IMPACTS OF CLIMATE AND MANAGEMENT OPTIONS ON ALASKA WILDLAND FIRE MANAGEMENT

A 2016 Joint Fire Science Program Project: Overview and Update

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Fall Fire Review
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Project Overview and Objectives

1. Science Assessment: What are the Implications of Future Climate for Fire in Alaska

- What are the projected changes and how do they vary across models?
- Developed website to capture projections and data based on ALFRESCO

2. Identify and Characterize Future Management Challenges and Alternatives

- Interviews to understand challenges, priorities, and future approaches
- Drive ALFRESCO simulations with 2-3 changes in management approaches

3. Explore Implications through Workshops

- Understand if some alternatives are preferable
- Characterize future needs
- Develop any recommendations for policy makers

1. ALFRESCO Output of Future Fire Activity

- Website available at:https://uasnap.shinyapps.io/jfsp-v10/
- We simulated maps of annual fire for combinations of 5 General Circulation Models and 3 emission scenarios
- 15 different sets of maps of future fire activity
- This provides a way to characterize the uncertainty associated with the assumptions about future climate

JFSP Alfresco

SNAP

Select data, then explore.

Data

Fire

Vegetation

Information

Take tour

Bookmark

[Note: Tour incomplete, under development. Bookmarking not yet available.]

Global / semi-global options.

Units

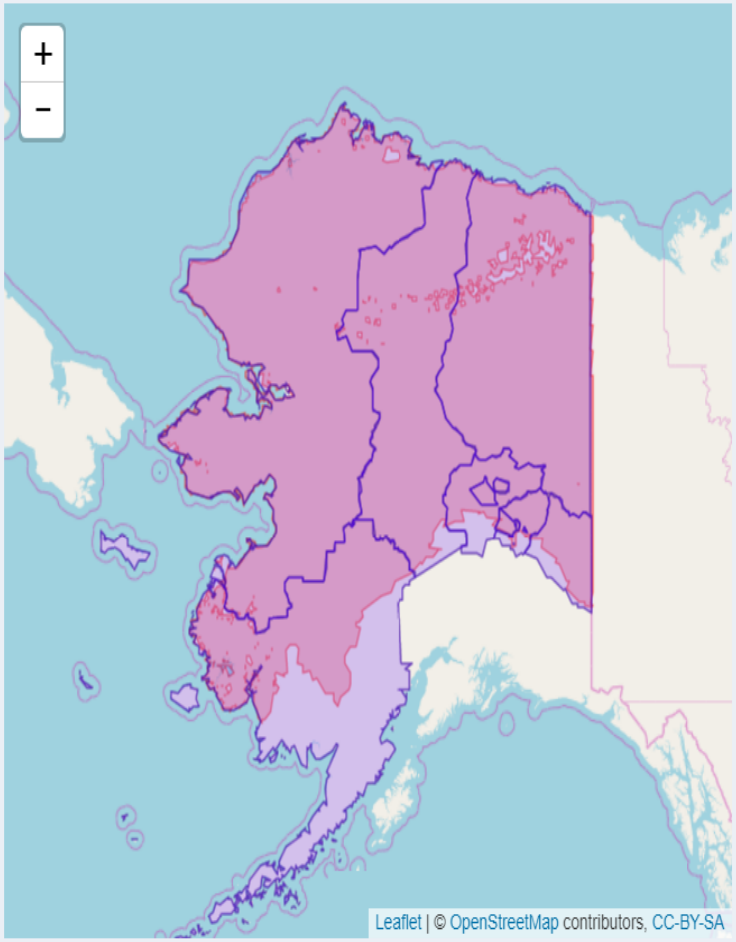
US

Axis scale

x1

Units apply to all data. Scale affects plot axes for burn area, fire size and vegetation cover area.

