

ESSAS Publications

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2013

Erga, S.R., N. Ssebiyonga, B. Hamre, Ø. Frette, F. Rey and K. Drinkwater. Nutrients and phytoplankton distribution and activity at the Barents Sea Polar Front in summer near Hopen and Storbanken. *Journal of Marine Systems* (In Press).

Hood, R.R., K.F. Drinkwater, and N. Mihalopoulos (Eds.). 2013. Large-Scale Regional Comparisons of Marine Biogeochemistry and Ecosystem Processes – Research Approaches and Results. Proceedings of an IMBER Workshop held as part of IMBIZOII on Crete, Greece, 10-14 October, 2010. *Journal of Marine Systems* 109-110: 1-175.

Hood, R.R., K.F. Drinkwater and N. Mihalopoulos. 2013. Large-scale regional comparisons of marine biogeochemistry and ecosystem processes – research approaches and results. *Journal of Marine Systems*, 109-110: 1-3. doi: [10.1016/j.jmarsys.2012.08.008](https://doi.org/10.1016/j.jmarsys.2012.08.008).

Hunt, G.L., Jr., Blanchard, A.L., Boveng, P., Dalpadado, P., Drinkwater, K. Eisner, L., Hopcroft, R., Kovacs, K.M., Norcross, B., Renaud, P., Reigstad, M., Skjoldal, H-R., Whitehouse, G.A., Woodgate, R. 2013. The Barents and Chukchi Seas: Comparison of two Arctic shelf ecosystems. *Journal of Marine Systems* 109-110: 43-68.

Petitgas, P., A.D. Rijnsdorp, M. Dickey-Collas, G.H. Engelhard, M.A. Peck, J.K. Pinnegar, K.F. Drinkwater, M. Huret and R.D.M. Nash. 2013. Impacts of climate change on the complex life cycles of fish populations. *Fisheries Oceanography*. doi:10.1111/fog.12010.

Salihoglu, B., S. Neuer, S., Painting S., Murtugudde R., Hofmann, E.E., Steele, J.H., Hood, R.R., Legendre, L., Lomas. M.W., Wiggert, J.D., Ito, S., Lachkar, Z., Hunt, G., Drinkwater, K.F., Sabine, C.L. 2013. Bridging marine ecosystem and biogeochemistry research: Lessons and recommendations from comparative studies. *Journal of Marine Systems* 109: 161-175.

2012

Peer-Reviewed Journals

- Børshheim, K.Y. and K.F. Drinkwater. 2012. Different temperature adaptation in Arctic and Atlantic heterotrophic bacteria in the Barents Sea Polar Front region, *Journal of Marine Systems*, doi:10.1016/j.jmarsys.2012.09.007.
- Danielson S, Hedstrom K, Aagaard K, Weingartner T, Curchitser E. 2012. Wind-induced reorganization of the Bering shelf circulation. *Geophysical Research Letters*, Vol. 39, L08601, doi:10.1029/2012GL051231, 2012.
- Erga, S.R., N. Sebiyonga, B. Hamre, Ø. Frette, E. Hovland, K. Drinkwater, and F. Rey. 2012. Environmental control of phytoplankton distribution and photosynthetic capacity at the Jan Mayen Front in the Norwegian Sea. *Journal of Marine Systems* doi: 10.1016/j.jmarsys.2012.01.006.
- Fer, I. and K. Drinkwater. 2012. Mixing in the Barents Sea Polar Front near Hopen in spring. *Journal of Marine Systems*. doi: 10.1016/j.jmarsys.2012.01.005.
- Friedland, K.D., C. Stock, K.F. Drinkwater, J. Link, R. Leaf, B. Shank, J. Rose, C.H. Pilskaln, and M. Fogarty. 2012. Pathways between primary production and fisheries yields of Large Marine Ecosystems. *PlosOne* 7: e28945. doi:1371/journal.pone.0028945.
- Hovland, E.K., K. Hancke, M.O. Alver, J. Høkedal, M. Moline, K. Drinkwater, E. Sakshaug, and G. Johnsen. 2012. Measured and modeled optical impact of an *Emiliania huxleyi* bloom in the frontal region of the central Barents Sea. *Journal of Marine Systems*. doi: 10.1016/j.jmarsys.2012.07.002.
- Mackas, D.L., Greve, W., Edwards, M., Chiba, S., Tadokoro, K., Eloire, D., Mazzocchi, M.G., Batten, S., Richardson, A.J., Johnson, C., Head, E., Conversi, A., Peluso, T. (2012) Changing zooplankton seasonality in a changing ocean: Comparing time series of zooplankton phenology. *Progress in Oceanography* 97-100, 31-62.
- Pfeiffer L, Haynie AC. 2012. The effect of decreasing seasonal sea-ice cover on the winter Bering Sea pollock fishery. *ICES Journal of Marine Science* (2012), 69(7), 1148–1159. doi:10.1093/icesjms/fss097.
- Schultner J, Kitaysky AS, Welcker J, Hatch S. 2012. Fat or lean: adjustment of endogenous energy stores to predictable and unpredictable changes in allostatic load. *Functional Ecology* 2012 doi: 10.1111/j.1365-2435.2012.02058.x
- Wiebe, P.H., B. Rudels, S.X. Cadrin, K.F. Drinkwater, and A. Lavin. 2012. Introduction to variability of the North Atlantic and its marine ecosystems, 2000–2009, the

