

**Finn Danielsen**  
**Ecologist, dr.scient.**  
**Greenland/Denmark**

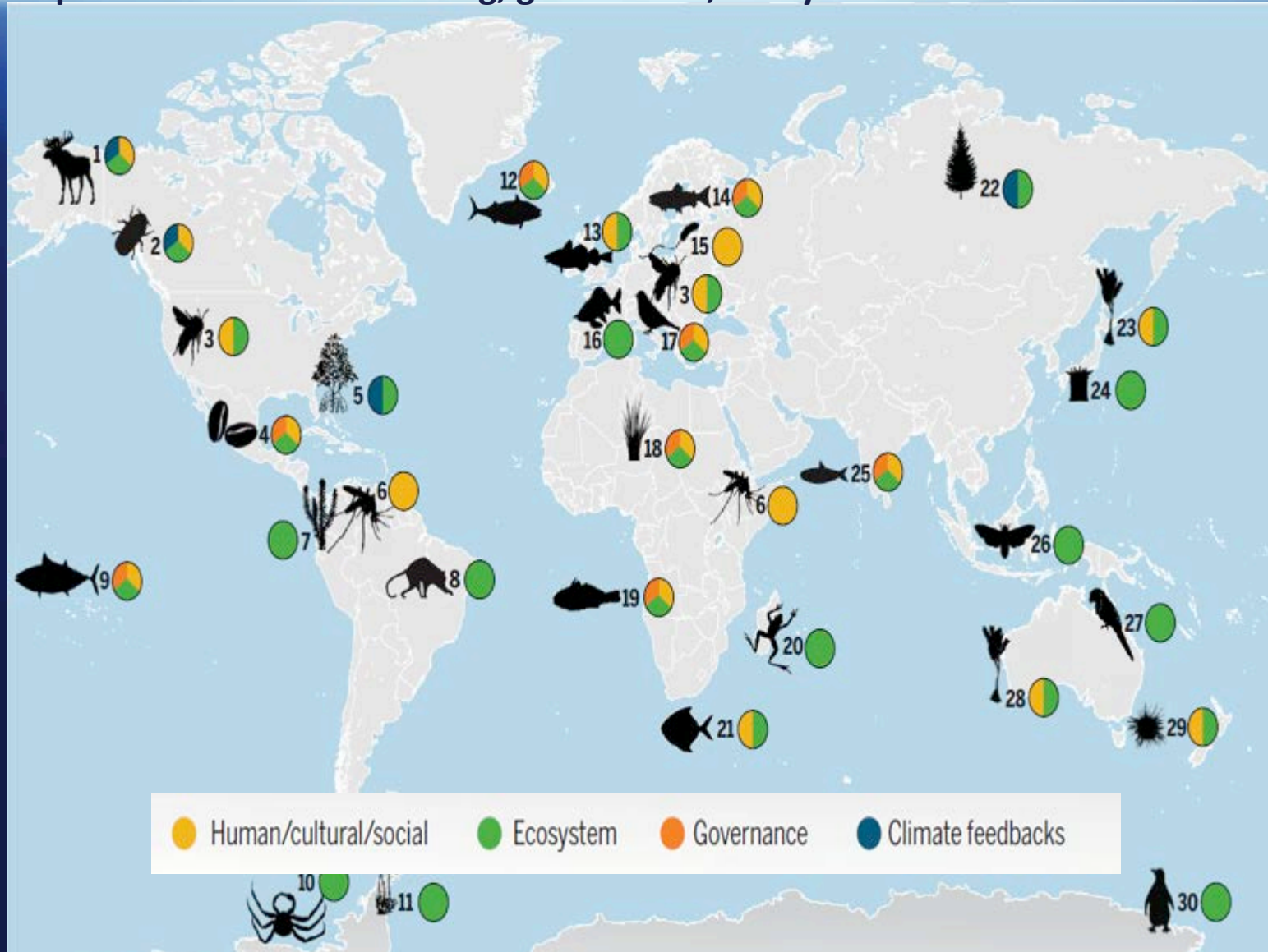
*Perspective on...*

**Implementing an  
observing network that  
addresses challenges of  
small-scale fisheries management**

*in a rapidly changing climate*

# Climate-driven changes in the distribution of life

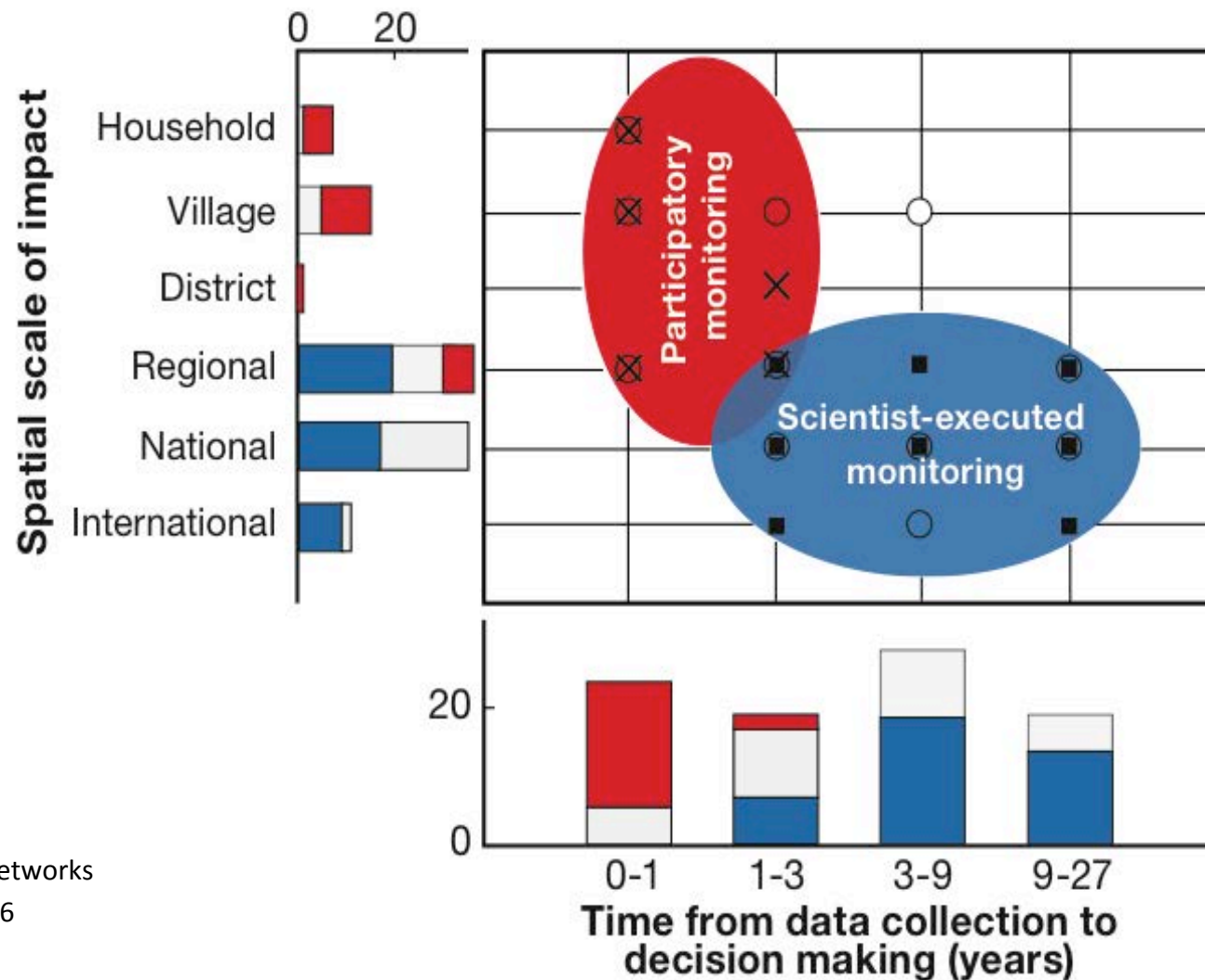
Impacts on human well-being, governance, ecosystems and climate feedback



To adapt to the rapid changes...

Management systems must be re-structured

# Decision-making from observing networks



$n = 104$  observing networks

*J. Appl. Ecol.* 47:1166

**Scale of decision-making and  
implementation time differ**

**Without involvement of local people:  
the monitoring may sometimes be  
isolated, academic exercises  
with limited impacts in the 'real' world**

# **Greenland Example**

**Pilot testing  
participatory  
observing and  
management of  
natural resources**





# SOCIAL AND ECONOMIC INEQUITY IN INUIT NUNANGAT

Many Inuit face social and economic inequities that impact our health and wellbeing

