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Deelrapport 2.22 : 13-uursmeting Sediview op 24/09/2008 tijdens doodtij - Deurganckdok (transect DGD)

Report 2.22 : Through Tide Measurement Sediview on 24/09/2008 during neap tide - Deurganckdok (transect DGD)

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i.s.m.

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1. INTRODUCTION

1.1. The assignment

This report is part of the set of reports describing the results of the long-term measurements conducted in Deurganckdok aiming at the monitoring and analysis of silt accretion. This measurement campaign is an extension of the study "Extension of the study about density currents in the Beneden Zeeschelde" as part of the Long Term Vision for the Scheldt estuary. It is complementary to the study 'Field measurements high-concentration benthic suspensions (HCBS 2)'.

The terms of reference for this study were prepared by the 'Departement Mobiliteit en Openbare Werken van de Vlaamse Overheid, Afdeling Waterbouwkundig Laboratorium' (16EB/05/04). The repetition of this study was awarded to International Marine and Dredging Consultants NV in association with WL|Delft Hydraulics and Gems International on 10/01/2006. The project term was prolonged with an extra year from April 2007 till March 2008 and a second time prolonged with one extra year from April 2008 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 and Port of Antwerp provided depth sounding measurements.

The execution of the study involves a twofold assignment:

- Part 1: Setting up a sediment balance of Deurganckdok covering a period of two years, i.e. 04/2007 – 03/2009
- Part 2: An analysis of the parameters contributing to siltation in Deurganckdok

1.2. Purpose of the study

The Lower Sea Scheldt (Beneden Zeeschelde) is the stretch of the Scheldt estuary between the Belgium-Dutch border and Rupelmonde, where the entrance channels to the Antwerp sea locks are located. The navigation channel has a sandy bed, whereas the shallower areas (intertidal areas, mud flats, salt marshes) consist of sandy clay or even pure mud sometimes. This part of the Scheldt is characterized by large horizontal salinity gradients and the presence of a turbidity maximum with depth-averaged concentrations ranging from 50 to 500 mg/l at grain sizes of 60 - 100 μm. The salinity gradients generate significant density currents between the river and the entrance channels to the locks, causing large siltation rates. It is to be expected that in the near future also the Deurganckdok will suffer from such large siltation rates, which may double the amount of dredging material to be dumped in the Lower Sea Scheldt.

Results from the study may be interpreted by comparison with results from the HCBS and HCBS2 studies covering the whole Lower Sea Scheldt. These studies included through-tide measurement campaigns in the vicinity of Deurganckdok and long term measurements of turbidity and salinity in and near Deurganckdok.

The first part of the study focuses on obtaining a sediment balance of Deurganckdok. Aside from natural sedimentation, the sediment balance is influenced by the maintenance and capital dredging works. This involves sediment influx from capital dredging works in the Deurganckdok, and internal relocation and removal of sediment by maintenance dredging works. To compute a sediment balance an inventory of bathymetric data (depth soundings), density measurements of the

deposited material and detailed information of capital and maintenance dredging works will be made up.

The second part of the study is to gain insight in the mechanisms causing siltation in Deurganckdok, it is important to follow the evolution of the parameters involved, and this on a long and short term basis (long term & through-tide measurements). Previous research has shown the importance of water exchange at the entrance of Deurganckdok is essential for understanding sediment transport between the dock and the river Scheldt.

1.3. Overview of the study

1.3.1. Reports

Reports of the project 'Opvolging aanslibbing Deurganckdok' between April 2008 till March 2009 are summarized in Table 1-1. An overview of the HCBS2 and 'Opvolging aanslibbing Deurganckdok' (between April 2006 till March 2008) reports are given in APPENDIX I.

This report 2.22, 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 Deurganckdok Reports

Report	Description
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 (I/RA/11283/08.085/MSA)
2.25	Through tide measurement Sediview DGD during spring tide Autumn 2008 (I/RA/11283/08.086/MSA)
2.26	Through tide measurement Sediview DGD during neap tide Winter 2009 (I/RA/11283/08.087/MSA)
2.27	Through tide measurement Sediview DGD during spring tide Winter 2009 (I/RA/11283/08.088/MSA)

Report	Description
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 (I/RA/11283/08.091/MSA)
2.31	Through tide measurement Salinity Profiling DGD Winter 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 (I/RA/11283/08.095/MSA)
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/11283/08.096/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 4/'06 – 3/'09 (I/RA/11283/08.098/MSA)

1.3.2. Measurement actions

Following measurements have been carried out during the course of this project:

1. Monitoring upstream discharge in the Scheldt river
2. Monitoring Salt and sediment concentration in the Lower Sea Scheldt taken from on permanent data acquisition sites at Lillo, Oosterweel and up- and downstream of the Deurganckdok.
3. Long term measurement of salt distribution in Deurganckdok.
4. Long term measurement of sediment concentration in Deurganckdok
5. Monitoring near-bed processes in the central trench in the dock, near the entrance as well as near the landward end: near-bed turbidity, near-bed current velocity and bed elevation variations are measured from a fixed frame placed on the dock's bed.
6. Measurement of current, salt and sediment transport at the entrance of Deurganckdok for which ADCP backscatter intensity over a full cross section are calibrated with the Sediview procedure and vertical sediment and salt profiles are recorded with the SiltProfiler equipment
7. Through tide measurements of vertical sediment concentration profiles -including near bed highly concentrated suspensions- with the SiltProfiler equipment. Executed over a grid of points near the entrance of Deurganckdok.
8. Monitoring dredging activities at entrance channels towards the Kallo, Zandvliet and Berendrecht locks
9. Monitoring dredging and dumping activities in the Lower Sea Scheldt

In situ calibrations were conducted on several dates to calibrate all turbidity and conductivity sensors, a description can be found in IMDC (2006a; 2007a; 2008f; 2008o).

1.4. Structure of the report

This report is the factual data report of the through tide measurements at the entrance of Deurganckdok on the 24th of September 2008. The first chapter comprises an introduction. The second chapter describes the measurement campaign and the equipment. Chapter 3 describes the course of the actual measurements. The results and processed data are presented in Chapter 4, whereas chapter 5 gives a preliminary analysis of the data.

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).

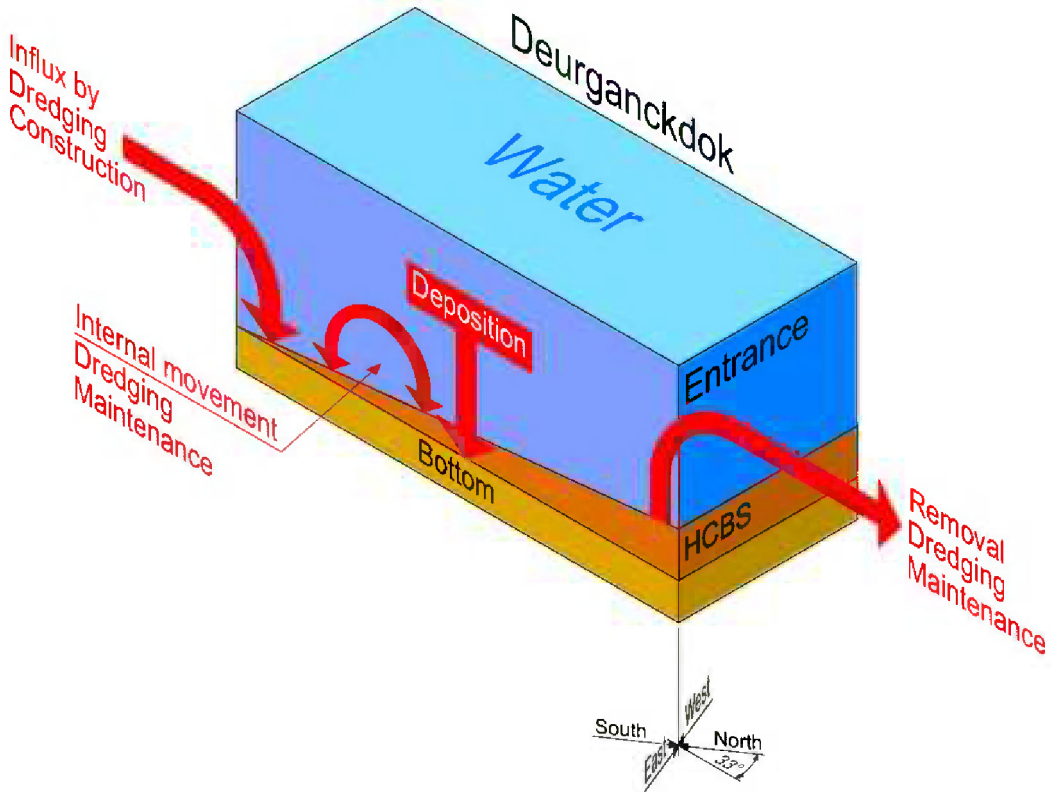


Figure 2-1: Elements of the sediment balance

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.

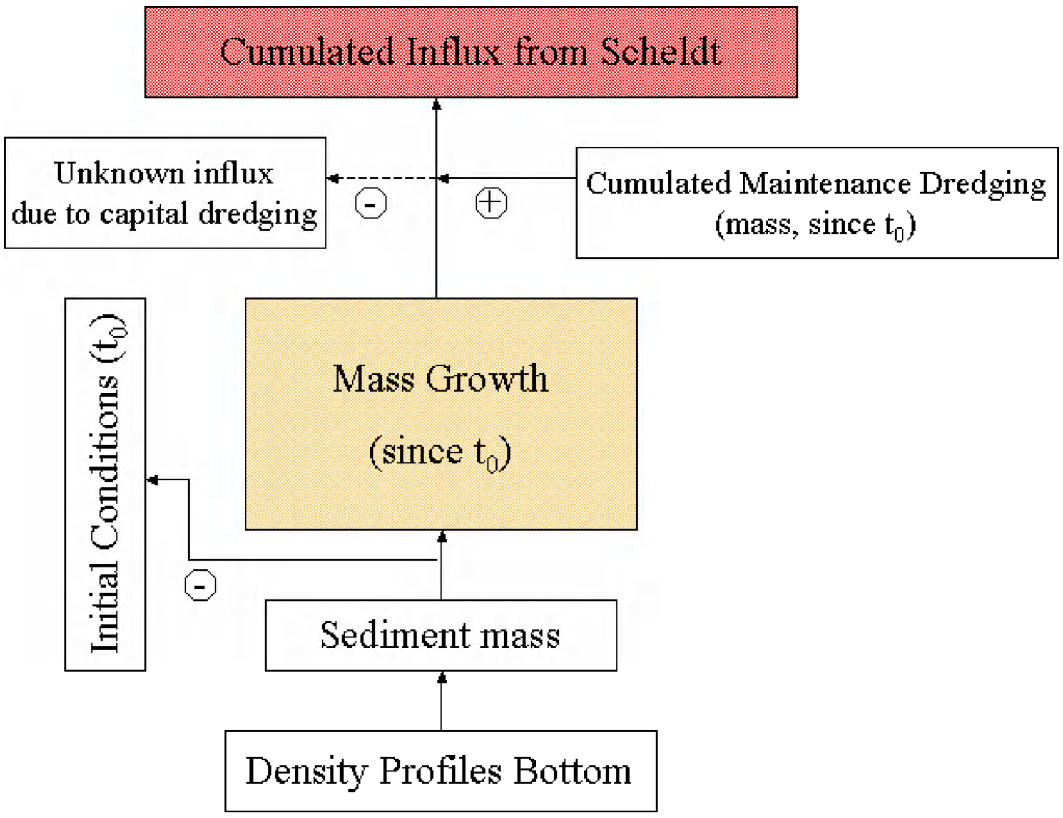


Figure 2-2: Determining a sediment balance

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

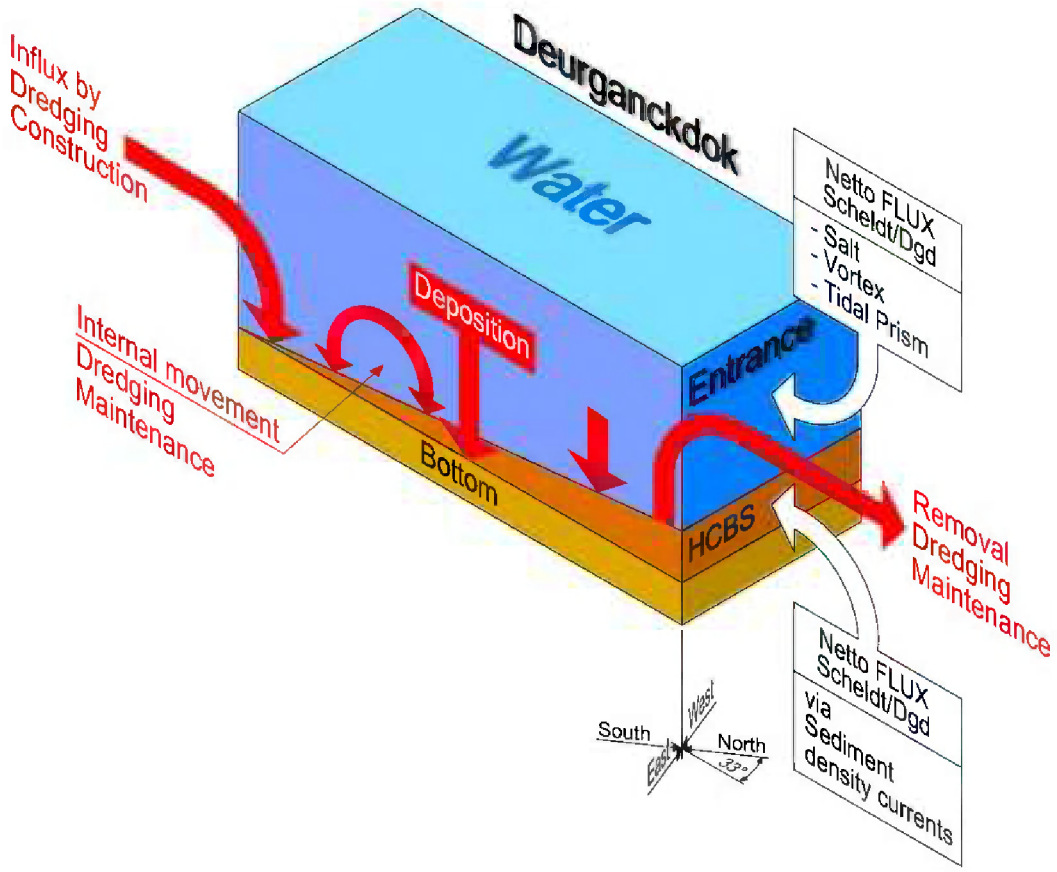


Figure 2-3: Transport mechanisms

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.

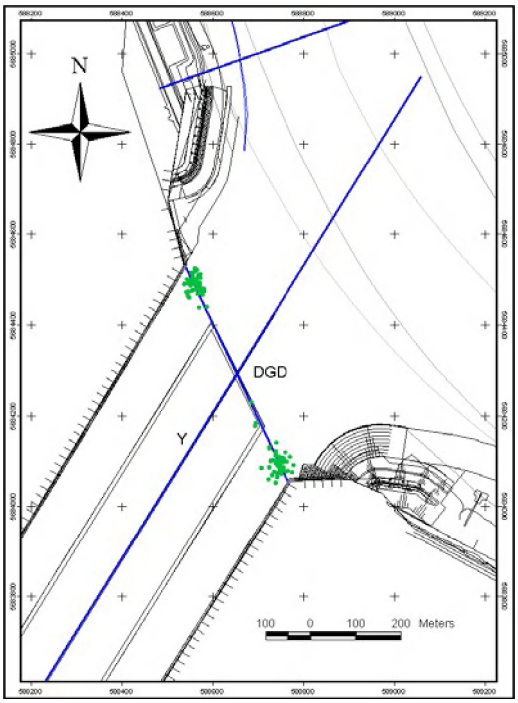


Figure 2-4: Map of sailed transect DGD, start- and end points (green) at Deurganckdok (DGD) on 24th of September 2008

2.2.2. Measurement procedure

Flow velocity, Turbidity, Salinity and Temperature measurements were conducted on the 24th of September 2008 from 6h00 MET until 18h50 MET. From the survey vessel Scheldewacht II a measurement cycle was completed every 25 minutes. 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.

Two calibration profiles were collected for each 2 transects (Table 2-2):

- One before sailing the transect at the bank where the start of the transect was
- One after sailing the transect at the bank where this transect ended and where the next transect started

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 (between 4 and 7 m from the water surface), one at 4 meters above the bottom and the last one at the water bottom. 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:Characteristics of Transect DGD.

Measurement location	Left Bank Easting [UTM31, ED50]	Left Bank Northing [UTM31, ED50]	Right Bank Easting [UTM31, ED50]	Right Bank Northing [UTM31, ED50]	Length [m]	Course [degr.]
Transect DGD	588 541	5 684 527	588 765	5 684 056	521	335

Table 2-2: Positions of the calibration points at transect DGD during flood and ebb.

Measurement point	Bank	Easting (UTM31 ED50)	Northing (UTM31 ED50)
Flood			
DGDau	Left	588561	5684369
DGDbu	Right	588682	5684113
Ebb			
DGDad	Left	588623	5684470
DGDbd	Right	588745	5684214

2.3. The equipment

2.3.1. ADCP

The current measurements were conducted using an RD Instruments ADCP 600 kHz Workhorse. For positioning the GPS onboard the vessel Scheldewacht II was used. For the measurement of the heading a gyrocompass was installed.

This 600 KHz ADCP system was mounted on a steel pole underneath the central axis 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, the heave compensator and the gyrocompass.

During the measurements the ADCP constantly measured upstream from the vessel. The acquisition software of Winriver was used. The main settings are given in Table 2-3.

Table 2-3: Main Configuration Settings of ADCP

Main configuration settings of ADCP 600kHz 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: 30°

2.3.2. OBS - CTD

A D&A type OBS 3A was used to measure depth, conductivity, temperature and turbidity.

Measured parameters by the OBS 3A sensor: temperature (°C), conductivity (µS/cm), absolute pressure (m), turbidity (NTU).

On Scheldewacht II, the OBS 3A device was mounted on a tow fish. 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 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 litre 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 23 seconds.

3. COURSE OF THE MEASUREMENTS

3.1. Measurement periods

At Deurganckdok ADCP tracks were sailed about every 13 minutes for 13 hours, in total 58 cross-sections.

Calibration profiles were taken at 2 locations (left bank, right bank). During every cycle, 1 calibration profile was taken serving as the second calibration of the previous transect and as the first calibration point of the current transect, resulting in a total of 58 profiles. APPENDIX 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 gauges. Graphs of the tide at Liefkenshoek on the 24th of September 2008 can be found in APPENDIX B. Table 3-1 gives the most important characteristics (high and low tide) of the tide at those gauges on the 24th of September 2008.

Table 3-1: High and low tide at Liefkenshoek on 24/09/2008

Liefkenshoek Tidal Gauge		
24th of September 2008		
	Time [MET]	***Water level [m TAW]***
LW (1)	4:20	0.41
HW (2)	10:40	4.19
LW (3)	17:00	0.15
HW (4)	23:20	4.65

In Table 3-2 the tidal characteristics of the tide on the 24th of September 2008 are compared to the average tide over the decade 1991-2000 (AMT, 2003).

Table 3-2: Comparison of the tidal characteristics of 24/09/2008 with the average tide, the average neap tide and the average spring tide over the decade 1991-2000 for Liefkenshoek.

	Neap tide (1991 - 2000)	***Avg Tide (1991 - 2000)***	***Spring Tide (1991 - 2000)***	***Tide 24/09/2008***
Water level [m TAW]				
LW (1)	0.39	0.05	-0.18	0.41
HW (2)	4.63	5.19	5.63	4.19
LW (3)	-	-	-	0.15
HW (4)	-	-	-	4.65
Tidal difference [m]				
Rising (1 to 2)	4.24	5.14	5.81	3.78
Falling (2 to 3)	4.24	5.14	5.81	4.04
Rising (3 to 4)	4.24	5.14	5.81	4.5
Duration [hh:mm]				
Rising (1 to 2)	6:40	6:50	7:02	6:20
Falling (2 to 3)	5:59	5:34	5:16	6:20
Rising (3 to 41)	-	-	-	6:20
Tide (1 to 3)	12:39	12:24	12:18	12:40
Tide (2 to 4)	-	-	-	12:40
Tidal coefficient				
Rising (1 to 2)	0.82	1.00	1.13	0.74
Falling (2 to 3)	0.82	1.00	1.13	0.79
Rising (3 to 4)	-	-	-	0.88

The tidal coefficients from 0.74 up to 0.88 for the measured tide of the 24th of September 2008 indicate that this tide has a smaller tidal range than the average tide for the decade of 1991-2000 and can be classified as a neap tide.

3.2.2. Meteorological data

Meteorological data at Woensdrecht (NL) was obtained from the website of the Dutch meteorological institute (KNMI) (KNMI, 2009).

The weather on the 24th of September 2008 was cloudy but dry with an air pressure of 1023.8 hPa The wind blew from East-North-East at an average velocity of 14 km/h (3 Bft) with maximal gust velocity of 25 km/h. The air temperature varied between 11 and 16°C. The sky was completely clouded but without precipitation.

3.3. Navigation information

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

3.4. Remarks on data

Shipwakes were removed from the ADCP data where possible.

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. The calibration curve can be found in report 2.34 (IMDC, 2009c).

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 (APPENDIX 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 4.2.3.1.

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.

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° and to 12% above the bottom when the beam angle is 30°. 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.

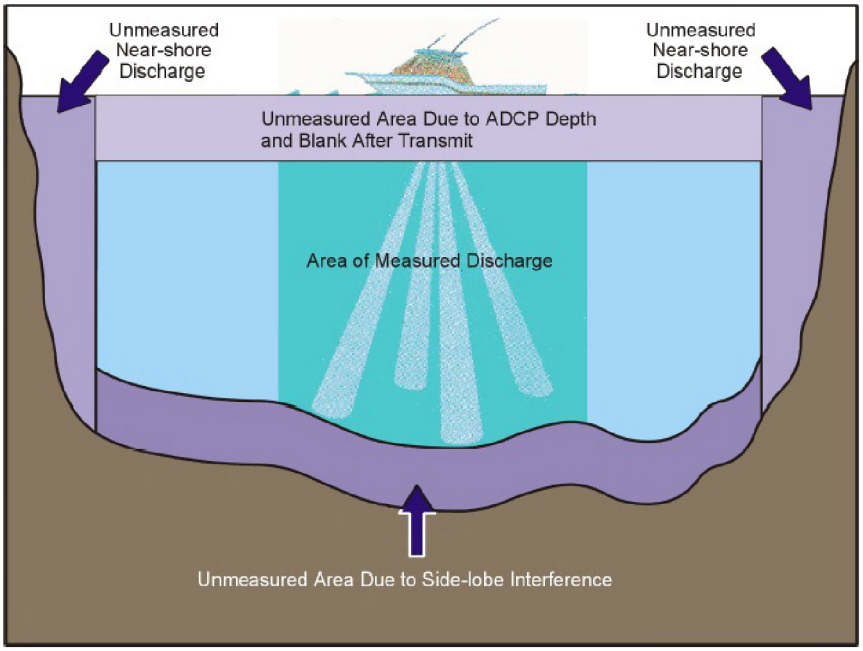


Figure 4-1: Unmeasured regions in the cross section (from RD Instruments, 2003)

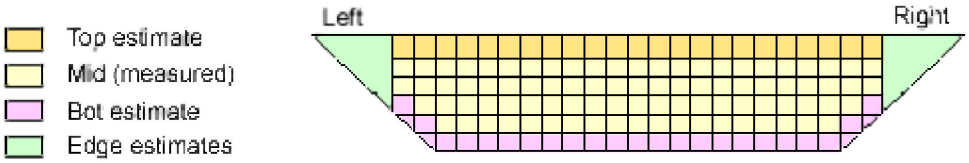


Figure 4-2: Measured and estimated discharges and sediment fluxes (DRL, 2005)

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). An overview of the used power concentration factor is given in APPENDIX E.

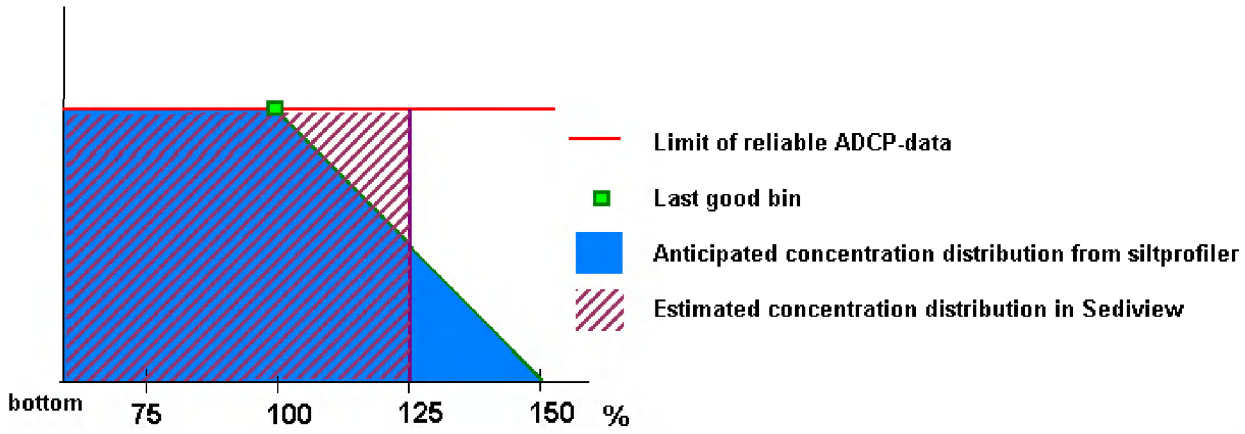


Figure 4-3: Principal of bottom estimate of the sediment concentration

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.

Table 4-2: Reference points at the quay wall on the left and right bank.

Coordinates (UTM31 ED50)	***Easting Left bank***	***Northing Left bank***	***Easting Right bank***	***Northing Right bank***
Transect DGD	588 541	5 684 527	588 765	5 684 056

The formula for determining the near shore discharge is:

$$Q_{shore} = CV_m Ld_m \text{ [m}^3\text{/s]}$$

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 ADCPs 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 APPENDIX A.

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

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

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

Tables in APPENDIX G give the values for discharges, sediment fluxes and the average measured SSC for the total cross-section.

- 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 APPENDIX H gives the temporal variation of the flux, discharge and SSC for the whole through tide measurement at Deurganckdok.

5. PRELIMINARY ANALYSIS OF THE DATA

5.1. The survey of 24th of September 2008

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. (APPENDIX 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 probably an example of the expected salt 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, one can notice in general a higher concentration during high water and during rising tide compared to during ebb tide. The highest SS concentrations (incoming and outgoing) occur around HW.

It can also be noticed that during the complete measurement cycle the incoming water has a higher SSC than the outgoing water (see Figure 5-1 and Table 5-1). The incoming averaged suspended sediment concentrations range from 20 mg/l up to 54 mg/l during ebb and from 22 mg/l to 59 mg/l during flood, whereas the outgoing concentrations range from 14 to 38 mg/l during ebb and from 27 to 46 mg/l during flood.

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

	Concentration [mg/l]								
	overall SSC			***incoming SSC***			***outgoing SSC***		
Tide	***minimum***	***average***	***maximum***	***minimum***	***average***	***maximum***	***minimum***	***average***	***maximum***
Ebb	16	25	43	20	30	54	14	22	38
Flood	25	37	52	22	37	59	27	37	46

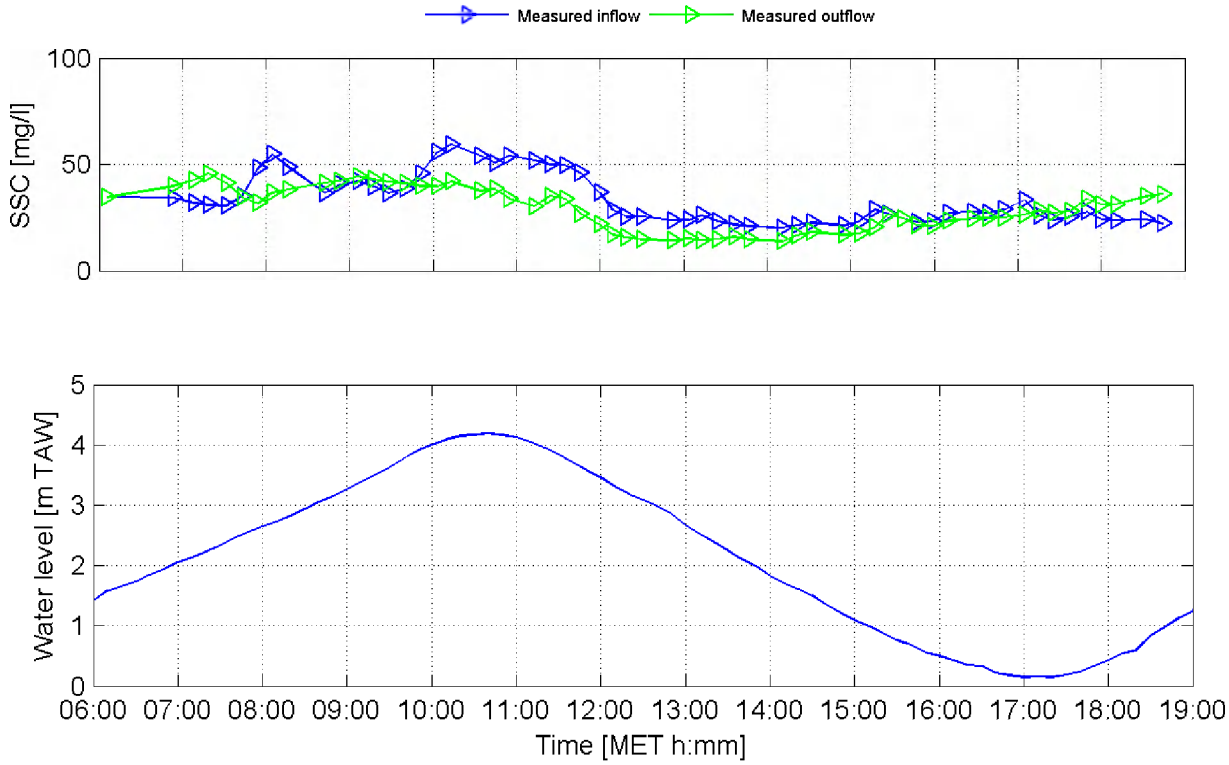


Figure 5-1 Average incoming and outgoing SSC over a complete tidal cycle on 24/9/2008

Considering the sediment fluxes, Figure 5-2-a shows that residual incoming transport is dominating during flood and lasts until approximately 1 hour after HW. Almost no residual outgoing sediment transport can be observed during the measurement campaign. In the first hour after high water there is a residual incoming sediment flux even though the resulting discharge is outgoing at that moment (see Figure 5-2-b).

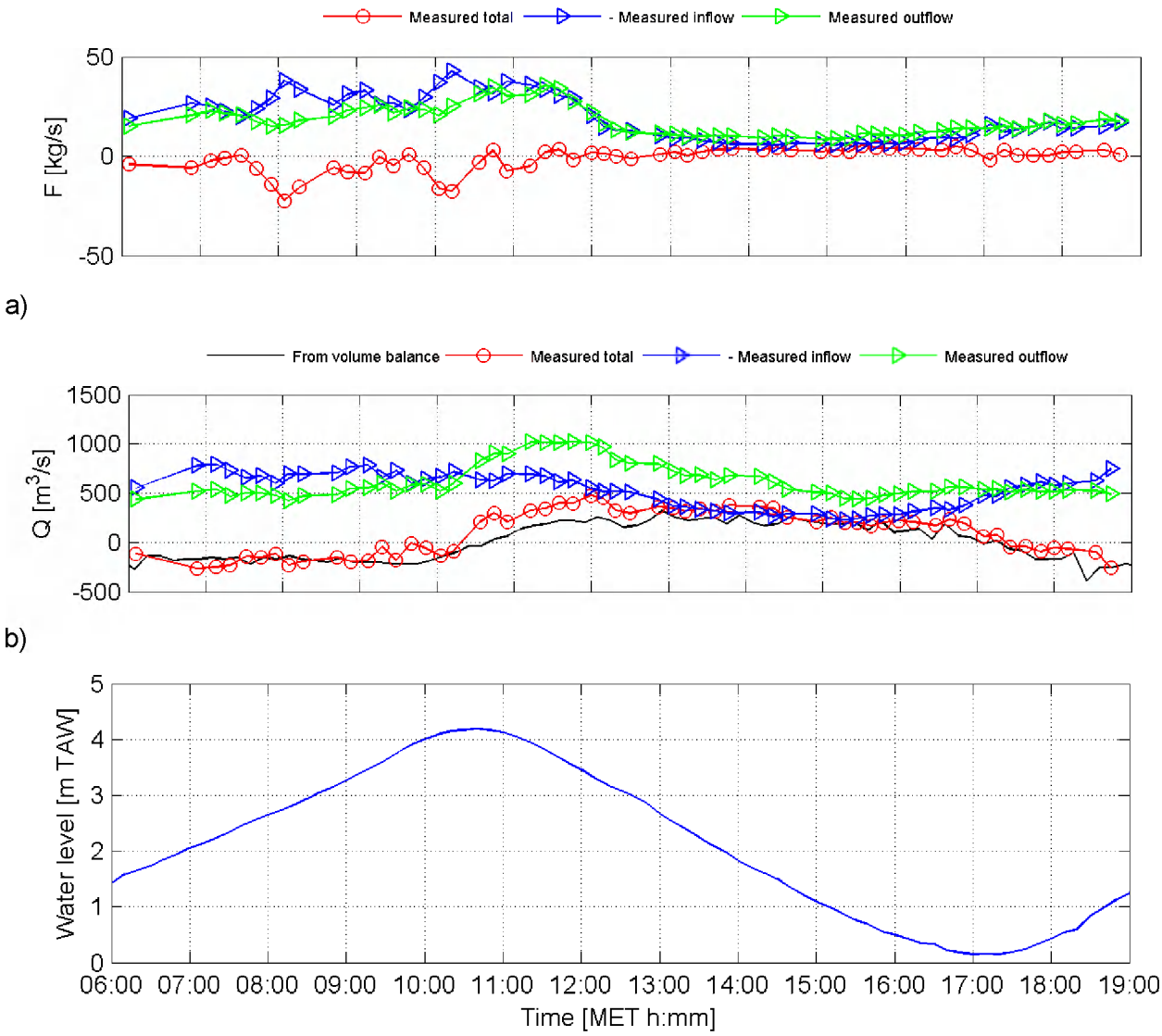


Figure 5-2 Total in/out/net flux a) and in/out/net discharge b) at DGD on September 24th 2008.

The first 3 hours after HW the outflow is approximately twice as high (+-1000 m³/s) as during the rest of the measurement day (see Figure 5-2-b) and is mainly situated in the upper part of the water column (see Figure 5-7). Incoming density currents near the bottom due to a higher salinity in the river than in the dock reach their maximum around slack tide on the Scheldt at approximately 1 hour after high water (see Figure 5-7).

5.2. Intercomparison with earlier surveys at DGD

Since 2005, IMDC has organised 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.

5.2.1. Fresh water discharge

The fresh water discharges at Schelle were calculated from the tributaries, which were recorded during the measurement campaigns. The calculation procedure is described in AZ (1974) and is based on the use of correction coefficients that take in account the surface of the hydrological basins. The daily 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 5-3.

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***	***Daily 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	27
DGD 3 (IMDC, 2008v)	26/06/2008	0.97	Average	20
DGD3 (IMDC 2008x)	24/09/2008	0.81	Neap	33
DGD 3 (IMDC, 2009a)	30/09/2008	1.08	Spring	16

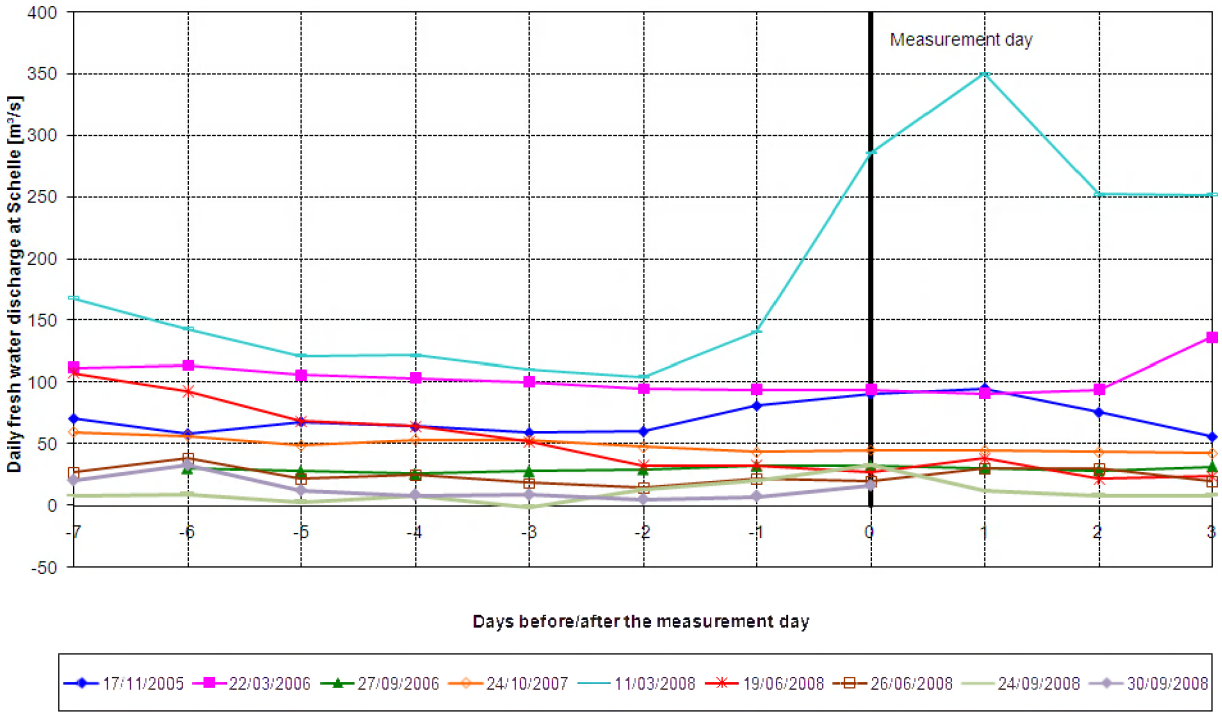


Figure 5-3: The daily fresh water discharge evolution at Schelle before and after a measurement day.

The results presented in Figure 5-4 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 +2σ and mean discharge -2σ.

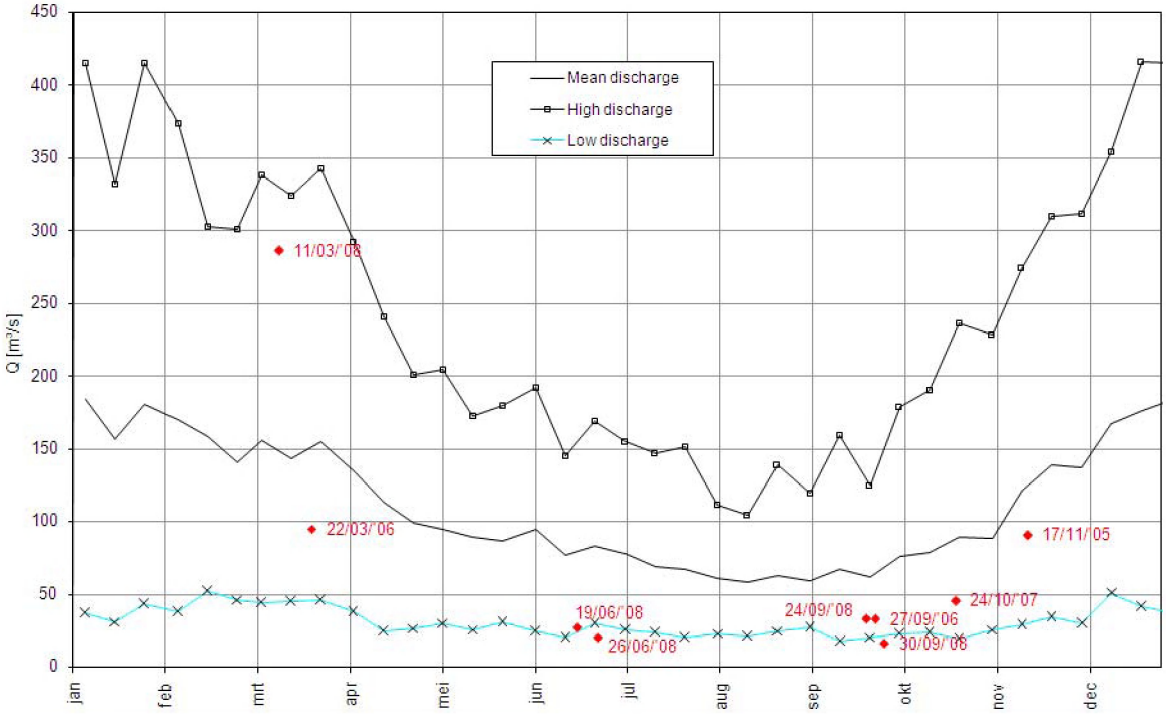


Figure 5-4: Mean fresh water discharge over a period of 30 year (1971-2000)

5.2.2. Sediment distributions and current pattern around HW

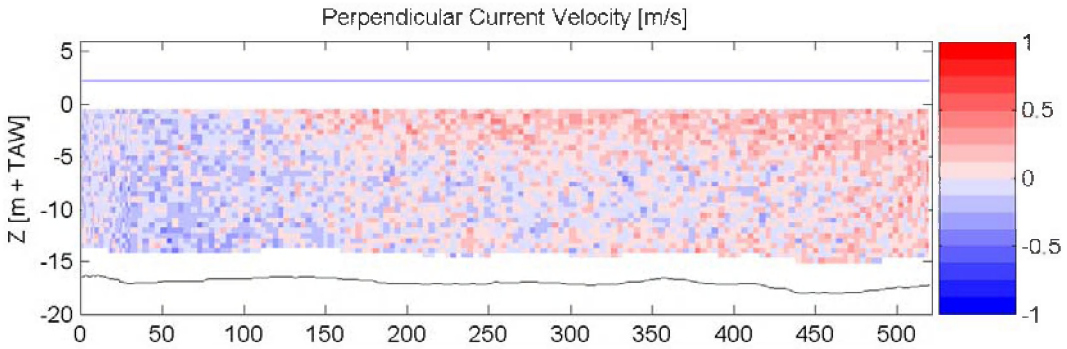
In Figure 5-5 and Figure 5-6 the 9 different measurement campaigns have been compared for about 3 hours after high water. Sediment distributions as well as current pattern in the cross section are similar for all campaigns. The western side of the dock is situated at the left of these figures, the eastern side at the right. The sediment distribution and current pattern of this neap tide measurement is less pronounced than the patterns during average and spring tide measurements.

In Figure 5-7 and Figure 5-8 the circulation pattern and sediment concentration have been compared for the same days but at about 1h after high water. Again the current pattern is almost identical between the different days with a salt wedge intruding near the bottom of the dock and compensatory outflow of fresher water near the surface. Except for the measurements at 11/03/2008, the sediment distributions are very similar between the different campaigns.

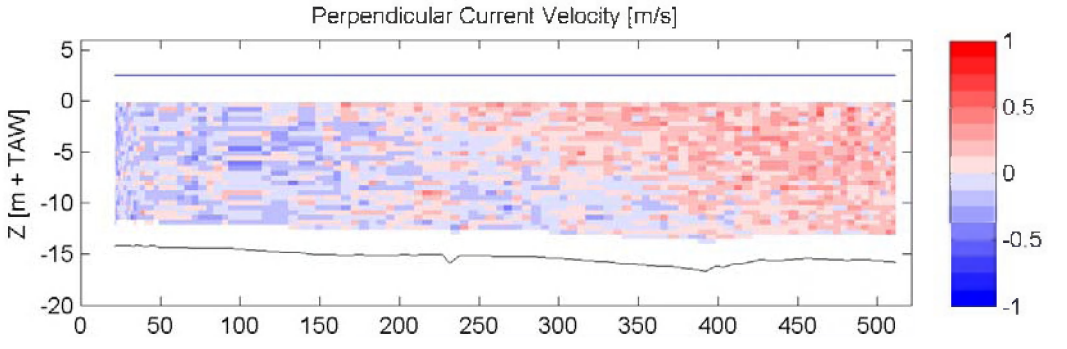
The measurements around HW on 11/03/2008 show a very different sediment distribution compared to the other measurement days. The sediment concentrations are considerably higher and this almost throughout the whole water column. These high concentrations can also be seen on the surrounding transects on 11/03/2008, so it is very unlikely these concentrations can be attributed to a shipwake.

These high concentrations must slightly be attributed to the high fresh water discharges, recorded on 11/03/2008 near Schelle (see Figure 5-4), but most particular to the extreme spring tide and stormy weather on that day. Compared with the other tides, the waterlevel at 11/03/2008 increases slower during the first hours of the flood. As a result, there is a huge intake of water during the second part of the flood phase. It is during these last hours of the flood, that those high concentrations were measured.

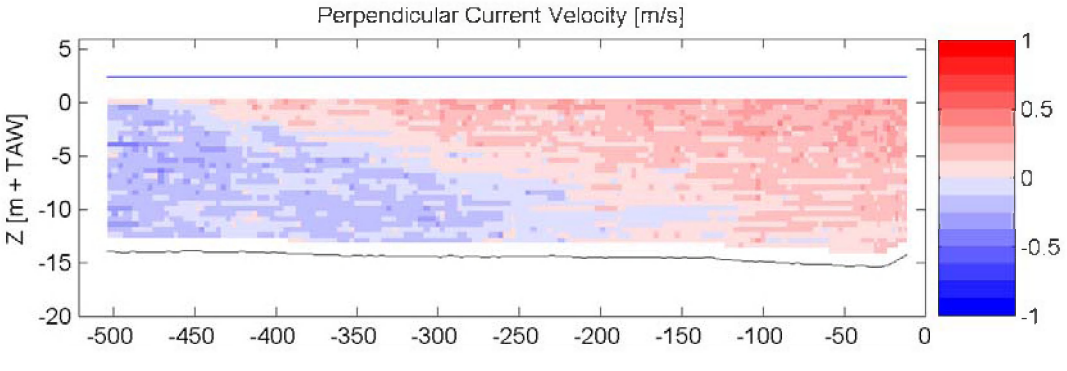
a)


Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
0
50
100
150
200
250
300
350
400
450
500
1
0.5
0
-0.5
-1

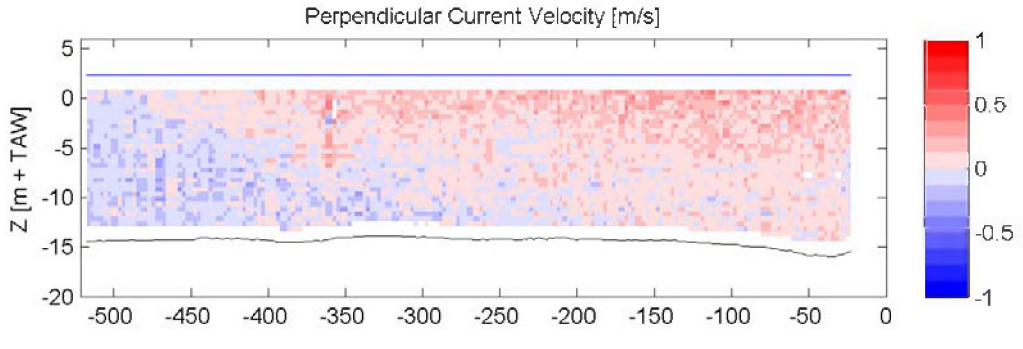
b)


Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
0
50
100
150
200
250
300
350
400
450
500
1
0.5
0
-0.5
-1

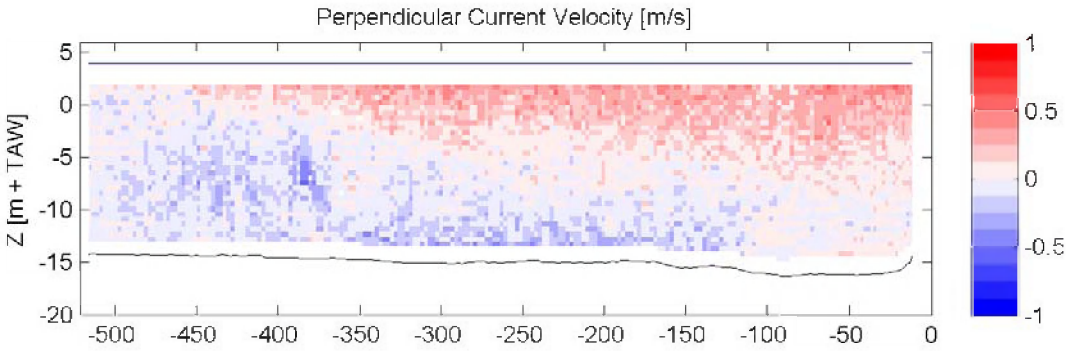
c)


Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
-500
-450
-400
-350
-300
-250
-200
-150
-100
-50
0
1
0.5
0
-0.5
-1

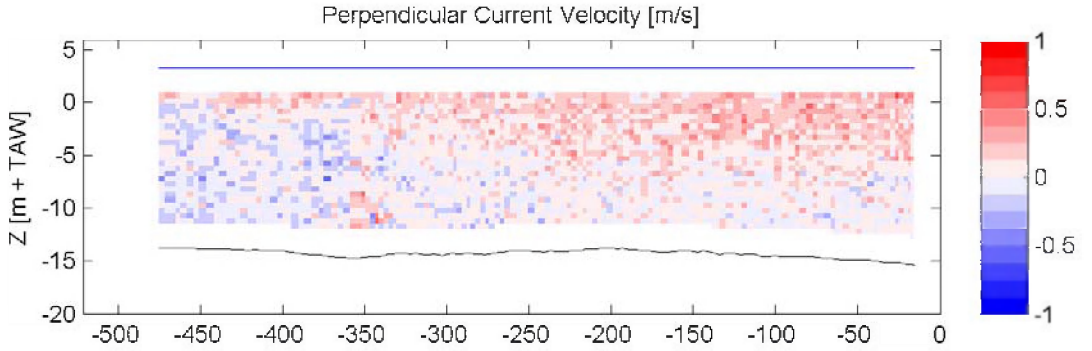
d)


Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
-500
-450
-400
-350
-300
-250
-200
-150
-100
-50
0
1
0.5
0
-0.5
-1

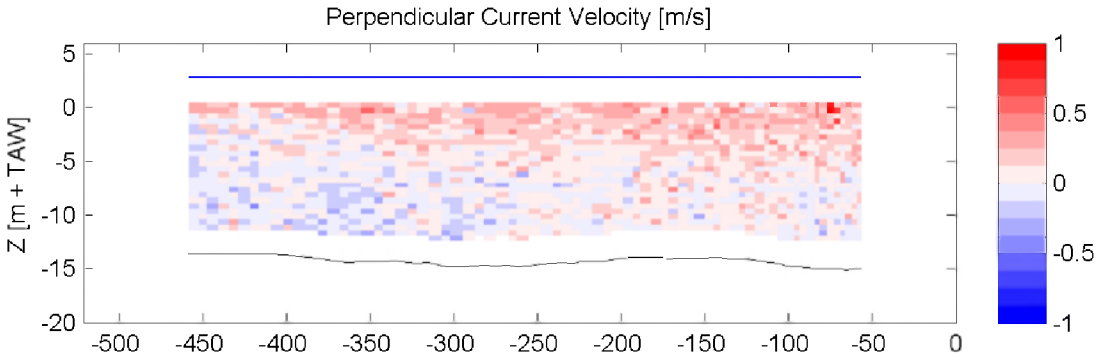
e)


Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
-500 -450 -400 -350 -300 -250 -200 -150 -100 -50 0
1
0.5
0
-0.5
-1

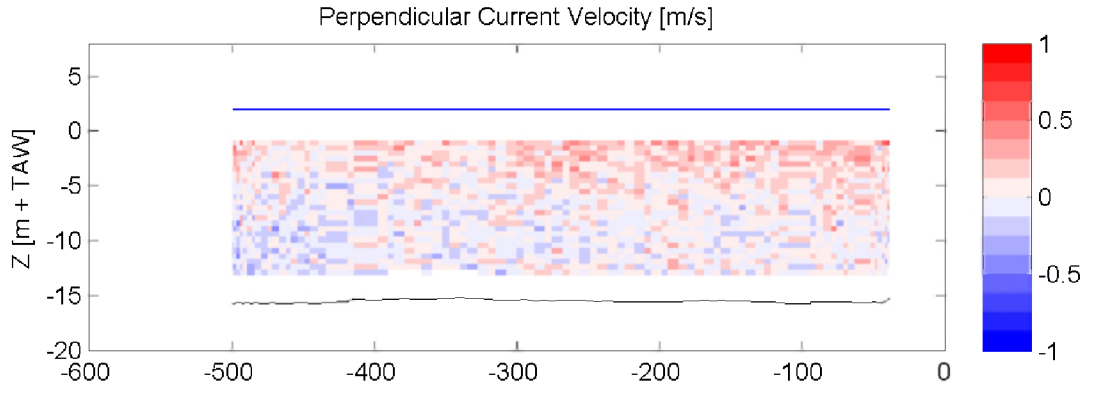
f)

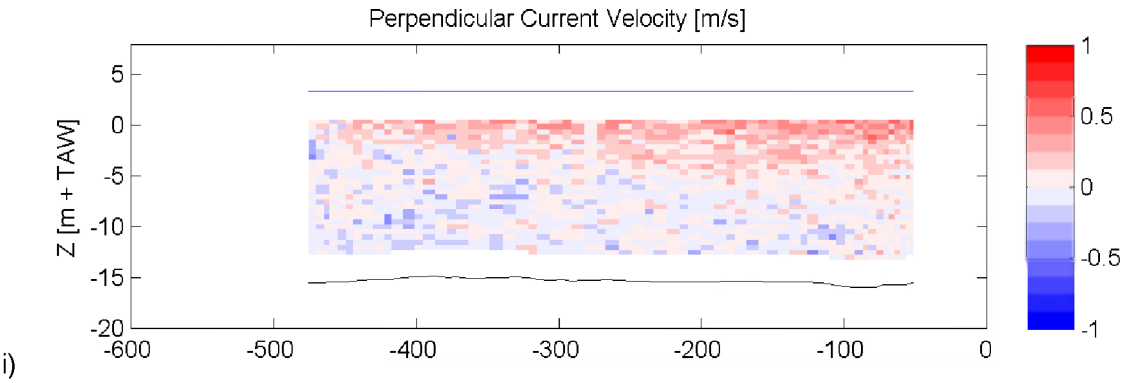

Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
-500 -450 -400 -350 -300 -250 -200 -150 -100 -50 0
1
0.5
0
-0.5
-1

g)


Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
-500 -450 -400 -350 -300 -250 -200 -150 -100 -50 0
1
0.5
0
-0.5
-1

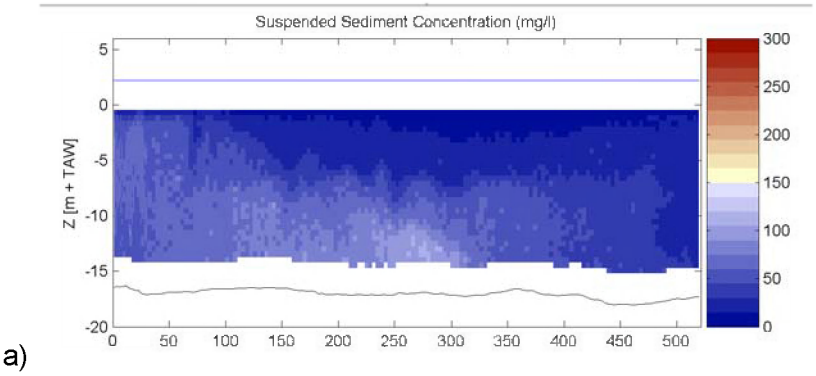
h)


Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
-600 -500 -400 -300 -200 -100 0
1
0.5
0
-0.5
-1

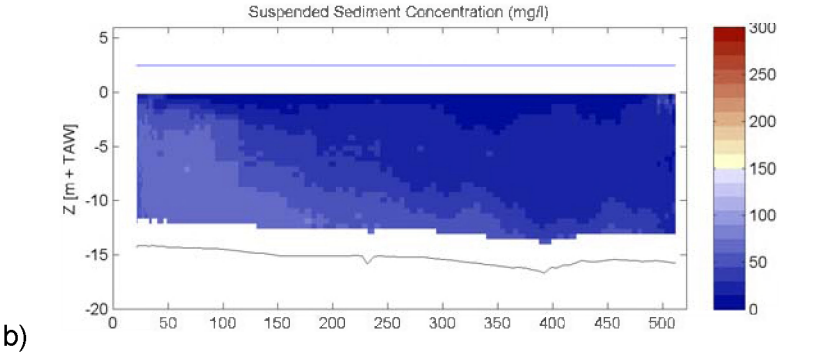


i)

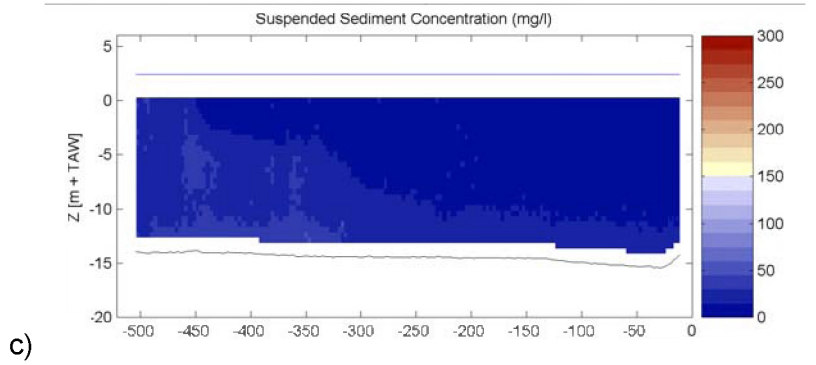
Figure 5-5: a) Perpendicular current velocity on 17/11/2005, b) on 22/03/2006, c) on 27/09/2006, d) on 24/10/2007, e) on 11/03/2008, f) on 19/06/2008, g) on 26/06/2008 h) 24/09/2008 and i) on 30/09/2008 at 3h after high water



a)

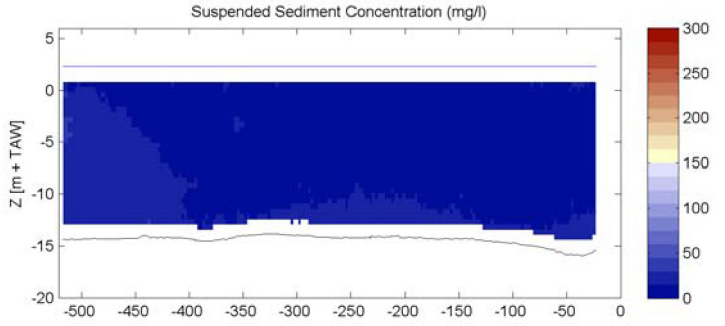


b)

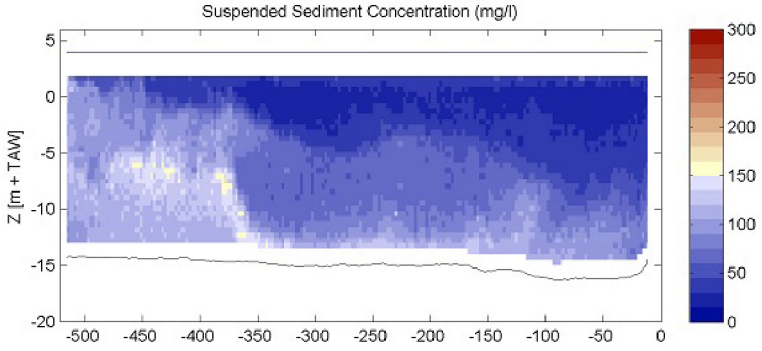


c)

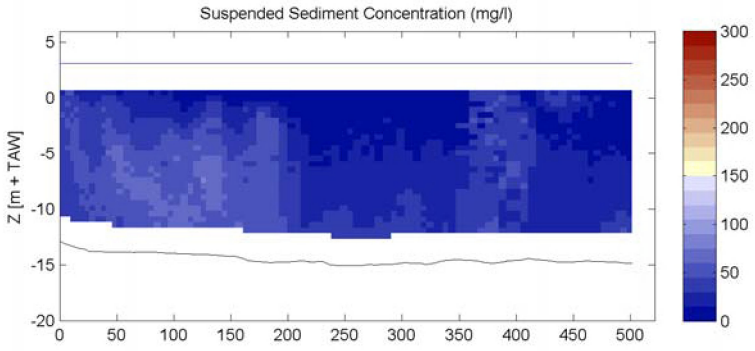
d)


Suspended Sediment Concentration (mg/l)
Z [m + TAW]
5
0
-5
-10
-15
-20
-500 -450 -400 -350 -300 -250 -200 -150 -100 -50 0
300
250
200
150
100
50
0

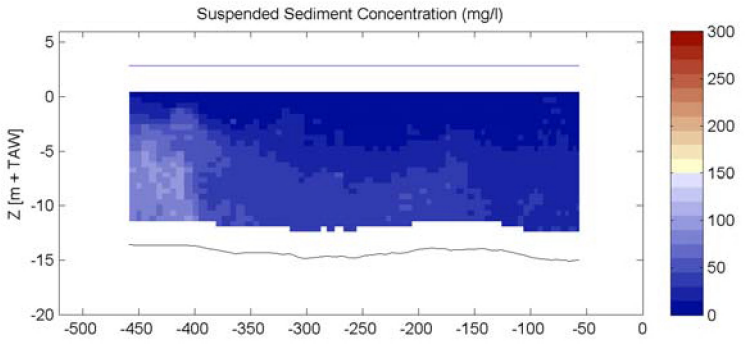
e)


Suspended Sediment Concentration (mg/l)
Z [m + TAW]
5
0
-5
-10
-15
-20
-500 -450 -400 -350 -300 -250 -200 -150 -100 -50 0
300
250
200
150
100
50
0

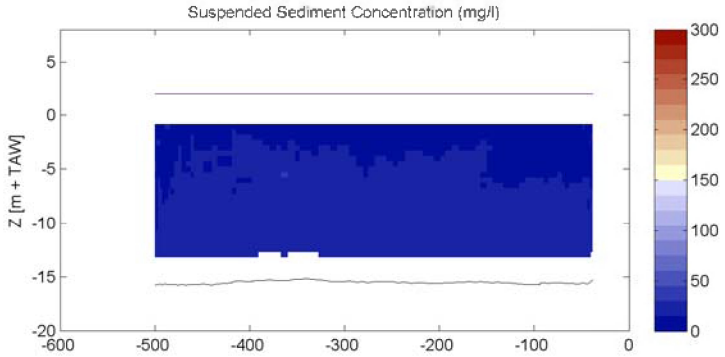
f)


Suspended Sediment Concentration (mg/l)
Z [m + TAW]
5
0
-5
-10
-15
-20
0 50 100 150 200 250 300 350 400 450 500
300
250
200
150
100
50
0

g)


Suspended Sediment Concentration (mg/l)
Z [m + TAW]
5
0
-5
-10
-15
-20
-500 -450 -400 -350 -300 -250 -200 -150 -100 -50 0
300
250
200
150
100
50
0

h)



i)

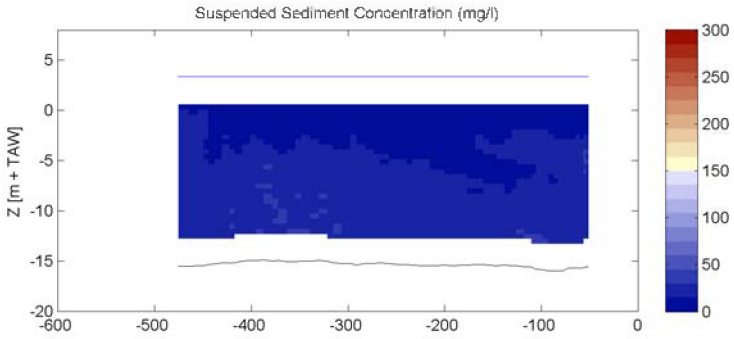
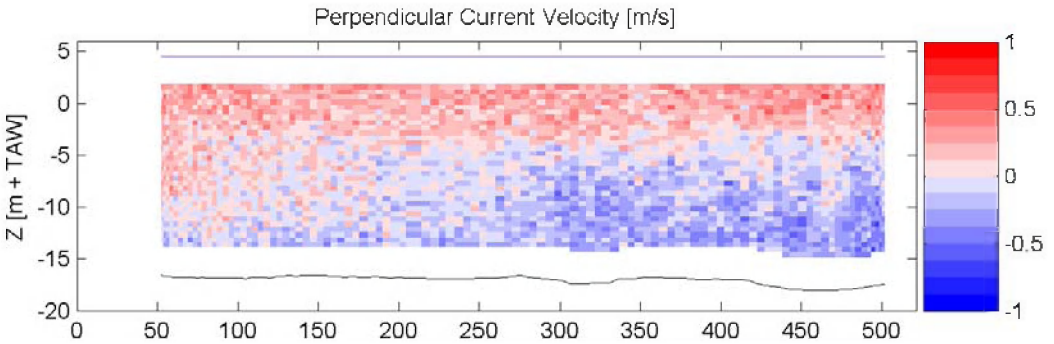
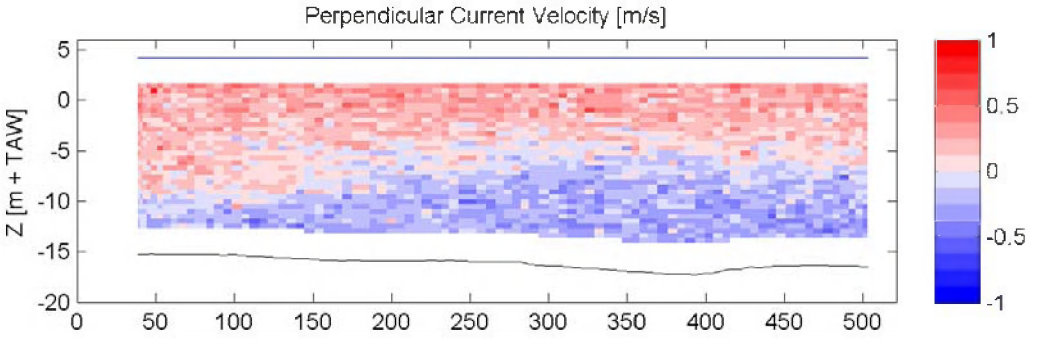


Figure 5-6: a) Suspended sediment concentration on 17/11/2005, b) on 22/03/2006, c) on 27/09/2006, d) on 24/10/2007, e) on 11/03/2008, f) on 19/06/2008, g) on 26/06/2008, on 24/09/2008 and i) 30/09/2008 at 3h after high water

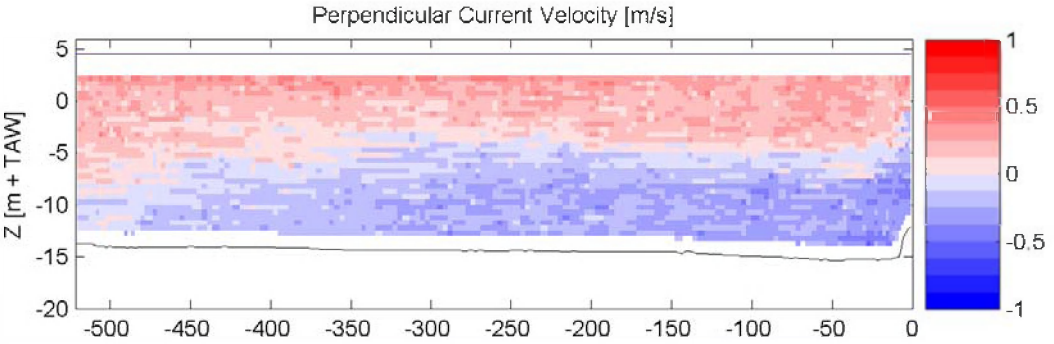
a)


Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
0
50
100
150
200
250
300
350
400
450
500
1
0.5
0
-0.5
-1

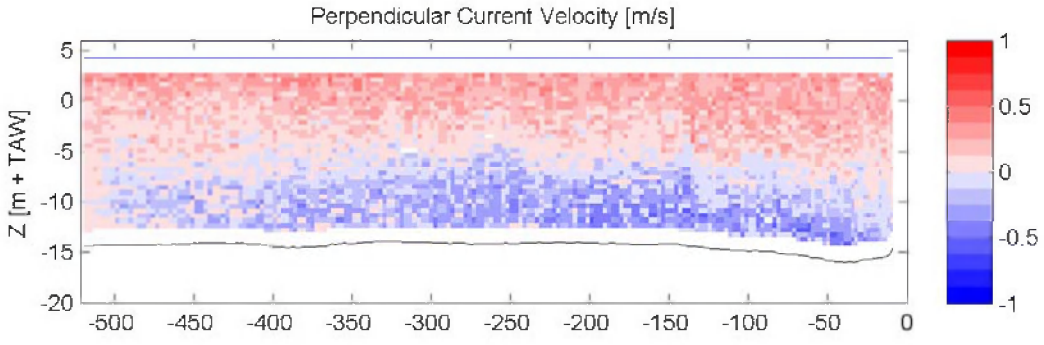
b)

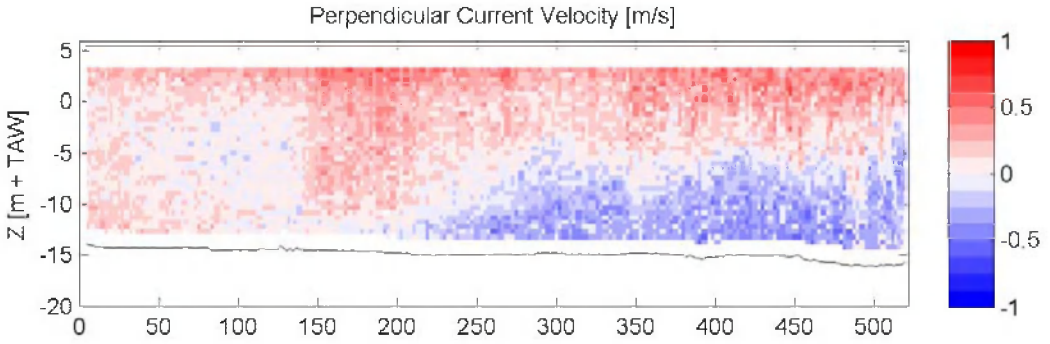

Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
0
50
100
150
200
250
300
350
400
450
500
1
0.5
0
-0.5
-1

c)

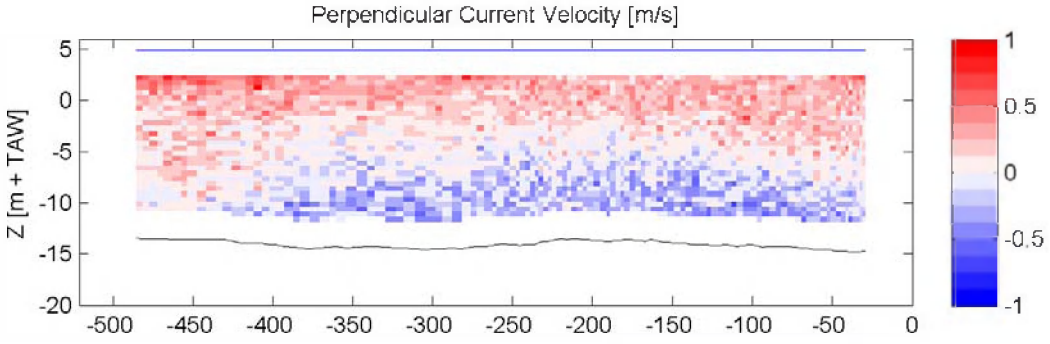

Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
-500
-450
-400
-350
-300
-250
-200
-150
-100
-50
0
1
0.5
0
-0.5
-1

d)

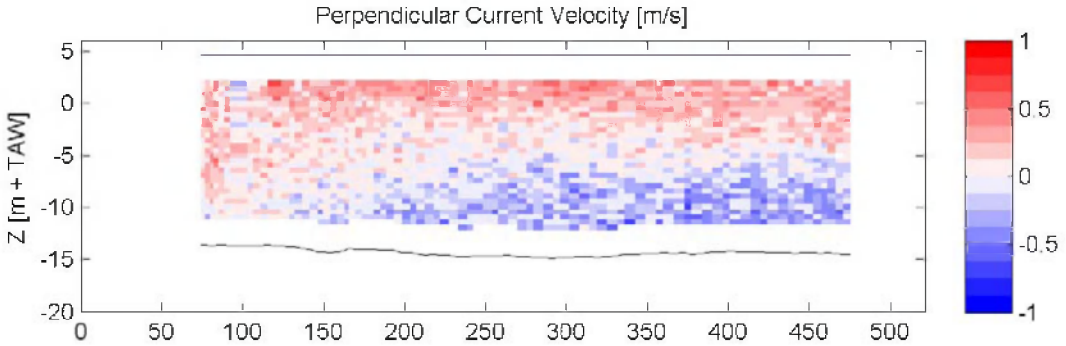

Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
-500
-450
-400
-350
-300
-250
-200
-150
-100
-50
0
1
0.5
0
-0.5
-1


Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
0
50
100
150
200
250
300
350
400
450
500
1
0.5
0
-0.5
-1

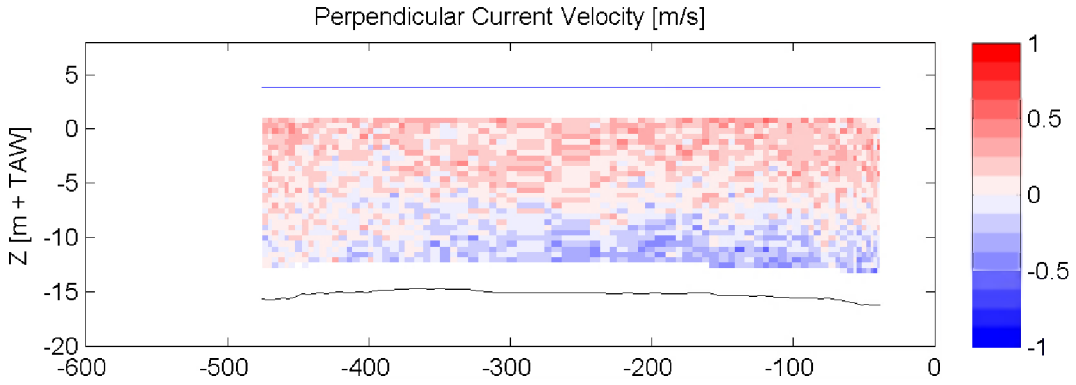
e)


Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
-500
-450
-400
-350
-300
-250
-200
-150
-100
-50
0
1
0.5
0
-0.5
-1

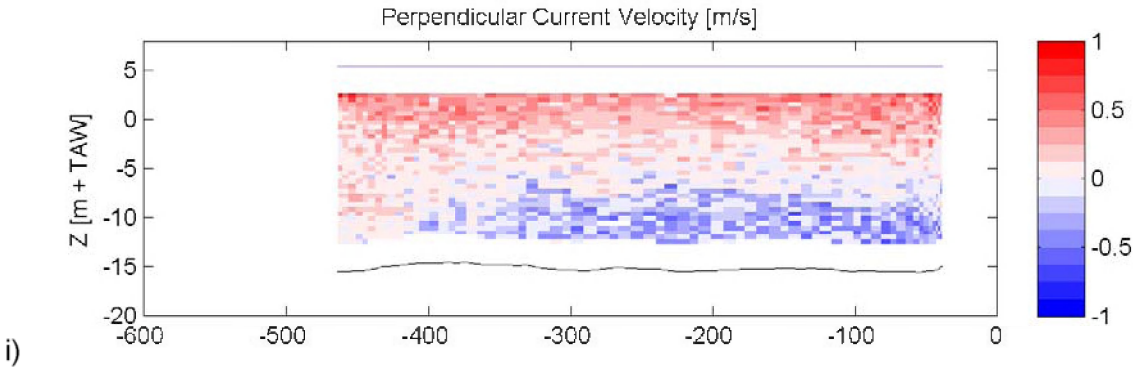
f)


Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
0
50
100
150
200
250
300
350
400
450
500
1
0.5
0
-0.5
-1

g)

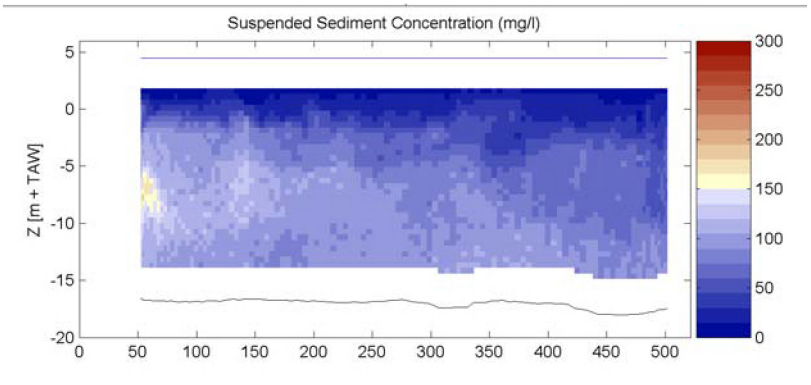

Perpendicular Current Velocity [m/s]
Z [m + TAW]
5
0
-5
-10
-15
-20
-600
-500
-400
-300
-200
-100
0
1
0.5
0
-0.5
-1

h)

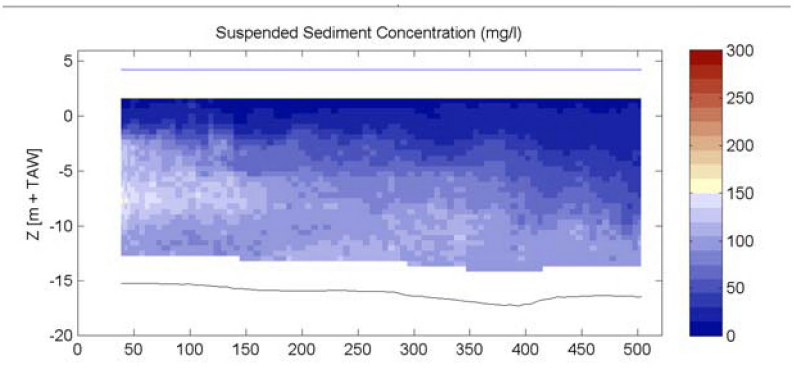


i)

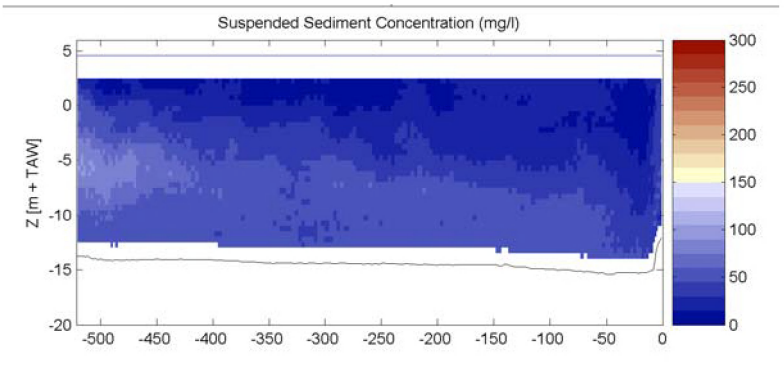
Figure 5-7: a) Perpendicular current velocity on 17/11/2005, b) on 22/03/2006 , c) on 27/09/2006, d) on 24/10/2007, e) on 11/03/2008, f) on 19/06/2008, g) on 26/06/2008, on h) 24/09/2008 and i) 30/09/2008 at 1h after high water



a)

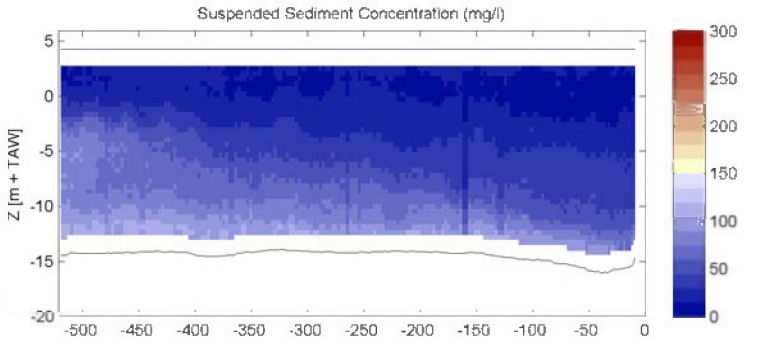


b)

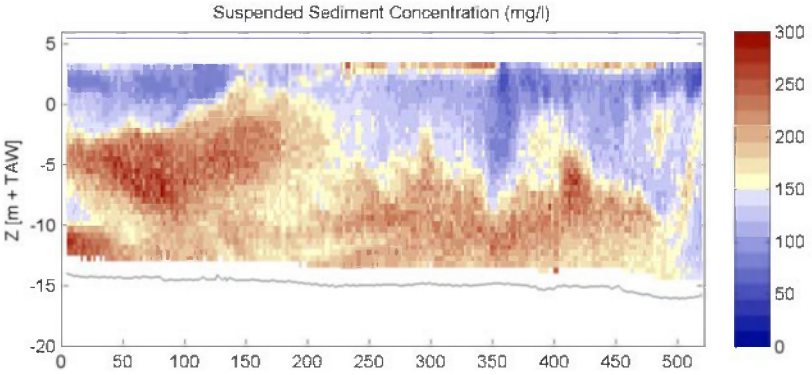


c)

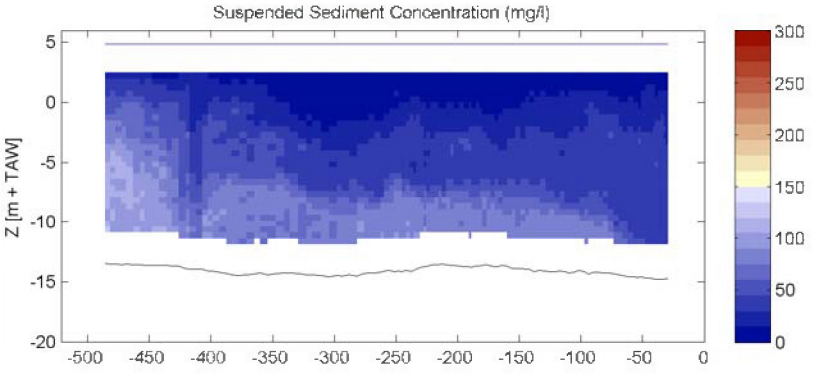
d)


Suspended Sediment Concentration (mg/l)
Z [m + TAW]
5
0
-5
-10
-15
-20
-500 -450 -400 -350 -300 -250 -200 -150 -100 -50 0
300
250
200
150
100
50
0

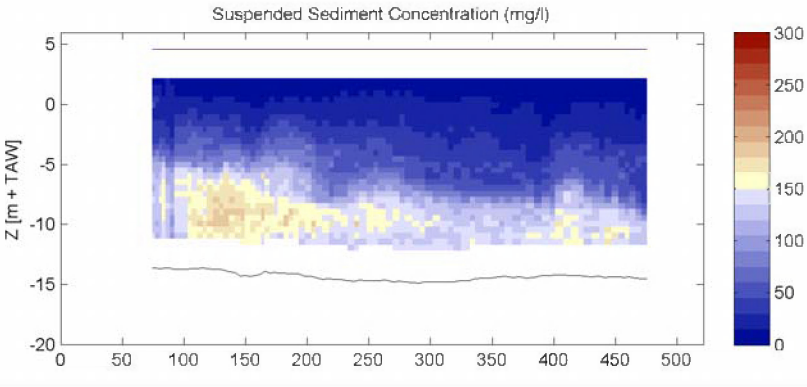
e)


Suspended Sediment Concentration (mg/l)
Z [m + TAW]
5
0
-5
-10
-15
-20
0 50 100 150 200 250 300 350 400 450 500
300
250
200
150
100
50
0

f)


Suspended Sediment Concentration (mg/l)
Z [m + TAW]
5
0
-5
-10
-15
-20
-500 -450 -400 -350 -300 -250 -200 -150 -100 -50 0
300
250
200
150
100
50
0

g)


Suspended Sediment Concentration (mg/l)
Z [m + TAW]
5
0
-5
-10
-15
-20
0 50 100 150 200 250 300 350 400 450 500
300
250
200
150
100
50
0

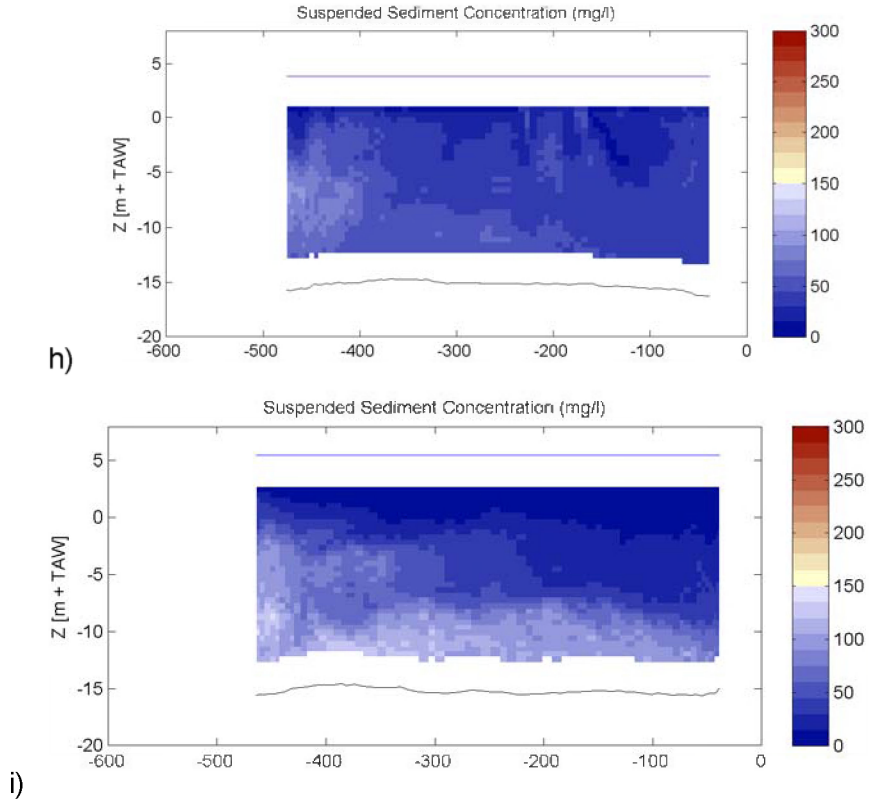


Figure 5-8: a) Suspended sediment concentration on 17/11/2005, b) on 22/03/2006 , c) on 27/09/2006, d) on 24/10/2007, e) on 11/03/2008, f) on 19/06/2008, g) on 26/06/2008, on h) 24/09/2008 & i) on 30/09/2008 at 1h after high water

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 24th of September 2008. 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]
Measured Total Ebb	25 792 421
Tidal Emptying	4 099 889
Measured Total Flood	26 619 095
Tidal Filling	3 620 075
Measured Total	52 411 517
Tidal Filling/Emptying Total	7 719 964

During flood on the 24th of September 2008, 26.4 million m³ water crossed the entrance and during ebb 25.7 million m³ (see Figure 5-9). In total 52.1 million m³ water crossed the docks entrance, of which only 15% (7.7 10^6 m³) can be contributed to tidal filling of Deurganckdok (see Figure 5-10). The other 85% of water displacement at the entrance must be caused by density and eddy currents.

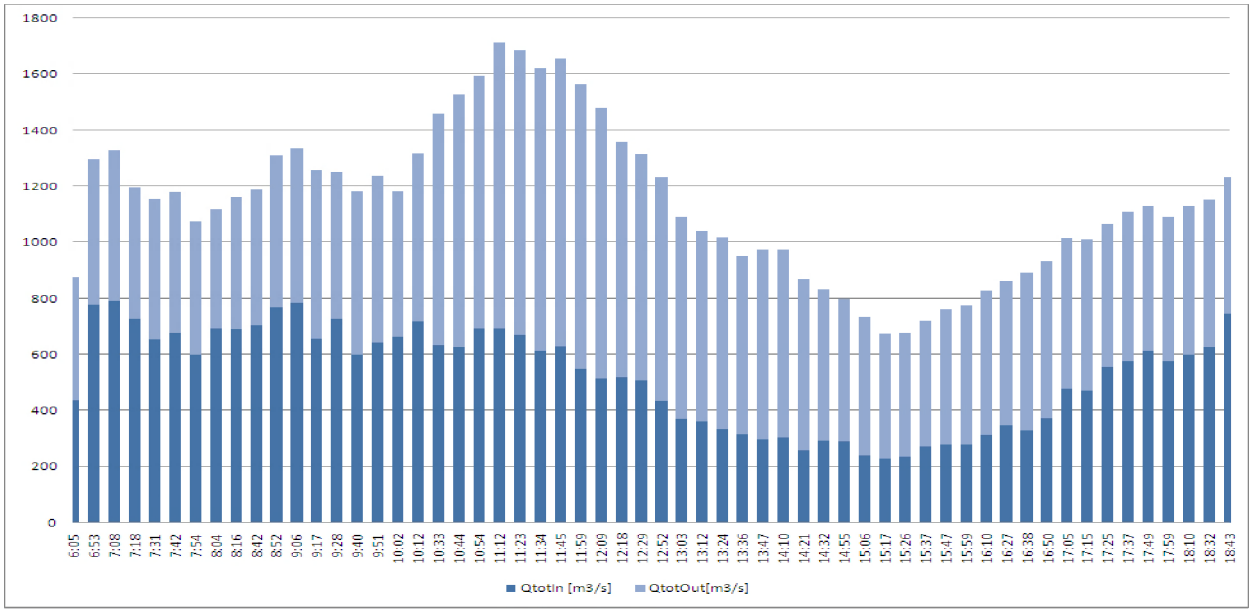


Figure 5-9 Total incoming and outgoing discharge at DGD on 24/09/2008

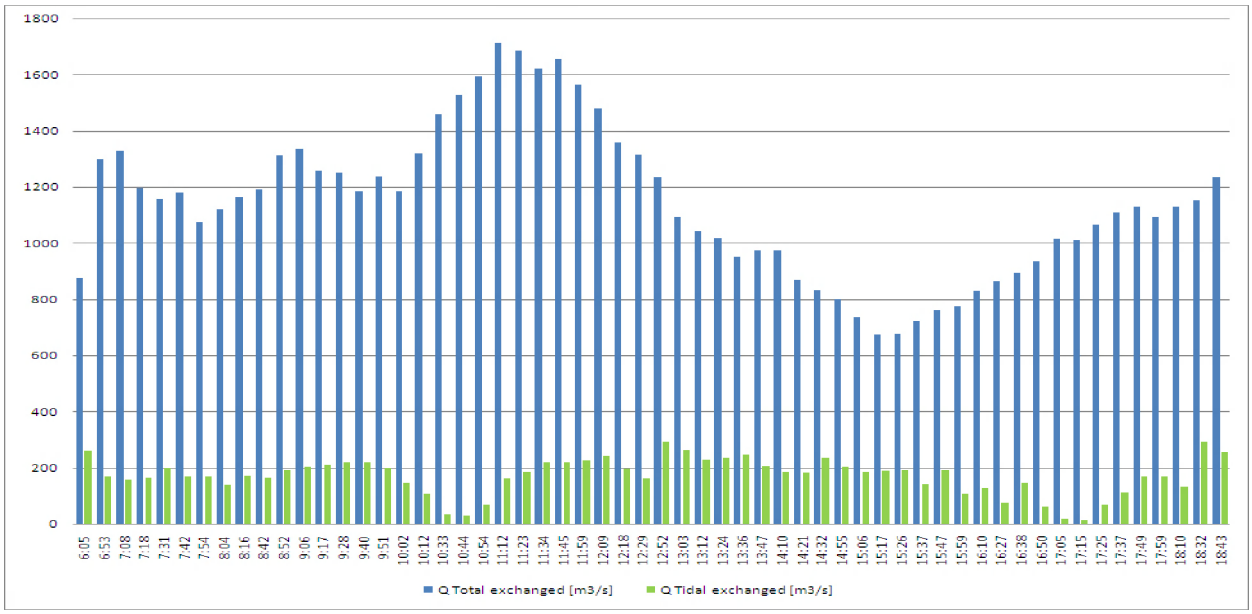


Figure 5-10 Total exchanged discharge versus exchanged discharge due to tidal filling at DGD on 24/09/2008

The measurements on the 24th of September show comparable results to the mathematical modelling results for Deurganckdok (IMDC, 1998). This 3-D model was used to analyse the different exchange mechanisms between the river and the dock. 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 :

- During a spring tide ebb or flood the water exchange due to tidal filling is $7x10^6$ m^3, due to eddy effects about 6-$12x10^6$ m^3 depending on the section and due to density effects about $29x10^6$ m^3. With density currents the total water exchange is thus about 42-$48x10^6$ m^3. Without density effects the exchange would reduce to about 13-$19x10^6$ m^3.
- Tidal filling and eddy effects are each responsible for ± 20% of the total water exchange.
- Density currents are responsible for ± 60-67% of the total water exchange.

Similar to the previous campaigns, the water balance doesn't match, as the measured emptying of the dock is 4.1 million m³ over a period where tidal emptying is just half a million m³ (see Table 5-4). The emptying of the dock is thus overestimated by the measurements with 3.6 million cubic metres.

In comparison to the 7.7 million m³ of water exchanged by tidal filling/emptying, this overestimation of 3.6 million m³ seem rather high (see Figure 5-11), but compared to the 52.1 million cubes, the overestimation error is only 7% of the total exchanged volume (see Figure 5-12).

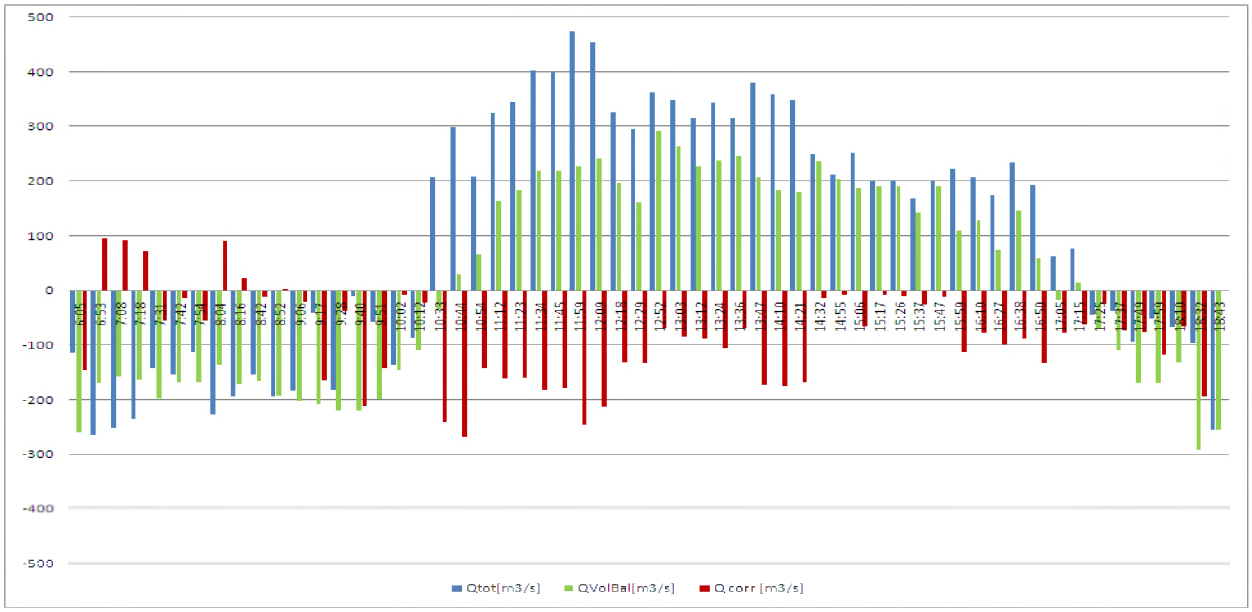


Figure 5-11 Measured residual discharge (Qtot) versus theoretical residual discharge (QVolBal) and correction offset (Qcorr) at DGD on 24/09/2008 (negative values represent incoming water)

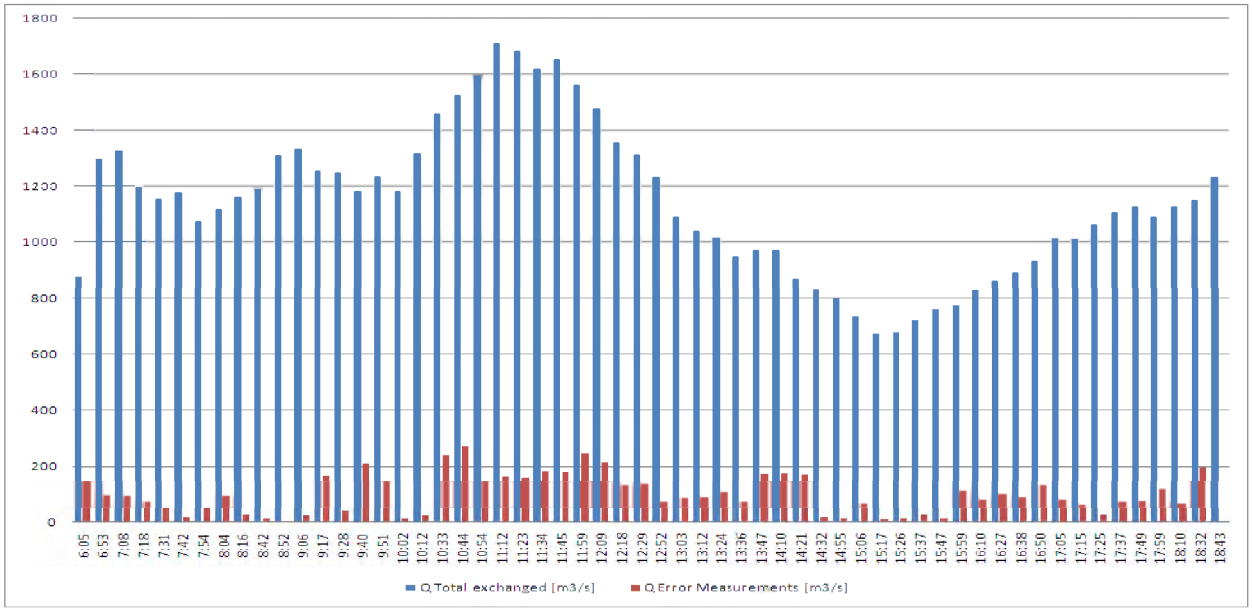


Figure 5-12 Absolute error in total water exchange versus total water exchange at DGD on 24/09/2008

Table 5-4 Total residual, incoming and outgoing water volumes in Deurganckdok during the measurement campaign of 24/9/08 compared to tidal filling/emptying volumes.

	Q Total Net [m^3]	***Q Total In [m^3]***	***Q Total Out [m^3]***
Measured Ebb	6 679 884	-9 556 269	16 236 153
Tidal Emptying	4 099 889	-	-
Measured Flood	-2 611 905	-14 615 500	12 003 595
Tidal Filling	3 620 075	-	-
Measured Net	4 067 979	-24 171 769	28 239 748
Tidal Emptying Net	479 814	-	-

One of the reasons of the overestimation can be found 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 can be minimised if a good vessel setup and appropriate ADCP and measurement protocol is chosen.

Compared to former campaigns, the effect of the top, bottom and edge estimates seems to be larger. This can be partly explained as a result of the boat setup and the used ADCP.

The uncertainty on the top estimated values has increased since the transducer depth of the ADCP was lowered from 1.4 meter (setup on the Parel II) to 1.8 meter (setup ADCP on the Scheldewacht II).

The uncertainty on the bottom estimated values for the measurements of 17/11/2005, 22/03/2006, 19/06/2008, 26/06/2008, 24/09/2008 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, 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 still doesn't fit well (see Figure 5-11). The main cause for this 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 five times bigger than the known resulting volume entering and leaving the dock, i.e. the tidal volume (see Figure 5-10).

In the future, it is important on one hand to minimize these estimates as much as possible by starting and ending the transects close to the quay walls, by minimising the transducer depth and by using an ADCP with a beam angle of 20° instead of 30°. On the second hand, it is important to maintain the high frequency of sailed transects.

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 5-14 it can be concluded that the residual sediment flux is less than a fifth of the total sediment exchange at the entrance of Deurganckdok and from Figure 5-13 it can be seen 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 overestimation of outgoing discharge will always lead to an underestimation of the incoming sediment mass.