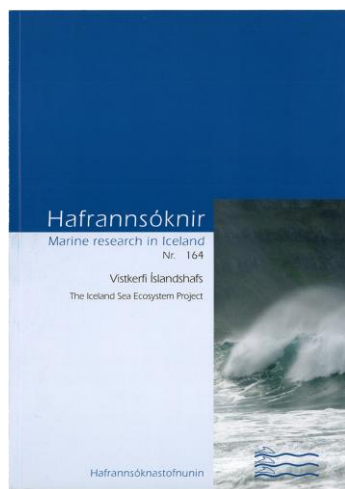
proceedings of an ICES/NAFO symposium held in Santander, Spain, 10–12 May 2011. ICES Journal of Marine Science, 69: 697-702.

Edited Theme Sections, Volumes, or Books

Marine Research in Iceland Report Series (Hafrannsóknir).

Issue No. 164. Published by the Marine Research Institute, Reykjavik, Iceland. The complete volume (with English abstracts) is available at the web page of the Marine Research Institute: <http://www.hafro.is/Bokasafn/Timarit/fjolrit-164.pdf>

About this volume



The main Icelandic contribution to the ESSAS program has been through a multi-disciplinary project on the ecosystem in the Iceland Sea entitled accordingly „The Iceland Sea Ecosystem Project“. The main objective of the project was to analyze ecosystem structure and function in the Iceland Sea and adjacent waters, with particular reference to the life history of the capelin. The project had its main field activity in 2006-2008 and since then the main work has involved analysis of data for publication. Recently a report of 9 papers summarizing the results from the Iceland Sea studies was published as issue no. 164 in the report series Hafrannsóknir (*Marine Reserach in Iceland* in English) published by the Marine

Research Institute, Reykjavik, Iceland. The papers are written in Icelandic but have English abstracts and also figure and table legends in English. The volume includes nine papers describing and dealing with the data collection, hydrography, nutrients, phytoplankton and primary production, zooplankton composition, trophic relations, and finally three papers on capelin biology and migrations.

Einarsson, B., A. Barbaro, B. Birnir, and S. Sigurðsson. 2012. Modelling and simulations of the migration, growth and maturity of capelin. Hafrannsóknir (Marine Reserach in Iceland) Report Series. Issue No. 164.

Gíslason, Á. and T. Silva. 2012. Abundance, composition and development of zooplankton in the subarctic Iceland Sea. Hafrannsóknir (*Marine Reserach in Iceland*) Report Series. Issue No. 164.

Gunnarsson, B. and K. Þórisson. 2012. The origin and drift route of capelin larvae. Hafrannsóknir (Marine Reserach in Iceland) Report Series. Issue No. 164.

Guðfinnsson, H.G. 2012. Changes in chlorophyll a, primary production and species composition in the Iceland Sea. Hafrannsóknir (Marine Reserach in Iceland) Report Series. Issue No. 164.

