Environment Canada Environnement Canada

Canada

Mercury Science in Canada: Links to the MFTP

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Why is Canada concerned about mercury?

- Mercury is toxic to humans and biota at levels found in the Canadian environment
  - Indigenous populations in several areas of the Arctic have blood mercury levels that exceed U.S. and Canadian established guidelines
  - Mercury is causing reproductive problems in wildlife at sites in Canada
- Mercury is the primary trigger of human fish consumption advisories in Canada
- Mercury levels are increasing in the Arctic environment and, thus, potentially increasing risk to Arctic peoples and wildlife
- Foreign emissions of mercury are increasing in some areas of the globe
- The role of climate change in exacerbating this risk is uncertain

Objective of Canada's Mercury Science Programs

- To provide coordinated, timely and relevant information to Canadians and decision-makers about the health and environmental effects of current and future levels of mercury

Objectives of the MFTP

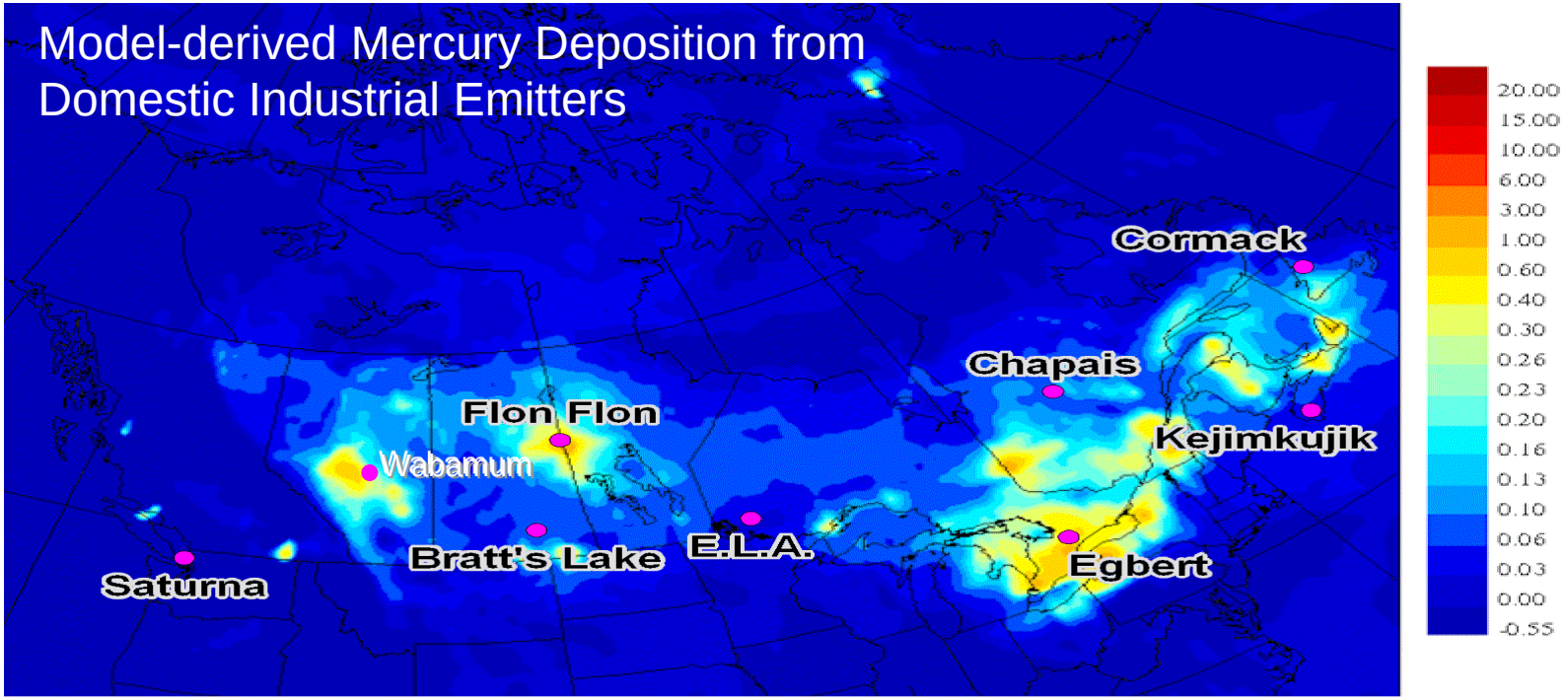
- Accelerating the development of sound scientific information to address uncertainties and data gaps in global mercury cycling and its patterns
- Enhancing the development of a globally-coordinated mercury observation system to monitor the concentration of mercury species into the air and water ecosystems
- Providing technical assistance and training, where possible, to support the development of critical information
- Enhancing sharing of such information among scientists and between them and policy-makers

