



# NEWSLETTER no. 3, 2017

ARCTic Marine Resources under Climate Change:  
Environmental, Socio-Economic Perspectives and Governance

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*In the Arctic, higher temperatures and retreating sea ice will redefine boundaries of biological life, ecological structure, and commercial and social opportunities. Complex interactions exist, from the physical impacts in terms of temperature, ocean currents, and sea ice, via biological and ecological adaptations in terms of changing habitats, growth, and species interactions, via social and business enterprises in terms of new fishing areas and trade routes, to governance implications in terms of pressure on existing agreements, surveillance, and commercial activity. ARC-Change will study some of these interlinkages while bringing together expertise from an array of disciplines and institutions.*

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Newsletter no. 3, headlines:

- *New publications*
- *Alf Håkon Hoel on 'Our Ocean'*
- *Workshops & meetings*

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### *New publications*

Over the past year, ARC-Change researchers have published several articles:

The 5+5 process in Arctic Fisheries, by A. H. Hoel (in *The Arctic in World Affairs: A North Pacific Dialogue on Arctic Futures*, edited by R.W. Corell, J. D. Kim, Y. H. Kim, O.R. Young, pp. 127-138, 2016)

Up the Ante on Bioeconomic Submodels of Marine Food Webs: A data-assimilation based approach, by N.-A. Ekerhovd and S.F. Kvamsdal (in *Ecological Economics* 131, pp. 250-261, 2016).

Økonomisk analyse av klippfisknæringa, by M. T. Bjørndal, T. Bjørndal, and N.-A. Ekerhovd (in *Økonomisk Fiskeriforskning: Ledelse, marked, økonomi*, 2017(1), pp. 1-13).

A bridge between continuous and discrete-time bioeconomic models: Seasonal fisheries, by S. F. Kvamsdal, J. M. Maroto, M. Moran, and L.K. Sandal (in *Ecological Modelling* 364, pp. 124-131).

Indexing of Technical Change in Aggregated Data, by S. F. Kvamsdal (in *Computational Economics*, forthcoming).

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### *Alf Håkon Hoel on 'Our Ocean'*

The following is based on an article in *Fiskeribladet*, November 3, by Alf Håkon Hoel.

Since the first meeting in 2014, the 'Our Ocean' conferences have been an interesting and valuable addition to international conferences centered on the ocean. At 'Our Ocean', governments and other actors agree on measures to secure healthy and sustainable oceans and report on earlier and existing measures and their experiences with these.

The conferences feature four set topics: Pollution, climate, fishing, and marine protected areas. At this year's

conference, held by the EU, two new topics were introduced: Maritime security and the blue economy.

'Our Ocean' leads to significant commitments towards ocean health and conservation. So far, measures for 120 billion NOK and more than 10 million square kilometers of protected ocean has been committed in connection to the conferences. Some of these measures would probably have been taken regardless of these conferences, while others would certainly not. Further, 'Our Ocean' creates publicity around important issues such as climate change and overfishing.

'Our Ocean' is a strike of political genius. The conferences lead to impressive commitments for the ocean that reflect good on the organizers who stand out as global leaders in marine sustainable management.

Indonesia will host 'Our Ocean' in 2018, and in 2019, Norway will host the conference. Norway has well developed management regimes for fisheries, the petroleum industry, and shipping. On-going policy work will move these developments further, and the 2019 conference is a great opportunity to show-case Norway's efforts towards healthy and sustainable oceans.

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### *Workshops & meetings*

**2017 World Conference on Natural Resource Modeling** On June 6-9, 2017, the annual conference of the Resource Modeling Association was held in Barcelona, Spain. Leif K. Sandal (ARC-Change) gave a presentation entitled 'A Contraction Approach to Discrete Multi-Period and Multi-State Optimization with Infinite Horizon'. The presentation comprises results from several on-going research efforts, including the article recently published in *Ecological Modelling* (see *New Publications*). The common theme in these various efforts are periodic variations of biological, environmental, or economic factors that affect a fisheries management problem. The presentation featured both formal methodological developments to deal with periodic problems, and applications of these methods to fisheries.

