North Slope Science Initiative (NSSI) Scenarios for Energy and Resource Development on the North Slope

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25 June 2014 – Study of Environmental Arctic Change webinar
NSSI Scenarios
Project Background

- Project initiative by North Slope Science Initiative (NSSI), funded by broad partnership and administered through BLM to develop Energy and Resource Development Scenarios

- Builds on series of “Emerging Issue Summaries” developed at direction of Oversight Group by Science Technical Advisory Panel (STAP), and Senior Staff Committee (SSC)

- Scenarios process to help NSSI member agencies and their partners refine research and monitoring investments
What is the future of energy development, resource extraction, and associated support activities on the North Slope and adjacent seas through 2040?
Project Objectives

- Use participatory scenarios process to explore plausible future development scenarios
  - Network of stakeholders: communities, local, state and federal agencies, industry, non-profit organizations and academia
  - Diverse source of knowledge and opinions

- Provide results that enable effective coordination of research and monitoring needs
  - Results from systematic assessment of assumptions, uncertainties

- **Products:**
  - Fact sheets - synthesis of knowledge on drivers of change and uncertainties
  - Spatially explicit development scenarios
  - Spatial data products
  - Final report from scenario workshops
  - Public outreach
Example application: Scenario C

Scenario B

Allocated Land Uses
- Residential
- Conservation
- Agriculture
- Transit Oriented Dev.
- Sea Level Rise

Current Land Uses
- Urban
- Conservation
- Agriculture
- Other
- Interstate Highways
- Major Rivers
- Major Lakes

Development, conservation and agriculture
From Vargas-Moreno 2012 (Everglades Landscape Scenario Project)

High Sea Level Rise – Low Financial Resources
Business as Usual – Double Population

Low Sea Level Rise – High Financial Resources
Proactive – Trend Population

Courtesy of GeoAdaptive
Participatory scenarios process

- Participation of groups with diverse knowledge, values, and expertise is fundamental to incorporate a breadth of ideas about the future.
- Provide transparent process on identifying key uncertainties and assumptions
- Identified scenarios reflect plausible outcomes with input from multiple stakeholders
Project Components

Background knowledge Review
Stakeholder Consultation

• Synthesize current knowledge with local, traditional knowledge
• Consult and distribute background information with stakeholders

Participatory Scenario Design and Development

• Inclusive of diverse knowledge and opinions
• Develop graphic and map-based scenarios
• Evaluate Scenarios

Development of Strategies for Monitoring and Research

• Summarize findings from Scenario Process
• Strategize Research and Monitoring
• Communicate results

Olivia Lee - Lead
J.C. Vargas - Lead
UAF, GeoAdaptive, NSSI
Key Groups

- Oversight and Scenarios Consultative Groups
  - Provide feedback on the preliminary prioritization of potential drivers
  - Provides feedback on the type of useful products to be developed
  - Suggest workshop participants, and expert contacts
  - Workshop participation

- Expert community
  - Builds on NSSI OG, STAP and SSC
  - Additional expertise from broader community (native community, non-profit organizations, academia)
  - Provide information and review developed background material
  - Subset will participate in workshops, identification and evaluation of scenarios
Drivers of change

• Economic and regulatory
  • Price of oil and gas products
  • Demand for energy/mineral resources
  • Regulatory environment
  • Development of infrastructure (onshore/coastal)
  • Price of other commodities (coal, minerals)
  • Oil/gas production tax code
  • Oil and gas development outside Alaska

• Technology and information
  • New technology (efficiency, discovery, clean-up)

• Demographics, Politics and Education
  • Global political stability

• Natural systems
  • Extent of seasonal sea ice
  • Climate change (temperature, precipitation)
  • Erosion (coastal/riverine)
  • Permafrost degradation
  • Endangered species listings & critical habitat designations
  • Human-caused environmental disasters (e.g. oil spills)

• Community dynamics
  • Community stance on development
  • Local (village/borough) economy
  • Community health and food security
Multi-dimensional drivers

Synthesize knowledge from subject matter experts

Bundle assumptions, build plausible scenarios (Scenario Identification Workshop)

<table>
<thead>
<tr>
<th>Air Temp (deg C)</th>
<th>Sea level rise (cm)</th>
<th>Permafrost active layer depth (cm)</th>
<th>Population</th>
<th>Oil price</th>
<th>Vessel activity</th>
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<tbody>
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<td>+5</td>
<td>Increase</td>
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<td>+20</td>
<td>Decrease</td>
<td>+20%</td>
<td>Decrease</td>
</tr>
</tbody>
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Projected annual ground temperatures (Jafarov et al. 2012) & projected surface temperature increase (SNAP)

Projected population growth

Planning documents

Alaska Oil production (Knapp 2012)
Scenarios as tools to identify science needs

- Link spatially explicit scenario outcomes with research and monitoring efforts
- Individual agencies can prioritize relevant research and monitoring needs
Tentative timeline

January 2014
Outreach in Barrow
Project Initiation Meeting
(Scenarios Consultative Group)

February – October 2014
Preliminarily prioritize drivers
Synthesis of background materials

November 2014
Scenarios Identification Workshop

January 2015
Scenarios Implications Workshop

February – April 2015
Refine scenarios

May 2015
Research and monitoring needs workshop

August 2015
Final report and project outreach
Questions and discussion

Project website:

North Slope Science Initiative:
http://www.northslope.org/scenarios/

Alaska Center for Climate Assessment and Policy:
https://accap.uaf.edu/?q=Scenario_planning_NSSI