

# House Resources Committee

## HB 173-Testimony

Effects and Adaptation  
To Climate Changes in Alaska



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## Impacts on the People and Communities

*Climate change is occurring, is very likely caused by human activities, and poses significant risks for a broad range of human and natural systems.*

*-America's Climate Choices: Final Report*

*The National Academies, 2011*



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# What Is ANTHC Doing?

Established a Center for Climate and Health

- Observe
- Respond
  - New ways of doing things
  - Innovate
  - Advocate
- Assist Communities in Planning for the Future
- Adaptation of Our Infrastructure Designs
  - Borrow from the principles of Native survival
    - Flexible, light, moveable when possible





# Awareness



# Center for Climate and Health



***Disease***



***Food Security***



***Injury***



***Behavioral Health***



***Water Security***

In 2009 ANTHC established for first center in the nation with a focus on understanding the connections between climate change, environmental impacts and health effects. We focus on five major topic areas.



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# Identifying health effects of climate change in Alaska

**Allergic Reactions**



**Travel Safety**

**Mental Health**



**Waterborne Disease**

**Food Spoilage**



**Respiratory Health**

**Food Confidence**



**Injury**

**Vessel Safety**



**Harvest Failures**



**Allergies**



**Infrastructure Damage**



**Food Safety**

The Center has described a wide variety of health effects as climate change priorities for the tribal health system.



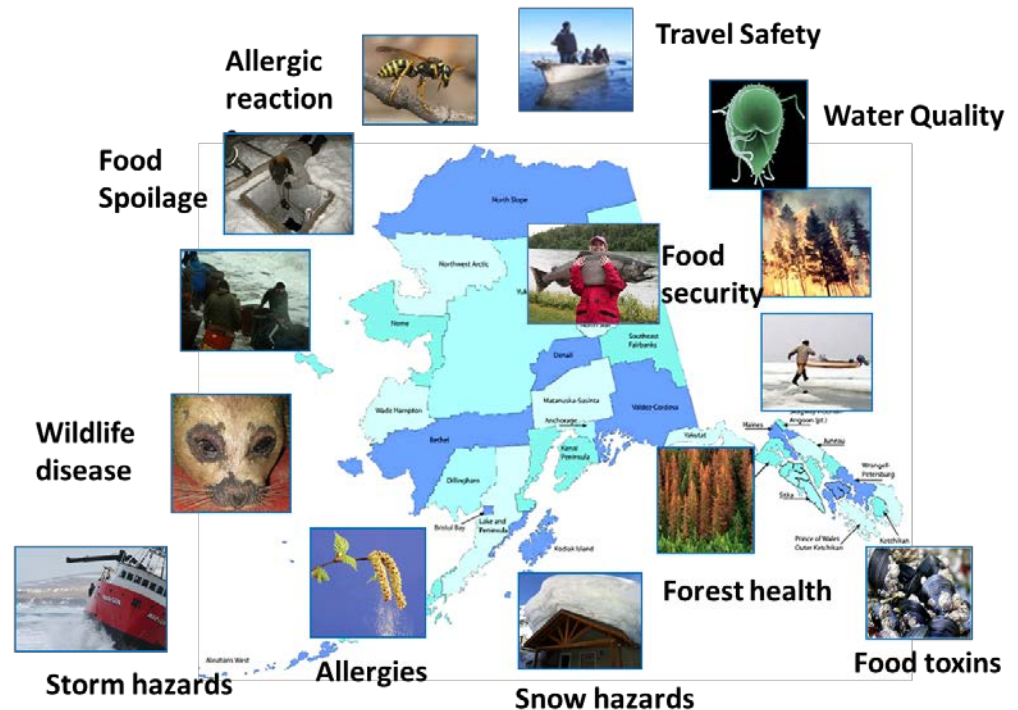
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# Local Environmental Observer (LEO) Network

Through these three activities:

- Scanning for events in the press,
- performing local assessments,
- and working with the LEO Network

we are beginning to describe some of the climate and health relationships.







