Visual Tools for Shared Understanding in Transdisciplinary Knowledge Processes

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Toolik All Scientist's Meeting
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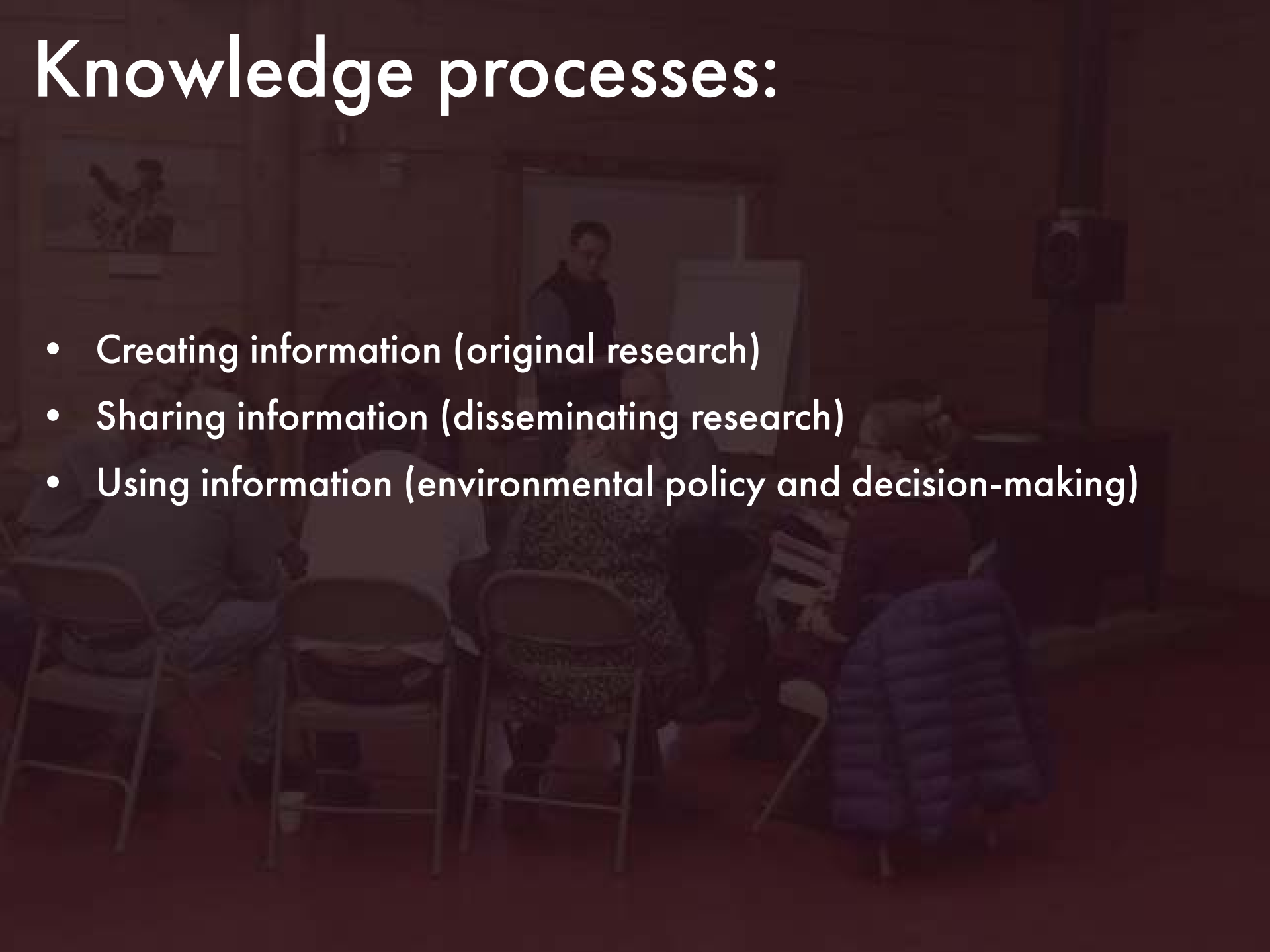
Knowledge processes:



- Creating information (original research)
- Sharing information (disseminating research)
- Using information (environmental policy and decision-making)

Arctic Context:

Complex social-environmental system

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Complex social-environmental system

