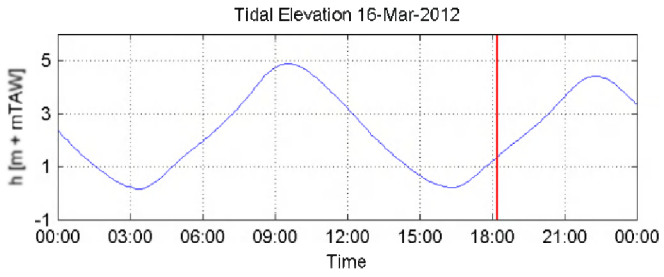
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9081_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
18:10 - 18:14

Time after HW [HH:MM]
-4:02

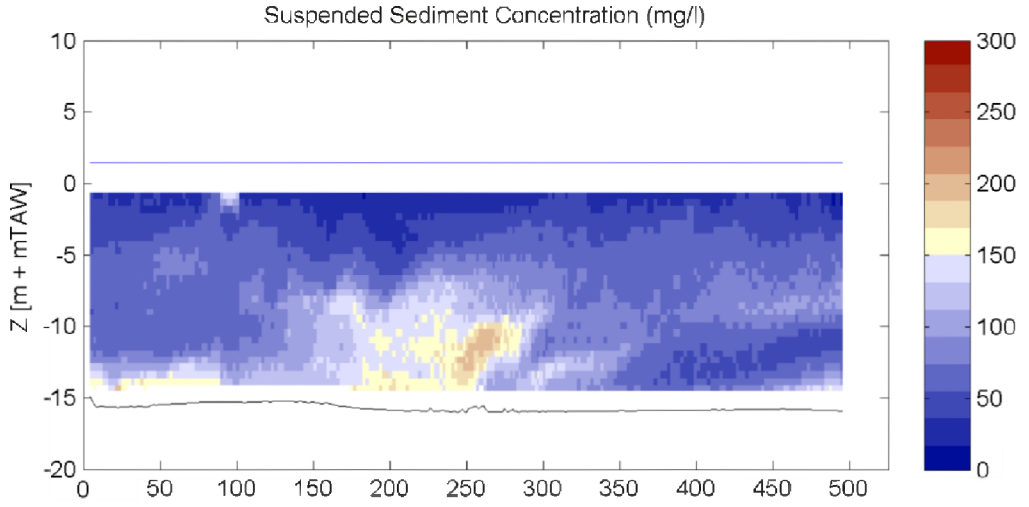
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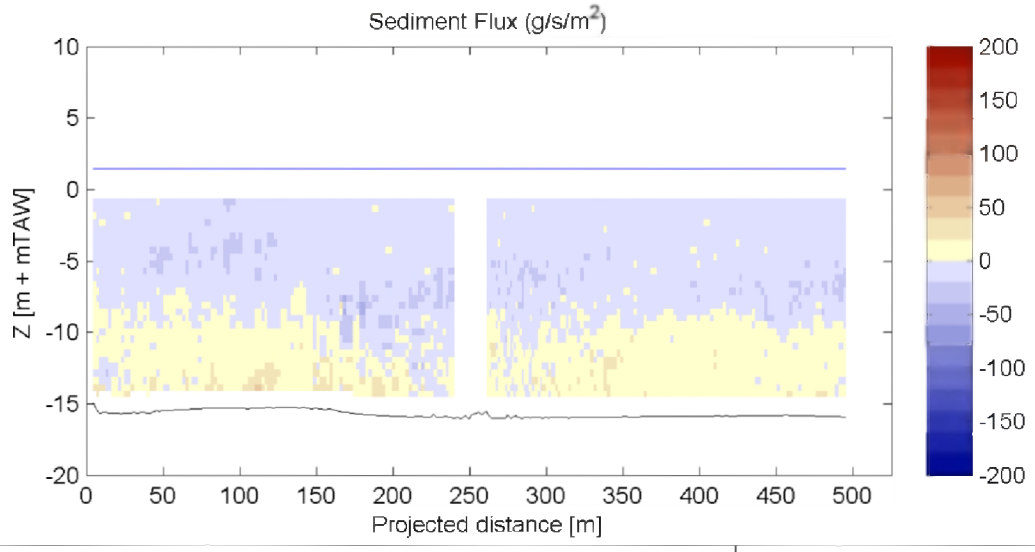
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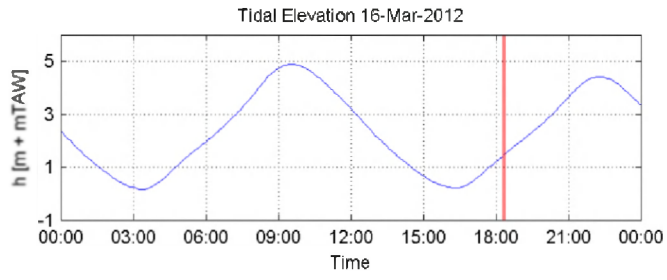
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9082_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

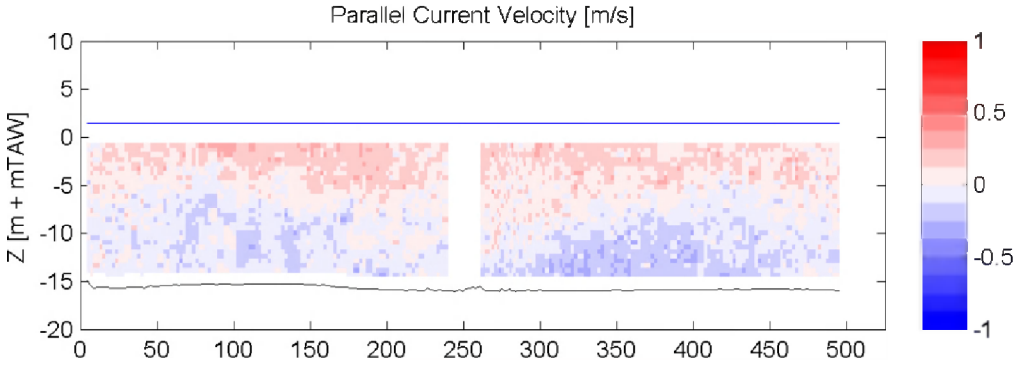
Date / Time [MET] :
16-Mar-2012
18:17 - 18:21

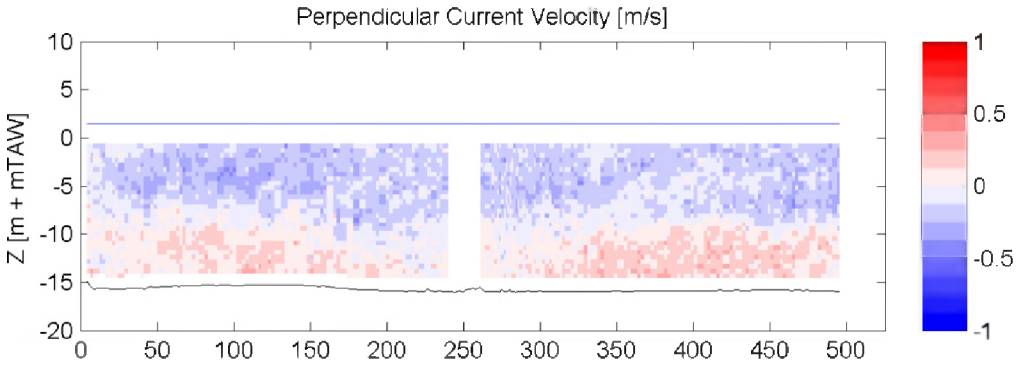
Time after HW [HH:MM]
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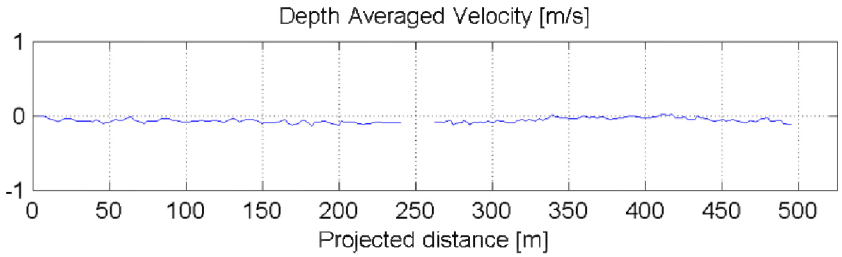
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In association with :
I/RA/11354/10.109/MBO/ANF

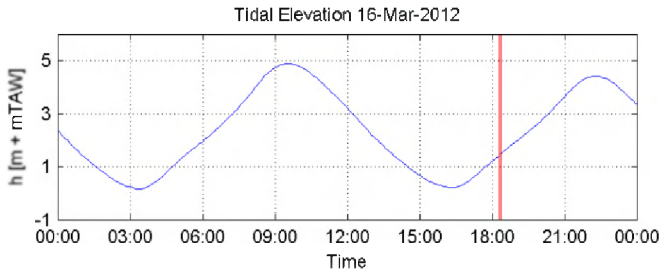
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9082_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

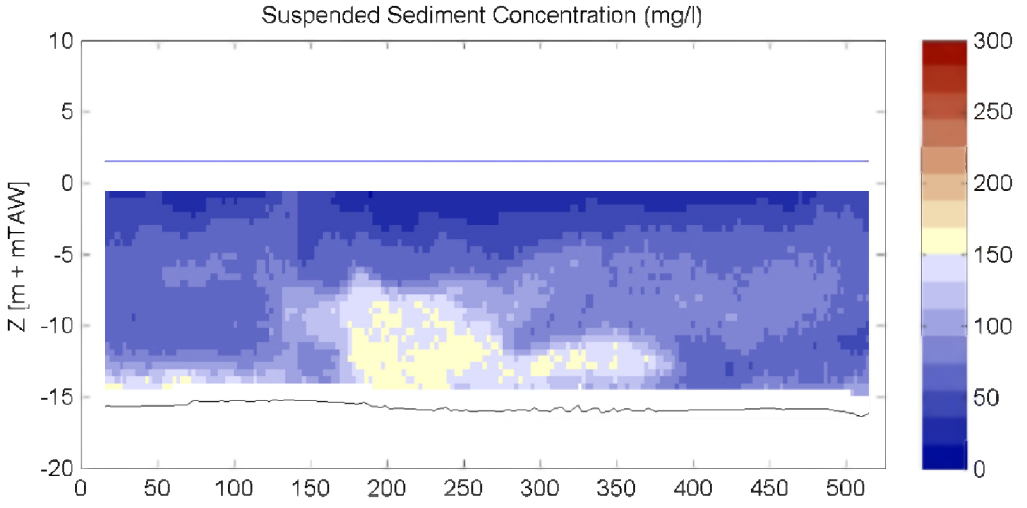
Date / Time [MET] :
16-Mar-2012
18:17 - 18:21

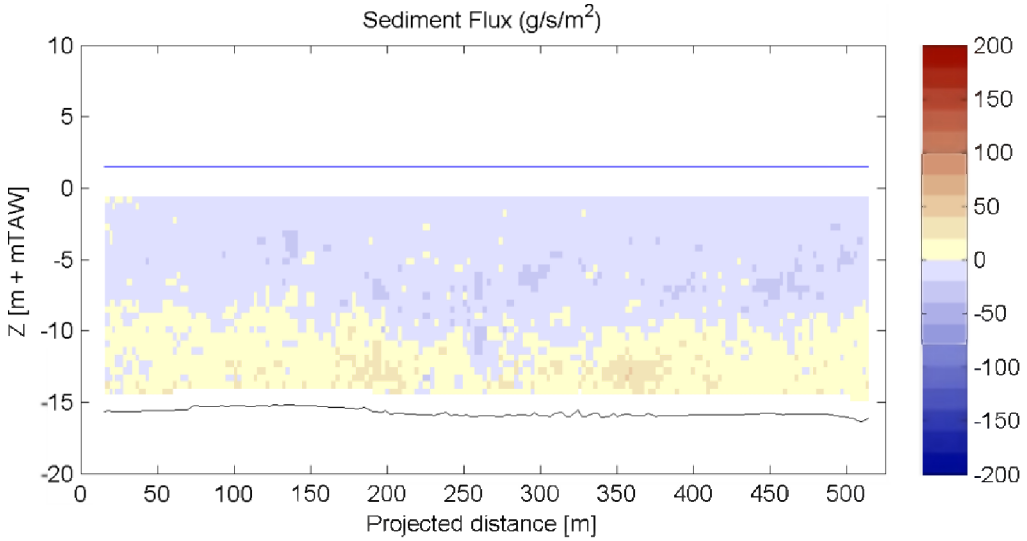
Time after HW [HH:MM]
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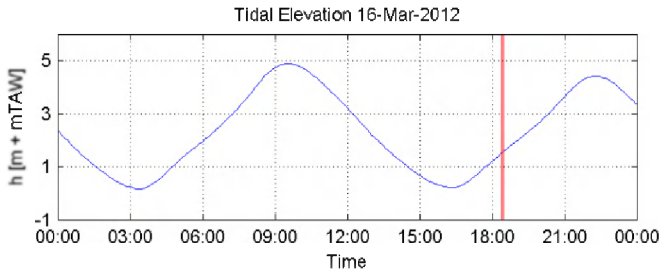
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9083_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

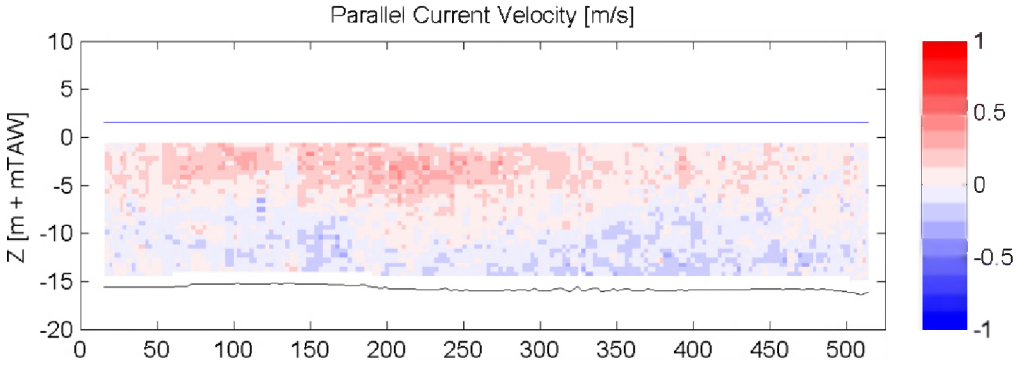
Date / Time [MET] :
16-Mar-2012
18:23 - 18:27

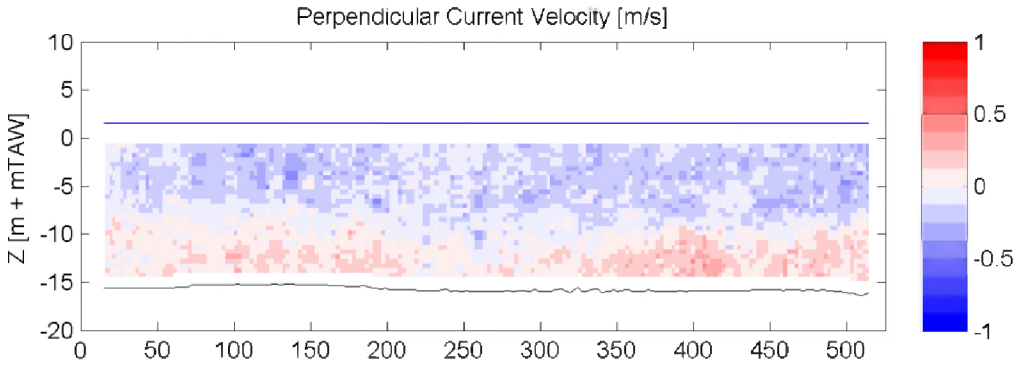
Time after HW [HH:MM]
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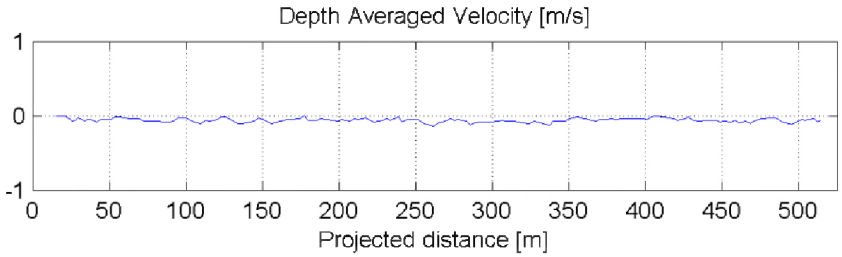
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

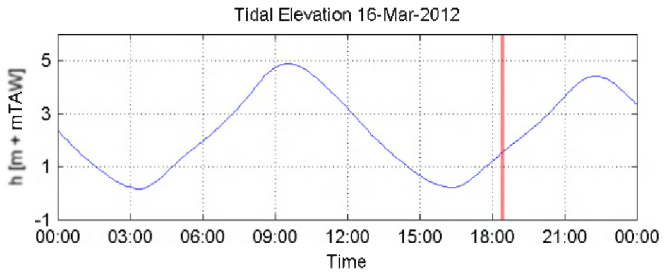
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9083_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

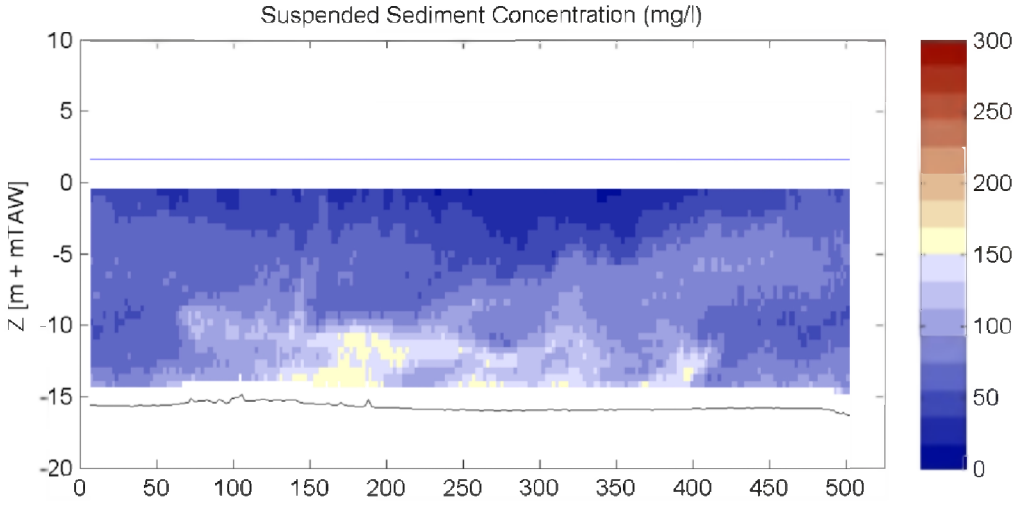
Date / Time [MET] :
16-Mar-2012
18:23 - 18:27

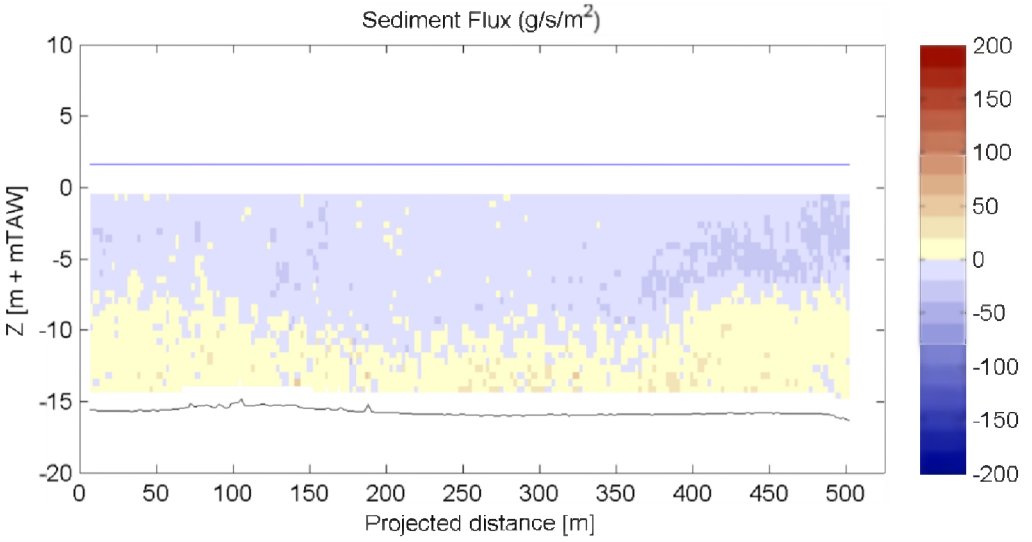
Time after HW [HH:MM]
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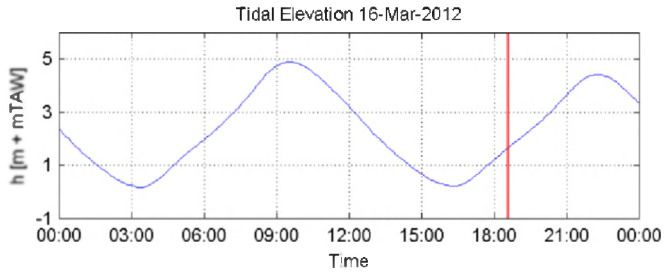
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9085_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

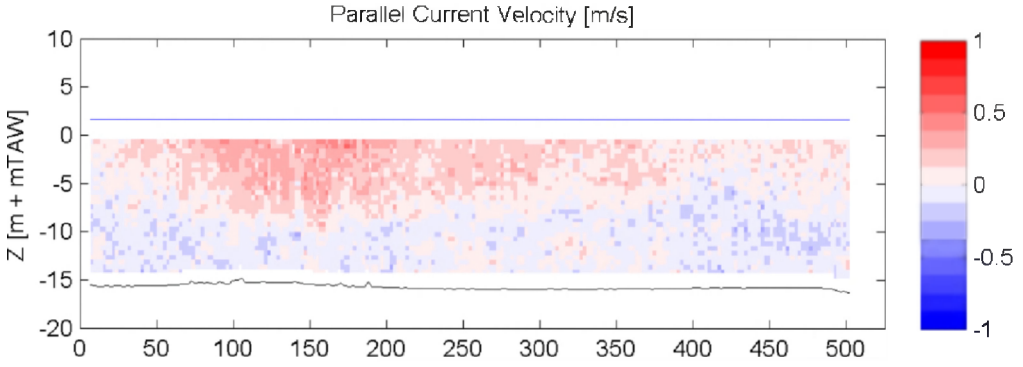
Date / Time [MET] :
16-Mar-2012
18:32 - 18:36

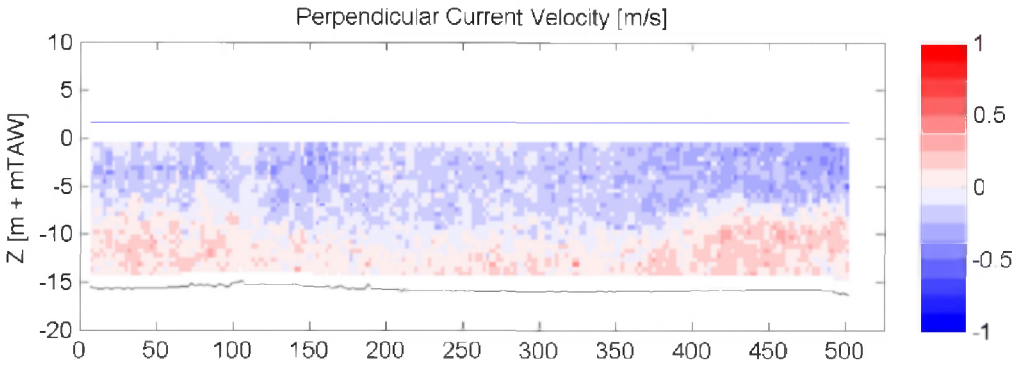
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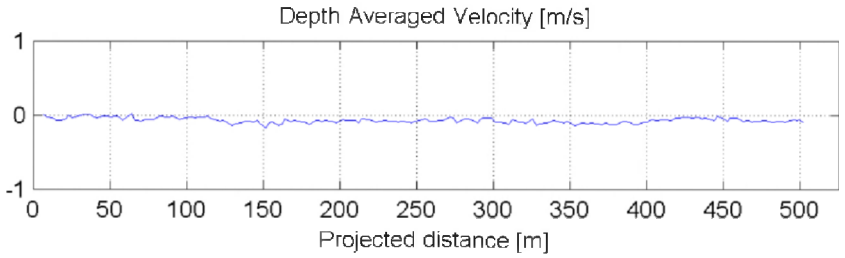
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

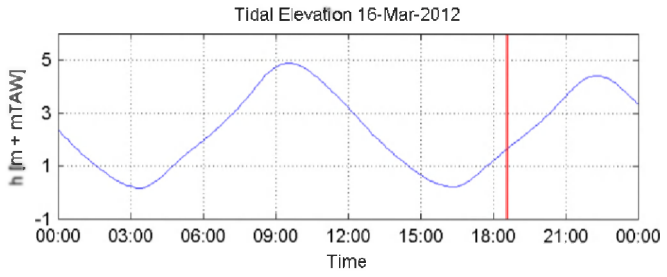
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9085_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

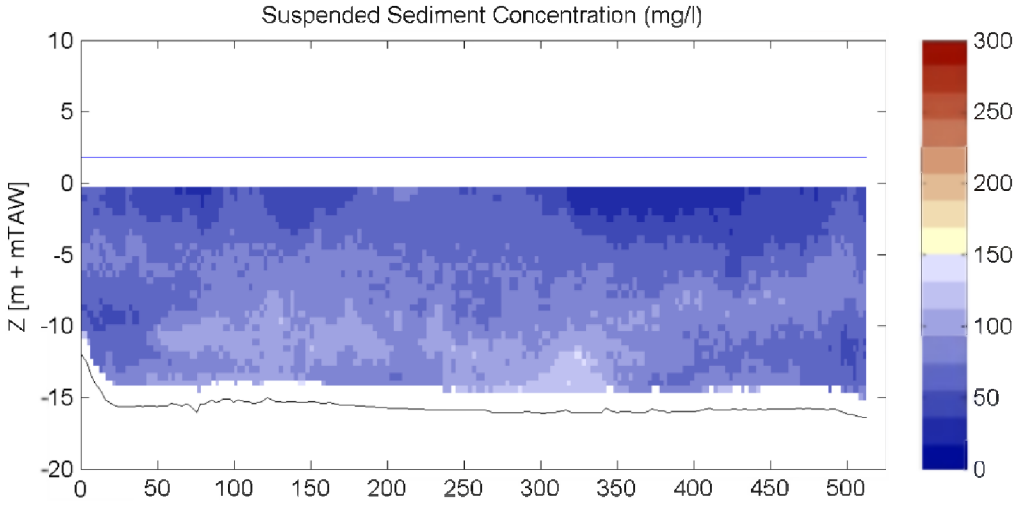
Date / Time [MET]
16-Mar-2012
18:32 - 18:36

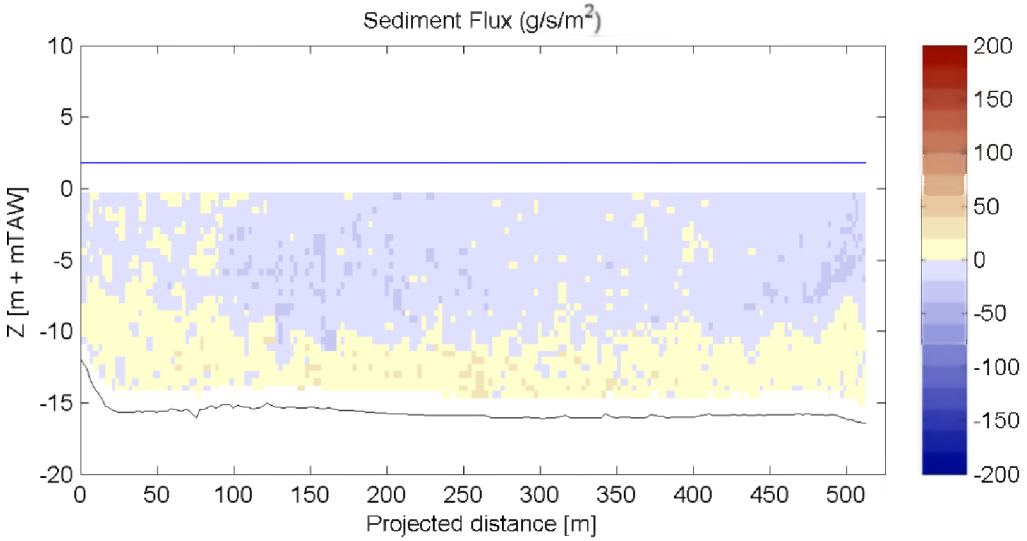
Time after HW [HH:MM]
-3:40

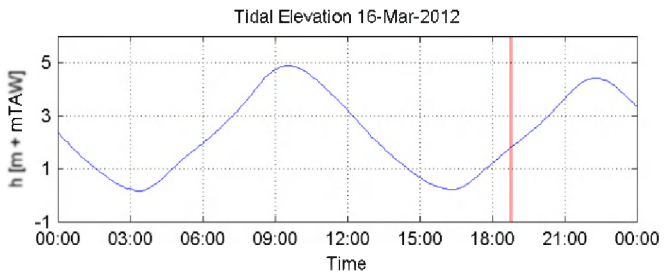
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9087_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

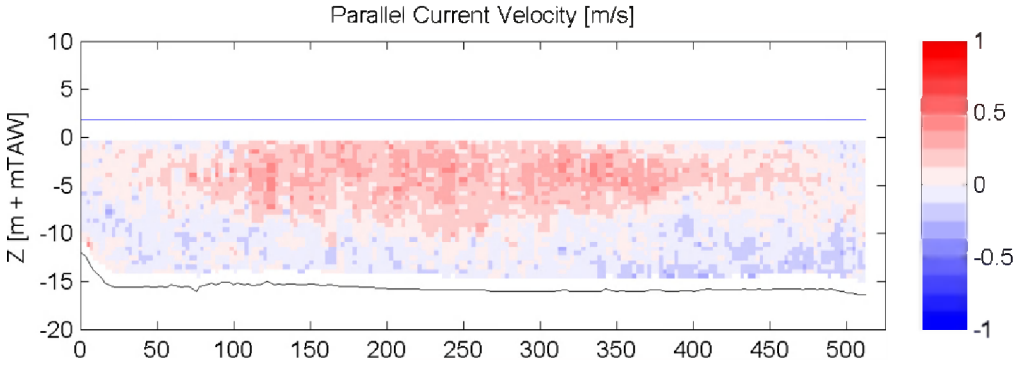
Date / Time [MET] :
16-Mar-2012
18:44 - 18:47

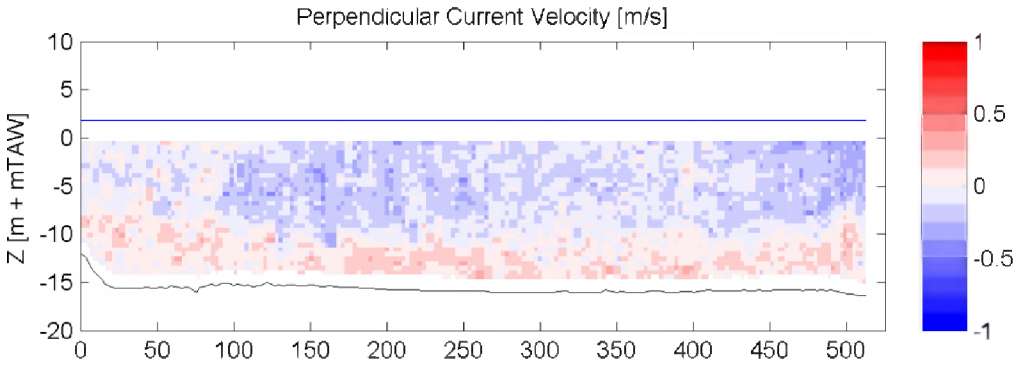
Time after HW [HH:MM]
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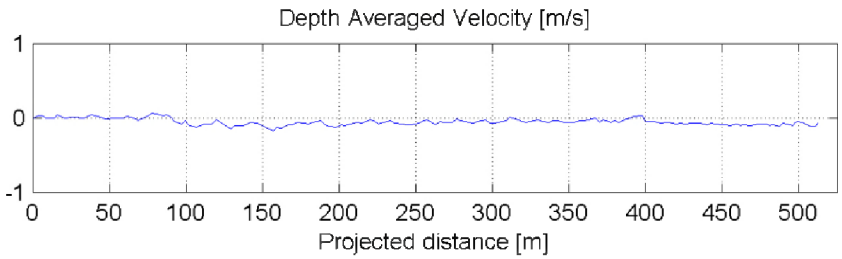
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

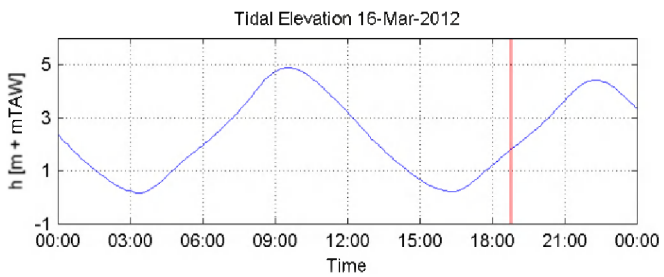
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9087_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

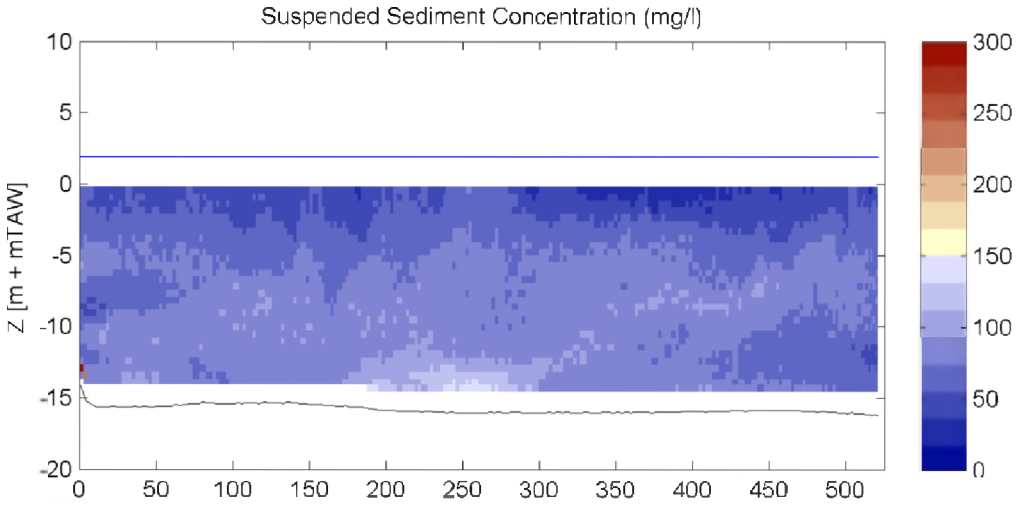
Date / Time [MET] :
16-Mar-2012
18:44 - 18:47

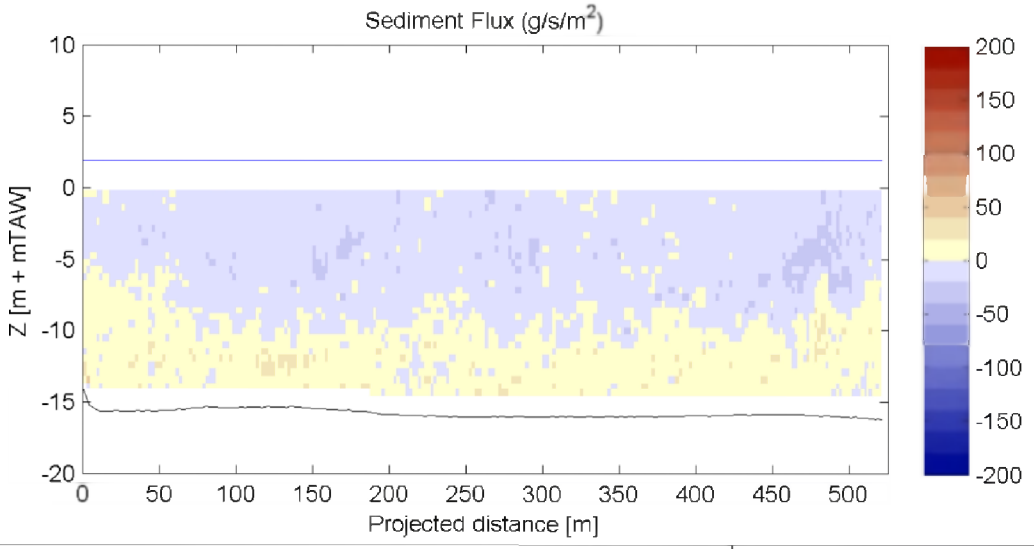
Time after HW [HH:MM]
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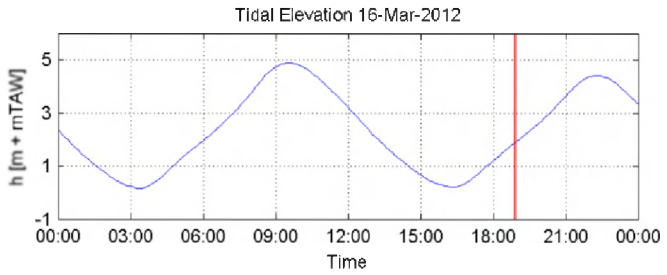
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9088_dgd_Tba_sub2.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

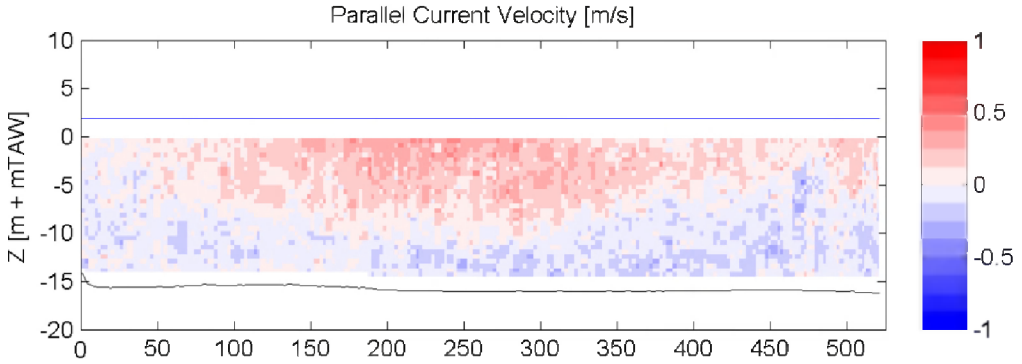
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16-Mar-2012
18:53 - 18:57

