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ANNOTATED BIBLIOGRAPHY SERIES IN SUPPORT OF COASTAL COMMUNITY HAZARD PLANNING—NORTHWEST ALASKA

NUNAM IQUA (SHELDON POINT), ALASKA

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This annotated bibliography is part of a series created to facilitate access to documents useful for coastal geohazard evaluation and community planning in Northwest Alaska. Below is a comprehensive list of community-specific information sources, each with full bibliographic information and an informative-style annotation that highlights content pertaining to the community of Nunam Iqua (Sheldon Point), Alaska. For a detailed description of the preparation and scope of this resource, please refer to this bibliography series' foreword. Any notable errors and/or omissions may be reported to the Coastal Hazards Program manager at the Alaska Division of Geological & Geophysical Surveys (DGGS).

Alaska Department of Commerce, Community & Economic Development (DCCED), accessed 2011, Division of Community & Regional Affairs (DCRA) Community Profiles [website]: Department of Commerce, Community & Economic Development.

http://www.commerce.state.ak.us/dca/profiles/profile-maps.htm

This website provides access to community profile maps for community-based planning. The maps are available in 24" by 36" and 30" by 42" formats. The Nunam Iqua maps were created in 2006, 1994, and 1979 based on land surveys and/or interpretation of aerial imagery. Subsistence hunting grounds, habitat areas, community buildings and public facilities are delineated. Shoreline position and potential erosion zones are included in the map content. All maps have been sponsored by the Alaska Division of Community & Regional Affairs and contracted to local agencies for production.

Alaska Department of Natural Resources Division of Coastal and Ocean Management (DCOM), accessed February 2011, Alaska coastal management program [website]: Alaska Department of Natural Resources Division of Coastal and Ocean Management.

http://alaskacoast.state.ak.us/Explore/Tour.html

This website outlines the Alaska Coastal Management Plans for each coastal district. It provides stewardship plans "to ensure a healthy and vibrant Alaskan coast that efficiently sustains long-term economic and environmental productivity."

Blier, Warren, Stanley Keefe, Wilson A. Shaffer, and Sung C. Kim, December 1997, Storm surges in the region of western Alaska: Monthly Weather Review, vol. 125, p. 3094–3108.

The authors describe the relationship between storm surges in Alaska and extratropical cyclones. They have identified Norton Sound and the Bering Sea as the two regions most vulnerable to cyclone-linked coastal flooding. A statistical storm surge model was developed in order to provide advanced warning to coastal villages; however, the author highlights that a more accurate model would be necessary to utilize this warning system as a hazard mitigation strategy. The installation of storm-surge gauges would also be required for this warning system to be used successfully.

Cacchione, David A., and David E. Drake, 1979, Sediment transport in Norton Sound, Alaska: U.S. Geological Survey Open-File report no. 79-1555, 88 p.

This report is an investigation of sediment dynamics in Norton Sound and the northern Bering Sea. The major topic of the research was sediment movement and hydrodynamic stresses that occur in the Sound and their relationship to Bering Sea ocean dynamics. Other studies have found sediment accumulation from the Yukon River inconsistent with the rate of supply. The modes of transport for this loss of materials are discussed in the report. This study attempts to provide a description of the bottom transport of sediments, pollutants, nutrients, and other particulate matter as well as identify hazardous sea floor conditions in Norton Sound.

Chikita, Kazuhisa A., Richard Kemnitz, and Ryuji Kumai, 2002, Characteristics of sediment discharge in the subarctic Yukon River, Alaska: Catena, vol. 48, p. 235–253.

The authors describe the construction of a physical model of sediment discharge from the Yukon River. The study uses the results of observations made in 1999 to characterize temporal patterns in the volume of sediment discharged by the Yukon River. The results of this study reveal that peak sediment discharge did not coincide with peak water discharge. The peak sediment discharge was linked to glacier-melt from summer to autumn, while peak water discharge was linked to snowmelt in the spring.

Denali Commission, March 2011, Road and waterfront project selections, fiscal year 2006–2011: Denali Commission, 9 p.

