Mega Perturbation Experiment 2014

MegaPex2014

15 September – 26 October

Last revision 2 April 2014

Water-related measurements

1. Bottom frame on the -8 m NAP equipped with Aquadopp HR, Vector, 2 OBS, Aquascat, PIV and ripple scanner. Measurements of flow velocity and sediment concentration near the bottom. Focus on cross shore transport on the middle shore face. S.MeirellesNunesDaRocha@tudelft.nl
2. Bottom frame on the -6 m NAP equipped with flow, transport and pressure meter, OBS and LISST. Measurements of flow velocity and sediment concentration near the bottom. Focus on cross shore transport on the middle shore face. Property of RWS. M.Henriquez@tudelft.nl
3. Cross shore array of 3 jetted poles on the -3.5 m NAP, -2 m NAP and -1.2 m NAP equipped with Aquadopp and OBS. Measurements of flow velocity and sediment concentration. Focus on longshore transport in the surfzone. M.A.deSchipper@tudelft.nl
4. Grid of 25 moored current meters (low-cost torpedoes) in the surfzone northward of the tip at the Sand Motor. Measuring tidal flow separation and eddy creation. Focus on swimmer safety. M.Radermacher@tudelft.nl
5. Bottom frame in the surfzone equipped with EMF, OBS and ripple scanner. Measurements of wave induced turbulence and sediment concentration. Focus on sediment stirring by wave breaking. J.A.Brinkkemper@uu.nl
6. Cross shore array of 4 frames in the intertidal zone equipped with pressure, ADV and OBS. Poles with pressure sensors complement the array. Measurements of surface elevation, flow velocity and sediment concentration. Focus on infra-gravity waves. A.T.M.deBakker@uu.nl
7. Cross shore array of groundwater monitoring wells. Measurements of groundwater level. Focus on Aeolian transport. B.G.Ruessink@uu.nl
8. Quad equipped with DGPS. Measurements of the inter-tidal topography. Focus on alongshore variability of topography. J.Rutten@uu.nl
9. Vessel Navicula equipped with A-Frame of 5 m height and 3000 kg load capacity, reel with castaway and box-cores, and side mounted ADCP. For deployment of offshore frames, moorings and flow velocity profile, CTD profile and sediment samples. Focus on Rhine ROFI and cross shore sediment transport. M.Henriquez@tudelft.nl
10. Mooring on the -10 m NAP and -18 m NAP equipped with CTD and OBS. Measuring the vertical profiles of salinity and turbidity. Focus on the dynamics of the Rhine ROFI. arhd@u.washington.edu (Alexander Horner-Divine)
11. Bottom frames at -10 m NAP and -18 m NAP equipped with upward looking ADCP, OBS and LISST. Measuring vertical profiles of flow velocity and sediment fractions. Focus on the dynamics of the Rhine ROFI. ajso@noc.ac.uk (Alejandro Souza)
12. Tripod on the -5 m NAP with 3 ADV, 3 OBS, 3 rapid sampling CT, downward and upward looking ADCP. Measuring the flow velocity, turbidity, salinity and density. Focus on the dynamics of the Rhine ROFI. ajso@noc.ac.uk (Alejandro Souza)
13. Total of 8 monitoring wells. Measuring groundwater level and salinity. Focus on the short and long term fresh-salt interface. S.Huizer@uu.nl
14. Vessel with mounted ADCP. Property of RWS. Measures the flow velocity profile. Focus on spatial and depth varying flow field. Roderik.Hoekstra@deltares.nl
15. Drone equipped with camera capturing dye that is released in the surfzone. Measuring dye patterns. Focus on diffusion and mixing in the surfzone. R.L.Brouwer@tudelft.nl

