

SUPPLEMENTARY MATERIALS FOR

THE PACE DATA HACKWEEK LAUNCHES A NEW WAVE OF OPEN SCIENCE

HOW WE DID IT (TWICE), AND WHY

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Box S1. Do you think having a shared JupyterHub (e.g., CryoCloud) impacts the practice of open science within the PACE community?

Removing Technical Barriers

- "It eliminates all of the data scientist/cloud engineering and allows scientists to jumpstart doing their science."
 - "It breaks down barriers so scientists can focus on their science, getting rid of hours spent setting up Python/cloud infrastructure on their laptops."
 - "It takes down the barrier to entry for cloud computing and provides an approachable introduction to Python in general. For the PACE Hackweek, we didn't have to worry about installing packages and dependencies, which can be confusing for someone transitioning from Matlab to Python."
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Fostering Collaboration and Community

- "The JupyterHub is a great resource and the cryocloud community is so supportive. I wish more people knew about this resource so that more science can happen, more efficiently."
 - "I think it encourages collaboration and cross-talk, especially with the slack channels being relatively active."
 - "Having this and the ability to share code makes it so much easier to learn from others and is such an invaluable resource."
 - "I think true open science has to be collaborative in a way. As such, platforms such as CryoCloud have an essential role in open science and I think they will impact the PACE community positively."
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Advancing Open and Reproducible Science

- "I think CryoCloud makes it easier to practice open science within the PACE community. It is much easier to share your code/data and make sure people can replicate your environment."
- "Shared JupyterHub platforms significantly improve collaboration and reproducibility. They allow researchers to work in a consistent environment, share workflows and code more easily, and lower technical barriers for new users."
- "I realize now, after using it, how useful it is and how important open science is."
- "A shared JupyterHub on the cloud makes it extremely easy for people to get started opening and processing PACE data. The only challenge is not everyone has access to a shared JupyterHub on the cloud, so that significantly impacts the practice of open science. Not everyone has the same ability to process PACE data in the same way."

Box S2. How do you anticipate continuing to work with your project team in the future?

- “Coordinating over Slack and video calls”
- “We are really excited about pursuing our project, and will start regular meetings with the whole group to move on, maybe work on an article. This was honestly an amazing experience to work together and learn from each other while being very excited by the project, and I think we really want to go on!”
- “Zoom meetings, collaborative coding”
- “PACE Hackweek slack channel in Cryocloud”
- “Yes, we have continued to meet bi-weekly”
- “We have discussed the possibility of working on the problem that we initially thought but couldn't do because of time constraints.”
- “On cryoCloud, Github, and Google Docs”
- “We plan to meet perhaps monthly to keep up on the project as PACE Cloud products further develop.”
- “We will improve our tool until we feel it can be released to the public. We already put together a calendar to start meeting periodically to work on it.”
- “My team and I are planning to continue collaborating on our project into the future, we are in the process of setting up weekly meetings to continue work.”
- “I anticipate continuing to collaborate with my team through GitHub, shared coding platforms, and regular virtual meetings. We plan to further develop the prototype we started during hackweek.”

Box S3. What concerns do you have about cloud computing?

- “Storage.”
- “Security.”
- “Running out of memory for large projects”
- “I still don't really understand what it costs, when it costs something and when it doesn't, and how to use it without being scared of bringing the system down. Also, I need to better understand how to optimize my code for cloud computing and what the pitfalls are, especially with debugging - honestly it almost feels like learning a new coding language.”
- “It would be good if we get free access to GPU.”
- “I worry about how much it costs CryoCloud and how to acknowledge their support.”
- “My biggest concern is how to use it properly without Internet access.”
- “Having to worry about expense with storage (even if I'm not the one paying).”
- “Not everyone has equal access.”
- “Access when there's no internet connection (this is rare, but if I want a satellite image in the field it may be challenging to access the data - although this issue may not be cloud computing specific)”
- “That the cloud may disappear, or may not be accessible (depending also on the travelling locations)!”
- “I'm a little nervous about losing access to CryoCloud, and don't know if my group would support cloud computing financially because they already pay for cluster computing.”
- “Using too much storage accidentally.”
- “First, adapting my way of thinking and working to cloud computing. Second, I am concerned that not enough people around me will use cloud computing, which will make collaboration a bit more difficult. Third, I am concerned with the longevity of cloud computing "platforms". Will I have to keep "jumping" from platform to platform? Am I at risk of losing my work framework?”
- “Costs and accessibility.”