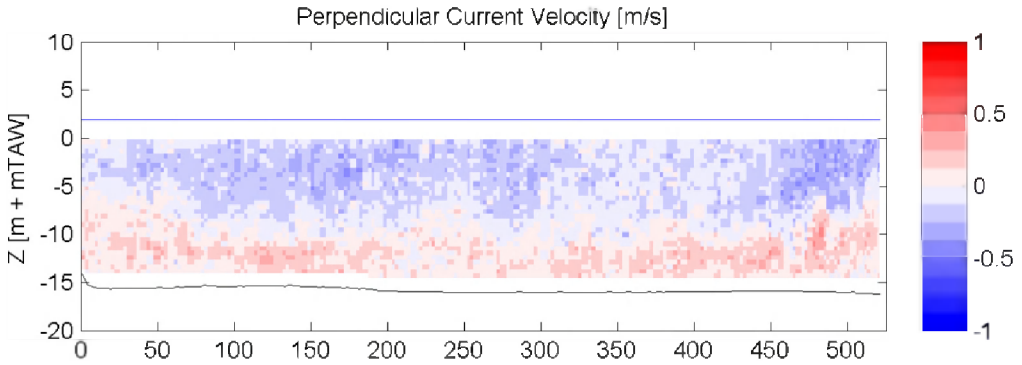
Time after HW [HH:MM]
-3:19

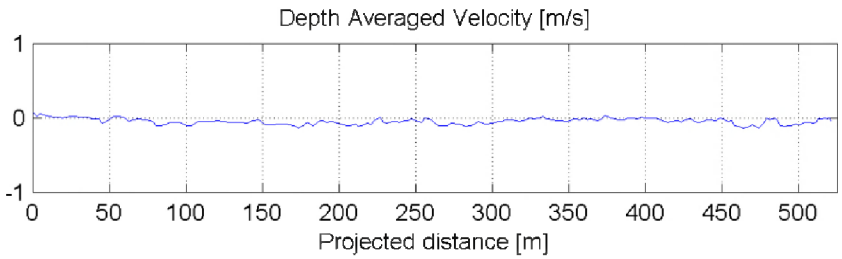
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

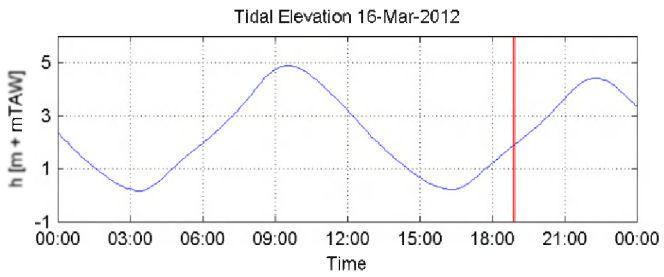
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9088_dgd_Tba_sub2.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

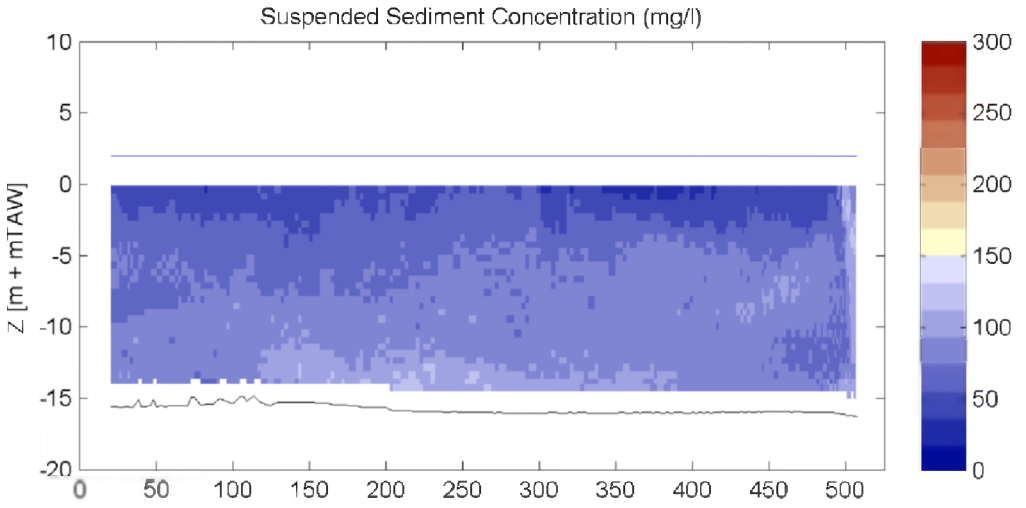
Date / Time [MET] :
16-Mar-2012
18:53 - 18:57

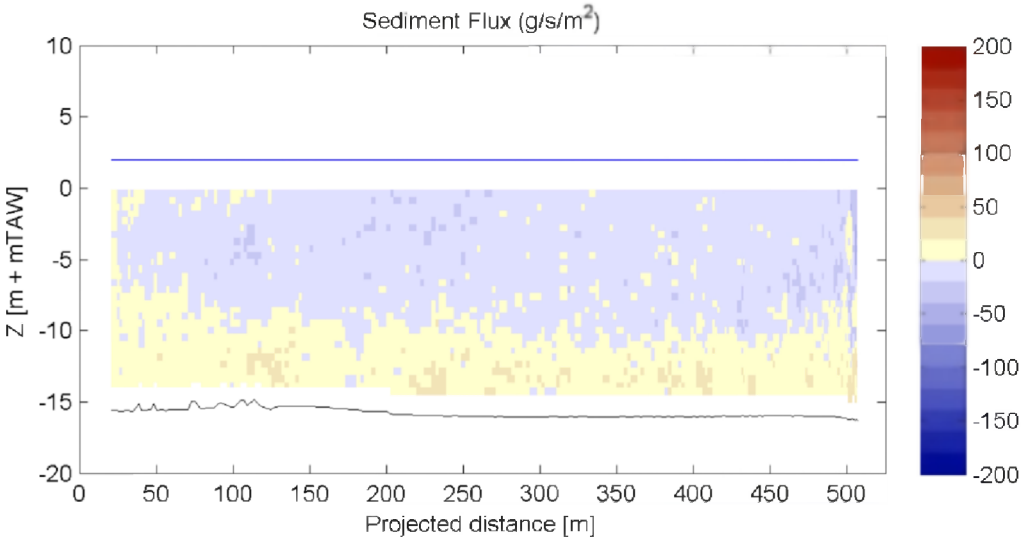
Time after HW [HH:MM]
-3:19

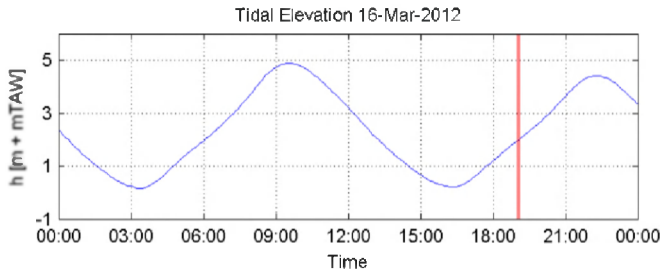
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9089_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

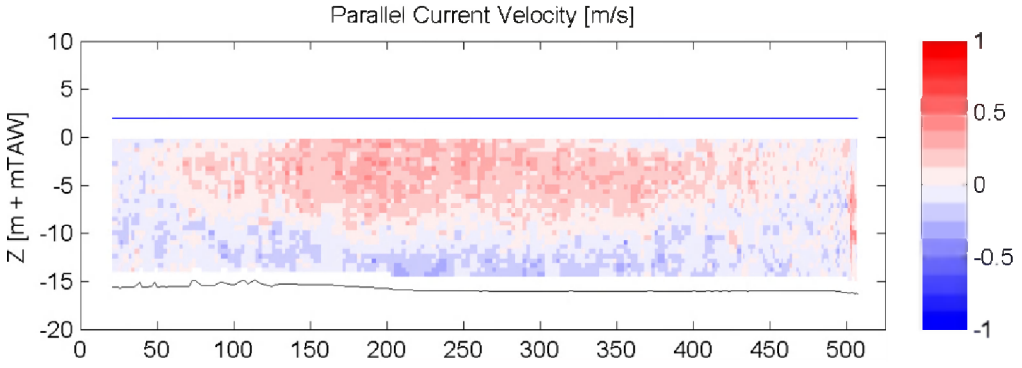
Date / Time [MET]:
16-Mar-2012
19:01 - 19:05

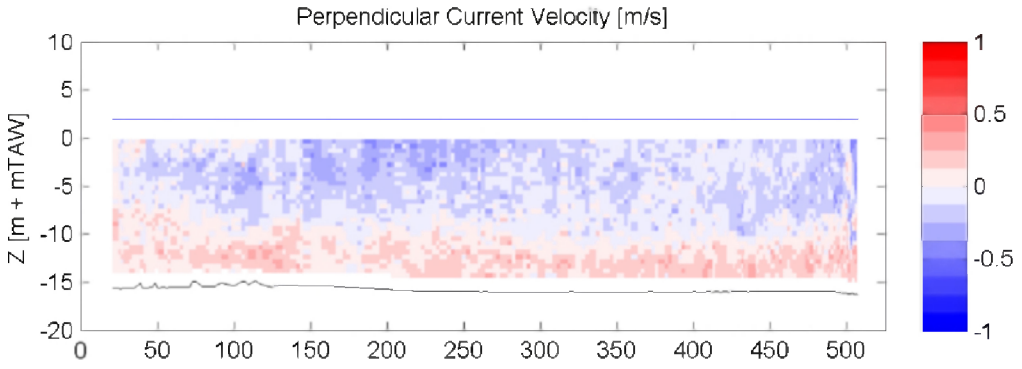
Time after HW [HH:MM]
-3:11

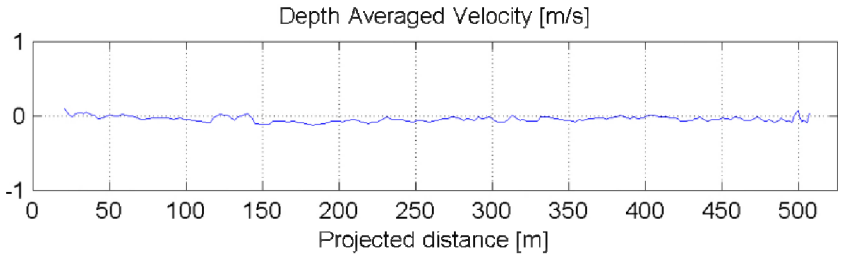
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

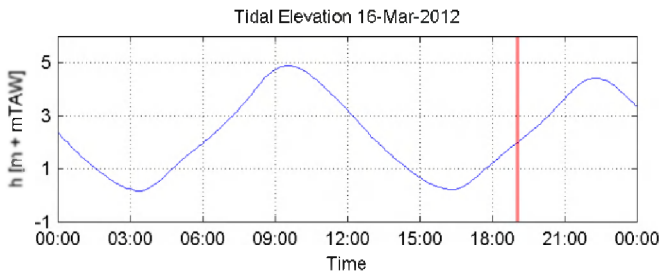
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9089_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

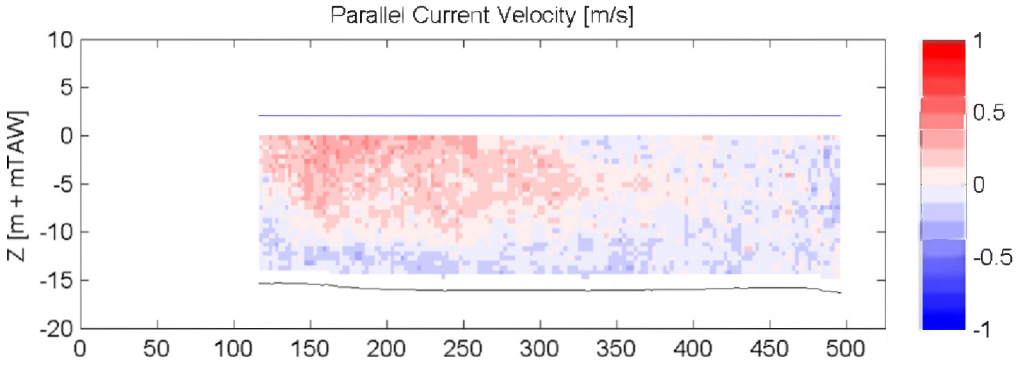
Date / Time [MET] :
16-Mar-2012
19:01 - 19:05

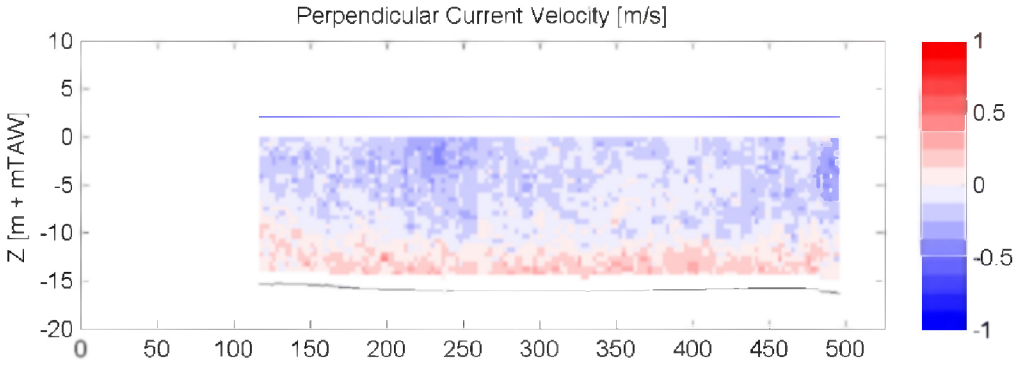
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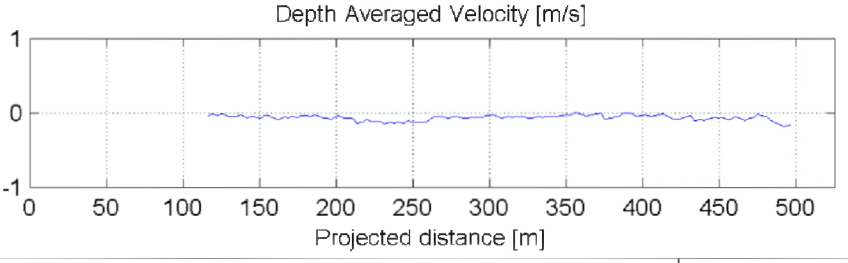
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

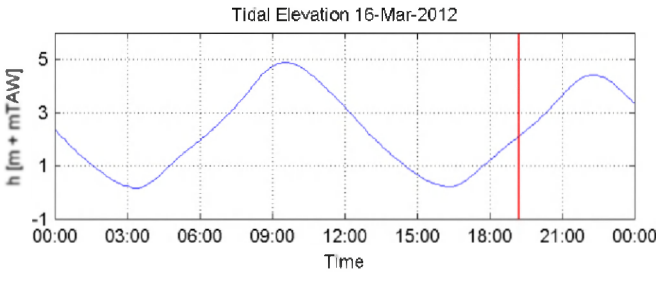
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9090_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

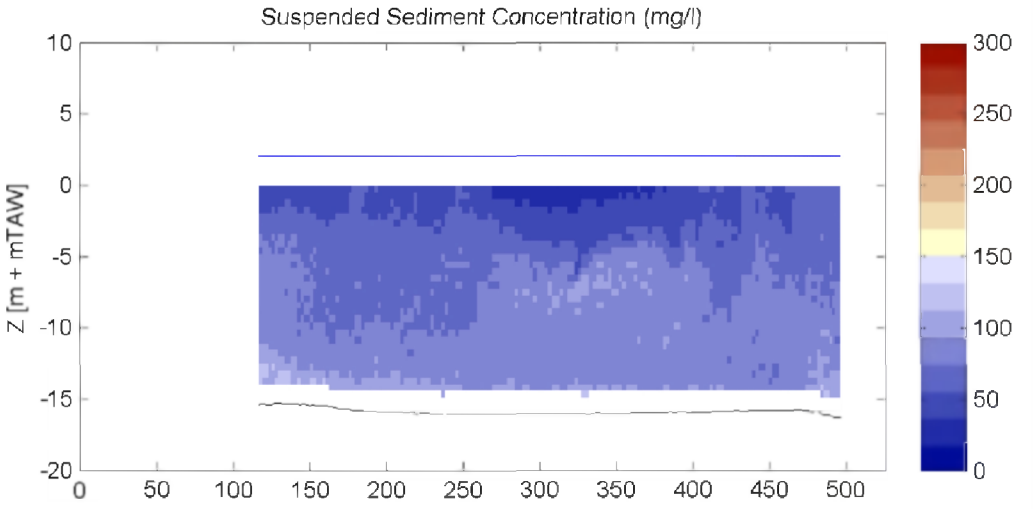
Date / Time [MET] :
16-Mar-2012
19:10 - 19:13

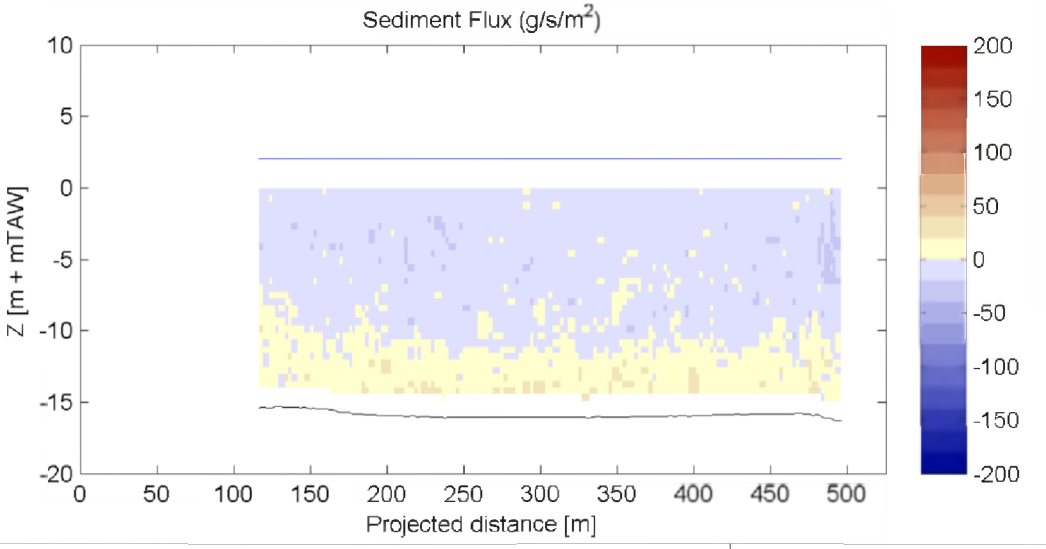
Time after HW [HH:MM]
-3:02

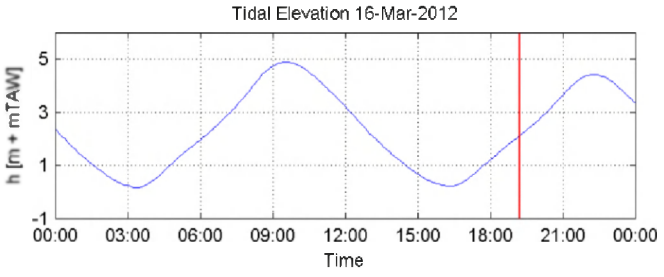
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9090_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

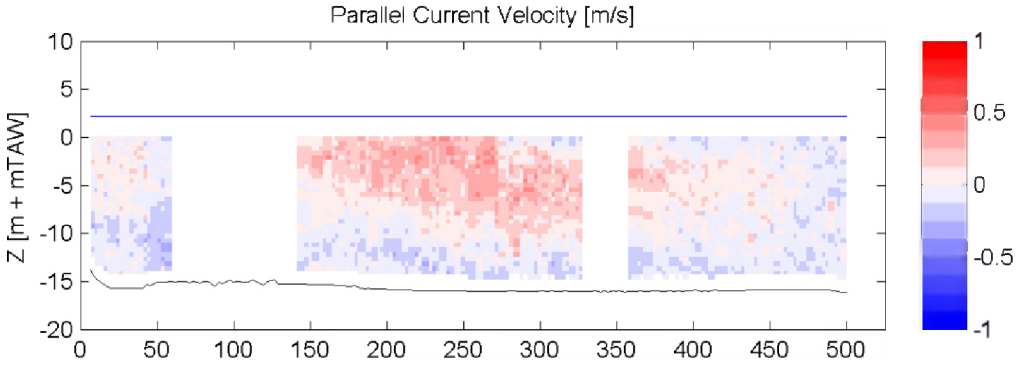
Date / Time [MET]:
16-Mar-2012
19:10 - 19:13

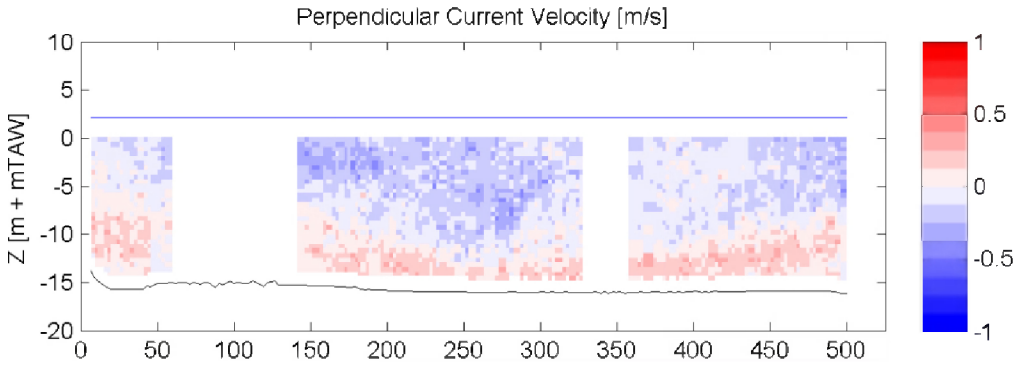
Time after HW [HH:MM]
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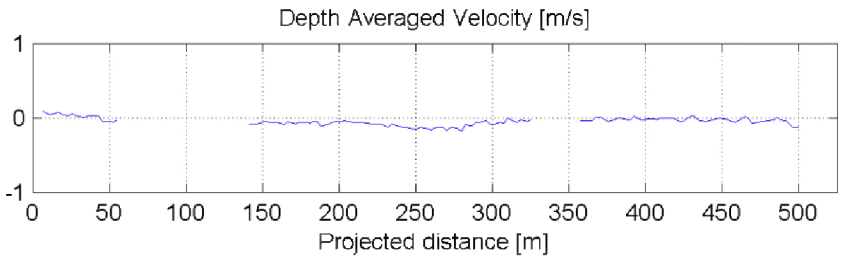
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

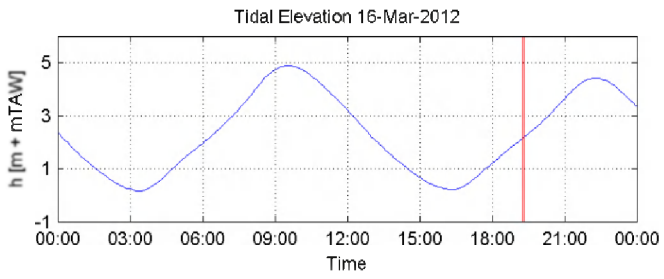
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9091_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

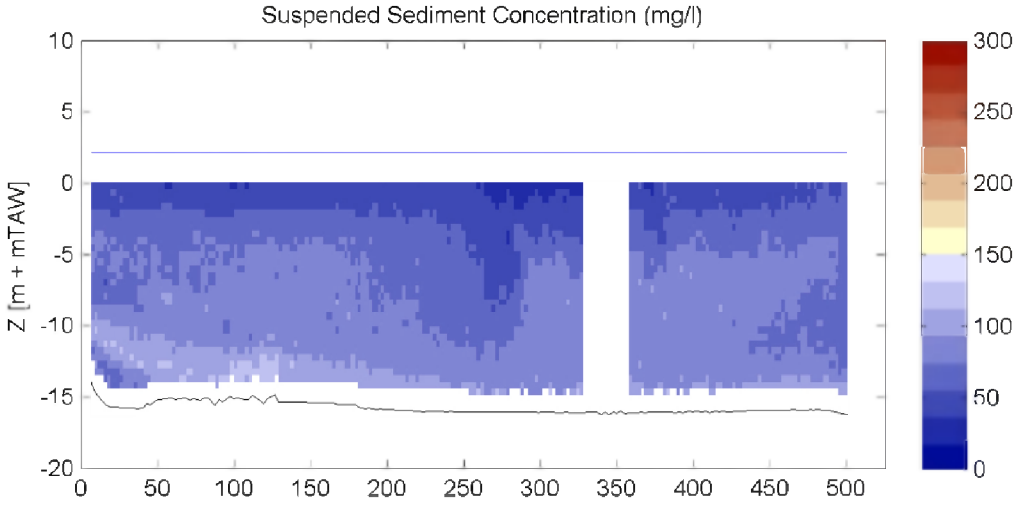
Date / Time [MET] :
16-Mar-2012
19:15 - 19:19

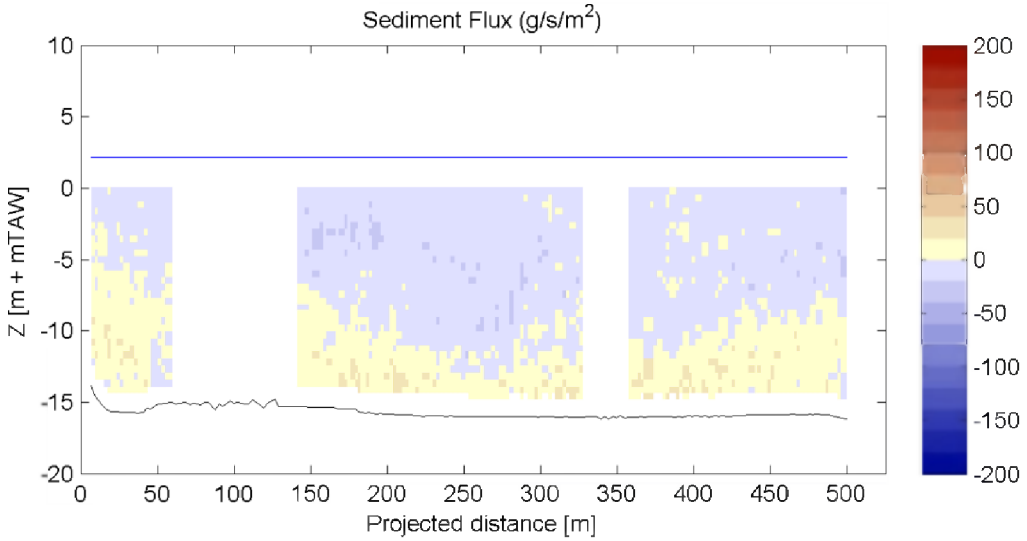
Time after HW [HH:MM]
-2:57

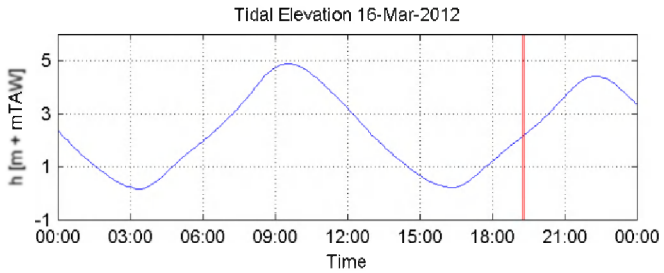
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9091_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

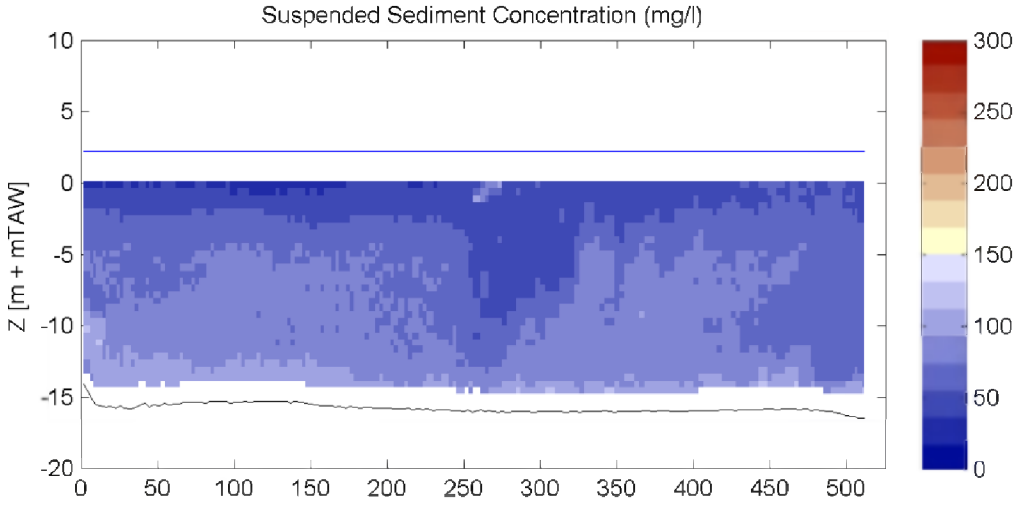
Date / Time [MET] :
16-Mar-2012
19:15 - 19:19

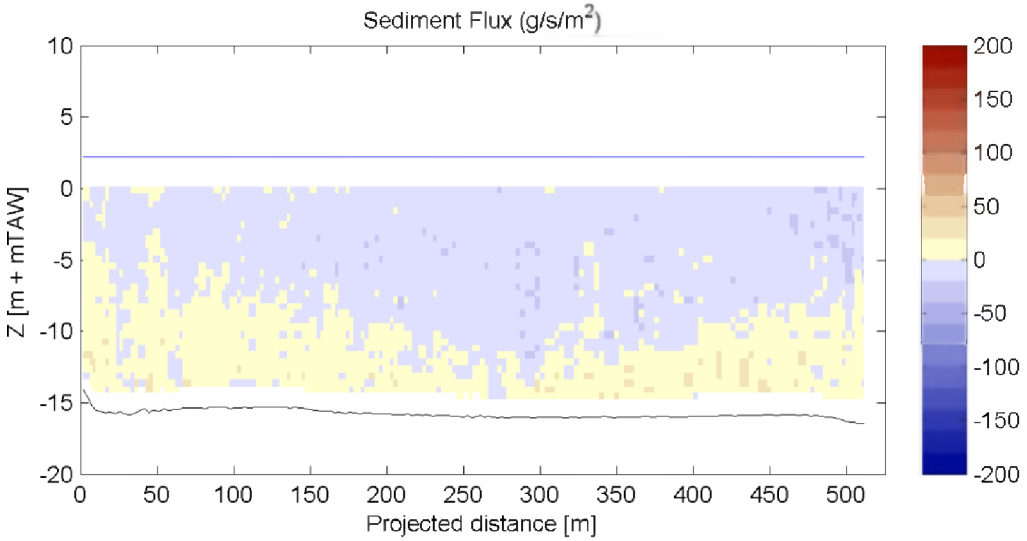
Time after HW [HH:MM]
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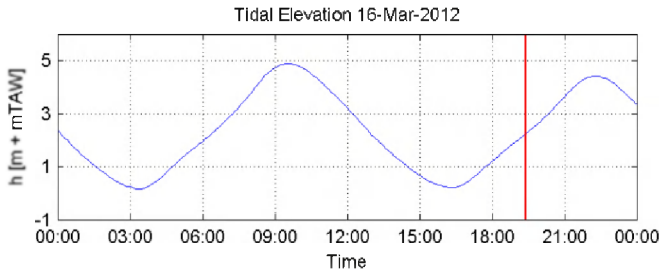
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9092_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
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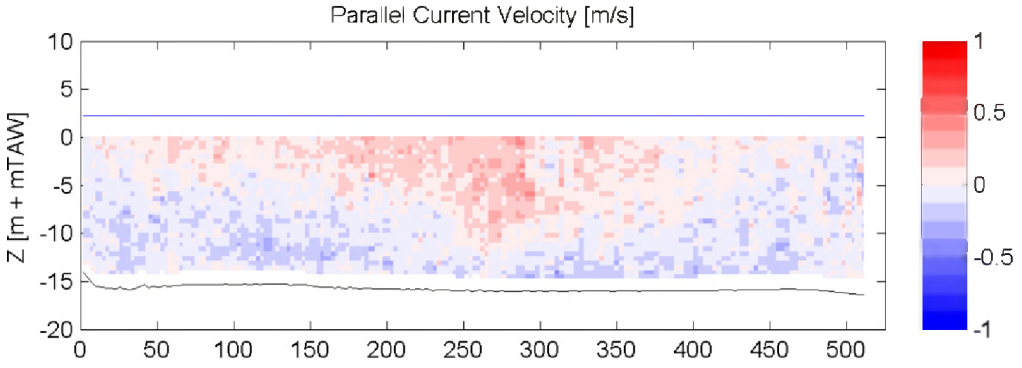
Date / Time [MET] :
16-Mar-2012
19:20 - 19:24

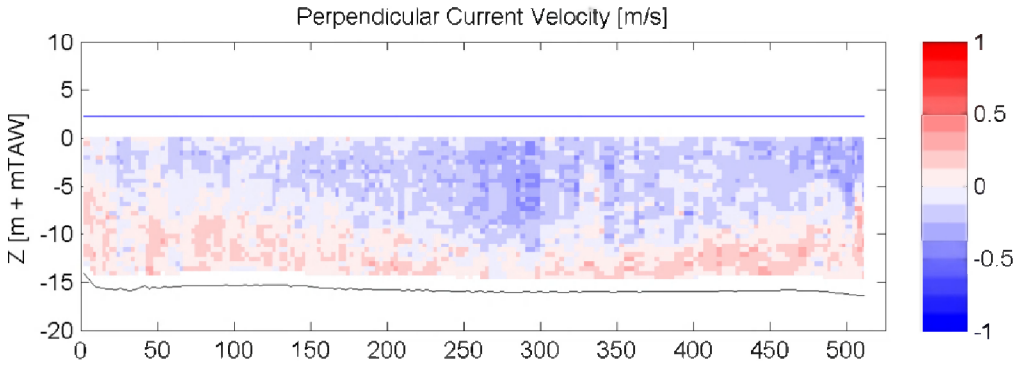
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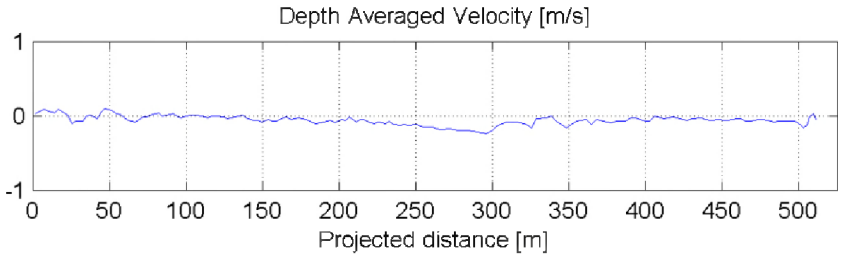
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

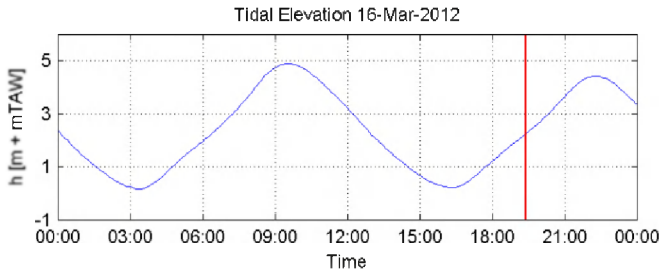
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9092_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
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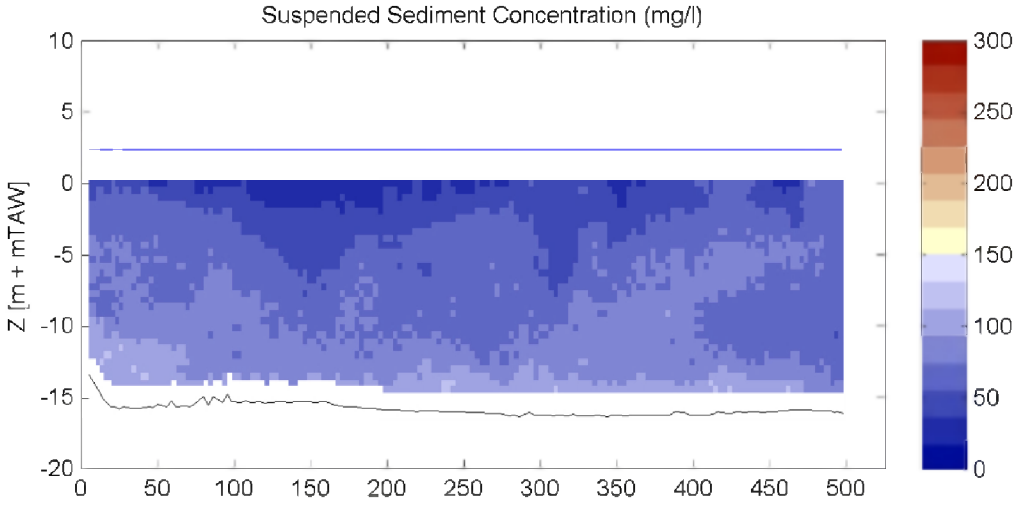
Date / Time [MET] :
16-Mar-2012
19:20 - 19:24

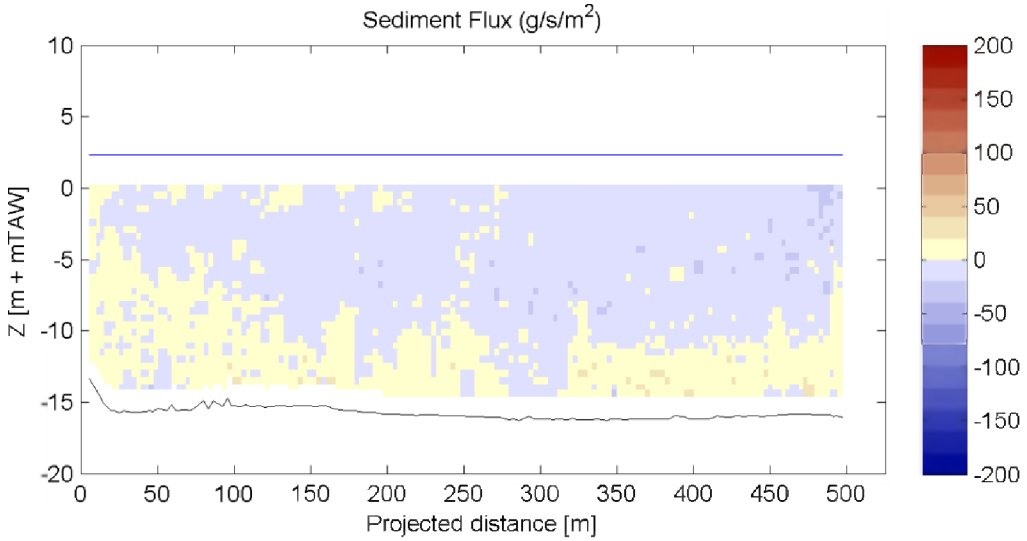
Time after HW [HH:MM]
-2:52

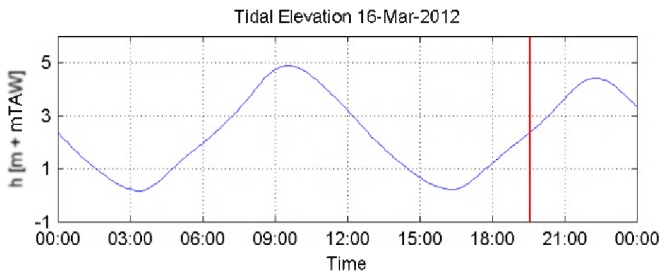
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9094_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

