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Newtok: struggle, survival and recovery¹

Three sides of saltwater seas delimit Alaska: the Beaufort and Chuckchi seas (north), the Bering Sea (west) and the Gulf of Alaska (south). The state of Alaska has 33,900 miles (54,563 km) of shoreline and around 10,000 rivers, which make Alaska the largest state of the United States. Alaska is also one of the least populated states with 680,000 inhabitants of which 13 per cent are Alaska natives. Most Alaskans live in cities but the majority of the state is who sparsely populated with small communities of indigenous populations that live in rural areas in the northern part of the state and in interior Alaska. Indigenous communities are divided in 6 groups² and many of these natives live in villages close to the sea or river and depend largely on hunting, fishing and gathering wild plants for food. Climate change effects are occurring faster than many climate models predicted. As a result, Alaskan natives face unprecedented challenges to adapt. Intergovernmental Panel on Climate Change describes in its last reports on the polar region (IPCC, 2014) that dangers include flooding in coastal communities, erosion, heavy rainfall, storms and snow melts. According to the Alaska Division of Homeland Security, since 1978, there have been more than 228 flooding events that led to state disaster declarations for 119 different Alaska communities and 40 per cent of these flood disasters occurred from 2000 to 2008 with 23 occurring in 2005 (U.S. Government Accountability Office, 2009.). The effects of climate change are believed by both the IPCC and the State Officials to be increasing. Climate change effects, especially erosion are well documented since the 1980s, both communities and state agencies developed a long-term strategy for protection (Robin Bronen 2013). The GAO reported in 2003 that 184 (86%) of the 213 communities were affected by severe flooding and erosion. The Immediate Actions Work Group (IAWG) in 2006 identified 6 communities that are the most imperiled communities by flooding and erosion. (Bronen,R. 2011.) The GAO reported that 12 villages have decided to relocate in part or entirely as an option largely because of flooding and erosion. Of those 12 villages, 4 communities (Shishmaref, Kivalina, Newtok, Shaktoolik) require entire relocation instead of moving infrastructure to higher ground. Consequently, because a catastrophic event could emerge in those communities within the next 15 years, their only alternative is migration. Hence, because of their geographic location, these communities must relocate if it desires a sustainable future. Newtok is the most advanced community

1. From the Newtokmoves.org

2. 6 groups compose the Alaska natives: Unangan (Aleuts), Alutiiq (Pacific Eskimos), Inupiat (northern eskimos), Yup'ik (Bering sea Eskimos) Athabascan (interior Indians) Tlingit and Haida (southeast Coastal Indians).

in the relocation process. This paper begins with an overview of the situation in Newtok. It then analyzes the community-driven relocation process (part 2). Finally, the paper will identify the challenges, what can be the policy changes and lessons that can be learned. (Part III)

1. OVERVIEW OF CLIMATE CHANGE IN NEWTOK

Newtok is a Yupik Eskimo village located on the Ninglik river, close to the Bering Sea. The village's ancestors have lived on the Bering Sea for more than 2,000 years. Newtok is clustered around 63 houses (Bronen, 2011). No roads lead to Newtok and the only access to the community is by airplane (seats maximum 10 persons). Airplanes deliver basic necessities such as food but due to extreme weather conditions, days can pass without any ability to travel. The community settled in its current site in 1950 when the Bureau of Indian Affairs imposed a requirement that children attend school. At the beginning of the fifties, around hundred people lived in the community but since then, the population has tripled. According to 2010 census, 354 people reside in the community. It was identified in December 2003 as an imminently threatened village that needs to be relocated. Newtok was successively declared as flood disaster area in 2004 and in 2005. Flooding from a 2005 storm turned the village into an island for several days and the Ninglick river barge was completely destroyed making it extremely difficult to deliver basic supplies such as fuel to the village.

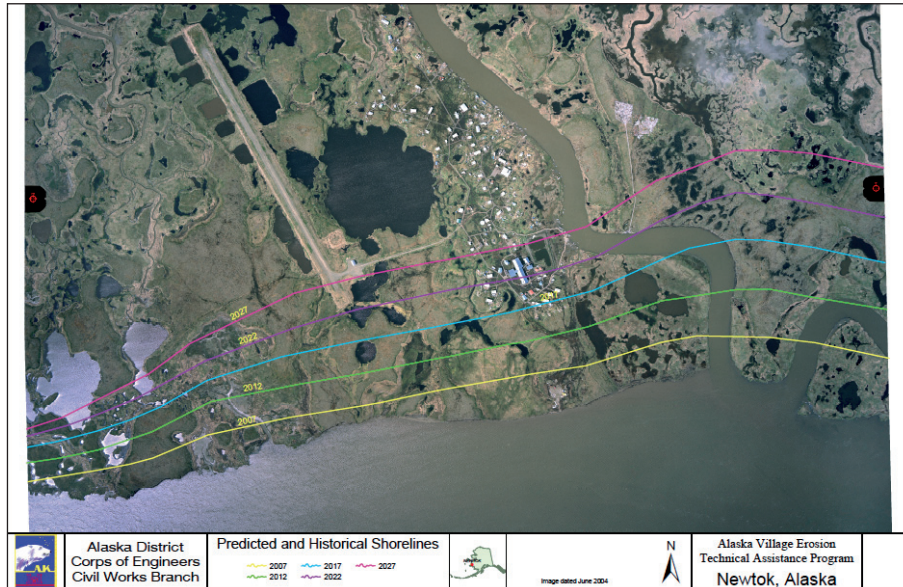
1.1. Newtok: impacts and vulnerability.

