Field Data on Soils, Vegetation, and Fire History for Alaska Tundra Sites, 1972-2020

Get Data

Documentation Revision Date: 2023-10-18

Dataset Version: 1

Summary

This dataset, titled the Synthesized Alaskan Tundra Field Database (SATFiD), provides a comprehensive collection of in-situ field data compiled from 37 existing datasets resulting from field surveys conducted at Alaska tundra sites between 1972 to 2020. The data were harmonized prior to being included in this dataset. The variables include active layer thickness, vegetation cover (by plant functional types), soil moisture and temperatures, as well as the wildfire history. SATFiD provides a unique lens into various long-term ecological processes within the tundra (such as the fire-permafrost-vegetation interactions) under a rapidly changing climate.

This dataset includes three files in comma-separated values (CSV) format.

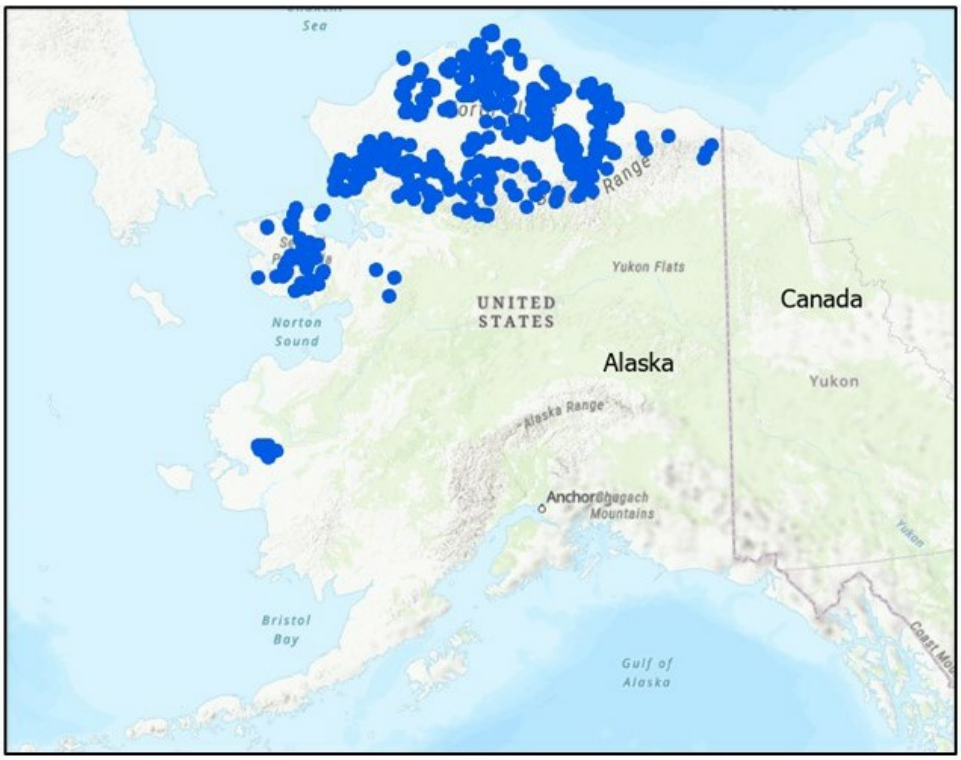

Figure 1. Locations (blue dots) of field sites in the Alaskan tundra that contributed data to this synthesis database.

Citation

Chen, D., X. Zhu, M. Kogure, E.E. Hoy, X. Xu, N.H.F. French, L.T. Berner, A.L. Breen, S. Bret-Harte, S.J. Davidson, J.J. Ebersole, G.V. Frost, S.J. Goetz, R.E. Hewitt, J.K.Y. Hung, C.M. Iversen, G. Iwahana, R. Jandt, L.K. Jenkins, A.N. Kade, I. Klupar, T.V. Loboda, S. Ludwig, M.J. Macander, M.C. Mack, C.R. Meyers, R.J. Michaelides, E.A. Miller, S. Natali, T.W. Nawrocki, P.R. Nelson, A.D. Parsekian, E. Rastetter, M.K. Raynolds, A.V. Rocha, K. Schaefer, U. Schickhoff, E.A.G. Schuur, S. Tsuyuzaki, C.E. Tweedie, S.V. Zesati, D.A. Walker, P.J. Webber, M. Williams, and D. Zona. 2023. Field Data on Soils, Vegetation, and Fire History for Alaska Tundra Sites, 1972-2020. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/2177

Table of Contents

1. Dataset Overview

This dataset, titled the Synthesized Alaskan Tundra Field Database (SATFiD), provides a comprehensive collection of in-situ field data compiled from 37 existing datasets resulting from field surveys conducted at Alaska tundra sites between 1972 to 2020. The data were harmonized prior to being included in this dataset. The variables include active layer thickness, vegetation cover (by plant functional types), soil moisture and temperatures, as well as the wildfire history. SATFiD provides a unique lens into various long-term ecological processes within the tundra (such as the fire-permafrost-vegetation interactions) under a rapidly changing climate.

