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AUV with confidence

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YUCO micro-AUVs

New solution to monitor coastal waters.

EOOS conference March 2022

Coastal monitoring… challenging environment

Fixed measurements

- Cabled / autonomous observatory
- Stationary buoys

Long-term

- Installation/Maintenance costs
- No spatialisation

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From surface vessel

- Hand-Held and towed instruments
- USVs
- ROVs

Short-term

- Human action dependent
- Mainly surface
- Wave dependent

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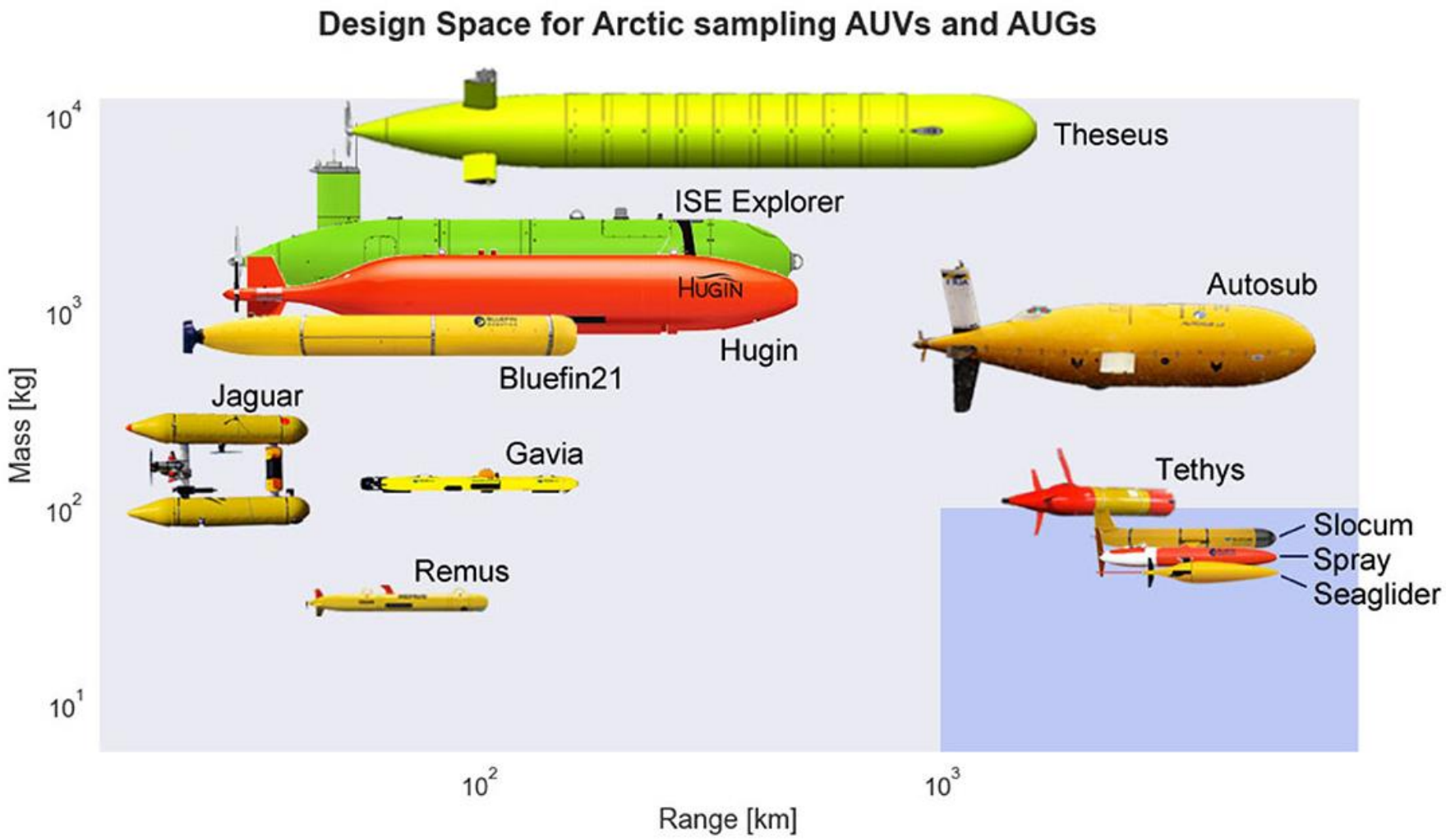
Autonomous platforms

