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ABoVE: Post-Fire and Unburned Vegetation Community and Field Data, NWT, Canada, 2017

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Dataset Version: 1

Summary

This dataset provides vegetation community characteristics, soil moisture, and biophysical data collected in 2017 from 11 study sites in the ABoVE Study area. The 11 study areas contained 28 sites that were burned by wildfires in 2014 and 2015, and 10 unburned sites in the Northwest Territories (NWT), Canada. Burned sites included peatland and upland. These field data include assessment of burn severity, vegetation inventories, ground cover, diameter and height for trees and shrubs, seedling and sprouting cover, soil moisture, and depth of unfrozen soil. Plot sizes were 10 m x 10 m with smaller subplots for selected measurements. Similar data were collected for these sites in the years 2015-2019 and are available in related separate datasets. Field data are provided in CSV format. The dataset includes digital photographs (in JPEG format) of vegetation conditions at sampling sites.

There are 970 data files included in this dataset: Eight files are in comma-separated values (CSV; *.csv) format and 962 digital photographs are in JPEG (*.jpg) format.

Figure 1. Researchers collecting data on vegetation and biophysical characteristics at a study site in Northwest Territories of Canada that was burned by wildfires in 2014-2015.

Citation

Bourgeau-Chavez, L.L., S.E. Grelick, N.H.F. French, D. Tanzer, and E.S. Kane. 2022. ABoVE: Post-Fire and Unburned Vegetation Community and Field Data, NWT, Canada, 2017. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1771

Table of Contents

1. Dataset Overview

This dataset provides vegetation community characteristics, soil moisture, and biophysical data collected in 2017 from 11 study sites in the ABoVE Study

area. The 11 study areas contained 28 sites that were burned by wildfires in 2014 and 2015, and 10 unburned sites in the Northwest Territories (NWT), Canada. Burned sites included peatland and upland. These field data include assessment of burn severity, vegetation inventories, ground cover, diameter and height for trees and shrubs, seedling and sprouting cover, soil moisture, and depth of unfrozen soil. Plot sizes were 10 m x 10 m with smaller subplots for selected measurements. Similar data were collected for these sites in the years 2015-2019 and are available in related separate datasets. Field data are provided in CSV format. The dataset includes digital photographs (in JPEG format) of vegetation conditions at sampling sites.

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

Bourgeau-Chavez, L.L., N.H.F. French, S. Endres, L. Jenkins, M. Battaglia, E. Serocki, and M. Billmire. 2016. ABoVE: Burn Severity, Fire Progression, Landcover and Field Data, NWT, Canada, 2014. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1307

- Bourgeau-Chavez et al. (2016) provides maps of peatland vegetation and fire progression during the 2014 fire season along with field data on burn severity, and the depth of peat and thawed ground at 30 burned sites. Aboveground biomass, soil moisture, and seedling sprouting data were collected at 17 of 30 sites.

Bourgeau-Chavez, L.L., S. Endres, L. Jenkins, M. Battaglia, E. Serocki, and M. Billmire. 2017. ABoVE: Burn Severity, Fire Progression, and Field Data, NWT, Canada, 2015-2016. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1548

- Bourgeau-Chavez et al. (2017) includes a fire progression map for 2015 and field data on biophysical and vegetation community characteristics as measured in Bourgeau-Chavez et al. (2016). Field data are from sites burned in 2014 and 2015.

Bourgeau-Chavez, L.L., J.A. Graham, S. Endres, N.H.F. French, M. Battaglia, D. Hansen, and D. Tanzer. 2019. ABoVE: Ecosystem Map, Great Slave Lake Area, Northwest Territories, Canada, 1997-2011. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1695

- Bourgeau-Chavez et al. (2019) provides ecosystem type map of the area surrounding Great Slave Lake, Northwest Territories, Canada for the time period 1997 to 2011 before the large fire season of 2014 to better understand the effects of fires in the area.

Bourgeau-Chavez, L.L., M. Battaglia, E.S. Kane, L.M. Cohen, and D. Tanzer. 2019. ABoVE: Post-Fire and Unburned Vegetation Community and Field Data, NWT, Canada, 2018. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1703

Bourgeau-Chavez, L.L., M.J. Battaglia, P. Siqueira, C. Weinstein, S. Rose, H. Smith, D. Uhelski, and D.J.L. Vander Bilt. 2021. ABoVE: Post-Fire and Unburned Vegetation Community and Field Data, NWT, Canada, 2019. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1900

- Bourgeau-Chavez et al. (2019) and Bourgeau-Chavez et al. (2021) hold field data collected in 2018 and 2019 from sites burned in 2014 and 2015. In addition, nine unburned sites were established for validation of UAVSAR airborne data collection. The same biophysical and vegetation community characteristics as measured in Bourgeau-Chavez et al. (2016; 2017) are included along with additional measures of woody vegetation.

Collectively, Bourgeau-Chavez et al. (2017; 2019; 2021; 2022) provide data on the impacts of the 2014 and 2015 fires on peatland ecosystems in NWT and the subsequent recovery of vegetation communities in those ecosystems from 2015 to 2019. The variables in the field data are highly similar across years; however, there are differences between the datasets due to the addition of new metrics and new sites as well as the abandonment of others.

Acknowledgments

2. Data Characteristics

Spatial Coverage: Near Great Slave Lake in Northwest Territories, Canada

ABoVE Reference Locations

Domain: Core ABoVE

State/territory: NWT

Region: Great Slave Lake

Grid Cells: Ah002v001, Bh012v011, Bh013v010, Bh013v011, Bh014v011, Ch075v071, Ch076v069, Ch076v071, Ch077v068, Ch078v067, Ch078v069, Ch079v065, Ch079v066, Ch083v067, Ch084v067, Ch084v068

Spatial Resolution: Field plot sizes range from 1–100 m^2

Temporal Coverage: 2017-08-03 to 2017-08-10 (some plot data from 2015-07-13 are included)

Temporal Resolution: One-time estimates

Study Area: Latitude and longitude are given in decimal degrees.