- Haynie, A.C. and L. Pfeiffer. 2012. Why economics matters for understanding the effects of climate change on fisheries. *ICES Journal of Marine Science*; doi:10.1093/icesjms/fss021. Published online: February 27, 2012.
- Ólafsdóttir, S.R. 2012. Regional distribution and uptake of nutrients in the Iceland Sea. *Hafrannsóknir (Marine Reserach in Iceland) Report Series. Issue No. 164.*
- Pálsson, Ó.K., H. Valdimarsson, S.R. Ólafsdóttir, H. Guðfinnsson, Á. Gíslason, H. Pétursdóttir, K. Þórisson, B. Gunnarsson, S. Sveinbjörnsson, A.M. Sigurðsson, A. Eydal, B. Sigurðarson, F. Guðmundsson, J.I. Jónsson, K. Valsdóttir, M. Danielsen, R. Guðmundsdóttir, R. Ólafsdóttir, S. H. Brynjólfsson, and T. Silva. 2012. Surveys and data collection in the Iceland Sea Ecosystem Project 2006-2008. *Hafrannsóknir (Marine Reserach in Iceland) Report Series. Issue No. 164.*
- Pálsson, Ó.K., S. Sveinbjörnsson, H. Valdimarsson, Á. Gíslason and H. Vilhjálmsón. 2012. Capelin lifehistory traits in the Iceland Sea. *Hafrannsóknir (Marine Reserach in Iceland) Report Series. Issue No. 164.*
- Pétursdóttir, H. 2012. Trophic relationships of abundant pelagic species in the Iceland Sea. *Hafrannsóknir (Marine Reserach in Iceland) Report Series. Issue No. 164.*
- Smart TI, Duffy-Anderson JT, and Horne JK. 2012. Alternating temperature states influence walleye pollock early life stages in the southeastern Bering Sea. *Mar Ecol Prog Ser 455: 257–267, 2012.*
- Valdimarsson , H. and S. Jónsson. 2012. Hydrographic conditions and currents in the Iceland Sea. *Hafrannsóknir (Marine Reserach in Iceland) Report Series. Issue No. 164.*
- Wuillez M, Ressler PH, Wilson CD, Horne JK. 2012. Multifrequency species classification of acoustic-trawl survey data using semi-supervised learning with class discovery. *JASA Express Letters*. [DOI: 10.1121/1.3678685] Published Online 26 January 2012.
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ICES Journal of Marine Science

Volume 69 Issue 7 September 2012

*Comparative Studies of Climate Effects on Polar and Subpolar Ocean Ecosystems:
Progress in Observation and Prediction*

Editors: K. Drinkwater, G. Hunt, Jr., O. Astthorsson, and E. Head

<http://icesjms.oxfordjournals.org/content/69/7.toc>



About this Special Issue

This Special Issue presents results from the ESSAS 2011 Open Science Meeting (OSM) on *Comparative Studies of Climate Effects on Polar and Subpolar Ocean Ecosystems: Progress in Observation and Prediction* held in Seattle, Washington, during May 2011. It contains 20 papers from the OSM along with an introduction to both the volume and the meeting. This meeting provided an opportunity to showcase the progress made within ESSAS and to identify remaining knowledge gaps and future research needs. The issue was dedicated in memory of

Bernard Megrey who passed away unexpectedly on October 1, 2010. Dr. Megrey was strongly involved in ESSAS, particularly with the modeling of marine ecosystems. Papers in this issue cover a wide variety of topics, including ecosystem components from physics to marine mammals to humans. The volume is organized geographically, stretching from the Sea of Okhotsk in the Pacific, through into the Arctic and the Atlantic, and ending in the Barents Sea. In addition, one paper deals with the Antarctic. The OSM and the papers in this issue have provided new results and methods that expand our knowledge of the sub-Arctic seas.

Special dedication to Bernard Megrey. 2012. ICES J. Mar. Sci. (2012) 69(7): 1119 doi:10.1093/icesjms/fss128.

Astthorsson, O.S., H. Valdimarsson, A. Gudmundsdottir, and G.J. Óskarsson. 2012. Climate-related variations in the occurrence and distribution of mackerel (*Scomber scombrus*) in Icelandic waters. ICES J. Mar. Sci. (2012) 69(7): 1289-1297 doi:10.1093/icesjms/fss084.

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Criddle, K.R. 2012. Adaptation and maladaptation: factors that influence the resilience of four Alaskan fisheries governed by durable entitlements. ICES J. Mar. Sci. (2012) 69(7): 1168-1179 doi:10.1093/icesjms/fss085.

Dalpadado, P., R.B. Ingvaldsen, L.C. Stige, B. Bogstad, T. Knutsen, G. Ottersen, and B. Ellertsen. 2012. Climate effects on Barents Sea ecosystem dynamics. ICES J. Mar. Sci. (2012) 69(7): 1303-1316 doi:10.1093/icesjms/fss063.