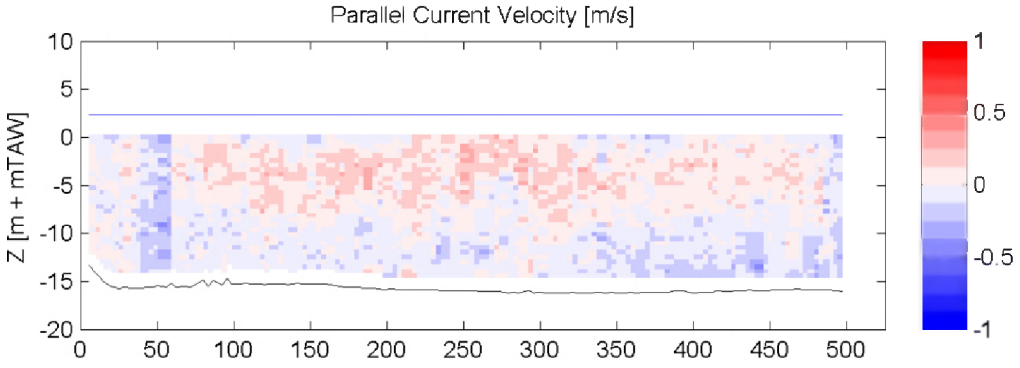
Date / Time [MET] :
16-Mar-2012
19:31 - 19:34

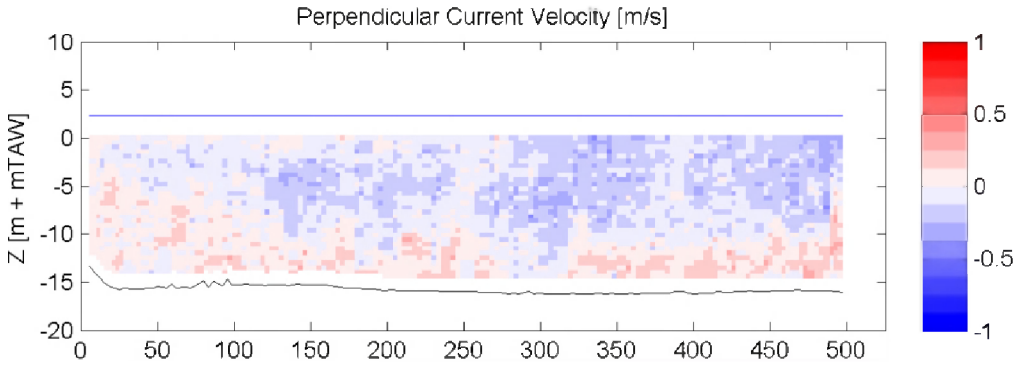
Time after HW [HH:MM]
-2:41

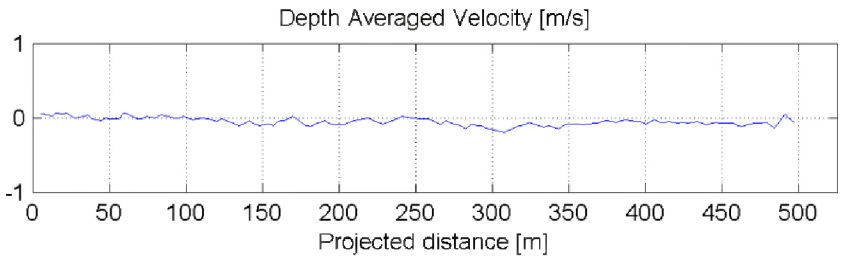
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

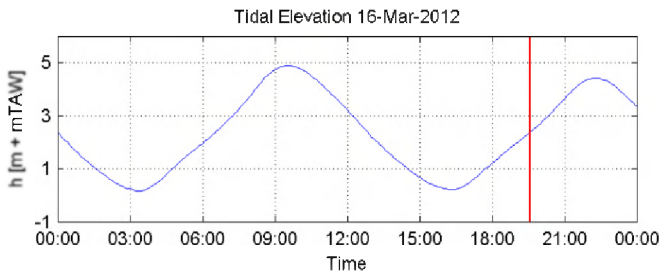
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9094_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

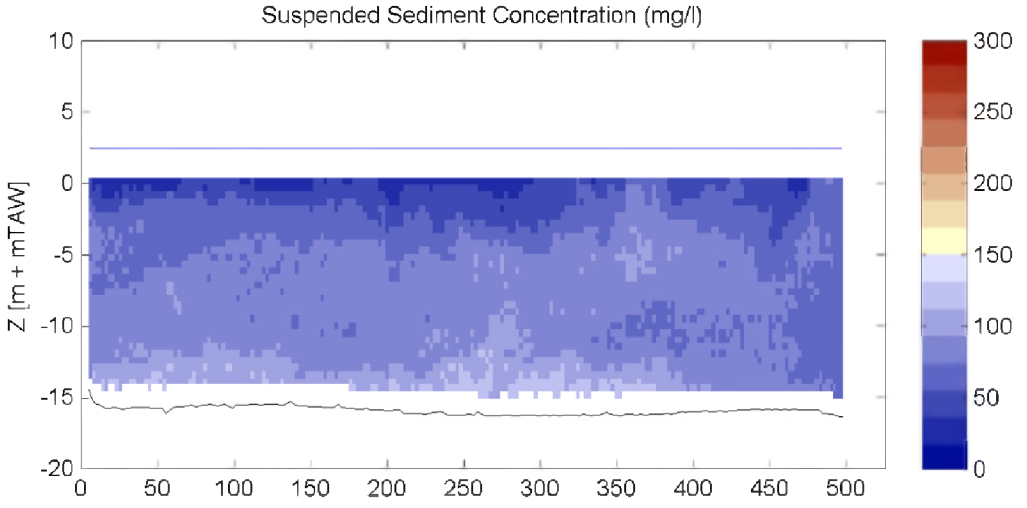
Date / Time [MET] :
16-Mar-2012
19:31 - 19:34

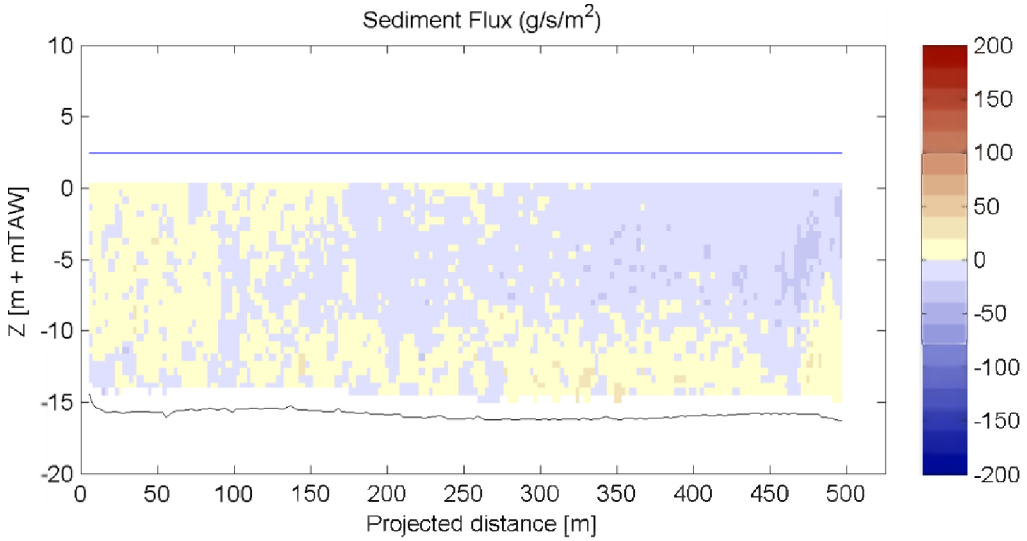
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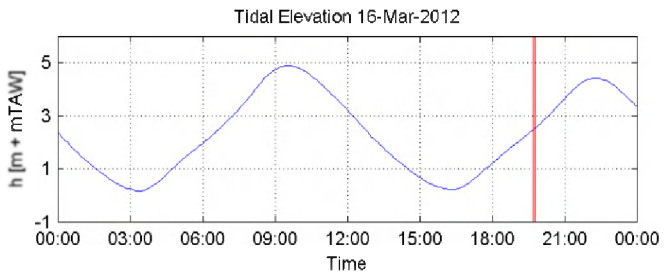
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9096_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

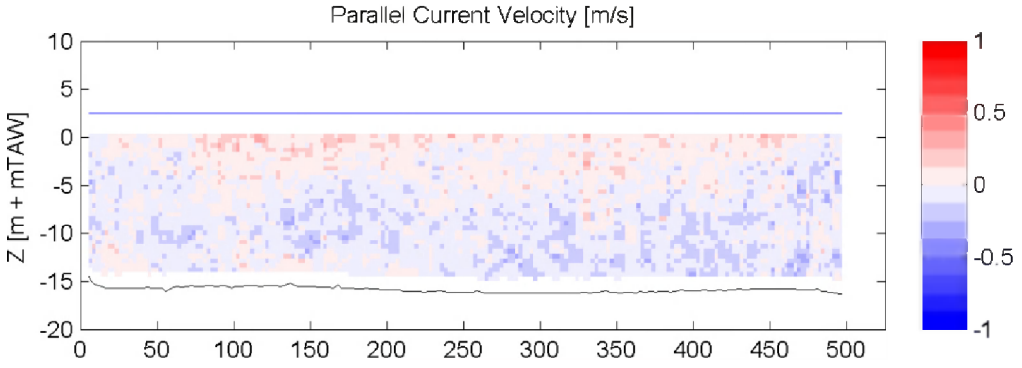
Date / Time [MET] :
16-Mar-2012
19:42 - 19:45

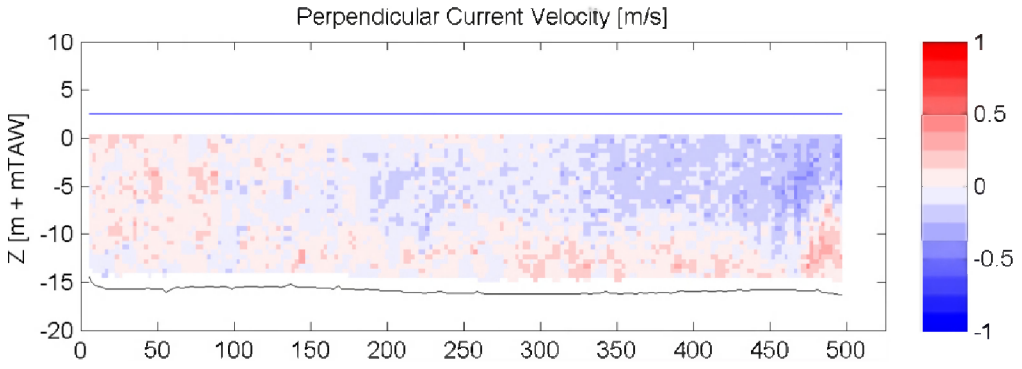
Time after HW [HH:MM]
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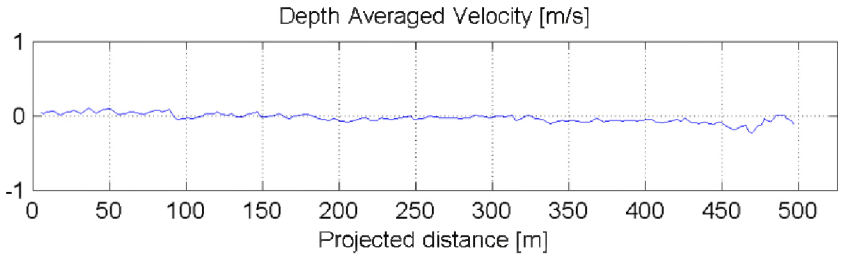
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

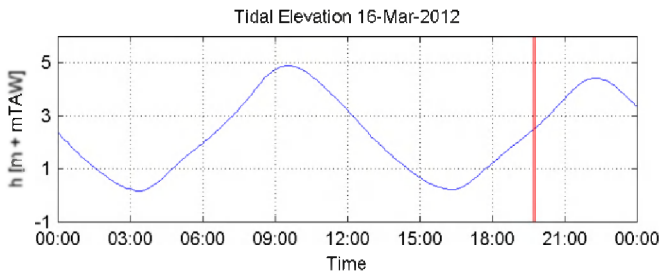
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9096_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

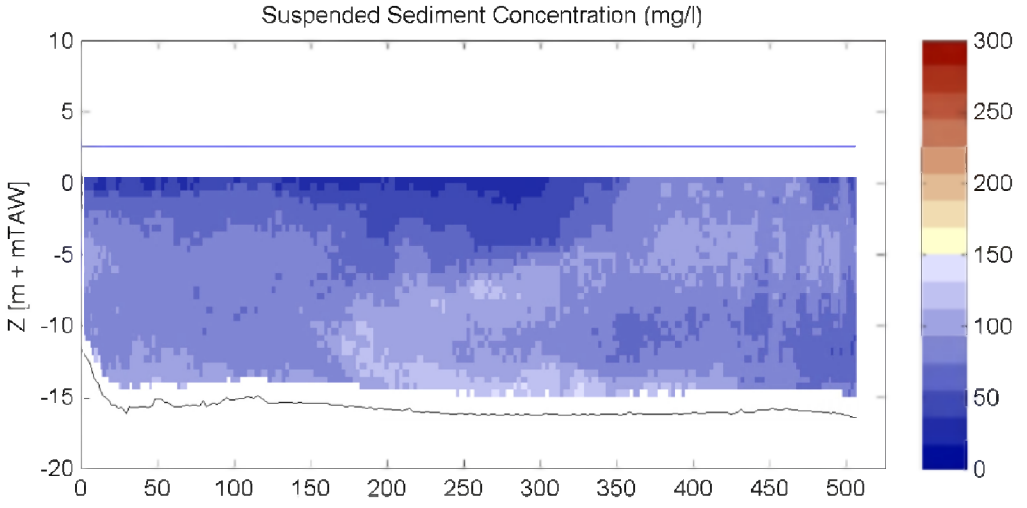
Date / Time [MET] :
16-Mar-2012
19:42 - 19:45

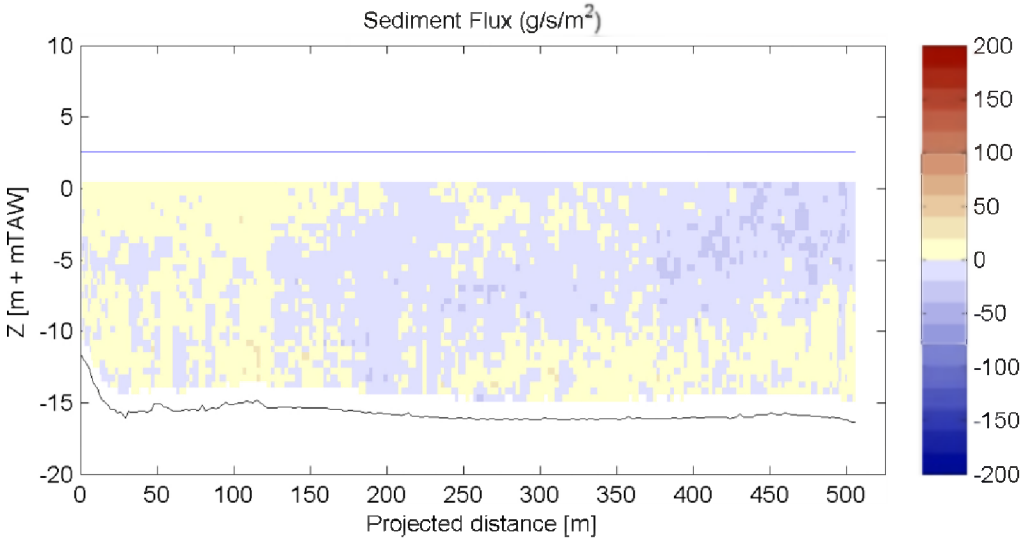
Time after HW [HH:MM]
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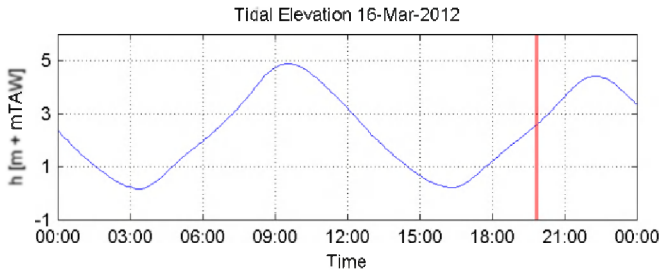
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9097_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

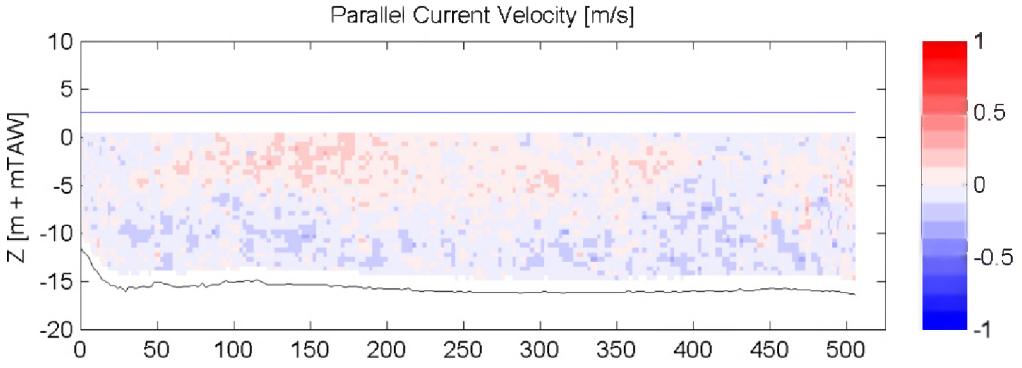
Date / Time [MET] :
16-Mar-2012
19:47 - 19:51

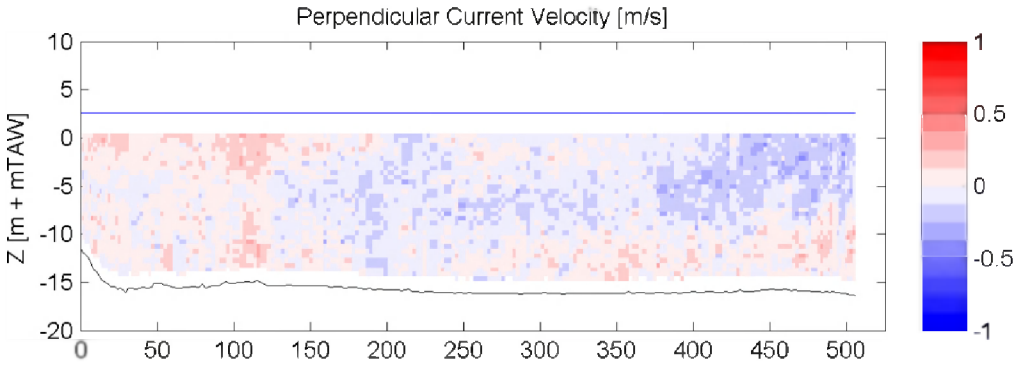
Time after HW [HH:MM]
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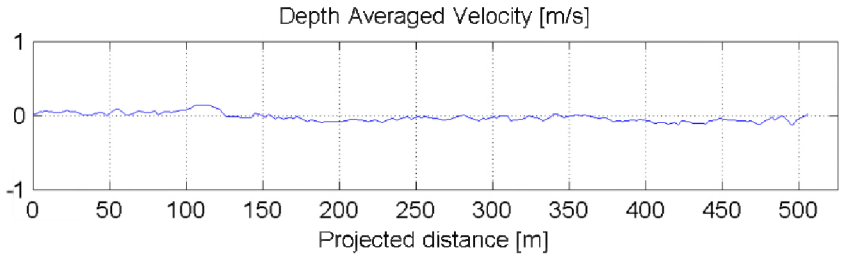
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

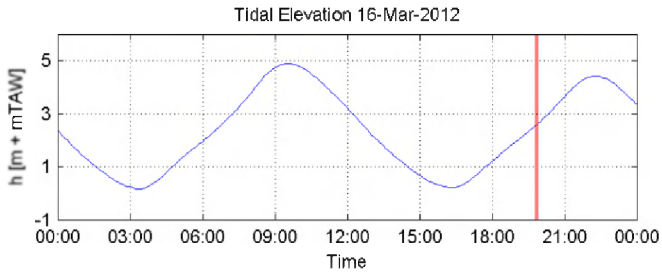
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9097_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

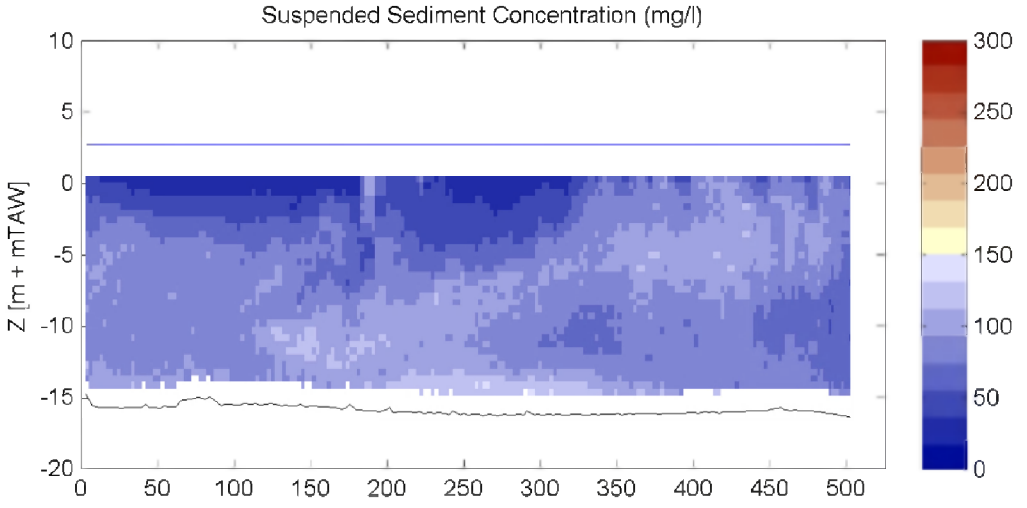
Date / Time [MET] :
16-Mar-2012
19:47 - 19:51

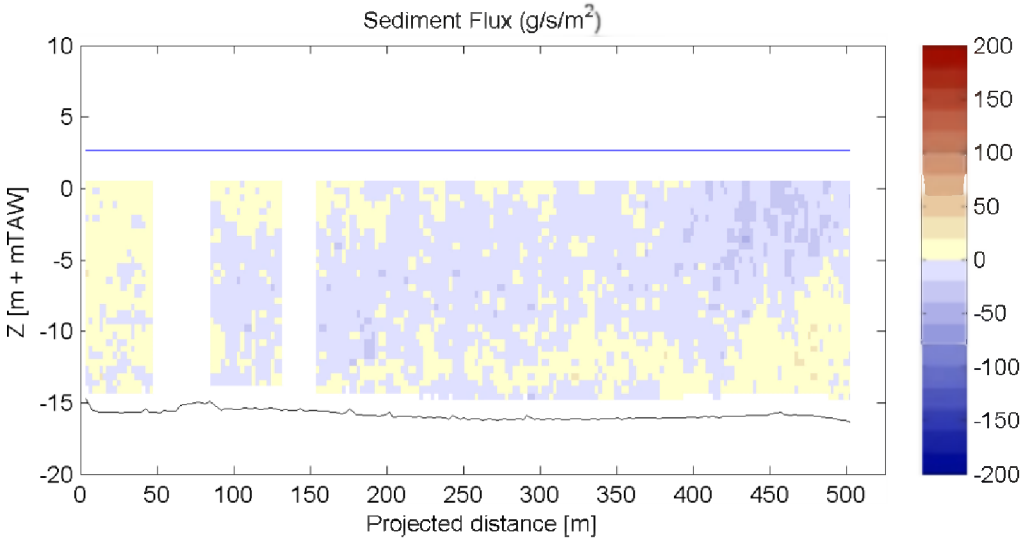
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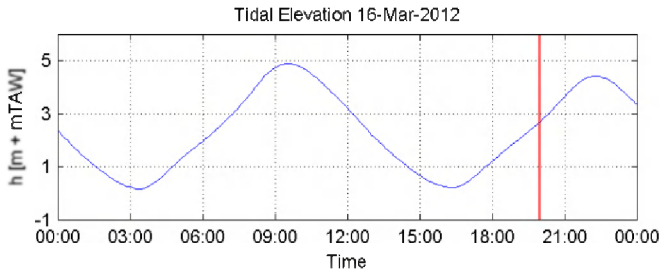
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9098_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

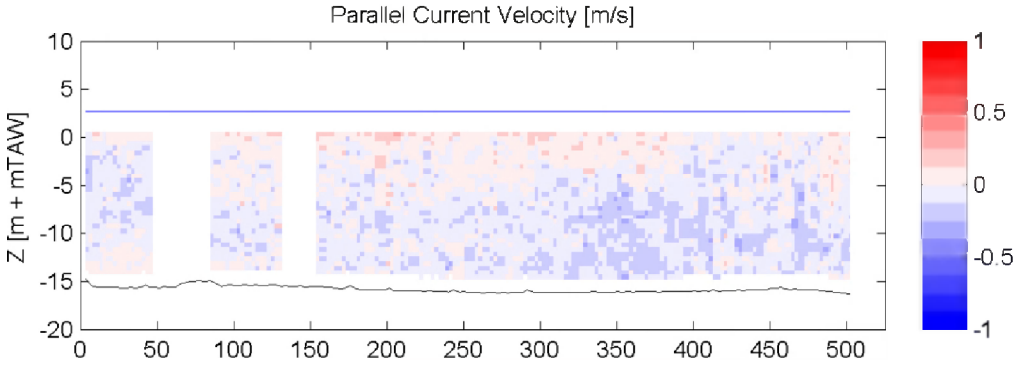
Date / Time [MET] :
16-Mar-2012
19:54 - 19:57

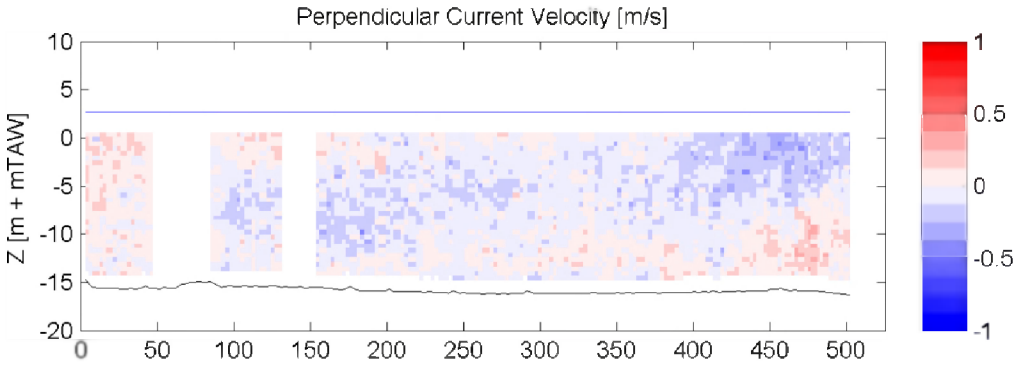
Time after HW [HH:MM]
-2:18

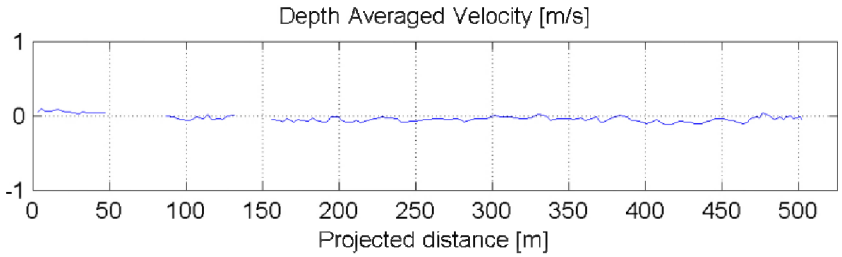
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

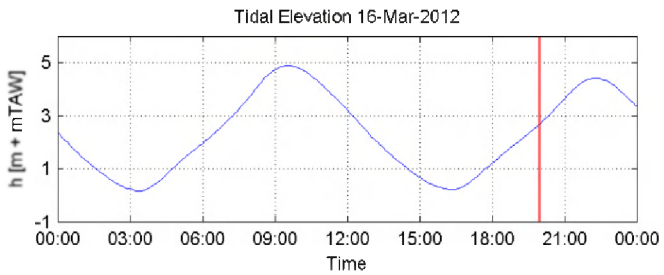
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9098_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

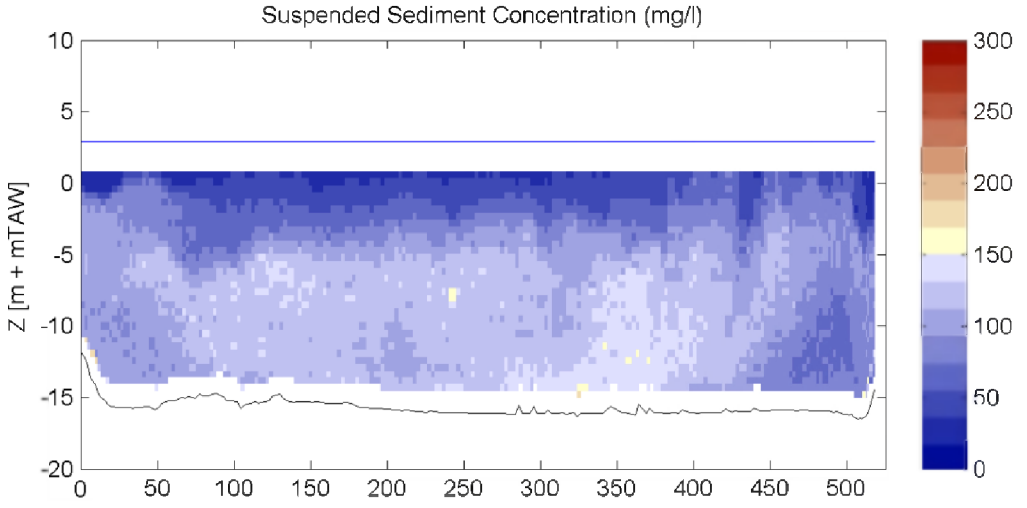
Date / Time [MET] :
16-Mar-2012
19:54 - 19:57

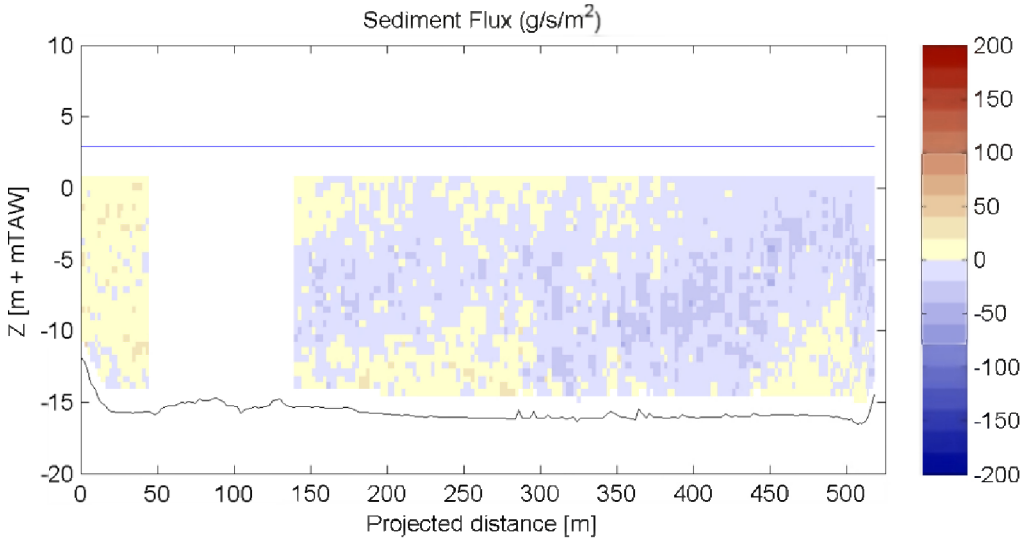
Time after HW [HH:MM]
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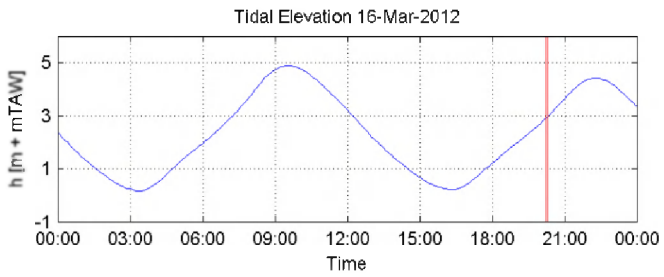
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9101_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

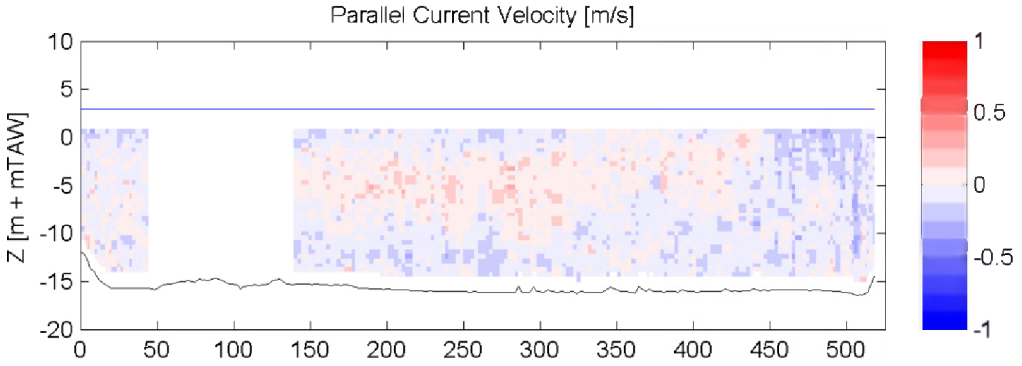
Date / Time [MET] :
16-Mar-2012
20:13 - 20:17

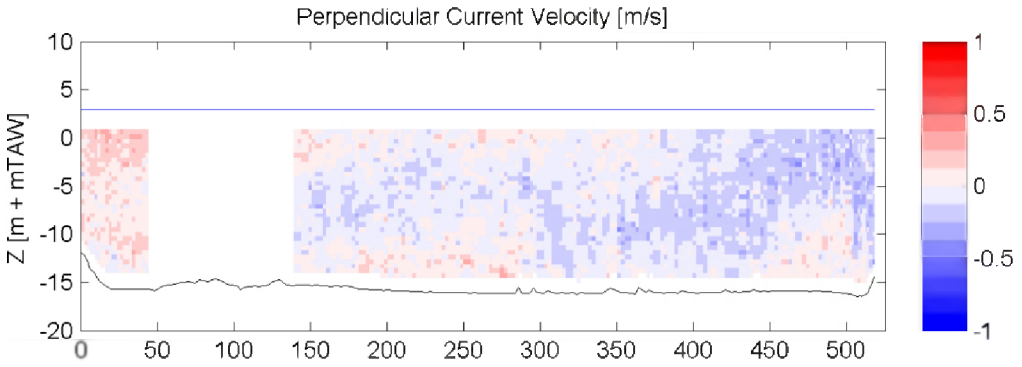
Time after HW [HH:MM]
-1:59

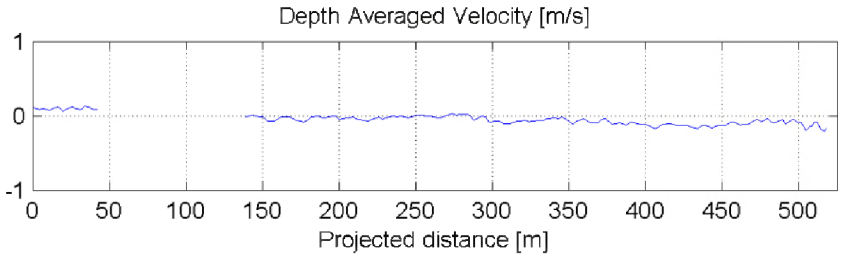
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In association with :
I/RA/11354/10.109/MBO/ANF

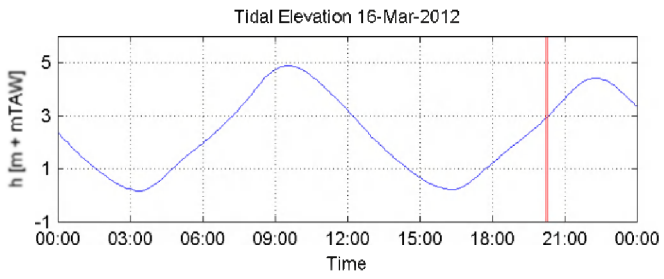
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9101_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
20:13 - 20:17

Time after HW [HH:MM]
-1:59

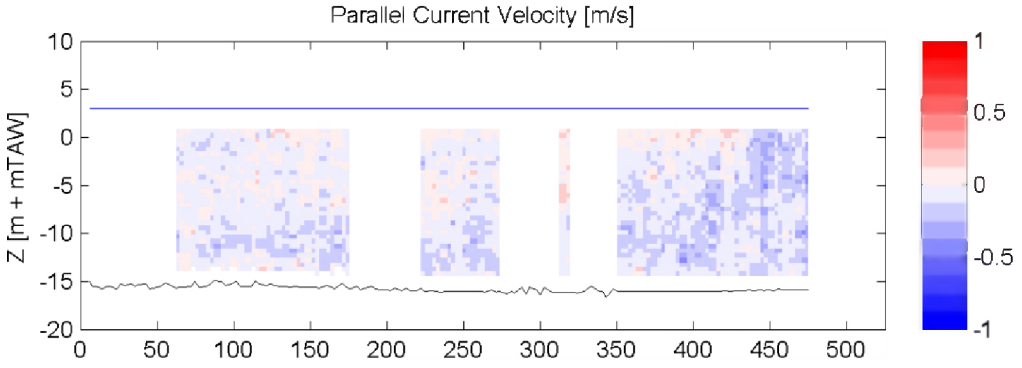
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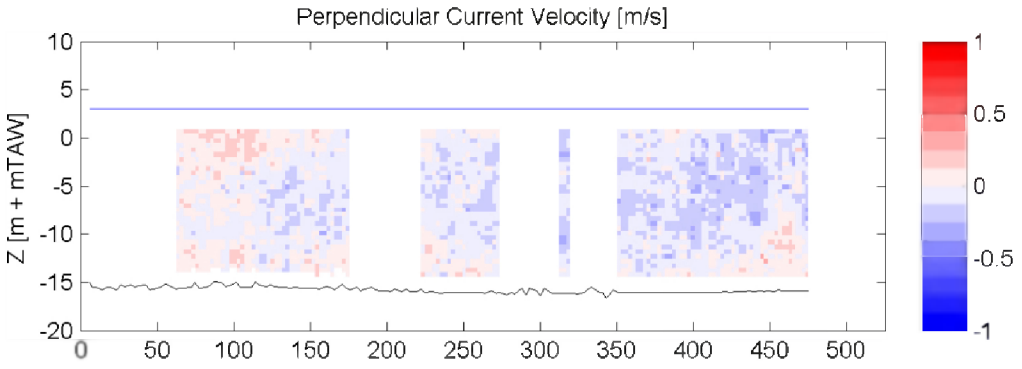
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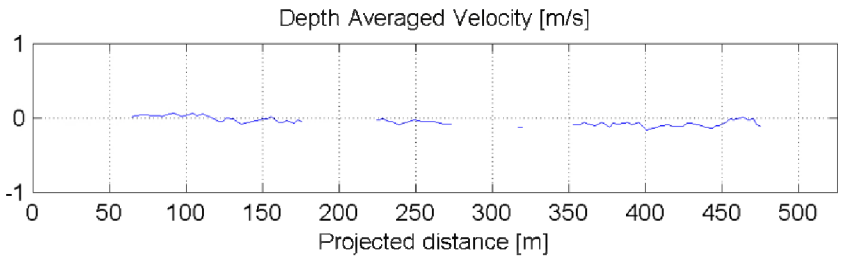
I/RA/11354/10.109/MBO/ANF

