



**Ocean Cryosphere Exchanges in Antarctica:
Impacts on Climate and the Earth system**

Deployment of the AUV in the Amundsen Sea

Milestone MS3



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Lead Beneficiary	<p>10 - University of Gothenburg (UGOT)</p>  <p>UNIVERSITY OF GOTHENBURG</p> <p>1 - Danish Meteorological Institute</p>  <p>Danmarks Meteorologiske Institut</p>
Author	PP10 University of Gothenburg: Anna Wåhlin, Stina Rebecka Wahlgren, Xiaohan Yuan
Contributors	All WP2 partners involved.
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Credits photo on the cover:	Adam Ulfsbo, University of Gothenburg

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Means of Verification of the Achievement of the Milestone

The milestone report has been checked by the WP2 leaders. Partner in charge of delivery of the milestone: UGOT.

Work Performed

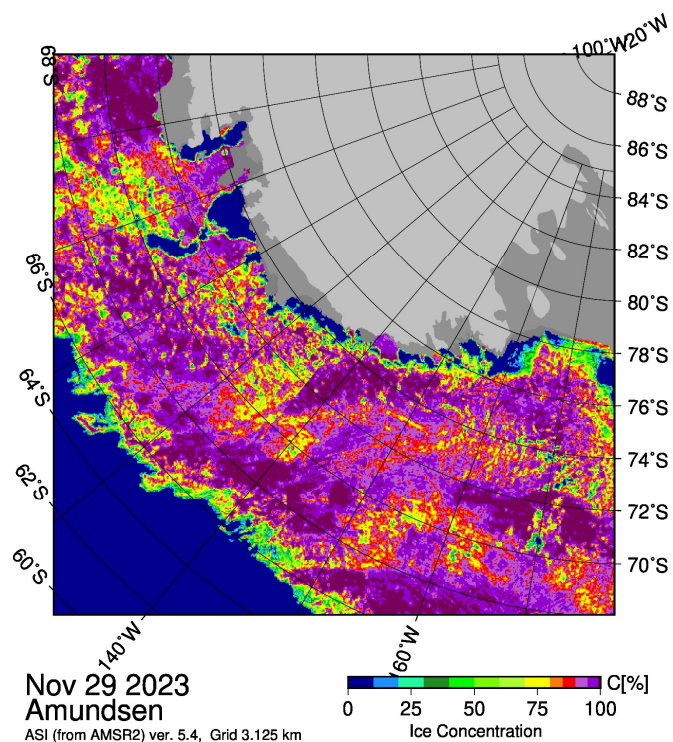
During 2023 we have performed tests of the vehicle in preparation for the Antarctic deployment. These tests were done in Sweden while the AUV was in our warehouse. We tested the function of the vehicle batteries, charging station, and power connection between the power supply, the charger, and the batteries, as this has proven a weak point in the past.

We have also tested one of the sensors planned to go as payload on the AUV, a Signature 1000 high frequency ADCP with capacity to detect small-scale motion in the water. This test was done in February 2023 during an expedition to the Baltic Sea, during an opportunity-based chance to perform AUV missions with the new sensor mounted. The result of this test was that the sensor does not achieve the desired effect mounted on the vehicle. New tests are being performed during a second opportunity-based chance, during which it will be lowered through a drill site in Fimbulisen, while it remains stationary. By comparing the two results it should be possible to determine the cause for the poor performance below the Baltic Sea ice.

During fall 2023 all involved scientists have undergone safety education, medical exams, assisted with packing of equipment, travel preparations, and worked with booking transport of goods from Sweden to New Zealand from where the cruise will depart in late December 2023. We have also worked with engaging support at home such as sending of remote sensing data and images to the ship during the expedition.

Below is shown an ice map of the region where we plan to perform missions. Exactly where the missions will take place will be ultimately decided by the ice conditions. To this date the ice conditions look favourable.

Figure 1: Ice map of the region where we plan to perform the missions.



The work performed to date for this task is listed below:

1. One site visit to the RVIB Araon has been performed, during which a plan for fastening of the container on deck and safe operations at sea was discussed and approved.
2. All equipment has been prepared for shipping.
3. All but three pallets of goods have been shipped.

4. The AUV battery and charging station has been serviced and improved to minimize risks of battery problems in the field.
5. All staff departing on the expedition has undergone medical exams, safety training, and other preparations needed before the expedition.
6. Travel arrangements have been made. The first scientist leaves Sweden on 19 December 2023, and the cruise departs on 28 December 2023 from Lyttleton (NZ).

The cruise finishes on 12 February 2024: A more complete milestone report on the outcomes of the cruise will be ready by early April. It will then include all data sets and information on the deployment.