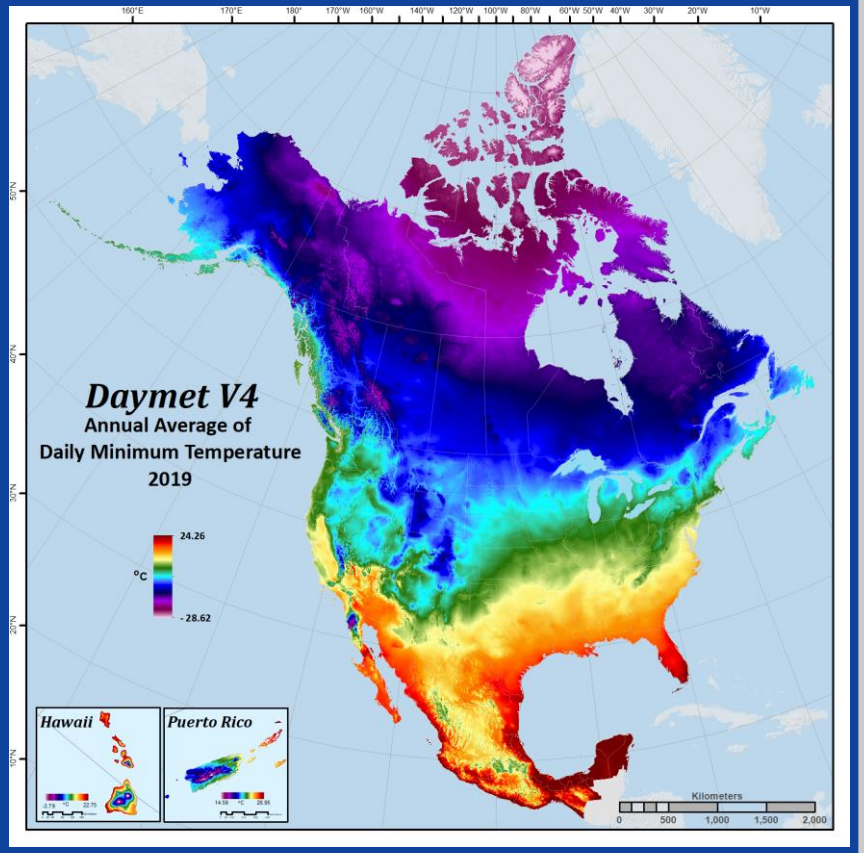
Daymet V4:

- NASA Earthdata Discovery/Access
- Analysis Ready Data
- Spatial Analysis in Python Xarray and Esri ArcGIS

NASA Earthdata Webinar, Aug 31, 2021

Michele Thornton (ORNL DAAC)
Rupesh Shrestha, Ph.D. (ORNL DAAC)
Lain Graham, Ph.D. (NASA ArcDAAC Collaboration/Esri)



The Oak Ridge National Laboratory Distributed Active Archive Center for Biogeochemical Dynamics operates under an interagency agreement between NASA and the U.S. Department of Energy

Webinar Objectives

1. Lower the barriers to obtaining subsets of gridded, multidimensional data available through web-based services like OPeNDAP
2. Introduce Python's Xarray (and other Geospatial capabilities) in performing spatial analysis on multidimensional datasets
3. Introduce Esri Multidimensional Raster Functionality

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Webinar Content

- Introduce ORNL DAAC
- Introduce Daymet Version 4 Data
- ORNL DAAC Daymet Website
- NASA Earthdata Find Data Website
- Notebook Workflows