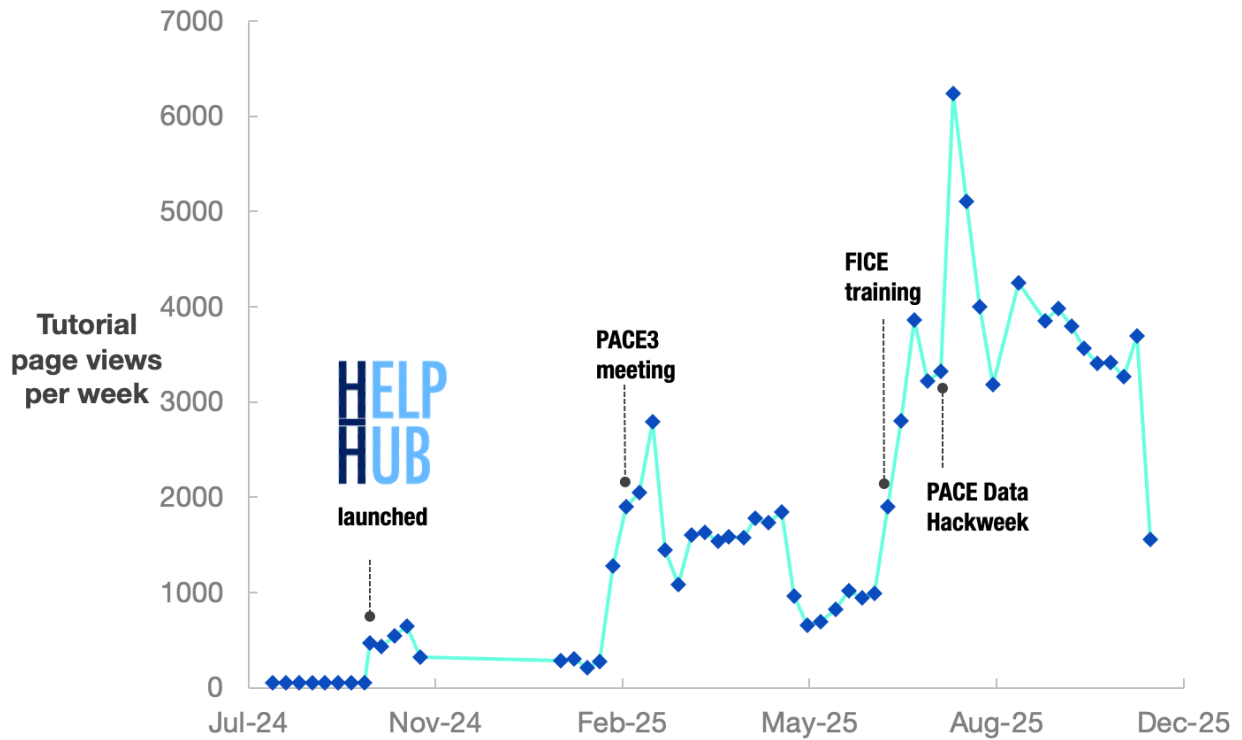
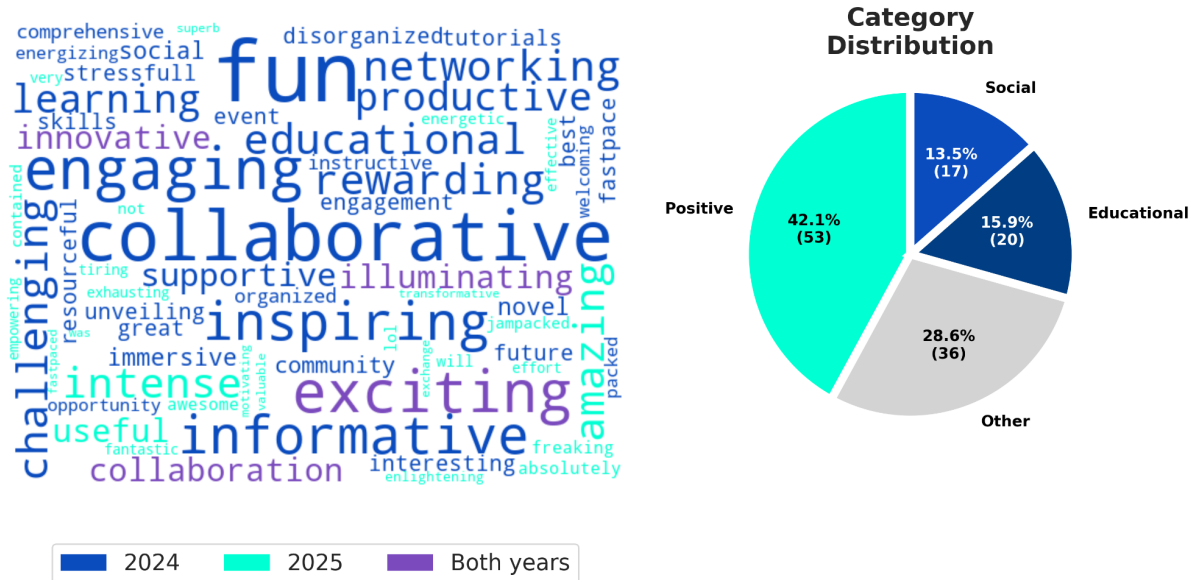


