ICES perspective on Arctic Observing Needs

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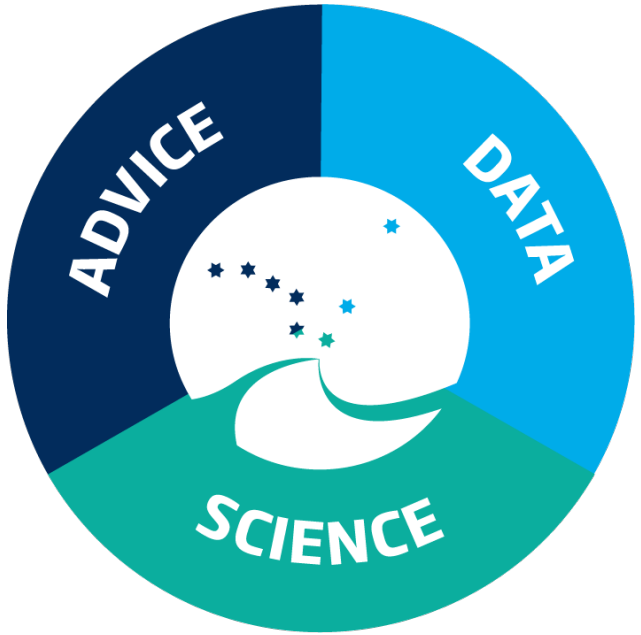
ICES CIEM

Science for sustainable seas

Jeremy Potter, NOAA

International Council for Exploration of the Sea



Products

- Recurrent advice on 200–250 fishing opportunities
- Special requests on broader ecosystem considerations, methods, standards, vulnerable marine ecosystems, indicator development
- International data hub
- International peer review
- Science highlights within areas of societal importance and overviews
- Identification of research needs
- Training
- Publications

20 member countries, >4 000 scientists, 160 working groups

Partners in the Arctic:

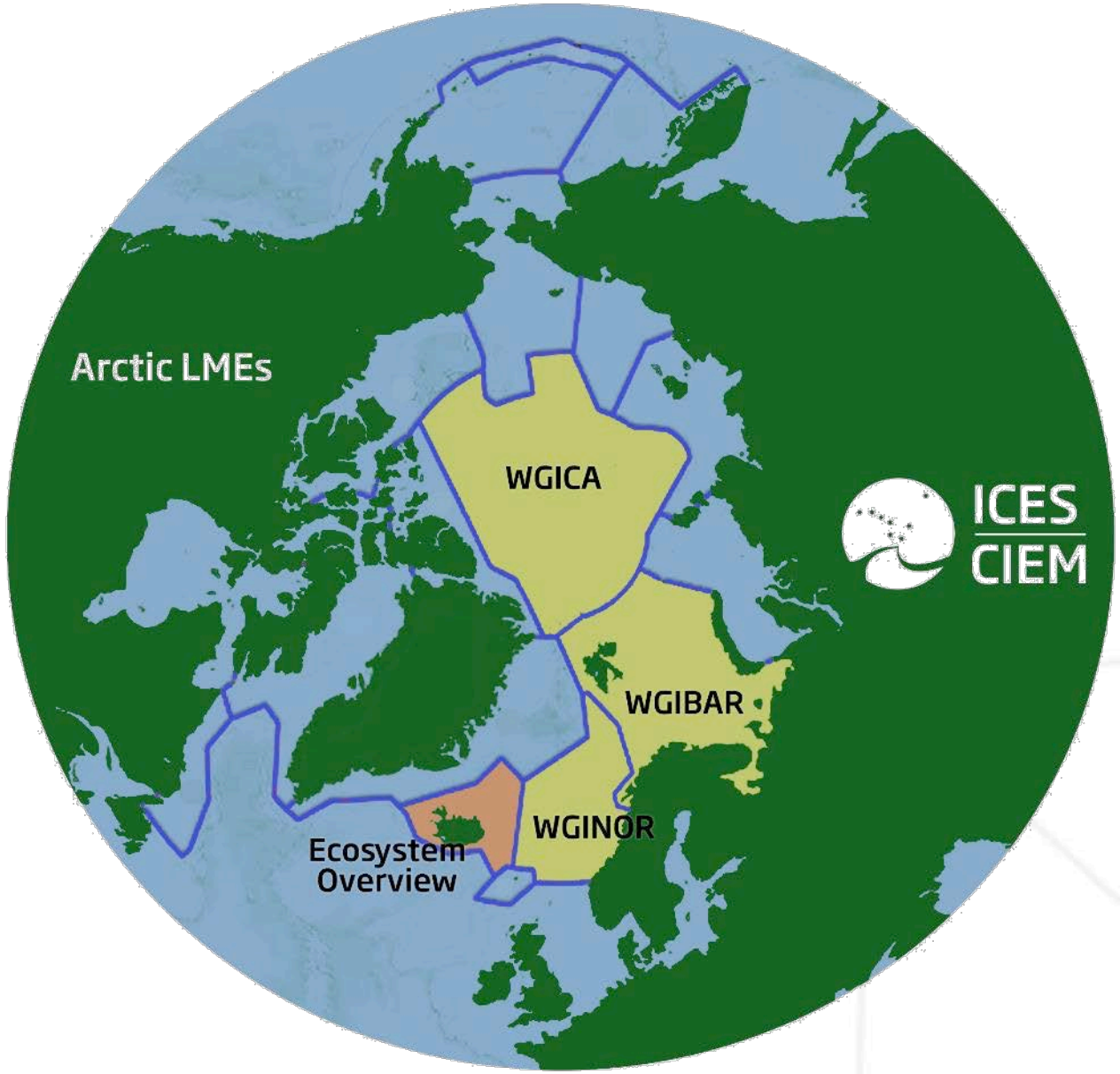
- PAME – human activity/environment
- AMAP – contaminants
- CAFF – biodiversity
- PICES – marine science

