

Why is

# mercury

a concern in the Arctic?

Owing to their traditional local diet some Arctic peoples receive high dietary exposure to mercury, raising concern for human health. Arctic wildlife also exhibit mercury levels that are above thresholds for biological effects raising concern for the environment. The Arctic is a remote region, far from major human sources of mercury releases. Despite this, a substantial amount of the mercury is carried into the Arctic region via long-range transport by air and water currents from human sources at lower latitudes. This situation calls for urgent global action to reduce mercury emissions.





Reducing human and environmental exposure to mercury in the Arctic will ultimately depend on global action to reduce the quantities of mercury entering the 'environmental reservoirs', in which mercury has already been accumulating as a result of human activities during the last 150 years. It is therefore vital that the momentum for global action is maintained.

## The AMAP 2011 Mercury Assessment

The Arctic Monitoring and Assessment Programme (AMAP) 2011 mercury assessment includes an evaluation of more than 80 time series of mercury in Arctic biota datasets collected over recent decades. Most of the time series datasets showing increasing trends are for marine species, followed by predatory freshwater fish species. The fact that trends are increasing in some marine species in Canada and West Greenland, despite reductions in North American emissions, is a particular cause for concern as these include species used for food.

## Arctic Peoples are at Risk

Mercury in the Arctic environment transfers into food chains where, as a result of biomagnification, it can reach levels of concern, particularly in the animals at the top of the Arctic's aquatic food webs. This is a serious problem for Arctic indigenous peoples who rely on hunting and fishing for their nutritional, social and cultural well-being. Their traditional diet, which includes marine mammals, some species of seabirds and their eggs, and marine and freshwater fish, can expose these Arctic residents to high levels of mercury. Although risks communications which may include dietary advice are helping to reduce mercury exposure for some high-risk Arctic residents, this is only a short-term solution. The

only true long-term solution is to reduce mercury concentrations in the environment, particularly in species of importance to the traditional/local diet by reducing global emissions.





## Where does mercury in the Arctic environment come from, and how does it get there?

Globally, about 2000 tonnes of mercury are emitted to the atmosphere each year as a result of human activities. A similar amount is emitted each year from natural sources. In addition, mercury that has accumulated in soils and ocean waters can be re-emitted to the air. This means that mercury contamination, a large part of which is derived from human activities, is recycled in the environment.

Studies indicate that if no action is taken, mercury emissions from human sources are likely to increase in the next decades, but if implemented, existing technologies could significantly reduce emissions.

Mercury is transported to the Arctic by air currents (within a matter of days) and ocean currents (that may take decades) and by rivers from human activities in lower latitudes. Coal burning outside the Arctic Region is the most significant source of mercury that can reach the Arctic via long-range transport. The chemical form

in which mercury is released, and the processes that transform mercury between its various chemical forms are key in determining how mercury is transported to the Arctic and what happens to it when it gets there.

The AMAP 2011 assessment estimates that considerable amounts of mercury are delivered to the Arctic Ocean from the air each year, with similar amounts arriving in inflow from the Atlantic and Pacific Oceans, rivers and coastal erosion. Recent budget calculations suggest that the Arctic Ocean accumulates large quantities of mercury each year.

## What controls mercury levels in the Arctic and what are the effects on Arctic biota?

Previous AMAP assessments raised fundamental questions regarding what controls mercury levels in the Arctic, and how (and when) these levels are likely to fall in response to controls on emissions. The cycling of methylmercury (one of the most toxic forms of mercury) is paramount in



Paul Fesseli, Canada

## Arctic Monitoring and Assessment Programme (AMAP)

The Arctic Monitoring and Assessment Programme (AMAP) is a working group of the Arctic Council. The Arctic Council is a high level intergovernmental forum to promote cooperation, coordination and interaction among the Arctic States, with the involvement of the Arctic Indigenous communities and other Arctic inhabitants on common Arctic issues, in particular issues of sustainable development and environmental protection in the Arctic. Members of the Arctic Council are the Arctic States (Canada, Denmark (including Greenland and the Faroe Islands), Finland, Iceland, Norway, Russian Federation, Sweden, and the United States of America) and the Permanent Participants (representatives of 6 Arctic indigenous peoples organizations). Numerous observer countries and international organizations are also part of the Arctic Council.

## Contact Information

AMAP Secretariat  
P.O. Box 8100 Dep.  
N-0032 Oslo  
Norway

Phone: +47 23 24 16 35  
E-mail: [amap@amap.no](mailto:amap@amap.no)  
[www.amap.no](http://www.amap.no)

this respect. The 2011 AMAP Assessment attempts to answer some of these questions. Furthermore, the report indicates that future climate change is likely to alter mercury delivery and fate in the Arctic in important ways. The effects of mercury on biota may be particularly detrimental for species at the limits of their tolerance to other environmental stressors. The overarching goal of the new AMAP assessment is to update information relevant to answering the questions “what controls mercury levels in the Arctic?” and “what are the effects on Arctic biota?”

## Arctic Council Calls for Global Action

The soon to be released AMAP 2011 Assessment on Mercury in the Arctic documents how mercury continues to present risks to the health of Arctic human populations and wildlife. A particular concern is the fact that in large areas of the Arctic mercury levels are continuing to rise in some Arctic wildlife despite reductions in emissions from human activities over the past 30 years in some parts of the world. Based on the results of the assessment the Arctic Council confirms the need

for concerted international action if mercury levels in the Arctic and in the rest of the world are to be reduced.

The AMAP 2011 assessment will be presented at the Arctic Council Ministerial Meeting to be held on 12 May 2011 in Nuuk, Greenland ([www.arctic-council.org](http://www.arctic-council.org)).

