NOOS annual report 2021

Member report - BSH

Country	Germany
Institution	Bundesmat für Seeschifffahrt und Hydrographie (Federal Maritime and Hydrographic Agency)
Observations Status and new initiatives	**Status:** • MARNET(Marine Environmental Monitoring Network in the North Sea and Baltic Sea) running with 12 stations (thereof 6 in the North Sea including FINO-platforms) • Real time measurements, e.g. temperature, salinity, current, water level, air temperature, wind, air pressure, radioaktivity, oxygen, pH • 13 stations for waves (thereof 10 in the North Sea incl. coop. with 3 windfarms) • 5 offshore water level stations (using remote sensing instruments, incl 3 windfarms) • several monitoring cruises per year to collect physical, chemical, and biological data • remote sensing data (e.g. SST, ice, water colour) • Seastate potal online • 5 hydro-acoustic measuring stations (thereof 3 in the North Sea) **Operational:** all stations are operational. Only Fehmarnbelt-Station is still wating for its repositioning. **New Initiatives:** Turbidity measurements in the inner part of the German Bight **Under development:** QM-procedur for turbidity measurements.
Modelling Status and new initiatives	**Status:** **operational on national level:** • Baroclinic 3dim. circulation models (BSHcmod+HBM) using 3 nested grids (6 nm, 3 nm, 0.5 nm), **5** day forecasts, **4** x daily • Biogeochemical model for North Sea and Baltic Sea with 2 nested grids, 5 day forecasts, 4 x daily (HBM+ERGOM) • Data assimilation for SST and temperature/salinity profiles based on LSEIK filter (HBM+PDAF), 3nm&0.5nm grid • Barotropic 2dim. storm surge model (BSHsmod) using 2 nested grids (6 nm, 3 nm), 4 x daily, forecasts up to 7 days • Baroclinic 3dim. circulation model (HBM) with high resolution (90m) for river Elbe, 2 x daily • **on demand:** Eulerian and Lagrangian dispersion models (HBMeuler & SeatrackWeb) for different substances, i.e. SPM • Climate service ("DAS") calculation and evaluation of projections • high resolution coupled circulation (HBM) and wave (WAM) model (running at German Weather Service, DWD)

	operational on European level: • Multi-model-ensemble of SST, SSS, SSC, SBT, SBS and transports in the North Sea and the Baltic Sea for CMEMS based on all available model results from NOOS and BOOS partners (Golbeck et al., 2015) **under development:** • Development of a new (finer) model grid • Data assimilation scheme for Baltic sea ice

Dissemination Status and new initiatives	*Status:*
	available at internet (www.bsh.de)
	Real Time Observations and forecasts:
	    • Tides
	    • Water levels, storm surges
	    • Currents
	    • Sea state
	    • Water temperatures (weekly SST), heat content
	    • Salinity
	    • Oxygen
	    • pH
	    • Ice
	    • Remote sensing
	    • Prediction models (Drift forecasts)
	    • Radioactivity
	    • Climate
	
	Additionally:
	    • Marine physical data
	    • measured water levels and wave data on ftp server (for NOOS members)
	    • computed water levels and wave data on ftp server(for NOOS members)
	    • computed transports in North Sea and North Sea/Baltic transition area on ftp server
	    • results of the BOOS/NOOS-RC-data centre (still pw-protected):
	        • compilation of all available S and T data
	        • ftp://ftp.bsh.de/outgoing/rcbono/
	        • ftp://ftp.bsh.de/outgoing/rcnws/
	    • Marine chemical data
	    • DOD (German Oceanographic Data Centre)
	    • MARNET monitoring network
	    • Data base for RT- and NRT-oceanographic data (national and international)
	    • data on ftp server (for NOOS members, and EU-wide)
	
	• Multi-model-ensemble for sea surface temperature, salinity and currents and sea bottom temperature and salinity:
	ftp://ftp.bsh.de/outgoing/opmodel_cmodnoku/my_ocean/MME/
	
	• NOOS homepage (hosted by BSH using the WordPress CMS)
	  o Computed transport forecasts for the North Sea on NOOS-homepage
	  o Computed forecasts of currents in the North Sea on NOOS-homepage
	  o Multi-Model-ensemble results for temperature, salinity (including a monthly validation), transport and currents on NOOS and BOOS homepage
	
	• NWS-Data Portal including RT- and NRT-data from the NWS:
	• http://nwsportal.bsh.de/nwsportal (graphics and figures free, download pw-protected)
	• New version of the NWS-Portal (still ß-Version): https://noosportal.bsh.de/
	• BSH-Spatial Data Infrastructure; incl. oceanographic, naut. hydrographic, shipping, environmental data: http://www.geoseaportal.de

	Under development: NRT and delayed mode data provision of underway- (TSG, Ferrybox, BGC) and CTD-data from the German research vessels (DAM)
Relevant national projects	• FINO: Research platforms North Sea and Baltic Sea (research to determining the effects of wind farms on the marine flora and fauna). Data base access for Meteorology and Oceanography via: fino.bsh.de • RAVE: Research Activities at "Alpha-Ventus" (accompanying/secondary research for off-shore wind park "Alpha Ventus"). One focus is on an national database for sea state data • PROWAS (until 11/2021): Pilot project on climate, waterways and shipping (hindcasts and climate projections for North Sea and Baltic) • InfoWaS: Development of a model-based information system for water quality in North Sea and Baltic Sea • MOSAB: Modeling of scrubber wastewater and polutant discharges from shipping and their dispersion in the marine environment, especially in the North and Baltic Seas • EASE: AI-based assistance by drift modelling for forensic investigations at sea • DAM (Deutsche Allianz Meeresforschung, German Marine Research Alliance)

Relevant International projects	• CMEMS (Copernicus Marine Environment Monitoring Service – NOT a project but an operational service), Involvement in
	   ○ Insitu TAC: Production and distribution unit for in-situ data of the North-West Shelf
	   ○ NWS MFC (NOWMAPS) mainly Validation and Quality Assurance for North West Shelf MFC, multi-model-ensemble production
	   ○ Baltic MFC Validation and Quality Assurance for Baltic MFC, biogeochemical model development, data assimilation and multi-model-ensemble for Baltic Sea MFC
	• EuroARGO: European contribution to a global ocean observatory
	• ICES (The International Council for the Exploration of the Sea: DIG Data and Information Group
	• Working groups in IOC:
	IODE (Committee on International Oceanographic Data Exchange)
	DataMEQ
	• SeaDataCloud: advance SeaDataNet Services and increase their usage, adopting cloud and High Performance Computing technology for better performance. (main BSH topic: Cruise summary reports: to be shifted to Ifremer), SDC is terminated
	• Involvement in EMODNET(European Marine Observation and Data Network): Emodnet Ingestion

Additional information	