aava_umiat_echurchill_1955_readme_metadata.pdf

AAVA readme file for Umiat Vegetation Plots (July 19, 2016)

Dataset Title: Umiat Vegetation Plots (Churchill 1955)

Dataset Author: Ethan D. Churchill

Alaska Arctic Vegetation Archive Dataset Name: umiat_echurchill (UMIAT_EC)

Dataset Description:

Early vegetation sampling on Alaska's North Slope was undertaken by Ethan D. Churchill while stationed at Umiat on the Colville River. Churchill's field work, undertaken in July and August of 1951, endeavored to identify plant communities, determine their relationship to environmental conditions, and obtain data for aerial photographic interpretation. The work was supported in part by the U.S. Air Force and Navy and culminated in a dissertation (Churchill 1954) and an article in the journal Ecology (Churchill 1955).

In July and August of 1951, 51 stands (areas of unified vegetation) were subjectively located and sampled. Stands were determined by aerial photography and ground reconnaissance to ensure homogeneity. Ten, 1-square meter plots were systematically located as uniformly and widely as possible within homogeneous vegetation of the stand but restricted so that transitional areas into adjacent stands were avoided. Plant species cover was recorded using a modified Hult-Sernander scale where: + (trace), 1 (covers less than 1/6 of the area), 2 (covers 1/6 to 1/8), 3 (covers 1/8 to 1/4), 4 (covers 1/4 to 1/2), 5 (covers 1/2 to 3/4), 6 (covers 3/4 to 4/4). Plant communities occur in 6 broad habitat types including: 1) Willow shrub vegetation of riparian areas and warm habitats (south-facing slopes) (2 plots), 2) Moist to wet acidic tussock and nontussock (Eriophorum vaginatum–Carex bigelowii–Sphagnum–Hylocomium) tundra (40 plots), 3) Dry acidic prostrate-shrub heaths (Arctous alpina, Salix phlebophylla, Empetrum heaths) (2 plots), 4) Frost boil vegetation in nonacidic tundra (Juncus biglumis, Saxifraga oppositifolia) (2 plots), 5) Alder communities (2 plots), and 6) Sedge grass and dwarf shrub mire and fen vegetation (3 plots).

Stands were not permanently marked and very little plot specific environmental data were recorded. A floristic-characteristic-species combination for each stand was identified and a preliminary analysis of the data is presented. Plot data for plant species cover and environmental variables came from the publication (Churchill 1955), while photographs were obtained from the thesis (Churchill 1954).

The Umiat data is included in both a PhD thesis and publication.

References:

Churchill, E.D. 1954. Phytosociological and environmental characteristics of some plant communities in the Umiat region of Alaska. PhD thesis, Catholic University of America, Washington, D.C.

Churchill, E. D. 1955. Phytosociological and environmental characteristics of some plant communities in the Umiat region of Alaska. Ecology. 36:606–627.

Primary contact: Donald A. (Skip) Walker, dawalker@alaska.edu, 907–474–2460

Other contacts: Amy Breen, albreen@alaska.edu, 907–474–6927

Primary Agency: Alaska Geobotany Center, University of Alaska Fairbanks

Direct Plot Archive Record Link: http://geobotanical.portal.gina.alaska.edu/catalogs/10678–alaska–arctic–vegetation–archive–umiat–church

Data prepared by: Lisa Druckenmiller (ladruckenmiller@alaska.edu)

Link to VegBank Record: yet to be entered

Missing data: Indicated by –9999 for numerical data and n/a for categorical or text data

Files Available for Download:

1) AAVA Umiat Modified Source Data

1a) AAVA Umiat Species Cover Data
aava_umiat_echurchill_1955_spp_modsrc.csv
aava_Umiat_echurchill_1955_spp_modsrc.xlsx

These files contain species cover data for the Umiat releves in both .csv and .xlsx format. Tables I–III in Churchill (1955) contain the available species data. The dataset presents the species cover classes according to a modified Hult–Sernander scale where: + (trace, 0.5 percent), 1 (covers less than 1/6 of the area, 4 percent), 2 (covers 1/16 to 1/8, 9 percent), 3 (covers 1/8 to 1/4), 4 (covers 1/4 to 1/2), 5 (covers 1/2 to 3/4), 6 (covers 3/4 to 4/4). Both the author's species 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. The plot numbers in the source data are the author's. The main plot numbers in the Turboveg database are accession numbers and will differ. The

author's plot numbers are retained in the 'Field releve number' field in the Turboveg database.

