

RAPID ECOREGIONAL ASSESSMENT

ALASKA TRAINING COURSE

REA POWER USER TRAINING DAY 1

Alaska State Office IT Lab

February 26, 2015



Welcome

Instructors	Thursday <i>End @ 4:15pm</i>	Friday <i>End @ 4pm</i>
Jamie Trammell , UAA Landscape Ecologist	Landscape Approach Context	Forecasting (2025 & 2060)
Monica McTeague , UAA Ecologist	The REA Approach	Integrated Products
Megan Walz , , REA Data Coordinator	BSWI RMP & REA	Mgt. Question Example
Karla Rogers , Natural Resource Specialist	REA Document-Overview	Lunch
Aliza Segal , Ecologist	Lunch (on own)	Planning Exercise
	CA Data	Applicability of REA
	CE Data	Wrap-up & Next Steps
	Closing Discussion	

Round Robin



- Name, your role, and office
- What natural resource issue reigns in your life?
- What do you expect to take away from this work session?



Workshop Objectives

Given an environmental challenge that spatially crosses management boundaries, identify and employ information from the **Rapid Ecological Assessment** to understand the ecological context and the extent and pattern of natural and human influences.

Given a public land management question, utilize the **Rapid Ecological Assessment** as one broad-landscape decision support tool for planning where to develop, conserve and restore environmental values and qualities or to direct mitigation.



What does the fox say....

Is this just dressing like a
fox and Eurodancing in the
woods?

Why are REAs important?



REAs are enabling the BLM to take a Landscape Approach

Why take a Landscape Approach?

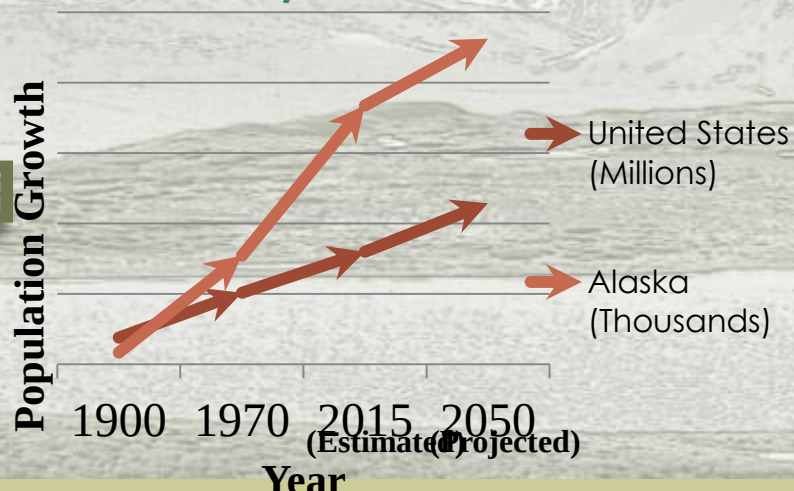
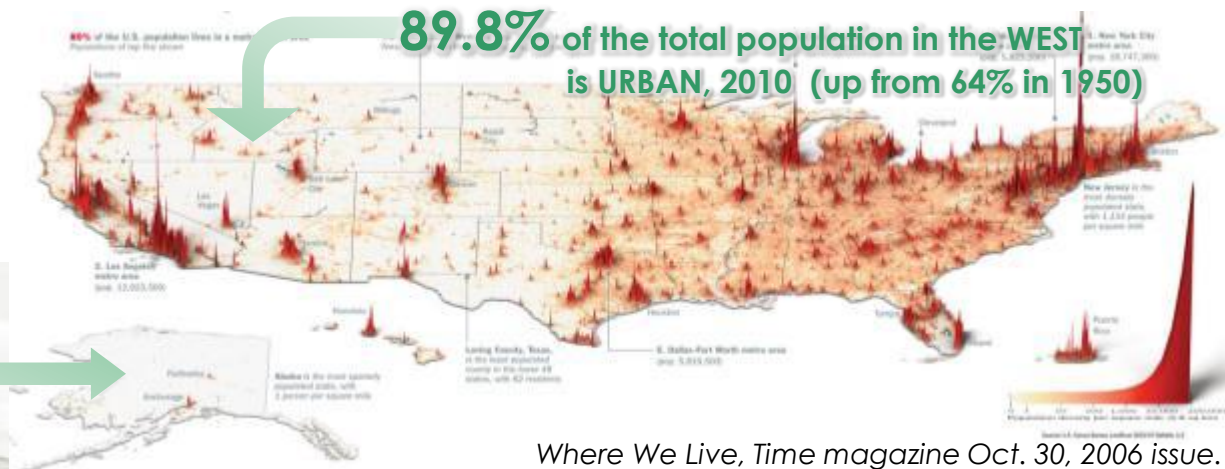
What does it mean to take a Landscape Approach?

What practical value is gained from a Landscape Approach and REAs?

Why take a Landscape Approach?

MAJOR TRENDS CONFRONTING PUBLIC LAND MANAGEMENT

Changing Demographics



HISTORIC PERSPECTIVE:

In the 1900s Teddy Roosevelt saw destruction in the west and became alarmed which fueled an American Conservation Movement. Since then the US has grown 320%, 2.8% year and is expected to grow another 43%, 1.2% annually by 2050.



Why take a Landscape Approach?

MAJOR TRENDS CONFRONTING PUBLIC LAND
MANAGEMENT

Climate Change

2



TEMPERATURE

Hotter



PRECIPITATION

Dryer in areas

Why take a Landscape Approach?

MAJOR TRENDS CONFRONTING PUBLIC LAND MANAGEMENT

Triggering Landscape-scale Issues

1 & 2



↑ spread of invasives
△ Chemicals
↑ Pollution

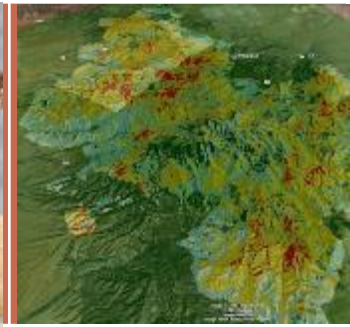


Urbanization = ↑ demands on land for food, water, energy, and access to live, work & play

- ↑ WUI, fire suppression
- ↑ Fragment landscapes



Pressure on wildlife (plants and animals) to live with us or on less



Change natural systems
△ Precip = Drought =
↑ mega-fires,
↑ invasive
Mega storms =
↑ erosion

Such issues cannot be effectively dealt with by a local office alone...or even BLM

Why take a Landscape Approach?

INITIATIVES

AIM

3



(Tsk, Tsk,
Tsk)

2004 - OMB found that BLM had “gaps in the monitoring of resource conditions to support management decisions” and that BLM had no reliable mechanism for reporting on the condition of public lands above the local level.

Why take a Landscape Approach?

INITIATIVES

Healthy Lands



2007 - National trends of increased urban-suburban development; increased outdoor recreational activity; rising demands for energy; impacts from large-scale wildfires; and the effects of an ongoing weed invasion caused the Department to give **BLM a funding increase to launch a landscape-level approach to improve the health & productivity of public land**

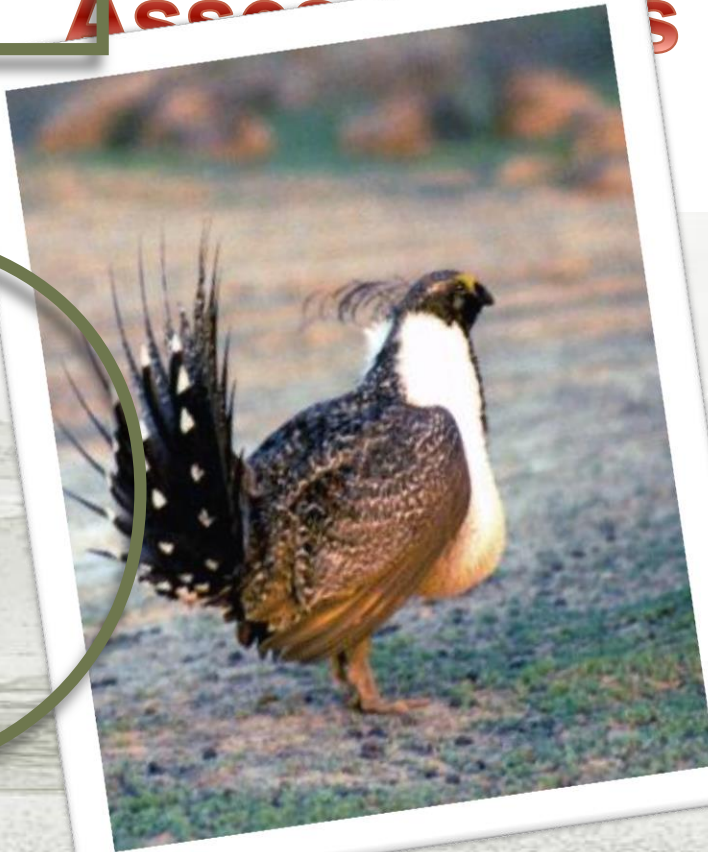


Why take a Landscape Approach?

INITIATIVES

Rapid Ecoregional

Assessments



2008 - BLM's new director foresaw an issue with analysis of Sage-grouse and identified the need for regional assessments.

2009 ARRA funding was a situation of being at the right place at the right time!

HISTORIC PERSPECTIVE:

James Caswell came from State of Idaho's Office of Species Conservation where he dealt with the Northern Spotted Owl Issue.



Why take a Landscape Approach?

Initiatives mark a shift toward a Bureau-wide coordinated effort to take a Landscape-scale Approach



Assessment, Inventory and Monitoring (AIM)

Spatially scalable data,

Standardized collection across jurisdictions

Focus on 10 Land Management ?



Healthy Lands (HL) Program

Landscape-level approach to meet multi-use demands

\$ on the ground in focal areas to accomplish restoration & conservation activities in 1-3 years time



Rapid Ecological Assessments (REA)

Examine ecological values, conditions and trends across ecoregions to better understand Climate Change and widespread influences on the environment

Improve BLM's ability to effectively work across jurisdictions.



Why take a Landscape Approach?

Secretary Jewell

Secretary Jewell on the Department's Mitigation Strategy



Why take a Landscape Approach?

Is It Because Of Federal Law?

■ FLPMA

- ◇ Inventory natural resource status and conditions
- ◇ Set goals & objectives in LRP
- ◇ Monitor for plan conformance

■ NEPA

- ◇ Identify the effects of a proposed action and reasonable alternatives on the human environment, prior to a decision.
- ◇ Identify alternatives
- ◇ Engage the public in the decision-making process

**NO
CHANGE**

**It is
shifting the
'style' of
doing
business...**

*think 'how' we
meet our
mandates*



Why take a Landscape Approach?



BLM Policy and Guidance

Use of Regional Assessments

- ◇ BLM IM 2013-082
- ◇ BLM IM 2014-125

Climate Change

- ◇ Draft IM

Regional Mitigation

- ◇ Draft MS-1794 – Regional Mitigation Manual Section

Healthy Lands Focal Areas

- ◇ BLM IM 2014-124

Land Health Assessment

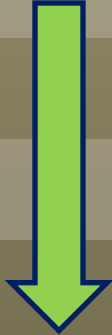
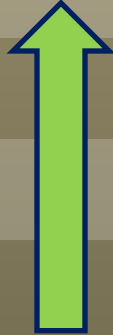
- ◇ 4180 Manual and Handbook

Integrated Veg Mgmt Manual



Why take a Landscape Approach?

Why did BLM wait so long?

Federal Land Management Agencies	Land Area	Budget
DOD	Smallest	Largest
NPS		
FWS		
USFS		
BLM	Largest	Smallest

BLM is a big organization.

BLM is a complex organization.

There are a lot of forces directing us.

BLM began realizing in the 1980's that there are resource issues that local offices could not effectively manage alone.

BLM has been applying a landscape-level approach on various efforts but not as a systematic standard of business.

This concept has gone by other names ...Ecosystem Management, Watershed Management, Others?



Why take a Landscape Approach?



- Support is coming from the Interior Secretary and the general public.
- BLM is now making a concerted effort to integrate landscape-scale into BLM's standard of practice.



What does it mean to take a Landscape Approach?



Looks like
a good
place for
my
project...

You sank
my Sage
Grouse!!



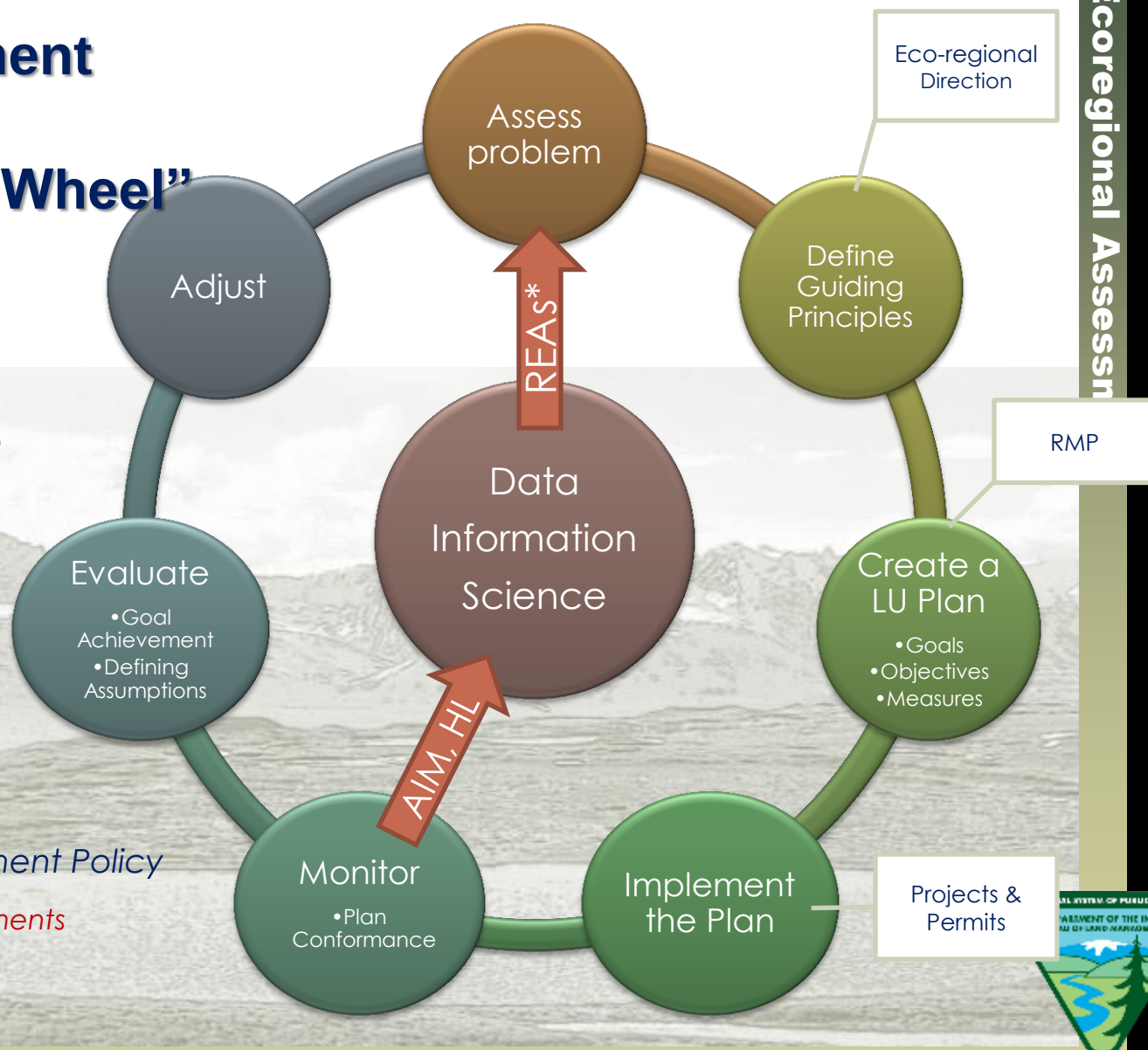
What does it mean to take a Landscape Approach?

It is a Management Framework – **BLM's "Wagon Wheel"**

The landscape approach builds on land management concepts and experiences that have been evolving for 30 years.

*Based on 522 DM 1 –
DOI's Adaptive Management Policy*

**REA + other available assessments*



What does it mean to take a Landscape Approach?

Working Definitions...

LANDSCAPE: "...a large area encompassing an interacting mosaic of ecosystems and human systems that is characterized by a set of common management concerns.

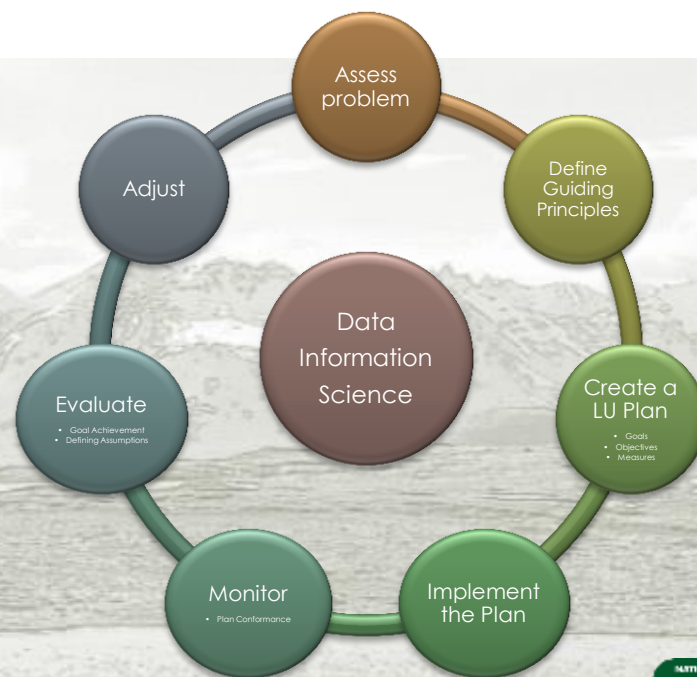
-A Strategy for Improving the Mitigation Policies and Practices of the Department of the Interior



An area of land, usually extensive, that includes physical elements of landforms, landcover, inhabitants, land use, structures, and climate conditions.

APPROACH:

A way of dealing with something.



What does it mean to take a Landscape Approach?

