



Climate science for Alaskans

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International
Arctic Research
Center



Eric Engman/Fairbanks Daily News Miner

Climate versus weather



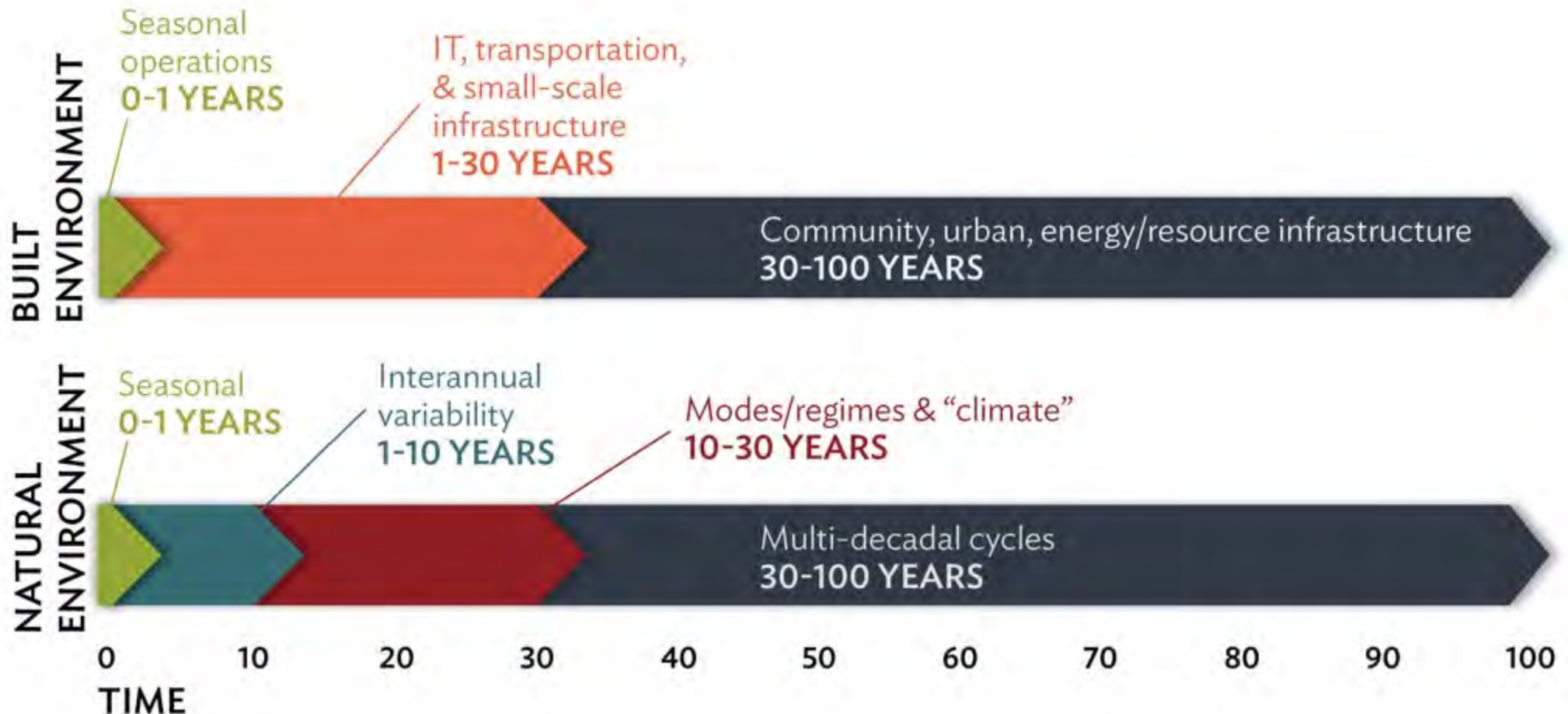
Climate ► Entire wardrobe



Weather ► What you wear today

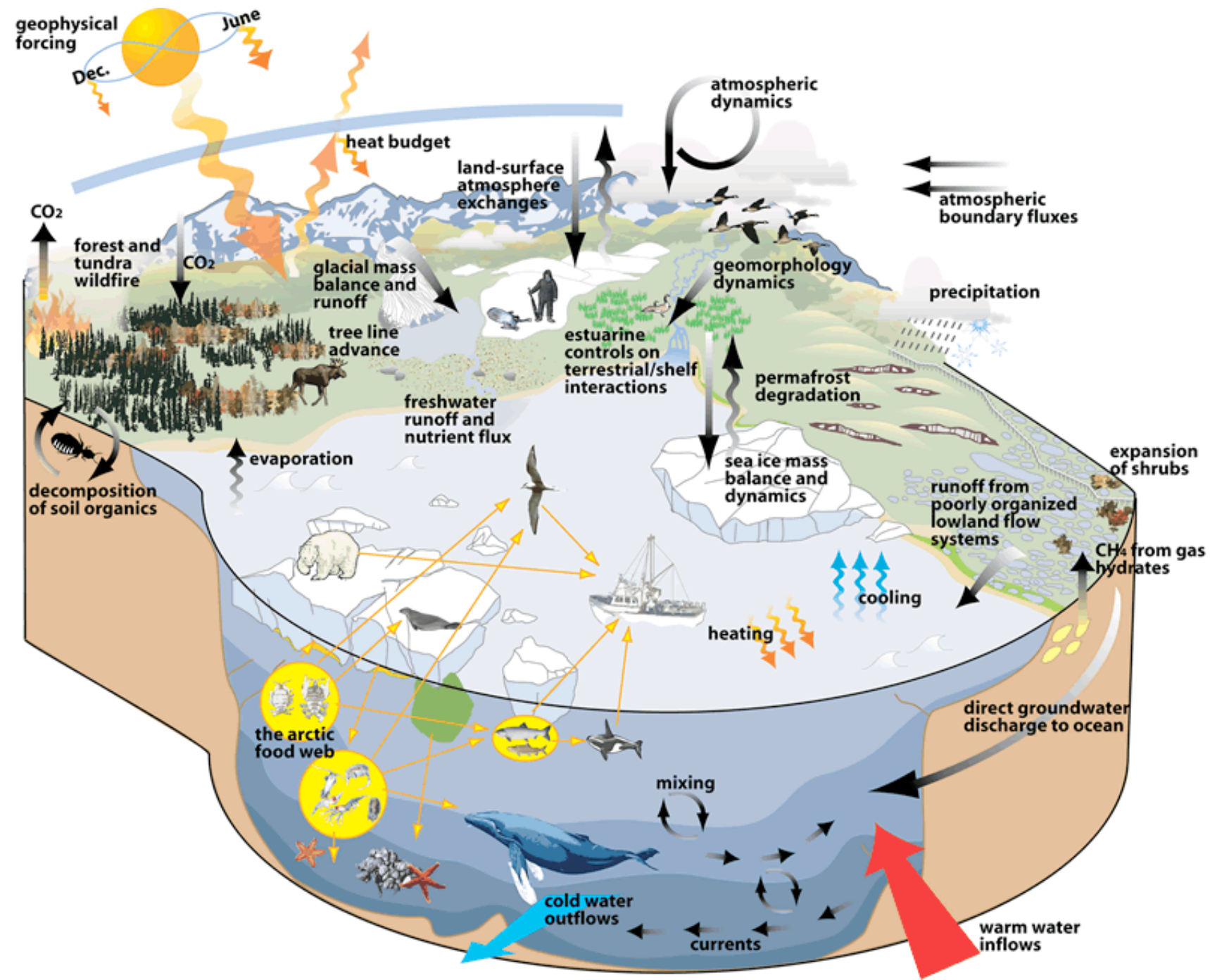
Average & range of atmospheric variables

