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Offshore Surveyor

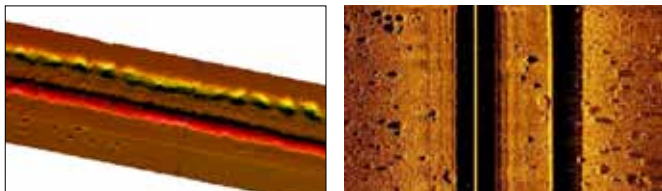


TYPICAL COMMERCIAL APPLICATIONS INCLUDE

Bathymetric surveys, environmental surveys, exploration and various construction support and inspection tasks for pipelines and platforms, utilizing side scan, camera and swath bathymetry or specialized payloads for environmental surveys, exploration, post hurricane inspection and pre/post lay and build surveys for pipelines and platforms.

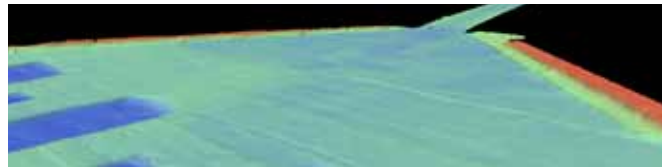
HIGH QUALITY DATA OUTPUT

All data is left in manufacturers original format and readily exportable to a number of post processing packages.



Left: A section of a 5km pipeline trench survey performed on completion of operations in the Caspian Sea. The trench was surveyed from the beach out starting in waters less than 2m deep.

Right: 900 kHz Side Scan image from pipeline inspection gathered by Gavia AUV using Auto Tracker, showing potential hazard to the pipeline.*



Detail of bathymetric harbor survey image gathered by Gavia AUV carrying a GeoSwath Plus, showing dredged areas used for barge anchorage. Images courtesy of NCS-Survey and BP Azerbaijani Subsea Performance Unit.

MODULAR CONSTRUCTION

Due to the modular construction of the Gavia, the system can conduct a variety of applications and additional capability is just a changeable module away.

Gavia modules can be purchased at later dates to increase capability as mission requirements dictate.



The Gavia Autonomous Underwater Vehicle (AUV) is a self contained, low logistics survey tool capable of delivering high quality data while operating from vessels of opportunity or from the shore.

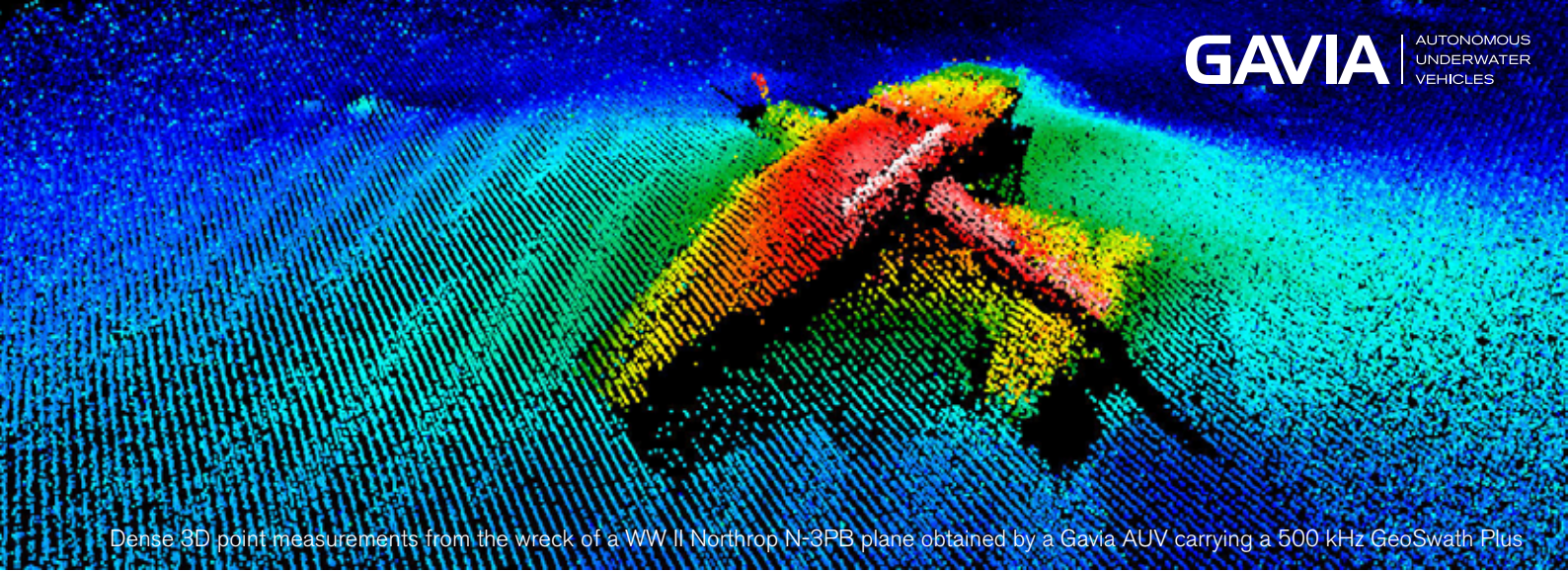
The Gavia AUV can be a powerful asset to any commercial survey operation and has been proven in real world environments, providing highly cost effective data when compared to traditional means using costly surface vessels and ROVs.