Project: Arctic-Boreal Vulnerability Experiment

The Arctic-Boreal Vulnerability Experiment (ABoVE) is a NASA Terrestrial Ecology Program field campaign being conducted in Alaska and western Canada, for 8 to 10 years, starting in 2015. Research for ABoVE links field-based, process-level studies with geospatial data products derived from airborne and satellite sensors, providing a foundation for improving the analysis, and modeling capabilities needed to understand and predict ecosystem responses to, and societal implications of, climate change in the Arctic and Boreal regions.

Related Datasets

Related datasets are listed in Table 2 below.

Acknowledgement

The development of this database and some related field projects were supported by NASA's Terrestrial Ecology Program (grant 80NSSC19M0106).

2. Data Characteristics

Spatial Coverage: Tundra ecosystems in Alaska

ABoVE Reference Locations

Domain: Core and extended

State/Territory: Alaska

Grid cells: Ah000v000, Ah001v000, Bh002v003, Bh003v001, Bh004v001, Bh004v002, Bh004v003, Bh005v001, Bh005v002, Bh006v001, Bh006v002, Bh006v003, Bh007v000, Bh007v001, Bh007v002, Bh007v003, Bh008v001, Bh008v002, Bh008v003, Bh009v002, Bh009v003, Bh009v004, Ch013v021, Ch013v022, Ch014v021, Ch014v022, Ch022v010, Ch023v011, Ch024v011, Ch024v013, Ch025v008, Ch025v011, Ch025v013, Ch025v014, Ch026v011, Ch026v012, Ch026v013, Ch027v009, Ch027v010, Ch027v011, Ch027v012, Ch027v013, Ch028v008, Ch028v011, Ch029v010, Ch029v018, Ch030v009, Ch030v016, Ch030v017, Ch031v009, Ch032v008, Ch032v009, Ch033v007, Ch033v008, Ch033v009, Ch033v010, Ch034v008, Ch034v009, Ch034v010, Ch035v008, Ch035v009, Ch035v012, Ch036v007, Ch036v008, Ch036v009, Ch036v010, Ch036v011, Ch036v012, Ch036v013, Ch036v015, Ch037v008, Ch037v009, Ch037v010, Ch037v011, Ch037v012, Ch037v013, Ch037v014, Ch038v009, Ch038v011, Ch038v012, Ch038v016, Ch038v017, Ch039v010, Ch039v012, Ch039v013, Ch039v014, Ch039v015, Ch039v017, Ch039v018, Ch040v007, Ch040v008, Ch040v015, Ch040v016, Ch040v018, Ch041v006, Ch041v008, Ch041v014, Ch041v015, Ch041v016, Ch041v017, Ch042v006, Ch042v008, Ch042v013, Ch042v014, Ch042v015, Ch042v016, Ch042v019, Ch043v004, Ch043v006, Ch043v007, Ch043v008, Ch043v009, Ch043v010, Ch043v013, Ch043v015, Ch043v016, Ch043v018, Ch043v019, Ch043v020, Ch044v010, Ch044v014, Ch044v016, Ch044v017, Ch044v020, Ch045v007, Ch045v008, Ch045v009, Ch045v010, Ch045v012, Ch045v013, Ch045v014, Ch045v018, Ch045v019, Ch045v020, Ch045v021, Ch046v007, Ch046v008, Ch046v009, Ch046v010, Ch046v011, Ch046v012, Ch046v014, Ch046v015, Ch046v022, Ch047v007, Ch047v008, Ch047v009, Ch047v010, Ch047v011, Ch047v012, Ch047v013, Ch047v014, Ch047v015, Ch047v016, Ch047v020, Ch047v021, Ch047v022, Ch048v007, Ch048v008, Ch048v009, Ch048v010, Ch048v011, Ch048v012, Ch048v014, Ch048v015, Ch048v016, Ch048v017, Ch048v018, Ch048v019, Ch048v020, Ch048v021, Ch049v007, Ch049v009, Ch049v013, Ch049v014, Ch049v015, Ch049v017, Ch049v018, Ch049v019, Ch049v020, Ch049v021, Ch050v007, Ch050v009, Ch050v010, Ch050v011, Ch050v014, Ch050v015, Ch050v019, Ch050v020, Ch050v022, Ch051v012, Ch051v013, Ch051v014, Ch051v015, Ch051v018, Ch051v019, Ch051v020, Ch051v021, Ch052v016, Ch052v018, Ch053v015, Ch053v016, Ch053v017, Ch053v018, Ch053v019, Ch053v022, Ch053v023, Ch054v017, Ch055v023, Ch056v026, Ch057v026

Spatial Resolution: Field plots and transects at point locations

Temporal Coverage: 1972-08-01 to 2020-08-15

Temporal Resolution: Seasonal

Study Area: (All latitudes and longitudes given in decimal degrees)

Study Area	Westernmost Longitude	Easternmost Longitude	Northernmost Latitude	Southernmost Latitude
Alaska	-166.4104	-141.6834	71.3340	61.1397

Data File Information

There are three files in this dataset in comma-separated values (CSV) format:

- *Tundra_field_database.csv* provides field data compiled from 37 sources.
- *Dataset_List.csv* lists the data sources with citation information. The "dataset_id" field links data sources to records in *Tundra_field_database.csv.*
- *Method_Differences.csv* provides notes on the measurement methods employed for selected variables (Table 1) by data source. The "dataset_id" field links data sources to records in *Tundra_field_database.csv.*

The nodata values are -999 for numeric fields and NA for character fields.

