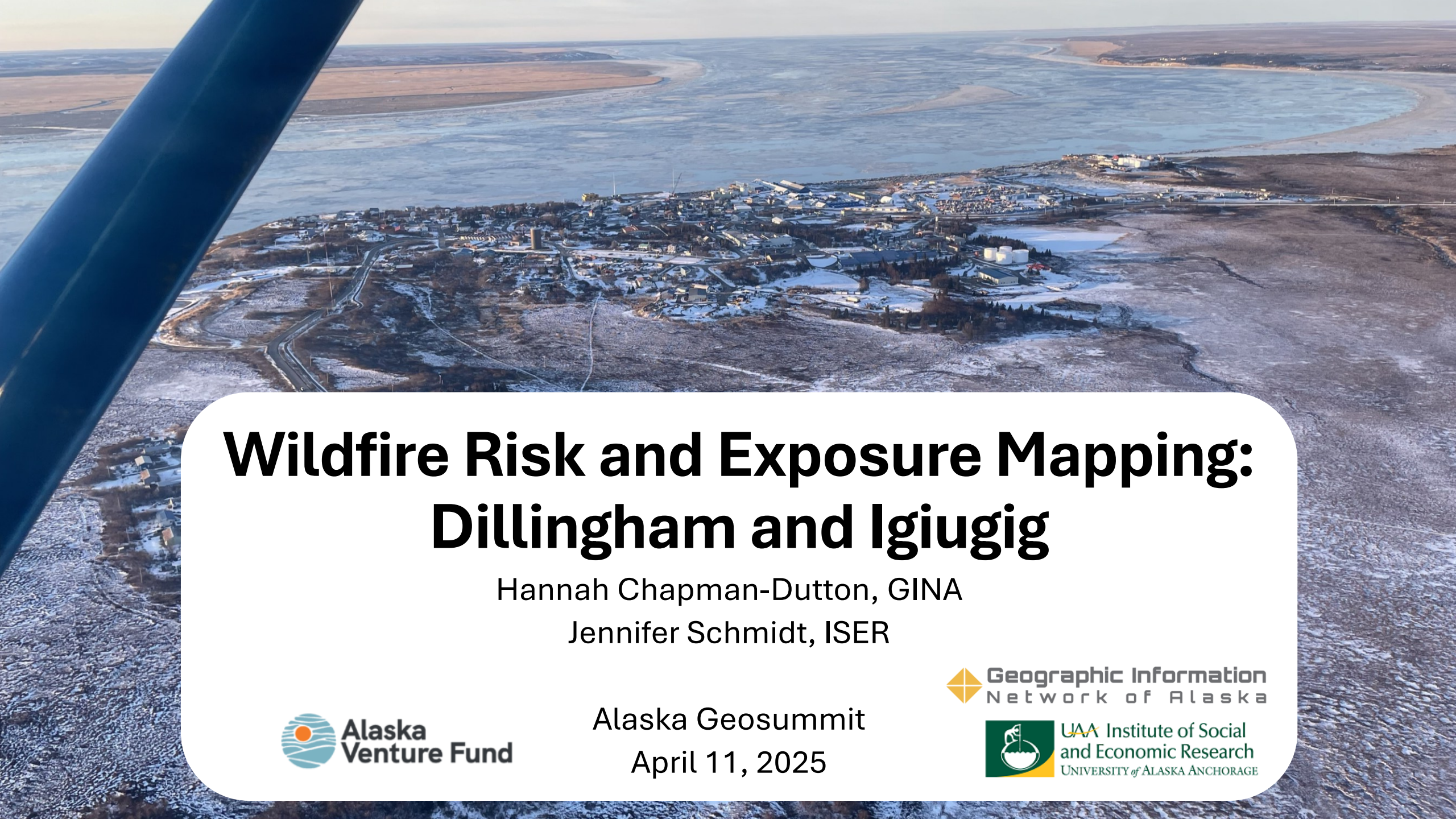


# Wildfire Risk and Exposure Mapping: Dillingham and Igiugig

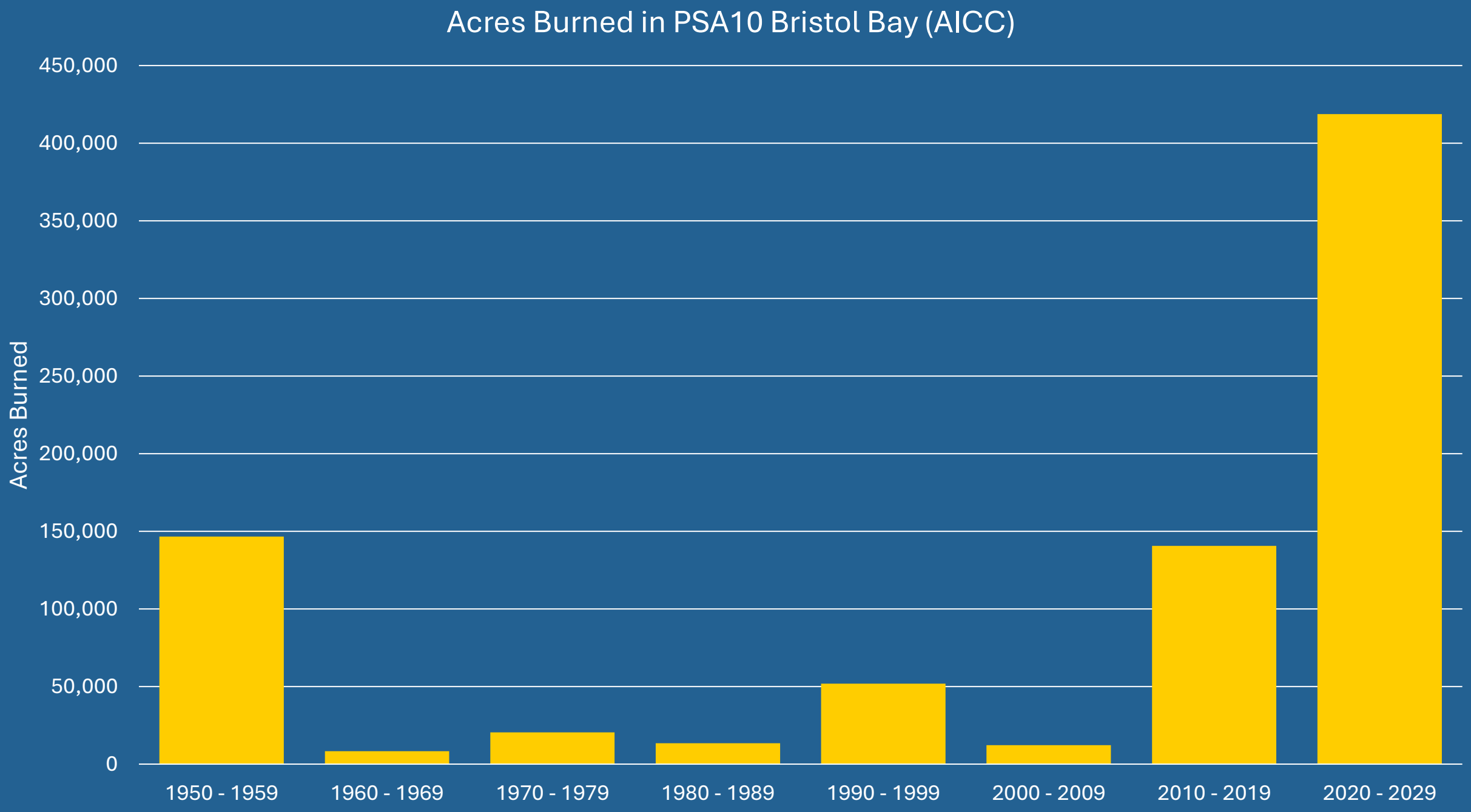
Hannah Chapman-Dutton, GINA
Jennifer Schmidt, ISER