GAVIA OFFSHORE SURVEYOR FEATURES

- » The Gavia AUV is stored in small cases that are both Fed Ex shippable and easily transportable in a van or pickup truck to operational site.
- » The Gavia can be operated by two people and does not require any specialized equipment for launch and recovery which is typically done from either the shore or small inflatable's.
- » Quick mobilization / demobilization - No installation or calibration of peripherals required.
- » Over the horizon communications through Iridium.
- » Easy to use chart-based graphical user interface with enhancements for commercial operations.
- » Small logistical footprint with no specialized equipment required to operate the system.
- » Low operating cost compared to traditional methods requiring costly surface vessels.
- » Proven survey grade deliverables from commercial pipeline and hydrographic surveys in real world environments.
- » Optional Payload modules for customer supplied sensors or additional sensors.
- » All data time synchronized and stored in manufacturer's original format and all vehicle logs in an open format.
- » Field swappable battery and sensor modules.
- » Compatible with a variety of third party post processing packages.

AUTONOMOUS PIPELINE INSPECTION

- » Using SeeByte's AutoTracker software, a Gavia AUV can autonomously detect and track a pipeline from onboard sensors while constantly maintaining a pre determined offset to optimize the data that is being collected. The AutoTracker is able to cope with both expected and unexpected pipe burials.
- » In summer of 2009, NCS Survey of Aberdeen operated a Gavia vehicle for commercial survey operations successfully inspecting approx. 90 km of pipeline in what is believed to be the first commercial deployment of the AutoTracker on a low logistics AUV.



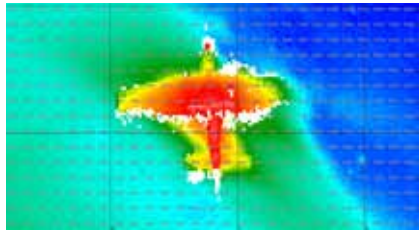
Dense 3D point measurements from the wreck of a WW II Northrop N-3PB plane obtained by a Gavia AUV carrying a 500 kHz GeoSwath Plus

Northrop Data Sets

Crashed by Reykjavik Airport during WW2



Northrop N-3PB.



Binned GeoSwath MBES image of target.



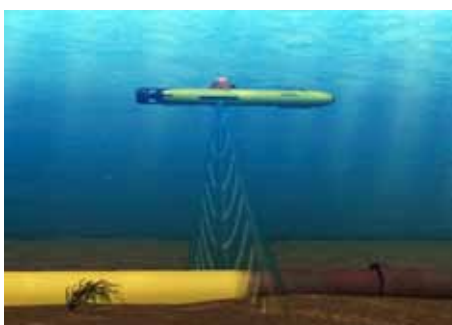
1800 kHz Side Scan Sonar image of target



Detail of bottom hatch from the Gavia camera system.

Pipeline Inspection

Image done by Black Laser Learning



OFFSHORE SURVEYOR SPECIFICATIONS

NAVIGATION

High accuracy DGPS ready receiver
 High-precision DVL-aided Inertial Navigation Kearfott T-24 Inertial Navigation System (INS) with Teledyne RDI Doppler Velocity Log (DVL) and direct Sound Velocity Meter.
 Positioning accuracy can be maintained over longer duration deployments by ranging to bottom-moored LBL transponders (optional).

COMMUNICATION

Wireless LAN: IEEE 802.11g compliant
 Satellite communications: Full global coverage via Iridium link
 Acoustic Modem: For tracking and status updates

MEASUREMENTS

Length: 2.7 m (typical, depends on configuration)
 Weight in air: 70 - 80 kg (typical, depends on configuration)
 Diameter: 200 mm
 Depth rating: 500m or 1000m
 Battery modules: 1.2 kW Lithium ion rechargeable cells per module
 Max speed: > 5.5 knots
 Endurance: Depending on speed and exact configuration. Typically 4 – 5 hours at 3 knots per rechargeable Battery module with all sensors (including Swath Bathymetry). Vehicle can be operated with two batteries for increased endurance (roughly doubled) or batteries can be field swapped for continuous operations.

TYPICAL CONFIGURATION

Offshore Surveyor base vehicle (500m or 1000m depth rating)
 High-precision DVL aided Inertial Navigation System (INS)
 Swath bathymetry module
 Side scan sonar / Camera
 Sound velocity meter
 Obstacle avoidance sonar
 AutoTracker from SeeByte
 Spare battery module(s).

The Gavia AUV has been in development since 1997 when the Gavia program was started as a joint development with the University of Iceland. Hafmynd was incorporated in 1999. Since then, numerous Gavia vehicles have been sold to military, commercial and scientific users in Iceland, Australia, Denmark, Portugal, United Kingdom, Canada and the United States as of 2010.