PAME
Protection of the Arctic Marine Environment

AMAP
Arctic Monitoring and Assessment Programme

CAFF
Conservation of Arctic Flora and Fauna

PICES



ICES activities

Integrated ecosystem assessments

Ecosystem overviews

Vulnerable marine areas

Invasive species

Fisheries advice (including Greenland)

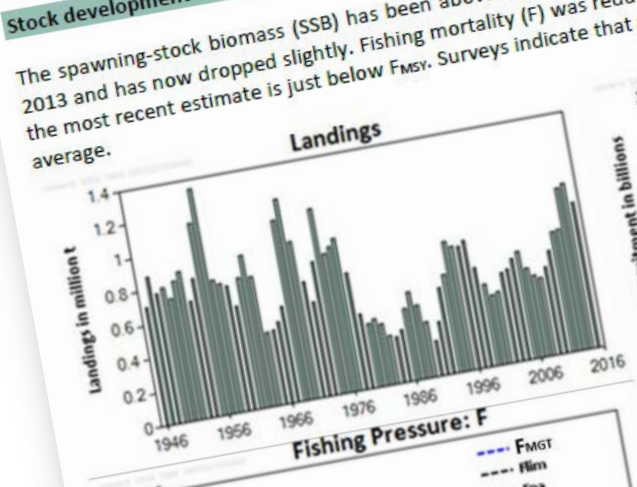
3.2 Cod (*Gadus morhua*) in subareas 1 and 2 (Northeast Arctic)

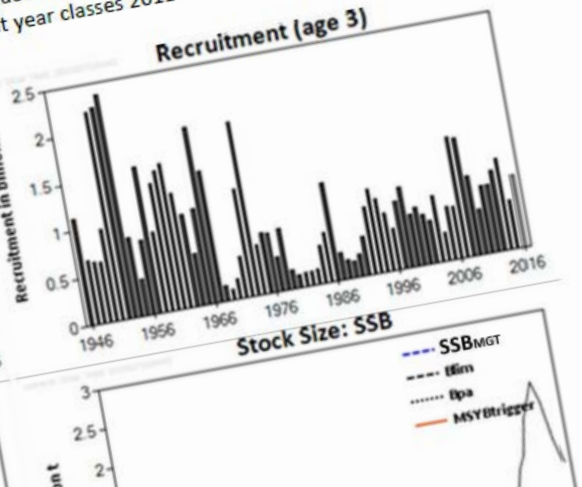
ICES stock advice

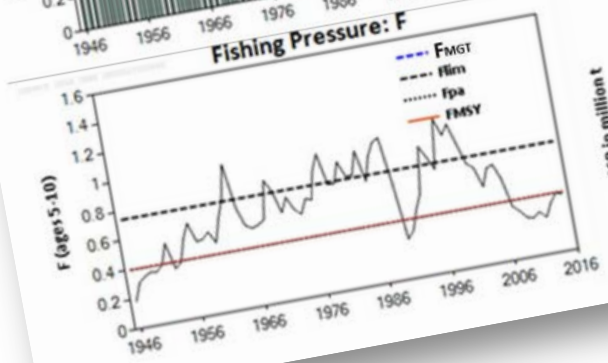
ICES advises that when the Joint Russian–Norwegian Fisheries Commission management plan is applied, catches in 2017 should be no more than 805 000 tonnes. Bycatch of coastal cod and *Sebastes norvegicus* should be kept as low as possible.