Alaska Venture Fund

Alaska Geosummit
April 11, 2025

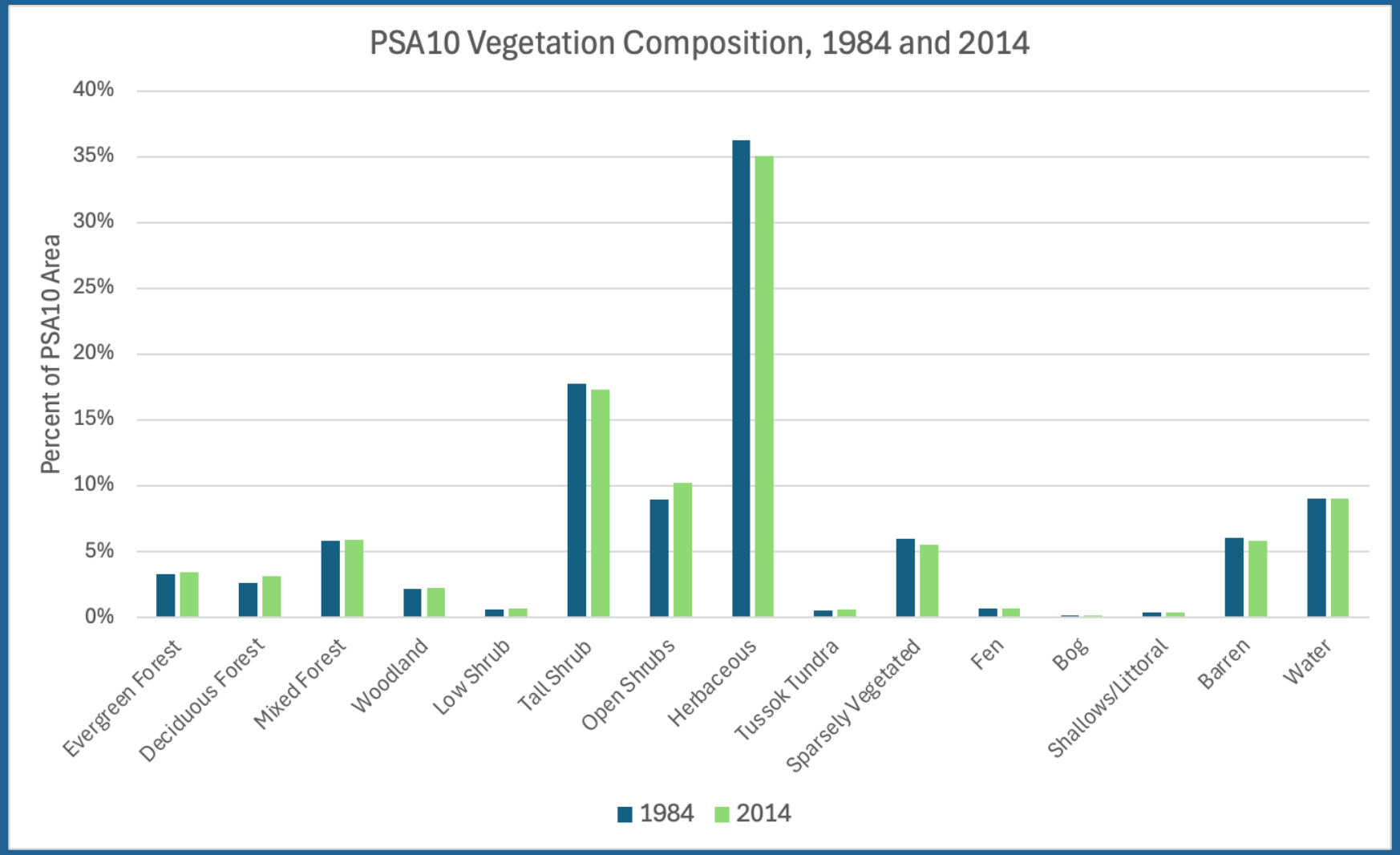
Geographic Information Network of Alaska

UAA Institute of Social and Economic Research
University of Alaska Anchorage


Acres Burned in PSA10 Bristol Bay (AICC)
Acres Burned
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
1950 - 1959
1960 - 1969
1970 - 1979
1980 - 1989
1990 - 1999
2000 - 2009
2010 - 2019
2020 - 2029

ABoVE vegetation data (derived from Landsat) is available over most of Alaska from 1984 to 2014.

Most of PSA10 falls into herbaceous and shrub categories, with some forested areas.



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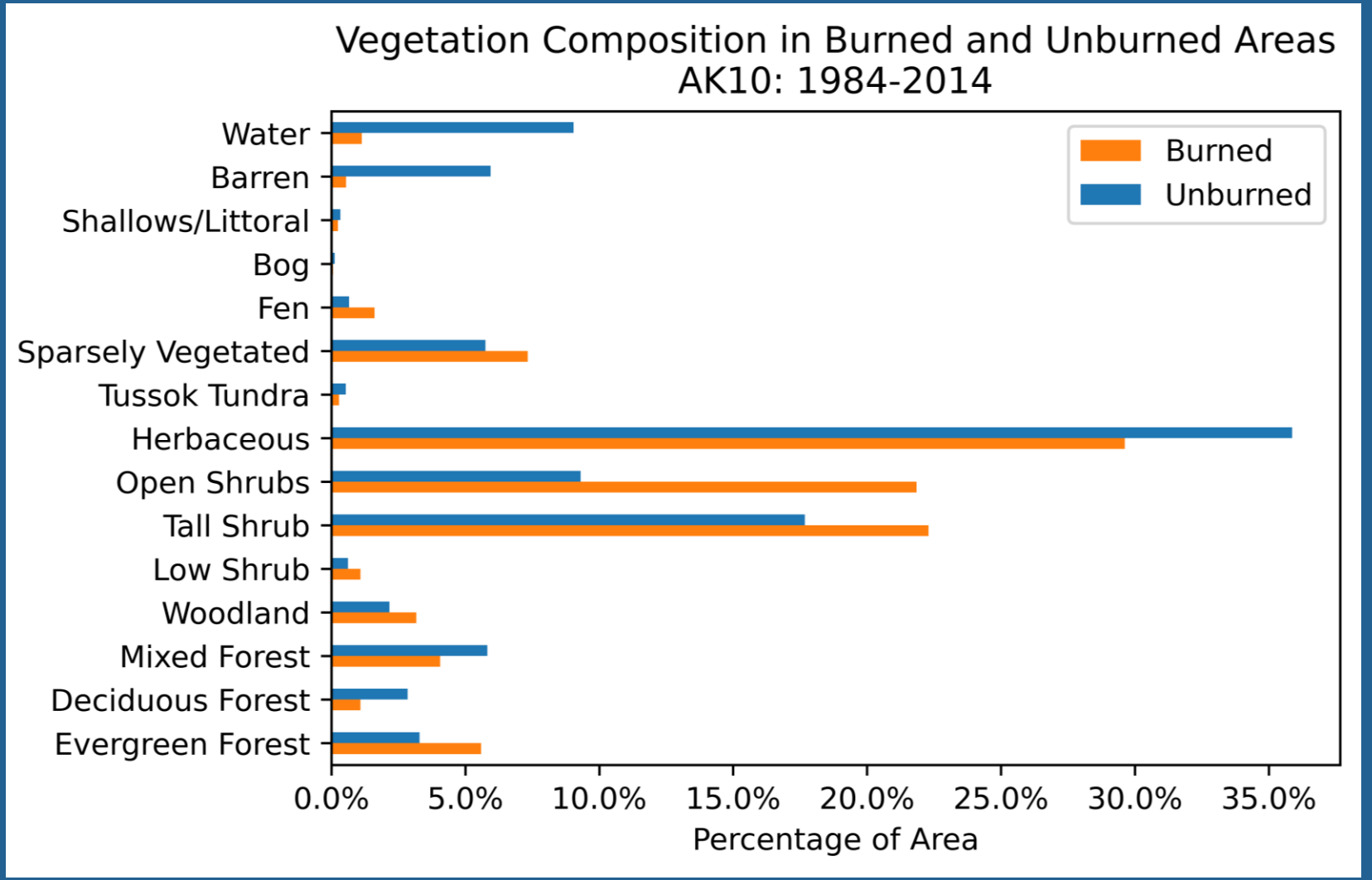

## Alaska Statewide Hazard Values

| Land cover type | Modified hazardous fuel ratings | | Hazard class |
|---|---|---|---|
| | 500m-adj | 100m-adj | |
| Evergreen forest | 100 | 100 | Very High |
| Deciduous forest | 6 | 30 | Low |
| Mixed forest | 75 | 75 | High |
| Woodland | 100 | 100 | Very High |
| Low shrub | 6 | 30 | Low |
| Tall shrub | 6 | 30 | Low |
| Open shrub | 20 | 50 | Low/Mod |
| Herbaceous | 6 | 30 | Low |
| Tussock tundra | 20 | 50 | Low/Mod |
| Sparsely vegetated | 0 | 0 | Very Low |
| Fen | 20 | 50 | Low/Mod |
| Bog | 0 | 0 | Very Low |
| Shallows/littoral | 0 | 0 | Very Low |
| Barren | 0 | 0 | Very Low |
| Water | 0 | 0 | Very Low |
| NA (Ice/Snow) | 0 | 0 | Very Low |