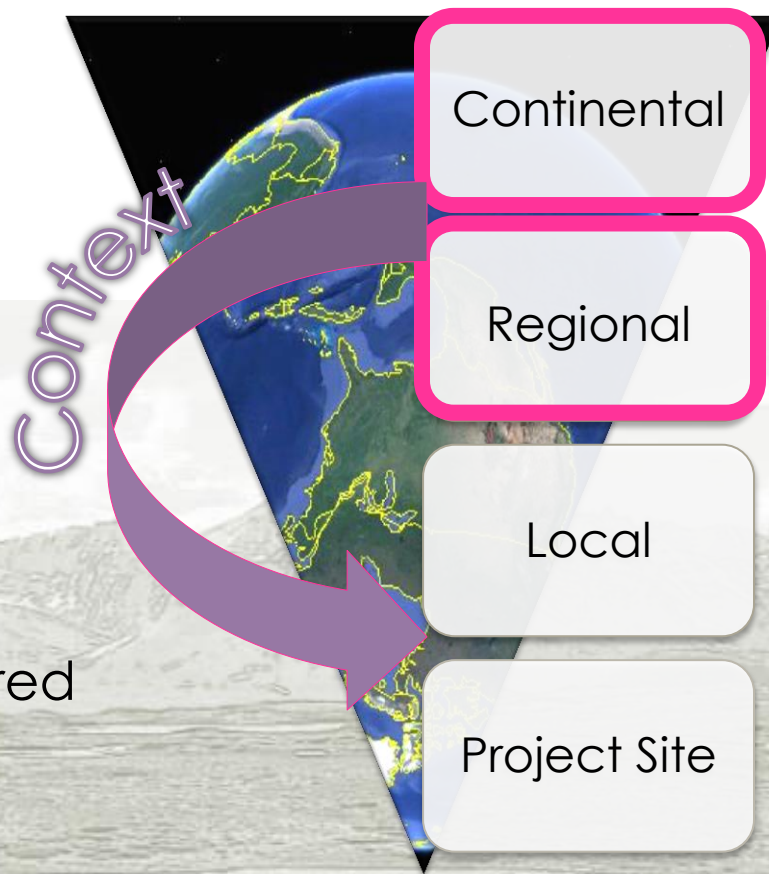
LANDSCAPE-SCALE:

A **spatial extent** that is large enough to understand the scope of an environmental issue. Typically means a continental or regional extent.

Important is the concept of....

NESTED HIERARCHY: A system of organizing by using tiered levels.

- Dominant-Submissive
- Parent-Child
- General-Specific



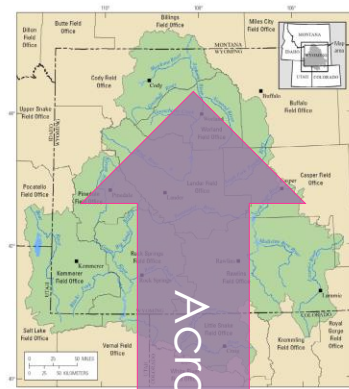
What does it mean to take a **Scale** Landscape Approach?

By Ecological subject matter

(Examples-general to specific-related by space)

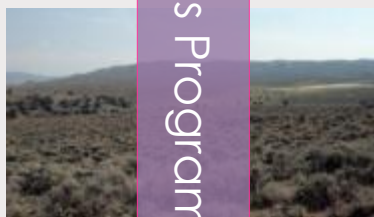
Ecoregions

***REAs use this!**
EPA Region III



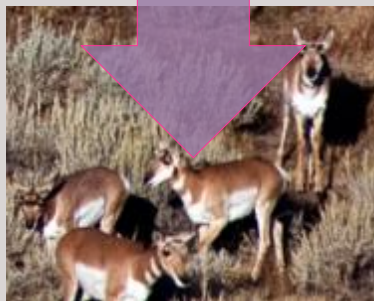
Water-sheds

***REAs use this!**
HUC



Animal or Plant life
(ecosystem ↔ community
↔ population ↔ organism)

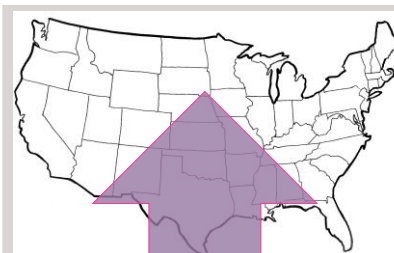
***REAs use this!**
Indicator species



By BLM Geo-political

(Examples-parent to child)

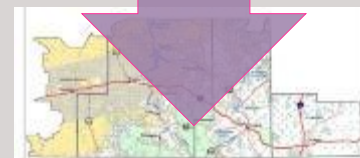
National



State/District



Field Office



What does it mean to take a Landscape Approach?

An important distinction...

Landscape Approach **Vs.** Landscape-scale

A management process to consider environmental matters at higher system-levels and sub-system levels in order to gain a broader context for making management decisions and taking actions.

Management perspective.

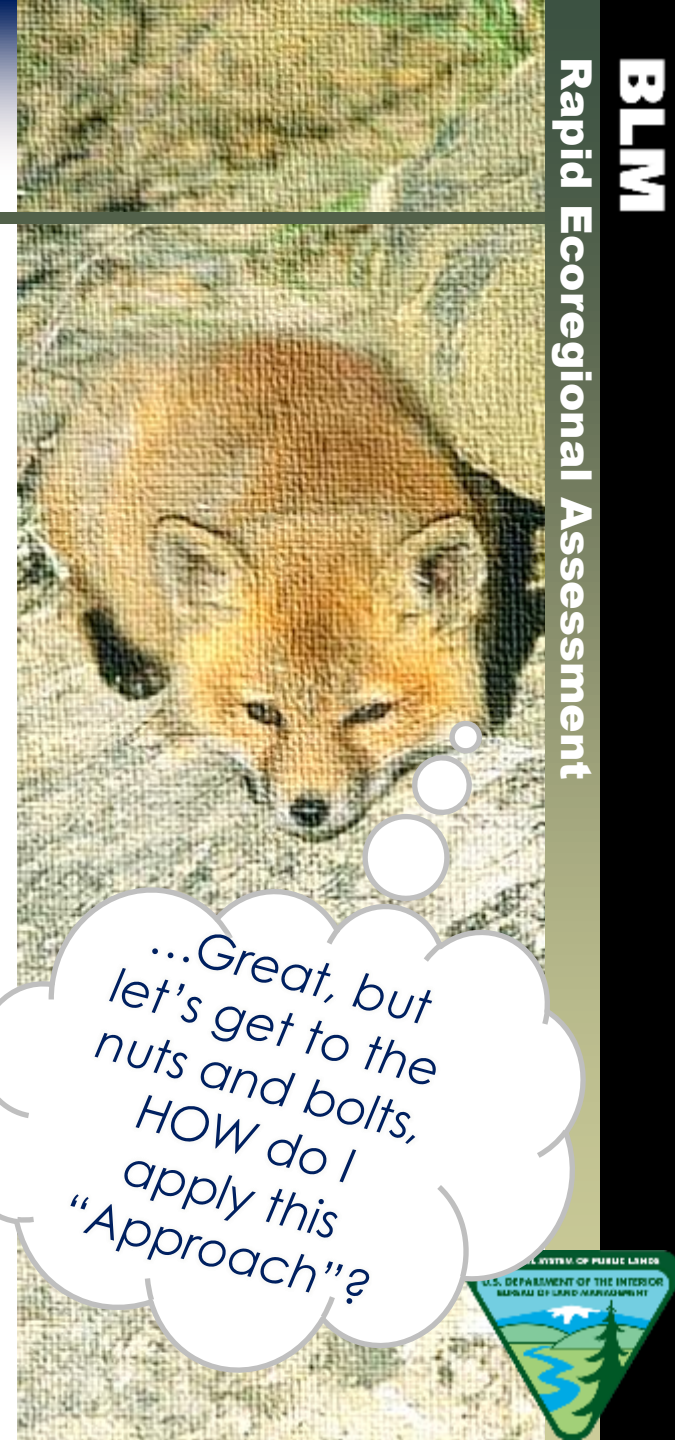
A spatial extent that is at an appropriate system level to understand a particular environmental issue.

Assessment perspective.

What practical value is gained from a Landscape Approach and REAs?

Seek to understand issues within a big enough context to set priorities & steer effectively... *Think in systems*

- △ What is important?
 - △ This sets direction for the future
 - △ Value-based (*WHO needs to be involved?*)
- △ What information do I have & need?
 - △ Foundation for understanding what needs done
 - △ Basis to identify the risks/threats & options to reduce those risks.
- △ What planning decisions need to be made?
 - △ line of attack, action plans and budgets.



What practical value is gained from a Landscape Approach and REAs?

Let's go through a simple example of the process together

	Career choice
What is important? What is the guiding vision?	<u>Strengths</u>—Good at, enjoy, & have a competitive advantage <u>Weaknesses</u>—Bad at <u>Values</u> —what is an important part of who you are that if not taken into account there is little chance of career satisfaction? <u>Expectations</u>— Salary levels (entry, mid-point and end), work environment (office or field, urban or rural, etc.) life-style (home-body vs. jetsetter), lifecycle (learning vs. earning)
What information do I have & need?	<u>Have:</u> Self-knowledge (school grades, aptitudes, successes & struggles) <u>Need:</u> options—what careers fit? Outlook for future demand, how options measure-up to “what is important”. (coarse-scale) Also short-term compare “best” schools, cost, locations, potential to get paid-work, housing, culture, overall vibe (City/school scale)
What planning decisions need to be made?	<u>Line of attack:</u> 1) Get missing information 2) assess options, 3) choose direction, 4) assess schools w/ realities of living and money constraints, 5) choose school, 6) scope-out potential employers, 7) make applications, 8) launch <u>Budget Plan:</u> Earn good grades for financial aid, seek employer who helps pay for school
What monitoring will be required?	Am I tapping into my strengths? Do I feel satisfied in with my work? Am I competitive? Am I earning what I thought by the time I thought?

What practical value is gained from a Landscape Approach and REAs?

Multi-scale decision making

Do you see how this approach helps identify what you need to know at each level of planning? (hone-in management questions or steering solutions as appropriate)

Career: Law vs. Science (for instance)

Company: Government vs. Private

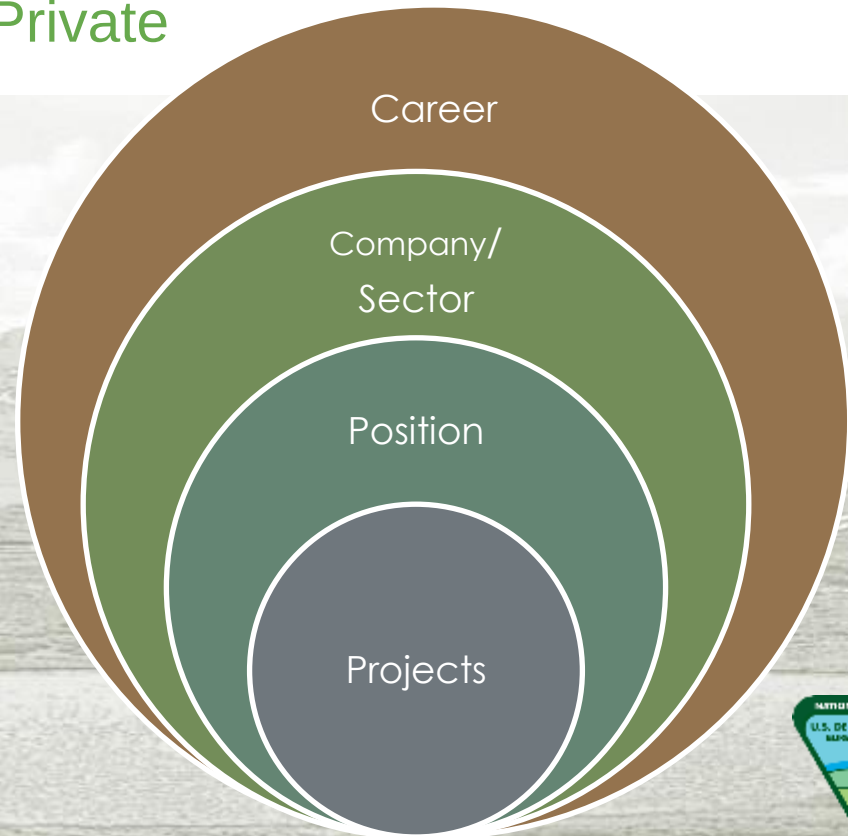
- size (chance for internal mobility)
- reputation
- regional office locations

Position: Technical vs. Mgt.

- requirements (KSAs)
- chances to advance
- compensation level
- work environment

Projects:

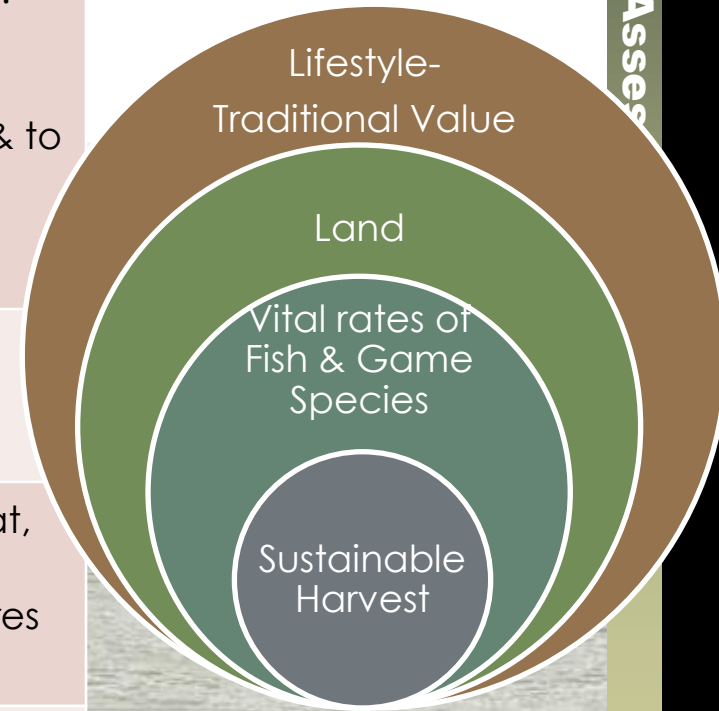
- variety of assignments
- application of skills



What practical value is gained from a Landscape Approach and REAs?

Do you see how this could be used for land management issues?

	Sustainable Subsistence in AK
What is important? What is the guiding vision?	<u>Strengths</u>— What forces are working to continue practicality of subsistence in AK? <u>Weaknesses</u>— What are the threats to subsistence? <u>Values</u> — Why is subsistence important & to who? <u>Expectations</u>— Lifestyle? Economic? Ecological sustainability?
What information do I have & need?	<u>Have:</u> Trend & condition info <u>Need:</u> Are the threats understood? (Be sure to know what hierarchal level!)
What planning decisions need to be made?	<u>Line of attack:</u> who, when, where, what, and how <u>Action Plan:</u> Goals, Objectives, Measures <u>Budget Needs:</u>
What monitoring will be required?	Of plan objectives. Of expectations. Of values



What practical value is gained

from a Landscape Approach and
REAs?

Value Added?

- Increase confidence in identifying “high priority” areas for monitoring, interventions, and steering activities
- Clear understanding of system interdependencies to better predict what reactions are likely from steering activities—up & down the hierarchy levels
- Broader body of evidence to back priority-settings
- Gain support for placing resources efficiently to perform effective interventions.
- Compete for internal and external funding sources

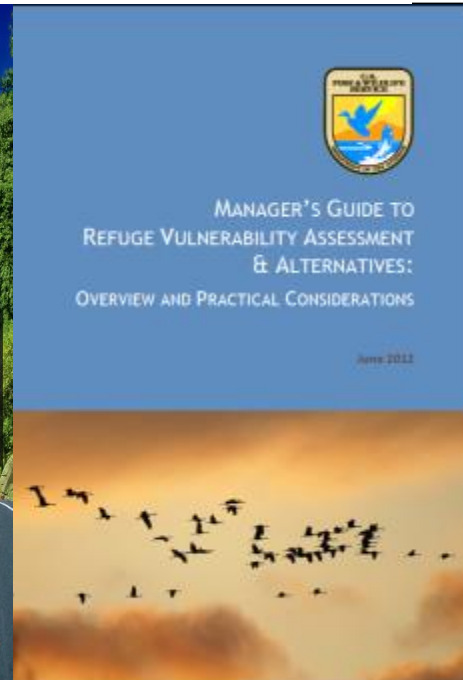
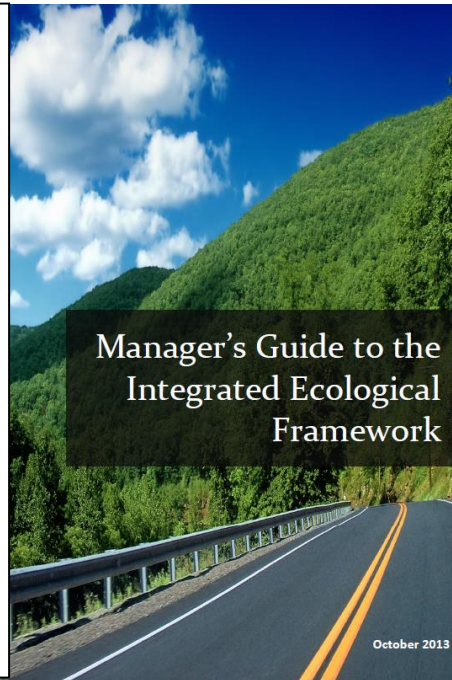
BLM is not the first to recognize the need for taking a broad-scale landscape approach to land management. Others are doing this approach...



Taking a Broader Landscape Approach

A Policy Framework for Modernizing Ontario's Approach to Natural Resource Management

Spring 2013
Ontario Ministry of Natural Resources



Landscape Stewardship Guide



NAASP
Northeastern Area Association of State Foresters

U.S. Department of Agriculture
Forest Service
Northeastern Area State and Private Forestry
Newtown Square, PA

NA-IN-05-11
September 2011
www.na.fs.fed.us



What practical value is gained from a Landscape Approach and REAs?

Overview of Proposed Framework

The table below provides an overview of the proposed framework, including goals, elements and a checklist of considerations to be used in applying management approaches to broader landscape

GOALS FOR MOVING TO A BROADER LANDSCAPE APPROACH				
1. Adopt a modern and sustainable approach to managing Ontario's natural resources by managing over broader areas and longer time periods. 2. Support, enable and advance ecosystem-based landscape management approaches in Ontario over time.				
ELEMENTS OF THE PROPOSED FRAMEWORK				
<i>Element 1: Manage at appropriate scales</i>	<i>Element 2: Integrate and coordinate</i>	<i>Element 3: Assess, manage, and mitigate risk</i>	<i>Element 4: Focus science and information resources</i>	<i>Element 5: Manage adaptively</i>
CONSIDERATIONS				
I. Where appropriate, use ecological functions and structures (e.g. natural disturbance patterns, watersheds, species distribution) to help identify ecologically meaningful scales of management II. Seek economies of scale in management effort and cost	III. Coordinate and integrate across programs and align resources relative to natural resource management priorities IV. Ensure clear policy and legislative guidance V. Leverage and coordinate with the work of others	VI. Use risk assessment techniques to prioritize management efforts VII. Use a standard risk management framework to assess, manage and mitigate risk VIII. Recognize that finer-scale, more detailed management effort may sometimes be necessary within a broader management approach	IX. Focus research and monitoring priorities on supporting management efforts at appropriate scales X. Effectively manage and utilize science and information, including expert and traditional knowledge XI. Continue to develop and use tools to support decision-making at larger scales	XII. Review the effectiveness of management strategies over time XIII. Identify knowledge gaps and uncertainties

(Fireside) Chat with David Wood



THE REA APPROACH

Landscape Approach

Issues and Questions?



