



Session EBM10:

*Building long-term ecosystem monitoring programs
to feed Arctic and international biodiversity assessments*

Arctic biodiversity Congress 2018

Wednesday 10 October, Erottaja, ELY, Rovaniemi, Finland • By Torben R. Christensen and Elmer Topp-Jørgensen, Aarhus University, Denmark



Building long-term ecosystem monitoring programs to feed Arctic and international biodiversity assessments


This session will explore how long-term ecosystem-based monitoring programs are designed, the considerations they must take, and how such programs can contribute to a circum-Arctic monitoring program.

Focus will be on how national programs are developed to bring biodiversity related data to the CBMP and what CBMP does to streamline data collection and dissemination in Arctic and international assessments.



Session EBM 10, Arctic Biodiversity Congress 2018
Wednesday 10 October, Erottaja, ELY, Rovaniemi, Finland





Building long-term ecosystem monitoring programs to feed Arctic and international biodiversity assessments

Opening of the session

- The Greenland Ecosystem Monitoring Programme - by Torben R. Christensen, GEM Scientific Leader
- Zackenberg Research Station, Greenland - by Niels Martin Schmidt, Zackenberg Scientific Leader
- Canadian High Arctic Research Station - by Donald McLennan, CHARS Head of Monitoring
- Circumpolar Biodiversity Monitoring Programme - by Sara Longan, CBMP Co-lead

Discussion



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Session EBM10:

The Greenland Ecosystem Monitoring program

*Professor Torben Røjle Christensen
Scientific Lead GEM*

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Zackenbergl, NE Greenland, September 2018







About GEM

Greenland Ecosystem Monitoring (GEM) is a long term research and monitoring programme operated by greenlandic and danish research institutions.

Since 1996.



AARHUS
UNIVERSITY



GEUS



Grønlands Naturinstitut
Pinngortitaleriffik • Greenland Institute of Natural Resources



