

Key message

IMARES is a key player in developing Arctic knowledge.
We are eager start new projects with our customers
to ensure a responsible use of Arctic areas.

Improving environmental performance of Arctic offshore operations

B.C. Bolman, M.J. van der Heuvel-Greve,
S. Lagerveld & A.J. Murk

London, 23 May 2014



Source: Bob Strong, Reuters



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For quality of life

Contents

1. IMARES & the Arctic Programme
2. Challenges for Arctic industries
3. Case studies
4. Conclusions

IMARES: Institute for Marine Resources and Ecosystem Studies

A scientific institute for strategic and applied marine ecological research in support of maritime policies and innovations.



Key expertise

- Environmental & socio-economic assessments
- Governance, stakeholder & institutional analysis
- Marine Spatial Planning & GIS
- Environmental monitoring
- Mesocosms & bioassays
- Ballast Water Test Facility
- Efficiency of oil spills response



Photo: IMARES

Mesocosm Test Facility



Added value

- Connect fundamental knowledge with applied knowledge
- Integration of university with contract research
- Bridging natural sciences & social sciences
- Multi disciplinary: ecology, ecotoxicology, policy, governance
- Decades of research experience in Russia, Norway, Antarctica
- Involved in NL, EU, OSPAR risk assessment frameworks



The Arctic Programme - Ambition

Key player in developing knowledge
for companies, governments & NGOs
to facilitate a responsible use of Arctic areas



Arctic Projects



Source: www.geographicguide.com

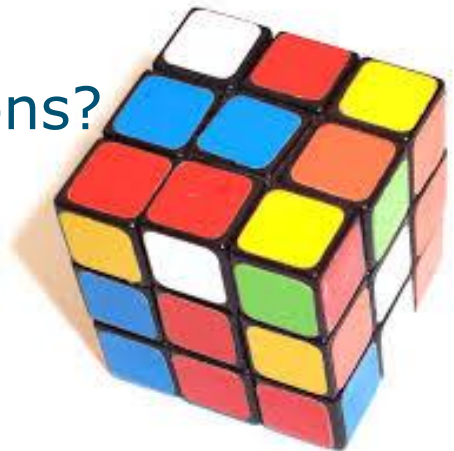
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Challenges 1/2 – Environment

How to.....

- comply with environmental requirements?
- cope with copy-paste of environmental norms?
- be involved in formulation of standards & regulations?
- deal with uncertainties & knowledge gaps?
- minimise impacts during design of operations?
- sustain & enhance ecological values?



Challenges 2/2 – International acceptance

How to...

- get a formal and informal license to operate?
- work from science (facts & figures) instead of emotions?
- involve stakeholders and create legitimacy?



