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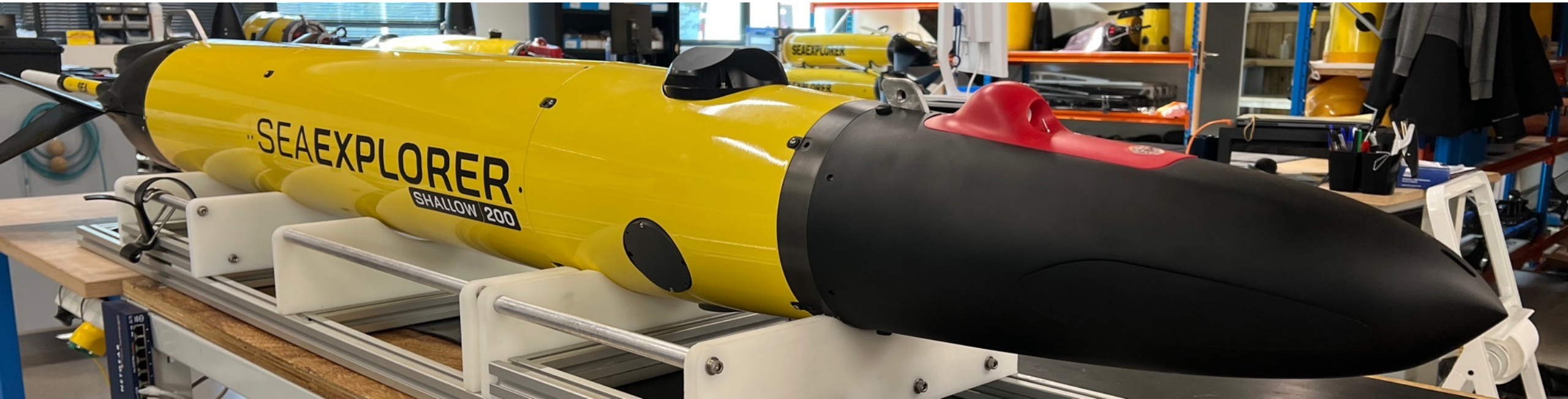
innovation & services at sea

IUGC2024

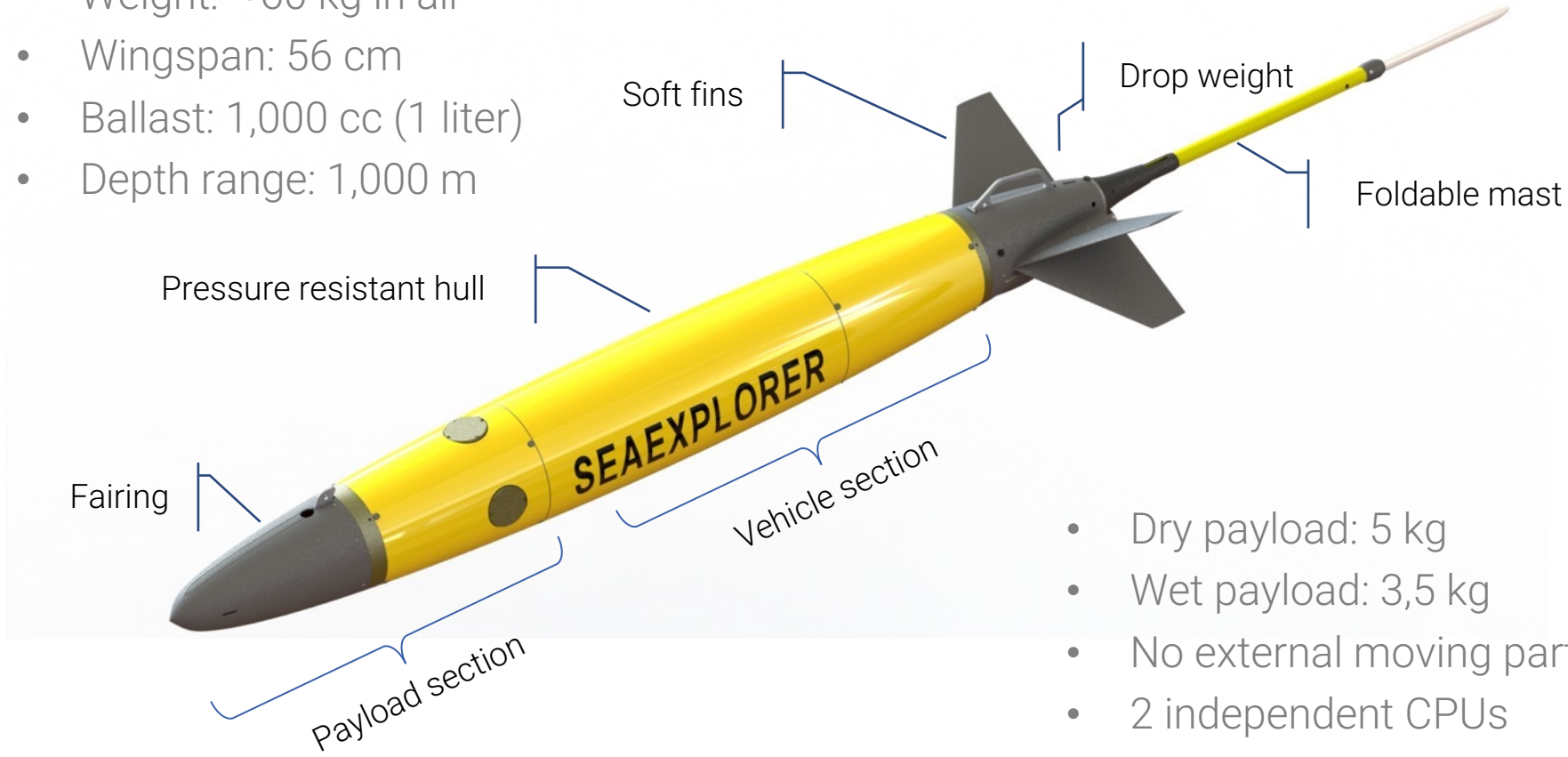
A new way to explore shallow waters: SeaExplorer Shallow