- Interconnected drivers of change
- Incomplete knowledge
- Uncertainty
- Diverse actors
- Lack of agreement on cause-effect relationships for environmental management

Challenges in Transdisciplinary Knowledge Processes:

Challenge:
Ineffective Communication

Misalignment in communication between diverse actors

- Differing levels of information
- Different mental modes of understanding

Solution:

Cultivating Shared Understanding:

- Meeting complexity with flexibility, sensitivity to context, and strategy
- Concerted effort to learn about one's own and other's assumptions concerning types of information, their value, and processes for achieving successful outcomes
- Consensus is not a requirement
- Devote time and make benefits explicit

Challenge:
Bias Toward Western Science

Exclusion of differentiated knowledge sources like local and traditional knowledge

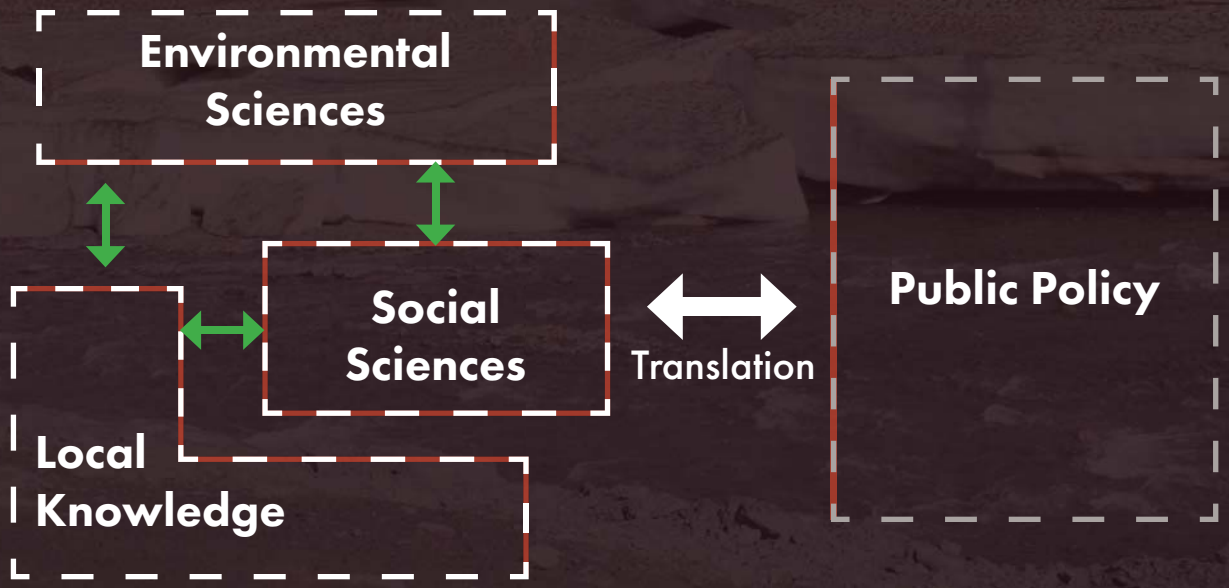
- Primacy of conventional, peer-reviewed science as trusted information
- Compromises legitimacy of research findings and the decisions based on them
- Challenge of ensuring meaningful participation from everyone involved

Solution:

Boundary Work

Tensions arise at the interface between communities with different views of what constitutes reliable or useful knowledge

"Spanning activities" facilitate collaboration across boundaries



Boundary Objects:

Boundary objects help facilitate boundary work. They are scientific objects with the dual role of crossing intersecting social groups AND satisfying the informational requirements of each

- Databases
- Standardized forms
- Visual tools

Focus:

What tools and processes are most effective at delivering information and creating shared understanding?