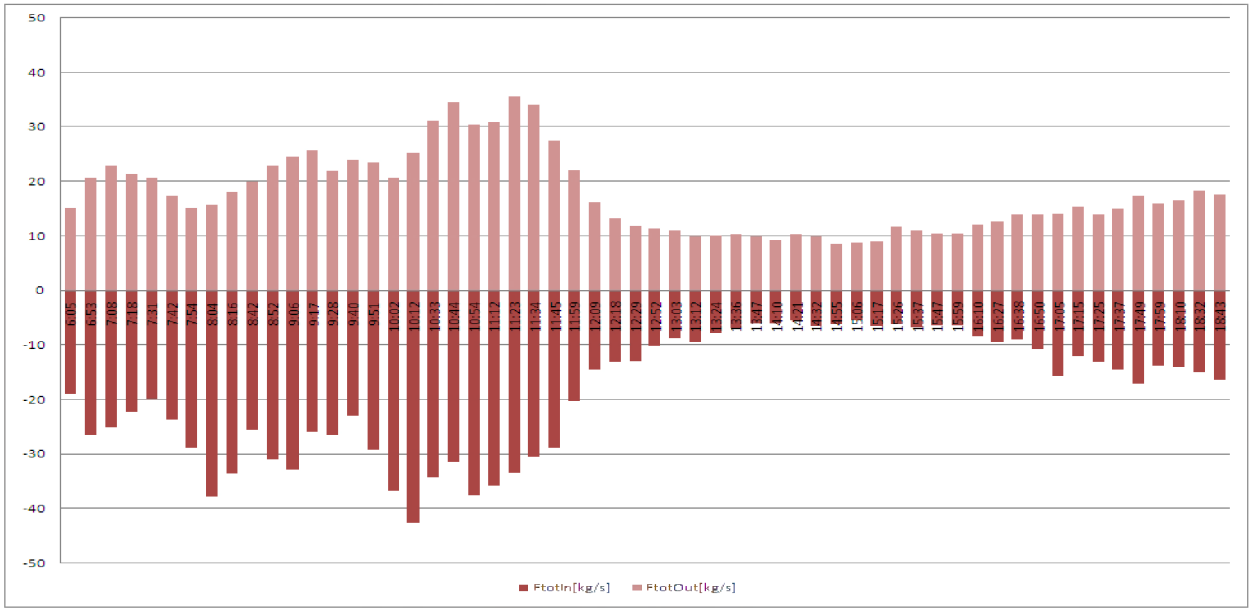


Figure 5-13 Total incoming and outgoing sediment flux at DGD on 24/09/2008 (negative values represent incoming sediment)

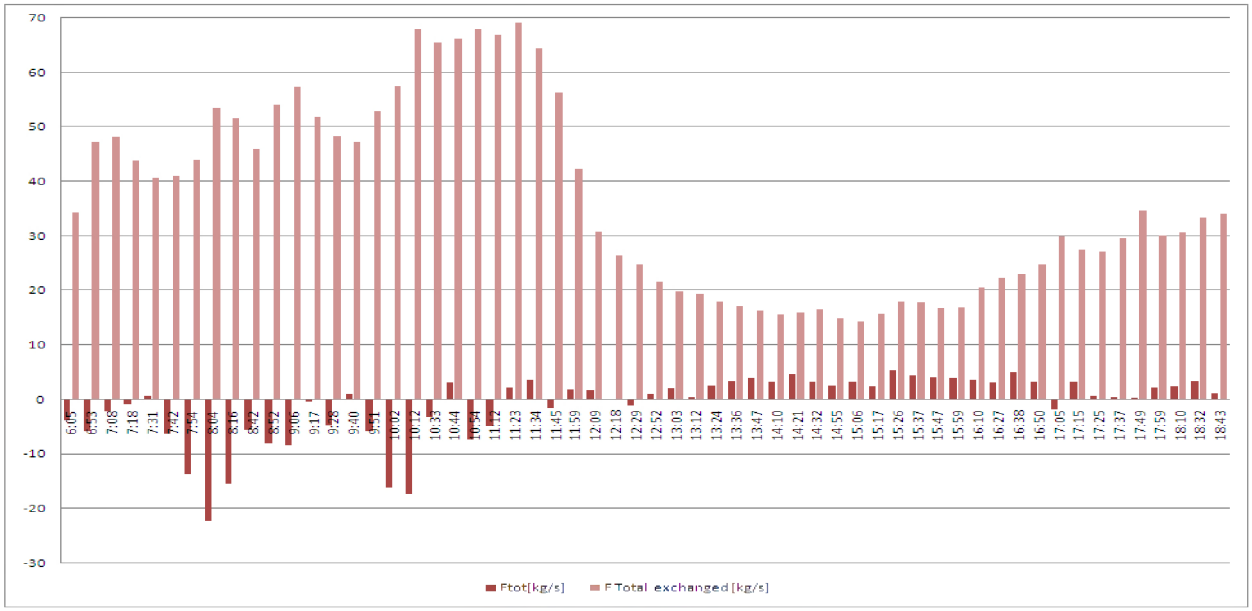


Figure 5-14 Total sediment flux versus total sediment exchange at DGD on 24/9/2008 (negative values represent incoming sediment)

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 case the total incoming measured discharge was retained and the total outgoing discharge was reduced with 3.3 million m^3, in the second case the total outgoing discharge was retained and the total incoming discharge was raised with 3.3 million m^3. In both cases the total settled sediment mass increased. The original deposited sediment mass was estimated at 68 tonnes, the sediment masses calculated with corrected discharges were estimated between 164 and 194 tonnes over the measurement cycle. During ebb approximately 700 tonnes of sediment passed the entrance of which 17 to 45 stayed into the dock; during flood approximately 1000 tonnes passed the entrance of which 147 to 149 stayed into the dock.

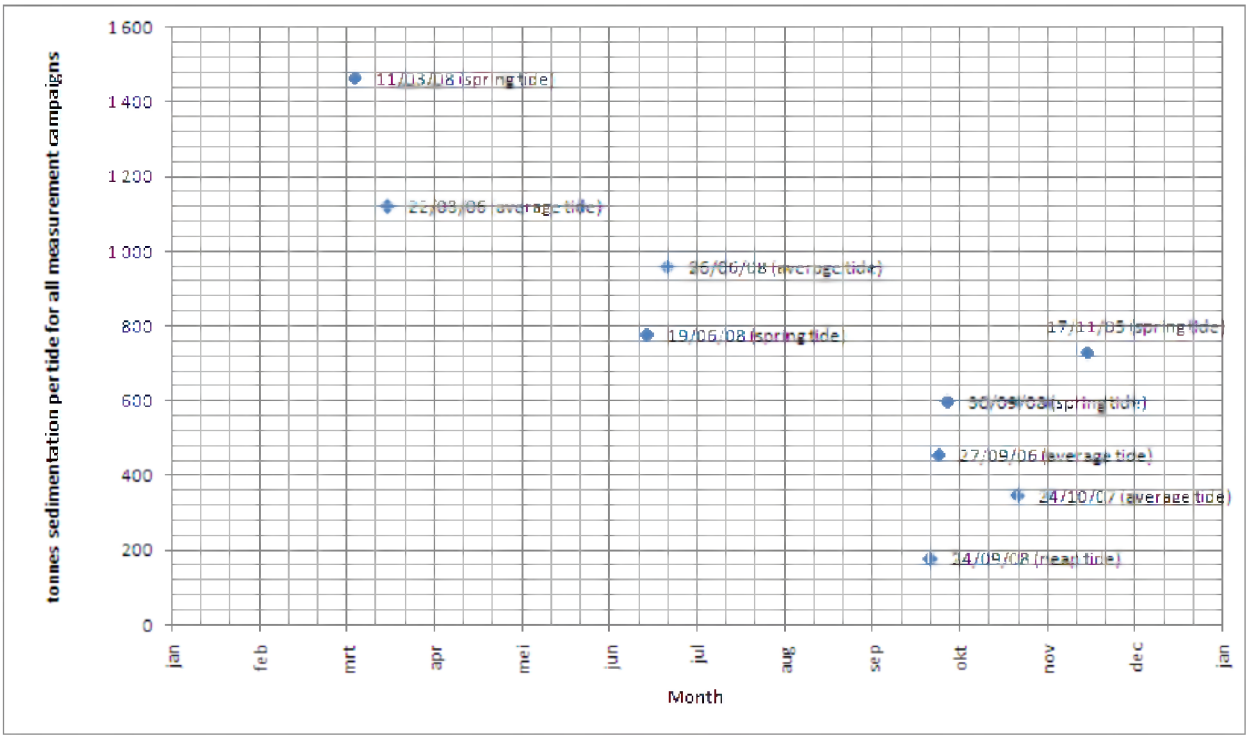


Figure 5-15 Overview of measured sediment deposition in Deurganckdock per tide by means of Sediview technique

In comparison to 3D simulations that were made to analyse the mud deposition in the dock (IMDC, 1998), model results from the empirical model described in report 4.10 (IMDC, 2008s) and former measurement campaigns at transect DGD, this resulting deposition during neap tide is rather low. The model results from the empirical model described in report 4.10 (IMDC, 2008s) show net siltation rates from 400 to 2000 tonnes per tide, with a yearly average of 1000 tonnes per tide. The model results of the 3D model (IMDC, 1998) simulated siltation rates of ±1200 tonnes during a neap tide and ±1700 tonnes during a spring tide.

Table 5-5: Water volumes during ebb, flood and measurement campaign on 17/11/2005 (Spring tide), 22/03/2006 (Average tide) and 27/09/2006 (Average tide) including theoretical expected volumes. The durations are based on ADCP measurement. Tidal data of gauge Liefkenshoek was used.

Measurement Day		***17/11/2005***	***22/03/2006***	***27/09/2006***
DGD surface area [10^3 m²]		750	750	750
Tidal coefficient		1.1	0.97	1.03
Duration of measurement [hh:mm]		10:57	12:52	12:42
Daily fresh water discharge at Schelle [m³/s]		91	94	33
Ebb	exchanged volume	34 136 616	33 830 522	33 338 727
	incoming volume	18 436 105	14 715 880	14 974 087
	outgoing volume	15 700 511	19 114 642	18 364 640
	residual outgoing volume	-2 735 594	4 398 762	3 390 553
	residual tidal emptying = theoretical residual outgoing volume	2 485 404	3 758 065	4 226 908
	overestimed outgoing volume	-5 220 998	640 696	-836 355
Flood	exchanged volume	24 304 195	28 058 426	24 938 855
	incoming volume	12 564 681	14 965 302	14 236 036
	outgoing volume	11 739 513	13 093 124	10 702 819
	residual incoming volume	825 168	1 872 179	3 533 217
	residual tidal filling = theoretical residual incoming volume	3 370 067	3 261 295	3 913 928
	underestimated incoming volume	2 544 898	1 389 116	380 711
Total	exchanged volume	58 440 811	61 888 948	58 277 582
	incoming volume	31 000 787	29 681 183	29 210 123
	outgoing volume	27 440 024	32 207 765	29 067 459
	residual outgoing volume	-3 560 763	2 526 583	-142 664
	residual tidal emptying = theoretical residual outgoing volume	-884 663	496 771	312 980
	overestimed outgoing volume	-2 676 100	2 029 812	-455 644

Table 5-6: Water volumes during ebb, flood and measurement campaign on 24/10/2007 (Average tide), 11/03/2008 (Spring tide), 19/06/2008 (Spring tide), 26/06/2008 Average tide, 24/09/2008 (neap tide) & 30/09/2008 (Spring tide), including theoretical expected volumes. The durations are based on ADCP measurement. Tidal data of gauge Liefkenshoek was used.

Measurement Day		***24/10/2007***	***11/03/2008***	***19/06/2008***	***26/06/2008***	***24/09/2008***	***29/09/2008***
DGD surface area [10^3 m^2]		1 019	1 019	1 019	1 019	1 019	1 019
Tidal coefficient		1.02	1.17	1.15	0.97	0.81	1.08
Duration of measurement [hh:mm]		12:24	12:23	12:32	12:20	12:38	12:49
Daily fresh water discharge at Schelle [m^3/s]		46	286	27	20	33	16
Ebb	exchanged volume	23 297 626	30 605 480	29 862 615	25 668 407	25 792 421	32 789 767
	incoming volume	8 579 394	10 263 013	10 501 491	8 246 217	9 556 269	10 949 298
	outgoing volume	14 718 232	20 342 466	19 361 124	17 422 189	16 236 153	21 840 470
	residual outgoing volume	6 138 838	10 061 934	8 859 633	9 175 972	6 679 884	10 891 172
	residual tidal emptying = theoretical residual outgoing volume	5 479 043	5 957 334	5 456 121	4 805 274	4 099 889	6 208 764
	overestimed outgoing volume	659 795	4 104 600	3 403 512	4 370 698	2 579 995	4 682 408
Flood	exchanged volume	19 611 830	22 983 058	26 368 812	24 109 880	26 619 095	25 215 597
	incoming volume	10 590 072	14 477 186	14 602 453	11 817 853	14 615 500	14 186 274
	outgoing volume	9 021 758	8 505 873	11 766 360	12 292 027	12 003 595	11 029 323
	residual incoming volume	1 568 313	5 965 867	2 836 093	474 174	2 611 905	3 156 951
	residual tidal filling = theoretical residual incoming volume	5 133 774	5 941 019	5 390 972	5 211 112	3 620 075	5 767 856
	underestimated incoming volume	3 565 461	-24 848	2 554 879	4 736 938	1 008 169	2 610 905
Total	exchanged volume	42 909 456	53 588 538	56 231 427	49 778 287	52 411 517	58 005 364
	incoming volume	19 169 465	24 740 199	25 103 943	20 064 071	24 171 769	25 135 572
	outgoing volume	23 739 990	28 848 339	31 127 483	29 714 217	28 239 748	32 869 792
	residual outgoing volume	4 570 525	4 096 067	6 023 540	9 650 146	4 067 979	7 734 220
	residual tidal emptying = theoretical residual outgoing volume	345 269	16 315	65 148	-405 838	479 814	440 908
	overestimed outgoing volume	4 225 255	4 079 752	5 958 392	10 055 984	3 588 164	7 293 313

Table 5-7 Range of sediment deposition during ebb, flood and measurement campaign on 17/11/2005 (Spring tide), 22/03/2006 (Average tide) and 27/09/2006 (Average tide), calculated with forced fitting water balances for those days. The duration is based on ADCP measurements.

Measurement Day		***17/11/2005***		***22/03/2006***		***27/09/2006***	
DGD surface area [10^3 m²]			750		750		750
Tidal coefficient			1.1		0.97		1.03
Duration of measurement [hh:mm]			10:57		12:52		12:42
Daily fresh water discharge at Schelle [m³/s]			91		94		33
Ebb	exchanged mass [kg]	1 703 926	2 367 275	1 780 460	1 867 483	1 056 448	1 090 019
	incoming mass [kg]	1 087 233	1 488 674	1 160 142	1 217 874	635 375	656 454
	outgoing mass [kg]	616 692	878 601	620 317	649 609	421 074	433 565
	residual incoming mass [kg]	470 541	610 073	539 825	568 265	214 301	222 890
Flood	exchanged mass [kg]	1 804 593	1 498 429	2 092 190	2 328 688	683 915	663 551
	incoming mass [kg]	999 502	841 383	1 319 543	1 459 070	462 843	448 383
	outgoing mass [kg]	805 091	657 046	772 648	869 618	221 073	215 168
	residual incoming mass [kg]	194 411	184 337	546 895	589 452	241 770	233 215
Total	exchanged mass [kg]	3 508 519	3 865 704	3 872 650	4 196 170	1 740 364	1 753 570
	incoming mass [kg]	2 086 735	2 330 057	2 479 685	2 676 943	1 098 217	1 104 837
	outgoing mass [kg]	1 421 783	1 535 647	1 392 965	1 519 227	642 146	648 733
	residual incoming mass [kg]	664 952	794 410	1 086 720	1 157 717	456 071	456 105

Table 5-8 Range of sediment deposition during ebb, flood and measurement campaign on 24/10/2007 (Average tide), 11/03/2008 (Spring tide), 19/06/2008 (Spring tide) and 26/06/2008 (Average tide), calculated with forced fitting water balances for those days. The duration is based on ADCP measurements.

Measurement Day		***24/10/2007***		***11/03/2008***		***19/06/2008***		***26/06/2008***	
DGD surface area [10^3 m^2]		1 019		1 019		1 019		1 019	
Tidal coefficient		1.02		1.17		1.15		0.97	
Duration of measurement [hh:mm]		12:24		12:23		12:32		12:20	
Daily fresh water discharge at Schelle [m^3/s]		46		286		27		20	
Ebb	exchanged mass [kg]	619 806	584 893	2 589 128	3 641 521	1 087 599	1 375 505	1 040 509	1 471 199
	incoming mass [kg]	335 783	316 828	1 387 950	1 989 942	668 861	865 152	694 822	1 008 047
	outgoing mass [kg]	284 023	268 065	1 201 178	1 651 579	418 737	510 353	345 687	463 151
	residual incoming mass [kg]	51 760	48 763	186 772	338 362	250 124	354 799	349 135	544 896
Flood	exchanged mass [kg]	1 015 320	714 273	2 928 327	2 956 105	1 710 175	2 039 419	1 173 483	1 884 440
	incoming mass [kg]	661 872	500 923	2 058 036	2 086 840	1 087 813	1 262 679	815 210	1 226 949
	outgoing mass [kg]	353 448	213 350	870 291	869 265	622 362	776 740	358 272	657 490
	residual incoming mass [kg]	308 424	287 573	1 187 745	1 217 575	465 450	485 939	456 938	569 459
Total	exchanged mass [kg]	1 635 126	1 299 166	5 517 455	6 597 625	2 797 774	3 414 924	2 213 992	3 355 639
	incoming mass [kg]	997 655	817 751	3 445 986	4 076 781	1 756 674	2 127 831	1 510 032	2 234 997
	outgoing mass [kg]	637 470	481 415	2 071 469	2 520 844	1 041 100	1 287 093	703 960	1 120 642
	residual incoming mass [kg]	360 185	336 337	1 374 517	1 555 937	715 574	840 738	806 073	1 114 355

Table 5-9 Range of sediment deposition during ebb, flood and measurement campaign on 24/09/2008 (neap tide) & 30/09/2008 (Spring tide), calculated with forced fitting water balances for those days. The duration is based on ADCP measurements.

Measurement Day		***24/09/2008***		***30/09/2008***	
DGD surface area [10^3 m^2]			1 019		1 019
Tidal coefficient			0.81		1.08
Duration of measurement [hh:mm]			12:38		12:49
Daily fresh water discharge at Schelle [m^3/s]			33		16
Ebb	exchanged mass [kg]	701 869	674 344	915 211	1 205 171
	incoming mass [kg]	402 477	316 469	558 775	768 792
	outgoing mass [kg]	299 392	357 875	356 437	436 379
	residual incoming mass [kg]	17 077	44 602	202 338	332 413
Flood	exchanged mass [kg]	993 459	991 306	1 135 260	1 341 907
	incoming mass [kg]	590 065	550 302	726 957	843 357
	outgoing mass [kg]	403 394	441 004	408 303	498 550
	residual incoming mass [kg]	146 908	149 061	318 655	344 807
Total	exchanged mass [kg]	1 695 328	1 665 650	2 050 471	2 547 078
	incoming mass [kg]	992 542	866 771	1 285 732	1 612 149
	outgoing mass [kg]	702 786	798 879	764 739	934 929
	residual incoming mass [kg]	163 986	193 663	520 993	677 220

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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.

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Van Maren DS (2006) 3D Mud transport model Zeeschelde, Scenario 4, Effect CDW on sedimentation Deurganckdok, WL Delft Hydraulics, Report Z3824, November 2006.

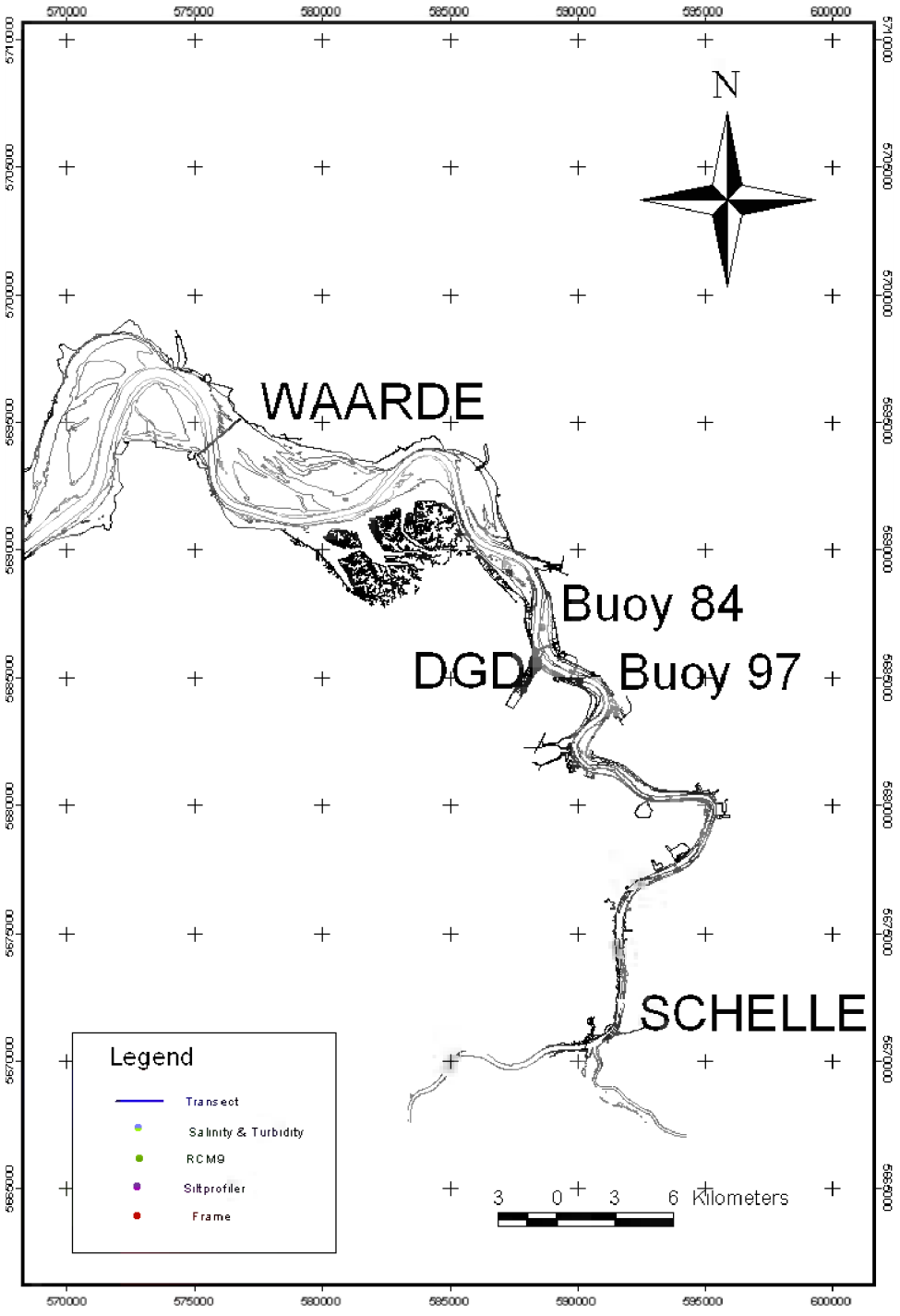
Wunderground (2008). Weather Underground: www.wunderground.com

KNMI (2009) Royal Dutch Meteorological Institute www.knmi.nl

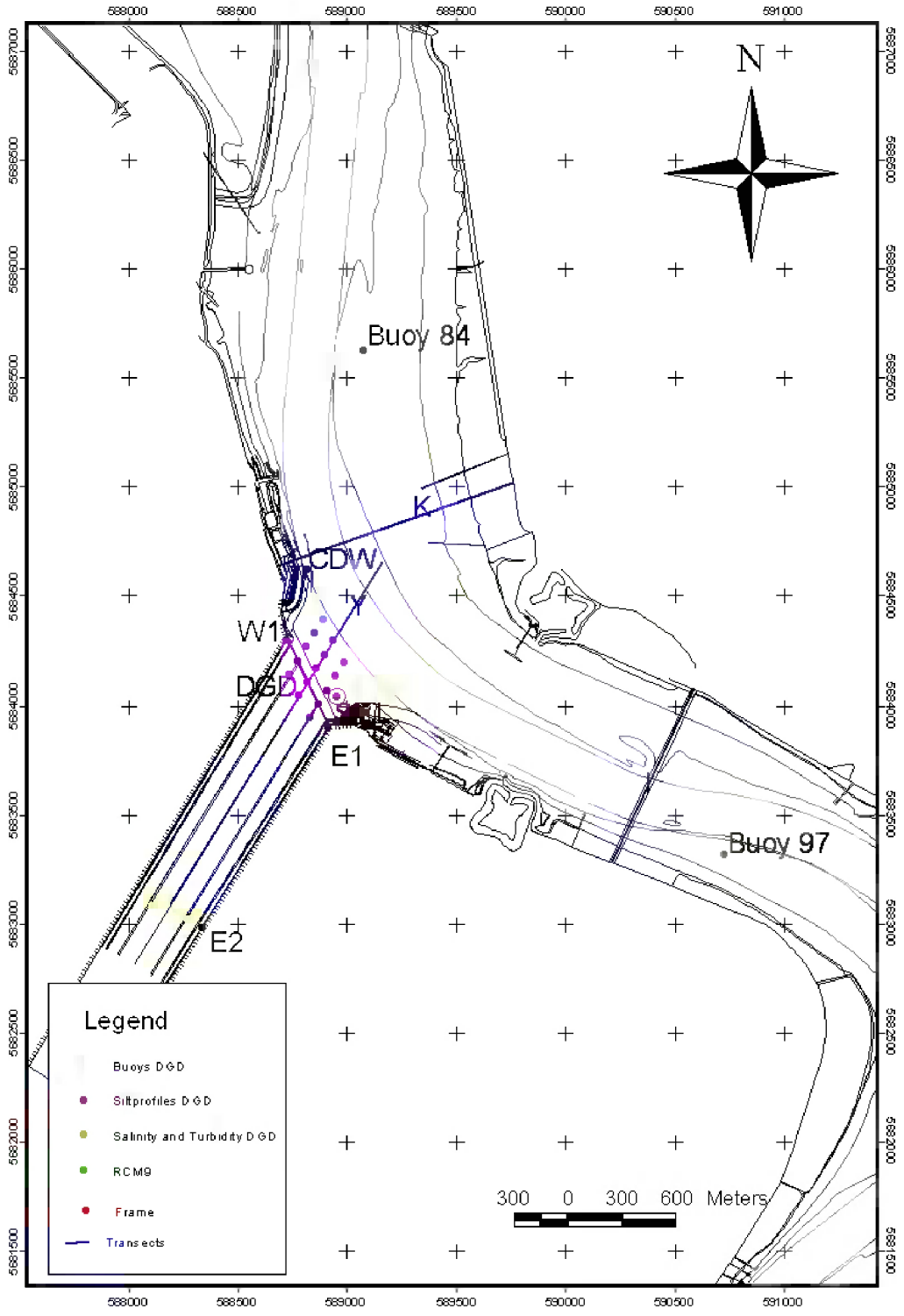
APPENDIX A.

OVERVIEW OF MEASUREMENT

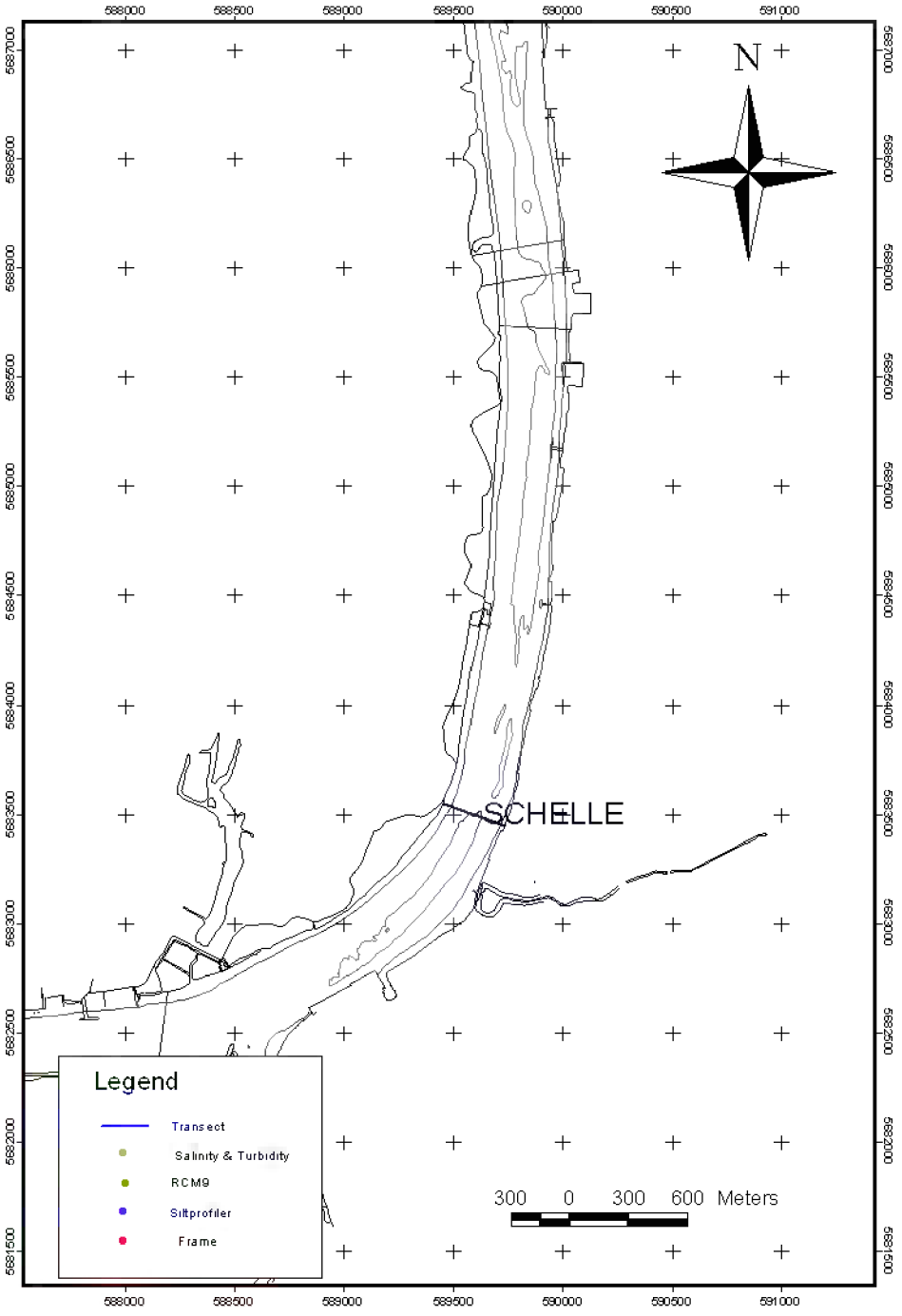
A.1 Overview of the measurement locations for the whole HCBS2 and Deurganckdok measurement campaigns



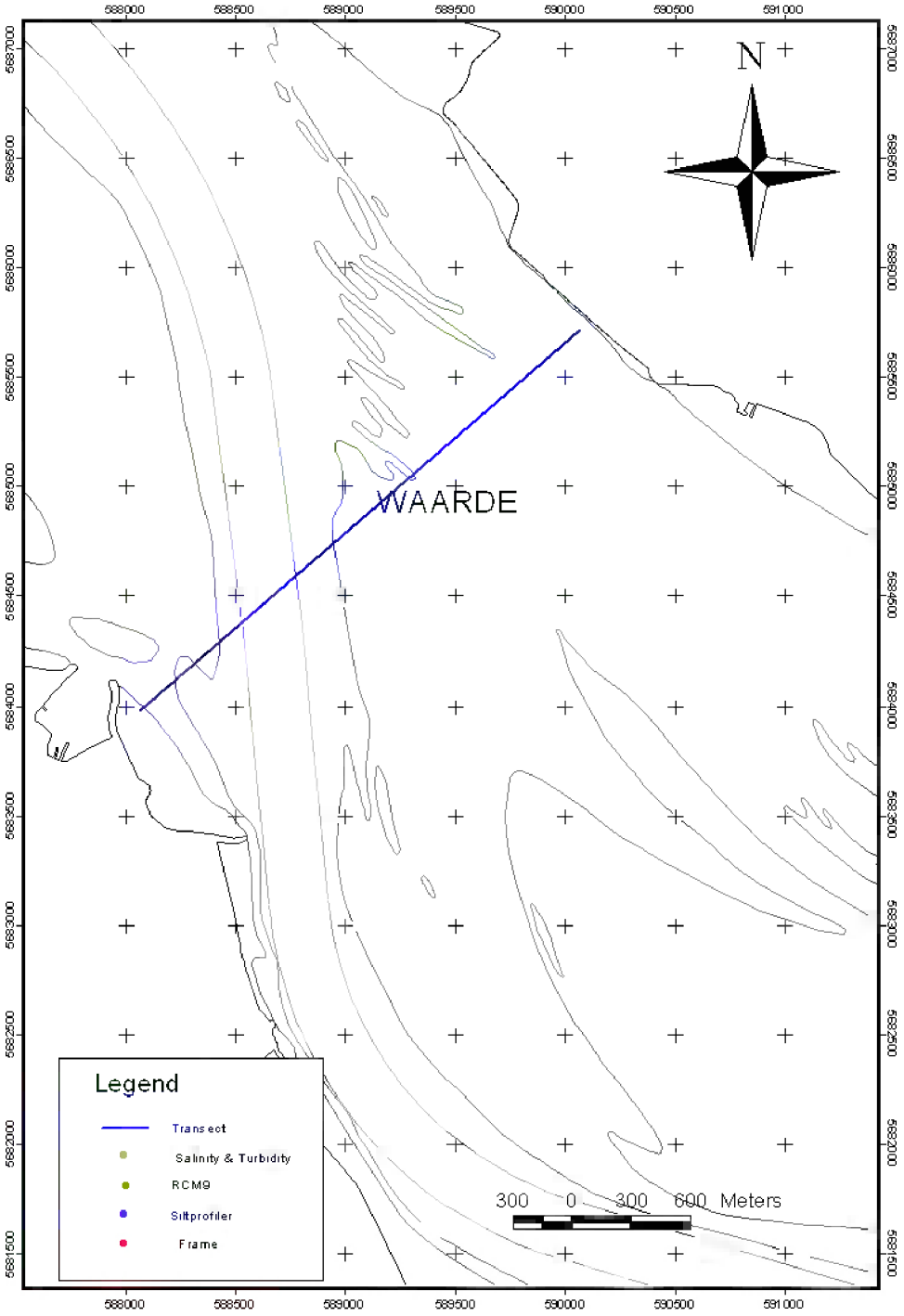
Annex Figure A-1: Overview of the measurement locations



Annex Figure A-2: Overview of the measurement locations at Deurganckdok



Annex Figure A-3: Transect S in Schelle



Annex Figure A-4: Transect W in Waarde

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

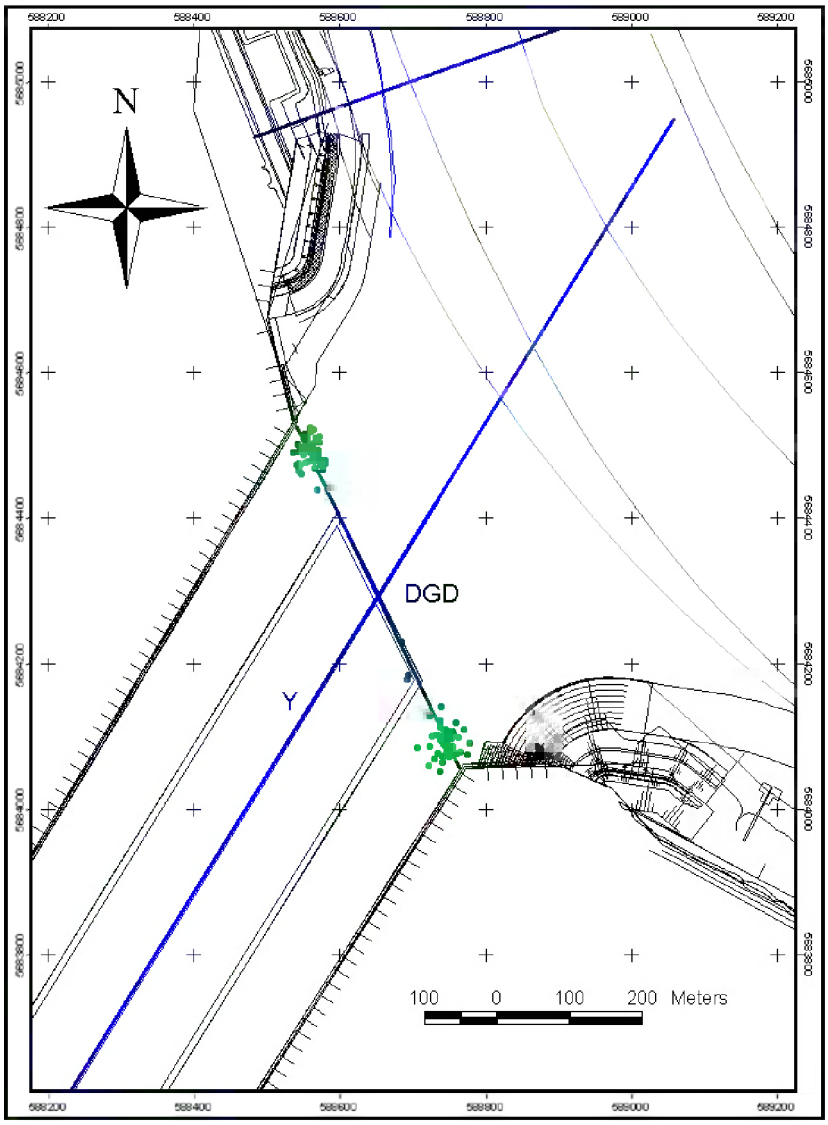
Annex Table A-1: coordinates of theoretical transects

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 Transect DGD on 24/09/2008



Annex Figure A-5: start and stop coordinates of the sailed sediview transects at DGD on 24/9/2008

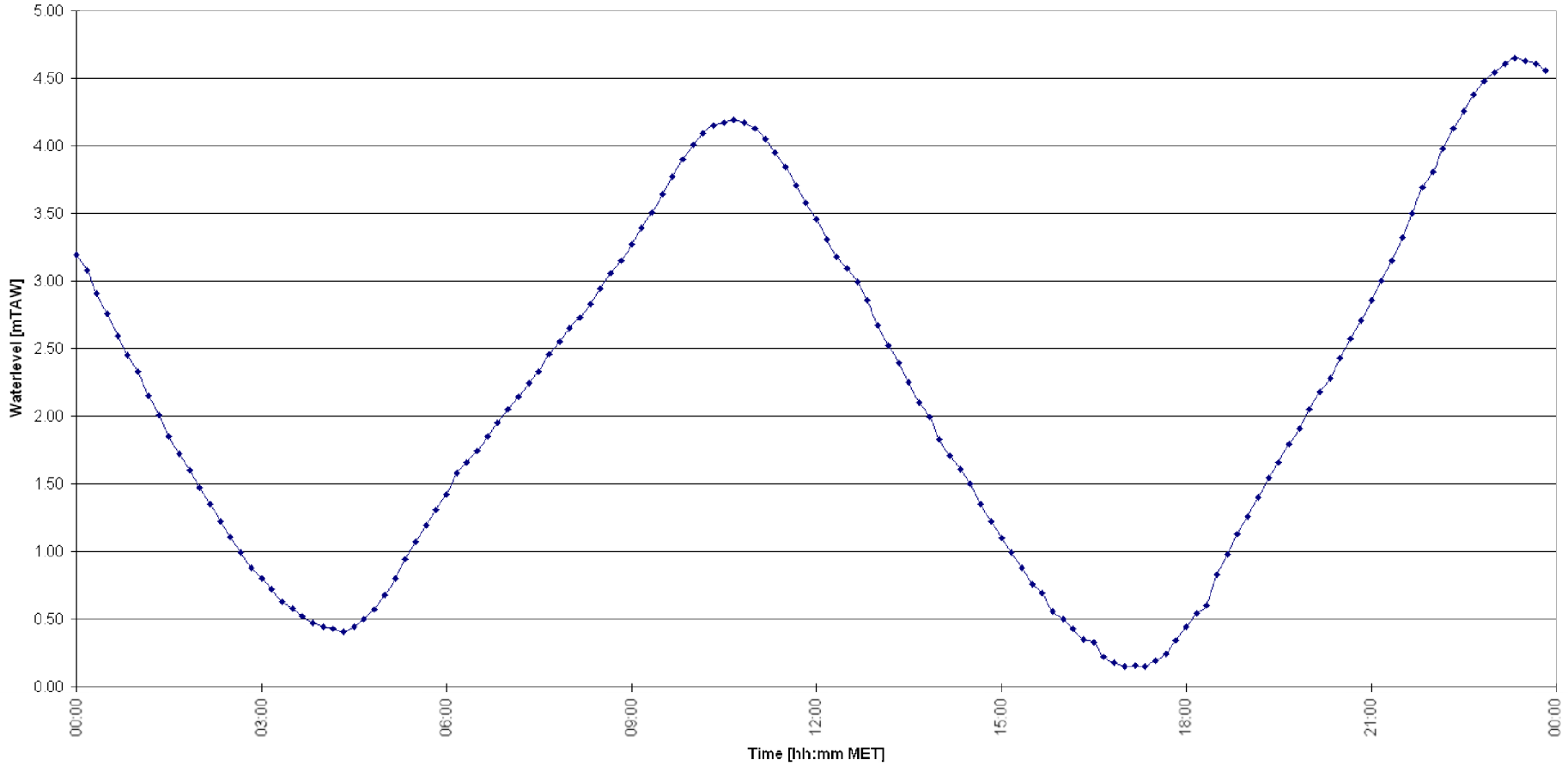
Annex Table A-3: coordinates of sailed transects

Transect name	Time after HW [hh:mm]	Time [hh:mm MET]	Easting Start (UTM31 ED50)	Northing Start (UTM31 ED50)	Easting Stop (UTM31 ED50)	Northing Stop (UTM31 ED50)	Transect length [m]
7002tdgdlr_sub.csv	-4:34	6:05	588588	5684439	588753	5684096	381
7004tdgdrl.csv	-3:46	6:53	588557	5684490	588723	5684058	462
7006tdgdlr_sub.csv	-3:31	7:08	588538	5684489	588743	5684088	450
7008tdgdrl_sub.csv	-3:21	7:18	588563	5684478	588725	5684128	385
7010tdgdlr_sub.csv	-3:08	7:31	588575	5684511	588738	5684095	447
7012tdgdrl_sub.csv	-2:57	7:42	588560	5684490	588744	5684074	455
7014tdgdlr_sub.csv	-2:45	7:54	588567	5684486	588747	5684088	437
7016tdgdrl_sub.csv	-2:35	8:04	588567	5684467	588735	5684076	425
7018tdgdlr_sub.csv	-2:23	8:16	588581	5684478	588748	5684086	426
7020tdgdrl_sub.csv	-1:57	8:42	588571	5684438	588692	5684178	287
7022tdgdlr_sub.csv	-1:47	8:52	588575	5684479	588762	5684077	443
7024tdgdrl_sub.csv	-1:33	9:06	588569	5684478	588706	5684084	417
7026dgdtlr_sub.csv	-1:22	9:17	588556	5684490	588724	5684129	398
7028dgdtrl_sub.csv	-1:11	9:28	588564	5684481	588724	5684086	426
7030dgdtlr_sub.csv	-1:00	9:40	588556	5684492	588748	5684096	440
7032dgdtrl_sub.csv	-0:48	9:51	588565	5684489	588728	5684100	422
7034dgdtlr_sub.csv	-0:37	10:02	588572	5684486	588734	5684101	418
7036dgdtrl_sub.csv	-0:27	10:12	588568	5684488	588740	5684093	430
7038dgdtlr_sub.csv	-0:06	10:33	588557	5684504	588738	5684121	423
7040dgdtrl_sub.csv	0:04	10:44	588578	5684465	588764	5684098	412
7042dgdtlr_sub.csv	0:14	10:54	588581	5684474	588754	5684096	415
7044dgdtrl_sub.csv	0:32	11:12	588564	5684495	588744	5684096	438
7046dgdtlr_sub.csv	0:43	11:23	588555	5684494	588755	5684105	437
7048dgdtrl_sub.csv	0:54	11:34	588565	5684487	588744	5684089	437
7050dgdtlr_sub.csv	1:05	11:45	588561	5684518	588751	5684086	472
7052dgdtrl_sub.csv	1:19	11:59	588572	5684492	588745	5684103	426
7054dgdtlr_sub.csv	1:29	12:09	588554	5684514	588738	5684118	436
7056dgdtrl_sub.csv	1:38	12:18	588562	5684522	588744	5684101	459
7058dgdtlr_sub.csv	1:49	12:29	588553	5684485	588760	5684119	421
7062dgdtlr_sub.csv	2:12	12:52	588542	5684472	588747	5684110	416
7064dgdtrl_sub.csv	2:23	13:03	588555	5684490	588732	5684101	427
7066dgdtlr_sub.csv	2:32	13:12	588568	5684502	588749	5684095	446
7068dgdtrl_sub.csv	2:44	13:24	588556	5684509	588755	5684085	468
7070dgdtlr_sub.csv	2:56	13:36	588549	5684460	588757	5684103	413
7072dgdtr_subl.csv	3:07	13:47	588557	5684511	588763	5684098	462
7076dgdtrl_sub.csv	3:30	14:10	588564	5684498	588730	5684069	461
7078dgdtlr_sub.csv	3:41	14:21	588546	5684464	588740	5684140	377
7080dgdtrl_sub.csv	3:52	14:32	588557	5684509	588778	5684090	474
7084dgdtrl_sub.csv	4:15	14:55	588554	5684492	588684	5684230	292
7086dgdtlr_sub.csv	4:26	15:06	588574	5684504	588748	5684108	432
7088dgdtrl_sub.csv	4:37	15:17	588576	5684471	588771	5684109	411
7090dgdtlr_sub.csv	4:46	15:26	588554	5684491	588775	5684075	472
7092dgdtrl_sub.csv	4:57	15:37	588550	5684497	588752	5684083	461

Transect name	*Time after HW [hh:mm]*	*Time [hh:mm MET]*	*Easting Start (UTM31 ED50)*	*Northing Start (UTM31 ED50)*	*Easting Stop (UTM31 ED50)*	*Northing Stop (UTM31 ED50)*	*Transect length [m]*
7094dgdtlr_sub.csv	5:07	15:47	588562	5684495	588766	5684077	465
7096dgdtrl_sub.csv	5:19	15:59	588546	5684473	588748	5684081	441
7098dgdtlr_sub.csv	5:30	16:10	588569	5684509	588756	5684080	467
7100dgdtrl_sub.csv	5:47	16:27	588548	5684471	588694	5684184	322
7102dgdtlr_sub.csv	5:58	16:38	588565	5684520	588743	5684100	456
7104dgdtrl_sub.csv	6:10	16:50	588555	5684475	588743	5684072	445
7106dgdtlr_sub.csv	6:25	17:05	588558	5684501	588745	5684088	454
7108dgdtrl_sub.csv	-6:14	17:15	588558	5684477	588750	5684071	449
7110dgdtlr_sub.csv	-6:04	17:25	588557	5684490	588755	5684085	451
7112dgdtrl_sub.csv	-5:52	17:37	588552	5684488	588742	5684064	465
7114dgdtlr_sub.csv	-5:40	17:49	588552	5684497	588748	5684093	449
7116dgdtrl_sub.csv	-5:30	17:59	588546	5684491	588741	5684071	463
7118dgdtlr_sub.csv	-5:19	18:10	588557	5684493	588753	5684099	440
7120dgdtrl_sub.csv	-4:57	18:32	588545	5684500	588738	5684051	489
7122dgdtlr_sub.csv	-4:46	18:43	588551	5684495	588738	5684113	426

APPENDIX B. TIDAL DATA

11283 – Autumn 2008 SURVEY



Measured tide on 24/09/2008 at Liefkenshoek

Location:	Date:
River Scheldt	24/09/2008

Data processed by: IMDC International Marine & Dredging Consultants

In association with: WL | delft hydraulics

I/RA/11283/08.083/MSA

APPENDIX C.

NAVIGATION INFORMATION AS RECORDED ON SITE

Ship: Scheldewacht II			***Date: 24/9/2008***
Location: Deurganckdok (transect DGD)			
Nr.	***Time (MET)***	***Type ship***	***Direction (Inbound/Outbound)***
1	8:20	Deseo kustvaarder	Outbound
2	9:30	Cosco Asia zeeschip	Inbound
3	9:17	DN 31 bagger	Crossing
4	10:10	DN 31 bagger	Crossing
5	10:18	Union Kodak sleepboot	Outbound
6	10:20	Duwbak	Inbound
7	10:23	Schelde 10 sleepboot	Outbound
8	10:33	Independent koppel 2 duwer	Inbound
9	10:46	So Long T3306	Inbound
10	10:56	Manou T1558	Inbound
11	11:00	Orida duwbak koppel	Outbound
12	11:25	China Shipping line zeeschip	Inbound
13	11:32	Rhine container	Outbound
14	11:37	Varik Tankschip T2206	Inbound
15	11:45	DN 31 bagger	Crossing
16	11:47	DN 31 bagger	Crossing
17	11:52	DN 31 bagger	Crossing
18	11:58	Union 11 sleepboot	Outbound
19	12:03	Union Emerald sleepboot	Outbound
20	12:11	Devotion T5134	Inbound
21	12:48	DN 31 bagger	Crossing
22	12:51	St. Antonius II koppel duw Rijn	Inbound
23	12:55	Dibo duwvaart	Inbound
24	13:19	Hen T1200 binnenschip	Inbound
25	13:32	Dubbel duwbak	Outbound
26	13:50	Binnenschip	Inbound
27	14:10	4 Politieboten	Outbound
28	14:17	Hen T1200 binnenschip	Outbound
29	14:30	Binnenschip T2000	Inbound
30	14:35	Binnenschip T2000	Outbound
31	14:58	Aloedo T2000	Outbound
32	14:58	Nirvana T2000	Outbound

Ship: Scheldewacht II			***Date: 24/9/2008***
Location: Deurganckdok (transect DGD)			
Nr.	***Time (MET)***	***Type ship***	***Direction (Inbound/Outbound)***
33	15:14	Binnenschip T2000	Inbound
34	15:15	Politie Zodiac	Inbound
35	15:16	Binnenschip T1500	Outbound
36	15:28	Pretoria T2560	Inbound
37	15:29	Varik Tanker T2206	Outbound
38	15:36	3 Politieboten	Inbound
39	15:37	1 Politieboot	Inbound
40	15:45	El-Blaja T1381	Inbound
41	15:46	Marinus 1500T	Outbound
42	16:00	4 Politieboten	Outbound
43	16:22	Marinus 1500T	Inbound
44	17:08	Macoma T3099	Outbound
45	17:20	Garialis duw T2900	Inbound
46	17:20	Dibo duw	Inbound
47	17:20	Mons duw 1500	Inbound
48	17:22	Independent duw convooi 3	Outbound
49	17:53	St. Antonius duw convooi 3	Outbound
50	17:58	DN 31 bagger	Crossing
51	18:50	idem	Inbound
52	19:15	idem bagger	Outbound
53	19:23	zeecontainer + loods	Inbound
54	19:25	Atlantis III T2455 duw	Inbound
55	19:27	DN 31 bagger	Inbound
56	19:34	Cygnus duwbak 2	Inbound
57	19:47	Union 7 sleepboot	Outbound

APPENDIX D.

UNESCO PSS-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.

APPENDIX E. OVERVIEW OF SEDIVIEW SETTINGS

Ship:		***Scheldewacht II***	
Location:		***Deurganckdok (transect DGD)***	
Date:		***24/09/2008***	
Parameters	***Value***	***Parameters***	***Value***
Inst. Depth (m)	1.8	*Compass offset (°)*	2
Force depth (m)	0	*Beam 3 misalignment (°)*	45
Velocity reference	BT	*Effective particle size (µm)*	20
Speed of sound algorithm	Urick	*Beam1 scale factor*	0.42
Error velocity	YES	*Beam2 scale factor*	0.41
External heading	NO	*Beam3 scale factor*	0.445
External Depth	NO	*Beam4 scale factor*	0.445
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)***
7002Tdgdlr	47	23.50
7004Tdgdrl	47	23.75
7006Tdgdlr	47	24.00
7008Tdgdrl	47	23.25
7010Tdgdlr	47	23.25
7012Tdgdrl	47	23.75
7014Tdgdlr	47	24.25
7016Tdgdrl	47	23.75
7018Tdgdlr	47	23.50
7020Tdgdrl	47	24.00
7022Tdgdlr	47	24.00
7024Tdgdrl	47	24.50
7026Tdgdlr	47	24.25
7028Tdgdrl	47	23.50
7030Tdgdlr	47	23.75
7032Tdgdrl	47	23.25
7034Tdgdlr	47	23.50
7036Tdgdrl	47	24.00
7038Tdgdlr	47	24.00
7040Tdgdrl	47	23.75
7042Tdgdlr	47	23.50
7044Tdgdrl	47	24.00
7046Tdgdlr	47	23.50
7048Tdgdrl	47	23.25
7050Tdgdlr	47	23.25
7052Tdgdrl	47	23.50

Filename	*Calibration const (Ks)*	*Backscatter coefficient (S)*
7054Tdgdlr	47	24.50
7056Tdgdrl	47	24.00
7058Tdgdlr	47	23.00
7060Tdgdrl	47	23.75
7062Tdgdlr	47	24.00
7064Tdgdrl	47	23.75
7066Tdgdlr	47	23.50
7068Tdgdrl	47	23.50
7070Tdgdlr	47	23.75
7072Tdgdrl	47	24.00
7074Tdgdlr	47	24.75
7076Tdgdrl	47	25.00
7078Tdgdlr	47	24.25
7080Tdgdrl	47	24.25
7082Tdgdlr	47	24.75
7084Tdgdrl	47	24.75
7086Tdgdlr	47	24.50
7088Tdgdrl	47	23.25
7090Tdgdlr	47	23.00
7092Tdgdrl	47	23.50
7094Tdgdlr	47	24.00
7096Tdgdrl	47	24.50
7098Tdgdlr	47	23.75
7100Tdgdrl	47	24.00
7102Tdgdlr	47	24.25
7104Tdgdrl	47	24.00
7106Tdgdlr	47	24.25
7108Tdgdrl	47	23.75
7110Tdgdlr	47	24.00
7112Tdgdrl	47	23.75
7114Tdgdlr	47	24.00
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7118Tdgdlr	47	24.00
7120Tdgdrl	47	24.00
7122Tdgdlr	47	24.00

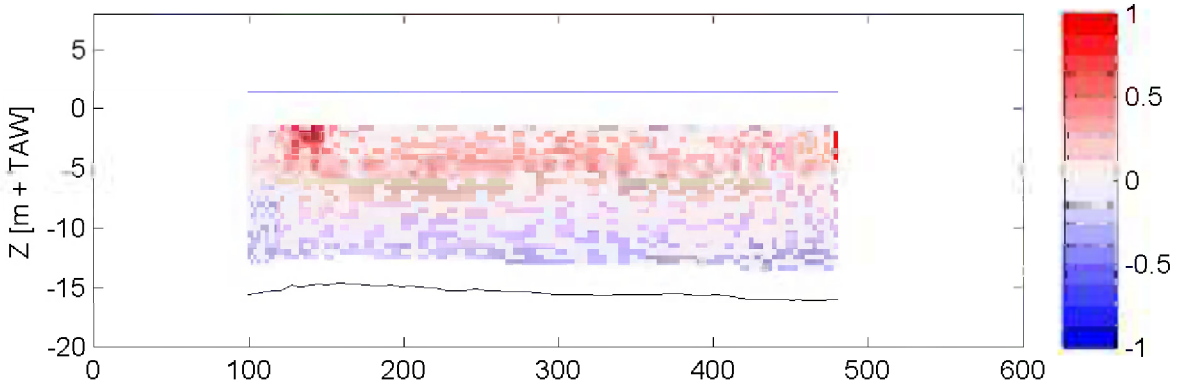
APPENDIX F.CONTOURPLOTS OF FLOW VELOCITIES, SEDIMENT CONCENTRATION AND SEDIMENT FLUX PER SAILED TRANSECT

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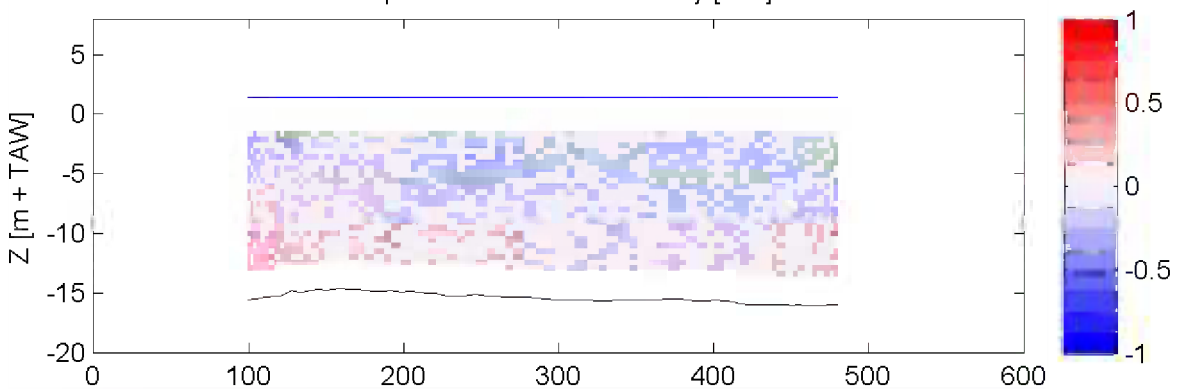
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7002tdgdlr_sub.csv	Location: Deurganckdok

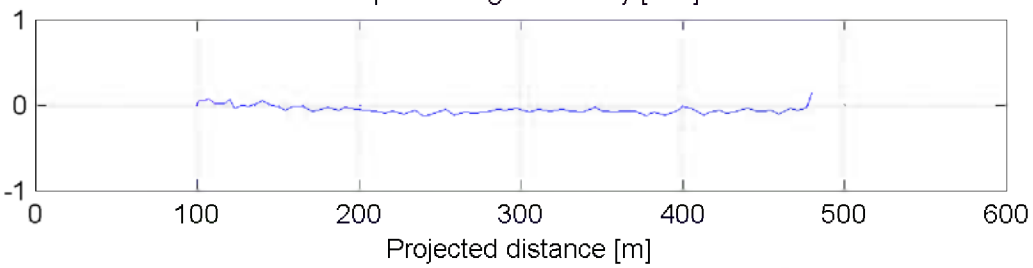
Parallel Current Velocity [m/s]



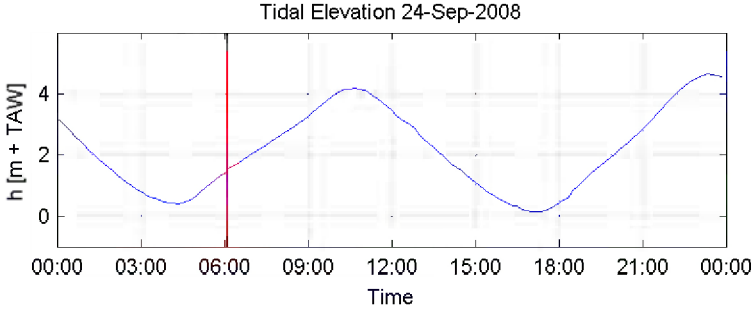
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

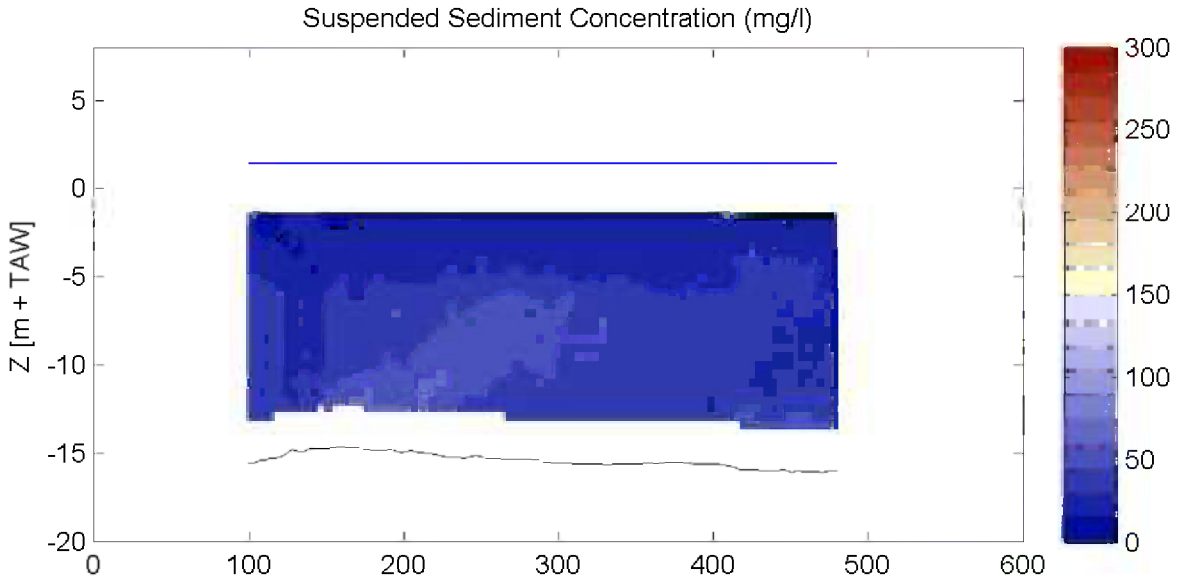
Date / Time [MET] :
24-Sep-2008
06:04 - 06:07

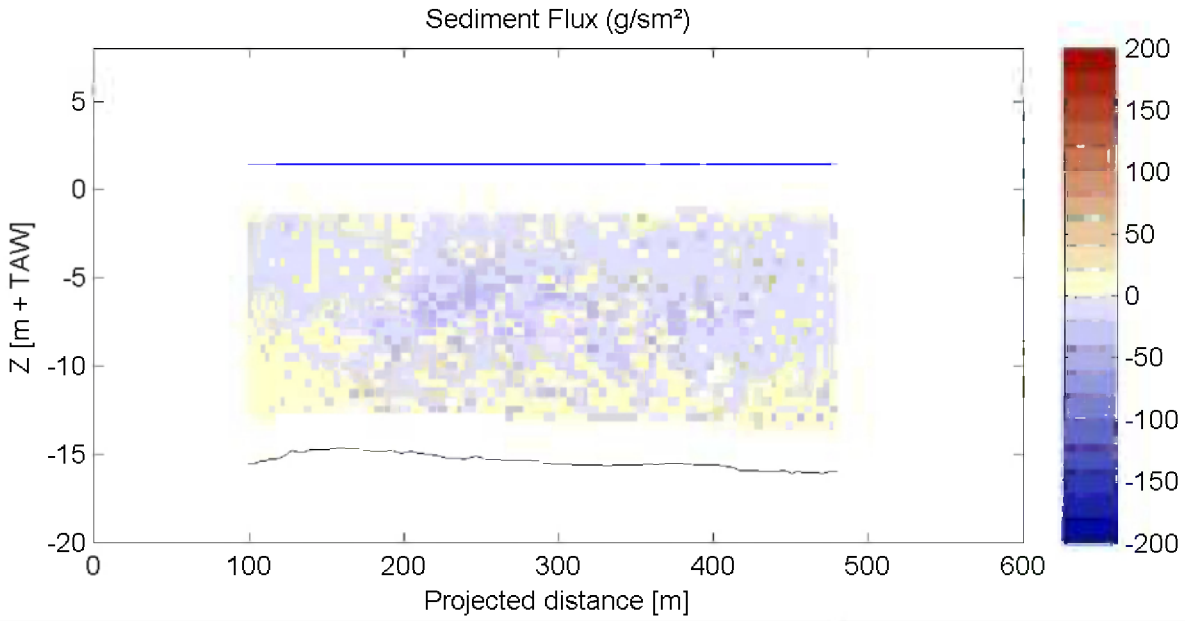
Time after HW [HH:MM]
-4:34

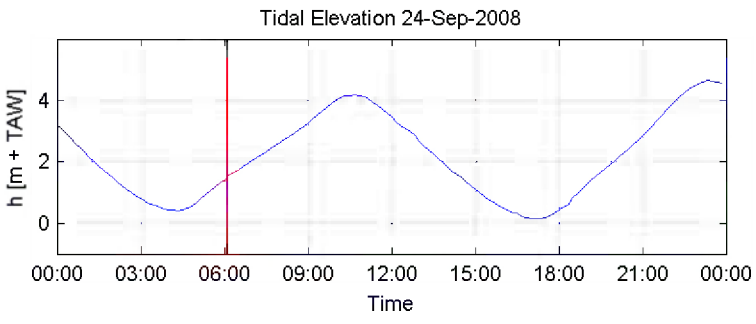
Data Processed by:
In association with :
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7002tdgdlr_sub.csv	Location: Deurganckdok







HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

06:04 - 06:07

Time after HW [HH:MM]

-4:34

Data Processed by:

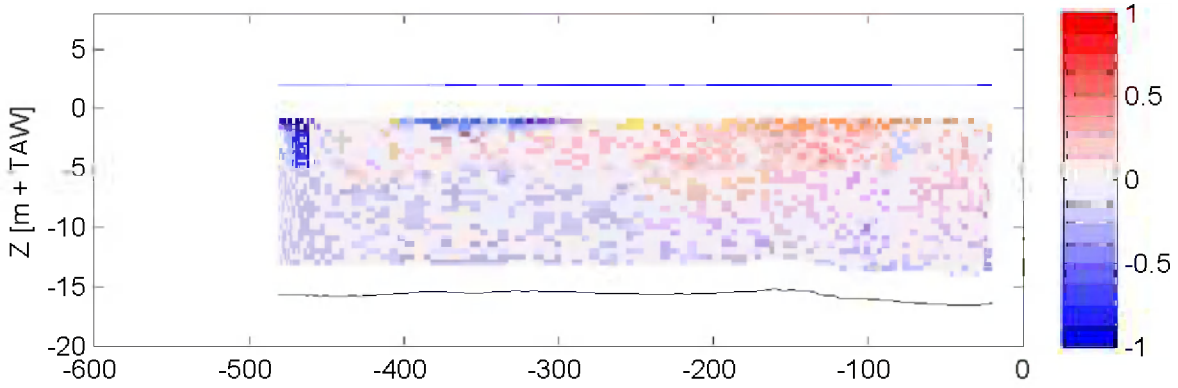
In association with :

I/RA/11283/08.083/MSA

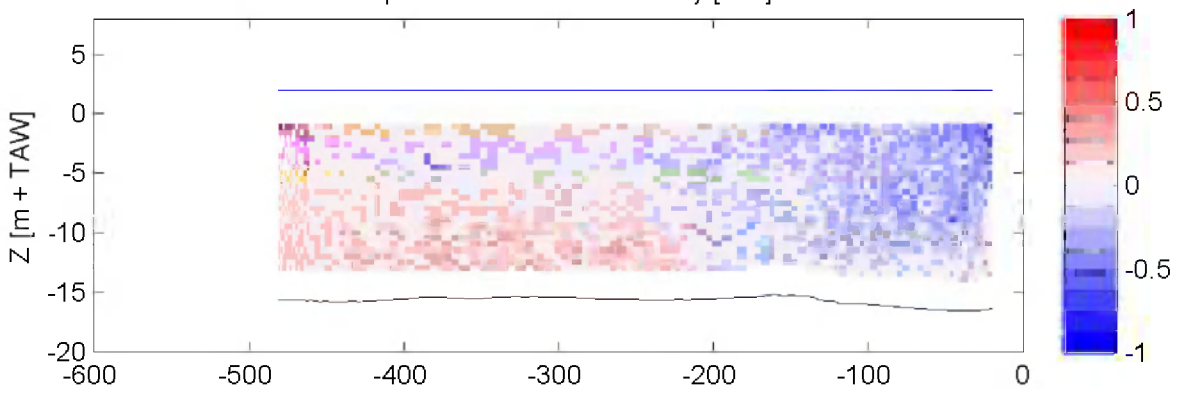
Opvolging aanslibbing DGD

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Sourcefile: 7004tdgdrl.csv	Location: Deurganckdok

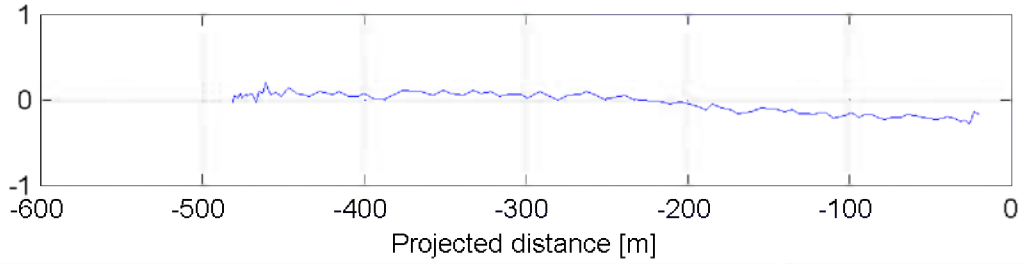
Parallel Current Velocity [m/s]



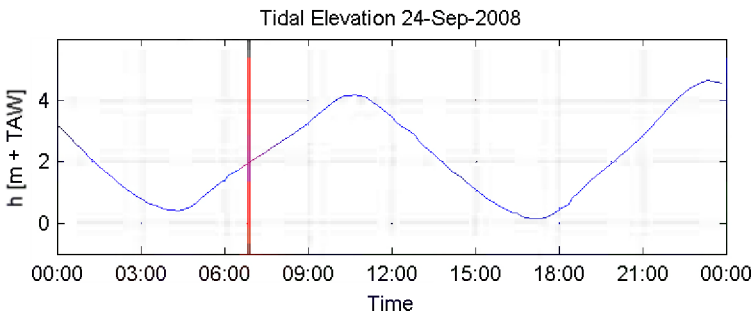
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :
24-Sep-2008
06:50 - 06:55

Time after HW [HH:MM]
-3:46

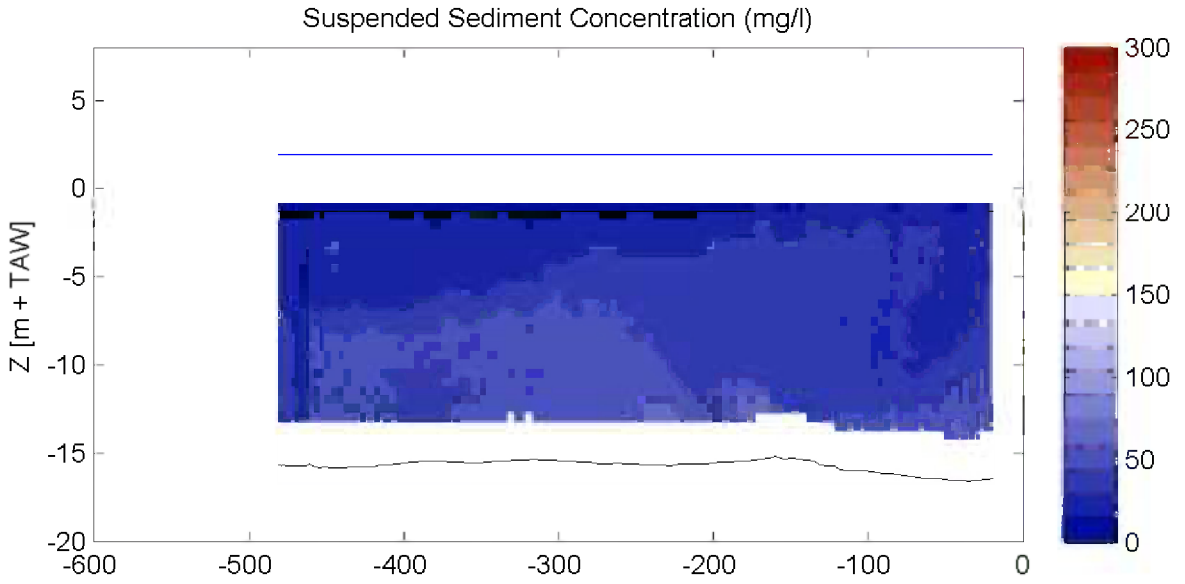
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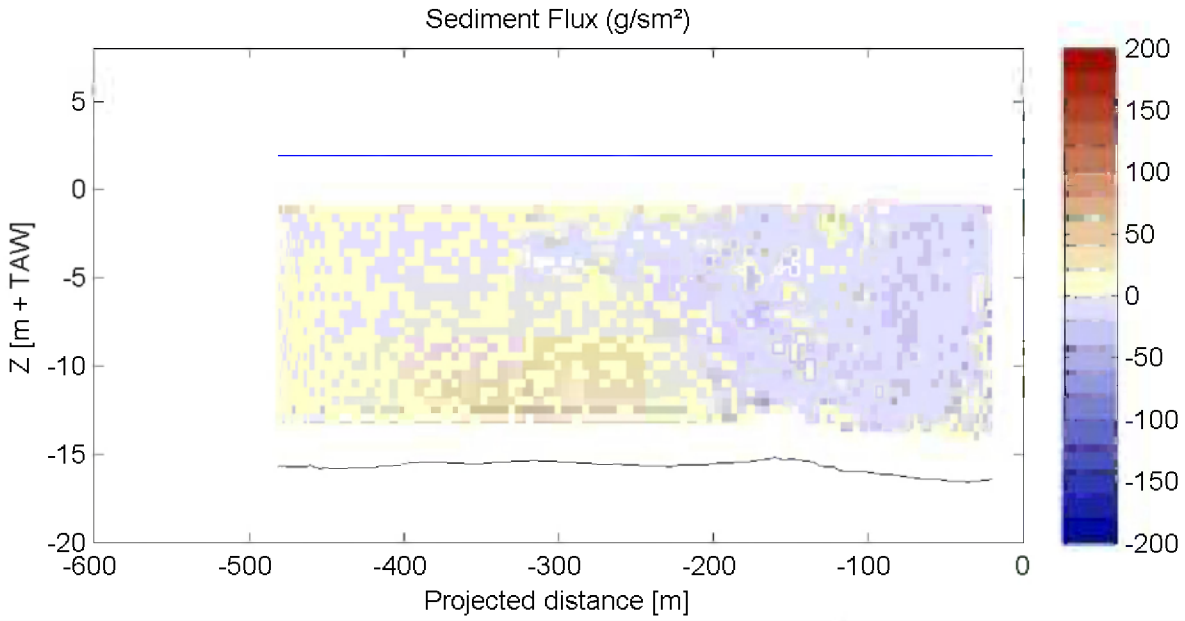
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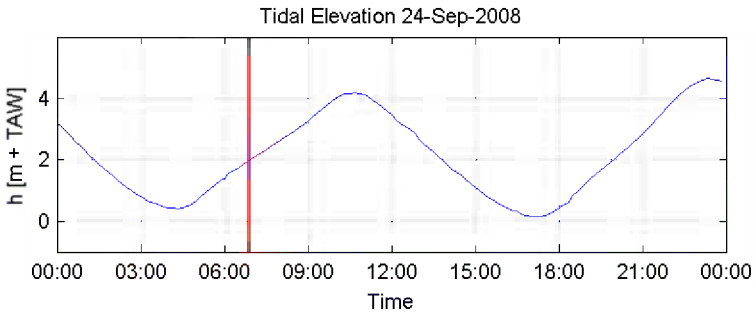
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7004tdgdrl.csv	Location: Deurganckdok







HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

06:50 - 06:55

Time after HW [HH:MM]

-3:46

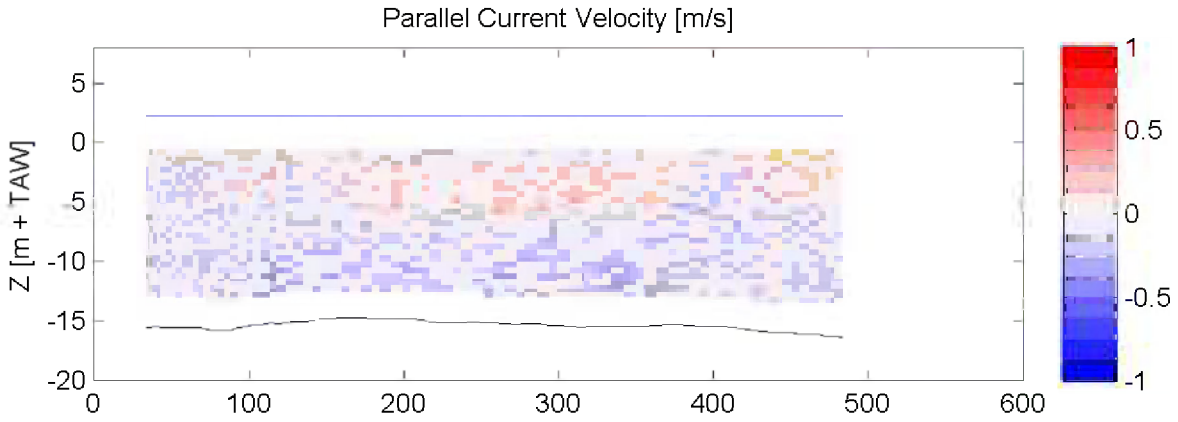
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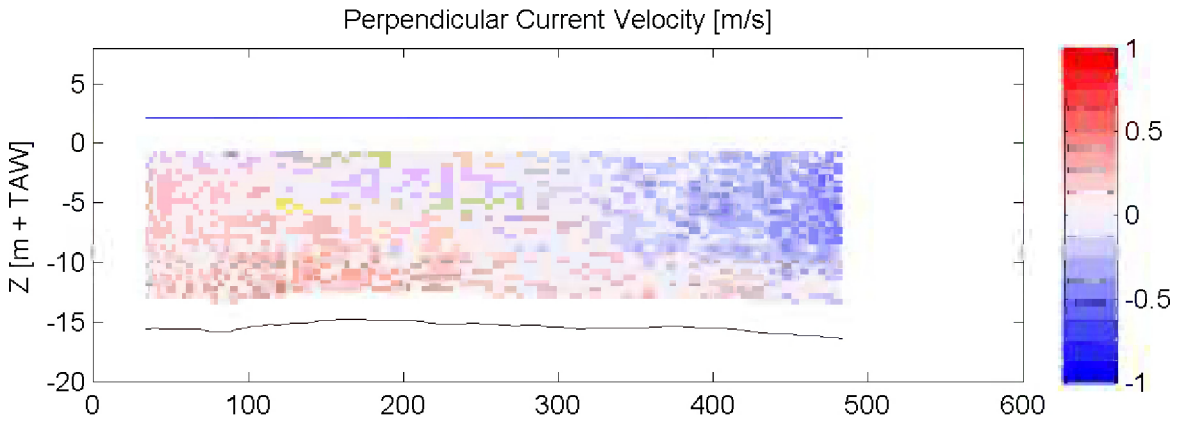
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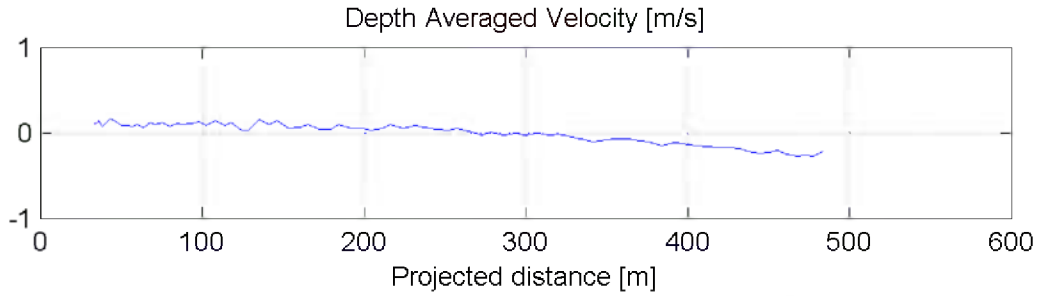
I/RA/11283/08.083/MSA

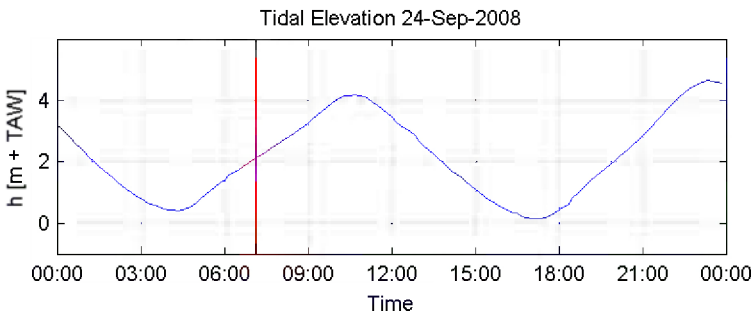
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7006tdgdlr_sub.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

07:06 - 07:10

Time after HW [HH:MM]

-3:31

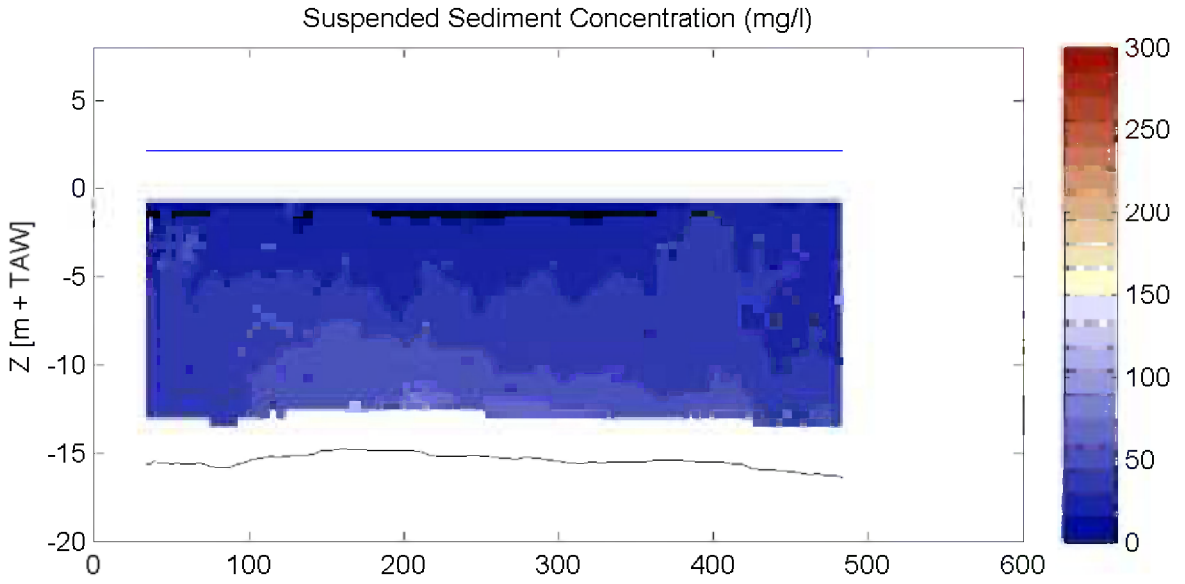
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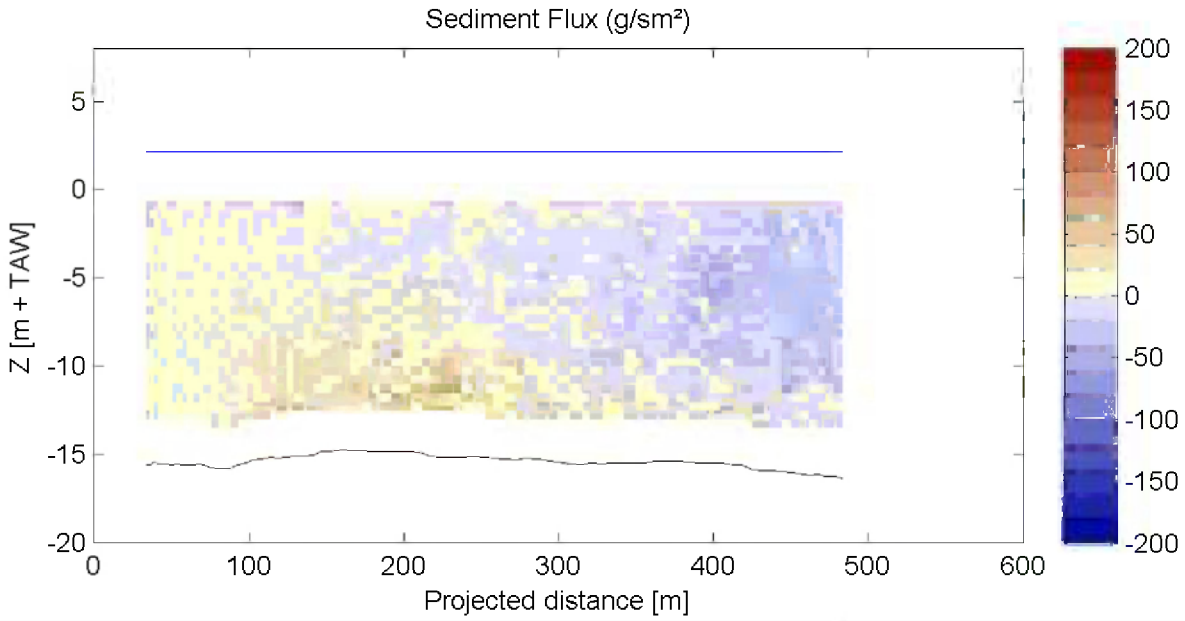
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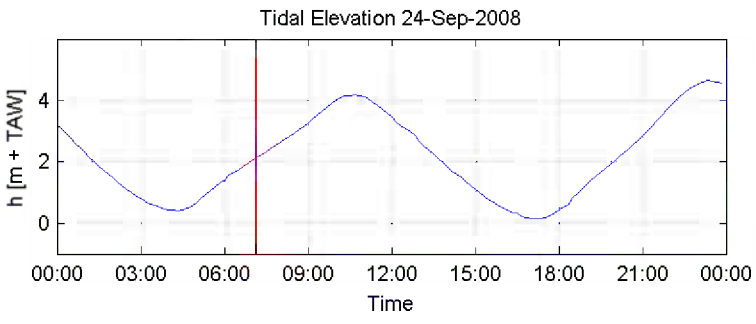
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7006tdgdlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

07:06 - 07:10

Time after HW [HH:MM]

-3:31

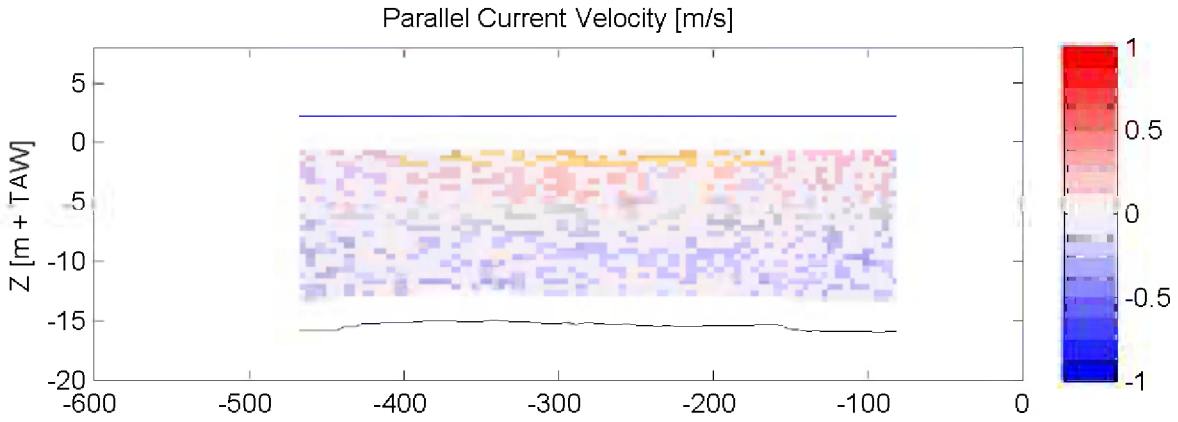
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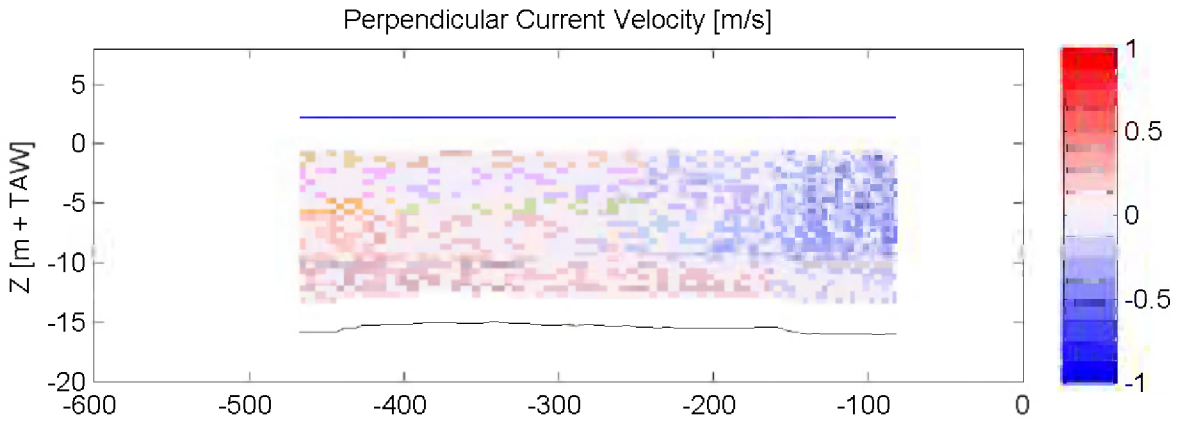
In association with :

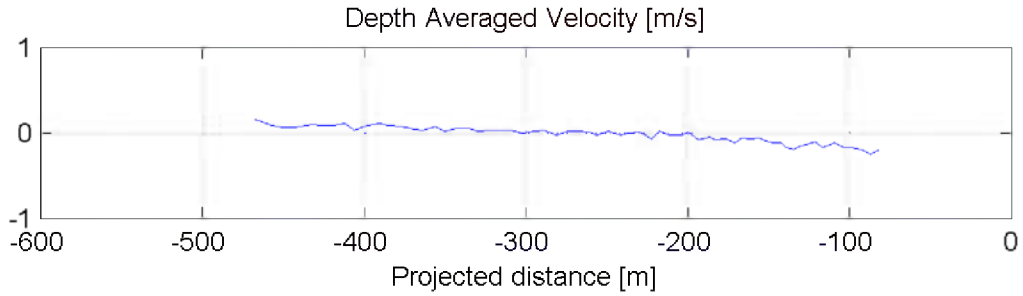
I/RA/11283/08.083/MSA

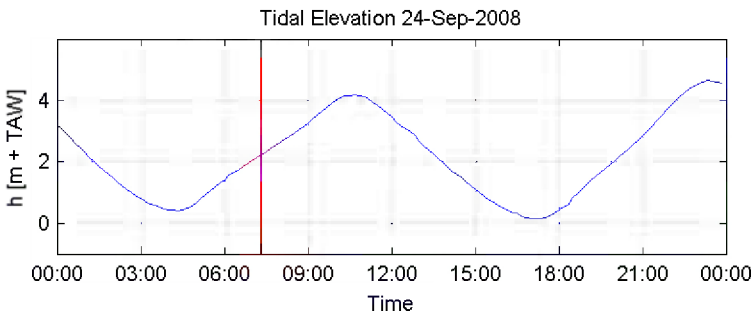
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7008tdgdrl_sub.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

07:17 - 07:20

Time after HW [HH:MM]

-3:21

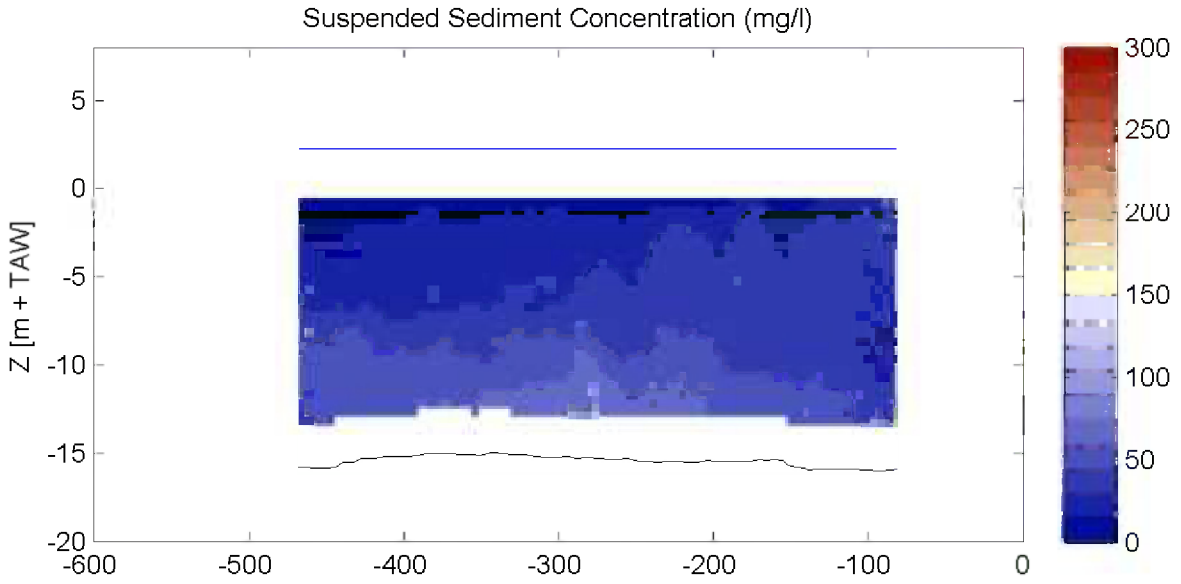
Data Processed by:

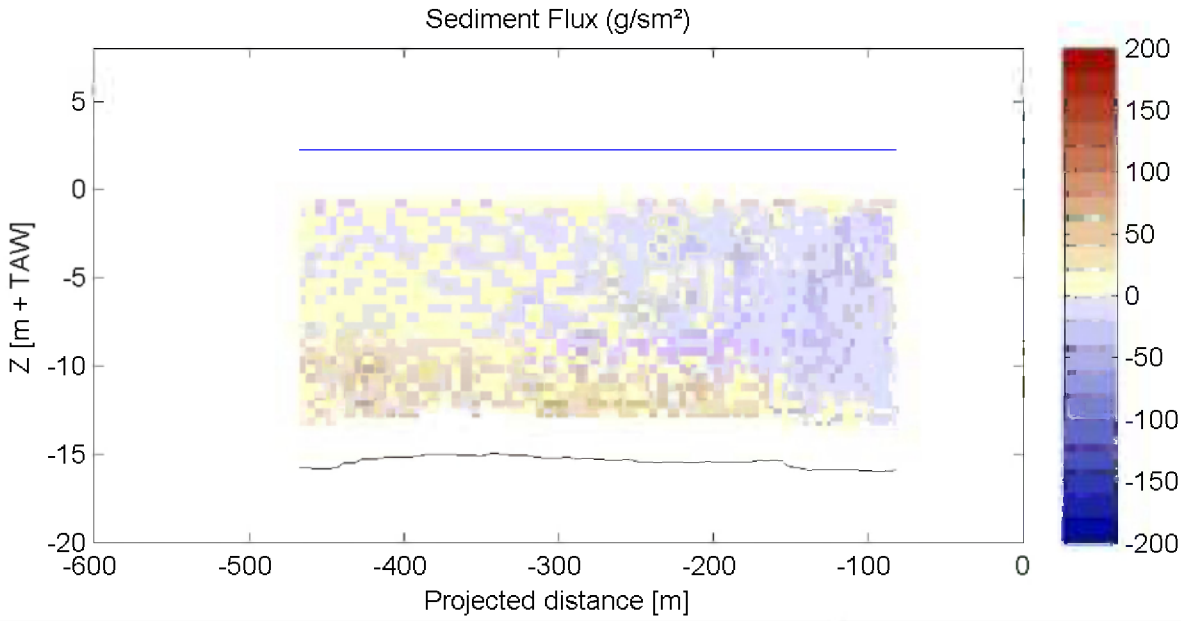
In association with :

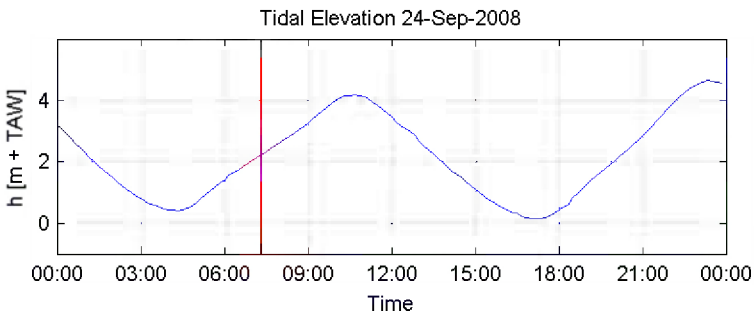
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7008tdgdrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

07:17 - 07:20

Time after HW [HH:MM]

-3:21

Data Processed by:

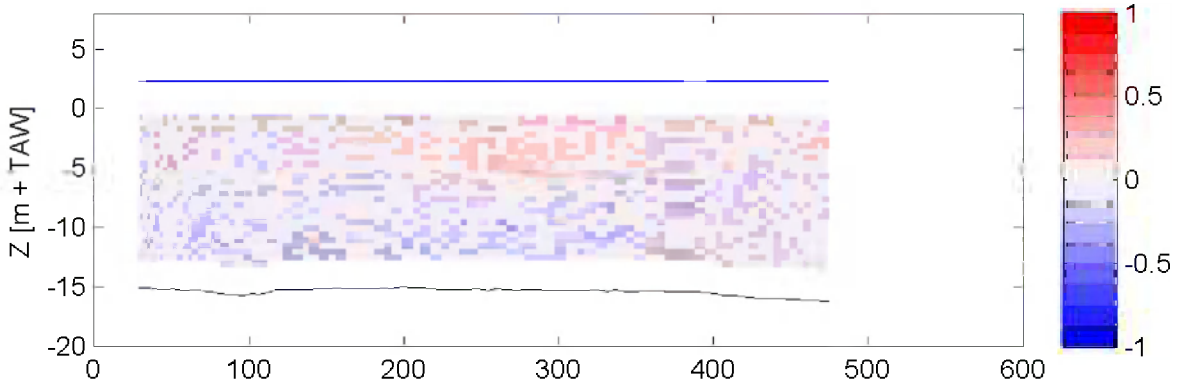
In association with :

I/RA/11283/08.083/MSA

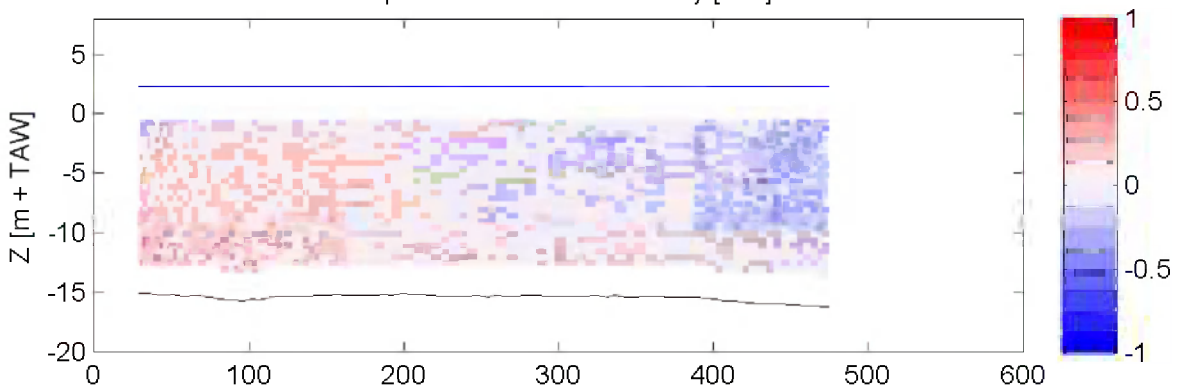
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7010tdgdlr_sub.csv	Location: Deurganckdok

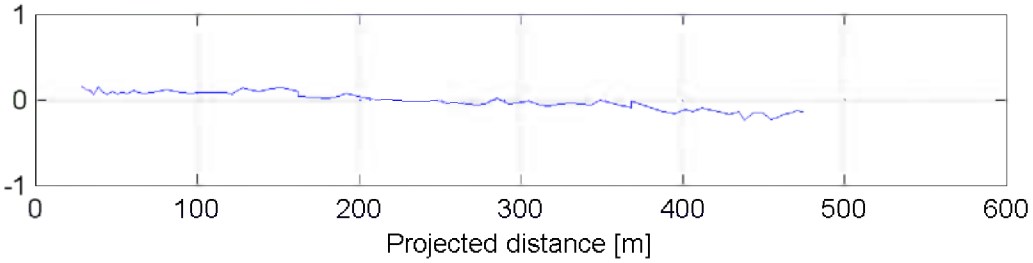
Parallel Current Velocity [m/s]



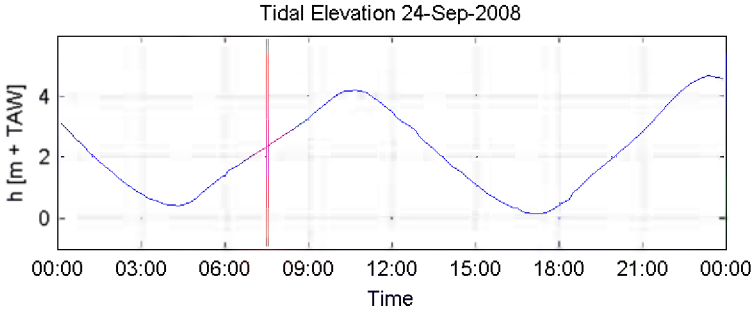
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

