REPORT

Vlaamse Overheid - Departement Mobiliteit en Openbare Werken

Afdeling Maritieme Toegang

Evaluation of the external effects on the siltation in Deurganckdok

Report 2.3: Through tide Sediview measurements during spring tide: Entrance Deurganckdok - Winter 2012

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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 spring 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 8th 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 2.3, 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: Winter 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).

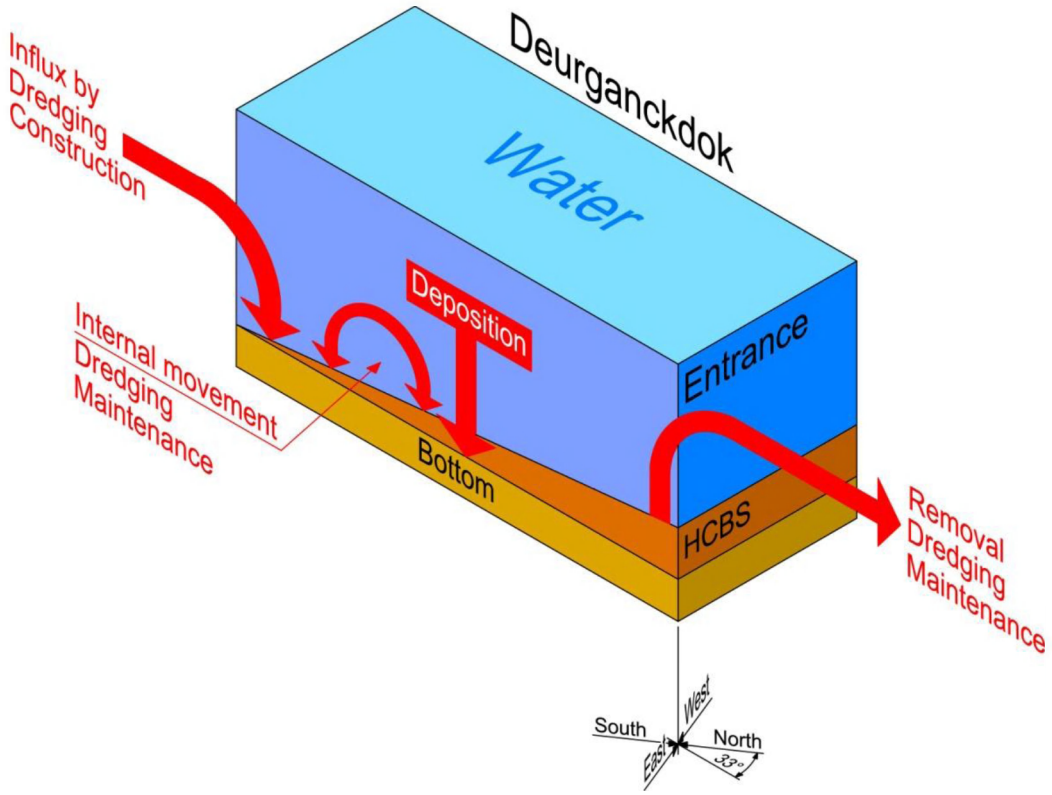


Figure 2-1: Elements of the sediment balance

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.

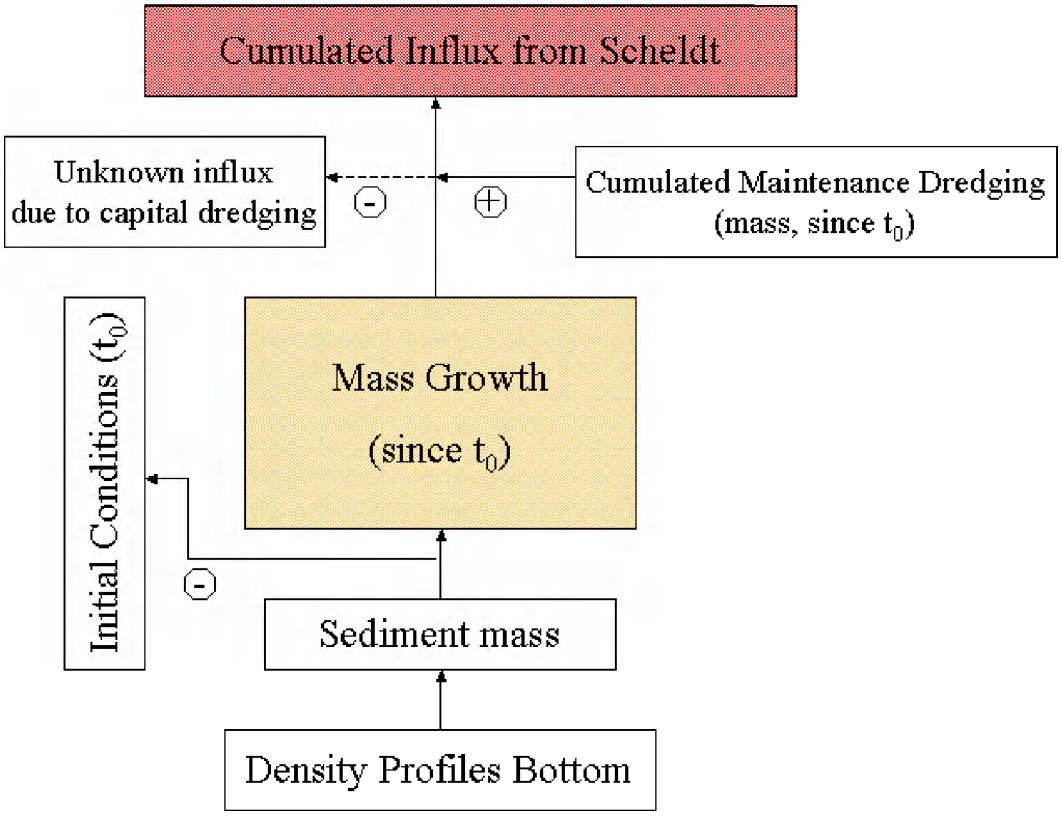


Figure 2-2: Determining a sediment balance

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

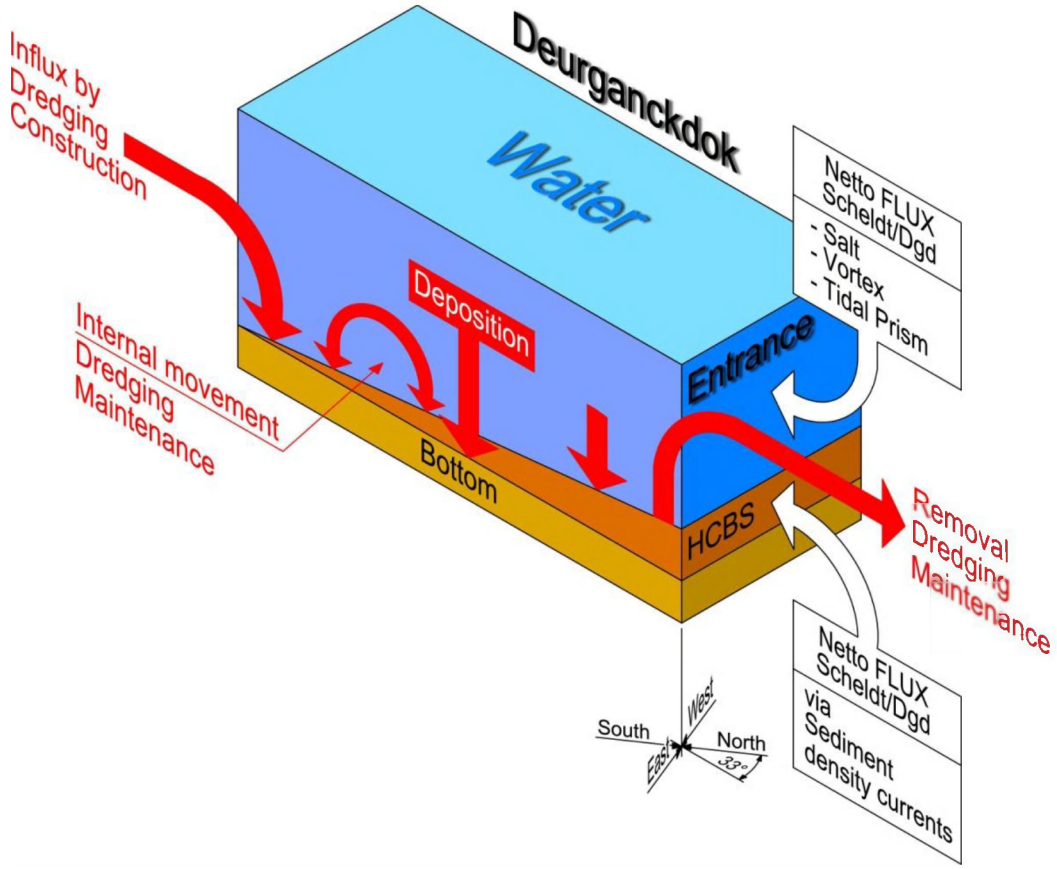


Figure 2-3: Transport mechanisms

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.

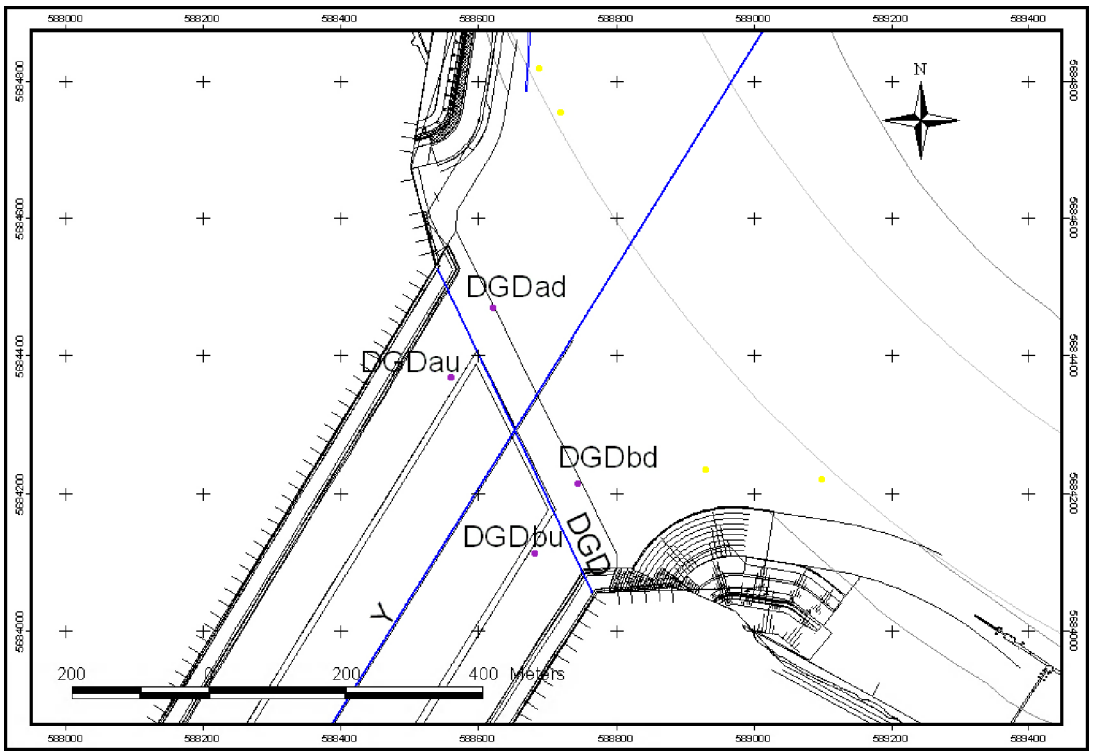


Figure 2-4: Map of sailed transect DGD perpendicular to Deurganckdok (DGD) on the 8th of March 2012 (ED50).

2.2.2 Measurement procedure

Flow velocity, Turbidity, Salinity and Temperature measurements were conducted on the 8th of March 2012 from 7h03 MET until 19h53 MET. This transect was sailed throughout 13 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 the 8th 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 14 minutes for 13 hours, in total 57 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 8th of March 2012 can be found in 0. Table 3-1 gives the most important characteristics (high and low tide) of the tide at this gauge on the 8th of March 2012.

Table 3-1: High and low tide at Liefkenshoek on 08/03/2012

Liefkenshoek Tidal Gauge		
8 March 2012		
	Time [MET]	***Water level [m TAW]***
HW (1)	03:05	5.96
LW (2)	10:05	-0.08
HW (3)	15:25	5.83
LW (4)	22:20	-0.21

In Table 3-2 the tidal characteristics of the tide on the 8th 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 08/03/2012 with the average tide, the average spring 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 08/03/2012***
Water level [m TAW]				
HW (1)	4.63	5.19	5.63	5.96
LW (2)	0.39	0.05	-0.18	-0.08
HW (3)	-	-	-	5.83
LW (4)	-	-	-	-0.21
Tidal difference [m]				
Falling (1 to 2)	4.24	5.14	5.81	6.04
Rising (2 to 3)	4.24	5.14	5.81	5.91
Falling (3 to 4)	4.24	5.14	5.81	6.04
Duration [hh:mm]				
Falling (1 to 2)	6:40	6:50	7:20	7:00
Rising (2 to 3)	5:59	5:34	5:16	5:20
Falling (3 to 4)	6:40	6:50	7:20	6:55
Tide (1 to 3)	12:39	12:24	12:18	12:20
Tide (2 to 4)	12:39	12:24	12:18	12:15
Tidal coefficient				
Rising (1 to 2)	0.82	1.00	1.13	1.17
Falling (2 to 3)	0.82	1.00	1.13	1.14
Rising (3 to 4)	0.82	1.00	1.13	1.17

The tidal coefficients from 1.14 up to 1.17 for the measured tide of the 8th of March 2012 indicate that this tide has a tidal range higher than average spring tide for the decade of 1991-2000, and therefore can be classified as spring tide.

3.2.2 Meteorological data

Meteorological data at Woensdrecht (NL) was obtained from the Weather Underground website (Wunderground, 2012).

The weather on the 8th of March 2012 was dry. The wind blew all day from the west at an average velocity of 13km/h. The air temperature varied between 6 and 9°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. Faulty velocities and shipwakes were removed from the data where possible and were interpolated.

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 (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 sidelobe.

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 back up check. The salinity and temperature was used to compute the acoustic water absorption (water attenuation coefficient). All water samples were analysed 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.

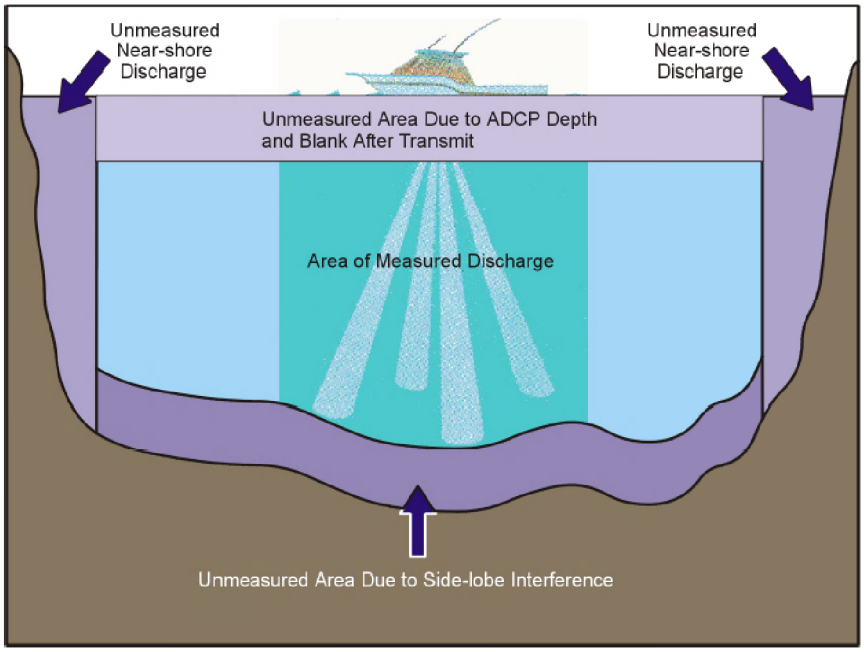


Figure 4-1: Unmeasured regions in the cross section (from RD Instruments, 2003)

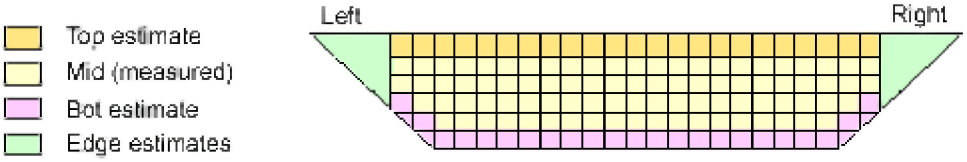


Figure 4-2: Measured and estimated discharges and sediment fluxes within Sediview (DRL, 2005)

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).

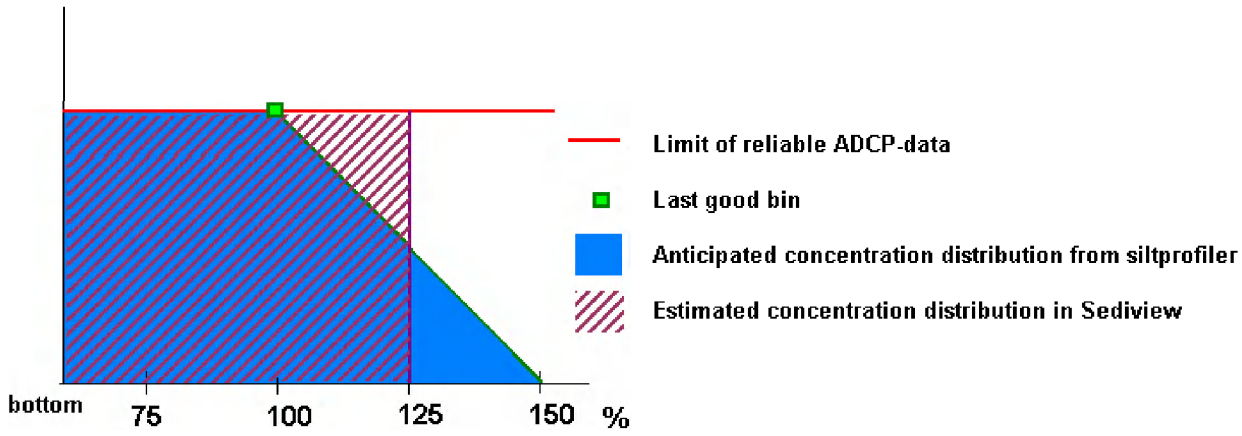


Figure 4-3: Principal of bottom estimate of the sediment concentration in Sediview

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:

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

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, contour plots 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 8TH 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. The highest incoming SSC occurs around HW and outgoing during 2 hours before HW. During the complete measurement cycle the incoming water has a higher SSC than the outgoing water (Figure 5-1). The incoming averaged suspended sediment concentrations range from 67 mg/l up to 216 mg/l during ebb and from 60 mg/l to 166 mg/l during flood, whereas the outgoing concentrations range from 18 to 62 mg/l during ebb and from 24 to 68 mg/l during flood (Table 5-1).

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	43	69	126	67	122	216	18	35	62
Flood	60	76	103	60	85	166	24	39	68

Considering the sediment fluxes, Figure 5-1 shows that residual incoming transport is slightly dominating during flood and more dominating during ebb. Any residual outgoing sediment transport can be observed during the measurement campaign. During ebb there is a residual incoming sediment flux even though the resulting discharge is outgoing at that moment (see Figure 5-1). 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.

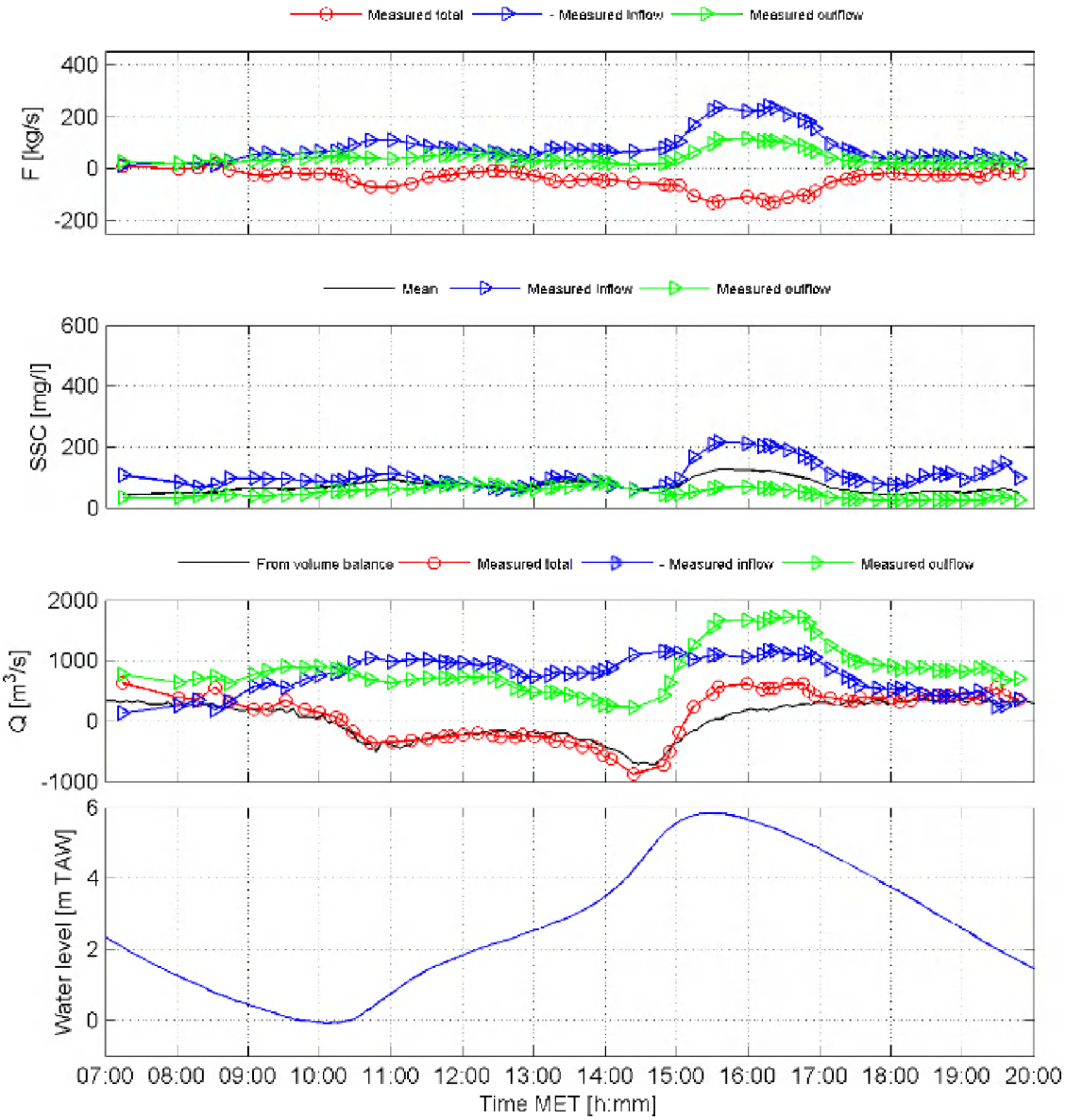


Figure 5-1 Total in/out/net flux, Total incoming/outgoing SSC, average in/out/net discharge and water level at DGD on March 8th 2012.

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 method 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 0. 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.

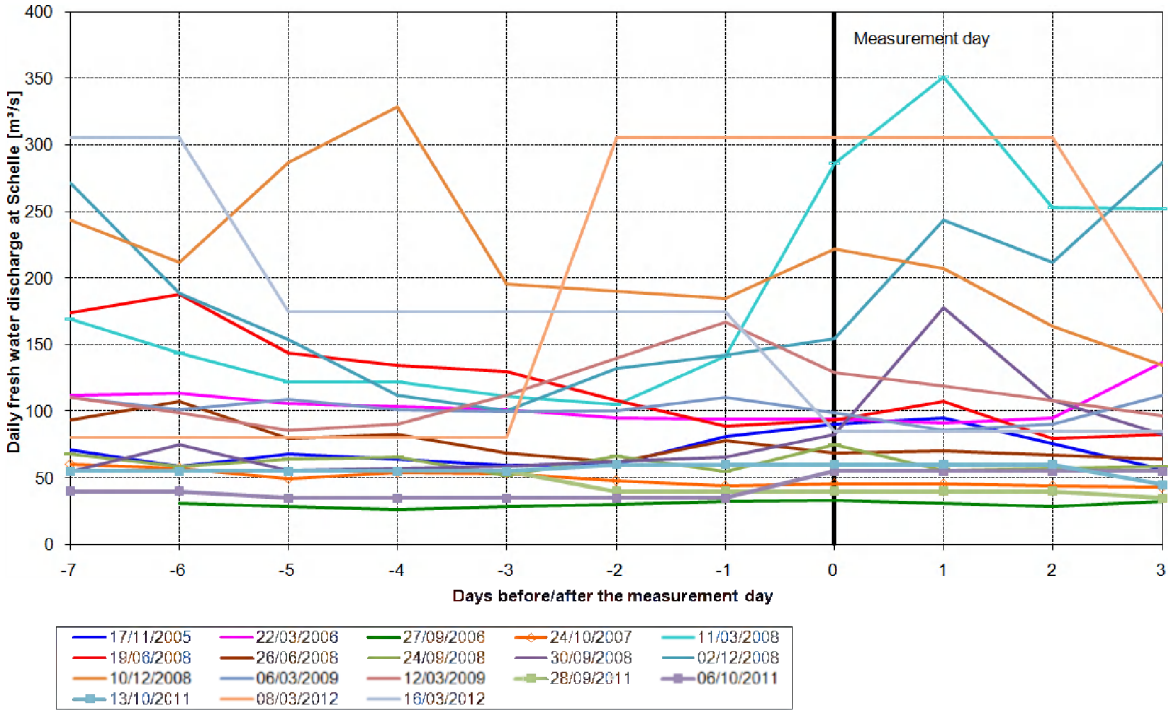


Figure 5-2: Daily fresh water discharge evolution at Schelle before and after a measurement day.

The results presented in 0 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

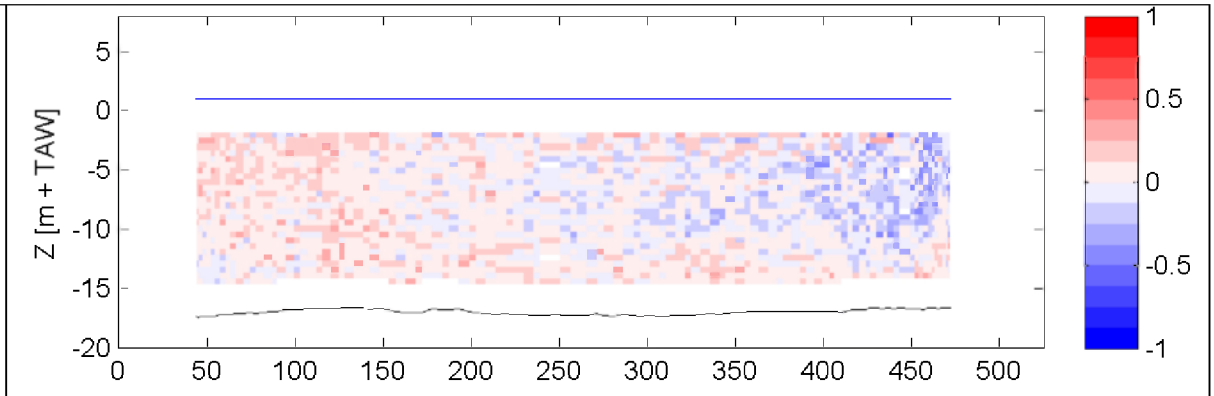
In Annex I the earlier measurement campaigns have been compared for about 3 hours after high water because it appeared that during the first campaigns the horizontal ebb eddy currents were clearly visible at 3 hrs after HW. Sediment distributions as well as current pattern in the cross section are similar 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 spring 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. 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.

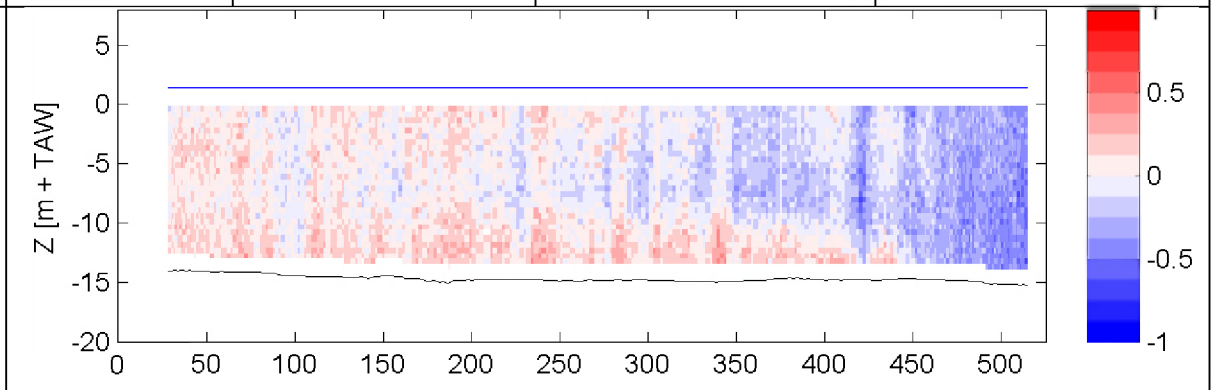
The current deflecting wall (CDW) construction at the North side of Deurganckdok should influence the horizontal eddy during flood. The CDW deflects the upper part of the water column into the dock to counter the clockwise eddy at the entrance. A near bed sill deflects the high concentration bottom layers 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: 3 and 1 hours before HW.

The flood horizontal eddy starts about 3 hours before HW and is finishing about HW. Before the CDW construction the current pattern at 3 hours before HW shows diagonal view which is a combination between a horizontal eddy and density current (Figure 5-3). After completing the CDW construction the current pattern shows more horizontal view which suggests that the horizontal eddy is less strong and the density current is more dominating. At 1 hour before HW can be seen that the upper part of the water column at the North side flows more into the dock after completing CDW (Figure 5-5). Also difference in meteo-hydrological conditions could be influence the strength of the density or eddy current. An extensive analyses is needed and will be covered in analysis report.

The difference SSC distribution is not very clear, except that the SSC of the measurement October 2012 are higher (Figure 5-4 and Figure 5-6). The higher concentrations are probably related to the important dredging activities during this period (IMDC, 2012m).



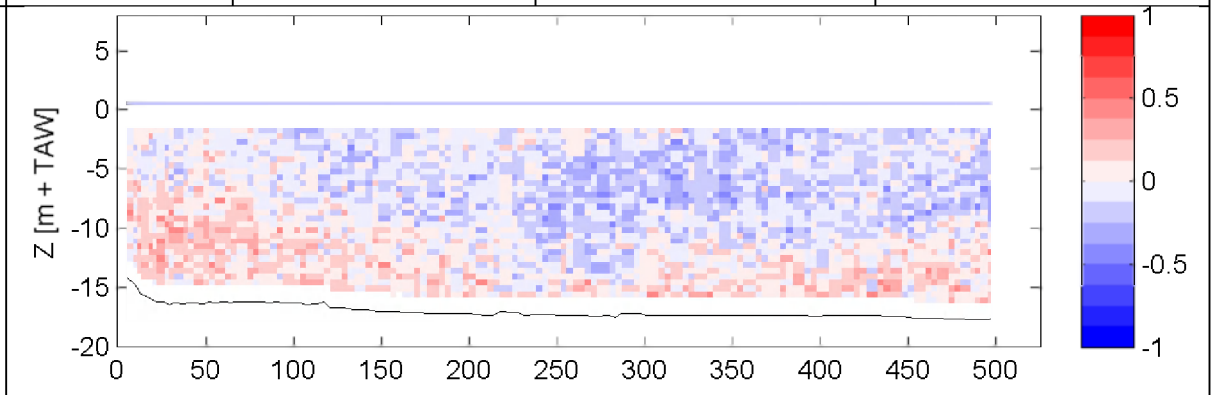
a)	30/09/2008	3 hrs before HW	Tidal coefficient: 1.08	Fresh water: 82 m³/s



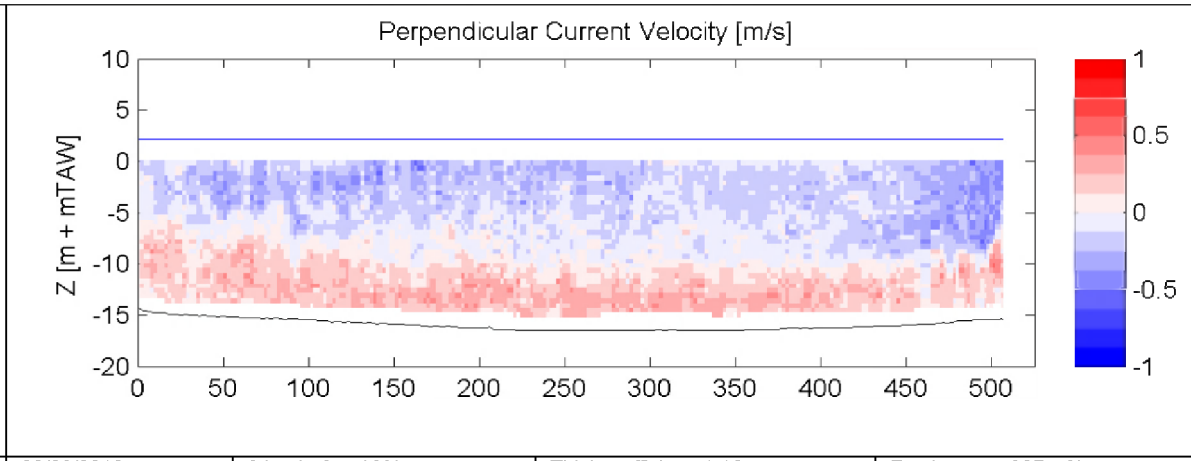
b)	12/03/2009	3 hrs before HW	Tidal coefficient: 1.24	Fresh water: 129m³/s

No velocity data available

c)	28/09/2011	3 hrs before HW	Tidal coefficient: 1.17	Fresh water: 40 m³/s

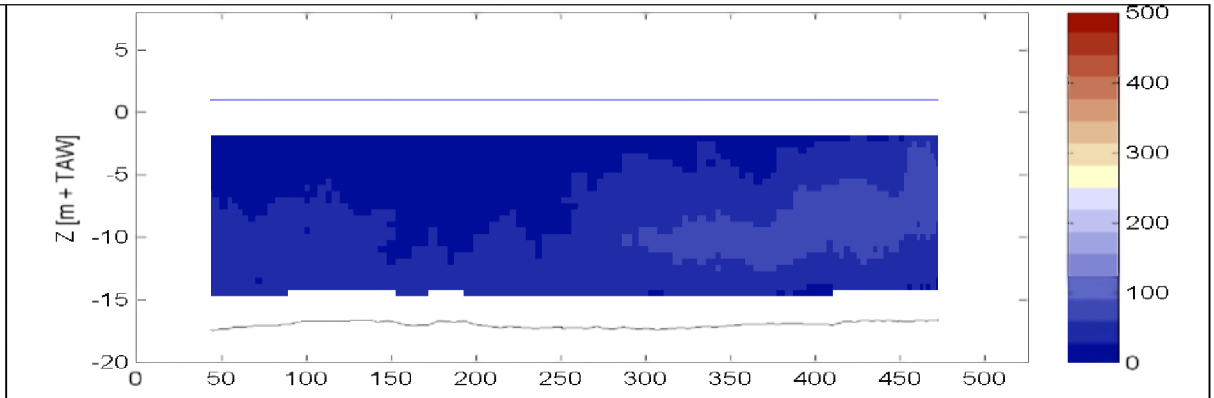


d)	13/10/2011	3 hrs before HW	Tidal coefficient: 1.06	Fresh water: 60 m³/s

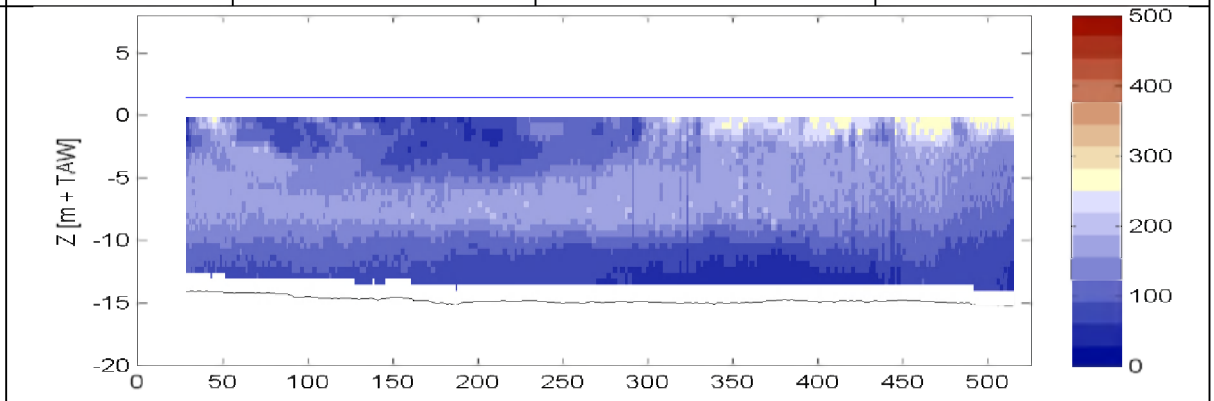


e)	08/03/2012	3 hrs before HW	Tidal coefficient: 1.16	Fresh water: 305 m³/s

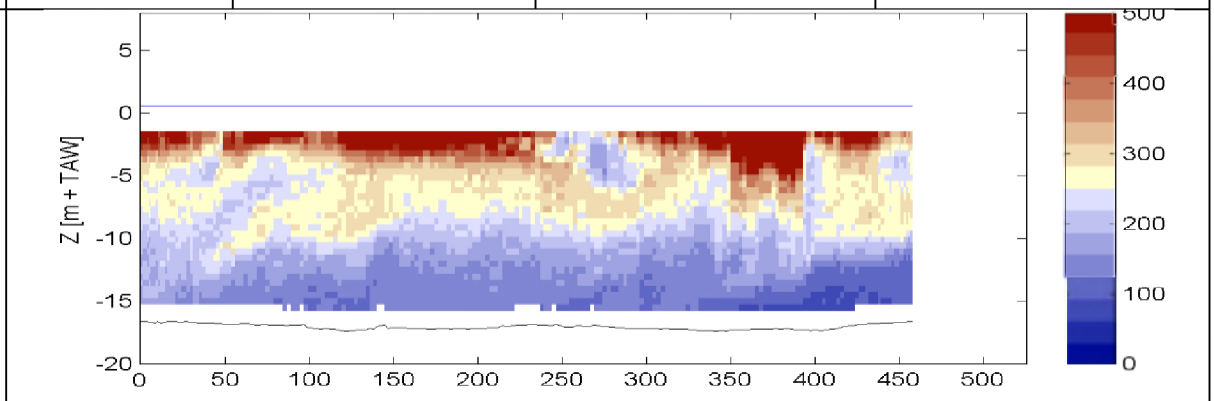
Figure 5-3: Perpendicular current velocity at 3hrs before high water during spring measurements



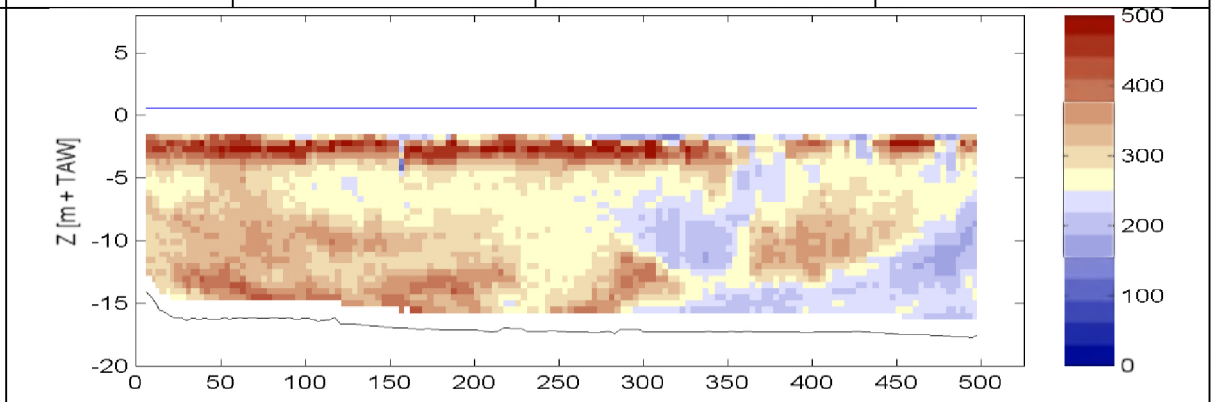
a)	30/09/2008	3 hrs before HW	Tidal coefficient: 1.08	Fresh water: 82 m³/s



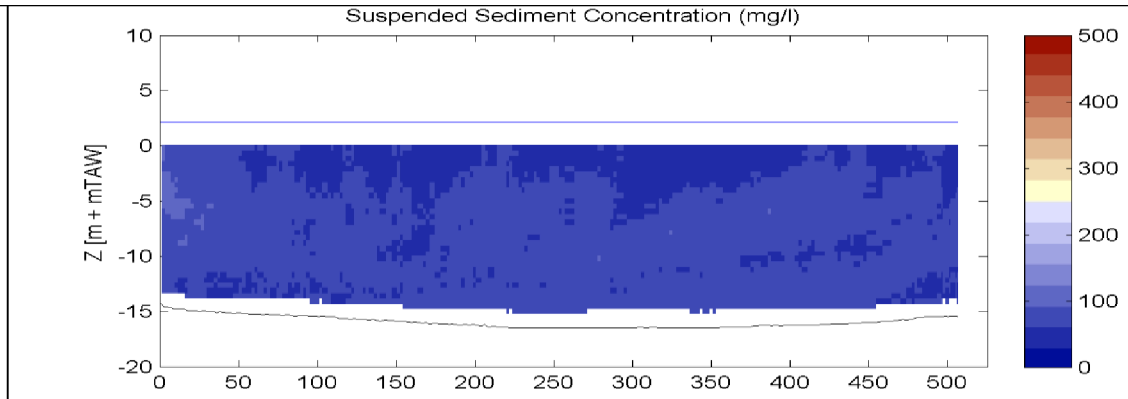
b)	12/03/2009	3 hrs before HW	Tidal coefficient: 1.24	Fresh water: 129m³/s



c)	28/09/2011	3 hrs before HW	Tidal coefficient: 1.17	Fresh water: 40 m³/s

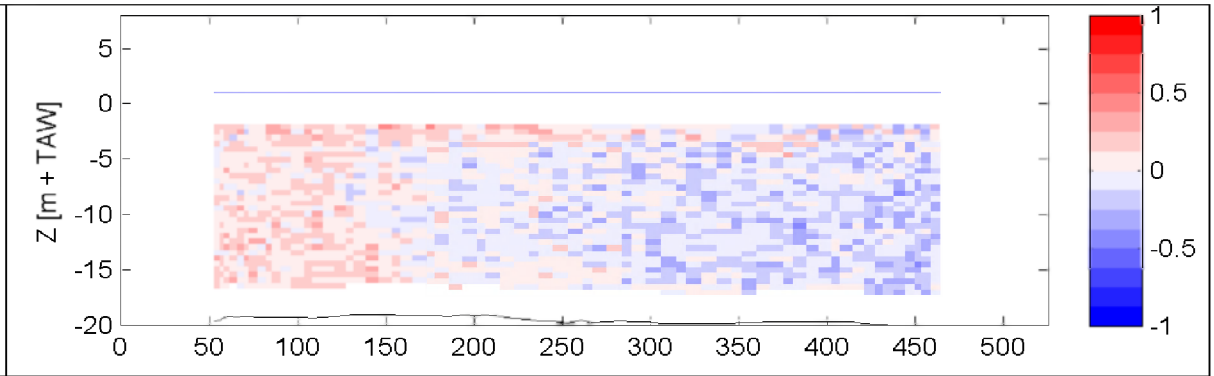


d)	13/10/2011	3 hrs before HW	Tidal coefficient: 1.06	Fresh water: 60 m³/s

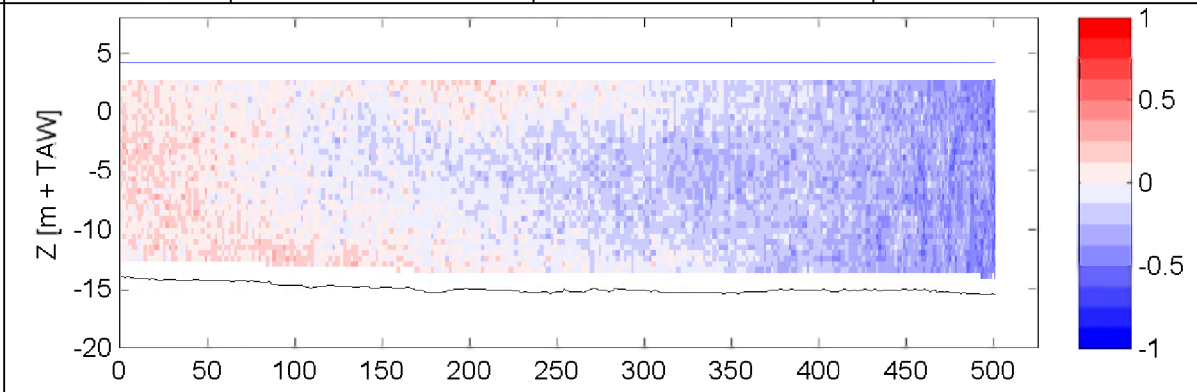


e)	08/03/2012	3 hrs before HW	Tidal coefficient: 1.16	Fresh water: 305 m³/s

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



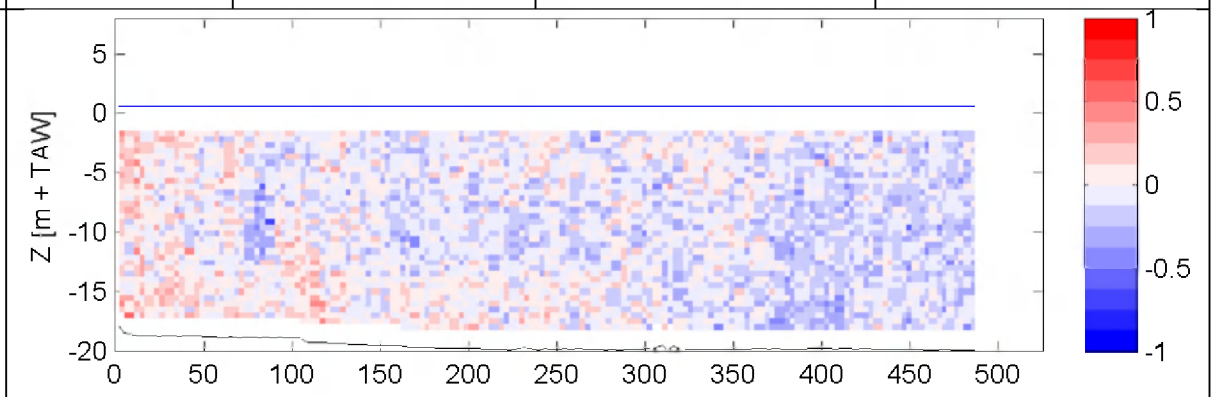
a)	30/09/2008	1 hr before HW	Tidal coefficient: 1.08	Fresh water: 82 m³/s



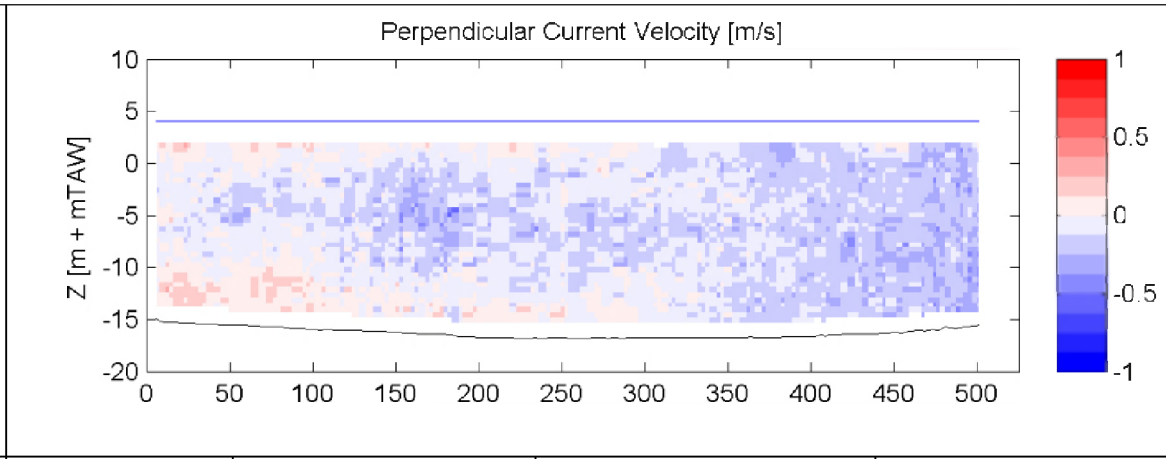
b)	12/03/2009	1 hr before HW	Tidal coefficient: 1.24	Fresh water: 129m³/s

No velocity data available

c)	28/09/2011	1 hr before HW	Tidal coefficient: 1.17	Fresh water: 40 m³/s

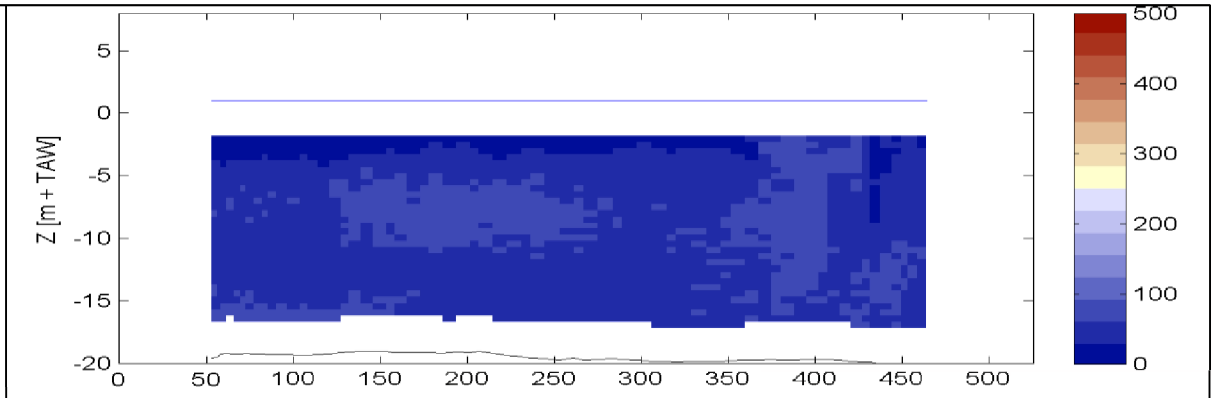


d)	13/10/2011	1 hr before HW	Tidal coefficient: 1.06	Fresh water: 60 m³/s

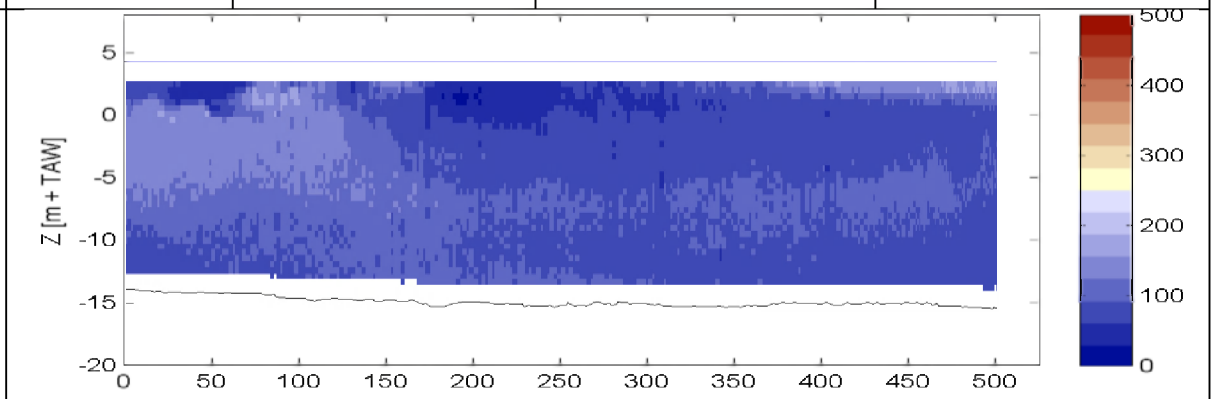


e)	08/03/2012	1 hrs before HW	Tidal coefficient: 1.16	Fresh water: 305 m³/s

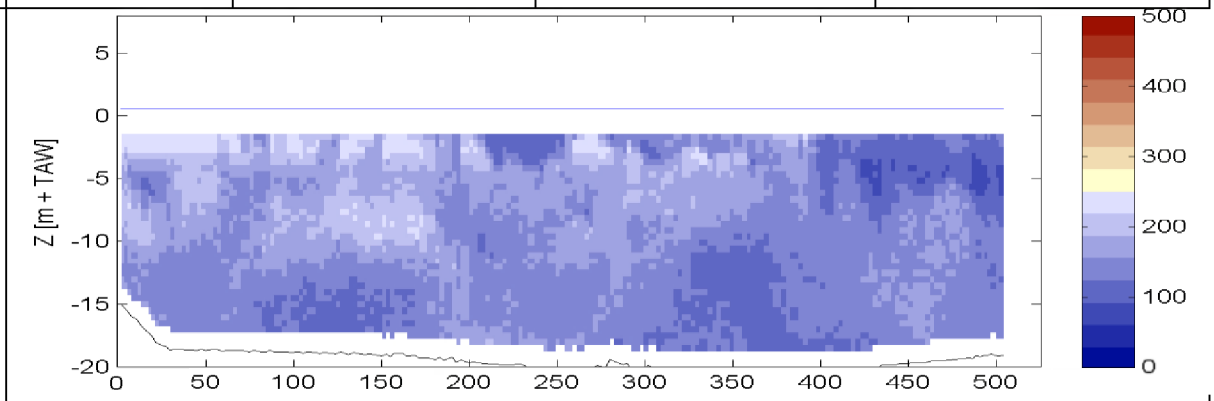
Figure 5-5: Perpendicular current velocity at 1hr before high water



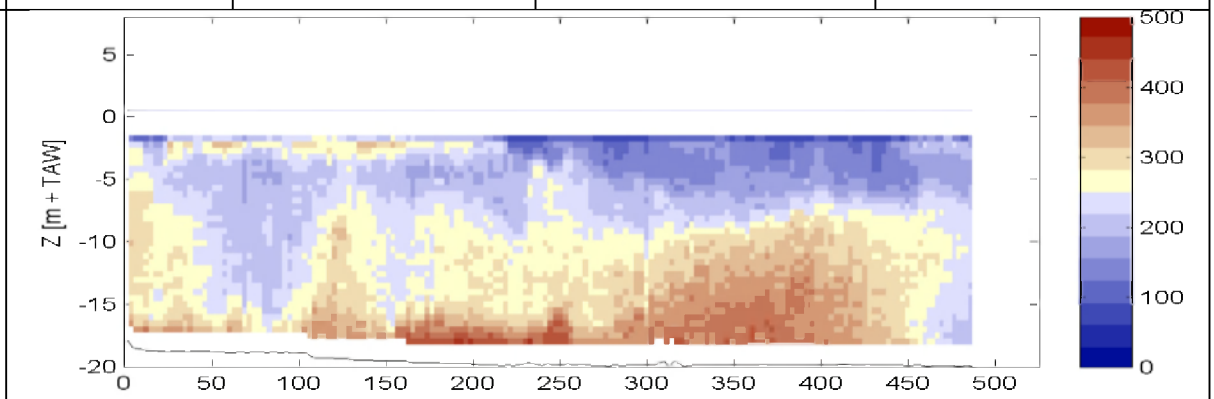
a)	30/09/2008	1 hr before HW	Tidal coefficient: 1.08	Fresh water: 82 m³/s



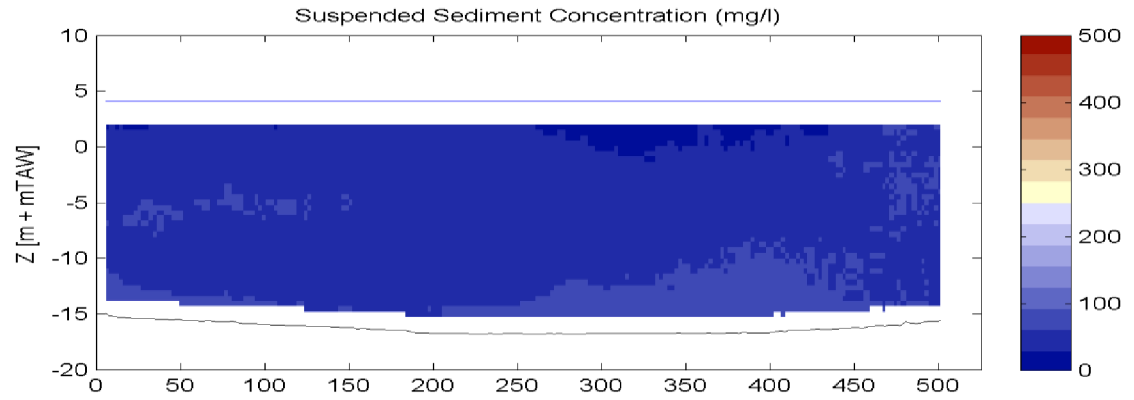
b)	12/03/2009	1 hr before HW	Tidal coefficient: 1.24	Fresh water: 129m³/s



c)	28/09/2011	1 hr before HW	Tidal coefficient: 1.17	Fresh water: 40 m³/s



d)	13/10/2011	1 hr before HW	Tidal coefficient: 1.06	Fresh water: 60 m³/s



e)	08/03/2012	1 hrs before HW	Tidal coefficient: 1.16	Fresh water: 305 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 8th 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	41 658 532	ADCP measurement
Tidal Emptying	6 382 534	Volume balance
Measured Total Flood	29 836 534	ADCP measurement
Tidal Filling	6 004 682	Volume balance
Measured Total	71 495 066	ADCP measurement
Tidal Filling/Emptying Total	12 387 217	Volume balance

During flood on the 8th of March 2012, 29.8 million m³ water crossed the entrance and during ebb it was 41.6 million m³ (see Table 5-3). In total 71.5 million m³ water crossed the docks entrance, of which only 13% (8 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 analyse 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.

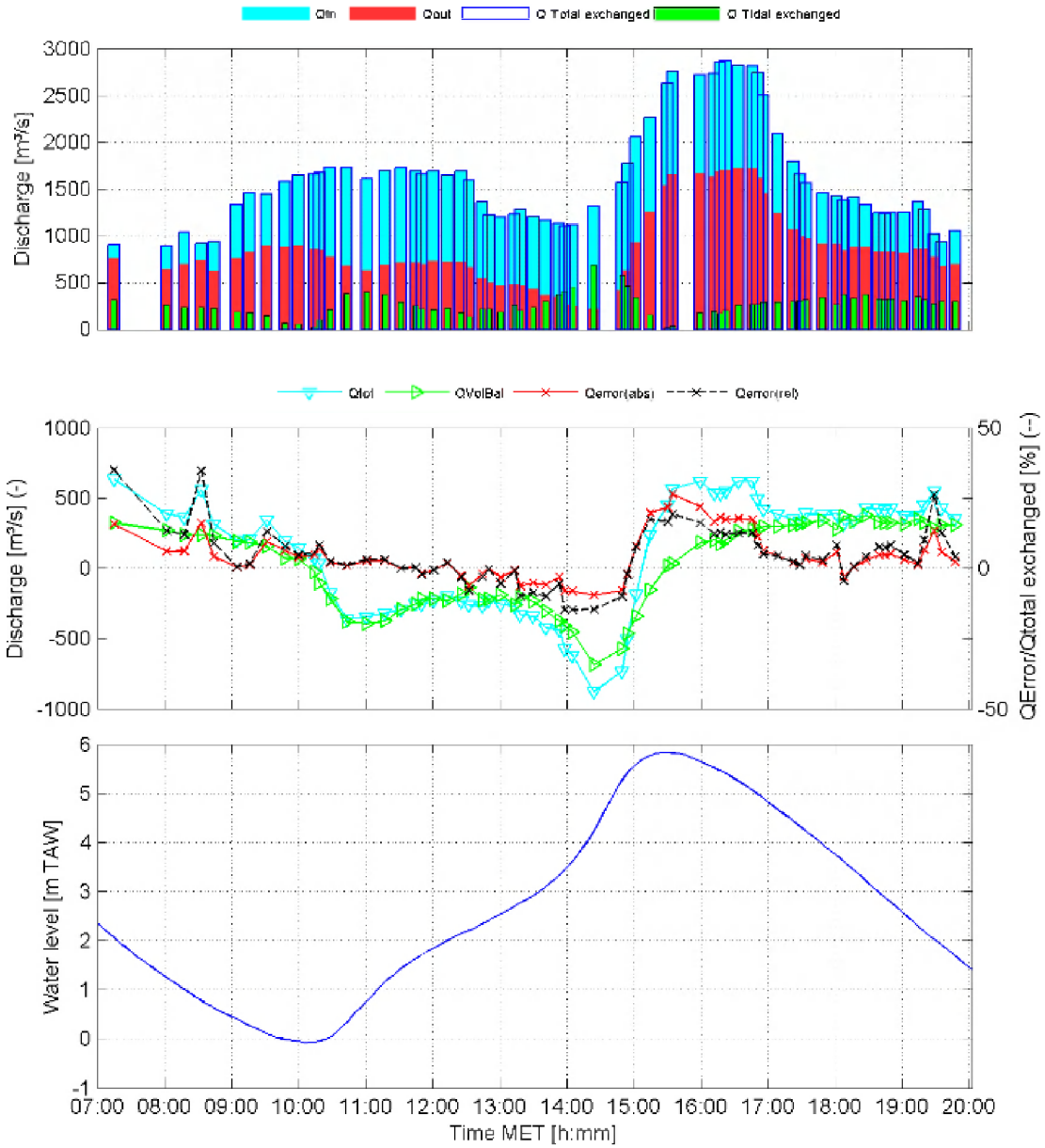


Figure 5-7: The water discharge at the entrance of Deurganckdok over a tidal curve on 08/03/2012. Top: Total incoming (Qin) and outgoing (Qout) discharge including the total water en tidal exchange; Central: Measured residual discharge (Qtot) versus theoretical residual discharge (QVolBal) and correction offset (Qerror) including relative error; Below: tidal curve.

The water balance almost matches during flood, as the measured filling of the dock is 6.18 million m³ over a period where tidal filling (calculated by integrating tide) is 6.00 million m³ (Table 5-4). The filling of the dock is thus slightly overestimated by the measurements with 0.2 million m³. In comparison to the total water exchange during flood is the overestimation 0.2% (Table 5-5). During emptying the dock we determine an overestimation of 6.0%.

During ebb, the volume is overestimated by the measurements by 4 million m³. In comparison to the 12.4 million m³ of water exchanged by tidal filling/emptying, overestimation of 4 million m³ seems rather reasonable (Table 5-5) and compared to the total exchange of 71.5 million m³, the overestimation error is small (6% of the total exchanged volume).

Table 5-4 Total residual, incoming and outgoing water volumes in Deurganckdok during the measurement campaign of 08/03/2012 compared to tidal filling/emptying volumes.

	Q Total Net [m^3]	Q Total In [m^3]	Q Total Out [m^3]
Measured Ebb*	10 703 150	15 477 691	26 180 841
Tidal Emptying**	6 382 534	-	-
Measured Flood*	6 181 277	18 008 905	11 827 629
Tidal Filling**	6 004 682	-	-
Measured Net*	4 521 873	33 486 597	38 008 470
Tidal Emptying Net**	377 852	-	-

(*: 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 08/03/2012.

	Q error [m^3]	Q error/water exchange* [%]
Overestimated outgoing volume	4 320 615	6.0
Overestimated ingoing volume	176 594	0.2
Overestimated total volume	4 144 021	5.8

One of the reasons of the under/overestimation in Figure 5-7 can be found in the ship wakes 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) with a total overestimation of 6%. 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 than the tidal volume.

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

Measurement Day		***17/11/2005***	***27/09/2006***	***24/10/2007***	***11/03/2008***	***19/06/2008***	***29/09/2008***
DGD surface area [10^3 m^2]		750	750	1 019	1019	1 019	1 019
Tidal coefficient		1.1	1.03	1.02	1.17	1.15	1.08
Duration of measurement [hh:mm]		10:57	12:42	12:24	12:23	12:32	12:49
Daily fresh water discharge at Schelle [m^3/s]		91	33	46	286	93	82
Ebb	exchanged volume [10^3 m^3]	34 137	33 339	23 298	30 605	32 790	29 863
	incoming volume [10^3 m^3]	18 436	14 974	8 579	10 263	10 949	10 501
	outgoing volume [10^3 m^3]	15 701	18 365	14 718	20 342	21 840	19 361
	residual outgoing volume [10^3 m^3]	-2 736	3 391	6 139	10 062	10 891	8 860
	residual tidal emptying = theoretical residual outgoing volume	2 485	4 227	5 479	5 957	6 209	5 456
	overestimated outgoing volume [10^3 m^3]	-5 221	-836	660	4 105	4 682	3 404
Flood	exchanged volume [10^3 m^3]	24 304	24 939	19 612	22 983	25 216	26 369
	incoming volume [10^3 m^3]	12 565	14 236	10 590	14 477	14 186	14 602
	outgoing volume [10^3 m^3]	11 740	10 703	9 022	8 506	11 029	11 766
	residual incoming volume [10^3 m^3]	825	3 533	1 568	5 966	3 157	2 836
	residual tidal filling = theoretical residual incoming volume	3 370	3 914	5 134	5 941	5 768	5 391
	overestimated incoming volume [10^3 m^3]	-2 545	-381	-3 565	25	-2 611	-2 555
Total	exchanged volume [10^3 m^3]	58 441	58 278	42 909	53 589	58 005	56 231
	incoming volume [10^3 m^3]	31 001	29 210	19 169	24 740	25 136	25 104
	outgoing volume [10^3 m^3]	27 440	29 067	23 740	28 848	32 870	31 127
	residual outgoing volume [10^3 m^3]	-3 561	-143	4 571	4 096	7 734	6 024
	residual tidal emptying = theoretical residual outgoing volume	-885	313	345	16	441	65
	overestimated outgoing volume [10^3 m^3]	-2 676	-456	4 225	4 080	7 293	5 958

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

Measurement Day		***12/03/2009***	***13/10/2011***	***08/03/2012***
DGD surface area [10^3 m^2]		1 019	1 019	1 019
Tidal coefficient		1.24	1.06	1.16
Duration of measurement [hh:mm]		12:10	12:37	12:50
Daily fresh water discharge at Schelle [m^3/s]		129	60	305
Ebb	exchanged volume [10^3 m^3]	29 457	26 728	41 658
	incoming volume [10^3 m^3]	12 387	9 940	15 478
	outgoing volume [10^3 m^3]	17 070	16 788	26 181
	residual outgoing volume [10^3 m^3]	4 683	6 847	10 703
	residual tidal emptying = theoretical residual outgoing volume	4 742	4 339	6 383
	overestimated outgoing volume [10^3 m^3]	-59	2 508	4 321
Flood	exchanged volume [10^3 m^3]	26 279	26 076	29 836
	incoming volume [10^3 m^3]	16 434	15 476	18 009
	outgoing volume [10^3 m^3]	9 844	10 599	11 828
	residual incoming volume [10^3 m^3]	6 590	4 877	6 181
	residual tidal filling = theoretical residual incoming volume	6 626	3 860	6 005
	overestimated incoming volume [10^3 m^3]	-36	1 016	176
Total	exchanged volume [10^3 m^3]	55 736	52 804	71 495
	incoming volume [10^3 m^3]	28 821	25 417	33 487
	outgoing volume [10^3 m^3]	26 914	27 387	38 008
	residual outgoing volume [10^3 m^3]	-1 907	1 971	4 522
	residual tidal emptying = theoretical residual outgoing volume	-1 884	479	378
	overestimated outgoing volume [10^3 m^3]	-23	1 492	4 144

5.2.4 Sediment balance

The mass of the suspended sediment, 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.

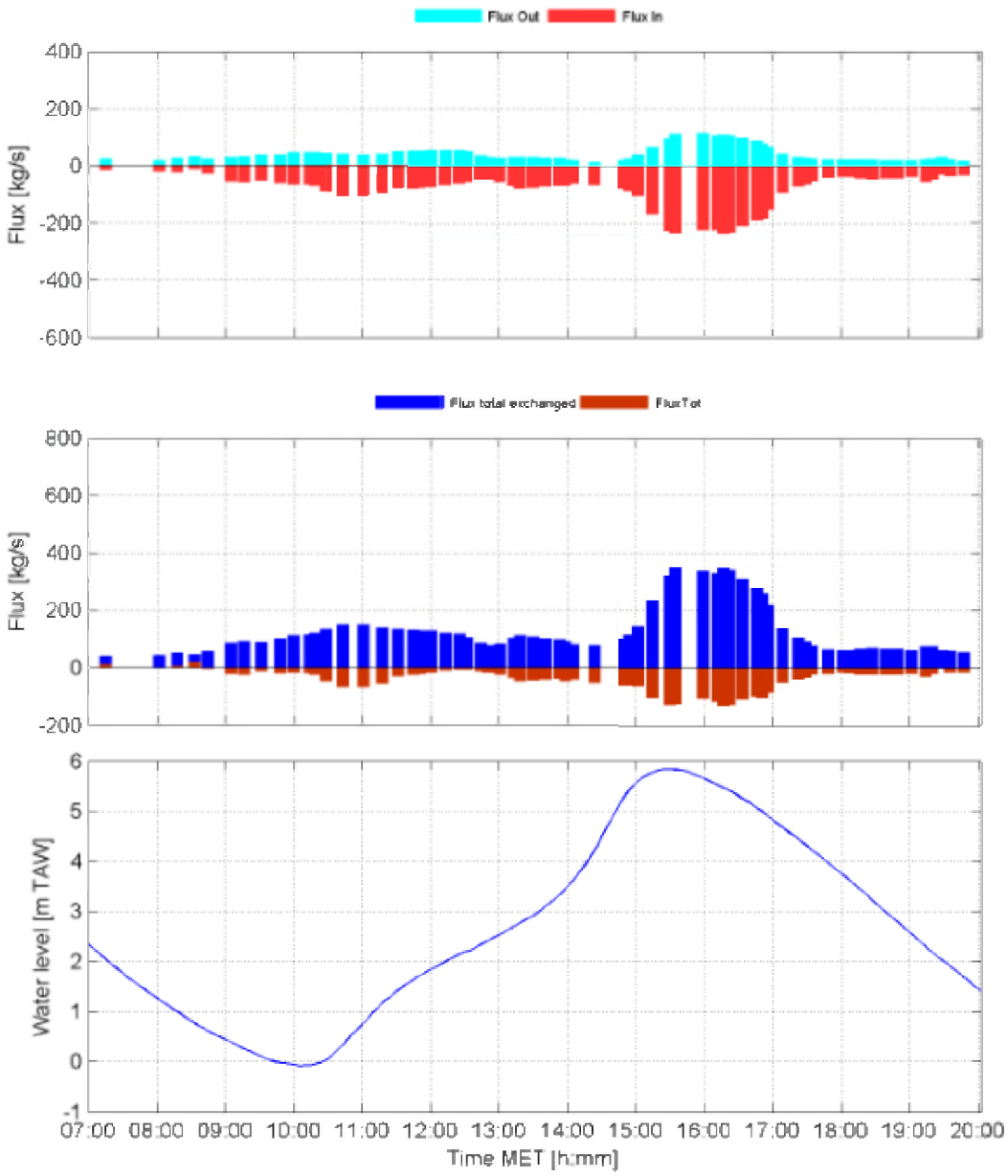


Figure 5-8: The sediment flux at the entrance of Deurganckdok on 08/03/2012 (negative values represent incoming sediment). Top: Total incoming (flux in) and outgoing sediment flux (flux out); Central: total sediment exchange versus total sediment flux; below: tidal curve

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 4.1 million m^3, in the second worst case the total outgoing discharge was retained and the total incoming discharge was reduced with 4.1 million m^3. Between this range the sediment mass will be situated. The settled sediment mass, calculated with corrected discharges, was estimated between 2011 and 2498 tonnes over the measurement cycle on 8/03/2012 (Table 5-7). During ebb approximately 3500 tonnes of sediment passed the entrance of which about 1400 tonnes stayed in the dock; during flood approximately 2350 tonnes passed the entrance of which about 850 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.]

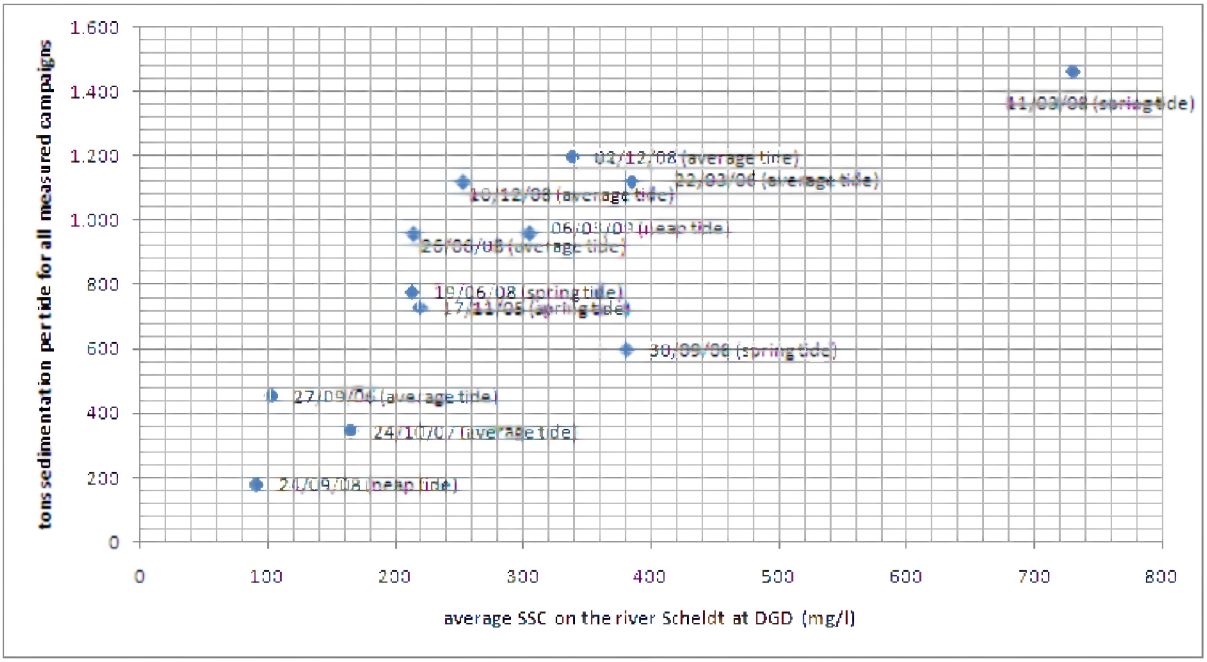


Figure 5-9: Overview of measured sediment deposition in Deurganckdok per tide by means of Sediview technique compared to average SSC on the river Scheldt.

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 2200 tonnes during spring tide is rather high. 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 the results don't shown a reduction in deposition. 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. However, 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.

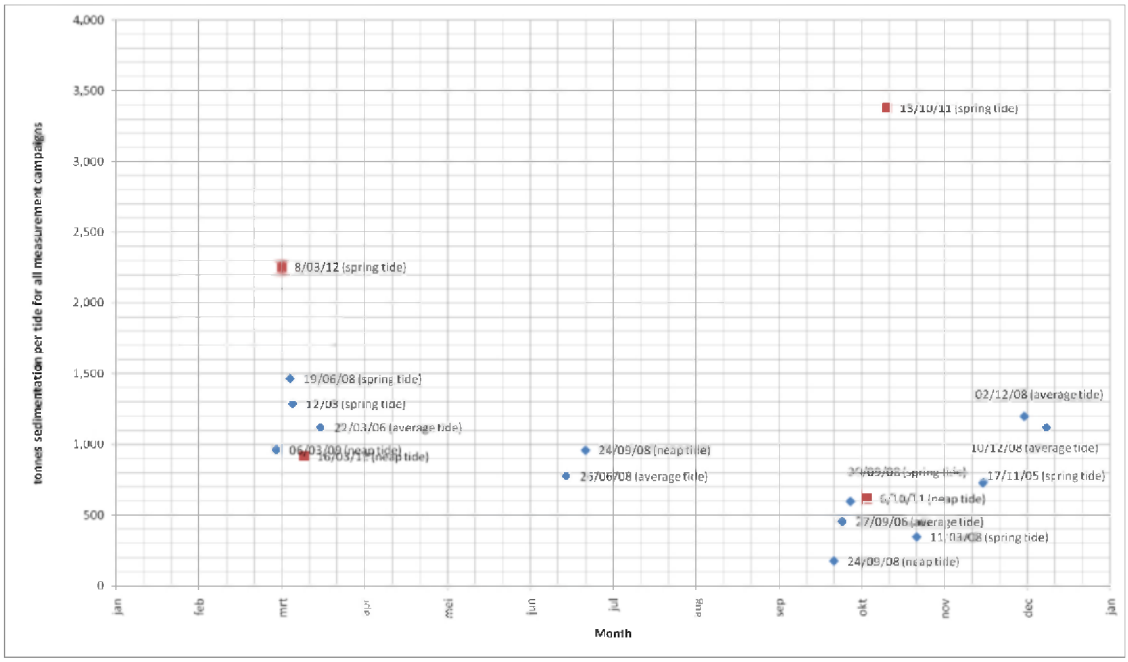


Figure 5-10: Evolution of the measured sediment deposition in Deurganckdok per tide by means of Sediview technique (blue dots: without CDW/with sill; red squares: with CDW/ without sill).

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		***17/11/2005***		***27/09/2006***		***24/10/2007***	
DGD surface area [10^3 m^2]		750		750		1 019	
Tidal coefficient		1.1		1.03		1.02	
Duration of measurement [hh:mm]		10:57		12:42		12:24	
Daily fresh water discharge at Schelle [m^3/s]		91		33		46	
Ebb	exchanged mass [ton]	1 704	2 367	1 056	1 090	620	585
	incoming mass [ton]	1 087	1 489	635	656	336	317
	outgoing mass [ton]	617	879	421	434	284	268
	residual incoming mass [ton]	471	610	214	223	52	49
Flood	exchanged mass [ton]	1 805	1 498	684	664	1 015	714
	incoming mass [ton]	1 000	841	463	448	662	501
	outgoing mass [ton]	805	657	221	215	353	213
	residual incoming mass [ton]	194	184	242	233	308	288
Total	exchanged mass [ton]	3 509	3 866	1 740	1 754	1 635	1 299
	incoming mass [ton]	2 087	2 330	1 098	1 105	998	818
	outgoing mass [ton]	1 422	1 536	642	649	637	481
	residual incoming mass [ton]	665	794	456	456	360	336

Measurement Day		***11/03/2008***		***19/06/2008***		***30/09/2008***	
DGD surface area [10^3 m^2]		1 019		1 019		1 019	
Tidal coefficient		1.17		1.15		1.08	
Duration of measurement [hh:mm]		12:23		12:32		12:49	
Daily fresh water discharge at Schelle [m^3/s]		286		93		82	
Ebb	exchanged mass [ton]	2 589	915	1 205	3 642	1 088	1 376
	incoming mass [ton]	1 388	559	769	1 990	669	865
	outgoing mass [ton]	1 201	356	436	1 652	419	510
	residual incoming mass [ton]	187	202	332	338	250	355
Flood	exchanged mass [ton]	2 928	1 135	1 342	2 956	1 710	2 039
	incoming mass [ton]	2 058	727	843	2 087	1 088	1 263
	outgoing mass [ton]	870	408	499	869	622	777
	residual incoming mass [ton]	1 188	319	345	1 218	465	486
Total	exchanged mass [ton]	5 517	2 050	2 547	6 598	2 798	3 415
	incoming mass [ton]	3 446	1 286	1 612	4 077	1 757	2 128
	outgoing mass [ton]	2 071	765	935	2 521	1 041	1 287
	residual incoming mass [ton]	1 375	521	677	1 556	716	841

Measurement Day		***12/03/2009***		***13/10/2011***		***08/03/2012***	
DGD surface area [10^3 m^2]		1 019		1 019		1 019	
Tidal coefficient		1.24		1.06		1.16	
Duration of measurement [hh:mm]		11:09		12:37		12:50	
Daily fresh water discharge at Schelle [m^3/s]		129		60		305	
Ebb	exchanged mass [ton]	2 727	2 669	6 334	5 853	3859	3007
	incoming mass [ton]	1 439	1 404	4 002	3 654	2735	2094
	outgoing mass [ton]	1 288	1 266	2 332	2 199	1124	913
	residual incoming mass [ton]	150	138	1 670	1 455	1611	1181
Flood	exchanged mass [ton]	3 253	3 531	6 578	6 644	2362	2355
	incoming mass [ton]	2 189	2 346	4 220	4 206	1625	1593
	outgoing mass [ton]	1 064	1 185	2 358	2 438	737	762
	residual incoming mass [ton]	1 125	1 161	1 862	1 769	888	830
Total	exchanged mass [ton]	5 980	6 201	12 912	12 497	6221	5361
	incoming mass [ton]	3 628	3 750	8 222	7 860	4360	3686
	outgoing mass [ton]	2 352	2 451	4 690	4 637	1861	1675
	residual incoming mass [ton]	1 276	1 299	3 532	3 224	2499	2011

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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.

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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.

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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).

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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.

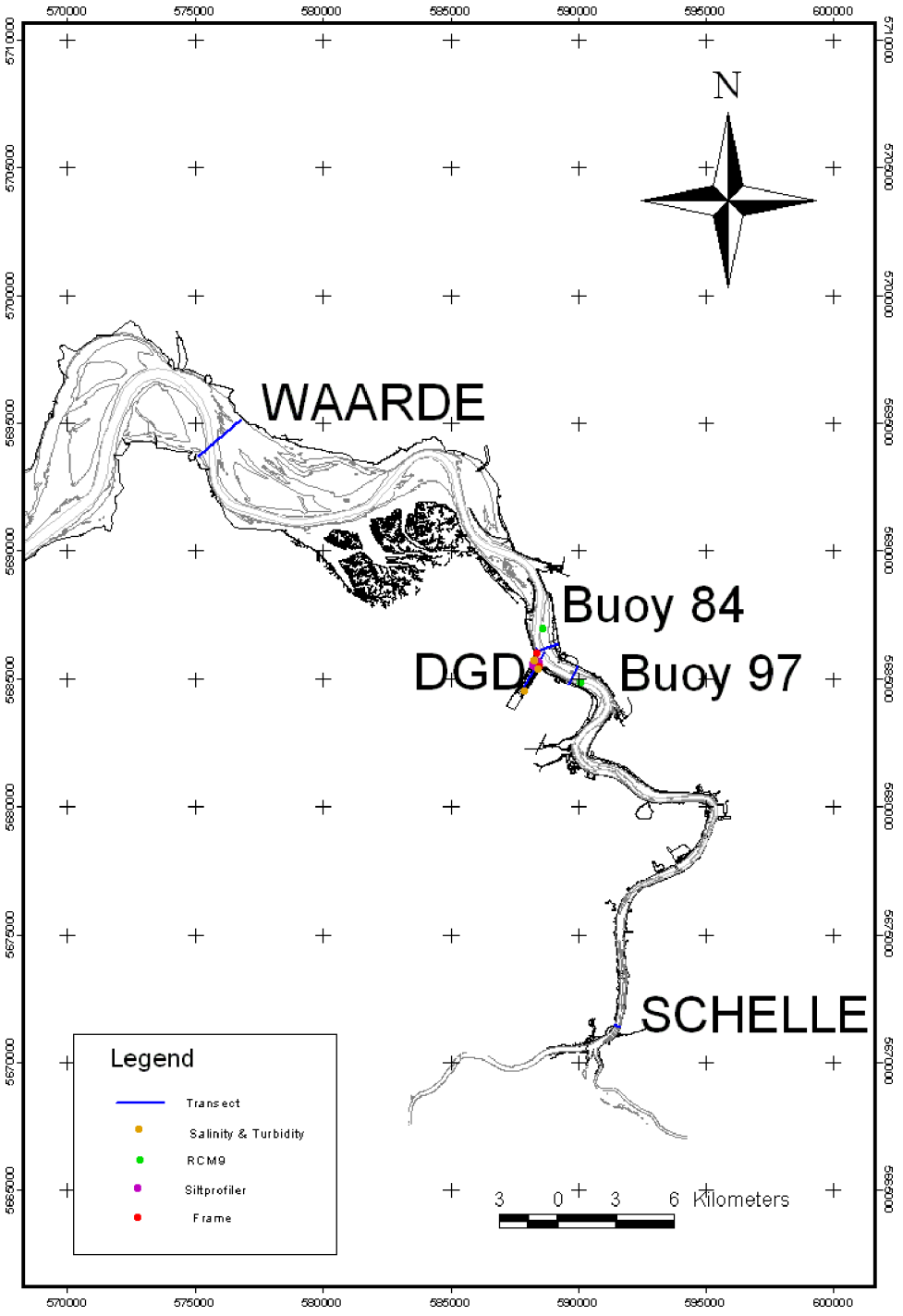
TV SAM (2006c) Langdurige stationaire ADCP stroommetingen te Oosterweel dukdalf 01/2006-06/2006. 42SR S032PIB 2A.

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

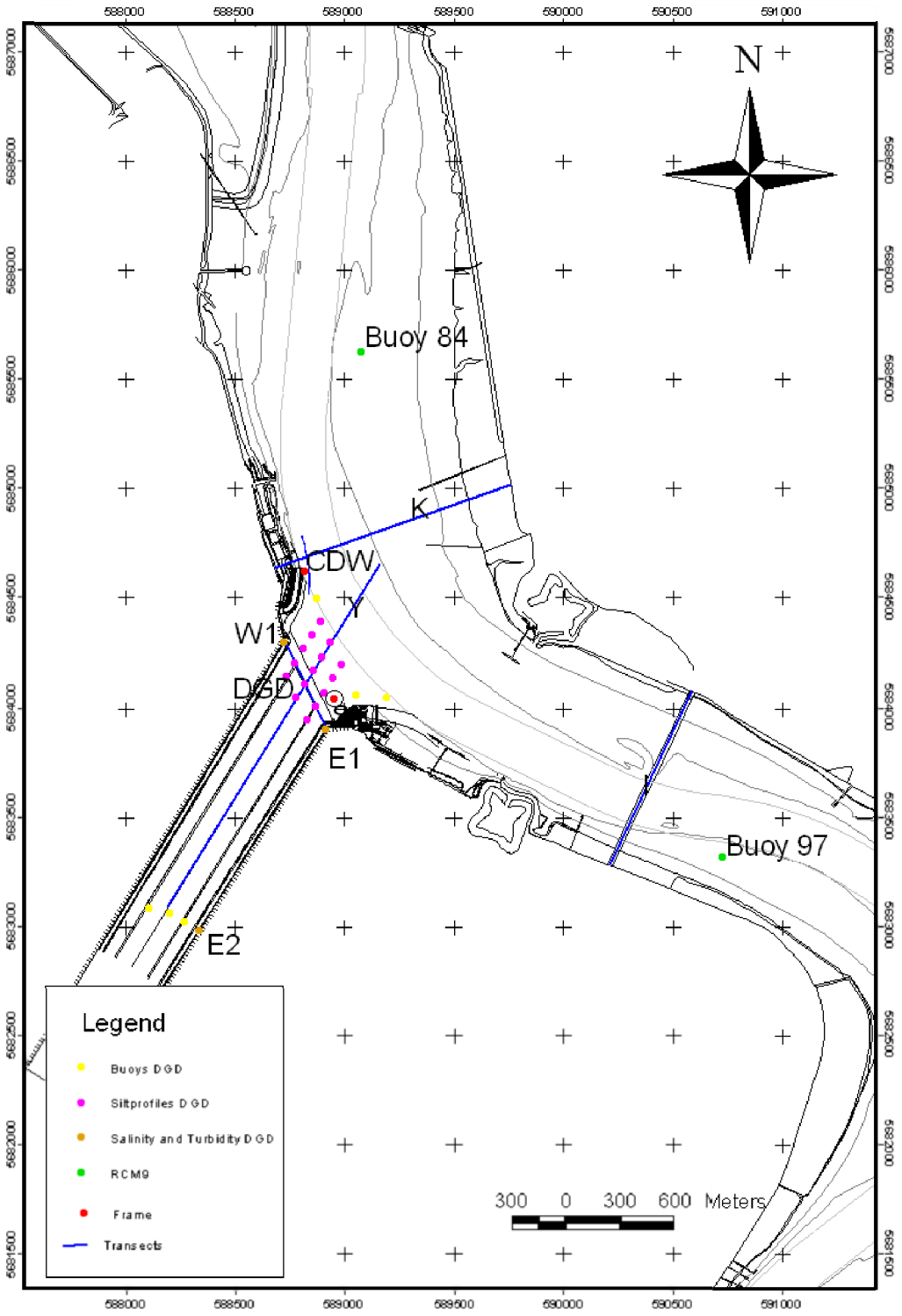
WL Delft Hydraulics (2004). Study of density currents in the framework of the LTV for the Scheldt Estuary. Executive summary. H3981-20.

