

Update on WGICA and CBMP Marine

ICES/PICES/PAME Working
Group on Ecosystem Assessment
of the Central Arctic Ocean
(WGICA)

CAFF Circumpolar Biodiversity
Monitoring Program – Marine
(CBMP Marine)



ICES/PICES/PAME Working Group on Integrated Ecosystem Assessment for the Central Arctic Ocean

(WGICA)

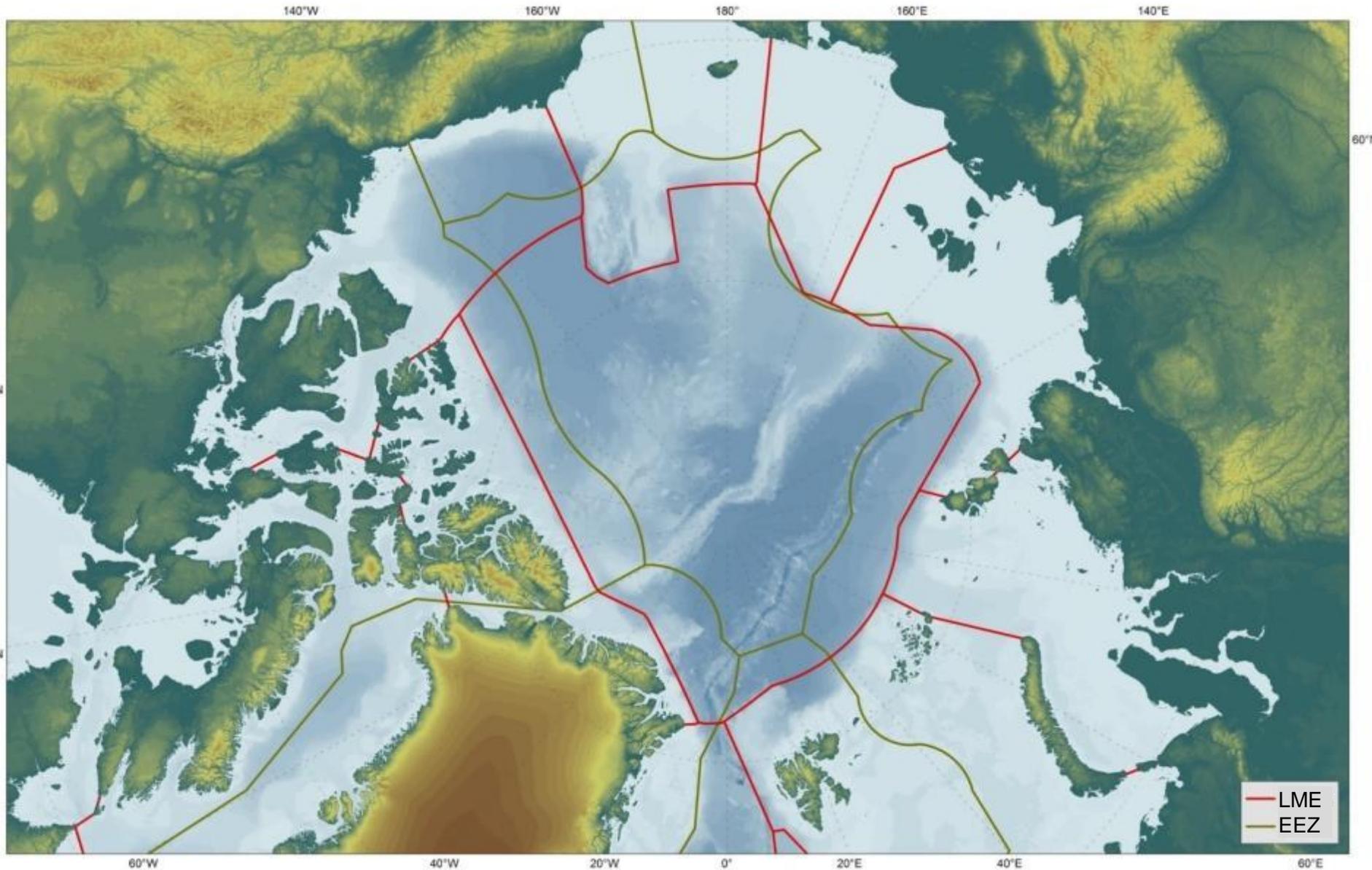
First meeting: May 2016, Copenhagen

Second meeting: April 2017, Seattle

WGICA Terms of Reference

- **Approach and methodology** for doing an IEA
- **Assemble data and information** and carry out appropriate analyses
- **Prepare an IEA outline** for the current status of the CAO ecosystem
 - ✓ **Productivity** – phyto- and zooplankton
 - ✓ **Fish stocks** – potential production, abundance
 - ✓ **Vulnerability** to oil and disturbance (shipping)
- Requirements and design of **research and monitoring**
- Identify **priority research issues**

