

Marine Robots Enable Ocean Exploration



Headquartered in the heart of Silicon Valley (Sunnyvale, California), Liquid Robotics, Inc. is an ocean data services provider and developer of the Wave Glider marine robot that revolutionises the persistence and economics of ocean observation.

Wave Glider Technology

grew out of a privately-funded project between Jupiter Research Foundation and Roger Hine (founder) that started in 2005 to monitor humpback whale vocalisations off-shore of the Big Island of Hawaii, an activity that it continues to conduct. The spectacular performance of the joint project led to a decision to productise the technology for broader scientific and commercial uses.

The company is private and was incorporated in January 2007 to continue development of the technology and the Wave Glider was first introduced in 2009.

Continuous Data Collection

The Wave Glider is a unique new platform that opens up new possibilities for scientific exploration, the efficient routing of ships, the monitoring and management of sea life, the safe extraction of oil and mineral resources, protection of our shores and national defence.

The Wave Glider eliminates the need for costly deep-water moorings or ship operations, and makes widespread and continuous data collection finally possible for scientific, commercial and military applications. The key innovation of the Wave Glider, Figure 3, is its ability to harvest energy from ocean waves to provide essentially limitless propulsion and ensuing persistent presence at the air-sea interface.

The Wave Glider can collect a wide variety of scientific and commercial data. Sensors have been integrated to measure weather, sea conditions, water quality and chemistry, living organisms, bottom topography and currents (both at and below the surface). Acoustic microphones and arrays have been adapted to record passing ships and the vocalisations of whales and other mammals.

Wave Gliders are produced and assembled at company headquarters in Sunnyvale, California. Final system and acceptance testing is performed at the company's deep-sea facility at Kawaihae Harbour in Kamuela, Hawaii. The company employs approximately 70 people.

Liquid Robotics generates revenue from:

- Wave Glider sales
- Application and payload integration
- Data services sales and operations
- Ongoing refurbishment, maintenance and upgrades

Liquid Robotics is primarily following a direct sales model in the US, where the customer base is concentrated among a few large users and system integrators.

International and Global Scope

Liquid Robotics has established an international business development operation and is assembling a network of local distribution partners in key overseas markets.

Wave Glider technology satisfies strong customer needs in a variety of industries:

- Ocean and Environmental Science – Unmet need for low-cost, persistent and directable data collection at the ocean surface, subsurface and sea/air interface.
- Defence – Massive requirements for ocean weather and current information, as well as subsurface acoustics and port and harbour security.
- Energy – Supporting the safe and environmental extraction of petroleum resources with water quality and sea life monitoring, as well as key information on currents and the retrieval of data from subsea instruments.
- Shipping – Reducing the USD2 million of fuel a container ship burns on a 28-day round trip ocean voyage. Routing is now done using weather models and approximated ocean currents. Liquid Robotics has an opportunity to provide 'now-casting' of actual ocean currents to improve routing, shorten transit times, and save shipping companies millions of dollars in fuel and operating costs.
- Fisheries – Improving the management of resources by providing fish counts, collecting data from ocean-floor fish counting sensors and

monitoring access to marine preserves.

View on the Future

Liquid Robotics is working with customers to tackle a wide variety of scientific and resource challenges in the ocean environment. Our Wave Glider technology represents a breakthrough in both the economics and persistence of ocean measurement and operation. We are just beginning to tap the potential in our scientific and commercial markets. Wave Glider technology will continue to evolve and expand to meet emerging customer needs.

<https://www.hydro-international.com/content/article/marine-robots-enable-ocean-exploration>