- temperature, humidity, wind, precipitation •
over a 30-yr period

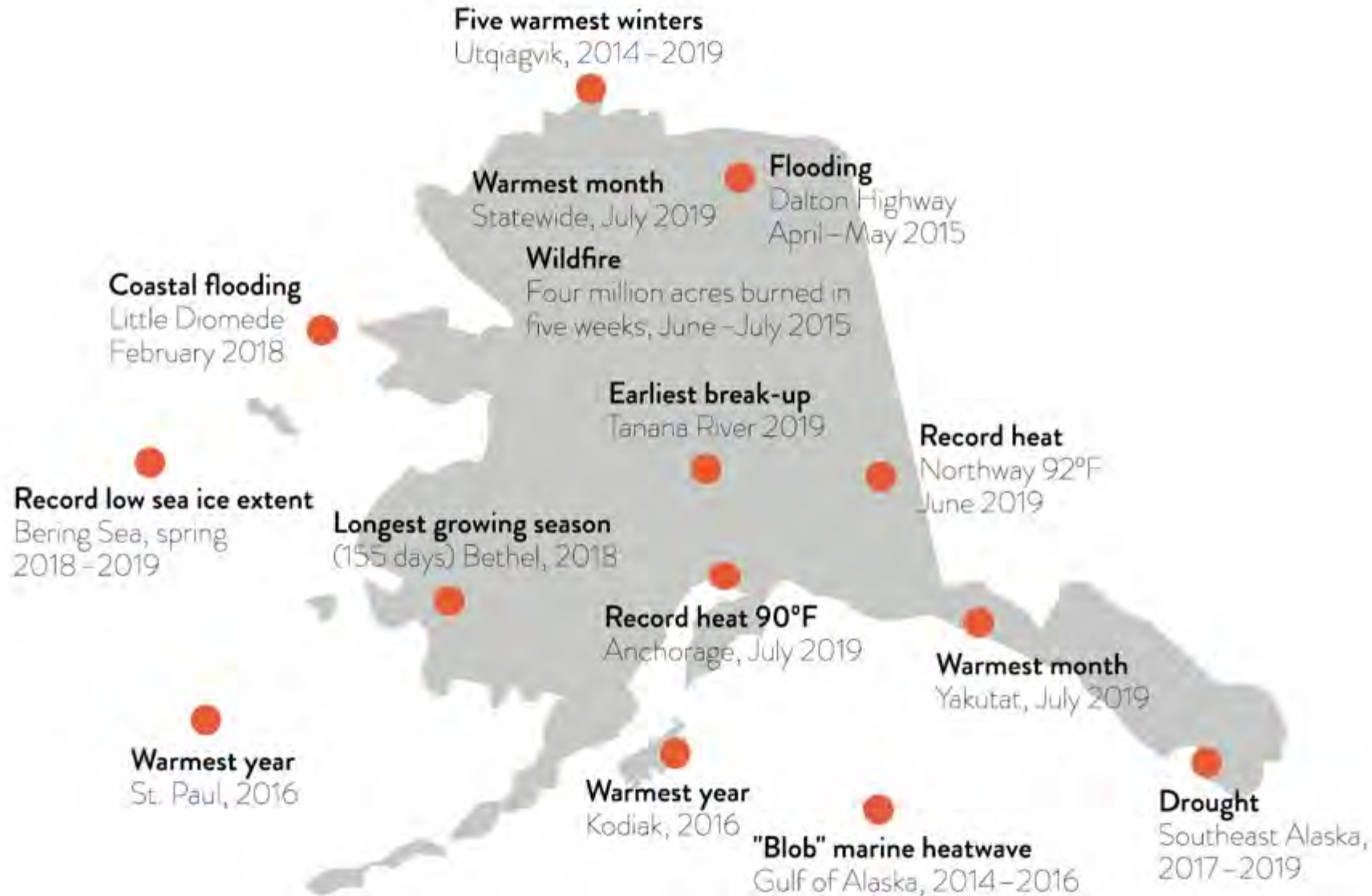


Alaska's climate is dominated by snow, glaciers, sea ice & permafrost

► causes major challenges



Alaska is experiencing profound environmental change related to **extreme weather events & deviations from the historic norm**



