

S4D Workshop : 'Modelling coupled social-ecological responses to climate variability and change in Arctic marine systems'

at the Oslo Centre for Interdisciplinary Environmental and Social Research, September 15-16, 2008

Workshop goals:

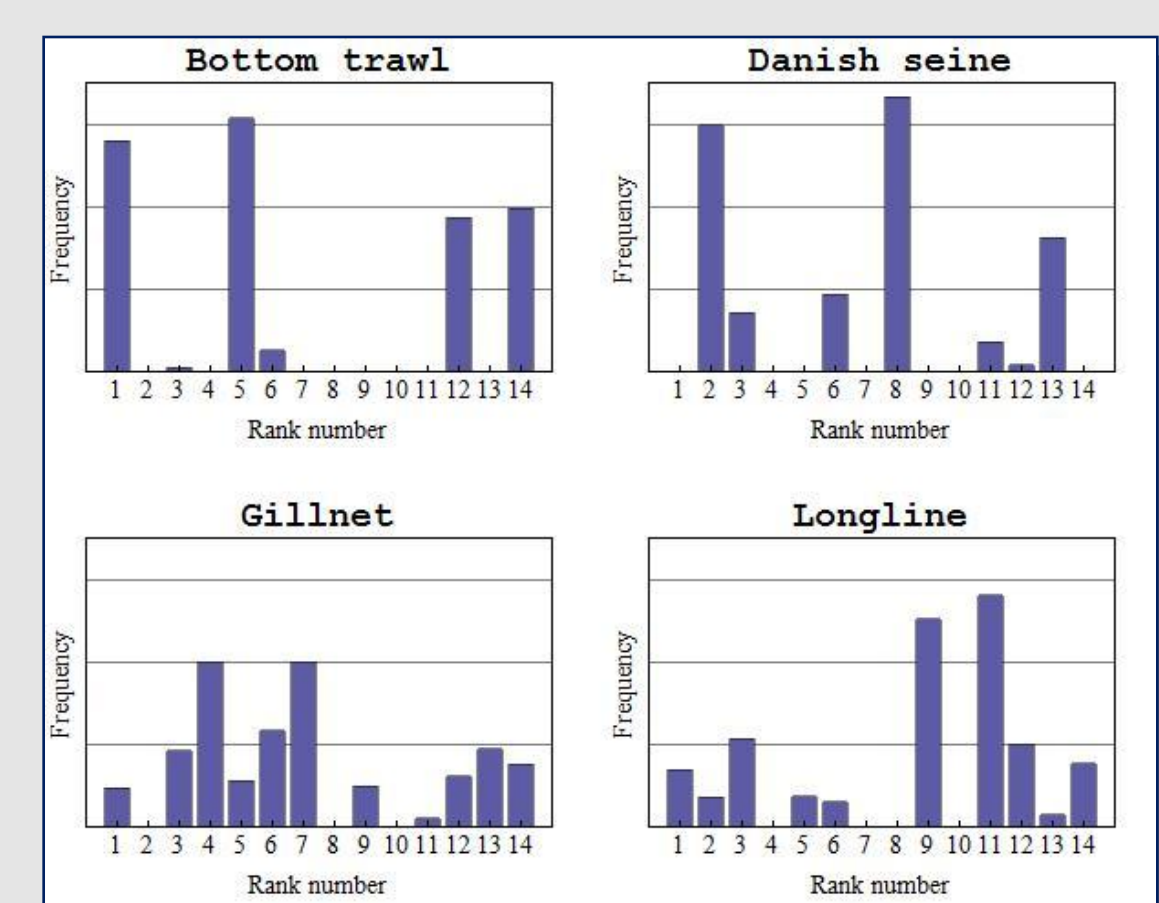
- Information respective research activities, from DAMOCLES and other projects
- Identification and discussion of key methodological challenges associated with modeling coupled social-ecological responses to climate change in marine environments
- Identification of some of the salient linkages between climate variability and change, and changes in the distribution and productivity of key marine fish species
- Identification of changes connected to shifts in harvesting practices and social and economic welfare in fishery-dependent regions

Key questions:

- What are the key variables to be considered for quantifying the relationship between variability/change in climate and in single fish species in the Arctic regions?
- What are the key variables that can be applied to quantify the relationship between climate-change induced changes in fish stocks, and fishing activities targeting those stocks?
- What types of measures can be used to assess the relationship between fishing activities and social and economic welfare at local, regional and national levels?
- What are the important non-climatic elements (e.g. regulatory and resource management components) to include in this type of modeling effort, and how should they be represented?
- Is simplification of complex systems possible, given the experience of experts within specific disciplines?
- What data do we need, and what are the challenges?
- What are the most important methodological gaps, and how can we address them?
- How can the different methodological approaches be combined in a fruitful way?
- Are there common challenges across programmes and disciplines that could be resolved through cooperation?
- What are the key areas for future research collaboration within the field of 'human impacts' in SEARCH, DAMOCLES and beyond?

