Pre-ABoVE: Vegetation Plots at Barter Island and Point Barrow, Alaska, 1994

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Documentation Revision Date: 2017-09-20

Data Set Version: 1

Summary

This dataset provides vegetation cover and environmental plot and soil data collected at two U.S. Air Force sites at Barter Island (BI) and Point Barrow (B), on the coastal North Slope of Alaska, in 1994. At Barter Island, 31 plots, and 30 plots at Barrow, were subjectively located in 14 plant communities. The investigation was part of a larger study initiated by the United States Congress to provide an opportunity to enhance the stewardship of the natural and cultural resources land under Department of Defense jurisdiction. These two sites were characterized to build an inventory of the biotic communities to compare them to historic communities.

During the vegetation survey, 61 releves (31 at Barter Island, and 30 at Barrow) were subjectively located in 14 plant communities and 4 broad habitat types including: 1) coastal salt marsh vegetation (4 plots), 2) dry coastal beach and sand dune vegetation (3 plots), 3) sedge grass and dwarf shrub mire and fen vegetation (36 plots), and 4) dry and mesic dwarf-shrub and graminoid vegetation on non-acidic substrate (18 plots). Species and environmental data including subjective site assessments were collected in the field. The size of each sample area was estimated after a complete species list was obtained and varied from 14 to 500 square meters. Soil samples were brought back to the lab for chemical analysis.

The plots were not permanently marked in 1994, but were identified on aerial photographs. From this information, plot GPS coordinates have been determined and are reported in this dataset.

There are four data files in comma-separated format (.csv) with this dataset and companion files with code and scalar descriptions, plot photos, and the the original data report..

Figure 1. Point Barrow research site (Cover of Elias et al.,1996).

Citation

Walker, D.A., and L.A. Druckenmiller. 2017. Pre-ABoVE: Vegetation Plots at Barter Island and Point Barrow, Alaska, 1994. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1534

Table of Contents

1. Data Set Overview

This dataset provides vegetation cover and environmental plot and soil data collected at two U.S. Air Force sites at Barter Island (BI) and Point Barrow (B), on the coastal North Slope of Alaska, in 1994. At Barter Island, 31 plots, and 30 plots at Barrow, were subjectively located in 14 plant communities. The investigation was part of a larger study initiated by the United States Congress to provide an opportunity to enhance the stewardship of the natural and cultural resources land under Department of Defense jurisdiction. These two sites were characterized to build an inventory of the biotic communities to compare them to historic communities.

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Project: Arctic-Boreal Vulnerability Experiment (ABoVE)

The Arctic-Boreal Vulnerability Experiment (ABoVE) is a NASA Terrestrial Ecology Program field campaign based in Alaska and western Canada between 2016 and 2021. Climate change in the Arctic and Boreal region is unfolding faster than anywhere else on Earth. ABoVE seeks a better understanding of the vulnerability and resilience of ecosystems and society to this changing environment.

Acknowledgements

These data were obtained from the Alaska Arctic Geoecological Atlas (http://agc.portal.gina.alaska.edu/), which provides access to existing Arctic vegetation plot and map data in support of the ABoVE campaign.

2. Data Characteristics

Spatial Coverage: Barter Island (BI) and Point Barrow (B), on the coastal North Slope of Alaska

ABoVE Site Designation:

Domain: Core ABoVE region

State/territory: Alaska (study sites around Barrow and Barter Island)

Grid cells: Ahh1Avv0Bh2Bv1, Ahh1Aw0Bh3Bv3

Spatial Resolution: Point resolution. Plots ranged in size from 14-500 square meters.

Temporal Coverage: August 1994, 19940801-19940811

Temporal Resolution: Each plot was sampled once

Study Area (All latitude and longitude given in decimal degrees)

Site	Westernmost Longitude	Easternmost Longitude	Northernmost Latitude	Southernmost Latitude
Barrow	-156.64432	-156.60601	71.33400	71.32265
Barter Island	-143.66956	-143.59660	70.13394	70.12040

Table 1. Data and companion files and descriptions.

