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Customized Online Aggregation & Summarization Tool for Environmental Rasters (COASTER)

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ABSTRACT

The Customized Online Aggregation & Summarization Tool for Environmental Rasters (COASTER) system (www.COASTERdata.net) was developed by Yellowstone Ecological Research Center (YERC) (www.yellowstoneresearch.org) in response to the information needs of end-user communities interested in decision-support for natural resource management. The purpose of COASTER is to greatly simplify the process of creating predictor datasets for research exploring environmental impacts driven by climate change, land-use activities, disturbance, and invasive spread. COASTER achieves this goal by providing users with a web-based system for processing environmental (gridded, raster) datasets, using a set of standardized functions, to create output customized to meet their analytical needs. In doing so, COASTER effectively translates large and cumbersome datasets into user-specified information useful for parameterizing statistical models and for visualizing spatial and temporal patterns within environmental datasets. The COASTER system currently contains over 10 terabytes of climate data from several sources. These datasets have daily temporal resolutions, spatial resolutions ranging from 1km to 330km, and temporal extents ranging from 30 to 64 years (1948-2011). COASTER datasets are primarily limited to North America, but gridded datasets from other regions can easily be added to the system. Variables within the climatic datasets available on COASTER include metrics quantifying temperature, precipitation, shortwave radiation, vapor pressure deficit, humidity, and wind conditions. Notable features of COASTER include a conceptually simple yet flexible set of functions capable of producing a wide range of outputs, a design applicable to many types of raster datasets, and results formatted for seamless integration within most GIS and remote sensing software packages.

KEYWORDS

Cite this paper

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