THE STATE of ALASKA

GOVERNOR MICHAEL J. DUNLEAVY

Perspectives on Building an Actionable Science Community

Sally Russell Cox

Navigating the New Arctic Annual Community Meeting

Day 3: Building a Foundation for Action

November 10, 2021

Alaska by the Numbers

Alaska is **1/5** the size of the contiguous Lower 48

200 of Alaska's **336** communities are off the road system

40% of all Federally Recognized Tribes are in Alaska

The average rural community population in Alaska

<500

95 % of the **144** environmentally threatened communities face infrastructure impacts from erosion, flooding and permafrost thaw are reliant on a subsistence economy

Each year the average rural Alaskan harvests **295 pounds** of food from the land and waters

The cost of goods and services in urban Alaska is 25% higher than the U.S. average and even higher in rural Alaska. For example, the cost of gas in Noatak, AK (Feb. 2020) was **$10/gallon**

Adapted with permission from the Alaska Climate Adaptation Science Center.

Alaska Climate Trends and Impacts

TRENDS

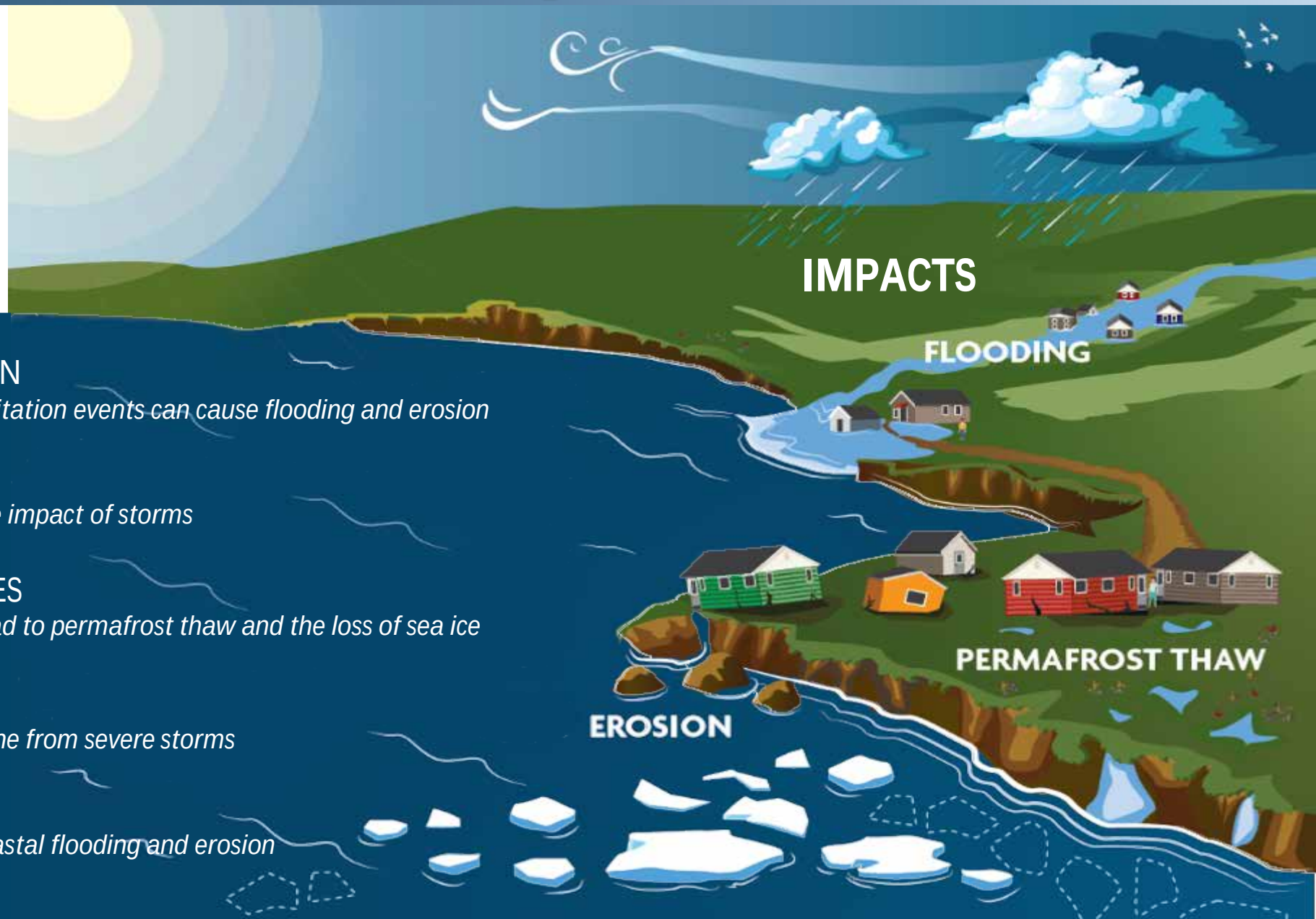
▲ INCREASED PRECIPITATION
More frequent and severe precipitation events can cause flooding and erosion

