

Arctic Research Program, FY2008 Progress Report
Publication and Report Annex
March 3, 2009

Program Managers: John Calder, +1-301-427-2470; Kathy Crane, +1-301-427-2471

Arctic Change Detection

2007

Alkire, M.B, K.K. Falkner, I. Rigor, M. Steele, and , J. Morison, The return of Pacific waters to the upper layers of the central Arctic Ocean, Deep Sea Research, v. 54, pp. 1509 – 1529, 2007.

Sasaki, Y.N. Y. Katagiri, S. Minobe, and I.G. Rigor, Autumn atmospheric preconditioning for interannual variability of wintertime sea-ice in the Okhotsk Sea, J. Oceanography, v. 63, n. 2, pp. 255-265, 2007.

Intergovernmental Panel on Climate Change (IPCC) Working Group I, Contribution to the Fourth Assessment Report of the IPCC - Climate Change 2007: The Physical Science Basis. (*Rigor, I.G. is a Contributing Author*).

Eriksson, C., A. Omstedt, J.E. Overland, D.B. Percival, and H.O. Mofjeld (2007): Characterizing the European sub-Arctic winter climate since 1500 using ice, temperature, and atmospheric circulation time series. J. Climate, 20(21), 5316–5334.

Liu, Y., J.R. Key, J.A. Francis and X. Wang. 2007. Possible causes of the decreasing cloud cover in the Arctic winter: 1982-2000, Geophysical Research Letters, 34, L14705, doi:10.1029/2007GL030042

Overland, J.E., J.E. Walsh, and M. Wang (2007): Why are ice and snow changing? Chapter 3 in Global Outlook for Ice and Snow, United Nations Environment Programme (UNEP), Division of Early Warning and Assessment (DEWA), 29–38.

Overland, J.E., and M. Wang (2007): Future regional Arctic Sea ice declines. Geophys. Res. Lett., 34(17), L17705, doi: 10.1029/2007GL030808.

Richter-Menge, J., J. Overland, A. Proshutinsky, V. Romanovsky, R. Armstrong, J. Morison, S. Nghiem, N. Oberman, D. Perovich, I. Rigor, L. Bengtsson, R. Przybylak, A. Shiklomanov, D. Walker, and J. Walsh (2007): 5. The Poles; a. Arctic — in *State of the Climate in 2006*, A. Arguez (ed.). Bull. Am. Meteorol. Soc., 88 (suppl.)(6), S62–S71.

J. Richter-Menge, J. Overland, E. Hanna, M.J.J.E. Loonen, A. Proshutinsky, V. Romanovsky, D. Russell, R. Van Bogaert, R. Armstrong, L. Bengtsson, J. Box, T.V. Callaghan, M. De Dapper, B. Ebbing, O. Grau, M. Hallinger, L.D. Hinzman, P. Huybrechts, G.J. Jia, C. Jonasson, J. Morison, S. Nghiem, N. Oberman, D. Perovich, R. Przybylak, I. Rigor, A. Shiklomanov, D. Walker, J. Walsh, and C. Zöckler (2007). Arctic Report Card 2007,

[http://www.arctic.noaa.gov/report07.](http://www.arctic.noaa.gov/report07)

Trites, A.W., A.J. Miller, H.D.G. Maschner, M.A. Alexander, S.J. Bograd, J.A. Calder, A. Capotondi, K.O. Coyle, E. Di Lorenzo, B.P. Finney, E.J. Gregr, C.E. Grosch, S.R. Hare, G.L. Hunt, J. Jahncke, N.B. Kachel, H.-J. Kim, C. Ladd, N.J. Mantua, C. Marzban, W. Maslowski, R. Mendelsohn, D.J. Neilson, S.R. Okkonen, J.E. Overland, K.L. Reedy-Maschner, T.C. Royer, F.B. Schwing, J.X.L. Wang and A.J. Winship. 2007. Bottom-up forcing and the decline of Steller sea lions (*Eumetopias jubatus*) in Alaska: Assessing the ocean climate hypothesis. *Fisheries Oceanography*, 16(1):46–67.

Wang, M., N.A. Bond, and J.E. Overland (2007): Comparison of atmospheric forcing in four sub-arctic seas. *Deep-Sea Res. II*, 54(23–26), 2543-2559.

Wang, M., J.E. Overland, V. Kattsov, J.E. Walsh, X. Zhang, and T. Pavlova (2007): Intrinsic versus forced variation in coupled climate model simulations over the Arctic during the Twentieth Century. *J. Climate*, 20(6), 1093–1107.

2008

Ogi, M., I. G. Rigor, M. G. McPhee, and J. M. Wallace, Summer retreat of Arctic sea ice: Role of summer winds, *Geophys. Res. Lett.*, 35, L24701, doi:10.1029/2008GL035672, 2008.

Haas, C., A. Pfaffling, S. Hendriks, L. Rabenstein, J.-L. Etienne, and I. Rigor, Reduced ice thickness in Arctic Transpolar Drift favors rapid ice retreat, *Geophys. Res. Lett.*, 35, L17501, doi:10.1029/2008GL034457, 2008.

Nghiem, S.V., I.G. Rigor, P. Clemente-Colón, D. K. Perovich, and G. Neumann, New record reduction of Arctic perennial sea ice in winter 2008, *Jet Propul. Lab. Doc. D-44233*, Pasadena, Calif., 2008.

Richter-Menge, J., J. Overland, M. Svoboda, J. Box, M.J.J.E. Loonen, A. Proshutinsky, V. Romanovsky, D. Russell, C.D. Sawatzky, M. Simpkins, R. Armstrong, I. Ashik, L.-S. Bai, D. Bromwich, J. Cappelen, E. Carmack, J. Comiso, B. Ebbing, I. Frolov, J.C. Gascard, M. Itoh, G.J. Jia, R. Krishfield, F. McLaughlin, W. Meier, N. Mikkelsen, J. Morison, T. Mote, S. Nghiem, D. Perovich, I. Polyakov, J.D. Reist, B. Rudels, U. Schauer, A. Shiklomanov, K. Shimada, V. Sokolov, M. Steele, M.-L. Timmermans, J. Toole, B. Veenhuis, D. Walker, J. Walsh, M. Wang, A. Weidick, C. Zöckler (2008). Arctic Report Card 2008, <http://www.arctic.noaa.gov/reportcard>.