Mercury Science Programs and Projects involving Canada

- Canada leads and/or engages in a number of domestic, bi-national and international scientific programs and projects that support the objectives of the Mercury Air Fate and Transport Partnership

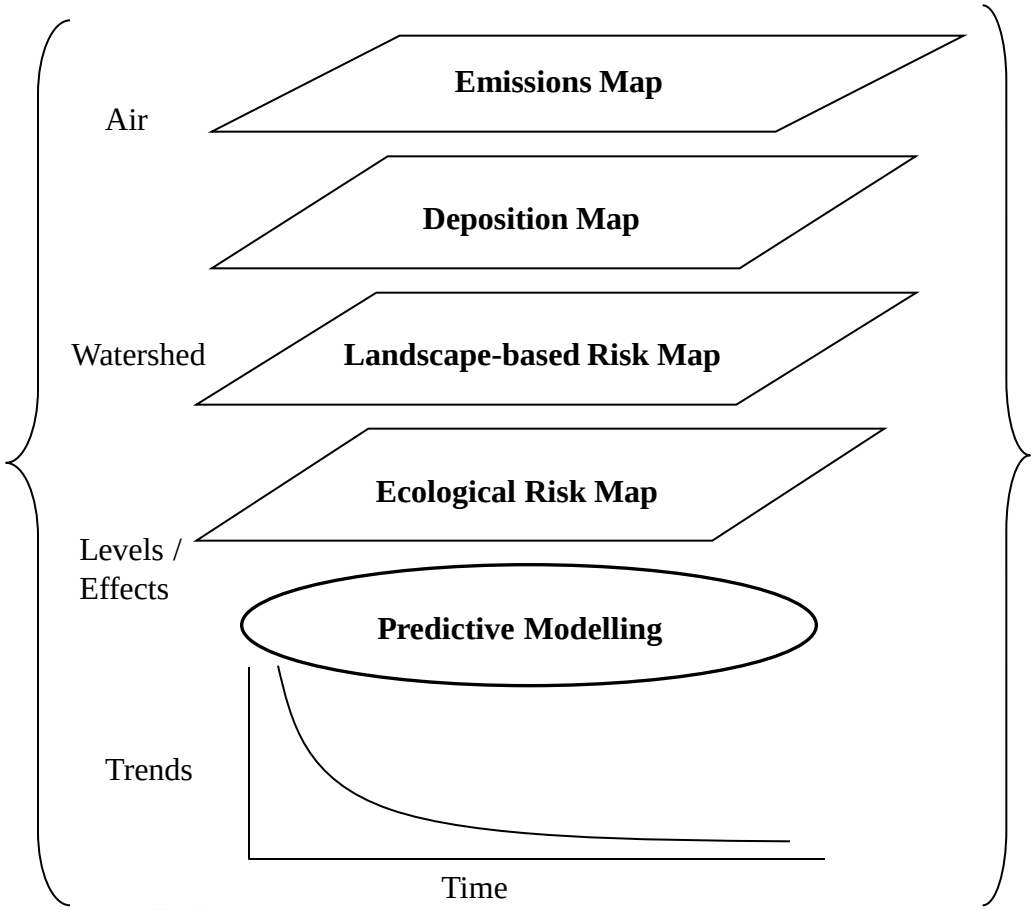
CARA Mercury Science Program

- Define the state-of-the-Canadian environment with respect to the transport, fate and effects of Hg in order to inform the development of new regulations and policies and evaluate the effectiveness of existing ones