Selawik River

Photo by Yuri Gorokhovich

# Climate Change Effects on Healthy Homes

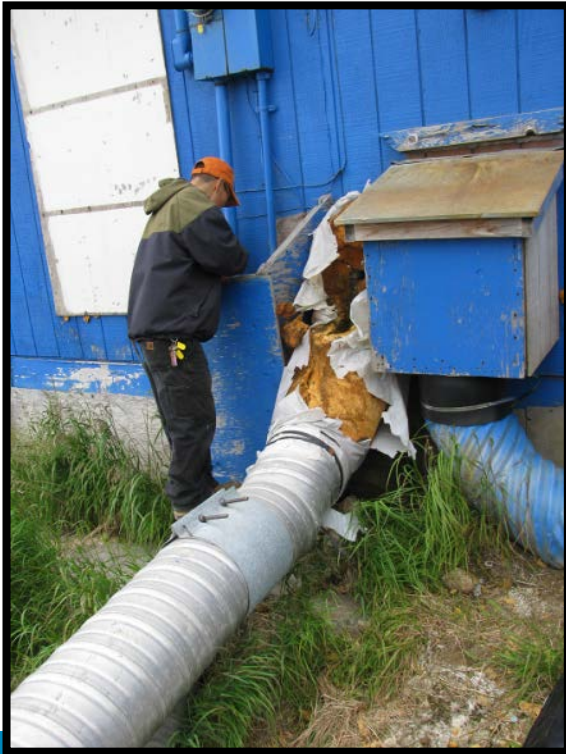
- Air Quality
  - Tightly constructed homes without cooling as temperatures rise
  - Wildfire smoke infiltrating homes
- Melting Permafrost
  - Shifting ground causes injury hazards and degrading home conditions





# Failed Arctic Boxes

**Box Pulled from Building**



**Insulation Wet/Removed**





# Structural Health

Massive ice formation exist in permafrost soil beneath many communities and structures.

When ice melts, the soils subside and the structures above the ice experience settlement that can be up to several feet, damaging foundations and pipelines.









In Kotlik, coastal flooding has damaged community infrastructure.



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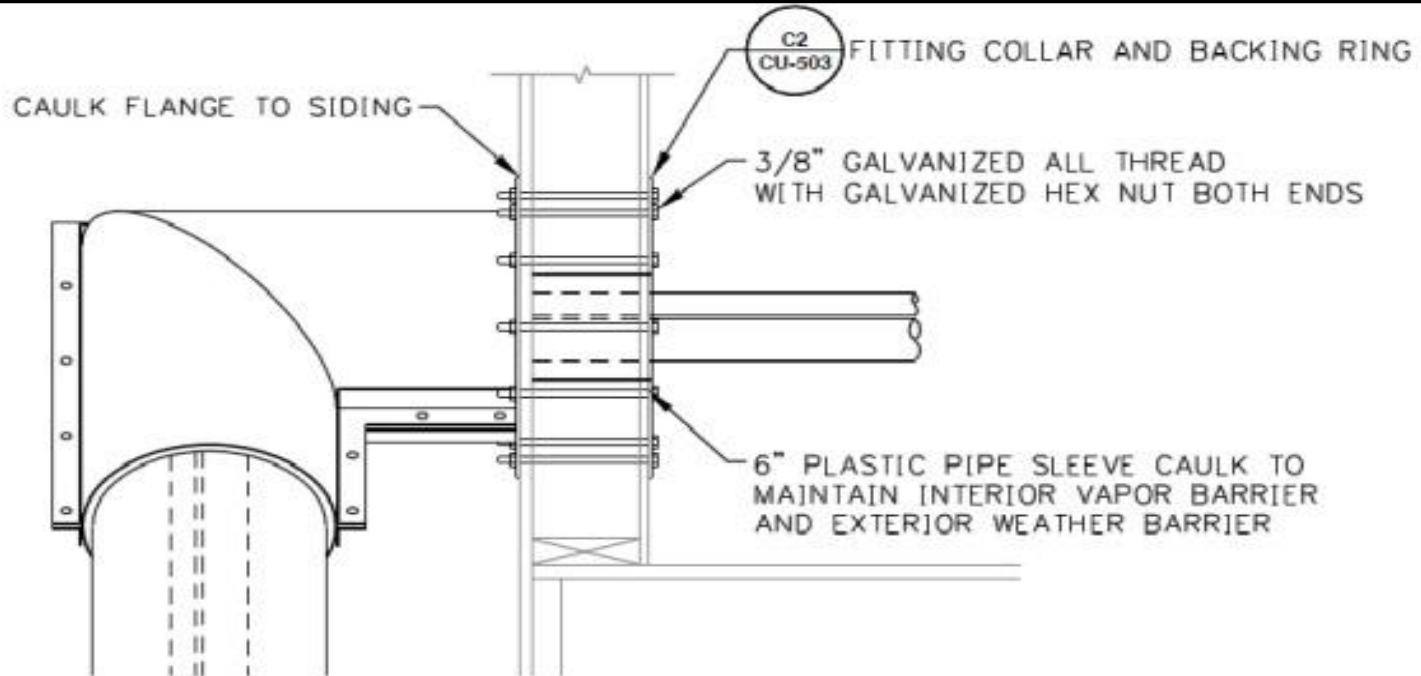
# Adapting Infrastructure to Climate Change

