

Alaska Region

Alaska Native Tribal Health Consortium's Portable Alternative Sanitation System

Uniquely Alaskan Challenges

For most of us who live on the U.S. mainland, it is difficult to imagine living without basic sanitation services such as indoor plumbing, and having to haul the family's toilet waste in 5-gallon buckets through the living room three times each day. While it is certainly true that many people, in particular tribal people, live off-grid with limited access to electrical and water services, the challenges of doing so are compounded when you live in a remote village in Alaska that has been experiencing extreme and accelerating impacts of climate change.

It is equally difficult for most people who live outside of Alaska to fully grasp the true existential threat of climate change to communities such as Newtok, Kivalina, Nuiqsut, Kotlik, Quinhagak, and countless others. These communities' villages are literally clinging to the edges of their homelands, as permafrost degrades, sea levels rise, river and ocean coastlines erode, freeze/melt cycles are disrupted, tropical storms reach clear to central Alaska, and all weather predictability seems to be lost. Reliance on seasonal rhythms, which Alaska Native community members have survived on for thousands of years, has vanished, along with sea ice, which once served as natural infrastructure that protected communities from storm surges.



Coastline erosion in Quinhagak. Photo credit: ANTHC

Coastline erosion has the obvious effect of reducing the livable land mass available to communities, but the detrimental impacts extend far beyond loss of land. The forces combine to literally undercut infrastructure such as schools, homes, and water pipelines. This compromises the entire system, including the health of the community as they lose reliable access to the already limited sanitation services they may have had in place, and there is no backup plan. Many Native Villages in Alaska never had sanitation services to begin with, so the demise of their waste disposal systems can lead to serious human health crises.

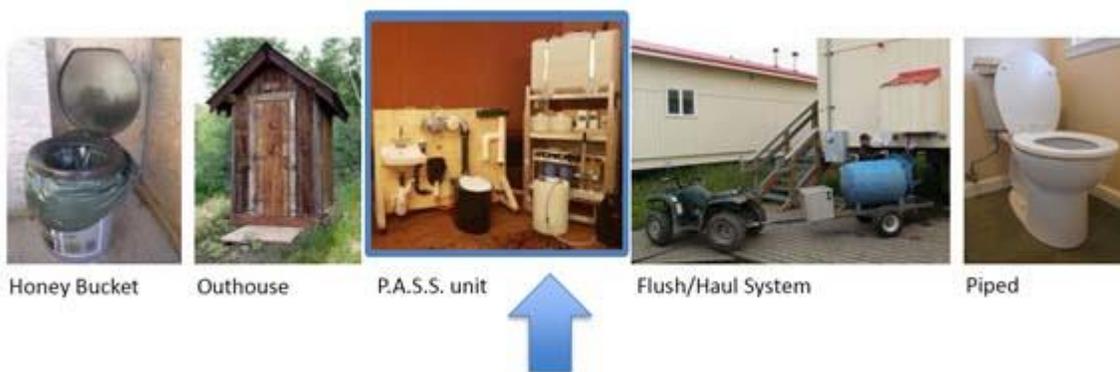


Damage from storm surge in Kotlik. Photo credit: ANTHC

Assessing the Challenges

In 2011, the [Alaska Native Tribal Health Consortium](#) (ANTHC) began publishing [Assessment Reports](#) to better understand and make recommendations on the impacts of climate change to communities throughout Alaska. The first one, [Climate Change in Kivalina](#), highlighted important vulnerabilities related to the sanitation system, water resources, infrastructure, and erosion. In fact, the summary of recommendations begins by stating, “The lack of adequate sanitation is the most immediate health threat in Kivalina,” (Brubaker 2011). While every village in Alaska has its own unique challenges, and there is no one-size-fits-all solution, the threats to their already limited access to sanitation is a thread that runs through many villages.

The ANTHC team knew that they had to identify creative solutions for communities with such an expansive range of challenges. Recognizing that sanitation was the most immediate health threat, but that attempting to establish permanent infrastructure would be an exercise in futility, they created a design concept that would ultimately be known as PASS: the Portable Alternative Sanitation System. PASS provides homeowners with basic sanitation services (such as human waste disposal, handwashing, and drinking water) but can also be moved to a new location if (and when) households in the community need to relocate. Additionally, PASS can be installed at a fraction of the cost of operations and maintenance for piped infrastructure.