Site	Westernmost Longitude	Easternmost Longitude	Northernmost Latitude	Southernmost Latitude
Northwest Territories, Canada	-117.3784	-111.3674	62.5828	60.5236

Data File Information

There are eight data files in comma-separated values (*.csv) format (Table 1) that provide measurements of vegetation, soil moisture, depth of the unfrozen ground, and other biophysical data collected in 2017 from sites in 11 study areas. These areas include sites that were burned by wildfire in 2014 or 2015 and also unburned sites (Table 2).

There are also 962 digital photographs in JPEG format (*.jpg). The files are named *Site_Plot_XXX_Y*.jpg, where

- *Site* = site name (Table 2)
- *Plot* = plot number, typically 1 to 6
- *XXX* = direction facing (N, E, W, S, nadir), "seedling" for seedling quadrat, or "other" for a miscellaneous photograph.
- *Y* = "a" or "b"; optional, used if >1 photo of a given *XXX* type is included for the plot.

Data File Details

Missing data are reported as NA if the column is text and as -9999 if the column is numeric.

Table 1. File names and descriptions.

File Name	Description
NWT_Wildfires_Field_data_summary_2017.csv	This file provides a summary of the field data collected at each site. It includes geographic coordinates, date of sampling, and types of data collected at 42 sites in 11 study areas. Site names that include "VAL" indicate unburned, validation sites for this study.
NWT_Wildfires_Burn_severity_Regrowth_2017.csv	Data for burn severity, the cover of woody and herbaceous vegetation, mosses, and liverworts along with measurements of peat, depth of unfrozen soil, and soil pH at 28 sites burned in 2014-2015 wildfires. The file lists the file names of photographs taken at these sites.
NWT_Wildfires_Biophysical_2017.csv	Data on ground, shrub, and canopy cover and ecosystem characteristics.
NWT_Wildfires_Biophysical_Inventory_2017.csv	Data on trees and shrubs.
NWT_Wildfires_Seedling_Sprouting_2017.csv	Data on seedlings/sproutings in areas affected by wildfires.
NWT_Wildfires_SoilMoisture_Hydrosensel_2017_BurnedSites.csv	Soil moisture and temperature data for sites affected by wildfires.
NWT_Wildfires_SoilMoisture_Hydrosensel_2017_UnburnedSites.csv	Soil moisture and temperature data for unburned, validation sites.
NWT_Wildfires_Unburned_validation_2017.csv	Data on topography, depth of unfrozen soil, ground cover, woody vegetation, and peat depth for unburned validation sites. The file lists file names of photographs taken at these sites.

Table 2. Names of study areas and sites. Study areas with "Val" in the name are unburned, validation sites.

Study Area	Sites
SS3	SS3-28, SS3-29, SS3-64, SS3-65, SS3-200
SS50	SS50-3, SS50-200
ZF14	ZF14-3, ZF14-200, ZF14-203, ZF14-207, ZF14-208, ZF14-210, ZF14-220
ZF17	ZF17-6, ZF17-7, ZF17-9, ZF17-40, ZF17-200, ZF17-203, ZF17-206, ZF17-207
ZF20	ZF20-3, ZF20-10, ZF20-26, ZF20-47
ZF28	ZF28-201
ZF46	ZF46-14
SS3-Val	SS3-Val205
ZF14-Val	ZF14-Val200, ZF14-Val-2R, ZF14-Val6, ZF14-Val7R
ZF20-Val	ZF20-Val200, ZF20-Val201, ZF20-Val202, ZF20-Val210
ZF46-Val	ZF46-Val200

Table 3. Variables names and descriptions in the file NWT_Wildfires_Field_data_summary_2017.csv.

Variable	Unit	Description
Site		Unique name given to a field site
Plot		Plot number for sampling location (1 to 6)
Site_Name		Site name followed by plot number
Date	YYYY-MM-DD	
Latitude	degrees_north	
Longitude	degrees_east	
BurnSeverity	Yes/No/YYYY	Presence of Burn Severity Data / other year of collection provided if applicable
Seedling/Sprouting		Presence of seedling/Sprouting Data: Yes or No

Variable	Unit	Description
Biophysical	Yes/No/YYYY	Presence of Biophysical Data / other year of collection provided if applicable
Soil Moisture		Presence of Soil Moisture Data: Yes or No
comment		

Table 4. Variables names and descriptions in the file NWT_Wildfires_Burn_severity_Regrowth_2017.csv.

