## Outline

- *Arctic coastal change & community-based observations*
- *Findings from a literature review & survey*
- *Illustrating key aspects of findings in Alaska case study*
- *Conclusions*

# *Community-based observations help interface Indigenous and local knowledge, scientific research, and education in response to rapid Arctic coastal change*


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IARC International Arctic Research Center, University of Alaska Fairbanks

UAF University of Alaska Fairbanks

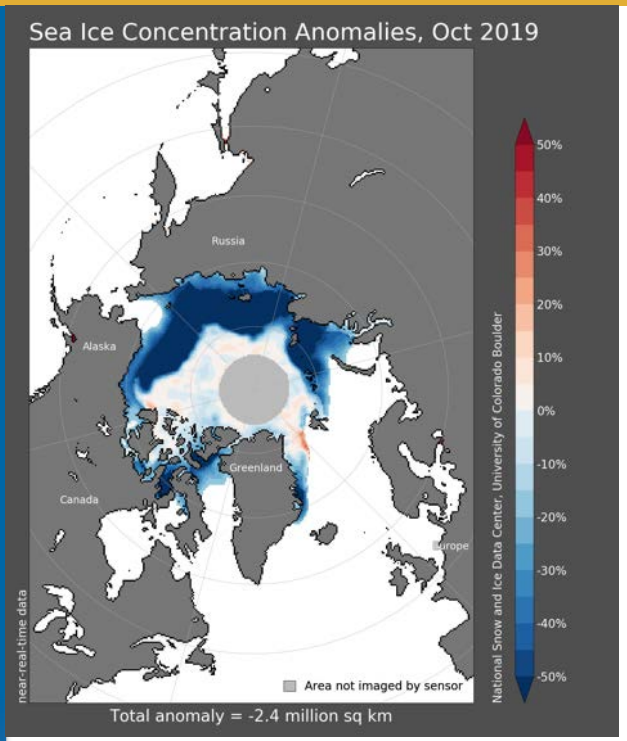
NORDECO Nordic Agency for Development and Ecology

One People-One River Yukon River Inter-Tribal Watershed Council

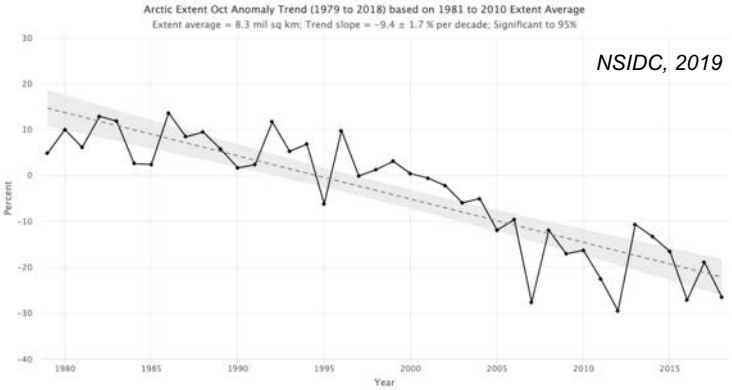
NSIDC

## *Key points*

- *Coastal sea-ice environments subject to most rapid change anywhere in Arctic*
- *Implications for coastal communities, food security, infrastructure & ecosystems*
- *Responses to such rapid change most effective when informed by local observations embedded in Indigenous & local knowledge*
- *Community-based observations create an interface for knowledge, scientific research, & (in)formal education to co-develop meaningful responses*




- Rapid loss of summer and fall sea ice exposes coastal communities & increases risk
- Recent losses of winter sea ice amplify impacts & contribute to ecosystem restructuring
- Community-based observations and Indigenous & local knowledge put change into perspective & point to response action