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- Laidre, K.L. and M.P. Heide-Jørgensen. 2012. Spring partitioning of Disko Bay, West Greenland, by Arctic and Subarctic baleen whales. *ICES J. Mar. Sci.* (2012) 69(7): 1226-1233 doi:10.1093/icesjms/fss095.
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Marine Ecology Progress Series

Volume 459, Inter-Research 2012, Pages 157 - 302

Comparative Analysis of Marine Fisheries Production

Editors: A. Bundy, J. Link, T. Miller, E. Moksness, K. Stergiou

<http://www.int-res.com/articles/theme/m459 ThemeSection.pdf>



About this Theme Section

The unifying theme of the studies in this Theme Section is the relative influence of a 'triad of drivers' — fishing, trophodynamic, and environmental — on fisheries production. The studies were developed during 2 international workshops held in 2010 and 2011, which assembled a database of fisheries, trophodynamic, and environmental time series from 13 northern hemisphere marine ecosystems, and applied a common production-

modeling approach to this data. The studies encompass empirical examinations of the datasets, production models fitted to the data at multiple levels of organization from single species to full ecosystems, and simulation studies examining the impacts of climate effects and alternative management strategies on fisheries production. The body of work presented in the Theme Section demonstrates that using both production modeling and the comparative approach together makes rapid progress towards ecosystem-based fishery management, whether the aim is a better understanding of the ecosystem or the provision of operational management advice.

Bundy, A., Bohaboy, E.C., Hjermann, D.O., Mueter, F.J., Fu, C., Link, J.S. 2012. Common patterns, common drivers: comparative analysis of aggregate surplus production across ecosystems. *MEPS* 459:203-218.

Fogarty, M.J., Overholtz, W.J., Link, J.S. 2012. Aggregate surplus production models for demersal fishery resources of the Gulf of Maine. *MEPS* 459:247-258.

Fu, C., Gaichas, S., Link, J.S., Bundy, A., Boldt, J.L., Cook, A.M., Gamble, R., Rong Utne, K., Liu, H., Friedland, K.D. 2012. Relative importance of fisheries, trophodynamic and environmental drivers in a series of marine ecosystems *MEPS* 459:169-184.

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Gaichas, S., Gamble, R., Fogarty, M., Benoît, H., Essington, T., Fu, C., Koen-Alonso, M., Link, J. 2012. Assembly rules for aggregate-species production models: simulations in support of management strategy evaluation. *MEPS* 459:275-292.

Gamble, R.J., Link, J.S. 2012. Using an aggregate production simulation model with ecological interactions to explore effects of fishing and climate on a fish community. *MEPS* 459:259-274.

Holsman, K.K., Essington, T., Miller, T.J., Koen-Alonso, M., Stockhausen, W.J. 2012. Comparative analysis of cod and herring production dynamics across 13 northern hemisphere marine ecosystems. *MEPS* 459:231-246.

Link, J.S., Gaichas, S., Miller, T.J., Essington, T., Bundy, A., Boldt, J., Drinkwater, K.F., Moksness, E. 2012. Synthesizing lessons learned from comparing fisheries production in 13 northern hemisphere ecosystems: emergent fundamental features. *MEPS* 459:293-302 .

Lucey, S.M., Cook, A.M., Boldt, J.L., Link, J.S., Essington, T.E., Miller, T.J. 2012. Comparative analyses of surplus production dynamics of functional feeding groups across 12 northern hemisphere marine ecosystems. *MEPS* 459:219-229.

Moksness, E., Link, J., Drinkwater, K., Gaichas, S. 2012. Bernard Megrey: pioneer of comparative Marine Ecosystem analyses. MEPS 459:165-167.

Pranovi, F., Link, J., Fu, C., Cook, A.M., Liu, H., Gaichas, S., Friedland, K.D., Rong Utne K., Benoît, P. 2012. Trophic-level determinants of biomass accumulation in marine ecosystems. MEPS 459:185-201.