Technical University of Denmark



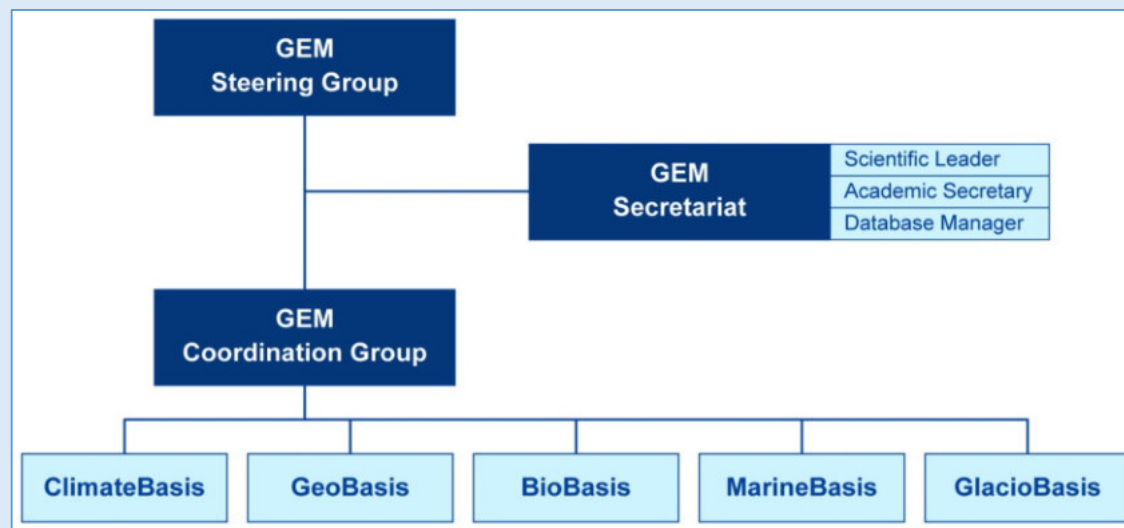
UNIVERSITY OF
COPENHAGEN



GEM Vision and Organisation

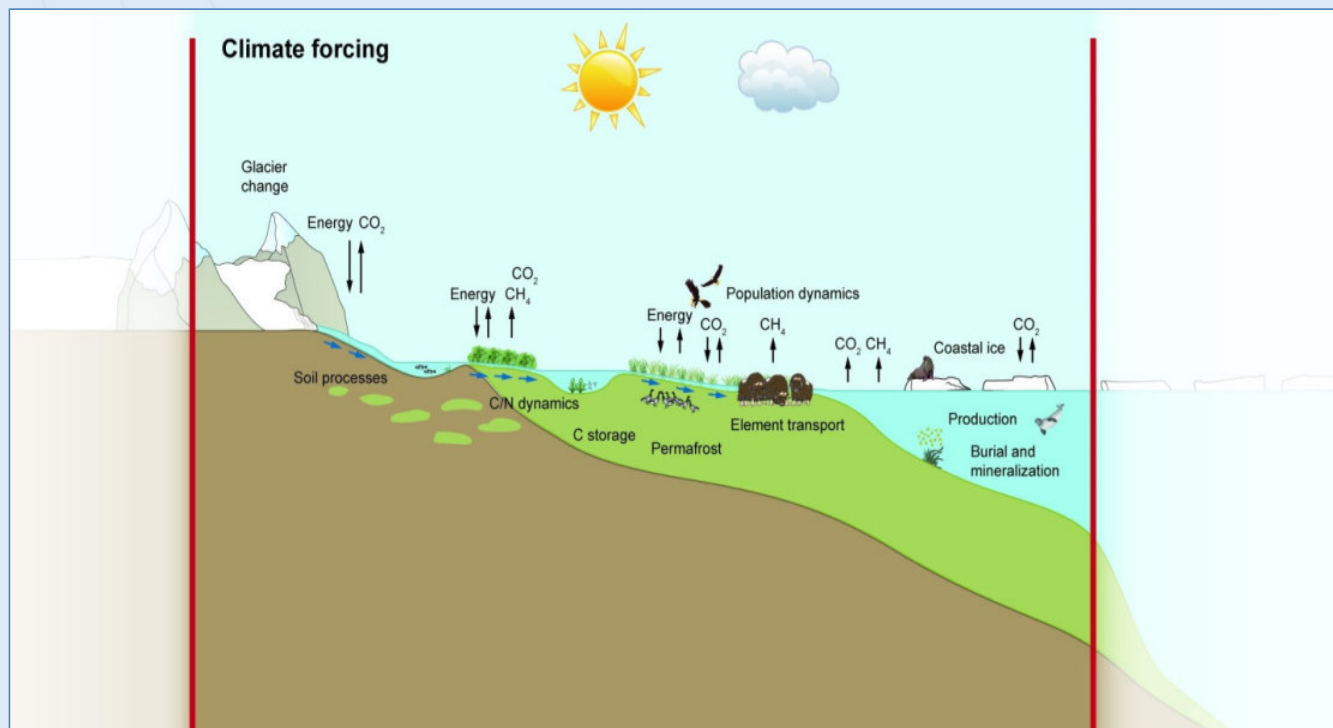
The vision of GEM

“GEM will contribute substantially to the basic scientific understanding of arctic ecosystems and their responses to climatic changes and variability as well as the potential local, regional and global implications of changes in arctic ecosystems.”





The GEM realm



Interdisciplinary research and monitoring of ecosystems from the edges of the Greenland Ice Sheet to coastal marine areas.

The GEM framework



ClimateBasis Programme

The GEM ClimateBasis Programme studies climate and hydrology providing fundamental background data for the other GEM programmes.



GeoBasis Programme

The GEM GeoBasis Programme studies abiotic characteristics of the terrestrial environment and their potential feedbacks in a changing climate.



BioBasis Programme

The GEM BioBasis Programme studies key species and processes across plant and animal populations and their interactions within terrestrial and limnic ecosystems.