Variable	Unit	Description
Site		Unique name given to a field site
Plot		Plot number (1-6 typically)
Date	YYYY-MM-DD	Date of field data collection
Time	HH:MM	Time at which fieldwork began in local time (MDT)
Observers		Initials of person(s) who collected data
Latitude	degrees_north	Latitude from GPS measured field location
Longitude	degrees_east	Longitude from GPS measured field location
Aspect		Cardinal direction that slope is facing
Slope Position		Location of field site on sloped land: top, middle, base
Slope_percent	percent	Percent rise-over-run for hillslope estimated
Elevation	m	Height above mean sea level from the GPS unit
Fire History		Fire history known: Yes or No
Year of burn	YYYY	Year of recent fire
Ecosystem_Class		Type of ecosystem, separately or in combination; Fen, Bog/Bog Like Treed Fen/Fen Like, Shrub Fen/Fen Like, Open Fen/Fen Like, Peatland Like, Peaty Spruce, Upland, Aspen Upland, Black Spruce Upland*see reference
Ash		Amount of ash present on ground surface: No, Light, Moderate, or Heavy
Moss_Unburned	percent	Percent of moss in 10-m x 10-m plot that is unburned
Moss_Singed	percent	Percent of moss in 10-m x 10-m plot that is singed
Moss_Light	percent	Percent of moss in 10-m x 10-m plot that is lightly burned
Moss_Moderate	percent	Percent of moss in 10-m x 10-m plot that is moderately burned
Moss_Severe	percent	Percent of moss in 10-m x 10-m plot that is severely burned
Litter_Unburned	percent	Percent of litter in 10-m x 10-m plot that is unburned
Litter_Singed	percent	Percent of litter in 10-m x 10-m plot that is lightly singed
Litter_Charred	percent	Percent of litter in 10-m x 10-m plot that is charred
Litter_Ashed	percent	Percent of litter in 10-m x 10-m plot that is ashed
Shrub_Unburned	percent	Percent of shrubs in 10-m x 10-m plot that is unburned
Shrub_Scorched	percent	Percent of shrubs in 10-m x 10-m plot that is lightly scorched
Shrub_LimbsLeft	percent	Percent of shrubs in 10-m x 10-m plot with some limbs left
Shrub_Consumed	percent	Percent of shrubs in 10-m x 10-m plot that is consumed
Canopy_NoMortality	percent	Percent of trees in 10-m x 10-m plot with no tree mortality
Canopy_DeadTreeNoFoliageConsumed	percent	Percent of trees in 10-m x 10-m plot with dead trees but no foliage consumed
Canopy_NeedlesSmallBranchesBurrned	percent	Percent of trees in 10-m x 10-m plot with needles and small branches burned
Canopy_SomeSecondayBranchesRemain	percent	Percent of trees in 10-m x 10-m plot with some secondary branches remaining
Canopy_>30percentPrimaryBranchesRemain	percent	Percent of trees in 10-m x 10-m plot with secondary branches burned and >30% of primary branches left
Canopy_<30percentPrimaryBranchesRemain	percent	Percent of trees in 10-m x 10-m plot with <30% primary branches remaining

Variable	Unit	Description
Canopy_NoPrimaryBranchesPoleCharreed	percent	Percent of trees in 10-m x 10-m plot with no primary branches and pole charred
Adventitious_Root1	cm	Height from current ground level up to one randomly selected adventitious root
Adventitious_Root2	cm	Height from current ground level up to one randomly selected adventitious root
Adventitious_Root3	cm	Height from current ground level up to one randomly selected adventitious root
Adventitious_Root4	cm	Height from current ground level up to one randomly selected adventitious root
Adventitious_Root5	cm	Height from current ground level up to one randomly selected adventitious root
NadirCover_Trees_Live	percent	* Nadir percent cover of live trees in 10-m x 10-m plot
NadirCover_ShrubLive	percent	* Nadir percent cover of live shrubs in 10-m x 10-m plot
NadirCover_ShrubDead	percent	* Nadir percent cover of dead shrubs in 10-m x 10-m plot
NadirCover_LiveWoodyDebris	percent	* Nadir percent cover of live woody debris in 10-m x 10-m plot
NadirCover_WoodyDebris	percent	* Nadir percent cover of woody debris in 10-m x 10-m plot
NadirCover_HerbaceousLive	percent	* Nadir percent cover of live herbaceous in 10-m x 10-m plot
NadirCover_HerbaceousDead	percent	* Nadir percent cover of dead herbaceous in 10-m x 10-m plot
NadirCover_MossLive	percent	* Nadir percent cover of live moss in 10-m x 10-m plot
NadirCover_MossLive_notes		Notes for NadirCover_MossLive
NadirCover_MossDead	percent	* Nadir percent cover of dead moss in 10-m x 10-m plot
NadirCover_MossDead_notes		Notes for NadirCover_MossDead
NadirCover_LiverwortLive	percent	* Nadir percent cover of live liverwort in 10-m x 10-m plot
NadirCover_LiverwortDead	percent	* Nadir percent cover of dead liverwort in 10-m x 10-m plot
NadirCover_MineralSoil	percent	* Nadir percent cover of exposed mineral soil in 10-m x 10-m plot
NadirCover_EquisetumLive	percent	* Nadir percent cover of live equisetum in 10-m x 10-m plot
Tree_Height1	m	Height (m) of tree 1
Tree_Condition1		Condition of tree 1: live or dead
Tree_Species1		Scientific name of of tree 1 species
Tree_Height2	m	Height (m) of tree 2
Tree_Condition2		Condition of tree 2: live or dead
Tree_Species2		Scientific name of of tree 2 species
Tree_Height3	m	Height (m) of tree 3
Tree_Condition3		Condition of tree 3: live or dead
Tree_Species3		Scientific name of of tree 3 species
Thaw_Depth_1	cm	Depth to ice measured with a bully tool, sample 1
Thaw_Depth_2	cm	Depth to ice measured with a bully tool, sample 2
Thaw_Depth_3	cm	Depth to ice measured with a bully tool, sample 3
Thaw_Depth_4	cm	Depth to ice measured with a bully tool, sample 4
Thaw_Depth_5	cm	Depth to ice measured with a bully tool, sample 5
Thaw_Depth_6	cm	Depth to ice measured with a bully tool, sample 6
depth_to_rock (cm)	cm	Depth to rock measure with a bully tool
Peat_Depth	cm	Total peat depth
Peat_Depth_notes	year	Notes on peat depth measurement. ">50" indicates that depth was greater than length of probe
Soil_pH	pH units	pH of soil
Soil_pH_notes		Notes on soil pH measurement

Variable	Unit	Description
Camera_ID		ID number of MTRI camera used for photos
North_Photo		File name(s) for north-facing photo(s) from plot center
East_Photo		File name(s) for east-facing photo(s) from plot center
South_Photo		File name(s) for south-facing photo(s) from plot center
West_Photo		File name(s) for west-facing photo(s) from plot center
Nadir_Photo		File name(s) for nadir facing photo(s) from plot center
Nadir_Seedling_photo		File names(s) for nadir photo(s) of 1 m x 1 m seedling plot
Notes_1	text	Whether the site was previously sampled for burn severity. If previously sampled, columns 15 through 40 will have missing data (NA or -9999).
Notes_2	text	Additional comments

* Nadir cover is from a bird's-eye view of the plot. Multiple layers are not considered; therefore, all nadir cover values must add to no more than 100 percent.

