

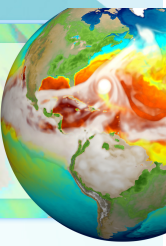
E3SM Communication

Internal and External

Renata McCoy

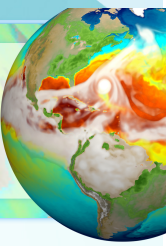
E3SM Chief Operating Officer/Project Engineer

E3SM has very well established and strong internal communication



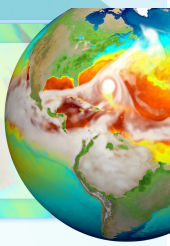
- E3SM was conceived as a distributed, multi-lab, multi-institutional project
- Immediately established communication protocols:
 - Confluence as Internal Wiki website
 - Teleconferencing (gotomeeting) available to all
 - Communication between team members
 - Usually weekly or bi-weekly with whole group, any team can have their own meetings as well as needed
 - Communication between and withing the leadership team
 - Exec weekly, Council bi-weekly, 1-on-1 Exec with Group Leads: bi-weekly with Core Groups, 1-in-4 weekly with NGDs
 - In-person (now virtual) meetings
 - All-Hands (1 to 2 per year)
 - E3SM Leadership (2 per year)
 - Advisory Committee Meetings with E3SM Leadership (1 per years)
 - Jira for task tracking across the project
 - Confluence pages for planning and reporting
 - Github for code issues tracking, Slack for fast communication mostly between developers

Maximizing transparency in all activities encouraging strong engagement across project



- Confluence is divided into spaces that belong to each E3SM group
- **Everyone** is welcomed to create pages, edit and comment in **every** space
- Confluence is set up so as to encourage people's engagement
 - AND it is working!
- Every **teleconference** meeting
 - Has a 'Meeting Notes' page with agenda (before meeting) AND call-in info
 - Everyone across the project is welcomed
 - After meeting, the 'What happened' notes are added
 - Everyone can read what was discusses, what was decided
 - This system creates **transparency** and establishes **further communication**
- Planning and reporting is done in Confluence - **transparent** to all
- Tasks are tracked in Jira with overviews in Confluence - **transparent** to all

E3SM Communication and Transparency in Planning, Tracking, Reporting

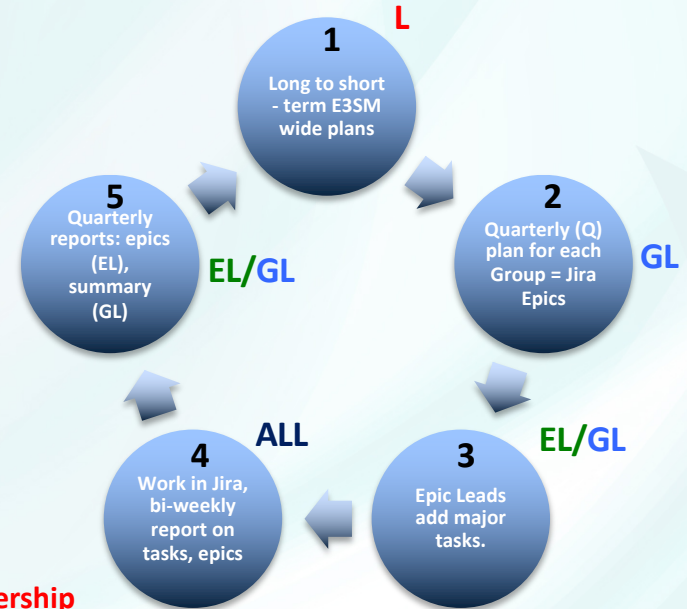


Well Establishes, Mature, Agile Development

- All steps transparent,
- Communicated across the project,
- Available on Confluence pages and in Jira

1. Long to short - term plan (10 years, 3 years, 1 year) (L)
 2. Quarterly plans = Jira Epics (GL)
 3. Create tasks in epics (EL/GL)
 4. Work in JIRA, bi-weekly reports (All)
 5. Quarterly Reports: Epics (EL) and Summary by Group Leaders (GL)
- Retrospective, Rebase, Repeat

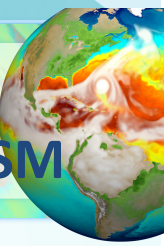
L – E3SM Leadership
GL – Group Leaders
EL – Epic Leaders
All – Everyone



Epic = Major task (~quarterly effort)

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

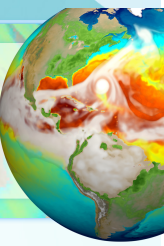


Projects can work on

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

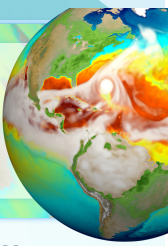
The E3SM Support Policies [\(https://e3sm.org/resources/policies/\)](https://e3sm.org/resources/policies/)

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** (v1.0 - Water Cycle Simulation Campaign, v1.1 –BGC, v1.2 Cryosphere)
- **Supported machines:** NERSC, Compy (internal Anvil)

External communication with ecosystem projects established protocols and policies