This website was developed as part of project (#16-1-01-18) funded by the Joint Fire Science Program. If you would be interested in participating in an interview to guide the direction of the management scenarios implemented as part of this work, please contact the project PI, Courtney Schultz (courtney.schultz@colostate.edu)



Fire Mgmt Zones

Delta Fairbanks Galena Military Southwest Tanana Tok Upper Yukon

Vegetation

Aggregate

GCM

GFDL-CM3

RCP

6.0

Simulations

Mean

Years

1950 2014 2099

1950 1965 1980 1995 2010 2025 2040 2055 2070 2085 2099

Detailed map

Show flammable region

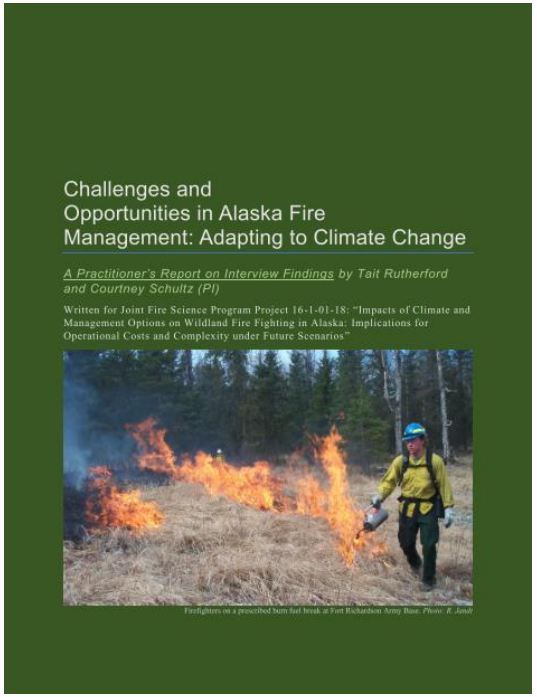
Full table subset and summaries

Full table | Burn area | Fire count | Fire size | Cover area | Stand age

Show 5 entries

2. Identify and Characterize Future Management Challenges and Alternatives

- Conducted 41 interviews this spring and summer
  - Protection agencies
  - Jurisdictional agencies
  - Alaska Department of Fish & Game
  - Alaska Native organizations
  - Borough emergency services departments
- Interview research objectives
  - Identify current values and priorities
  - Identify advantages and challenges in current management system
  - Characterize future management needs & approaches
- Developed Practitioner's Report (available from us or AFSC)



Interview Results: Priorities

- Values that require protection from fire
  - Life and property
  - Subsistence hunting (caribou habitat)
  - Cultural and tourist sites
  - Natural resources (timber, carbon sinks)
- Values that rely on fire
  - Natural ecological processes and habitat
  - Subsistence hunting (moose habitat)
- Other values
  - Economic efficiency
  - Employment opportunities

Photo: R. Jandt

Interview Results: Advantages of the System

- Characteristics that Support Communication and Adaptation Across the State
  - Strong interagency relationships and lines of communication
  - Interagency agreements and organizations
  - Biannual interagency meetings (spring and fall)
  - Iterative use of science to improve management
- Additional collaboration
  - Kenai Peninsula All Hands/All Lands group
  - Outreach and education

Photo: R. Jandt

Interview Results: Challenges

- Interagency planning and communication: integrating fire and land management planning
- Funding
  - Budgeting difficulties
  - Question of funding fuels work
- Staffing
  - Consolidation of offices
  - Lack of new recruits
  - Loss of on-the-ground experience

Photo: R. Jandt

Interview Results: Possible Future Needs

- With more fire, need to increase capacity to protect values
- Changes to the management options map
  - Expanding full and critical buffers around protected sites
  - A need to put together a group to revisit the map?
- Increased fuels management
  - Fuel breaks to make suppression easier and allow more natural fire
  - Fuel treatments to enhance habitat if natural burning becomes too risky