Richter-Menge and others (2008): 5. The Poles; a. Arctic — in State of the Climate in 2007, D. H. Levinson and J. H. Lawrimore (ed.). *Bull. Am. Meteorol. Soc.*, 89 (suppl.)(7), S85–S97.

Overland, J., J. Turner, J. Francis, N. Gillett, G. Marshall, and M. Tjernstrom (2008): The Arctic and Antarctic: Two faces of climate change. *Eos Trans. AGU*, 89(19), 177–178.

Overland, J.E., and M. Wang (2008): The Poles: Atmosphere. In State of the Climate in 2007, D. H. Levinson and J. H. Lawrimore (eds.). Bull. Am. Meteorol. Soc., 89(7), S85–S86.

Overland, J.E., M. Wang, and S. Salo (2008): The recent Arctic warm period. Tellus, 60A, 589–597.

Ray, G.C., G.L. Hufford, I.I. Krupnik, and J.E. Overland (2008): Diminishing sea ice. Science (Letters), 321(5895), 1443–1444.

Overland, J., J. Turner, J. Francis, N. Gillett, G. Marshall, and M. Tjernstrom (2008): The Arctic and Antarctic: Two faces of climate change. Eos Trans. AGU, 89(19), 177–178.

Hopcroft, R.R., Bluhm, B.A., Gradinger, R.R., 2008. Arctic Ocean Synthesis: Analysis of Climate Change Impacts in the Chukchi and Beaufort Seas with Strategies for Future Research (2nd edition). North Pacific Research Board, Anchorage, Alaska, p. 153.

2009

Hutchings, J.K., and I.G. Rigor, Mechanisms explaining the anomalous ice conditions in the Beaufort Sea during 2006 and 2007, J. Geophys. Res., submitted, 2009.

Kwok, R., G. F. Cunningham, M. Wensnahan, I. Rigor, H. J. Zwally, and D. Yi, Thinning and volume loss of the Arctic Ocean sea ice cover: 2003-2008, J. Geophys. Res., submitted, 2009.

Wood, K. R. and J. E. Overland (2009): Early 20th century Arctic warming in retrospect. Inter. J. Climatology [In review]

Overland, J.E., M. Wang, and S. Salo (2009): The recent Arctic warm period. Tellus. [In press]

Perovich, D.K. and J.A. Richter-Menge, [Loss of ice in the Arctic](#), Annual Review of Marine Science, 1, 417 - 441, 2009.

Bond, N.A., J.E. Overland, and S.A. Salo (2009): Influence of the regional atmospheric circulation on the observed shortwave radiation at the North Pole. J. Geophys. Res. [In preparation].

Ladd, C., and J.E. Overland (2009): Retrospective analysis of sea surface temperature in the northern Bering and Chukchi seas. J. Geophys. Res. [In Review].

Overland, J.E. (2009): The case for global warming in the Arctic. In: Influence of Climate Change on the Changing Arctic and Sub-Arctic Conditions, JC.J. Nihoul and A.G. Kostianoy (eds.), Springer, 13-23.

Overland, J.E. (2009): Meteorology of the Beaufort Sea, *J. Geophys. Res.* [In Press]

Overland, J.E.(2009): Atmospheric circulation changes during the Arctic warm period. *Tellus* [In Review]

Conferences, Proceedings & Presentations

Hutchings, J. and I. Rigor, Mechanisms explaining anomalous ice conditions in the Beaufort Sea during 2006 and 2007, American Geophysical Union, Fall Meeting 2008, abstract# C51A-0525, 2008.

Nghiem, S., I. Rigor, P. Clemente-Colón, D. Perovich, J. Richter-Menge, Y. Chao, G. Neumann and M. Ortmeyer, Recent State of Arctic Sea Ice, American Geophysical Union, Fall Meeting 2008, abstract# C44A-01, 2008.

Rigor, I.G., P. Clemente-Colon, E. Hudson (INVITED), The International Arctic Buoy Programme (IABP): A Cornerstone of the Arctic Observing Network, OCEANS 2008, Quebec, Canada, September 2008.

Rigor, I.G. (INVITED), Climate Change: Developments in the Arctic, Alaska Forum on the Environment, Anchorage, AK, February 2008.

Arctic Climate Observatories

Peer-Reviewed 2007

Verlinde, J., J.Y. Harrington, G.M. McFarquhar, V.T. Yannuzzi, A. Avramov, S. Greenberg, N. Johnson, G. Zhang, M.R. Poellot, J.H. Mather, D.D. Turner, E.W. Eloranta, B.D. Zak, A.J. Prenni, J.S. Daniel, G.L. Kok, D.C. Tobin, R. Holz, K. Sassen, D. Spangenberg, P. Minnis, T.P. Tooman, M.D. Ivey, S.J. Richardson, C.P. Bahrmann, M. Shupe, P.J. Demott, A.J. Heymsfield, and R. Schofield, 2007: The Mixed-Phase Arctic Cloud Experiment (M-PACE). */Bull. Amer. Met. Soc./*, 88, 205-220.

Schofield, R., J. S. Daniel, R. W. Portmann, H. L. Miller, S. Solomon, C. S. Eubank, M. L. Melamed, A. O. Langford, M. D. Shupe, and D. D. Turner, 2007: Retrieval of effective radius and liquid water path from ground-based instruments: A case study at Barrow, Alaska. */J. Geophys. Res./*, 112, /D21203, doi:10.1029/2007JD008737/. /

Shupe, M.D., 2007: A ground-based multiple remote-sensor cloud phase classifier. */ Geophys. Res. Lett./*, 34, L22809, doi:10.1029/2007GL031008.

Cohen L., Helmig, D., Neff, W, Grachev, A., and Fairall, C. 2007: Boundary-Layer Dynamics and its Influence on Atmospheric Chemistry at Summit, Greenland. *Atmospheric Environment*. 41(24), 5044 - 5060.

Grachev, A. A., Andreas, E. L, Fairall, C. W., Guest, P. S., and Persson, P. O. G.: 2007a, ‘SHEBA Flux-Profile Relationships in the Stable Atmospheric Boundary Layer’, *Boundary-Layer Meteorology*. 124(3), 315 - 333.