- Water and Sewer along with Transportation Infrastructure is estimated to be most vulnerable to climate change.
- Cost of not adapting infrastructure has been estimated to shorten the useful life of water and sewer infrastructure by 3.5 years (20 year normal design life assumed).
- Compounding this shortened life over decades adds Billions of dollars to preserving the sanitation utility. Estimated to add \$3-6 B (rebuilding) by 2030 for Alaskan villages.

(Larsen, Goldsmith, Smith, et al (2007) Estimating Future Costs for Alaska Public Infrastructure At Risk from Climate Change.



# Adaptation make pipe flexible not rigid



A3

## SERVICE LINE HOUSE CONNECTION

1 1/2" = 1'-0"



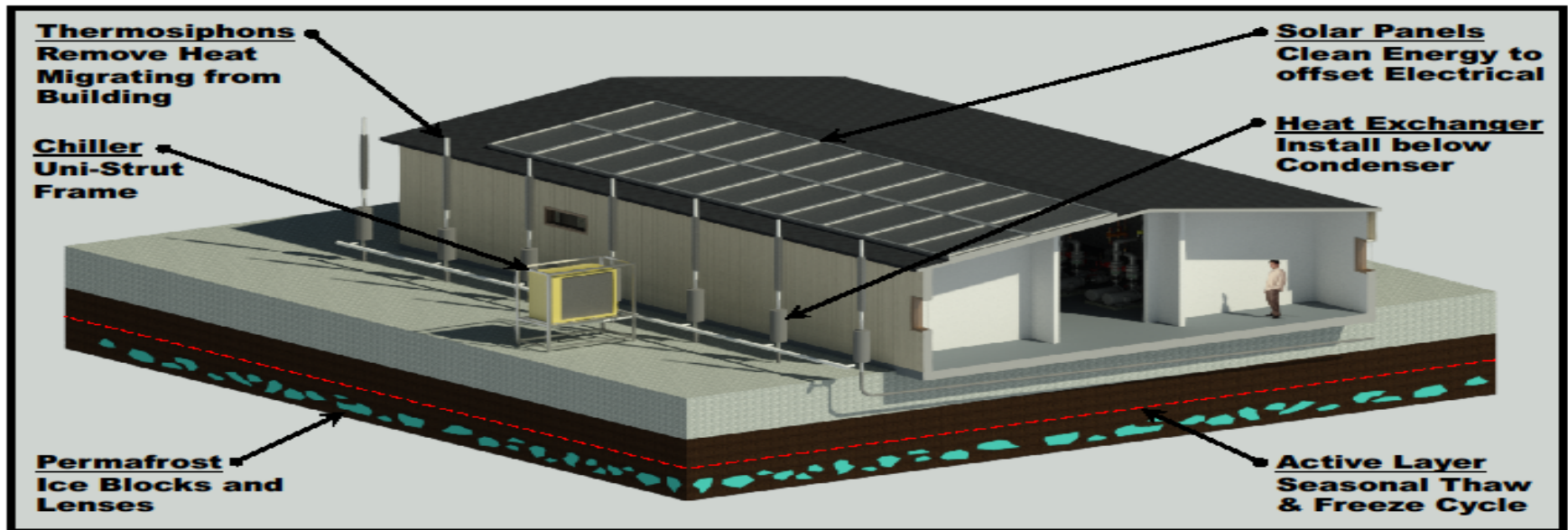
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# Arctic Box Adaption pipe flex's to accommodate differential settling