- AUVs
- Gliders and floats

Short & Long-term

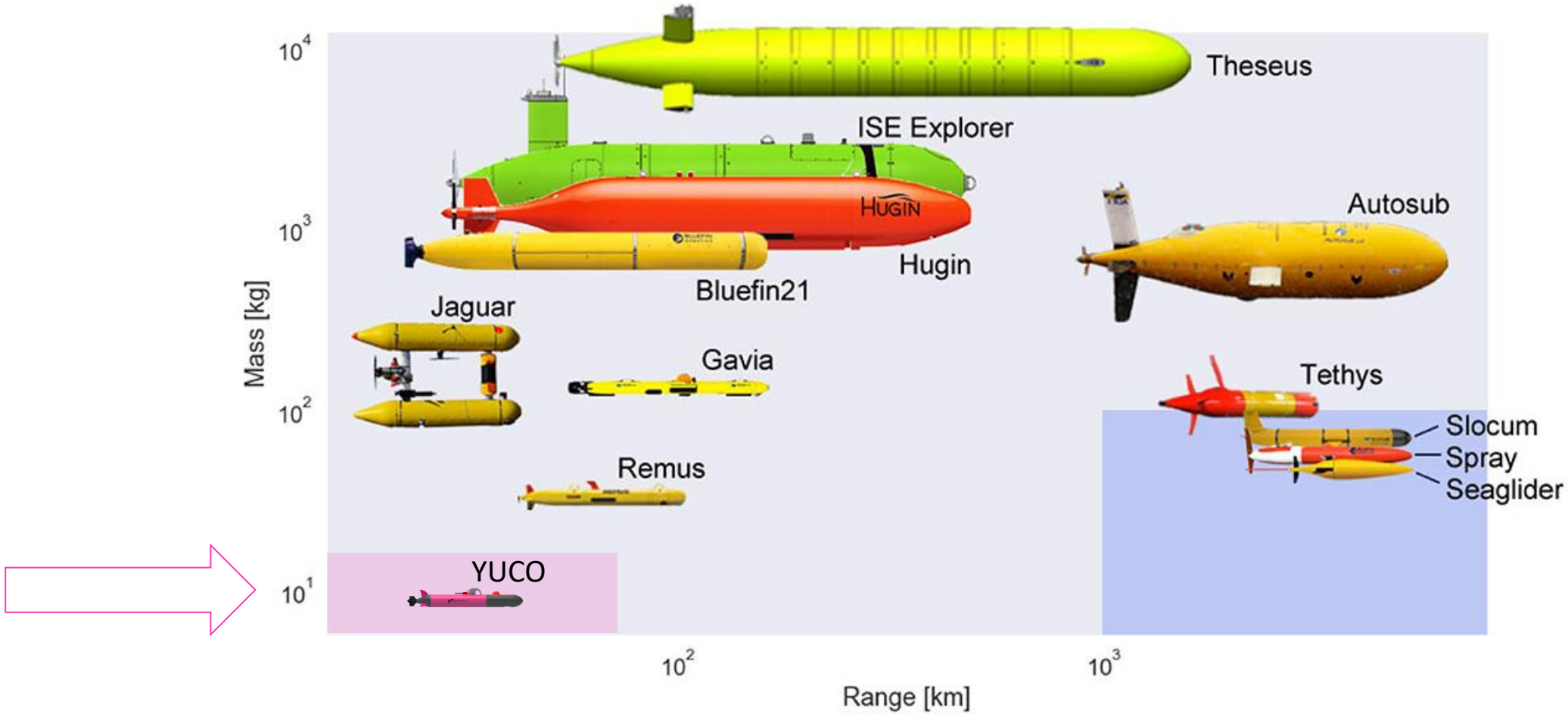
- Deployment capabilities
- Current dependant

Coastal monitoring… challenging environment



Source : Improving Resource Management for Unattended Observation of the Marginal Ice Zone Using Autonomous Underwater Gliders
Zachary Duguid and Richard Camilli

Coastal monitoring… challenging environment



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The YUCO micro-AUV aim is to :

- fill the gap in coastal waters moniroting
- measure in hard to access areas
- allow NO vessel near-shore monitoring

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Well... in a way... to use an AUV in costal waters as an AUV is meant to be used.

YUCO-Carrier - Main features

- < 10kg in air
- 300m depth rated
- Up to 6knots
- Up to 10 hours Li-ion (~3h with NiMH version)

- Up to 50cm / 2km in payload section

- INX © Naigation accuracy
  - 2% or better with DVL
  - 2 to 10% without DVL

  NO NEED OF EXTERNAL POSITIONING SYSTEM






YUCO micro-AUV range

YUCO-SCAN

YUCO-PAM

YUCO-CTD

YUCO-PHYSICO

YUCO micro-AUV range

YUCO-SCAN

YUCO-PAM

YUCO-CTD

YUCO-PHYSICO

... Hopefully more to come in 2022!

