

ESIP Open Science Cluster Meeting Journal

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Telecon 34 2/24/26 - ESIP Open Science Cluster

Participants (Name, organization, email, (optional: interests within the cluster/for upcoming meetings))

1. Colleen Rosales, OpenAQ, colleen@openaq.org
2. Alycia Crall, ESIP, alyciacrall@esipfed.org
3. Joshua Brinks, ISciences, jbrinks@isciences.com
4. Lorraine Tighe, ESIP Open Science Cluster Co-Chair, Esri, Director of Earth Sciences Solutions ltighe@esri.com
5. Julia Lober, Boise State University, julialober@u.boisestate.edu
6. Juanisa McCoy

Agenda

- Sharing insights from conference + events + articles
 - AGU
 - Open Science pavilion site - a lot of traffic, close to poster session
 - plan for another session in 2026 (AGU, ESIP July 2026 meeting)
 - plan for a presence in the open science pavilion
 - town halls
 - ESIP
 - 200+ online attendees in January
 - July ESIP Meeting: Austin, TX + Online – Jul 28-31, 2026
 - AMS
 - overarching openness about science
 - attendance impacted by weather
 - open code/open methods project (modeling) for early alert (from Josh)
 - town halls - more optimistic than AGU
 - Environmental Data Science Summit
 - [Turning Data into Action: Reflections from the Final NCEAS Environmental Data Science Summit](#)
 - Unconference for 2 ½ days -> participants determined agenda; check-ins to ensure work could be done in time; broke into different working groups with multiple themes
 - ESIP does an unconference session during July meeting
 - The State of Open Data 2025
 - [webinar recorded](#)
 - FAIR and CARE -> awareness high; challenge is application in workflows
 - Mentioned data sharing thoughts; discussing what should have been done or what is being done

- Apprehension in sharing data in areas impacted significantly by colonialism, extraction, etc.
- benefit of public goods greater than costs
- Figshare founder shared data is open but models using data are not necessarily open

Shared Links in chat

- Registration link for future calls (starting March):
https://esipfed-org.zoom.us/meeting/register/R0SvpBZFQyWuy5Pfe8h_Bg
- Open Science article by Bertram, et al Cell Press (2023):
<https://doi.org/10.1016/j.cub.2023.05.036>
- A 2021 study found that 73% of theoretically-executable Jupyter notebooks* don't work as-is:
<https://doi.org/10.1145/3324884.341658>
- Another study found that they were able to successfully run only 24% of unambiguous execution order Python notebooks; only 4% produced the same results:
<https://doi.org/10.1109/MSR.2019.00077>
- Template for Cluster plan:
https://docs.google.com/document/d/14v8jMVAloe8Cl6124A4VDmldmAp6e_E9_4XCqBvOqA/e_dit?tab=t.0

Notes

- Upcoming: Open Science Cluster Survey + plans for 2026
- Upcoming conferences
 - FedGeoDay fedgeo.us, April 22-23
 - EGU, May 3-8, Vienna Austria
 - Data Help Desk
 - upcoming sessions on open data repositories

A 2021 study found that 73% of theoretically-executable Jupyter notebooks* don't work as-is

Wang, et al <https://doi.org/10.1145/3324884.341658>

*N = 936

- Required humans to infer (and often guess) the order in which the authors created the cells.

Another study found that they were able to successfully run only 24% of unambiguous execution order Python notebooks; only 4% produced the same results.

Pimentel et al. (2019) <https://doi.org/10.1109/MSR.2019.00077>

- Only 14% declared dependencies; not all declarations are valid.
- Other problems: Unavailable files, external tools required, files designed for other systems

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 - <https://doi.org/10.1145/3324884.341658>
 - <https://doi.org/10.1109/MSR.2019.00077>

Telecon 33 11/18/25 - ESIP Open Science Cluster

Participants (Name, organization, email, (optional: interests within the cluster/for upcoming meetings))

7. Joshua Brinks (ISciences, LLC)
8. Colleen Rosales, OpenAQ, colleen@openaq.org
9. Walid Ouaret, University of Maryland, wouaret@umd.edu
10. Lorraine Tighe, ESIP Open Science Cluster Co-Chair, Esri, Director of Earth Sciences Solutions ltighe@esri.com
- 11.

