# 2021 ARCTIC STRATEGIC TRANSPORTATION AND RESOURCES (ASTAR) PROJECT FIELD STATION LOCATION DATA AND DESCRIPTIONS: WAINWRIGHT, ATQASUK, AND UTQIAGVIK, NORTH SLOPE, ALASKA

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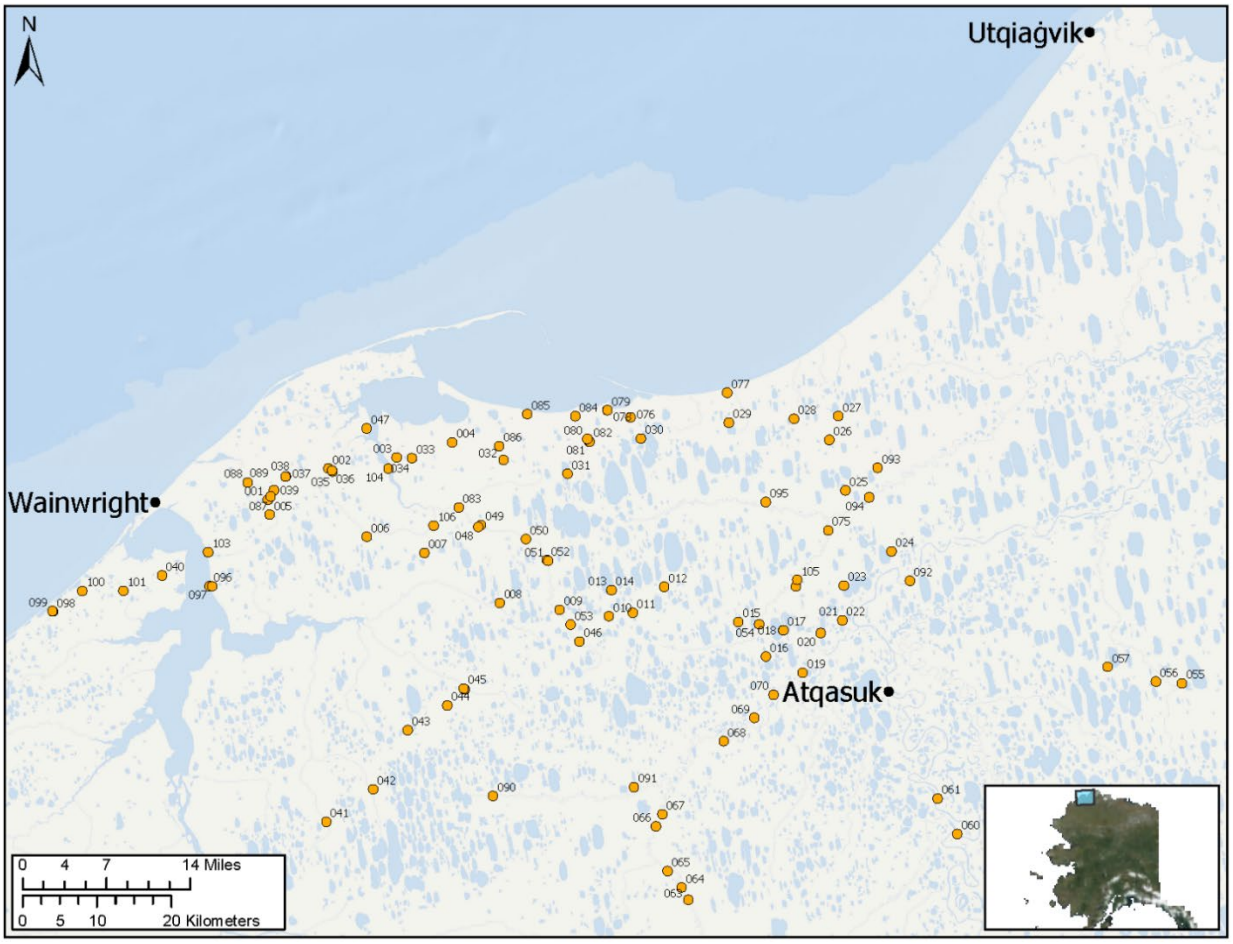
**Raw Data File 2023-4**

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

Marlee D. Haralson[1], Trent D. Hubbard[1], and Simone Montayne[1]

## ABSTRACT

During the summer of 2021, geologists from the Alaska Division of Geological & Geophysical Surveys (DGGS) conducted fieldwork for an area of approximately 24,842 km$^2$ 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 locations and descriptions for 99 power-auger hole, outcrop, test pit, and surface exposure field sites. Digital data are available as comma-separated value (.csv) files from the DGGS website https://doi.org/10.14509/30961.

## 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 by prioritizing community and cultural connectivity, regional support, reduced cost of living, increased safety, and responsible infrastructure development.