Annex A Overview of measurement

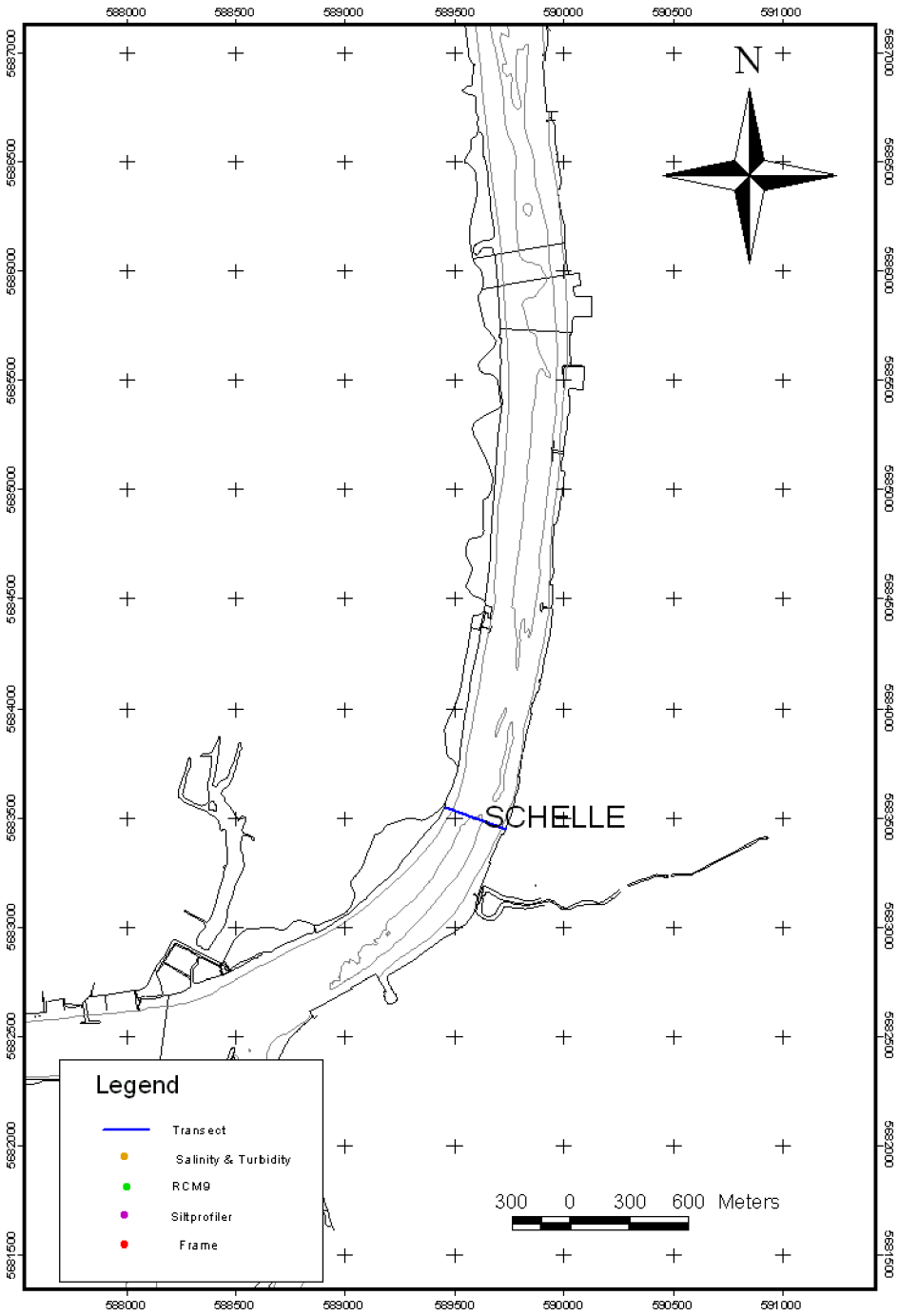
A.1 Overview of the measurement locations for the whole HCBS2 and Deurganckdok measurement campaigns



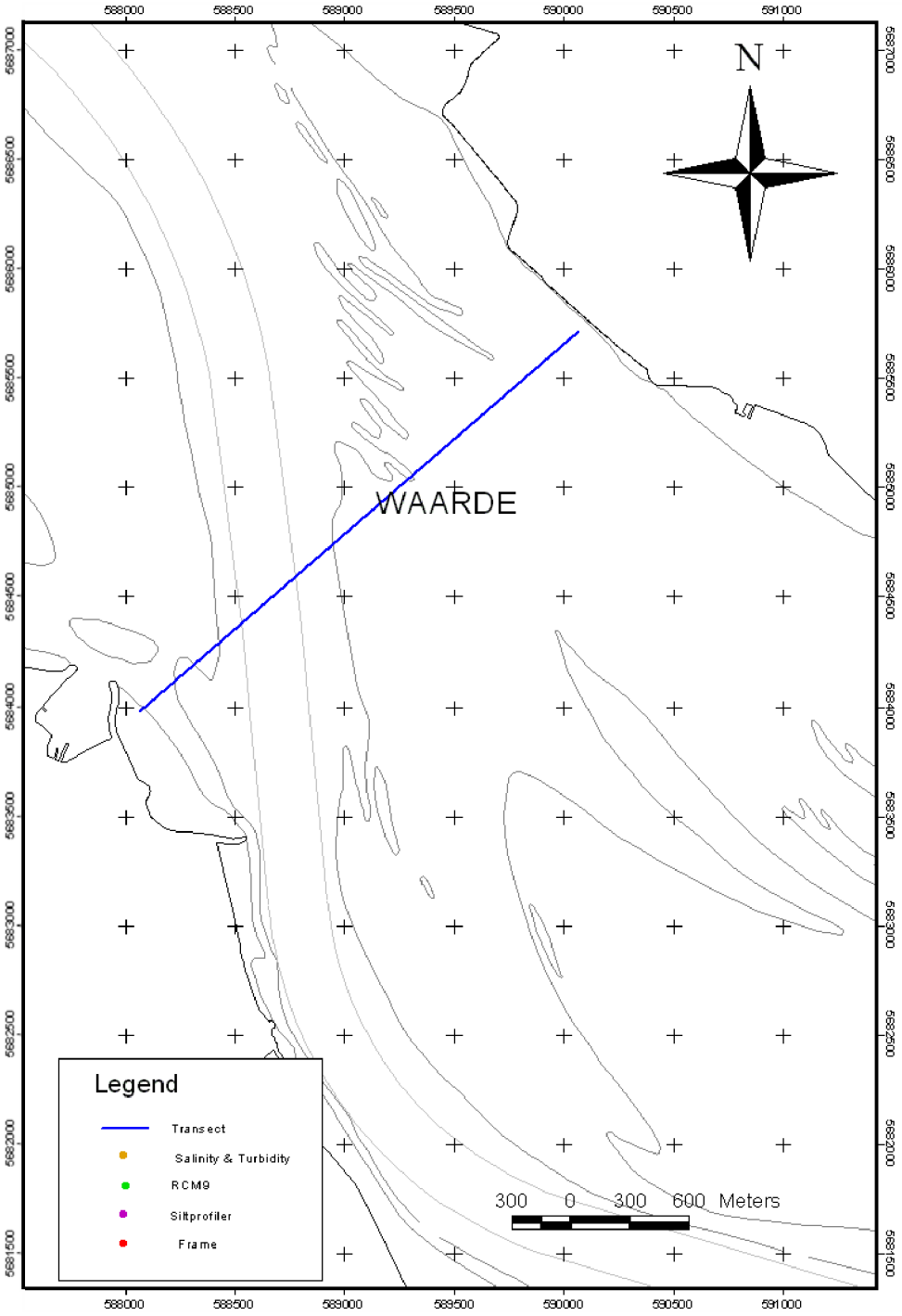
Annex Figure 1: Overview of the measurement locations



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 08/03/2012

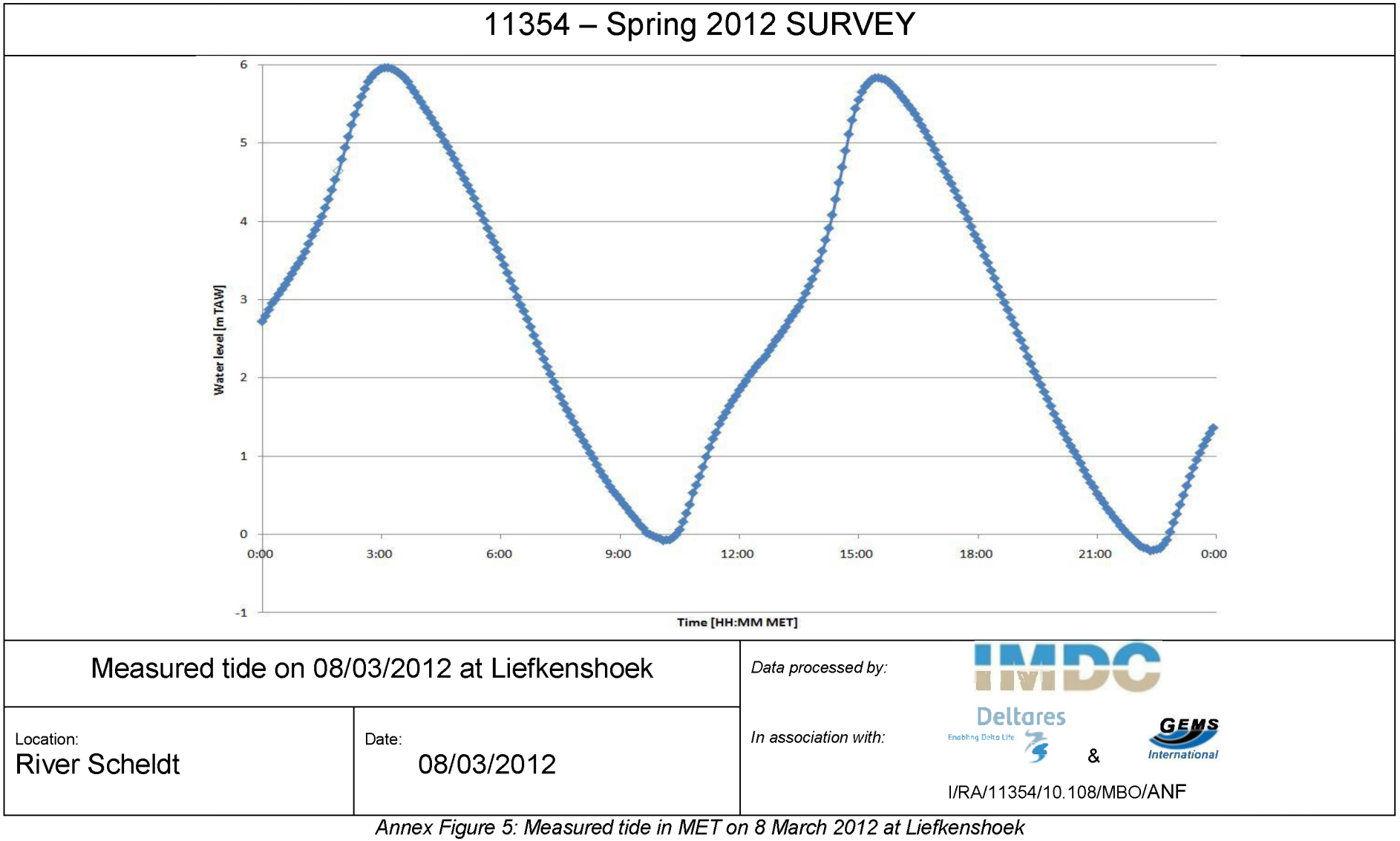
FileName	Time [hh:mm MET]	Time after HW [hh:mm]	Easting Left (UTM31 WGS84)	Northing Left (UTM31 WGS84)	Easting Right (UTM31 WGS84)	Northing Right (UTM31 WGS84)	Transect length [m]	Transect heading [°]
6501_dgdTAB_sub.csv	07:15	4:09	588486	5684236	588656	5683877	397	-25
6507_dgdTAB_sub.csv	08:03	4:56	588456	5684299	588659	5683872	473	-27
6508_dgdTBA_sub.csv	08:18	5:12	588462	5684286	588655	5683879	450	155
6509_dgdTAB_sub.csv	08:33	5:27	588530	5684142	588668	5683852	320	-25
6511_dgdTBA_sub.csv	08:45	5:38	588452	5684307	588656	5683877	477	155
6513_dgdTAB_sub.csv	09:06	5:59	588448	5684316	588667	5683855	510	-25
6514_dgdTBA_sub.csv	09:17	6:10	588454	5684302	588662	5683865	485	156
6515_dgdTAB_sub.csv	09:33	6:26	588465	5684279	588658	5683873	449	-25
6517_dgdTBA_sub.csv	09:49	6:42	588453	5684303	588663	5683863	488	155
6519_dgdTAB_sub.csv	10:01	6:54	588453	5684303	588670	5683849	503	-25
6520_dgdTBA_sub.csv	10:15	-5:11	588457	5684295	588664	5683862	480	155
6521_dgdTAB_sub.csv	10:20	-5:06	588455	5684301	588663	5683863	486	-24
6523_dgdTBA.csv	10:29	-4:57	588459	5684292	588670	5683848	484	155
6525_dgdTAB.csv	10:44	-4:42	588459	5684293	588663	5683863	476	-26
6527_dgdTAB_sub.csv	11:02	-4:24	588470	5684269	588665	5683859	454	-25
6529_dgdTBA_sub.csv	11:18	-4:08	588455	5684300	588646	5683898	444	155
6531_dgdTAB_sub.csv	11:32	-3:53	588470	5684268	588661	5683867	445	-24
6532_dgdTBA_sub.csv	11:46	-3:40	588451	5684309	588670	5683847	512	157
6533_dgdTAB.csv	11:51	-3:35	588453	5684305	588667	5683854	499	-25
6535_dgdBA_sub.csv	12:02	-3:24	588454	5684302	588654	5683883	464	155
6537_dgdTAB_sub.csv	12:14	-3:12	588469	5684270	588668	5683852	463	-24
6538_dgdTBA_sub.csv	12:27	-2:59	588447	5684316	588660	5683868	496	155
6539_dgdTAB.csv	12:34	-2:52	588453	5684305	588666	5683856	497	-25
6542_dgdAB.csv	12:46	-2:40	588450	5684310	588662	5683865	492	155
6543_dgdBA_sub.csv	12:51	-2:34	588455	5684299	588665	5683858	488	-27
6545_dgdTAB_sub.csv	13:02	-2:24	588453	5684305	588661	5683866	486	155
6547_dgdTBA_sub.csv	13:15	-2:11	588453	5684304	588670	5683849	504	-25
6548_dgdTAB.csv	13:20	-2:06	588448	5684315	588671	5683847	519	155
6549_dgdTBA_sub.csv	13:31	-1:55	588457	5684297	588662	5683865	478	-25

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 [°]
6551_dgdTAB_sub.csv	13:42	-1:44	588450	5684311	588669	5683850	511	155
6553_dgdTBA.csv	13:54	-1:31	588456	5684297	588667	5683853	492	-23
6554_dgdTAB_sub.csv	13:59	-1:27	588455	5684299	588659	5683870	475	154
6555_dgdTBA_sub.csv	14:06	-1:20	588472	5684265	588668	5683853	456	-26
6557_dgdTAB_sub.csv	14:25	-1:01	588450	5684312	588662	5683865	495	154
6559_dgdTBA_sub.csv	14:51	-0:35	588471	5684268	588666	5683856	456	-26
6560_dgdTAB_sub.csv	14:55	-0:30	588460	5684289	588651	5683888	445	151
6561_dgdTBA.csv	15:03	-0:23	588460	5684289	588667	5683853	482	-26
6563_dgdTAB_sub.csv	15:16	-0:10	588447	5684317	588667	5683855	507	155
6565_dgdTBA_sub.csv	15:32	0:05	588453	5684305	588669	5683849	504	-24
6566_dgdTAB.csv	15:36	0:09	588451	5684309	588661	5683867	478	156
6570_dgdTAB_sub.csv	16:00	0:34	588447	5684317	588666	5683856	510	155
6572_dgdTBA_sub.csv	16:14	0:47	588458	5684294	588669	5683851	491	-23
6573_dgdTAB_sub.csv	16:18	0:52	588456	5684298	588653	5683884	459	155
6574_dgdTBA.csv	16:24	0:57	588447	5684317	588669	5683851	516	-25
6576_dgdTAB_sub.csv	16:35	1:08	588448	5684316	588668	5683852	513	156
6578_dgdTBA_sub.csv	16:48	1:21	588449	5684313	588669	5683850	512	-25
6579_dgdTAB.csv	16:52	1:25	588449	5684312	588652	5683886	472	156
6580_dgdTBA_sub.csv	16:58	1:30	588454	5684302	588667	5683854	496	-25
6582_dgdTAB_sub.csv	17:10	1:43	588451	5684308	588667	5683855	502	155
6584_dgdTBA_sub.csv	17:24	1:57	588460	5684289	588671	5683846	490	-25
6585_dgdTAB_sub.csv	17:30	2:03	588449	5684312	588657	5683875	485	156
6586_dgdTBA_sub.csv	17:35	2:08	588455	5684301	588665	5683860	489	-24
6588_dgdTAB_sub.csv	17:50	2:23	588449	5684313	588656	5683878	482	156
6590_dgdTBA_sub.csv	18:03	2:36	588475	5684259	588671	5683847	456	-24
6591_dgdTAB_sub.csv	18:09	2:42	588447	5684317	588637	5683917	443	154
6592_dgdTBA.csv	18:18	2:51	588457	5684296	588668	5683852	492	-25
6594_dgdTAB_sub.csv	18:29	3:02	588458	5684295	588663	5683862	480	152
6596_dgdTBA_sub.csv	18:41	3:14	588453	5684305	588669	5683850	504	-25
6597_dgdTAB_sub.csv	18:46	3:19	588447	5684316	588650	5683890	471	154

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 [°]*
6598_dgdTBA_sub.csv	18:51	3:24	588463	5684284	588670	5683849	481	-25
6600_dgdTAB_sub.csv	19:03	3:36	588456	5684299	588663	5683862	483	155
6602_dgdTBA_sub.csv	19:16	3:49	588461	5684288	588669	5683851	484	-26
6603_dgdTAB_sub.csv	19:21	3:54	588457	5684297	588665	5683859	485	154
6604_dgdTBA_sub.csv	19:30	4:03	588476	5684256	588655	5683879	418	-26
6605_dgdTAB.csv	19:36	4:10	588459	5684291	588647	5683897	436	154
6607_dgdTAB.csv	19:49	4:22	588452	5684306	588670	5683849	507	-25

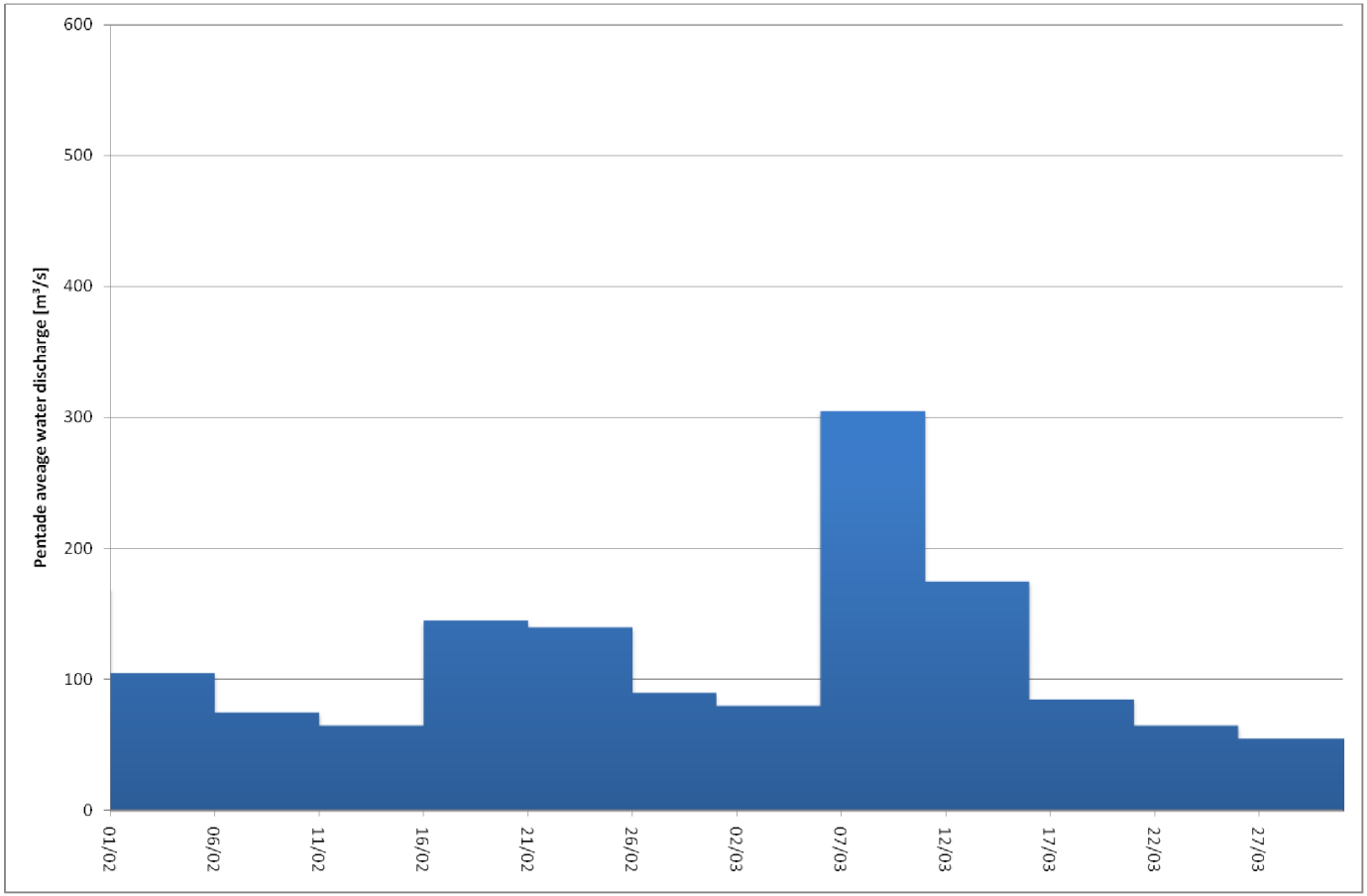
Annex B Tidal and discharge data

B.1 Tidal data

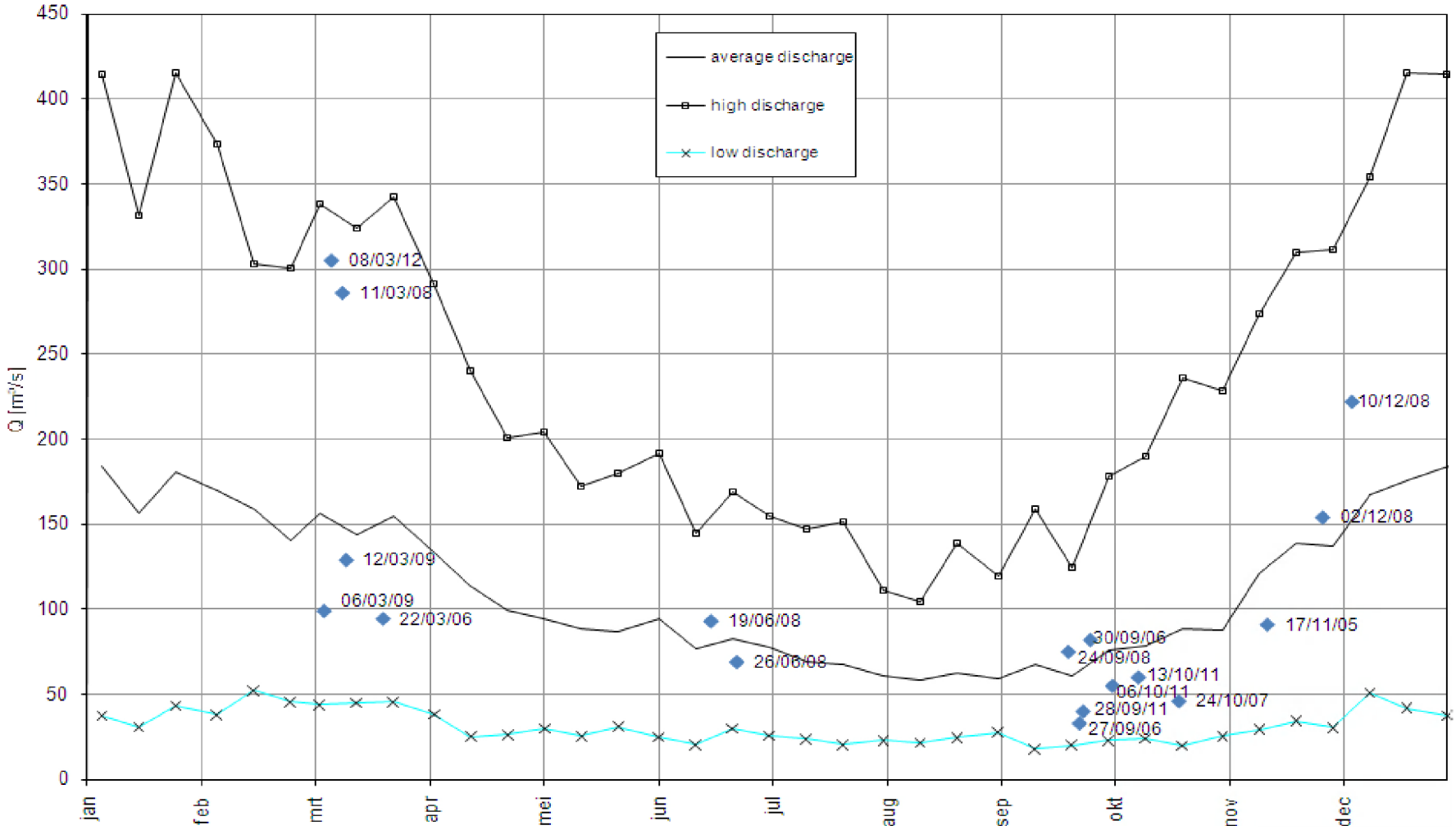


Annex Figure 5: Measured tide in MET on 8 March 2012 at Liefkenshoek

B.2 Discharge data



Annex Figure 6: Pentade average discharges of the river Scheldt in Schelle of the months February and March of 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***
6567_dgdTBA	Afgebroken wegens scheepvaart

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		*08/03/2012*	
Parameters	***Value***	***Parameters***	***Value***
Inst. Depth (m)	1.09	*Compass offset (°)*	-5
Force depth (m)	0	*Beam 3 misalignment (°)*	-5
Velocity reference	BT	*Effective particle size (µm)*	20
Speed of sound algorithm	Urick	*Beam1 scale factor*	0.435
Error velocity	YES	*Beam2 scale factor*	0.41
External heading	NO	*Beam3 scale factor*	0.435
External Depth	NO	*Beam4 scale factor*	0.44
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)***
6501_dgdTAB_sub	54	19.25	90.15	34.21
6507_dgdTAB_sub	54	19.5	20.02	28.73
6508_dgdTBA_sub	54	19.5	34.83	37.03
6509_dgdTAB_sub	54	19.5	194.29	7.17
6511_dgdTBA_sub	54	20	10.53	34.42
6513_dgdTAB_sub	54	20.5	1.63	9.67
6514_dgdTBA_sub	54	20.5	16.16	20.78
6515_dgdTAB_sub	54	20.5	41.75	30.41
6517_dgdTBA_sub	54	20.5	15.04	18.29
6519_dgdTAB_sub	54	20.25	15.04	3.17
6520_dgdTBA_sub	54	20.25	23.85	17.31
6521_dgdTAB_sub	54	20.25	17.65	18.40
6523_dgdTBA	54	20.25	27.42	2.72
6525_dgdTAB	54	20.25	27.08	18.43
6527_dgdTAB_sub	54	20.25	53.11	14.07
6529_dgdTBA_sub	54	20.75	19.32	57.80

Filename	*Calibration const (Ks)*	*Backscatter coefficient (S)*	*Distance to the left bank (m)*	*Distance to the right bank (m)*
6531_dgdTAB_sub	54	20.5	53.81	23.38
6532_dgdTBA_sub	54	20.5	8.55	1.65
6533_dgdTAB	54	20.5	13.60	8.76
6535_dgdBA_sub	54	20.5	16.69	40.62
6537_dgdTAB_sub	54	20.5	51.60	7.17
6538_dgdTBA_sub	54	20.5	1.01	24.55
6539_dgdTAB	54	20.5	13.10	11.13
6542_dgdAB	54	21.25	7.60	21.58
6543_dgdBA_sub	54	21.25	19.61	13.62
6545_dgdTAB_sub	54	21.5	12.90	22.40
6547_dgdTBA_sub	54	20.75	14.14	3.34
6548_dgdTAB	54	20.75	1.93	1.15
6549_dgdTBA_sub	54	20.75	22.32	20.82
6551_dgdTAB_sub	54	20.25	6.66	4.27
6553_dgdTBA	54	20.25	22.11	8.16
6554_dgdTAB_sub	54	20.25	19.54	27.05
6555_dgdTBA_sub	54	20.25	57.92	7.63
6557_dgdTAB_sub	54	20.75	5.95	20.93
6559_dgdTBA_sub	54	19.75	54.79	10.95
6560_dgdTAB_sub	54	19.75	30.73	46.91
6561_dgdTBA	54	19.75	31.34	8.16
6563_dgdTAB_sub	54	18.5	0.47	10.30
6565_dgdTBA_sub	54	18.5	13.49	3.86
6566_dgdTAB	54	18.5	9.33	22.87
6570_dgdTAB_sub	54	18.5	0.21	11.54
6572_dgdTBA_sub	54	18.5	25.45	5.14
6573_dgdTAB_sub	54	18.5	21.48	41.53
6574_dgdTBA	54	18.5	0.46	5.05
6576_dgdTAB_sub	54	18.5	1.65	6.73
6578_dgdTBA_sub	54	18.75	4.17	4.91
6579_dgdTAB	54	18.75	5.59	44.45
6580_dgdTBA_sub	54	18.75	16.66	9.28

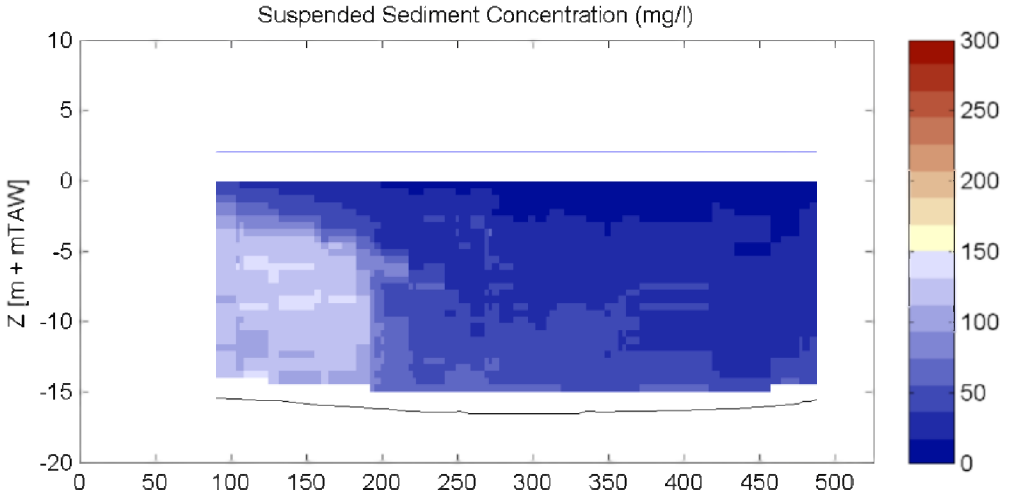
Filename	*Calibration const (Ks)*	*Backscatter coefficient (S)*	*Distance to the left bank (m)*	*Distance to the right bank (m)*
6582_dgdTAB_sub	54	19.25	9.74	10.16
6584_dgdTBA_sub	54	18.75	30.94	0.41
6585_dgdTAB_sub	54	19.25	4.99	32.09
6586_dgdTBA_sub	54	19.25	17.69	14.99
6588_dgdTAB_sub	54	19.25	4.40	35.69
6590_dgdTBA_sub	54	19	64.76	0.60
6591_dgdTAB_sub	54	19	0.06	78.85
6592_dgdTBA	54	19	22.87	6.48
6594_dgdTAB_sub	54	19	24.48	17.50
6596_dgdTBA_sub	54	19	13.52	4.52
6597_dgdTAB_sub	54	19	0.98	49.24
6598_dgdTBA_sub	54	19	37.09	3.40
6600_dgdTAB_sub	54	19	20.46	18.09
6602_dgdTBA_sub	54	19	31.90	5.74
6603_dgdTAB_sub	54	19	22.26	13.90
6604_dgdTBA_sub	54	19	67.09	36.21
6605_dgdTAB	54	19	29.03	56.60
6607_dgdTAB	54	19	11.66	2.93

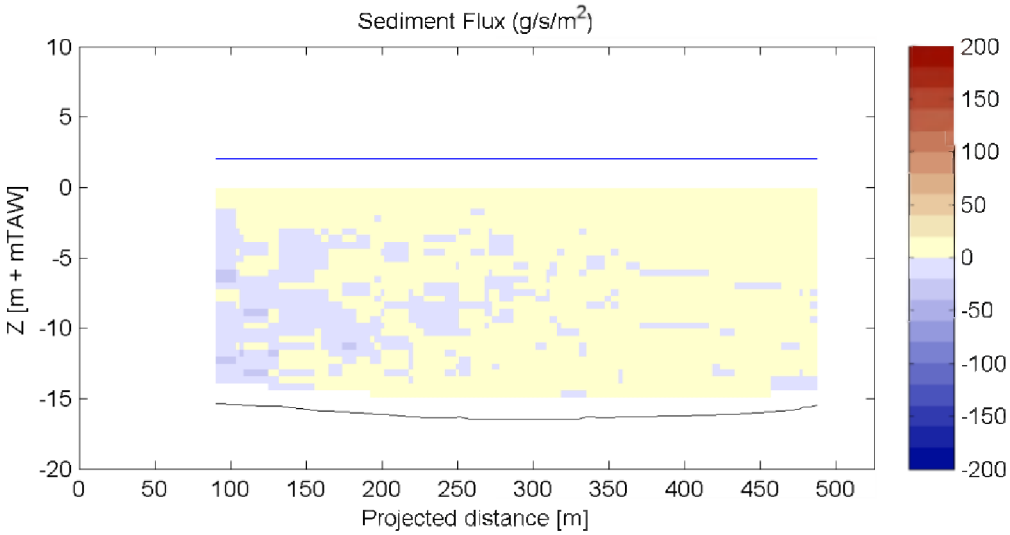
Annex F Contour plots of flow velocities, Sediment Concentration and Sediment Flux, per sailed transect

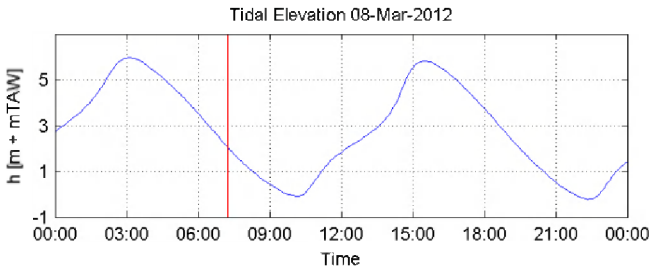
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Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6501_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

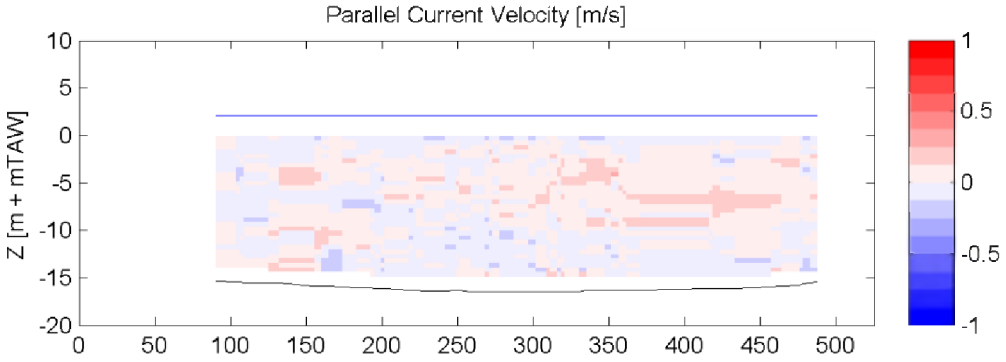
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08-Mar-2012
07:13 - 07:15

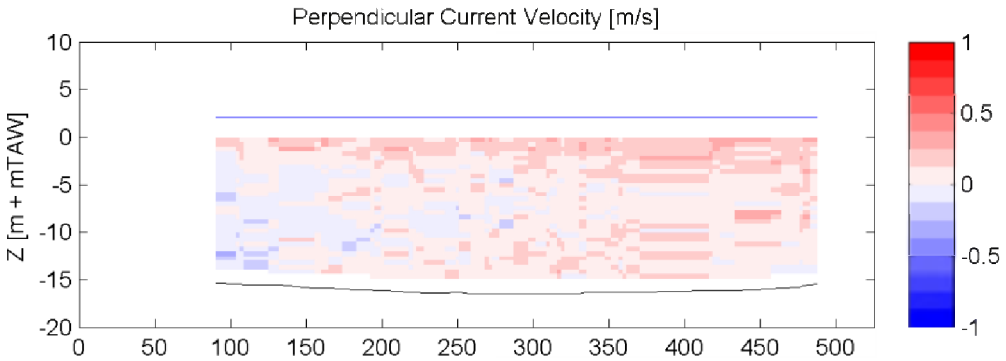
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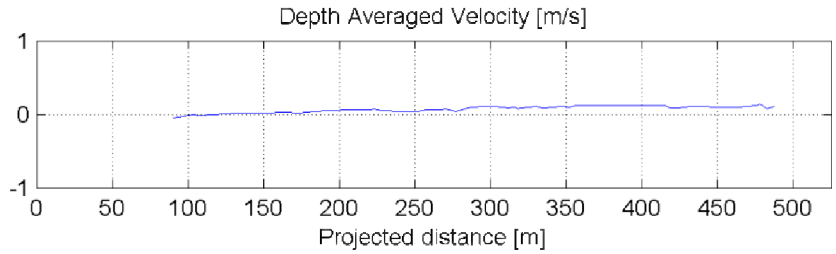
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

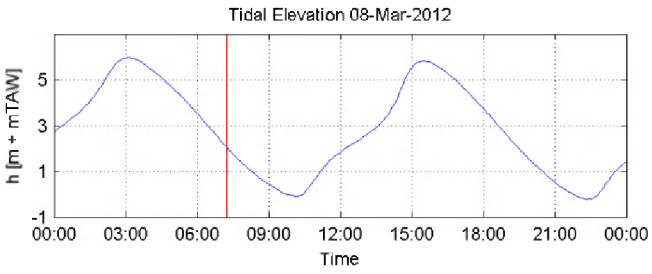
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6501_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

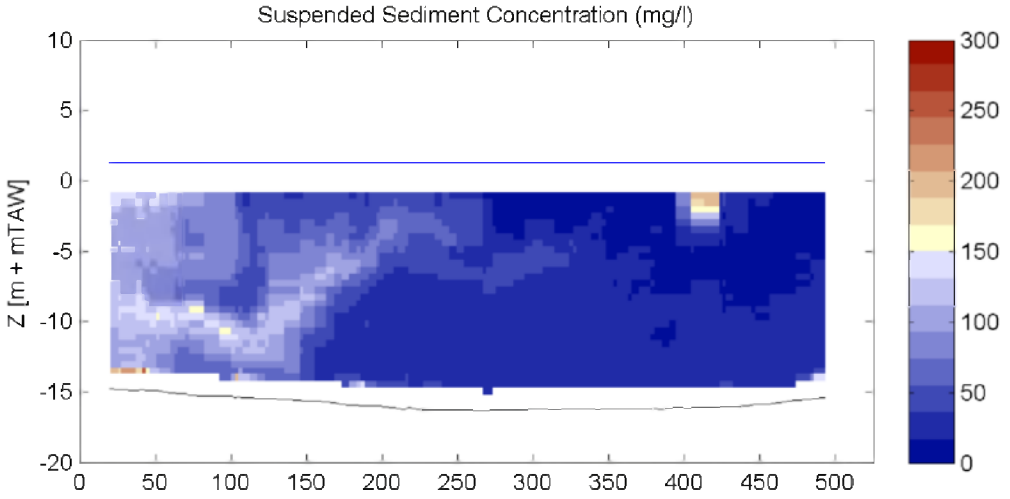
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08-Mar-2012
07:13 - 07:15

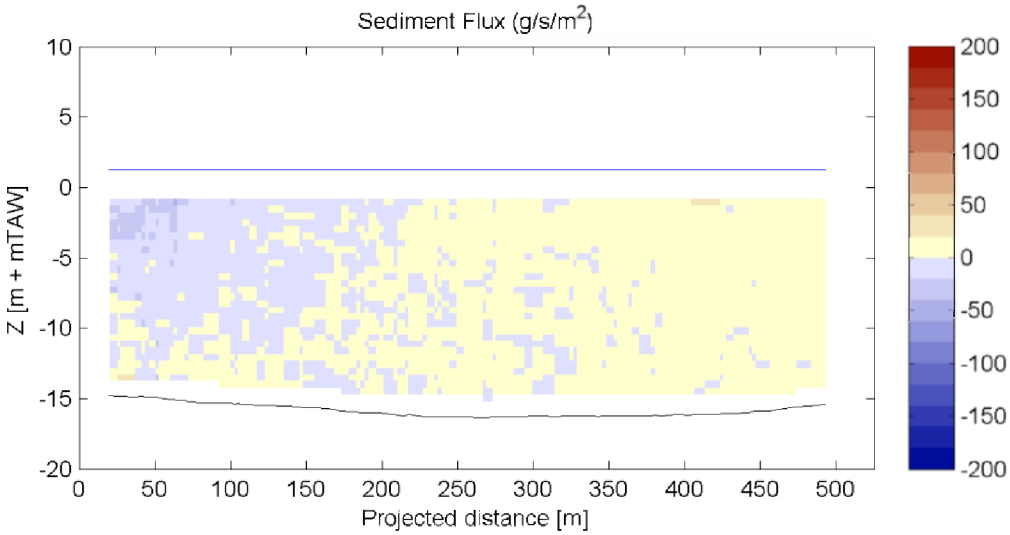
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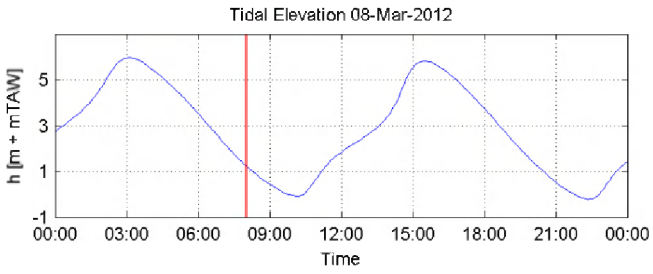
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6507_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW: 03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

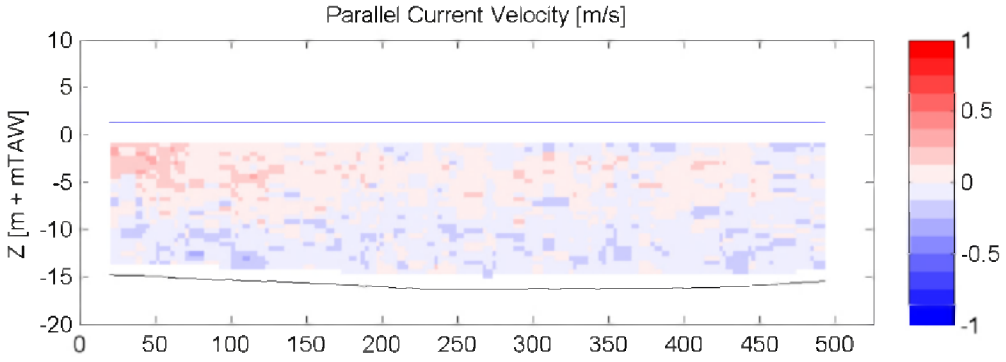
Date / Time [MET] :
08-Mar-2012
07:59 - 08:03

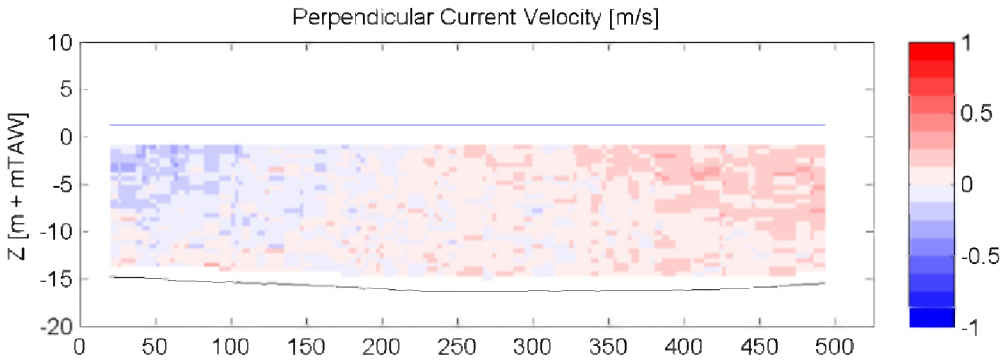
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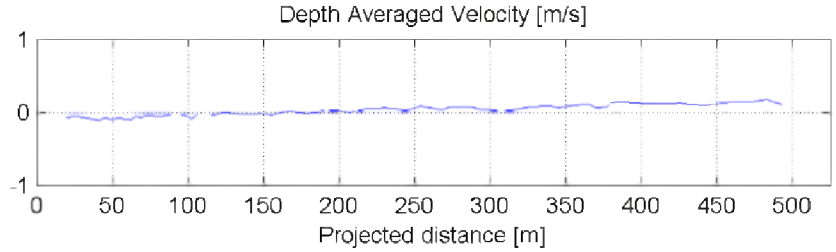
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In association with :
I/RA/11354/10.108/MBO/ANF

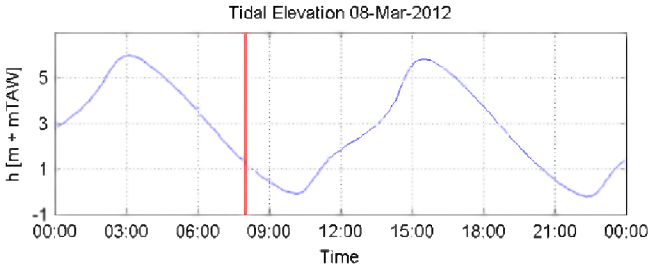
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6507_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

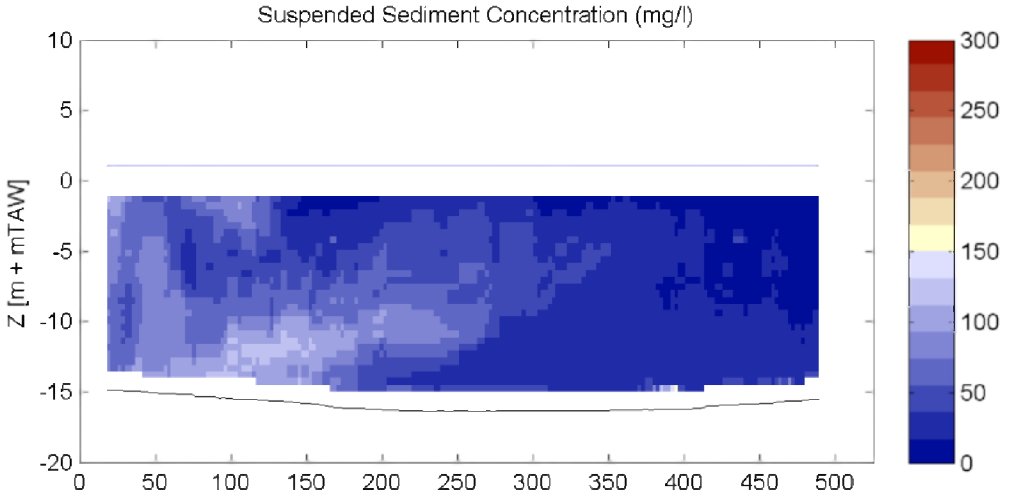
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07:59 - 08:03

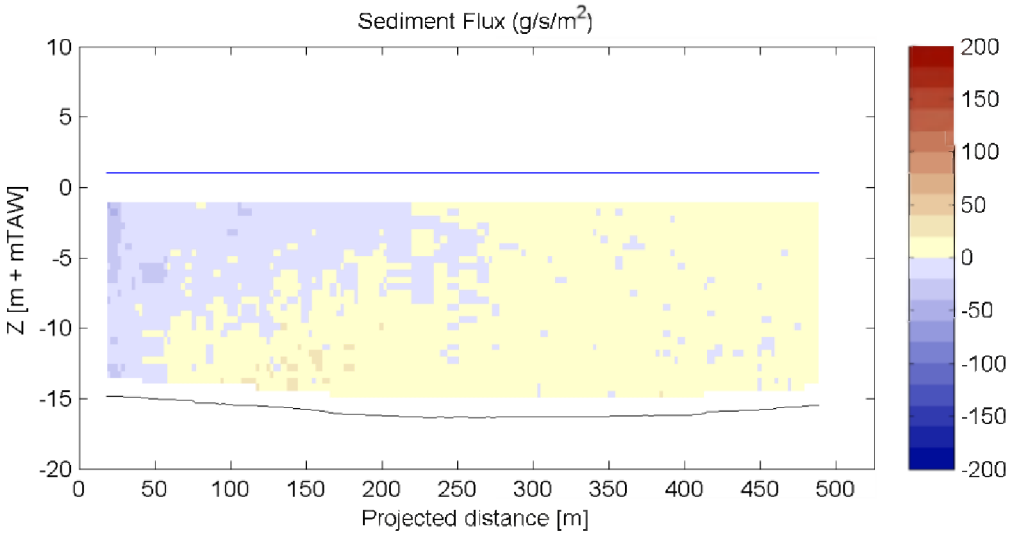
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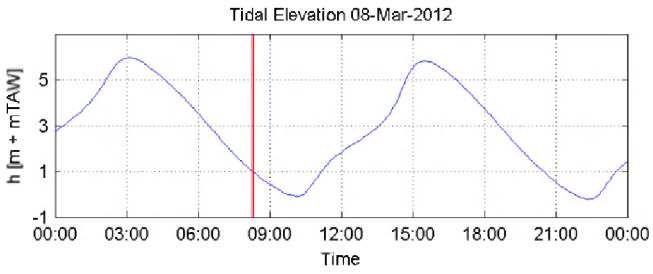
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6508_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW: 03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

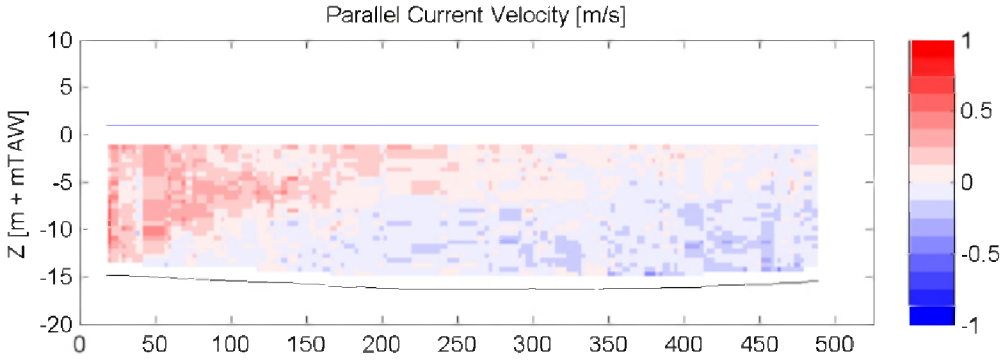
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08-Mar-2012
08:15 - 08:19

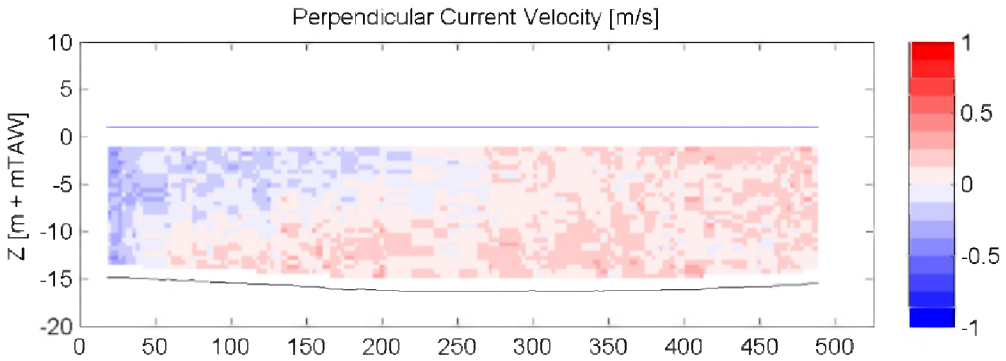
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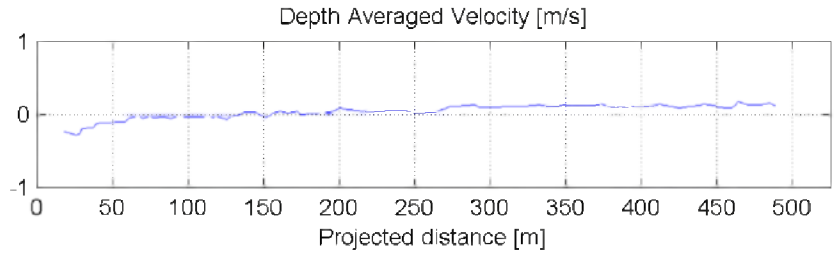
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In association with :
I/RA/11354/10.108/MBO/ANF

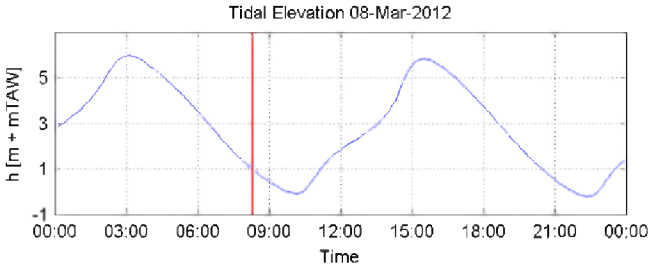
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6508_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

Date / Time [MET] :
08-Mar-2012
08:15 - 08:19

Time after HW [HH:MM]
5:12

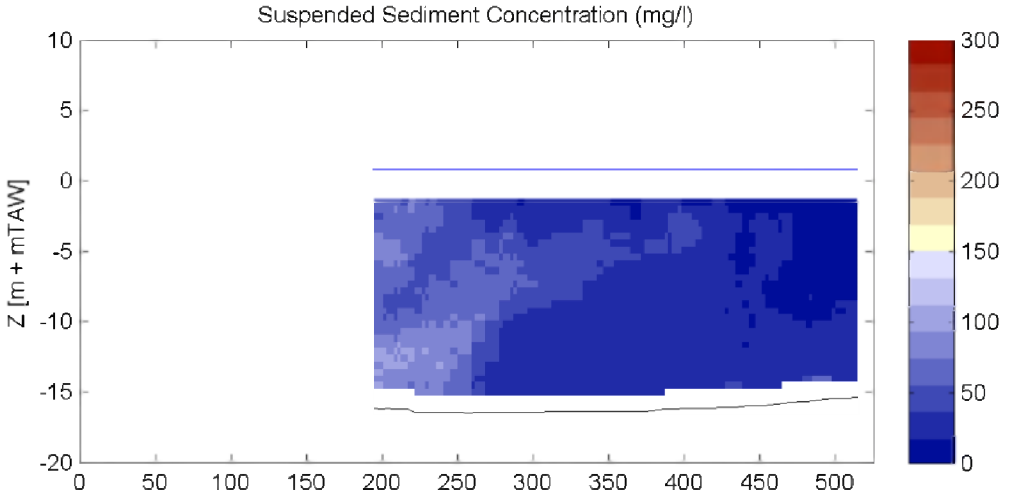
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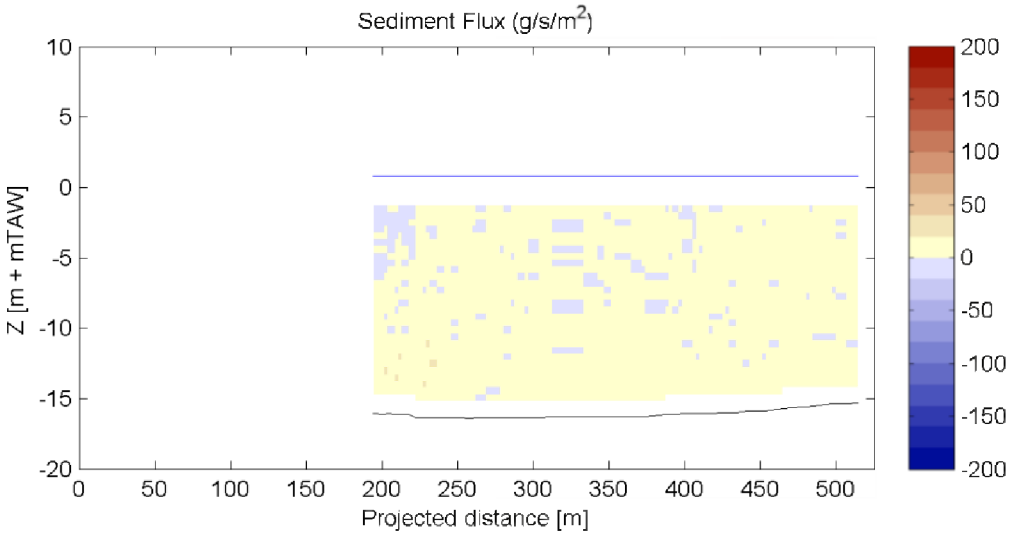
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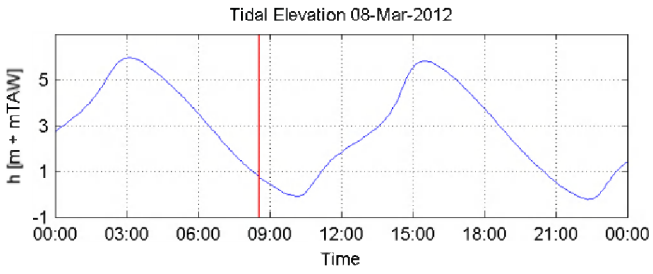
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6509_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW: 03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

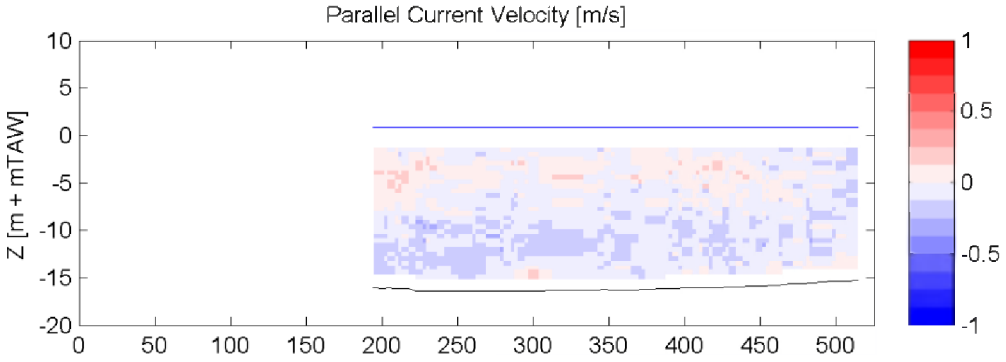
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08-Mar-2012
08:31 - 08:33

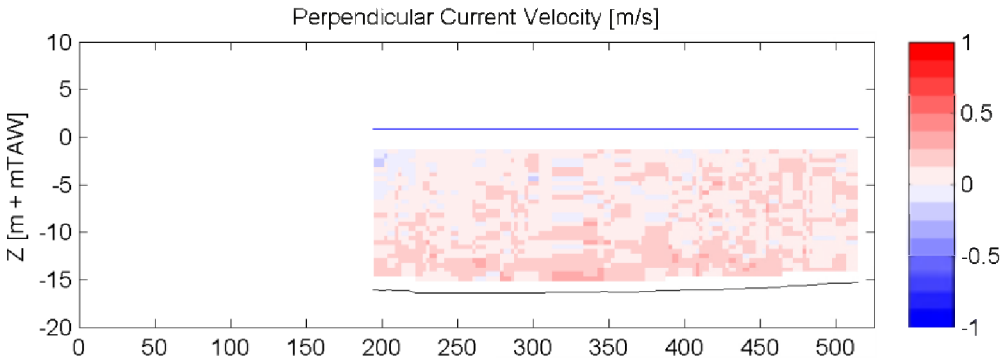
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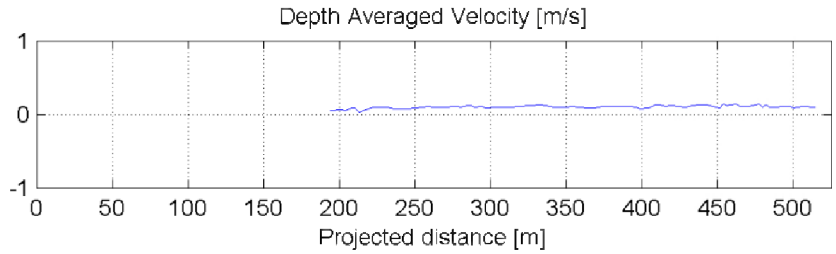
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

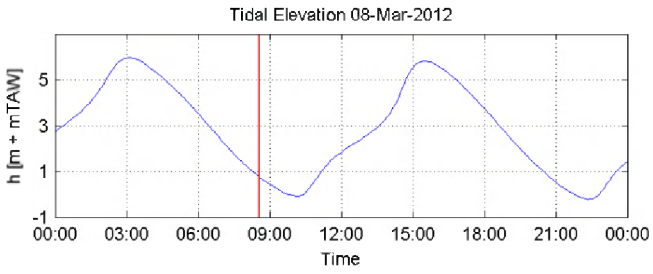
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6509_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

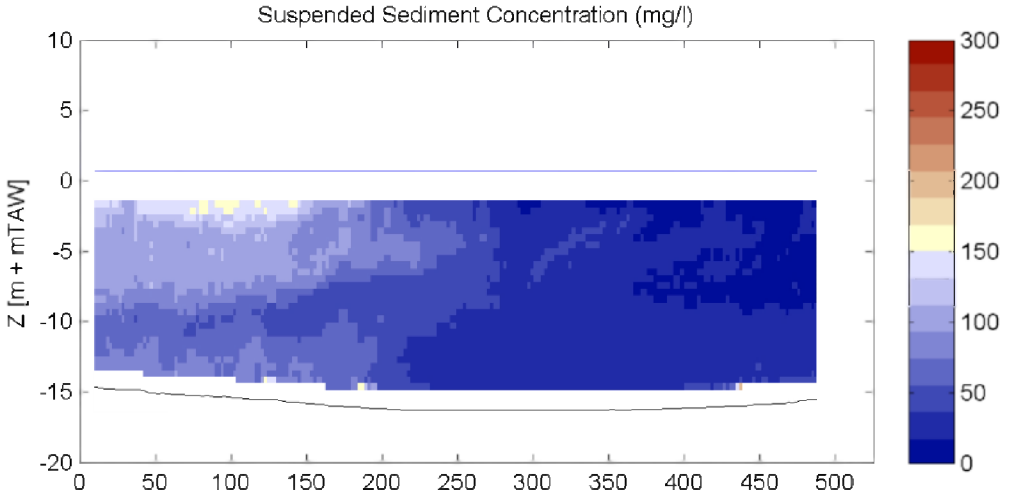
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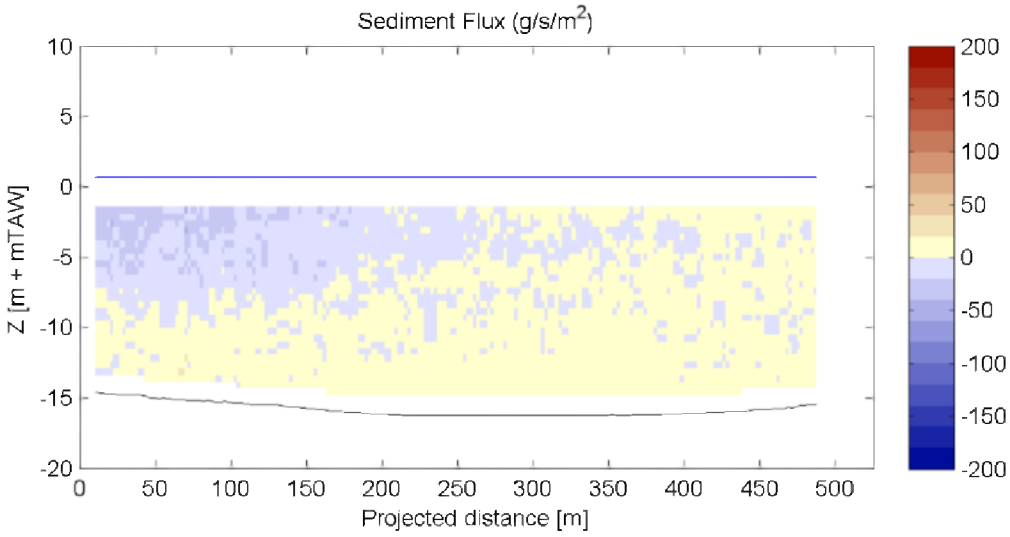
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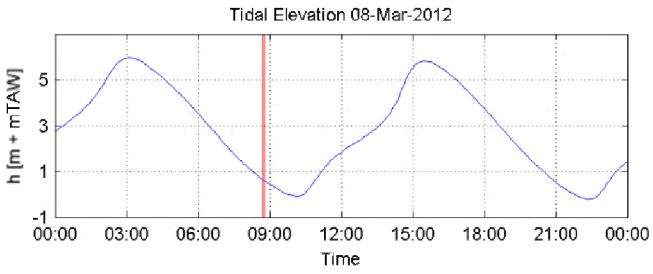
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6511_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW: 03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

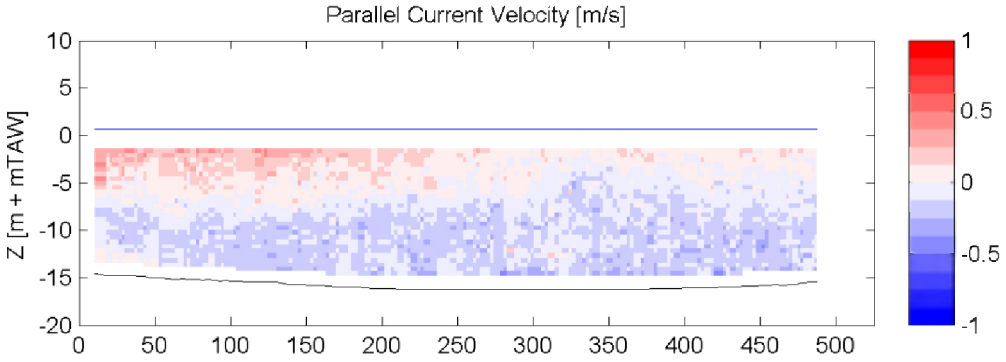
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08-Mar-2012
08:41 - 08:45

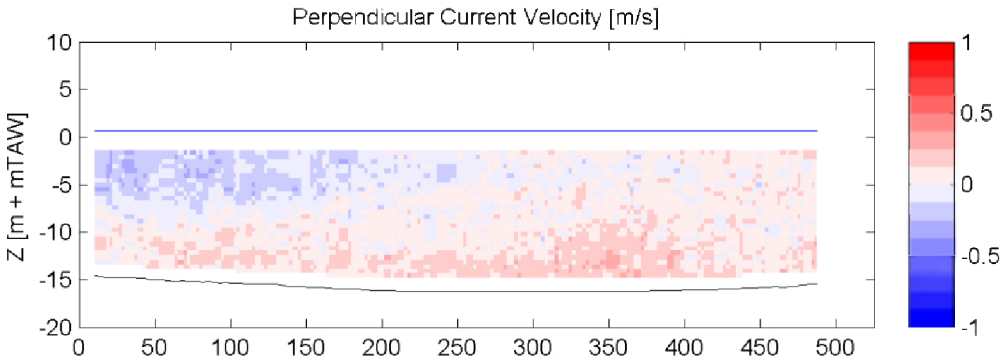
Time after HW [HH:MM]
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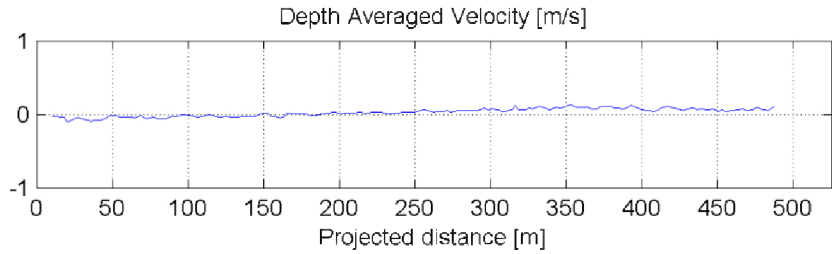
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In association with :
I/RA/11354/10.108/MBO/ANF

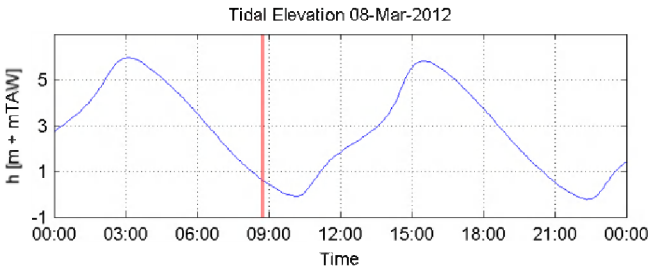
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6511_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
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10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

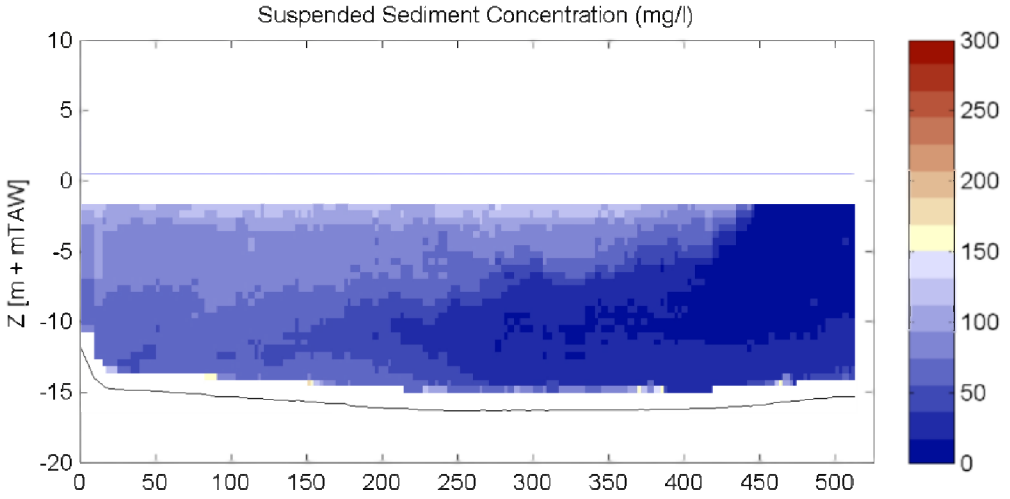
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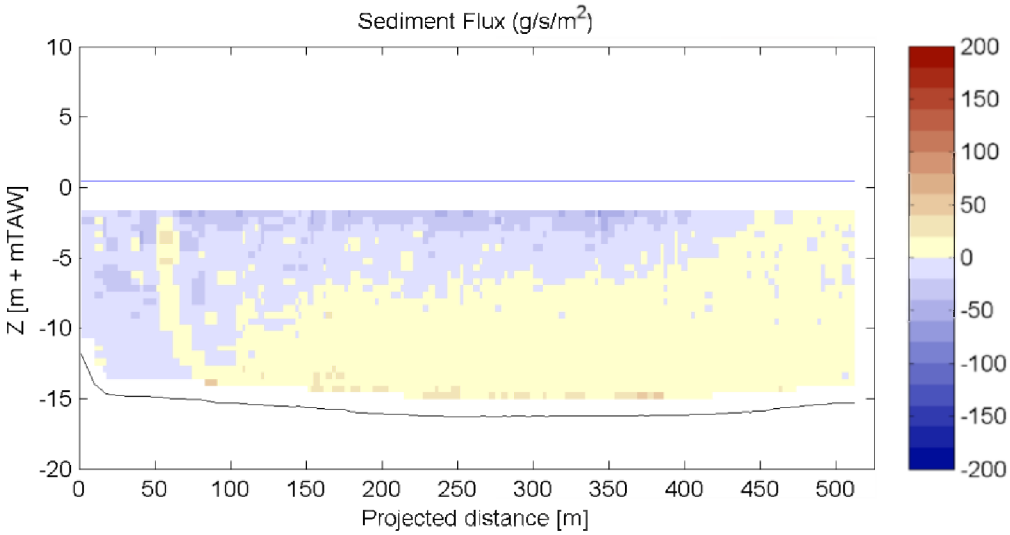
Time after HW [HH:MM]
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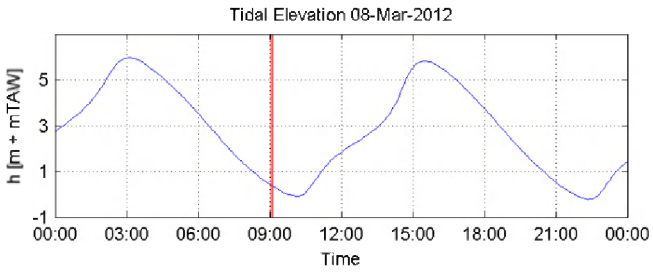
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6513_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
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10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

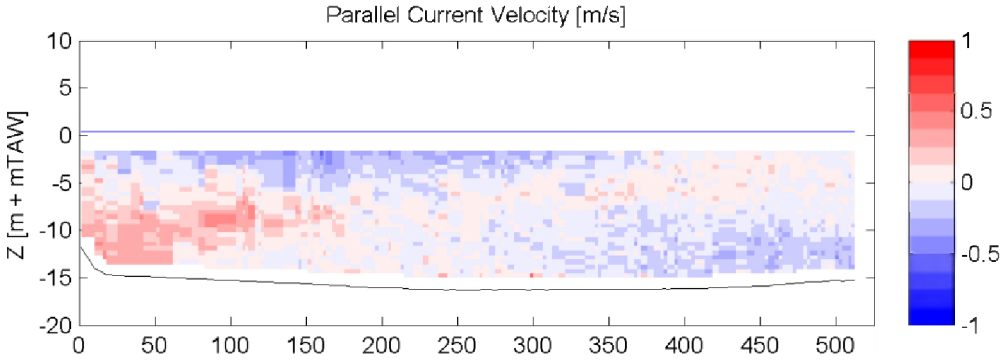
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08-Mar-2012
09:02 - 09:06

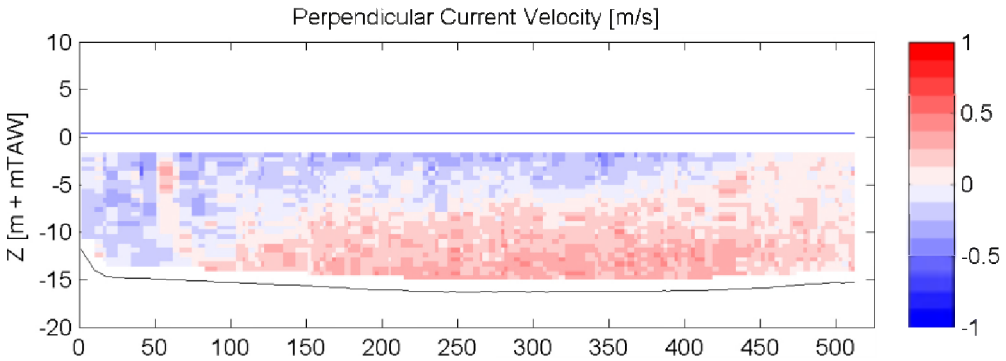
Time after HW [HH:MM]
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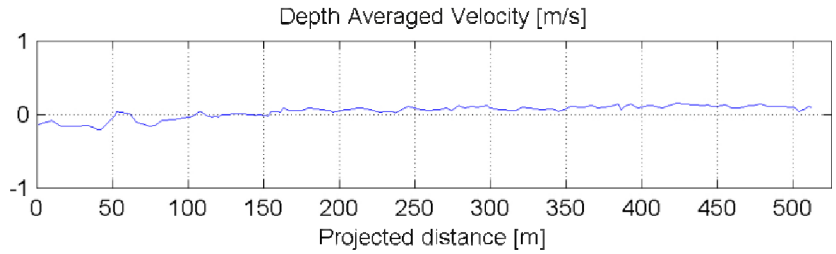
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I/RA/11354/10.108/MBO/ANF

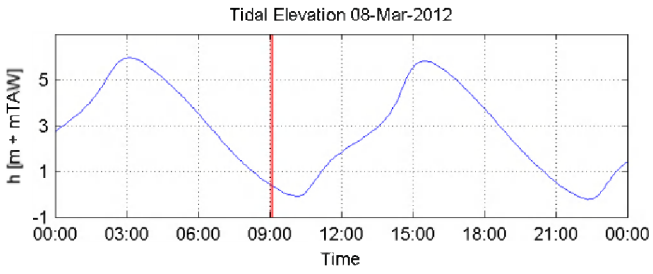
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6513_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
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10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

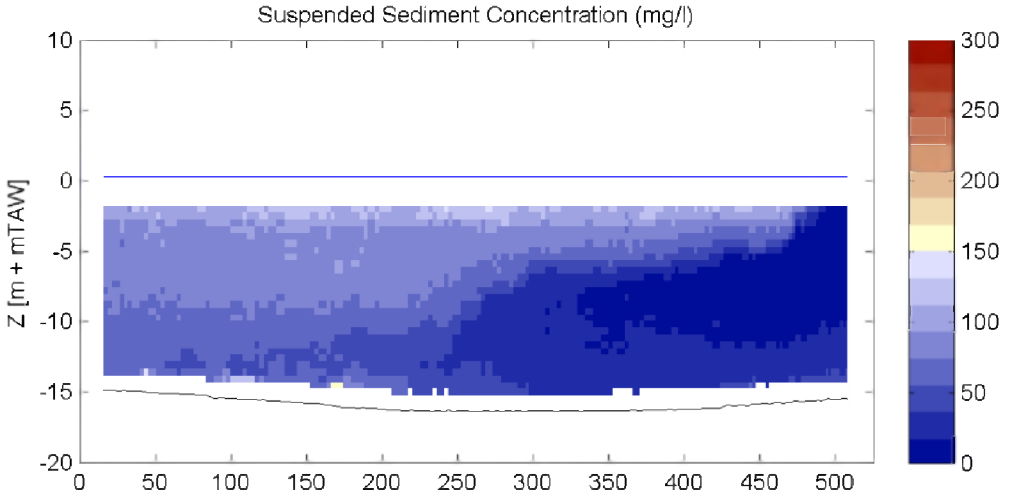
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08-Mar-2012
09:02 - 09:06

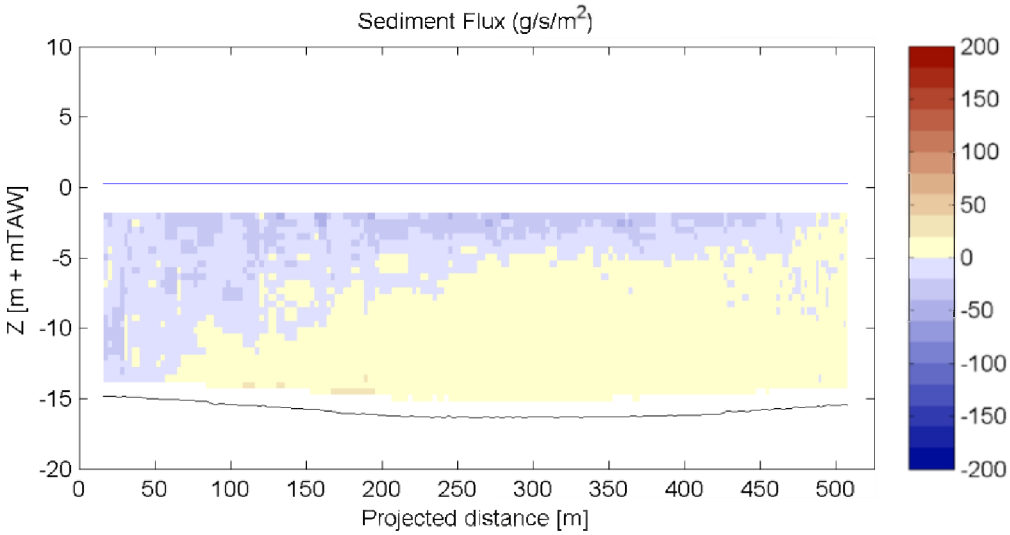
Time after HW [HH:MM]
5:59

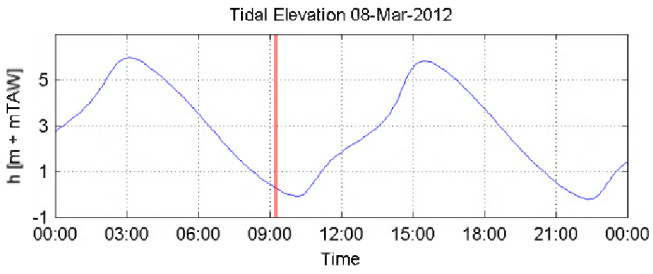
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6514_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

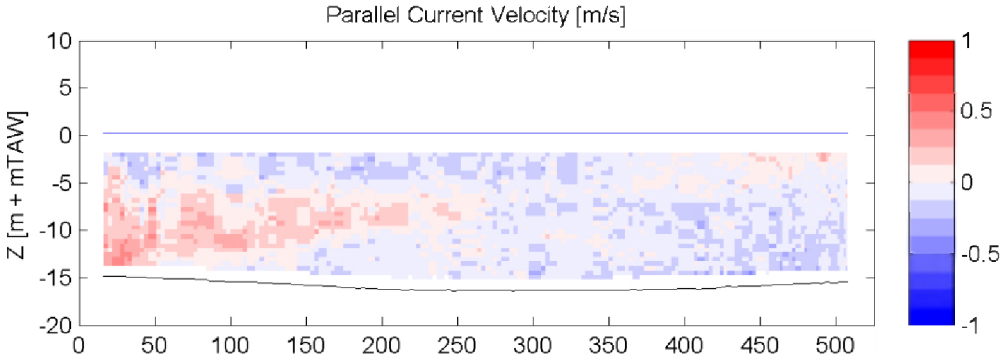
Date / Time [MET] :
08-Mar-2012
09:14 - 09:17

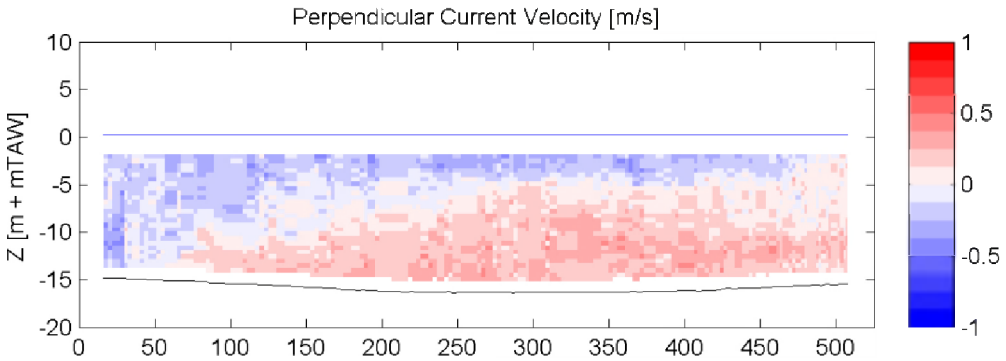
Time after HW [HH:MM]
6:10

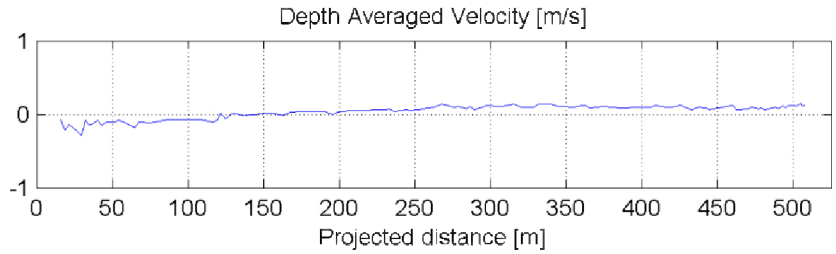
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

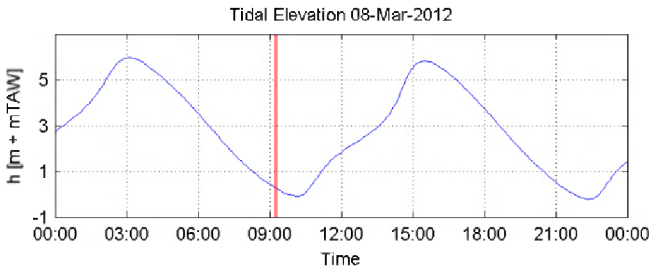
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6514_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

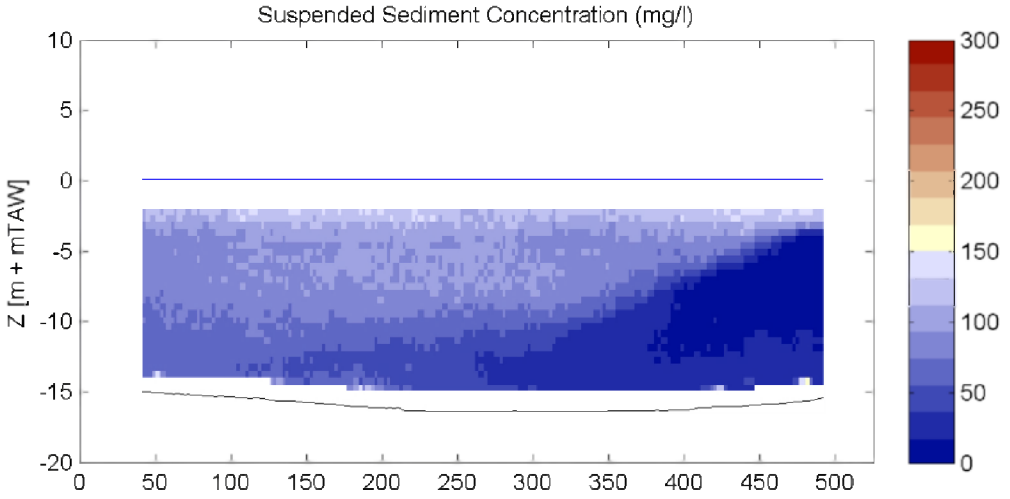
Date / Time [MET] :
08-Mar-2012
09:14 - 09:17

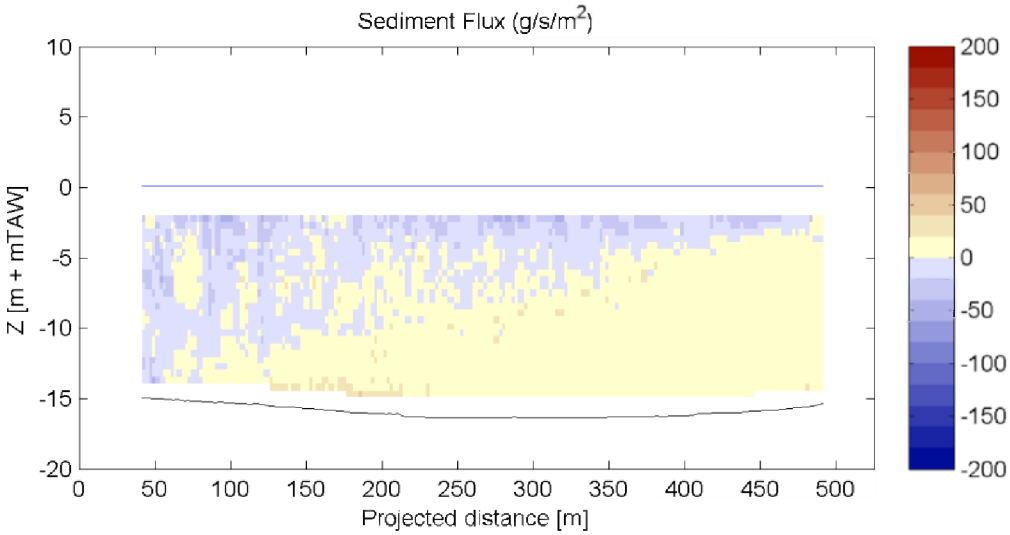
Time after HW [HH:MM]
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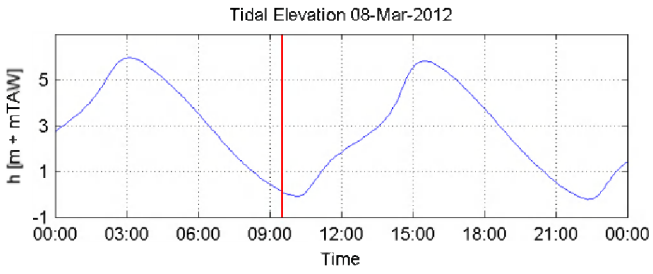
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6515_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

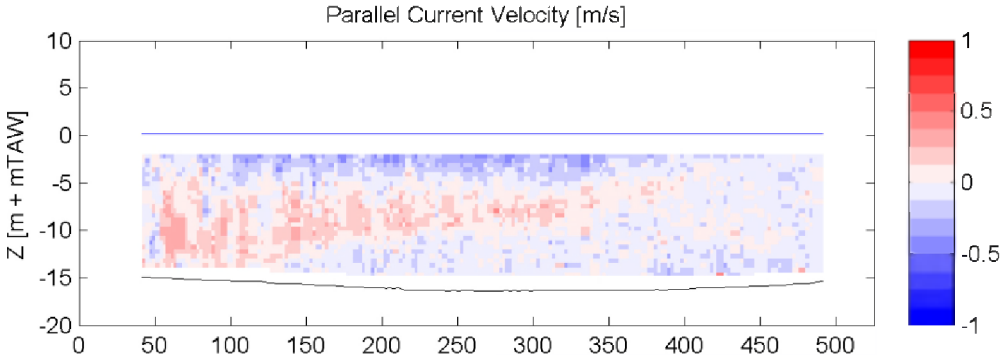
Date / Time [MET] :
08-Mar-2012
09:29 - 09:33

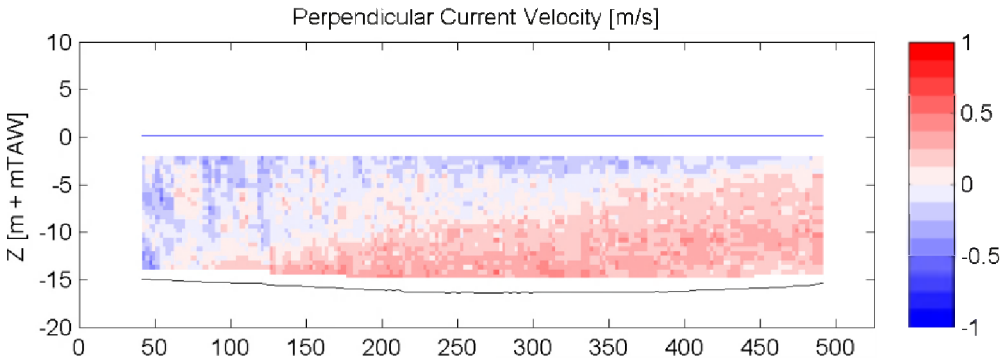
Time after HW [HH:MM]
6:26

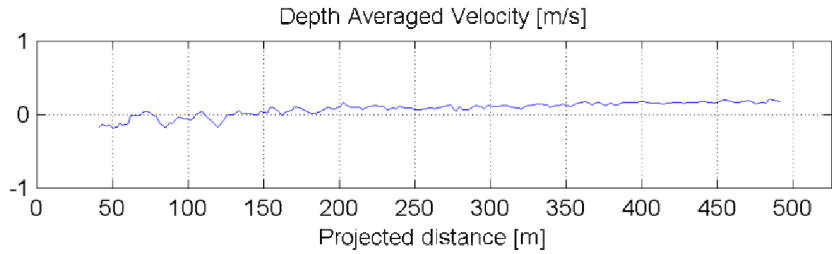
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

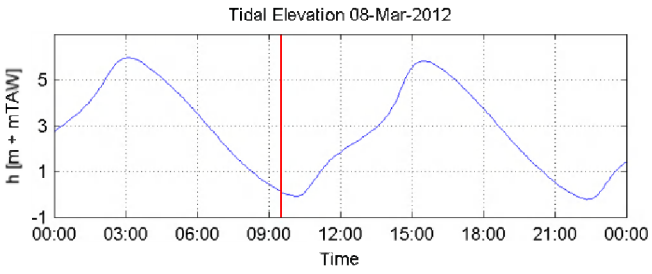
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6515_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

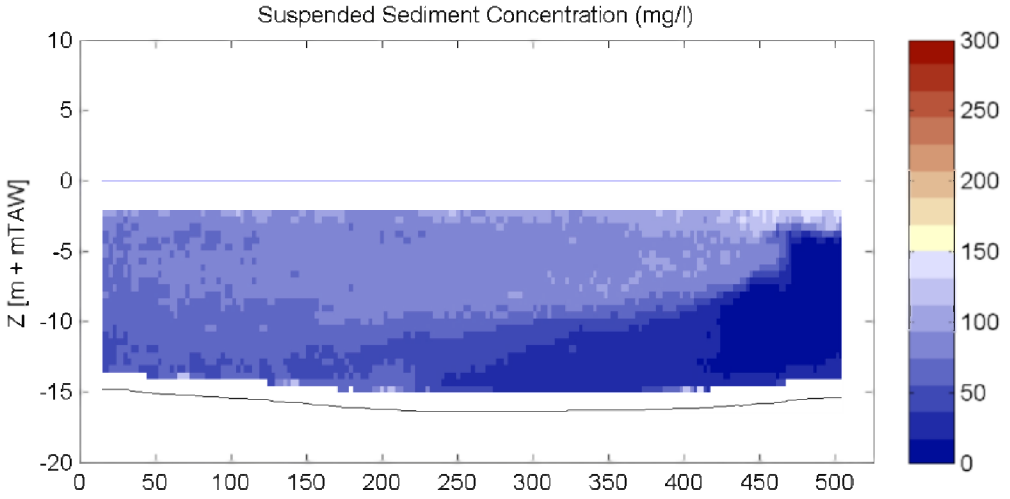
Date / Time [MET] :
08-Mar-2012
09:29 - 09:33

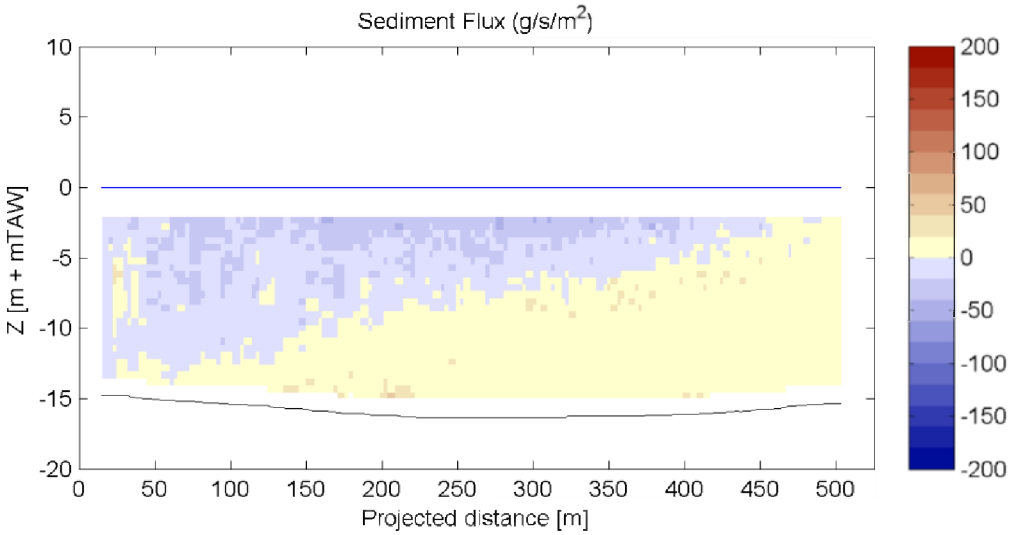
Time after HW [HH:MM]
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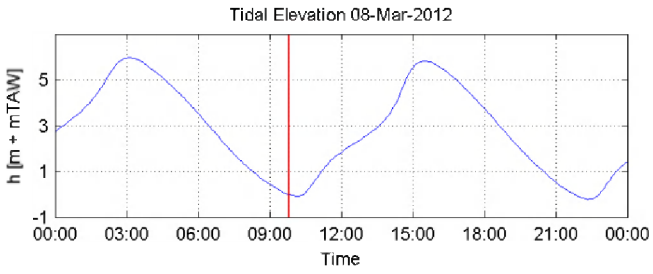
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6517_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

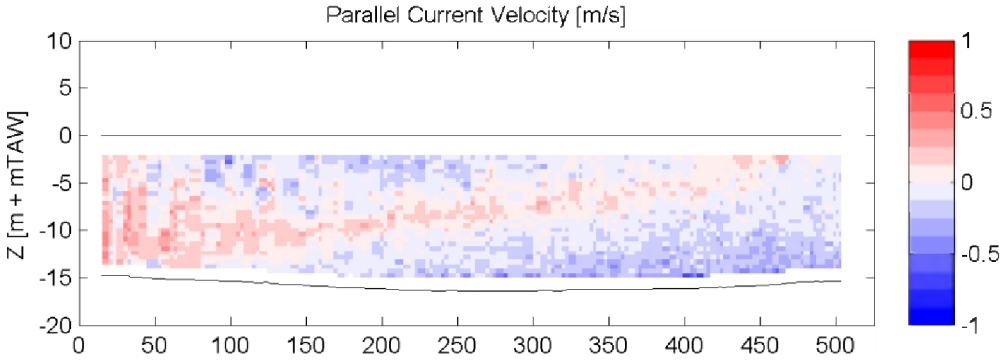
Date / Time [MET] :
08-Mar-2012
09:45 - 09:49

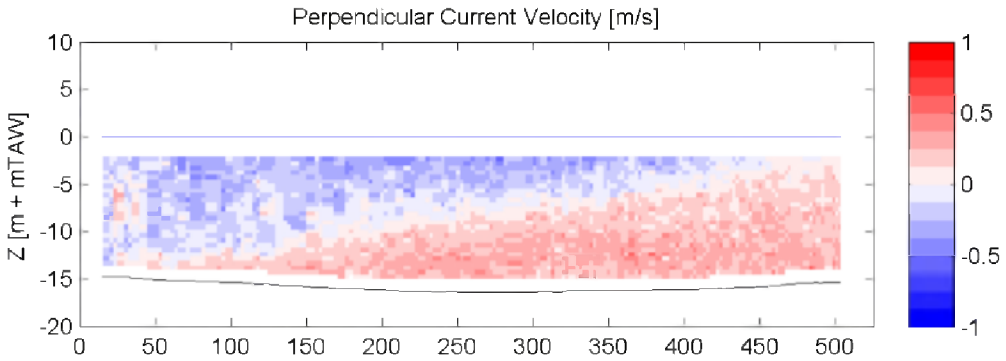
Time after HW [HH:MM]
6:42

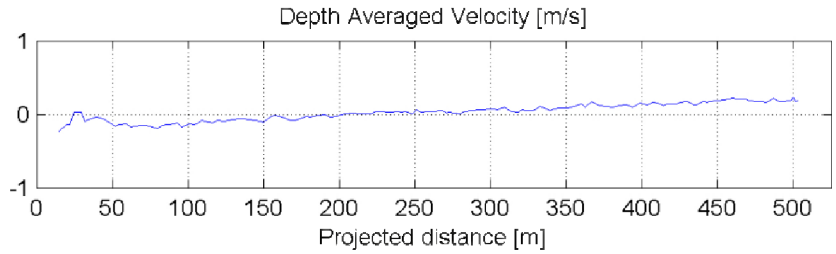
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

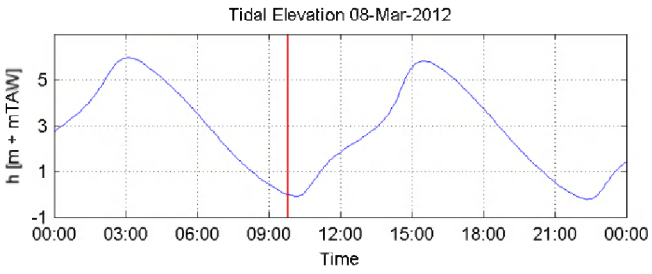
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6517_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

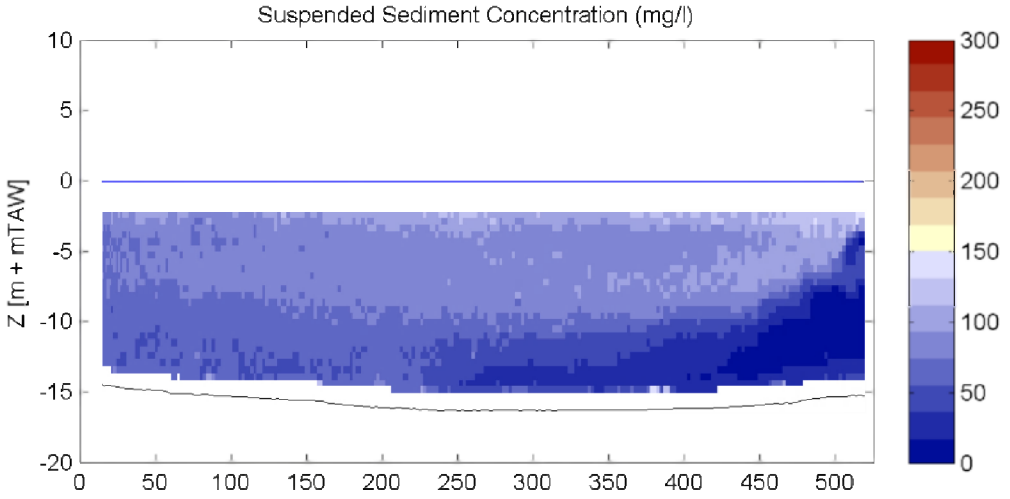
Date / Time [MET] :
08-Mar-2012
09:45 - 09:49