## Bristol Bay Hazard Values

### Moderate Grass Model

| | | | |
|---|---|---|---|
| Herbaceous | 20 | 50 | Low/Mod |

### High Grass Model

| | | | |
|---|---|---|---|
| Herbaceous | 75 | 75 | High |

+

| | | | |
|---|---|---|---|
| Lichens | 6 | 30 | Low |
| Lichens | 20 | 50 | Low/Mod |

## Alaska Statewide Hazard Values

| Land cover type | Modified hazardous fuel ratings | | Hazard class |
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## Bristol Bay Hazard Values

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| | | | |
|---|---|---|---|
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|---|---|---|---|
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+

| | | | |
|---|---|---|---|
| Lichens | 6 | 30 | Low |
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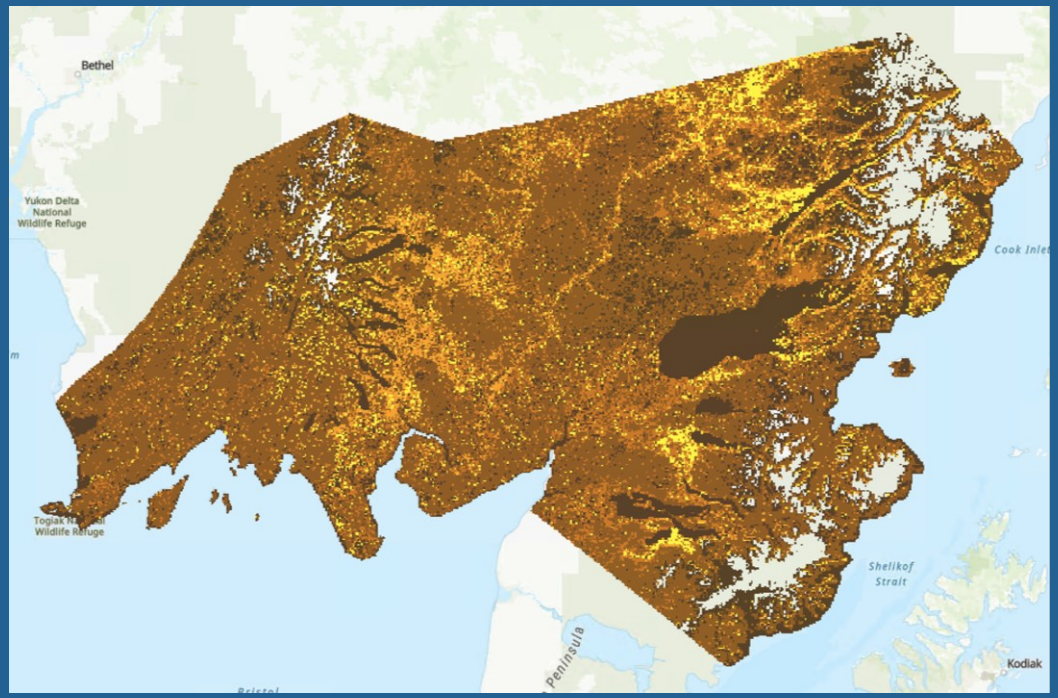
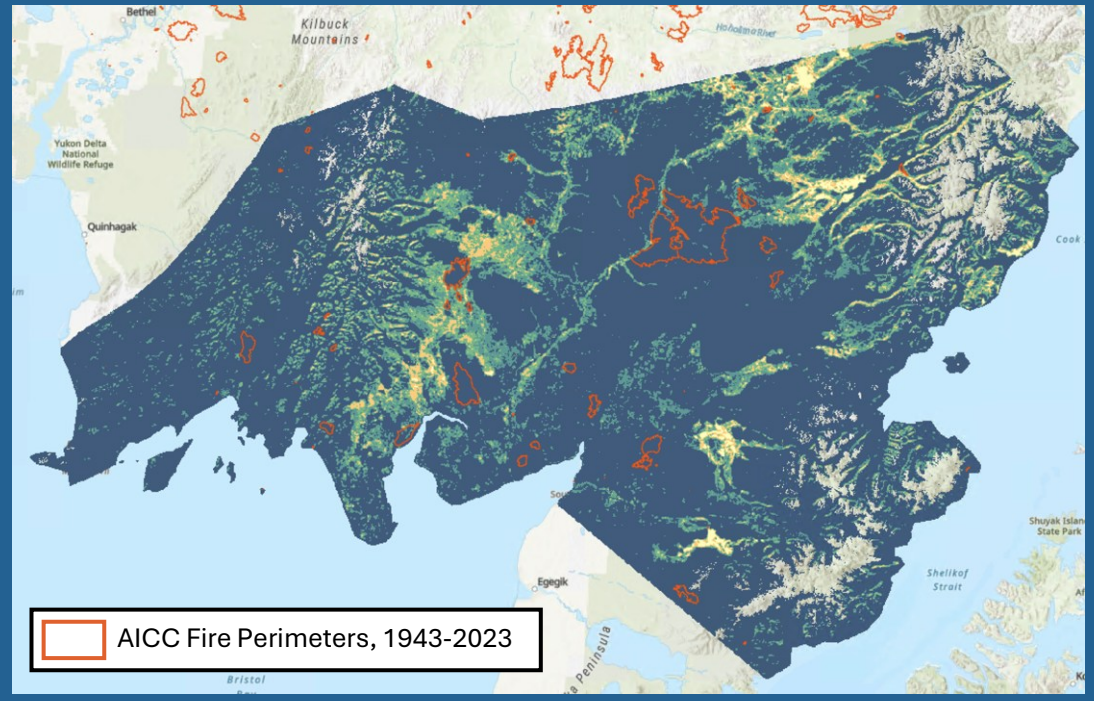
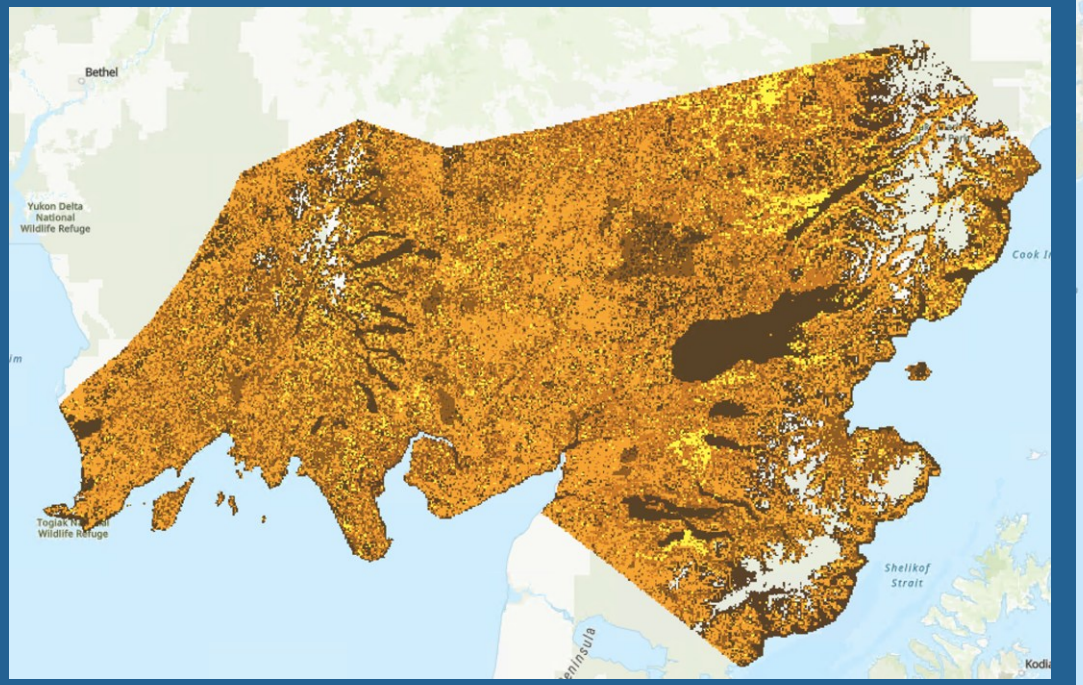
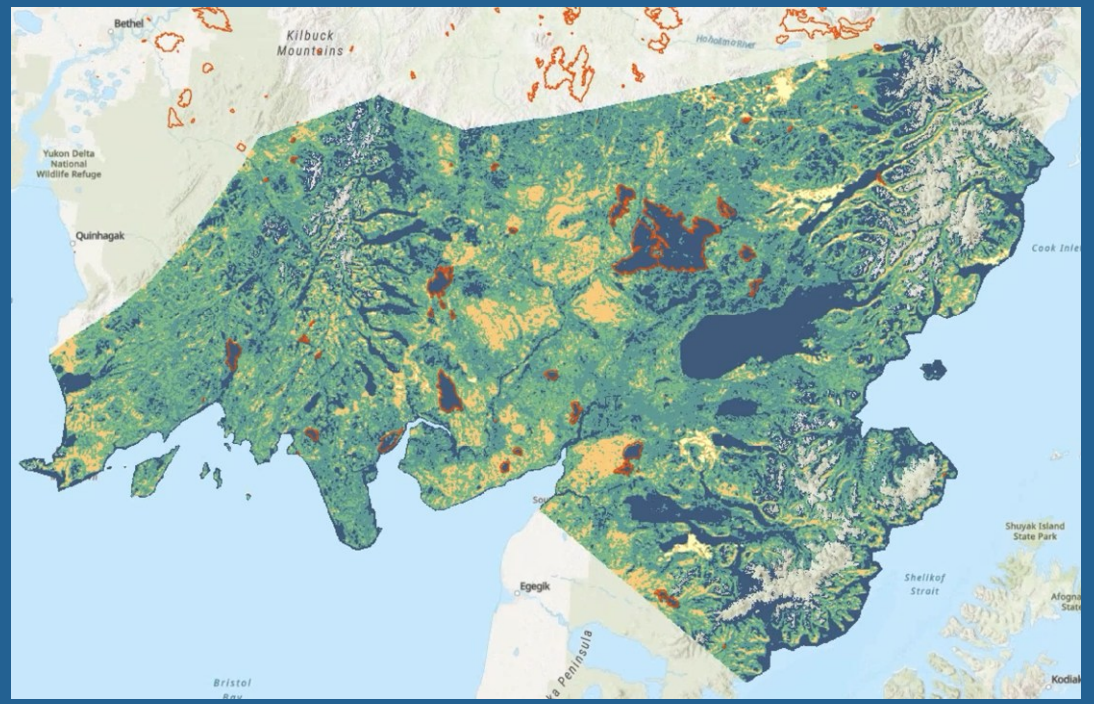
Original Exposure



