Greenland Integrated Observing System

GIOS is a new, comprehensive and coordinated, joint effort from the Danish realm, to provide new knowledge about the climate change in the Arctic environment, how quickly the changes occur and how they can affect the rest of the globe.

GIOS boosts collaboration between all Arctic research environments within the Danish realm to ensure it maintain a leading role in Greenland environmental research and a well-informed Arctic voice in the international debate.

GIOS develops sustainable research infrastructure in and around Greenland. Where possible, GIOS stations will be supplied with green energy and will continuously monitor condition of the air, ice, sea and land.

GIOS covers the entire climate gradient in the Arctic and ensures an easy, open and fast access to measured data for everyone worldwide.

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GEUS

DTU Technical University of Denmark

AALBORG UNIVERSITY DENMARK

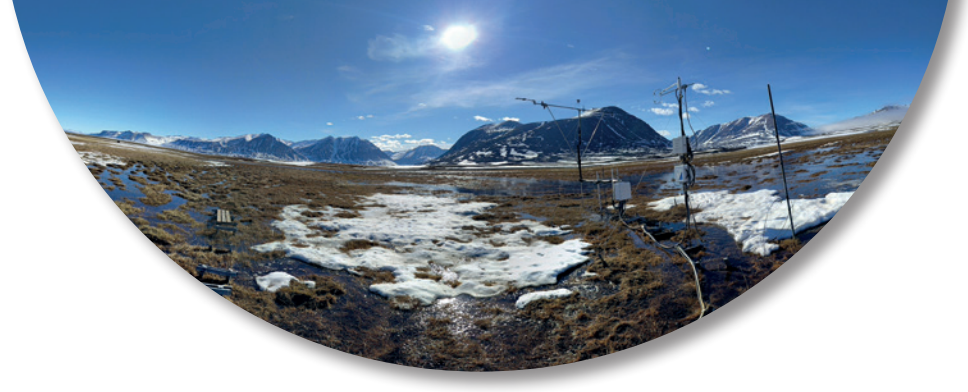
UNIVERSITY OF COPENHAGEN

Grønlands Naturinstitut
Pinngortitaleriffik · Greenland Institute of Natural Resources

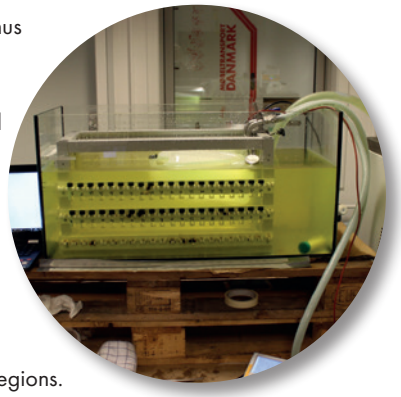
ASIAQ GREENLAND SURVEY

GREENLAND INTEGRATED OBSERVING SYSTEM

www.GIOS.org



ONE ACCESS POINT TO ALL GIOS DATA



GIOS makes its open data available globally and thus links Greenland research across scientific disciplines and various other stakeholders. In combination with improved and interlinked logistics, GIOS is designed to attract international partners and promote research of the highest of international standards. The GIOS data resource ensures the necessary ground truth data for satellite measurements and offers far better options to test and develop more robust models that remain an essential tool for understanding the mechanisms behind the ongoing changes across the Greenland and its neighboring regions.

JOINT RESEARCH IN THE ARCTIC

The GIOS partnership is comprehensive across Arctic research; developing and streamlining data collection in and around Greenland. GIOS partner institutions include: the Greenland Institute of Natural Resources; Aarhus University; Copenhagen University; Technical University of Denmark; The Geological Survey of Denmark and Greenland, Asiaq the Greenland Survey, Aalborg University. Affiliated partners include: Danish Meteorological Institute; Danish Arctic Command; University of Southern Denmark; Greenland National Museum; University of Greenland and Havstoven in the Faroe Islands.

The joint effort covers the collection of data on:

- the Greenland ice sheet, seasonal snow and sea ice;
- the evolution of permafrost and terrestrial and marine ecosystems;
- hydrologic and oceanographic conditions in and surrounding Greenland;
- atmospheric composition, meteorology and geomagnetic conditions.

NEW DATA FROM SUSTAINABLE MEASUREMENT STATIONS

The GIOS partnership develops and implements:

- instrumentation that measures conditions on land, in the atmosphere, in fresh water and the ocean. The measuring stations form nodes from which data is continuously recorded and transmitted. The measurements are kept running by solar and wind energy, reducing the environmental footprint of the data collection and ensuring the data collection can take place year round.
- profiling buoys measure physical, chemical and biological conditions in the ocean.
- airborne sensors measure snow depth and sea ice thickness.
- atmospheric and ecosystem stations measuring greenhouse gas fluxes, concentrations and space weather.
- climate chambers inform biological studies of climate effects.
- a mobile ice camp supports observation of the ice sheet.

The expansion of the research infrastructure maintains and expands the long-term climate records that have been collected across Greenland. The data records allow for documenting the fast changes in the Arctic. The new GIOS infrastructure provides data that complements the data records that are vital to understand and explain the mechanisms behind the observed changes.