It was observed that a combination of gradual ecosystem changes and rapid onset extreme environment events threaten the village (Bronen, 2013). Newtok sits on top of permafrost in one of the largest river delta in the world. Consequently, in thaws period and with warmer temperature, the village becomes muddy and has no bearing capacity. Permafrost³ is melting mainly due to temperature increases. The GAO observes the increase in temperature led to thawing of permafrost, provoking severe degradation of villages' shorelines and riverbanks that slump, erode, and threaten the communities to see the infrastructure to sink into the earth. Melting of sea ice leaves communities and shorelines extremely vulnerable to storm and waves. It is the combination of thawing permafrost, temperature changes, wave action and river current that is accelerating the erosion. Erosion is causing the Ninglick River to move closer to the village. Villagers observed that "every year during the storm season, that river can take away up to 300 feet a year (...)" Every year storms are getting worse, and floods more intense".(Goldenberg, The Guardian, 2013) The state spent around 1.5 million USD to control the erosion between 1983 and 1989. Nevertheless, the Army Corps of Engineers estimated that the highest point of the villages (the school) could be under water by 2017. (NPR 2013)

Climate change not only has ecological impacts mentioned above, but impacts on the community as well.

3. Permafrost can be defined as permanently frozen subsoil, which is found over 80 percent of Alaska, it keeps the land intact, together and especially habitable along the northwestern coast in Alaska.

Figure 1. Alaska Village Erosion Newtok (Corps of Engineers. Alaska Village Erosion Technical Assistance Program 2006.)



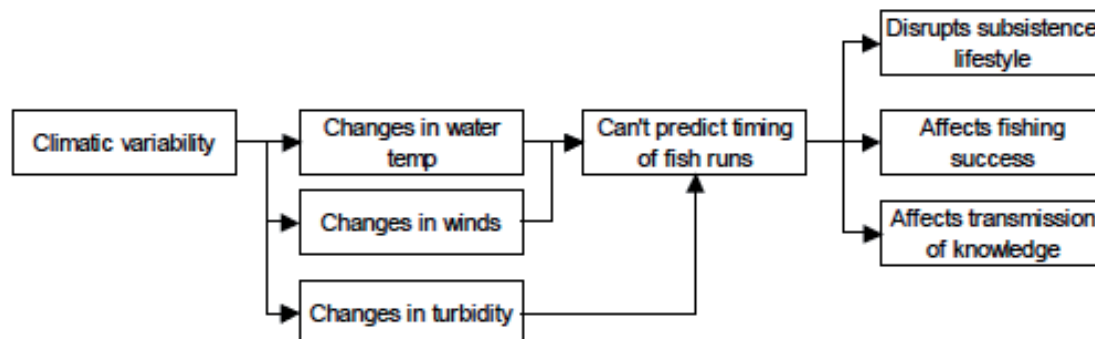
1.2. Mains areas of vulnerability:

Subsistence activities, health, safety, and infrastructure services.

Subsistence activities:

Climate change affects fish stocks⁴ that are constrained to migrate to cooler places or even disappearing altogether, leaving millions of people without food and source of income. Changes in vegetation patterns clearly affect migration patterns of bird and animal life, which will in turn impact the ability of Alaska natives to gather their traditional food (Bronen 2013). Climate change affects both terrestrial and marine habitats, which have consequences nutritionally and culturally for Alaskan Natives. It is harder to predict availability, movement, and behavior of animals as Stanley Tom, tribal administrator said “The snow disappears way late. That is making the geese come at the wrong time. Now they are starting to lay their eggs when there is still snow and ice and we can’t go and pick them (Goldenberg, 2013).” However, the increased variability and uncertainty have also effected social, economical and cultural activities. These subsistence activities are interwoven into the fabric of their lives and form the foundation for continuity between generations by promoting the basic values of Alaska native culture. Hence, climate change caused the Newtok community to change their old-centuries routines. This variability and uncertainty is costly for those populations because it is important to highlight that Alaska is the most extensive area of poverty in the United States (GAO,2009) in terms of household income and has the highest cost in commercial goods because of their isolations. Consequently, given this economic difficulty, indigenous communities are completely dependent on their local environment (for food, transportation and their survival) and have lived off the land and sea for millennia.

4. The marine mammal that are dependent on sea ice for their habitat are disappearing such as: bowhead whales, beluga, whales, seals, walrus, polar bears and a strong decline in salmon stock. (Bronen 2011)



(Example relating to changes in timing of fish. Source: Shearer, Christine. *The Political Ecology of Climate Adaptation Assistance: Alaska Natives, Displacement, and Relocation*. Diss. U of California, Santa Barbara, 2012. N.p.: Journal of Political Ecology, 2012. Print.)

Health and safety

Climate change started to have impacts on the health of communities. According to the Center For Climate and Health Alaska native tribal health consortium, climate change increases “vulnerability to injury, disease, mental stress, food insecurity and water insecurity.” The Center For Climate And Health reported that the Northwest Arctic region has the highest rate of respiratory infections. As a result of a lack of central water supply and treatment sources, Alaskan communities have higher rates of respiratory and skin infections. It was observed that climate change is causing stress due to environmental conditions and fear related to security and safety (Center for Climate and Health, 2011).