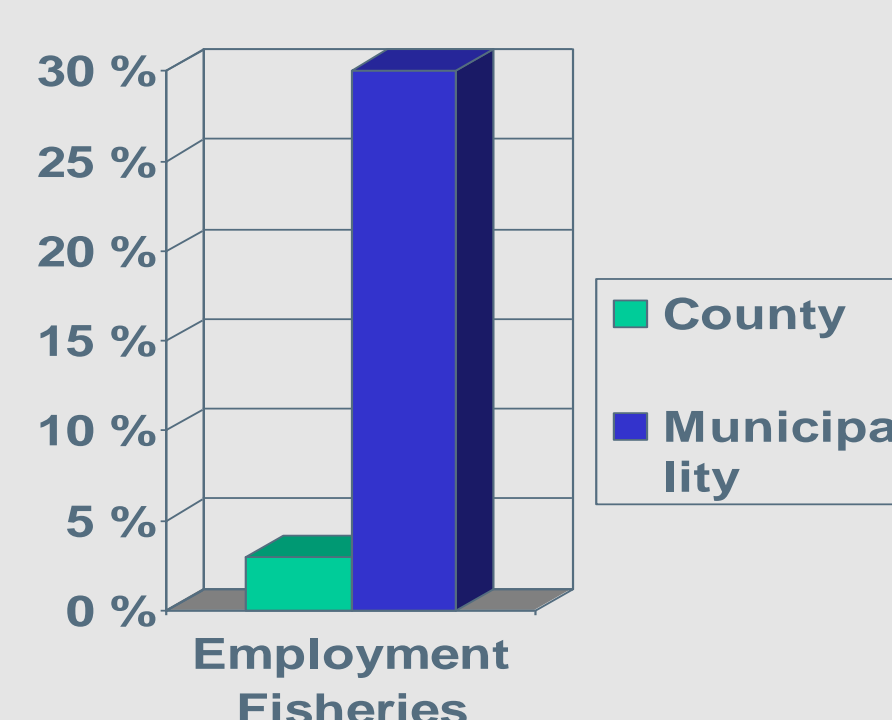
Example for complex modelling incl. management (from A. Eide)

Theoretical cod fleet performance each quarter 1946-2004 on the basis of costs, prices and fishing technology of year 2000, and historical cod stock biomasses and age compositions



Aspects of vulnerability in Norwegian municipalities (from Hovelsrud/West)

Are people involved in the fisheries sector in Norway vulnerable to climate change?

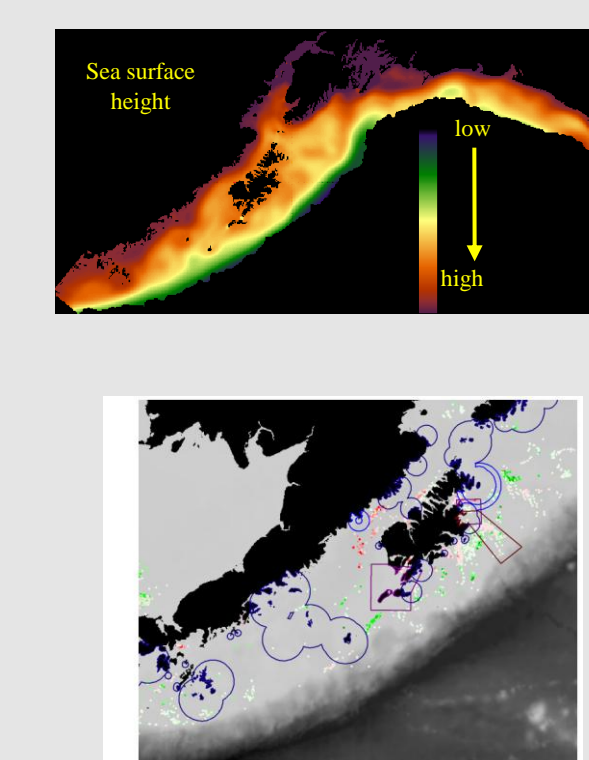


- 3 % at the county level
- Upwards of 30 % at the municipal level
- Perhaps even greater share in smaller communities
- What are the alternatives employment opportunities to fisheries?
- Are there other factors to consider?