Table 1. Variables in *Tundra_field_database.csv* .

Variable	Units	Description
plot_id	-	A unique ID for every plot included
dataset_id	-	Dataset ID number
dataset_name	-	Name of dataset
latitude	degree north	Latitude of plot
longitude	degree east	Longitude of plot
date	YYYYMMDD	Date of data collection. Note: if a data point's collection month and/or day are unrecorded, their values are set to 0.
plot_original_id	-	Plot ID as defined in original dataset
soil_temp_10cm	degree C	Surface temperature at 10-cm depth (degrees Celsius)
pH	1	Soil pH
water_table	cm	Water table (cm)
soil_moist	1	Volumetric water content in percent
ALT_mean	cm	Active layer thickness (cm)
org_soil_depth	cm	Organic soil depth (cm)
LAI_mean	1	Leaf area index
shrub_height	cm	Shrub height (cm)
stem_count	1	Stem count
moss_cover	1	Moss cover in percent
lichen_cover	1	Lichen cover in percent
graminoid_cover	1	Graminoid cover in percent
forb_cover	1	Forb cover in percent
shrub_cover	1	Shrub cover in percent
bare_cover	1	Bare soil cover in percent
litter_cover	1	Litter cover in percent
harv_bio	g m^{-2}	Harvested biomass (g per m^2)
yr_data	YYYY	Year of data collection (YYYY)
burned_status	-	Whether plot was burned in the past at the time of data collection ("Burned" or "Unburned")
freq_pre	1	Number of times wildfires occurred prior to data collection
yr_lfire	YYYY	Year of last known wildfire before data collection
n_yr_lfire	y	Number of years between last known wildfire before data collection and data collection
dnbr	1	Difference Normalized Burn Ratio (dNBR) of the last known wildfire before data collection based on Landsat-derived Burn Scar dNBR dataset
all_fire_yrs	YYYY	Years of all known wildfires occurred at this point (comma-separated list)
yr_nfire	YYYY	Year of next known wildfire after data collection
yrs_nfire	y	Number of years between data collection and next known wildfire after data collection
freq_total	1	Number of times wildfires occurred based on known wildfire history

Table 2. Datasets included in this database. The *dataset_id* field links records in Tundra_field_database.csv to these sources.

dataset_id	dataset_name	citation
AKVEG_2022	Alaska Vegetation Plots Database (AKVEG)	Nawrocki, T.W., Wells, A.F., Macander, M.J., Powers, E.M., Flagstad, L.A., Droghini, A., Gravely, H.A., Steer, M.A., Frost, G.V., Boucher, T.V., Roland, C.A., Miller, A.E., Swanson, D.K., and Johanson, J.K. 2022. Alaska Vegetation Plots (AKVEG) Database. University of Alaska Anchorage. <https://akveg.uaa.alaska.edu >
Berner_2018	ABoVE: Gridded 30-m Aboveground Biomass, Shrub Dominance, North Slope, AK, 2007-2016	Berner, L.T., Jantz, P., Tape, K.D., and Goetz, S.J. 2018. ABoVE: Gridded 30-m Aboveground Biomass, Shrub Dominance, North Slope, AK, 2007-2016. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ornldaac/1565