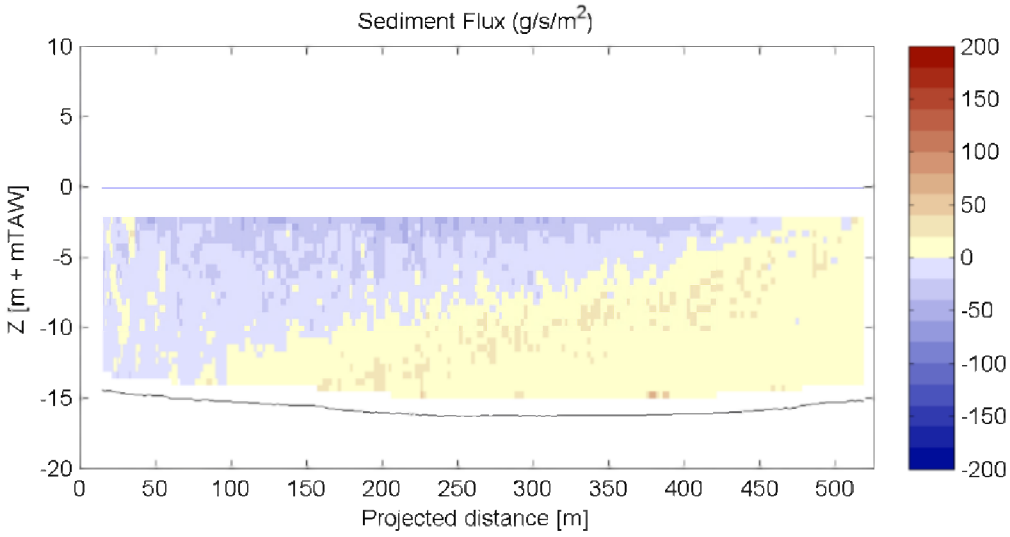
Time after HW [HH:MM]
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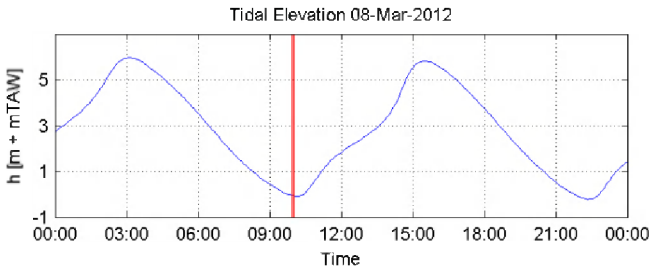
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6519_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

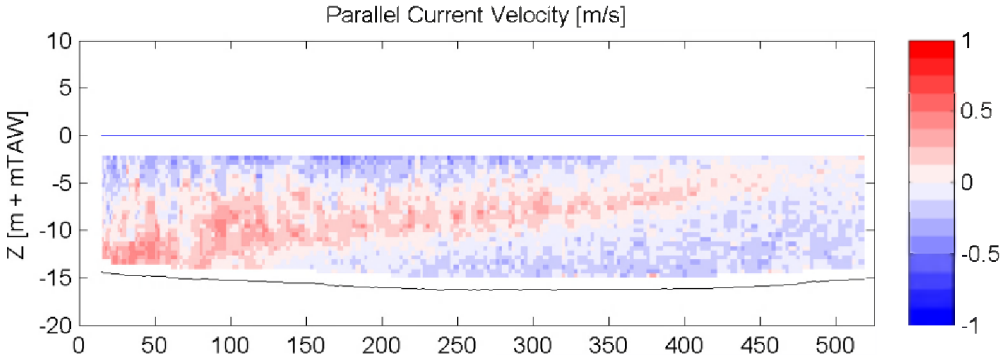
Date / Time [MET] :
08-Mar-2012
09:57 - 10:01

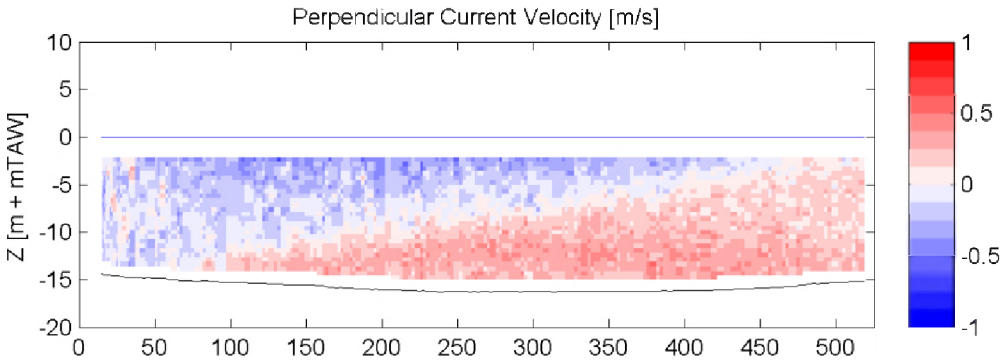
Time after HW [HH:MM]
6:54

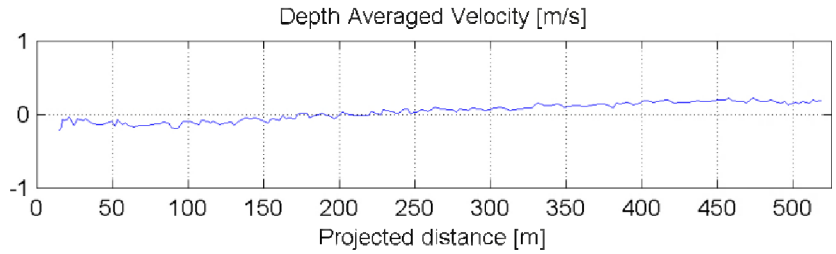
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

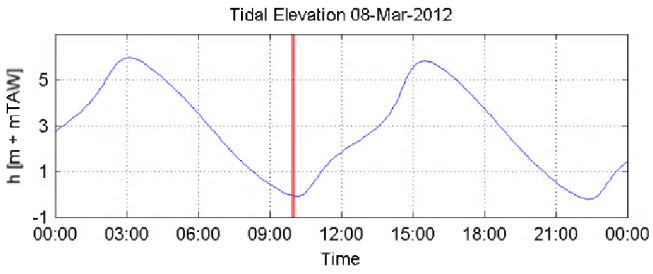
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6519_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

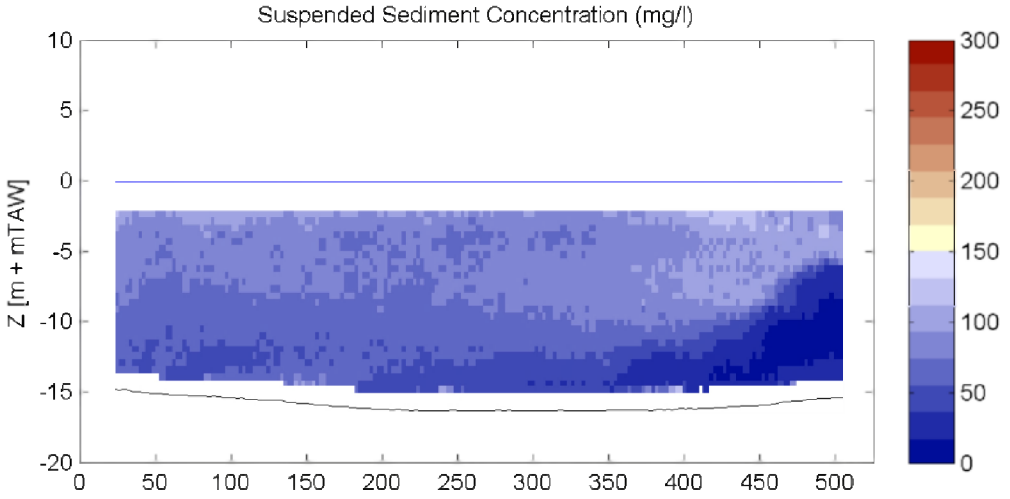
Date / Time [MET] :
08-Mar-2012
09:57 - 10:01

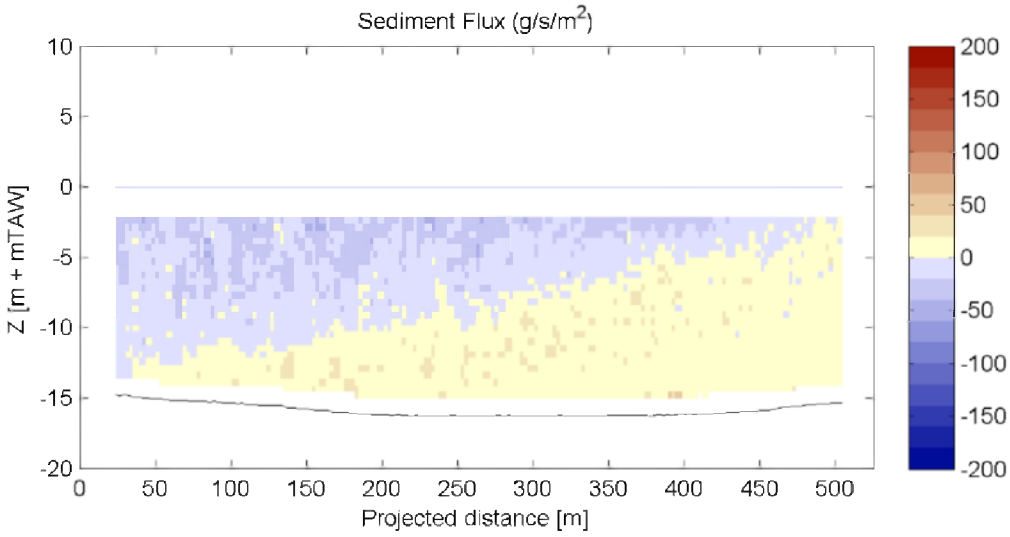
Time after HW [HH:MM]
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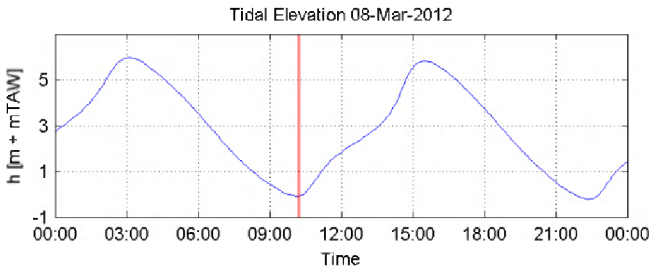
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6520_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

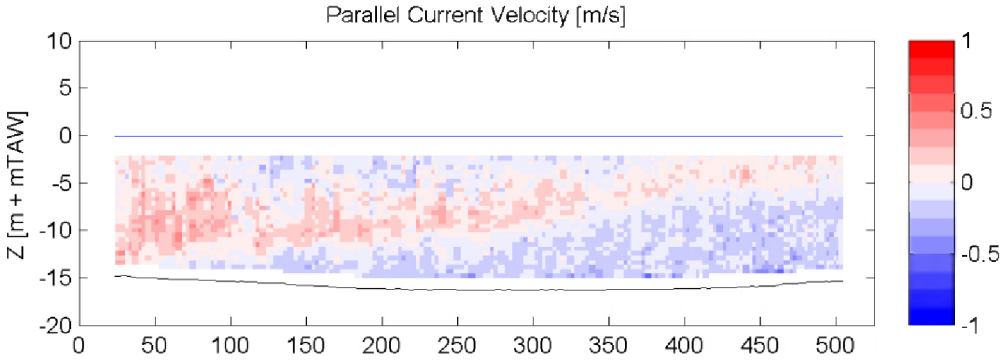
Date / Time [MET] :
08-Mar-2012
10:11 - 10:15

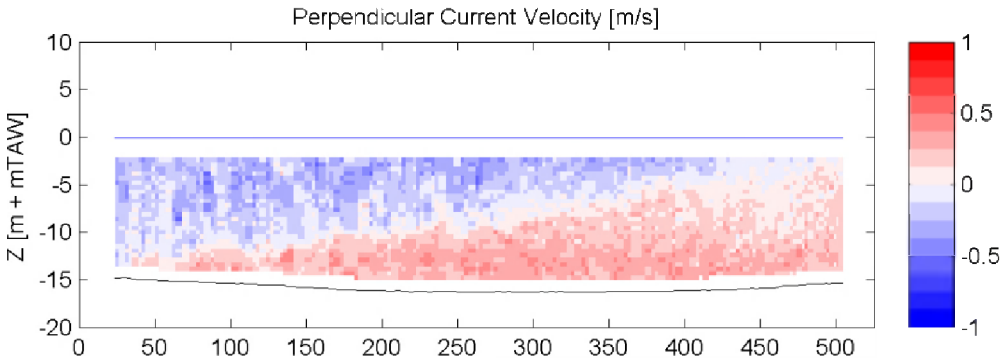
Time after HW [HH:MM]
-5:11

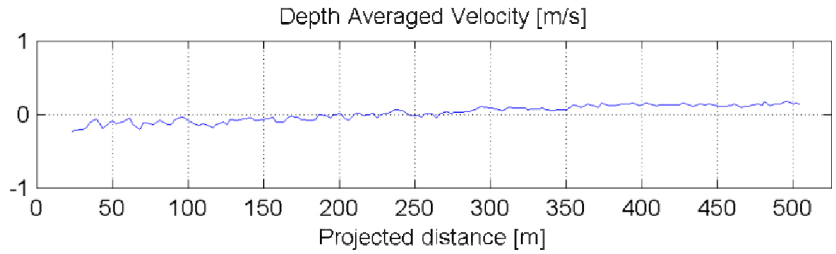
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

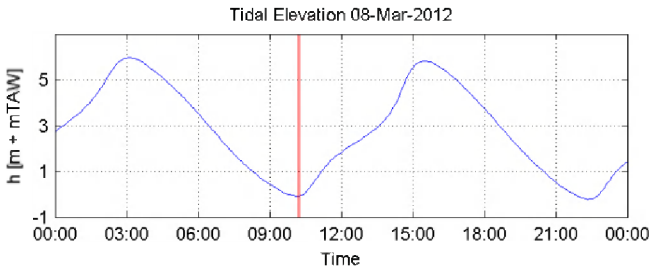
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6520_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW: 03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

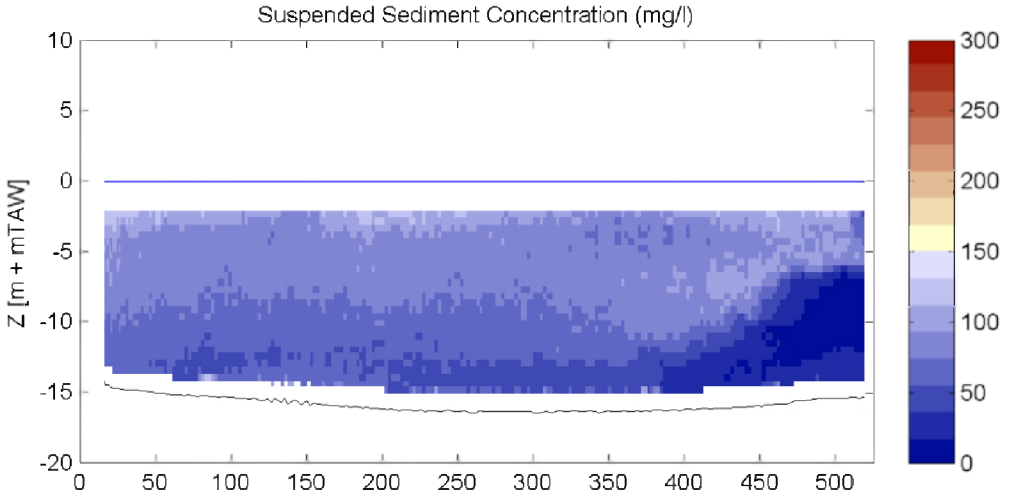
Date / Time [MET] :
08-Mar-2012
10:11 - 10:15

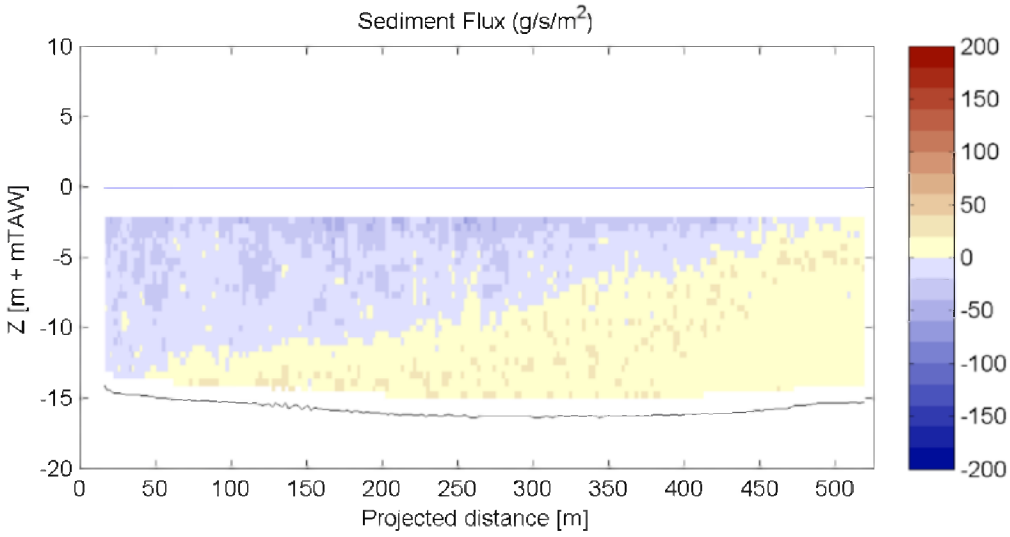
Time after HW [HH:MM]
-5:11

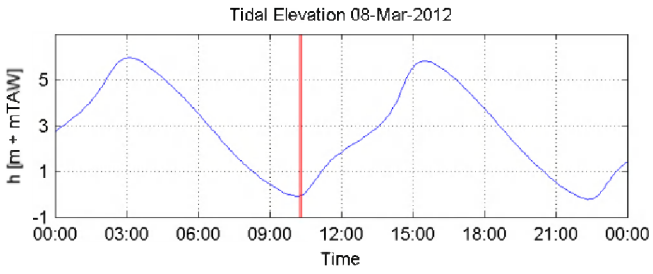
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6521_dgdTAB.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

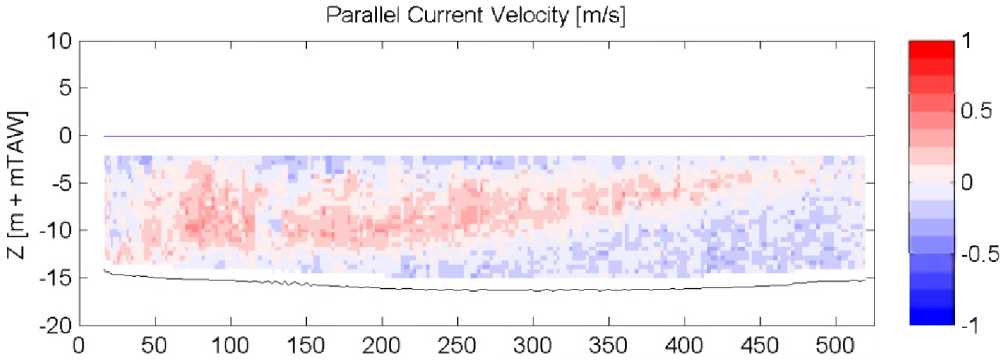
Date / Time [MET] :
08-Mar-2012
10:16 - 10:20

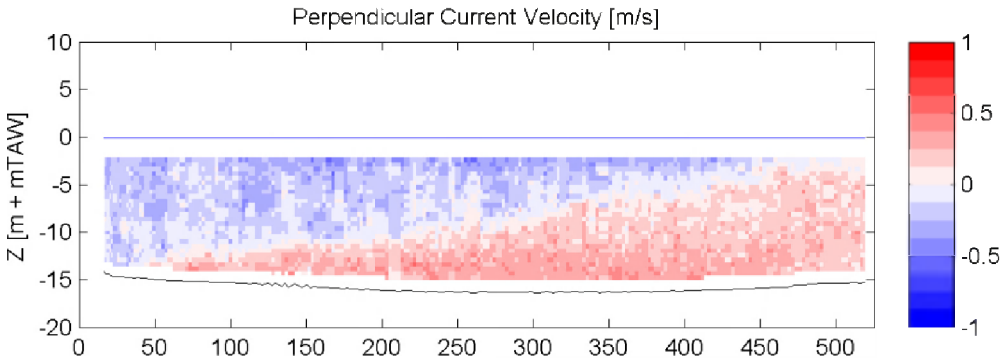
Time after HW [HH:MM]
-5:06

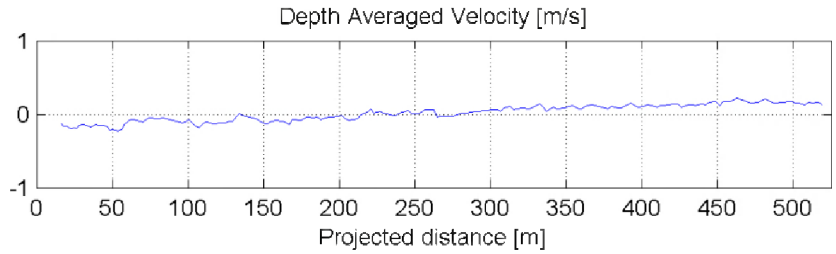
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

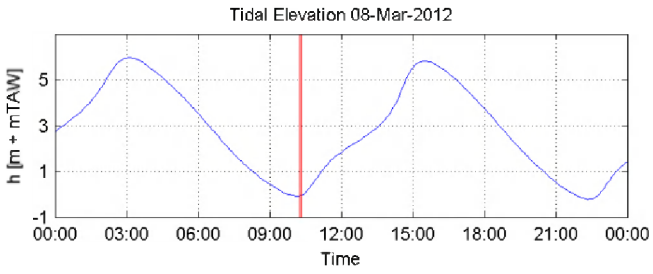
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6521_dgdTAB.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

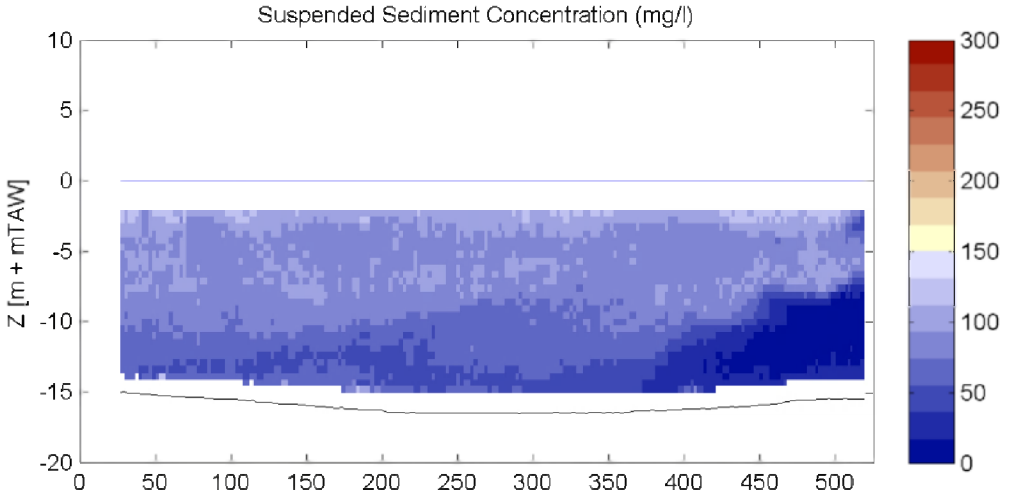
Date / Time [MET] :
08-Mar-2012
10:16 - 10:20

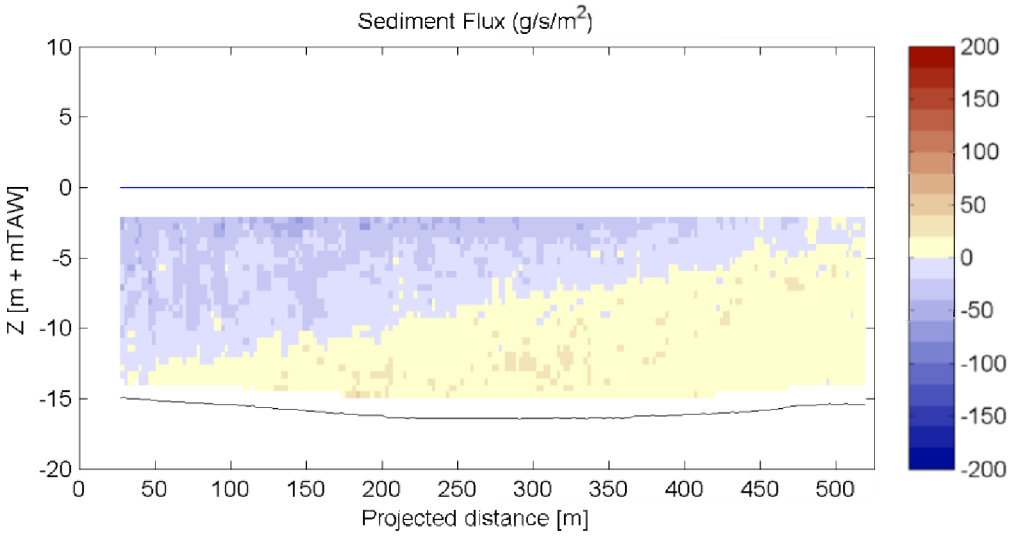
Time after HW [HH:MM]
-5:06

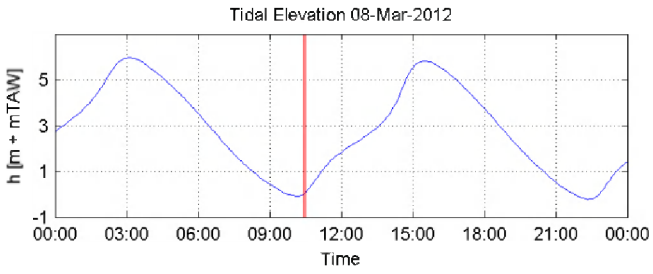
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6523_dgdTBA.csv	Location: Deurganckdok







HW/LW: 03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

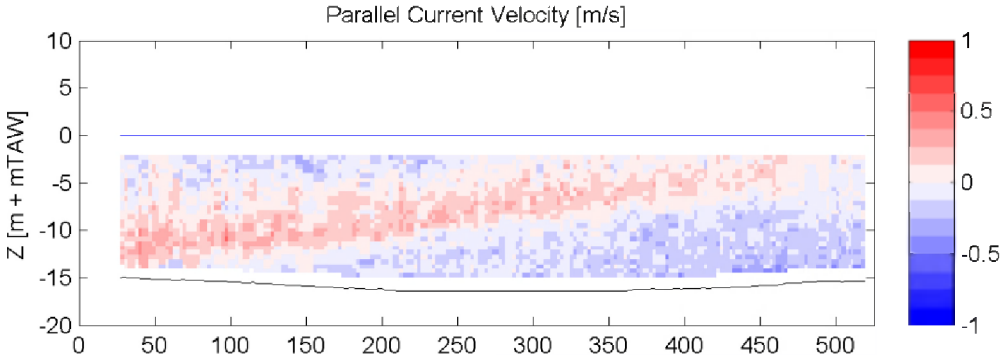
Date / Time [MET] :
08-Mar-2012
10:26 - 10:29

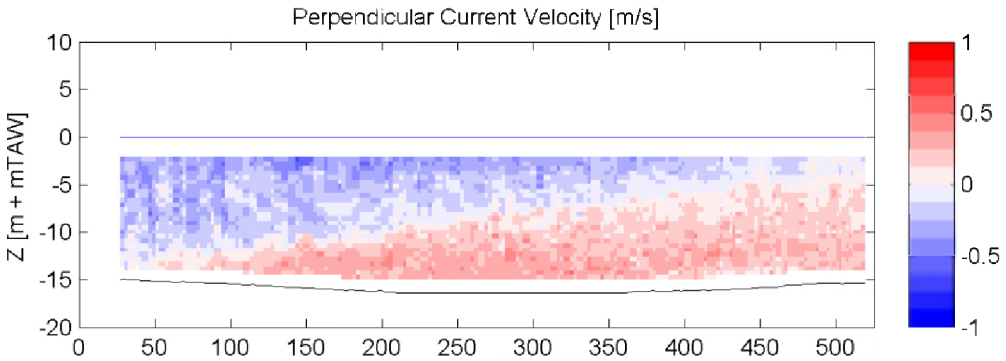
Time after HW [HH:MM]
-4:57

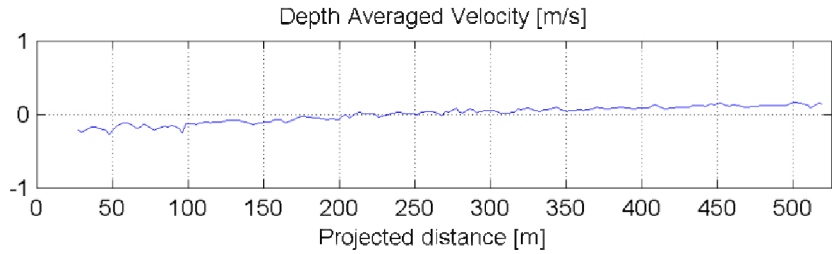
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

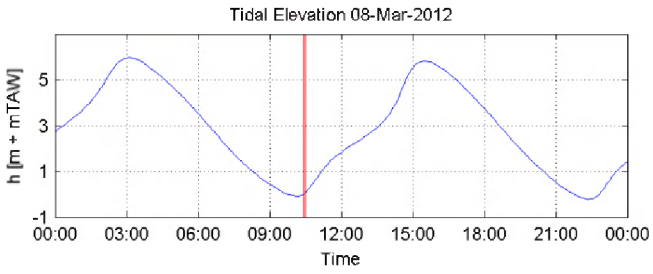
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6523_dgdTBA.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

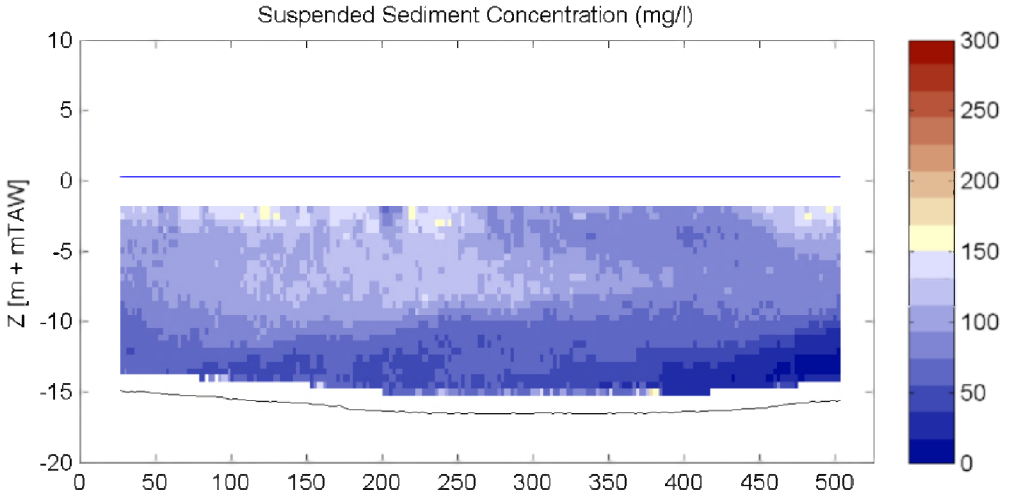
Date / Time [MET] :
08-Mar-2012
10:26 - 10:29

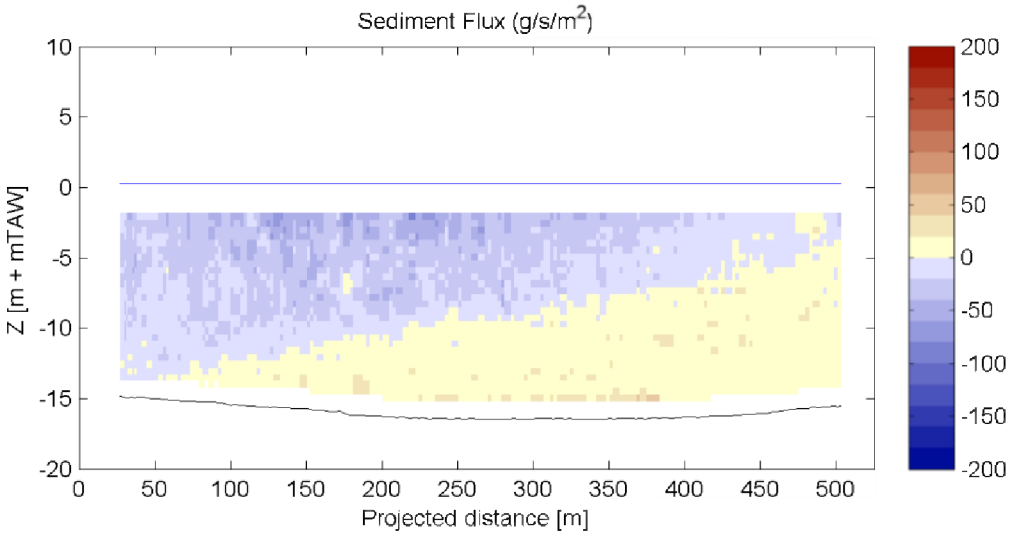
Time after HW [HH:MM]
-4:57

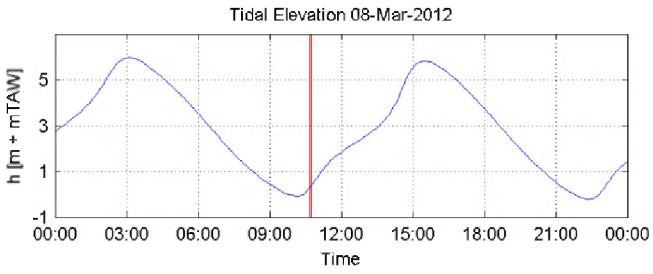
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6525_dgdTAB.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

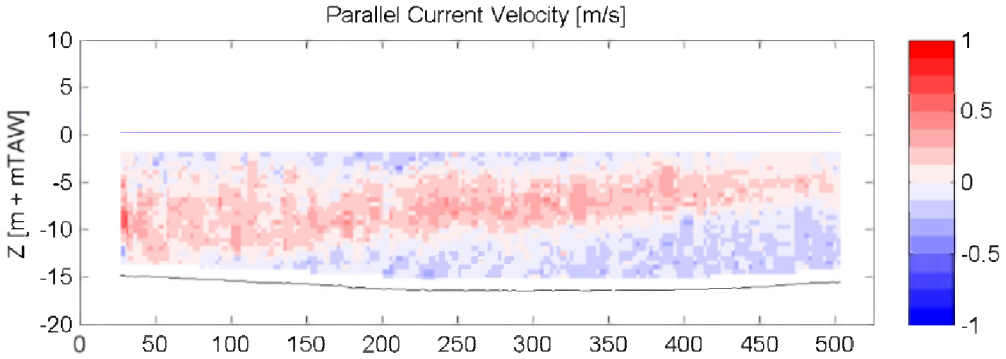
Date / Time [MET] :
08-Mar-2012
10:40 - 10:44

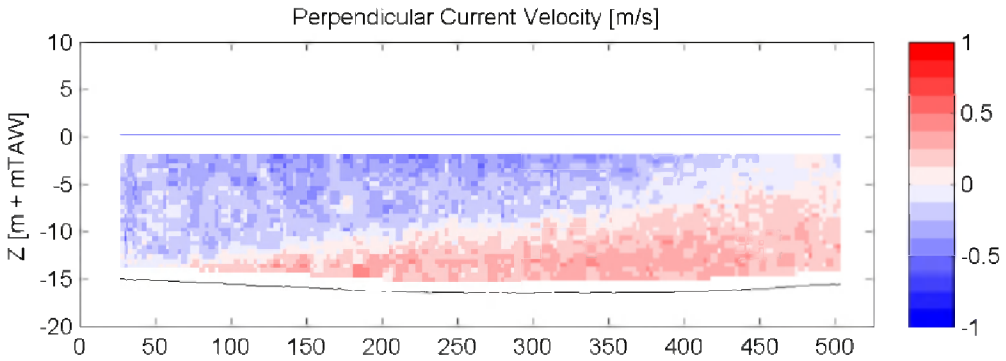
Time after HW [HH:MM]
-4:42

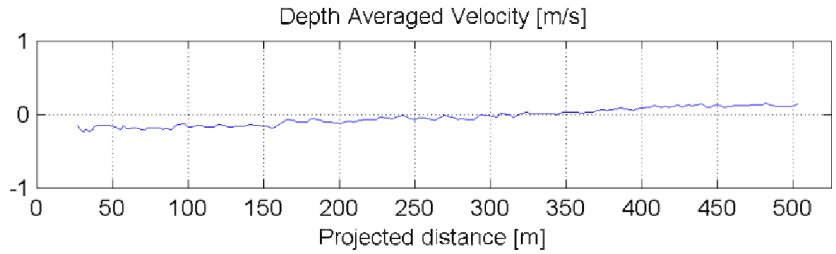
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

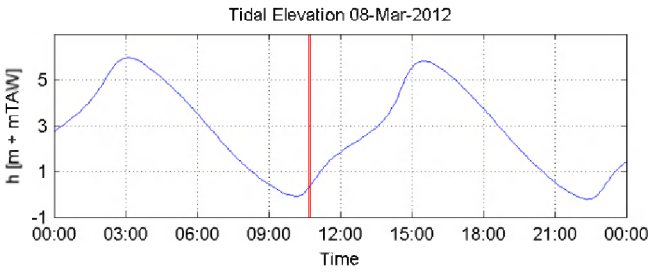
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6525_dgdTAB.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

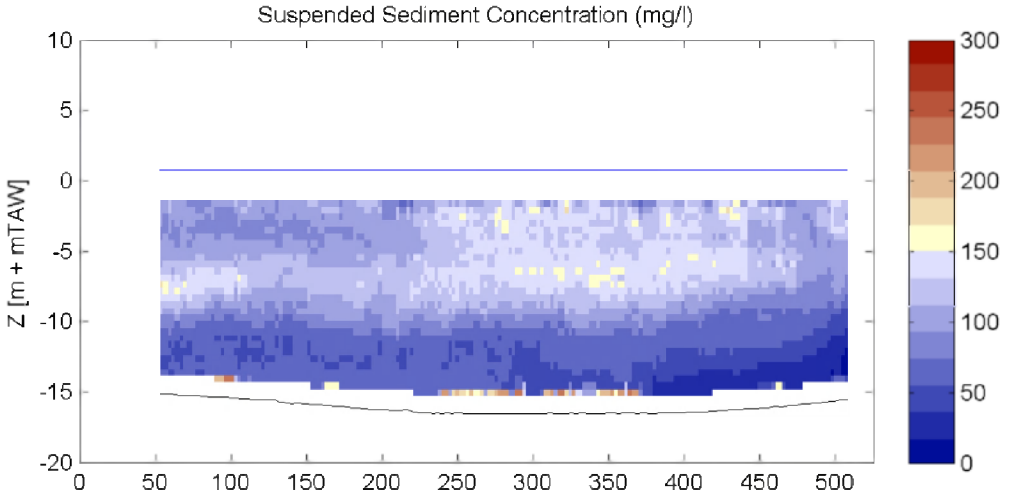
Date / Time [MET] :
08-Mar-2012
10:40 - 10:44

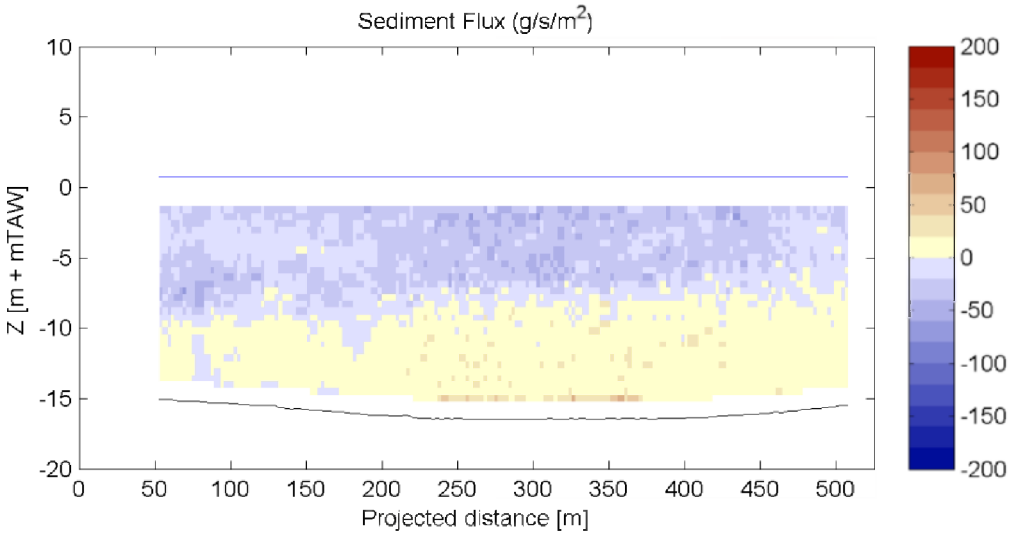
Time after HW [HH:MM]
-4:42

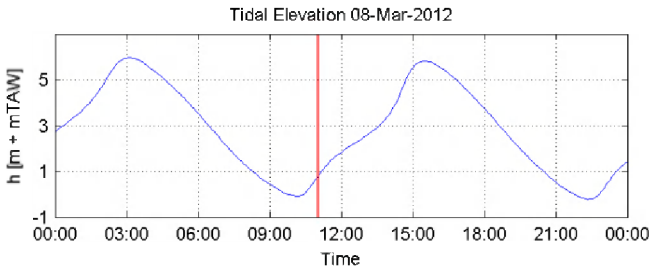
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6527_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

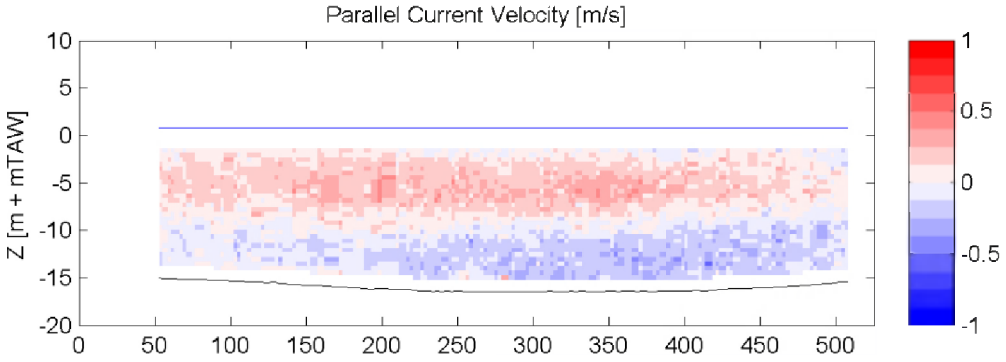
Date / Time [MET] :
08-Mar-2012
10:59 - 11:02

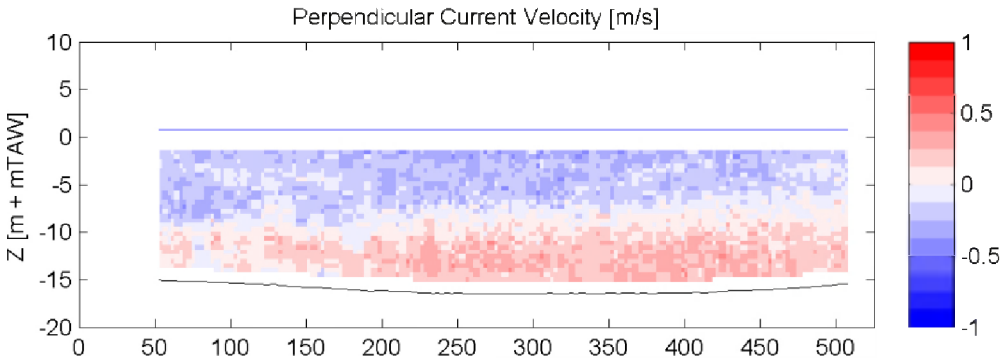
Time after HW [HH:MM]
-4:24

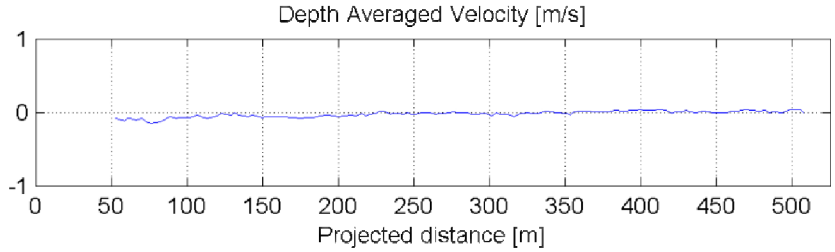
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

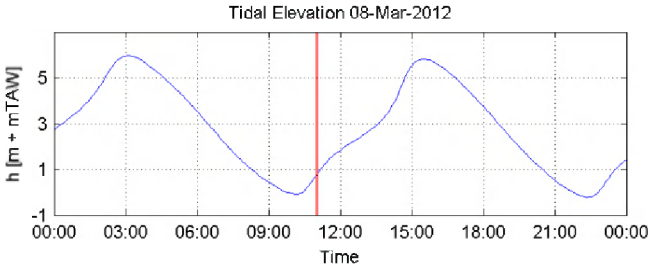
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6527_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

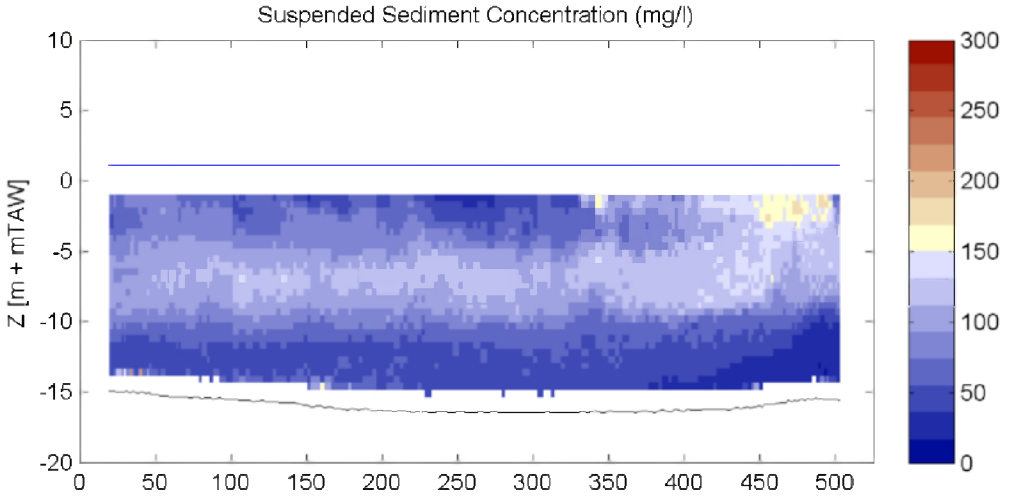
Date / Time [MET] :
08-Mar-2012
10:59 - 11:02

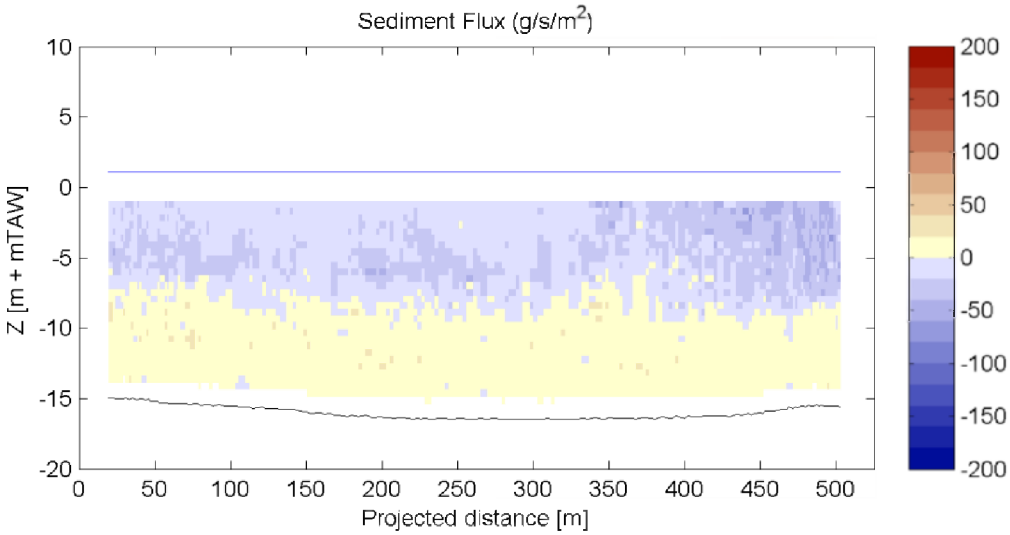
Time after HW [HH:MM]
-4:24

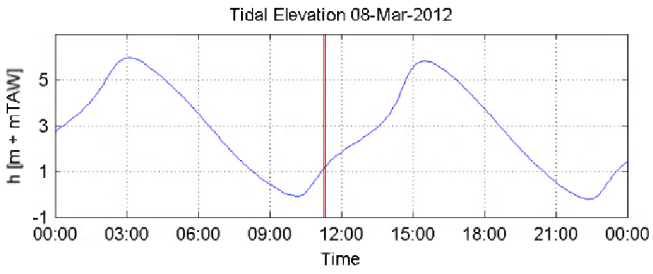
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6529_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

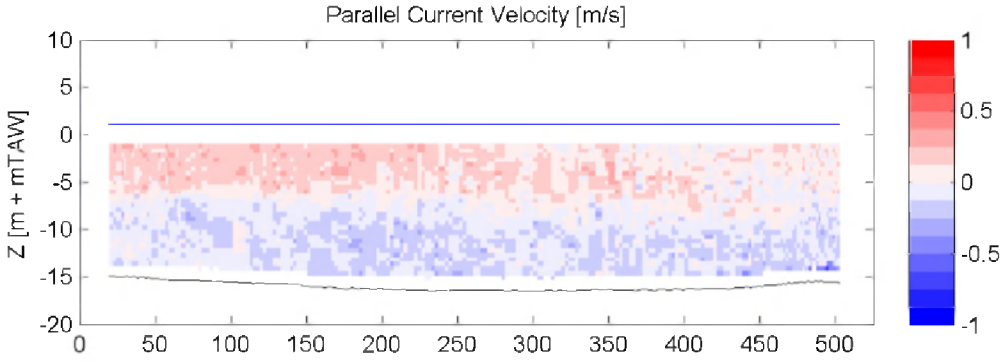
Date / Time [MET] :
08-Mar-2012
11:14 - 11:18

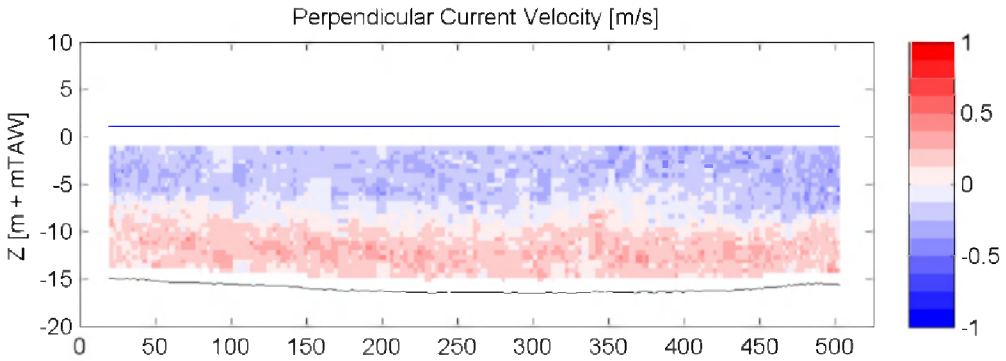
Time after HW [HH:MM]
-4:08

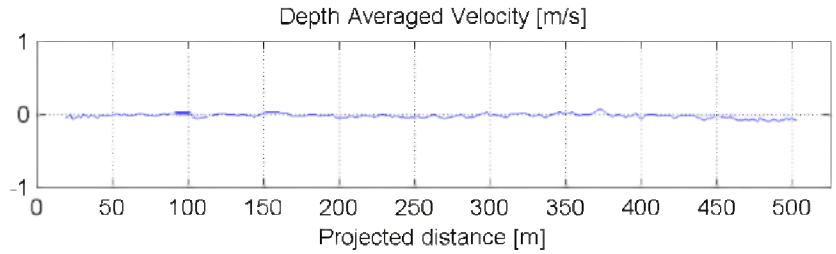
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

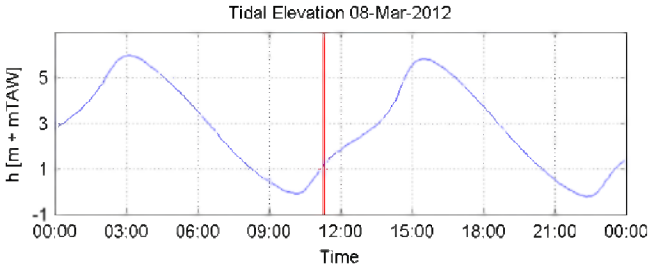
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6529_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

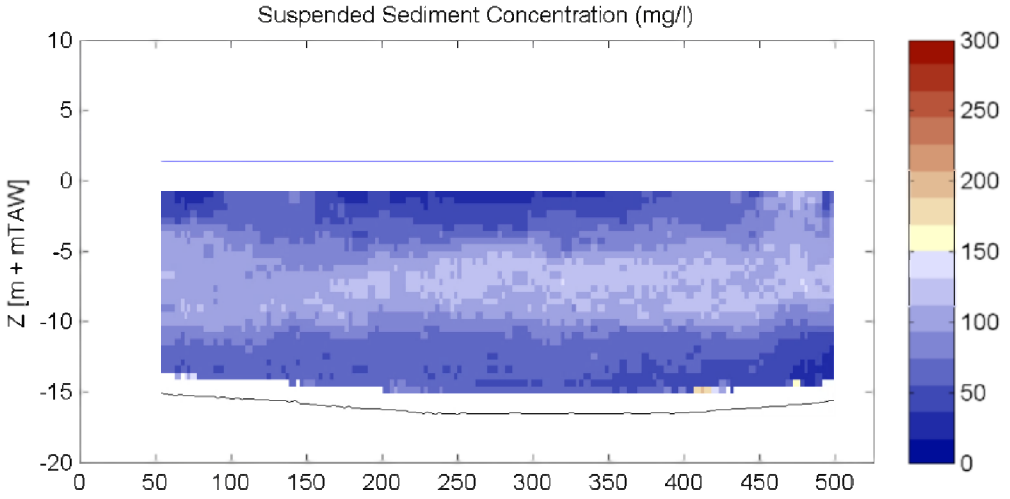
Date / Time [MET] :
08-Mar-2012
11:14 - 11:18

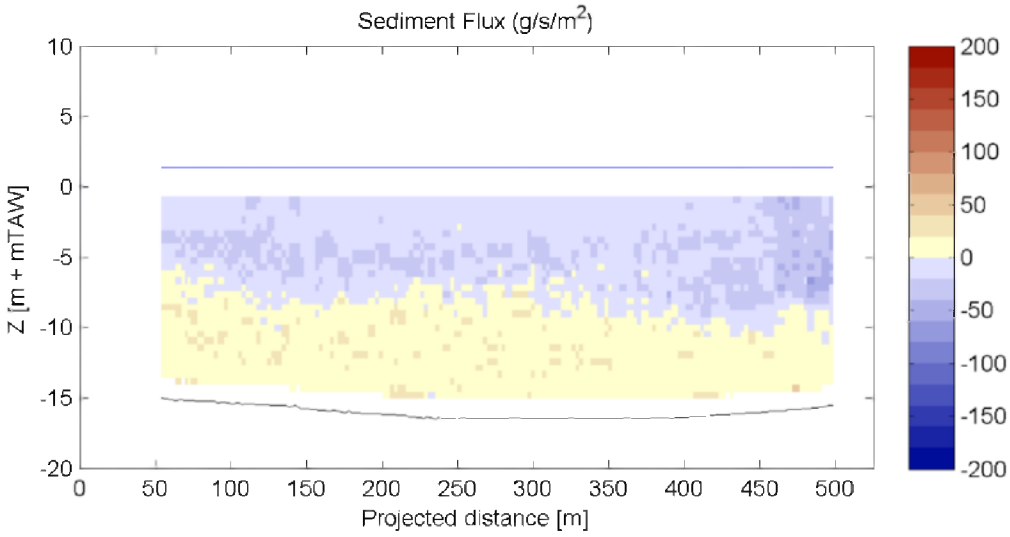
Time after HW [HH:MM]
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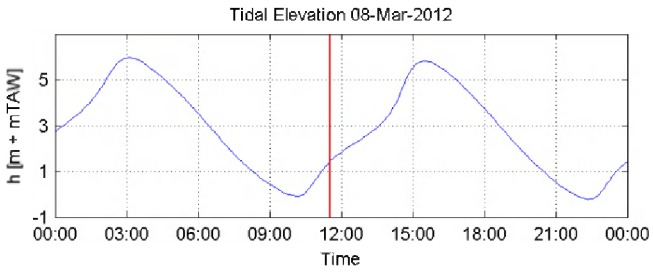
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6531_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

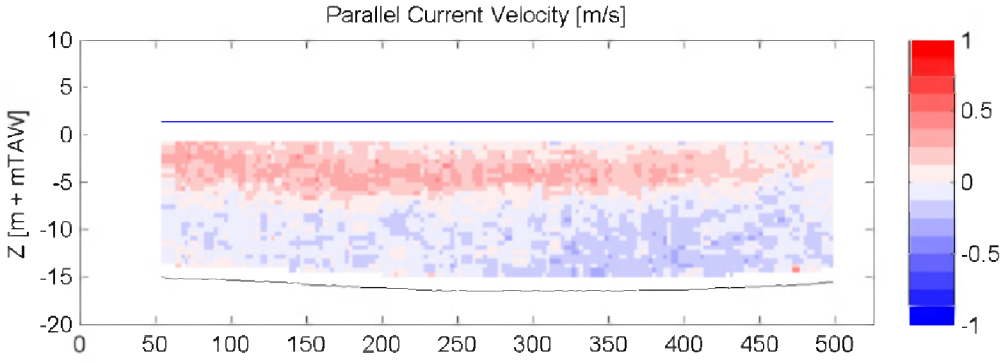
Date / Time [MET] :
08-Mar-2012
11:29 - 11:32

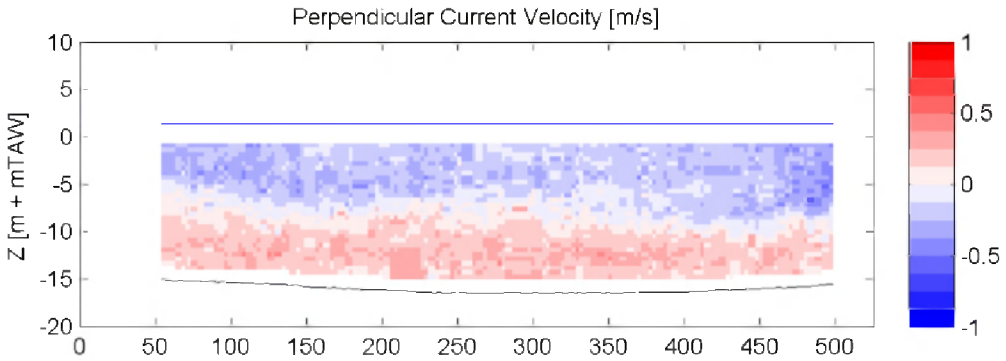
Time after HW [HH:MM]
-3:53

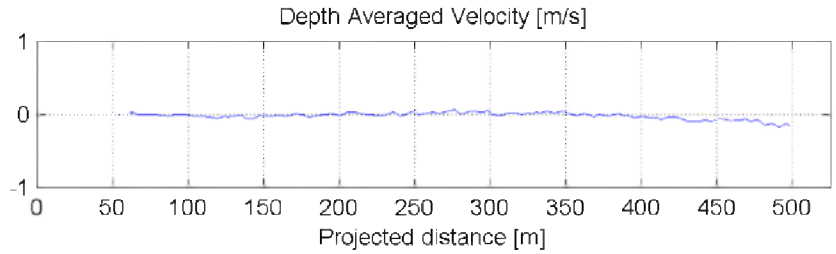
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

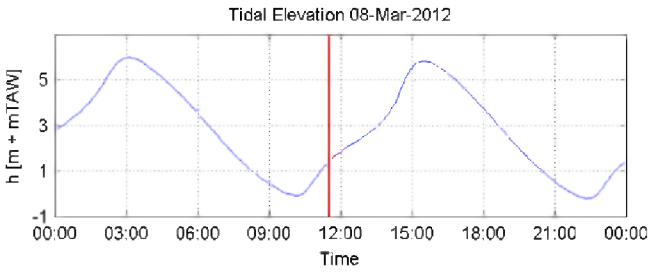
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6531_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

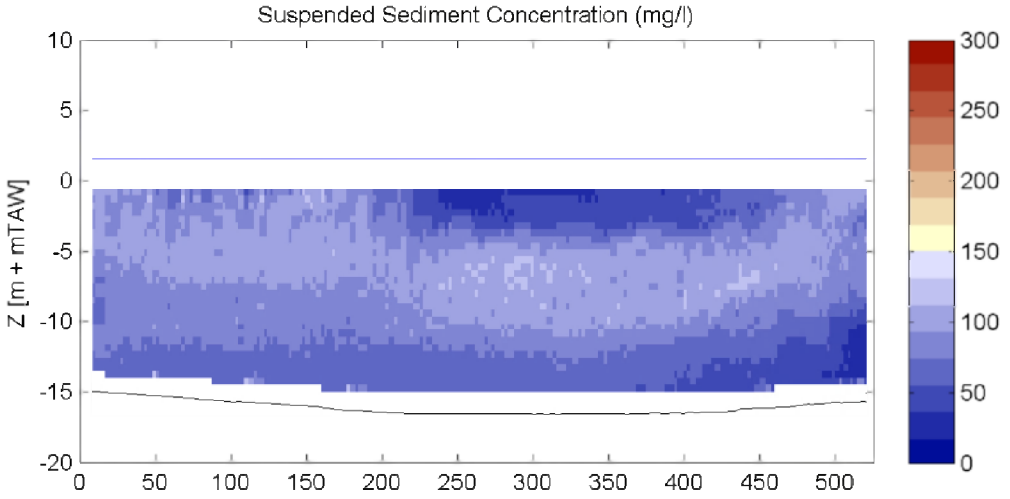
Date / Time [MET] :
08-Mar-2012
11:29 - 11:32

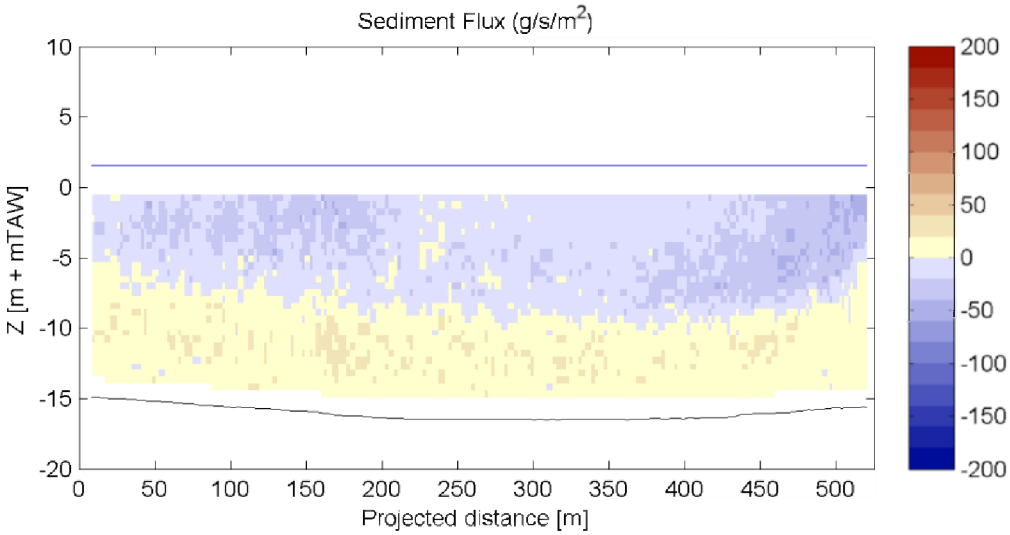
Time after HW [HH:MM]
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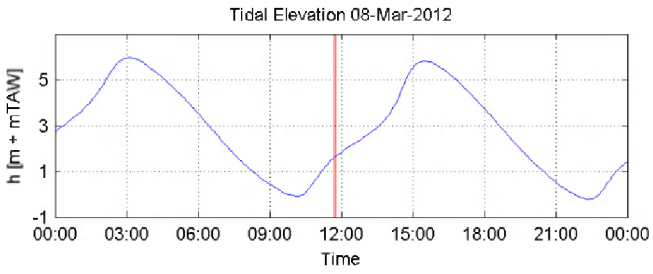
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6532_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

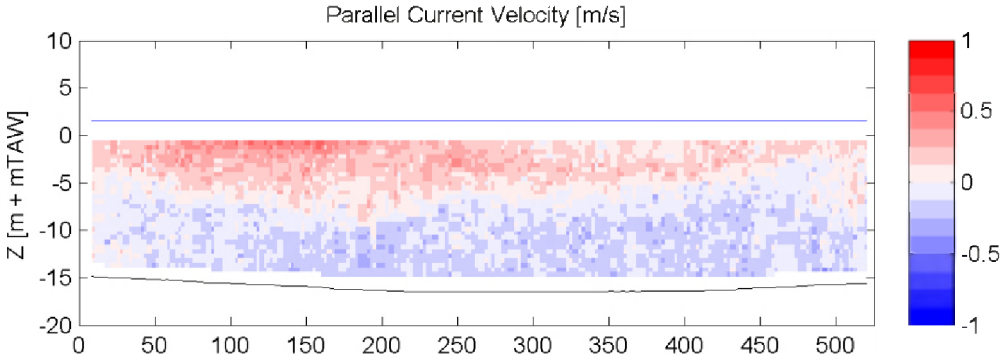
Date / Time [MET] :
08-Mar-2012
11:42 - 11:46

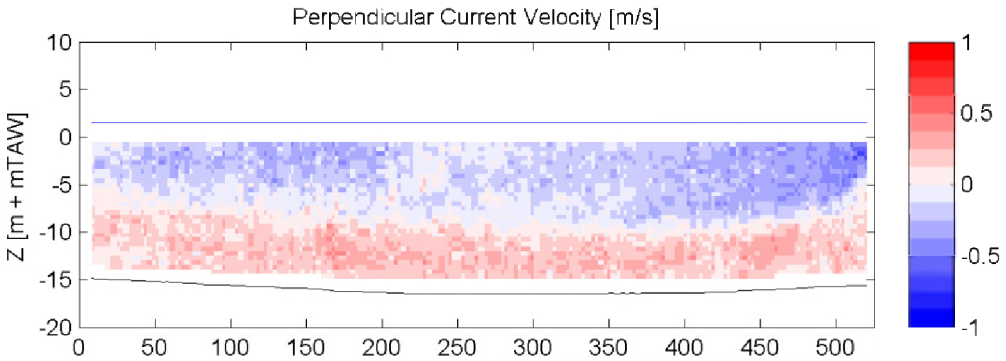
Time after HW [HH:MM]
-3:40

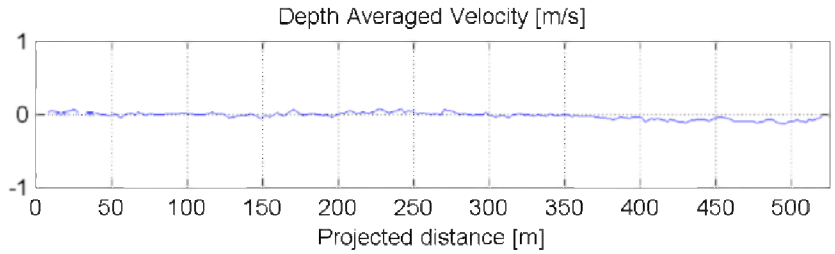
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

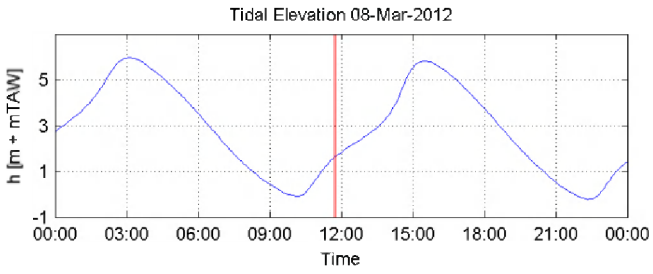
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6532_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

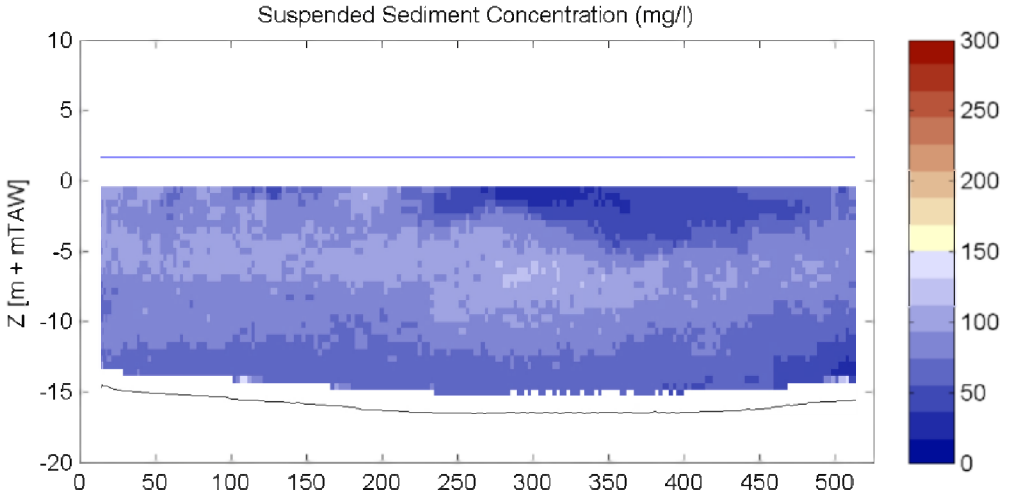
Date / Time [MET] :
08-Mar-2012
11:42 - 11:46

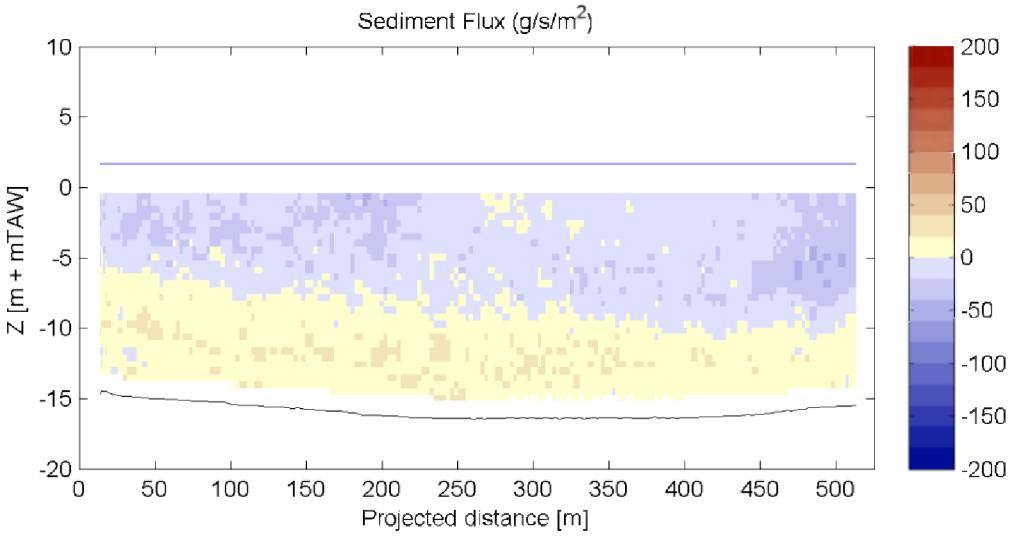
Time after HW [HH:MM]
-3:40

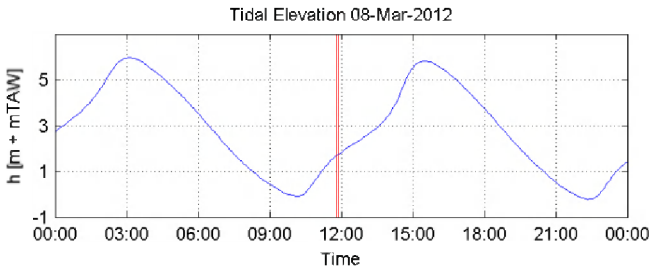
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6533_dgdTAB.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

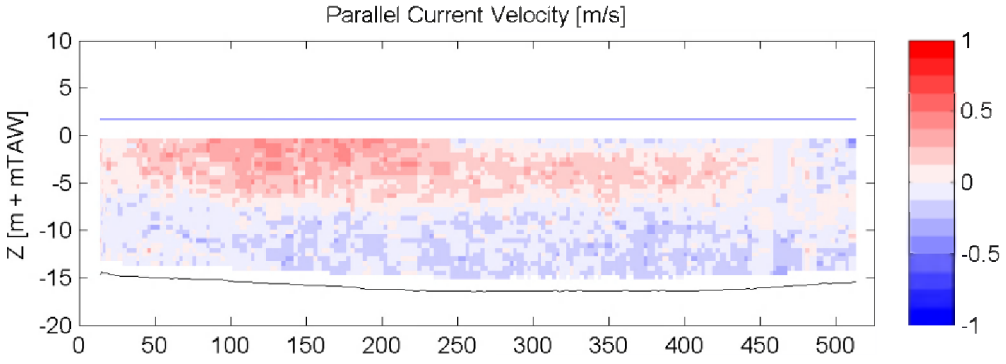
Date / Time [MET] :
08-Mar-2012
11:48 - 11:51

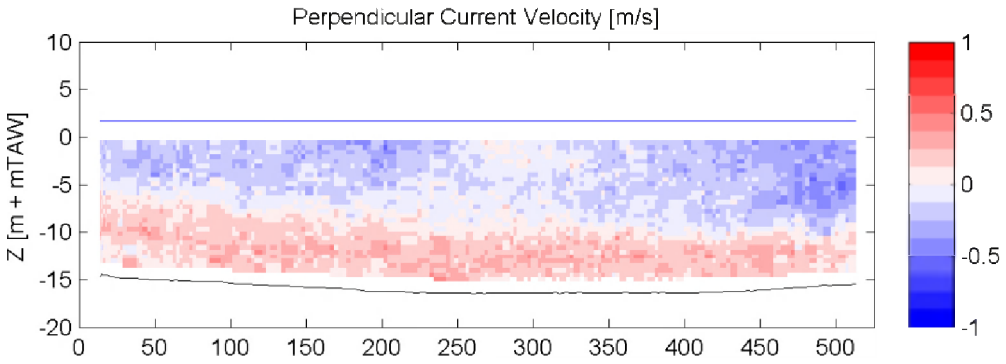
Time after HW [HH:MM]
-3:35

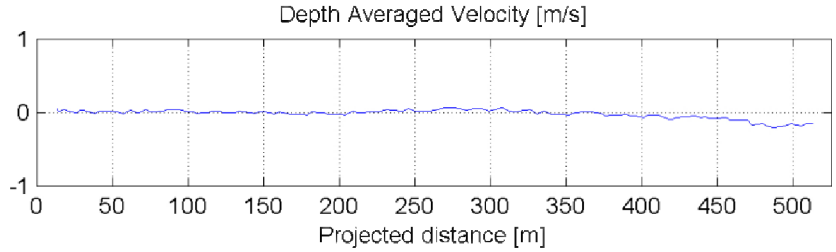
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

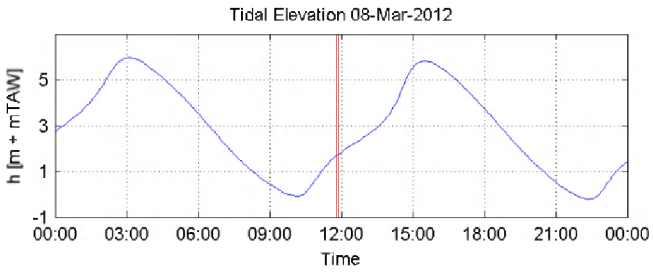
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6533_dgdTAB.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

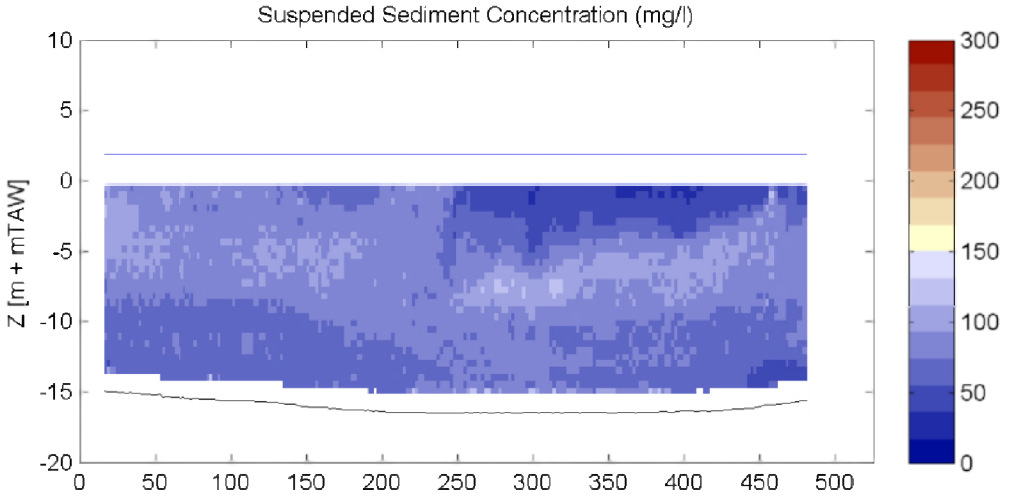
Date / Time [MET] :
08-Mar-2012
11:48 - 11:51

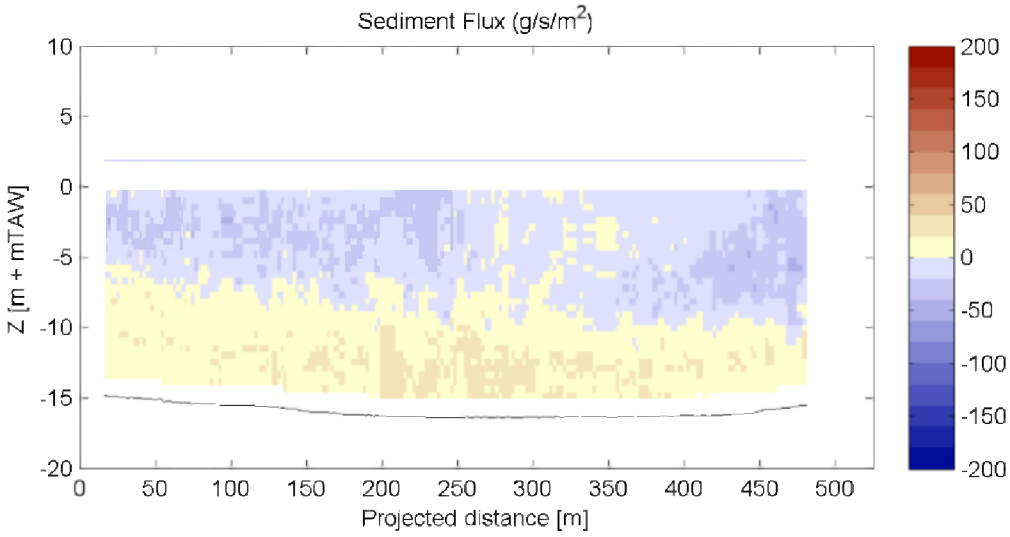
Time after HW [HH:MM]
-3:35

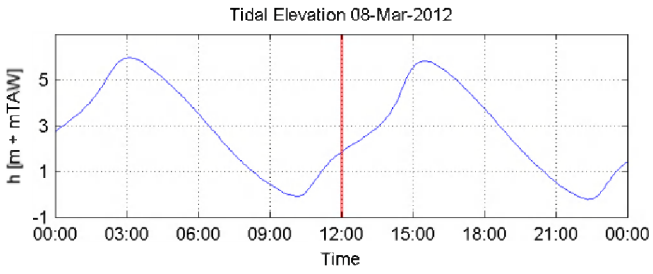
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6535_dgdBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

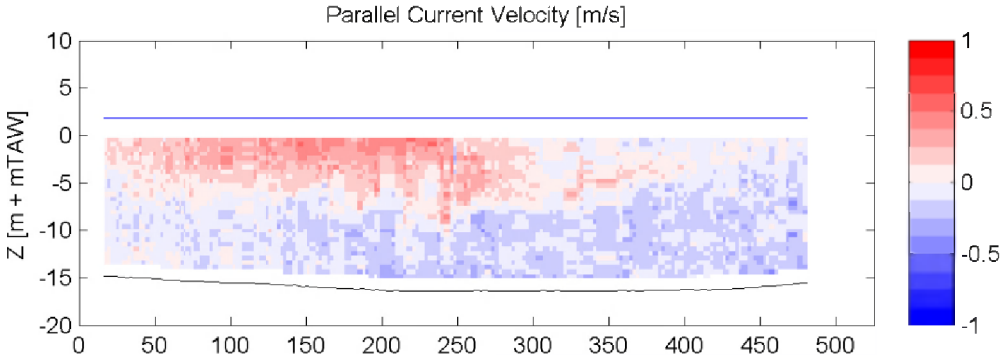
Date / Time [MET] :
08-Mar-2012
11:58 - 12:02

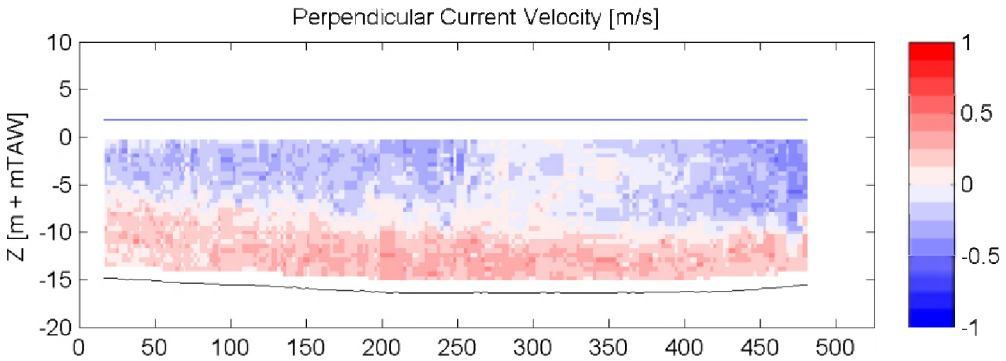
Time after HW [HH:MM]
-3:24

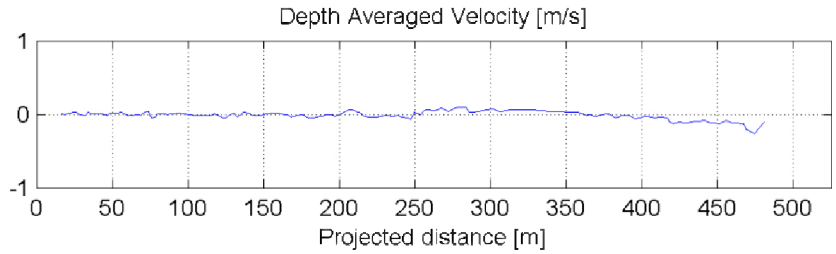
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

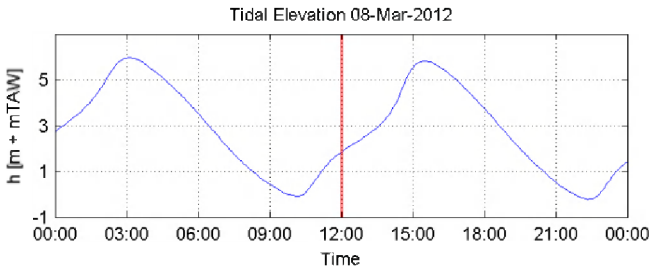
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6535_dgdBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

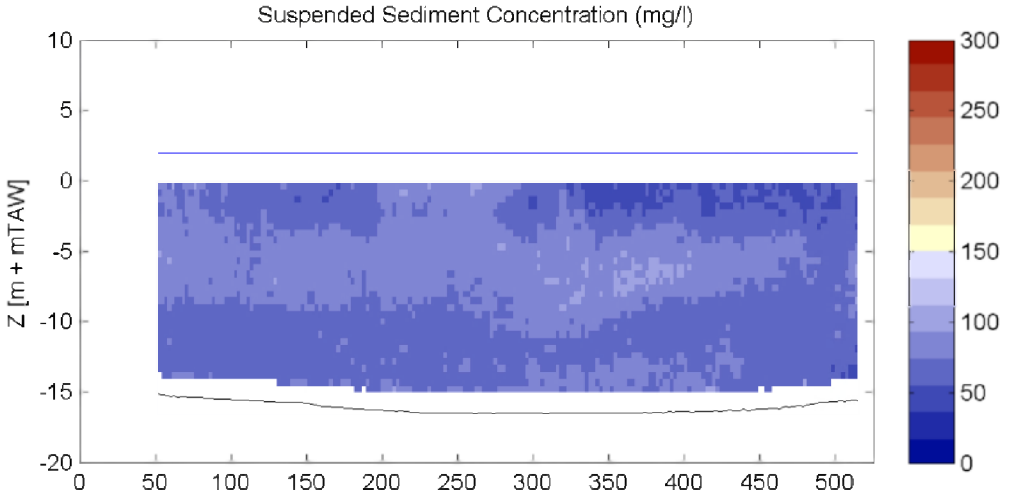
Date / Time [MET] :
08-Mar-2012
11:58 - 12:02

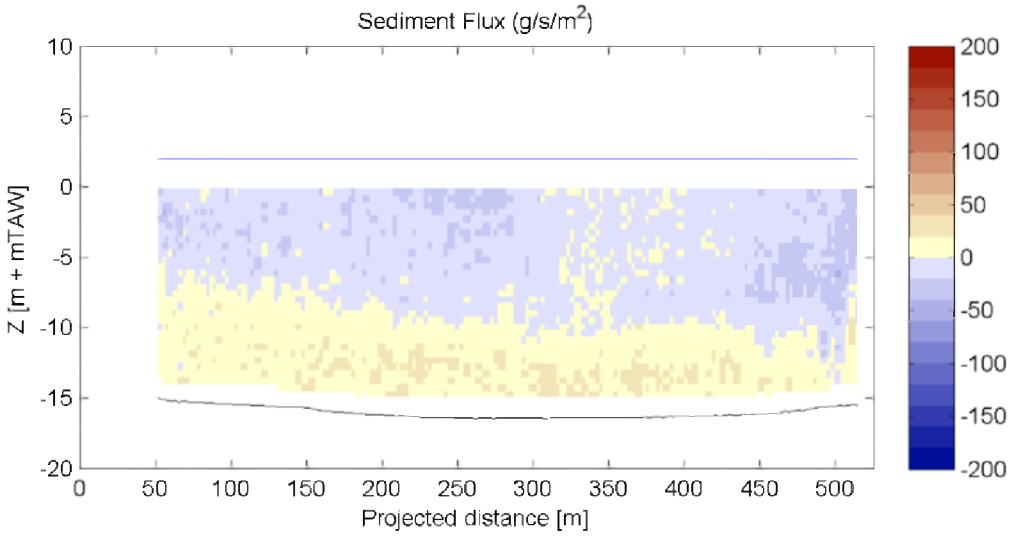
Time after HW [HH:MM]
-3:24

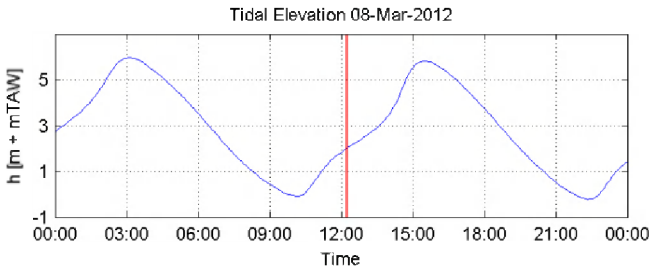
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6537_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

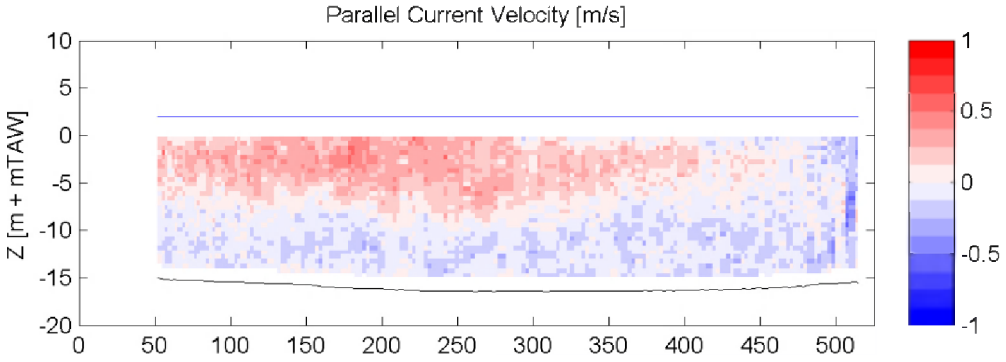
Date / Time [MET] :
08-Mar-2012
12:11 - 12:14

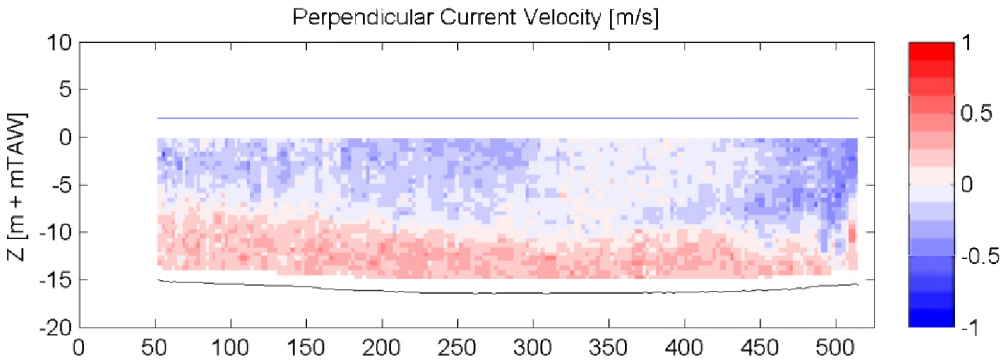
Time after HW [HH:MM]
-3:12

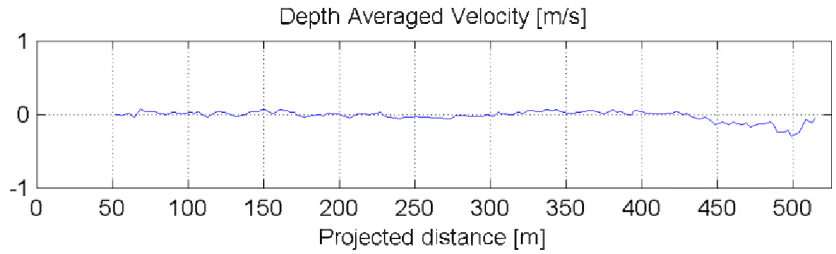
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

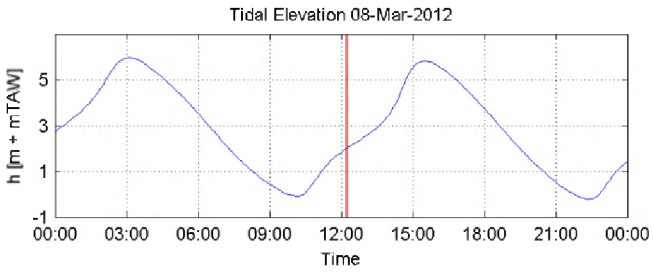
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6537_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

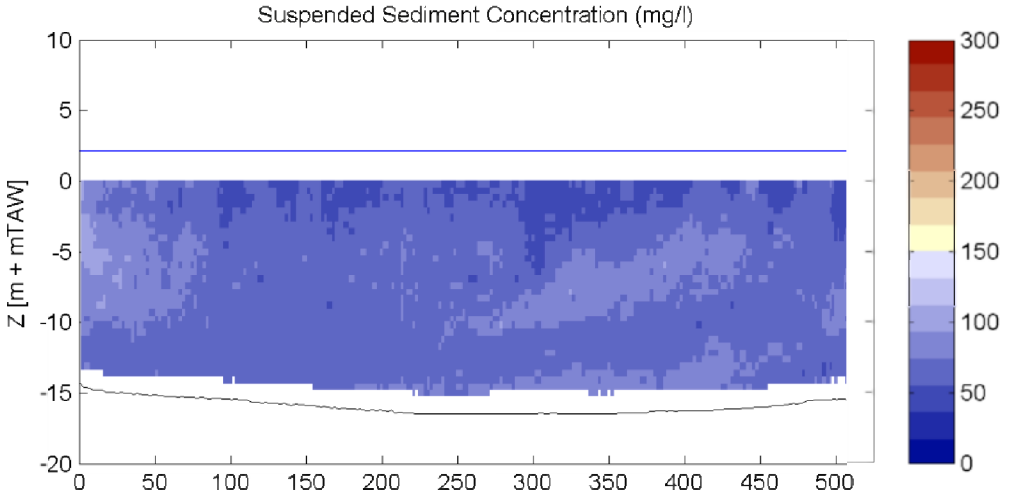
Date / Time [MET] :
08-Mar-2012
12:11 - 12:14

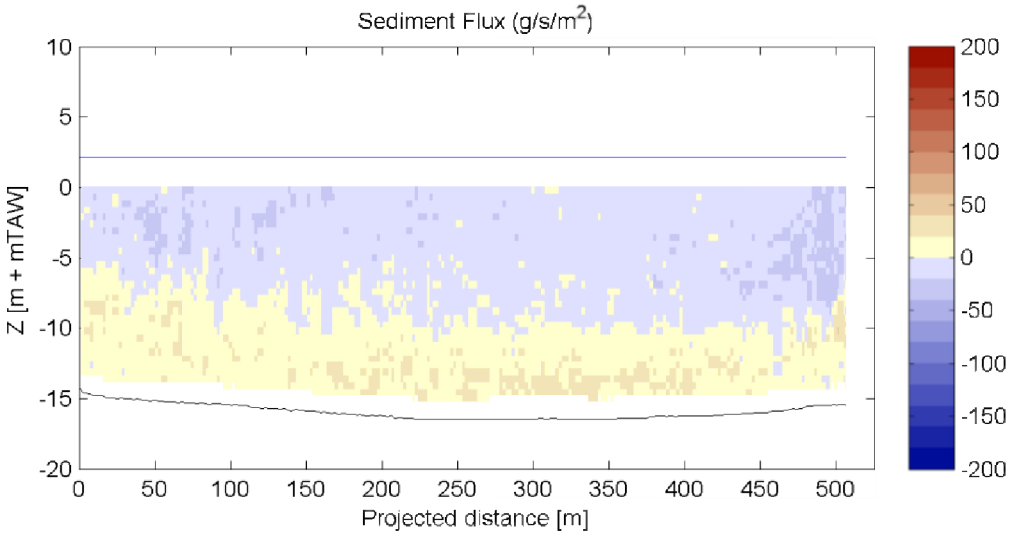
Time after HW [HH:MM]
-3:12

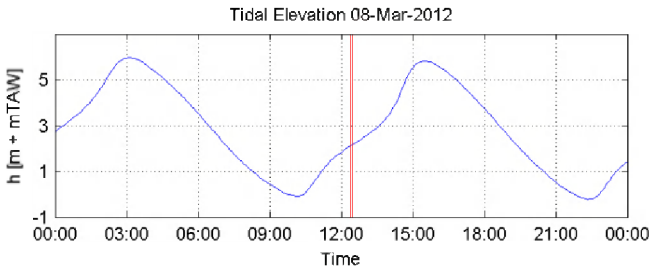
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6538_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