FIGURE S1. Timeline of the Help Hub tutorial page views per week from July 2024 to December 2025, showing the increase in page views after the launch of the [Help Hub](#). The PACE3 meeting was a combined science meeting that brought together three interrelated PACE science groups: PACE PAX (the Postlaunch Airborne eXperiment), the third PACE Science and Applications Team (SAT3), and the PACE Validation Science Team (PVST). The Field Inter-Comparison Exercise (FICE) training was an advanced, hands-on training course focused on in situ ocean color radiometry and satellite validation.



FIGURE S2. Word cloud summarizing responses to the feedback survey question, “Are you more confident in your ability to use PACE data because of the Hackweek?”

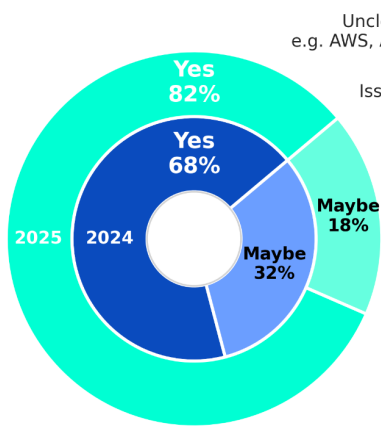
How would you describe the PACE Data Hackweek in Three Words?



Total responses: 2024 (n=25), 2025 (n=16) | Total words: 126

FIGURE S3. Word cloud and attitude assessment summarizing responses to the feedback survey question, “How would you describe the PACE Data Hackweek in three words?”

Do you anticipate using cloud computing with PACE data for your research?



