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DATA PAPER

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Climate data from the Rocky Mountain Biological Laboratory (1975–2022)

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Abstract

The Rocky Mountain Biological Laboratory (RMBL; Colorado, USA) is the site for many research projects spanning decades, taxa, and research fields from ecology to evolutionary biology to hydrology and beyond. Climate is the focus of much of this work and provides important context for the rest. There are five major sources of data on climate in the RMBL vicinity, each with unique variables, formats, and temporal coverage. These data sources include (1) RMBL resident billy barr, (2) the National Oceanic and Atmospheric Administration (NOAA), (3) the United States Geological Survey (USGS), (4) the United States Department of Agriculture (USDA), and (5) Oregon State University's PRISM Climate Group. Both the NOAA and the USGS have automated meteorological stations in Crested Butte, CO, ~10 km from the RMBL, while the USDA has an automated meteorological station on Snodgrass Mountain, ~2.5 km from the RMBL. Each of these data sets has unique spatial and temporal coverage and formats. Despite the wealth of work on climate-related questions using data from the RMBL, previous researchers have each had to access and format their own climate records, make decisions about handling missing data, and recreate data summaries. Here we provide a single curated climate data set of daily observations covering the years 1975–2022 that blends information from all five sources and includes annotated scripts documenting decisions for handling data. These synthesized climate data will facilitate future research, reduce duplication of effort, and increase our ability to compare results across studies. The data set includes information on precipitation (water and snow), snowmelt date, temperature, wind speed, soil moisture and temperature, and stream flows, all publicly available from a combination of sources. In addition to the formatted raw data, we provide several new variables that are commonly used in ecological analyses, including growing degree days, growing season length, a cold severity index, hard frost days, an index of El Niño-Southern Oscillation, and aridity (standardized precipitation evapotranspiration index). These new variables are calculated from the daily weather records. As appropriate, data are also presented as minima, maxima, means, residuals, and cumulative measures for various time scales including days, months, seasons, and years.

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The RMBL is a global research hub. Scientists on site at the RMBL come from many countries and produce about 50 peer-reviewed publications each year. Researchers from around the world also routinely use data from the RMBL for synthetic work, and educators around the United States use data from the RMBL for teaching modules. This curated and combined data set will be useful to a wide audience. Along with the synthesized combined data set we include the raw data and the R code for cleaning the raw data and creating the monthly and yearly data sets, which facilitate adding additional years or data using the same standardized protocols. No copyright or proprietary restrictions are associated with using this data set; please cite this data paper when the data are used in publications or scientific events.

KEYWORDS
alpine, growing degree days, montane, precipitation, Rocky Mountain Biological Laboratory, seasonal, snow, standardized precipitation evapotranspiration index, stream flow, temperature

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The complete data set is available as Supporting Information. Data are also available from the Open Science Framework at https://www.doi.org/10.17605/OSF.IO/8EZKA.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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