Breen_2018a	Arctic Vegetation Plots in Burned and Unburned Tundra, Alaska, 2011-2012	Breen, A.L., and Walker, D.A. 2018. Arctic Vegetation Plots in Burned and Unburned Tundra, Alaska, 2011-2012. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1547
Breen_2018b	Arctic Vegetation Plots, Poplars, Arctic and Interior AK and YT, Canada, 2003-2005	Breen, A.L., Walker, D.A., and Druckenmiller, L.A. 2018. Arctic Vegetation Plots, Poplars, Arctic and Interior AK and YT, Canada, 2003-2005. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1376
Davidson_2018	Arctic Vegetation Plots in Flux Tower Footprints, North Slope, Alaska, 2014	Davidson, S.J., Zona, D., and Walker, D.A. 2018. Arctic Vegetation Plots in Flux Tower Footprints, North Slope, Alaska, 2014. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1546
Ebersole_2018	Arctic Vegetation Plots at Oumalik, AK, 1983-1985	Ebersole, J.J., and Walker, D.A. 2018. Arctic Vegetation Plots at Oumalik, AK, 1983-1985. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1506
Frost_2020	ABoVE: Vegetation Composition across Fire History Gradients on the Y-K Delta, Alaska	Frost, G.V., Loehman, R.A., Nelson, P.R., and Paradis, D.P. 2020. ABoVE: Vegetation Composition across Fire History Gradients on the Y-K Delta, Alaska. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1772
Hollingsworth_2020	Seward Peninsula post-fire vegetation and soil data from multiple burns occuring from 1971 to 2012	Hollingsworth, T.N., Breen, A., Mack, M.C., and Hewitt, R.E. 2020. Seward Peninsula post-fire vegetation and soil data from multiple burns occuring from 1971 to 2012: "SPANFire" Study Sites Sampled in July 2012. <http://www.lter.uaf.edu/data/data-detail/id/752>
Iwahana_2005	Active layer thickness data collected in Kougarok, Seward Peninsula between 2005 and 2013	Iwahana, G., Harada, K., Uchida, M., Tsuyuzaki, S., Saito, K., Narita, K., Kushida, K., and Hinzman, L.D. 2016. Geomorphological and geochemistry changes in permafrost after the 2002 tundra wildfire in Kougarok, Seward Peninsula, Alaska. Journal of Geophysical Research: Earth Surface, 121, 1697-1715 https://doi.org/10.1002/2016JF003921
Jandt_1995	BLM Ulukluk and Seward Data	1. Jandt, R., Joly, K., Meyers, C.R., and Racine, C. 2008. Slow recovery of lichen on burned caribou winter range in Alaska tundra: Potential influences of climate warming and other disturbance factors. Arctic Antarctic and Alpine Research, 40, 89-95 https://doi.org/10.1657/1523-0430(06-122)[jandt]2.0.co;2 2. Jandt, R.R., and Meyers, C.R. 2000. Recovery of lichen in tussock tundra following fire in northwestern Alaska. In: US Department of the Interior, Bureau of Land Management, Alaska State Office https://doi.org/10.5962/BHL.TITLE.61209
Jorgenson_2018	Arctic Vegetation Plots in NPS Arctic Network Parks, Alaska, 2002-2008	Jorgenson, M.T., Walker, D.A., and Breen, A.L. 2017. Arctic Vegetation Plots in NPS Arctic Network Parks, Alaska, 2002-2008. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1542
Kade_2018	Arctic Vegetation Plots at Frost Boil Sites, North Slope, Alaska, 2000-2006	Kade, A.N., and Walker, D.A. 2018. Arctic Vegetation Plots at Frost Boil Sites, North Slope, Alaska, 2000-2006. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1361
Loboda_2022	Burned & Unburned Field Site Data, Noatak, Seward, and North Slope, AK, 2016-2018	Loboda, T.V., Jenkins, L.K., Chen, D., He, J., and Baer, A. 2022. Burned and Unburned Field Site Data, Noatak, Seward, and North Slope, AK, 2016-2018. ORNL Distributed Active Archive Center, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1919
Macander_2021	ABoVE: Tundra Plant Functional Type Continuous-Cover, North Slope, Alaska, 2010-2015	Macander, M.J., Frost, G.V., Nelson, P.R., and Swingley, C.S. 2021. ABoVE: Tundra Plant Functional Type Continuous-Cover, North Slope, Alaska, 2010-2015. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1830
Mack_2011	Characterization of sites for estimating C and N loss from 2007 ARF, sampled in 2008	Mack, M. 2016. Characterization of burned and unburned moist acidic tundra sites for estimating C and N loss from the 2007 Anaktuvuk River Fire, sampled in 2008. ver 5. Environmental Data Initiative, https://doi.org/10.6073/pasta/81868b65c853d5eb2052d9f1a8397d0d
Miller_2022	BLM Anaktuvuk Fire Effects Monitoring	Miller, E.A., Jandt, R., Baughman, C.A., Jones, B.M., and Yokel, D.A. 2022. ABoVE: Post-Fire and Unburned Field Site Data, Anaktuvuk River Fire Area, 2008-2017. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/2119