Jeremy Sitbon - 10/06/2024



What we do: SeaExplorer glider

- **General features**
  - Length: 2 m (+ 0,8m foldable antenna)
  - Weight: ~60 kg in air
  - Wingspan: 56 cm
  - Ballast: 1,000 cc (1 liter)
  - Depth range: 1,000 m



- Dry payload: 5 kg
- Wet payload: 3,5 kg
- No external moving parts
- 2 independent CPUs

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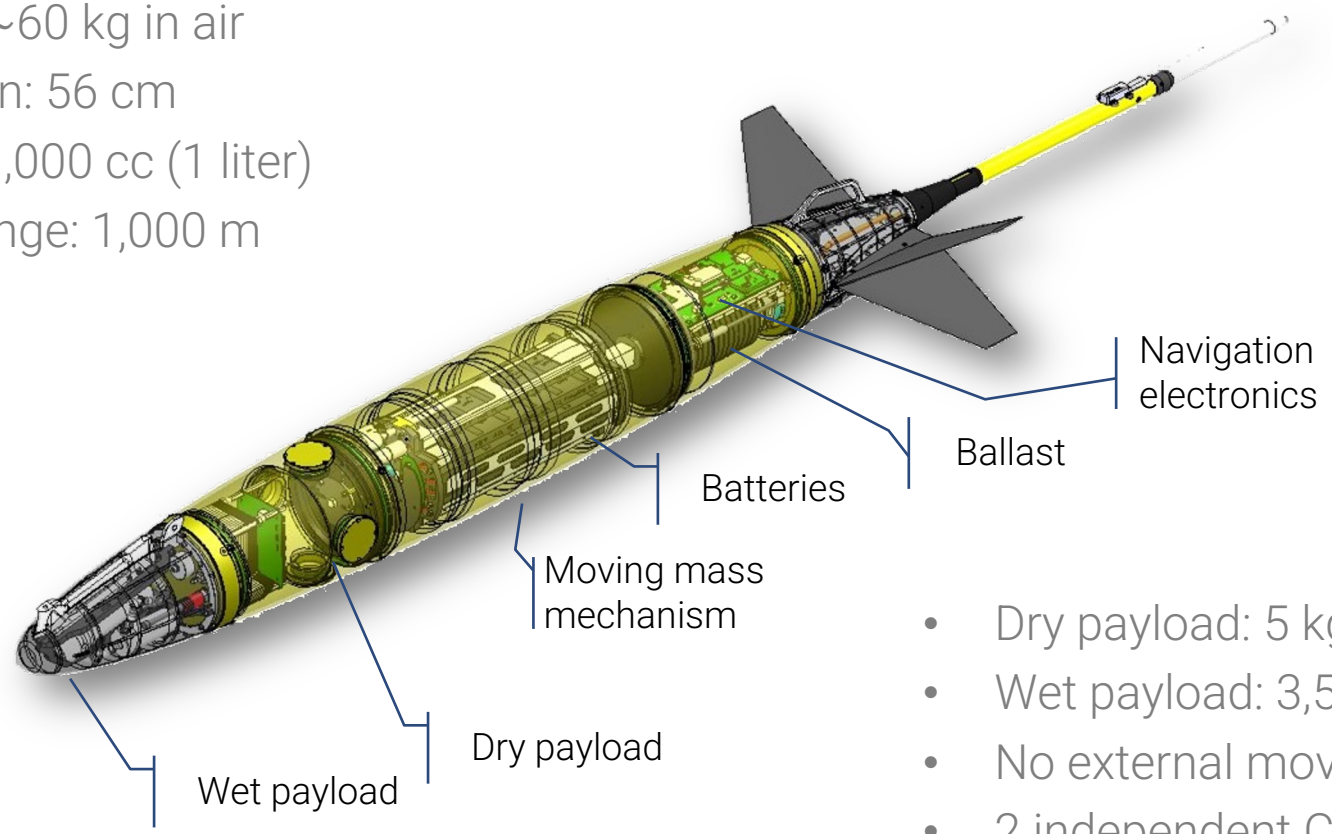

