

Arctic Observation Integration Workshops

17–20 March 2008

IBM Palisades Conference Center

Palisades, New York

Tentative Agenda

Arctic Observing Network (AON) Meeting (Room A350)

Monday, 17 March 2008

Continental breakfast available starting at 7:30 a.m (Coffee Pavilion A390). Full breakfast available 6:30–8:30 a.m (Hearth Dining Room) for participants staying at the IBM Center.

8:15 a.m. Introduction and Workshop Goals *Hajo Eicken, University of Alaska Fairbanks*
Peter Schlosser, Lamont-Doherty Earth Observatory

8:30 a.m. AON Progress and Development, Brief SAON Update *Martin Jeffries, NSF*
AON Program Director

AON Project Presentations

10-minute talks, with time for questions and discussion after each group of projects (PIs with two projects are given additional time). Presenters are asked to limit the presentation to four (4) slides:

- 1) Title and Project Team Members
- 2) Project Status and Progress
- 3) Coordination and Integration Plans
- 4) Future Directions and Planning for the 2008 Season

Human Dimensions Project

8:45 a.m. Is the Arctic Human Environment Moving to a New State?
Larry Hamilton, University of New Hampshire
Sharman Haley, University of Alaska Anchorage

8:55 a.m. Brief Discussion: Developing AON Human Dimensions research and coordinating networked observations

Atmosphere Projects:

9:05 a.m. Core Atmospheric Measurements at Summit, Greenland Environmental Observatory
Joe McConnell, Desert Research Institute

9:15 a.m. Pan-Arctic Studies of the Coupled Tropospheric, Stratospheric, and Mesospheric Circulation
Richard Collins, University of Alaska Fairbanks

9:25 a.m. Development of Data Products for the University of Wisconsin High Spectral Resolution Lidar
Ed Eloranta, University of Wisconsin-Madison

Arctic Observing Network (AON) Meeting (Continued)

- 9:35 a.m. Cloud Properties Across the Arctic Basin from Surface and Satellite Measurements
- An Existing Arctic Observing Network
Matthew Shupe, University of Colorado
- 9:45 a.m. Brief Discussion: Coordinating & Integrating Atmosphere Observations
- Ocean and Sea Ice Projects:**
- 10:00 a.m. The State of the Arctic Sea Ice Cover: An Integrated Seasonal Ice Zone
Observing Network (SIZONET) *Hajo Eicken, University of Alaska Fairbanks*
- 10:10 a.m. Ice Mass Balance Buoy Network: Coordination with DAMOCLES
Don Perovich, CRREL
- 10:20 a.m. Design and Initialization of an Ice-Tethered Array Contributing to the Arctic Observing
Network [**and**] Towards an Arctic Observing Network: An Array of Ice-Tethered
Profilers to Sample the Upper Ocean Water Properties During the International Polar Year
John Toole, Woods Hole Oceanographic Institution
- 10:35 a.m. BREAK
- 10:50 a.m. Ocean-Ice Interaction Measurements Using Autonomous Ocean Flux Buoys in
the Arctic Observing System [**and**] Toward Developing an Arctic Observing
Network: An Array of Surface Buoys to Sample Turbulent Ocean Heat and Salt
Fluxes During the IPY
Bill Shaw, Naval Postgraduate School
- 11:05 a.m. The Collaborative O-Buoy Project: Deployment of a Network of Arctic Ocean
Chemical Sensors for the IPY and Beyond
Don Perovich, CRREL
- 11:15 a.m. Coordination, Data Management, and Enhancement of the International Arctic
Buoy Programme (IABP) *Ignatius Rigor, University of Washington*
- 11:25 a.m. A Modular Approach to Building an Arctic Observing system for the IPY and
Beyond in the Switchyard Region of the Arctic Ocean
Peter Schlosser, Lamont-Doherty Earth Observatory
- 11:35 a.m. The Beaufort Gyre System: The Flywheel of the Arctic
Andrey Proshutinsky, Woods Hole Oceanographic Institution
- 11:45 a.m. Observing the Dynamics of the Deepest Waters in the Arctic Ocean
Mary-Louise Timmermans, Woods Hole Oceanographic Institution
- 11:55 a.m. North Pole Station: A Distributed Long-Term Environmental Observatory (**and**)
Aerial Hydrographic Surveys for IPY and Beyond: Tracking Change and
Understanding Seasonal Variability *Jamie Morison, University of Washington*

Arctic Observing Network (AON) Meeting (Continued)

