The Role of Sea-Ice in ArcticNet IRISes

Summary

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The observed decline in the summer sea ice, in terms of both magnitude and trend, is alarming. We are changing the arctic from one that has been dominated by multiyear sea ice to one that will now be dominated by first-year sea-icerelated processes. We can expect a seasonally ice free arctic early in this century. It is important to note that our planet has not had a seasonally ice-free Arctic for at least the past 1.1 million years. This reduction in sea ice is of critical importance to all peoples of the world because of the role that the Arctic plays in the ventilation of the Atlantic and Pacific (Carmack et al. 2006) and because of the large effect that the sea ice albedo-feedback mechanism has on acceleration of warming and increased fluxes of green house gases to the atmosphere (due to permafrost melt). Both flora and fauna have evolved over millions of years to take advantage of the presence and timing of the seasonal sea ice life cycle. Now, northern peoples increasingly are finding their traditional way of life under pressure from these changes as they struggle to adapt. Global warming changes both dynamic and thermodynamic processes of snowcovered sea ice and these changes have an impact throughout both the physical and biogeochemical cycling in the Arctic marine system. The next few decades will proceed with significant challenges for the Arctic. Marine ecosystems will come under increasing pressure; industrial activity will increase as more exploration and development occurs; and the Inuit people will increasingly find it a challenge to use sea ice for cultural and subsistence purposes. This project will provide sea ice expertise to the coordinated ArcticNet IRISs of the coastal Canadian Arctic, supplying the required information for sound management of these challenges.

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Natural Resources Canada - Office of Energy Research and Development
Program of Energy Research and Development (PERD)

Publications

Articles Published in Refereed Publications

Asplin, M.G., Barber, D.G., Galley, R.G., Prinsenberg, S., 2011, FLEXURAL SWELL AND FRACTURE WITHIN SUMMER PERENNIAL PACK ICE IN THE SOUTHERN BEAUFORT SEA, Nature Climate Change, , Submitted

Asplin, M.G., Lukovich, J.V. and Barber, D.G., 2009, Atmospheric forcing of the Beaufort Sea Ice Gyre: Surface pressure climatology and sea ice motion, Journal of Geophysical Research. Vol. 114, C00A06, doi:10.1029/2008JC005127, 1, Published

Asplin, M.G., Lukovich, J.V., Barber, D.G, 2009, Atmospheric forcing of the Beaufort Sea ice gyre: Part I: Lower-troposphere-surface coupling, Journal of Geophysical Research, 1, Accepted

Asselin NC, Barber DG, Stirling I, Ferguson SH, Richard PR., 2010, Beluga (Delphinapterus leucas) habitat selection in the eastern Beaufort Sea in spring, 1975 to 1979., Polar Biology, 1, Accepted

Barber, D. G., M. Asplin, Y. Gratton, J. Lukovich, R. Galley, R. Raddatz, and D. Leitch, 2009, The International Polar Year (IPY) Circumpolar Flaw Lead (CFL) System Study: Introduction and Physical System, Atmosphere-Ocean, 1, Submitted

Barber, D.G., Asplin, M., Gratton, Y., Lukovich, J., Galley, R., Raddatz, R., and Leitch, D., 2010, The International Polar Year (IPY) Circumpolar Flaw Lead (CFL) System Study: Introduction and Physical System, Atmosphere-Ocean, , Accepted

Barber, D.G., Galley, R., Asplin, M.G. De Abreu, R., Warner, K., Pućko, M., Gupta, M., Prinsenberg, S. and Julien, S. , 2009, Perennial pack ice in the southern Beaufort Sea was not as it appeared in the summer of 2009, Geophysical Research Letters, 36, L24501, doi:10.1029/2009GL041434, 1, Published

Barber, D.G., Lukovich, J.V., Keogak, J., Baryluk, S., Fortier, L., Henry, G., 2008, The changing climate of the Arctic, Arctic, 61, Suppl.1, 7 - 26, Published

Candlish, L.M., Raddatz, R.L. Asplin M.G. and Barber D.G., 2011, On the Use of CloudSat and Cailpso to Study Clouds in a High Latitude Polar Environment, Journal of Geophysical Research - Atmosphere, , Submitted

Candlish, L.M., Raddatz, R.L., Asplin, M.G., Barber, D.G., 2010, Veracity of Atmospheric Temperature and Absolute Humidity Profiles over the Beaufort Sea and Amundsen Gulf from a Microwave Radiometer, Journal of Atmospheric and Oceanic Technology, , Submitted

Chaulk, A., Stern,G. Armstrong,D. Barber,D.G. Wang, F., 2011, Mercury Distribution and Transport across the Ocean-Sea Ice-Atmosphere Interface in the Western Arctic Ocean, Environmental Science and Technology, 1, Accepted

Else, B., Papakyriakou, T., Galley,R., Drennan, W., Miller,L., Thomas,H., 2010, Eddy covariance measurements of wintertime CO2 fluxes in an Arctic polynya: Evidence for enhanced air–sea gas transfer during ice formation, Journal of Geophysical Research, , Submitted