Natali_2022	Field data collected in YKD, Alaska, 2015-2019	1. Ludwig, S., Holmes, R.M., Schade, J., Natali, S., and Mann, P. 2018. Polaris Project 2017: Vegetation biomass, carbon, and nitrogen, Yukon-Kuskokwim Delta, Alaska. Arctic Data Center, https://doi.org/10.18739/A2FJ29D12 2. Ludwig, S., Holmes, R.M., Natali, S., Mann, P., and Schade, J. 2018. Polaris Project 2017: Soil fluxes, carbon, and nitrogen, Yukon-Kuskokwim Delta, Alaska. Arctic Data Center, https://doi.org/10.18739/A2Q23R08G 3. Natali, S. 2018. Yukon-Kuskokwim Delta fire: thaw depth, soil temperature, and point-intercept vegetation, Yukon-Kuskokwim Delta Alaska, 2015-2016. Arctic Data Center, https://doi.org/10.18739/A2707WP16 4. Ludwig, S., Holmes, R.M., Natali, S., Schade, J., and Mann, P. 2018. Yukon-Kuskokwim Delta fire: vegetation biomass, Yukon-Kuskokwim Delta Alaska, 2016. Arctic Data Center, https://doi.org/10.18739/A29S1KK6T 5. Olefeldt, D., Hovemyr, M., Kuhn, M., Bastviken, D., and Bohn, T. 2021. The fractional land cover estimates from the Boreal-Arctic Wetland and Lake Dataset (BAWLD), 2021. Arctic Data Center, https://doi.org/10.18739/A2C824F9X
Raynolds_2018	Arctic Vegetation Plots ATLAS Project North Slope and Seward Peninsula, AK, 1998-2000	Raynolds, M.K., Walker, D.A., Breen, A.L., and Edwards, E.J. 2018. Arctic Vegetation Plots ATLAS Project North Slope and Seward Peninsula, AK, 1998-2000. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1541
Rocha_2015	Anatuvuk River fire scar thaw depth measurements during the 2008 to 2014 growing season	Rocha, A., and Shaver, G. 2016. Anatuvuk River fire scar thaw depth measurements during the 2008 to 2014 growing season ver 6. Environmental Data Initiative, https://doi.org/10.6073/pasta/93121fc86e6fbcf88de4a9350609aed6
Rocha_2020	Leaf area index (LAI) recorded from a nitrogen (N), phosphorus (P) and N+P fertilization experiment at the 2007 Anaktuvuk River, Alaska, USA fire scar during the 2016-2019 growing seasons	Rocha, A. 2020. Leaf area index (LAI) recorded from a nitrogen (N), phosphorus (P) and N+P fertilization experiment at the 2007 Anaktuvuk River, Alaska, USA fire scar during the 2016-2019 growing seasons ver 2. Environmental Data Initiative, https://doi.org/10.6073/pasta/06559231aa04fd7fecd661f107985c8f
Schaefer_2021	ABoVE: Soil Moisture and Active Layer Thickness in Alaska and NWT, Canada, 2008-2020	Schaefer, K., Clayton, L.K., Battaglia, M., Bourgeau-Chavez, L.L., Chen, R.H., Chen, A.C., Chen, J., Bakian-Dogaheh, K., Douglas, T.A., Grelick, S.E., Iwahana, G., Jafarov, E., Liu, L., Ludwig, S., Michaelides, R.J., Moghaddam, M., Natali, S., Panda, S.K., Parsekian, A.D., Rocha, A.V., Schaefer, S.R., Sullivan, T.D., Tabatabaeenejad, A., Wang, K., Wilson, C.J., Zebker, H.A., Zhang, T., and Zhao, Y. 2021. ABoVE: Soil Moisture and Active Layer Thickness in Alaska and NWT, Canada, 2008-2020. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1903
Schickhoff_2018	Arctic Vegetation Plots in Willow Communities, North Slope, Alaska, 1997	Schickhoff, U., Walker, D.A., Breen, A.L., and Druckenmiller, L.A. 2018. Arctic Vegetation Plots in Willow Communities, North Slope, Alaska, 1997. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1368
Shaver_2012a	Leaf Area Index every 15 cm of 1m x 1m chamber flux and point frame plots and sites where dataloggers monitored PAR above, within and below S. pulchra and B. nana canopies during the growing season at the Toolik Field Station in AK, Summer 2012	Shaver, G. 2012. Leaf Area Index every 15 cm of 1m x 1m chamber flux and point frame plots and sites where dataloggers monitored PAR above, within and below S. pulchra and B. nana canopies during the growing season at the Toolik Field Station in AK, Summer 2012. Environmental Data Initiative, https://doi.org/10.6073/pasta/627698983259d6963a6083d5251723cc
Shaver_2012b	3 different LAI methodologies, Toolik Field Station in AK the summer of 2012	Shaver, G. 2023. Summary of three different Leaf Area Index (LAI) methodologies of 19 1m x 1m point frame plots sampled near the LTER Shrub plots at Toolik Field Station in AK the summer of 2012. Environmental Data Initiative, https://doi.org/10.6073/pasta/17302da4bd951a9dc4140187f03fae24
Shaver_2013	Summary of soil temperature, moisture, and thaw depth for 14 chamber flux measurements sampled near LTER shrub sites at Toolik Field Station, Alaska, summer 2012	Shaver, G. 2013. Summary of soil temperature, moisture, and thaw depth for 14 chamber flux measurements sampled near LTER shrub sites at Toolik Field Station, Alaska, summer 2012. Environmental Data Initiative, https://doi.org/10.6073/pasta/7ccf390e6fe4824e93b7a2b844605a40
Shaver_2016	Summer soil temperature and moisture at the Anaktuvuk River sites from 2010 to 2013	Shaver, G., and Laundre, J. 2016. Summer soil temperature and moisture at the Anaktuvuk River Severely burned site from 2010 to 2013 ver 2. Environmental Data Initiative, https://doi.org/10.6073/pasta/3094e3e293703580c95e17ddce51af65
Sloan_2018	Arctic Vegetation Plots for NGEE-Arctic at Barrow, Alaska, 2012	Sloan, V.L., Walker, D.A., Breen, A.L., and Druckenmiller, L.A. 2018. Arctic Vegetation Plots for NGEE-Arctic at Barrow, Alaska, 2012. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1505