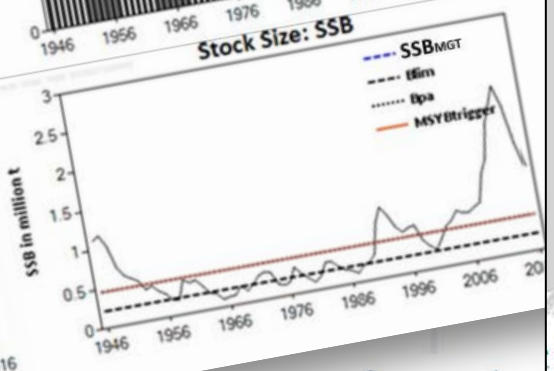
Stock development over time

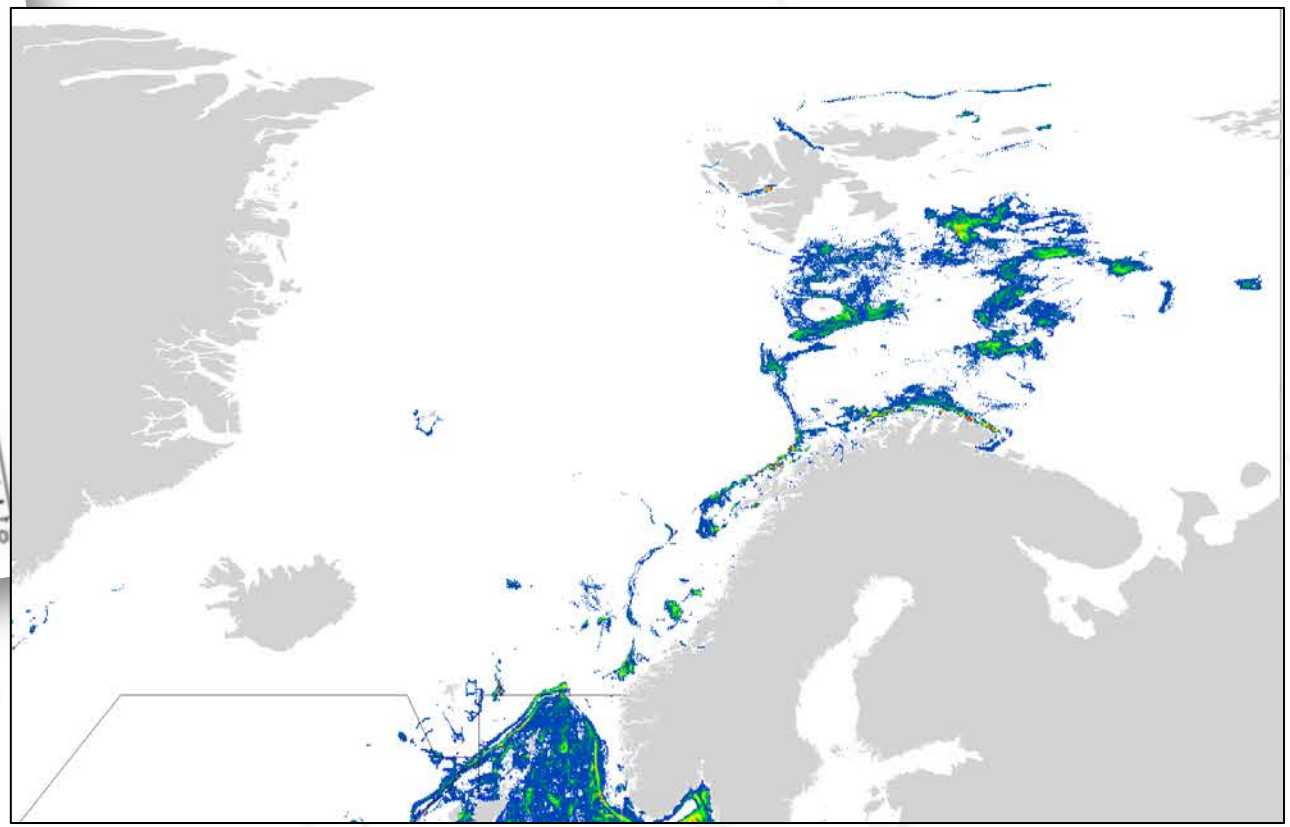
The spawning-stock biomass (SSB) has been above MSY $B_{trigger}$ since 2002. The total stock biomass (TSB) reached a peak in 2013 and has now dropped slightly. Fishing mortality (F) was reduced from well above F_{lim} in 1997 to below F_{MSY} in 2007 and the most recent estimate is just below F_{MSY}. Surveys indicate that year classes 2011–2014 are above or around the long-term average.



