

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

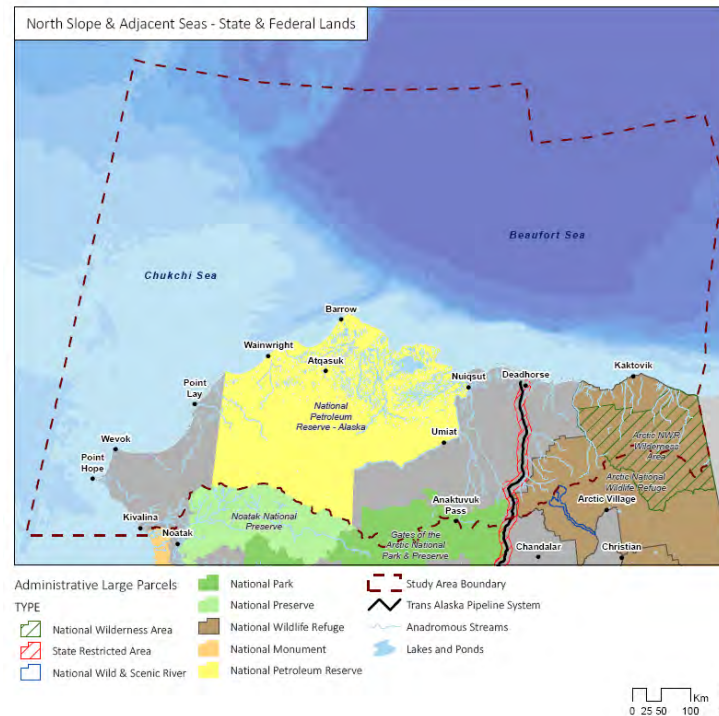


NSSI Scenarios Project Background

- 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

Focal Question

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

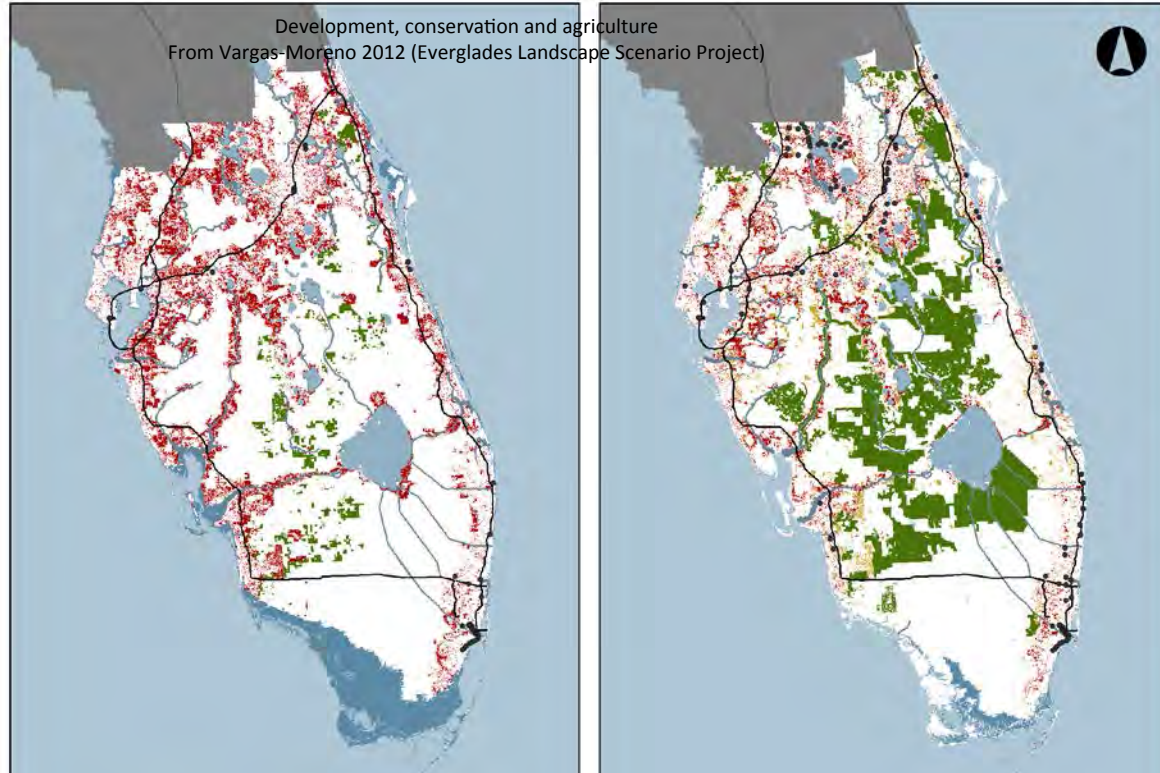
Example application: **Scenario C**

Scenario B

Only Area
Allocated

Year: 2060

- 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



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

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



USGS
science for a changing world



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

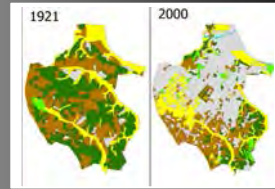


Background knowledge Review Stakeholder Consultation



Olivia Lee - Lead

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



Participatory Scenario Design and Development



J.C. Vargas - Lead

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



Development of Strategies for Monitoring and Research



UAF, GeoAdaptive, NSSI

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

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**

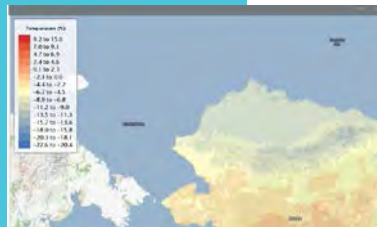
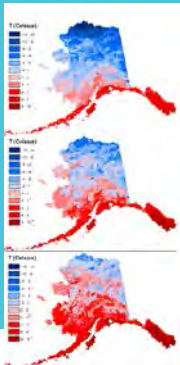
- Community stance on development
- Local (village/borough) economy
- Community health and food security

Multi-dimensional drivers

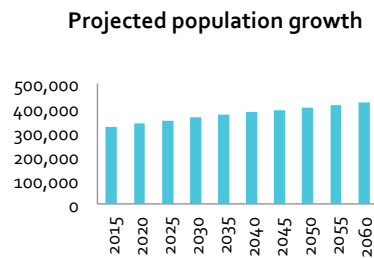
Synthesize knowledge from subject matter experts

Bundle assumptions, build plausible scenarios (Scenario Identification Workshop)