Deep Sea Research Part II: Topical Studies in Oceanography

Volumes 65–70, 15 June 2012, Pages 1- 316

Understanding Ecosystem Processes in the Eastern Bering Sea

<http://www.sciencedirect.com/science/journal/09670645/65>



About this Volume

This special issue of *Deep Sea Research II* assembles papers describing newly acquired Bering Sea Project data, placing them in context with respect to historical data, and assessing their implications for the future of the Bering Sea ecosystem. It brings together a series of information-rich papers that begin to explore different aspects of the ecosystem and its linkages. The eastern Bering Sea shelf is characterized by runs of years of extensive ice cover and cold water temperatures that contrast with years of lesser ice extent and warmer water temperatures. Six papers describe the spatial and temporal variability of sea-ice extent and timing, and water column conditions, modelling of the atmospheric and oceanic conditions, and an analysis that places recently observed atmospheric variability in the context of a nearly century-long record of observations. Each paper extends its analyses to the implications of the observed variability for the ecosystem. Five papers focus on the distribution of nutrients on the shelf and the associated spatial and temporal variability of primary production and carbon flux. Two manuscripts discuss variability in the seafloor ecosystem in response to these physical forcings and carbon flux. Five additional manuscripts describe zooplankton, ichthyoplankton, and fish egg observations from the Bering Sea shelf in relation to other observed aspects of the ecosystem. The remaining six papers focus on fish, sea birds, fur seals, and cetaceans, discussing both their distributions and their relation to other ecosystem variables, as well as behavioural modelling approaches. Thus, this volume begins to explore this ecosystem's energy flow in cold and warm years and its relation to sea ice dynamics; investigates the impacts of a varying ocean climate on fish spawning location, phenology, and survival; explores new technologies; examines relationships of seabirds, fur seals and whale diets, foraging behaviour and abundance with oceanographic variables and prey abundance and the interaction of top-level predators with prey hot spots; and assesses environmental effects on pollock and cod catch variability. Analysis and synthesis within and across

program components will continue over the next two years under the guidance of the Science Advisory Board, with additional special issues being prepared and planned.

Bacheler, Nathan M., Lorenzo Ciannelli, Kevin M. Bailey, Valerio Bartolino. Do walleye pollock exhibit flexibility in where or when they spawn based on variability in water temperature?, *Deep Sea Research Part II: Topical Studies in Oceanography*, Volumes 65–70, 15 June 2012, Pages 208-216, ISSN 0967-0645, 10.1016/j.dsr2.2012.02.001.

Cooper, L.W., M.A. Janout, K.E. Frey, R. Pirtle-Levy, M.L. Guarinello, J.M. Grebmeier, J.R. Lovvorn. The relationship between sea ice break-up, water mass variation, chlorophyll biomass, and sedimentation in the northern Bering Sea, *Deep Sea Research Part II: Topical Studies in Oceanography*, Volumes 65–70, 15 June 2012, Pages 141-162, ISSN 0967-0645, 10.1016/j.dsr2.2012.02.002.

Cross, Jessica N., Jeremy T. Mathis, Nicholas R. Bates. Hydrographic controls on net community production and total organic carbon distributions in the eastern Bering Sea, *Deep Sea Research Part II: Topical Studies in Oceanography*, Volumes 65–70, 15 June 2012, Pages 98-109, ISSN 0967-0645, 10.1016/j.dsr2.2012.02.003.

Davenport, Emily S., David H. Shull, Allan H. Devol. Roles of sorption and tube-dwelling benthos in the cycling of phosphorus in Bering Sea sediments, *Deep Sea Research Part II: Topical Studies in Oceanography*, Volumes 65–70, 15 June 2012, Pages 163-172, ISSN 0967-0645, 10.1016/j.dsr2.2012.02.004.

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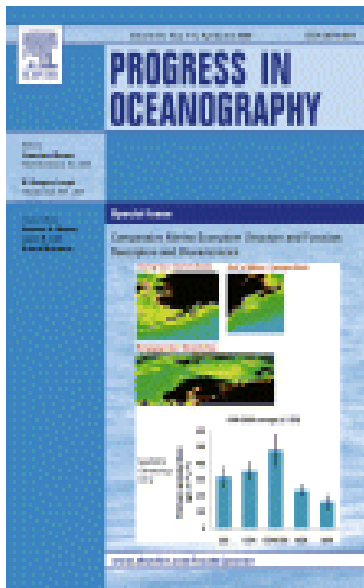
Science Digest — Progress in Oceanography

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Comparative Marine Ecosystem Structure and Function: Descriptors and Characteristics

