

CLIMATE CHANGE, DISPLACEMENT AND COMMUNITY RELOCATION

LESSONS FROM ALASKA

May 2017





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REFUGEE COUNCIL



This report is a collaboration between the Norwegian Refugee Council (NRC) and the Alaska Institute for Justice (AIJ), generously funded by Iceland's Ministry of Foreign Affairs. The lead authors are Dr. Robin Bronen and Denise Pollock from AIJ.

NRC is an independent humanitarian organization providing assistance, protection and durable solutions to displaced people worldwide. NRC is engaged at the global, regional and national level to better protect people displaced by disasters and the adverse effects of climate change. This includes the prevention of displacement by supporting states and communities to adopt disaster risk reduction and climate change adaptation measures.

AIJ is a non-governmental organisation dedicated to protecting the human rights of Alaskans. Its research and policy institute focuses on social and environmental justice issues. This work includes working at the international, national and local level to develop policies that protect the human rights of those forced to relocate because of climate change and working with Alaska Native Tribes to develop community-based adaptation strategies.

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Cover photo: Unalakleet during the 2011 Bering Sea storm. Photo credit: Steve Ivanoff.

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FOREWORD

Displacement associated with disasters and climate change is one of the biggest humanitarian challenges of our times. According to the Norwegian Refugee Council's Internal Displacement Monitoring Centre, sudden-onset disasters displace an average of 25.4 million people a year. That's equivalent of someone forced to flee their home every second.

An unknown number of people are also displaced by slow-onset disasters such as drought and sea level rise. Climate change is expected to cause more frequent and intense extreme weather events in the coming decades, which will further heighten the risk of displacement. States have a responsibility to protect and assist displaced people, prepare for disasters and take measures to prevent displacement. Several global policies adopted in 2015 and 2016 recognise that there are a number of ways to do so, including the use of planned relocation to help communities move and settle on safer land before disasters strike.

The pace of climate change is faster and its impacts more severe in the Arctic than anywhere else in the world. What happens in the Arctic has major implications for the planet as a whole, and not least for Alaska, where indigenous communities are planning to relocate entire coastal villages inland to protect their lives and preserve their lifestyles and culture.

Their experience is a concrete example of preventive planned relocation, and as such it provides an opportunity to understand the challenges and advantages inherent in such undertakings, and so to better prepare for them. This report will help to inform governments and communities in other regions facing similar protection concerns, particularly those with indigenous communities at risk of displacement.

The work with communities in Alaska will also provide vital input for global policies and other regional and national processes that aim to prevent, reduce or at least mitigate displacement associated with disasters and the adverse effects of climate change. These include the Platform on Disaster Displacement, which was established to implement the Nansen Initiative's protection agenda on cross-border disaster displacement, the Sendai Framework for Disaster Risk Reduction and the Paris Agreement on climate change.

Indigenous communities often have the least access to resources to prepare and respond to disasters and the adverse effects of climate change, and also tend to be neglected when it comes to the design and implementation of policies and plans. Decision-makers and practitioners should give them particular attention and support to ensure that their social and cultural rights are protected and that they are fully involved in the relocation process at all stages.



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INTRODUCTION

Community relocations induced by climate change are perhaps the greatest human rights challenge of our time. Those who have contributed least to our climate crisis are the first to face the permanent loss of their homelands and the need to relocate. Such relocations affect the human right to life and self-determination, and a wide range of social, economic and cultural rights.

This report presents the preliminary findings of research involving 15 Alaska Native communities which are designing a community-led relocation process in response to the impacts of climate change. It presents a brief overview of climate change in Alaska, examines its impact on rural Alaska Native villages and analyses the challenges for state, federal and tribal governments in implementing planned relocation as a long-term disaster risk reduction (DRR) strategy. It describes the steps the communities are taking to design and effect their relocation and outlines policy recommendations.

Alaska Natives are among the first to decide that the relocation of whole communities is the only long-term adaptation strategy to protect them from the impacts of climate change. The outcomes of their work designing and implementing such a community-led relocation process will be used to inform global policy discussions on the displacement of indigenous communities, the governance issues that need to be addressed to facilitate planned relocations as a disaster risk reduction strategy and to support the Platform on Disaster Displacement (see page 16 for more on PDD).

