

aava\_prudhoebay\_dwalker\_1985\_readme\_metadata.pdf

AAVA readme file for Prudhoe Bay (February 17, 2020)

Dataset Title: Alaska Arctic Vegetation Archive: Prudhoe Bay  
Vegetation Plots

Dataset Author: Donald A. (Skip) Walker

Alaska Arctic Vegetation Archive Dataset Name: prudhoebay\_dwalker  
(PRU\_DW)

#### Dataset Description:

The vegetation of the Prudhoe Bay area was described and mapped by D. A. Walker for his dissertation research at the University of Colorado, Department of Environmental, Population and Organismic Biology (Walker 1981). The study was initiated in 1973 under the U.S. Tundra Biome portion of the International Biological Program (IBP) and is part of U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory (CRREL) research activities conducted under DA Project 4A161102AT24. Results were also included in CRREL report 85-14 (Walker 1985) and are the source of this dataset. This is an important and timely study because it came 5 years after the discovery of the Prudhoe Bay Oilfield and includes baseline vegetation and environmental data of the Prudhoe Bay Oil Field.

Data from eighty-nine subjectively located study plots are presented. Plots occur in forty-three plant communities and 4 broad habitat categories including: 1) dry tundra (gravelly pingos, high-centered polygons, frost scars, dry river sands and gravels, sand dunes, river bluffs, coastal beaches, and early melting snowbeds) (24 plots), 2) moist tundra (moist nonacidic tundra, acidic coastal tundra, snowbeds, moist stream banks, bird mounds and animal dens, and moist sandy tundra) (33 plots), 3) wet tundra (wet nonacidic tundra, wet acidic tundra, and wet saline coastal tundra) (22 plots), and 4) aquatic tundra (shallow and deep water habitats) (10 plots).

Plots were permanently marked in a corner of the first square meter of the 1 m by 10 m plots, and in a corner of the 1 square meter plots. Species and environmental data (including soil physical variables, subjective site assessments, and active layer depths) were collected in the field and soil samples were brought back to the lab for the chemical assessments. Approximate GPS coordinates were obtained for all but 2 plots by the author in 2013 utilizing aerial photographs of the study area in conjunction with Google Earth imagery.

These data were subsequently used in several reports and publications listed below.

## References:

Raynolds, M. K., D. A. Walker, K. J. Ambrosius, J. Brown, K. R. Everett, M. Kanevskiy, G. P. Kofinas, V. E. Romanovsky, Y. Shur, and P. J. Webber. 2014. Cumulative geocological effects of 62 years of infrastructure and climate change in ice-rich permafrost landscapes, Prudhoe Bay Oilfield, Alaska. *Global Change Biology* 20:1211–1224.

Walker, D. A., K. R. Everett, P. J. Webber, and J. Brown (Editors). 1980. *Geobotanical Atlas of the Prudhoe Bay Region, Alaska*. CRREL Report 80-14. U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire, USA.

Walker, D. A. 1981. *The vegetation and environmental gradients of the Prudhoe Bay region, Alaska*. Dissertation. University of Colorado, Boulder, CO, USA.

Walker, D. A. 1985. *The vegetation and environmental gradients of the Prudhoe Bay region*. CRREL Report No. 85-14. U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire, USA.

Walker, D. A., and W. Acevedo. 1987. *Vegetation and a Landsat-derived Land Cover Map of the Beechey Point Quadrangle, Arctic Coastal Plain, Alaska*. CRREL Report 87-5. U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire, USA.

Walker, D. A., and K. R. Everett. 1991. *Loess ecosystems of northern Alaska: regional gradient and toposequence at Prudhoe Bay*. *Ecological Monographs* 61:437–464.

Webber, P. J. and D. A. Walker. 1975. *Vegetation and landscape analysis at Prudhoe Bay, Alaska: a vegetation map of the Tundra Biome study area*. Pages 81–91 in J. Brown, editor. *Ecological Investigations of the Tundra Biome in the Prudhoe Bay Region, Alaska*. Biological Papers of the University of Alaska, Fairbanks, Alaska, USA.