This report contains a description of all of the funding dispersed by the Denali Commission Transportation Program from 2006–2011. The document is organized by project and includes completion status. Nunam Iqua was given $172,363 in 2007 for road improvements and $1,000,000 in 2008 for new boardwalk construction; both projects were completed.

Drake, D.E., D.A. Cacchione, R.D. Muench, and C.H. Nelson, 1980, Sediment transport in Norton Sound, Alaska: Marine Geology, vol. 36, p. 97–126.

This study examines the suspended sediment and ocean circulation of the northeastern part of the Bering Sea shelf. The authors describe the fate of sediment delivered by the Yukon River to the southwestern corner of Norton Sound and the importance of storm events in Norton Sound associated with erosion and transport of sediment. Landsat images were also used to inspect the distribution of sediments and regional circulation in the Sound.

Engineering and Environmental Internet Solutions, LLC, 2011, Nunam Iqua ADOT&PF Sheldon Point airport weather station [website]: Alaska Department of Transportation & Public Facilities.

http://www.yukon-watershed.org/Nunam_Iqua/nunamiqua.html

This website provides information on the installation, operation, and maintenance of a meteorological station for collection of hourly wind speed and direction data from the Sheldon Point airport. The project website reports data in near-real time (no more than 24-hour delay).

Immediate Action Workgroup (IAWG), Michael Black and Patricia Opheen, eds., March 2009, Recommendations to the Governor's Subcabinet on Climate Change: Immediate Action Workgroup, 162 p.

The Immediate Action Workgroup was established to address known threats to Alaskan communities caused by coastal erosion, thawing permafrost, flooding, and fires. This report is a follow-up to the recommendations made in April 2008 (in which Nunam Iqua was not mentioned), and provides recommendations of actions and policies to be implemented in 2009 and 2010.

Nunam Iqua has been recognized as receiving agency actions from the U.S. Army Corps of Engineers, Department of Commerce, Community, & Economic Development, Division of Emergency Management, and the Alaska Department of Transportation & Public Facilities. There has been one flood, in 1979, defined as a disaster event. Other events have caused damage to the airport boardwalks; projects have been pursued by the FAA to eliminate the boardwalks and construct a road for access.

Lower Kuskokwim Economic Development Council, June 2006, Lower Kuskokwim Economic Development Council comprehensive economic development strategy and area plan: Lower Kuskokwim Economic Development Council, Bethel, Alaska, 28 p.

This report presents an economic development strategy by the Lower Kuskokwim Economic Development Council (LKEDC). The purpose of this report is to identify a more stable and diversified economy, assist in creating employment opportunities, improve local economic conditions, and act as a catalyst for guiding and coordinating the efforts of individuals and organizations concerned with sustainable economic and natural-resource development in the region. The main areas of economic development are the promotion of fisheries resources, tourism and infrastructure development, job development, and the coordination of LKEDC services to local residents. Specific communication efforts, opportunities, and goals are listed for each subject, including watershed management.

Maynard and Partch, 1984, Capital improvements program briefing paper Yukon–Kuskokwim needs assessment and regional plan: Alaska Department of Community & Regional Affairs (DCRA),79 p.

This report identifies the multi-year capital improvement needs for 50 communities in the Yukon–Kuskokwim Region. The region was chosen for study because of the rapid change from subsistence to cash-based economy. The capital improvements are summarized in tables for each community and are at a scale that will bring substantial benefits to the region.

Nunam Iqua Advisory Planning Board, 2008, Nunam Iqua hazard mitigation plan: Nunam Iqua Advisory Planning Board, 46 p.

This report prioritizes and provides mitigation planning for natural hazards threatening Nunam Iqua. Nunam Iqua is identified as incurring risks from erosion and flooding. The erosion is caused by both coastal and riverine sources. The modes of transport for sediment are through tidal waters, wave action, river action and current, and melting permafrost. Flooding occurs through rainfall-runoff, snowmelt, groundwater, ice jam, fluctuating lake levels, alluvial fan floods, glacial outbursts, and coastal storm surges. A storm-surge identification map and typical spring flooding map are provided for possible points of inundation due to these types of flooding. Pictures of flooding events are provided in this report. A list of facilities with structural values is also included.