Photo: R. Jandt

Key Issues to Address

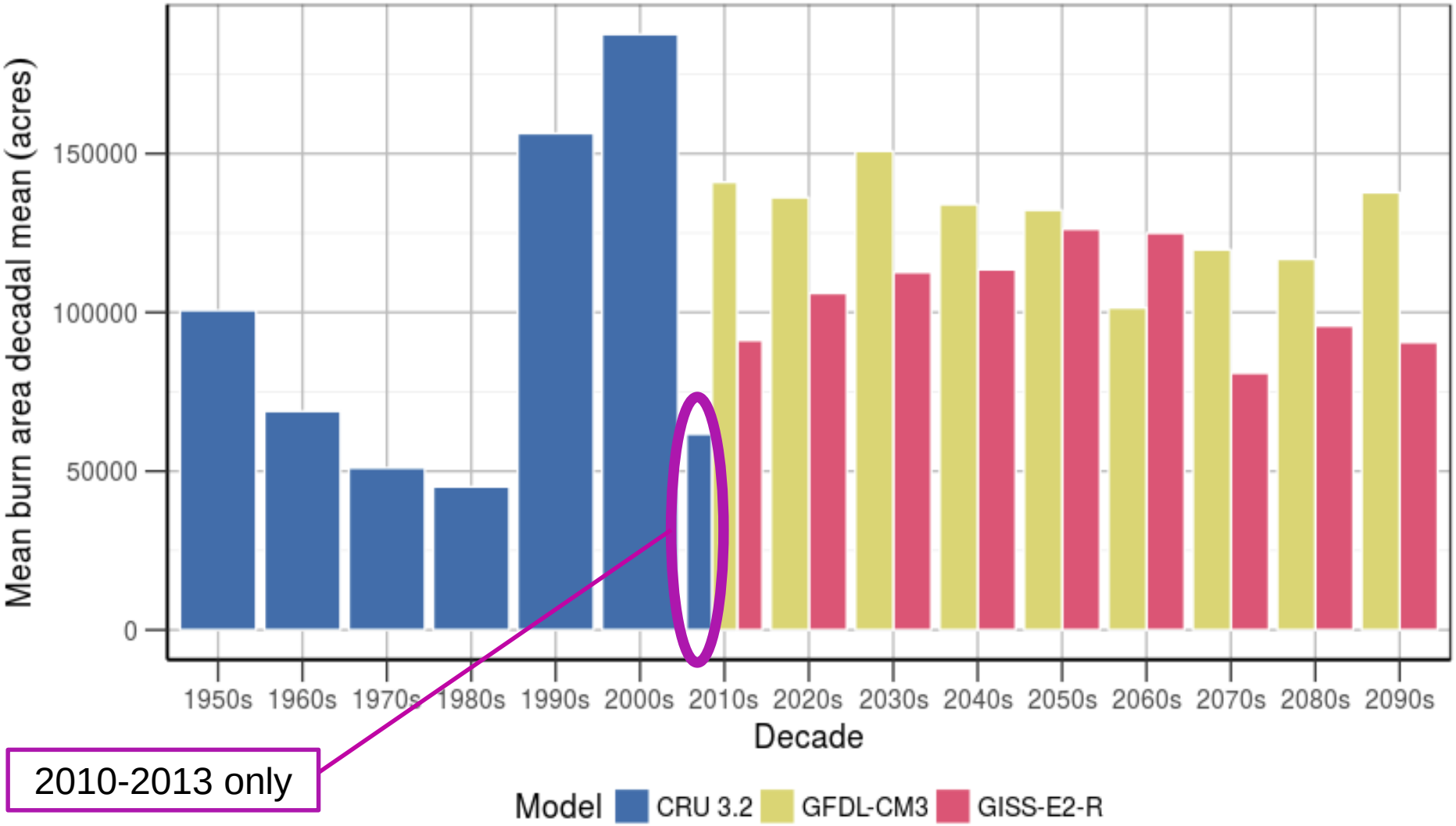
- Budgets, funding, and capacity
  - Creating budgeting models specific to Alaska
  - Increased capacity (funding and staff) to meet needs
  - Varying funding sources for fuel projects
- Prioritization and protection of remote sites
- Climate change adaptation and mitigation
  - Adaptation: management option changes and increased use of fuel projects
  - Mitigation: protection of carbon offset credits and permafrost
- Two possible alternative approaches worth exploring
  - Increasing critical and full buffers around communities and valued sites
  - Increasing the use of large-scale fuel breaks and fuel treatments

2. Return to Model Results: The Baseline

- Across all GCMs, at a statewide level we see…
  - An increase in the number of fires
  - An increase in the area burned
  - A significant shift in the dominant vegetation
- Examples are shown on next slides for middle of the road RCP (6.0) and two middle of the road GCMs