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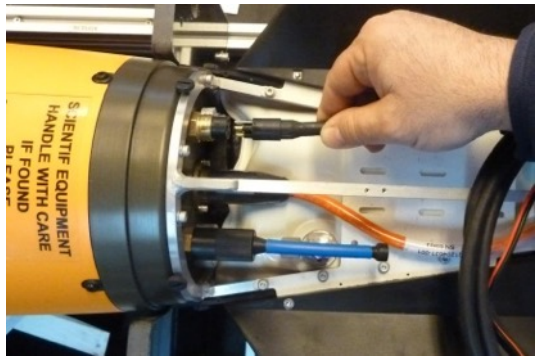
What we do: SeaExplorer glider

- **Rechargeable batteries**
  - ✓ No vehicle opening
  - ✓ No re-ballasting
  - ✓ No-recalibration
  - ✓ Cost Free reconditioning



- **Interchangeable Payload Sections**
  - ✓ Modularity for quick payload replacement
  - ✓ Easy disconnection of payload sections

→ Immobilization time and costs drastically reduced!

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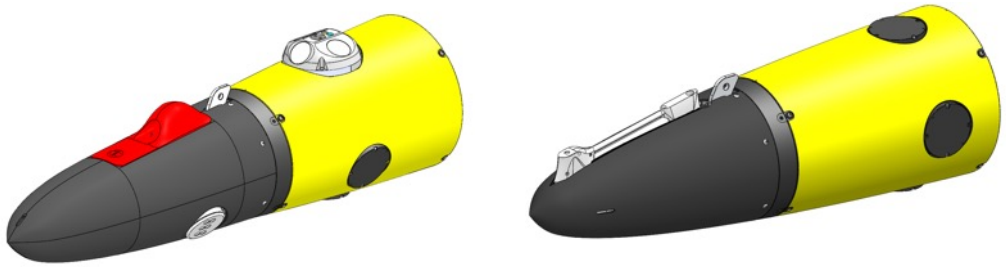
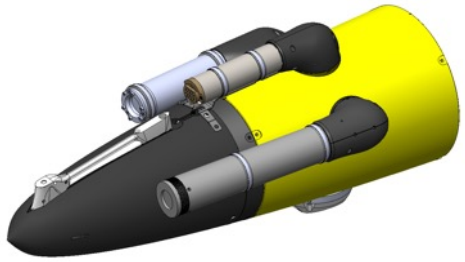
Sensors and scientific applications

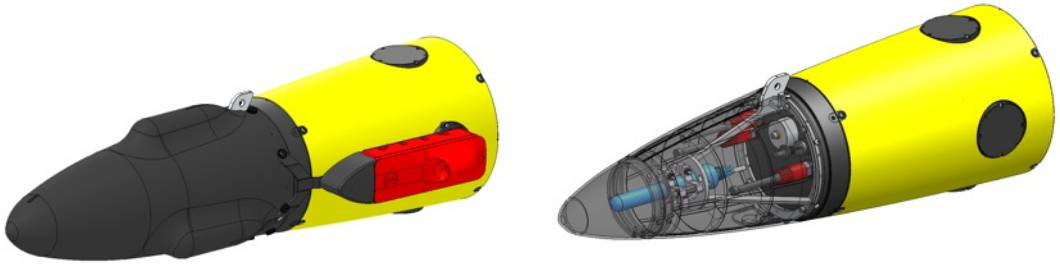
- **Physical oceanography**
  - Conductivity, Temperature Depth
  - Current: ADCP



- **Dissolved Gas** (Thursday - 11:45)
  - O2 / CO2 / CH4 / PH
  - Fluorometers



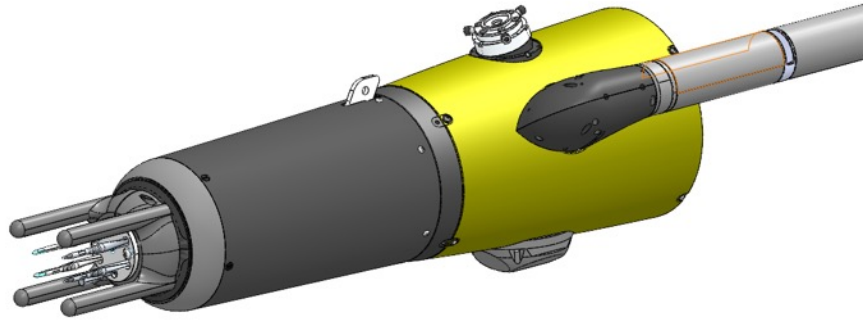
- **PAM (Passive acoustic monitoring)**
  - AURIS (Tuesday - 16:45)
    - Onboard processing / AI
    - Backseat driving
    - 4 to 8 hydrophones
  - Porpoise



Sensors and scientific applications

- **Biogeochemistry: (phytoplankton, zooplankton)**
  - Fluorometers
    - Tridente
    - FLNTU / FLBBCD / FLBBPE / FLBBPC
    - FRFF
  - UVP6 (Wednesday - 10:00)
  - UBAT
  - Echosounder (IMAGENEX)

- **Specific applications**
  - Microstructure (MR1000G)
  - Nitrate (SUNA)
  - Irradiance (MPE-PAR / OCR-504)
  - Lab On Chip



