Pacific Arctic Group (PAG)

Synthesis Update

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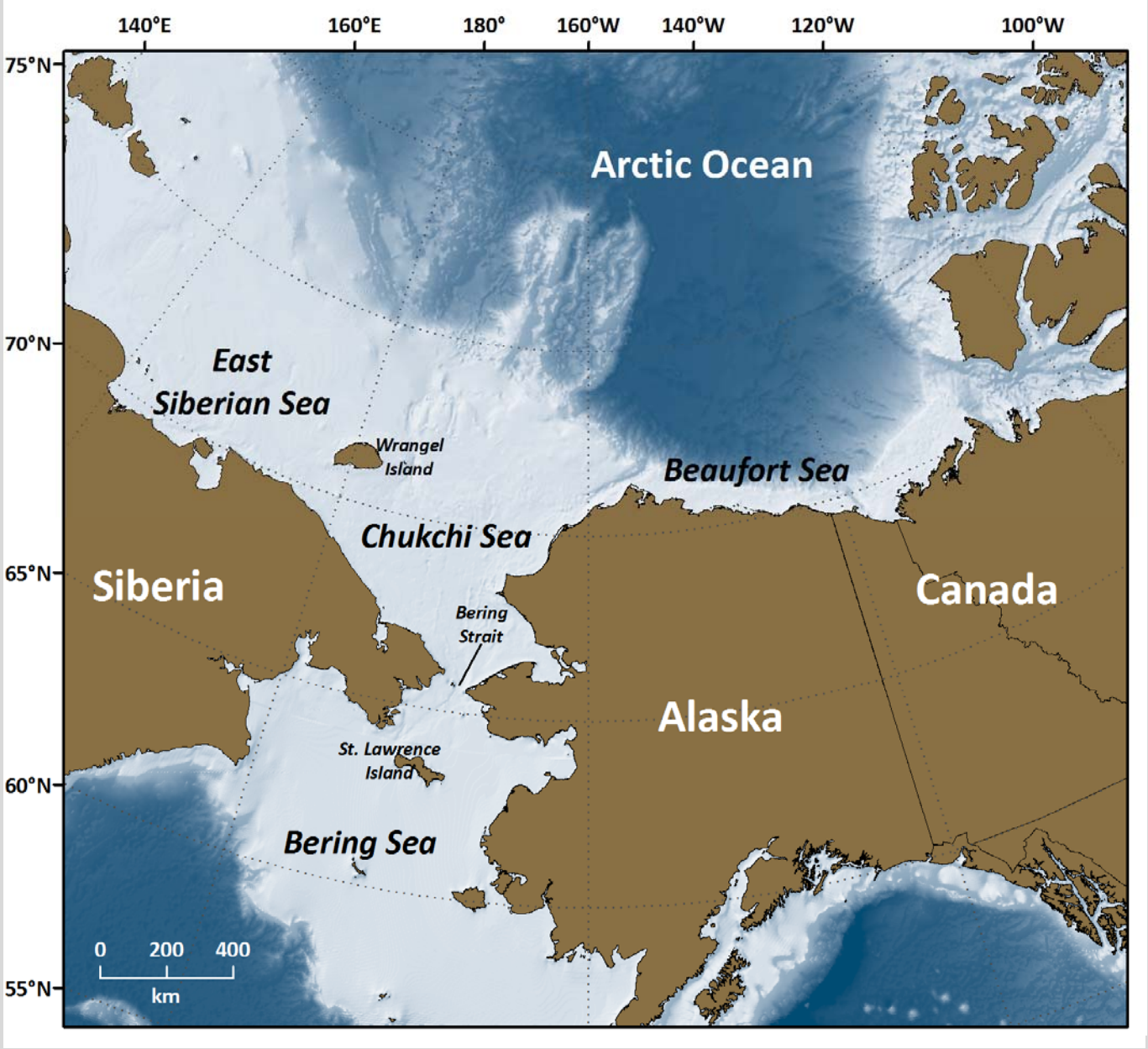
Seoul, Korea



PAG defines the **“Pacific sector”*** of the Arctic as the marine area from the Northern Bering Sea into the Chukchi Sea and adjacent Seas, and extending into the deep basins of the Arctic Ocean, with model boundaries from Aleutian Island and deep Bering Sea northward to Arctic Basin

OBJECTIVES OF PAR SYNTHESIS

1. present results from research, observation and modeling activities related to the PAG area, both retrospective and IPY efforts

2. share information on current modeling activities covering the PAG synthesis area; work toward a shared modeling system

3. identify status trends, and major new findings and understanding of state and processes in the PAG area

4. using best available model projections, prepare hypotheses regarding the future evolution of the physics and biology of the region

5. prepare scientific conclusions and recommendations to guide future PAG science activities

6. specifically for the PAG region, identify critical marine components of a future Arctic Observing Network

PAR Overview

1. Geographic area over which data is to be considered: Upstream (Bering Sea) to downstream (Chukchi Sea, portions East Siberian and Beaufort Sea, Canadian Arctic Archipelago, Arctic Ocean)

