

Search ORNL DAAC

Search

[DAAC Home](#) > [Get Data](#) > [NASA Projects](#) > [Arctic-Boreal Vulnerability Experiment \(ABOVE\)](#) > [User guide](#)

ABOVE: Annual Thaw Slump Expansion on East Fork Chandalar River, Alaska, 2008-2017

Get Data

Documentation Revision Date: 2019-12-17

Dataset Version: 1

Summary

This dataset provides a time series of spatial data showing the expansion of a thaw slump on the East Fork Chandalar River near the community of Venetie, Alaska, from 2008 through 2017. The erosion of vegetated areas along the river was documented by manually digitizing imagery from ESRI basemaps and Landsat 5 (TM), 7 (ETM+), and 8 (OLI), using the band combination of shortwave infrared 2, shortwave infrared 1, and red.

This dataset includes a shapefile (.shp compressed into .zip format) showing the time series of expansion of the thaw slump. Companion files include a Google Earth .kmz with the same information as the shapefile and an annotated .pdf file showing the change in eroded area and including recent aerial photographs of the slump area.

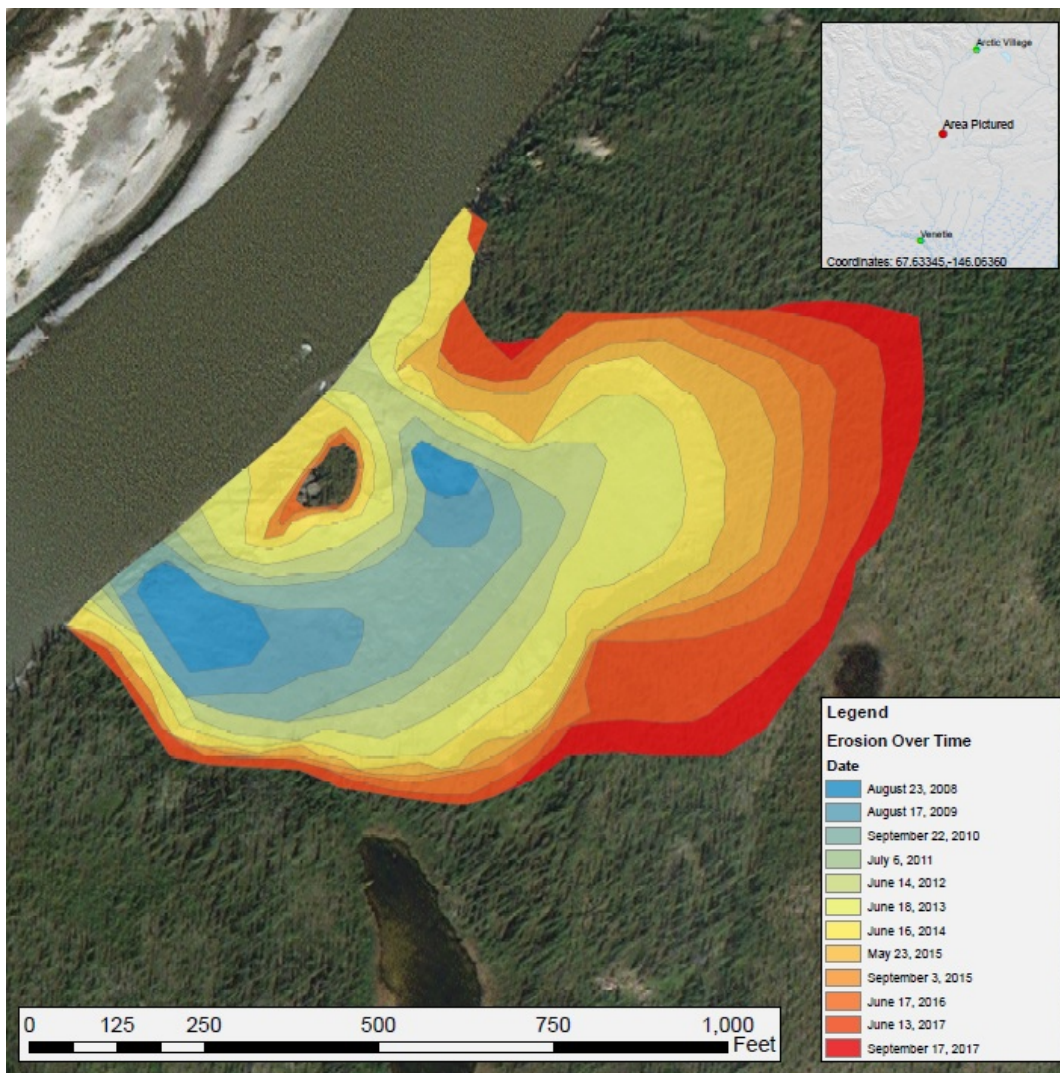


Figure 1. Annual expansion of a thaw slump on the East Fork Chandalar River near the community of Venetie, Alaska, from 2008 through 2017. The erosion time series was created by manually digitizing from ESRI basemap and Landsat 5, 7, and 8 imagery. The eroded area appears to be growing steadily, mostly to the east, with apparent limitation on growth to the north and south. Source: Thaw_Slump_Images.pdf companion file.

Citation

Anderson, V., D.R.N. Brown, and T.J. Brinkman. 2019. ABoVE: Annual Thaw Slump Expansion on East Fork Chandalar River, Alaska, 2008-2017. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1724>

Table of Contents

1. [Dataset Overview](#)
2. [Data Characteristics](#)
3. [Application and Derivation](#)
4. [Quality Assessment](#)
5. [Data Acquisition, Materials, and Methods](#)
6. [Data Access](#)
7. [References](#)

1. Dataset Overview

This dataset provides a time series of spatial data showing the expansion of a thaw slump on the East Fork Chandalar River near the community of Venetie, Alaska, from 2008 through 2017. The erosion of vegetated areas along the river was documented by manually digitizing imagery from ESRI basemaps and Landsat 5 (TM), 7 (ETM+), and 8 (OLI), using the band combination of shortwave infrared 2, shortwave infrared 1, and red.

