

The Northland it is a Changin'

Come gather round people  
Wherever you roam  
And admit that the waters  
Around you have gone  
And accept it that soon  
You'll be dry to the bone  
If your salmon to you  
Are worth savin'  
Then start takin' a stand  
Or the fish will be gone  
For the rivers they are a changin'

Come smokejumpers and tankers  
Who fight fires to no end  
And watch the land change  
The spruce won't come again  
And don't speak too soon  
While the smoke's in the wind  
There's no tellin' which  
Of the species will win  
For the caribou now  
Have no lichen to chow  
For the fires they are a ragin'

Come senators, congressman  
Please heed the call  
Don't stand in the doorway  
Don't block up the hall  
For folks are on edge  
And the food stores are small  
There's a riot outside

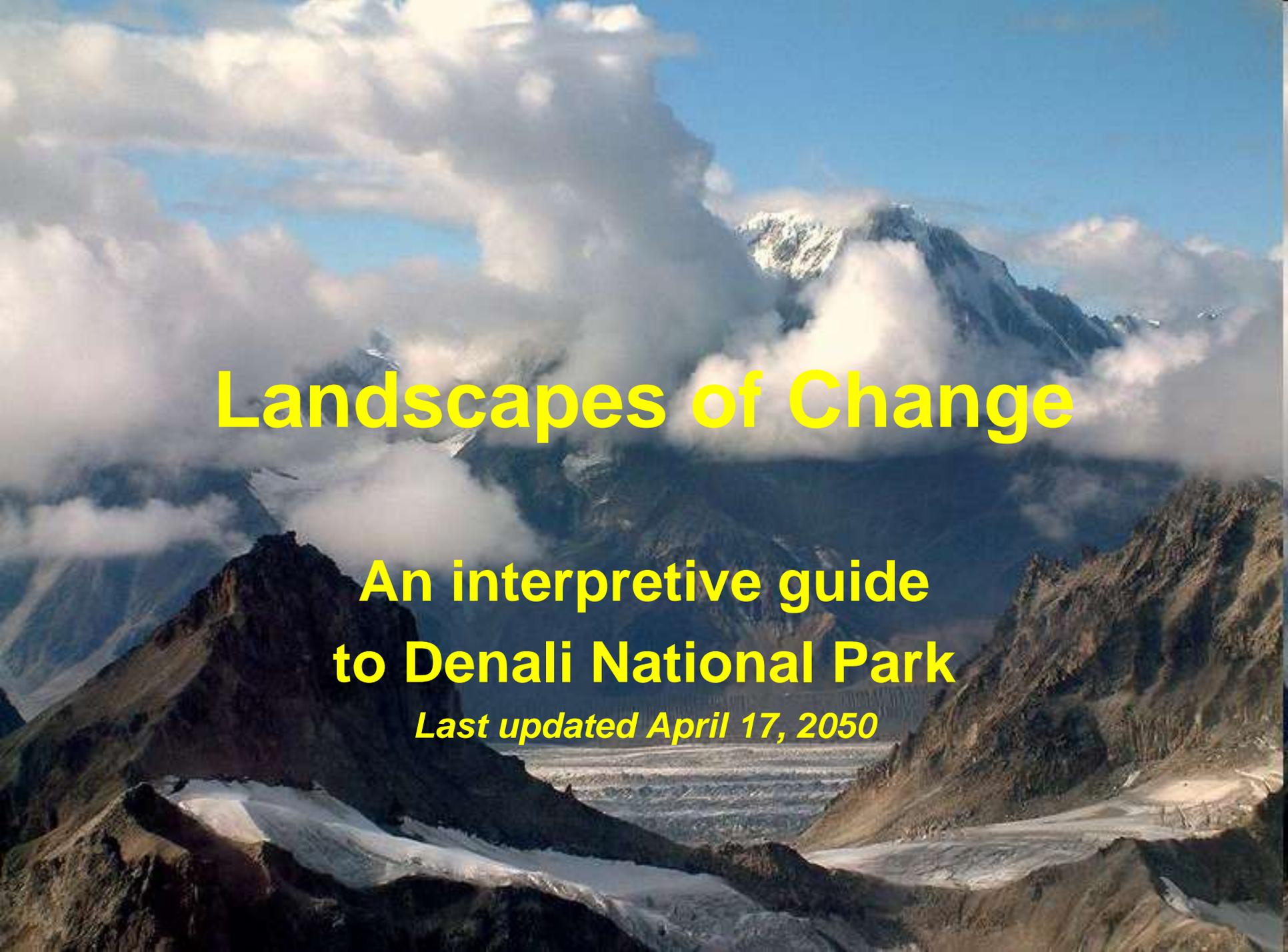
And it's ragin'  
Your mandates will crumble  
And we'll clog up your halls  
For the lawsuits they're a comin'

Come hikers and paddlers  
And give us a hand  
While the last of the glaciers  
Are still on the land  
Your sons and your daughters  
Won't see them firsthand  
The old road is  
Rapidly sinkin'  
Your access is limited  
With less frozen land  
For the North it is a thawin'

Come hunters and gatherers  
It's time to unite  
Across northern nations  
For C&T rights  
The moose and the berries  
Have vanished from sight  
Expenses are  
Rapidly risin'  
Can traditions survive  
When the land doesn't thrive?  
For subsistence it is a changin'

The rivers don't freeze  
The heat is here now  
The mule deer and cougars  
And bison now prowl

In a land lacking wetlands  
And most waterfowl  
The landscape is  
A rapidly changin'  
And the native species  
Have thrown in the towel  
For phenology it is a changin'  
For the climate it is a changin'



