



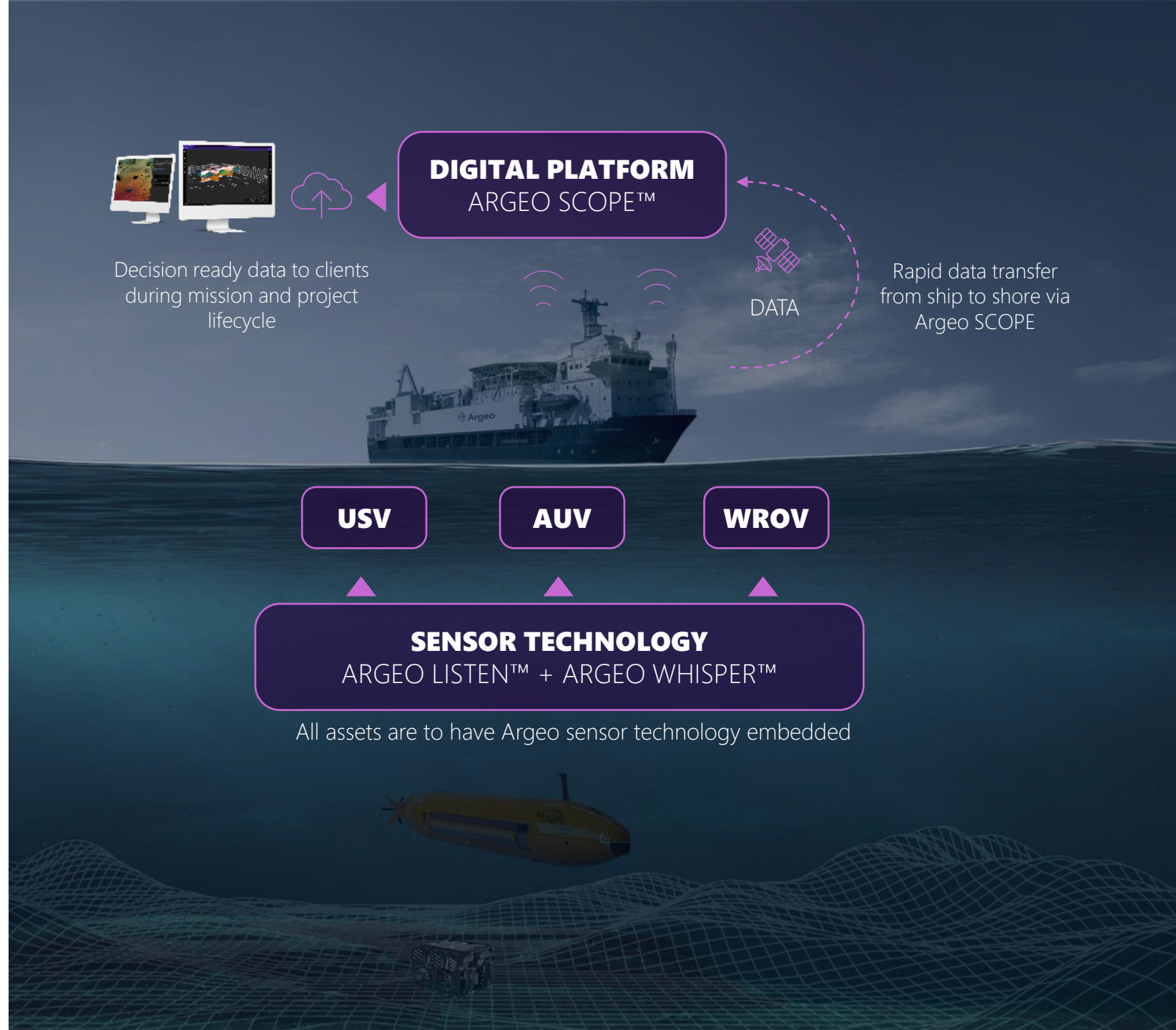
Automating seabed mapping and object detection

