

# Use of Collaborative Autonomous Systems for Subsea Inspection

**James Cowles** Commercial Technical Sales Manager







Designed and built over 95 Autonomous Surface Vehicle Systems





# How did we get here?







**ASV** unmanned  
marine systems

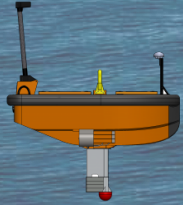
2005 – 2017

**1334** days

of unmanned  
operations



# Commercial and Scientific ASVs



**C-Stat 2**  
2 built  
1 in build



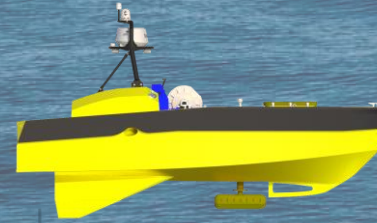
**C-Cat 3**  
2 built



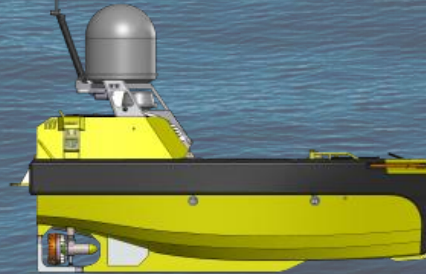
**C-Enduro**  
3 built  
1 in build



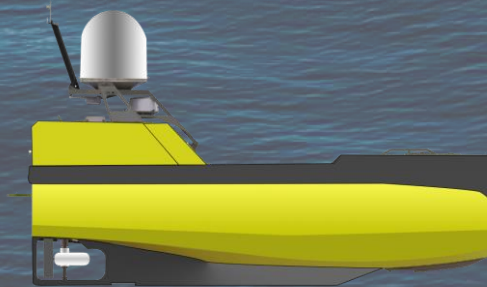
**C-Worker 4**  
1 built  
1 in build



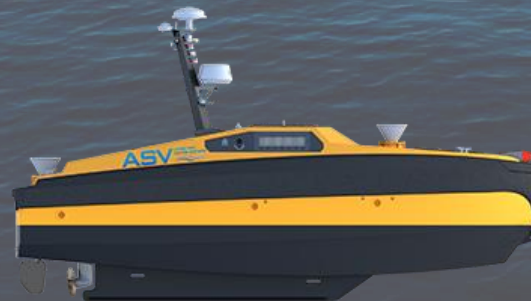
