

Big Data in water surveillance: FerryBox systems

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NorSOOP: Norwegian Ships Of Opportunity Program for marine and atmospheric research (www.niva.no/norsoop)

Norwegian Institute for Water Research - NIVA (lead)
Partners: Insitute for Marine Research, Akvaplan-niva, met.no,
Associated Partners (TBD): HZG, RWS, UNI-Res, DMI, SAHFOS, NILU, Univ. Rode Island, OceanVisuals

Research Vessels and autonomous vehicle

Standard Ferrybox

- Core: Temperatur, Salinity, Chl-a, Fluorescence, cDOM, Fluorescence, PC, Fluorescence, Turbidity/Scattering
- Water Samplers (Chl-a, TSM, cDOM_obs, Pig_Abs, Nutrients)
- Nutrient analyzers (PO4, NO3, SiO2, NH4)
- Carbonsystem (pH, pCO2, Alkalinity)

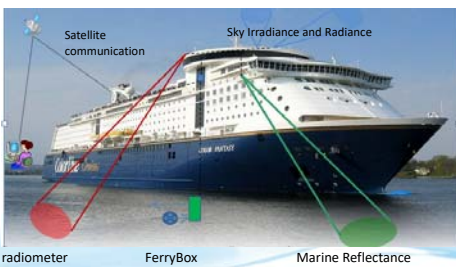
Deck installations:

- Marine reflectance and PAR
- Weather stations (e.g. True Wind)
- Sea Surface Temperature (DMI)
- Hyper Spectral Lidar (Ocean Visuals)

Advanced installations:

- Contaminants and microplastic sampler
- CPR (SAHFOS), ADCP and XBT (Univ. Rode Island)
- Flow Cytometry, Imaging, PSICAM, FRFR/PAM, Atmospheric properties over marine water

What is a FerryBox?!



Andrew King 04.10.2018

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FerryBox and what it can do!

Sea water

Ship hull

Inside ship

Sensor Cabinet

- Advanced sensors: temp, Chl, salinity, CDOM, salinity sensor, magnetometer, turbid, chl
- Chl-a Fluorescence
- Turbidity
- Oxygen
- Temp./Salinity
- De-bubbler

Water sampler

GPS

Data log files

Ship deck

- Wind speed & direction
- Air temp, pressure, humidity
- Radiance/irradiance
- Advanced sensors: chl-a, chl-b, other parameters
- Water: thermal, pH, DOC, salinity, turbid, sample

Downwelling radiance

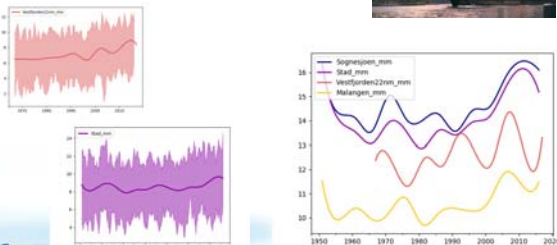
Upwelling radiance

Microplastic filtration



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Long timeseries along Norwegian coast using FerryBox on Coastal Steamer Temperature developments



Monthly average temperature and salinity 2005 to 2014 between Bodø-Stamsund



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Algae concentrations along the coast

