

The Norwegian Coastal Administration ensures safe navigation

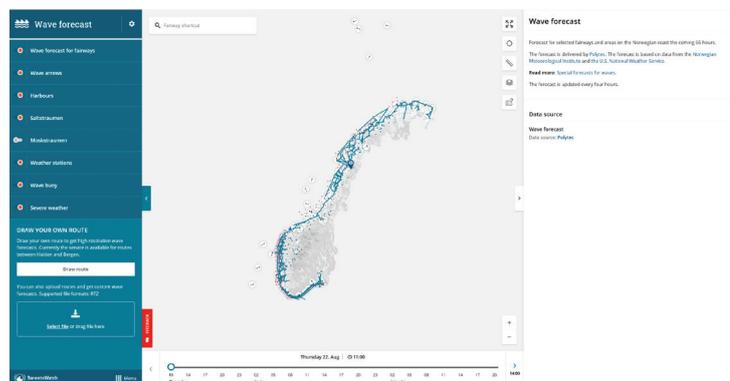
MEASURING ENVIRONMENTAL DATA WITH THE AANDERAA MOTUS WAVE BUOY

Safe navigation and up to date weather information from the MOTUS Wave Buoy

The Norwegian Coastal Administration (NCA) ensures safe navigation in the fairways along the coast and in the entry to ports. Their responsibilities include aids to navigation services, AIS network, vessel traffic services (VTS) and reporting services. As part of this, the NCA deploys and maintains the lights and marker buoys along the Norwegian coast and provide reporting services for wave and currents.



MOTUS Wave Buoy on the West Shores of Norway



BarentsWatch service providing data for the coastal industries

“The Aanderaa MOTUS Wave Buoy is particularly important for measuring the waves and currents in the area”

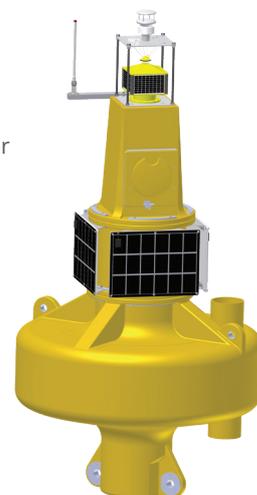
In 2017, the NCA wanted to replace one of their standard Cardinal West marker at a challenging location on the Western Shores of Norway. They also needed to measure the waves and currents in the area, especially to give the fishermen information on the conditions, but also for all other ships in that area. Large waves are common and several earlier marker buoys had drifted during winter storms. They approached Aanderaa to see if the MOTUS Buoy equipped with wave, current and met sensors from Aanderaa could possibly do the job of both the marker buoy and provide data from the area. The challenge posed by the NCA was on several fronts:

- 1) Providing a reliable marker buoy in a challenging location with IALA certified nav aids
- 2) Providing quality wave, met and current data consistently from this location
- 3) Minimizing the need for boat operations of the combined solution
- 4) Seamlessly provide data to their existing BarentsWatch wave and current service
- 5) Providing data via AIS to users in the region

The solution offered by Aanderaa

The Aanderaa team had at that point delivered several combination buoys for navigational marking and data delivery. The core of the system was the MOTUS wave sensor which can be optimized for the SB138P, and the Doppler Current Profiler Sensor (DCPS). The latter employs a fast dynamic compensation algorithm specifically well suited for buoy measurements. In addition, the team at Aanderaa had gained valuable experience in mooring design which was utilized to provide a new type of mooring suitable for rough wave locations. Based on this, the requirements from the NCA was fulfilled by supplying a solution where:

- 1) All sensors were mounted firmly on the buoy, no moving parts
- 2) Subsea sensors were mounted in a protective moon pool
- 3) Power package for equipment was designed with enough capacity to last through the Northern winter
- 4) Lantern solution with Solamax 65 from Tideland ensuring lantern up-time through the winter
- 5) Data delivered in real-time on NetCDF for integration to the reporting services of the NCA
- 6) No magnetic interference of chains on wave and current sensors by utilizing an external compass
- 7) Mooring designed with a combination of rope, chain and elastics that could withstand the rough local environment



BarentsWatch

The BarentsWatch service provides data about many different aspects influencing coastal industries. The most important one is the wave forecasting services, but there are also warnings of polar low pressure events, current forecast for critical areas, and vessel information in and around harbors. The wave forecasts are based on models from the Norwegian Meteorological Institute as well as Notional Oceanic and Atmospheric Administration (NOAA), and has been developed by the Uni Research Polytec in close connection to the NCA and BarentsWatch. The wave forecasts cover the Norwegian coastline, but with special focus on some critical areas where special wave patterns exist. The final physical location of the MOTUS Wave Buoy was in a critical area, and the data would be assimilated in the models to improve their predictability.

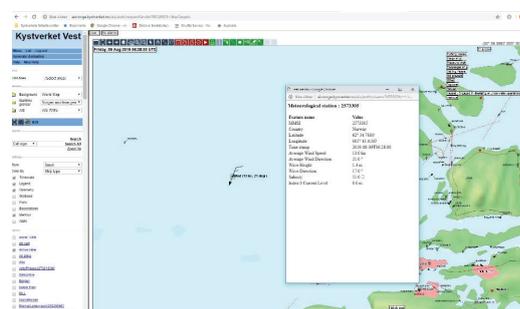


The MOTUS Wave Buoy displayed in the BarentsWatch service.

“The AIS (Automatic Identification System) distributes environmental information in the already existing systems in most vessels”

AIS

The AIS (Automatic Identification System) has traditionally been used to identify vessels around the world equipped with the mandated AIS transponder. The system is also capable of handling environmental information in a special message, which regular AIS transponders can decode and display. This is an excellent way to distribute up to date weather, wave and current information in the already existing systems in most vessels. Data from the MOTUS buoy is now distributed via the AIS to users in the area assisting all mariners.



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