Oceanology International, March 2024

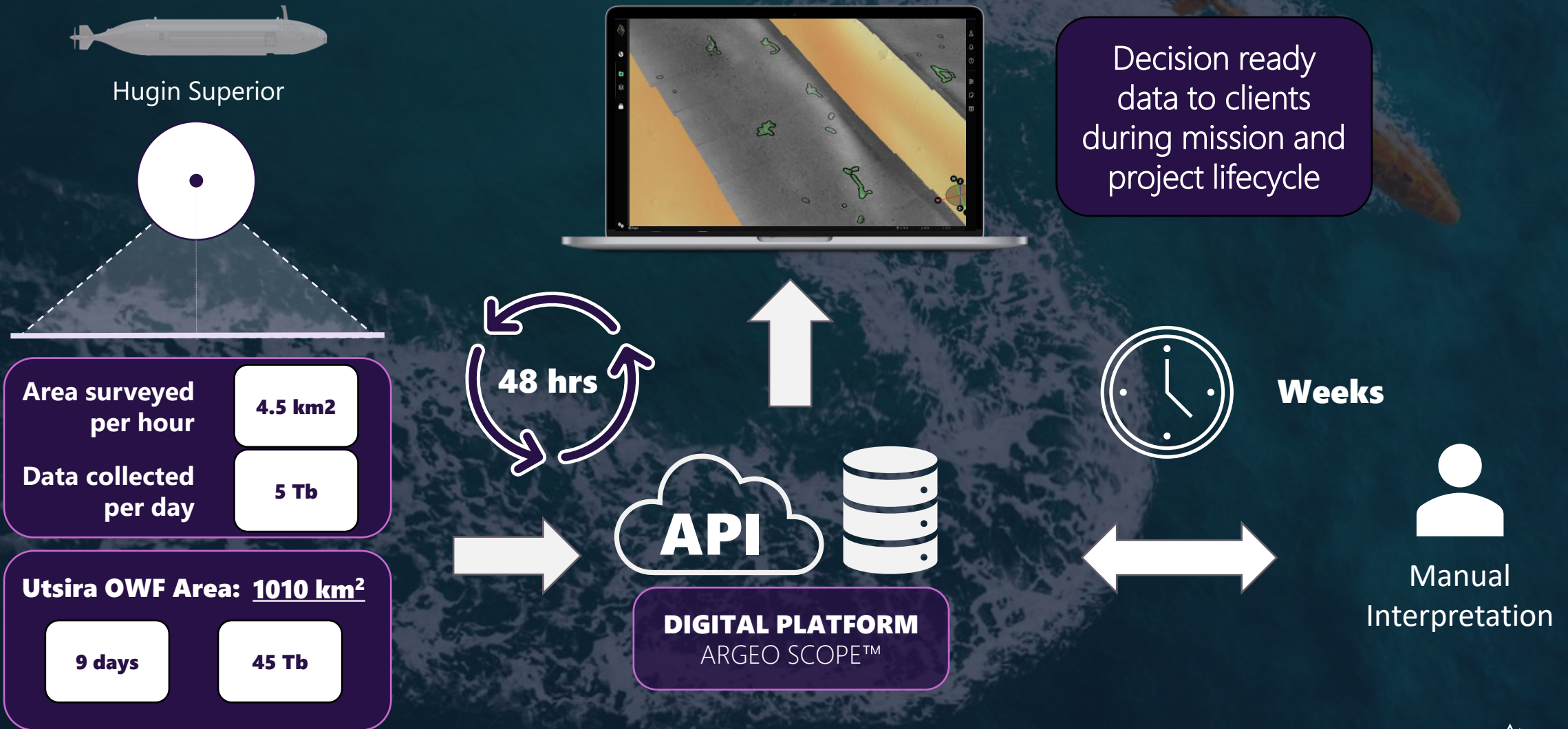
Kristian Hjorth, Product Manager Argeo SCOPE

