SIPN Community Meeting at AGU Fall Meetings
Wednesday, 17 December 2014
Informal summary notes of discussion

Presentation Team:
Cecilia Bitz and Muyin Wang

Other SIPN Leadership Team members present:
Julienne Stroeve, Jim Overland, Phil Jones, Walt Meier, Larry Hamilton, Jenny Hutchings, Hajo Eicken, and Helen Wiggins

Community members present included:
Martin Jeffries, Bill Wiseman, Jenny Baeseman, Ludovic Brucker, Richard Callather, Mitch Bushuk, Jonny Day, Rosie Eade, Janet Intrieri, Dmitir Kondrashov, Linghan Li, Ross Lieb-Lappen, Mike Steele, Xaingshan Tian-Kunze, Xiojun Yaun, Barbara Winter, Jinlun Zhang, Shuting Yang, Andrew Roberts, Wislaw Maslowsky, Bruno Tremblay, Amy Soloman, Jessica Rohde

ARCUS staff present: Betsy Turner-Bogren and Kristina Creek

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Presentation Overview:

The meeting was led by Cecilia Bitz and Muyin Wang and focused on issues related to predicting sea ice with methods that are sensitive to initial conditions. Specifically, the goal of this meeting was to set up a common protocol for experiments to test sensitivity to initial conditions in sea ice forecasts of summer 2015 and to discuss metrics that are responsive to stakeholder needs. This was an open meeting, and all SIPN and Sea Ice Outlook participants who use initial conditions in a model were invited. There were 34 members of the community in attendance.

The SIPN 2014 Modeling Meeting Presentation is available as a PDF and can be downloaded at: http://www.arcus.org/sipn/meetings/agu/2014/modeling .

The presentation included an overview of SIPN goals and review of 2014 Sea Ice Outlook (SIO) season including synthesis and analysis of contributions.

The goals for the meeting, to discuss end users' needs and discuss experiments for 2015 and beyond, were introduced with slides summarizing recent interviews Adrian Tivy has had with FEDNAV (http://www.fednav.com/en), observations by Matthieu Chavallier on his year as a sea ice modeler with Total Energy in 2008, sea ice prediction information needs, lessons learned from the 2014 SIO modeling contributions, the SIPN experiments from the 2014 April workshop challenge and lessons learned, and proposed plans for a new experiment to be lead by Muyin Wang and Ed Blanchard-Wrigglesworth.

Informal summary of community comments and discussions:

Sea Ice Prediction information needs
- Hajo encouraged people to focus on freeze-up and break-up because those are the interests of the shipping industry
- Another member asked how skill of models should be defined.
Response included spatial correlation and ice edge definitions. Cecilia noted this would be a good focus for an Action Team – to take on the task of understanding what users want, finding that information, and validating it.

SIO modeling contributions
- A member asked what is meant by uncertainty associated with model parameters/physics are not evaluated
Response included that different models have different physics and individual models are sensitive to their own physics. Cecilia noted it would help to have more people doing season retrospectives.

SIPN Experiments
- Cecilia asked April workshop participants to produce a repeat of 2014 September forecast but to do so with a -1meter perturbation. She found that models do not all use the same month for initialization.

Planning a New Experiment
- Plans are to initialize with same May 1 thickness, and have it available sooner than last year so that people can practice how to get the data into their system.
- Discussion included words of caution that with fully coupled models the dynamic shock will last one to two months and there will be a massive influx of freshwater in some places that may not reveal much about the model. Others commented that the effect would not be that drastic.
- Cecilia observed that three years is not enough time to assess skill—her retrospective forecast for 20 years did have skill but the last two years were off.
- Jinlun suggested that using different approaches, such as replacing ice thickness with PIOMAS ice thickness, could reduce the initial shock, we need to think about long term approach, that over years we can produce a framework that improves predictions; won't be fixed in one year but could be greatly improved over time.
- Cecilia commented it would be great if we had everyone able to assimilate another model's thickness, but right now that is probably not realistic; people don't have the mechanisms in place to do so.
- Mike Steele said itfeels like he is missing step one, which is why we are doing this. We are trying to improve modeling/forecasting, and one component is ice thickness, so let's see if we have an error in ice thickness, how that affects the forecasts. Other things, such as sea ice extent, are maybe better constrained by observations.
- Cecilia commented that most of the information carried through from spring to fall are the initial conditions such as ice thickness (most important) and sea surface temperature (SST).

Other Topics
Idealized Experiments:
-Jonny Day suggested running experiments in toy models where the sea ice thickness in known and change other parameters to see how forecasts are affected. That allows a look at many different variables.
-Cecilia mentioned a recent paper that claimed to have extremely high predictability of melt pond coverage, she'd be interested in seeing the spatial patterns that came about, because paper really only examined the pan-Arctic coverage.
-Hajo agreed and commented tat the highest prediction skill is in May when neither models or nature show much in the way of ponding. He encouraged group to somehow make sure that whatever real data is available on pond distribution is compared so we know how well they line up. (For on-ship observations data can be sent out with in five days, as long as the ship is sending in their information.)The uncertainty in clouds and surface radiation balance is another good thing to look at.
-Amy responded to prompt that her group is just going to be starting with their model in January and will take time to "spin up." They have other priorities and not sure they will have a lot of time to focus on idealized experiments.
- Other comment: snow, melt ponds, ocean heat content, other initial conditions besides thickness – would be good to evaluate in some simple way how those things affect models and predictions.
- Martin asked how good melt pond information could be retrieved from MODIS. (Would data be based on thresholds of reflectance?)
- Walt responded that it's not by identifying individual melt ponds, but rather by other signatures such as blueness, reflections, etc. (This was verified by reconnaissance flights doing imaging to compare.)
- Wislaw suggested that varying initial conditions, consistent in whatever model is being used; could change thickness conditions in the model. Suggested to try four different methods and see out how important that is.
- Jessica suggested the IARPC website would be a great place to post this information or to ask people for ideas.
- Martin -described IARPC's job and position in government; collaboration teams are completely open to anyone who wants to join, including those overseas. He encourages people to participate.