Grachev, A. A., Andreas, E. L, Fairall, C. W., Guest, P. S., and Persson, P. O. G.: 2007b, 'On the Turbulent Prandtl Number in the Stable Atmospheric Boundary Layer', *Boundary-Layer Meteorology*. 125(2), 329 - 341.

Esau, I. N. and A. A. Grachev: 2007, 'Turbulent Prandtl Number in Stable Stratified Atmospheric Boundary Layer: Intercomparison between LES and SHEBA Data', *e-WindEng*, 2007 (006). pp. 01-17. ISSN 1901-9181.(<http://ejournal.windeng.net/>).

Stone, R. S., G. P. Anderson, E. Andrews, E. G. Dutton, E. P. Shettle, and A. Berk (2007), Incursions and radiative impact of Asian dust in northern Alaska, */Geophys. Res. Lett./*, 34, L14815, doi:10.1029/2007GL029878.

Bernhard, G., C. R. Booth, J. C. Ehramjian, R. Stone, and E. G. Dutton (2007), Ultraviolet and visible radiation at Barrow, Alaska: Climatology and influencing factors on the basis of version 2 National Science Foundation network data, *J. Geophys. Res.*, 112, D09101, doi:10.1029/2006JD007865.

Treffeisen, R., Tunved, P., Ström, J., Herber, A., Bareiss, J., Helbig, A., Stone, R. S., Hoyningen-Huene, W., Krejci, R., Stohl, A., and Neuber, R.: Arctic smoke – aerosol characteristics during a record smoke event in the European Arctic and its radiative impact, *Atmos. Chem. Phys.*, 7, 3035-3053, 2007.

Tomasi, C., et al. (2007), Aerosols in polar regions: A historical overview based on optical depth and in situ observations, */J. Geophys. Res./*, 112, D16205, doi:10.1029/2007JD008432. (_/including Stone and Andrews contribution/_)

2007-2008 Conferences

Darby, L.S., T. Uttal, J. Burkhart, and J. Drummond, 2007: International Arctic Systems for Observing the Atmosphere (IASOA): 2007 Observatory Upgrades in Canada, Greenland, Russia and the United States. */AGU Fall Meeting/*, San Francisco, California, USA, 10-14 December 2007.

Shupe, M., P. Kollias, G. McFarquhar, M. Poellot, and E. Eloranta, 2007: Vertical motions in Arctic mixed-phase stratus. */Proc. 9th Conf. on Polar Met. and Ocean./*, AMS, St. Johns, Newfoundland, May 28 – June 1.

Shupe, M., T. Uttal, D. Wolfe, and D. Welsh, 2007: Cloud occurrence at Arctic atmospheric observatories. */Proc. 9th Conf. on Polar Met. and Ocean./*, AMS, St. Johns, Newfoundland, May 28 – June 1.

Eloranta, E., T. Uttal, M. Shupe, and V. Walden, 2007: The measurements of particle size in Arctic clouds using high spectral resolution lidar and millimeter wavelength radar data. /Proc. 9th Conf. on Polar Met. and Ocean./, AMS, St. Johns, Newfoundland, May 28 – June 1.

Solomon, A., O. Persson, M. Shupe, H. Morrison, and J.-W. Bao, 2007: Mesoscale simulations of polar clouds during M-PACE. /Proc. 9th Conf. on Polar Met. and Ocean./, AMS, St. Johns, Newfoundland, May 28 – June 1.

Uttal, T., M. Shupe, V. Walden, E. Eloranta, O. Persson, and D. Hazen, 2007: Radar, radiometers, interferometers and lidar in Eureka, Canada for cloud and aerosol studies. /Proc. 9th Conf. on Polar Met. and Ocean./, AMS, St. Johns, Newfoundland, May 28 – June 1.

Kollias, P., E. Luke, and M. Shupe, 2007: Cloud phase identification using radar Doppler spectra. /Proc. 9th Conf. on Polar Met. and Ocean./, AMS, St. Johns, Newfoundland, May 28 – June 1.

Eloranta, E. W., T. Uttal, and M. Shupe, 2007: Cloud particle size measurements in Arctic clouds using lidar and radar data. /International Geoscience and Remote Sensing Symposium/, IEEE, Barcelona.

Eloranta, E. W., T. Uttal, and M. Shupe, 2007: A 2-year climatology of Arctic clouds for Eureka Canada prepared from High Spectral Resolution Lidar data. /American Geophysical Union/, San Francisco, CA.

Persson, O. and R. Stone, 2007: Evidence of Forcing of Arctic Regional Climate by Mesoscale Processes. / AMS/ Jan. 15-16, 2007, San Antonio, TX.

Grachev, A., E. Andreas, C. Fairall, P. Guest, O. Persson: 2007, ‘Influence of stability on the turbulent Prandtl number in the stable atmospheric boundary layer’ (EGU2007-A-04471), EGU General Assembly 2007, Vienna, Austria, 15 – 20 April 2007, Session: AS2.04 Boundary Layers in High Latitudes: Observations and Modeling.

Fairall, C. and A. Grachev: 2007, ‘An Analysis of Turbulent and Radiative Flux Gradient Relationships in the Highly Stable Polar Surface Layer’ (EGU2007-A-04662), EGU General Assembly 2007, Vienna, Austria, 15– 20 April 2007, Session: AS2.04 Boundary Layers in High Latitudes:Observations and Modeling.

Neff, W., D. Helmig, A. Grachev, D. Davis: 2007, ‘An overview of the effect of boundary layer processes on surface [NO] concentrations during ANTCI 2003’ (EGU2007-A-09238), EGU General Assembly 2007, Vienna, Austria, 15 – 20 April 2007, Session: CR70 Snow dynamics and snow-atmosphere exchange over Greenland and Antarctica.

Uttal T. 2007 Tiksi Hydrometeorological Observatory Planning and Implementation Update
May, 2007, ESRL, NOAA -Roshydromet Workshop Report
<http://tf.tribes.cc/telfort/px/url/287/www.esrl.noaa.gov/psd/psd3/arctic/meetings/tiksi/>

Darby, L.S., *Seasonal Behavior of Radiosonde-measured Temperature and Winds at Three Arctic Stations: Sodankyla (Finland), Barrow (Alaska), and Eureka (Canada). */AGU Fall Meeting/, San Francisco, California, USA, 15-19 December 2008.