# Landscapes of Change

**An interpretive guide  
to Denali National Park**

*Last updated April 17, 2050*

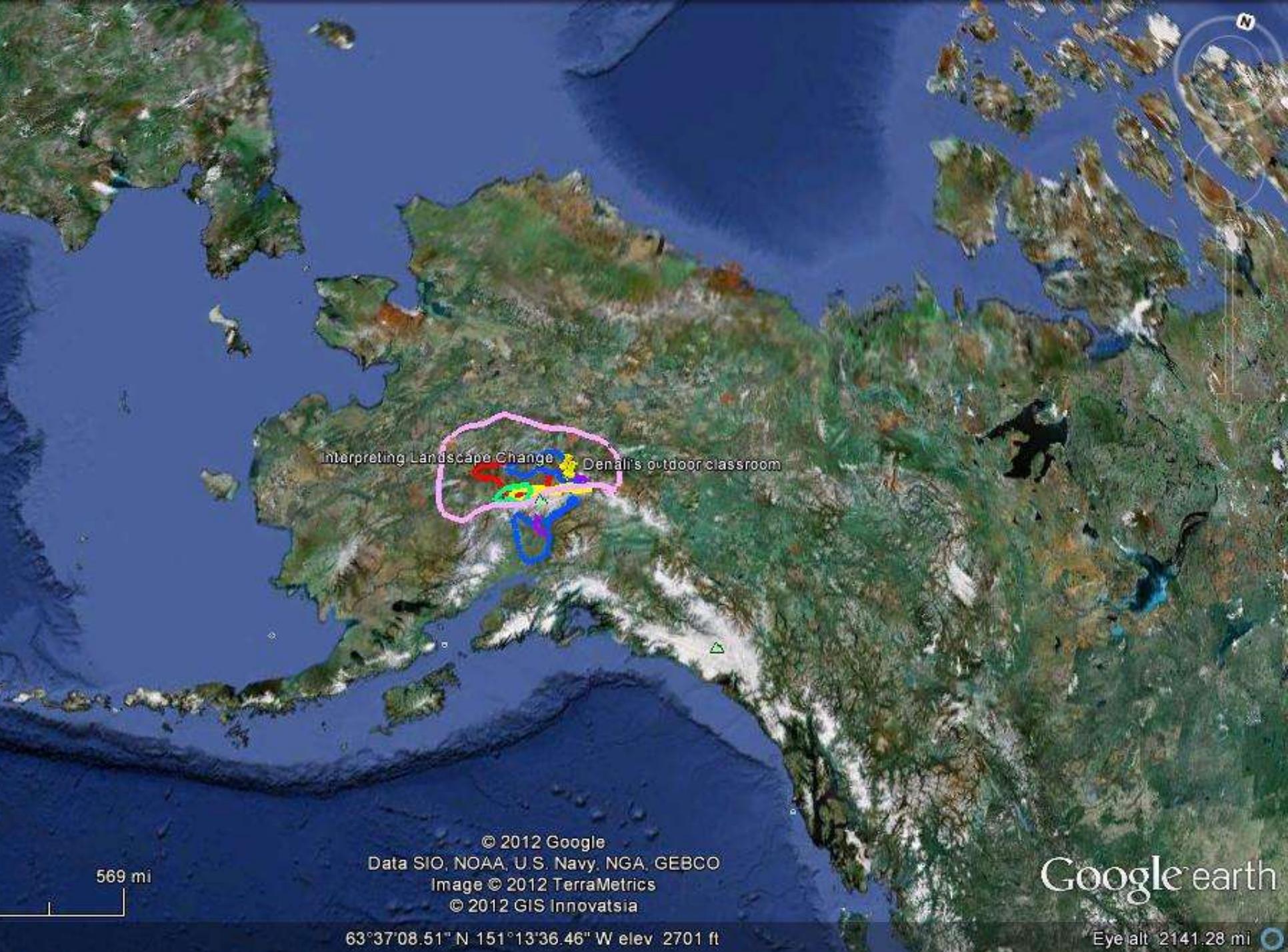


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38°57'33.80" N 95°15'55.74" W elev 1015 ft

Google

Eye alt 683



Interpreting Landscape Change

Denali's outdoor classroom

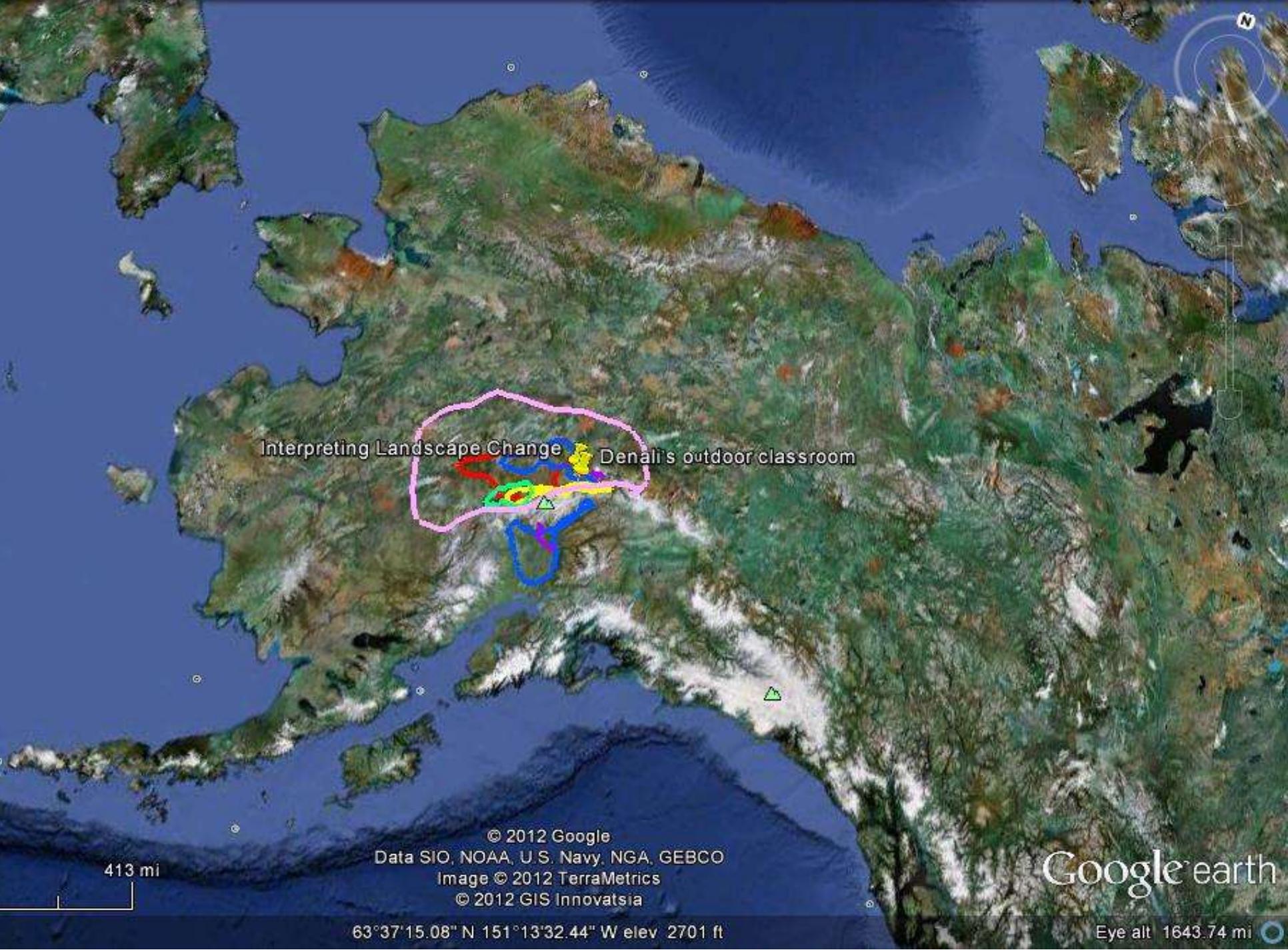
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Google earth

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Interpreting Landscape Change Denali's outdoor classroom

413 mi

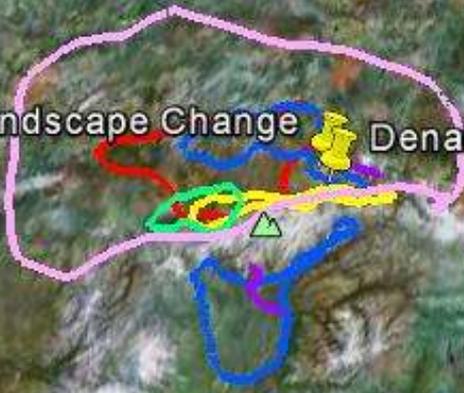
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Google earth

Eye alt 1643.74 mi

Interpreting Landscape Change Denali's outdoor classroom



308 mi

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Google earth

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Interpreting Landscape Change