Complete subsea service provider

From acquisition to
actionable data



Information flow during seabed surveys



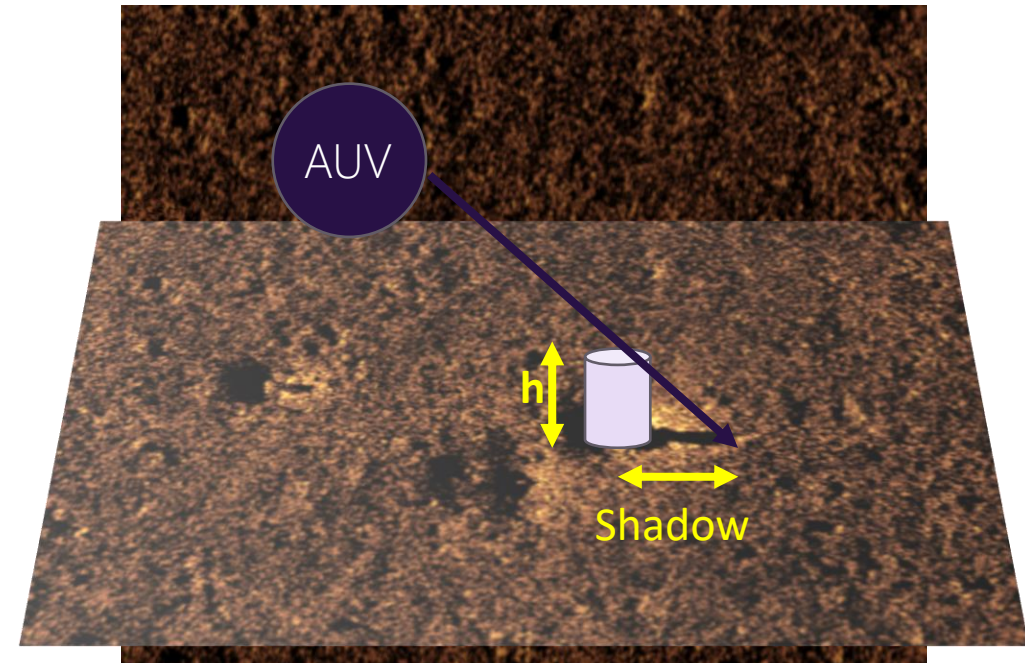
Object Detection: Manual Workflow

Example requirements from clients:

- Detect and identify all objects larger than 0.5m
- Cross-correlate datasets:
 - Bathymetry
 - Backscatter
 - SAS/SSS
 - Magnetic anomalies
 - SBP
- Dimensions:
 - Width, length, height(!), burial depth
- SSDM classifications

Utsira OWF Area: 1010 km²

256x256 images: 1.5 M
10cm resolution



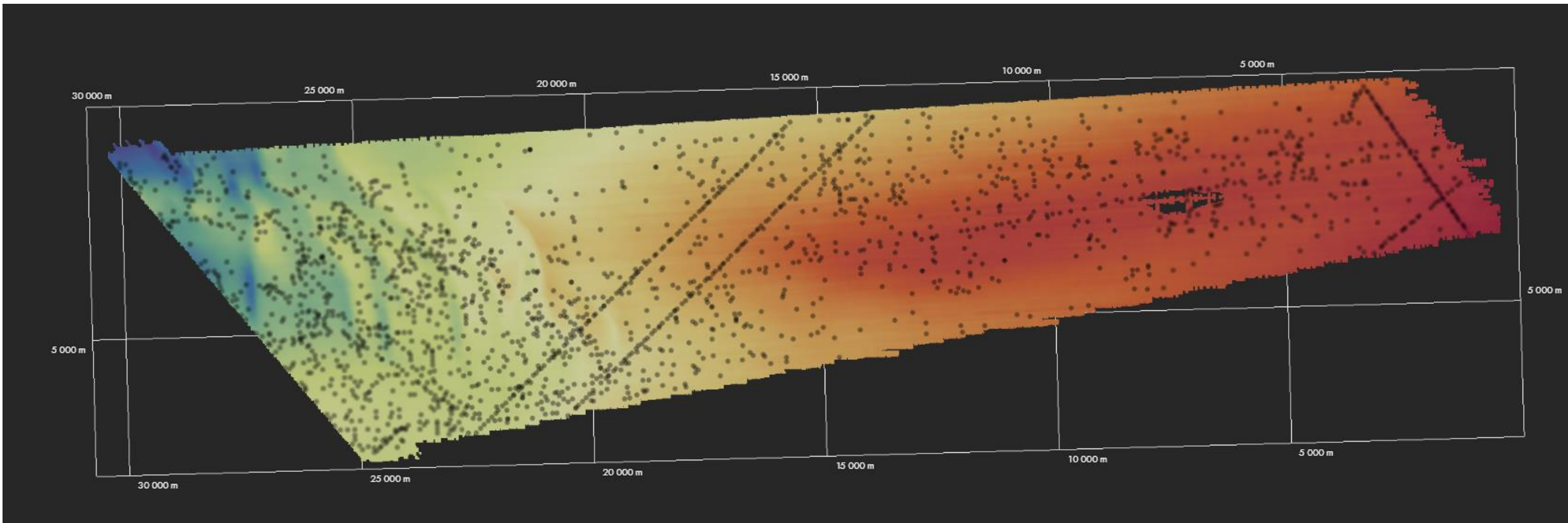
Object Detection: Manual Workflow

Internal Experience:

- 150km²: ~3000 contacts (SAS).
- Estimate: 100hrs manual labor per data type
- Note: We collect ~100km² per 24hrs.