Galley, R.G., D.G. Barber, E. Key and S. Prinsenberg, 2009, On the relative contributions of sea ice dynamic and thermodynamic processes controlling the annual evolution of the Cape Bathurst Flaw Lead Polynya System, Journal of Geophysical Research, 1, Submitted

Geldsetzer, T. and Yackel , J.J., 2010, Sea ice type and open water discrimination using dual co-polarized C-band SAR, Canadian Journal of Remote Sensing, Vol. 35(1), 73-84, Published

Geldsetzer, T., Langlois, A. and Yackel, J.J. , 2009, Dielectric properties of brine-wetted snow on first-year sea ice, Cold Regions Science and Technology, Vol. 58, 47-56, Published

Geuguen, C. Granskog, M., McCullough, G., Barber, D.G., 2010, Characterization of colored dissolved organic matter in Hudson Bay and Hudon Strait using parallel factor analysis, Journal of Marine Systems, 1, Published

Gupta, M., Isleifson, D., Scharien, R.K., Galley, R., and Barber, D.G., 2010, On the nature and detection of surface roughness of the marginal ice zone, International Journal of Remote Sensing, , Submitted

Hochheim, K. and Barber, D.G., 2009, Atmospheric Forcing of Sea Ice in Hudson Bay during the Fall Period, 1980-2005, Journal of Geophysical Research, 1, Accepted

Hochheim, K. and Barber, D.G., 2010, Atmospheric Forcing of Sea Ice in Hudson Bay during the Fall Period, 1980-2005, Journal of Geophysical Research, v.115, no. C05009 (doi:10.1029/2009JC005334), 20 pp., Published

Hochheim, K., Lukovich, J.V., Barber, D.G., 2010, Atmospheric forcing of sea ice in Hudson Bay during the spring season, 1980 - 2005, Journal of Geophysical Research, , Submitted

Hop, H., Mundy, C.J., Rossnagel, A., Gosselin, M., Barber, D.G., 2011, Zooplankon bloom and ice amphipod bust below melting sea ice in the Amundsen Gulf, Arctic Canada Polar Biology, 1, Accepted

Isleifson, D., A. Langlois, D. Barber and L. Shafai, 2009, C-band Scatterometer Measurements of of Multiyear Sea Ice Before Fall Freeze-Up in the Canadian Arctic, IEEE Transactions on Geoscience and Remote Sensing, Col., Vol. 47, Issue 6., 1651-1661, Published

Isleifson, D., Hwang, B.J., Barber, D.G., Scharien, R. and Shafai, L., 2009, C-band Polarimetric Backscattering Signatures of Newly Formed Sea Ice during Fall Freeze-up, IEEE Transactions on Geoscience and Remote Sensing, 1, Accepted

Isleifson, D., Hwang, B.J., Barber, D.G., Scharien, R. and Shafai, L., 2010, C-band Polarimetric Backscattering Signatures of Newly Formed Sea Ice during Fall Freeze-up, IEEE Transactions on Geoscience and Remote Sensing, v.48, no.8, 3256-3267, Published

Lalande, C, A. Forest, D.G. Barber, Y. Gratton and L. Fortier, 2009, Variability in the annual cycle of vertical particulate organic carbon export on Arctic shelves: Contrasting the Laptev Sea, Northern Baffin Bay and the Beaufort Sea, Continental Shelf Research, Vol. 29, Issue 17, 2157-2165, Published

Lukovich, J. V., M. G. Asplin, and D. G. Barber, 2009, Atmospheric forcing of the Beaufort Sea ice gyre: Part 2. Surface-stratosphere coupling, Journal of Geophysical Research, 114, C00A03, doi:10.1029/2008JC004849, Published

Lukovich, J. V., M. G. Asplin, and D. G. Barber , 2009, On horizontal wind gradient variability from the stratosphere to the lower troposphere in the Arctic, Journal of Geophysical Research,114, C00A03, doi:10.1029/2008JC004849, Published

Lukovich, J.V., Babb, D., Barber, D.G.,, 2010, Ice beacon trajectories in the Arctic during the CFL study, Journal of Geophysical Research - Oceans, , Submitted

Lukovich, J.V., Belanger,C. Gratton,Y. and D. Barber, D., 2011, Ice beacon reversals in the Arctic during the CFL study, Journal of Geophysical Research - Oceans, 1, Submitted

Mundy, C.J., M. Gosselin, J.K. Ehn, Y. Gratton, A. Rossnagel, D.G. Barber, J. Martin, J.-É. Tremblay, M. Palmer, K. Arrigo, G. Darnis, L. Fortier, B. Else and T. Papakyriakou, 2009, ontribution of under-ice primary production to an ice-edge upwelling phytoplankton bloom in the Canadian Beaufort Sea, Geophysical Research Letters, Vol. 36, Issue 17, 10.1029/2009GL038837, Published

Partington, K., Flach, J.D., Barber, D., Isleifson, D., Meadows, P., and Verlaan, P., 2010, Dual-Polarization C-Band Radar Observations of Sea Ice in the Amundsen Gulf, IEEE Transactions on Geoscience and Remote Sensing, v.48, no.6 (10.1109/TGRS.2009.2039577), 2685-2691, Published

