

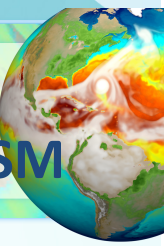
E3SM Communication and Support for E3SM Ecosystem Projects

Renata McCoy

E3SM Chief Operating Officer/Project Engineer

The growing E3SM ecosystem

Projects that use E3SM model, data, or develop specific aspects of E3SM



E3SM project

- Model development, simulation campaign, computational performance, infrastructure, data publication, research

Ecosystem project

- DOE BER ESMD Funded Projects
 - SFA, SciDAC, ECP, University Projects

Collaborators from External Projects

External Projects – non-collaborators

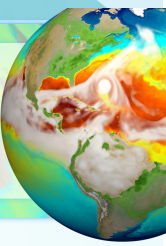


Projects can work on

- Model development for E3SM
- Analysis of E3SM data
- Running E3SM simulations for research

The E3SM Support Policies

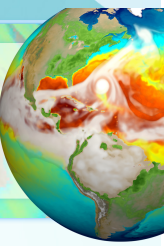
Open code, public data, limited support



- **E3SM code** is open development (<https://github.com/E3SM-Project/>)
- E3SM reserves the right to first publication from its data, hence
- Data is made available after first overview journal publication is submitted
- **Data** can be downloaded through: (<https://e3sm.org/data/>)
 - **All Data: ESGF** E3SM project space: in native format, on native grid and regridded to lon-lat,
 - Also accessible through Globus (<https://esgf-node.llnl.gov/projects/e3sm/>)
 - **Subset:** ESGF CMIP6 (subset of variables in CMIP6 format)
 - **Subset:** NERSC HPSS (world readable, native format)
- Simulation description, compsets, documentation available when data available
- Only production, main simulations are supported
- The only **supported E3SM versions** are:
 - maint-v1.0, maint-v1.1, maint-v1.2
- **Supported machines:** NERSC, Compy (internal Anvil)

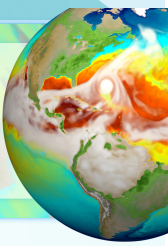
Word of Caution

When running simulations make sure to start with “maint” branch



- Our code is constantly evolving and a work in progress
- The “master” branch (the head) is not stable code
- The ”next” branch is not stable code
- Only versions that were used in main simulation campaigns are maintained and supported
- **Please use**
 - **maint-1.0** Water Cycle Simulation Campaign (CMIP6 DECK simulations)
 - **maint-1.1** Biogeochemical Cycles Simulation Campaign
 - **maint-1.2** Cryosphere Simulation Campaign
- Detailed info on the E3SM Model and Development Guide
 - <https://acme-climate.atlassian.net/wiki/spaces/DOC/>

When working on code development make sure to have a POC from E3SM on the project

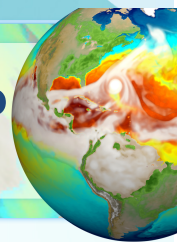


If you are planning on developing a piece of code for E3SM:

- 1) Coordinate early through the E3SM POC (Point Of Contact), so you understand
 - E3SM current and future code plans
 - E3SM interest and needs
- 2) Complete Code Review Process: Design Document, Verification, Validation, Performance
 - E3SM's new feature requirement
 - <https://acme-climate.atlassian.net/wiki/spaces/DOC/pages/29754189/Code+Review+Process+Implementation>
- 3) Adhere to coding standards
- 4) Pay attention to performance
- 5) Plan a lot of time for integration with E3SM
- 6) If you complied with all requirements and the E3SM project is willing to incorporate the code
 - make sure there is a developer available to work closely with E3SM to resolve any issues when coupling to the full code stack and testing

Due to project's limited resources – please realize that we cannot guarantee that we will incorporate the code

Want an early access to the data or simulation?

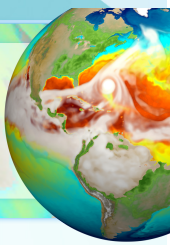


Please submit a **collaboration request** specifying

- What data/simulation/early access information/ you need
- What research you are planning to do
- Specify an E3SM POC
- Agree to collaborate and include the E3SM POC in your publication
- Simply fill in the doc at
 - https://e3sm.org/about/collaboration/collaboration_request/

Working with native E3SM data files?

