USVs – Efficient Ocean Data Collection in less than 40m water.
NOAA Hydrographic Services Review Panel Public Meeting
02 September 2021
USV Fleet

- XOCEAN operates a fleet of 15 x Uncrewed Surface Vessels (USVs) with an additional 4 vessels in production in 2021.
Technology

Key Features

- **Sensors**: Power (up to 6.4kW) and payload capacity (up to 500 kg) for commercial grade sensors.
- **Control**: Full ‘Over Horizon’ satellite operations; real-time monitoring and control.
- **Efficient**: Slipway, crane or vessel launch (LARS); continuous 24/7 operations up to 22 days.
Technology

**XOCEAN CyberDeck**

- USV Pilots and Online Surveyors monitor and control the vessels and survey system remotely in real-time 24/7.
  - Platform is uncrewed not autonomous
USV Advantages

- Using 3 USVs on one project is approx. 25% lower cost and 3 x faster.

- Computers drive boats better than humans and together with smart software makes for more efficient data collection.

- Additional sensors can be used to collect sub-seabed data, weather observations and marine mammals as well as bathymetry.

- Weather downtime lower cost as no-one is on board.
Human Advantages

- Remote access brings the experts to the boats.
- It also allows a more balanced lifestyle including homeworking – ideal for gender balance and Mariners/Surveyors wanting to return to work.
- It is cool tech which attracts the younger generation.
- Working globally means that no-one has to work a night shift.
Environmental Advantages

- Minimal carbon usage – approximately two gallons of diesel per day
- Quiet and slow platform which doesn’t interfere with marine mammals
- All cameras are recorded 24/7 and can be used to identify species.
Efficient Operations

Launch & Recovery System

- Safely lift and house USVs on a vessel.
- Enables force multiplier approach in more remote locations.
- USV Pilots & Surveyors operating remotely, minimising vessel crew.
Canadian Arctic Surveys 2021

Vessels
- X0-450 (C30513NS)
- Leeway Odyssey (38m oceanographic research vessel)

Operations to date
- Force multiplier
- Twice the acquisition coverage for small additional cost
Advantages of multiple USVs

- Shorten survey time to cover an area
- Less resources required to run multiple USVs, therefore lower cost:
  - 1 x USV Pilot per USV
  - 1 x Surveyor for 3 x USVs
  - 2 x Field Ops for 4 x USVs
- Less exposure to weather events.
Combining USVs & UAVs

Coastal Surveys

- Combined USV and UAV method:
  - USV surveys at high water
  - UAV surveys at low water
Ocean data, delivered.