Denali's outdoor classroom

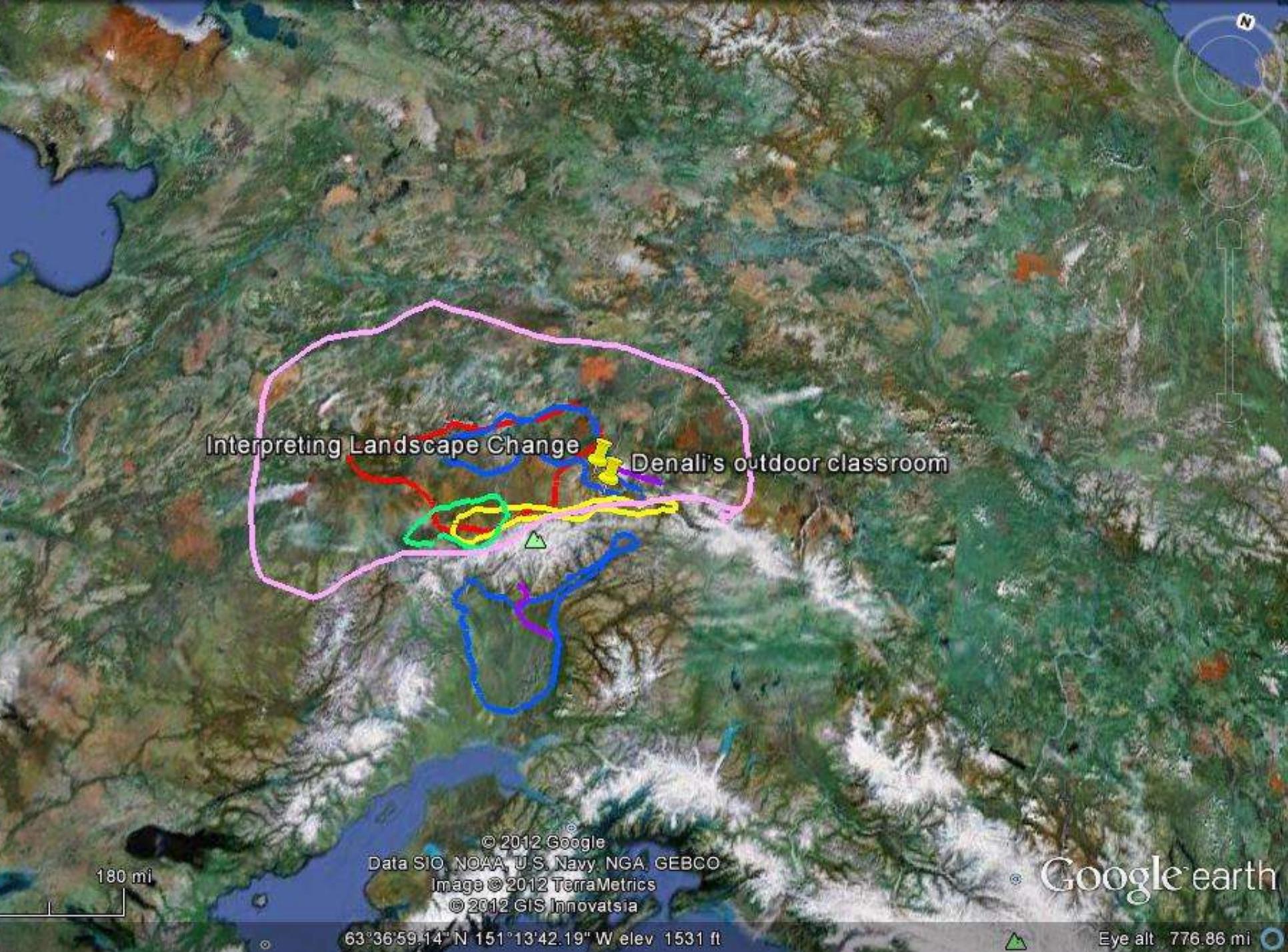
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Interpreting Landscape Change

Denali's outdoor classroom

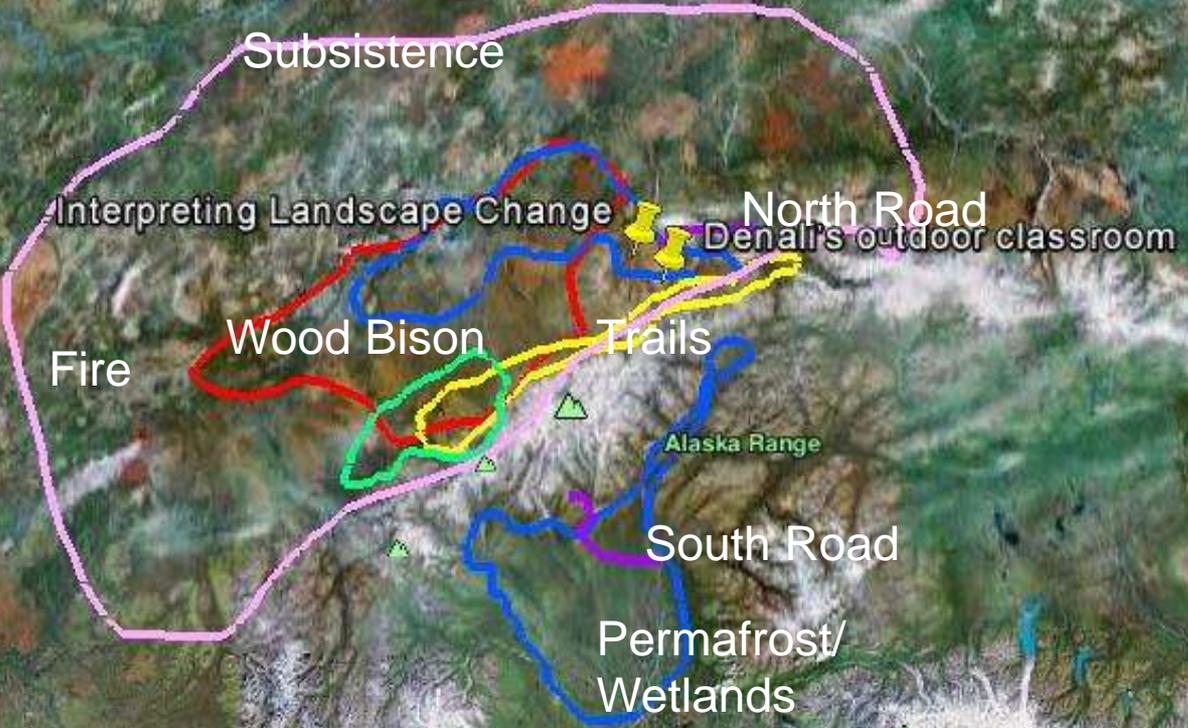
180 mi

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Google earth

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Eye alt 776.86 mi



153 mi

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Google earth

63°26'51.27" N 152°04'38.34" W elev. 1739 ft

Eye alt 624.07 mi

## Interpreting Landscape Change

In the past several decades, (starting in 2011) we have developed an integrated set of interpretive and educational materials focused on the issue of Denali's changing landscapes in response to climate change. We use a variety of different resources including paired historical-recent photos, quantitative data from the park's long term vegetation monitoring program, and materials from various scientific research studies to develop a suite of exhibits and information about how the Park landscape has changed over time in response to the changing climate. The flagship product from this work is the "climate change holodeck" which allows visitors to experience several decades of accelerated vegetation change in a sensoround 3D virtual reality environment. For example, the visitor can experience first-hand the thrill of repeated high-intensity crown fires that have occurred in the warmed park landscape. The products will include displays at the visitors center, web exhibits, technical reports to communicate the changes that have occurred in the Park.