2. Time period to be considered: Decades leading up to IPY, IPY, and build scenarios decades past IPY

3. Science questions to be addressed by the synthesis and types of data to be included in the synthesis: Pacific-influenced Arctic system status and trends in atmosphere, sea ice, physical forcing, and biogeochemical/biological ecosystem response

4. Linkage between observational data and modeling: results from PAG modeling/data fusion workshop and other chapters

5. Products: Special book volume confirmed in Springer for PAG synthesis chapters; other special science volumes

6. Scope: Synthesis through workshops and invited participants

7. Endorsed by: IASC, AOSB:MWG, and the ICSU IPY project office as an IPY legacy effort

Summary of PAR Synthesis Activities

- **Fall 2007:** PAG created PAR synthesis group
- **Jan. 2008**: PAR Modeling Workshop #1, Sanya, China; resulted in special issue of Chinese Journal of Polar Science, Vol. 9, 2008; 13 papers
- **May 2009:** PAR Biology Workshop #2, Seattle, WA, USA; Feature article in EOS (May 2010); producing chapters for book in progress
- **June 2009:** PAR Marine Carbon Cycling Workshop #3, Xiamen, China; Special issue Deep Sea-Research in progress, Lead editor: Wei-Jun Cai et al.
- **Feb. 2010**: AGU/ALSO/TOS Ocean Sciences Meeting, Portland, Oregon, USA: Oceans10-IT24: Ecosystem Change in the Pacific Arctic in Relation to the Pan-Arctic System (Leads: Grebmeier, Moore, Maslowski, Zhao), orals and posters
- **June 2010**: OSLO IPY Conference, Oslo, Norway; Session T3-1: Ecosystem Change in the Pacific Arctic in Relation to the Pan-Arctic System (Leads: Grebmeier, Zhao, Mathis)
- **June 2010:** PAR Synthesis Lead author meeting, OSLO IPY Conference, Oslo, Norway
- **September 2010-spring 2011**: submission of chapter manuscripts, in review and revisions during spring/summer; est. submission volume to Springer October 2011
- **April 2012:** Plan release of Springer book at 2012 ASSW and IPY conference, Montreal Canada

Title Book: THE PACIFIC ARCTIC SECTOR: STATUS AND TRENDS
Publisher: Springer, est. publ. date, 2012

Ch. 1 Introduction (Guest editors: Grebmeier, J.M., W. Maslowski, J. Zhao): book format

Ch. 2 Recent and Future Change in the Meteorology of the Pacific Arctic **(Overland, J.E**., J. Wang, R.S. Pickart, and M. Wang)

Ch. 3 Long-Term Trends and Recent Interannual Variability of Sea Ice Cover in the Pacific Arctic Region **(K.E. Frey,** James A. Maslanik, Jaclyn Clement Kinney)

Ch. 4 Physical oceanography, hydrography, and shelf-basin exchange processes **(Williams, B.)**

Ch. 5 Physical processes and large scale circulation controlling Pacific-Arctic Interaction **(Maslowski, W.**)

Ch. 6 Model-Data Fusion Studies of Pacific Arctic Climate and Ice-Ocean Processes (**Wang, J.,** H. Eicken, Y. Yu, J. Zhang, H. Hu, M. Ikeda, K. Mizobata, and J. Overland)

Ch. 7 On the Flow Through Bering Strait: A Synthesis of Model Results and Observations **(Kinney, J.C.,** W. Maslowski, Y. Aksenov, B. de Cuevas, J. Jakacki A. Nguyen, R. Osinski, M. Steele, R.A. Woodgate, and J. Zhang)

Ch. 8 Western Arctic Ocean Carbon Cycle: Fluxes Across Boundaries in a Changing Environment **(Cai, W.J. and N. Bates**)

Ch. 9 Carbon Biogeochemistry of the Western Arctic: Production, Export and Ocean Acidification **(Mathis, J.T.,** J.M. Grebmeier, D.A. Hansell, R.R. Hopcroft, D.L. Kirchman, S.H. Lee, and S.B. Moran)

Ch. 10 Biodiversity & Biogeography of Lower Trophic Systems in the Pacific Sector (**Nelson, J. et al.**)

Ch. 11 Marine Fishes, Birds and Mammals as Sentinels of Ecosystem Variability and Reorganization in the Pacific Arctic Region **(Moore, S.E., E. Logerwell,** L. Eisner, E. Farley, L. Harwood, K. Kuletz, J. Lovvorn, J. Murphy, L. Quakenbush)

Ch. 12 Progress and Challenges In Biogeochemical Modeling Of The Pacific Arctic Region (**Deal, C.J., N. Steiner,** J. Christian, J.Clement-Kinney, K. Denman, S. Elliott, G. Gibson, M. Jin, D. Lavoie, S. Lee, W. Lee, W. Maslowski, J. Wang, E. Watanabe)

Ch. 13 Paleoceanograpy over the last 10,000 yrs in the Pacific Arctic **(Caissie, B. and J. Brigham Grette)**

Ch. 14 Summary and future direction, including need for time series observations in PAR and summary themes for future international collaboration research **(Guest editors)**

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