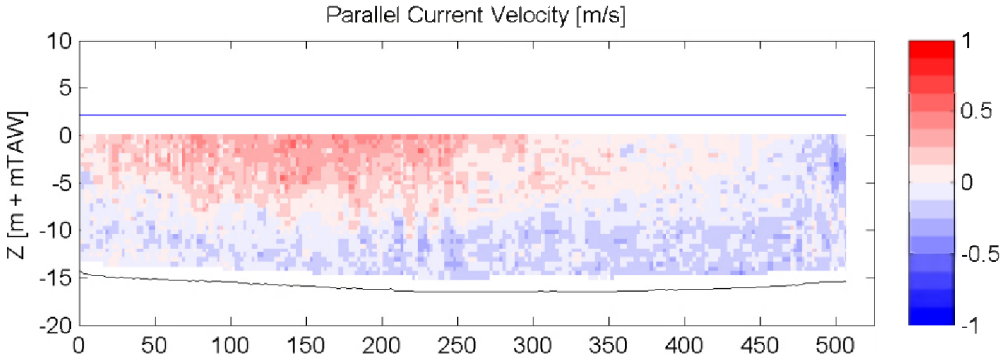
Date / Time [MET] :
08-Mar-2012
12:23 - 12:27

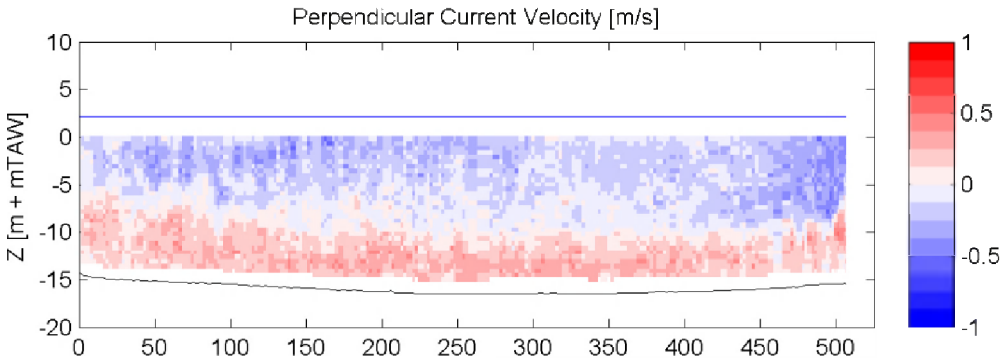
Time after HW [HH:MM]
-2:59

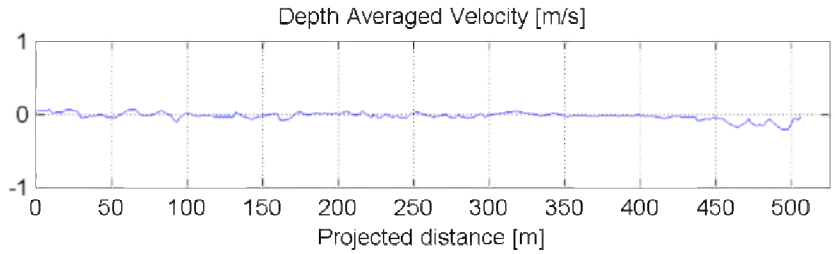
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

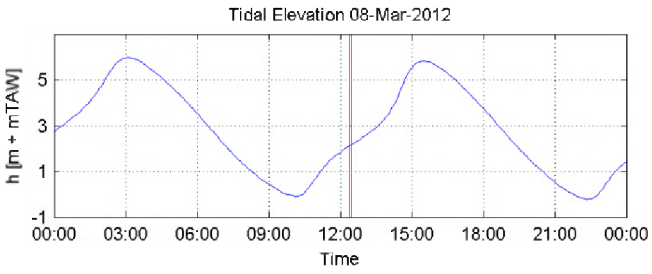
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6538_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

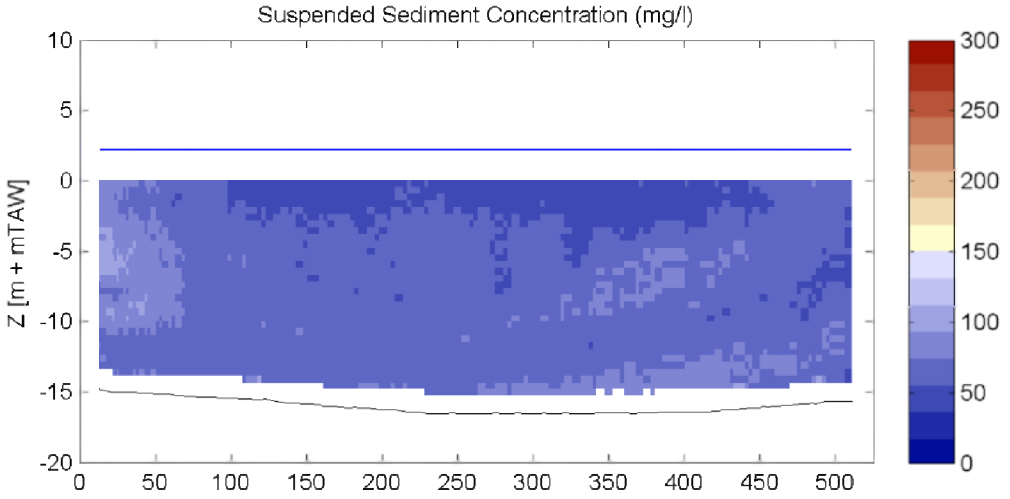
Date / Time [MET] :
08-Mar-2012
12:23 - 12:27

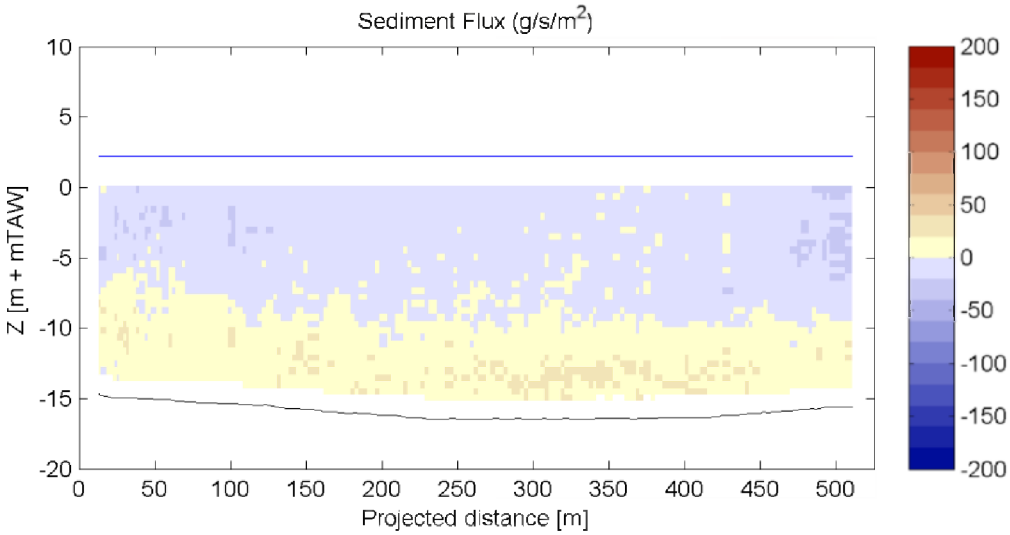
Time after HW [HH:MM]
-2:59

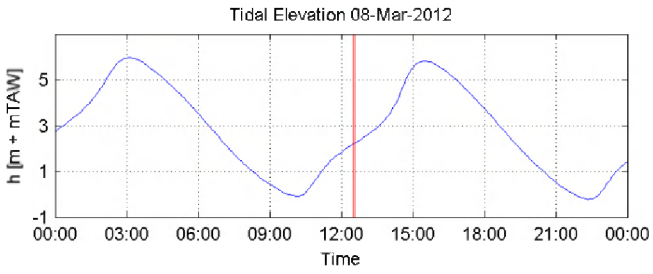
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6539_dgdTAB.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

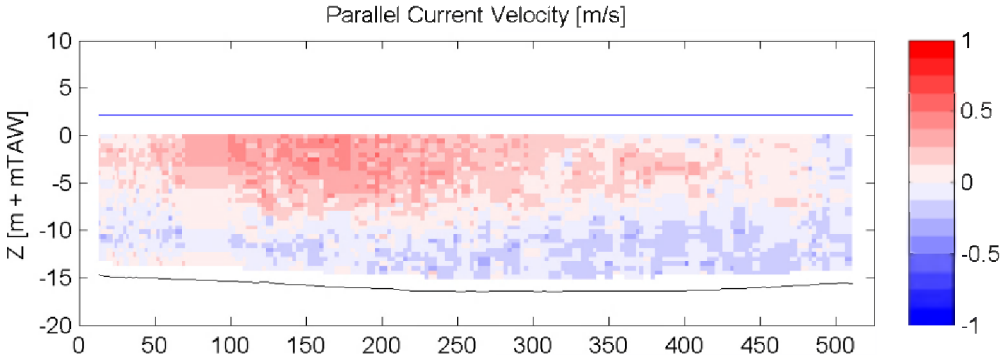
Date / Time [MET] :
08-Mar-2012
12:30 - 12:34

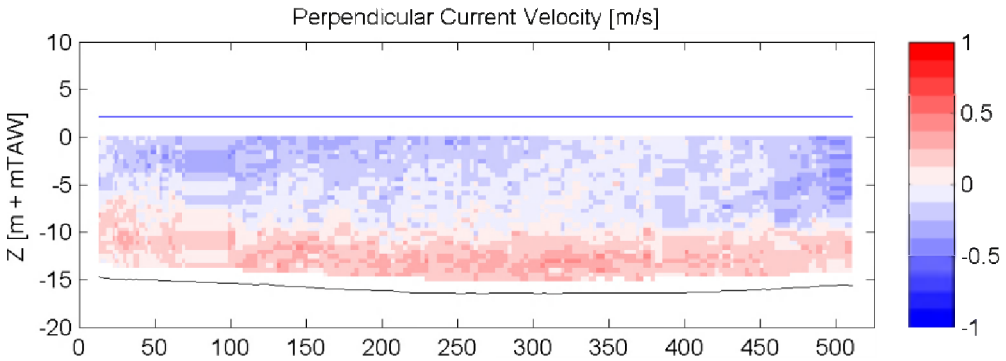
Time after HW [HH:MM]
-2:52

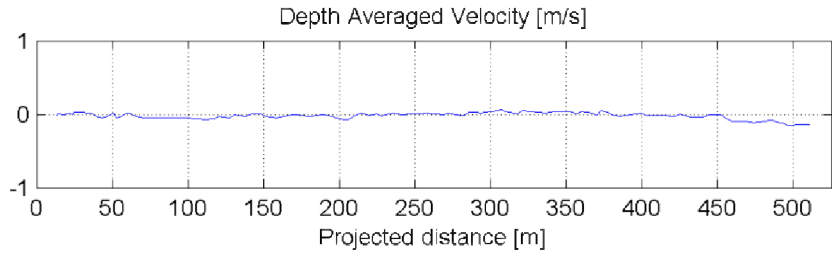
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

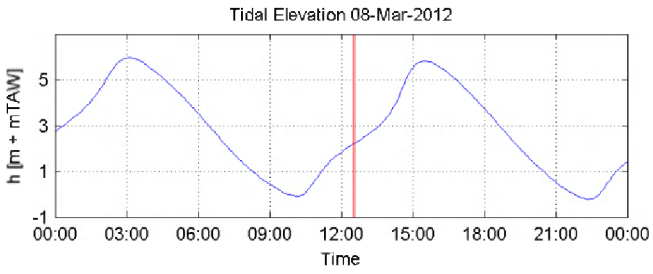
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6539_dgdTAB.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

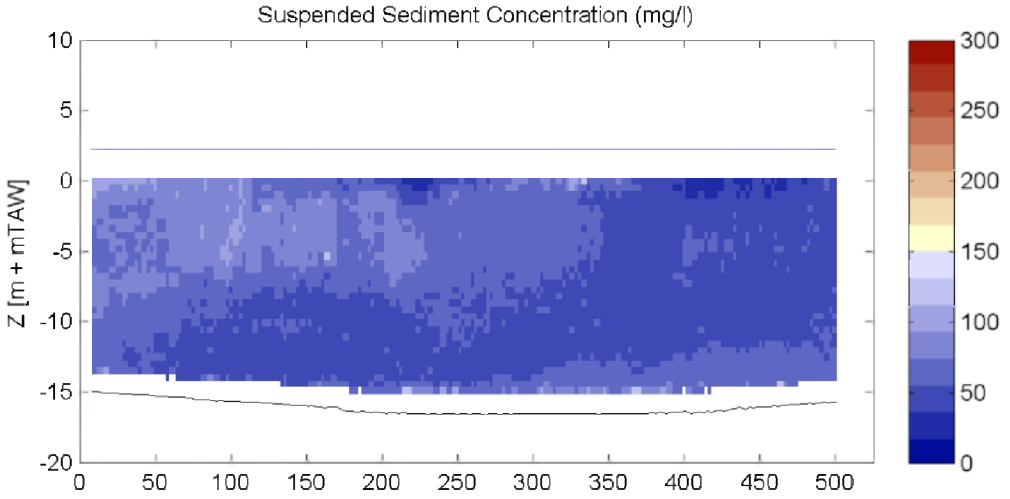
Date / Time [MET] :
08-Mar-2012
12:30 - 12:34

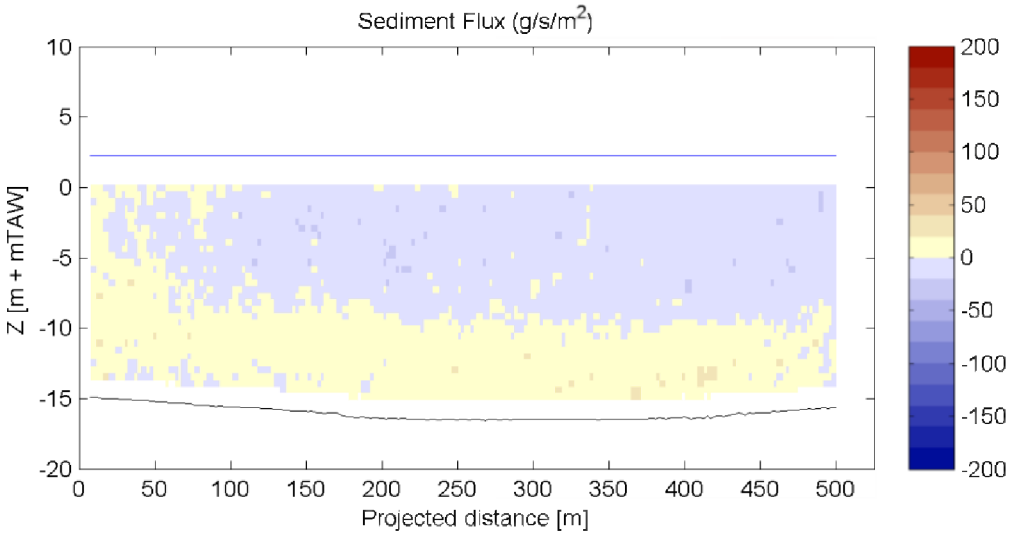
Time after HW [HH:MM]
-2:52

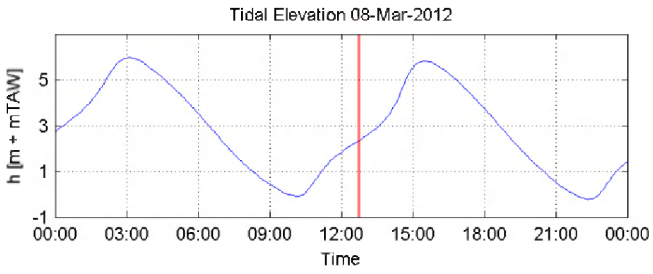
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6542_dgdAB.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

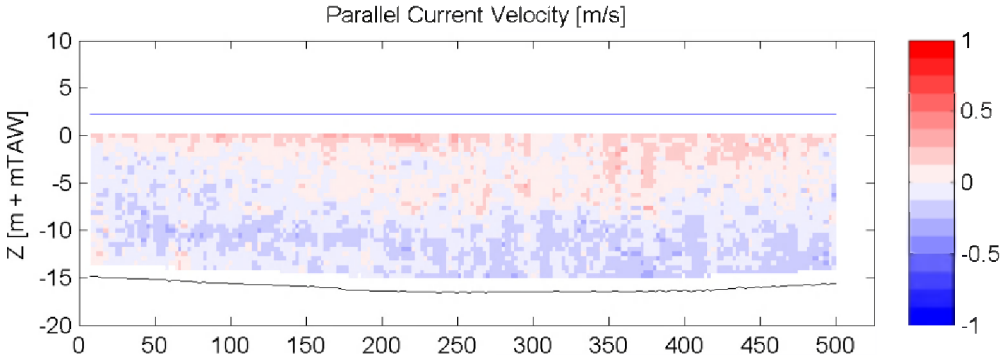
Date / Time [MET] :
08-Mar-2012
12:42 - 12:46

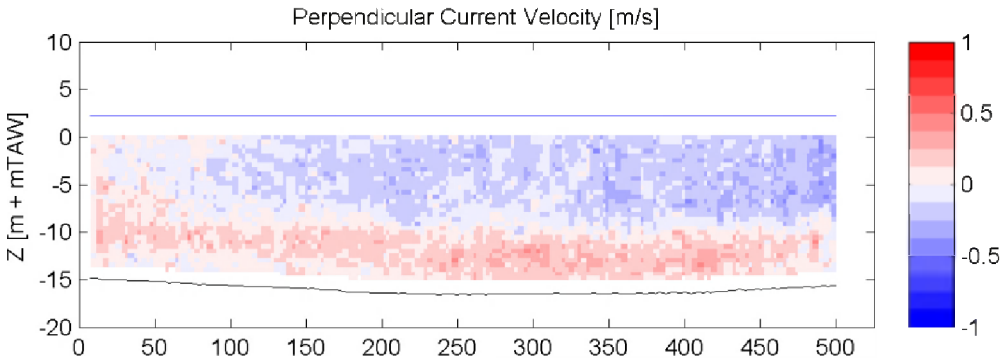
Time after HW [HH:MM]
-2:40

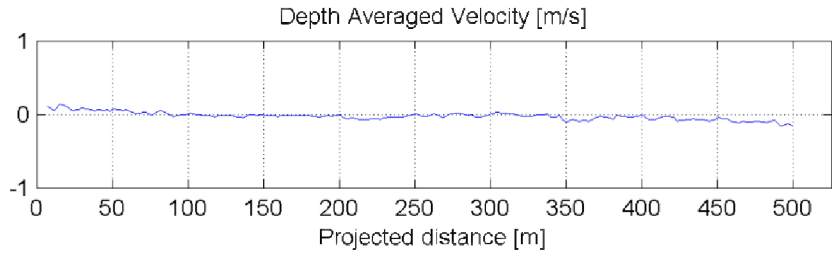
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

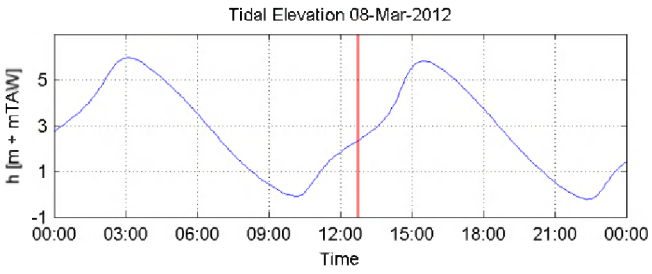
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6542_dgdAB.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

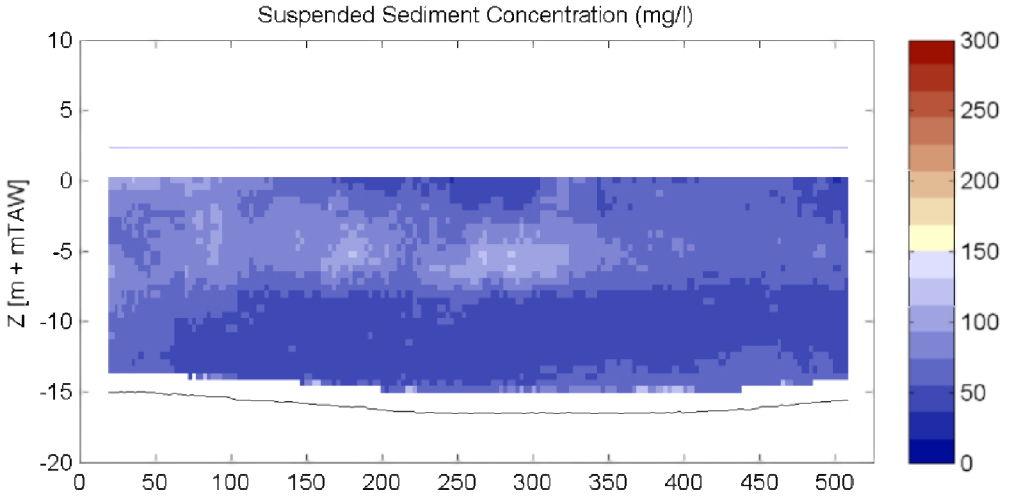
Date / Time [MET] :
08-Mar-2012
12:42 - 12:46

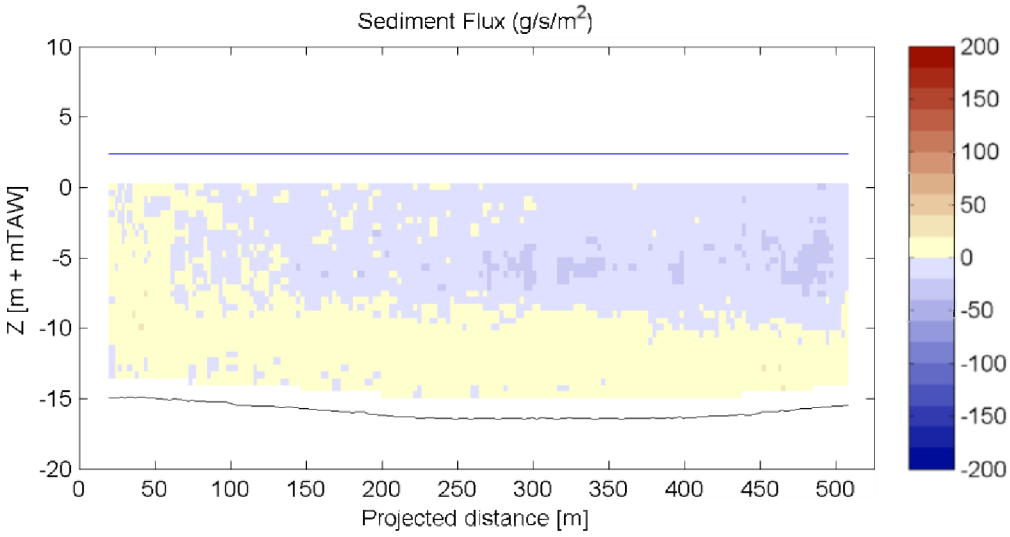
Time after HW [HH:MM]
-2:40

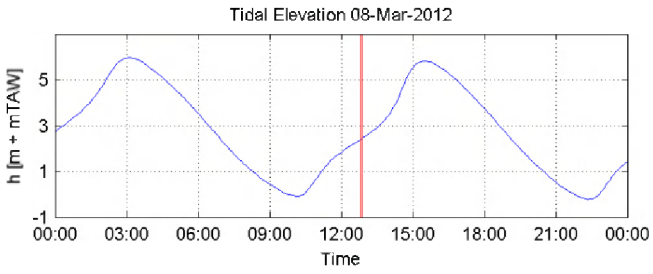
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6543_dgdBA_sub.csv	Location: Deurganckdok







HW/LW: 03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

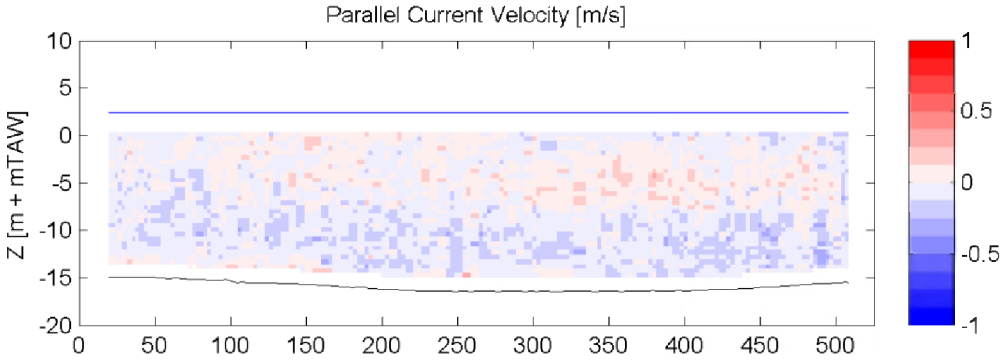
Date / Time [MET] :
08-Mar-2012
12:48 - 12:51

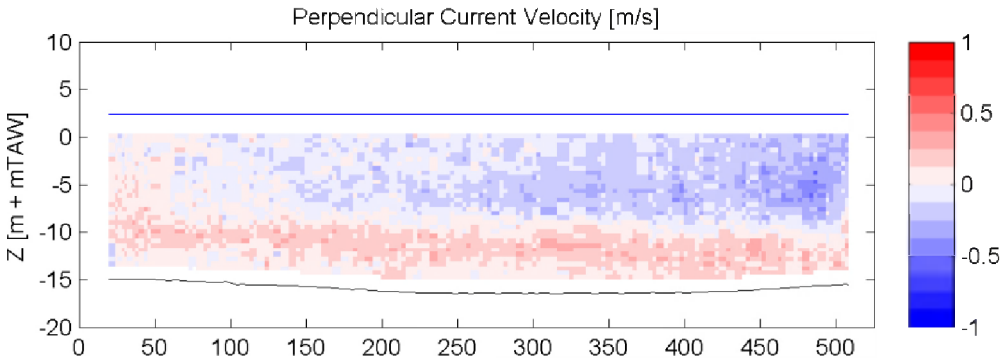
Time after HW [HH:MM]
-2:34

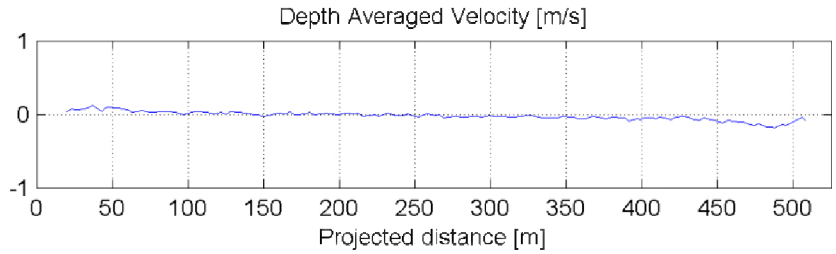
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

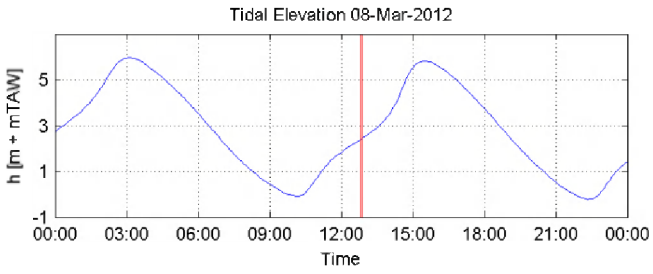
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6543_dgdBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

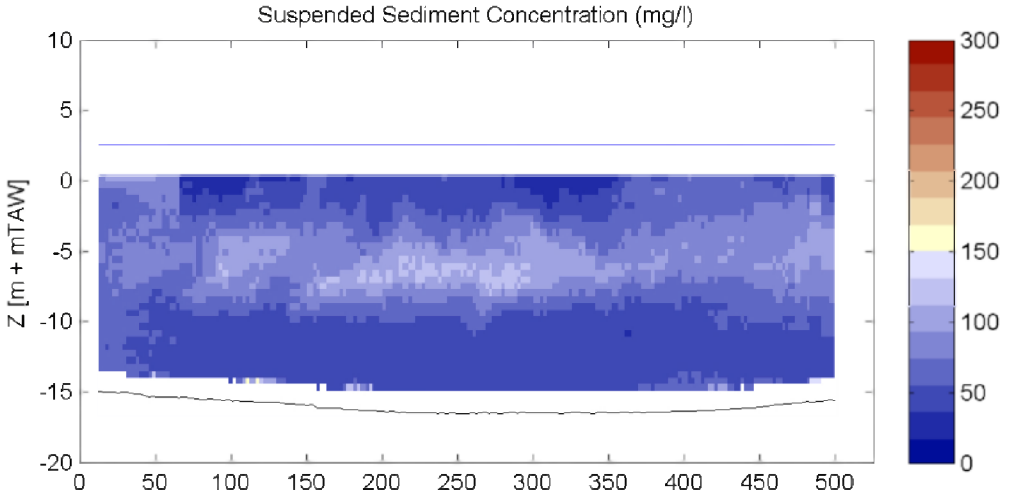
Date / Time [MET] :
08-Mar-2012
12:48 - 12:51

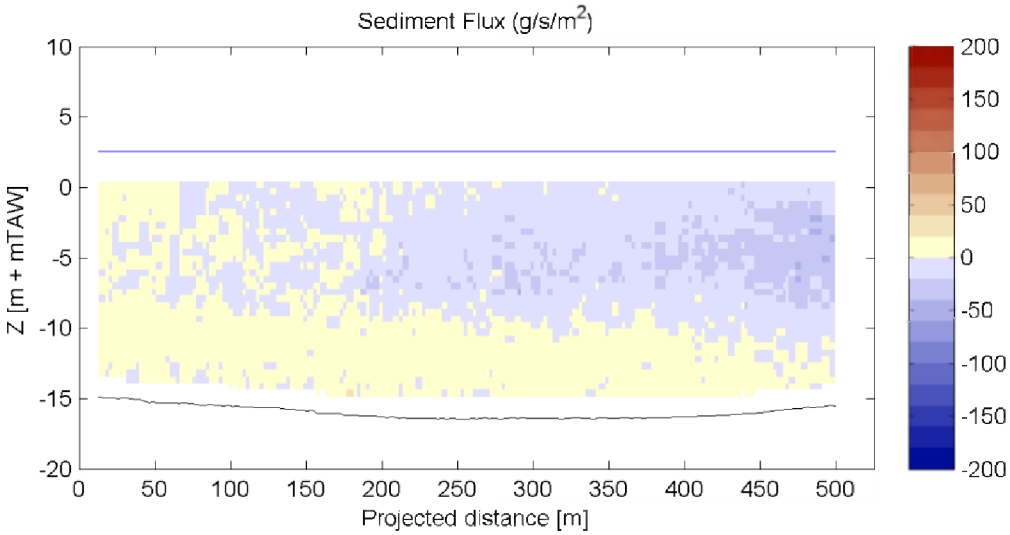
Time after HW [HH:MM]
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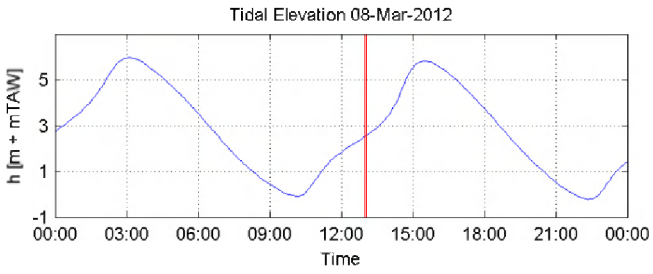
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6545_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

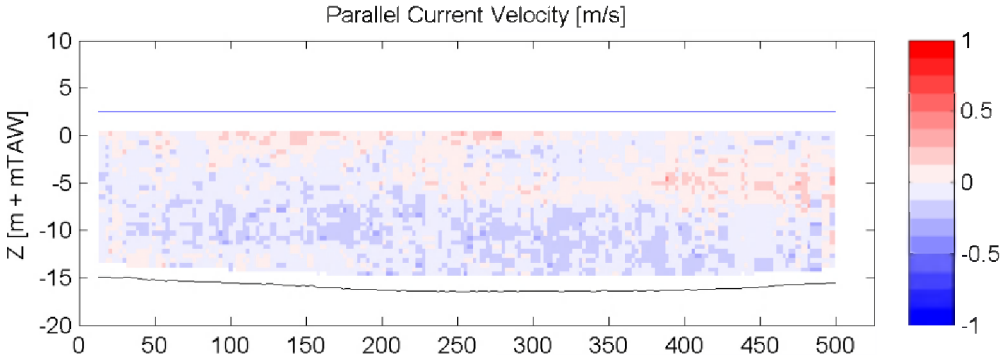
Date / Time [MET] :
08-Mar-2012
12:58 - 13:02

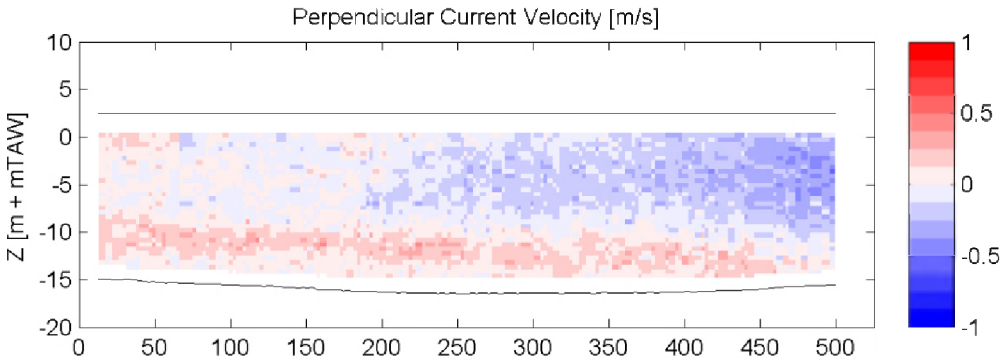
Time after HW [HH:MM]
-2:24

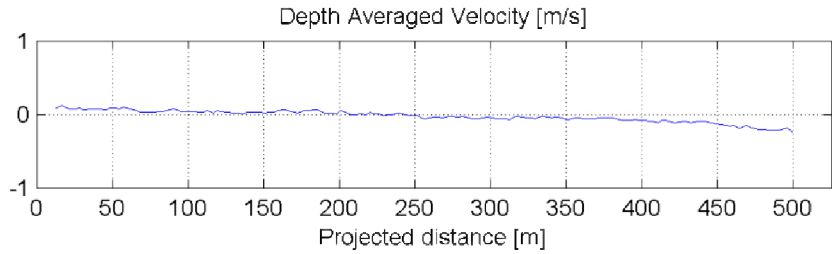
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

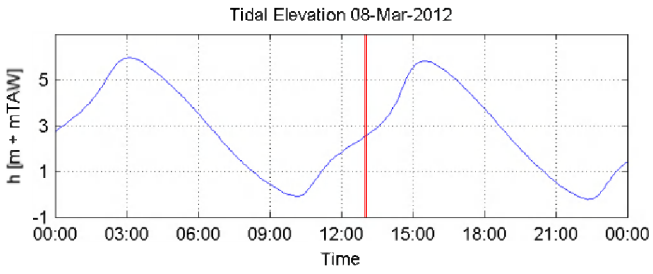
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6545_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

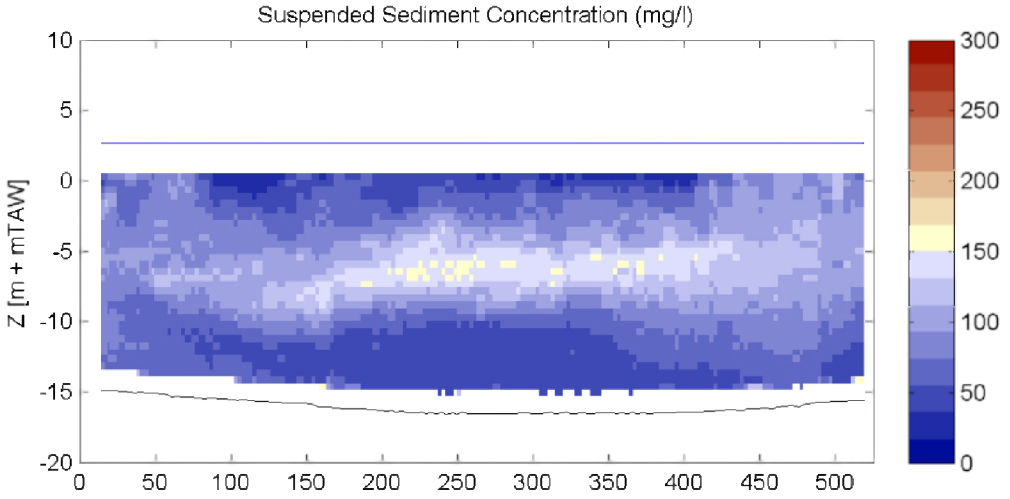
Date / Time [MET] :
08-Mar-2012
12:58 - 13:02

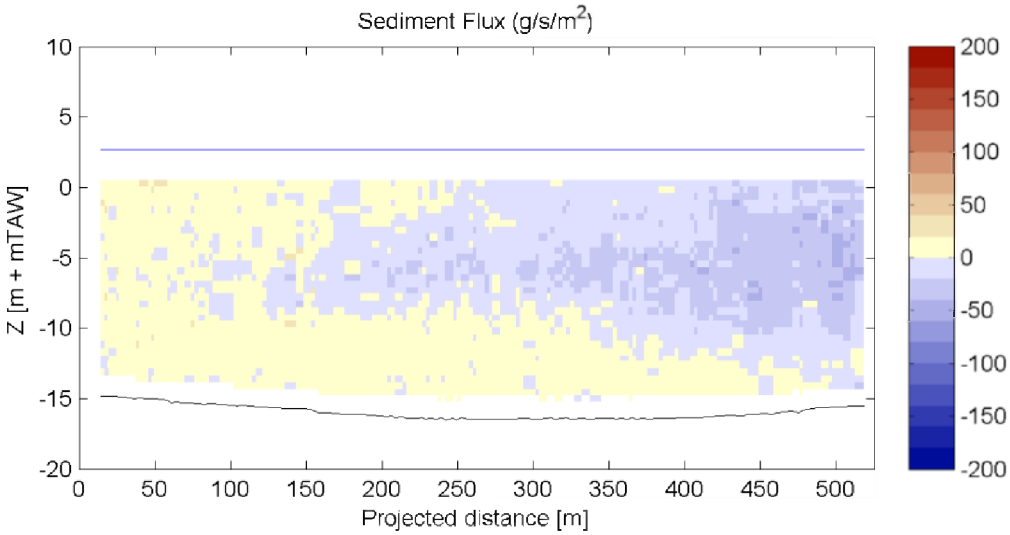
Time after HW [HH:MM]
-2:24

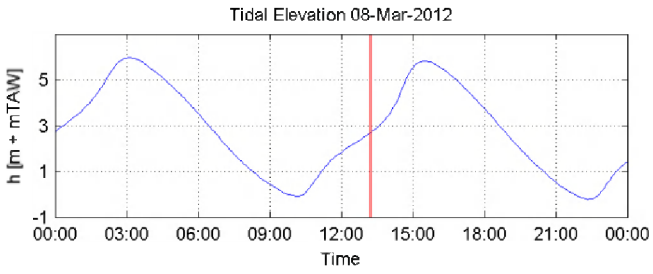
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6547_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

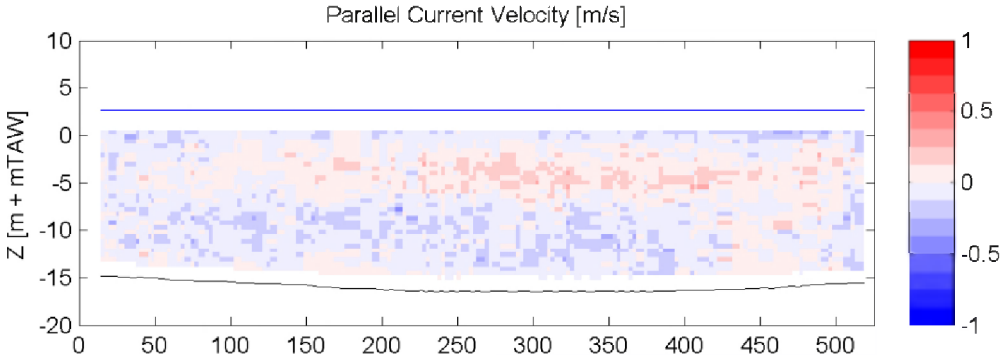
Date / Time [MET] :
08-Mar-2012
13:11 - 13:15

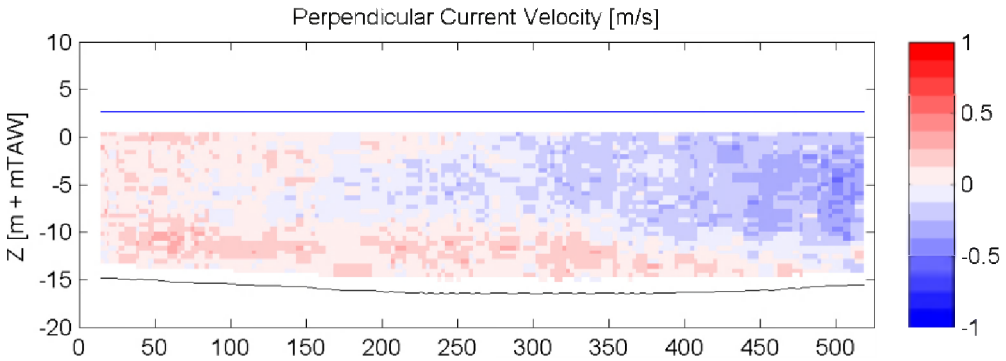
Time after HW [HH:MM]
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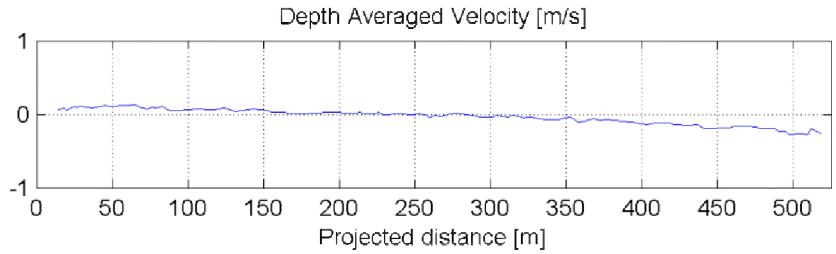
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

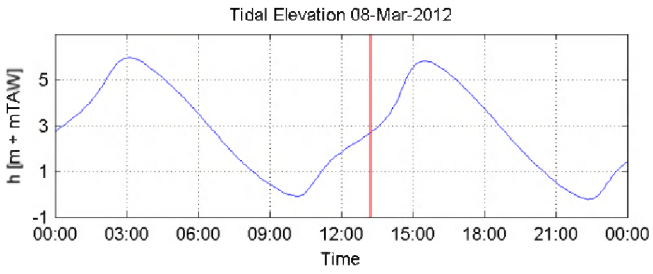
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6547_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

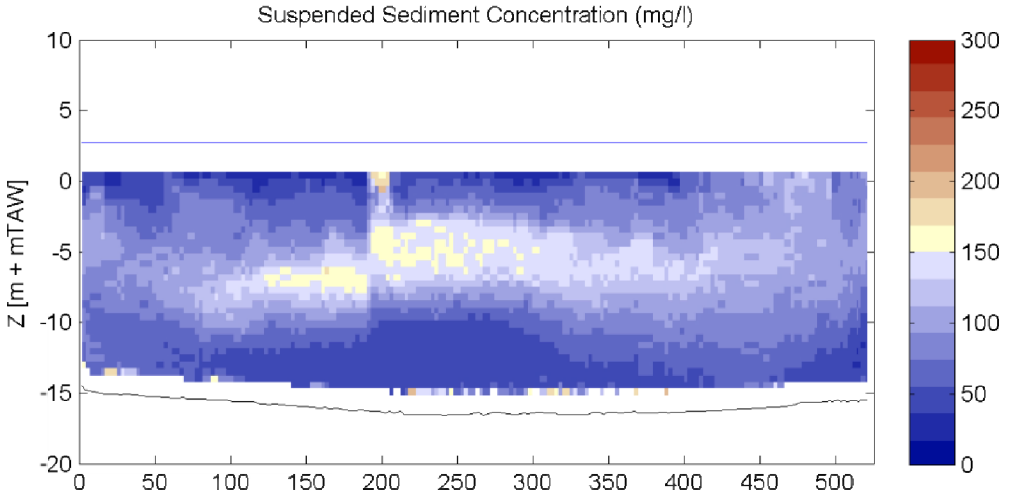
Date / Time [MET] :
08-Mar-2012
13:11 - 13:15

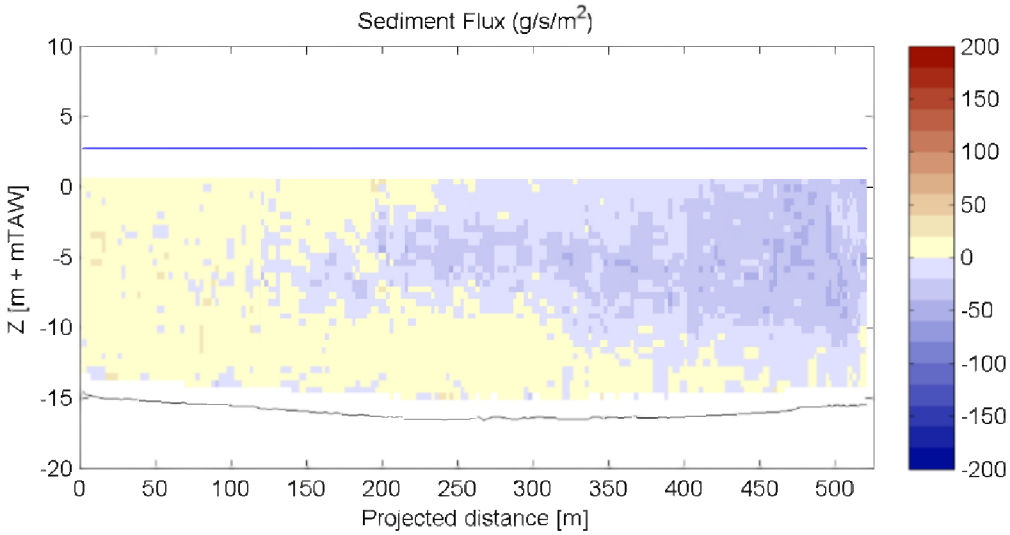
Time after HW [HH:MM]
-2:11

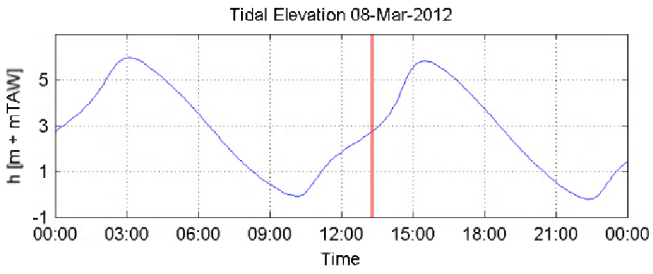
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6548_dgdTAB.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

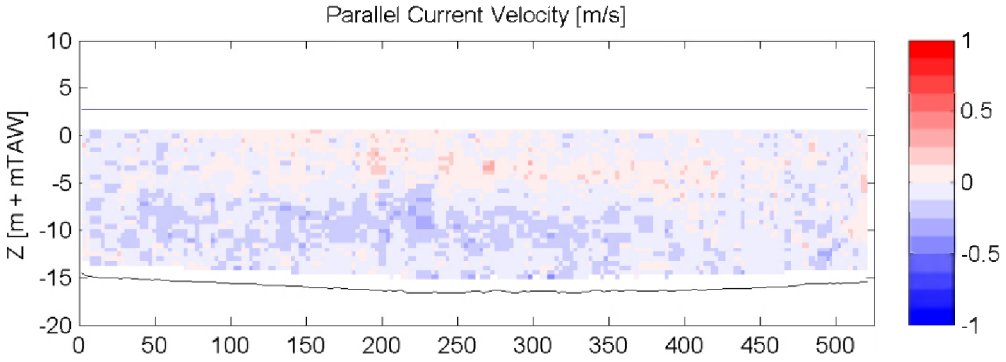
Date / Time [MET] :
08-Mar-2012
13:16 - 13:20

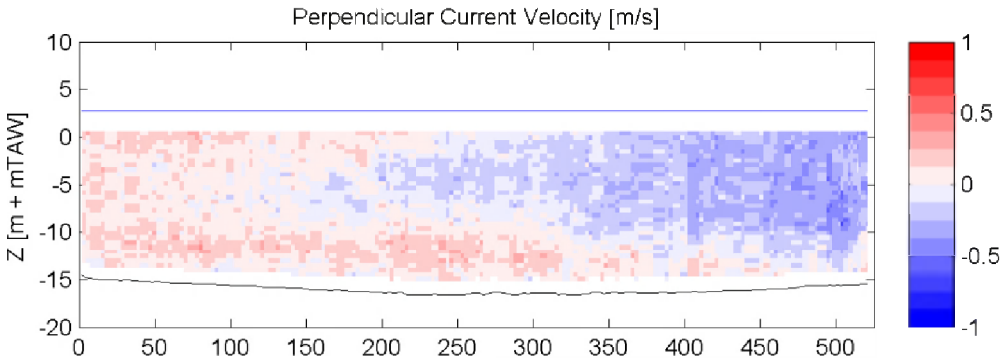
Time after HW [HH:MM]
-2:06

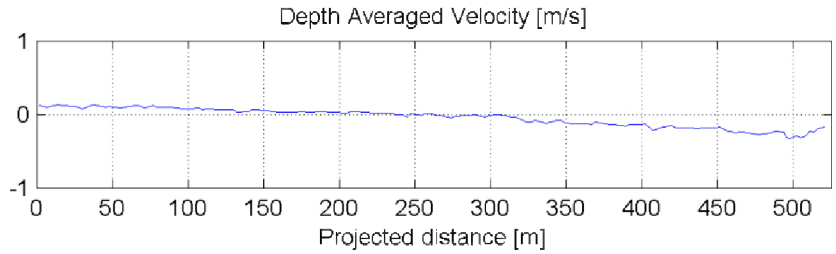
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

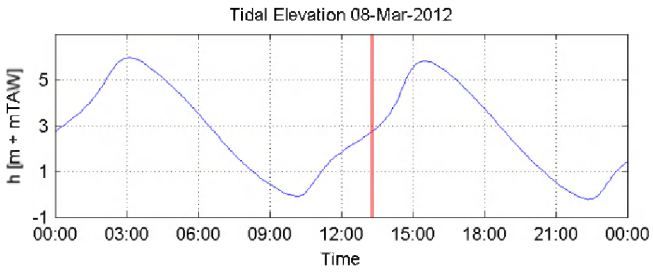
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6548_dgdTAB.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

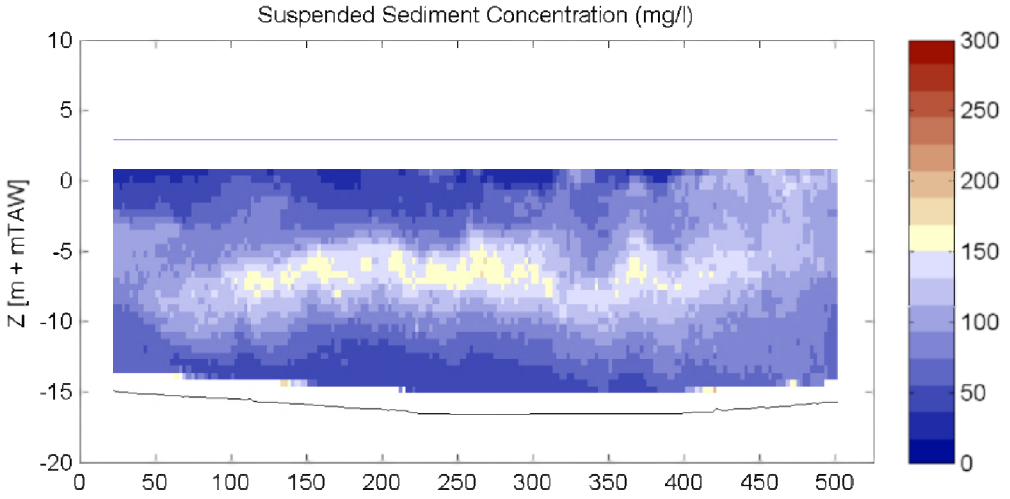
Date / Time [MET] :
08-Mar-2012
13:16 - 13:20

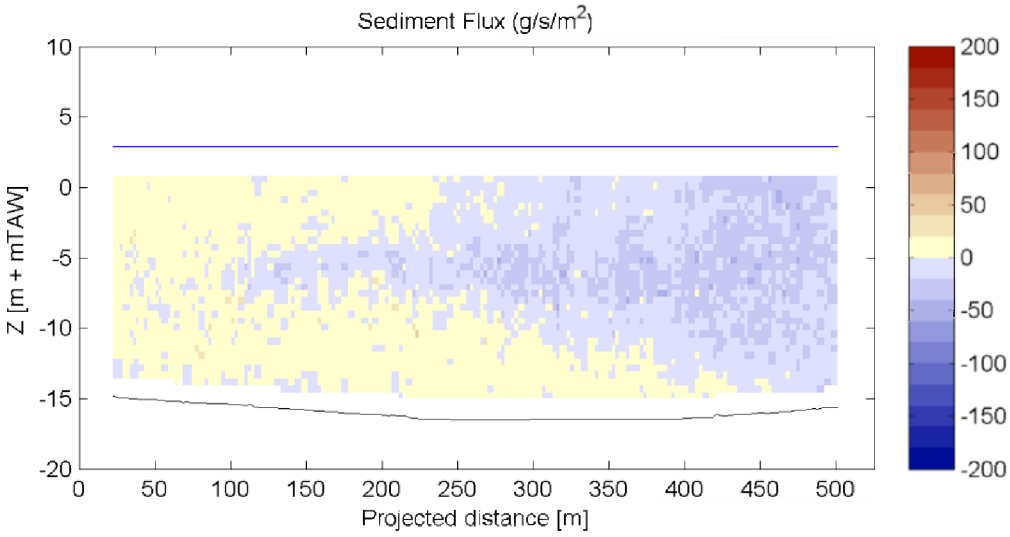
Time after HW [HH:MM]
-2:06

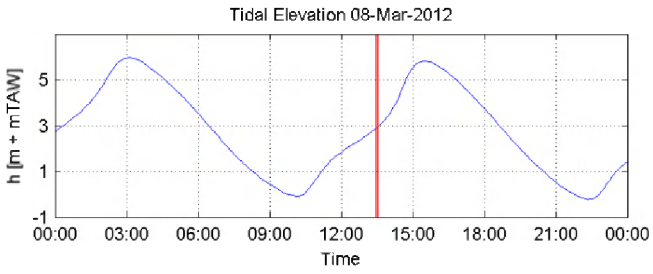
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6549_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

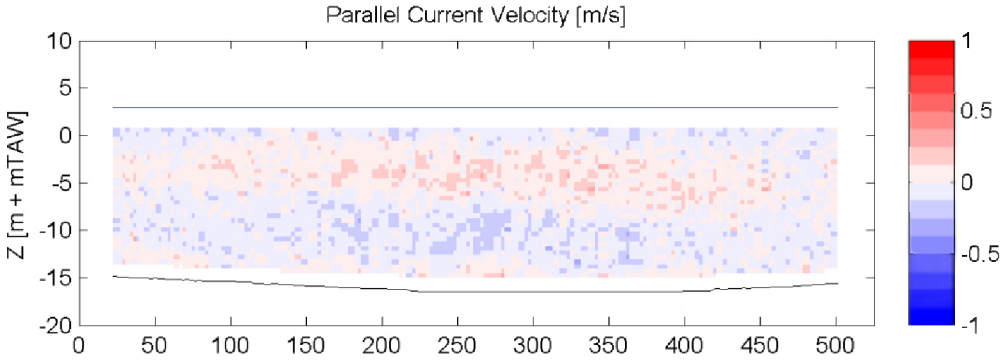
Date / Time [MET] :
08-Mar-2012
13:28 - 13:31

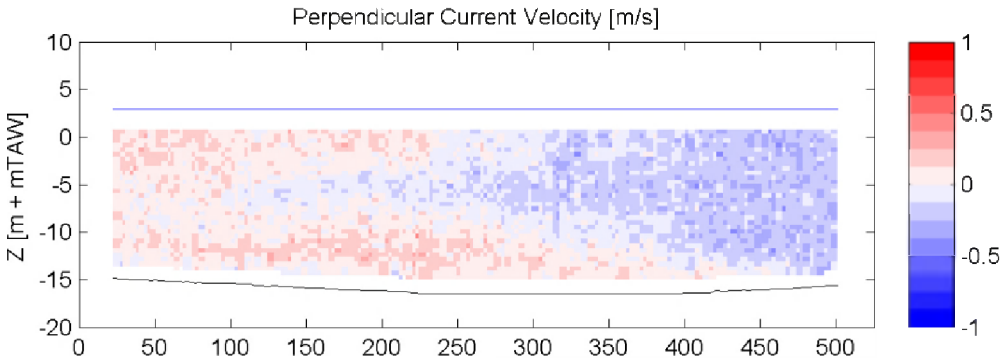
Time after HW [HH:MM]
-1:55

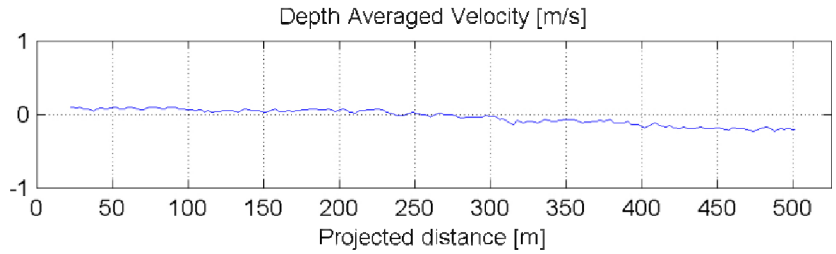
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

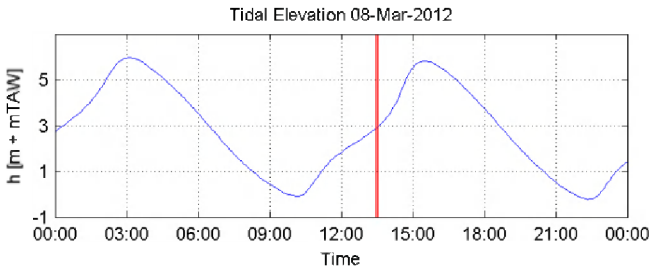
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6549_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

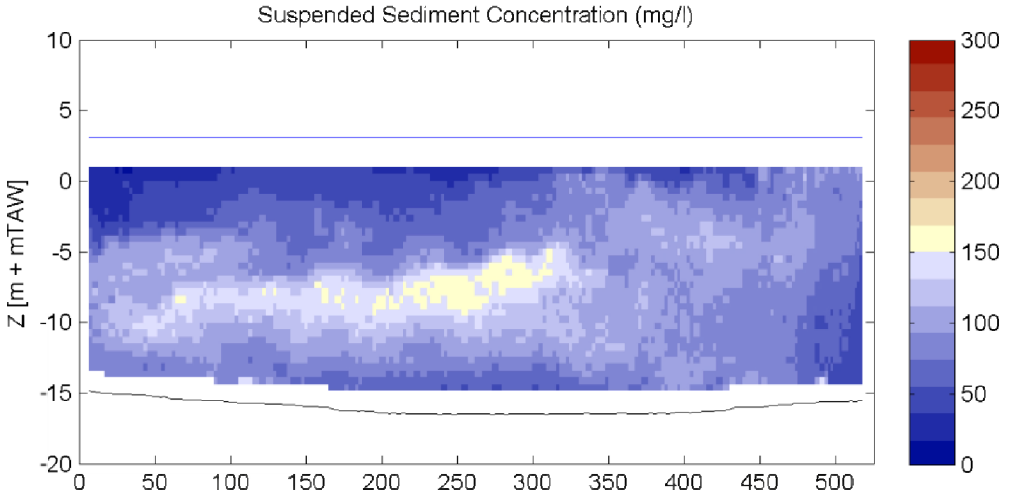
Date / Time [MET] :
08-Mar-2012
13:28 - 13:31

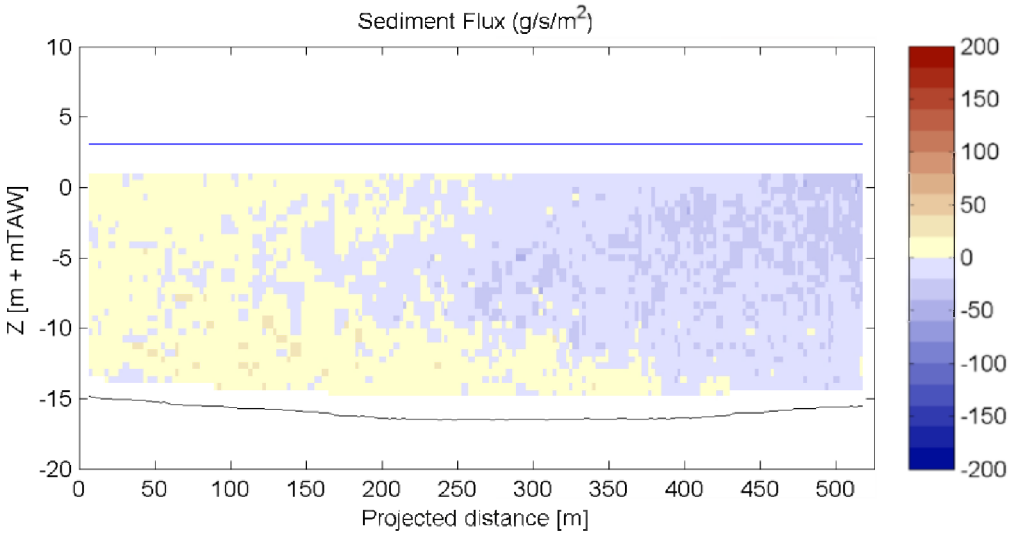
Time after HW [HH:MM]
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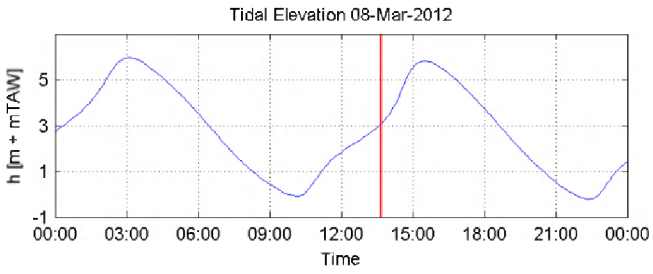
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6551_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

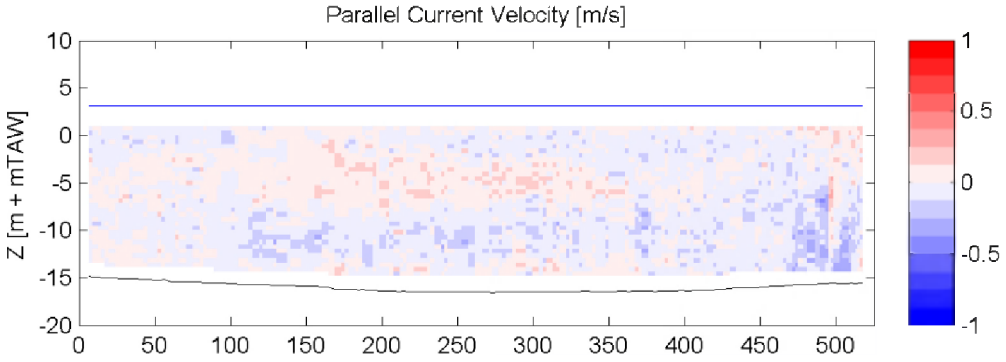
Date / Time [MET] :
08-Mar-2012
13:38 - 13:42

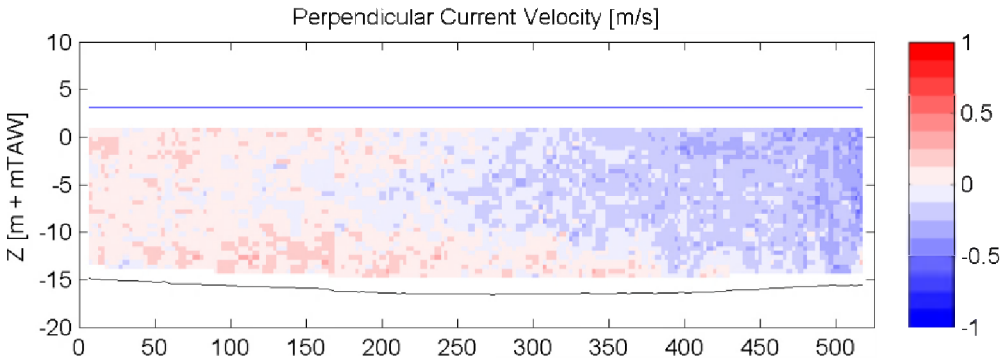
Time after HW [HH:MM]
-1:44

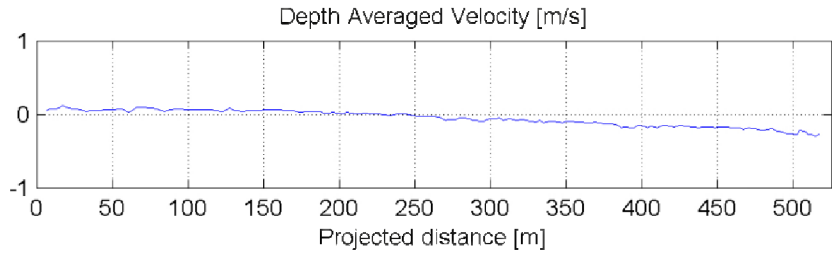
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

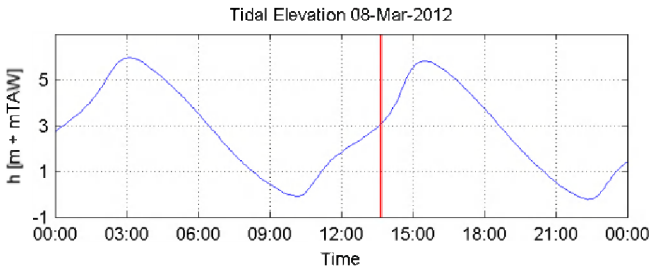
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6551_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

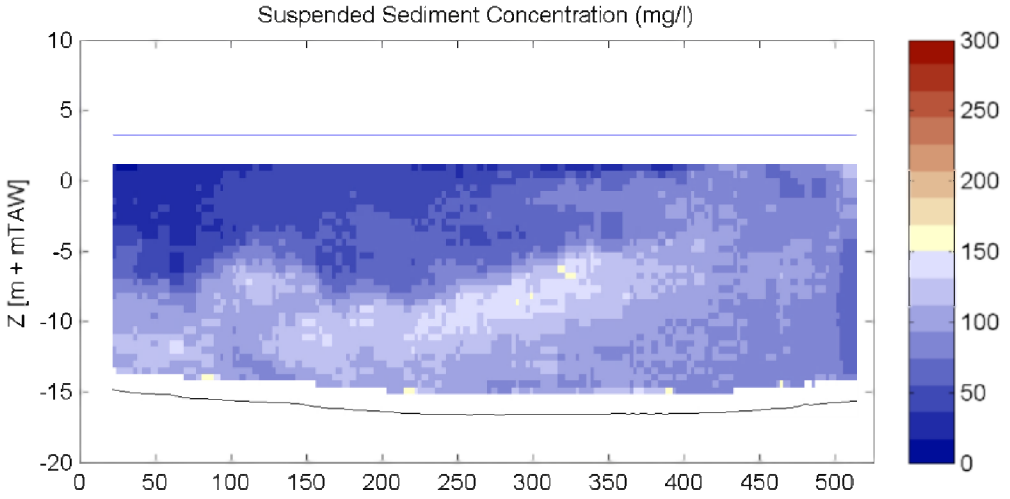
Date / Time [MET] :
08-Mar-2012
13:38 - 13:42

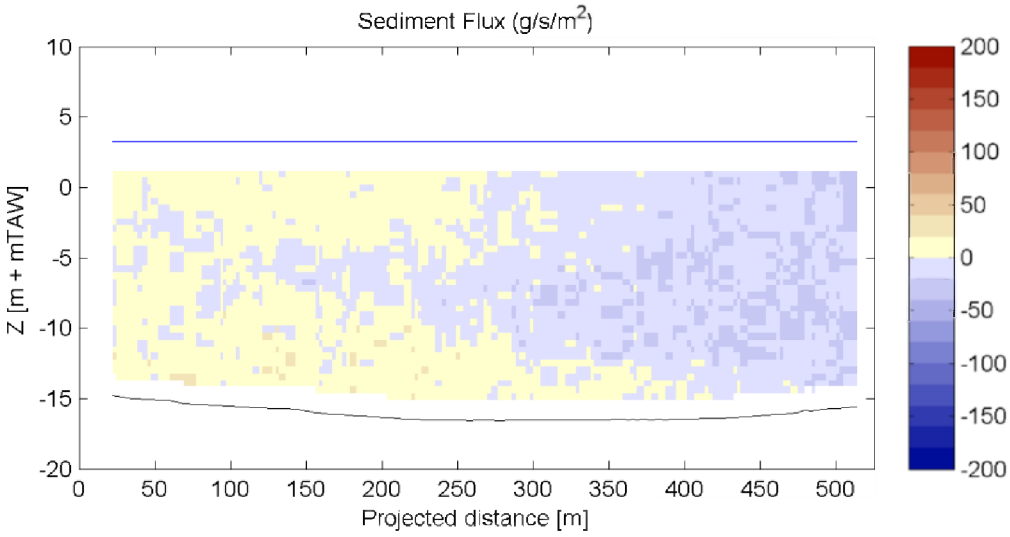
Time after HW [HH:MM]
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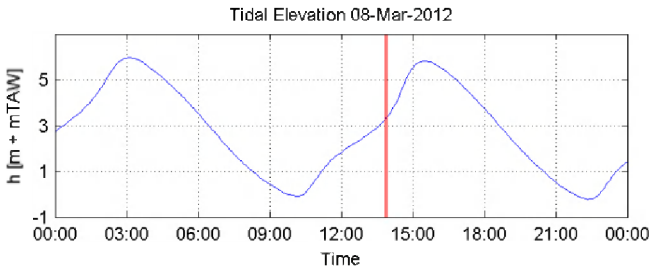
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6553_dgdTBA.csv	Location: Deurganckdok







HW/LW: 03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

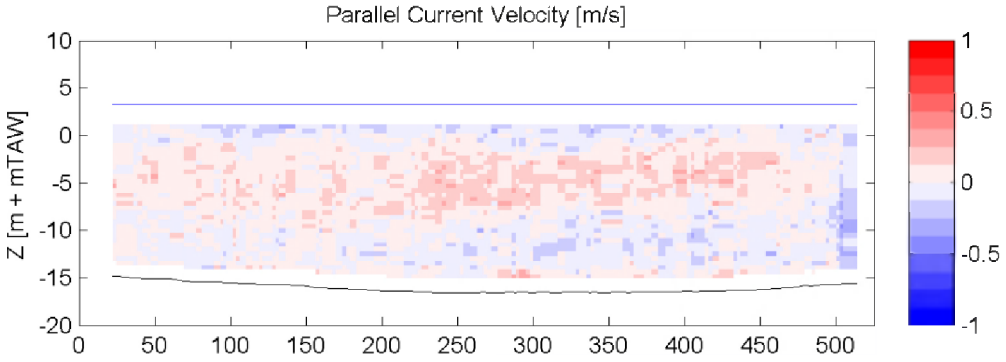
Date / Time [MET] :
08-Mar-2012
13:51 - 13:54

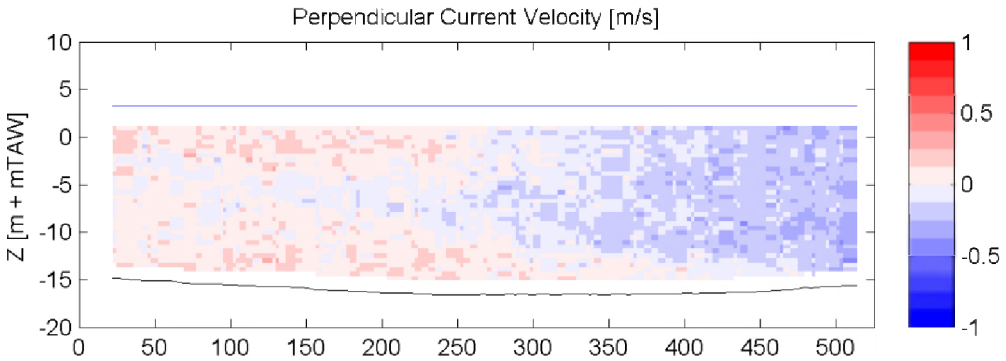
Time after HW [HH:MM]
-1:31

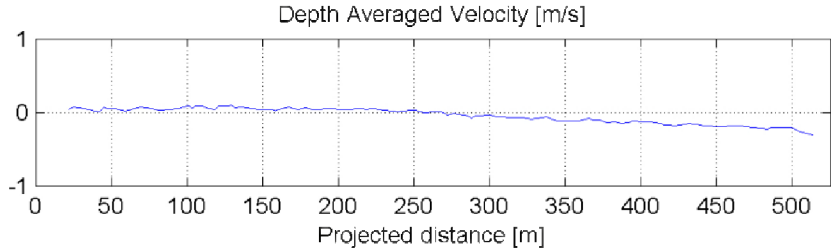
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

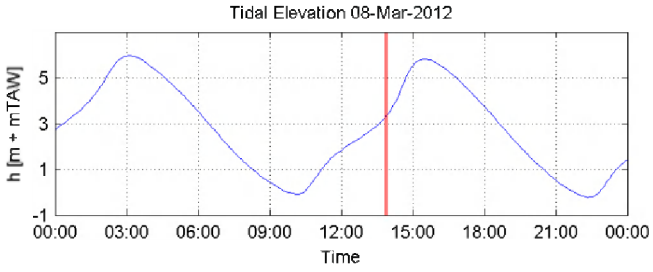
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6553_dgdTBA.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

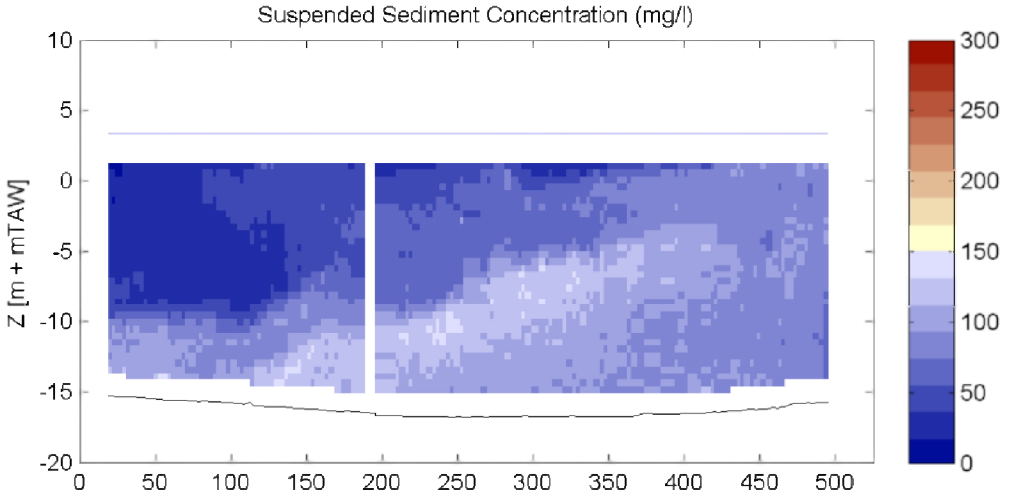
Date / Time [MET] :
08-Mar-2012
13:51 - 13:54

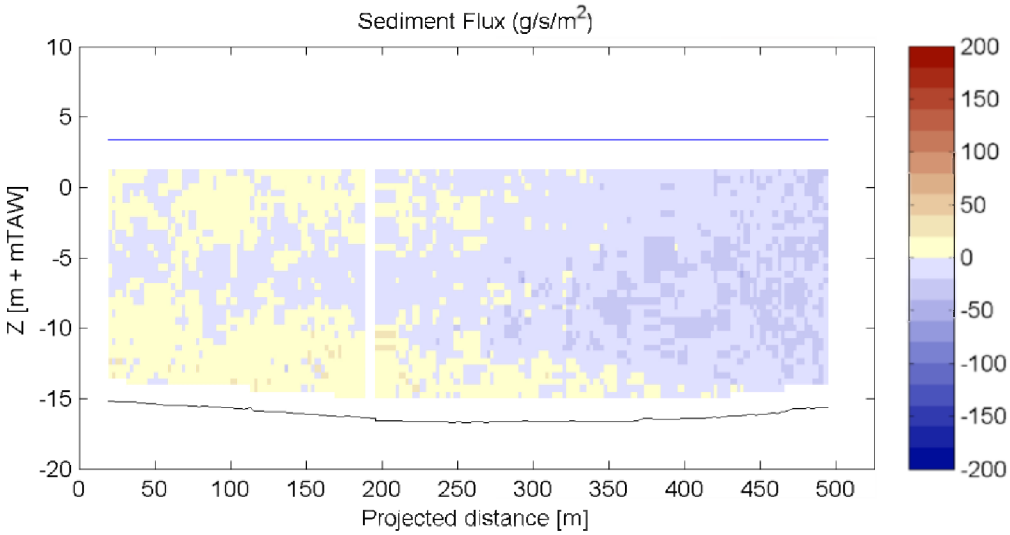
Time after HW [HH:MM]
-1:31

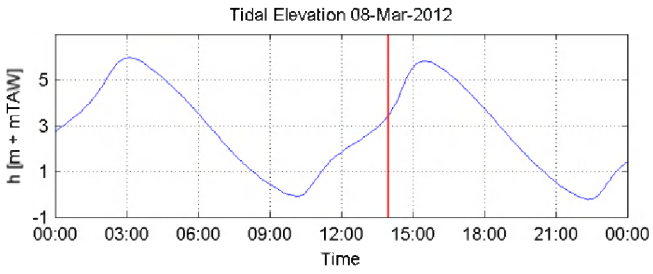
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6554_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

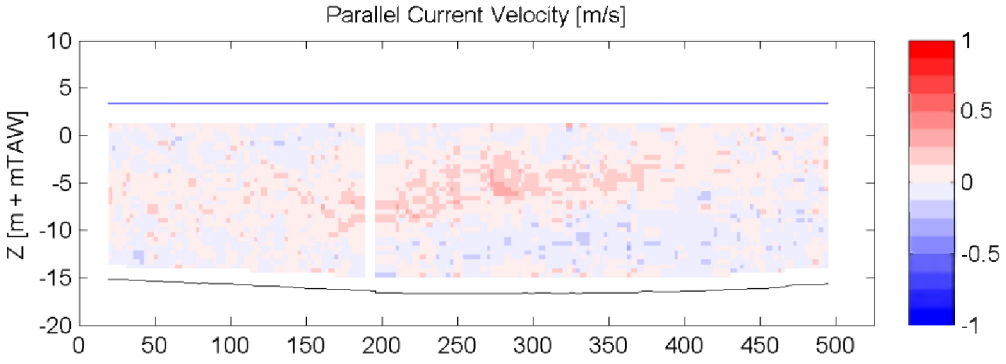
Date / Time [MET] :
08-Mar-2012
13:56 - 13:59

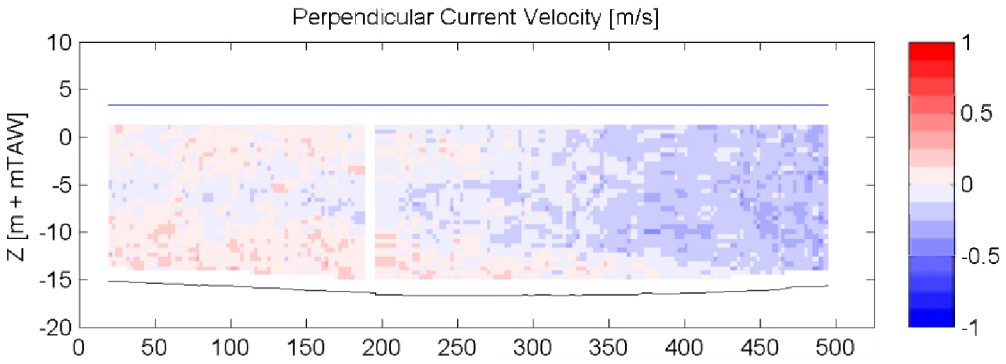
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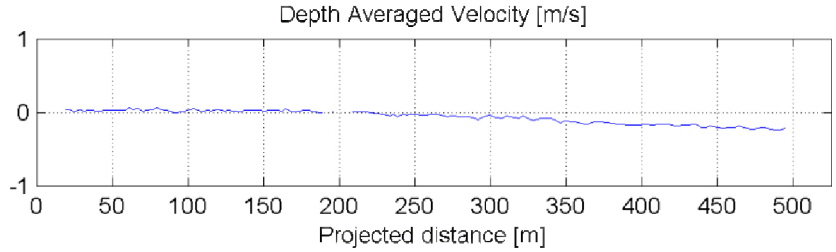
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

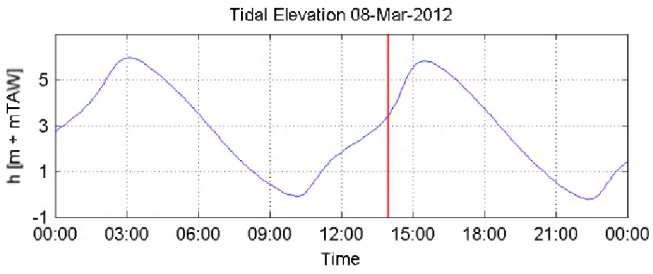
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6554_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

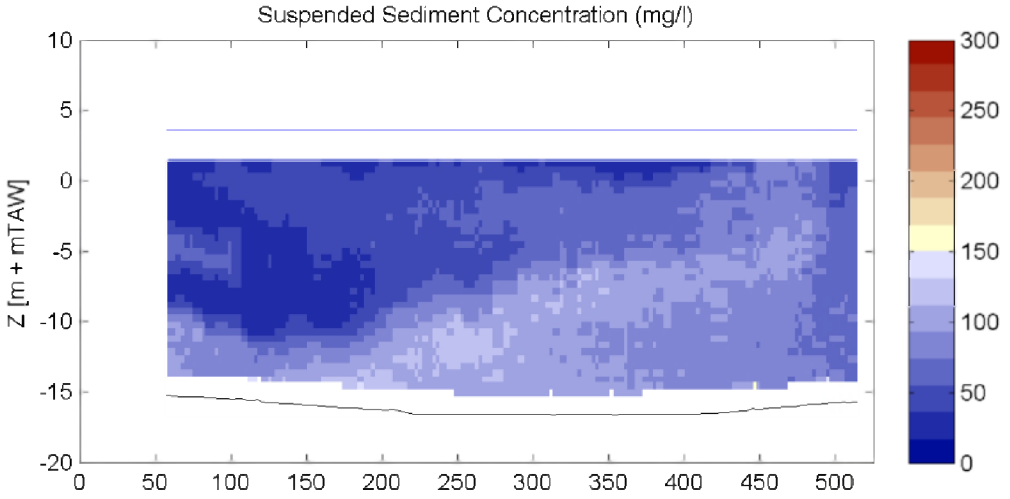
Date / Time [MET] :
08-Mar-2012
13:56 - 13:59

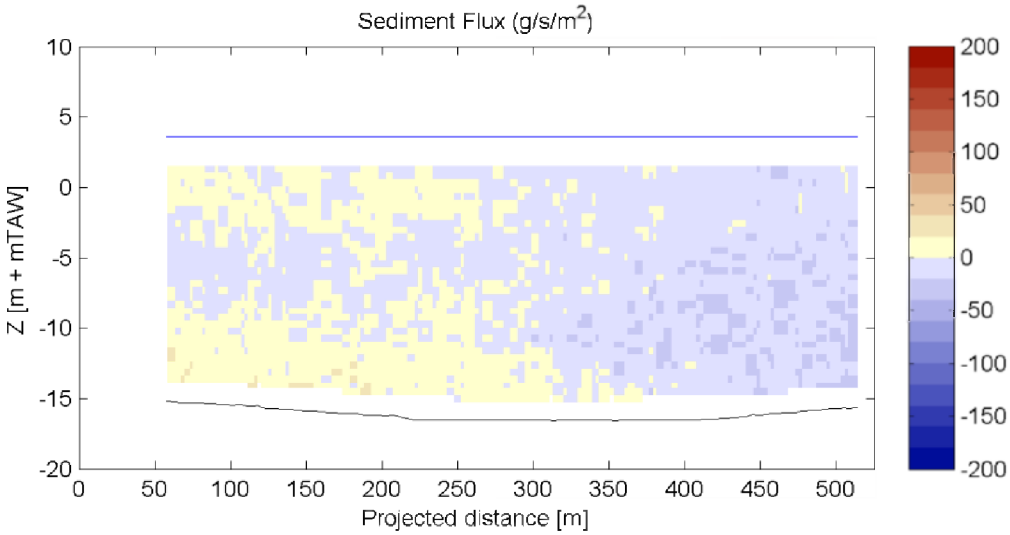
Time after HW [HH:MM]
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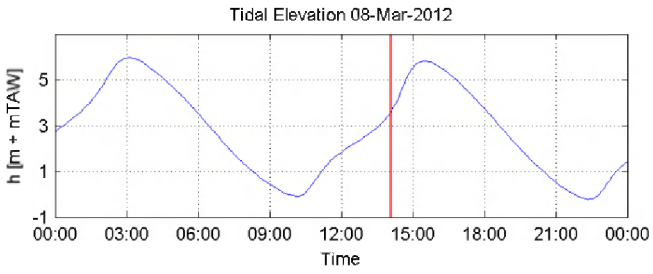
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6555_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

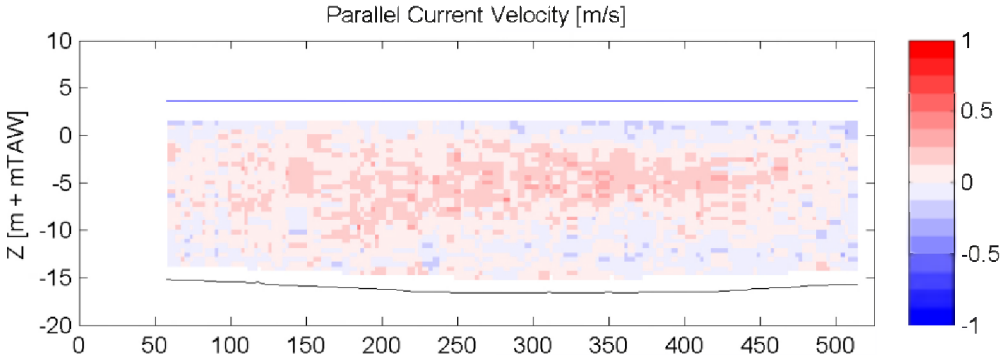
Date / Time [MET] :
08-Mar-2012
14:03 - 14:06

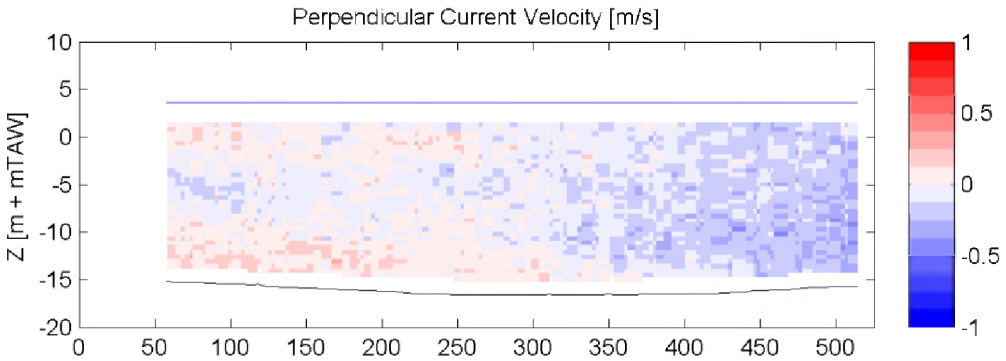
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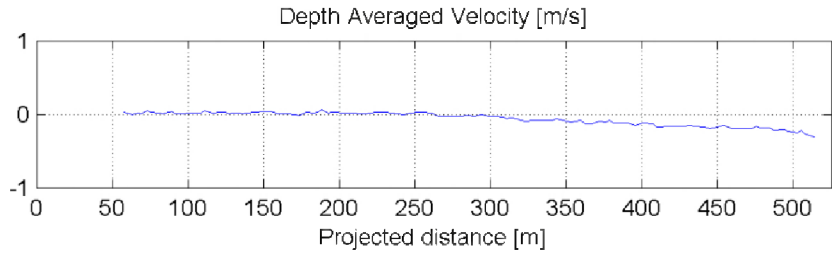
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

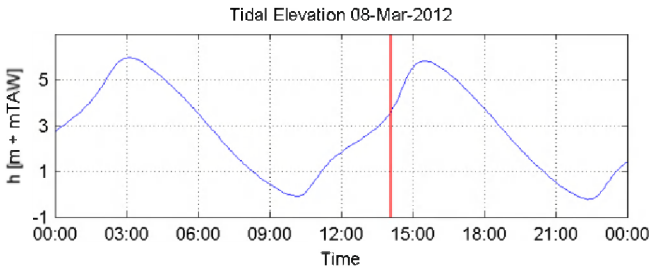
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6555_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

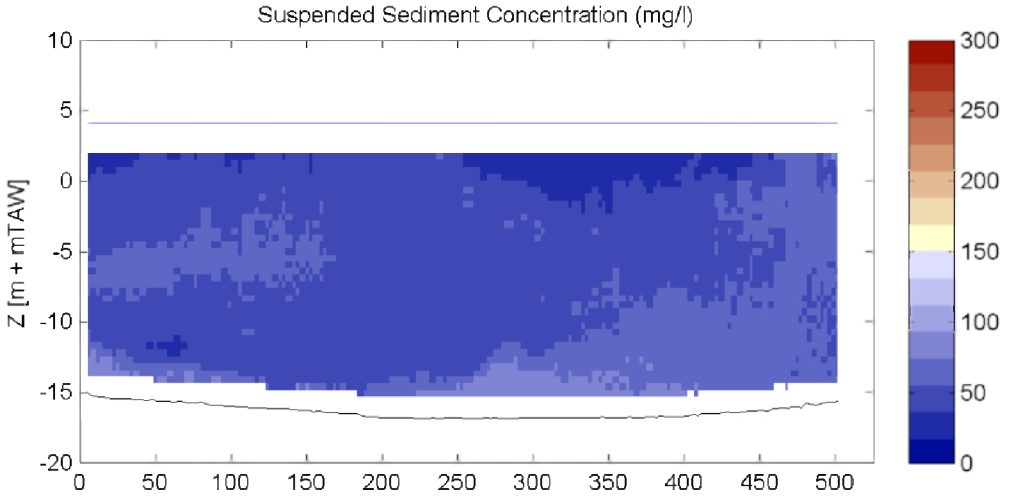
Date / Time [MET] :
08-Mar-2012
14:03 - 14:06

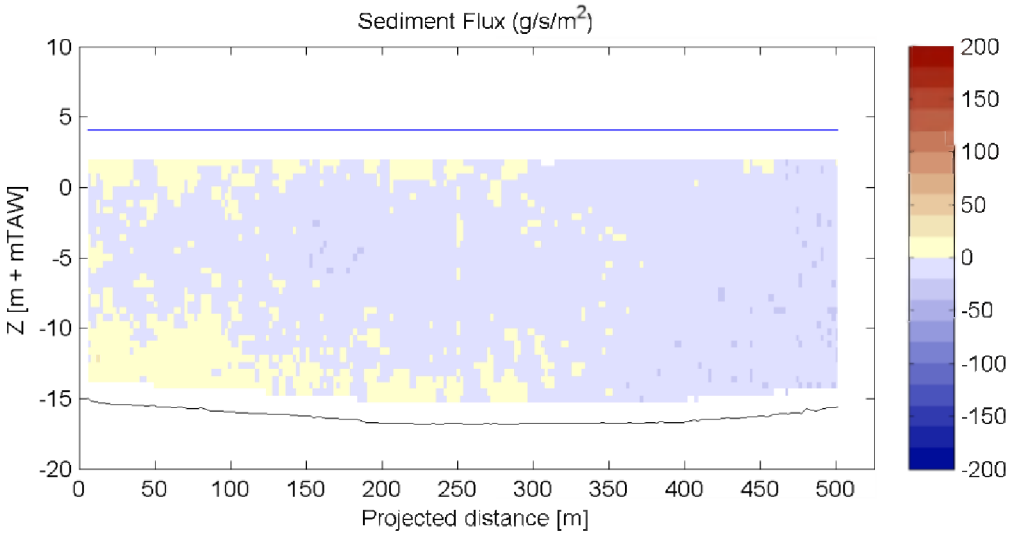
Time after HW [HH:MM]
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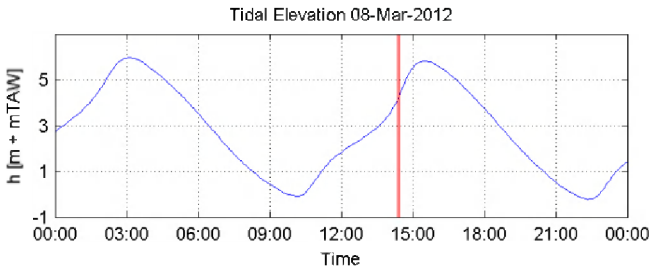
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6557_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

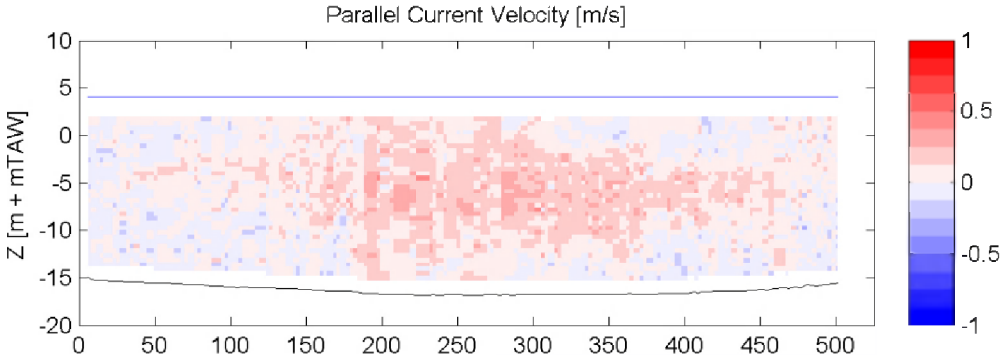
Date / Time [MET] :
08-Mar-2012
14:22 - 14:25

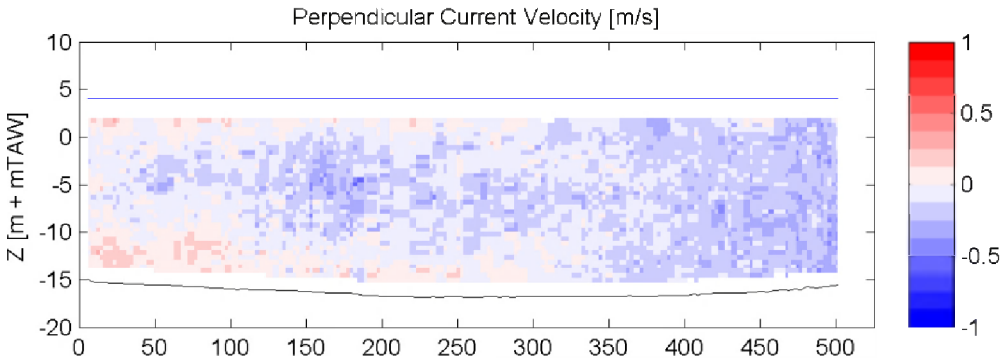
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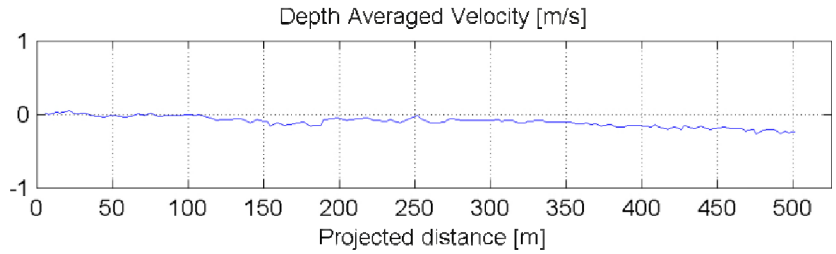
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