Source: www.averytoday.com

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C-IMAGE

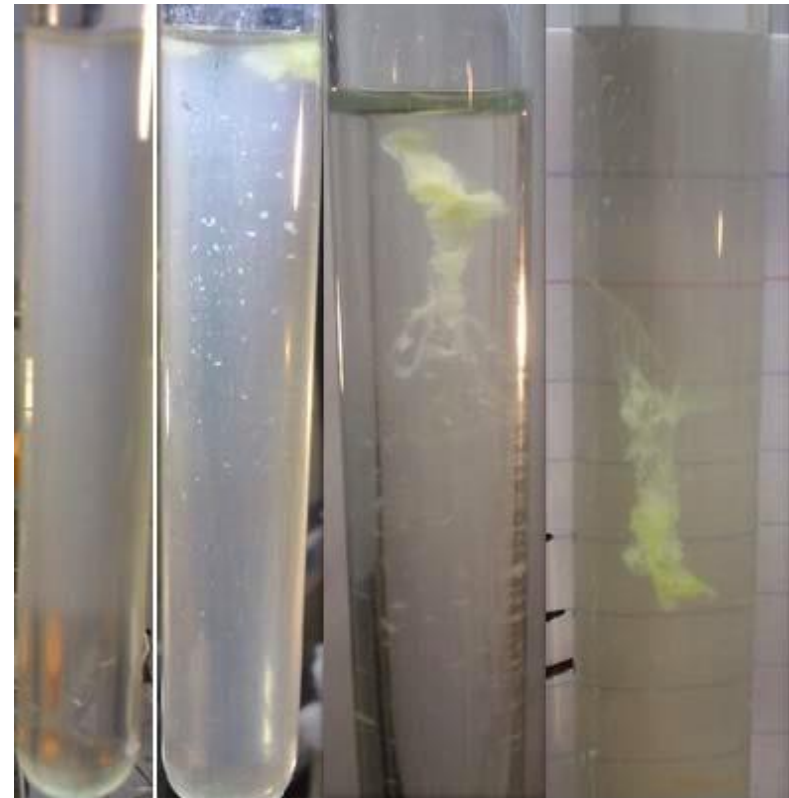
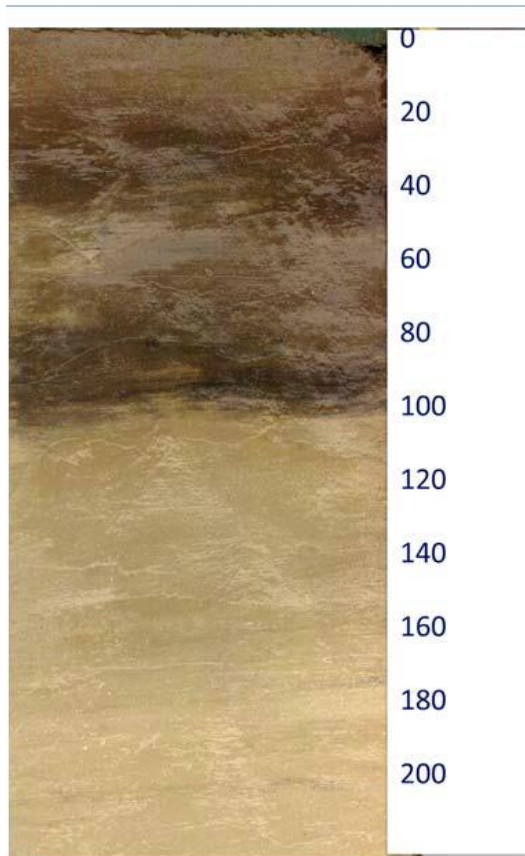
CASE