Tsuyuzaki_2013	Field data collected in Kougarok, Seward Peninsula in 2013	Tsuyuzaki, S., Iwahana, G., and Saito, K. 2018. Tundra fire alters vegetation patterns more than the resultant thermokarst. Polar Biology, 41, 753-761 https://doi.org/10.1007/s00300-017-2236-7
Tweedie_2018	Arctic Vegetation Plots at Atqasuk, Alaska, 1975, 2000, and 2010	Tweedie, C.E., Webber, P.J., Komarkova, V., Villarreal, S., Walker, D.A., Breen, A.L., and Druckenmiller, L.A. 2018. Arctic Vegetation Plots at Atqasuk, Alaska, 1975, 2000, and 2010. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1371
Walker_2018a	Arctic Vegetation Plots Legacy Project Barter Island and Point Barrow, Alaska, 1994	Walker, D.A., and Druckenmiller, L.A. 2018. Arctic Vegetation Plots Legacy Project Barter Island and Point Barrow, Alaska, 1994. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1534
Walker_2018b	Arctic Vegetation Plots, Prudhoe Bay ArcSEES Road Study, Lake Colleen, Alaska, 2014	Walker, D.A., and Raynolds, M.K. 2018. Arctic Vegetation Plots, Prudhoe Bay ArcSEES Road Study, Lake Colleen, Alaska, 2014. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1555
Walker_2018c	Arctic Vegetation Plots from Pingo Communities, North Slope, Alaska, 1984-1986	Walker, M.D., and Walker, D.A. 2018. Arctic Vegetation Plots from Pingo Communities, North Slope, Alaska, 1984-1986. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1507
Walker_2018d	Arctic Vegetation Plots at Happy Valley, Alaska, 1994	Walker, D.A. 2018. Arctic Vegetation Plots at Happy Valley, Alaska, 1994. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1354
Walker_2018e	Arctic Vegetation Plots at Imnavait Creek, Alaska, 1984-1985	Walker, D.A. 2018. Arctic Vegetation Plots at Imnavait Creek, Alaska, 1984-1985. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1356
Walker_2018f	Arctic Vegetation Plots at Toolik Lake, Alaska, 1989	Walker, D.A., and Barry, N.C. 2018. Arctic Vegetation Plots at Toolik Lake, Alaska, 1989. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1333
Webber_2018	Arctic Vegetation Plots for IBP Tundra Biome, Barrow, Alaska, 1972-2010	Webber, P.J., Villarreal, S., Tweedie, C.E., and Walker, D.A. 2018. Arctic Vegetation Plots for IBP Tundra Biome, Barrow, Alaska, 1972-2010. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1535
Williams_1999	Measurements along the Kuparuk River basin, 1997, North Slope, AK	Williams, M., and Rastetter, E. 1999. Measurements of Leaf area, foliar C and N for 14 sites along a transect down the Kuparuk River basin, summer 1997, North Slope, Alaska. Environmental Data Initiative, https://doi.org/10.6073/pasta/a5a4d4154e0a8181a5523b4d9c49ed99

3. Application and Derivation

This database is a comprehensive collection of *in situ* data collected in Alaskan tundra, an area that is extremely remote and thus difficult to access. The data are useful for long-term studies of tundra ecosystems and their responses to fire disturbance.

4. Quality Assessment

Because this database is a compilation of existing datasets, no uncertainty analysis was conducted.

5. Data Acquisition, Materials, and Methods

This database was compiled from 37 datasets resulting from field surveys conducted across the Alaskan tundra over the past half century (Table 2, Section 2 of this document). The included datasets were harmonized before they were incorporated into the database. A wide variety of variables are included, such as active layer thickness, vegetation cover (by plant functional types), soil moisture and temperatures, as well as the wildfire history. The *Method_Differences.csv* file provides notes on the field measurement methods employed for selected variables by dataset.

This dataset is a comprehensive collection of in-situ data collected in Alaskan tundra, an area that is extremely remote and thus difficult to access. It provides a unique lens into various long-term ecological processes within the tundra (such as the fire-permafrost-vegetation interactions) under a rapidly changing climate.