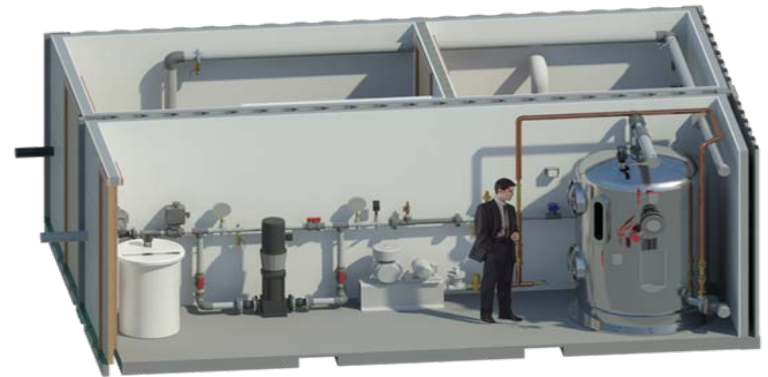


# Adaptation: Using Solar Energy to Keep the Ice Rich Soil Chilled



# Adaptation: Modular Water Treatment Plant

ANTHC has implemented a new approach to water treatment by constructing water treatment plants off-site. The buildings have one or more modules that are built in Anchorage and shipped to the community. The structures can be moved to the community and with the community if threatened by eroding shorelines or flooding

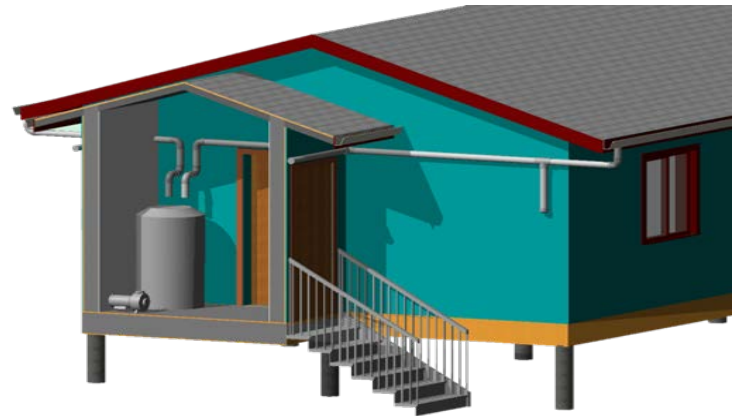


# Portable Alternative Sanitation System (PASS) in Kivalina

ANTHC has developed a small demonstration project in Kivalina that will allow the community to adapt to climate change. This system is entirely homeowner-based, designed to address the most basic sanitation needs and is portable.



Typical system layout

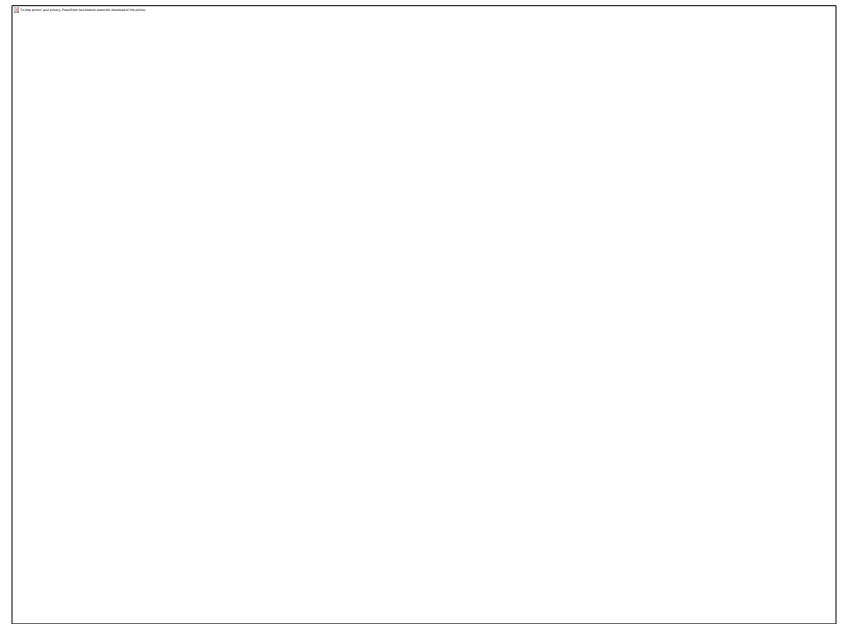


Rain catchment system



# Relocation Support for Environmentally Threatened Communities

- Empower and engage the Community to drive community design
- Utilize institutional knowledge to inform planning process
- Implement holistic approach to ensure synergy in infrastructure development





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