Accelerated warming in the Arctic has tremendous implications for the world as a whole, and not least Alaska. Less sea ice covers the Arctic Ocean today than at any time in recent geological history, and landmasses are also affected by rising temperatures. Permanently frozen subsoil, or permafrost, keeps land intact and habitable along

the state's north-west coast, but it is melting. This has led to increased erosion rates and flooding, which damage or destroy infrastructure and threaten the livelihoods and wellbeing of people residing throughout state.

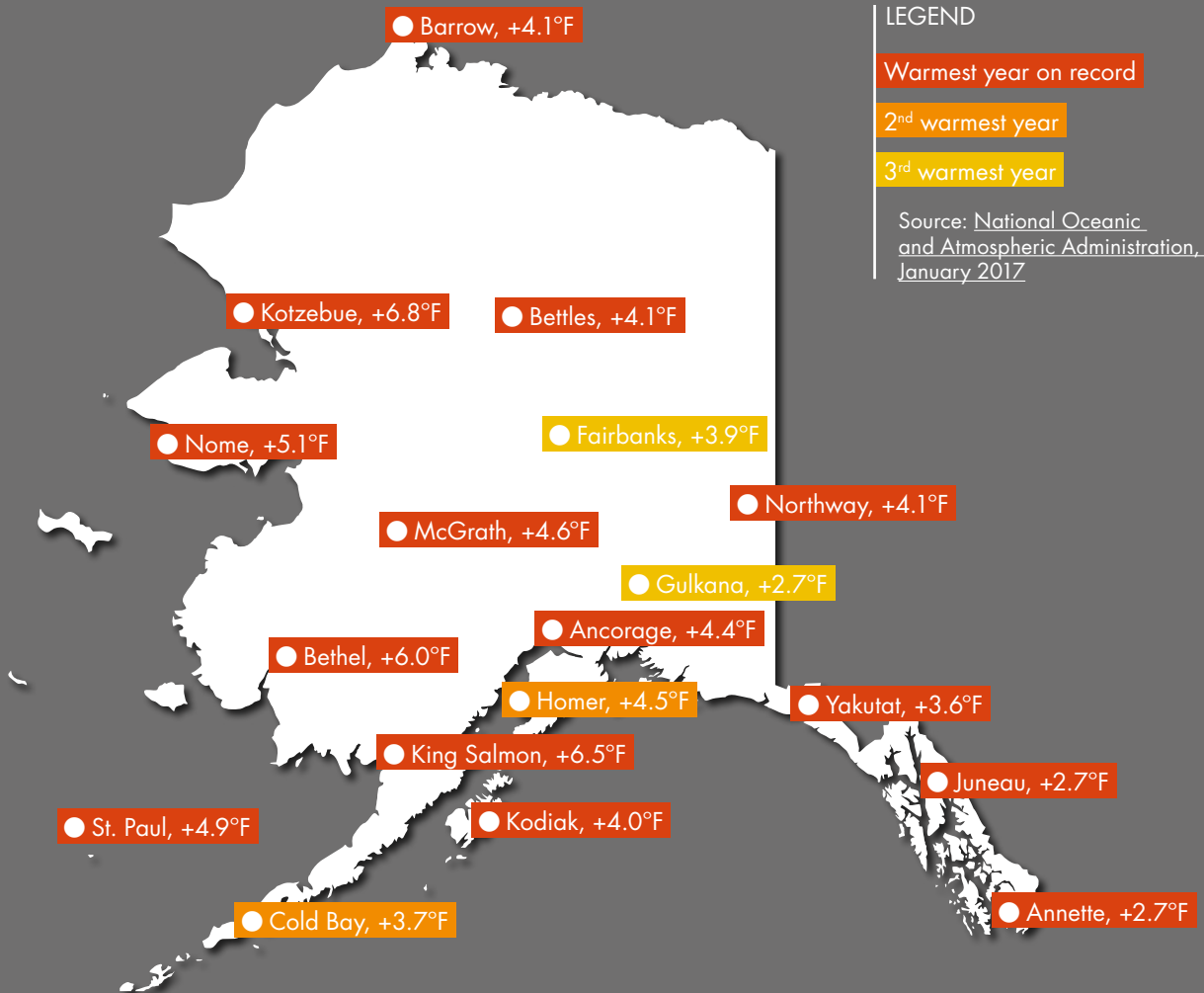
Federal and state government agencies have documented these climate change impacts and the pressing need to protect Alaskan communities since 2003. They have spent millions of dollars on erosion control and flood protection, but the measures have not been enough to protect all of those at risk. For a number of Alaska Native communities, protection in place is not possible, leaving community relocation as the only adaptation strategy available to them. Despite enormous effort, the agencies, however, have failed to address the needs of communities facing the prospect for more than a decade.

