

Subproject: A validation of surface and upper-air winds

Actual field dates: July 8-Oct.12, 2014

Field site: Baffin Bay, Northwest Passage, Kane Basin, Amundsen Gulf, Beaufort Sea, Chukchi Sea, Canada Basin

Number of man-days in the field: 246

Summary:

During leg 2 our goal was to deploy 9 ice towers (not 12 due to financial restrictions). Due to time constraints and bad weather we were able to deploy only 5 of these towers. The deployment of each tower required finding the correct type of ice. Typically the ice floes in the area were rotting first year ice, making it difficult to locate a suitable thick piece of ice. The goal was to find a piece of ice that would survive through the melt and into the fall freeze up, and possibly through to the next summer. Deployment from the ship took approximately 2 hours. Due to time constraints no physical sampling was done.

Each tower collected surface winds, speed and direction, surface pressure, air temperature, and humidity data. All data was transmitted remotely via an Iridium modem. All data is a ten minute average leading up to the hour. Position only ice beacons were placed next to every OIT to transmit the latitude and longitude at hourly intervals. On September 1 2014 a strong wind event occurred resulting in the loss of one of the OITs. During the event winds were measured at up to 50 km/hr. The wind event was strong enough to break up ice that was 3.6 meters thick.

After two and a half months all five of On Ice Towers stopped reporting. The battery life was full for each station when the data stopped coming, indicating power supply was not an issue. The lack of data is likely due to the environment; polar bears will attack the towers and destroy them. Ridging and deformation of the ice pans could have broken the towers apart, or heavy icing and snowfall could prevent the data from transmitting.

As winds can vary tremendously over a short region it is intrinsically difficult to compare two different measurements unless they are in the same location. Further comparisons over longer time periods are required before any conclusions can be drawn.

Photos:

Fig.1: 2014 CCGS Amundsen Cruise Path. Credit: Keith Levesque

Fig.2: The deployment of an On-Ice Tower away from the ship. Credit: Lauren Candlish

Fig.3: Deployment of an On-Ice Tower using the helicopter Credit: Lauren Candlish