- 12:10 p.m. An Innovative Observational Network for Critical Arctic Gateways:
Understanding Exchanges through Davis and Fram Straits
Craig Lee, University of Washington
- 12:20 p.m. Comparison of Water Properties and Flows in the U.S. and Russian Channels of
the Bering Strait - 2005 to 2006 **[and]** The Pacific Gateway to the Arctic-
Quantifying and Understanding Bering Strait Oceanic Fluxes
Rebecca Woodgate, University of Washington
- 12:35 p.m. Bering Sea Sub-Network: International Community-Based Observation Alliance
for Arctic Observing Network (BSSN)
Victoria Gofman, Aleut International Association
- 12:45 p.m. Brief Discussion: Coordinating Ocean and Sea Ice Observations

1:00 p.m. LUNCH (Hearth Dining Room)

Hydrology/Cryosphere Projects:

- 2:00 p.m. Thermal State of Permafrost (TSP): The U.S. Contribution to the International
Permafrost Observation Network **[and]** Development of a Network of Permafrost
Observatories in North America and Russia: The US Contribution to the
International Polar Year *Jerry Brown, International Permafrost Association*
- 2:15 p.m. A Prototype Network for Measuring Arctic Winter Precipitation and Snow Cover
(Snow-Net) **[and]** Long-term Measurements and Observations for the
International Arctic Research Community on the Kuparuk River Basin, Alaska
Matthew Sturm, CRREL
- 2:35 p.m. Arctic Great Rivers Observatory *Peter Raymond, Yale University*
- 2:45 p.m. Columbia Glacier Project *Tad Pfeffer, University of Colorado Boulder*
- 2:55 p.m. Brief Discussion: Coordinating Hydrology/Cryosphere Observations

Terrestrial Ecosystem Projects:

- 3:10 p.m. Study of Arctic Ecosystem Changes in the IPY using the International Tundra
Experiment *Steve Oberbauer, Florida International University*
- 3:20 p.m. Carbon, Water, and Energy Balance of the Arctic Landscape at Flagship Observatories
and in a PanArctic Network
Gus Shaver, Marine Biological Laboratory
Donie Bret-Harte, University of Alaska Fairbanks
- 3:30 p.m. Brief Discussion: Coordinating Terrestrial Ecosystem Observations

3:45 p.m. BREAK

Arctic Observing Network (AON) Meeting (Continued)

Data Management and Coordination:

- 4:05 p.m. Exchange for Local Observations and Knowledge in the Arctic (ELOKA)
Mark Parsons, National Snow and Ice Data Center
- 4:15 p.m. Cooperative Arctic Data and Information Service (CADIS)
 - Update on CADIS activities and portal development
 - Issues on data sharing, collaboration, and integration*James Moore, NCAR Earth Observing Laboratory, and CADIS Team*
- 5:15 p.m. Review of discussions, plan for any evening working groups, goal for Tuesday
- 6:00 p.m. DINNER (Hearth Dining Room)
- 7:00 p.m. Working group(s) addressed topics identified during the day. Working group topics included:
1. Data management and integration
 2. Observing system/network design, and coordination and integration through observations and modeling
 3. Interactions between human activities and sea, land, ice, and atmosphere

Tuesday, 18 March 2008

- 8:30 a.m. Welcome, review of Monday's discussions, and goal for the day
Martin Jeffries, Hajo Eicken, Peter Schlosser

International Observing Programs and Efforts

- 8:35 a.m. International Study of Arctic Change (ISAC)
Maribeth Murray, University of Alaska Fairbanks
- 8:50 a.m. Developing Arctic Modeling and Observing Capabilities for Long-term Environmental Studies (DAMOCLES)
Jean-Claude Gascard, Université Pierre et Marie Curie
- 9:05 a.m. Nansen and Amundsen Basins Observational System (NABOS)
Igor Polyakov, International Arctic Research Center (IARC)
- 9:20 a.m. ArcticNet and Canadian Arctic Research Efforts
Martin Fortier, Université Laval
- 9:35 a.m. Japanese Arctic Research Efforts
Koji Shimada, Japan Agency for Marine-Earth Science and Technology (JAMSTEC)
- 9:50 a.m. U.S. Agency Activities:
John Calder, Arctic Research Office, NOAA
Peter Murdoch, U.S. Geological Survey

Lee Koss, BLM-Alaska State Office
John Farrell, U.S. Arctic Research Commission
Dan Lubin, NSF Office of Polar Programs, Cyberinfrastructure Program Manager

10:20 a.m. BREAK

Integrating Multidisciplinary Observations in a Changing Arctic

10:40 a.m. Reports from Monday evening break-out groups (10-minute presentations):

