Advancing Predictability of Sea Ice: Phase 2 of the Sea Ice Prediction Network (SIPN2)

• Multi-prong approach spanning from theoretical to user-inspired research, building on SIPN:
  1. Dynamical & Statistical methods, oceanic heat & Pacific sector climate variability
  2. Evaluate of SIO forecast methods
  3. Develop new observation-based products to improve sea-ice predictions
  4. Evaluate the socio-economic value of sea-ice predictions based on stakeholder product needs
  5. Evolve network SIO forecasts and further develop network activities.
SIPN Accomplishments In Brief

• Since 2014, we have organized the SIO, collecting and synthesizing Outlooks
• Collect and analyze full fields
• Provide a curated website of observational fields for initializing and evaluating sea ice prediction
• Organize coordinated experiments among network forecasters to test sensitivity to sea ice thickness and influence of post processing
• Led about over a dozen peer-reviewed papers about SIPN activities and insights about improved observations to constrain forecasts

[C. Bitz]
SIPN Accomplishments In Brief

• Create teams of collaborators for network activities
• Develop new metrics for evaluation
• Run webinars about SIPN activities
• Organize the annual Polar Prediction Workshops
• Host annual meetings at AGU
• Present at conferences and meetings about SIPN

[C. Bitz]
Sea ice variability is increasing*

Figure 2 A) Monthly standardized sea-ice extent (SIE) anomalies 1979-2016 from observations (blue) and running 10-year variability of normalized anomalies (orange), B) September SIE variability across all CESM Large Ensemble (CESM-LE) members over 1921-2080 and, C) September sea-ice variability as a function of ensemble-mean September SIE in the CESM-LE (black crosses) and observations (red cross).

[E Blanchard-Wrigglesworth]
SIPN2 team

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Peter Bieniek, Alaska climate
Hajo Eicken, Sea ice
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SIPN2 team

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New Aspects of SIPN2

• Perfect model experiments to investigate the role of oceanic heat on the limits of subseasonal-to-seasonal (S2S) sea-ice predictability

• Evaluate the economic value of sea ice forecasts for Alaska maritime industry, obtain guidance on improved products and targeted observations

• Applying the potential of predictive power from complex systems research

• Identify role of regional processes in the Pacific sector for pan-Arctic change
Data Portal for SIPN Forecasts

- Full Fields
- 0 to 12 month Range
- Year round

Five phases of development in 2018-2019

Access to data products

SIPN participants server-side access to data processing

Data upload (by participants or from NMME/S2S)

Automated creation of products and visualizations

Public access to forecast visualizations

Contact Cecilia bitz@uw.edu for more info
Why collaborate?

• More groups participating in the SIO -> better statistics, deeper understanding of the problem

• See where your results fit in relation to the community’s

• Design your own new SIO product or experiment! (e.g., regional forecast, fixed initial thickness, etc.)

• It will soon be much easier: SIPN data portal will make it much easier to collaborate

• Join network to strengthen the bridge between observations & modeling

• Join discussions and networking on stakeholder-focus activities with AK shipping/maritime industry
Additional Announcements

• Spring 2018 ICEX ice camp as opportunity to explore utility of freeze-up/winter predictions for operational support.

• James Doyle – THINICE

• Arctic Sea Ice Prediction Stakeholders Workshop at Arctic Frontiers Conference - Tromso, Norway: 22 January 2018

• Other announcements?
THINICE is a field campaign proposal to identify mechanisms that offer predictability of Arctic cyclones and their two-way interactions with sea ice and midlatitudes.

Contact James Doyle or Cecilia Bitz for more info.