

Climate change in the Norwegian Arctic – Consequences for life in the north (NorACIA main report)

Eirik Mikkelsen, September 2011

1. Project / publication	<p>Øseth, E. (2010): <i>Climate changes in the Norwegian Arctic – Consequences for life in the north</i>. Norwegian Polar Institute Report Series 136. Tromsø: Norwegian Polar Institute</p> <p>http://www.ssf.npolar.no/documents/Rapport136Eng.pdf</p> <p>The project also included various sub-reports and special studies, see: http://noracia.npolar.no/litteratur</p>
2. Initiator	<p>The Norwegian government assigned the NorACIA project. The Norwegian Ministry of the Environment formally mandated it.</p>
3. Objective	<p>The main objectives of this project were to gather and visualize existing knowledge and to develop new knowledge about climate conditions in the Norwegian part of the Arctic. As a follow up of the ACIA process, the NorACIA project aimed to identify the most important knowledge gaps that needed to be followed up in new research.</p> <p>The main task was to gather knowledge about climate change in the Norwegian Arctic area, which can form a basis for further assessments and initiatives related to climate change and its consequences. Five assessments were carried out and formed the basis for the main report:</p> <ol style="list-style-type: none"> 1: Climate developments in Northern Norway and Svalbard in the period 1900-2100. 2: Physical and biogeochemical processes. 3: Consequences for ecosystems and biodiversity. 4: Consequences for people and society. 5: Use of mitigation measures.
4. Geographical delimitation	<p>The Norwegian Arctic area: the Barents Sea, Svalbard and Northern Norway.</p>
5. Time horizon	<p>The climate study incorporates explicit scenarios up to the year 2100. The other reports have a less specific time horizon. The social scientific assessments (reports 4 and 5 above) make explicit that, from a planning perspective, it is difficult to use a 100-years perspective. The significance of other large societal developments (such as globalization) is hard to predict and can have higher significance to developments in the Arctic area than climate change.</p>
6. Thematic focus	<p>The main focus is on the significance of climate change. With respect to the social scientific assessments in this project, the reports assign importance to other developments as well.</p>
7. Images of the future	<p>The future is portrayed for different ecosystems in the north as well as for various industries and activities that are nature and resource dependent.</p>
8. Key driving forces	<p>Primarily climate change.</p>
9. Uncertainties/wildcards	<p>Most important uncertainties are related to terrestrial and marine ecological change (and tipping points).</p> <p>With respect to societal change, changes independent of climate change are</p>

	presented as the main wild cards.
10. Accomplishment and collaboration	This is an expert-based study, in which academic departments were responsible for the sub-reports. The Ministry of the Environment was part of the steering committee.
11. Method	The study is based on quantitative modeling simulations of climate change (meteorology). However, it was primarily a qualitative assessment with respect to the consequences on the biogeochemical and ecological system as well as with reference to the consequences for society.
12. Sources of information	With respect to societal developments and adaptation initiatives, the study builds upon qualitative change based on interpretations of the climate scenarios. In order to assess the meaning of social change to local society and mitigation/adaptation strategies and initiatives, the report uses statistics (industrial activity, infrastructure, and the frequency of climate-related events) as well as qualitative research methods.
13. Strengths	The basic climate scenarios have a resolution of 25x25 kilometers, which is significantly larger than the area used in the ACIA study. Newer studies have a resolution down to 1x1 km for selected and delimited Norwegian areas. With reference to societal consequences and mitigation both top-down and bottom-up methods are developed and used/tested. The former methods are based on statistics, while the latter are based on interviews and processes that include local stakeholders in order to understand and interpret climate scenarios and their influences/effects as well as possibilities for mitigation/adaption.
14. Weaknesses	There still exists large uncertainty about the consequences of climate change, especially as we move along the chain of causes and effects from physical processes to ecosystem effects and to societal effects. Analyzing the combined and aggregated effects of climate change and various socio-economic and cultural developments involves great challenges, which is not only applicable to this study.
15. Attention and significance	This report received a lot of media attention when it was presented (in presence of the Minister of the Environment). The report and the underlying work form a basis for continued assessments in this field. It is also used in the climate-adaption work of the Norwegian government.
16. Relevance for the Fram Centre	This work is of general relevance for the Fram Centre and all of its flagships. Cooperation with Vestlandsforskning could be relevant for continuing the development of methods in order to assess the societal consequences of climate change.
17 Additional comments	This review is based on the author's involvement in the NorACIA project and shared responsibility for the sub-reports 4 and 5, as well as on a study of the main report and the other special studies.