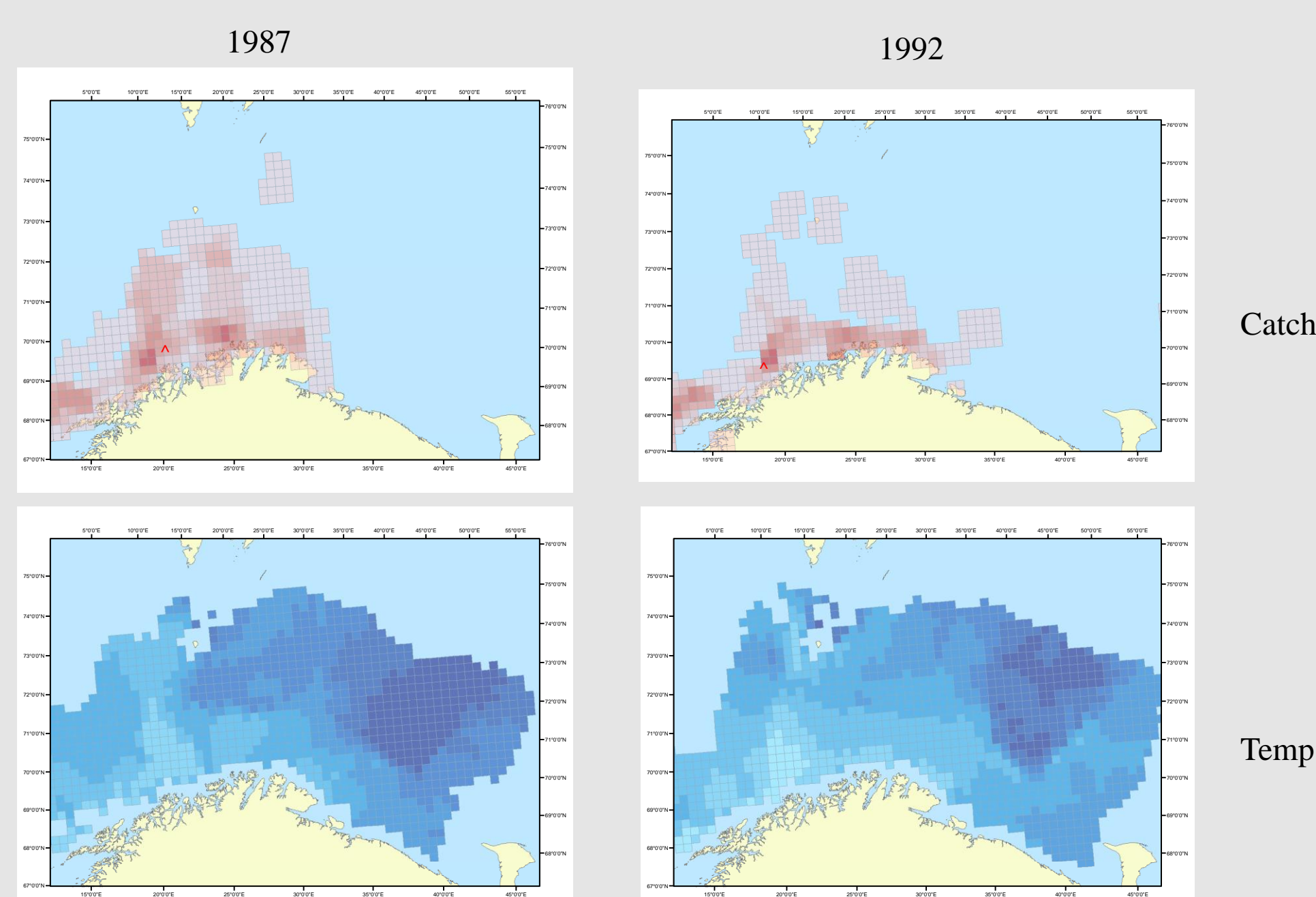
High resolution fisheries catch vs. cost evaluation (from Berman)

Spatial Fisheries Values in the North Pacific - Study Objectives

1. Link spatial variability of fisheries catch per unit of effort (CPUE) and profitability over the season to environmental variables;
1. Develop methods to estimate opportunity costs to the fishing industry of habitat closures, at time and area scales relevant to management decisions.