**ESSAS OSM 2017** On June 12-16, 2017, over 200 scientists and environmental and fisheries managers from

more than 15 countries participated in the ESSAS 3rd International Open Science Meeting in Tromsø. Organised by the "Ecosystem Studies of the Subarctic and Arctic Seas" (ESSAS) Program, this year's meeting had the overall theme "Moving in, out, and across Arctic and Subarctic Marine Ecosystems: Shifting Boundaries of Water, Ice, Flora, Fauna, People and Institutions". The program provides a platform for multidisciplinary research into drivers of variability and change in Arctic and subarctic marine environments and their impact on humans, including human use of natural resources. Angelika Renner, Anne Britt Sandø, Bjarte Bogstad, and Alf Håkon Hoel (ARC-Change), and Geir Odd Johansen (collaborator in the Stockshift-project) participated in the conference, and presented ongoing research and the ARC-Change project.

#### 24<sup>th</sup> Ulvön Conference on Environmental Economics

The annual Ulvön-conference took place, on Ulvön in northern Sweden, on June 20-22, 2017. The conference attracts environmental and resource economists from around the world for a few hectic days with busy discussions and warm social gatherings. Sturla Kvamsdal (ARC-Change) presented the article 'Bioeconomic modelling of seasonal fisheries' which regards a new method for optimal management of seasonal fisheries. A simple example demonstrate the problems arising from a management scheme abstracting from the seasonal features.

**Midsundkonferansen «Havblikk 2017»** On July 6-7, 2017, the North Atlantic Institute for Sustainable Fishing (NAIS) held their annual fishery conference in Midsund, Norway. The conference theme was sustainability, local communities and the fisheries. Nils-Arne Ekerhovd (ARC-Change) gave a talk entitled "Eksempel på maritime bærebjelker i lokalsamfunnet – Verdiskapning I klippfiskproduksjon" ("An example of a maritime backbone in local communities – The value creation in the production of salted and dried cod"). The presentation reviewed the domestic value chain, the principle of calculating value creation, and the values created in the fishing fleet, the processing industry, and the exporting sector. The presentation also featured the value

distribution between the government, the employees, and the company owners.

**5th FiSCAO** On 24-26 October, the 5th scientific meeting on fish in the central Arctic Ocean was held in Ottawa, Canada, by invitation of the Department of Fisheries and Oceans. In 2015, the five coastal states to the central Arctic Ocean - the Russian Federation, USA, Canada, Denmark/Greenland, and Norway entered into an agreement to prevent unregulated fishing in the high seas area in the central Arctic Ocean. An important part of this agreement was to work towards the establishment of a Joint Program of Scientific Research and Monitoring for this area. Another important part was a continued process whereby also Japan, the Peoples' Republic of China, the Republic of Korea, Iceland and the EU were to be included in a future arrangement to prevent unregulated fishing in the high seas area. Also, the International Council for the Exploration of the Sea (ICES), the North Pacific marine science organization (PICES), as well as Arctic Council working groups (PAME, CAFF) have participated in this work. In Ottawa, meeting participants discussed implementation of the science plan, including designs of a mapping program, a monitoring program, resource needs, and issues of data collection and management. Alf Håkon Hoel (ARC-Change) took part in the meeting.

**Bergen Fisheries Economics Workshop 2017** On October 27-28, 2017, a selected group of fisheries economists met at the Norwegian School of Economics in Bergen. The workshop was organized in collaboration with the ARC-Change project and featured several ARC-Change researchers, among them Marko Lindroos, Stein Ivar Steinshamn, Dan Gordon, Nils-Arne Ekerhovd, and Sturla Kvamsdal. The workshop program, presentations, and papers are available at the workshop webpage:

[goo.gl/HbsNyt](http://goo.gl/HbsNyt)

Note: Alf Håkon Hoel is currently employed at the Norwegian Embassy in Washington DC, and his presence at various meetings is not exclusively as an ARC-Change researcher. The ARC-Change project nevertheless benefits greatly from the experience and insight he gains in his current work.

Main project partners:



HAVFORSKNINGSINSTITUTTET  
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Web: [goo.gl/rxMhHP](http://goo.gl/rxMhHP)