- *Working Group 1: AON as a "Collaboratory"; Use of cyberinfrastructure; Data Management; Communications and information dissemination*

Rapporteur: Jim Moore

- *Working Group 2: Observing system/network design; Coordination/integration through observations and modeling*

Rapporteur: David Holland

- *Working Group 3: Interactions between human activities and ice, ocean, atmosphere, and land*

Rapporteur: Sharman Haley

11:10 a.m. Discussions on next steps for developing an integrated multidisciplinary network out of individual projects and efforts:

- Gaps in meeting the scientific objectives for observing, understanding, and responding to change, and how they can be addressed
- Plans for integration and coordination among AON projects
- Plans and next steps for integration and coordination between AON and other national and international efforts
- Data coordination issues
- Specific needs given the rapid and unexpected changes in 2007
- Specific needs for the 2008 observing season and for the longer-term

12:00 p.m. LUNCH (Hearth Dining Room) (Chairs and Rapporteurs Meet for Lunch)

1:00 p.m. Conclusions, Recommendations, and Next Steps:

Martin Jeffries, Hajo Eicken, Peter Schlosser

- What are the priorities and next steps for meeting the observing, understanding, and responding to change scientific objectives?
- What are the priorities for integration and coordination among AON projects?
- What are the priorities for international integration and coordination?
- What are the achievable action items that can be accomplished in the next 12 months?
- What can AON produce as a lasting legacy of IPY?

- Workshop product/publication, timeline, and assignments

2:00 p.m. AON Meeting Adjourns

Concurrent Afternoon Sessions:

2:00 p.m. Lagrangian Platform Workshop begins (Room A350)

2:00 p.m. CADIS portal training for AON PIs (Room A230 on 2nd floor)

2:00 p.m. AON working groups, as needed (Rooms A360, B340, C370)

Lagrangian Platform Workshop (Room A350)

- 2:00 p.m. Introduction *Craig Lee, University of Washington*
- Welcome, agenda overview and workshop charge. Emphasize objectives, tasks and products.
- 2:10 p.m. Science Drivers and Fit within AON *Jean-Claude Gascard, Université Pierre et Marie Curie*
- (1) Autonomous and Lagrangian platforms in the context of AON. What science questions might these platforms contribute to, what critical measurements might they allow? How can they help measure change, and where do they fit within the existing suite of platforms and approaches (e.g. hydrography, moorings)?
 - (2) Science drivers/key measurements:
 - (a) Surface albedo
 - (b) Ice thickness distribution
 - (c) Persistent (year-round, multi year), full-depth, extensive measurements of watermass variability. Quantify broad changes in heat and freshwater storage, vertical stratification.
 - (d) Long-term characterization of watermass and velocity structure across key frontal regions, slope-shelf interfaces.
- 2:25 p.m. Current state of the technology (Introduced and moderated by Lee)
- (1) What's working today, and how is it used? What are the major technological and development hurdles?
 - (2) 5-minute summaries of state of play in:
 - a. Arctic buoy program- Rigor
 - b. ITPs (WHOI ITP and POPS)- Gascard/Toole
 - c. Floats (PPF and DAMOCLES)- Gascard/Toole
 - d. Gliders and AUVs- Lee
 - e. Navigation and communications- Lee
- 3:00 p.m. BREAK
- 3:15 p.m. Discussion (moderated by Lee and Gascard)
Try to touch on the following broad topics:
- (1) How could these platforms be exploited to track, understand, and ultimately forecast arctic change? Are they appropriate tools for this task? How might they be employed? How will these platforms complement conventional approaches and technologies?
 - (2) How should these technologies be adapted in response to the changing Arctic? Specifically, how might these platforms and approaches be changed to compensate for and exploit changes in arctic ice cover?
 - (3) Identify technological challenges and development goals for enhancing the utility of autonomous Lagrangian platforms in the Arctic. Identify political and

international coordination issues that will need to be addressed. How would the resulting systems fit within the larger scheme of arctic observing?

Lagrangian Platform Workshop (Continued)

- 5:00 p.m. Recommendations and Next Steps (moderated by Lee and Gascard)
- (1) What are immediate, mid- and long-term strategies to improve observational system design?
 - (2) What specific efforts should be directed toward developing autonomous and Lagrangian systems and/or supporting technologies to provide long-term operation in the changing Arctic?
 - (3) Discussion of workshop product(s), next steps, and writing assignments.