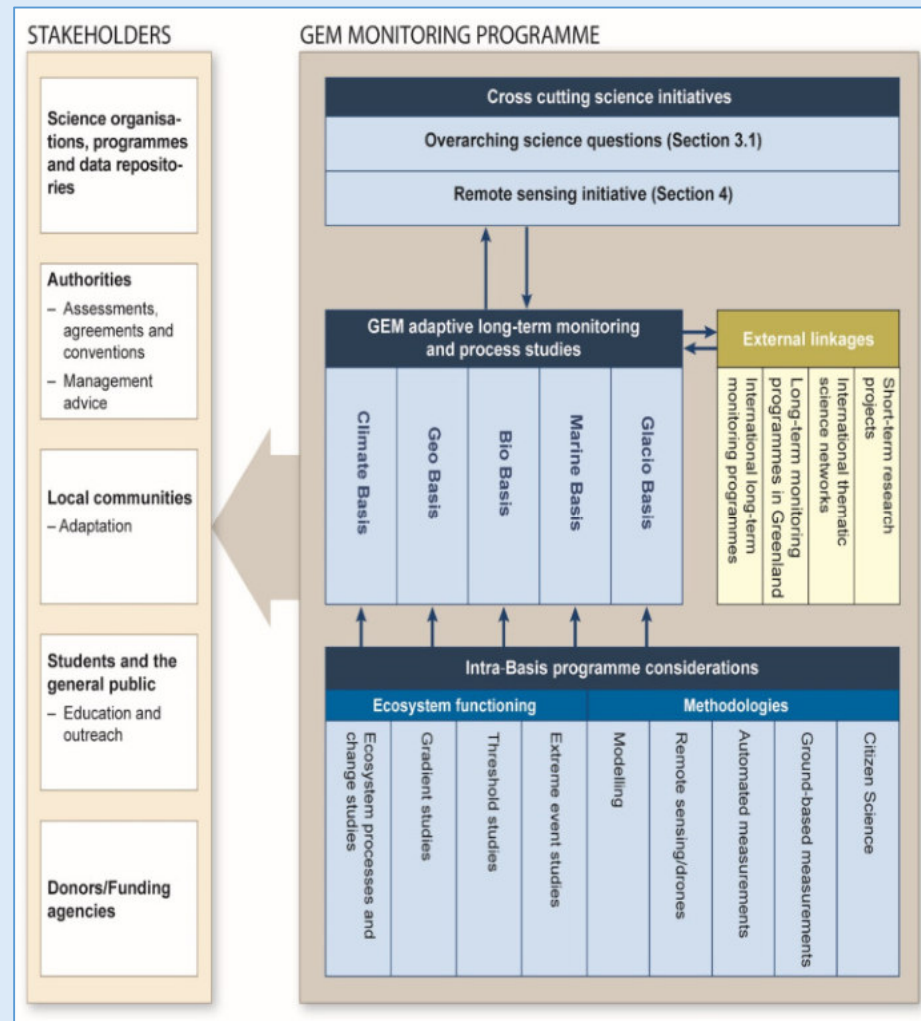
MarineBasis Programme

The GEM MarineBasis Programme studies key physical, chemical and biological parameters in marine environments.



GlacioBasis Programme

The GEM GlacioBasis Programme studies ice dynamics, mass balance and surface energy balance in glaciated environments.



