Improving Project Sustainability through Training

CASS BOF Days
Feb 10, 2026

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Shared notes: https://bit.ly/CASS2026training

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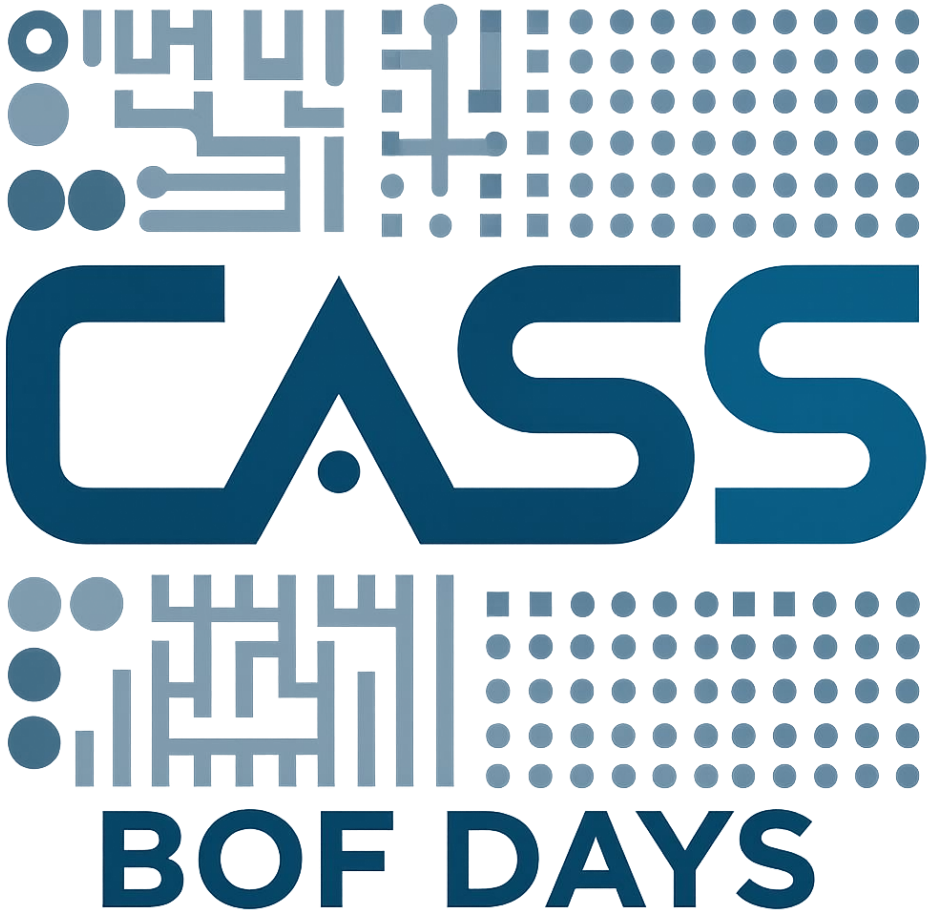
BOF Days

February 10 - 12, 2026

https://cass.community

The Consortium for the Advancement of Scientific Software (CASS)



https://cass.community/news/2026-02-10-cass-bof-days.html

CASS: Stewardship and Advancement of the Scientific Software Ecosystem

- **Inward-facing activities:** Strengthening software products
  - Improve development practices, sustainability, quality, and trustworthiness
  - Enhance user experience and integration within the broader ecosystem
- **Outward-facing activities:** Community engagement and discovery
  - Curate and evolve the software portfolio
  - Help teams connect with and grow their user communities
  - Enable the broader community to discover and adopt useful software

CASS Members

CORSA
Partnering with foundations to provide sustainable pathways for scientific software

FASTMATH
Stewardship, advancement, and integration for math and ML/AI packages

PESO
Stewarding, evolving and integrating a cohesive ecosystem for DOE software

RAPIDS
Stewardship, advancement, and integration for data, visualization and ML/AI packages

S4PST
Stewardship, advancement and engagement for programming systems

STEP
Stewardship, advancement of software tools for understanding performance and behavior

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Engage with CASS!