Prinsenberg, S. and Peterson, I., 2011, Observing regional-scale pack ice decay processes with helicopter-borne sensors and moored Upward Looking Sonars, Annals of Glaciology v.52, no.57, 1-8, Published

Prinsenberg, S., Nudds, S. Peterson, I., 2011, Pack ice variability of the Amundsen Gulf of the Canadian Beaufort Sea, Journal of Geophysical Research, 1, Submitted

Proshutinsky, A., R. Krishfield, D.G. Barber, 2009, Preface to the special section on the Beaufort Gyre Climate System Exploration Study. Documenting key parameters to understand environmental variability, Journal of Geophysical Research, Vol. 114, 10.1029/2008JC005162, Published

Pucko M., Stern G.A., Macdonald R.W. and Barber, D.G., 2010, alpha- and beta-hexachlorocyclohexane (HCH) measurements in the brine fraction of sea ice in the Canadian High Arctic using a sump-hole technique, Environmental Science and Technology, vol. 44, no. 24, 9259-9264, Published

Pucko, M., G. Stern, D. G. Barber, R.W. Macdonald, B. Rosenberg, 2010, The International Polar Year (IPY) Circumpolar Flaw Lead (CFL) System Study: the importance of brine processes for α- and γ-hexachlorocyclohexane (HCH) accumulation/rejection in sea ice, Atmosphere-Ocean, 1, Submitted

Pucko, M., Stern, G. Barber, D.G., Macdonald, R.W. and Rosenberg, B., 2010, The International Polar Year (IPY) Circumpolar Flaw Lead (CFL) System Study: the importance of brine processes for alpha- and beta-hexachlorocyclohexane (HCH) accumulation/rejection in sea ice, Atmosphere-Ocean, v.48, no. 4, 244-262, Published

Pucko, M., Stern, G.A., Macdonald, R.W., Rosenberg, B., and Barber, D.G., 2011, The influence of atmosphere-snow-ice-ocean interactions on the levels of hexachlorocyclohexanes (HCHs) in the Arctic cryosphere, Journal of Geophysical Research-Oceans, 1, Accepted

Raddatz, R.L., Asplin, M.G., Barber, D.G., 2009, Characterization of the thermodynamic structure of the winter and spring atmospheric boundary layer over an arctic flaw lead region, Journal of Geophysical Research, 1, Submitted

Raddatz, R.L., Asplin, M.G., Candlish,L.M., Barber, D.G.,, 2010, General characteristics of the atmospheric boundary layer in a flaw lead polynya region for winter and spring, Boundary Layer Meteorology, 1, Published

Raddatz, R.L., Galley, R.J., Barber, D.G., 2010, Linking the Atmospheric Boundary Layer to Amundsen Gulf Sea Ice: a meso- to synoptic-scale perspective from winter to summer 2008, Journal of Geophysical Research, , Submitted

Scharien, R.K., Geldsetzer, T., Barber, D.G., Yackel, J.J. and Langlois, A., 2010, Physical, dielectric, and C band microwave scattering properties of first-year sea ice during advanced melt, J. Geophys. Res., 115, C12026, doi:10.1029/2010JC006257, 16pp, Published

Scharien, R.K., Yackel, J.J., Barber, D.G., Gupta, M., 2010, C-band polarimetric signatures of first-year sea ice and melt ponds during advanced melt, IEEE Trans. Geosci Remote Sens, , Submitted

Tivy, A., Howell, S.E.L., Alt, B., McCourt, S., Chagnon, R., Crocker, G., Carrieres, T. and Yackel, J.J., 2011, Trends and variability in summer sea ice cover in the Canadian Arctic based on the Canadian Ice Service Digital Archive, 1960-2008 and 1968-2008., J. Geophys. Res., doi:10.1029/2009JC005855, 16pp, Published

Tivy, A., Howell, S.E.L., Alt, B., Yackel, J.J. and Carrieres, T, 2011, Origins and levels of seasonal forecast skill for sea ice in Hudson Bay using Canonical Correlation Analysis, J. Climate (in press), 15pp, Accepted

Tremblay, J.E., Belanger, S., Barber, D.G., Asplin, M., Martin, J., Darnis, G., Fortier, L., Gratton, Y., Link, H., Archambault, P., Sallon, A., Michel, C.,, 2010, Climate forcing multiplies biological productivity in the coastal Arctic Ocean, science, , Submitted

Wong F., Jantunen L. M., Pucko M., Papakyriakou T., Stern G. A. and Bidleman T. F., 2010, Air-Water Exchange of Anthropogenic and Natural Organohalogens on International Polar Year (IPY) Expeditions in the Canadian Arctic, Environmental Science and Technology, 1, Published

Zhang J., Li T., Barber D.G., Ren J., Pućko M., Li S. and Li X., 2010, Attenuation of lateral propagating light in sea ice measured with an artificial lamp in winter Arctic.,, Cold Regions Science and technology, 6, Accepted

Zhao, J. T. Li, D. G. Barber, J. Ren, M. Pucko, S. Li, and X Li., 2010, Attenuation of lateral propagating light in sea ice measured with an artificial lamp in winter., Cold Regions Science and Technology., 1, Published