change

Denali's outdoor classroom

Alaska Range

Chugach Mountain

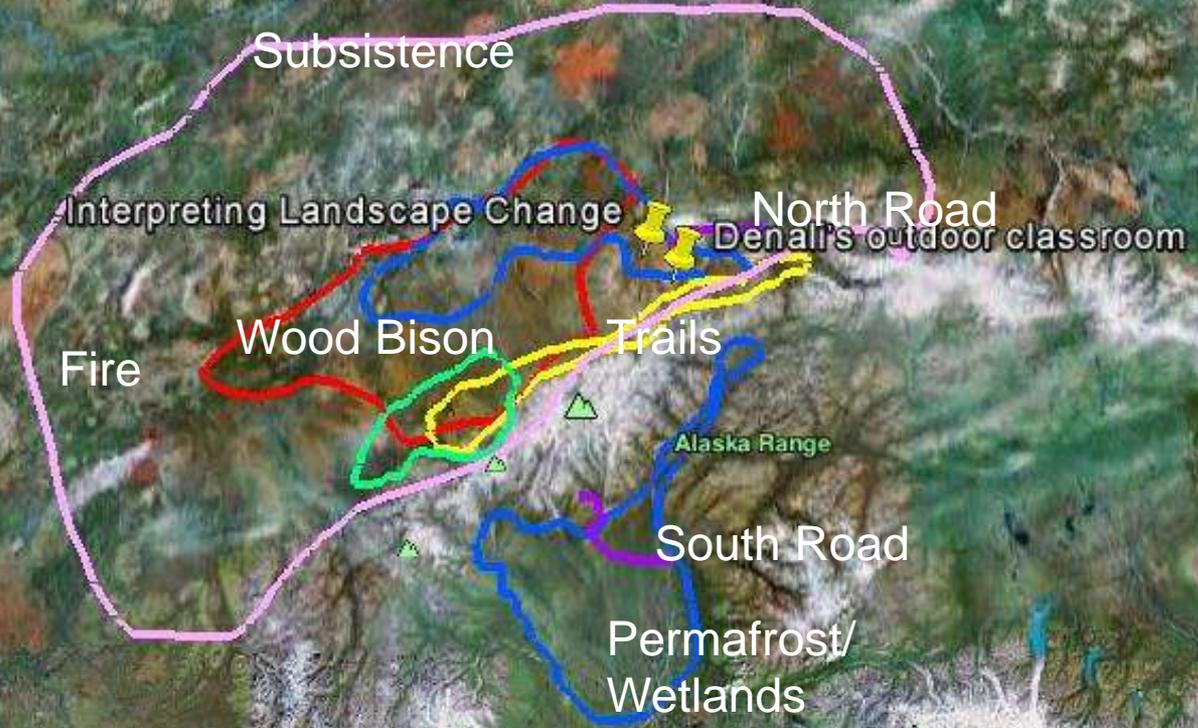
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## Subsistence

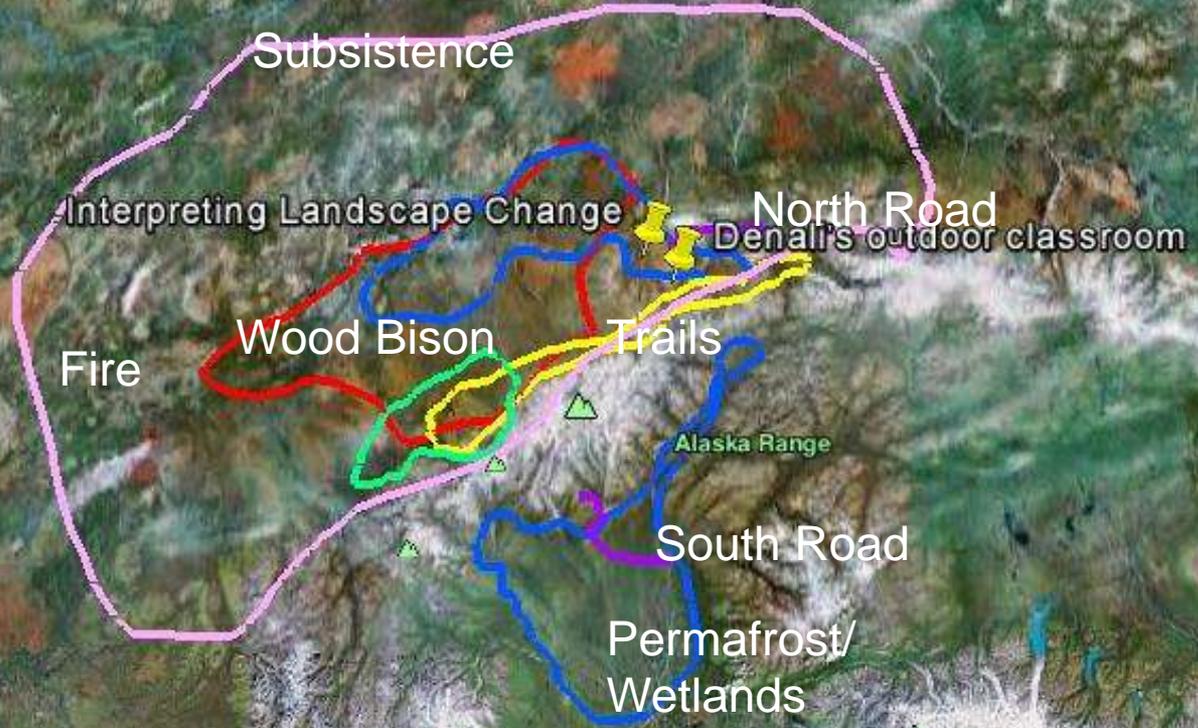
Denali subsistence users have worked with NPS managers to modify hunting laws and policy to adapt as much as possible to the warmer and more moist climate we see today. Examples of the changes include broader hunting seasons and harvest methods that better mimic natural predation. The park managers have worked with subsistence users to help communicate these changing subsistence patterns to the public so that they can better understand the role of subsistence in a changing world. Working together we have been able to maintain subsistence as a viable lifestyle and continue the connectivity of people to the land.

120 mi

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## Fire on the landscape

Creating Patchy Landscapes. The recent increase in woody vegetation has created the possibility for catastrophic, large-scale fires. Large fires can consume the organic layer of the soil leading to increased erosion, loss of seed banks and increase in invasive species. In response, the National Park Service has begun to use fire as a way to decrease the risk of catastrophic fires. Side benefits include increasing habitat niches on the landscape and increasing wildlife viewing opportunities. Schoolchildren learn about fire as a management tool while park visitors enjoy the benefits of fire treatment areas as ideal places to view wildlife.