Large Marine Ecosystems (red) and Territorial Boundaries (green) of the Central Arctic Ocean



WGICA Key Questions

1. What projected shifts in climate and oceanography are likely to impact ecosystems in the Central Arctic Ocean?
2. What is the productivity of plankton, benthic organisms, and sea ice biota in the Central Arctic Ocean?
3. What is the potential productivity of fish stocks in the Central Arctic Ocean?
4. What is the vulnerability of ice-associated marine mammals and birds in the Central Arctic Ocean to climate change, shipping, potential commercial fishing, and other anthropogenic activities?

Climate, oceanography and sea ice

- Changing Arctic climate and sea ice
- “Great Melt” – including a climate assessment in the CAO IEA

Primary production

- Limiting factors for primary production
- Light conditions
- Nutrients

Fish and fish stocks

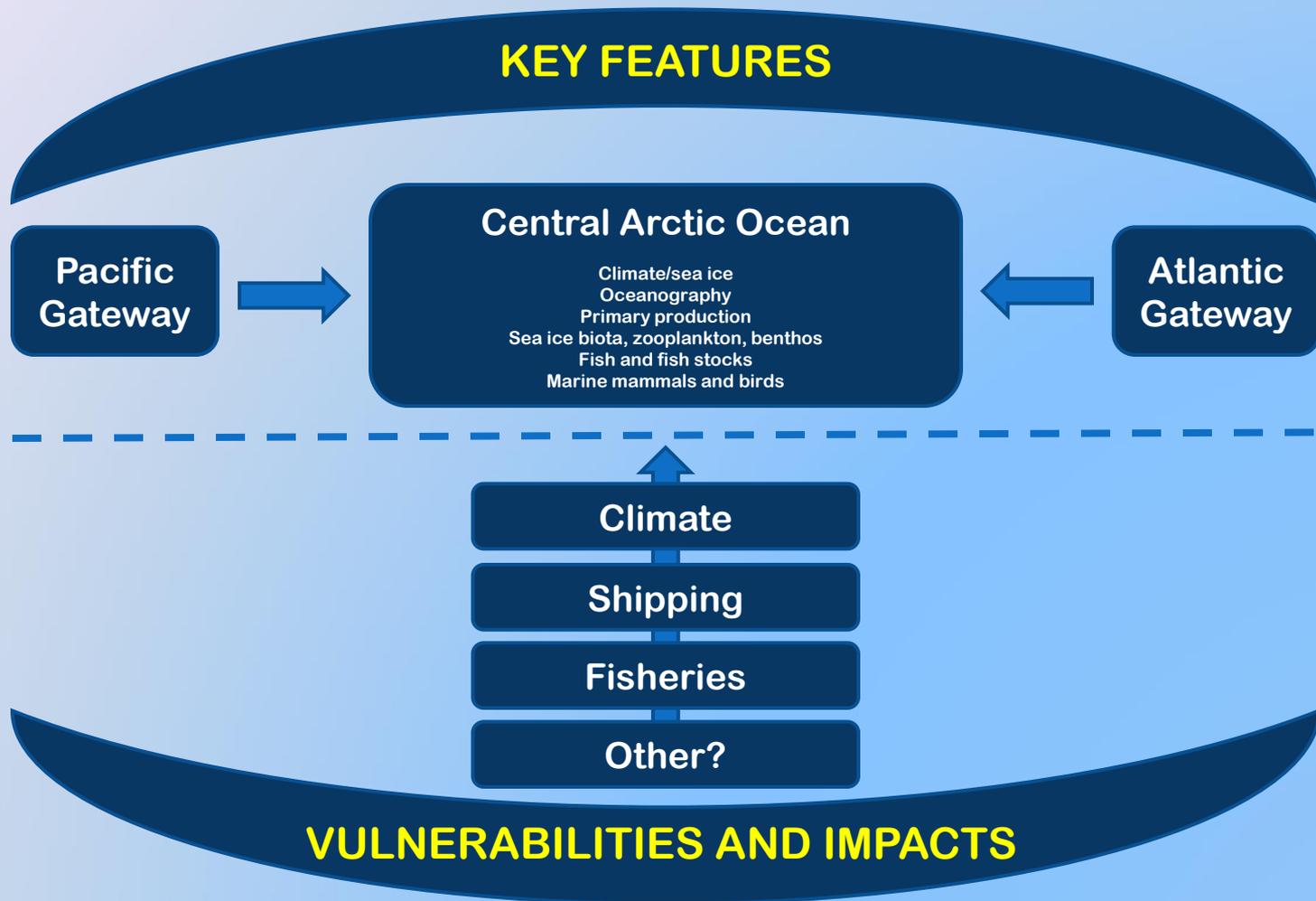
- Arctic fishes – overview
- Occurrence/distribution of fish in the Arctic Ocean