Training Goals

- Understand how results are organized and interpreted in REA Documents
- Know what data is available from the REAs
- Access data through REA data portal and Citrix
- Reproduce results with updated datasets using provided models
- Identify issues or projects where multi-office coordination would be appropriate

Project Team

University of Alaska

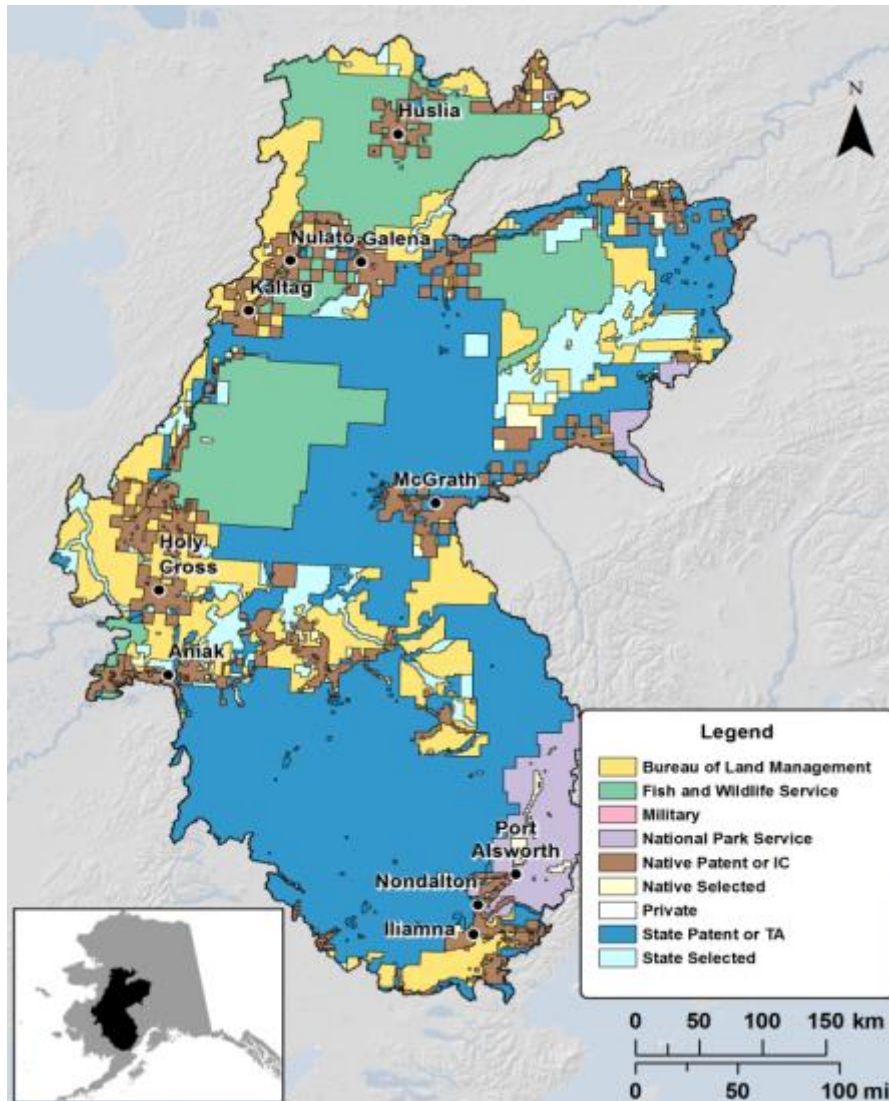
- Alaska Center for Conservation Science
 - Alaska Natural Heritage Program (AKNHP - UAA)
- Institute of Social and Economic Research (ISER - UAA)
- Scenarios Network for Alaska & Arctic Planning (SNAP - UAF)
- Margaret J King & King & Associates

Bureau of Land Management

- National Operation Center (NOC)
- Alaska State Office
- Anchorage Field Office
- Central Yukon Field Office



Land Status



Owner/Management Agency	Area in Sq. Km.	% of Study Area
Bureau of Land Management	35,572.58	15.41%
US Fish & Wildlife Service	39,937.81	17.3%
Military	169.56	0.07%
NPS	9,290.04	4.02%
State Patent or TA	100,331.62	43.46%
State Select	15,086.17	6.53%
Native Patent or IC	27,494.35	11.91%
Native Select	2,958.54	1.28%
Private	31.1	0.01%
Total	230,871.76	100%

Assessment Management Team and Technical Team

- **BLM**

- Alaska State Office
- Anchorage Field Office
- National Operations Center
- Central Yukon Field Office
- Fairbanks District Office
- Oregon

- **FWS**

- Innoko NWR
- Koyukuk/Nowitna NWR
- Northwest Boreal LCC

- **USGS**

- Alaska Science Center

- **NPS**

- Arctic Network
- Southwest Alaska Network

- **State of Alaska**

- Department of Natural Resources



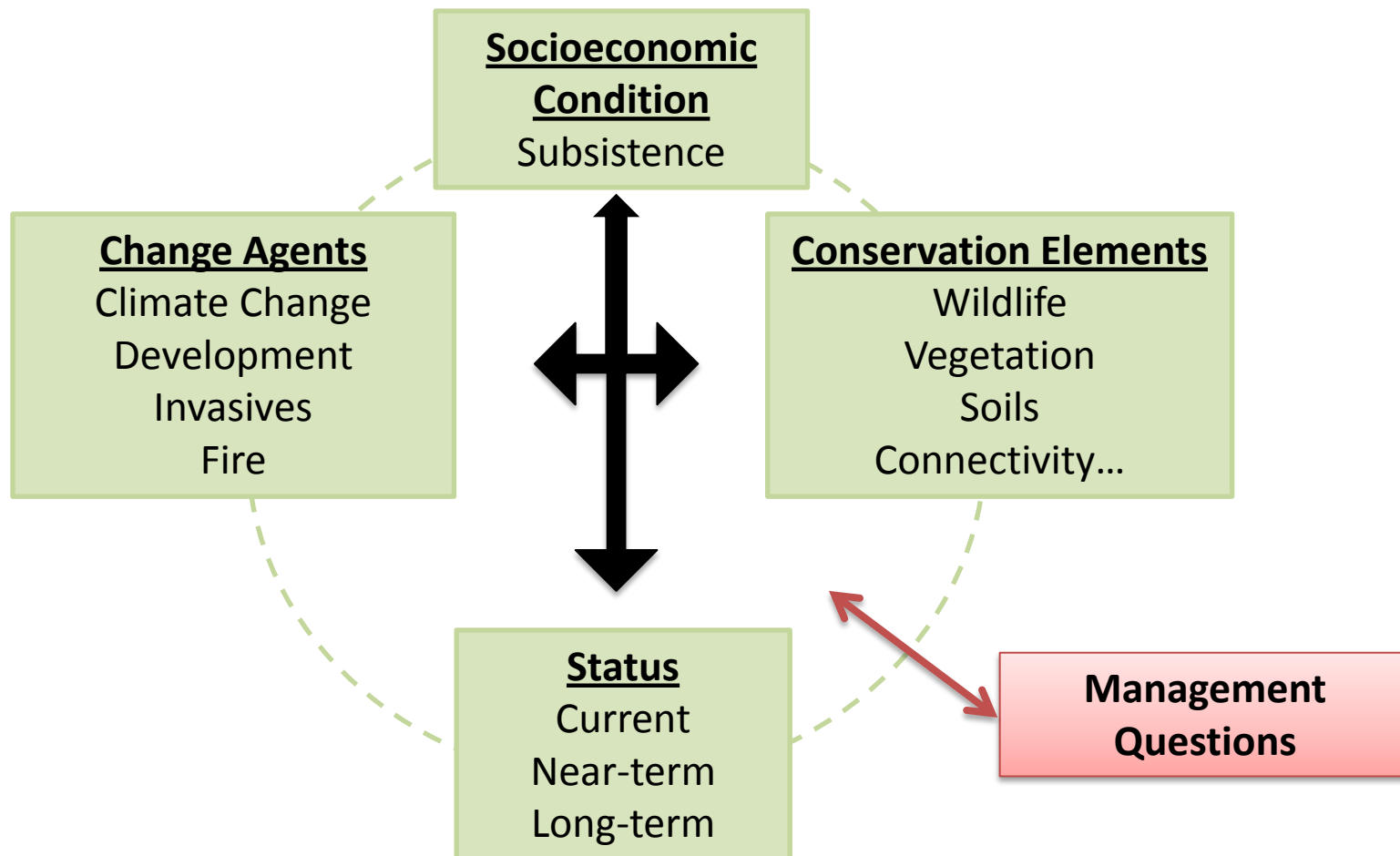
Land Owners and Stakeholders

- 3 Community Meetings
 - Galena
 - Newhalen
 - Anaik
- Periodic Newsletters to all Regional Stakeholders



What is an REA?

An REA is a rapid assessment of an ecoregion's Conservation Elements, the Change Agents that impact them, and their current and future status.



REA Limitations

- Limited to existing geospatial datasets
- Identify data limitations and deficiencies
- Focus on management questions
- Geoprocessing emphasis on ModelBuilder and Python Scripts
- Easily repeatable processes



REA COMPONENTS

Core REA Analysis

- Where are CEs currently distributed?
- What is the current status of CAs?
- Where might CEs occur in the near-term and long-term future?
- Where might CAs differ in the near-term and long-term future?
- Where do CEs and CAs overlap in the near-term and long-term future?

Timeframes

- Current: understanding of current resource distribution or status
- Near-Term Future: modeling from broad landscape perspective to understand potential conditions in 2025
- Long-Term Future: modeling from broad landscape perspective to understand potential conditions in 2060



Selecting Conservation Elements and Change Agents: Integration of Management and Science

Management Question Tract

Identify regional needs of resource managers



- What physical and perceptual limitations to access to subsistence resources by local residents are caused by oil/gas activities?
- How will changes in precipitation, evapotranspiration, and active layer depth alter summer surface water availability in shallow-water and mesic/wet tundra habitats and how reliable are these projections?



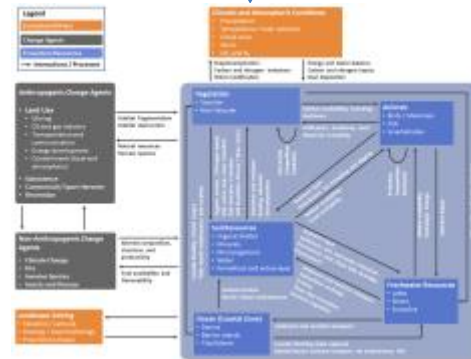
Identification of CEs and CAs that are significant for resource managers



Management and ecosystem-derived CEs and CAs are integrated to create a final suite for consideration by the AMT.

Science/Ecosystem Tract

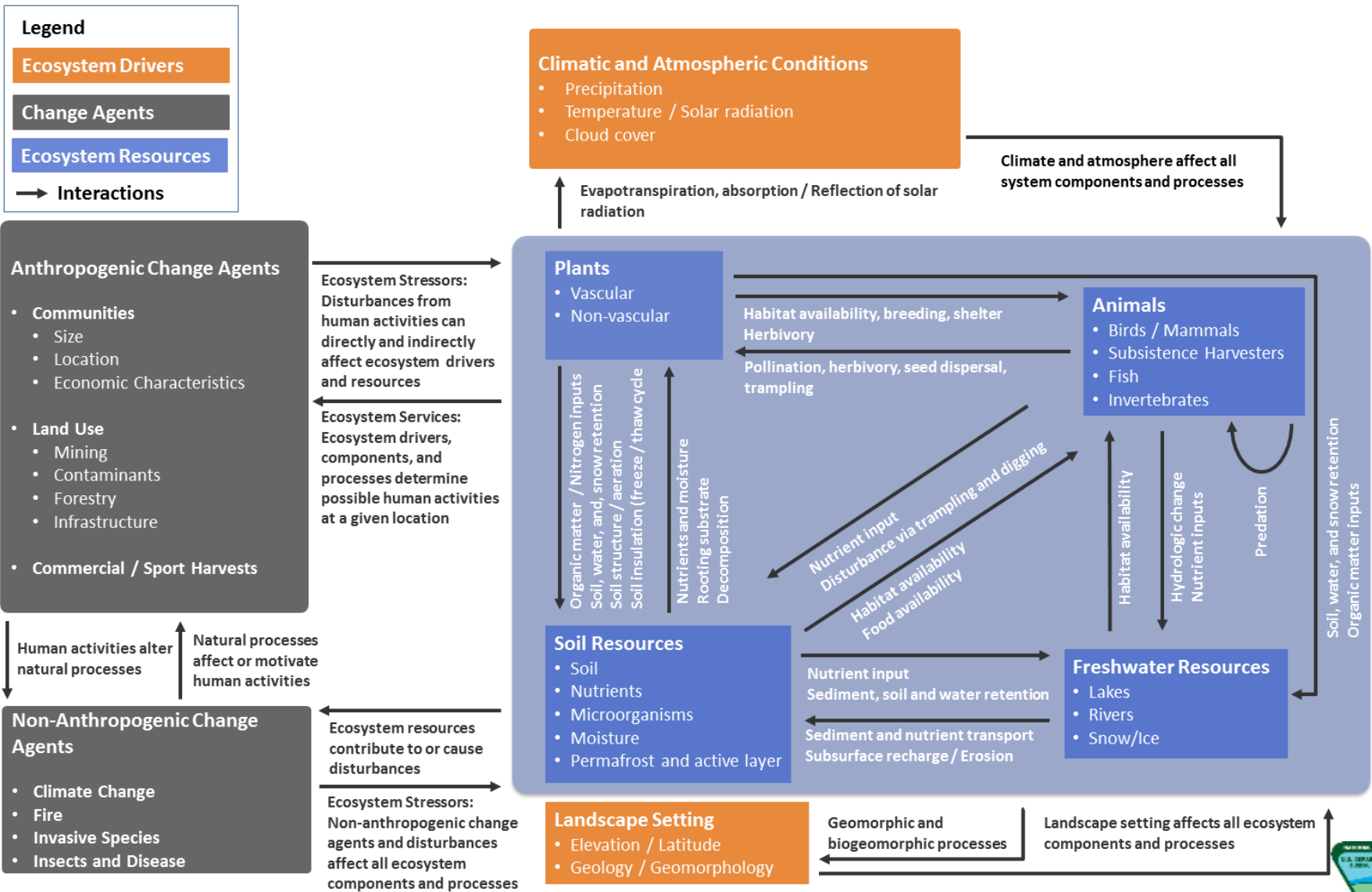
Develop an understanding of critical ecosystem components, processes, and interactions necessary for maintenance of sustainable ecosystems



Identification of regionally significant CEs and CAs integral to model



Ecoregional Conceptual Model



Management Questions / Needs

- Ecoregional assessment is **guided and focused** by Management Questions
- Identify **regional** issues faced by land and other resource managers
- Provide a clear direction; **focus** the work effort
- Identify **data needs** and provide context to issues; avoid collecting irrelevant data



Change Agents

Features or phenomena that have the potential to affect size, condition, and landscape context of CEs

Fire



Invasive Species



Insect and Disease



Permafrost



Development



Change Agents

Climate Change

Fire



Permafrost



Alaska Climate Research Center

Pest and Disease

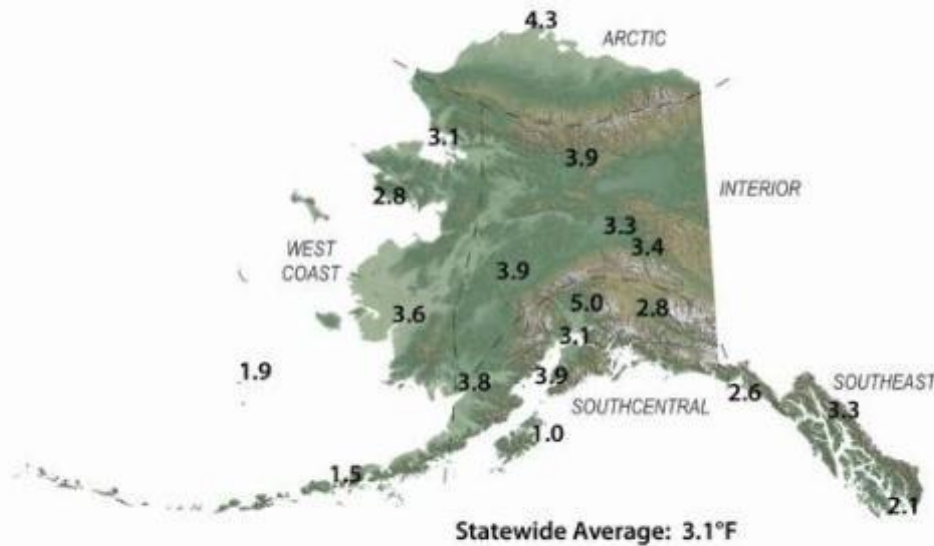


Sea Level Rise



Geophysical Institute, University of Alaska Fairbanks

Total Change in Mean Annual Temperature (°F), 1949 - 2008



Conservation Elements

- **Conservation Elements (CEs)** are biotic constituents (i.e. wildlife and plant species or assemblages) or abiotic factors (i.e. soils) of regional importance in major ecosystems and habitats across the ecoregions
- Selected CEs are meant to represent key resources so that the collective group of conservation elements serves as a tool to assess ecological integrity