- Learn about CASS:
  - https://cass.community/about/
- Join the CASS Announcement list (low-volume):
  - http://eepurl.com/iRiSnY
- Find out more about our **software products**
  - Catalog: https://cass.community/software/
  - Collected as part of the Extreme-Scale Scientific Software Stack (E4S)
- Participate in **CASS Working Groups**
  - Impact Framework, Integration, Metrics, Software Ecosystem, User-Developer Experience, Workforce
  - https://cass.community/working-groups/

CASS & CORSA background

- Consortium for the Advancement of Scientific Software (CASS, cass.community) is a federation of member organizations committed to the stewardship and advancement of the current and future ecosystem of scientific computing software
- CASS members support specific scientific communities or provide crosscutting capabilities related to scientific software stewardship
- Center for Open-Source Research Software Stewardship and Advancement (CORSA, corsa.center) is one of the CASS member organizations

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CORSA

- Mission: promote sustainable practices in research software community and support the development, maintenance, and long-term viability of research software
- Vision: CORSA serves as a community of practice that enables pathways for open-source scientific software projects to avail themselves of resources for long-term growth, stewardship, advancement, and innovation
- Goal: facilitate and assist CASS member projects with their sustainability practices, including joining a foundation, collecting and analyzing metrics, and implementing best practices in software stewardship

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CORSA activities

- Initially
  - Pathways to Foundations: Assisting the research software ecosystem to avail the resources and community structure of open source software foundations
  - Software Sustainability Metrics: Curating metrics that enable software projects to better understand and improve their sustainability; identify software sustainability metrics frameworks and a set of tools that can enable projects to collect and analyze metrics specific to their software
    - BOF - A Practical Guide to Measuring Project Sustainability, 2/12/26 @ 11am
- Now considering sustainability training
  - Hypothesis: sustainability skill development process would benefit from the availability of more training material and training opportunities, and additional coordination in creating, maintaining, and delivering it

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Sustainability and training

- Research software is developed and maintained by people/roles, e.g. developer, maintainer, tester, user support
- Each role requires a set of competencies, e.g.,
  - Software-focused work in design, implementation, testing, and optimization
  - User-focused work such as documentation, support, and training
  - Community-focused work such as outreach and engagement
  - Business-focused work such as project management, fundraising, and reporting
- Each competency is based on a set of skills, which can apply to multiple competencies
- No one starts with all the skills they need, or are competent in all the areas they need to be
- Much skill development happens today via mentoring and on-the-job training, as well as more formal training

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Outline

The intent of this BOF is to discuss:

1. Hypothesis: the sustainability skill development process would benefit from the availability of more training material and training opportunities, and additional coordination in creating, maintaining, and delivering it
2. What sustainability-related training material is currently available, and from whom
3. Gaps, particularly around competencies that are not software-focused but are essential to sustaining research software project
4. The potential audience for such training
5. Willingness of projects and their members to get involved in creating, maintaining, and delivering training material
6. Opportunities for collaboration with other groups outside of CASS that have shared interests in software-related training

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Introduction to training, roles, competencies, skills, and software sustainability

- DisCouRSE (Developing a Community of Leaders in Digital Research) - https://discourse-network.github.io/
  - UKRI-funded Network+ project to encourage and support the development of leaders across all digital Research Technical Professional (dRTP) roles, resulting in an empowered and connected community equipped to shape the future of digital research
- Digital Research Competencies (DIRECT) framework - currently has 163 competencies (group of skills) in 7 areas
  - Information and data technologies
  - Software engineering and development
  - ICT infrastructures
  - Professional skills
  - Leadership & management
  - Domain expertise & research
  - Communication

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Introduction to training, roles, competencies, skills, and software sustainability

- Software engineering and development area (https://directframework.com/competencies/#header-2) includes five competencies
  - Web & mobile development
  - Software engineering methodologies and tools
  - Software/computer science concepts & theory
  - Software design & architecture
  - User Interface/User Experience (UI/UX) design