Loss of infrastructure

In 1996, the village dumpsite eroded in the Ninglick River, effecting nearby residents. In 2005, the primary barge eroded into the Ninglick River. Barges are essential during summer because they deliver essential supply for community. The loss of barge landing severely impacted the village, now lacking cost-effective fuel delivery for power sources in the village. Despite the fact that a new barge landing is essential, it is not possible because of erosion. Consequently, as climate-induced ecological hazards increase and Newtok’s decision to relocate, it has limited capital investment in existing public infrastructure (Bronen NYU). In addition, Newtok lacks a new sewage disposal system because of their decision to relocate. The community is also facing saline intrusion impacts, which deteriorates the potable water. Coastal erosion ultimately affects the lives of people in this community.

Several options are available to solve this crisis: stay in Newtok and control erosion, collocate to other established villages in the region or relocate the entire village to other new site.

2. RELOCATION AS THE ONLY RESPONSE TO THE CRISIS

Erosion control is nearly impossible and the US Army Corps engineers recognized that then collocation alternative would destroy the Newtok community identity. Therefore, relocation is the only solution to protect community residents. In its last report IPCC stated that “decreased sea ice thickness and extent, less predictable weather, severe storms, sea level rise, changing seasonal melt/freeze up rivers and

lakes, change in snow type and timing, increasing shrub growth, permafrost thaw and storm-related erosion which in turn are causing such severe loss of land in some regions that a number of Alaskan coastal villages are having to relocate entire communities". (IPCC. 2014. Polar regions. IPCC WGII AR5 Chapter 28. p18) IPCC recognizes that there are important threats for Alaskan communities that have no choice than to relocate.

2.1. Selection of the site: a solution to the crisis

In 1994, the Newtok traditional council began a relocation planning process by analyzing 6 potential villages. The council produced criteria to evaluate the relocation site's habitability for the community: "Good soil foundation for village development, no erosion, land suitable for an airport, good barge access and access to subsistence". Consequently, according to those criteria the council selected the northwestern part of the Nelson Island (fifteenth largest island in the US), which is located nine miles away from the current site. 3 communities are located on this island with 1,065 residents and 75% of the land is currently inhabited. It is important to underscore that the Yupi'k made sure that they did not trespass on subsistence areas of other villages by choosing the northwestern part of Nelson Island. No road lead to or from the relocation site and there are no pre-existing infrastructure. The community decided to call the new site Mertarvik (Yupi'k name) that means "getting water from the spring". However, contrary to what we might think, migration for Alaska natives is not something new. Historically, the ancestors of those communities migrated towards several coastal and inland for hunting and fishing to gather subsistence harvests. They moved according to the seasons to follow the "wild game" and fish on which they are mainly dependent (Bronen 2013). However, the US Department of the Interior's Bureau of Education imposed that children must attend school, which created a shift in their migration pattern in the late nineteenth and early twentieth century. As a result, the building of schools, sewage systems, water and electricity infrastructure led to a reversal from seasonal migration to the installation of permanent settlement at the school site chosen by the federal government, reducing the community's ability to move (Bronen 2013).

Climate change effects are therefore affecting communities' ability to adapt to their changing environment through their traditional migration pattern. This change created a new set of dependencies on the government to respond effectively to environmental changes (Bronen, Chapin 2013). Erosion, which is partly a natural process and the principal cause for displacement for Alaska Native, becomes an issue for the reason that communities are tied to the land and built infrastructure such as schools, power plants, and health clinics. Traditionally, communities could migrate easily from areas affected by erosion because they did not rely on built infrastructure (Bronen 2013). Therefore, it was not the first time that Newtok had to migrate because in 1949, the community relocated from "Old Keavalik" to the current Newtok to avoid flooding and find a suitable ground for a new school. As a result, Mertarvik must be their last move. As a traditional council member said, "this will be our last final move. Mertarvik is going to be a lifetime permanent location, higher ground with rock underneath". For these reason, the inhabitants chose carefully the location and voted three times (1996, 2001, 2003) to relocate. The community was opposed to the notion of collocation with other communities. As Stanley Tom, tribal liaison for the Newtok Traditional Council declared in "we opposed to collocation to 100 percent (...) we are all relatives here, we want to be together as much as we can." (Bronen,R. 2011.)

How to obtain ownership of a land?

Nelson Island is owned by federal government and managed by the US Fish and Wildlife Service (USFWS). The phase of the acquisition of the land are as follows (Robin Bronen 2011): First, the community needs the support from the Newtok

Native Corporation;⁵ Secondly, obtain approval from the United States Fish Wildlife Service; Thirdly, the community needs Congress to authorize the land exchange and enact the legislation, which was done on November 17, 2003.

Environmental considerations in Mertarvik

Mertarvik was chosen for its important natural resources. Nevertheless, the community was part of environmental studies since 2006, to outline anticipated impacts and cumulative impacts on protected resources due to their settlement. (Community of Newtok and the Newtok Planning Group. 2011). Listed below are several examples of the Newtok community assessment on Mertarvik and within Nelson Island:

Table 1. Community of Newtok and the Newtok Planning Group. 2011 Relocation Report: Newtok to Mertarvik. Rep.