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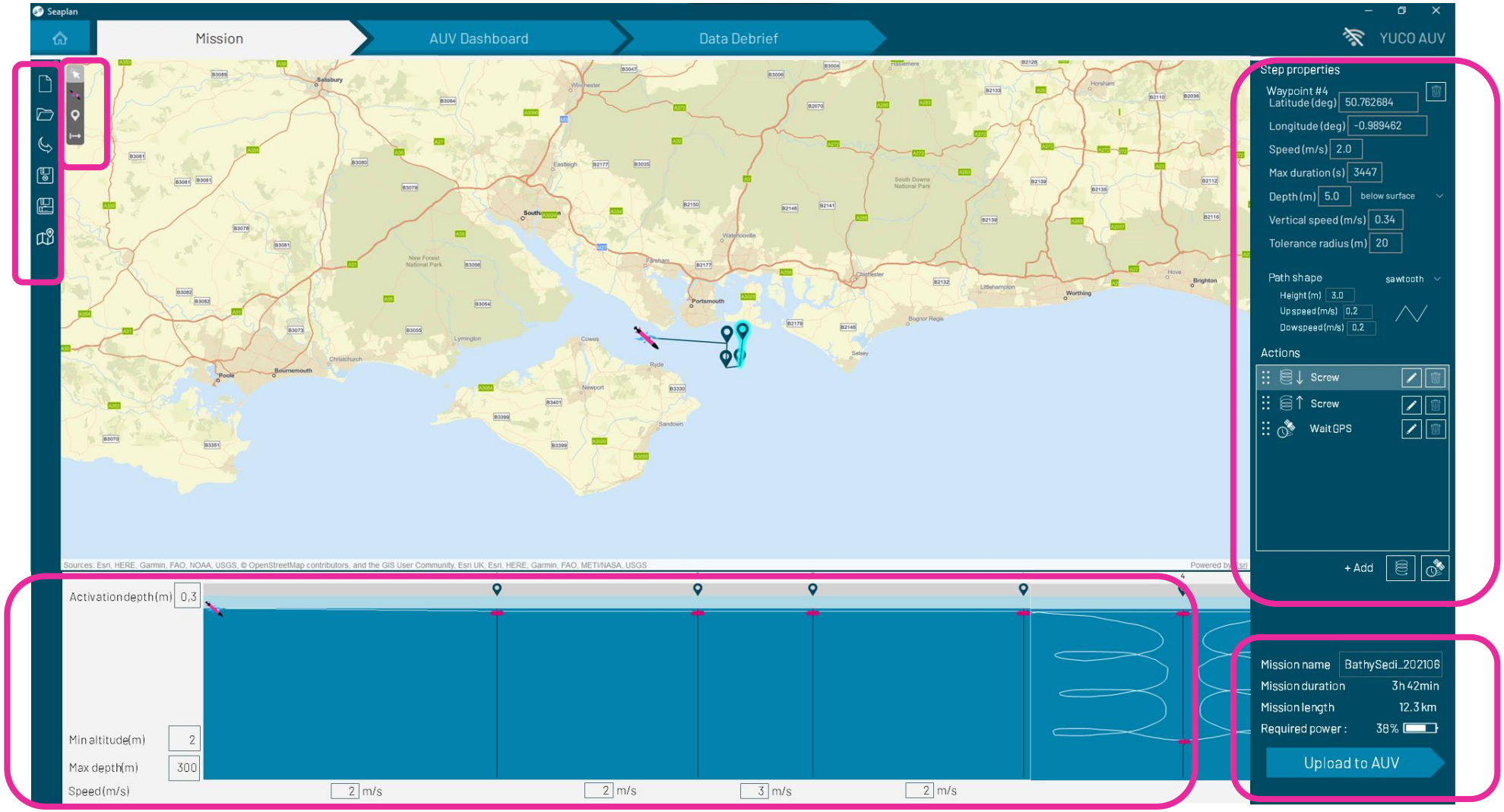
The YUCO micro-AUV is able to :

- Be programmed by non AUV specialist
- Be deployed by any operator – even if it is the first time they have a YUCO micro-AUV in their hands

