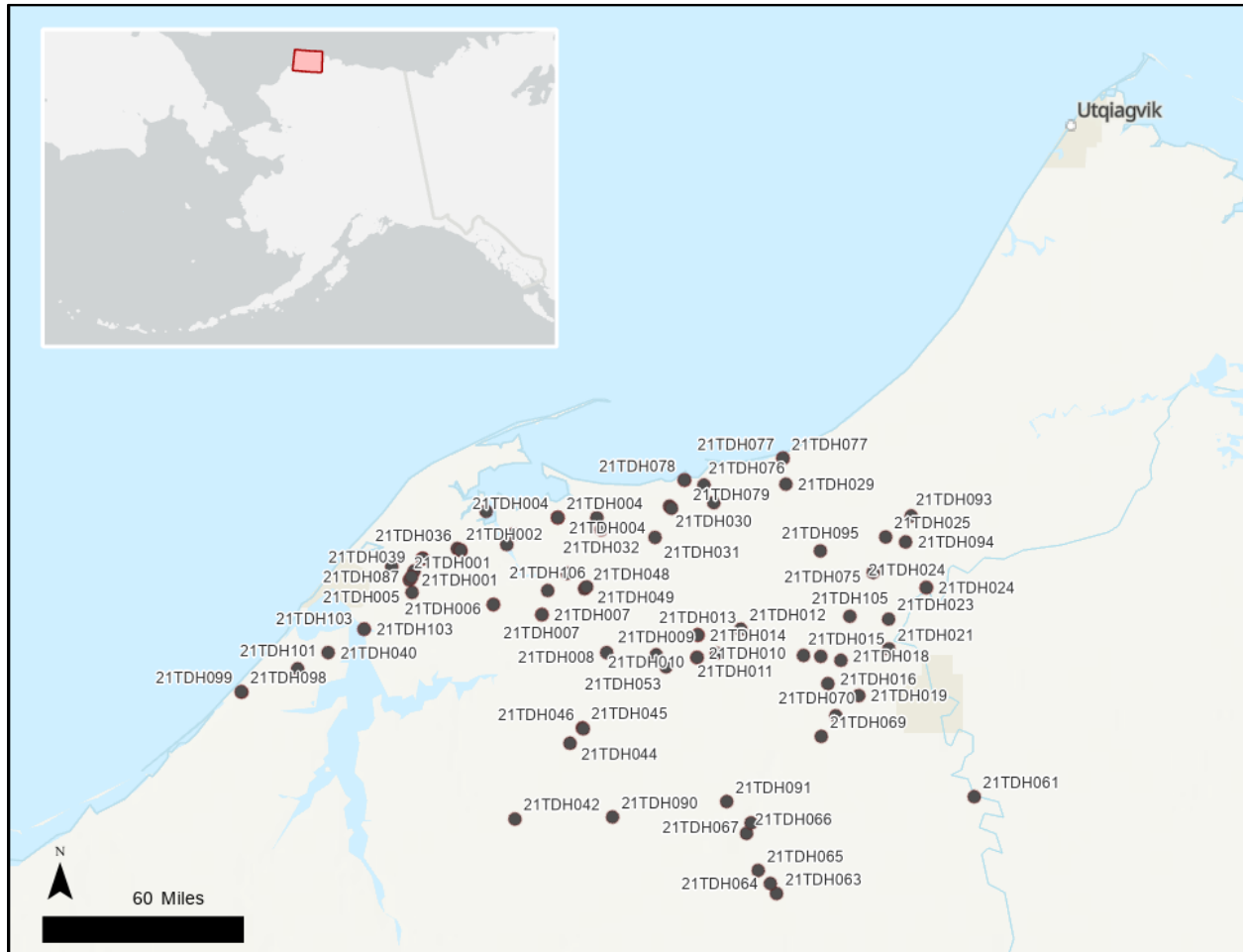


2021 ARCTIC STRATEGIC TRANSPORTATION AND RESOURCES (ASTAR) PROJECT GEOTECHNICAL DATA AND SAMPLE DESCRIPTIONS: WAINWRIGHT, ATQASUK, AND UTQIAGVIK, NORTH SLOPE, ALASKA

Marlee D. Haralson, Trent D. Hubbard, and Simone Montayne

Raw Data File 2023-5



Field station locations where samples were collected during the 2021 field season

This report has not been reviewed for technical content or for conformity to the editorial standards of DGGs.