07:29 - 07:33

Time after HW [HH:MM]

-3:08

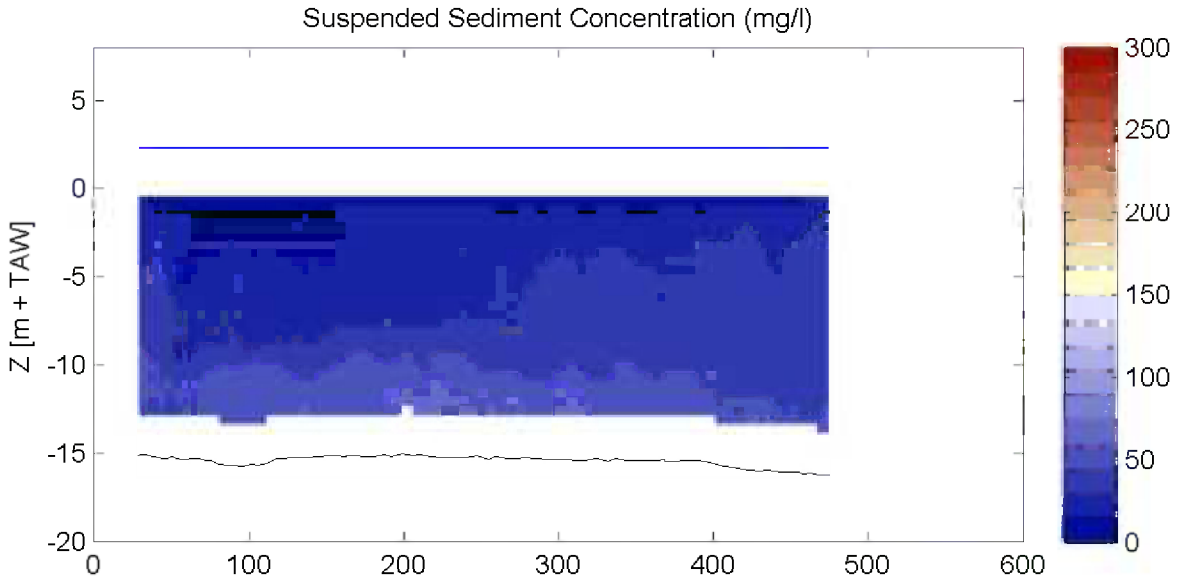
Data Processed by:

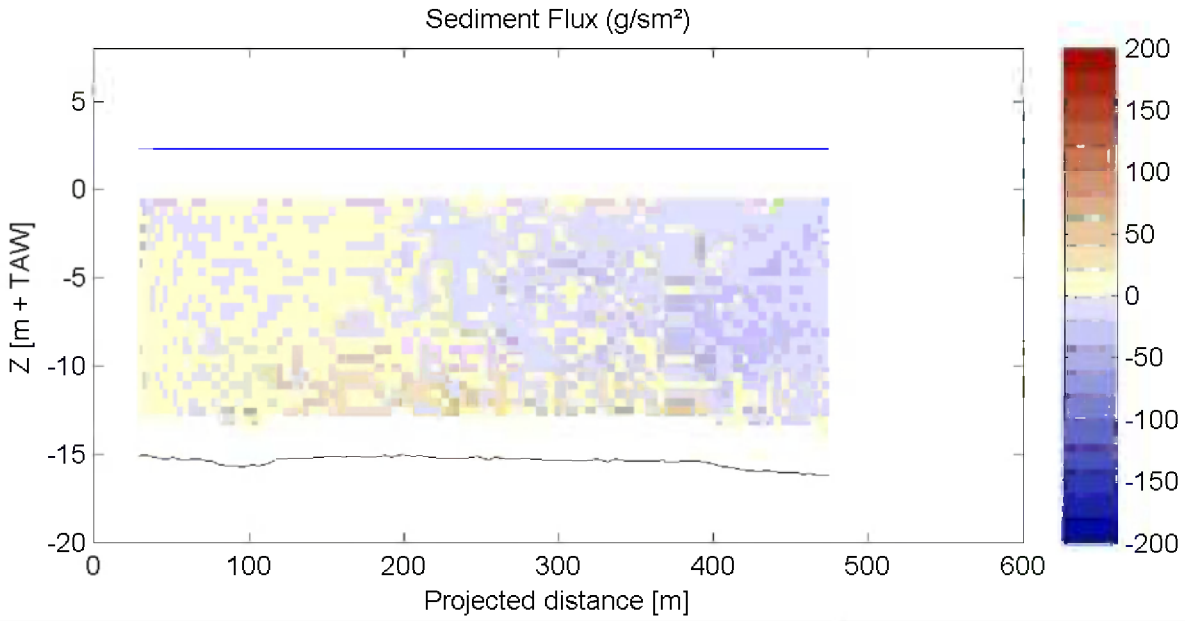
In association with :

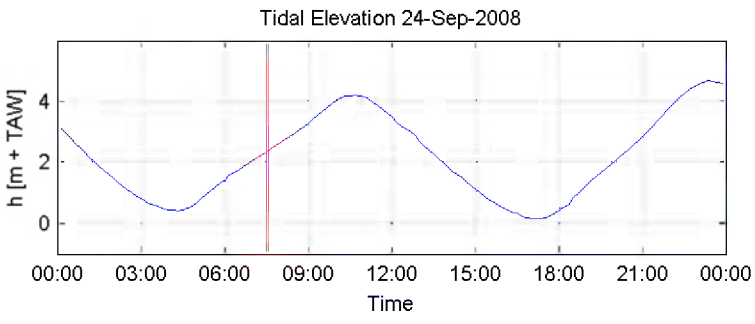
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7010tdgdlr_sub.csv	Location: Deurganckdok







HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

07:29 - 07:33

Time after HW [HH:MM]

-3:08

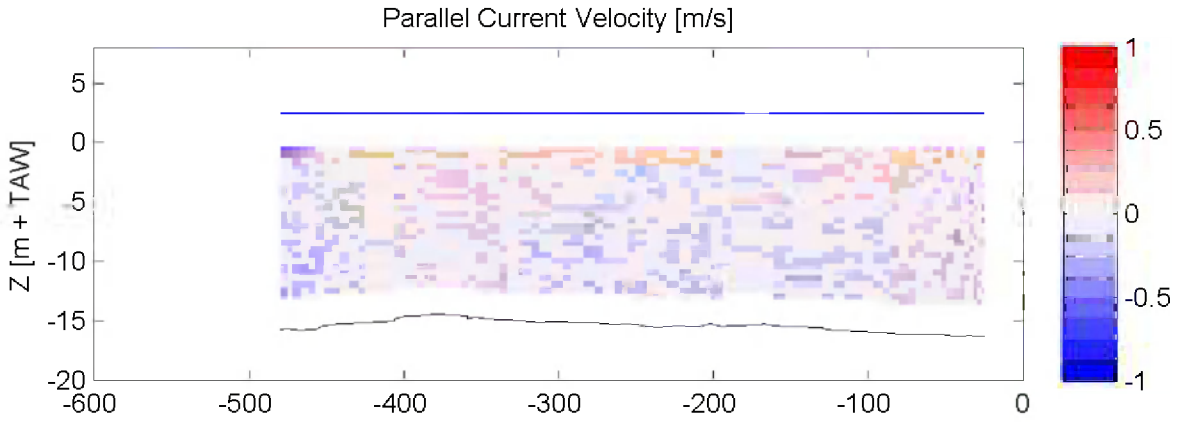
Data Processed by:

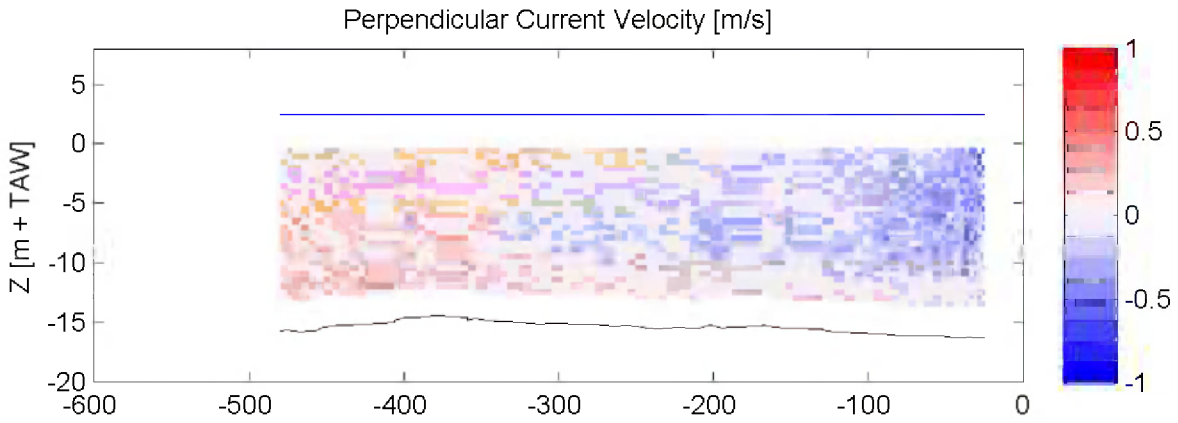
In association with :

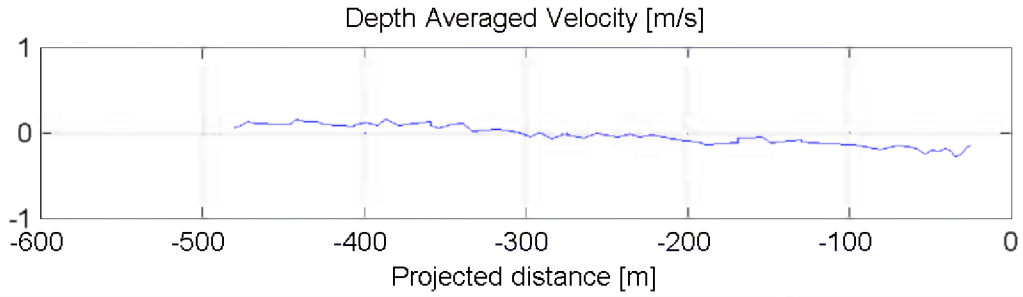
I/RA/11283/08.083/MSA

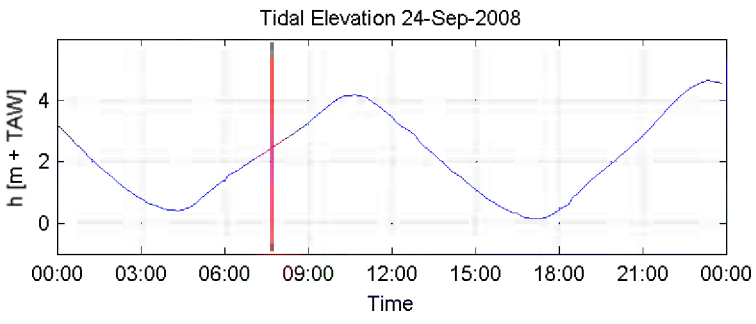
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7012tdgdrl_sub.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

07:41 - 07:44

Time after HW [HH:MM]

-2:57

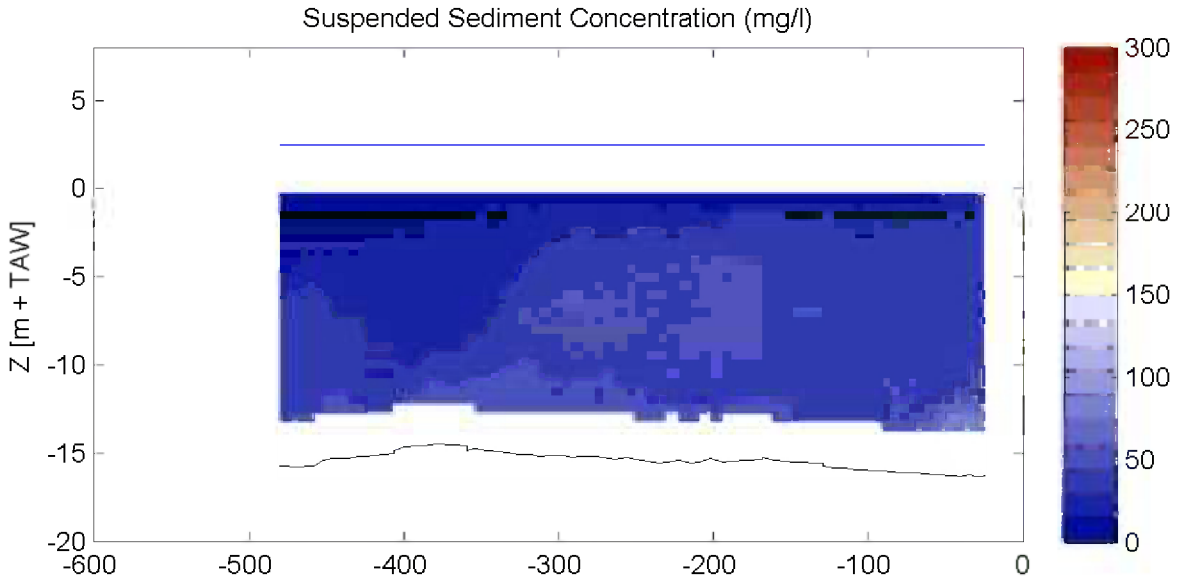
Data Processed by:

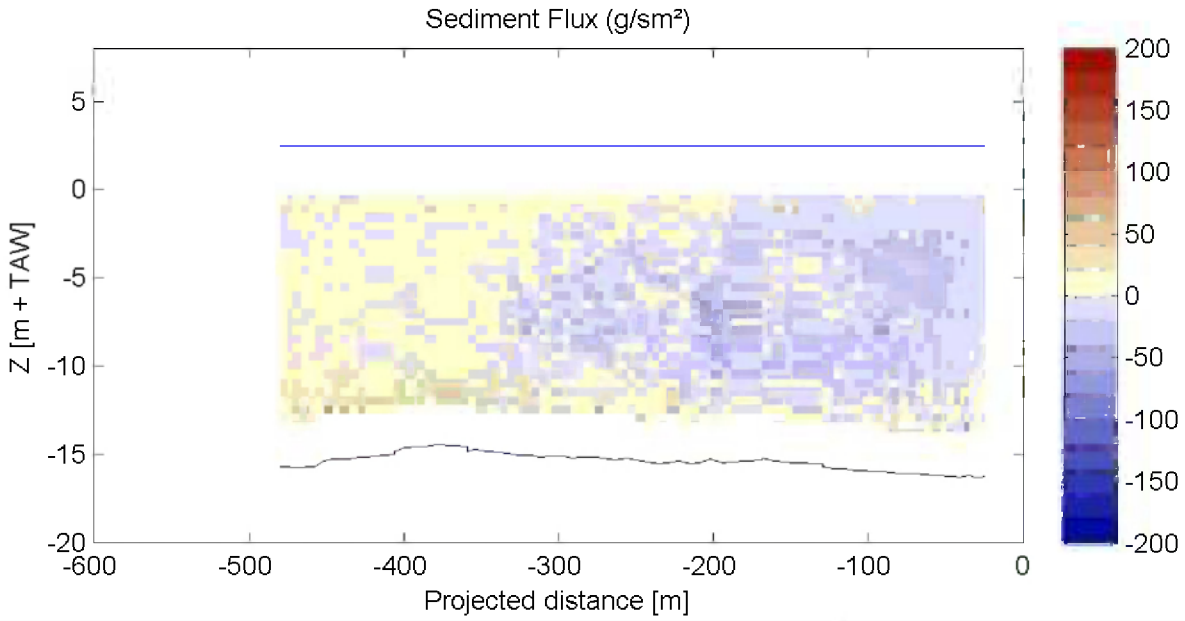
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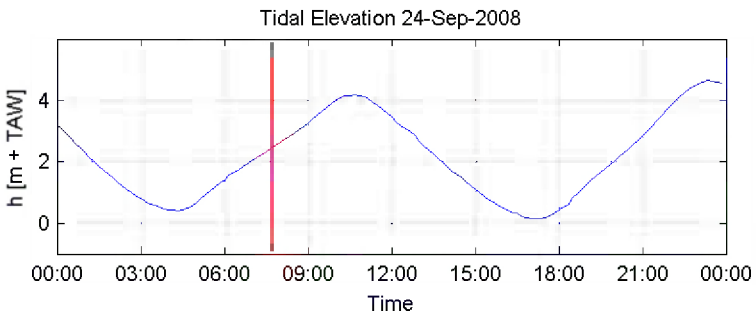
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7012tdgdrl_sub.csv	Location: Deurganckdok







HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

07:41 - 07:44

Time after HW [HH:MM]

-2:57

Data Processed by:

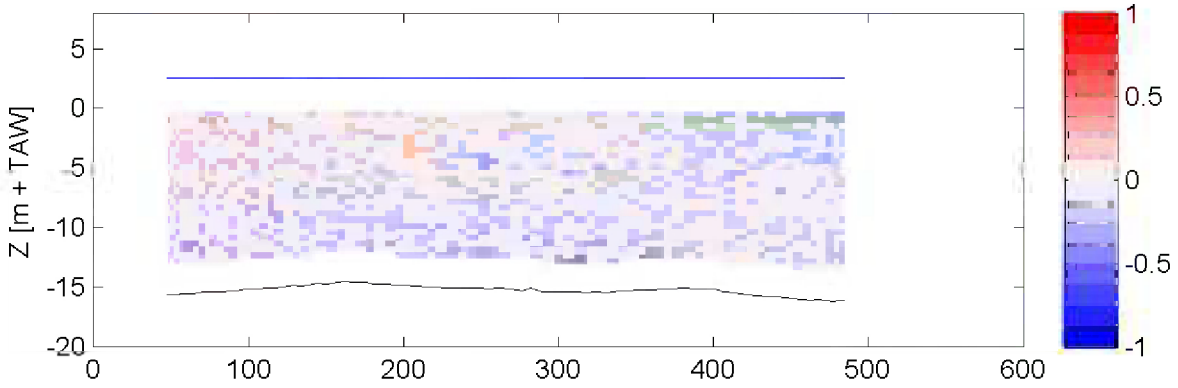
In association with :

I/RA/11283/08.083/MSA

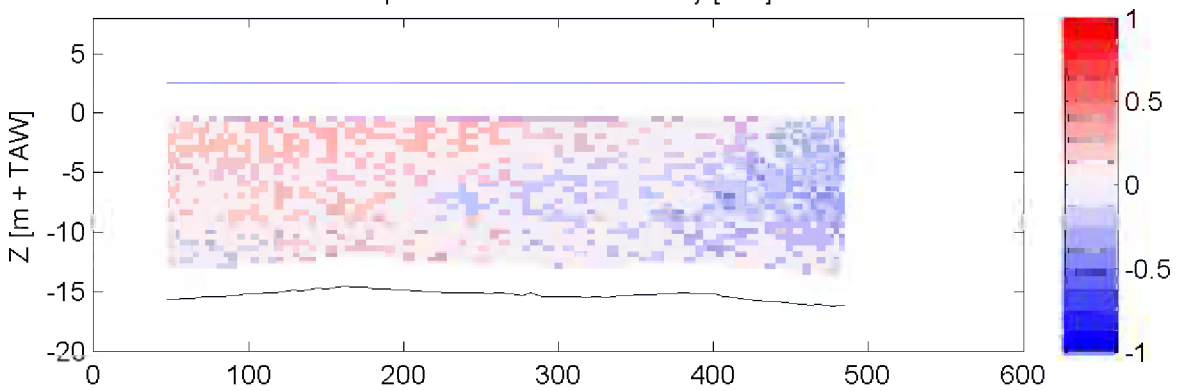
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7014tdgdlr_sub.csv	Location: Deurganckdok

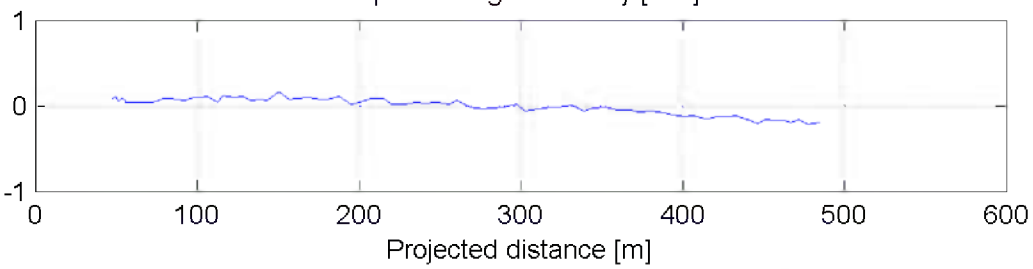
Parallel Current Velocity [m/s]



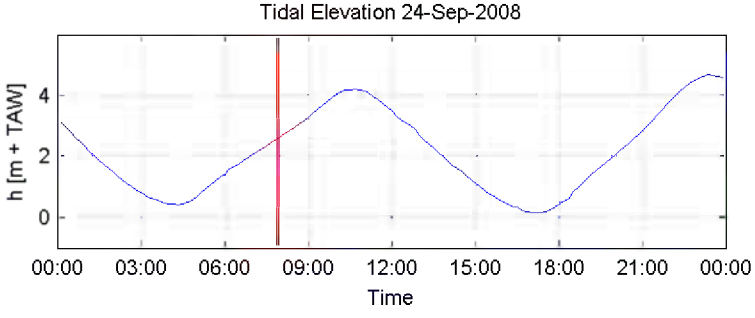
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

07:52 - 07:56

Time after HW [HH:MM]

-2:45

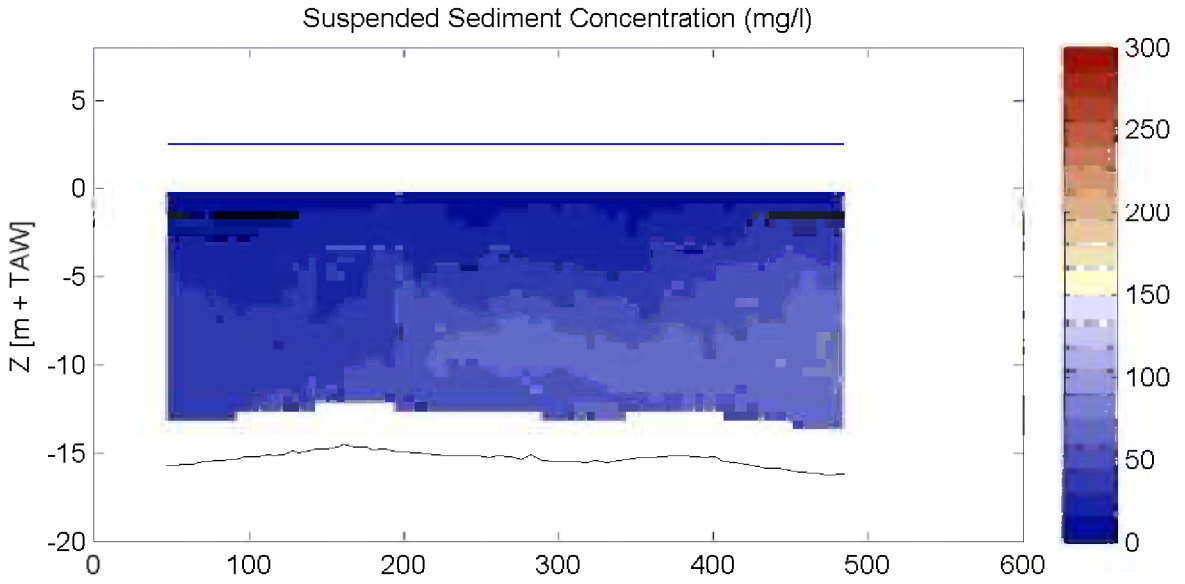
Data Processed by:

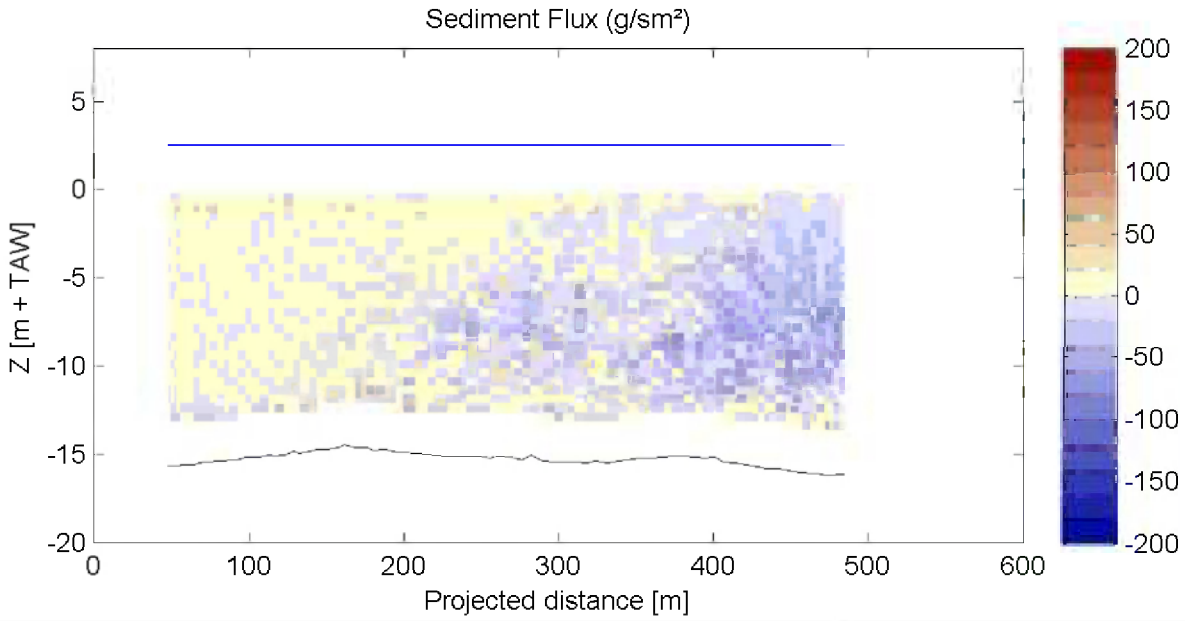
In association with :

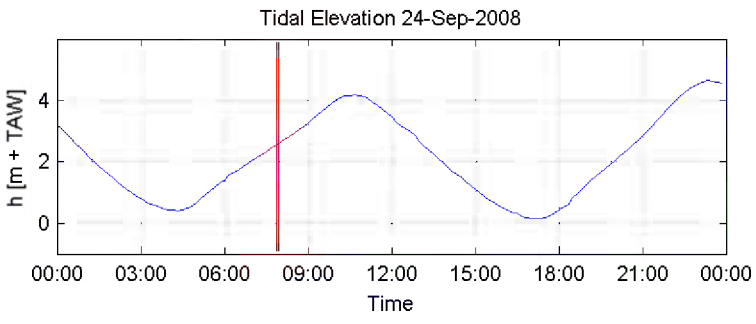
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7014tdgdlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

07:52 - 07:56

Time after HW [HH:MM]

-2:45

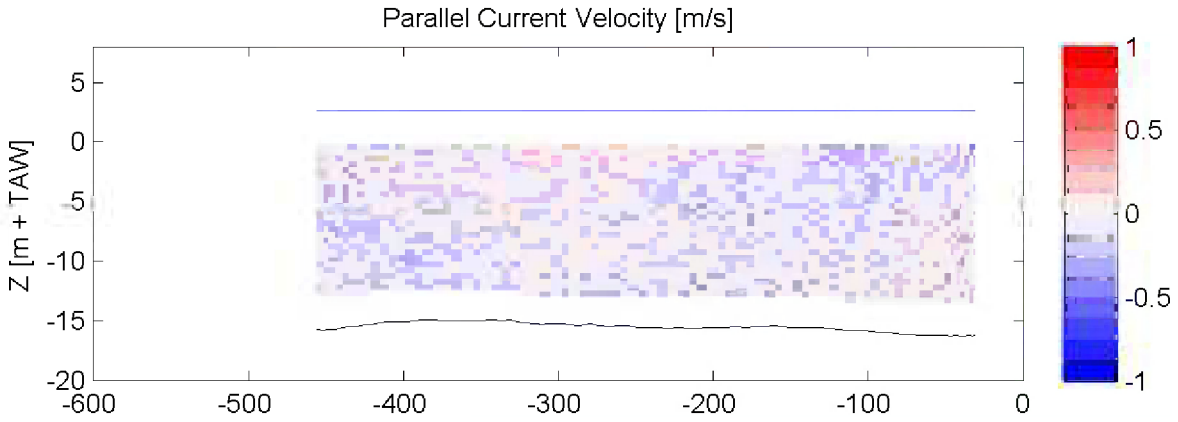
Data Processed by:

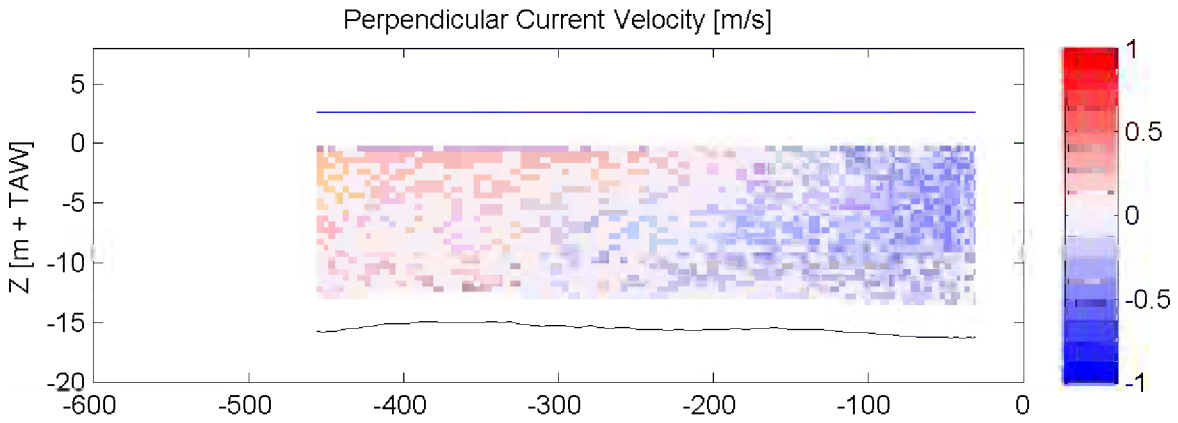
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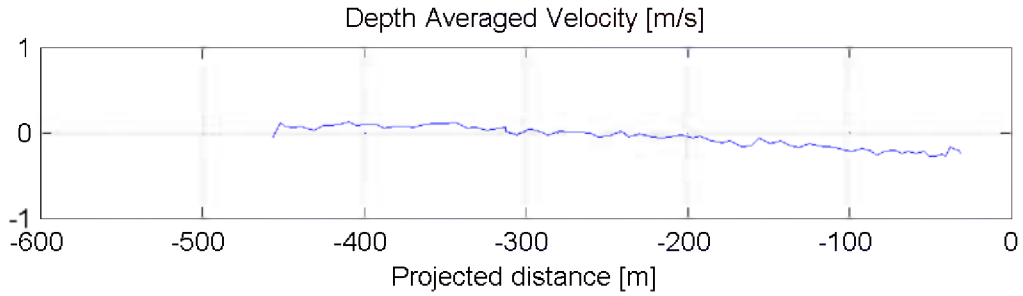
I/RA/11283/08.083/MSA

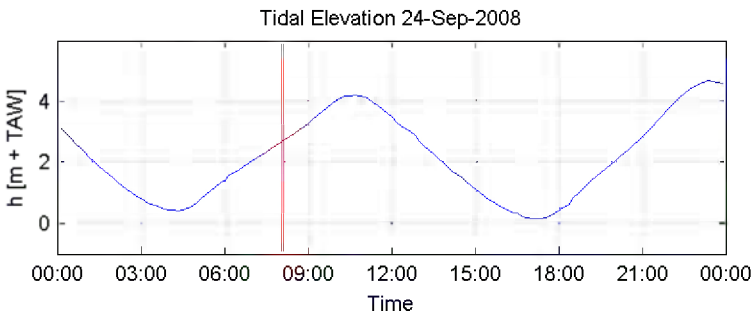
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7016tdgdrl_sub.csv	Location: Deurganckdok









HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

08:02 - 08:06

Time after HW [HH:MM]

-2:35

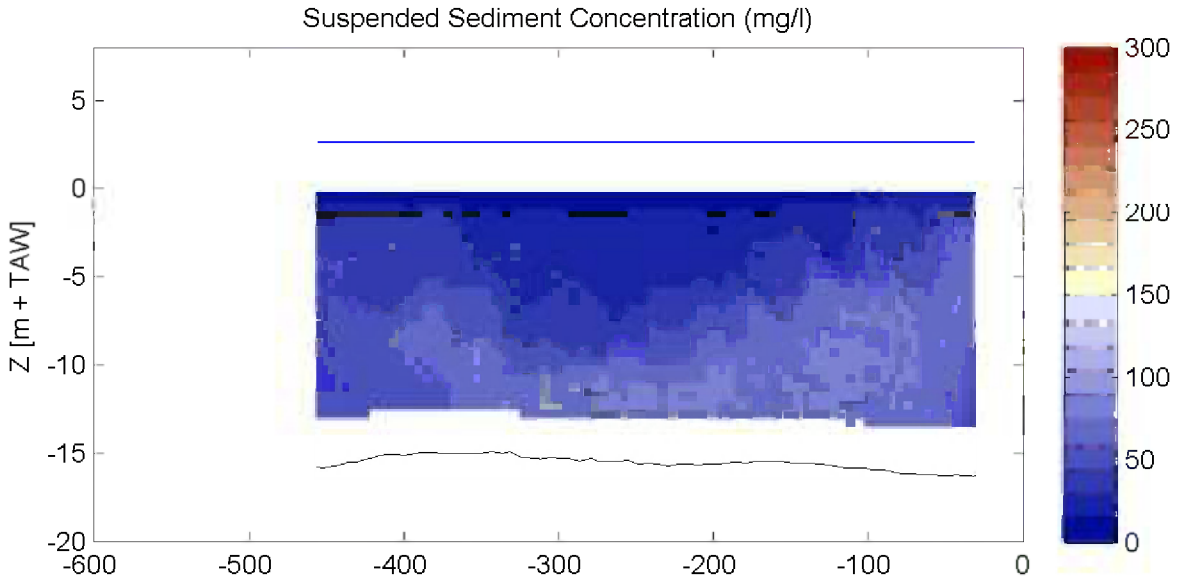
Data Processed by:

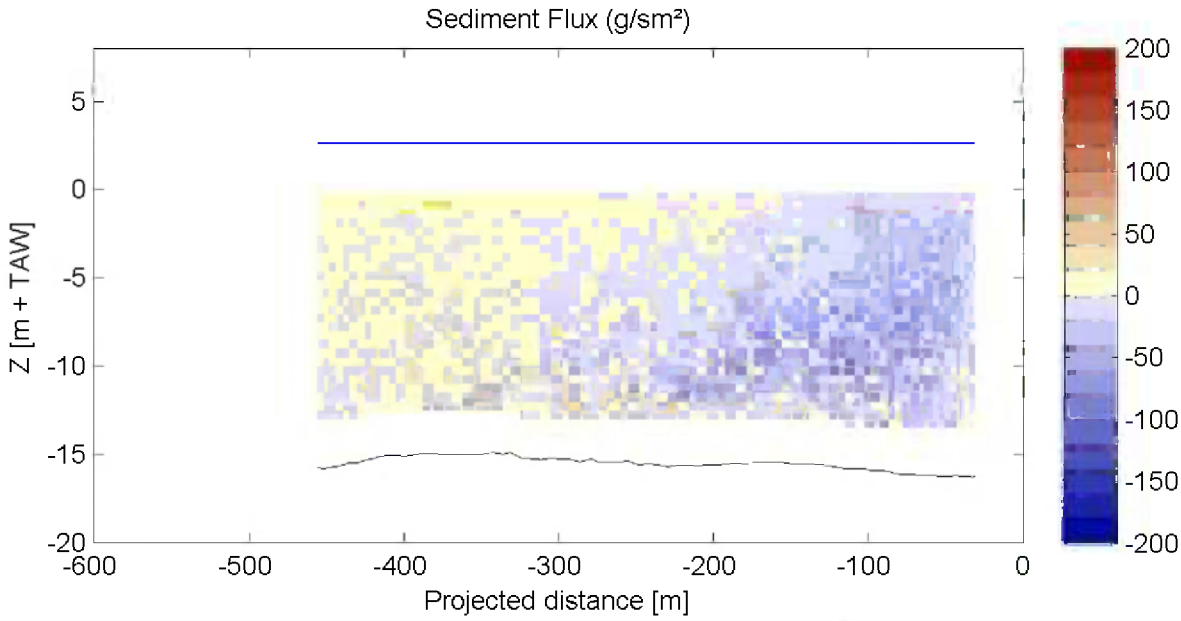
In association with :

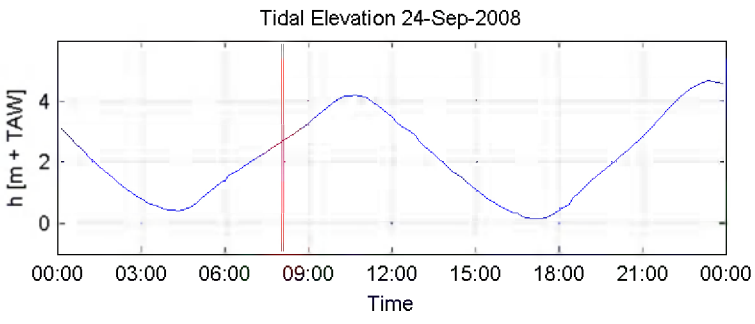
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7016tdgdrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

08:02 - 08:06

Time after HW [HH:MM]

-2:35

Data Processed by:

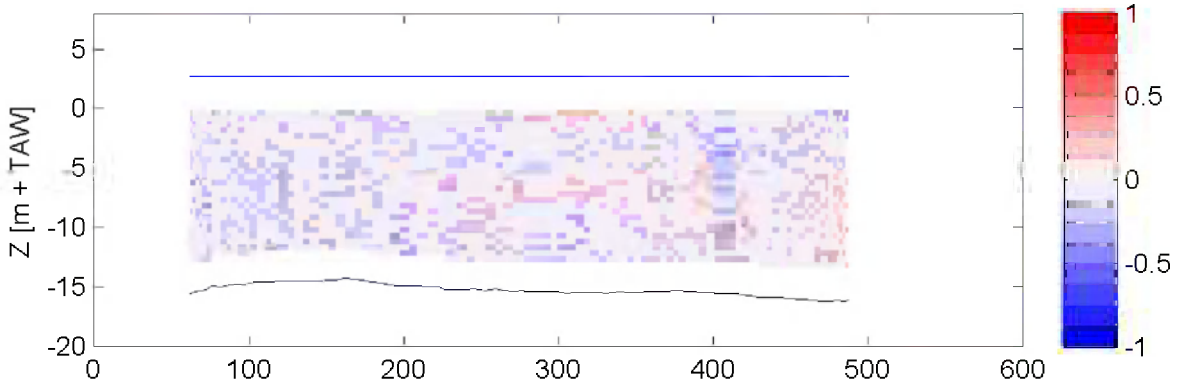
In association with :

I/RA/11283/08.083/MSA

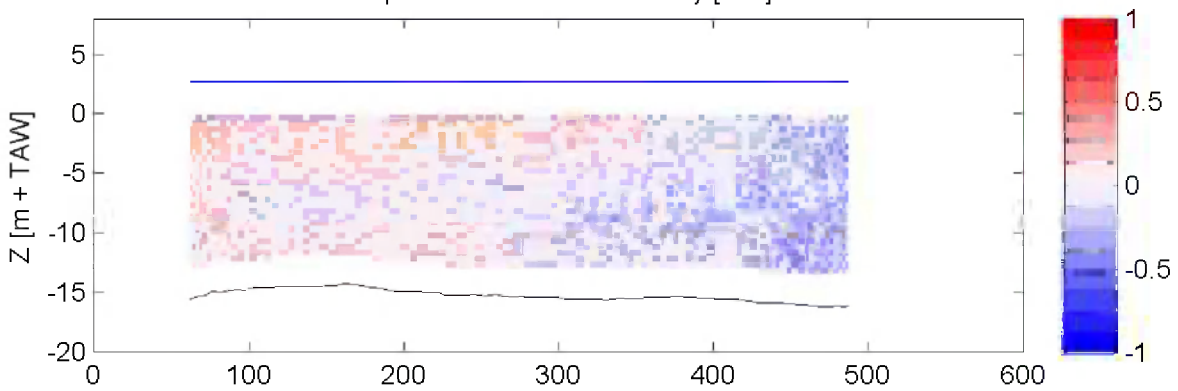
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7018tdgdlr_sub.csv	Location: Deurganckdok

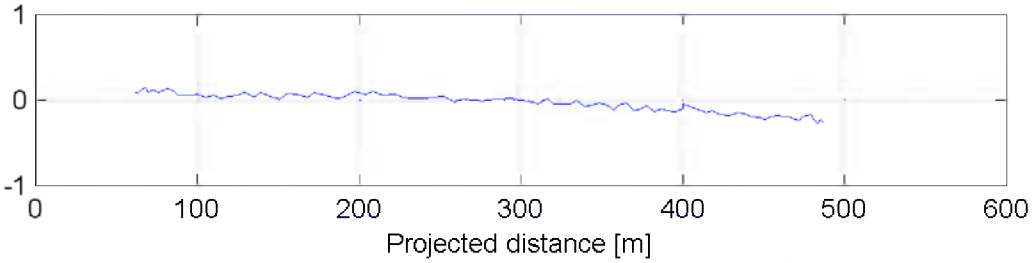
Parallel Current Velocity [m/s]



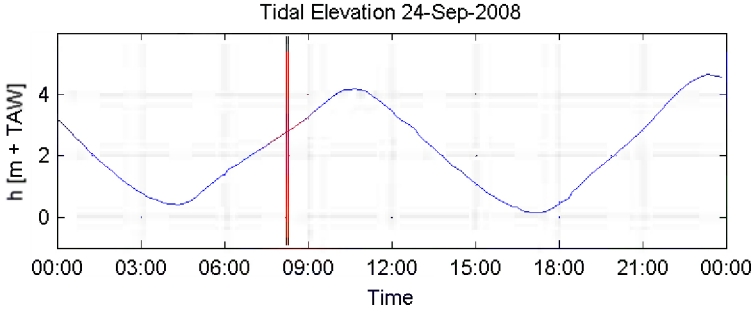
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

08:14 - 08:18

Time after HW [HH:MM]

-2:23

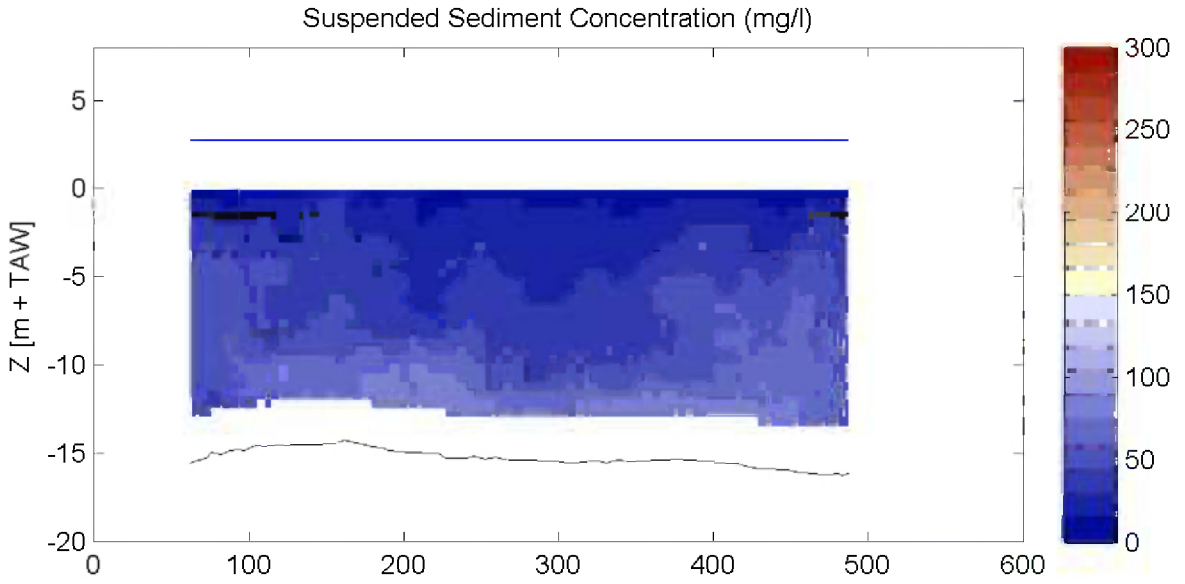
Data Processed by:

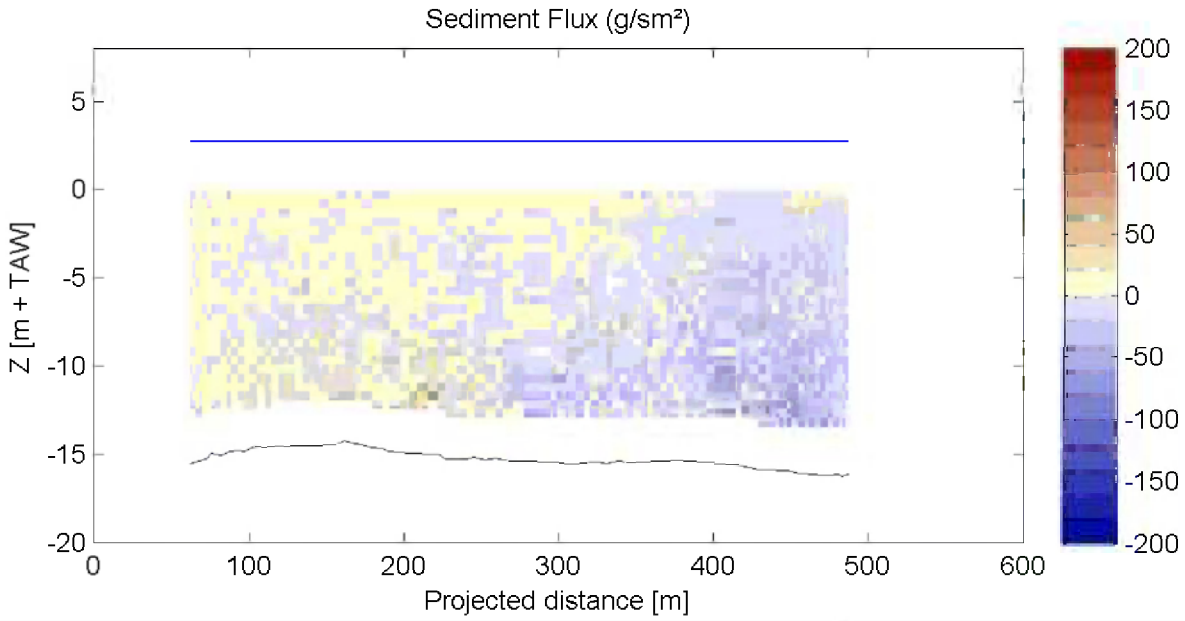
In association with :

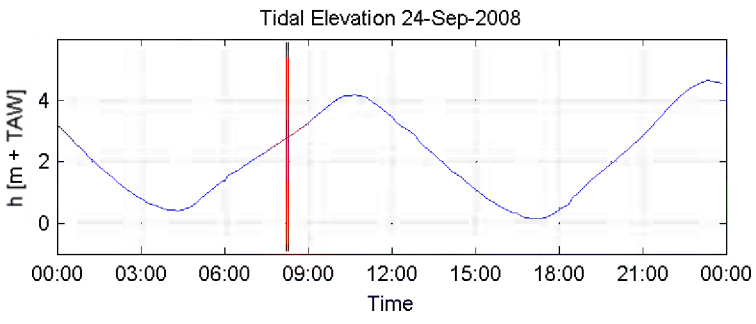
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7018tdgdlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :
24-Sep-2008
08:14 - 08:18

Time after HW [HH:MM]
-2:23

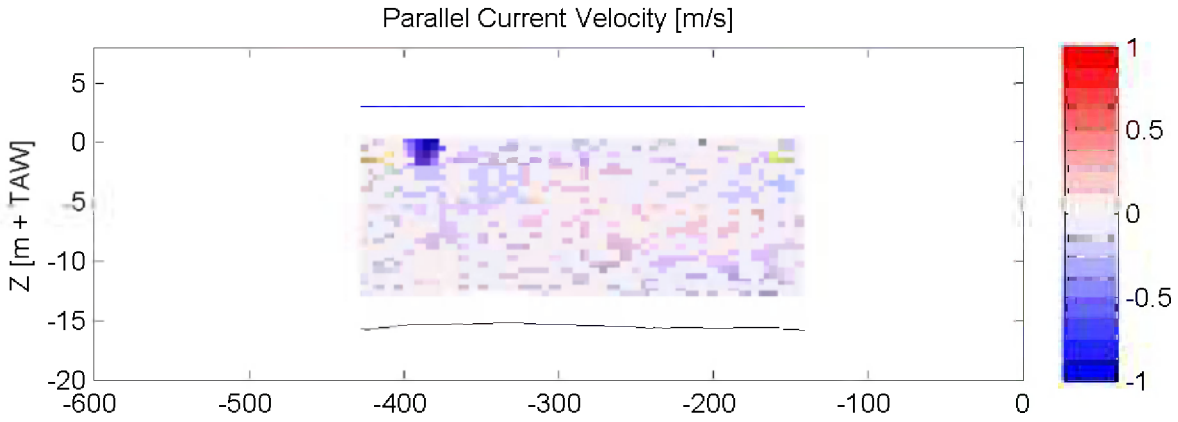
Data Processed by:

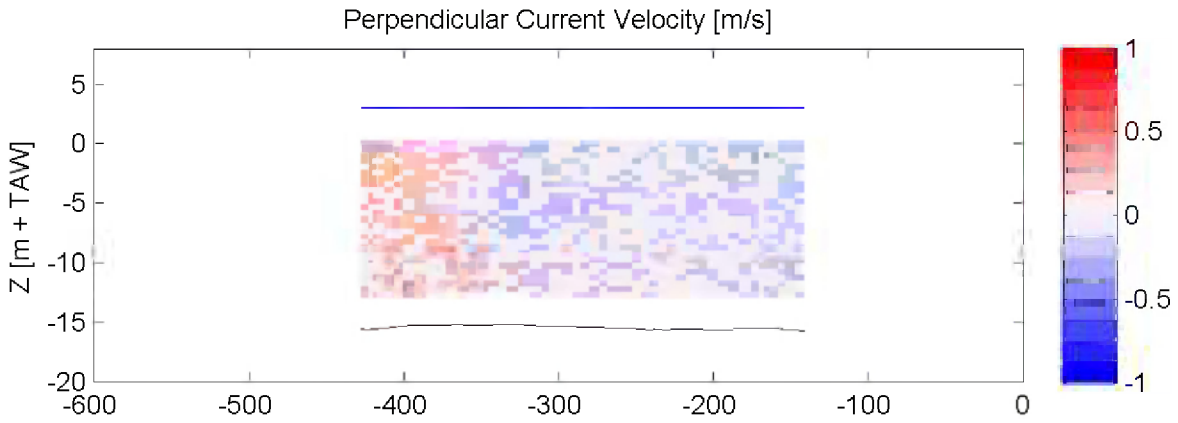
In association with :

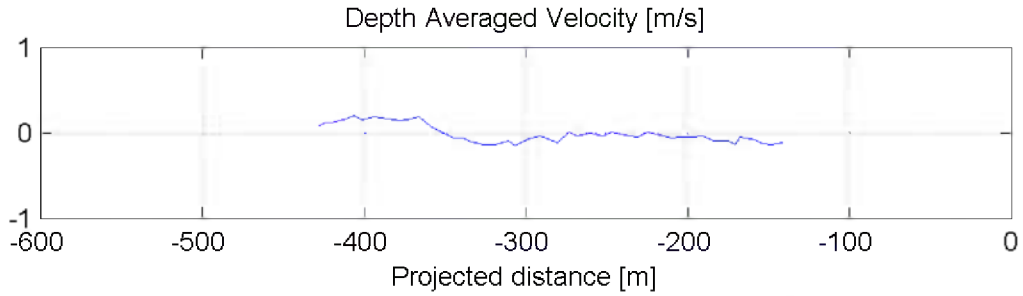
I/RA/11283/08.083/MSA

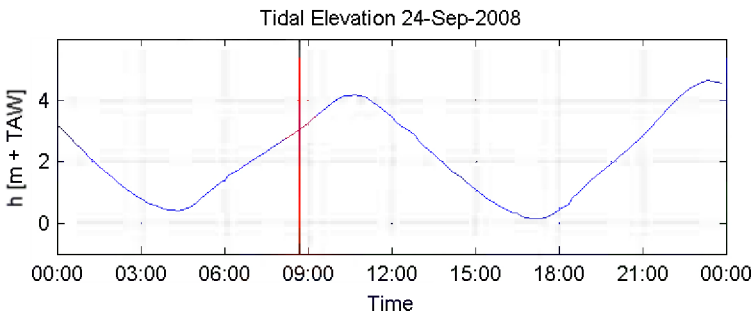
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7020tdgdrl_sub.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

08:41 - 08:43

Time after HW [HH:MM]

-1:57

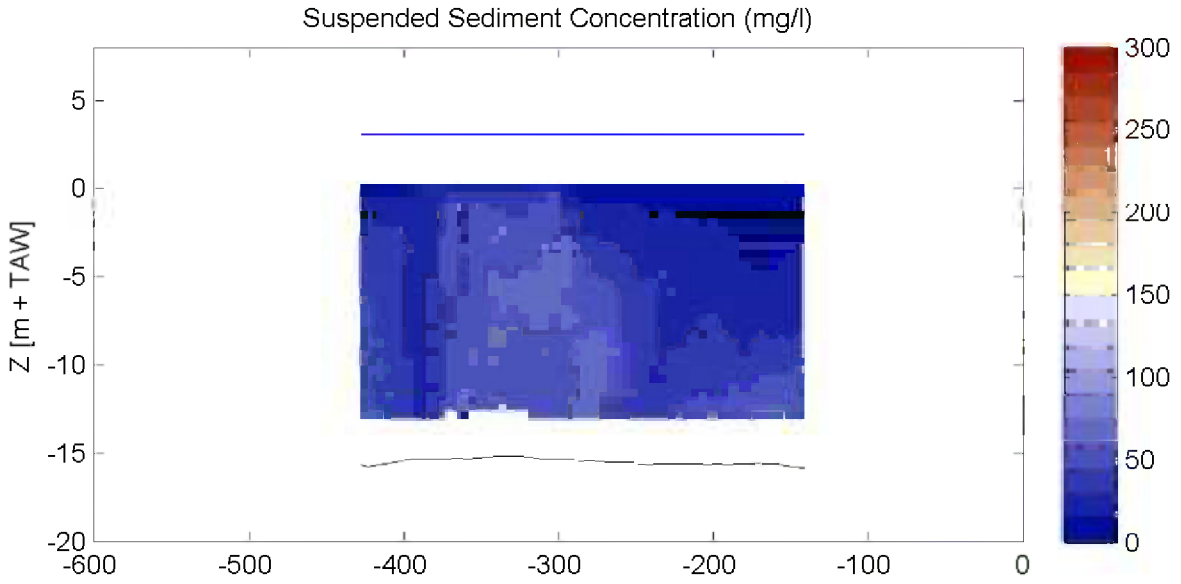
Data Processed by:

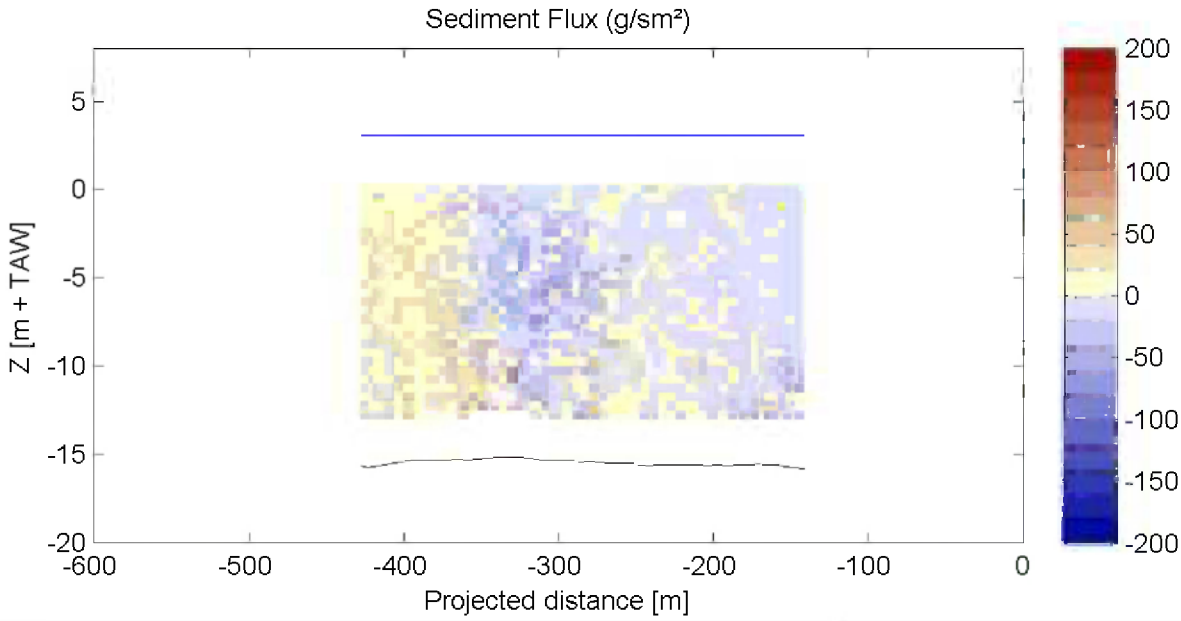
In association with :

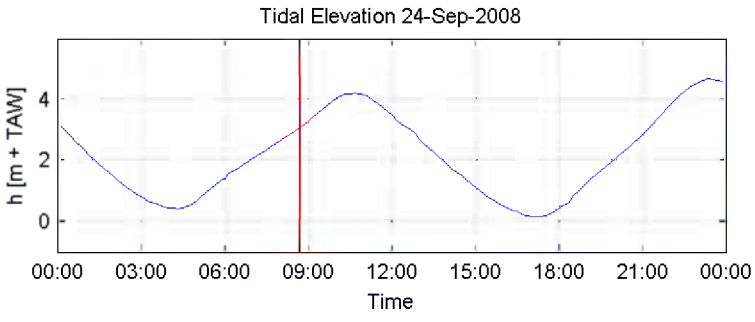
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7020tdgdrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

08:41 - 08:43

Time after HW [HH:MM]

-1:57

Data Processed by:

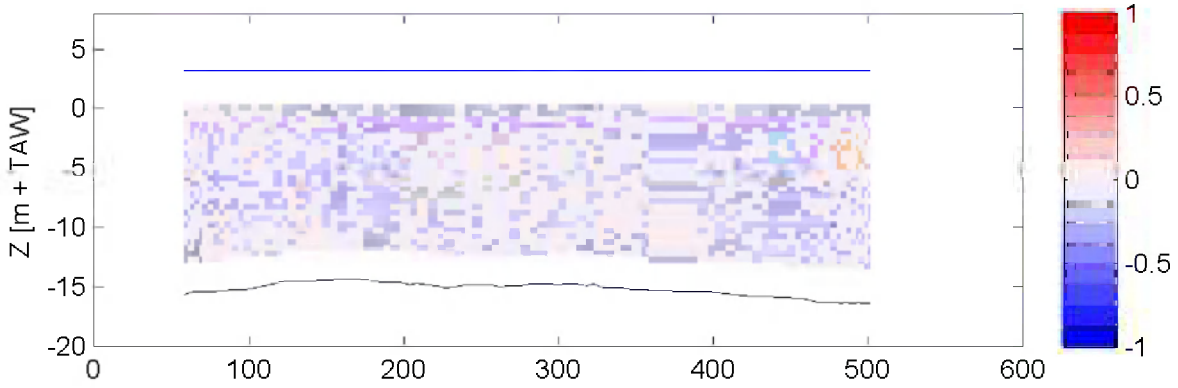
In association with :

I/RA/11283/08.083/MSA

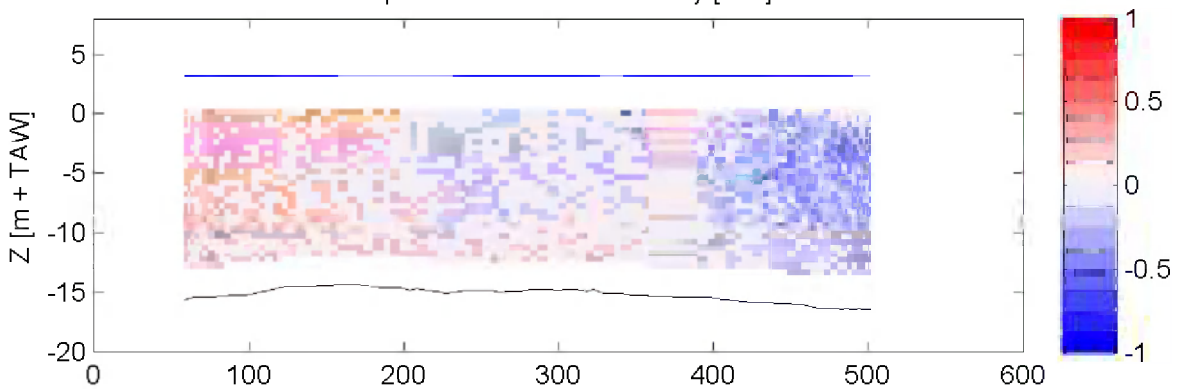
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7022tdgdlr_sub.csv	Location: Deurganckdok

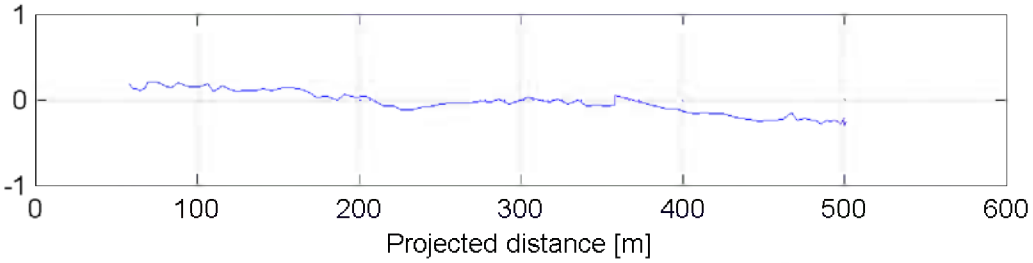
Parallel Current Velocity [m/s]



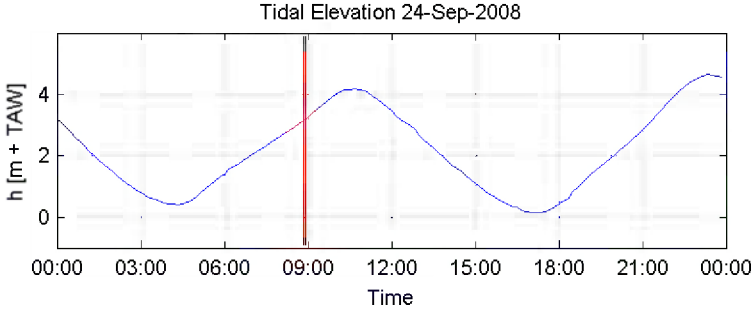
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

08:50 - 08:54

Time after HW [HH:MM]

-1:47

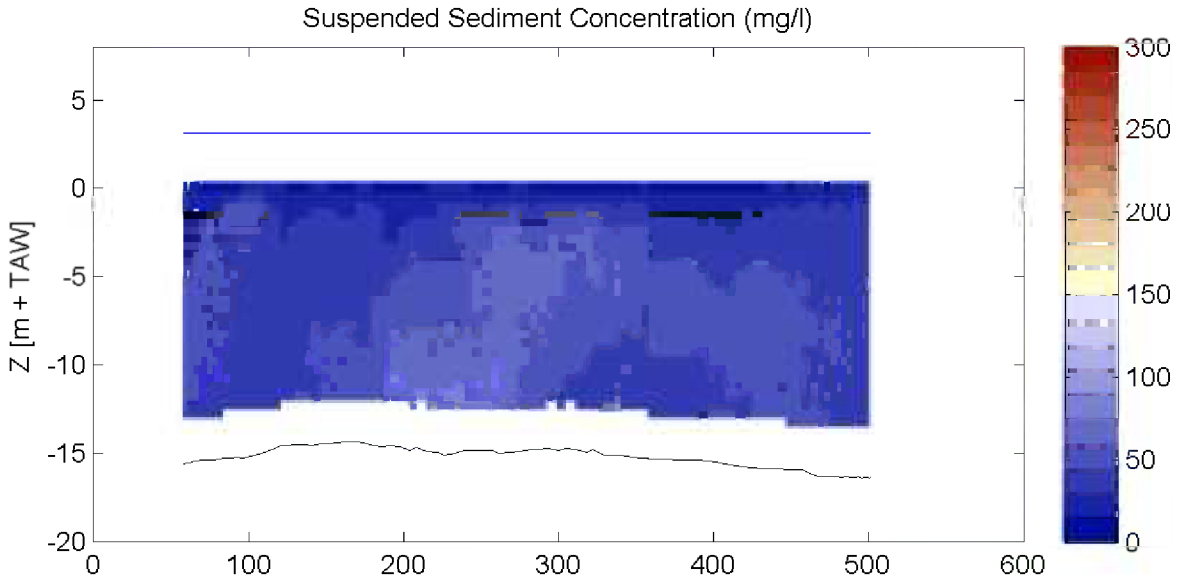
Data Processed by:

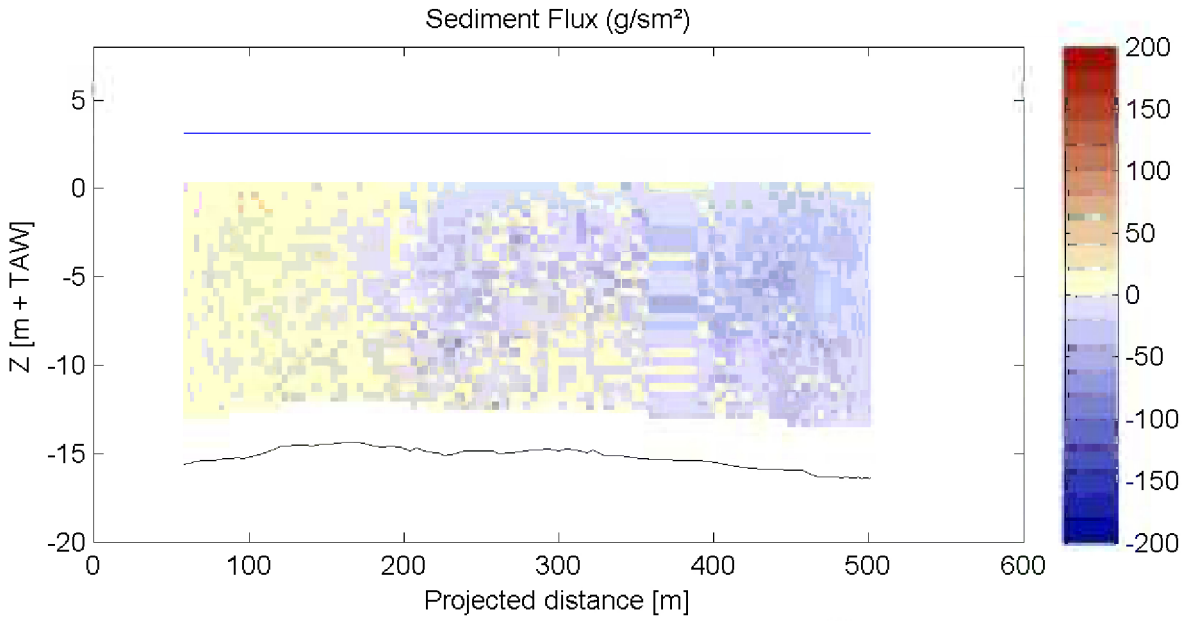
In association with :

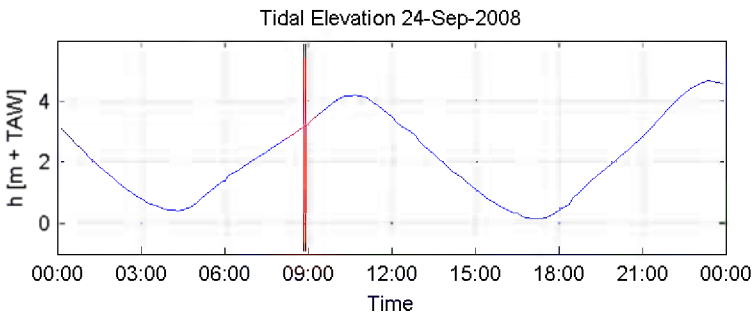
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7022tdgdlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

08:50 - 08:54

Time after HW [HH:MM]

-1:47

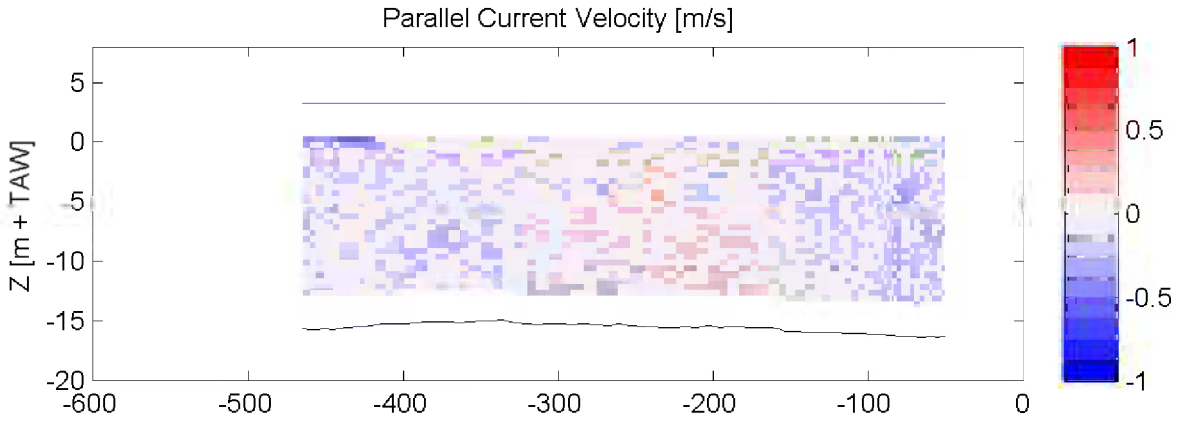
Data Processed by:

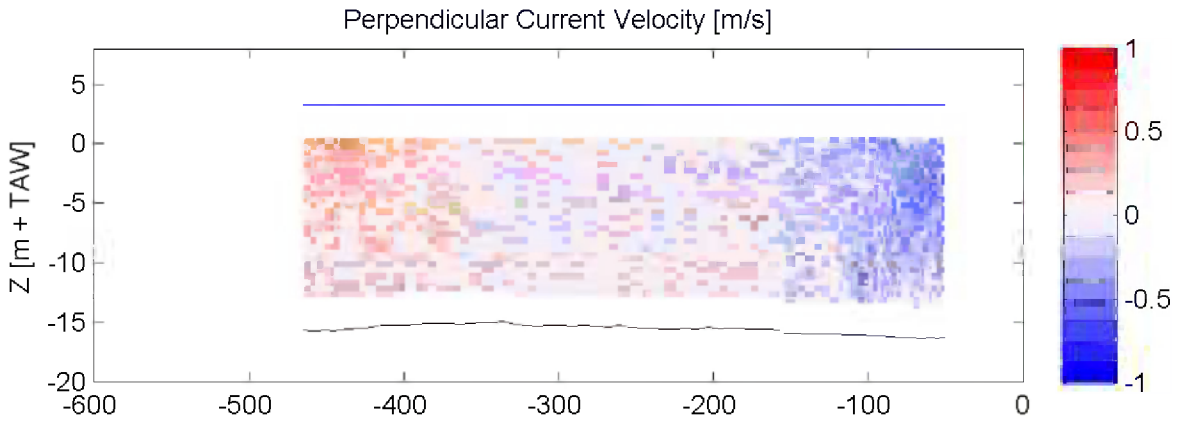
In association with :

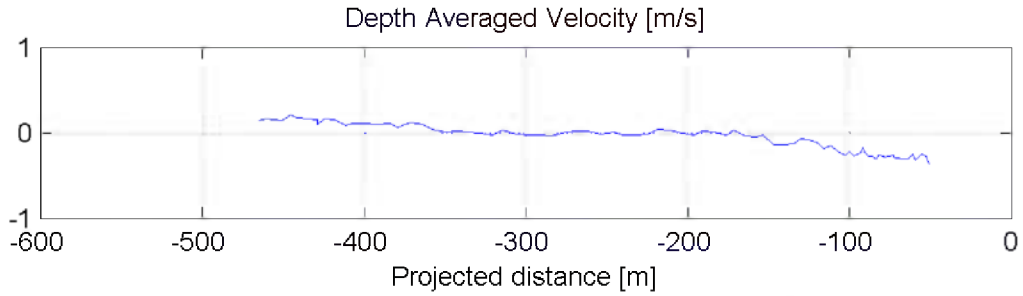
I/RA/11283/08.083/MSA

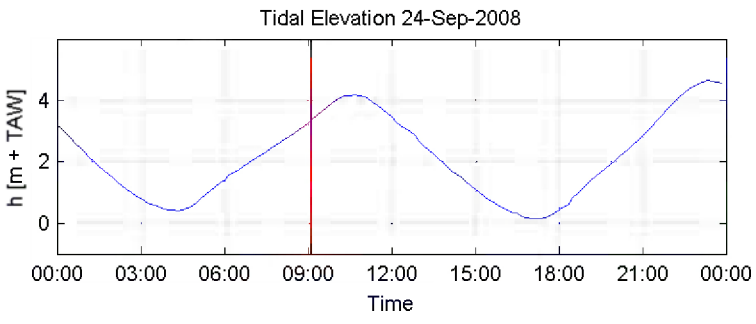
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7024tdgdrl_sub.csv	Location: Deurganckdok









HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

09:04 - 09:07

Time after HW [HH:MM]

-1:33

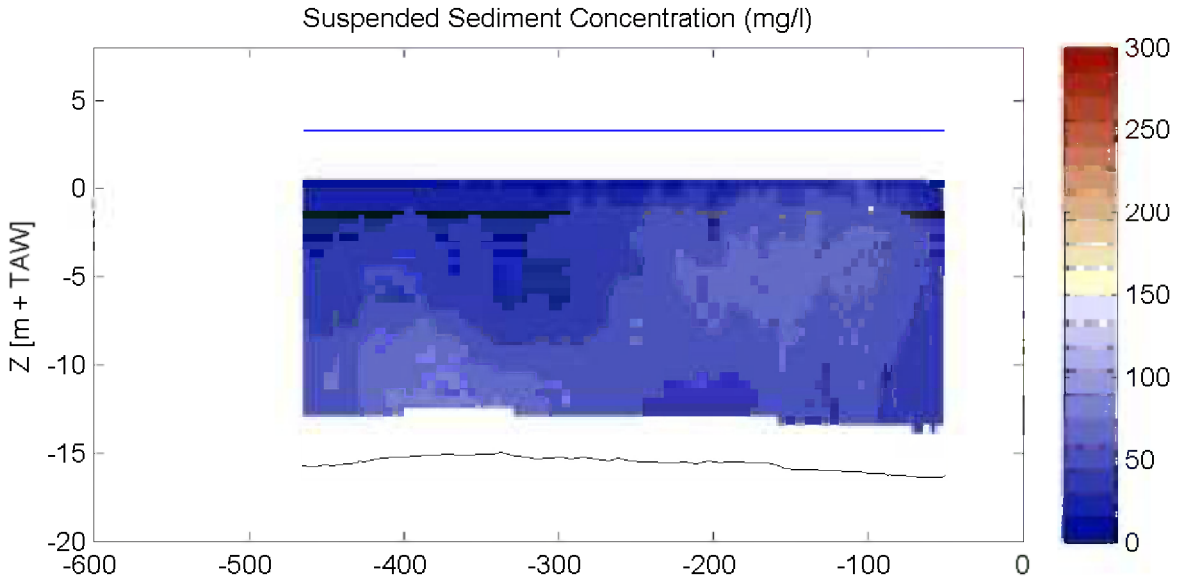
Data Processed by:

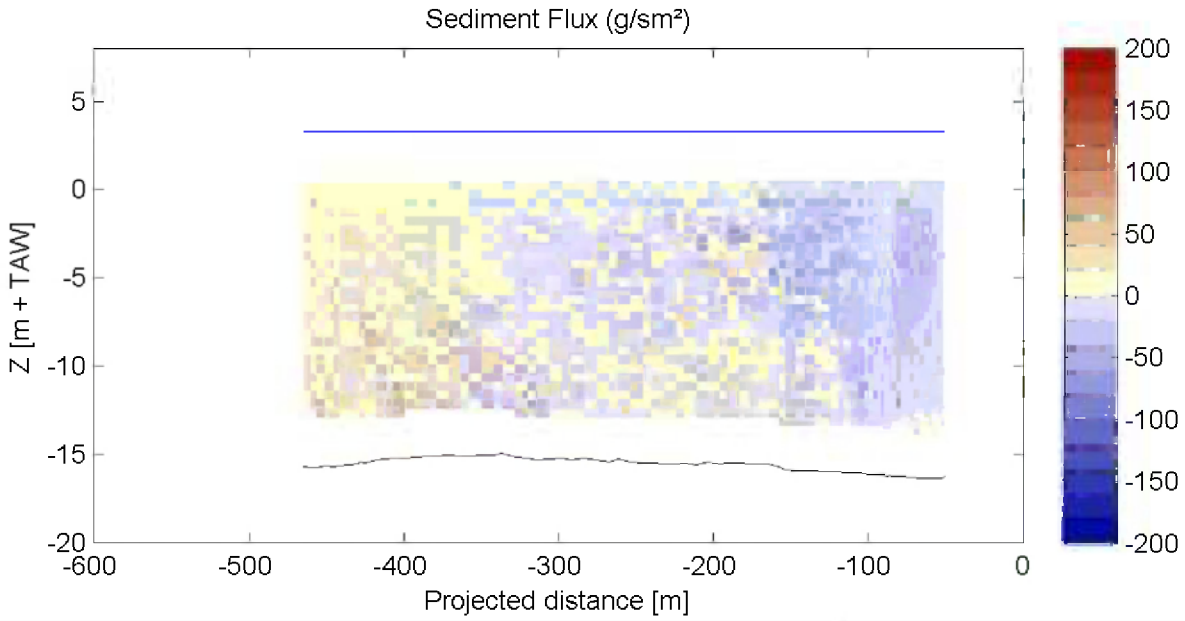
In association with :

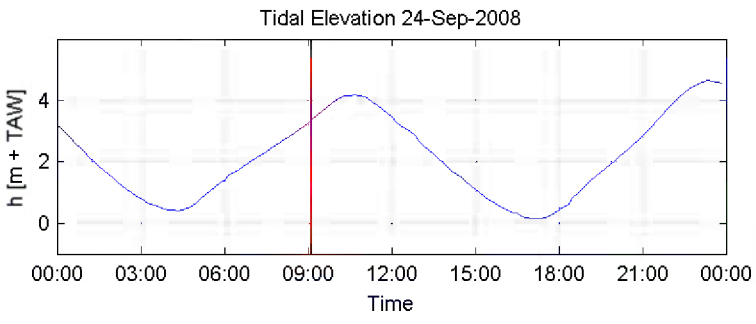
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7024tdgdrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

09:04 - 09:07

Time after HW [HH:MM]

-1:33

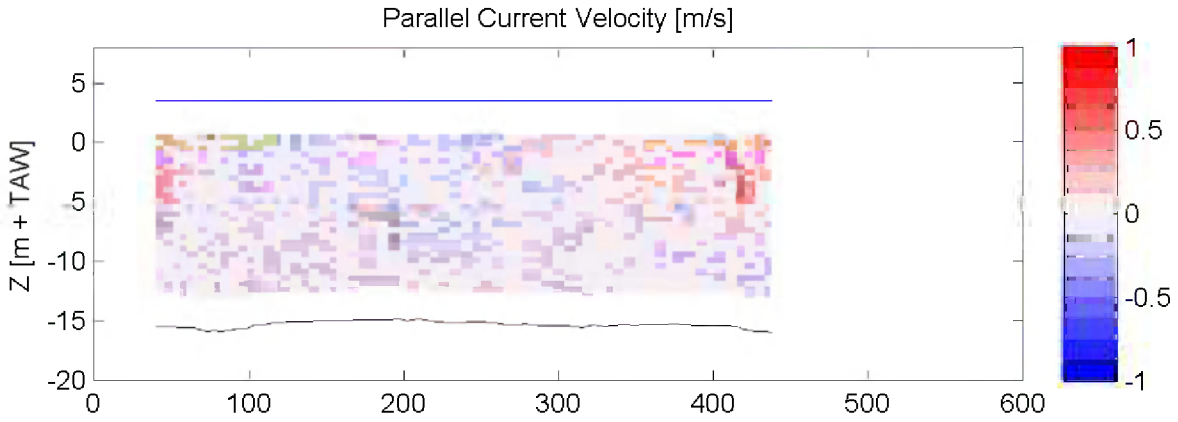
Data Processed by:

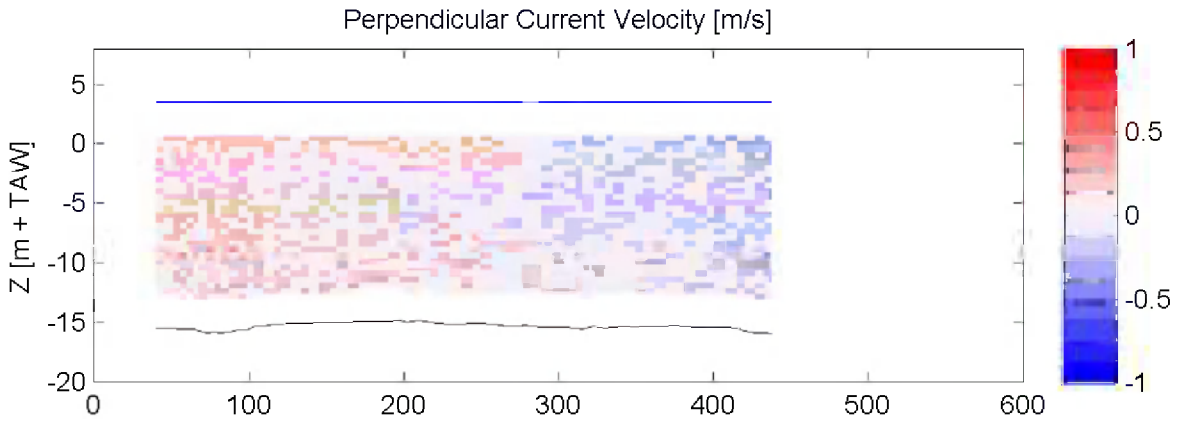
In association with :

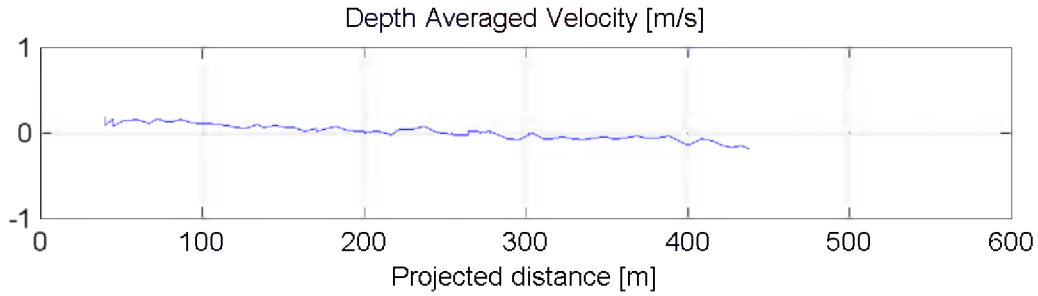
I/RA/11283/08.083/MSA

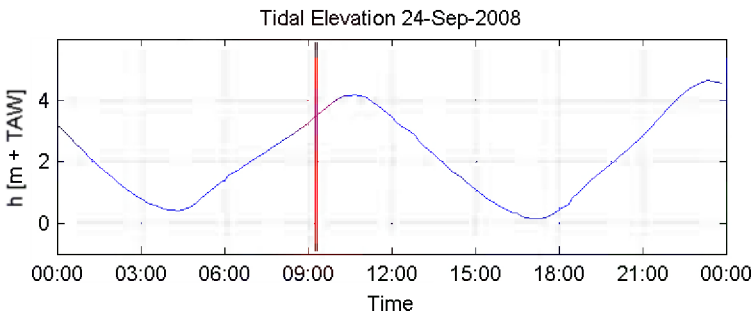
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7026dgdtlr_sub.csv	Location: Deurganckdok









HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

09:15 - 09:19

Time after HW [HH:MM]

-1:22

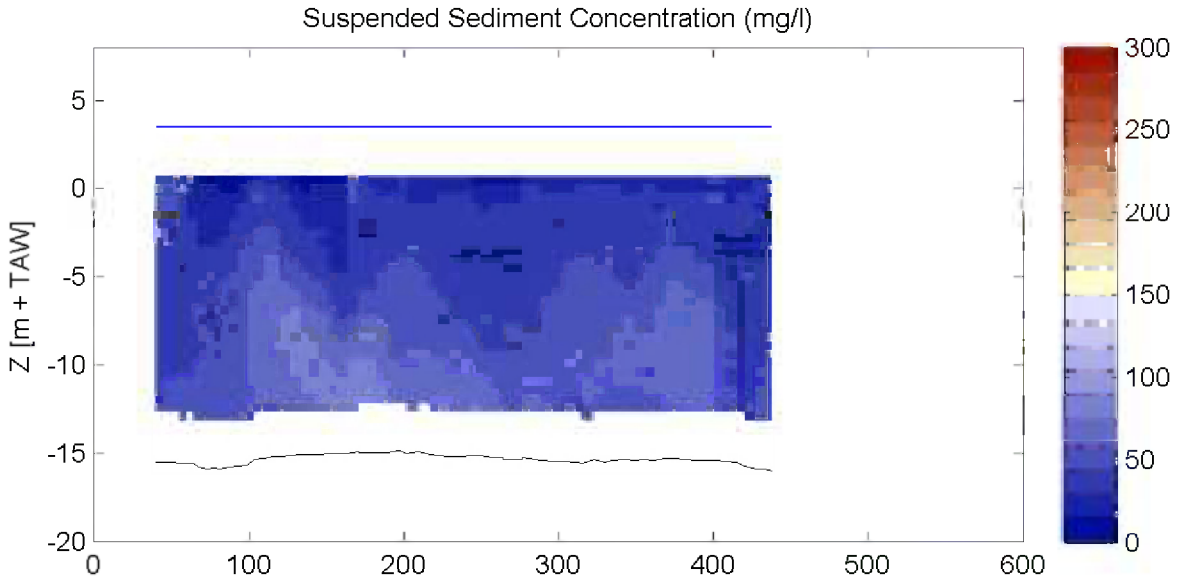
Data Processed by:

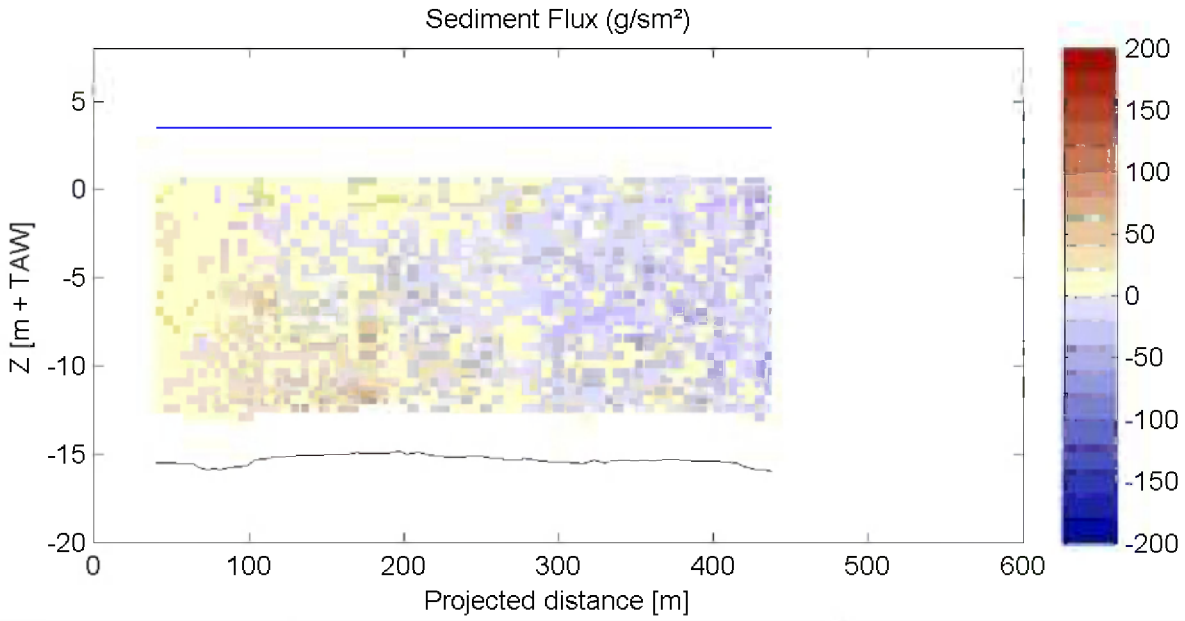
In association with :

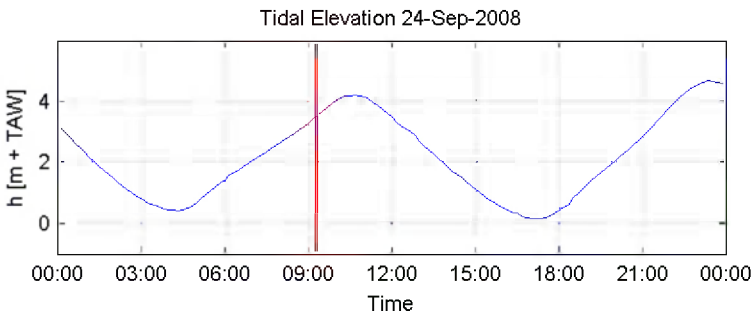
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7026dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

09:15 - 09:19

Time after HW [HH:MM]

-1:22

Data Processed by:

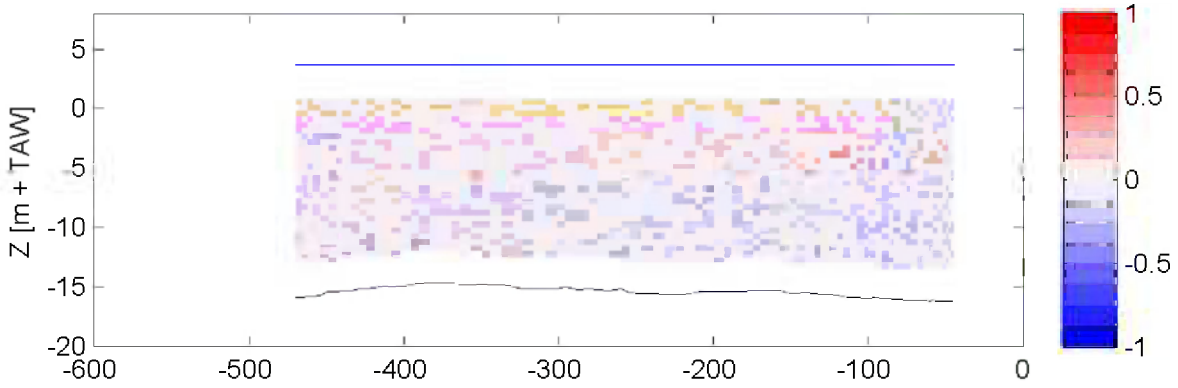
In association with :

I/RA/11283/08.083/MSA

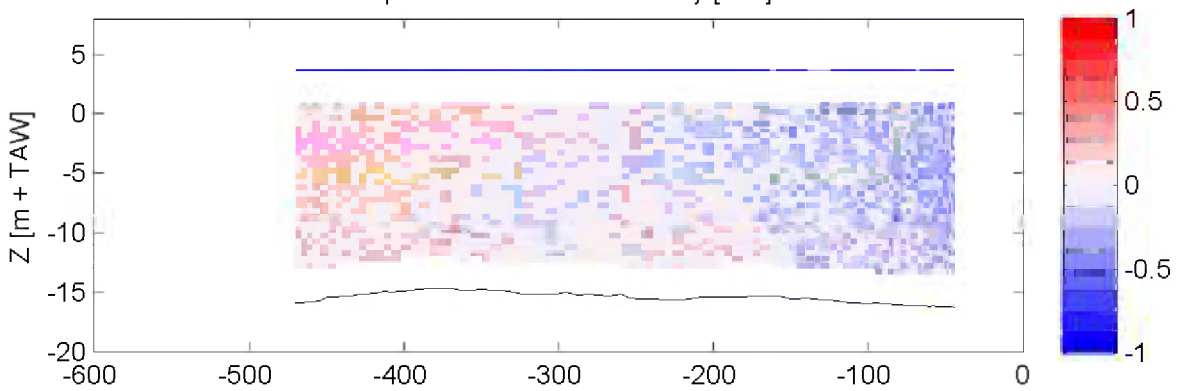
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7028dgdtrl_sub.csv	Location: Deurganckdok

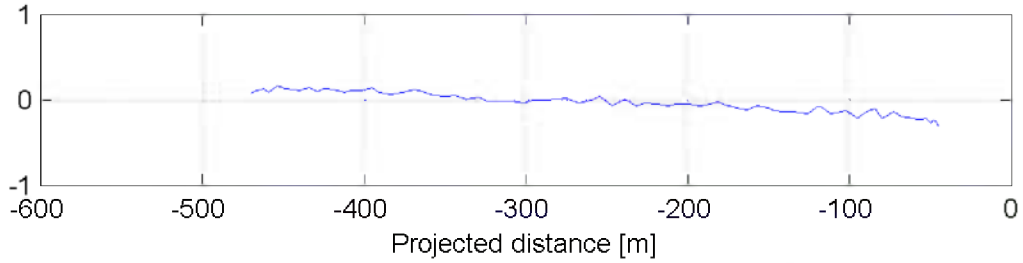
Parallel Current Velocity [m/s]



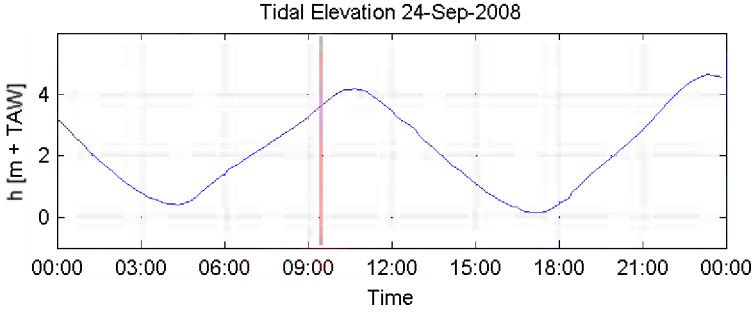
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

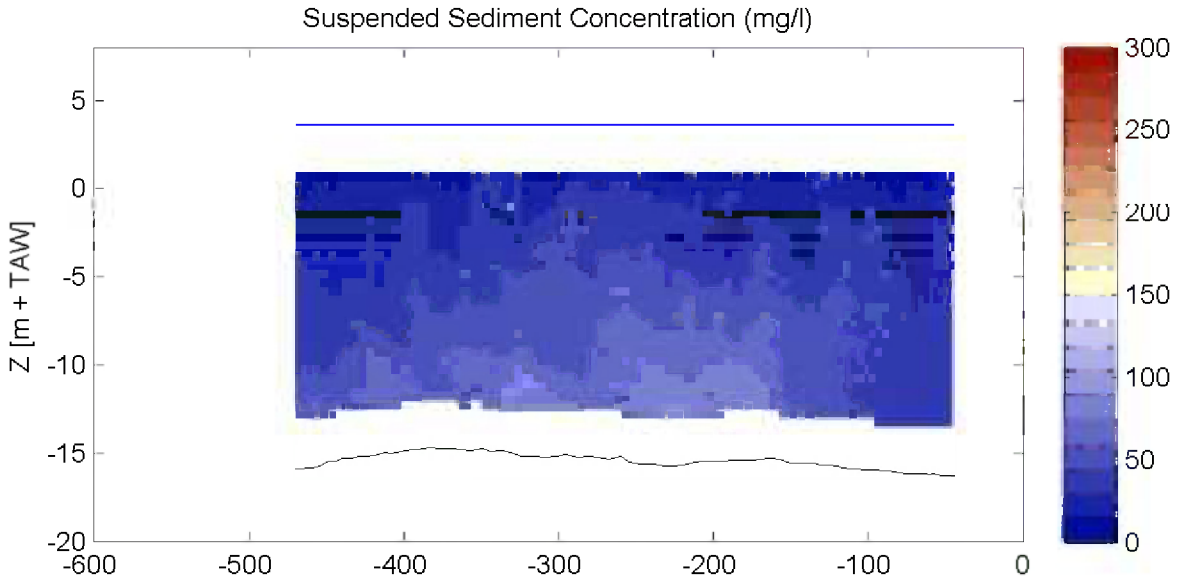
Date / Time [MET] :
24-Sep-2008
09:26 - 09:29

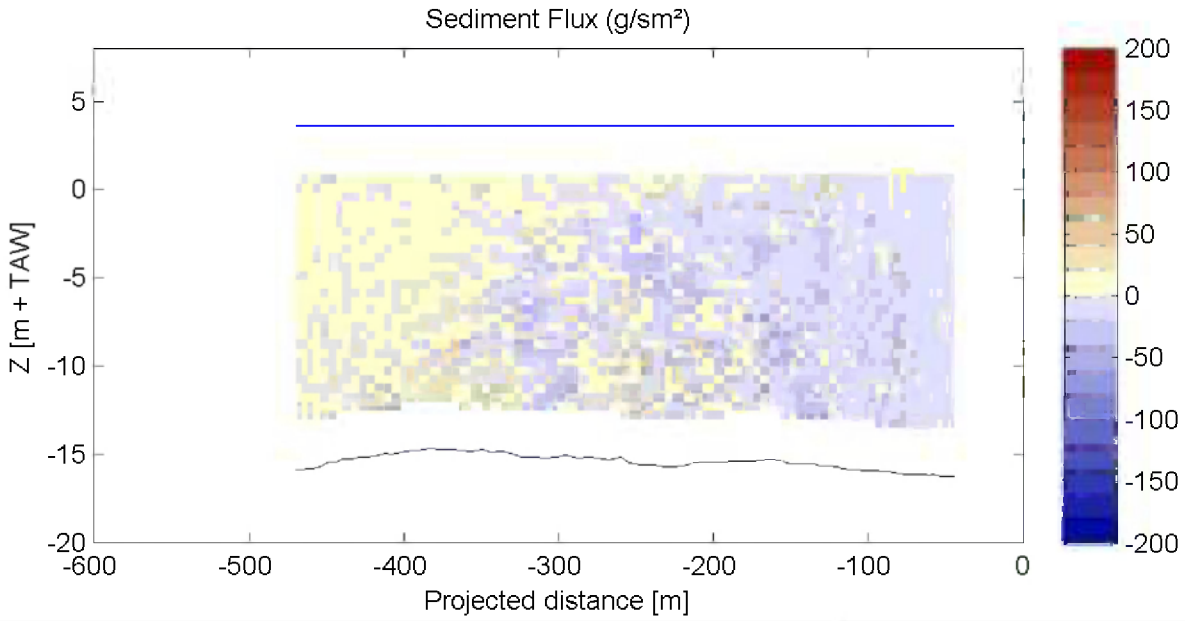
Time after HW [HH:MM]
-1:11

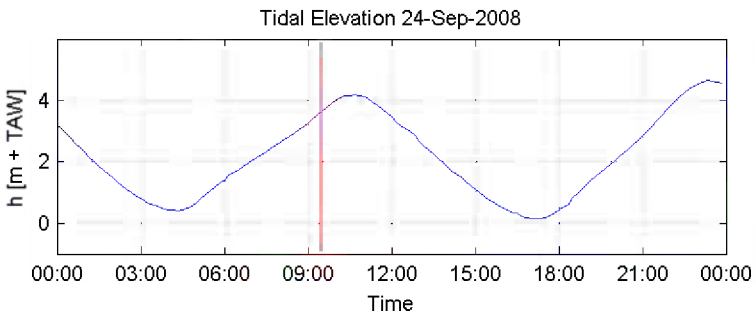
Data Processed by:
In association with :
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7028dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

09:26 - 09:29

Time after HW [HH:MM]

-1:11

Data Processed by:

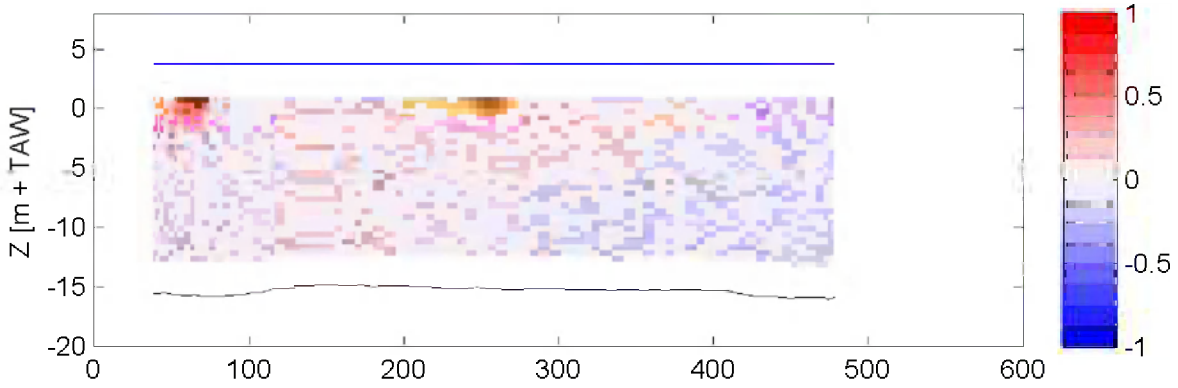
In association with :

I/RA/11283/08.083/MSA

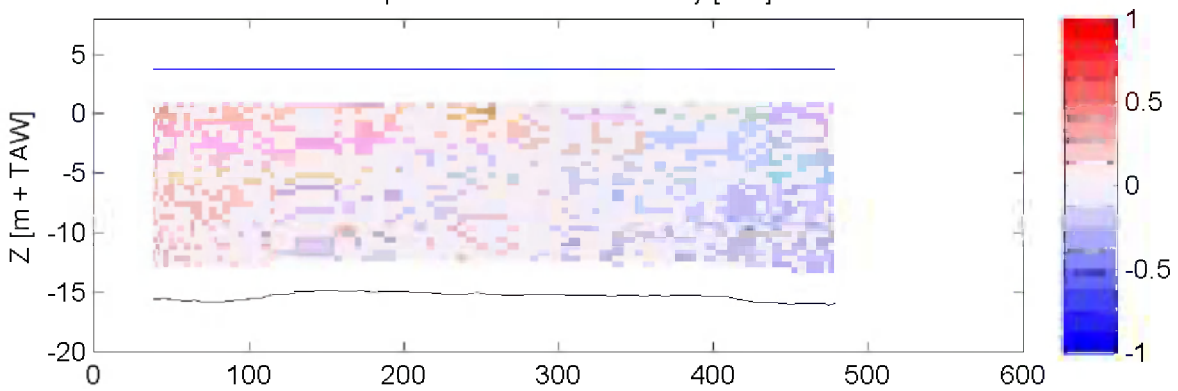
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7030dgdtlr_sub.csv	Location: Deurganckdok

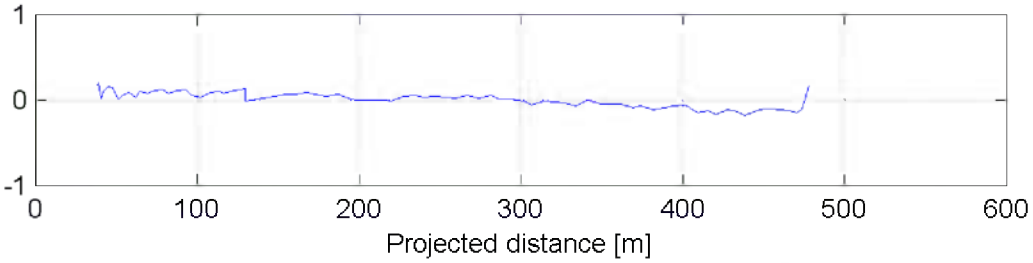
Parallel Current Velocity [m/s]



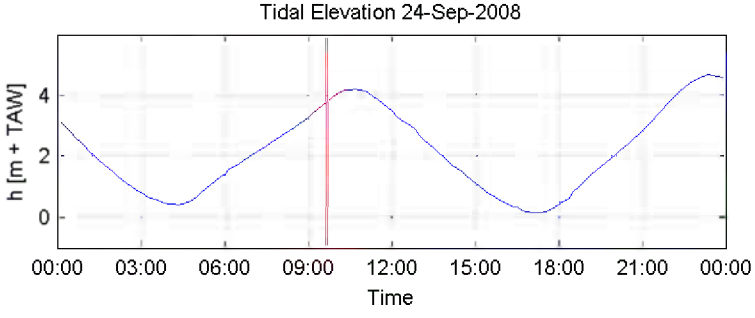
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

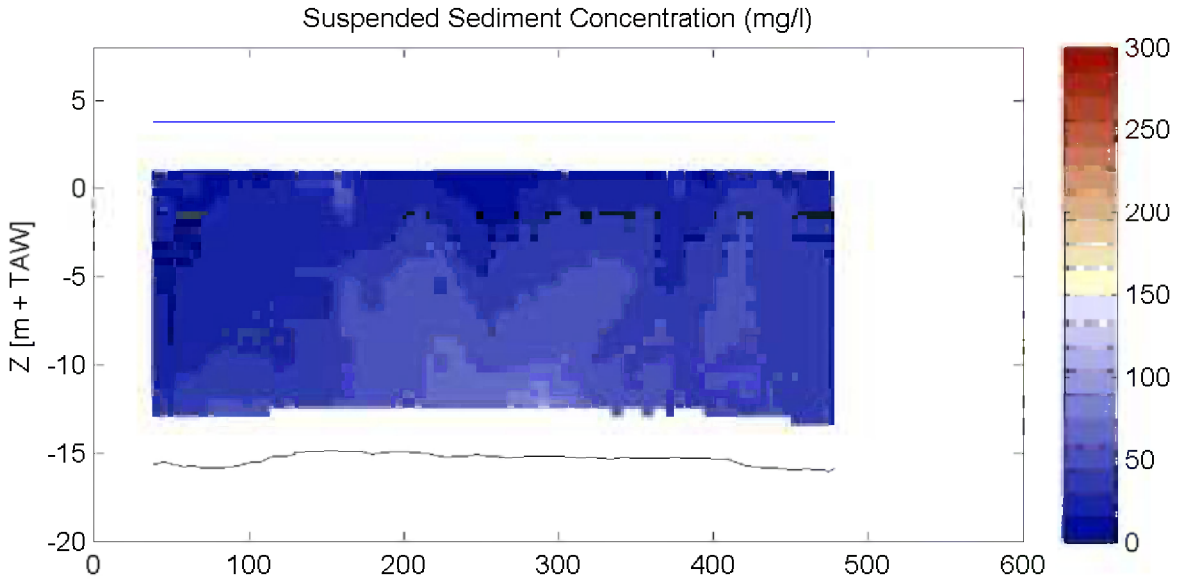
Date / Time [MET] :
24-Sep-2008
09:38 - 09:41

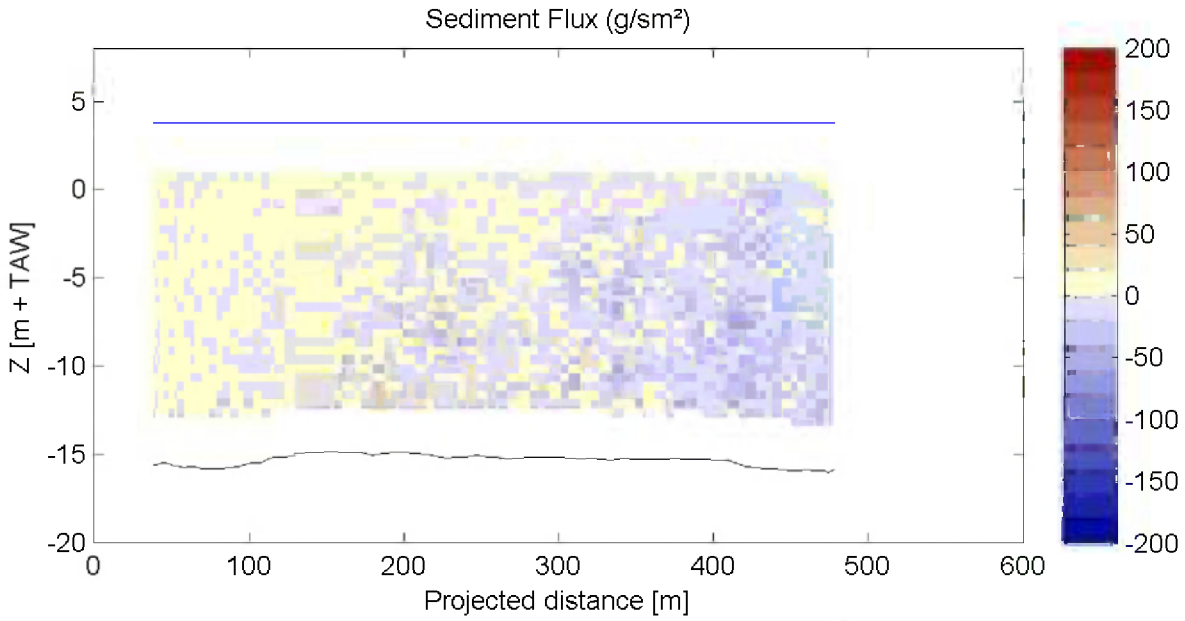
Time after HW [HH:MM]
-1:00

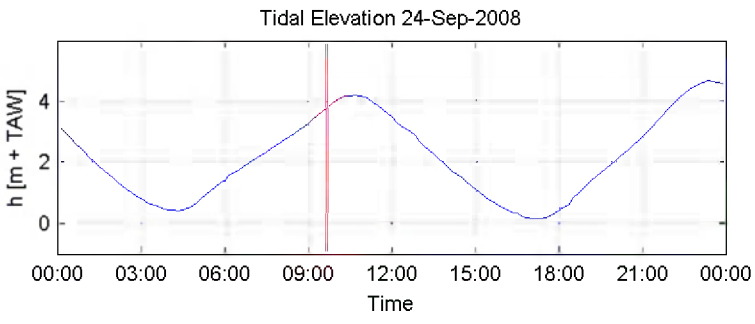
Data Processed by:
In association with :
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7030dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

09:38 - 09:41

Time after HW [HH:MM]

-1:00

Data Processed by:

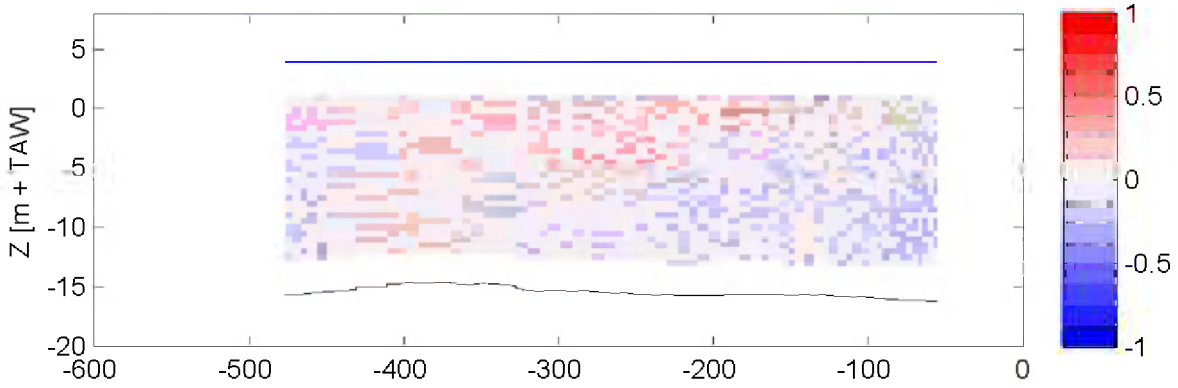
In association with :

I/RA/11283/08.083/MSA

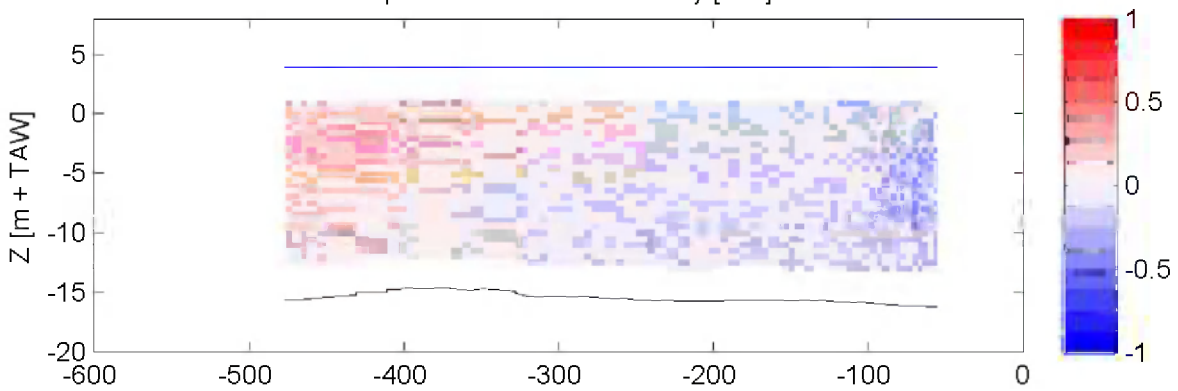
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7032dgdtrl_sub.csv	Location: Deurganckdok

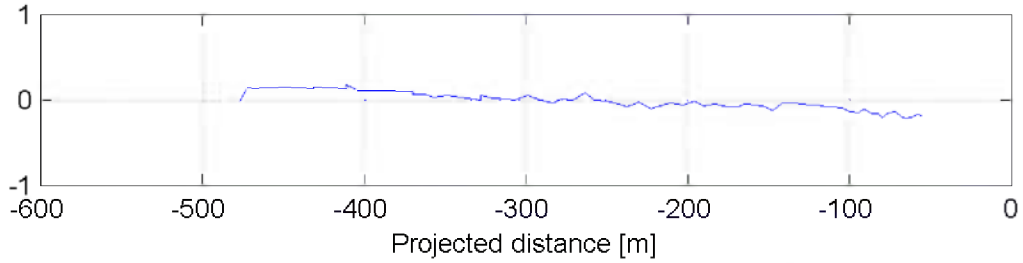
Parallel Current Velocity [m/s]



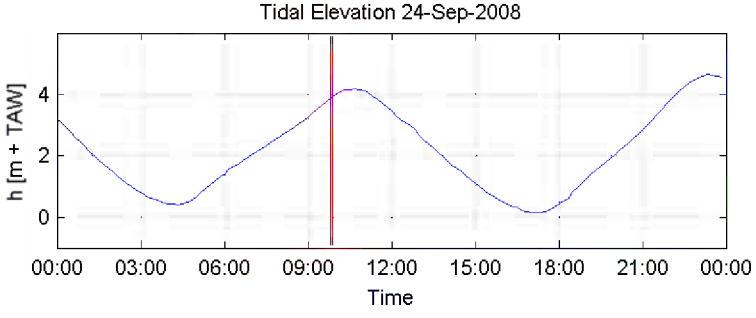
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

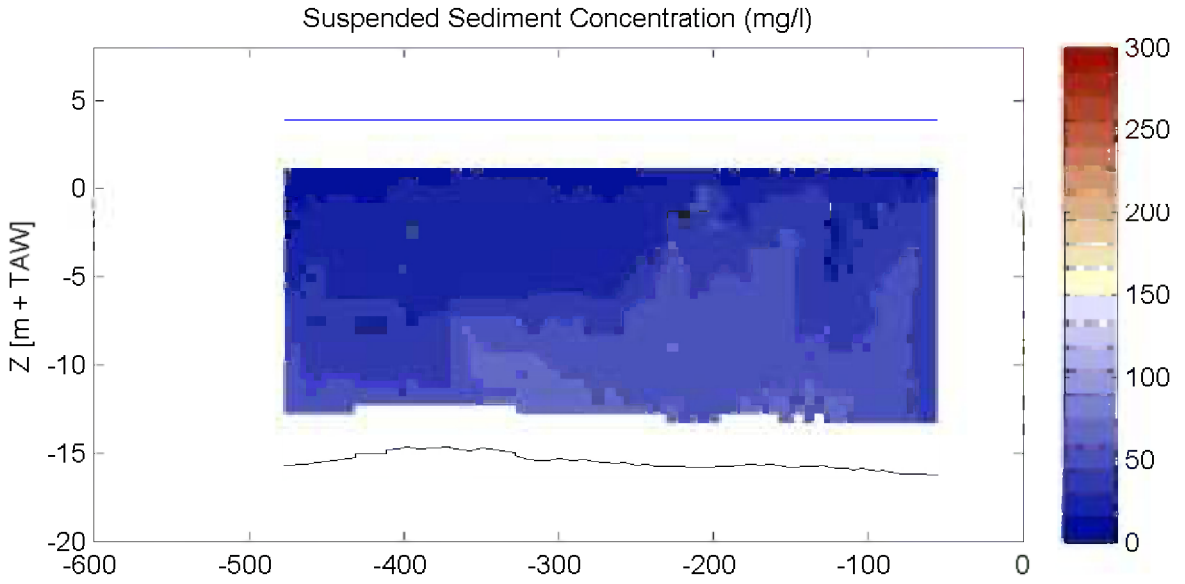
Date / Time [MET] :
24-Sep-2008
09:49 - 09:52

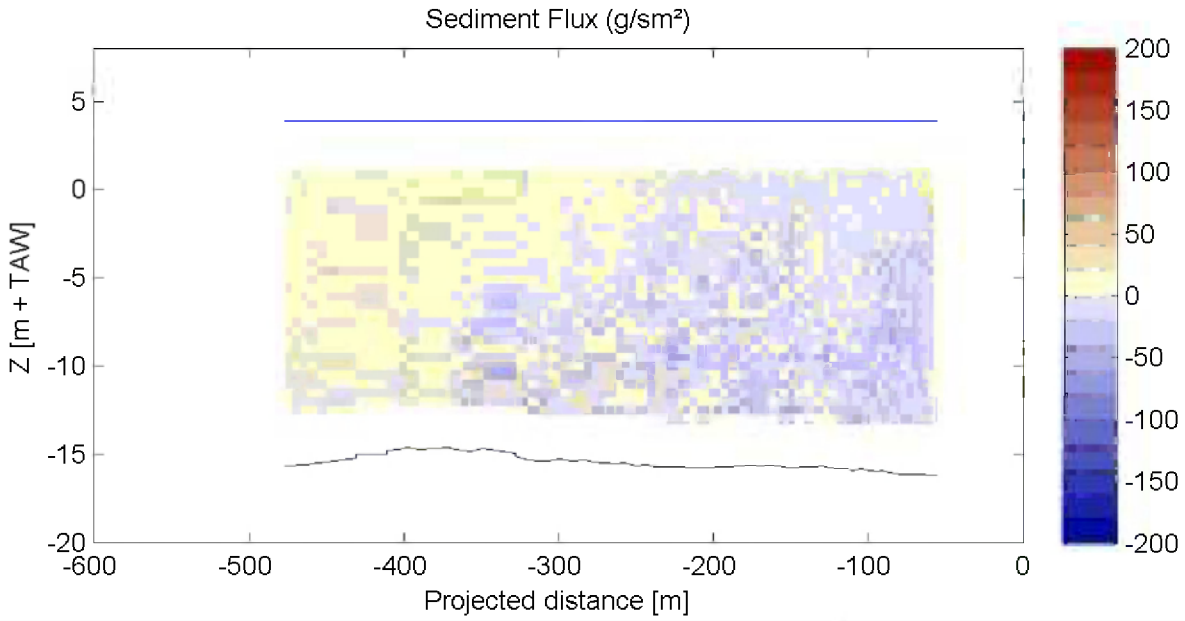
Time after HW [HH:MM]
-0:48

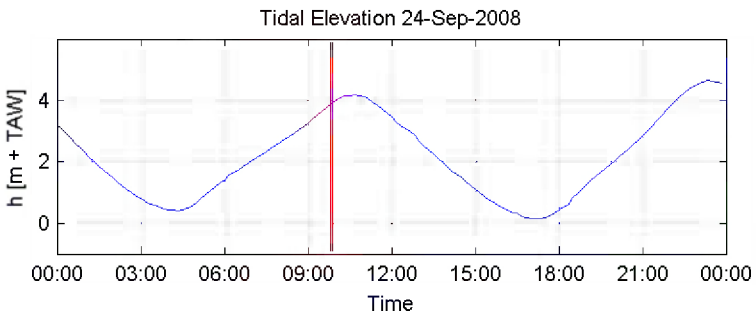
Data Processed by:
In association with :
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7032dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

09:49 - 09:52

Time after HW [HH:MM]

-0:48

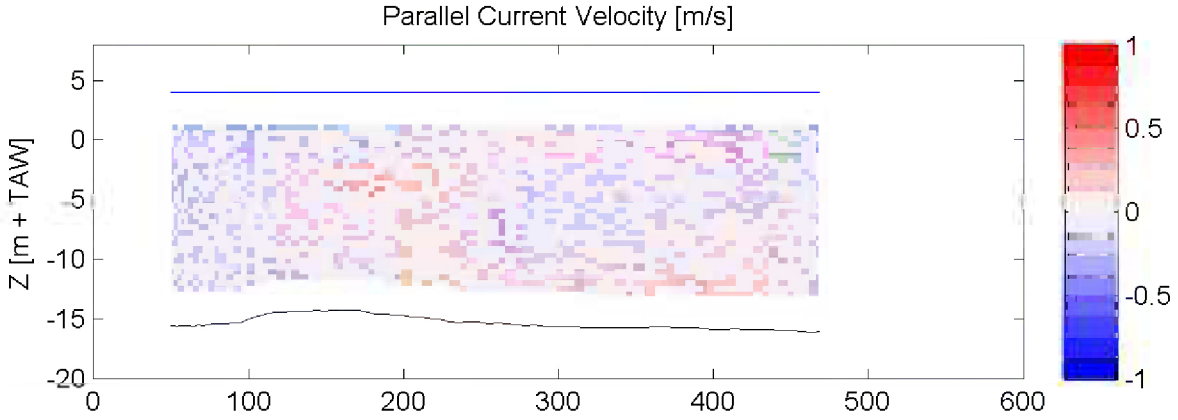
Data Processed by:

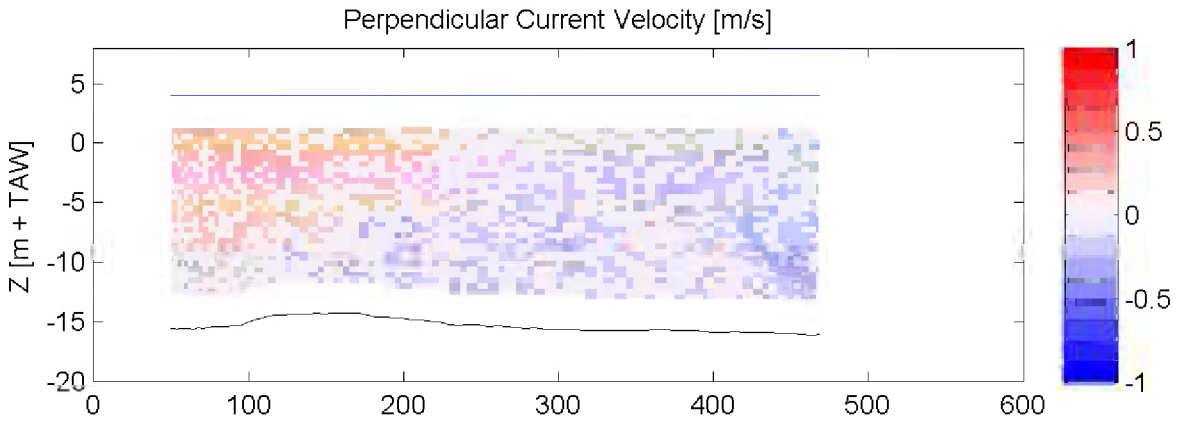
In association with :

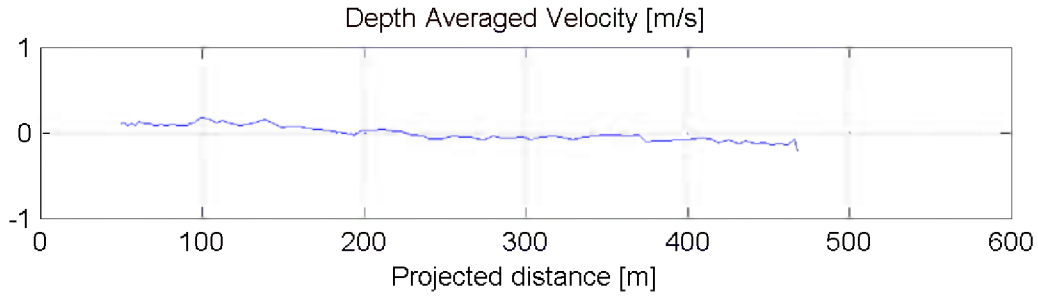
I/RA/11283/08.083/MSA

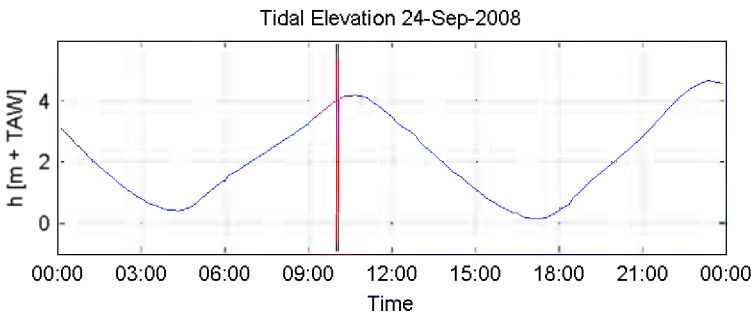
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7034dgdtlr_sub.csv	Location: Deurganckdok









HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

10:01 - 10:04

Time after HW [HH:MM]

-0:37

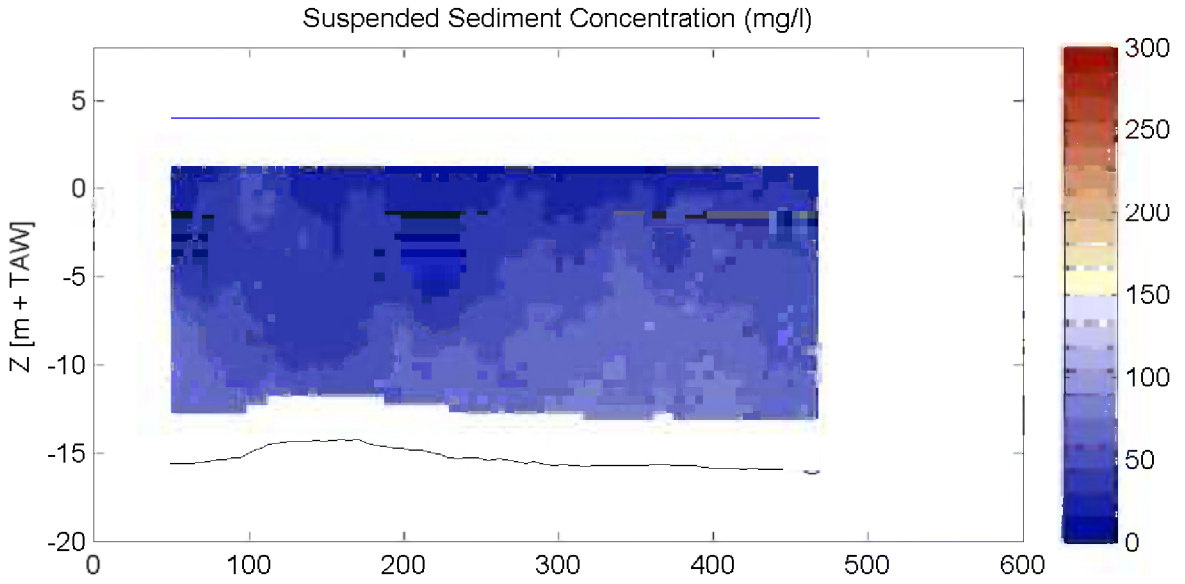
Data Processed by:

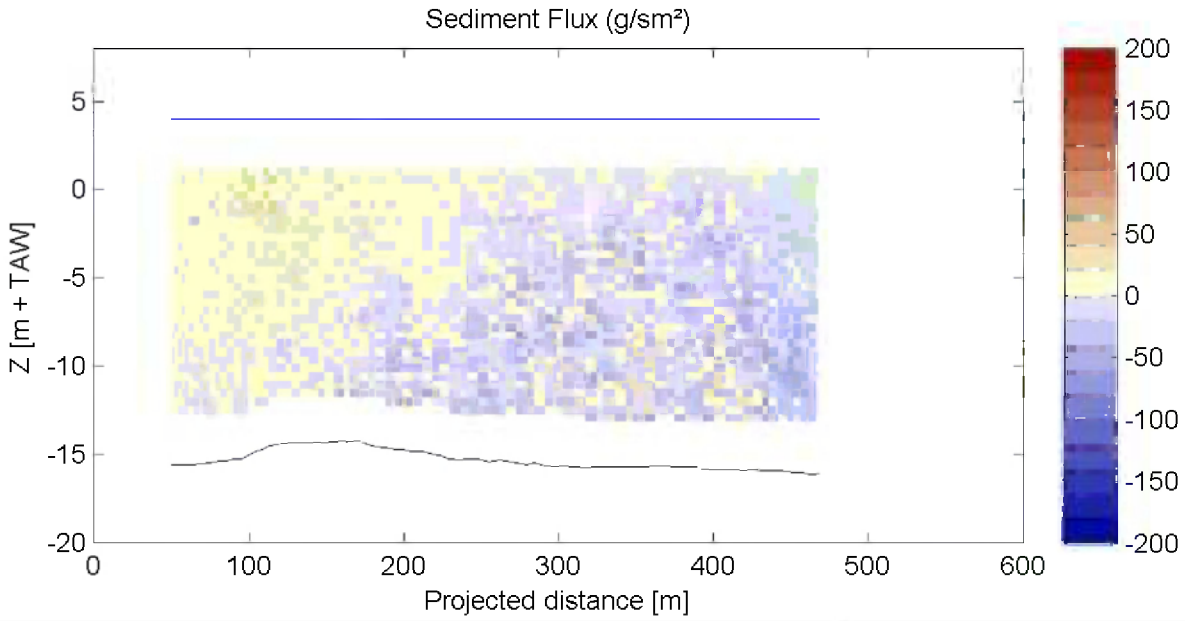
In association with :

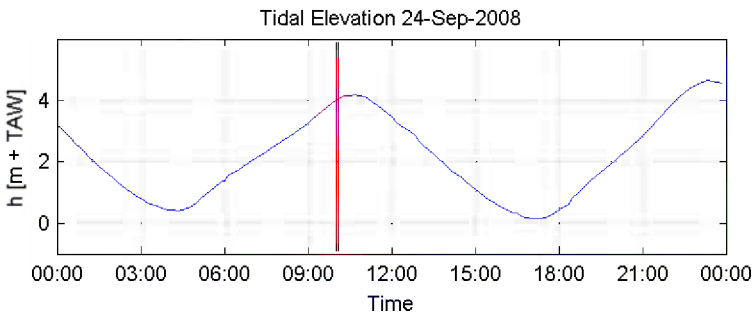
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7034dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

10:01 - 10:04

Time after HW [HH:MM]

-0:37

Data Processed by:

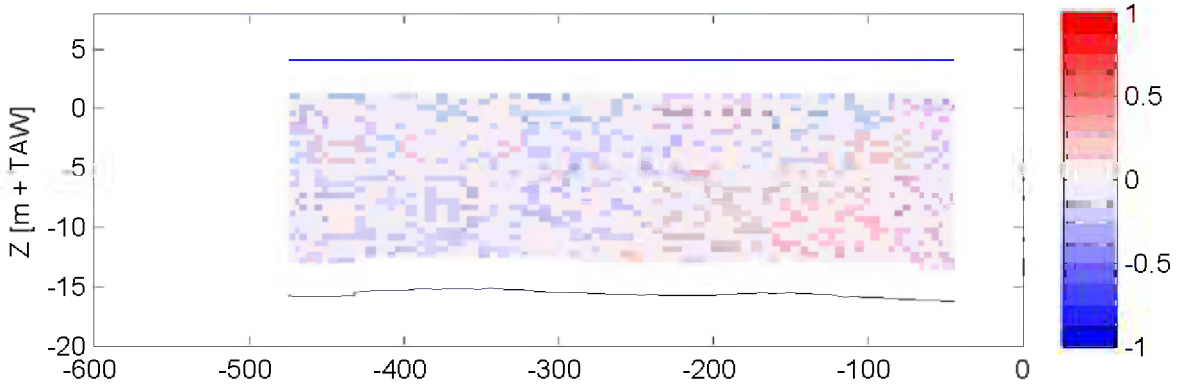
In association with :

I/RA/11283/08.083/MSA

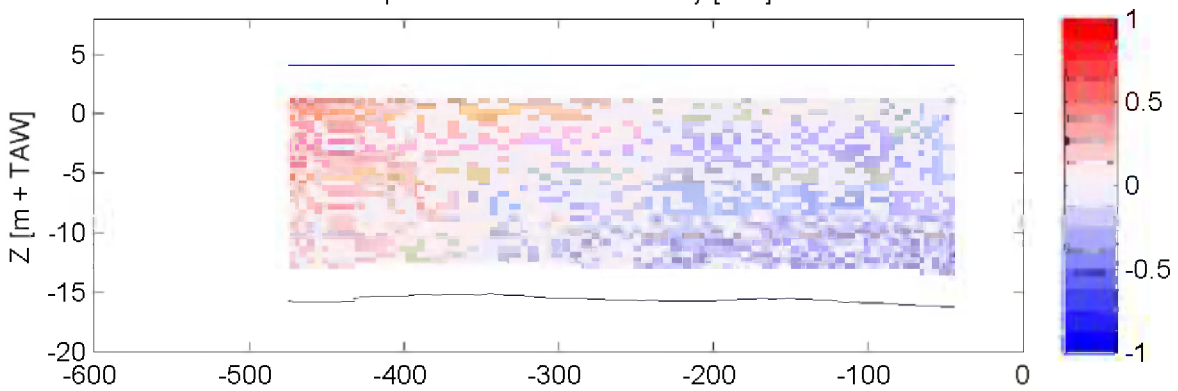
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7036dgdtrl_sub.csv	Location: Deurganckdok

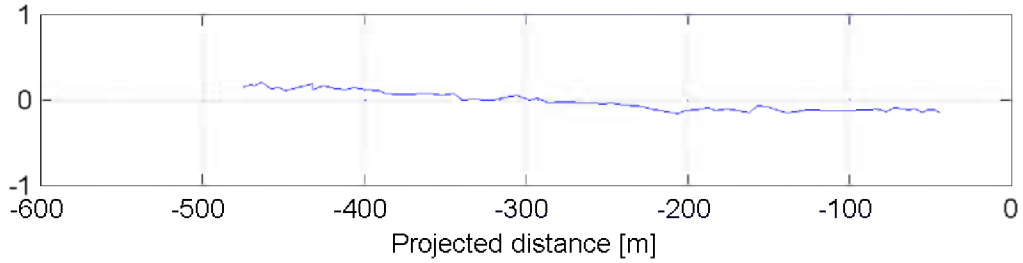
Parallel Current Velocity [m/s]



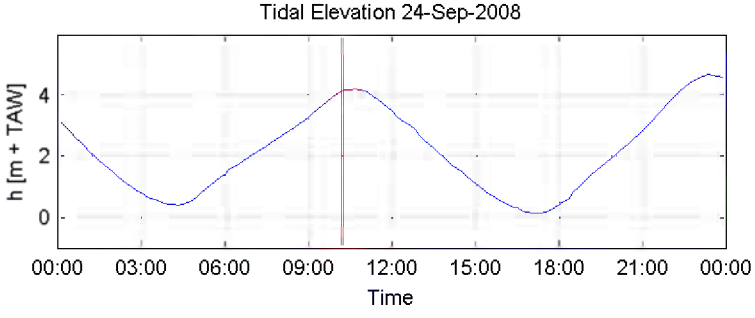
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

10:11 - 10:14

Time after HW [HH:MM]

-0:27

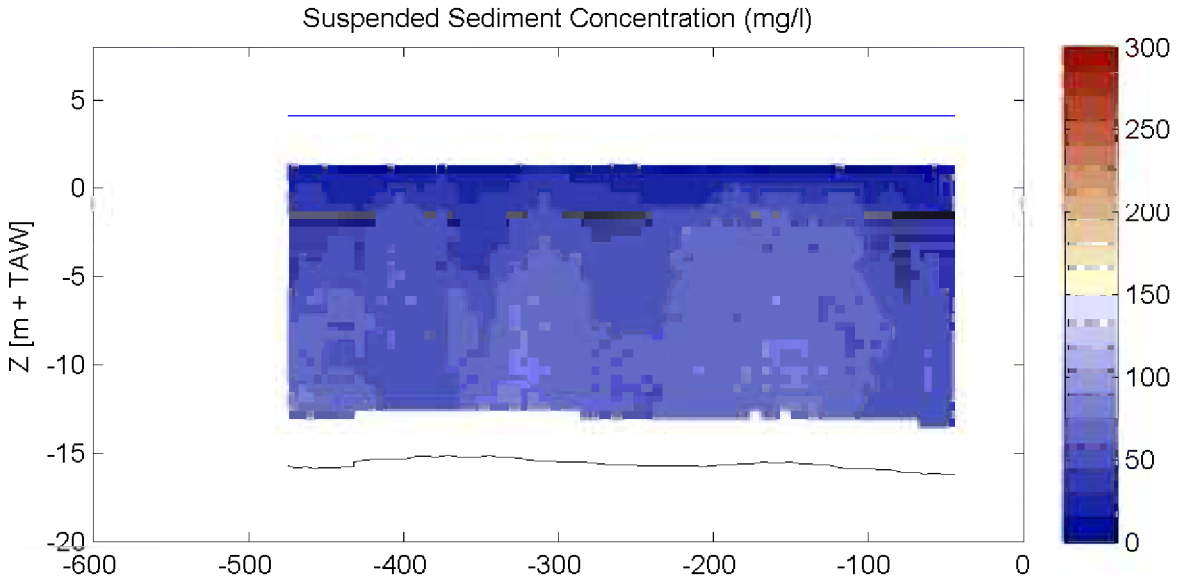
Data Processed by:

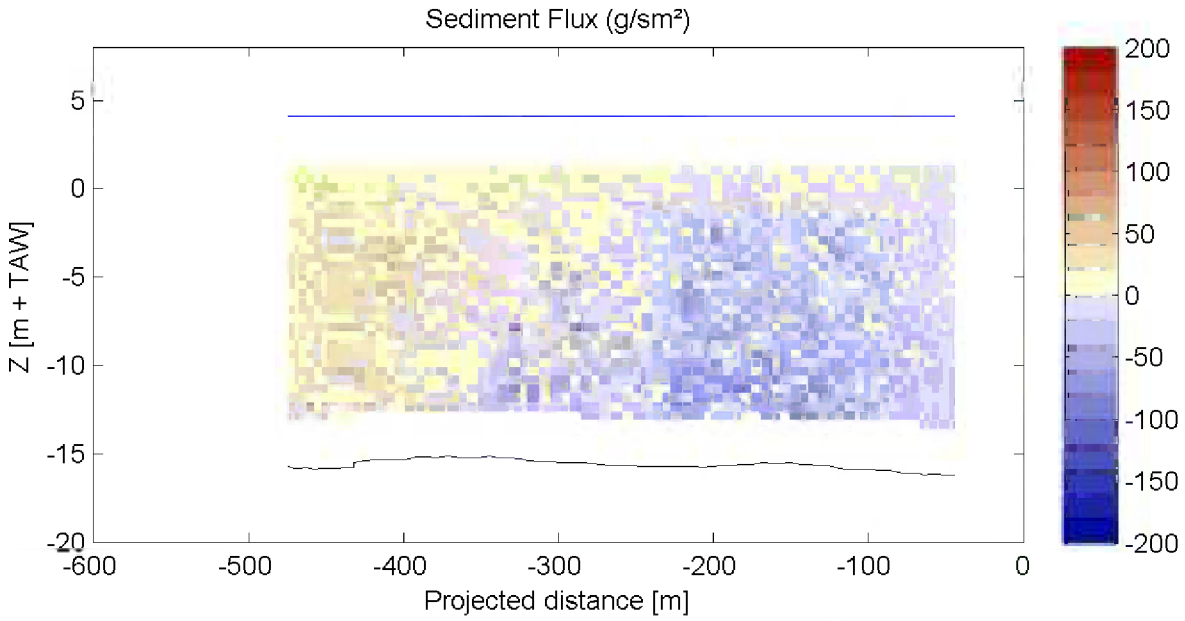
In association with :

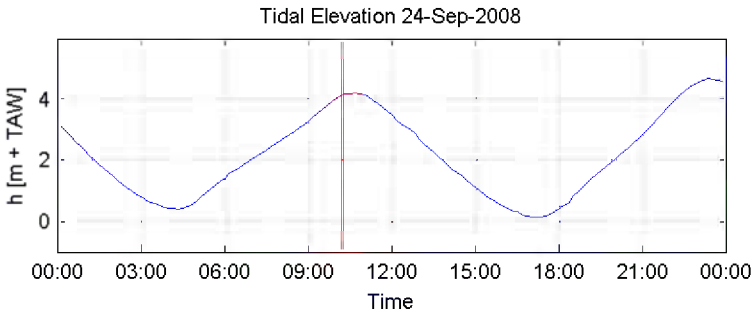
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7036dgdtrl_sub.csv	Location: Deurganckdok







HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

10:11 - 10:14

Time after HW [HH:MM]

-0:27

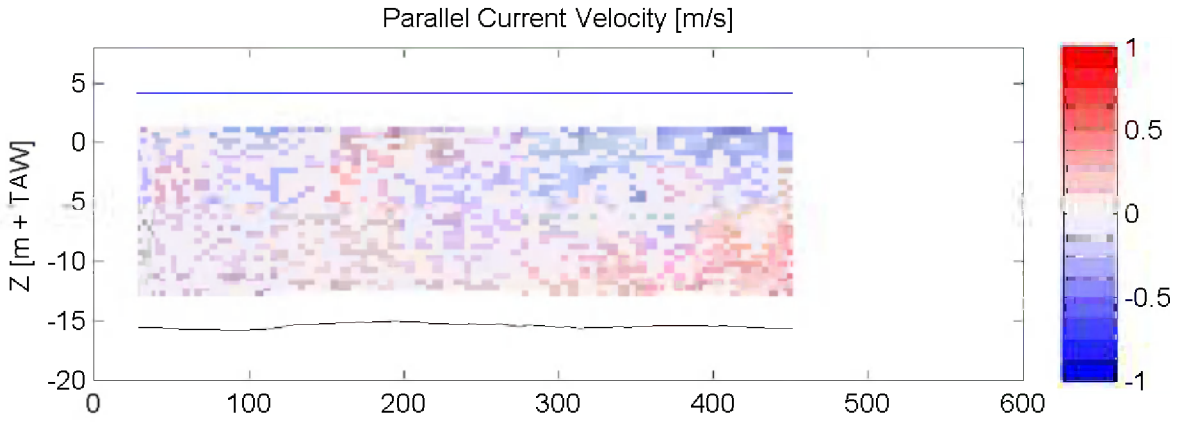
Data Processed by:

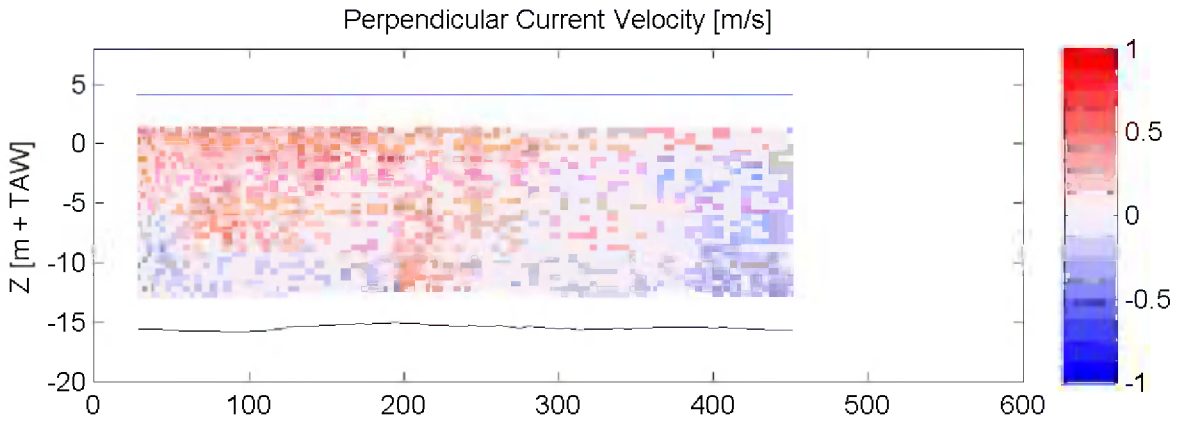
In association with :

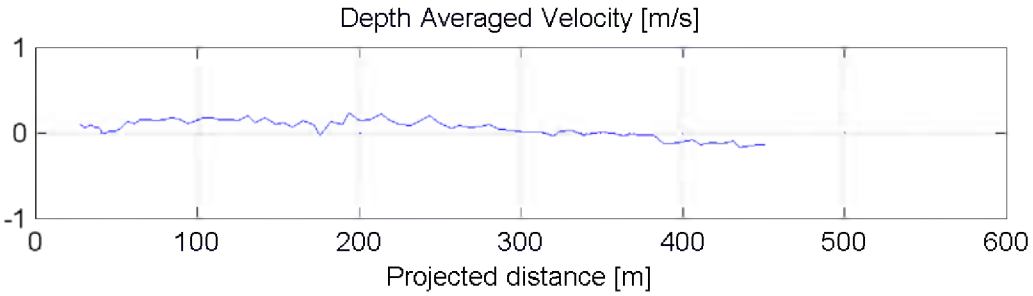
I/RA/11283/08.083/MSA

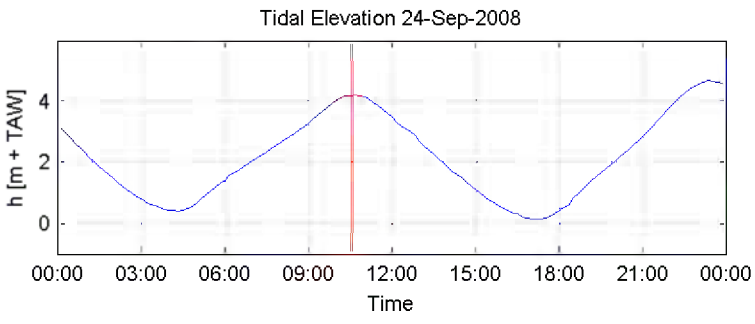
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7038dgdtlr_sub.csv	Location: Deurganckdok









HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

10:31 - 10:35

Time after HW [HH:MM]

-0:06

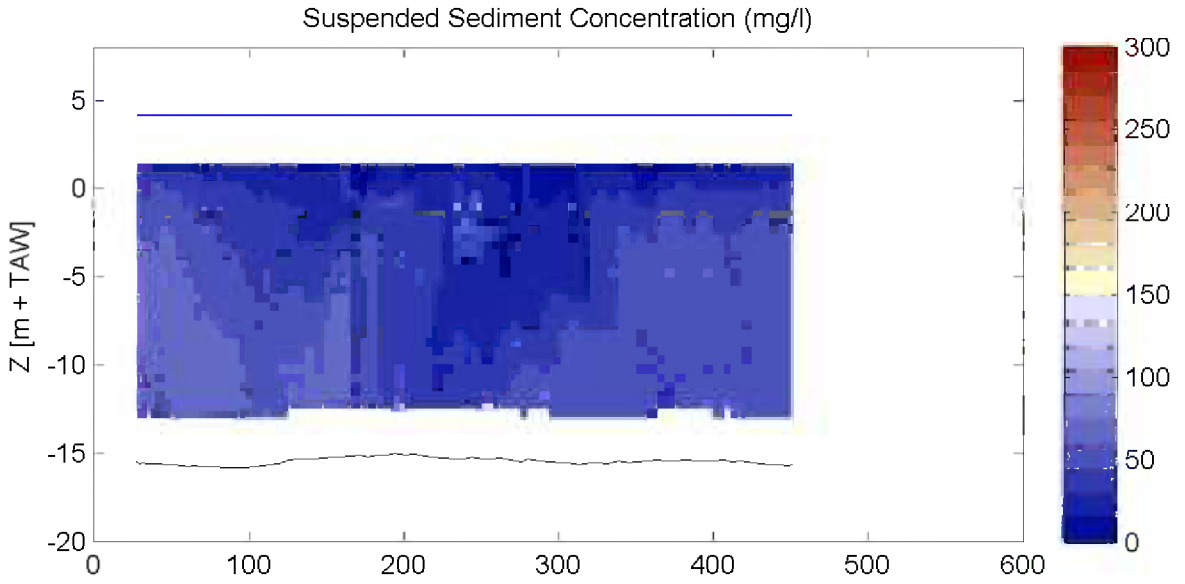
Data Processed by:

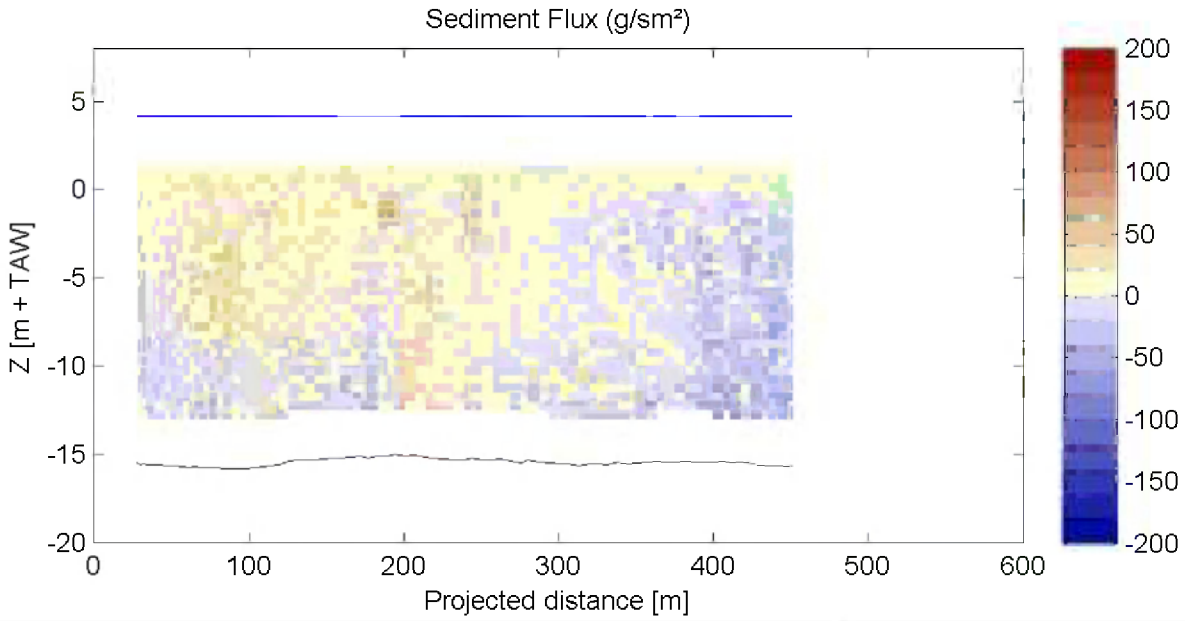
In association with :

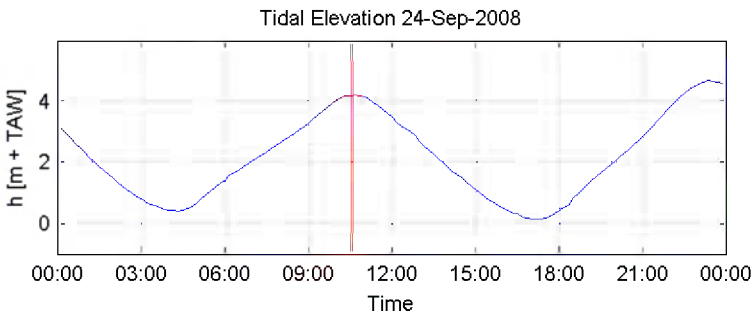
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7038dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

10:31 - 10:35

Time after HW [HH:MM]

-0:06

Data Processed by:

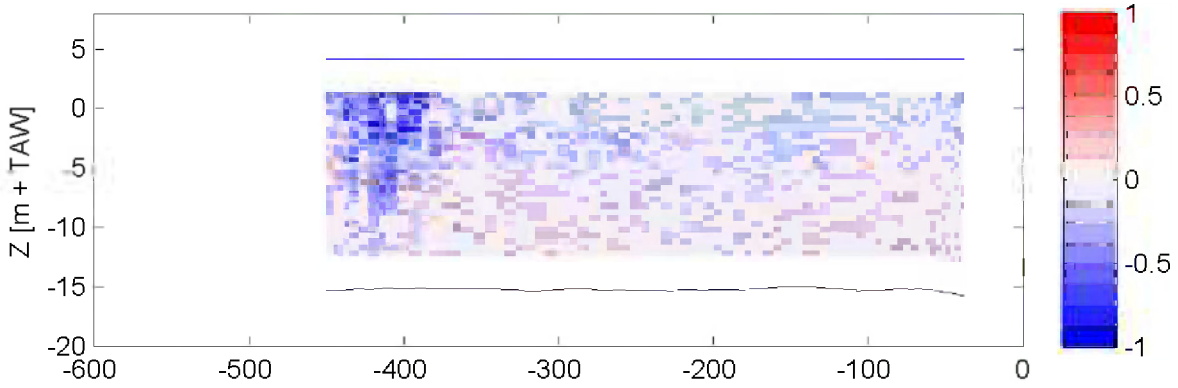
In association with :

I/RA/11283/08.083/MSA

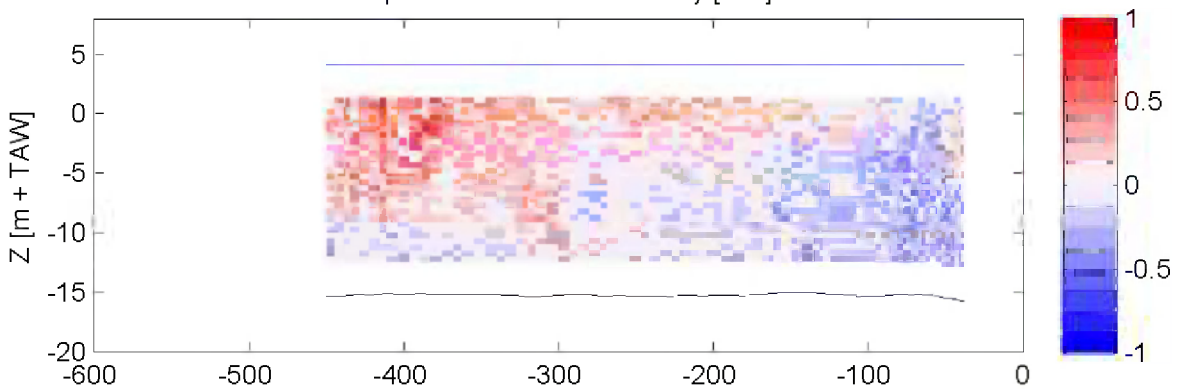
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7040dgdtrl_sub.csv	Location: Deurganckdok

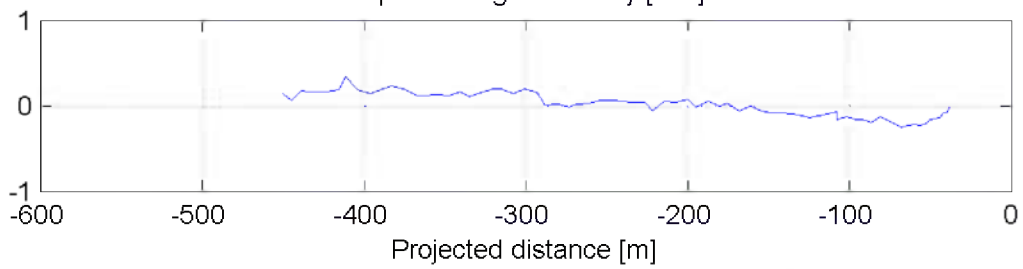
Parallel Current Velocity [m/s]



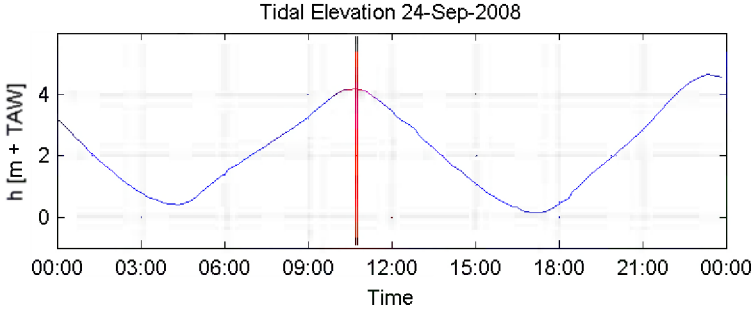
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

10:42 - 10:45

Time after HW [HH:MM]

0:04

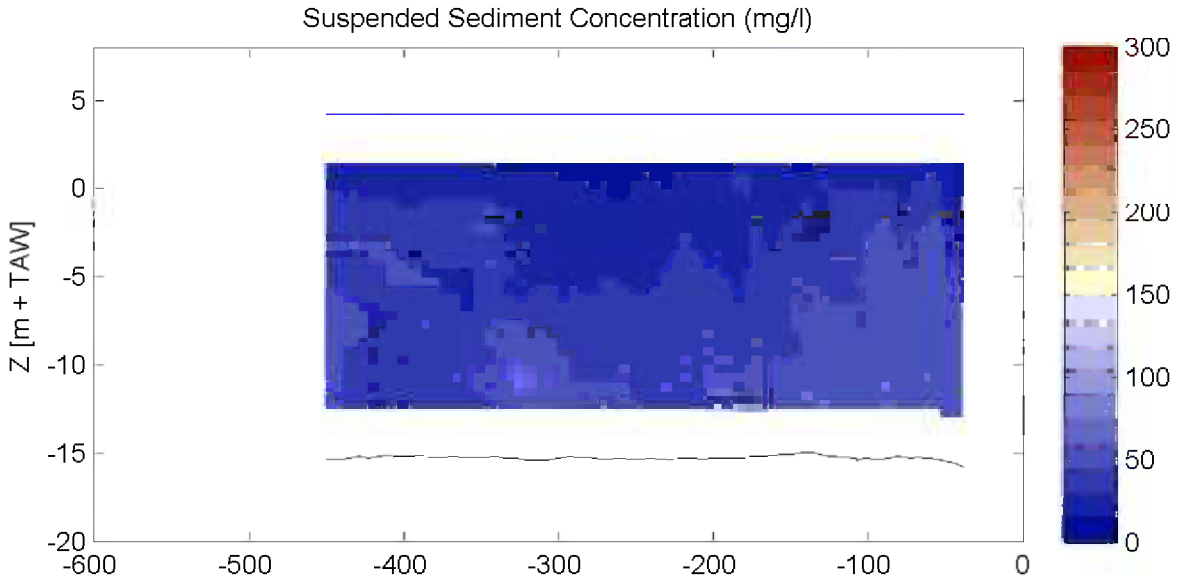
Data Processed by:

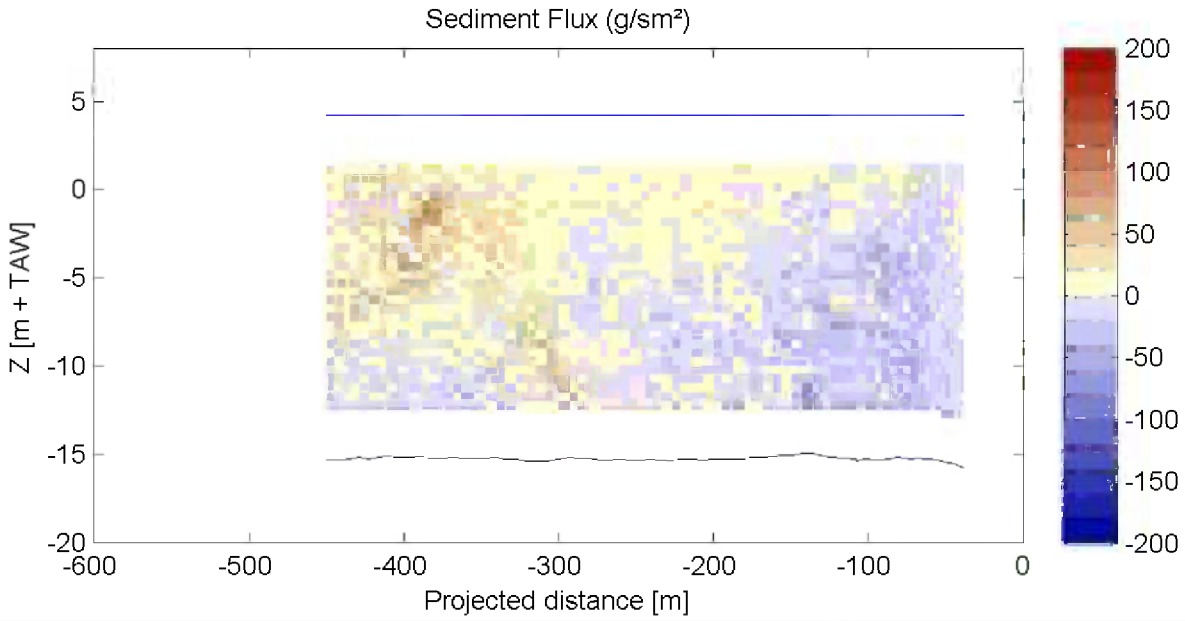
In association with :

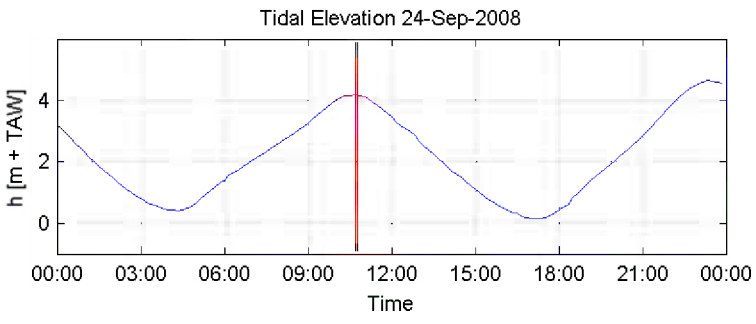
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7040dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

10:42 - 10:45

Time after HW [HH:MM]

0:04

Data Processed by:

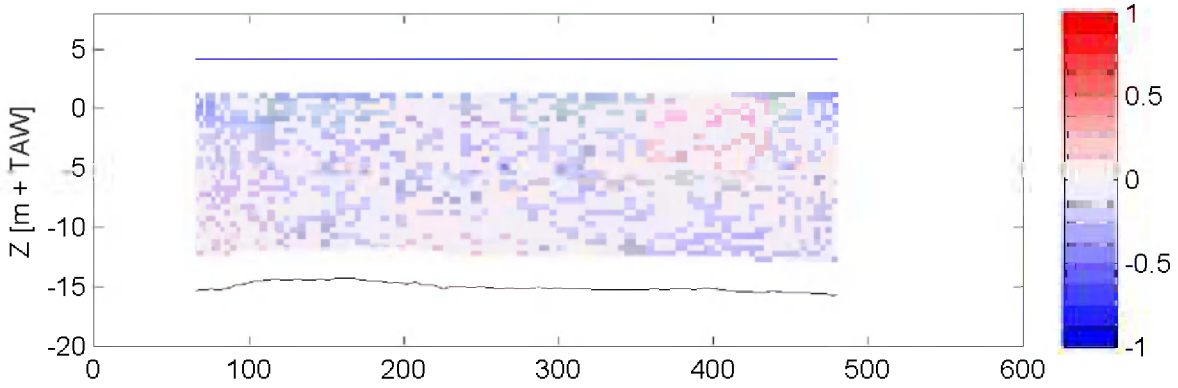
In association with :

I/RA/11283/08.083/MSA

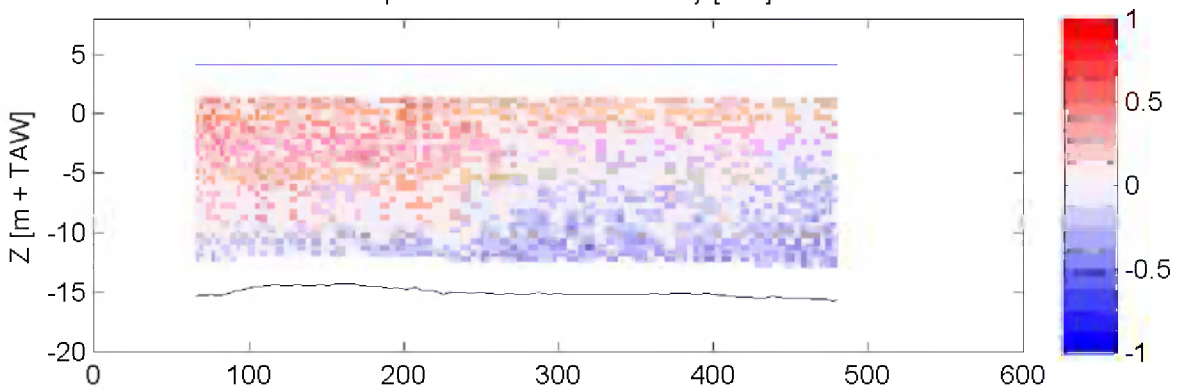
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7042dgdtlr_sub.csv	Location: Deurganckdok

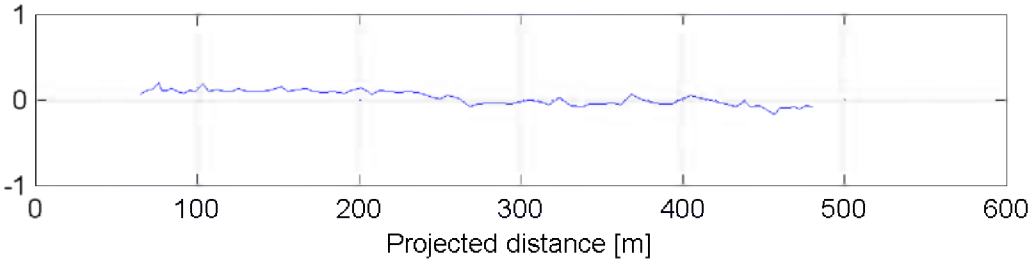
Parallel Current Velocity [m/s]



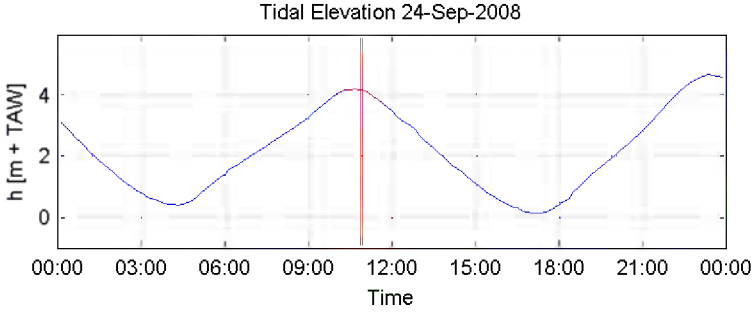
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

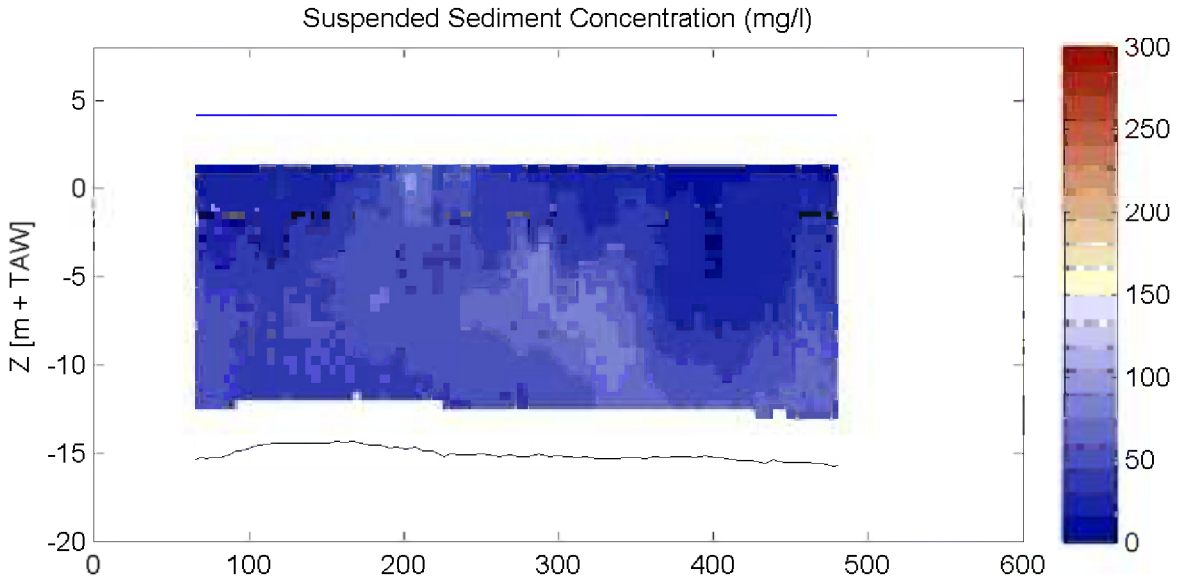
Date / Time [MET] :
24-Sep-2008
10:52 - 10:56

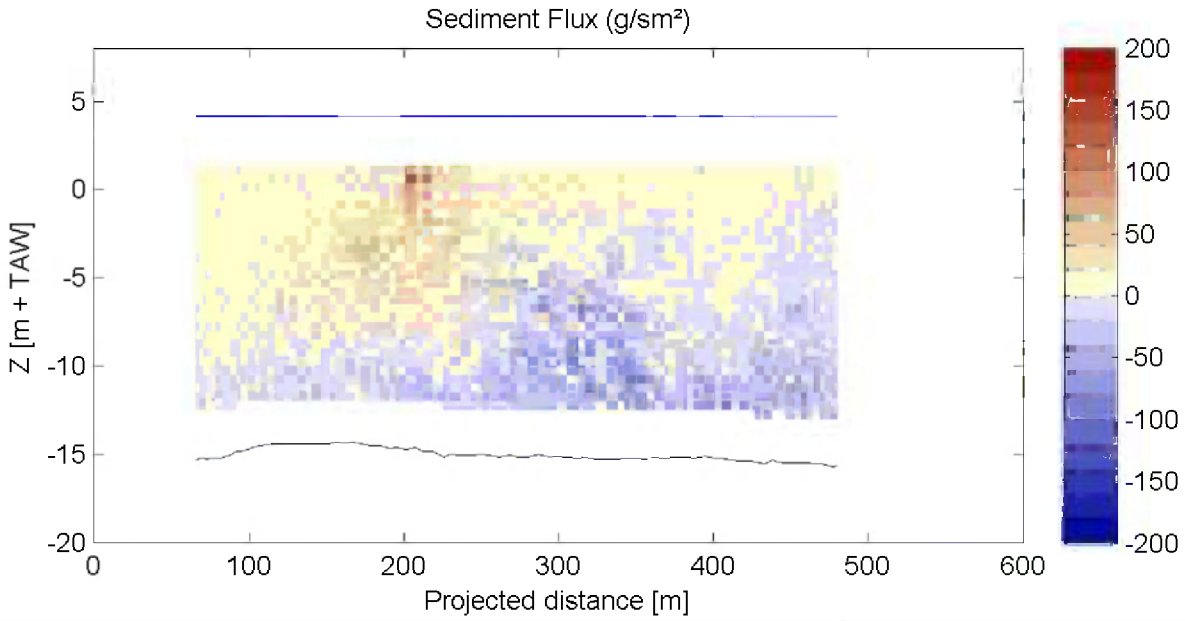
Time after HW [HH:MM]
0:14

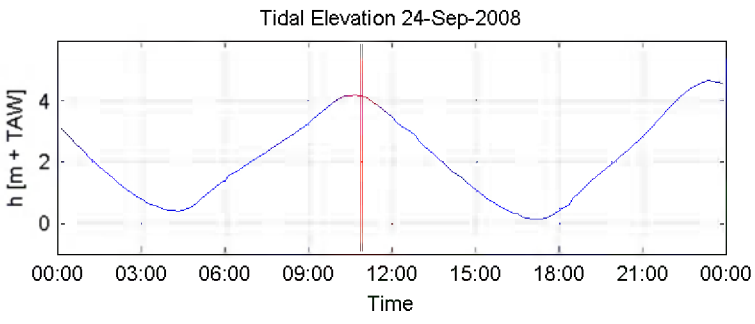
Data Processed by:
In association with :
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7042dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

10:52 - 10:56

Time after HW [HH:MM]

0:14

Data Processed by:

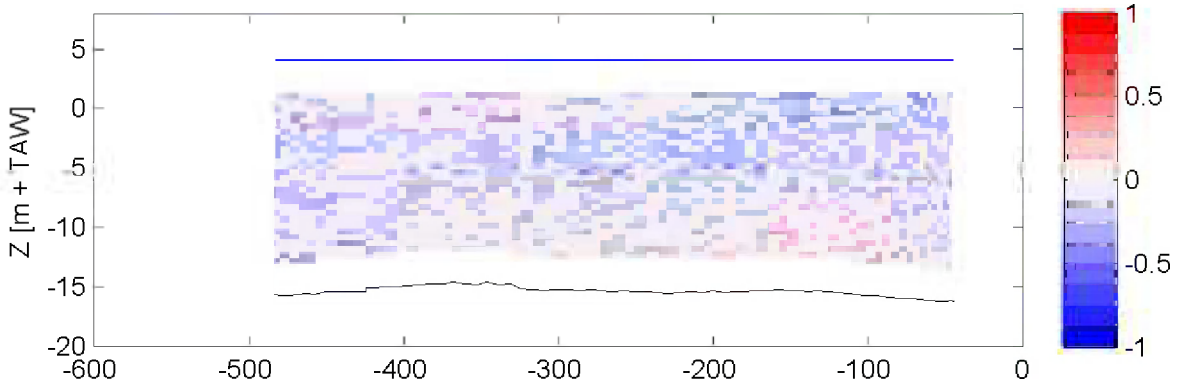
In association with :

I/RA/11283/08.083/MSA

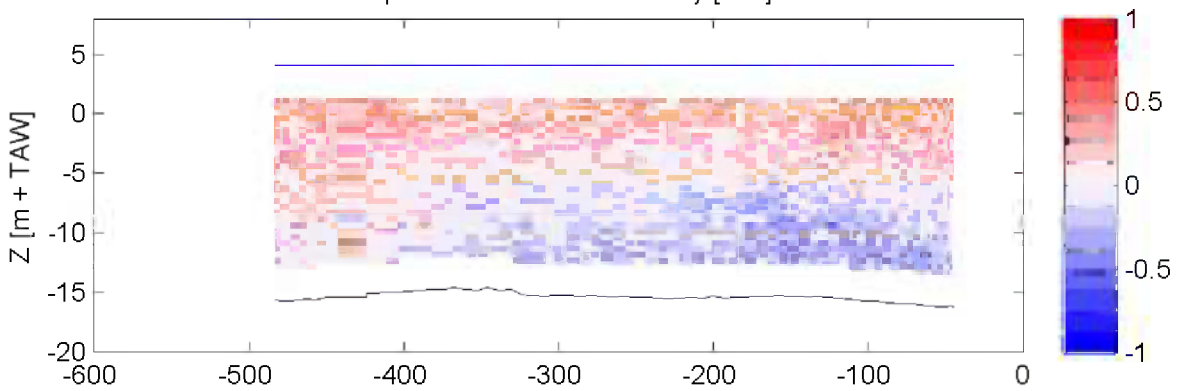
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7044dgdtrl_sub.csv	Location: Deurganckdok

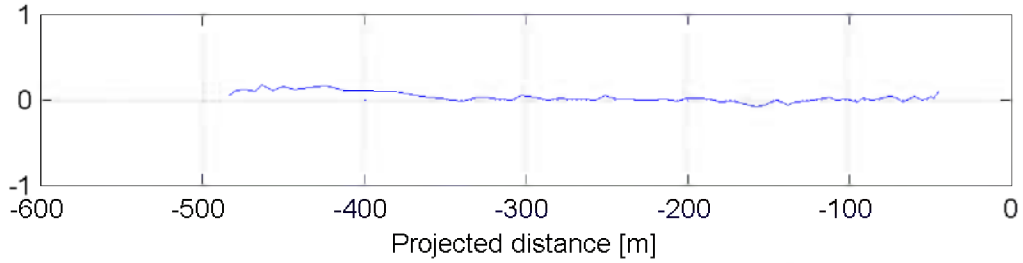
Parallel Current Velocity [m/s]



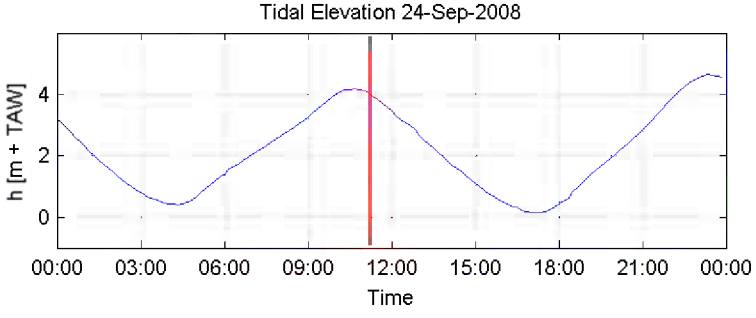
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

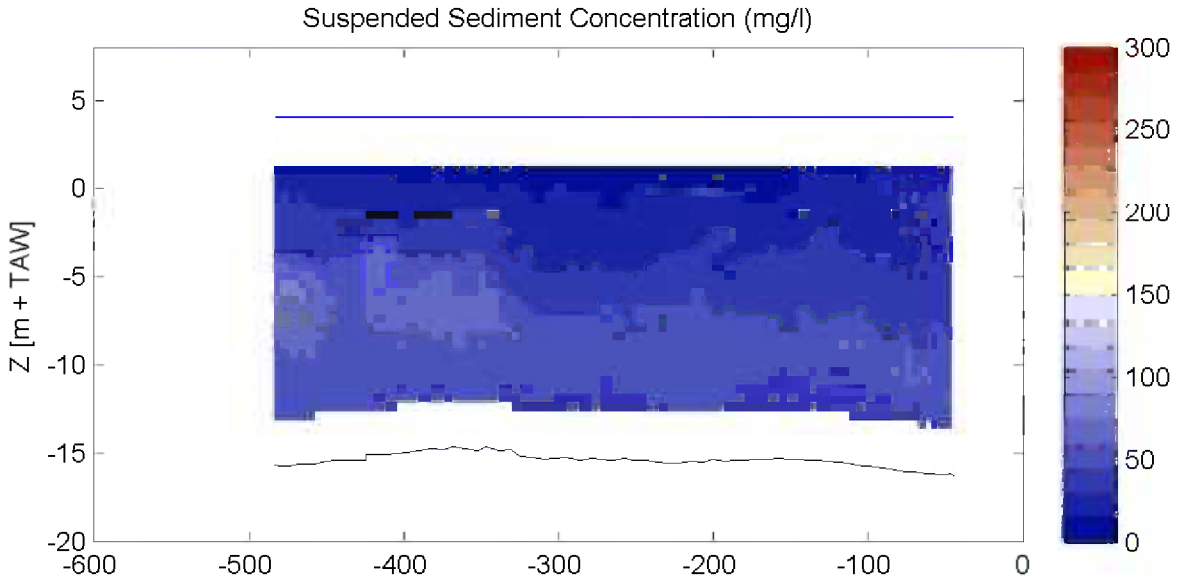
Date / Time [MET] :
24-Sep-2008
11:11 - 11:14

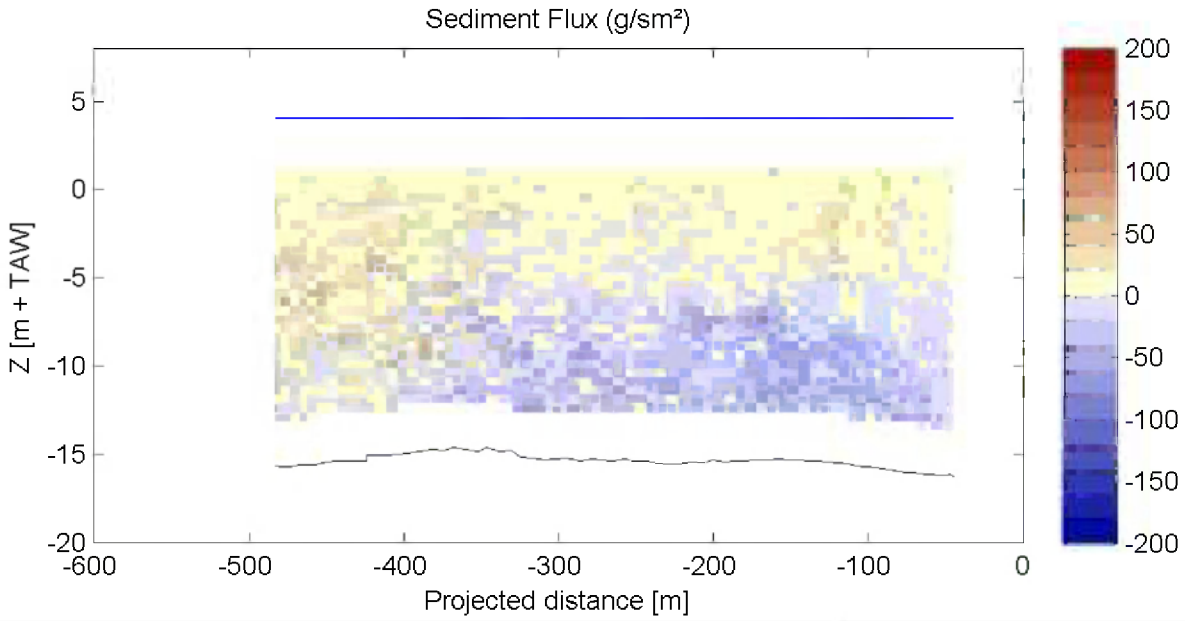
Time after HW [HH:MM]
0:32

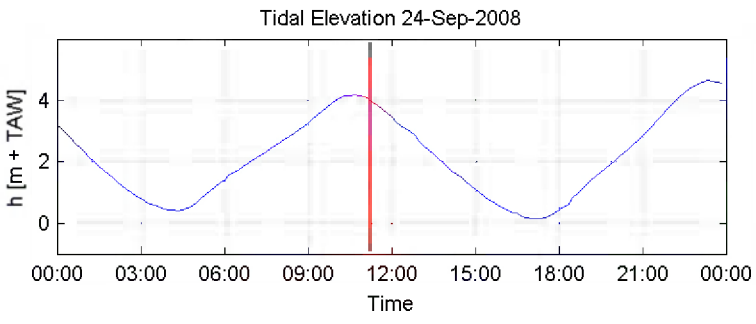
Data Processed by:
In association with :
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7044dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

11:11 - 11:14

Time after HW [HH:MM]

0:32

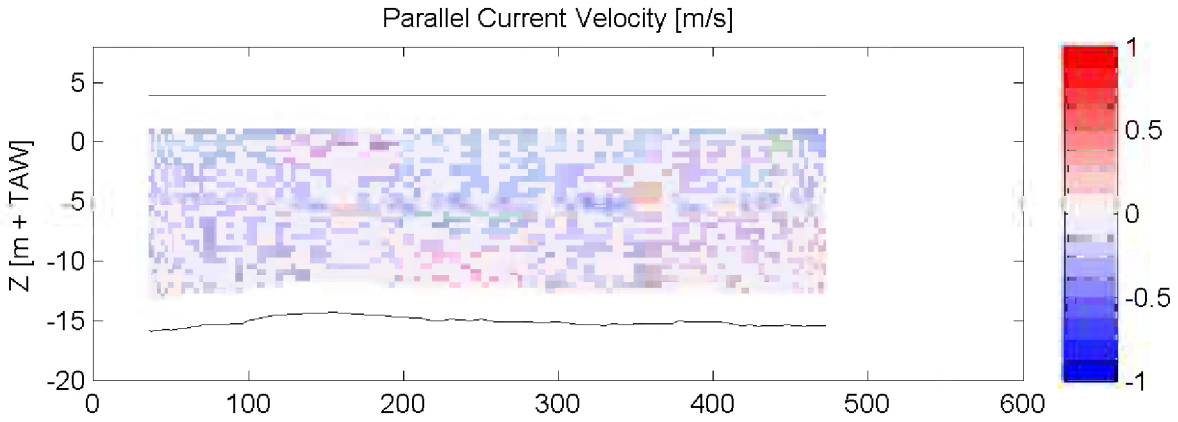
Data Processed by:

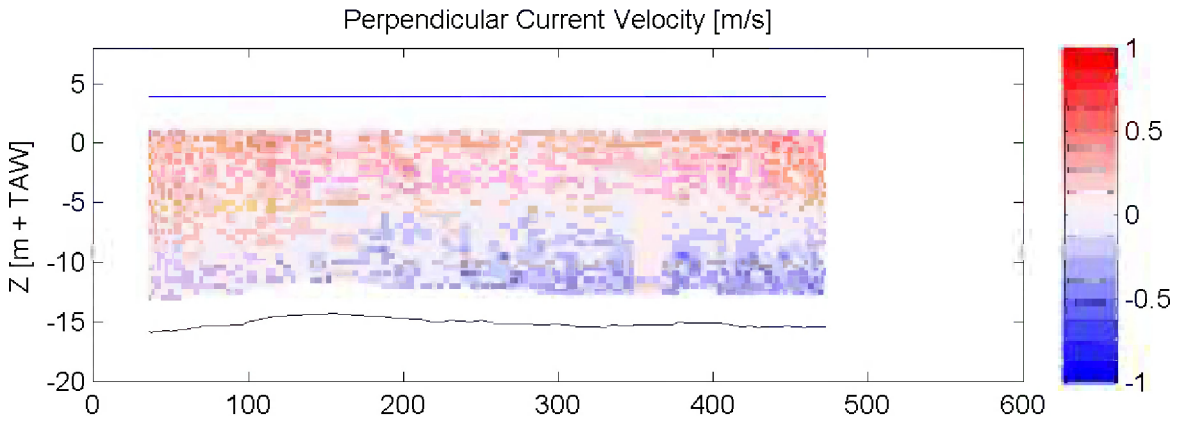
In association with :

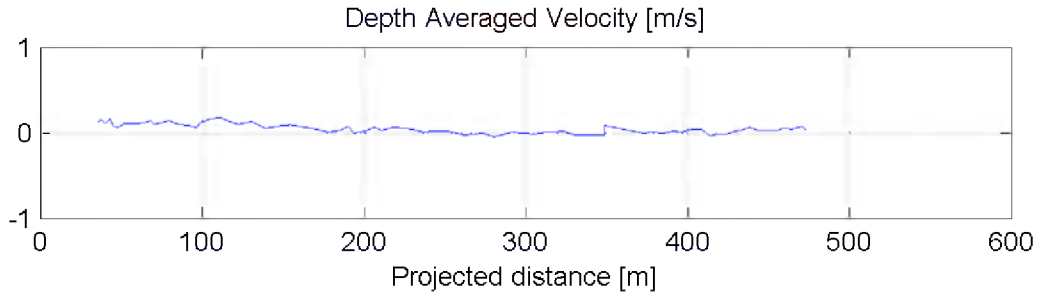
I/RA/11283/08.083/MSA

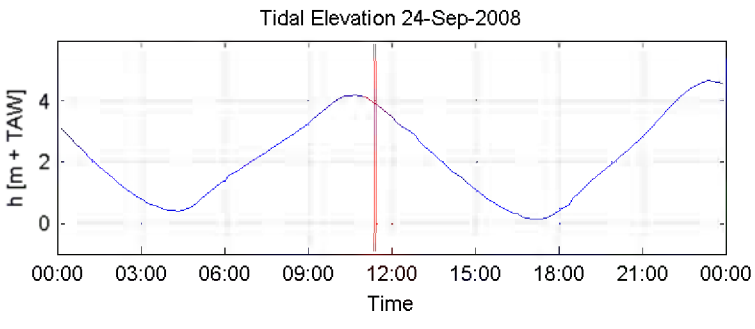
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7046dgdtlr_sub.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

11:21 - 11:25

Time after HW [HH:MM]

0:43

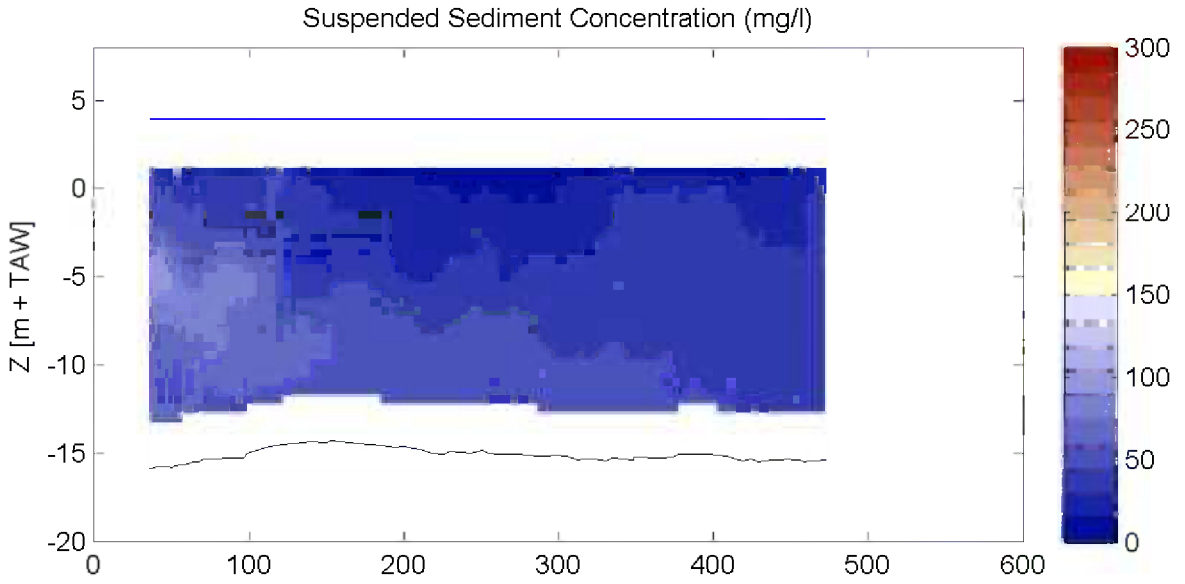
Data Processed by:

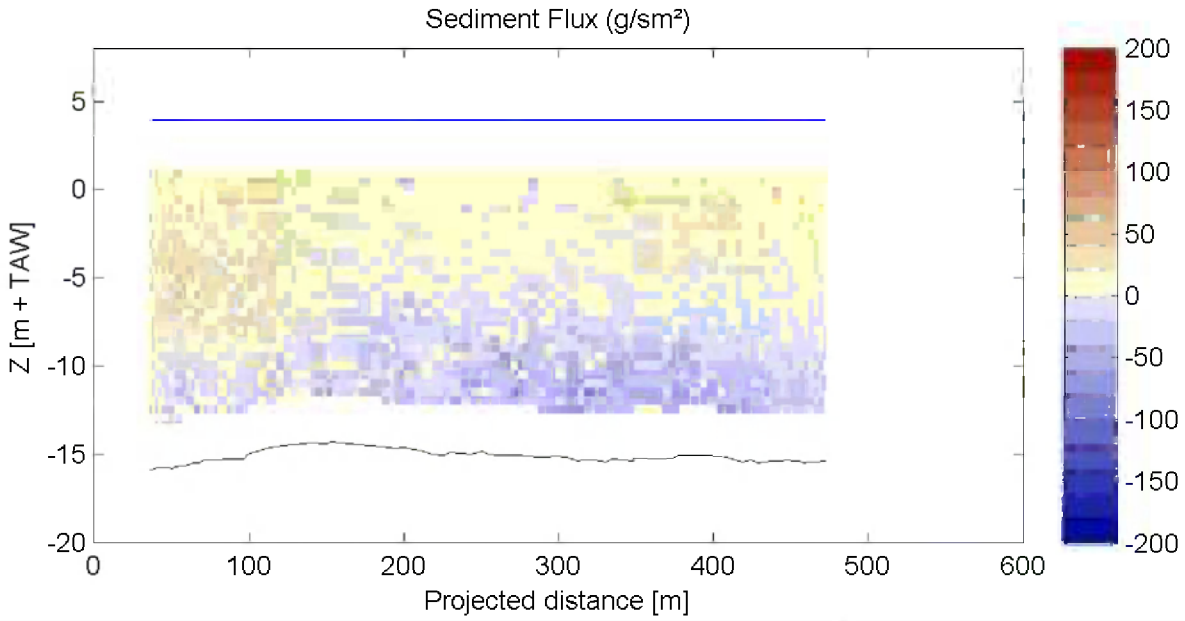
In association with :

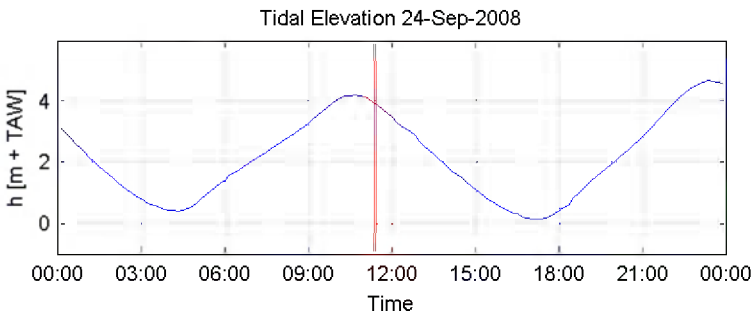
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7046dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

11:21 - 11:25

Time after HW [HH:MM]

0:43

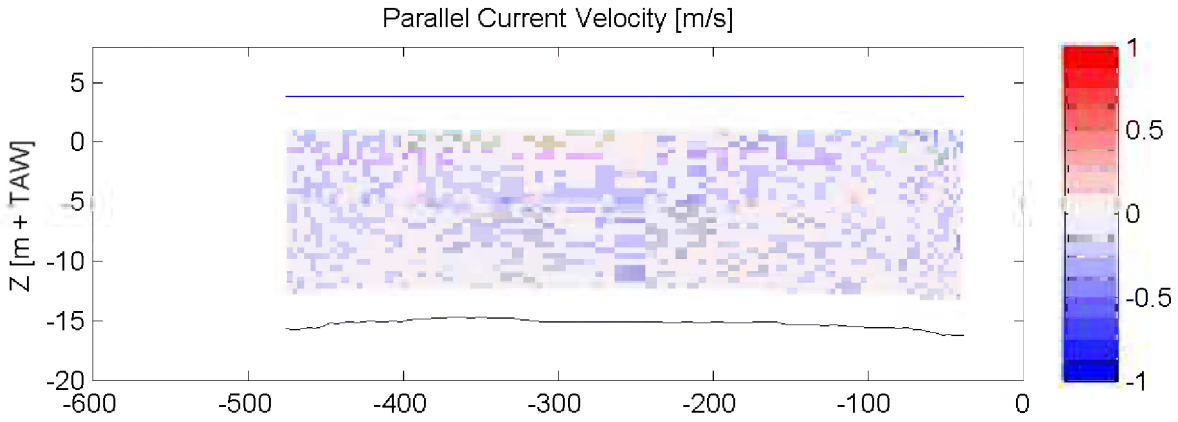
Data Processed by:

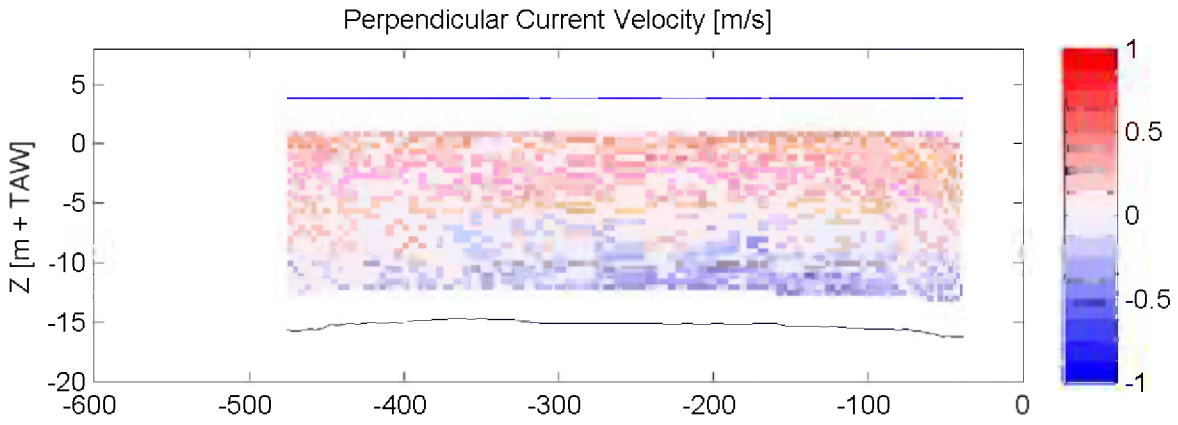
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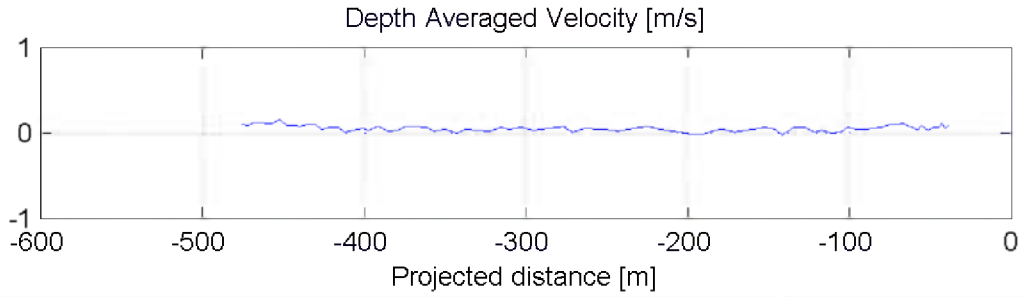
I/RA/11283/08.083/MSA

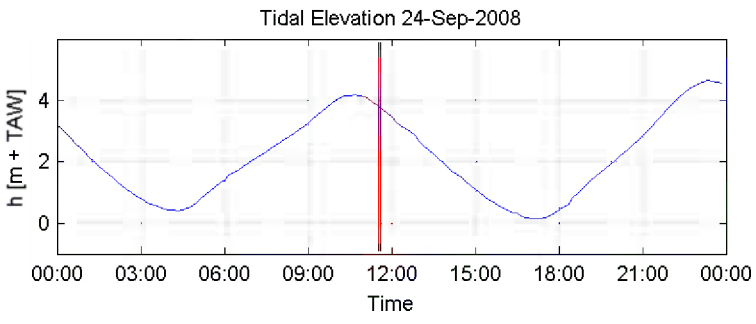
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7048dgdtrl_sub.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

11:32 - 11:36

Time after HW [HH:MM]

0:54

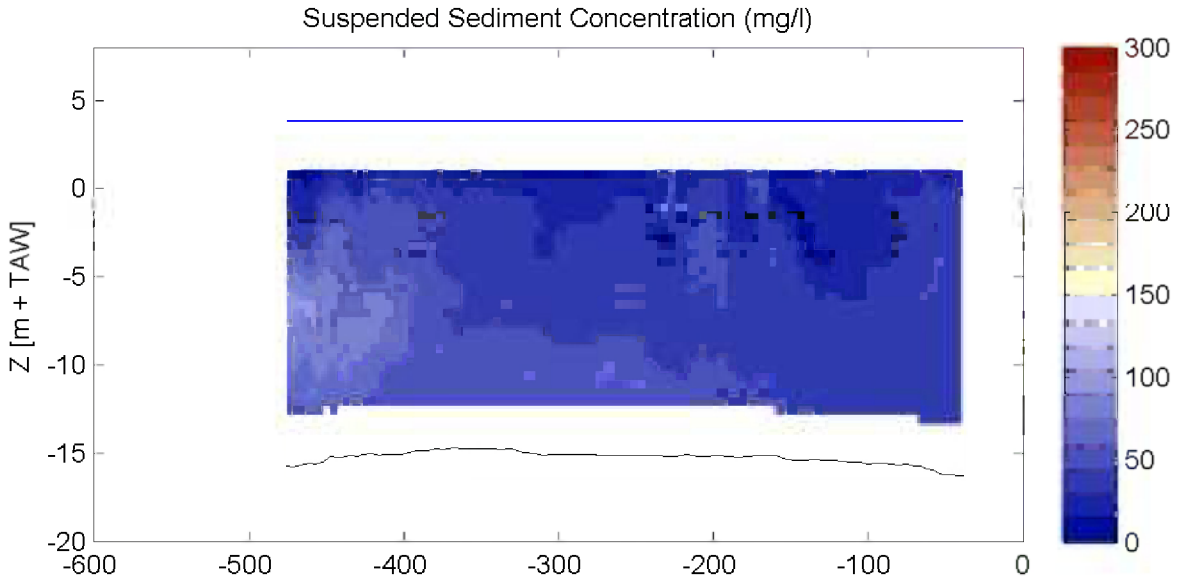
Data Processed by:

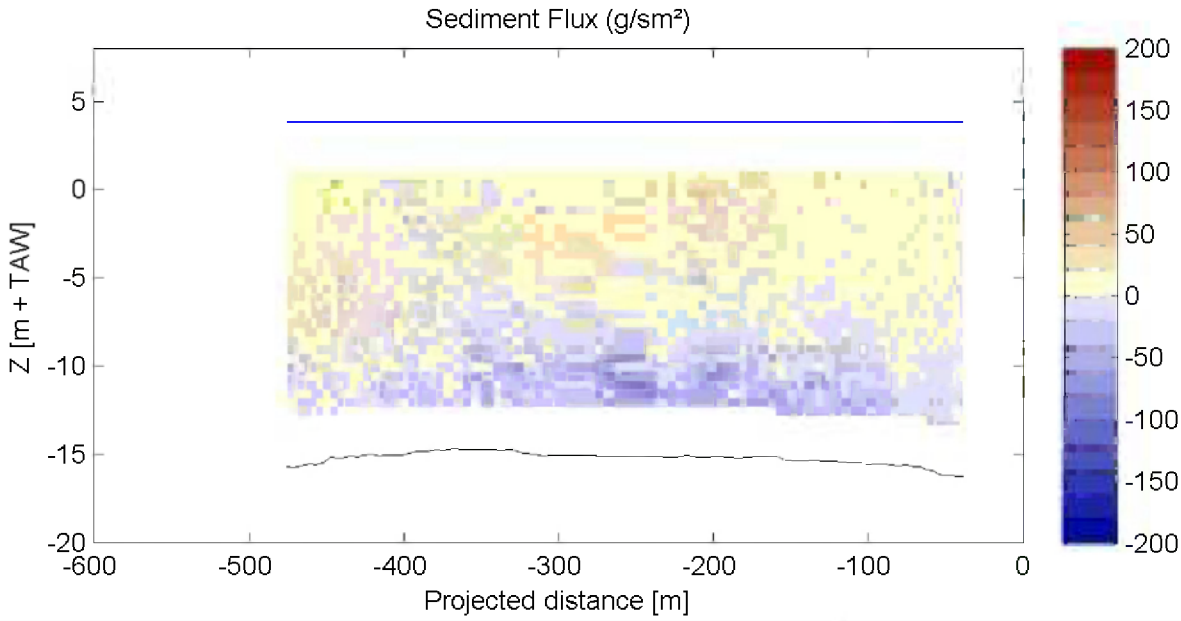
In association with :

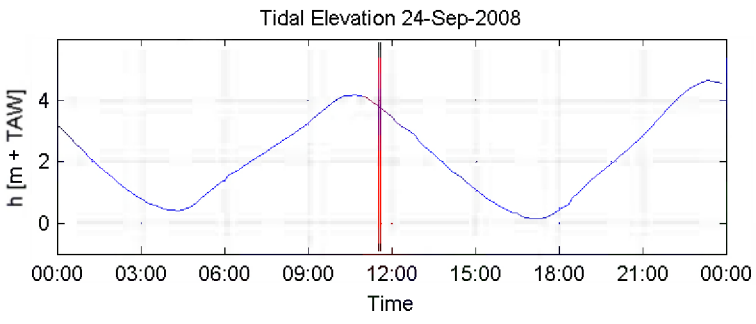
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7048dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

11:32 - 11:36

Time after HW [HH:MM]

0:54

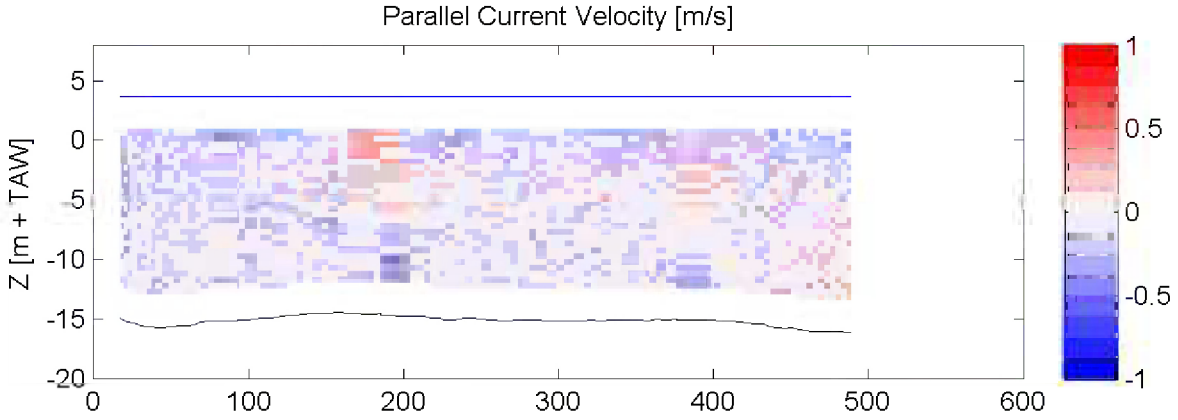
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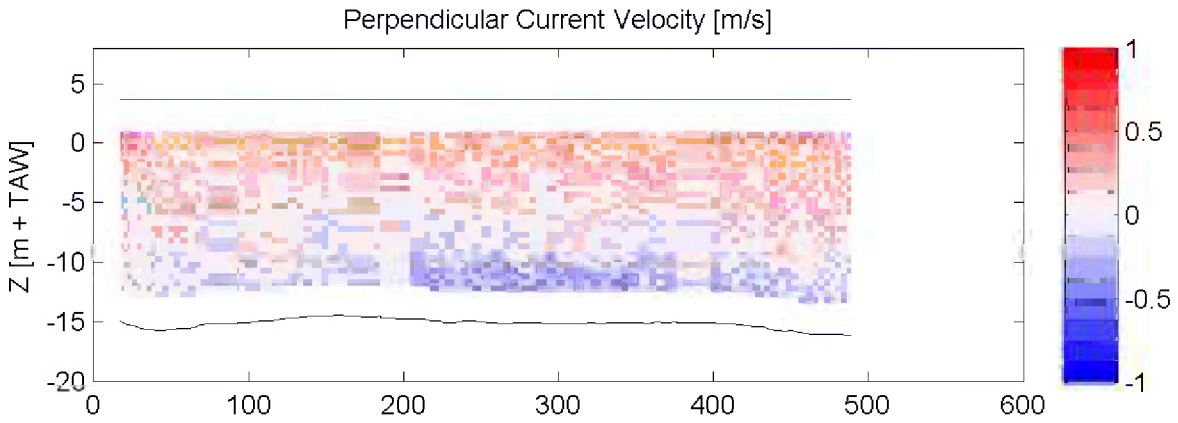
In association with :

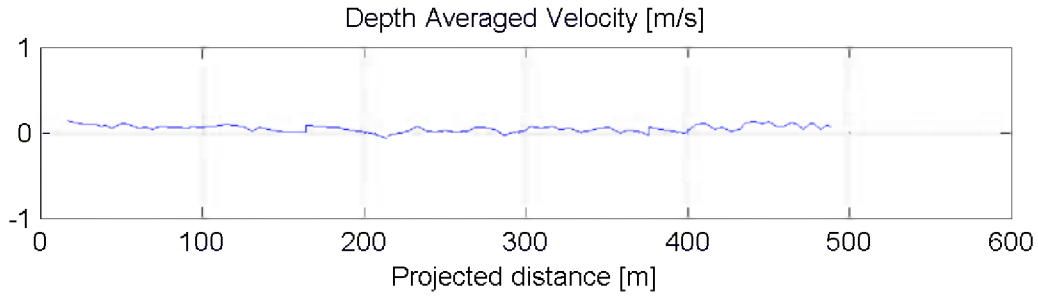
I/RA/11283/08.083/MSA

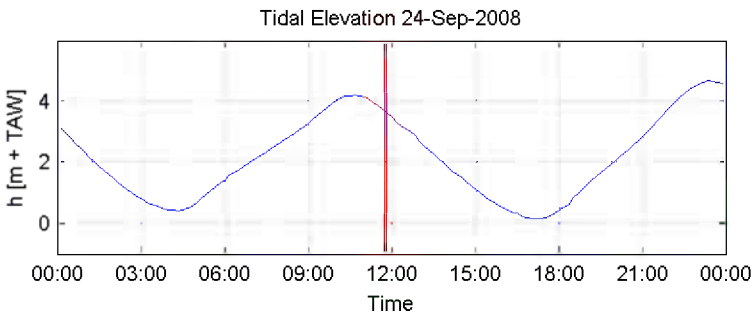
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7050dgdtlr_sub.csv	Location: Deurganckdok









HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

11:43 - 11:47

Time after HW [HH:MM]

1:05

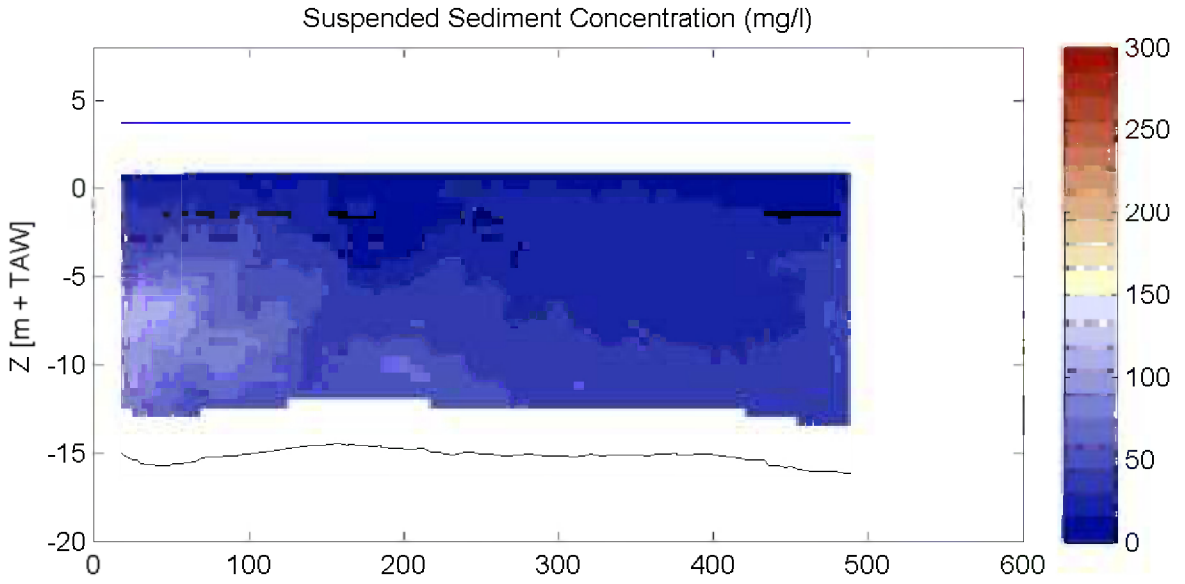
Data Processed by:

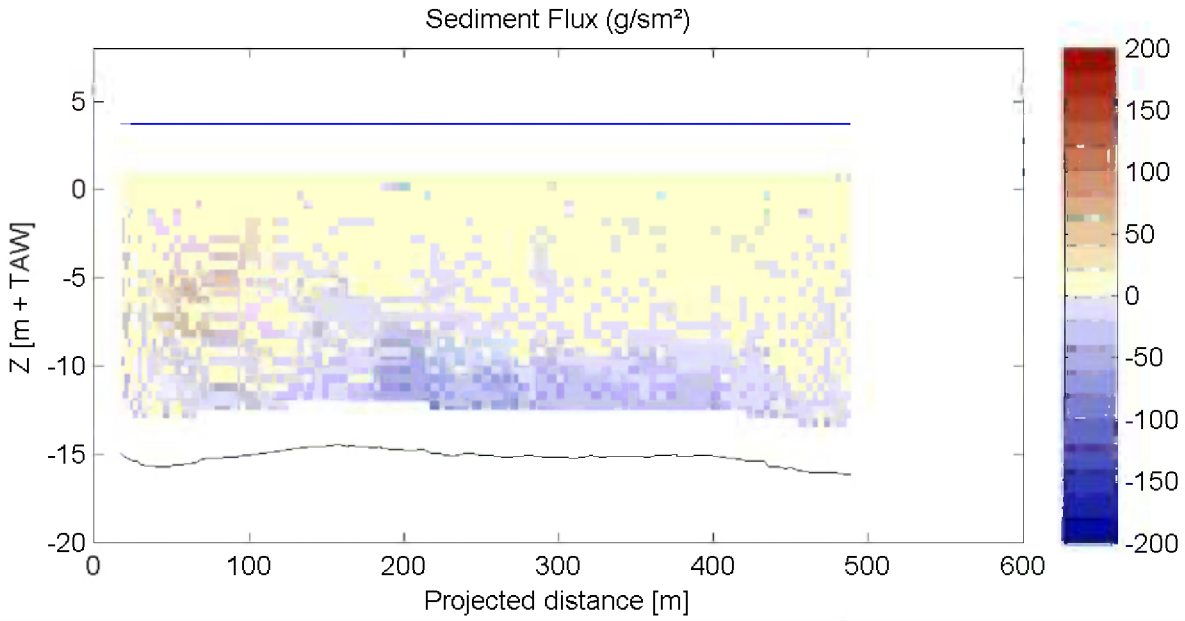
In association with :

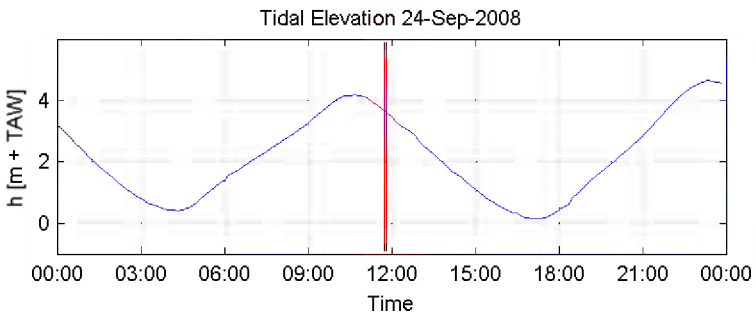
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7050dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

11:43 - 11:47

Time after HW [HH:MM]

1:05

Data Processed by:

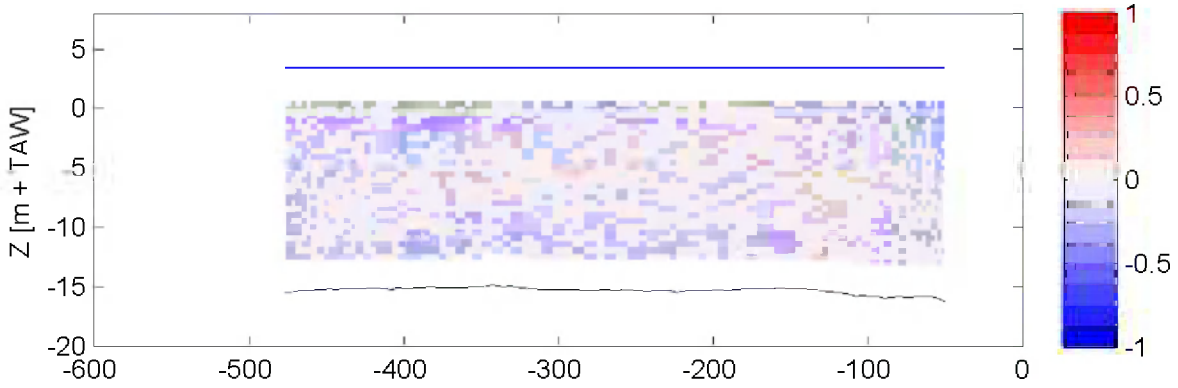
In association with :

I/RA/11283/08.083/MSA

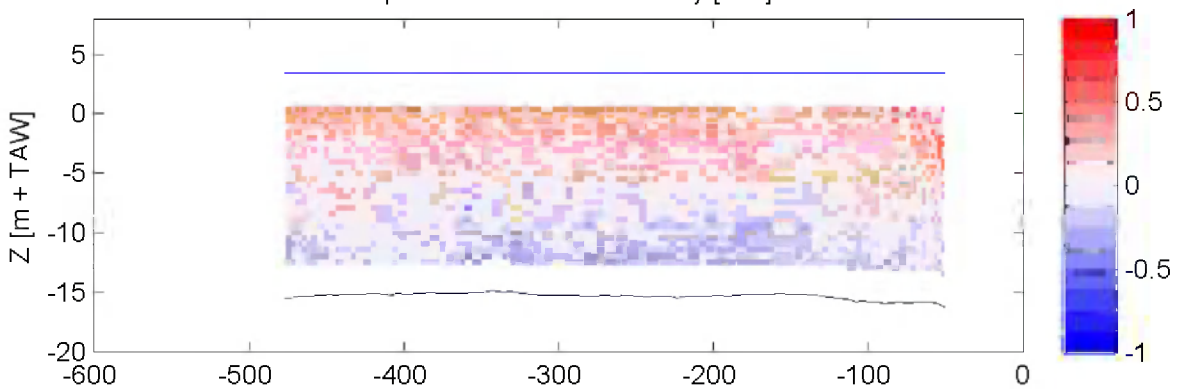
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7052dgdtrl_sub.csv	Location: Deurganckdok

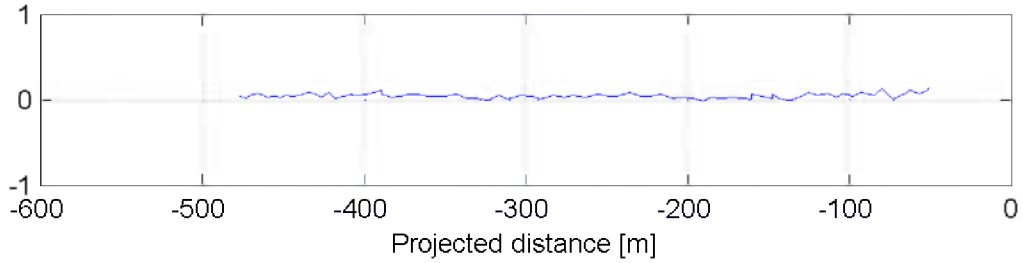
Parallel Current Velocity [m/s]



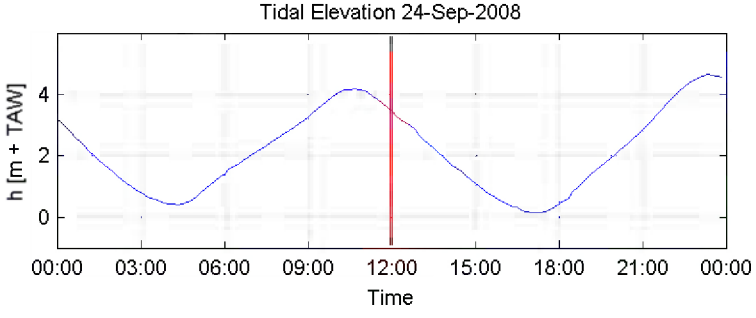
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

11:57 - 12:01

Time after HW [HH:MM]

1:19

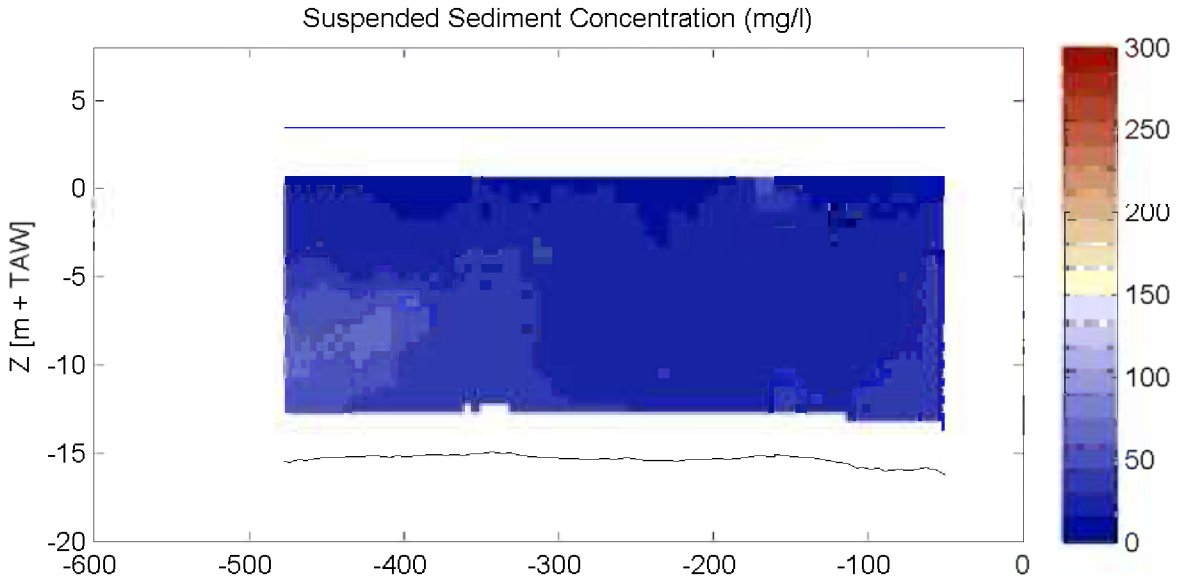
Data Processed by:

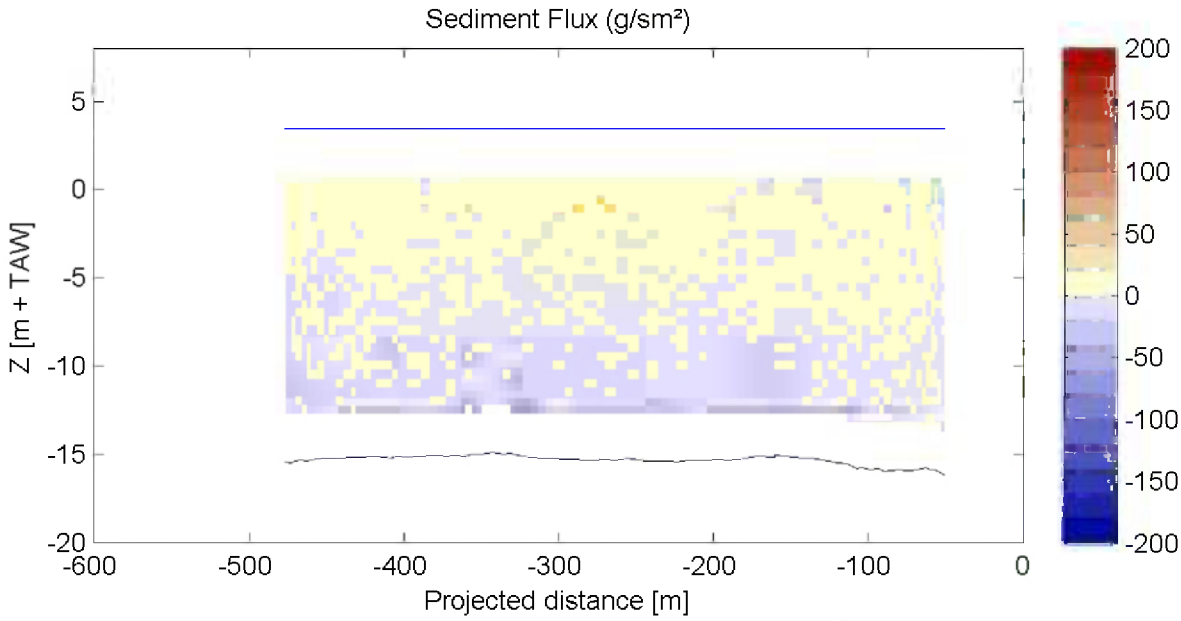
In association with :

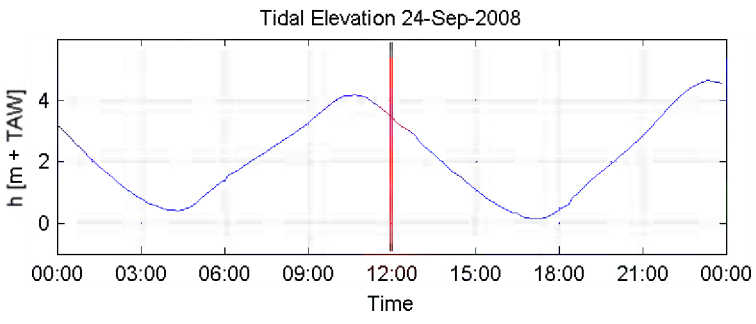
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7052dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

11:57 - 12:01

Time after HW [HH:MM]

1:19

Data Processed by:

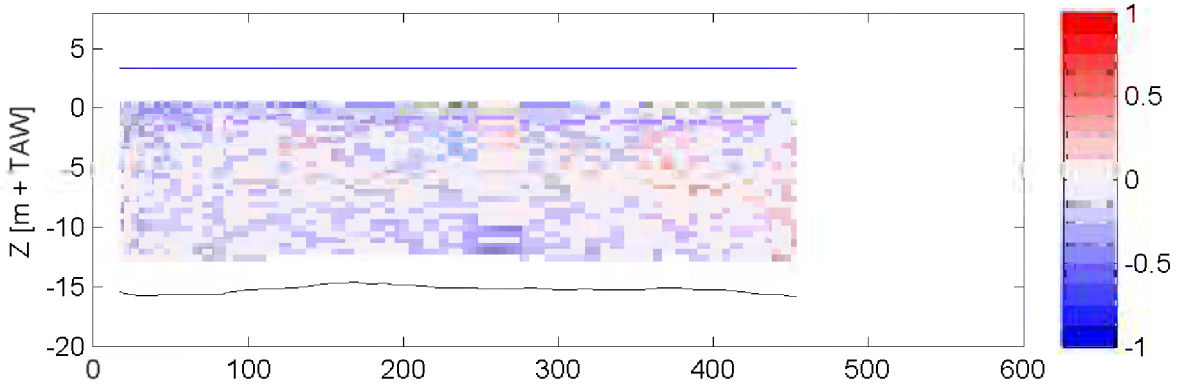
In association with :

I/RA/11283/08.083/MSA

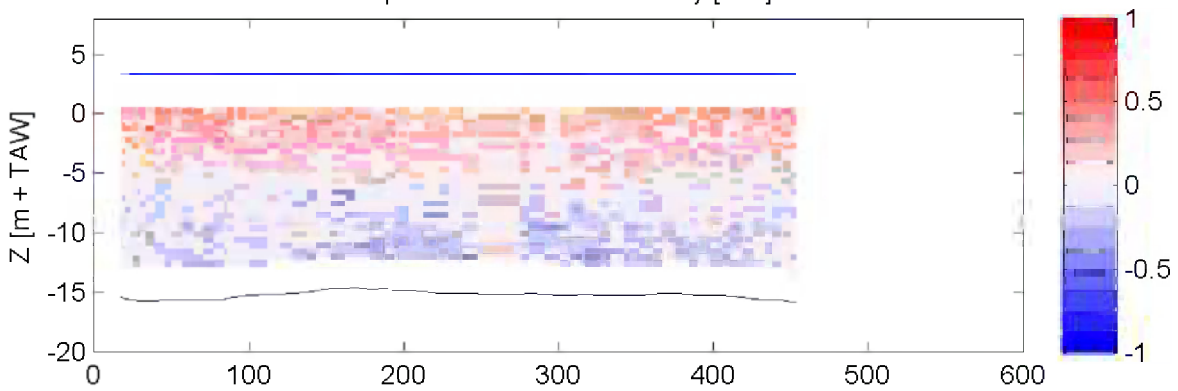
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7054dgdtlr_sub.csv	Location: Deurganckdok

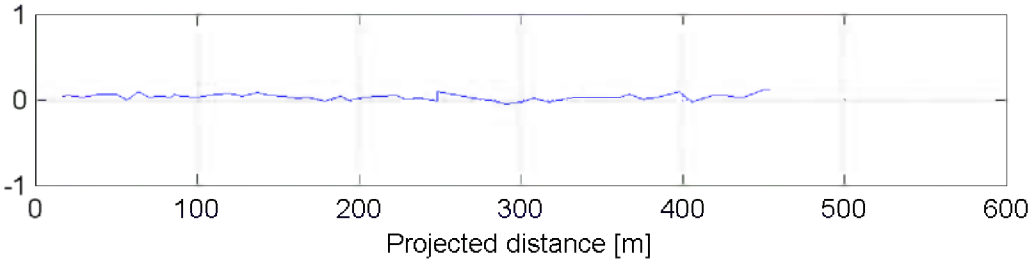
Parallel Current Velocity [m/s]



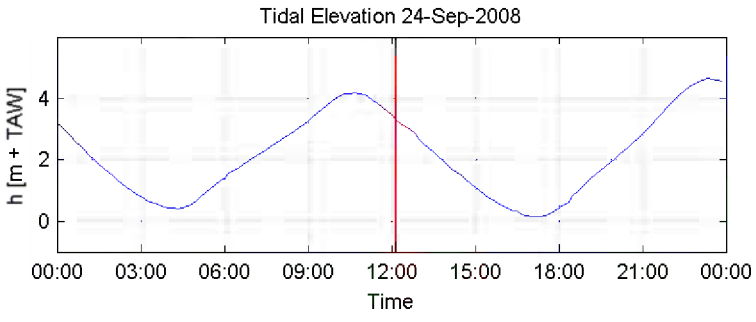
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

12:07 - 12:10

Time after HW [HH:MM]

1:29

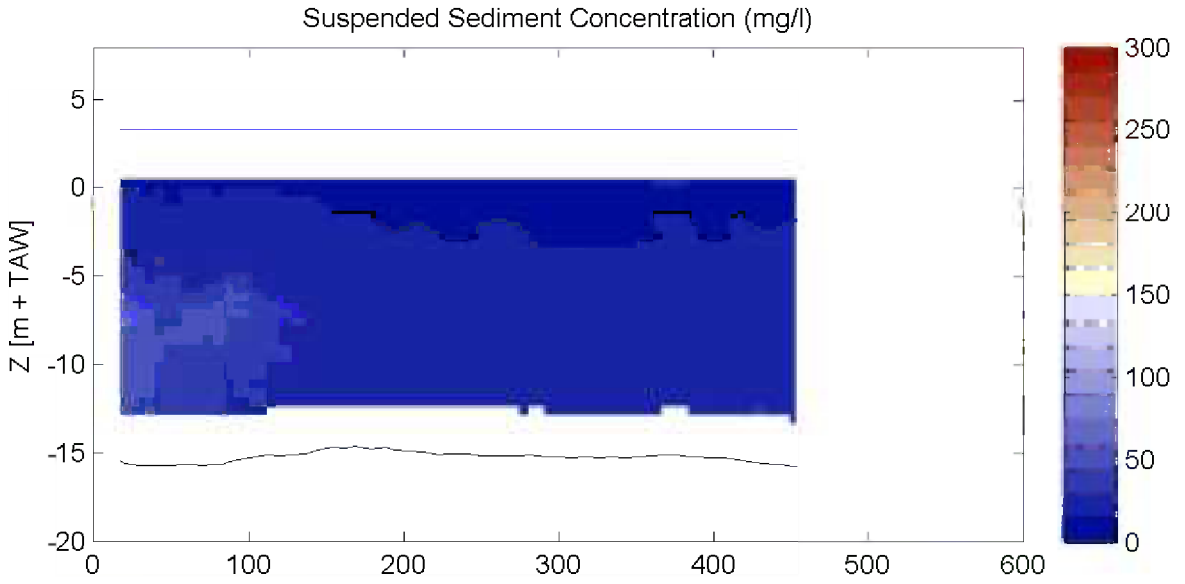
Data Processed by:

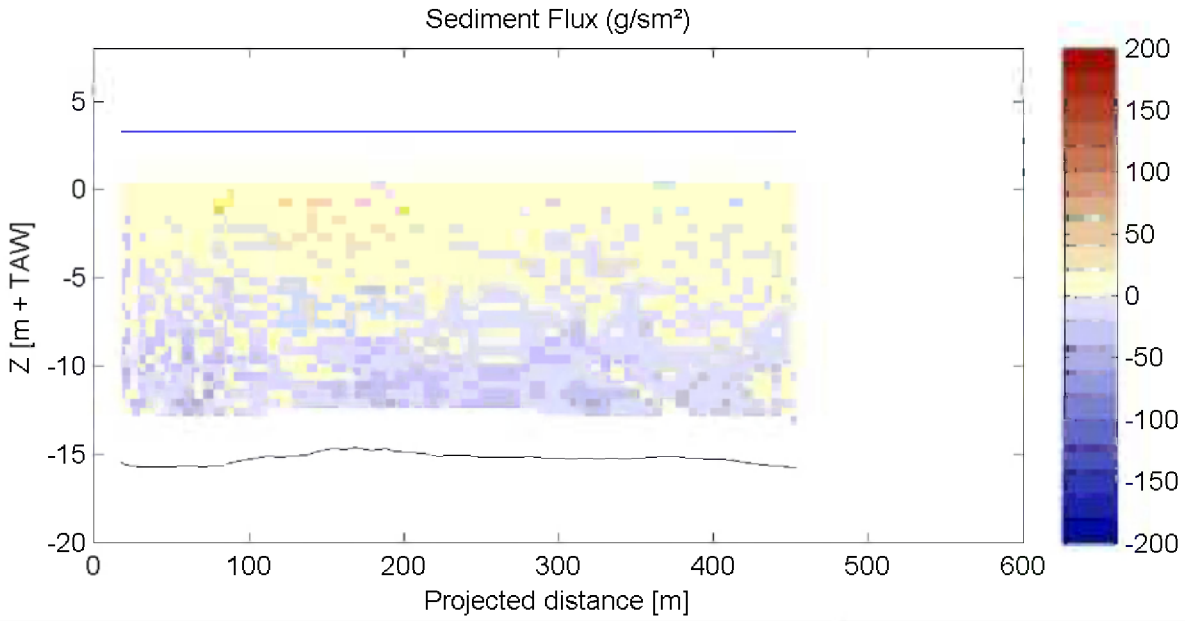
In association with :

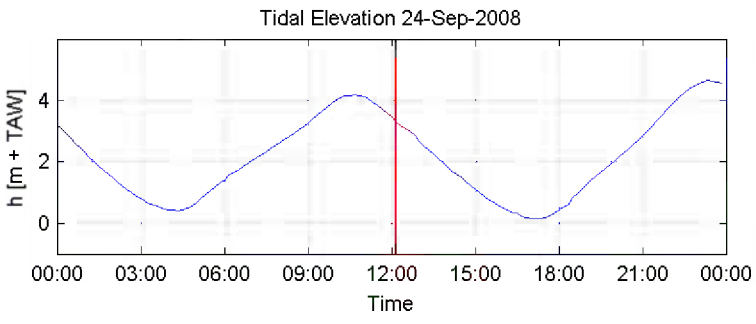
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7054dgdtlr_sub.csv	Location: Deurganckdok







HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

12:07 - 12:10

Time after HW [HH:MM]

1:29

Data Processed by:

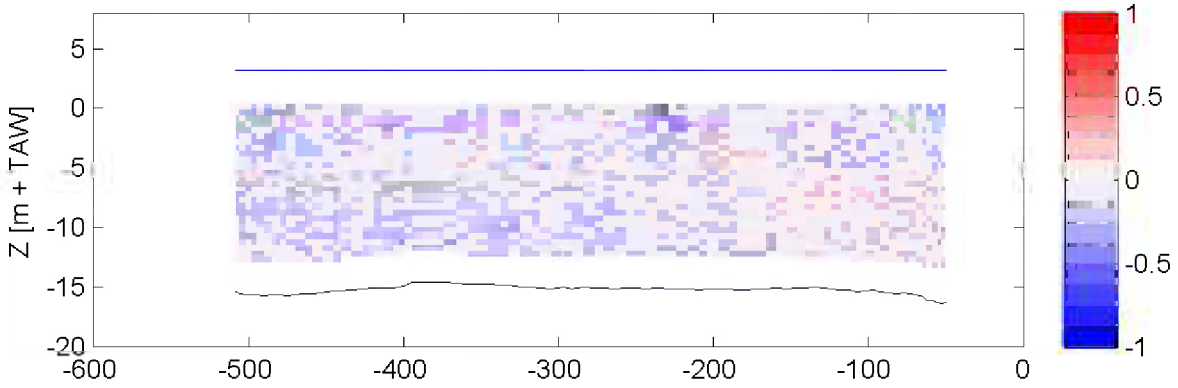
In association with :

I/RA/11283/08.083/MSA

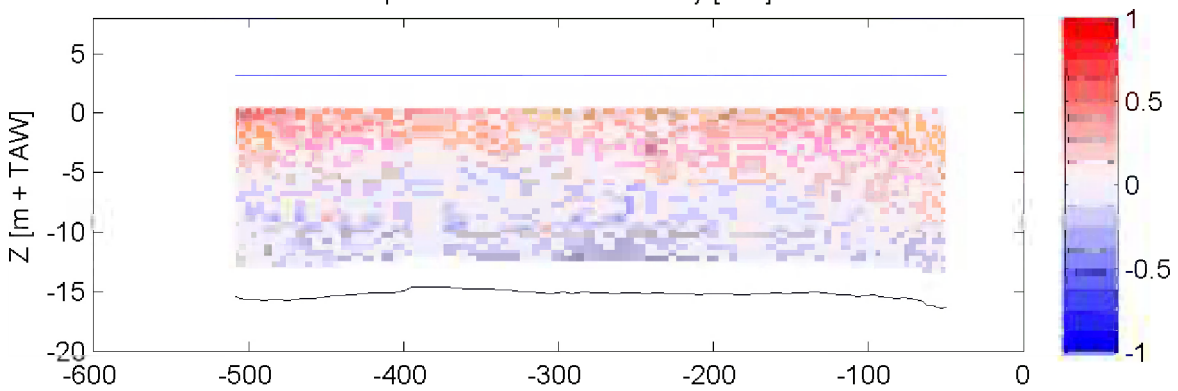
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7056dgdtrl_sub.csv	Location: Deurganckdok

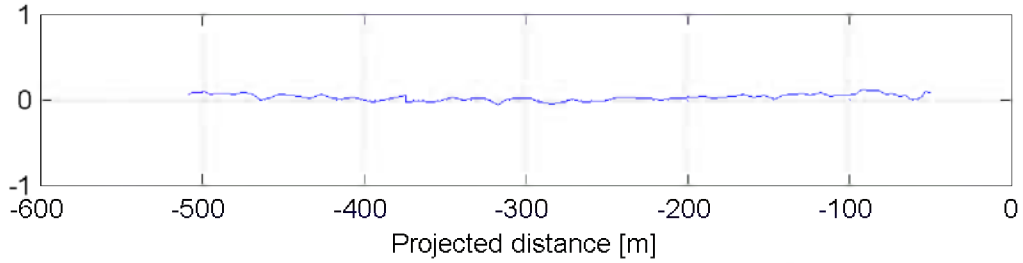
Parallel Current Velocity [m/s]



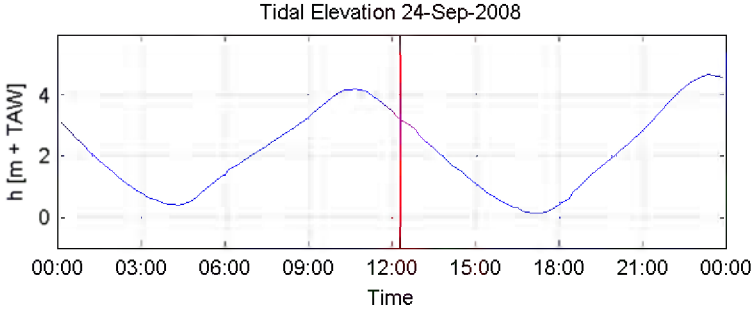
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :
24-Sep-2008
12:16 - 12:20

Time after HW [HH:MM]
1:38

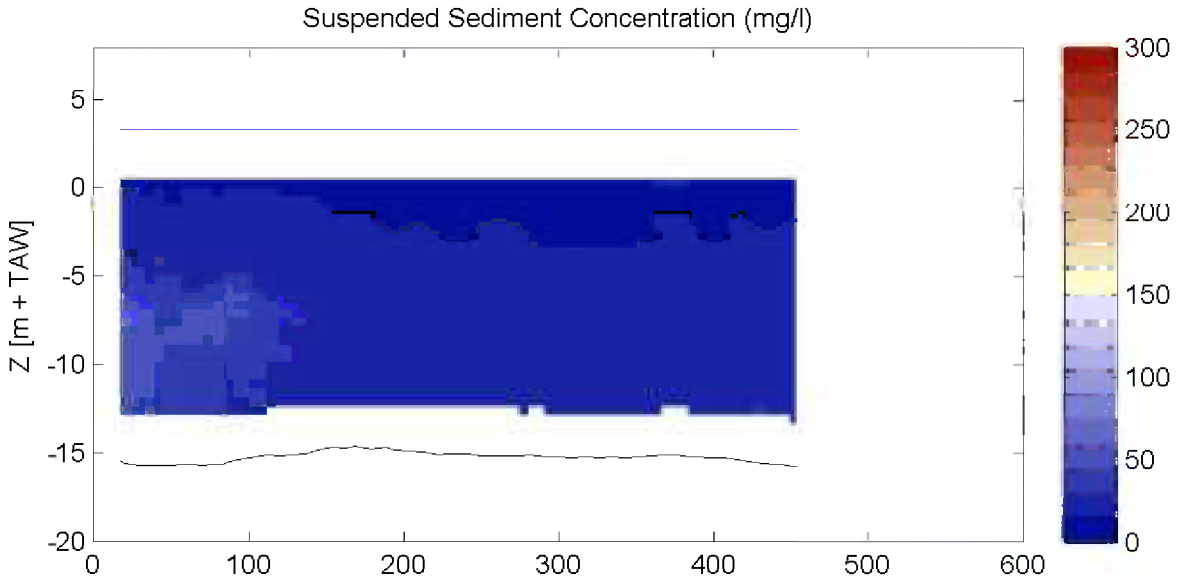
Data Processed by:

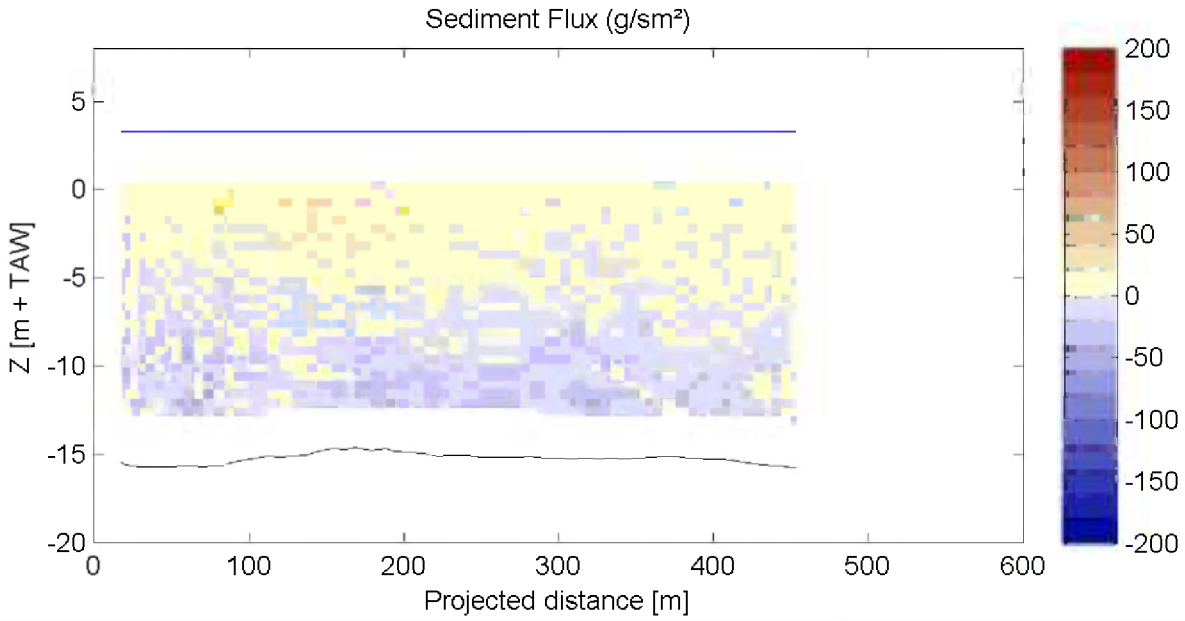
In association with :

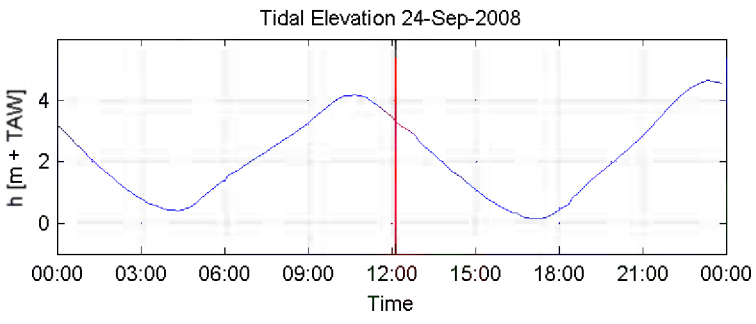
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7054dgdtlr_sub.csv	Location: Deurganckdok







HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

12:07 - 12:10

Time after HW [HH:MM]

1:29

Data Processed by:

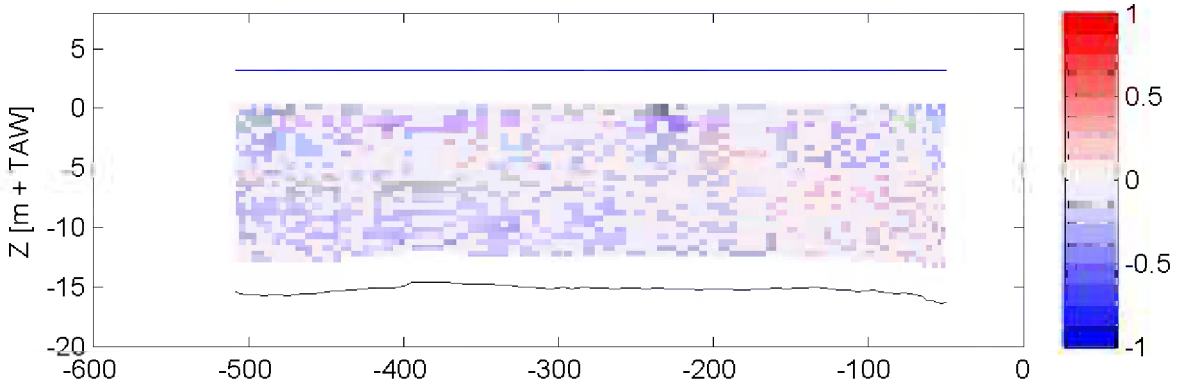
In association with :

I/RA/11283/08.083/MSA

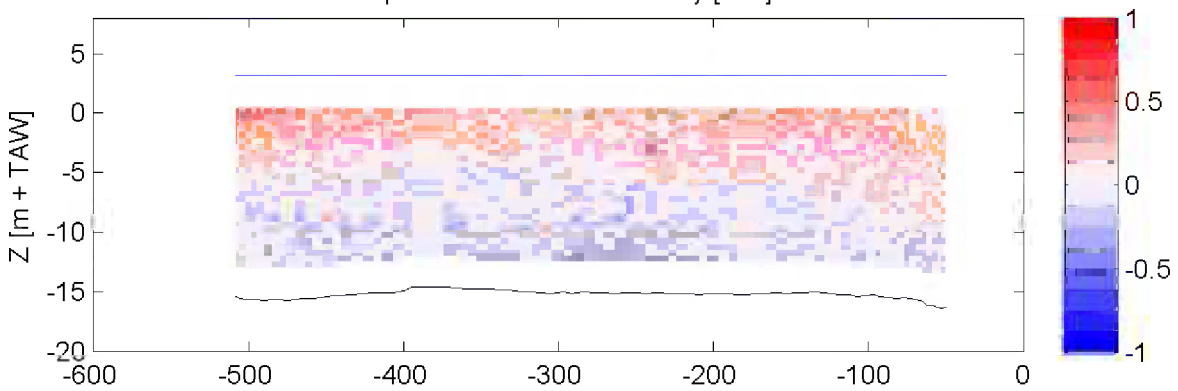
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7056dgdtrl_sub.csv	Location: Deurganckdok

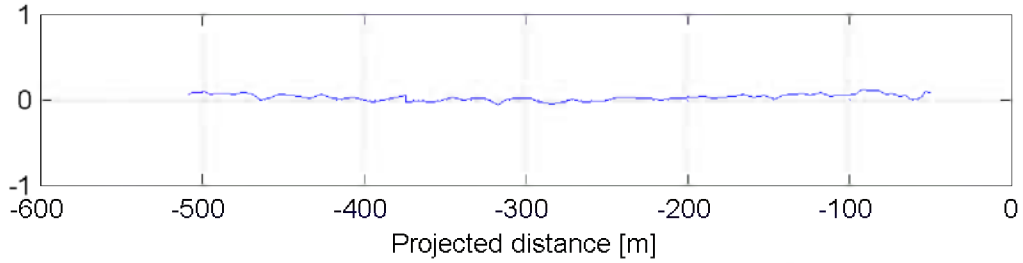
Parallel Current Velocity [m/s]



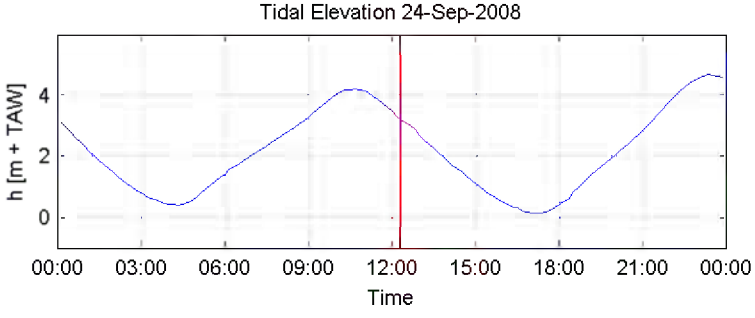
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :
24-Sep-2008
12:16 - 12:20

Time after HW [HH:MM]
1:38

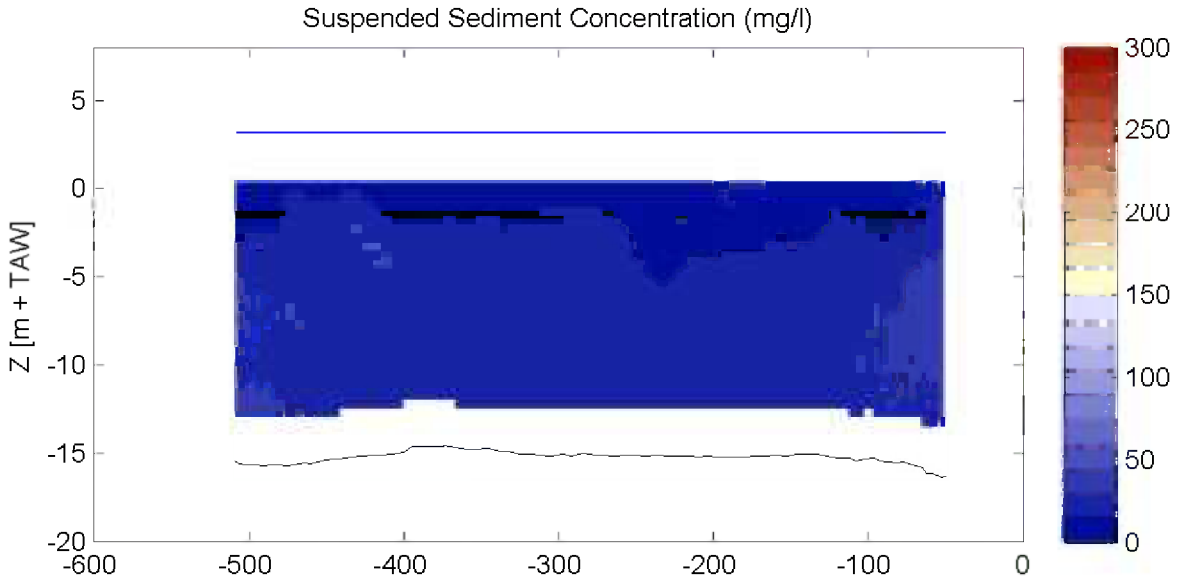
Data Processed by:

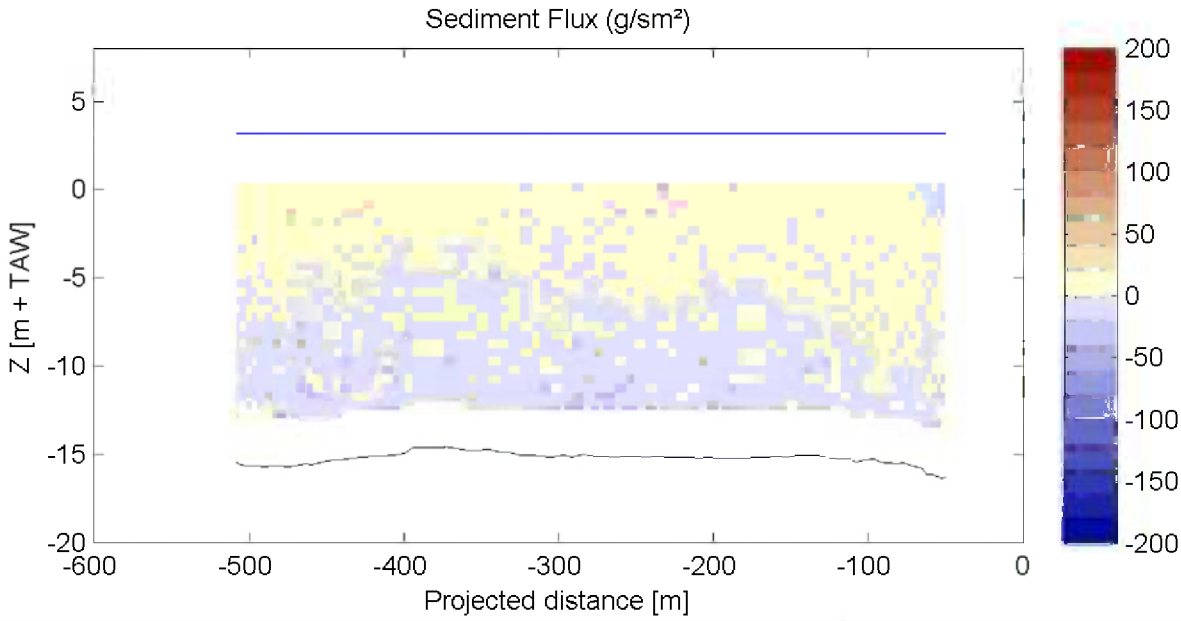
In association with :

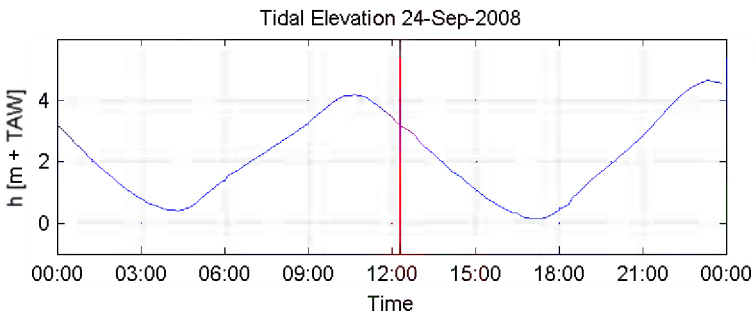
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7056dgdtrl_sub.csv	Location: Deurganckdok







HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

12:16 - 12:20

Time after HW [HH:MM]

1:38

Data Processed by:

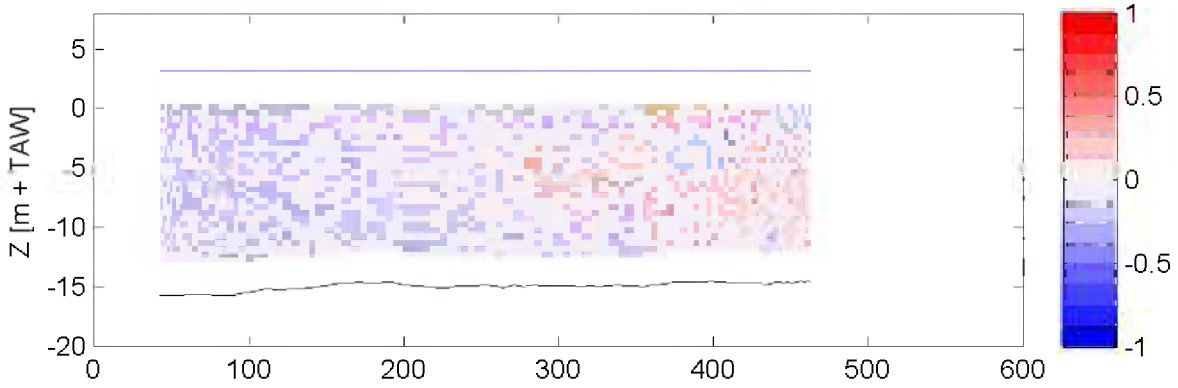
In association with :

I/RA/11283/08.083/MSA

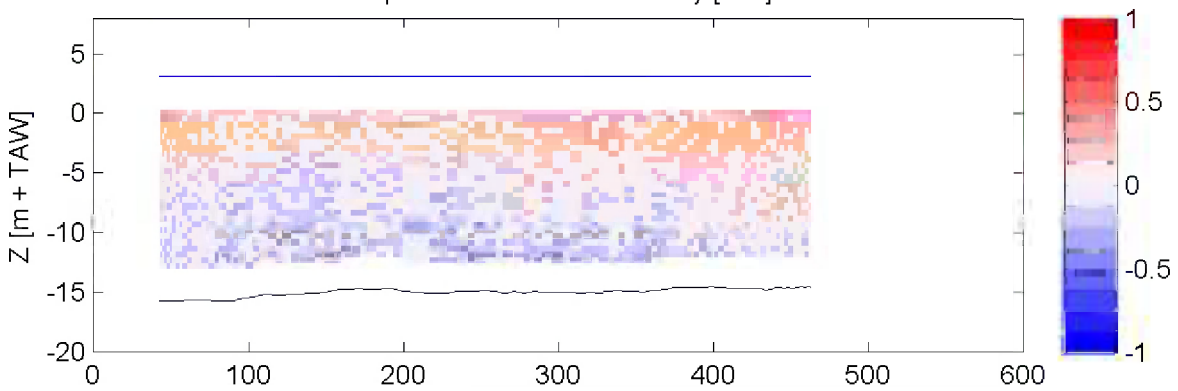
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7058dgdtlr_sub.csv	Location: Deurganckdok

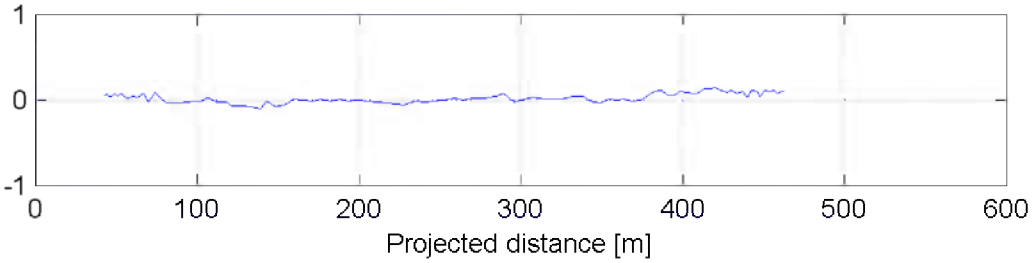
Parallel Current Velocity [m/s]



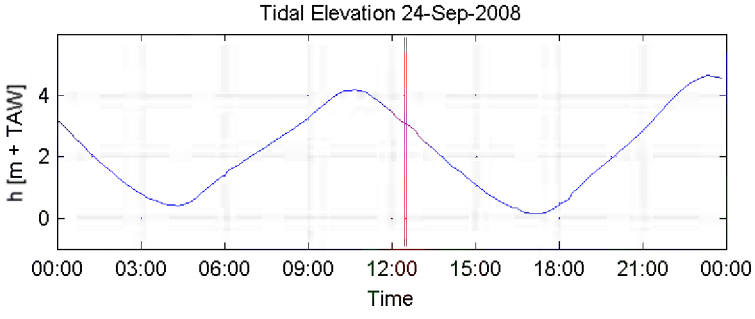
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

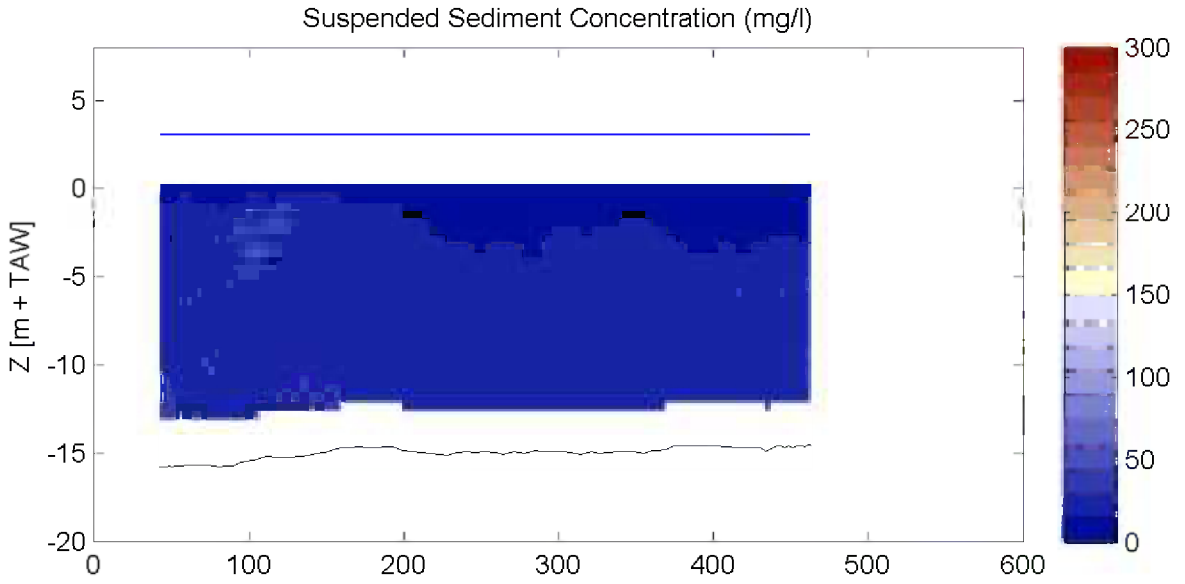
Date / Time [MET] :
24-Sep-2008
12:27 - 12:32

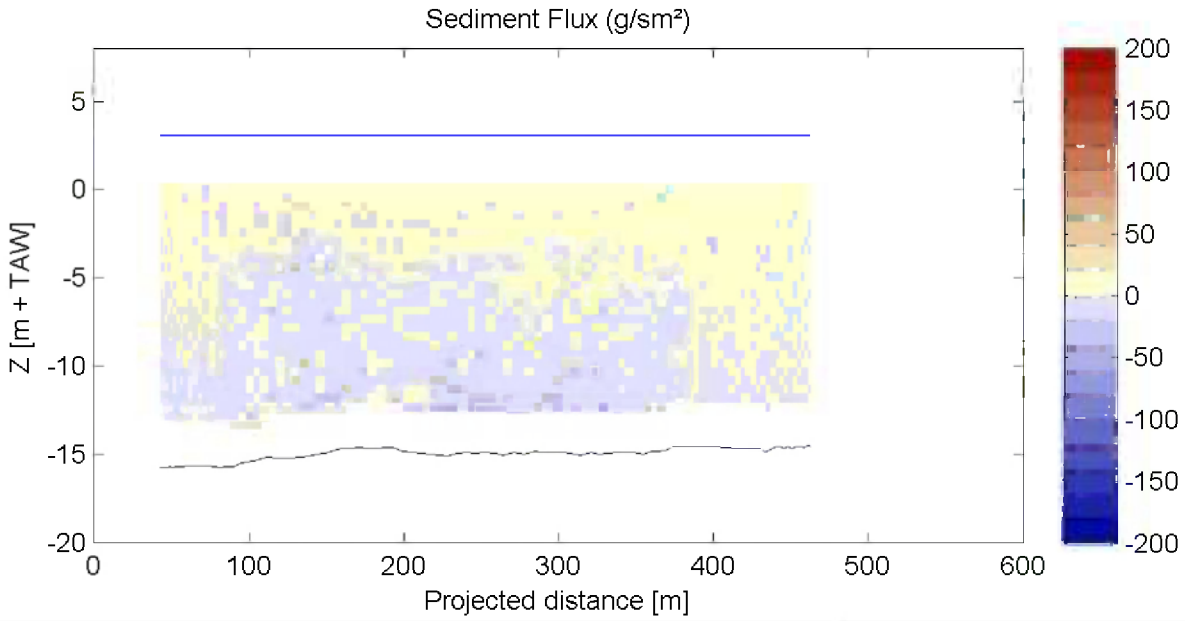
Time after HW [HH:MM]
1:49

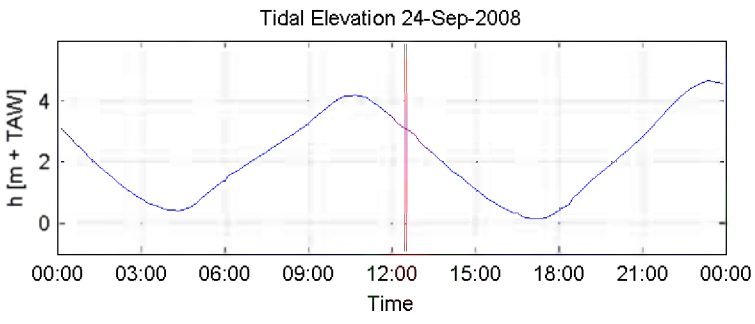
Data Processed by:
In association with :
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7058dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

12:27 - 12:32

Time after HW [HH:MM]

1:49

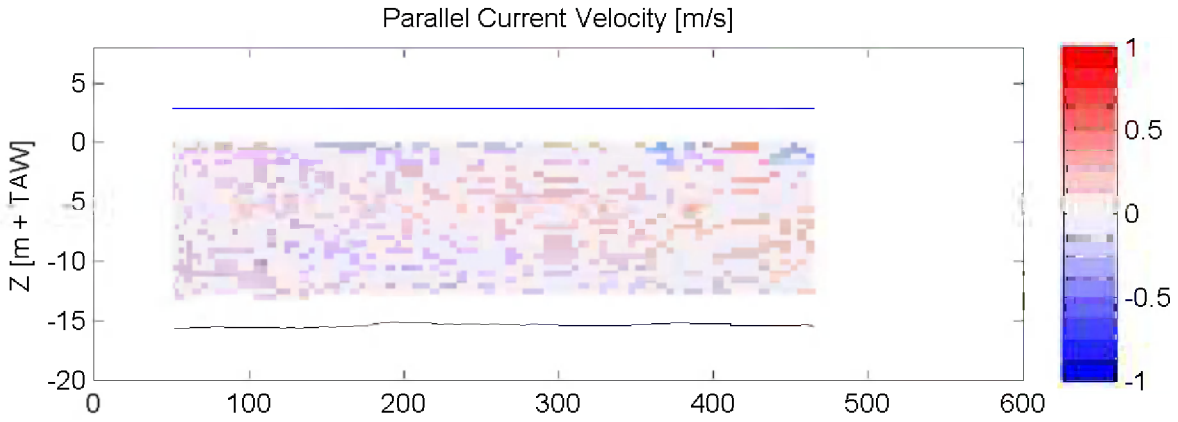
Data Processed by:

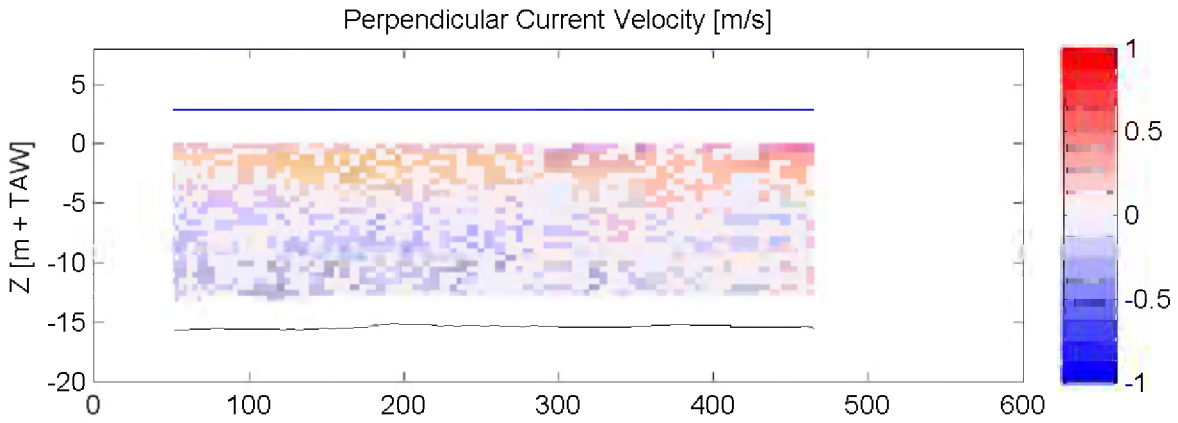
In association with :

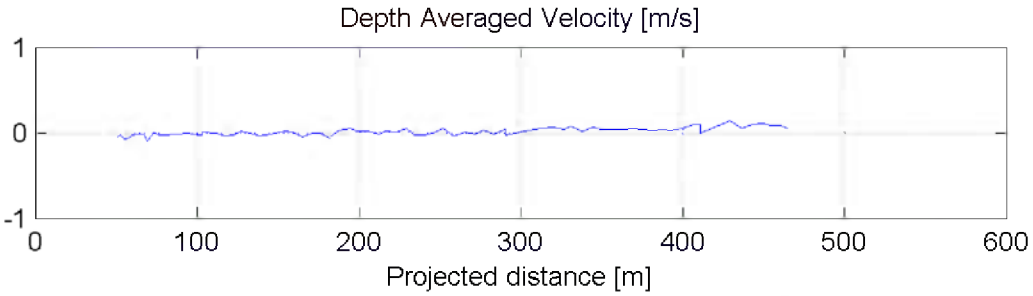
I/RA/11283/08.083/MSA

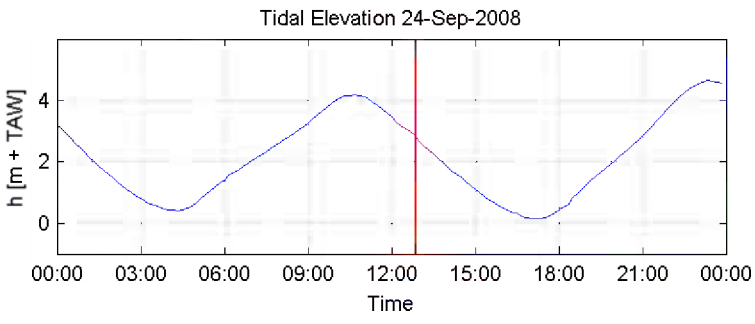
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7062dgdtlr_sub.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

12:50 - 12:53

Time after HW [HH:MM]

2:12

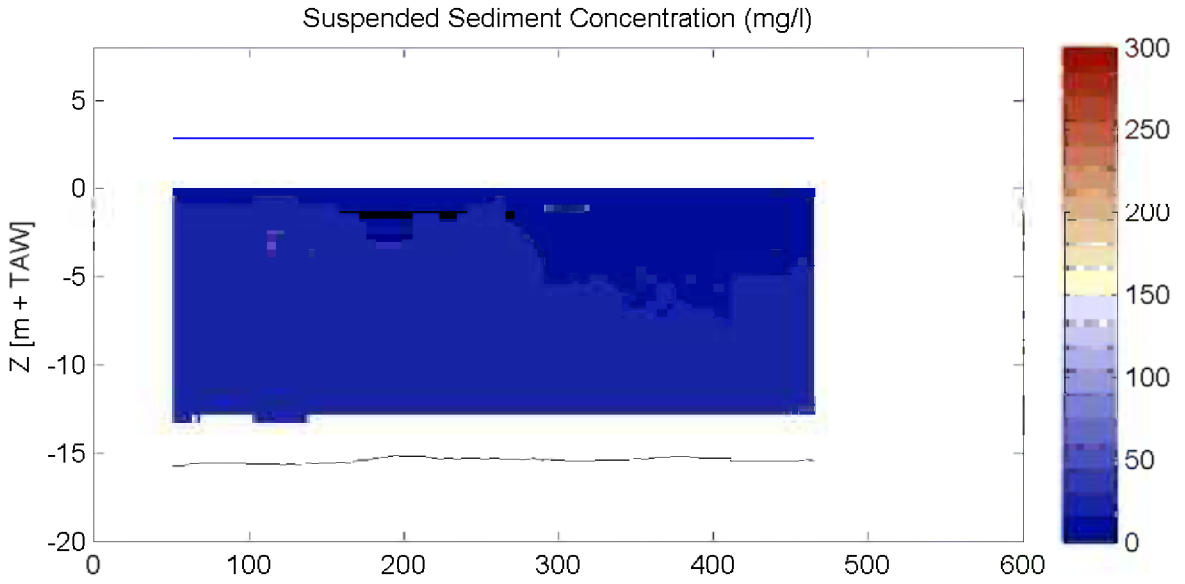
Data Processed by:

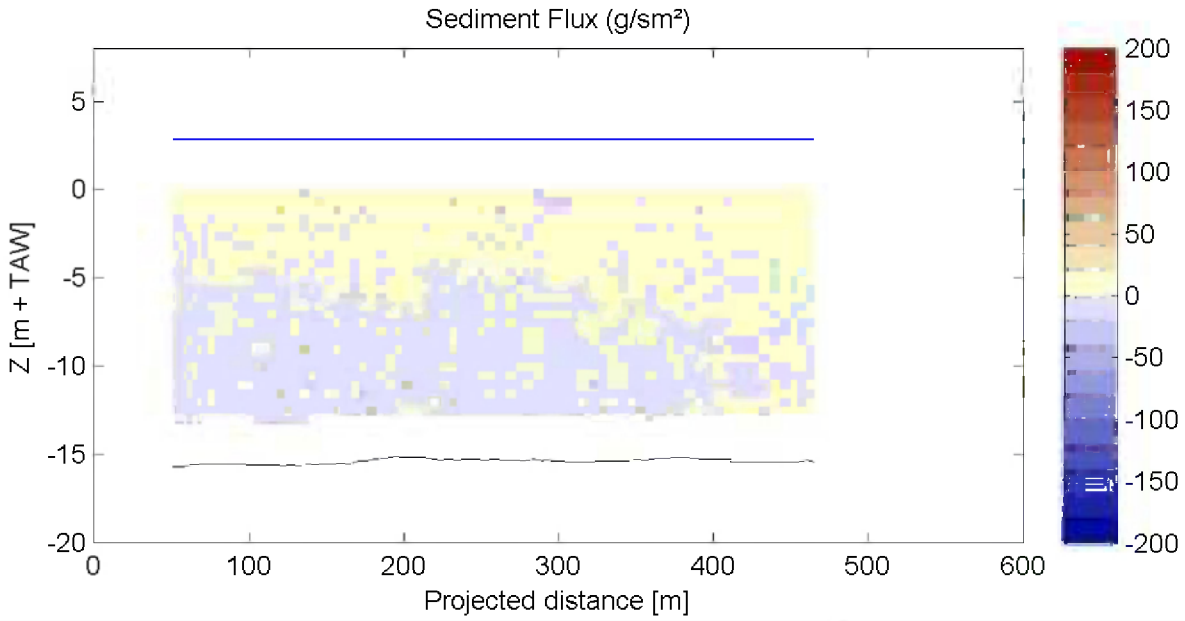
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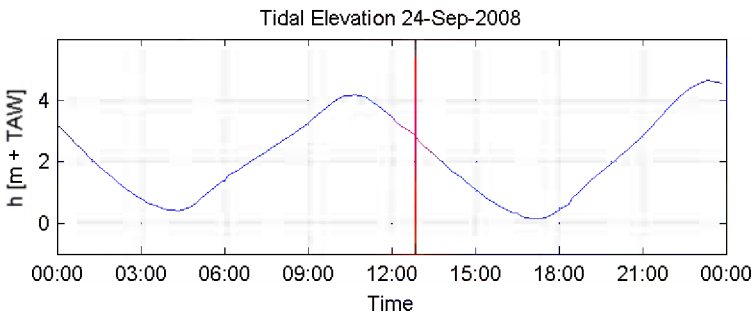
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7062dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

12:50 - 12:53

Time after HW [HH:MM]

2:12

Data Processed by:

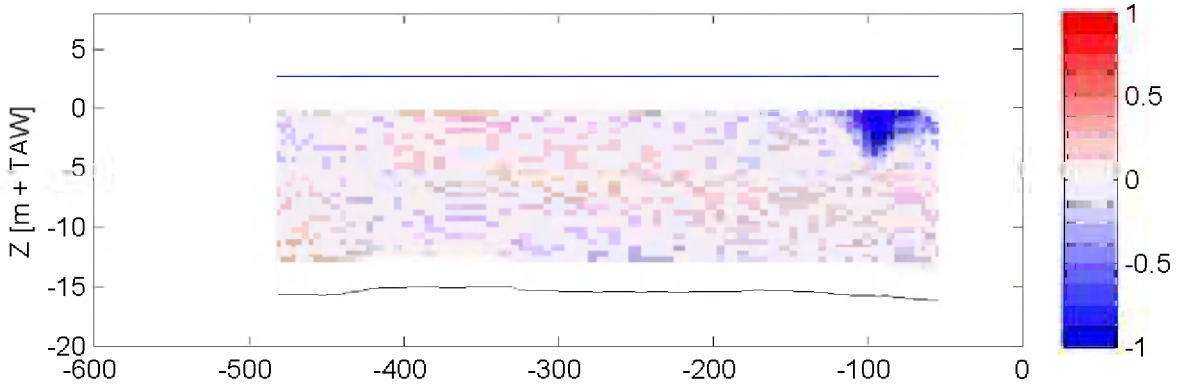
In association with :

I/RA/11283/08.083/MSA

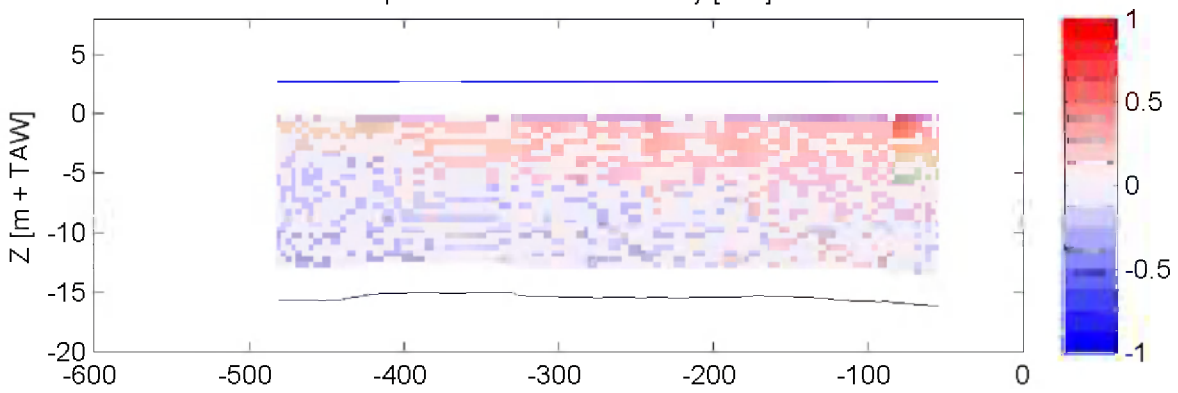
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7064dgdtrl_sub.csv	Location: Deurganckdok

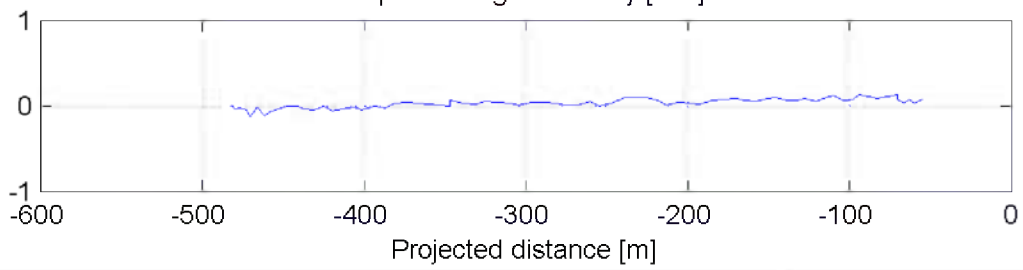
Parallel Current Velocity [m/s]



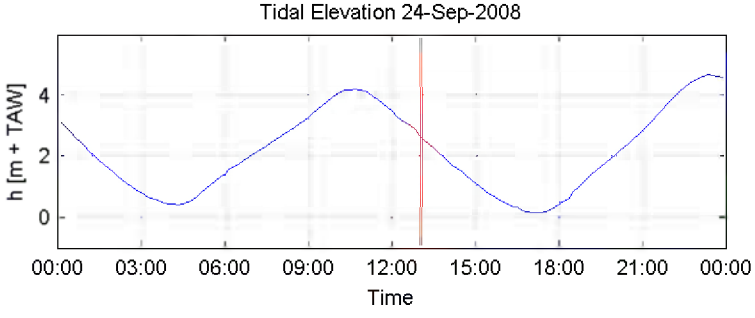
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

13:02 - 13:05

Time after HW [HH:MM]

2:23

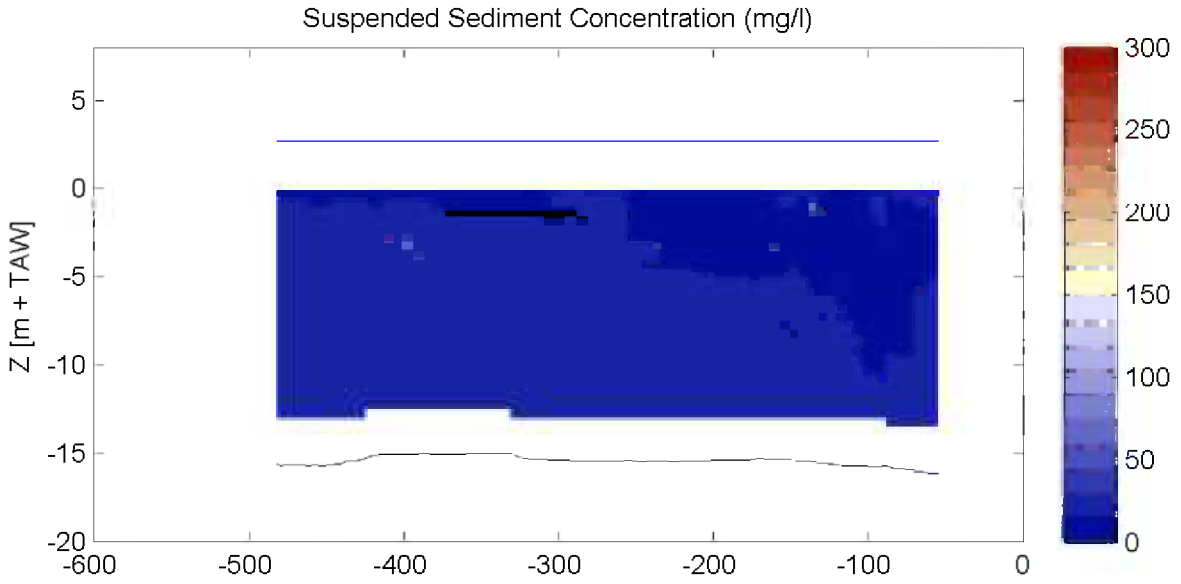
Data Processed by:

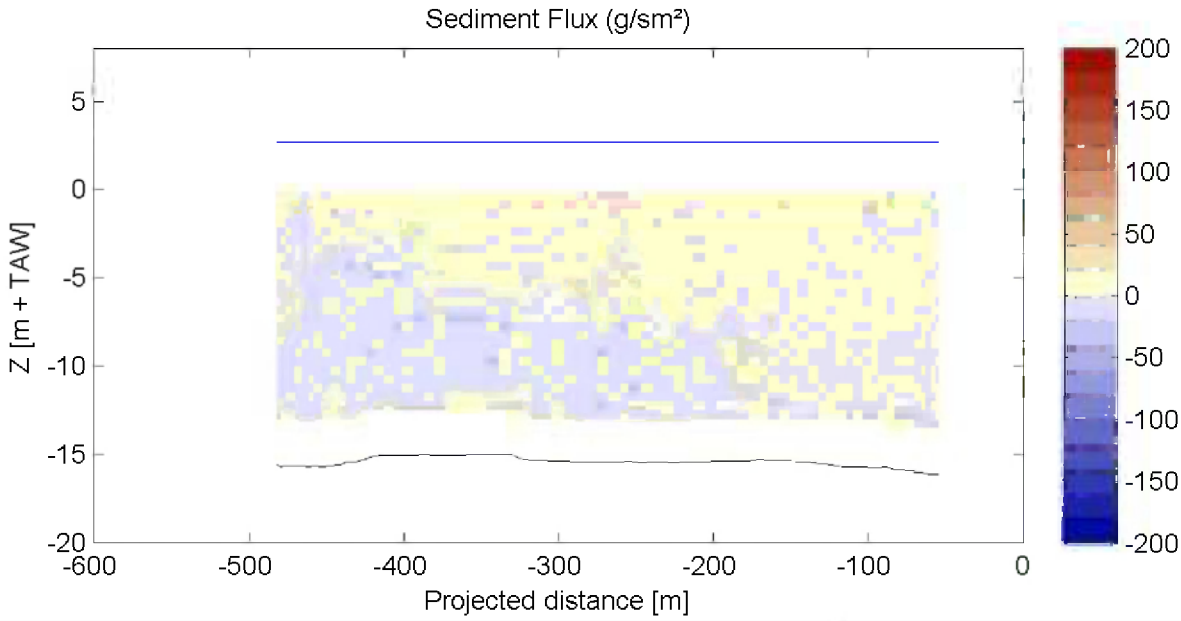
In association with :

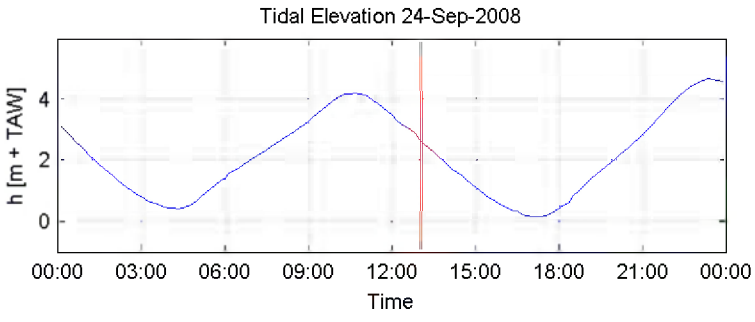
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7064dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

13:02 - 13:05

Time after HW [HH:MM]

2:23

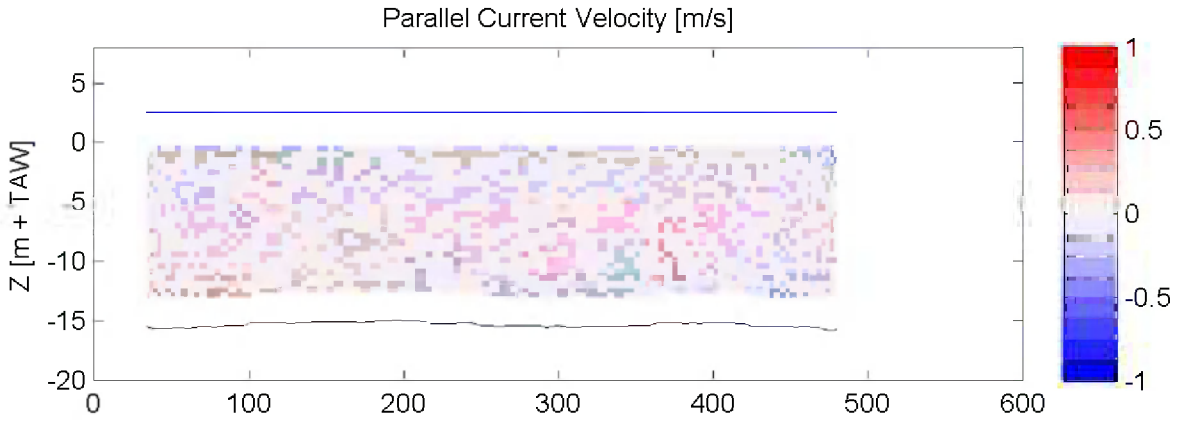
Data Processed by:

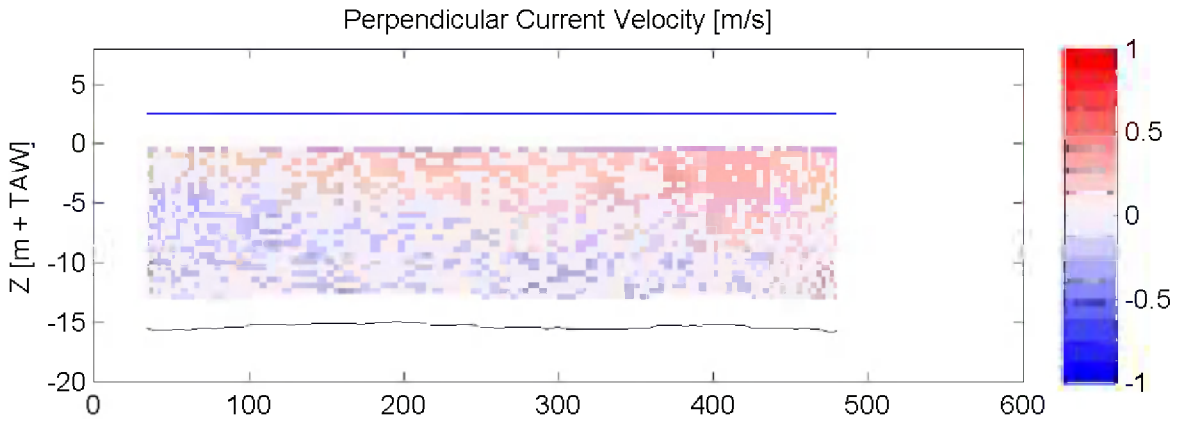
In association with :

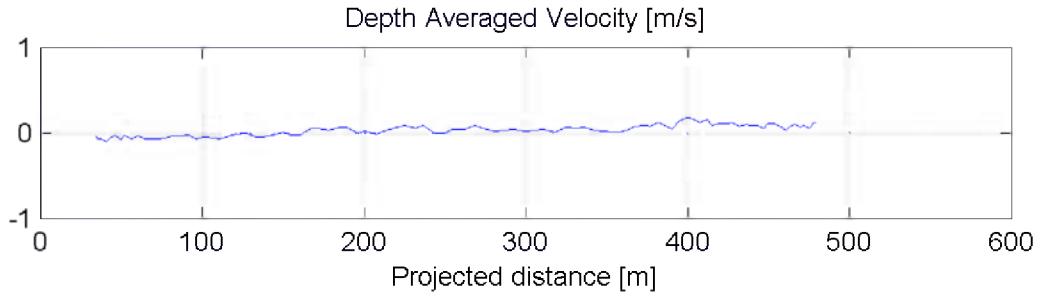
I/RA/11283/08.083/MSA

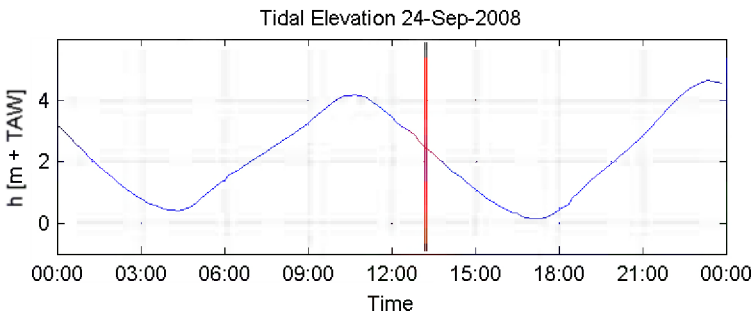
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7066dgdtlr_sub.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

13:10 - 13:14

Time after HW [HH:MM]

2:32

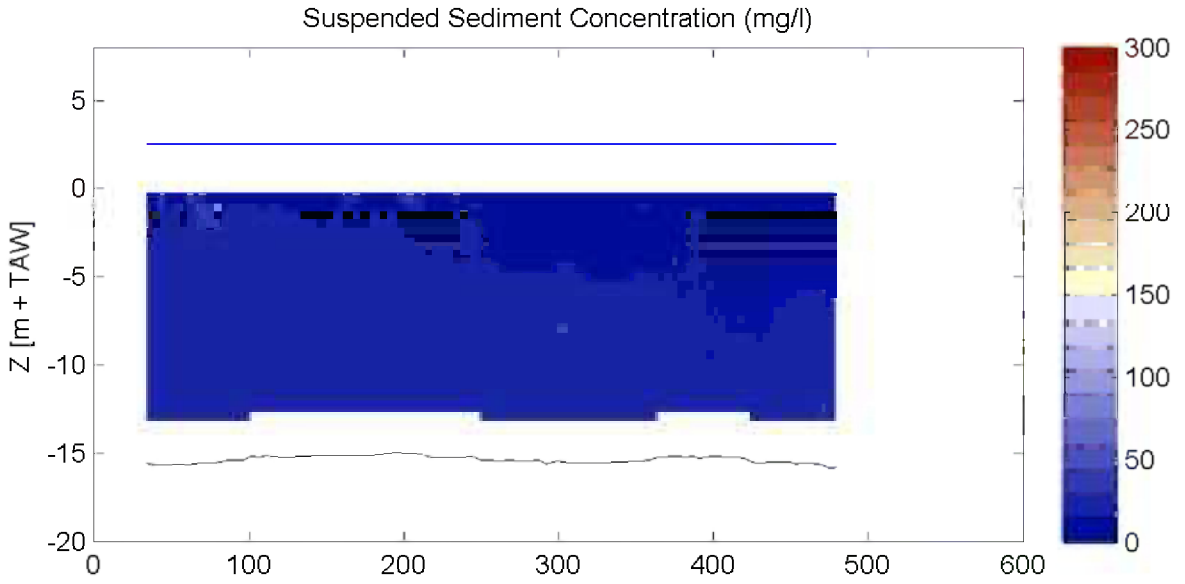
Data Processed by:

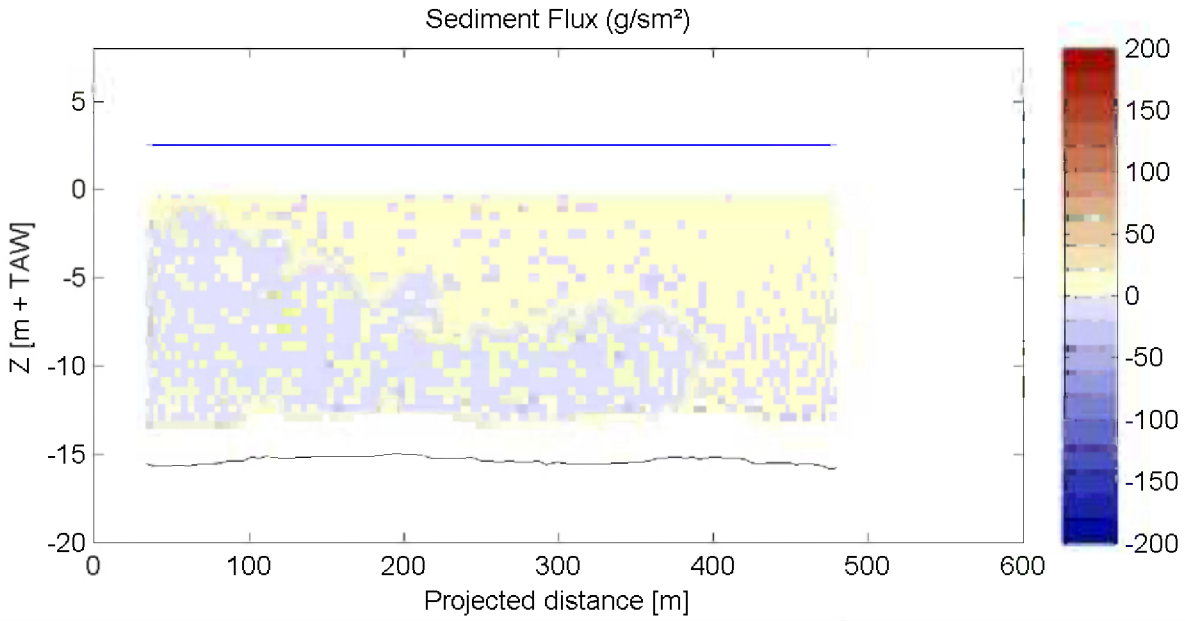
In association with :

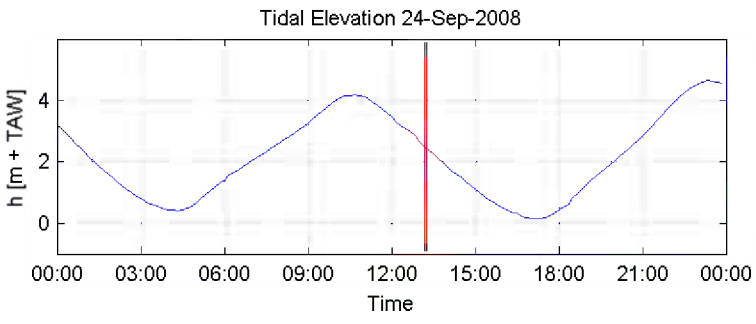
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7066dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

13:10 - 13:14

Time after HW [HH:MM]

2:32

Data Processed by:

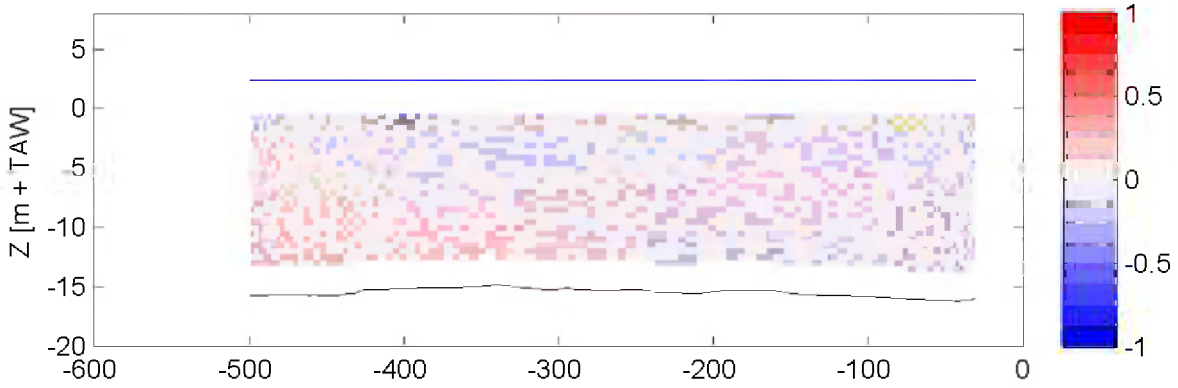
In association with :

I/RA/11283/08.083/MSA

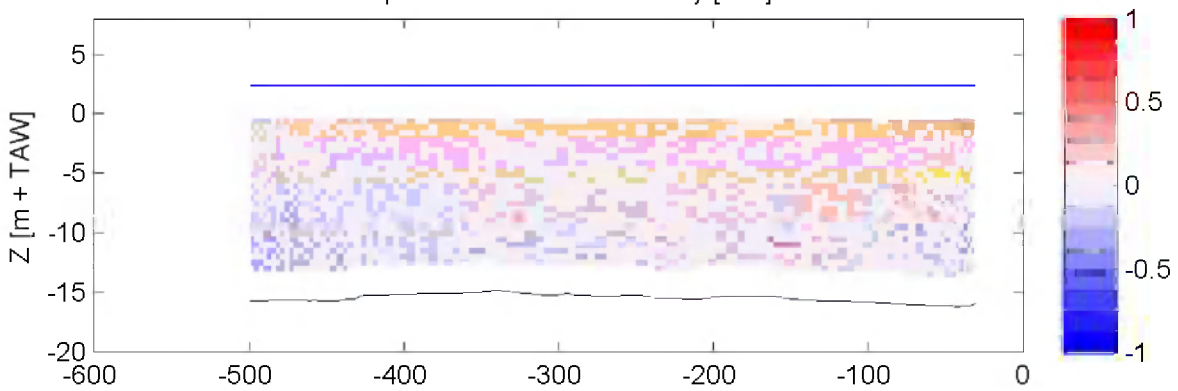
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7068dgdtrl_sub.csv	Location: Deurganckdok

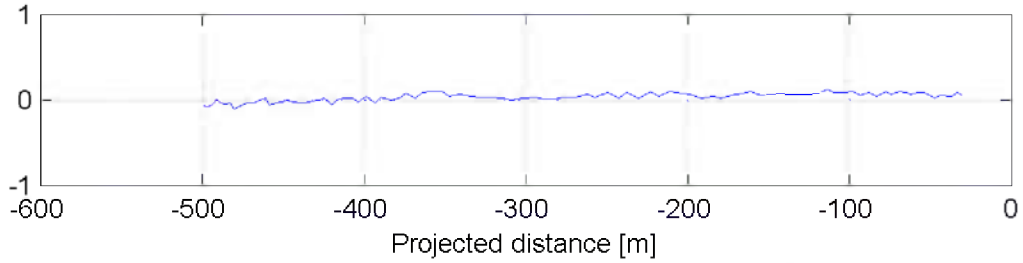
Parallel Current Velocity [m/s]