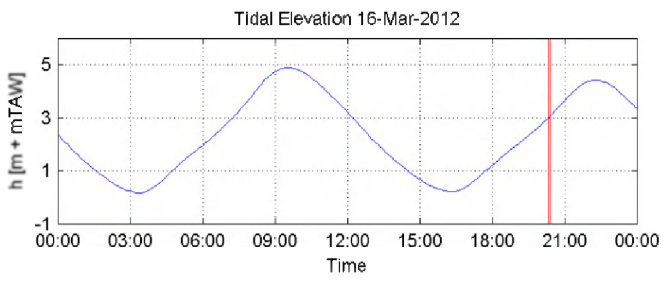
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9102_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
20:20 - 20:23

Time after HW [HH:MM]
-1:52

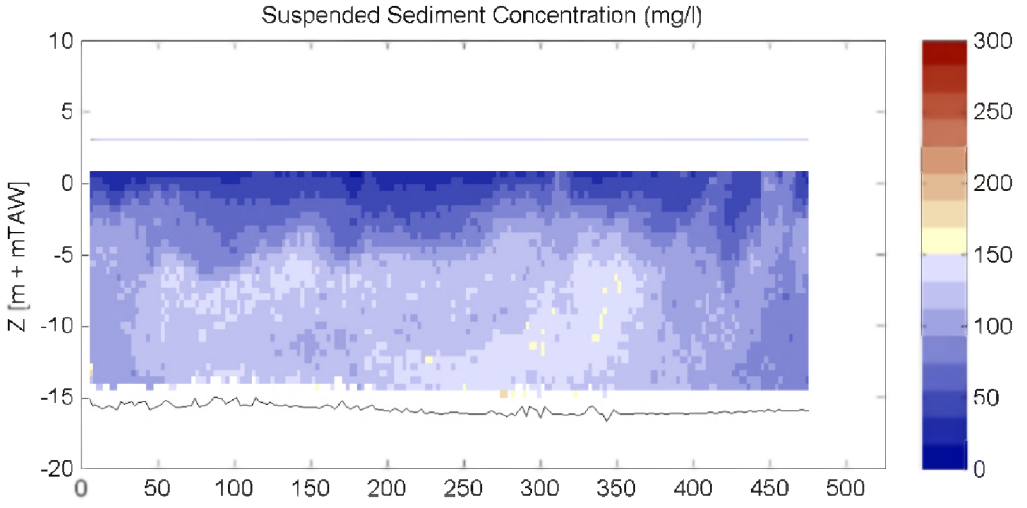
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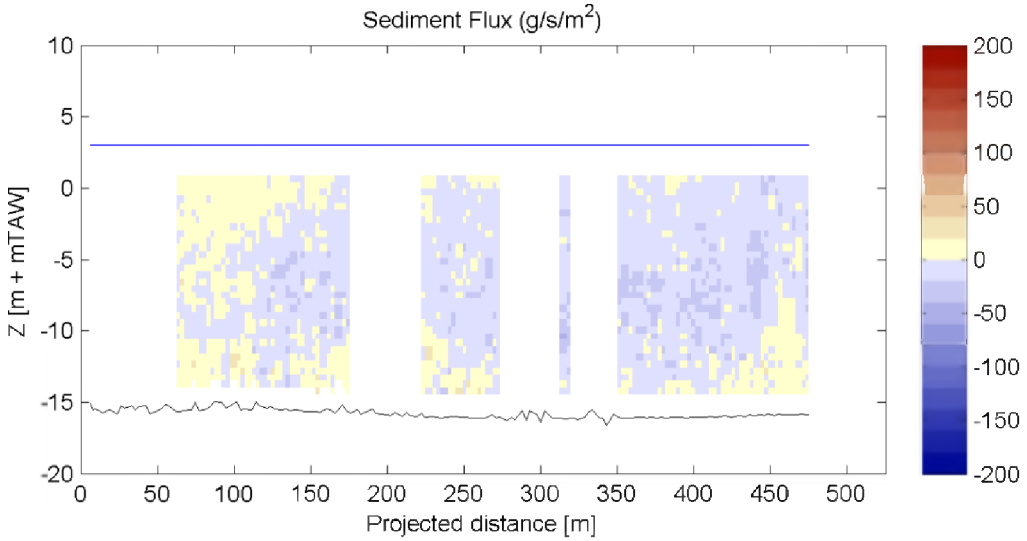
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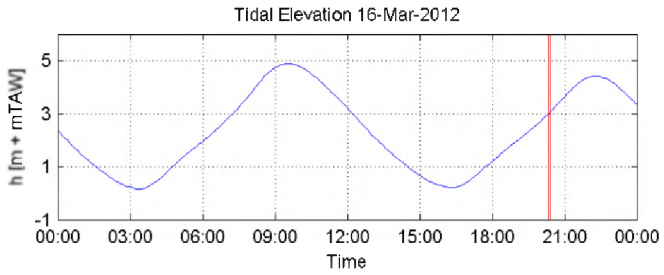
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9102_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

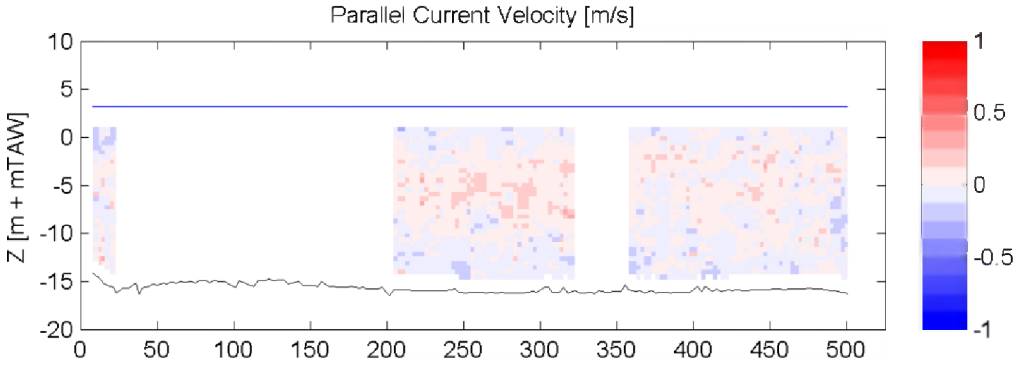
Date / Time [MET] :
16-Mar-2012
20:20 - 20:23

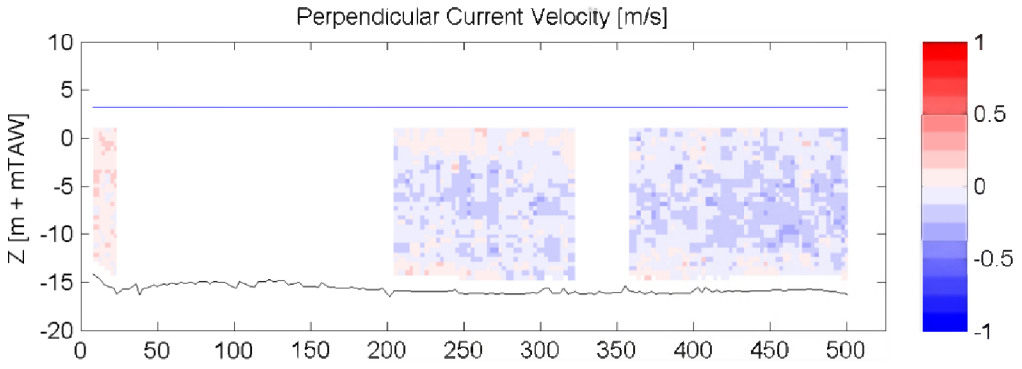
Time after HW [HH:MM]
-1:52

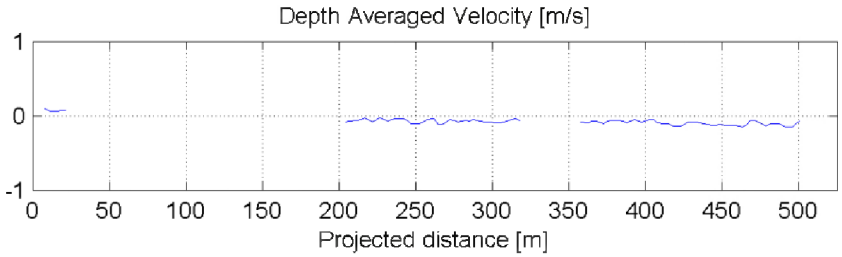
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

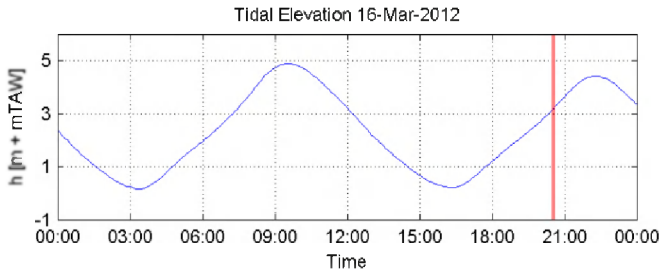
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9104_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

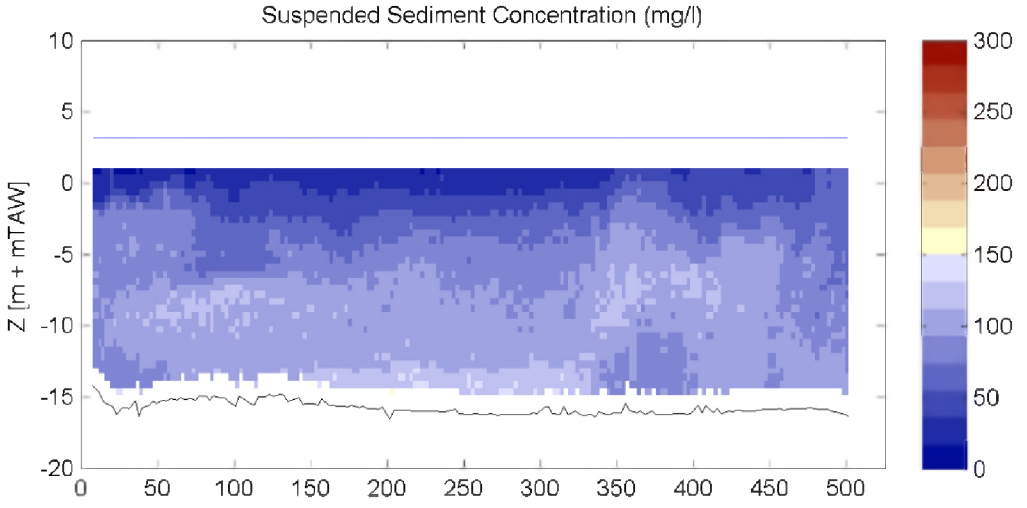
Date / Time [MET] :
16-Mar-2012
20:30 - 20:34

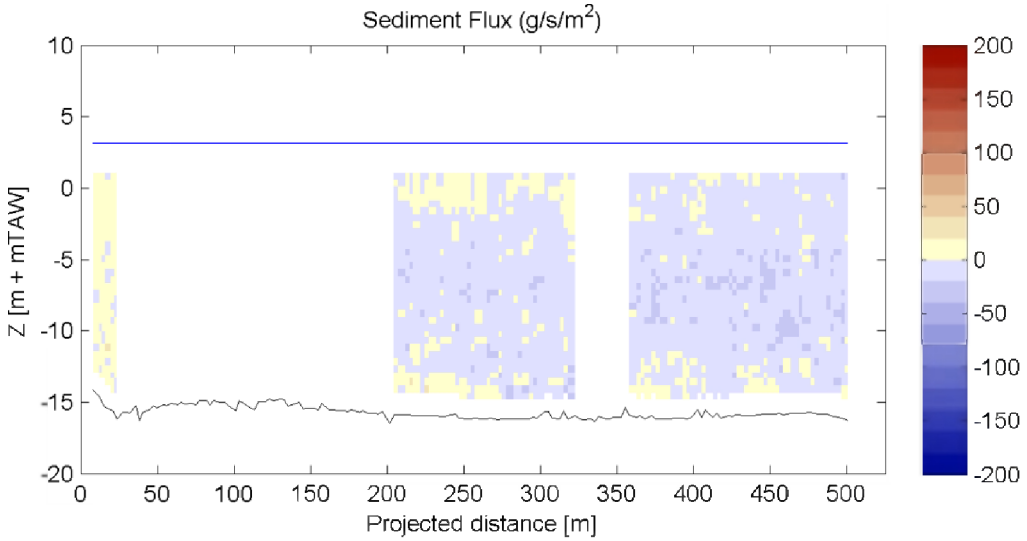
Time after HW [HH:MM]
-1:42

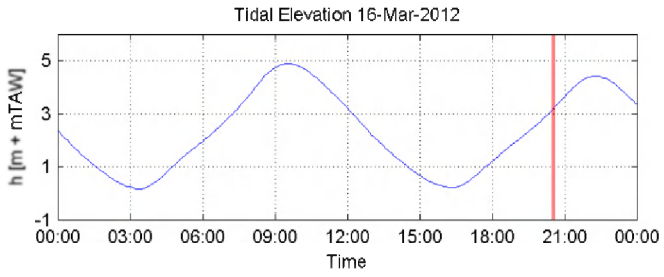
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9104_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

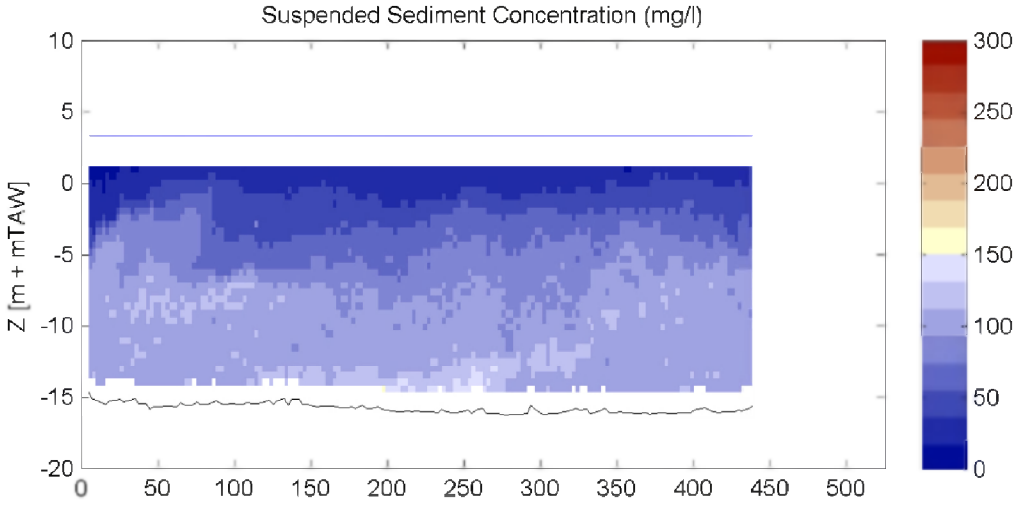
Date / Time [MET] :
16-Mar-2012
20:30 - 20:34

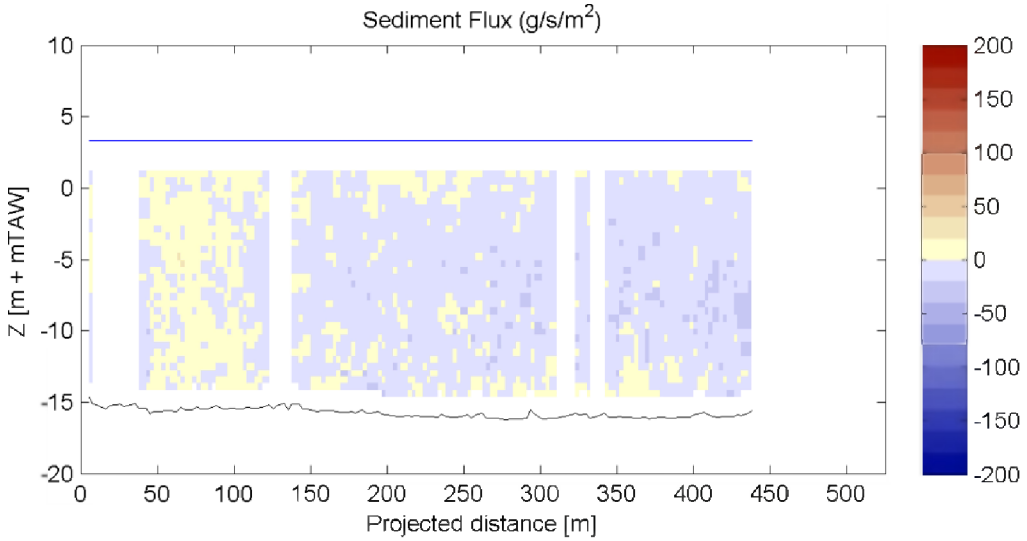
Time after HW [HH:MM]
-1:42

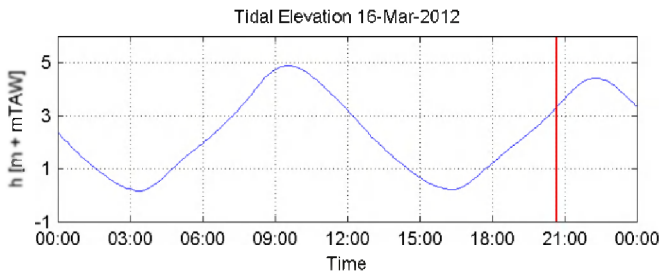
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9105_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

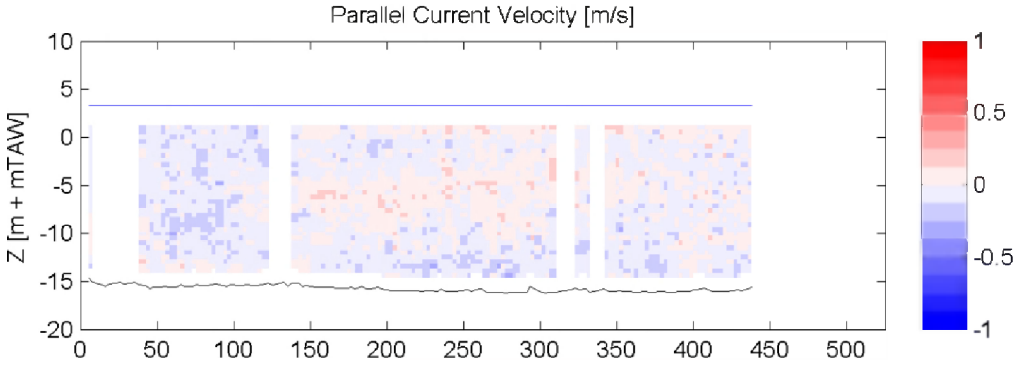
Date / Time [MET] :
16-Mar-2012
20:37 - 20:40

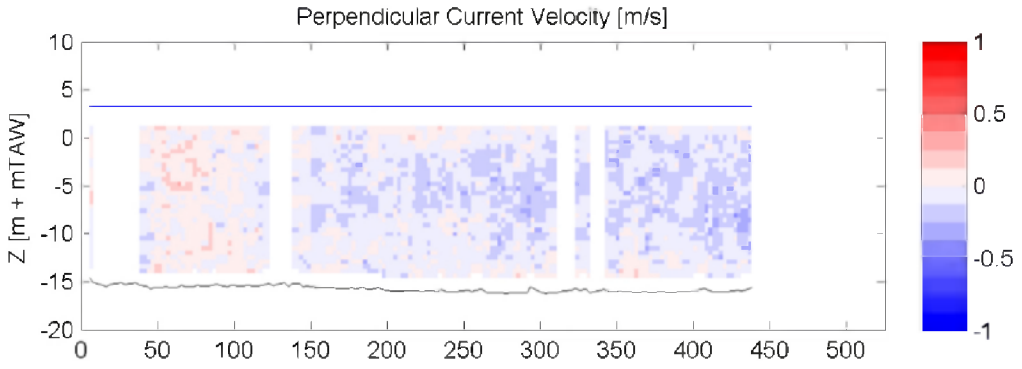
Time after HW [HH:MM]
-1:35

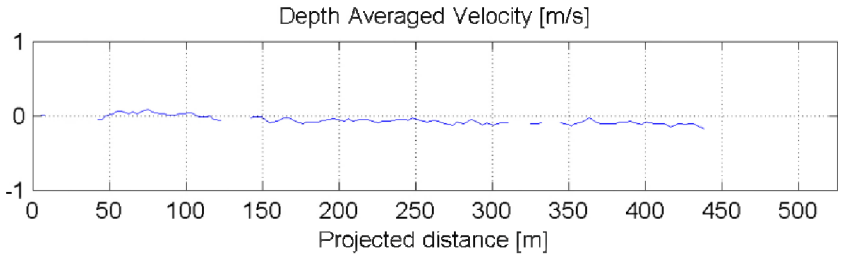
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

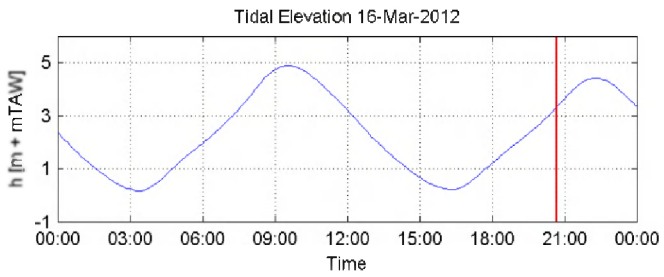
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9105_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

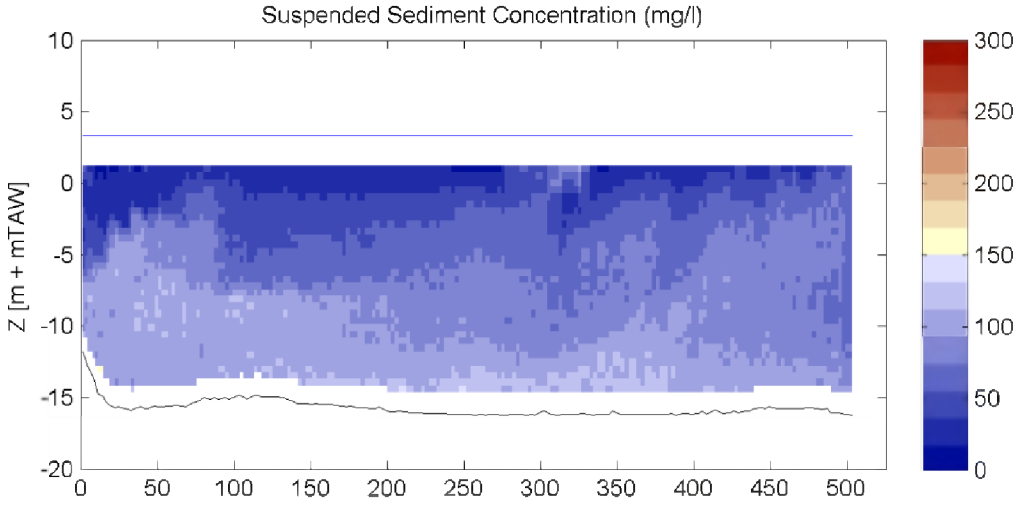
Date / Time [MET]:
16-Mar-2012
20:37 - 20:40

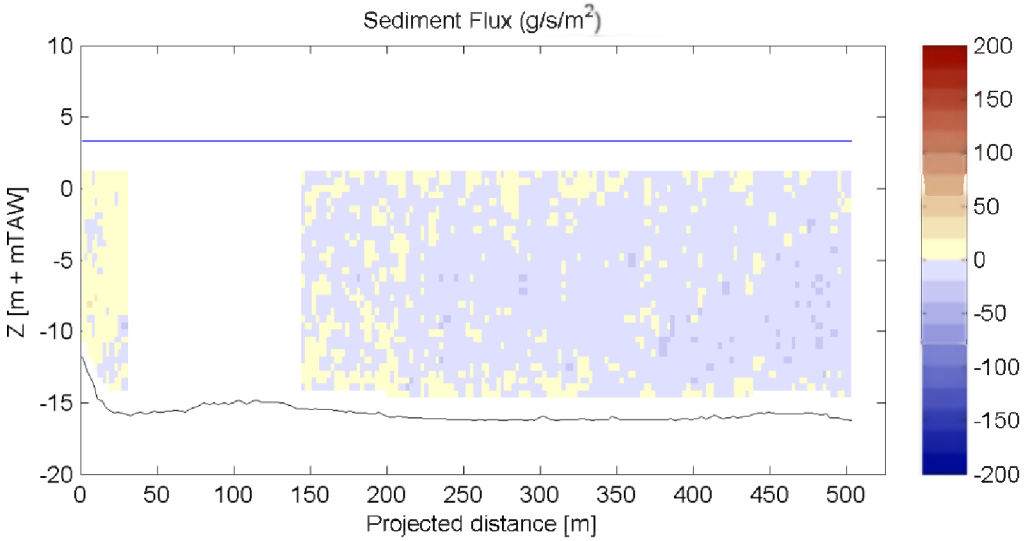
Time after HW [HH:MM]
-1:35

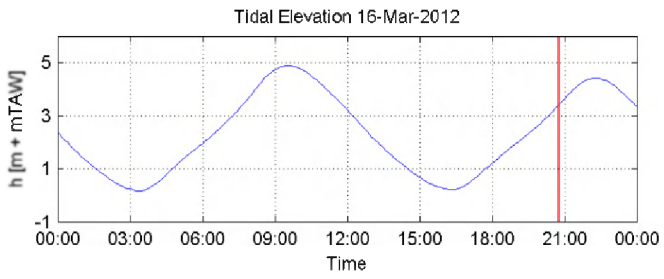
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9106_dgd_Tab_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

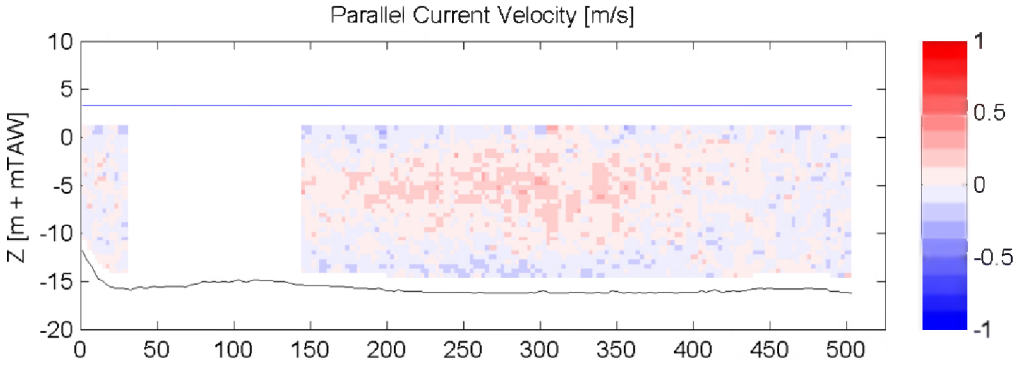
Date / Time [MET] :
16-Mar-2012
20:42 - 20:45

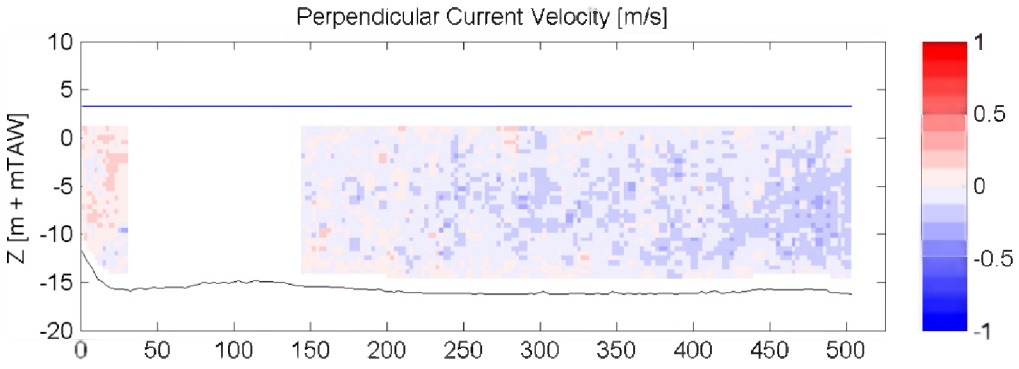
Time after HW [HH:MM]
-1:30

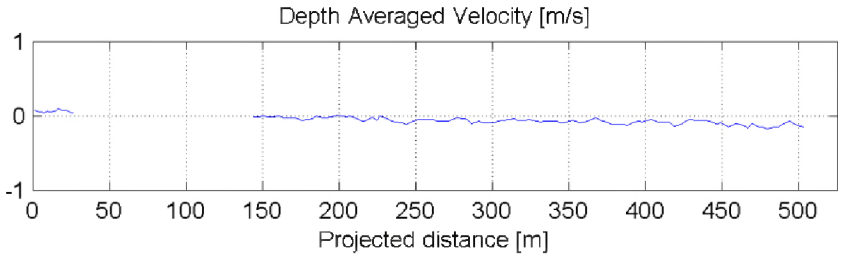
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

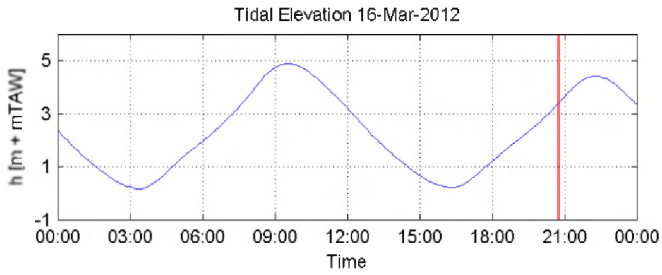
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9106_dgd_Tab_sub.csv	Location: Deurganckdok









HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

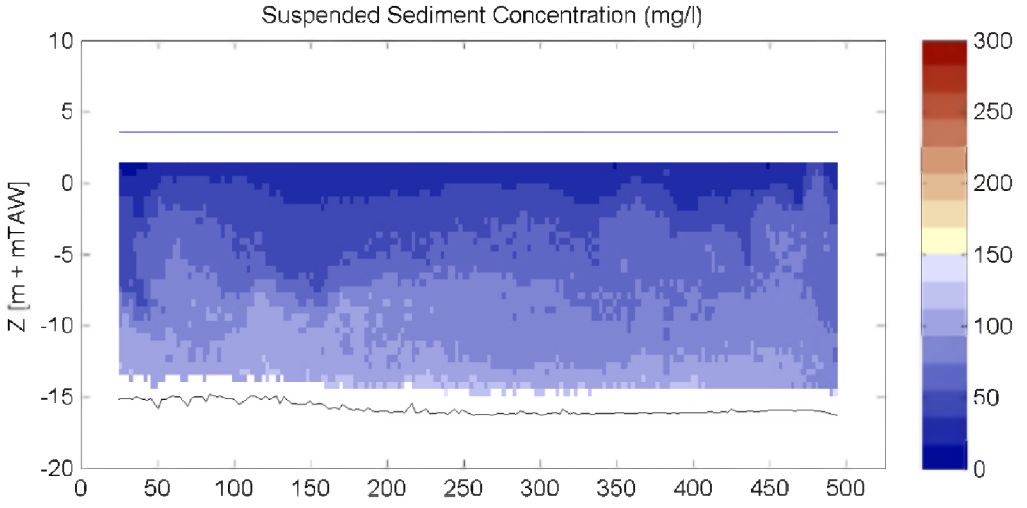
Date / Time [MET] :
16-Mar-2012
20:42 - 20:45

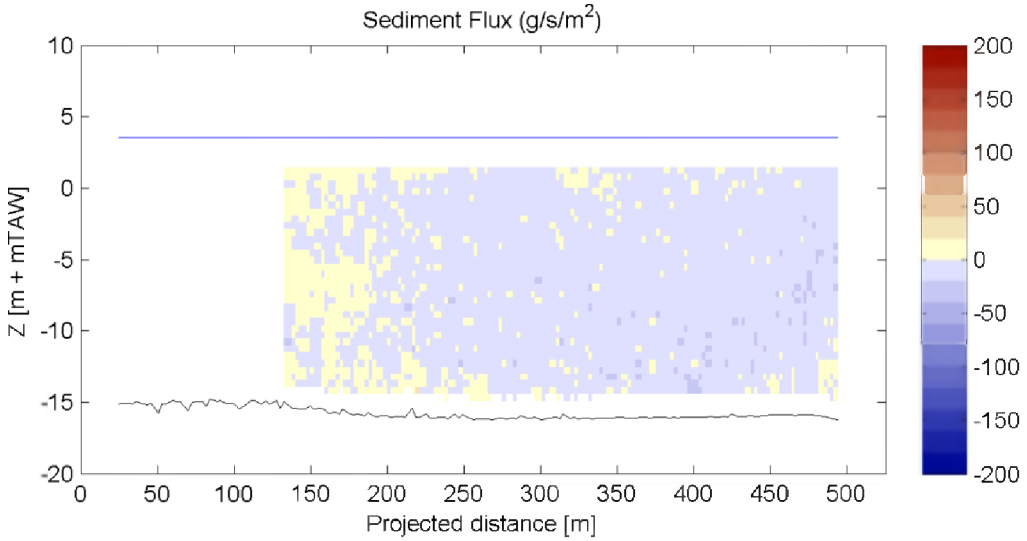
Time after HW [HH:MM]
-1:30

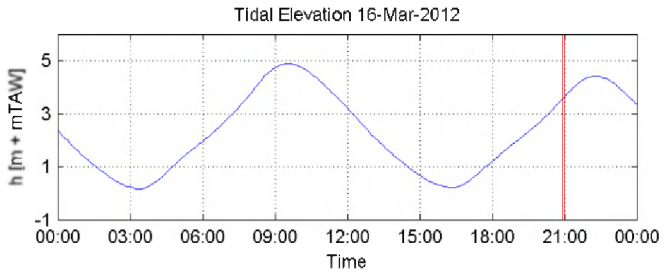
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9108_dgd_Tba_sub.csv	Location: Deurganckdok







HW/LW: 10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

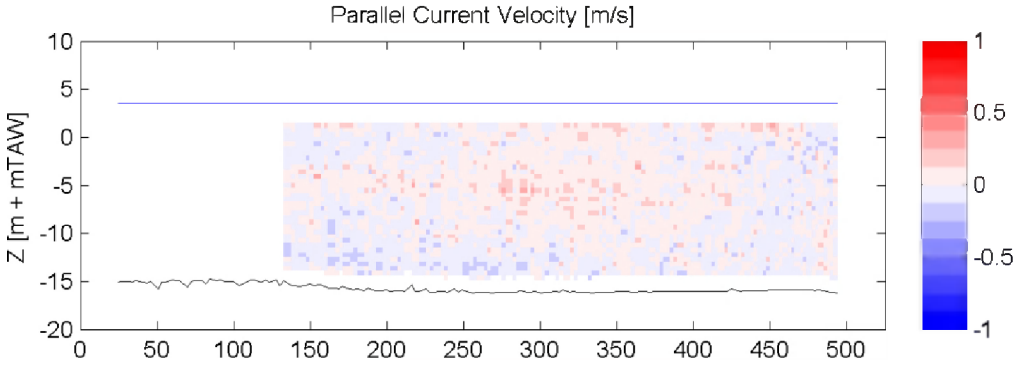
Date / Time [MET] :
16-Mar-2012
20:55 - 20:58

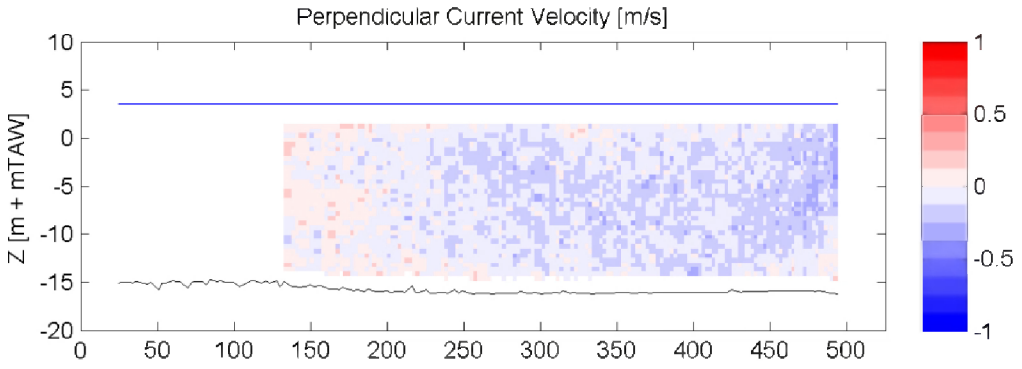
Time after HW [HH:MM]
-1:18

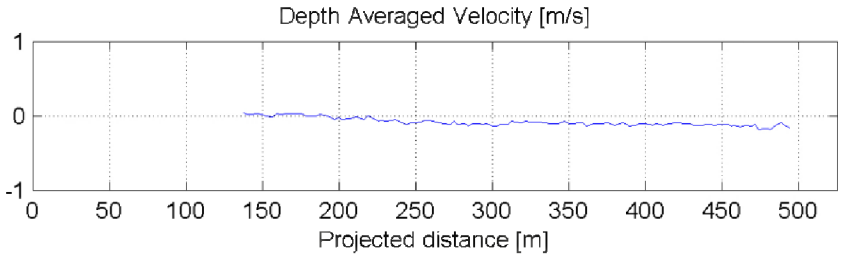
Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

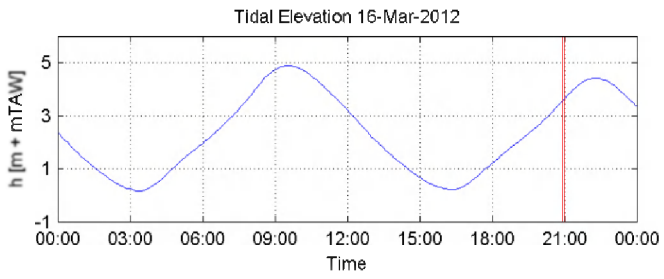
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 9108_dgd_Tba_sub.csv	Location: Deurganckdok









HW/LW:
10:05: h = 4.76 m+mTAW
16:20: h = 0.21 m+mTAW
22:15: h = 4.41 m+mTAW

Date / Time [MET] :
16-Mar-2012
20:55 - 20:58

Time after HW [HH:MM]
-1:18

Data Processed by:
In association with :
I/RA/11354/10.109/MBO/ANF

Annex G Discharge, sediment flux and average sediment concentration for the total cross-section

G.1 Discharge distribution over the cross section: positive is from dock to river