2023
STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS



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2021 ARCTIC STRATEGIC TRANSPORTATION AND RESOURCES (ASTAR) PROJECT GEOTECHNICAL SAMPLE DATA DESCRIPTIONS: WAINWRIGHT, ATQASUK, AND UTQIAGVIK, NORTH SLOPE, ALASKA

Marlee D. Haralson¹, Trent D. Hubbard¹, and Simone Montayne¹

ABSTRACT

During the summer of 2021, the Alaska Division of Geological & Geophysical Surveys (DGGS) conducted fieldwork in northwestern Alaska between Wainwright, Atqasuk, and Utqiagvik in support of a sand and gravel resource assessment for the Arctic Strategic Transportation and Resources (ASTAR) Project. This report includes sample locations and descriptions of 84 samples from power-auger holes, outcrops, test pits, and representative surface exposures. Analytical data tables associated with this report are available in digital format as comma-separated value (.csv) files from the DGGS website <https://doi.org/10.14509/30962>.

BACKGROUND

The ASTAR Project is a collaborative effort initiated by the Alaska Department of Natural Resources (DNR) in partnership with the North Slope Borough to identify, evaluate, and advance opportunities to enhance the quality of life and economic opportunities in North Slope communities through responsible infrastructure development. The ASTAR team worked with communities and regional stakeholders to identify which projects and project areas may offer the most cumulative benefit to the region by prioritizing community and cultural connectivity, regional support, reduced cost of living, increased safety, and responsible infrastructure development.

During the summer of 2021, DGGS collected 84 samples in northwestern Alaska between the communities of Wainwright, Atqasuk, and Utqiagvik in support of the ASTAR sand and gravel resource assessment project (fig. 1). Construction-grade sand and gravel resources are lacking in this region and our detailed sedimentological descriptions are essential to better understand the quality, quantity, and distribution of sand and gravel resources. This report is one of two 2021 field data publications and includes geotechnical sample descriptions of the 84 samples. The data presented here serve as supplemental information to the 2021 field data collection report, which includes field station location information and sample descriptions from approximately 99 field stations visited (Haralson and others, 2023). Data from this report will be added to a sand and gravel resource database, providing critical information for planning and further resource assessment.

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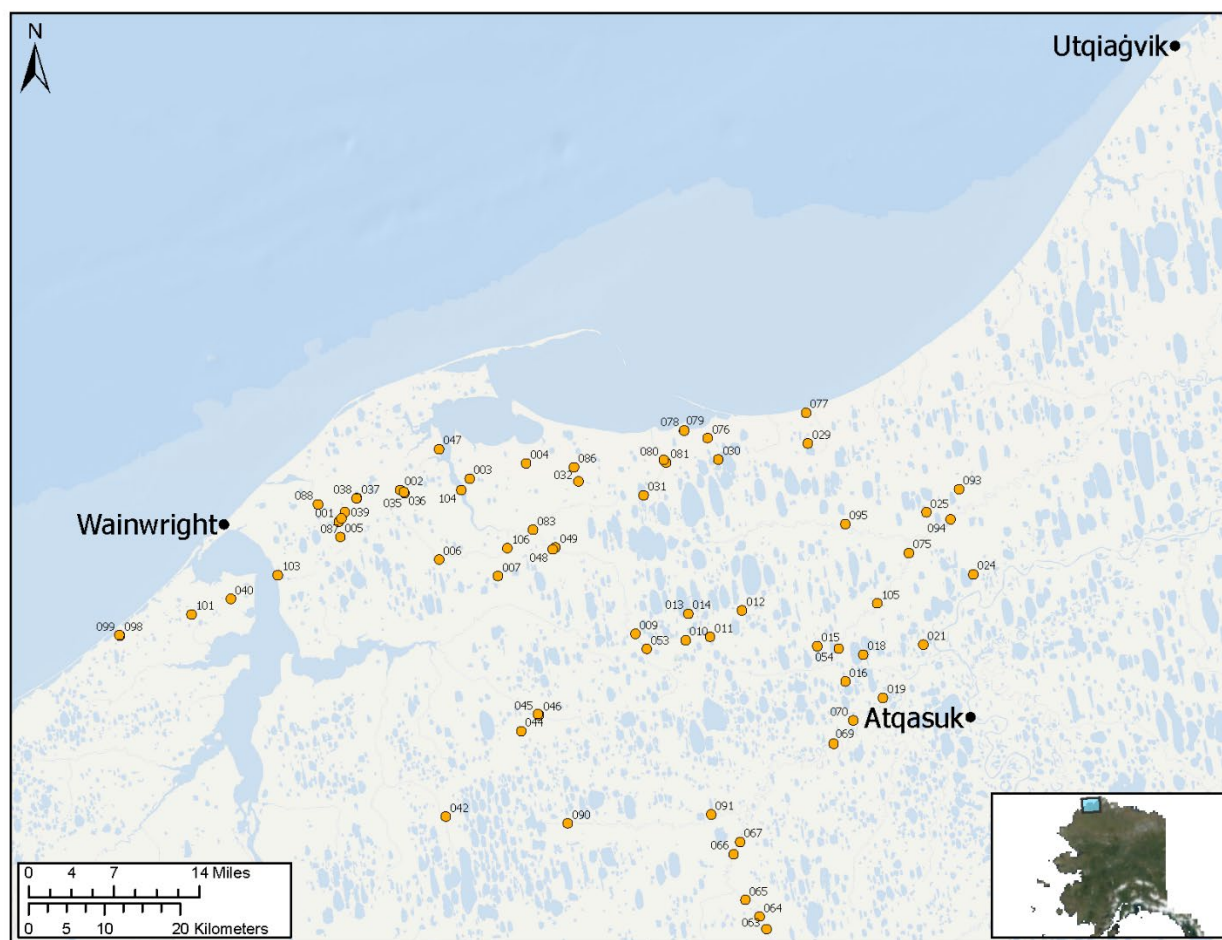


