Processed Catchment-Averaged Meteorological Forcings from Daymet for Streamflow Monitored Catchments in British Columbia and Transboundary Basins

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Dataset Metadata

Description

This dataset provides catchment-averaged daily meteorological time series for selected watersheds in British Columbia and adjacent regions. Meteorological variables are derived from the Daymet gridded climate dataset (Version 4 R1) at a 1-km spatial resolution and include:

- Precipitation (prcp)
- Maximum and minimum temperature (tmax, tmin)
- Shortwave radiation (srad)
- Vapor pressure (vp)
- Snow water equivalent (swe)
- Day length (dayl)
- Potential evapotranspiration (PET), computed using the Penman-Monteith method via the PyDaymet package

Catchment boundaries were used to clip and average Daymet tiles (provided in Catchment_polygons.geojson). The NetCDF files in this directory contain time series representing catchment average meteorological forcings. The files are provided in the format required for ingesting into the NeuralHydrology Python Package for research in applying neural networks to hydrological prediction.

NOTE:

> The .nc files are not formatted for display in GIS software. It is recommended to use the xarray python package to work with these files.

The data were generated using the scripts provided in the `process_metforcings` Python repository available at: https://github.com/dankovacek/process_metforcings

Files

- meteorological forcings following the format `<Official_ID>_daymet.nc` (compressed in the archive file `BC_Monitored_catchment_mean_met_forcings_20250320.zip`)
  - Contains daily time series of the meteorological variables listed above, averaged over the catchment polygon defined in `Catchment_polygons.geojson`.
- `Catchment_polygons.geojson`

  - Contains the catchment polygons used for clipping and averaging Daymet tiles. Each polygon is associated with an `Official_ID` that matches the naming convention of the output NetCDF files.

Subject

- Hydrology
- Climate Forcings
- Environmental Science
- GIS
- Meteorology

Keywords

Daymet, catchment, watershed, meteorological forcing, evapotranspiration, precipitation, temperature, PET, BCUB, gridded climate data, NetCDF

Resource Type

Dataset

Related Publications

Thornton, M. M., Shrestha, R., Wei, Y., Thornton, P. E., Kao, S., & Wilson, B. E. (2022).
Daymet: Monthly Climate Summaries on a 1-km Grid for North America, Version 4 R1.
ORNL DAAC, Oak Ridge, Tennessee, USA.
https://doi.org/10.3334/ORNLDAAC/2129

Rights

Please cite both the original Daymet dataset and this processing workflow when using this data.

Language

English

Funding

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Version

v1.0 (2025-03-20)

File Format

NetCDF (.nc), GeoJSON (.geojson)

Repository

GitHub repository for processing workflow:
https://github.com/dankovacek/process_metforcings

Spatial Coverage

- Region: British Columbia, Canada and adjacent hydrologic regions (Yukon, Northwest Territories, Alaska, Alberta, Montana, Idaho, Washington)
- CRS: Lambert Conformal Conic (Daymet native projection), BC Albers (EPSG 305)

Temporal Coverage

- 1980–2023 (inclusive)

Methods

Meteorological variables were processed by identifying Daymet tiles that spatially intersect each catchment polygon, downloading the relevant data, clipping and reprojecting to match each catchment's geometry, and computing area-weighted means for each day. For potential evapotranspiration, PyDaymet's implementation of the Penman-Monteith method was used.

The full processing workflow is documented and implemented in the accompanying Python scripts and shell commands within the GitHub repository.

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