



ON THE SURFACE

CSDMS Quarterly Newsletter
November 2021

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CSDMS 2022 Annual Meeting

Please join us for the CSDMS Annual Meeting, "[CSDMS 2022: Environmental Extremes and Earthscape Evolution](#)", [May 17th - 19th, 2022](#). The theme will be broad in scope, showcasing modeling-oriented projects that range from fundamental research in evolution of the landscape and seascape to more specific experimental or applied work involving the impact of environmental extremes on the Earthscape. Environmental extremes are widely defined to capture the morphodynamic impact of events like wildfires, hydrologic extremes, tsunamis, storm surges, or hurricanes, on the Earthscape.

Although we hope an onsite meeting in Boulder will be possible, a final decision on the format of the meeting (onsite or virtual) will be announced in January, 2022. The health and safety of our attendees is our top priority. Regardless of format, there will be a great lineup of Keynote Talks and Clinics! Lively poster sessions and breakout sessions/jams will provide a chance to meet with old and new friends, and learn about new tools and resources.

- **Student Modeler Competition** submission deadline is January 14th, 2022. [Submission requirements and additional details can be found here.](#)
- **Call for Clinic presentations!** Each year a variety of clinics are available for registered meeting attendees. If you would like to provide a clinic, [additional details and the submission form can be found here.](#) Submitters will be notified of acceptance decisions by January 7th, 2022. Deadline to submit is December 3rd, 2021.



[Register Now!](#)
[CSDMS 2021 Fall Webinar Series](#)

Join us for the remaining two CSDMS 2022 Fall Webinars focusing on the [CSDMS Workbench](#). **Registration is required and links/details are provided below.** The upcoming webinars are:

CSDMS Data Components

Friday, November 12th, 2021 @ 10:00AM MST

Tian Gan and Mark Piper

CSDMS IF Research Software Engineers (Gan-Postdoc), Institute of Arctic and Alpine Research, University of Colorado, Boulder

A data component is a software tool that wraps an API for a data source with a Basic Model Interface ([BMI](#)). It is designed to

provide a consistent way to access various types of datasets and subsets of them without needing to know the original data API. Each data component can also interact with numerical models that are wrapped in the [pymt](#) modeling framework. This webinar will introduce the data component concept with a demonstration of several examples for time series, raster, and multidimensional space-time data. [REGISTER](#)

Shuffling Landscapes: the Impact of Landslides on Topographical Evolution through a Modeler's Lens

Tuesday, November 30th, 2021 @ 10:00AM MST

Benjamin Campforts

CSDMS IF Postdoc/Research Software Engineer, Institute of Arctic and Alpine Research, University of Colorado, Boulder

Landslides mobilize tons of sediment in the blink of an eye. From an engineering perspective, one typically looks at topographical relief as a causal factor triggering landslides. From a geomorphological perspective, one could wonder how landslides and landslide derived sediment alter the evolution of landscapes. Curious to find out what landslides do with the evolution of landscapes? Tune in for this webinar to figure out how to use the Landlab HyLands component to address this question. [REGISTER](#)

Previous CSDMS-sponsored webinars are [archived here](#) and available for viewing anytime. If you have suggestions for future Webinars, please contact csdms@colorado.edu.

New CSDMS Data Components

CSDMS has just released two additional data components for community member usage! These data components allow models to seamlessly communicate with data as well as with other models. Applied to data, the BMI acts as a common hub that connects spokes to the many data formats within the earth sciences. See a [complete list of data components currently available here](#).

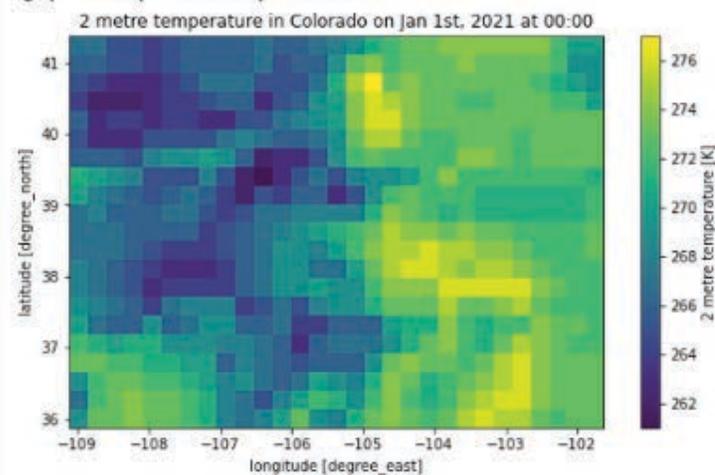
[ERA5 data component](#): ERA5 datasets are [reanalysis data](#) which assimilate observations in the upper air and near surface such as temperature, precipitation, and snow depth (<https://confluence.ecmwf.int/display/CKB/ERA5>). ERA5 data component can download the datasets and wrap them with Basic Model Interface (BMI). This data component makes the ERA5 datasets to be easily coupled with other datasets or models that expose a BMI.

- **source repository:** https://github.com/gantian127/bmi_era5
 - **documentation:** <https://bmi-era5.readthedocs.io/>
 - **pymt:** https://github.com/gantian127/pymt_era5
-

[The GeoTiff data component](#) allows access to raster data and metadata from a GeoTIFF file through an API or a BMI.