Darby, L.S., J. Burkhart, E. Dlugokencky, J. Drummond, P. Fogal, A. Makshtas, V. Martyschenko, R. Schnell, T. Uttal, B. Vasel, 2008: International Arctic Systems for Observing the Atmosphere (IASOA): 2007 Observatory Upgrades in Canada, Greenland, Russia, and the United States. /SCAR/IASC IPY Open Science Conference/, St. Petersburg, Russia, 8-11 July, 2008.

Darby, L., J. Burkhart, E. Dlugokencky, J. Drummond, P. Fogal, A. Makshtas, V. Martyschenko, R. Schnell, T. Utall, B. Vasel, 2008: International Arctic Systems for Observing the Atmosphere (IASOA): Recent and planned observatory upgrades in Canada, Greenland, Russia and the United States. /Geophysical Research Abstracts/, Vol. 10, EGU2008-A-10504, 2008 EGU General Assembly 2008.

Darby, L., 2008: Data trends from radiosondes launched from Sodankylä (Finland), Barrow (Alaska) and Eureka (Canada). /Geophysical Research Abstracts/, Vol. 10, EGU2008-A-00000, 2008 EGU General Assembly 2008.

Darby, L.S., J. Burkhart, E. Dlugokencky, J. Drummond, P. Fogal, A. Makshtas, V. Martyschenko, R. Schnell, T. Uttal, B. Vasel, 2008: International Arctic Systems for Observing the Atmosphere (IASOA): 2007 Observatory Upgrades in Canada, Greenland, Russia, and the United States. /SCAR/IASC IPY Open Science Conference/, St. Petersburg, Russia, 8-11 July, 2008.

Darby, L., J. Burkhart, E. Dlugokencky, J. Drummond, P. Fogal, A. Makshtas, V. Martyschenko, R. Schnell, T. Utall, B. Vasel, 2008: International Arctic Systems for Observing the Atmosphere (IASOA): Recent and planned observatory upgrades in Canada, Greenland, Russia and the United States. /Geophysical Research Abstracts/, Vol. 10, EGU2008-A-10504, 2008 EGU General Assembly 2008.

Darby, L., 2008: Data trends from radiosondes launched from Sodankylä (Finland), Barrow (Alaska) and Eureka (Canada). /Geophysical Research Abstracts/, Vol. 10, EGU2008-A-00000, 2008 EGU General Assembly 2008.

2008

Turner, D, and E. Eloranta, "Validating mixed-phase cloud optical depth retrieved from infrared observations with high spectral resolutionlidar", IEEE Geoscience and Remote Sensing Letters, p. , vol. , (2008). Accepted

Lesins, G., L. Bourdages, T.J. Duck, E.W. Eloranta, and V.P. Walden, "Large surface radiative forcing from diamond dust measured in the High Arctic at Eureka.", IEEE Geoscience and Remote Sensing Letters, p. , vol. , (2008)

Grachev, A. A., E. L Andreas, C. W. Fairall, P. S. Guest, and P. O. G. Persson, 2008: Turbulent measurements in the stable atmospheric boundary layer: 10 years of the SHEBA Experiment. /Acta Geophysica/, *56*(1), 142-166.

Matrosov, S. Y., M. D. Shupe, and I. V. Djalalova, 2008: Snowfall retrievals using millimeter-wavelength cloud radars. /J. Appl. Meteor. Clim./, 47, 769-777.

Persson, P. O. G, E. L Andreas, C. W. Fairall, A. A. Grachev, P. S. Guest, and J. Maslanik, 2008: Effect of surface heterogeneity on energy fluxes during the SHEBA winter. Extended abstracts, Boundary-Layer and Turbulence Conference, Stockholm, Sweden, June 9-13, 2008.

Shupe, M.D., P. Kollias, M. Poellot, and E. Eloranta, 2008: On deriving vertical air motions from cloud radar Doppler spectra./ J. Atmos. Ocean. Technol./, 25, 547-557.

Shupe, M. D., P. Kollias, P.O.G. Persson, and G. M. McFarquhar, 2008: Vertical motions in Arctic mixed-phase stratiform clouds. /J. Atmos. Sci./, 65, 1304-1322.

Tjernstrom, M., J. Sedlar, and M. D. Shupe, 2008: How well do regional climate models reproduce radiation and clouds in the Arctic? An evaluation of ARCMIP simulations. /J. Appl. Met. Clim./, accepted.

Tjernstrom, M., J. Sedlar, and M. D. Shupe, 2008: How well do regional climate models reproduce radiation and clouds in the Arctic? An evaluation of ARCMIP simulations. /J. Appl. Met. Clim./, 47, 2405-2422.

Shupe, M.D., J.S. Daniel, G. De Boer, E.W. Eloranta, P. Kollias, E. Luke, C. N. Long, D. D. Turner, and J. Verlinde, 2008: A focus on mixed-phase clouds: The status of ground-based observational methods. /Bull. Amer. Meteor. Soc./, 87, 1549-1562.

Loukachine, E. G. Dutton, C. Schaaf, and M. O. Roman III (2008), Radiative impact of boreal smoke in the Arctic: Observed and modeled, J. Geophys. Res. 113, D14S16, doi:10.1029/2007JD009657

O'Neill, N. T., O. Pancrat1, K. Baibakov1, E. Eloranta, R. L.,Batchelor, J. Freemantle, L. J. B. McArthur, K. Strong, R. Lindenmaier,

"Occurrence of weak, sub-micron, tropospheric aerosol events at high Arctic latitudes", Geophys. Res. Lett., p. , vol. 35, (2008). Published,

2009

de Boer, G., G.J. Tripoli, and E.W. Eloranta, "Preliminary comparison of CloudSAT-derived microphysical quantities with ground-based measurements for mixed-phase cloud research in the Arctic," J. Geophys. Res, p. , vol. , (2009). Accepted,

de Boer, G., E. W. Eloranta, and M. D. Shupe, 2009: Arctic mixed-phase stratiform cloud properties from multiple years of surface-based measurements at to high-latitude locations. J. Atmos. Sci., submitted.