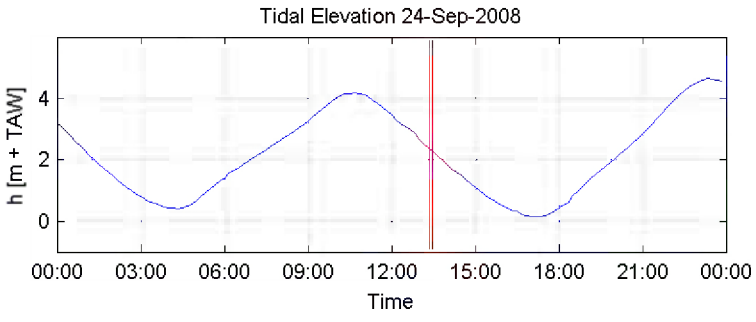
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

13:22 - 13:26

Time after HW [HH:MM]

2:44

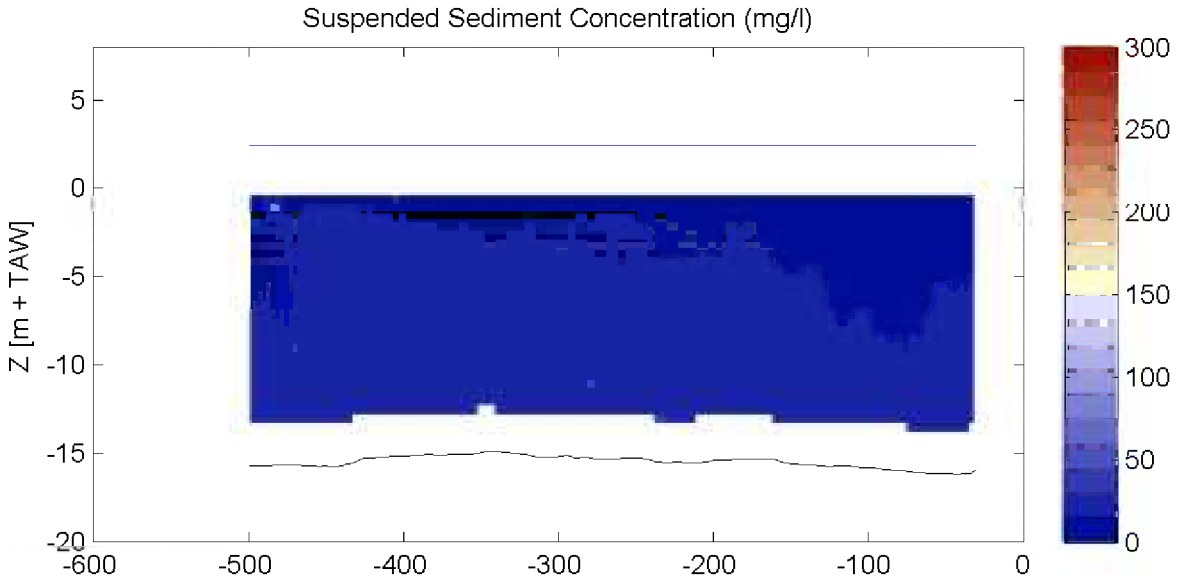
Data Processed by:

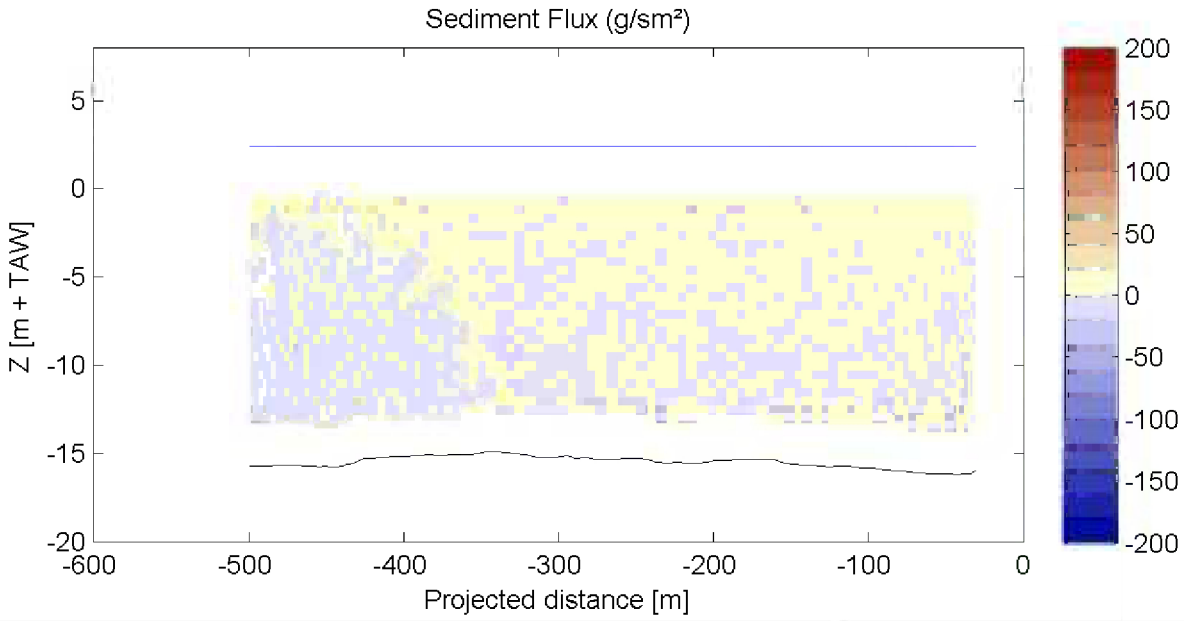
In association with :

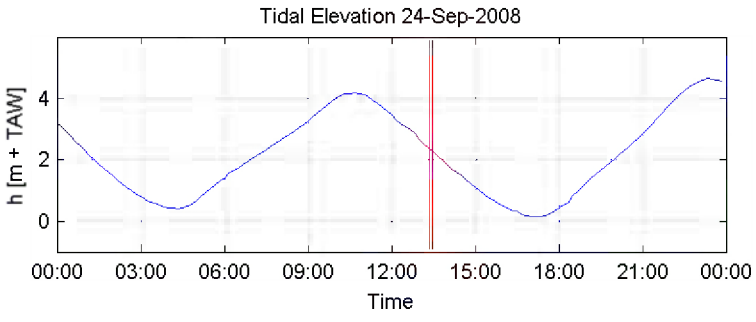
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7068dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

13:22 - 13:26

Time after HW [HH:MM]

2:44

Data Processed by:

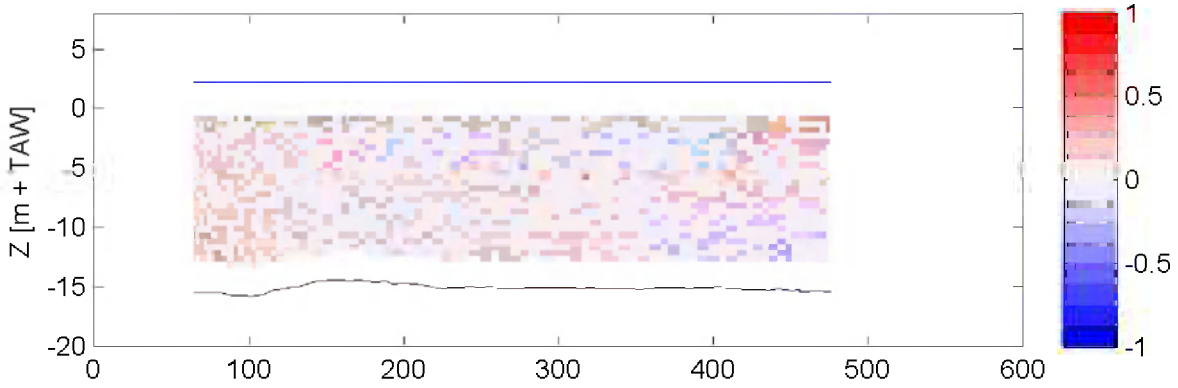
In association with :

I/RA/11283/08.083/MSA

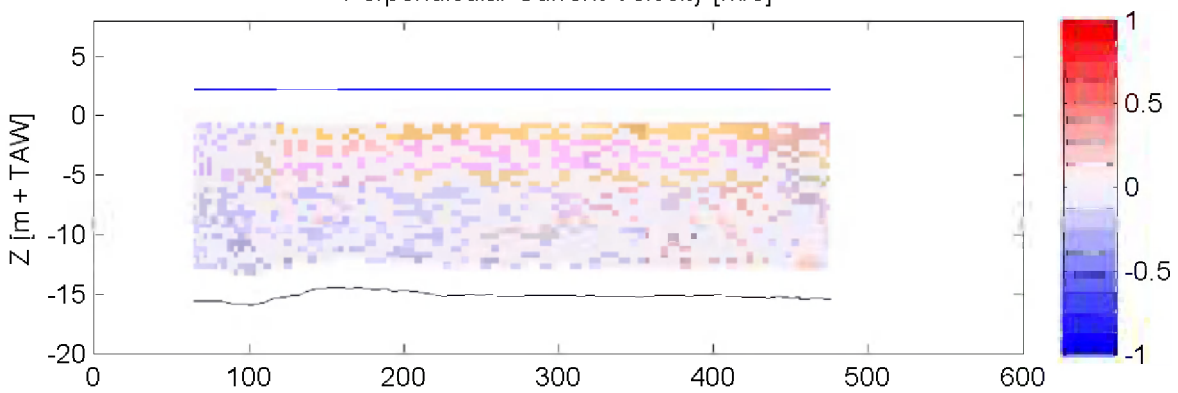
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7070dgdtlr_sub.csv	Location: Deurganckdok

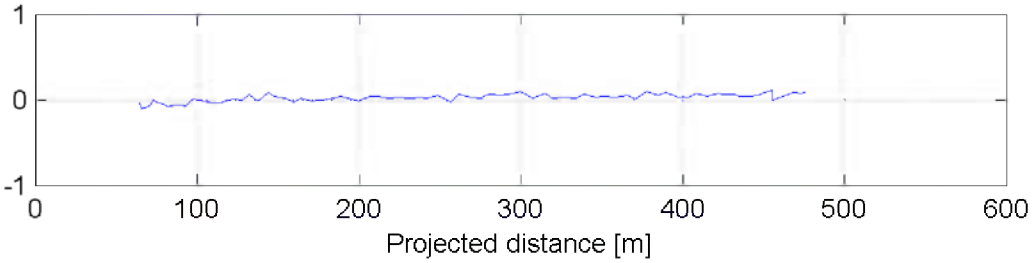
Parallel Current Velocity [m/s]



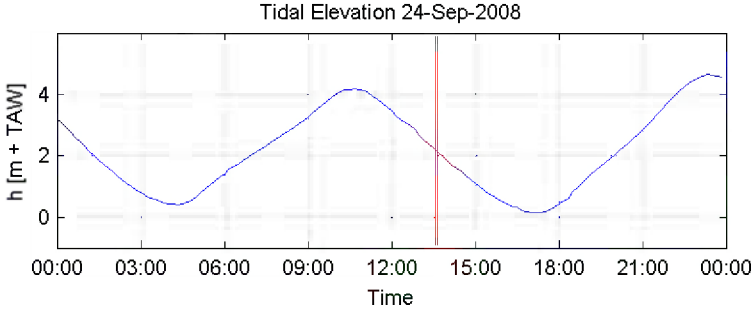
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

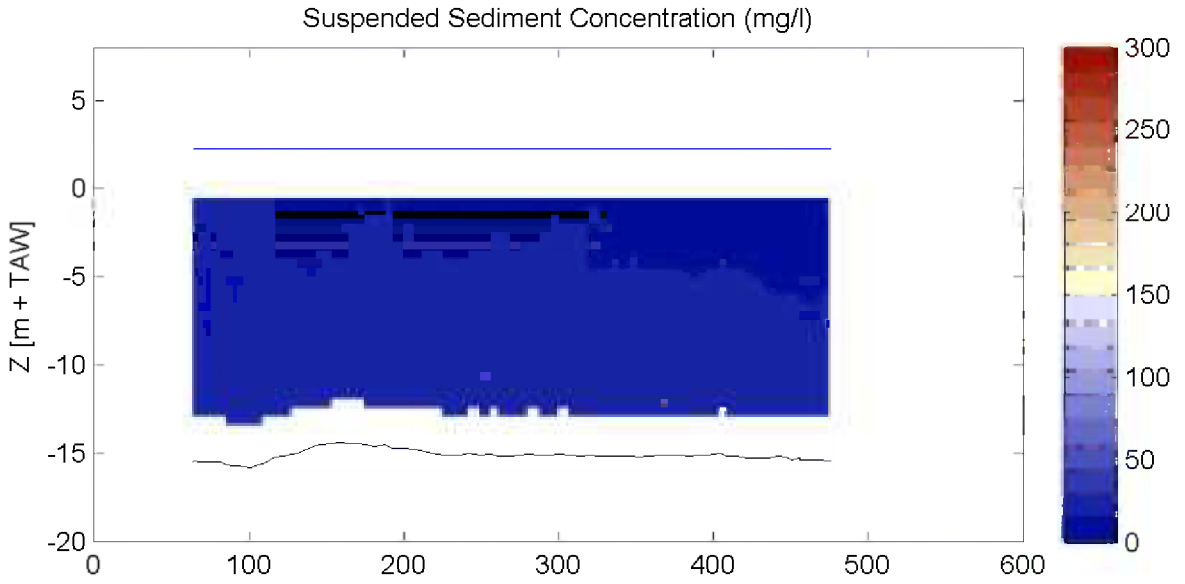
Date / Time [MET] :
24-Sep-2008
13:34 - 13:37

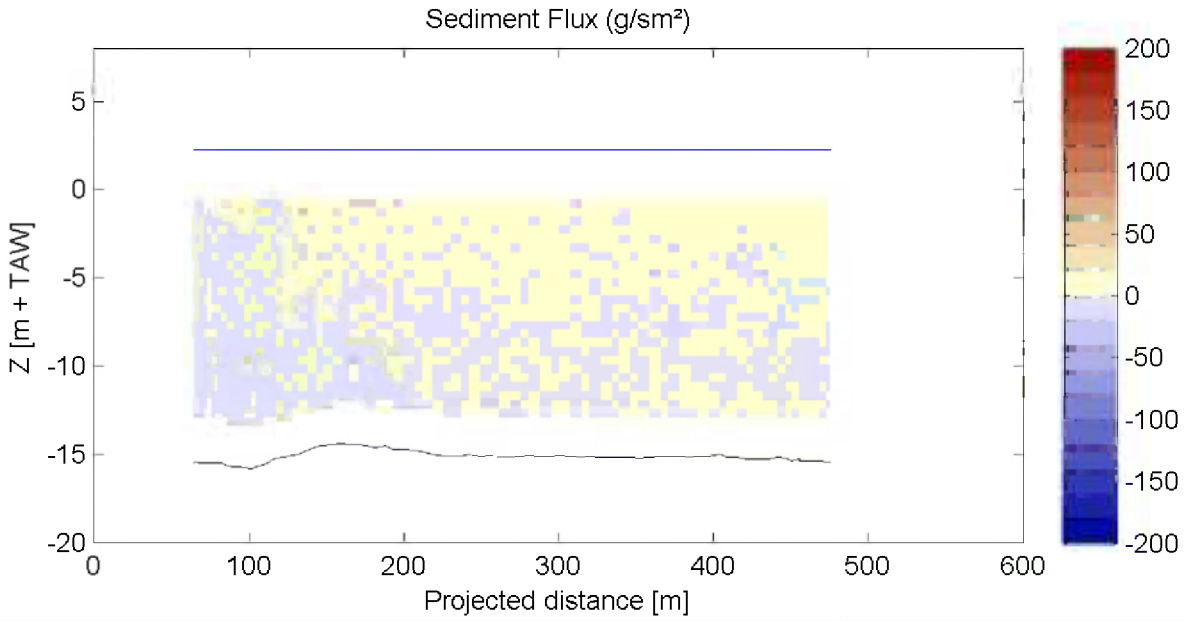
Time after HW [HH:MM]
2:56

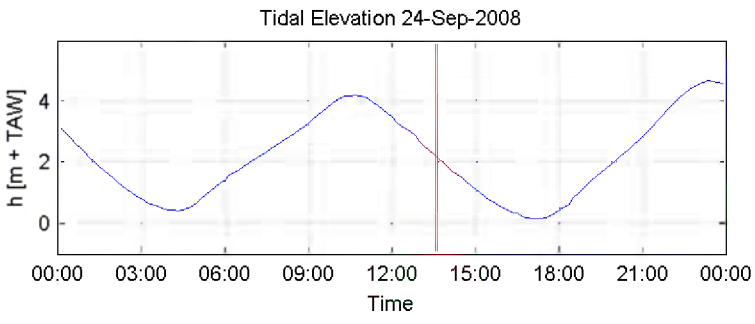
Data Processed by:
In association with :
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7070dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

13:34 - 13:37

Time after HW [HH:MM]

2:56

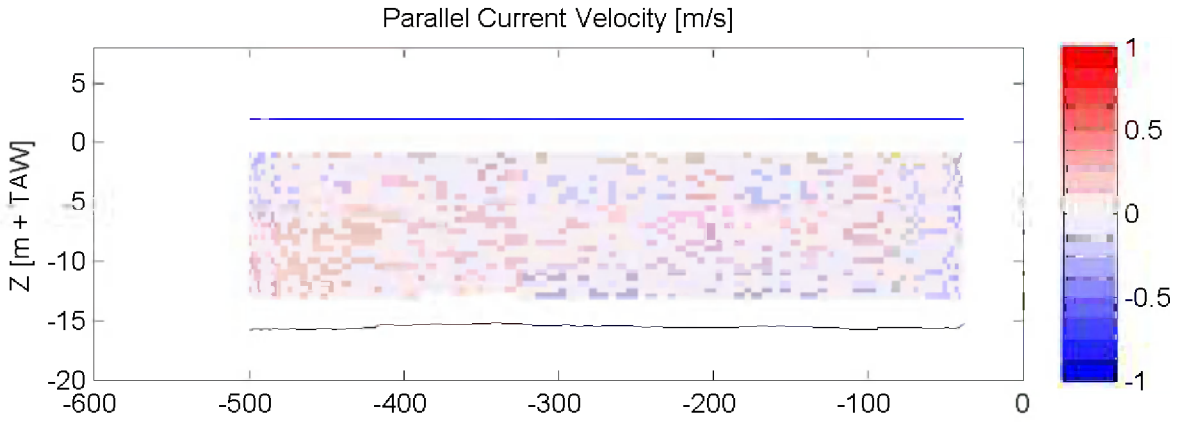
Data Processed by:

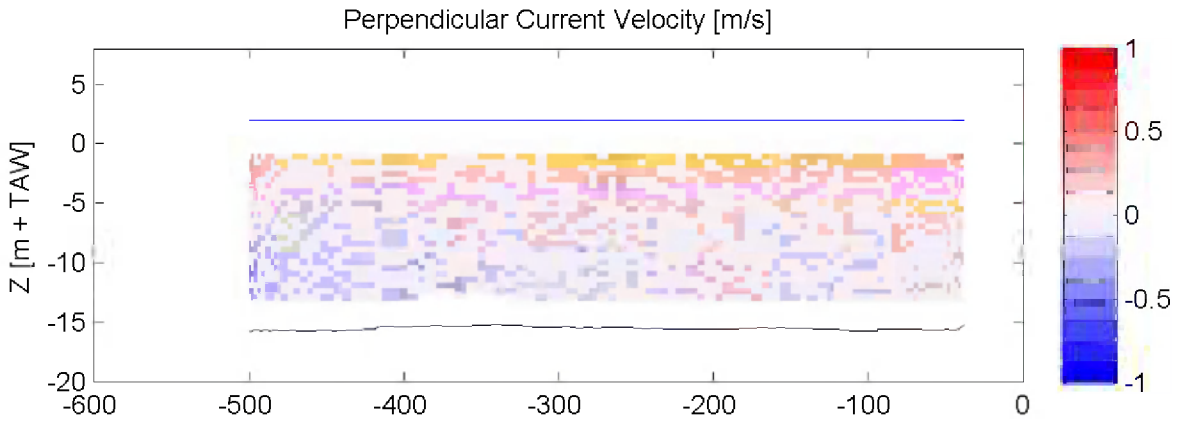
In association with :

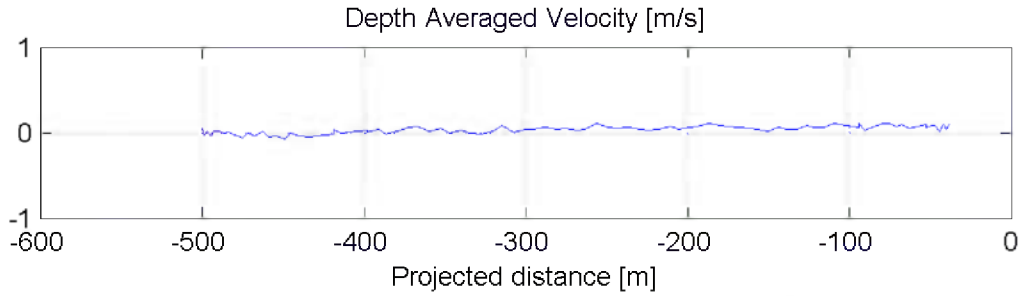
I/RA/11283/08.083/MSA

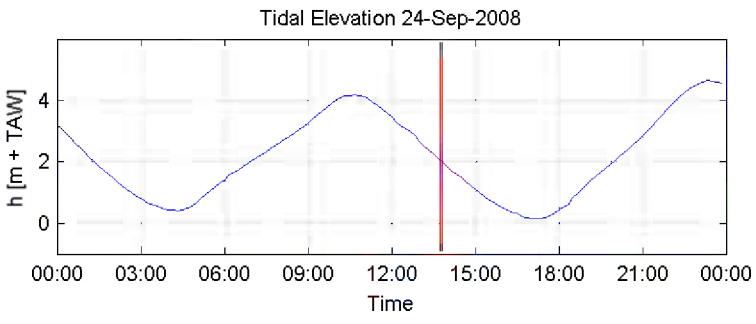
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7072dgdtr_subl.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

13:45 - 13:49

Time after HW [HH:MM]

3:07

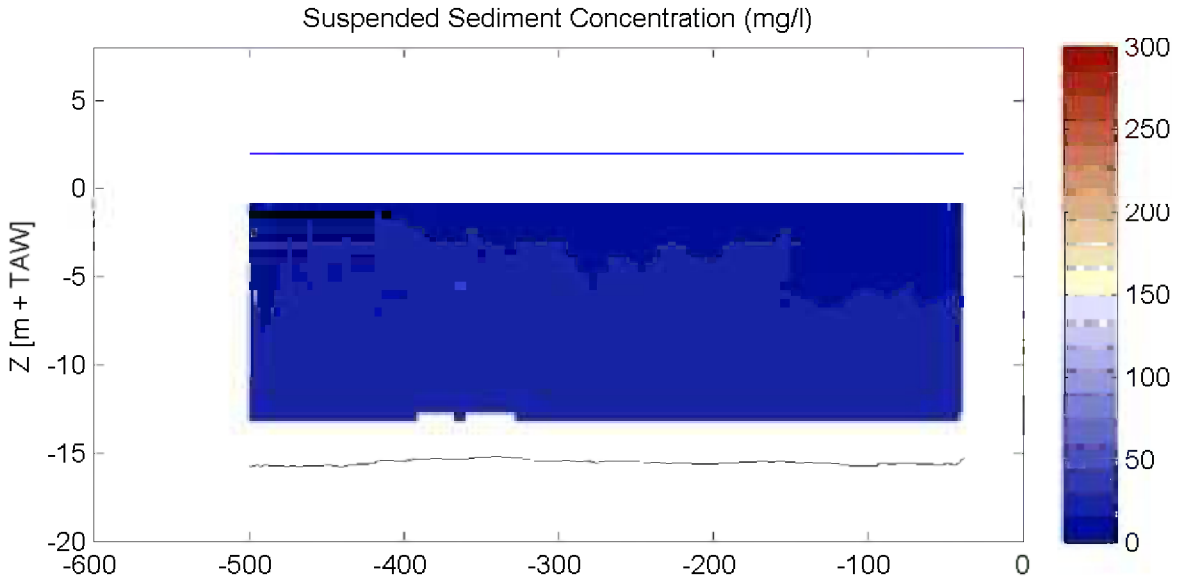
Data Processed by:

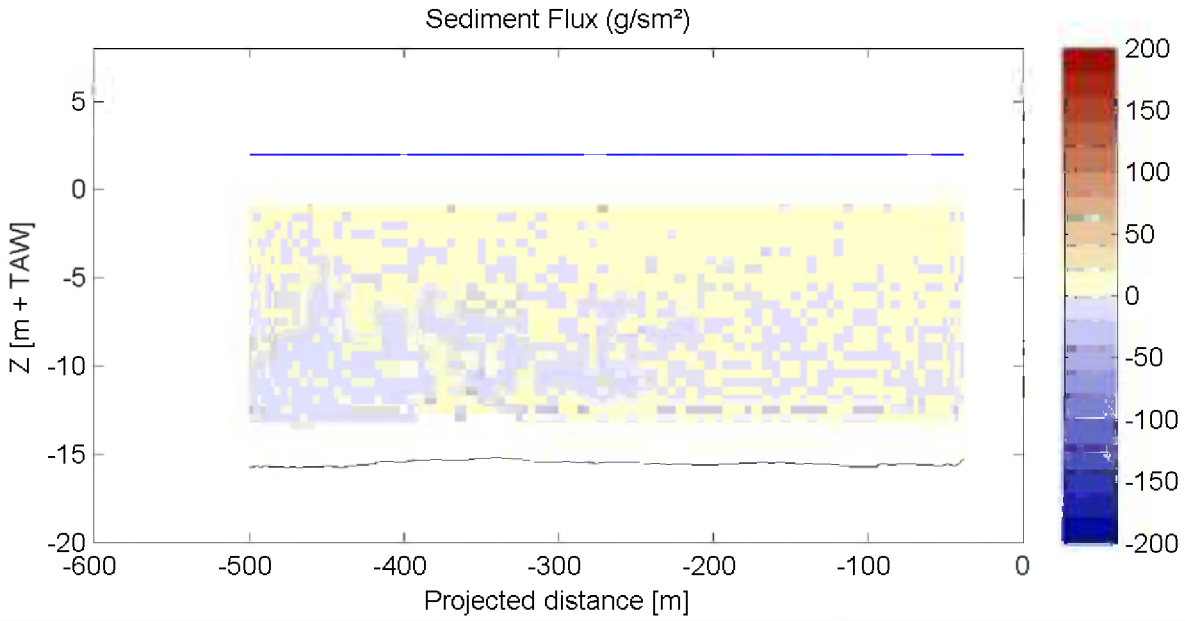
In association with :

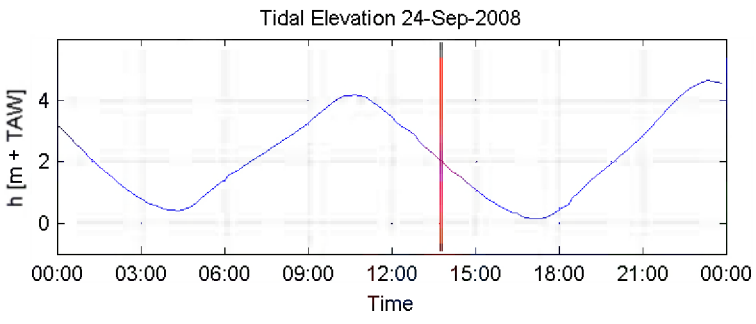
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7072dgdtr_subl.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

13:45 - 13:49

Time after HW [HH:MM]

3:07

Data Processed by:

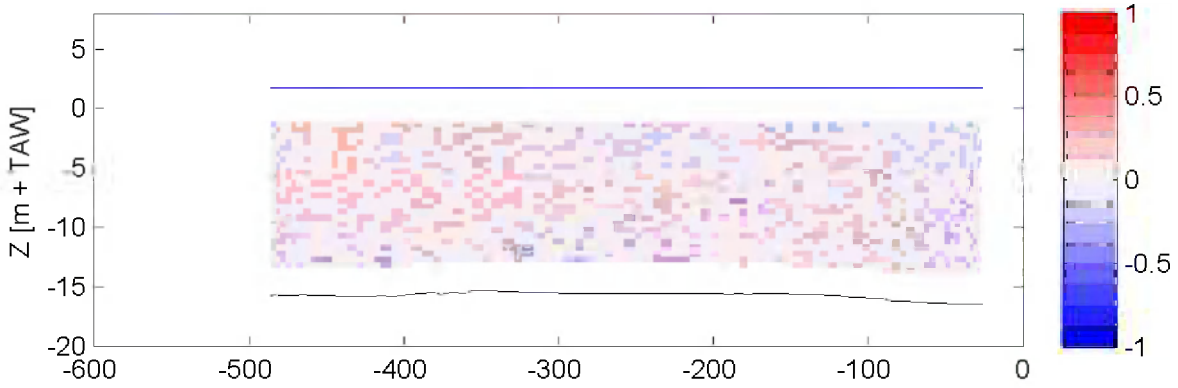
In association with :

I/RA/11283/08.083/MSA

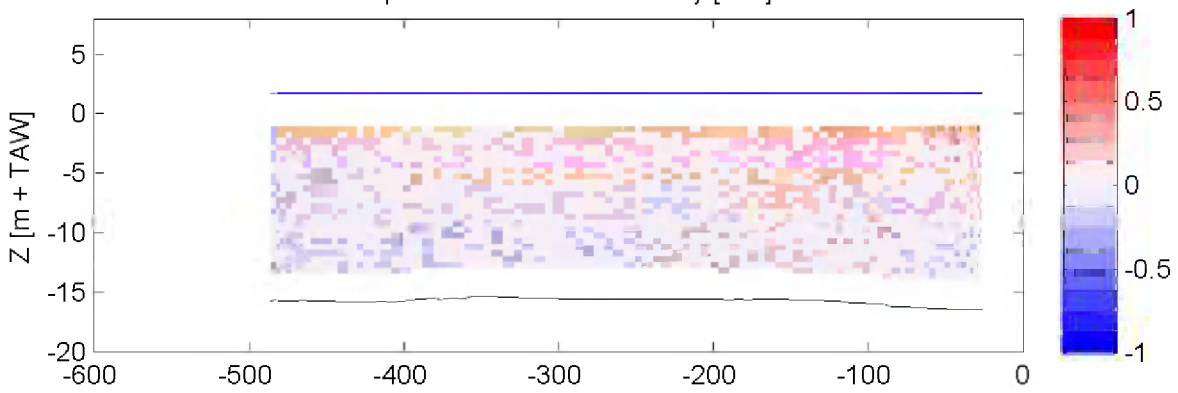
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7076dgdtrl_sub.csv	Location: Deurganckdok

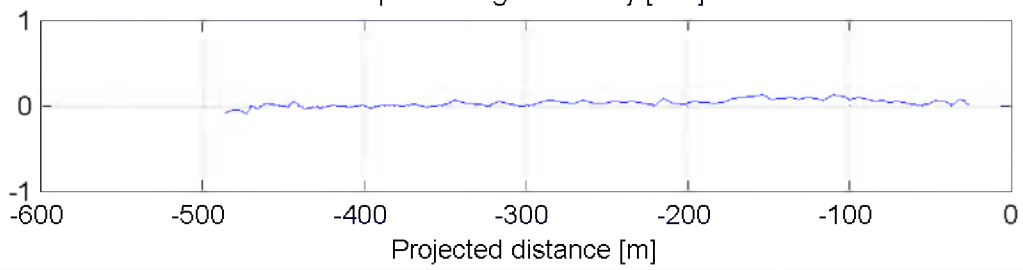
Parallel Current Velocity [m/s]



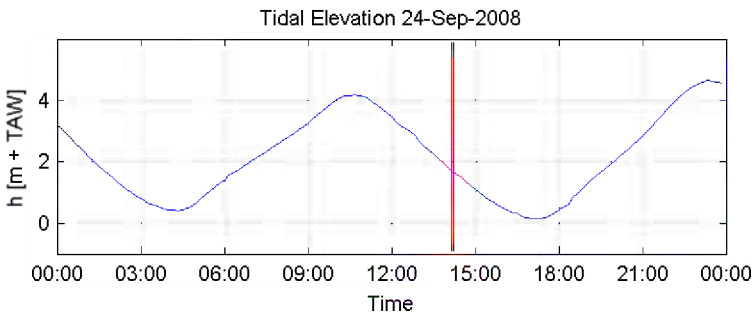
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

14:08 - 14:12

Time after HW [HH:MM]

3:30

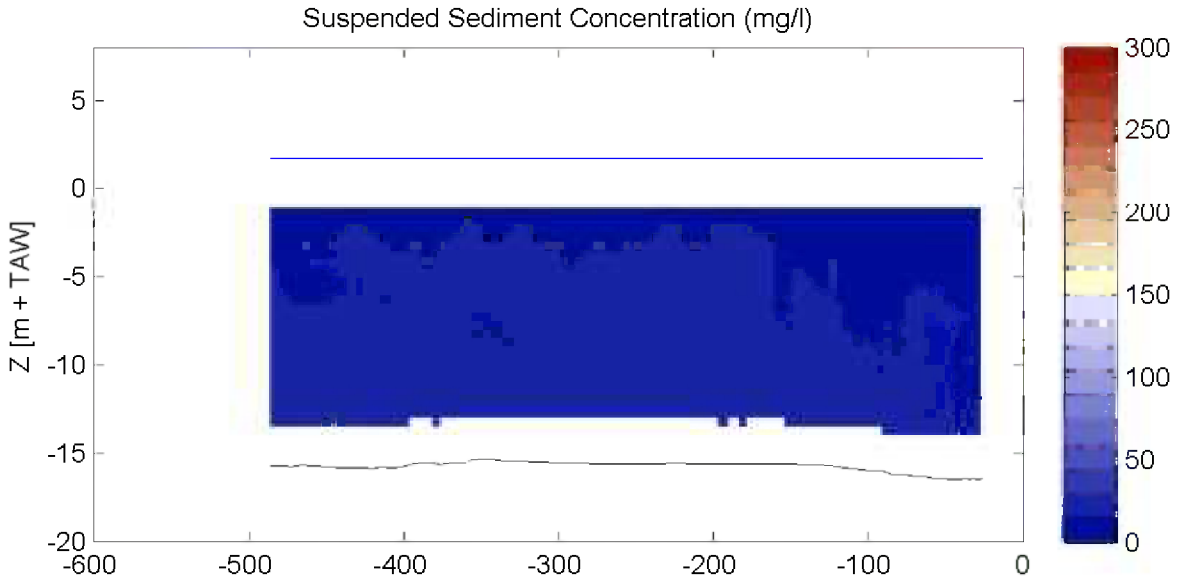
Data Processed by:

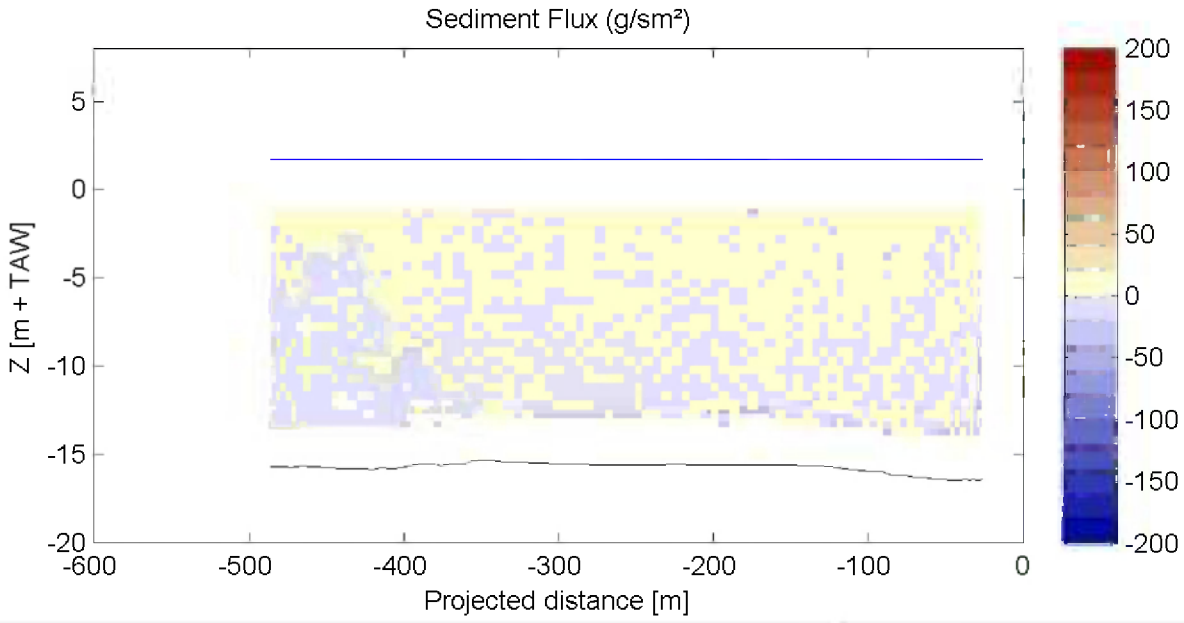
In association with :

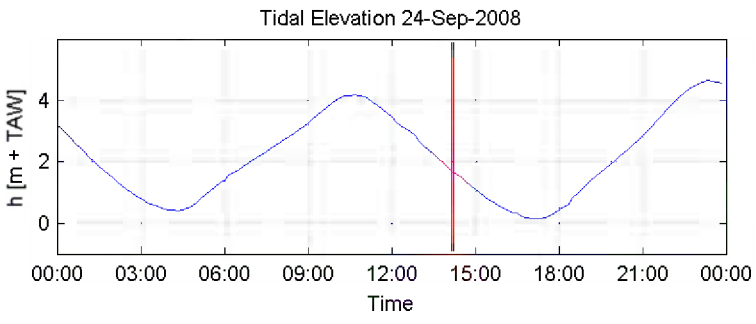
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7076dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

14:08 - 14:12

Time after HW [HH:MM]

3:30

Data Processed by:

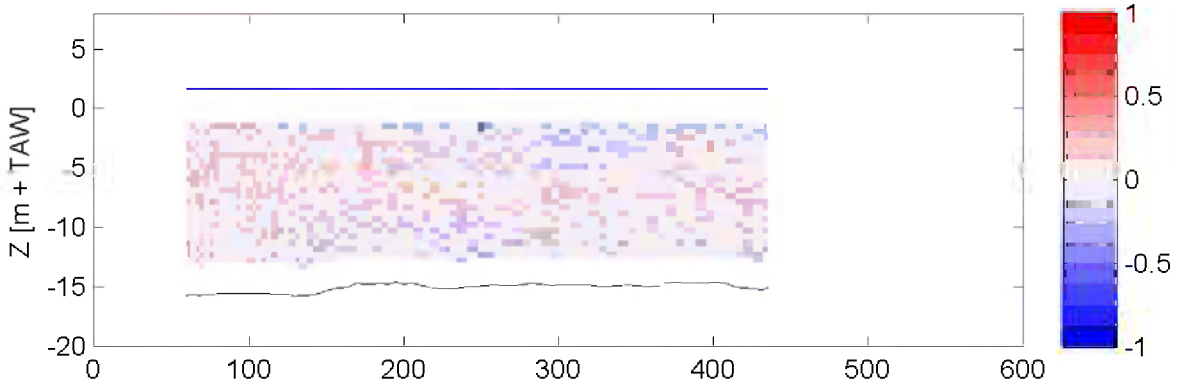
In association with :

I/RA/11283/08.083/MSA

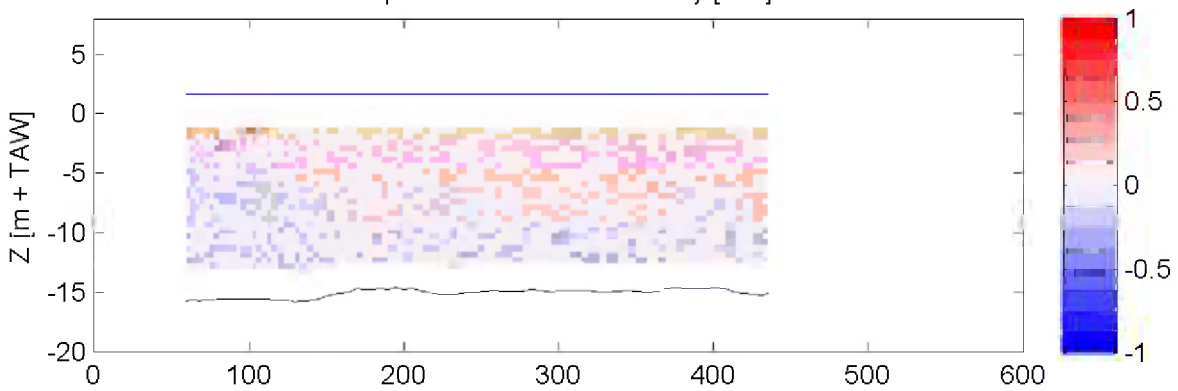
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7078dgdtlr_sub.csv	Location: Deurganckdok

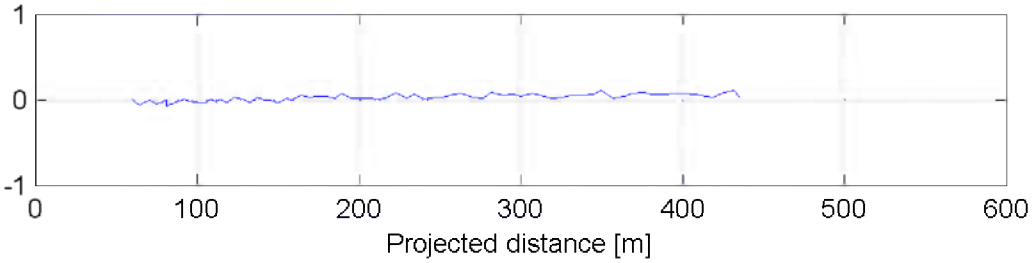
Parallel Current Velocity [m/s]



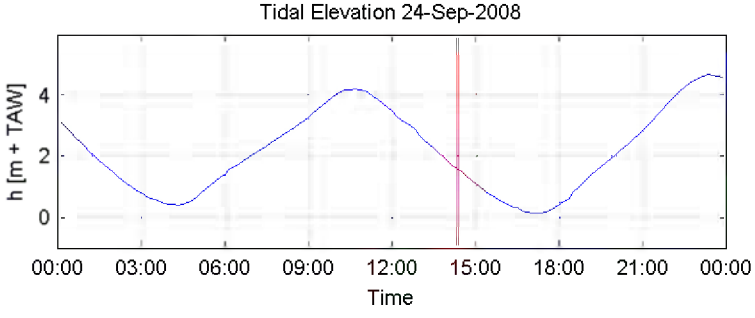
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

14:19 - 14:22

Time after HW [HH:MM]

3:41

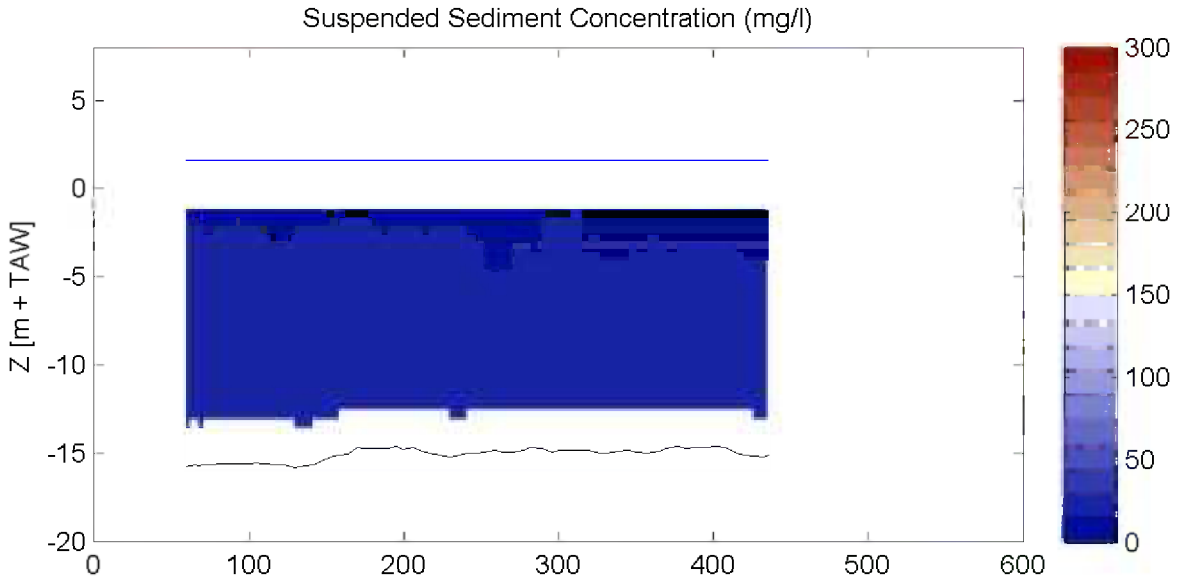
Data Processed by:

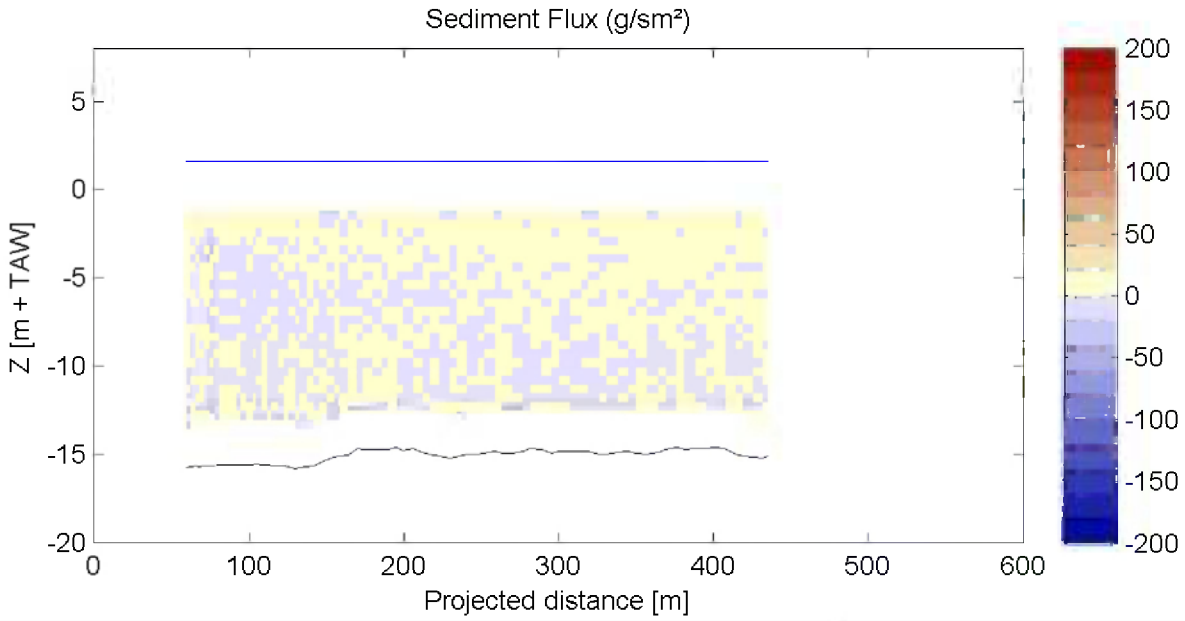
In association with :

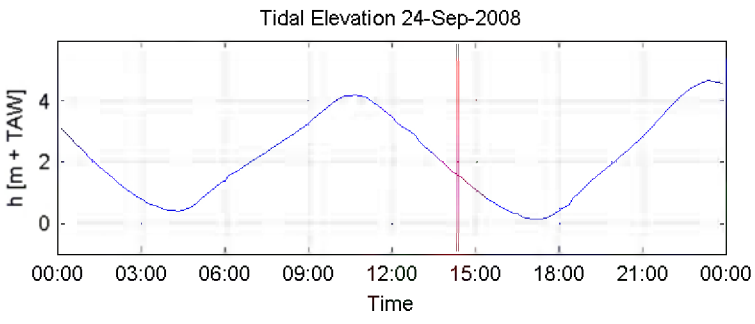
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7078dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

14:19 - 14:22

Time after HW [HH:MM]

3:41

Data Processed by:

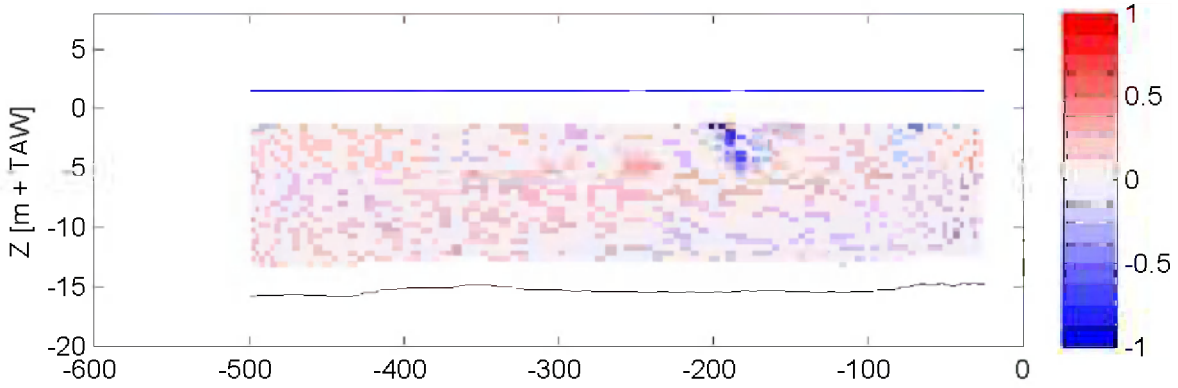
In association with :

I/RA/11283/08.083/MSA

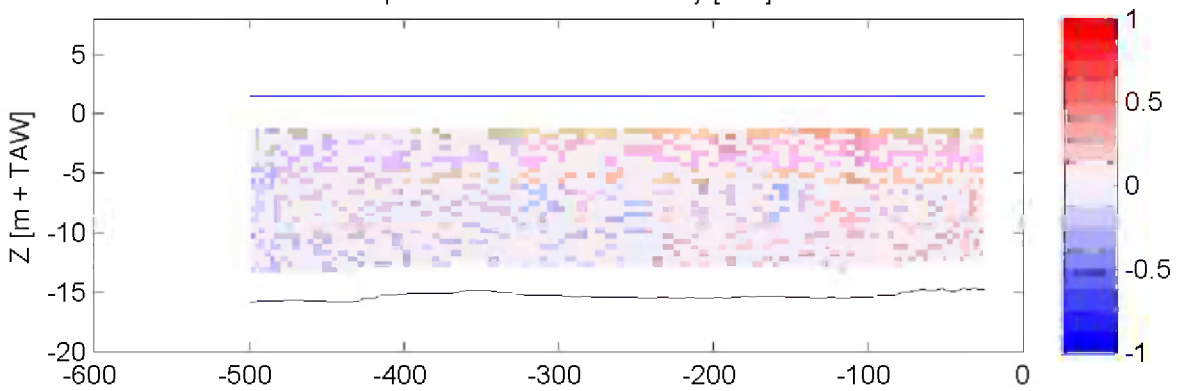
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7080dgdtrl_sub.csv	Location: Deurganckdok

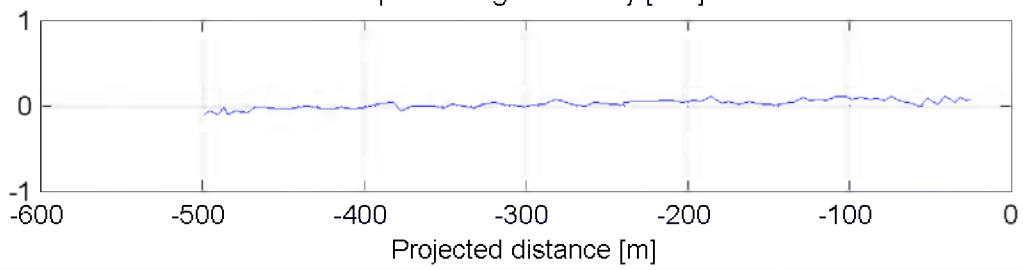
Parallel Current Velocity [m/s]



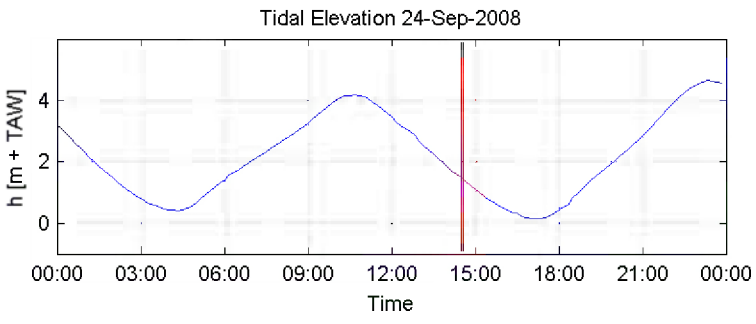
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

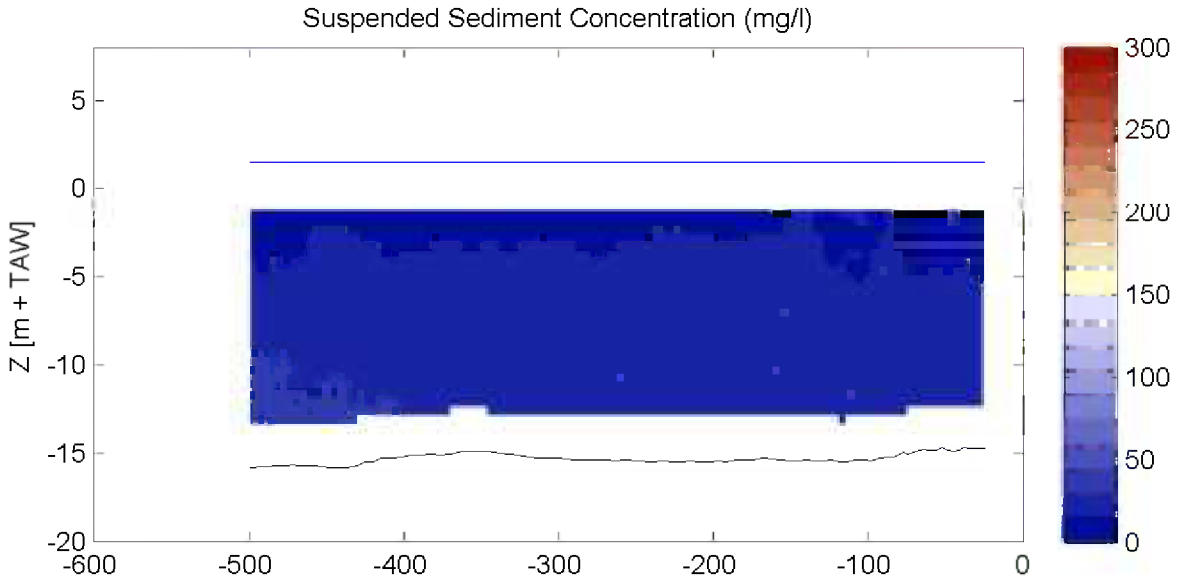
Date / Time [MET] :
24-Sep-2008
14:30 - 14:34

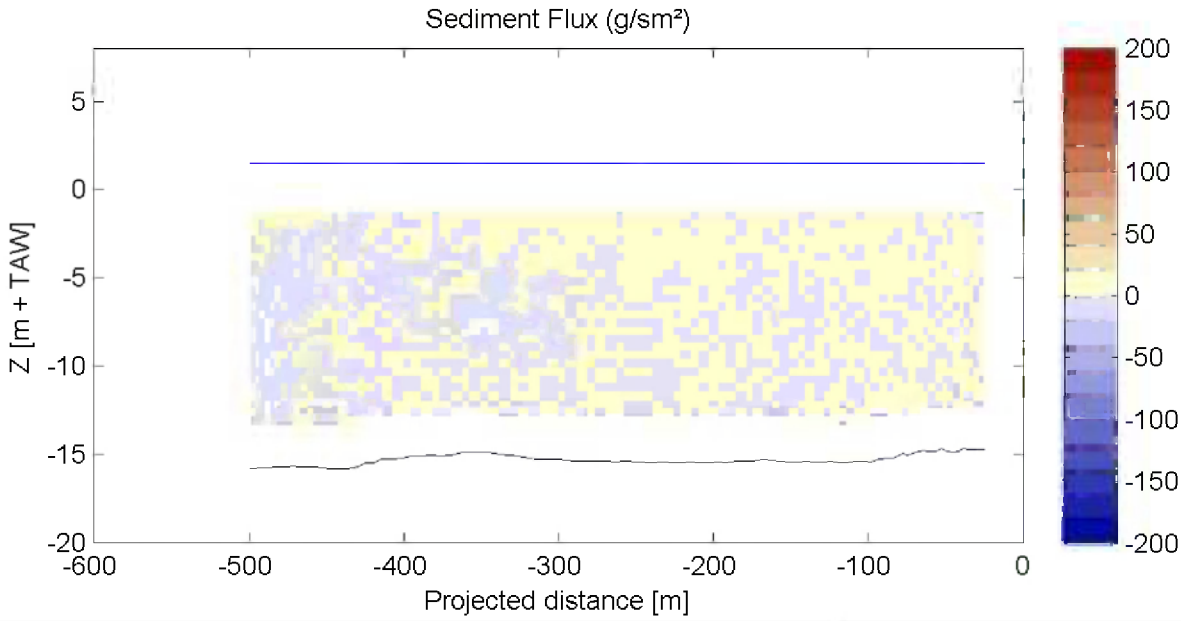
Time after HW [HH:MM]
3:52

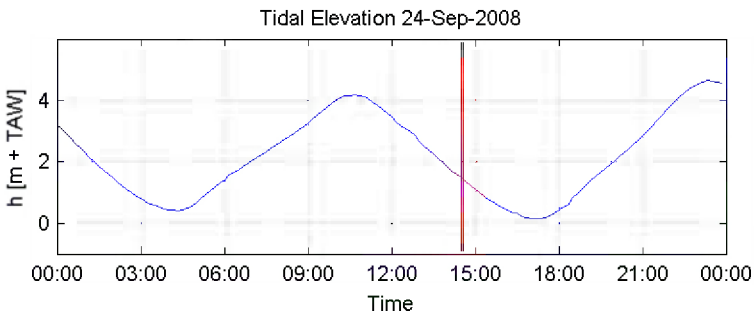
Data Processed by:
In association with :
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7080dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

14:30 - 14:34

Time after HW [HH:MM]

3:52

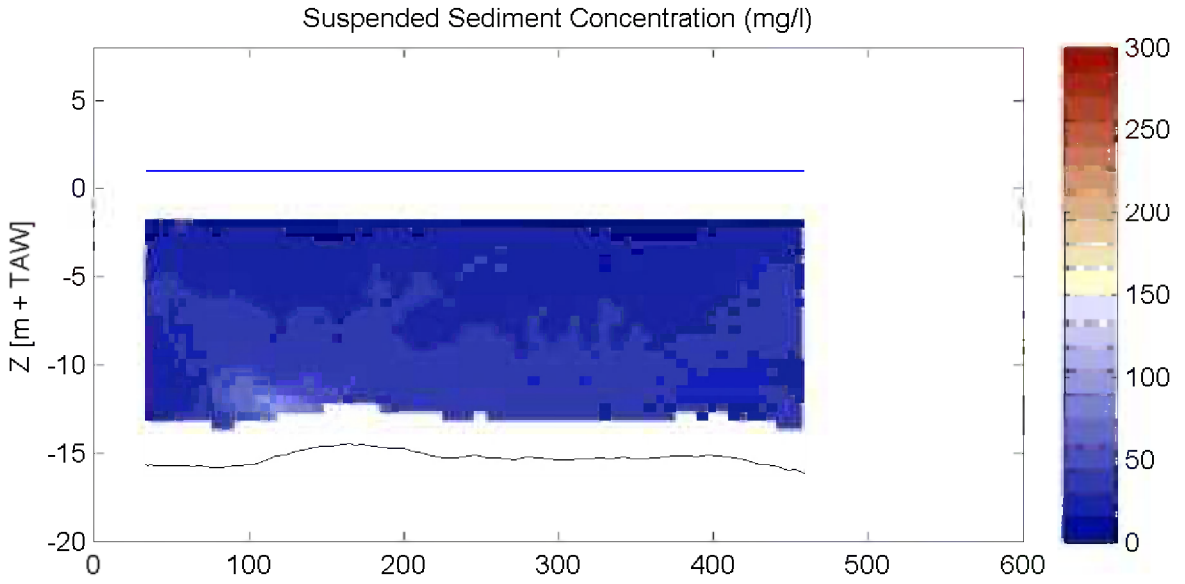
Data Processed by:

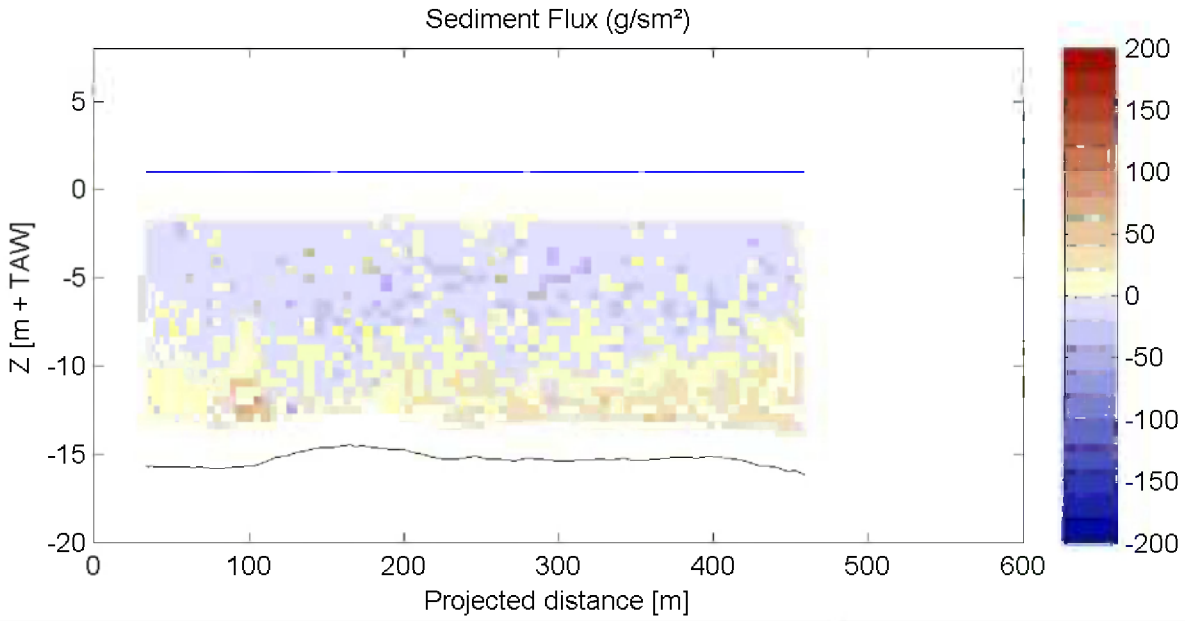
In association with :

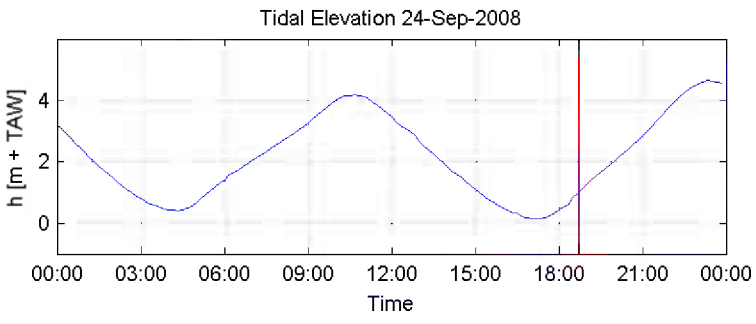
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7122dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

18:42 - 18:45

Time after HW [HH:MM]

-4:46

Data Processed by:

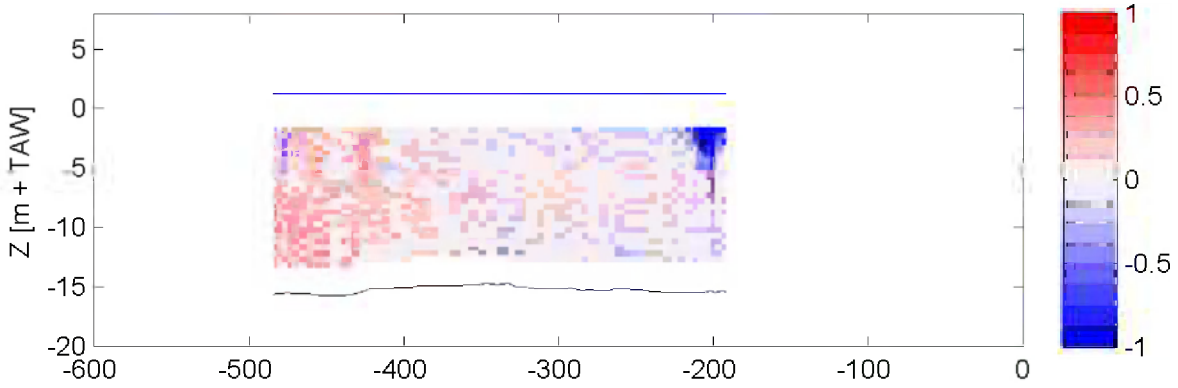
In association with :

I/RA/11283/08.083/MSA

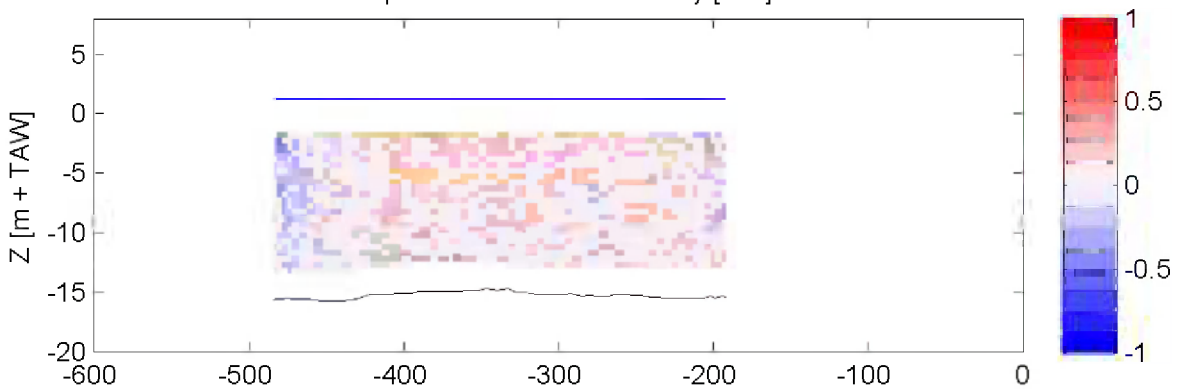
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7084dgdtrl_sub.csv	Location: Deurganckdok

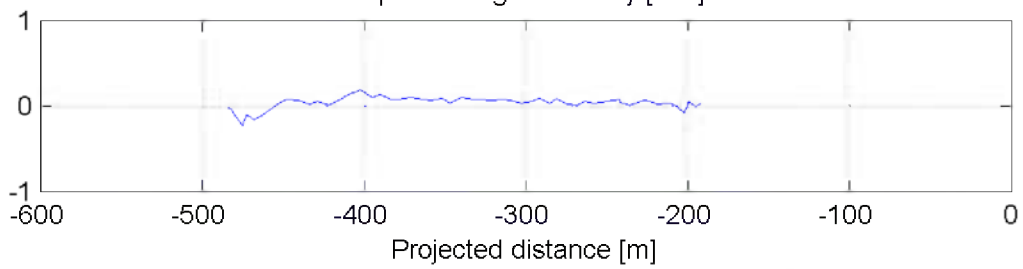
Parallel Current Velocity [m/s]



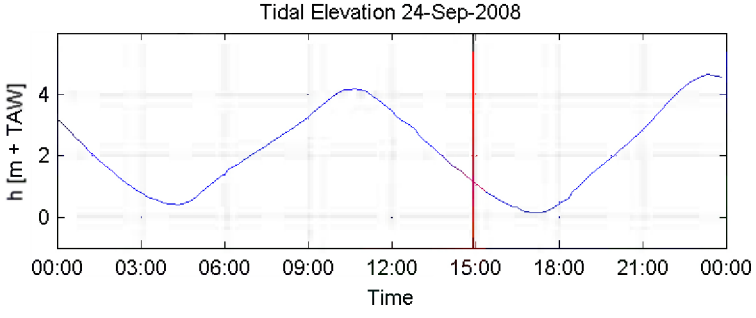
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

14:54 - 14:56

Time after HW [HH:MM]

4:15

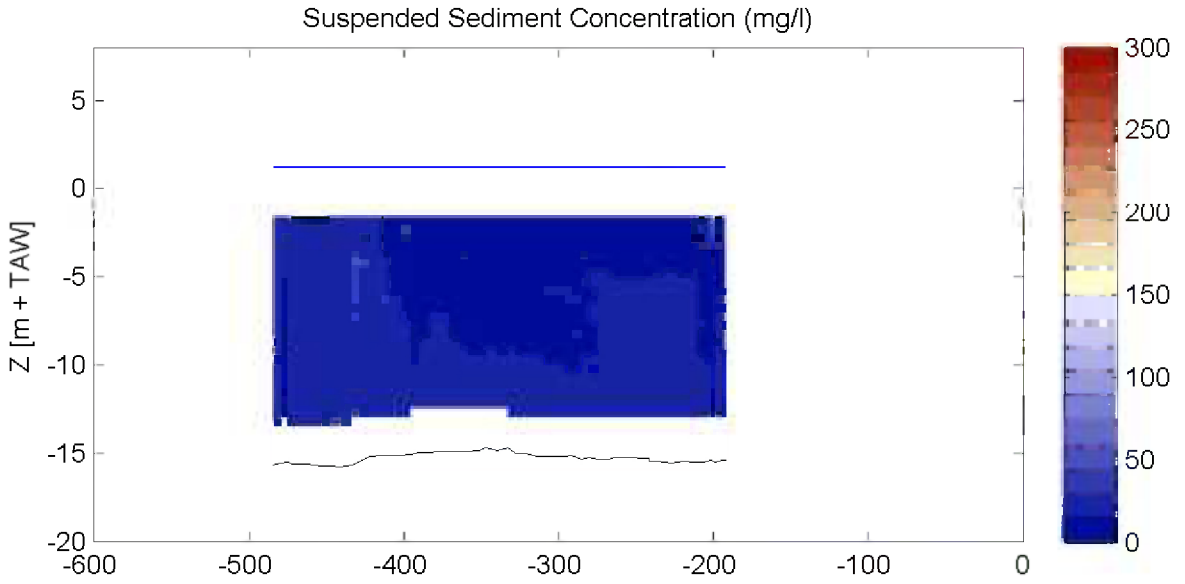
Data Processed by:

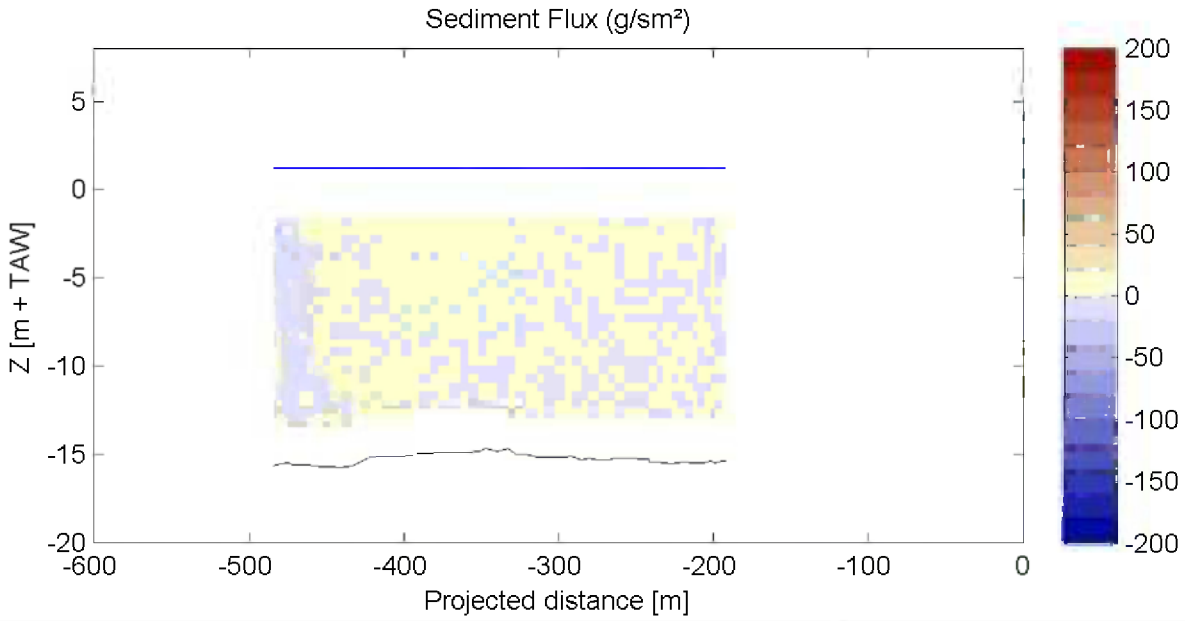
In association with :

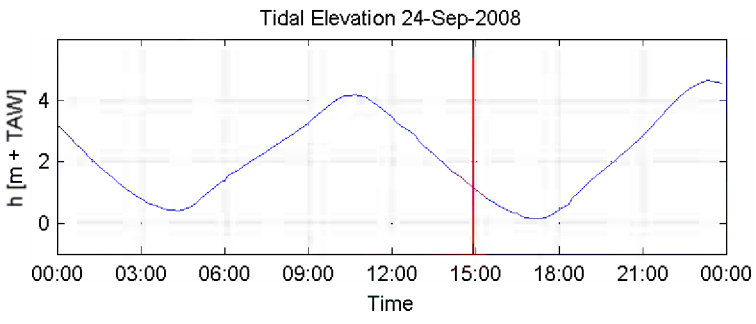
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7084dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

14:54 - 14:56

Time after HW [HH:MM]

4:15

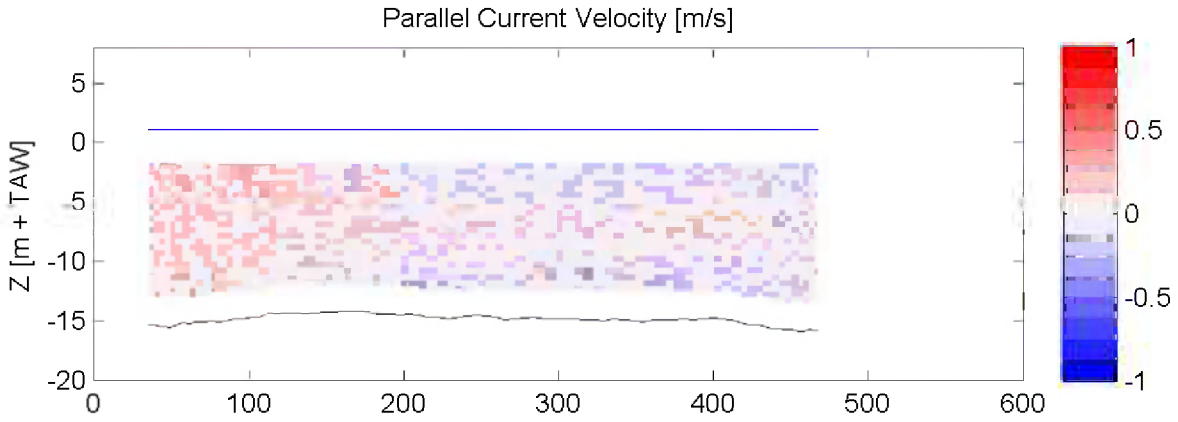
Data Processed by:

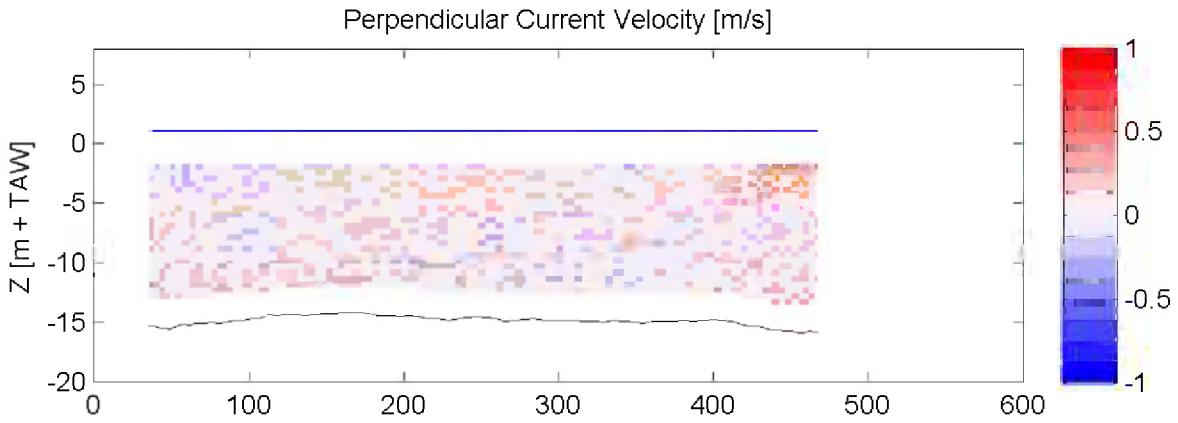
In association with :

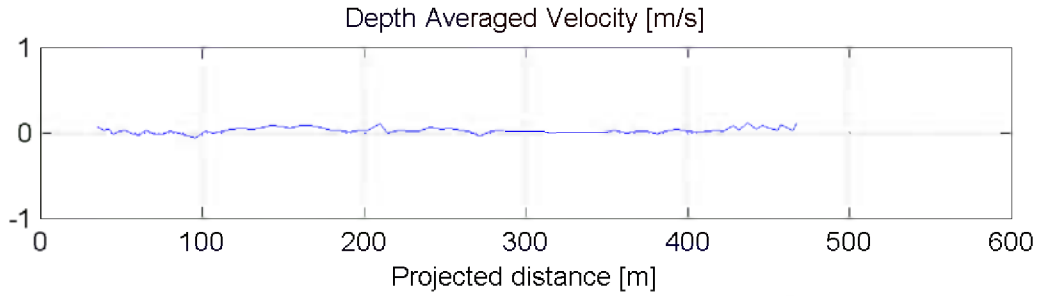
I/RA/11283/08.083/MSA

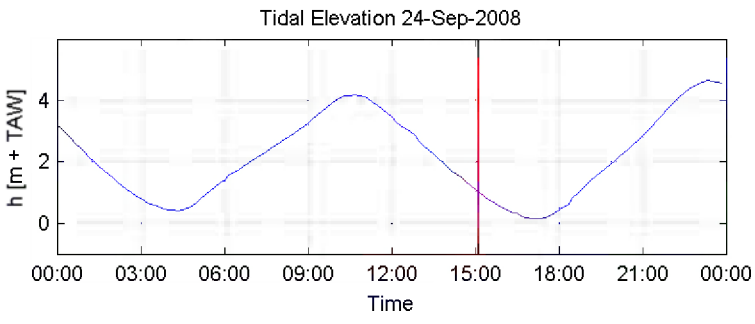
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7086dgdtlr_sub.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

15:04 - 15:08

Time after HW [HH:MM]

4:26

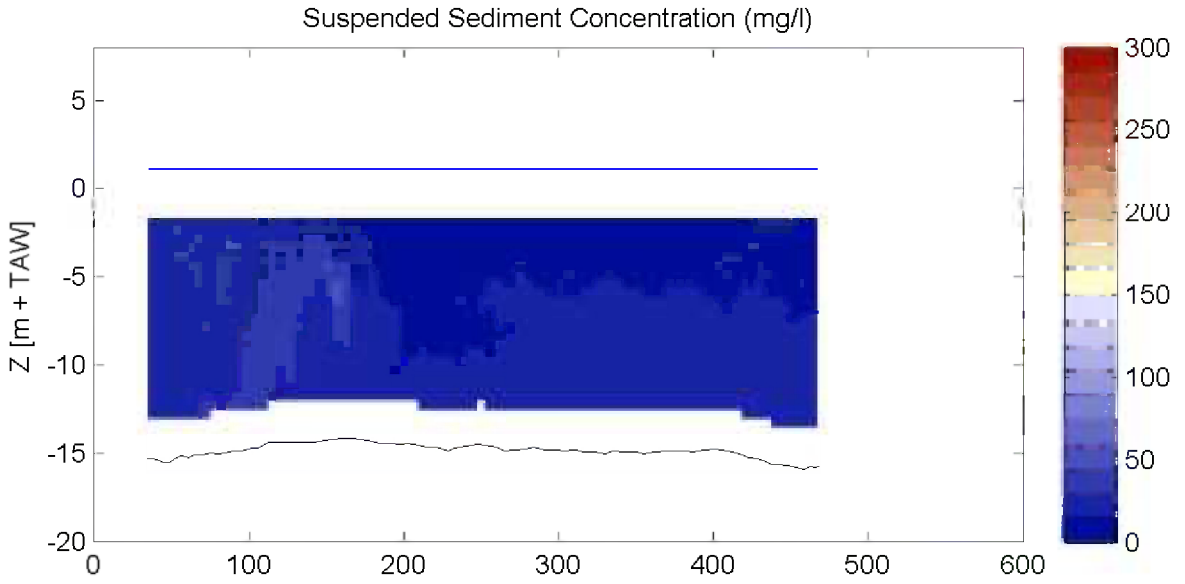
Data Processed by:

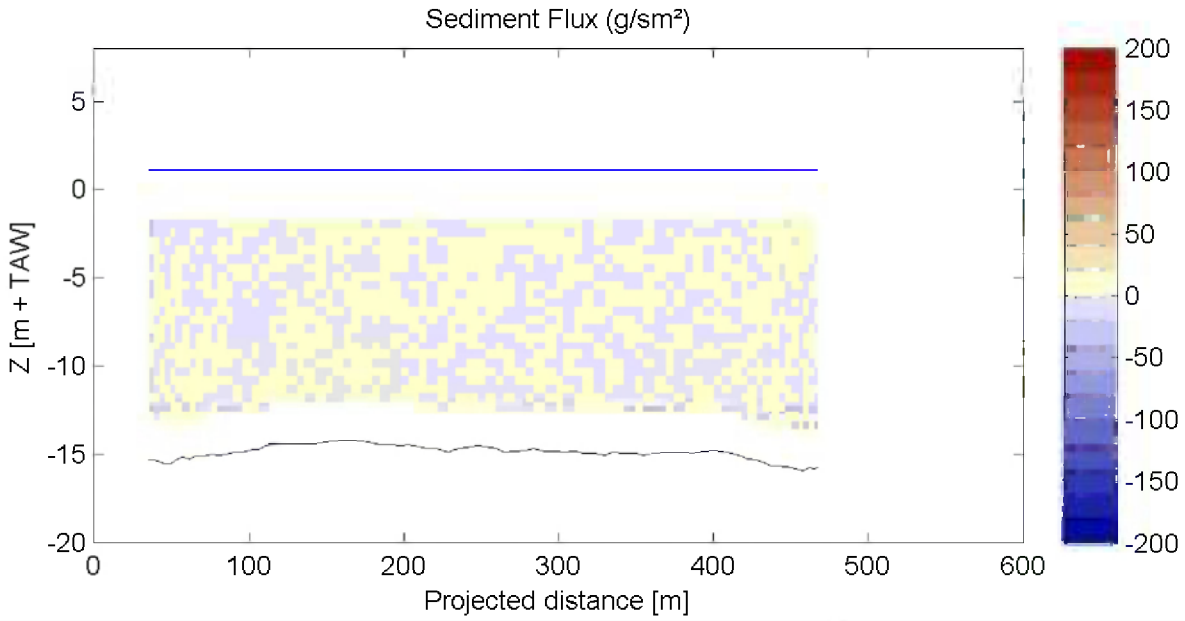
In association with :

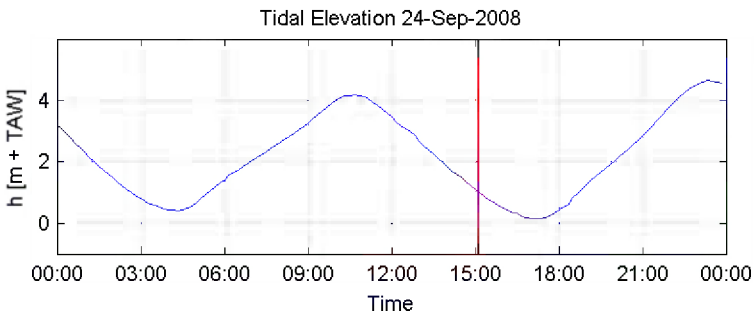
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7086dgdtlr_sub.csv	Location: Deurganckdok







HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

15:04 - 15:08

Time after HW [HH:MM]

4:26

Data Processed by:

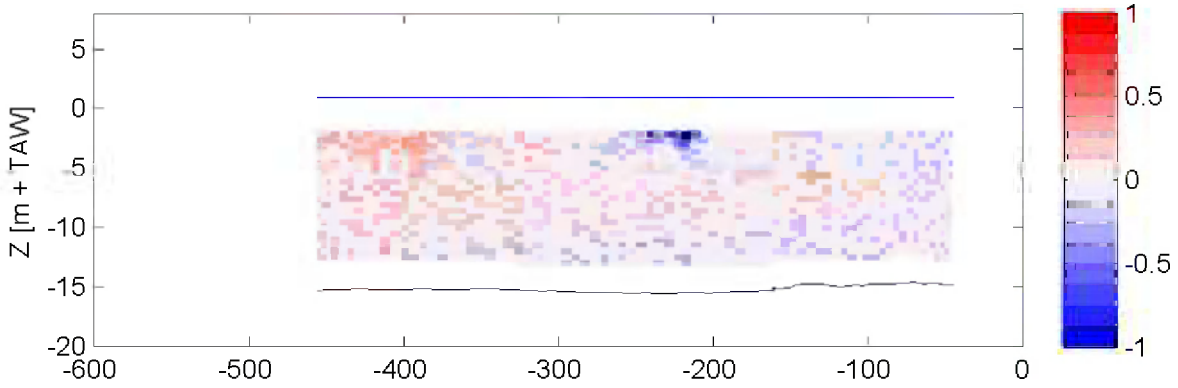
In association with :

I/RA/11283/08.083/MSA

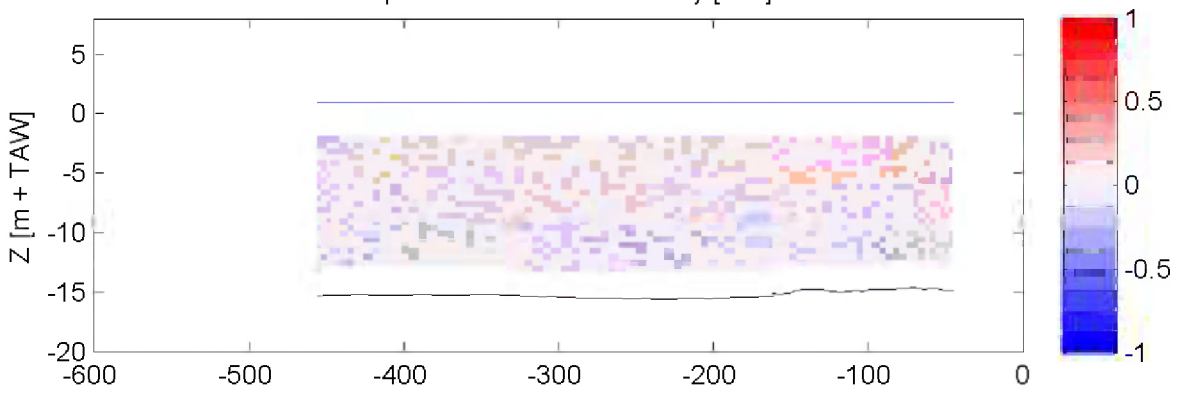
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7088dgdtrl_sub.csv	Location: Deurganckdok

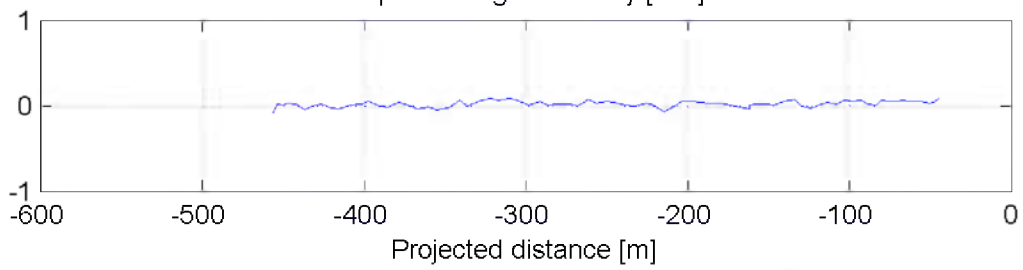
Parallel Current Velocity [m/s]



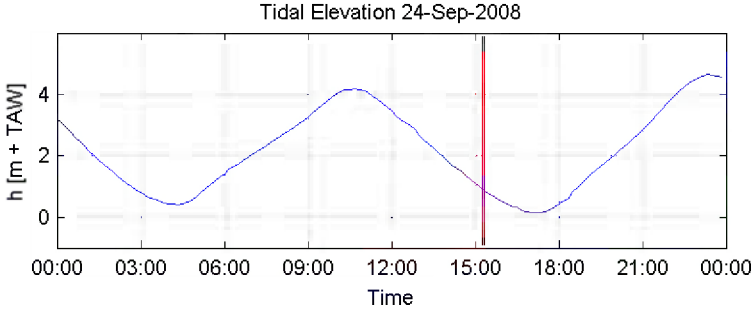
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

15:15 - 15:18

Time after HW [HH:MM]

4:37

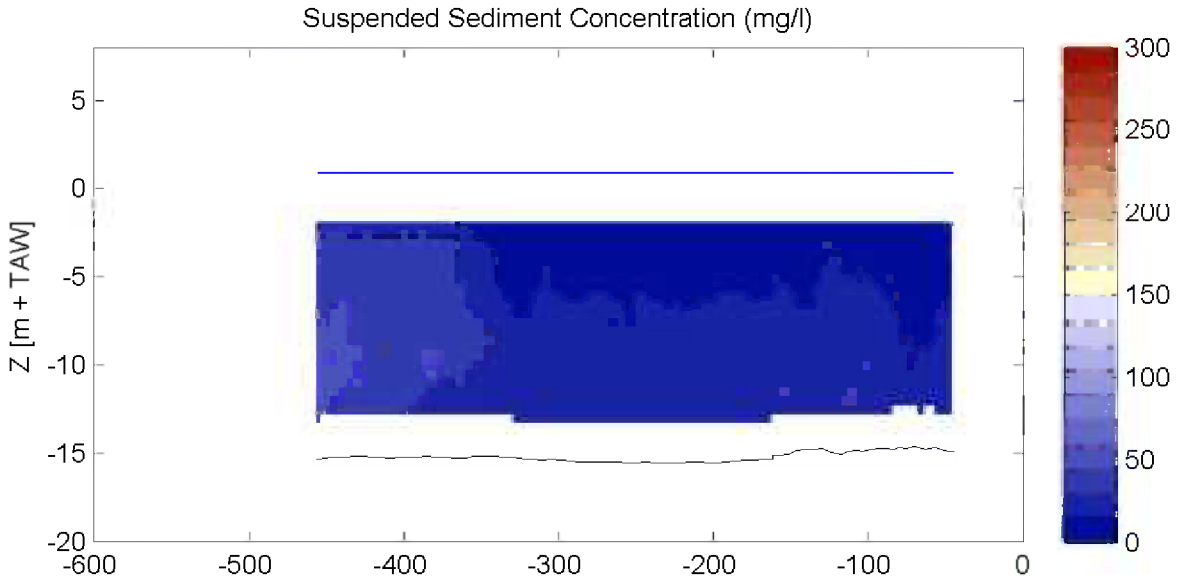
Data Processed by:

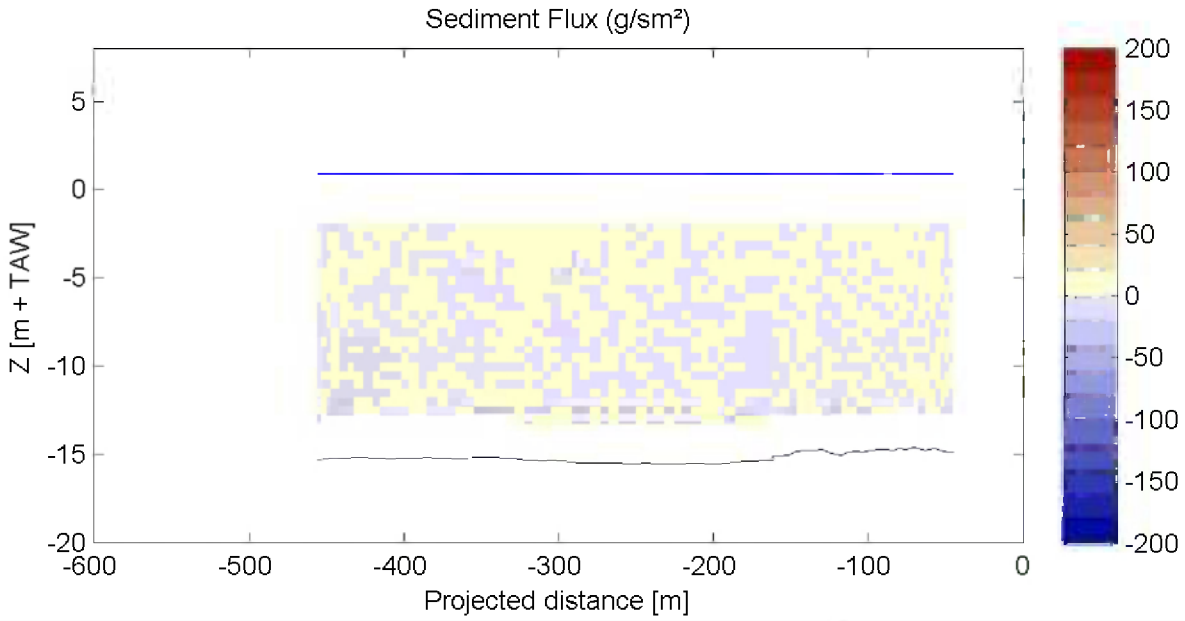
In association with :

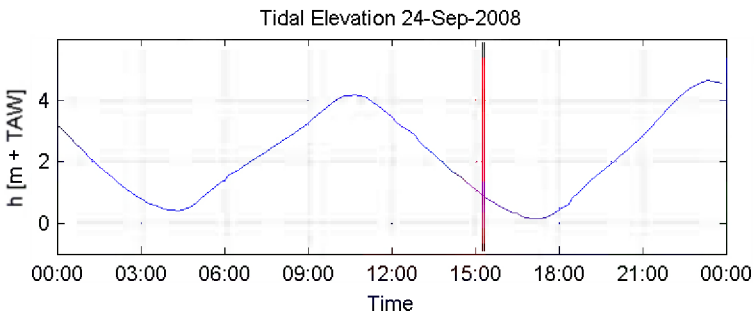
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7088dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

15:15 - 15:18

Time after HW [HH:MM]

4:37

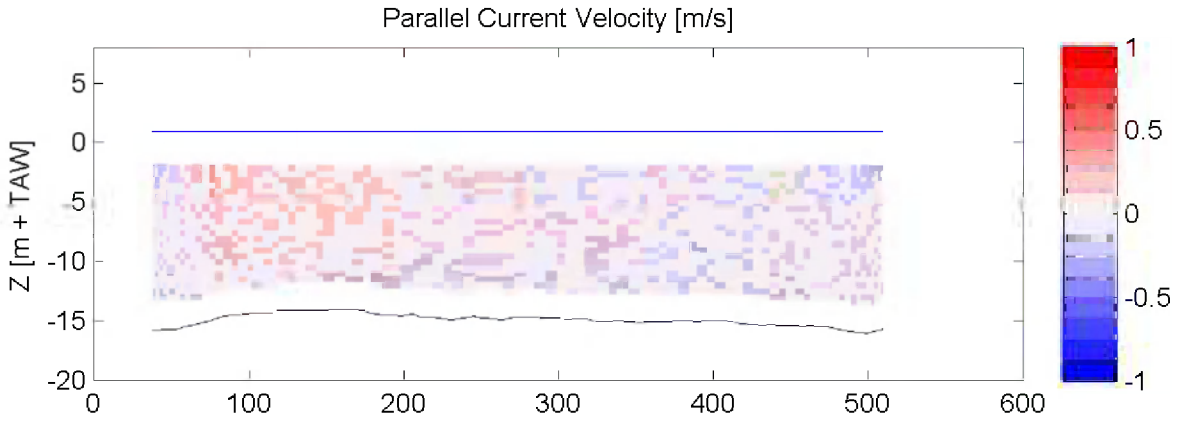
Data Processed by:

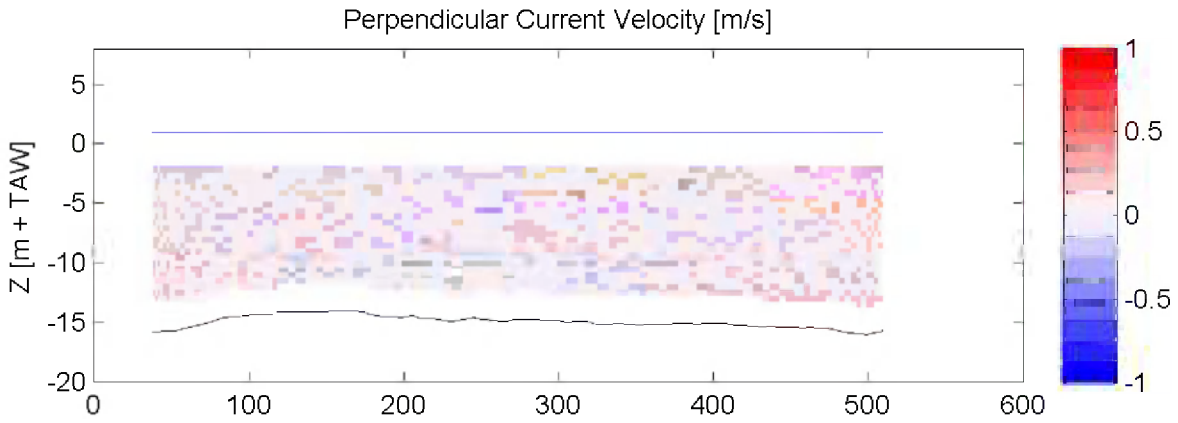
In association with :

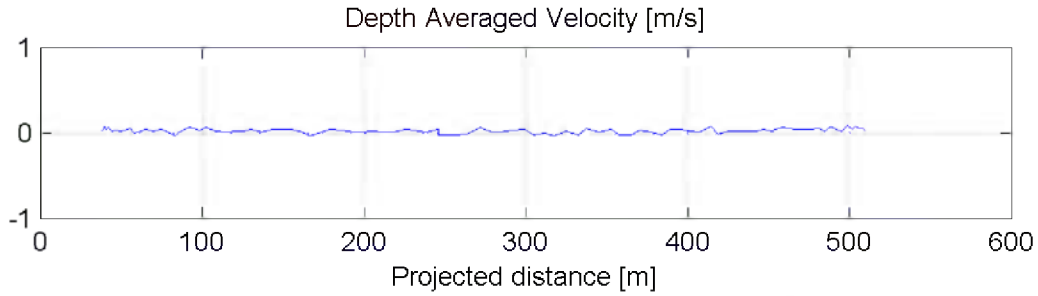
I/RA/11283/08.083/MSA

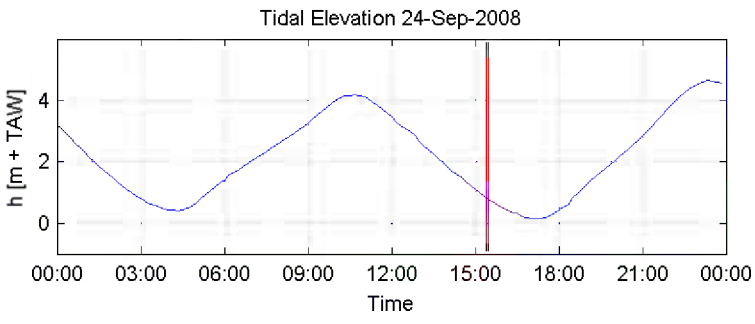
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7090dgdtlr_sub.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

15:24 - 15:28

Time after HW [HH:MM]