Spatial distrib of temp and cod catches (from Stiansen/Johansen)



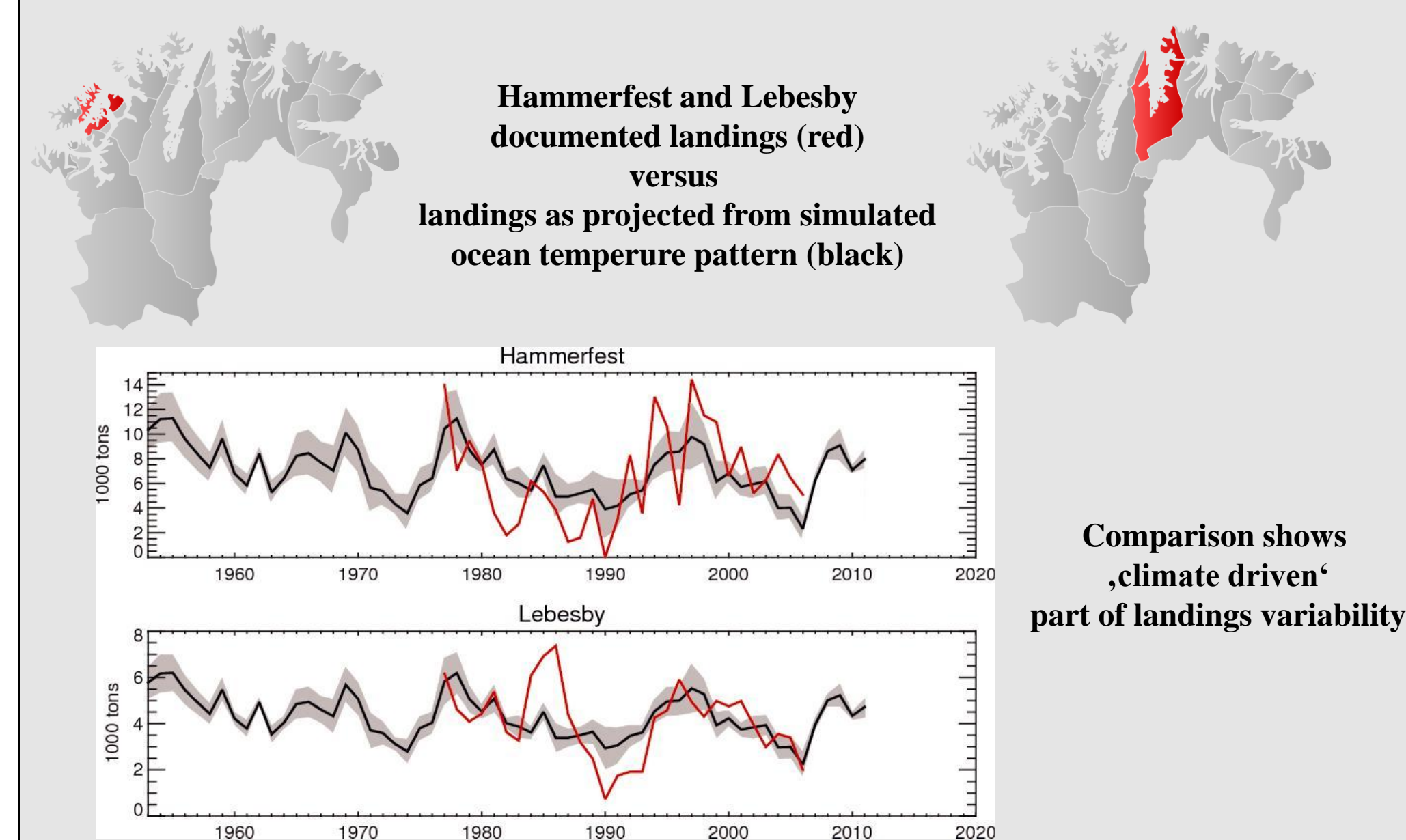
Analysis of Murmansk fisheries (from Stammler/Gossmann)

Fishery sector northern Russia



- The Northern basin, with approx. 20% of Russia's total catches, has the Barents Sea as its main fishing ground.
- Murmansk – ice-free port on Kola peninsula is the main fishing port of the northern basin.
- There is no 'coastal fishing' in terms of western understanding, and there are few 'traditional fishing communities' in the northern basin. Fishing is an 'urban' activity in the sense that the vast majority of 'fishery-related activities' takes place in Murmansk, or were carried out by vessels registered in this city.

Cod catch in DAMOCLES municipalities and relation to ocean climate (from Karcher/Kauker)



Future issues

- The urgent need for Arctic wide fish landings data is documented, and should be part of an Arctic Observing Network (AON)
- Cooperation of DAMOCLES work with the FishExchange program offers promising prospects for both. First ideas for joint work on Cod-Climate have been developed.
- Further exchange and discussions on construction and validation of simplified models for the links of the physical system via fisheries to local economic data is desired, a further workshop for next year was mentioned as an option
- There is common understanding among the participants coming from differing approaches that spacial variability has to be accounted for ('space matters')
- This aspect will have to be considered in future studies, also in simplified model approaches.

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More details under:
www.oasys-research.de/S4D_Oslo