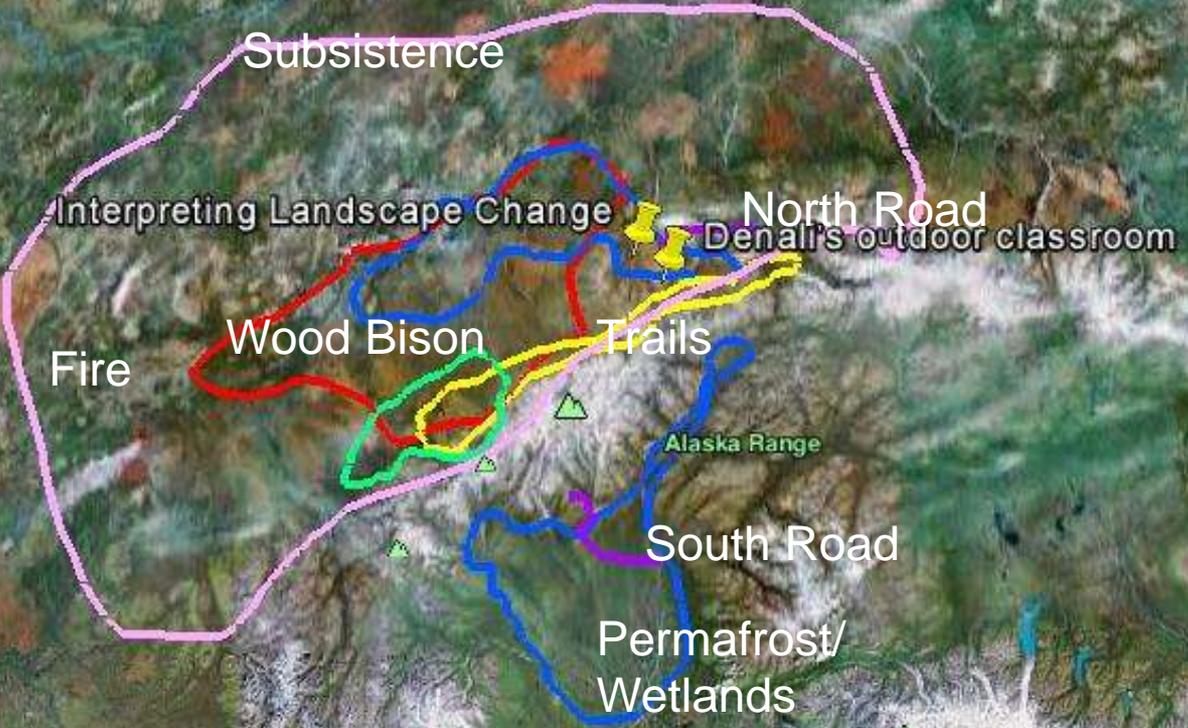
Wrangell Mountains

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63°26'51.27" N 152°04'38.34" W elev. 1739 ft

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## South Denali Road

Recent thawing of the permafrost in the Denali area has allowed for significant improvement in road access to remote areas. Visitors can now drive to remote/secluded trailheads and rivers in the Matsu and Denali Boroughs and enjoy the bountiful fishing and hiking of the area. Visitors can access the new Susitna Dam and enjoy premier fishing and water skiing opportunities. Campgrounds along the reservoir offer fantastic opportunities to enjoy the Alaskan wilderness in the comfort of your RV. Climbers can now access the famous Denali Base Camp in the luxury of their car rather than paying the exorbitant price to fly.

Alaska Range

Wrangell Mountains

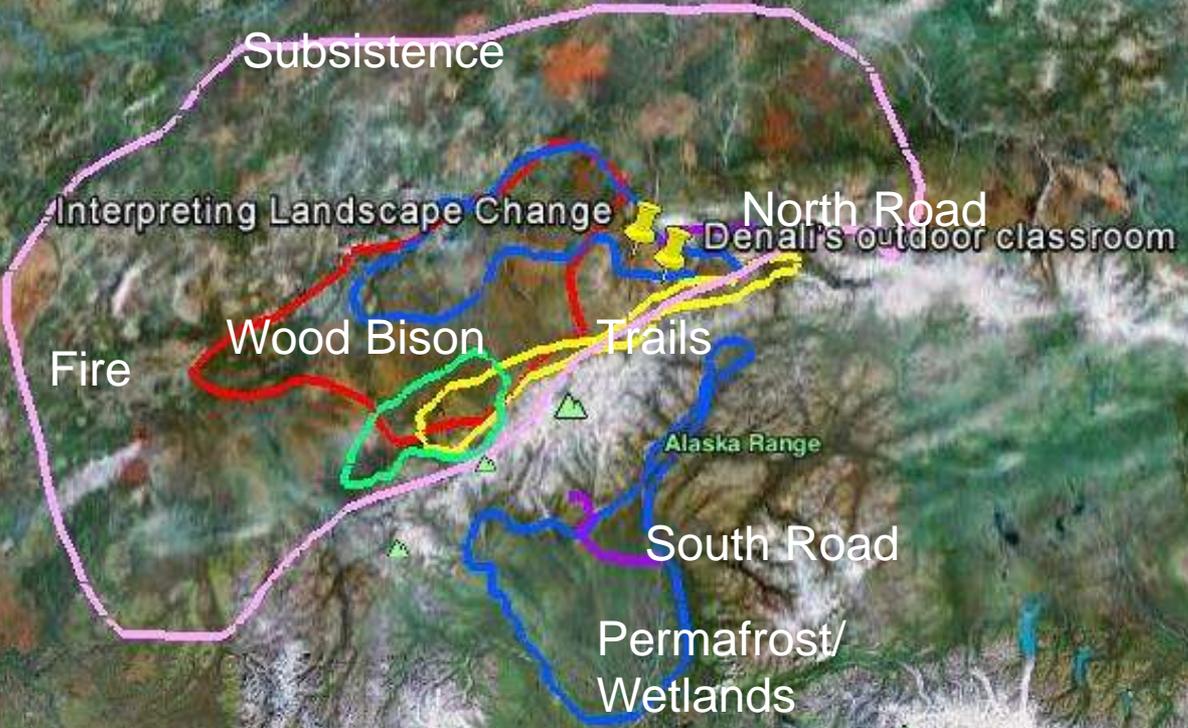
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Image © 2012 TerraMetrics

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## North Denali Road

Recent thawing of the permafrost in the Denali area has allowed for significant improvement in road access to remote areas. Visitors can now drive to remote/secluded trailheads and rivers in the Matsu and Denali Boroughs and enjoy the bountiful fishing and hiking of the area. Visitors can access the new Susitna Dam and enjoy premier fishing and water skiing opportunities. Campgrounds along the reservoir offer fantastic opportunities to enjoy the Alaskan wilderness in the comfort of your RV. Climbers can now access the famous Denali Base Camp in the luxury of their car rather than paying the exorbitant price to fly.

Interpreting Landscape Change

Denali's outdoor classroom

Alaska Range

Wrangell Mountains

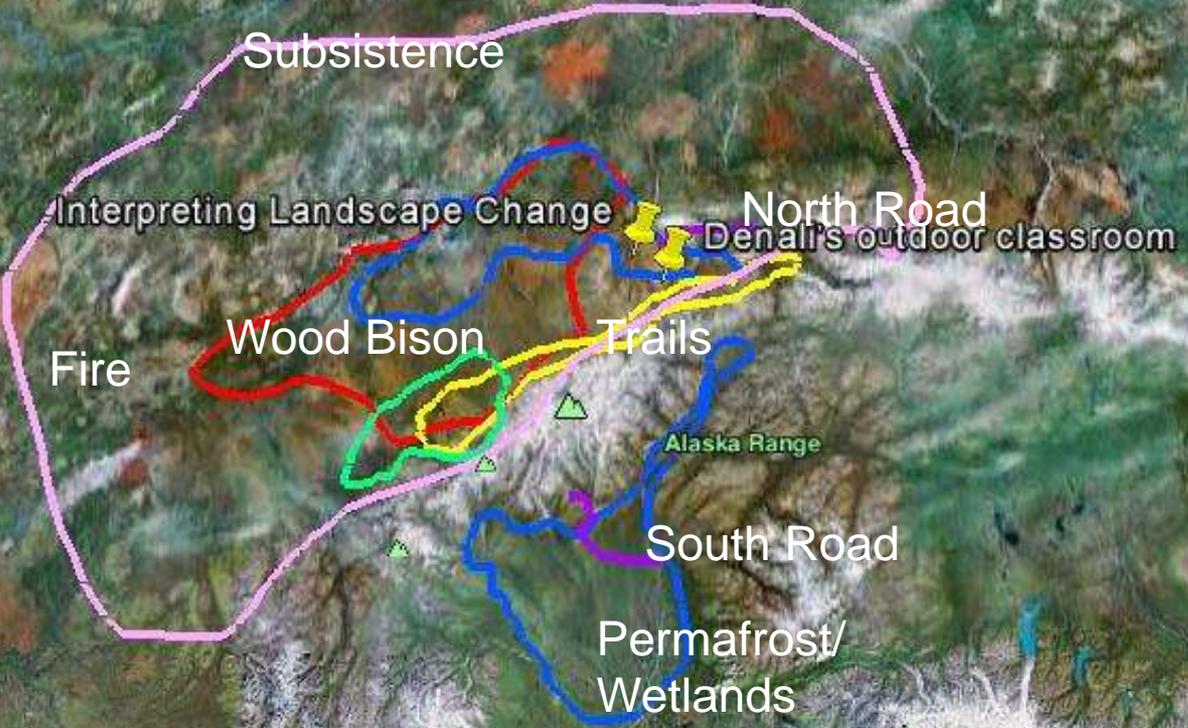
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## Wood bison