4:46

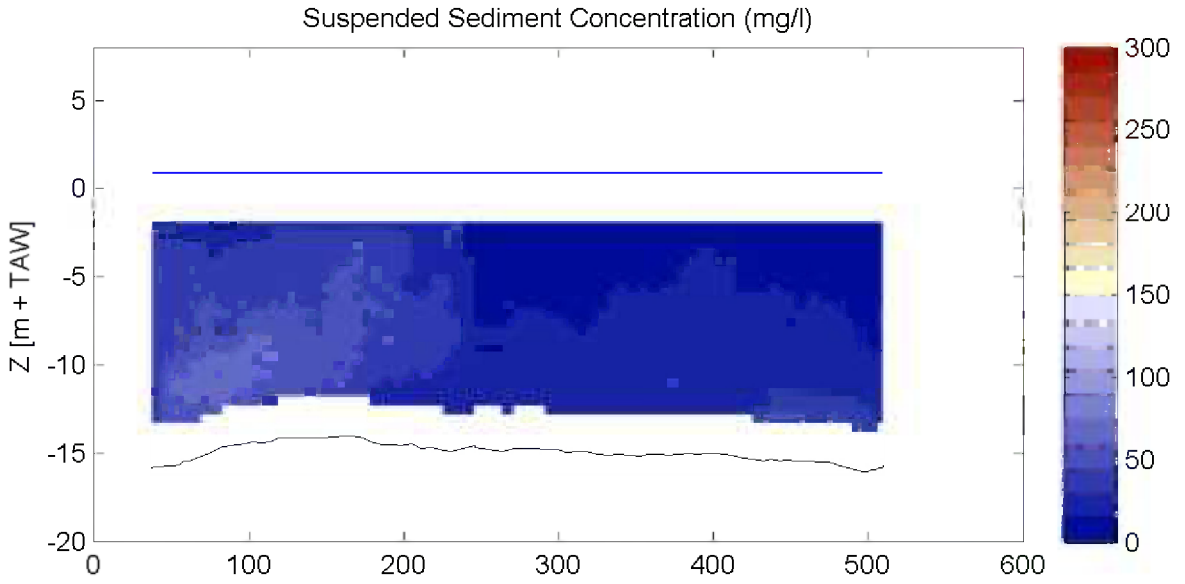
Data Processed by:

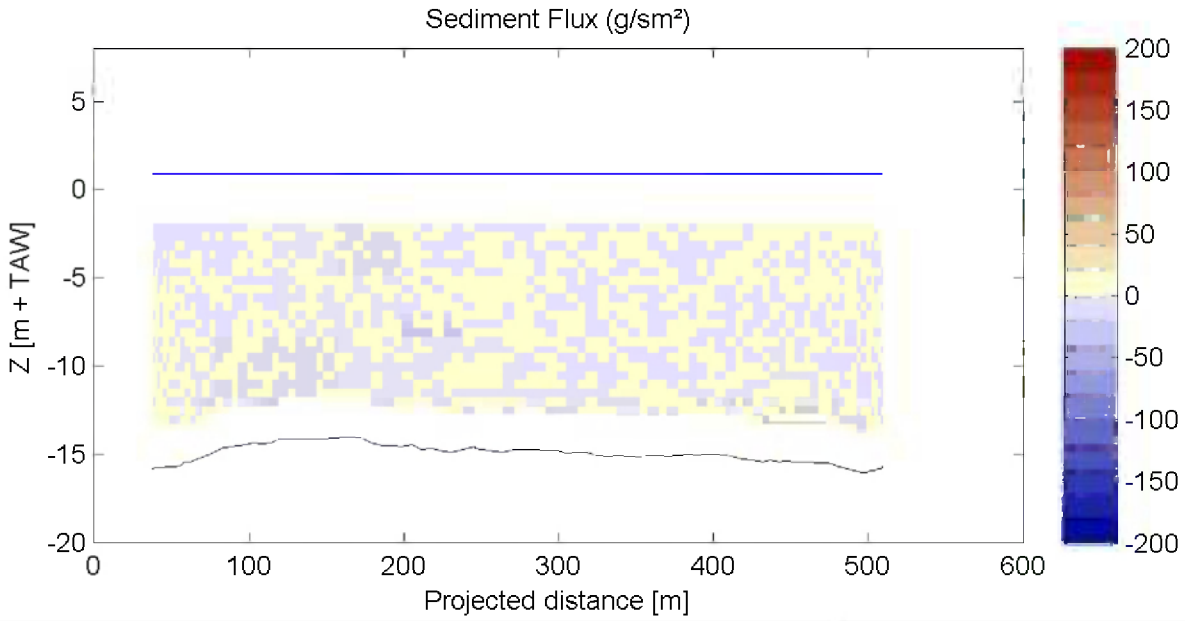
In association with :

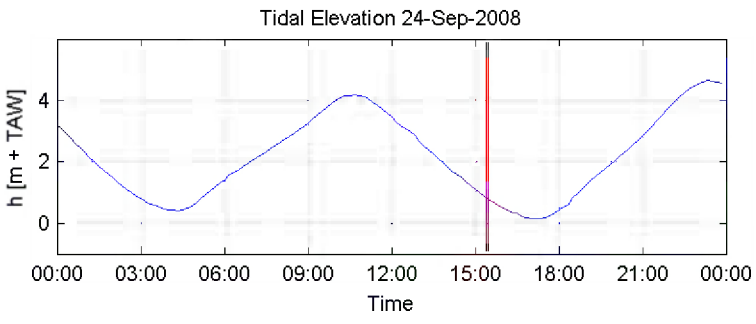
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7090dgdtlr_sub.csv	Location: Deurganckdok







HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

15:24 - 15:28

Time after HW [HH:MM]

4:46

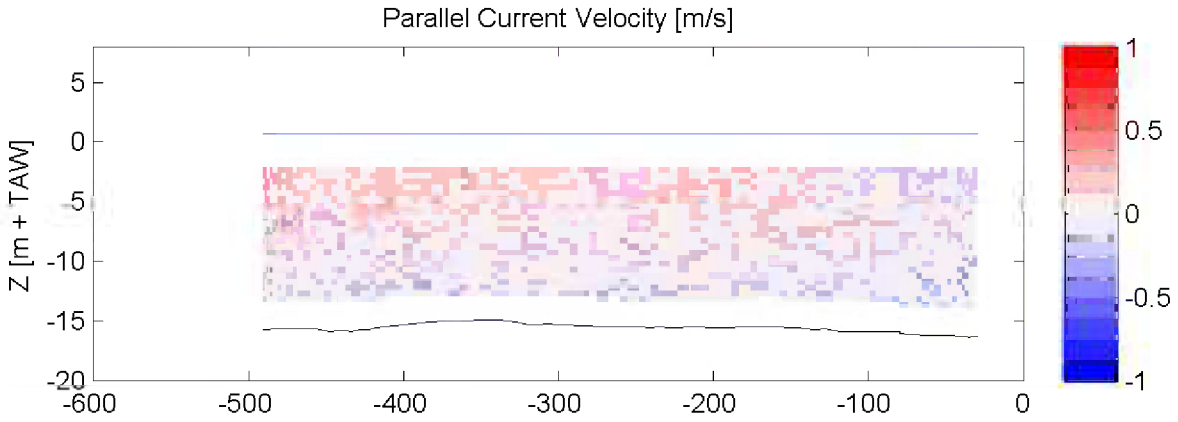
Data Processed by:

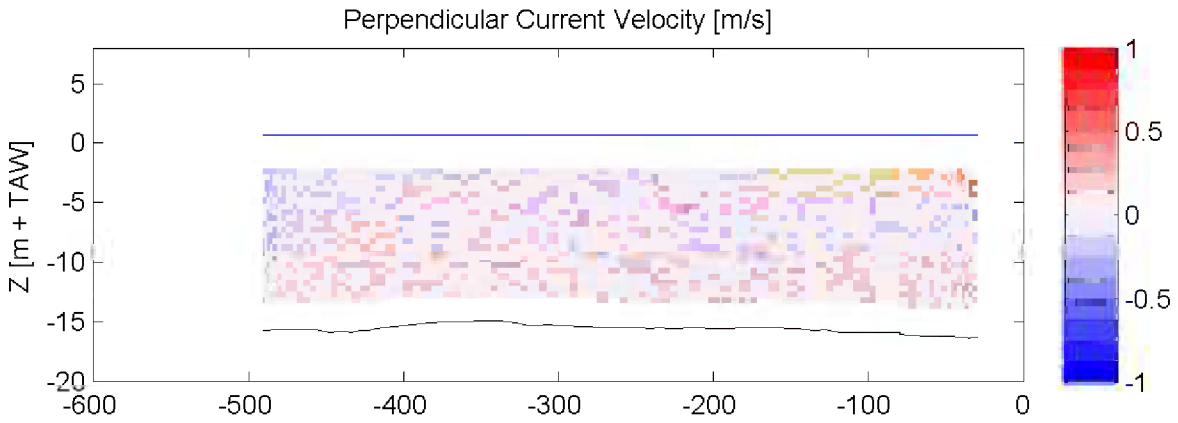
In association with :

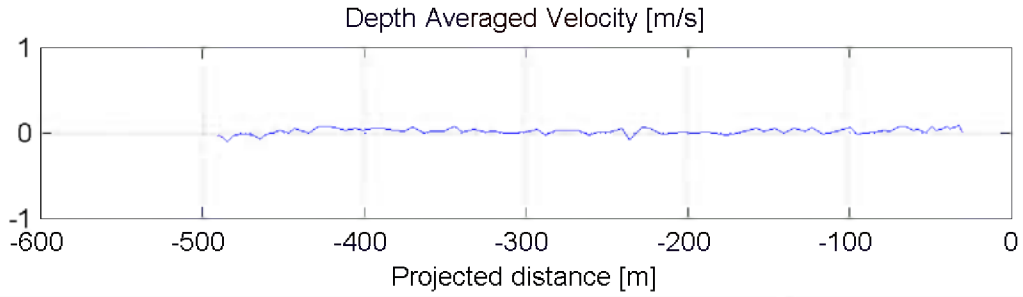
I/RA/11283/08.083/MSA

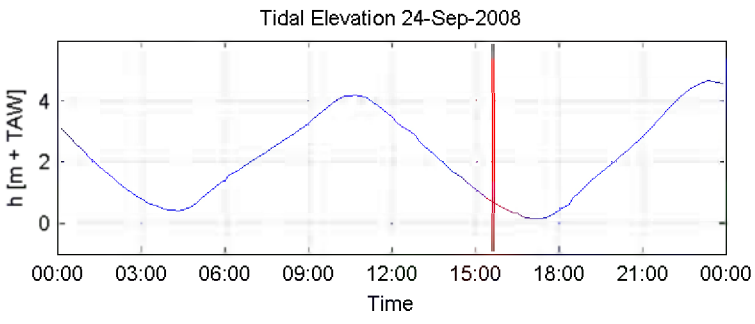
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7092dgdtrl_sub.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

15:35 - 15:39

Time after HW [HH:MM]

4:57

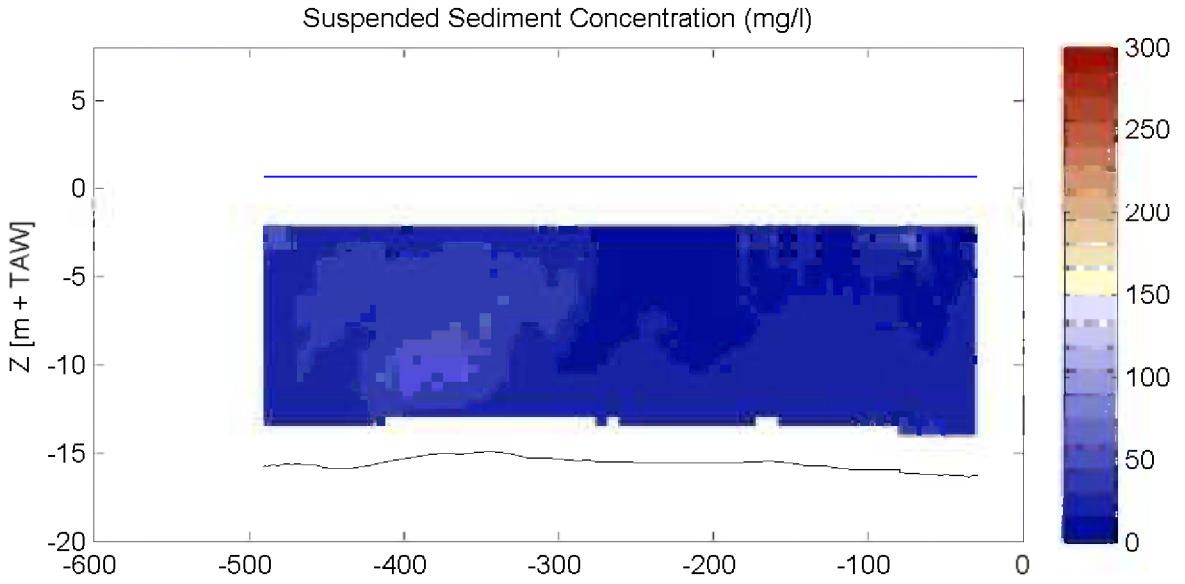
Data Processed by:

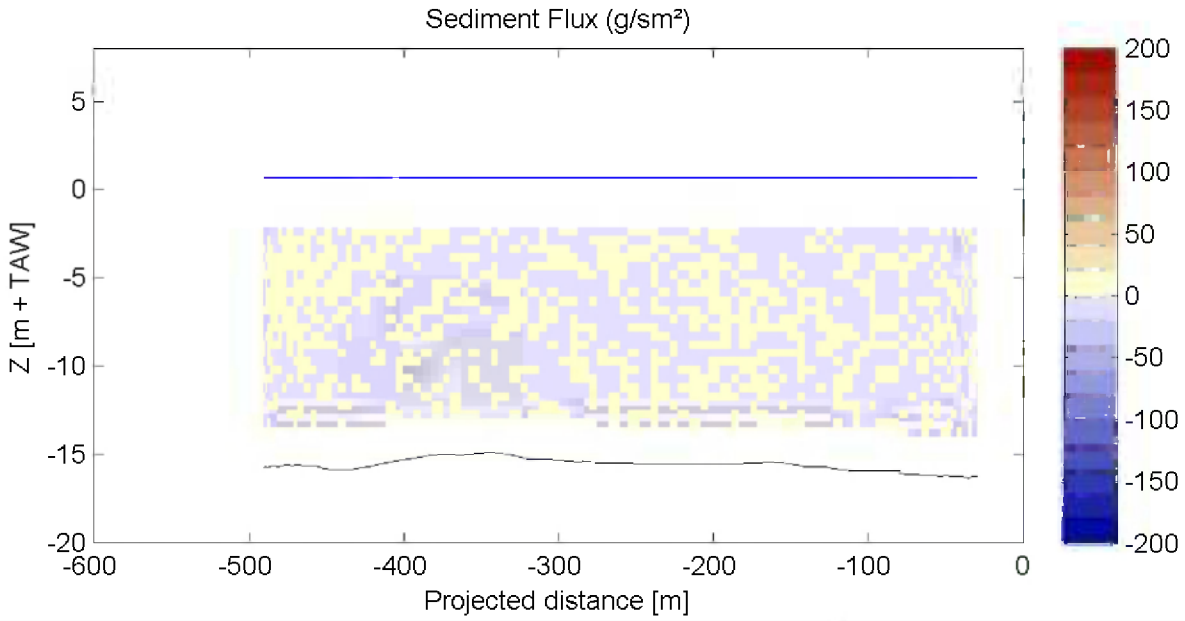
In association with :

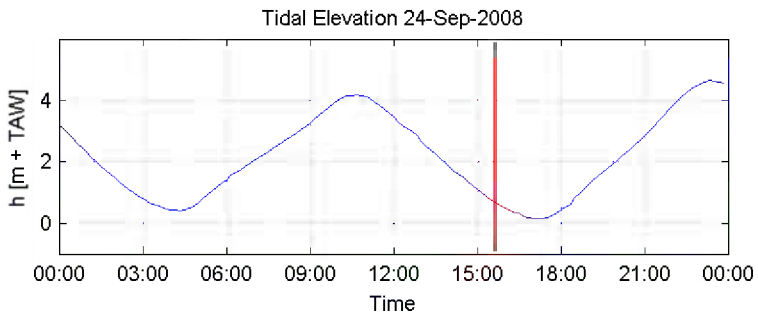
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7092dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

15:35 - 15:39

Time after HW [HH:MM]

4:57

Data Processed by:

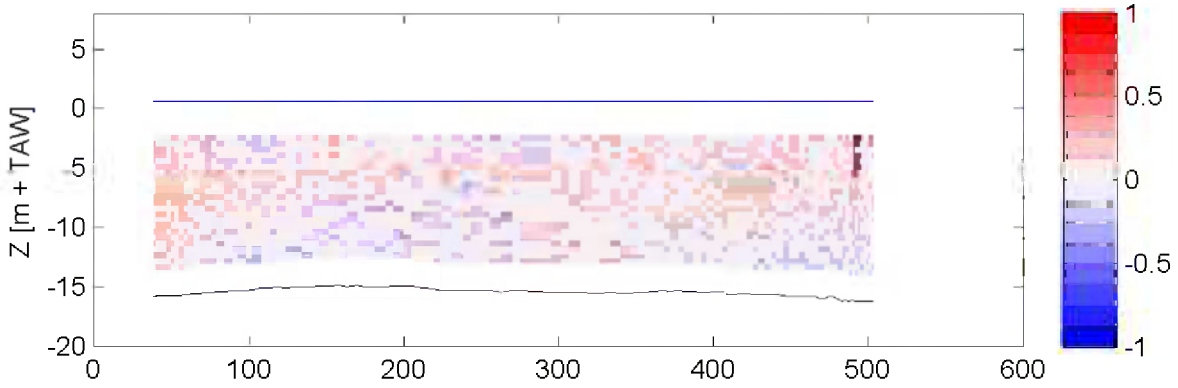
In association with :

I/RA/11283/08.083/MSA

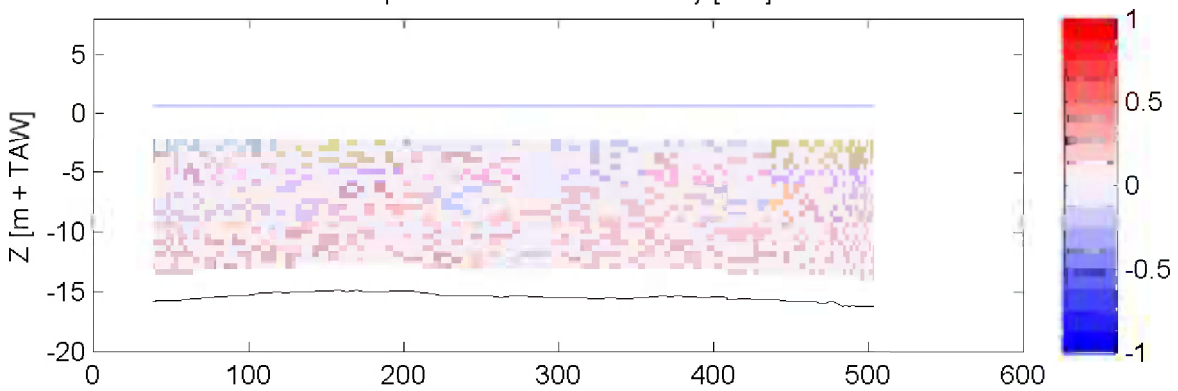
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7094dgdtlr_sub.csv	Location: Deurganckdok

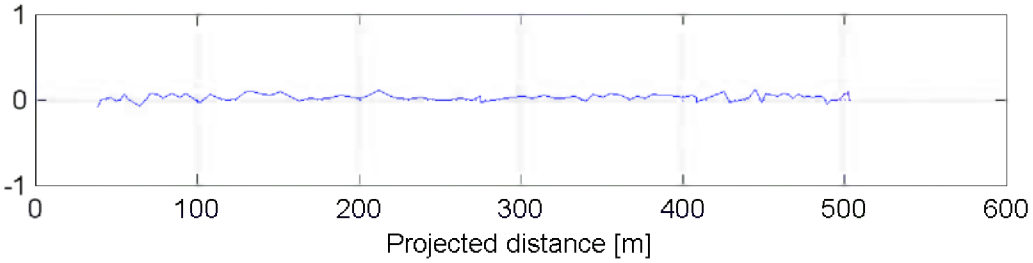
Parallel Current Velocity [m/s]



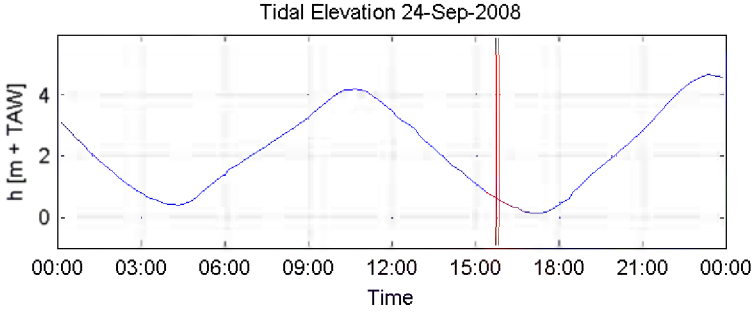
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

15:45 - 15:49

Time after HW [HH:MM]

5:07

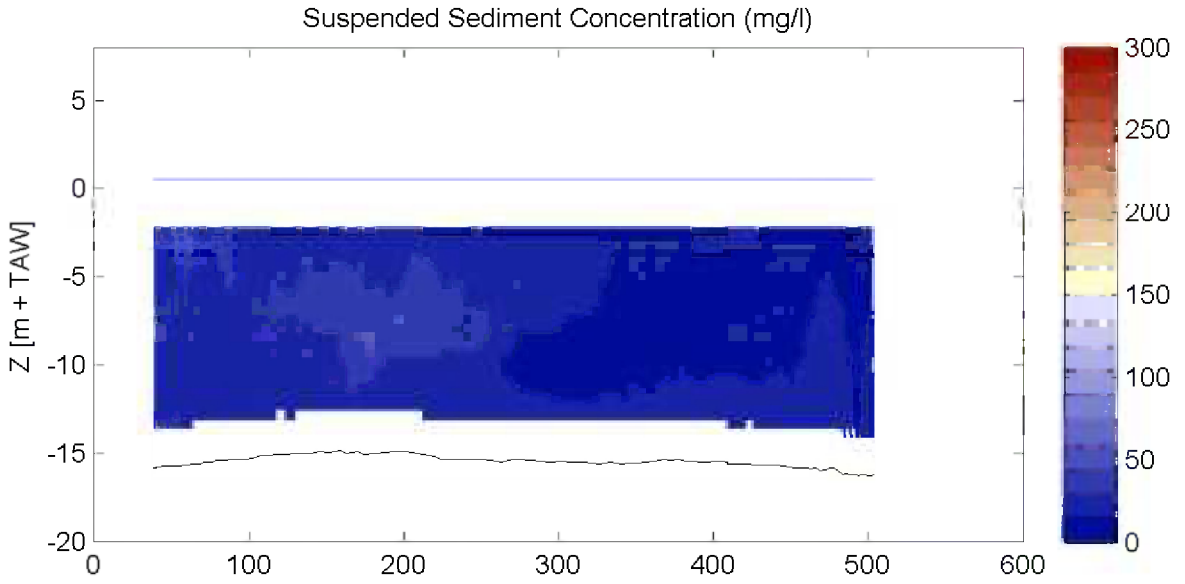
Data Processed by:

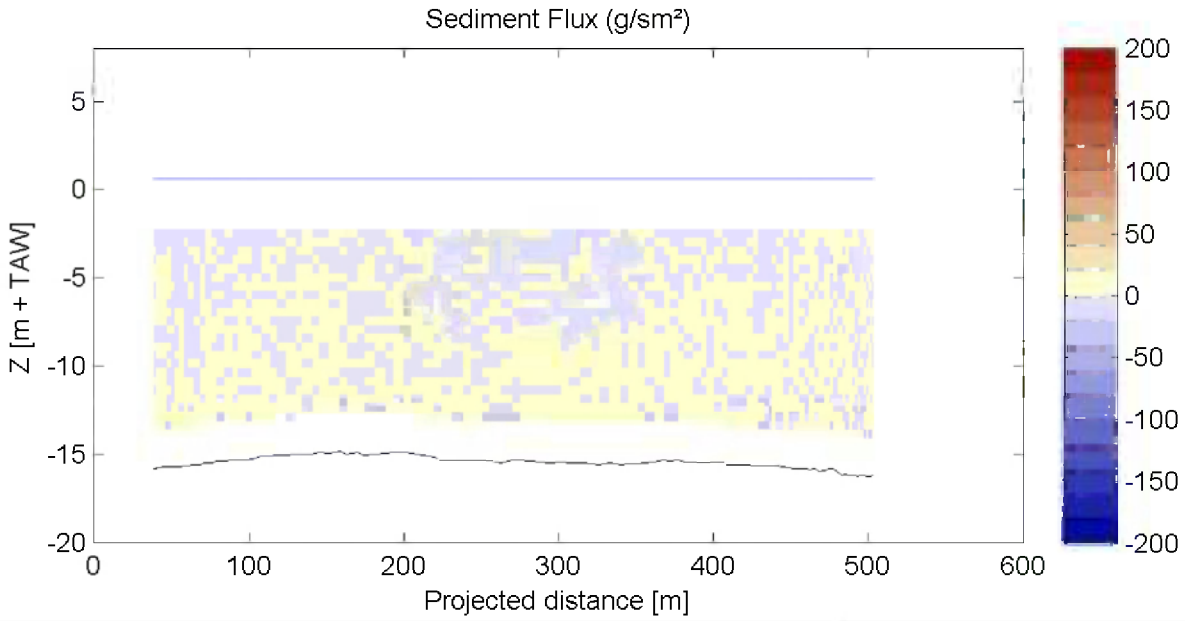
In association with :

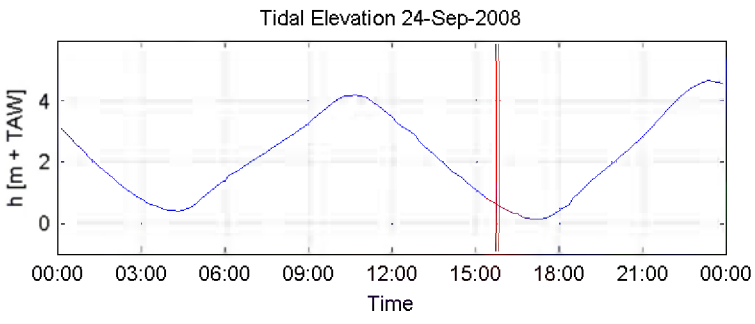
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7094dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

15:45 - 15:49

Time after HW [HH:MM]

5:07

Data Processed by:

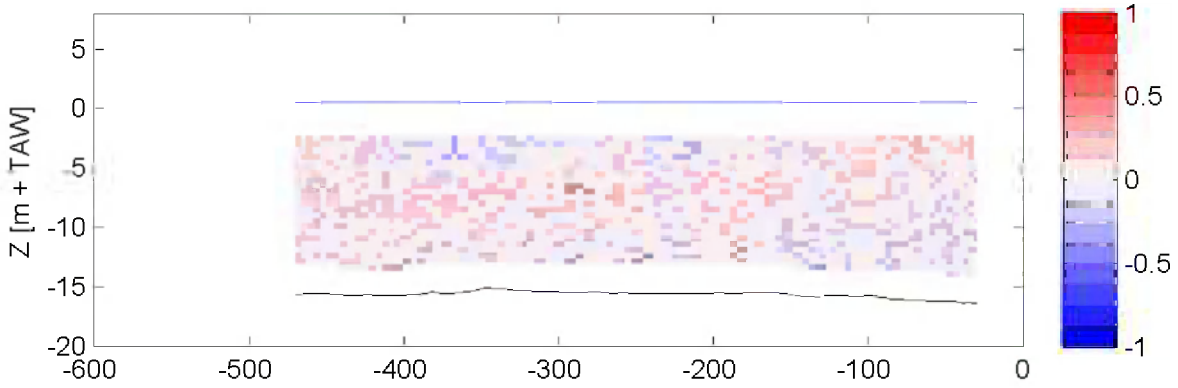
In association with :

I/RA/11283/08.083/MSA

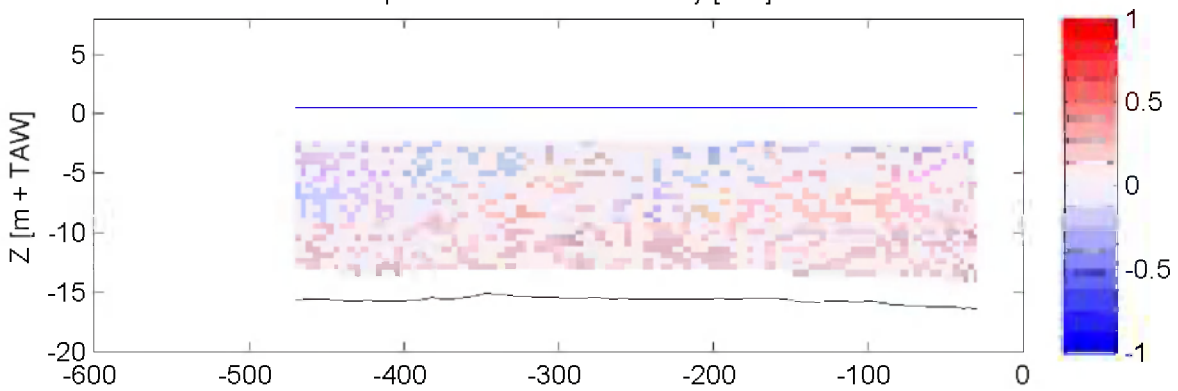
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7096dgdtrl_sub.csv	Location: Deurganckdok

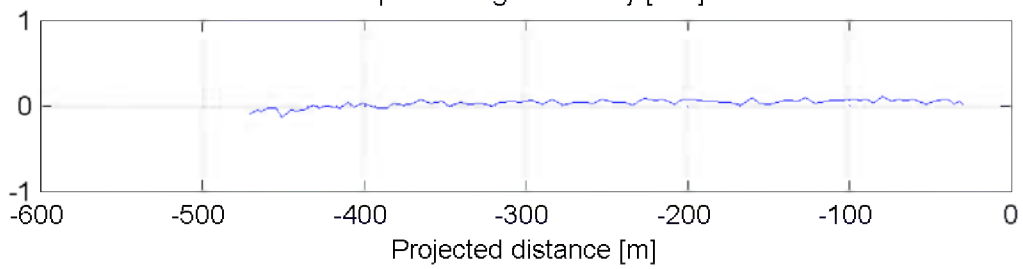
Parallel Current Velocity [m/s]



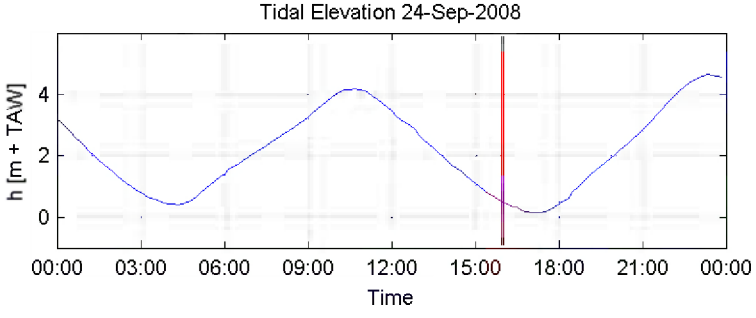
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

15:57 - 16:01

Time after HW [HH:MM]

5:19

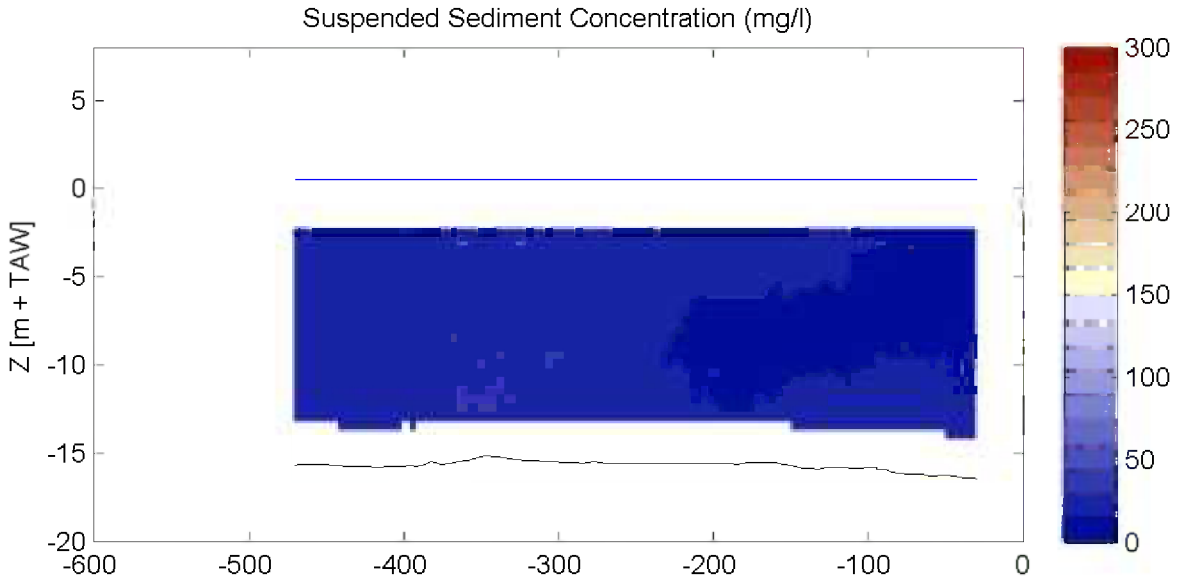
Data Processed by:

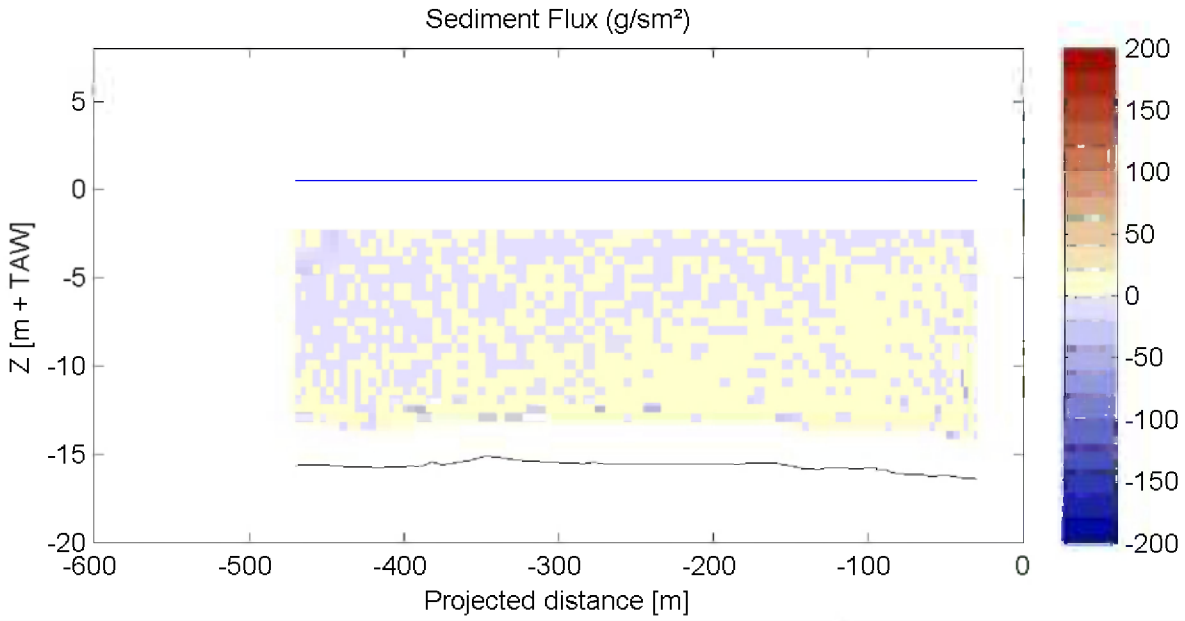
In association with :

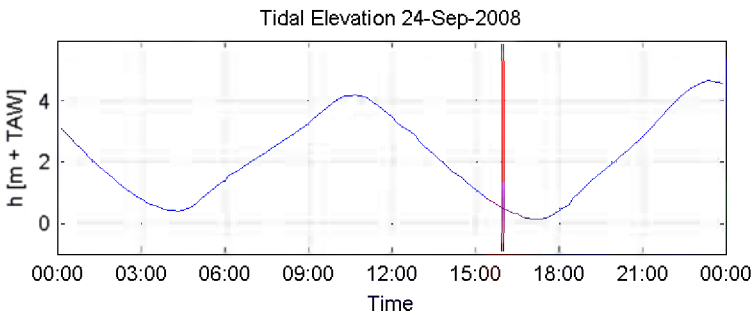
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7096dgdtrl_sub.csv	Location: Deurganckdok







HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

15:57 - 16:01

Time after HW [HH:MM]

5:19

Data Processed by:

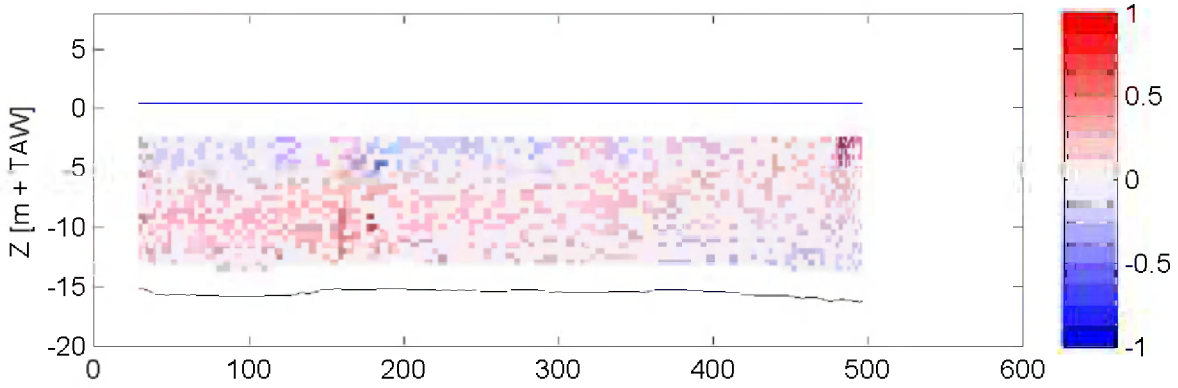
In association with :

I/RA/11283/08.083/MSA

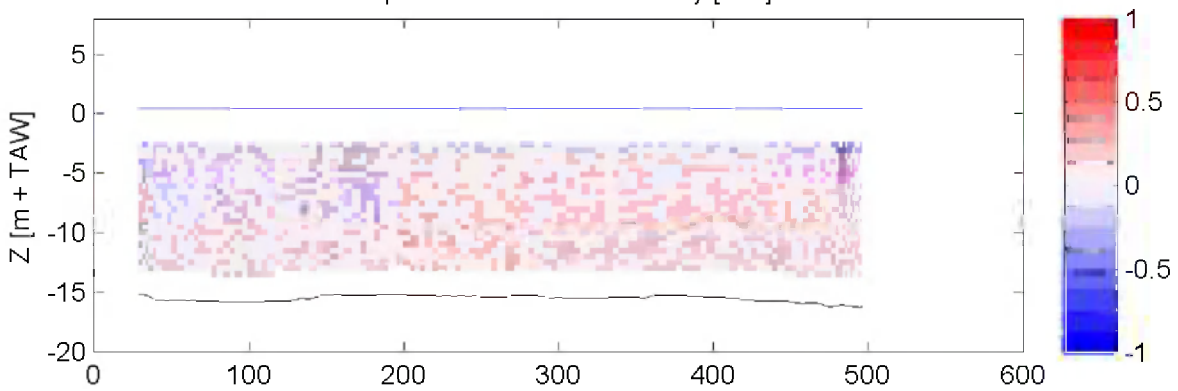
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7098dgdtlr_sub.csv	Location: Deurganckdok

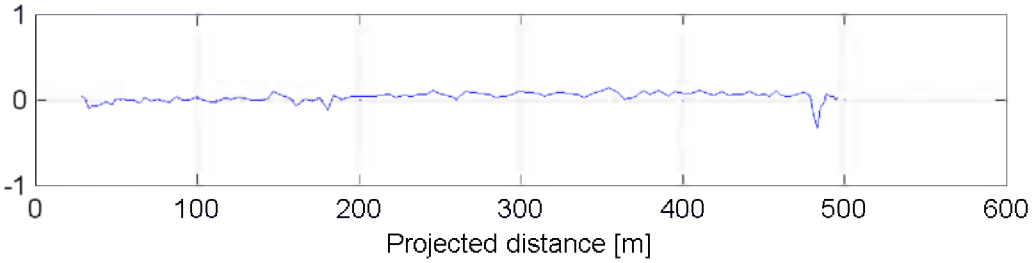
Parallel Current Velocity [m/s]



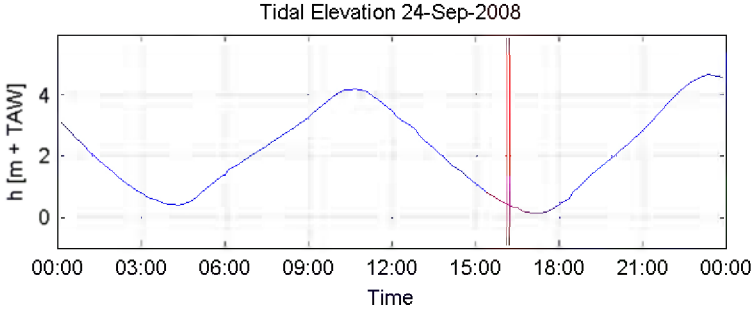
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

16:07 - 16:12

Time after HW [HH:MM]

5:30

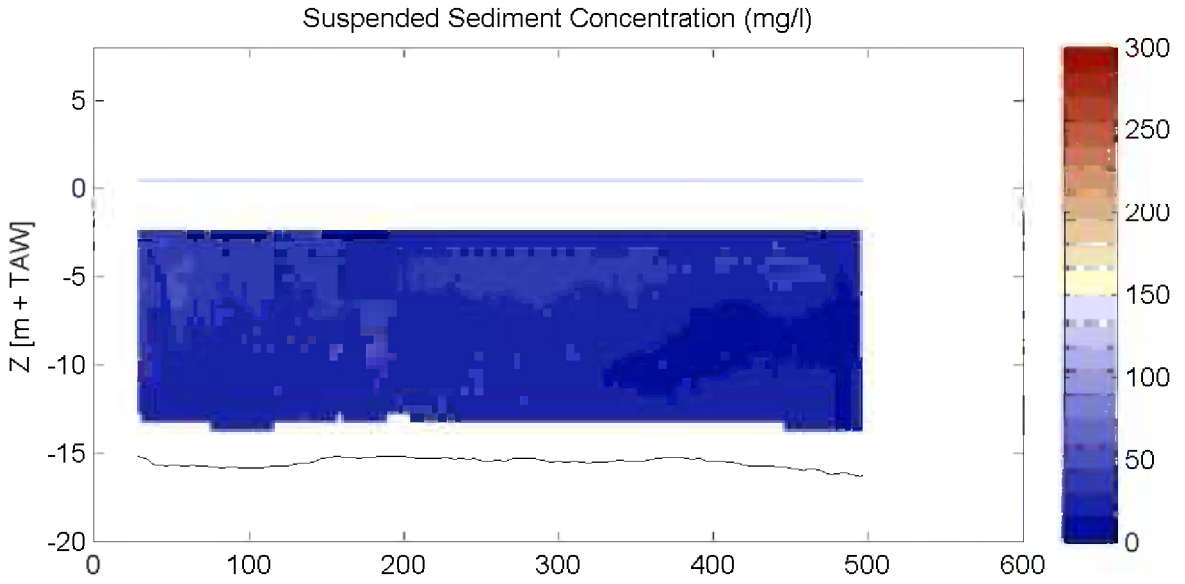
Data Processed by:

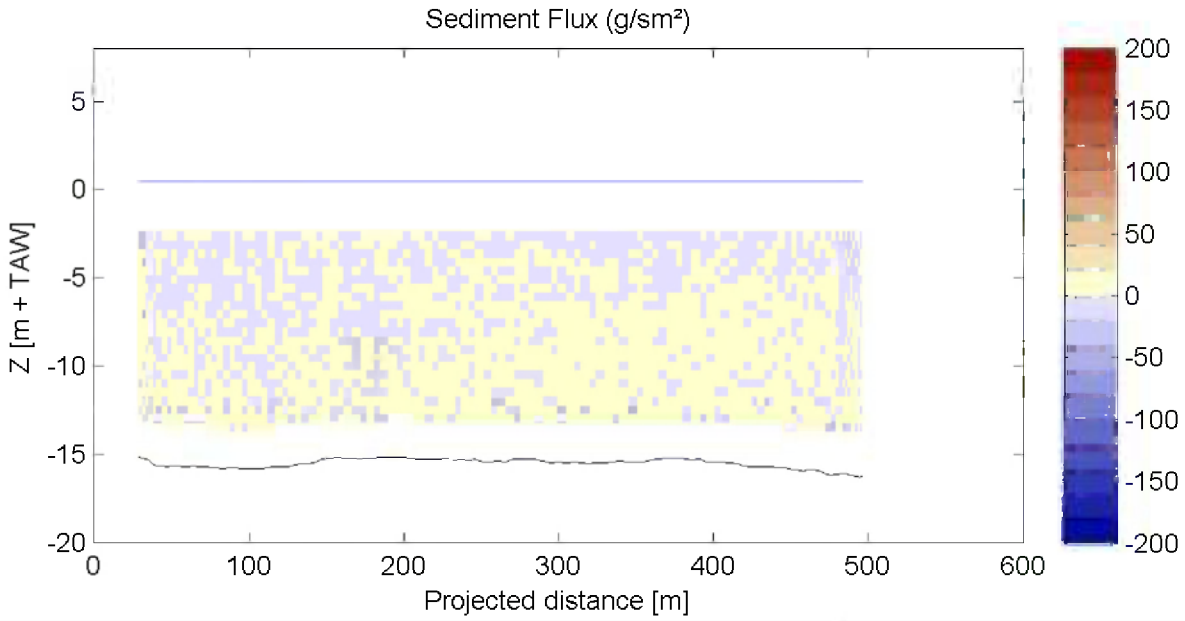
In association with :

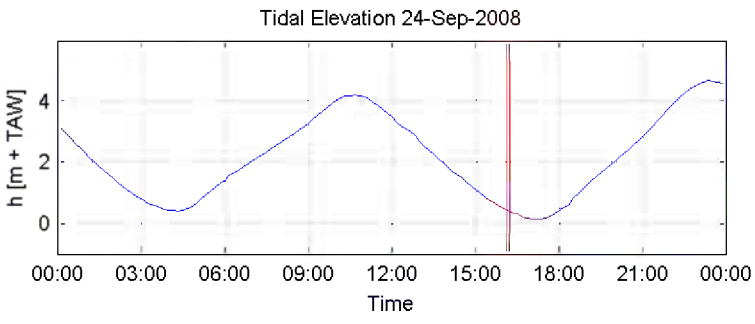
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7098dgdtlr_sub.csv	Location: Deurganckdok







HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

16:07 - 16:12

Time after HW [HH:MM]

5:30

Data Processed by:

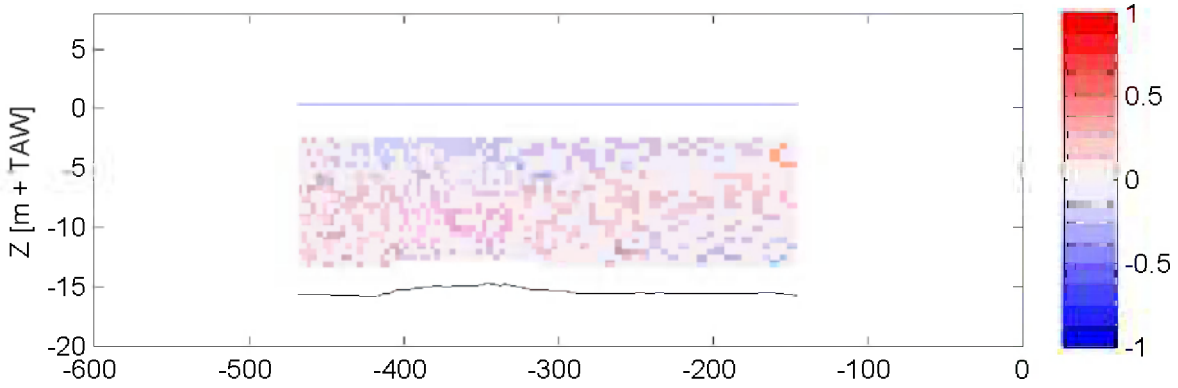
In association with :

I/RA/11283/08.083/MSA

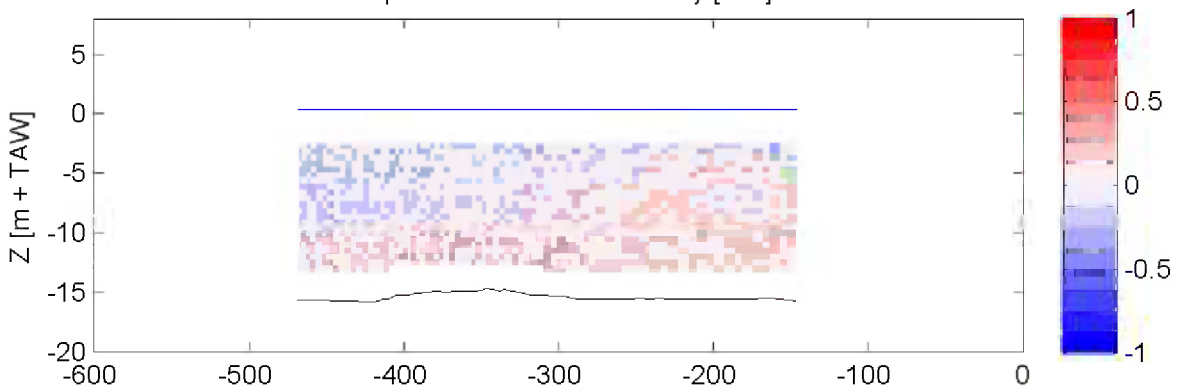
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7100dgdtrl_sub.csv	Location: Deurganckdok

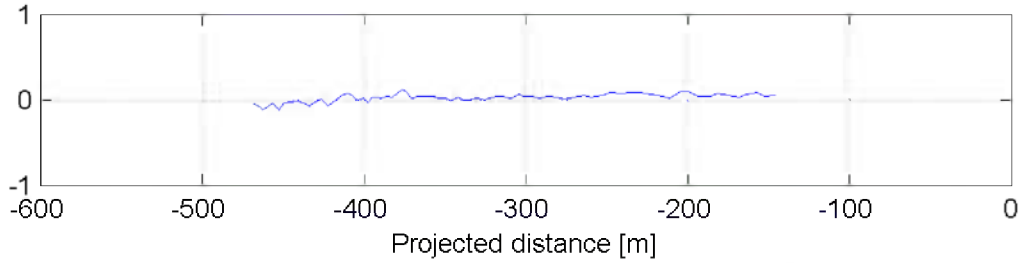
Parallel Current Velocity [m/s]



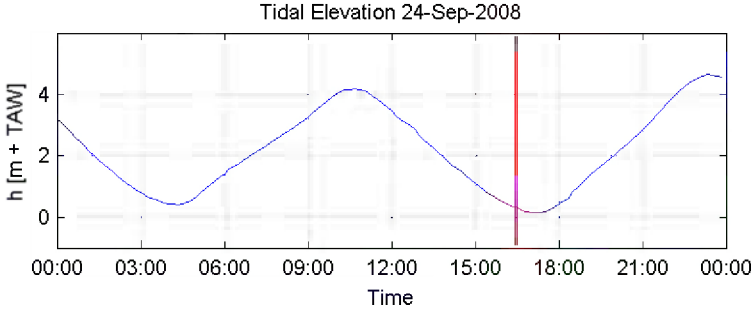
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :
24-Sep-2008
16:26 - 16:29

Time after HW [HH:MM]
5:47

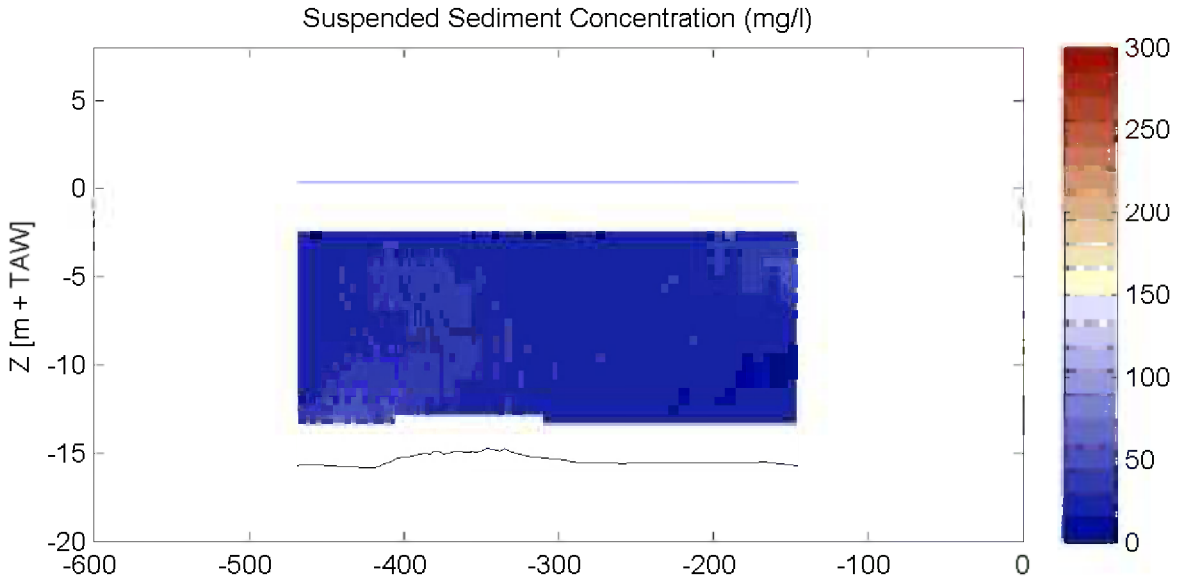
Data Processed by:

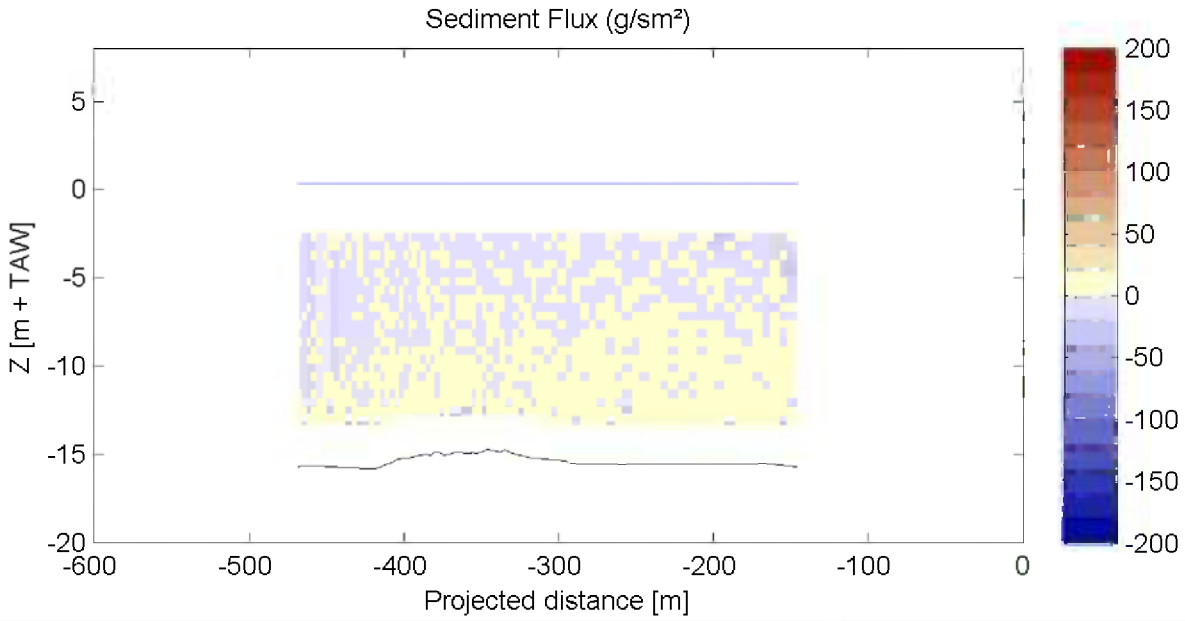
In association with :

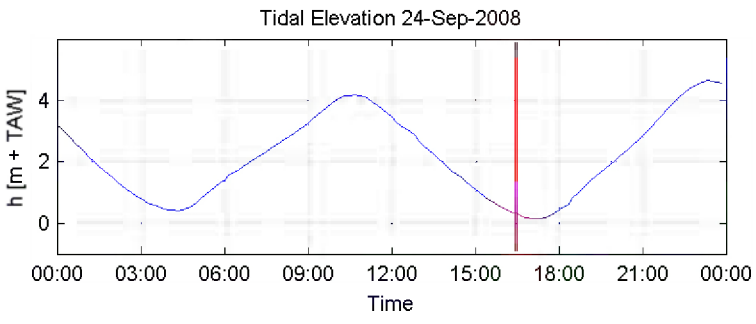
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7100dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

16:26 - 16:29

Time after HW [HH:MM]

5:47

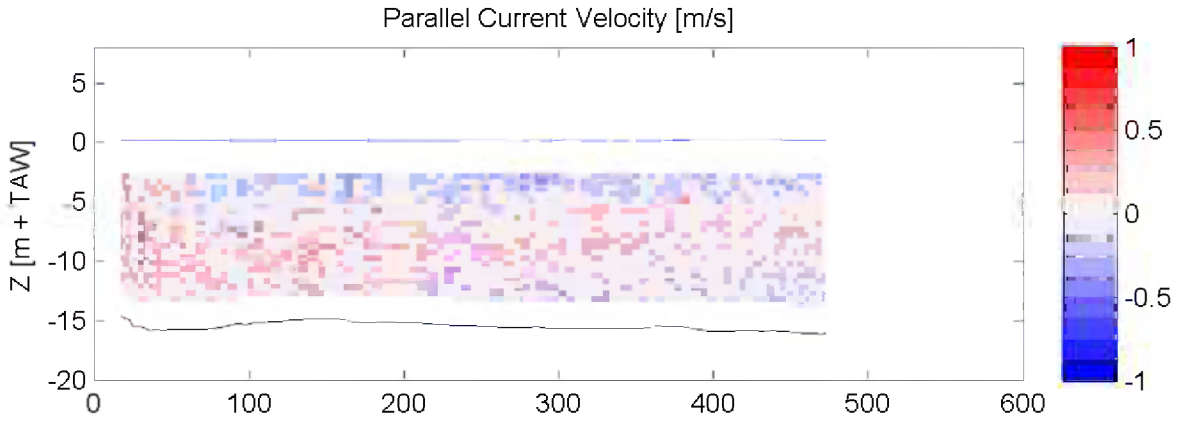
Data Processed by:

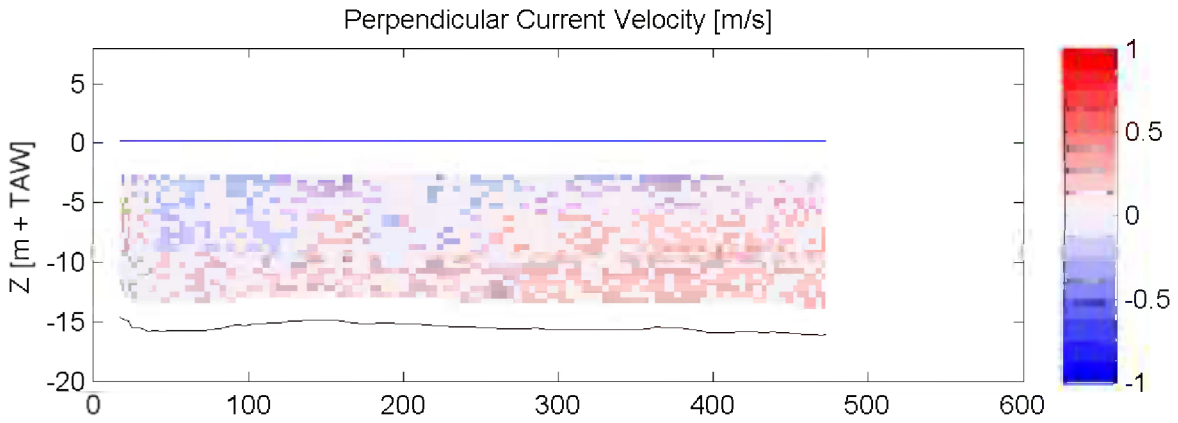
In association with :

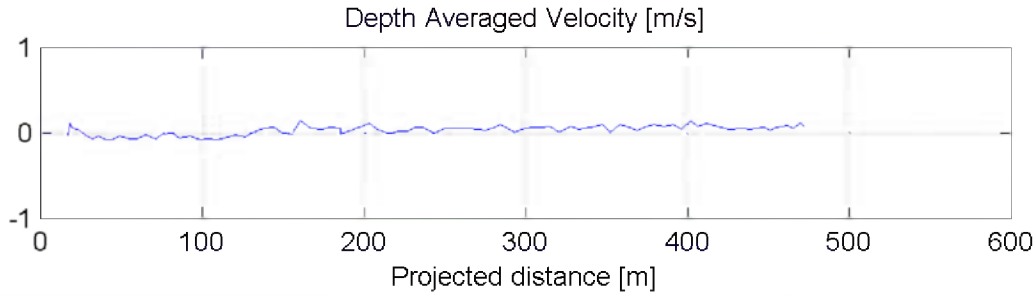
I/RA/11283/08.083/MSA

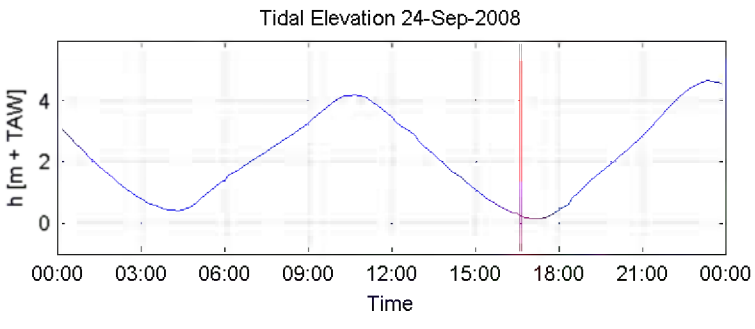
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7102dgdtlr_sub.csv	Location: Deurganckdok









HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

16:36 - 16:40

Time after HW [HH:MM]

5:58

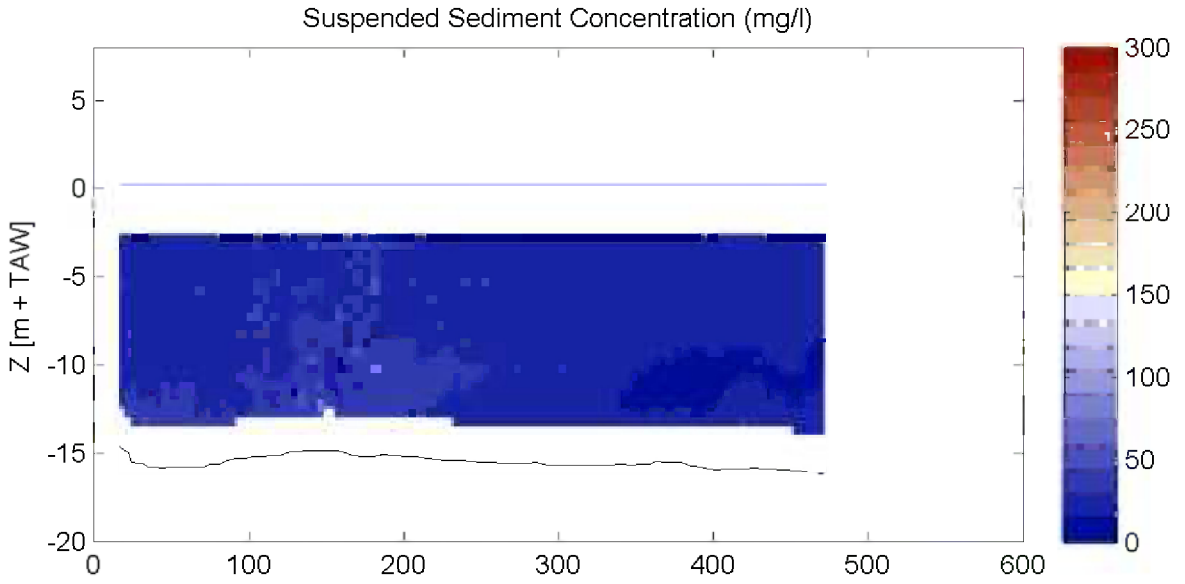
Data Processed by:

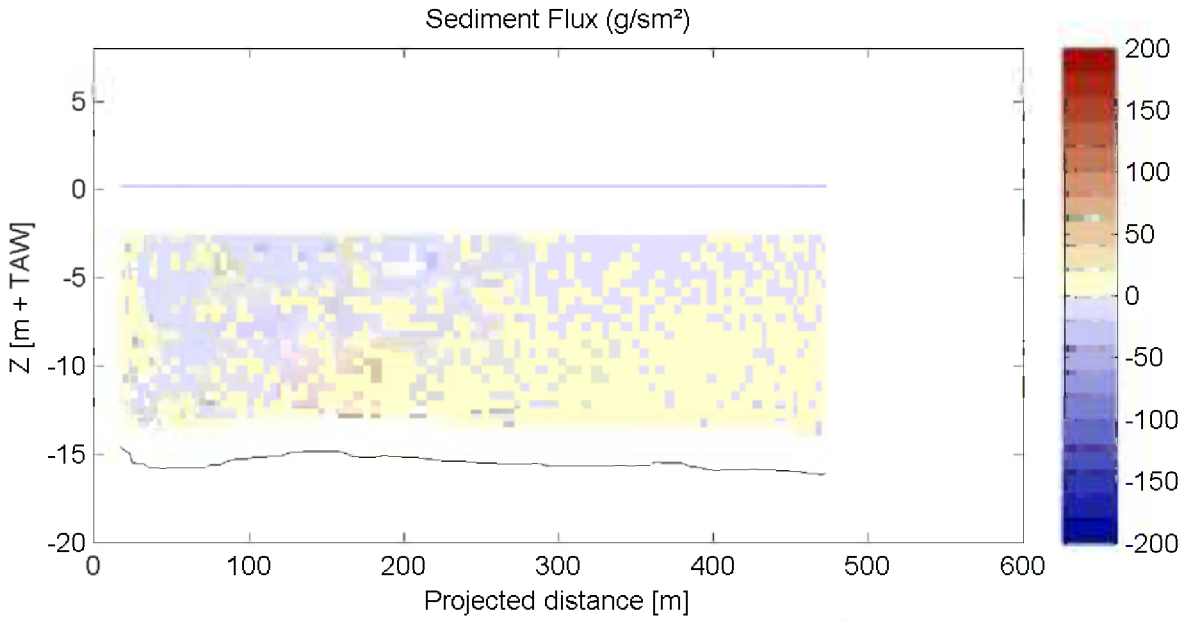
In association with :

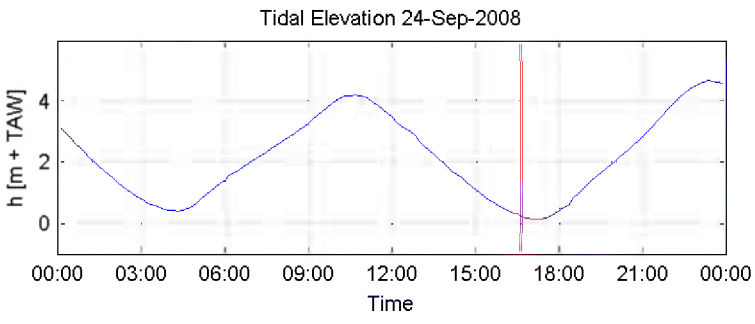
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7102dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

16:36 - 16:40

Time after HW [HH:MM]

5:58

Data Processed by:

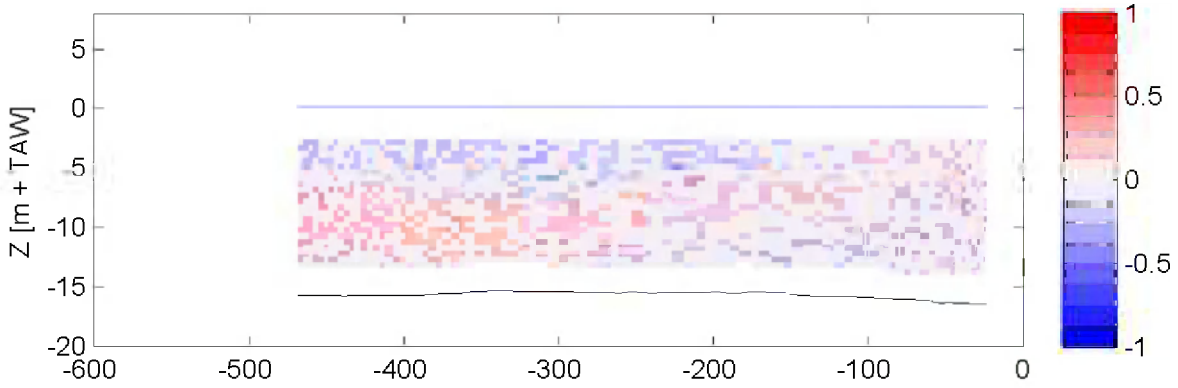
In association with :

I/RA/11283/08.083/MSA

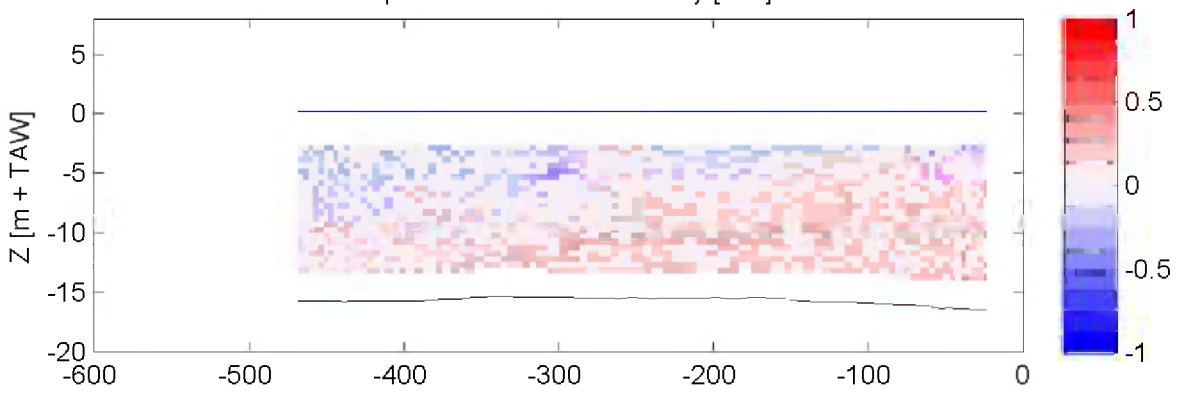
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7104dgdtrl_sub.csv	Location: Deurganckdok

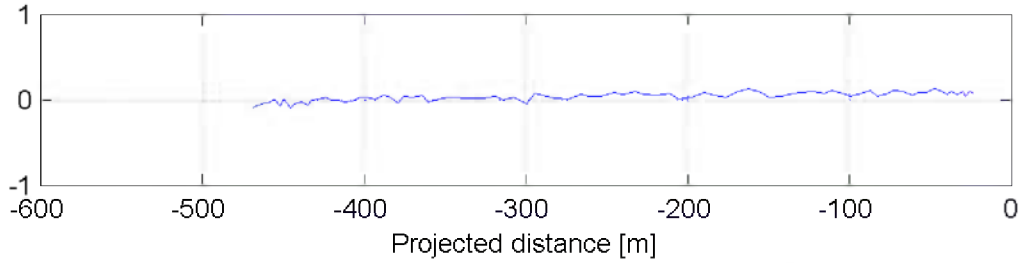
Parallel Current Velocity [m/s]



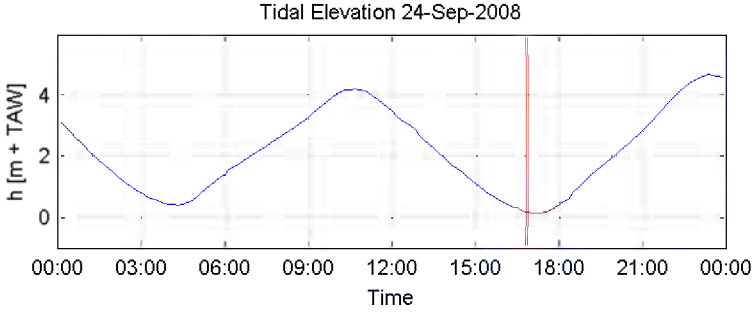
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

16:48 - 16:51

Time after HW [HH:MM]

6:10

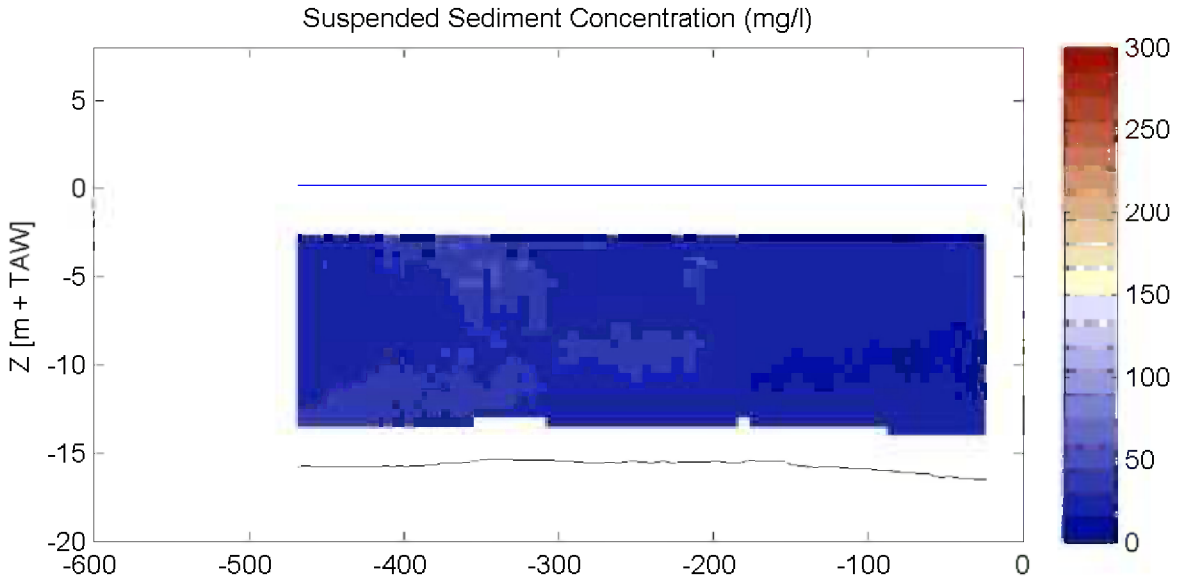
Data Processed by:

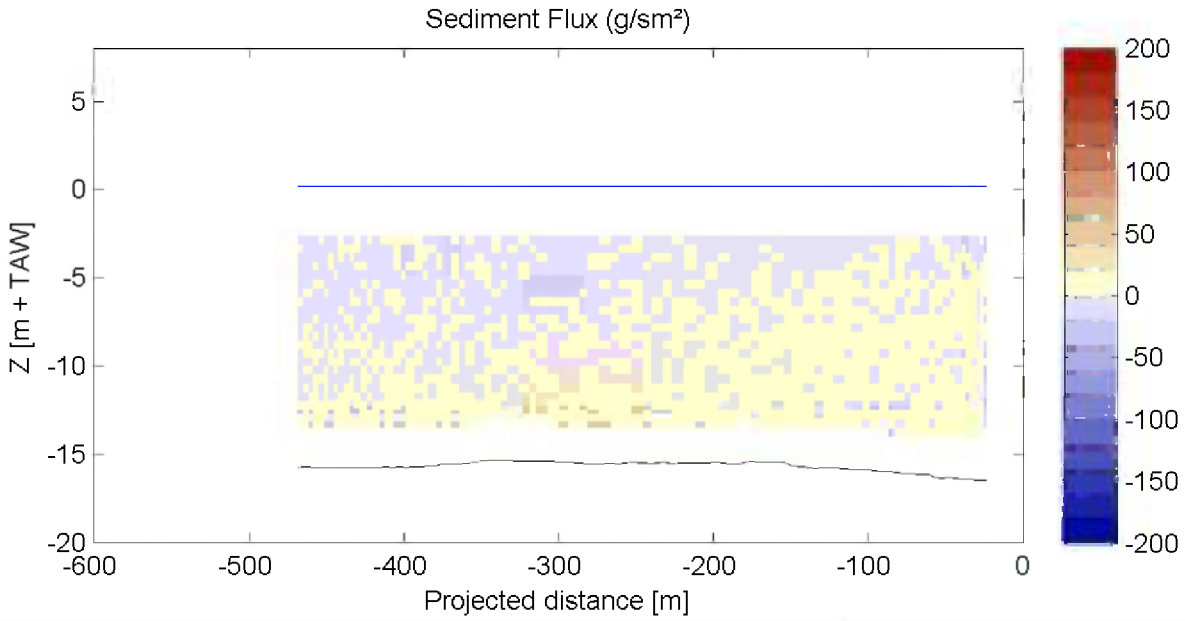
In association with :

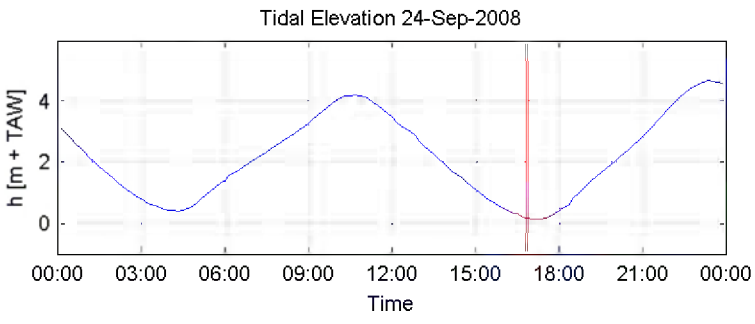
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7104dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

16:48 - 16:51

Time after HW [HH:MM]

6:10

Data Processed by:

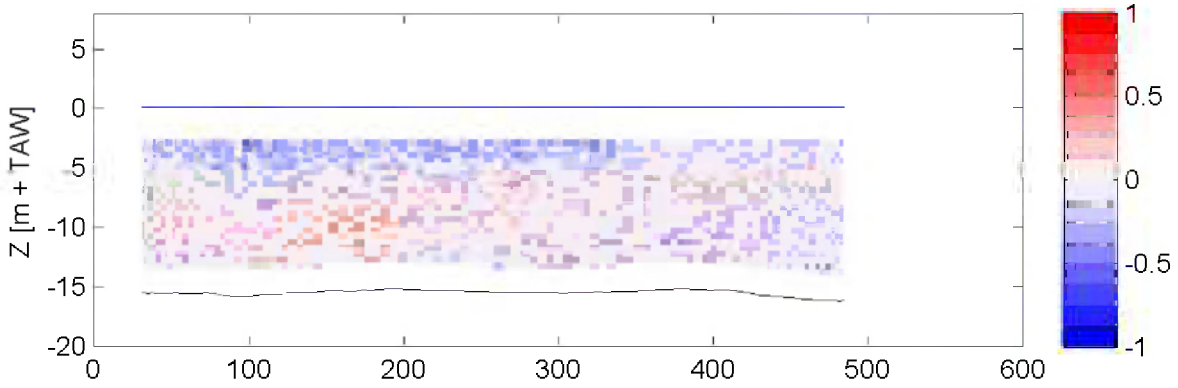
In association with :

I/RA/11283/08.083/MSA

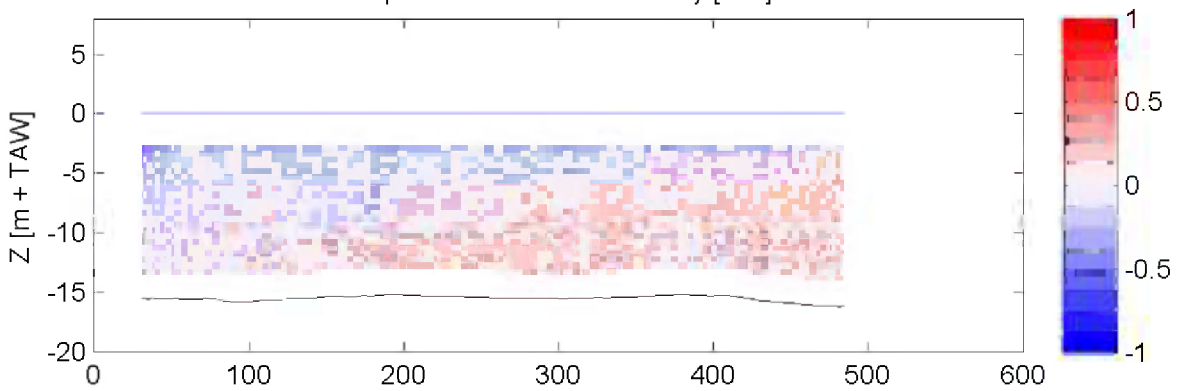
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7106dgdtlr_sub.csv	Location: Deurganckdok

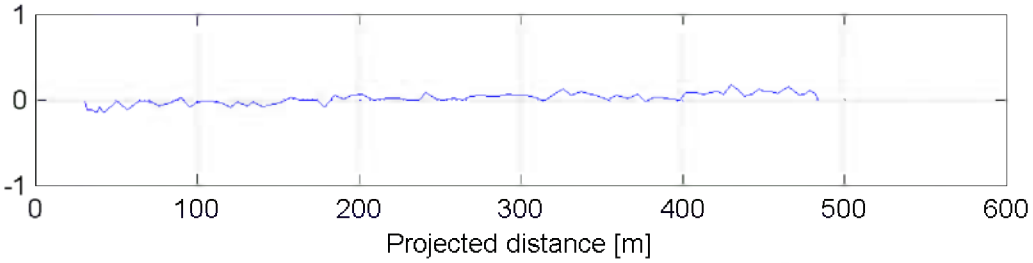
Parallel Current Velocity [m/s]



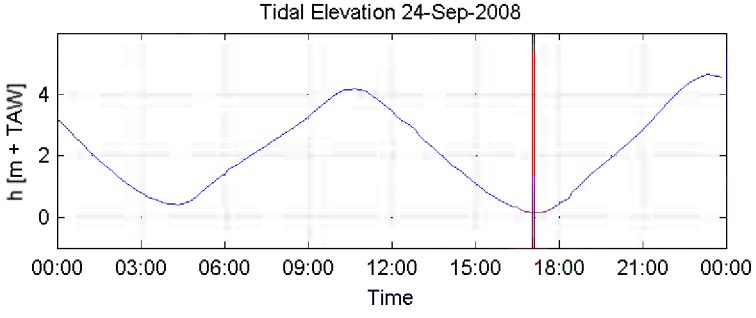
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

17:02 - 17:07

Time after HW [HH:MM]

6:25

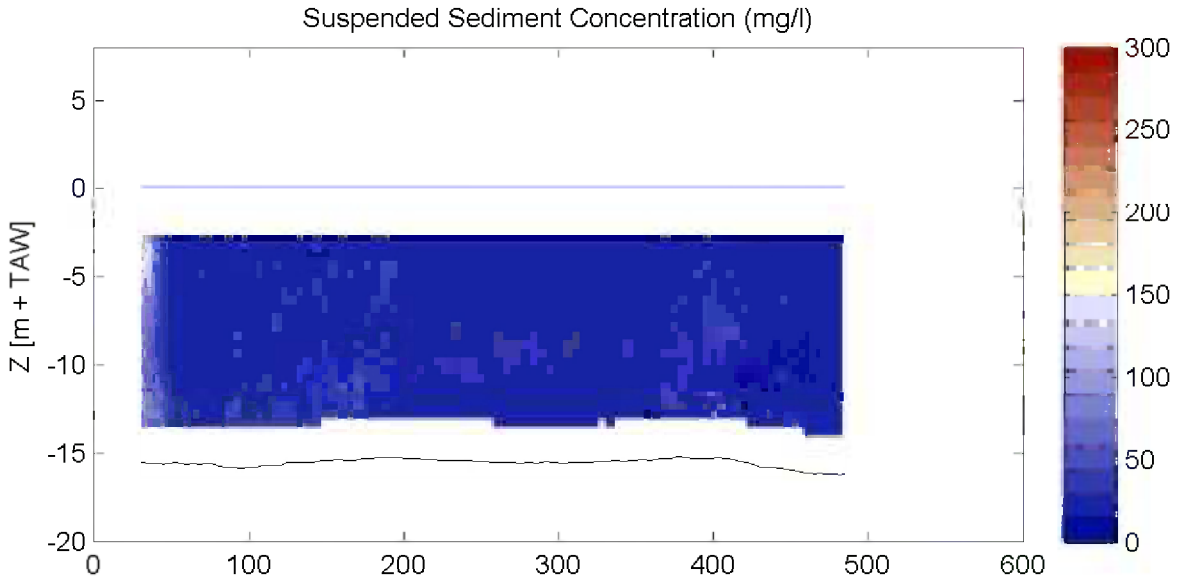
Data Processed by:

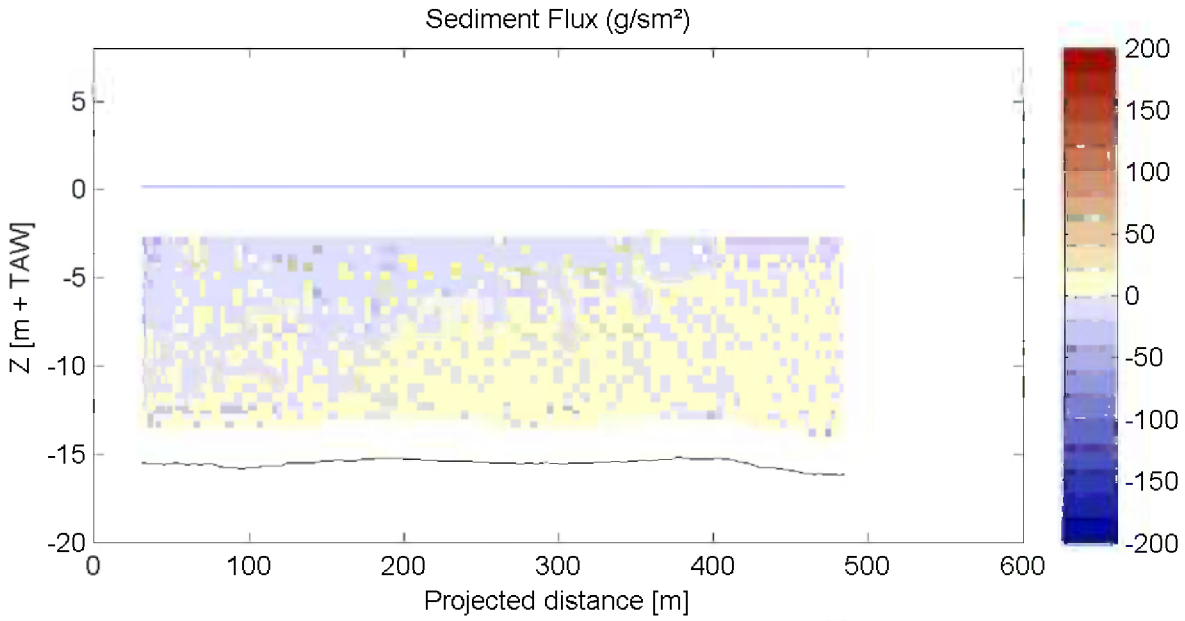
In association with :

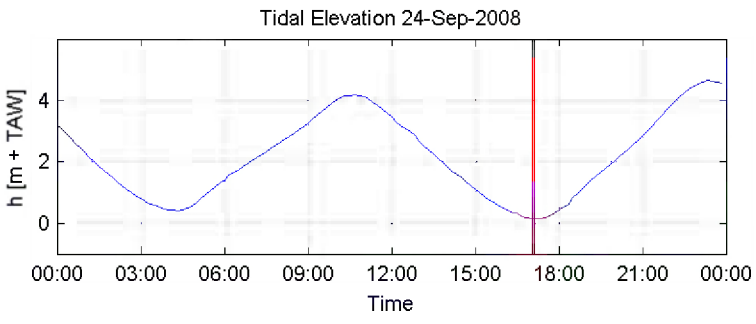
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7106dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

17:02 - 17:07

Time after HW [HH:MM]

6:25

Data Processed by:

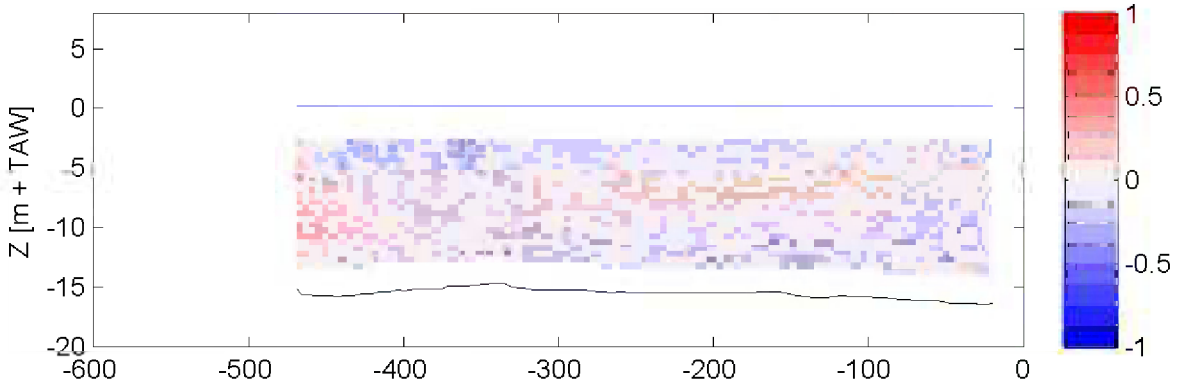
In association with :

I/RA/11283/08.083/MSA

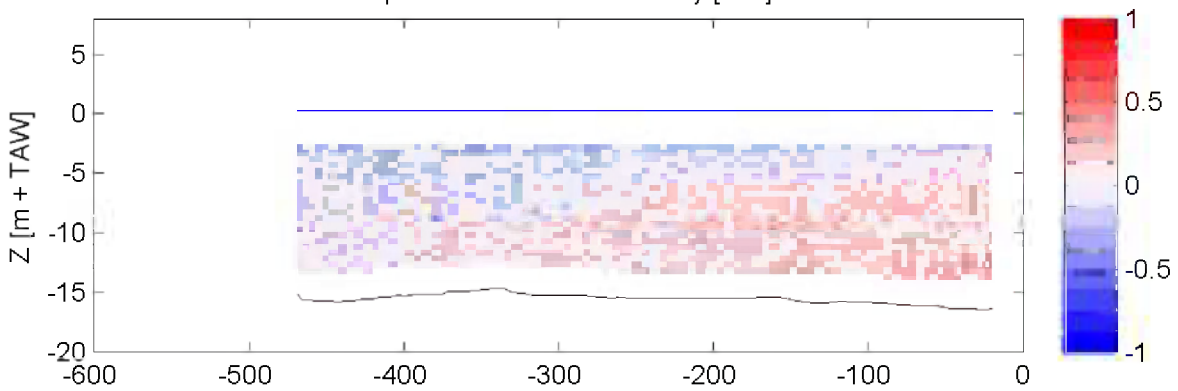
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7108dgdtrl_sub.csv	Location: Deurganckdok

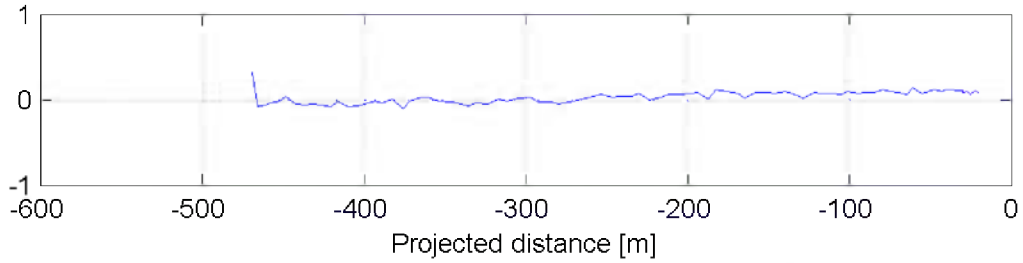
Parallel Current Velocity [m/s]



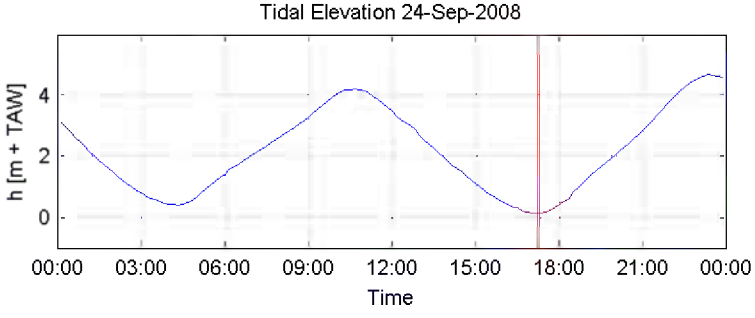
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

17:13 - 17:17

Time after HW [HH:MM]

-6:14

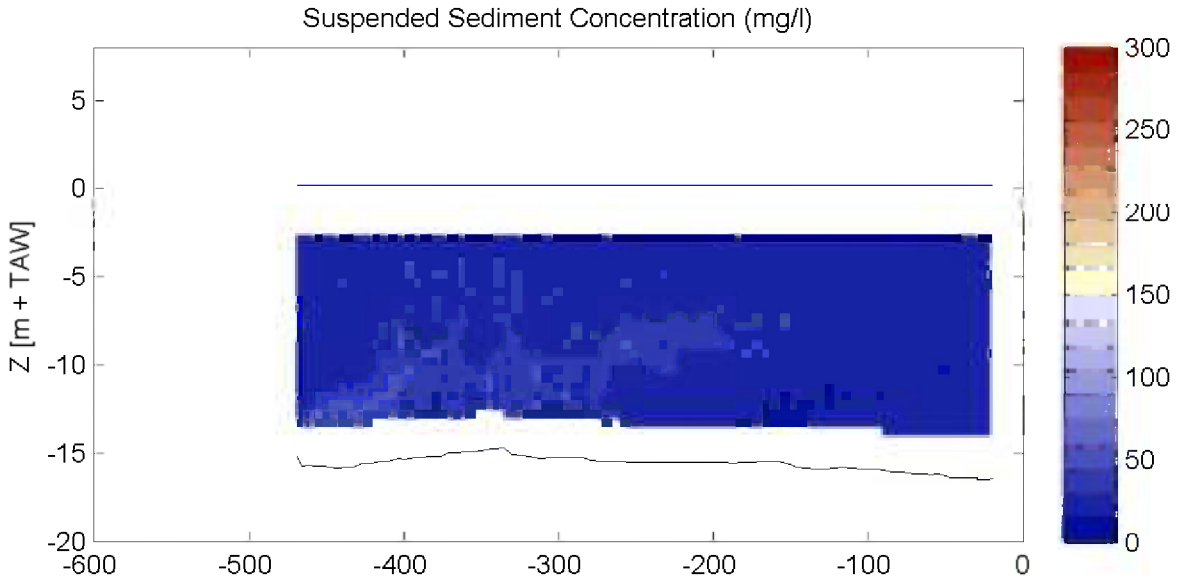
Data Processed by:

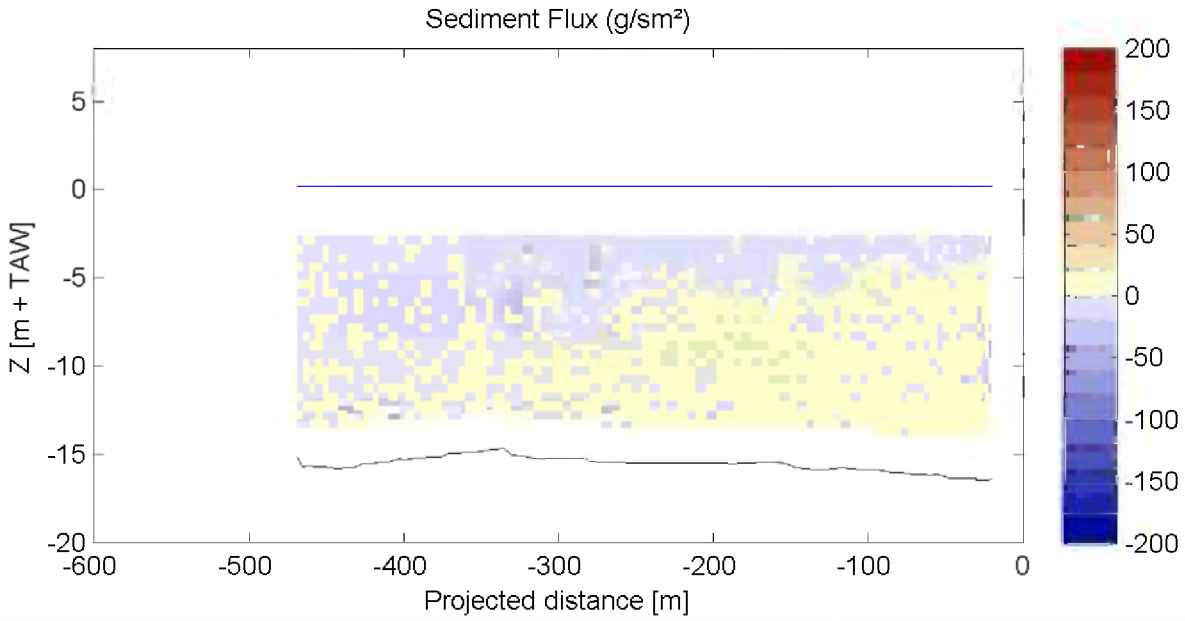
In association with :

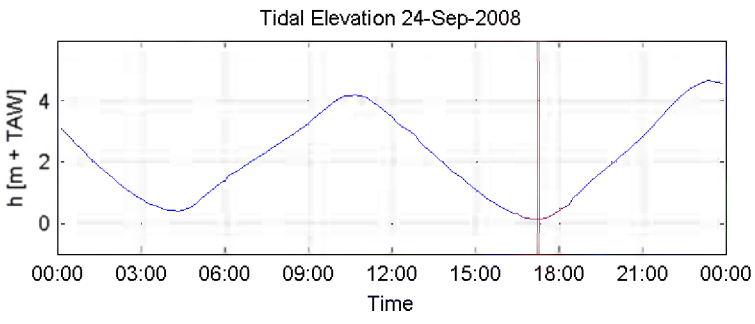
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7108dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

17:13 - 17:17

Time after HW [HH:MM]

-6:14

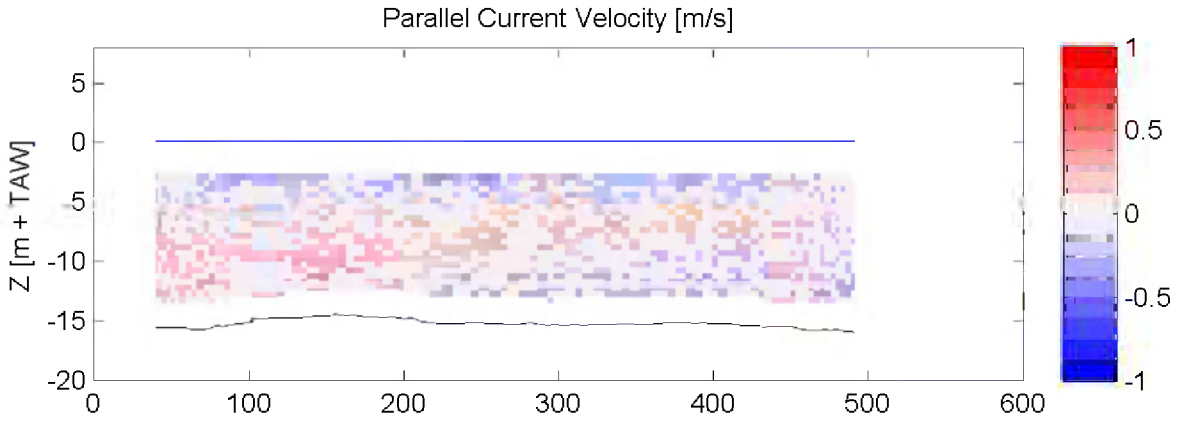
Data Processed by:

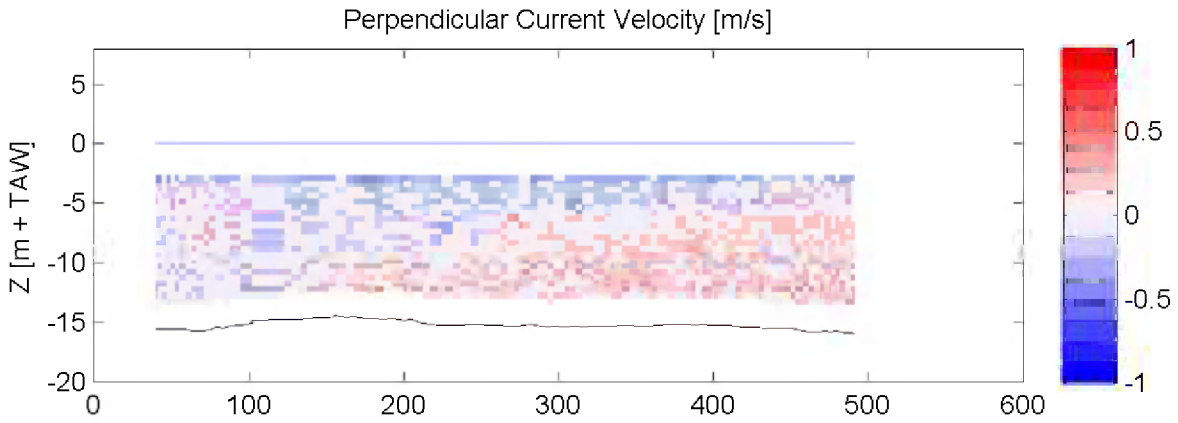
In association with :