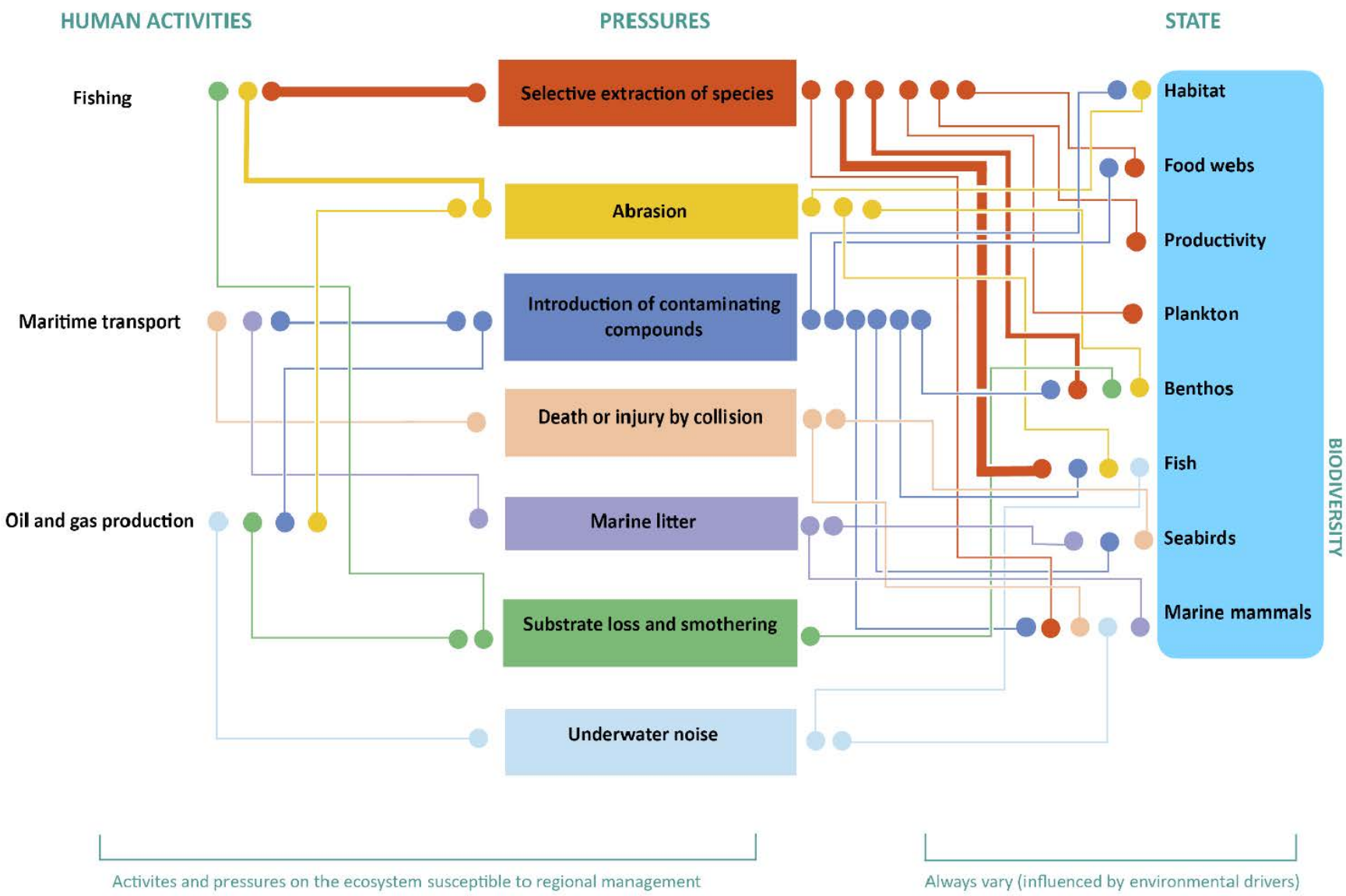


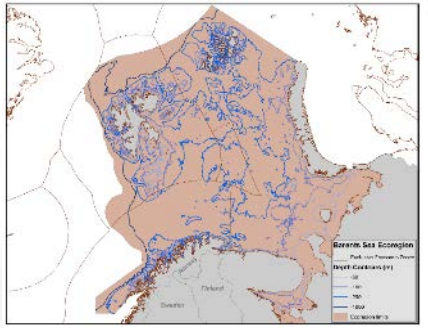






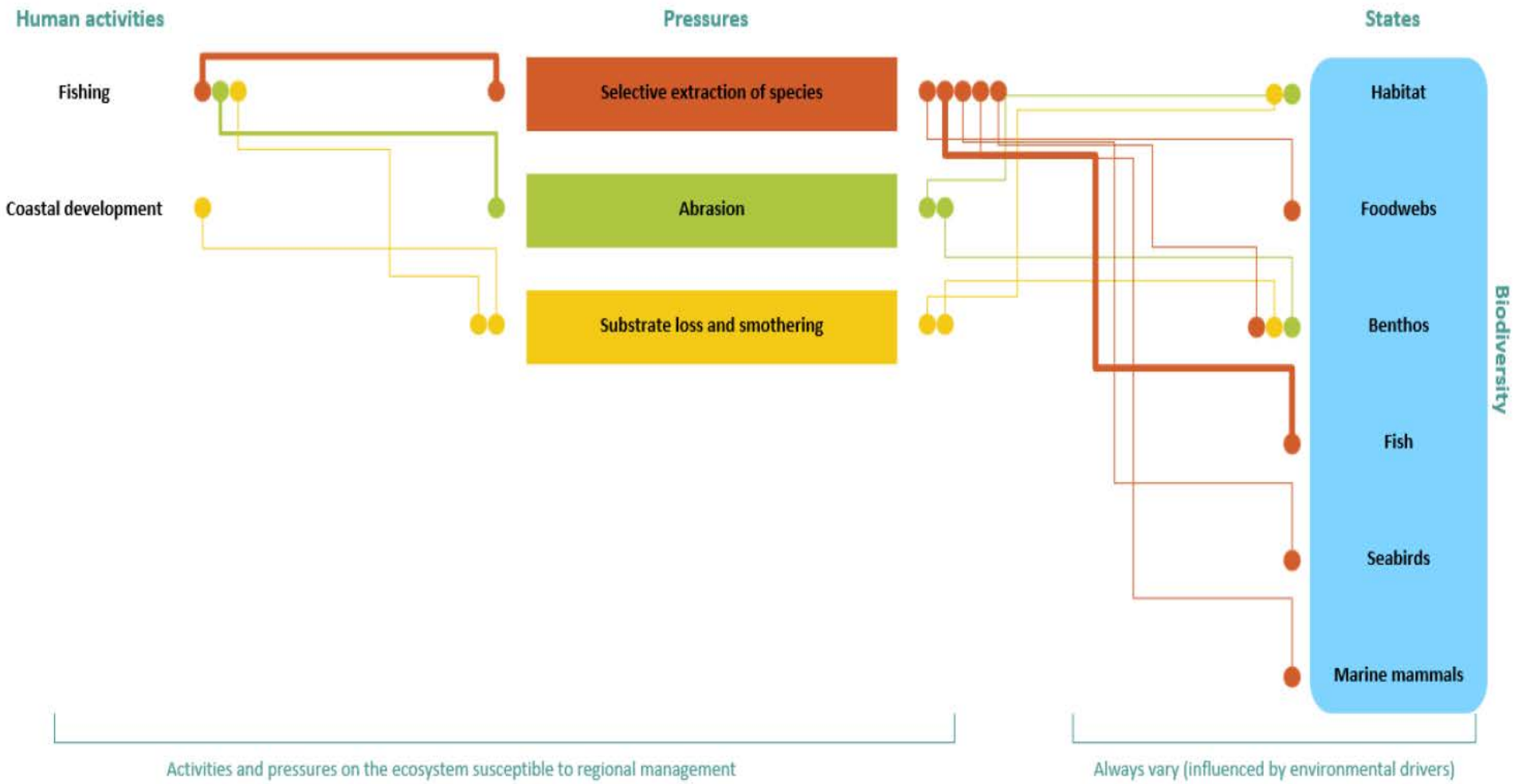
Ecosystem Overview Barents Sea

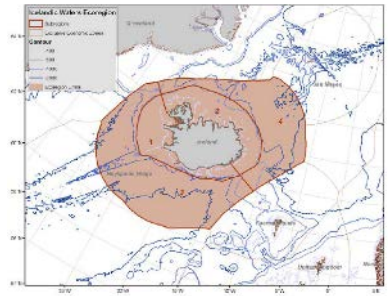




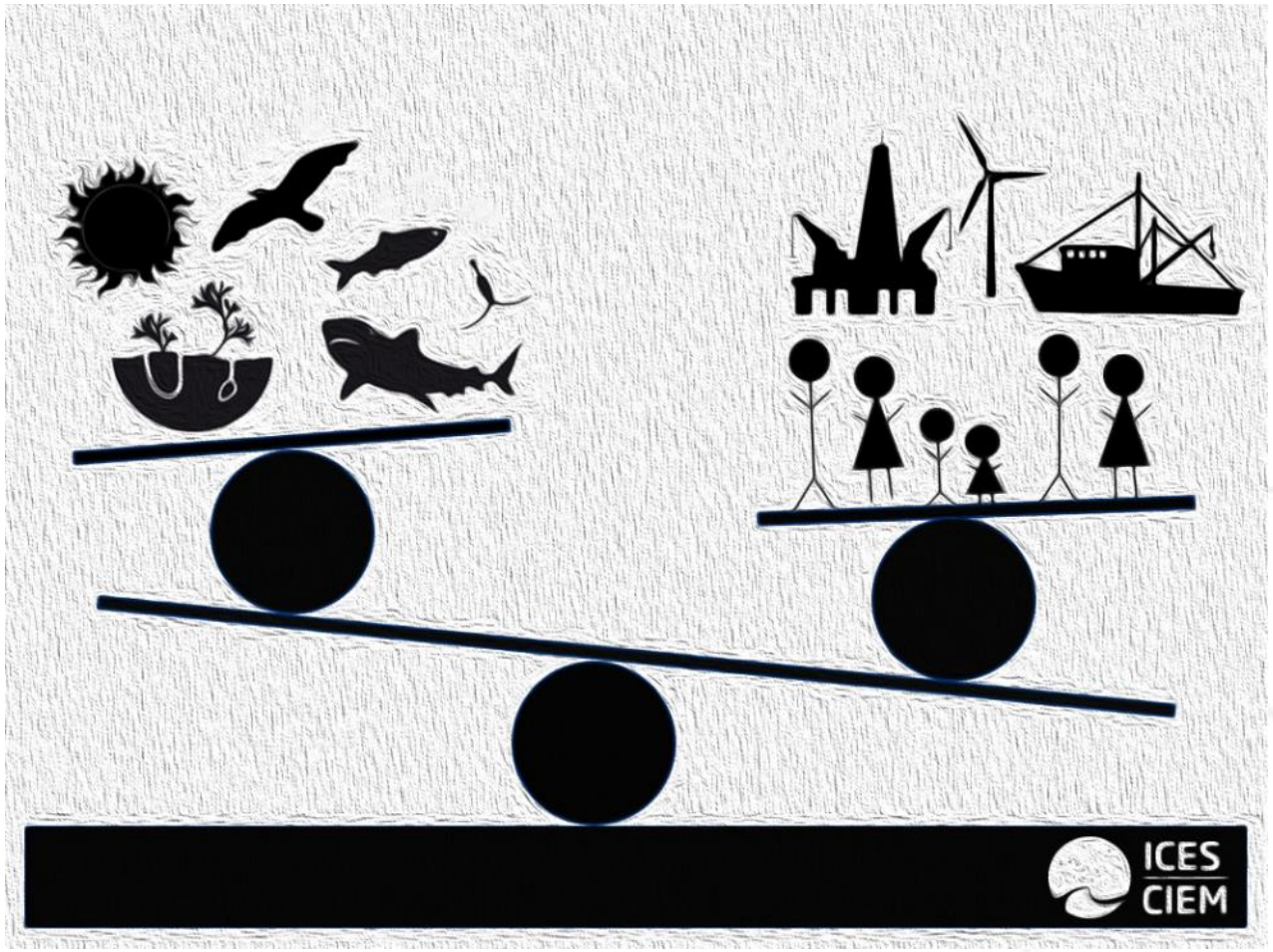
http://www.ices.dk/community/advisory-process/Pages/Ecosystem-overviews.aspx