6:00 p.m. Dinner (Hearth Dining Room)
Organizing Committee meet for dinner together in the Hearth Dining Room

7:00 p.m.– Working group(s) as needed

Lessons from the 2007 Arctic Sea-ice Minimum Workshop (Room A350)

Wednesday, 19 March

Continental breakfast available starting at 7:30 a.m. each morning (Coffee Pavilion A390). Full breakfast available 6:30–8:30 a.m. for participants staying at the venue (Hearth Dining Room).

8:30 a.m. Introduction, Background and Workshop Goals

Martin Miles, Environmental Systems Analysis Research Center (ESARC)

Jean-Claude Gascard, Université Pierre et Marie Curie

I. 2007 CHANGES IN COMPONENTS OF THE ARCTIC SYSTEM

Sea Ice Changes:

8:45 a.m. Sea-Ice Changes Observed in 2007/8 and Leading-up

Ignatius Rigor, University of Washington

Jean-Claude Gascard, Université Pierre et Marie Curie

Martin Miles, ESARC

Hajo Eicken, University of Alaska Fairbanks

Discussion

Atmospheric Changes:

9:30 a.m. Arctic Temperature and Modes-of-Variability

Jim Overland, NOAA PMEL

Jean-Claude Gascard, Université Pierre et Marie Curie

Radiation and its Role in Sea-Ice Melt

Don Perovich, CRREL

Discussion

10:30 a.m. BREAK

Ocean Changes:

11:00 a.m. Ocean Changes Observed in 2007 and Leading-up

Rebecca Woodgate, University of Washington

Jean-Claude Gascard, Université Pierre et Marie Curie

Igor Polyakov, International Arctic Research Center (IARC)

Koji Shimada, Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

Discussion

12:00 p.m. LUNCH (Hearth Dining Room)

Terrestrial Ecosystem Changes:

1:00 p.m. Recent Changes in Circum-Arctic Vegetation: Greening of the Arctic
Skip Walker, University of Alaska Fairbanks

Lessons from the 2007 Arctic Sea-ice Minimum Workshop (Continued)

Marine and Terrestrial Changes – Other:

1:15 p.m. Recent Changes in the Greenland Ice Sheet
Mark Fahnestock, University of New Hampshire

Human System Changes:

1:30 p.m. Human Response to the Recent Sea-Ice and Climate-System Changes
Maribeth Murray, University of Alaska Fairbanks

Brief Discussion

II. SYNTHESIS OF 2007 ARCTIC-SYSTEM CHANGES:

1:45 p.m. Synthesis Overview
Martin Miles (ESARC)
Hajo Eicken, University of Alaska Fairbanks

2:00 p.m. Presentations and Discussion (Plenum, with break-out groups)
Cecilia Bitz, University of Washington
Frank Kauker, Ocean Atmosphere System
Ralf Döscher, Swedish Meteorological and Hydrological Institute
Jinlun Zhang, University of Washington

Discussion

3:00 p.m. BREAK

3:30 p.m. Working Groups:

1. Through modeling and data analysis activities – including retrospective analyses of the long-term observational record – how well do we *understand* 2007? What are the gaps in observing and understanding sea-ice loss and related changes?
2. What do modeling and data analysis tell us about overall system behavior that is relevant for *predicting* sea ice – on seasonal to decadal time scales – and related arctic changes? How does the “tipping point” concept factor in?
3. What are the science / policy / human implications of the unexpected, faster-than-forecast changes? What does this mean for *responding* to change?

6:00 p.m. Dinner (Hearth Dining Room)

7:00 p.m. Working Groups Continue

Thursday, 20 March

III. LESSONS FROM 2007: GAPS AND NEEDS FOR UNDERSTANDING ARCTIC CHANGE

8:30 a.m. Welcome, review of Wednesday discussions, and today's goal

Martin Miles (ESARC)

Jean-Claude Gascard, Université Pierre et Marie Curie

9:00 a.m. Working Group Reports

10:00 a.m. BREAK

10:30 a.m. Conclusions, recommendations, and next steps:

- Given the unexpected changes witnessed in 2007, what are the priorities for observing, understanding, and responding to change activities?
- How should these priorities be addressed? What are the next steps?
- Discussion of workshop products (synthesis papers and other products), next steps, and writing assignments

Concluding Workshop Series Discussion

12:00 p.m. Workshop Series Conclusions and Recommendations: Summary of the week's discussions, achievements, and next steps

12:30 p.m. Workshop Series Adjourns

12:30 p.m. LUNCH (Hearth Dining Room) (Possible Organizing Committee Meeting)

1:30 p.m.–
4:00 p.m. Meeting rooms available for continued working groups and other discussions