## Inuit Nunangat

**52%** of Inuit in Inuit Nunangat live in crowded homes\*<sup>1</sup>

**34%** of Inuit aged 25 to 64 in Inuit Nunangat have earned a high school diploma<sup>1</sup>

**70%** of Inuit households in Nunavut are food insecure<sup>2</sup>

**\$23,485** The median before tax individual income for Inuit in Inuit Nunangat<sup>1</sup>

**30** The number of physicians per 100,000 population in Nunavut<sup>4</sup>

**47.5%** of Inuit in Inuit Nunangat are employed<sup>1</sup>

**72.4 years**  
The projected life expectancy for Inuit in Canada<sup>† 5</sup>

**12.3** The infant mortality rate per 1,000 for Inuit infants in Canada.<sup>6</sup>



**IMR**

## All Canadians

**9%** of all Canadians live in crowded homes\*<sup>1</sup>

**86%** of all Canadians aged 25 to 64 have earned a high school diploma<sup>1</sup>

**8%** of all households in Canada are food insecure<sup>3</sup>

**\$92,011** The median before tax individual income for non-Indigenous people in Inuit Nunangat<sup>1</sup>

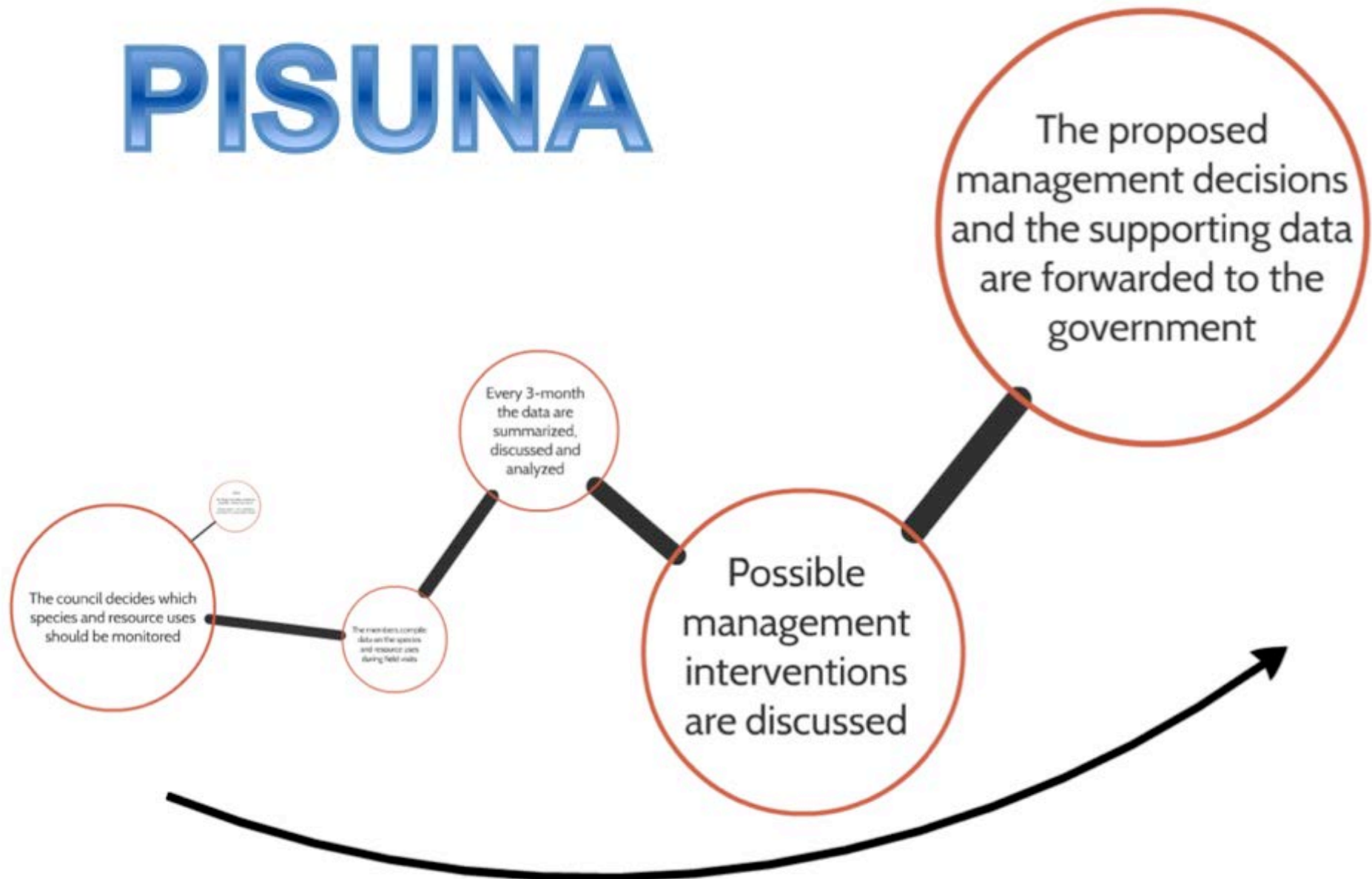
**119** The number of physicians per 100,000 population in Urban Health Authorities<sup>4</sup>