Ecosystem Overview Icelandic waters





Integrated ecosystem assessments (IEA)



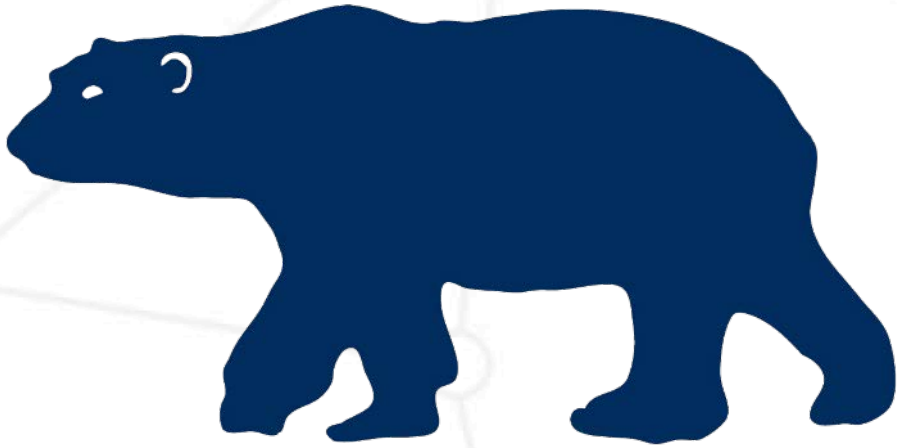
IEA is a tool for ecosystem based management

Balancing human activities & environmental stewardship in a multiple use context