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pl.wikipedia.org

Webbing effect



a. 24 hours b. 48 hours

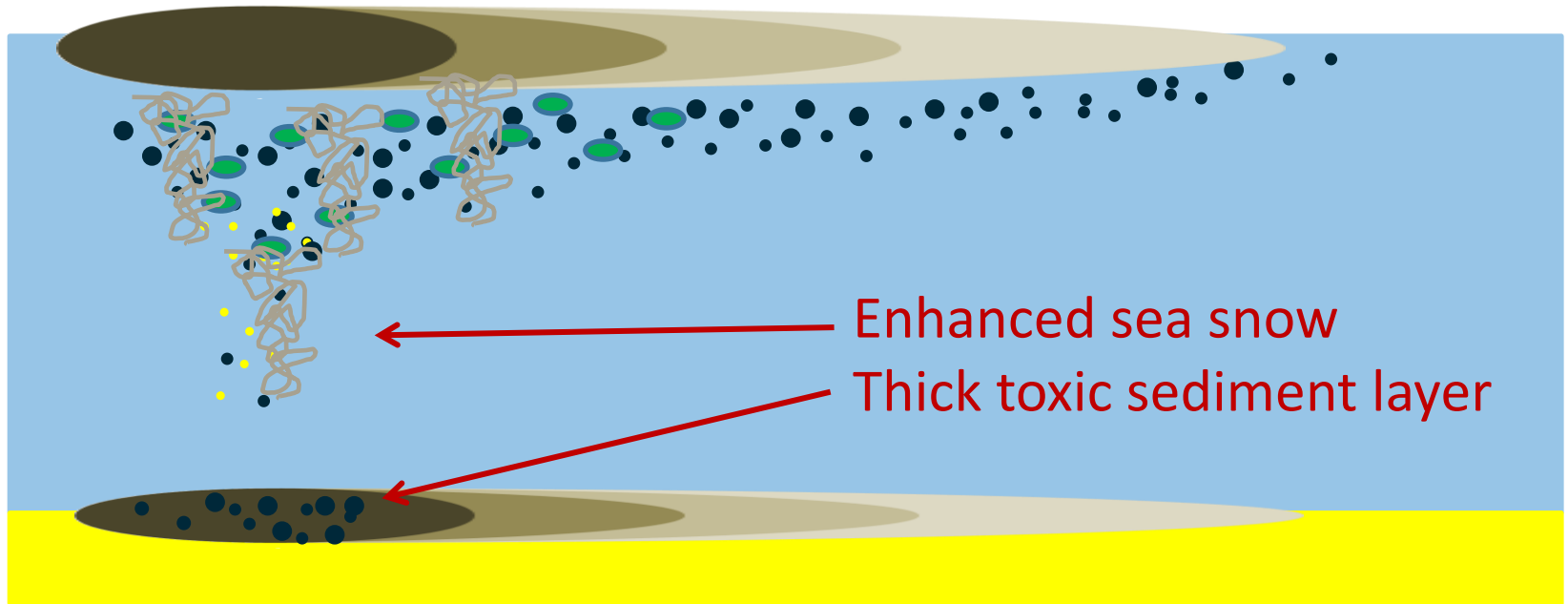
c. 6 - 8 days



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Webbing effect

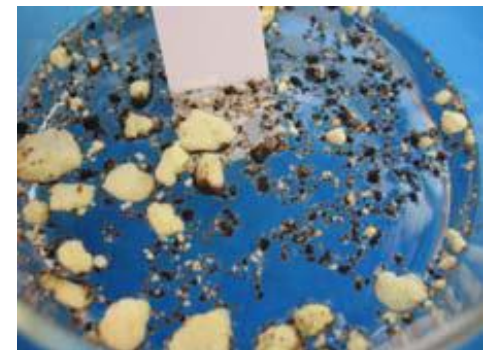


EcoTech

- Water-repellent foam
- High capability to absorb organic chemical liquids

Ambitions for further research:

- Does webbing occur in Arctic conditions?
- Simulate arctic oil spill
- Testing under Arctic conditions



Spitsbergen – Bio Indicators research

CASE



Photo: Bas Bolman



Photo: Bas Bolman



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Arctic Operations Handbook



OBJECTIVE :

Develop guidelines for Safe Arctic Offshore Operations such as transport and installation of fixed, floating and subsea units, dredging, trenching, pipe laying and floating oil/gas production.



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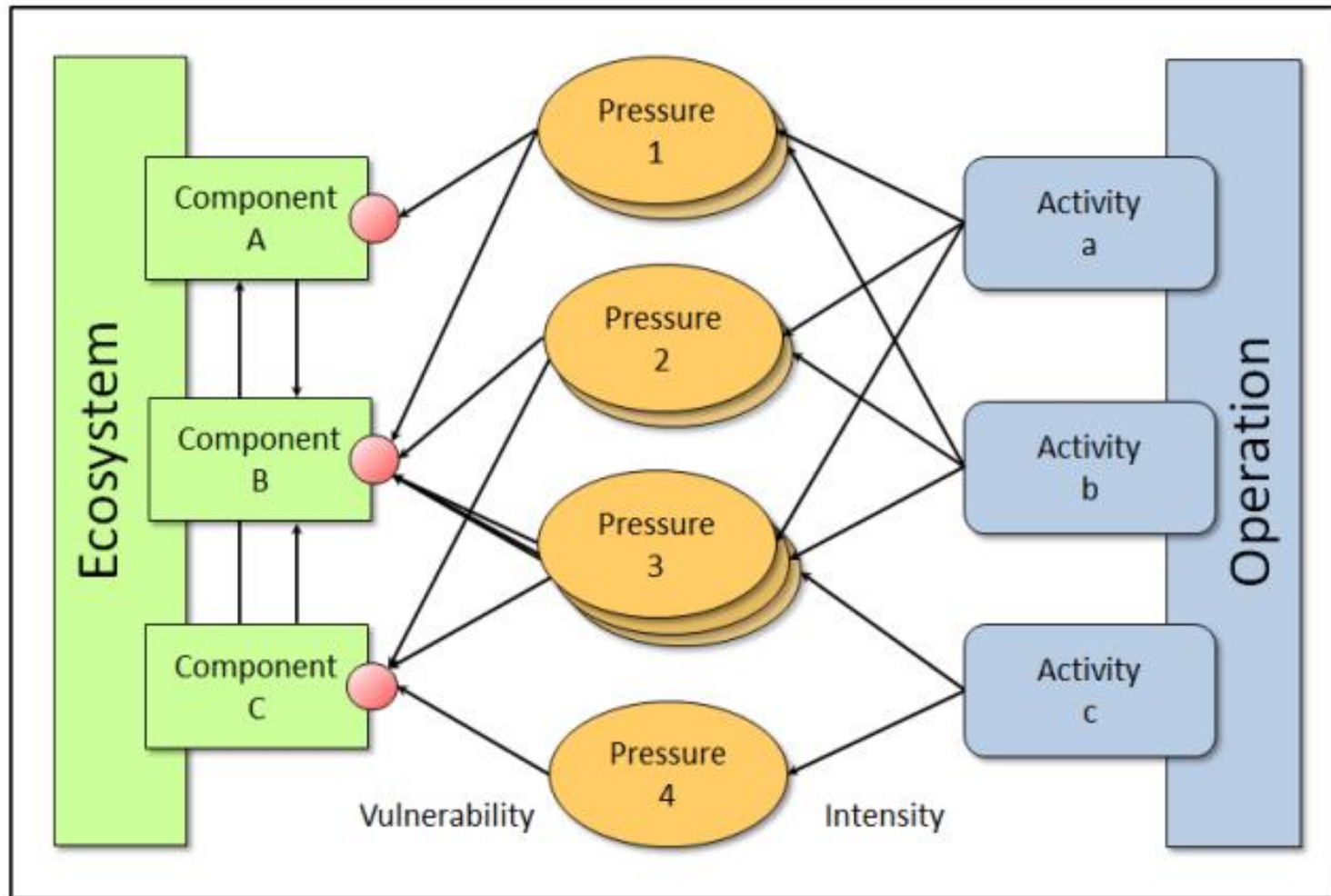
Arctic Operations Handbook JIP