Role of Visual Tools in Conveying Place-Based Knowledge:

Researching visual tools and their ability to aid in the development of shared understanding between local communities and outsiders by improving understanding of place-based concepts

- Long-term environmental change
- Scale and magnitude of change
- Impact on local ways of life

Visual Tools:

The range of “visual artifacts” (maps, drawings, diagrams, digital graphics, photographs, etc) with different functions and uses in constructing meaning

For Example: Photography

Credit: Jessica Cherry

For Example: Photography

Benefits

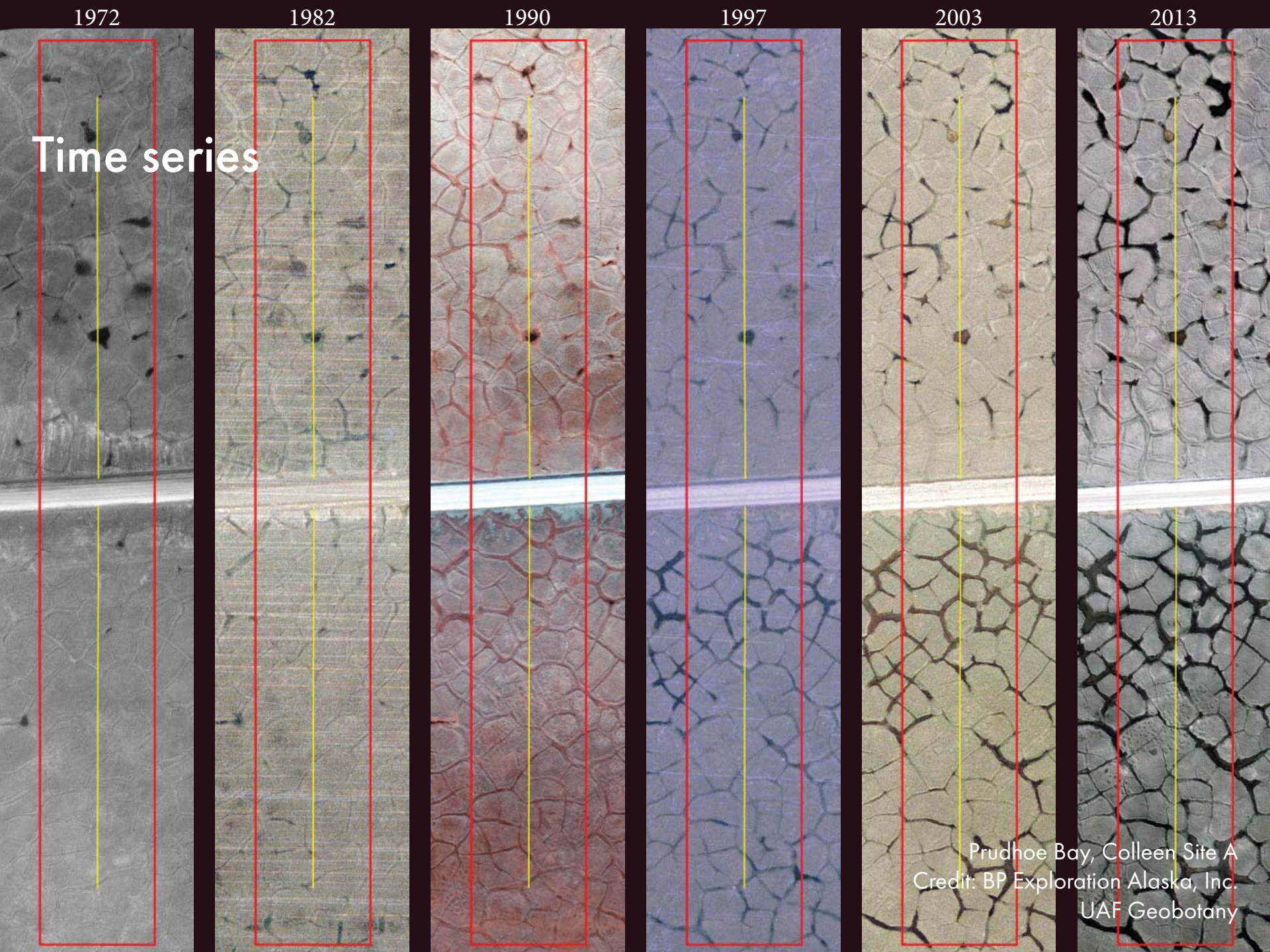
- "Naturalistic" images
- Abundance of detail
- A sense of "trustworthiness"