Conservation Elements

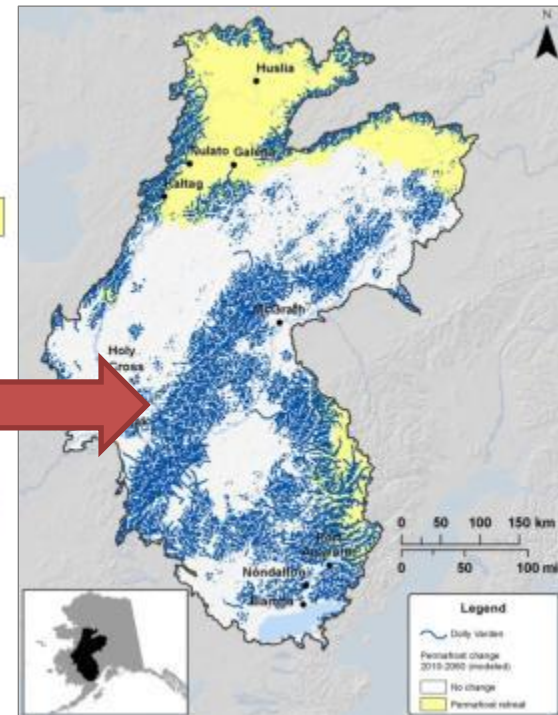
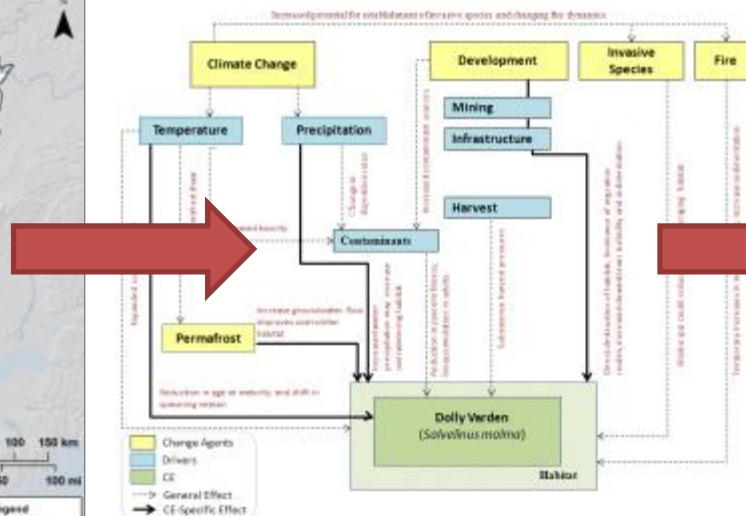
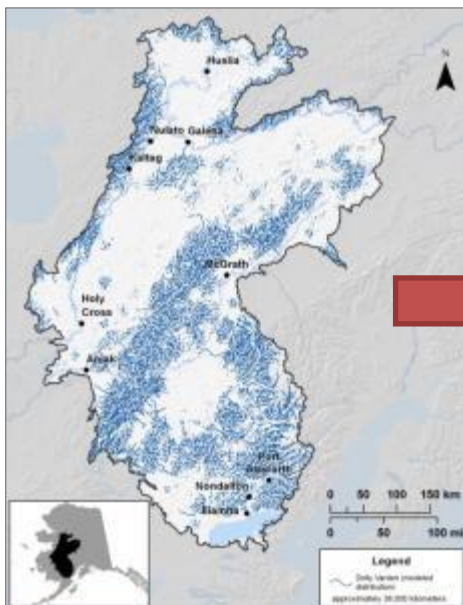
Coarse-Filter = regionally significant terrestrial vegetation and aquatic ecosystems that represent dominant ecological patterns



Fine-Filter = species or species assemblages that represent critical ecosystem functions and services

Core CE Analysis

1. Current Distribution
2. Conceptual Model
3. Attributes and Indicators
4. Intersect the distribution of each CE with most important CA variables



Terrestrial Coarse-Filter CEs

Conservation Element (CE)
Deciduous forest
Dwarf shrub (mesic)
Large floodplains
Herbaceous wetlands
Low shrub
Tall shrub
White spruce or black spruce



Aquatic Coarse-Filter CEs

Connected Lakes

Important breeding habitat for aquatic insects, fish, waterbirds and shorebirds and provide subsistence and recreational use

Disconnected Lakes

Important breeding habitat for aquatic insects, fish, waterbirds and shorebirds; flood storage, groundwater regeneration; invertebrate and waterfowl habitat

Streams

High stream connectivity in the summer, important spawning, rearing, and overwintering habitat

Terrestrial Fine-Filter CEs

Conservation Element (CE)

Moose

Caribou

Muskox

North American beaver

Gray wolf

American peregrine falcon

Trumpeter swan

Olive-sided flycatcher



Aquatic Fine-Filter CEs

Chinook Salmon



Northern Pike



Chum salmon



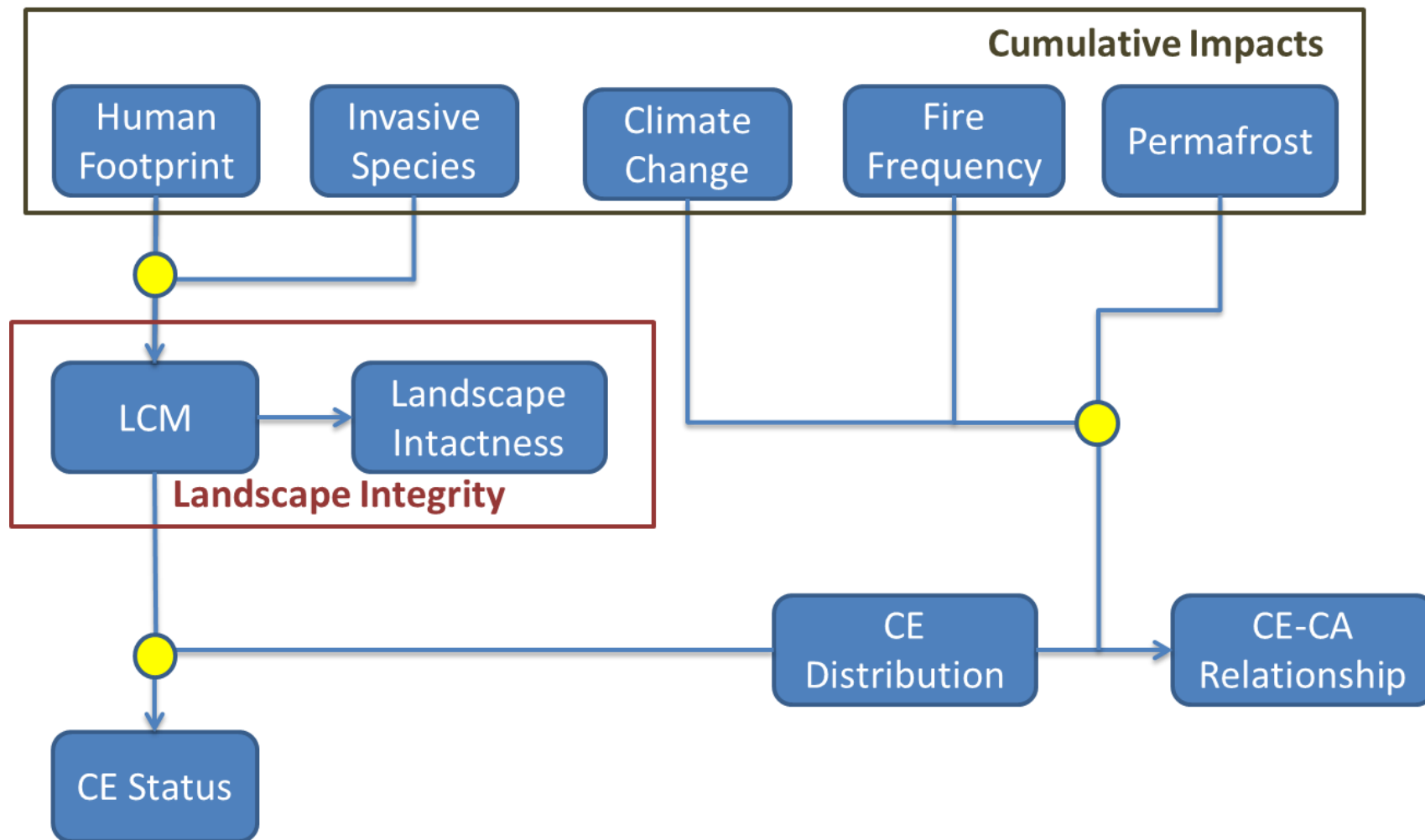
Dolly Varden



Sheefish



Integrated Products



DIFFERENCES: SNK vs YKL



SNK vs YKL Approaches

32 Coarse-Filter CEs

56 Fine-Filter CEs

10 Coarse-Filter CEs

13 Fine-Filter CEs

SNK: Many CEs and MQs assessed, more broad/low detail

YKL: Fewer CEs and MQs assessed, high detail, CE conceptual models and A&I, MQ process models

AKNHP was a subcontractor for the initial phase of the SNK only and cannot answer questions related to interpretation

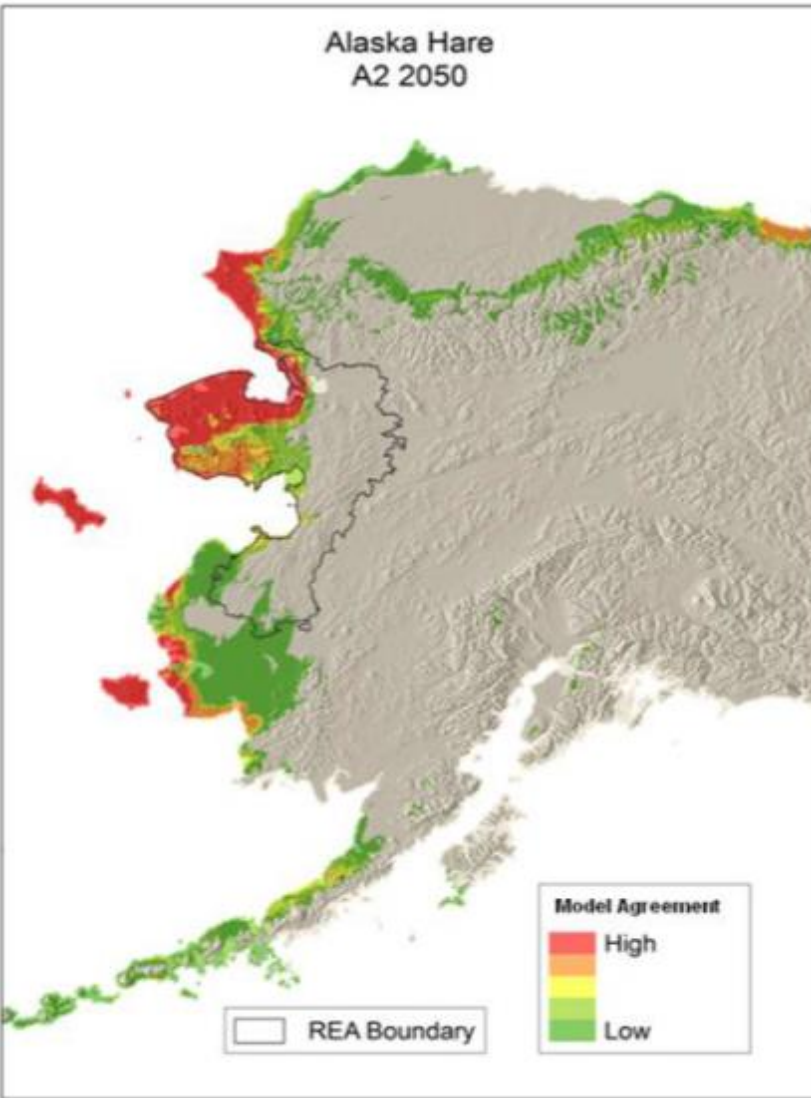


SNK vs YKL Approaches

- The SNK used more of a cookie cutter approach for REAs vs. using Alaska specific parameters for the integrated products
 - We have refined the LCM for the YKL REA
 - We developed a Cumulative impact model to integrate all CAs to help REA users interpret and synthesize the data

Bioclimatic Envelopes in SNK

Alaska Hare
A2 2050



- Areas in red are where 5 out of 5 models agree that suitable habitat will occur in 2050
- Areas in green are supported by only one model

This type of analysis not included in YKL

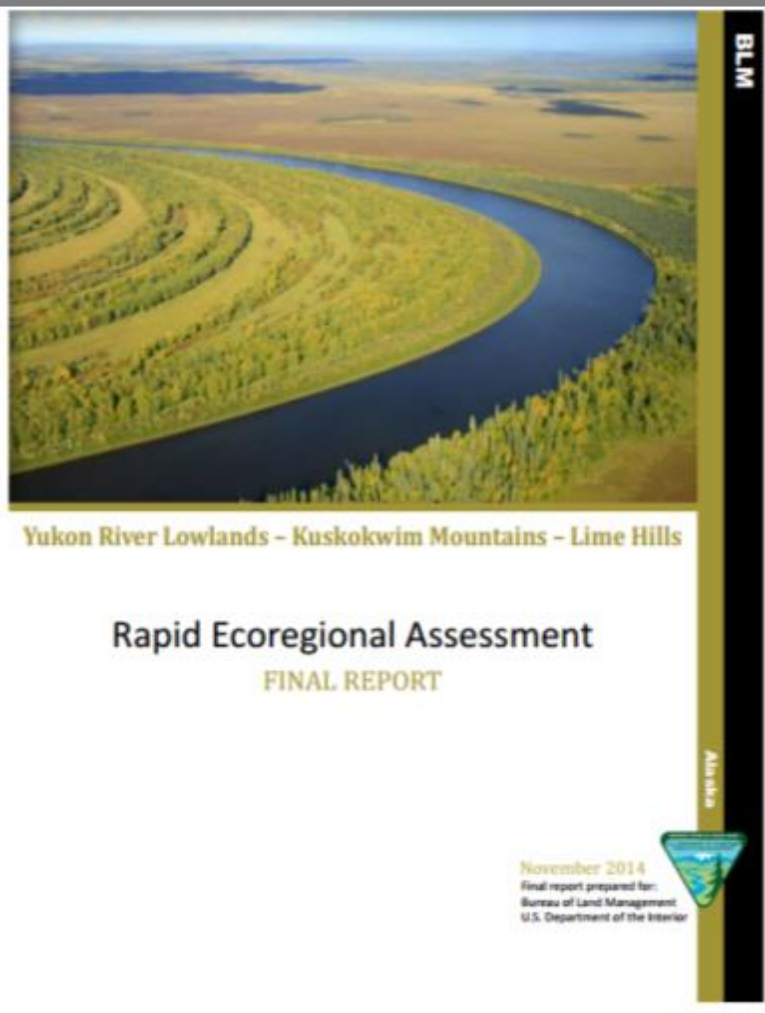
PREREQUISITE QUESTIONS

**Yukon River Lowlands – Kuskokwim Mountains –
Lime Hills Rapid Ecoregional Assessment
Technical Supplement**



Technical supplement to the final report prepared for:
Bureau of Land Management
U.S. Department of the Interior

July 2014



OVERVIEW OF DOCUMENTS

Final Documents

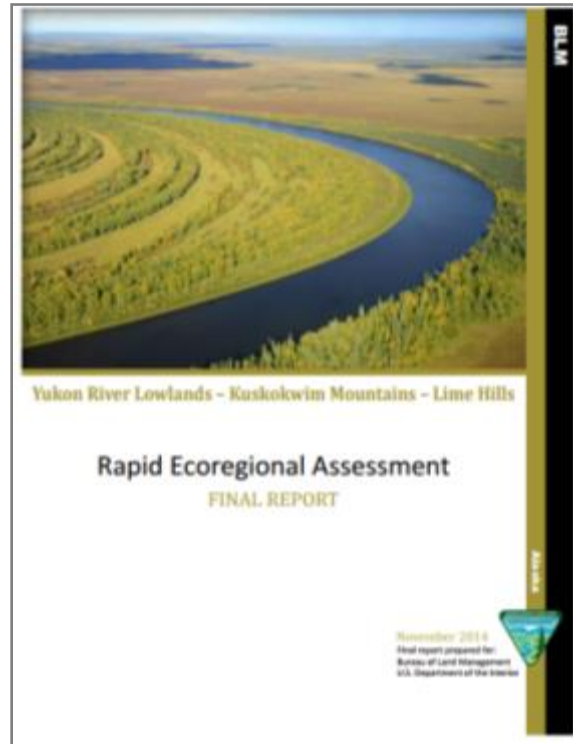
Executive Summary:
Take Home Messages
Major Data Gaps
Case Studies

Yukon River Lowlands – Kuskokwim Mountains –
Lime Hills Rapid Ecoregional Assessment
Technical Supplement



Technical supplement to the final report prepared for:
Bureau of Land Management
U.S. Department of the Interior

July 2014



Technical Supplement
Detailed Methods
Detailed Results
Management Questions
Limitations and Detailed Data Gaps

Executive Summary

1. Introduction

- 1.2 Report Structure
- 1.3 Study Area
- 1.4 REA Approach

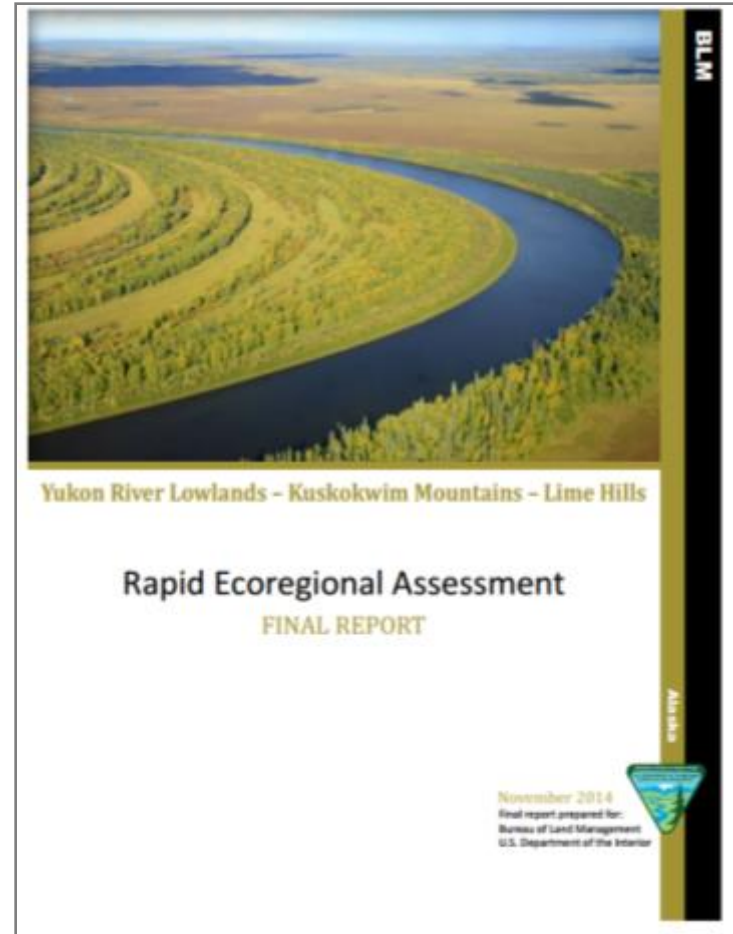
2. Baseline

- 2.1 Baseline Datasets
- 2.2 Data Discovery
- 2.3 Baseline Data Creation

3. Landscape Change

- 3.1 Conceptual Models
- 3.2 Quantifying Change
- 3.3 Landscape Change Summary

4. Future Opportunities



Technical Supplement Section A

BLM

Rapid Ecoregional Assessment

Introduction to the Technical Supplement



- What is a Rapid Ecoregional Assessment?
- Description of Rapid Ecoregional Study Area
- Assessing Current Conditions
- Projecting Future Landscape Condition
- Assumptions and Limitations