Figure 1. Map showing field station locations (orange circles) where samples were collected during the 2021 field season. Black circles indicate villages (Wainwright, Atkasuk, Utqiagvik). Three-digit labels correspond to the field station location ID (e.g., 067 represents a sample collected at field site 21TDH067).

METHODS

Sample Collection

Data were collected using GPS-enabled tablets running the ESRI ArcGIS Collector app, which have a reported error of approximately 10 m. Latitude and longitude are reported in the WGS84 datum. Sediment samples were collected between July 6 and July 21, 2021. Sediment sample labels correspond to field station locations. Samples were collected from outcrops, the ground surface adjacent to streams and lakes, and 7-cm-diameter auger holes drilled to a depth of approximately 3.5 m. All samples were stored in resealable plastic bags. At some locations we collected a series of samples across a vertical exposure (profile description or auger) to determine changes in sediment character. Bulk composition samples were also collected on ground surface or at the bottom of water bodies to obtain a representative sample at the field station site.

Sample Preparation

After returning from the field, samples were air-dried, described, and photographed. This data release consists of post-field sample descriptions made by geologists. Photographs are not included in this dataset but are available on the DGGS website photo database (Athey and others, 2017). The data have not been reviewed for technical content and should be considered preliminary.

Analytical Methods

Data include geotechnical data, descriptions, and photographs. We followed conventions used in the Alaska Geotechnical Field Manual where appropriate (Alaska Department of Transportation and Public Facilities [AKDOT&PF], 2007). Attribute information includes moisture content, color based on six standard Munsell colors (Munsell, 1994): light brown, yellowish-orange, greenish-gray, olive-gray, light gray, and dark gray, Unified Soil Classification System soil type (USCS) (American Society for Testing and Materials, 2000), maximum grain (clast) size, material (clast) concentration, clast composition (mineralogy or lithology), coarse-grained particle angularity, presence or absence of organics (Schoeneberger and others, 2012), and reaction when treated with 10 percent hydrochloric acid (HCl) (AKDOT&PF, 2007). The following nomenclature is used to define the concentration (percentage) of gravel, defined as clasts greater than 2 mm, used to describe samples:

Trace (less than 1 percent)

Rare (1–4 percent)

Some (4–12 percent)

Common (12–30 percent)

Many (30–60 percent)

Abundant (60–100 percent)

ACKNOWLEDGMENTS

The State of Alaska funded this work as part of the ASTAR Capital Improvement Project. The U.S. Bureau of Land Management provided additional funding and support through a National Petroleum Reserve-Alaska Resource Inventory and Database Development Grant (L18AC00019-03). DGGS ASTAR work supports a collaborative effort between the North Slope Borough and the Department of Natural Resources to strengthen community infrastructure and facilitate access to arctic resources while enhancing the quality of life and economic opportunities for North Slope communities. It also provides valuable information for land-use management and planning decisions.

We appreciate the collaboration and support of AKDOT&PF. In addition, the Alaska Energy Services Corporation (ASRC), North Slope Borough, Olgoonik Corporation, and City and Native Village of Wainwright provided much-appreciated logistical support and guidance during field preparation and data collection efforts which ensured a successful field season. We would also like to importantly thank Anthony

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