The GEM strategy 2017-2021

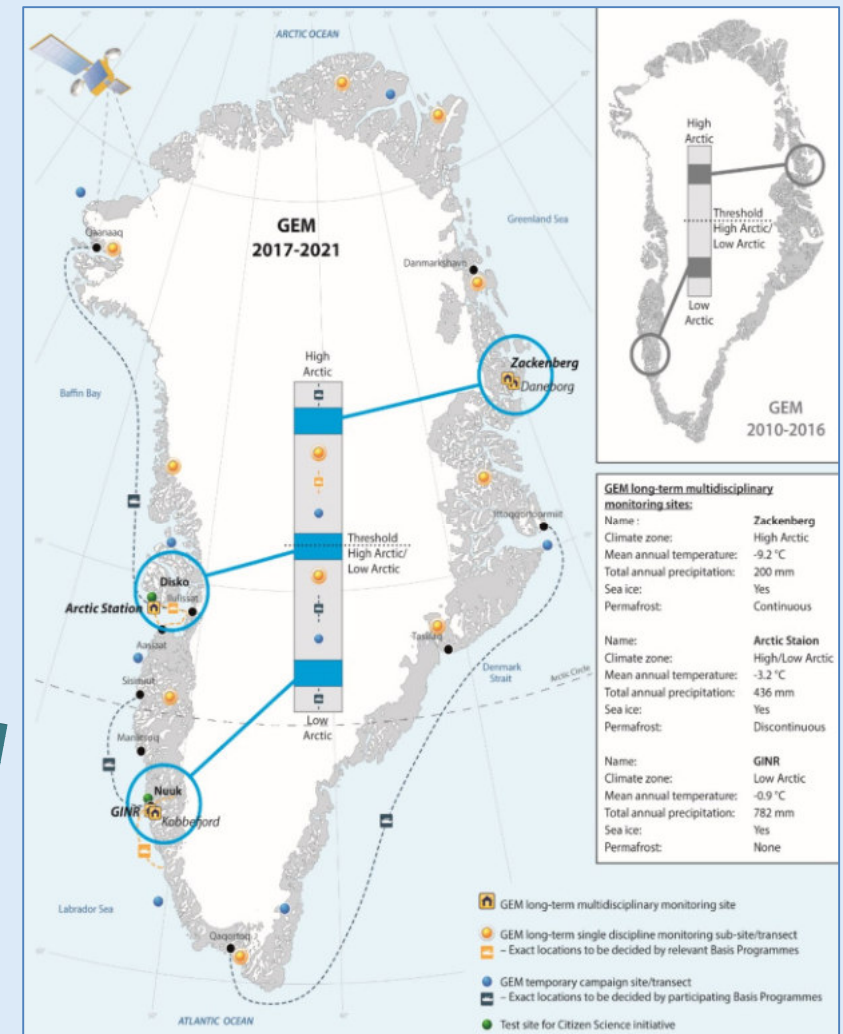
Overarching science questions

Upscaling

- Expand monitoring setup
- Remote sensing component
- **Cooperation with other long-term monitoring initiatives**

Applied science

Outreach and education



Available on www.g-e-m.dk



GEM history



Zackenberg since 1996



Nuuk since 2006



Disko since 2017

Zackenberg Basis Programmes	Nuuk Basis Programmes	Disko Basis Programmes
Climate	Climate	Climate (2017)
Geo	Geo	Geo (2017)
Bio	Bio	-
Marine	Marine	-
Glacio	Glacio (2017)	Glacio (2017)