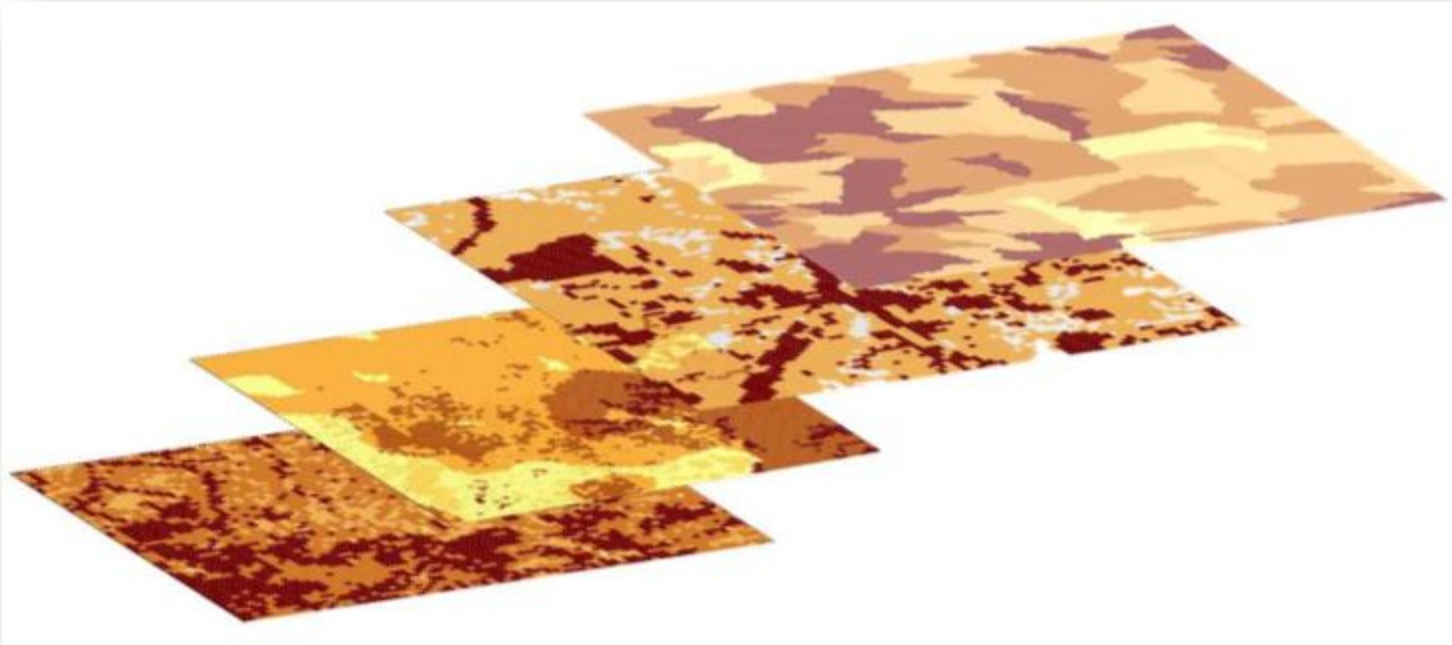
Technical Supplement Section B



Change Agents

- Climate
- Fire
- Soil Thermal Dynamics
- Invasive Species
- Anthropogenic Agents

Technical Supplement Section C



Landscape and Ecological Integrity

- Introduction
- Landscape Condition
- Landscape Integrity
- Cumulative Impacts

Technical Supplement Section D



Conservation Elements

- Terrestrial Coarse-Filter CEs
- Terrestrial Fine-Filter CEs
- Aquatic Coarse-Filter CEs
- Aquatic Fine-Filter CEs



Technical Supplement Section E

Data Gaps and Omissions



- Data Gaps
- Omitted Management Questions

Overview of Structure

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1.2. Methods.....	B-4
1.3. Results.....	B-10
1.4. Climate Clusters (Cliomes)	B-37
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CHANGE AGENT DATASETS

Climate Change

Climate Change (CL)

Precipitation

Temperature

Snow Day Fraction

Day of Thaw

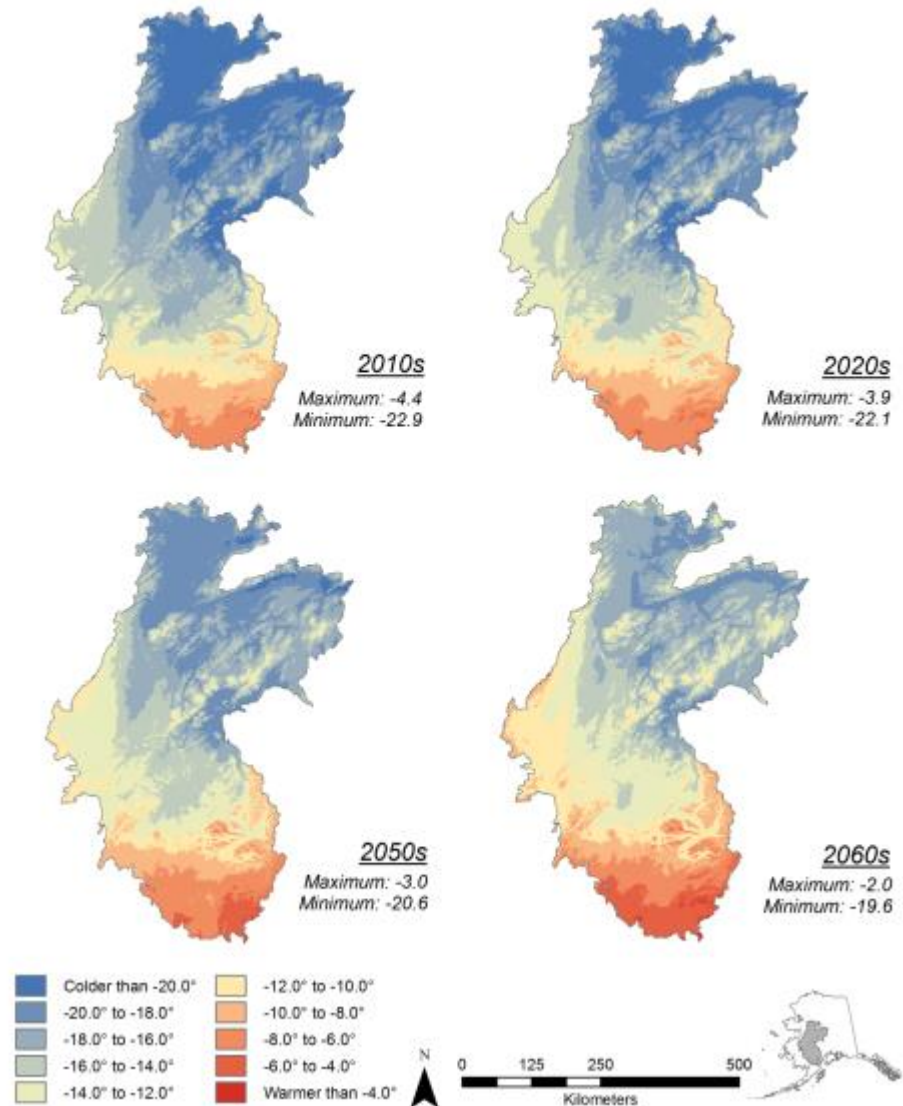
Day of Freeze

Length of Growing

Season

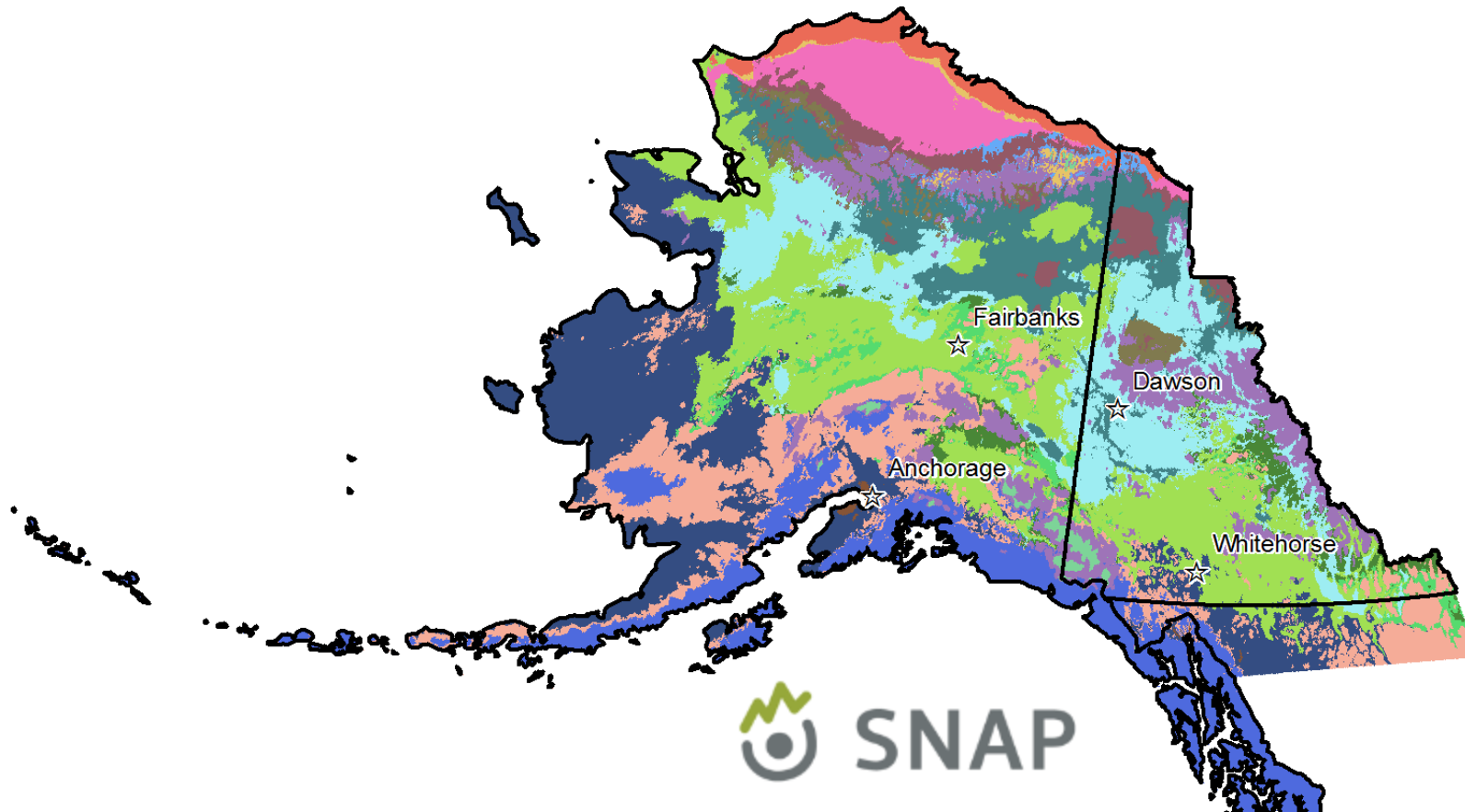
Climates

January Temperatures (°C): A2 Scenario



Cliomes

Clustering creates groupings of similar climate in a statewide ecological context, allowing for simultaneous consideration of multiple climate variables and projections of how climate change may cause these patterns to shift.

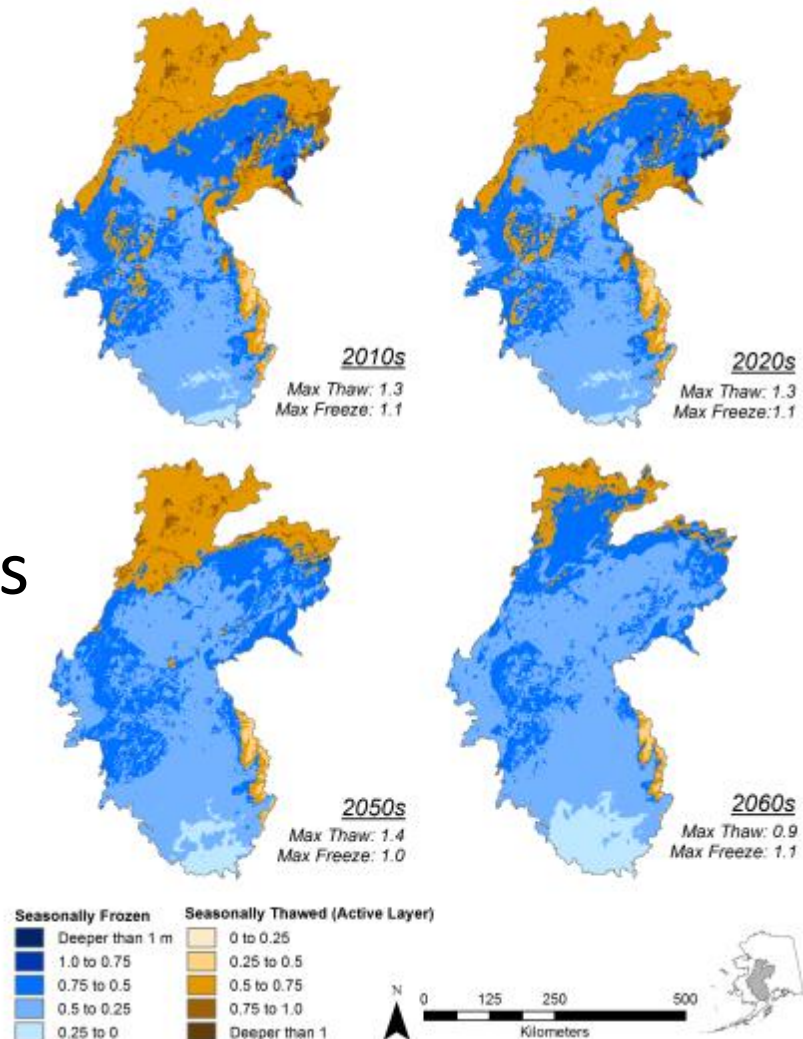


Permafrost

Permafrost (PF)

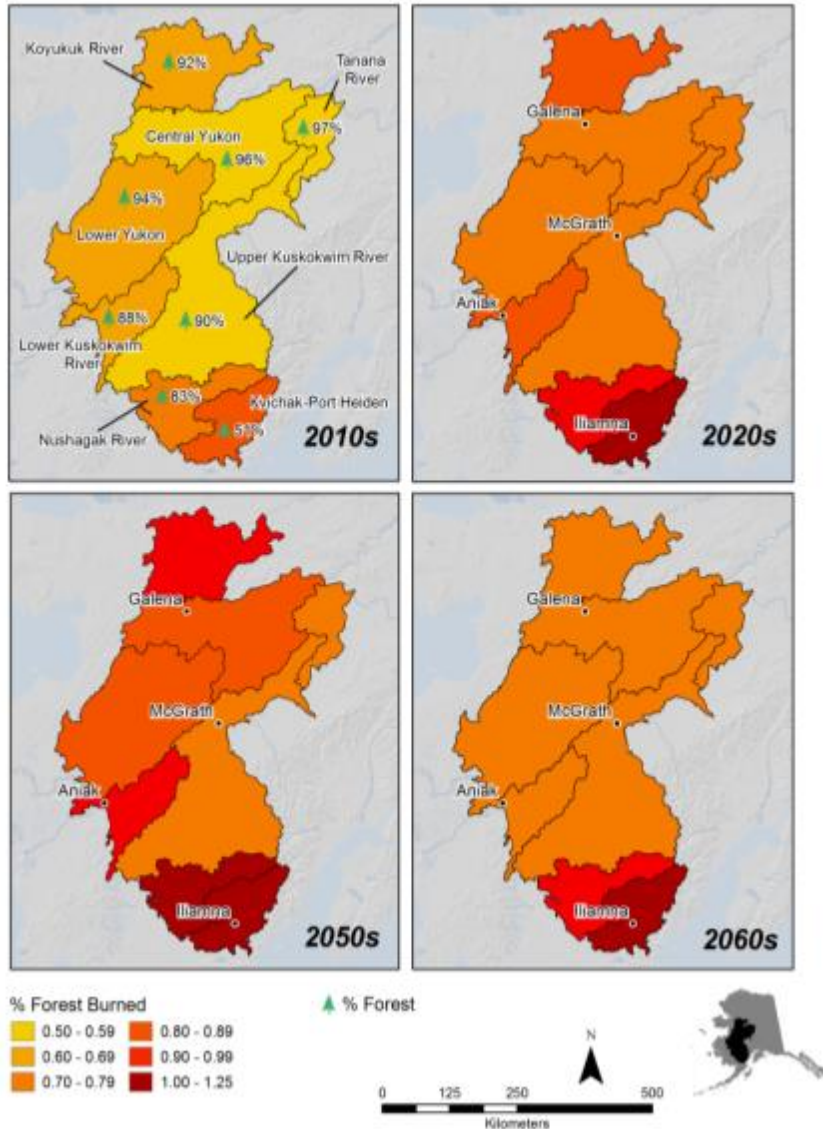
Active Layer Thickness
Mean Annual Ground
Temperature
Change from continuous
to discontinuous

Active Layer and Seasonally Frozen Layer Thickness (m)



Fire

ALFRESCO Boreal Fire Statistics: Decadal Annual Area Burned



Fire (FI)

Historic Fire Scar
Percent Burn
Return Interval

Invasive Species

Invasive Species (IV)