▲ INCREASED WIND SPEEDS
High wind speeds can amplify the impact of storms

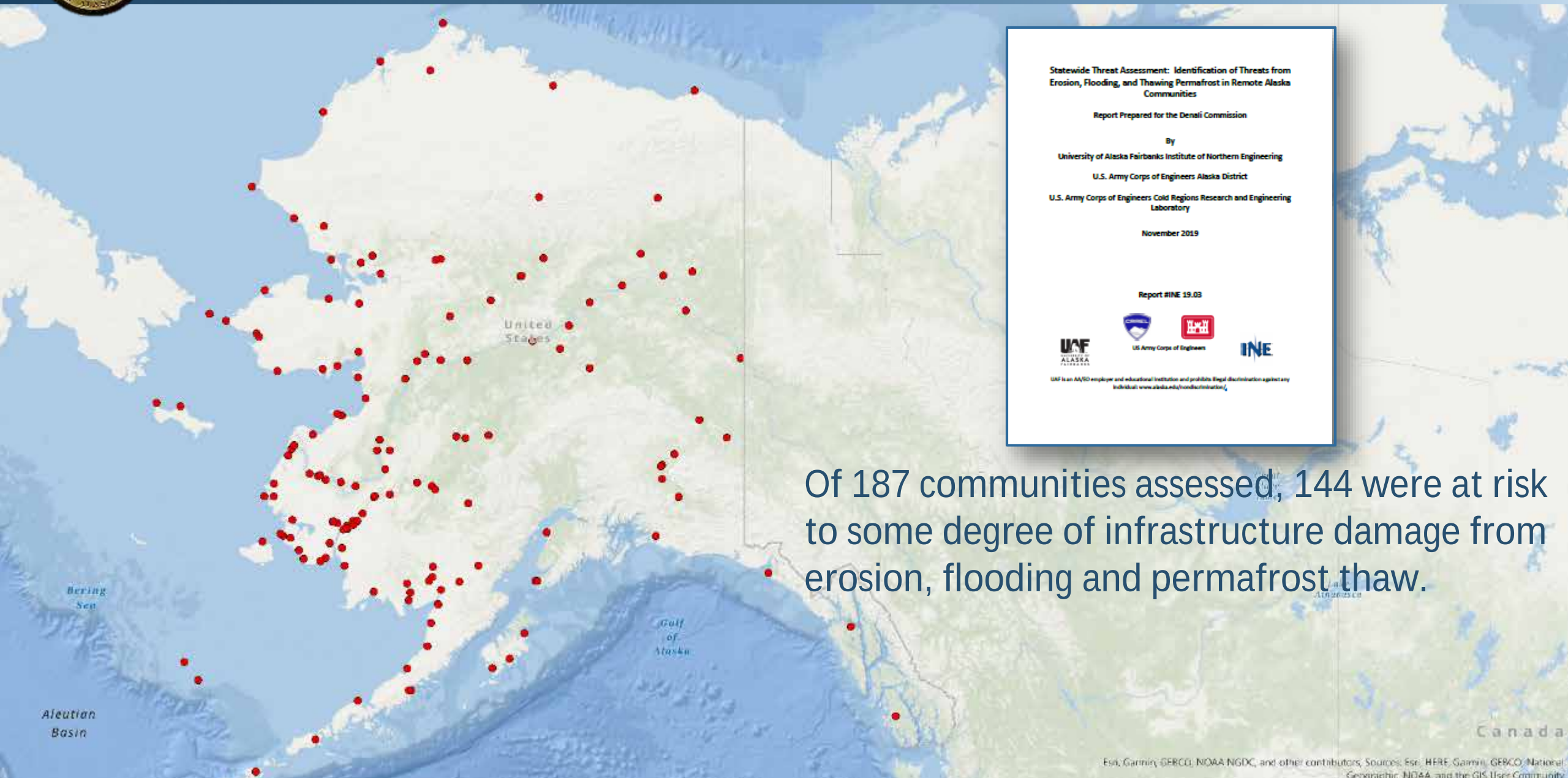
▲ RISING AIR TEMPERATURES
Warming air temperature can lead to permafrost thaw and the loss of sea ice

