Sea Ice for Walrus Outlook

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Melting Ice, Rising Seas Focus Session
16 November 2016
ARCUS is a catalyst for interdisciplinary thinking, acting, and education leading to the development of highly collaborative partnerships.
Sea Ice for Walrus Outlook (SIWO)

A cross-boundary collaboration

WHAT
Weekly forecasts of weather and sea ice conditions combining operational sea-ice products, model forecasts, and local observations

WHY
To provide subsistence hunters, local communities, and marine resource managers with practical, regional information on weather and sea ice conditions

FUNDING

MANAGEMENT

OPERATIONAL PARTNERS

Eskimo Walrus Commission
“To protect the pacific walrus population.”

Indigenous sea ice experts
Background

- SIWO launched in 2010 in response to community needs in the Bering Strait
- Format – Weekly forecasts during April – June
- Integration of scientific information and local observations
  - Combined summary of current conditions, ice and weather forecasts, remote sensing imagery, and local observations
- Accessible format – Web, social media
Weekly Outlooks

Sea Ice Products

Remote sensing Data

- NASA Aqua & Terra MODIS (Visible & IR)
- SNPP – VIIRS (Visible, IR, and Day-Night-Band)
- Sentinel-1a and -1b (Synthetic Aperture Radar)
Weekly Outlooks

Model Forecasts

- Forecast discussion
  - Weather system/wind synopsis
  - Temperature trends
  - Assessment of ice conditions relevant to walrus

- 5-day wind forecast

- Core communities bounded by the forecast zones are Gambell, Wales, and Shishmaref
Weekly Outlooks

Local Observations

• Local observations presented alongside scientific information with equal emphasis

• Platform for sharing of knowledge and observations among Bering Strait communities

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Weekly Outlooks

Local Observations

- Local observations valuable to scientists, industry, and shipping/transportation
- Provides validation of scientific observations, imagery, and models
Observations from Shishmaref
20 May 2016 - Curtis Nayokpuk
The ice is stable for travel to leads 5 to 6 miles north of Shishmaref, and hunters are having good bearded seal hunts. There are no open, ice-free areas to venture further out from the boat launch and no walrus have been seen yet. Bearded seals will be the main take for now as ice holds and forecasted southerly winds should open up large ice pans for safe travel out for walrus later in the week.

Observations from Gambell
2 June 2016 - Merle Apassingok
Most of the ice has melted and what was left has been taken by the current in the immediate vicinity of Gambell. There is some remnant shorefast ice on the north side of the island. The broken up ice from the Gulf of Anadyr is still expected but it hasn’t been seen yet.
Applications of ICESat-2

Information need: Sea ice type and distribution

• Directly tied to animal abundance, availability, and behavior
  – Haul-outs – used for resting between feeding events
  – Calving areas – for ice-dependent seals, walrus

• Polynyas – presence of open water areas, biologically productive

• Open water leads – allow access and travel through open water by both humans and wildlife
Applications of ICESat-2

Information need: Tools to support food-security and safety of indigenous communities

• Unprecedented rates of change make conditions difficult to predict

• Descriptive information on sea ice conditions (freeboard, concentration) is increasingly valuable for travel on or through sea ice

• The SIWO network can readily communicate this new information to our users
Applications of ICESat-2

State-of-the-Science and Opportunities

• Visible satellite imagery and SAR currently provide quality observations of sea ice position and concentration

• Challenges:
  – Visible satellite imagery limited by cloud cover
  – SAR limited by geographic coverage in SIWO area
  – Interpretation of sea ice thickness

• Opportunity to improve interpretations of sea ice thickness with ICESat-2 observations
Looking Ahead

• Proposal submitted for community workshop

• Evaluate utility of current outlooks and new information and tools needed by users

• Determine best way to deliver outlook to users

• Consider broader geographic, temporal, and subsistence species support
Get the Outlook!

• Visit the SIWO website
  – https://www.arcus.org/search-program/siwo

• Receive weekly outlook emails

• Find us on Facebook
  – https://www.facebook.com/seaiceforwalrus/

• Join ARCUS as an organization or individual!
  – https://www.arcus.org/
## Preliminary Perspectives

| Synergistic Opportunities | • Deliver information from ICESat-2 via existing SIWO network of indigenous and community users  
|                           | • Improved observations of sea ice thickness to support Arctic community food-security and safety |
| Understanding processes, informing decisions | • Provide more detailed descriptive information and predictions of sea ice type and characteristics – especially sea ice thickness  
|                                           | • Validation/verification of sea ice models |
| Challenges | • Direct incorporation of ICESat-2 information into SIWO products – Need frequent, location-specific information in an easy-to-understand format |