- **Configuration on demand**

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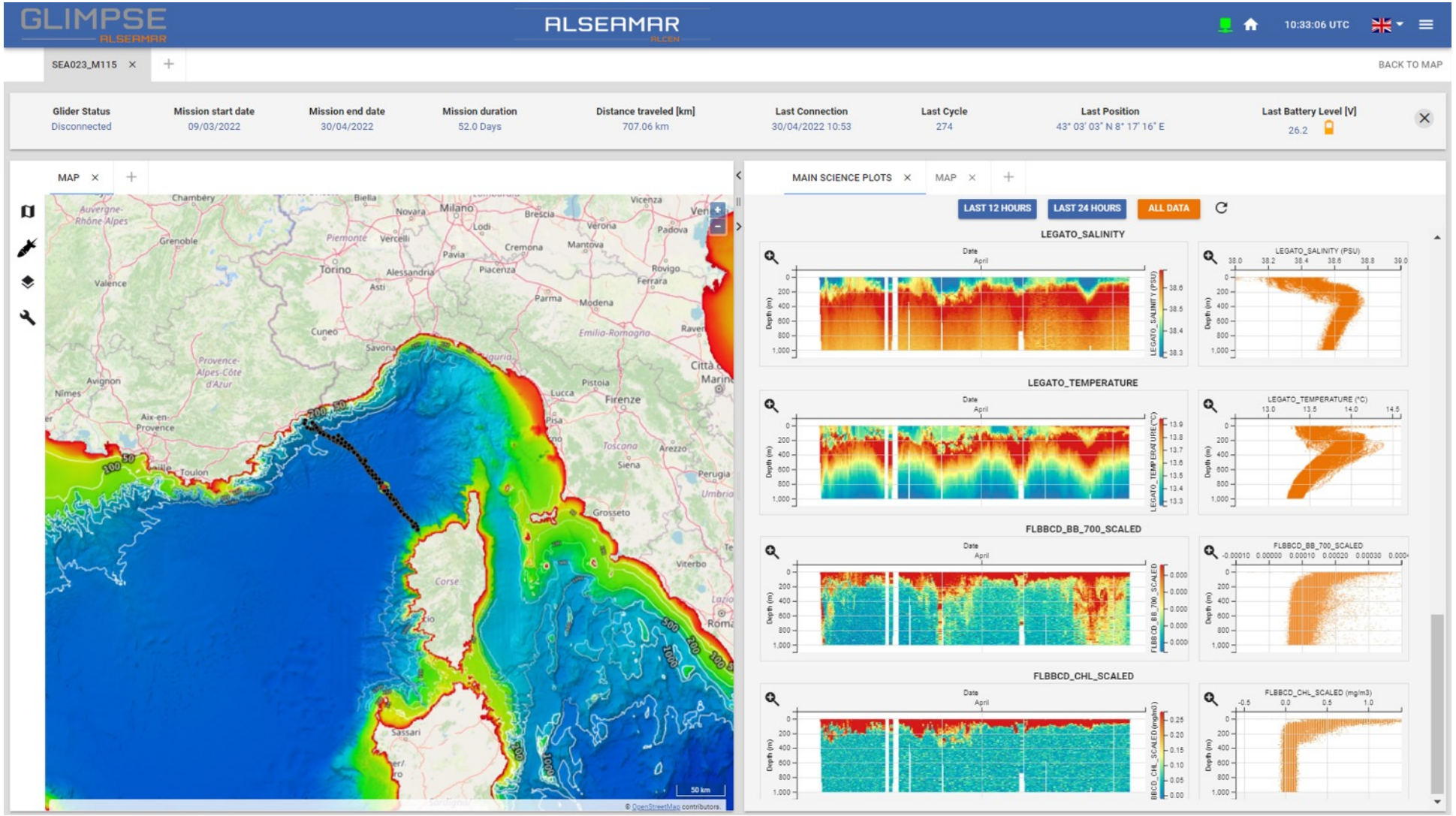