CARA Mercury Science Program: Approach

- To enhance and advance on-going and past research and monitoring efforts to develop a cohesive national description of mercury pollution in Canada

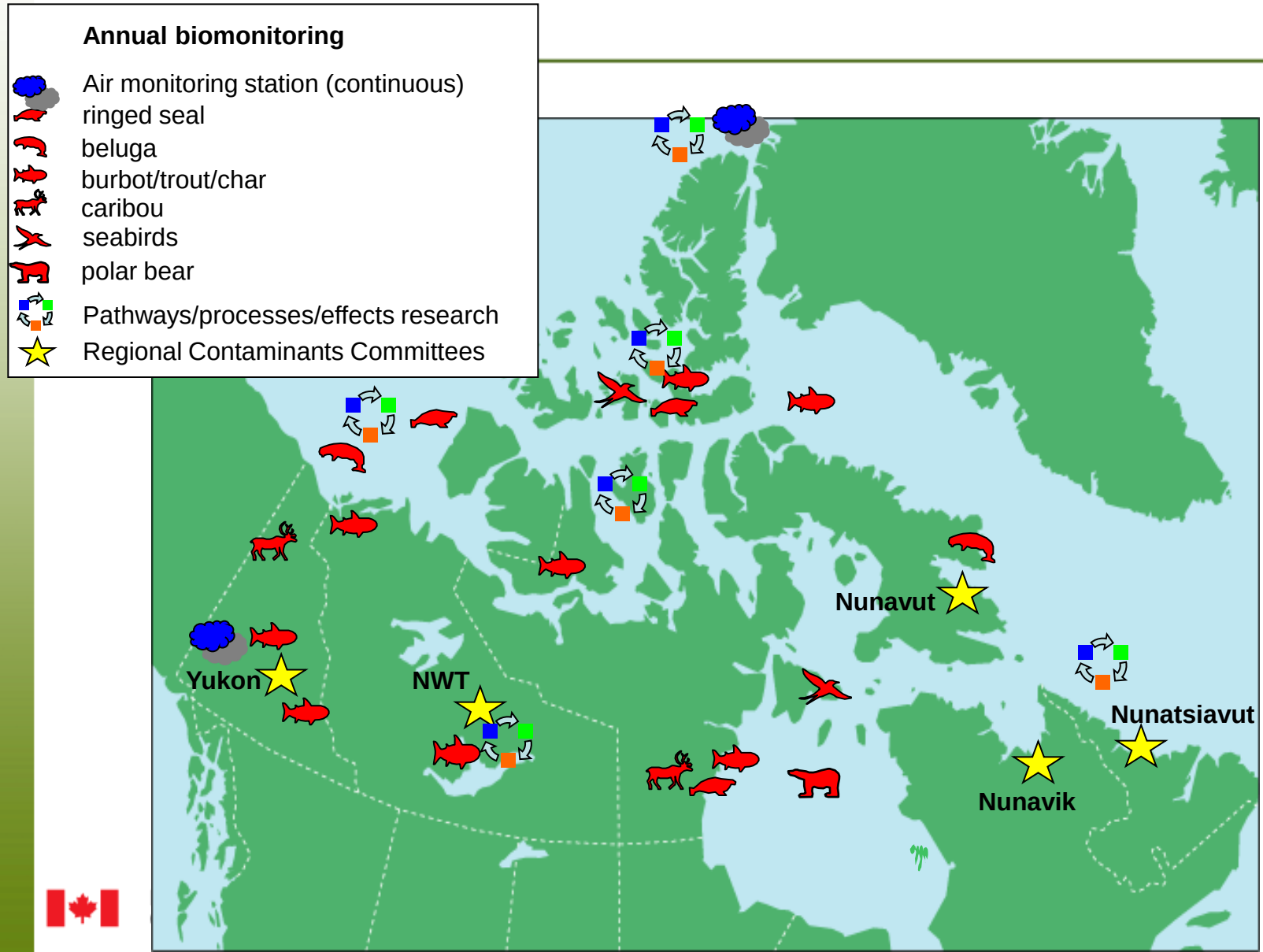


Northern Contaminants Program – Mercury Related Activities