Data File Name	Description
Barter_Barrow_Species_Data.csv	This file contains species cover data for the vegetation plots. Species cover classes are old Braun-Blanquet: r (rare), + (common, but less than 1 percent cover), 1 (1-5 percent), 2 (6 to 25 percent), 3 (26 to 50 percent), 4 (51 to 75 percent), 5 (76 to 100 percent). The field plot numbers in the modified source data are the authors. The author's plot numbers, location initials BI (Barter Island) and B (Barrow), releve number, and occasionally a letter, A or B that represent a releve microsite.
Barter_Barrow_Environmental_Data.csv	Plot data including soil code, moisture, slope, aspect, and topography data. Also includes percent groundcover.
Barter_Barrow_Soil_Data.csv	These are the soils data Barrow and Barter Island. Soils data include soil moisture, bulk density, pH, and thaw depth.
Barter_Barrow_Soil_Descriptions.csv	Soil descriptions transcribed directly from field forms including horizon, horizon depth, and other field descriptions.
Companion Files	

Barter_Barrow_Env_Codes_Scalars.pdf	Codes and scalars used in the **Barter_Barrow_Environmental_Data.csv** are defined and described in this companion file.
Barter_Barrow_Veg_Plots_Photos.pdf	These are photographs of the vegetation plots. Not all plots have photographs, and due to light leaks, many of the existing photographs were cropped for presentation.

Data File Information:

There are four data files with this dataset in comma-separated (.csv) format. These data may also be found in the TURBOVEG database.

Missing data are represented as -9999.

Barter_Barrow_Species_Data.csv

The source of these data is the data report Elias et al. (1996: Appendix E).

Both the author's determination and the current taxonomy according to the Panarctic Species List (PASL) are listed. Taxa are listed in alphabetical order according to the accepted PASL name.

> Species cover classes are old Braun-Blanquet: r (rare), + (common, but less than 1 percent cover), 1 (1-5 percent), 2 (6 to 25 percent), 3 (26 to 50 percent), 4 (51 to 75 percent), 5 (76 to 100 percent). In four instances, taxa were lumped into a single taxon in the PASL: 1) Dicranum scoparium (Dicranum scoparium and Dicranum majus), 2) Dicranum spadiceum (Dicranum spadiceum and Dicranum angustum), 3) Salix rotundifolia (Salix rotundifolia ssp. reticulata and Salix rotundifolia x pulchra), 4) Tortula leucostoma (Tortula leucostoma and Desmatodon leucostoma). The field plot numbers in the modified source data are the authors. The author's plot numbers, location initials BI (Barter Island) and B (Barrow), releve number, and occasionally a letter, A or B that represent a releve microsite.

This file contains species cover data for the vegetation plots. Taxa are listed in alphabetical order according to the accepted PASL name. The plot numbers are prefixed with either Barter Island (BI) or Barrow (B).

Column Numbers	Column Name	Description
1	PASL_TAXON_SCIENTIFIC_NAME_NO_AUTHORS	Current Taxonomy according to the Panarctic Species List (PASL) without authors names
2	PASL_TAXON_SCIENTIFIC_NAME_WITH_AUTHOR(S)	Current Taxonomy according to the Panarctic Species List (PASL)
3	DATASET_TAXON	Dataset taxonomy
4 to 65	BI-1 BI-28, B-1 TO B-31	Column headings are all 61 plot numbers. Species cover data are given as percentage.

Barter_Barrow_Environmental_Data.csv

The source of these data is the Legacy data report by Elias et al. (1996: Figure 2, Table 5, Appendix E), original datasheets, and L. Druckenmiller used the aerial photographs in the report and Google Earth to estimate the plot latitudes and longitudes, in that order.