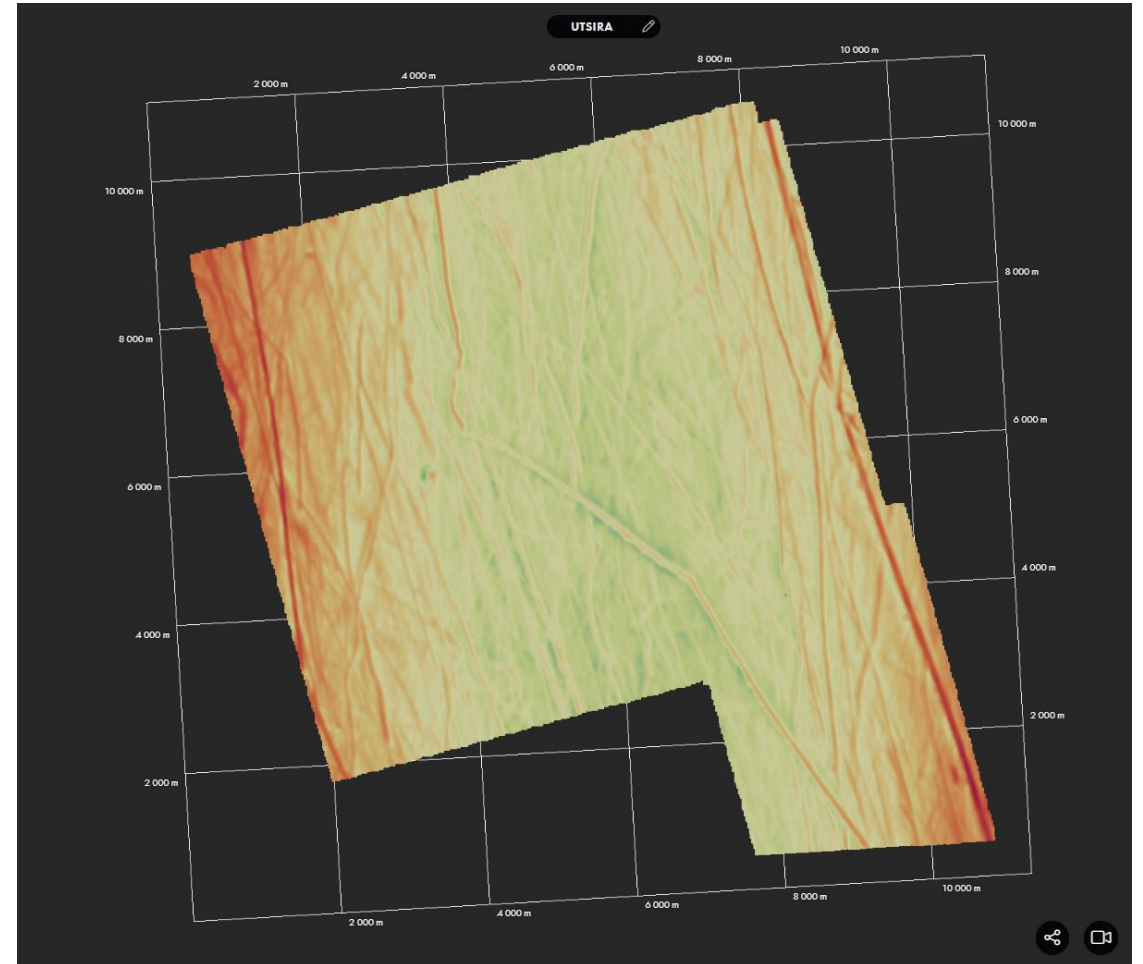
Ten noorden van de Waddeneilanden OWF public data:

- 120km²: ~2000 contacts (SSS+Mag).