Mission edit - Layout

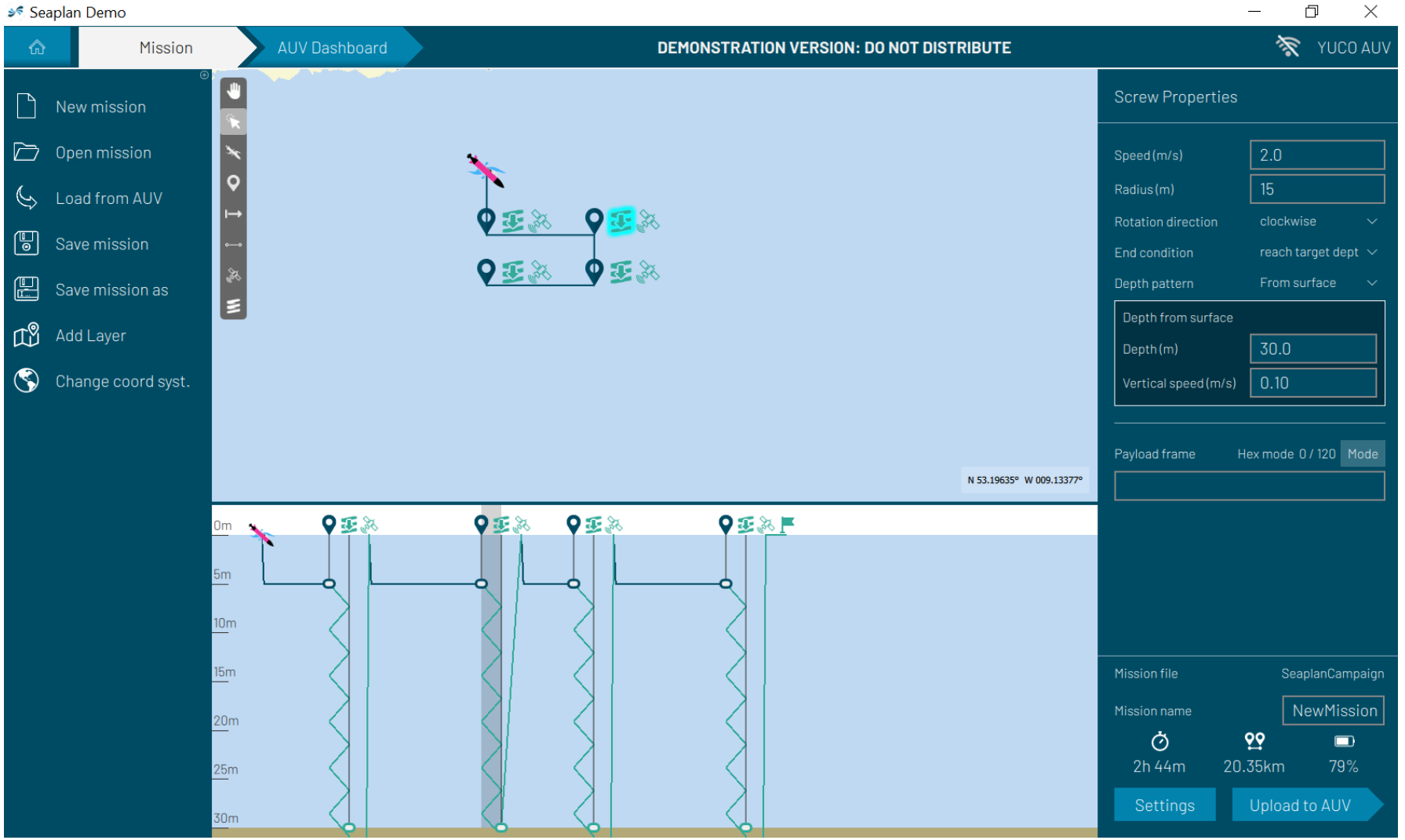
Menu and toolbar

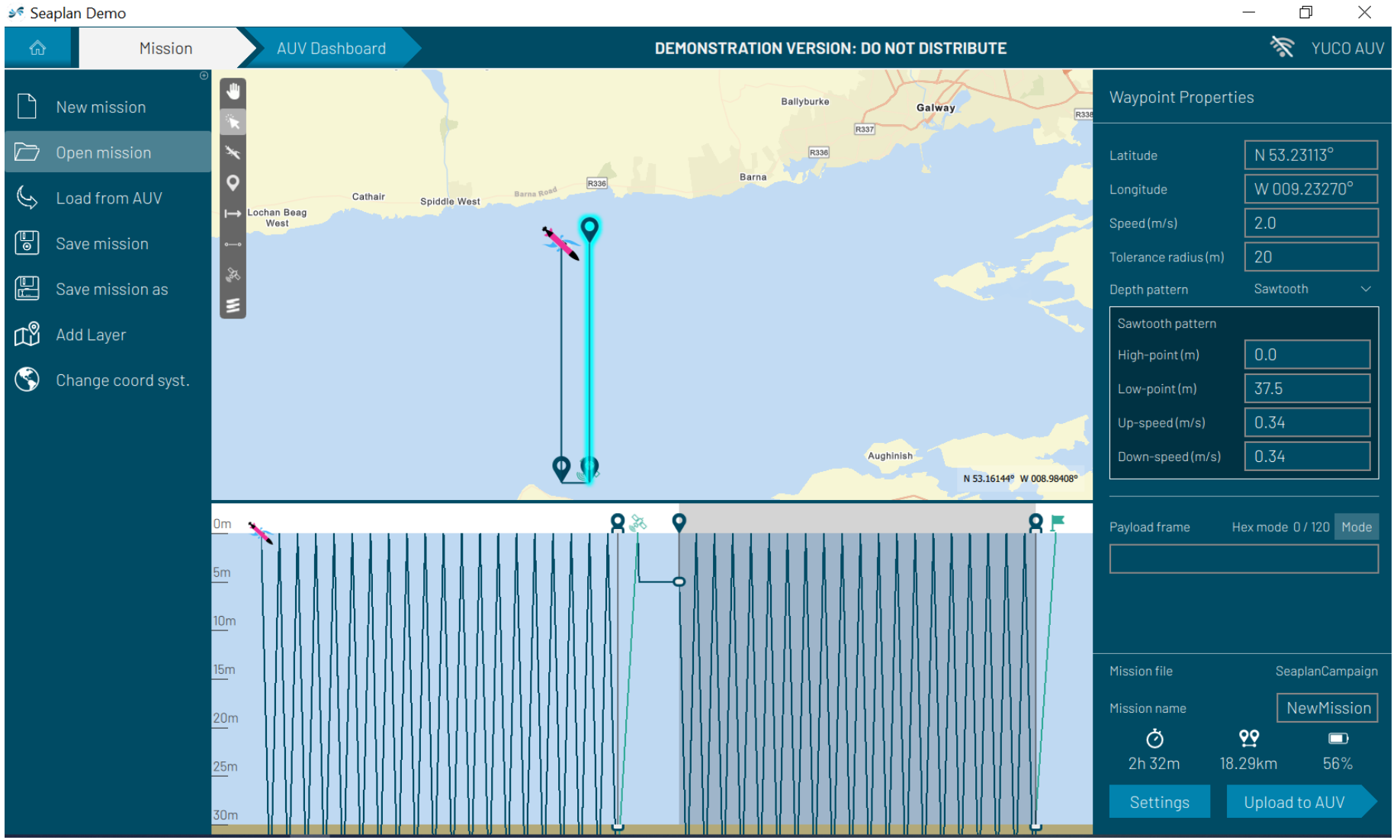


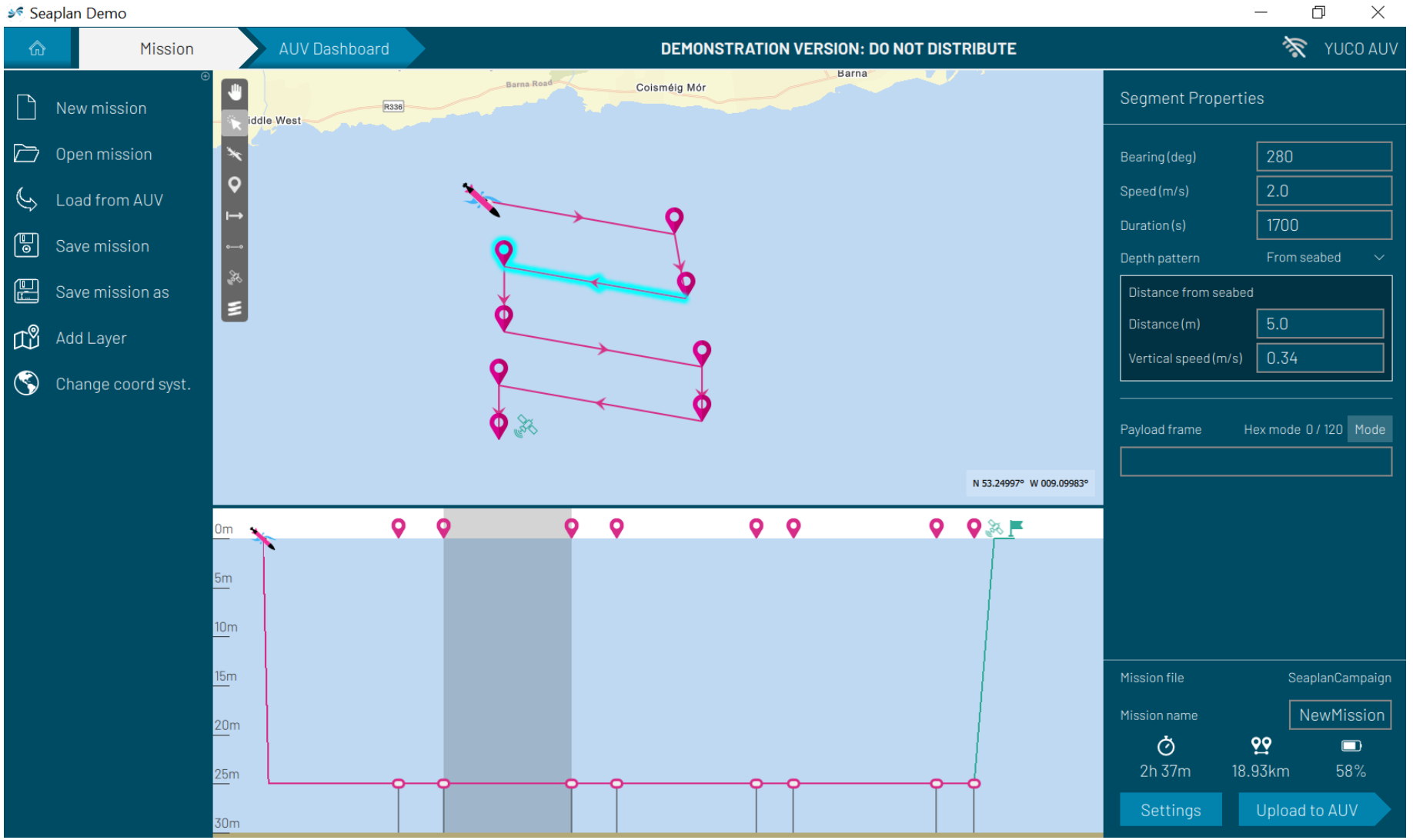
Depth view

Step properties

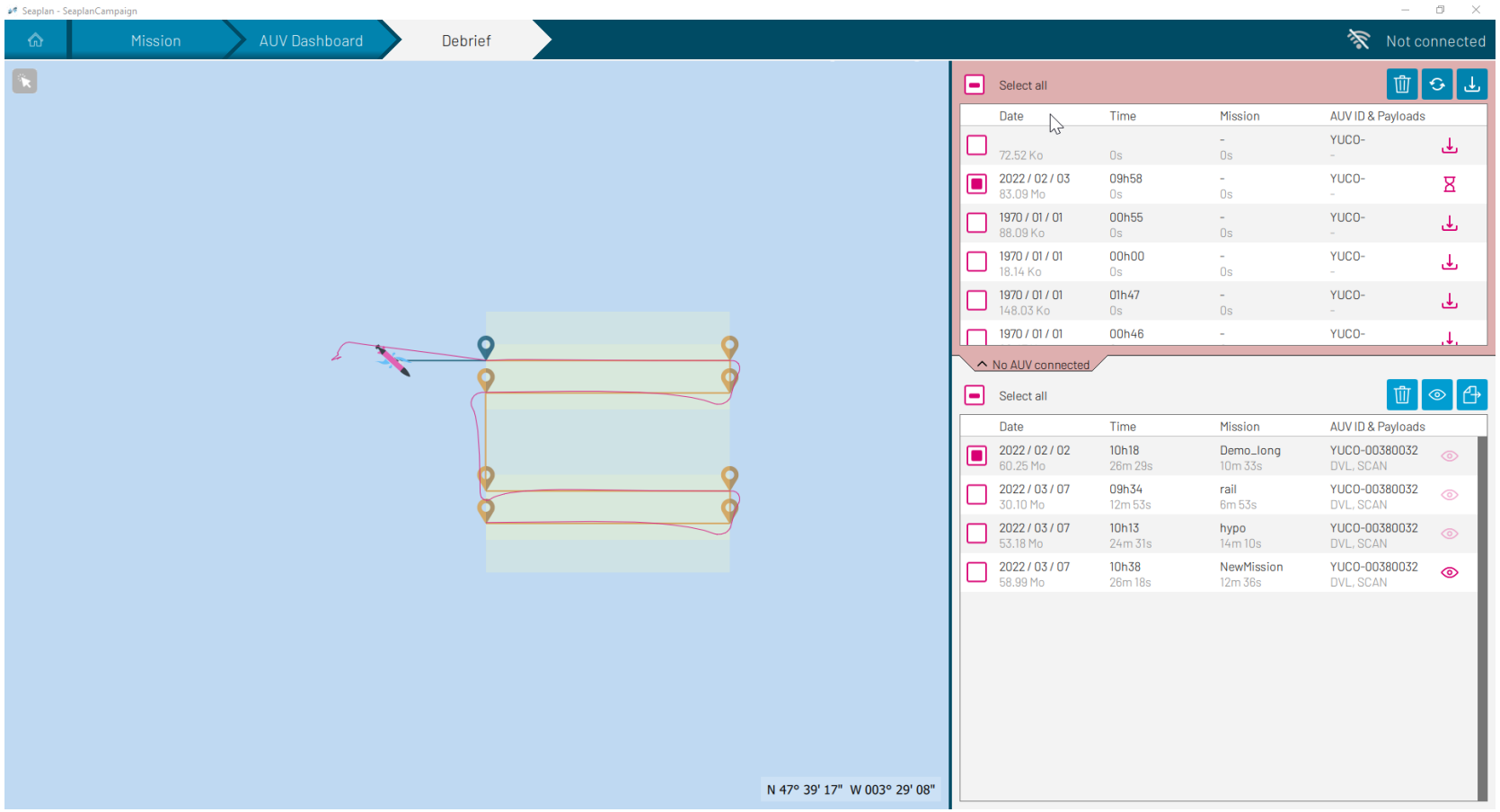
Mission summary


Seaplan Demo
Mission
AUV Dashboard
DEMONSTRATION VERSION: DO NOT DISTRIBUTE
YUCO AUV
New mission
Open mission
Load from AUV
Save mission
Save mission as
Add Layer
Change coord syst.
N 53.19635° W 009.13377°
0m
5m
10m
15m
20m
25m
30m
Screw Properties
Speed (m/s) 2.0
Radius (m) 15
Rotation direction clockwise
End condition reach target dept
Depth pattern From surface
Depth from surface
Depth (m) 30.0
Vertical speed (m/s) 0.10
Payload frame
Hex mode 0 / 120
Mode
Mission file SeaplanCampaign
Mission name NewMission
2h 44m
20.35km
79%
Settings
Upload to AUV