6. Data Access

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

Field Data on Soils, Vegetation, and Fire History for Alaska Tundra Sites, 1972-2020

Contact for Data Center Access Information:

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

7. References

Berner, L.T., P. Jantz, K.D. Tape, and S.J. Goetz. 2018. ABoVE: Gridded 30-m Aboveground Biomass, Shrub Dominance, North Slope, AK, 2007-2016. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1565

Breen, A.L., & Walker, D.A. (2018). Arctic Vegetation Plots in Burned and Unburned Tundra, Alaska, 2011-2012. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1547

Breen, A.L., Walker, D.A., & Druckenmiller, L.A. (2018). Arctic Vegetation Plots, Poplars, Arctic and Interior AK and YT, Canada, 2003-2005. ORNL Distributed Active Archive Center, https://doi.org/10.3334/ORNLDAAC/1376

Davidson, S.J., and D. Zona. 2018. Arctic Vegetation Plots in Flux Tower Footprints, North Slope, Alaska, 2014. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1546

Ebersole, J.J. 2018. Arctic Vegetation Plots at Oumalik, AK, 1983-1985. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1506

Frost, G.V., R.A. Loehman, P.R. Nelson, and D.P. Paradis. 2020. ABoVE: Vegetation Composition across Fire History Gradients on the Y-K Delta, Alaska. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1772

Hollingsworth, T.N., A. Breen, M.C. Mack, and R.E. Hewitt. 2020. Seward Peninsula post-fire vegetation and soil data from multiple burns occuring from 1971 to 2012: SPANFire Study Sites Sampled in July 2012. http://www.lter.uaf.edu/data/data-detail/id/752

Iwahana, G., K. Harada, M. Uchida, S. Tsuyuzaki, K. Saito, K. Narita, K. Kushida, and L.D. Hinzman. 2016. Geomorphological and geochemistry changes in permafrost after the 2002 tundra wildfire in Kougarok, Seward Peninsula, Alaska. Journal of Geophysical Research: Earth Surface 121:1697-1715. https://doi.org/10.1002/2016JF003921

Jandt, R., K. Joly, C.R. Meyers, and C. Racine. 2008. Slow recovery of lichen on burned caribou winter range in Alaska tundra: Potential influences of climate warming and other disturbance factors. Arctic Antarctic and Alpine Research 40: 89-95. https://doi.org/10.1657/1523-0430(06-122)[jandt]2.0.co;2

Jandt, R.R., and C.R. Meyers. 2000. Recovery of lichen in tussock tundra following fire in northwestern Alaska. In: US Department of the Interior, Bureau of Land Management, Alaska State Office. https://doi.org/10.5962/BHL.TITLE.61209

Jorgenson, M.T. 2018. Arctic Vegetation Plots in NPS Arctic Network Parks, Alaska, 2002-2008. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1542

Kade, A.N. 2018. Arctic Vegetation Plots at Frost Boil Sites, North Slope, Alaska, 2000-2006. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1361

Loboda, T.V., L.K. Jenkins, D. Chen, J. He, and A. Baer. 2022. Burned and Unburned Field Site Data, Noatak, Seward, and North Slope, AK, 2016-2018. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1919

Ludwig, S., R.M. Holmes, J. Schade S. Natali, and P. Mann. 2018. Polaris Project 2017: Vegetation biomass, carbon, and nitrogen, Yukon-Kuskokwim Delta, Alaska. Arctic Data Center. https://doi.org/10.18739/A2FJ29D12

Ludwig, S., R.M. Holmes, S. Natali, J. Schade, and P. Mann. 2018. Yukon-Kuskokwim Delta fire: vegetation biomass, Yukon-Kuskokwim Delta Alaska, 2016. Arctic Data Center. https://doi.org/10.18739/A29S1KK6T

Ludwig, S., R.M. Holmes, S. Natali, P. Mann, and J. Schade. 2018. Polaris Project 2017: Soil fluxes, carbon, and nitrogen, Yukon-Kuskokwim Delta, Alaska. Arctic Data Center. https://doi.org/10.18739/A2Q23R08G

Macander, M.J., G.V. Frost, P.R. Nelson, and C.S. Swingley. 2020. ABoVE: Tundra Plant Functional Type Continuous-Cover, North Slope, Alaska, 2010-2015. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1830

Mack, M. 2016. Characterization of burned and unburned moist acidic tundra sites for estimating C and N loss from the 2007 Anaktuvuk River Fire, sampled in 2008. ver 5. Environmental Data Initiative. https://doi.org/10.6073/pasta/81868b65c853d5eb2052d9f1a8397d0d

Miller, E.A., R. Jandt, C.A. Baughman, B.M. Jones, and D.A. Yokel. 2022. ABoVE: Post-Fire and Unburned Field Site Data, Anaktuvuk River Fire Area, 2008-2017. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/2119

Natali, S. 2018. Yukon-Kuskokwim Delta fire: thaw depth, soil temperature, and point-intercept vegetation, Yukon-Kuskokwim Delta Alaska, 2015-2016. Arctic Data Center. https://doi.org/10.18739/A2707WP16

Nawrocki, T.W., A.F. Wells, M.J. Macander, E.M. Powers, L.A. Flagstad, A. Droghini, H.A. Gravely, M.A. Steer, G.V. Frost, T.V. Boucher, C.A. Roland, A.E. Miller, D.K. Swanson, and J.K Johanson. 2022. Alaska Vegetation Plots (AKVEG) Database. University of Alaska Anchorage. https://akveg.uaa.alaska.edu