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Direct Plot Archive Record Link: <http://geobotanical.portal.gina.alaska.edu/catalogs/6803-alaska-arctic-vegetation-archive-prudhoe-bay-v>

Data prepared by: Lisa Druckenmiller (ladruckenmiller@alaska.edu) and Amy Breen (albreen@alaska.edu)

Link to VegBank Record: Will add when available

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

Files Available for Download:

1) AAVA Prudhoe Bay Modified Source Data

1a) Prudhoe Bay Species Cover

aava\_prudhoebay\_dwalker\_1985\_spp\_modsrc.csv

aava\_prudhoebay\_dwalker\_1985\_spp\_modsrc.xlsx

These files contain species cover data for the Prudhoe Bay vegetation plots in both .csv and .xlsx format. The source of these data is the Prudhoe Bay CRREL report 85-14 (Walker 1985). Species cover classes are by percent. 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. In one instance, taxa were lumped into a single taxon in the PASL: 1) *Ochrolechia frigida* (*Ochrolechia frigida* and *Ochrolechia frigida theleporoides*). 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.

1b) Prudhoe Bay Environmental Data

aava\_prudhoebay\_dwalker\_1985\_allenv\_modsrc.csv

aava\_prudhoebay\_dwalker\_1985\_allenv\_modsrc.xlsx

These files contain modified environmental data for the Prudhoe Bay vegetation plots in both .csv and .xlsx format. The source of these data is the Prudhoe Bay CRREL report 85-14 (Walker 1985; Tables T3, B1, B2, B3, author's notes, calculations). For the source of the fields within the file, see 4) below. The header data in the Turboveg database only includes a subset of these data. 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. The codes used in this file are in the Legend for Environmental Variables file in the project metadata folder (aava\_prudhoebay\_dwalker\_1985\_envlegend\_metadata.pdf).

Improvements to the source data include: 1) plots were dropped that only included environmental data but no species data, 2) the author chose 1974 as the start date for the project, and vegetation field work was accomplished in July and August of that year, 3) latitude and longitude were obtained for all but two of the plots by the author in 2013 using aerial photographs from the project and Google Earth, 4) an

aspect (in Table B3) of 'flat' was added where blanks were present, 5) erect dead and prostrate dead were combined for the field 'Cover litter', and 6) all soil physical and chemical data came from the 10 cm depth per the text, and where present, L. Druckenmiller in 2013 used sand/silt/clay data and the Natural Resources Conservation Service Texture online converter to obtain soil textures.

## 2) AAVA Prudhoe Bay Turboveg Database aava\_prudhoebay\_dwalker\_1985\_tv.zip

This file is the Prudhoe Bay 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 (beta 1.0) created for the Arctic Vegetation Archive. The current data dictionary and PASL files are required for the correct use of these data in Turboveg and are available through a download in the catalog record.

For the crosswalk from the modified source data to the Turboveg database, we made the following changes to the environmental data: 1) slope was converted from classes to a single digit as follows 0-1 degrees (0 degrees), 1-3 degrees (2 degrees), 3-5 degrees (4 degrees), and greater than 5 degrees were educated guesses for the stated location, 2) aspect was to crosswalk to the Turboveg categories, 3) accuracy estimates were made for latitudes and longitudes by the author, 4) pH was reduced to a single digit after the decimal, and 4) habitat type, plot position, and surficial geology were provided by the author, and 5) Habitat types were assigned by D. A. 'Skip' Walker in 2013, modified by Jozef Sibik and D. A. 'Skip' Walker in 2016, and modified again by Sibik and Walker in November 2019. All habitat type code changes are documented in the modified source environmental data file for the project. A history of habitat type code changes is detailed in a metadata folder titled 'Habitat\_type\_history\_metadata\_2013-2019.'

## 3) AAVA Prudhoe Bay Ancillary Data

### 3a) Prudhoe Bay Plot Location Map aava\_prudhoebay\_dwalker\_1985\_plotmap\_anc.pdf

This file is an aerial photograph map of the Prudhoe Bay vegetation plots created by L. Wirth (GINA, UAF) from plot localities provided by D. Walker in 2014.

3b) Prudhoe Bay Plot Photos  
aava\_prudhoebay\_dwalker\_1985\_plotphotos\_anc.pdf

This file contains many of the plot and plot close-up photos scanned in 2014 from slides or prints for the Prudhoe Bay Dataset.

3c) Prudhoe Bay Soils Data  
aava\_prudhoebay\_dwalker\_1985\_soildata\_anc.csv  
aava\_prudhoebay\_dwalker\_1985\_soildata\_anc.xlsx

These are the soils physical and chemical data for the Prudhoe Bay vegetation plots from the CRREL report 85-14 (Table B2). Soil terminology is according to Soil Survey Staff (1974). Soil pH was reduced to a single digit after the decimal for entry into Turboveg. See the data report (Walker 1985) for further information.

3d) Prudhoe Bay Publications

These are pdf files of most of the references cited in the dataset description for the Prudhoe Bay vegetation plots. D. A. Walker's dissertation is not provided for download. Journal names are abbreviated using the standards for the abbreviation of titles of periodicals and serial titles.

