OFFwind Highlights No. 2 – MAY 2024

SEA ICE STUDIES

The strategy outlined for conducting ice measurements during the winter of 2023-2024 involved regular excursions to gauge ice thickness approximately once every month spanning from January through April.

The objective entailed venturing out to locations with ice coverage, with the hope that portions of the windfarm area would freeze over, enabling us to procure measurements for comparative analysis against calculated data.

First ice measuring expedition

The initial sea ice measurement took place on January 8, 2024. Preceding the expedition, there had been an exceptionally cold two-week period, with temperatures plummeting to -30 degrees Celsius. A hydrocopter was deployed to access the ice. The measurement plan involved traversing a line from the shoreline out to the Windmill area. Starting near the coastline, measurements were to be taken approximately every kilometer along the line until reaching open water.

Picture 1. Ice measurement 8.1.2024

The ice closest to the coastline had been present for a longer duration, while the ice nearer to the windmill area had formed more recently, just prior to the measurement expedition. The older ice measured approximately 30 cm in thickness. Moving along the line, newer ice was encountered, nearly as thick as the older ice. North of Harvungön, there had been open water a few days prior to the expedition. However, by the time of measurement, this area was covered with new thin ice, approximately 6-7 cm thick. Unfortunately, it was not sturdy enough to support the hydrocopter, so we halted our progress and waited for the ice to strengthen.

Picture 2. North of Harvungön at the new thin ice line

Second ice measurement expedition

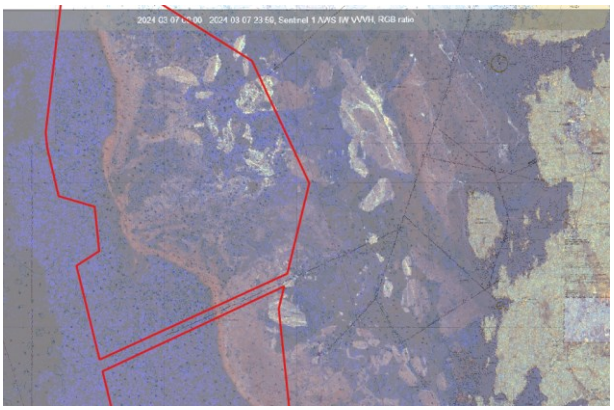
The second ice measurement expedition took place on 6.2.2024. In the weeks leading up to the expedition, we experienced weather with higher temperatures and strong winds from various directions. From the satellite images, it was difficult to determine the condition of the ice, so we decided to go out with a hydrocopter to assess the ice situation. When we approached the area where we conducted ice measurements during the first expedition, we found that the winds had broken up the ice, leaving a lot of ice floes standing on edge. We still attempted to venture further out to see if the ice might be smoother there, but when we reached Harvungön, we had to abort to avoid the risk of the hydrocopter breaking in the uneven ice. We observed some ice ridges with piled-up ice on shoals further inland. There is a video from the expedition filmed with drones available on the project's website. Picture 2 depicts the ice conditions outside Harvungön, while Picture 3 showcases ice walls that have accumulated along the shoreline.

Picture 3. Outside Harvungön 6.2.2024

Picture 4. Ice walls

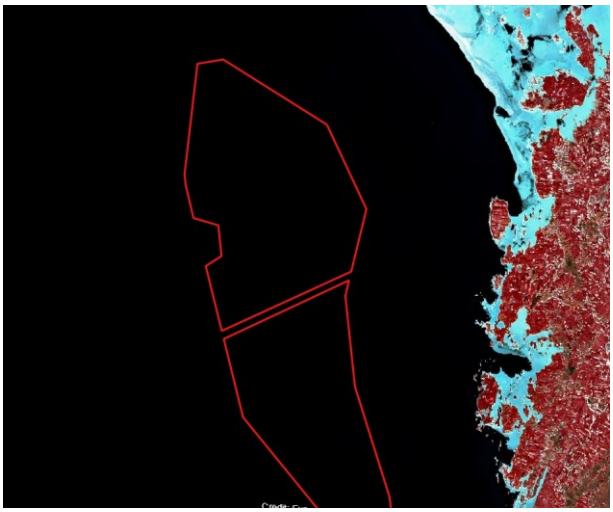
Ice situation from Satellite images.

Since we couldn't reach the wind farm site with the hydrocopter, we decided to monitor the situation via satellite images. Extended periods of cloudy weather forced us to rely more on SAR radar images. Below is a picture from 7.3.2024, showing that the ice edge passes through the wind farm area. At the ice edge, there appears to be a pressure ridge that doesn't seem too high, and further inland, there seem to be various formations of piled-up ice.



Picture 5. Ice situation 7.3.2024

A satellite image from 9.4.2024 shows that the ice edge has now receded within Harvungön. It's not visible in this satellite image, but large ice masses are still floating around and could drift back into the area with the wind at any time.



Picture 6. Ice situation 9.4.2024

Summary

In summary, we never ventured further out than the northern tip of Harvungön with the hydrocopter because of the ice conditions. Considering maintenance work on the upcoming wind turbines, we can conclude that under these conditions, it's difficult to reach the planned area with a hydrocopter or hovercraft from the nearby Storkors fishing harbor. A better alternative would be to use an ice-going boat and depart from the port in Kaskö or the deep-water port in Kristinestad.

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