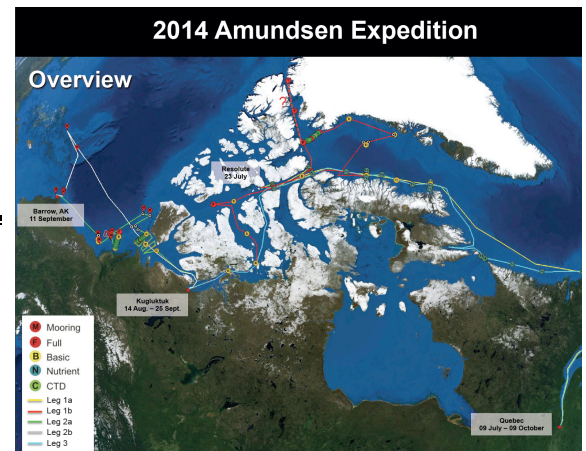


Figure 1



Figure 2

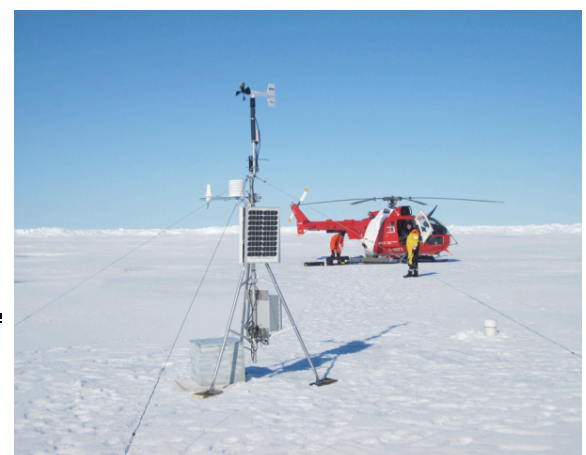
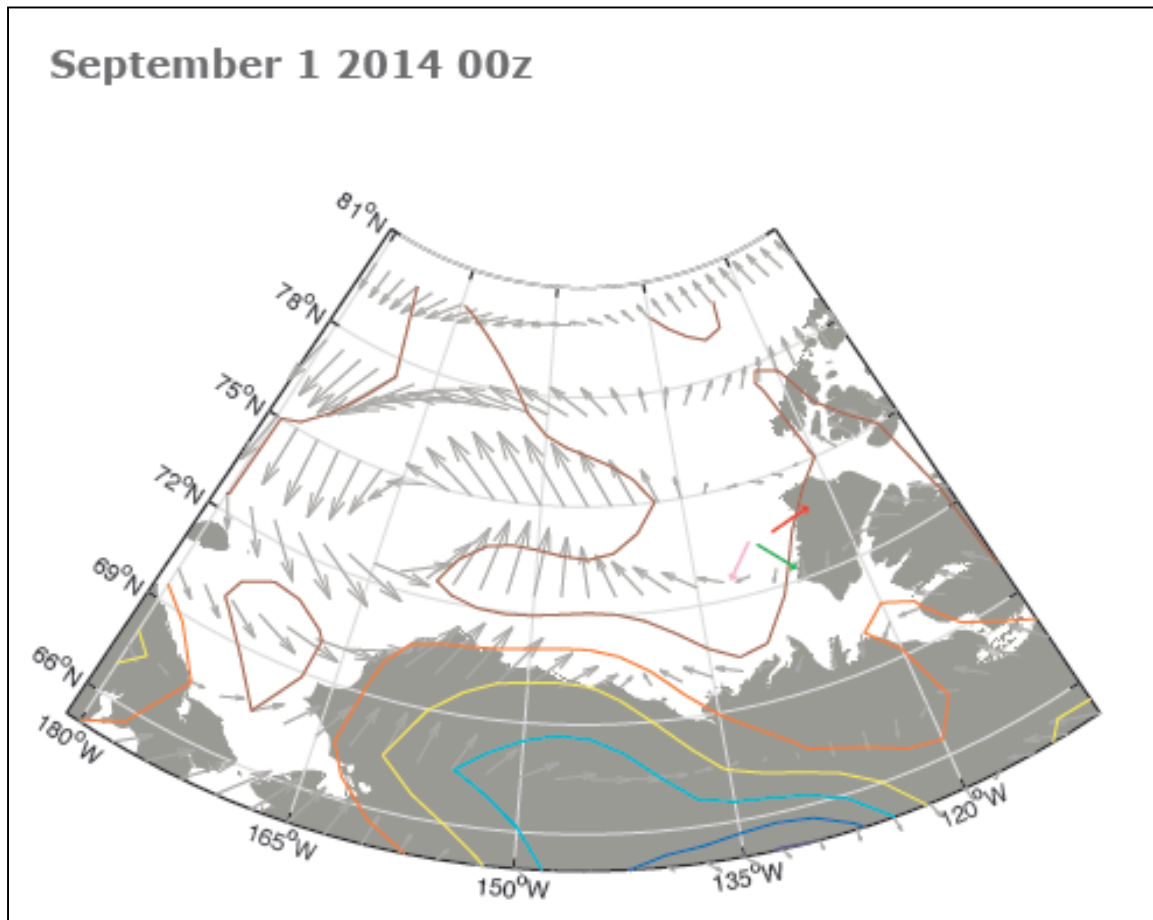


Figure 3

Fig.4: This map shows the NCEP re-analysis pressure and winds for the region. The winds for the on ice towers are shown in pink, green and red. The second tower (red) was deployed on the large piece of ice that was further from the ice edge and on the far east of the pack. Credit: Lauren Candlish



Participants:

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Acknowledgements:

CERC, NSERC, ArcticNet and ExxonMobil

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