Barriers to Cloud Computing with PACE Data

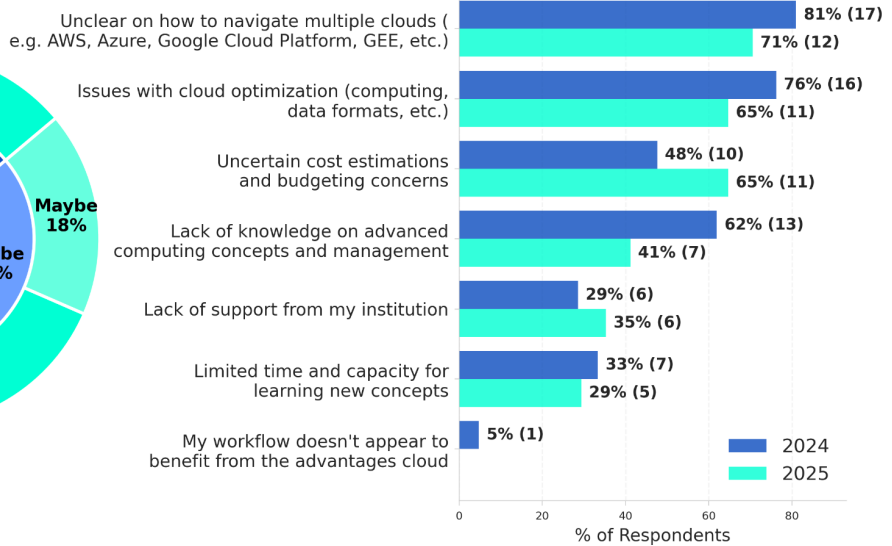


FIGURE S4. Responses to the feedback survey question, “Do you anticipate using cloud computing with PACE data for your research?” along with a bar chart showing the percentage of respondents identifying perceived barriers to using cloud computing with PACE data.

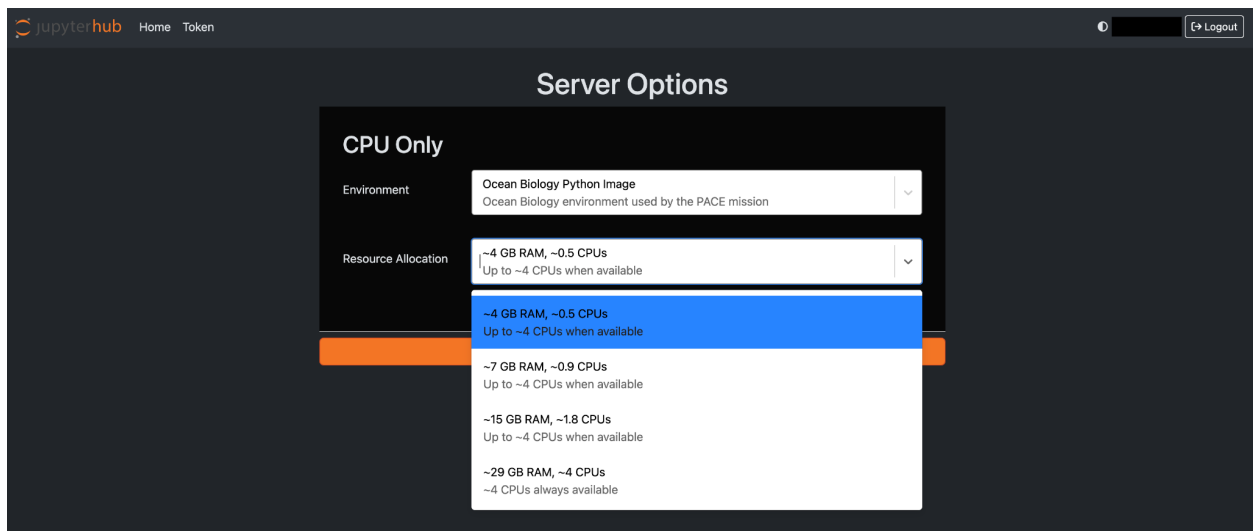


FIGURE S5. Login server options for the CryoCloud JupyterHub.