Exploring the tradeoffs and impacts between activities

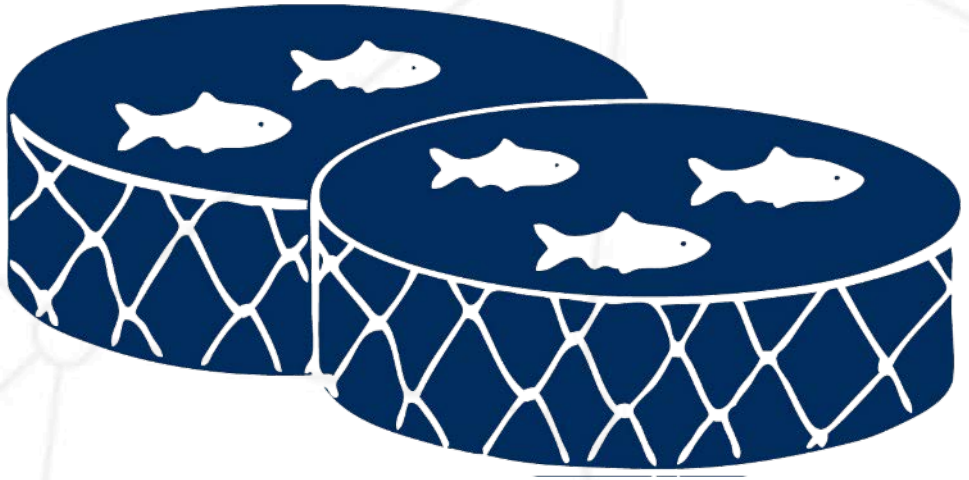
Issues highlighted by IEA groups 1

- Reduction in ice, increase in temperature
- Identifying species & habitats vulnerable to human impacts
- Invasive species
- Impact of reduction of Arctic water influence in Barents Sea



