COLLEEN E SWAN, TRIBAL ADMINISTRATOR
NATIVE VILLAGE OF KIVALINA
P.O. BOX 50051
KIVALINA, ALASKA 99750
PH: 907-645-2153
FX: 907-645-2193
EM: colleen.swan@kivaliniq.org

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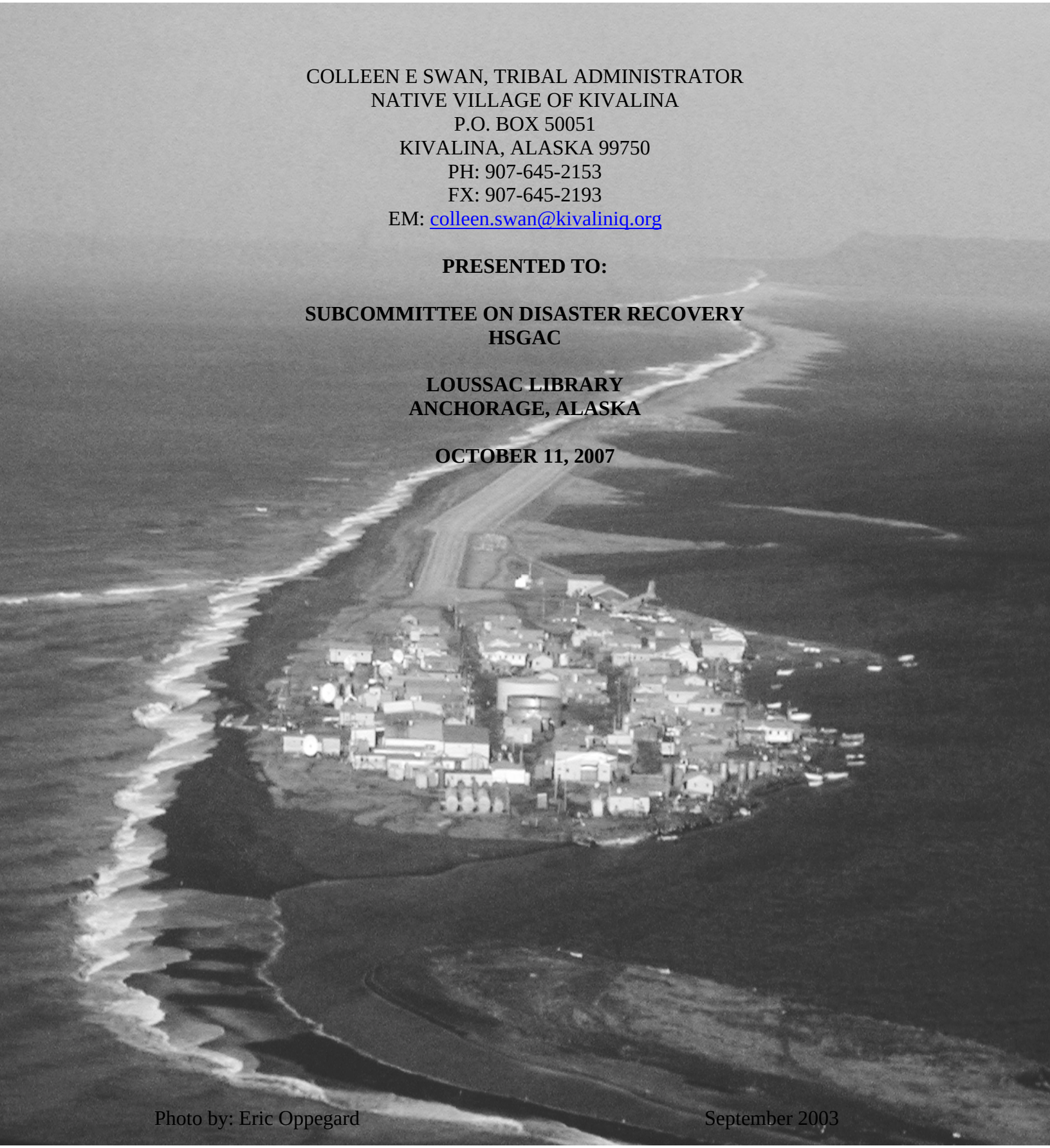

