



# HGF Alliance ROBEX Robotic Exploration of Extreme Environments

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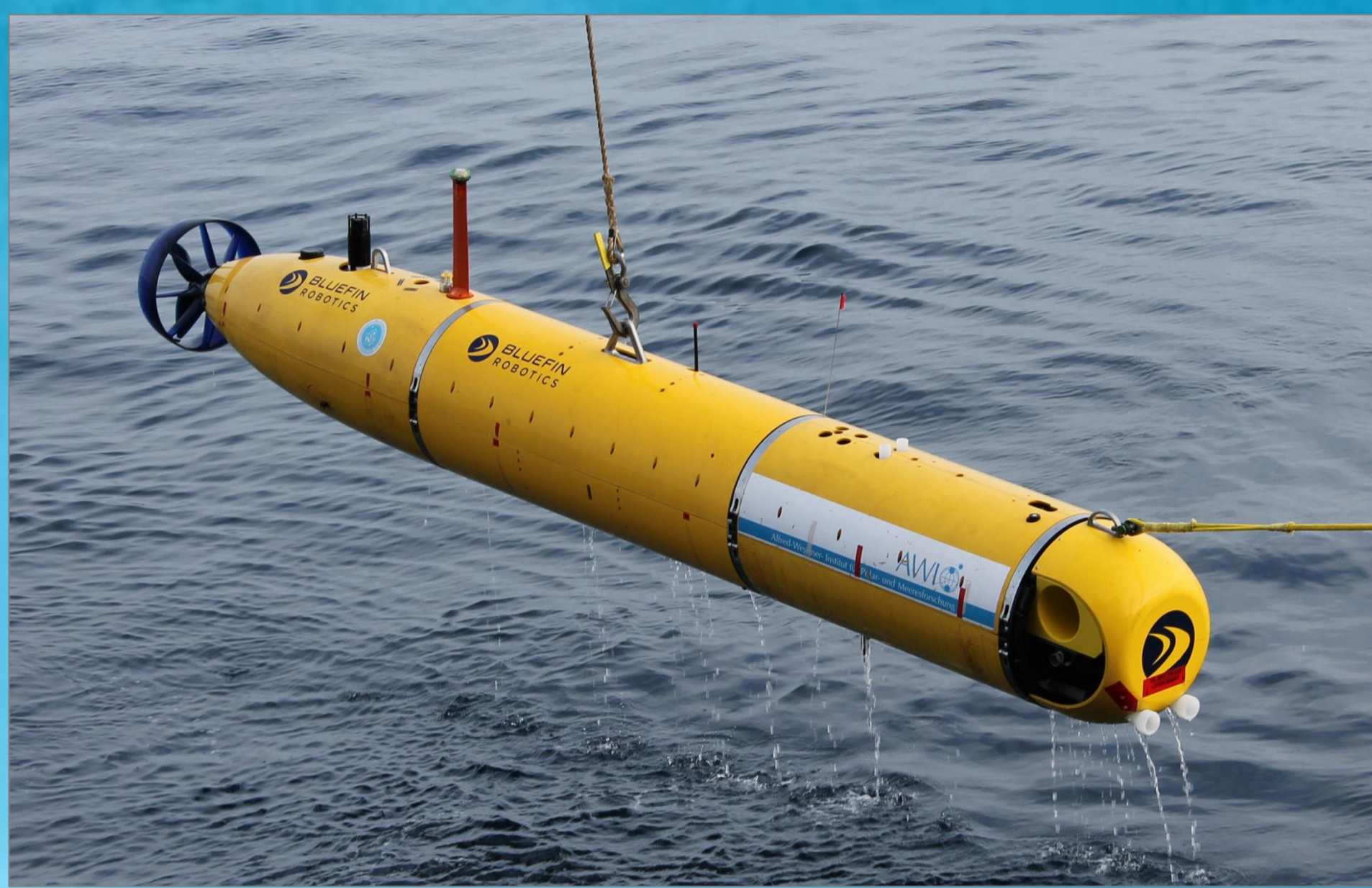
## Investigating the Basis of the Marine Food Chain with an AUV

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### Vehicle

1.