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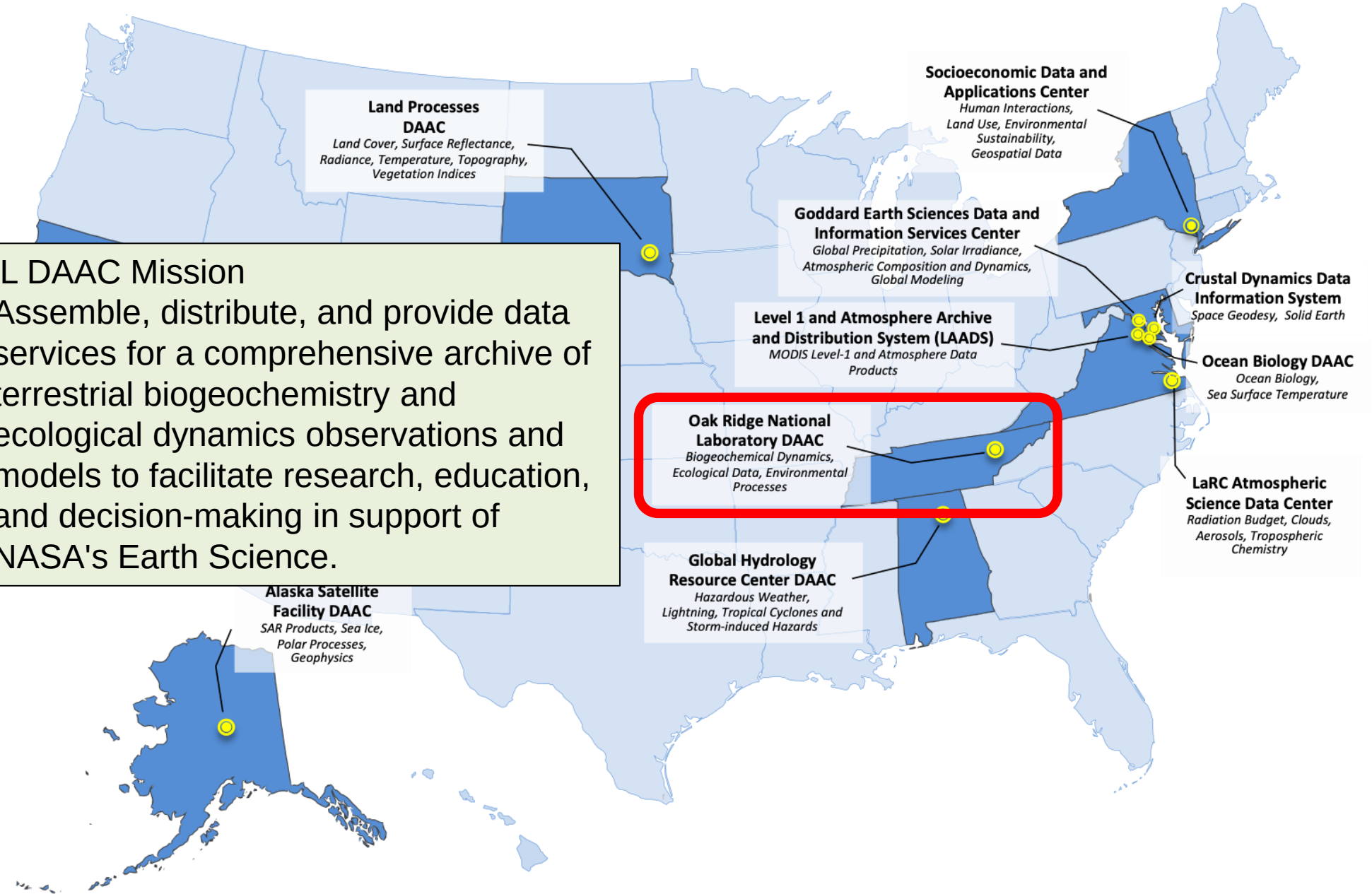
EOSDIS Distributed Active Archive Centers (DAAC)s

ORNL DAAC Mission

Assemble, distribute, and provide data services for a comprehensive archive of terrestrial biogeochemistry and ecological dynamics observations and models to facilitate research, education, and decision-making in support of NASA's Earth Science.