Codes and scalars are defined and described in the companion file: Barter_Barrow_Env_Codes_Scalars.pdf

Column Name	Units	Description
ORDER		Sort order
FIELD_RELEVE_NUMBER		Plot number

TURBOVEG_ACCESSION_NUMBER		Turboveg database are accession numbers
PLANT_COMMUNITY_NAME		
DATE	YYYYMMDD	Survey date
LATITUDE	Decimal degrees, WGS 84	Latitude estimated from aerial photographs in the report in conjunction with Google Earth
LONGITUDE	Decimal degrees, WGS 84	Longitude estimated from aerial photographs in the report in conjunction with Google Earth
RELEVE_MEASUREMENT	M X M	Plot size
PLOT_LOCATION_ DESCRIPTION		
PLANT_COMMUNITY_DESCRIPTION		
SLOPE	Degrees	Slope of plot area in degrees
ASPECT	Degrees	Aspect of plot area in degrees
LANDFORMS	Code	Refer to the code defined in companion file Barter_Barrow_Env_Codes_Scalars.pdf
SURFICIAL_ GEOLOGY	Code	Refer to the code defined in companion file Barter_Barrow_Env_Codes_Scalars.pdf
SURFICIAL_GEOMORPHOLOGY	Code	Refer to the code defined in companion file Barter_Barrow_Env_Codes_Scalars.pdf
MICROSITE	Code	Refer to the code defined in companion file Barter_Barrow_Env_Codes_Scalars.pdf
SITE_MOISTURE	Scalar	Refer to the scalar defined in companion file Barter_Barrow_Env_Codes_Scalars.pdf
SOIL_MOISTURE	Scalar	Refer to the scalar defined in companion file Barter_Barrow_Env_Codes_Scalars.pdf
TOPOGRAPHIC_POSITION	Code	Refer to the code defined in companion file Barter_Barrow_Env_Codes_Scalars.pdf
SOIL_UNIT	Code or Comment	Refer to the code defined in companion file Barter_Barrow_Env_Codes_Scalars.pdf

EXPOSURE_SCALE	Scalar	Refer to the scalar defined in companion file Barter_Barrow_Env_Codes_Scalars.pdf
ESTIMATED_SNOW_DURATION	Scalar	Refer to the scalar defined in companion file Barter_Barrow_Env_Codes_Scalars.pdf
ANIMAL_DISTURBANCE	Scalar (remarks)	Refer to the scalar defined in companion file Barter_Barrow_Env_Codes_Scalars.pdf
STABILITY	Scalar (remarks)	Refer to the scalar defined in companion file Barter_Barrow_Env_Codes_Scalars.pdf
LOW_SHRUBS	%	Percent of plot cover that is low shrubs
DWARF_SHRUBS	%	Percent of plot cover that is dwarf shrubs
EVERGREEN_SHRUBS	%	Percent of plot cover that is evergreen shrubs
DECIDUOUS_SHRUBS	%	Percent of plot cover that is deciduous shrubs
COVER_FORBS	%	Percent of plot cover that is forbs
COVER_GRAMINOIDS	%	Percent of plot cover that is graminoids
COVER_LICHEN LAYER	%	Percent of plot cover that is lichen
COVER_BRYOPHYTES	%	Percent of plot cover that is bryophytes
COVER_BARE_ROCK	%	Percent of plot cover that is bare rock
COVER_BARE_SOIL	%	Percent of plot cover that is bare soil
COVER_OPEN_WATER	%	Percent of plot cover that is water
COVER_FROST_SCAR	%	Percent of plot cover that is frost scar
COVER_TOTAL_DEAD	%	Percent of plot cover that is dead vegetation
MEAN_CANOPY_HEIGHT	CM	Mean vegetation height in centimeters

Barter_Barrow_Soil_Data.csv

These are the soils data Barrow and Barter Island. Soils data include soil moisture, bulk density, pH, and thaw depth from Elias et al. (1996, Appendix E).

A sample of soil at or near 10 cm depth was collected and gravimetric soil moisture, bulk density, and soil pH (saturated paste method) were determined in a lab. Thaw depth was measured in the field.

All soil samples were collected at 10-cm depth. Data not provided are represented as -9999.