Issues highlighted by IEA groups 2

- Changes in productivity (primary & secondary)
- How to utilize traditional knowledge
- Impact of recovery of fish stocks on ecosystem
- Ocean acidification
- What are social drivers

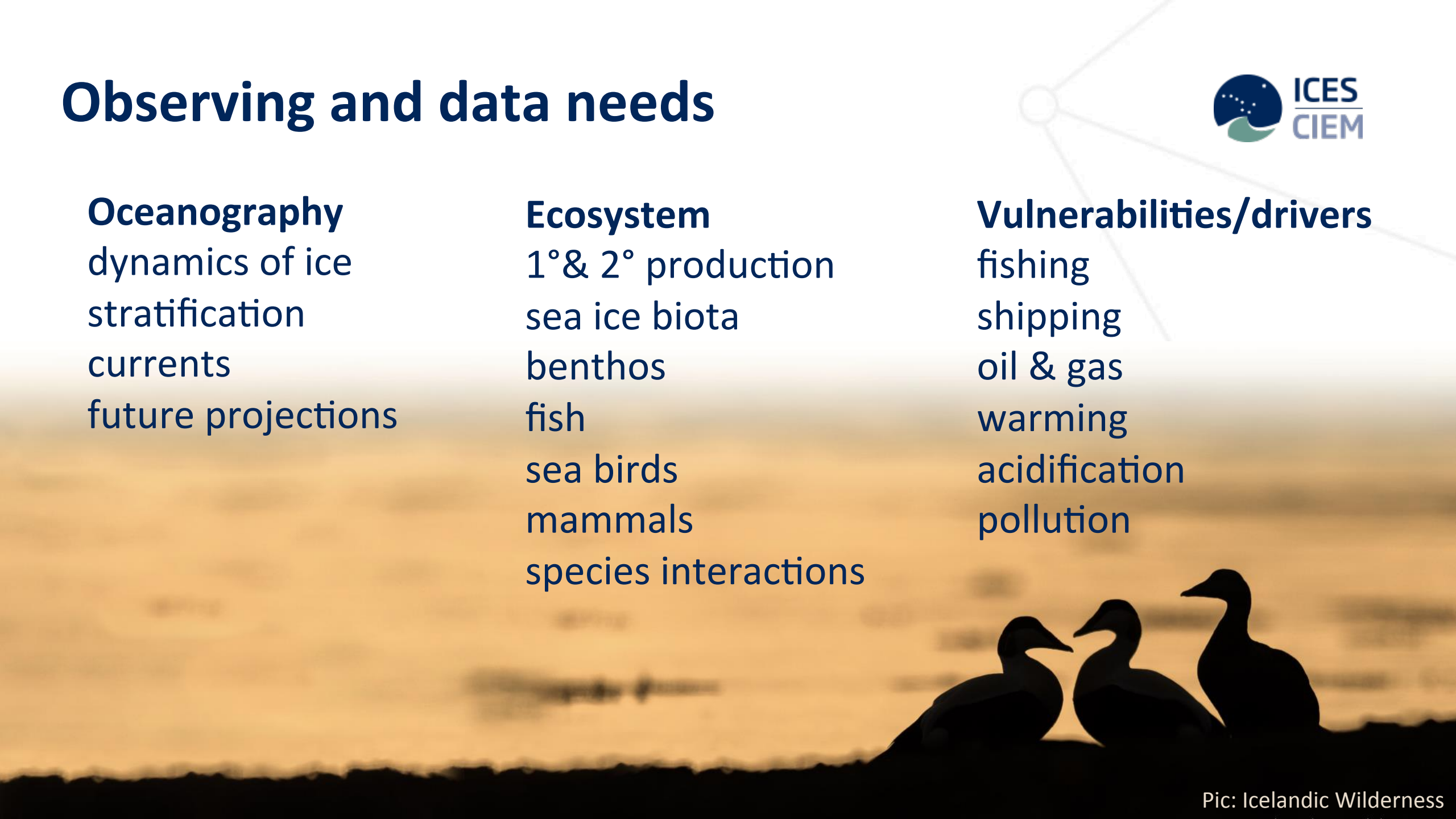


Observing and data needs

Oceanography
dynamics of ice
stratification
currents
future projections

Ecosystem
1°& 2° production
sea ice biota
benthos
fish
sea birds
mammals
species interactions