de Boer, G., T. Hashino, and G.J. Tripoli,, "A Theory for Ice Nucleation Through Immersion Freezing in Mixed-Phase Stratiform Clouds,", Atmospheric Research., p. , vol. , (2009). Submitted,

G. Lesins, L. Bourdages, T.J. Duck, E.W. Eloranta, and V.P. Walden, "Large surface radiative forcing from diamond dust measured in the High Arctic at Eureka.", ACPD, p. , vol. , (2009). Published,

Klein, S.A., R. McCoy, H. Morrison, A. Ackerman, A. Avramov, G. DeBoer M. Chen, J. Cole, A. D. DelGenio, M. Falk, M. Foster, A. Fridlind, J.-C. Golaz, T. Hashino, J. Harrington, C. Hoose, M. Khairoutdinov, V. Larson, X. Liu, Y. Luo, G. McFarquhar, S. Menon, R. Neggers, S. Park, M. Poellot, J. M. Schmidt, I. Sednev, B. Shipway, M. D. Shupe, D. Spangenberg, Y. Sud, D. D. Turner, D. Veron, K. von Salzen, G. Walker, Z. Wang, A. Wolf, S. Xie, K.-M. Xu, F. Yang, and G. Zhang, 2009: Intercomparison of model simulations of mixed-phase clouds observed during the ARM Mixed-Phase Arctic Cloud Experiment. Part I: Single layer cloud. /Quart. J. Roy. Meteor. Soc/, accepted.

Morrison, H., R. McCoy, S. Klein, S. Xie, Y. Luo, A. Avramov, M. Chen, J. Cole, M. Falk, M. Foster, A. Del Genio, J. Harrington, C. Hoose, M. Khairoutdinov, V. Larson, X. Liu, G. McFarquhar, M. Poellot, K. von Salzen, B. Shipway, M. D. Shupe, Y. Sud, D. Turner, D. Veron, G. Walker, Z. Wang, A. Wolf, K.-M. Xu, F. Yang, and G. Zhang, 2009: Intercomparison of model simulations of mixed-phase clouds observed during the ARM Mixed-Phase Arctic Cloud Experiment. Part II: Multi-layered cloud. /Quart. J. Roy. Meteor. Soc/, accepted.

Arctic Observing Network

Arctic Observing Network: Toward a U.S. Contribution to Pan-Arctic Observing, 2007, Arctic Research of the U.S. v. 21 pp 1-94. Managing Editorial Committee: M. Jeffries, F. Korsmo, J. Calder and K. Crane

Crane, K., and J. Grebmeier, 2007, Monitoring the Arctic Ocean North of the Pacific Ocean, *EOS*, Vol. 88, No. 39, P. 384

First IPY Workshop on Sustaining Arctic Observing Networks: Workshop Report, 2007, Arctic Council and IPY, Stockholm 12-14, November 2007 pp.1-34

Arctic Reanalysis

Bromwich, D.H., R.L. Fogt, K.I. Hodges and J.E. Walsh. 2007. A tropospheric assessment of the ERA-40, NCEP, and JRA-25 global reanalyses in the polar regions. *Journal of Geophysical Research*, 112(D10):D10111, doi:10.1029/2006JD007859

Fan, X., J.E. Walsh and J.R. Krieger. 2007. A one-year experimental Arctic reanalysis and comparisons with ERA-40 and NCEP/NCAR reanalyses. *Proceedings of the 7th International Conference on Global Climate: Connections to Arctic (GCCA-7)*, Fairbanks, Alaska, 19–20 February 2007, pp. 37–40.

Hines, K.M., D.H. Bromwich and L.-S. Bai. 2007. Polar-optimized WRF. *Preprints, 8th Annual WRF User's Workshop*, Boulder, Colorado.

Ice Mass Balance

Claffey K.J., B.C. Elder, J.A. Richter-Menge, D.K. Perovich (2007) [Ice Mass Balance Buoy. Understanding the Poles, Argos Forum #65](#), 18-21.

Kwok, R., G. F. Cunningham, H. J. Zwally, and D. Yi (2007), Ice, Cloud, and land Elevation Satellite (ICESat) over Arctic sea ice: Retrieval of freeboard, *J. Geophys. Res.*, 112, C12013, doi:10.1029/2006JC003978.

Nghiem, S.V, I.G. Rigor, D.K. Perovich, P. Clemente-Colon, J.W. Weatherly and G. Neumann (2007) Rapid reduction of Arctic perennial sea ice, *Geophys. Res. Lett.*, 34, L19504, doi:10.1029/2007GL031138.

Perovich, D.K., J.A. Richter-Menge, B.C. Elder, and C.M. Polashenski, Arctic sea ice melt in the summer of 2008, *Fall Meeting of the American Geophysical Union*, 2008.

Perovich, D. K., J. A. Richter-Menge, K. F. Jones, and B. Light (2008), Sunlight, water, and ice: Extreme Arctic sea ice melt during the summer of 2007, *Geophys. Res. Lett.*, 35, L11501, doi:10.1029/2008GL034007.

RUSALCA Benthic Ecosystems Biodiversity and Change Observations

Iken K, Bluhm BA, Dunton K. Benthic food web structure serves as indicator of water mass properties in the southern Chukchi Sea. Deep Sea Research II, special issue, in prep in 2007, submitted Mar 2008

Presentations

Iken K, Grebmeier JM, Norcross BL, Sirenko BI, Bluhm BA, Cooper LW, Dunton K, Gagaev S, Holladay B. Benthic studies in the Chukchi Sea: The contribution by the Russian-American Long-Term Census of the Arctic (RUSALCA) program. Arctic Frontiers Conference, Tromsø, Norway, Jan 21-26, 2007 (talk)

Gradinger R, Bluhm BA, Hopcroft RR. Arctic Ocean Diversity Census of Marine Life project and IPY. 1st Arctic Marine Biodiversity IPY Cluster Meeting, Frankfurt, Germany, Feb 2007 (talk)

Reports:

Hopcroft, R.R., Bluhm, B.A., Gradinger, R.R., 2008. Arctic Ocean Synthesis: Analysis of Climate Change Impacts in the Chukchi and Beaufort Seas with Strategies for Future Research (2nd edition). North Pacific Research Board, Anchorage, Alaska, p. 153

RUSALCA Benthic-Water Column Fluxes

Grebmeier, J.M. and J.P. Barry (2007). Benthic processes in polynyas, pp. 363-390. In: W.O. Smith, Jr. and D.G. Barber (eds), Polynyas: Windows to the World, Elsevier Oceanography Series, Volume 74.