Project: ABoVE

The Arctic-Boreal Vulnerability Experiment (ABoVE) is a NASA Terrestrial Ecology Program field campaign taking place in Alaska and western Canada between 2016 and 2021. Climate change in the Arctic and Boreal region is unfolding faster than anywhere else on Earth, resulting in reduced Arctic sea ice, thawing of permafrost soils, decomposition of long-frozen organic matter, widespread changes to lakes, rivers, coastlines, and alterations of ecosystem structure and function. ABoVE seeks a better understanding of the vulnerability and resilience of ecosystems and society to this changing environment.

Related Datasets:

Brown, D.R.N. 2019. ABoVE: Riverbank Erosion and Vegetation Changes, Yukon River Basin, Alaska, 1984-2017. ORNL DAAC, Oak Ridge, Tennessee, USA. DOI: <https://doi.org/10.3334/ORNLDAAC/1616>

Brown, D.R.N., T.J. Brinkman, and D. Verbyla. 2019. ABoVE: River Ice Breakup and Freeze-up Stages, Yukon River Basin, Alaska, 1972-2016. ORNL DAAC, Oak Ridge, Tennessee, USA. DOI: <https://doi.org/10.3334/ORNLDAAC/1697>

Cold, H.S., T.J. Brinkman, C. Adams, A. Demientieff, I. Demientieff, R. Demientieff, E. Frank, G. Frank, D. Painter, J. Roberts, M. Snyder, C. Taylor, J. Turner, C. Wallace, and M. Walsh. 2019. ABoVE: Environmental Conditions and Subsistence Resource Access, Alaska, 2016-2017. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1705>

Neufeld, G., L. Naaktgeboren, D. Gonzalez, and C. Brown. 2019. ABoVE: Subsistence Resource Use Areas of Interior Alaskan Communities, 2011-2017. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1725>

Acknowledgements:

Funding from NASA Arctic-Boreal Vulnerability Experiment (NNX15AT72A).

2. Data Characteristics

Spatial Coverage: East Fork Chandalar River near the community of Venetie, Alaska,

ABoVE reference locations:

Domain: Core ABoVE

State/territory: Alaska

Grid cell: Ch049v026

Spatial Resolution: Annual erosion increment derived from 30 m Landsat imagery over this 260 x 375 m area.