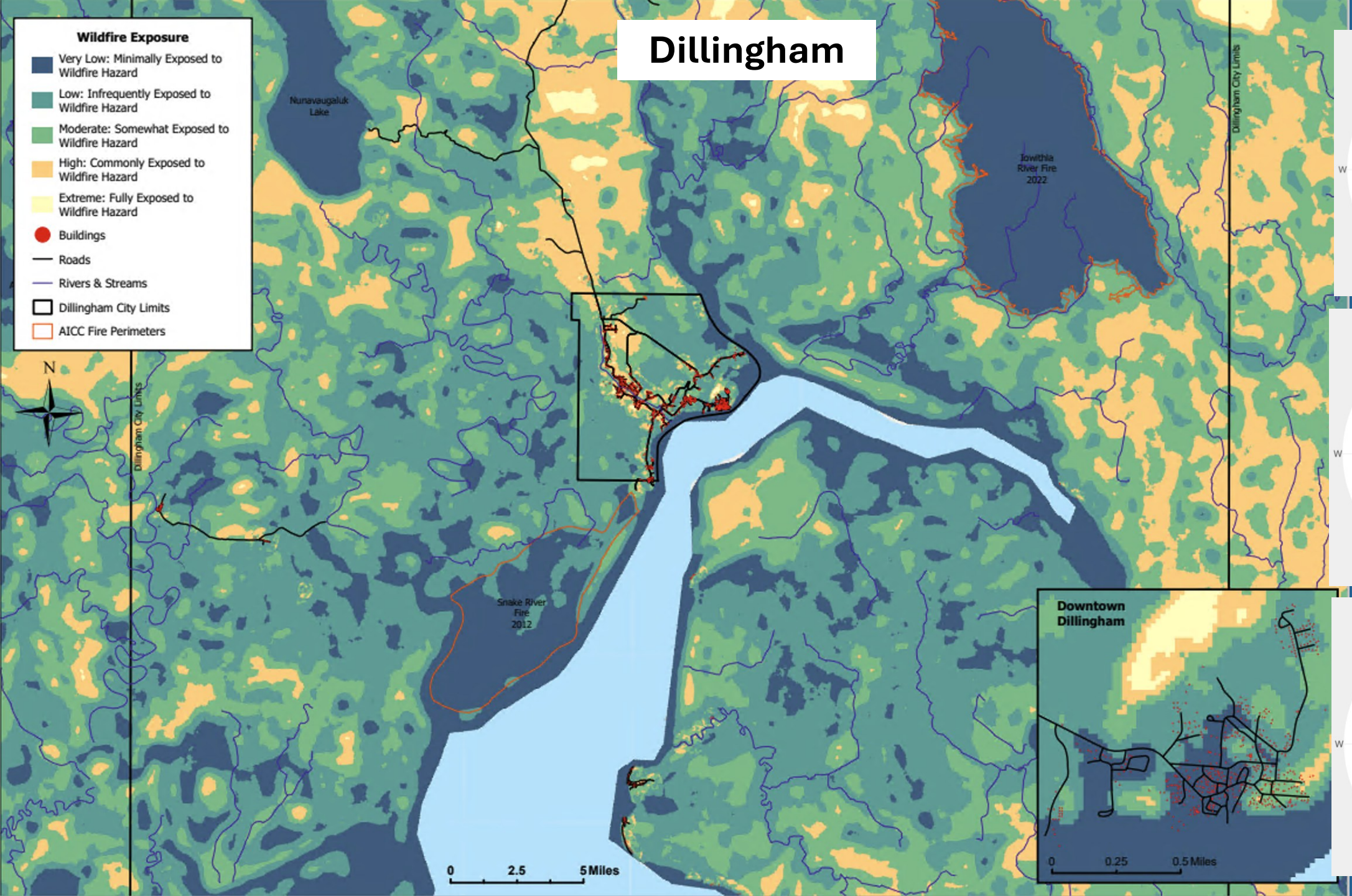




Updated Exposure

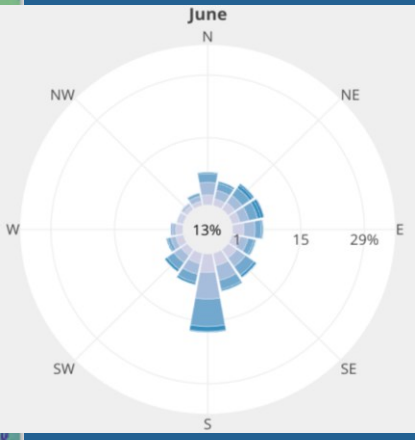


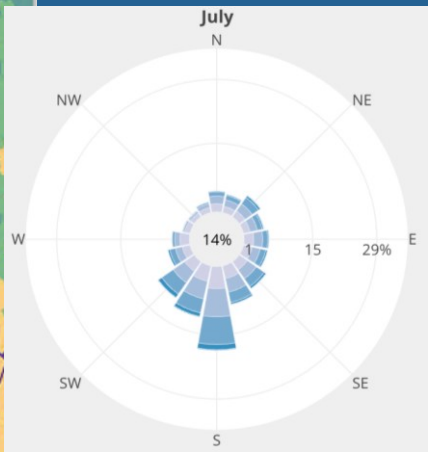



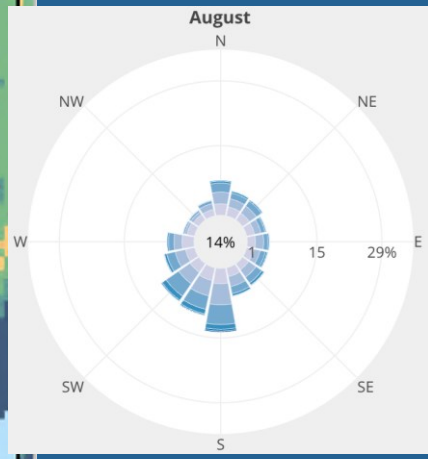
# Dillingham


Wildfire Exposure
Very Low: Minimally Exposed to Wildfire Hazard
Low: Infrequently Exposed to Wildfire Hazard
Moderate: Somewhat Exposed to Wildfire Hazard
High: Commonly Exposed to Wildfire Hazard
Extreme: Fully Exposed to Wildfire Hazard
Buildings
Roads
Rivers & Streams
Dillingham City Limits
AICC Fire Perimeters
N
Nunavaugaluk Lake
Iowithia River Fire 2022
Snake River Fire 2012
Dillingham City Limits
Dillingham City Limits
0 2.5 5 Miles