Current Infestations

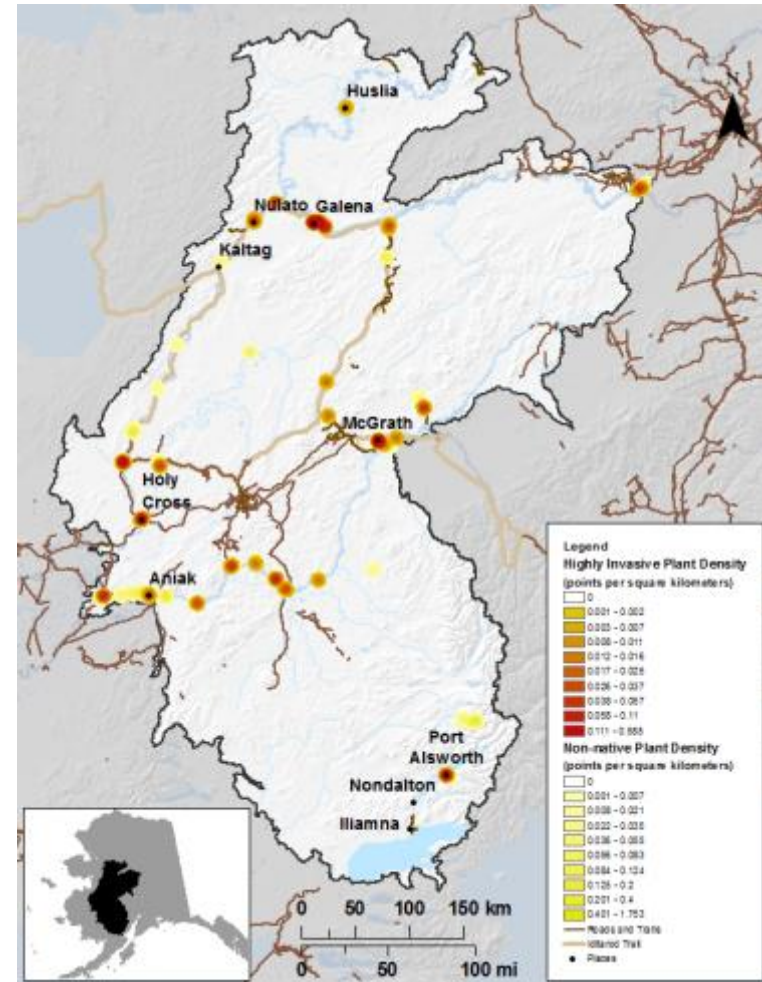
Infestation Vulnerability

MQ 29: Insect and Disease*

Forest Damage

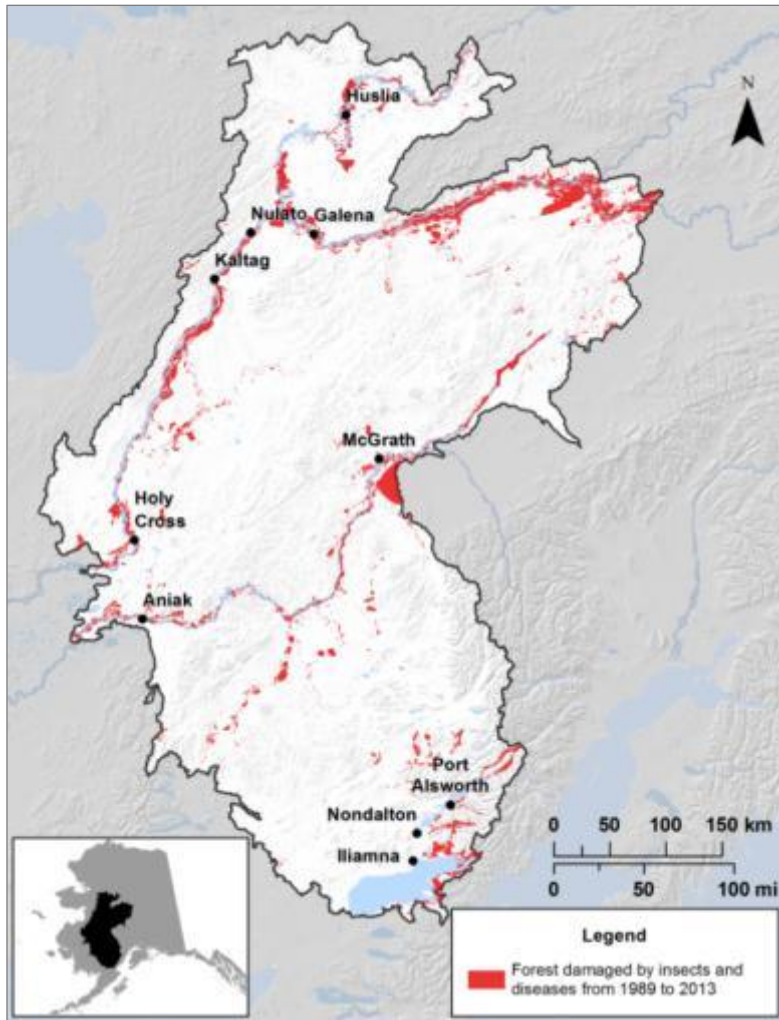
Spruce Beetle Damage

Flight Paths

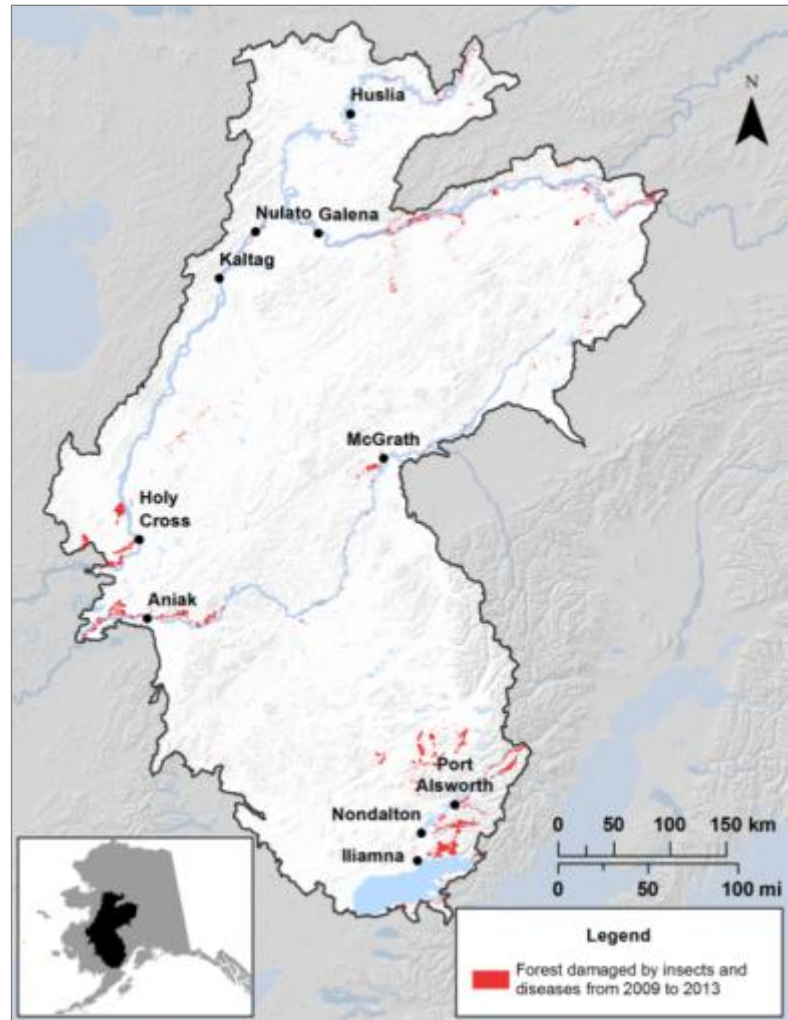


*Insect and Disease damage not modeled into future

Insect and Disease Damage



Forest Damage 1989 to 2013



Forest Damage 2009 to 2013

Development Data

Development (DV)

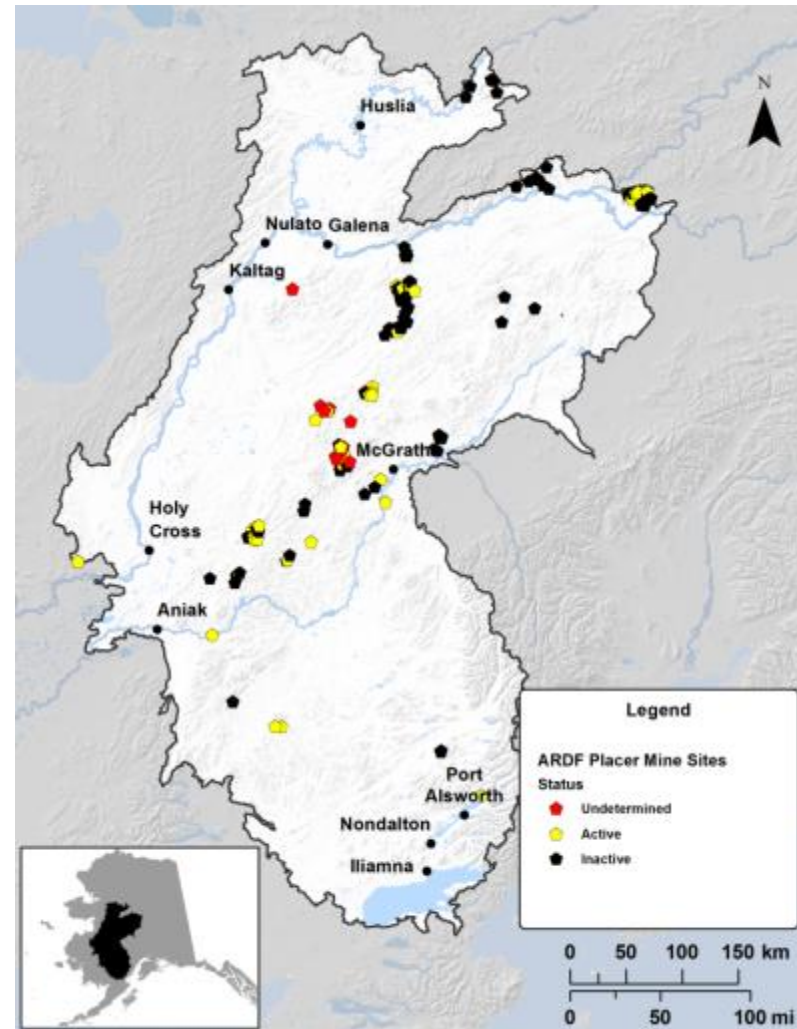
Communities

Transportation

Communication

Renewable Energy

Mining



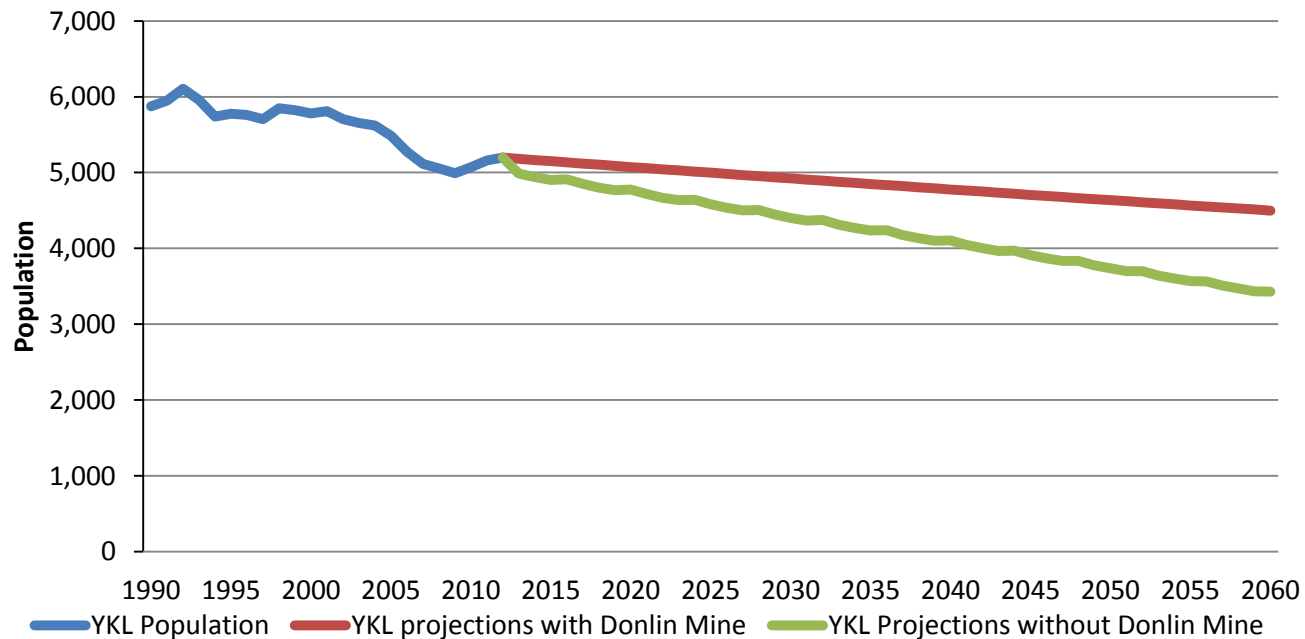
Socioeconomic Data

Socioeconomic (DV)

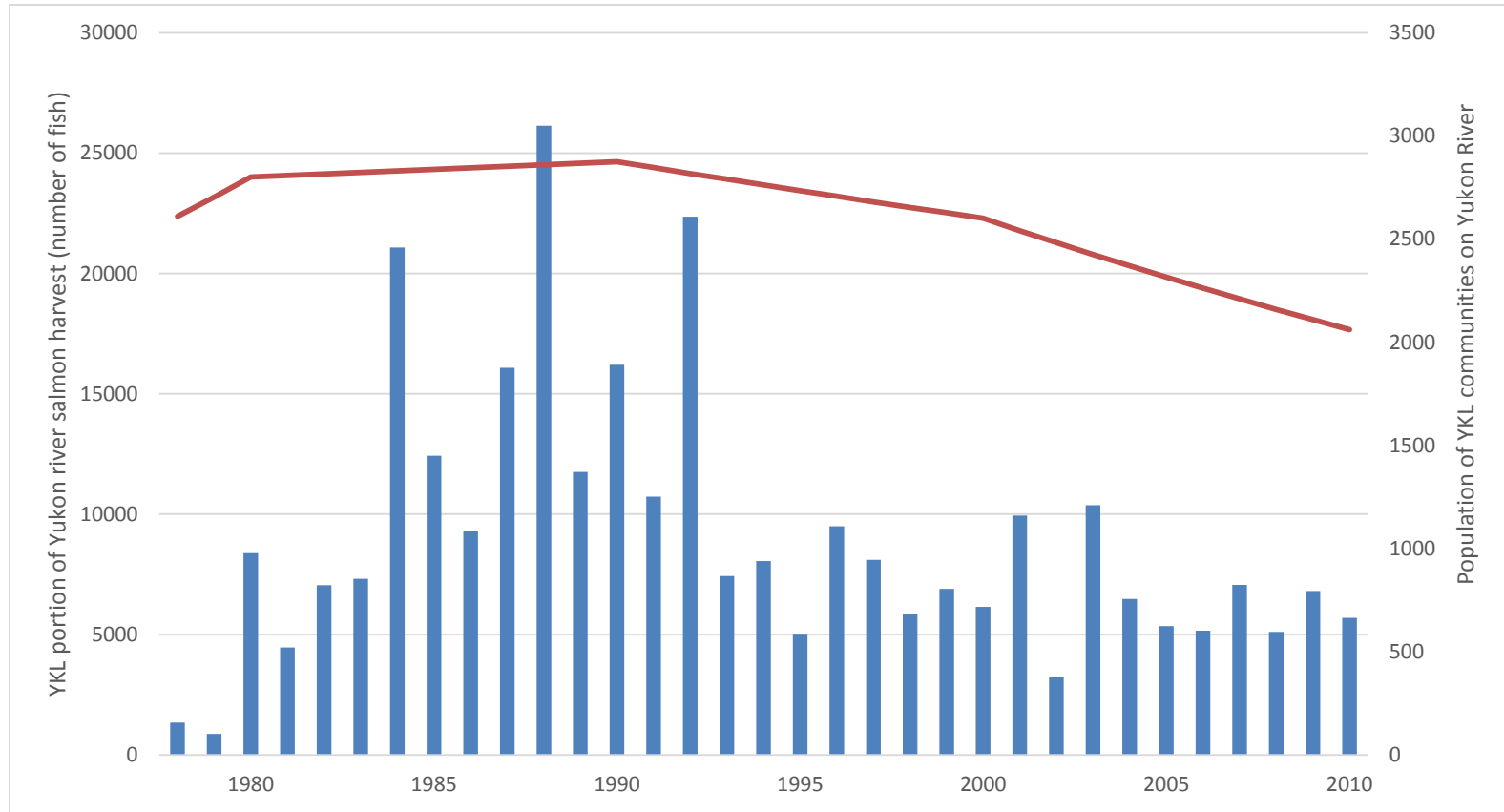
Population and Demographics

Education

Income



Subsistence Data



Subsistence harvest numbers of salmon among Yukon river communities in YKL region; and the total population in those communities.



Traditional Ecological Knowledge

- Compiled a database with 57 documents that contain relevant TEK.
- All entries are coded for CAs and Cas
- TEK not collected consistently.
- Suggested next steps include:
 - Initiate efforts to devise standard methods to collect, compile, and document TEK in Alaska
 - Encourage national and international research efforts in recording, compiling, and utilizing TEK for resource management
 - Provide opportunities for individual researchers to collaborate and share their work on TEK in Alaska



CONSERVATION ELEMENT DATASETS

Conservation Elements

Terrestrial Coarse-Filter CEs

- | | |
|--------------------------------|-----------------------|
| • Deciduous Forest | • Dwarf Shrub |
| • White Spruce or Black Spruce | • Herbaceous Wetlands |
| • Tall Shrub | • Large Floodplains |
| • Low Shrub | |

Aquatic Coarse-Filter CEs

- | | |
|-------------------|----------------------|
| • Streams | • Disconnected Lakes |
| • Connected Lakes | |

Terrestrial Fine-Filter CEs

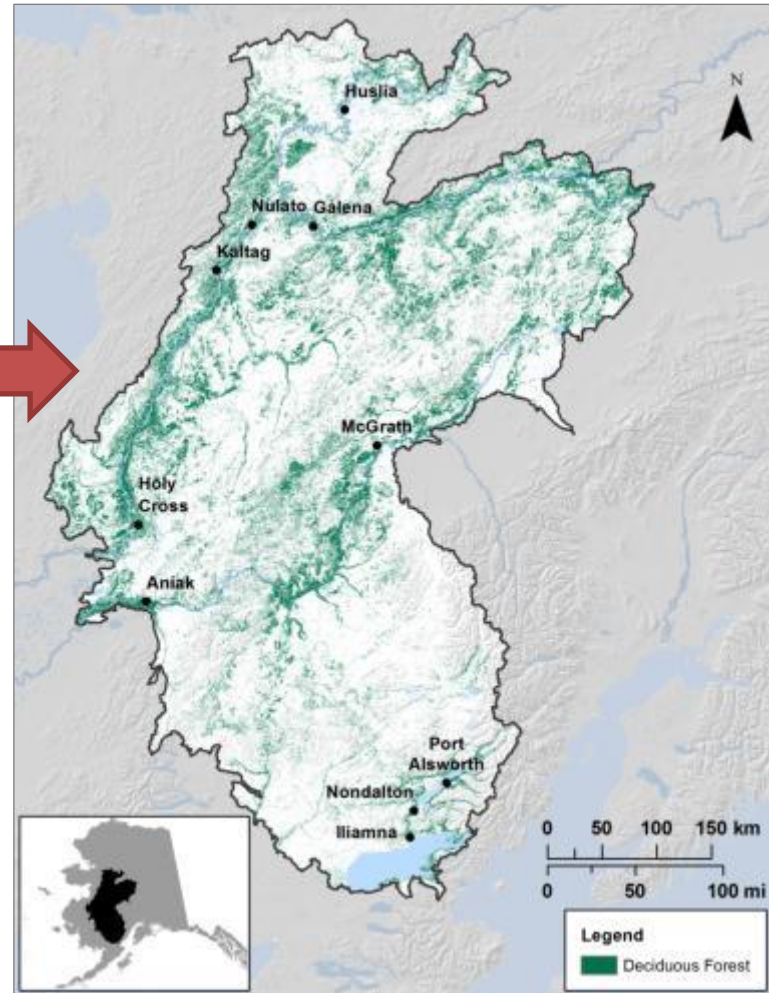
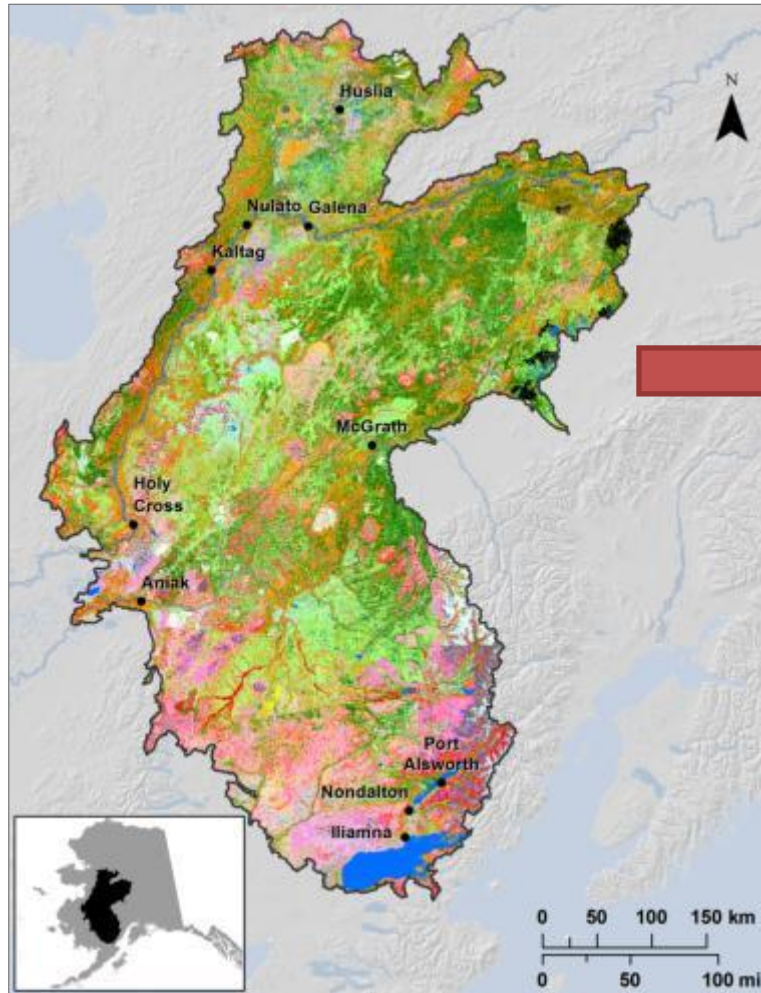
- | | |
|-------------------|-----------------------------|
| • Moose | • Gray wolf |
| • Caribou | • American peregrine falcon |
| • Muskox | • Trumpeter swan |
| • American beaver | • Olive-sided flycatcher |