Agenda

- Thank you to outgoing ESIP fellow, Walid!
- Past and Upcoming Open Science Events
- ESIP Jan26 Submission Review: [W 2026 Open Science Cluster Session Proposal.docx](#)

Shared Links in chat

- <https://www.harveststat.org/>
- <https://2026januaryesipmeeting.sched.com/>

Notes

- Forward to Open Science Cluster listserv
 - AGU Opportunities:
 - Open Science sessions: Poster and Oral
 - ESIP Data Help Desk
 - ESRI Booth - Open Science Kiosk - wait for information from Lorraine
 - possible time to gather ESIP Open Science folks
 - EGU Open Science Geospatial Session:
<https://meetingorganizer.copernicus.org/EGU26/session/56635>
- (ASAP) Send out Google Doc version of session proposal for feedback

Telecon 32 10/28/25 - ESIP Open Science Cluster

Participants (Name, organization, email, (optional: interests within the cluster/for upcoming meetings))

12. Colleen Rosales, OpenAQ, colleen@openaq.org
13. Alycia Crall, ESIP, alyciacrall@esipfed.org
14. Lorraine Tighe. ESIP Open Science Cluster Co-Chair, ltighe@esri.com, Director of Earth Sciences, Esri
15. Carla McAuliffe, IGES, carla_mcauliffe@strategies.org
16. Josh Brinks, jbrinks@isciences.com
17. Bruce Caron bruce@tnms.org
18. walid ouaret wouaret@umd.edu

[Total: 11 participants]

Agenda

- Presentations: Open Science & Earth Observation: Tools for Climate Agriculture, Education, and more [this presentation is being recorded]
- Walid Ouaret, University of Maryland: Earth Observations
- Josh Brinks, ISCIences

Shared Links in chat

- Josh Brinks' presentation: <https://joshbrinks.github.io/esip-os-cluster-202510/slides.html>
- Open Climate Science for Agriculture: openclimatescience.github.io
- nClimGridExplorer: <https://nclimgrid.isciences.com/>
- Open Science Handbook (Bruce Caron): <https://openscientist.pubpub.org/>
- <https://eartharxiv.org/>
- ESIP Session Proposal:  Call for Sessions JAN26

Notes

- Upcoming Open-Science Cluster meetings this year: November 18; December 16, 2025
- Walid's presentation:
 - openness has a cost
 - collaboration: education and skills
 - open climate science curriculum for agriculture
 - designed for diverse audiences

- water resources, soil health, crop conditions and crop production
 - translations in English, French, Arabic
- if people want to contribute, some ways include help in translations and verification
 - unfortunately, volunteers do not have enough time to go through verifications and keep up with the demand for workshops
- Open Climate Science for Agriculture: openclimatescience.github.io
- (from audience)
 - piggybacking on curriculum for funding
 - learning from ESRI on MOOCs
- Josh's presentation
 - ISciences Open Science Portfolio
 - ISciences is private, but into open science (which also benefits them as a company)
 - DANTE: Data Analysis Toolbox for Environmental Research
 - TOPS-SCHOOL: ScienceCore Heuristics for Open Science Outcomes in learning Overview
 - NASA-funded Open Science training curriculum
 - NASA, NOAA, NCEI datasets
 - SCALAR: ScienceCore Curriculum for AI Literacy and Research
 - nClimGrid Explorer
 - R package and Shiny web app for NOAA nClimGrid-Daily dataset (funded by ESIP Lab grant)
 - climate and social vulnerability analysis
 - exactextractr Package: High-performance zonal statistics for R
 - orders of magnitude fast than competing methods
 - GDAL Contributions
 - Water Security Indicator Model
 - global forecasting tool
 - NIDIS / [Drought.gov](https://drought.gov)
 - Lessons learned:
 - struggling with stakeholder engagement and design; niche domains
 - simplify front-end product
 - not everyone is on-board with open science (e.g., corporate customers)
 - (audience discussion)
 - how to get the open-science tools in front of the right audience and finding the users?
 - graduate degrees in Data Science - good "customer" for this work
 - K-12 space (e.g. Arizona ArcGIS competition)

Telecon 31 09/23/25 - ESIP Open Science Cluster

Participants (Name, organization, email, (optional) interests within the cluster/for upcoming meetings)

19. Walid Ouaret , University of Maryland , wouaret@umd.edu

20.

Agenda

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Shared Links in chat

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Cluster output examples to model community paper output

Notes

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**Telecon 30 08/26/25 - ESIP Open Science
Cluster**

Participants (Name, organization, email, (optional) interests within the cluster/for upcoming meetings)

21. Lorraine Tighe, Esri, ltighe@esri.com
22. Colleen Rosales, OpenAQ, colleen@openaq.org
23. Walid Ouaret , University of Maryland , wouaret@umd.edu
24. Alycia Crall, ESIP, alyciacrall@esipfed.org
25. Althea Marks, University of Washington, amarks1@uw.edu
26. Maricela Abarca, Stanford University Libraries, mabarca@stanford.edu, how to teach open science basics/best practices to researchers
27. Jessica Morgan, NOAA, jessica.morgan@noaa.gov
28. Josh Brinks
29. Aaron Friesz, ESIP, aaronfriesz@esipfed.org

Agenda

- welcome new members!
- recap of open science-related activities during the ESIP meeting
- collaboration on a [Data Help Desk activity](#)
- open science community paper
- future lightning talk topics & speakers!