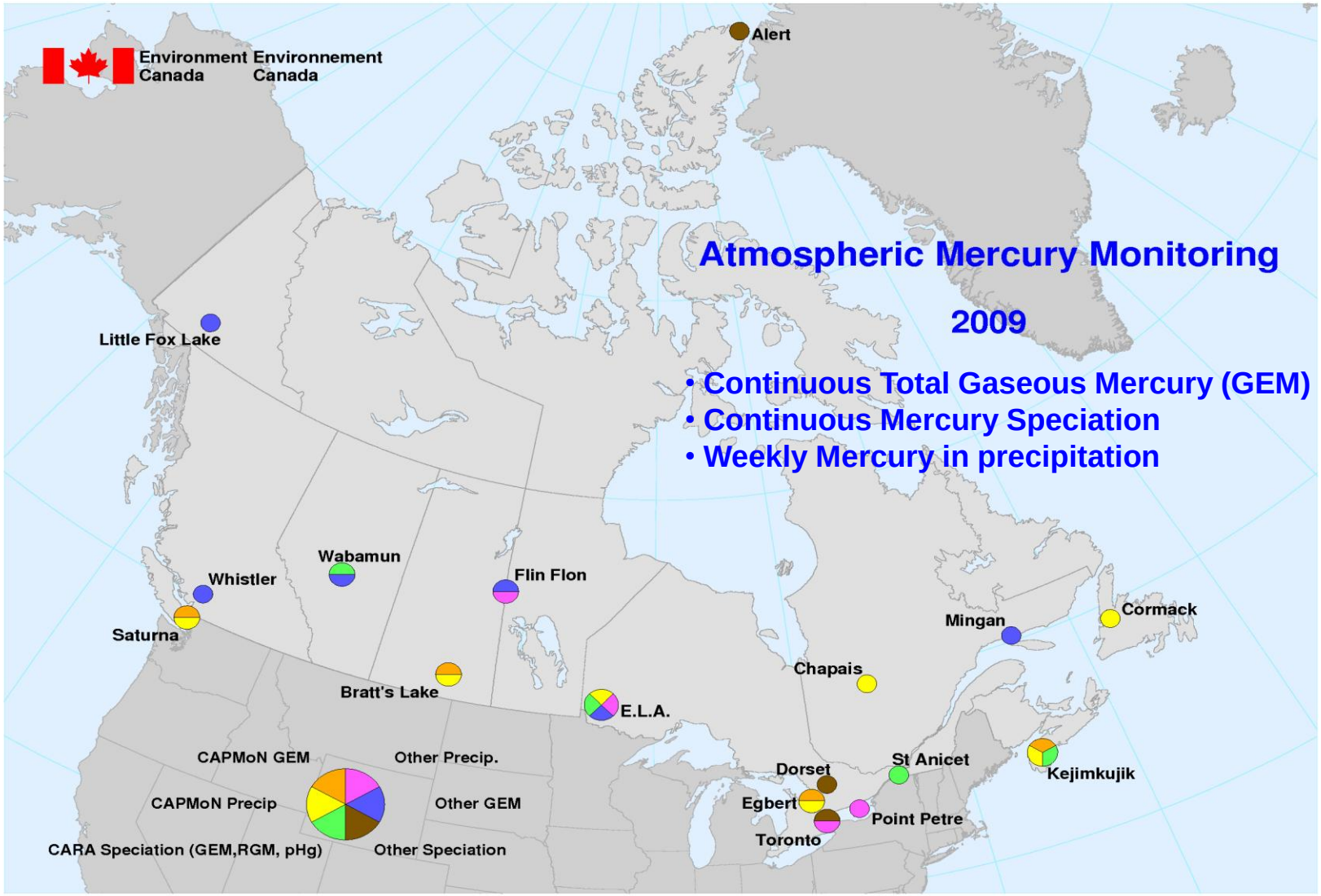
- **Goal:** To reduce and, wherever possible, eliminate contaminants in traditionally harvest foods and provide information that assists informed decision-making by individuals and communities in their food use