The Alaska Institute for Justice (AIJ) invited 27 such communities imminently threatened by flooding and erosion to participate in the project to design and implement a governance framework for community-led relocation. Fifteen agreed to take part, and this report is based on the work being done with them. Two of the communities, Kivalina and Shishmaref, have decided that the relocation of their entire community is their best long-term adaptation strategy. One, Unalakleet, is currently relocating some infrastructure to a hillside close to its current location. The remaining 12 are in the process of assessing whether protection in place can be a long-term adaptation strategy or whether they will have to resort to relocation.

The aim is to design and implement a relocation process that affirms the communities' right to self-determination and ensures that their social and cultural rights are protected before, during and after their move.

AN OVERVIEW OF CLIMATE CHANGE IN ALASKA

CLIMATE WARMING IN 2016



Alaska has warmed twice as fast as the global average over the past half a century, and temperatures are projected to rise by 1-3C (1.8-5.5F) by 2050 and by 3-7.5C (5.4-13.5F) by 2100.

The state recorded its warmest year on record in 2016, with new monthly highs for January, February, October and November. Temperatures were an average of 2.2C (4F) higher than the 1981 to 2010 norm (Richter-Menge et al, 2016).

→ **The decrease in the extent of Arctic sea ice** is having detrimental effects on many coastal Alaska Native communities, exposing them to flooding and erosion caused by storms that originate in the Bering and Chukchi Seas and occur primarily between August and early December (Walsh et al, 2015; Shulski and Wendler, 2007). The extent of late-summer sea ice has declined by 40 per cent since the beginning of satellite records in 1979, meaning that larger autumn storm waves cause more coastal erosion. Near-shore pack ice used to provide coastal communities with a protective barrier (Shulski and Wendler, 2007). Record losses in the extent of sea ice were observed every month in 2016 except during the summer.

→ **Permafrost**, which keeps land intact and habitable along Alaska's north-west coast, **is thawing as temperatures rise**, causing infrastructure, including water and sewage systems, to sink and altering their structural integrity (GAO, 2009). Coastal bluffs previously "cemented" by permafrost are also thawing, making them more vulnerable to erosion. Standard defences to protect coastal communities, such as rock walls and sandbags, have been largely ineffective.

→ **Accelerated erosion** is leading Alaska Native communities to consider relocation. In the past they have been able to move away from affected areas because they did not depend on built infrastructure, but the construction of facilities such as schools, power plants, health clinics and airports has tied communities to one place (USACE, 2009). Some have sought to move their infrastructure to higher ground near their villages, other communities need to relocate in their entirety because there is no higher ground nearby.

→ **Changing climatic conditions are altering the abundance and distribution of wildlife**, reducing the availability of Alaska Native communities' traditional subsistence foods. Marine quarry such as bowhead whales, beluga whales, ringed seals, bearded seals, walrus, and polar bears depend on sea ice for their habitat and have been affected by the warmer temperatures. On land, vegetation is changing, as are the migration patterns of mammals and birds (Kofinas et al, 2010; Simpkins, 2010).

These environmental changes have had a profound impact on the health and safety of community residents. They face life-threatening danger when storms occur, more people are falling ill from water-borne diseases and insect bites, and some have suffered from allergies that result from increases in the pollen count of certain plant species (Brubaker, 2011).

Cultural traditions have also been affected. Elders have long passed on their understanding of ice and weather conditions to younger members of their communities, but the rapidly changing Arctic make it harder for the keepers of indigenous knowledge to assess environmental conditions that affect travel safety and the timing and locations for harvesting subsistence resources. It is also more difficult for them to determine culturally informed adaptation strategies.

“Here is a climate change and storm surge picture of our village. We are not looking forward to fall or winter weather. We've had high tides as late as November and December. Earlier rainy seasons during the winter and spring caused our runway to shut down, either due to ice conditions, or mud and slush. Golovin airport is the only way into and out of our community. We were concerned when airplanes couldn't come in. Thankfully, we didn't have a life-threatening emergency.”