Check tutorials on regridding data and available tools



E3SM Infrastructure team developed detailed instructions and online tutorials on

- How to regrid the cube sphere E3SM atmosphere model output to regular longitude-latitude (lon-lat) grid data
- How to regrid the cube sphere E3SM land model output to regular lon-lat grid data using sub-grid scale regridding, taking into account land fraction around coastal areas
- How to regrid E3SM's Model for Prediction Across Scales (MPAS) ocean and sea-ice unstructured Voronoi grid data to regular lon-lat grid data.

<https://e3sm.org/about/events/e3sm-tutorials/>

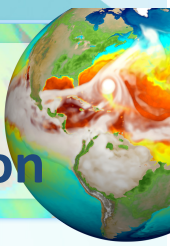
Check also available diagnostics and analysis tools

<https://e3sm.org/resources/tools/>



Where to find the information

e3sm.org public website, one-stop shop for all project communication



One-stop shop

- <https://e3sm.org>

The model

- <https://e3sm.org/model/running-e3sm/e3sm-quick-start/>

The data

- <https://e3sm.org/data/>

Simulation campaigns

- <https://e3sm.org/research/science-campaigns/v1-campaign/>

E³SM Energy Exascale Earth System Model

ABOUT | RESEARCH | MODEL | DATA | PUBLICATIONS | RESOURCES

Three new model components are included in the E3SM v1 configuration: Model for Prediction Across Scales (MPAS) Ocean, MPAS Sea Ice, and MPAS Land Ice. Pictured here is global E3SM emulation showing eddy activity.
Credit: M. Pearson, P. Webster and C. Fiegler

DOE's E3SM is a state-of-the-science Earth system model development and simulation project to investigate energy-relevant science using code optimized for DOE's advanced computers

THE 2020 VIRTUAL ESMD/ESM PI MEETING
October 26-29, 2020

The Earth System Model Development (ESMD) program Area Principle Investigator (PI) and E3SM Annual All-Hands meeting will be held October 26-29, 2020. It is the joint meeting of all projects supported by ESMD including DOE-led (SPARC, JGI, E3SM, SORAC) projects, University-led projects as well as the projects jointly funded by ESMD and other program areas.
Registration is now open. Please visit <https://www.orau.gov/esmd-e3sm> to register.
Draft Agenda

FEATURE STORY

- From Program Manager: Xujing Dai presents news about E3SM and DOE >>>
- Mesoscale Eddies: Improvements in E3SM mesoscale eddy parametrizations GMRG and Red meeting >>>
- DL for Sub-Grid Processes: Outlining sub-grid cloud physics to deep learning DL neural networks >>>
- COVID-19 Research: E3SM scientists join others to study COVID-19's emissions reductions impact on climate >>>

BRIEF

- Deep Learning
- Model Performance
- Model Performance
- Model Performance

Latest News, Research Highlights

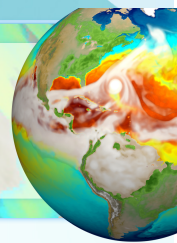
E3SM Floating Points Newsletter, and e3sm.org

Subscribe to quarterly E3SM *FLOATING POINTS* Newsletter

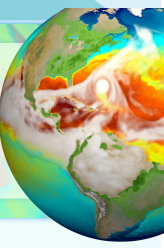
- send email to LISTSERV@LISTSERV.LLNL.GOV
with body: 'subscribe E3SM-news'

(subject line is ignored)

More in-depth development information public documentation on E3SM internal Confluence



- Recently we have enabled anonymous access to the very detailed documentation on E3SM Confluence
 - <https://acme-climate.atlassian.net/wiki/spaces/DOC/>
- Information available
 - Detailed Development Guide
 - Simulations Documentation
 - Coding Standards
 - Code Review Process
- Project plans, simulation campaigns, code versions v3/v4, data
 - <https://e3sm.org>



Thank You, Questions?

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