**C-Worker 5**  
4 built



**C-Worker 6**  
2 built  
1 in build



**C-Worker 7**  
2 built



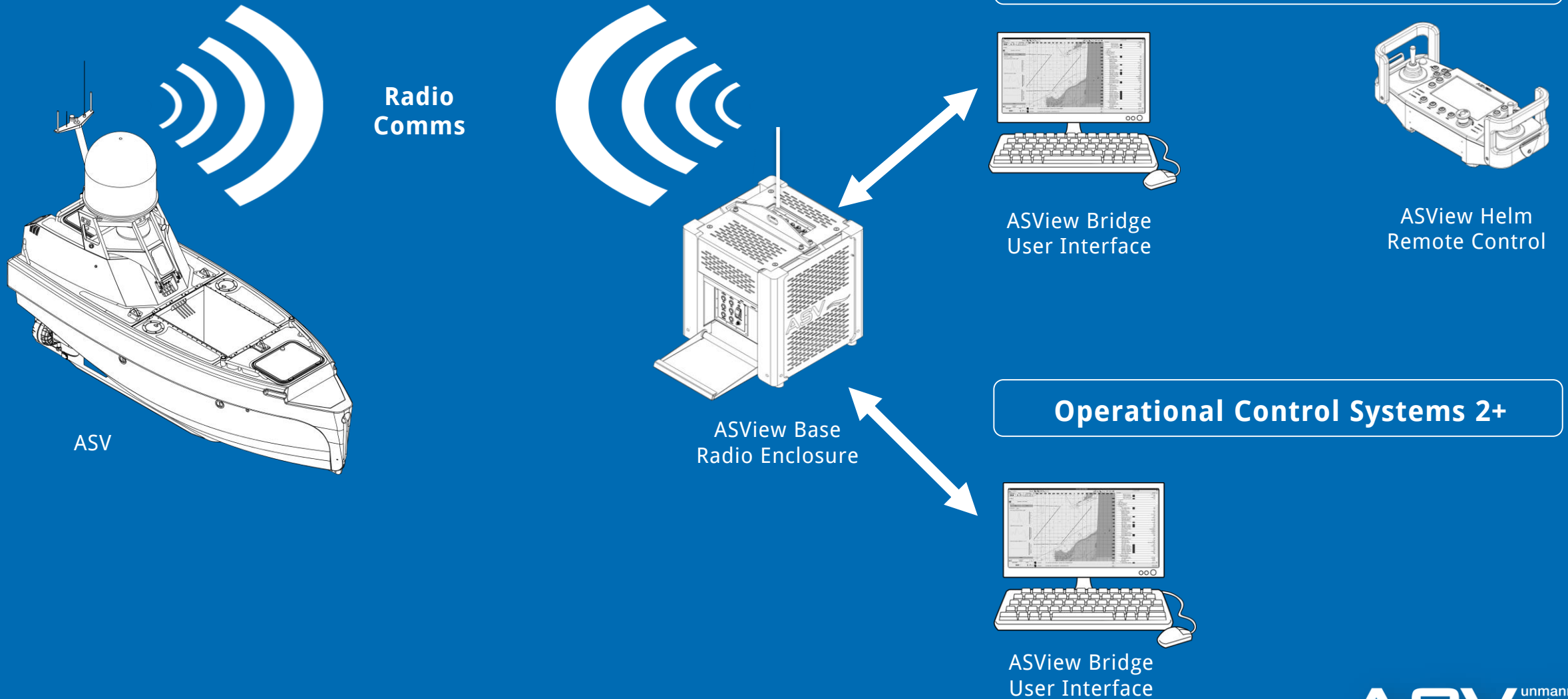
**C-Worker 8**  
6 built  
2 in build





ASView

# ASView™ Control System



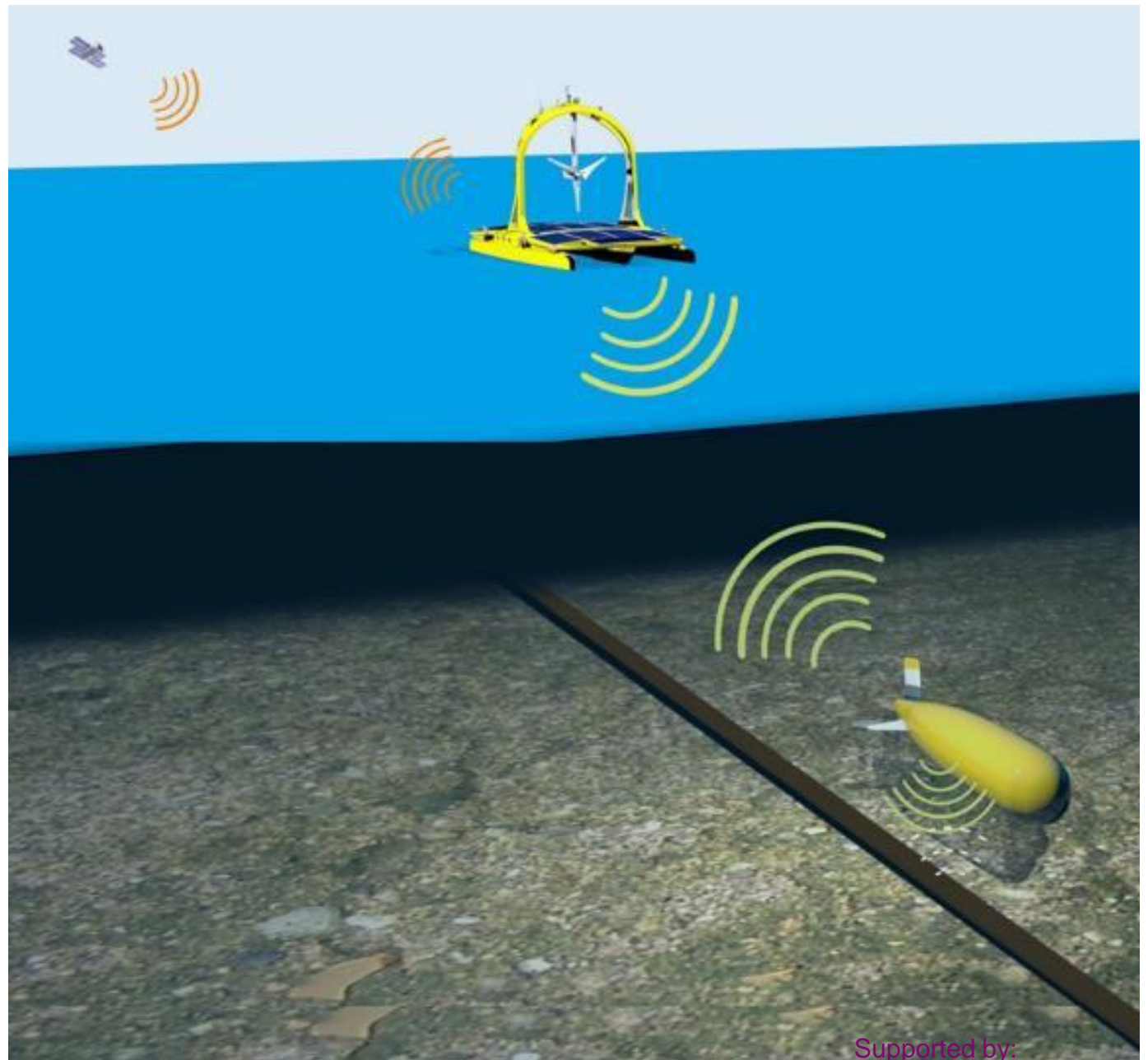