- **Activities:**
  - Environmental Monitoring and Research
  - Human Health
  - Communications and Outreach
  - International Engagement
    - Arctic Council – Arctic Monitoring and Assessment Program
    - United Nations Environment Programme

NCP Environment Monitoring and Research



CAPMoN – Canadian Air & Precipitation Monitoring Network

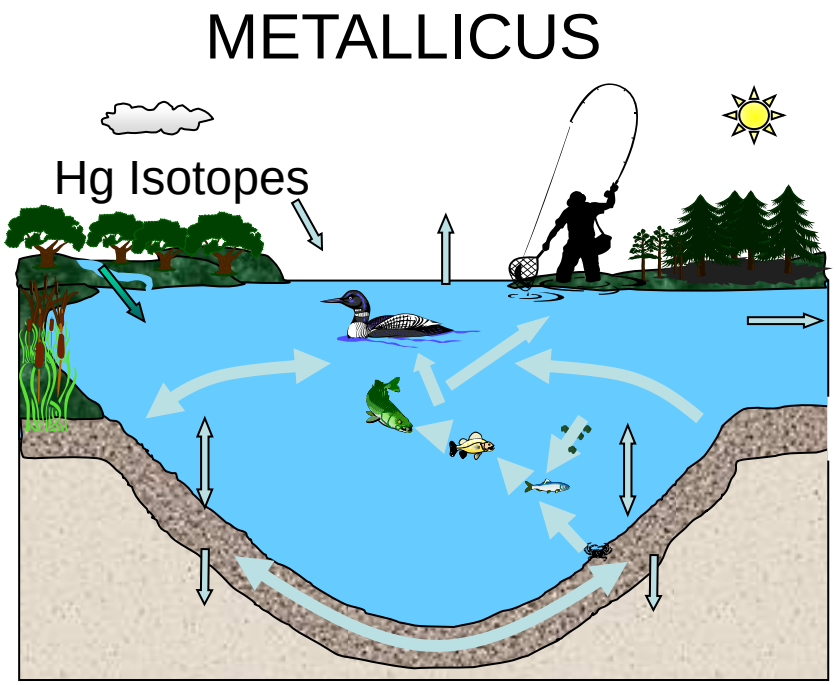


CAPMoN and a GMOS

- Canada collaborates with the U.S. on monitoring:
  - CAPMoN sites are part of NADP-MDN (incl. inter-comparison sites)
  - Canadian scientists participate in the development of the Standard Operating Procedure and QA/QC protocols used at Canadian and U.S. NADP-Atmospheric Mercury Network (AMNet) sites
  - Canada and the U.S. are doing a QC inter-comparison for speciation data
    - Compare data quality control handling methods between NADP program and EC's QC module
    - Year-long data sets from Canadian and U.S. sites have been exchanged with NADP scientists
- Canada is interested in participating in the development of a global mercury observation system