**60.2%** of all Canadians are employed<sup>1</sup>

**82.9 years**  
The projected life expectancy for non-Indigenous people in Canada<sup>5</sup>

**4.4** The non-indigenous infant mortality rate per 1,000 for Canada.<sup>6</sup>

# PISUNA



*PISUNA = Piniakkanik sumiiffini nalunaarsuineq*



## STEPS


The Village Committees established  
Local Natural Resource Councils

Comprised of hunters and fishers  
and other with environment interest


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Local Natural Resource Councils

Comprised of hunters and fishers  
and other with environment interest

The council decides which  
species and resource uses  
should be monitored




The members compile  
data on the species  
and resource uses  
during field visits



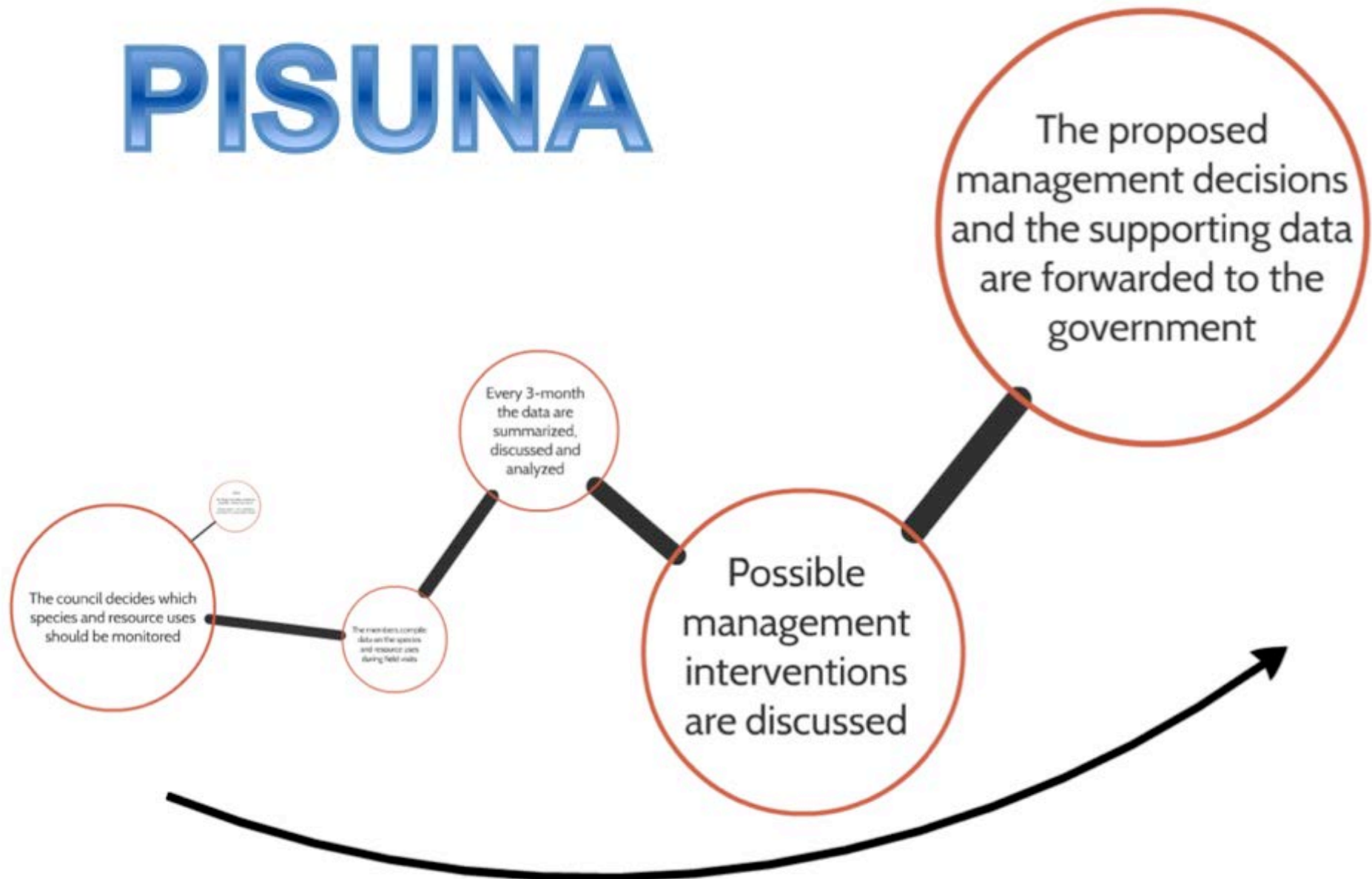
Every 3-months  
the data are  
summarized,  
discussed and  
analyzed