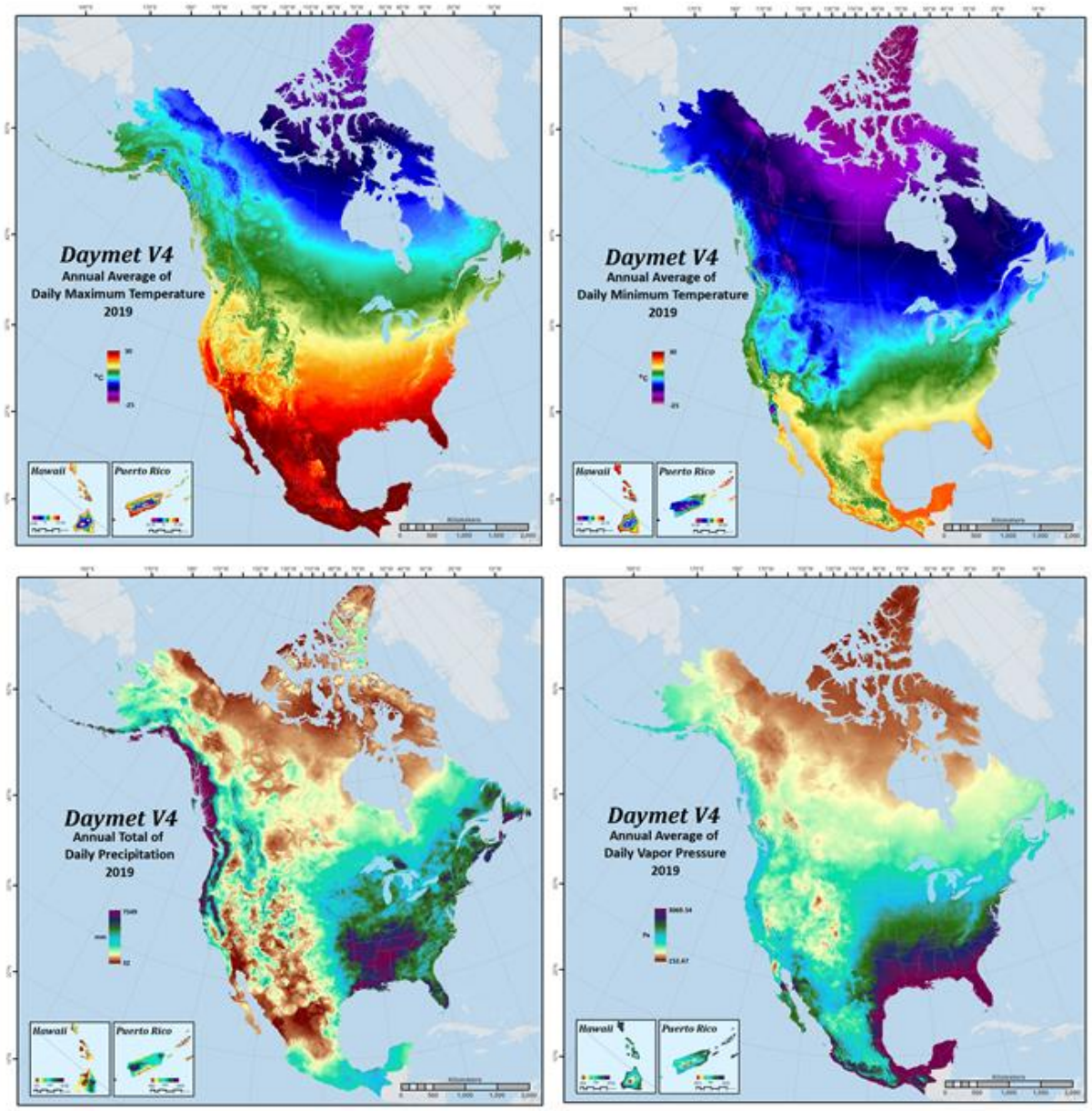
Daymet

- gridded daily meteorological dataset derived from land surface weather station observations

Data Characteristics

Temporal / Spatial Resolution ….. Daily / 1km x 1 km
Years Available ….. 1980 – 2020 (and 2021)
Spatial Region ….. North America, Hawaii, Puerto Rico
Primary Format …. netCDF

Daymet Data Products	
Variable	Units
maximum temperature	°C
minimum temperature	°C
shortwave radiation	W/m^2
vapor pressure	Pa
snow water equivalent	kg/m^2
precipitation	mm/day
day length	s/day