Downtown Dillingham
0 0.25 0.5 Miles


June
N
NE
E
SE
S
SW
W
NW
13%
15
29%


July
N
NE
E
SE
S
SW
W
NW
14%
15
29%

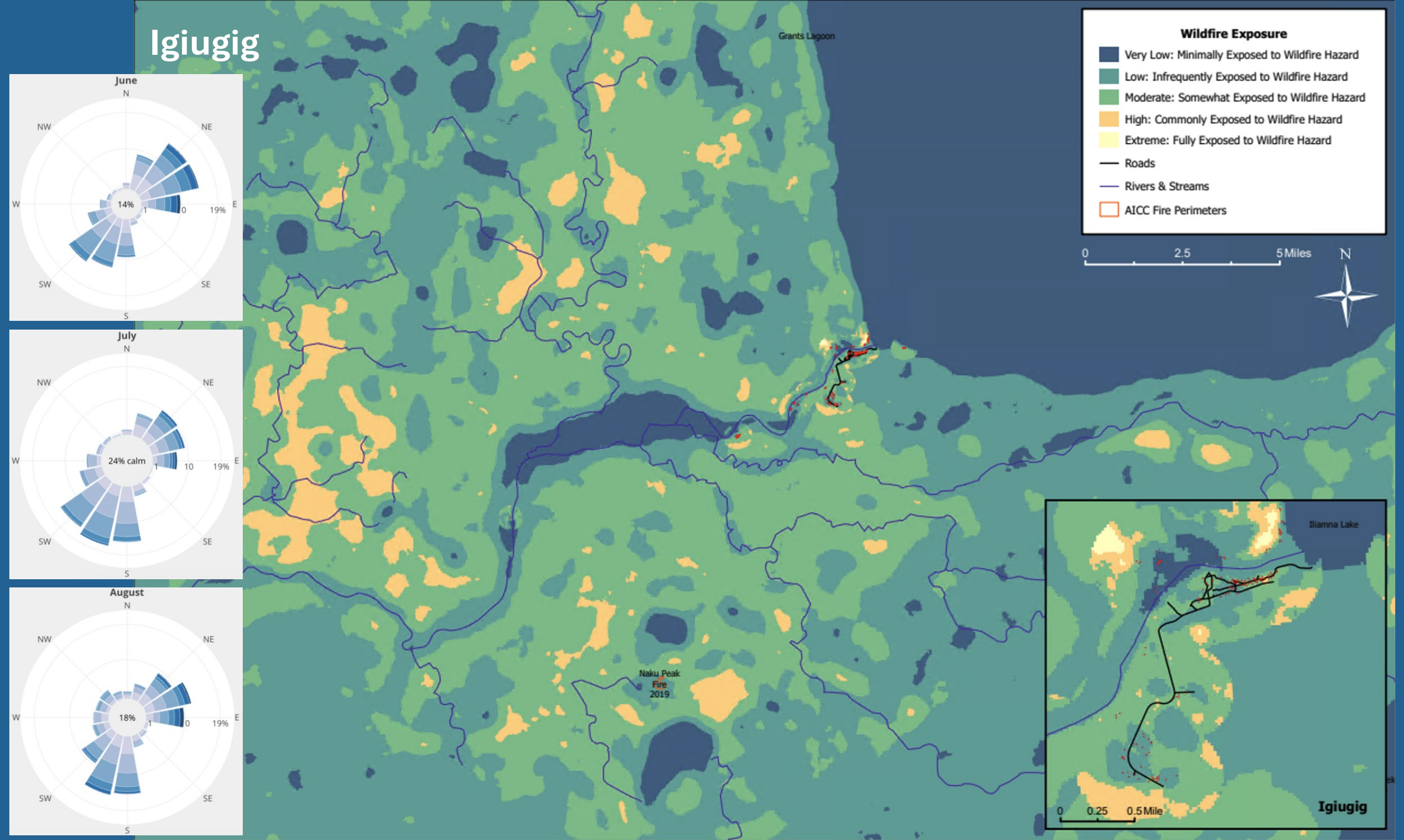

August
N
NE
E
SE
S
SW
W
NW
14%
15
29%

# Igiugig


June
N
NW
NE
W
E
SW
SE
S
14%
1
0
19%


July
N
NW
NE
W
E
SW
SE
S
24% calm
1
10
19%


August
N
NW
NE
W
E
SW
SE
S
18%
1
0
19%


Grants Lagoon
Naku Peak
Fire
2019
Wildfire Exposure
Very Low: Minimally Exposed to Wildfire Hazard
Low: Infrequently Exposed to Wildfire Hazard
Moderate: Somewhat Exposed to Wildfire Hazard
High: Commonly Exposed to Wildfire Hazard
Extreme: Fully Exposed to Wildfire Hazard
Roads
Rivers & Streams
AICC Fire Perimeters
0
2.5
5 Miles
N
Iliamna Lake
0
0.25
0.5 Mile
Igiugig

Shaded boxes are layers produced

Hazardous fuel + Structure density as **fuel** and **value**

**How hot!**

Add in fuel from houses
(3 units per house up to 100)

Enhanced hazardous fuels × **Value**

Structure importance factor

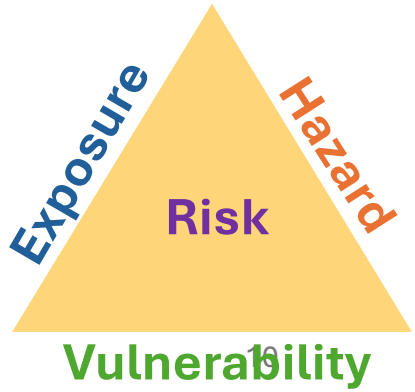
Residential & Critical Infrastructure (1.0)