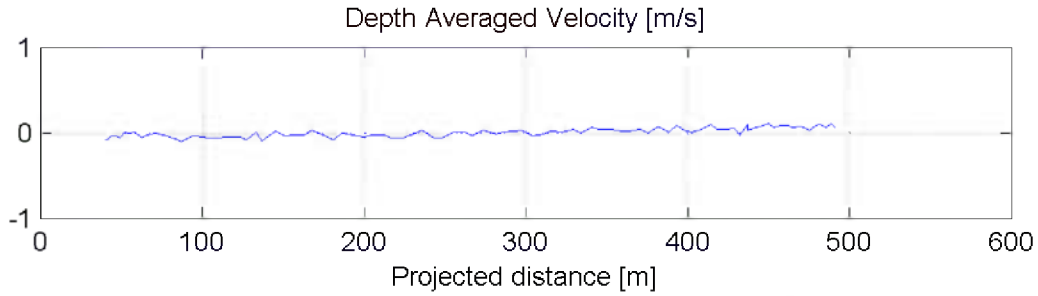
I/RA/11283/08.083/MSA

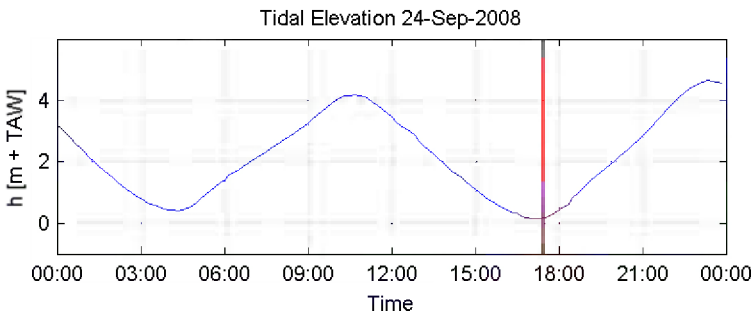
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7110dgdtlr_sub.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

17:23 - 17:27

Time after HW [HH:MM]

-6:04

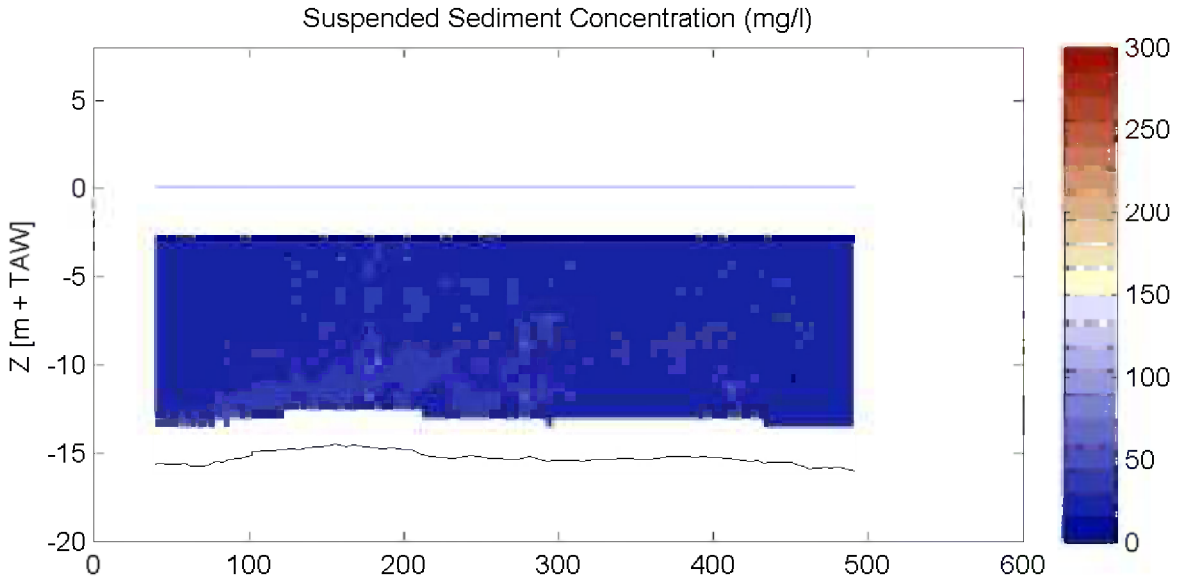
Data Processed by:

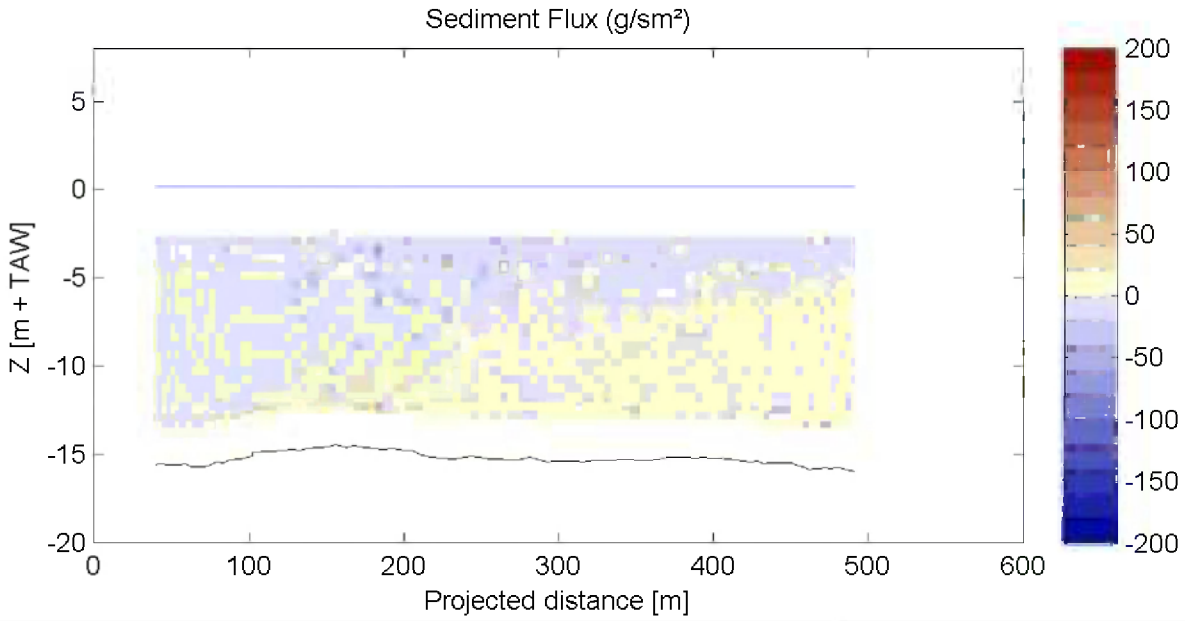
In association with :

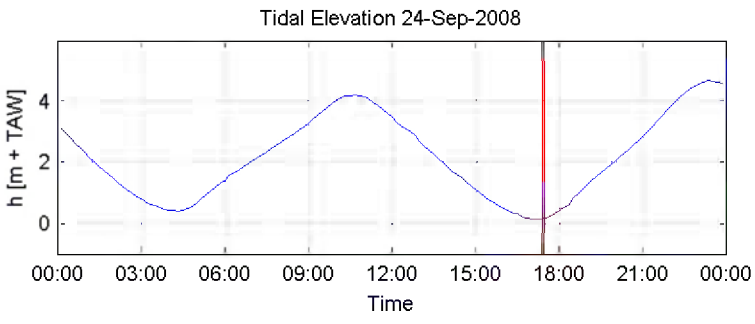
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7110dgdtlr_sub.csv	Location: Deurganckdok







HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

17:23 - 17:27

Time after HW [HH:MM]

-6:04

Data Processed by:

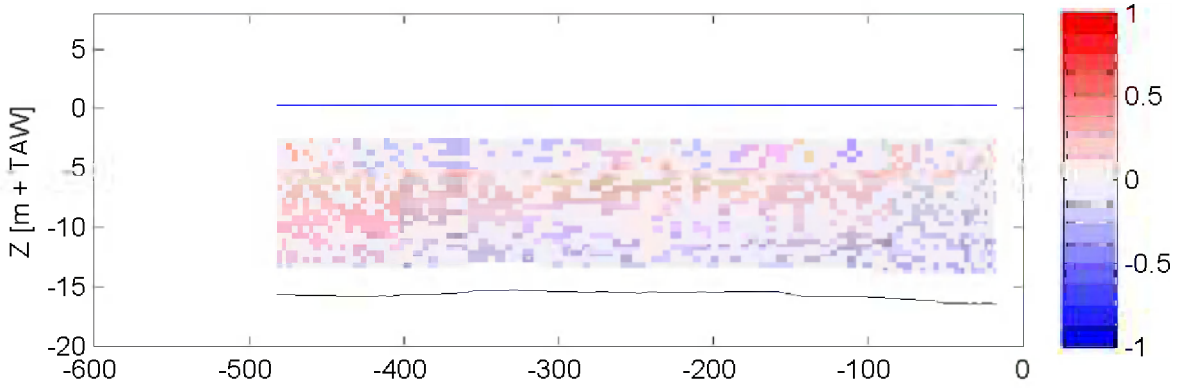
In association with :

I/RA/11283/08.083/MSA

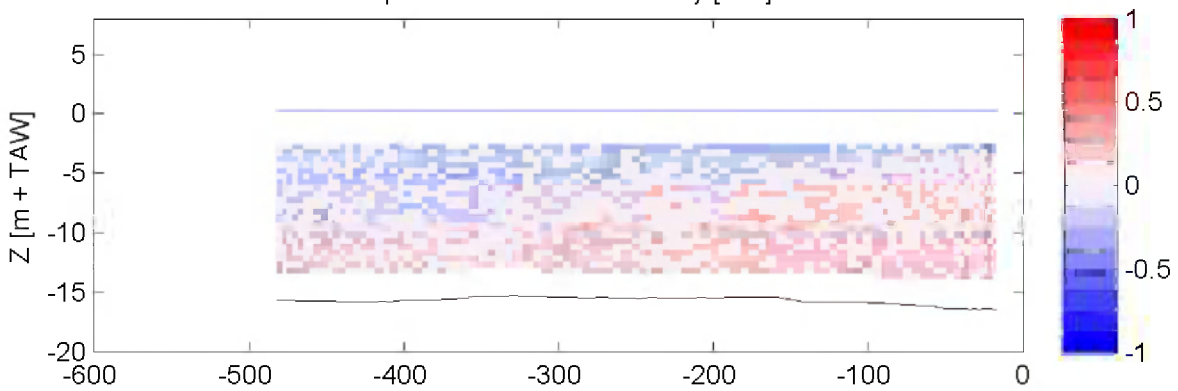
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7112dgdtrl_sub.csv	Location: Deurganckdok

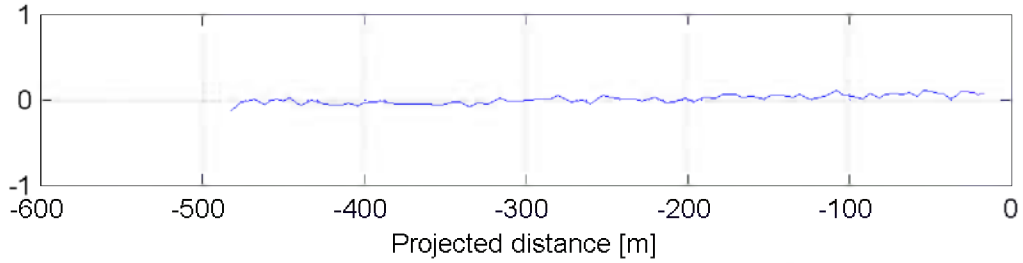
Parallel Current Velocity [m/s]



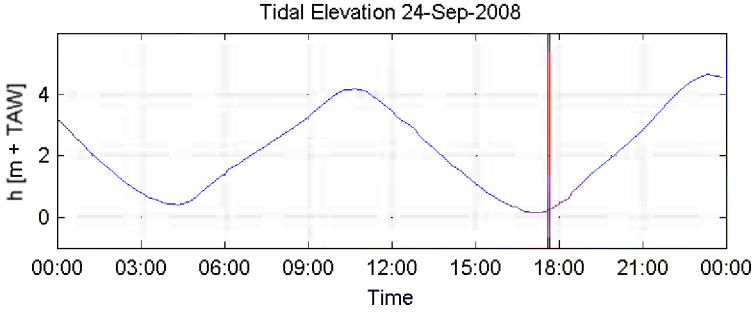
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

17:35 - 17:39

Time after HW [HH:MM]

-5:52

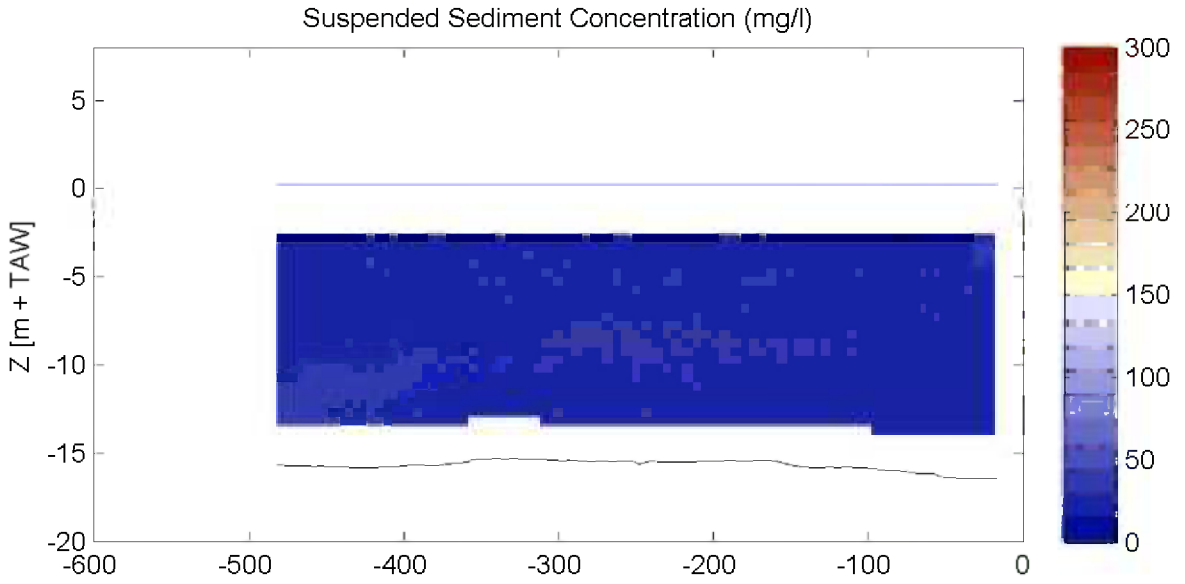
Data Processed by:

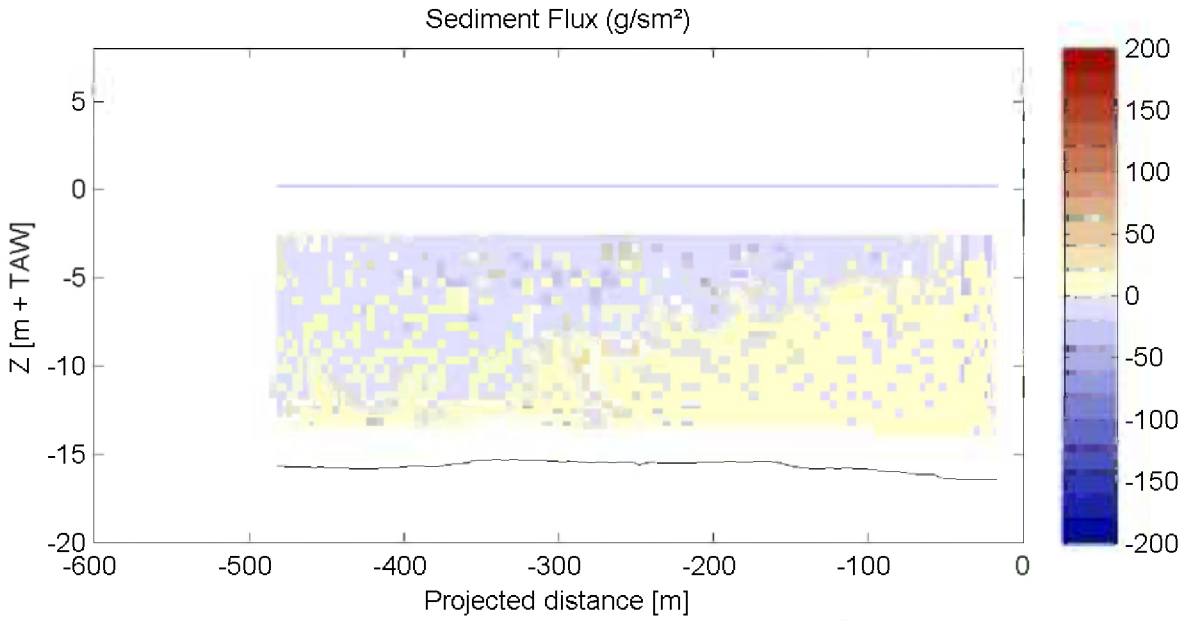
In association with :

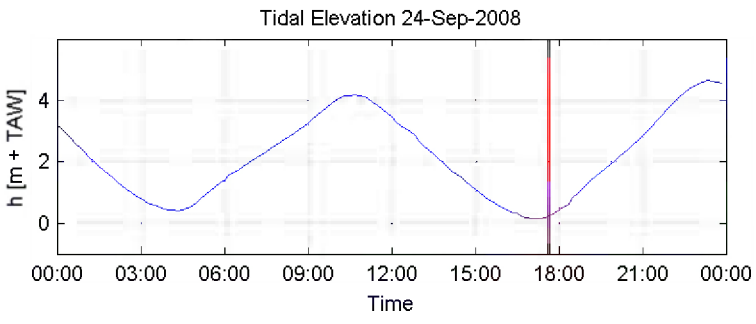
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7112dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

17:35 - 17:39

Time after HW [HH:MM]

-5:52

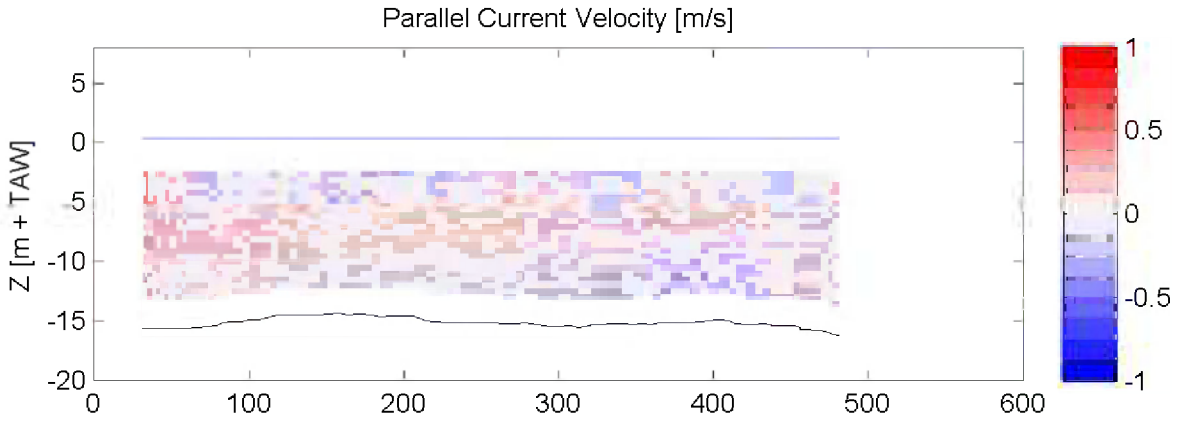
Data Processed by:

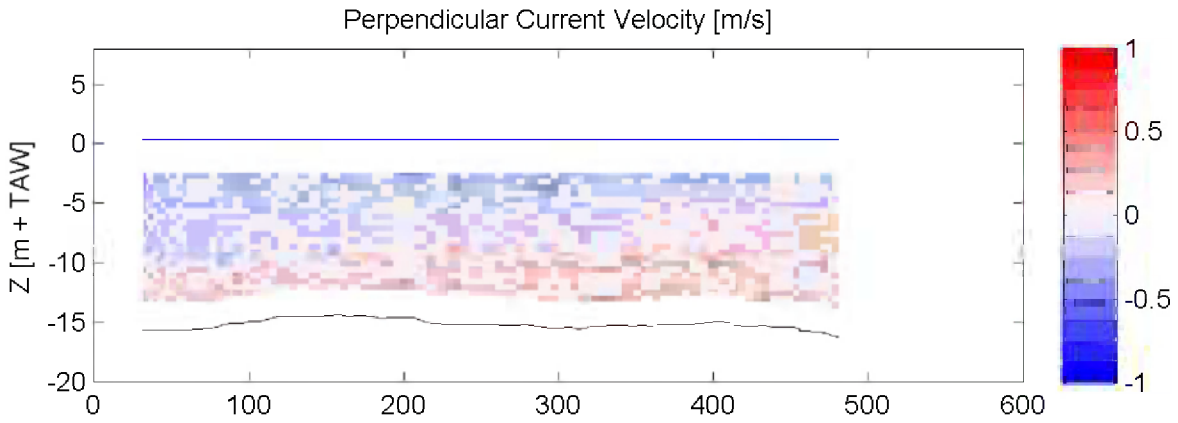
In association with :

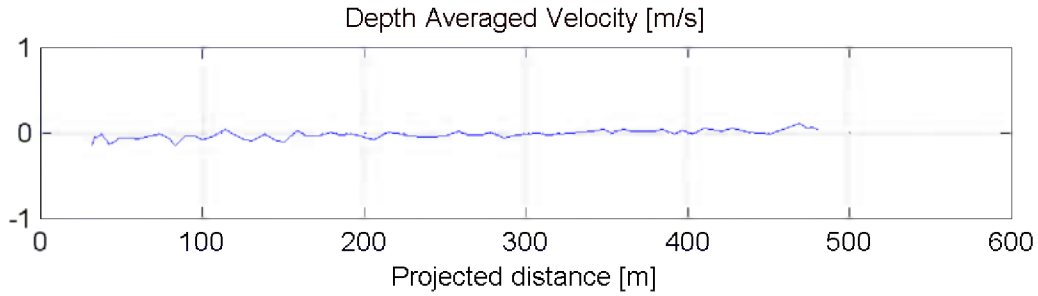
I/RA/11283/08.083/MSA

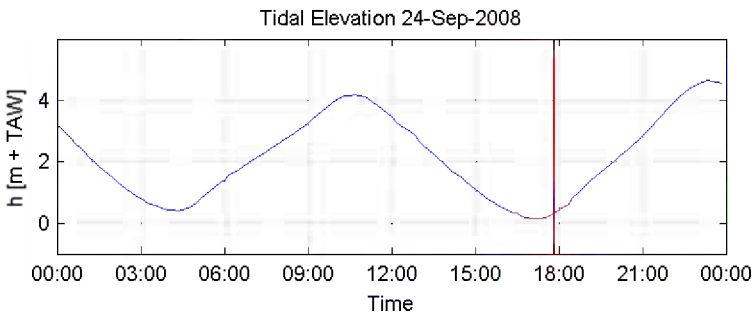
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7114dgdtlr_sub.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

17:48 - 17:51

Time after HW [HH:MM]

-5:40

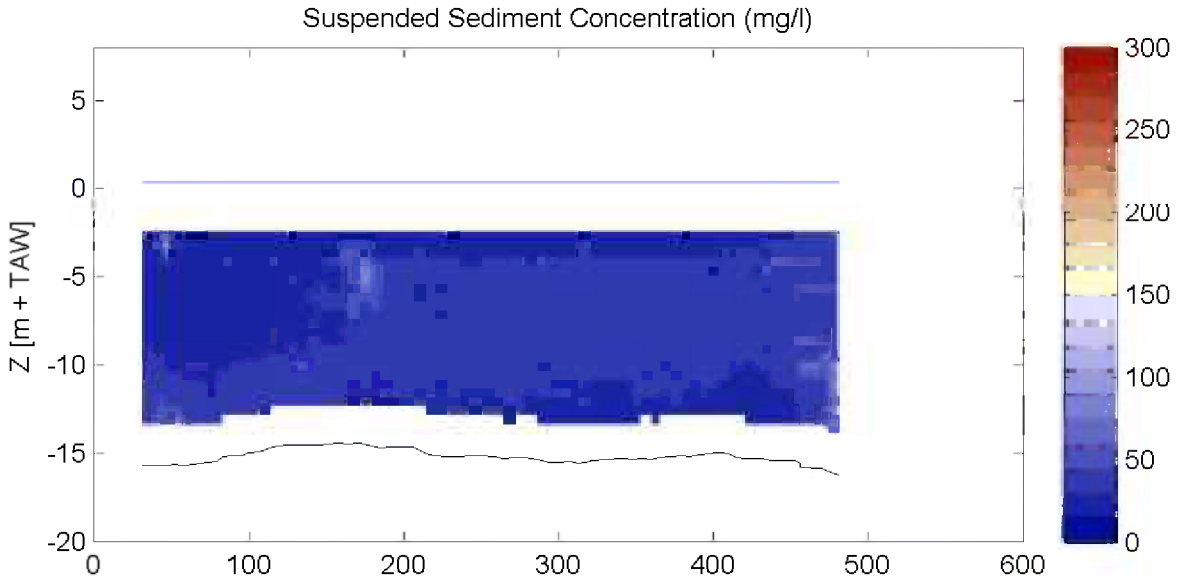
Data Processed by:

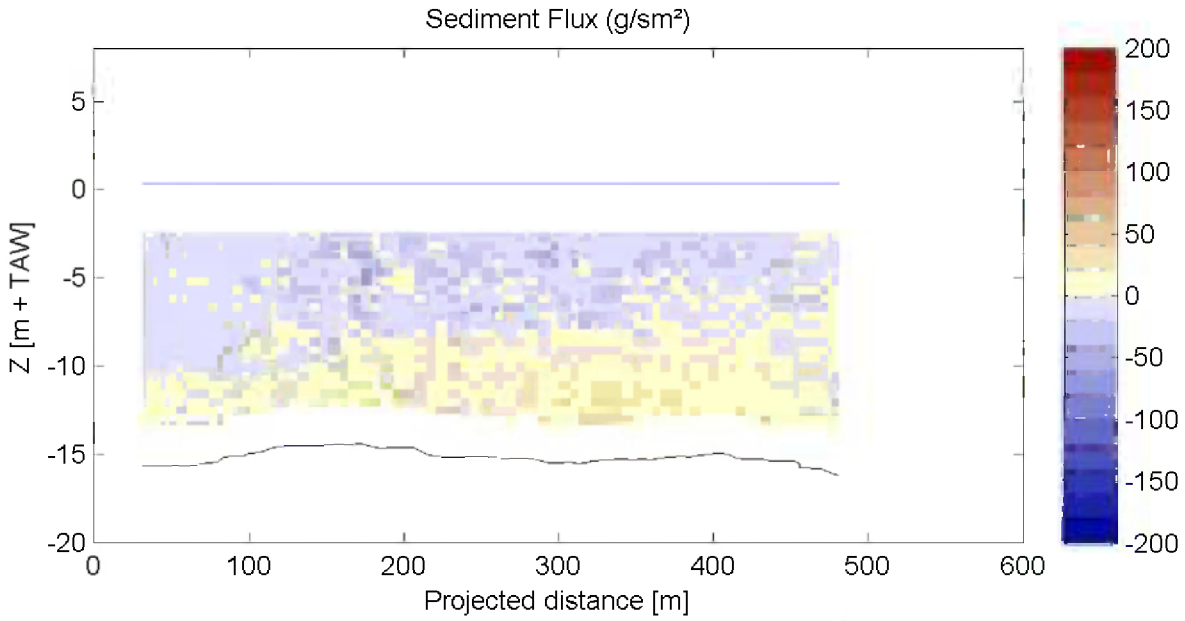
In association with :

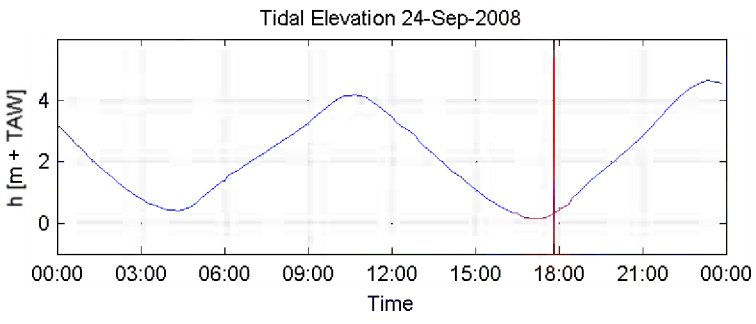
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7114dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

17:48 - 17:51

Time after HW [HH:MM]

-5:40

Data Processed by:

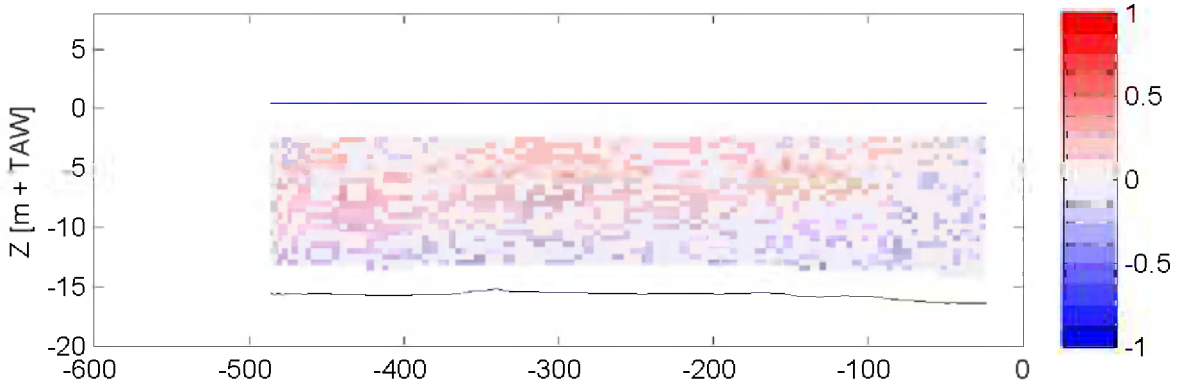
In association with :

I/RA/11283/08.083/MSA

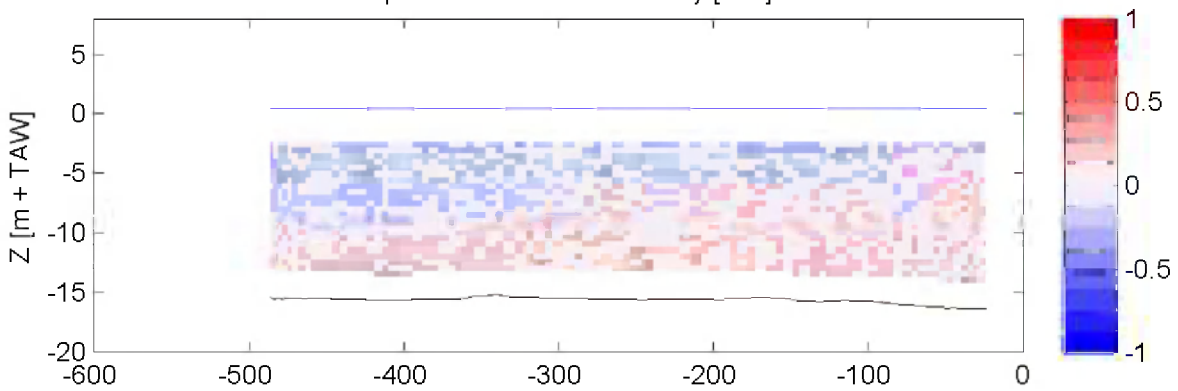
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7116dgdtrl_sub.csv	Location: Deurganckdok

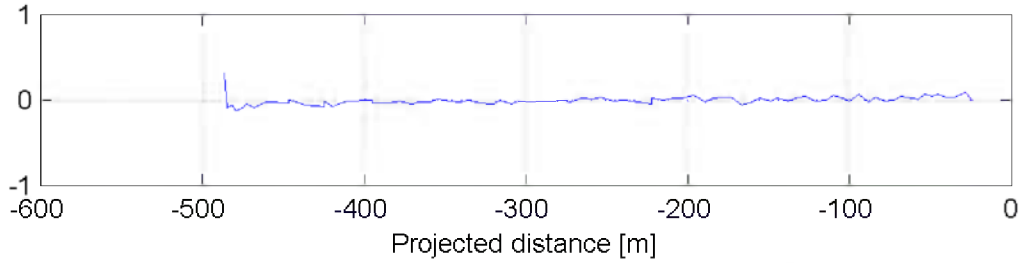
Parallel Current Velocity [m/s]



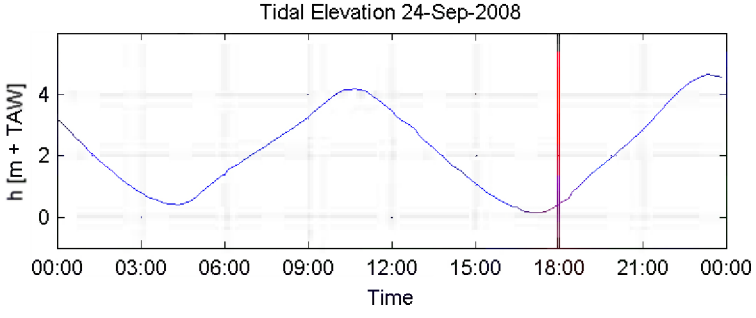
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

17:57 - 18:01

Time after HW [HH:MM]

-5:30

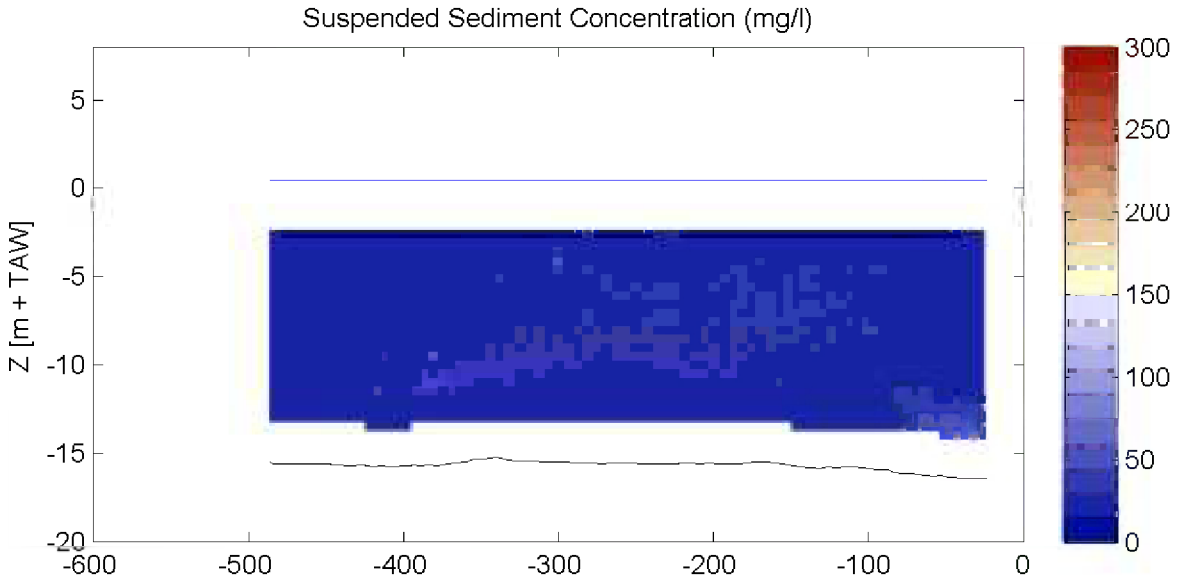
Data Processed by:

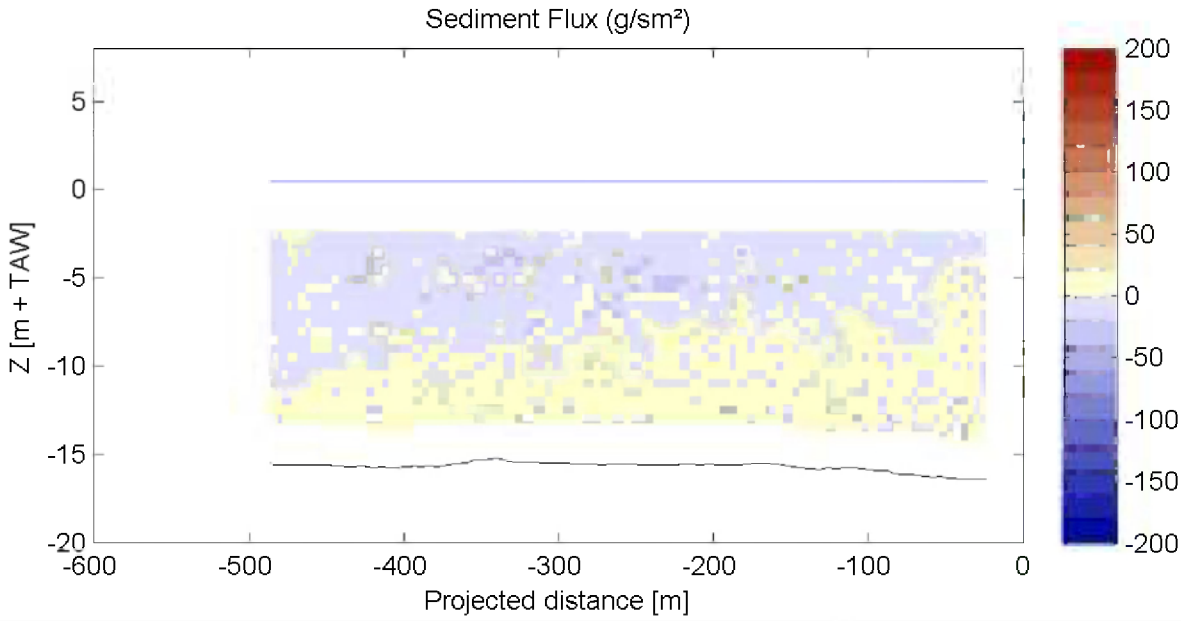
In association with :

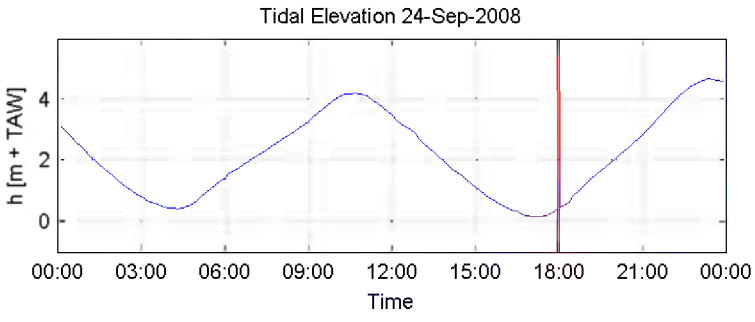
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7116dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

17:57 - 18:01

Time after HW [HH:MM]

-5:30

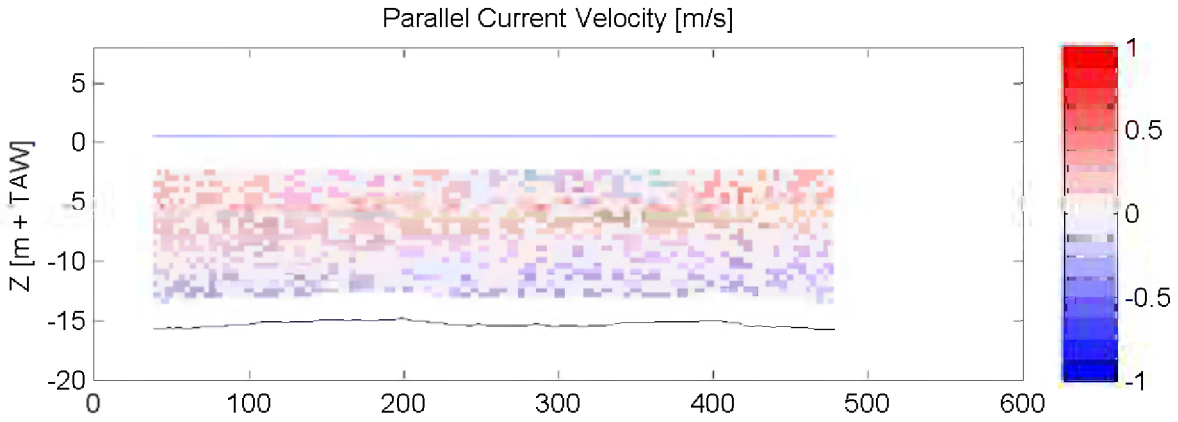
Data Processed by:

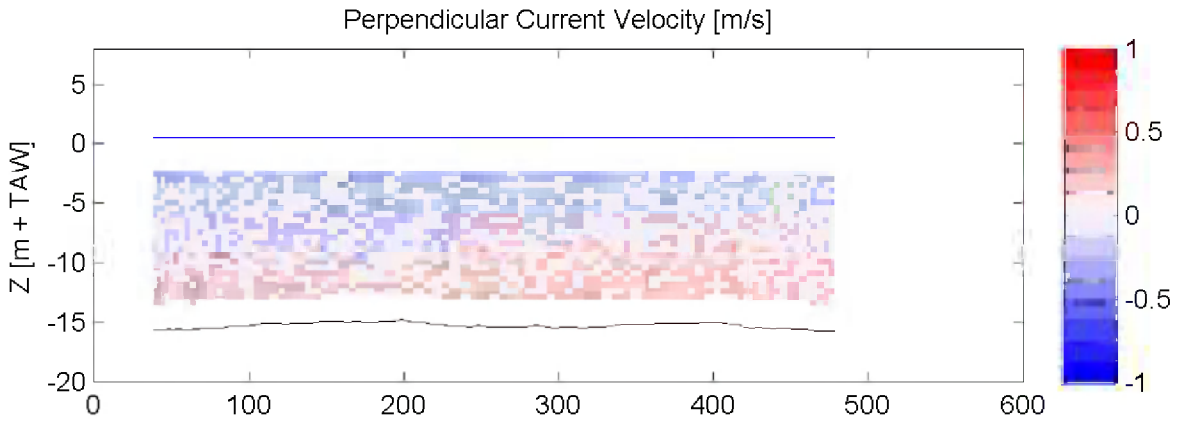
In association with :

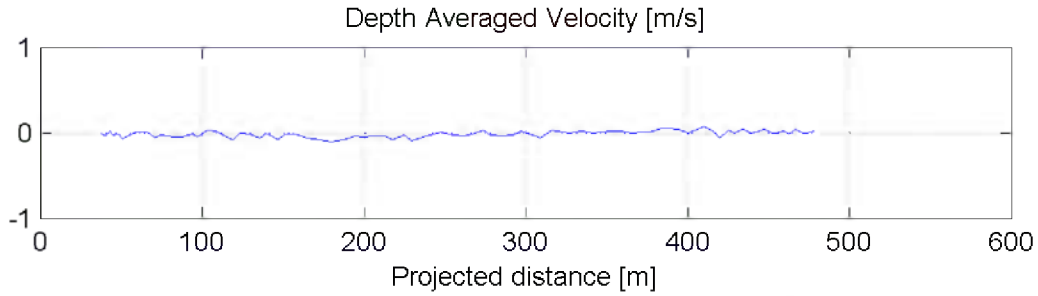
I/RA/11283/08.083/MSA

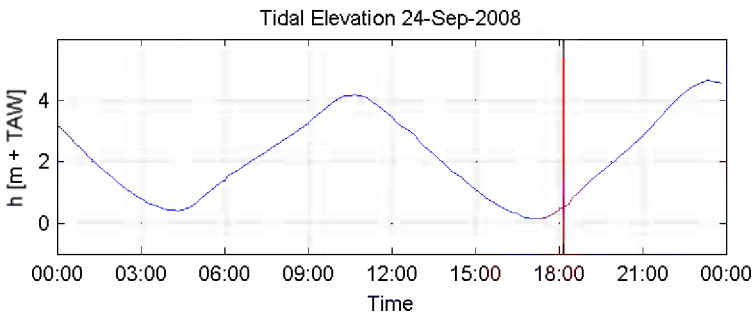
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7118dgdtlr_sub.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

18:08 - 18:12

Time after HW [HH:MM]

-5:19

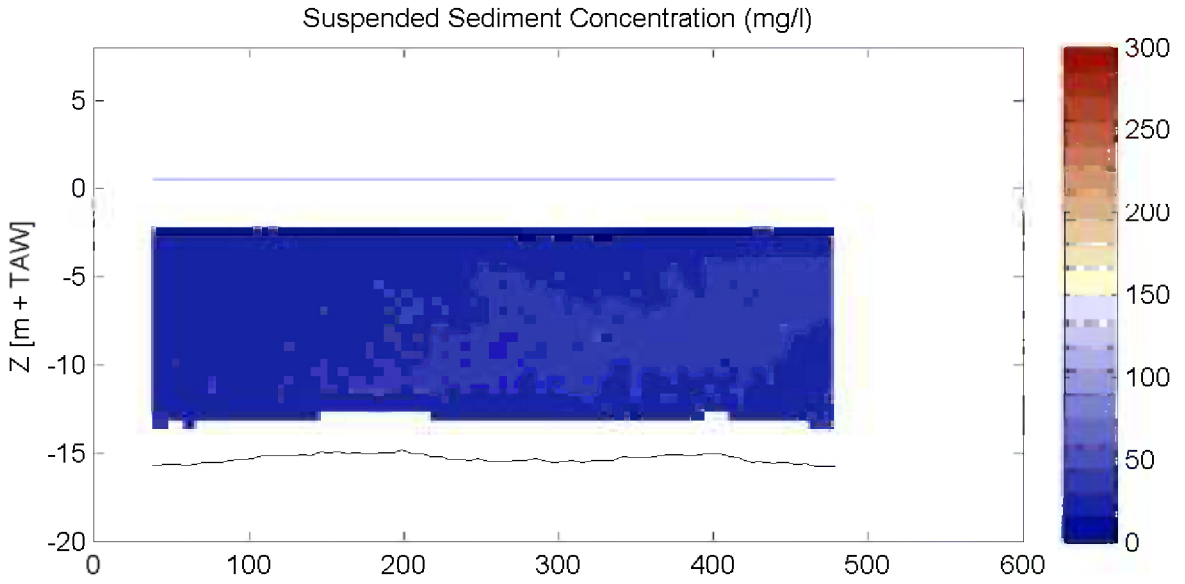
Data Processed by:

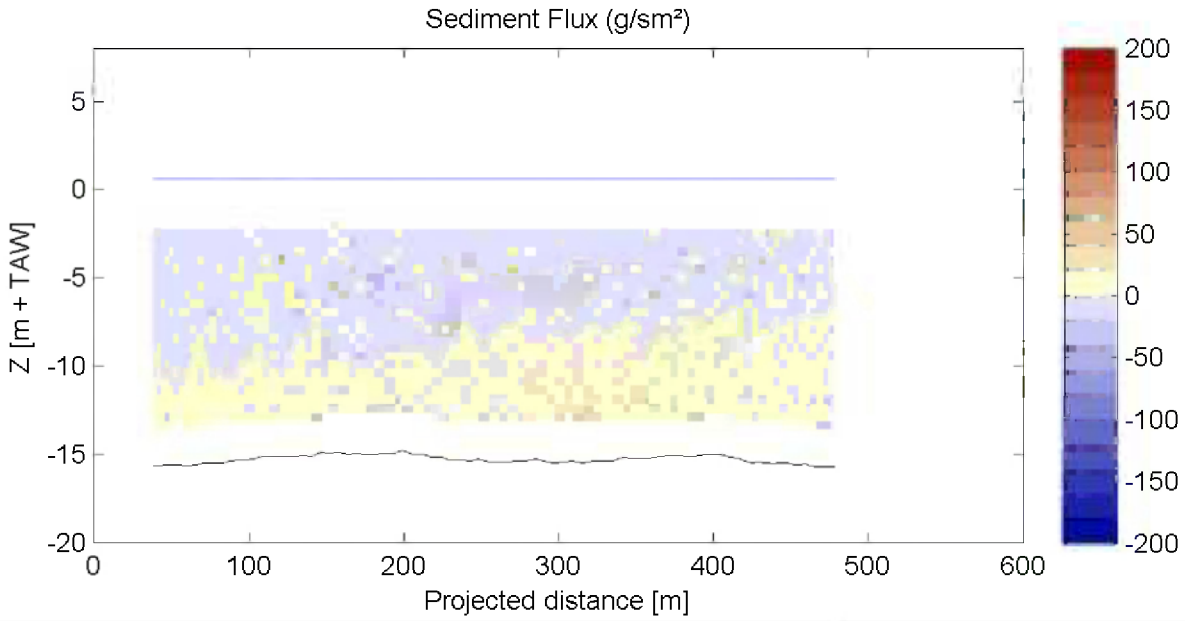
In association with :

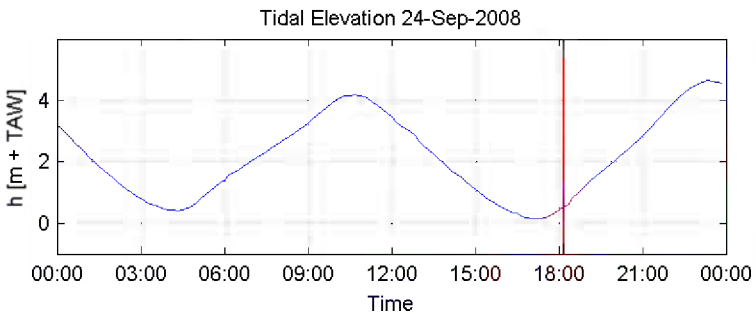
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7118dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

18:08 - 18:12

Time after HW [HH:MM]

-5:19

Data Processed by:

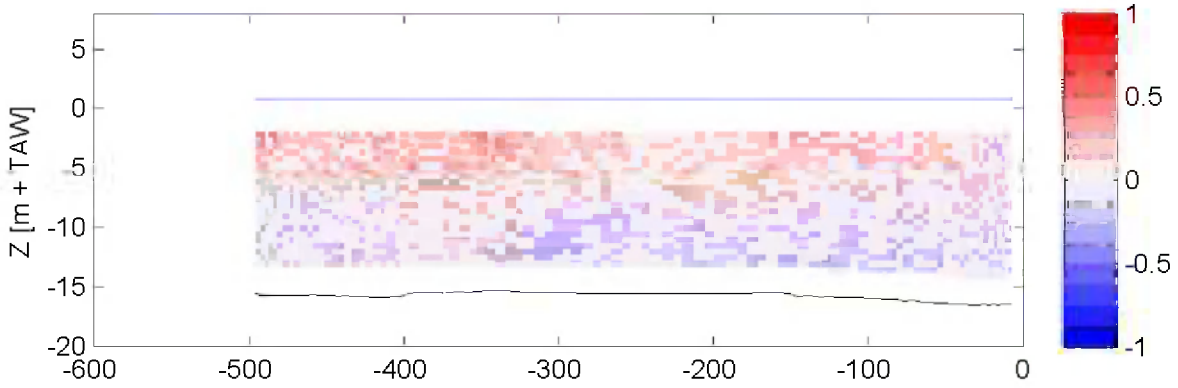
In association with :

I/RA/11283/08.083/MSA

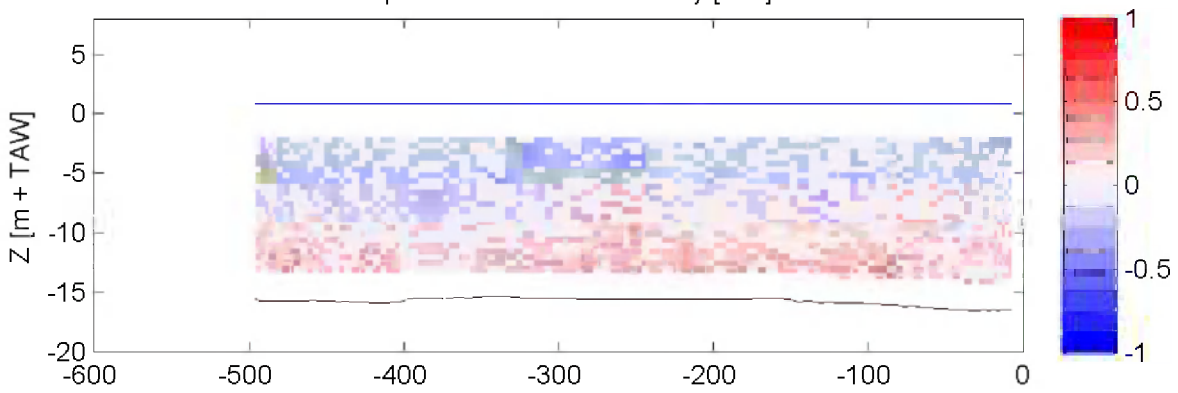
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7120dgdtrl_sub.csv	Location: Deurganckdok

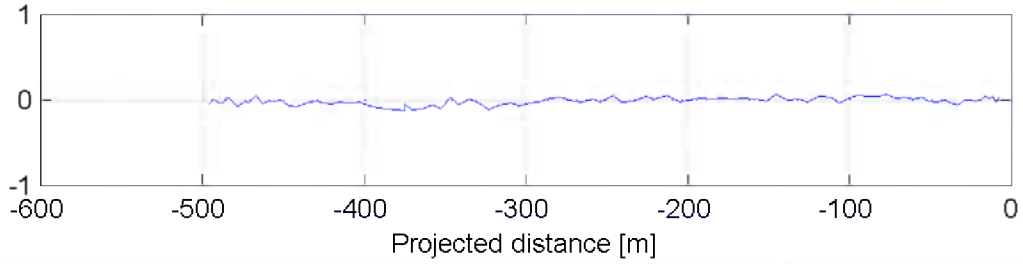
Parallel Current Velocity [m/s]



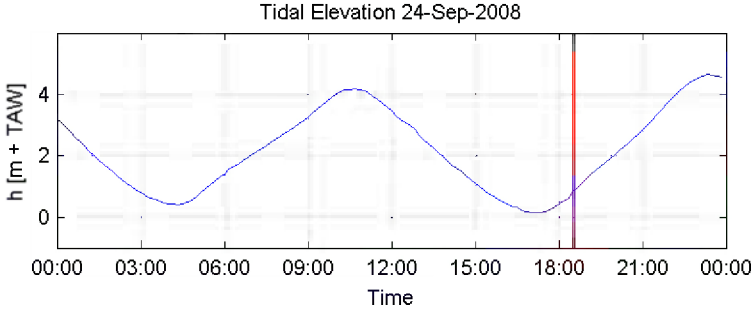
Perpendicular Current Velocity [m/s]



Depth Averaged Velocity [m/s]



Tidal Elevation 24-Sep-2008



HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

18:30 - 18:34

Time after HW [HH:MM]

-4:57

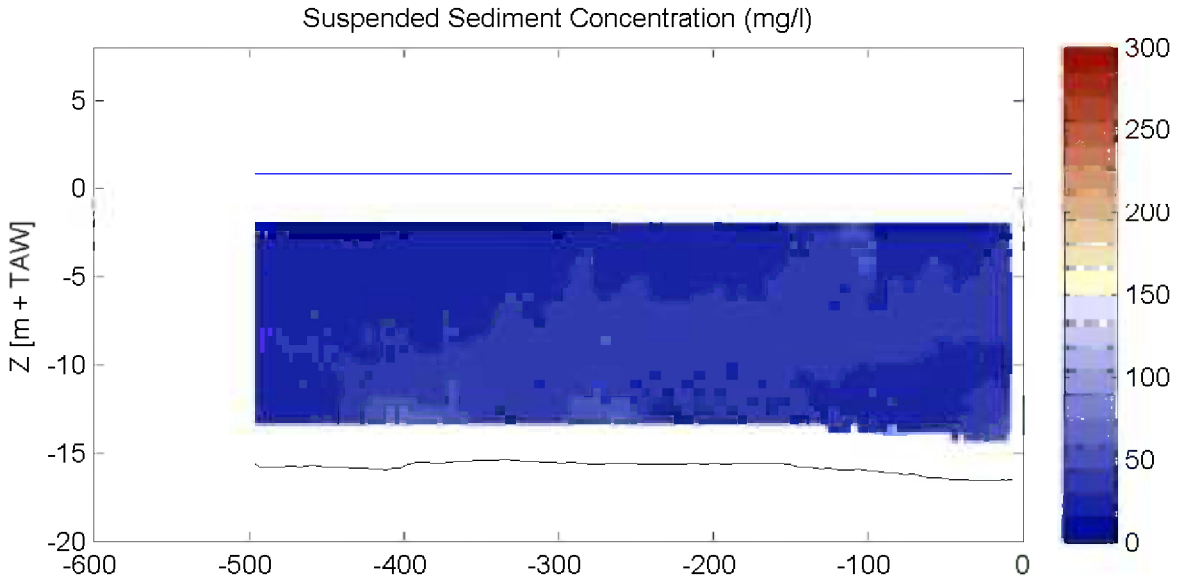
Data Processed by:

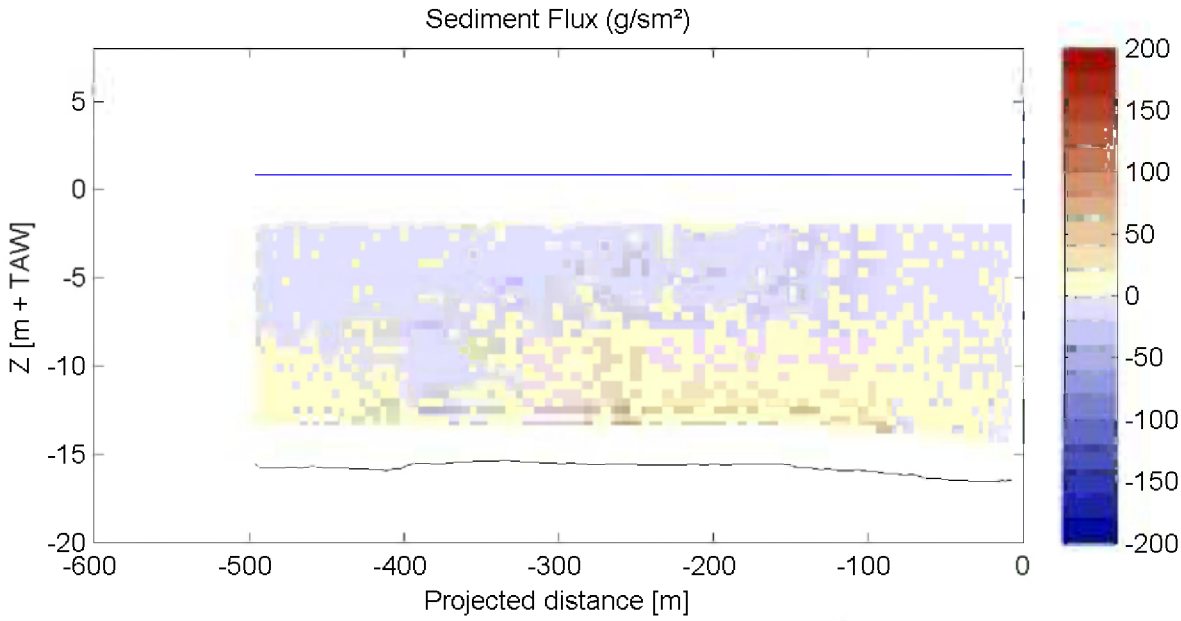
In association with :

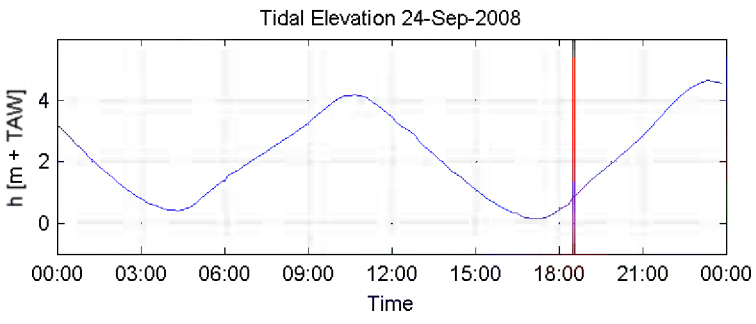
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7120dgdtrl_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

18:30 - 18:34

Time after HW [HH:MM]

-4:57

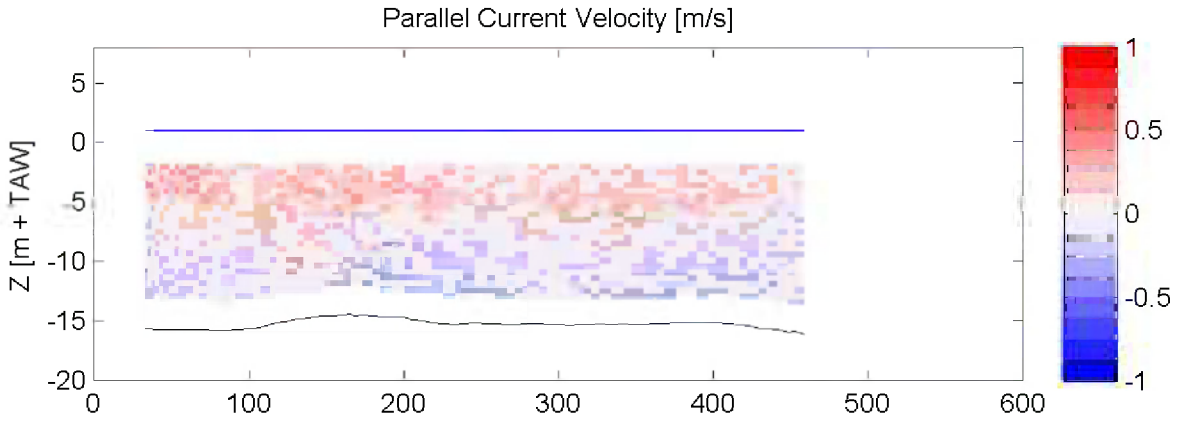
Data Processed by:

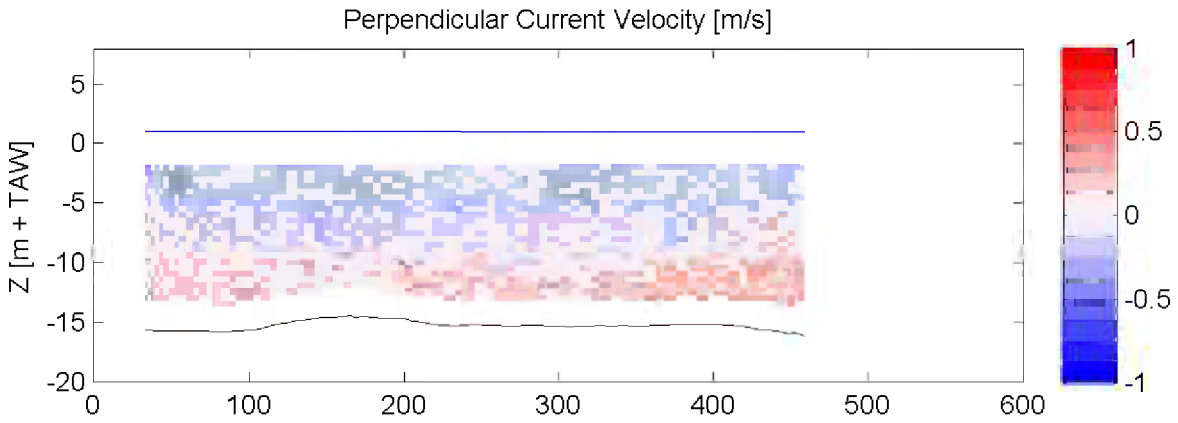
In association with :

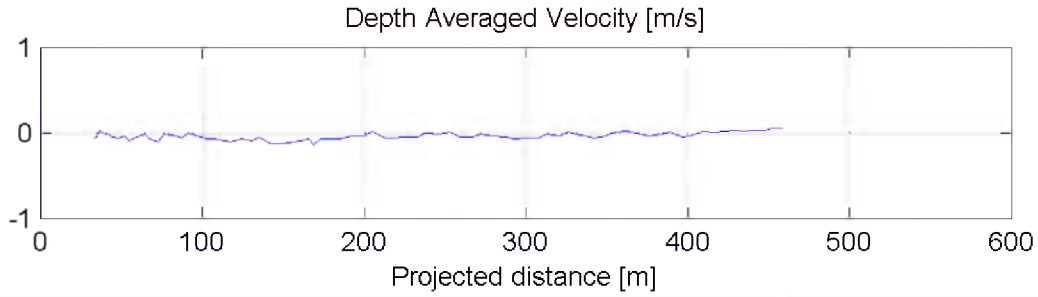
I/RA/11283/08.083/MSA

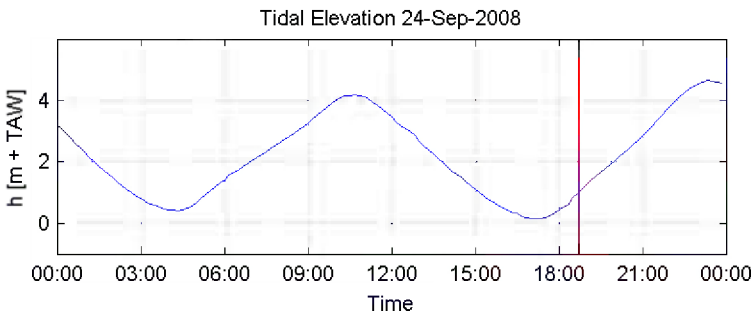
Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7122dgdtlr_sub.csv	Location: Deurganckdok









HW/LW: 10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

18:42 - 18:45

Time after HW [HH:MM]

-4:46

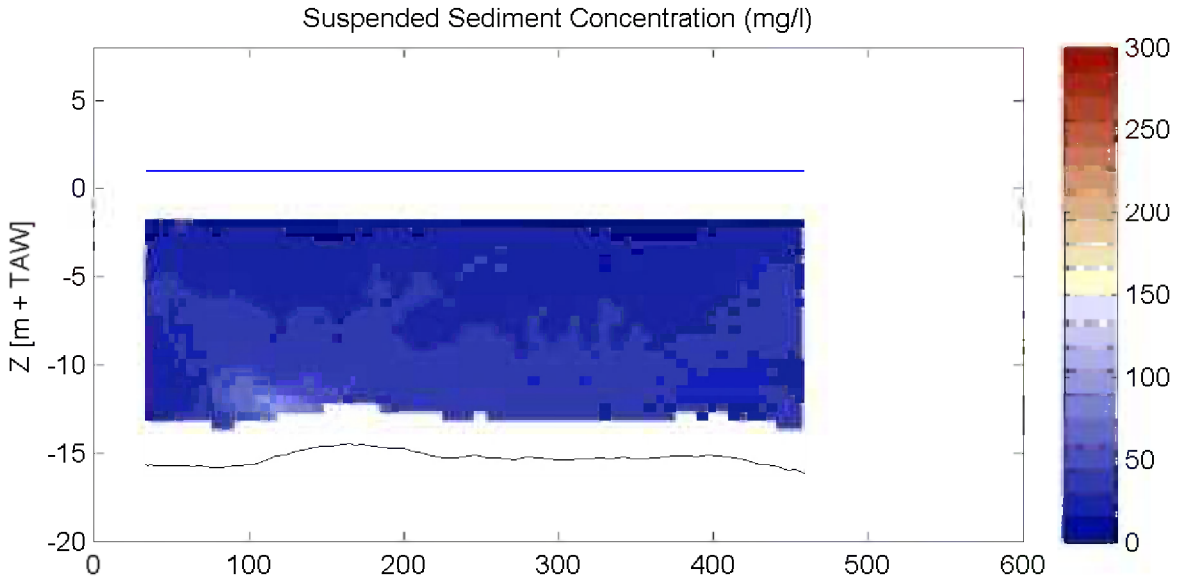
Data Processed by:

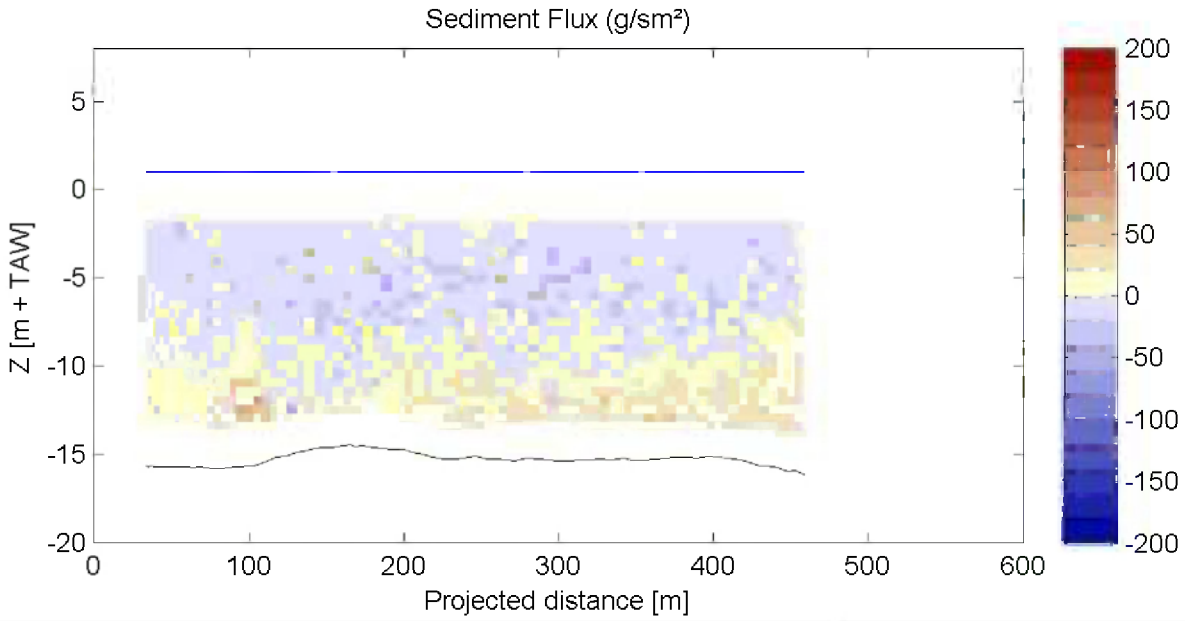
In association with :

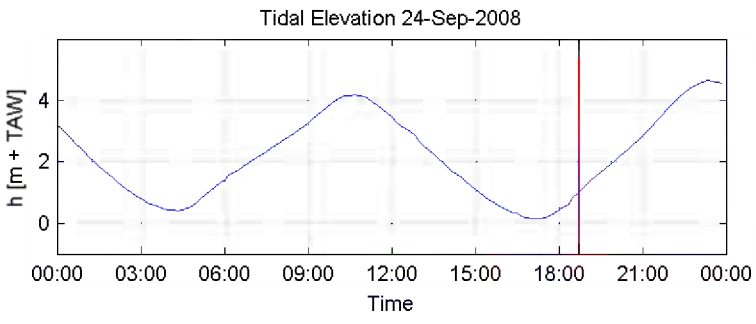
I/RA/11283/08.083/MSA

Opvolging aanslibbing DGD

11283	Equipment(s): ADCP
Sourcefile: 7122dgdtlr_sub.csv	Location: Deurganckdok







HW/LW:
10:40: h = 4.19 m+TAW
17:10: h = 0.16 m+TAW
23:30: h = 4.63 m+TAW

Date / Time [MET] :

24-Sep-2008

18:42 - 18:45

Time after HW [HH:MM]

-4:46

Data Processed by:

In association with :

I/RA/11283/08.083/MSA

APPENDIX G. DISCHARGE, SEDIMENT FLUX AND AVERAGE SEDIMENT CONCENTRATION FOR THE TOTAL CROSS-SECTION

Discharge distribution over the cross section: positive is from dock to river

Filename	*Time to HW [hh:mm]*	*Time [hh:mm]*	*Qmid [m3/s]*	*Qtop [m3/s]*	*Qbot [m3/s]*	*Qleft [m3/s]*	*Qright [m3/s]*	*Qtot [m3/s]*	*Q tidal filling [m3/s]*
7002tdgdlr_sub.csv	-4:34	6:05	-241	-60	78	112	-4	-115	-261
7004tdgdrl.csv	-3:46	6:53	-197	-70	78	-53	-70	-266	-170
7006tdgdlr_sub.csv	-3:31	7:08	-122	-53	111	56	-223	-251	-159
7008tdgdrl_sub.csv	-3:21	7:18	-57	-13	48	26	-275	-235	-164
7010tdgdlr_sub.csv	-3:08	7:31	-82	-48	100	54	-121	-143	-198
7012tdgdrl_sub.csv	-2:57	7:42	-187	1	50	17	-76	-155	-168
7014tdgdlr_sub.csv	-2:45	7:54	-65	72	7	41	-104	-112	-169
7016tdgdrl_sub.csv	-2:35	8:04	-260	50	-32	57	-99	-228	-137
7018tdgdlr_sub.csv	-2:23	8:16	-178	64	-35	100	-138	-195	-172
7020tdgdrl_sub.csv	-1:57	8:42	-46	-4	6	161	-254	-155	-166
7022tdgdlr_sub.csv	-1:47	8:52	-230	0	1	130	-96	-194	-192
7024tdgdrl_sub.csv	-1:33	9:06	-123	-1	11	112	-245	-184	-204
7026dgdtlr_sub.csv	-1:22	9:17	23	18	84	75	-123	-42	-208
7028dgdtrl_sub.csv	-1:11	9:28	-157	-18	-7	77	-208	-182	-221
7030dgdtlr_sub.csv	-1:00	9:40	-23	61	-24	89	-21	-10	-221
7032dgdtrl_sub.csv	-0:48	9:51	-17	35	-36	114	-167	-58	-200
7034dgdtlr_sub.csv	-0:37	10:02	-67	46	-65	83	-146	-137	-146
7036dgdtrl_sub.csv	-0:27	10:12	-145	98	-117	125	-119	-86	-109
7038dgdtlr_sub.csv	-0:06	10:33	293	189	-45	46	-219	207	-34
7040dgdtrl_sub.csv	0:04	10:44	166	174	-84	164	-69	299	30
7042dgdtlr_sub.csv	0:14	10:54	118	184	-199	98	-70	208	67
7044dgdtrl_sub.csv	0:32	11:12	191	232	-193	121	25	325	163
7046dgdtlr_sub.csv	0:43	11:23	230	226	-213	84	-11	345	185
7048dgdtrl_sub.csv	0:54	11:34	272	227	-209	118	26	402	220
7050dgdtlr_sub.csv	1:05	11:45	274	279	-267	41	37	399	219
7052dgdtrl_sub.csv	1:19	11:59	253	239	-169	102	74	474	227
7054dgdtlr_sub.csv	1:29	12:09	156	226	-105	17	189	455	241
7056dgdtrl_sub.csv	1:38	12:18	160	248	-156	27	22	327	195
7058dgdtlr_sub.csv	1:49	12:29	57	205	-146	60	94	296	161
7062dgdtlr_sub.csv	2:12	12:52	110	176	-33	-10	145	363	292
7064dgdtrl_sub.csv	2:23	13:03	171	169	-47	6	54	349	264
7066dgdtlr_sub.csv	2:32	13:12	155	154	-46	-23	53	316	228
7068dgdtrl_sub.csv	2:44	13:24	200	175	-36	-13	45	343	237
7070dgdtlr_sub.csv	2:56	13:36	143	128	-16	-61	83	316	246
7072dgdtr_subl.csv	3:07	13:47	196	177	-12	6	49	380	206
7076dgdtrl_sub.csv	3:30	14:10	186	183	-39	-25	35	359	184
7078dgdtlr_sub.csv	3:41	14:21	139	108	9	7	116	349	180
7080dgdtrl_sub.csv	3:52	14:32	108	109	16	-18	18	250	237
7084dgdtrl_sub.csv	4:15	14:55	128	76	42	-48	-11	212	203
7086dgdtlr_sub.csv	4:26	15:06	134	50	17	7	81	252	187
7088dgdtrl_sub.csv	4:37	15:17	90	63	1	-8	25	199	190
7090dgdtlr_sub.csv	4:46	15:26	124	21	42	24	12	201	191

Filename	*Time to HW [hh:mm]*	*Time [hh:mm]*	*Qmid [m3/s]*	*Qtop [m3/s]*	*Qbot [m3/s]*	*Qleft [m3/s]*	*Qright [m3/s]*	*Qtot [m3/s]*	*Q tidal filling [m3/s]*
7092dgdtrl_sub.csv	4:57	15:37	82	6	54	-19	21	169	143
7094dgdtlr_sub.csv	5:07	15:47	156	-39	87	-17	22	202	190
7096dgdtrl_sub.csv	5:19	15:59	148	-29	101	-11	15	221	109
7098dgdtlr_sub.csv	5:30	16:10	177	-48	100	-18	8	206	128
7100dgdtrl_sub.csv	5:47	16:27	94	-38	66	-60	78	173	75
7102dgdtlr_sub.csv	5:58	16:38	152	-67	112	12	54	235	146
7104dgdtrl_sub.csv	6:10	16:50	188	-73	133	-43	19	193	59
7106dgdtlr_sub.csv	6:25	17:05	86	-158	114	-57	18	62	-17
7108dgdtrl_sub.csv	-6:14	17:15	132	-123	118	-12	26	76	14
7110dgdtlr_sub.csv	-6:04	17:25	12	-208	115	-44	24	-44	-69
7112dgdtrl_sub.csv	-5:52	17:37	24	-167	159	-24	10	-38	-110
7114dgdtlr_sub.csv	-5:40	17:49	-66	-191	147	-29	5	-93	-170
7116dgdtrl_sub.csv	-5:30	17:59	-38	-147	162	-6	6	-51	-170
7118dgdtlr_sub.csv	-5:19	18:10	-75	-177	174	-10	9	-67	-133
7120dgdtrl_sub.csv	-4:57	18:32	-99	-129	175	-6	-3	-97	-292
7122dgdtlr_sub.csv	-4:46	18:43	-184	-165	133	-13	-27	-255	-255

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

Filename	*Time to HW [hh:mm]*	*Time [hh:mm]*	*Fmid [kg/s]*	*Ftop [kg/s]*	*Fbot [kg/s]*	*Fleft [kg/s]*	*Fright [kg/s]*	*Ftot [kg/s]*
7002tdgdlr_sub.csv	-4:34	6:05	-7	-2	4	4	-2	-4
7004tdgdrl.csv	-3:46	6:53	-4	-3	5	-4	-2	-6
7006tdgdlr_sub.csv	-3:31	7:08	0	-2	7	2	-8	-2
7008tdgdrl_sub.csv	-3:21	7:18	0	-1	5	1	-9	-1
7010tdgdlr_sub.csv	-3:08	7:31	-1	-1	7	2	-4	1
7012tdgdrl_sub.csv	-2:57	7:42	-9	-1	3	1	-2	-6
7014tdgdlr_sub.csv	-2:45	7:54	-9	1	0	1	-6	-14
7016tdgdrl_sub.csv	-2:35	8:04	-19	0	-3	1	-6	-22
7018tdgdlr_sub.csv	-2:23	8:16	-11	1	-3	4	-6	-16
7020tdgdrl_sub.csv	-1:57	8:42	-2	0	0	5	-6	-6
7022tdgdlr_sub.csv	-1:47	8:52	-11	0	0	5	-3	-8
7024tdgdrl_sub.csv	-1:33	9:06	-7	-1	1	3	-8	-9
7026dgdtlr_sub.csv	-1:22	9:17	2	0	5	3	-6	0
7028dgdtrl_sub.csv	-1:11	9:28	-6	-1	0	2	-6	-5
7030dgdtlr_sub.csv	-1:00	9:40	-3	3	-1	2	4	1
7032dgdtrl_sub.csv	-0:48	9:51	-5	0	-1	7	-7	-6
7034dgdtlr_sub.csv	-0:37	10:02	-8	1	-6	2	-8	-16
7036dgdtrl_sub.csv	-0:27	10:12	-13	3	-10	4	-5	-17
7038dgdtlr_sub.csv	-0:06	10:33	7	5	-4	2	-12	-3
7040dgdtrl_sub.csv	0:04	10:44	2	5	-5	11	-4	3
7042dgdtlr_sub.csv	0:14	10:54	-2	6	-13	2	-5	-7
7044dgdtrl_sub.csv	0:32	11:12	-1	5	-12	3	-1	-5
7046dgdtlr_sub.csv	0:43	11:23	5	6	-13	5	-1	2
7048dgdtrl_sub.csv	0:54	11:34	6	7	-13	4	1	3
7050dgdtlr_sub.csv	1:05	11:45	1	5	-15	2	2	-2
7052dgdtrl_sub.csv	1:19	11:59	2	4	-7	3	2	2
7054dgdtlr_sub.csv	1:29	12:09	0	3	-4	0	3	2
7056dgdtrl_sub.csv	1:38	12:18	1	3	-4	0	0	0
7058dgdtlr_sub.csv	1:49	12:29	-1	3	-5	0	1	-1
7062dgdtlr_sub.csv	2:12	12:52	0	2	-2	-1	1	1
7064dgdtrl_sub.csv	2:23	13:03	1	3	-1	0	0	2
7066dgdtlr_sub.csv	2:32	13:12	0	2	-1	-1	-1	0
7068dgdtrl_sub.csv	2:44	13:24	2	2	-1	0	0	2
7070dgdtlr_sub.csv	2:56	13:36	1	2	-1	-1	2	3
7072dgdtr_subl.csv	3:07	13:47	2	2	0	0	1	4
7076dgdtrl_sub.csv	3:30	14:10	2	2	-1	-1	0	3
7078dgdtlr_sub.csv	3:41	14:21	2	2	0	0	2	5
7080dgdtrl_sub.csv	3:52	14:32	1	2	0	-1	0	3
7084dgdtrl_sub.csv	4:15	14:55	1	1	1	-1	-1	2
7086dgdtlr_sub.csv	4:26	15:06	2	0	1	0	1	3
7088dgdtrl_sub.csv	4:37	15:17	1	1	0	-1	0	2
7090dgdtlr_sub.csv	4:46	15:26	3	0	2	1	0	5
7092dgdtrl_sub.csv	4:57	15:37	2	0	2	-1	0	4

Filename	*Time to HW [hh:mm]*	*Time [hh:mm]*	*Fmid [kg/s]*	*Ftop [kg/s]*	*Fbot [kg/s]*	*Fleft [kg/s]*	*Fright [kg/s]*	*Ftot [kg/s]*
7094dgdtlr_sub.csv	5:07	15:47	3	-1	2	0	0	4
7096dgdtrl_sub.csv	5:19	15:59	2	-1	2	0	0	4
7098dgdtlr_sub.csv	5:30	16:10	3	-2	3	0	0	4
7100dgdtrl_sub.csv	5:47	16:27	2	-1	2	-1	0	3
7102dgdtlr_sub.csv	5:58	16:38	3	-2	3	0	0	5
7104dgdtrl_sub.csv	6:10	16:50	4	-2	4	-1	0	3
7106dgdtlr_sub.csv	6:25	17:05	2	-5	3	-6	0	-2
7108dgdtrl_sub.csv	-6:14	17:15	3	-3	3	2	1	3
7110dgdtlr_sub.csv	-6:04	17:25	1	-5	4	-1	1	1
7112dgdtrl_sub.csv	-5:52	17:37	1	-4	5	0	0	0
7114dgdtlr_sub.csv	-5:40	17:49	-1	-6	6	0	1	0
7116dgdtrl_sub.csv	-5:30	17:59	0	-3	5	0	0	2
7118dgdtlr_sub.csv	-5:19	18:10	-1	-4	6	0	0	2
7120dgdtrl_sub.csv	-4:57	18:32	-1	-3	8	0	0	3
7122dgdtlr_sub.csv	-4:46	18:43	-2	-3	6	0	0	1

Sediment concentration distribution over the cross section

Transect name	*Time after HW [hh:mm]*	*Time [hh:mm MET]*	*Average overall SS Concentration [mg/l]*	*Average incoming SS Concentration [mg/l]*	*Average outgoing SS Concentration [mg/l]*
7002tdgdlr_sub.csv	-4:34	6:05	35	35	34
7004tdgdrl.csv	-3:46	6:53	36	34	40
7006tdgdlr_sub.csv	-3:31	7:08	36	32	43
7008tdgdrl_sub.csv	-3:21	7:18	37	31	46
7010tdgdlr_sub.csv	-3:08	7:31	35	31	41
7012tdgdrl_sub.csv	-2:57	7:42	35	35	34
7014tdgdlr_sub.csv	-2:45	7:54	41	48	32
7016tdgdrl_sub.csv	-2:35	8:04	48	55	37
7018tdgdlr_sub.csv	-2:23	8:16	44	49	38
7020tdgdrl_sub.csv	-1:57	8:42	38	37	41
7022tdgdlr_sub.csv	-1:47	8:52	41	41	42
7024tdgdrl_sub.csv	-1:33	9:06	43	42	44
7026dgdtlr_sub.csv	-1:22	9:17	41	40	43
7028dgdtrl_sub.csv	-1:11	9:28	39	36	42
7030dgdtlr_sub.csv	-1:00	9:40	40	39	41
7032dgdtrl_sub.csv	-0:48	9:51	43	45	40
7034dgdtlr_sub.csv	-0:37	10:02	49	56	40
7036dgdtrl_sub.csv	-0:27	10:12	52	59	42
7038dgdtlr_sub.csv	-0:06	10:33	45	54	38
7040dgdtrl_sub.csv	0:04	10:44	43	50	38
7042dgdtlr_sub.csv	0:14	10:54	43	54	34
7044dgdtrl_sub.csv	0:32	11:12	39	52	30
7046dgdtlr_sub.csv	0:43	11:23	41	50	35
7048dgdtrl_sub.csv	0:54	11:34	40	50	34
7050dgdtlr_sub.csv	1:05	11:45	34	46	27
7052dgdtrl_sub.csv	1:19	11:59	27	37	22
7054dgdtlr_sub.csv	1:29	12:09	21	28	17
7056dgdtrl_sub.csv	1:38	12:18	19	25	16
7058dgdtlr_sub.csv	1:49	12:29	19	25	15
7062dgdtlr_sub.csv	2:12	12:52	17	24	14
7064dgdtrl_sub.csv	2:23	13:03	18	24	15
7066dgdtlr_sub.csv	2:32	13:12	19	26	14
7068dgdtrl_sub.csv	2:44	13:24	18	23	15
7070dgdtlr_sub.csv	2:56	13:36	18	22	16
7072dgdtr_subl.csv	3:07	13:47	17	21	15
7076dgdtrl_sub.csv	3:30	14:10	16	20	14
7078dgdtlr_sub.csv	3:41	14:21	18	21	17
7080dgdtrl_sub.csv	3:52	14:32	20	23	18
7084dgdtrl_sub.csv	4:15	14:55	18	21	17
7086dgdtlr_sub.csv	4:26	15:06	19	23	17
7088dgdtrl_sub.csv	4:37	15:17	23	29	20
7090dgdtlr_sub.csv	4:46	15:26	27	27	26

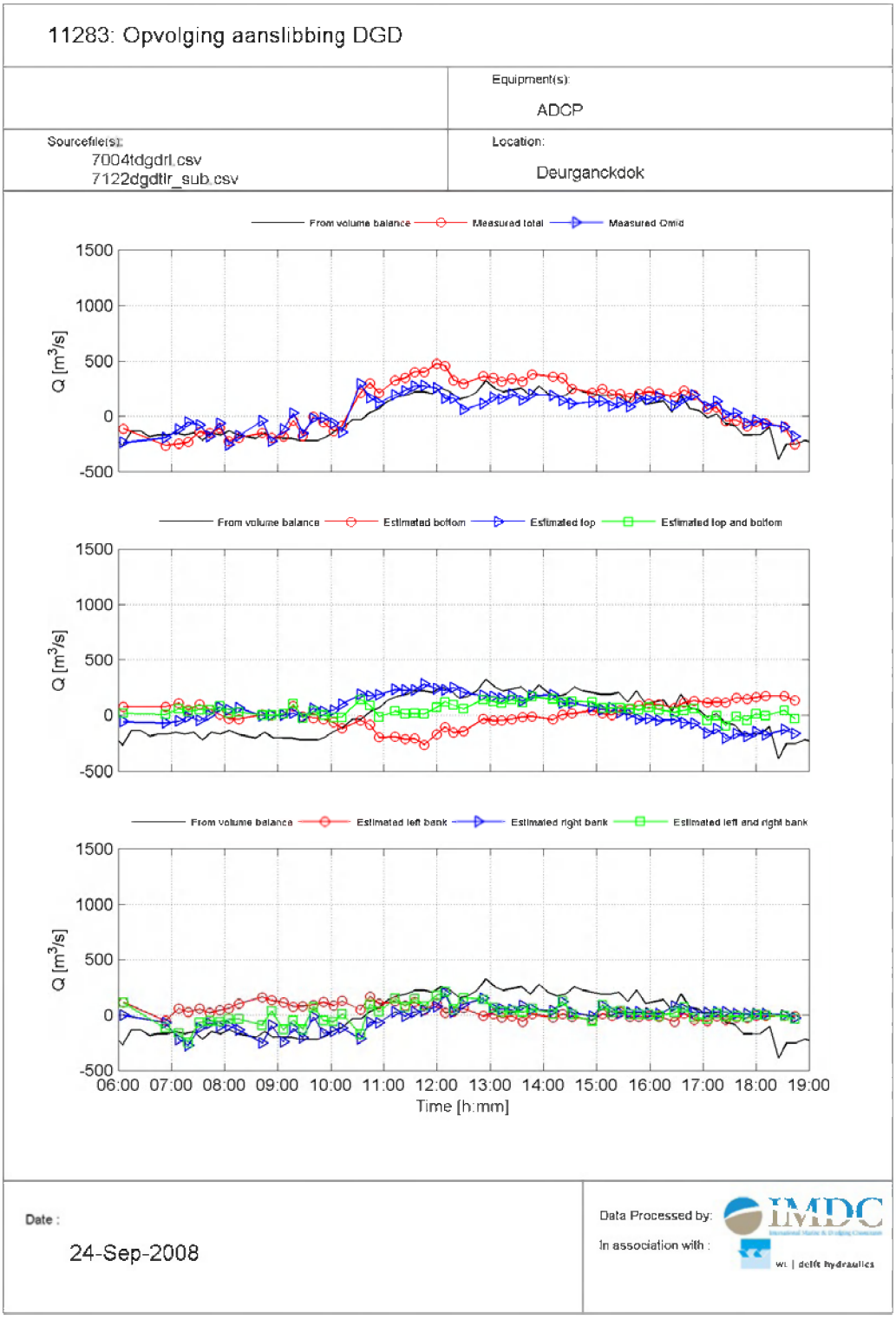
Transect name	*Time after HW [hh:mm]*	*Time [hh:mm MET]*	*Average overall SS Concentration [mg/l]*	*Average incoming SS Concentration [mg/l]*	*Average outgoing SS Concentration [mg/l]*
7092dgdtrl_sub.csv	4:57	15:37	25	25	25
7094dgdtlr_sub.csv	5:07	15:47	22	23	22
7096dgdtrl_sub.csv	5:19	15:59	22	23	21
7098dgdtlr_sub.csv	5:30	16:10	25	27	23
7100dgdtrl_sub.csv	5:47	16:27	26	28	25
7102dgdtlr_sub.csv	5:58	16:38	26	27	25
7104dgdtrl_sub.csv	6:10	16:50	26	29	25
7106dgdtlr_sub.csv	6:25	17:05	30	33	26
7108dgdtrl_sub.csv	-6:14	17:15	27	26	28
7110dgdtlr_sub.csv	-6:04	17:25	25	24	27
7112dgdtrl_sub.csv	-5:52	17:37	27	25	28
7114dgdtlr_sub.csv	-5:40	17:49	31	28	34
7116dgdtrl_sub.csv	-5:30	17:59	27	24	31
7118dgdtlr_sub.csv	-5:19	18:10	27	24	31
7120dgdtrl_sub.csv	-4:57	18:32	29	24	35
7122dgdtlr_sub.csv	-4:46	18:43	28	22	36

	Concentration [mg/l]								
	overall SSC			*incoming SSC*			*outgoing SSC*		
Tide	*minimum*	*average*	*maximum*	*minimum*	*average*	*maximum*	*minimum*	*average*	*maximum*
Ebb	16	25	43	20	30	54	14	22	38
Flood	25	37	52	22	37	59	27	37	46

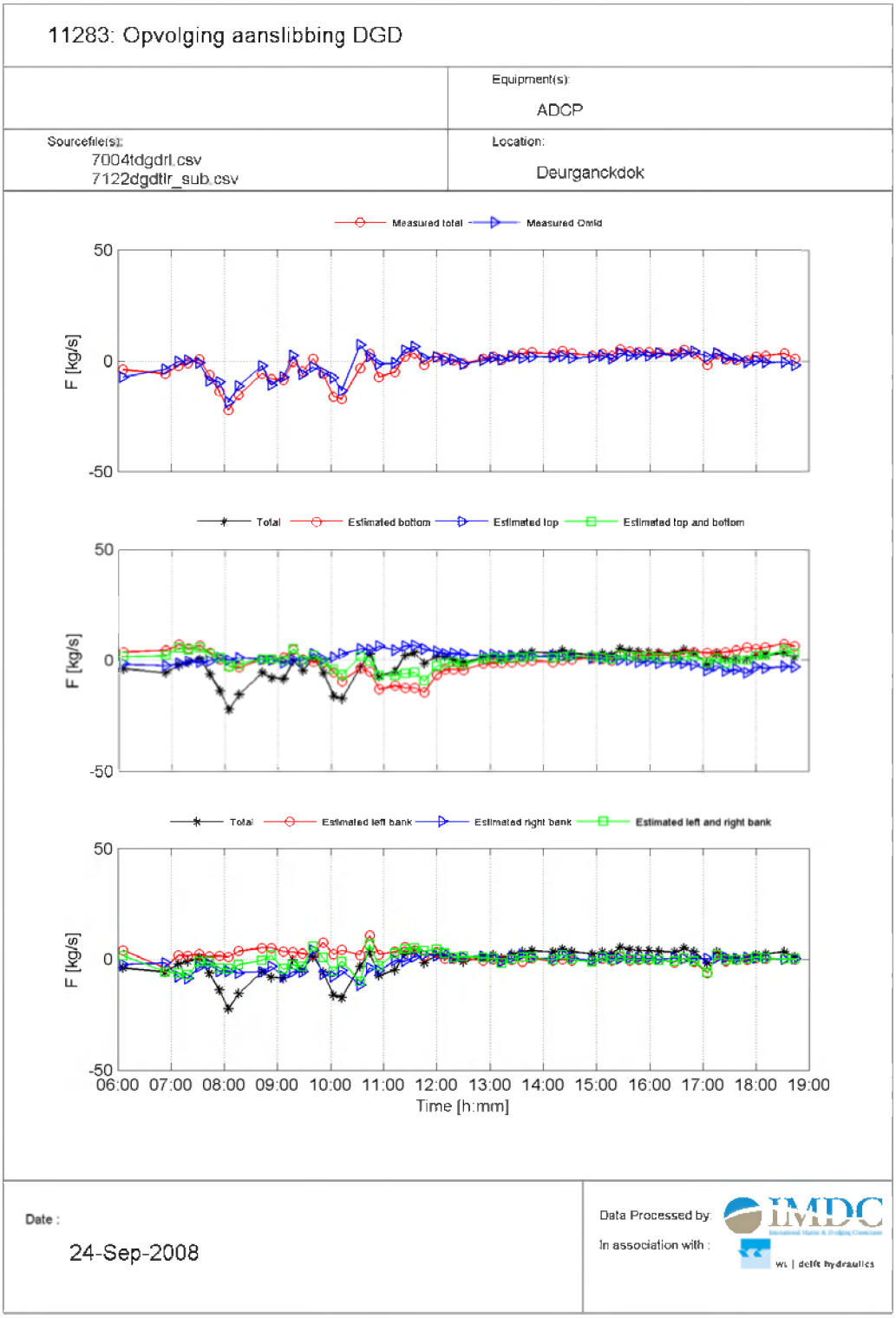
APPENDIX H.

TEMPORAL VARIATION OF FLUX, DISCHARGE AND SUSPENDED SEDIMENT CONCENTRATION

Total theoretical discharge (black line) and total discharge calculated from the measurements (red line in first figure) through the measured cross section, positive is from dock to river. Contribution of top, bottom, left and right estimates to the total discharge (figure 2 and 3).



Total sediment flux calculated from the measurements (red line in first figure) through the measured cross section, positive is from dock to river. Contribution of top, bottom, left and right estimates to the total sediment flux (figure 2 and 3).



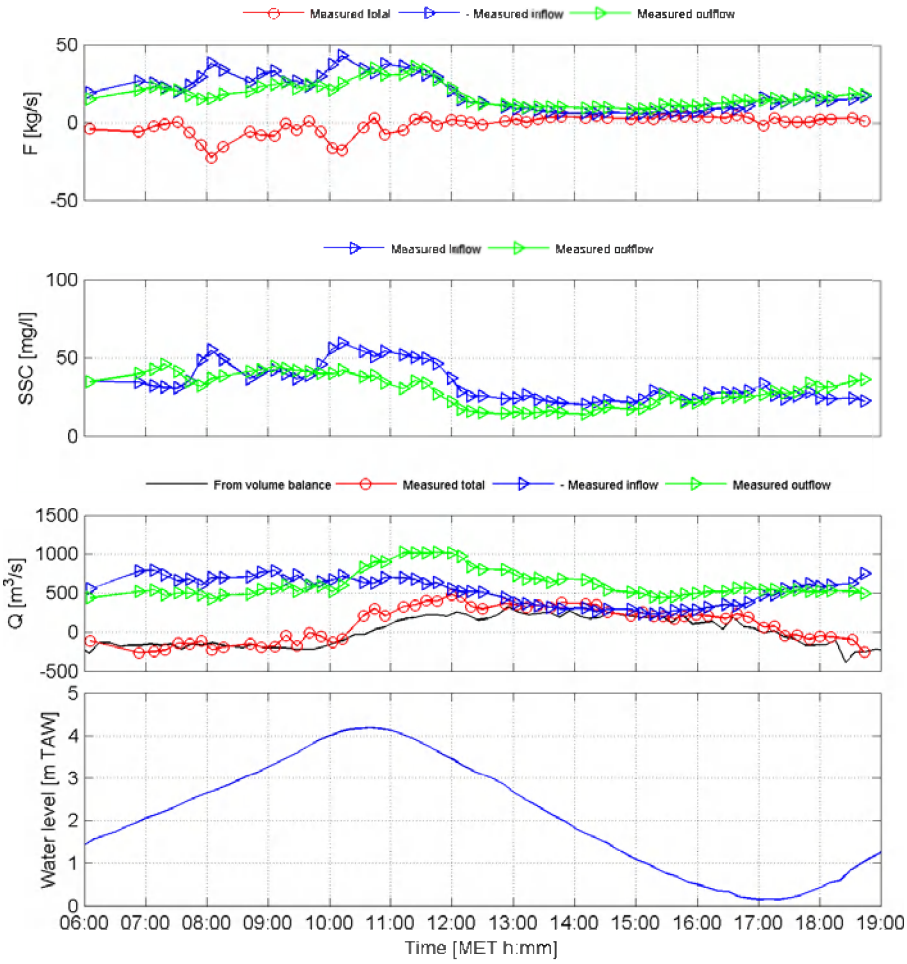
Total water and sediment exchange through the measured cross-section in comparison to the resulting in- and outflow through the transect. Average suspended sediment concentration of incoming and outgoing water.

11283: Opvolging aanslibbing DGD

Equipment(s):
ADCP

Sourcefile(s):
7004tdgdrl.csv
7122dgdtlr_sub.csv

Location:
Deurganckdok



Date :
24-Sep-2008

Data Processed by:
In association with :

APPENDIX I.

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 2007
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)
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	Salt-Silt distribution & Frame Measurements Deurganckdok 13/3/2006 – 31/05/2006 (I/RA/11283/06.121/MSA)
2.7	Salt-Silt distribution & Frame Measurements Deurganckdok 15/07/2006 – 31/10/2006 (I/RA/11283/06.122/MSA)
2.8	Salt-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)
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

Report	Description of Opvolging aanslibbing Deurganckdok between April 2006 till March 2007
~~3.2~~	~~Boundary condtions: Annual report (I/RA/11283/06.128/MSA)~~[1]
Analysis	
4.1	Analysis of Siltation Processes and Factors 4/'06 – 3/'07 (I/RA/11283/06.129/MSA)

Report	Description of Opvolging aanslibbing Deurganckdok between April 2007 till March 2008
Sediment Balance: Bathymetry surveys, Density measurements, Maintenance and construction dredging activities	
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) & Calibrations	
2.09	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)
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	Salt-Silt distribution Deurganckdok summer (21/6/2007 – 30/07/2007) (I/RA/11283/07.092/MSA)
2.17	Salt-Silt distribution & Frame Measurements Deurganckdok autumn (17/09/2007 - 10/12/2007) (I/RA/11283/07.093/MSA)
2.18	Salt-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	
3.10	Boundary conditions: Three monthly report 1/4/2007 – 30/06/2007

[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 2007 till March 2008
	(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	
4.10	Analysis of Siltation Processes and Factors 4/'07 – 3/'08 (I/RA/11283/07.102/MSA)