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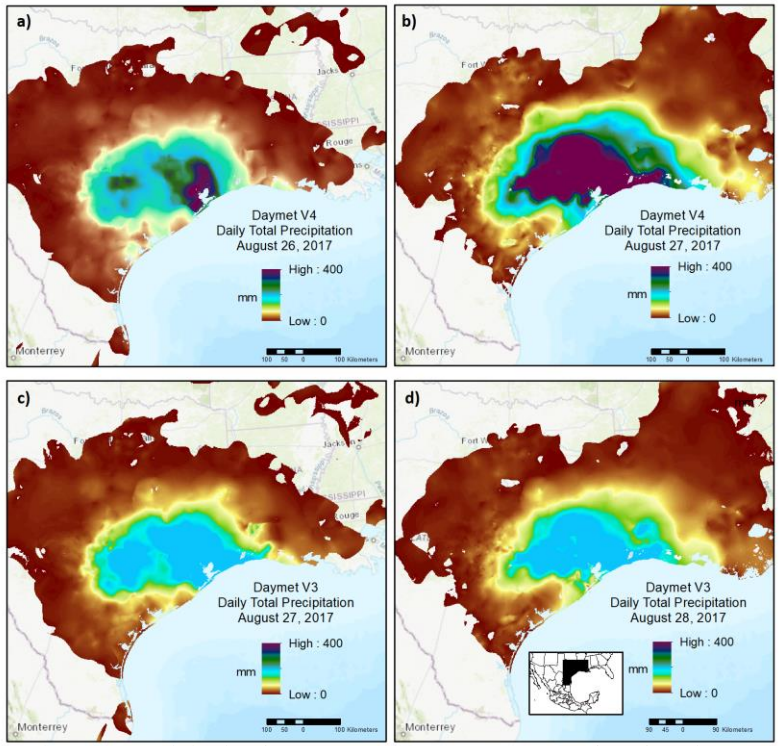
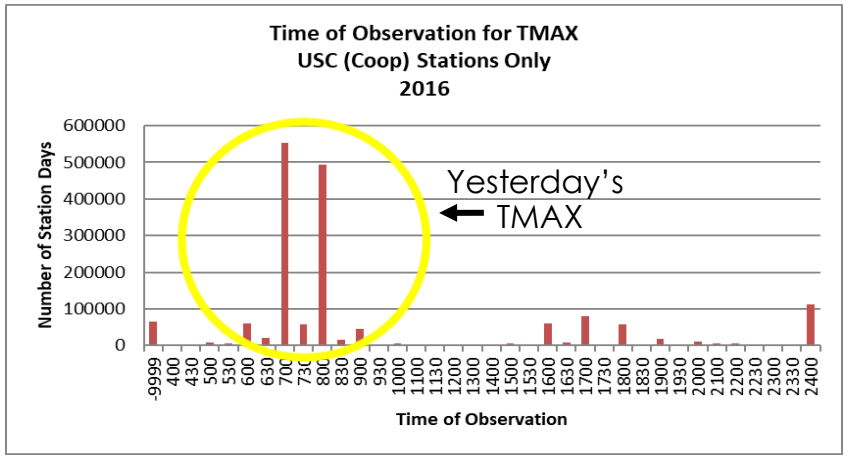
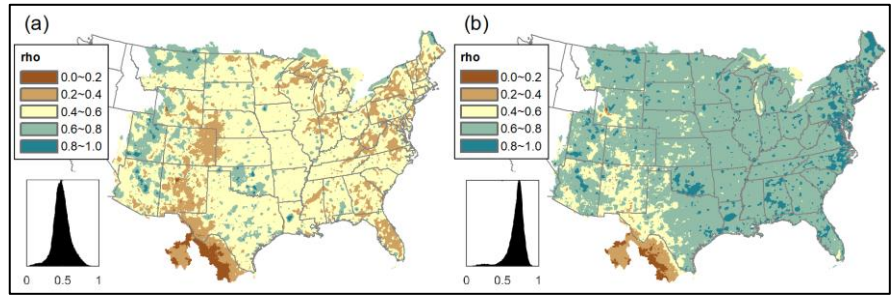
Daymet V4 - Improvements

- Version 4 – Data Released in December 2020
- Improvements include:
  - development to the three-dimensional regression model techniques in the core algorithm
  - reductions in the timing bias of input weather station measurements
  - novel approach to handling high elevation temperature measurement biases



Daily total precipitation for a sub-region that shows landfall of Hurricane Harvey in late August 2017. Top panels show two days from the Daymet V4. Bottom panels show the corresponding days from the V3 dataset. Date shifting based on time-of-observation bias for precipitation are shown.





Radar-validated precipitation timing

Thornton, P.E., R. Shrestha, M. Thornton, S.-C. Kao, Y. Wei, B.E. Wilson (2021) Gridded daily weather data for North America with comprehensive uncertainty quantification. *Nature Scientific Data*, DOI:: 10.1038/s41597-021-00973-0