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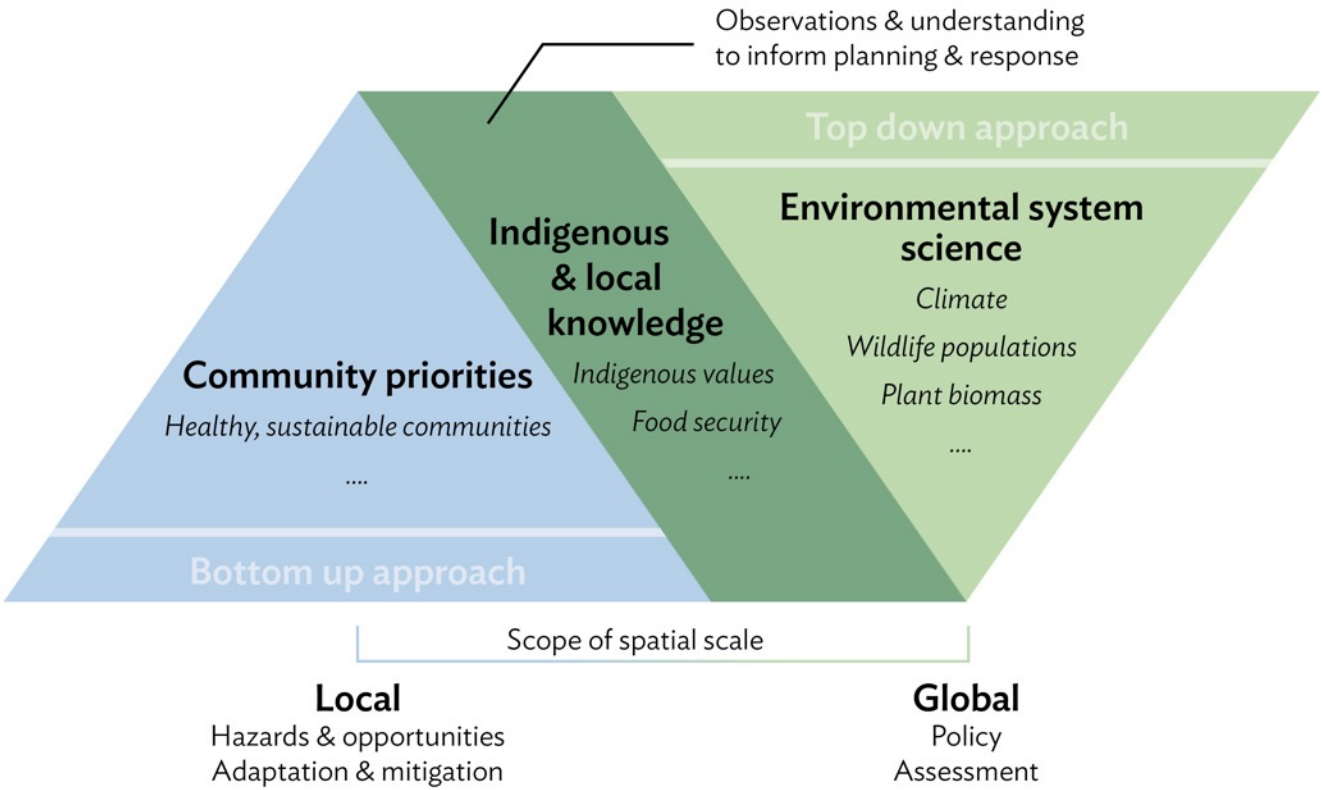
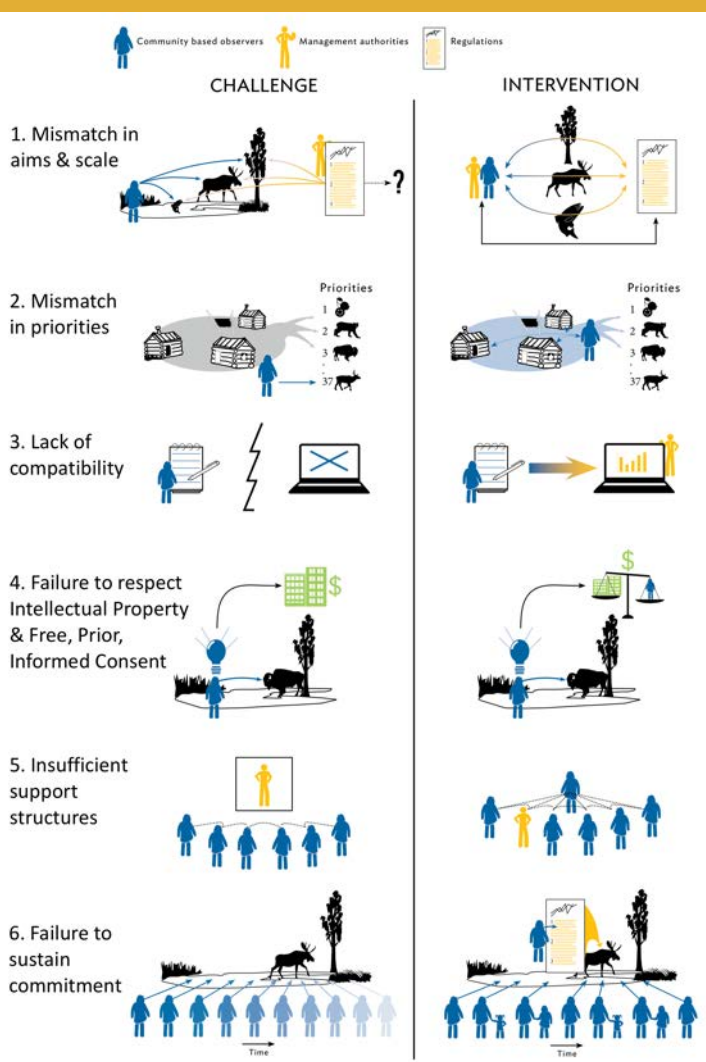