METALLICUS

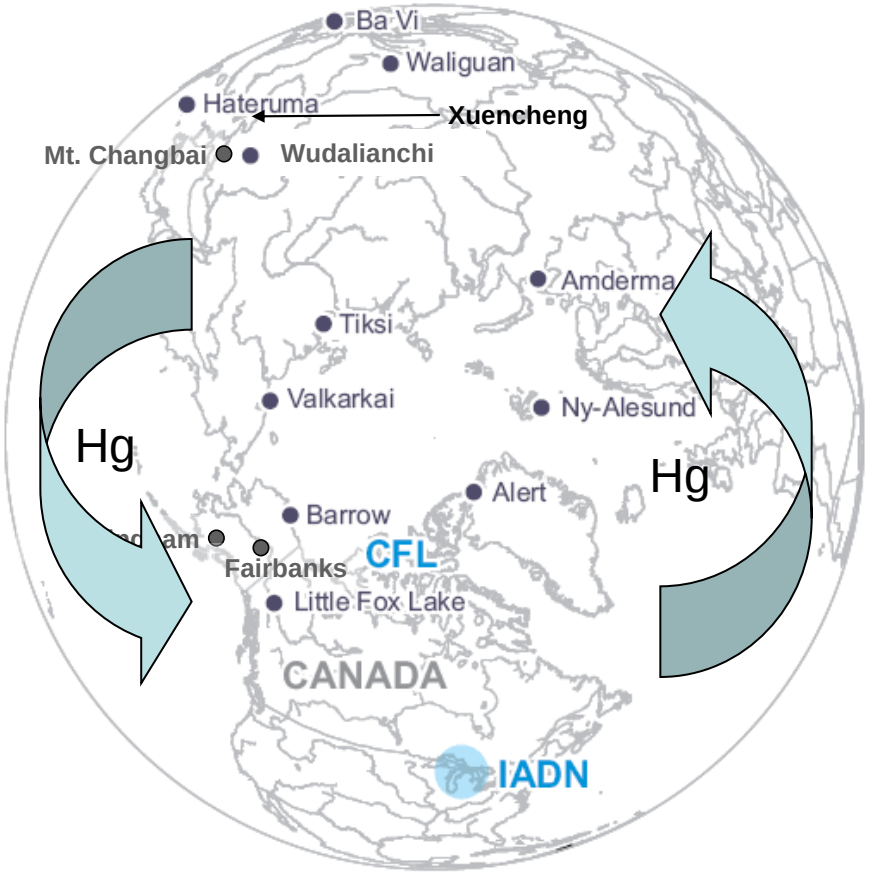
- A bi-national, whole-ecosystem study being conducted in the Experimental Lakes Area (ELA), Ontario
- Goal: To directly determine the response of mercury levels in fish to changes in atmospheric mercury deposition



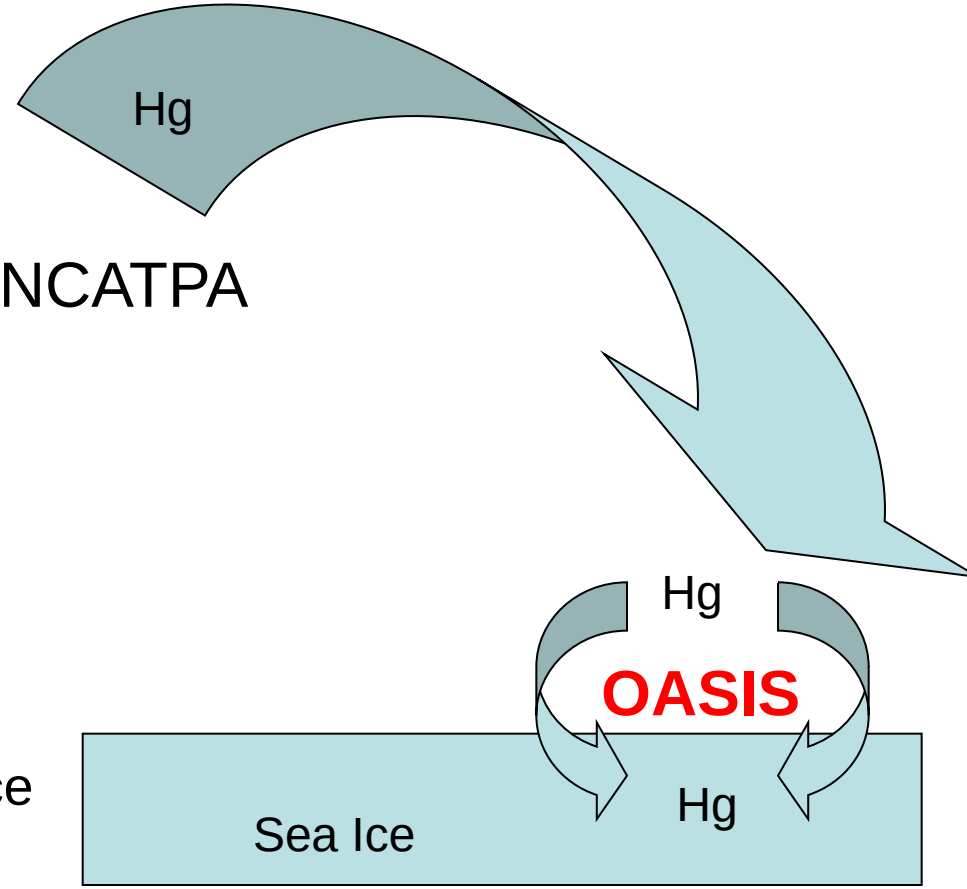
IPY – INCATPA (2007-09)