4) AAVA Prudhoe Bay Metadata  
aava\_prudhoebay\_dwalker\_1985\_readme\_metadata.txt  
aava\_prudhoebay\_dwalker\_1985\_envlegend\_metadata.pdf  
Folder: Habitat\_type\_history\_metadata\_2013-2019

These files are metadata for the Prudhoe Bay vegetation plots and include a readme file and legend for the modified environmental data that are specific to this dataset. Habitat types changed during the course of the project through review and analysis. A history of these changes is included in the metadata folder titled 'Habitat\_type\_history\_metadata\_2013-2019.'

Modifications to environmental source data:

The table below in comma separated values format indicates the modifications made to source data in the preparation of the AAVA Prudhoe Bay Modified Source Environmental Data files (aava\_prudhoebay\_dwalker\_1985\_allenv\_modsrc.csv and aava\_prudhoebay\_dwalker\_1985\_allenv\_modsrc.xlsx) and fields that were used to crosswalk these data to the Turboveg database (aava\_prudhoebay\_dwalker\_1985\_tv.zip).

VARIABLE NAME, IN MODIFIED SOURCE ENVIRONMENTAL DATA FILE, IN TURBOVEG FILE AS NAMED HEADER, SOURCE AND CHANGES MADE TO DATA FIELD PLOT NUMBER, Y, Y, All tables. Walker 1985. The plot numbers in the modified source data are the author's. A number of plots were dropped

due to lack of species data. 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.

STAND TYPE (+=SEE MASTER MAPS WALKER ET AL. (1980)),Y,N,Table 3 Walker 1985. Occurs on at least one of the four master maps (Walker et al.

1980). Aided in crosswalk to Turboveg field 'Habitat type.'

PLANT COMMUNITY DESCRIPTION,Y,N,"Table 3 Walker 1985. Data for Turboveg field 'Soil moisture'" and 'Plant community.'"

MICROSITE,Y,N,Table B1 Walker 1985. Aided in crosswalk to the Turboveg field 'Habitat type.'

SOIL MOISTURE (PERCENT) IN 1977,Y,N,Table B1 Walker 1985.

BULK DENSITY (GM/CUBIC CM) IN 1977,Y,N,Table B1 Walker 1985.

SAND (PERCENT),Y,N,Table B1 Walker 1985. Aided in soil texture calculation.

SILT (PERCENT),Y,N,Table B1 Walker 1985. Aided in soil texture calculation.

CLAY(PERCENT),Y,N,Table B1 Walker 1985. Aided in soil texture calculation.

FIELD CAPACITY (PERCENT 1/3 BAR),Y,N,Table B1 Walker 1985.

WILTING POINT (PERCENT AT 15 BAR),Y,N,Table B1 Walker 1985.

AVAILABLE WATER (PERCENT),Y,N,Table B1 Walker 1985.

HYGROSCOPIC MOISTURE (PERCENT),Y,N,Table B1 Walker 1985.

WATER ABSORPTION (PERCENT),Y,N,Table B1 Walker 1985.

ORGANIC MATTER (PERCENT),Y,N,Table B1 Walker 1985.

PH-AT 10 CM (PASTE),Y,Y,Table B2 Walker 1985. Modified to a single digit after the decimal for crosswalk to Turboveg 'pH.'

NH4-MASS CONCENTRATION-AT 10 CM (PPM),Y,N,Table B2 Walker 1985.

NO3-MASS CONCENTRATION-AT 10 CM (PPM),Y,N,Table B2 Walker 1985.

C03-MASS CONCENTRATION-AT 10 CM (PERCENT),Y,N,Table B2 Walker 1985.

P-MASS CONCENTRATION-AT 10 CM (PPM),Y,N,Table B2 Walker 1985.

K-MASS CONCENTRATION-AT 10 CM (PPM),Y,N,Table B2 Walker 1985.

CA-MASS CONCENTRATION-AT 10 CM (PPM),Y,N,Table B2 Walker 1985.

MG-MASS CONCENTRATION-AT 10 CM (PPM),Y,N,Table B2 Walker 1985.

LOCATION (CODE),Y,Y,Table B3 Walker 1985. Turboveg field 'Location.'

TEMPERATURE REGIME (SCALAR),Y,N,Table B3 Walker 1985.

MOISTURE REGIME (SCALAR),Y,N,Table B3 Walker 1985.

SNOW REGIME (SCALAR),Y,N,Table B3 Walker 1985.

CRYOTURBATION REGIME (SCALAR),Y,N,Table B3 Walker 1985.

