NOOS annual report 2013

Member report – MET Norway

September 2013

Country	Norway
Institution	Meteorologisk institutt/Norwegian Meteorological Institute (MET Norway)
Observations **Status and new initiatives**	***Status:*** • MET Norway operates the Norwegian national network of synoptic weather observations, both on land and on offshore installations in the North and Norwegian Seas. • Limited ocean observations are collected in real-time at offshore sites in the North and Norwegian Seas and archived at MET Norway. 1. Waves: Ekofisk, Sleipner, Heimdal, Gullfaks C, Troll A, Draugen, Ormen Lange, Norne; Statfjord (good quality). NRT datafeeds from 4 of the North Sea platforms to the NOOS wave data exchange are being implemented. 2. Water level: Ekofisk, Draugen (fair quality) 3. Temperature (near-surface): Ekofisk, Sleipner, Heimdal, Gullfaks C, Troll A, Draugen, Heidrun (sporadic, fair quality) • MET Norway manages data from short-range HF Radar installation at Fedje (near Bergen). NB! Data acquisition halted in May 2011, but is planned rejuvenated in 2013! • Provides river data for all major Norwegian rivers to NOOS repository. Also included in the data provision are HBV model data for Swedish rivers from SMHI. *New Initiatives:* • Participating in SOROS InterReg project to prepare for a Danish-Norwegian-Swedish HF Radar network around the Skagerrak.
Modelling **Status and new initiatives**	***Status:*** **New HPC platform operational from Fall 2012.** <u>Operational physical and ecosystem:</u> • *Regional – North Atlantic and Arctic Oceans*: TOPAZ; HYCOM coupled ocean-ice code; ~12 km curvilnear grid; climatological OBC; weekly analysis with daily updated 10-day forecast; assimilation of SST, altimeter SLA, **T/S profiles**, ice concentration and **ice drift** using EnKF. One-way coupled ecosystem model NORWECOM, no specific data assimilation. MyOcean Arctic MFC product. • *Regional – North Atlantic and Arctic Oceans*: Arctic.20KM; ROMS coupled ocean-ice code; 20 km polar-stereographic grid; **nested in FOAM global**; daily updated 7-day forecast; assimilation of ice concentration. • *Regional – Nordic Seas*: Nordic.4KM; ROMS coupled ocean-ice code; 4 km polar-stereographic grid; OBC from Arctic.20KM; 8 tidal constituents; twice daily updated **5-day** forecast. Basis for MyOcean NWS ensemble product. • Coastal – Norwegian coast: NorKyst.800M: ROMS ocean code; 800 m polar-stereographic grid; OBC from Nordic.4KM; daily updated 66-hour forecast; no assimilation. • See Figure 1. • Regional – North Sea: Bio.20KM; coupled MIPOM-NORWECOM ocean-ecosystem code; **RETIRED** • Regional – North Sea/Skagerrak: Bio.4KM; coupled MIPOM-NORWECOM ocean-ecosystem code; **RETIRED** <u>Operational wave:</u> • Regional – Northern hemisphere: WAM code; 50 km rotated geographic grid; daily updated 60-hr forecasts. • Regional – Nordic Seas: WAM code; 10 km polar-stereographic grid; twice daily updated 66-hr forecasts. • Regional – Norwegian coastal waters: WAM code; 4 km polar-stereographic grid; twice daily updated 66-hr forecasts.