- Intercontinental Atmospheric Transport of Anthropogenic Pollutants to the Arctic (INCATPA)

- Goal: To investigate the transport of persistent organic pollutants (POPs) and mercury from the Asian Pacific area into the Canadian Arctic
- Canada leads a team of scientists from China, Japan, Vietnam, Russia and the U.S. to measure and model the transport and fate of POPs and mercury

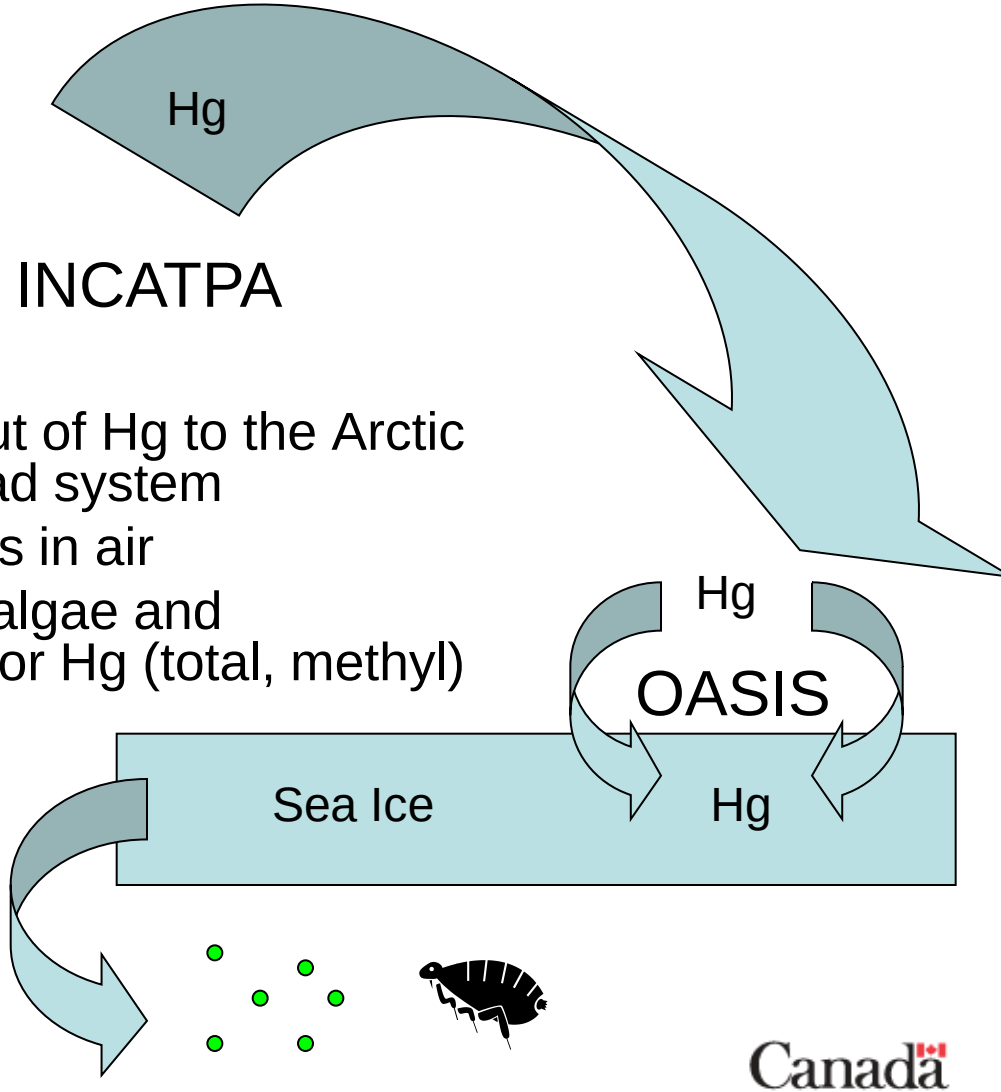


IPY – OASIS (Ocean-Atmosphere-Sea Ice – Snowpack) (2007-09)



- Goal: To understand what happens to the Hg cycle over the frozen (melting-freezing) ocean
- Measure in situ GEM, RGM, PHg, BrO, O3, met over the ice
- Logistically challenging!

IPY-CFL (Circumpolar Flaw Lead)



- Goal: To investigate the input of Hg to the Arctic ecosystem around a flaw lead system
- Measurements of Hg species in air
- Snow, brine, seawater, ice, algae and zooplankton were sampled for Hg (total, methyl)

Canadian Mercury Science Assessment (2013)

- **Goal:** To produce a comprehensive national description of mercury in the Canadian environment
- **Purposes:**
  - Inform decision-making
  - Establish a baseline against which future changes in mercury emissions can be assessed
  - Establish a baseline against which the effects of future changes in the environment on mercury can be assessed
  - Identify priorities for future science activities

Bi-National and Global Assessments

- **Great Lakes Basin Mercury Science Assessment (2011)**
  - To describe the extent and effects of mercury pollution in the Great Lakes Basin
- **AMAP/NCP Mercury Assessment (2011)**