Table 5. Variables names and descriptions in the file NWT_Wildfires_Biophysical_2017.csv.

Variable	Units	Description
Site		Unique name given to a field point
Plot		Plot number (1-6 typically)
Date	YYYY-MM-DD	Date of field data collection
Observer		Initials of person(s) who collected data
Latitude	decimal degrees	GPS measured field location
Longitude	decimal degrees	GPS measured field location
Time	HH:MM	Time at the start of the sampling in the plot reported in local time (MDT)
Live_Canopy_Cover	percent	*Percent of canopy (tree) cover classified as live
Medium_shrub_cover	percent	*Percent of shrub cover classified as live
Dominant_Cover		Description of the dominant cover type. Choices included: forested; shrub; herbaceous or some combination of these cover types
Ecosystem_Type		Ecosystem type(s) represented in the plot: bog; fen; lowland; upland see table for defining characteristics
Wetness		Description of the soil moisture status: dry; moist; soggy; standing water or some combination of these conditions
Plot_Size	m	Size of sampling plot reported in meters by meters
OS_top_condition		Notes on the condition of the top layer of organic soil with respect to type (thatch, live moss, dead moss, etc.) and to burning: ash; burned; singed or charred or unburned
OS_top_thickness	cm	Thickness of the top component of the organic soil layer reported in centimeters
OS_Dead_moss_layer_thickness	cm	Thickness of the dead moss component of the organic soil layer reported in centimeters
OS_Upper_duff_layer_thickness	cm	Thickness of the upper duff component of the organic soil layer reported in centimeters
OS_Lower_duff_layer_thickness	cm	Thickness of the lower duff component of the organic soil layer reported in centimeters
Total_Peat_depth	cm	Depth of peat
GC_Sphag_coverage	percent	* Percent of ground covered in Sphagnum moss reported as percent of total plot area
GC_Sphag_distribution		Pattern of distribution of sphagnum: reported as "Even" or "Patchy"
GC_Feather_Moss_coverage	percent	* Percent of ground covered in Feather moss reported as percent of total plot area
GC_Feather_Moss_distribution		Pattern of distribution of feather moss: reported as "Even" or "Patchy"
GC_Reindeer_lichen_coverage	percent	* Percent of ground covered in reindeer lichen reported as percent of total plot area
GC_Reindeer_lichen_distribution		Pattern of distribution of reindeer lichen: reported as "Even" or "Patchy"
GC_Other_lichen_coverage	percent	* Percent of ground covered in other lichen reported as percent of total plot area
GC_Other_lichen_distribution		Pattern of distribution of other lichen: reported as "Even" or "Patchy"

Variable	Units	Description
GC_Grasses_coverage	percent	* Percent of ground covered in grasses reported as percent of total plot area
GC_Grasses_distribution		Pattern of distribution of low shrubs: reported as "Even" or "Patchy"
GC_Low_Shrubs_coverage	percent	* Percent of ground covered in low shrubs reported as percent of total plot area
GC_Low_Shrubs_distribution		Pattern of distribution of low shrubs: reported as "Even" or "Patchy" Yes it should be peripheral
GC_Woody_debris_coverage	percent	* Percent of ground covered in woody debris reported as percent of total plot area
GC_Woody_debris_distribution		Pattern of distribution of woody debris: reported as "Even" or "Patchy"
GC_Herbaceous_coverage	percent	* Percent of ground covered in herbaceous plants reported as percent of total plot area
GC_Herbaceous_distribution		Pattern of distribution of herbaceous plants: reported as "Even" or "Patchy"
GC_other_type		Description of other ground cover type
GC_other_coverage	percent	* Percent of ground covered in other ground cover reported as percent of total plot area
GC_other_distribution		Pattern of distribution of other ground cover type: reported as "Even" or "Patchy"
GC_other_type		Description of other ground cover type
GC_other_coverage	percent	* Percent of ground covered in other ground cover reported as percent of total plot area
GC_other_distribution		Pattern of distribution of other ground cover type: reported as "Even" or "Patchy"
GC_other_type		Description of other ground cover type
GC_other_coverage	percent	* Percent of ground covered in other ground cover reported as percent of total plot area
GC_other_distribution		Pattern of distribution of other ground cover type: reported as "Even" or "Patchy"
GC_other_type		Description of other ground cover type
GC_other_coverage	percent	* Percent of ground covered in other ground cover reported as percent of total plot area
GC_other_distribution		Pattern of distribution of other ground cover type: reported as "Even" or "Patchy"

* These percent cover values may sum to over 100% because multiple layers of vegetation were measured.

Table 6. Variables names and descriptions in the file NWT_Wildfires_Biophysical_Inventory_2017.csv.

Variable	Unit	Description
Site		Unique name given to a field site, typically representing 100 m x 100 m area
Plot		Plot number (1 to 6), with each plot typically 10 m x 10 m
Date	YYYY-MM-DD	Date of data collection
Observers		Initials of person(s) who collected data
Plot size	m	Plot dimensions: typically 10 m x 10 m or 5 m x 5 m
Life_form		Description of life form: "Shrub" or "Tree"
Condition		Condition of vegetation: "Standing" or "Fallen"
Species		Scientific name of vegetation species measured. "Snag" if dead tree of unknown species.
Diameter_type		Whether the tree or shrub was measured at the base (basal) or diameter at breast height (dbh)
Diameter	cm	Measured diameter
Height	m	Tree or shrub height in meters
Status		Whether the tree or shrub was "Live" or "Dead" at time of sampling, or "None" if no tree or shrub present in plot. Most are dead from wildfire.
Notes		Comments on the data collected or site notes

Table 7. Variables names and descriptions in the file NWT_Wildfires_Seedling_Sprouting_2017.csv.