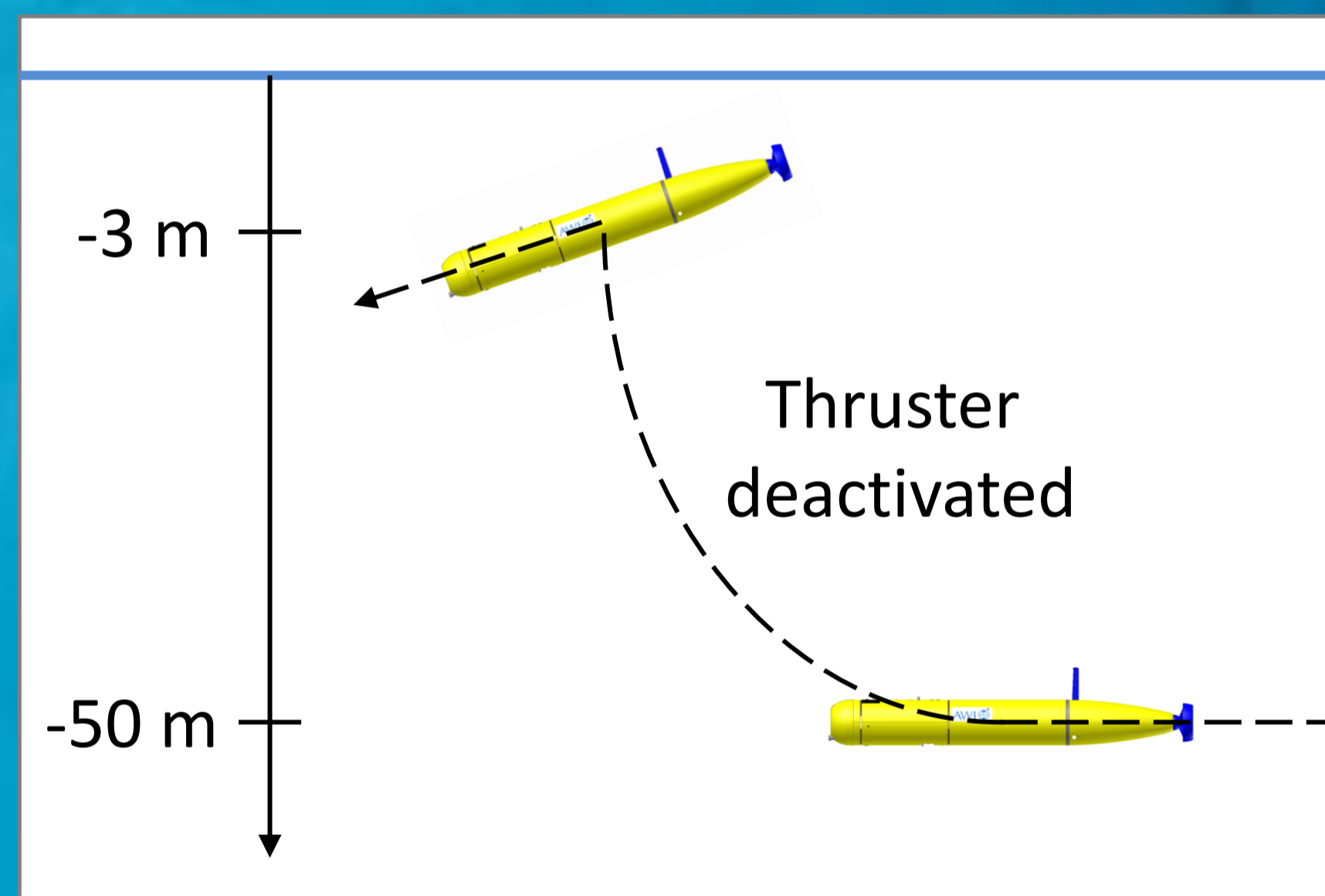