Denali assists the migration of wood bison The Denali wood bison herd reached 700 individuals this year, a dramatic increase from the 50 that were initially introduced in 2030. Wood bison are now extinct within their 20th century Canadian range due to winter ice storms. Due to this extirpation, combined with Denali's declining caribou populations and the increase in suitable bison habitat within the park, in 2030 Denali decided to adopt the Matanuska herd. This introduction of a species known to have inhabited Denali historically has helped prevent the expansion of non-native plains bison from east of the park. Wood bison will provide subsistence resources to Alaskans who no longer have access to caribou herds. In addition, visitors are greatly enjoying this new member of Denali's megafauna. Through its willingness to embrace assisted migration, Denali has helped expand the genetic diversity of this endangered species. Attempts are underway to breed woolly mammoths using viable genetic materials melted out of permafrost; this species will be a top priority for introduction once a self-sustaining herd has been established.

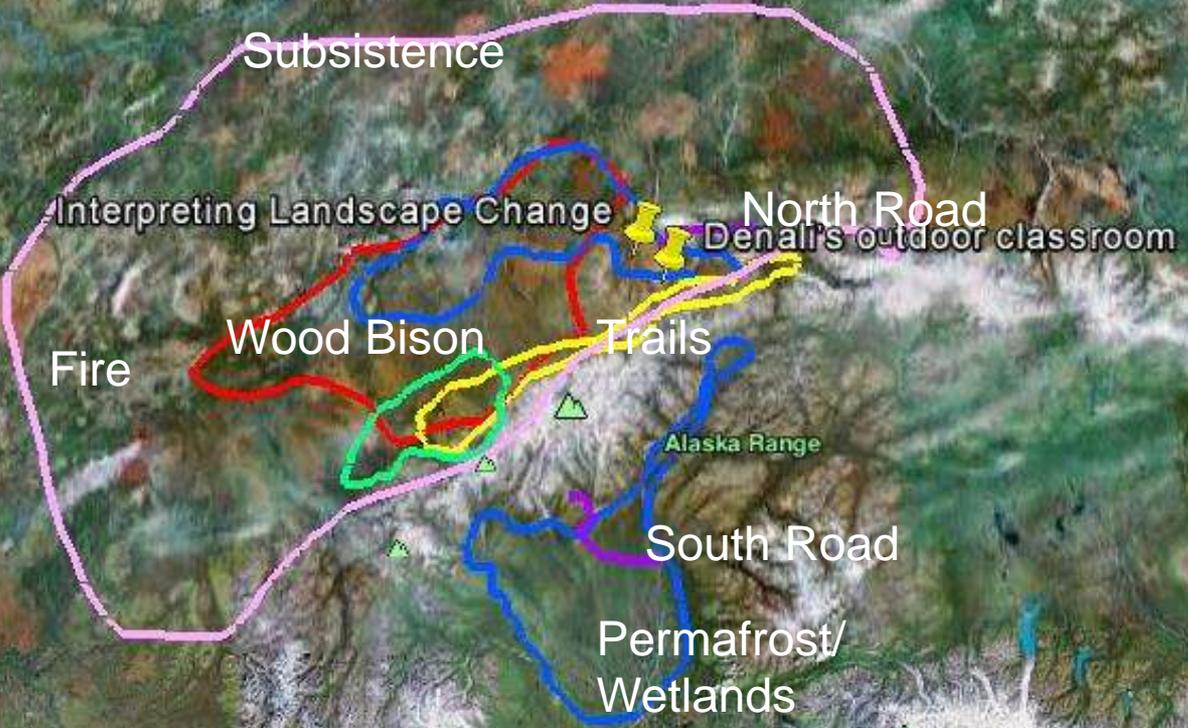
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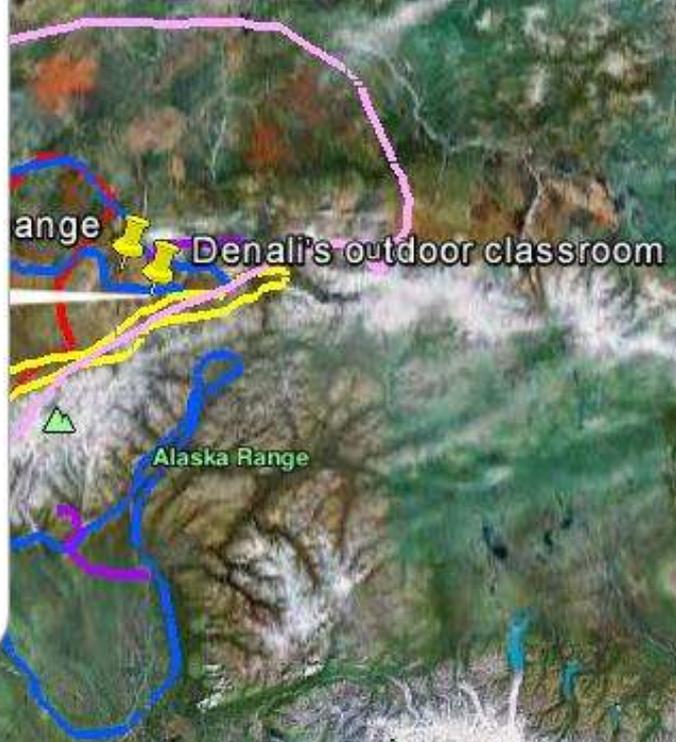
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## Denali's outdoor classroom

Alaskans embrace science education in Denali's outdoor classroom

Alaska has realized the criticality of having its youth learn about science using nature as a classroom, and has chosen Denali as the perfect location for this interactive learning experience. Denali provides an ideal setting for young Alaskans to learn about science, resource management, and outdoor appreciation and stewardship. The Murie Science Experience, a five-day, residential science program for sixth-graders, uses the Murie Science and Learning Center Residential Facility as a base for learning about managing natural resources in the context of climate change. Activities ranging from tracing treeline movement on the flanks of Mt. Healy to measuring phenology changes by observing budset timing using repeat photographs allow students to explore subalpine wilds and gain appreciation for our changing environment. These young stewards will be poised to understand and mitigate new challenges as they arise during the 22nd century and beyond.