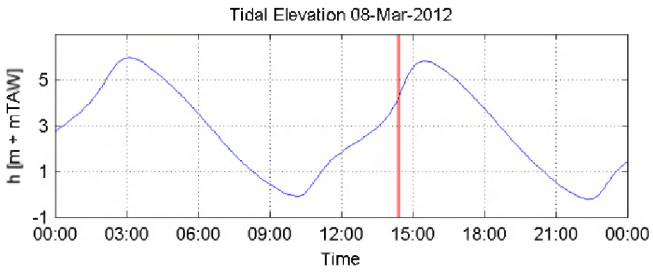
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6557_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

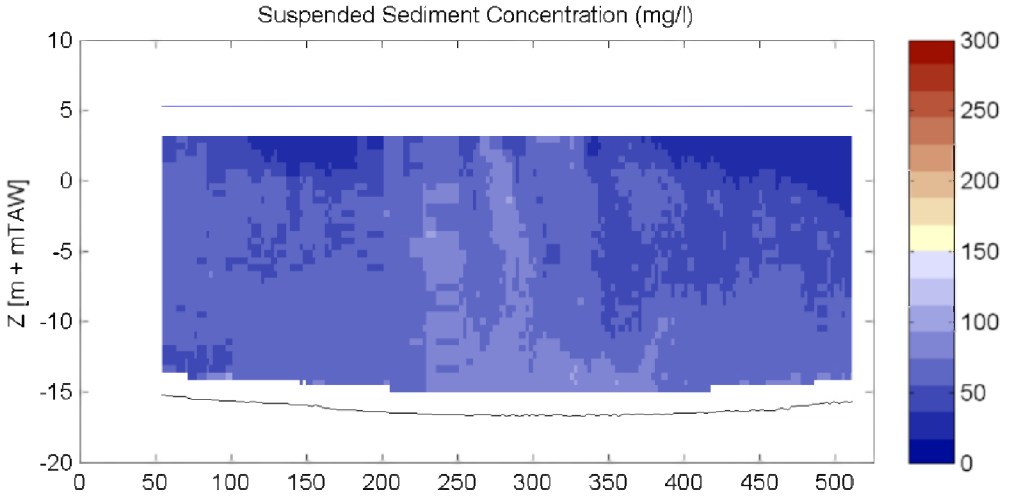
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08-Mar-2012
14:22 - 14:25

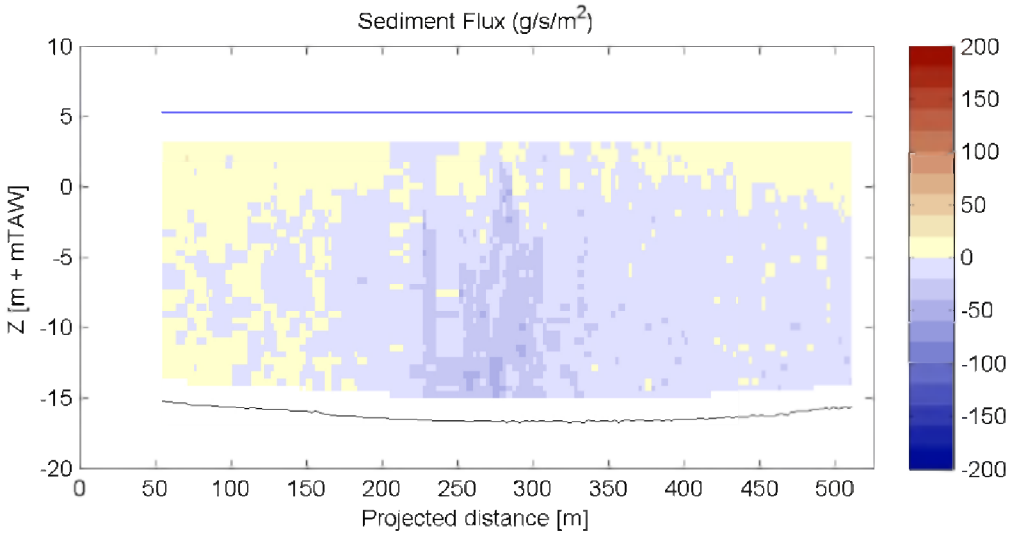
Time after HW [HH:MM]
-1:01

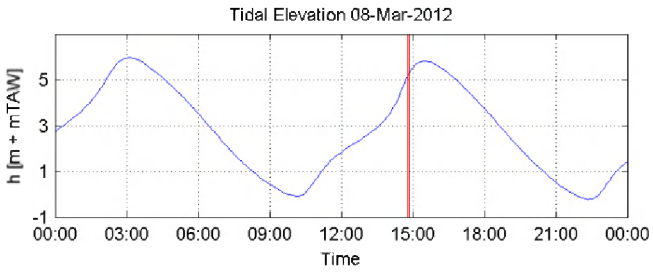
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6559_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

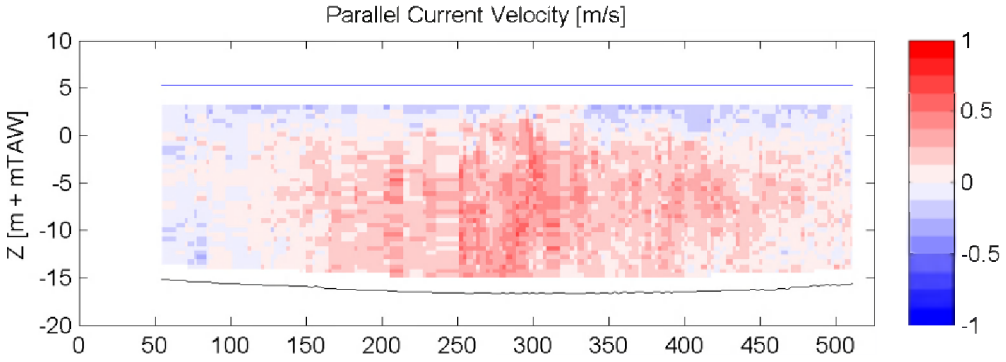
Date / Time [MET] :
08-Mar-2012
14:47 - 14:51

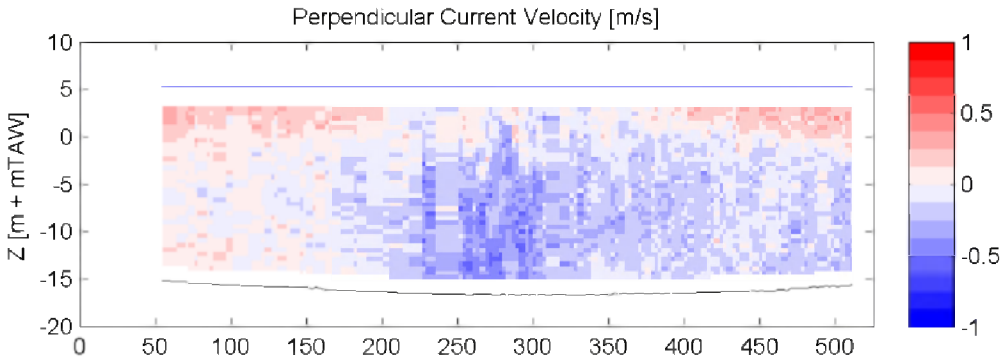
Time after HW [HH:MM]
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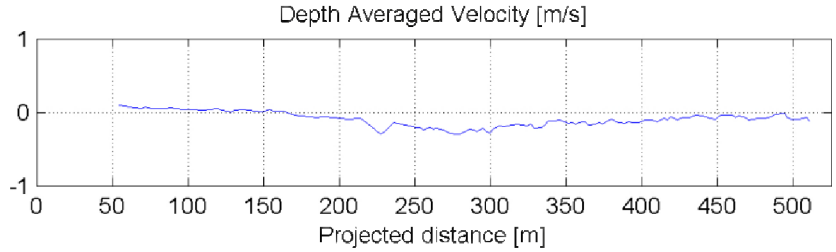
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

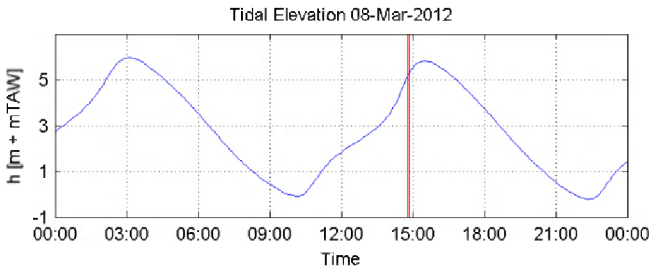
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6559_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

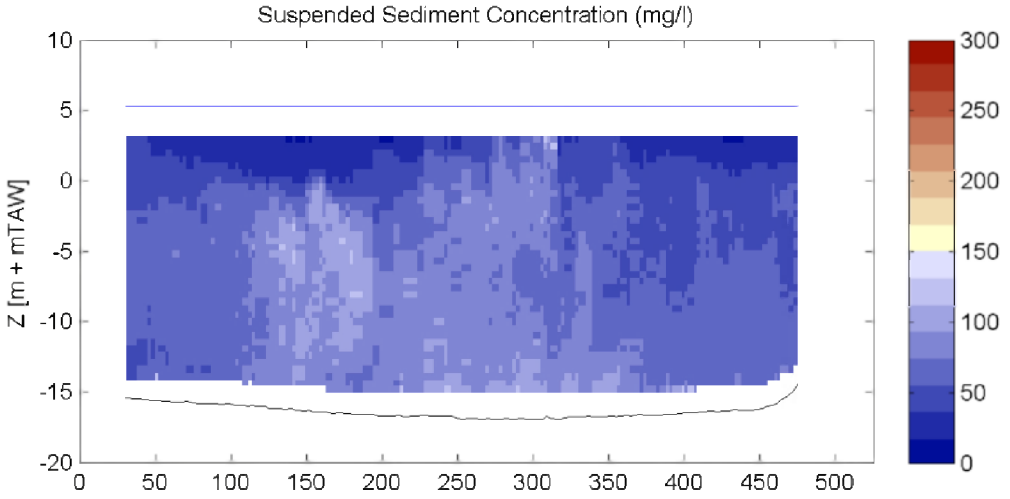
Date / Time [MET] :
08-Mar-2012
14:47 - 14:51

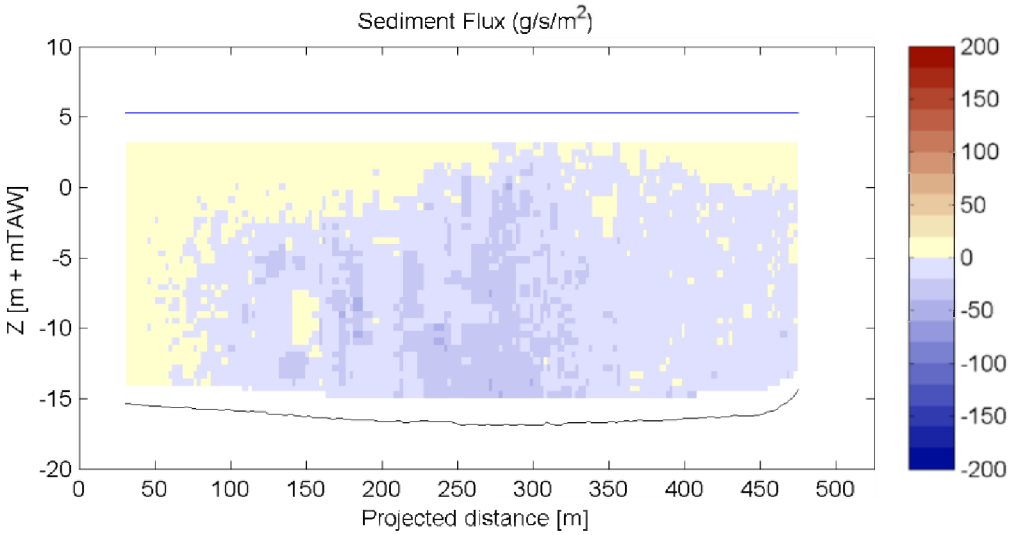
Time after HW [HH:MM]
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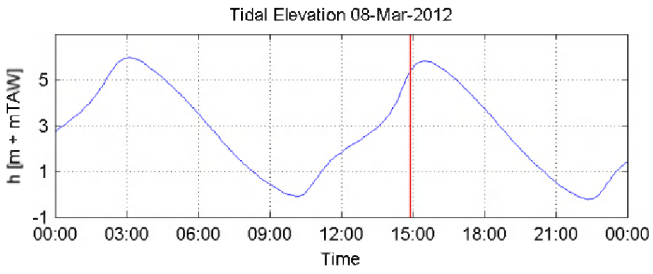
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6560_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW: 03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

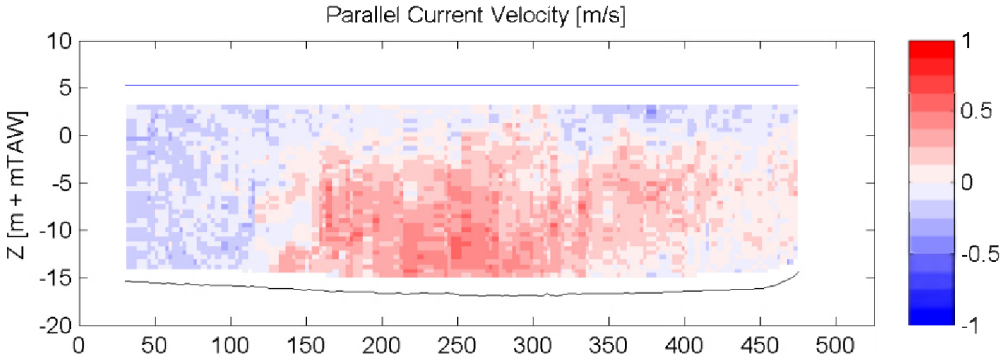
Date / Time [MET] :
08-Mar-2012
14:52 - 14:55

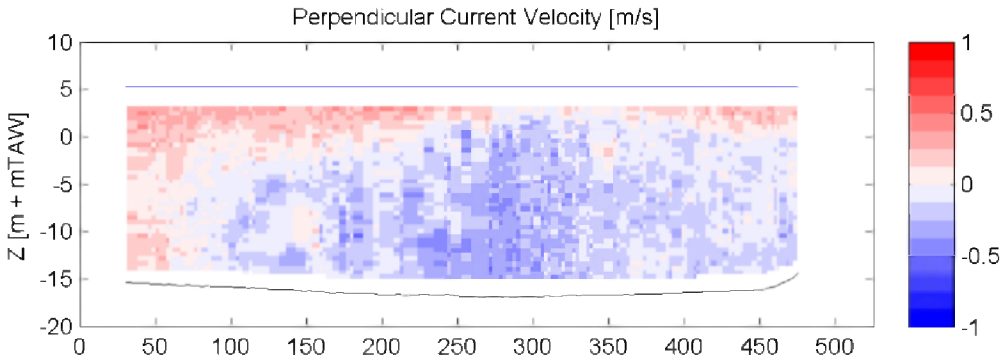
Time after HW [HH:MM]
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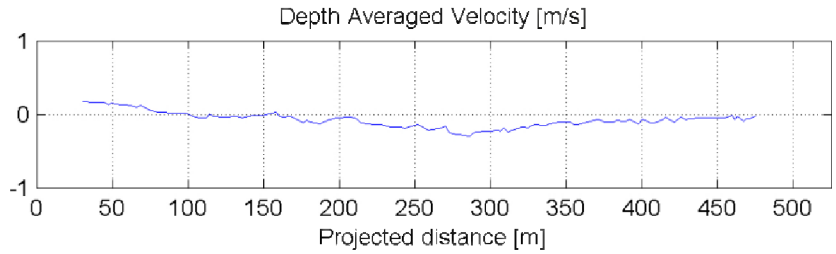
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

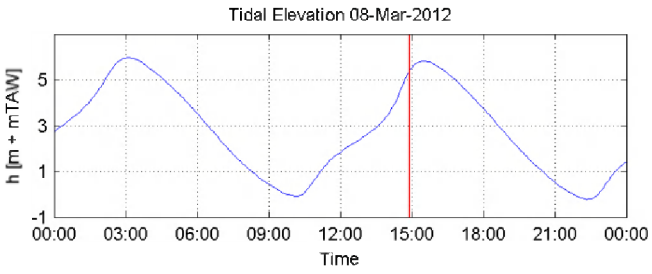
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6560_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

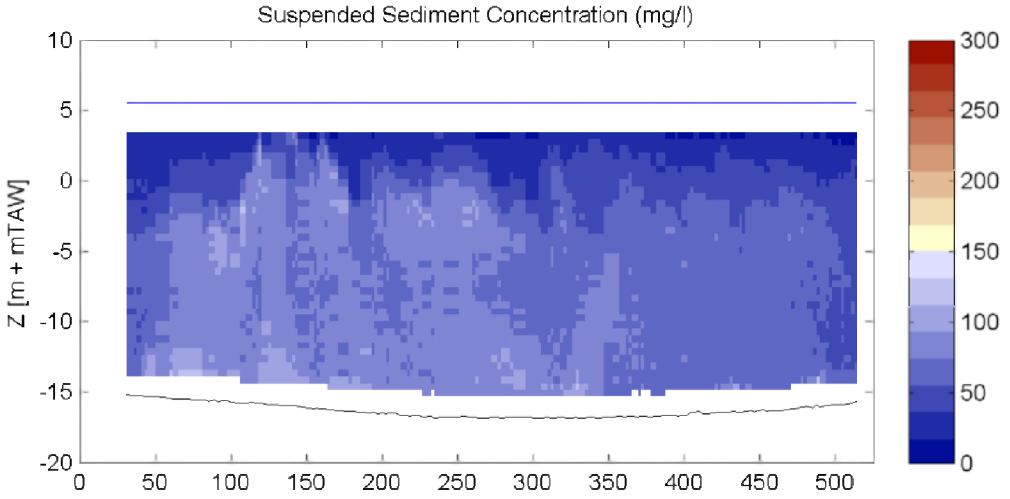
Date / Time [MET] :
08-Mar-2012
14:52 - 14:55

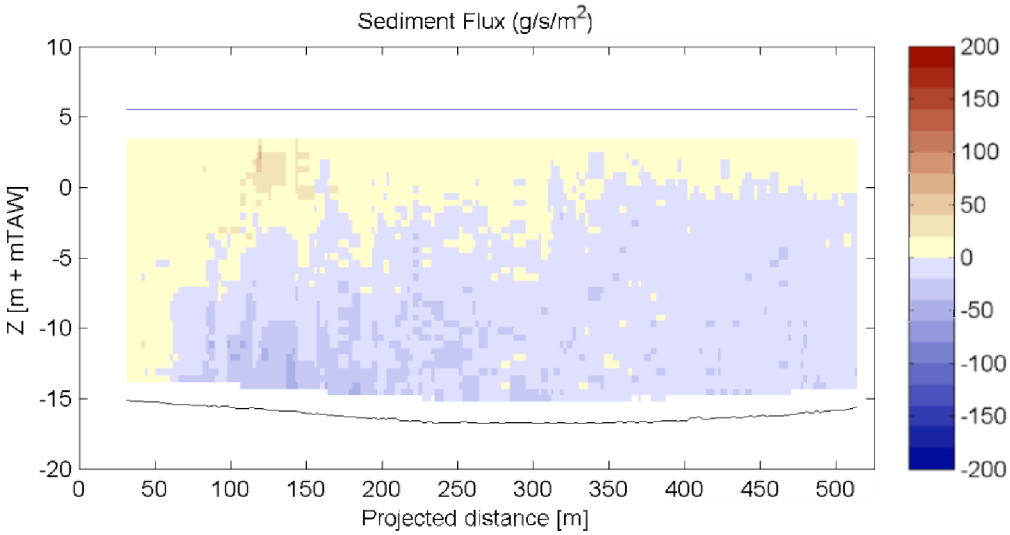
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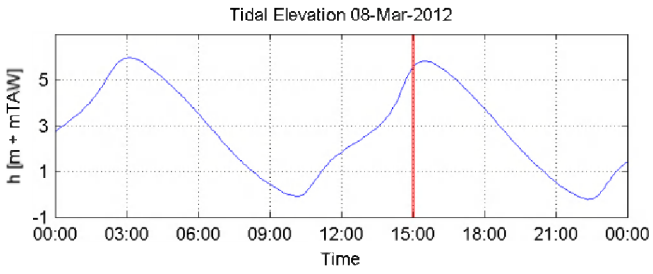
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6561_dgdTBA.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

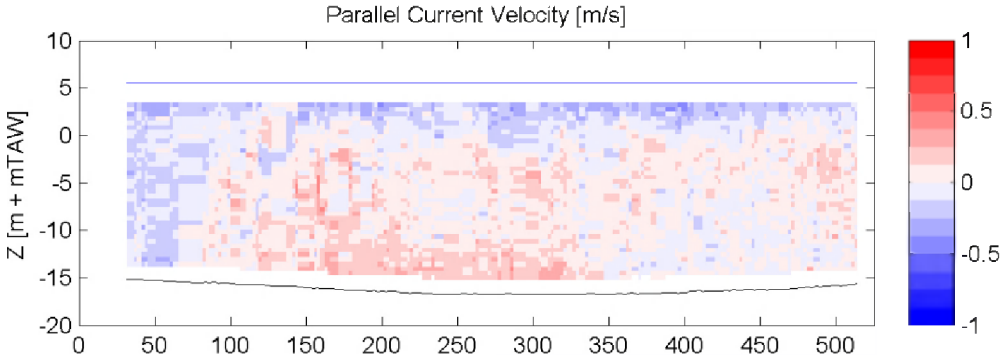
Date / Time [MET] :
08-Mar-2012
14:59 - 15:03

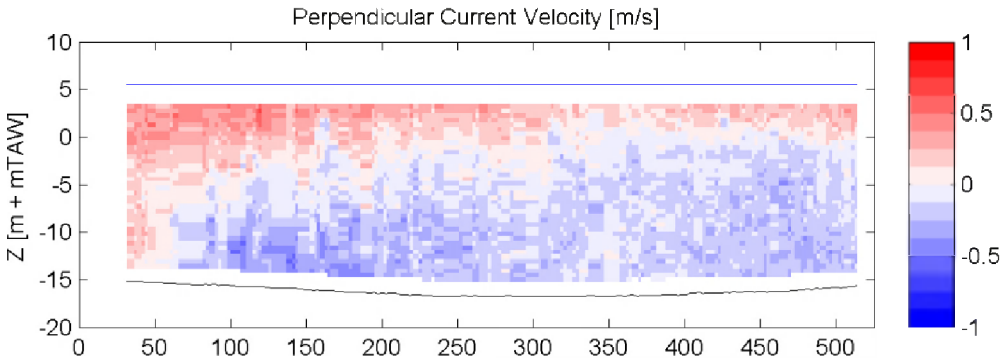
Time after HW [HH:MM]
-0:23

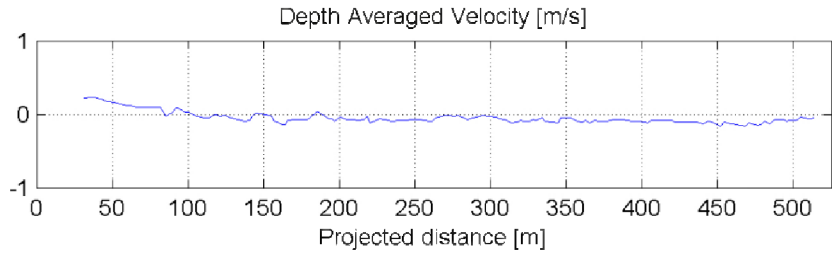
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

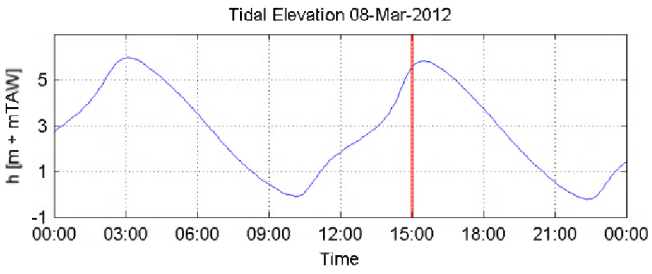
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6561_dgdTBA.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

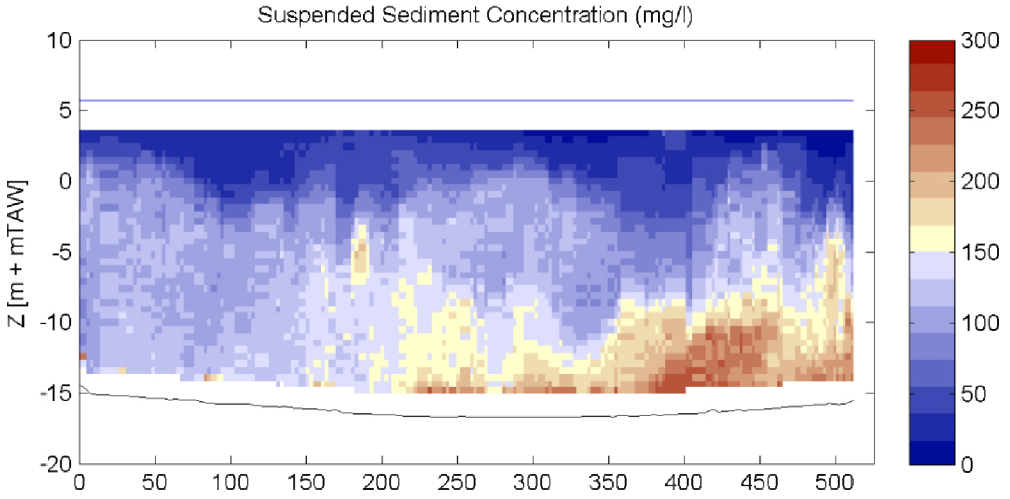
Date / Time [MET] :
08-Mar-2012
14:59 - 15:03

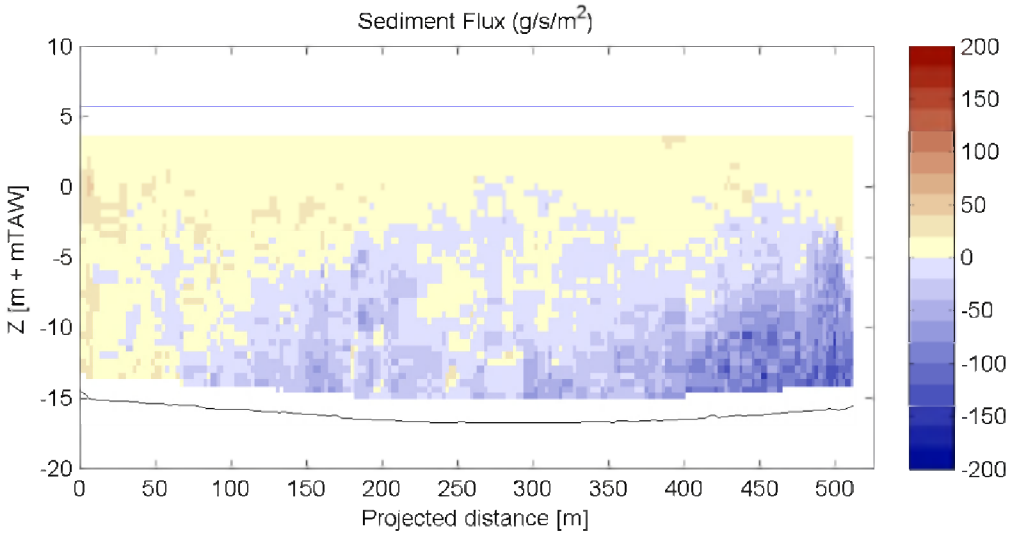
Time after HW [HH:MM]
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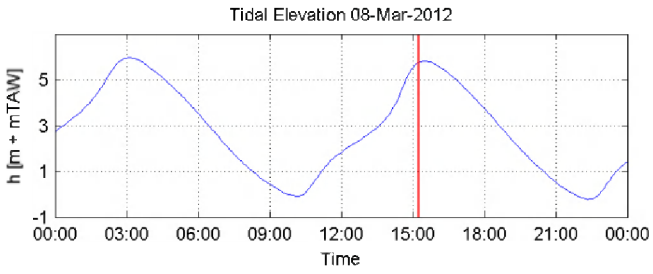
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6563_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

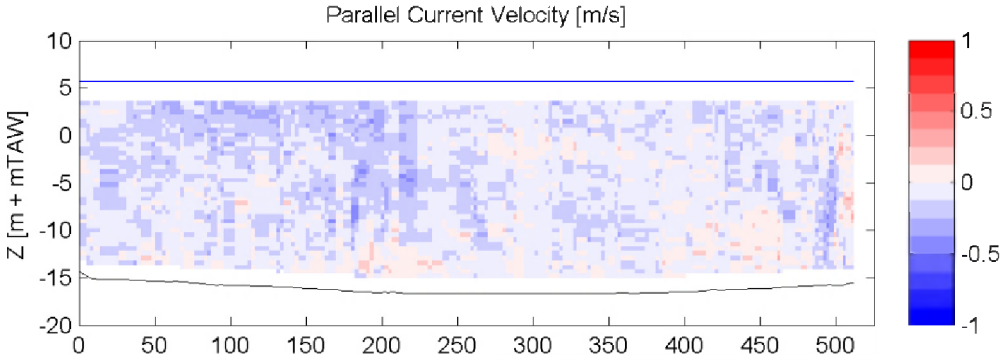
Date / Time [MET] :
08-Mar-2012
15:12 - 15:16

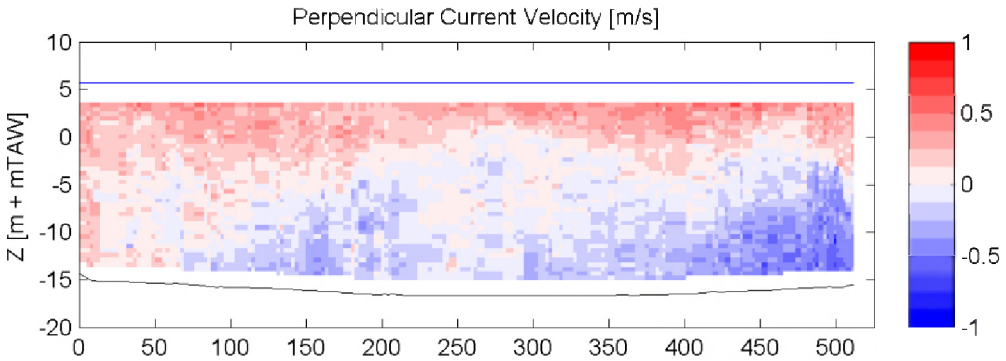
Time after HW [HH:MM]
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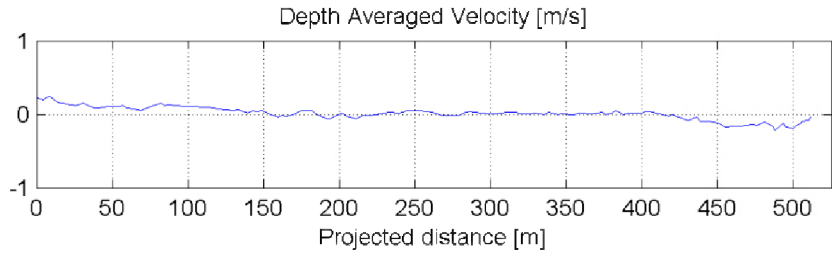
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

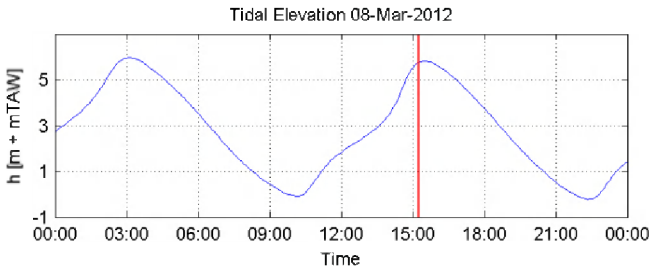
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6563_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

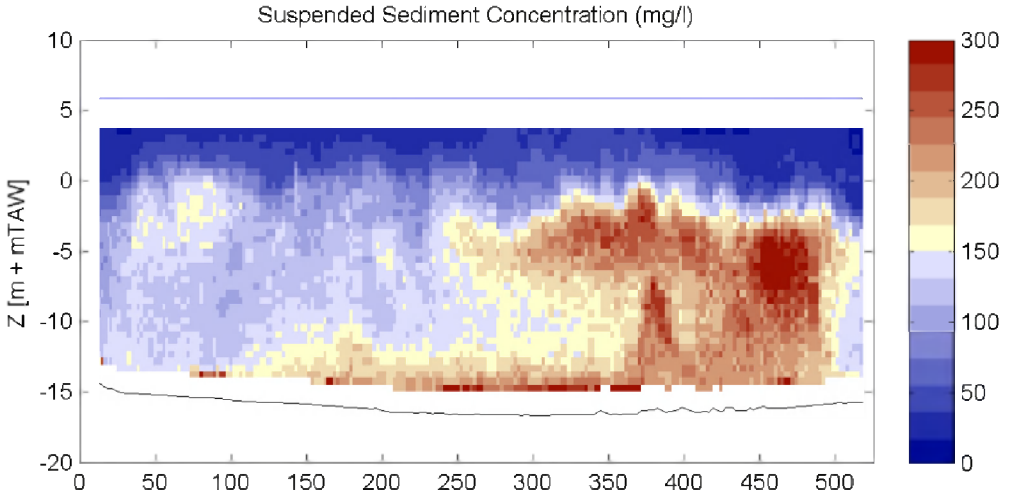
Date / Time [MET] :
08-Mar-2012
15:12 - 15:16

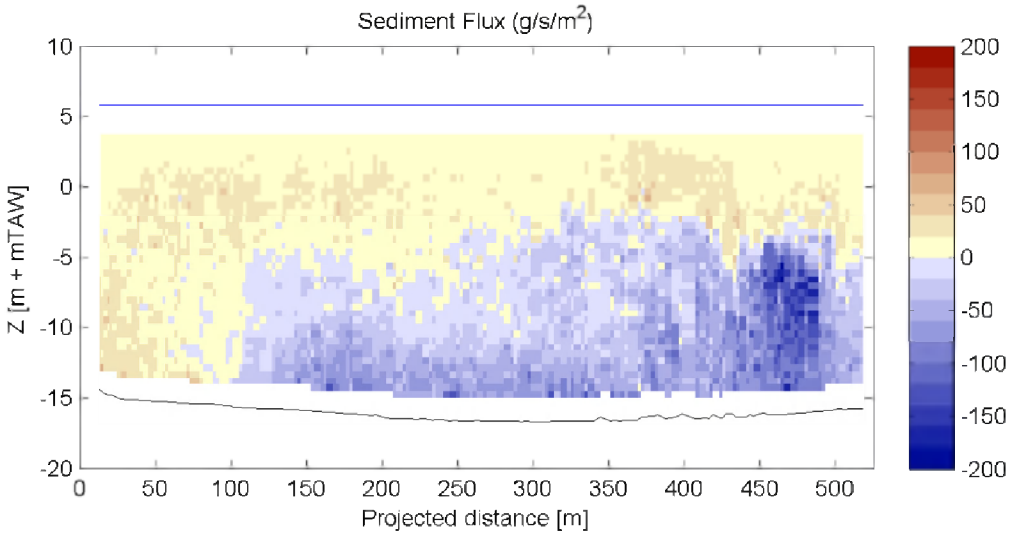
Time after HW [HH:MM]
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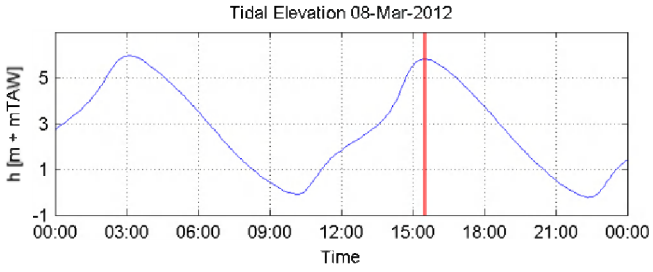
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6565_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

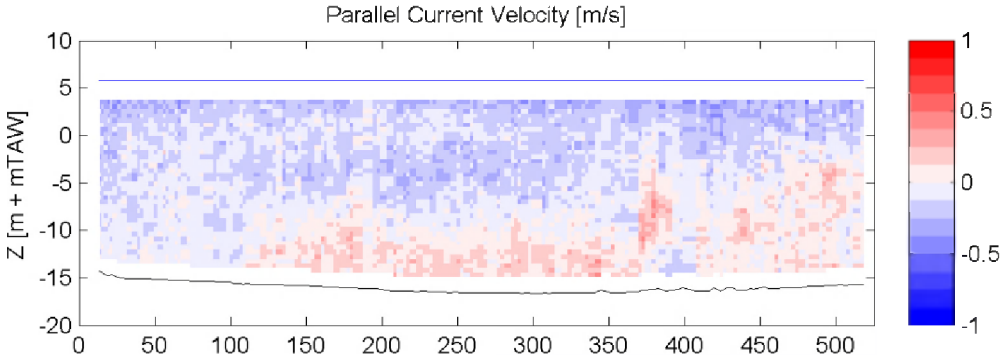
Date / Time [MET] :
08-Mar-2012
15:28 - 15:32

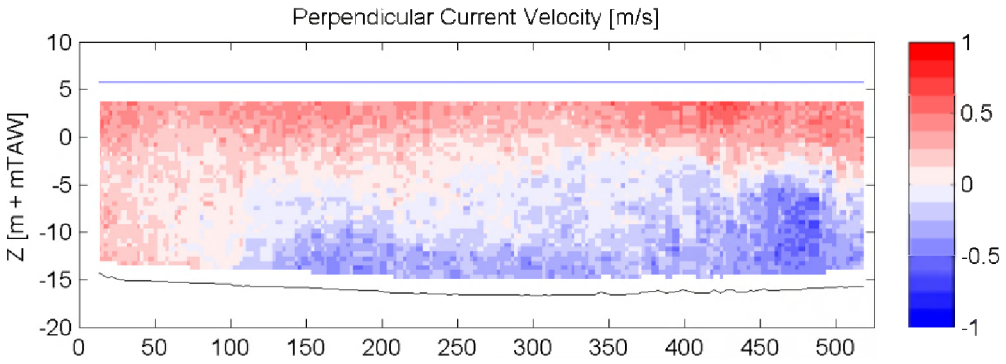
Time after HW [HH:MM]
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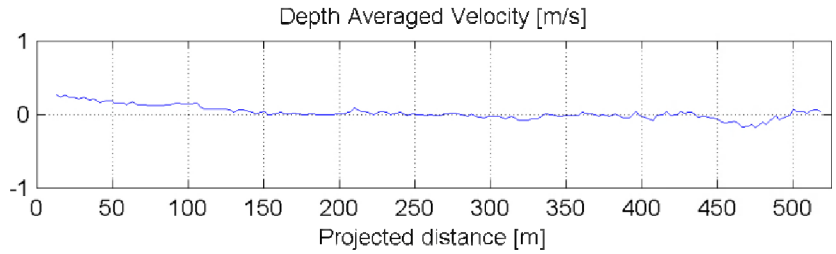
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

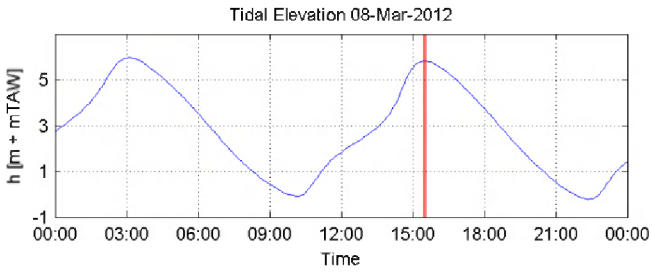
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6565_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

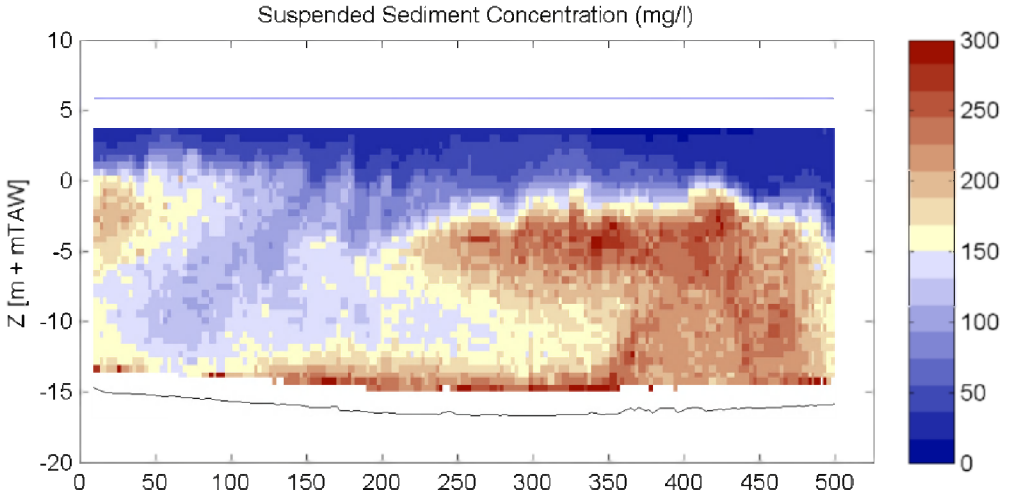
Date / Time [MET] :
08-Mar-2012
15:28 - 15:32

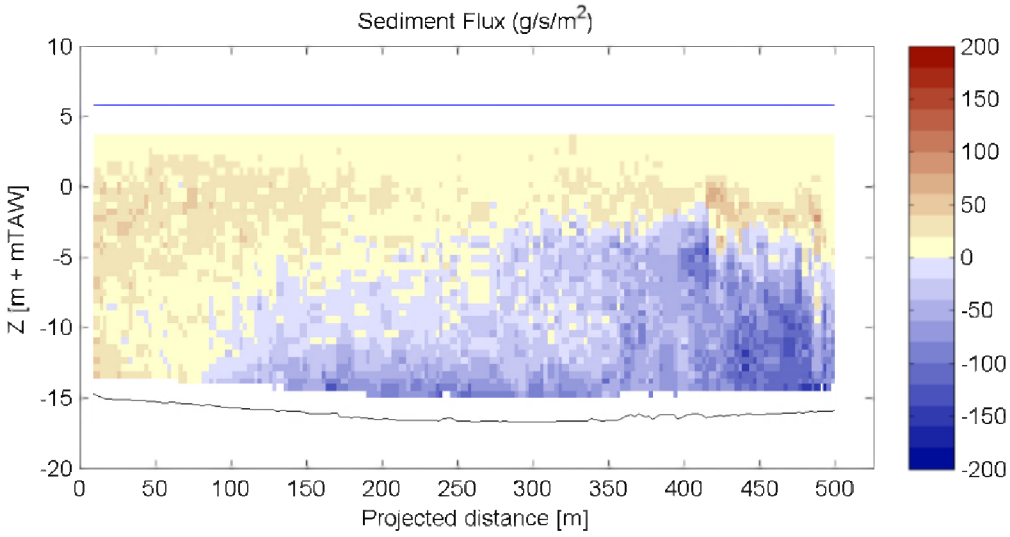
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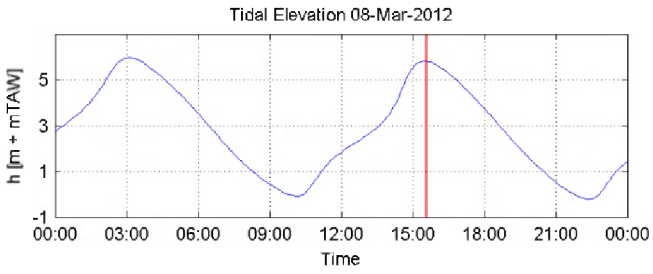
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6566_dgdTAB.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

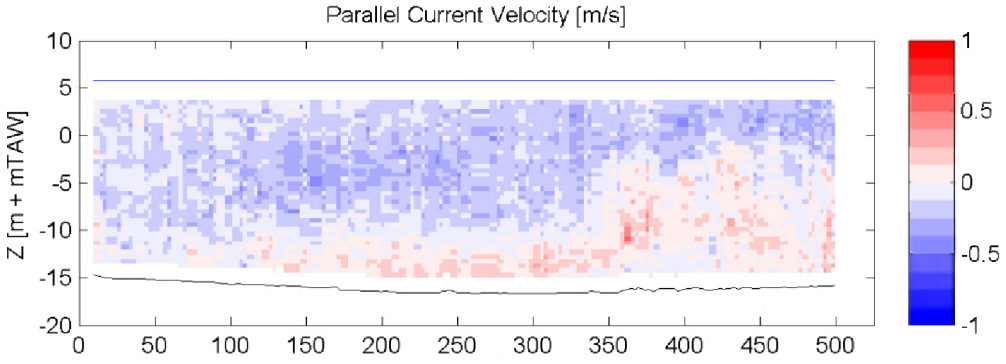
Date / Time [MET] :
08-Mar-2012
15:32 - 15:36

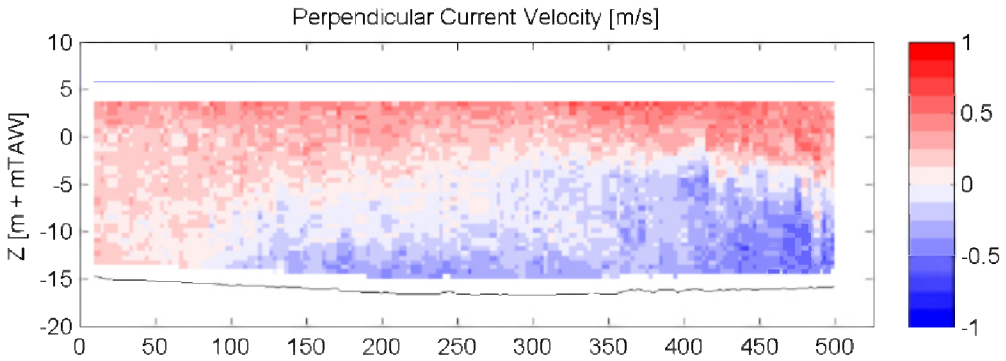
Time after HW [HH:MM]
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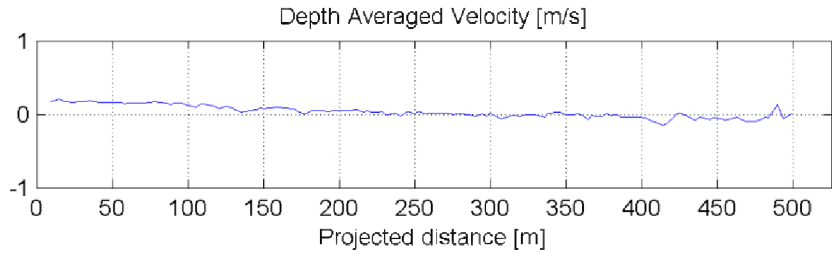
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

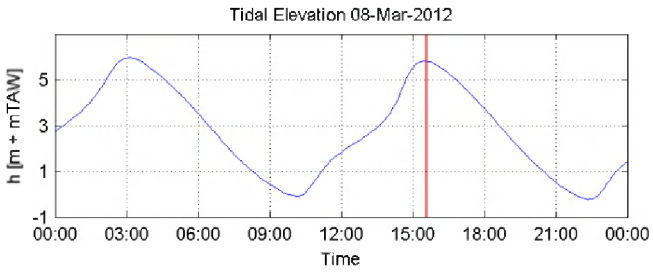
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6566_dgdTAB.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

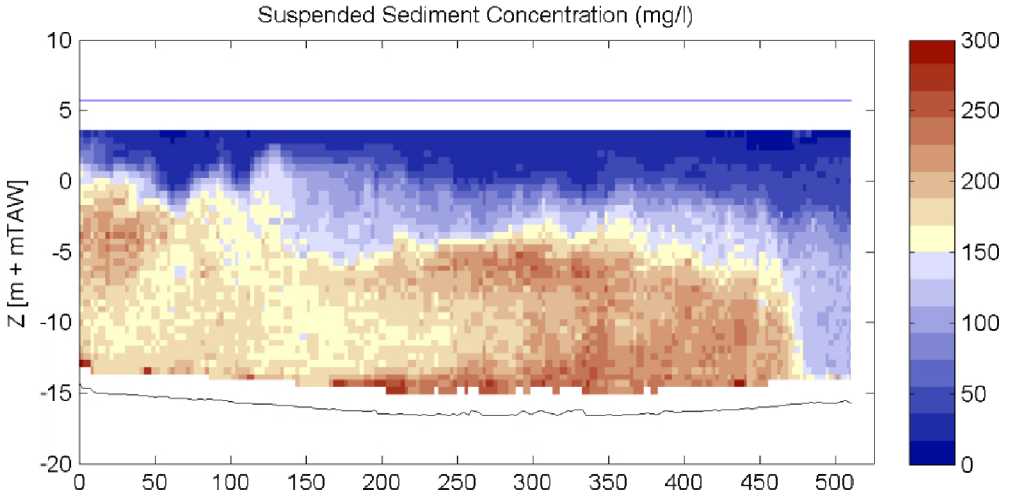
Date / Time [MET] :
08-Mar-2012
15:32 - 15:36

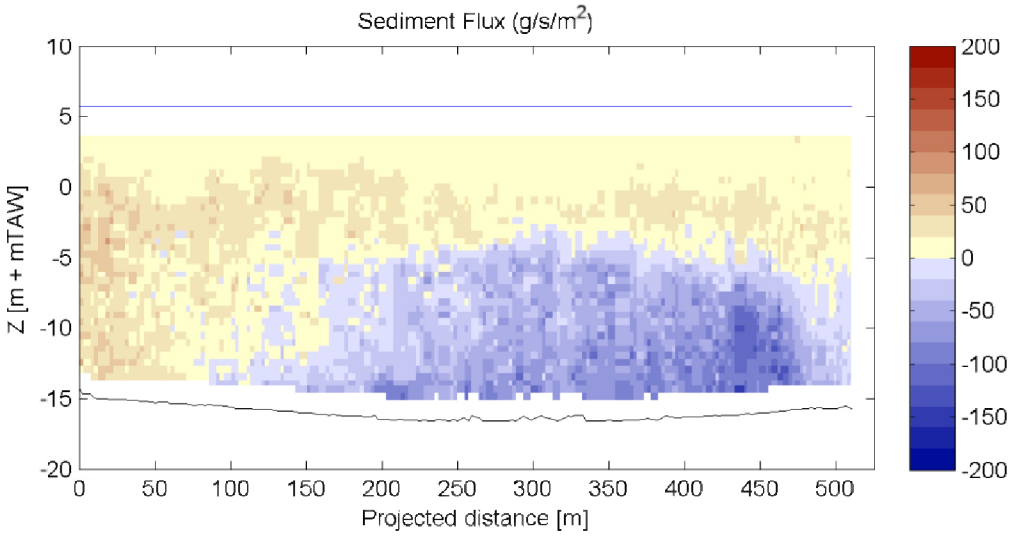
Time after HW [HH:MM]
0:09

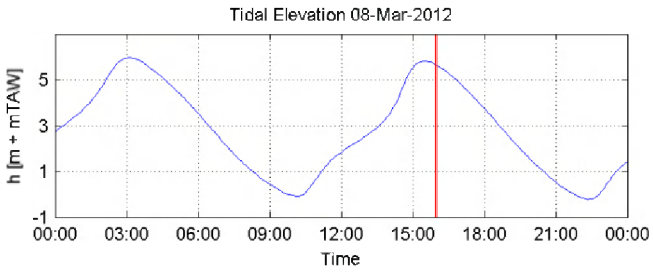
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6570_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

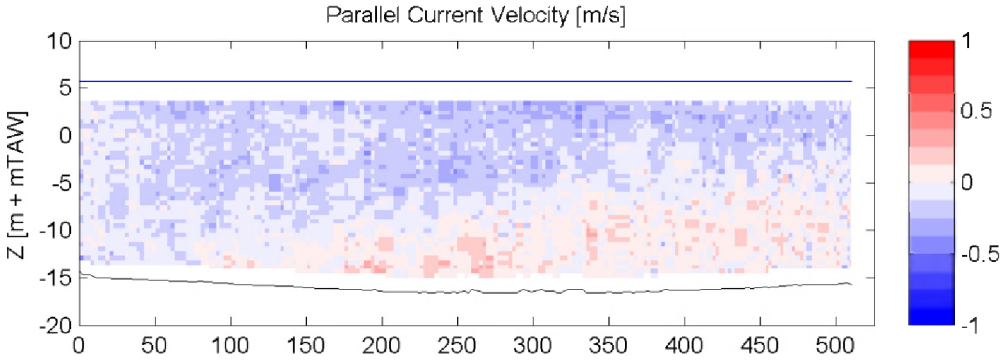
Date / Time [MET] :
08-Mar-2012
15:57 - 16:00

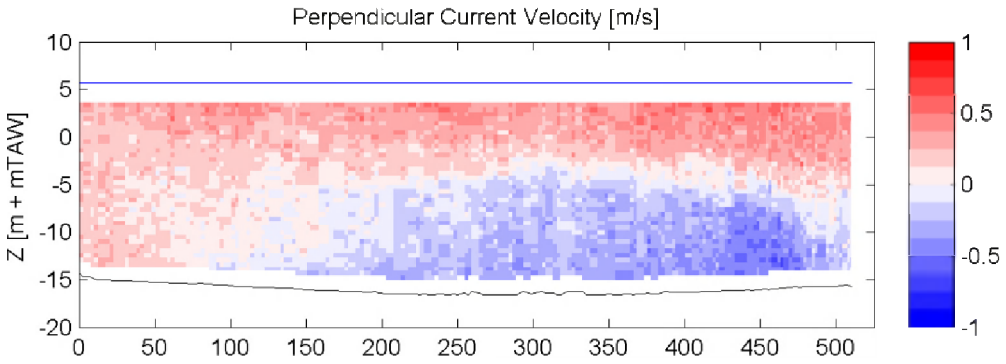
Time after HW [HH:MM]
0:34

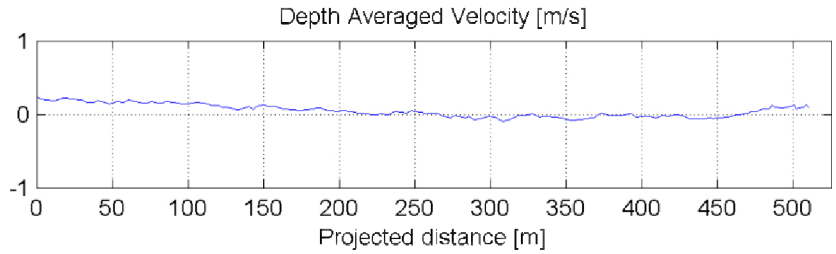
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

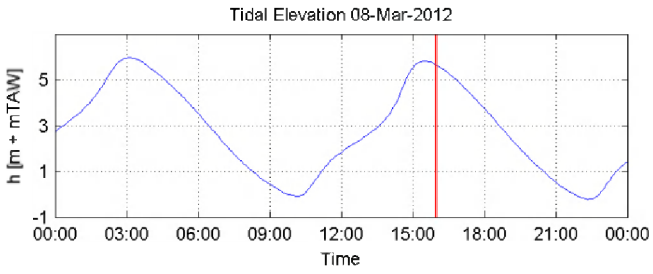
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6570_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

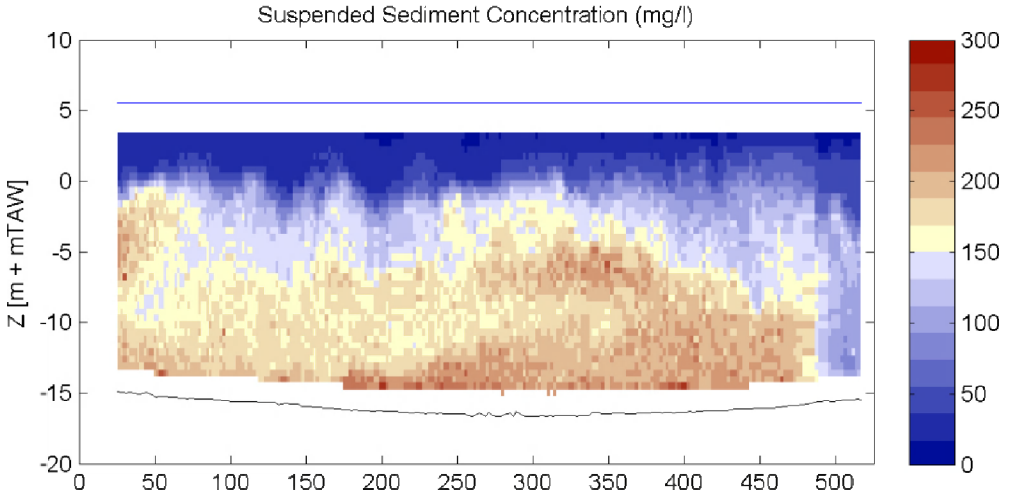
Date / Time [MET] :
08-Mar-2012
15:57 - 16:00

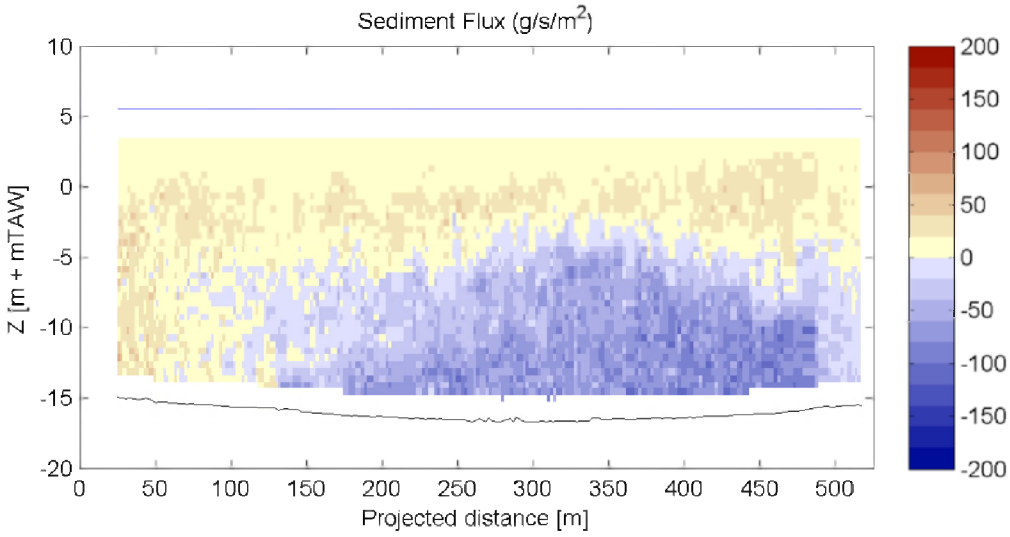
Time after HW [HH:MM]
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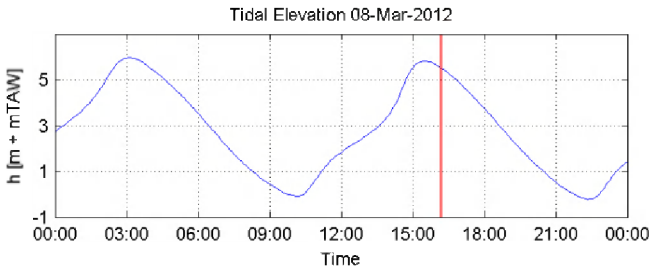
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6572_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

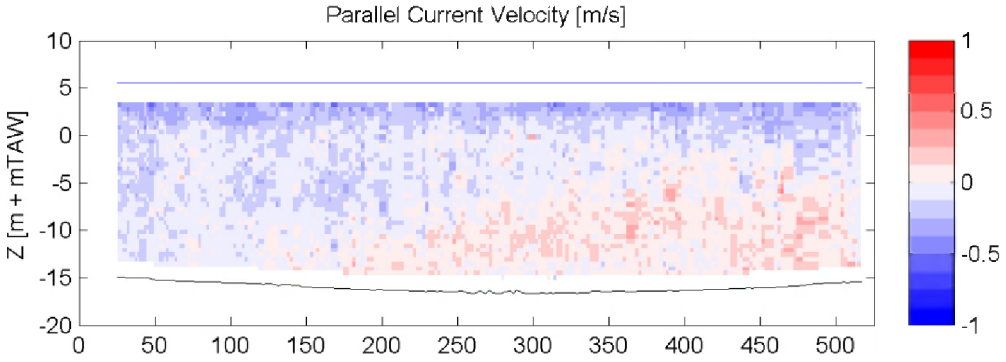
Date / Time [MET] :
08-Mar-2012
16:09 - 16:14

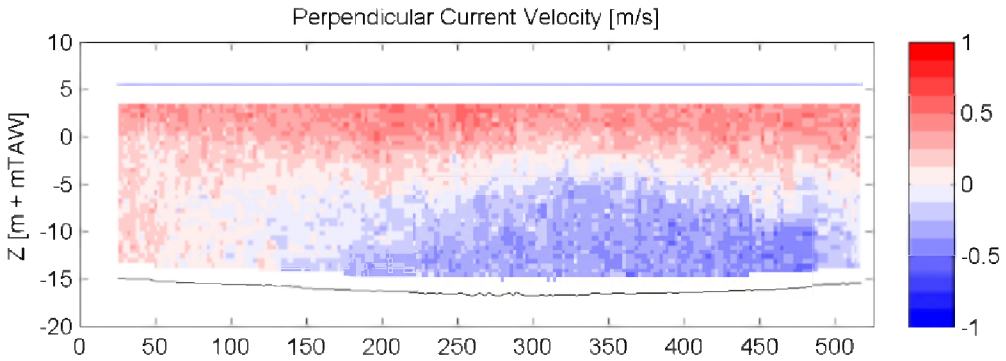
Time after HW [HH:MM]
0:47

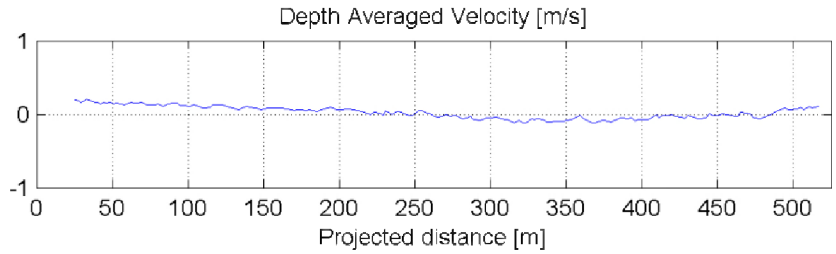
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

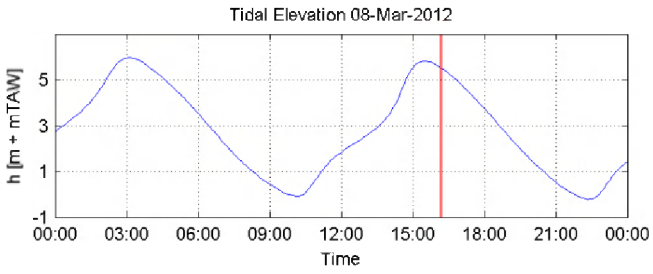
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6572_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

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

Time after HW [HH:MM]
0:47

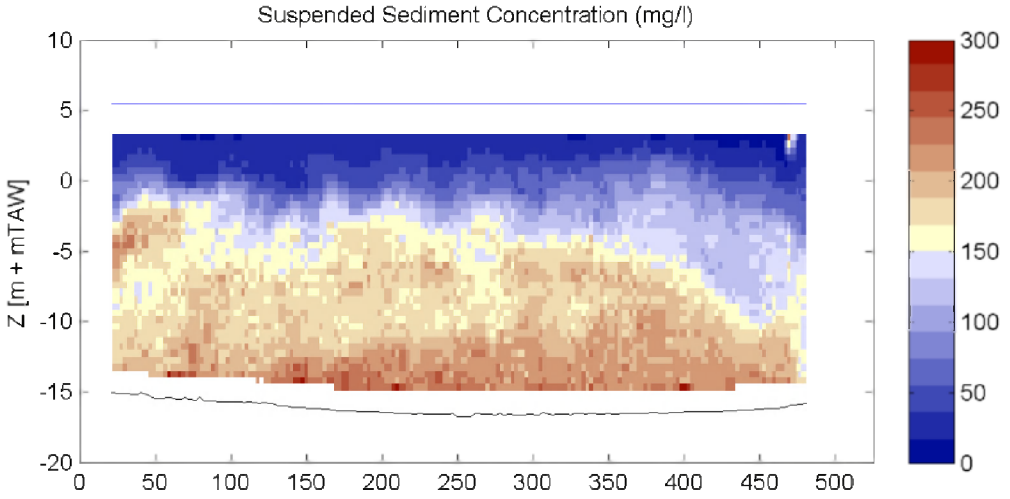
Data Processed by:

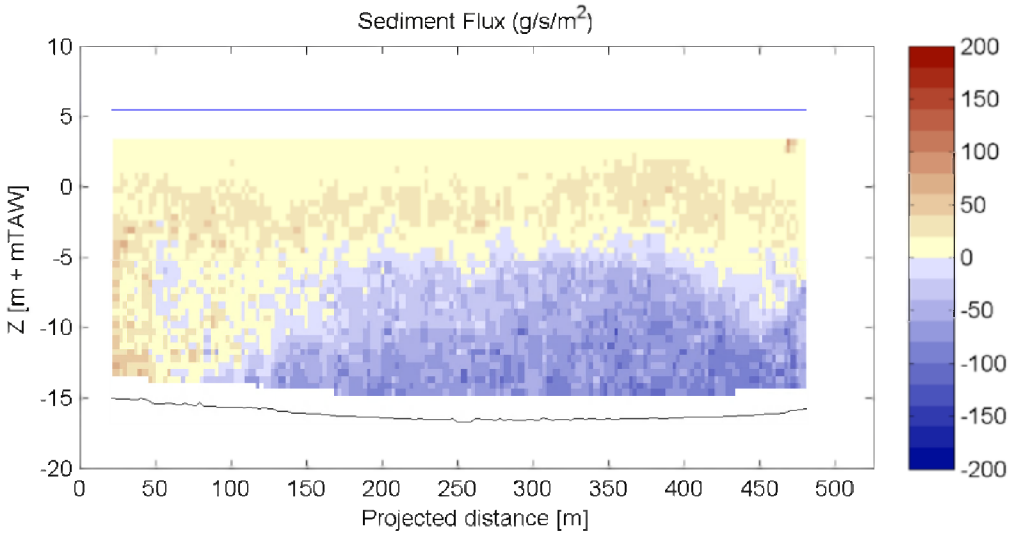
In association with :

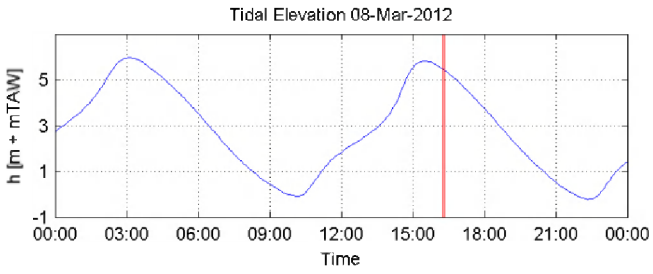
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6573_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

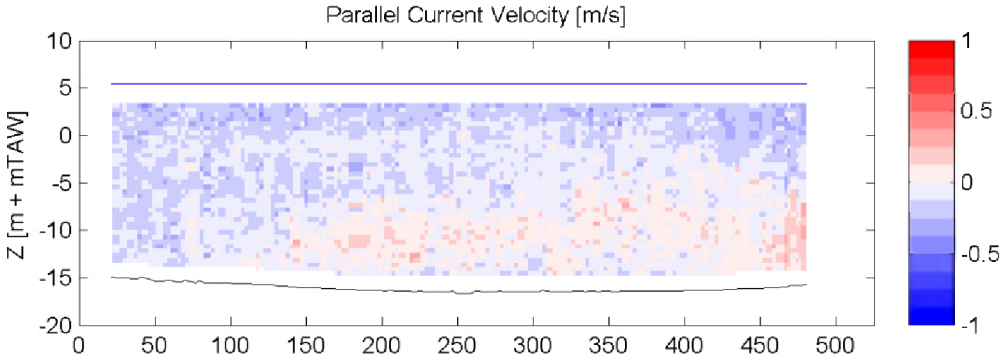
Date / Time [MET] :
08-Mar-2012
16:15 - 16:18

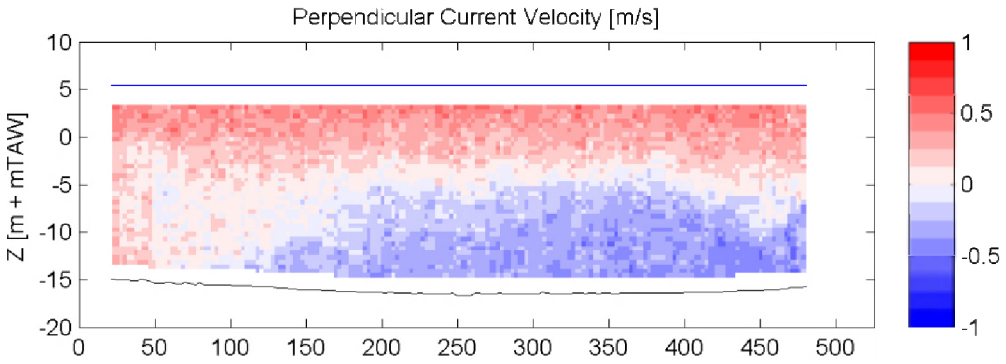
Time after HW [HH:MM]
0:52

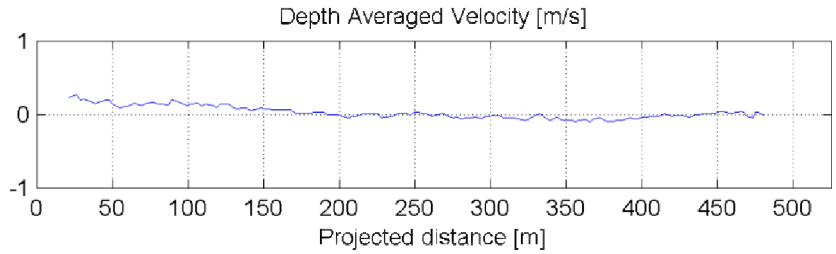
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

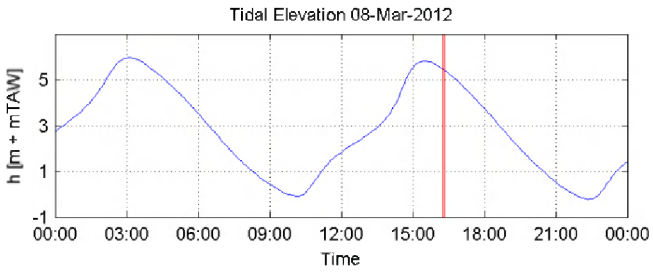
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6573_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

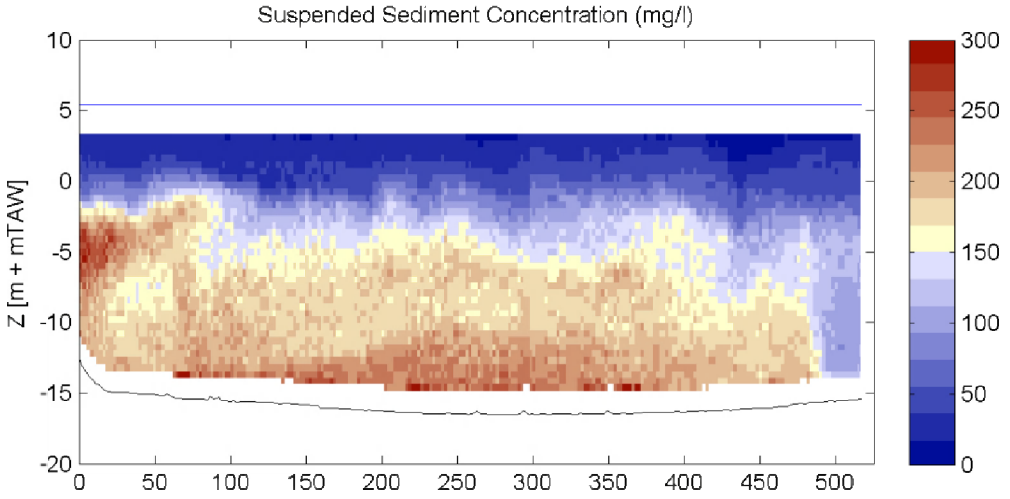
Date / Time [MET] :
08-Mar-2012
16:15 - 16:18

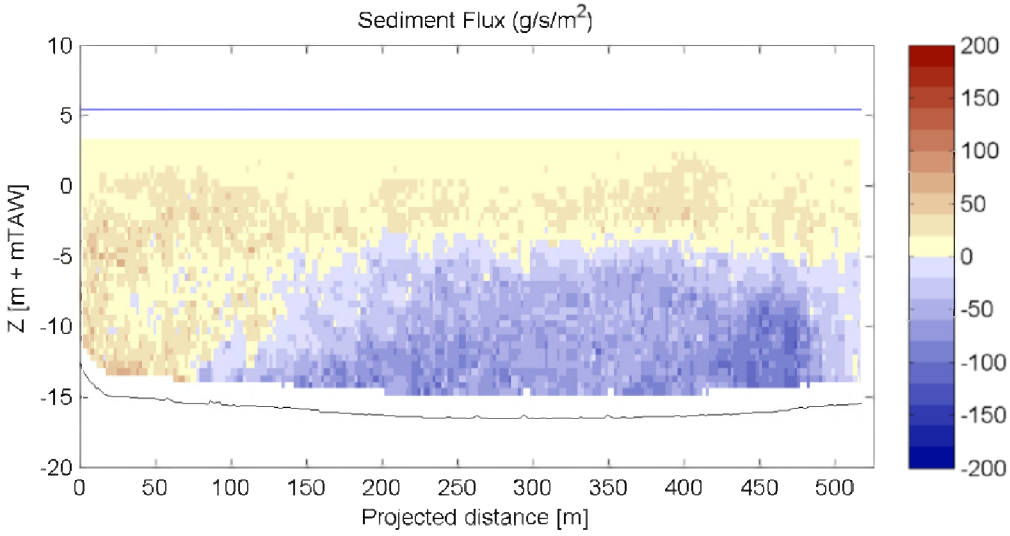
Time after HW [HH:MM]
0:52

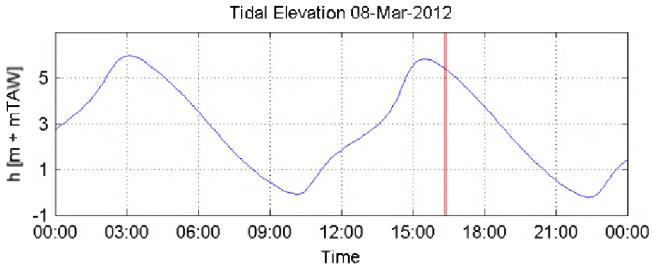
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6574_dgdTBA.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

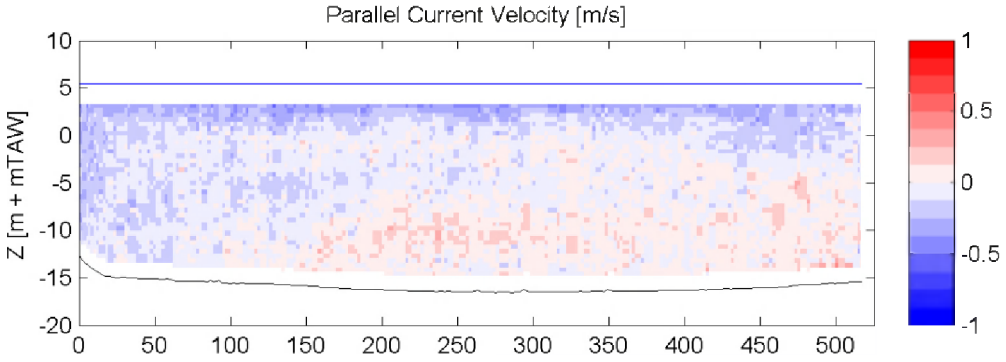
Date / Time [MET] :
08-Mar-2012
16:19 - 16:24

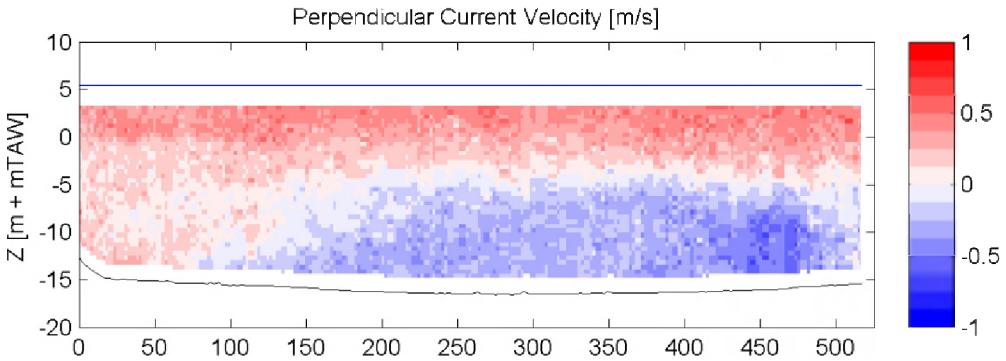
Time after HW [HH:MM]
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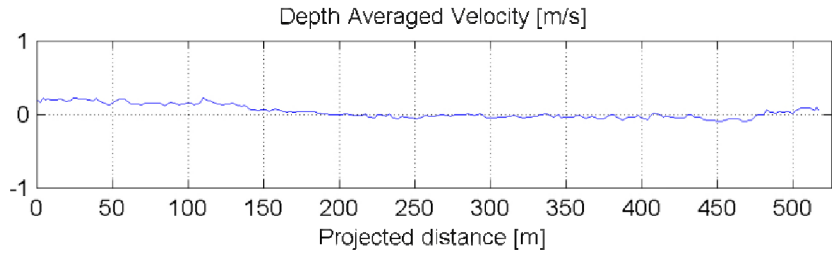
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

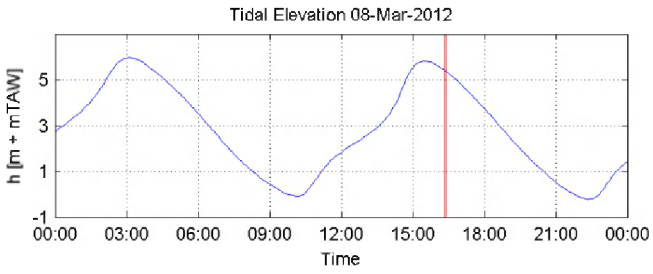
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6574_dgdTBA.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

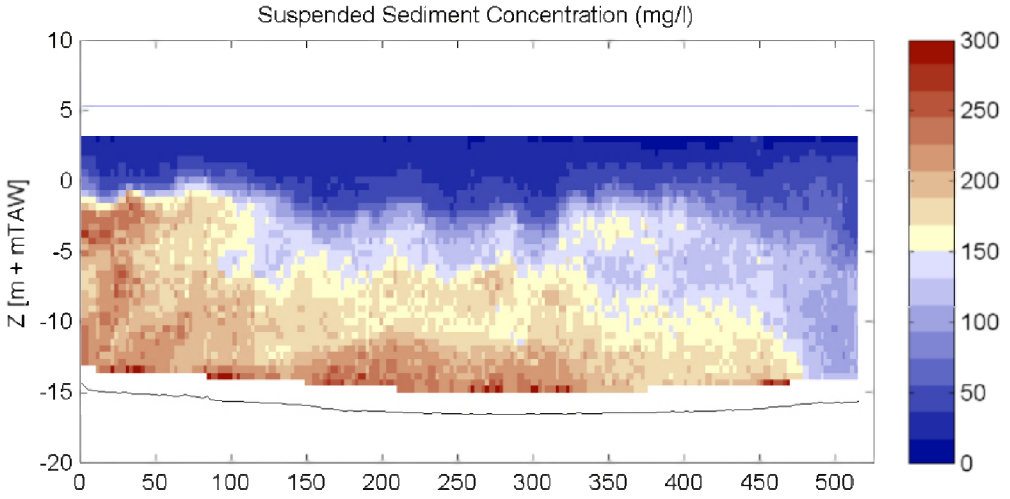
Date / Time [MET] :
08-Mar-2012
16:19 - 16:24

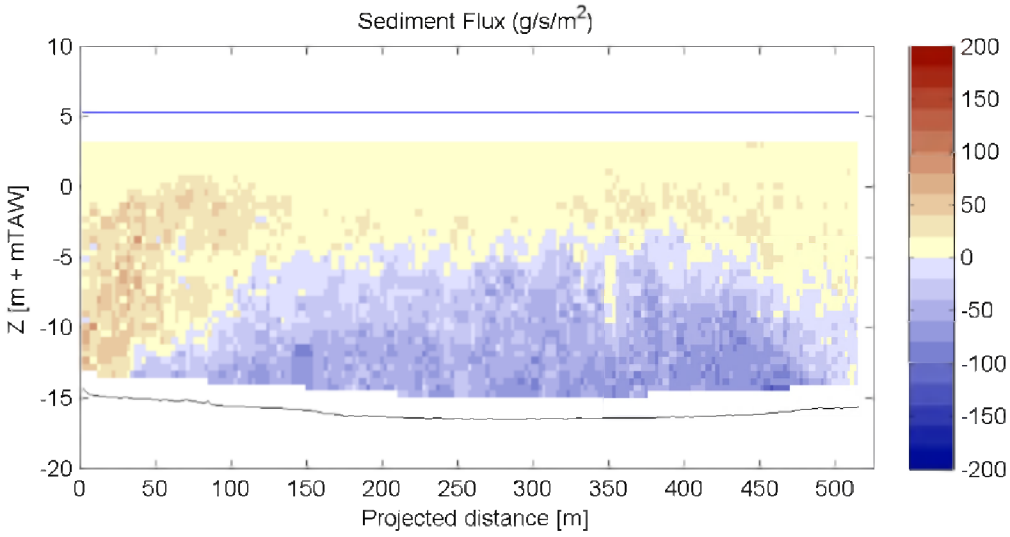
Time after HW [HH:MM]
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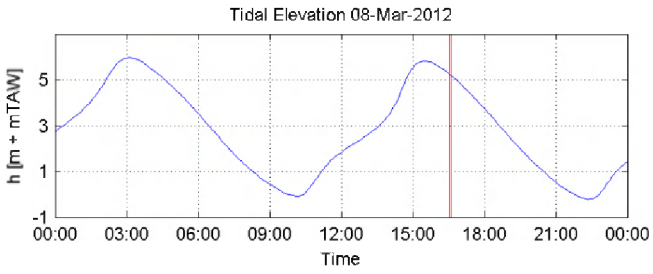
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6576_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

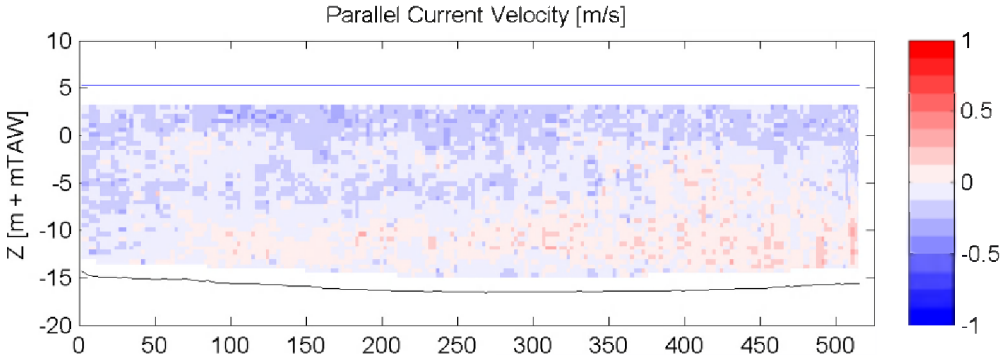
Date / Time [MET] :
08-Mar-2012
16:31 - 16:35

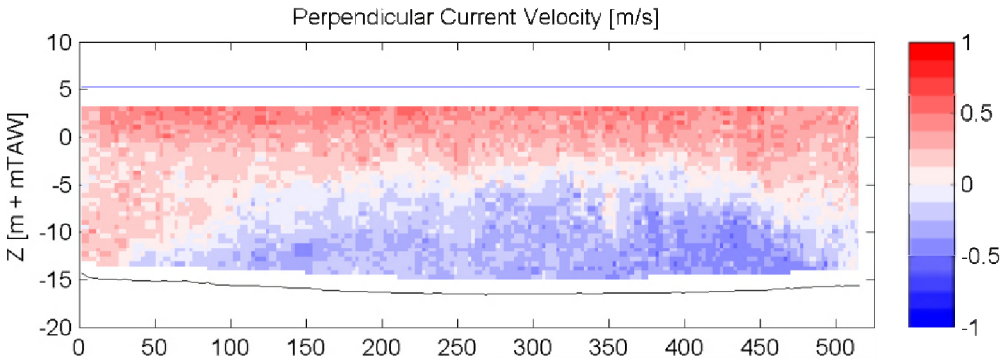
Time after HW [HH:MM]
1:08

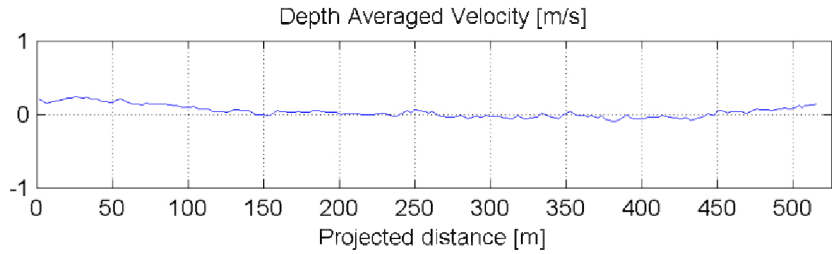
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

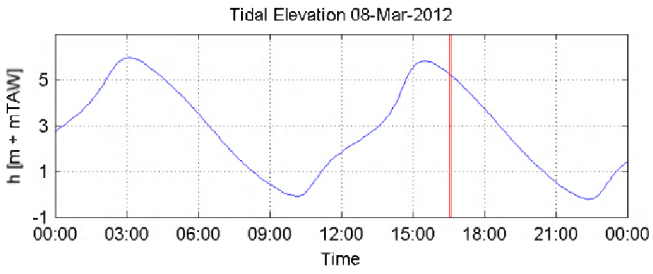
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6576_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW: 03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

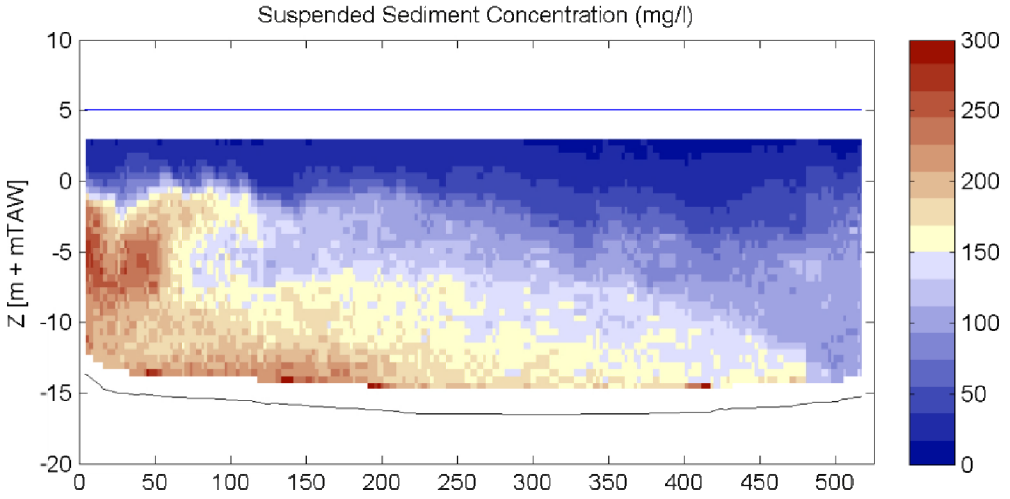
Date / Time [MET] :
08-Mar-2012
16:31 - 16:35

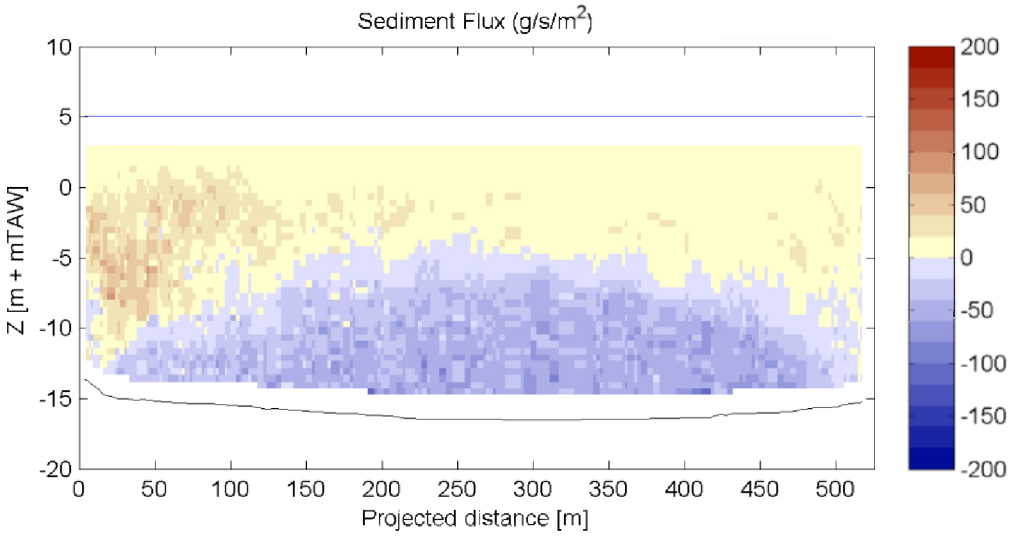
Time after HW [HH:MM]
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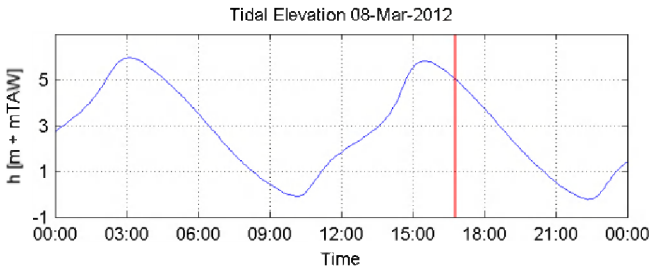
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6578_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

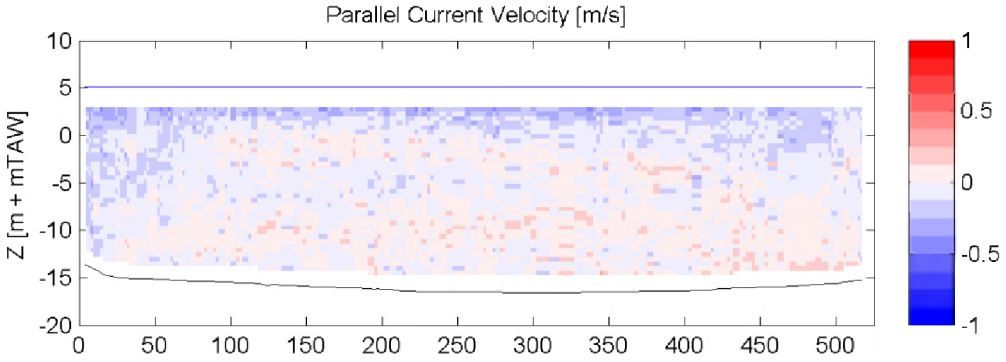
Date / Time [MET] :
08-Mar-2012
16:43 - 16:48

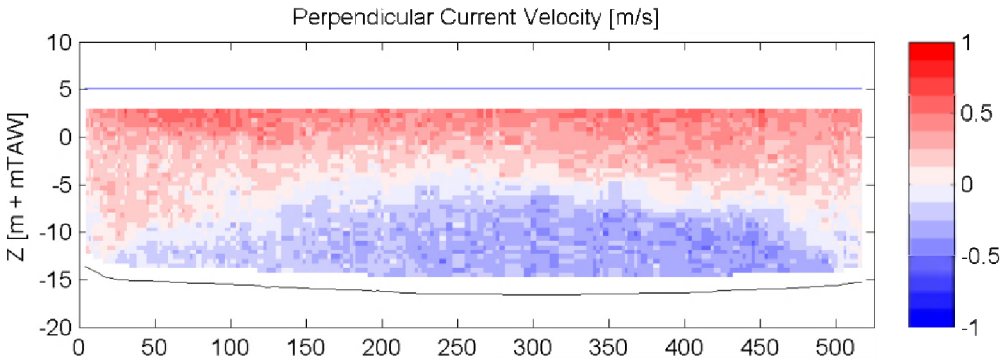
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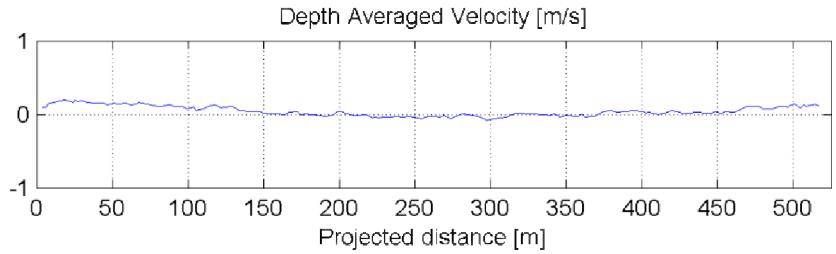
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

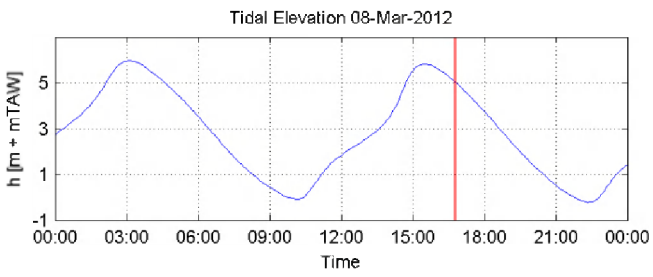
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6578_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

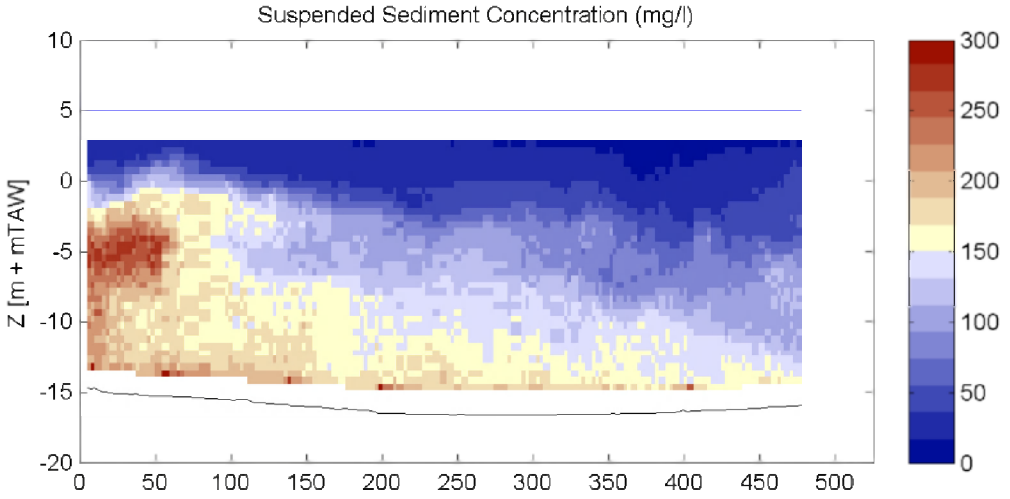
Date / Time [MET] :
08-Mar-2012
16:43 - 16:48