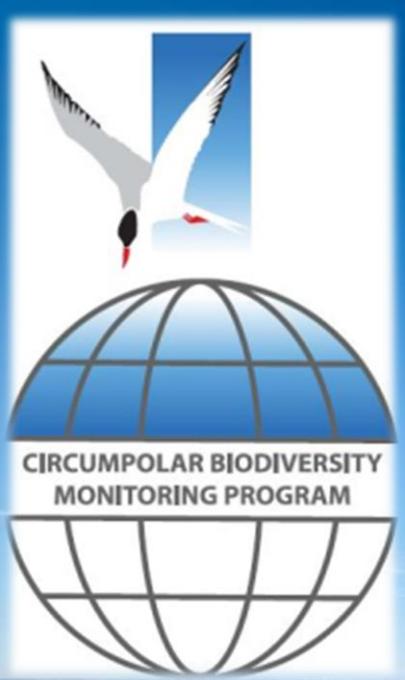
Ecosystem vulnerability

- Sources of potential impact to ecosystem
- Sea ice biota, plankton, benthos
- Marine mammals seabirds



Integrated Ecosystem Assessment





- International expert network improving detection, understanding, reporting on Arctic biodiversity trends
- Expert monitoring groups: Marine
Freshwater
Terrestrial
Coastal

Circumpolar Biodiversity Monitoring Program (CBMP)



Arctic Marine Areas



32 million km²

- 6% of earth's surface
- Over 21,000 species
- Key global role
- Challenging to monitor
- Changes happening quickly

CBMP Marine Expert Networks: CAFF

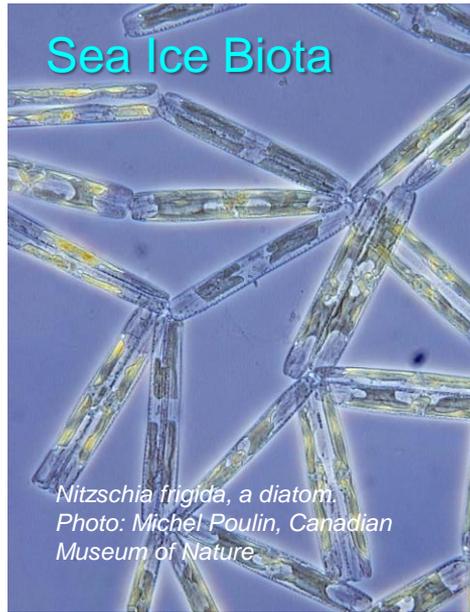
Conservation of Arctic Flora and Fauna

Plankton



Under ice amphipod, Gammarus wilkitzkii. Photo: Shawn Harper, University of Alaska Fairbanks

Sea Ice Biota



Nitzschia frigida, a diatom. Photo: Michel Poulin, Canadian Museum of Nature

Benthos



In situ Gorgonocephalus. Photo: Peter Bondo Christensen, Aarhus University

Fish



Polar cod. Photo: Shawn Harper, University of Alaska Fairbanks

Seabirds



Eiders in polynya. Photo Vicky Johnston, ECCC

Marine Mammals



Bowhead whale. Photo: Vicki Beaver, Alaska Fisheries Service, NOAA

State of the Arctic Marine Biodiversity Report

CAFF

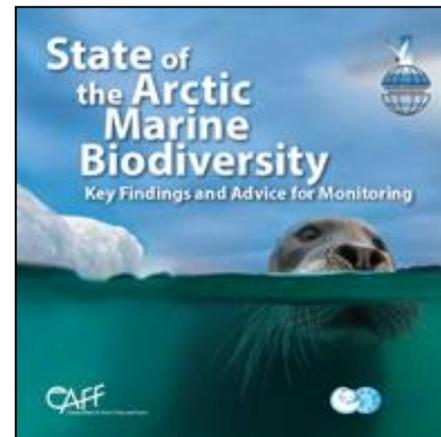
For more information please visit:

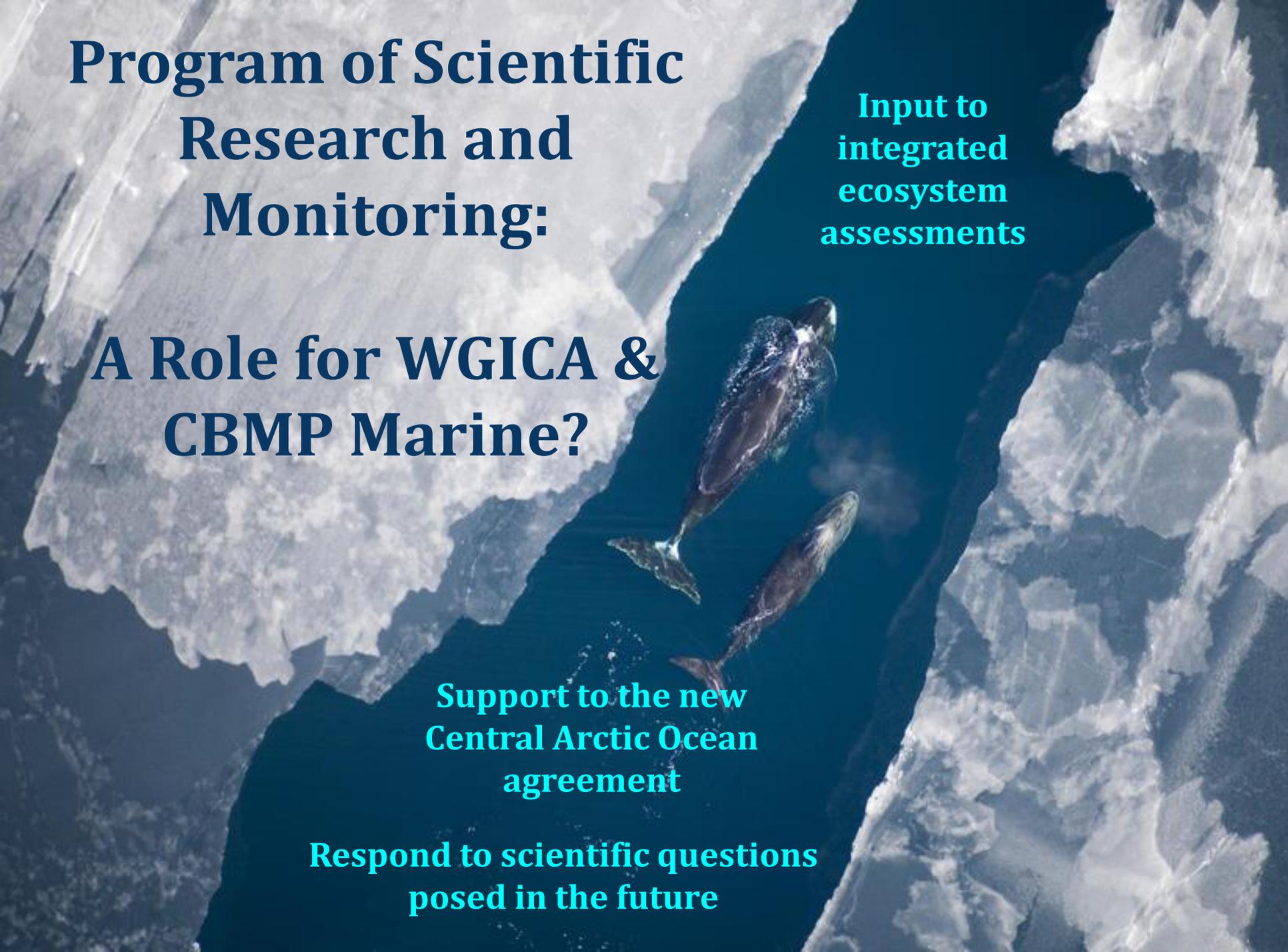
<https://www.arcticbiodiversity.is/marine>

Bearded seal. Photo: Audunn Rikardsen

State of the Arctic Marine Biodiversity Report

- Describes information from existing biodiversity monitoring programs about changes occurring in Arctic ecosystems and knowledge gaps
- Provides key trends and advice for monitoring, directed towards policy and decision makers





**Program of Scientific
Research and
Monitoring:**

**Input to
integrated
ecosystem
assessments**

**A Role for WGICA &
CBMP Marine?**

**Support to the new
Central Arctic Ocean
agreement**

**Respond to scientific questions
posed in the future**