Continuous measurements

1. Kijkduin Argus station with 6 cameras. Generating timex, min, max and pixel time stacks of the nearshore. Focus on estimating bottom topography, categorizing beach properties such as water, sand and vegetation. M.Henriquez@tudelft.nl
2. Sand Motor Argus tower with 8 cameras. Generating timex, min, max and pixel time stacks of the nearshore. Focus on estimating bottom topography, categorizing beach properties such as water, sand and vegetation. Irv.Elshoff@deltares.nl
3. Pan tilt zoom cameras on the Sand Motor Argus tower. Capturing vegetation and beach surface. Focus on Aeolian sediment supply toward the upper beach and dunes. Irv.Elshoff@deltares.nl
4. SeaDarQ X-Band radar. Generating intensity maps every 2 seconds. Focus on estimating topography, currents, wave height and flow structures. Cilia.Swinkels@deltares.nl
5. Workhorse ADCP. One 1200 kHz between Sand Motor and Kijkduin on -5 m NAP. One 600 KHz north of Kijkduin on -7 m NAP. Output every 5 minutes. Focus on impact of Sand Motor on currents. Roderik.Hoekstra@deltares.nl
6. Wave rider buoy located at -10 m NAP. Measuring wave characteristics. Focus on local wave conditions. Roderik.Hoekstra@deltares.nl
7. Jet-ski and quad equipped with RTK-GPS measuring topography from dune foot to -5 m NAP every two months. Focus on morphologic evolution. Sierd.deVries@tudelft.nl
8. Sand and salt spray traps distributed over a grid of 5 by 4 in the dunes. Measuring amount of sand and salt. Focus on fresh water extraction area. Sarah.Marx@rws.nl

Sand-related measurements

1. Thermal infrared camera on top of the Atlantic Hotel at Kijkduin looking at the intertidal zone. Measuring the temperature of the bed. Focus on Aeolian transport. B.M.Hoonhout@tudelft.nl
2. Moisture probes in the intertidal area in front of Atlantic Hotel at Kijkduin. Measuring the moisture of the sand. Focus on the validation of the thermal infrared camera and Aeolian transport. B.M.Hoonhout@tudelft.nl
3. Local wind station on the beach in front of Atlantic Hotel at Kijkduin. Measuring wind speed and direction. Focus on Aeolian transport. B.M.Hoonhout@tudelft.nl
4. Macro photography at the intertidal zone and beach. Measuring grain size distribution. Focus on Aeolian transport. B.M.Hoonhout@tudelft.nl
5. Cross shore array of laser sensors in front of Atlantic Hotel at Kijkduin. Measuring instantaneous transport volumes. Focus on Aeolian transport. B.M.Hoonhout@tudelft.nl
6. Multiple ultrasonic echo sounders in the dune in front of Atlantic Hotel at Kijkduin. Measuring the relative bed level change. Focus on detecting significant transport events. B.M.Hoonhout@tudelft.nl
7. RTK-GPS transects of dune face in front of Atlantic Hotel at Kijkduin. Measuring the topography. Focus on accretion and erosion of the dune. B.M.Hoonhout@tudelft.nl
8. Collection of Van Veen grab samples on cross-shore transects from -5 m NAP to 0 m NAP. One at the tip of the Sand Motor consisting of 24 samples and one at the north side of the Sand Engine consisting of 31 samples. Measuring the grain size distribution every week. Focus on spatial and temporal variability of grain size distribution in relation to flow conditions and morphology. Bas.Huisman@deltares.nl
9. Box cores at the -3 m NAP, -5 m NAP and -8 m NAP. In the two transects of item 8 at the end of the experiment. Measuring grain size distribution. Focus on vertical stratification of the bed. Bas.Huisman@deltares.nl
10. Bore holes at the spit on the Sand Engine. Measuring vertical stratigraphy. Focus on sediment deposition in time. Bas.Huisman@deltares.nl
11. Grid 200 x 200 of soil samples (cores) over the Sand Motor. Measurement at the top soil layer and at 1 m deep consisting of grain size distribution, nutrients (N, P and C) and main/spore elements of porewater. Focus on available nutrients and acid conditions at the Sand Motor. I.R.Pit@uu.nl
12. Off-road vehicle equipped with terrestrial laser scanner and DGPS. Measurements of the beach and dune topography and moisture content. Focus on dune growth and Aeolian transport. B.G.Ruessink@uu.nl

