

CLIVAR/CliC Northern Oceans Region Panel

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Panel overview

~1-2 paragraphs background with a summary of panel current main mission and 2017-2018 activities and obstacles, if any.

NORP serves as an international forum for coordinating and strategizing activities on the role of the Arctic Ocean in the context of the global climate system from a coupled perspective. NORP facilitates progress in the development of tools and methods to monitor and assess climate variability and change, and evaluate climate predictability of the ocean-atmosphere-ice system in the Arctic and Subarctic Ocean. NORP coordinates efforts to enhance the ability to monitor the coupled system, understand the driving mechanisms of the system change from a coupled process perspective, and predict the evolution of the emerging New Arctic climate. NORP plays a central role in coordinating, monitoring, and evaluating the progress of such activities during and beyond the Year of Polar Prediction.

Achievements for 2017-18

NORP was approved by the WCRP JSC on April 3, 2017. The first panel telecon was held on November 27, 2017 and monthly telecons have been held to date.

The 1st session of CLIVAR/CliC NORP was held on 15-16 June 2018, at Congress Centre Davos, Switzerland. NORP is organized into 6 task teams; Arctic ocean reanalyses, Arctic ocean in Arctic amplification, Arctic midlatitude linkages, Anthropogenic and natural forcing, Model errors in Arctic projections, and Greenland ice sheet – ocean interactions. Teams core activities, discussion points, emerging challenges, and deliverables were discussed. Talks to develop coordination with other international groups were presented by Lee Cooper (chair of the IASC Marine Working Group) and Olga Zolina (member of the CLIVAR Climate Dynamics Panel). Scientific presentations were given by Sheldon Bacon and Xiangdong Zhang on Arctic-mid-latitude linkages, Amy Solomon on the upcoming MOSAiC year-long drift campaign, Dirk Olonscheck on understanding internal variability of sea ice and surface air temperature, and Ruth Mottram on Greenland Ice Sheet – Ocean Interactions: Emerging Challenges and Opportunities.

Since the 13th session of the CLIVAR/CliC/SCAR Southern Ocean Region Panel (SORP) also occurred in Davos on 14-15 June, a joint session from SORP and NORP was convened on the afternoon of 15 June. During the joint NORP/SORP session processes that cause variability in the Arctic and Southern Oceans, outstanding polar issues, polar-midlatitude linkages, the role of the tropics on the polar regions, and comparison of sea ice behavior at both polar was discussed. It was decided that a topic of mutual interest is

the role of freshwater fluxes in polar climate and that a workshop should be organized on this topic in the near future.

A workshop proposal was submitted to the Aspen Global Change Institute (AGCI) entitled, “Role of Freshwater in Polar Ocean Climate Change and Global Linkages”. This workshop (if approved) will take place in fall 2019 and will be organized with the CLIVAR/CLiC/SCAR Southern Ocean Region Panel. This workshop will bring together experts across the many disciplines involved in the role of freshwater in polar ocean climate change and global linkages, as well as graduate students and post-doctoral scholars working in this research area, to assess the current state-of-knowledge, identify research gaps and observational uncertainty and needs, and map out a strategy for progress on both regional and global scales. This workshop is designed to develop a research agenda on polar climate change in advance of the upcoming Sixth International Panel on Climate Change Assessment Report. This workshop will bring the polar science community together to advance research on WCRP Grand Challenges “Melting Ice and Global Consequences”, “Weather and Climate Extremes”, “Regional Sea-Level Change and Coastal Impacts”, and “Near-term Climate Prediction”.

Co-chair Amy Solomon gave an invited talk at AGU 2017 on the formation and motivation for the CLIVAR/CLiC NORP.

NORP members contributed to the CLIVAR OceanObs19 Community White Paper by writing the section on “Observational challenges and needs in the polar oceans”.

Plans for 2019 and beyond

- 1) Fall 2019 AGCI workshop (described in previous section)
- 2) Pre-AGU 2018 workshop on Greenland Freshwater Fluxes
This workshop will bring together participants across disciplines to discuss two challenges. The first is bridging the scales between freshwater fluxes from Greenland outlet glaciers and fjords to the ocean. The second is developing better freshwater flux forcings from Greenland through parameterizations or transfer functions (present-day and future scenarios) in ocean and other large-scale models. Participants will gather to develop a mutual appreciation of the challenges, identify individual and cross-community needs, highlight potential approaches for improvement, and build cross-community relationships.
- 3) FAMOS 2018 Talk on NORP motivation and near-term scientific objectives.
- 4) EGU 2018 Session on “Changes in the Arctic Ocean, sea ice and subarctic seas systems: Observations, Models and Perspectives”.
- 5) Write white paper on sea-ice ocean metrics for lower-latitude-Arctic interactions for CMIP diagnostics.
- 6) Work with national representatives to secure support for Arctic ocean-sea ice state estimates.
- 7) Advance studies on Greenland ice sheet – ocean interactions: Advocate for inclusion in CMIP7 and Sea level call in Horizon2020.

- 8) Coordinate archiving/mirroring of past/future campaign/in-situ data for assimilation and analysis: Coordinate with CLIVAR Global Synthesis and Observations Panel.

Articles published in 2017/18 as part of panel activities (if any)

CLIVAR OceanObs19' Community White Paper

Budget and other needs for 2019

Please keep in mind that the overall budget of CLIVAR is limited and this needs to be distributed between all activities and the SSG meeting.

If the AGCI joint NORP/SORP workshop is approved for fall 2019, NORP requests support for members to participate in this meeting. We request ~\$5,000 to support travel to/from the meeting.

Annex A

Proforma for CLIVAR Panel requests

for SSG approval for meetings

1. **Panel or Working Group:** CliC/CLIVAR Northern Oceans Region Panel (NORP)
2. **Title of meeting or workshop:** AGCI Workshop on the role of freshwater in polar ocean climate change and global linkages.
3. **Proposed venue:** Aspen, Colorado USA
4. **Proposed dates:** fall 2019
5. **Proposed attendees, including likely number:**
Attendees will be 14 panel members and approximately 40 invited scientists.
6. **Rationale, motivation and justification, including: relevance to CLIVAR science & WCRP Grand Challenges, and any cross-panel/research foci links and interactions involved:**
This workshop is designed to develop a research agenda on polar climate change in advance of the upcoming Sixth International Panel on Climate Change Assessment Report. This workshop will bring the polar science community together to advance research on WCRP Grand Challenges “Melting Ice and Global Consequences”, “Weather and Climate Extremes”, “Regional Sea-Level Change and Coastal Impacts”, and “Near-term Climate Prediction”.
7. **Specific objectives and key agenda items:**
This workshop will bring together experts across the many disciplines involved in the role of freshwater in polar ocean climate change and global linkages, as well as graduate students and post-doctoral scholars working in this research area, to assess the current state-of-knowledge, identify research gaps and observational uncertainty and needs, and map out a strategy for progress on both regional and global scales.
8. **Anticipated outcomes (deliverables):**
This workshop will bring together experts across the many disciplines involved in the role of freshwater in polar ocean climate and global linkages, as well as, graduate students and post-doc scholars working in this research area to assess current state-of-knowledge, identify research gaps, observational uncertainty and needs, and map out a strategy for progress on regional and global scales.
9. **Format:** Workshop
10. **Science Organizing Committee (if relevant)** NORP/SORP
11. **Local Organizing Committee (if relevant)** AGCI
12. **Proposed funding sources and anticipated funding requested from WCRP:**
NORP requests ~\$5,000 from WCRP to pay for travel to/from Aspen Colorado for the panel members to participate in the workshop.