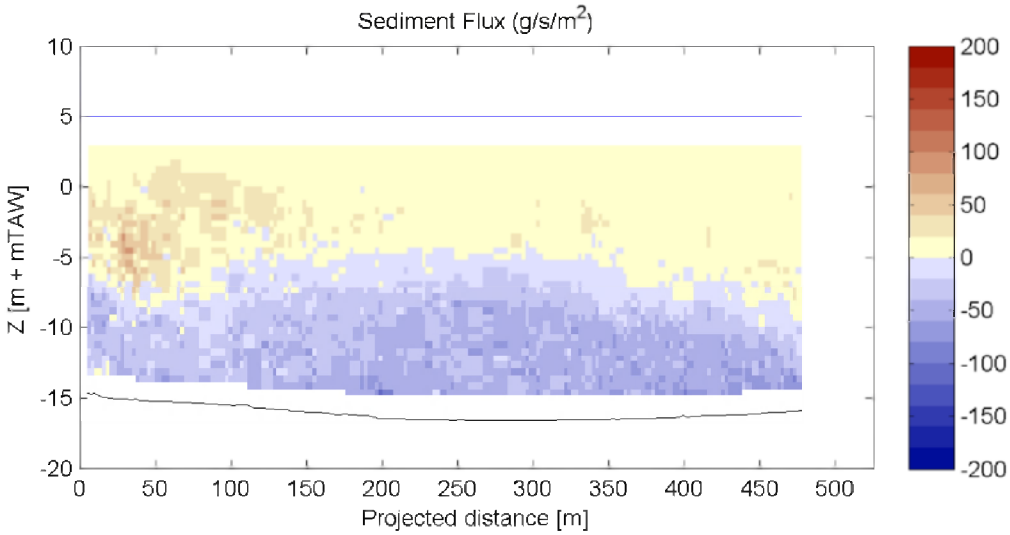
Time after HW [HH:MM]
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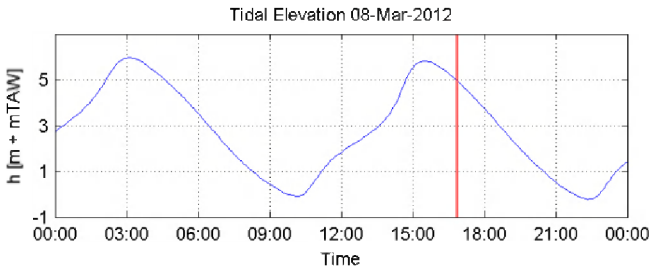
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6579_dgdTAB.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

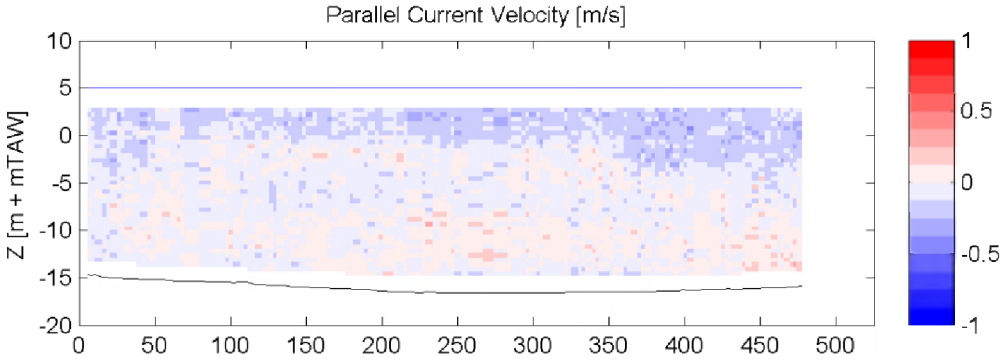
Date / Time [MET] :
08-Mar-2012
16:49 - 16:52

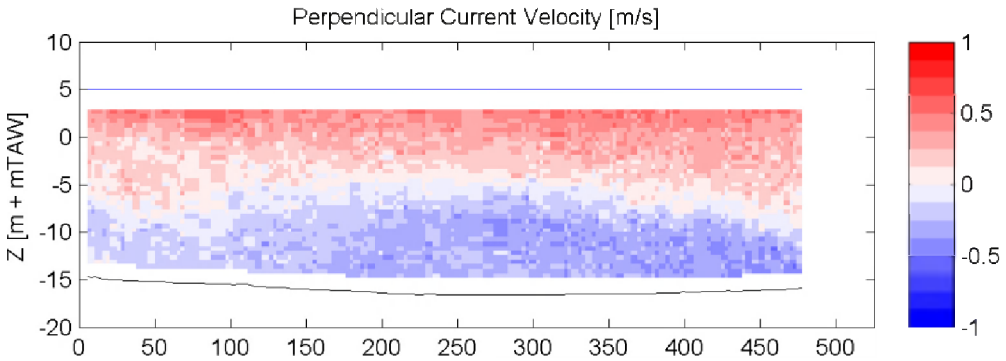
Time after HW [HH:MM]
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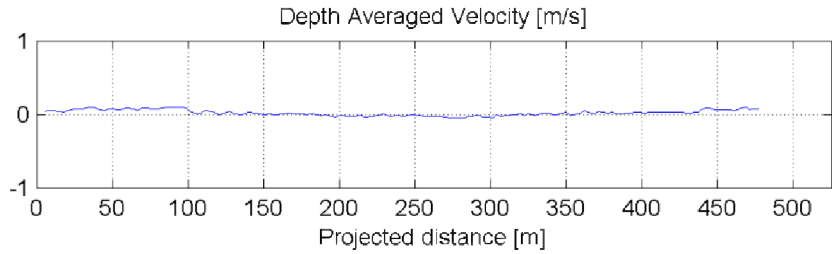
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

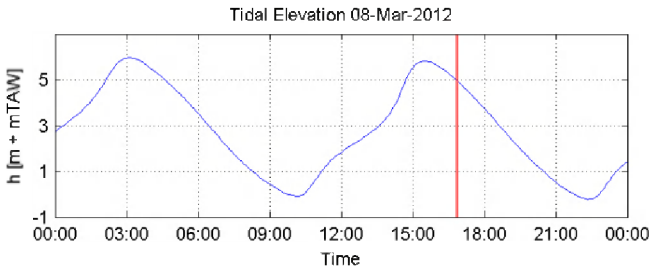
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6579_dgdTAB.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

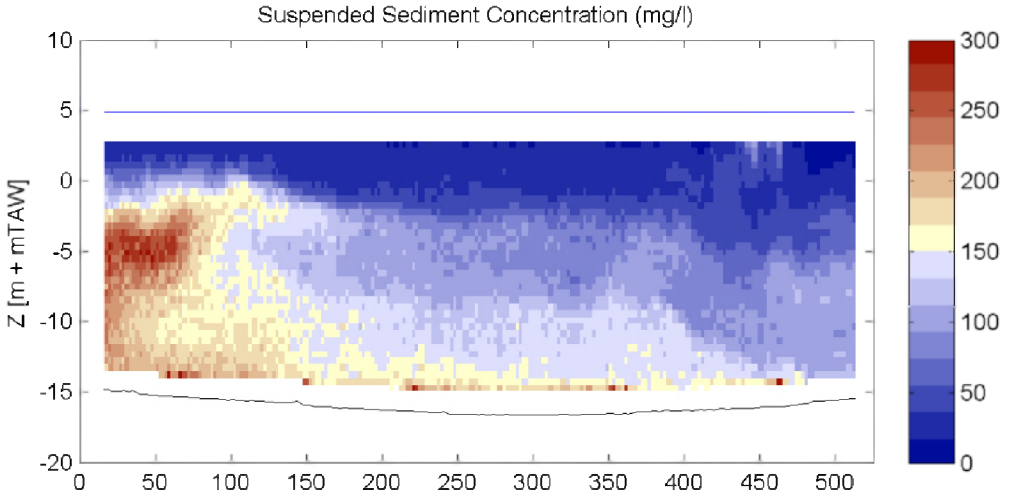
Date / Time [MET] :
08-Mar-2012
16:49 - 16:52

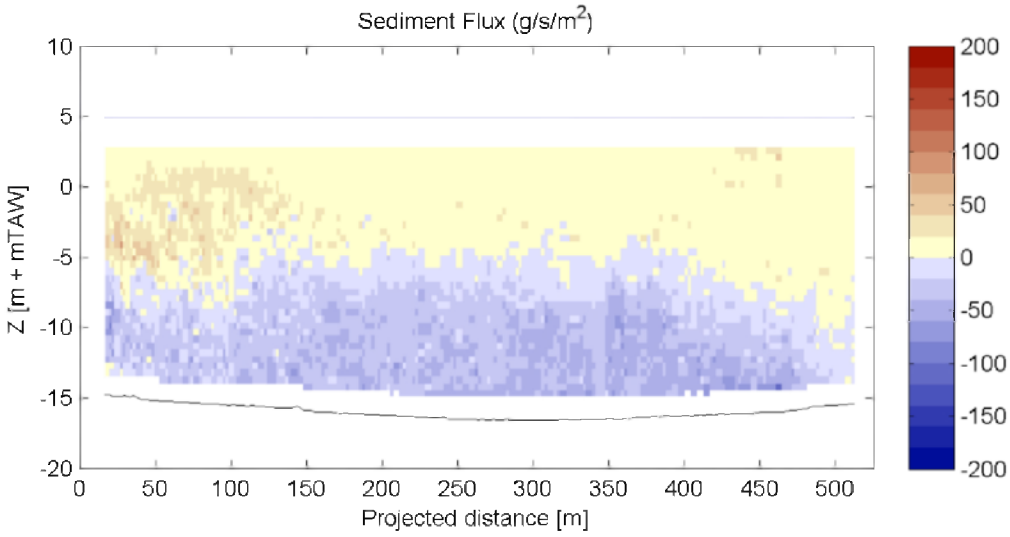
Time after HW [HH:MM]
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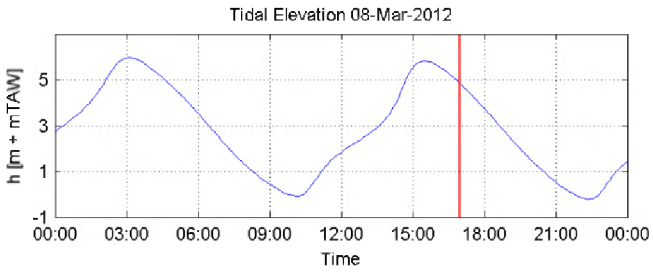
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6580_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

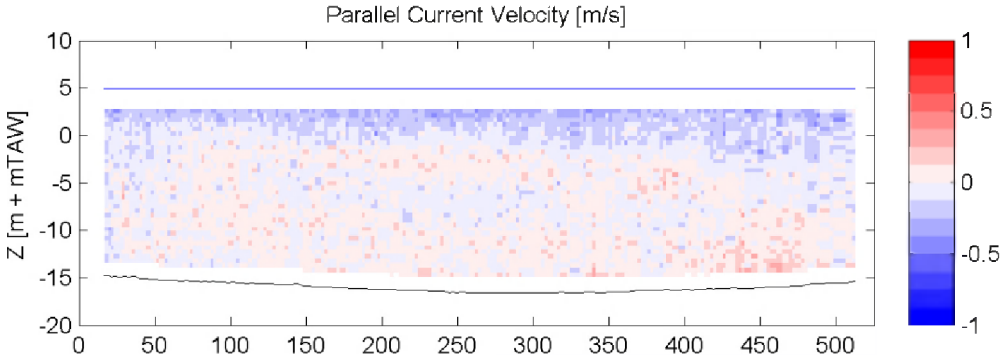
Date / Time [MET] :
08-Mar-2012
16:53 - 16:58

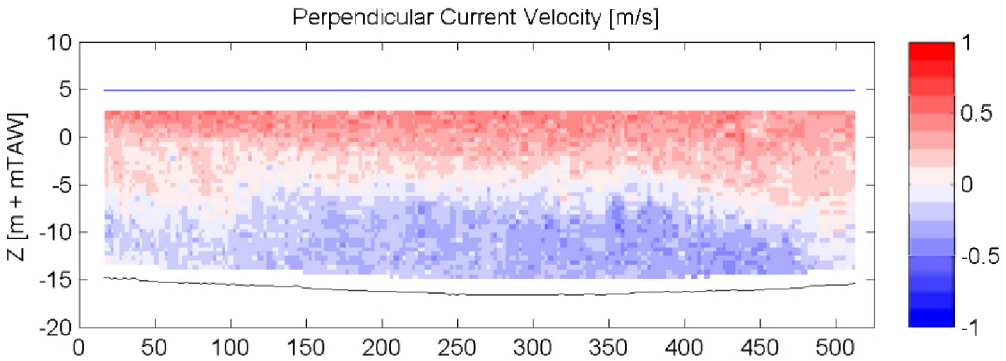
Time after HW [HH:MM]
1:30

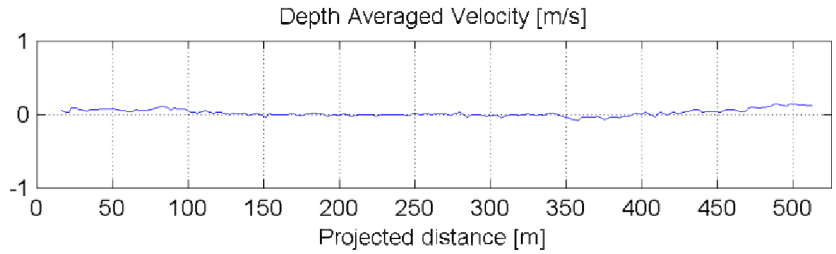
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

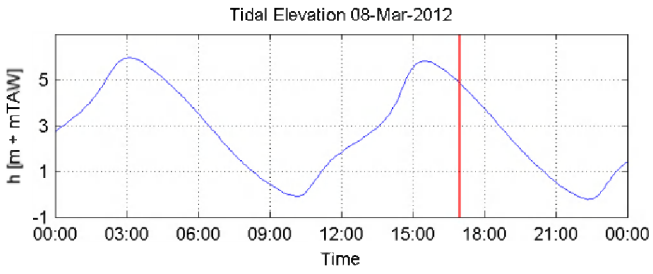
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6580_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

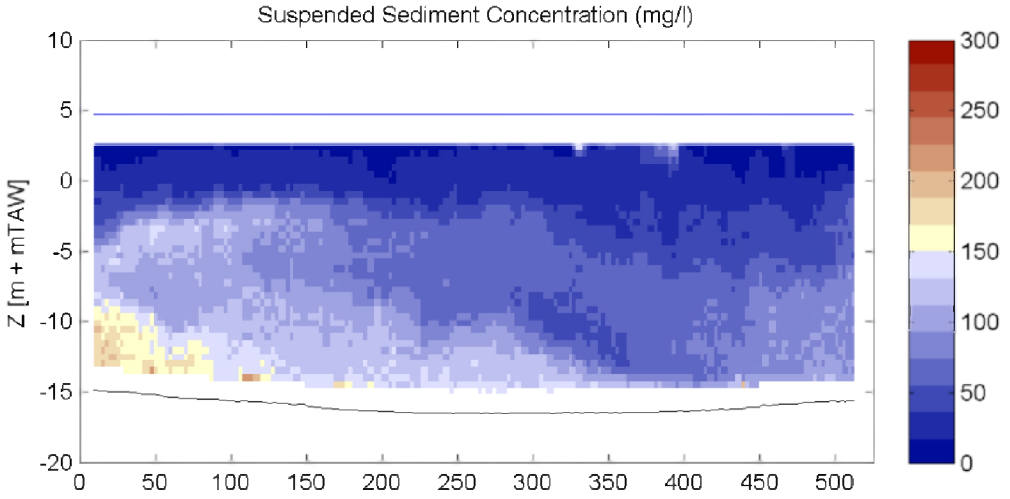
Date / Time [MET] :
08-Mar-2012
16:53 - 16:58

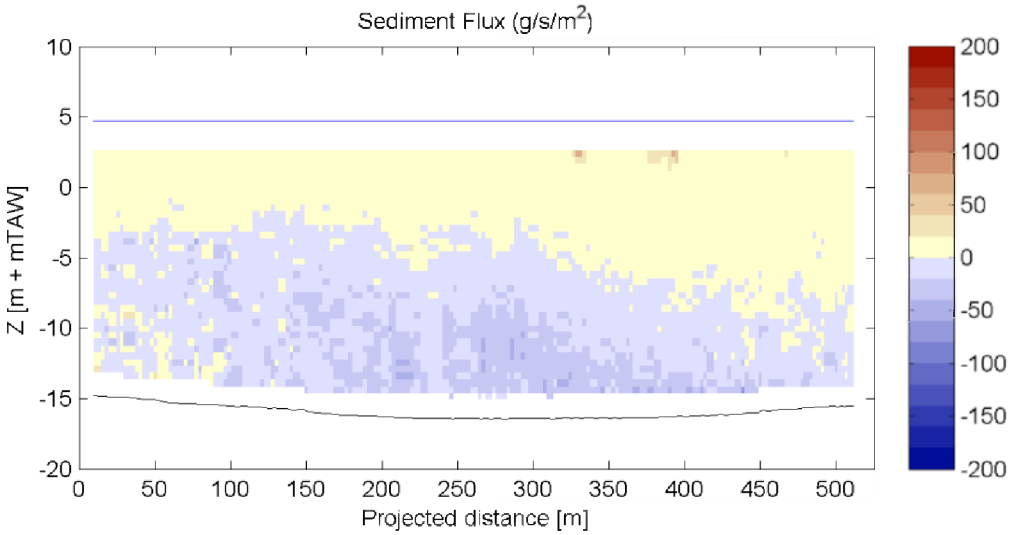
Time after HW [HH:MM]
1:30

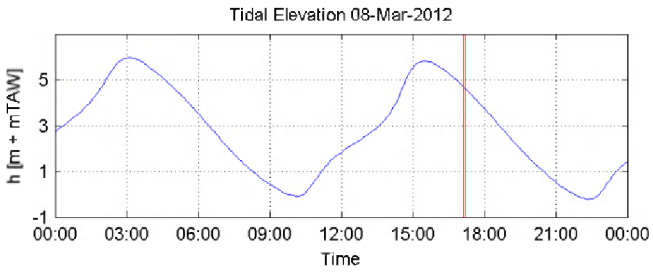
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6582_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW: 03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

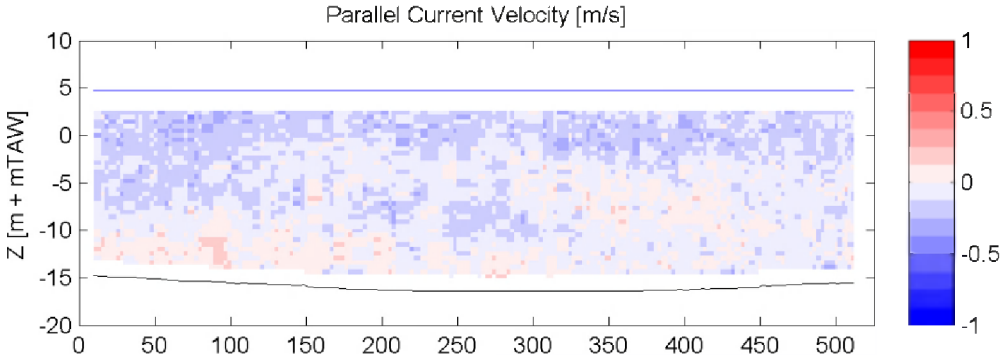
Date / Time [MET] :
08-Mar-2012
17:07 - 17:10

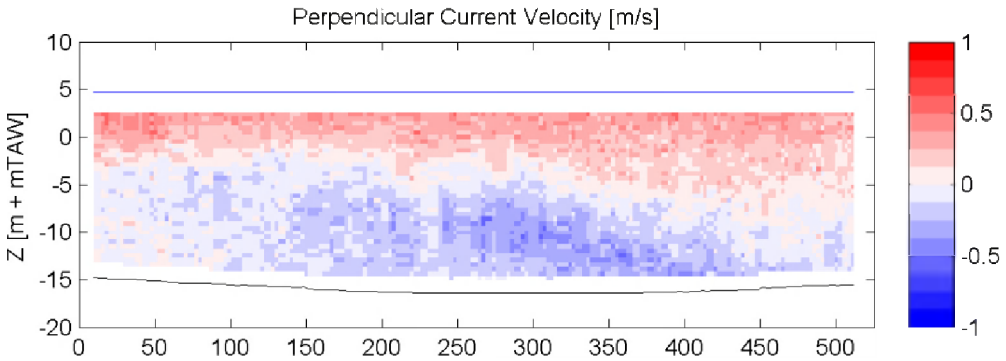
Time after HW [HH:MM]
1:43

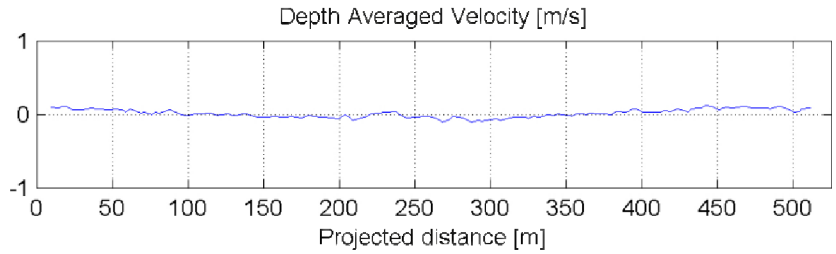
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

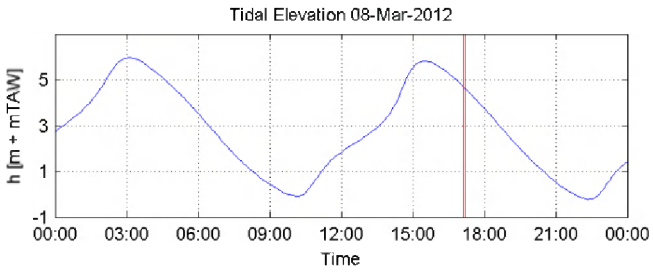
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6582_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

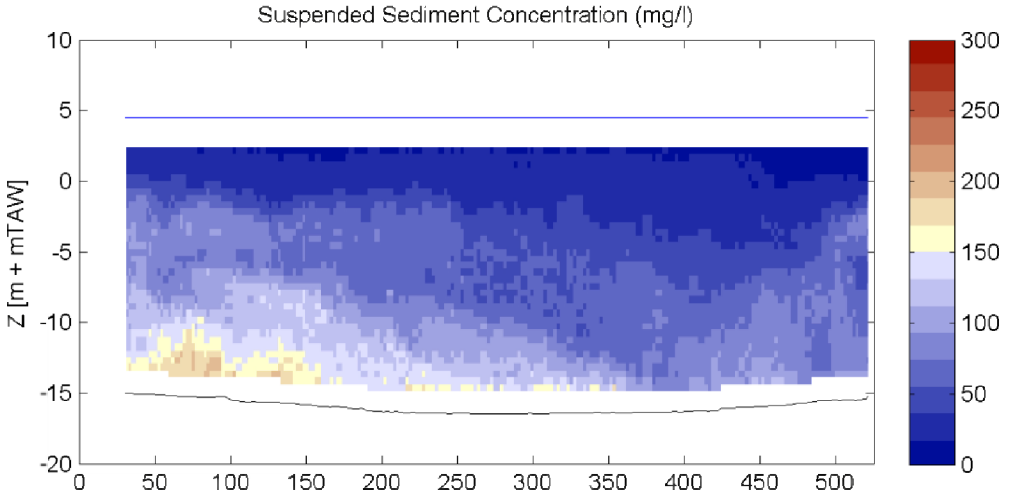
Date / Time [MET] :
08-Mar-2012
17:07 - 17:10

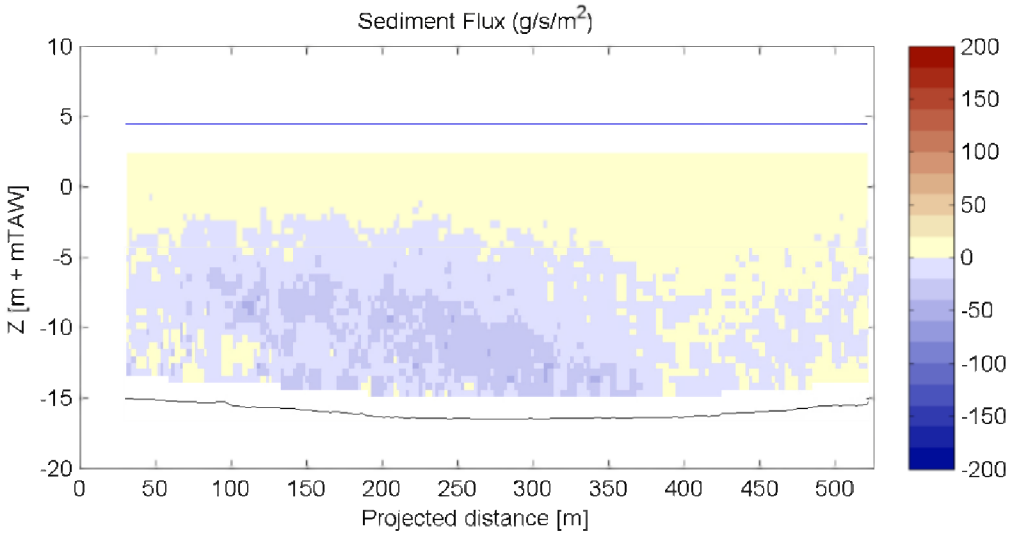
Time after HW [HH:MM]
1:43

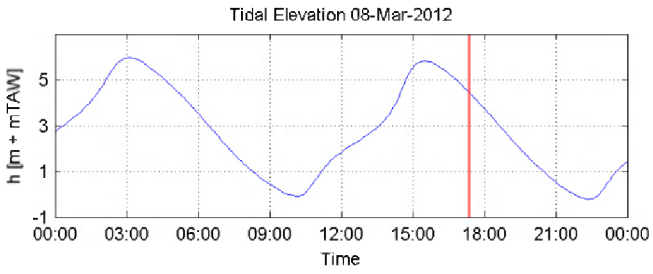
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6584_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW: 03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

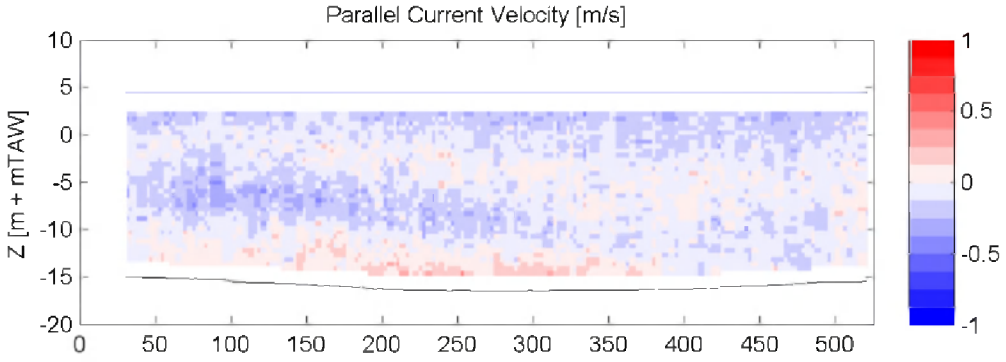
Date / Time [MET] :
08-Mar-2012
17:20 - 17:24

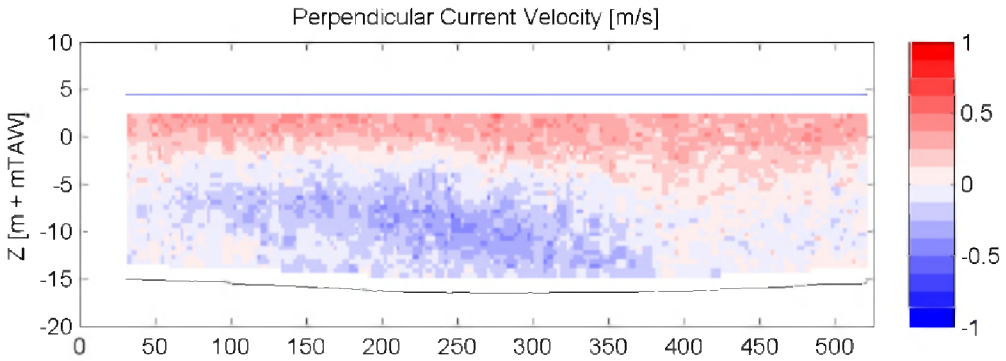
Time after HW [HH:MM]
1:57

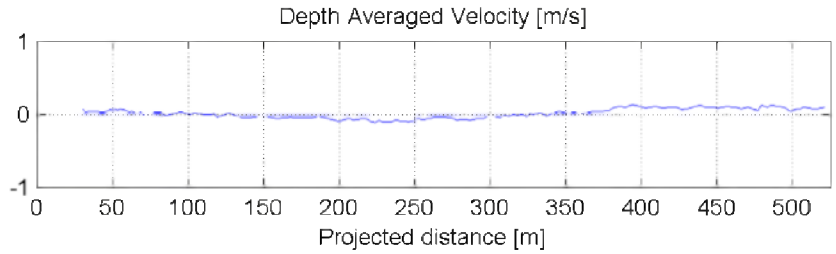
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

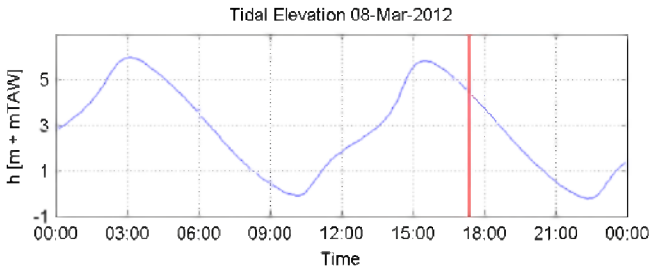
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6584_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

Date / Time [MET] :
08-Mar-2012
17:20 - 17:24

Time after HW [HH:MM]
1:57

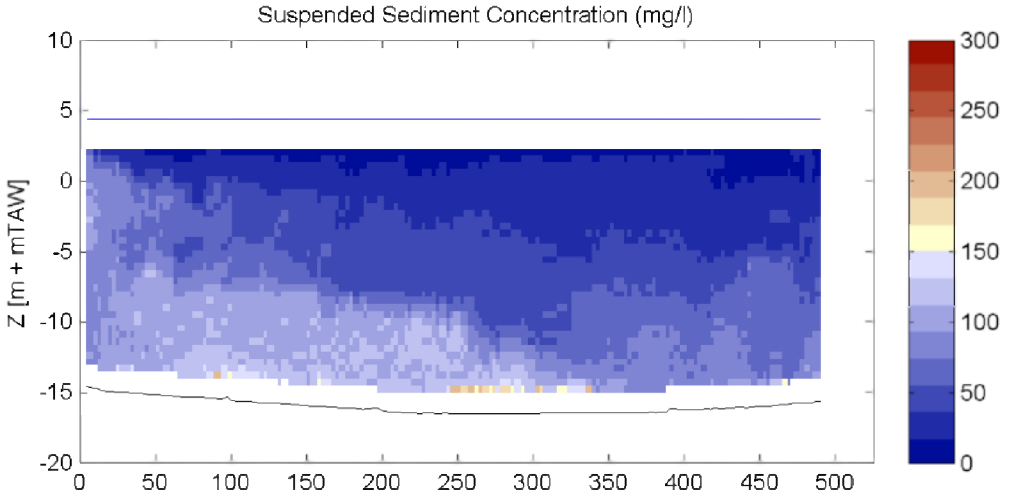
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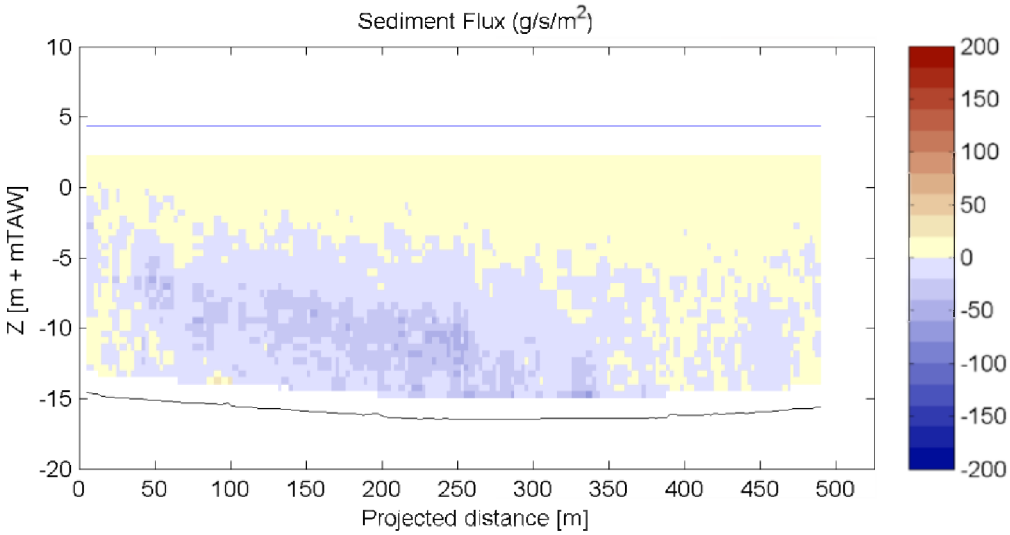
In association with :

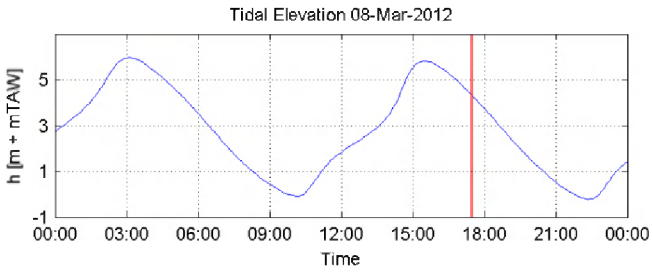
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6585_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

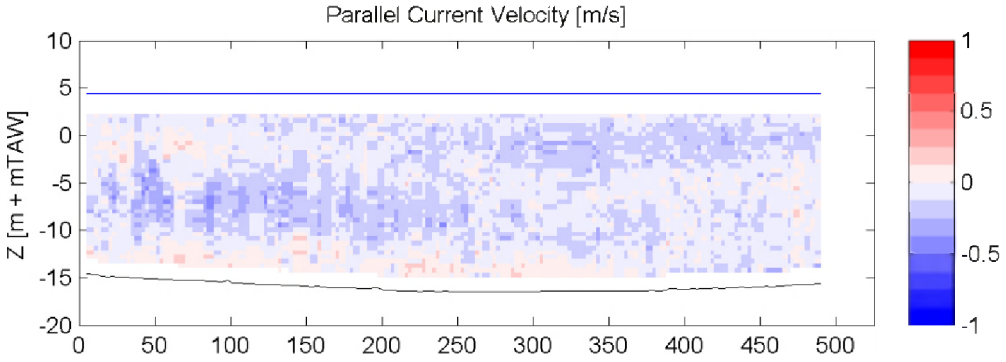
Date / Time [MET] :
08-Mar-2012
17:26 - 17:30

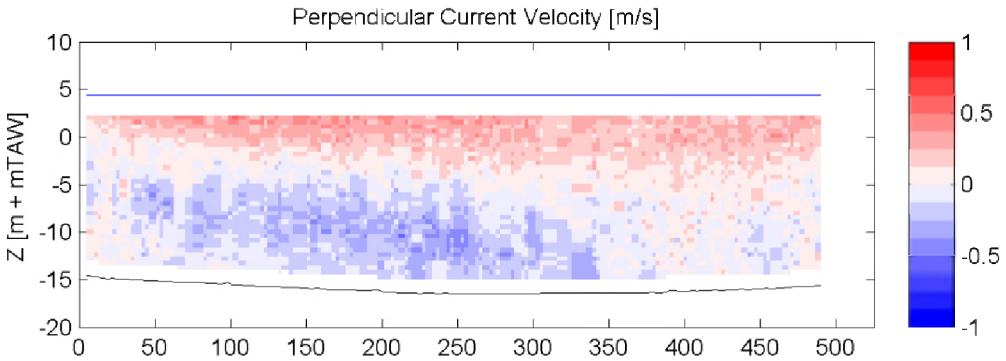
Time after HW [HH:MM]
2:03

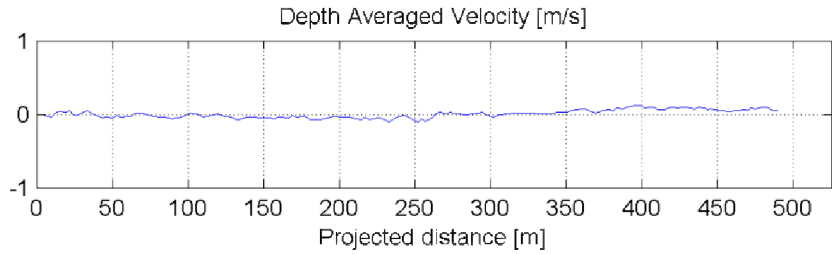
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

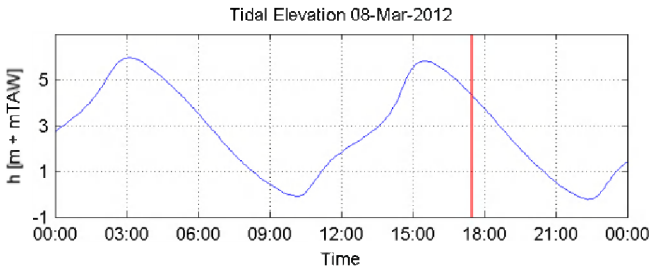
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6585_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

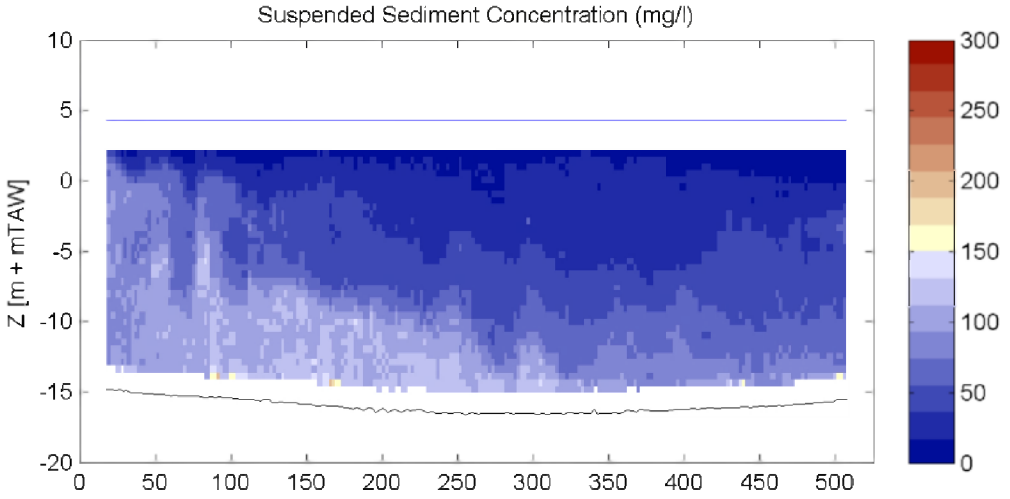
Date / Time [MET] :
08-Mar-2012
17:26 - 17:30

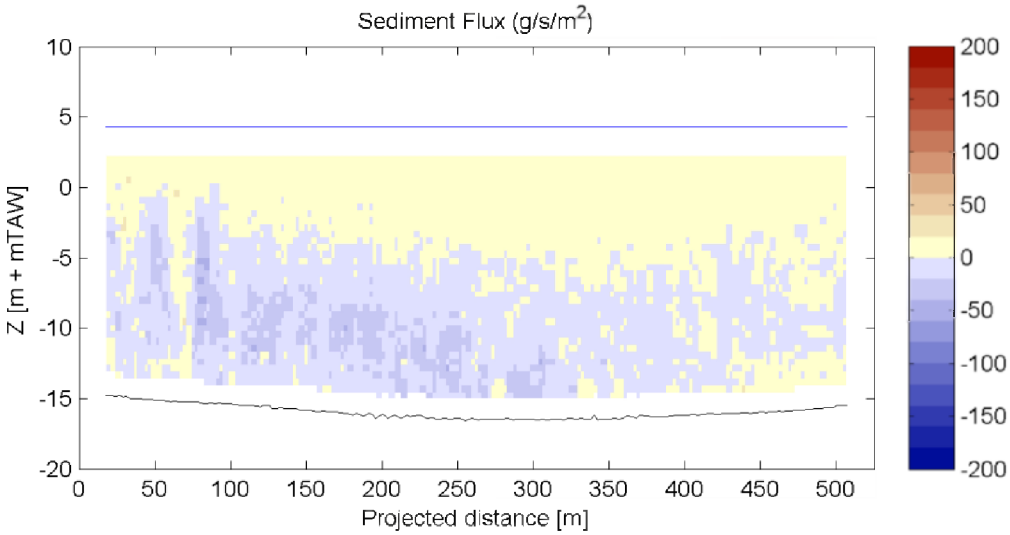
Time after HW [HH:MM]
2:03

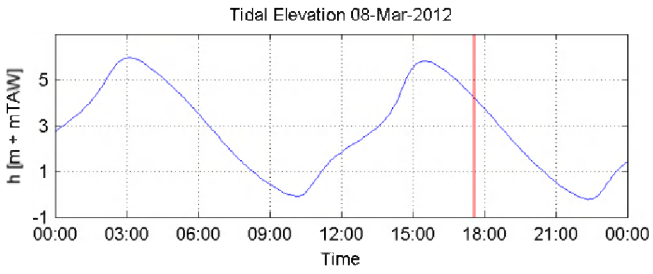
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6586_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

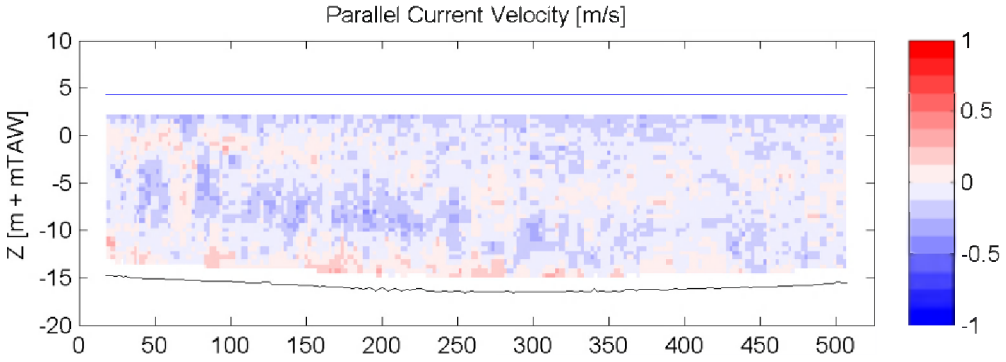
Date / Time [MET] :
08-Mar-2012
17:31 - 17:35

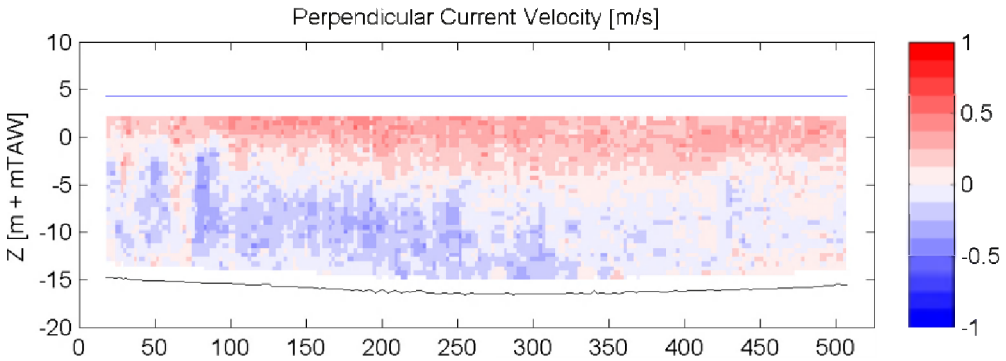
Time after HW [HH:MM]
2:08

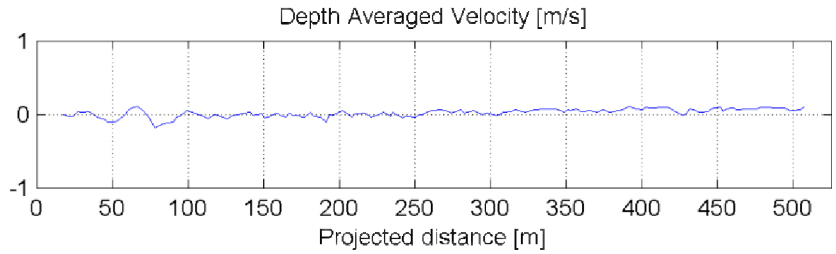
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

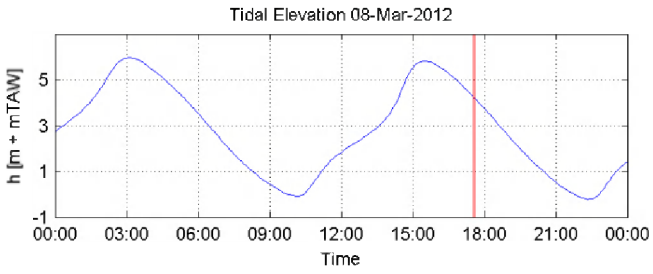
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6586_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

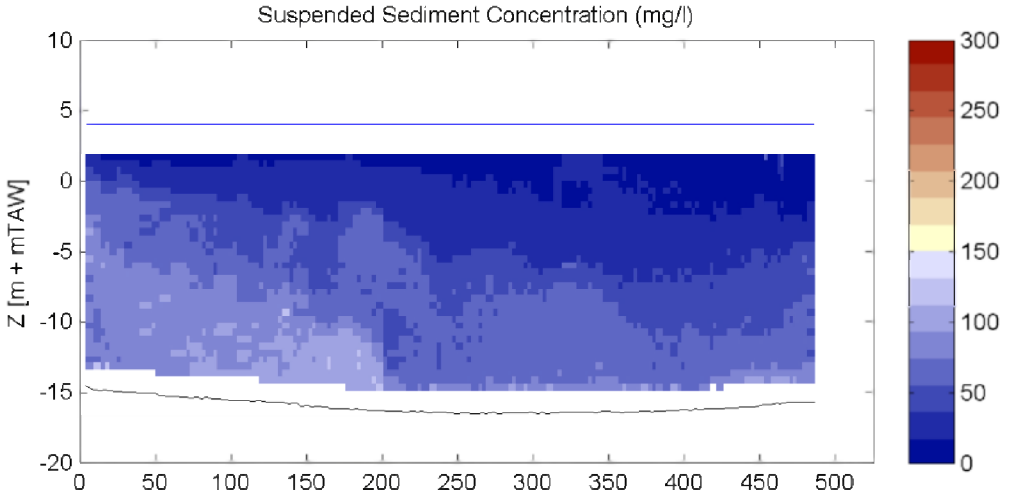
Date / Time [MET] :
08-Mar-2012
17:31 - 17:35

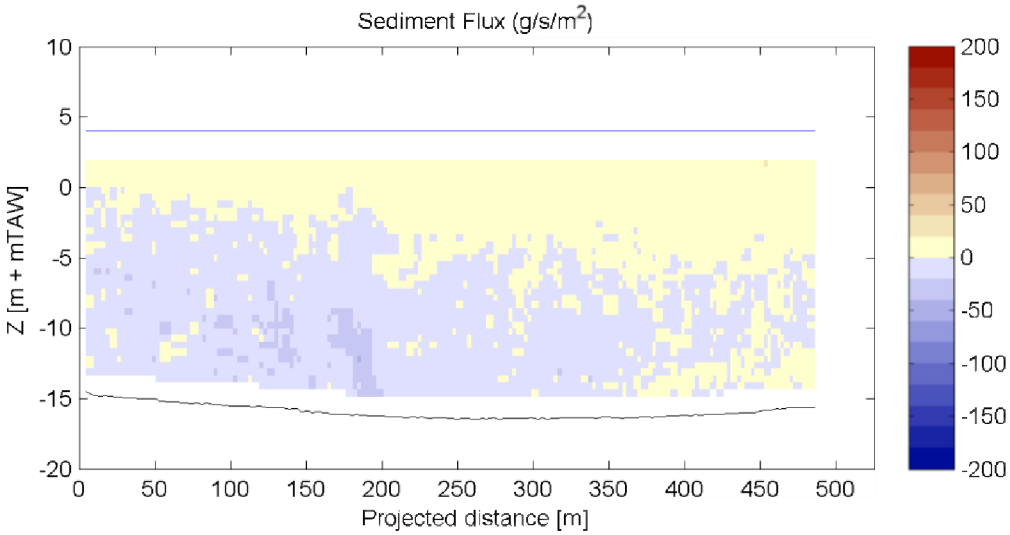
Time after HW [HH:MM]
2:08

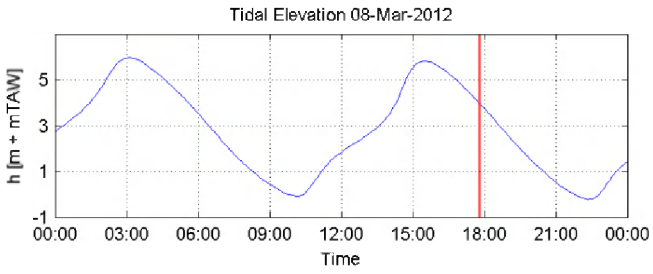
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6588_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

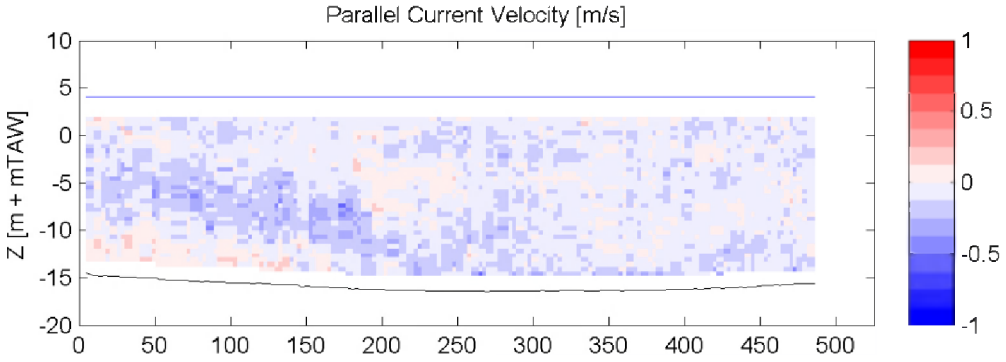
Date / Time [MET] :
08-Mar-2012
17:47 - 17:50

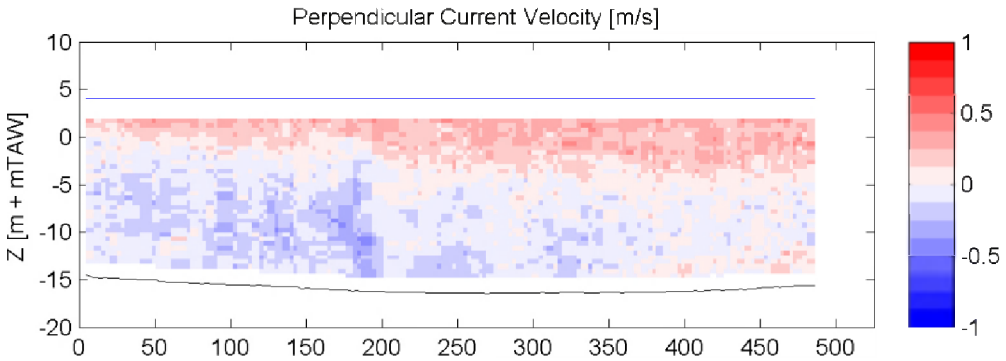
Time after HW [HH:MM]
2:23

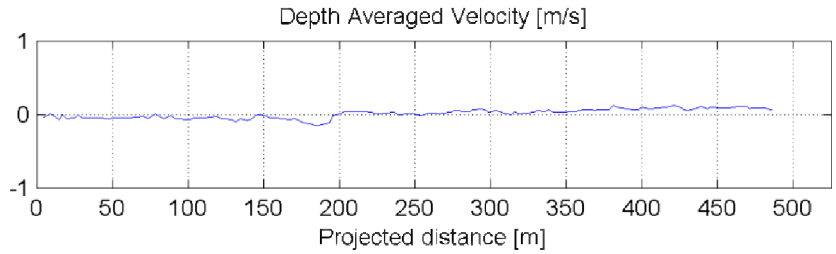
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

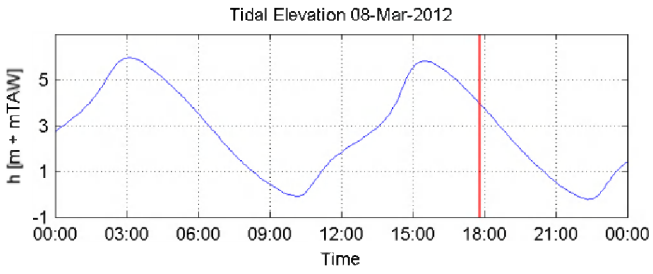
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6588_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

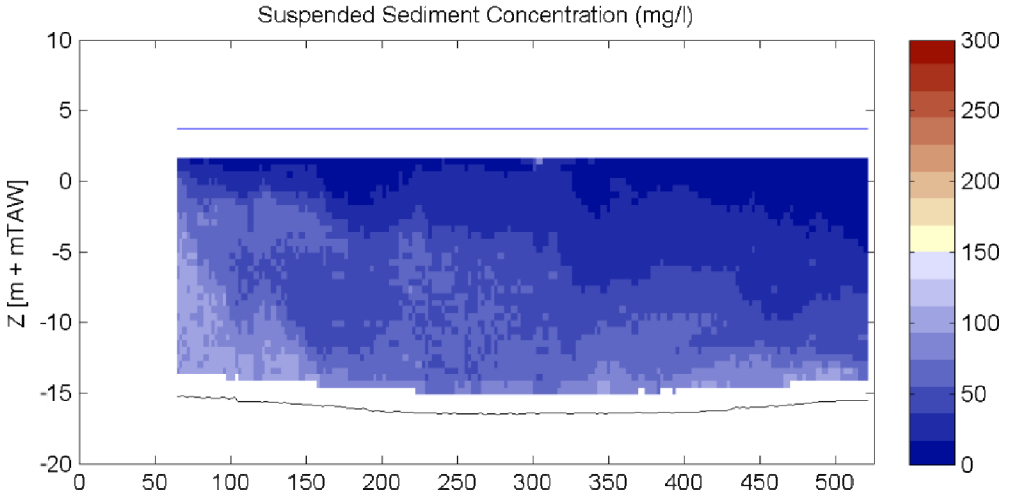
Date / Time [MET] :
08-Mar-2012
17:47 - 17:50

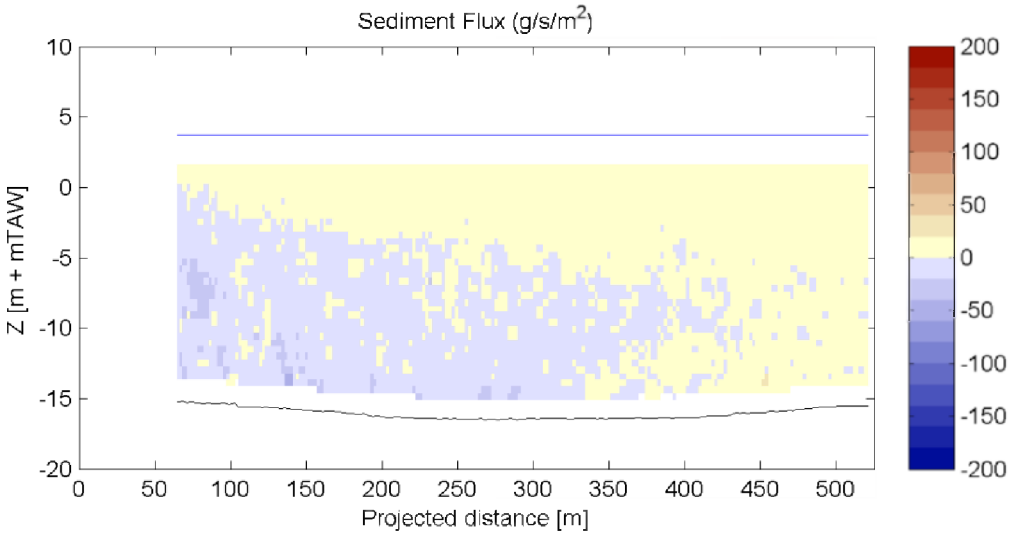
Time after HW [HH:MM]
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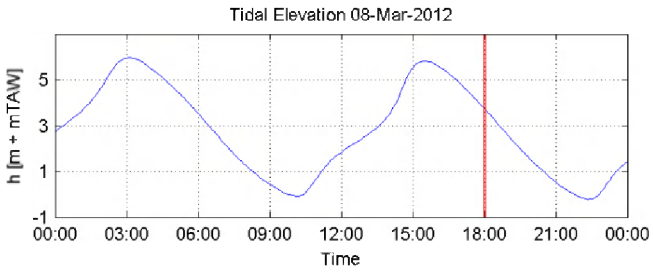
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6590_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

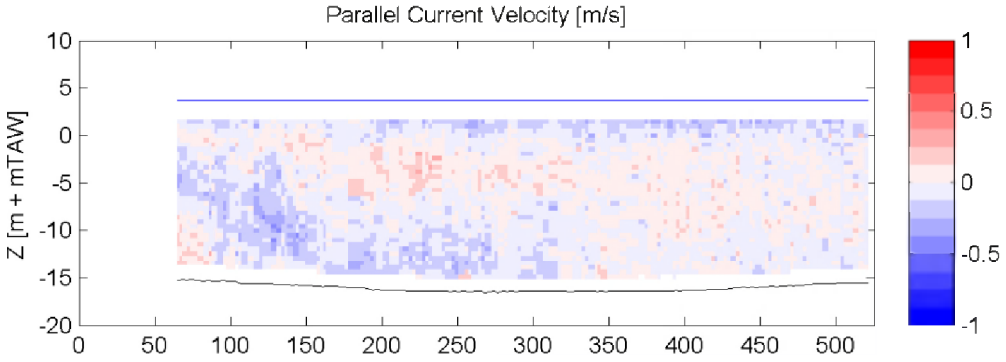
Date / Time [MET] :
08-Mar-2012
17:59 - 18:03

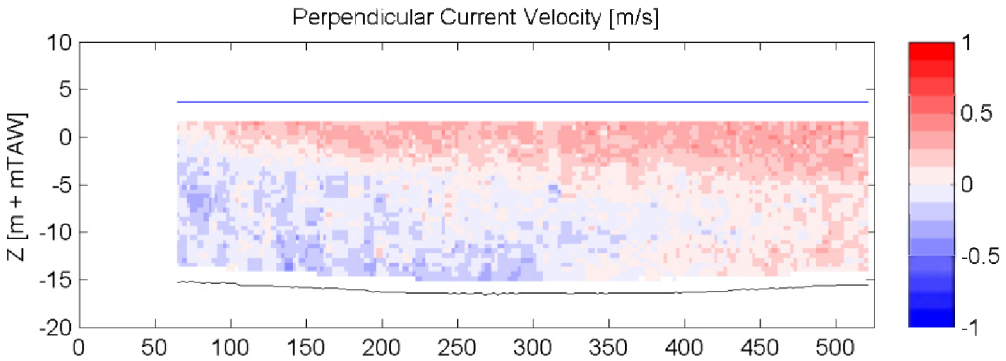
Time after HW [HH:MM]
2:36

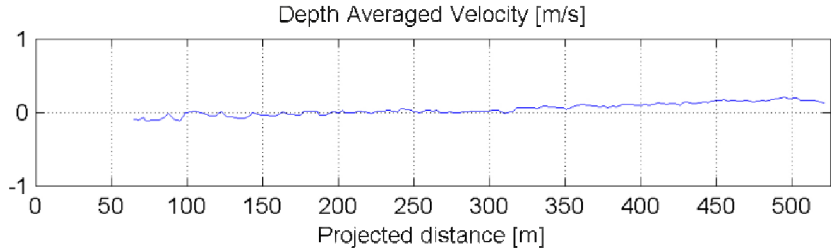
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

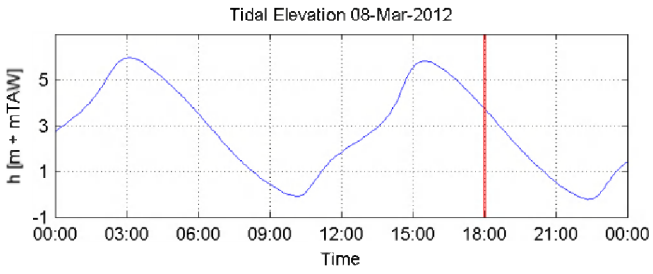
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6590_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

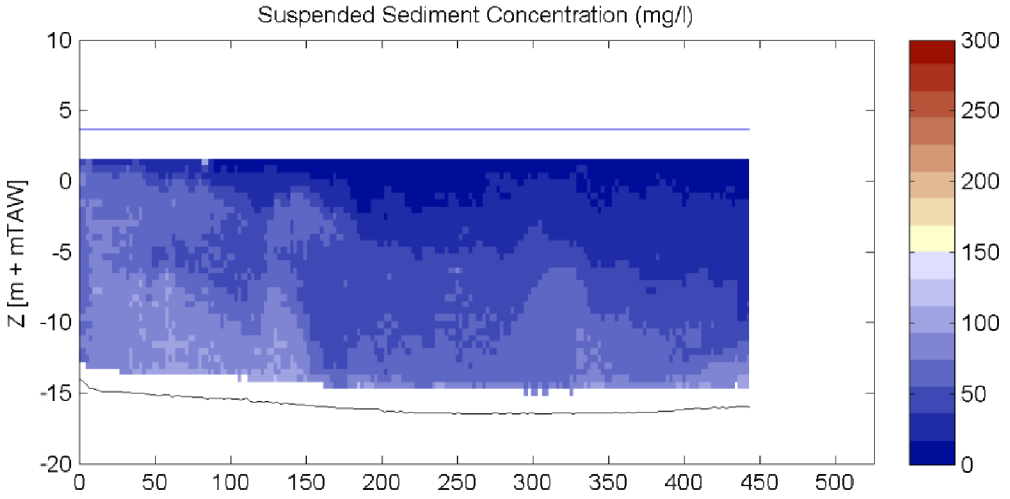
Date / Time [MET] :
08-Mar-2012
17:59 - 18:03

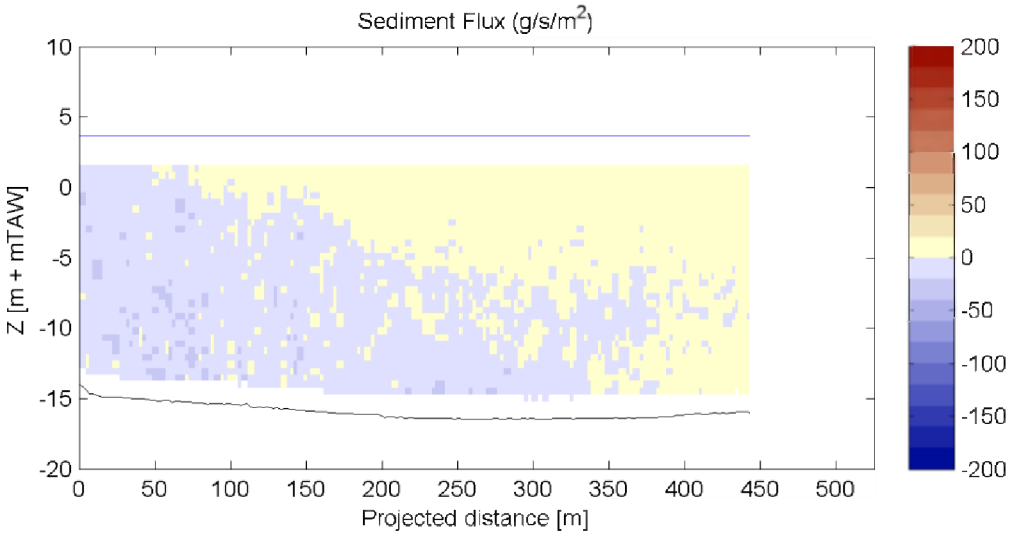
Time after HW [HH:MM]
2:36

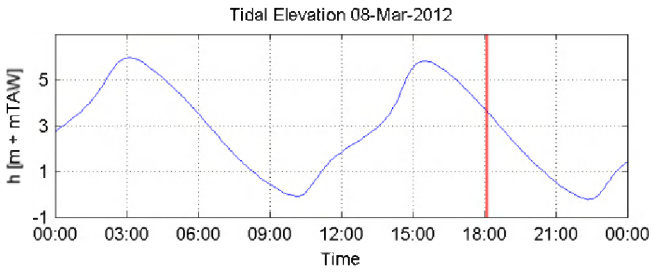
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6591_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

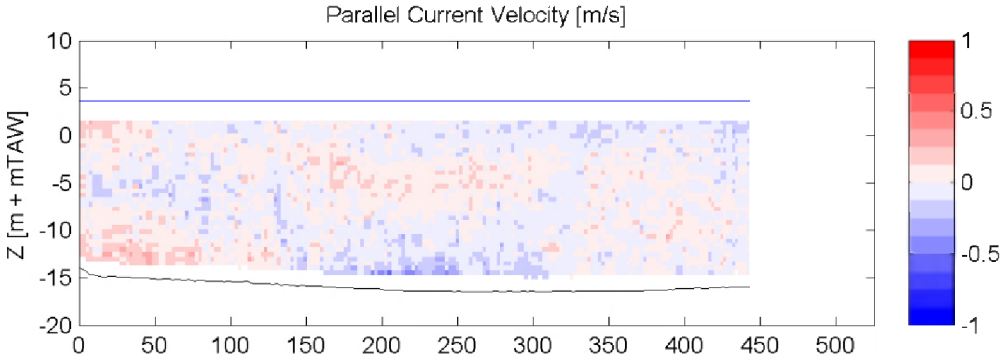
Date / Time [MET] :
08-Mar-2012
18:05 - 18:09

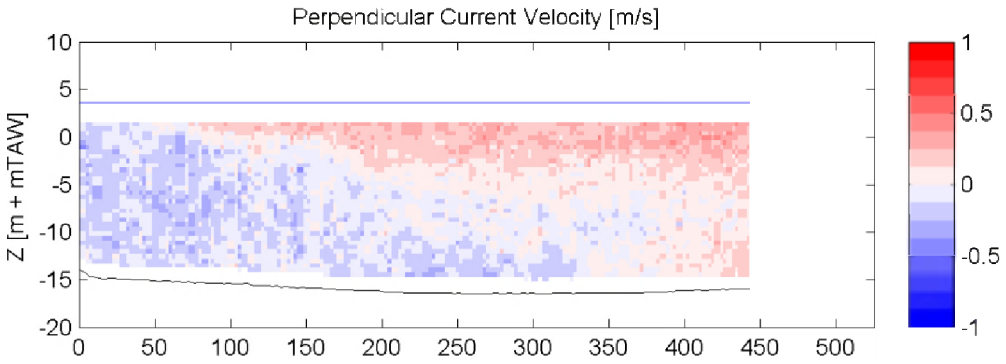
Time after HW [HH:MM]
2:42

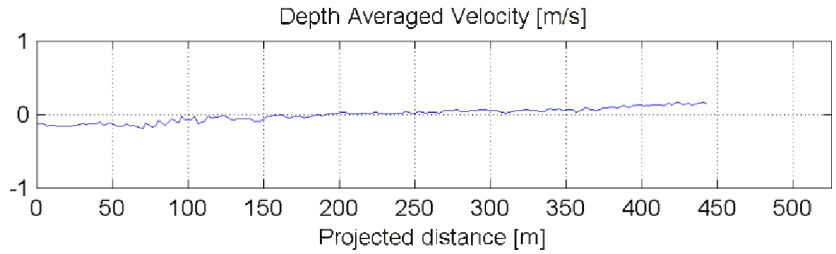
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

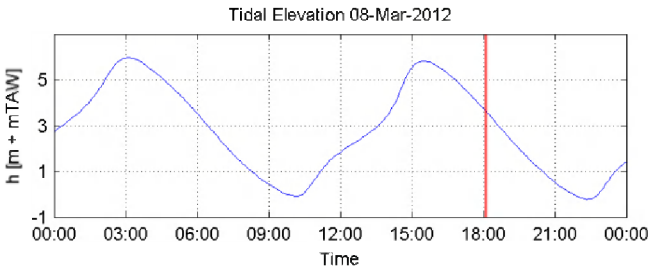
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6591_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

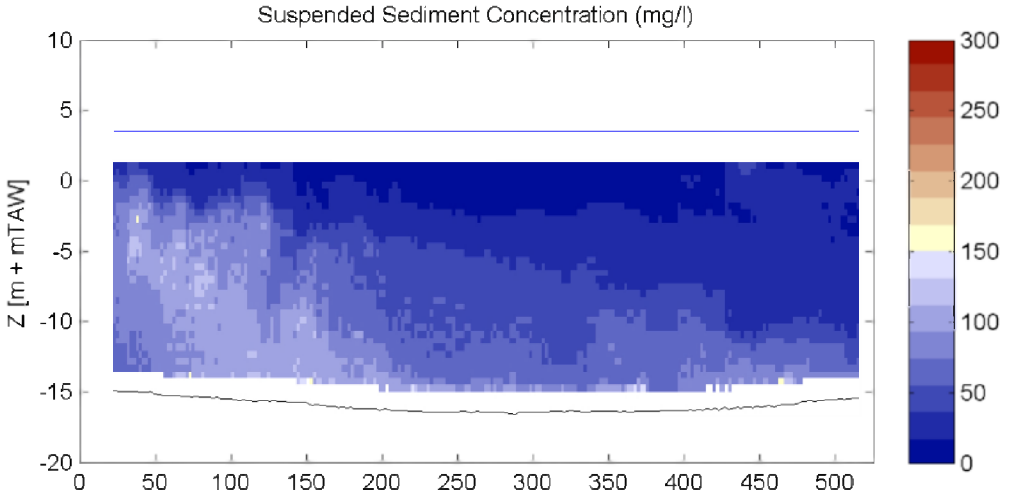
Date / Time [MET] :
08-Mar-2012
18:05 - 18:09

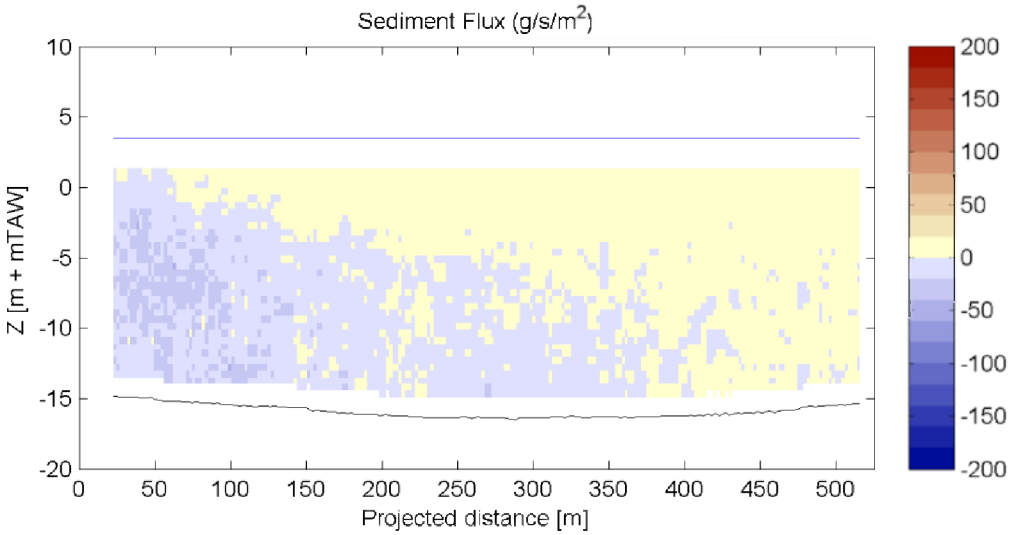
Time after HW [HH:MM]
2:42

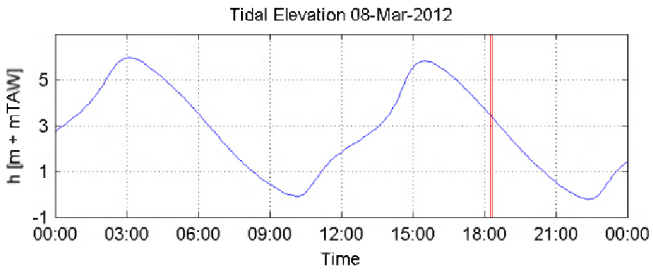
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6592_dgdTBA.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

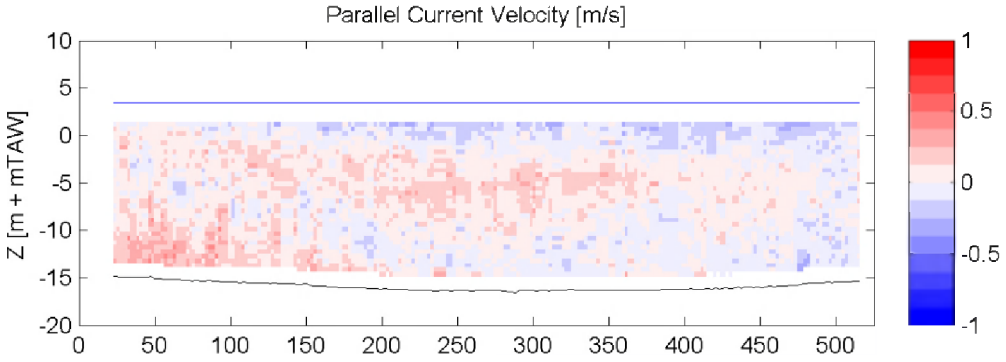
Date / Time [MET] :
08-Mar-2012
18:14 - 18:18

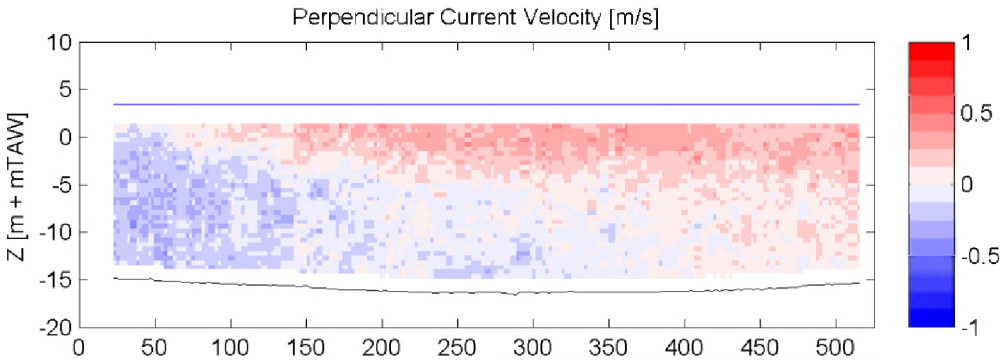
Time after HW [HH:MM]
2:51

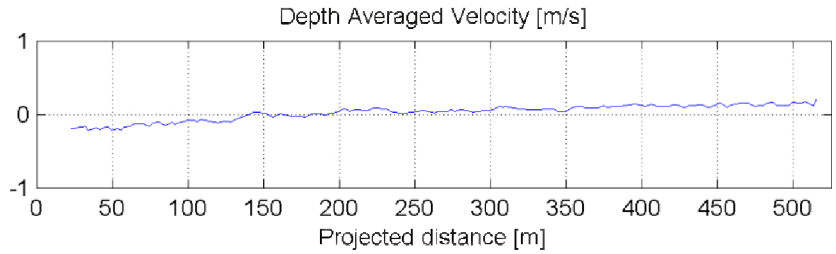
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

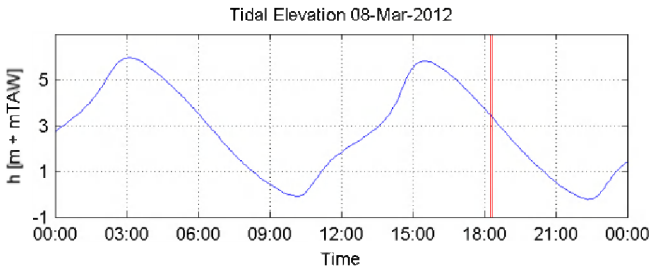
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6592_dgdTBA.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

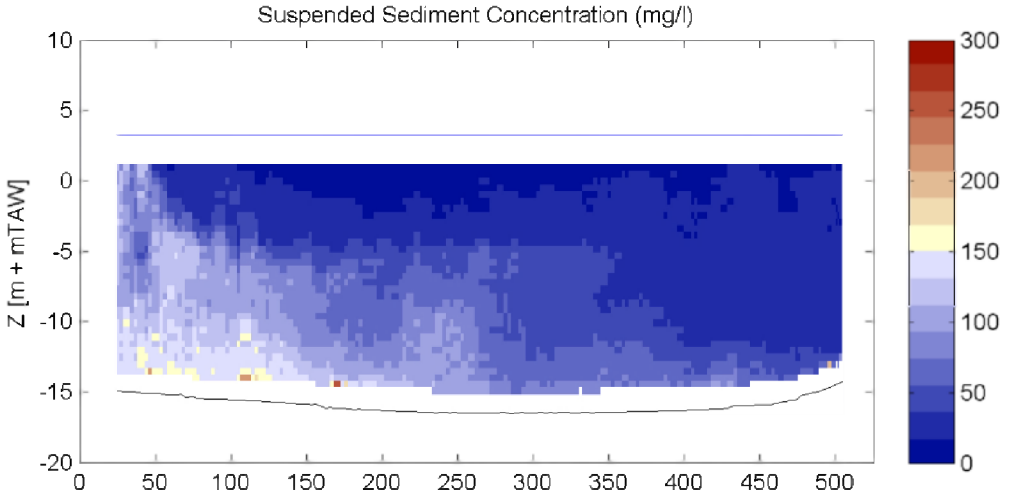
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08-Mar-2012
18:14 - 18:18

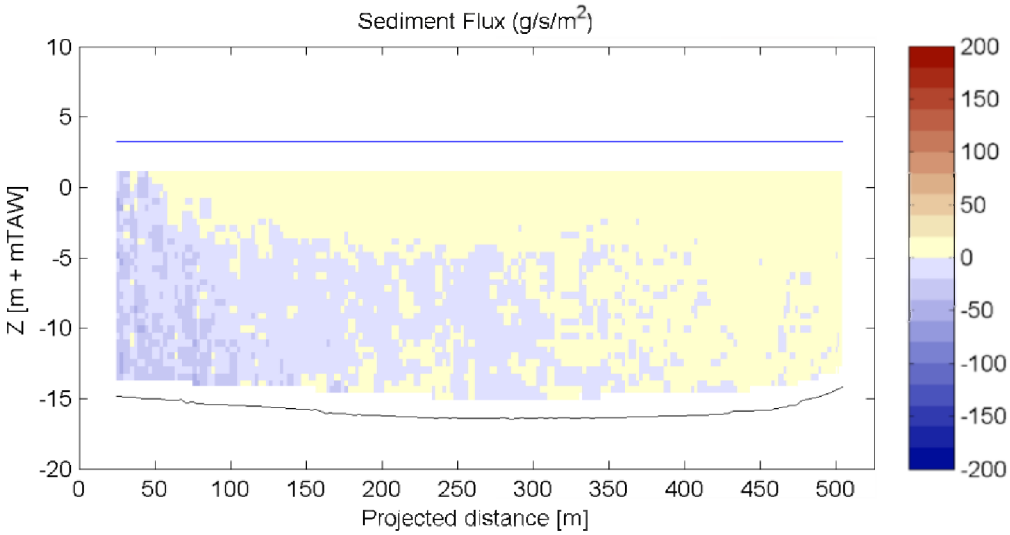
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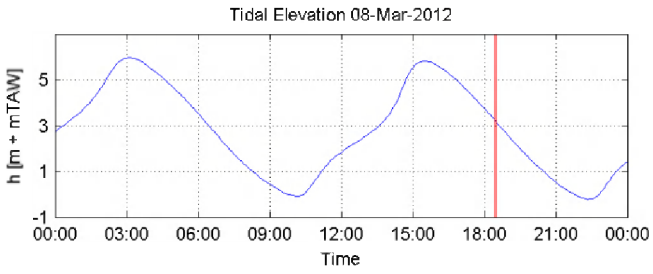
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6594_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

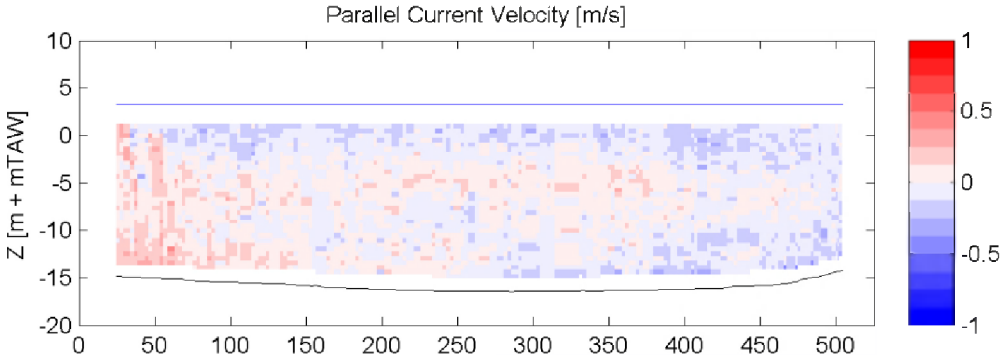
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08-Mar-2012
18:25 - 18:29

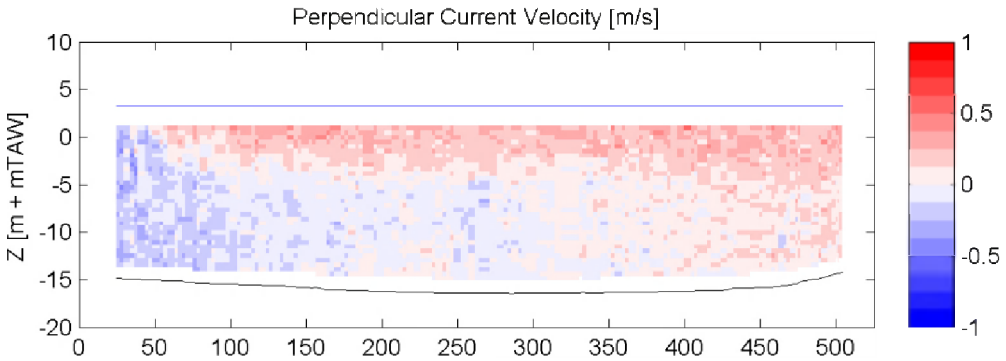
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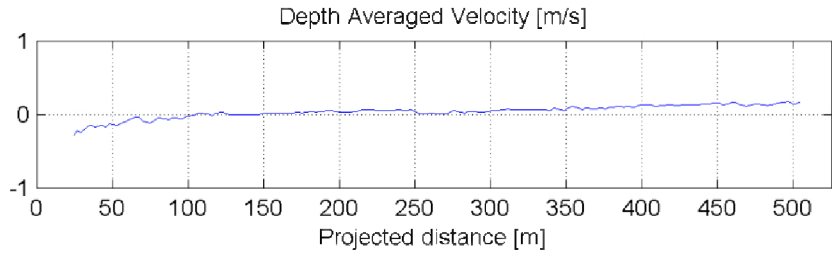
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

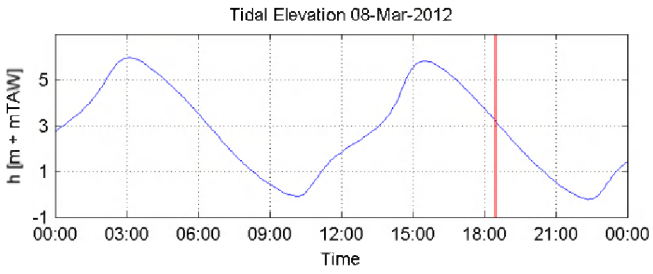
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6594_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

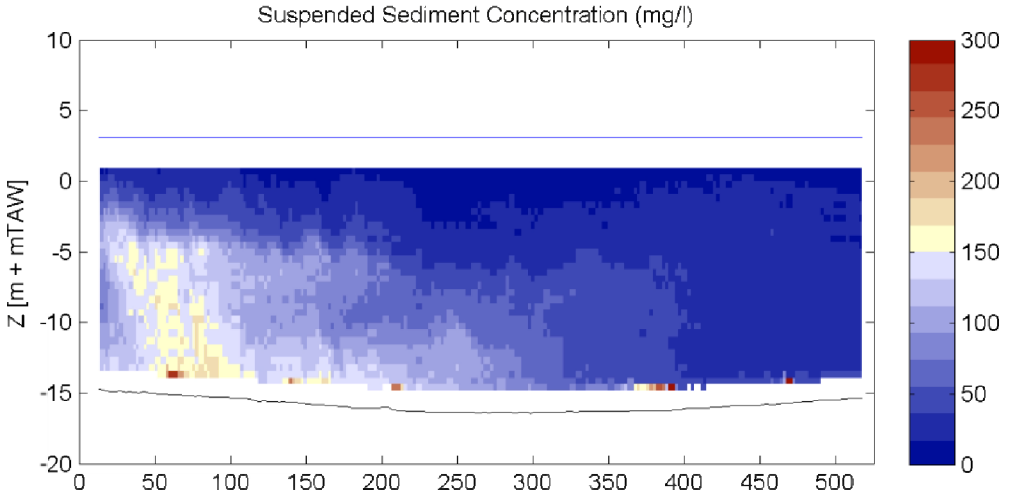
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08-Mar-2012
18:25 - 18:29

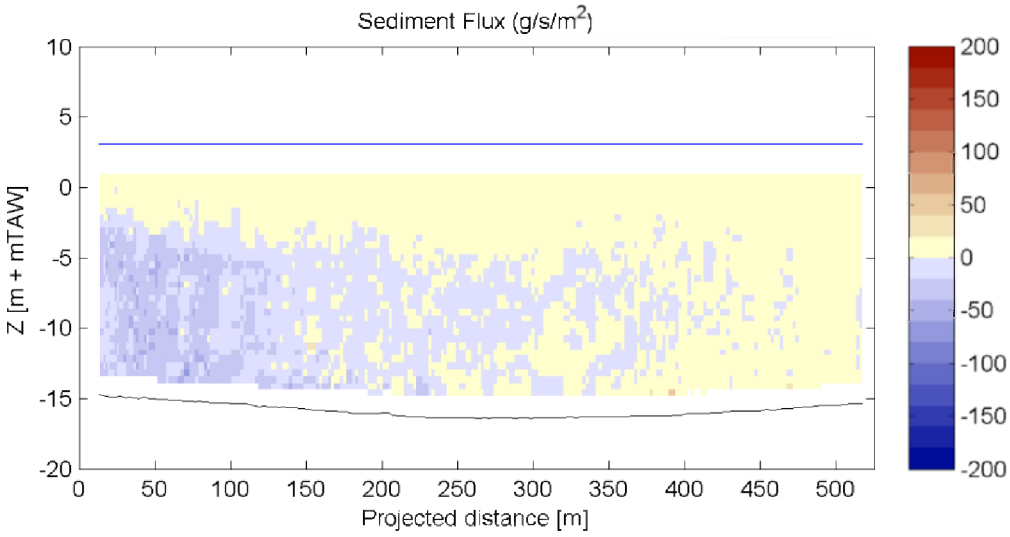
Time after HW [HH:MM]
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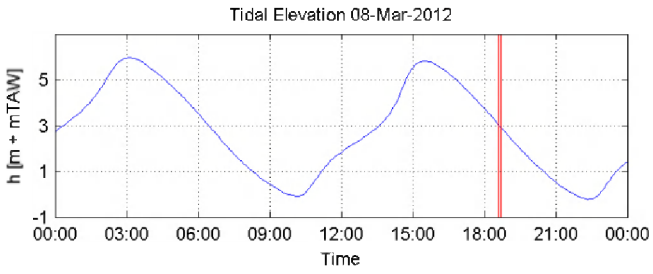
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6596_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

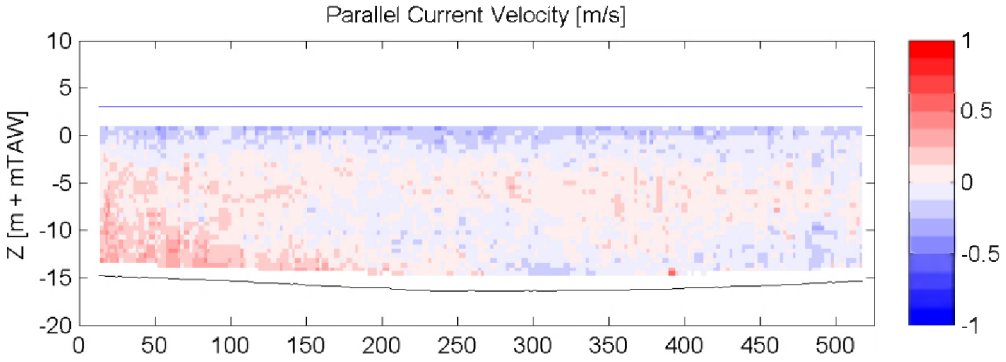
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08-Mar-2012
18:37 - 18:41

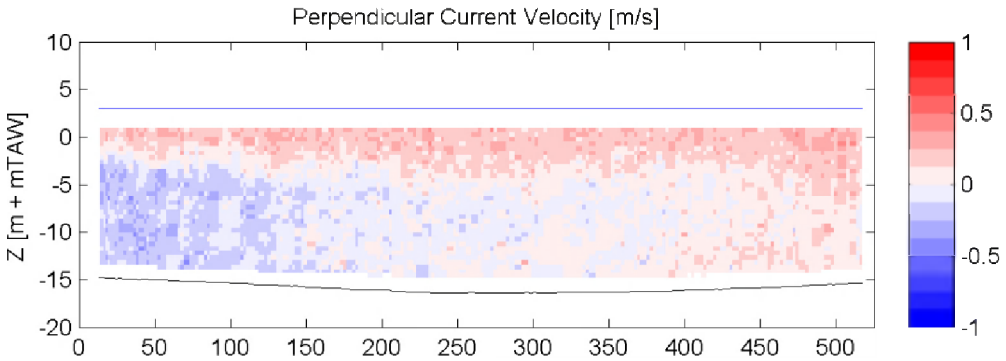
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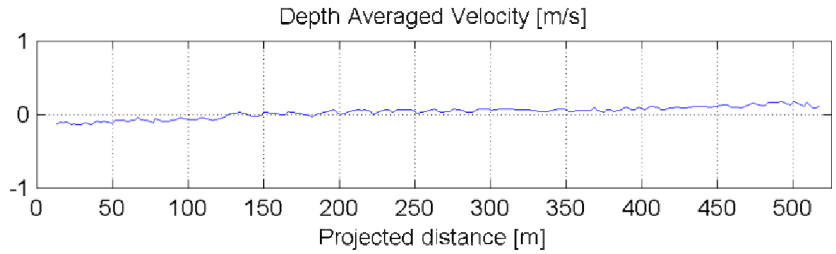
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I/RA/11354/10.108/MBO/ANF

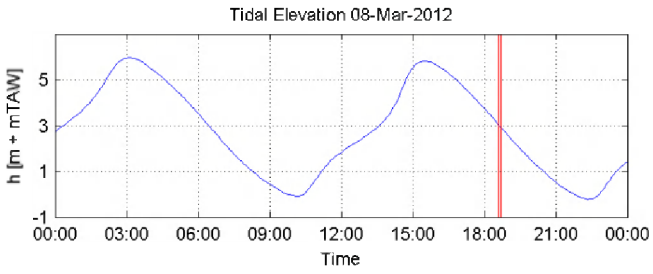
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6596_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

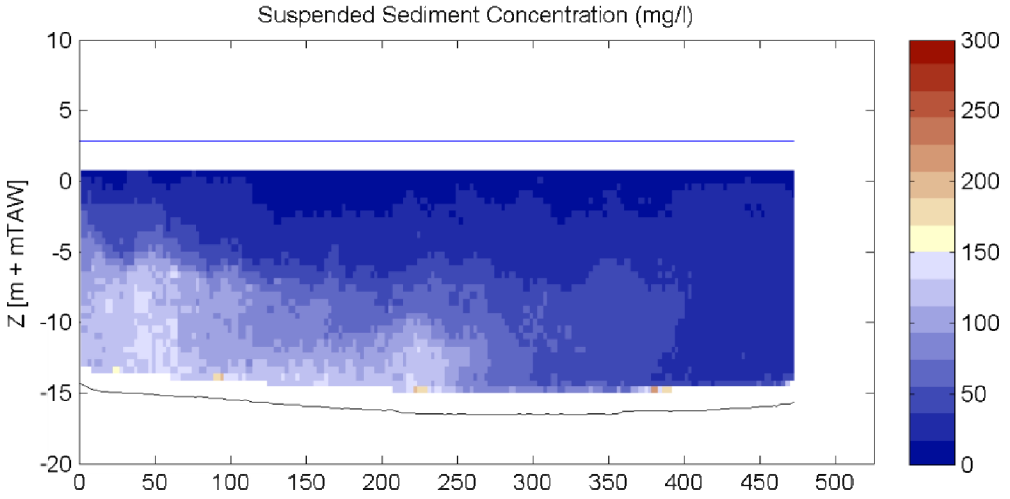
Date / Time [MET] :
08-Mar-2012
18:37 - 18:41

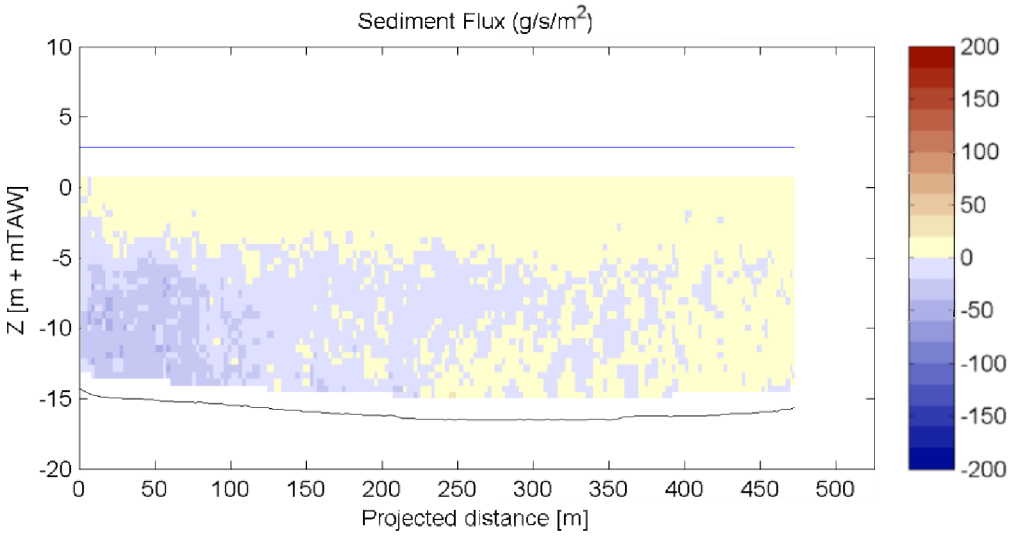
Time after HW [HH:MM]
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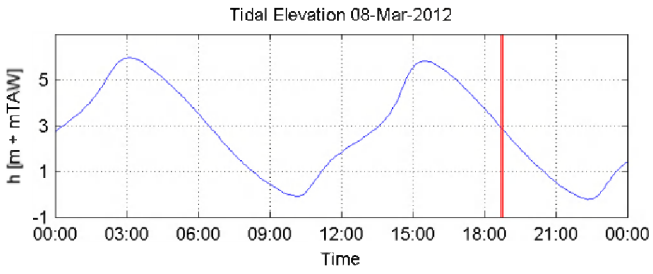
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6597_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW: 03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