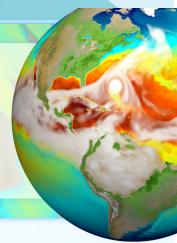


The ecosystem projects planning on developing a piece of code for E3SM shall:

- 1) Coordinate early through the E3SM POC (Point Of Contact) to 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) 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 – the E3SM cannot guarantee that it will incorporate the code

Policies on external project gaining early access to the data, simulation or other info

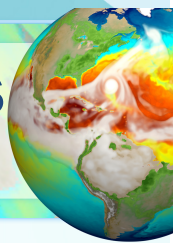


External Projects can submit a **collaboration request** specifying

- 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/

E3SM develops tutorials to help external users

Tutorials on running the model, working with data, E3SM tools



E3SM Infrastructure team developed detailed instructions and online tutorials on

- Quick Start on running the model
- Working with E3SM tools: E3SM-diags, MPAS-analysis, Zstash, PACE
- 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.

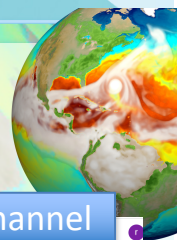
<https://e3sm.org/about/events/e3sm-tutorials/>

Diagnostics and analysis tools documentation:

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



E3SM Project holds bi-weekly All-hands Presentations recorded and released as YouTube webinars



- All-Hands Presentations
 - Science Highlights
 - Code Development
 - Performance Tools
 - Algorithm Highlight
 - Software Tools
 - Invited Talks from Ecosystem
- Bi-Weekly Webinars
- Listed on e3sm.org
- Posted on E3SM YouTube Channel

E3SM Energy Exascale Earth System Model

ABOUT RESEARCH MODEL DATA PUBLICATIONS RESOURCES

Home > About > Events > All-Hands Presentations

ALL-HANDS PRESENTATIONS

Creation of an SST variability metric for E3SM
by LeAnn Corliss
PDF of Presentation
MP4 Movie (on the E3SM YouTube Channel)

Creation of an SST variability metric for E3SM
16:38

High-Order, Property-Preserving Semi-Lagrangian Tracer Transport and Physics-Dynamics-Grid Remap in EAMv2
by Andrew M. Bradley
PDF of Presentation
MP4 Movie (on the E3SM YouTube Channel)

Debugging E3SM Atmosphere Model
by Balwinder Singh
PDF of Presentation
MP4 Movie (on the E3SM YouTube Channel)

BGC Webinar: August 25, 2020
Hurricanes and Ocean Biogeochemistry
by Karthik Balaguru
PDF of Presentation
MP4 Movie (on the E3SM YouTube Channel)

Introduction to E3SM Diagnostics Package (e3sm_diags v2)
by Ali Zhang
PDF of Presentation

E3SM E3SM - Energy Exascale Earth System Model

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Uploads PLAY ALL SORT BY

Creation of an SST variability metric for E3SM
6 views · 1 month ago

High-Order, Property-Preserving Semi-Lagrangian Tracer Transport and Physics-Dynamics-Grid Remap in EAMv2
22 views · 1 month ago

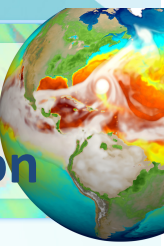
Debugging E3SM Atmosphere Model
23 views · 1 month ago

BGC Webinar: August 25, 2020
59 views · 2 months ago

Introduction to E3SM Diagnostics Package (e3sm_diags v2)
11 views · 3 months ago

E3SM Public Website – WordPress

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/>

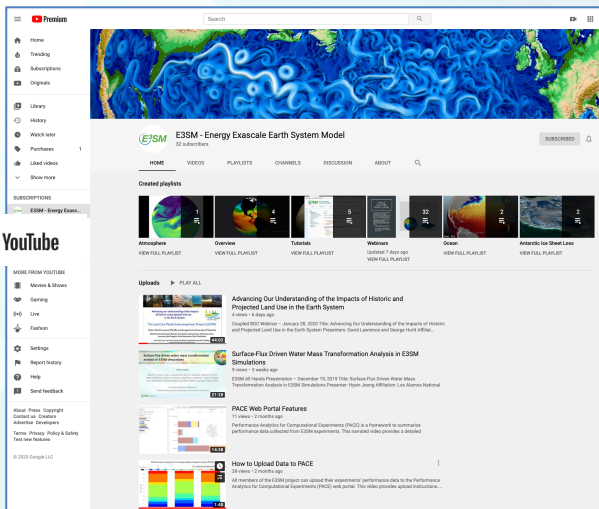
The screenshot shows the E3SM public website homepage. At the top, there is a navigation bar with the E3SM logo and the text "Energy Exascale Earth System Model". Below the navigation bar is a large blue banner with a globe and the text: "Three new model components are included in the E3SM v1 configuration: 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". Below the banner is a section titled "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". Further down is a section titled "THE 2020 VIRTUAL ESMD/E3SM PI MEETING" with the date "October 26-29, 2020" and a registration link. Below that is a "FEATURE STORY" section with four articles: "From Program Manager", "Mesoscale Eddies", "DL for Sub-Grid Processes", and "COVID-19 Research". At the bottom is a "BRIEF" section with four images: a globe, a jet engine, a stack of books, and a keyboard.