Other Refereed Contributions

Asplin, M.G., Barber, D.G., Galley., R.G., Prinsenberg, S. , 2009, Storm swell-induced fracturing of multi-year sea ice in the Southern Beaufort Sea: Case study Summer 2009, 2009 AGU Fall Meeting , Poster, Published

Asplin, M.G., Barber, D.G., Galley., R.G., Prinsenberg, S., 2010, Storm swell-induced fracturing of multi-year sea ice in the Southern Beaufort Sea: Case study Summer 2009., oral presentation, IPY Oslo Science Conference, 8-12 June 2010, Oslo, Norway, 1, Published

Barber D. G., Mundy C. J., Papakyriakou T., Macdonald R., Gratton Y., Fortier L., Gosselin M., Hanesiak J., Tremblay J., Ferguson S., Stern G., Meakin S., Deming J. and Pucko M.,, 2010, The International Polar Year (IPY) – Circumpolar Flaw Lead (CFL) system study: an overview and update., oral presentation, IPY Oslo Science Conference, 8-12 June 2010, Oslo, Norway, 1, Published

Barber, D. G., B.J. Hwang, J. K. Ehn, J. Iacozza, R. Galley, J. Hanesiak, T. Papakyriakou, J. V. Lukovich, 2009, The Ocean—Sea Ice—Atmosphere (OSA) Interface in the Southern Beaufort Sea, On thin ice: a synthesis of the Canadian Arctic Shelf Exchange Study (CASES), 216, Published

Fuller, M.C., Derksen, C., Lemmetyinen, J., and Yackel, J.J., 2010, The impact of the seasonal evolution of snow properties on microwave emission model performance, Abstract C33A-0515 presented at the 2010 Fall Meeting, AGU San Francisco, Calif., 13-17 Dec, 1, 1, Published

Galley, R.J. and D.G. Barber, 2010, 2010, Fast ice in the Canadian Arctic: Climatology and Trends,, EOS Trans. American Geophysical Union, 91 Fall Meet. Suppl., Abstract C43E-0603, 13-17 December, San Francisco, CA., 1, Published

Hochheim, K., Barber, D.G. and Lukovich, J.V., 2010, Chapter 2: Changing sea ice conditions in Hudson Bay, 1979 – 2005, In : `A little less Arctic : top predators in the world's largest northern inland sea, Hudson Bay, 39-52, Published

Prinsenberg, S., Peterson, I., Barber, D. and M. Asplin, 2010, Long period swells break up the Canadian Beaufort Sea pack ice in September 2009, Proceedings of the 29th International Offshore and Polar Engineering Conference, Beijing, China, 1155-1161, Published

Prinsenberg, S.J., 2009, Formation of a 1.5km wide ice rubble field from a 60cm thick flaw lead in Eastern Canadian Beaufort Sea , Conference Proceedings: 2009 International Conference on Port and Ocean Engineering under Arctic Conditions, 1, Published

Prinsenberg, S.J., 2009, Ice thickness measurements with a miniature Electromagnetic Sensor Sled, Proceedings: Int. Society of Offshore and Polar Engineering ISOPE, 1, Published

Prinsenberg, S.J. and Holladay, J.S., 2009, Ice thickness measurements with a miniature Electromagnetic Sensor Sled, Conference Proceedings: 2009 Int. Society of Offshore and Polar Engineering ISOPE-2009, Vol. 1, 666-671, Published

Prinsenberg, S.J., I.K. Peterson and J.S. Holladay, 2009, Formation of a 1.5km wide ice rubble field from a 60cm thick flaw lead in Eastern Canadian Beaufort Sea, Conference Proceedings: 2009 International Conference on Port and Ocean Engineering under Arctic Conditions, 1, Published

Rossnagel, A., D G Barber, C J Mundy, J Ehn, M Gosselin, 2009, The effect of spatially variable surfaces on PAR transmission, solar heating and primary production under first-year sea ice during advanced stages of melt, 2009 AGU Fall Meeting Proceedings, 1, Published

Stewart, D.B. and Barber, D.B., 2010, Chapter 1: The Ocean-Sea Ice-Atmosphere System of the Hudson Bay Complex, In : `A little less Arctic : top predators in the world's largest northern inland sea, Hudson Bay, 1-38, Published

Non-Refereed Contributions

Asplin, M.G., 2011, Cyclones in the Arctic and their Influence on Sea Ice,, Northwest Territories International Polar Year Results Meeting, Inuvik, NWT, Jan. 18 – 21, 2011., 1, Published

Asplin, M.G., Candlish, L., Barber, D.G., Raddatz, R.L., 2010, A surface-to-environment synoptic typing approach to investigate ocean-sea ice-atmosphere coupling in the Cape Bathurst flaw lead., Poster presented December 16th 2010 at the American Geophyiscal Union Fall meeting, San Fransisco, United States., 1, Published

Asplin, M.G., Candlish, L.M., Barber, D.G., Raddatz, R.L. , 2009, Atmosphere-Sea Ice Coupling over the Cape Bathurst Flaw Lead during the International Polar Year Circumpolar Flaw Lead System Study, 2009 Circumpolar Flaw Lead (CFL) All-Hands Meeting, 1, Published