Toby Anungazuk

Environmental coordinator, Chinik Eskimo community



© Toby Anungazuk, Golovin village

BACKGROUND

Alaska has more than 33,000 miles of coastline, 10,000 named rivers, thousands of unnamed rivers, creeks and springs and three million lakes (Shulski and Wendler, 2007; USACE 2009). Around 200 indigenous communities live along navigable waters, which they depend on for travel and access to hunting and fishing areas (GAO, 2003). The rapidly changing climate presents the communities concerned with unprecedented challenges to adapt (Markon, 2012).

The ancestors of current residents migrated seasonally between coastal and inland hunting and fishing camps, following the foods on which they depended for their survival (ANTHC, 2011; Marino, 2012). Alaska Native people coalesced in permanent settlements primarily because of the US Department of the Interior’s requirement that their children attend school (Darnell, 1979; Marino, 2012). The federal government determined the location of education facilities and the settlements that grew up around them along with sewage, water and electricity infrastructure based on barge access to the location. No roads lead to or from these communities (Bronen and Chapin, 2013).

IDENTIFYING COMMUNITIES AT IMMINENT RISK OF DISPLACEMENT

The erosion Alaska Native communities face is well documented. Several, including those now most threatened, began documenting its impact in the 1980s in order to develop a long-term strategy for protection in place. Alaska's government has also recorded the impact of erosion on communities throughout the state over the same time period (ADOT and PF, 1984).

More recently, the US Army Corps of Engineers (USACE), the US Government Accountability Office (GAO) and the Alaska Sub-Cabinet on Climate Change Immediate Action Workgroup (IAWG) have all published numerous reports that highlight the increasing severity of the erosion and its impact. A 2003 GAO study found that 86 per cent of Alaska Native villages, or 184 communities, were affected to some extent by flooding and erosion and that while the problems are long standing, various studies indicate that coastal villages are becoming more susceptible due in part to rising temperatures.

Six years later, GAO identified 31 communities imminently threatened by flooding and erosion, of which 12 were exploring relocation options for part or all of their villages (GAO, 2009). Also in 2009, USACE produced its Alaska Baseline Erosion Assessment, which classified 26 of the same communities GAO had identified as in need of "priority action" either by initiating an evaluation of potential solutions or continuing with ongoing efforts to manage erosion.

The reports used diverse methodologies to assess and prioritise the threats to the communities they identified in an effort to prompt immediate action. They also evaluated past efforts to protect communities in place and the cost and viability of future protection, including relocation (GAO, 2003 and 2009; USACE, 2006 and 2009; IAWG, 2008 and 2009).

The 15 communities AIJ is working with – Atmautluak, Chevak, Elim, Eyak, Golovin, Kivalina, Kotlik, Kwigillingok, Nelson Lagoon, Nunapitchuk, Quinhagak, Port Heiden, Shishmaref, Teller and Unalakleet – are primarily located along the west coast of Alaska. They are pursuing a range of adaptation responses, from implementing flood and erosion control to enable protection in place to facilitating community relocation. All 15 were identified in the 2009 GAO report as imminently threatened by flooding and erosion, and are geographically remote, with only planes providing year-round access. Thirteen have no roads to or from their villages.

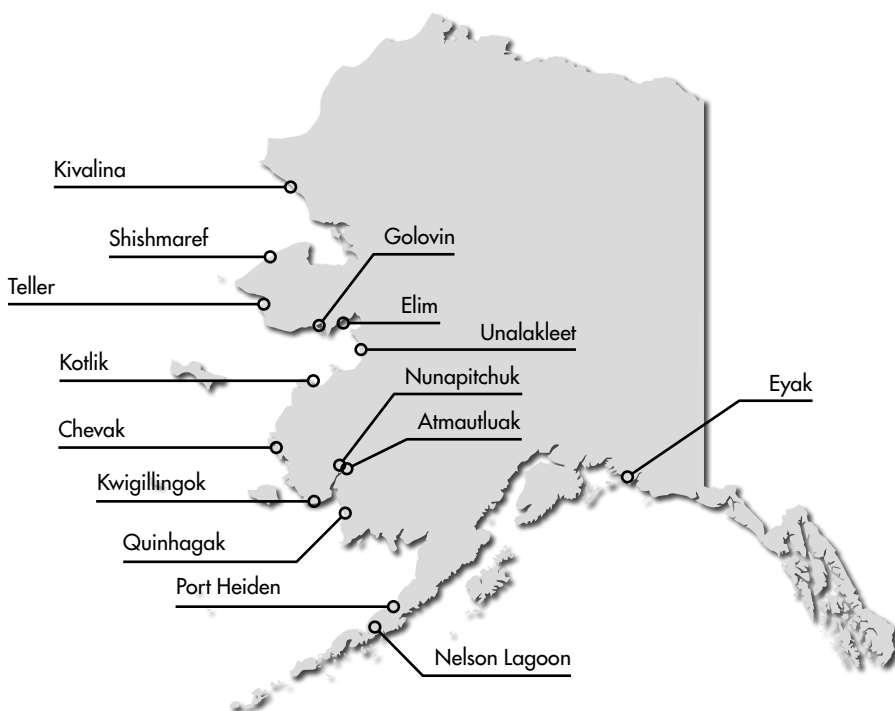
Each village is a federally-recognised indigenous tribe, and subsistence hunting and gathering are central to their culture and survival (USBIA, 2008; GAO, 2009). Village life revolves around these activities, with the resources obtained from the natural environment forming the basis for community cohesion, social identity, livelihoods and cultural events.