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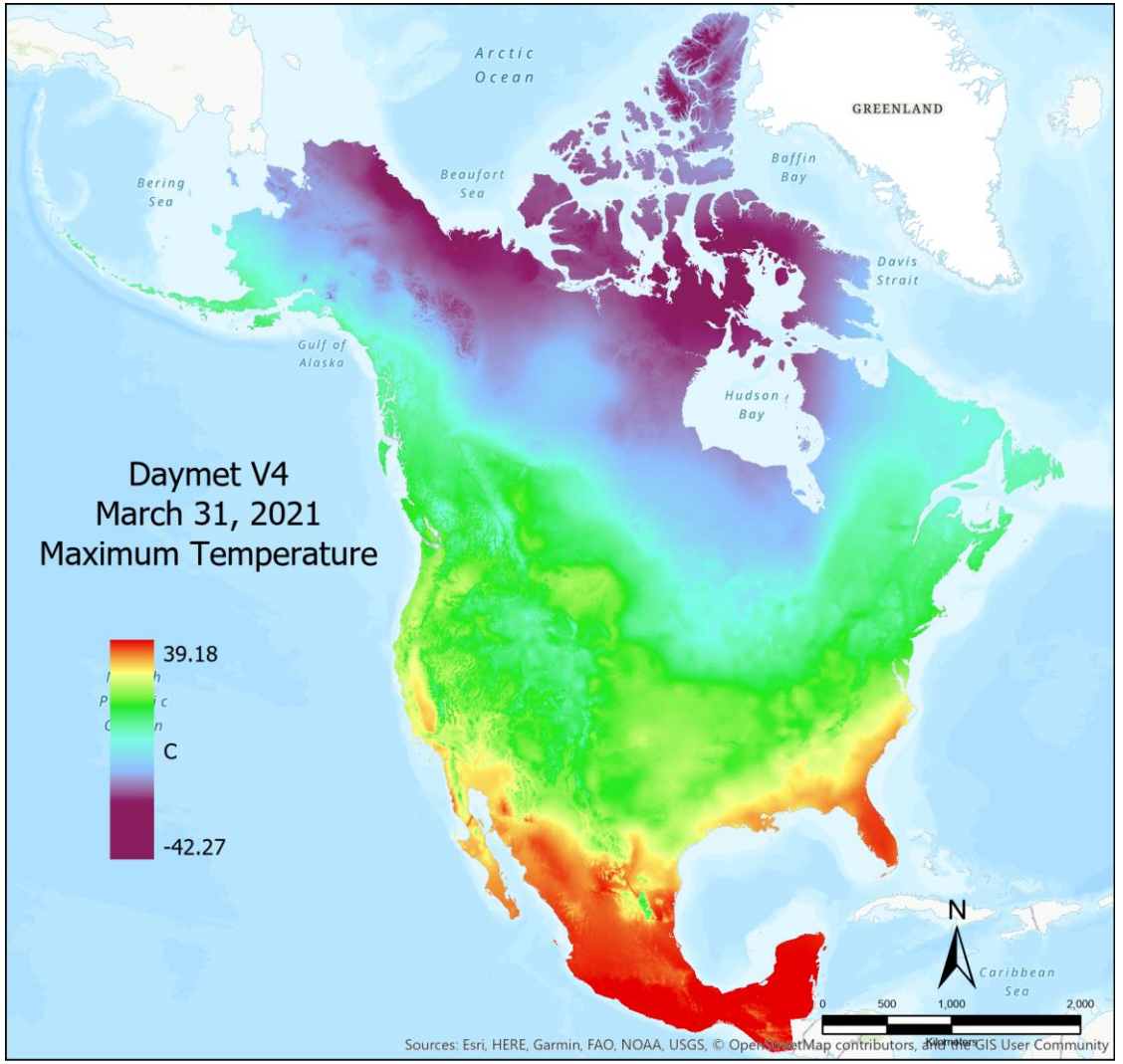
Daymet V4 lower-latency data product

- Daymet V4 lower-latency (LL)
  - Starting in Jan, 2021, Daymet ***daily data*** is provided on a monthly cycle
  - Published as a separate, provisional dataset
  - At the time of this Webinar; Jan, Feb, Mar, Apr, May, Jun, July daily data are available
  - Thornton, M.M., R. Shrestha, P.E. Thornton, S. Kao, Y. Wei, and B.E. Wilson. 2021. Daymet Version 4 Monthly Latency: Daily Surface Weather Data. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1904