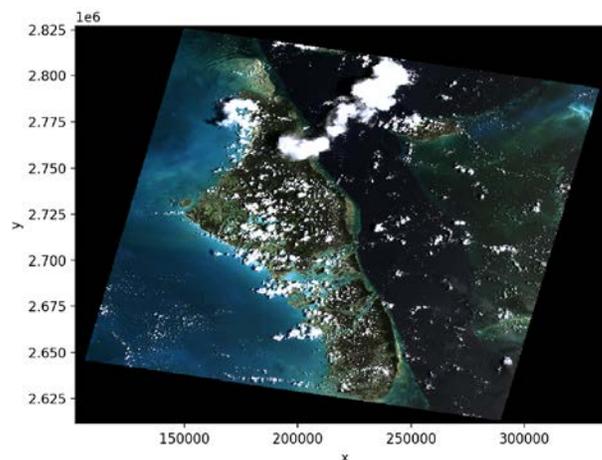
- **documentation:** <https://bmi-geotiff.readthedocs.io>

Fig 1 plot example ERA5 temperature data



pymt component: https://github.com/pymt-lab/pymt_geotiff

- **source code repository:** <https://github.com/csdms/bmi-geotiff>



Example GeoTIFF image display through xarray and the GeoTiff data component.

CSDMS Resources for Community Members

CSDMS offers a number of products and services to enhance your teaching and research. We encourage community members to explore the [Education, Products and Services tabs](#) on the CSDMS website for the full suite of resources. The following are just a few examples:

[The CSDMS Workbench](#) is the integrated system of software tools, technologies, and standards developed by CSDMS for building, interfacing, coupling, and running models. Each element of the CSDMS Workbench is developed as open source software and released to the community.

CSDMS [Education and Knowledge Transfer Repository](#). The repo now contains 24 labs covering a variety of earth surface processes that can be run in Jupyter Notebooks or Binder. New labs are added regularly! We encourage CSDMS members to donate labs to the EKT repo for the benefit of your fellow community members and students. [Labs can be submitted here](#).

CSDMS offers a [JupyterHub](#) for community member usage. If you're interested in a dedicated, always-on computational resource for a workshop or class this fall, consider using the CSDMS JupyterHub. Most of the labs from the [EKT Repository](#) are already hosted, and with the help of a CSDMS research software engineer, getting your own labs hosted is a snap. See our [JupyterHub wiki page](#) for more information, including instructions on

how to sign up for an account.

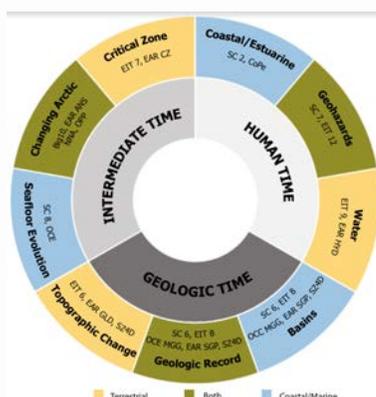
Through the [Research Software Engineering as a Service \(RSEaaS\) program](#), CSDMS offers community members one-on-one consulting with a CIF software engineer. The CSDMS Integration Facility can provide several pro-bono hours to a project and if additional time is required, we can discuss hourly rate-based options and/or collaborations.

CSDMS also offers a free [HPC resource Blanca!](#) Gaining access is easy and it's a great resource for students.

Have a question or need assistance? The [CSDMS Help Desk](#) is available! Every question asked helps build a stronger community resource - so ask away!

Last but not least, the [CSDMS Job Board](#) lists many open positions of interest to community members.

Open Earthscape has Launched!



CSDMS is pleased to announce [Open Earthscape](#), a new initiative that will build on previous CSDMS investments. Understanding the past, present, and future of Earth's surface requires open science and open software. To meet that need, the Community Surface Dynamics Modeling System (CSDMS) launched a voyage to enhance and expand the flagship [CSDMS Workbench](#): a powerful set of software tools and protocols for analyzing and modeling the Earth's changing surface.

The NSF-supported OpenEarthscape project will raise the proportion and quality of community-built software that adheres to the FAIR principles (Findable, Accessible, Interoperable, Reusable). OpenEarthscape will include:

- EarthscapeHub: a community JupyterHub server that provides easy access to CSDMS tools and libraries
- New capacity for creating and sharing reproducible model-data analysis packages
- Major enhancements to the Landlab and PyMT libraries for model construction and coupling
- An extended version of the Basic Model Interface standard to address parallel architecture and coupling
- Improved library capabilities for data I/O and visualization

Stay tuned to the CSDMS web portal for the latest developments in OpenEarthscape!

Other NSF-funded Programs Offering Training/Services to the ESP Community!

Code to Communicate, an NSF OAC Cybertraining pilot project led by CSDMS members Nicole Gasparini, Isamar Cortés, and Mark Piper, will provide bilingual training to geoscience graduate students in programming and science communication. The program kicks off in January 2022, with two five-week online instruction sessions, culminating in a week-long in-person GeoHackeo at Tulane University in June. Applications are due November 12. See <https://twitter.com/CodeCommunicate> for more information, and links to apply in Spanish and English.

[The Science Gateways Community Institute](#) is again offering a free virtual session of the [Jumpstart Your Sustainability Plan mini-course this winter](#). If you are interested in developing a sustainability strategy for your project's gateway, this is a great resource!

December 6-8, 2021

12-1:30 pm ET | 9-10:30 am PT on days one and two, and 12-2 pm ET | 9-11 am PT on the third and final day

[Register by December 1, 2021](#)

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**CSDMS is an NSF
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