For Example: Photography

Drawbacks

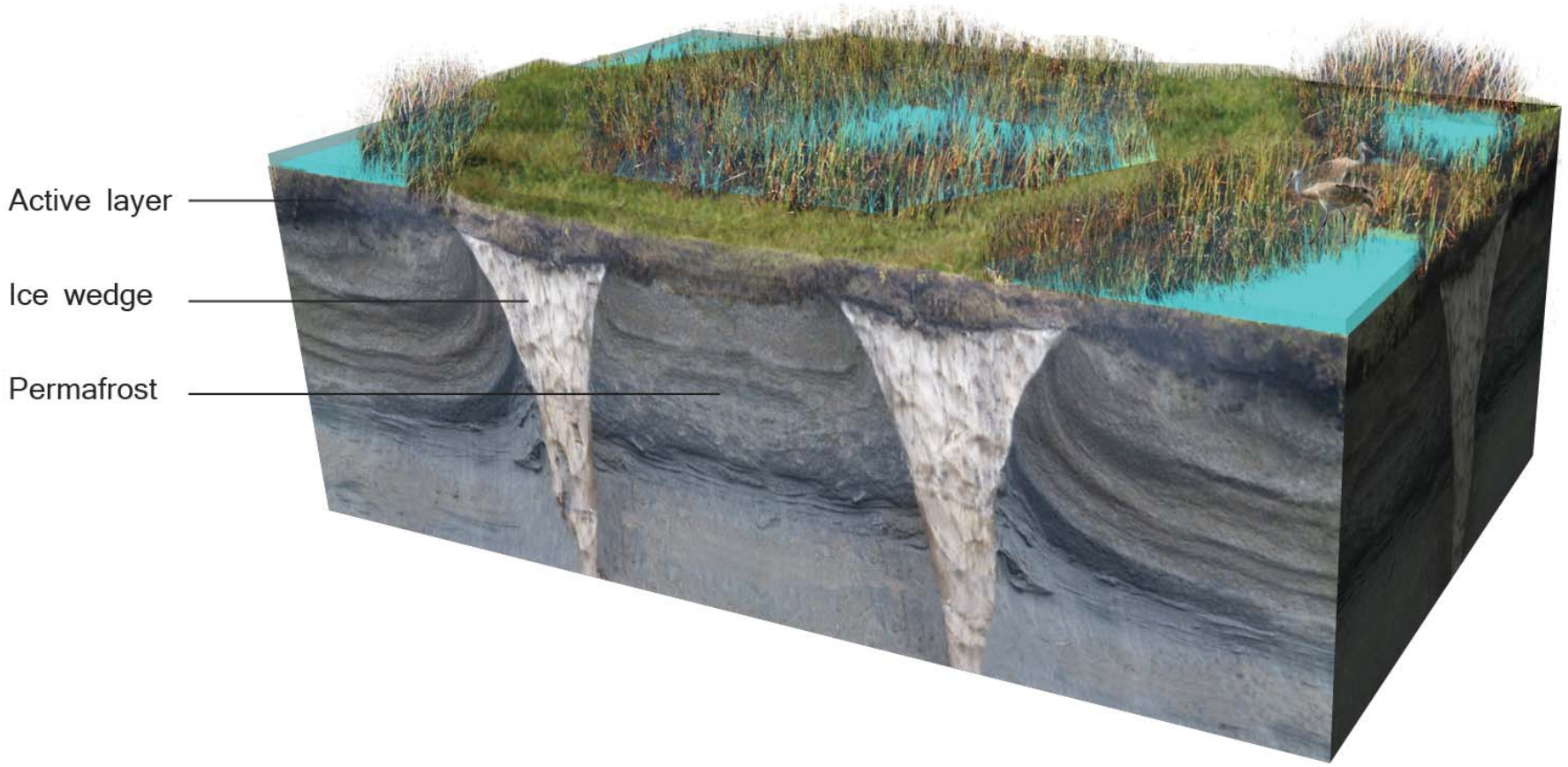
- Snapshot in time
- Hidden processes
- Limited to what has already happened

Time series



Prudhoe Bay, Colleen Site A
Credit: BP Exploration Alaska, Inc.
UAF Geobotany

Revealing hidden processes



Thermokarst degradation
Credit: Anna Liljedahl, et al.
Tracie Curry

Potential futures

Arctic Food Network
Credit: Lateral Office Architecture
Venice Architecture Biennale 2014

Benefits of visuals:

Benefits of visuals:

- Showing versus telling
- Brings an additional aesthetic and affective dimension into communication.
- Can enhance the potential to express identities and values through color, perspective, typography, etc.