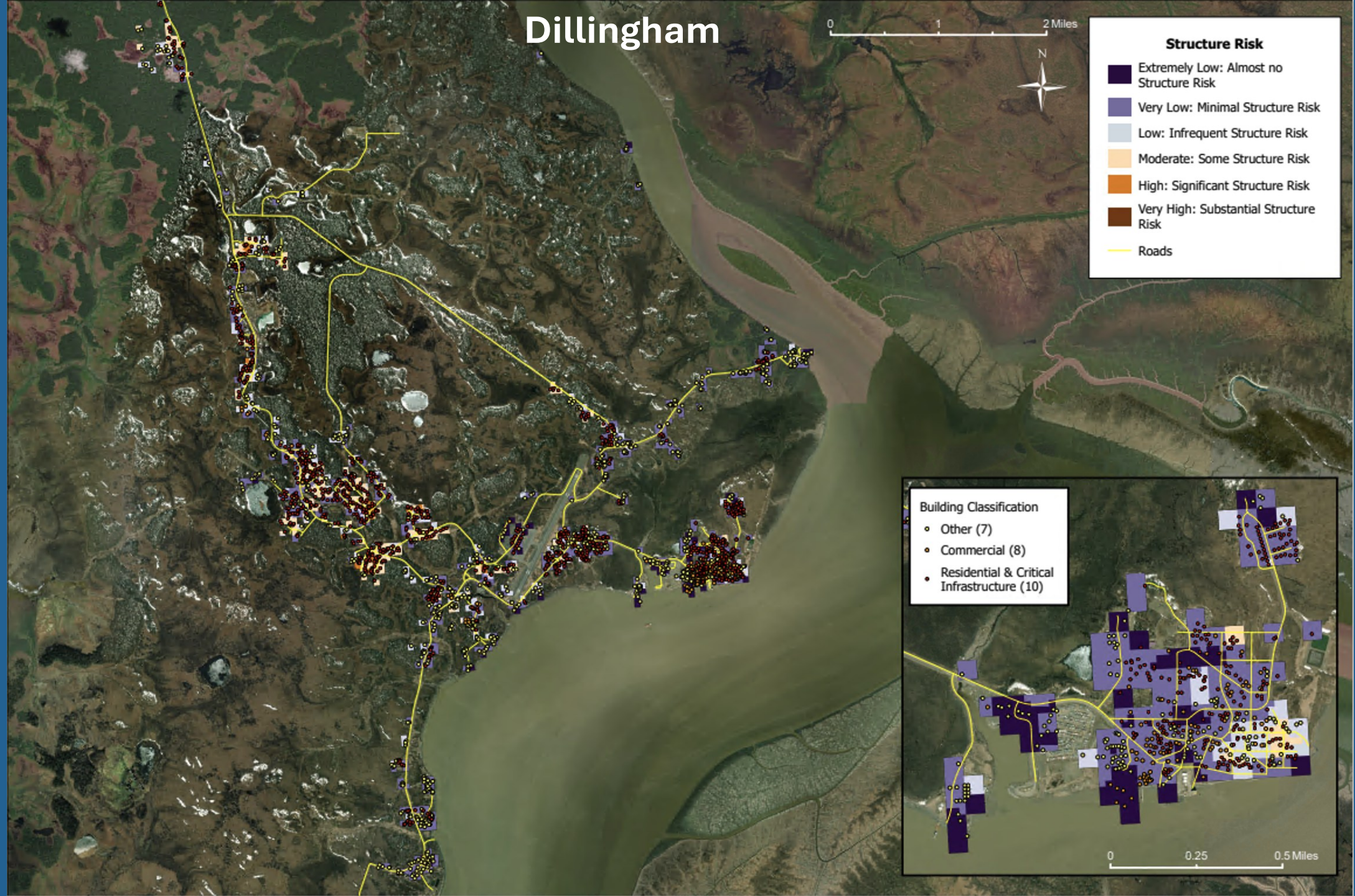
Commercial, Industrial, Military (0.8)

Other - Nature (0.7)

= Building vulnerability × Wildfire exposure = Structure Risk

**Likelihood of getting there!**




Dillingham
0
1
2 Miles
N
Structure Risk
Extremely Low: Almost no Structure Risk
Very Low: Minimal Structure Risk
Low: Infrequent Structure Risk
Moderate: Some Structure Risk
High: Significant Structure Risk
Very High: Substantial Structure Risk
Roads
Building Classification
Other (7)
Commercial (8)
Residential & Critical Infrastructure (10)
0
0.25
0.5 Miles


Igiugig
0
0.25
0.5 Miles
N
Structure Risk
Extremely Low: Almost no Structure Risk
Very Low: Minimal Structure Risk
Low: Infrequent Structure Risk
Moderate: Some Structure Risk
High: Significant Structure Risk
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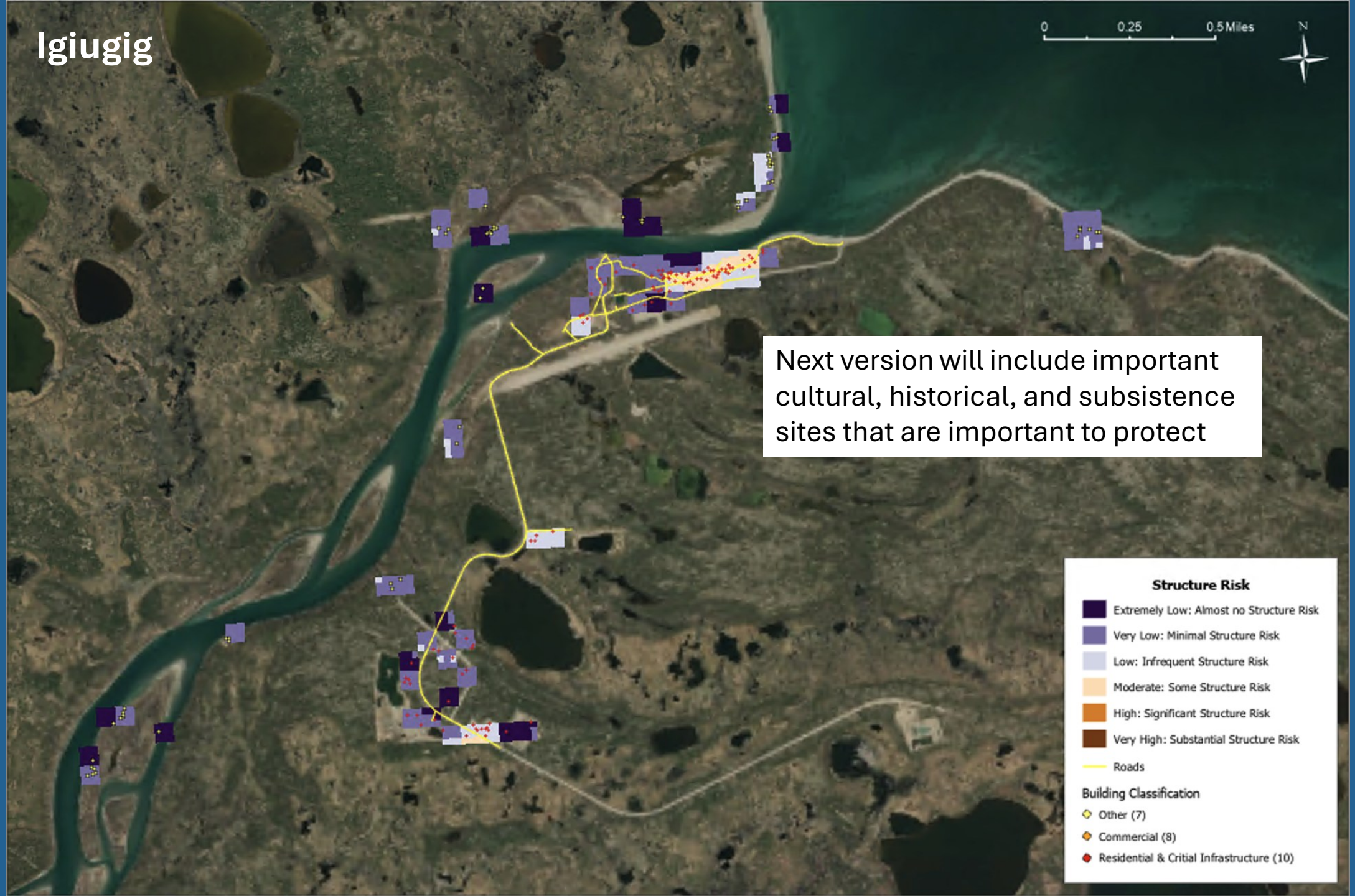
Roads
Building Classification
Other (7)
Commercial (8)
Residential & Critial Infrastructure (10)


Igiugig
0
0.25
0.5 Miles
N
Next version will include important cultural, historical, and subsistence sites that are important to protect
Structure Risk
Extremely Low: Almost no Structure Risk
Very Low: Minimal Structure Risk
Low: Infrequent Structure Risk
Moderate: Some Structure Risk
High: Significant Structure Risk
Very High: Substantial Structure Risk
Roads
Building Classification
Other (7)
Commercial (8)
Residential & Critial Infrastructure (10)