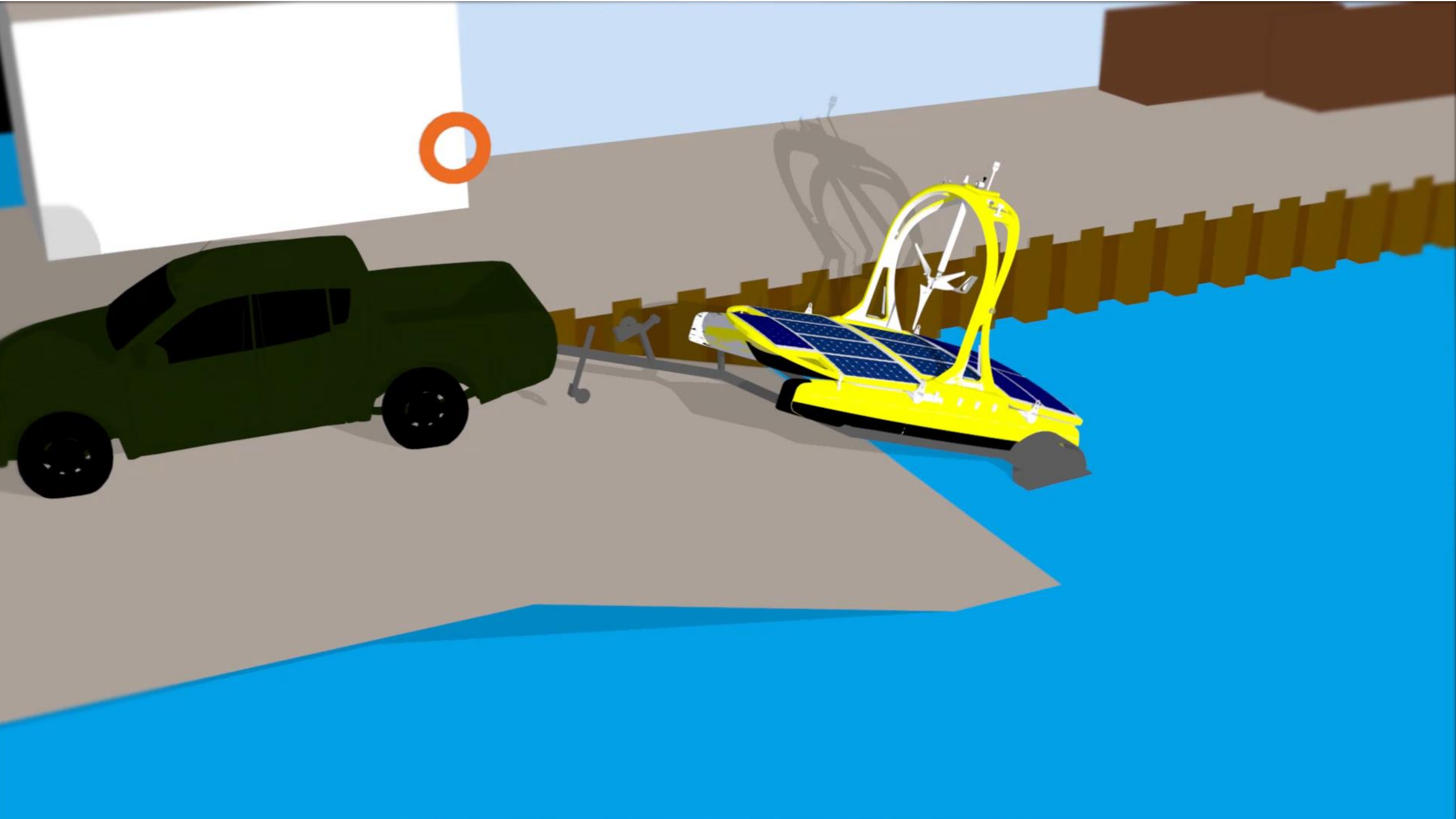
# ASSSS & APSS



# Concept overview





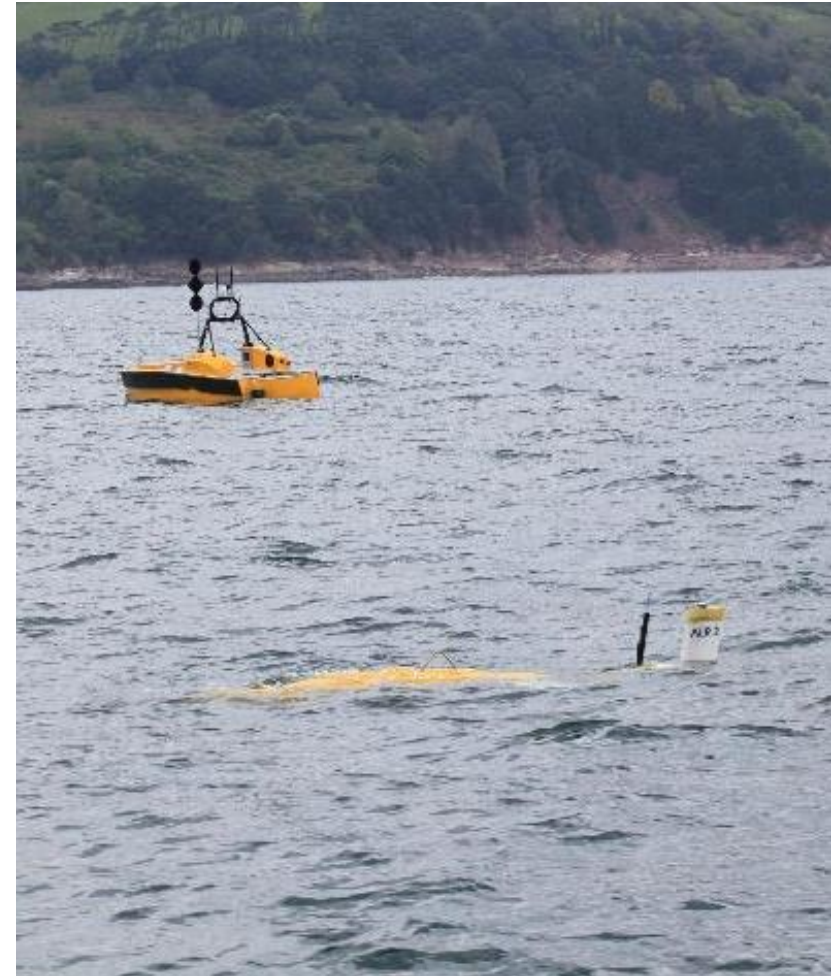




# System Trials

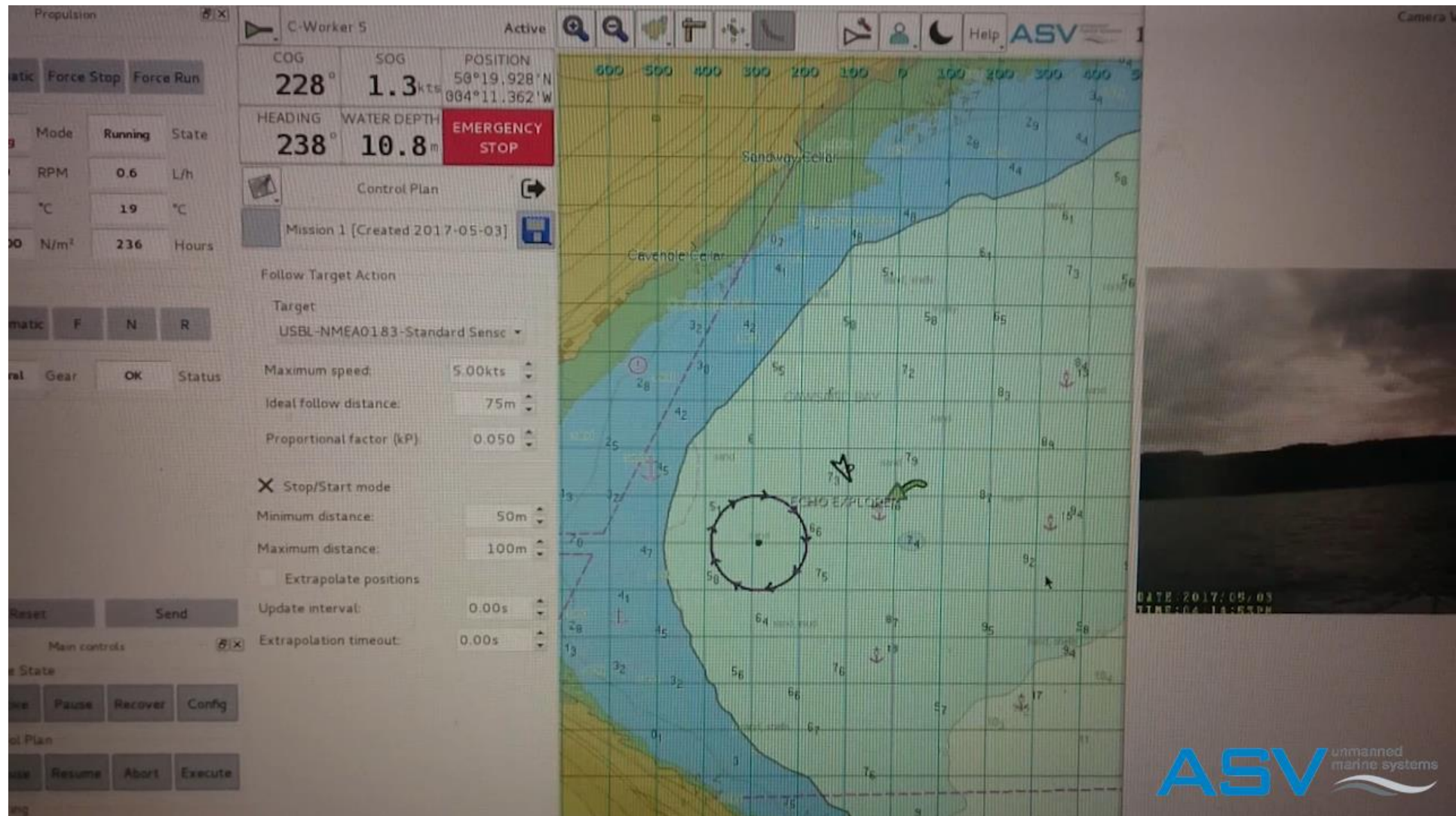
## Two sets of system trials completed:

- ASV-ALR tracking proven
- ASV-ALR A-Comms proven
- ASV optical comms proven
- Solstice data gathered



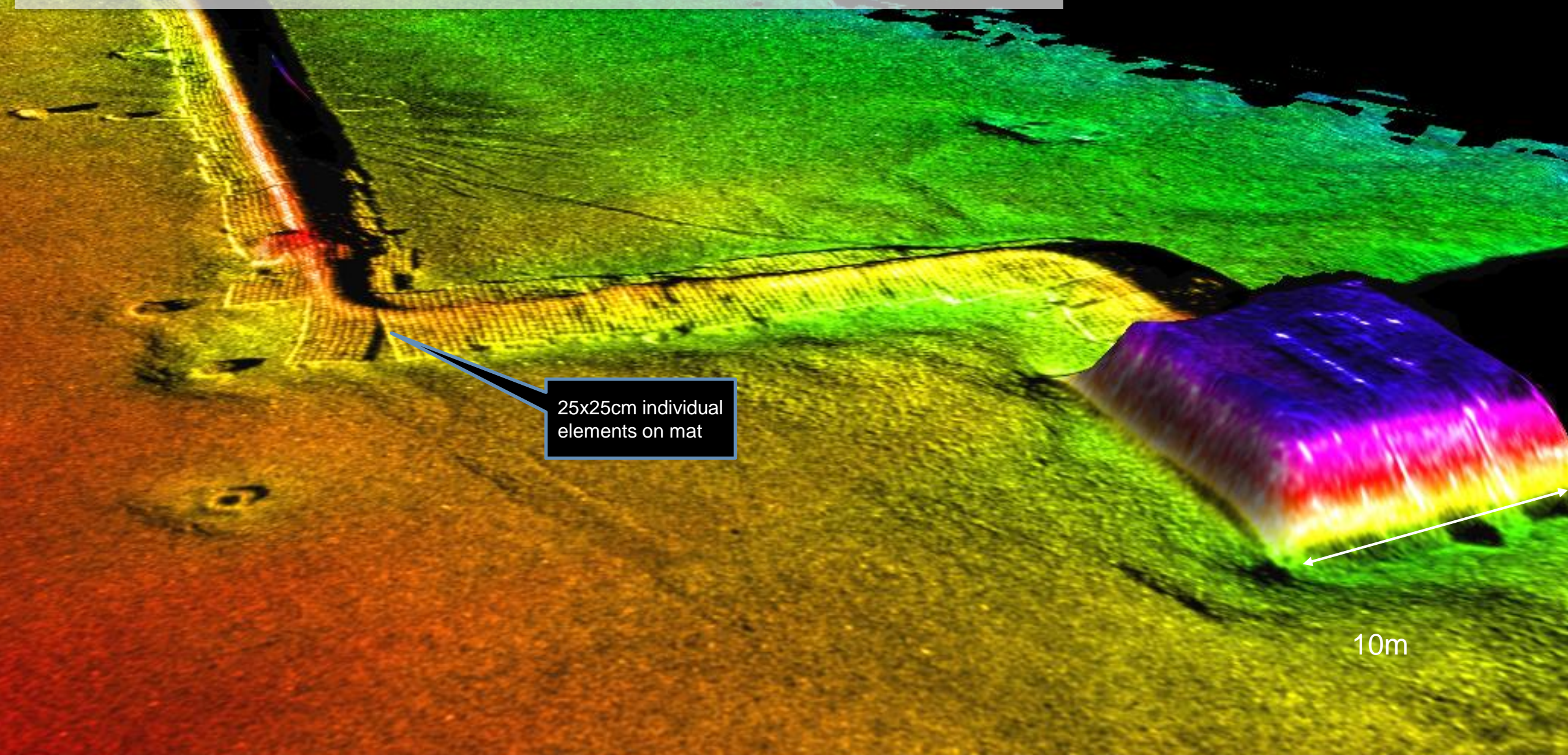


# Follow Behaviour





## Solstice data







ARISE



# ARISE



DSV ship 80-150m 40-150 crew



C-Worker 24  
For comparison



On board ROV control  
centre



Saturation Diving  
bell



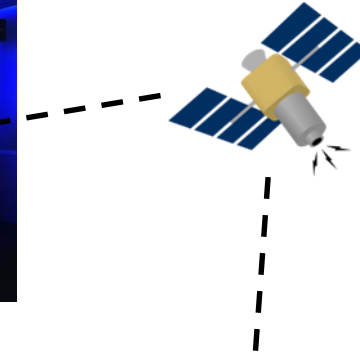
Work class  
ROV

- DSVs are large and expensive to mobilise
- ROVs require highly skilled and experienced operators, usually 3 per shift
- Reduced subsea situational awareness increases task time
- Costs of repeat visits ensures a mobilise for all eventualities model

**Today**



Shore based control centre



C-Worker 24 – Unmanned 24m autonomous vehicle

- Reduced vessel size and no crew provides significant cost savings
- Reduced costs provide an opportunity to triage and mobilise exact equipment
- ROV autonomy reduces operation time by over 50%
- Over the horizon control from shore based control room—quicker access to skilled support staff
- Autonomous operation utilising artificial intelligence with human oversight