Aquatic Fine-Filter CEs

- | | |
|------------------|-----------------|
| • Chinook salmon | • Sheefish |
| • Chum salmon | • Northern pike |
| | • Dolly Varden |



Vegetation Distributions

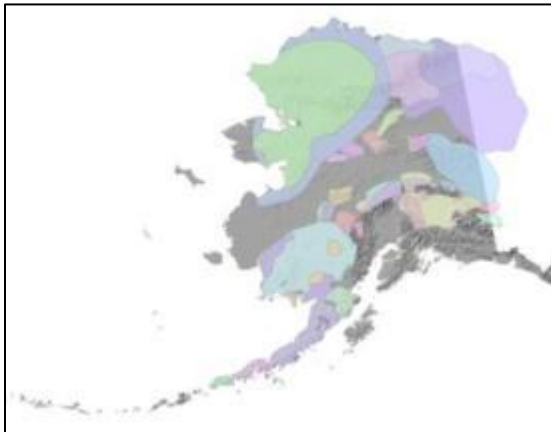


Terrestrial Species Distributions

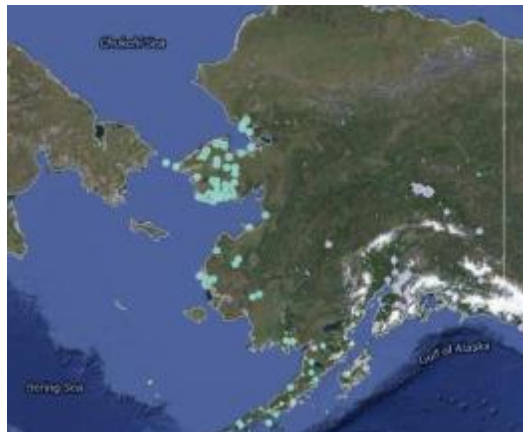
To help delineate the distribution of all terrestrial fine-filter CEs, we obtained:

1. Polygon range maps (AKNHP, ADF&G)
2. Occurrence data (AKGAP, AKNHP, NPS and other independent sources)
3. Distribution models (AKGAP)

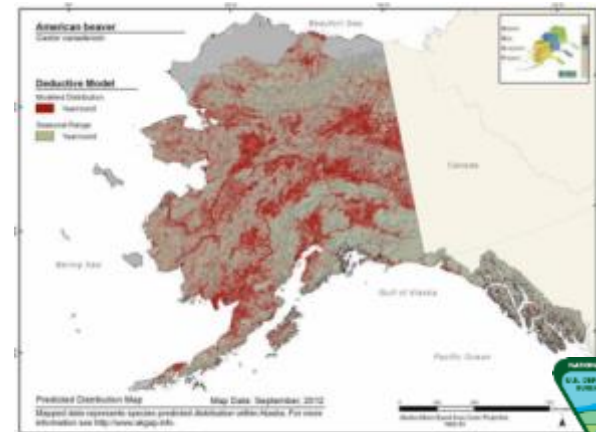
1.



2.



3.



GAP Distribution Models



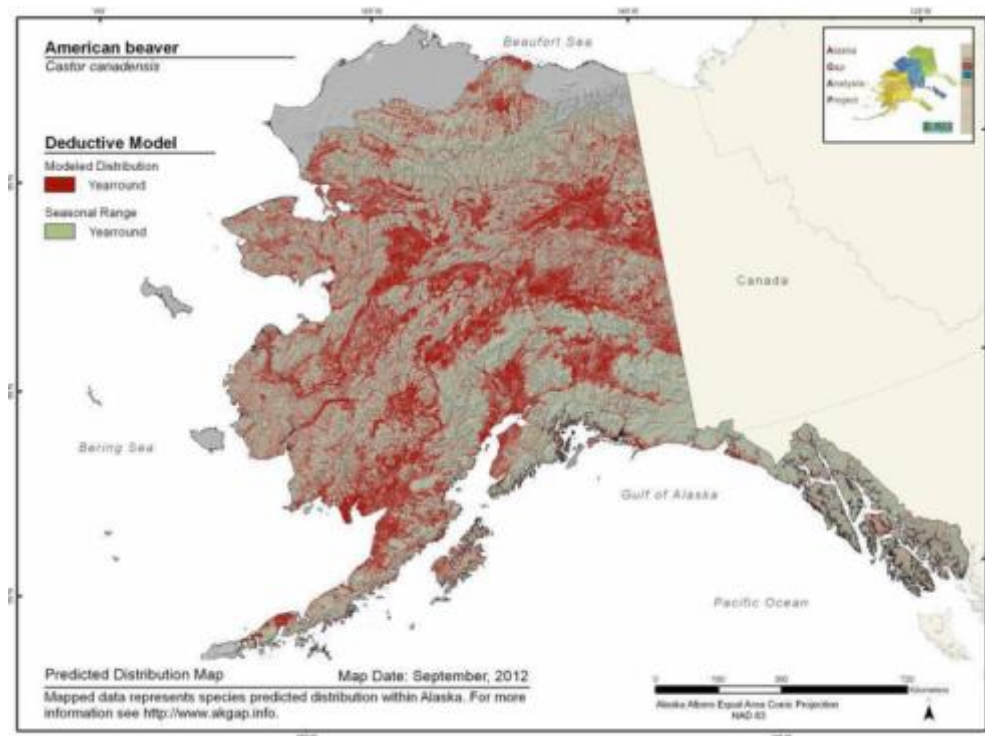
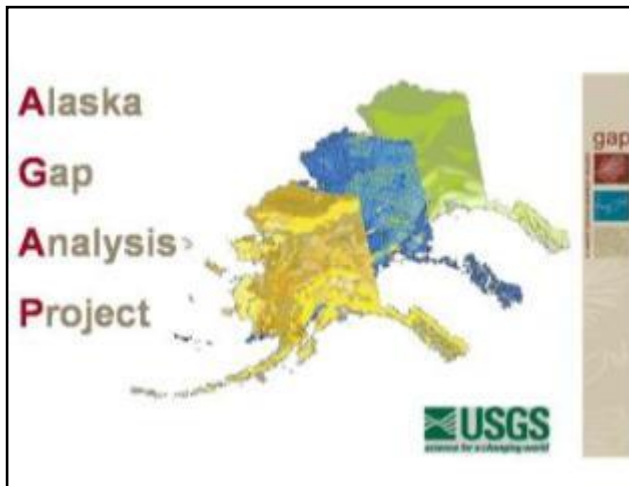
American beaver