Asplin, M.G., Lukovich, J.V., Barber, 2008, Atmospheric forcing of the Beaufort Sea ice gyre: Part I: Lower-troposphere-surface coupling., Poster, IASC-SCAR Open Science Conference, 1, Published

Asselin, N.C., P.R. Richard, D.G. Barber, 2008, Early migration of beluga (Delphinapterus Leucas) into the Amundsen Gulf in the Spring of 2008, Proceedings, Arctic Change (Poster), 1, Published

Asselin, N.C., P.R. Richard, D.G. Barber, S.H. Ferguson and I. Stirling, 2009, Beluga (Delphinapterus leucas) use of the Circumpolar Flaw Lead in the Eastern Beaufort Sea, 2009 Conference of the Society for Marine Mammalogy, Poster, Published

Babb, D., Galley, R. and Barber, D., 2010, The use of in-situ measurements on the dynamic and thermodynamic properties of arctic sea ice, through the use of ice mass balace buoys, ArcticNet Annual Science Meeting (poster), 1, Published

Babb,D. Galley,R. and D.Barber, D., 2010, Observations on the temporal evolution of the ice mass balance and thermodynamic properties of sea ice in the Canadian Arctic, Poster at the ArcticNet Annual Science Meeting Ottawa, December 2010., 1, Published

Barber et al, 2008, Outreach and Arctic Marine Science, Proceedings (Invited Speaker), AGU Fall Meeting, 1, Published

Barber et al, 2008, Sea Ice, Climate Change and Marine Ecosystems, Proceedings (Invited Speaker), AGU Fall Meeting, 1, Published

Barber et al, 2008, The Circumpolar Flaw Lead System Study, Proceedings, Arctic Change, 1, Published

Barber et al, 2009, The Circumpolar Flaw Lead System Study, Proceedings (Invited Speaker), Arctic Frontiers, 1, Published

Barber, D., Galley, R. and Warner, K., 2010, Using C-band scatterometer data to aid in sea ice classification, ArcticNet Annual Science Meeting (poster), 1, Published

Barber, D.G., 2009, Where has all the multi-year sea ice gone?, 2009 ArcticNet Annual Conference Proceedings, 1, Published

Barber, D.G., Asplin, M.G., Deming, J., Ferguson, S., Fortier, L., Gosselin, M., Gratton, Y., Hanesiak, J., Meaken, S., Mundy, C.J., Papakyriakou, T., Tremblay, J.E., Stern, G., 2008, An overview of physical and biological response to sustained decreased of sea ice in the Southern Beaufort Sea: Experiences from the IPY-CFL project, Proceedings, American Geophysical Union Fall Meeting, 1, Published

Barber, D.G., C J Mundy, T N Papakyriakou, R W Macdonald, Y Gratton, L Fortier, M Gosselin, J Hanesiak, J Tremblay, S Ferguson, G Stern, S Meakin, J W Deming, D Leitch, 2009, The International Polar Year (IPY) Circumpolar Flaw Lead (CFL) system study: a focus on fast ice edge systems, 2009 AGU Fall Meeting Proceedings, 1, Published

Barber, D.G., D. Leitch, 2008, The Circumpolar Flaw Lead System Study, 2008 CMOS Annual Congress, 1, Published

Barber, D.G., D. Leitch, 2008, The Circumpolar Flaw Lead System Study, Proceedings, 2008 IPY-SCAR meeting, 1, Published

Barber, D.G., Galley, R., Asplin, M.G., De Abreu, R., Warner, K-A., Pucko, M., Gupta, M., Prinsenberg, S., Julien, S., 2010, The perennial pack ice in the southern Beaufort Sea was not as it appeared in the summer of 2009, Poster, ArcticNET Science Meeting 2010, Ottawa, ON. Presented 14 December 2010, 1, Published

Barber, D.G., R. Galley, M. G. Asplin, R. De Abreu, K.-A. Warner, M.Pućko, M. Gupta, and S. Prinsenberg, 2009, The summer perennial pack ice in the Southern Beaufort Sea was not as it appeared in the summer of 2009, 2009 ArcticNet Annual Conference Proceedings, Poster, Published

Barber, L., P. Collin, L. Malo, N. Snape, S. Roy, 2008, Projet Ant-Arctique – A classroom approach to polar research, Proceedings, Arctic Change (Poster), 1, Published

Campbell, K., Mundy, C.J., Barber, D. and Gosselin, M., 2010, Investigation of physical-biological processes in first year sea ce using transmitted spectral irrandiance, ArcticNet Annual Science Meeting (poster), 1, Published

Candlish, L.M., Asplin, M.G., Raddatz, R.L., Barber, D.G. , 2009, Data Comparisons of Vaisala Radiosonde Temperature and Vapour Density Profiles to Radiometrics Profiling Radiometers in the Southern Beaufort Sea, 2009 Circumpolar Flaw Lead (CFL) All-Hands Meeting, Poster, Published

Candlish, L.M., R.L. Raddatz, M.G. Asplin and D.G. Barber, 2010, On the Use of CloudSat and Cailpso to Study Clouds in a High Latitude Polar Environment., Oral Presentation October 27th, 2010 at the Nasa A-Train Symposium, New Orleans, USA., 1, Published