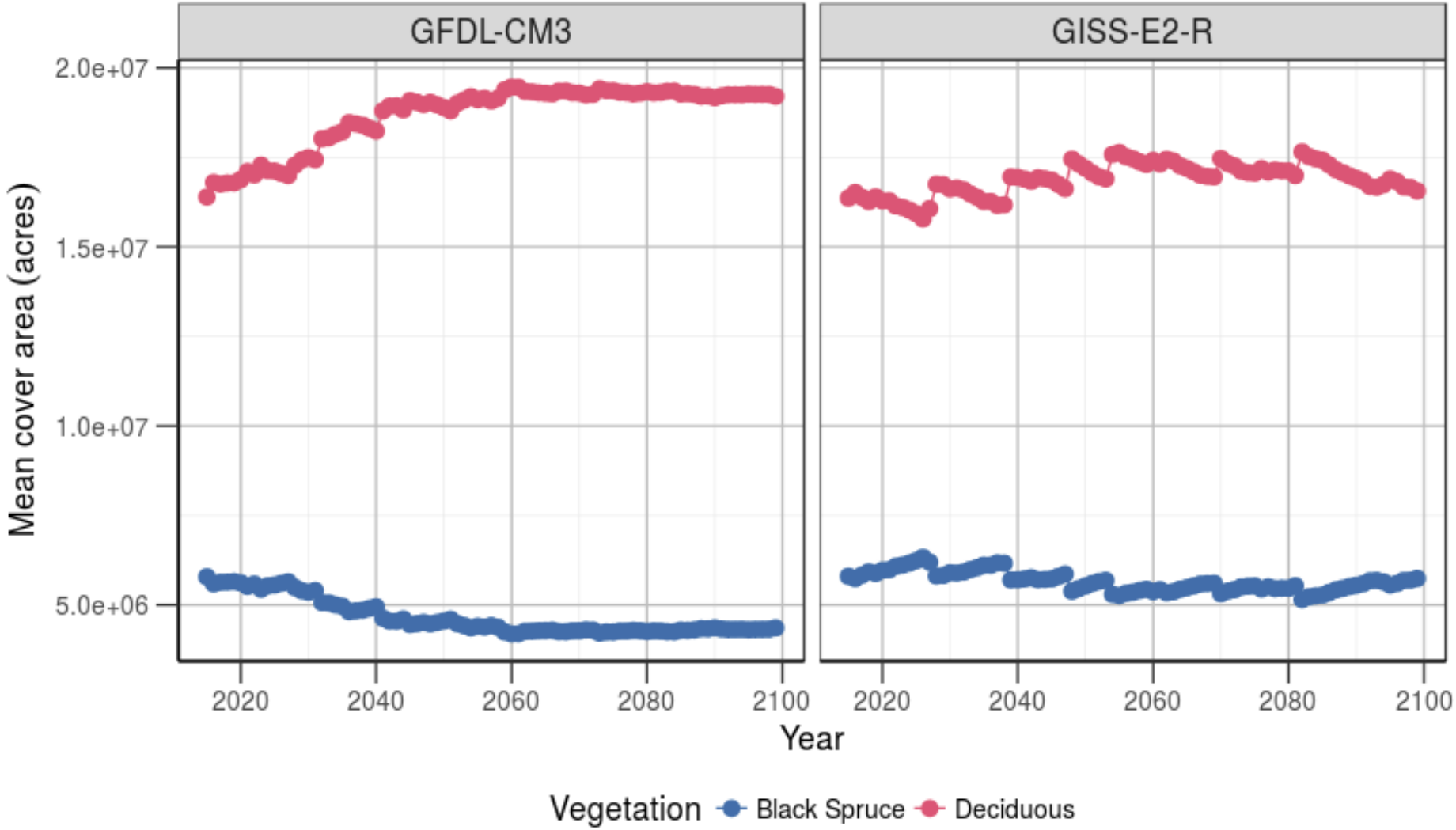
Increasing Number of Fires

Increasing Decadal Area Burned



2010-2013 only

More Deciduous, Less Spruce