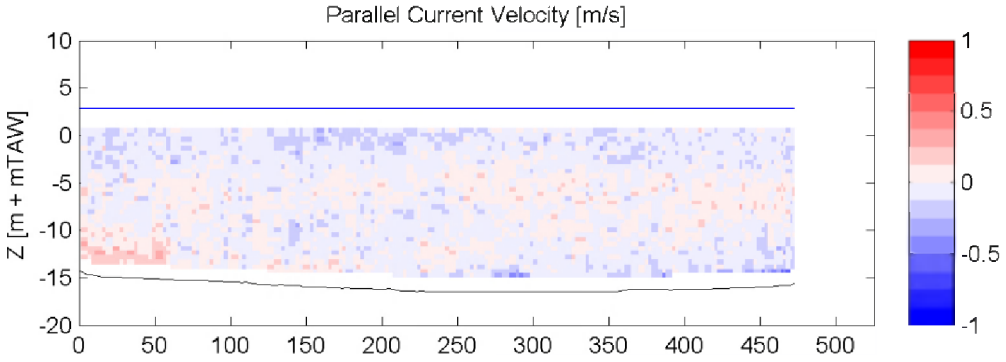
Date / Time [MET] :
08-Mar-2012
18:42 - 18:46

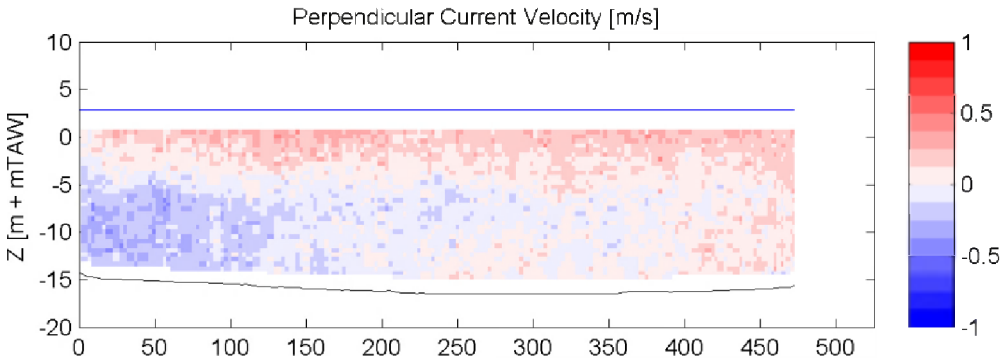
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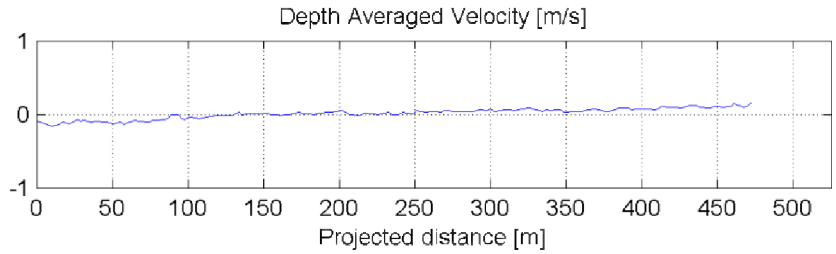
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

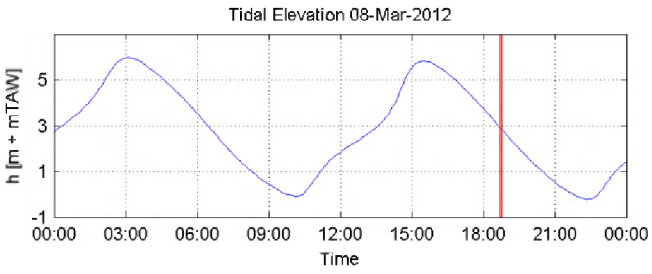
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6597_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

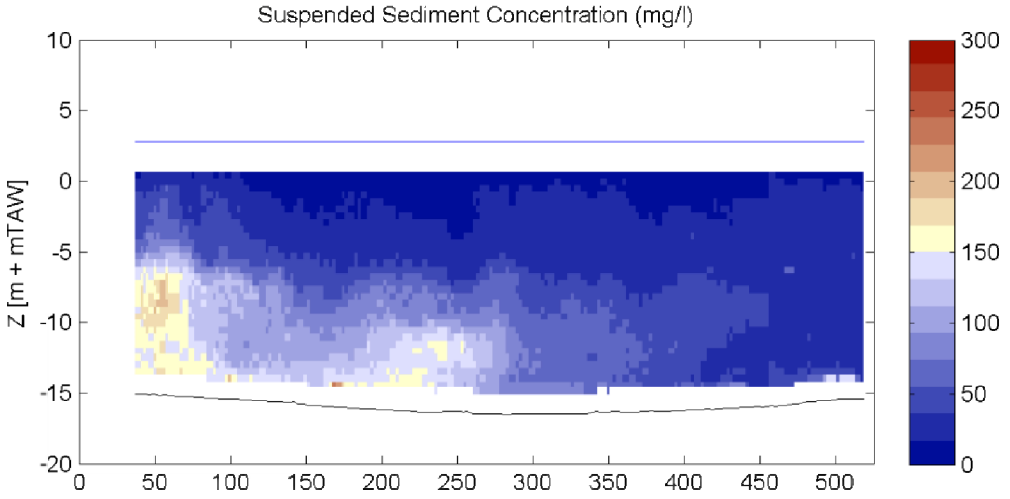
Date / Time [MET] :
08-Mar-2012
18:42 - 18:46

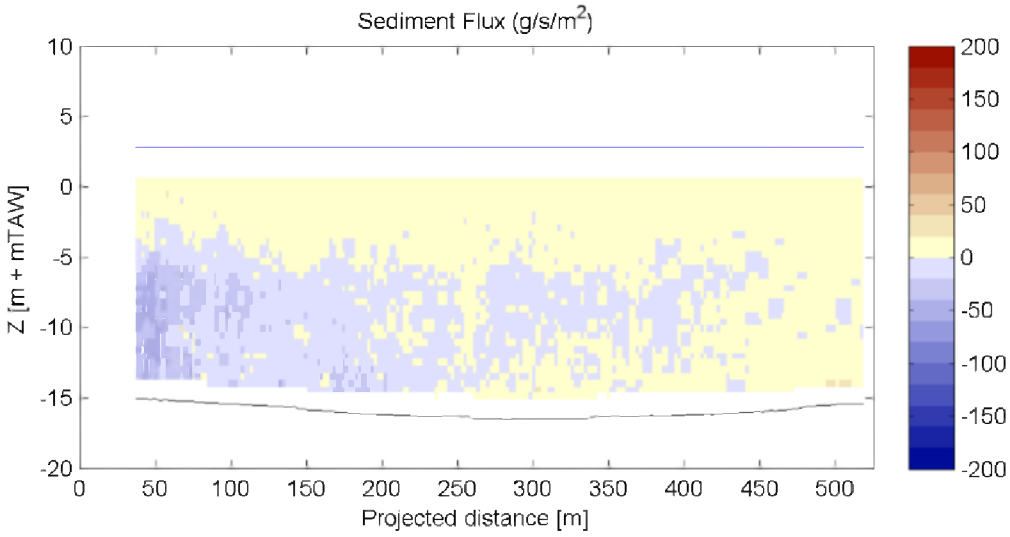
Time after HW [HH:MM]
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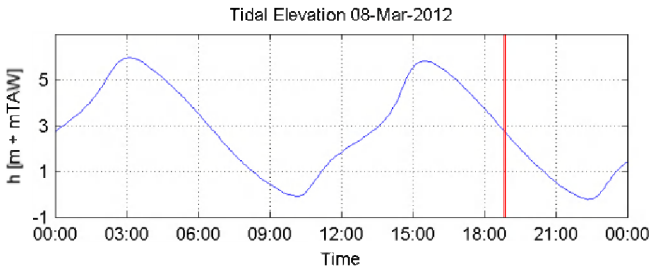
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6598_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

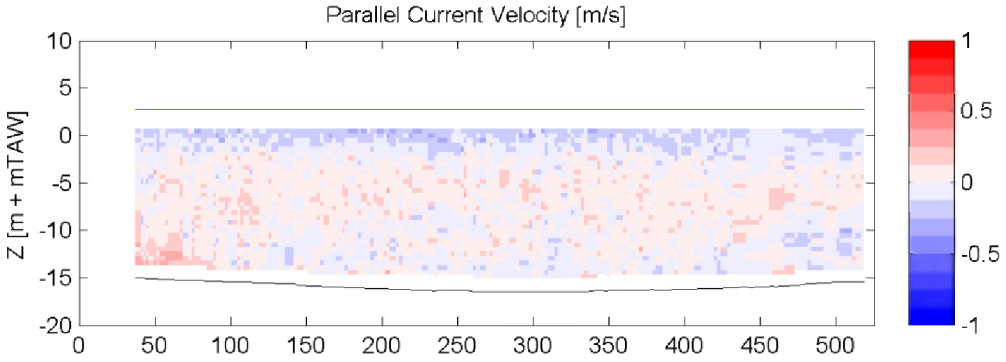
Date / Time [MET] :
08-Mar-2012
18:47 - 18:51

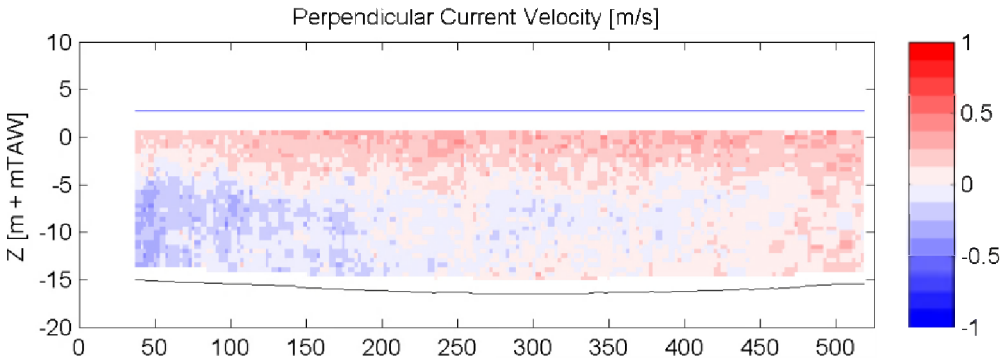
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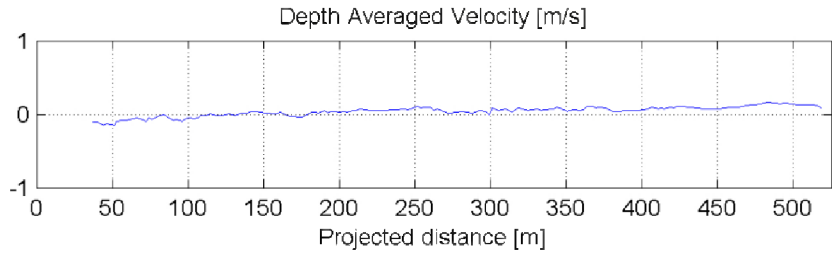
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In association with :
I/RA/11354/10.108/MBO/ANF

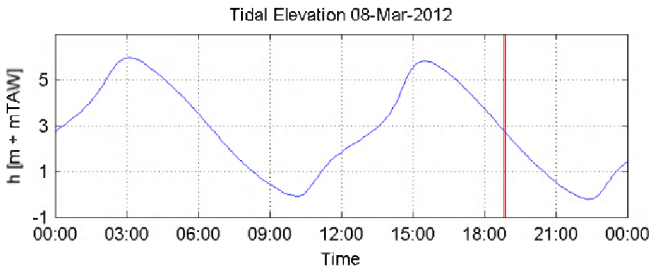
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6598_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

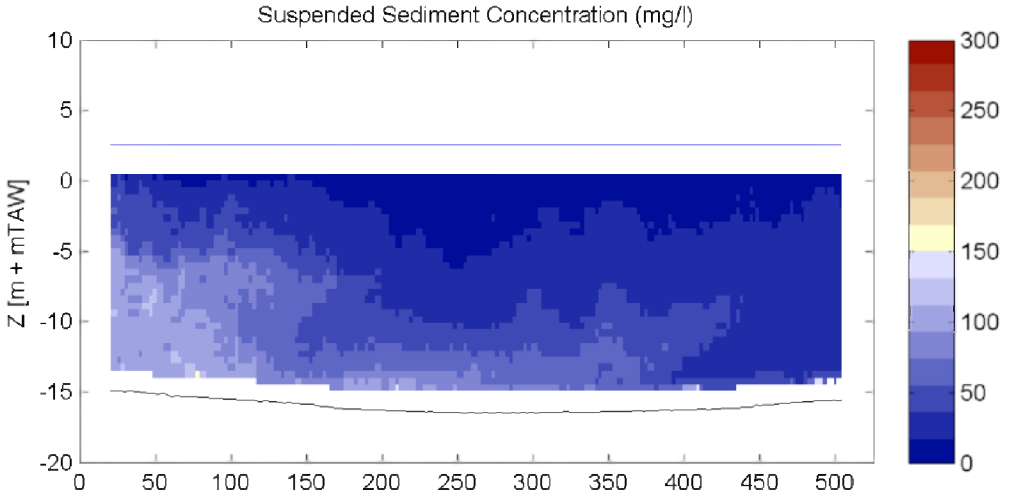
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08-Mar-2012
18:47 - 18:51

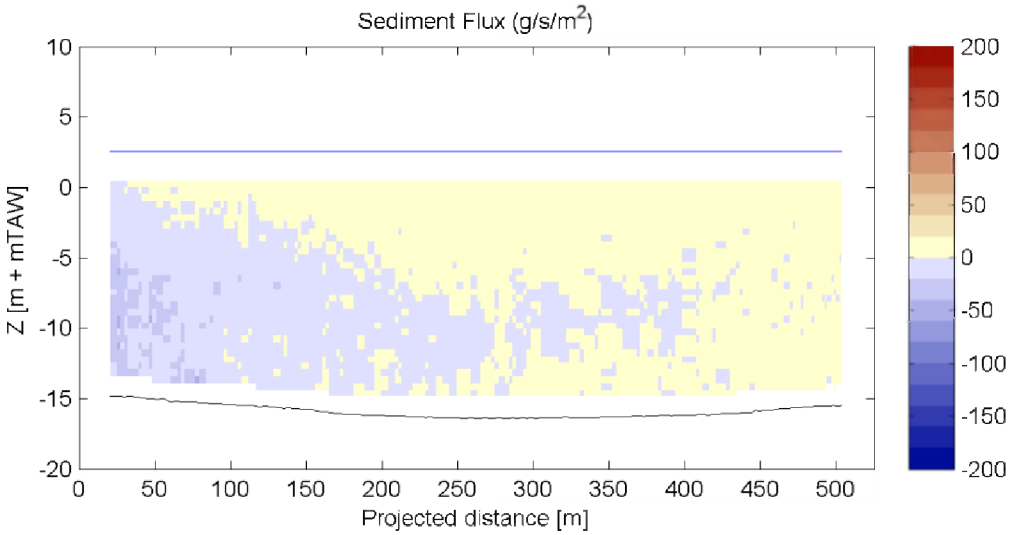
Time after HW [HH:MM]
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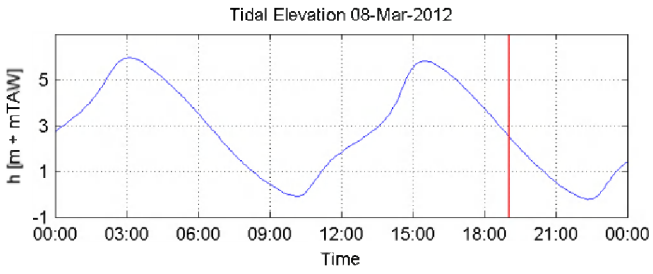
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6600_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

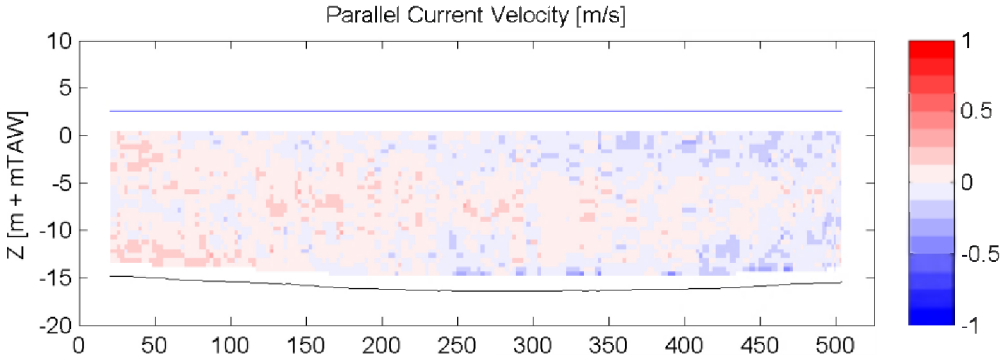
Date / Time [MET] :
08-Mar-2012
19:00 - 19:03

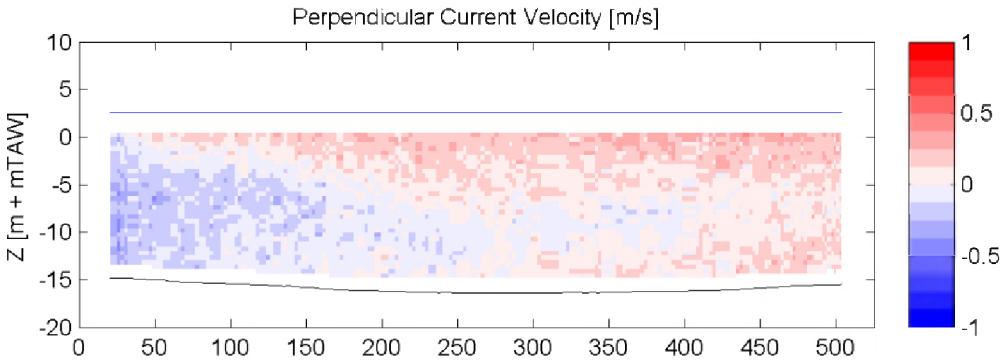
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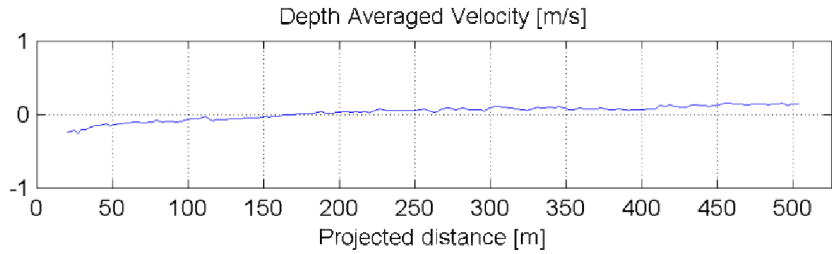
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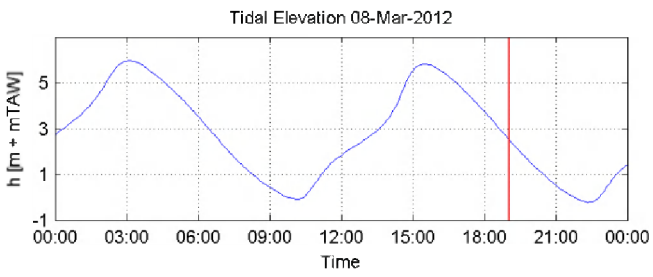
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6600_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

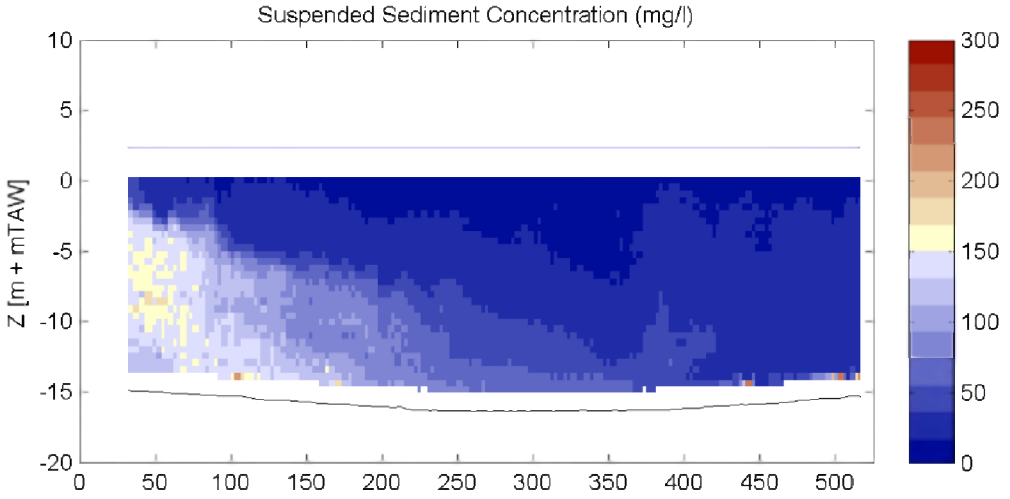
Date / Time [MET] :
08-Mar-2012
19:00 - 19:03

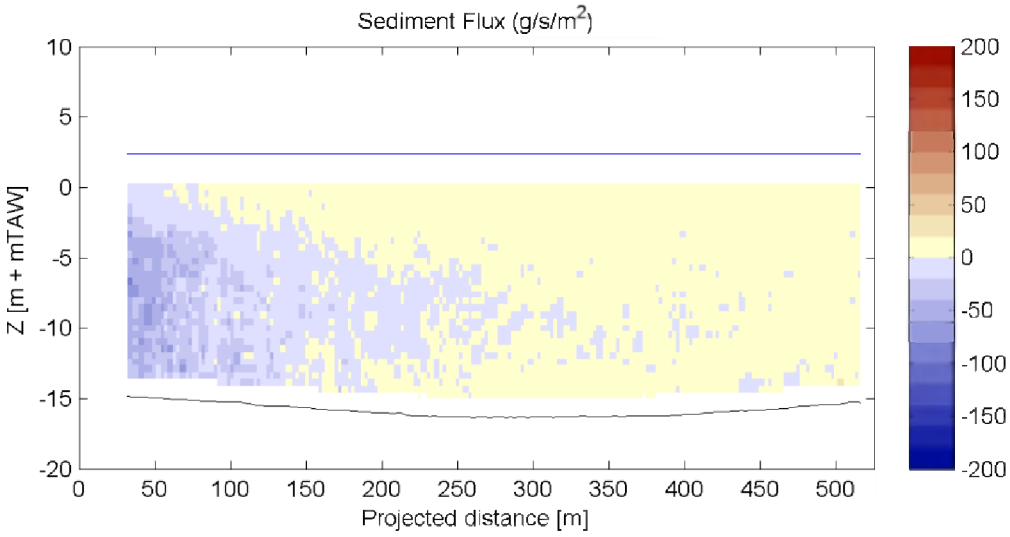
Time after HW [HH:MM]
3:36

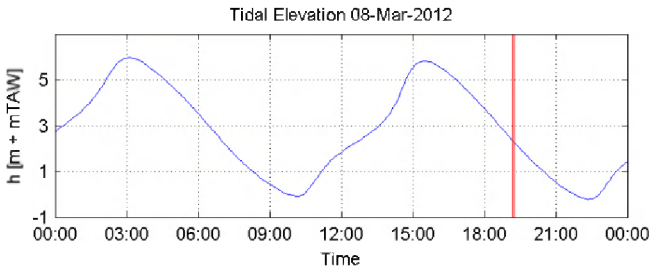
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6602_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW: 03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

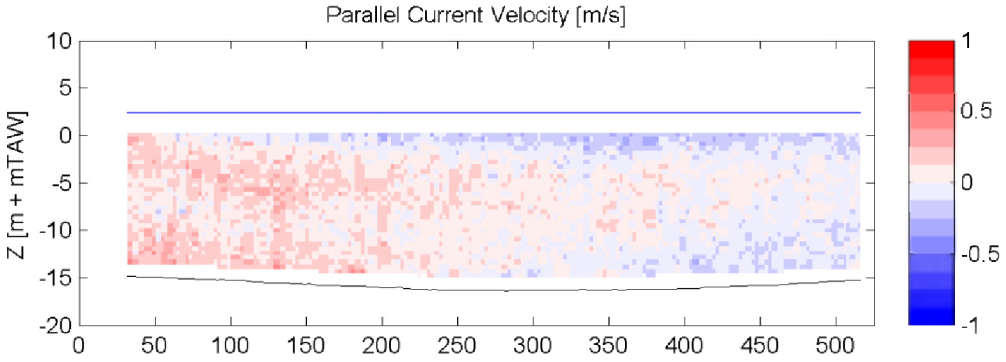
Date / Time [MET] :
08-Mar-2012
19:12 - 19:16

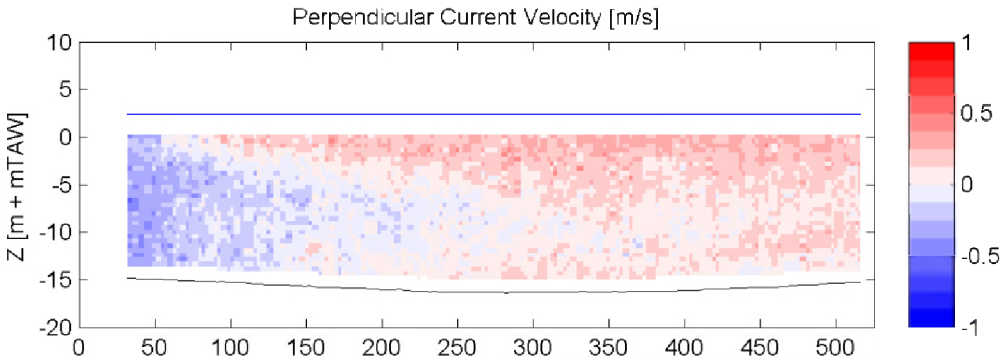
Time after HW [HH:MM]
3:49

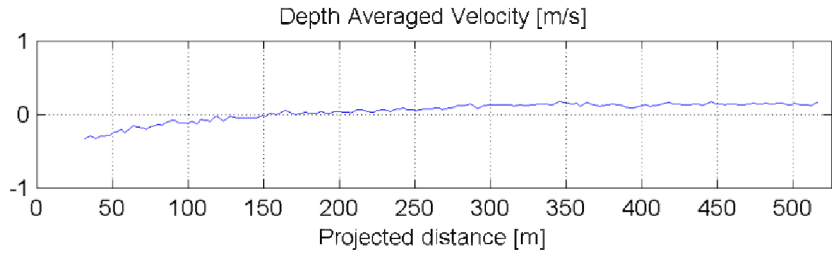
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

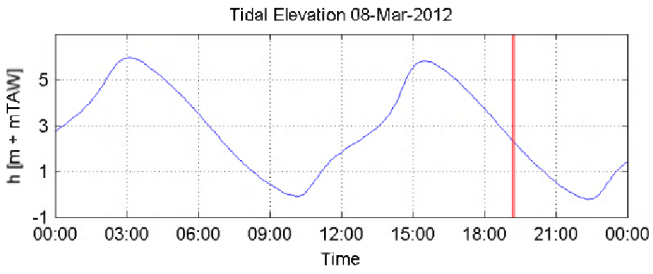
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6602_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

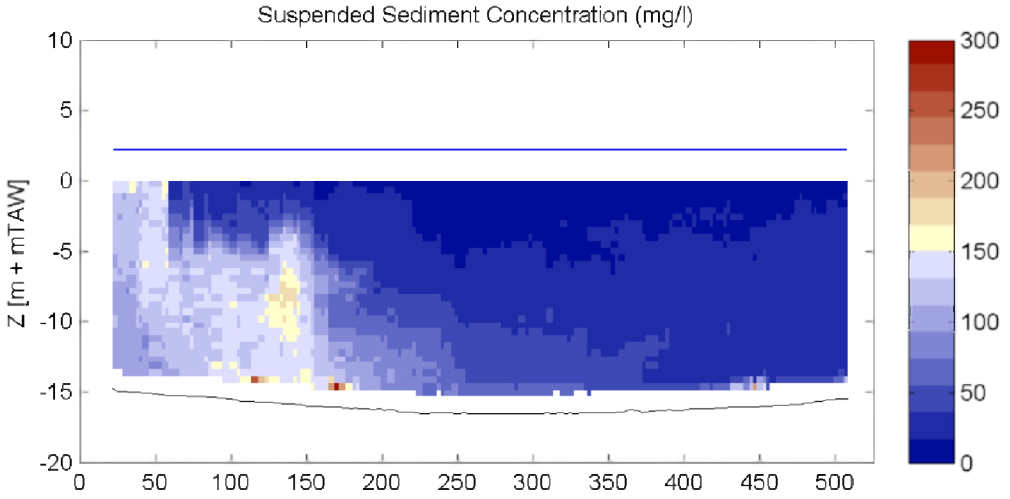
Date / Time [MET] :
08-Mar-2012
19:12 - 19:16

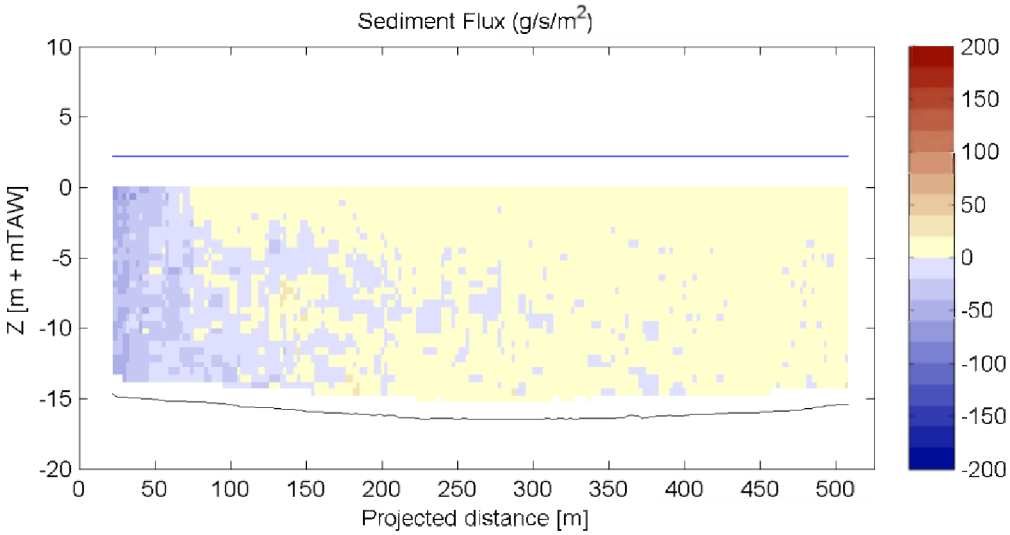
Time after HW [HH:MM]
3:49

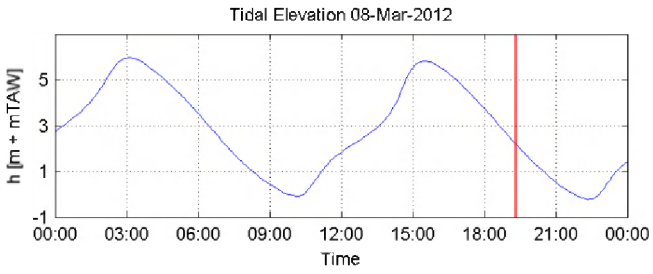
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6603_dgdTAB_sub.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

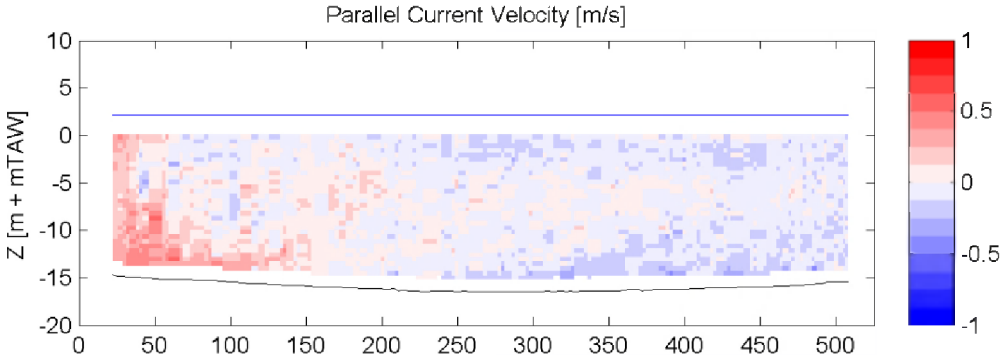
Date / Time [MET] :
08-Mar-2012
19:17 - 19:21

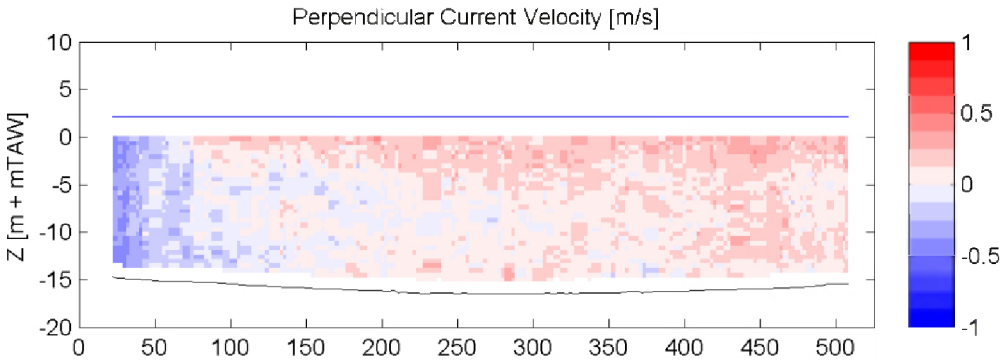
Time after HW [HH:MM]
3:54

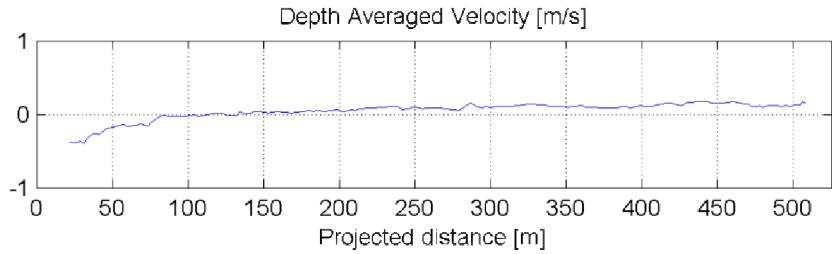
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

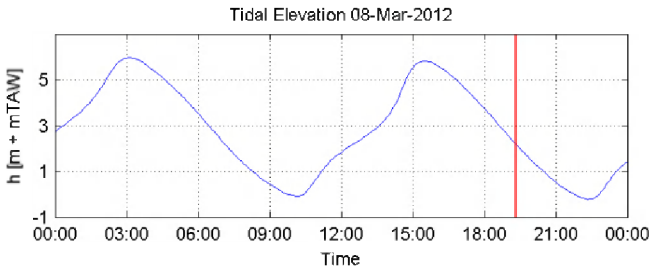
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6603_dgdTAB_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

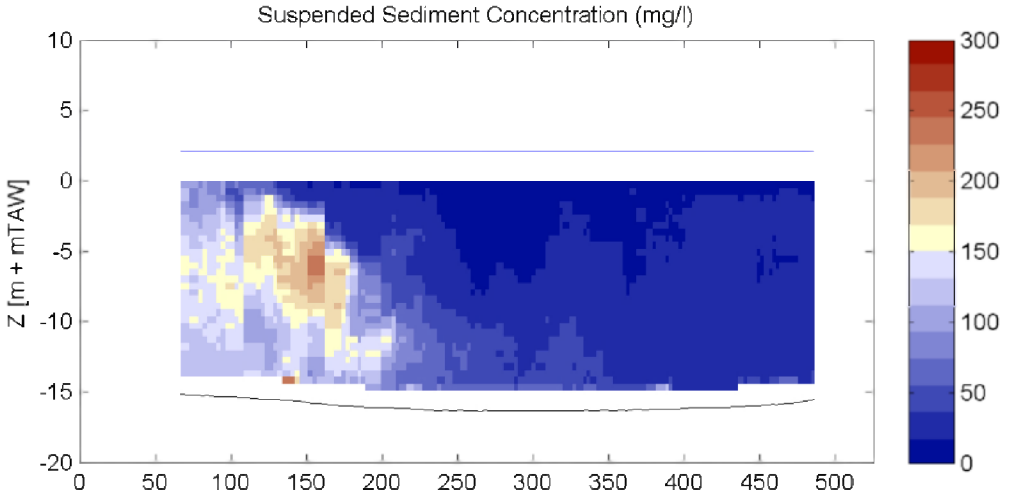
Date / Time [MET] :
08-Mar-2012
19:17 - 19:21

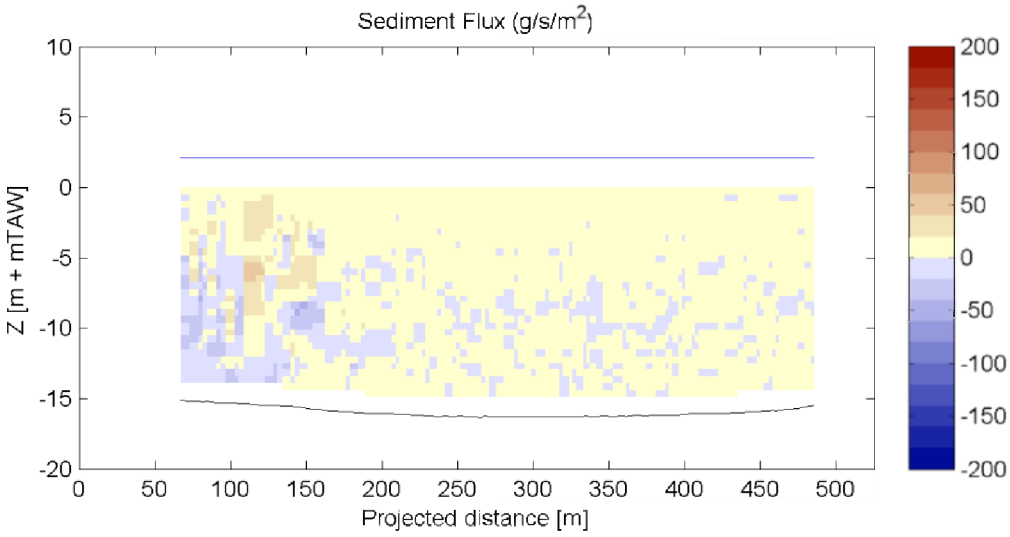
Time after HW [HH:MM]
3:54

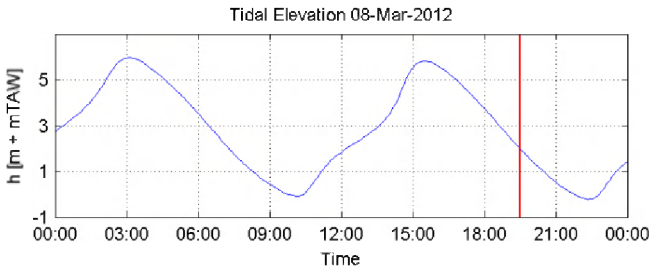
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6604_dgdTBA_sub.csv	Location: Deurganckdok







HW/LW: 03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

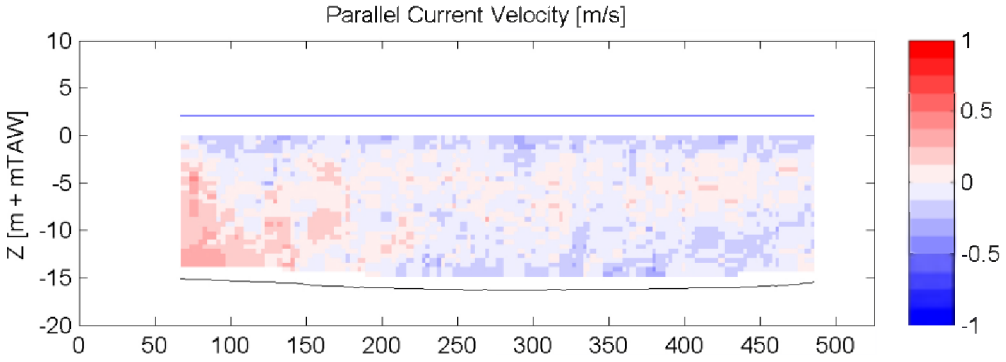
Date / Time [MET] :
08-Mar-2012
19:27 - 19:30

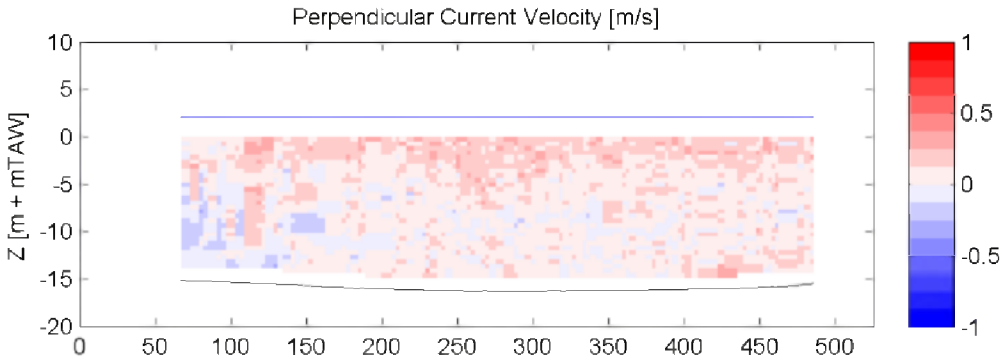
Time after HW [HH:MM]
4:03

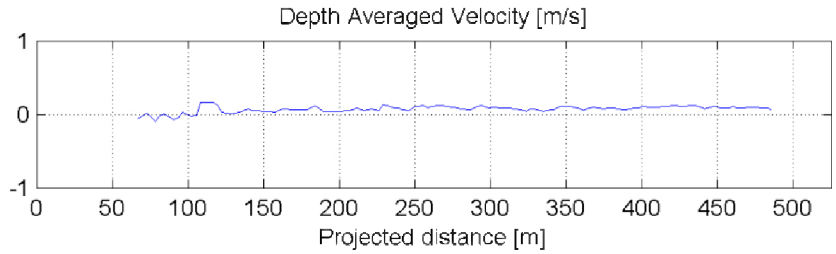
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

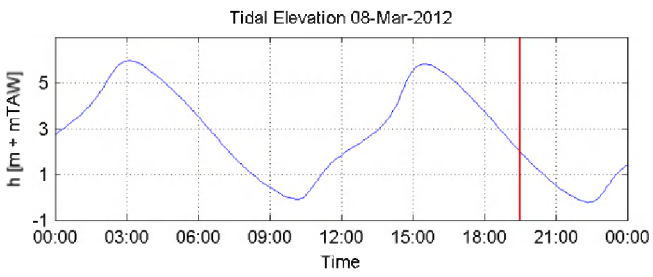
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6604_dgdTBA_sub.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

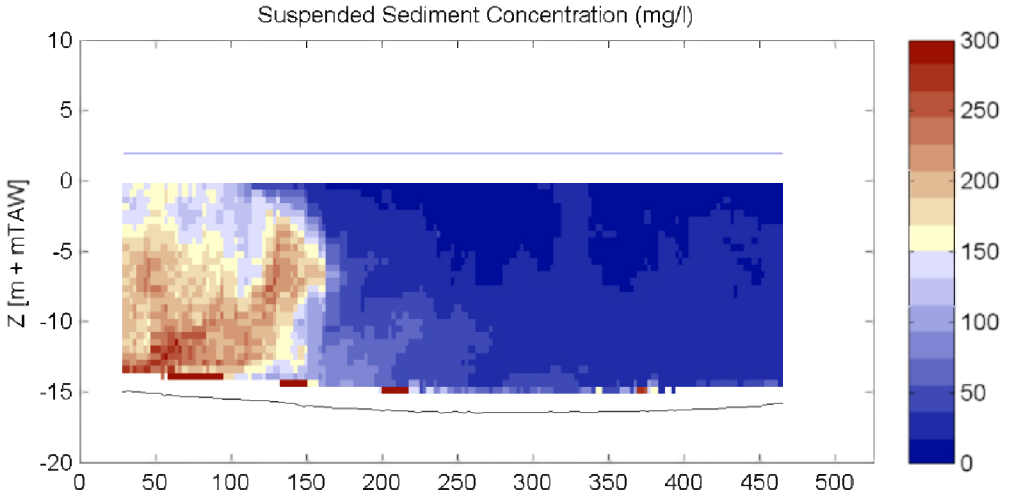
Date / Time [MET] :
08-Mar-2012
19:27 - 19:30

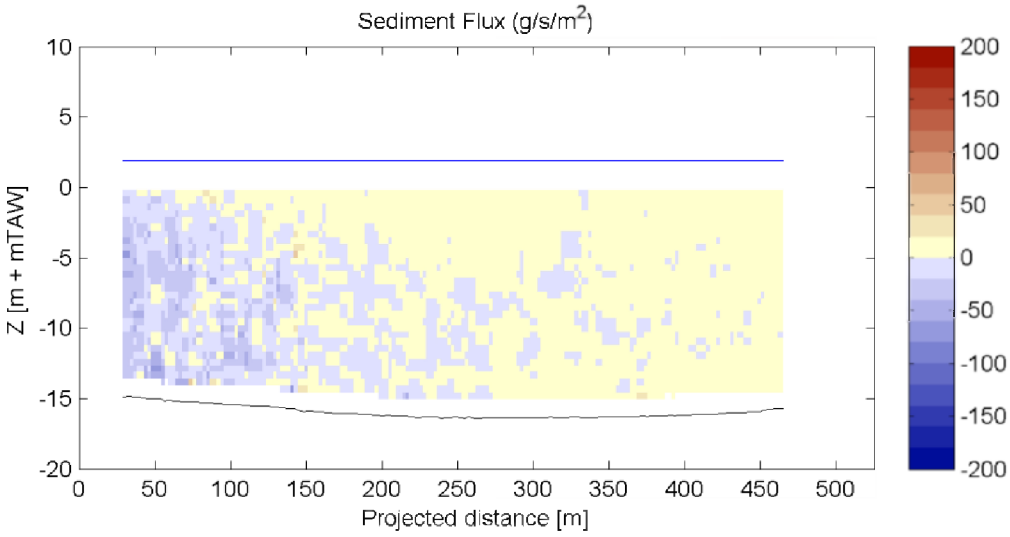
Time after HW [HH:MM]
4:03

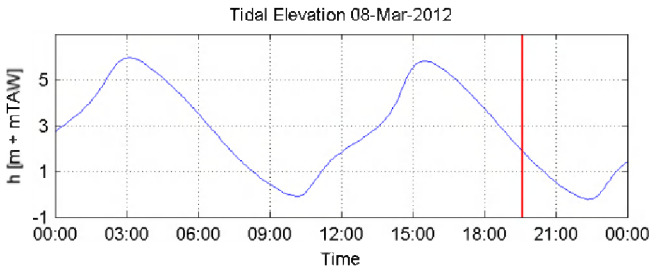
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6605_dgdTAB.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

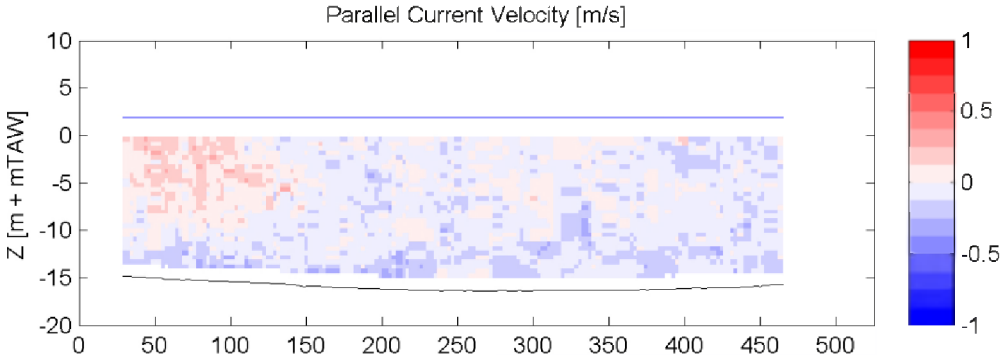
Date / Time [MET] :
08-Mar-2012
19:33 - 19:36

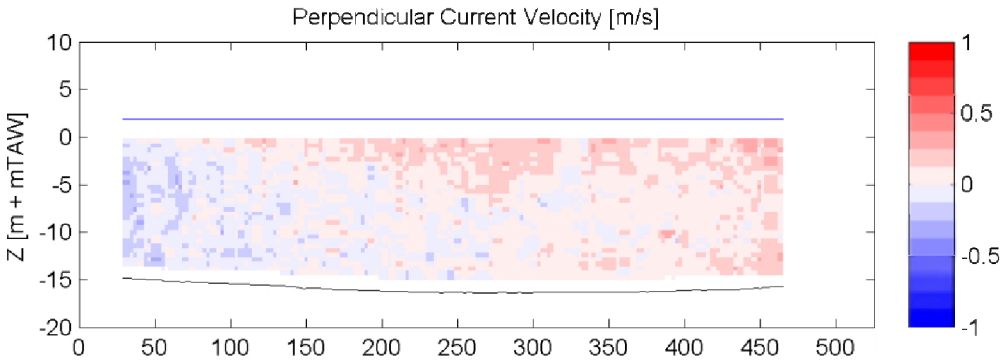
Time after HW [HH:MM]
4:10

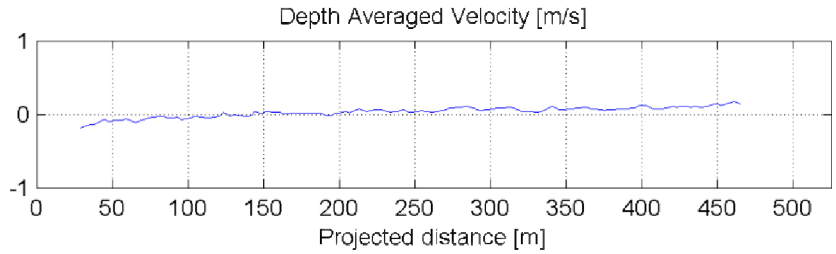
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

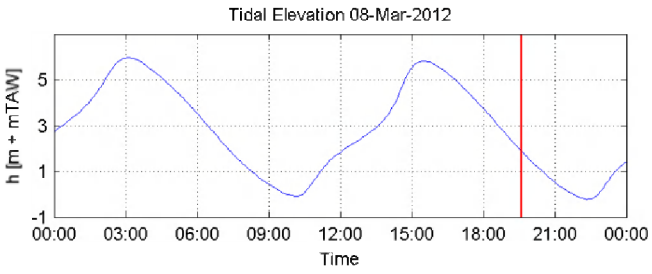
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6605_dgdTAB.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

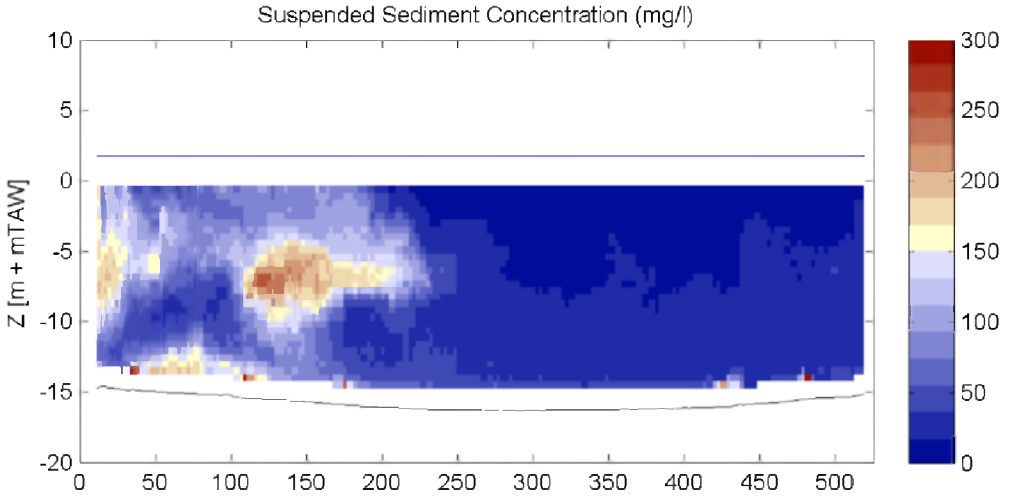
Date / Time [MET] :
08-Mar-2012
19:33 - 19:36

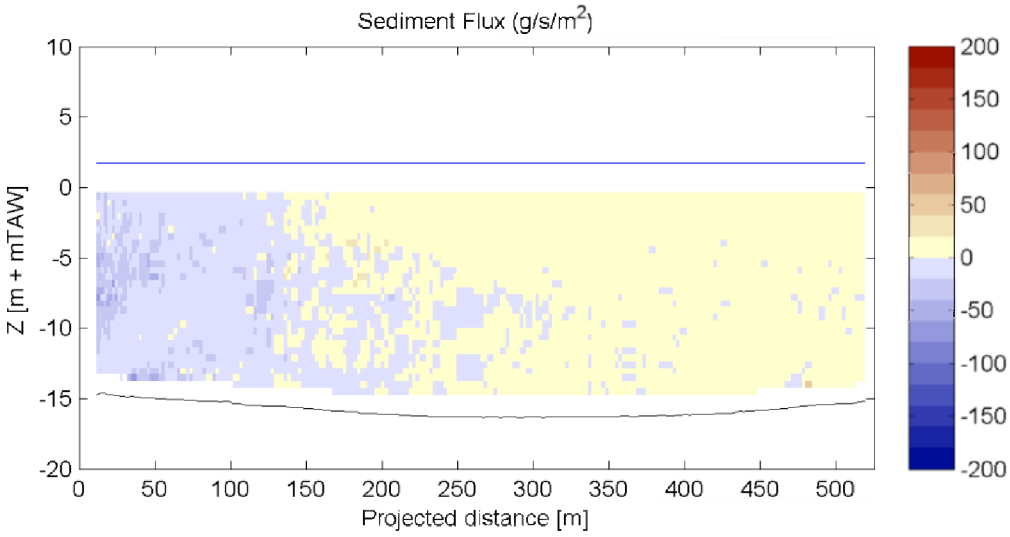
Time after HW [HH:MM]
4:10

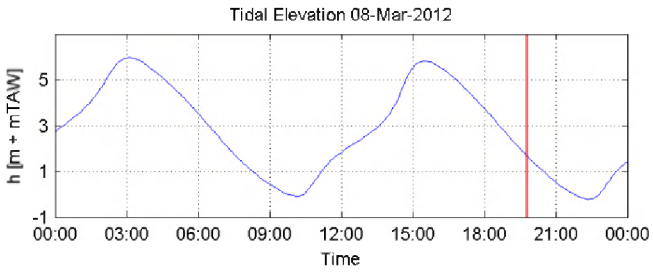
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6607_dgdTAB.csv	Location: Deurganckdok







HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

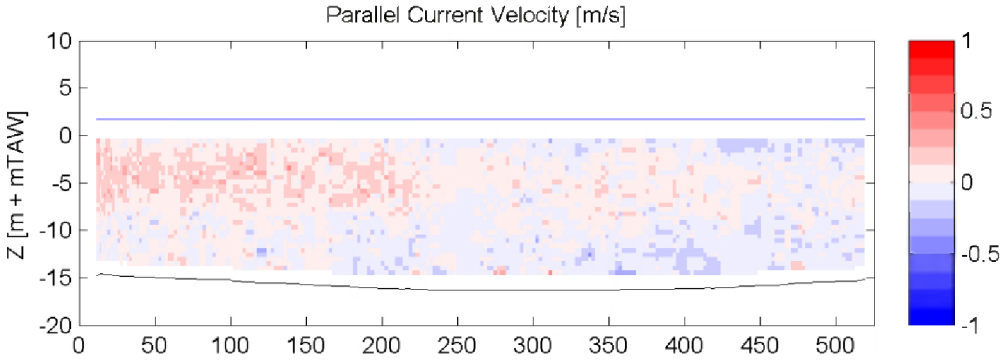
Date / Time [MET] :
08-Mar-2012
19:45 - 19:49

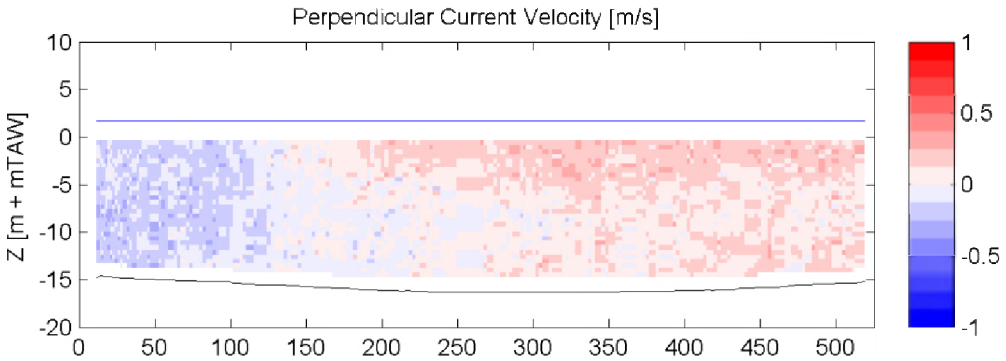
Time after HW [HH:MM]
4:22

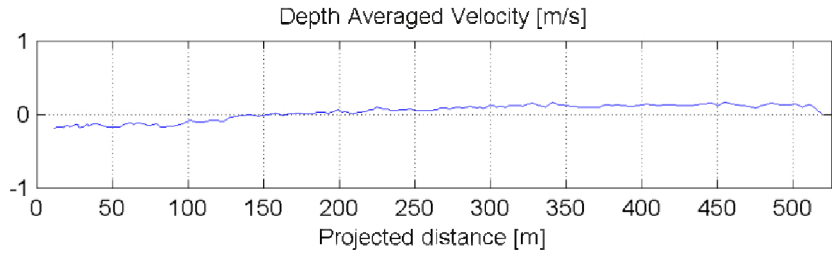
Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

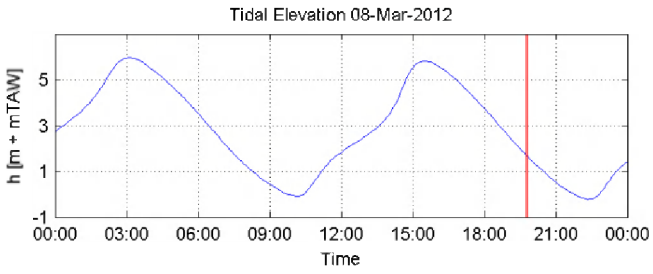
Evaluatie aanslibbing Deurganckdok

11354	Equipment(s): ADCP
Sourcefile: 6607_dgdTAB.csv	Location: Deurganckdok









HW/LW:
03:05: h = 5.96 m+mTAW
10:05: h = -0.08 m+mTAW
15:25: h = 5.83 m+mTAW

Date / Time [MET] :
08-Mar-2012
19:45 - 19:49

Time after HW [HH:MM]
4:22

Data Processed by:
In association with :
I/RA/11354/10.108/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]
6501_dgdTAB_sub	4:09	07:14	406	164	29	-24	58	632	319
6507_dgdTAB_sub	4:56	08:01	241	27	42	-24	63	384	266
6508_dgdTBA_sub	5:12	08:17	263	1	68	-126	72	361	238
6509_dgdTAB_sub	5:27	08:32	439	33	31	189	10	555	236
6511_dgdTBA_sub	5:38	08:43	160	-47	98	-9	40	311	229
6513_dgdTAB_sub	5:59	09:04	262	-183	113	-3	11	197	190
6514_dgdTBA_sub	6:10	09:15	232	-214	131	-43	36	202	180
6515_dgdTAB_sub	6:26	09:31	440	-136	158	-91	73	342	153
6517_dgdTBA_sub	6:42	09:47	174	-217	149	-19	49	193	68
6519_dgdTAB_sub	6:54	09:59	247	-226	164	-25	8	141	62
6520_dgdTBA_sub	-5:11	10:13	107	-220	178	-61	36	67	-26
6521_dgdTAB_sub	-5:06	10:18	125	-226	181	-38	39	30	-107
6523_dgdTBA	-4:57	10:28	-5	-280	174	-75	5	-177	-218
6525_dgdTAB	-4:42	10:42	-229	-277	138	-79	30	-364	-382
6527_dgdTAB_sub	-4:24	11:00	-146	-233	113	-72	6	-346	-397
6529_dgdTBA_sub	-4:08	11:16	-154	-225	127	-12	-64	-324	-377
6531_dgdTAB_sub	-3:53	11:31	-134	-203	86	3	-53	-295	-295
6532_dgdTBA_sub	-3:40	11:44	-153	-244	155	5	-2	-254	-257

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]*
6533_dgdTAB	-3:35	11:49	-151	-218	116	5	-23	-260	-221
6535_dgdBA_sub	-3:24	12:00	-84	-187	156	3	-122	-231	-217
6537_dgdTAB_sub	-3:12	12:12	-137	-177	154	-1	-16	-198	-232
6538_dgdTBA_sub	-2:59	12:25	-192	-210	177	1	-22	-237	-185
6539_dgdTAB	-2:52	12:32	-143	-200	105	1	-24	-263	-137
6542_dgdAB	-2:40	12:44	-202	-130	88	11	-52	-268	-226
6543_dgdBA_sub	-2:34	12:50	-170	-104	73	20	-21	-228	-222
6545_dgdTAB_sub	-2:24	13:00	-199	-77	65	18	-78	-256	-191
6547_dgdTBA_sub	-2:11	13:13	-263	-64	72	18	-14	-272	-261
6548_dgdTAB	-2:06	13:18	-346	-53	43	3	-4	-331	-204
6549_dgdTBA_sub	-1:55	13:29	-264	-29	29	30	-74	-342	-237
6551_dgdTAB_sub	-1:44	13:40	-412	-71	32	8	-21	-424	-306
6553_dgdTBA	-1:31	13:53	-370	-39	44	14	-35	-440	-377
6554_dgdTAB_sub	-1:27	13:57	-480	-72	18	8	-110	-575	-410
6555_dgdTBA_sub	-1:20	14:04	-457	-48	-2	20	-34	-621	-457
6557_dgdTAB_sub	-1:01	14:23	-845	-49	-28	2	-91	-880	-689
6559_dgdTBA_sub	-0:35	14:49	-767	104	-103	69	-19	-733	-574
6560_dgdTAB_sub	-0:30	14:54	-614	179	-121	90	-55	-504	-465
6561_dgdTBA	-0:23	15:01	-437	274	-183	129	-9	-189	-344
6563_dgdTAB_sub	-0:10	15:14	115	367	-170	2	-17	237	-158

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]*
6565_dgdTBA_sub	0:05	15:30	191	419	-214	62	3	451	18
6566_dgdTAB	0:09	15:34	296	423	-177	32	-9	563	34
6570_dgdTAB_sub	0:34	15:59	427	394	-185	1	23	617	181
6572_dgdTBA_sub	0:47	16:11	195	405	-203	89	9	531	200
6573_dgdTAB_sub	0:52	16:17	179	391	-113	86	2	533	171
6574_dgdTBA	0:57	16:22	272	444	-200	1	7	546	202
6576_dgdTAB_sub	1:08	16:33	315	436	-142	5	17	617	264
6578_dgdTBA_sub	1:21	16:46	355	477	-204	9	11	617	272
6579_dgdTAB	1:25	16:50	152	418	-160	4	64	495	272
6580_dgdTBA_sub	1:30	16:55	149	422	-195	16	21	420	295
6582_dgdTAB_sub	1:43	17:08	89	353	-83	16	15	386	297
6584_dgdTBA_sub	1:57	17:22	76	316	-70	22	1	347	306
6585_dgdTAB_sub	2:03	17:28	30	286	-47	1	40	334	313
6586_dgdTBA_sub	2:08	17:33	159	283	-44	0	18	389	322
6588_dgdTAB_sub	2:23	17:48	67	244	0	-3	50	379	340
6590_dgdTBA_sub	2:36	18:01	329	248	-48	-111	2	386	272
6591_dgdTAB_sub	2:42	18:07	-25	164	-58	0	196	309	371
6592_dgdTBA	2:51	18:16	215	226	-55	-73	17	342	335
6594_dgdTAB_sub	3:02	18:27	282	220	-1	-86	40	428	373

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]*
6596_dgdTBA_sub	3:14	18:39	224	228	-18	-25	8	421	327
6597_dgdTAB_sub	3:19	18:44	97	211	-4	-2	99	412	320
6598_dgdTBA_sub	3:24	18:49	294	229	-8	-75	7	424	323
6600_dgdTAB_sub	3:36	19:01	187	186	16	-74	43	373	313
6602_dgdTBA_sub	3:49	19:14	311	187	8	-154	13	375	350
6603_dgdTAB_sub	3:54	19:19	339	153	36	-128	32	451	321
6604_dgdTBA_sub	4:03	19:28	427	144	26	-30	46	546	281
6605_dgdTAB	4:10	19:35	201	111	11	-62	131	421	306
6607_dgdTAB	4:22	19:47	254	107	15	-31	4	349	306

G.2 Sediment flux distribution over the cross section: positive is from dock to river

Filename	Time after HW [hh:mm]	Time [hh:mm]	Fmid [kg/s]	Ftop [kg/s]	Fbot [kg/s]	Fleft [kg/s]	Fright [kg/s]	Ftot [kg/s]
6501_dgdTAB_sub	4:09	07:14	9.3	3.1	1.5	-4.8	1.4	10.5
6507_dgdTAB_sub	4:56	08:01	-1.4	-2.0	2.0	-2.6	1.3	-0.3
6508_dgdTBA_sub	5:12	08:17	5.9	-2.5	4.1	-9.9	1.2	3.9
6509_dgdTAB_sub	5:27	08:32	15.0	0.6	0.2	15.1	0.2	19.2
6511_dgdTBA_sub	5:38	08:43	-5.5	-7.6	5.5	-1.1	1.1	-4.5
6513_dgdTAB_sub	5:59	09:04	-11.5	-20.4	4.6	-0.2	0.2	-24.8
6514_dgdTBA_sub	6:10	09:15	-13.9	-22.5	7.0	-3.1	0.7	-27.1
6515_dgdTAB_sub	6:26	09:31	4.8	-15.6	8.1	-7.0	1.3	-15.0
6517_dgdTBA_sub	6:42	09:47	-11.7	-19.9	7.4	-1.3	1.1	-20.7
6519_dgdTAB_sub	6:54	09:59	-3.1	-21.6	8.2	-1.7	0.2	-19.6
6520_dgdTBA_sub	-5:11	10:13	-7.5	-20.0	10.3	-4.8	1.1	-20.6
6521_dgdTAB	-5:06	10:18	-8.9	-21.8	10.6	-3.4	1.3	-26.2
6523_dgdTBA	-4:57	10:28	-23.3	-28.3	10.5	-6.8	0.1	-48.1
6525_dgdTAB	-4:42	10:42	-47.2	-31.1	8.3	-6.9	1.2	-70.5
6527_dgdTAB_sub	-4:24	11:00	-43.0	-27.2	8.1	-9.5	-0.7	-70.8
6529_dgdTBA_sub	-4:08	11:16	-34.1	-19.4	7.6	-0.9	-12.9	-56.5
6531_dgdTAB_sub	-3:53	11:31	-17.6	-11.5	5.8	1.6	-6.1	-33.3
6532_dgdTBA_sub	-3:40	11:44	-22.5	-18.1	11.9	0.3	-0.2	-28.0
6533_dgdTAB	-3:35	11:49	-16.5	-15.3	8.5	0.1	-1.9	-24.6
6535_dgdBA_sub	-3:24	12:00	-10.9	-12.4	13.9	-0.3	-8.9	-18.5
6537_dgdTAB_sub	-3:12	12:12	-11.3	-12.1	13.7	-0.9	-1.0	-12.0
6538_dgdTBA_sub	-2:59	12:25	-9.7	-12.4	15.9	0.0	-0.6	-7.6
6539_dgdTAB	-2:52	12:32	-4.6	-10.8	9.9	-0.1	-1.3	-8.1
6542_dgdAB	-2:40	12:44	-12.5	-7.1	7.2	0.8	-2.3	-13.3
6543_dgdBA_sub	-2:34	12:50	-16.5	-6.1	5.8	1.5	-1.2	-18.0
6545_dgdTAB_sub	-2:24	13:00	-23.4	-3.8	4.3	1.2	-6.4	-27.9
6547_dgdTBA_sub	-2:11	13:13	-39.4	-4.8	5.5	1.5	-1.3	-38.8
6548_dgdTAB	-2:06	13:18	-48.6	-5.4	3.4	0.3	-0.3	-48.1
6549_dgdTBA_sub	-1:55	13:29	-39.5	-5.2	1.6	2.1	-6.5	-47.1

Filename	Time after HW [hh:mm]	Time [hh:mm]	Fmid [kg/s]	Ftop [kg/s]	Fbot [kg/s]	Fleft [kg/s]	Fright [kg/s]	Ftot [kg/s]
6551_dgdTAB_sub	-1:44	13:40	-38.5	-6.3	3.1	0.6	-1.4	-42.3
6553_dgdTBA	-1:31	13:53	-35.0	-4.3	4.5	0.9	-2.7	-40.2
6554_dgdTAB_sub	-1:27	13:57	-41.9	-5.4	2.9	0.7	-9.0	-47.5
6555_dgdTBA_sub	-1:20	14:04	-34.9	-3.0	0.5	2.1	-2.3	-43.0
6557_dgdTAB_sub	-1:01	14:23	-45.6	-1.9	-2.5	0.1	-5.4	-53.4
6559_dgdTBA_sub	-0:35	14:49	-56.8	3.1	-10.8	4.1	-1.3	-61.2
6560_dgdTAB_sub	-0:30	14:54	-57.9	5.1	-13.4	4.7	-3.7	-62.6
6561_dgdTBA	-0:23	15:01	-47.5	7.8	-18.8	5.9	-0.7	-64.7
6563_dgdTAB_sub	-0:10	15:14	-70.4	10.4	-43.4	0.2	-6.6	-104.6
6565_dgdTBA_sub	0:05	15:30	-96.3	13.3	-56.1	4.8	-0.7	-129.8
6566_dgdTAB	0:09	15:34	-77.4	13.3	-61.0	4.4	-8.3	-125.0
6570_dgdTAB_sub	0:34	15:59	-59.3	10.5	-50.2	0.1	0.2	-107.1
6572_dgdTBA_sub	0:47	16:11	-88.9	10.6	-51.8	11.1	0.2	-118.0
6573_dgdTAB_sub	0:52	16:17	-89.8	10.9	-53.2	10.2	-11.7	-130.7
6574_dgdTBA	0:57	16:22	-88.9	11.2	-53.7	0.2	0.0	-127.7
6576_dgdTAB_sub	1:08	16:33	-68.3	10.3	-52.0	0.8	0.7	-110.0
6578_dgdTBA_sub	1:21	16:46	-58.2	10.6	-49.3	1.2	0.5	-100.1
6579_dgdTAB	1:25	16:50	-72.8	9.6	-46.1	-0.2	-2.0	-105.1
6580_dgdTBA_sub	1:30	16:55	-62.3	11.5	-39.5	0.0	0.7	-86.0
6582_dgdTAB_sub	1:43	17:08	-36.4	7.8	-18.1	0.2	0.3	-52.4
6584_dgdTBA_sub	1:57	17:22	-34.0	6.3	-11.8	-0.1	0.0	-40.1
6585_dgdTAB_sub	2:03	17:28	-32.3	5.7	-10.5	0.0	1.4	-34.5
6586_dgdTBA_sub	2:08	17:33	-23.6	5.3	-6.4	-0.3	0.5	-25.7
6588_dgdTAB_sub	2:23	17:48	-20.3	4.3	-5.2	-0.3	0.9	-20.4
6590_dgdTBA_sub	2:36	18:01	-4.1	3.9	-4.7	-10.8	0.0	-16.7
6591_dgdTAB_sub	2:42	18:07	-19.4	1.9	-6.1	0.0	6.8	-18.1
6592_dgdTBA	2:51	18:16	-17.7	3.5	-6.2	-5.8	0.4	-24.0
6594_dgdTAB_sub	3:02	18:27	-14.2	3.1	-4.3	-9.9	1.1	-24.7
6596_dgdTBA_sub	3:14	18:39	-21.4	4.1	-5.8	-3.1	0.2	-25.3
6597_dgdTAB_sub	3:19	18:44	-22.1	3.2	-6.1	-0.2	2.1	-24.4
6598_dgdTBA_sub	3:24	18:49	-13.2	3.7	-4.7	-13.7	0.2	-24.8

Filename	*Time after HW [hh:mm]*	*Time [hh:mm]*	*Fmid [kg/s]*	*Ftop [kg/s]*	*Fbot [kg/s]*	*Fleft [kg/s]*	*Fright [kg/s]*	*Ftot [kg/s]*
6600_dgdTAB_sub	3:36	19:01	-10.9	2.5	-1.2	-6.7	1.0	-21.2
6602_dgdTBA_sub	3:49	19:14	-19.0	2.3	-2.3	-19.7	0.3	-32.7
6603_dgdTAB_sub	3:54	19:19	-11.8	-1.0	-1.1	-14.4	0.7	-22.8
6604_dgdTBA_sub	4:03	19:28	13.6	3.3	-2.1	-4.6	1.1	-0.8
6605_dgdTAB	4:10	19:35	-13.2	1.7	-2.7	-11.5	2.8	-16.0
6607_dgdTAB	4:22	19:47	-10.7	-0.2	-1.3	-4.1	0.1	-16.1

G.3 Sediment concentration distribution over the cross section

Transect name	*Time after HW [hh:mm]*	*Time [hh:mm]*	*Average measured SS Concentration [mg/l]*	*Average measured incoming SS Concentration [mg/l]*	*Average measured outgoing SS Concentration [mg/l]*
6501_dgdTAB_sub	4:09	07:14	43	106	32
6507_dgdTAB_sub	4:56	08:01	46	82	32
6508_dgdTBA_sub	5:12	08:17	48	67	38
6509_dgdTAB_sub	5:27	08:32	51	75	45
6511_dgdTBA_sub	5:38	08:43	60	96	41
6513_dgdTAB_sub	5:59	09:04	64	96	39
6514_dgdTBA_sub	6:10	09:15	63	94	39
6515_dgdTAB_sub	6:26	09:31	62	95	42
6517_dgdTBA_sub	6:42	09:47	63	87	45
6519_dgdTAB_sub	6:54	09:59	67	87	51
6520_dgdTBA_sub	-5:11	10:13	69	85	54
6521_dgdTAB	-5:06	10:18	71	89	55
6523_dgdTBA	-4:57	10:28	78	96	56
6525_dgdTAB	-4:42	10:42	87	106	59
6527_dgdTAB_sub	-4:24	11:00	93	113	62
6529_dgdTBA_sub	-4:08	11:16	83	97	61
6531_dgdTAB_sub	-3:53	11:31	77	82	70
6532_dgdTBA_sub	-3:40	11:44	78	82	73
6533_dgdTAB	-3:35	11:49	77	80	74
6535_dgdBA_sub	-3:24	12:00	76	77	76
6537_dgdTAB_sub	-3:12	12:12	74	72	75
6538_dgdTBA_sub	-2:59	12:25	69	65	75
6539_dgdTAB	-2:52	12:32	66	61	73
6542_dgdAB	-2:40	12:44	62	60	65
6543_dgdBA_sub	-2:34	12:50	64	66	61
6545_dgdTAB_sub	-2:24	13:00	70	77	59
6547_dgdTBA_sub	-2:11	13:13	82	93	65
6548_dgdTAB	-2:06	13:18	87	99	66

Transect name	*Time after HW [hh:mm]*	*Time [hh:mm]*	*Average measured SS Concentration [mg/l]*	*Average measured incoming SS Concentration [mg/l]*	*Average measured outgoing SS Concentration [mg/l]*
6549_dgdTBA_sub	-1:55	13:29	88	99	68
6551_dgdTAB_sub	-1:44	13:40	86	90	78
6553_dgdTBA	-1:31	13:53	85	87	80
6554_dgdTAB_sub	-1:27	13:57	83	83	83
6555_dgdTBA_sub	-1:20	14:04	73	71	77
6557_dgdTAB_sub	-1:01	14:23	60	60	57
6559_dgdTBA_sub	-0:35	14:49	63	69	44
6560_dgdTAB_sub	-0:30	14:54	65	78	41
6561_dgdTBA	-0:23	15:01	70	93	42
6563_dgdTAB_sub	-0:10	15:14	103	166	51
6565_dgdTBA_sub	0:05	15:30	121	206	61
6566_dgdTAB	0:09	15:34	126	216	67
6570_dgdTAB_sub	0:34	15:59	123	211	68
6572_dgdTBA_sub	0:47	16:11	120	203	64
6573_dgdTAB_sub	0:52	16:17	121	206	63
6574_dgdTBA	0:57	16:22	118	201	62
6576_dgdTAB_sub	1:08	16:33	109	189	57
6578_dgdTBA_sub	1:21	16:46	98	171	51
6579_dgdTAB	1:25	16:50	94	162	47
6580_dgdTBA_sub	1:30	16:55	87	146	45
6582_dgdTAB_sub	1:43	17:08	65	111	34
6584_dgdTBA_sub	1:57	17:22	58	99	30
6585_dgdTAB_sub	2:03	17:28	55	94	28
6586_dgdTBA_sub	2:08	17:33	50	89	27
6588_dgdTAB_sub	2:23	17:48	44	79	24
6590_dgdTBA_sub	2:36	18:01	43	76	25
6591_dgdTAB_sub	2:42	18:07	45	75	26
6592_dgdTBA	2:51	18:16	47	85	24
6594_dgdTAB_sub	3:02	18:27	52	104	25
6596_dgdTBA_sub	3:14	18:39	54	113	25
6597_dgdTAB_sub	3:19	18:44	52	107	24

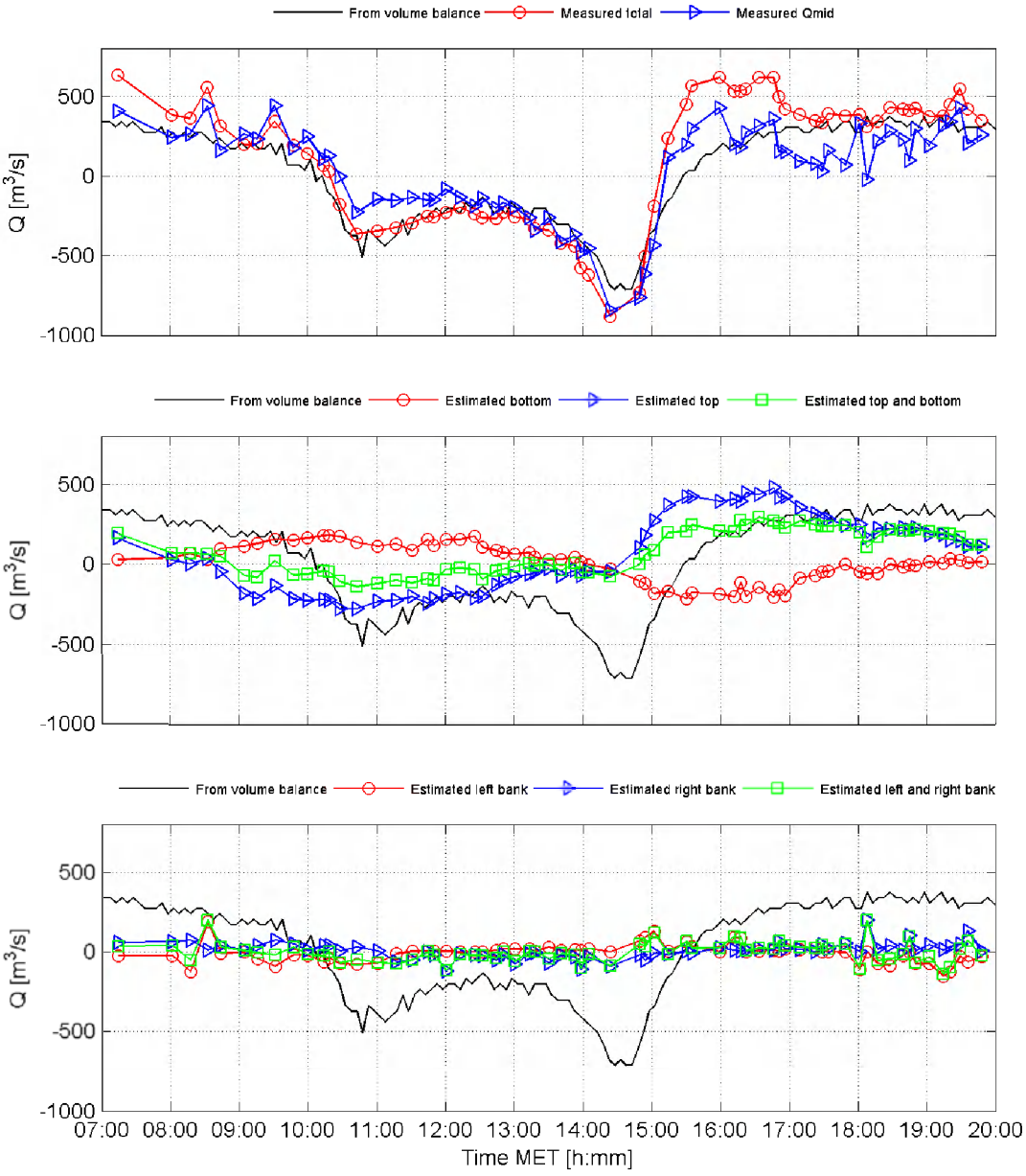
Transect name	*Time after HW [hh:mm]*	*Time [hh:mm]*	*Average measured SS Concentration [mg/l]*	*Average measured incoming SS Concentration [mg/l]*	*Average measured outgoing SS Concentration [mg/l]*
6598_dgdTBA_sub	3:24	18:49	53	111	25
6600_dgdTAB_sub	3:36	19:01	48	92	24
6602_dgdTBA_sub	3:49	19:14	56	110	25
6603_dgdTAB_sub	3:54	19:19	58	116	30
6604_dgdTBA_sub	4:03	19:28	60	131	38
6605_dgdTAB	4:10	19:35	63	147	32
6607_dgdTAB	4:22	19:47	49	97	26

Tide	Concentration [mg/l]								
	overall SSC			incoming SSC			outgoing SSC		
	min	average	max	min	average	max	min	average	max
Flood	60	85	139	54	88	124	48	84	165
Eb	18	42	69	19	52	90	18	35	62

Annex H Temporal variation of total flux, total discharge and suspended sediment concentration

Evaluatie aanslibbing Deurganckdok

	Equipment(s): ADCP
Sourcefile(s): 6501_dgdTAB_sub.csv 6607_dgdTAB.csv	Location: Deurganckdok



Date : 08-Mar-2012	Data Processed by: IMDC In association with : GEMS Deltares I/RA/11354/10.108/MBO

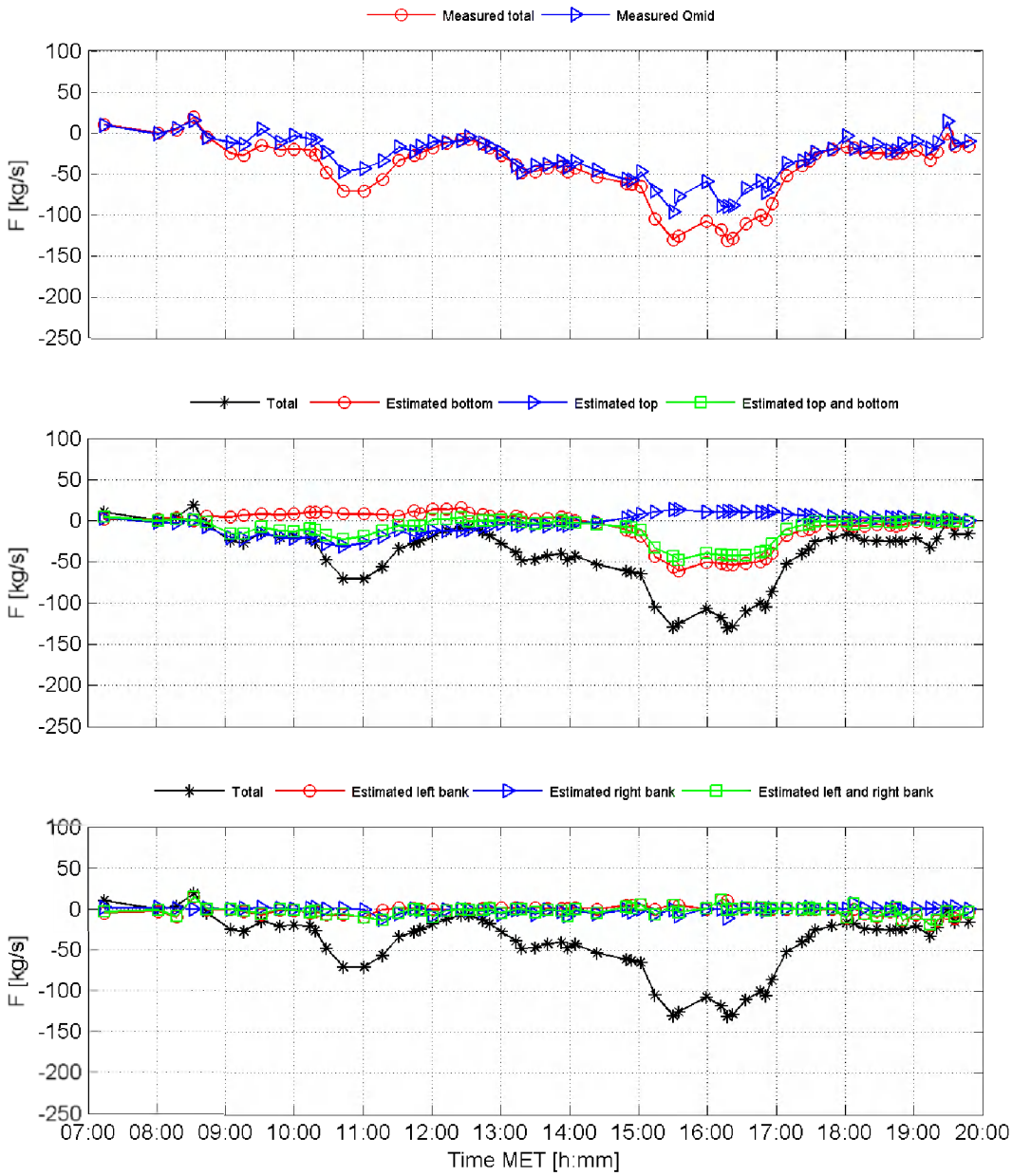
Annex Figure 8: Total discharge through the measured cross section, positive is from dock to river

Evaluatie aanslibbing Deurganckdok

Equipment(s):
ADCP

Sourcefile(s):
6501_dgdTAB_sub.csv
6607_dgdTAB.csv

Location:
Deurganckdok



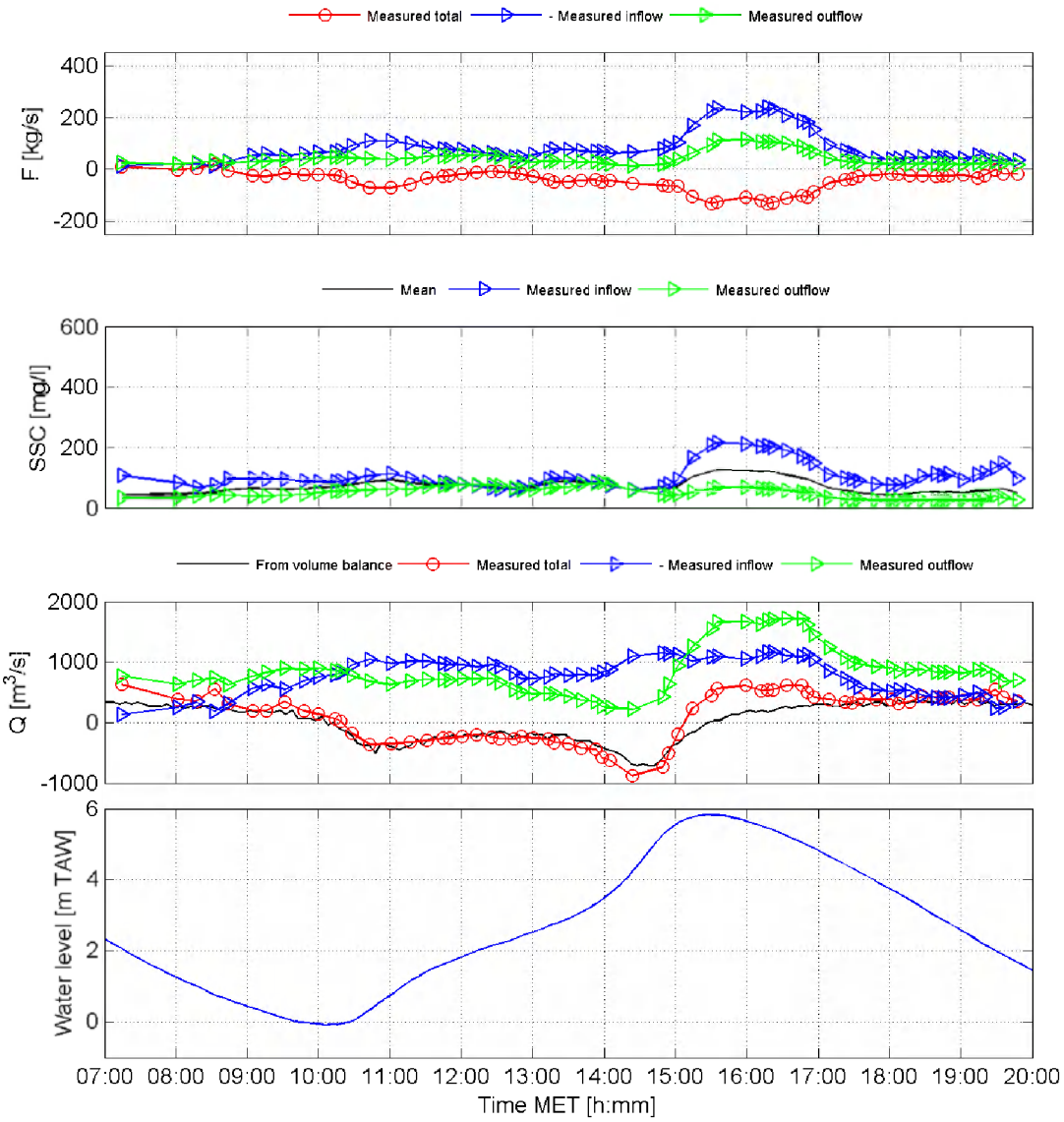
Date :
08-Mar-2012

Data Processed by:
In association with :
I/RA/11354/10.108/MBO/ANF

Annex Figure 9: Total flux through the measured cross section, positive is from dock to river

Evaluatie aanslibbing Deurganckdok

	Equipment(s): ADCP
Sourcefile(s): 6501_dgdTAB_sub.csv 6607_dgdTAB.csv	Location: Deurganckdok



Date : 08-Mar-2012	Data Processed by: IMDC In association with : GEMS Deltares I/RA/11354/10.108/MBO/ANF

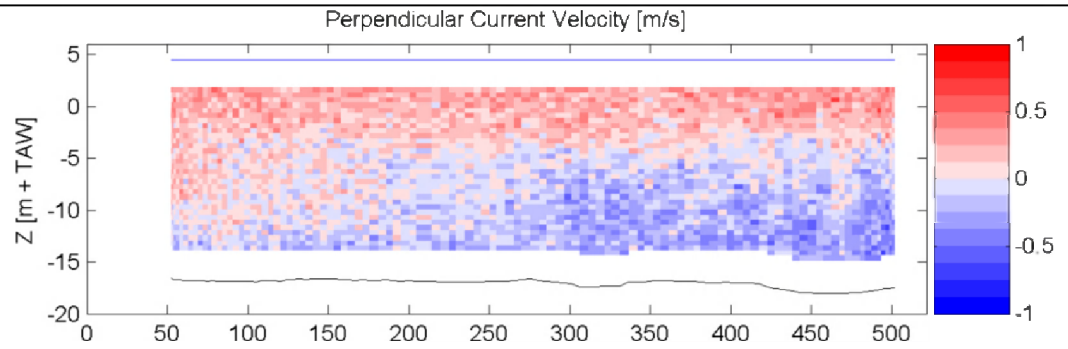
Annex Figure 10: Suspended sediment concentration through the measured cross section

Annex I Current and SSC patterns - intercomparison with earlier measurement campaigns at Deurganckdok

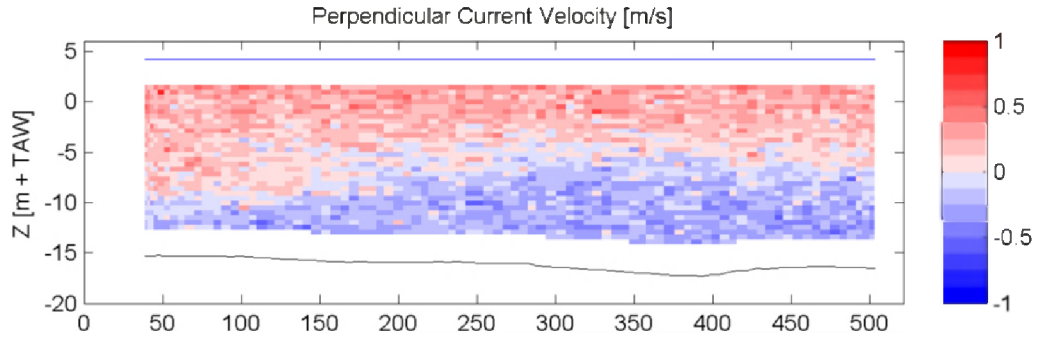
I.1 Overview of the different campaigns

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**

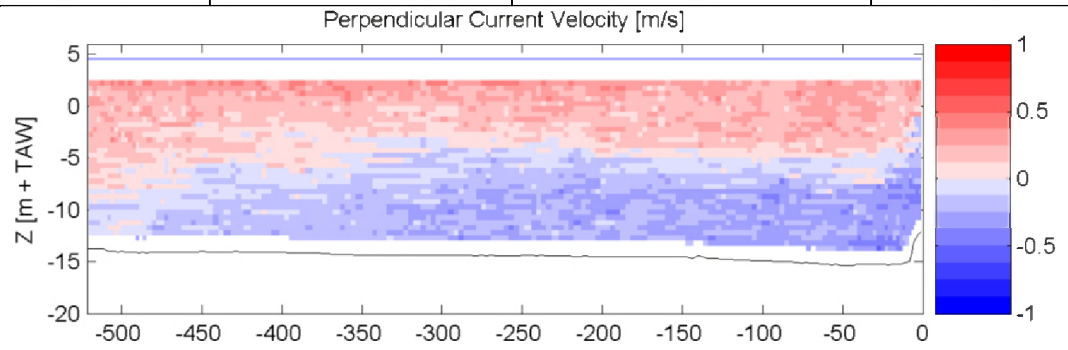
I.2 1 hour after HW (density currents)



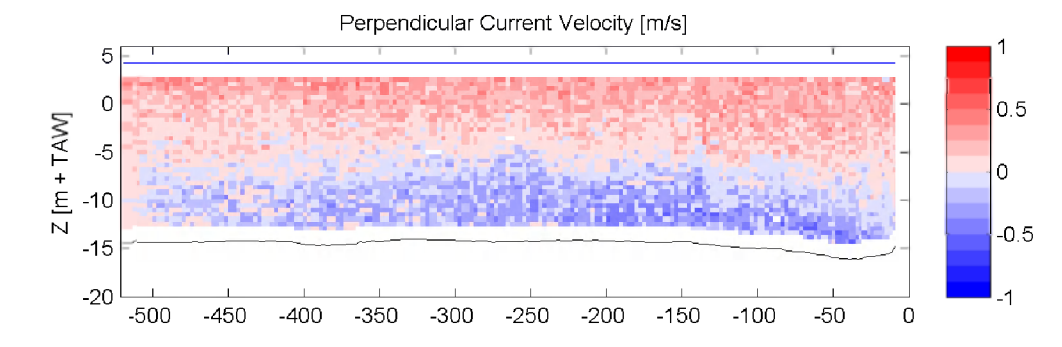
a)	17/11/2005	1 hr after HW	Tidal coefficient: 1.10	Fresh water: 91 m³/s