- Community-driven observations and Indigenous & local knowledge form an interface between local-scale action-focused monitoring and international observing frameworks

## Key points

- *Community-based monitoring analyzed through literature review of 128 projects globally and analysis of survey data for 30 Arctic efforts (Eicken et al., BioScience, in review)*
- *Research points to six key principles and interventions that aid effective monitoring, co-production & actionable science*
- *These include matching observing program & community priorities, creating sufficient organizational support structures, ensuring sustained community commitment*




***Key interventions to address challenges:***

- Develop best practices for government agencies to incorporate community-based monitoring (CBM) into decision-making [1]
- Emphasize community engagement in academic assessment & promotion [1]
- Involve community representatives & CBM programs in observing system design & implementation [1,2]
- Raise funding agency awareness of co-production support mechanisms [2]
- Clarify data ownership & data use rights, develop model agreements drawing on Indigenist data management concepts [3,4]
- Include program sustainability in CBM design from outset, recognize importance of trust & capacity [5,6]
- Provide incentives for community member involvement similar to those for scientists, e.g. salary, recognition as co-authors [6]
- Include youth in monitoring process to build future monitoring capacity and sustain interest across generations [6]

## Key points

- *Alaska Arctic Observatory & Knowledge Hub (A-OK) illustrates sharing of knowledge & tools around observations by Iñupiat ice & marine ecosystem experts*
- *Collaboration with sea-ice geophysicists & marine biologists to track change in ice use & coastal environment*
- *Co-development of an observing framework & observations database provides an interface for exchange & an education resource*


**AAOKH observers**

Bobby Schaeffer, Kotzebue
Billy Adams, Utqiaġvik
Carla SimsKayotuk, Kaktovik
Guy Omnik, Point Hope
Joe Mello Leavitt, Utqiaġvik
Robert Tokeinna Jr, Wales
Steven Patkotak, Wainwright
Vince Schaeffer, Kotzebue

***Practices implemented in A-OK:***

- Involve community representatives & CBM programs in observing system design & implementation
- Clarify data ownership & data use rights, develop model agreements drawing on Indigenist data management concepts
- Provide incentives for community member involvement similar to those for scientists, e.g. salary, recognition as co-authors
- Include youth in monitoring process to build future monitoring capacity and sustain interest across generations

[Shown in light grey: Not implemented yet]

## Key points

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- Evolution of partnership: Focus on tracking & understanding changing ice conditions & ice use → Local responses to changing conditions (ice trail mapping, hazard assessment & communication, eco-system change)

## Key points

- *Social media (in particular Facebook) as most effective means for communication across A-OK communities, assessment of trends & hazards from observations*
- *A-OK website (arctic-aok.org) mostly used as repository & to access detailed observations & data sets*

Alaska Arctic Observatory and Knowledge Hub
@ArcticAOK

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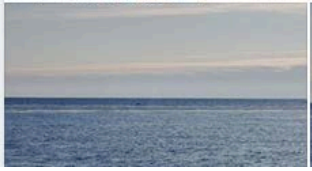

Organization

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University of Alaska Fairbanks
Fairbanks, Alaska 99775

(907) 474-1553

Contact Alaska Arctic Observatory and Knowledge Hub on Messenger

arctic-aok.org

Organization

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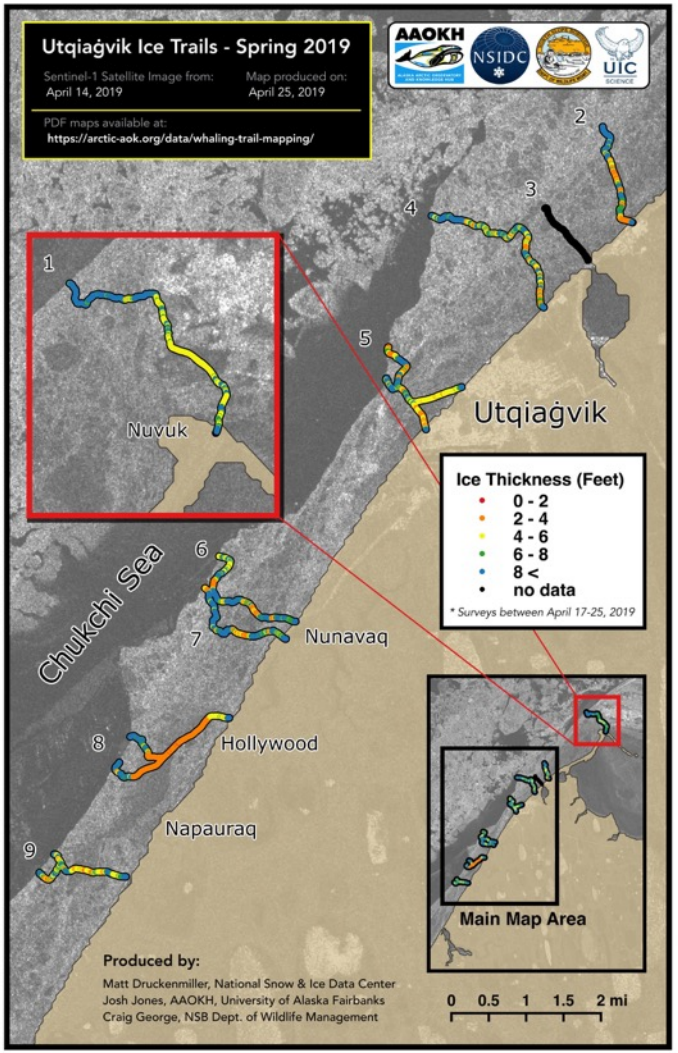
Page created - July 12, 2016