Edited by Bernard A. Megrey, Jason S. Link, and Erlend Moksness

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About this Volume

The original idea to conduct multi-ecosystem comparisons among our set of collaborators began in September 2005, during the ICES Annual Science Conference in Aberdeen, Scotland. As part of the Norway–US bilateral agreement on cooperative research, a group of scientists from the Institute of Marine Research (IMR) in Norway and the United States’ National Oceanic and Atmospheric Administration’s (NOAA), National Marine Fisheries Service (NMFS) Northeast Fisheries Science Center (NEFSC) and the Alaska Fisheries Science Center (AFSC) held an informal meeting to discuss research areas of mutual interest to all three institutions. Given the recent emphasis on Ecosystem-Based Fisheries Management, the topic of ecosystem comparisons was

identified as being a research area being pursued independently within all three laboratories. All agreed that cooperation between the two institutions would benefit and enhance the activities within each lab that were already underway. Thus, the decision was made to pursue a collaborative project among the three institutions on the topic of comparative ecosystems analysis.

In March 2006, scientists from IMR, NEFSC and AFSC held a research planning workshop at the NEFSC in Woods Hole USA. At this meeting, discussions resulted in two primary products concerning the agreed upon theme of ecosystem comparisons: (1) a proposal to the Norwegian Research Council for funding a longer-term bilateral collaboration between IMR and NMFS to conduct an ecosystem comparison project called MENU (Marine Ecosystems of Norway and the US) and (2) a proposal to the International Council for the Exploration of the Sea (ICES) to hold a Symposium on the topic of Ecosystem Comparisons at their 2007 annual meeting. Both proposals were accepted.

The following year, a MENU “hands-on” technical workshop was held in Bergen, Norway in March 2007. The participants from IMR, NEFSC and AFSC – representing data and modeling experts familiar with six separate marine ecosystems – met to share data, discuss methods of marine ecosystem comparisons, and actually execute comparative analyses. As a workshop product, five scientific papers, co-authored by a joint team of Norwegian and US scientists, were planned, outlined and initiated.

In the following fall, during the 2007 ICES Annual Science Conference in Helsinki, Finland, the accepted ICES proposal realized fruition as a well-subscribed theme session on “Comparative Marine Ecosystem Structure and Function: Descriptors and Characteristics”. The session, co-sponsored by the GLOBEC Ecosystem Studies of the Subarctic Seas (ESSAS) program and the North Pacific Marine Science Organization (PICES), successfully showcased 27 oral presentations and nine posters, nine presentations of which originated from the MENU project. The papers contained in this special issue, five of which result from the MENU project, are an outcome of the

presentations given at the Helsinki Theme session. As was apparent at the Helsinki Theme session, there was both keen interest in the topic and abundant parallel, extant work underway in many other locales. Although the present volume originated out of MENU collaborations, it became apparent that we needed to include a broader set of ecosystems in this comparative context. Thus, the papers in this volume highlight some of the most modern applications of comparative marine ecosystem analysis.

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About this Volume

This volume is an important product of the GLOBEC-ESSAS Symposium on "Effects of climate variability on sub-arctic marine ecosystems". It consists of regional reviews of four of the six sub-Arctic regions addressed in the symposium, and seven disciplinary papers focused on physical and chemical aspects, eight papers on phytoplankton and zooplankton, 11 on higher trophic levels, including benthos, fish, seabirds, and marine mammals, and two on the human dimension of climate impacts on marine ecosystems. In the regional reviews, we sought papers that would update the regional overviews published in the Addendum to the ESSAS Science Plan (Hunt and Drinkwater, 2005). These regional review papers will serve not only as introductions to the marine literature of each region, but also as benchmarks against which future change may be measured. In the remaining disciplinary papers, authors were urged to focus on mechanisms whereby climate might impact biological processes in marine ecosystems. We sought examinations of mechanisms linking trophic levels, and where possible studies that used comparative approaches or examined linkages between trophic levels. The inclusion of papers discussing the human dimensions of climate impacts on sub-Arctic seas was an important component of the symposium, and needs to be a prominent component of future studies of the responses of marine ecosystems to climate change. Humans presently have a major top-down forcing influence on the ocean, and this influence is likely to change as the marine ecosystems on which we depend respond to climate change. In turn, these ecosystem responses will affect the goods and services that we can expect to obtain from the oceans. The symposium made a start in this direction, but much more work needs to be done on how humans affect and are affected by change in marine ecosystems. Examinations of these human dimensions are expected to be an important part of the ESSAS program and its constituent programs such as BEST and Marine ecosystems of Norway and the United States (MENU).

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