Key examples of where climate science is improving Alaskans' lives

1

**Engineering
support**

2

**Wildfire
tools**

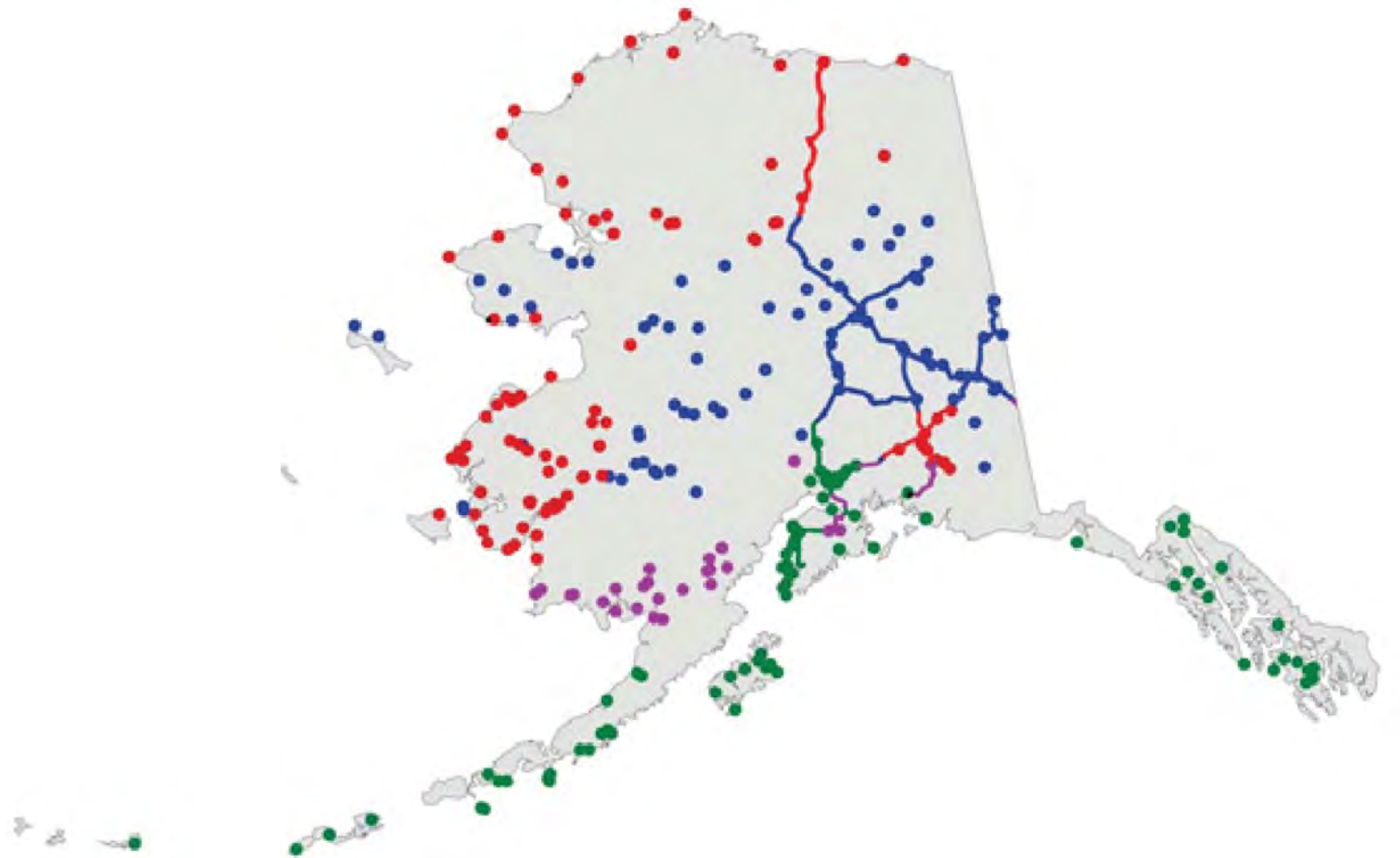
3

**Aviation
safety**








4

**Workforce
development**

Alaska has
2,137
miles of
permafrost
susceptible
roads &
321
permafrost
susceptible
communities