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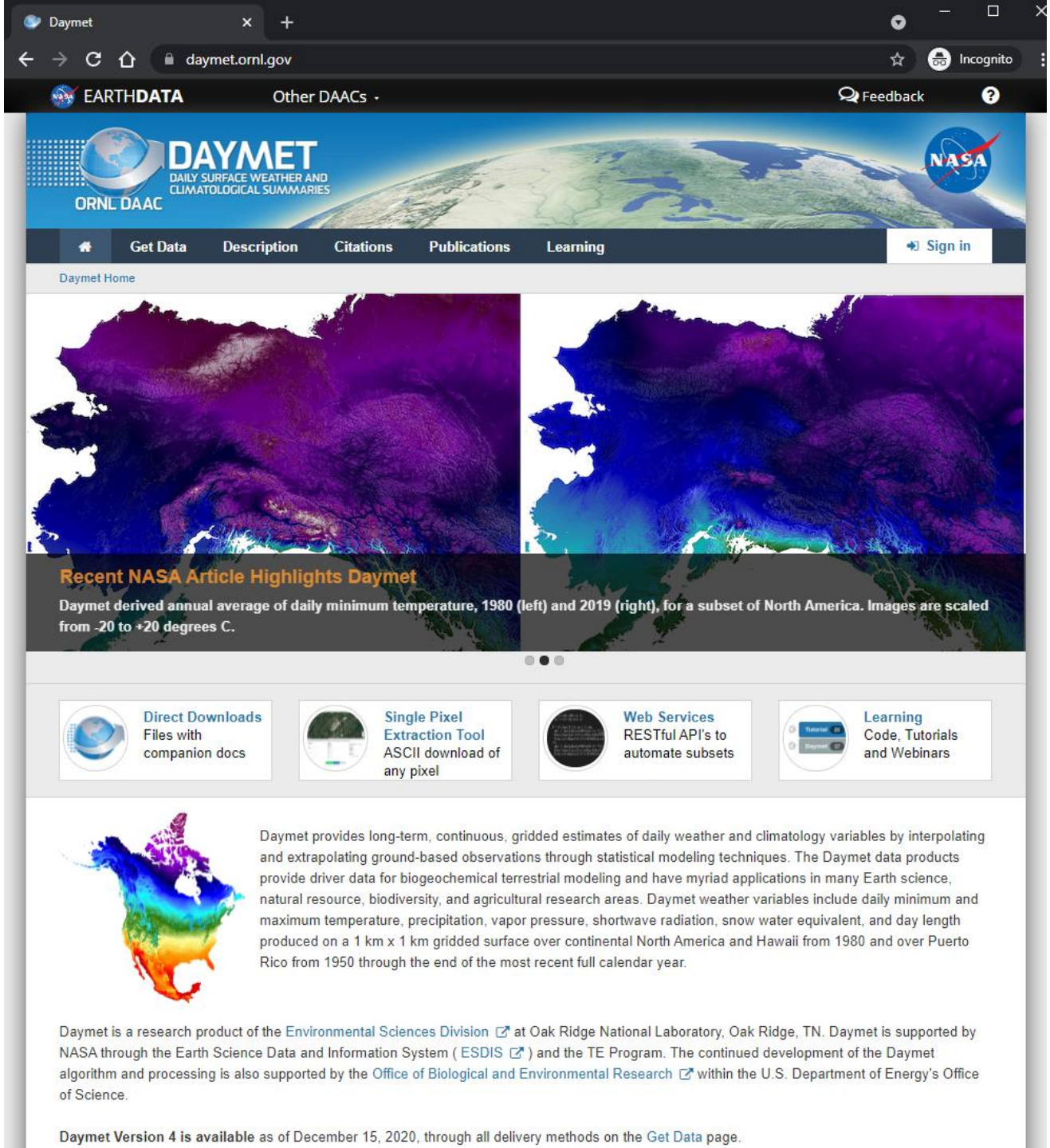
Daymet – Website

- ORNL DAAC Daymet Project Page

  https://daymet.ornl.gov

- Four Main V4 `**Collections**`
  - Daily Surface Weather Data
  - Annual Climate Summaries
  - Monthly Climate Summaries
  - Daily Data, Monthly Latency



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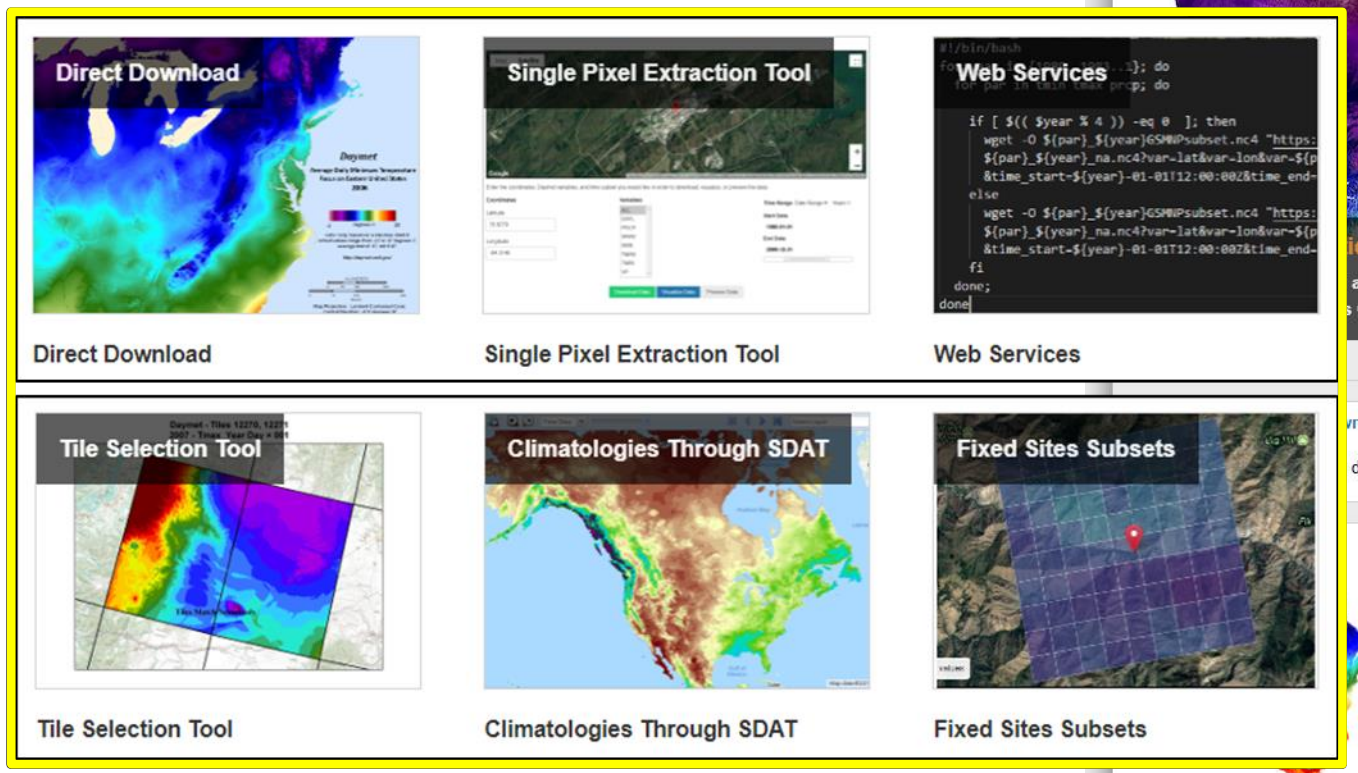