Air Temp (deg C)	Sea level rise (cm)	Permafrost active layer depth (cm)	Population	Oil price	Vessel activity
+0.5	5	+5	Increase	+ 10%	Increase
+0.1	3.5	+10	Increase	- 15%	No change
No change	1.0	+20	Decrease	+20%	Decrease



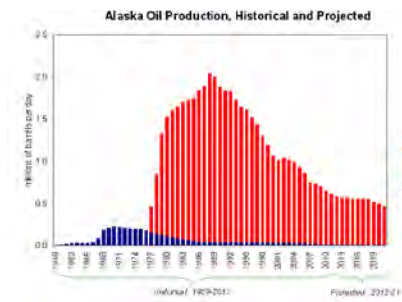
Projected annual ground temperatures (Jafarov et al. 2012) & projected surface temperature increase (SNAP)



US Census Bureau



Planning documents



Alaska Oil production (Knapp 2012)

Scenarios as tools to identify science needs



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North Slope Science Initiative

Monitoring Studies (Filtered)

Year	Duration	Prima	Affiliation	Topics	Subtopics	Local	Energy
ong	2005-Present	BP	Industry	birds, mammals	birds, foxes	Gr	No
ong	1987-2013	Bu...	Federal	social, mammals	subsistence, ...	Be	So
ong	1968-2013	Bu...	Federal	social, mammals	subsistence, ...	Ch	So
ong	2000-2017	Bu...	Federal	physics, mam...	water, water	Be	Co
ong	2008-2015	Bu...	Federal	social, vegeta...	water theme...	Ch	W
ong	1070-2016	Bu...	Federal	mammals	marine mamm...	Ch...	So
ong	2007-2017	Bu...	Federal	mammals	humpback wh...	Be	So
ong	1999-2012	Bu...	Federal	social, mammals	subsistence, ...	Or...	So
ong	1972-Present	U...	Federal	mammals	moose	AN	No
ong	1969-Present	U...	Federal	mammals	muskrat	AN	No
ong	2004-Present	No...	Local	vegetation, b...	Caribou, geese	Ar	Ve
ong	1987-Present	U...	Federal	vegetation, bi...	large mammal...	Al	Ve
ong	1995-Present	No...	Local	social, birds, f...	birds, fish, la...	No	So

Studies are filtered on Topics: mammals. Displaying studies 1 - 123 of 133.

- 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