Modifications to the source data include dropping the pluses and minuses associated with cover values as presented in the publication (although not where plus alone indicates a trace) as these symbols were not assigned a value.

1b) AAVA Umiat Environmental Data
aava_umiat_echurchill_1955_allenv_modsrc.csv
aava_umiat_echurchill_1955_allenv_modsrc.xlsx

These files contain modified environmental data for the Umiat Study in .csv and .xlsx format. The source of these data is Churchill (1955) Tables I–III and the text. The stand numbers in the source data are the author's. The main plot numbers in the Turboveg database are accession numbers and will differ. The author's stand numbers are retained in the 'Field releve number' field in the Turboveg database. The modified Hult–Sernander scales used are described above under species cover data. See Churchill (1955) for an explanation of the Homogeneity–Index and Frequency–Homogeneity Test. Mosses and lichens were not identified to species but were assigned a cover class and along with bare ground cover are included here.

2) AAVA Umiat Turboveg Database
aava_umiat_echurchill_1955_tv.zip

This file is the Umiat Turboveg Database (.dbf). Turboveg is a software program for managing vegetation–plot data (see http://www.synbiosys.alterra.nl/turboveg/). The database includes both species cover and environmental header data. The header data for the database are consistent across all datasets in the AAVA. There are both required and recommended fields for inclusion in the AAVA. Consequently, only a subset of the modified source environmental data are included in the database and these may be cross–walked to the AAVA data dictionary. The species nomenclature used in the database is according to the Panarctic Species List created for the Arctic Vegetation Archive. The current data dictionary and PASL files are required for the correct use of these data in Turboveg. These files are updated periodically and available for download via 'Data and Resources' section of the data record.

For the cross–walk from the source data to the Turboveg database, we made the following changes: for the species data 1) In 5 instances, taxa were lumped into a single taxon in the PASL: 1) Carex bigelowii s. ensifolia (Carex consimili and Carex lugens), 2) Equisetum arvense s. alpestre (Equisetum arvense var. boreale and Equisetum arvense var. boreale f. pseudo–varium), 3) Salix niphoclada (Salix brachycarpa var. mexiae and Salix niphoclada), 4) Salix glauca s. acutifolia (Salix desertorum, Salix glauca var. acutifolia, Salix glauca var alisceae),

and 5) Salix pulchra (Salix pulchra and Salix pulchra var. palmeri).

For the crosswalk for environmental data: 1) A verbal description of aspect was converted to degrees and then crosswalk to Turboveg categorical data. Where slope was 0 and aspect was lacking, aspect values were converted to -1 "too flat to determine", 2) Cover of mosses, lichens, and bare ground were converted from the modified Hult-Sernander scale codes (pluses and minuses were dropped due to lack of assigned value) to fractional ranges given in the text (Churchill 1955). The midpoint in the fractional range was taken and converted to a cover percentage as indicated here: + (trace or 0.5 percent), 1 (covers less than 1/6 of the area or 4 percent), 2 (covers 1/6 to 1/8 or 9 percent), 3 (covers 1/8 to 1/4 or 18 percent), 4 (covers 1/4 to 1/2 or 38 percent), 5 (covers 1/2 to 3/4 or 63 percent), 6 (covers 3/4 to 4/4 or 87 percent), 3) Habitat types and site moisture were assigned by D. A. 'Skip' Walker in January 2016., and 4) No location data is available for the plots so all were assigned the latitude and longitude for Umiat.