**PERMAFROST-SUSCEPTIBLE
roads communities**

	 Continuous (90–100%)
	 Discontinuous (50–90%)
	 Sporadic (10–50%)
	 Less than 10%

SIZE OF IMPACT?

roads (miles)	communities (number • population)
456	87 • 40,811
1,211	79 • 47,140
189	26 • 5,235
281	129 • 396,821



Arctic-EDS supports infrastructure

1. Improve engineering design & planning
 - ▶ impacts of thawing permafrost & environmental changes
2. Allow projected future climate changes to be incorporated into design criteria
 - ▶ produce more robust & cost-effective built infrastructure

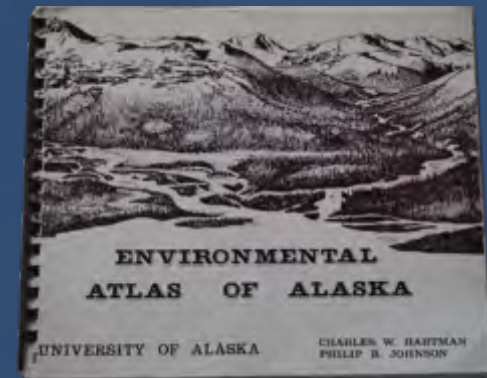




AK DOT

\$ 2 million over 3 years

1. Funded by DOD to deal with infrastructure threats in a changing climate
2. Expanded to support Alaska engineering community
 - User engagement campaign
 - Explore how engineers and planners want to access data & information