Variable	Unit	Description
Site		Unique name given to a field location
Plot		Plot number (1 to 6)
Site_Plot		Site name followed by plot number
Date	YYYY-MM-DD	Date of sampling

Variable	Unit	Description
Observers		Initials of person(s) who collected data
Plot_size	m	Plot size typically 1 m x 1 m but may be smaller or larger depending on site conditions
Species		Scientific name of vegetation species measured
Condition		Condition of vegetation: seedling or sprouting
Count	1	Number the of seedling or sproutings
Seedbed		Seedbed type: sphagnum, unburned organic material (duff and litter), thick burned organic material, thin burned organic material, or exposed mineral soil
Percent		Percent cover of species that were not able to be counted due to high density or structure.
comment		Comments on site conditions

Table 8. Variables names and descriptions in the file NWT_Wildfires_SoilMoisture_HydrosenseI_2017_BurnedSites.csv.

Variable	Unit	Description
Site		Unique name given to a field location, each site was nominally 100 m x 100 m in size, and six 10 m x 10 m plots were sampled within that area
Observers		Initials of person(s) who collected data
Date	YYYY-MM-DD	Date of sampling
Start_Time	HH:MM	Time that data collection at that location began
Weather		Weather at time of collection. It was important to note if raining or recently rained.
Plot1_Probe_depth_1	cm	The depth to which the tip of the data probe was inserted, from surface down for 6, 12, and 20 cm. A soil pit was dug and probe inserted horizontally for depths greater than 20 cm using the 12 cm probe tine length unless otherwise noted
Soil_Temp_Plot1	degrees Celsius	Soil temperature at plot 1, sampled from surface and also at 50 cm depth or maximum depth sampled
Plot_1_Period1	ms	Hydrosense-1 probe period at plot 1 in milliseconds
VWC_plot1	1	Volumetric Water Content (cm^3 cm^{-3}) of the soil at plot 1 based on Hydrosense-1 default algorithm for loam soil
Plot_1_notes		Notes for probe depth, soil temperature, VWC measurements
Plot2_Probe_Depth	cm	The depth to which the tip of the data probe was inserted, from surface down for 6, 12, and 20 cm. A soil pit was dug and probe inserted horizontally for depths greater than 20 cm using the 12 cm probe tine length unless otherwise noted
Soil_Temp_plot2	degrees Celsius	Soil temperature at plot 1, sampled from surface and also at 50 cm depth or maximum depth sampled
Plot_2_Period2	ms	Hydrosense-1 probe period at plot 2 in milliseconds
VMC_plot2	1	Volumetric Water Content (cm^3 cm^{-3}) of the soil at plot 2 based on Hydrosense-1 default algorithm for loam soil
Plot_2_notes		Notes for probe depth, soil temperature, VWC measurements.
Plot3_ProbeDepth_3	cm	The depth to which the tip of the data probe was inserted, from surface down for 6, 12, and 20 cm. A soil pit was dug and probe inserted horizontally for depths greater than 20 cm using the 12 cm probe tine length unless otherwise noted
Soil_Temp_3	degrees Celsius	Soil temperature at plot 3, sampled from surface and also at 50 cm depth or maximum depth sampled
Plot_3_Period	ms	Hydrosense-1 probe period at plot 3 in milliseconds
VMC_Plot3	1	Volumetric Water Content (cm^3 cm^{-3}) of the soil at plot 3 based on Hydrosense-1 default algorithm for loam soil
Plot_3_notes		Notes for probe depth, soil temperature, VWC measurements.
Plot4_ProbeDepth_4	cm	The depth to which the tip of the data probe was inserted, from surface down for 6, 12, and 20 cm. A soil pit was dug and probe inserted horizontally for depths greater than 20 cm using the 12 cm probe tine length unless otherwise noted
Soil_Temp_4	degrees Celsius	Soil temperature at plot 4, sampled from surface and also at 50 cm depth or maximum depth sampled
Plot_4_Period	ms	Hydrosense-1 probe period at plot 4 in milliseconds

Variable	Unit	Description
VMC_plot4	1	Volumetric Water Content (cm^3 cm^{-3}) of the soil at plot 1 based on Hydrosense-1 default algorithm for loam soil
Plot_4_notes		Notes for probe depth, soil temperature, VWC measurements.
Plot5_ProbeDepth_5	cm	The depth to which the tip of the data probe was inserted, from surface down for 6, 12, and 20 cm. A soil pit was dug and probe inserted horizontally for depths greater than 20 cm using the 12 cm probe tine length unless otherwise noted
Soil_Temp_5	degrees Celsius	Soil temperature at plot 5, sampled from surface and also at 50 cm depth or maximum depth sampled
Plot_5_Period	ms	Hydrosense-1 probe period at plot 5 in milliseconds
VMC_Plot5	1	Volumetric Water Content (cm^3 cm^{-3}) of the soil at plot 5 based on Hydrosense-1 default algorithm for loam soil
Plot_5_notes		Notes for probe depth, soil temperature, VWC measurements.
Plot6_ProbeDepth_6	cm	The depth to which the tip of the data probe was inserted, from surface down for 6, 12, and 20 cm. A soil pit was dug and probe inserted horizontally for depths greater than 20 cm using the 12 cm probe tine length unless otherwise noted
Soil_Temp_6	degrees Celsius	Soil temperature at plot 6, sampled from surface and also at 50 cm depth or maximum depth sampled
Plot_6_Period	ms	Hydrosense-1 probe period at plot 6 in milliseconds
VMC_Plot6	1	Volumetric Water Content (cm^3 cm^{-3}) of the soil at plot 1 based on Hydrosense-1 default algorithm for loam soil
Site_Notes		Notes on rockiness, soils, ice, or deviations in the sampling

Table 9. Variables names and descriptions in the file NWT_Wildfires_SoilMoisture_HydrosenseI_2017_UnburnedSites.csv.