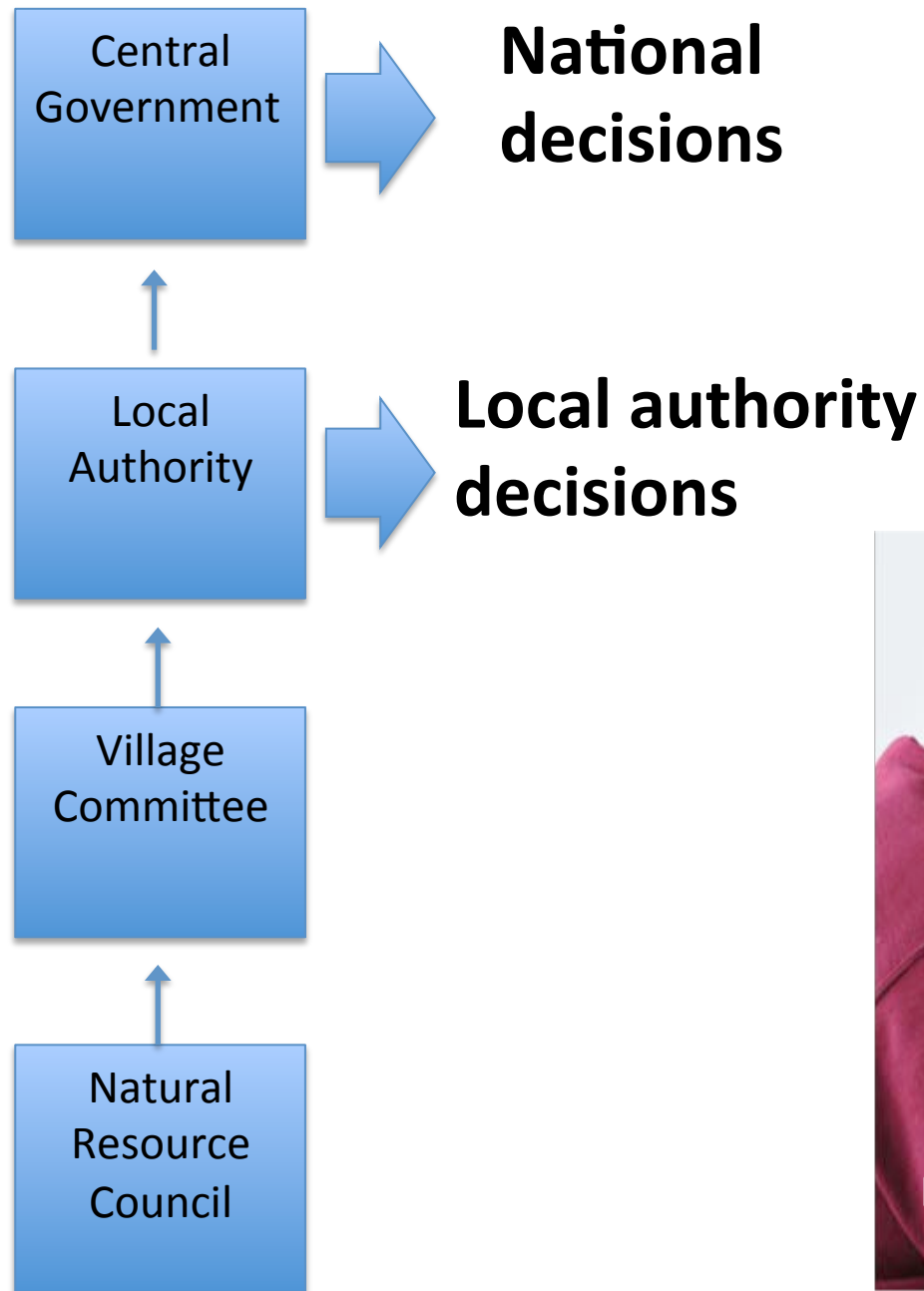
Possible  
management  
interventions  
are discussed