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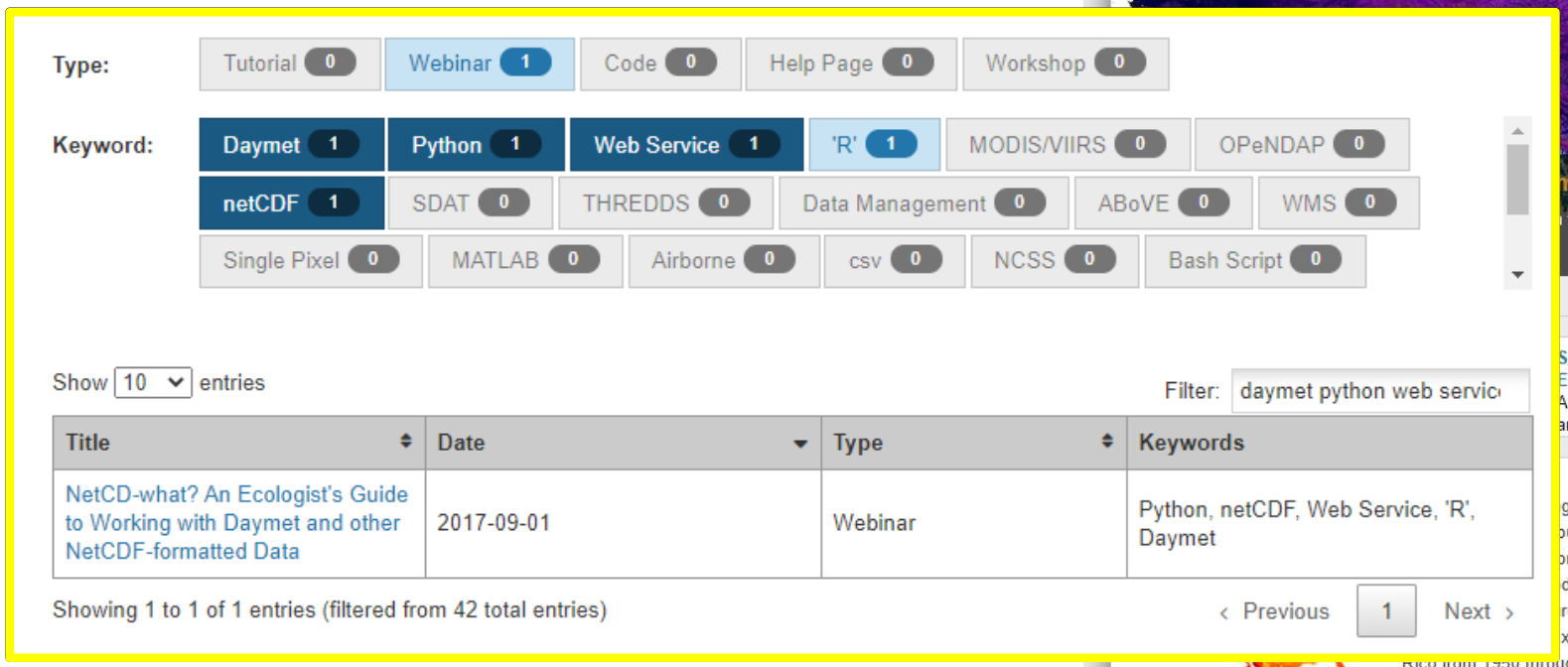
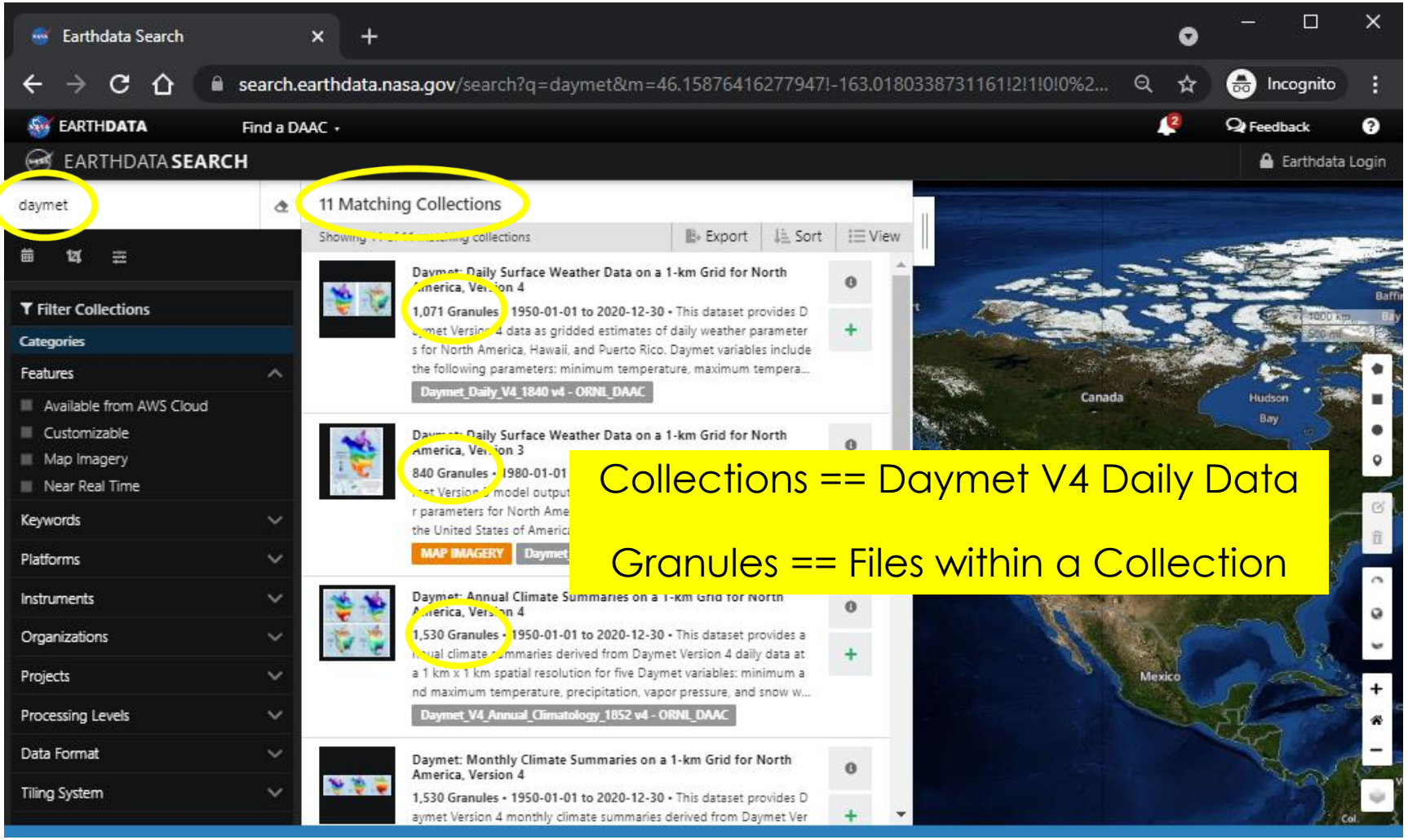


Daymet

- NASA Earthdata Data Search

  https://search.earthdata.nasa.gov/search



Notebook Content

- Daymet V4 - Programmatic Data Discovery, Access, Subsetting, and Download for Analysis Ready Data
- Daymet V4 - Deriving Climatological Normals and Anomalies from Analysis Ready Subsets
- ArcGIS – Analyzing Climate Impact on Wine Production In Califonia Using Multidimentional Analysis

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