Thorsteinson, Lyman K., Paul R. Becker, and David A. Hale, 1989, The Yukon Delta—A synthesis of information: National Oceanic and Atmospheric Administration (NOAA), Anchorage, Alaska, OCS study no. MMS 89-0081, 89 p.

This document contains a synthesis of physical and ecological information about the Yukon–Kuskokwim River Delta. "[Since 1974], the Outer Continental Shelf Environmental Assessment Program has administered oceanographic research to characterize the environmental components and processes of the Alaskan Outer Continental Shelf." This research, once primarily based on oil and gas exploration, has provoked interest about the importance of the physical and biological habitats of the delta.

The physical environment is described in terms of geomorphology, hydrology, bathymetry, sedimentology, coastal circulation, hydrography, and environmental sensitivity mapping. The biological environment is described in terms of primary productivity, invertebrates, fisheries, avifauna, and mammals.

Areas of research highlighted as in need of further exploration are ice-edge effects, prevailing sea-ice movements to the southwest, and subsurface northwesterly transport of Norton Sound water masses. If oil and gas exploration develops, more work must be conducted to determine the effects this activity would have on the estuarine habitat.

U.S. Army Corps of Engineers, accessed 2011, Civil works floodplain management services [website]: U.S. Army Corps of Engineers, Alaska District.

http://www.poa.usace.army.mil/en/cw/fld_haz/floodplain_index.htm

This website provides flood-hazard data for communities throughout Alaska. A link to a flood-hazard-specific bibliography, maintained by the U.S. Army Corps of Engineers, is provided. Survey information is provided for estimated flood heights for the 1972 flood in Sheldon Point. Notes are also provided on various areas throughout the community, which were affected by the flood.

U.S. Army Corps of Engineers, March 2009, Study findings and technical report: Alaska baseline erosion assessment: Elmendorf Air Force Base, Alaska, U.S. Army Corps of Engineers, Alaska District, 68 p.

http://www.poa.usace.army.mil/AKE/Home.html

This statewide assessment was conducted by the U.S. Army Corps of Engineers to coordinate, plan, and prioritize responses to erosion throughout Alaska. This report has recognized Nunam Iqua as one of 178 communities identified as having erosion issues.

U.S. Government Accountability Office (GAO), June 2009, Report to congressional requestors—Alaska Native villages, limited progress has been made on relocating villages threatened by flooding and erosion: U.S. General Accountability Office Report GAO-040895T, 53 p.

http://www.gao.gov/products/GAO-09-551

This report is a follow-up to the 2003 GAO report on flooding and erosion in Alaska Native villages (in which Nunam Iqua was not mentioned), and was completed to identify concerns due to climate change that have increased the urgency of federal and state efforts. The GAO developed recommendations for Congress that include:

1. *A flooding assessment to augment the erosion assessment completed by the Army Corps of Engineers.*
2. *An amendment to federal legislation so that 64 more villages may be eligible for grants.*
3. *Designating a federal entity to oversee and coordinate village relocation efforts.*

Nunam Iqua is mentioned as one of 33 Alaska Native villages with a FEMA-approved disaster mitigation plan.

Walters, L., and M. Cushing, 1995, Community profile—Sheldon Point: Alaska Department of Community & Regional Affairs (DCRA), 19 p.

This profile includes information on the community's status in the following areas: Facilities, U.S. Census, economy and employment, schools, rural businesses, contacts, municipal officials, municipal finances, rural grants, and ANCSA land status.

Wise, James L., Albert L. Comiskey, and Richard Becker, 1981, Storm surge climatology and forecasting in Alaska: Anchorage, Alaska, Arctic Environmental Information and Data Center, University of Alaska, 26 p.

The objective of this study was to improve the quality of life and the security of property in coastal areas susceptible to flooding by enhancing the decision-making process for human activities and development. This study compiles historical climatological data to develop a surge forecast regression equation. One storm surge, in 1974, was recorded for Sheldon Point and used in this report.