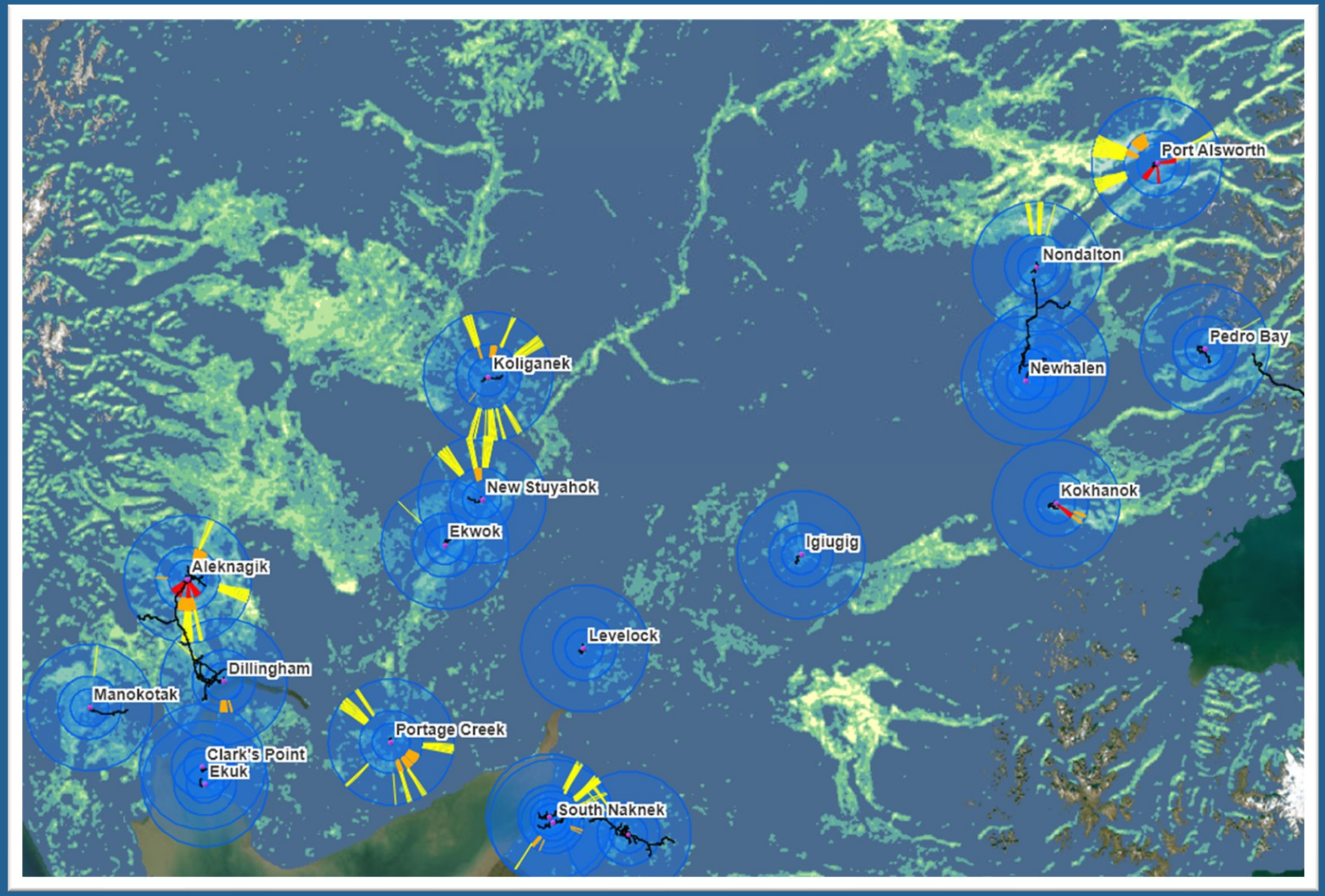
# Next Steps

- Finalize maps with community input
- Create modelled 2054 maps
  - Create fire scars using Flammap
  - Model vegetation succession within burned areas
  - Include shrubification estimates

- Bristol Bay: wildfire risk assessment and directionality with **grass model and lichen**

https://bit.ly/BBNAwildfire

BBNA Wildfire




Alaska Venture Fund

# Thank You

Jennifer Schmidt: jschmidt@alaska.edu
Hannah Chapman-Dutton: hrchapmandutton@alaska.edu
Owen Larson: ojlarson@alaska.edu

Alaska Geosummit

April 9, 2025

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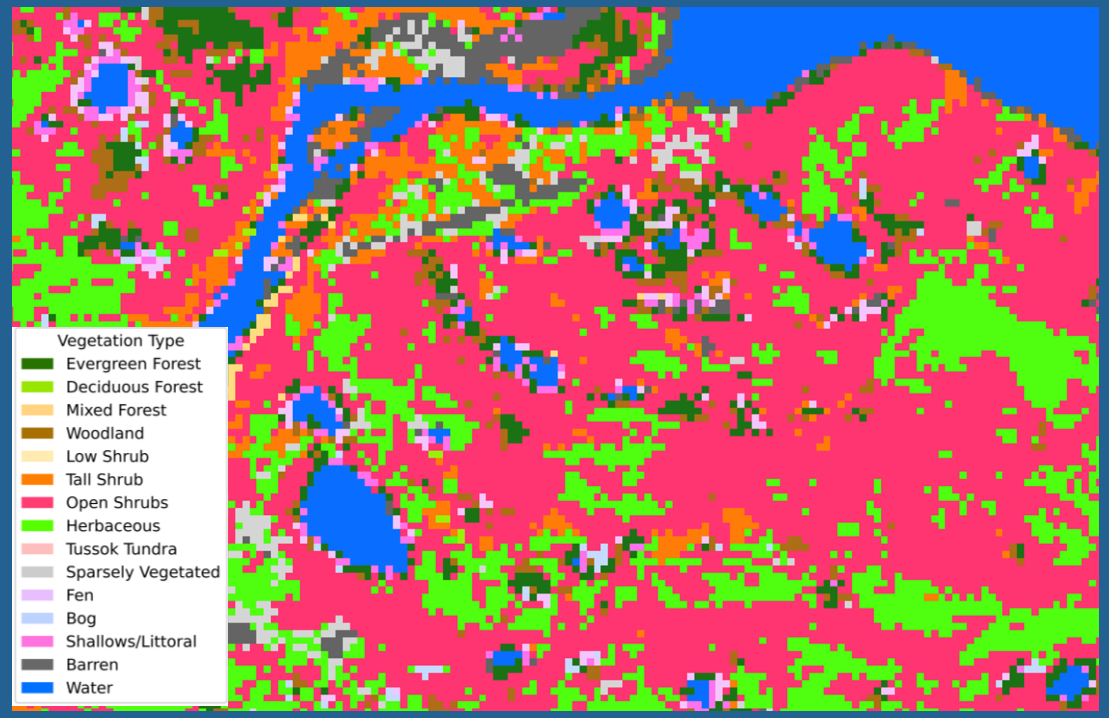
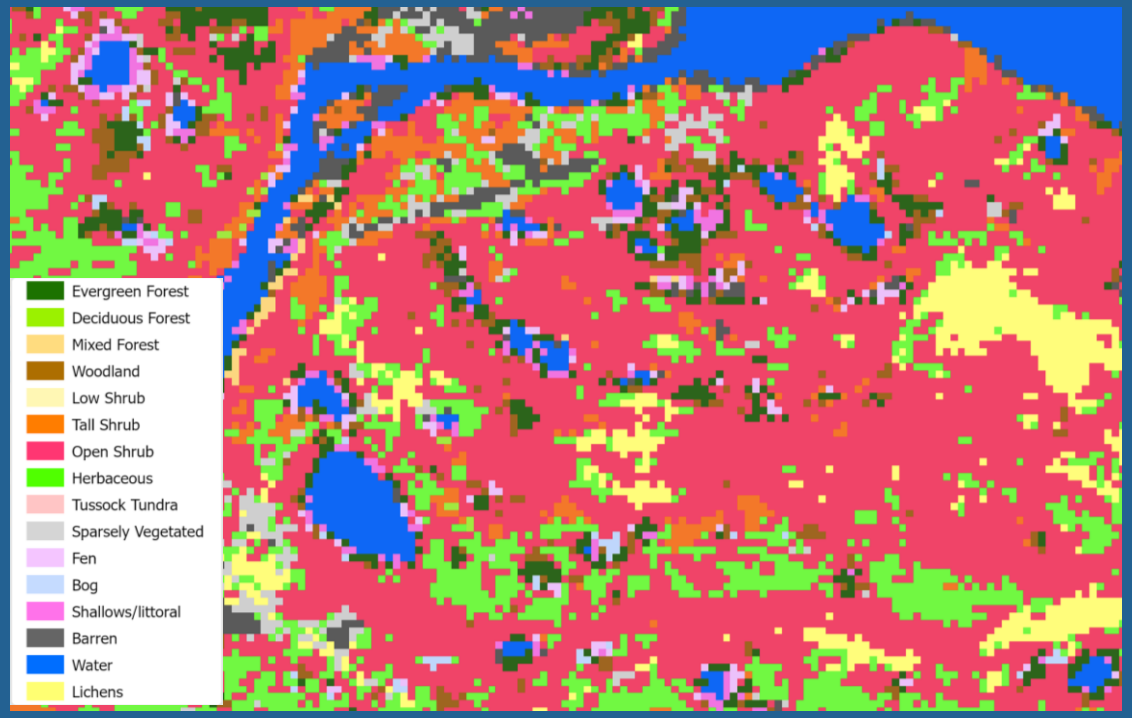
# Subsistence Use: Caribou & Lichens