The villages have small cash economies, and only limited work opportunities. Food bought in stores is expensive because of the high cost of its transport to isolated areas, making subsistence activities vital to the communities' food security.

To convey the complexity of the governance and protection challenges associated with climate change displacement in Alaska, below is description of situations and choices facing three of the communities AIJ is working with.

**MAP OF THE
15 COMMUNITIES
WORKING WITH AIJ
TO DESIGN A
COMMUNITY-LED
RELOCATION PROCESS**

Source: Alaska Coastal Hazards Program



COMMUNITY RELOCATION

Shishmaref is an Inupiat Eskimo village of around 600 people located on Sarichef island in the Chukchi Sea, north of the Bering Strait and 50 kilometres (30 miles) south of the Arctic Circle. Sarichef is a barrier island (USACE, 2006). Between 1973 and 2013, ten flooding events were recorded in Shishmaref, seven of them declared state emergencies and three federal emergencies. Erosion and littoral drift are causing Sarichef’s footprint to move. Since 1969, Shishmaref has lost an estimated 60 metres (200 feet) of land (AECOM, 2016). Between 1973 and 2015, eleven erosion-related events occurred in the village, four of them declared state disasters and two federal disasters.

Erosion has undermined buildings and infrastructure, causing several structures to collapse into the sea. Protection measures have been ineffective in anything but the short term. Numerous control and facility relocation projects have been undertaken in an attempt to protect the community in place and provide more time to relocate it. Between 1973 and 2009, the state, federal, and

tribal governments invested about \$16 million in shoreline protection (GAO, 2009).

A rock-wall barrier was constructed along significant portions of Shishmaref’s sea front in 2009 and 2010, but around a third of the village, including the airport, homes and community infrastructure, remain exposed. The 2009 USACE report stated that severe damage was expected by 2019.

An additional 170 metres (550 feet) of seawall on the northern edge of the ocean side of the community would protect the sewage lagoon and launderette. Another seawall is needed to protect the north-west and south-west part of the village, which would also protect the road leading to the landfill and the airport.

If the road remains unprotected and continues to erode, the community will not be able to dispose of their waste safely (HDR, 2016). Alaska Native communities such as Shishmaref need resources to protect their health and safety in place until the relocation process is fully implemented.



© Annie Weyiouanna, Shishmaref

Shishmaref has been planning for relocation since 1976, and residents voted to do so in 2002. Two years later the Shishmaref Erosion and Relocation Coalition (SERC) chose Tin Creek, around 20 kilometres (12 miles) from the village's current location, as its preferred relocation site. The community reiterated its decision to relocate and again chose Tin Creek as its preferred site in 2007 (BEESC, 2010). More than 127 location studies have been conducted near Shishmaref to help the community choose a relocation site, but according to a 2016 engineering report that analysed the sites previously studied, none provided enough information to determine the suitability of Tin Creek because of a lack of funding sources (AECOM 2016). The most recent vote took place in August 2016 to decide on their chosen relocation site since receiving the most recent geotechnical report regarding relocation site vulnerability to future climate hazards, such as thawing permafrost (Alaska Dispatch News, 2016).