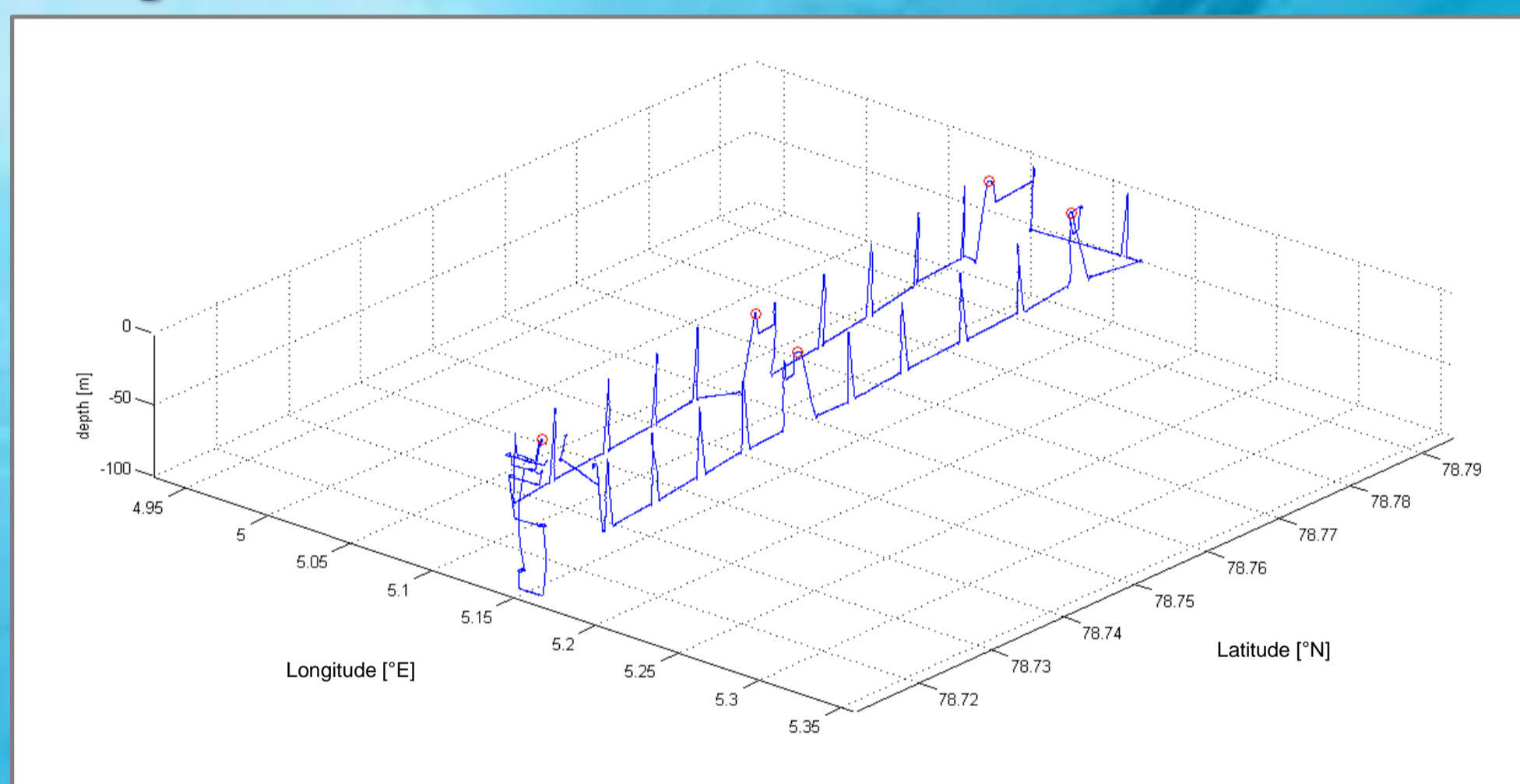