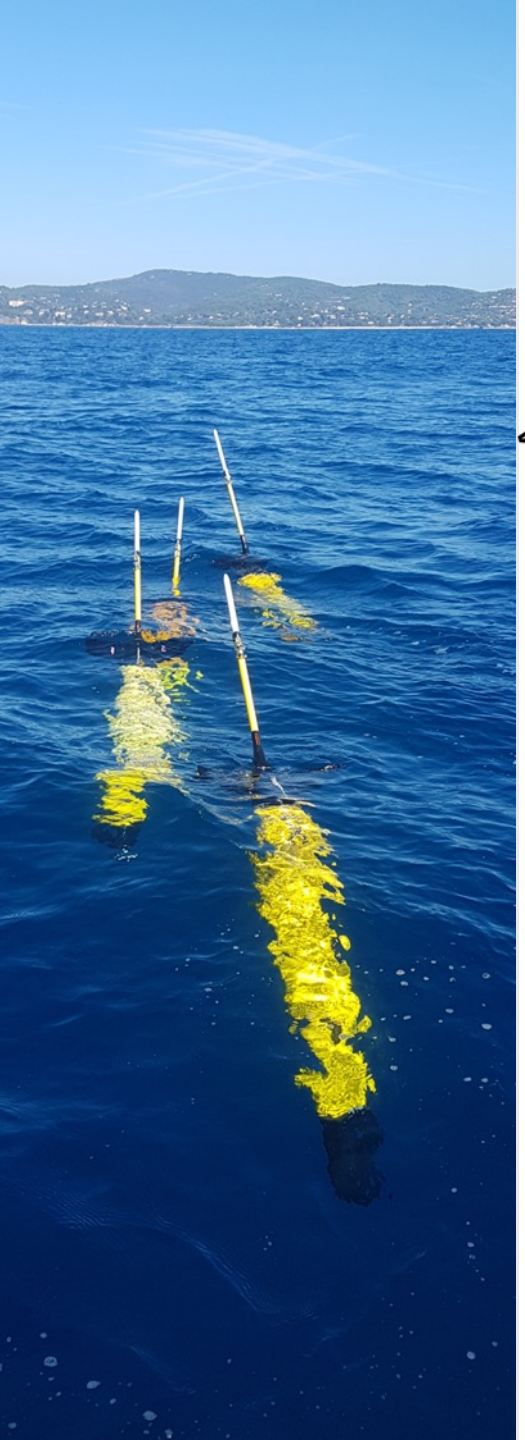
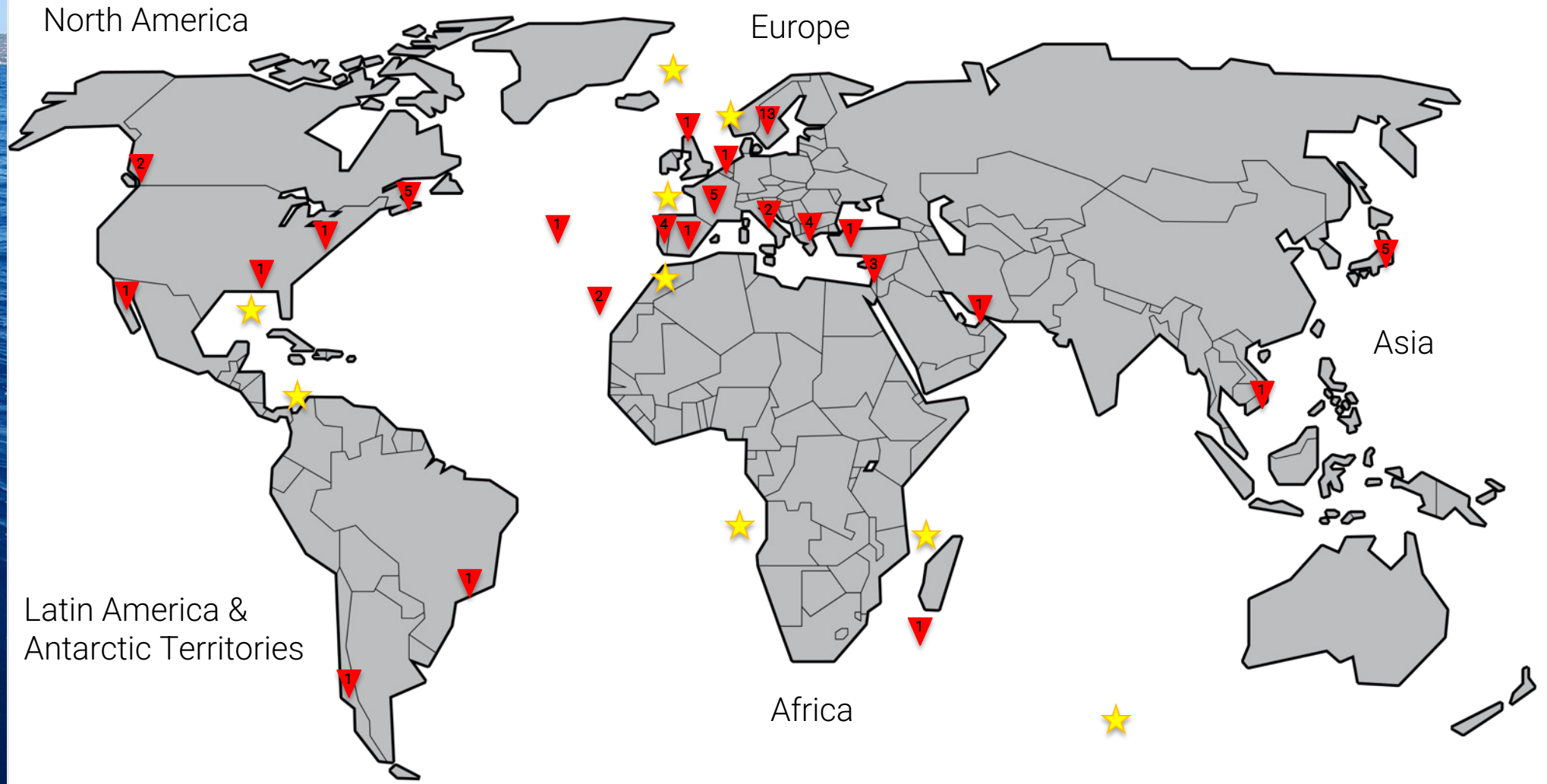
Piloting - Mission planning - Real time data analysis