Temporal Coverage: 2008-08-23 to 2017-09-17

Temporal Resolution: Annual or more frequent imagery

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

Site	Westernmost Longitude	Easternmost Longitude	Northernmost Latitude	Southernmost Latitude
Venetie, Alaska, USA	-146.066957	-146.058091	67.634967	67.632627

Data File Information

This dataset includes a shapefile (.shp compressed into .zip format) showing the time series of expansion of the thaw slump.

Data file: *thaw_slump_expansion.zip*

This shapefile has one attribute: *Date*: the date the imagery was captured identifies each polygon. See Figure 1.

Shapefile spatial reference properties: WGS_1984_UTM_Zone_6N (EPSG code: 32606)

Companion File Information

Companion files include (1) a Google Earth file (*thaw_slump_expansion.kmz*) that provides the same information as the shapefile, and (2) an annotated .pdf (*Thaw_Slump_Images.pdf*) showing the change in eroded area and with recent aerial photographs of the slump area.

3. Application and Derivation

The time series data provided by this dataset was used to assess the annual change in a major permafrost thaw slump adjacent to the East Fork Chandalar River near the community of Venetie. The expansion of the thaw slump may have increased the rates of erosion and sediment loading in river systems affecting fish habitat, fishing practices (nets, fish wheels), and boat navigability to traditional harvest areas.

4. Quality Assessment

No information provided.

5. Data Acquisition, Materials, and Methods

Rural communities in Interior Alaska have expressed concern that increased rates of erosion and sediment loading in river systems are affecting fish habitat, fishing practices (nets, fish wheels), and boat navigability to traditional harvest areas. At the request of the Venetie Traditional Council in Venetie, Alaska, we used remote sensing to assess annual change in a major permafrost thaw slump adjacent to the main river that this community uses for fishing and access to traditional harvest areas.



Figure 2. Aerial photo of affected area taken May 16, 2017. The silt on the left of the image appears to have come from the eroded area to the right, building up the eastern bank of the river. Source: *Thaw_Slump_Images.pdf* companion file.

Selected Imagery

This dataset provides a time series of spatial data showing the expansion of a thaw slump on the E. Fork Chandalar River near Venetie, Alaska from 2008 through 2017. The erosion of vegetated areas was documented by manually digitizing imagery from Landsat 5 (TM), 7 (ETM+), and 8 (OLI) and ESRI basemaps.

The imagery used were acquired on the following dates:

Landsat 5: August 23, 2008, August 17, 2009, July 6, 2011.

Landsat 7: September 22, 2010, June 14, 2012

Landsat 8: June 18, 2013, May 23, 2015, September 3, 2015, June 17, 2016, June 13, 2017, September 17, 2017.

ArcMap Imagery Basemap: June 16, 2014

Time Series Development

The time series was created by manually digitizing imagery from ESRI basemaps and Landsat 5 (TM), 7 (ETM+), and 8 (OLI) using a combination of shortwave infrared 2, shortwave infrared 1, red bands.

"7-6-4" band combination and the panchromatic band "band 8" for Landsat 8,

"7-5-3" band combination for Landsat 5 and 7



Figure 3. Aerial photo from the same date as Figure 2. Rivulets appear to be forming gullies and accelerating the erosion. Source: *Thaw_Slump_Images.pdf* companion file.

6. Data Access

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

[ABoVE: Annual Thaw Slump Expansion on East Fork Chandalar River, Alaska, 2008-2017](#)

Contact for Data Center Access Information:

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

7. References

Corresponding author: Todd J. Brinkman, University of Alaska Fairbanks, tjbrinkman@alaska.edu



[Privacy Policy](#) | [Feedback](#) | [Help](#)

Home

About Us

Mission
Data Use and Citation Policy
User Working Group
Partners

Get Data

Science Themes
NASA Projects
All Datasets

Submit Data

Submit Data Form
Data Scope and Acceptance
Data Authorship Policy
Data Publication Timeline
Detailed Submission
Guidelines

Tools

MODIS
THREDDS
SDAT
Daymet
CARVE Data Viewer
Soil Moisture Visualizer
Land - Water Checker

Resources

Learning
Data Management
News

[Contact Us](#)