#### Parameters / Instrumentation:

- Conductivity
- Temperature
- Pressure
- Nitrate
- Photosynthetically Active Radiation
- Carbon Dioxide
- Fluorescence (Chlorophyll a)
- Fluorescence (CDOM)
- Dissolved Oxygen
- Sample Collector

### Operation

2.

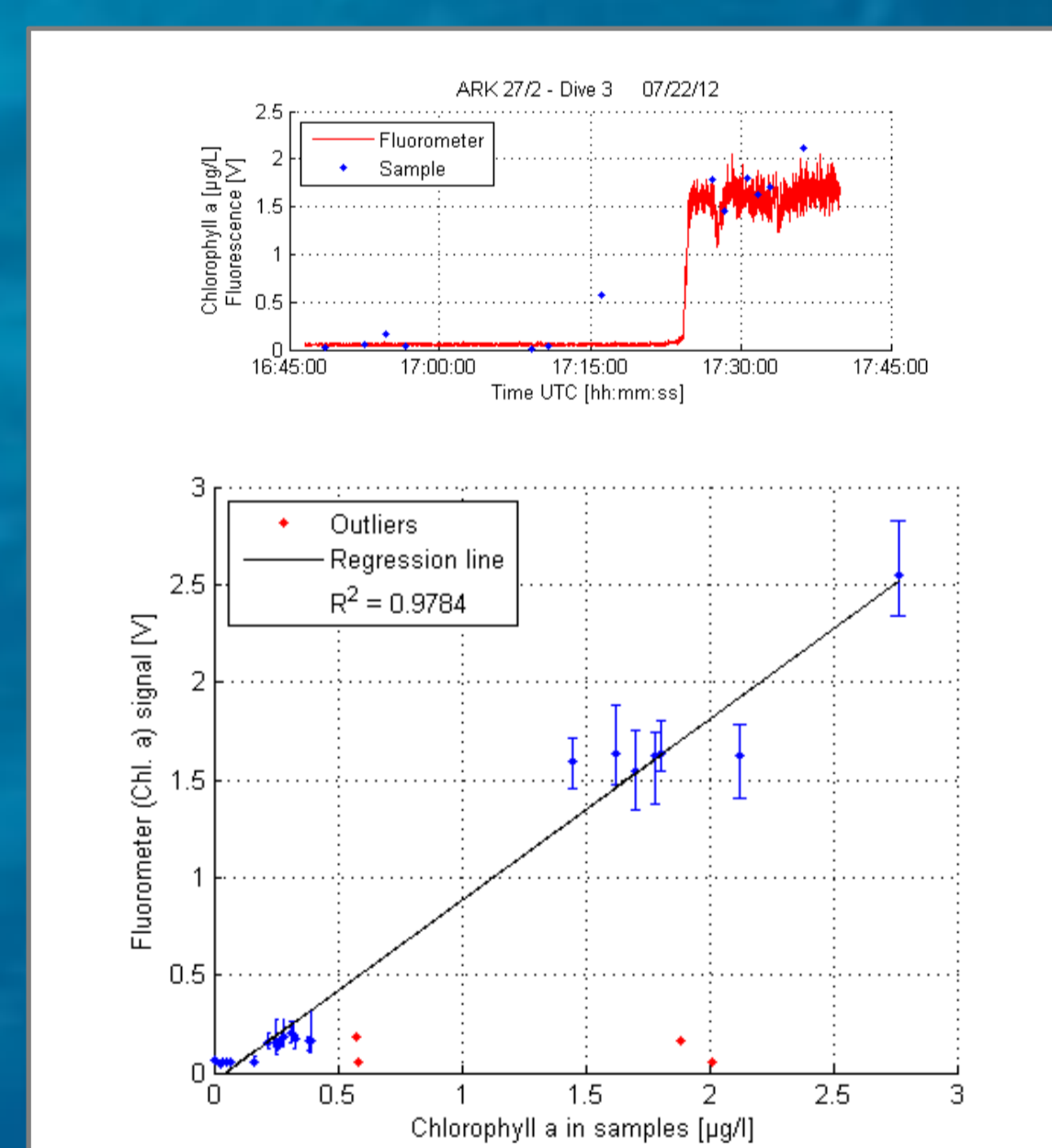
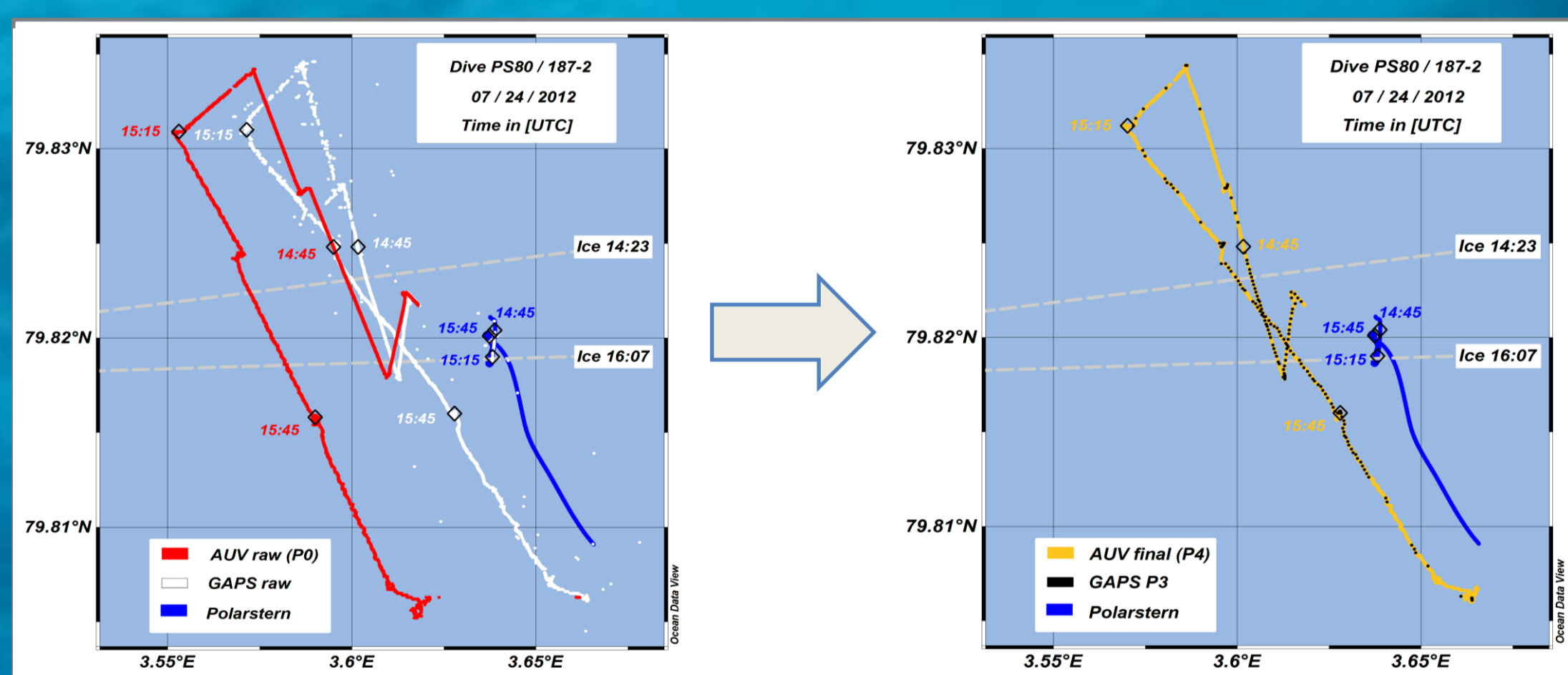


