

Report of Investigation 2021-3 Kotzebue

EROSION EXPOSURE ASSESSMENT—KOTZEBUE

Richard M. Buzard, Mark M. Turner, Katie Y. Miller, Donald C. Antrobus, and Jacquelyn R. Overbeck



Kotzebue, Alaska, in 2012. Photo: ShoreZone, shorezone.org.



Published by
STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
2021



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State of Alaska
Department of Natural Resources
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Suggested citation:

Buzard, R.M., Turner, M.M., Miller, K.Y., Antrobus, D.C., and Overbeck, J.R., 2021, Erosion Exposure Assessment of Infrastructure in Alaska Coastal Communities: Alaska Division of Geological & Geophysical Surveys Report of Investigation 2021-3. <https://doi.org/10.14509/30672>



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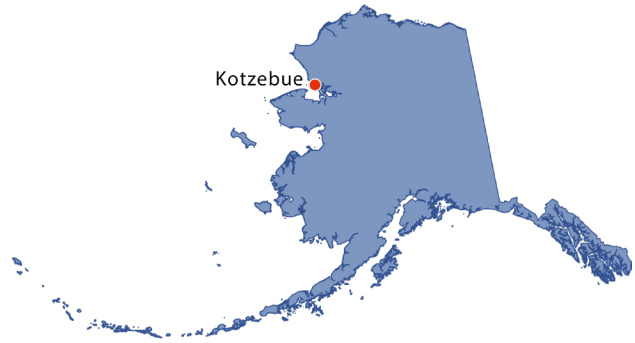
KOTZEBUE EROSION EXPOSURE ASSESSMENT

This is a summary of results from an erosion forecast near infrastructure at Kotzebue, Alaska. We conduct a shoreline change analysis, forecast 60 years of erosion, and estimate the replacement cost of infrastructure in the forecast area. Buzard and others (2021) describe the method and guidance for interpreting tables and maps.

Source data for this summary include the following:

- Shoreline change assessment ArcGIS shapefiles from Overbeck and others (2020) updated to the vegetation line if appropriate.
- Infrastructure AutoCAD outlines and metadata from Division of Community & Regional Affairs (2013) Community Profile Map series.
- Added infrastructure such as roads, water and sanitation facilities, and outbuildings, delineated if visible in the most up-to-date high resolution (≤ 0.66 ft [20 cm] ground sample distance) aerial orthoimagery (National Geodetic Survey, 2021).
- Computed infrastructure cost of replacement based on square or linear footage from Buzard and others (2021).

Kotzebue is located on the Baldwin Peninsula in Kotzebue Sound. Erosion in Kotzebue is driven by storm surge and beach souring from sea ice (U.S. Army Corps of Engineers [USACE], 2008). Overbeck and others (2020) show the beach along Kotzebue is near stable with accretion ranging



between 1 and 2.3 feet per year at the airport. The majority of Kotzebue's infrastructure is protected from erosion by a seawall and boulders that have been placed along the front of the community since the 1980s (USACE, 2008). Some erosion is reported near the landfill (USACE, 2008), but the change is too small to measure from historical and modern aerial imagery. Due to the presence of shoreline protection and stability of the shoreline, we do not forecast erosion at Kotzebue.

Despite the inability to forecast erosion, there is still potential for erosion exposure from storm surge and thawing permafrost. USACE (2008) reports that the community has repaired erosion protection after major storm events in 2002 and 2004. Storm damages can be monitored with repeat beach elevation measurements using GPS or digital elevation models.

ACKNOWLEDGMENTS

This work was funded by the Denali Commission Village Infrastructure Protection Program through the project "Systematic Approach to Assessing the Vulnerability of Alaska's Coastal Infrastructure to Erosion." The community of Kotzebue was not consulted for this report.

¹ Alaska Division of Geological & Geophysical Surveys, 3354 College Rd., Fairbanks, Alaska 99709-3707

² Alaska Native Tribal Health Consortium, 4000 Ambassador Drive, Anchorage, Alaska 99508

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