Vulnerabilities/drivers
fishing
shipping
oil & gas
warming
acidification
pollution



Pic: Icelandic Wilderness

ICES
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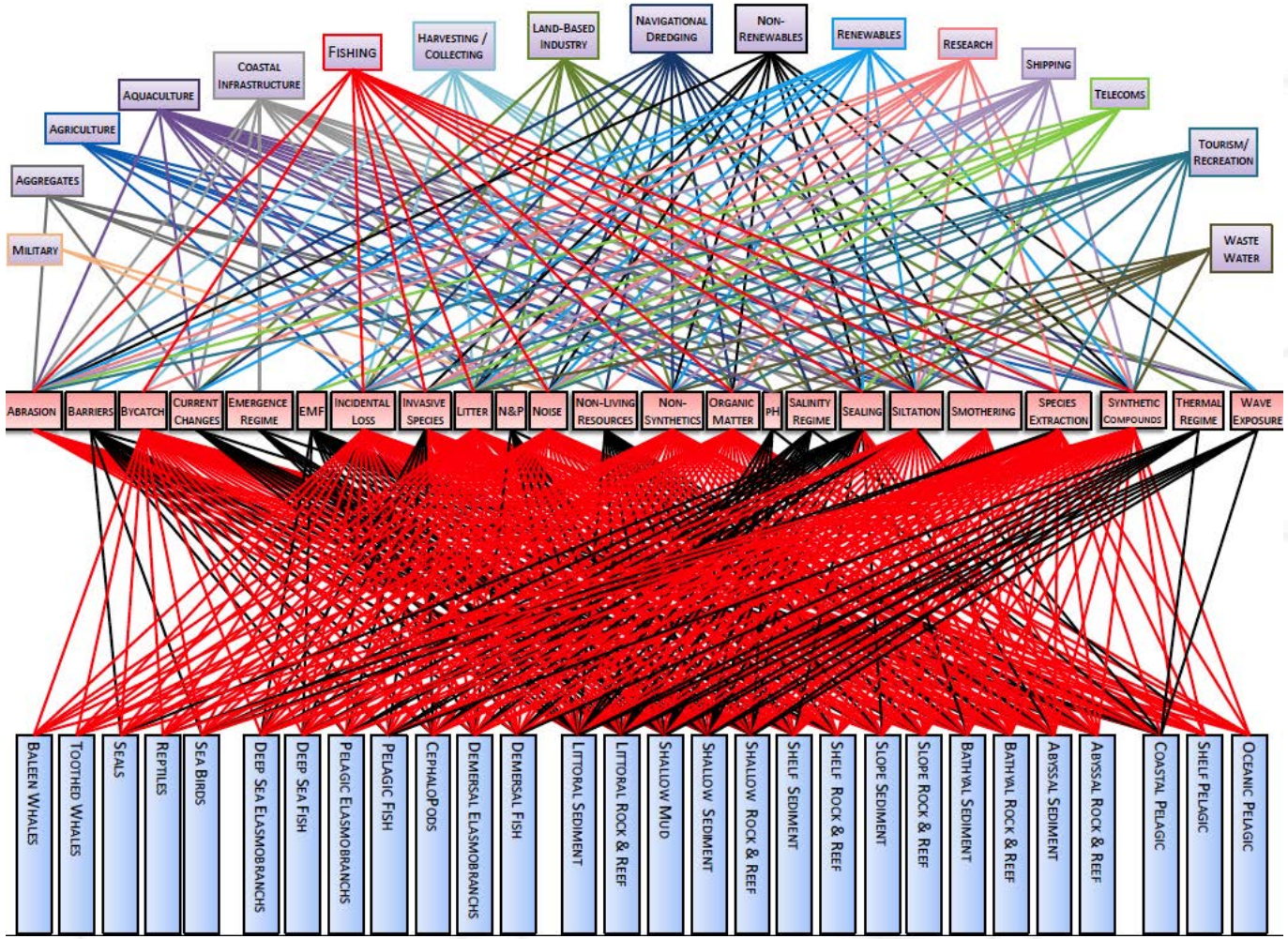
Thank you!

Picture: Alexander Fotolia

Building EOs

Sources of information
National MSFD initial assessments
OSPAR reports
HELCOM reports
Environmental assessments
ODEMM project
WG reports: WGIAB, WGIBAR, WGINOSE, WGEAWESS



Building EOs

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+ Expert judgment

North Sea	Celtic Seas	BoB/Iberian	Baltic Sea
Abrasion	Abrasion	Extraction Species	Extraction Species
Smothering/ sedimentation	Extraction Species	Abrasion	Nutrient Input
Substrate Loss	Smothering/ sedimentation	Smothering/ sedimentation	Contaminants
Extraction Species	Substrate Loss	Nutrient input	Substrate Loss
Extraction non-living	Contaminants	Contaminants	Invasive Species

Review by IEA groups / ACOM