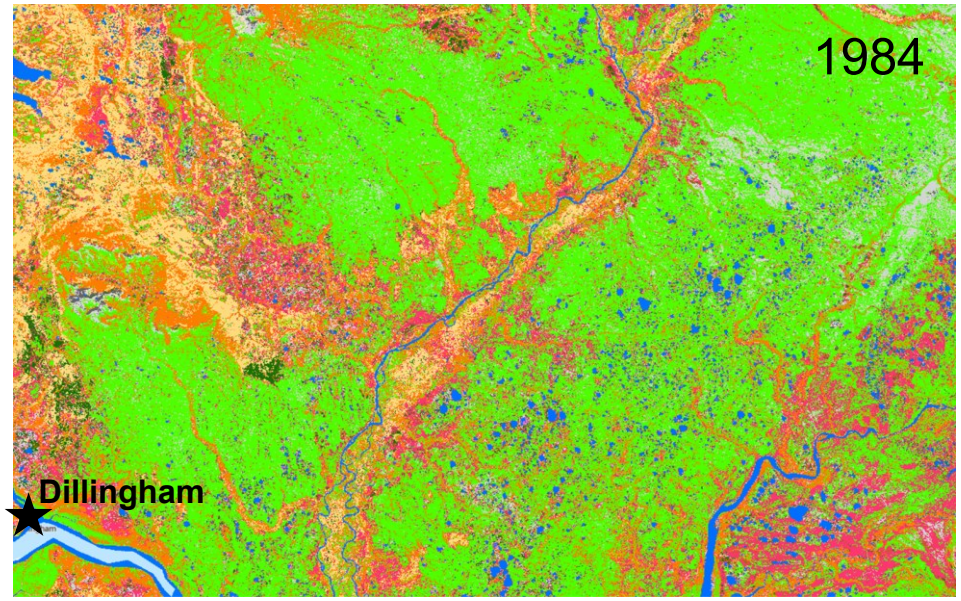
- Added lichens[1] category to modelled 2023 ABoVE vegetation layer to account for potential caribou usage
- How will wildfires in the region affect caribou populations?

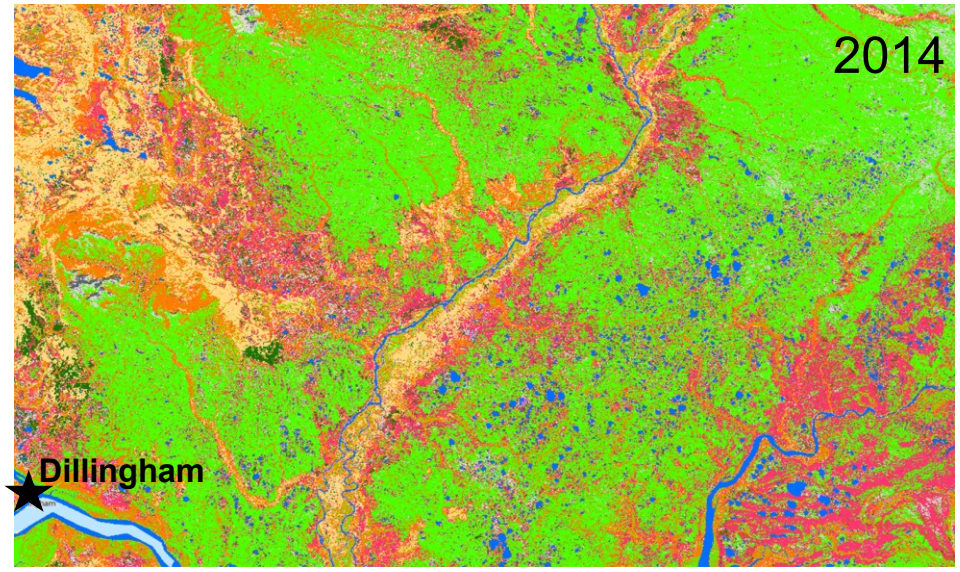


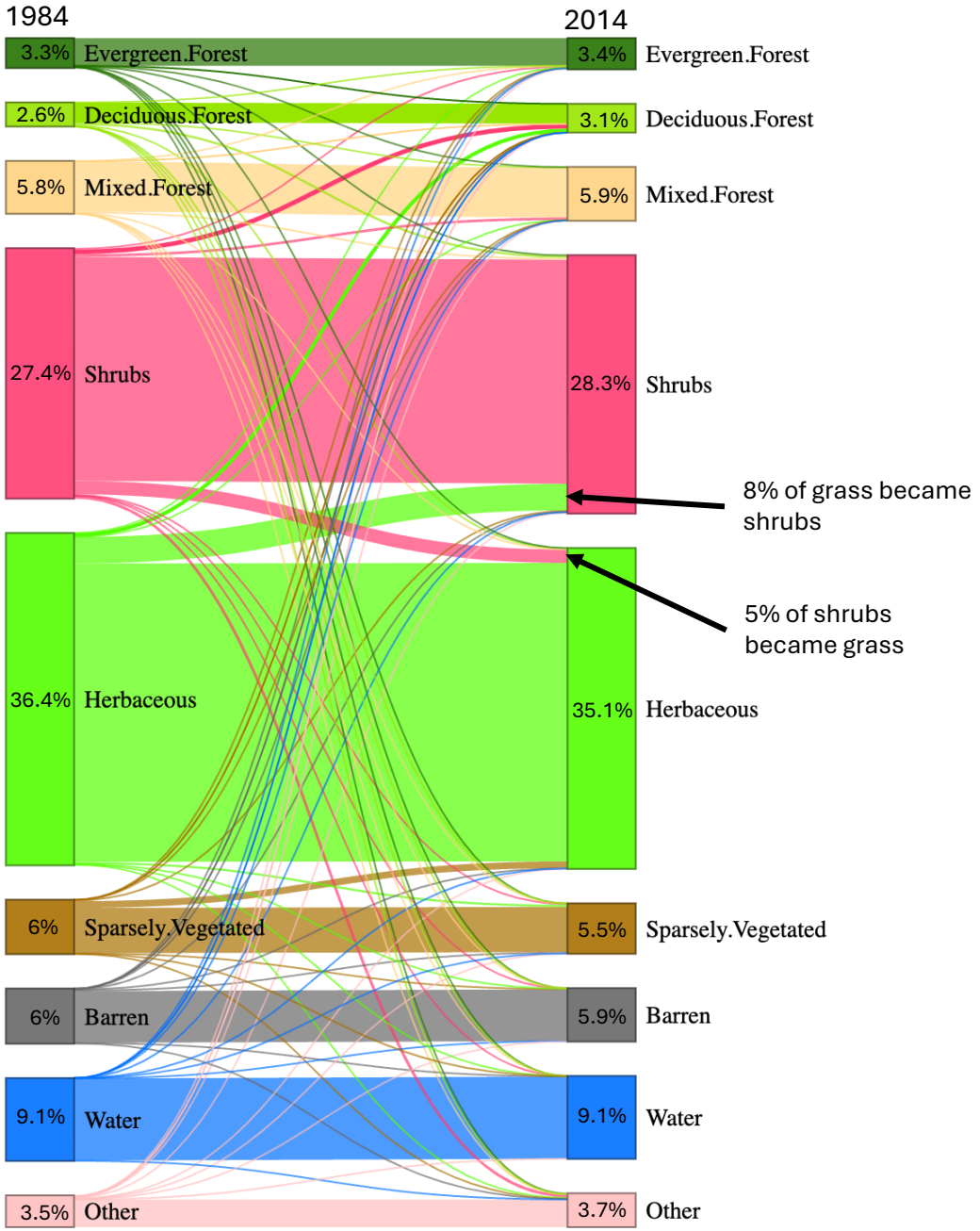




[1]Macander, M.J., and P.R. Nelson. 2022. ABoVE: Modeled Top Cover by Plant Functional Type over Alaska and Yukon, 1985-2020. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/2032

# Investigating shrubification



# Investigating shrubification

- Will burned areas regrow with more shrubs?
- Will increasing shrubs in key areas improve moose subsistence hunting?
- Would controlled burns increase or improve moose habitat?