Candlish, LM., and D.G. Barber, 2009, On the use of CloudSat and Calipso to Study Clouds Over Sea Ice in the Southern Beaufort Sea, 2009 AGU Fall Meeting , Poster, Published

Collins, K., Hamilton, J. and Prinsenberg, S., 2010, Relationships between zooplankton, sea ice, and ocean conditions in Barrow Strait 1998-2009, ArcticNet Annual Science Meeting (poster), 1, Published

Davies, E.G.R., and J.V. Lukovich, 2010, Session co-chairs, Systems modeling for better Arctic policy,, CMOS-CGU 2010 Congress, Ottawa, Ontario, May 31st - June 4th, 2010., 1, Published

Davies, E.G.R., J. V. Lukovich, D. G. Barber, S. P. Simonovic, and M.Daraeikhah, 2009, A system dynamics approach to climate change adaptation and mitigation strategies in the Arctic: Seeking sustainability in a rapidly changing environment, 2009 ArcticNet Annual Conference Proceedings, 1, Published

Falk-Petersen, S., H. Hop, E. Leu, A. Wold, 2008, The Calanus Complex in a Pan-Arctic perspective, Proceedings, Arctic Change, 1, Published

Fisico, T. D. and D.G. Barber, 2008, Measuring Atmospheric and Surface Properties Over the Northern Hemisphere Using Passive Microwave Remote Sensing, Proceedings, Arctic Change (Poster), 1, Published

Fuller, M.C., Peters, M. and J.J. Yackel , 2009, Towards validation of RADARSAT-2 data and snow on first-year sea ice parameterization, 2009 Eastern Snow Conference, Poster, Published

Fuller, M.C., Peters, M. and J.J. Yackel , 2009, Snow thickness as a function of sea ice-type using in situ, C-band scatterometer, and RADARSAT-2 data, 2009 Canadian Symposium on Remote Sensing, Poster, Published

Galley, R.J., M Trachtenberg, A Langlois, D G Barber, L Shafai, 2009, Observations of Geophysical and Dielectric Properties and Ground Penetrating Radar Signatures or Discrimination of Snow, Sea Ice, and Freshwater ice Thickness, 2009 AGU Fall Meeting , Poster, Published

Gunn, G., Barber, D., McCullough, G., Hocheim, K., 2010, Ocean colour remote sensing in Hudson Bay: in situ methods of deriving water-leaving radiance for chlorophyll estimation in optically-complex water., Poster. ArcticNET Science Meeting 2010, Ottawa, ON. Presented 14 December 2010, 1, Published

Gupta, M. and Barber, D.G., , 2009, Sea ice roughness of various ice types using laser profiling system, 2009 Circumpolar Flaw Lead (CFL) All-Hands Meeting, Poster, Published

Gupta, M., D.G. Barber, 2008, Ocean surface roughness in moderating ocean-sea ice-atmosphere processes within the marginal ice zone, IMPETUS-2008 Polar Ocean Observation and Monitoring (Poster), 1, Published

Gupta, M., D.G.Barber, 2008, Ocean surface roughness in moderating ocean-sea ice-atmosphere processes within the marginal ice zone, Proceedings, Arctic Change (Poster), 1, Published

Haas, C, 2008, Pan-Arctic sea ice mass balance observations- status and challenges, Proceedings, Arctic Change, 1, Published

Hochheim, K.P., J. V. Lukovich, R. Galley, M. G. Asplin, D.G. Barber, and M. Curry., 2010, Changes in the Sea Ice in the Eastern Arctic as a function of Atmospheric Forcing: 1980-2008., Presented at the STAR Workshop June 14-15, 2010, Winnipeg, MB., 1, Published

Holladay, S., Prinsenberg, S. and Peterson, I., 2010, Measuring Arctic Nearshore Properties with a Multi-Frequency Airborne Electromagnetic Sensor, Proceedings of the Twentieth (2010) International Offshore and Polar Engineering Conference, Beijing, China, 1134, Published

Hossain, M., Gill, J.P. and Yackel, J, 2010, Discrimination of First Year Sea Ice Features Using Polarimetric SAR Data, Abstract C11A-0518 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec, 1, Published

Howell, S., Tivy, A.C., Alt, B., McCourt, S., Chagnon, R., Crocker, G., Carrieres, T.G. and Yackel, J., 2010, Trends and variability in summer sea ice cover in the Canadian Arctic based on the Canadian Ice Service Digital Archive, Abstract C21C-0571 presented at the 2010 Fall Meeting, AGU San Francisco, Calif., 13-17 Dec, 1, Published

Isleifson, D., Hwang, B. J., Barber, D. , 2008, Microwave Remote Sensing of Frost Flowers During the CFL Project, Proceedings, Arctic Change (Poster), 1, Published

Laider, G., R. DeAbreu, P. Elee, C. Furgal, T. Hirose, T. Ikummaq, E. Joamie, M. Kapfer, D. Piekarz, 2008, Connecting community observations and expertise with the floe edge service, Proceedings, Arctic Change, 1, Published

Lalumiere, L. and S.J. Prinsenberg, 2009, Integration of a Helicopter-Based Ground Penetrating Radar (GPR) with a Laser, Video and GPS System, Conference Proceedings: 2009 Int. Society of Offshore and Polar Engineering ISOPE-2009, Vol. 1, 658-665, Published