Variable	Unit	Description
Site		Unique name given to a field location. Each site was representative of a given ecotype covering a minimum size of 40 m x 50 m (.2 ha). Site consists of five sampling plots within a 30 m x 30 m square: center of square and four corners.
Observers		Initials of person(s) who collected data
Date	YYYY-MM-DD	Date of field data collection
Start_Time	HH:MM	Time that data collection at that location began
Weather		weather at time of collection - important to note if raining or recently rained
CenterPlot_Probe_depth1	cm	The depth to which the tip of the data probe was inserted, from surface down for 6, 12, and 20 cm, and a soil pit was dug and probe inserted horizontally for depths greater than 20 cm using the 12 cm probe tine length unless otherwise noted
Soil_Temp_Plot1	degrees Celsius	Soil temperature at plot 1, sampled from surface and also at 50 cm depth or maximum depth sampled
Plot_1_Period1	ms	The Hydrosense-1 probe period at plot 1 in milliseconds
VWC_plot1	1	Volumetric Water Content (cm^3 cm^{-3}) of the soil at plot 1 based on Hydrosense-1 default algorithm for loam soil
Plot2_Probe_Depth_NorthofCenter2	cm	The depth to which the tip of the data probe was inserted, from surface down for 6, 12, and 20 cm, and a soil pit was dug and probe inserted horizontally for depths greater than 20 cm using the 12 cm probe tine length unless otherwise noted
Soil_Temp_plot2	degrees Celsius	Soil temperature at plot 2, sampled at the surface and at 50 cm depth or maximum depth sampled
Plot_2_Period2	ms	The Hydrosense-1 probe period at plot 2 in milliseconds
VMC_plot2	1	Volumetric Water Content (cm^3 cm^{-3}) of the soil at plot 2 based on Hydrosense-1 default algorithm for loam soil
Plot3_ProbeDepth_EastofCenter3	cm	The depth to which the tip of the data probe was inserted, from surface down for 6, 12, and 20 cm, and a soil pit was dug and probe inserted horizontally for depths greater than 20 cm using the 12 cm probe tine length unless otherwise noted
Soil_Temp_3	degrees Celsius	Soil temperature at plot 3, sampled at the surface and at 50 cm depth or maximum depth sampled
Plot_3_Period	ms	The Hydrosense-1 probe period at plot 3 in milliseconds

Variable	Unit	Description
VMC_Plot3	1	Volumetric Water Content (cm^3 cm^{-3}) of the soil at plot 3 based on Hydrosense-1 default algorithm for loam soil
Plot4_ProbeDepth_SouthofCenter4	cm	The depth to which the tip of the data probe was inserted, from surface down for 6, 12, and 20 cm, and a soil pit was dug and probe inserted horizontally for depths greater than 20 cm using the 12 cm probe tine length unless otherwise noted
Soil_Temp_4	degrees Celsius	Soil temperature at plot 4, sampled at the surface and at 50 cm depth or maximum depth sampled
Plot_4_Period	ms	The Hydrosense-1 probe period at plot 4 in milliseconds
VMC_plot4	1	Volumetric Water Content (cm^3 cm^{-3}) of the soil at plot 4 based on Hydrosense-1 default algorithm for loam soil
Plot5_ProbeDepth_WestofCenter5	cm	The depth to which the tip of the data probe was inserted, from surface down for 6, 12, and 20 cm, and a soil pit was dug and probe inserted horizontally for depths greater than 20 cm using the 12 cm probe tine length unless otherwise noted
Soil_Temp_5	degrees Celsius	Soil temperature at plot 5, sampled at the surface and at 50 cm depth or maximum depth sampled
Plot_5_Period	ms	The Hydrosense-1 probe period at plot 5 in milliseconds
VMC_Plot5	1	Volumetric Water Content (cm^3 cm^{-3}) of the soil at plot 5 based on Hydrosense-1 default algorithm for loam soil
Notes		Notes on rockiness, ice, or deviations in the sampling

Table 10. Variables names and descriptions in the file NWT_Wildfires_Unburned_validation_2017.csv.

Variable	Unit	Description
Site		Unique name given to a field site
Date	YYYY-MM-DD	
Time	HH:MM	Time at which fieldwork began in local time (MDT)
Latitude	decimal degrees	Latitude of sampling site
Longitude	decimal degrees	Latitude of sampling site
Elevation	m	Elevation above mean sea level of site
Aspect		Description of topographic aspect
Slope		Description of topographic slope
Observers		Initials of person(s) who collected data
Depth_to_Frozen_ground_sam1	cm	Depth of soil to Frozen Ground Layer at location 1 within plot
Depth_to_Frozen_ground_sam2	cm	Depth of soil to Frozen Ground Layer at location 2 within plot
Depth_to_Frozen_ground_sam3	cm	Depth of 3soil to Frozen Ground Layer at location 3 within plot
Depth_to_Frozen_ground_sam4	cm	Depth of soil to Frozen Ground Layer at location 4 within plot
Depth_to_Frozen_ground_sam5	cm	Depth of soil to Frozen Ground Layer at location 5 within plot
Depth_to_Frozen_ground_sam6	cm	Depth of soil to Frozen Ground Layer at location 6 within plot
Depth_to_Frozen_ground_notes		Notes regarding depth to frozen ground measurements.
Soil_pH	pH units	Soil pH measurement
Ecosystem_type		Type of ecosystem, individually or in combination: Bog/Bog Like, Fen/Fen Like, Treed Bog, Shrub Fen, Treed Fen, Open Fen, Upland, Marsh, Shrubby, Sparse Trees, Lowland White Pine
Wetness		Wetness of ground: Dry (no moisture present); Moist(moisture present but not saturated); Soggy (saturated with water but no areas of standing water); Standing Water (visible standing water present in plot)
Vegetation_present		List of vegetation species present
Dense_trees	percent	Percent of plot (1/2 acre area) covered in dense trees.
Dense_trees_dist		Description of dense tree distribution: E (evenly distributed), C (center only), P (peripheral) , EP (evenly distributed but patchy), EC (evenly distributed clumps).