Categories	Assessment
Birds and waterfowl <i>Mertarvik is rich in bird species in diversity and home of large number of nesting waterfowl. It is also one of the most productive areas in the world of geese.</i>	The settlement of a community in the northwestern part of Nelson Island will have limited impact to waterfowl habitats. There is a potential for temporary and permanent loss of waterfowl habitat through construction of improvements and temporary construction disturbance.
Wetlands, vegetation <i>Wetlands consist of wet tundra within the majority of relocation area lands. Any ground disturbance would likely have an effect on wetland habitats.</i>	Temporary and permanent impacts to wetlands are anticipated as a result of community development at Mertarvik.
Cultural resources <i>Several archeological sites are closed to the northwestern part of Nelson Island.</i>	Sites are located one mile from Mertarvik but no historic properties would be affected by the proposal construction of infrastructure.

To sum up the community is anticipating the cumulative impacts to protected resources of Mertarvik, especially through avoidance, mitigation plans and minimization. Nevertheless, some cumulative impacts are not anticipated.

2.2. The relocation process

The actors: key components of the relocation success.

State and federal agencies

In 2007, the governor of Alaska created the Alaska Climate Change Sub Cabinet to implement a climate change strategy for the state, immediate action workgroup is one of the advisory of the sub cabinet. State and federal government are co chairs and this work group issued recommendation to the governors and address the immediate humanitarian needs of the communities forced to relocation.

5. Robin Bronen explains that the Newtok Native Corporation (NNC) was created according to the Alaska Native Claims settlement that required indigenous tribe to be organized as profit or non profit corporation to receive title to the surface and subsurface land rights. These corporations were developed on the regional and village level. The village corporation is allowed to give to any member of the community the land used by that occupant as her home or subsistence campsite. The Newtok Native Corporation played an active role in the acquisition of Mertarvik. Tom Stanley, newtok’s tribal administrator (equivalent of a mayor) underscored in one of his presentation, the NNC attempted for years to reach an agreement with USFWS, it obtained services of lobbyist at the federal level, secured the backing of Alaska congressman and Senators in Washington D.C and negotiated the terms of the transfer. NNC is the unique ownership of the land whereas the council is the only one authority governing the site with several state and federal agencies to make the relocation easier.

Newtok Planning Group:

The Newtok Planning Group is a multi level interdisciplinary government workgroup in Alaska focused on relocation created in May 2006 from an ad hoc series of meetings. The group is unique in Alaska in its multidisciplinary and multijurisdictional structure. Its main objective is to identify agency resources and to establish a strategy for assisting Newtok in its relocation.

The governor of Alaska declared that NPG should “act as the state coordinating agency to coordinate with other state and federal agencies to propose long term solutions to the ongoing erosion issues (...)”. No State or Federal Agency govern or guide the relocation process, on the contrary they are guided by a collective desire to provide assistance to the Newtok Traditional Council.

Communities

The Newtok community is a key actor in the relocation process because they are not just participating but leading the process. The community set the direction and priorities, pushing funding opportunities, as well as building a skilled labor force. (Mertarvik relocation plan). The building of skilled labor force demonstrates the community’s commitment to move. Recently, 17 community members completed 3 months of training in construction, electrical and mechanical trades. Hence, by gaining skills, the community will be able to build and maintain their new community. Newtok is the only authority that makes the final decisions on action. Consequently, Mertarvik does not depend on the agenda of individual government department. In 2012, the Newtok traditional council passed a set of guiding principles that must be apply and promote in the relocation process by partner and all the community residents. The relocation process has to be defined by the Yupik way of life. (Community of Newtok and the Newtok Planning Group 2011). Here are few examples of what can be found in the guidelines:

... remain a distinct, unique community – our own community, stay focused on our vision by taking small steps forward each day; make decisions openly and as a community and look to elders for guidance; our voice comes first – we have first and final say in making decisions and defining priorities, by implementing nation-building principles and working with our partners; no matter how long it takes, we will work together to provide support to our people in both Mertarvik and Newtok; development should reflect our cultural traditions. (Community of Newtok and the Newtok Planning Group. 2011 :27)

Harvard University’s project on American Indian Economic Development observed that if the community was not taking the lead, some government agency would have decided that the “best option” was to collocate with other tribal villages. Residents took the lead because they did not want to lose their ties as unique people. Land in Yup’ik identity is crucial; it is critical to stay within ancestral territory. Mertarvik is a solution to stay connected to each other and to their physical, economic and cultural heritage. As it was mentioned in the Harvard project: “This community-driven approach has helped the village work successfully with complex bureaucracies, even though a majority of Newtok residents are not fluent in English.”

Design and development of Newtok’s relocation plan

The Newtok Planning Group (NPG) is engaged in a multi-year effort to establish a strategic relocation planning process. Despite all the challenges that faced NPG, they succeeded with other agencies to build key infrastructure such as barge landing, six homes and the foundation of an emergency evacuation center that will serve as a temporary emergency shelter for Newtok residents, after the move, it will become the Mertarvik Community Center. The US Army helps with the construction for 5