Biotic-related measurements

1. Cross shore array of 5 frames with organism mimics, from -8 m NAP to dune foot at the tip of the Sand Motor and one array north of Kijkduin. Measuring sediment flux near mimics with camera. Focus on sediment stabilization by biotic environment. Simeon.Moons@nioz.nl
2. Collecting macroinvertebrates by sieving at 12 cross-shore transects consisting of 6 locations each. Measuring the amount and different macroinvertebrates. Focus on viability of macroinvertebrate communities at sand nourishments. E.M.van.Egmond@vu.nl
3. Unmanned aerial vehicle equipped with camera flying over the Sand Motor area. Mapping vegetation and dune formation. Focus is sand supply for dune formation. Corjan.Nolet@wur.nl
4. Small vessel for bird observation. Count of kinds. Focus on hydrographic features and foraging behavior of seabirds. Marjolein.Post@wur.nl
5. Mobile Robin radar to detect birds. Spatial and temporal distribution of birds. Focus on hydrographic features and foraging behavior of seabirds. Marjolein.Post@wur.nl
6. Plots of 8 vegetation's consisting of Ammophila arenaria, Elytrigia juncea, mixed and bare, all with and without wrackline. These plots are repeated over 5 cross-shore transects consisting of 4 locations. Measuring viability of vegetation. Focus on dune formation. Marinka.vanPuijenbroek@wur.nl

Projects and Principal Investigators

Monitoring and Evaluation Pilot Sand Motor. Principal investigator is Rijkswaterstaat where Carola van Gelder-Maas is program officer. Deltares executes this project where Arjen Boon is project manager.

NatureCoast. Multidisciplinary scientific project concerning the Sand Motor. Funded by STW.
Principal Investigators are Stive (TUDelft), Thissen (TUDelft), Aerts (VU), Lulofs (UT), Wijnberg (UT), Hulscher (UT), Bressers (UT), Bierkens (UU), Wassen (UU), Ruessink (UU), Riksen (WUR), Lindeboom (WUR), Berendse (WUR), Herman (NIOZ), van der Meer (NIOZ).
The postdocs are Arjen Luijendijk (TUDelft), Timothy Price (VU) and Vera Vikolainen (UT).
The PhD students are Max Radermacher (TUDelft), Jantien Rutten (UU), Lianne van der Weerd (UT), Corjan Nolet (WUR), Simeon Moons (NIOZ), Marjolein Post (WUR), Marinka van Puijenbroek (WUR), Emily van Egmond (VU), Sebastian Huizer (UU), Iris Pit (UU), Ewert Aukes (UU), Lotte Bontje (TUDelft).

NEMO. Scientific project at the TUDelft concerning coastal morphology. Funded by EU.
Principal Investigators are Marcel Stive, Sierd de Vries and Matthieu de Schipper.
The postdocs are Ronald Brouwer and Martijn Henriquez.
The PhD students are Bas Hoonhout, Bas Huisman and Saulo Meirelles.

Sustainable ROFIs. Scientific project at the TUDelft concerning the dynamics of the Rhine river plume in the Nortsea. Funded by STW. Principal Investigators is Julie Pietrzak.

Alejandro Souza. Scientist from National Oceanographic Centre in the UK. Collaborating with Julie Pietrzak (TUDelft).

Alexander Horner-Devine. Scientist from University of Washington in the US. Collaborating with Julie Pietrzak (TUDelft).

source: http://www.flickr.com/photos/zandmotor

TU Delft Delft University of Technology

IDEAS

Nature Coast BUILDING WITH NATURE

STW Nieuwe technologie mogelijk maken

ZANDMOTOR DELFLANDSE KUST

Challenge the future