Generic Framework

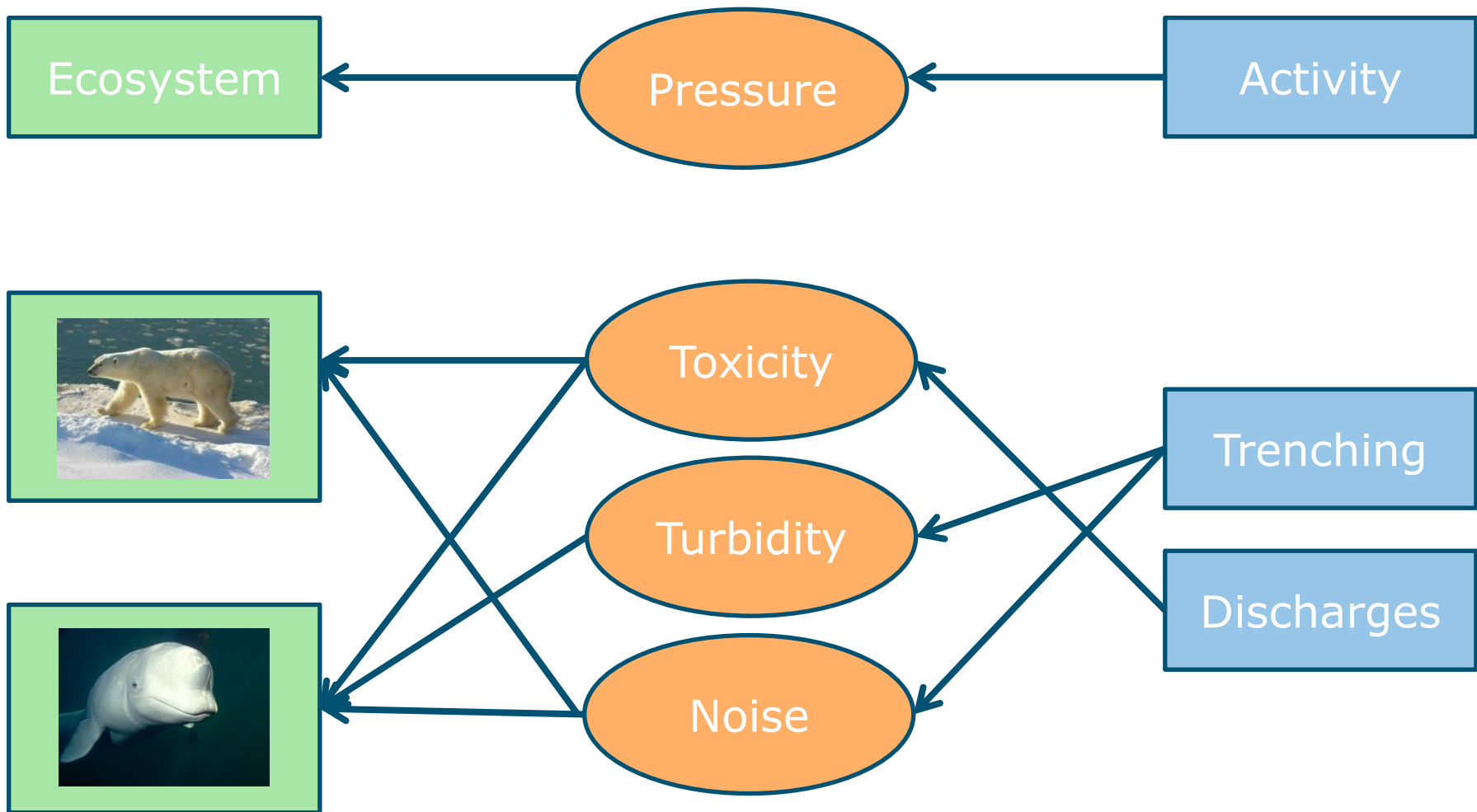
- Identify potential effects in design phase of operations
- Include & prioritise all relevant pressures
- Comparative analysis of impacts of different designs
- Ensure that the design itself is a mitigation measure
- Protocols for structured, step by step analysis
- Case study: trenching in Baffin Bay (confidential)