years through its Innovative Readiness Training Program⁶, which provides military personnel with real-world training on civilian projects. In 2009, Army personnel began to work on a barge landing facility that allows equipment and materials to be shipped to the new site and the construction of an access road that connects the barge landing to the future village followed. Each of these projects was developed with supervision of the Newtok residents and leaders and built with funding from numerous sources, including the U.S. Army Corps of Engineers, the Alaska Department of Transportation and Public Facilities, the Alaska Department of Environmental Conservation, the U.S. Department of Commerce, and the Bureau of Indian Affairs. (Harvard Project, 2010) Mertarvik will reflect the community's layout and the University of Harvard noted that the community center's cultural element includes two huge steam baths, storage areas for hunting and fishing gear, and space for cold storage of fish and game. Elders' knowledge helped orientate the new buildings by taking into account sun, wind, and snowdrifts. (Harvard Project, 2010) 27 million has been spent in Mertarvik so far, but currently no electric, sewage or water system exists at the new site. However, because the relocation process is too slow, in October 2013, villagers accused their own council of "failing to hold regular elections, and raised a petition to through out the leaders and replace Stanley Tom (Tribal Administrator)" (The Guardian, 2013). Dissidents voted for a new council and installed their own leaders but Patricia Cochran, director of Alaska Native Science commission reveals that the upheavals is typical from native communities that are confronting climate change. She adds, "I do not think you would find one community that says they are happy with the pace that's gone on".

Table 2 Table with future cost and how long does the community have (Source: Aveta Report 2006, Newtok relocation could run as high as \$130 million, or \$350,000 per villager)

Community	Cost of future erosion protection	Cost to relocate	How long does the community have*
Bethel	\$ 5,000,000	N/A	> 100 years
Dillingham	\$ 10,000,000	N/A	> 100 years
Kaktovik	\$ 40,000,000	\$ 20-40 Million	> 100 years
Kivalina	\$ 15,000,000	\$ 95-125 Million	10-15 years
Newtok	\$ 90,000,000	\$ 80-130 Million	10-15 years
Shishmaref	\$ 16,000,000	\$ 100-200 Million	10-15 years
Unalakleet	\$ 30,000,000	N/A	> 100 years

*These numbers assume no future erosion protection, including that listed here, is not implemented.

Moreover, 2 years ago, Newtok launched a website⁷, newtokmoves.org to be able to raise fund from business and individuals. "We want to raise the money to move our village by doing it the American way: hard work, community and faith. We don't want taxpayer money to fund all of our projects and stimulate what little

6. The innovative Readiness Training provides real world training opportunities for our service members and units to prepare them for their wartime missions while supporting the needs of America's underserved communities. (<http://irt.defense.gov/>)

7. The missions of the newtokmoves.org website are to show exactly what is taking place in their village, from the devastating flooding, erosion and government red tape, to the new native businesses that will fund their growth and allow the village to move 375 residents across the river and out of danger.

economy we have. We want to build an economy that will last and continue to provide for our village for generations to come.”(from NewtokMoves.org) They also want to create new native businesses to fund their own growth and allow them to move their 375 residents.

4 phases

The community sets up 4 stages for the settlement of the community. They will not move all at the same time but it will occur through a process that is incremental and organic in nature. (Community of Newtok and the Newtok Planning Group 2011)

1. Getting ready

This phase correspond to current phase of the relocation. This phase include site selection, building the basic infrastructure such as road, barge landing and water wells.

2. Pioneering

Upagluteng means pioneering in Yupik, which refers to the traditional practice of moving with seasons. Six homes are already built to shelter the first pioneers at Mertarvik. Nevertheless, the families that chose to pioneer will not leave full time without the structure to ensure their safety. They will live during the summer and winter months. The Newtok Traditional Council hopes that this pioneering phase will motivate others move and in doing so, boost confidence for needed infrastructures (Community of Newtok and the Newtok Planning Group 2011). This step is important because it will send a clear message to agencies that it is really happening and that the community is serious about the move. For the community, pioneering is an opportunity to return to traditional ways of life.

3. Transition

An increasing number of community members will make the move (100 or more). With more and more people, more infrastructures will be in place, such as bigger health services, airports, landfills, stores, and community greenhouses might be in place during this phase.

4. Final stage

Final move of all residents to the new town. Villagers do not really know when this step will happen, for some they are losing hope because the process is taking too long.

3. HOW TO OVERCOME THE DIFFERENT CHALLENGES ?

3.1. Newtok’s relocation challenges:

Challenges that are facing Newtok and more generally communities that are threatened by climate change were summed up by the tribal administrator of Newtok, Tom Stanley: “no agency has [the] authority to lead relocation efforts; no funding specially for relocation, patchwork funding from agencies and grants and getting fund take time that we don’t have. We can’t keep up erosion.” (Bronen 2013)

No agencies have the authority

Many reports by federal agencies recognized that no agency has the authority to relocate communities, no governmental organization exists that can address strategic planning needs of relocation and the logistics of decommissioning the original community location, including hazardous, waste clean-up and preservation of cultural site. (Afifi, Tamer, and Jill Jäger, 2010) Hence, there is a lack of leadership and

a multitude of agencies that have their own program, funding priorities, authorities and fiscal rules that are not able to conduct multi-agency cooperation efforts (Alaska Village Erosion Technical Assistance Program, AVETA, 2006) Newtok is dealing with more than 25 different federal, state, tribal and nonprofit agencies (Bronen, Climate-induced community relocations). Other villages such as Kivalina that in search for relocation face the same problem. Janet Mitchell (Kivalina City Administrator) is convinced that «the relocation would move faster if we had a lead entity, someone focused on relocation» and she would prefer to have «a group of people from different agencies. That would make it more powerful. Everyone would have a voice. Including Kivalina.» (Shearer, 2012) This lack of leadership created inefficiency because they are not ensuring that villages in the greatest peril get the highest in priority for assistance. Consequently, currently policies hinder the relocation efforts (Shearer, 2012). Agencies lack the technical, financial and organizational capacity to relocate communities.