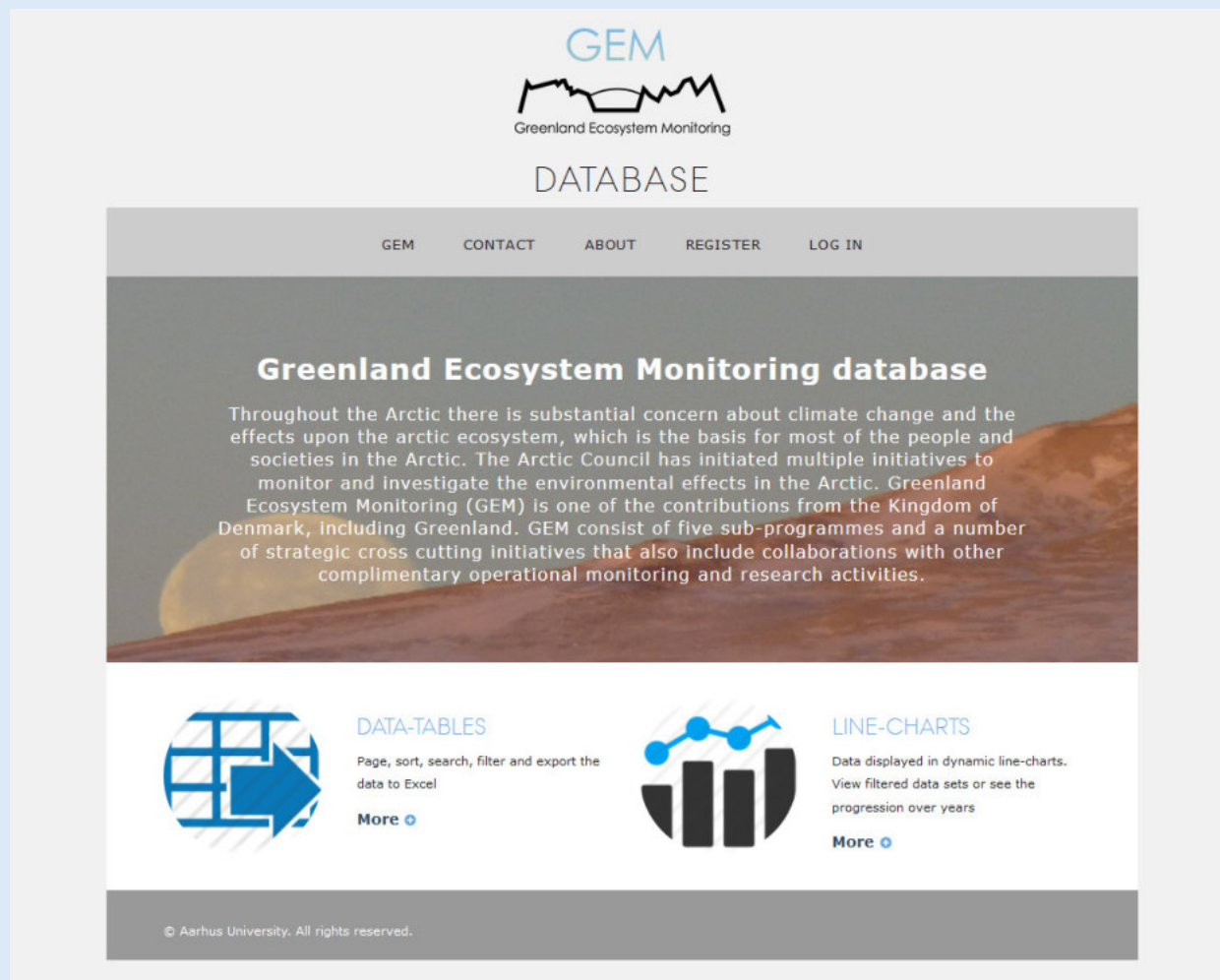
GEM database

GEM database: <http://data.g-e-m.dk/>

(all GEM data are made freely available)

Selected data sets are also submitted to regional/global repositories.

More than 500 registered users distributed all over the World





GEM results and publications

GEM database (open access)

- >1000 parameters monitored

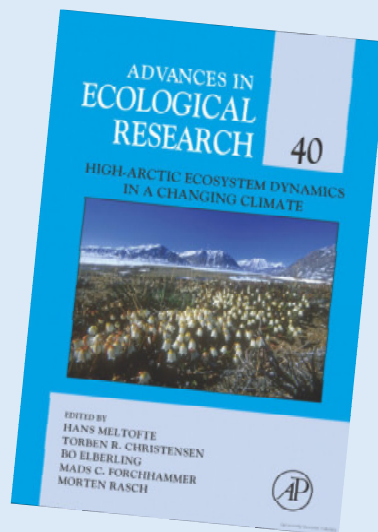
Numerous scientific publications

Annual reports (until 2015)

Annual report cards (from 2016)

Conferences, workshops,
posters, newspaper articles,
website

Master students, PhD students,
Post docs



Special issue of Advances
in Ecological research

Published 2008

Zackenberg: 10 years



Special issue of AMBIO

Published 2017

Zackenberg: 20 years

Nuuk/Kobbefjord: 10 years

Links to publications on www.g-e-m.dk



Annual report cards..