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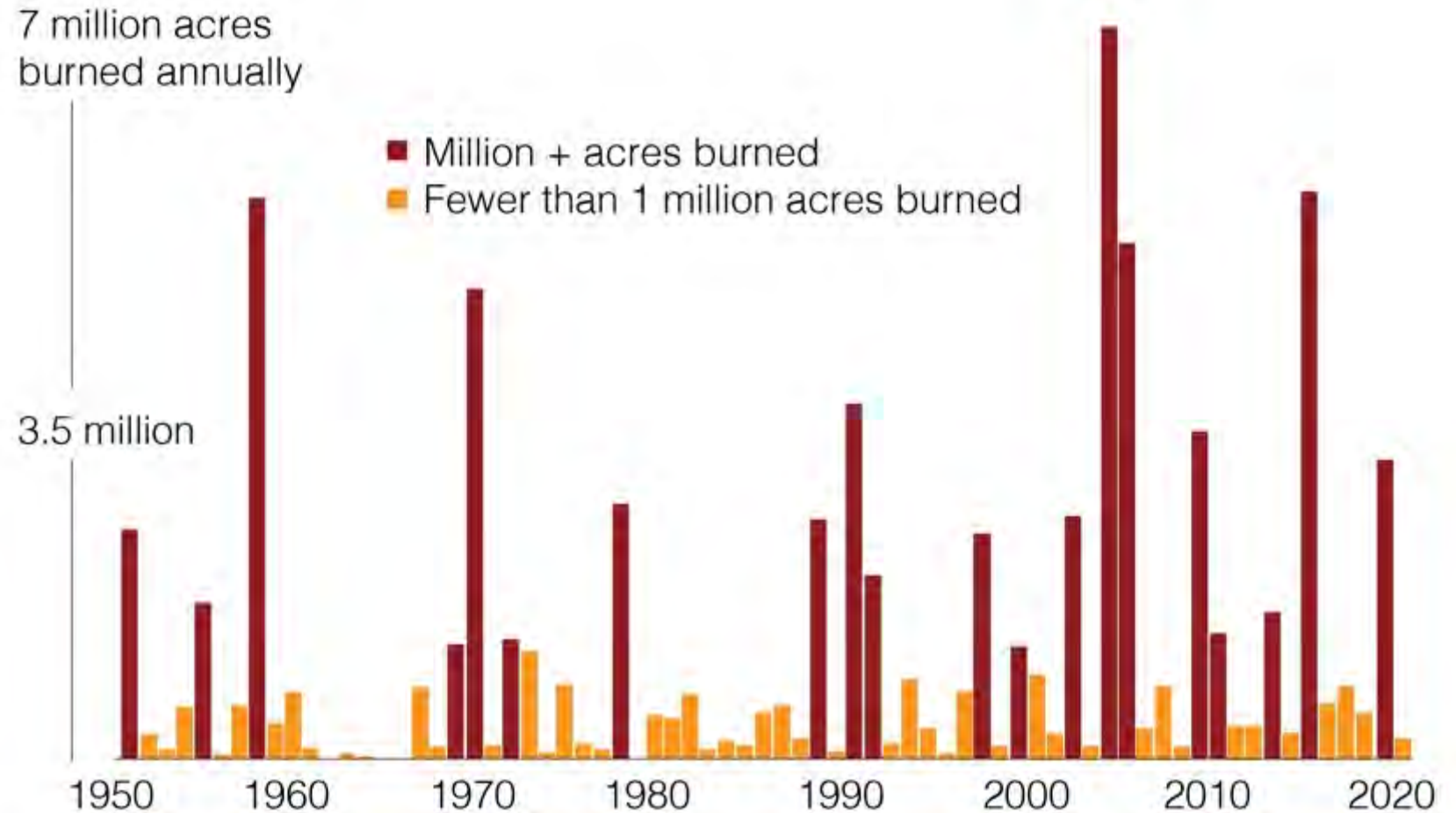
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From 2001-
2020 wildfire
burned
2.5x
more acres
than during
the previous
two decades.



Improving wildfire prediction

- Wildfire managers use the **Wildfire Build-Up Index** to assess wildfire danger based on fuel dryness.
 - **PAST-** only use the index to predict fire activity a few days out.
 - **NOW-** predict the index months before the coming fire season.
- Predictions split into intervals & regions relevant to the fire community.
- The seasonal outlook allows managers to **plan resources & personnel months in advance.**



Work by graduate student Cecilia Borries-Strigle



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Tools for pilots

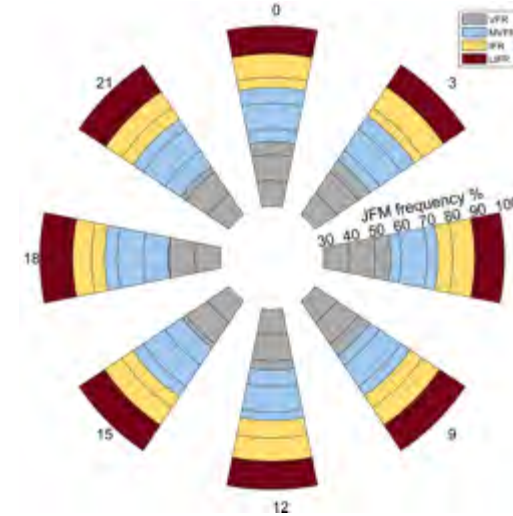


- Need for improved weather & climate products for Alaska airports
- Aviation climatologies show **frequency of specific cloud cover & visibility categories** at Alaska airports
- In development: historical changes in wind speed & direction