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Introduction to training, roles, competencies, skills, and software sustainability

- Software engineering methodologies and tools competency (https://directframework.com/competencies/#header-2-2) includes 23 skills
  - Compilers
  - Generative AI
  - Reading and understanding code/documentation
  - Data analysis & visualisation
  - Pattern recognition in text
  - Computer modelling & simulation
  - Coding conventions, code formatting and linting tools
  - Testing methodologies & tools
  - Debugging tools
  - Code review techniques
  - Profiling & optimising code
  - Log analysis
  - Software version control
  - Software quality practices & assurance
  - Documenting code & software
  - Organising and documenting software projects
  - Software licensing
  - Packaging & releasing code
  - Deploying code
  - Containerisation
  - Task automation/tool pipelines
  - Computational scientific workflows
  - Environmental impact awareness & measurement

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Introduction to training, roles, competencies, skills, and software sustainability

- Roles require competencies, competencies require skills
- Lots of competencies, lots of skills
- Some competencies apply to multiple roles
- Some skills apply to multiple competencies
- But some skills have been missing, particularly around sustainability
    - Some sustainability and community skills are now being added

- All skills have to be supported by training

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Draft structure of potential training topics (1) & existing material

- Funding models (grants, volunteers, services, dual licensing, …)
  - https://github.com/danielskatz/sustaining-research-projects
- Software foundations (who they are, what they offer, pros and cons, …)
  - https://github.com/danielskatz/sustaining-research-projects?tab=readme-ov-file#foundations--consortiums
  - https://corsa.center/#foundations
- Working with industry (how to, pros and cons, …)
  - ?
- Community management
  - CSCCE; Turing Way

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Draft structure of potential training topics (2)

& existing material

- Technical debt (definition, measurement, tools, examples, how to use, …)
  - ?
- Software engineering practices (design, development, testing, CI/CD, packaging, …)
  - IDEAS-ECP, INTERSECT, URSSI Winter Schools, …
- RSEng training
  - INTERSECT, URSSI Winter Schools, …
- Working with user facilities
  - ?
- Project practices (licenses, governance, roadmap, code of conduct, etc.)
  - https://github.com/corsa-center/oss-documents

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Sources of existing material & potential collaborators

- Focus: community building & maintaining
  - CSCCE / Bidaro (https://www.birdaro.org/) - community-focused
  - Mozilla/GitHub (https://medium.com/read-write-participate/introducing-open-leaders-x-ol%CB%A3-a12e049f5cc0?p=a12e049f5cc0 ; https://www.mozillafoundation.org/en/initiatives/mozilla-open-leaders/) - community-focused
  - Open Leaders Syllabus (https://mzl.la/olx-syllabus)
  - CHAOSS sustainability lab (https://oss-sustainability-lab.com) - community-focused
- Focus: Training
  - Carpentries (incubator specifically), US-RSE (& other RSE associations) training working group
- Focus: Software practices +
  - INTERSECT, Code Refinery, URSSI winter schools, UNIVERSE-HPC, IDEAS-ECP, S³ School (https://indico.in2p3.fr/event/36319/)
- Focus: sustainability, business development
  - Mike Zentner's Science Gateways training, NSF iCorps
- UK DRI skills projects (DisCouRSE, DRIFT, CHARTED, …)

Who is missing?

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Training topics & existing material discussion

- Does the structure make sense?
- What topics are missing?
- Is additional material available?

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Project & staff interest in attending training discussion

- Would attending such training be of interest to your project?
- Would it be of interest to you?
- Why or why not?
- Which specific topics?
- How could it provide more value to projects/staff?

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Project & staff interest in creating, maintaining, delivering training discussion

- Would your project be interested in creating, maintaining, and delivering such training materials?
- Would you personally?
- Why or why not?

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Planning for next steps

- Discussion
- Should we create a CASS Training Working Group?

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