

# Unmanned Systems Support

*Production Services*

*Commercial & Research Clients*

*Test Ranges for Testing, Demonstration, Training*



Expertise is cultivated through familiarity, testing and application. This requires focused efforts to develop solutions. Our team, services and facilities are the catalyst to get new technical solutions in the unmanned- autonomous space **commercial ready**. Innovators are developing new unmanned and autonomous solutions for almost every industry. Conventional methods are being reinvented while entirely new technical solutions are evolving at a rapid pace. We provide agile development, operation and training support for changing industries.



*With persistent 24/7 operational capability, multi-platform autonomous survey systems provide autonomous marine platforms with capabilities that deliver advantages over traditional offshore manned water craft survey methods. ASVs can operate in single units or in 'swarms', can operate as manned platform support and are available in all sizes from very compact (left) and large (right).*

## SYSTEM INTEGRATION

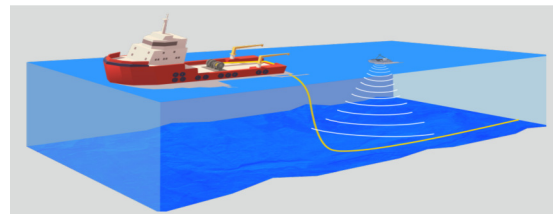
Our team has the resources and shop facility access to assemble the required system components together and make them work. Just a sampling of the many integration services we can provide include;

- Design, 3D modeling
- 3D printing, CNC, fabrication
- sensor integration
- communications, diagnostics
- marine/harsh environment configuration

## TECHNOLOGY AGNOSTIC

Our development services are not limited to any manufacturer or technology or hull configuration. We can work with a range of providers supporting;

- Full ocean depth to near shore shallow water bathymetric surveys, fiber optic cable laying, offshore infrastructure monitoring, etc.
- Platforms and Sensors including water conditions
- Real-time monitoring with mesh network connectivity
- Pre-programmed routes and mission planning
- Motion Reference, Geolocation, Data processing
- Modular mission specific configuration
- Quick mobilization even where access is limited



*From full ocean depth to near shore shallow water with limited access, ASVs can host many different sensors to meet a myriad of project requirements.*

Earth Systems Management, LLC is based on the Eastern Shore of VA with rapid access to the waters of both the Atlantic and to the Chesapeake Bay. ESM is currently seeking unique marine survey projects to demonstrate our service offerings and capability.

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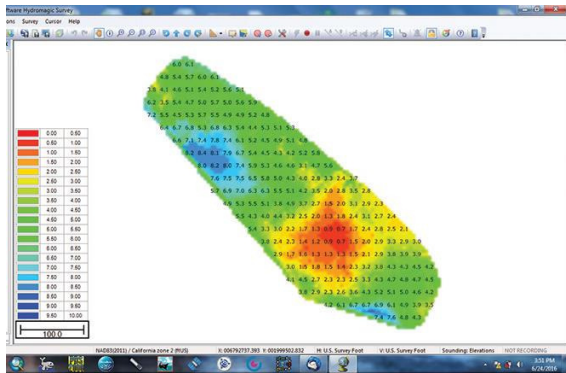
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## TECHNOLOGY DEMONSTRATION



*A shallow water channel ping sonar bathymetric survey.*

Institutional funding requires successful technology demonstration along with team track record as highly weighted criteria for funding selection. Intellectual property (IP) historically cited as investor protection is quickly becoming an antiquated and slow strategy to secure first mover position. Speed and agility in the development and application of technical solutions is the new norm and limiting factor. We provide the support and environment to demonstrate new technology for potential investors and clients.

## COMMERCIAL READY

Our third-party validation serves to strengthen the cache of the team and their technical solutions. Results of our **Testing, Demonstration** and **Training** services is a commercially ready solution for the market. Companies can expedite the process of combining functionality into viable integrated systems for commercial application. We use a systematic process to write and execute scripts to test this equipment integration from a functional performance level to a full integrated system validation. New product demonstration is a natural byproduct of capturing these successful tests.

## Training

As a company grows, training of new technical staff can become a limiting factor. The most technically knowledgeable people are often deployed full time on revenue producing jobs. We can help companies scale up trained workforce by accelerating familiarity with equipment and operations in live environments. Programs created with the help of the subject matter experts (SME) result in a compressed learning curve within a controlled environment rather than in the field where clients are at risk.

### Project Commercial Support – Fee Structure

<u>Support Service</u>	<u>Initial Mobilization</u>	<u>Return Mobilization</u>	<u>Ongoing Operational Days</u>
Project Scope and Approach			
Commissioning Equipment and Systems			
Technology Demonstration			
Workforce Development and Training			
Commercial Operations Support			

\*Fees exclude rental of specialized sensors and equipment. Assumes clients and strategic partners contribute to the effort with expertise, platforms, sensors and systems. Projected mobilization durations range from a few days to a full week.

This chart illustrates how projections of support fees will be structured as a rough order of magnitude subject to unique project requirements.