Filename	*Time after HW [hh:mm]*	*Time [hh:mm]*	*Qmid [m3/s]*	*Qtop [m3/s]*	*Qbot [m3/s]*	*Qleft [m3/s]*	*Qright [m3/s]*	*Qtot [m3/s]*	*QVolBal [m3/s]*
9002_dgd_Tba_sub	-1:28	08:36	-247	50	-10	0	-11	-218	-272
9004_dgd_Tab	-1:13	08:51	-287	61	-16	3	-1	-68	-176
9005_dgd_Tba_sub	-1:03	09:01	601	215	-38	13	-22	565	-145
9006_dgd_Tab_sub	-0:55	09:09	422	251	-85	3	-39	528	-125
9008_dgd_Tba_sub	-0:45	09:19	60	257	-41	54	-145	269	-68
9010_dgd_Tab_sub	-0:36	09:28	130	314	-116	6	-17	276	10
9011_dgd_Tba_sub	-0:29	09:35	-127	249	-119	258	-62	241	13
9012_dgd_Tab_sub	-0:22	09:42	141	341	-144	9	-12	293	32
9014_dgd_Tba_sub	-0:11	09:53	-47	292	-103	80	-5	231	102
9016_dgd_Tab_sub	0:01	10:06	-11	312	-134	3	15	186	129
9017_dgd_Tba_sub	0:10	10:15	-163	283	-66	93	17	189	151
9018_dgd_Tab_sub	0:21	10:26	55	365	-138	1	8	282	220
9020_dgd_Tba_sub	0:32	10:37	8	328	-43	59	12	371	204
9022_dgd_Tab_sub	0:42	10:47	235	394	-167	2	13	419	299
9023_dgd_Tba_sub	0:54	10:59	19	350	-165	-1	36	311	238
9024_dgd_Tab_sub	1:06	11:11	192	349	-121	0	13	372	220
9026_dgd_Tba_sub	1:39	11:44	2	264	-43	-1	39	315	250
9027_dgd_Tab_sub	1:49	11:54	200	268	-93	-2	38	356	284

Filename	Time after HW [hh:mm]	Time [hh:mm]	Qmid [m3/s]	Qtop [m3/s]	Qbot [m3/s]	Qleft [m3/s]	Qright [m3/s]	Qtot [m3/s]	QVolBal [m3/s]
9029_dgd_Tba_sub	2:06	12:11	66	206	-40	-21	17	286	306
9030_dgd_Tab_sub	2:11	12:16	181	196	-21	-1	38	352	217
9031_dgd_Tba_sub	2:20	12:25	115	157	14	-17	39	317	306
9033_dgd_Tab_sub	2:28	12:33	115	134	-2	-2	31	285	272
9034_dgd_Tba_sub	2:36	12:41	144	133	20	-20	25	312	272
9035_dgd_Tab_sub	2:46	12:51	221	135	3	0	25	366	306
9036_dgd_Tba	2:53	12:58	178	140	7	0	33	343	272
9038_dgd_Tab_sub	3:03	13:08	128	121	-14	-2	10	270	231
9040_dgd_Tba_sub	3:13	13:18	144	124	15	0	8	286	245
9041_dgd_Tab_sub	3:29	13:34	196	136	-18	0	0	292	247
9042_dgd_Tba_sub	3:36	13:41	99	121	-23	1	9	235	233
9044_dgd_Tab_sub	3:48	13:53	175	106	-12	-1	2	244	257
9046_dgd_Tba_sub	4:00	14:05	111	57	15	-9	1	199	204
9047_dgd_Tab_sub	4:05	14:10	163	59	14	-19	7	216	181
9048_dgd_Tba_sub	4:17	14:22	158	22	48	-3	6	235	235
9049_dgd_Tab_sub	4:23	14:28	181	39	38	-1	3	237	229
9051_dgd_Tba_sub	4:35	14:40	96	-21	63	-1	11	150	213
9053_dgd_Tab_sub	4:46	14:51	15	-33	59	0	3	57	170
9054_dgd_Tba_sub	4:53	14:58	12	-64	85	-14	0	29	170
9055_dgd_Tab_sub	5:01	15:06	36	-49	61	-6	11	44	170

Filename	Time after HW [hh:mm]	Time [hh:mm]	Qmid [m3/s]	Qtop [m3/s]	Qbot [m3/s]	Qleft [m3/s]	Qright [m3/s]	Qtot [m3/s]	QVolBal [m3/s]
9057_dgd_Tba_sub	5:16	15:21	39	-65	79	-28	9	43	144
9059_dgd_Tab_sub	5:27	15:32	93	-72	42	-15	26	43	133
9060_dgd_Tba_sub	5:34	15:39	-55	-116	59	-5	40	-40	90
9061_dgd_Tab_sub	5:38	15:43	46	-97	57	-41	30	-39	68
9062_dgd_Tba_sub	5:50	15:55	-73	-136	104	-47	15	-106	90
9064_dgd_Tab_sub	6:04	16:09	12	-165	117	-45	0	-139	34
9066_dgd_Tba_sub	-5:48	16:26	-344	-208	93	-4	88	-319	-24
9067_dgd_Tab_sub	-5:42	16:32	-195	-162	108	-89	10	-343	-102
9068_dgd_Tba_sub	-5:35	16:39	-253	-214	92	-11	14	-360	-117
9069_dgd_Tab_sub	-5:26	16:48	-231	-184	79	-23	18	-326	-88
9071_dgd_Tba_sub	-5:17	16:57	-134	-200	99	-4	21	-274	-170
9073_dgd_Tab_sub	-5:02	17:12	-328	-224	117	-2	6	-382	-174
9074_dgd_Tba_sub	-4:56	17:18	-254	-214	116	-11	11	-365	-187
9075_dgd_Tab_sub	-4:48	17:26	-235	-196	83	0	3	-363	-213
9076_dgd_Tba_sub	-4:42	17:32	-274	-204	62	-4	-21	-389	-299
9078_dgd_Tab_sub	-4:19	17:55	-105	-135	56	-15	-21	-257	-238
9078_dgd_Tab_sub	-4:19	17:55	-77	-117	38	-22	-41	-271	-238
9080_dgd_Tba_sub	-4:09	18:05	-340	-171	57	-12	-58	-447	-204
9081_dgd_Tab_sub	-4:02	18:12	-264	-150	58	0	-9	-426	-204
9082_dgd_Tba_sub	-3:55	18:19	-436	-169	76	-1	-42	-532	-238

Filename	*Time after HW [hh:mm]*	*Time [hh:mm]*	*Qmid [m3/s]*	*Qtop [m3/s]*	*Qbot [m3/s]*	*Qleft [m3/s]*	*Qright [m3/s]*	*Qtot [m3/s]*	*QVolBal [m3/s]*
9083_dgd_Tab_sub	-3:49	18:25	-417	-166	57	-5	-7	-562	-218
9085_dgd_Tba_sub	-3:40	18:34	-500	-194	74	-4	-23	-604	-219
9087_dgd_Tab_sub	-3:28	18:46	-413	-143	70	0	-14	-515	-204
9088_dgd_Tba_sub2	-3:19	18:55	-367	-166	85	0	0	-441	-204
9089_dgd_Tab_sub	-3:11	19:03	-316	-155	112	11	-11	-410	-170
9090_dgd_Tba_sub	-3:02	19:12	-371	-128	63	-61	-72	-527	-269
9091_dgd_Tba_sub	-2:57	19:17	-384	-191	77	6	-31	-535	-237
9092_dgd_Tba_sub	-2:52	19:22	-461	-158	75	2	-8	-530	-204
9094_dgd_Tab_sub	-2:41	19:33	-389	-107	50	4	-14	-439	-204
9096_dgd_Tba_sub	-2:31	19:43	-217	-48	27	3	-22	-279	-194
9097_dgd_Tab_sub	-2:25	19:49	-187	-14	18	0	-6	-216	-218
9098_dgd_Tba_sub	-2:18	19:56	-240	-26	-14	4	-11	-282	-247
9101_dgd_Tab_sub	-1:59	20:15	-346	4	-3	0	-9	-364	-249
9102_dgd_Tba_sub	-1:52	20:22	-378	-29	-19	1	-53	-476	-272
9104_dgd_Tab_sub	-1:42	20:32	-543	-29	20	9	-44	-574	-272
9105_dgd_Tba_sub	-1:35	20:39	-397	-14	-11	-1	-194	-587	-272
9106_dgd_Tab_sub	-1:30	20:44	-417	-3	-14	1	-38	-511	-272
9108_dgd_Tba_sub	-1:18	20:56	-471	-29	-25	19	-60	-566	-276

G.2 Sediment flux distribution over the cross section: positive is from dock to river

Filename	Time to HW [hh:mm]	Time [hh:mm]	Fmid [kg/s]	Ftop [kg/s]	Fbot [kg/s]	Fleft [kg/s]	Fright [kg/s]	Ftot [kg/s]
9002_dgd_Tba_sub	-1:28	08:36	-27.3	2.1	-1.3	-0.1	-0.6	-27.4
9004_dgd_Tab	-1:13	08:51	-41.6	1.6	-2.7	0.2	-0.1	-35.6
9005_dgd_Tba_sub	-1:03	09:01	-5.0	6.1	-14.9	0.8	-3.1	-29.8
9006_dgd_Tab_sub	-0:55	09:09	-43.3	8.5	-28.5	0.2	-8.4	-72.5
9008_dgd_Tba_sub	-0:45	09:19	-93.6	10.1	-25.8	6.7	-30.1	-115.3
9010_dgd_Tab_sub	-0:36	09:28	-69.9	9.9	-27.3	0.5	-2.7	-100.6
9011_dgd_Tba_sub	-0:29	09:35	-81.4	5.9	-32.7	7.0	-11.7	-105.8
9012_dgd_Tab_sub	-0:22	09:42	-67.0	9.0	-32.9	0.8	-4.0	-97.9
9014_dgd_Tba_sub	-0:11	09:53	-78.8	7.0	-31.8	9.0	-4.0	-92.3
9016_dgd_Tab_sub	0:01	10:06	-50.2	5.6	-20.4	0.3	-0.1	-73.1
9017_dgd_Tba_sub	0:10	10:15	-62.4	4.0	-25.1	3.2	-0.2	-75.1
9018_dgd_Tab_sub	0:21	10:26	-48.6	5.1	-20.2	0.1	0.1	-63.8
9020_dgd_Tba_sub	0:32	10:37	-37.9	4.3	-18.3	3.7	-0.4	-49.0
9022_dgd_Tab_sub	0:42	10:47	-25.4	7.0	-17.9	0.1	0.2	-39.6
9023_dgd_Tba_sub	0:54	10:59	-33.1	4.4	-16.4	-0.1	0.4	-39.2
9024_dgd_Tab_sub	1:06	11:11	-15.3	4.8	-10.0	0.0	0.1	-23.7
9026_dgd_Tba_sub	1:39	11:44	-14.0	4.7	-7.6	0.0	0.8	-15.6
9027_dgd_Tab_sub	1:49	11:54	-6.8	4.2	-6.5	-0.1	0.9	-10.0
9029_dgd_Tba_sub	2:06	12:11	-9.3	2.8	-3.3	-0.9	0.4	-8.8
9030_dgd_Tab_sub	2:11	12:16	-5.2	2.8	-2.0	0.0	0.8	-4.7
9031_dgd_Tba_sub	2:20	12:25	-4.8	2.1	-0.7	-0.7	0.8	-3.3
9033_dgd_Tab_sub	2:28	12:33	-5.0	2.0	-0.8	-0.1	0.6	-2.6
9034_dgd_Tba_sub	2:36	12:41	-1.2	1.9	0.6	-1.0	0.7	0.6
9035_dgd_Tab_sub	2:46	12:51	0.2	1.8	0.2	0.0	0.5	2.2
9036_dgd_Tba	2:53	12:58	-1.7	1.9	0.3	0.0	0.8	1.2
9038_dgd_Tab_sub	3:03	13:08	-2.2	2.6	-1.3	-0.1	0.2	-0.8
9040_dgd_Tba_sub	3:13	13:18	-3.6	2.0	-1.0	0.0	0.2	-2.4
9041_dgd_Tab_sub	3:29	13:34	-3.2	2.5	-3.0	-0.1	0.0	-3.8
9042_dgd_Tba_sub	3:36	13:41	-4.5	2.5	-3.2	0.0	0.2	-4.2
9044_dgd_Tab_sub	3:48	13:53	-1.0	1.7	-2.0	-0.1	0.1	-1.2

Filename	Time to HW [hh:mm]	Time [hh:mm]	Fmid [kg/s]	Ftop [kg/s]	Fbot [kg/s]	Fleft [kg/s]	Fright [kg/s]	Ftot [kg/s]
9046_dgd_Tba_sub	4:00	14:05	2.2	0.9	0.7	-0.5	0.0	2.8
9047_dgd_Tab_sub	4:05	14:10	4.3	0.9	1.0	-1.0	0.2	5.4
9048_dgd_Tba_sub	4:17	14:22	5.2	0.3	2.5	-0.1	0.1	7.8
9049_dgd_Tab_sub	4:23	14:28	6.2	1.0	2.0	0.0	0.1	9.2
9051_dgd_Tba_sub	4:35	14:40	5.8	-0.5	3.9	0.0	0.3	9.0
9053_dgd_Tab_sub	4:46	14:51	3.3	-0.7	4.0	0.0	0.1	7.3
9054_dgd_Tba_sub	4:53	14:58	4.4	-1.7	5.7	-0.3	0.0	7.2
9055_dgd_Tab_sub	5:01	15:06	1.5	-1.6	4.4	-0.4	0.3	4.2
9057_dgd_Tba_sub	5:16	15:21	-0.1	-3.3	5.3	-2.3	0.3	1.3
9059_dgd_Tab_sub	5:27	15:32	3.3	-4.2	3.5	-1.2	1.9	3.6
9060_dgd_Tba_sub	5:34	15:39	3.1	-6.1	7.4	-0.3	4.1	8.1
9061_dgd_Tab_sub	5:38	15:43	8.4	-5.4	8.5	-2.6	3.3	9.1
9062_dgd_Tba_sub	5:50	15:55	-2.4	-8.9	11.4	-3.3	1.3	-0.5
9064_dgd_Tab_sub	6:04	16:09	-2.6	-12.2	11.0	-3.5	-0.1	-9.3
9066_dgd_Tba_sub	-5:48	16:26	-23.5	-13.5	8.0	-0.2	4.7	-20.8
9067_dgd_Tab_sub	-5:42	16:32	-13.9	-9.7	9.2	-5.5	0.5	-20.4
9068_dgd_Tba_sub	-5:35	16:39	-16.1	-12.5	8.0	-0.6	0.8	-19.5
9069_dgd_Tab_sub	-5:26	16:48	-12.7	-9.8	7.0	-1.1	1.0	-14.7
9071_dgd_Tba_sub	-5:17	16:57	-4.9	-10.4	9.7	-0.2	1.0	-8.3
9073_dgd_Tab_sub	-5:02	17:12	-15.9	-10.8	11.0	0.0	0.4	-12.8
9074_dgd_Tba_sub	-4:56	17:18	-11.9	-10.2	11.0	-0.6	1.0	-11.6
9075_dgd_Tab_sub	-4:48	17:26	-10.9	-9.2	8.4	0.0	0.2	-12.2
9076_dgd_Tba_sub	-4:42	17:32	-13.5	-10.0	7.8	-0.2	-1.1	-12.6
9078_dgd_Tab_sub	-4:19	17:55	3.1	-6.0	9.1	-0.5	-1.8	0.4
9078_dgd_Tab_sub	-4:19	17:55	5.4	-5.1	7.3	-0.6	-3.0	0.4
9080_dgd_Tba_sub	-4:09	18:05	-13.5	-6.3	7.3	0.1	-4.5	-12.2
9081_dgd_Tab_sub	-4:02	18:12	-12.0	-5.3	7.7	0.4	-0.5	-12.8
9082_dgd_Tba_sub	-3:55	18:19	-22.2	-6.3	9.9	0.0	-2.3	-18.3
9083_dgd_Tab_sub	-3:49	18:25	-19.6	-6.2	9.7	-0.2	-0.4	-18.6
9085_dgd_Tba_sub	-3:40	18:34	-25.0	-8.0	10.5	-0.3	-1.6	-23.0
9087_dgd_Tab_sub	-3:28	18:46	-24.7	-7.1	8.6	0.0	-0.9	-23.2
9088_dgd_Tba_sub2	-3:19	18:55	-20.2	-8.2	9.5	0.0	0.0	-18.4

Filename	Time to HW [hh:mm]	Time [hh:mm]	Fmid [kg/s]	Ftop [kg/s]	Fbot [kg/s]	Fleft [kg/s]	Fright [kg/s]	Ftot [kg/s]
9089_dgd_Tab_sub	-3:11	19:03	-16.2	-8.0	13.2	0.8	-1.0	-14.7
9090_dgd_Tba_sub	-3:02	19:12	-20.7	-6.2	8.5	-2.2	-4.6	-21.8
9091_dgd_Tba_sub	-2:57	19:17	-17.9	-9.1	9.1	0.6	-1.8	-20.6
9092_dgd_Tba_sub	-2:52	19:22	-22.6	-7.7	9.1	0.2	-0.6	-20.9
9094_dgd_Tab_sub	-2:41	19:33	-20.6	-5.2	6.4	0.3	-0.9	-19.6
9096_dgd_Tba_sub	-2:31	19:43	-15.1	-3.0	3.2	0.1	-1.2	-17.1
9097_dgd_Tab_sub	-2:25	19:49	-18.1	-2.1	2.1	0.0	-0.6	-19.8
9098_dgd_Tba_sub	-2:18	19:56	-23.3	-3.2	-1.6	0.3	-0.8	-29.2
9101_dgd_Tab_sub	-1:59	20:15	-40.2	-0.4	-0.7	0.0	-0.7	-40.5
9102_dgd_Tba_sub	-1:52	20:22	-40.4	-1.9	-0.7	0.0	-3.4	-45.9
9104_dgd_Tab_sub	-1:42	20:32	-46.2	-1.6	2.2	0.7	-3.5	-48.4
9105_dgd_Tba_sub	-1:35	20:39	-33.1	-0.4	-1.6	-0.1	-15.9	-48.3
9106_dgd_Tab_sub	-1:30	20:44	-32.4	-0.3	-1.9	0.1	-2.7	-39.8

G.3 Sediment concentration distribution over the cross section

Transect name	*Time [hh:mm MET]*	*Time after HW [hh:mm]*	*Average measured SS Concentration [mg/l]*	*Average measured incoming SS Concentration [mg/l]*	*Average measured outgoing SS Concentration [mg/l]*
9002_dgd_Tba_sub	08:36	-1:28	82	89	70
9004_dgd_Tab	08:51	-1:13	85	109	59
9005_dgd_Tba_sub	09:01	-1:03	104	199	61
9006_dgd_Tab_sub	09:09	-0:55	122	234	62
9008_dgd_Tba_sub	09:19	-0:45	128	219	60
9010_dgd_Tab_sub	09:28	-0:36	108	184	51
9011_dgd_Tba_sub	09:35	-0:29	103	174	46
9012_dgd_Tab_sub	09:42	-0:22	101	171	48
9014_dgd_Tba_sub	09:53	-0:11	96	157	47
9016_dgd_Tab_sub	10:06	0:01	75	120	36
9017_dgd_Tba_sub	10:15	0:10	66	111	28
9018_dgd_Tab_sub	10:26	0:21	60	101	28
9020_dgd_Tba_sub	10:37	0:32	52	86	27
9022_dgd_Tab_sub	10:47	0:42	45	76	24
9023_dgd_Tba_sub	10:59	0:54	40	68	18
9024_dgd_Tab_sub	11:11	1:06	35	59	18
9026_dgd_Tba_sub	11:44	1:39	33	53	19
9027_dgd_Tab_sub	11:54	1:49	31	51	20
9029_dgd_Tba_sub	12:11	2:06	31	49	20
9030_dgd_Tab_sub	12:16	2:11	31	49	21
9031_dgd_Tba_sub	12:25	2:20	31	47	22
9033_dgd_Tab_sub	12:33	2:28	32	47	23
9034_dgd_Tba_sub	12:41	2:36	31	45	24
9035_dgd_Tab_sub	12:51	2:46	30	46	23
9036_dgd_Tba	12:58	2:53	31	48	24
9038_dgd_Tab_sub	13:08	3:03	34	50	25
9040_dgd_Tba_sub	13:18	3:13	36	61	24
9041_dgd_Tab_sub	13:34	3:29	39	71	24

Transect name	Time [hh:mm MET]	Time after HW [hh:mm]	Average measured SS Concentration [mg/l]	Average measured incoming SS Concentration [mg/l]	Average measured outgoing SS Concentration [mg/l]
9042_dgd_Tba_sub	13:41	3:36	40	68	25
9044_dgd_Tab_sub	13:53	3:48	37	60	26
9046_dgd_Tba_sub	14:05	4:00	34	44	29
9047_dgd_Tab_sub	14:10	4:05	34	41	32
9048_dgd_Tba_sub	14:22	4:17	35	36	34
9049_dgd_Tab_sub	14:28	4:23	36	33	37
9051_dgd_Tba_sub	14:40	4:35	37	30	41
9053_dgd_Tab_sub	14:51	4:46	38	30	45
9054_dgd_Tba_sub	14:58	4:53	38	29	46
9055_dgd_Tab_sub	15:06	5:01	43	40	46
9057_dgd_Tba_sub	15:21	5:16	52	53	51
9059_dgd_Tab_sub	15:32	5:27	63	61	64
9060_dgd_Tba_sub	15:39	5:34	70	58	83
9061_dgd_Tab_sub	15:43	5:38	73	60	87
9062_dgd_Tba_sub	15:55	5:50	73	67	81
9064_dgd_Tab_sub	16:09	6:04	73	72	74
9066_dgd_Tba_sub	16:26	-5:48	68	67	68
9067_dgd_Tab_sub	16:32	-5:42	65	64	68
9068_dgd_Tba_sub	16:39	-5:35	64	62	67
9069_dgd_Tab_sub	16:48	-5:26	63	59	69
9071_dgd_Tba_sub	16:57	-5:17	63	57	72
9073_dgd_Tab_sub	17:12	-5:02	63	56	76
9074_dgd_Tba_sub	17:18	-4:56	64	57	78
9075_dgd_Tab_sub	17:26	-4:48	65	58	80
9076_dgd_Tba_sub	17:32	-4:42	69	60	87
9078_dgd_Tab_sub	17:55	-4:19	74	61	95
9078_dgd_Tab_sub	17:55	-4:19	76	61	99
9080_dgd_Tba_sub	18:05	-4:09	72	60	98
9081_dgd_Tab_sub	18:12	-4:02	70	59	95
9082_dgd_Tba_sub	18:19	-3:55	71	60	99
9083_dgd_Tab_sub	18:25	-3:49	72	60	104

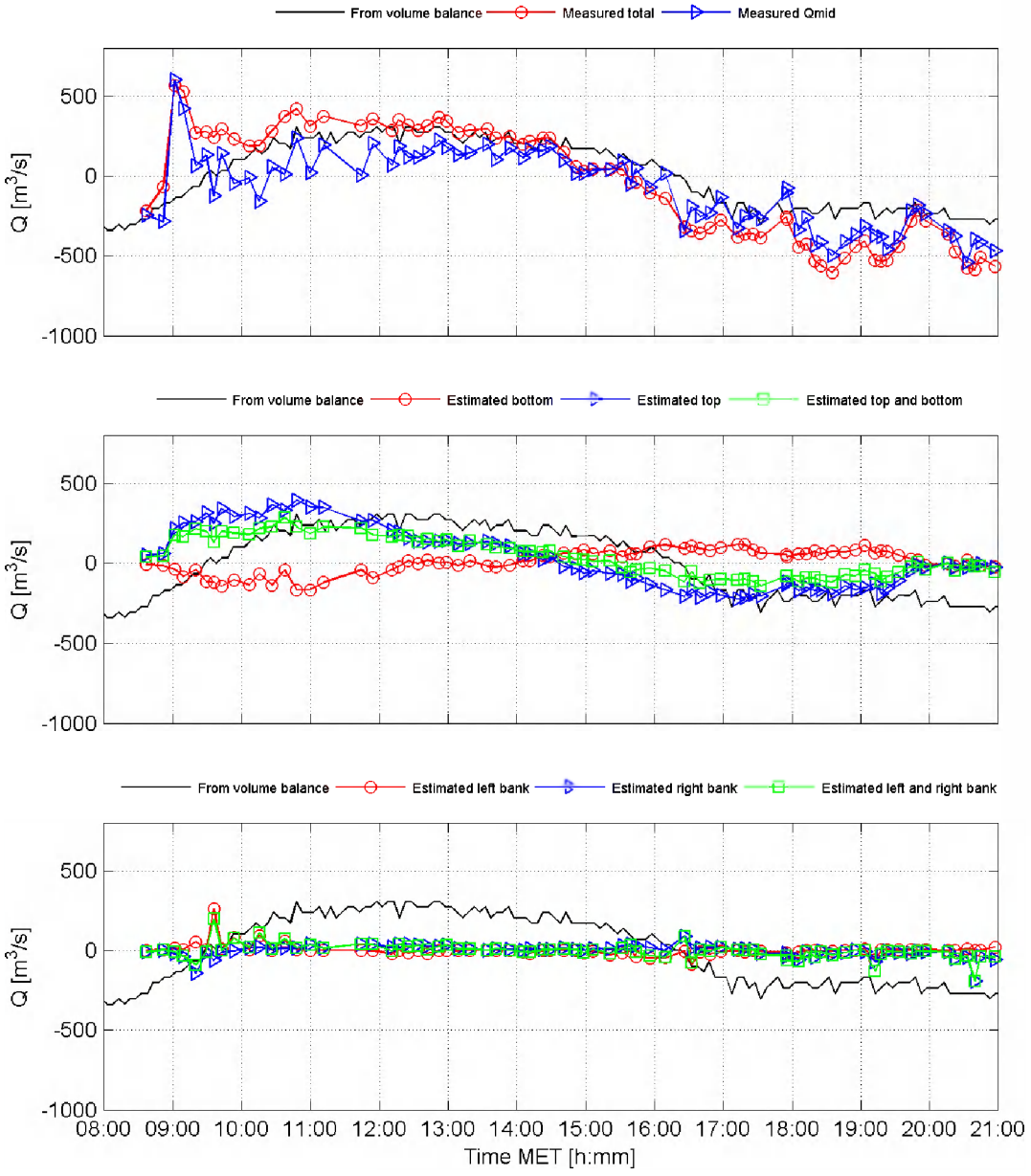
Transect name	*Time [hh:mm MET]*	*Time after HW [hh:mm]*	*Average measured SS Concentration [mg/l]*	*Average measured incoming SS Concentration [mg/l]*	*Average measured outgoing SS Concentration [mg/l]*
9085_dgd_Tba_sub	18:34	-3:40	71	60	101
9087_dgd_Tab_sub	18:46	-3:28	72	64	93
9088_dgd_Tba_sub2	18:55	-3:19	73	64	90
9089_dgd_Tab_sub	19:03	-3:11	75	65	94
9090_dgd_Tba_sub	19:12	-3:02	73	63	96
9091_dgd_Tba_sub	19:17	-2:57	70	60	94
9092_dgd_Tba_sub	19:22	-2:52	69	60	91
9094_dgd_Tab_sub	19:33	-2:41	70	62	87
9096_dgd_Tba_sub	19:43	-2:31	75	72	81
9097_dgd_Tab_sub	19:49	-2:25	80	83	76
9098_dgd_Tba_sub	19:56	-2:18	84	89	74
9101_dgd_Tab_sub	20:15	-1:59	93	99	80
9102_dgd_Tba_sub	20:22	-1:52	94	95	91
9104_dgd_Tab_sub	20:32	-1:42	87	86	92
9105_dgd_Tba_sub	20:39	-1:35	81	82	79
9106_dgd_Tab_sub	20:44	-1:30	75	76	69

Tide	Concentration [mg/l]								
	overall SSC			incoming SSC			outgoing SSC		
	min	average	max	min	average	max	min	average	max
Ebb	30	44	75	29	58	120	18	36	87
Flood	63	80	128	56	90	234	46	78	104

Annex H Temporal variation of total flux, total discharge and suspended sediment concentration

Evaluatie aanslibbing Deurganckdok

	Equipment(s): ADCP
Sourcefile(s): 9002_dgd_Tba_sub.csv 9108_dgd_Tba_sub.csv	Location: Deurganckdok



Date :

16-Mar-2012

Data Processed by:

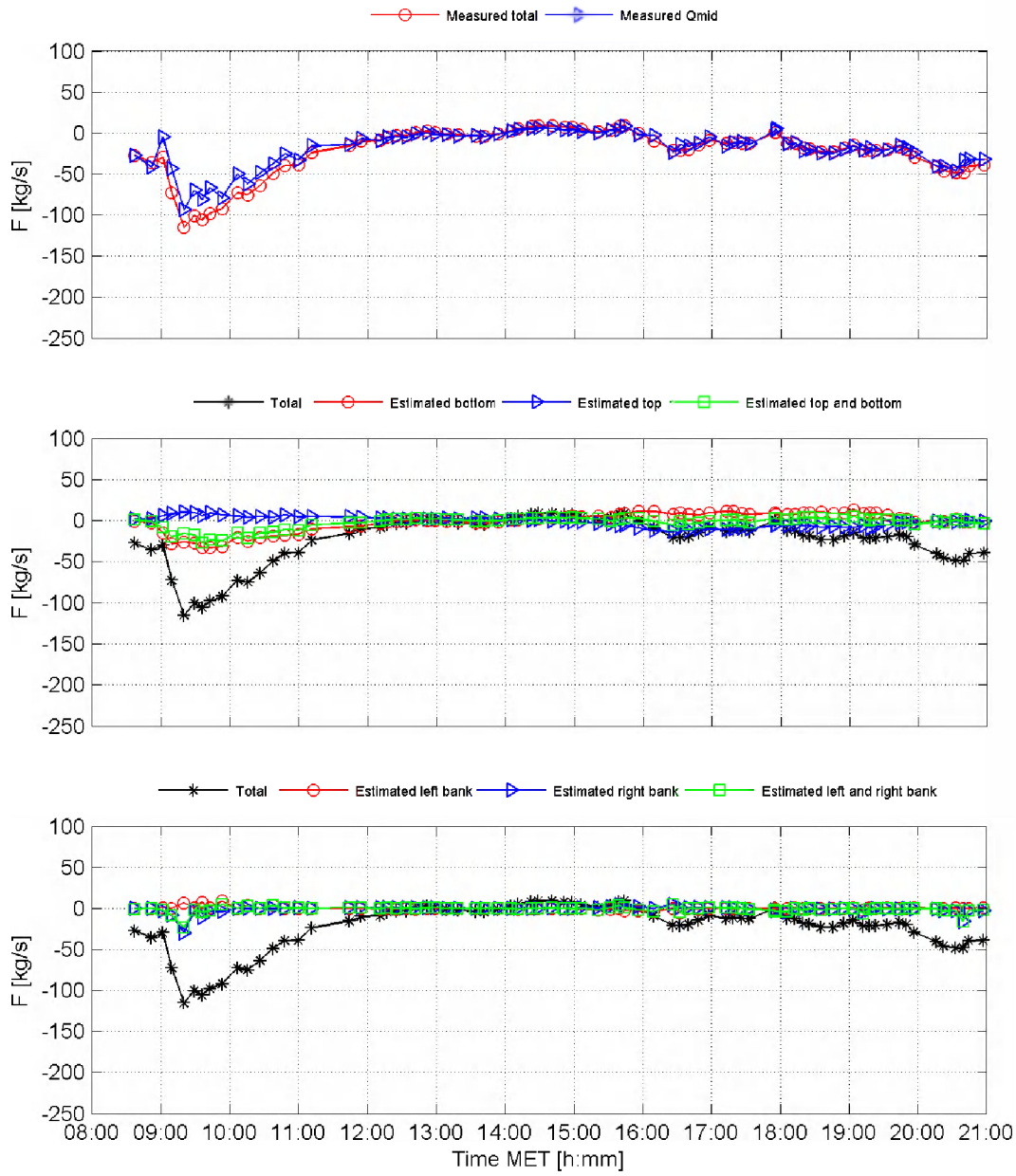
In association with :

I/RA/11354/10.109/MBC

Annex Figure 8: Total discharge through the measured cross section, positive is from dock to river

Evaluatie aanslibbing Deurganckdok

	Equipment(s): ADCP
Sourcefile(s): 9002_dgd_Tba_sub.csv 9108_dgd_Tba_sub.csv	Location: Deurganckdok



Date :

16-Mar-2012

Data Processed by:

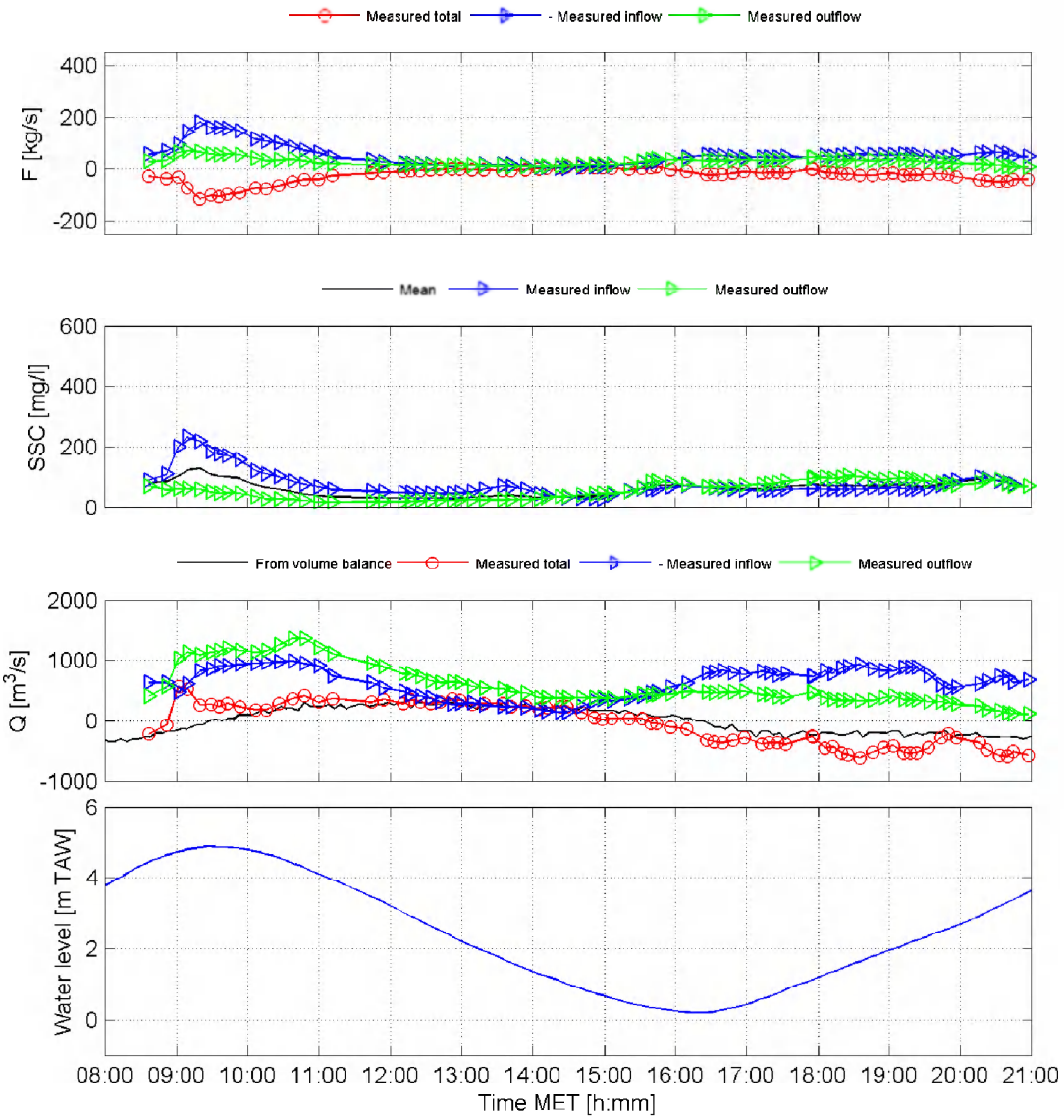
In association with :

I/RA/11354/10.109/MBC

Annex Figure 9: Total flux through the measured cross section, positive is from dock to river

Evaluatie aanslibbing Deurganckdok

	Equipment(s): ADCP
Sourcefile(s): 9002_dgd_Tba_sub.csv 9108_dgd_Tba_sub.csv	Location: Deurganckdok



Date :

16-Mar-2012

Data Processed by:

In association with :

I/RA/11354/10.109/MBO/[illegible]

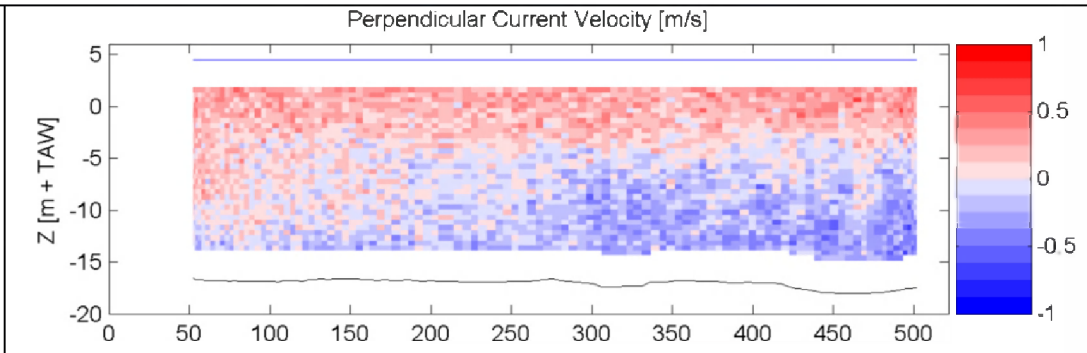
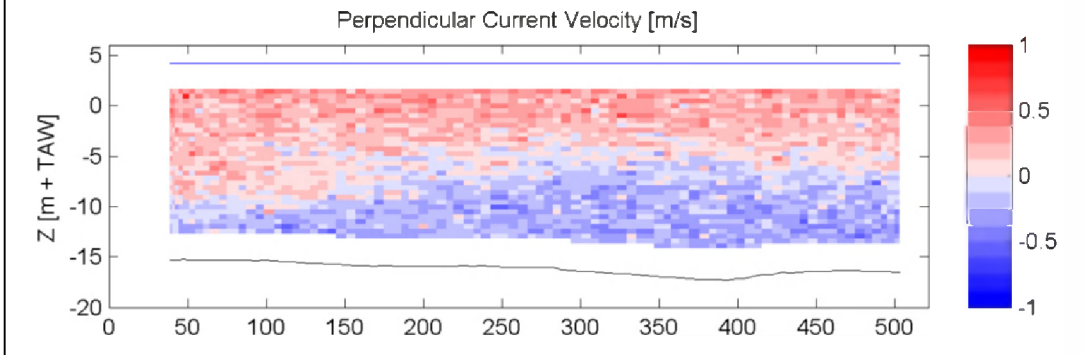
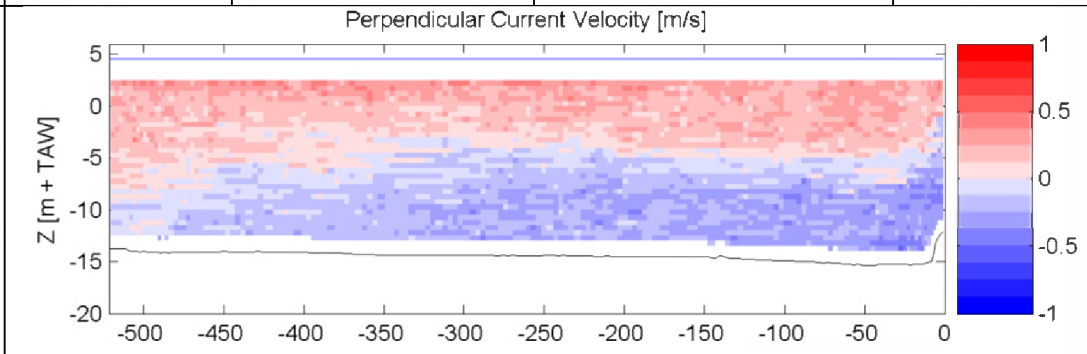
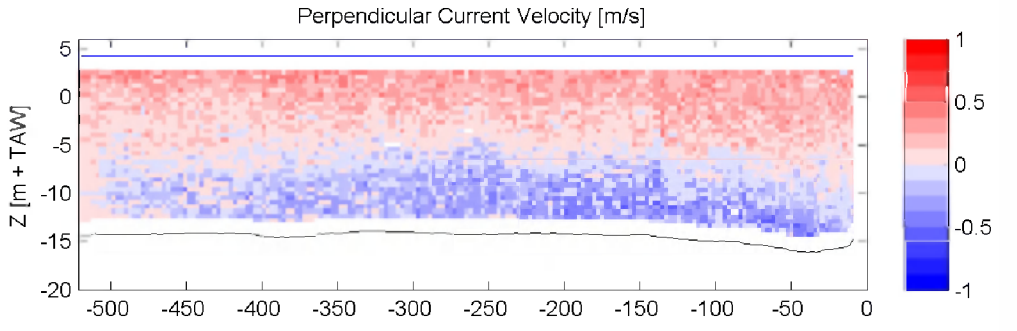
Annex Figure 10: Suspended sediment concentration through the measured cross section