Column Name	Units	Description
ORDER		
FIELD NUMBER		
DATE	YYYYMMDD	
LATITUDE	Decimal degrees, WGS 84	Latitude estimated from aerial photographs in the report in conjunction with Google Earth
LONGITUDE	Decimal degrees, WGS 84	Longitude estimated from aerial photographs in the report in conjunction with Google Earth
SOIL_MOISTURE	%	Soil moisture
BULK_DENSITY	G/CUBIC CM	Bulk density
SOIL_PH		Soil pH (paste)
THAW_DEPTH	CM	Thaw depth, mean of 5 measurements

Barter_Barrow_Soil_Descriptions.csv

Soil descriptions transcribed directly from field forms entered by L. Druckenmiller.

Column Name	Units	Description
PLOT		Plot number
DATE	YYYYMMDD	Survey date
DEPTH	CM	Depth range of described soil horizon
HORIZON		Soil horizon

DESCRIPTION_NOTES		Data from field forms entered by L. Druckenmiller including brief soil descriptions.

3. Application and Derivation

Two sites were characterized to build an inventory of the present biotic communities to compare them to historic communities.

4. Quality Assessment

During compilation of these data from Elias et al., (1986) in support of the ABoVE campaign, the Alaska Arctic Geoecological Atlas used aerial photographs and Google Earth to estimate plot latitudes and longitudes and corrected plant community names for plots BI-2,5, BI-27, B-17, and B-18 (by D. A. Walker in 2015).

5. Data Acquisition, Materials, and Methods

Site Description

The data were collected as part of the Legacy Resource Management Program (Department of Defense, Legacy Project Number 0742) that was part of a larger study initiated in 1991 by the United States Congress to provide an opportunity to enhance the stewardship of the natural and cultural resources on the more than 25 million acres of land under Department of Defense jurisdiction. To achieve this goal, the Department of Defense initially gave high priority to inventorying, protecting, and restoring natural resources. In Alaska, two U.S. Air Force sites on the coastal North Slope of Alaska, Barter Island and Barrow, were characterized to build an inventory of the present biotic communities to compare them to historic communities. Dr. Donald A. (Skip) Walker conducted the vegetation inventory in 1994, the results of which are included in a data report by Elias et al. (1996).

Vegetation Survey

During the vegetation survey, 61 releves (31 at Barter Island and 30 at Barrow) were subjectively located in 14 plant communities and 4 broad habitat types including: 1) coastal salt marsh vegetation (4 plots), 2) dry coastal beach and sand dune vegetation (3 plots), 3) sedge grass and dwarf shrub mire and fen vegetation (36 plots), and 4) dry and mesic dwarf-shrub and graminoid vegetation on non-acidic substrate (18 plots). Species and environmental data including subjective site assessments were collected in the field.

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The plots were not permanently marked but were located on aerial photographs. Lisa Druckenmiller used the aerial photographs in the report and Google Earth to estimate the plot latitudes and longitudes, in that order.

Soil Samples

A sample of soil at or near 10 cm depth was collected and gravimetric soil moisture, bulk density, and soil pH (saturated paste method) were determined in a lab. Thaw depth was measured in the field.