Generic Framework



Generic Framework



Example of output

Relative impact	Operation 1	Operation 2	Operation 3	Operation 4
phytoplankton	Low impact	Low impact	Low impact	Low impact
zooplankton	Low impact	Low impact	Low impact	Low impact
benthos	High impact	Medium impact	Low impact	Medium impact
sea ice habitat	Low impact	Low impact	Low impact	Low impact
Polar cod	Low impact	Low impact	Low impact	Low impact
Arctic char	Low impact	Low impact	Low impact	Low impact
Brünnich's guillemot	Low impact	Low impact	Low impact	Low impact
Arctic tern	Low impact	Low impact	Low impact	Low impact
Atlantic puffin	Low impact	Low impact	Low impact	Low impact
Polar bear	Low impact	Low impact	Low impact	Low impact
Bowhead whale	High impact	Low impact	Low impact	Medium impact
Narwhal	Medium impact	Medium impact	Low impact	Medium impact
Ringed seal	Low impact	Medium impact	Low impact	Low impact
Atlantic walrus	Medium impact	Medium impact	Low impact	Low impact

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Operation 3	Low impact	Low impact	Low impact	Medium impact
Operation 4	Low impact	Low impact	Low impact	Low impact
Operation 5	Low impact	Low impact	Low impact	Low impact
Operation 6	Low impact	Low impact	Low impact	Low impact
Operation 7	Medium impact	Low impact	Low impact	Low impact
Operation 8	High impact	Low impact	Low impact	Low impact
Operation 9	Low impact	Low impact	Low impact	Low impact
Operation 10	Low impact	Low impact	Low impact	Low impact
Operation 11	Low impact	Low impact	High impact	Low impact
Operation 12	Low impact	Low impact	Medium impact	Low impact
Operation 13	Low impact	Low impact	Low impact	Low impact
Operation 14	Low impact	Low impact	Medium impact	Low impact

Low impact	Low impact
Medium impact	Medium impact
High impact	High impact

Ambitions for further research

- Develop protocols for baselines studies, EIA, monitoring
 - Include the recovery potential of organisms
 - Utilise Building with Nature principles
 - In search of partners & financiers!
-
- Free download of all reports:
 - www.arctic-operations-handbook.info

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Conclusions

- IMARES is a key player in developing Arctic knowledge
- Key expertise on Arctic impact assessments & oil spills
- Multidisciplinary; bridging fundamental & applied sciences
- Facilitate our customers in responsible operations
- Eager to start new projects with new partners!

Questions?

bas.bolman@wur.nl

+31 6 2301 9608

www.arctic.wur.nl

