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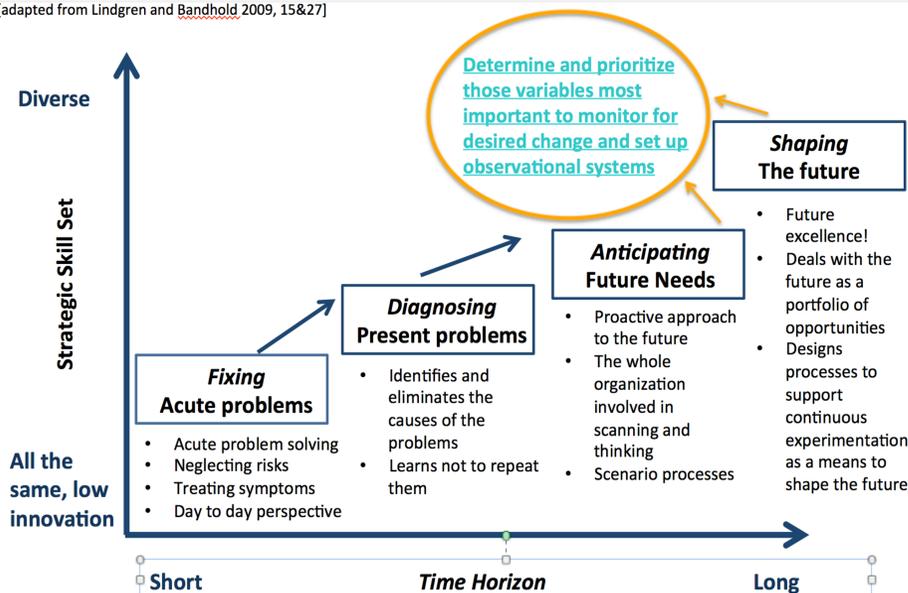
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INTRODUCTION Scenarios are used to think ahead in rapidly changing, complex, and competitive environments, and make crucial decisions in absence of complete information about the future. Currently, at many regional scales of governance, there is a growing need for legitimate tools that enable the actors (e.g., governments, corporations, organized interests) at local-scales to address pressing concerns in the midst of uncertainty. This is particularly true of areas experiencing rapidly changing environments (e.g., drought, floods, diminishing sea ice, erosion) and complex social problems (e.g., remote communities, resource extraction, threatened cultures). Scenario exercises produce neither forecasts of what is to come nor are they visions of what participants would like to happen. Rather, they produce pertinent evidence-based information related to questions of “what would happen if...” and thus provide the possibility of strategic decision-making to plan research that promotes community resilience.

Anticipatory Governance

Anticipatory governance refers to the capacity for futures thinking within governments that enables current decisions to target long-range goals under conditions of uncertainty and invest in physical and human capital to reduce risk. Investment includes research programs, observation and monitoring systems. *Participatory scenarios* enhance anticipatory governance capacity because scenario exercises rest on an understanding of information pertinent to answering key questions tailored by those using the process. The data used can come from a variety of sources such as climate change models, Indigenous knowledge, practitioner experience, or community values. In this sense, scenario development is based on science –established facts about how the world works – but the process of using science and values, is flexible to the knowledge needs and expertise of participants. The blend of imaginative thinking and tangible data is what makes scenarios such a powerful tool for society.

[adapted from Lindgren and Bandhold 2009, 15&27]



Northern Alaska Scenarios Project 2013-2017

We are using a *participatory explorative scenario process* consisting of four stages: (1) gathering of information relevant for the problem at hand, (2) evaluation and synthesis of this information to develop raw scenarios, (3) review and revision to develop final scenarios, and (4) use of scenarios to develop monitoring indicators for social and environmental systems that matter to those people living in the Arctic.

The **Northern Alaska Scenarios Project (NASP)** was developed to help identify and synthesize input by engaging expert residents of the North Slope and Northwest Arctic Boroughs related to the future of healthy sustainable communities. This project used a participatory scenario workshop process to foster effective communication among these experts across different sectors such as education, justice, mental and physical health, subsistence, youth, Iñupiaq values, and business development. It used a series of three workshops (Barrow, Kotzebue, Anchorage) in 2015–2016 to bring experts from both boroughs together to share creative strategies for the next few decades so that those living in Arctic Alaska can proactively shape their futures. From an academic perspective, the project tested the few but often referenced key variables for sustainable Arctic communities asserted by the Arctic Social Indicators Report II¹, SLiCA², Kruse et. al³. It does so at a time of intense interest in the Arctic from state (Alaska Arctic Policy Commission) and federal governments (Office of Science and Technology Policy) and significant revitalized interest in rural and Indigenous governance (e.g., lands into trust decision 2014).