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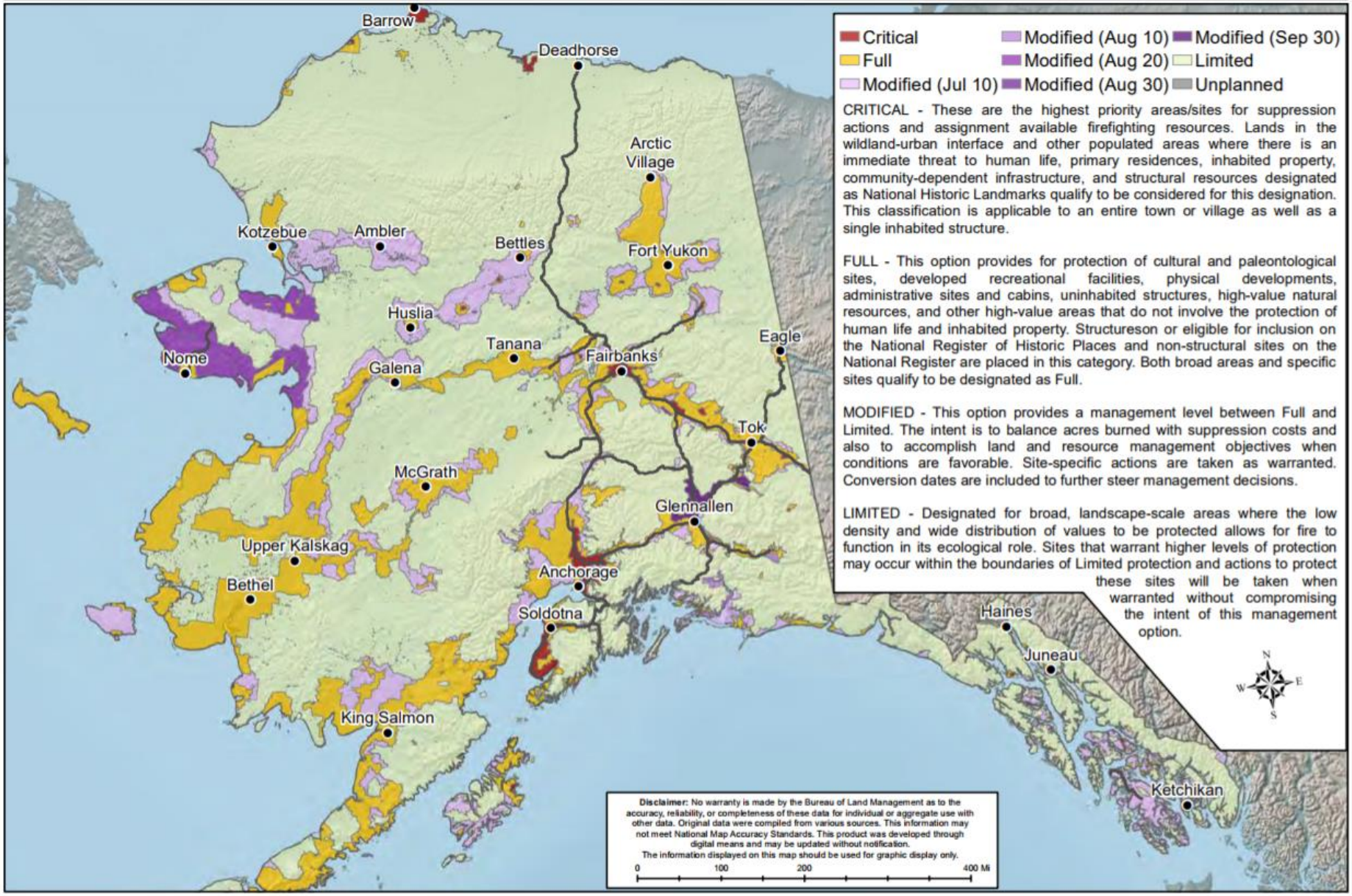
Fire Management Options