Muskox

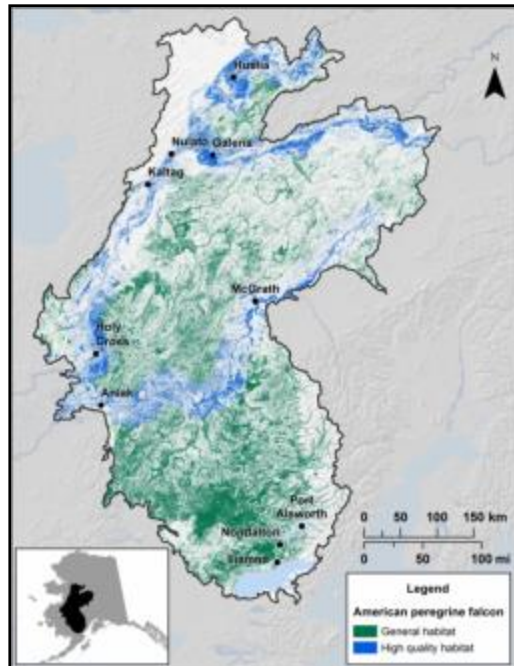


Moose

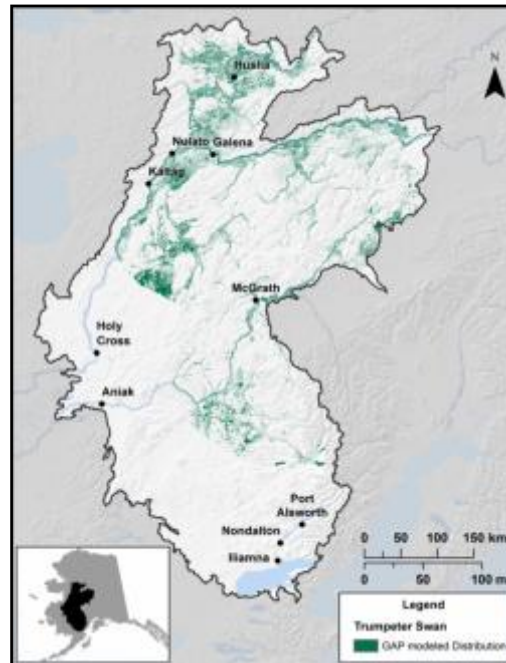


GAP Distribution Models

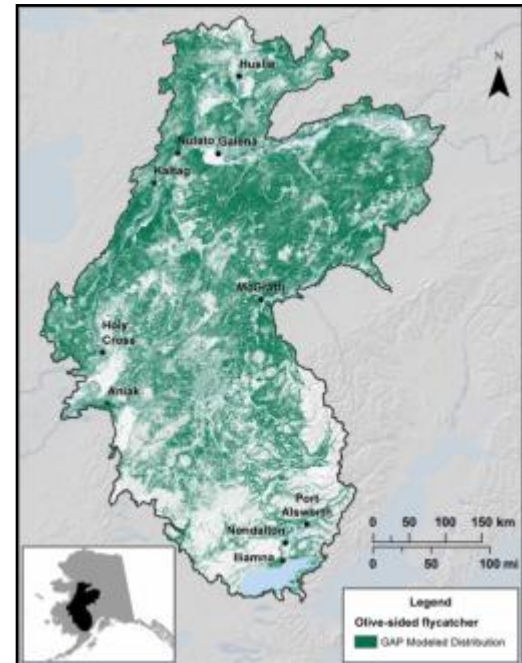
American
Peregrine Falcon



Trumpeter
Swan



Olive-sided
Flycatcher

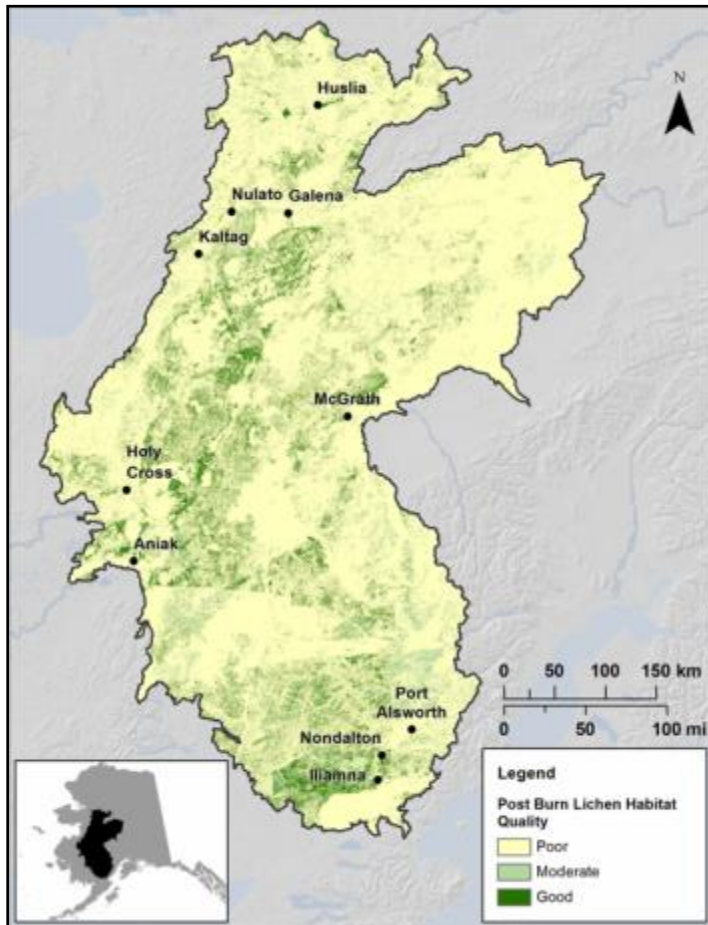


BLM Sensitive Species

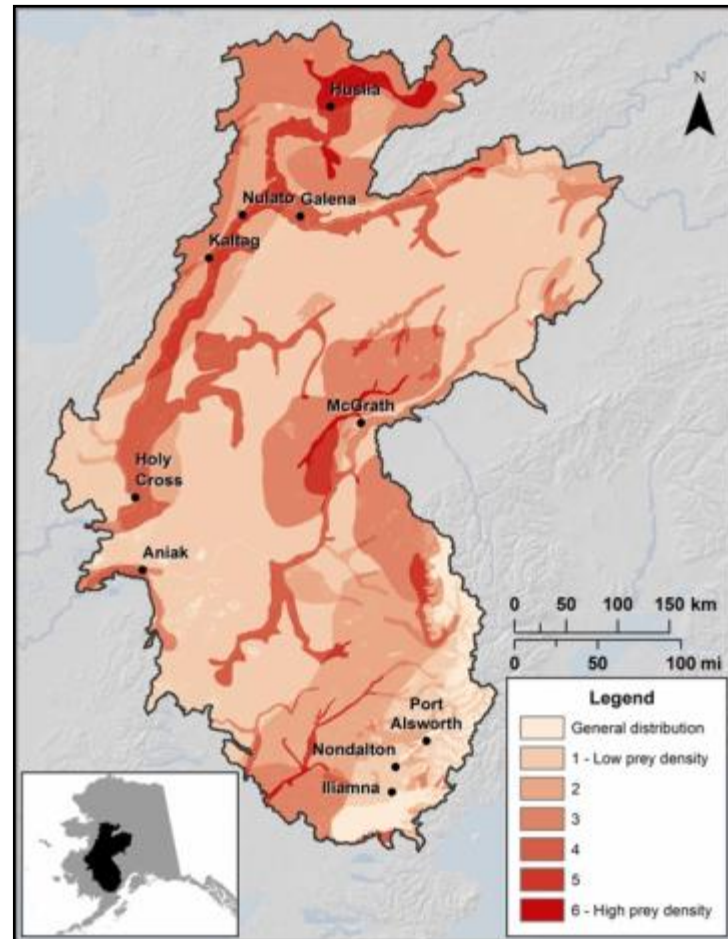


Distribution Models

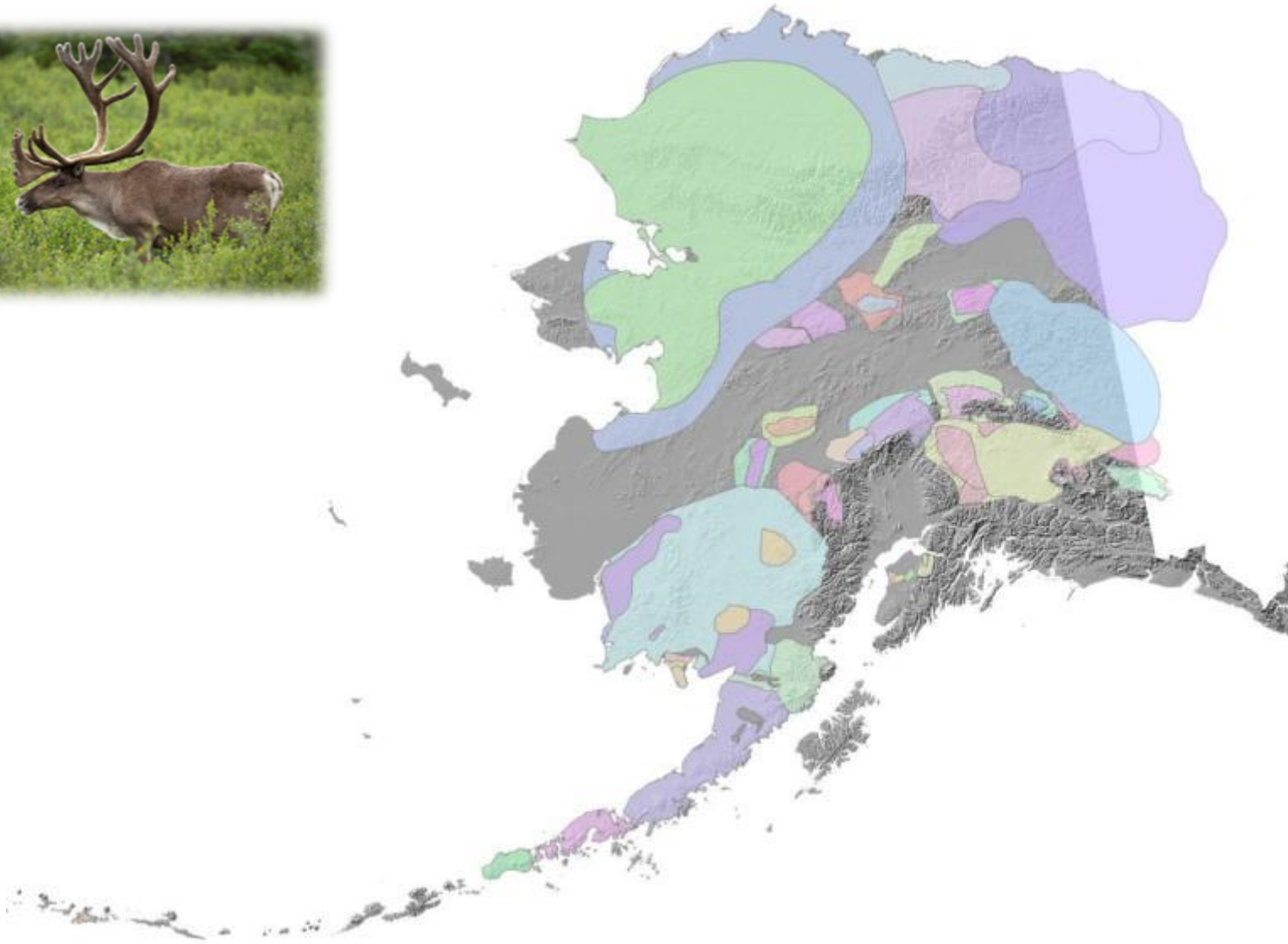
Forage for Caribou, Moose,
and Muskox



Prey Density for Gray
Wolf

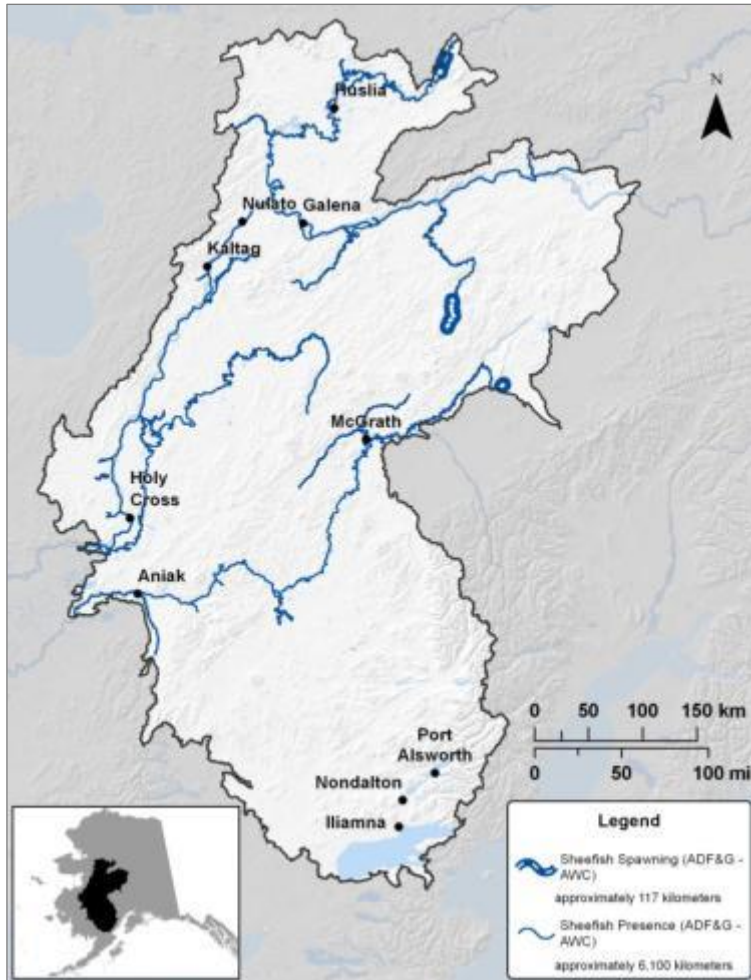


Range Maps

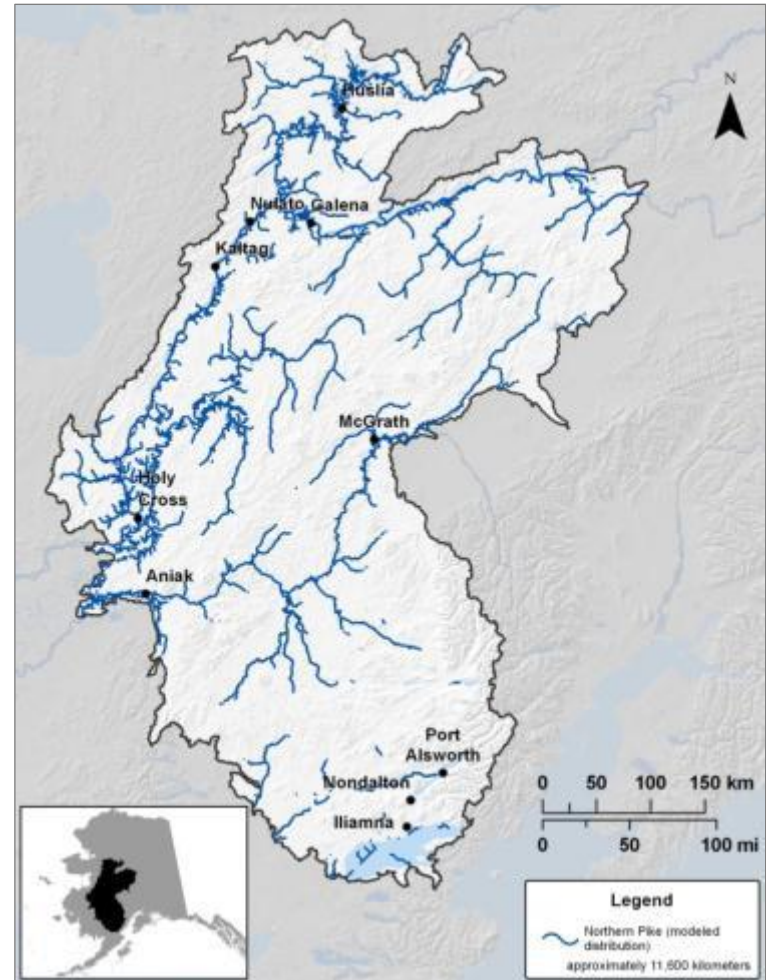


Fish Distribution

Anadromous Waters Catalog (AWC)

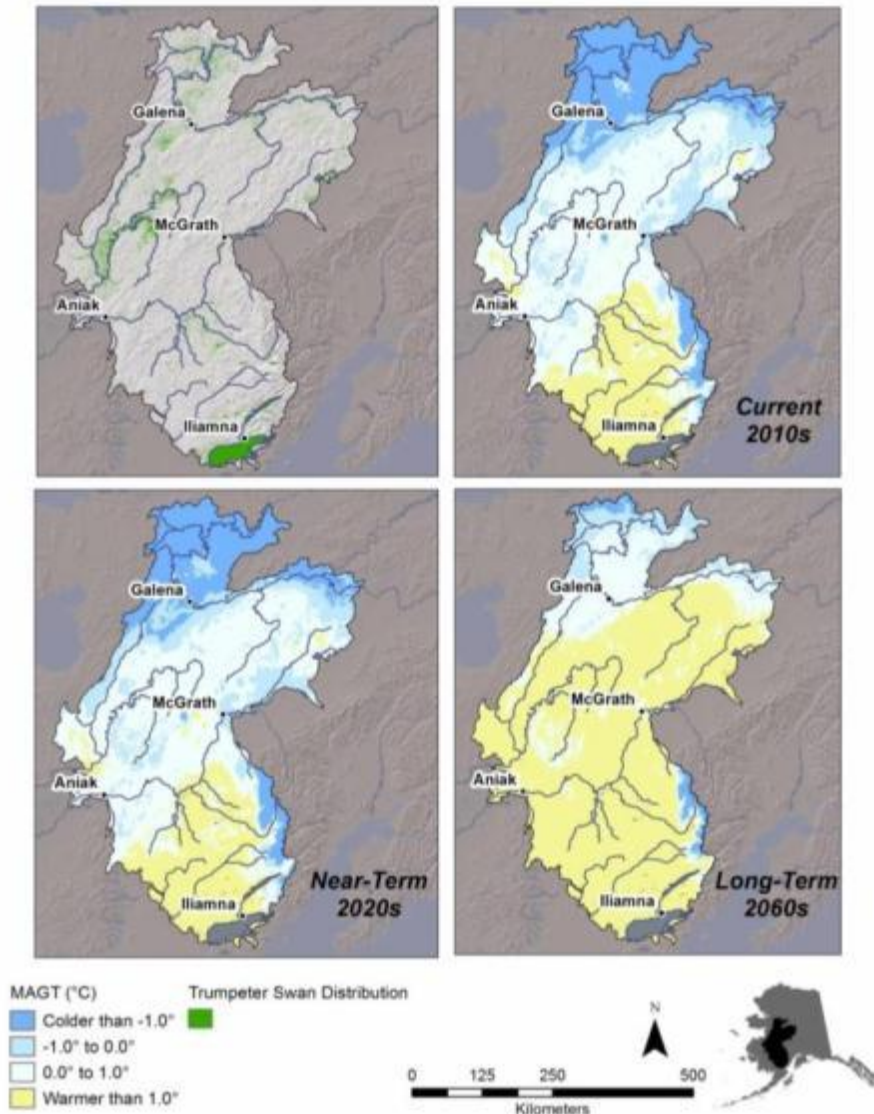


Modeled



Trumpeter Swan x Permafrost

Trumpeter Swan Distribution and Mean Annual Ground Temperature (°C): A2 Scenario



Permafrost

Mean annual ground temperature (MAGT) at one meter depth serves as a reasonable proxy for the presence/absence of ecologically significant permafrost.

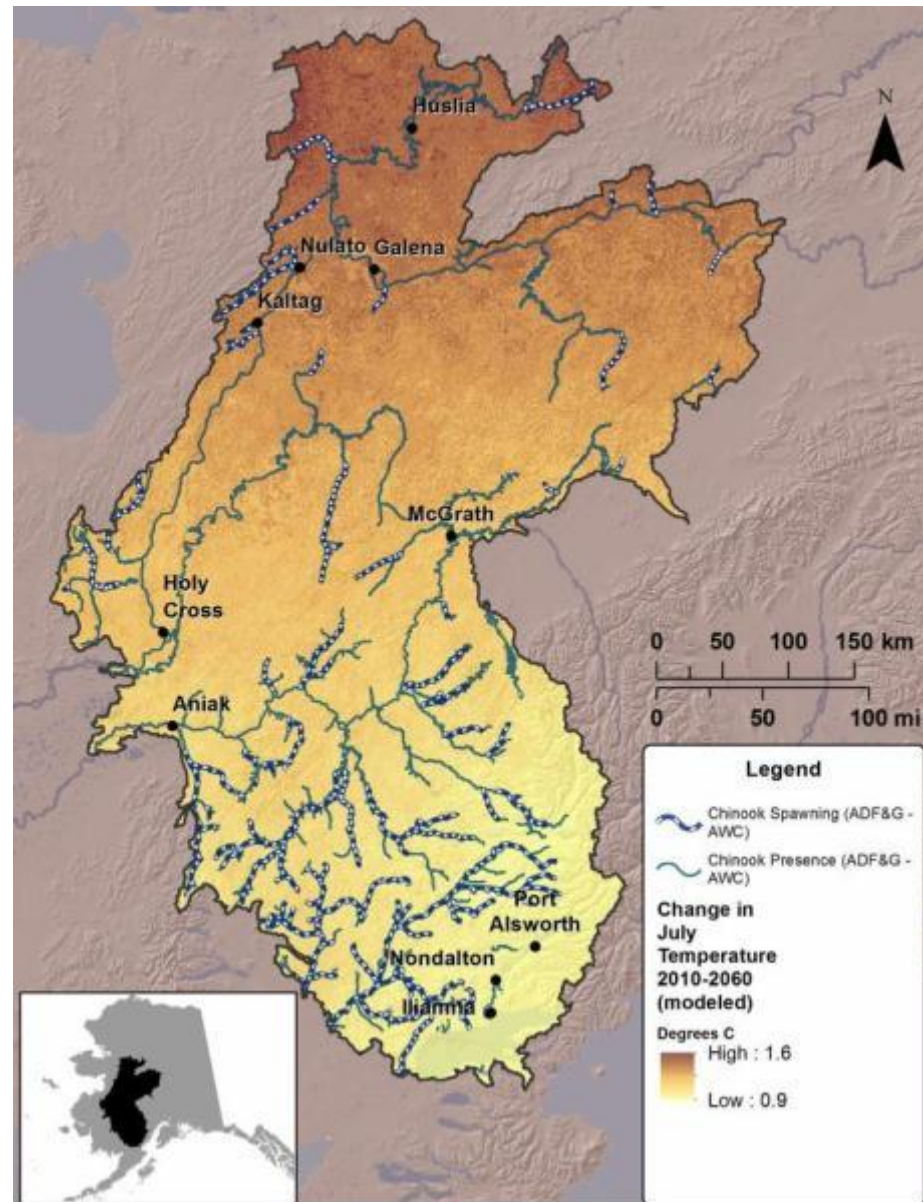
Swan habitat includes permafrost and non-permafrost areas.

However, areas projected to undergo significant permafrost thawing may be susceptible to changes in drainage that might affect habitat.

Blue areas are frozen; white to yellow areas are thawed.

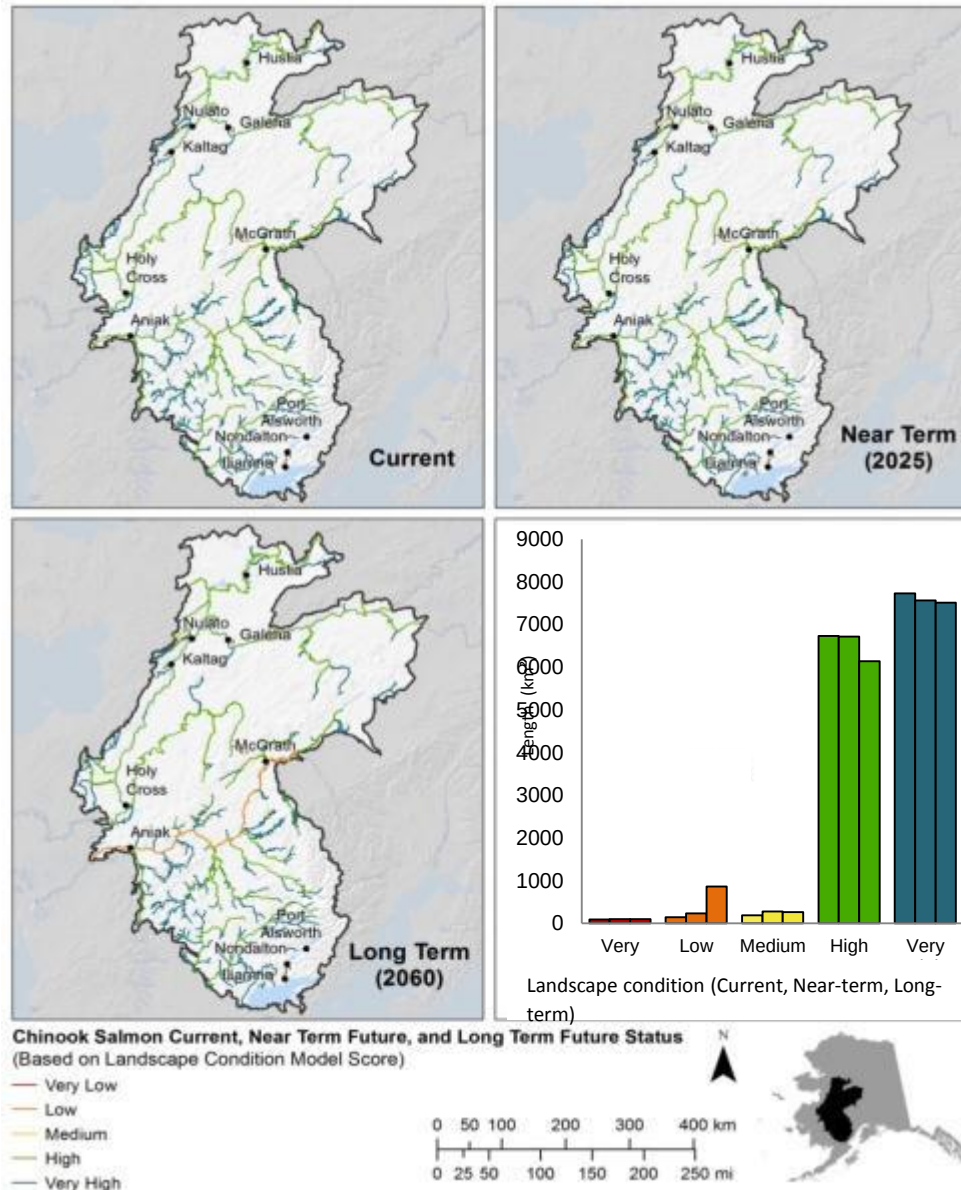
Chinook Salmon x Temperature

- **Water temperatures above 15°C**
 - Mean July temperatures since 2002 around 15-18°C
- **Potential impacts to subsistence and commercial fisheries**



Salmon x Landscape Condition

- Majority of habitat is currently very high condition.
- Areas of low landscape condition are localized near communities.
- Future projections remain relatively intact and in good condition.
- Exception: Kuskokwim road development.



QUESTIONS?

DISCUSSION



Day Two Agenda

Friday, February 27 (9:00 am – 4:00 pm)

- | | |
|---------------|---|
| 9:00 – 9:30 | Questions, review, and open discussion from day one |
| 9:30 – 9:45 | Future (2025 and 2060) Models <ul style="list-style-type: none">- What's Available for CAs and CEs |
| 9:45 – 10:00 | Integrated Products Background <ul style="list-style-type: none">- Landscape Condition Model- Integrity Assessment- Cumulative Impacts |
| 10:00 – 10:15 | Break |
| 10:15 – 11:15 | Exercise: Exploring Integrated Products through Citrix <ul style="list-style-type: none">- Cumulative Impacts Model- Landscape Condition Model |
| 11:15 – 12:00 | Example Management Question (MQ) related to caribou |

***** Submit at least one idea of an appropriate use of REA results (write on 3x5 card) *****



Day Two Agenda

Friday, February 27 (9:00 am – 4:00 pm)

12:00 – 1:00 Lunch Break

1:00 – 1:30 Discuss examples from index cards

1:30 – 2:30 **Exercise: Hypothetical planning exercise using REA data**

- Use LCM to look at hypothetical impacts to caribou status
- Discuss scale
- Appropriate datasets

2:30 – 2:45 Break

2:45 – 3:15 **Appropriate & Inappropriate use of REA Data**

- Interpreting and misinterpreting REA results
 - Absence of universal interpretations.. Must consider the subject
 - Color, scales, legend
- Configuration & location considerations
 - Patches versus matrix configuration, hot spots
- Understand the data that went into it
 - Accuracy, Vintage, Completeness, Known issues/gaps, Implications



Day Two Agenda

Friday, February 27 (9:00 am – 4:00 pm)

3:15 – 3:45

Applications of REA Data in the BLM

- Using REA for landscape questions/problems
- Landscape approach to natural resource planning
- Projects with potential REA utility
- Other examples of landscape approaches; external to BLM
 - YKL REA to BSWI
 - YKL REA to BSWI
 - NOS REA for NSSI
- Look at landscape level patterns to help with planning/ analysis
- Discussion of submitted decision problems:
 - What are participants doing now to support decisions?
 - How to apply these products to select decision examples?

3:45 – 4:00

Open Discussion

