Sea Ice Outlook Meeting
Monday, 15 March 2010, Miami, Fl.

Meeting Notes and Action Items
(Action items are shown in bold)

Participants:
Jim Overland, Son Nghiem, Walt Meier, Brendan Kelly, Todd Arbetter, Nancy Soreide, Jean-Claude Gascard, Helen Wiggins, Florence Fetterer, Adrienne Tivy, Jenny Hutchings, Klaus Dethloff, Peter Schlosser, Ronnie Owens, Frank Kauker (via phone)

(1) Presentation by Frank Kauker: Seasonal Predictability of Sea Ice Minimum Extent - Lessons from the Sea Ice Outlook 2008/9
- over/underestimating ice cover based on forcing data (ERA overestimates, NCEP underestimates) – difference between the two forcings 1 mio sqkm for summer minimum
- comparable output from ensemble forecasts by Zhang group (UW) and Kauker et al. (AWI/OASys)
- hypothetical June 2007 outlook: around 4 mio sqkm for forcings from '89, '94 and others
- 1989 and 1994 had similar atmospheric conditions to 2007 but ice was too thick to respond; 2006 ice was thin but summer atmospheric conditions did not help develop record minimum
- end-of-winter ice thickness fields key to controlling range of outlook values
- clustering of ice volume for 2000s decade in contrast with ice extent (which lacks clustering)
- relative importance of summer atmospheric as opposed initial thickness field; relative importance of winter conditions
- need for ice thickness data
- not optimistic about summer forecasts of weather and circulation

Discussion and conclusions
- Where are data for initialization of thickness fields most valuable? Area of greatest interest are East Siberian Sea & Laptev Sea & Chukchi Sea; in general ice thickness over thin ice are most valuable over thinner ice, since thick ice is already modeled well
- Are maps of MY vs FY ice distribution of value? Challenge to describe uncertainties with MY & FY concentration maps
- with 0.5-1m thickness uncertainty quoted for ICESat (Kwok), even ICESat data would not constrain ensemble simulations much

(2) Jim Overland: Summary of 2009 Outlook activities
- impact of low ice years on delay in fall freeze-up is becoming more important
- role of atmospheric dipole pressure pattern (more frequent in spring and summer in the last decade than before)

- discussion of wide range of outlooks in 2008 and narrow range in 2009: Depends also strongly on how outlook contributors deal with uncertainty (heuristic vs. ensemble-simulation approaches)
- ensemble simulation (Kauker et al.) indicated 10% probability of summer ice extent higher than the actual minimum observed in 2009

(3) Discussion of pan-Arctic outlook

A. Broader goals
- Outlook of value as an open forum for exchange between scientific community (modelers, field observations and others), operational forecasters, other experts
- contributions by operational services constrained by lack of time
- Canadian Ice Service posts first outlook on March 15 (updated every month); any information available at that early time will be useful
- Outlook can provide insight into a range of confidence for community perspectives as well as important background information on ice development

- Create a web page as part of the Outlook that provides links to key resources relevant for contributors to Outlook [SIO Central Office-ARCUS]
- By early May the following information should be provided to the SIO Central Office (to Helen Wiggins):
- Frank Kauker: Graph of ice thickness initialization field used for ensemble simulations in 2010; any information on press releases from AWI group as the become available
- Todd Arbetter: Interpret existing ice charts for early May time frame to generate an ice thickness chart
- Walt Meier: Ice age map from SSM/I
- Ignatius Rigor: Ice age map from buoys [Ignatius needs to be contacted by SIO Central Office with this request as he could not attend meeting]
- Jim Overland: Provide link to or information on 15-day atmospheric forecast
- Son Nghiem: Ice type maps from OceanSat 2 (see also below)
- Discussion of access to OceanSat 2 data (India) to derive ice type maps after demise of QuikScat (Son Nghiem)
- Son Nghiem (with Florence Fetterer's help) will draft letter and identify addressee for recommendation from Outlook group for early May ice type maps from OceanSat 2
- Cryosat-2 will be launched in April 2010; data access may be too late for this year
- For SIO it is important to preserve ad-hoc approaches
- SIO Central Question: What is the range of plausible outlook estimates based on reasonable physical hypotheses?
- Highlight uncertainty range in products: Frank Kauker will provide better (i.e. more comprehensive) estimate of uncertainty range that includes not only atmospheric circulation impacts (as done in past outlooks) but also ice thickness initialization uncertainty estimates [Frank Kauker]

- Send out announcement on April 2 encouraging wider community to contribute to outlook efforts, including a request for products or information that may help in coming up with estimates [SIO Central Office]; Walt Meier will provide a paragraph of text that describes what type of information may be relevant [Walt Meier]; message should also include reference to Regional Outlooks and Sea Ice for Walrus Outlook