#### Float Maneuver:

- Thruster deactivated
- > Vehicle ascends slowly
- > Little disturbance of surface water stratification
- > High resolution vertical profile
- Repeated Floats for 3D investigation

### Data processing

3.



#### Data Correction (left image):

- Acoustic vehicle tracking
- > Correction of navigation errors
- > Resilient georeferencing

#### Sensor Calibration (right image):

- Collecting water samples during the dive
- > In-situ calibration of sensor data
- > Quantitative Chlorophyll a data

### Results

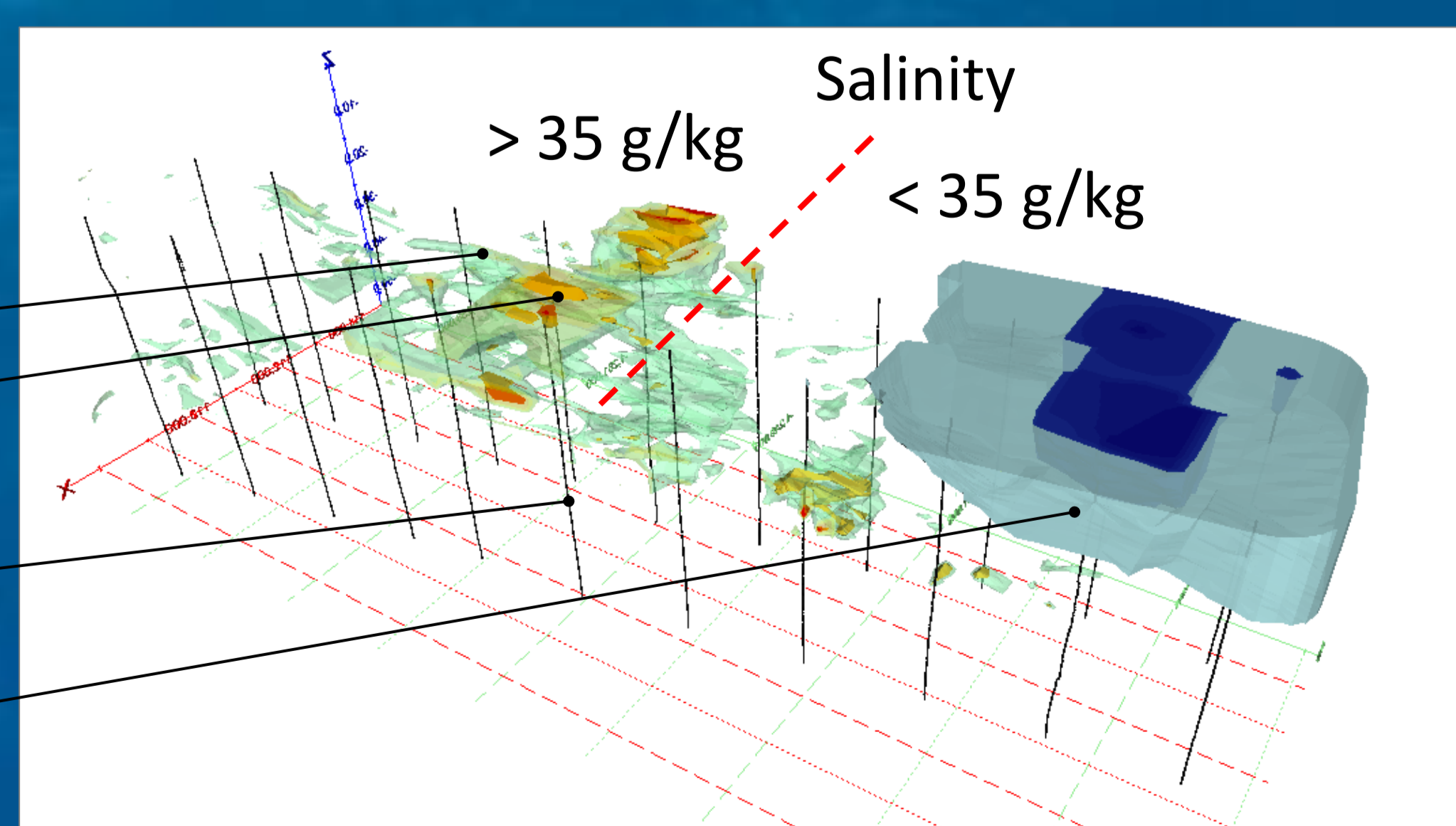
4.

Chlorophyll a concentration:

- > 2.5  $\mu\text{g/l}$
- > 4.0  $\mu\text{g/l}$

Ascend during Float maneuver

10 m thick melt water layer (salinity < 34.5 g/kg)



#### Dive in Arctic Marginal Ice Zone:

- > Chlorophyll a as tracer for phytoplankton and marine primary production
- > Almost synoptic, volumetric investigation of phytoplankton standing stock
- > "Patchy" distribution of phytoplankton along ice edge