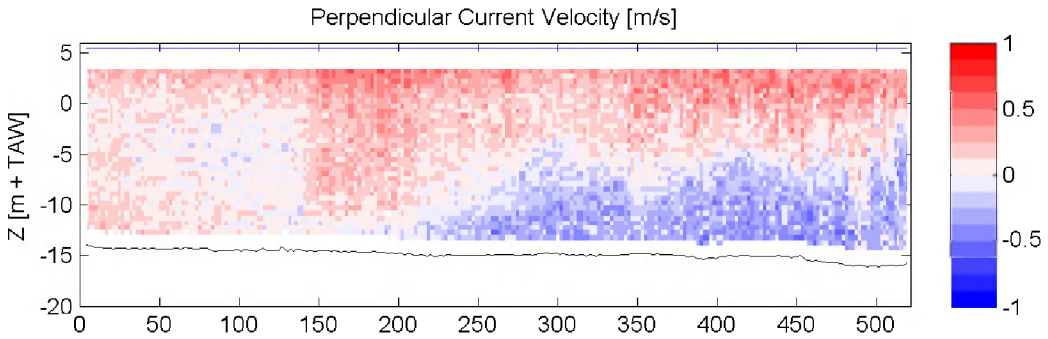
Annex I Current and SSC patterns - intercomparison with earlier measurement campaigns at Deurganckdok

I.1 Overview of the different campaigns

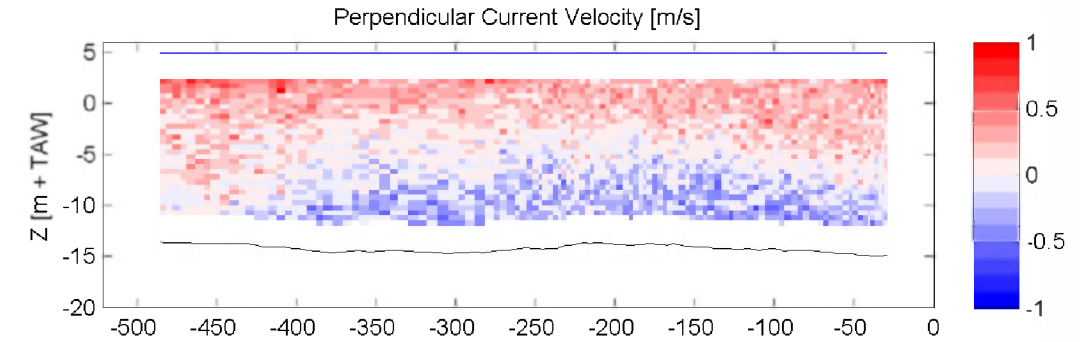
Tidal Coefficient at tidal gauge: Liefkenshoek				
PROJECT (DESCRIPTION)	***Date***	***Tidal coefficient***	***Tidal phase***	***Fresh water discharge at Schelle [m³/s]***
HCBS 1 (IMDC, 2006m)	17/11/2005	1.10	Spring	91*
HCBS 2 (IMDC, 2006c)	22/03/2006	0.97	Average	94*
HCBS 2 (IMDC, 2007o)	27/09/2006	1.03	Average	33*
DGD 1 (IMDC, 2008a)	24/10/2007	1.02	Average	46*
DGD 2 (IMDC, 2008k)	11/03/2008	1.17	Spring	286*
DGD 3 (IMDC, 2008u)	19/06/2008	1.15	Spring	93*
DGD 3 (IMDC, 2008v)	26/06/2008	0.97	Average	69*
DGD3 (IMDC 2008x)	24/09/2008	0.81	Neap	75*
DGD 3 (IMDC, 2009a)	30/09/2008	1.08	Spring	82*
DGD 3 (IMDC, 2009e)	02/12/2008	0.98	Average	154*
DGD 3(IMDC,2009f)	10/12/2008	0.97	Average	222*
DGD 3(IMDC,2009i)	06/03/2009	0.82	Neap	99*
DGD 3(IMDC,2009n)	12/03/2009	1.24	Spring	129*
Eff DGD (IMDC, 2012a)	28/09/2011	1.06	Avg/Spring	40**
Eff DGD (IMDC, 2012b)	06/10/2011	0.83	Neap	55**
Eff DGD (IMDC, 2012a)	13/10/2011	1.17	Spring	60**
Eff DGD (IMDC, 2012b)	08/03/2012	1.16	Spring	305**
Eff DGD (IMDC, 2012a)	16/03/2012	0.88	Neap	85**

I.2 1 hour after HW (density currents)

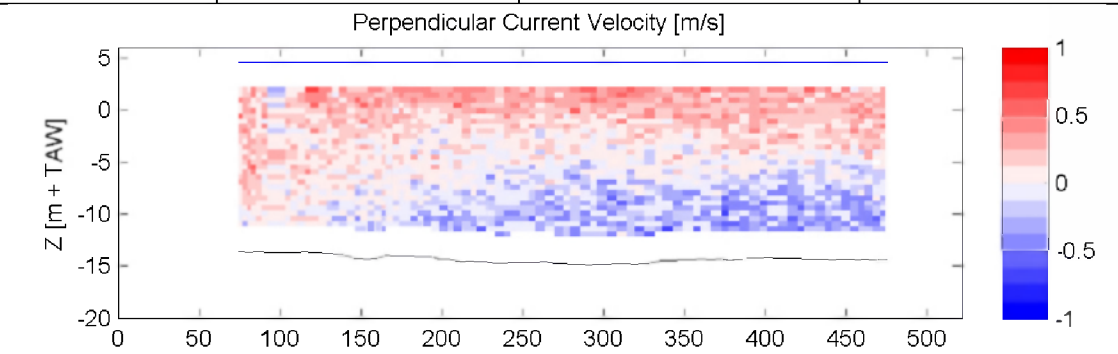
				
a)	17/11/2005	1 hr after HW	Tidal coefficient: 1.10	Fresh water: 91 m³/s
				
b)	22/03/2006	1 hr after HW	Tidal coefficient: 0.97	Fresh water: 94 m³/s
				
c)	27/09/2006	1 hr after HW	Tidal coefficient: 1.03	Fresh water: 33 m³/s
				
d)	24/10/2007	1 hr after HW	Tidal coefficient: 1.02	Fresh water: 46 m³/s



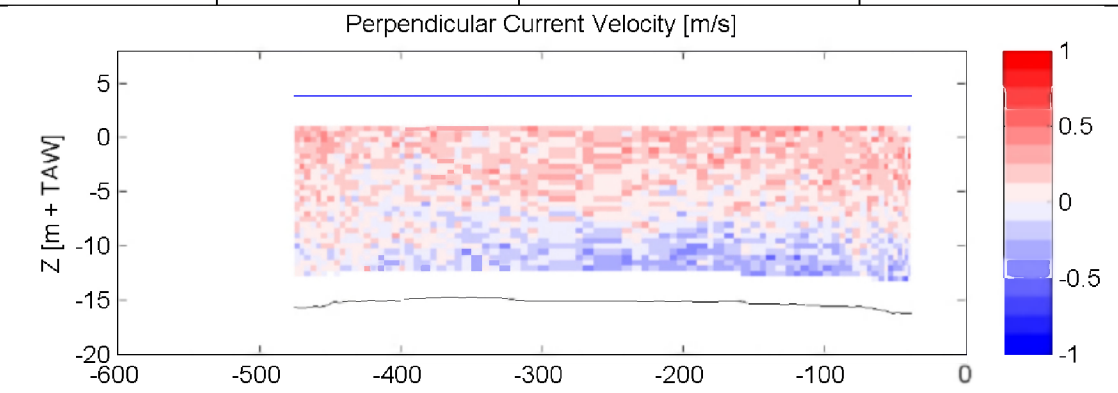
e)	11/03/2008	1 hr after HW	Tidal coefficient: 1.17	Fresh water: 286 m³/s



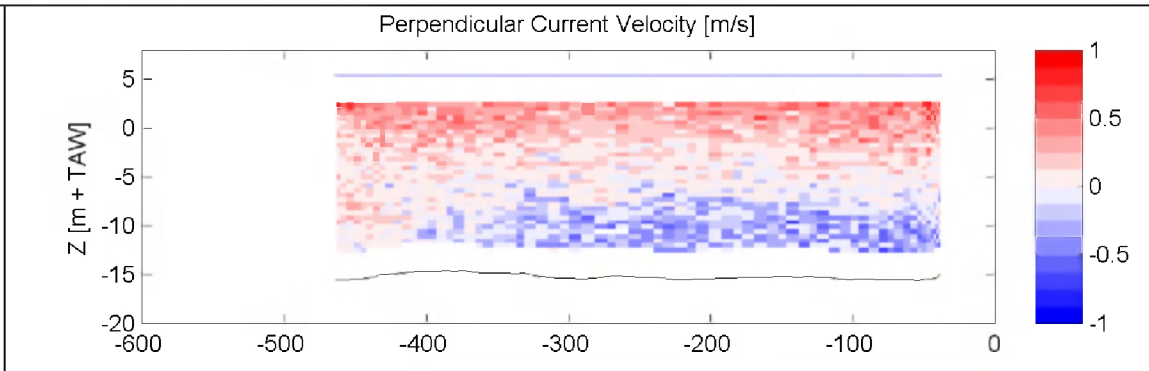
f)	19/06/2008	1 hr after HW	Tidal coefficient: 1.15	Fresh water: 93 m³/s



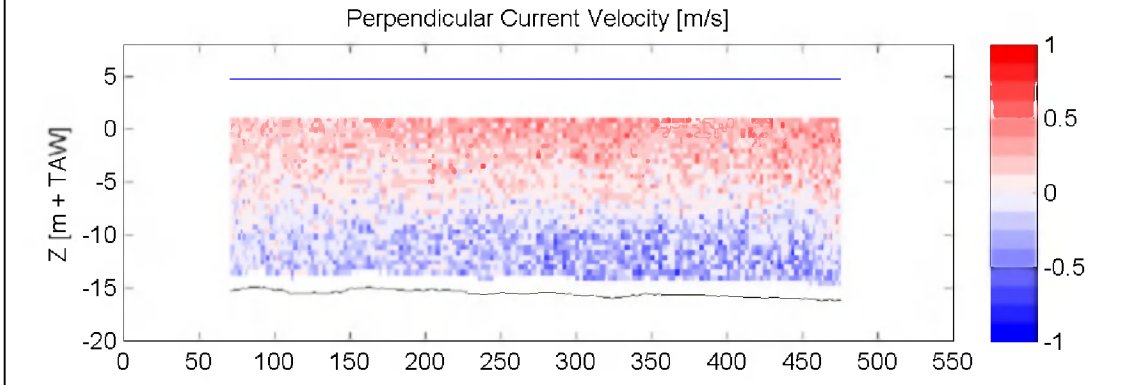
g)	26/06/2008	1 hr after HW	Tidal coefficient: 0.97	Fresh water: 69 m³/s



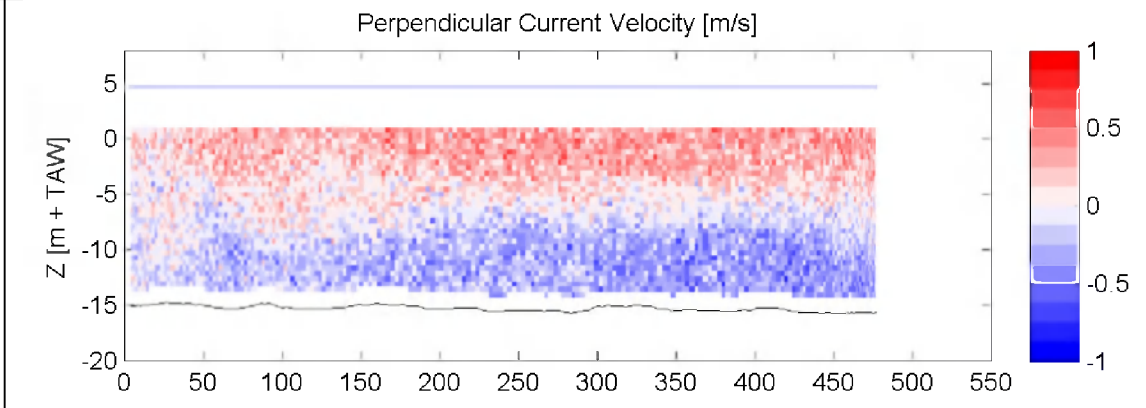
h)	24/09/2008	1 hr after HW	Tidal coefficient: 0.81	Fresh water: 75 m³/s



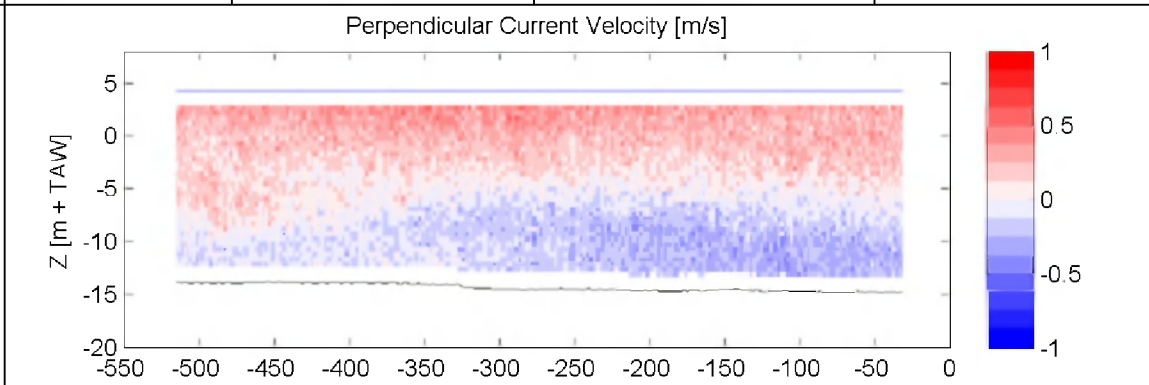
i)	30/09/2008	1 hr after HW	Tidal coefficient: 1.08	Fresh water: 82 m³/s



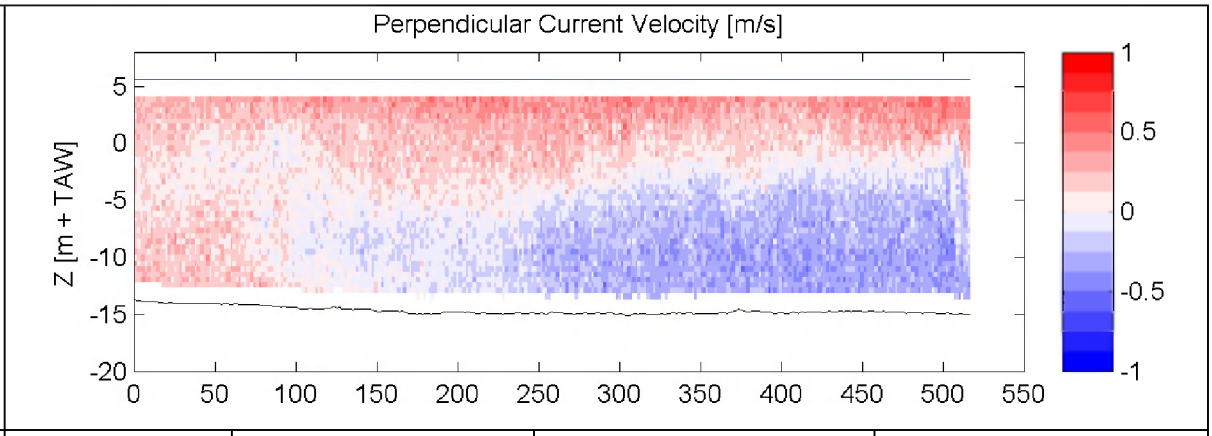
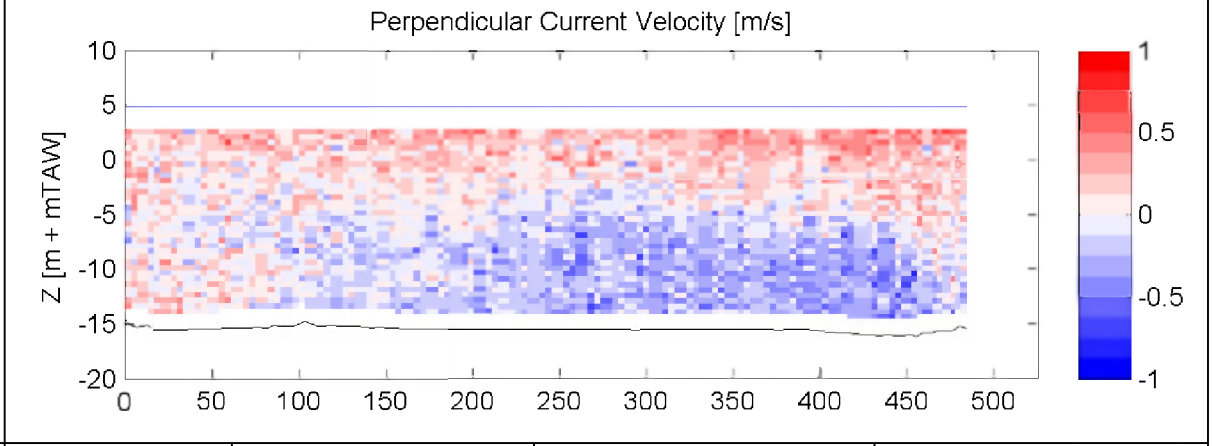
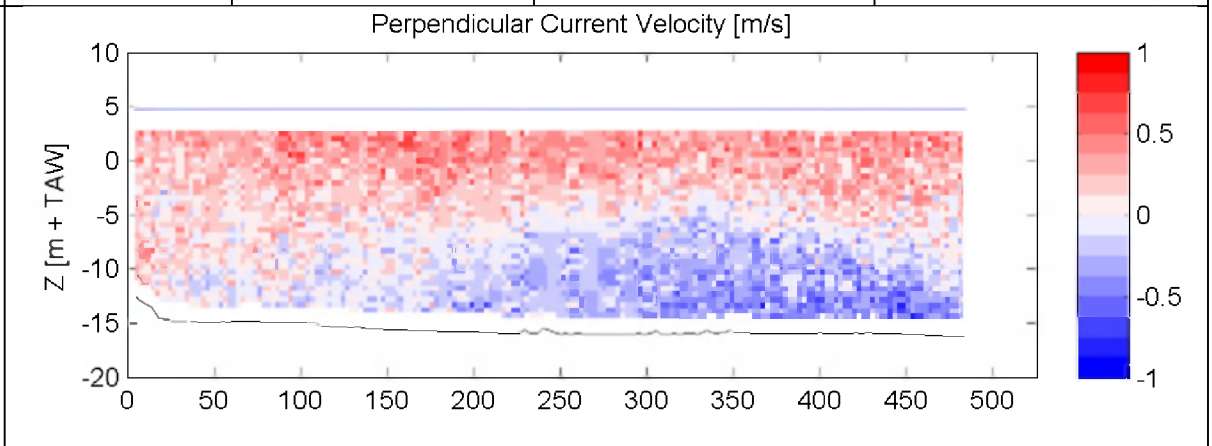
j)	02/12/2008	1 hr after HW	Tidal coefficient: 0.98	Fresh water: 154 m³/s

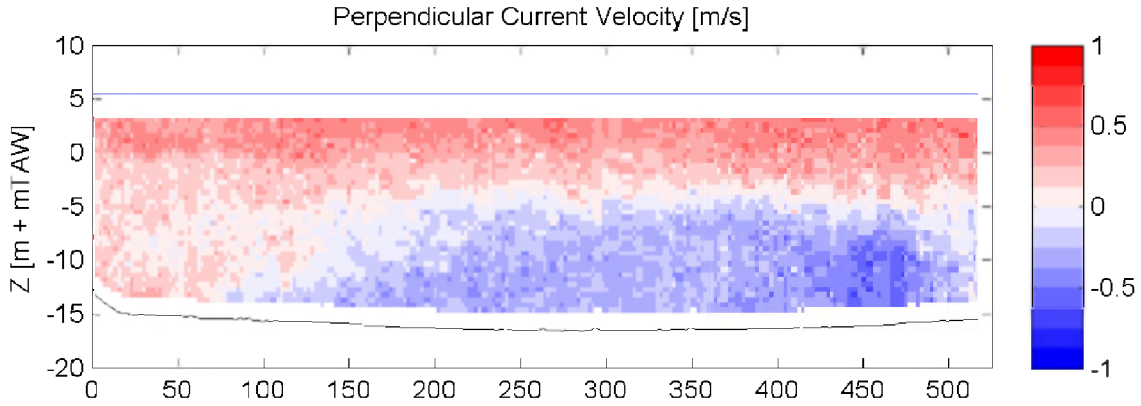


k)	10/12/2008	1 hr after HW	Tidal coefficient: 0.97	Fresh water: 222 m³/s

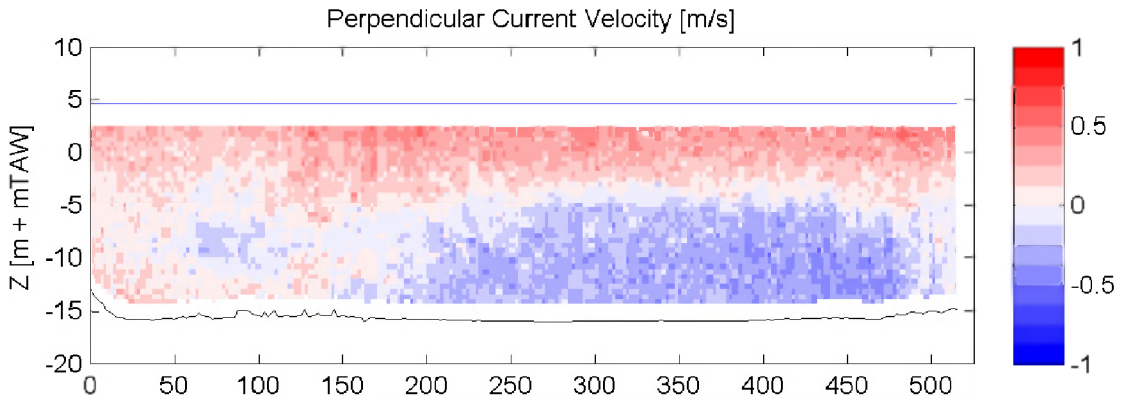


l)	06/03/2009	1 hr after HW	Tidal coefficient: 0.82	Fresh water: 99m³/s

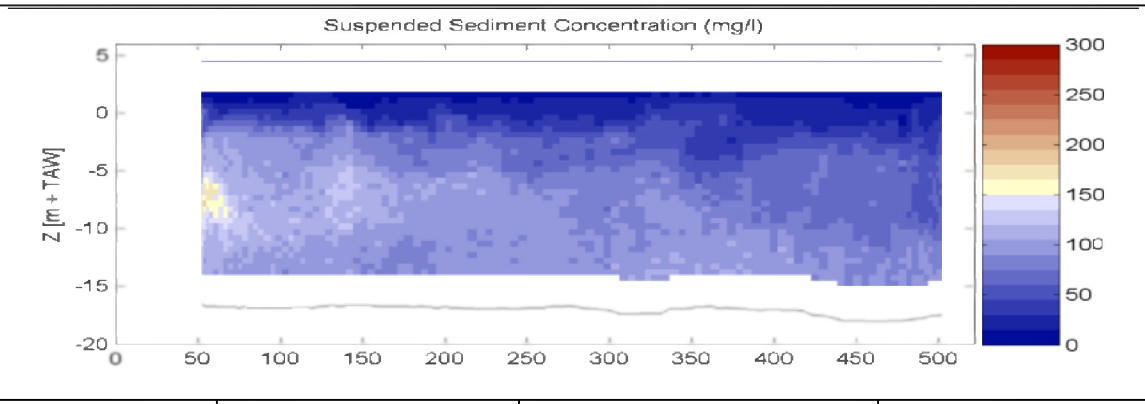
				
m)	12/03/2009	1 hr after HW	Tidal coefficient: 1.24	Fresh water: 129m³/s
	No velocity data available			
n)	28/09/2011	1 hr after HW	Tidal coefficient: 1.17	Fresh water: 40 m³/s
				
o)	06/10/2011	1 hr after HW	Tidal coefficient: 0.83	Fresh water: 55 m³/s
				
p)	13/10/2011	1 hr after HW	Tidal coefficient: 1.06	Fresh water: 60 m³/s



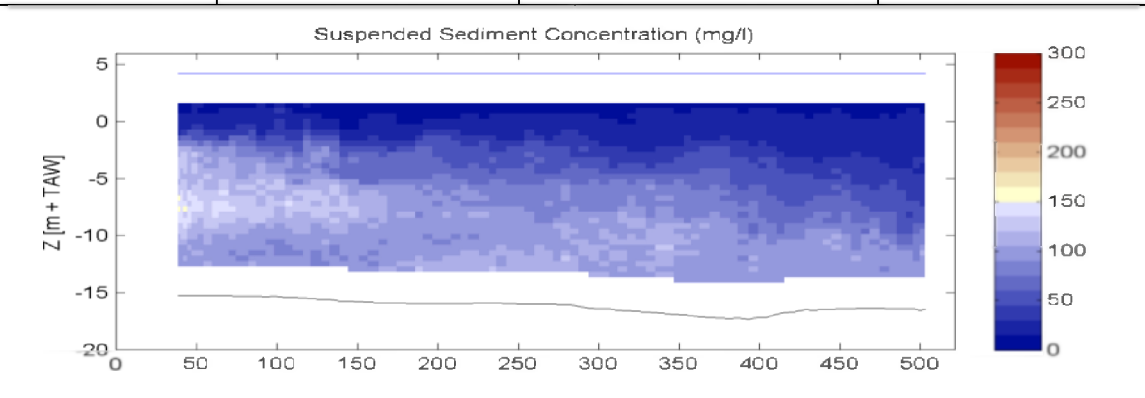
q)	08/03/2012	1 hr after HW	Tidal coefficient: 1.16	Fresh water: 305 m³/s



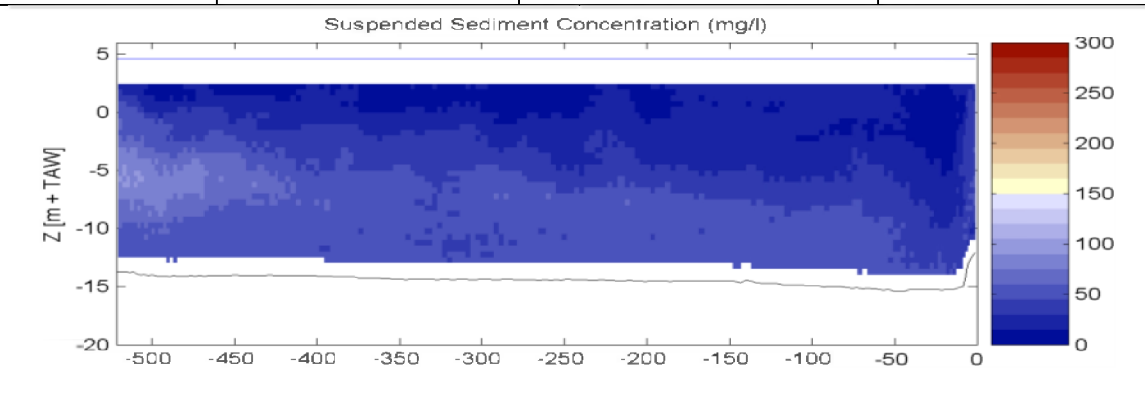
r)	16/03/2012	1 hr after HW	Tidal coefficient: 0.88	Fresh water: 85 m³/s



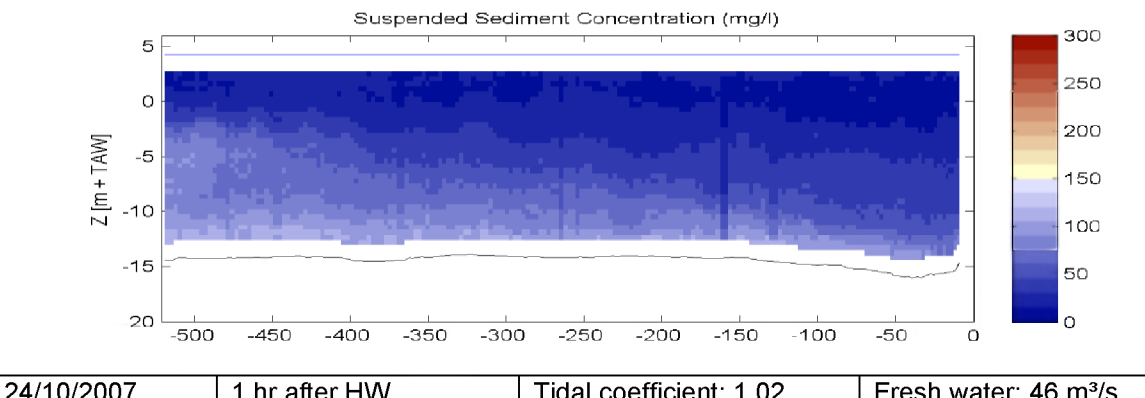
a)	17/11/2005	1 hr after HW	Tidal coefficient: 1.10	Fresh water: 91 m³/s



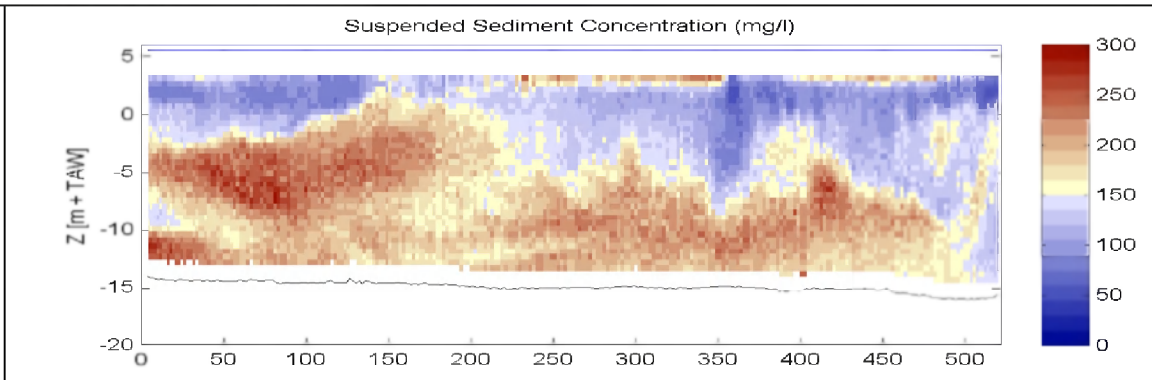
b)	22/03/2006	1 hr after HW	Tidal coefficient: 0.97	Fresh water: 94 m³/s



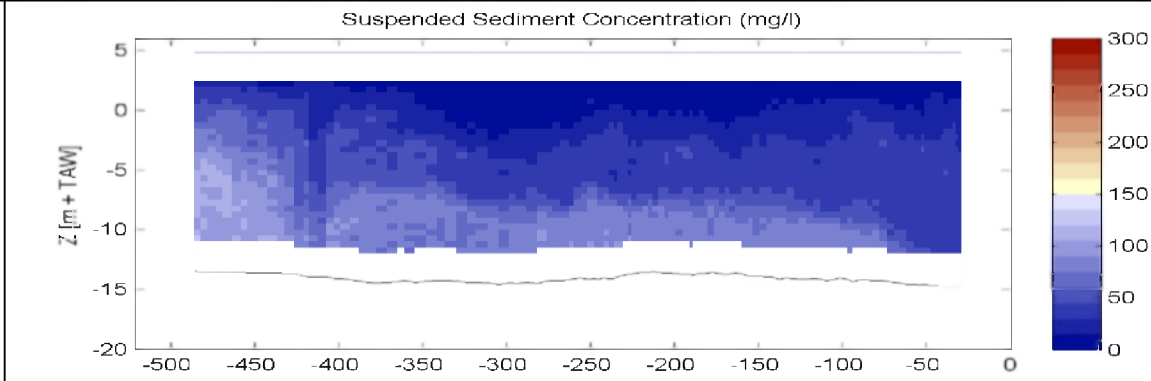
c)	27/09/2006	1 hr after HW	Tidal coefficient: 1.03	Fresh water: 33 m³/s



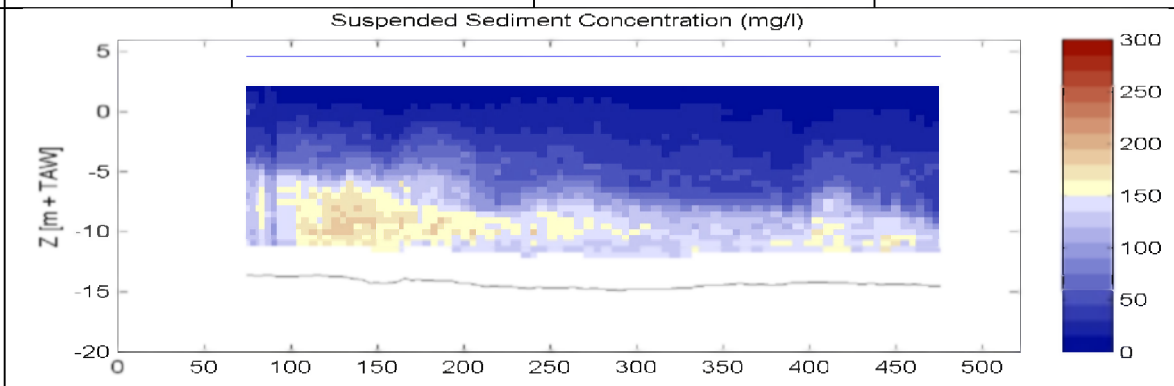
d)	24/10/2007	1 hr after HW	Tidal coefficient: 1.02	Fresh water: 46 m³/s



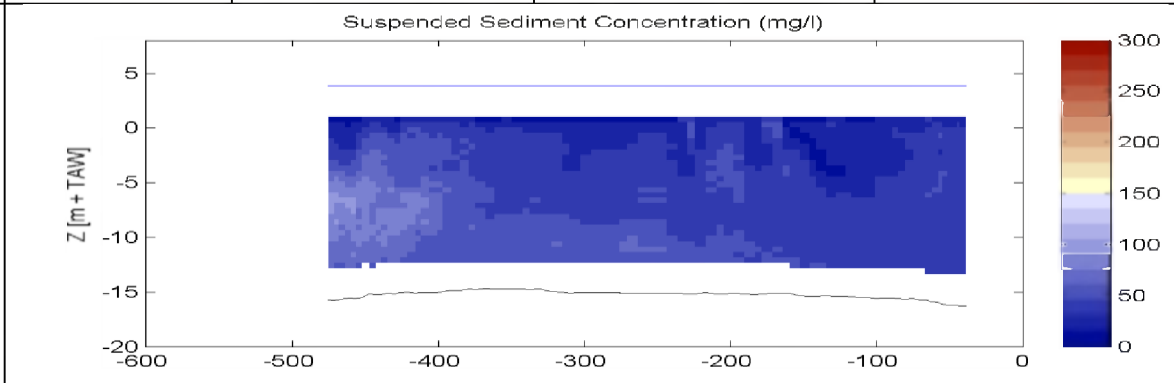
e)	11/03/2008	1 hr after HW	Tidal coefficient: 1.17	Fresh water: 286 m³/s



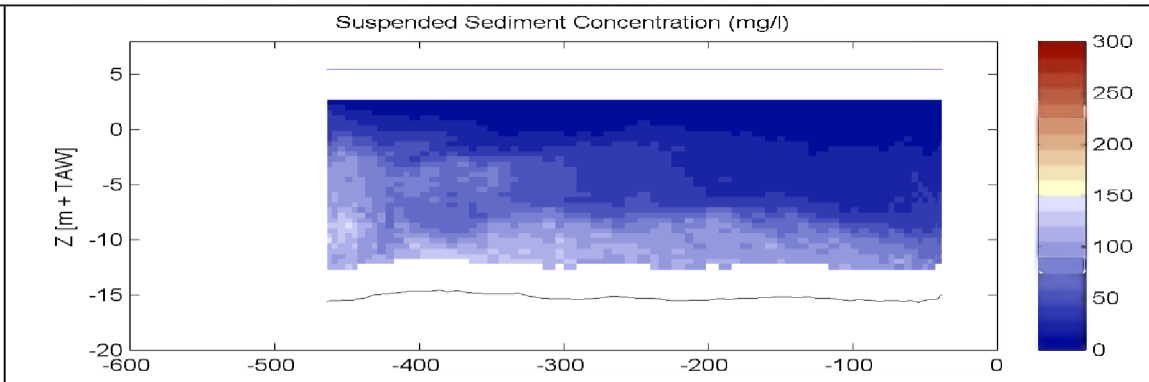
f)	19/06/2008	1 hr after HW	Tidal coefficient: 1.15	Fresh water: 93 m³/s



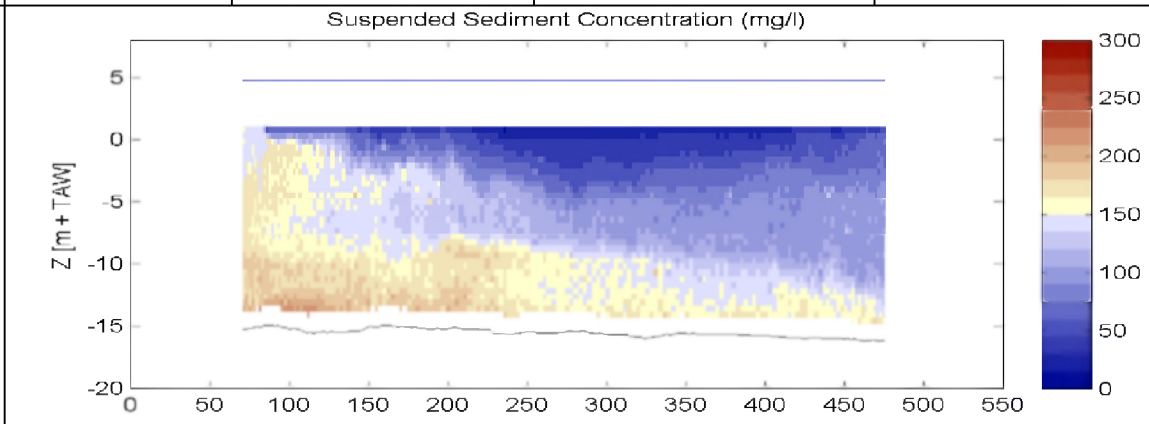
g)	26/06/2008	1 hr after HW	Tidal coefficient: 0.97	Fresh water: 69 m³/s