Project details:

- Participatory action research in partnership with Native Village of Wainwright
- Elder interviews
- Visual representation of interview narratives
- Focus groups

Target Audience:

Academically trained persons involved in natural resource management and environmental policy

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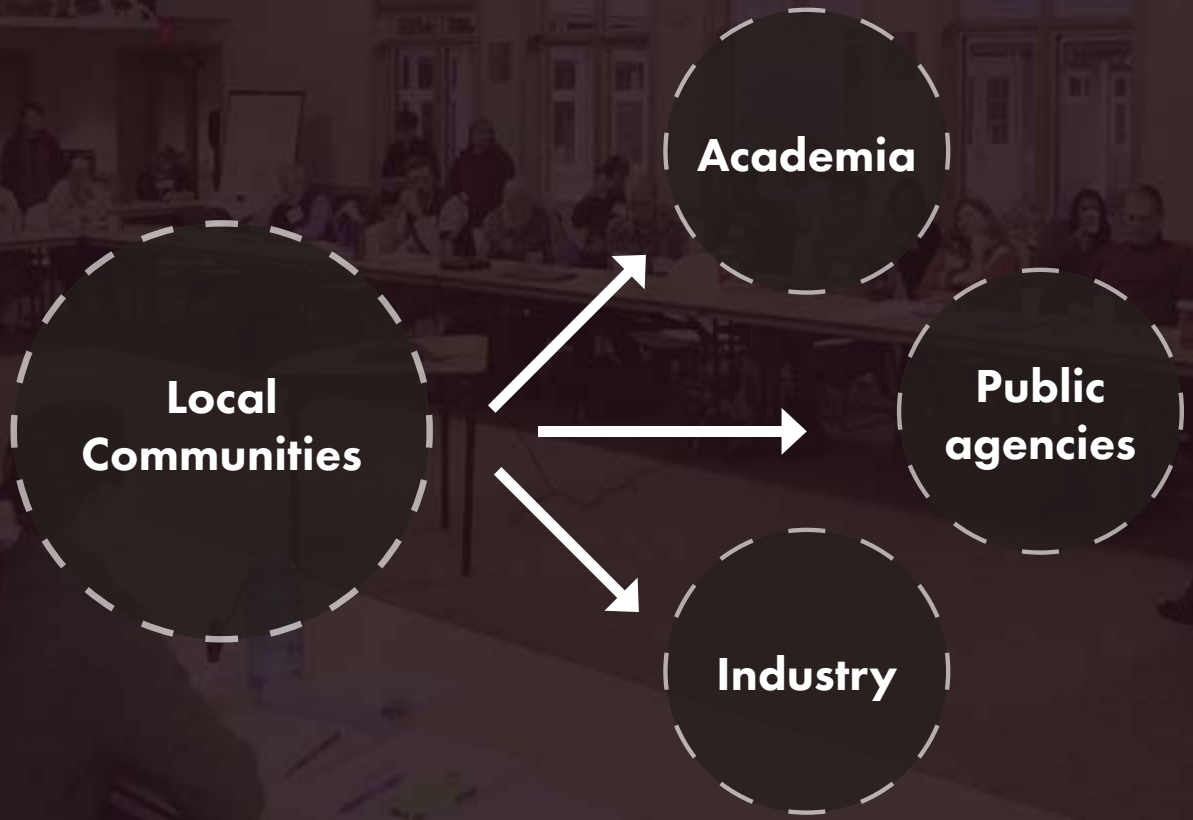
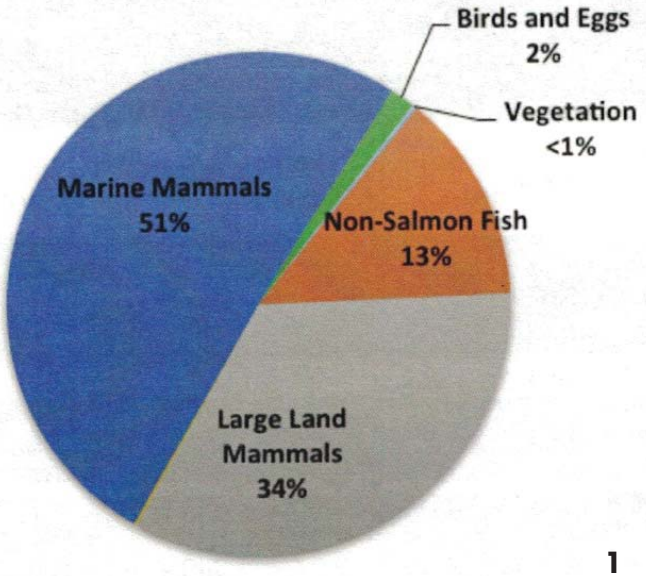