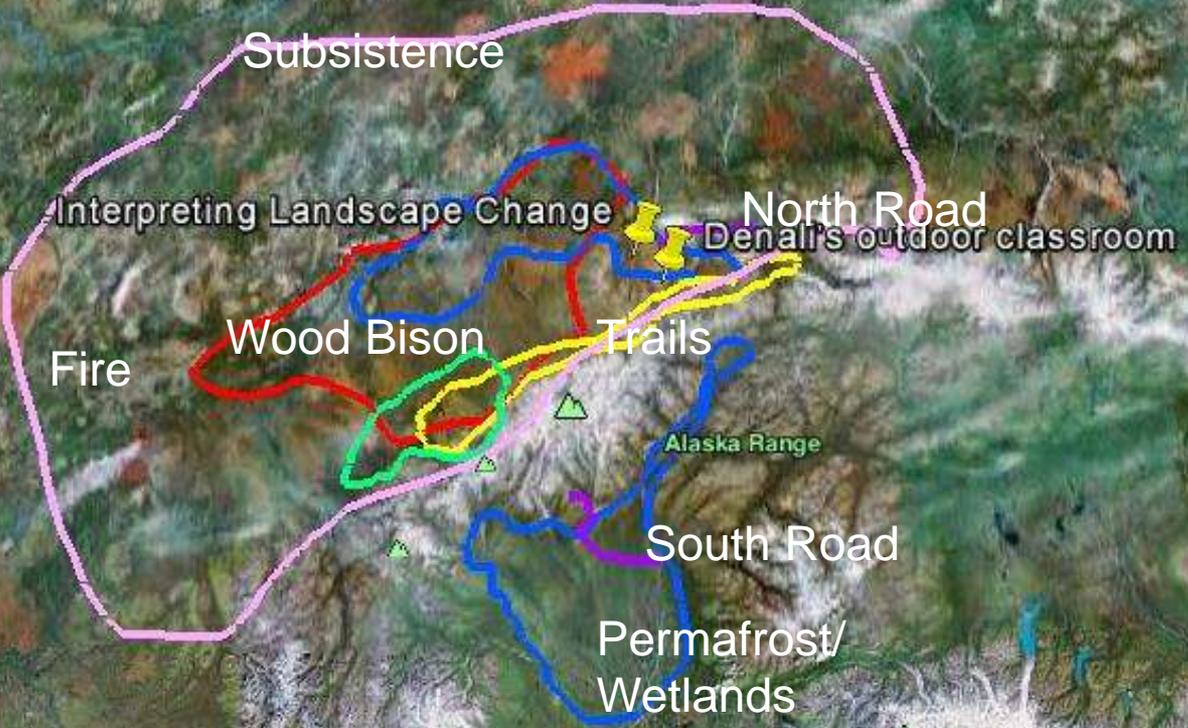


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## Permafrost and wetlands

Loss of extensive areas of permafrost and associated wetlands in the northern part of Denali. Accompanying this loss is a significant increase in collapse scar ponds and bogs. Expansion of groundwater discharge wetlands, primarily fens, in the northern part of the Park is associated with higher precipitation in the mountain recharge zones. Increase in both forested wetlands, fens and bogs in the southern part of the Park.

s outdoor classroom

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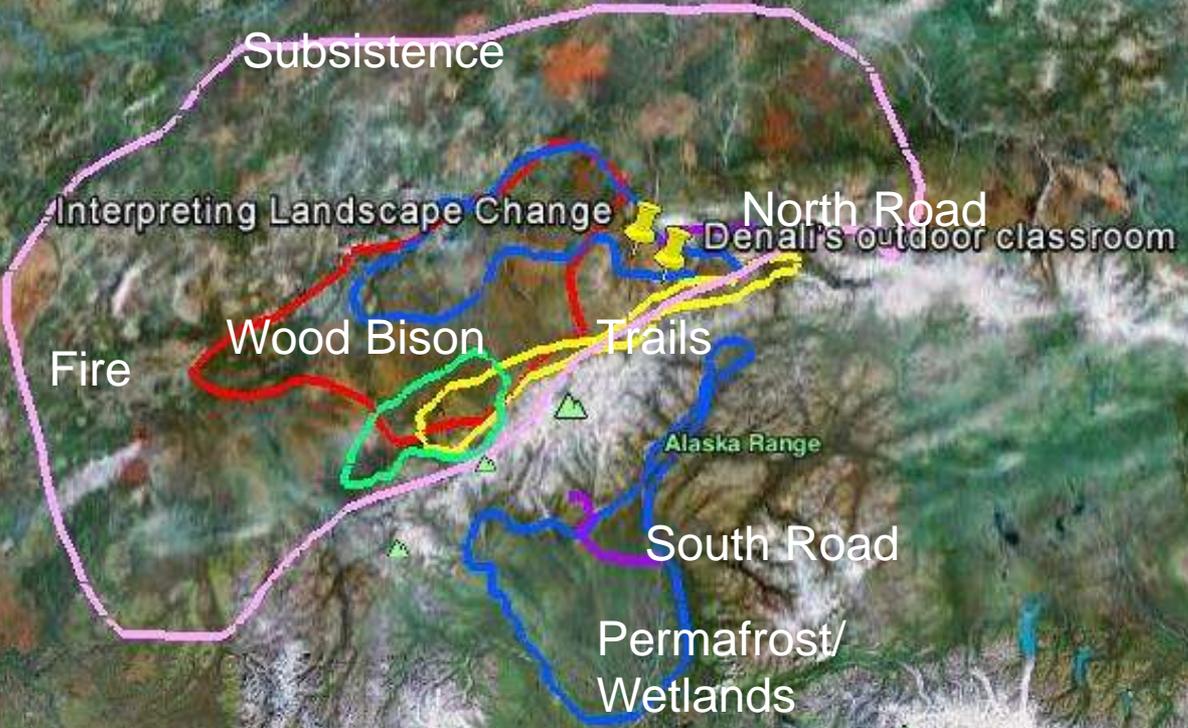
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Wrangell Mountains

Google earth

63°36'55.05" N 151°13'44.68" W elev 2440 ft

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Eye alt 624.07 mi

## Denali Park Trails

The hiking trails within the greater Denali area have been developed to provide visitors with unfettered access to the world class wilderness of the area. Visitors can easily hike through the dense vegetation of the valleys to gain access to the surrounding peaks to soak in the views of the Alaska Range. The lands, whether they are managed by the State, Borough or National Park Service, are all equally accessible and pristine.

Interpretive

Denali's outdoor classroom

Alaska Range

Wrangell Mountains

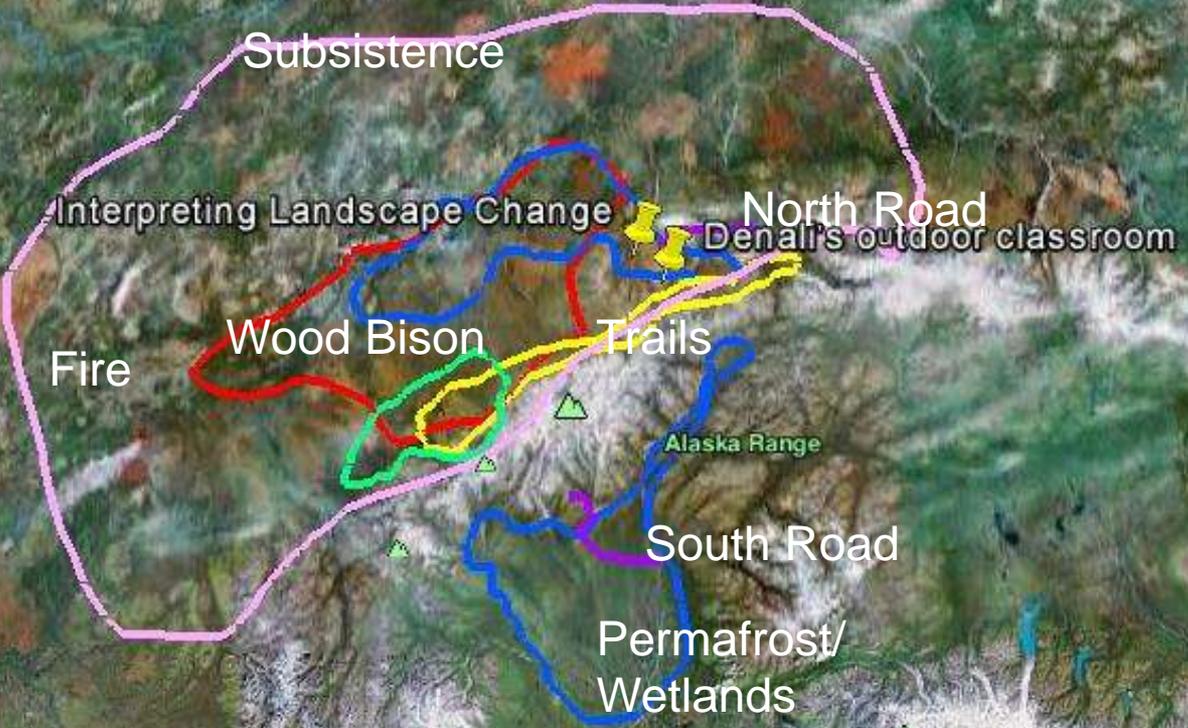
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Google earth