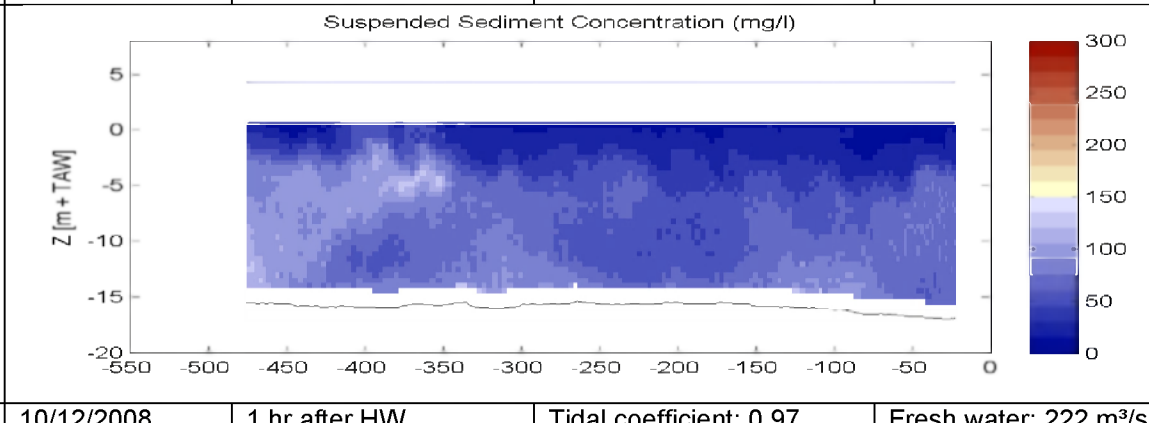
h)	24/09/2008	1 hr after HW	Tidal coefficient: 0.81	Fresh water: 75 m³/s



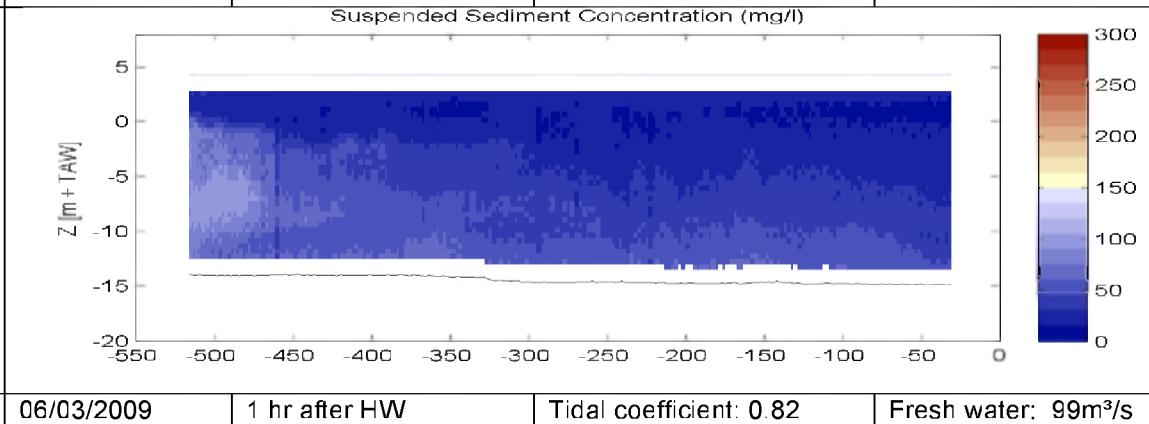
i)	30/09/2008	1 hr after HW	Tidal coefficient: 1.08	Fresh water: 82 m³/s



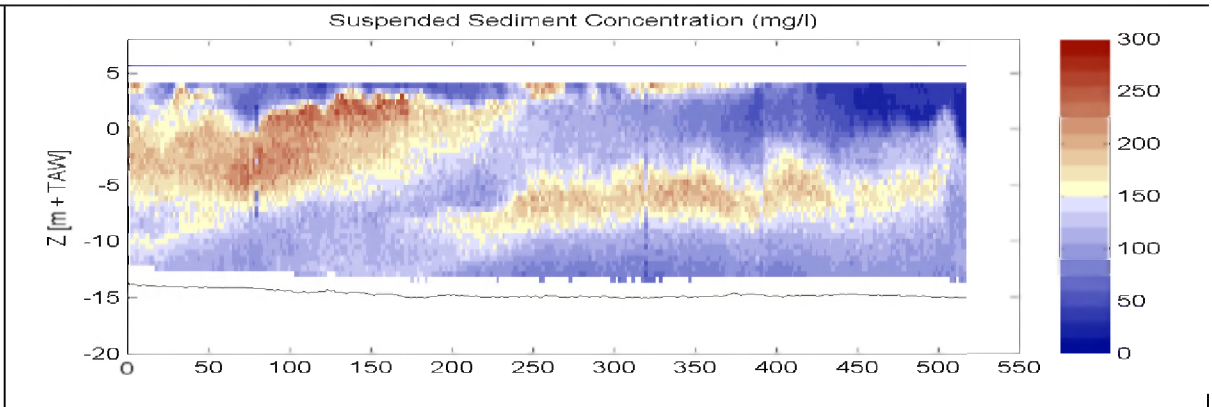
j)	02/12/2008	1 hr after HW	Tidal coefficient: 0.98	Fresh water: 154 m³/s



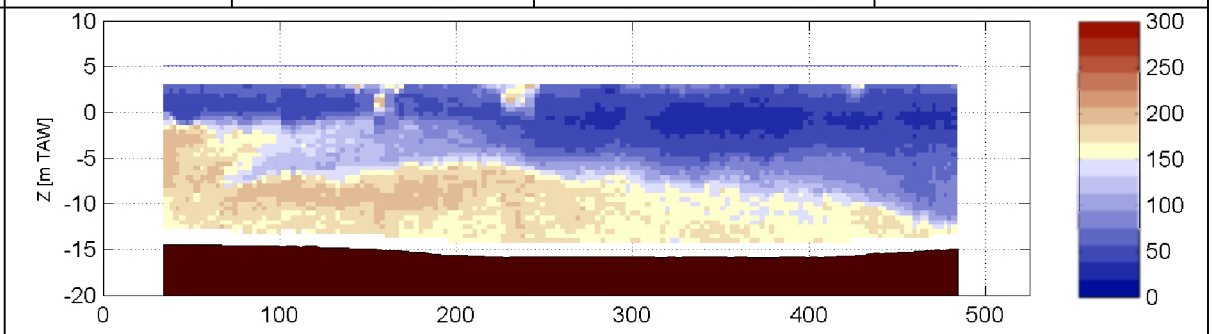
k)	10/12/2008	1 hr after HW	Tidal coefficient: 0.97	Fresh water: 222 m³/s



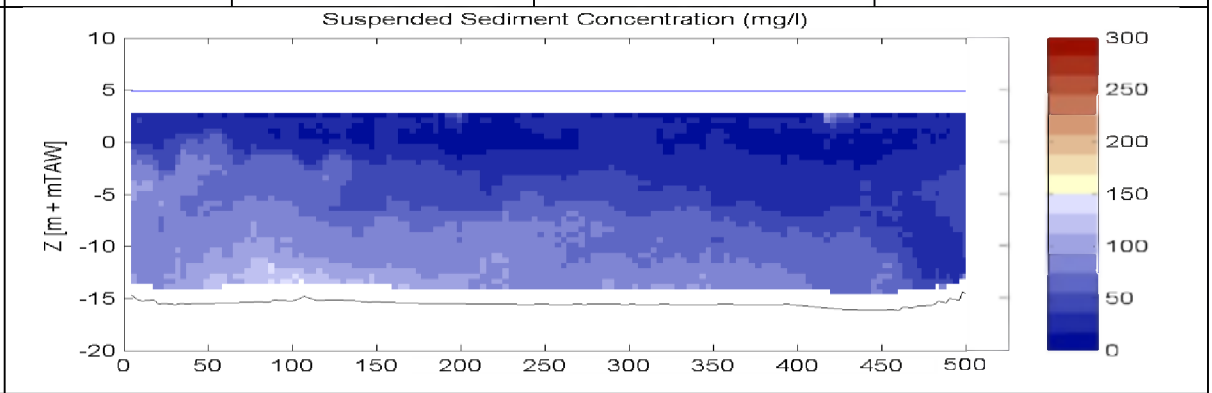
l)	06/03/2009	1 hr after HW	Tidal coefficient: 0.82	Fresh water: 99m³/s



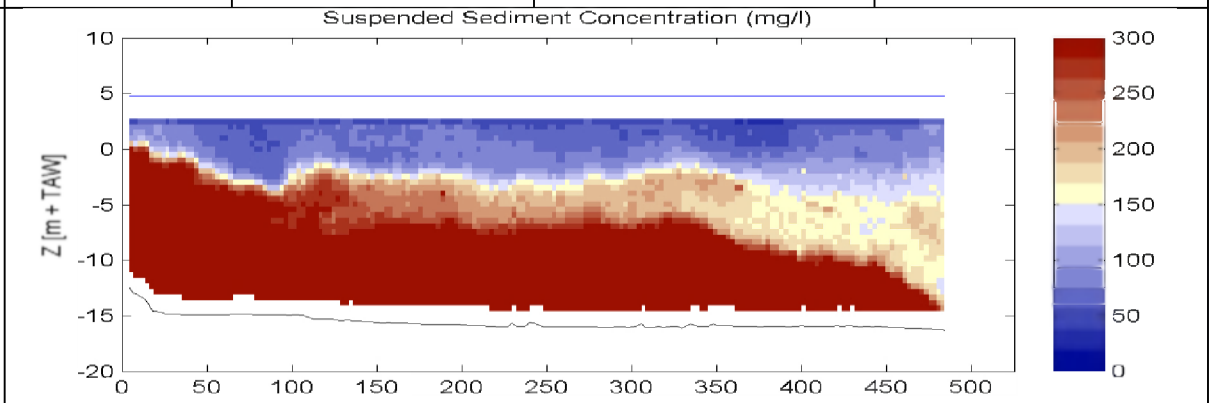
m)	12/03/2009	1 hr after HW	Tidal coefficient: 1.24	Fresh water: 129m³/s



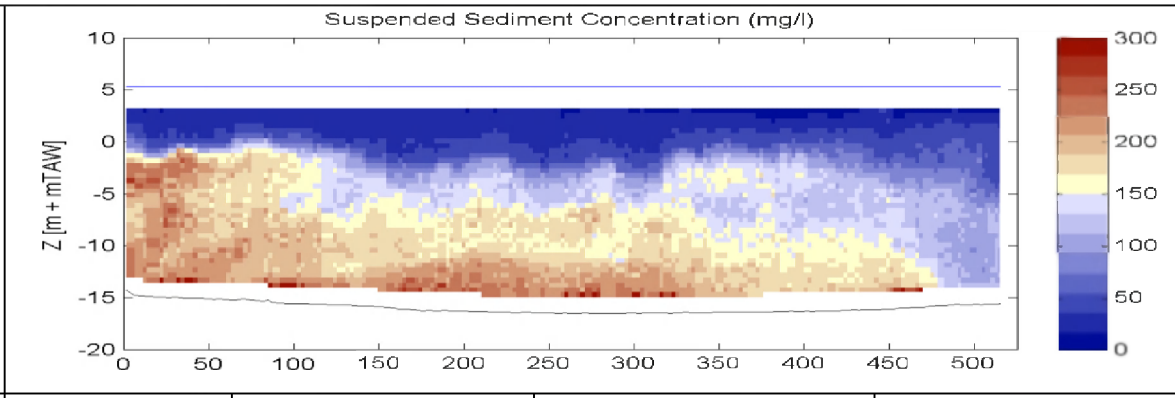
n)	28/09/2011	1 hr after HW	Tidal coefficient: 1.17	Fresh water: 40 m³/s



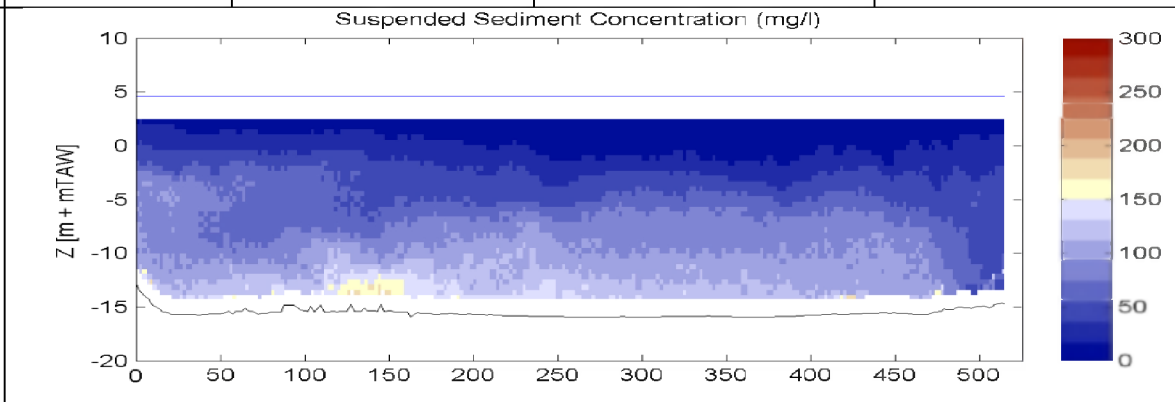
o)	06/10/2011	1 hr after HW	Tidal coefficient: 0.83	Fresh water: 55 m³/s



p)	13/10/2011	1 hr after HW	Tidal coefficient: 1.06	Fresh water: 60 m³/s

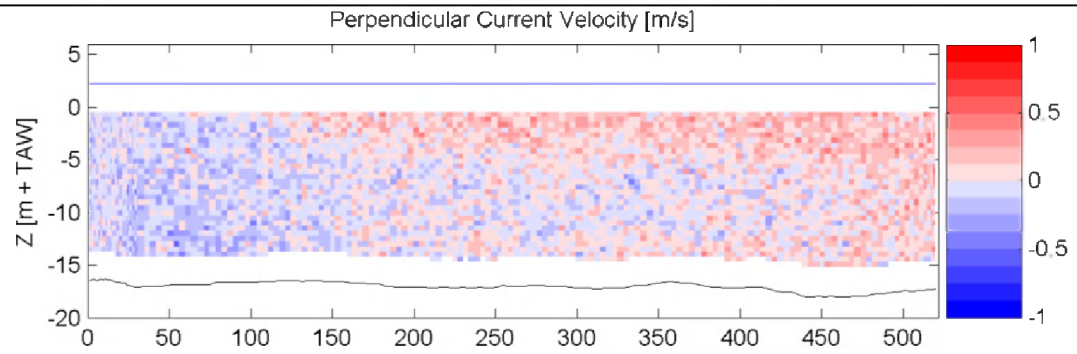


q)	08/03/2012	1 hr after HW	Tidal coefficient: 1.16	Fresh water: 305 m³/s

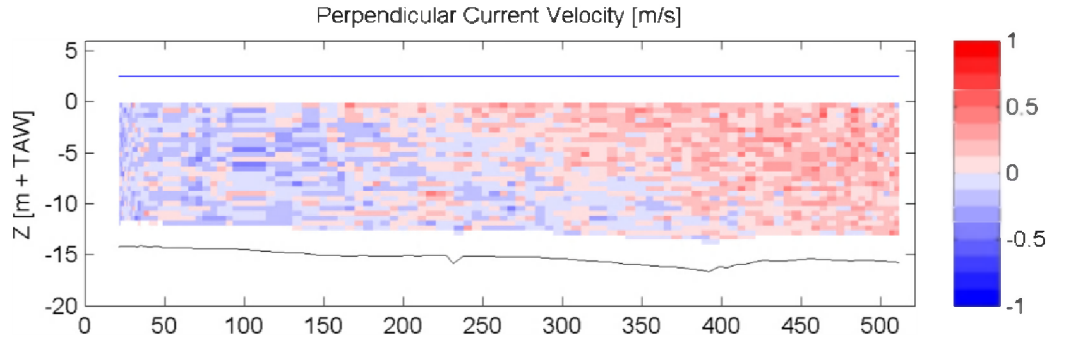


r)	16/03/2012	1 hr after HW	Tidal coefficient: 0.88	Fresh water: 85 m³/s

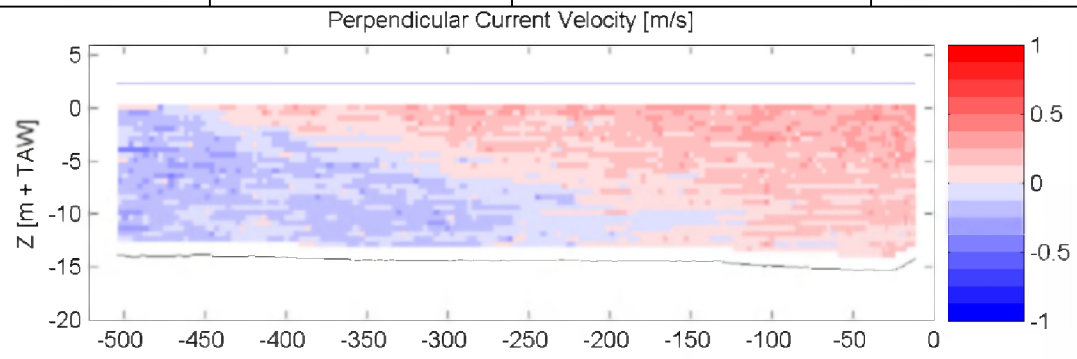
I.3 3 hours after HW (density currents)



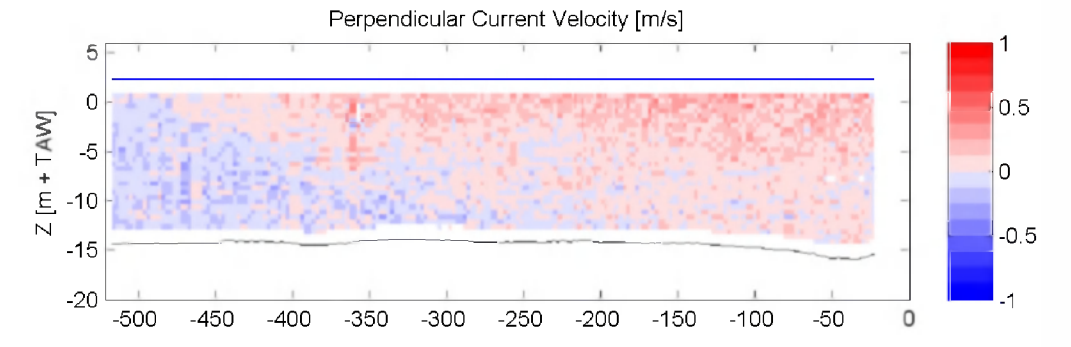
a)	17/11/2005	3 hrs after HW	Tidal coefficient: 1.10	Fresh water: 91 m³/s



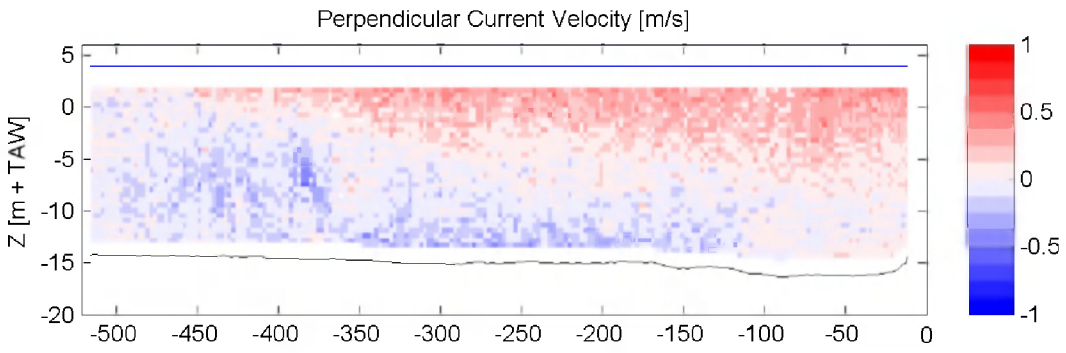
b)	22/03/2006	3 hrs after HW	Tidal coefficient: 0.97	Fresh water: 94 m³/s



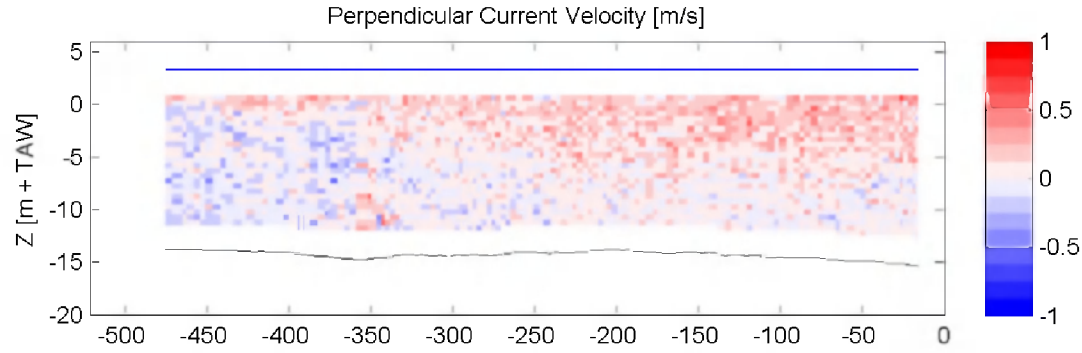
c)	27/09/2006	3 hrs after HW	Tidal coefficient: 1.03	Fresh water: 33 m³/s



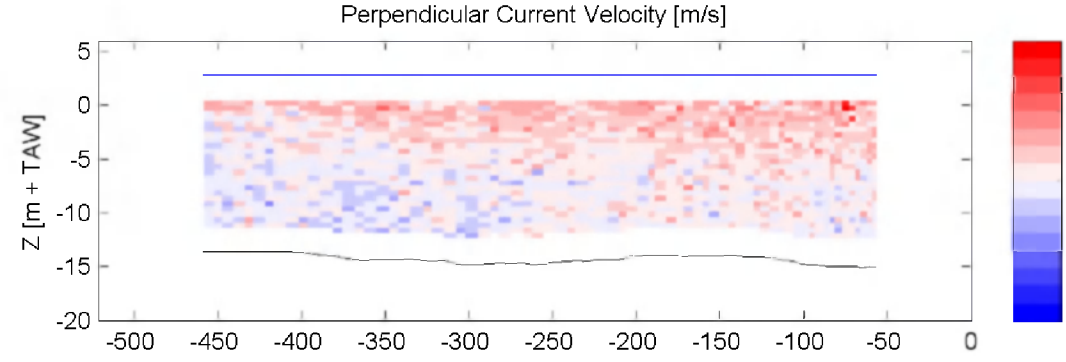
d)	24/10/2007	3 hrs after HW	Tidal coefficient: 1.02	Fresh water: 46 m³/s



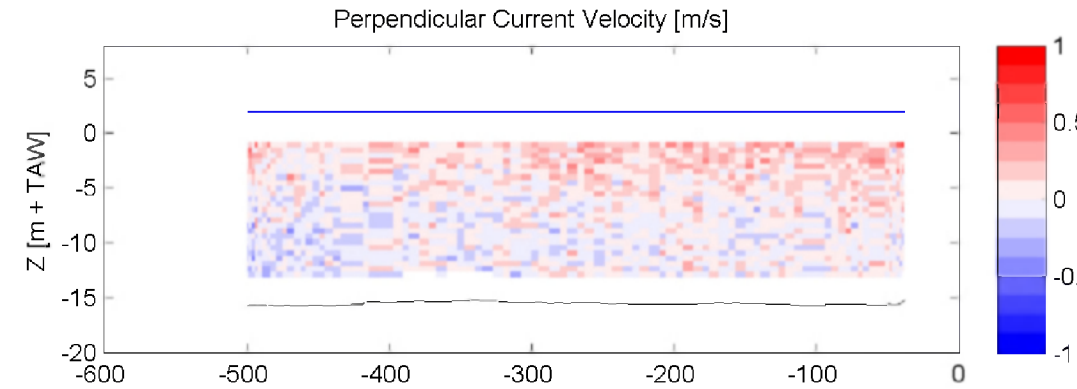
e)	11/03/2008	3 hrs after HW	Tidal coefficient: 1.17	Fresh water: 286 m³/s



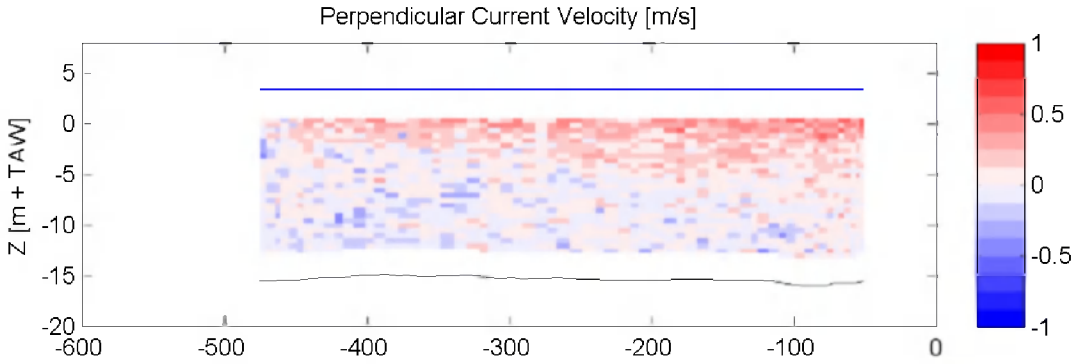
f)	19/06/2008	3 hrs after HW	Tidal coefficient: 1.15	Fresh water: 93 m³/s



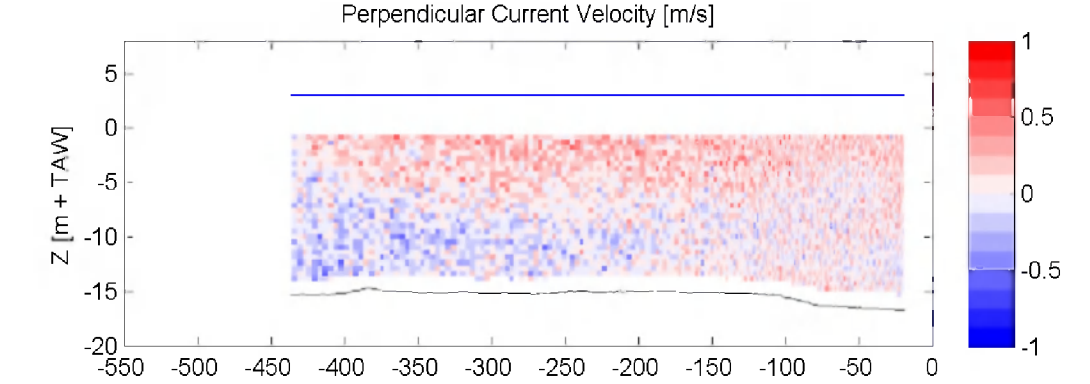
g)	26/06/2008	3 hrs after HW	Tidal coefficient: 0.97	Fresh water: 69 m³/s



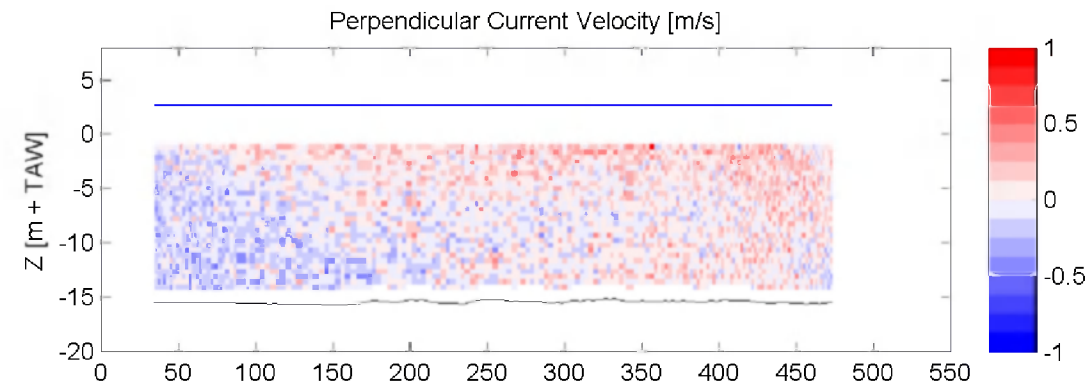
h)	24/09/2008	3 hrs after HW	Tidal coefficient: 0.81	Fresh water: 75 m³/s



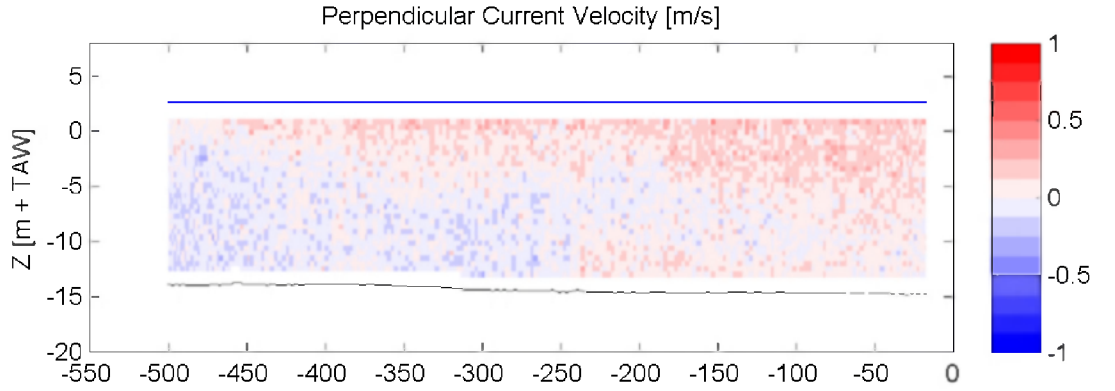
i)	30/09/2008	3 hrs after HW	Tidal coefficient: 1.08	Fresh water: 82 m³/s



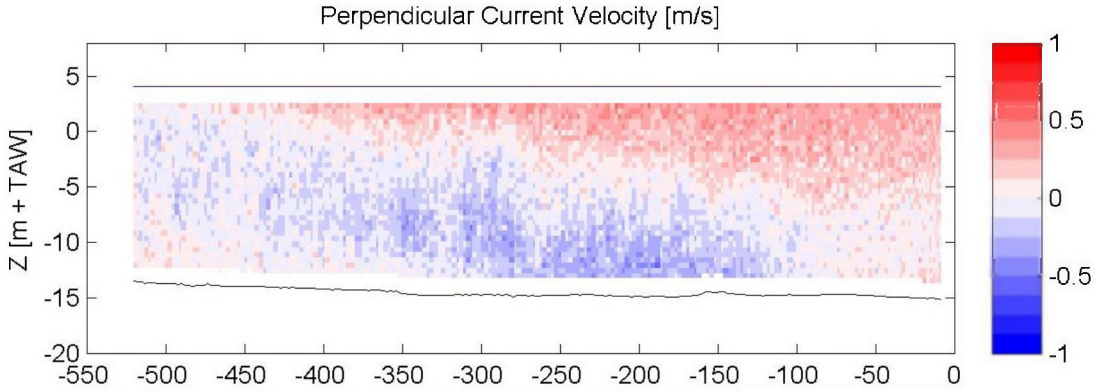
j)	02/12/2008	3 hrs after HW	Tidal coefficient: 0.98	Fresh water: 154 m³/s



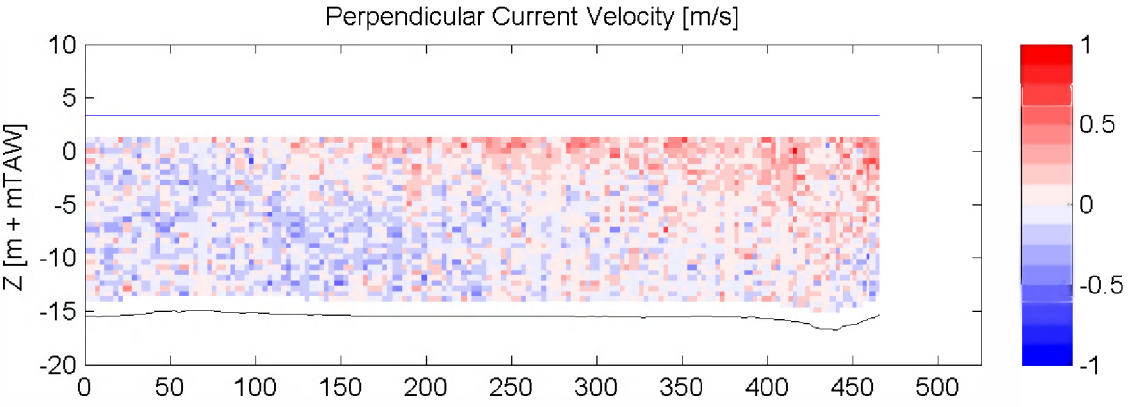
k)	10/12/2008	3 hrs after HW	Tidal coefficient: 0.97	Fresh water: 222m³/s



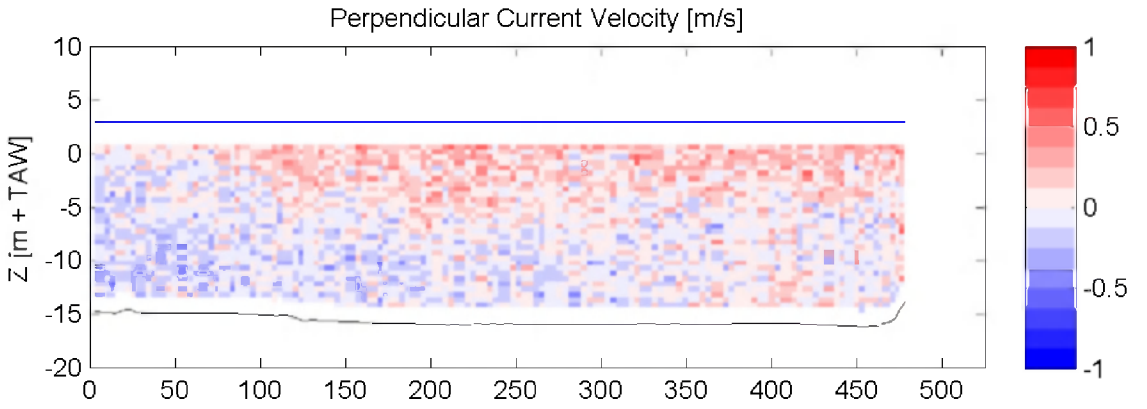
l)	06/03/2009	3 hrs after HW	Tidal coefficient: 0.82	Fresh water: 99m³/s



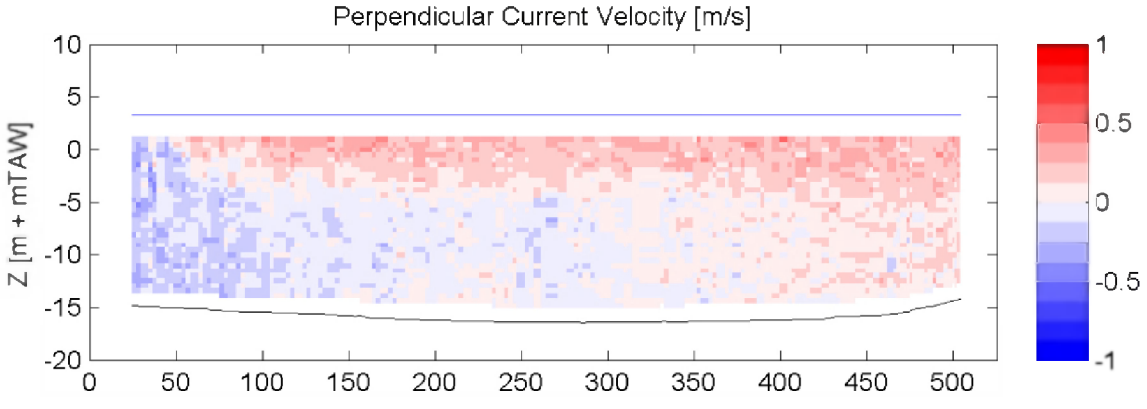
m)	12/03/2009	3 hrs after HW	Tidal coefficient: 1.24	Fresh water: 129m³/s
	No velocity data available			
n)	28/09/2011	3 hrs after HW	Tidal coefficient: 1.17	Fresh water: 40 m³/s