VEGETATION TYPE (WALKER AND WEBBER 1980),Y,N,Table B3 Walker 1985.

Aided in crosswalk to the Turboveg field 'Habitat type.'

TOPOGRAPHIC FEATURE (CODE),Y,N,Table B3 Walker 1985. Crosswalked to Turboveg field 'Topographic position.'

SLOPE (CODE),Y,Y,"Table B3 Walker 1985. Slope inclinations were converted as follows: 0-1 degrees=0 degrees,1-3 degrees=2 degrees, 3-5 degrees=4 degrees, >5 degrees =estimated by location. Included in Turboveg field 'Slope.'"

HUMMOCK-MEAN HEIGHT (CM),Y,N,Table B3 Walker 1985.

ASPECT,Y,N,Table B3 Walker 1985. Converted to degrees and crosswalked to Turboveg field 'Aspect.'

SOIL COVER (PERCENT),Y,N,Table B3 Walker 1985.  
ROCK COVER (PERCENT),Y,N,Table B3 Walker 1985.  
WATER COVER (PERCENT),Y,N,Table B3 Walker 1985.  
THAW DEPTH (CM) IN 1977,Y,N,Table B3 Walker 1985.  
WATER DEPTH (CM) IN 1977,Y,N,Table B3 Walker 1985.  
MARL SURFACE COVER (PERCENT),Y,N,Table B3 Walker 1985.  
CRUSTOSE LICHEN COVER (PERCENT),Y,N,Table B3 Walker 1985.  
FOLIOSE LICHEN COVER (PERCENT),Y,N,Table B3 Walker 1985.  
BRYOPHYTE COVER (PERCENT),Y,N,Table B3 Walker 1985.  
ERECT DEAD PLANT COVER (PERCENT),Y,N,Table B3 Walker 1985.  
PROSTRATE DEAD PLANT COVER (PERCENT),Y,N,Table B3 Walker 1985.  
PLOT SIZE (CODE),Y,Y,Table B3 Walker 1985.  
ANIMAL DISTURBANCE-CARIBOU FECES (FREQUENCY),Y,N,Table B3 Walker 1985.  
ANIMAL DISTURBANCE-CARIBOU GRAZING (FREQUENCY),Y,N,Table B3 Walker 1985.  
ANIMAL DISTURBANCE-BROWN LEMMING (FREQUENCY),Y,N,Table B3 Walker 1985.  
ANIMAL DISTURBANCE COLLARED LEMMING (FREQUENCY),Y,N,Table B3 Walker 1985.  
ANIMAL DISTURBANCE-MISCELLANEOUS BIRD (FREQUENCY),Y,N,Table B3 Walker 1985.  
ANIMAL DISTURBANCE-FOX (FREQUENCY),Y,N,Table B3 Walker 1985.  
ANIMAL DISTURBANCE-PTARMIGAN (FREQUENCY),Y,N,Table B3 Walker 1985.  
ANIMAL DISTURBANCE-GOOSE (FREQUENCY),Y,N,Table B3 Walker 1985.  
ANIMAL DISTURBANCE-SQUIRREL (FREQUENCY),Y,N,Table B3 Walker 1985.  
ANIMAL DISTURBANCE-BEAR (FREQUENCY),Y,N,Table B3 Walker 1985.  
COMMUNITY DESCRIPTION AND LOCATION,Y,N,D. A. Walker added site descriptions in 2013 based on Table 3 (Walker 1985) and imagery in Google Earth included in the Turboveg field 'Remarks.'  
LATITUDE (WGS 84),Y,Y,D. A. Walker used Google Earth to pin locations and obtain latitude.  
LONGITUDE (WGS 84),Y,Y,D. A. Walker used Google Earth to pin locations and obtain longitude.  
LITTER COVER (CALCULATED),Y,N,L. Druckenmiller combined prostrate dead erect dead vegetation cover to crosswalk to Turboveg field 'Cover litter.'  
SOIL TEXTURE (CALCULATED),Y,Y,"L. Druckenmiller used sand, silt, and clay data and the U.S.D.A. Natural Resources Conservation Service Texture Calculator ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2\\_054167](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_054167)) for Turboveg field 'Soil texture.'"  
HABITAT TYPE 2013-2016,Y,N,Habitat types assigned by D.A. 'Skip' Skip Walker.  
HABITAT TYPE 2016-2018,Y,N,Turboveg habitat types modified by Jozef Sibik and D. A. 'Skip' Skip Walker.  
HABITAT TYPE 20191113,Y,Y,Turboveg habitat types modified by Jozef Sibik and D. A. 'Skip' Skip Walker.