▼ LOSS OF SEA ICE
Barrier sea ice buffers the coastline from severe storms

▲ SEA LEVEL RISE
Rising sea level contributes to coastal flooding and erosion



2019 Alaska Statewide Threat Assessment



Statewide Threat Assessment: Identification of Threats from Erosion, Flooding, and Thawing Permafrost in Remote Alaska Communities

Report Prepared for the Denali Commission

By

University of Alaska Fairbanks Institute of Northern Engineering

U.S. Army Corps of Engineers Alaska District

U.S. Army Corps of Engineers Cold Regions Research and Engineering Laboratory

November 2019

Report #INE 19.03

US Army Corps of Engineers

Of 187 communities assessed, 144 were at risk to some degree of infrastructure damage from erosion, flooding and permafrost thaw.

Flooding

Flooding in Buckland, Alaska, May 2021

Photo: John Jones

Erosion

Newtok, Summer 2020
Photo: Romy Cadiente

Newtok, Summer 2006
Photo: Village Safe Water Program

Thawing Permafrost

Thawing permafrost turns Kongiganak cemetery into swamp, 2017

Photo: Alamy

How Communities are Responding to Environmental Change

Protection-in-place: The use of shoreline protection measures and other controls to prevent or minimize impacts. These measures allow the community to remain in its current location.

Managed retreat: Moving a portion of the community away from hazard-prone areas to locations in the community or adjacent to the current site. In order to successfully retreat, a community needs developable land nearby.

Relocation: Moving the entire community to a new location that is not connected to the current site. Relocation is the option of last resort.

Protection-in-Place

Rock revetment in Kivalina

Photo: Alaska ShoreZone

Managed Retreat

Managed retreat at Napakiak

Photo: City of Napakiak

Relocation

Newtok’s new village site, Mertarvik

Photo: UMCOR

Three Phases of Adaptation

Assess Risk

- Collect site-specific baseline data such as LIDAR, bathymetry, tidal determinations, river currents, sediment transport, flood history, etc.
- Integrate local knowledge of hazards and community-based observations with scientific information
- Conduct hazard-specific forecasts such as shoreline mapping, inundation and storm surge modeling, hydrodynamic modeling, permafrost degradation modeling, etc.

Planning

- Provide technical assistance to ensure community understands results of risk assessments in previous phase
- Develop strategies to respond to the risks identified in the previous phase, accounting for the requirements of individual types of infrastructure.
- Identify both near-term and long-term solutions.

Implementation

- Carry out preferred solutions or actions through locally-managed construction or outside project management contractors.
- Includes permitting, contracting, administrative reporting, and reimbursement processes.

Local Understanding of Risk → **Develop Actions to Reduce Risk** → **Increased Local Resilience**

Some Tips for Turning Research into Action

Engage the Community in Your Work

- Involve community members in data collection and assessment process
- Integrate vast local knowledge community holds into your work
- Help them expand their knowledge in a way that enhances their decision-making processes - *the more informed the decision-making process, the more sustainable the actions will be*
- Share final results of project with community
- Empowers and honors community decision-making, sovereignty, and self-determination

Erosion monitoring training at Goodnews Bay, 2016
Photo: Gabe Dunham

Some Tips for Turning Research into Action

Challenges with In-Person Community Engagement?

- Can your project provide resources to enhance community engagement?
  - Technology such as a data plan and tablet for community leaders to meet with you virtually?
    - Useful post-pandemic when weather prohibits travel
- Not comfortable with community engagement?
  - Connect with the people who engage with communities on a regular basis
    - Oftentimes costs no extra $$ and can be a win-win for everyone

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