Levels of sanitation service in rural Alaska

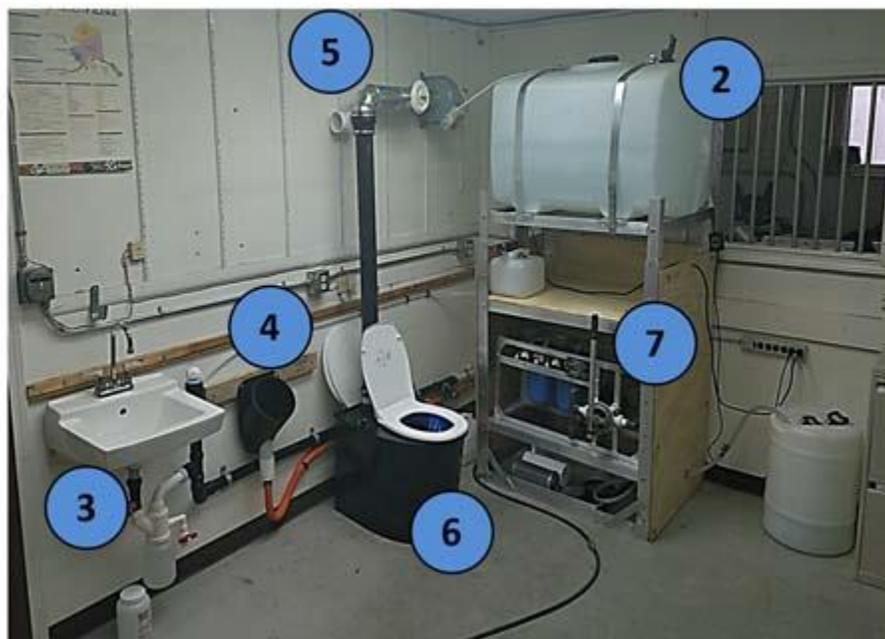
Photo credit: ANTHC

Challenges, of course, remain. PASS does not have the same capabilities as a piped water system, but more than that, most homes in Alaskan Villages have not been designed with allocated space for bathrooms. In order for PASS to be successful, the ANTHC team must work very closely with individual homeowners to

design, implement, and ensure proper use and maintenance of the systems, and those conversations can be awkward. Ultimately the success or failure of the system is dependent on human behavior, so ensuring homeowner buy-in is critical. The ANTHC team has to understand how to interface with each affected community in such a way that is culturally appropriate and effective. The engineers, designers, and construction managers are all indigenous to Alaska, which has aided them in being able to effectively and sensitively communicate with the homeowners and communities.

ANTHC hopes to inspire other communities with similar challenges to use PASS as an example of one solution, and they know that in order for PASS to be successful anywhere, it must be recognized that the goal is not to change the way a community lives, but to bring greater social justice by enhancing their lives, their health, and the health of the environment. We must begin meeting people where they are, and not seeing new ideas as “all or nothing” changes. To do so, we must change the little things in how we behave and interface, and in the dialogues in which we engage. This leads to a different response from the affected communities, one that is usually more understanding and accepting of new ideas.

Typical System Layout:



- 1. RAIN CATCHMENT
- 2. WATER STORAGE TANK
- 3. LOW-FLOW SINK
- 4. WATERLESS URINAL
- 5. INTEGRATED VENTILATION
- 6. SEPARATING TOILET
- 7. WATER TREATMENT SYSTEM

Photo credit: ANTHC

Documenting the Success

As part of the desire to expand PASS both within and outside of Alaska, ANTHC received a grant from the [Robert Wood Johnson Foundation](#) to conduct research and document the health impacts of PASS. This health and wellness study looks at people living in homes before PASS is implemented, and again at those same homes after PASS is implemented. Although the data is preliminary, the researchers have heard and seen some very positive results (for example, mothers who say their kids are healthier, and kids who say they are now going to school more often), and will be documenting the results over the next 1-3 years.

While the challenges in rural Alaska are great, so too is the team from ANTHC that is working to help improve the lives of the Native Alaskans who live there. Everyone involved in the PASS project - from the engineers to the designers to the researchers - cares deeply about the health and well being of the people, and works synergistically both within the team and with the people of these remote lands.

References

Brubaker, M., Berner, J., Bell, J., & Warren, J. (2011). Climate change in Kivalina, Alaska: Strategies for community health. ANTHC Center for Climate and Health. http://anthc.org/wp-content/uploads/2016/01/CCH_AR_012011_Climate-Change-in-Kivalina.pdf

This profile was developed in 2020 by Dara Marks-Marino, Institute for Tribal Environmental Professionals, Northern Arizona University, with financial support from the Bureau of Indian Affairs. The profile is available on the Tribes & Climate Change website: www7.nau.edu/itep/main/tcc/Tribes/. The tribal climate change profiles featured on the website are intended to be a pathway to increasing knowledge among tribal and non-tribal organizations interested in learning about climate change mitigation and adaptation efforts.

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