

iSPHERE Tracking Oil Spills Around The World

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Modern technology and communications have revolutionized the collection of data from oceanographic drifting buoys. iSPHERE, an oil spill tracking buoy, is a proven high performance instrument which customers trust for use in the harsh offshore environment.

Oil spill tracking buoys are used in a variety of applications. For contingency planning, drifters are used to calibrate oil spill trajectory models. During oil spill exercises, neutrally buoyant and biodegradable items such as wood chips and orange peels are used to simulate the oil spill. During an actual spill, buoys are deployed from either the air or a ship or rig. They are also used for oceanographic studies.

Customers consist of the offshore oil industry – oil companies, oil spill response companies and supply vessel companies. In fact, the largest oil companies in the world rely upon iSPHERE to track oil spills in real time and develop predictions models on migration of spills. The oceanographic scientific community uses iSPHERE, as well as oil spill modelers. A major example in 2010 was the use of iSPHERE buoys during the Deep Water Horizon spill in the Gulf of Mexico. In addition, government departments such as NOAA, Fisheries and Oceans, Environment Canada and the Canadian Coast Guard use the product for tracking, modeling and research. Private firms around the world which are contracted as early responders also rely heavily on iSPHERE.

Careful design of the buoy hull along with proper ballasting, to keep the buoy upright with the waterline at its equator, ensures good buoy performance in a variety of wind, wave and current conditions. The spherical shape and weight of the buoy have been precisely calibrated to ensure that the buoy drifts with the top layer of the ocean and mimics the motion of an oil slick.

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A significant feature of iSPHERE and one which separates it from its competition, is the use of the Iridium satellite network to transmit data from anywhere in the world within one minute. It is an efficient and low cost telemetry system and has completely revolutionized oil spill response. iSPHERE's designer and manufacturer MetOcean Telematics in partnership with Iridium has negotiated an exclusive drifter-lifetime Iridium pricing arrangement for the delivery of real time data. Several different pricing packages are available including a special pricing plan for emergency stand by service for oil spill response. This allows the companies to purchase a large number buoys and keep them on stand-by ready for immediate deployment. **MetOcean** also provides secure on-line web access to data processing, alarming, storage and mapping.

Iridium is the largest commercial satellite constellation in the world. There are always at least three satellites overhead anywhere on the planet. Designed for use by the military, it is a very robust and dependable system. Today about 30 percent of Iridium's business is the US Department of Defense which uses it for voice communications and GPS tracking data logistics. Unlike the ARGOS and GOES satellite systems, Iridium provides real time two-way communications to and from the remote device. This bidirectional communication ability allows the end user to select an

on demand Iridium transmission interval according to operational requirements. Iridium messages can be routed to the customer's ship, company headquarters, to a cellular phone such as a Blackberry, an Iridium handset or to any computer. It is a comprehensive and flexible system.



Scientifically, iSPHERE behaves like a maximum leeward drift object in the water. The force of the wind against the exposed surface of the buoy causes it to move through the water in a generally downwind direction. The resultant motion of the buoy is made up of the leeway drift and the movement of the upper layer of the ocean caused by the surface currents. iSPHERE has been shown to drift in the direction of the oil slick closest to the ocean's surface.

James Dempsey is an oil spill response consultant and the president of Cormorant Ltd in St. John's Newfoundland, a company which provides marine environmental services. He has used several generations of drift buoys over the past 25 years and is a strong supporter of the product. iSPHERE is a "reliable, Canadian made tool, which has the right combination of drift and windage to represent ocean surface conditions. There are not a lot of instruments that can do that." Furthermore, he is most impressed that MetOcean has assumed the task of data collection, processing and quality control and makes the data available to its customers on the web from its in-house data centre. The data can be mapped to Google Earth.

iSPHERE is a low cost expendable Lagrangian drifter with a state-of-the-art data acquisition system which collects real-time sea surface temperature data with an accurate thermistor as well as GPS positional data. The buoy's position is transmitted as part of the Iridium message. During critical operations the sampling rate can be increased to send vital data to the user. For example, transmissions every 30 minutes can be altered to every 15 minutes. It is user-friendly and easy for one person to operate. It is turned on by the removal of a magnet.



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The buoy is designed by MetOcean Telematics, a Canadian manufacturing and development firm based in Dartmouth, Nova Scotia. They are data collection and communication experts who are world leaders in the design and manufacture of air- and ship-deployed drifting buoys.



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