Lalande, C., K. Lepore, L.W. Cooper, J.M. Grebmeier, and S.B. Moran (2007), Export fluxes of particulate organic carbon in the Chukchi Sea: A comparative study using $^{234}\text{Th}/^{238}\text{U}$ disequilibria and drifting sediment traps. *Marine Chemistry*, 103: 185-196.

Lalande, C., Grebmeier, J.M., Wassmann, P., Cooper, L.W., Flint, M.V., Sergeeva, V.M. (2007). Export fluxes of biogenic matter in the presence and absence of seasonal sea ice cover in the Chukchi Sea. *Continental Shelf Research*, 27:2051-2065.

Coakley, B., H.N. Edmonds, K. Frey, J.-C. Gascard, J.M. Grebmeier, H., Kassens, J. Thiede, and C. Wegner (2007). Past, present and future, A science program for the Arctic Ocean linking ancient and contemporary observations of change through modeling. *EOS* 88 (28), 287.

Crane, K., and J.M. Grebmeier (2007). Monitoring the Arctic Ocean North of the Pacific Ocean, Pacific Arctic Group Meeting, Shanghai, China, October 11-12, 2006, *Eos*, Vol. 88 (39), 384.

Lepore, K., S.B. Moran, J.M. Grebmeier, L.W. Cooper, C. Lalande, W. Maslowski, V. Hill, N.R. Bates, D.A. Hansell, J.T. Mathis, R.P. Kelly (2007), Seasonal and Interannual Changes in particulate organic carbon export and deposition in the Chukchi Sea, *Journal of Geophysical Research*, Vol. 112, C10024, doi:10.1029/2006JC003555.

Cooper, L.W., C. Lalande, R.P. Levy, I.L. Larsen, and J.M. Grebmeier (2008), Sedimentation and water column indicators of organic carbon processing in the Bering Strait shelf region:

evidence for seasonal and decadal shifts, 2nd SBI Special Issue, Deep-Sea Research II (in press).

Grebmeier, J.M., and L.W. Cooper, Sediment Biogeochemical Tracers and Carbon Cycling in the Bering and Chukchi Seas during 1988 and 1993 (2008), In: Results of the Fourth Joint US-Russia Bering & Chukchi Seas Expedition (BERPAC), Summer 1993. U.S. Fish and Wildlife Service, Washington, DC. (in press).

Pirtle-Levy, R., J.M. Grebmeier, L.W. Cooper, and I.L Larsen (2008) Seasonal variation of chlorophyll a in Arctic sediments implies long persistence of plant pigments, 2nd SBI Special Issue, Deep-Sea Research II (in press).

Sukhanova, I.N., M.V. Flint, L.A. Pautova, D. A. Stockwell, J.M. Grebmeier, and V. M. Sergeeva (2008), Phytoplankton of the Western Arctic in the Vegetation Season of 2002: Structure and Seasonal Changes, 2nd SBI Special Issue, Deep-Sea Research II (in press).

RUSALCA Oceanographic Changes in the Gateway Area

Pickart, R.S., L.J. Pratt, T.E. Whitledge, 2008: Flow of dense water into the western Arctic Ocean through Herald Canyon. EOS Trans. AGU, 2008 Ocean Sci. Meet. Suppl., pg. 358.

Pickart, R. S., L. J. Pratt, D. J. Torres, T. E. Whitledge, A. Y. Proshutinsky, K. Aagaard, T. A. Agnew, G. W. K. Moore, H. J. Dail, 2009: Evolution and dynamics of the flow through Herald Canyon in the Western Chukchi Sea. Deep Sea Research, accepted.

Pickart, R.S. and G. Stossmeister, 2009: Outflow of Pacific water from the Chukchi Sea to the Arctic Ocean. Chinese Journal of Polar Oceanography, accepted.

RUSALCA Bering Strait Fluxes

Woodgate, R.A., K.Aagaard, J.H.Swift, W.M.Smethie and K.K.Falkner, 2007, Atlantic Water Circulation over the Mendeleev Ridge and Chukchi Borderland from Thermohaline Intrusions and Water Mass Properties, Journal of Geophysical Research, 112, C02005, doi:10.1029/2005JC003416.

<http://psc.apl.washington.edu/HLD/CBL/Atlanticwaterzigzagpaper.html>

Woodgate, R., K.Aagaard, J.Swift, B.Smethie and K.Falkner, Temperature-salinity Zigzags:Tracing Atlantic Water through the Arctic using Double-Diffusive Intrusions, 2007, Poster at Gordon Conference.

Woodgate, R.A., K.Aagaard and T.Weingarter, 2007, First steps in calibrating the Bering Strait Throughflow, APL internal report, 20pp,
<http://psc.apl..washington.edu/BeringStrait.html>

White, D., L. Hinzman, L. Alessa, J. Cassano, M. Chambers, K. Falkner, J. Francis, B. Gutowski, M. Holland, M. Holmes, H. Huntington, D. Kane, A. Kliskey, C. Lee, J. McClelland, B. Peterson, F. Straneo, M. Steele, R. Woodgate, D. Yang, K. Yoshikawa, T. Zhang, 2007, The Arctic Freshwater System: changes and impacts, *Journal of Geophysical Research*, 112, G04S54, doi:10.1029/2006JG000353..

Nechaev, D., G. Panteleev, R. Woodgate, 2007, Variational reconstruction of the Chukchi Sea circulation in October-December 1990. abstract for AGU Dec 2007.

Gieger B., "Our Changing Climate – The Poles", 2008, outreach book from Sally Ride Science, includes feature on Woodgate and polar research.

Woodgate, R.A., 2008, Mooring cruise report for RUSALCA Sever to the Bering Strait, August/Sept 2007, <http://psc.apl.washington.edu/BeringStrait.html>

Melling, H., K.K.Falkner, R.A.Woodgate, S.Prinsenberg, A.Muenchow, D.Greenberg, T.Agnew, R.Samelson, C.Lee, B.Petrie, Freshwater Fluxes via Pacific and Arctic Outflows across the Canadian Polar Shelf, 2008, ASOF (Arctic Subarctic Ocean Fluxes) special volume, Springer-Verlag.