**ARISE demonstrator– Developed by 2020**



# ARISE Project outline

## Platforms

- C-Worker 7 – 7m Autonomous Surface Vehicle
- Integrated observation class ROV (Seatratics predator)



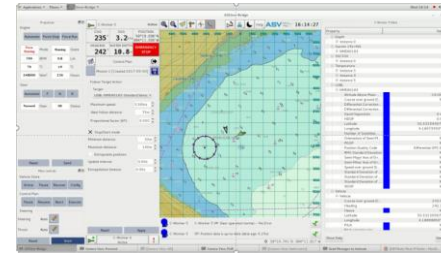
## Testing

- Testing at FABtest range will enable the understanding of the development of critical robotic system interfaces
- Evaluation of mooring inspection
- Testing on operational wave power device
- Evaluation of autonomy levels



## Software

- ASView – control software utilising advanced autonomy and AI for collision avoidance and operational efficiency
- ROV autonomy software proven to reduce time on task and during transit
- Investigation into AI improvements



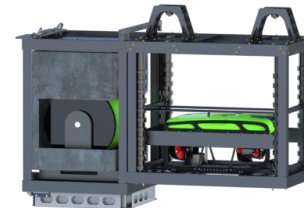
ASView for autonomous control of ASV



Off the shelf ROV autonomy (from SeeByte)

## ROV Payload Integration

- Communications integration
- Power integration
- Tether management
- Autonomous launch
- Autonomous recovery















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