Variable	Unit	Description
Moderate_trees	percent	Percent of plot (1/2 acre area) covered in moderate trees.
Moderate_trees_dist		Description of moderate tree distribution: E (evenly distributed), C (center only), P (peripheral), EP (evenly distributed but patchy), EC (evenly distributed clumps).
Sparse_trees	percent	Percent of plot (1/2 acre area) covered in sparse trees.
Sparse_trees_dist		Description of sparse tree distribution: E (evenly distributed), C (center only), P (peripheral), EP (evenly distributed but patchy), EC (evenly distributed clumps).
Open_water	percent	Percent of plot (1/2 acre area) covered in open water.
Open_water_dist		Description of open water distribution:: E (evenly distributed), C (center only), and P (peripheral)
Shrubby	percent	Percent of plot (1/2 acre area) covered in shrubs.
Shrubby_dist		Description of shrub distribution: E (evenly distributed), C (center only), and P (peripheral)
Moss	percent	Percent of plot (1/2 acre area) covered in moss.
Moss_dist		Description of moss distribution: E (evenly distributed), C (center only), and P (peripheral)
Grass_sedge	percent	Percent of plot (1/2 acre area) covered in grass/sedge.
Grass_sedge_dist		Description of grass/sedge distribution:: E (evenly distributed), C (center only), and P (peripheral)
Herbeceous_cover	percent	Percent of plot (1/2 acre area) covered in non-grass/sedge, herbaceous vegetation.
Herbeceous_dist		Description of herbaceous cover (not grass/sedge) distribution:: E (evenly distributed), C (center only), and P (peripheral)
Other_1_descript		Description of other vegetation cover
Other_1	percent	Percent of plot (1/2 acre area) covered in other vegetation.
Other_1_dist		Description of distribution of other vegetation: E (evenly distributed), C (center only), P (peripheral), EP (evenly distributed but patchy), EC (evenly distributed clumps).
Other_2_descript		Description of other vegetation cover
Other_2	percent	Percent of plot (1/2 acre area) covered in other vegetation.
Other_2_dist		Description of distribution of other vegetation: E (evenly distributed), C (center only), P (peripheral), EP (evenly distributed but patchy), EC (evenly distributed clumps).
Dom_spp		Scientific name of dominant species (grasses and sedges not identified to species)
Dom_Live_ht	m	Average height of live dominant species 1
Dom_Dead_ht	m	Average height of dead dominant species 1
Dom_density	percent	Percent of area covered by dominant species 1
Dom_pct_live	percent	Percent of dominant species 1 live (by area)
Dom_pct_dead	percent	Percent of dominant species 1 dead (by area)
Dom_stage		Growth Stage for dominant species: dormant, emerging, seedling, immature, mature, flowering
Sec_spp		Scientific name of secondary species (grasses and sedges not identified to species)
Sec_live_ht	m	Average height of live secondary species
Sec_dead_ht	m	Average height of dead secondary species
Sec_density	percent	Percent of area covered by secondary species
Sec_pct_live	percent	Percent of secondary species live (by area)
Sec_pct_dead	percent	Percent of secondary species dead (by area)
Sec_stage		Growth Stage for secondary species: dormant, emerging, seedling, immature, mature, flowering
Height_to_lowest_living_branch	m	Height of average lowest living branch
Average_Tree_Ht_m	m	Height of average living tree matched to tree of lowest living branch
Average_Shrub_Ht_m	m	Height of average shrub
Camera_ID		ID number of MTRI camera used for photos

Variable	Unit	Description
North_Photo		File name(s) for north-facing photo(s) from plot center
East_Photo		File name(s) for east-facing photo(s) from plot center
South_Photo		File name(s) for west-facing photo(s) from plot center
West_Photo		File name(s) for south-facing photo(s) from plot center
Nadir_Photo		File name(s) for nadir facing photo(s) from plot center
Other_photo		File name(s) for miscellaneous photo(s) of plot
Photo_notes		Notes regarding field photographs
Soil_live_moss	cm	Depth of live moss layer present in 40 cm soil profile
Soil_dead_moss	cm	Depth of dead moss layer present in 40 cm soil profile
Soil_upper_duff	cm	Depth of upper duff layer present in 40 cm soil profile
Soil_ lower_duff	cm	Depth of lower duff layer present in 40 cm soil profile
Peat_Depth	cm	Depth of organic peat soil
Site_notes		Additional notes/comments

3. Application and Derivation

The goal of this project was to collect remote sensing and field data to support scientific research on the impacts of the 2014-2015 fires in Northwest Territories of Canada.

4. Quality Assessment

Quality control checks were performed on the field data. Data were recorded in the field on field sheets, then entered into a Microsoft Excel spreadsheet. A second person checked the entered data against the original field sheets. A third person cross-referenced field data with information available from additional field sheets, GPS, or cameras, and checked for missing values and anomalies (out-of-range values); corrections were made as needed.

Soil moisture is sampled at each plot with five repeated samples within an arm's length at each depth with the Hydrosense instrument. This replication allows for spatial averaging across the site (6 plots x 5 samples per plot = 30 samples per site).