At the first IWAG meeting in Fairbanks, Alaska in November 2007, SERC's representative, Tony Weyiouanna, ended his presentation by saying:

“*The no action option for Shishmaref is the annihilation of our community ... We are unique, and need to be valued as a national treasure by the people of the United States. We deserve the attention and help of the American people and the federal government.*

“*[We request] that Shishmaref be used as a state/federal demonstration project with maximum flexibility to determine what changes need to be made to lower the cost and impact of relocation, identify a state or federal champion to facilitate state and federal agency coordination for relocation of communities ... Shishmaref, we are worth saving.*”



© Steve Ivanoff, Unalakleet

MANAGED RETREAT

Unalakleet, with a population of 274 people, is located on a four-mile spit that lies between Norton Sound and the mouth of the Unalakleet river, 240 kilometres (150 miles) south-east of Nome. The majority of residents are Alaska Native Unaligmiut. The village is eroded on both the ocean side and by the river. The erosion is worse on the ocean side because of storms that wash away the beach.

Unalakleet was declared a state flood disaster area in 2003 and 2005. The 2005 storm caused severe erosion to the protective seawall, flooding the village (GAO, 2009). Six flooding events were recorded between 1965 and 2013, four of them declared state disasters and three federal disasters.

Various erosion protection measures have been put in place. In 2000 the Natural Resource Conservation Service (NRCS) installed gabions, wire baskets filled with rock, at a cost of about \$1.3 million. A storm in November 2003 severely damaged the installation, which was repaired in 2007. USACE began the construction of a

460-metre (1,500-foot) revetment over the existing gabions in 2010 (USACE, 2006 and 2009). The cost of the project was estimated at \$28 million.

Unalakleet is committed to strengthening its projects to mitigate the erosion until the community can relocate to a hillside north-west of the village. Thirty homes have been built on four different hills, which can in the meantime serve as evacuation shelters during storms (CUHMPT, 2015).

ADAPTATION OPTIONS TO STAY IN PLACE

Teller is an Inupiat Eskimo community of 256 people located on a spit between Port Clarence and Grantley Harbor on the Seward peninsula, 116 kilometres (72 miles) north-west of Nome (Tetra Tech, 2010). Flooding occurs during Bering Sea storms, rainfall in summer and autumn, spring snowmelt and ice-jam floods. Almost half Teller's homes are built in an area vulnerable to flooding (Hammond, 2014). Nine flooding events were reported between 1913 and 2013, five of them

declared state emergencies and four federal emergencies (GAO, 2009).

A 2005 sanitation facilities master plan for Teller found that coastal erosion could isolate the community from the mainland. Permafrost degradation threatens its only access to potable water, and the school's sewage lagoon is located in an area at risk of flooding and erosion. (Tetra Tech 2010).

The community is working to protect itself in place by elevating the evacuation road, which is at sea-level and floods easily, improving erosion control and encouraging utility companies to protect vulnerable infrastructure (Hammond, 2014; HMP 2013).

ALASKA STATE GOVERNMENT RESPONSE

The former Alaska governor Sarah Palin set up the Alaska Climate Change Sub-Cabinet in 2007, and it in turn established IAWG in the same year (State of Alaska, 2007). IAWG was a collaborative, multidisciplinary and inter-governmental workgroup tasked with identifying the needs of communities imminently threatened by the effects of erosion, flooding, permafrost degradation and other impacts associated with climate change (IAWG, 2008).

IAWG identified six communities most at risk and developed a strategy to respond to the threats they faced, including the submittal of funding recommendations to Alaska's state legislature in an effort to ensure they would receive the financial resources they needed to respond to the changing environment. The group also published two reports with recommendations for responding to the communities' needs (IAWG 2008 and 2009).

It last met in March 2011. It did not receive authorisation to continue its work under Sean Parnell, who was state governor from 2009 to 2014, and no explanation has been given for its failure to do so (IAWG 2011).

In 2008, the Alaska State Legislature established the Alaska Climate Change Mitigation Program (ACCMP) (3AAC 195.040) to address the emergent needs of communities faced with displacement. Funding from the ACCMP is limited to two community categories. Non-competitive funding is allocated to six communities designated by name that are currently threatened by climate-induced ecological change.

The remaining funds are administered through a competitive grant process to communities based on an evaluation of four factors:

- 1 risk to life or safety during storm or flood events;
- 2 loss of critical infrastructure;
- 3 threats to public health;
- 4 loss of 10 percent or more of residential dwellings.

Communities that receive this funding to complete hazard impact assessments are then eligible for additional funding to support adaptation activities, including relocation planning.

Shishmaref and Kivalina are two of the six named communities in the regulation. Through the ACCMP, each community received funding for relocation planning so that they can each identify a relocation site that federal, state, and village officials agree is safe, sustainable, and desirable for the subsistence lifestyle of the villagers.

