DRAFT AGENDA: Workshop
“Observations of upper-ocean and sea-ice interactions in the eastern Arctic Ocean”

April 24-25, 2014
The Westin Arlington Gateway
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Motivation: Rapid changes in the Arctic sea-ice cover over the past several decades suggest transition to a "New Arctic", with a stronger seasonal cycle of ice cover and a thinner and more mobile ice pack when present. Under these conditions we expect much more energetic upper ocean mixing and advective processes as the reduced ice cover leads to stronger direct exchanges of heat, freshwater and momentum between the atmosphere and ocean, with more pronounced seasonal cycling. The interactions between a changing sea-ice state and the underlying ocean are, however, poorly understood, leading to large uncertainties in the potential feedbacks (both positive and negative) that will determine the rate of transition to a New Arctic, and the nature of the sea-ice pack if a new steady state is reached. These uncertainties have practical implications for a diverse range of interests, including broader climate modeling, seasonal to decadal Arctic prediction, resource utilization, navigation, fisheries, and stability of Arctic coastal communities.

Many critical upper-ocean and sea-ice processes occur at time and length scales that are too small to be explicitly represented in basin and global climate models, and observations do not exist on the relevant scales to improve model parameterizations. We hypothesize that a detailed, comprehensive suite of measurements, designed to take advantage of recent improvements in conceptual understanding and instrumentation, can lead to greatly improved parameterizations of these processes. We further hypothesize that the distinct ocean, sea-ice and atmospheric states of the eastern Arctic, relative to those of the more intensively studied Beaufort Gyre, will lead to distinct sea-ice and upper-ocean processes and responses to comparable trends in atmospheric variables such as air temperature and downwelling radiation.

It is hoped that the workshop and subsequent open review of the resulting draft White Paper will lead to a concrete science plan for addressing these issues, with broad US and international Arctic community support for proposed activities.

Specific Objectives for the workshop

Identify key science questions and hypotheses that must be addressed by an experimental program in order to significantly advance our understanding of sea-ice and upper-ocean processes and interactions in the eastern Arctic Ocean.

Identify essential technologies and platforms to address these questions and hypotheses, including but not limited to: potential for ship surveying; one or more focused ice camps; drifters, underwater and airborne autonomous vehicles; and satellite or airborne remote sensing.
Develop plan for experiment logistics; identify timeline, multi-agency funding sources, international cooperation strategies, and management approaches.

Develop approaches for coordination of the proposed activities with wider Arctic science community. Identify needs of satellite and modeling communities in observational data collected during the ice camp. Develop plan for engagement of young scientists in project activities.

**Documentation**

Workshop coordinators will develop a draft White Paper summarizing the workshop outcomes. This document will be circulated amongst all workshop participants for further comment, then posted, broadly advertised and shared directly with our peers for further community comment before being finalized two months after the workshop.
April 24, 2014, Thursday

Welcome from the Organizing Committee: Igor Polyakov, Laurie Padman, Jenny Hutchings and TBD

Afternoon Session: 13.00 – 18.00, coffee break 15.20 – 15.50.
Chair: TBD

I. Arctic climate: State of knowledge and uncertainties.

1. Presentation #1. Challenges of building a comprehensive picture of pan-Arctic changes. Igor Polyakov - 20 min.


3. Presentation #4. Role of mixing in the upper-ocean interior in delivering heat to the bottom of ice in the Arctic Ocean. P. Winsor – 30 min.

4. Presentation #3. Lateral heterogeneity of the upper ocean: How to understand heat partitioning between ice, upper ocean, dissipation. L. Rainville – 30 min.

5. Presentation #5. Interactions between Arctic Ocean upper-ocean heat content, sea-ice properties and atmospheric radiative terms at local (ice-floe) spatial scale. L. Padman – 30 min.

Coffee break 15.20 – 15.50

II. Logistics for the field campaign

1. David Barber, University of Manitoba, CCGS Amundsen – 20 min.

2. Vladimir Ivanov, AARI, RV Akademik Fedorov and IB Kapitan Dranitsyn – 20 min.

3. MOSAIC and LANCE ice camps – Ola Persson and LANCE project PI. – 2x20min.

4. General discussion including questions, field experiment requirements etc. – 50 min.

Dinner (19.00 – 21.00): Place TBD.

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April 25, 2014, Friday

Morning Coffee: 8.30 – 9.00.

Morning session: 9.00 – 12.00. Coffee break 10.00 – 10.15. Chair: TBD

Parallel sessions: 9.00 – 11.00

I. Parallel session “Observing vertical transports above and below sea ice floe.”
   Discussion of basic science drivers, questions and hypotheses.
   Discussion of interdisciplinary linkages.
   Discussion of implementation strategies including international cooperation etc.

II. Parallel session “Observing uptake of atmospheric heat by upper ocean and its delivery to the bottom of sea-ice floe”.
    Discussion of basic science drivers, questions and hypotheses.
    Discussion of interdisciplinary linkages.
    Discussion of implementation strategies including international cooperation etc.

III. Parallel session “Observing local changes in the context of large scale Arctic variability”.
     Discussion of basic science drivers, questions and hypotheses.
     Discussion of interdisciplinary linkages.
     Discussion of implementation strategies including international cooperation etc.

Joint session: 11.00 – 12.00
   Summaries from parallel panels.
   Discussion of basic science drivers, questions and hypotheses.
   Discussion of interdisciplinary linkages.

Lunch: 12.00 p.m. – 13.00 p.m.

Afternoon Session: 13.00 – 17.00 p.m. Coffee break 15.00 – 15.30.
Chair: TBD

IV. Developing logistical strategies.
    Timeline.
    Writing science plan.
    Funding sources and strategies.
    Implementation strategies including integrative observation strategies, international cooperation etc.
    Engagement of wider communities (satellite, modeling, etc).
    Engagement of young scientists

Adjourn by 17:00 hrs.