# PISUNA



*PISUNA = Piniakkanik sumiiffini nalunaarsuineq*





Meeting Natural Resource Council



**How is the  
information used?**



**Data:**

Shrimp trawlers in shallow sea area

**Observation:**

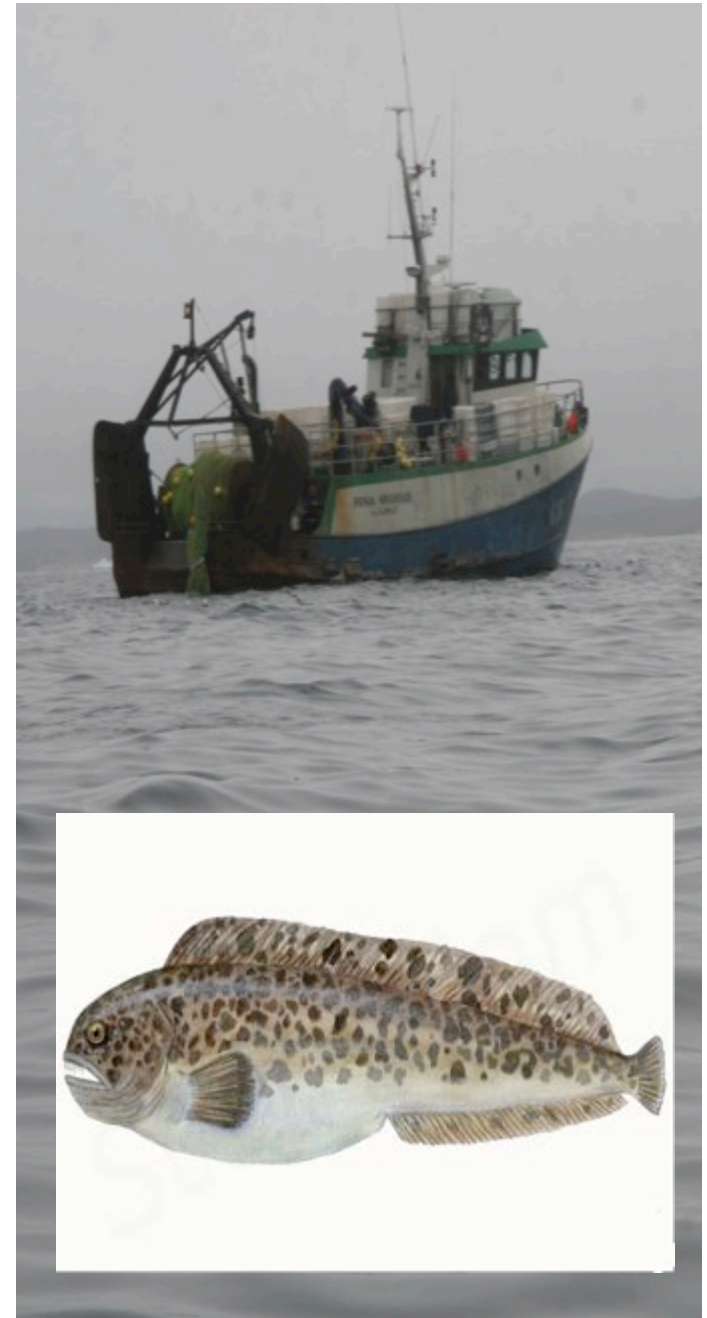
More trawlers than before

**Issue:**

Degradation of the seafloor might affect Wolf-Fish

**Recommendation:**

Restrict the size of vessels in the area



# Data managers:



# Findings example – Cod





# Findings example – Cod



Akunnaaq, early Sep. 2010. By Gerth Nielsen



## Search the observations catalog:



[View All](#)

Search for:

AND:

AND:

AND:

Date range:  to

Search for Atlantic Cod



The [PISUNA-net](#) Observation Database is a collaboration between the Greenland Ministry of Fisheries and Hunting, Qaasuitsup Municipality, Greenland Fishers and Hunters Association, [ELOKA](#), the University of Alaska Fairbanks, and NORDECO. This Web site is hosted by the [National Snow and Ice Data Center](#).



Version 1.3.1

Rails version: 4.1.16, Rails environment: staging

## Search the observations catalog:



Search for:

AND:

AND:

AND:

Date range: 2009-05-01 to 2016-09-01

Search for Atlantic Cod

Home Search Observations Research methods Contacts Add observation Logged in as pisuna admin Log out						
<p><b>CURRENT SEARCH</b></p> <p>Keyword(s):</p> <p>Date(s): 2009-05 - 2016-09-01</p> <p>Community: All</p> <p>Coordinator: All</p> <p>Living Resources: Atlantic Cod</p> <p><a href="#">Refine Search</a></p> <p><a href="#">New Search</a></p>						
<p><b>Search Results</b></p> <p>Showing comments 1 - 20 of 72</p> <p>20 per page</p> <p>Go to Page: 1</p> <p>Sort By: <a href="#">Date (Latest-Oldest)</a></p>						
Date	Coordinator	Community	Additional elements noted (legend)			
2016-09	Karl S. Marcussen	Attu			<a href="#">Transcript</a>	<a href="#">Edit</a>
2016-08	Tom Møgelgård	Kitsissuarsuit			<a href="#">Transcript</a>	<a href="#">Edit</a>
2016-08	Karl S. Marcussen	Attu			<a href="#">Transcript</a>	<a href="#">Edit</a>
2016-08	Tom Møgelgård	Kitsissuarsuit			<a href="#">Transcript</a>	<a href="#">Edit</a>
2016-07	Karl S. Marcussen	Attu			<a href="#">Transcript</a>	<a href="#">Edit</a>
2016-07	Tom Møgelgård	Kitsissuarsuit			<a href="#">Transcript</a>	<a href="#">Edit</a>
2016-06	Edvard I. Kristiansen	Kangersuatsiaq			<a href="#">Transcript</a>	<a href="#">Edit</a>
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2016-05	Edvard I. Kristiansen	Kangersuatsiaq			<a href="#">Transcript</a>	<a href="#">Edit</a>
2016-05	Karl S. Marcussen	Attu			<a href="#">Transcript</a>	<a href="#">Edit</a>
2016-04	Edvard I. Kristiansen	Kangersuatsiaq			<a href="#">Transcript</a>	<a href="#">Edit</a>
2016-04	Karl S. Marcussen	Attu			<a href="#">Transcript</a>	<a href="#">Edit</a>
2016-03	Per Ole Fredriksen	Attu			<a href="#">Transcript</a>	<a href="#">Edit</a>
2016-03	Edvard I. Kristiansen	Kangersuatsiaq			<a href="#">Transcript</a>	<a href="#">Edit</a>