	• Coastal – Mid-Norway: Trondheimsleia SWAN; 500m polar-stereographic grid; daily updated 24 hr forecast. • Coastal – West-Norway: Karmøy SWAN; 200m polar-stereographic grid; daily updated 24 hr forecast. • Coastal – North-Norway: Sørøya SWAN; 100m polar-stereographic grid; daily updated 24 hr forecast. Emergency response: • *Oil spill fate:* OSCAR code operational; real-time forcing data (wind, wave, currents, temperature, salinity) accessible from MET Norway. • *Drifting objects (search and rescue):* LEEWAY code; real-time forcing data (wind, wave, currents, temperature, salinity) from MET Norway. • *Ship drift:* SHIP code; real-time forcing data (wind, wave, currents, temperature, salinity) accessible from a variety of sources inside and outside MET Norway. Pre-operational and other: • 50-year (1959-2008) hindcast of ROMS on extended Nordic.4KM grid completed (SVIM project). • Basic assimilation implemented in ROMS: nudging for satellite SST and ice concentration. • Implementation of 4DVar for ROMS, satellite SST and ice concentration, in situ profile data. Ongoing internal project with PhD student. ***New initiatives:*** • E-HYPE hindcast river data implemented in ROMS and run in multidecade hindcast production; E-HYPE real-time forecast data are being implemented in ROMS for operational forecasting. • Rejuvenation of the old OD3D oil spill fate code started; alternative to OSCAR, basis for ensemble prediction system • Review of requirements for ecosystem forecast products (nutrients, algae, oxygen); coupling of NORWECOM to ROMS postponed. • Participating in new national Center of Excellence program on radioactivity impacts on the environment; development of models for transport of radioactivity in the ocean.
Dissemination Status and new initiatives	***Status:*** • Some MET Norway operational ocean products available for viewing and download (grib) at http://www.yr.no/hav_og_kyst/. • Core forecast products freely available by OpeNDAP and WMS at http://thredds.MET Norway/thredds/fou-hi/fou-hi.html. Currently contains data from NorKyst.800M coastal ocean model, **Nordic.4KM regional ocean mode, Arctic.20KM basin ocean model**, WAM.10KM wave model and HIRLAM.10KM atmospheric model. • MyOcean operational ocean products are offered through MyOcean dissemination services (user-authentication required): FTP at ftp://ftp.myocean.met.no, **SUBSETTER** and **DirectGetFile** at www.myocean.eu. Includes: NWS forecast (MET Norway) and hindcast (IMR) data, both with biogeochemical data on AMM7 grid; Arctic (TOPAZ) biogeochemical forecasts, as well as satellite sea ice products (also from DMI, FMI, DTU, NERSC, BAS) and SST products (Arctic hi-res analysis). • Routine validation of MyOcean ARC forecast products are published at http://myocean.met.no/ARC-MFC/V2Validation/index.html. ***New initiatives*** • Common portal for dissemination of all freely available ocean and sea ice products from MET Norway. Use catalogue, OpeNDAP, http and WMS services for discovery, viewing and download. Implementation started with http://normap.met.no/metamod.
Relevant national projects	Norwegian Research Council: **BioWave** (improved surface fluxes from wave models) Norwegian Research Council: **OilWave** (improved surface fluxes from wave models) Norwegian Research Council: **NORMAP** (national archive of satellite data) Norwegian Research Council: **SVIM** (ensemble prediction of larvae drift, Barents Sea)

	Norwegian Navy: **GEOMETOC** (development of services for naval applications) Foreign Min.: **BarentsWatch** (national portal for the "greater" Barents Sea. Opened 30 May 2012 at http://www.barentswatch.no)
Relevant International projects	EU-FP7: **MyOcean2**: Copernicus Marine Service (MET Norway hosts ARC-MFC and OSI-TAC) EU-FP7: **OPERR** (implement and assess E-HYPE for northern Europe). **Ended Jan 2013.** EU-FP7: **MyWave:** GMES wave supplement to MyOcean (MET Norway coordinator) NOAA: **Deep-C:** Development of community oil spill fate code EU-FP7: **SIDARUS**: Sea ice downstream services Offshore JIP: **NoNoCurr**: Trial hindcast N. North Sea currents for a period of one year (2011)
Additional information	Member of JCOMM ETMSS (Expert Team on Maritime Safety Services).

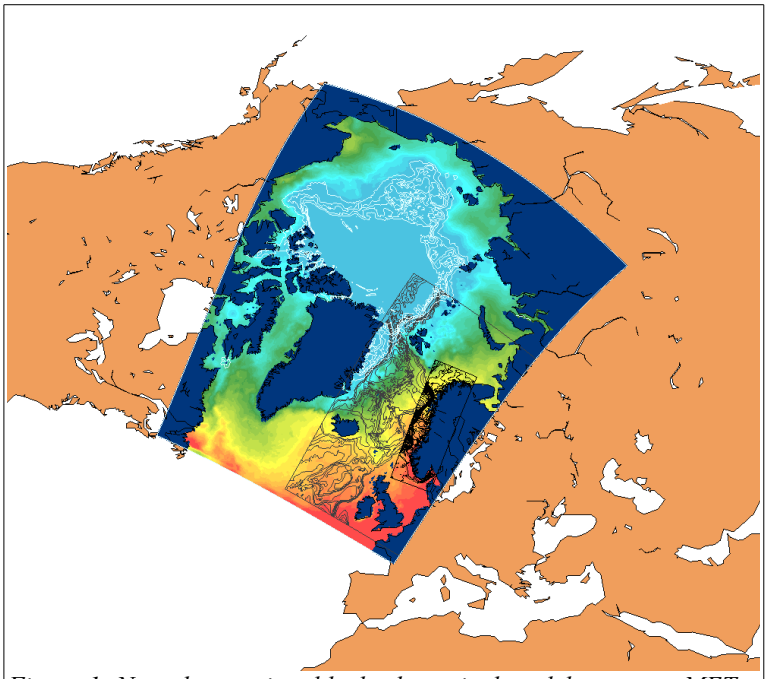

Figure 1: Nested operational hydrodynamical model system at MET Norway. Grid spacings: outer domain 20 km; intermediate domain 4 km; inner domain 800 m. Outer model gets open boundary conditions from UK Met Office's FOAM system.