Autonomous Underwater Vehicle (AUV) Survey Services: Safer and Faster Operations (55% more efficient) in Challenging Conditions Compared to Traditional Surveys

This case study explores the successful implementation of AUVs to perform seabed inspection and mapping missions typically performed by a vessel and divers. AUVs collected multiple types of data including bathymetry, side scan sonar, sub-bottom profiles, magnetometer, and optical images in an area characterized by rough sea conditions, with wave heights often reaching 10 feet, conditions which exceed safety considerations for divers. By adopting AUV technology, the client experienced numerous benefits, including elimination of risks associated with human divers, overall cost savings, quicker survey completion, and faster data delivery.

Challenge: Harsh Sea Conditions

Our client faced several challenges when trying to obtain high-quality geophysical data in an area known for its harsh sea conditions. Traditional survey methods using large vessels and divers were not only time-consuming and expensive, but also risky, given unpredictable weather and large waves. The client sought a more efficient, safe, and cost-effective solution to meet their surveying needs.

Solution: Ocean Data as a Service (ODaaS) using AUVs

After careful evaluation of available solutions, the client decided to utilize Terradepth's ODaaS solution utilizing AUVs, achieving the following benefits:

- **Enhanced Safety:** By eliminating the need for human divers, the client significantly reduced the potential risks associated with adverse weather conditions and challenging underwater environments. The vessel used could stay in safe waters while the AUVs collected data near the sea bottom, unaffected by sea state, reducing risk further.
- **Faster and more cost-effective data delivery.** Since AUV missions are less susceptible to rough sea conditions, additional operational windows were available. In addition, AUVs can collect both sidescan and magnetometer data at the same time; vessels would require towed devices for each, meaning two passes. In the end, AUVs covered the area in a total of 16 days including two days downtime due to sea state while a vessel and divers would have taken a minimum of 35 days for the same survey, including an estimated 12 days downtime.
- **Enhanced Data Quality:** The AUVs traveled closer to the sea bottom, resulting in higher resolution data than traditional towed devices and improved project outcomes and decision-making.
- **Cost Savings:** The use of AUVs led to cost savings in several areas:
  - *Smaller ops team:* Fewer personnel were required for survey operations.
  - *Easier transport:* Equipment was transported in compact and robust Pelican cases, simplifying logistics and reducing transportation costs.
  - *Utilization of existing vessel:* Terradepth's equipment was small and easy to deploy; the client let Terradepth utilize their existing smaller vessels for launching and recovering the AUVs, eliminating the need for hard-to-find and costly survey vessels.

Result

Safer data collection, operations time reduced by 55%, and better and faster ocean decisions through accurate and cost-effective data.

The use of AUVs proved to be a game-changer for the customer and resulted in repeat business. Terradepth's approach overcame the challenges posed by rough sea conditions, eliminating reliance on human divers, and reducing operations time. The enhanced efficiency, safety, and cost-effectiveness of the AUV survey services highlight the importance of leveraging cutting-edge technology to address unique challenges and maximize operational success in demanding marine environments.

"Through the relentless pursuit of continuous innovation, our ODaaS solution has revolutionized marine data collection, providing enhanced safety and a remarkable reduction in operations time. As we navigate the challenges of the marine environment, we believe that progress is not just about efficiency; it's about safeguarding people, marine life, and oceans while allowing people to make better and faster ocean decisions."

Joe Wolfel,
CEO of Terradepth