5. Data Acquisition, Materials, and Methods

This project used remote sensing and field data to characterize the impacts of wildfires that occurred in 2014 and 2015 in the North Slave, South Slave, and Dehcho Regions of Northwest Territories (NWT), Canada (Fig. 2). This five-year study focused on four 2014 NWT fires (ZF17, ZF20, SS3, SS15) and five 2015 NWT Fires (ZF14, ZF2, SS50, SS81, SS28). Field data collection occurred annually from 2015 to 2019. This dataset provides data collected in 2017 from study sites listed in Table 2.
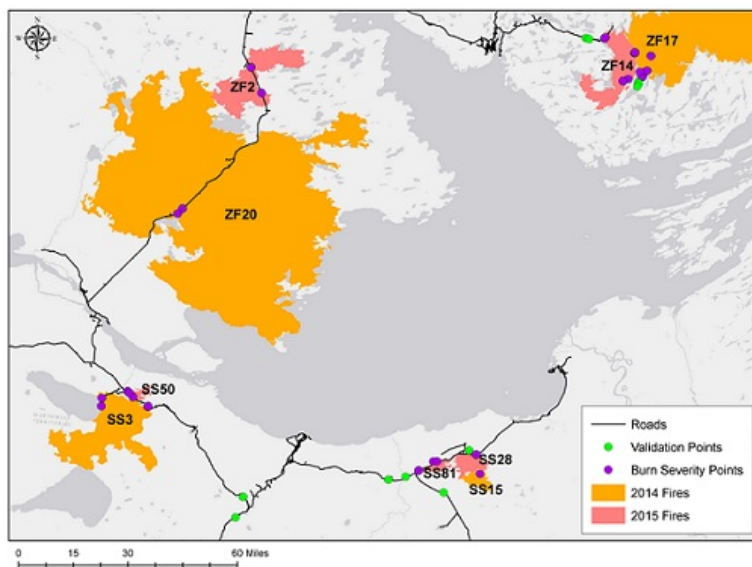

Figure 2. Wildfire areas with burned and validation field site locations around Great Slave Lake in the Northwest Territories, Canada.

In 2017, seven study areas that had experienced wildfire in 2014-2015 were sampled (Table 2). In addition, four unburned areas, termed validation sites, were sampled. Field crews used a handheld GPS, a GPS camera, maps of aerial photographs, and tape measures. At each site, a vegetative index was constructed, ecosystem type was assigned, species diversity was noted, dominant species composition was assigned, the water level was measured, vegetation life stage recorded, and height and density measured for the overstory. Thaw depth was measured with a peat rod from the top of the moss to the frozen layer. Geolocated photographs were taken in the four cardinal directions at study plots providing an additional layer of validation and ground truth for each location.

At each site, biophysical site characteristics, burn severity, soil moisture, thaw depth, and seedling/sprouting data were collected in up to six plots along

two transects to characterize a homogenous area of 100 m x 100 m. The typical plot size was 10 m x 10 m. Burn damage severity class was recorded for moss, litter, shrub, and tree canopy. Nadir percent cover by vegetation class was recorded for live/dead shrubs, woody debris, herbaceous, and moss. Three representative tree heights were recorded and up to five adventitious root heights were recorded. Peatland type, thaw depth, and peat thickness as well as ash presence are also reported for all plots.

Figure 3. Photograph of seedling quadrat at site ZF17-40. Source: ZF17-40_1_seedling.jpg

At sites in the burned areas, detailed measurements of soil moisture & temperature, seedling/sprouting, and aboveground biomass were sampled in 10 m x 10 m plots and smaller quadrats. Soil moisture was measured with a Hydrosense 1 instrument. Five measurements were made at each of four soil depths: 6, 12, 20, and 50 cm. The probe period and volumetric water content were collected at six points within each plot. Soil temperature was measured using a Hannah Instruments HI 145 probe. Two different lengths of probes were used: 20 and 12 cm. Both probes were placed straight down into the soil. In addition, at 6 cm depth, the 12 cm probe was placed at a 30-degree angle. Seedlings/sproutings, along with groundcover, were sampled in 0.5 m^2 or 1.0 m^2 quadrats at the corner of each site. For aboveground biomass, the coverage, heights, and diameters of trees and shrubs were measured. The tree/shrub species and DBH or basal diameter were recorded along with the height of representative trees.

6. Data Access

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

ABoVE: Post-Fire and Unburned Vegetation Community and Field Data, NWT, Canada, 2017

Contact for Data Center Access Information:

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

7. References

Bourgeau-Chavez, L.L., M.J. Battaglia, P. Siqueira, C. Weinstein, S. Rose, H. Smith, D. Uhelski, and D.J.L. Vander Bilt. 2021. ABoVE: Post-Fire and Unburned Vegetation Community and Field Data, NWT, Canada, 2019. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1900

Bourgeau-Chavez, L.L., J.A. Graham, S. Endres, N.H.F. French, M. Battaglia, D. Hansen, and D. Tanzer. 2019. ABoVE: Ecosystem Map, Great Slave Lake Area, Northwest Territories, Canada, 1997-2011. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1695

Bourgeau-Chavez, L.L., M. Battaglia, E.S. Kane, L.M. Cohen, and D. Tanzer. 2019. ABoVE: Post-Fire and Unburned Vegetation Community and Field Data, NWT, Canada, 2018. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1703

Bourgeau-Chavez, L.L., S. Endres, L. Jenkins, M. Battaglia, E. Serocki, and M. Billmire. 2017. ABoVE: Burn Severity, Fire Progression, and Field Data, NWT, Canada, 2015-2016. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1548

Bourgeau-Chavez, L.L., N.H.F. French, S. Endres, L. Jenkins, M. Battaglia, E. Serocki, and M. Billmire. 2016. ABoVE: Burn Severity, Fire Progression, Landcover and Field Data, NWT, Canada, 2014. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1307

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