3) AAVA Umiat Ancillary Data

3a) Umiat Photos
aava_umiat_echurchill_1955_photos_anc.pdf

This file contains digitized photographs from Churchill (1954). Black and white images of many of the plant communities described in the data set are included in this file.

3b) Umiat Location Map
aava_umiat_echurchill_1955_plotmap_anc.pdf

This map indicates the general vicinity of Umiat. No specific stand location information is documented in Churchill (1954, 1955).

3c) Umiat Publications
churchille_1954_phd_theses_umiat_plantcom.pdf
churchille_1955_ecology_phytosocenv_charac_plant_comm_umiat.pdf

These .pdf files contain the source data Churchill (1954, 1955) for the Umiat dataset. Churchill (1955) was chosen for species and environmental data entry, while photographs came from Churchill (1954).

4) AAVA Umiat Metadata
aava_umiat_echurchill_1955_readme_metadata.pdf
aava_umiat_echurchill_1955_readme_metadata.txt

This readme file is the metadata for the Umiat dataset.

Modifications to environmental source data:

The table below in comma-separated value format indicates the modifications made to source data in the preparation of the AAVA Umiat vegetation plot modified source environmental data files (aava_umiat_echurchill_1955_allenv_modsrc.csv and aava_umiat_echurchill_1955_allenv_modsrc.xlsx) and fields that were used to crosswalk these data to the Turboveg database (aava_umiat_echurchill_1955_tv.zip).

```
VARIABLE,IN ENVIRONMENTAL MODIFIED SOURCE DATA FILE,IN TURBOVEG FILE AS THE SAME NAMED FIELD,DATA SOURCE AND CHANGES MADE TO DATA
FIELD STAND NUMBER,Y,Y,Churchill (1955; Tables I-III).
COVER MOSSES (PERCENT),Y,Y,"Churchill (1955; Tables I-III). Total moss cover was estimated for the plots and recorded as species data, but due to a lack of species identification, percentages were recorded in Turboveg header data as cover class 'Mosses and Liverworts'."
COVER LICHENS(PERCENT),Y,Y,"Churchill (1955; Tables I-III). Total lichen cover was estimated for the plots and recorded as species data, but due to a lack of species identification, percentages were recorded in Turboveg header data as a cover class 'Lichen'."
COVER BARE SOIL (PERCENT),Y,Y,Churchill (1955; Tables I-III).
TOTAL VASCULAR SPECIES IN QUADRATS,Y,N,Churchill (1955; Tables I-III).
AVERAGE NUMBER OF VASCULAR SPECIES IN QUADRAT,Y,N,Churchill (1955; Tables I-III).
HOMOGENEITY-INDEX,Y,N,Churchill (1955; Tables I-III).
FREQUENCY-HOMOGENEITY TEST,Y,N,Churchill (1955; Tables I-III).
DATE (YEAR),Y,Y,"Churchill 1955. No specific month or day information was documented. According to the text, plots were sampled in July and August of 1951."
PLOT AREA (SQUARE METERS),Y,Y,Churchill 1955. From the text.
PLOT SHAPE,Y,Y,Churchill 1955. From the text.
COMMUNITY TYPES AND SUBTYPE,Y,Y,Churchill 1955. Specific plant community names were only available for select plots described in the text.
SLOPE (DEGREES),Y,Y,Churchill 1955. Slope was only available for select plots described in the text.
ASPECT (DEGREES),Y,Y,"Churchill 1955. For Turboveg, descriptive directions were converted to numeric directions, and where slope was recorded as '0' aspect was recoded as too flat to determine."
TOPOGRAPHIC POSITION,Y,Y,Churchill 1955. Topographic position was only available for select plots.
SITE MOISTURE,Y,Y,Churchill 1955. Site moisture was only available for select plots.
STAND LOCATION AND DESCRIPTION,Y,Y,Churchill 1955. From the text where available.
```