Photo by: Eric Oppegard September 2003

KIVALINA:

The village of Kivalina is located on the southern tip of an 8-mile long barrier reef. According to Ernest S. Burch, Jr. (1998), the village was officially established with the introduction of a school that was built in 1905-06 on the southern tip of the island, and the immigration of a reindeer herder from Barrow who brought much needed reindeer meat to the village, and the establishment of a mission. The *Kivallinigmiut* (Kivalina population) are the original native inhabitants of the area that includes both the Kivalina and Wulik Rivers. The Kivalina people originally lived their lives in settlements located inland for most of the year along the rivers. Their hunting habits determined their movements in the Kivalina region, including hunting along the coast for sea mammals. The construction of the school required them to settle on the island in order for their children to gain an education.

NATURAL EROSION:

Erosion problems have always naturally occurred along the Kivalina coast. According to a National Geodetic Survey-Erosion Impacts Study conducted by the National Oceanic & Atmospheric Administration (NOAA), which began in 1953 and ended in 2003, the island of Kivalina has lost approximately 27 acres on the Chukchi Sea side of the island with 8 acres accreted on the Kivalina Lagoon resulting in a net loss of 19 acres in the study period. Naturally occurring erosion and accretion is considered to be typical of barrier islands. The result of this study confirms the stories that elders of the community have told about the 2nd and 3rd ridges of the island parallel to the existing village site that no longer exist due to erosion.

RELOCATION DISCUSSIONS IN THE EARLY YEARS:

The village began discussions in the 1950s about relocating the village after minor flooding occurred that did not inundate the village but the storms did over-top the uplands of the island that threatened to flood homes located along the coast. A vote was held in an election process that resulted in a split decision that ended the effort to relocate the village almost immediately.

RELOCATION DISCUSSIONS RESUMED:

In 1990, discussions to relocate the village began once again to address over-crowding conditions caused by the shrinking island and a growing population. Because of the over-crowding due to lack of development space coupled with the lack of water/sewer services, health conditions of the community became a concern. Land erosion and global warming were minor issues during the first years of the developing village relocation project.

In 1998, an election was held by the City of Kivalina to provide the people in the village an opportunity to select an option to address the concerns raised during 8 (eight) years of discussions. In that election process, a site was selected that was later determined by studies done by the Army Corps of Engineers to be rich with permafrost and was deemed unsuitable as a potential new village site. In response, in 2000, another election was held by the City of Kivalina which resulted in the selection of another site closer to the ocean. Global warming remained a part of the discussions because of land erosion along the Wulik River beginning to emerge.

GLOBAL WARMING:

Once what the people thought was the final vote for a new village site was made, global warming became an open issue. Predictions were made of a potential for coastal flooding in Alaska. Although no concrete evidence existed, and while skeptics abound, the global warming discussion began to have its effect on the Kivalina Relocation Project. Studies that were thought to be near completion became insufficient to address global warming and what is now perceived to be an unsuitable site because of the unproven flood-prone designation of the selected site. The Kivalina Relocation Project is now hindered because of this discussion. The original Master Schedule, as devised by the Army Corps of Engineers, planned for the village move to begin in the summer of 2006.

LAND EROSION:

In the summer of 2004, a laundry facility drain field project was constructed by the Alaska Native Tribal Health Consortium. This project required a certain amount of fill

material to cover the leach field. The material used to cover the field was taken from an area adjacent to it behind the Northwest Arctic Borough School District property despite warnings from a local resident that this removal of beach fill would cause an erosion problem.

During the fall sea storm season in 2004, approximately 60 feet of land eroded. An elder in the village observing the efforts of the local volunteers to save the property from erosion made a comment of how he had never seen sea levels that high as he was witnessing it that day. In his book entitled, "The Inupiaq Eskimo Nations of Northwest Alaska," Ernest S. Burch, Jr. states, "…oceans begin to freeze in October until the time the ice leaves in early July…" (p. 28). Ocean ice that had traditionally kept sea storms under some control to prevent waves from slamming into the land were absent that year and have been absent during the last few years. The fall sea storms of 2005 followed with the same results.