Dmitrenko, I. A., S. A. Kirillov, V.V. Ivanov, and R. A. Woodgate, 2008, Mesoscale Atlantic Water Eddy off the Laptev Sea continental slope carries the signature of upstream interaction, *J. Geophys. Res.*, doi: 10.1029/ 2007JC00449, in press.

Woodgate, R.A., The Ocean's role in the 2007 Arctic Sea-ice Minimum, invited talk at NY Sea-ice retreat workshop, Palisades, New York, April 2008

Mizobata, K., K.Shimada, R.Woodgate, S-I. Saitoh and J. Wang, submitted 2008, Estimation of heat flux through the eastern Bering Strait, *Journal of Oceanography*.

RUSALCA Biogeochemistry

Lein, A. Yu., A.S. Savvichev, I.I. Rusanov, G.A. Pavlova, N.A. Belyaev, K. Crane, N.V. Pimenov and M.V. Ivanov, 2007, Biogeochemical Processes in the Chukchi Sea, *Lithology and Mineral Resources*, Vol. 42, No. 3. pp. 221-239

Savvichev, A.S., I.I. Rusanov, N.V. Pimenov, E.E. Zakharova, E.F. Veslopologova, A. Yu. Lein, K. Crane and M.V. Ivanov, 2007, Microbial Processes of the Carbon and Sulfur Cycles in the Chukchi Sea, *Microbiology*, vol. 76, No. 5, pp. 603-613

Savvichev A.S., I.I. Rusanov, Pimenov, N.V., Lein A. Yu, Ivanov, M.V., 2006 Biogeochemical Assessment of Water Column and Bottom Sediments of the Chukchi Sea, *Modern Ecological Problems of the North. Proceedings of the International Conference 10-12 October, Apatity, 2004*, p. 105-107

RUSALCA Fish Biodiversity and Change Observations

Busby, M. S. and R. L. Cartwright. *Paraliparis adustus* and *Paraliparis bullacephalus* (Teleostei: Liparidae): Two new snailfishes from Alaska(Ichthyological Research) submitted.

Mecklenburg, C.W., D.L. Stein, B.A. Sheiko, N. V. Chernova, T. A. Mecklenburg, and B.A. Holladay, 2007, Russian-American Long-Term Census of the Arctic: Benthic Fishes Trawled in the Chukchi Sea and Bering Strait, August 2004, Northwestern Naturalist, v. 88 pp. 168-187

Norcross, B. L. , Holladay, B. A., Busby, M. S., and K. L. Mier. Frontal structure in the Chukchi Sea determines small demersal and larval fish communities (Deep Sea Research II) submitted

Norcross, B.L., B.A. Holladay, and C.W. Mecklenburg. 2008. Current and historic distribution and ecology of demersal fishes in the Chukchi Sea Planning Area. CMI Annual Review, Fairbanks, AK, February 2008.

Norcross, B.L., B.A. Holladay, M. Busby and K. Mier. Oceanography, Ichthyoplankton, and Bottom Fishes of Bering Strait and Chukchi Sea. Gilbert Ichthyological Society, Newport, OR, September 2006.

Norcross, B.L., B.A. Holladay, M. Busby and K. Mier. Oceanography, Ichthyoplankton, and Bottom Fishes of Bering Strait and Chukchi Sea., American Fisheries Society, Early Life History Section, Larval Fish Conference, Lake Placid, NY, September 2006.

RUSALCA, *Marine Geology-Baseline Observation*

Astakhov, A.S., R. Wang, M.V. Ivanov and K. Crane, The Sediment Geochemistry of the Chukchi Sea and Adjacent Arctic Basin: Multivariate Statistical Analysis, Chemical Partitioning. Signs of Recent Geodynamic Activity, Marine Geology, submitted

Glasby, G.P., G.A. Cherkashov, G.M. Gavrilenko, v.A. Rashidov, and I.B. Slovtsov, 2006, Submarine hydrothermal activity and mineralization on the Kurile and western Aleutian island arcs, N.W. Pacific Marine Geology, v. 231 pp 163-180

RUSALCA Productivity: *Observations and Change*

Lee, S.H., T.E. Whitledge and S.H. Kang. 2007. Recent carbon and nitrogen uptake rates of phytoplankton in Bering Strait and the Chukchi Sea. Continental Shelf Research 27:2231-2249.

Rho, T.K. and T.E. Whitledge. 2007. Characteristics of seasonal and spatial variations of primary production over the southeastern Bering Sea shelf. Continental Shelf Research 27:2556-2569.

Steward, G.F., L.B. Fandino, J.T. Hollibaugh, T.E. Whitledge and F. Azam. 2007. Microbial biomass and viral infections of heterotrophic prokaryotes in the sub-surface layer of the central Arctic Ocean. Deep-Sea Research I 54:1744-1757.

RUSALCA Water Column Zooplankton Biodiversity and Change Observations

Berline L., Spitz Y.H., Ashjian C.J., Campbell R.G., Maslowski W., Moore S.E. Euphausiid transport in the Western Arctic Ocean. Marine Ecology Progress Series 360: 163-178..

Campbell, R.G., Sherr, E.B., Ashjian, C.J., Plourde, S. Sherr, B.F., Hill, V., Stockwell, D.A. Mesozooplankton prey preference and grazing impact in the Western Arctic Ocean. In Press, Deep-Sea Research II.

Kosobokova, K.N., H.-J. Hirche & R.R. Hopcroft. 2007. Egg production of deep-water copepods in the Arctic Ocean. Mar. Biol. 151:919-934.

Moore, S.E., George, J.C., Sheffield, G., Bacon, J., Ashjian, C.J., SNACS Team. Bowhead whale distribution and feeding in the western Alaskan Beaufort Sea during late summer, 2005-2006. Submitted to Arctic.

Okkonen, S.R., Ashjian, C.J., Campbell, R.G., Potter, R. Intrusion of warm Bering/Chukchi waters onto the shelf in the western Beaufort Sea. In Revision, J. Geophys. Res.

Beckendorf, K., Ashjian, C., Moore, S., Braund, S. 2008. In search of whale food. Science Scope 31: 42-47.

