

Fugro Oceanor

# They need satellites for communication

## Equipment aimed at detecting the status of the oceans



*Monitoring the oceans by satellite.  
Photo: ESA/Meris*

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Most of the Earth is covered by water, mainly concentrated in the large oceans. The status of these has decisive importance for the conditions on Earth. This spans over fields such as climate, weather, food production etc. To monitor and know the mechanisms in the oceans is therefore important.

Satellites in different orbits around Earth secure the vital survey, but to interpret and understand the data it is necessary to monitor the water in greater detail. This can be used in many ways, but the large and inaccessible areas pose a serious problem in trying to do so.

The shipping traffic has monitored the oceans at all times, sometimes systematically, sometimes not, but the most serious problem is that they only follow fixed routes and seldom go to the more inaccessible areas of the oceans. An important tool to see to that it is done is to set out automatic buoys on the oceans, fixed or drifting and let them continually monitor the parameter in the chosen water.

One of the more well-known systems for monitoring the oceans is the Seawatch system.

SEAWATCH™ is a product that incorporates moored buoys, sensors, data processing, software, communication interfaces, simulation models and modules for training and institutional capacity building. The system or modules of the system can be used to complete national, regional or local marine environmental monitoring in deep and shallow water.

We have visited the company that develops and builds the system.

Nearly all types of sensors can be built into our buoys, weather or meteorologically, says Technical Manager, Svein Erik Aasen. The restriction is that to make the sensors suitable for placing in buoys they must have long maintenance interval and they must have a relatively low energy consume. The buoys can be equipped with solar cells or small windmills, but the place for batteries can be the limiting factor.

The key for our product is they can carry out the first processing in the buoys, before the data is sent to the customer. A relatively quick processor onboard processes, and reduces the large amount of data before transmitting. Initially, the buoys were developed by SINTEF, Trondheim, for the oil activities in the North Sea. The oil explorers needed those for wind, currents and wave data for especially limited areas, and buoys were well suited for the task. The need for this type of monitoring increased quickly

and developing and production became parts of a new company, Oceanor, now named Fugro Oceanor. The company develops and builds the buoys at the factory in Trondheim.

## Turned to more environmental data

From initially only monitoring currents and waves, the area of utilisation has been turned to the more environmental field such as monitoring biological and chemical data, Svein Erik Aasen continues. The flexibility of the system makes them capable of monitoring the El Niño in South America, forecast typhoons in India, monitor the water quality in Thailand, and monitor the water quality and wave altitudes in the Mediterranean. The shell is the same in most cases, but the content varies. In addition to data from the buoys, the customer can place data from other sources like satellite measurements, global meteorological systems etc., and together make models that can forecast different types of occurrences. Data transmitting is mainly carried out via satellites, and some depend on placing the buoys at the customers' wish, satellites in geostationary orbits or in polar orbits. The data is mainly received by the customers, but in some cases, Fugro Oceanor can receive the data. In some cases even process the data and deliver results to the customers.

All buoys of these types are anchored, irrespectively of water depth. Water depths of 5-6,000 metres are not a problem. Service and maintenance will be carried out by the customers themselves in most cases after training from the supplier, however sometimes Fugro Oceanor can carry out and completely be in charge of the running service. Buoys from Fugro Oceanor are placed over most of the world, not least in the Far East, where some countries have large country covering networks of buoys as an important system for ocean monitoring.



## Services if one needs it

The company can also sell services to the customers in form of measurements, analysis of the measurement and they can sell services in form of raw data including necessary software, and the customers can use the data to find the information needed. The company is very interdisciplinary. For developing and building the buoys engineers and technicians within the field of mechanic, electronic and software are necessary, but we have also meteorologists and oceanographers in-house to be more a partner instead of an instrument supplier.

Today the company has about 50 employees, of whom 35 are situated in Trondheim, whereas the rest are in Sandnes, Norway. "Being a part of Fugro means we are a part of a company with a presence in most all countries in the world. We also have a great contact network", Technical Manager Svein Erik Aasen concludes the conversation.

## FACTS

The SEAWATCH-system may include the following components:

- Moored oceanographic buoys (Wavescan buoy, Seawatch buoy and Seawatch Mini or other data sources). These can have a fixed position or they can be drifting buoys.
- Real time, two-way communication system. Mainly the buoys are connected to the customers via already established communication systems like Inmarsat, or via one types of polar orbiting satellites like Metop.
- Component for integration of data from other sources (delivered on client's request). Databases and presentation software including GIS.
- Numerical models (several options can be included on client request)
- Module for training and institutional capacity building.

SEAWATCH can serve as a basis for a complete regional environmental monitoring and forecasting system, or easily be integrated into already existing infrastructure.