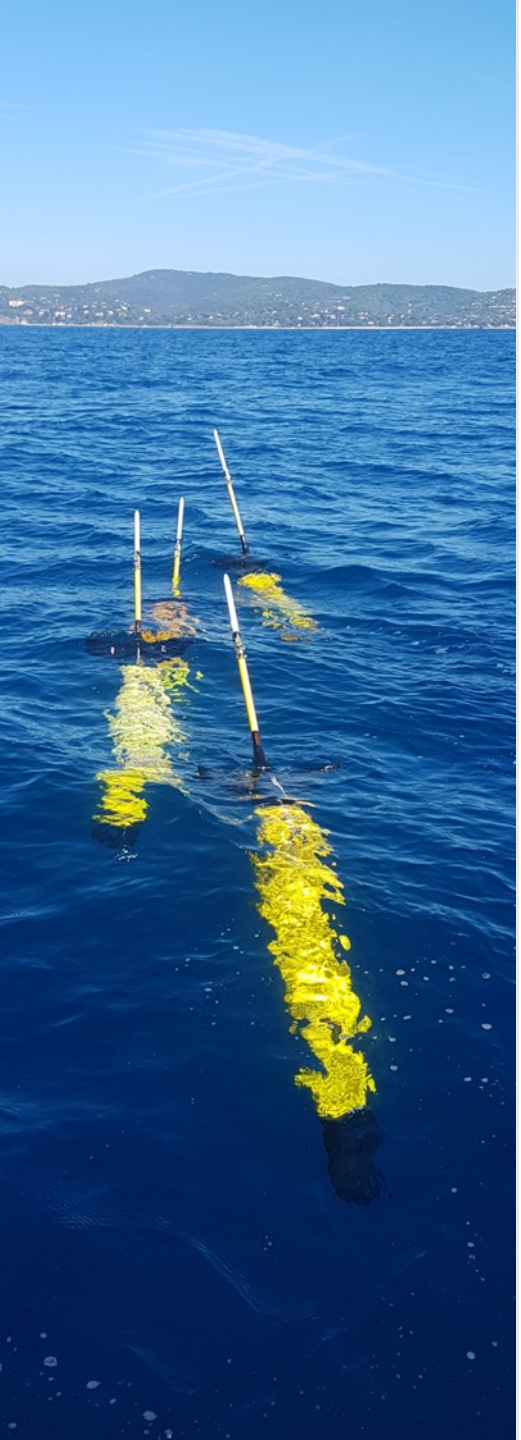


Workshop Tuesday – 13:30



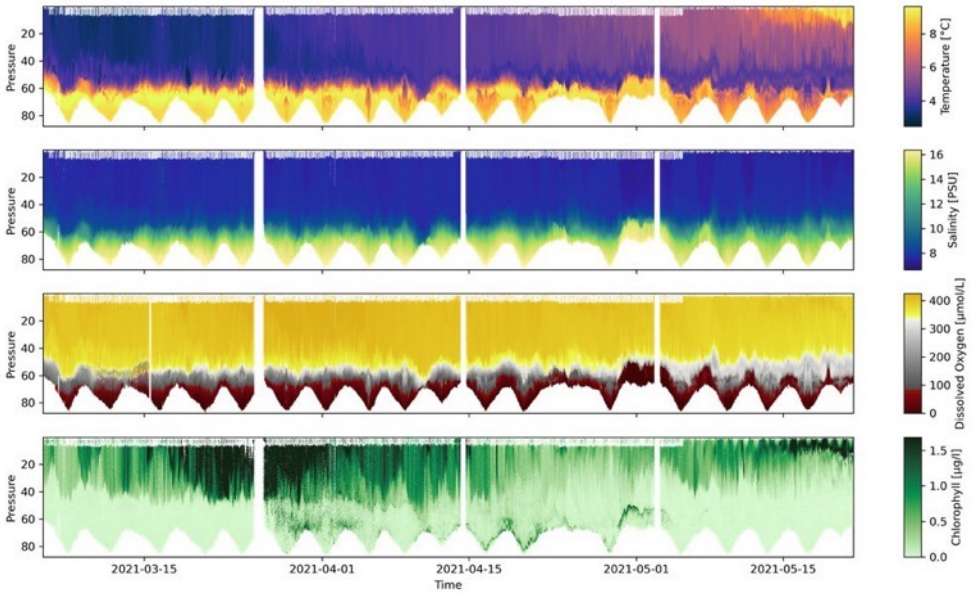
Community of users (feb 2023)





Community of users

- **Voice of the Ocean & University of Gothenburg (Sweden)**
  - The SAMBA program provides high resolution observations in the Baltic Sea thanks to several permanent glider observatories, providing new insights into short term, patchy and submesoscale processes, as well as long-term processes.