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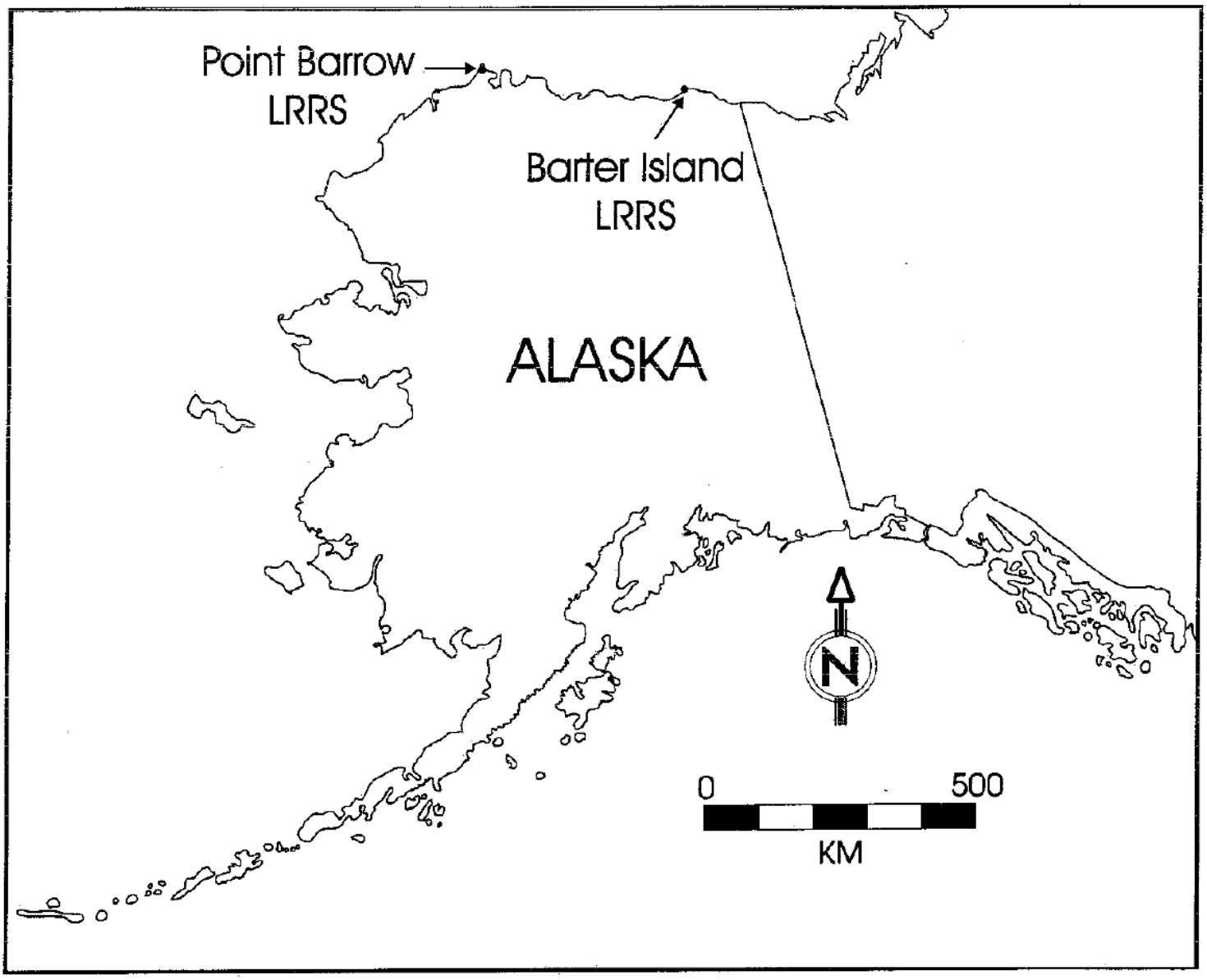

Figure 2. Location of Barrow and Barter Island research sites.

The report Elias et al. (1996) also includes data on Holocene and modern insects, and Holocene plant communities (pollen).

This dataset was provided by the GINA repository at: http://agc.portal.gina.alaska.edu/catalogs/10672-alaska-arctic-vegetation-archive-legacy-vegeta

6. Data Access

These data are available through the Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC).

Pre-ABoVE: Vegetation Plots at Barter Island and Point Barrow, Alaska, 1994

Contact for Data Center Access Information:

- E-mail: uso@daac.ornl.gov
- Telephone: +1 (865) 241-3952

7. References

Elias, S., S. K. Short, D. A. Walker, and N. A. Auerbach. 1996. Historical biodiversity at Remote Air Force Sites in Alaska. Legacy Resource Management Program Project #0742, Point Barrow and Barter Island Long Range Radar Sites, Alaska. Data Report, Institute of Arctic and Alpine Research, University of Colorado, Boulder, Colorado, USA.