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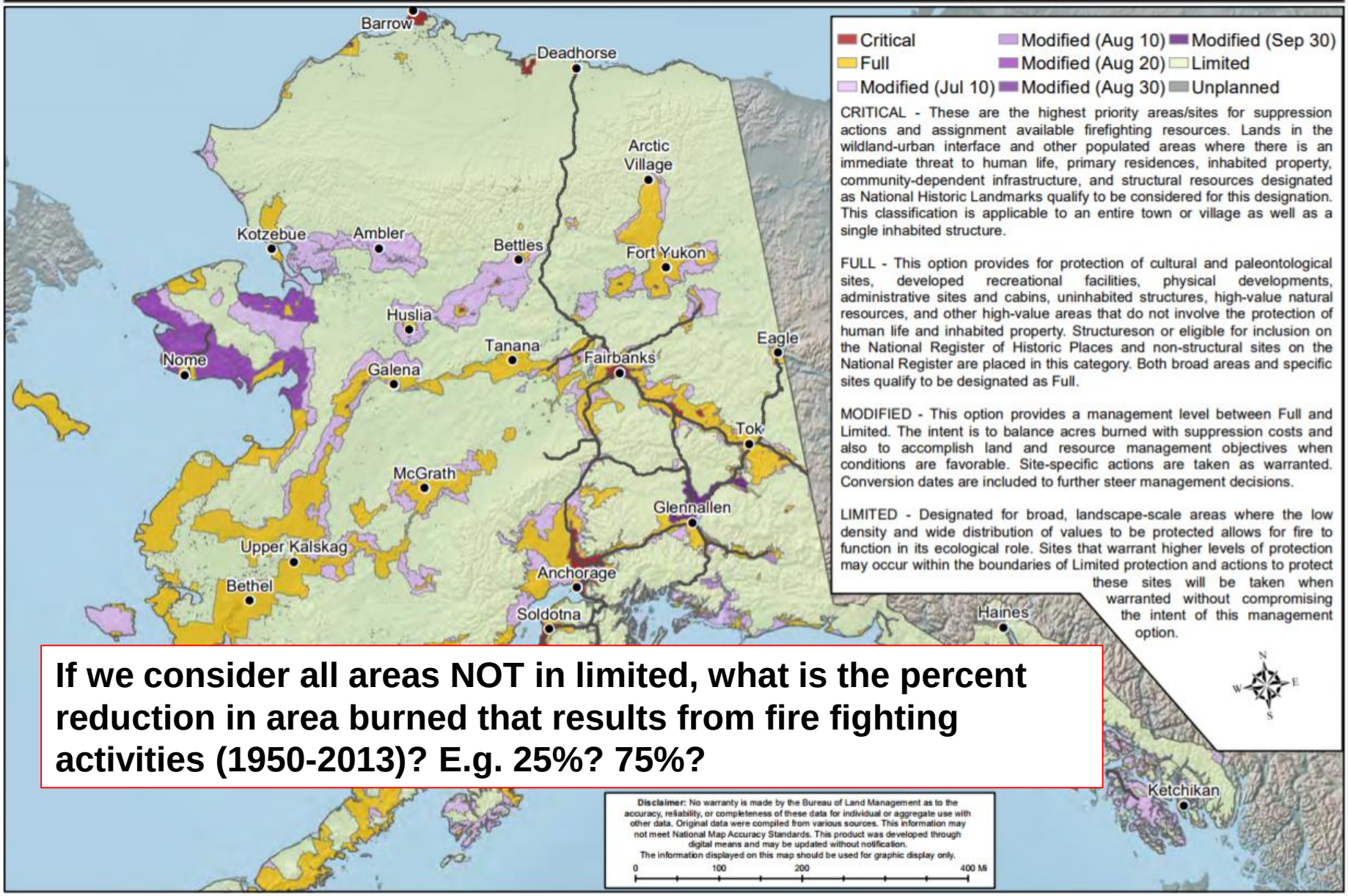
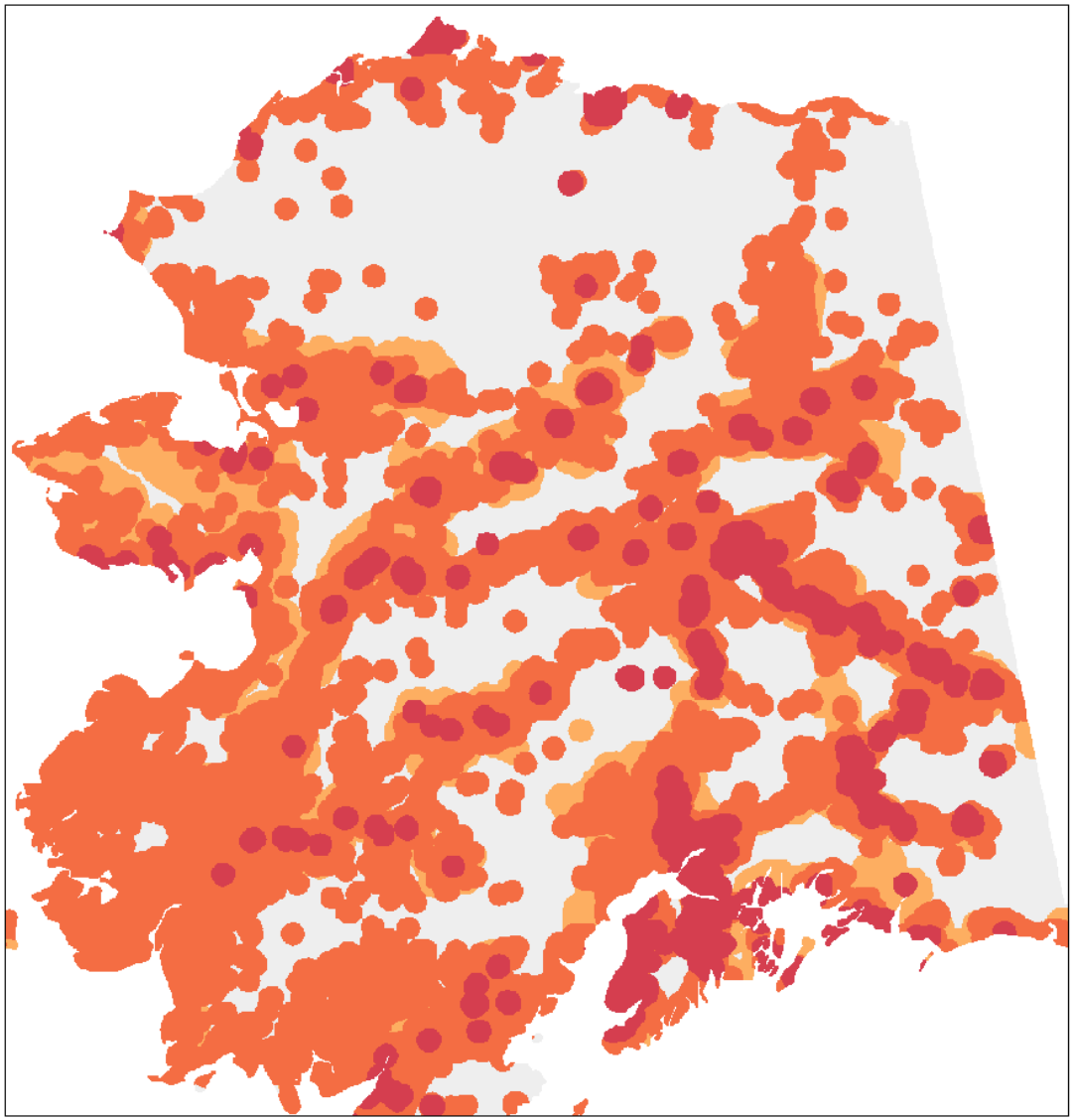
Fire Management Options