Leitch, D.L., Stern, G., and Barber, D.G., 2011, The Circumpolar Flaw Lead System Study: An Overview, Northwest Territories International Polar Year Results Meeting, Inuvik, NWT, Jan. 18 – 21, 2011., 1, Published

Li, Tao, D.G. Barber, and J. Zhao, 2009, Distribution of in-water solar radiation in marginal ice zones of Canadian Arctic, 2009 ArcticNet Annual Conference, Poster, Published

Lukovich, J.V., Asplin, M.G., Barber, D.G. , 2008, Atmospheric forcing of the Beaufort Sea ice gyre: Surface-Stratosphere coupling, Proceedings, American Geophysical Union Fall Meeting (Poster), 1, Published

Lukovich, J.V., D. Babb and D.G. Barber, 2009, Ice beacon trajectories in the Arctic during the CFL study, 2009 Circumpolar Flaw Lead (CFL) All-Hands Meeting, 1, Published

Lukovich, J.V., D. Babb and D.G. Barber, 2010, Ice beacon trajectories in the Arctic during the IPY- Circumpolar Flaw Lead (CFL) study,, CMOS-CGU 2010 Congress, May 31st - June 4th, 2010, oral presentation., 1, Published

McCullough, G., D. Barber, and K. Hochheim, 2009, Dynamics of the Nelson Estuary polynya in southwest Hudson Bay, 2009 ArcticNet Annual Conference, Poster, Published

Nudds, S., Lu, Y., Dumpont, F., Lei, J., Dunphy, M. and S. Prinsenberg, 2010, Modelling ocean and sea-ice conditions in the Canadian Arctic Archipelago using high-resolution nested model within a pan-arctic model, ArcticNet Annual Science Meeting (poster), 1, Published

Peters, M. and J. J.Yackel , 2009, Evolution of snow distribution on first-year sea ice, 2009 AGU Fall Meeting , Poster, Published

Peterson, I., Prinsenberg, S., Hamilton, J. and R. Pettipas, 2010, Wind effects on ocean volume transport, air temperature, and sea-ice area in the Canadian Arctic Archipelago, ArcticNet Annual Science Meeting (poster), 1, Published

Prinsenberg, S., 2010, Available ice thickness data set collected in the Canadian Beaufort Sea with helicopter-borne sensors, US-Canada Northern Forum, Calgary, Nov 27 - Dec 3 (presentation), 1, Published

Prinsenberg, S., 2010, Helicopter-borne Ground-Penetrating-Radar (GPR) sensor for measuring snow depths and low saline ice thickness using Labrador Shelf and Mackenzie Delta 2010 data, ArcticNet Annual Science Meeting (presentation), 1, Published

Prinsenberg, S., 2010, Observing the Snow and Ice Properties in the Arctic Coastal Waters of the Canadian Beaufort Sea with Helicopter-Borne Ground-Penetrating Radar, Laser and Electromagnetic Sensors, ArcticNet Annual Science Meeting (presentation), 1, Published

Prinsenberg, S., Peterson, I., Holladay, S. and L. Lalumiere, 2010, Observing the snow and ice properties in the arctic coastal water of the Canadian Beaufort Sea with helicopter-borne ground-penetrating radar, laser and electromagnetic sensors, ArcticNet Annual Science Meeting (poster), 1, Published

Prinsenberg, S.J., 2009, Ice and snow instrumentation tested during the Ice Survey on the CCGS icebreaker “Amundsen” IPY’s Circumpolar Flaw Lead Program (CFL), 2009 Circumpolar Flaw Lead (CFL) All-Hands Meeting, 1, Published

Prinsenberg, S.J., 2009, IPY’s Circumpolar Flaw Lead Program (CFL) Helicopter-borne Ice sensor survey from the CCGS icebreaker “Amundsen”, 2009 CMOS Annual Meeting, 1, Published

Prinsenberg, S.J., 2009, Hudson Bay Oceanography and ice-ocean processes, Invited speaker to Centre for Earth Observation Science (CEOS), University of Manitoba, 1, Published

Prinsenberg, S.J., 2009, Progressing from ocean climate physics to Ecosystem and real-time research in Lancaster Sound, 2009 ArcticNet Annual Conference Proceedings, 1, Published

Prinsenberg, S.J. and Y. Gratton, 2009, Formation and ridging of flaw leads in the eastern Canadian Beaufort Sea, 2009 AGU Fall Meeting , Poster, Published

Prinsenberg, S.J., I. Peterson, D.G. Barber, and M. Asplin, 2009, Beaufort Sea pack ice break up by long period swells, 2009 DAMOCLES Science meeting, Poster, Published

Pucko M., Stern G.A., Macdonald R.W., Rosenberg B., and Barber D.G., 2010, The influence of atmosphere-snow-ice-ocean interactions on the levels of hexachlorocyclohexanes (HCHs) in the Arctic cryosphere.,, oral presentation, 2010 ArcticNet ASM, 14-17 December 2010, Ottawa, Quebec, Canada, 1, Published

