

The topic of surveillance of civil off-shore infrastructure is increasingly becoming a significant issue globally. In response to this, WERA has provided an upgrade to its [High Frequency ocean radar system](#) to monitor ship activities far behind the horizon.

Several "WERA" ocean radar systems are located on the European coastline as well as the East and West Coasts of North America. The systems located at the German Bight, the Dutch North Sea coast, and the French and Italian Coasts are particularly well suited for this technical application of ship detection.

The WERA ocean radar, represented in Canada by [ASL Environmental Sciences](#), is classified as a "dual-use" system because it is suited for oceanographic applications as well as over-the-horizon ship detection and tracking. It can be used for the surveillance of very large areas of the coastal ocean to identify suspicious ship manoeuvres. This technology should be of interest to all countries with infrastructure on their coast.

About 10 years ago, HELZEL developed a specific product for surveillance applications: the HELZEL OTHR. This OTHR system provides ship tracking for ranges of up to 200 nautical miles and is already in use in Asia and Africa. The main application is the surveillance of the exclusive economic zone (EEZ) to detect illegal fishing activities or other suspicious activities, e.g. smuggling or piracy and, of course, threats to off-shore infrastructure. To extend an existing ocean radar WERA for ship-tracking applications, the systems may need to be refurbished and extended to 16 receiver channels. For new installations, the OTHR systems are best suited for these surveillance applications.

It is worth mentioning, that such a "military" OTHR system can be used for civil applications as well. These dual-use applications include wave measurement, tsunami detection and ocean current monitoring for environmental protection and search and rescue.

Figure 1 shows the existing WERA system at Tofino, BC.

The data of the WERA system on Wangerooge, Germany are used to demonstrate this feature. Figure 2 shows ship tracks generated by this WERA system. The range is 70 km in this case.

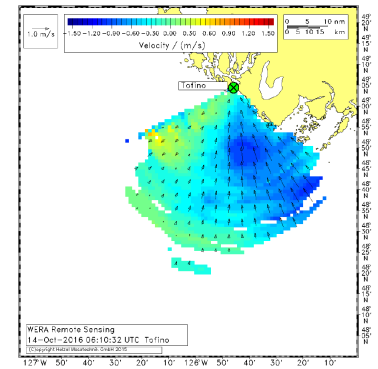


Figure 1. WERA Antenna Array near Tofino, Canada, the map show the ocean currents monitored by the ocean radar system. Within this area it would be possible to track ships as well.

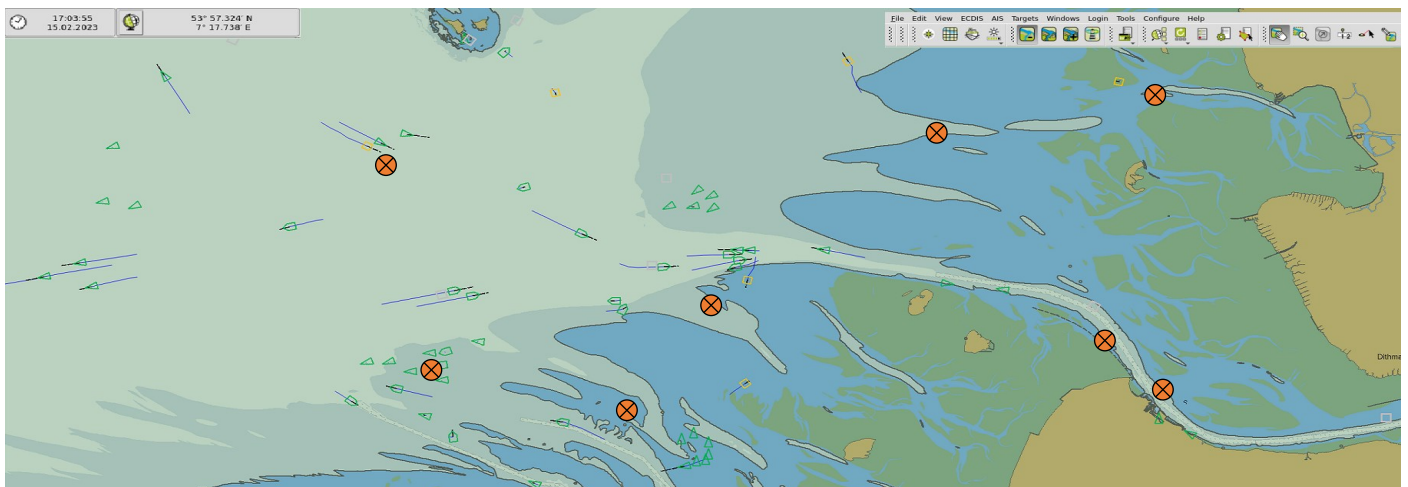


Figure 2. Map with ship tracks generated by WERA on Wangerooge island. The green marked targets are identified by means of AIS. The orange marked targets don't have any identification or have turned off their AIS and thus these targets are visible on the radar monitor only. *The Multi-Sensor Tracker Software, used in the analysis, was developed and provided for these tests by Innovative Navigation GmbH.*