If we consider all areas NOT in limited, what is the percent reduction in area burned that results from fire fighting activities (1950-2013)? E.g. 25%? 75%?

Example Operational Alternative

- Increased spatial buffer sizes by 15 km for Critical, Full and Modified
- We've decreased both ignitions and fire spread
- Key question: What's a realistic level of decreased area burned?



Specific Questions of Possible Interest

- Compare baseline with different management approaches (e.g. extended buffers and large fuel breaks)
- We can use both the climate and management scenarios to inform specific questions about the likelihood of specific events
- Questions might be, comparing business as usual with other alternatives:
  - How many times does fire come within 25km of a town?
  - How much does area burned change?
  - How much can management affect vegetation change?
  - What are the dynamics over time (e.g. can you reduce area burned now but it increases again later?)

Project Objective 3: Additional Science/Manager Communication

- Research Questions
  - Which management alternatives might be preferable in the future and why?
  - How are fire-related resource needs likely to change in the future, and to what extent would those needs change, depending management approach?
  - What recommendations do managers have to policy makers about potential management and policy changes into the future?

3. Explore Implications through Workshops

- Approach: Workshops in Spring
- For example, my takeaways for BAU scenario
  - More ignitions and longer seasons means more need for resources
  - More area will continue to burn and more big years (here and in lower 48); a need for more resources with greater mobility?
  - More ignitions in critical areas along roads may have significant costs for the State
  - Greater need to protect key values may mean a need for more remote capacity or adjustments of suppression expectations

Questions and Comments

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  - Nancy Fresco, nlfresco@alaska.edu
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Percent Reduction for Suppression Levels

- We quantify suppression levels using the reduction in total area burned relative to baseline for 1950-2013.

- Low had an average of 126,000 km^2 burn in 1950-2013, which was a 14.3% decrease from the baseline