OBIS annual meeting, Halifax, Canada (October) - Paper presented: Towards Global Data Synthesis: A predictive model for the Circumpolar Arctic using high-quality public online 'presence only' data sources for zooplankton (Rutzen Heutmann & Hopcroft)

Hopcroft, R.R., Kosobokova, K.N., accepted 2008. Distribution and production of Pseudocalanus species in the Chukchi Sea. Deep-Sea Res. II.

Hopcroft, R.R., Kosobokova, K.N., accepted 2008. Zooplankton community patterns in the Chukchi Sea during summer 2004. Deep-Sea Res. II.

Bucklin, A., Hopcroft, R.R., Kosobokova, K.N., Nigro, L.M., Ortman, B.D., Jennings, R.M., Sweetman, C.J., accepted 2008. DNA barcoding of Arctic Ocean holozooplankton for species identification and recognition. Deep-Sea Res. II.

Alaska Marine Science Symposium – Anchorage, Alaska (January) - Poster: Arctic Ocean synthesis: Analysis of Climate Change impacts in the Chukchi and Beaufort Seas with strategies for future research (Hopcroft, Bluhm, Gradinger)

Earmarked Programs

NABOS/CABOS

Principal Investigator/s:

Igor Polyakov, International Arctic Research Center, Fairbanks, AK, USA

Published:

Ivanov, V., and P. Golovin, Observations and modeling of dense water cascading from the north-western Laptev Sea shelf, *J. Geophys. Res.*, 112, C09003, doi:10.1029/2006JC003882, 2007.

Dmitrenko, I. A., I. V. Polyakov, S. A. Kirillov, L. A. Timokhov, I. E. Frolov, V. T. Sokolov, H. L. Simmons, V. V. Ivanov, and D. Walsh (2008), Toward a warmer Arctic Ocean: Spreading of the early 21st century Atlantic Water warm anomaly along the Eurasian Basin margins, *J. Geophys. Res.*, 113, C05023, doi:10.1029/2007JC004158, 2008 .

Polyakov, I. V. , V. Alexeev, G. I. Belchansky, I. A. Dmitrenko, V. Ivanov, S. Kirillov, A. Koralev, M. Steele, L. A. Timokhov, I. Yashayaev, Arctic Ocean freshwater changes over the past 100 years and their causes, *J. Climate*, 21(2), 364–384, 2008.

Walsh, D., I. Polyakov, L. Timokhov, and E. Carmack, Thermohaline structure and variability in the eastern Nansen Basin as seen from historical data, *J. Marine Research*, 65, 685–714, 2007.

Polyakov, I. V. and Co-Authors, Observational program tracks Arctic Ocean transition to a warmer state, *Eos, Transactions, American Geophysical Union*, Vol. 88, 398-399, 2007.

In press:

Ivanov, V., and Co-authors, Seasonal variability of properties in the boundary current north of Svalbard, *Deep-Sea Research*.

Submitted:

Bauch, D., Wegner, C., Hölemann, J., Kirillov, S., Dmitrenko, I., Pivovarov, S., Timokhov, L., Kassens, H., Seasonal succession and inter-annual variability of the Laptev Sea hydrology and exchange with Arctic Halocline waters based on 1993 to 2003 expedition data. *J. Geophys. Res.*

Dmitrenko, I., S. Kirillov, and B. Tremblay, The long-term and interannual variability of summer fresh water storage over the eastern Siberian shelf: Implication for climatic change, *J. Geophys. Res.*

Polyakov, I. and Co-authors, North Atlantic warming: Fingerprints of global warming and long-term variability, *Climate Dynamics*.

Simmons, H. L. The geography of subharmonic instability of the semi-diurnal internal tide, *J. Phys. Oceanogr.*

Polyakov, I. V., U. S. Bhatt, and V. A. Alexeev, Suppressed polar amplification of long-term variations in recent decades: Fingerprint of climate change? *Geophys. Res. Lett.*

NABOS Technical Report # 5.

Siberian Shelf Studies (Methane and Carbon Fluxes)

Shakhova, N., and I.Semiletov, 2007. Methane release and coastal environment in the East-Siberian Shelf. *Journal of Marine Systems*, 66, 227-243.

Semiletov, I., I.I. Pipko, I.A. Repina, Shakhova N., 2007. Carbonate dynamics and carbon dioxide fluxes across the atmosphere-ice-water interfaces in the Arctic Ocean Pacific sector of the Arctic, *Journal of Marine Systems*, 66, 204-226.

Shakhova, N., I. Semiletov, A. Salyuk, N. Belcheva, and D. Kosmach, 2007a, Anomalies of methane in air above the sea surface in the East-Siberian Arctic shelf, *Transactions of Russian Academy of Sciences*, 414 (6), (translated in English by Springer).

Shakhova, N., I. Semiletov, and N. Belcheva, 2007b, The Great Siberian Rivers as a source of methane on the Russian Arctic shelf, *Transactions of Russian Academy of Sciences*, 414 (5), (translated in English by Springer).

Repina, I.A., I. Semiletov, A.S. Smirnov (2007), Direct measurement of CO₂ fluxes in the Laptev Sea in summer, *Transactions of Russian Academy of Sciences*, 413 (5), (translated in English by Springer).

Semiletov, I.P. and I.I. Pipko, 2007, Sinks and sources of carbon dioxide in the Arctic Ocean, *Transactions of Russian Academy of Sciences*, in press.

Van Dongen B.E., I.P. Semiletov, J.W.H. Weijers, and Ö. Gustafsson. 2007, Contrasting lipid biomarker composition of terrestrial organic matter exported from across the Eurasian Arctic by the five Great Russian Arctic Rivers, *Global Biogeochemical Cycles*, in press.

Vetrov, A.A., I.P. Semiletov, O.V. Dudarev, V.I. Peresipkin, and A.N. Charkin (2007), Study of composition and origin of organic matter in the East-Siberian Sea bottom sediments, *Geokhimiya (Geochemistry)*, in press.

Elmquist M., I. Semiletov, L. Guo and Ö. Gustafsson. 2007, Pan-Arctic patterns in black carbon sources and fluvial discharges deduced from radiocarbon and PAH source apportionment markers in estuarine surface sediments, *Global Biogeochemical Cycles*, in press.