What is required for healthy sustainable communities in Arctic Alaska by 2040?

The three workshops and participation of 51 resident experts co-produced key factors, indicators, and a set of robust scenarios related to the Arctic residents’ futures thinking and NASP team research. The scenarios themselves are another set of data beyond this poster. *Bolded terms had significant overlap across the five clusters.*

Key Factors/Key Drivers

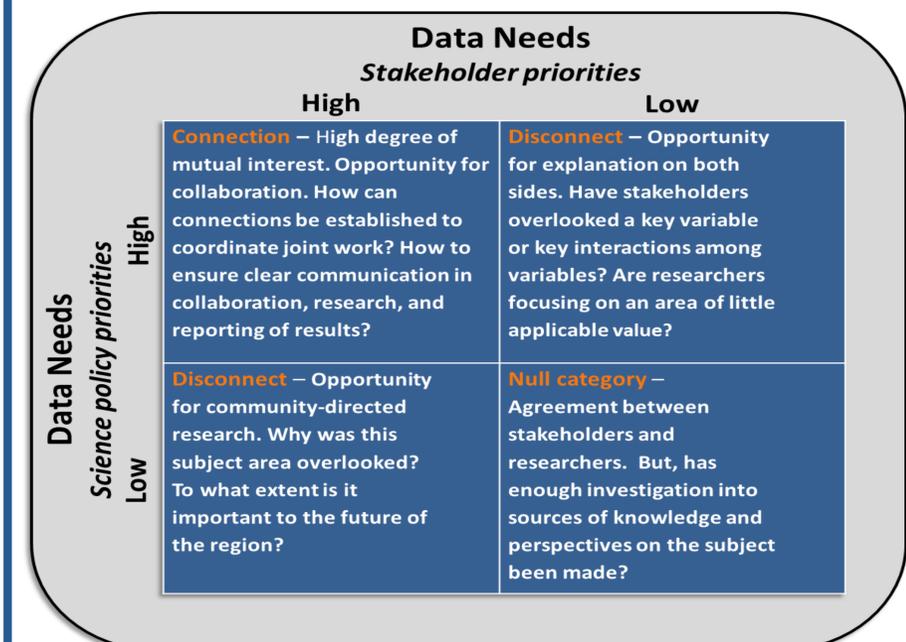
1. Iñupiaq Values
2. Land management and ownership
3. Subsistence security
4. Sustainable energy
5. Participation in the regulatory process
6. Interaction of levels of governments
7. Substance abuse and related crime
8. Intersectional community engagement
9. Preparation of teachers and school administrators
10. Climate change at the global and regional scale
11. Access to quality healthcare
12. Transmission and recognition of Indigenous knowledge
13. Demographics
14. Cost of living
15. Pan-Arctic collaboration
16. Tribal governance
17. Access to and affordability of housing
18. Local determination
19. Language proficiency
20. Local access to education for college, career, and livelihood readiness
21. Access to markets

Five Clusters for Monitoring

- ◆ Fate Control
- ◆ Economics
- ◆ Culture
- ◆ Education
- ◆ Well-being

What can scenarios do for geoscience?

See **Eicken et al. poster for sea ice specifically**. Because scenarios focus participants on how to maintain, develop, or avoid some attribute for the future, they rely on participants to focus on normative values and core system functions. These are informed by what science can bring to the participants, but participants also inform scientists about what matters to them. This can translate into more effective research programs.



CONCLUSIONS

Our findings reinforce the growing evidence from studies related to Arctic community sustainability and human development that indicate tight connections between fate-control, health, and environmental change. Geophysical, ecological, and social sciences must research in coordination and cooperation with Arctic residents and communities to maximize:

1. Applicability of research to governance strategies and thus investment
2. Research access and local-regional scale coordination of data
3. Long-term planning to reduce risks and enhance detection of surprises.

ACKNOWLEDGEMENTS

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