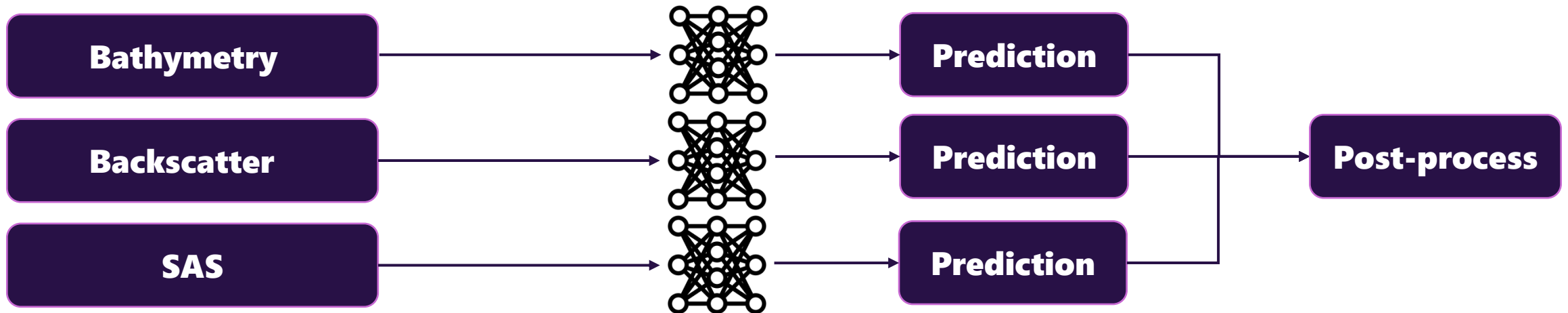
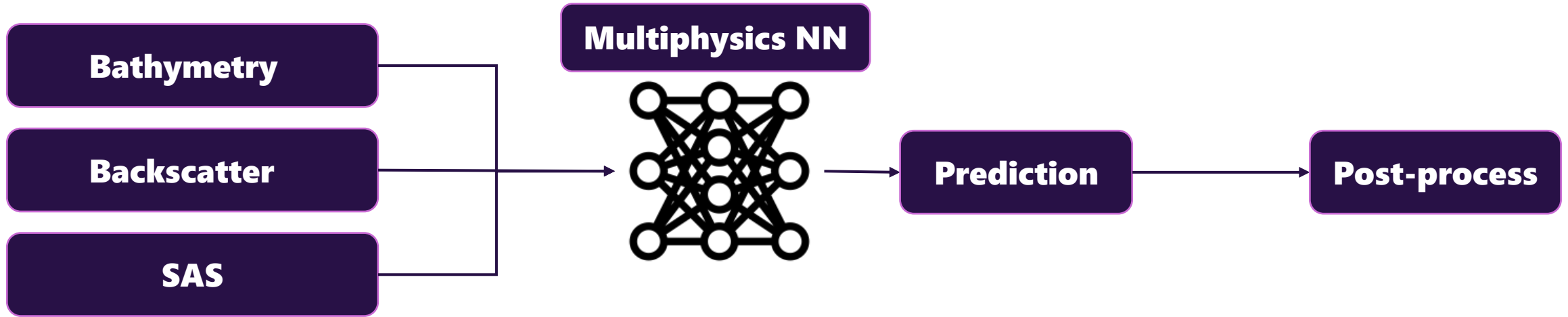


Case study: Utsira OWF Area

- Argeo collected MC data from Utsira Nord in 2022.
- Data sources:
 - MBES Bathymetry 50x50cm
 - MBES Backscatter 50x50cm
 - Synthetic Aperture Sonar 50x50cm
- Area: 100km²
- 17000 images (overlapping)
- Investigating a multiphysics neural network approach



Comparing Neural Networks



Case study: Preliminary results

- Unfiltered: 25000 objects
- Post-processed: 3700 objects
 - Merge & filtering
 - A lot of room for improvement
- Number of objects identified roughly equal with each approach.
- Some pitfalls with Multiphysics approach
 - Alignment



Key questions & takeaways:

- Training data always key
- How does networks generalize over different sensors and different geologies?
- What's the optimal way of designing the workflow?

Information flow during seabed surveys