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Eye alt 624.07 mi

“Pretty Sunsets” / Is There Anyone Out There?  
Climate Change Scenario Workshop  
April 16 – 18, 2012

Look at that sunset . Pretty ain't it ...  
Damn! Sometimes I wish I were not so beautiful.  
Sometimes people just see the beauty, but they don't really see me.  
Name's Gaia ... People call me Mother Earth ... or you can call me “The land.”  
(Waves dismissively) Whatever ...  
Whatever ... That would sum up my life today: "Whatever"

Let me tell you:  
I've always tried to take care of myself. I had a lot of self-control. (Straightens up)  
Sure, I'd go through phases - doesn't everybody - but I kept it together.  
But now, I'm not so sure. I'm starting to feel out of balance.  
(aside) Whew, it's hot in here. Are you hot?

Used to be I felt I had plants on all the right places.  
Tall trees, willows, beautiful little tundra flowers of all different colors ...  
And berries - oo-oo Baby! I was fecund!  
But then things started to change. It's like my soul just dried up.  
All of a sudden I've got shrubs squeezing out my grasses and flowers.

And the fires!  
I used to lo-o-o-ve a good fire to stir the pot!  
But now they're happening all the time.  
I can't send out a lightning bolt without burning down the house.  
After a fire, I don't mess putting up trees anymore. I just replace 'em with grass.  
Sure, a grassland is pretty ... esp. when you don't know what used to be there.

\* cough \* sorry about the smoke ... \* cough \*  
I need a drink. But I am clean out of little ponds.  
I'd drink out of my rivers, but, have you seen my sediments loads ...

Oh, what used to be there ... my animals, my animals ...  
I used to be crawling with all sort of things:  
Grizzly bears, black bears, caribou, moose, sheep, wolves ...  
They found what they needed to live, and I didn't worry about them too much.  
But I didn't realize how all my vegetation changes were taking a toll.  
First my pika ... gone ...  
Then my caribou .. not gone, but hard to find - almost the same thing.  
Then my bears - going, going ...  
Then - oh, hello! - I got wood bison. Where'd you come from?

My timing is off.  
My birds show up. My insects have hatched and gone.

I'm ... just ... off ...

Oh, people come. They travel that road.  
They still see wildlife. They think I'm fine.  
But believe me: It just ain't the same.

And that road: Everybody worries about that road.  
"Oh Gaia, don't let that permafrost go! We'll lose that road."  
But I ask you: What's in it for me?

I used to be decked out in blue ice and white snow.  
But hemlines have moved up, if you know what I mean, and I'm not too comfortable with that.

You look at me and - if you ignore those fire scars - I look pretty and green and I know what you're thinking: you want to hike all over me ...  
That's fine, but I'm NOT the same.  
And no one seems to notice.  
Hey, Green and Gray (waves) Hey, HEY, hey!  
(Shrugs) Nothing ...

I used to feel connected with people.  
All of them.  
I fed them and they paid attention. But now there were so many ...  
8 billion ... op, 8 billion and one.

Even with so many, there were a few - those special few - who still paid attention.  
I looked at them and they looked at me and it was like we were in love ... but was more than that: we understood each other ...  
But this world - it's so hustling and bustling ...  
They move away. It's like they said to me: It's over.  
I'm lonely ...

Bright side \* cough \* all this smoke makes for beautiful sunsets.  
I look at them and feel despair.  
Makes me want to climb to the highest mountain and shout:  
Is anyone out there ... who cares?

## **SUPERINTERDENT'S ANNUAL REPORT for WRST & YUCH = WRYCH**

Superintendent Emily McCarthy

- Due to decreased resources and diminished federal and public support, WRST and YUCH were forced to merge into a new “park” unit with a redefined ANILCA mission, passed by Congress in 2025. This mission includes continuing monitoring and permitting, however, the unit must fund its entire budget from fees within the unit. Resource development is now permitted and generates most of the income.

### **Funding Changes**

As Congress expects, Park operations will be funded 100% through various fees. Most Park activities will continue to be carried out by concessionaires and cooperators including Native Corporations

### **Subsistence**

**Due to changes in federal and state legislation spurred by lawsuits, the Federal and State Subsistence programs have merged.**

*Because of a diminished year round economic base, remaining subsistence users rely even more heavily on local subsistence resources.*

This has increased competition between local and urban subsistence users.

We are challenged to manage the expanding and degrading ORV trail networks due to increased subsistence activities.

On a positive note, we had a celebration for Eagle resident, Charley Baker who caught the first Yukon River chum seen in the last 5 years.

The fish was so rare and unusual that instead of eating the salmon, the fish has been stuffed and is on display at the post office.

### **Management of Kennecott**

Renovation of the Kennecott historic mining buildings has finally been completed with funding from WorldWideTours.

Visitation to the park is primarily focused on the new and improved McCarthy Road to Kennecott.

Primary visitation in the park continues to be affluent visitors who request guided hunting and special tours to Kennecott. The McCarthy-WorldWideTours Air Strip has been enlarged to accommodate jets.

New lodge and private enterprise development continues to occur at the end of the McCarthy Road.

### **Permitting and Mineral Activity**

A co-management agreement was used to build roads to logging grounds and mineral deposits.

Metal prices continues to rise, which has increased mining development in Woodchopper Creek in the Yukon Charley region.

This year we saw the extraction of over 1000 ounces of gold from Woodchopper Creek and we continue to facilitate river access to oil and gas leases on Nation River.

The challenges associated with the permitting and monitoring requirements for new methods of In-situ extraction of minerals in frozen soils, remain problematic and an unfunded mandate.

### **Degradation of and Increasing Wetlands**

Heavier rainstorms in recent years have caused slumping and erosion which has damaged roads and trails and has taxed our ability to maintain access (especially to in-holders) and prevent resource damage.

Visitation in wilderness has been reduced to almost nothing, except for consumptive uses and resource development.

We need monitoring for resource issues but have minimal funding and staff. The monitoring process has been almost exclusively handed over to university research and private contractors.

Contracting for resource monitoring is focused on NPS mandates to preserve charismatic megafauna, as reflected in park enabling legislation.

Invasive species issues have increased along the roads, trails, and river corridors and remain focused on reed canary grass, white sweetclover, bird vetch, dandelions and a newly discovered Asiatic species.

On a positive note, a new local subsistence industry, the making and selling of dandelion wine, has emerged.

Also, biomass generators in the local communities are being partially supported by invasive species biomass. Harvesting of these exotics for fuel has had the unexpected consequence of further degrading the ORV trails and associated landscapes.