

## Mooring scientific instruments in challenging North Sea conditions – Troubled water

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Marine and coastal ecosystems should be managed in a sustainable way by 2020 with effective regulations in place, as stated by the United Nations sustainable development goals. To have an effective management in place, ecosystem functioning and dynamics should be thoroughly understood and detailed information on movement behaviour and habitat use should be available. In the framework of the Belgian contribution to LifeWatch (<http://www.lifewatch.be/>) a biodiversity Observatory was established in the Belgian part of the North Sea (BPNS) to provide the scientific data needed for management and conservation of species and habitats. For the Observatory, hydrophones, among other scientific instruments, are deployed in the coastal waters of the BPNS. These hydrophones detect the presence of marine mammals and tagged fish.

The hydrophones are installed at strategic locations and different installation methods are used. Mooring scientific equipment in the coastal waters of the North Sea is challenging. Strong currents, sediment transport and high waves prevail. Moreover, many different anthropogenic and natural sound sources mask the recordings the instruments. As a result, attachment methods and mooring designs should be well-considered. Where feasible, hydrophones are attached to a construction on the seabed (e.g. ship wreck, wind turbine) or at surface buoys (e.g. beacons for navigation or research). At locations where no structure is available, other mooring methods are required.

At the Flanders Marine Institute, we developed a mooring frame for the installation of scientific instruments at the seabed. The mooring facilitates a convenient, cost-effective deployment with no disposal of material after recovery, minimal chance of loss of equipment and an assurance of high quality data. Moreover, the design is modulated and tested for the inclusion of other scientific instruments for oceanographic and/or biological research. Do you want to learn more about this mooring device? Visit us at the LifeWatch Demo booth!

Keywords: Scientific instruments; Bottom mooring; VLIZ tripod; Observatory