The PISUNA-net Observation Database is a collaboration between the Greenland Min Web site is hosted by the National Snow and Ice Data Center.



NORDECO  
National Oceanic Research and Development Center

Version 1.3.1  
Rails version: 4.1.16, Rails environment: staging



2016-09	Tom Mølgård	Kitsissuarsuit	§?		
2016-09	Tom Mølgård	Kitsissuarsuit	§?		
2016-09	Tom Mølgård	Kitsissuarsuit	§?		
2016-09	Tom Mølgård	Kitsissuarsuit			
2016-08	Edvard I. Kristiansen	Kangersuatsiaq	§?		
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Search for:

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AND:

Date range: 2009-05-01 to 2016-09-01

Search for Atlantic Cod

Home Search Observations Research methods Contacts Add observation Logged in as pisuna admin Log out

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[Refine Search](#)

**Search Results**  
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Go to Page: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72  
Sort by:

Date	Coordinator	Community	Additional elements noted (legend)	Transcript	AB details	Edit
2016-09	Karl S. Marcussen	Attu		Transcript	AB details	Edit
2016-08	Tom Møgelgaard	Kitissuarsuit		Transcript	AB details	Edit
2016-08	Karl S. Marcussen	Attu		Transcript	AB details	Edit
2015-08	Tom Møgelgaard	Kitissuarsuit		Transcript	AB details	Edit
2016-07	Karl S. Marcussen	Attu		Transcript	AB details	Edit
2016-07	Tom Møgelgaard	Kitissuarsuit		Transcript	AB details	Edit
2016-06	Edvard I. Kristiansen	Kangersuatsiaq		Transcript	AB details	Edit
2016-06	Karl S. Marcussen	Attu		Transcript	AB details	Edit
2016-05	Edvard I. Kristiansen	Kangersuatsiaq		Transcript	AB details	Edit
2016-05	Karl S. Marcussen	Attu		Transcript	AB details	Edit

Search for details

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NORDECO  
National Observations  
Database for Greenlandic  
and Arctic

Version 1.3.1  
Rails version: 4.1.16, Rails environment: staging

Observation ID: KANKR160301\_4  
Recorder: pisuna admin  
Coordinator: Edvard I. Kristiansen  
(Kangersuatsiaq)  
Date: 2016-03  
Observation area: Kangersuatsiaq

## Observation Details

[Back to search results](#)

**Total trips:** 30  
**Quantity caught:** 0  
**Trend:** Increasing

### Comment:

Increasing numbers are observed and most are of medium size. There are only few large individuals

### Importance

Long lines for Atlantic Cods are now placed for no longer than one hour as there are so many Atlantic Cods

### Suggested Action

We recommend that the Atlantic Cod surveys carried out up here in the north, also near Kangersuatsiaq, to also clarify the options here.

# Management Proposals

**This has resulted in 494 management proposals:**

- Change in fishing and hunting seasons: 146
- Change in quotas: 123
- Other change of rules and bylaws: 125
- Facilitate trade: 35
- Increase monitoring and research: 30
- ‘Current management is fine’: 36

# Status of the Management Proposals

- The proposals concern **90 different actions** for 30 species/resource uses
- Most submitted to the Local Government Authority
- A few submitted to the central government

**Possible to sustain**

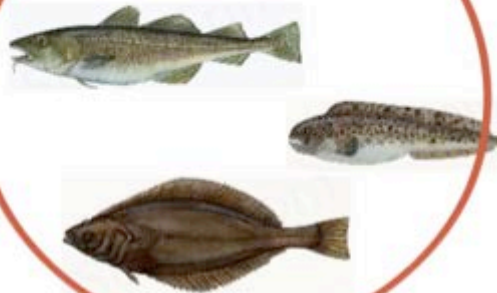
**Present all year  
round**



How do reports by  
community  
members compare  
with professional  
scientists' reports?