No relocation policy

There is a need to strengthen risk mitigation and relocation measures. As stated by Janet Mitchell, tribal administrator of another village threatened by coastal erosion: «The word relocation doesn't exist on the federal level, and I doubt that it exists at the state level» (Shearer, 2012). She also stated “at the federal, state, and tribal levels, there is a lack of clearly defined risk mitigation protocols and resettlement procedures that would trigger more pro-active measures to ensure Kivalina's safety.”

No specific funding is dedicated for relocation

Gap in the US legislation. “It is not as if you suffer a drought, a hurricane, tornado, and you can apply for disaster relief...” (Goldenberg in NPR, 2013). Moreover, according to Chapin and Bronen in their article in 2013 they demonstrate that the erosion is currently the primary cause and a significant hazard faced by Alaskan coastal communities but it is not included in the list of major disasters in the Stafford Act.

Suzanne Goldenberg, award winning journalist for the Guardian, in her article⁸ bemoan the fact that “climate change moves too slowly to be recognized as a disaster and because you need to move people now, before the disaster occurs”) Erosion is not included in the Stafford Act which mean that communities cannot apply for funding. As Robin Bronen declared in an interview for The Guardian “We weren't thinking of climate change when federal disaster relief legislation was passed (...) Our legal system is not set up. The institutions that we have created to respond to disasters are not up to the task of responding to climate change.” The Stafford Act and its amendments require that funding must be spent to restore infrastructures back to their disaster, not to move them altogether. (Petersen, Backer Institute Alaska, 2012). However, communities in Alaska are living in locations which are inhabitable. Consequently, they are not able to receive government funding (Bronen 2011) The actual Federal Emergency Management Agency can only operate for immediate disaster, hence this agency is reactive and not proactive.

Ack in assessing climate change

No method exists to determine whether and when a community can no longer be protected in place with traditional flood and erosion control.

8. Goldenberg, S. « America's First Climate Refugees in Newtok, Alaska. » *The Guardian*. N.p., 13 May 2013. Web.

Statutory barriers

Current policies discourage the building of new infrastructure at the relocation site. For instance, the Alaska department of transportation requires at least 25 students in order to build a school.

Consequently, US legislation (in regards to the post-disaster recovery and hazard mitigation statutory framework) led only to inflexible answers to random extreme weather events. Their main responses are to rebuild and repair infrastructure in place and protect population from future hazards through erosion and flood protection. (Goldenberg, *The Guardian*, 2013) Nevertheless, as Kivalina experienced, protection community in place with rock walls or sandbags are unsuccessful in Alaska despite that millions of dollars have been spent. In September 2006, Kivalina (north of Newtok), after having received a new construction of millions of dollars of seawall, federal government came to celebrate its completion. Everything, however, had not gone as planned, a storm damaged the seawall before the celebration and provoked cancelation of the celebration by the official. After a year, another storm damaged the seawall. 250 residents were evacuated because the seawall was unable to protect them. Hence, technology is inefficient currently to protect people who are living in vulnerable risk-prone.

3.2. The potential solutions that can move the relocation forward:

The policy recommendations are mainly coming from Robin Bronen articles. She is a human right lawyer that works for a long time on the case of Newtok. As more and more Americans are aware and concerned by Arctic climate change; new sets of policies are more than needed. The United States of America needs to imagine a new response framework for erosion.

Two axes can improve the relocation process; on the one hand, creating relocation and on the other hand, governance policies that go along with new institutions.

“Climigration”

The first policy recommendation that can be made is to give a clear definition of the displacement category ‘climate-induced migration’ and profile the population groups that must move (Bronen, 2009). This definition will be the foundation to create a legal and institutional framework to relocate communities. Robin Bronen observes that it exists three drivers of climate-induced migration creating therefore, three categories. Consequently, each type of migration will need a specific institutional framework.

Table 3 Three categories of migrants (Bronen, 2013)

Extreme weather events (hurricane, tornadoes)	Individuals and household
Depletion of ecosystem services (salt water intrusion, drought)	Mass migration (entire communities) are forced to evacuate temporarily.
Ongoing ecological changes caused by the combination of the two mentioned above.	Mass migration (entire community) are forced to relocate permanently.

Climigration would be the best word to describe what is occurring in Alaska but also elsewhere. Climigration is a specific type of permanent population displacement that occurs when community is required to protect residents from climate-induced biophysical changes that alter ecosystem, damage or destroy public infrastructure and repeatedly endanger human lives (Bronen 2009). Climigration is different from migration because it implies that there is an inability to return home because home may be underwater or sinking. “Climigration” creates a new set of indicators for governments and non-government actors to identify when to collectively and collaboratively shift from the traditional post disaster recovery response to a

community relocation process (Bronen, 2011). Those indicators will help to determine which communities are most at risk and to relocate. In Alaska, the indicators of socio-ecological vulnerability demonstrating that relocation is required may contain:

- 1 Repetitive loss community infrastructure
- 2 Imminent danger to the community from the on-going ecological changes and repeated random extreme weather event
- 3 No ability from community expansion
- 4 Number of evacuation incidences
- 5 Number of people evacuated
- 6 Predicted rates of environmental change
- 7 Repeated failure of hazard mitigation measures
- 8 Viability of access to transportation, potable water...
- 9 Decline in socio-economic indicators, food security, loss of livelihood

Therefore, forced migration due to climate change must be clearly defined and have a specific framework response that is distinct from other environmental catastrophes that also cause people to migrate.