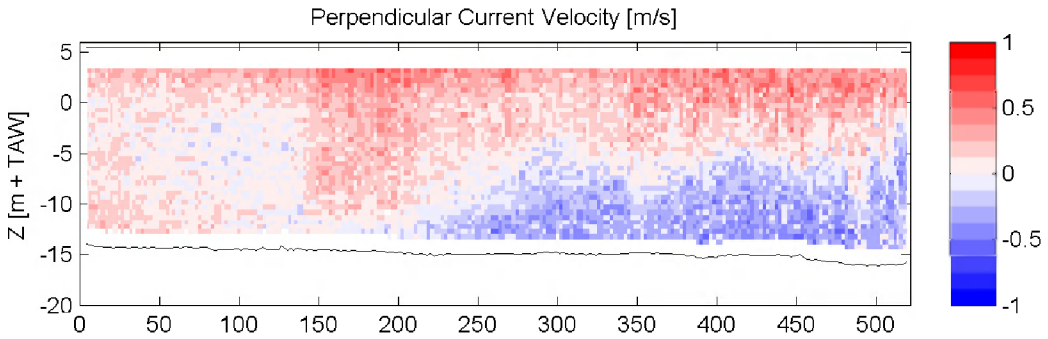
b)	22/03/2006	1 hr after HW	Tidal coefficient: 0.97	Fresh water: 94 m³/s



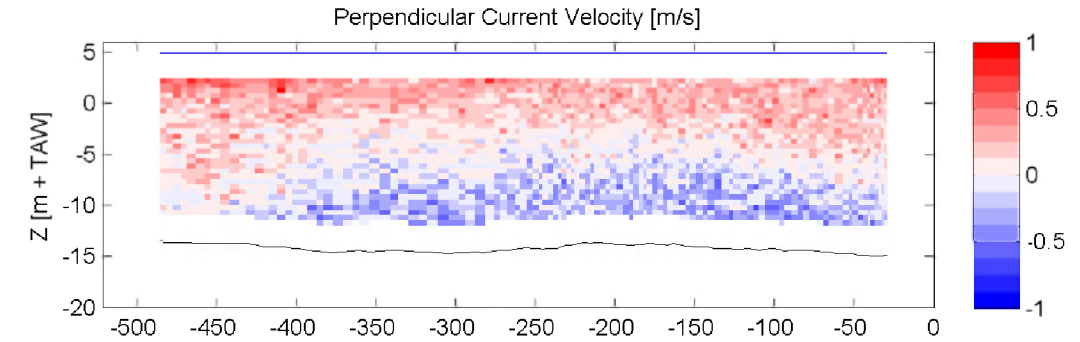
c)	27/09/2006	1 hr after HW	Tidal coefficient: 1.03	Fresh water: 33 m³/s



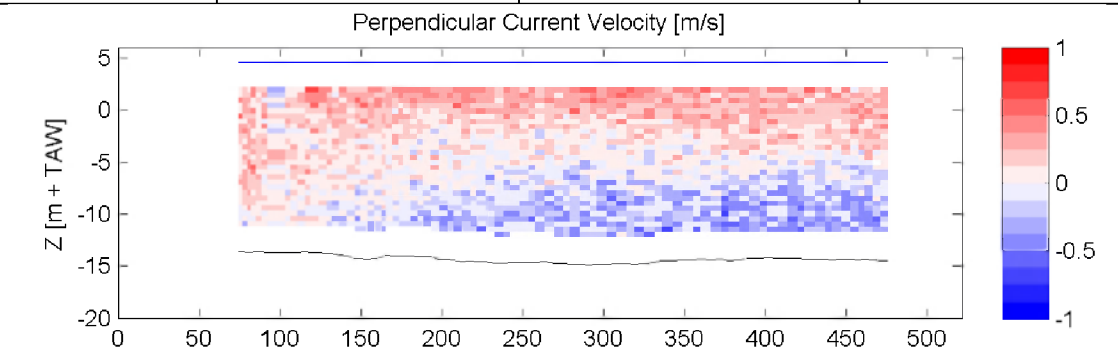
d)	24/10/2007	1 hr after HW	Tidal coefficient: 1.02	Fresh water: 46 m³/s



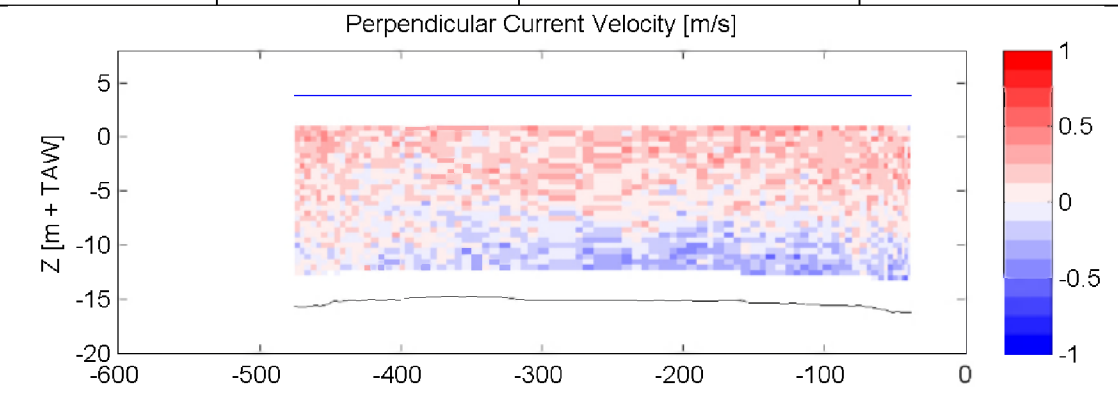
e)	11/03/2008	1 hr after HW	Tidal coefficient: 1.17	Fresh water: 286 m³/s



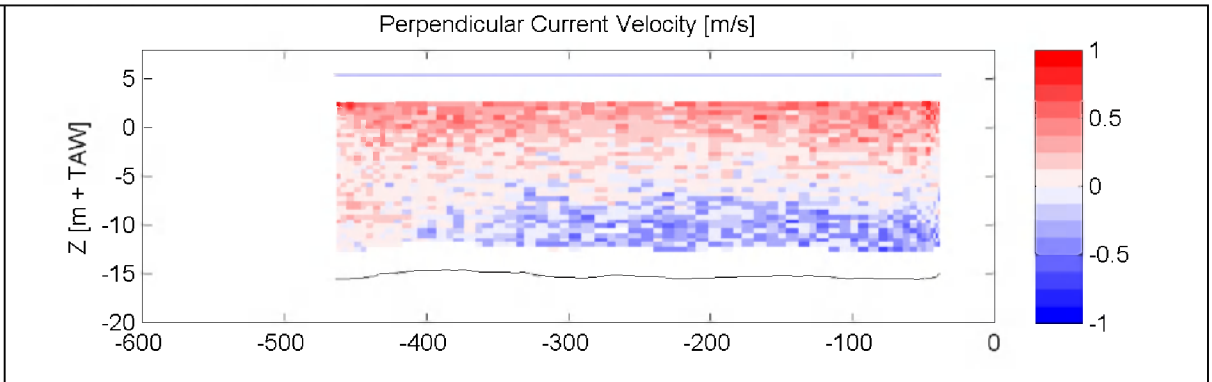
f)	19/06/2008	1 hr after HW	Tidal coefficient: 1.15	Fresh water: 93 m³/s



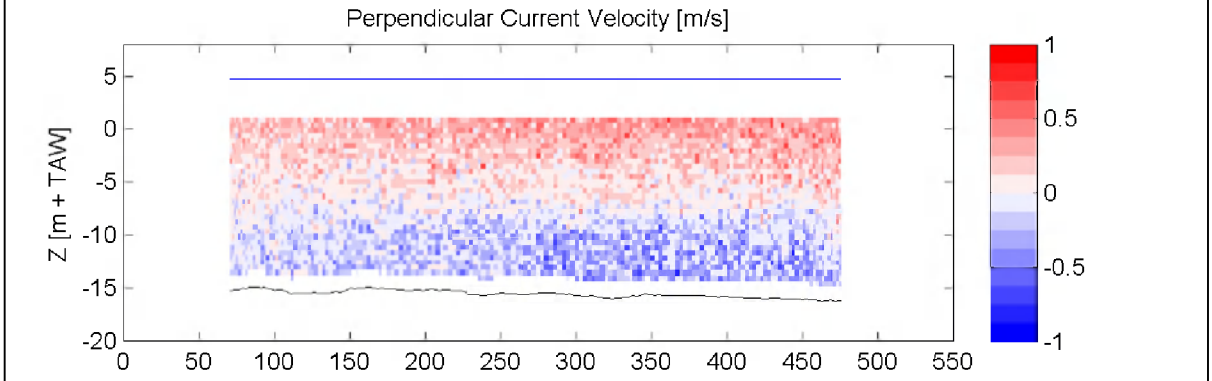
g)	26/06/2008	1 hr after HW	Tidal coefficient: 0.97	Fresh water: 69 m³/s



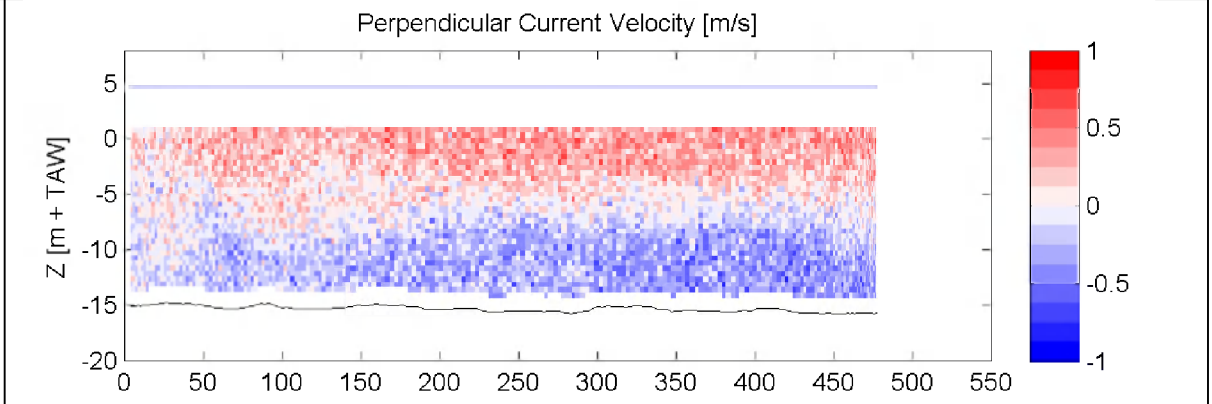
h)	24/09/2008	1 hr after HW	Tidal coefficient: 0.81	Fresh water: 75 m³/s



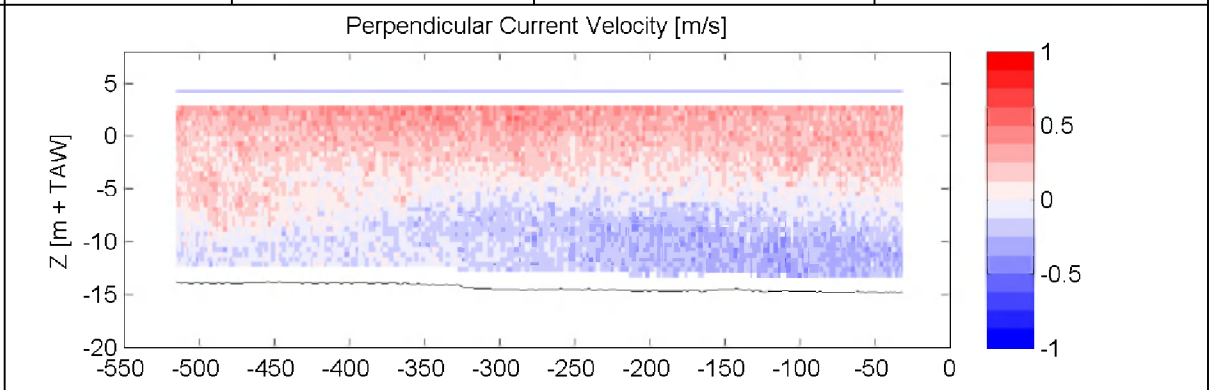
i)	30/09/2008	1 hr after HW	Tidal coefficient: 1.08	Fresh water: 82 m³/s



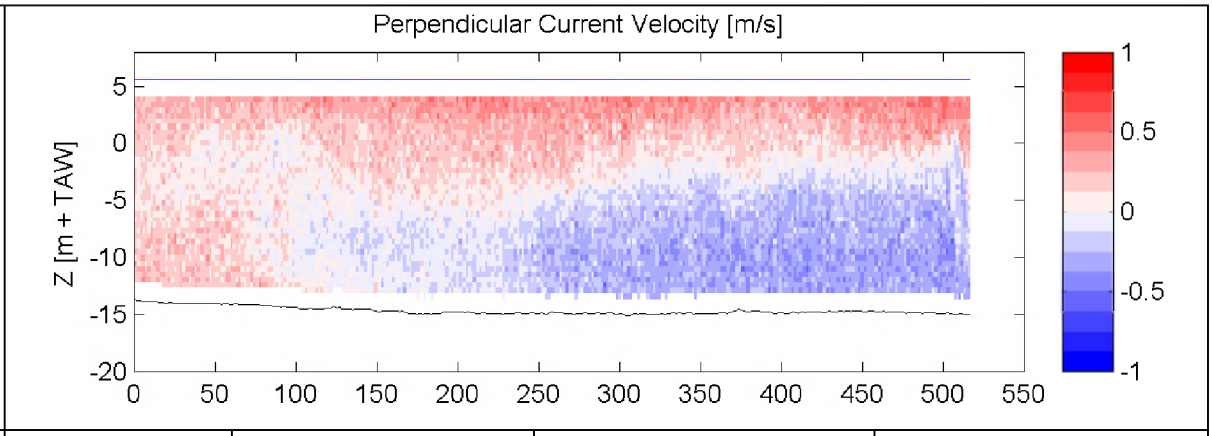
j)	02/12/2008	1 hr after HW	Tidal coefficient: 0.98	Fresh water: 154 m³/s



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



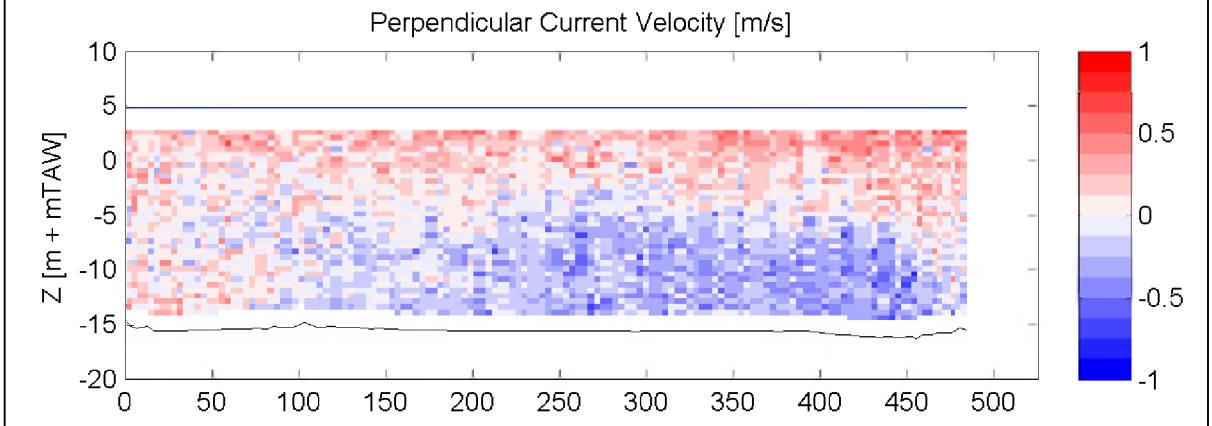
l)	06/03/2009	1 hr after HW	Tidal coefficient: 0.82	Fresh water: 99m³/s



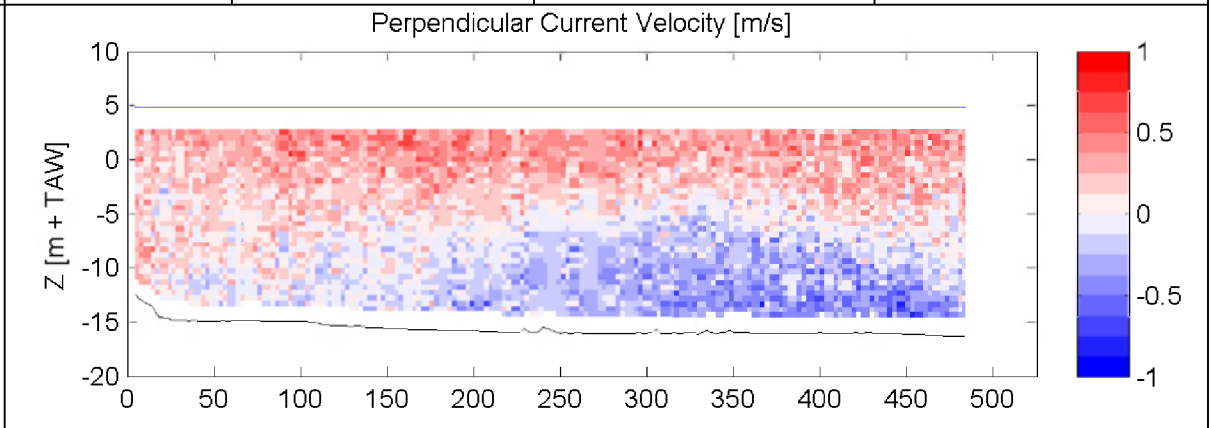
m)	12/03/2009	1 hr after HW	Tidal coefficient: 1.24	Fresh water: 129m³/s

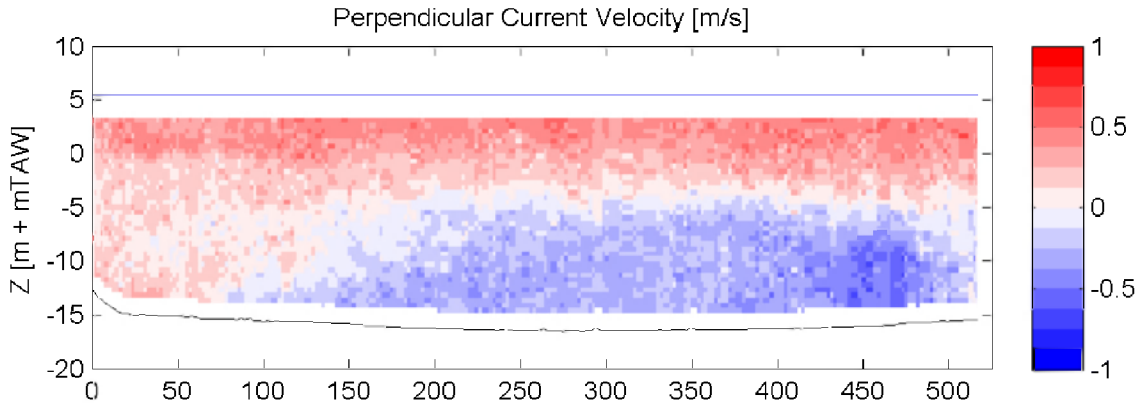
No velocity data available

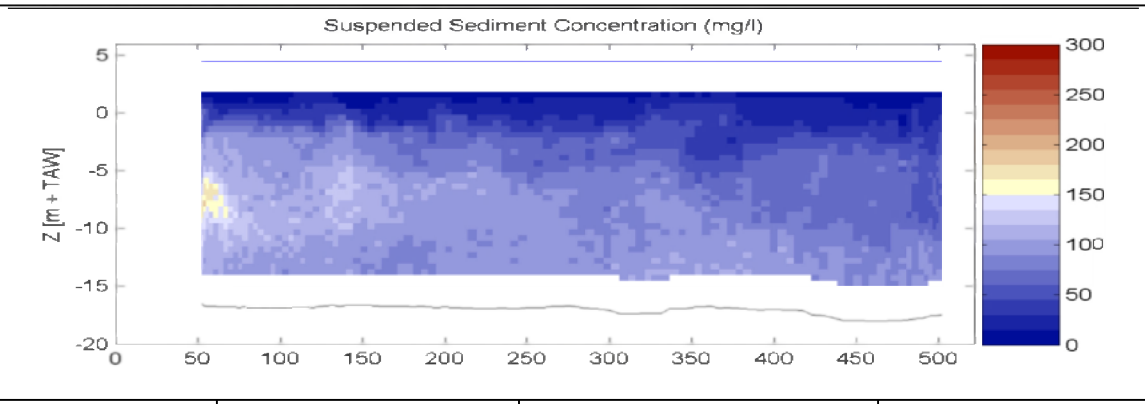
n)	28/09/2011	1 hr after HW	Tidal coefficient: 1.17	Fresh water: 40 m³/s



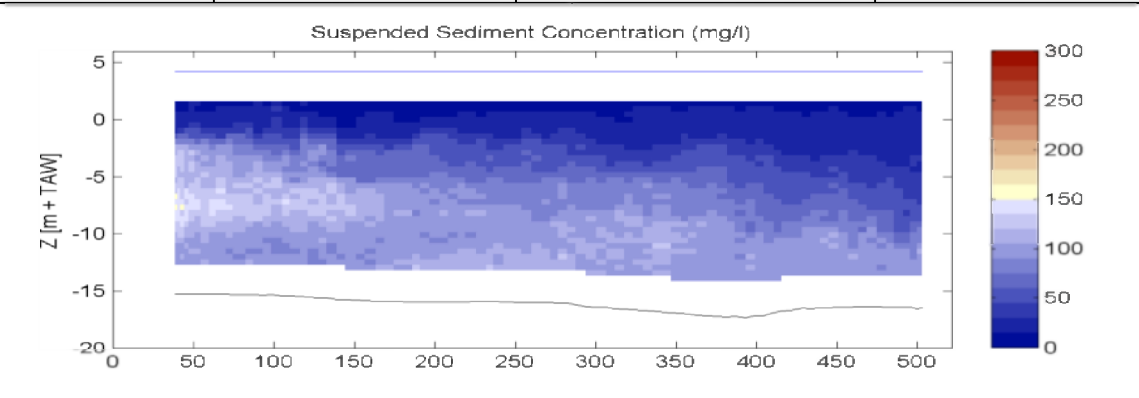
o)	06/10/2011	1 hr after HW	Tidal coefficient: 0.83	Fresh water: 55 m³/s



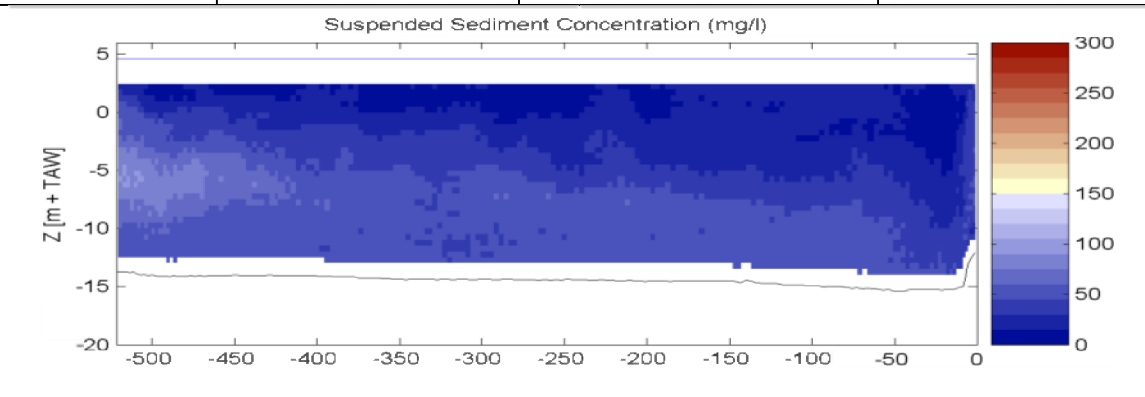
p)	13/10/2011	1 hr after HW	Tidal coefficient: 1.06	Fresh water: 60 m³/s
				
q)	08/03/2012	1 hr after HW	Tidal coefficient: 1.16	Fresh water: 305 m³/s



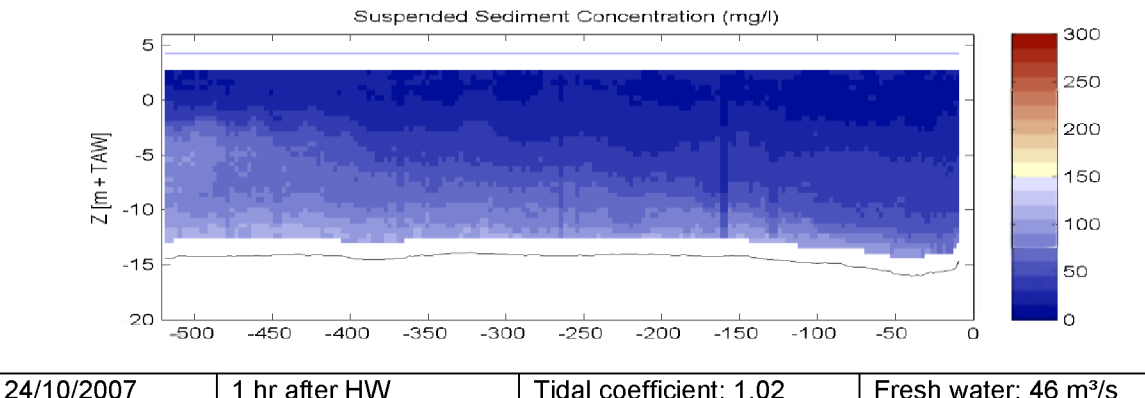
a)	17/11/2005	1 hr after HW	Tidal coefficient: 1.10	Fresh water: 91 m³/s



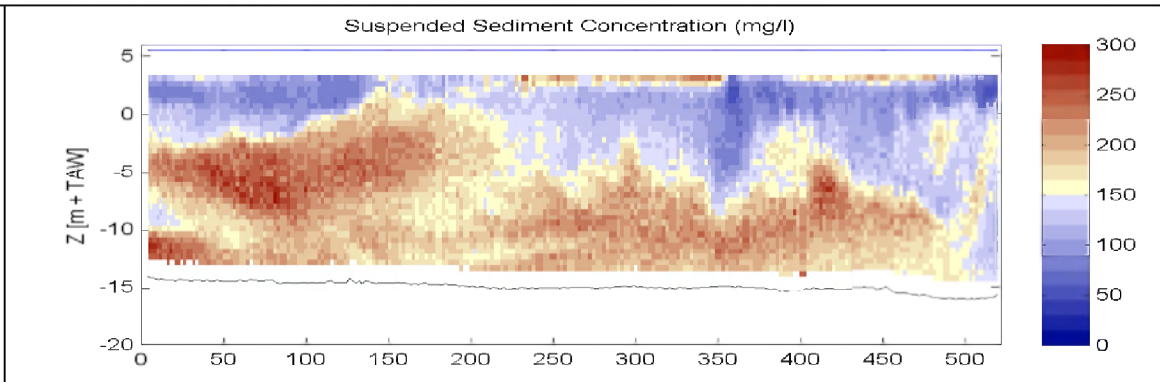
b)	22/03/2006	1 hr after HW	Tidal coefficient: 0.97	Fresh water: 94 m³/s



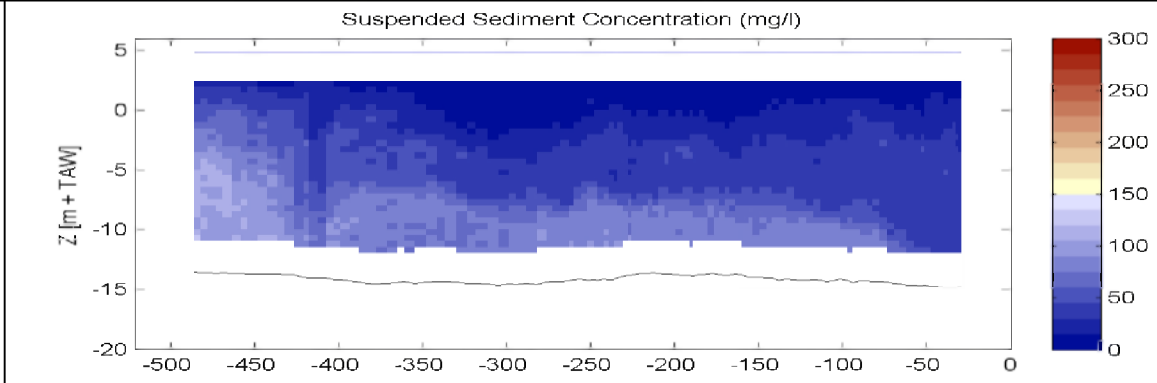
c)	27/09/2006	1 hr after HW	Tidal coefficient: 1.03	Fresh water: 33 m³/s



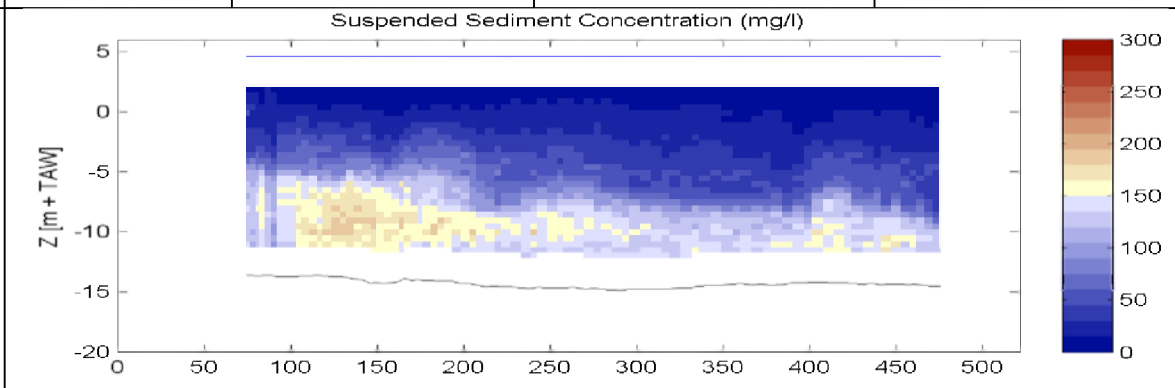
d)	24/10/2007	1 hr after HW	Tidal coefficient: 1.02	Fresh water: 46 m³/s



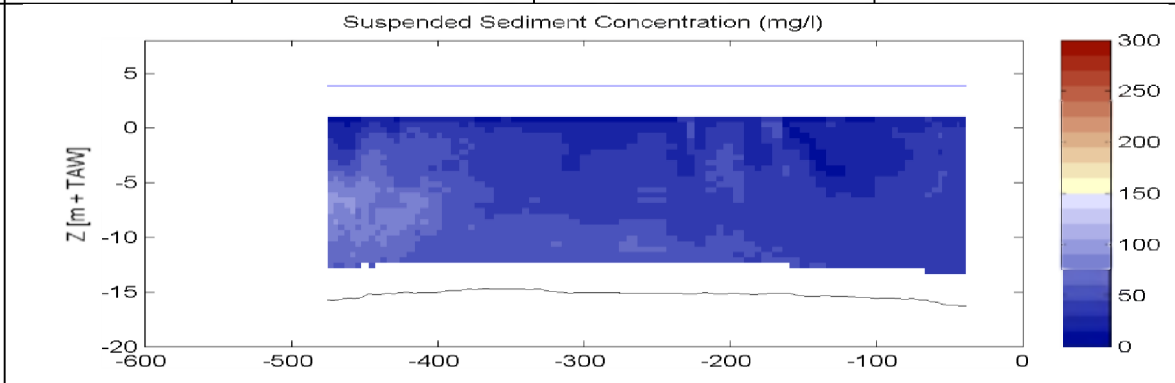
e)	11/03/2008	1 hr after HW	Tidal coefficient: 1.17	Fresh water: 286 m³/s



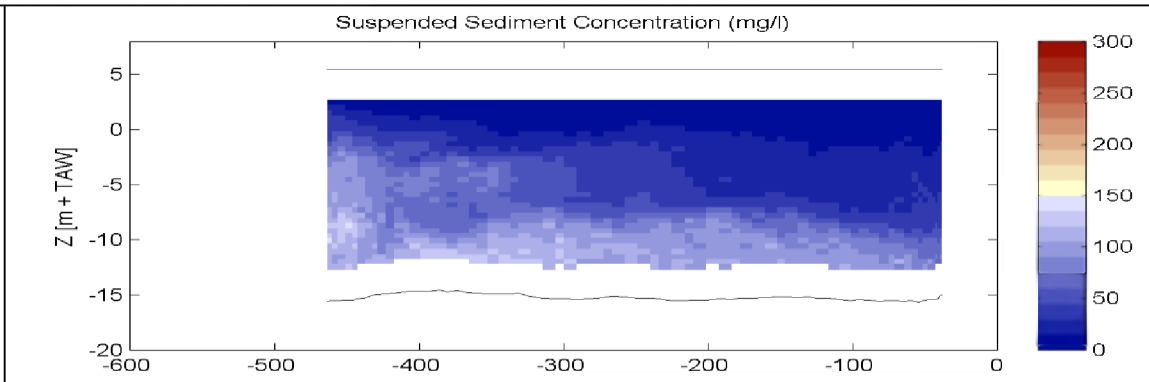
f)	19/06/2008	1 hr after HW	Tidal coefficient: 1.15	Fresh water: 93 m³/s



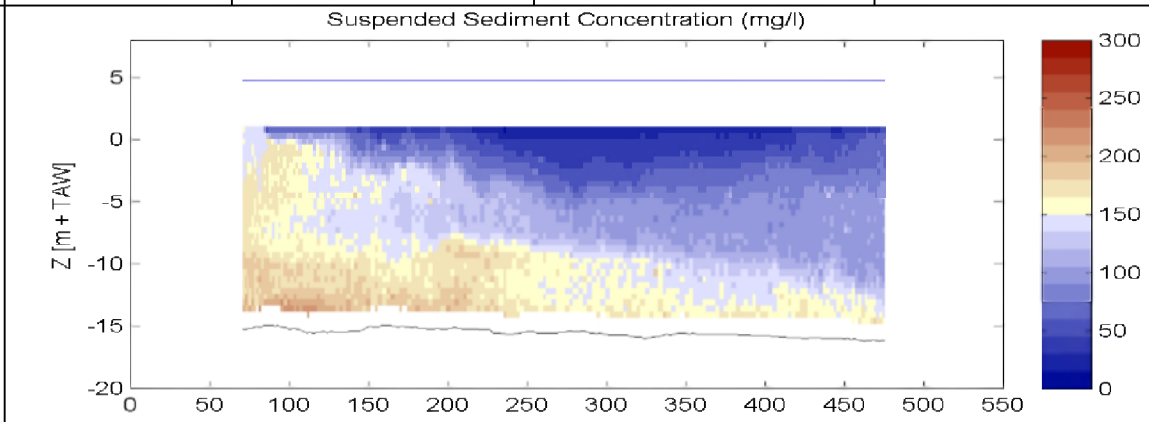
g)	26/06/2008	1 hr after HW	Tidal coefficient: 0.97	Fresh water: 69 m³/s



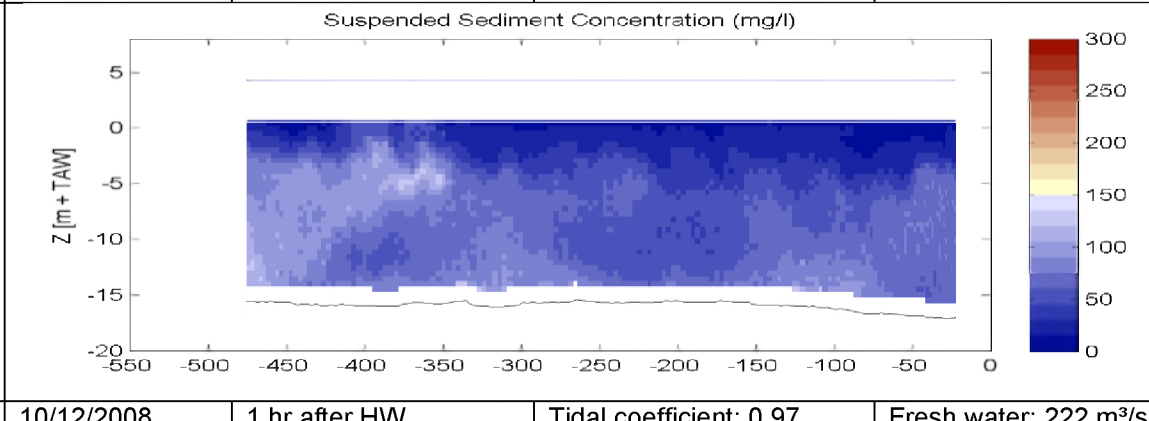
h)	24/09/2008	1 hr after HW	Tidal coefficient: 0.81	Fresh water: 75 m³/s



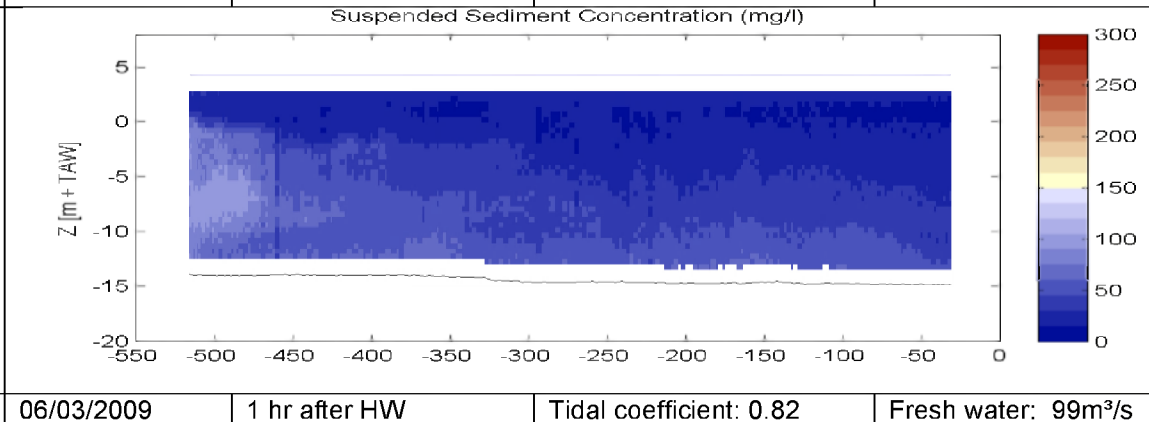
i)	30/09/2008	1 hr after HW	Tidal coefficient: 1.08	Fresh water: 82 m³/s



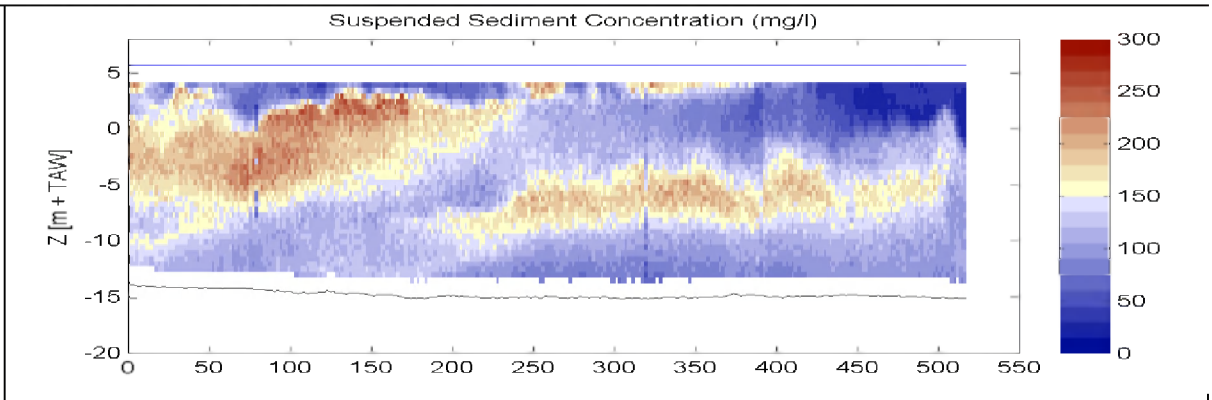
j)	02/12/2008	1 hr after HW	Tidal coefficient: 0.98	Fresh water: 154 m³/s



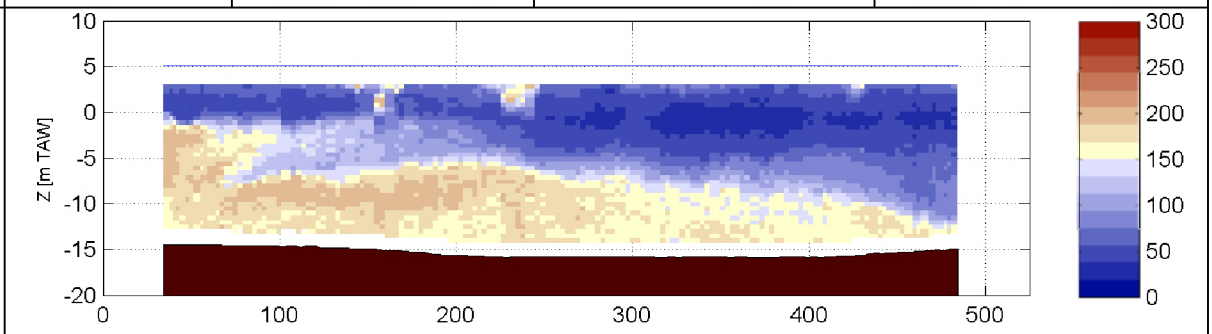
k)	10/12/2008	1 hr after HW	Tidal coefficient: 0.97	Fresh water: 222 m³/s



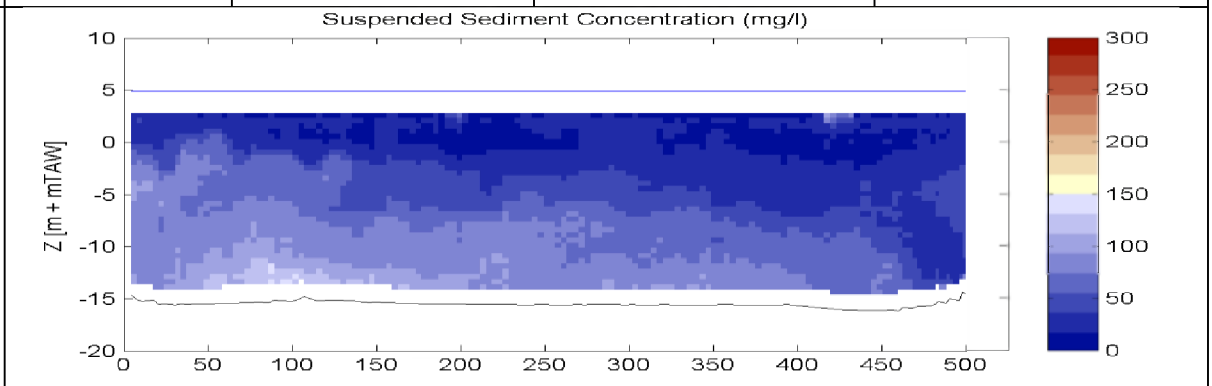
l)	06/03/2009	1 hr after HW	Tidal coefficient: 0.82	Fresh water: 99m³/s



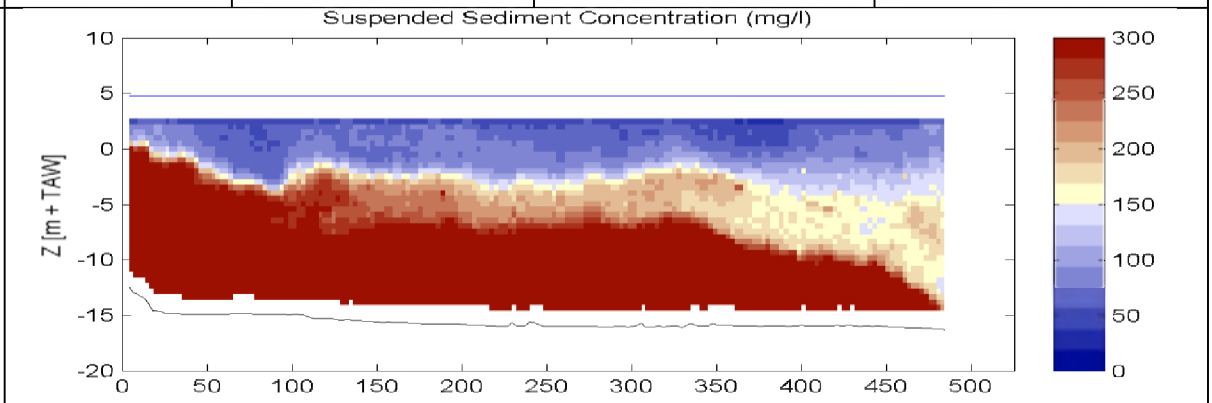
m)	12/03/2009	1 hr after HW	Tidal coefficient: 1.24	Fresh water: 129m³/s



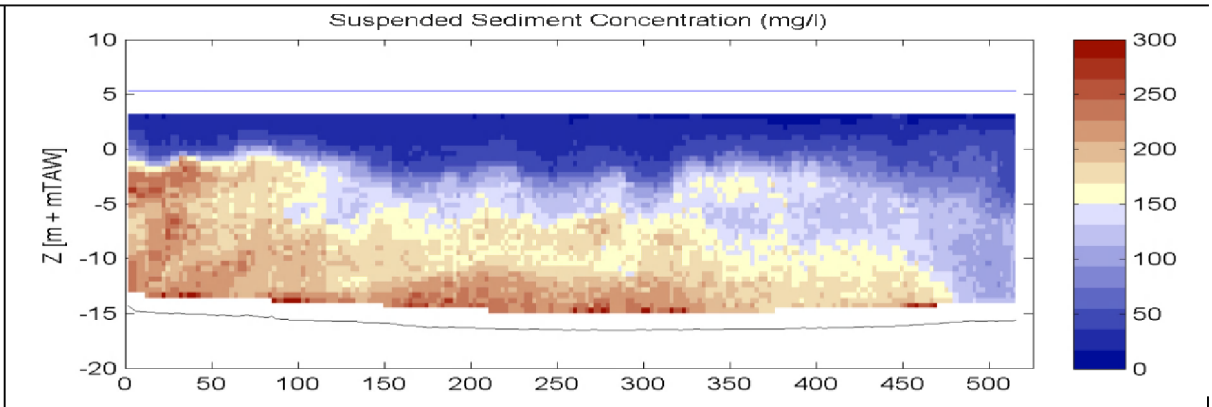
n)	28/09/2011	1 hr after HW	Tidal coefficient: 1.17	Fresh water: 40 m³/s



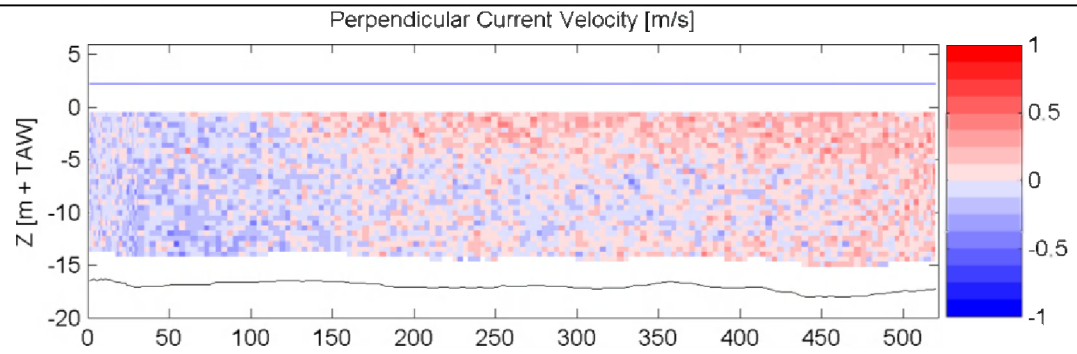
o)	06/10/2011	1 hr after HW	Tidal coefficient: 0.83	Fresh water: 55 m³/s



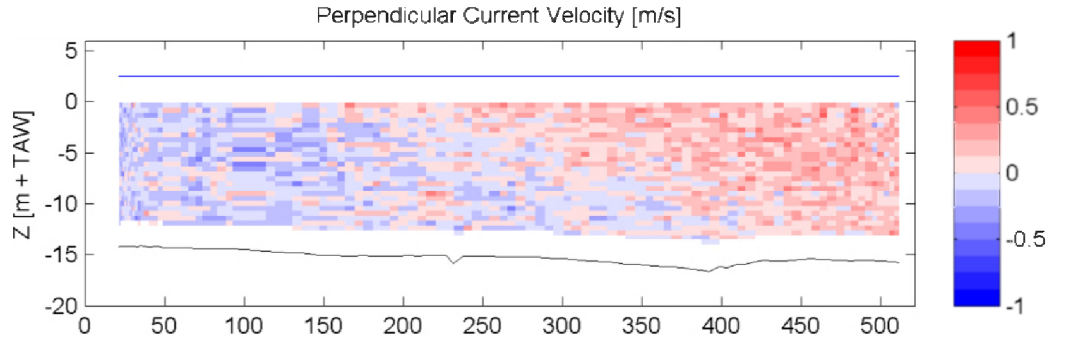
p)	13/10/2011	1 hr after HW	Tidal coefficient: 1.06	Fresh water: 60 m³/s

				
q)	08/03/2012	1 hr after HW	Tidal coefficient: 1.16	Fresh water: 305 m³/s

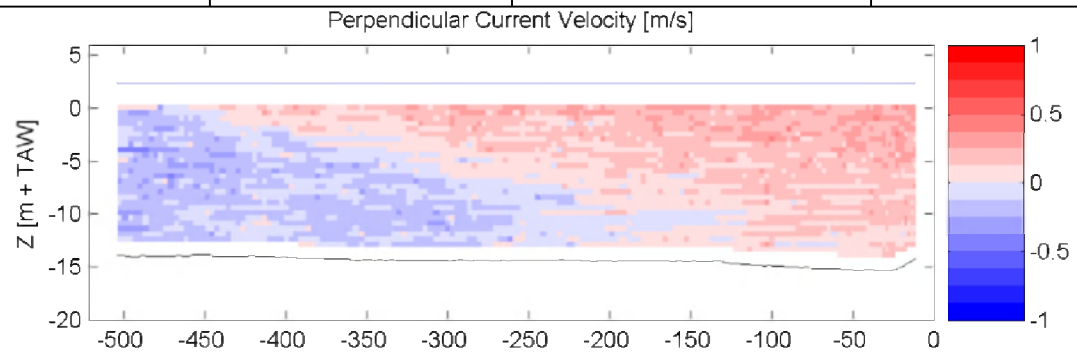
I.3 3 hours after HW (density currents)



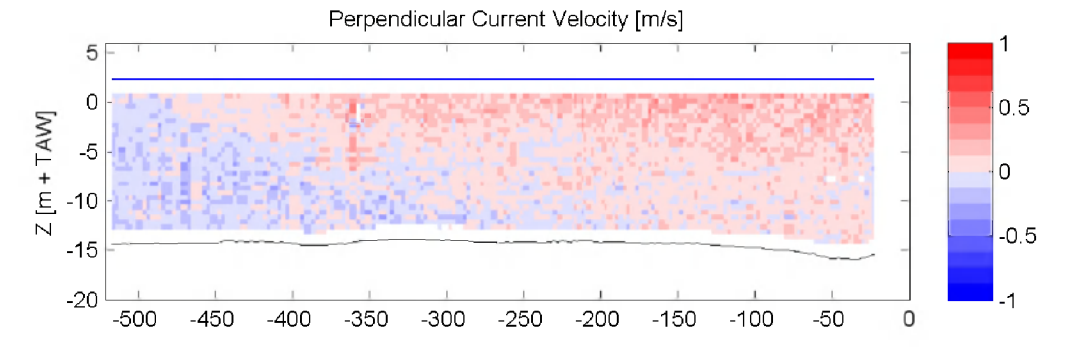
a)	17/11/2005	3 hrs after HW	Tidal coefficient: 1.10	Fresh water: 91 m³/s



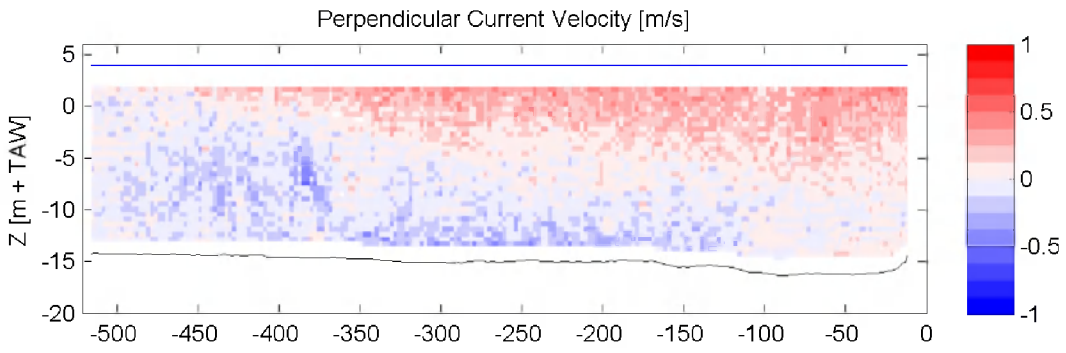
b)	22/03/2006	3 hrs after HW	Tidal coefficient: 0.97	Fresh water: 94 m³/s



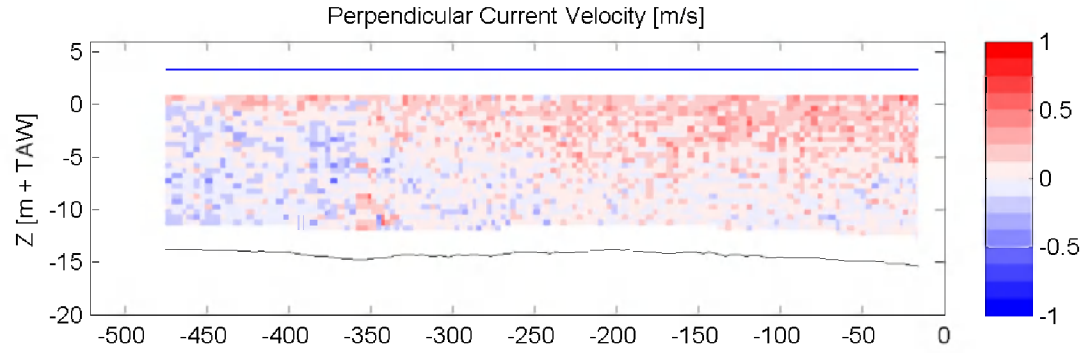
c)	27/09/2006	3 hrs after HW	Tidal coefficient: 1.03	Fresh water: 33 m³/s



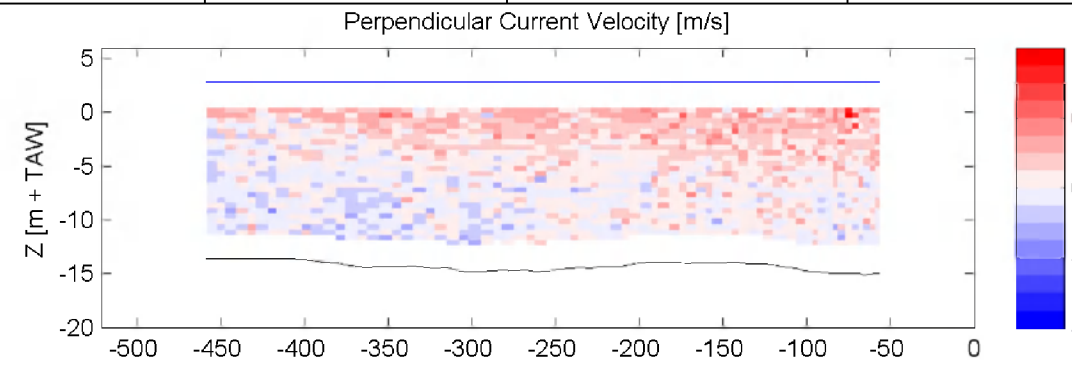
d)	24/10/2007	3 hrs after HW	Tidal coefficient: 1.02	Fresh water: 46 m³/s



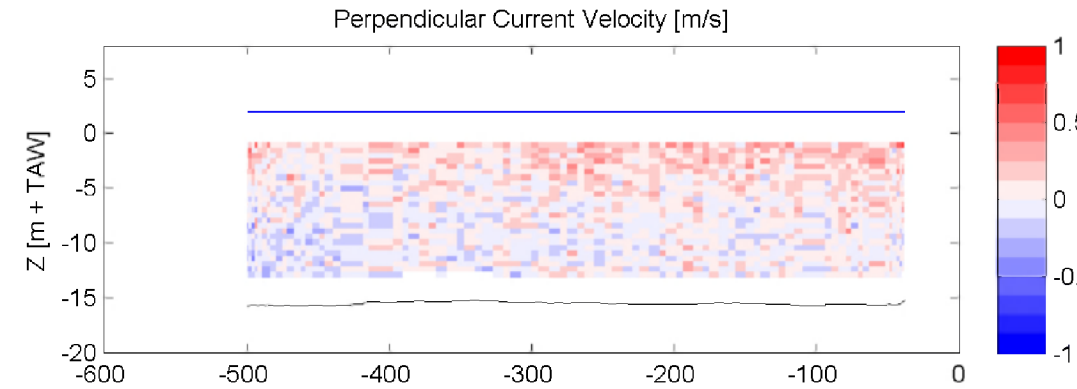
e)	11/03/2008	3 hrs after HW	Tidal coefficient: 1.17	Fresh water: 286 m³/s



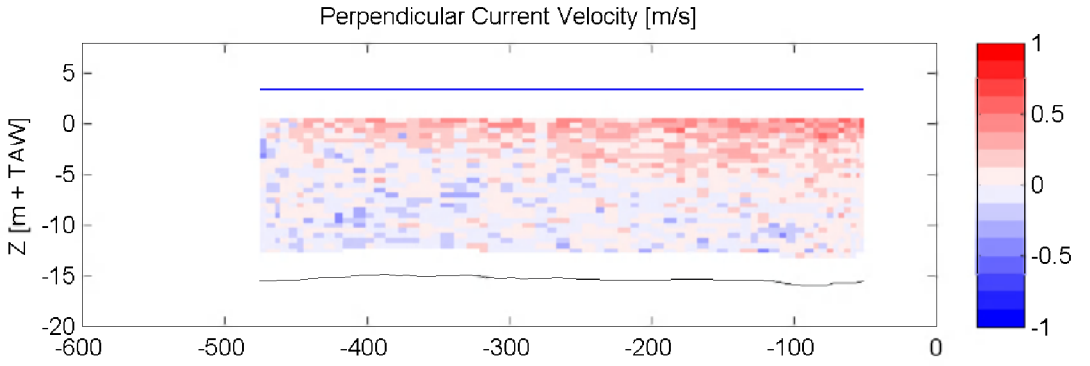
f)	19/06/2008	3 hrs after HW	Tidal coefficient: 1.15	Fresh water: 93 m³/s



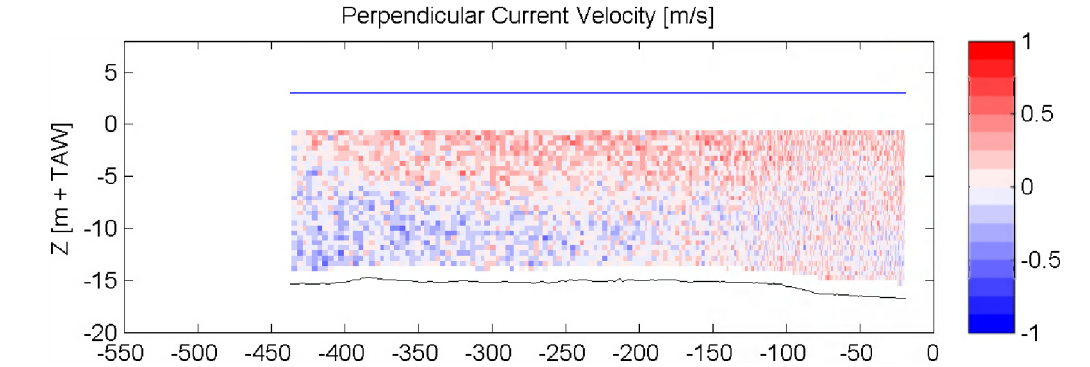
g)	26/06/2008	3 hrs after HW	Tidal coefficient: 0.97	Fresh water: 69 m³/s



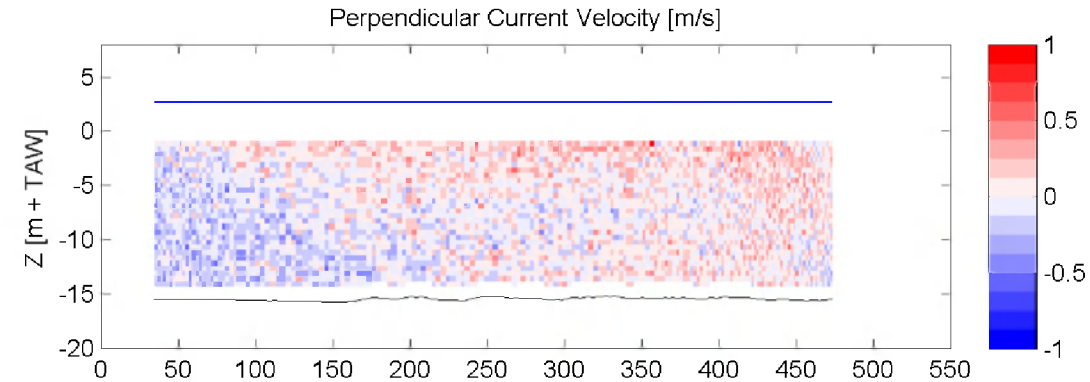
h)	24/09/2008	3 hrs after HW	Tidal coefficient: 0.81	Fresh water: 75 m³/s



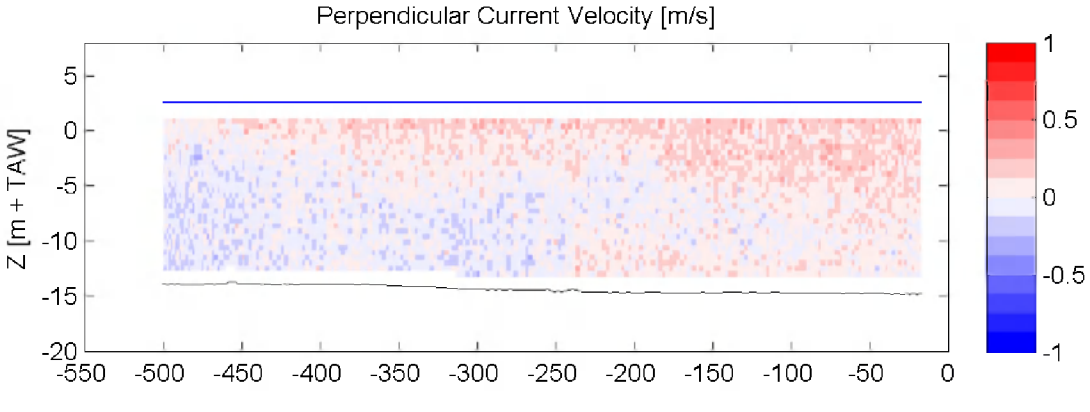
i)	30/09/2008	3 hrs after HW	Tidal coefficient: 1.08	Fresh water: 82 m³/s



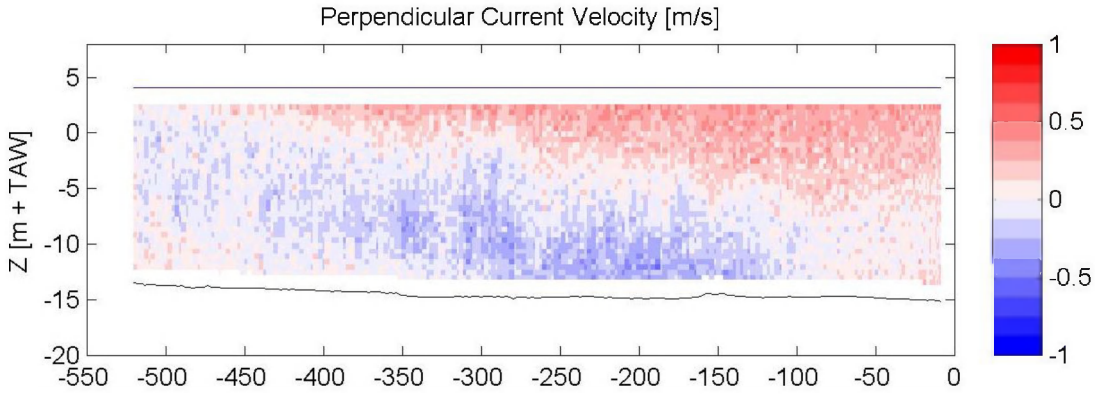
j)	02/12/2008	3 hrs after HW	Tidal coefficient: 0.98	Fresh water: 154 m³/s



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



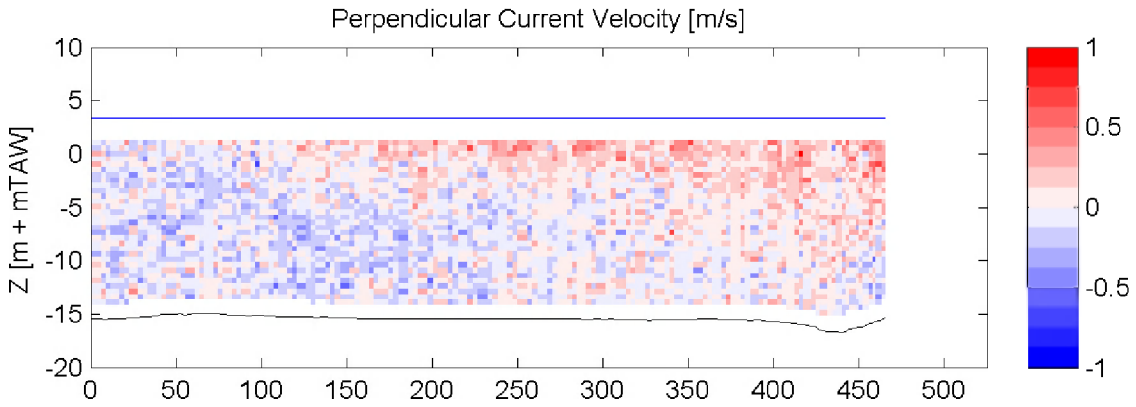
l)	06/03/2009	3 hrs after HW	Tidal coefficient: 0.82	Fresh water: 99m³/s



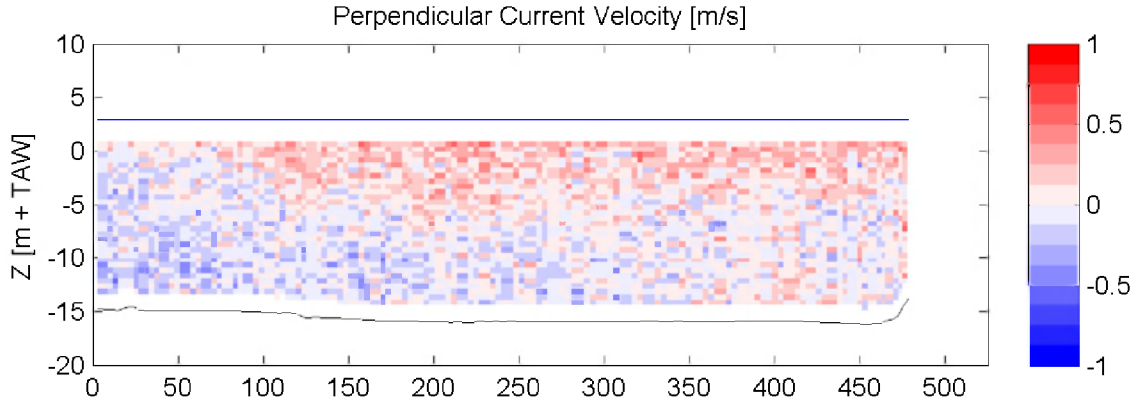
m)	12/03/2009	3 hrs after HW	Tidal coefficient: 1.24	Fresh water: 129m³/s

No velocity data available

n)	28/09/2011	3 hrs after HW	Tidal coefficient: 1.17	Fresh water: 40 m³/s

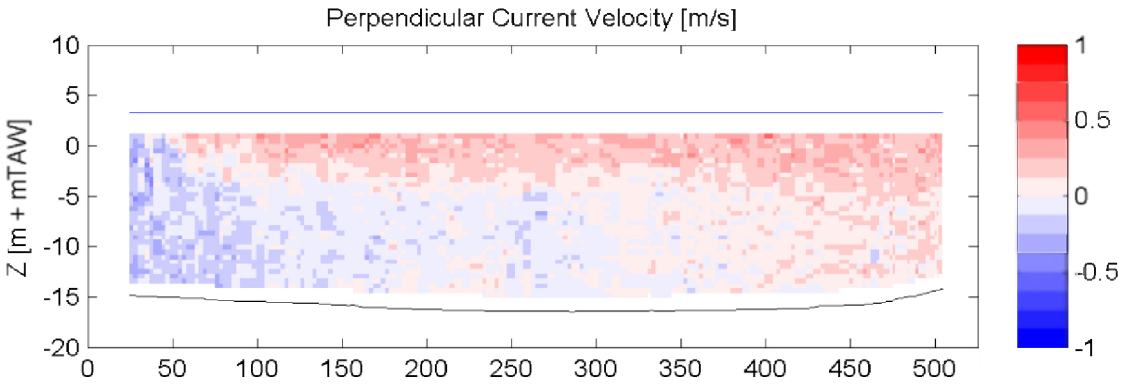


o)	06/10/2011	3 hrs after HW	Tidal coefficient: 0.83	Fresh water: 55 m³/s

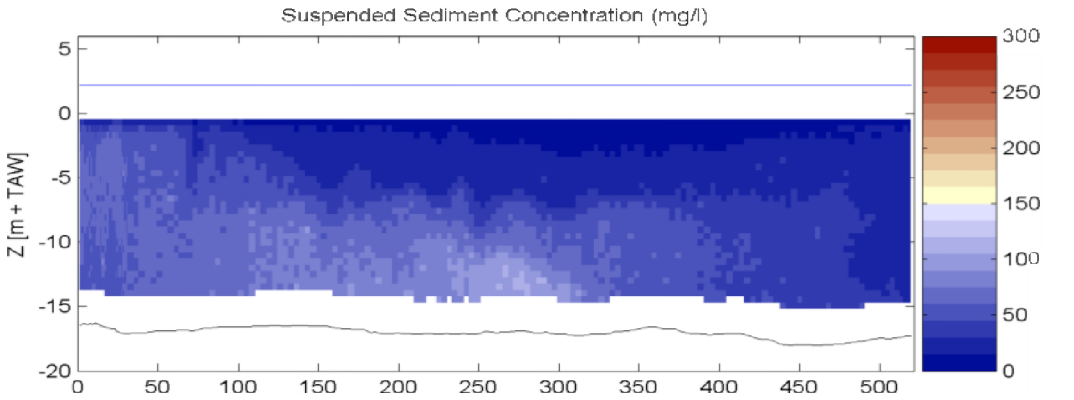


p)	13/10/2011	3 hrs after HW	Tidal coefficient: 1.06	Fresh water: 60 m³/s

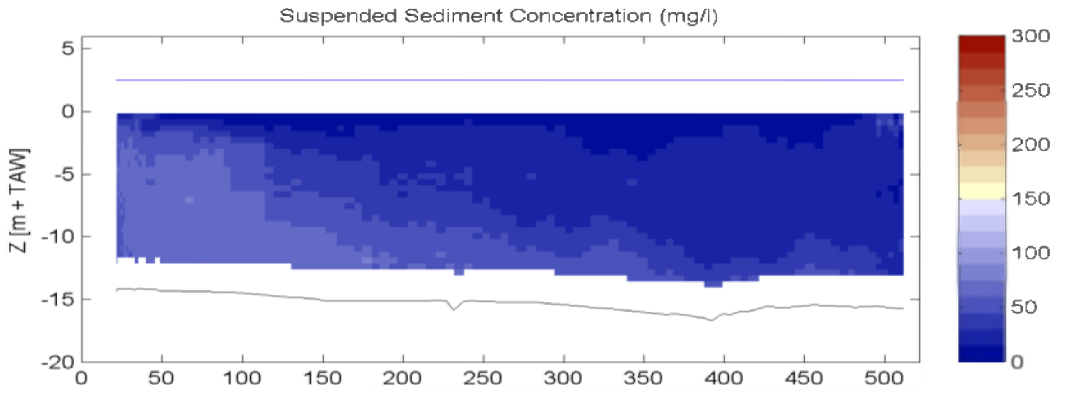
Annex Figure 11: Perpendicular current velocity at 3h after high water



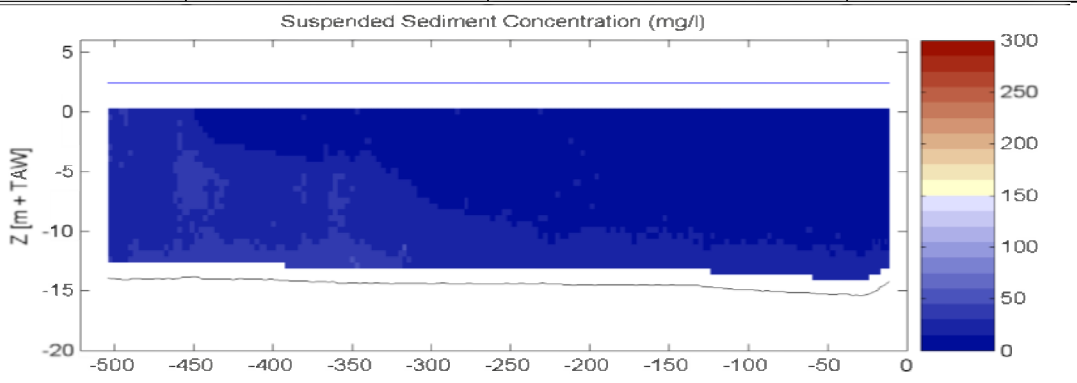
q)	08/03/2012	3 hr after HW	Tidal coefficient: 1.16	Fresh water: 305 m³/s



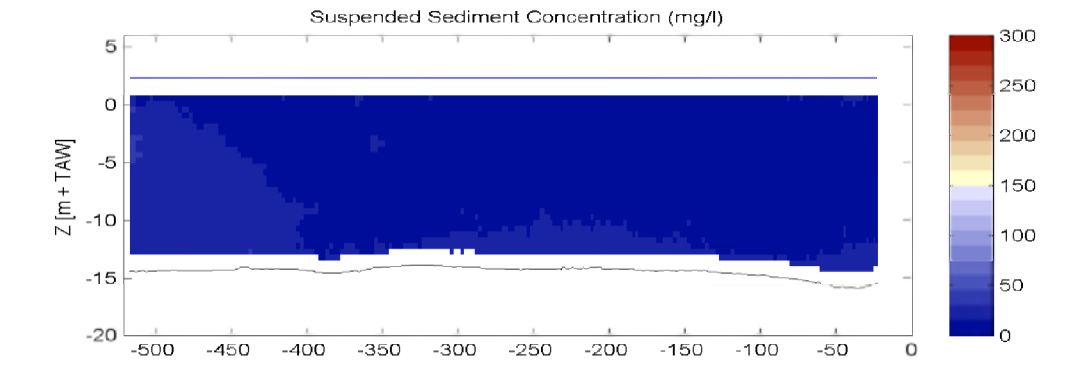
a)	17/11/2005	3 hrs after HW	Tidal coefficient: 1.10	Fresh water: 91 m³/s



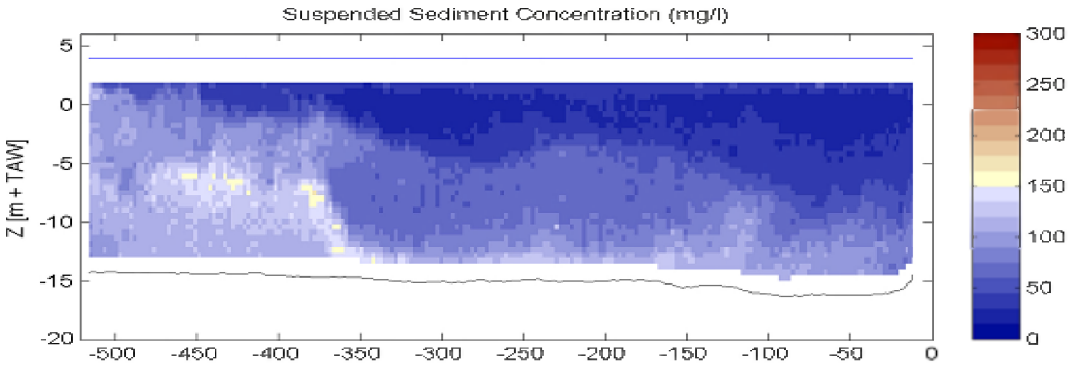
b)	22/03/2006	3 hrs after HW	Tidal coefficient: 0.97	Fresh water: 94 m³/s



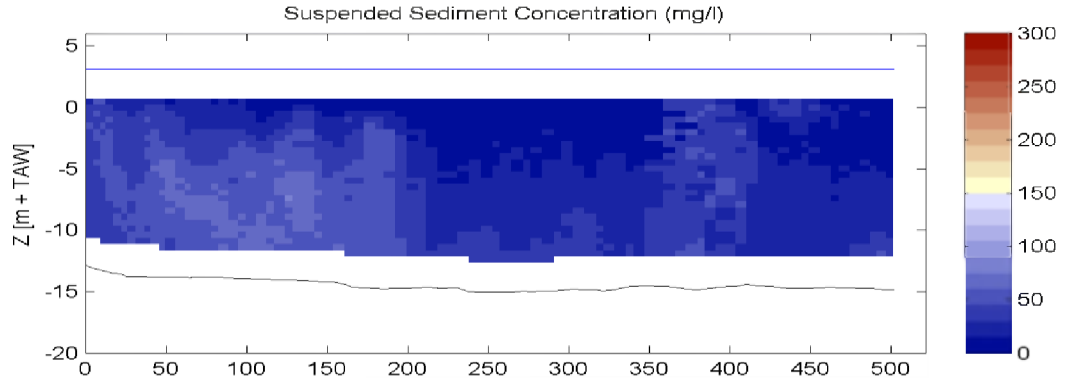
c)	27/09/2006	3 hrs after HW	Tidal coefficient: 1.03	Fresh water: 33 m³/s



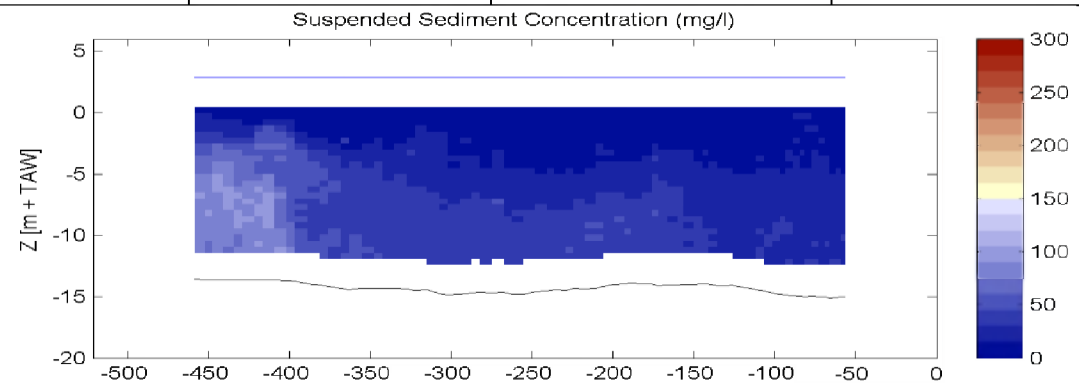
d)	24/10/2007	3 hrs after HW	Tidal coefficient: 1.02	Fresh water: 46 m³/s



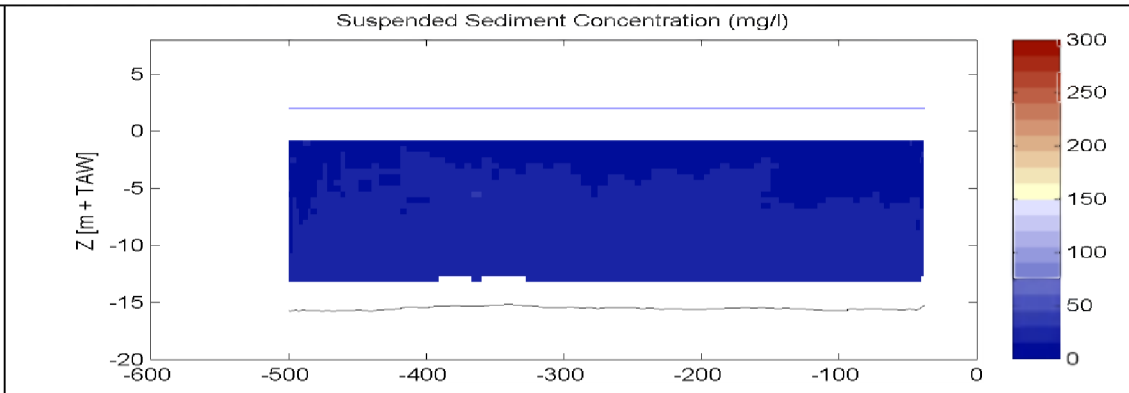
e)	11/03/2008	3 hrs after HW	Tidal coefficient: 1.17	Fresh water: 286 m³/s



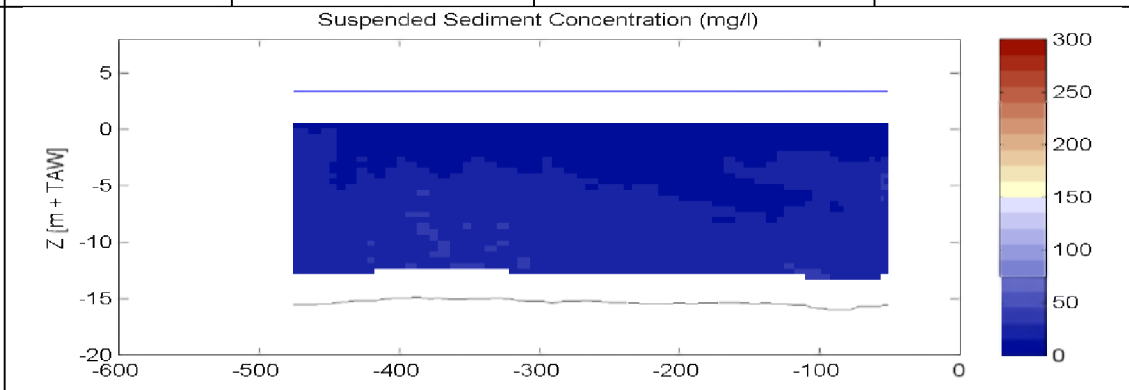
f)	19/06/2008	3 hrs after HW	Tidal coefficient: 1.15	Fresh water: 93 m³/s



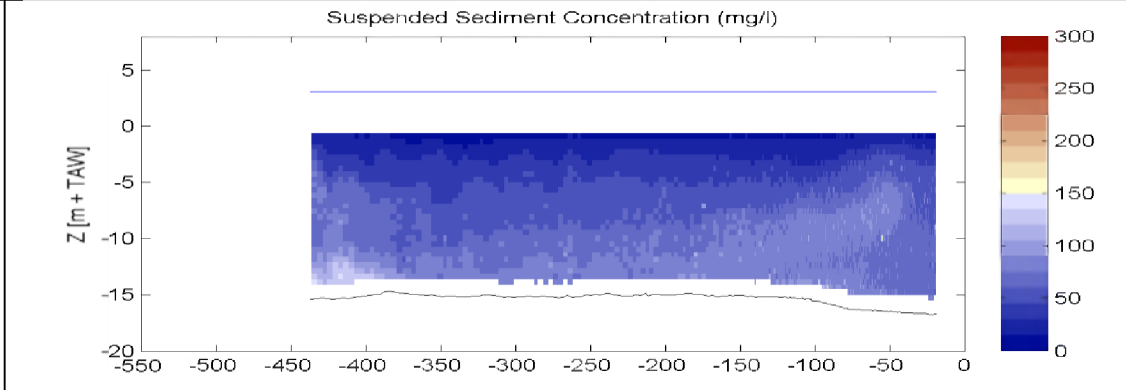
g)	26/06/2008	3 hrs after HW	Tidal coefficient: 0.97	Fresh water: 69 m³/s



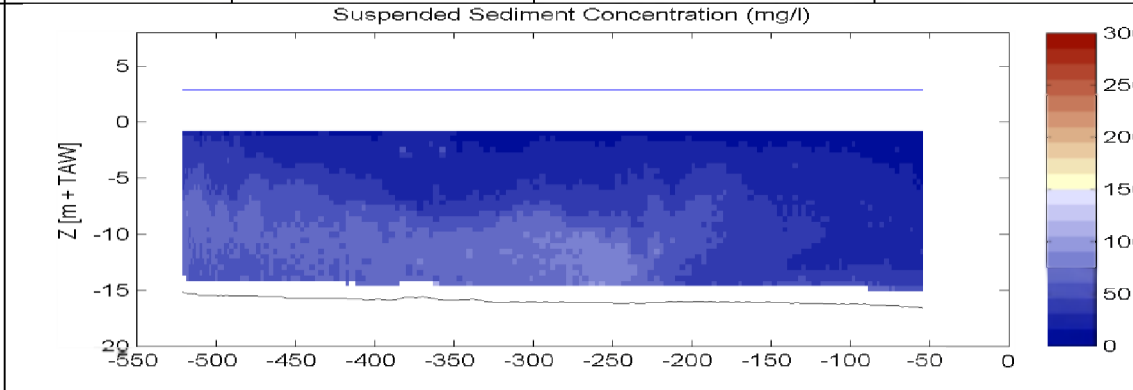
h)	24/09/2008	3 hrs after HW	Tidal coefficient: 0.81	Fresh water: 75 m³/s



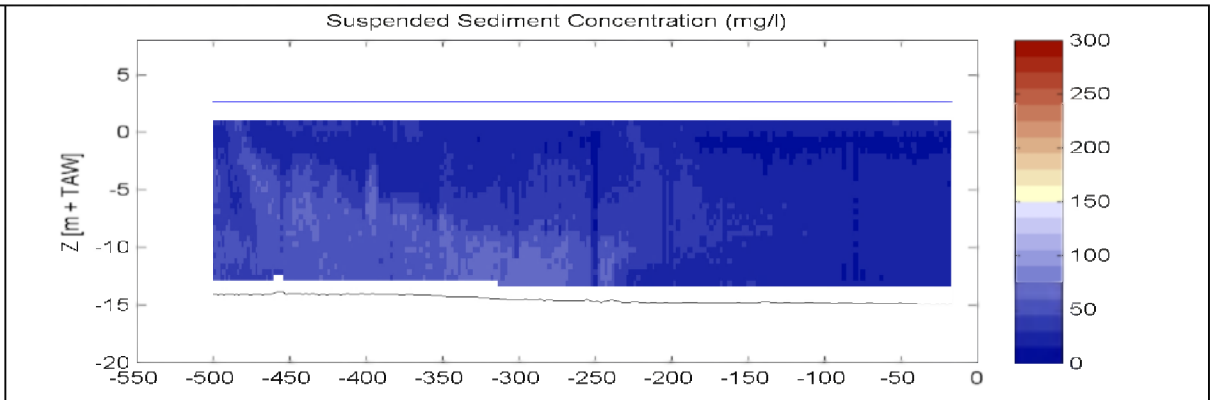
i)	30/09/2008	3 hrs after HW	Tidal coefficient: 1.08	Fresh water: 82 m³/s



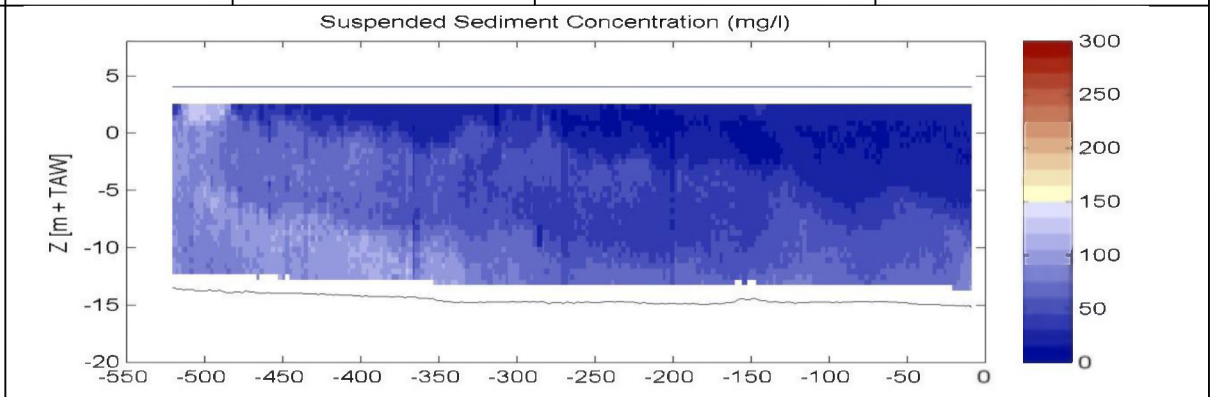
j)	02/12/2008	3 hrs after HW	Tidal coefficient: 0.98	Fresh water: 154 m³/s



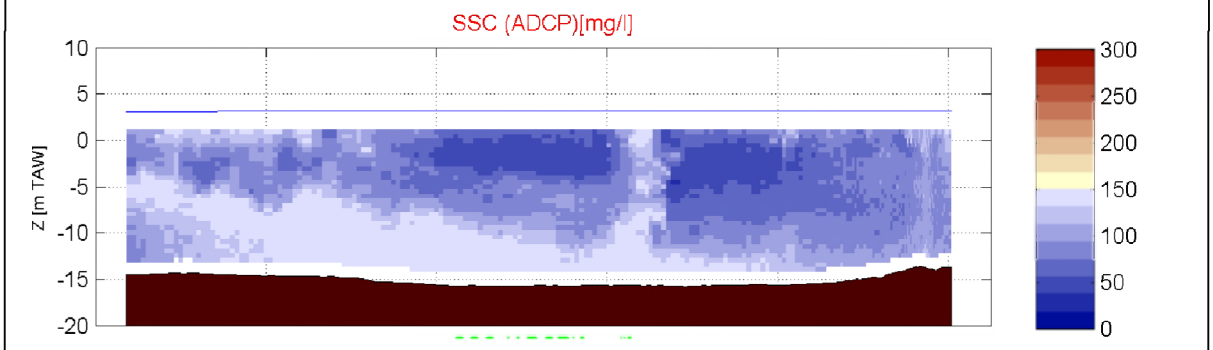
k)	10/12/2008	3 hrs after HW	Tidal coefficient: 0.97	Fresh water: 222m³/s



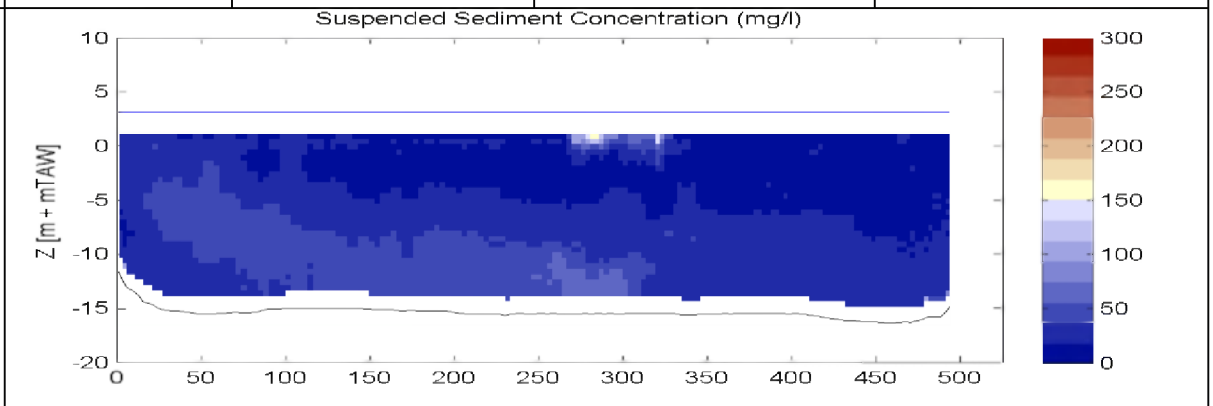
l)	06/03/2009	3 hrs after HW	Tidal coefficient: 0.82	Fresh water: 99m³/s



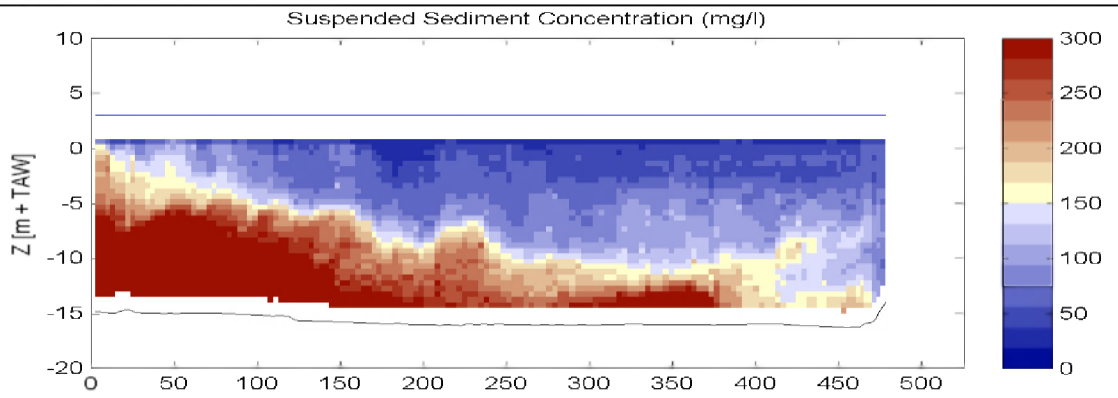
m)	12/03/2009	3 hrs after HW	Tidal coefficient: 1.24	Fresh water: 129m³/s



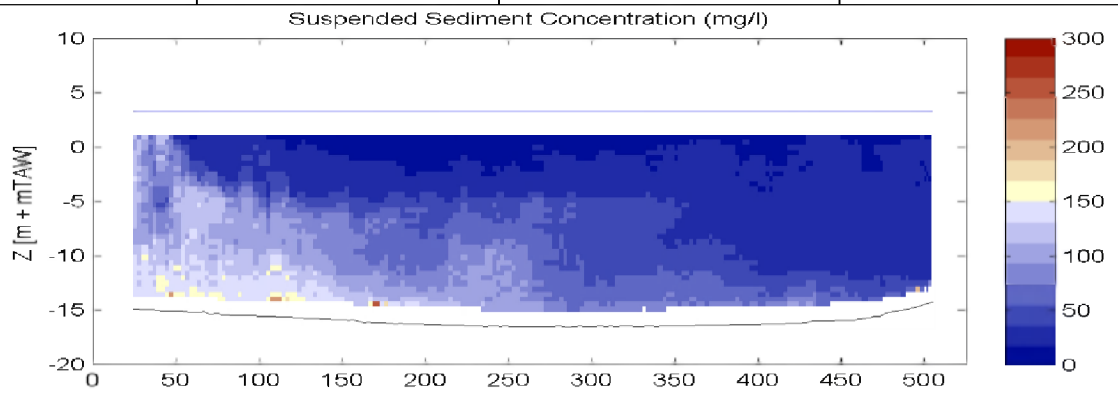
n)	28/09/2011	3 hrs after HW	Tidal coefficient: 1.17	Fresh water: 40 m³/s



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 hr after HW	Tidal coefficient: 1.16	Fresh water: 305 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)