The second program provides funding to the Alaska Division of Community and Regional Affairs (DCRA) to organize inter-agency working groups, which include tribal, local, regional, state, and federal stakeholders for the three most imperiled communities, Shishmaref, Newtok and Kivalina. These working groups developed strategic plans to respond to current and future threats to the well-being of community residents and infrastructure endangered by erosion, flooding and storm surge.

PLANNED RELOCATION AS A DRR STRATEGY

Relocation in Alaska is a process whereby an entire community's housing and infrastructure is reconstructed elsewhere (Bronen, 2011). It also means maintaining access to subsistence areas, improving livelihoods through employment opportunities and ensuring social and kinship networks are sustained. It takes place as a DRR strategy because of recurring extreme weather events and ongoing environmental change that cause extensive damage to infrastructure and repeatedly put people in danger (Bronen, 2011).

Planned relocation means:

- 1 A long-term process that takes place over years
- 2 Tribal governments, community leaders and residents leading the decision-making
- 3 People continue to live in their original village while the relocation occurs. This means they have not been displaced by an extreme weather event that caused their evacuation, their inability to return home or their need for humanitarian assistance, shortening the time-frame in which relocation must occur
- 4 An adaptation strategy of last resort, and a decision that a community concerned must make when no other strategies can protect it in place

PROTECTION AND INSTITUTIONAL CHALLENGES

Relocation because of climate change presents an unprecedented challenge to the communities affected, which face the loss of their land and connections to their ancestral heritage, and to the governments responsible for protecting vulnerable populations. In Alaska it presents two critical governance challenges.

First, no federal or state government agency has the mandate or funding to implement relocation if a community makes the decision to move. This is the problem facing two of the Alaska Native communities AIJ is working with, Shishmaref and Kivalina. As a result, neither has relocated despite federal, state and tribal authorities recognising such a move is their only sustainable long-term adaptation strategy.

Second, if climate change impacts render the places where people live uninhabitable and causes land to disappear, new governance processes are needed to determine whether people can be protected in place or require relocation. No such framework to do so exists in the US or elsewhere, and its absence hampers the ability of tribal, local, regional and national government agencies to address the urgent need for Alaska Native communities to determine the circumstances in which relocation becomes their best long-term adaptation strategy.

The US Congress bicameral taskforce on climate change recognised these institutional gaps in its December 2013 report. It recommended "that the Administration devote special attention to the problems of communities that decide they have little choice but to relocate in the face of the impacts of climate change. Because the relocation of entire communities due to climate change is such an unprecedented need, there is no institutional framework within the US to relocate communities, and agencies lack technical, organizational, and financial means to do so".

Barack Obama's taskforce on climate preparedness and resilience echoed the recommendation in November 2014, and affirmed that the federal government would take a lead role in establishing an institutional framework to respond to the complex challenges of displacement and relocation associated with climate change (White House, 2014).

In September 2015, Obama designated the Denali Commission as the lead agency to coordinate federal, state and tribal entities in helping communities to develop and implement both short

and long-term solutions to the impacts of climate change, including coastal erosion, flooding and permafrost degradation ([White House, 2015](#)).

The commission is an independent federal agency established in 1998 to provide critical utility, infrastructure and economic support in Alaska with a focus on the state's remote communities. In order to fulfil its role, it established a programme in 2015 to focus its work on the 31 imminently threatened communities identified in the 2009 GAO report. A primary focus is to fund projects in the communities such as Kivalina and Shishmaref, which GAO identified as needing to relocate as soon as possible.

DESIGNING AND IMPLEMENTING A COMMUNITY-LED RELOCATION PROCESS

A governance framework is needed to determine whether, when and how relocations associated with climate change should take place. An adaptive governance framework would incorporate current governance mechanisms to protect people in the places where they live, such as erosion and flood control measures, and create new mechanisms so that national, state, local and tribal authorities can shift their efforts from protection in place to managed retreat and community-led relocation (Bronen and Chapin, 2013; Bronen, 2011). Indicators are needed to determine the point in time that this needs to occur.

THE NEED FOR COMMUNITY-BASED MONITORING

Community-based monitoring involves following the effects of environmental change on the health and wellbeing of community residents, and is a useful tool in helping to determine when planned relocation should occur as a DRR strategy. In collaboration with state and federal agencies such as the NOAA National Weather Service Sea Ice Program and the Alaska Coastal Hazards Program, Alaskan Native communities are currently focussed on monitoring erosion and sea ice conditions.