EROSION PROTECTION MEASURES:

In the summer of 2006, the Northwest Arctic Borough, with funds from the Denali Commission and the State of Alaska, constructed a project to protect life and property in Kivalina with concertainers (wire baskets) and fabric lining stapled together at the seams. On the day that the celebration of the completion of the project was scheduled, a minor sea storm struck and immediately damaged the sea wall. The celebration was cancelled and repair work began with funds leftover from the original project. A combination of several factors may have contributed to the failure including poor engineering and design work, elevated sea levels, lack of fall ice formation, and annual fall sea storms.

NATIVE VILLAGE OF KIVALINA RESPONSE:

At the request of the Tribal Office staff of the *federally recognized Tribe*, the Army Corps of Engineers designed a geotextile 2 cubic yard sack erosion protection project after assessing the damage to the sea wall. But before any funds could be found to pay for this project, unusually early fall sea storms struck the village in July. That project design was abandoned due to an early fall sea storm season and lack of funding.

ALTERNATIVE PLANS:

The undertow of the ocean surge has considerable strength. Not only does the wave action slam the wall, causing damage with each blow, but the undertow in turn draws the sand material out from under the baskets causing them to collapse. To address this situation, when the Borough made the leftover funds available, the project supervisor devised a plan to restore some of the damaged baskets. But the before any significant progress could be made, an earlier than usual sea storm struck again in August of 2007 and destroyed the plans to salvage and fill the wire mesh baskets with supersacks filled with gravel. That plan was abandoned also due to more unusually early sea storms.

EMERGENCY EROSION PREVENTION MEASURES:

With funds leftover from the original sea wall project, which is mostly depleted today, the Kivalina work crews have managed to keep the sea wall from tumbling into the ocean. But with the lack of support for their efforts from the usual slush ice that once formed in October, all they have been able to do is to throw supersacks at the problem. Each time a storm strikes, more 1-cubic yard super sacks are lost to the ocean. As of Monday, October 8, 2007, the sea wall continues to develop new problems, including a deepening ocean along the shore. Another problem that we face is lack of funding needed to prevent the loss of critical infrastructure, such as the fuel storage facility for the power plant that serves the community.

POSSIBLE SOLUTIONS FOR THE FUTURE:

The Alaska District Army Corps of Engineers has developed a plan and design for a rock revetment project for construction in 2008 pending appropriation of funding from Congress.

RECOMMENDATIONS:

Based on our situation here in Kivalina, and all of the problems that seem to be associated with global warming, the Native Village of Kivalina recommends the following:

1. Inter-agency response, which includes the State of Alaska, the Federal Government as part of their trust responsibility to Tribes, and other entities need to come together WITH the local governing bodies of the village to devise a plan to address erosion and relocation issues. More funds should be provided to the local governing bodies, whose knowledge has been more accurate due to the fact that the people live close to the land, to provide for coordination of the project. Every prediction made locally regarding the Kivalina situation by the elders and local community members has come to pass.

2. Consideration should be made for the Army Corps of Engineers to be designated new responsibilities to take the lead in addressing the issues of relocating the village of Kivalina in consultation with the Native Village of Kivalina as part of their trust responsibilities to the Tribe. No agency has been identified to take the lead in the Kivalina Relocation Project and no discussions have taken place on a continuous basis.

3. Since no real studies have ever been done on permafrost and being that Alaska is 70% wetland, study plans need to be devised to monitor the permafrost condition in Arctic Alaska. TechCominco-Red Dog Mine has been monitoring the temperature of the permafrost in the Red Dog mine area that shows warming temperatures of the permafrost. With the land slides now occurring inland, this leaves a question wide-open for the residents of Kivalina who wish to move inland to higher ground as to just how safe any area is in Alaska.

4. Response to Kivalina's situation has been piece-mealed so badly that no one seems to know what to do. An inter-agency committee should be formed to address erosion in Alaska given the fact that arctic conditions seem to be deteriorating with rising sea levels and warmer temperatures. According to a report made recently to the Alaska Climate Impact Assessment Commission by the NF&WS's Jim Dau, there are more "slumps", also called "sinkholes" by others, than he has ever seen before. Being that Alaska is 70% wetland, a committee would be appropriate to address the many problems associated with the warming climate.