## Key points

- *A-OK knowledge hub combines Iñupiaq sea-ice & environmental knowledge, daily observations, ice-trail surveys, satellite & coastal radar imagery to provide integral picture of coastal environment*
- *Most utilized & highly valued information products related to ice use & hazards*




- Spring ice trail surveys conducted for over a decade (location, thickness) as important community resource
- Trail surveys also provide insight into adaptation to changing ice regime & changes in coastal sea-ice mass balance

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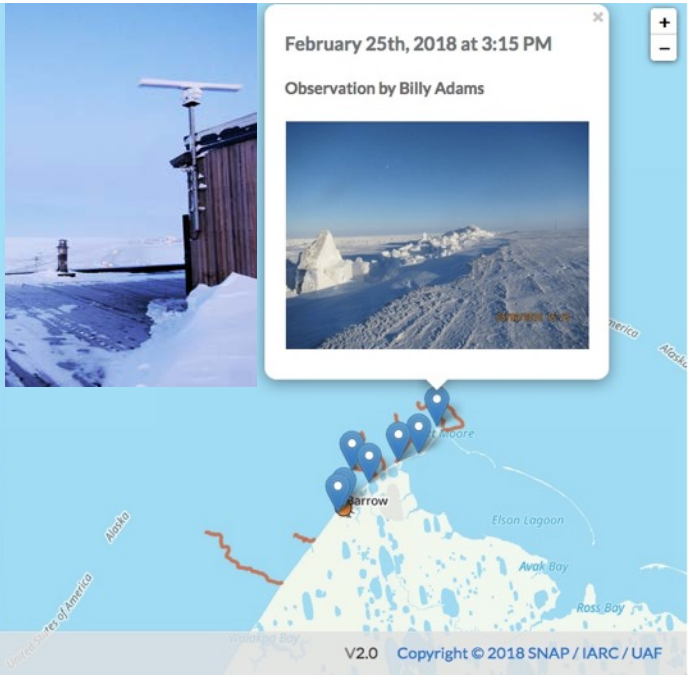


- Daily observations of ice conditions, coastal environment & coastal marine ecosystem by Iñupiaq knowledgeholders
- Observations informed & guided by use of ice & coastal environments
- In context of adaptation & decision-making near-realtime & subseasonal scale information products building on collaboration of greatest value
- Long-term observing record & observations database less utilized; value in education & knowledge preservation for each community

## Key points

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- *Most utilized & highly valued information products related to ice use & hazards*
- *Transition to operational information products next — but more challenging — step*


- Hypothetical framework for ice & coastal marine hazard assessment drawing on expert observations & coastal radar
- Hazard assessment & communication scheme developed through guidance by community emergency responders & agency personnel (Kettle et al., 2019, Polar Geogr., DOI: 10.1080/1088937X.2019.1707318)

## Thanks & Conclusions

We acknowledge A-OK steering committee members & contributors; the NSIDC ELOKA Team provided critical database development support.
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- CBM efforts fill pressing information needs, support desired management outcomes, enhance efficiency & sustainability of observing efforts, and reduce response times to adapt to a rapidly changing Arctic
- For CBM to inform planning, prediction & response requires continuity, focus on key variables & desired outcomes, as well as the capacity to sustain & adapt observations in rapidly changing settings
- Projects such as A-OK can serve as proving grounds to develop best practices & effective approaches
- Challenges that need to be addressed:
  - → Program sustainability
  - → Incorporation of CBM-derived information into government agency decision-making
  - → Community engagement in academic assessment & promotion