Latest News, Research Highlights E3SM Floating Points Newsletter, and e3sm.org

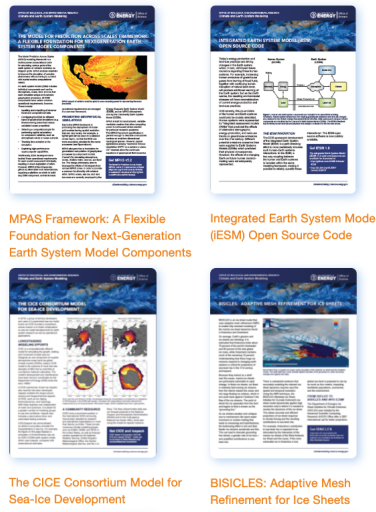
Quarterly E3SM FLOATING POINTS Newsletter

■ Communication Team

- Project pamphlets, brochures, technical highlights, publicity
- E3SM Quarterly Newsletter <https://e3sm.org/about/news/newsletter-archive/>
- Maintains E3SM YouTube Channel
- e3sm.org website updates



Technical Highlights

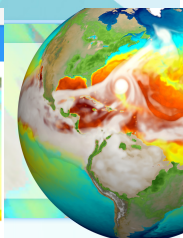


MPAS Framework: A Flexible Foundation for Next-Generation Earth System Model Components

Integrated Earth System Model (ESM) Open Source Code


The CICE Consortium Model for Sea-Ice Development

BISICLES: Adaptive Mesh Refinement for Ice Sheets



News from DOE's state-of-the-science earth system model development project.

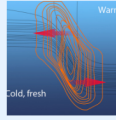
From the Program Manager



As we are all settling into a new way of working, the E3SM team has been continuing to make good progress over past few months. The E3SM version 1 simulation campaign is nearly complete and the team is working hard toward finalizing version 2 of E3SM scheduled for this September. [Read more.](#)

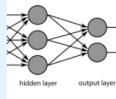
Project News

Modeling Ocean Mesoscale Eddies



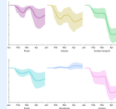
Learn why better modeling of mesoscale eddies - the "weather" of the ocean - is important. [Read more.](#)

Outsourcing Sub-Grid Cloud Physics to Neural Networks



Modern machine learning methods provide interesting breakthrough potential for representing sub-grid processes in next-generation climate simulations. [Read more.](#)

E3SM Effort on COVID-19



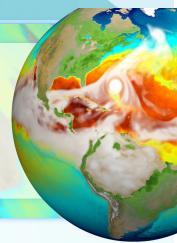
E3SM, along with several other international Earth System Models, plans to quantify the effect of COVID-related emissions reductions on climate. [Read more.](#)

Scientific Visualization of E3SM's Cryosphere Campaign Simulations



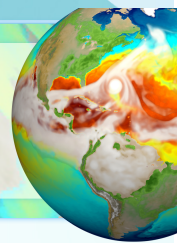
The overarching goal of the Cryosphere Visualization Project is to use visualization to provide a better understanding of the land ice response to ocean forcing. [Read more.](#)

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>

Conclusions



- **Internal Communication**

- **Well established, transparent, extremely well functioning**

- Based on cloud software: Confluence, Jira, GoToMeeting, Slack, Github
- Established schedule for teleconferences and in-person (currently virtual) meetings
- Policy and standardized way on sharing the outcomes of all meetings (in Confluence)

- **External Communication**

- **Public Website** <https://e3sm.org>

- One-stop shop for all project activities, plans, simulation campaigns, data, tools, documentation

- **E3SM Floating Points** - quarterly newsletter

- Reaching nearly 500 subscribers, project's heart-beat, research highlights, publicity

- **Public Confluence Space** integrated with internal Confluence

- Very detailed, up to date documentation

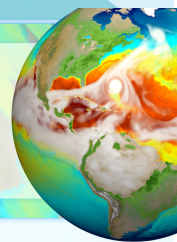
- **Support Policies** on data, code, simulations, collaboration and other requests

- clearly stated on e3sm.org
- Support person in training

- Yearly all-hands (PI) meetings, bi-weekly all-hands presentations

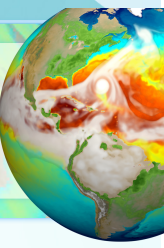
- Dedicated slack channel for external users help questions

A Few Remarks on E3SM's Excellent Internal Communication



We did not get here by chance!!

- We addressed communication thoughtfully early in the project
- We cultivate transparency as a project philosophy
- We require all work to be documented in Confluence
- We have (nearly) free-for-all attitude to Confluence to make communication easy
- We require all work to have a task and a task to have a deliverable, that is often documentation
- We have a well established development cycle with standardized planning and standardized reporting



Thank You, Questions?

This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DEAC52-07NA27344. It is supported by the Energy Exascale Earth System Model (E3SM) project, funded by the U.S. Department of Energy, Office of Science, Office of Biological and Environmental Research. IM Release LLNL-PRES-816372