Olefeldt, D., M. Hovemyr, M. Kuhn, D. Bastviken, and T. Bohn. 2021. The fractional land cover estimates from the Boreal-Arctic Wetland and Lake Dataset (BAWLD), 2021. Arctic Data Center. https://doi.org/10.18739/A2C824F9X

Raynolds, M.K. 2018. Arctic Vegetation Plots ATLAS Project North Slope and Seward Peninsula, AK, 1998-2000. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1541

Rocha, A. 2020. Leaf area index (LAI) recorded from a nitrogen (N), phosphorus (P) and N+P fertilization experiment at the 2007 Anaktuvuk River, Alaska, USA fire scar during the 2016-2019 growing seasons ver 2. Environmental Data Initiative. https://doi.org/10.6073/pasta/06559231aa04fd7fecd661f107985c8f

Rocha, A., and G. Shaver. 2016. Anatuvuk River fire scar thaw depth measurements during the 2008 to 2014 growing season ver 6. Environmental Data Initiative. https://doi.org/10.6073/pasta/93121fc86e6fbcf88de4a9350609aed6

Schaefer, K., L.K. Clayton, M.J. Battaglia, L.L. Bourgeau-Chavez, R.H. Chen, A.C. Chen, J. Chen, K. Bakian-Dogaheh, T.A. Douglas, S.E. Grelick, G. Iwahana, E. Jafarov, L. Liu, S. Ludwig, R.J. Michaelides, M. Moghaddam, S. Natali, S.K. Panda, A.D. Parsekian, A.V. Rocha, S.R. Schaefer, T.D. Sullivan, A. Tabatabaeenejad, K. Wang, C.J. Wilson, H.A. Zebker, T. Zhang, and Y. Zhao. 2021. ABoVE: Soil Moisture and Active Layer Thickness in Alaska and NWT, Canada, 2008-2020. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1903

Schickhoff, U. 2018. Arctic Vegetation Plots in Willow Communities, North Slope, Alaska, 1997. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1368

Shaver, G. 2012. Leaf Area Index every 15 cm of 1m x 1m chamber flux and point frame plots and sites where dataloggers monitored PAR above, within and below S. pulchra and B. nana canopies during the growing season at the Toolik Field Station in AK, Summer 2012. Environmental Data Initiative. https://doi.org/10.6073/pasta/627698983259d6963a6083d5251723cc

Shaver, G. 2013. Summary of soil temperature, moisture, and thaw depth for 14 chamber flux measurements sampled near LTER shrub sites at Toolik Field Station, Alaska, summer 2012. Environmental Data Initiative. https://doi.org/10.6073/pasta/7ccf390e6fe4824e93b7a2b844605a40

Shaver, G. 2023. Summary of three different Leaf Area Index (LAI) methodologies of 19 1m x 1m point frame plots sampled near the LTER Shrub plots at Toolik Field Station in AK the summer of 2012. Environmental Data Initiative. https://doi.org/10.6073/pasta/17302da4bd951a9dc4140187f03fae24

Shaver, G., and J. Laundre. 2016. Summer soil temperature and moisture at the Anaktuvuk River Severely burned site from 2010 to 2013, ver 2. Environmental Data Initiative. https://doi.org/10.6073/pasta/3094e3e293703580c95e17ddce51af65

Sloan, V.L. 2018. Arctic Vegetation Plots for NGEE-Arctic at Barrow, Alaska, 2012. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1505

Tsuyuzaki, S., Iwahana, G., & Saito, K. (2018). Tundra fire alters vegetation patterns more than the resultant thermokarst. Polar Biology, 41, 753-761. https://doi.org/10.1007/s00300-017-2236-7

Tweedie, C.E., P.J. Webber, V. Komarkova, and S. Villarreal. 2018. Arctic Vegetation Plots at Atqasuk, Alaska, 1975, 2000, and 2010. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1371

Walker, D.A. 2018. Arctic Vegetation Plots at Happy Valley, Alaska, 1994. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1354

Walker, D.A. 2018. Arctic Vegetation Plots at Imnavait Creek, Alaska, 1984-1985. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1356

Walker, D.A. 2018. Arctic Vegetation Plots at Toolik Lake, Alaska, 1989. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1333

Walker, D.A. 2018. Arctic Vegetation Plots Legacy Project Barter Island and Point Barrow, Alaska, 1994. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1534

Walker, D.A. 2018. Arctic Vegetation Plots, Prudhoe Bay ArcSEES Road Study, Lake Colleen, Alaska, 2014. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1555

Walker, M.D. 2018. Arctic Vegetation Plots from Pingo Communities, North Slope, Alaska, 1984-1986. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1507

Webber, P.J., S. Villarreal, and C.E. Tweedie. 2018. Arctic Vegetation Plots for IBP Tundra Biome, Barrow, Alaska, 1972-2010. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1535

Williams, M., and E. Rastetter. 1999. Measurements of Leaf area, foliar C and N for 14 sites along a transect down the Kuparuk River basin, summer 1997, North Slope, Alaska. Environmental Data Initiative. https://doi.org/10.6073/pasta/a5a4d4154e0a8181a5523b4d9c49ed99