Seaplan Demo
Mission
AUV Dashboard
DEMONSTRATION VERSION: DO NOT DISTRIBUTE
YUCO AUV
New mission
Open mission
Load from AUV
Save mission
Save mission as
Add Layer
Change coord syst.
Ballyburke
Galway
Barna
Cathair
Spiddle West
Lochan Beag West
Aughinish
N 53.16144° W 008.98408°
0m
5m
10m
15m
20m
25m
30m
Waypoint Properties
Latitude
N 53.23113°
Longitude
W 009.23270°
Speed (m/s)
2.0
Tolerance radius (m)
20
Depth pattern
Sawtooth
Sawtooth pattern
High-point (m)
0.0
Low-point (m)
37.5
Up-speed (m/s)
0.34
Down-speed (m/s)
0.34
Payload frame
Hex mode 0 / 120
Mode
Mission file
SeaplanCampaign
Mission name
NewMission
2h 32m
18.29km
56%
Settings
Upload to AUV

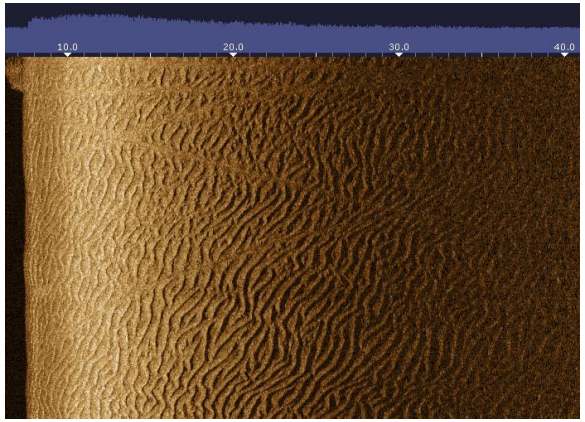

Seaplan Demo
Mission
AUV Dashboard
DEMONSTRATION VERSION: DO NOT DISTRIBUTE
YUCO AUV
New mission
Open mission
Load from AUV
Save mission
Save mission as
Add Layer
Change coord syst.
Barna Road
Coisméig Mór
Barna
R336
N 53.24997° W 009.09983°
0m
5m
10m
15m
20m
25m
30m
Segment Properties
Bearing (deg)
280
Speed (m/s)
2.0
Duration (s)
1700
Depth pattern
From seabed
Distance from seabed
Distance (m)
5.0
Vertical speed (m/s)
0.34
Payload frame
Hex mode 0 / 120
Mode
Mission file
SeaplanCampaign
Mission name
NewMission
2h 37m
18.93km
58%
Settings
Upload to AUV

