

# LASER BATHYMETRY PRODUCT HISTORY

In over 35 years of research and development, Optech, the world leader in lidar technology, has designed and delivered many airborne laser bathymeter systems. Optech laser bathymeters specialize in the rapid and safe collection of georeferenced position and elevation data, as well as camera and hyperspectral information suitable for a multitude of disciplines, including engineering, science, environmental studies and military strategy. High area coverage rates, seamless data acquisition across the land/sea interface, ease of operation and rapid deployment make Optech's airborne laser bathymeters a cost-effective complementary survey tool to medium- and deepwater, vessel-based survey equipment.

**2012 CZMIL** – To be delivered to the **US Navy**, this integrated lidar-imagery sensor system and software suite is designed for the highly automated generation of physical and environmental information products for mapping the coastal zone.

**2011 CZMIL** – To be delivered to the **US Army Corps of Engineers (USACE)**, this multisystem development program culminates in three advanced systems that improve performance in surf zones and turbid waters. They incorporate advances in processing bathymetric lidar signals and lidar/hyperspectral sensor fusion, together with hardware features such as an enlarged aperture receiver (4 times the size of previous sensors) and doubled spatial resolution. CZMIL is being developed under the auspices of USACE and the Joint Airborne Lidar Bathymetry Technical Center of Expertise (JALBTCX).

**2010 SHOALS 3000** – Delivered to the **United Arab Emirates Military Survey Department** in 2010, together with an ALTM 3100, this system provides enhanced bathymetric and topographic mapping capability in coastal areas.

**2005 SHOALS 3000TH (CHARTS)** – Delivered to the **US Navy** in 2005, as an upgrade to the USACE SHOALS 1000T. It increased the data collection rate to 3,000 depth measurements/sec, and 20,000 topographic measurements/sec. Also added were a hyperspectral camera and an expanded software suite. This upgrade provides increased data collection rates, seafloor classification software and a larger swath width to accommodate the greater area coverage required for world-wide littoral mapping carried out by JALBTCX.

**2005 SHOALS 1000T** – Delivered to **Fugro-Pelagos Inc.** in early 2005, the SHOALS 1000T gave Fugro-Pelagos the advantage of being the first commercial service provider to add airborne lidar bathymetry to their already extensive list of mapping tools. Now the most appropriate tool or combination of tools can be used to meet client needs efficiently and increase profitability.

**2003 SHOALS 1000T** – In 2003, Optech delivered to **USACE** the world's first airborne lidar bathymeter with a topographic option, collecting 1,000 water depth soundings/sec and 10,000 coastal terrain elevation measurements/sec. Smaller, faster, and lighter than previous systems, the SHOALS 1000T deploys rapidly anywhere in the world from a variety of aircraft.



*CZMIL: The new-generation airborne multi-sensor mapping system*

**2003 SHOALS 1000** – Delivered to the **Japan Coast Guard** in 2003, the SHOALS 1000 collects data that meets International Hydrographic Organization (IHO) Order 1 standards with area coverage rates as high as 70 km<sup>2</sup>/hour.

**1995 HAWKEYE** – Two systems were delivered in 1995 to the **Swedish Hydrographic Department** and the **Swedish Navy** via Saab Dynamics, the local prime contractor. The systems are similar to SHOALS and are used for both hydrography and target detection.

**1994 SHOALS 200** – Delivered to **USACE** in 1994 for hydrographic applications, the SHOALS 200 was originally installed in a Bell 212 helicopter. In 1998 it was upgraded to a SHOALS 400, with increased measurement capability to facilitate operation from a fixed-wing aircraft.

**1988 ALARMS** – This mine detection system was developed and built for the **US Defense Advanced Research Projects Agency (DARPA)** in 1988. During the Gulf War, Optech was selected by the US government as the only firm capable of developing this system on short notice. In less than seven months Optech delivered the system for successful field trials. Flight-testing has shown ALARMS to be valuable in the area of mine counter-measures (MCM).

**1988 FLASH** – Delivered to the **Swedish Defense Research Institute (FOA)** in 1988, this prototype system was used to detect objects within the water column.

**1984 LARSEN 500** – Delivered to the **Canadian Hydrographic Service** in 1984 to survey shallow coastal water in the Canadian Arctic, the LARSEN 500 is the world's first operational airborne lidar bathymeter system. Once proven, the system was deployed for surveys in the Canadian Arctic. Canadian Chart #7750 of Cambridge Bay, Northwest Territories, Canada—circa 1985—was the first hydrographic chart created using airborne lidar bathymetry.

## Optech Incorporated

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