*Fish*



*Other*



Winter sea-ice



Offshore ships



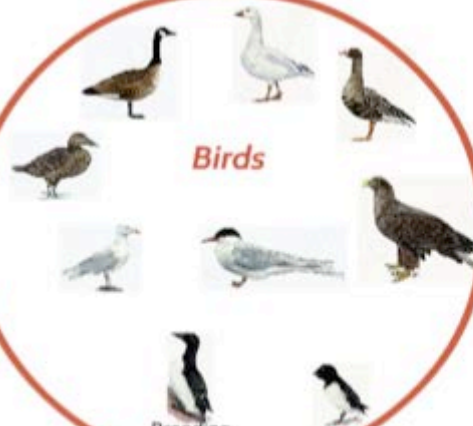
Trawling



*Marine mammals*



*Birds*



Breeding

*Land mammals*





Abundance data from  
community members but  
little or no abundance data  
from scientists



Trawling



No correspondence

Correspondence



**Participatory  
observing can...**

**Document local  
knowledge**

**Encourage local  
discussion**

**Shorten the time  
from observation to  
decision**



**Does not replace scientist monitoring**

**Helps pinpoint species and areas in  
need of attention**

**'Take home message'**

**Adapting to global species re-  
distribution requires**

**'All hands on deck'**

Respect, Collaboration, Exchange & Cross-  
weaving of Indigenous, Industry, Community-  
based and Formal/Academic science

Pech et al. *Science* 355:1389 (2017)

# Suggestion

Explicitly address cross-weaving  
of knowledge systems and CBM  
in the **“Joint Statement”**

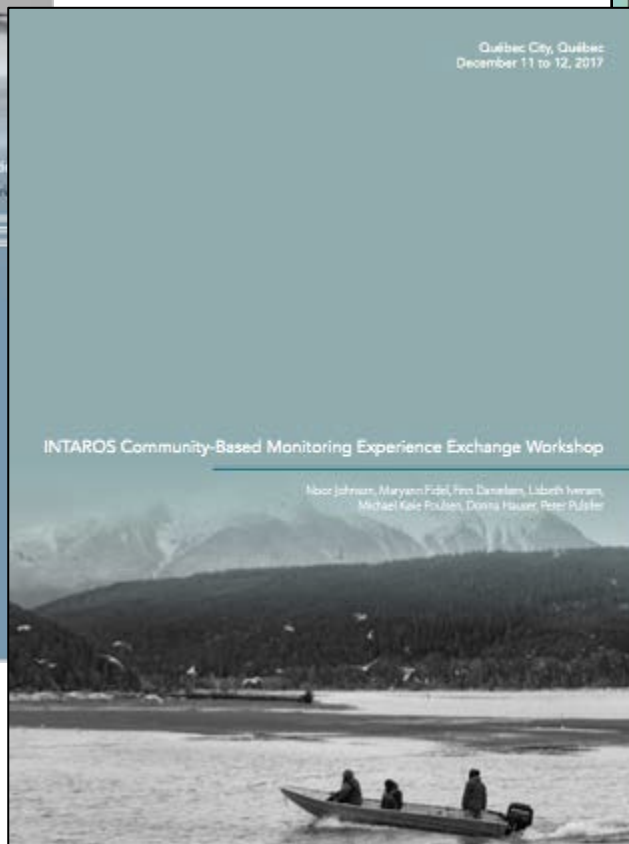
# INTAROS WP4: “Enhance community-based observing”

Workshops: Fairbanks, Alaska; Québec City, Canada; Komi and Yakutia, Russia



Participants in Quebec City Workshop, Dec. 2017

<http://www.intaros.eu/>  
<http://eloka-arctic.org/content/reports>





# Acknowledgements

Funding for INTAROS from European Union's Horizon 2020 Research and Innovation Programme under GA No. 727890

Workshop co-organizing organizations: ELOKA, YRITWC, CSPIN, NORDECO, IARC, NERSC

Participants of workshops in Fairbanks, Québec, Komi-Izhma, and Zhigansk – thank you for your insights!

National Science Foundation Grant Numbers PLR 1513438, ARC 0856634 and ARC 1231638





# Thanks



UArctic



N. Levermann, P. Jakobsen, B. Lyberth, H. Eicken, P. Pulsifer, N. Johnson, J. Collins, B. Sheffield, M. Fidel, L. Iversen, O. Lee and many more. Photos: E. Topp-Jørgensen, M. R. Hansen, M. K. Poulsen, M. Enghoff. Tweet and French poster: B. Strasser. Map: G. Pecl.



Qujanaq!