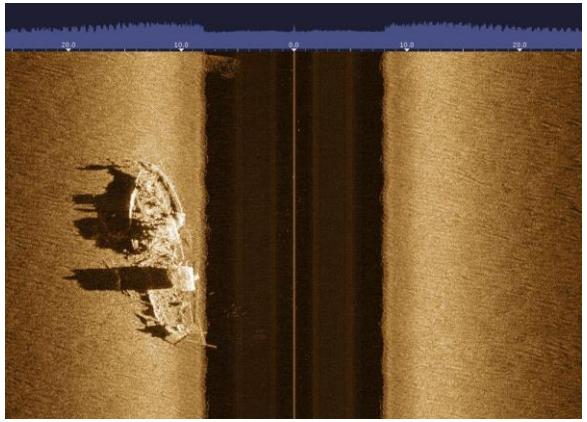
Mission debriefs

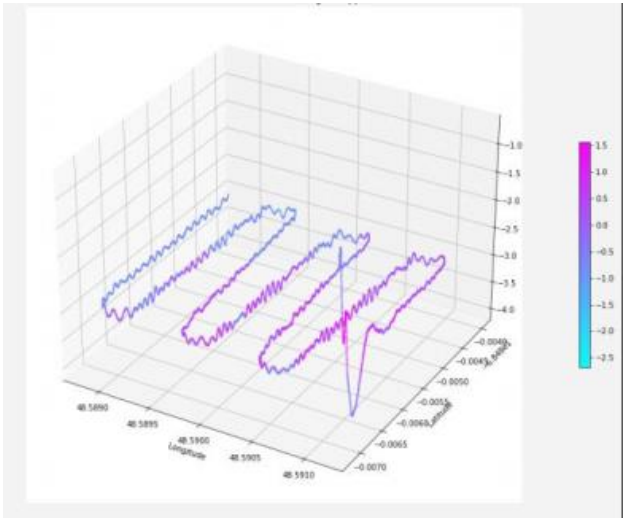


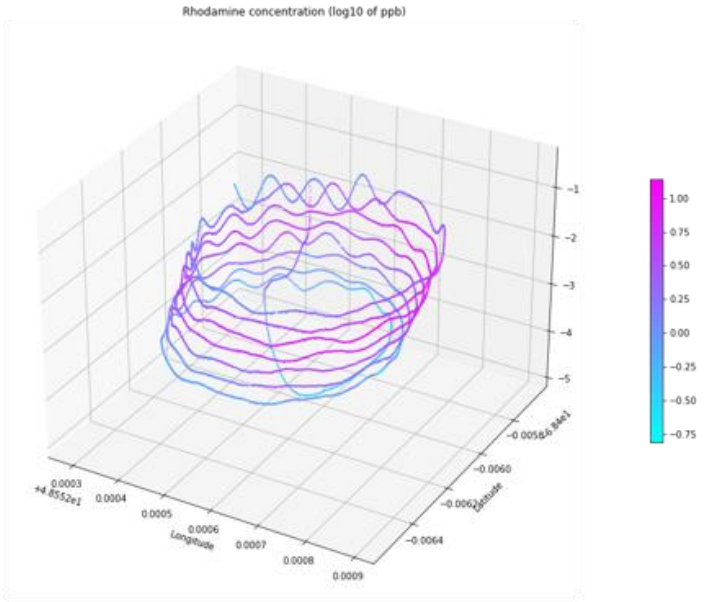
- Sensor synch with nav in csv
- All nav and internal files at 20Hz

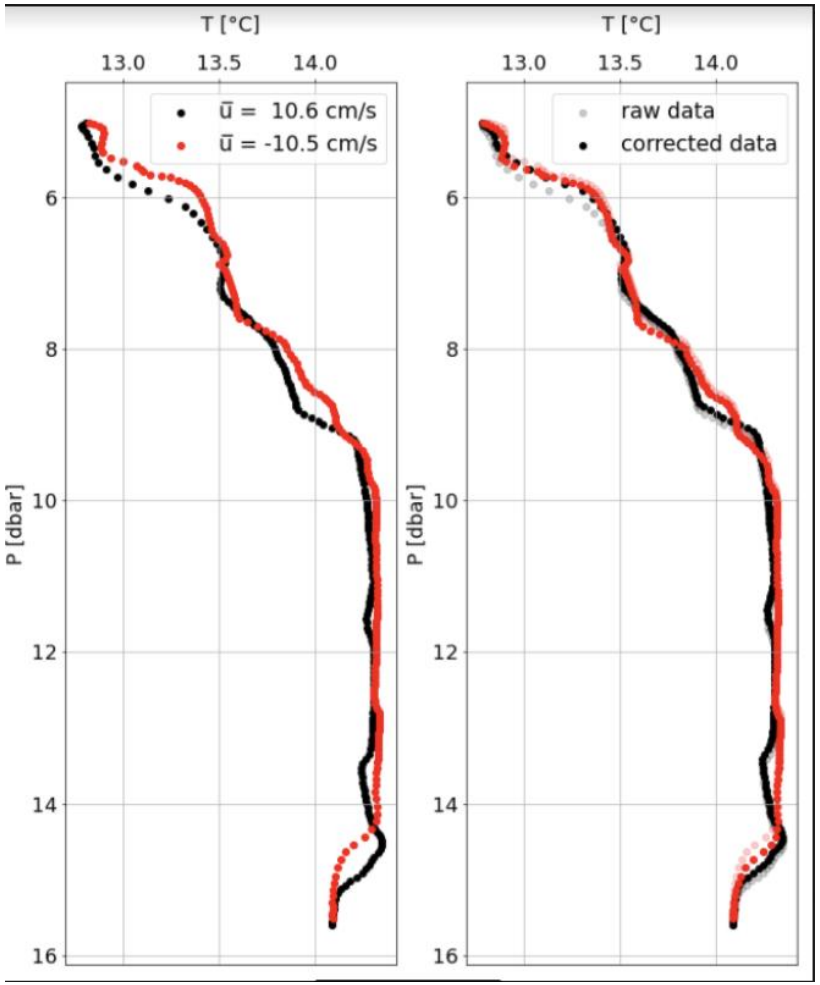
Some data...


10.0
20.0
30.0
40.0






Rhodamine concentration (log10 of ppb)
Latitude
Longitude


T [°C]
13.0
13.5
14.0
ū = 10.6 cm/s
ū = -10.5 cm/s
raw data
corrected data
P [dbar]
6
8
10
12
14
16

In a nutshell

- increased periodicity, spatialization and duration of in-situ measurements with reduced costs,
- measurements in hard to access area,
- ability to deploy and recover from any type of vessel or even from the shore, and by non-trained operators,
- increased quality and variety of measurements.

Some partners / customers...

Thanks

Thanks a lot ☺

… not sure there is time for questions so

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www.seaber.fr