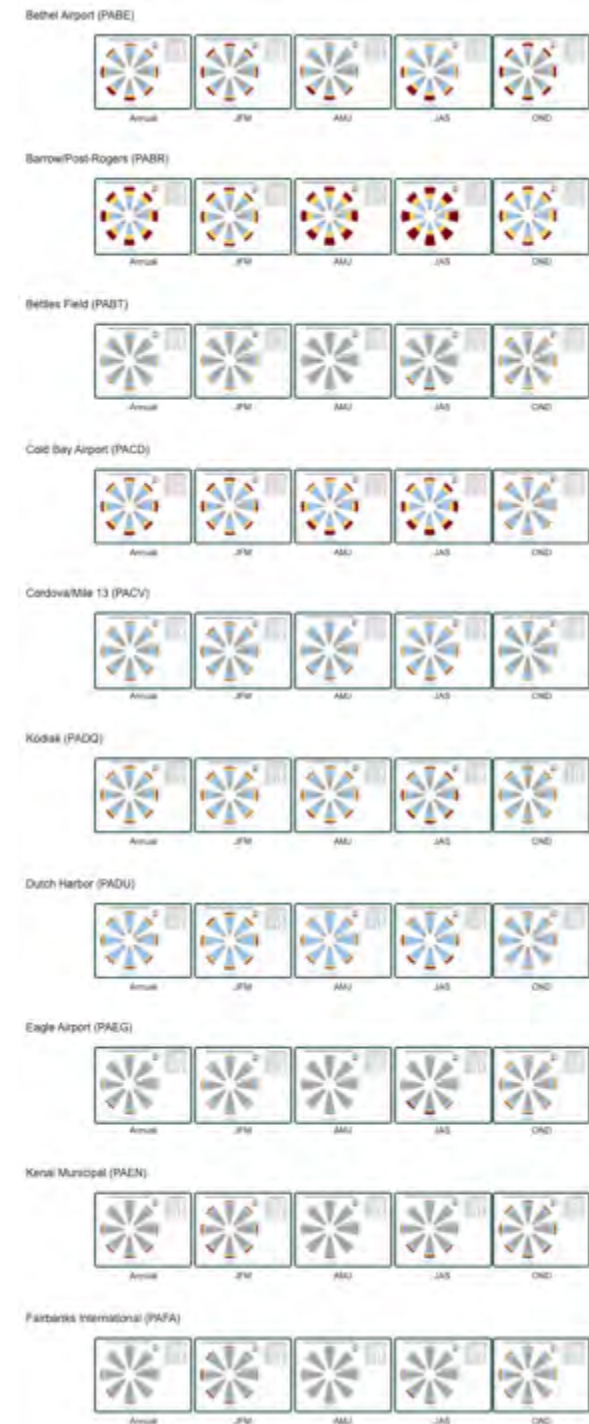
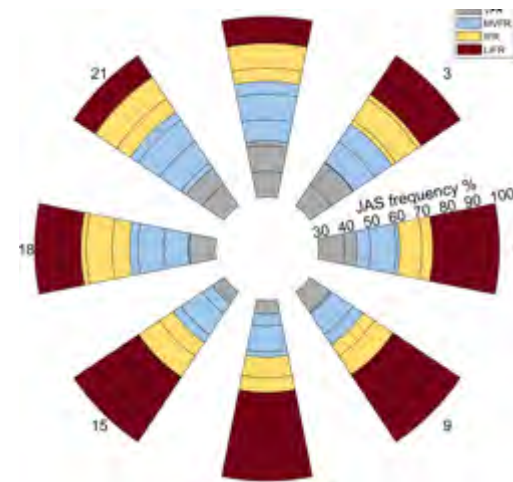