After defining the building foundation, the next steps are to create relocation and adaptive governance policy frameworks.

Relocation policy

As a human right lawyer, Robin Bronen included on relocation policy, human right principles that must govern the relocation process. The social, economic and cultural rights of individuals have to be protected during the relocation process (Bronen 2009). Relocation policy must begin with a community vote and relocation site process with the approval from the community. For Robin Bronen, these principles in the relocation policy framework will enhance the resilience capacity of communities by addressing socioeconomic issues, such as lack of economic development and poverty, which can contribute to communities' vulnerability.

An adaptive governance framework as a potential solution.

A multi-level and multi-disciplinary governance framework is crucial for relocation because it involves a wide range of actors. Consequently to have an adaptive governance structure, several changes could be needed.

Amendments

The Stafford Act should be amended to include erosion effects. The term "natural catastrophe" should be extended to include gradual and recurring climate induced ecological processes. This would let the President to declare such circumstances as disaster and release funds for predisaster hazard mitigation.

Change in Federal and State statutes to specifically permit Federal disaster relief funding to be used and federal agencies to participate in building new infrastructure and relocating an entire community to a relocation site when durable adaptation is impossible to the current site location (Bronen and Chapin, 2013)

Those two amendments will allow communities threatened by climate-induced ecological changes to shift from disaster recovery to community relocation (Bronen 2013).

New institutions

It is necessary to create institutions in order to implement relocation policy and new governance.

- The existing community government must have the authority to be a key leader and decision maker in the relocation process.
- Clear organizational structure to implement efficiently relocation policy.
- Federal and state relocation would be responsible for implementing: process

- framework for relocation planning and implementation and an operational framework for the actual relocation.
- States and Federal statutes should outline the institutional framework and funding for the relocation process.
 - Define the governance authority at the relocation site
 - Clear statutory guidance about the role of local government.
 - Interdisciplinary, multi sector approach will foster local governing institutions in identifying potential solutions.
 - To resolve the funding, state of Alaska can dedicate a portion of oil revenue to climate measure.

A lead agency is essential to provide commitment, direction and unity of purpose. This lead agency would then be able to tap the skills and abilities of the other agencies to accomplish task within their fields of expertise. (Shearer, 2012)

3.3. Lesson learned through the case of Newtok

However, what is happening to Newtok could affect millions of people all over the world. Approximately 10% of the world's population lives in coastal communities (10m or less above the sea level). Newtok's relocation process is a good model for other communities because it created a governance structure with the Newtok Planning Group that bring community, federal, state, tribal governmental and non governmental together in the relocation process to help the community by building infrastructure at the relocation site. Certainly as Larry Hartig, commissioner of Alaska department of environmental conservation declares, "We are construing the track as we go. We're trying to find the track and putting it in front of the train." The main lesson that can be learned from Newtok is that local leadership is essential because the community had to compensate the lack of lead agency. The community is serving "as both as the glue and directors of the efforts to date" (Community of Newtok and the Newtok Planning Group, 2011). It is important to engage the community in decision-making process from the start. It is not an easy task because a cultural and language gaps can exist; hence, ensuring communication is crucial. The coastal Louisiana Tribe⁹ is also facing the same situation than Alaska coastal communities. The Isle de Jean Charles was recently affected in 2012 by Hurricane Isaac and people raised their homes to adapt to land loss and the rising waters. It was observed that in the 1950s, the Isle was about 5 miles by 12 miles whereas nowadays, the land is around ¼ mile by 2 miles. This diminution is partly a result of oil and gas companies but it is also due to intense coastal erosion and saltwater intrusion. Coastal Louisiana has experienced one of the highest rates of relative sea level rise in the world, with 8 inches in the last 50 years (Koppel Maldonado, 2013). The Isle no longer has natural protection against hurricane and storms. Since 2005, the tribal community faced 6 major storms. If nothing is done, the Isle will disappear by 2050. Here again, the traditional chief is working to relocate together "those who have scattered and those who would like a communal safe haven". (Community of Newtok and the Newtok Planning Group, 2011) He explained that, "people want to come back to the community. We have to come together to ensure the land belongs to us while we move to a safe location" The community leaders pushed for relocation in 2002 through the Army Corps of Engineers, and also in 2009, but just as the Newtok community met regulatory challenges of relocating an entire community without internal and little external funding. As Julie Koppel Maldonado notes¹⁰ that after the BP disaster in 2010, representatives of Newtok, Isle de Jean Charles, and other Louisiana and Alaska

9. Grand Bayou Village, Grand Caillou/Dulac, Isle de Jean Charles and Pointe-au-Chien Indian Tribes

10. The Impact of Climate Change on Tribal Communities in the US: Displacement, Relocation, and Human Rights,

at-risk coastal communities came together through the work of an academic center and a religious congregation to develop people-to-people learning exchange, as well as advocacy through local and national social and political structures and systems. She also reveals that those communities traveled to each other's lands and communities to learn what each is experiencing and take the knowledge back as advocates on the others' behalf. The communities continue the knowledge exchanges and co-learning based on local, citizen science and traditional ecological knowledge.