Pucko, M., G. A. Stern, D. G. Barber, R. W. Macdonald and B. Rosenberg, 2009, The importance of brine processes for α- and γ-hexachlorocyclohexane (HCH) accumulation/rejection in the sea ice, 2009 Circumpolar Flaw Lead (CFL) All-Hands Meeting, 1, Published

Rossnagel, A. L., D. G. Barber, J. K. Ehn, C. J. Mundy, R. Laing, and K. Hochheim, 2008, Influence of snow and melting sea ice on light availability for primary production, Proceedings, Arctic Change (Poster), 1, Published

Rossnagel, A., D G Barber, C J Mundy, J Ehn, M Gosselin, 2009, The effect of spatially variable surfaces on PAR transmission, solar heating and primary production under first-year sea ice during advanced stages of melt, 2009 Circumpolar Flaw Lead (CFL) All-Hands Meeting, Poster, Published

Scharien, R.K., Geldsetzer, T., and J.J. Yackel , 2009, Analysis of C-Band polarimetric radar backscatter from melt pond covered first-year sea ice, 2009 IEEE International Geoscience & Remote Sensing Symposium (IGARSS ‘09), 1, Published

Scharien, R.K., Yackel, J.J., Barber, D.G., 2010, C-Band dual-pol and polarimetric radar signatures of first-year sea ice during advanced, meltpaper presented at the 31st Symposium on Canadian Remote Sensing – The Prairie Summit, Regina, Canada., , Accepted

Staebler, R.M., Bottenheim, J., Seabrook, J., Whiteway, J., Asplin, M.G., Barber, D.G., Pohler, D., Friess, U. , 2008, Investigating Arctic boundary layer ozone depletions: sodar, lidar and microwave profiler measurements on the frozen Arctic Ocean, Proceedings, American Geophysical Union Fall Meeting (Poster), 1, Published

Staebler, R.M., Bottenheim, J., Steffen, A., Netcheva, S., Seabrook, J., Whiteway, J., Asplin, M.G., Else, B., Barber, D.G., Papkyriakou, T., Pohler, D., Friess, U., Tackett, P., Shepson, P, 2007, Measurements to investigate Arctic ozone and mercury depletions under IPY-OASIS., Proceedings, Arctic Change (Poster), 1, Published

Stainton, E. C., T. Papakyriakou, R. H. Hesslein, and D. G. Barber, 2009, Summer air-water CO2 exchange and physiochemical processes of the Churchill River estuary, 2009 ArcticNet Annual Conference, Poster, Published

Tivy, A., B. Alt, T. Carrieres and J. Yackel , 2009, Evaluation of an empirical method for generating seasonal forecasts of sea ice parameters, 2009 International Conference on Port and Ocean Engineering under Arctic Conditions, Poster, Published

Varma, H., C. Hannah, G. Costello, T. Spears, W. Woodford, C. Delbridge, R. MacNab, 2008, A novel database architecture for diverse bathymetri datasets: application to the Canadian Arctic and the Northwest Atlantic, Proceedings, Arctic Change (Poster), 1, Published

Wold, A., G. Darnis, J. Soreiede, L. Fortier, S. Falk-Petersen, 2008, Lipid composition of the High Arctic herbivorous Calanus Hyperboreus during spring in the Amundsen Gulf, Arctic Canada, Proceedings, Arctic Change (Poster), 1, Published

Yackel, J.J., Fuller, M.C., Iacozza, J., Scharien, R.K. and D.G. Barber , 2009, Snow thickness as a function of sea ice-type using RADARSAT-2 polarimetric data, 2009 Circumpolar Flaw Lead (CFL) All-Hands Meeting, Poster, Published

Specialized Publications

Asplin, M.G. and Galley, R.J, 2011, CCGS Amundsen 2010 Field Program: ArcticNet / BP Partnership, CEOS ArcticNet 2010 Data Report, 125, Published

Asselin, N., 2011, Spring distribution and habitat use of belugas (Delphinapterus leucas) in the eastern Beaufort Sea., MSc thesis., , Accepted

Barber, D.G and Barber, D.,, 2010, Merging Science and Traditional Knowledge During the Fourth International Polar Year, Two Ways of Knowing, 287, Published

Candlish, L.M., 2011, An Investigation of Atmospheric Temperature, Humidity and Cloud Detection Techniques Over the Arctic Marine Cryosphere., MSc thesis., , Submitted

Prinsenberg, S., Peterson, I., Holladay, S. and Lalumiere, L., 2010, Helicopter-borne sensors monitoring the pack ice properties of Mackenzie Delta April 2010 Sea Ice Survey, Canadian Technical Report of Hydrography and Ocean Sciences, 267: viii, 62pp, Published

Prinsenberg, S.J., , 2009, Update on sea ice and mooring studies at Bedford Institute of Oceanography, Power Plant Presentation, Brussels, Belgium, 1, Published

Scharien, R.K., 2010, Physical and Polarimetric C-band Microwave Scattering Properties of First-Year Arctic Sea Ice during the Advanced Melt Season, Doctoral Thesis, 250, Published

Wang, R. and Shen.H, 2010, On developing a continuum model for wave propagation in ice-covered seas., Coastal Hazards,ASCE/EMI special publication, 1, Accepted