<https://wrcc.dri.edu/Climate/akdash.php>

Deadhorse January-March



Deadhorse July-September



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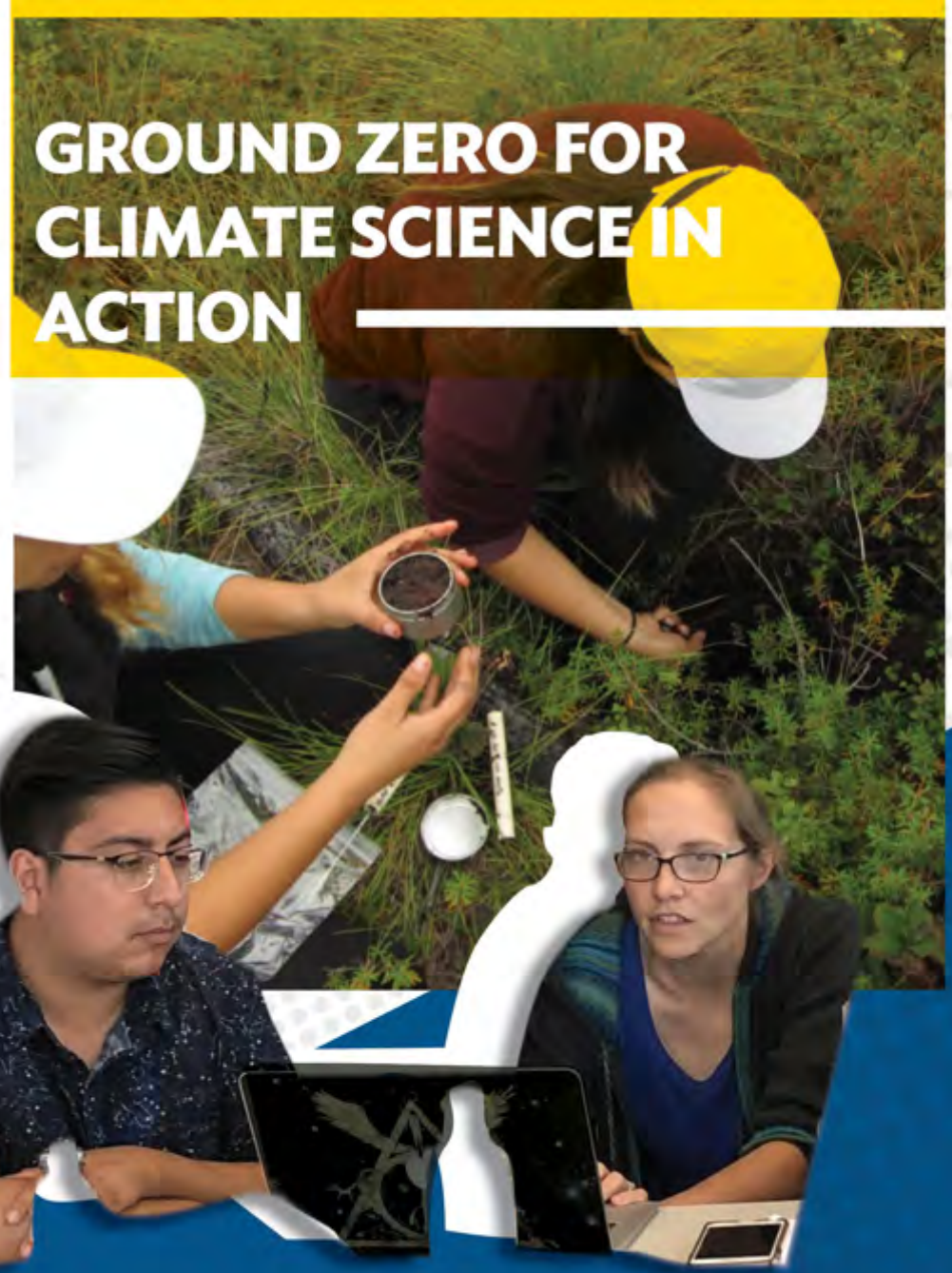
Growing the climate workforce

Climate Scholars prepares high-achieving students to solve climate change issues

- Understand cross-cutting impacts of climate change related to Alaska's economy, defense & infrastructure
- Hands-on experience working in diverse sectors
- Shape innovative & collaborative action



<https://uaf.edu/honors/climate-scholars/>



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