Newtok not the first and not the last...

Climate change is affecting communities around the world. In Alaska, climate-induced ecological changes caused by a combination of gradual ecological processes and extreme weather events are damaging community infrastructure, threatening lives and the well being of community residents, altering the habitability of indigenous communities. Therefore, relocation is the only available solution but the current legislation such as the post-disaster recovery or hazard mitigation laws are not designed to respond to permanent displacement. Communities that want to relocate such as Newtok that was our case study are facing policy and practical challenge that hinders the process. Newtok is projected to be underwater by 2017 but in 2013, only 6 homes were built and no one has move at the new site. Newtok is currently the only Alaskan communities advancing in the relocation process. Federal agencies had declared that 11 Alaskan communities are in imminent danger. Hence, it's time for the United States of America to respond to climate-induced relocation and implement efficient policies in order to relocate rapidly threatened communities. The USA have an incredible opportunity to take the lead and create a new model of adaptive governance and a set of new institutions that can facilitate an effective transition from protection in place to community relocation that government throughout the world faced with "climigration" can implement (Bronen, 2011). ♦

BIBLIOGRAPHY

ARTICLES

- Bronen, R. 2009. Forced Migration of Alaskan Indigenous Communities Due to Climate Change: Creating a Human Rights Response In Linking Environmental Change, Migration & Social Vulnerability. A. Oliver-Smith and X. Shen, eds. Pp. 68-73. UNU Institute for Environment and Human Security. Hohenkammer, Germany.
- Bronen, R. 2011. Climate-induced community relocations: creating an adaptive governance framework based in human rights doctrine. *NYU Review of Law and Social Change* 35:356-406
- Bronen, R., and F.S. Chapin III, 2013: "Adaptive governance and institutional strategies for climate-induced community relocations in Alaska." *Proceedings of the National Academy of Sciences*, v. 110, pp. 9320-9325.
- Bronen, R. 2013. *Climate-Induced Displacement of Alaska Native Communities*, Brookings-Bern Project on Internal Displacement, 30 January 2013, available at: <http://www.refworld.org/docid/510a3f9c2.html>
- Brubaker, Michael, James Berner, Raj Chavan, and John Warren. 2011. «Climate Change and Health Effects in Northwest Alaska.» *Global Health Action* 4.0
- Cochran, P., O.H. Huntington, C. Pungowiyi, S. Tom, F.S. Chapin III, H.P. Huntington, N.G. Maynard, and S.F. Trainor. 2013. Indigenous frameworks for observing and responding to climate change in

Alaska. *Climatic Change* 117(4): DOI 10.1007/s10584-013-0735-2 .

- Koppel Maldonado, Julie, Christine Shearer, Robin Bronen, Kristina Peterson, and Heather Lazrus. "The Impact of Climate Change on Tribal Communities in the US: Displacement, Relocation, and Human Rights." *Special Issue: Climate Change and Indigenous Peoples in the United States: Impacts, Experiences and Actions* 120.3 (2013): n. pag. *Springer*. Web.
- Marino, E. (2012). The long history of environmental migration: Assessing vulnerability construction and obstacles to successful relocation in Shishmaref, Alaska. *Glob. Environ. Change*. doi:10.1016/j.gloenvcha.2011.09.016
- Petersen, R. 2012. The Difficulty Relocating Climate-Affected Communities, BAKER INSTITUTE ALASKA. Web.
- THE HARVARD PROJECT ON AMERICAN INDIAN ECONOMIC DEVELOPMENT. John F. Kennedy School of Government - Harvard University, 2010. Web.
- Shearer, Christine. *The Political Ecology of Climate Adaptation Assistance: Alaska Natives, Displacement, and Relocation*. Diss. U of California, Santa Barbara, 2012. N.p.: Journal of Political Ecology, 2012. Print.

BOOK

- Afifi, Tamer, and Jill Jäger. *Environment, Forced Migration and Social Vulnerability*. Berlin: Springer, 2010. Print.

NEWSPAPER ARTICLE:

- Goldenberg, S. «America's First Climate Refugees in Newtok, Alaska.» *The Guardian*. N.p., 13 May 2013. Web.
- Three-part series on America's first climate refugees in Newtok, Alaska.
- NPR. «Impossible Choice Faces America's First 'Climate Refugees'» *NPR*. NPR, 18 May 2013. Web.

REPORT

- Community of Newtok and the Newtok Planning Group. 2011 *Relocation Report: Newtok to Mertavik*. Rep.
- GAO, 2009. Alaska Native Village: limited progress has been made on relocating villages threatened by flooding and erosion, Government Accountability Office Washington.
- IPCC. 2014. Polar regions. IPCC WGII AR5 Chapter 28.
- Corps of Engineers. *Alaska Village Erosion Technical Assistance Program (AVETA)*. Rep. The U.S. Army Corps of Engineer, Apr. 2006. Web.
- USACE. 2009. Alaska baseline erosion assessment. *U.S. Army Corps of Engineers Study Findings and Technical Assessment Report*.
- Gregory, R., Failing, L., & Leiserowitz, A. (2006). Climate change impacts, vulnerabilities, and adaptation in Northwest Alaska (No. 06-11). Eugene: Decision Research

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