Target Audience:

Considerations

- Trained in the conventions of Western science
- Accustomed to charts, diagrams, and technical line drawings with limited color, texture, and perspective
- Assigning greater truth to abstracted images of generalizable scientific information,
- and lesser truth to naturalistic or interpretive images about concrete, individual events and people

Figure 6.6. Comparison of harvest by category of harvested resources, Kaktovik.



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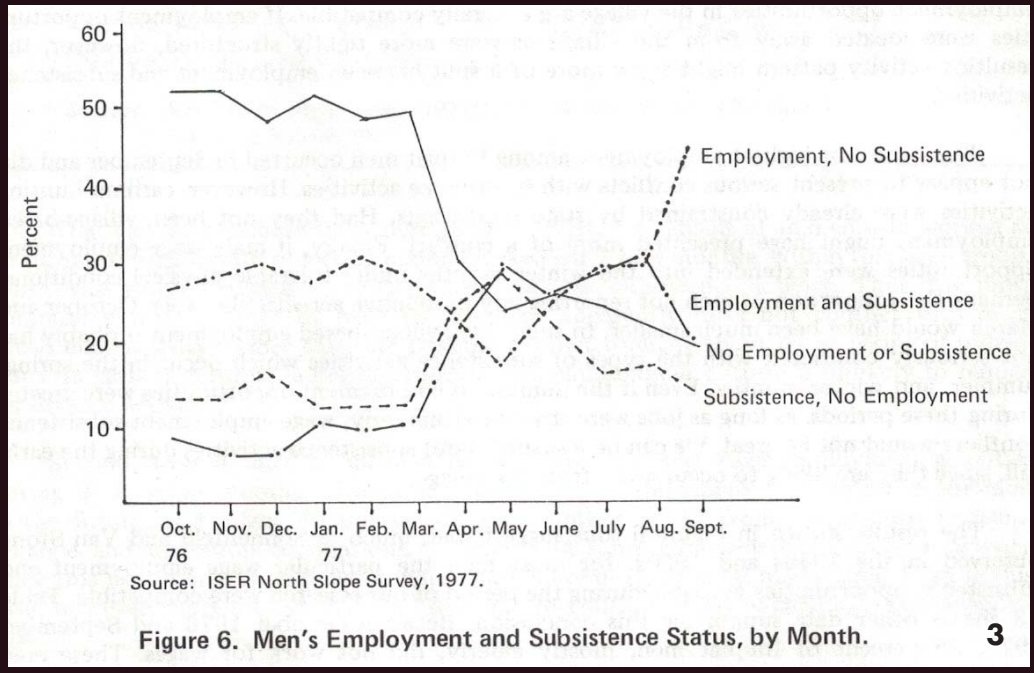

Figure 6. Men's Employment and Subsistence Status, by Month.

3

Table 6.14. Comparison of harvested pounds by category of resources, Kaktovik.

Resource	Harvest in pounds usable weight	
	Total	Per capita
Salmon	287.9	1.0
Non-Salmon Fish	27,198.4	94.8
Large Land Mammals	68,458.4	238.5
Small Land Mammals	301.8	1.1
Marine Mammals	103,107.7	359.3
Birds and Eggs	3,261.7	11.4
Vegetation	341.8	1.2

2

1, 2: Kofinas et al. (2016), Subsistence Sharing and Cooperation Networks: Kaktovik, Wainwright, and Venetie, Alaska. OCS Study BOEM 2015-023
3: ISER North Slope Survey, 1977

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Collaboration Between Social and Ecological Scientists:

- Establishing shared understanding
- Create a strategy for continual collaboration early in the process
- Ability to downscale

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