The Baltic Sea and coastal environment issues

- The continental shelf represents about **27 million square kilometers** with a typical depth of **100-200m.**

  Monitoring the coastal environment:

  - Physical oceanography
  - Pollution
  - Fisheries
  - Mammals near human activities
  - …

- The SeaExplorer system is fine tuned to be **most efficient in waters up to 1000m.**
- SeaExplorer is rechargeable, easy and quick to turn around (1day) so usable in these challenging environments

ShallowExplorer:

Alseamar's efficient shallow water solution

- Based on the SeaExplorer knowledge we have been working since 2022 on the newest solution for long-endurance in shallow-water

ShallowExplorer - Energy

- **Energy:**
  - Rechargeable Li-ion – charges in 6 hours
  - Single battery
  - Double battery option

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ShallowExplorer - Ranges

- **Ranges** (at 200m with CTD - DO):
  - Single battery: **65 days** and **1,290 km**
  - Double battery: **112 days** and **2,200 km**

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ShallowExplorer - Size

- **Size:**
  - Single battery: Length: **2,20 m** - Weight: **65 kg**
  - Double battery: Length: **2,70 m** - Weight: **90 kg**
  - Diameter: **23 cm**
  - Wing span: **65 cm**

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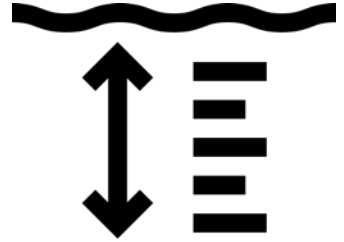
ShallowExplorer – Depth & Ballast

- **Depth :**
  - Maximum **200m** - typical 60m
  - Minimum
    - Propelled: **5m**
    - Gliding: **20m**
- **High efficiency ballast**
- Extra large volume: **1600cc**
- **Flies in high density gradients**
  - 2x batteries: **15-17Δσ**
  - 1x battery: **20-24Δσ**



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ShallowExplorer – General

- Software and Electronics
  - **Shared with the SeaExplorer**
- Piloting
  - **GLIMPSE compatible**
- Payloads
  - **100% SeaExplorer compatible**
- Robust design
  - **No external moving part**

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Thrusters option

- Maximum speed: **2 knots**
- Same battery consumption no matter the depth
- **Horizontal flights** / propelled saw tooth
- **Hybrid vehicle**

- Dual propellers
- Efficient turning radius
- **Foldable blades**

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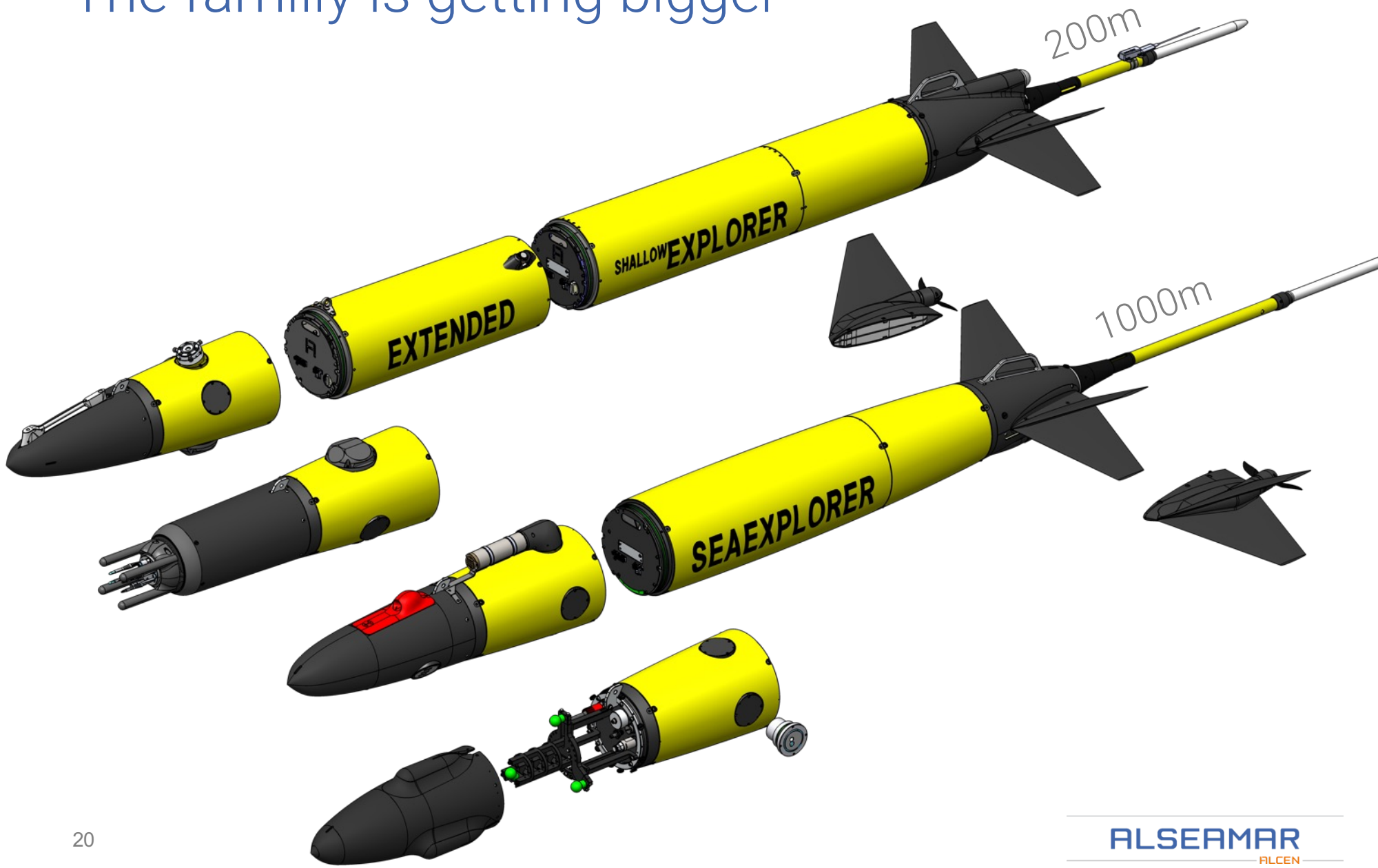
Thrusters option