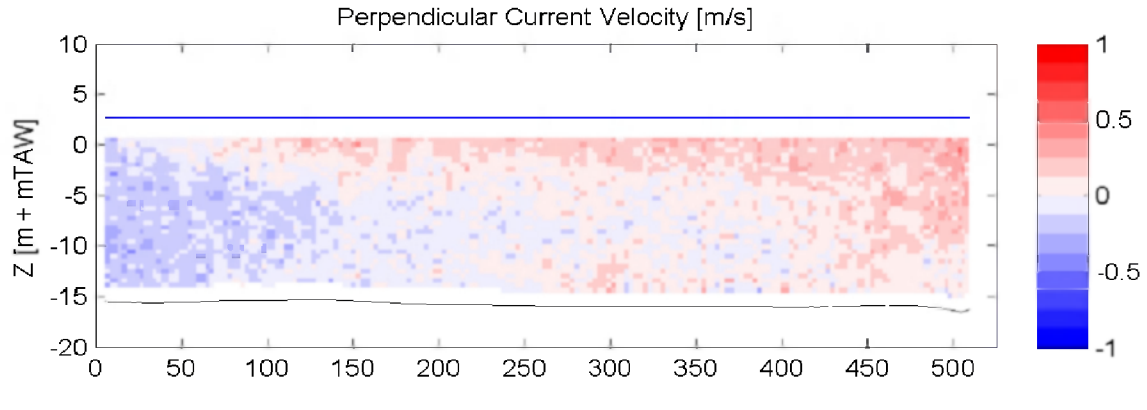
o)	06/10/2011	3 hrs after HW	Tidal coefficient: 0.83	Fresh water: 55 m³/s



p)	13/10/2011	3 hrs after HW	Tidal coefficient: 1.06	Fresh water: 60 m³/s

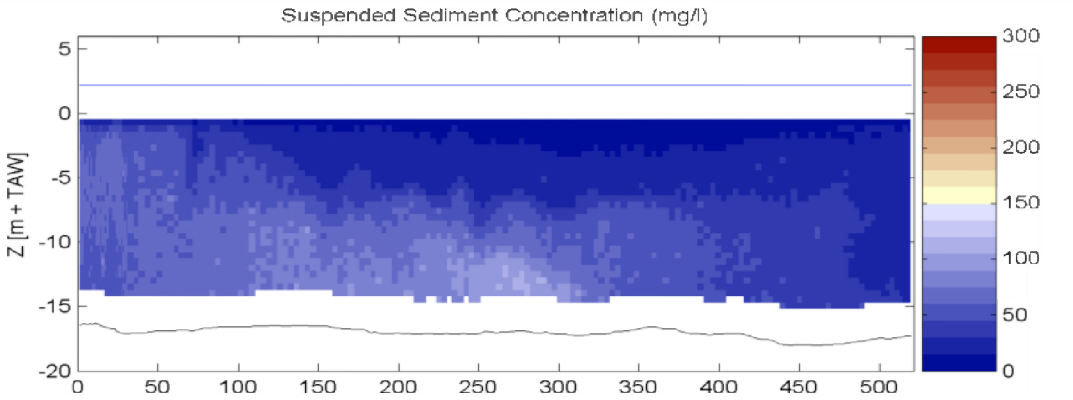


q)	08/03/2012	3 hrs after HW	Tidal coefficient: 1.16	Fresh water: 305 m³/s

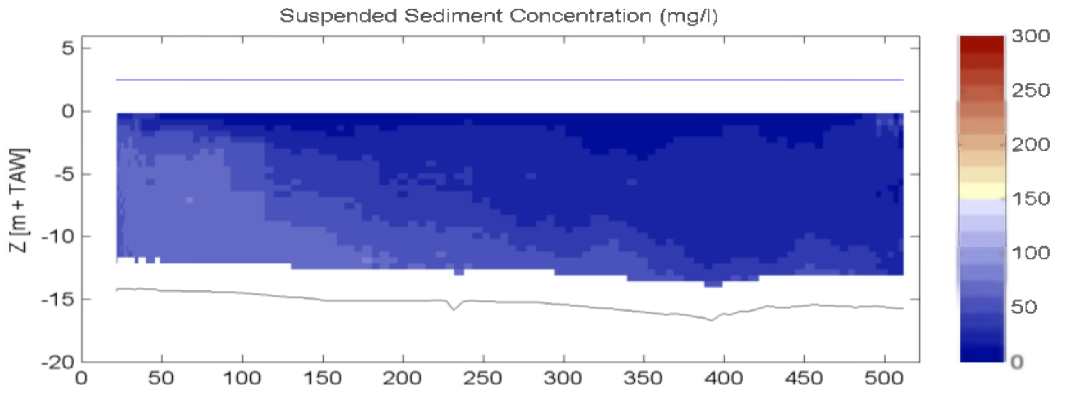


r)	16/03/2013	3 hrs after HW	Tidal coefficient: 0.88	Fresh water: 85 m³/s

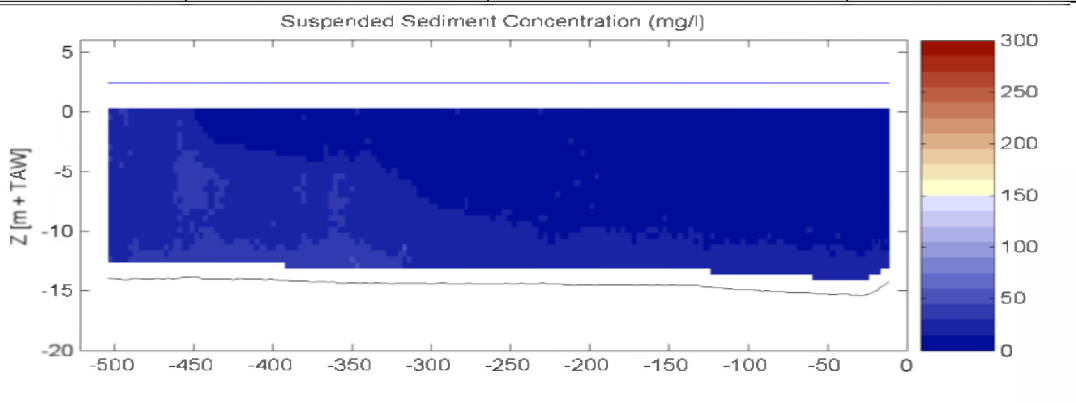
Annex Figure 11: Perpendicular current velocity at 3h after high water



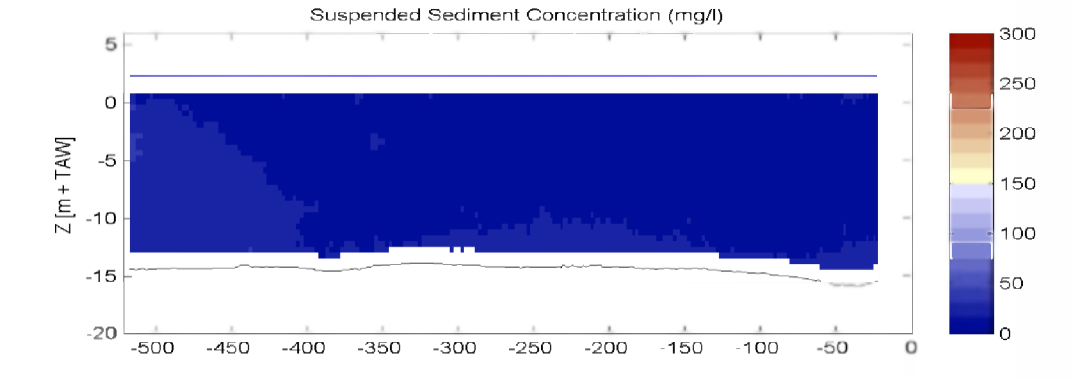
a)	17/11/2005	3 hrs after HW	Tidal coefficient: 1.10	Fresh water: 91 m³/s



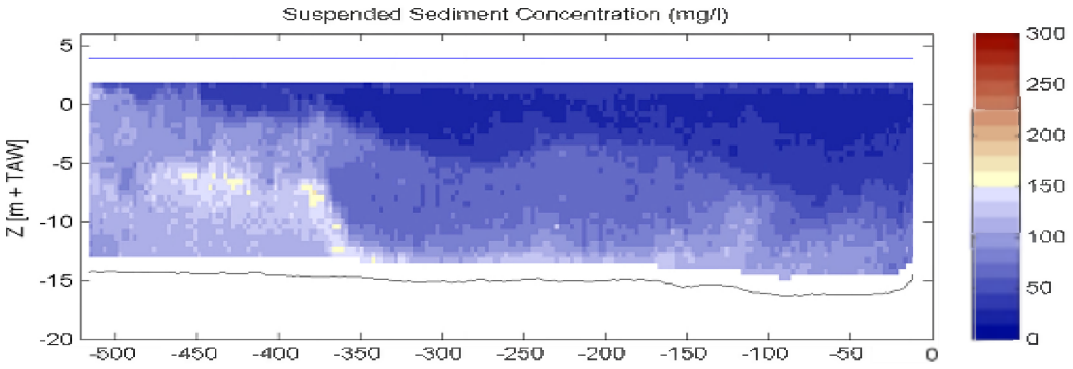
b)	22/03/2006	3 hrs after HW	Tidal coefficient: 0.97	Fresh water: 94 m³/s



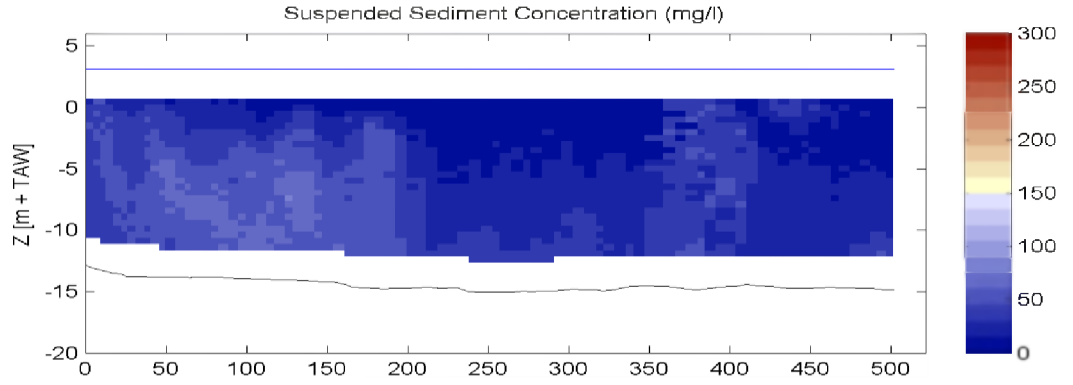
c)	27/09/2006	3 hrs after HW	Tidal coefficient: 1.03	Fresh water: 33 m³/s



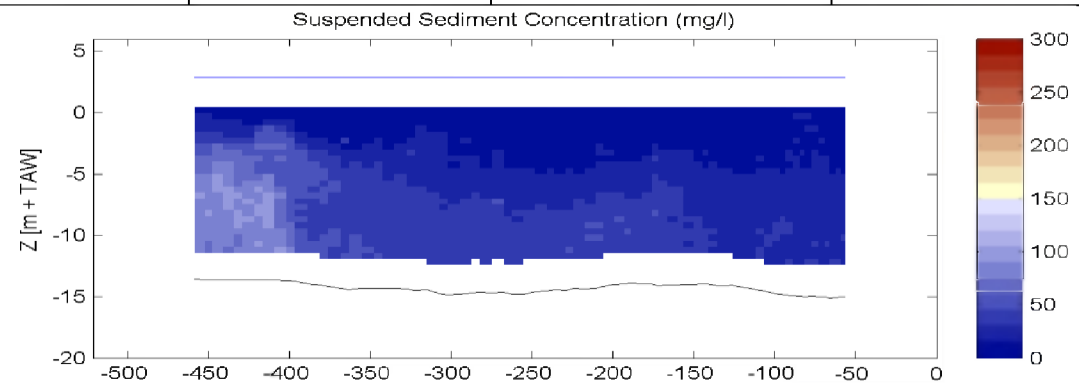
d)	24/10/2007	3 hrs after HW	Tidal coefficient: 1.02	Fresh water: 46 m³/s



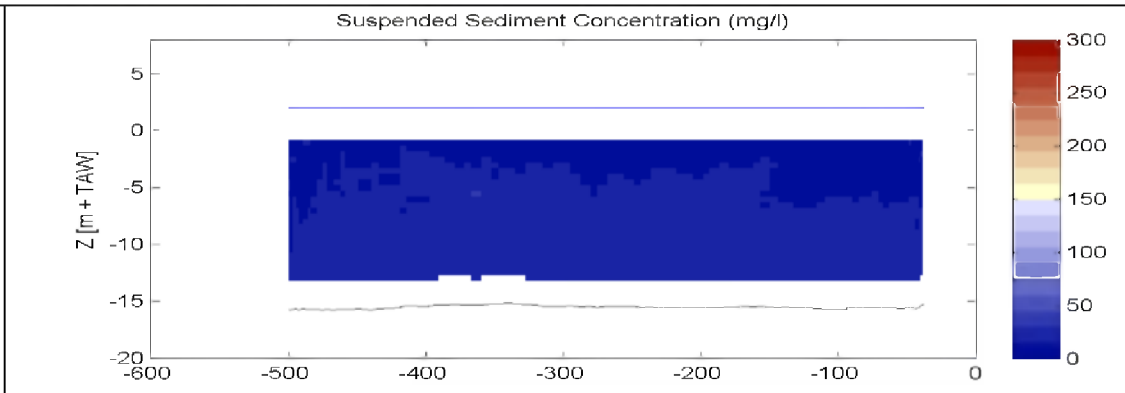
e)	11/03/2008	3 hrs after HW	Tidal coefficient: 1.17	Fresh water: 286 m³/s



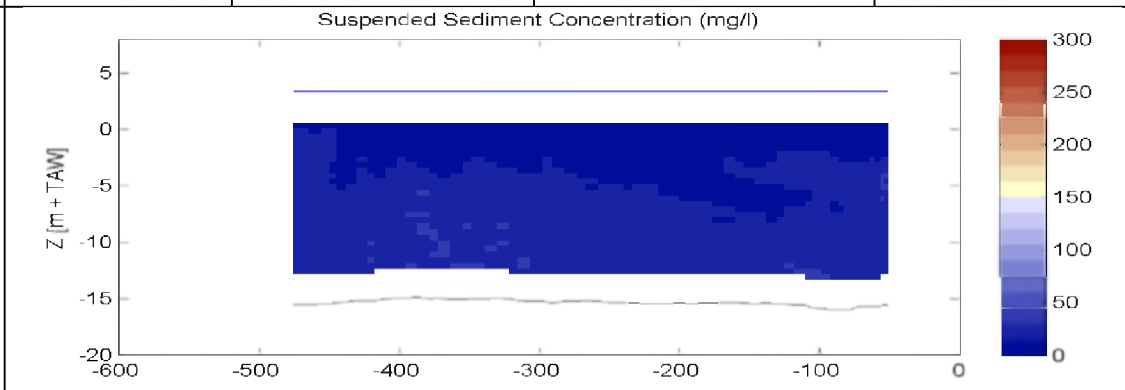
f)	19/06/2008	3 hrs after HW	Tidal coefficient: 1.15	Fresh water: 93 m³/s



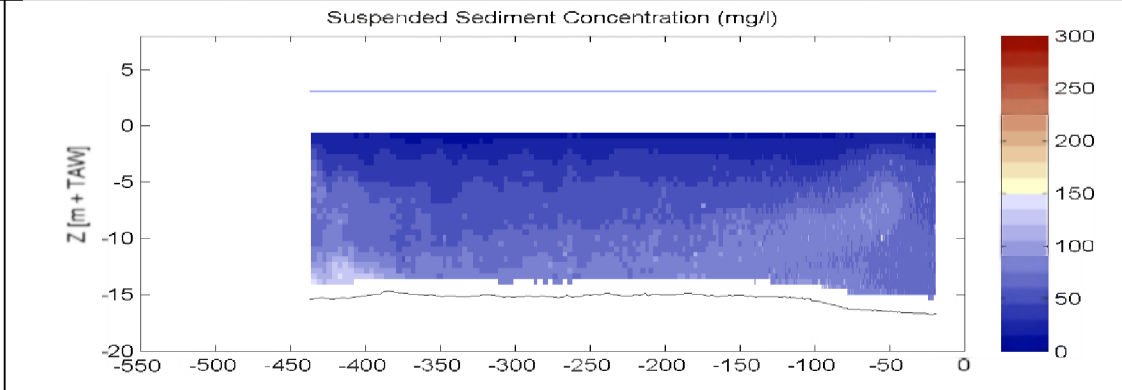
g)	26/06/2008	3 hrs after HW	Tidal coefficient: 0.97	Fresh water: 69 m³/s



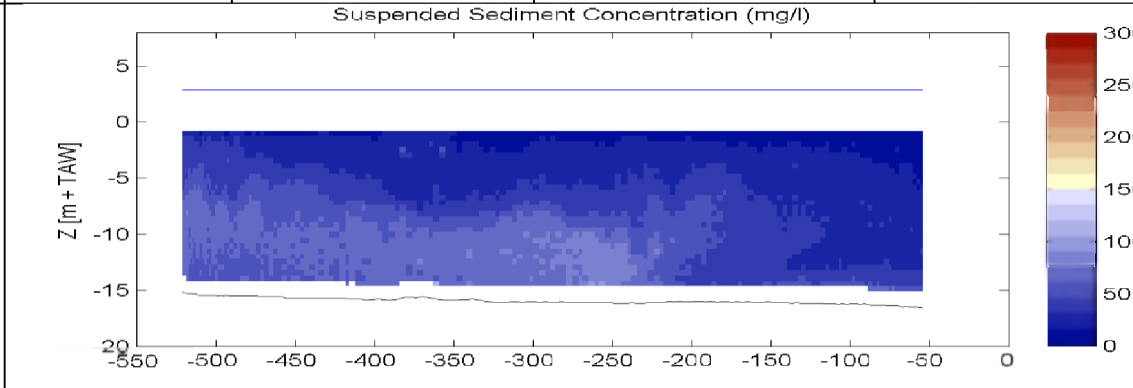
h)	24/09/2008	3 hrs after HW	Tidal coefficient: 0.81	Fresh water: 75 m³/s



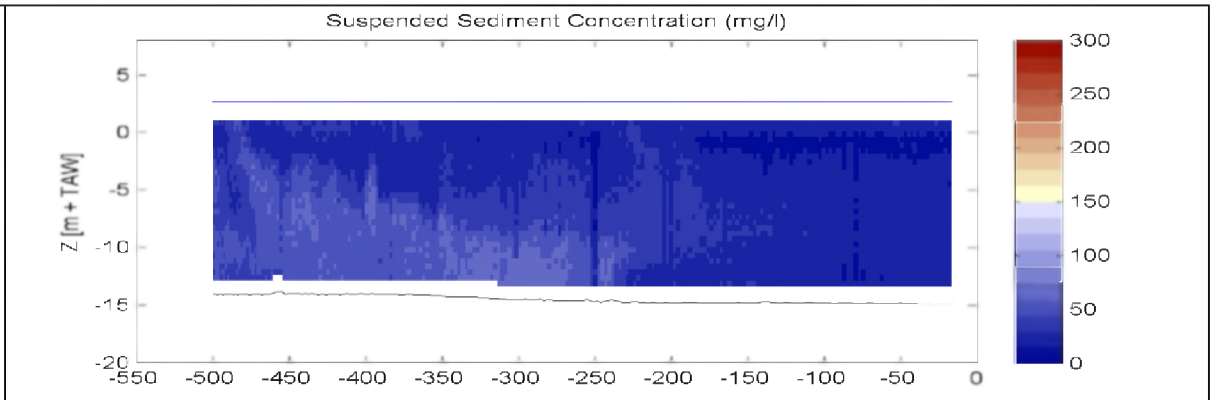
i)	30/09/2008	3 hrs after HW	Tidal coefficient: 1.08	Fresh water: 82 m³/s



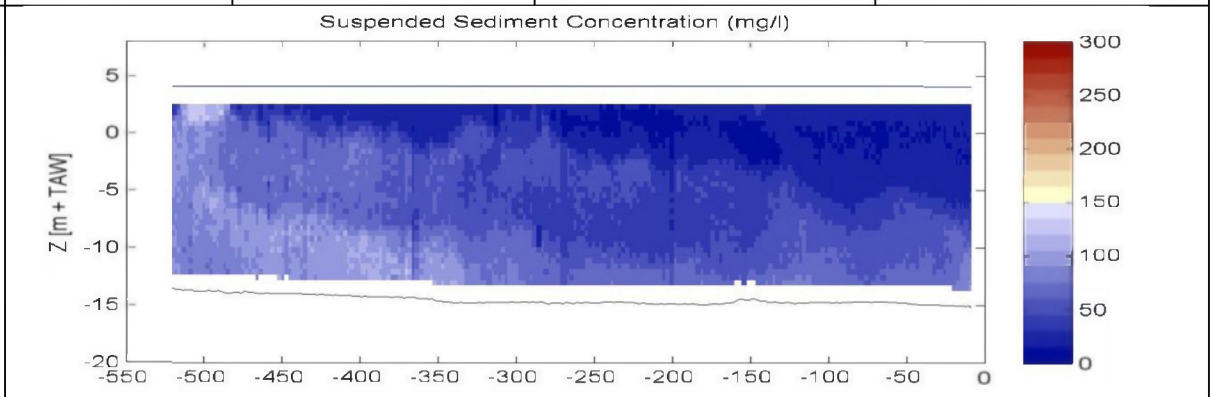
j)	02/12/2008	3 hrs after HW	Tidal coefficient: 0.98	Fresh water: 154 m³/s



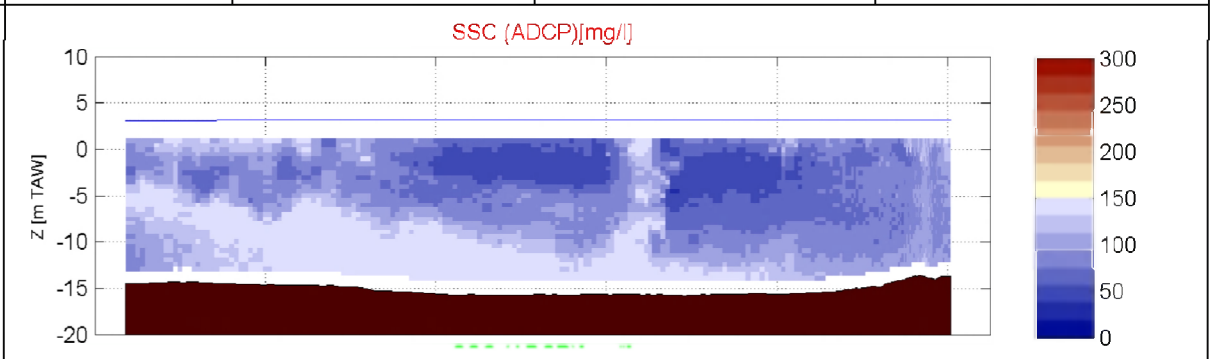
k)	10/12/2008	3 hrs after HW	Tidal coefficient: 0.97	Fresh water: 222m³/s



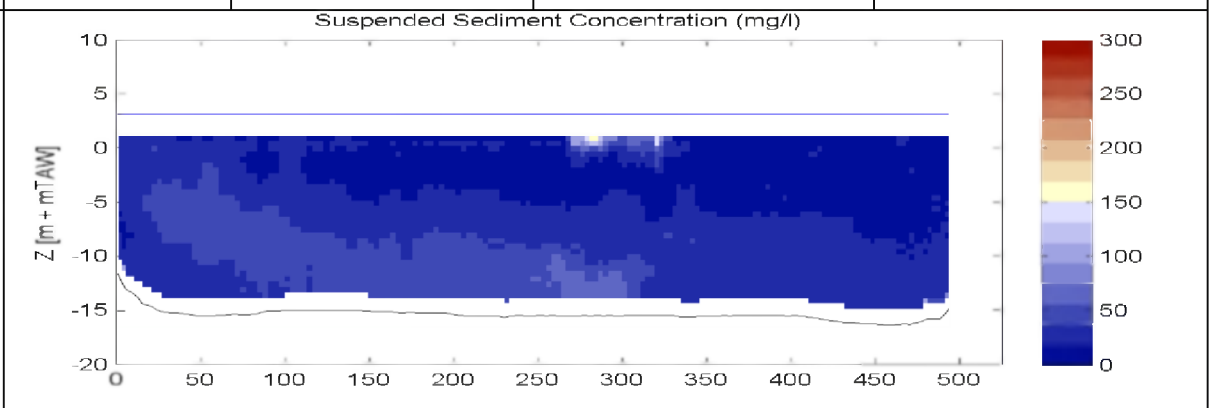
l)	06/03/2009	3 hrs after HW	Tidal coefficient: 0.82	Fresh water: 99m³/s



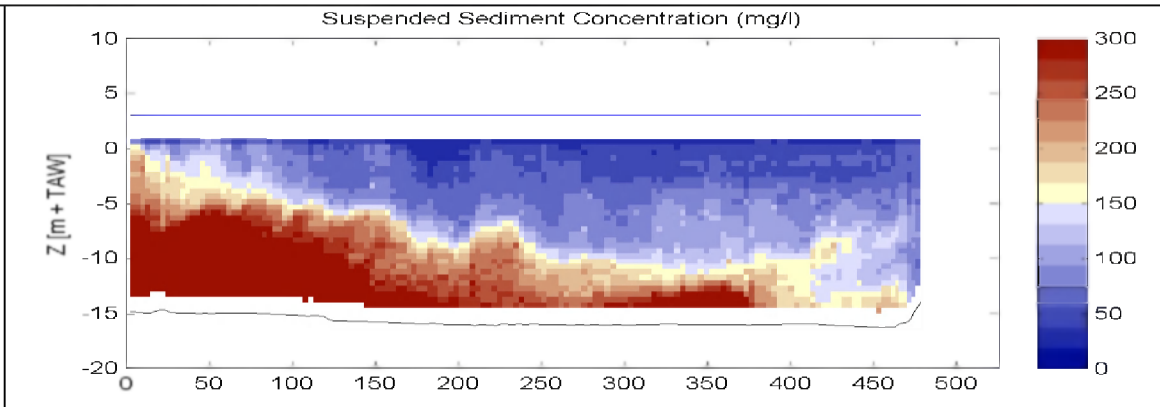
m)	12/03/2009	3 hrs after HW	Tidal coefficient: 1.24	Fresh water: 129m³/s



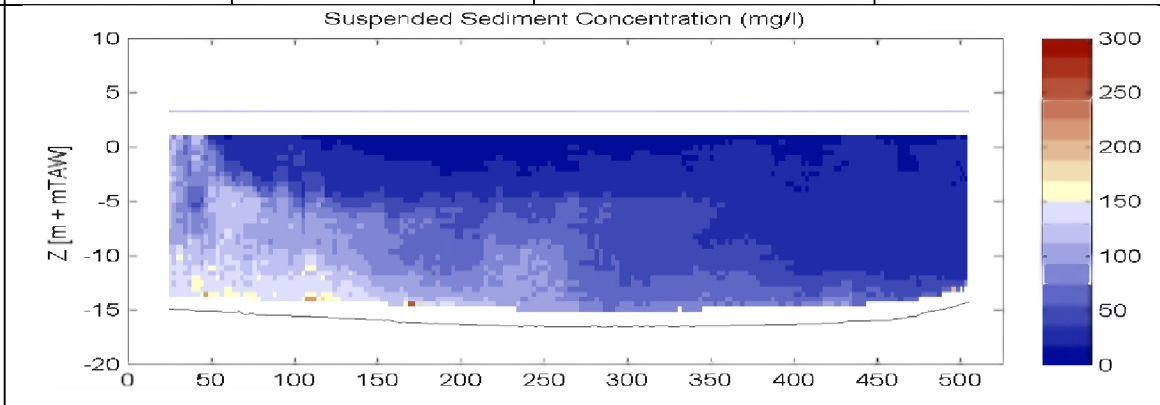
n)	28/09/2011	3 hrs after HW	Tidal coefficient: 1.17	Fresh water: 40 m³/s



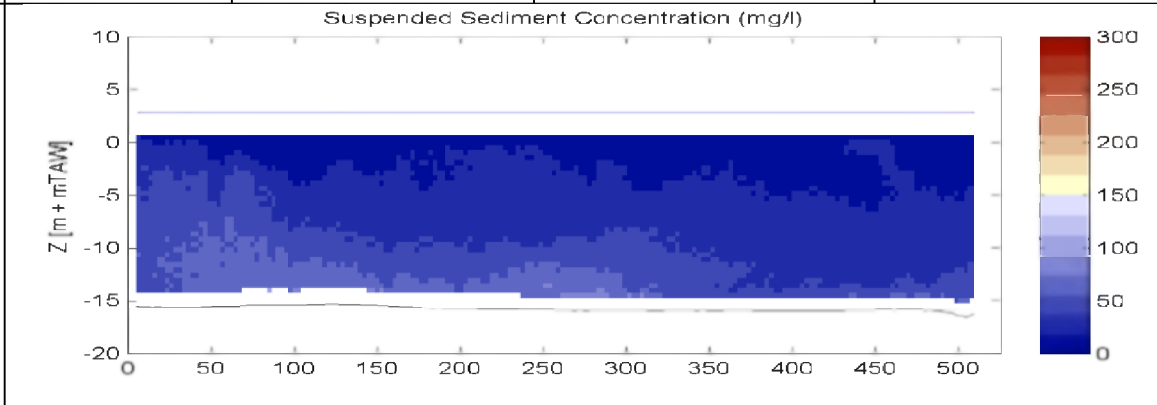
o)	06/10/2011	3 hrs after HW	Tidal coefficient: 0.83	Fresh water: 55 m³/s



p)	13/10/2011	3 hrs after HW	Tidal coefficient: 1.06	Fresh water: 60 m³/s



q)	08/03/2012	3 hrs after HW	Tidal coefficient: 1.16	Fresh water: 305 m³/s



r)	16/03/2012	3 hrs after HW	Tidal coefficient: 0.88	Fresh water: 85 m³/s

Annex J Overview of HCBS2 and aanslibbing Deurganckdok reports

Report	Description of HCBS2
Ambient Conditions Lower Sea Scheldt	
5.3	Overview of ambient conditions in the river Scheldt – January-June 2006 (I/RA/11291/06.088/MSA)
5.4	Overview of ambient conditions in the river Scheldt – July-December 2006 (I/RA/11291/06.089/MSA)
5.5	Overview of ambient conditions in the river Scheldt : RCM-9 buoy 84 & 97 (1/1/2007 -31/3/2007) (I/RA/11291/06.090/MSA)
5.6	Analysis of ambient conditions during 2006 (I/RA/11291/06.091/MSA)
Calibration	
6.1	Winter Calibration (I/RA/11291/06.092/MSA)
6.2	Summer Calibration and Final Report (I/RA/11291/06.093/MSA)
Through tide Measurements Winter 2006	
7.1	21/3 Scheldewacht – Deurganckdok – Salinity Distribution (I/RA/11291/06.094/MSA)
7.2	22/3 Parel 2 – Deurganckdok (I/RA/11291/06.095/MSA)
7.3	22/3 Laure Marie – Liefkenshoek (I/RA/11291/06.096/MSA)
7.4	23/3 Parel 2 – Schelle (I/RA/11291/06.097/MSA)
7.5	23/3 Laure Marie – Deurganckdok (I/RA/11291/06.098/MSA)
7.6	23/3 Veremans Waarde (I/RA/11291/06.099/MSA)
HCBS Near bed continuous monitoring (Frames)	
8.1	Near bed continuous monitoring winter 2006 (I/RA/11291/06.100/MSA)
INSSEV	
9	Settling Velocity - INSSEV summer 2006 (I/RA/11291/06.102/MSA)
Cohesive Sediment	
10	Cohesive sediment properties summer 2006 (I/RA/11291/06.103/MSA)
Through tide Measurements Summer 2006	
11.1	Through Tide Measurement Sediview and Siltprofiler 27/9 Stream - Liefkenshoek (I/RA/11291/06.104/MSA)
11.2	Through Tide Measurement Sediview 27/9 Veremans - Raai K (I/RA/11291/06.105/MSA)
11.3	Through Tide Measurement Sediview and Siltprofiler 28/9 Stream - Raai K (I/RA/11291/06.106/MSA)
11.4	Through Tide Measurement Sediview 28/9 Veremans - Waarde(I/RA/11291/06.107/MSA)
11.5	Through Tide Measurements Sediview 28/9 Parel 2 - Schelle (I/RA/11291/06.108/MSA)
11.6	Through Tide measurement 26/9 Scheldewacht – Deurganckdok – Salinity

	Distribution (I/RA/11291/06.161/MSA)
Analysis	
12	Report concerning the presence of HCBS layers in the Scheldt river (I/RA/11291/06.109/MSA)

Report	Description of Opvolging aanslibbing Deurganckdok between April 2006 till March 2008
Sediment Balance: Bathymetry surveys, Density measurements, Maintenance and construction dredging activities	
1.1	Sediment Balance: Three monthly report 1/4/2006 – 30/06/2006 (I/RA/11283/06.113/MSA)
1.2	Sediment Balance: Three monthly report 1/7/2006 – 30/09/2006 (I/RA/11283/06.114/MSA)
1.3	Sediment Balance: Three monthly report 1/10/2006 – 31/12/2006 (I/RA/11283/06.115/MSA)
1.4	Sediment Balance: Three monthly report 1/1/2007 – 31/03/2007 (I/RA/11283/06.116/MSA)
1.5	Annual Sediment Balance (I/RA/11283/06.117/MSA)
1.6	Sediment balance Bathymetry: 2005 – 3/2006 (I/RA/11283/06.118/MSA)
1.10	Sediment Balance: Three monthly report 1/4/2007 - 30/06/2007 (I/RA/11283/07.081/MSA)
1.11	Sediment Balance: Three monthly report 1/7/2007 – 30/09/2007 (I/RA/11283/07.082/MSA)
1.12	Sediment Balance: Three monthly report 1/10/2007 – 31/12/2007 (I/RA/11283/07.083/MSA)
1.13	Sediment Balance: Three monthly report 1/1/2007 – 31/03/2007 (I/RA/11283/07.084/MSA)
1.14	Annual Sediment Balance (I/RA/11283/07.085/MSA)
Factors contributing to salt and sediment distribution in Deurganckdok: Salt-Silt (OBS3A) & Frame measurements, Through tide measurements (SiltProfiling & ADCP)	
2.1	Through tide measurement Siltprofiler 21/03/2006 Laure Marie (I/RA/11283/06.087/WGO)
2.2	Through tide measurement Siltprofiler 26/09/2006 Stream (I/RA/11283/06.068/MSA)
2.3	Through tide measurement Sediview spring tide 22/03/2006 Veremans (I/RA/11283/06.110/BDC)
2.4	Through tide measurement Sediview spring tide 27/09/2006 Parel 2 (I/RA/11283/06.119/MSA)
2.5	Through tide measurement Sediview average tide 24/10/2007 Parel 2 (I/RA/11283/06.120/MSA)
2.6	Salinity-Silt distribution & Frame Measurements Deurganckdok 13/3/2006 – 31/05/2006 (I/RA/11283/06.121/MSA)
2.7	Salinity -Silt distribution & Frame Measurements Deurganckdok 15/07/2006 – 31/10/2006 (I/RA/11283/06.122/MSA)
2.8	Salinity-Silt distribution & Frame Measurements Deurganckdok 12/02/2007 – 18/04/2007 (I/RA/11283/06.123/MSA)
2.9	Calibration stationary equipment autumn (I/RA/11283/07.095/MSA)
2.10	Through tide measurement Siltprofiler 23 October 2007 (I/RA/11283/07.086/MSA)

Report	Description of Opvolging aanslibbing Deurganckdok between April 2006 till March 2008
2.11	Through tide measurement Salinity Profiling winter (I/RA/11283/07.087/MSA)
2.12	Through tide measurement Sediview winter 11 March 2008 Transect I (I/RA/11283/07.088/MSA)
2.13	Through tide measurement Sediview winter 11 March 2008 Transect K (I/RA/11283/07.089/MSA)
2.14	Through tide measurement Sediview winter 11 March 2008 Transect DGD (I/RA/11283/07.090/MSA)
2.15	Through tide measurement Siltprofiler 12 March 2008 (I/RA/11283/07.091/MSA)
2.16	Salinity-Silt distribution Deurganckdok summer (21/6/2007 – 30/07/2007) (I/RA/11283/07.092/MSA)
2.17	Salinity-Silt distribution & Frame Measurements Deurganckdok autumn (17/09/2007 - 10/12/2007) (I/RA/11283/07.093/MSA)
2.18	Salinity-Silt distribution & Frame Measurements Deurganckdok winter (18/02/2008 - 31/3/2008) (I/RA/11283/07.094/MSA)
2.19	Calibration stationary & mobile equipment winter (I/RA/11283/07.096/MSA)
Boundary Conditions: Upriver Discharge, Salt concentration Scheldt, Bathymetric evolution in access channels, dredging activities in Lower Sea Scheldt and access channels	
3.1	Boundary conditions: Three monthly report 1/1/2007 – 31/03/2007 (I/RA/11283/06.127/MSA) including HCBS 2 report 5.5
~~3.2~~	~~Boundary condtions: Annual report (I/RA/11283/06.128/MSA)~~[1]
3.10	Boundary conditions: Three monthly report 1/4/2007 – 30/06/2007 (I/RA/11283/07.097/MSA)
3.11	Boundary conditions: Three monthly report 1/7/2007 – 30/09/2007 (I/RA/11283/07.098/MSA)
3.12	Boundary conditions: Three monthly report 1/10/2007 – 31/12/2007 (I/RA/11283/07.099/MSA)
3.13	Boundary conditions: Three monthly report 1/1/2008 – 31/03/2008 (I/RA/11283/07.100/MSA)
3.14	Boundary conditions: Annual report (I/RA/11283/07.101/MSA)
Analysis	
4.1	Analysis of Siltation Processes and Factors, 4/'06 – 3/'07 (I/RA/11283/06.129/MSA)
4.10	Analysis of Siltation Processes and Factors, 4/'07 – 3/'08 (I/RA/11283/07.102/MSA)

[1] considered in report 5.6 'Analysis of ambient conditions during 2006' (I/RA/11291/06.091/MSA) in the framework of the study 'Extension of the study about density currents in the Beneden Zeeschelde'

Report	Description of Opvolging aanslibbing Deurganckdok between April 2008 till March 2010
Sediment Balance: Bathymetry surveys, Density measurements, Maintenance and construction dredging activities	
1.20	Sediment Balance: Three monthly report 1/4/2008 - 30/6/2008 (I/RA/11283/08.076/MSA)
1.21	Sediment Balance: Three monthly report 1/7/2008 – 30/9/2008 (I/RA/11283/08.077/MSA)
1.22	Sediment Balance: Three monthly report 1/10/2008 – 31/12/2008 (I/RA/11283/08.078/MSA)
1.23	Sediment Balance: Three monthly report 1/1/2009 – 31/03/2009 (I/RA/11283/08.079/MSA)
1.24	Annual Sediment Balance (I/RA/11283/08.080/MSA)
Factors contributing to salt and sediment distribution in Deurganckdok: Salt-Silt (OBS3A) & Frame measurements, Through tide measurements (SiltProfiling & ADCP) & Calibrations	
2.20	Through tide measurement Sediview DGD during average tide Spring 2008 – 19 June 2008 (I/RA/11283/08.081/MSA)
2.21	Through tide measurement Sediview DGD during average tide Spring 2008 –26 June 2008 (I/RA/11283/08.082/MSA)
2.22	Through tide measurement Sediview DGD during neap tide Summer 2008 – 24 September 2008 (I/RA/11283/08.083/MSA)
2.23	Through tide measurement Sediview DGD during spring tide Summer 2008 – 30 September 2008 (I/RA/11283/08.084/MSA)
2.24	Through tide measurement Sediview DGD during neap tide Autumn 2008 – 02 December 2008 (I/RA/11283/08.085/MSA)
2.25	Through tide measurement Sediview DGD during spring tide Autumn 2008 – 10 December 2008 (I/RA/11283/08.086/MSA)
2.26	Through tide measurement Sediview DGD during neap tide Winter 2009 – 06 March 2009 (I/RA/11283/08.087/MSA)
2.27	Through tide measurement Sediview DGD during spring tide Winter 2009 – 12 March 2009 (I/RA/11283/08.088/MSA)
2.28	Through tide measurement ADCP eddy DGD Summer 2008 – 1 October 2008 (I/RA/11283/08.089/MSA)
2.29	Through tide measurement Siltprofiler DGD Summer 2008 – 29 September 2008 (I/RA/11283/08.090/MSA)
2.30	Through tide measurement Siltprofiler DGD Winter 2009 – 13 March 2009 (I/RA/11283/08.091/MSA)
2.31	Through tide measurement Salinity Profiling DGD Winter 2009 – 11 March 2009 (I/RA/11283/08.092/MSA)
2.32	Salt-Silt distribution Deurganckdok: Six monthly report 1/4/2008 - 30/9/2008 (I/RA/11283/08.093/MSA)
2.33	Salt-Silt distribution Deurganckdok: Six monthly report 1/10/2008 – 31/3/2009 (I/RA/11283/08.094/MSA)
2.34	Calibration stationary & mobile equipment Autumn 2008 – 27 & 28 October 2008 (I/RA/11283/08.095/MSA)

Report	Description of Opvolging aanslibbing Deurganckdok between April 2008 till March 2010
Boundary Conditions: Upriver Discharge, Salt concentration Scheldt, Bathymetric evolution in access channels, dredging activities in Lower Sea Scheldt and access channels	
3.20	Boundary conditions: Six monthly report 1/4/2008 – 30/09/2008 (I/RA/11283/08.097/MSA)
3.21	Boundary conditions: Six monthly report 1/10/2008 – 31/03/2009 (I/RA/11283/08.097/MSA)
Analysis	
4.20	Analysis of Siltation Processes and Factors (I/RA/11283/08.098/MSA)