  - To describe the transport, fate and effects of mercury in the Arctic
- **UNEP Global Mercury Programme Assessments**
  - To describe sources, emissions, transport, fate and effects of mercury at the global-scale

Hg HALIFAX 2011

WWW.MERCURY2011.ORG

10th INTERNATIONAL CONFERENCE ON MERCURY AS A GLOBAL POLLUTANT

July 24-29, 2011, Halifax, N.S., Canada

WWW.MERCURY2011.ORG

Canada's Contribution to UNEP Governing Council Priorities

- **Enhancing development of national inventories on mercury**
  - Canada has added the release of mercury from mercury-containing products to its inventory
- **Raising public awareness and supporting risk communication**
  - Canada will host the 10th International Conference on Mercury as a Global Pollutant, July 24-29, 2011 in Halifax, Nova Scotia
- **Providing information on sound management of mercury**
  - Canada is currently leading, or contributing to, a domestic, bi-national and international scientific assessment of mercury

Conclusions

- Canada's mercury science programs are designed to inform the development of new regulations and policies and track the effectiveness of existing ones
- EC's research community is well connected with the national and international research community and participates in many international projects
- Foreign anthropogenic mercury emissions comprise a large fraction of the mercury deposited on Canada, hence, Canada is very interested in supporting international efforts to reduce mercury emissions
- Canada is engaged in a number of scientific programs and projects that support the objectives of the MF&T and UNEP Governing Council priorities