B. In-situ observations

- Jenny Hutchings will provide ground-based observations schedule from www.iceplan.org website to SIO Central Office for posting on SIO resources website [Jenny Hutchings & SIO Central Office]
- Encourage contributions from ground-based, aerial campaigns to provide information on actual ice conditions [Jenny Hutchings will contact ice observers on expeditions in the area]
- Encourage collection of data on heat storage in low-ice areas (e.g., Beaufort Sea hole in ice pack in 2009), e.g., through CTD casts [Jenny Hutchings and others]
- Jenny Hutchings will create a template on what will be useful for people to report from ship-based (and where available aerial) observations (emphasis on supplying data in June & late August); for European activities work with contacts at AWI (Stefan Hendricks) [Jenny will contact]; Sebastian Gerland at NPI [Hajo will provide initial contact]; Alexander Makshtas at AARI [Hajo will provide initial contact]
- Determination of timing of melt onset is important for ground-based observations, encourage local observers to report [Jenny Hutchings]
- Pan-ARCMIP carried out in 2009; repeat of program planned for April 2011 (with involvement by K. Dethloff and others); Alexander Makshtas & Vladimir Sokolov at AARI are Russian contacts
- Klaus Dethloff: not as pessimistic about predictability of atmosphere; interesting paper on long-term impact (months) of ice minima on teleconnections (paper by Meiji Honda et al. in GRL, 2009)
- Improving ice thickness products: improve accuracy of ice age/ice tracking products; assess how representative IMB measurements of surface/bottom ablation are of regional conditions; survey before onset of melt season is important
- For SIO, we are still lacking low-uncertainty, broad coverage ice thickness products (see above)
- International community needs to consider collaborative access to Siberian Arctic [Hajo will bring this up in discussion on International Day 4 at SoA Conference]
- How to best solicit and encourage Potential contribution from Russian ice analysts?
- contact Alexander Makshtas or colleagues at AARI and inquire about availability of up-to-date Russian ice charts [Florence Fetterer]
- More detailed ice analysis product to be included in outlook preparation: Examine ice charts in locations that are likely to experience rapid ice retreat
- Post NWS Alaska Ice charts on resource page [Ronnie Owens with input from Hajo]

C. SIO Products & Outcomes

- Discussion of SIO products: Summary of activities in context of NSF broader impacts criteria, e.g., value for SEARCH Responding to Change activities, highlight papers that build on outlook (Zhang, Kauker, etc.) [Helen & Hajo will compile summary, Jim & Nancy will search fo Outlook-related papers]

- Provide statistics on web page hits (2008 & 2009), also broken down by domain (edu vs. com and others) [Central Office]

- How are we continuing as international activity post-DAMOCLES? Consider inclusion in MoUs or agreements with ArcticNet and other international partners [Hajo]

- Consider dedicated proposal to NSF in 2011 to support key contributors & activities that go beyond current synthesis and exchange forum

- Consider open letter to agencies: What specific observations are most needed to improve outlook? [Unclear who was going to pursue to item: Son Nghiem & Florence Fetterer?]

- Comparison runs between different outlook ensemble model simulations based on standardized conditions to allow assessment of intercomparibility [Hajo will check with Zhang, Kauker & others about feasibility]

(4) Regional outlook summary

- Regional outlook will request two types of input or products: Option 3 (based on Adrienne Tivy's nomenclature) – categorical forecast as in past year, and Option 2 – quantitative forecast of summer ice extent for different sub-regions
- Sub-regions OK but Jim Overland has concerns about lumping Barents & Kara Seas together because of different teleconnection patterns for two regions
- Retrospective analysis will be conducted for contributors for option 2

- Pre-product to be released in 2nd week of May that includes Adrienne Tivy's forecast and other resources (see above) [Central Office]

(5) Sea ice for walrus outlook (SIWO)

- Discussion of spatial resolution of forecast model: Key issue is which air mass (North Pacific-Bering-Arctic) affects region
- First product will be prepared for Friday March 26 – for internal review
- First released product Friday April 2

- Provide Nancy Soreide with information on walrus tracking data from USGS [Hajo]

- Calling up local experts in communities to transmit information and build communication [Vera Metcalf? & Hajo]

- Assessment of current ice conditions relevant to distribution and access of walrus: Gary Hufford

- Local hunter assessment [coordinated by Vera & Hajo]

- Ice conditions at the floe-scale: Input from hunters and other ice experts, information collected by Central Office
- access to archived conditions?

- Diagnostic discussion page with comments by a range of experts (target Igor Krupnik, Carleton Ray, Leonard Apangalook, Brendan Kelly and others specifically) sent in to ARCUS