Summary

Since 2015, Lauren Farmer and Alex Cowan have collected sea ice data while employed as photographer and geologist on Russian icebreaker "50 Let Pobedy", chartered in the summer season by tour operator Poseidon Expeditions. With prior and ongoing training, and the support of their advisors, they endeavor to collect sea ice data such as extent, thickness, age and degree of melt during repeat transects from Franz Josef Land to the geographic North Pole.

In June/July of 2017, these visual observations will be paired with meteorological recordings timed to satellite overpasses and in coordination with NASA’s GLOBE Observer program. Lauren and Alex will also record melt pond salinity and depth profiles at an ice station at the pole and gather aerial video and photos of the pack ice during helicopter flights.

With this extended access to the eastern Arctic Ocean during the early stages of the summer melt season and following a relatively unusual repeat transect itinerary, they look forward to contributing to YOPP and collaborating with interested partners. Additionally, they are open to discussing further projects during this
planned period of observing, such as the deployment of buoys and weather balloons.

Description

In the summer season, Russian icebreaker "50 Let Pobedy" is chartered by tour operator Poseidon Expeditions, which takes paying passengers from Murmansk to the North Pole. During these voyages, repeat transects of the Arctic Ocean are made from the pack ice edge near Franz Josef Land to the geographic North Pole. In 2015, Lauren Farmer and Alex Cowan, who are employed as on board photographer and geologist, completed their first sea ice data collection season, and with the support of their advisors, Don Perovich of CCREL and Jennifer Hutchings of the Oregon State University, their work was published as a project update in Eos. (https://eos.org/project-updates/citizen-scientists-train-a-thousand-eyes-on-the-north-pole)

This sea ice data collection will continue in June/July of 2017 and will consist of visual observations made from the bridge of the ship during icebreaking days, recording coverage, floe size, ice thickness and age, degree of melt and topography, which will then be inputted into the Arctic Ship-borne Sea Ice Standardization Tool (ASSIST). Aerial video and photos will be captured from a helicopter during scenic tours. At an ice station at the North Pole, several melt ponds of varying size and characteristics will be measured.

In addition to the sea ice data collection, meteorological observations including visibility, cloud cover and cloud type will be undertaken, timed to overpasses of the NPP, TERRA and AQUA satellites. Additionally, we plan to collect seawater samples for testing of the presence of microplastics by nonprofit group Adventure Scientists, an existing citizen science partner of the polar tourism industry.

We feel our projects aim to achieve the following YOPP objectives:

- Gathering additional observations through field programs aimed at improving understanding of polar key processes;
- Improving verification of polar weather and environmental predictions to obtain quantitative knowledge on model performance, and on the skill of operational forecasting systems for user-relevant parameters; and efficiently monitor progress.

The project is also highly cost effective as it takes advantage of expedition cruises funded by paying passengers, so no additional monetary resources or grants are required.

We believe in open data sharing and our observations are available on the Ice Watch website (https://sites.google.com/a/alaska.edu/ice-watch/). We would also be pleased to provide raw data to the YOPP Data Legacy portal in a timely manner at the end of the season. Additionally, we feel education and outreach, both to relevant audiences and to the public, is vital to the growth of the citizen science movement. Following the summer season, we intend to speak at a number of conferences and give lectures on the completed work both to the science community and the tourism industry, and will describe the parameters of the research and the value and uses of the data collected. Communicating the success of these data collection efforts can serve to inspire members of the polar tourism industry to initiate more projects of this kind, opening up many expedition vessels operating in high latitudes as platforms for science.

We hope our upcoming plans will contribute to YOPP and warrant endorsement, and we are very much open to discussing additional collaborations with interested partners.
Update from Mai 2017: "While our current focus is on our upcoming data collection period in June/July 2017, we plan to return to the Arctic for a 2018 season during the SOP-NH2 period, continuing the planned sea ice and meteorological data collection, with the possibility of extending our observing period to include additional North Pole cruises and the deployment of buoys and/or weather balloons. We also intend to be working on board expedition cruise vessels in the Antarctic Peninsula during SOP-SH and would welcome developing an Antarctic-based project to achieve YOPP objectives during this time. • SOP-NH2: July 1st to September 30th, 2018 in the Arctic, and • SOP-SH: November 16th, 2018 to February 15th, 2019 in the Antarctic."

Timeline

2017-06-01 - 2017-07-31

User relevant aspects

This year we hope to work more closely with providers such as the Norwegian Ice Desk in order to provide data of best value to forecasters.

Regional emphasis

Northern hemisphere: Yes
Southern hemisphere: No

Further specification

While this submission focuses on projects for the boreal summer in the Arctic Ocean, we also spend the austral summer working on an expedition vessel on the Antarctic Peninsula, and would welcome a discussion of ways we can contribute to the YOPP during the SOP of December 2018 to February 2019.

Key project deliverables

1. Ground level sea ice characteristics along a transect line between Franz Josef Land and the North Pole;
2. Melt pond coverage data derived from aerial footage, and also depth and salinity profiles from an ice station at the North Pole;
3. Meteorological observations timed to satellite overpasses;
4. Public outreach through participation of passengers on the ship.
Data management

Sea ice observations will be archived and available at the Arctic Shipborne Sea Ice Standardization Tool (ASSIST) website at https://sites.google.com/a/alaska.edu/ice-watch/

Is data provided to WMO Global Telecommunication System

No

Real-time provision

Sea ice observations are usually uploaded within 5-7 days of collection via a cellular connection in Murmansk. Aerial footage and melt pond profiles are delivered at the end of the season. We will investigate providing any relevant data to WMO GTS.

Other information

We are very interested in assisting with buoy deployment and would welcome any discussion or request regarding this. We have access to an ice drill and cranes on board the ship.

Timelines

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<tr>
<th>Location</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Start date</th>
<th>End date</th>
<th>Activity</th>
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<td>Arctic Ocean</td>
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<td></td>
<td>2017-06-15</td>
<td>2017-07-07</td>
<td>Observations made while on board icebreaker vessel and at North Pole</td>
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