HUMAN RIGHTS PROTECTIONS: Community-based monitoring is a vital component of a human rights-based governance framework for relocation, given the importance of embedding the right to self-determination. Doing so gives communities the right to decide whether, when and how to relocate. Community-based monitoring is essential to exercising the right to self-determination because it builds communities' adaptive capacity and provides a methodology to assess the circumstances in which relocation may be the best long-term adaptation strategy to ensure cultural resilience.

ENVIRONMENTAL AND SOCIAL IMPACT

MONITORING: Engaging and empowering communities is vital to any process that aims to improve their adaptive capacity. Community-based strategies to document environmental change are essential because slow-onset processes such as erosion are affecting habitability. The objective assessment of a hazard, social perceptions of it and the ability to anticipate its sociological impacts are central to the development of sustainable adaptation strategies. To integrate the concept of collaboration into conventional risk management, those most directly affected by a hazard must participate actively in gathering data during the risk assessment process (Bronen, 2015).

INVOLVING GOVERNMENT INSTITUTIONS:

Community-based monitoring must be done with federal and state government agencies in order for tribes to access the resources and technical assistance they need to make well-informed adaptation decisions and implement measures based on them. Government agencies are also able to provide communities environmental information on a regional and national level, giving them a fuller picture of the changes taking place.

INTEGRATING TRADITIONAL KNOWLEDGE AND MODERN SCIENCE:

Involving elders and young people in the process provides an opportunity to develop culturally-informed responses. It is vital to integrate elders' traditional knowledge of environmental change with modern scientific approaches throughout the adaptation planning process.

INTERNATIONAL APPROACH TO PLANNED RELOCATION

The Alaska Native experience in planning relocations associated with climate change has informed international processes and frameworks such as the UN Framework Convention on Climate Change (UNFCCC), the Sendai Framework for Disaster Risk Reduction 2015-2030 and the Platform on Disaster Displacement in follow-up to the Nansen Initiative.

The latter was launched by the Swiss and Norwegian governments in 2012 as a state-led consultative process to establish a protection agenda to address the needs of people displaced across borders by disasters and climate change. The agenda, which has been endorsed by more than 100 countries in October 2015, recognised planned relocation as a DRR tool.

To follow up on the Nansen Initiative's work and implement the protection agenda's recommendations, the Platform on Disaster Displacement (PDD) was established in 2016. Several of its goals for 2016 to 2019 relate to planned relocation.

The 2015 UNFCCC Paris Agreement addresses the issue of displacement associated with climate change. It calls on the executive committee of the Warsaw International Mechanism for Loss and Damage Associated with Climate Change Impacts to establish a taskforce to develop recommendations for integrated approaches to avert, minimise and address such displacement.

The Sendai framework was adopted in March 2015 and addresses a range of issues related to displacement, including planned relocation as a DRR strategy.

The results of the work with Alaska Native communities will provide vital knowledge for PDD and will help to inform implementation of the Paris agreement, the Sendai framework and other relevant global policies and frameworks.

POLICY RECOMMENDATIONS ON HOW TO CREATE A RELOCATION GOVERNANCE FRAMEWORK

Relocation is always an adaptation strategy to be implemented as a last resort when it is not possible to protect populations from climate change impacts. Multi-level collaborative governance systems are critical to the design and implementation of a community-led relocation process. In order to accomplish this, national, regional, local and tribal governments should:

→ **Review laws** designed to respond to extreme weather events and mitigate hazards to determine whether they need to be modified to address adverse effects of climate change such as sea level rise and create governance mechanisms to increase DRR.

→ **Assess which government agencies**, at each level of governance, need to be involved in climate change adaptation and disaster relief and response.

→ **Develop multi-disciplinary working groups**, which include populations living in climate vulnerable locations, at each level of governance to develop coordinated strategies.

→ **Identify locations** where there is an imminent threat of displacement associated with climate change and involve the populations concerned in community-based monitoring of environmental change.

→ **Design and implement** community-based monitoring of environmental change and the impact of this change on the community's culture, economy, health and well-being.

→ **Identify relocation indicators**, working with affected populations, to determine the point in time when a preventive relocation should be implemented.

→ **Identify potential funding** at all levels of governance for preventive planned relocations from existing national, regional and donor-based programmes in order to determine gaps and develop a strategy to fill them.

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