During the summer of 2021, DGGS made observations and collected field data at 99 sites 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 materials 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 field data publications from the 2021 field season. It includes information collected from outcrop and surface exposure observations, test pit (trench) observations, and observations of material from shallow holes (less than 3.5 meters deep) drilled with a Tanaka power-auger. In addition to the data published in this report, geotechnical information for 84 samples collected in the field is available in Haralson and others (2023). We will add data from this report to a sand and gravel resource database we are currently developing, providing critical information for planning and further resource assessment.

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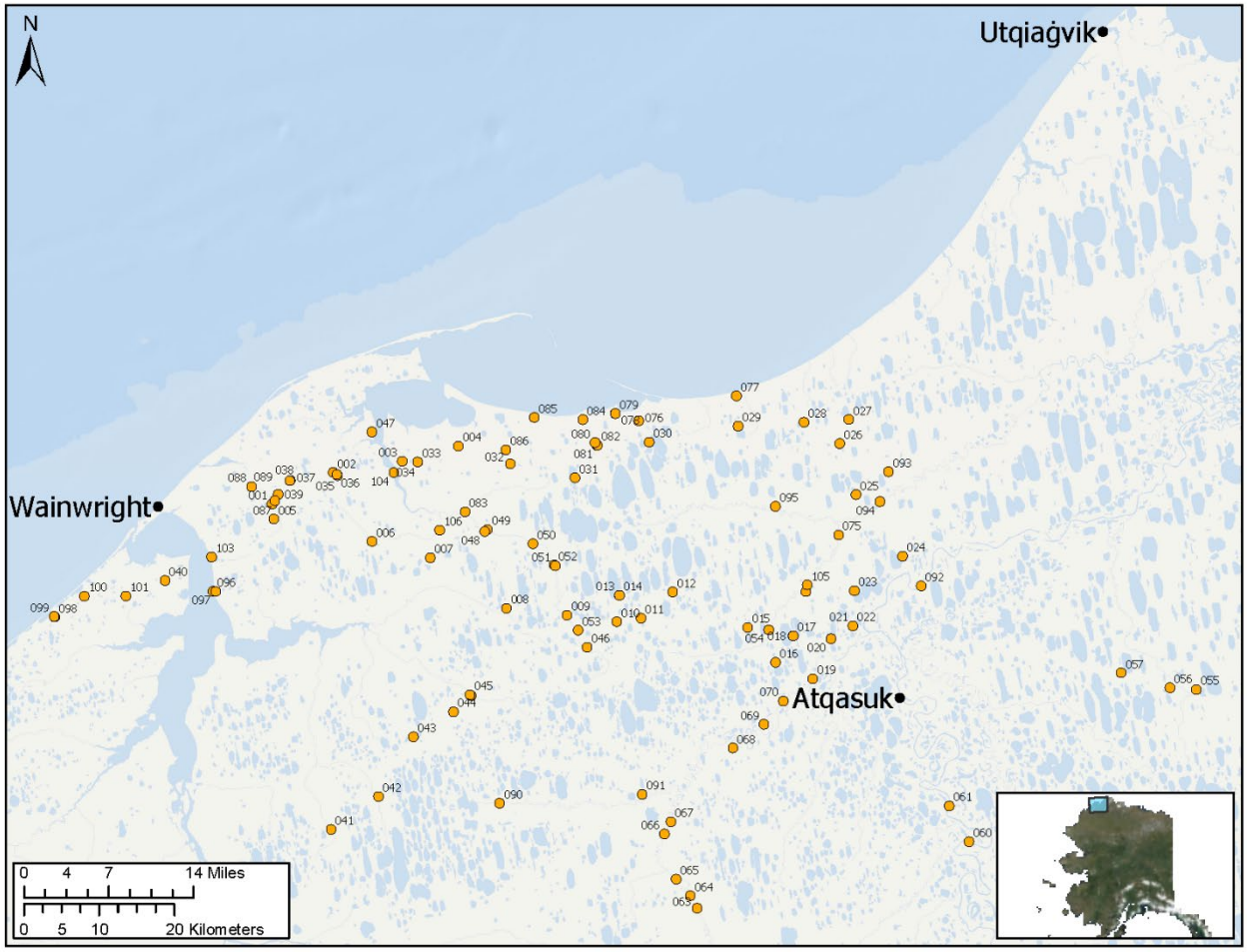


**Figure 1.** Map showing field station locations (orange circles) where field data were collected during the 2021 field season. Three-digit labels correspond to the field station location ID (e.g., 067 represents field data collected at field station site 21TDH067).

## METHODS

### Sample Collection

Field station location data and sediment samples were collected between July 6 and July 21, 2021, using GPS-enabled tablets running the ESRI ArcGIS Collector app, with a reported error of approximately 10 m. Latitude and longitude are reported in the WGS84 datum. Our field data includes field location information and material descriptions. Where appropriate, we followed conventions in the Alaska Geotechnical Field Manual (Alaska Department of Transportation and Public Facilities, 2007). Attribute information includes the following descriptions for field station sites: station identification value, geographic location, geologic description, weather sky conditions (Manley and McIntyre, 2004), temperature (Celsius), vegetation, ice probe refusal depth, and data collection sampling method. Surface materials and interval descriptions (if appropriate) are assigned Unified Soil Classification System (USCS) group symbol, interval number, and

depth (cm). Interval descriptions include the following attributes: color based on six standard Munsell colors (Munsell, 1994) (light brown, yellowish-orange, greenish-gray, olive-gray, light gray, and dark gray, USCS soil type (American Society for Testing and Materials, 2000), ice content, maximum grain (clast) size, presence/absence of gravel clasts (e.g., clasts greater than 2mm), clast composition or lithology, coarse-grained particle angularity, and the presence or absence of organics (Schoeneberger and others, 2012).