- Shallow capabilities
- **Surface propulsion**
- Compatible Shallow and SeaExplorer

- Available **NOW**

The familly is getting bigger



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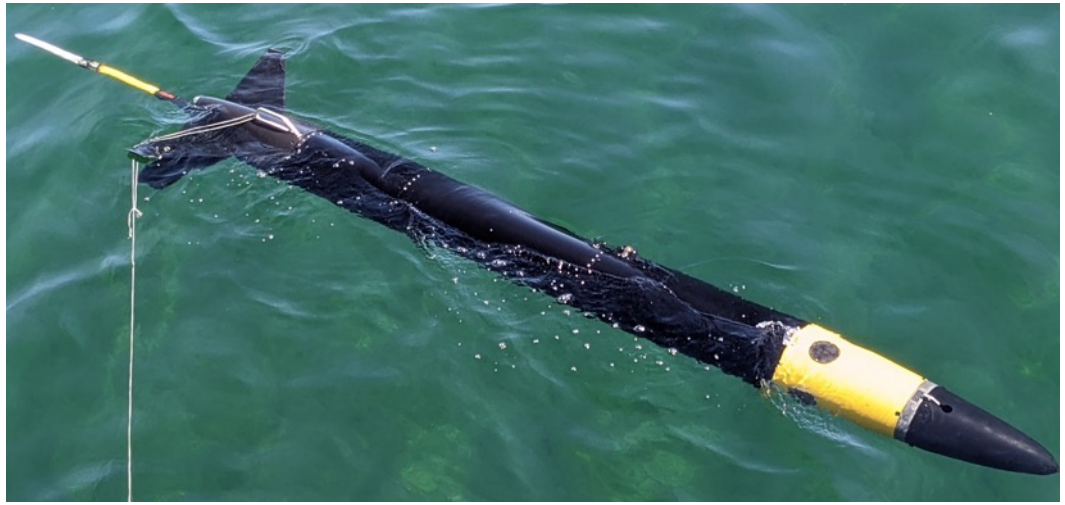
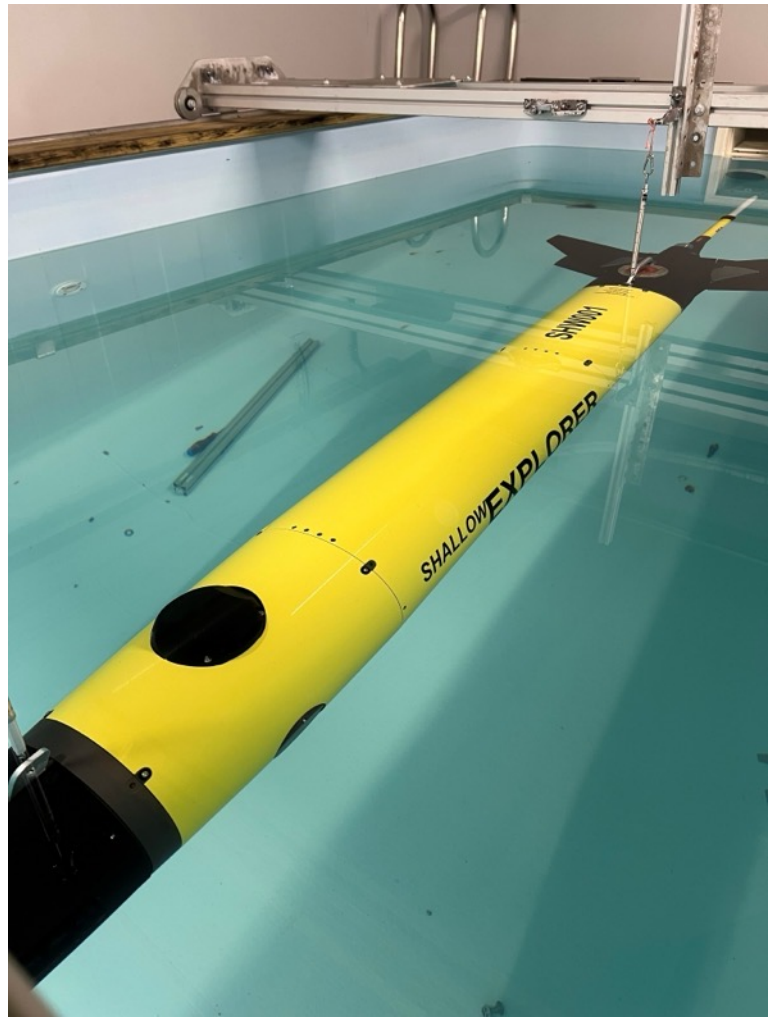
ShallowExplorer timeline

- Glider robustness tests at sea **NOW**
- Full system first deliveries **2025**
- Available to everyone **2026**
- Available **NOW** in pre-order





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