Hard copy 2017 edition available here and pdf
on www.g-e-m.dk

Links to publications on www.g-e-m.dk



The GEM stakeholders

Cooperation between institutions and with external projects and scientists

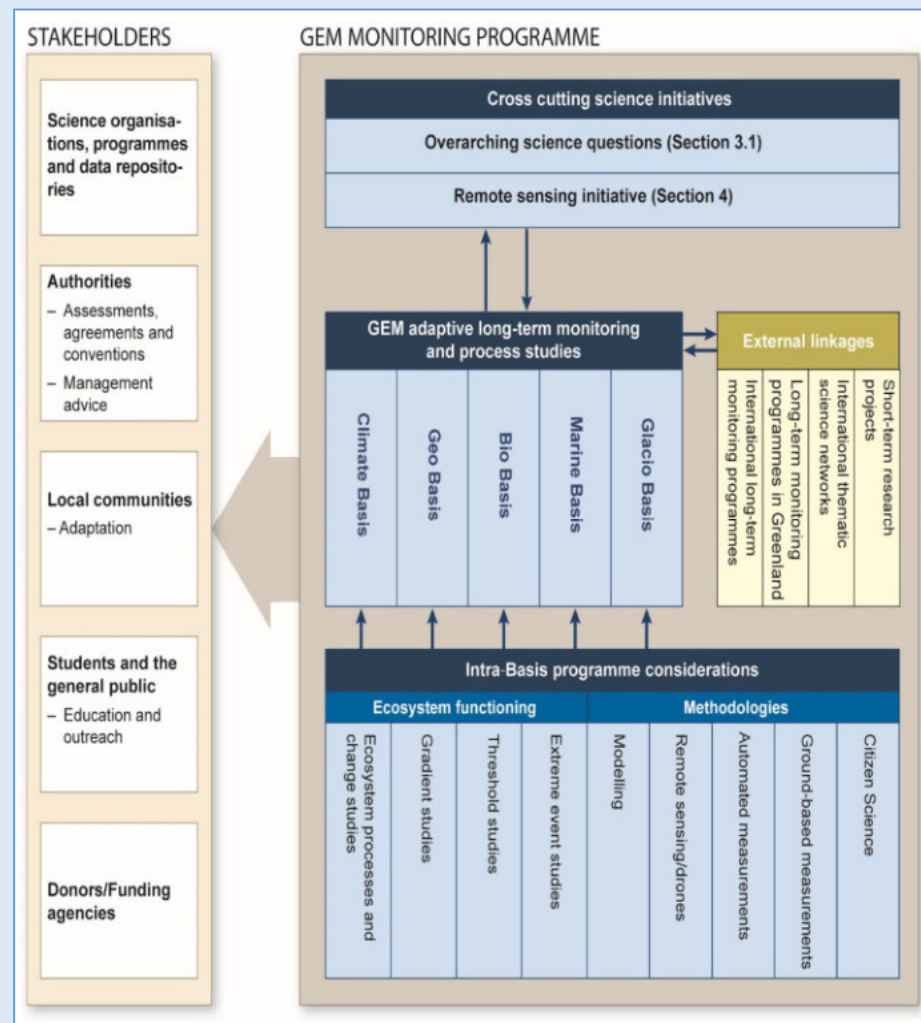
39 scientific networks/organisations

12 data international repositories

Danish and greenlandic authorities

Committments to Arctic Council programs such as AMAP and CBMP

Universities and publications for the general public





GEM funding

- GEM is funded primarily from the Danish Energy Agency, the Danish Environmental Protection Agency, both through DANCEA, and the Government of Greenland.
- Currently operational funds approach 30 million DKR/year, with 2/3 being obtained from DANCEA means and the rest being Government of Greenland funds and co-financing from the participating institutions.



GEM is asking in this session:

- From the perspective of CBMP, are we doing the right thing?
- How may we learn from new efforts e.g. CHARS?
- How may we best transfer experience and data into synthesis efforts?
- What are the key messages from GEM and CHARS to a circumpolar distributed application?

A map of Greenland is located in the top-left corner of the slide. The landmass is white with a grey border representing the coastline. Several yellow dots are placed along the coast, indicating sampling locations. Faint grey lines representing latitude and longitude are visible across the map. The background of the slide is a light blue gradient with faint, thin grey lines radiating from the bottom-left towards the top-right.

THANK YOU