## Data Collection Field Methods

The data in this report includes field station descriptions made by geologists while drilling Tanaka power-auger test holes, data collected while examining outcrops, data collected while digging test pits, and data collected while observing surface materials. The following sampling methods used in this study are described below.

### *Auger Sites*

Data from drilled test holes were collected by field geologists using a Tanaka power-auger to drill on favorable terrain such as a flat, dry surface, often on a raised tundra polygon. We used the average of three ice probe refusals (cm) to determine the depth of ice, frozen soils, bedrock, or clay-rich materials that limited auger performance. Two geologists operated the Tanaka power-auger while one geologist described sediment churned from the auger flight and carried to the surface. Each auger flight is approximately 132 cm long and 7 cm in diameter. During drilling, geologists looked for any visible changes in sediment character. Geologists recorded observations using tablets running the ESRI Arc Collector app, and sediment samples were retrieved if appropriate.

Additionally, we took photos before and after drilling the test hole and added these photos to the DGGS photo database (Athey and others, 2017). After data collection, we refilled each hole with the removed sediment and replaced the organic mat when possible.

### *Outcrops*

We cleaned surfaces at soil profiles exposed along bluff, river, and lake margins, allowing us to describe a profile on a freshly exposed vertical surface. When appropriate, we described sedimentary and pedogenic features using U.S. Department of Agriculture Natural Resources Conservation Service terminology (Schoeneberger, 2012). We collected serial bulk and oriented samples from documented soil horizons for laboratory geotechnical analyses. Additionally, we took photos before and after cleaning surfaces and added them to our DGGS photo database (Athey and others, 2017). After data collection, we replaced sediment to restore the outcrop as best we could.

### *Test Pits*

At sites unsuitable for drilling auger test holes or collecting profile descriptions, we dug a test pit to collect subsurface data. We used a hand shovel to expose subsurface sediment and dig test pits to depths of

approximately 30 cm. We used trowels to clean freshly exposed surfaces to describe stratigraphy and collect samples. Additionally, we took before and after photos, which we added to the DGGS photo database (Athey and others, 2017). After data collection, we replaced the sediment.

### *Surface Observations*

When appropriate, we collected data and made observations about the surface material. The surface was generally left undisturbed. However, we sometimes collected representative rock samples, using a hand trowel when necessary. In addition, we often took geo-located photos to document site materials and added these to the DGGS photo database (Athey and others, 2017).

## ACKNOWLEDGMENTS

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We appreciate the Alaska Department of Transportation and Public Facilities (AKDOT&PF) support. In addition, the Arctic Slope Regional Corporation (ASRC), North Slope Borough, Olooginik 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 thank Anthony Gallagher (DGGS), Hans Hoffman (ASRC), and Tim Tannenbaum (AKDOT&PF) for fieldwork assistance, data collection, and help in determining potential field station sites.

## REFERENCES

Alaska Department of Transportation and Public Facilities (AKDOT&PF), 2007, Alaska Geotechnical Procedures Manual: Alaska Department of Transportation and Public Facilities, 187 p. https://dot.alaska.gov/stwddes/desmaterials/assets/pdf/geo_man/geotechmanual_all_07.pdf

American Society for Testing and Materials (ASTM), 2000, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System): ASTM Standard Practice D2487-00, 12 p. https://doi.org/10.1520/D2487-00

Athey, J.E., Seitz, S.S., and DGGS Staff, 2017, Geologic Photos of Alaska: Alaska Division of Geological & Geophysical Surveys Digital Data Series 14, http://doi.org/10.14509/photodb. https://doi.org/10.14509/29735

Haralson, M.D., Hubbard, T.D., and Montayne, Simone, 2023, 2021 Arctic Strategic Transportation and Resources (ASTAR) project geotechnical data and sample descriptions: Wainwright, Atqasuk, and

Utqiagvik, North Slope, Alaska: Alaska Division of Geological & Geophysical Surveys Raw Data File 2023-5, 4 p. https://doi.org/10.14509/30962

Manley, P.N., and McIntyre, K.K., 2004, Multiple species inventory and monitoring protocol region 3 study plan: implementation of the point count survey method: U.S. Forest Service, 193 p.

Munsell Color, 1994, Munsell soil color charts 1994: New Windsor, New York, GretagMacBeth.

Schoeneberger, P.J., Wysocki, D.A., Benham, E.C., and Soil Survey Staff, 2012, Field book for describing and sampling soils, Version 3.0: U.S. Department of Agriculture, Natural Resources Conservation Service, National Soil Survey Center, 298 p.