Shared Links in chat

- The Turing Way: <https://www.turing.ac.uk/research/research-projects/turing-way>
- Background on our ongoing Open Science Cluster work (written by Lorraine Tighe): <https://www.esri.com/en-us/industries/blog/articles/embracing-open-science-a-journey-of-collaboration-and-innovation>
- Data Help Desk playbook: https://esipfed.github.io/data-help-desk/docs/resources/questions_from_users.html
- If you were unable to make [yesterday's webinar](#), the recording is now on ESIP's YouTube channel along with [recordings from all the meeting's sessions](#).
- <https://www.esipfed.org/community-calendar/>
- Center for Open Science webinar Oct 7: https://cos-io.zoom.us/webinar/register/6617510416446/WN_UzPkhT6GTBO2DZgqtQdCCA?hsCtaTracking=d7c7b95f-c143-4884-be5b-a562373bd499%7Cb66ab261-89db-4850-81bd-e1fdb6da4c9#/registration

Cluster output examples to model community paper output

- Repository Crisis Scorecards (example of cluster output in Zenodo with ESIP branding): <https://zenodo.org/records/15208172>
- Biological data standards cluster: [webbook via GitHub](#)
- ESIP DMP: <https://github.com/ESIPFed/esipDMP>

Notes

- NOAA Data Management Handbook update (v1.1) upcoming in October (possible talk to OS cluster by then - Jessica Morgan, NOAA)
 - [NOAA Administrative Order \(NAO\) 212-15B: Management of NOAA Data and Information, Data Management Handbook](#) (v1.0)
 - Specific use case - quickly getting a DOI for a publication-associated dataset, e.g., [Zenodo | NOAA NESDIS Community](#)
 - NOTE: NOAA will be tidying up its various [Zenodo Communities](#)
- Community paper writing updates - writing stage
 - Possible sharing: Zenodo/Figshare/Github/EarthArXiv
 - If dynamic - how might we want people to continue to contribute
 - Forms in addition to Zenodo
 - ESIP [endorsement process](#) (for cluster outputs)
 - not required when sharing in Zenodo, but can be used if wanted
 - Assistance available from Alycia and Aaron (ESIP)

Data Help Desk one-pager comments, additions, etc:

- List of additional Federal data repositories [to add to [Data Help Desk doc](#)]:
 - [NOAA Centers for Environmental Information \(NCEI\)](#)
 - [DOE Data Infrastructure for a Virtual Ecosystem \(ESS-DIVE\)](#)
 - [EPA Water Quality Data \(WQX\)](#)
 - [NASA Open Science Data Repository \(OSDR\)](#)
 - [NIH National Center for Biotechnology Information \(NCBI\)](#), including [GenBank](#)
 - [NIST Public Data Repository \(PDR\)](#)
 - [USDA Ag Data Commons](#)
 - [USGS ScienceBase](#)
 - see also: [Generalist Repository Ecosystem Initiative | Data Science at NIH](#)
- List of additional Generalist data repositories [to add to [Data Help Desk doc](#)]:
 - [KNB](#) A repository for all environmental or ecological related data.
 - [Mendeley](#) A free and secure cloud-based communal repository.
 - [OBIS OBIS-USA Node](#) is the marine data thematic node of [GBIF-US](#)
 - [Movebank](#) The repository publishes animal tracking and animal-borne sensor datasets, harmonized using a shared, publicly documented data model and vocabulary.
 - [Figshare](#) A provider of open research repository infrastructure. NOTE: terms and conditions preclude Federal agencies from using figshare, so maybe not *really* an open data repository

Generalist Data Repositories Data repositories that accept data from individual scientists regardless of data type, format, content, or disciplinary focus.	Cost	Size Limit	Retention Period
Zenodo Terms DCDR doi Open to all research outputs from all fields of science regardless of funding source.	none	50 GB	lifetime; 20+ years
KNB Terms USGS doi A repository for all environmental or ecological related data.	none	50 GB	lifetime
Mendeley Terms GREI doi A free and secure cloud-based communal repository.	none	10 GB	permanent
BCO-DMO Terms CoreTrustSeal doi A repository for biological and chemical oceanography data resulting from research conducted in coastal, marine, great lakes, and laboratory environments.	none	Individual files not to exceed 10 GB	See WHOI & NCEI
OBIS Terms USGS doi OBIS-USA Node is the marine data thematic node of GBIF-US (POC Mathew Biddle < mathew.biddle@noaa.gov >)	none	10 GB	See NCEI
Movebank Terms USGS doi The repository publishes animal tracking and animal-borne sensor datasets, harmonized using a shared, publicly documented data model and vocabulary.	none	2 GB	10+ years

- If ESIP branding is needed (+ help with formatting), need to connect with Zoe (zoegentes@esipfed.org)- confirm with Chandra (DHD lead) if this is desired
- Mark which ones are data-sharing platforms/repositories (i.e., can public add data/publish on it), and which ones are data sources.
- DHD schedule
 - [AMS](#) - New Orleans, LA 12-16 January ✓
 - [EGU](#) - Vienna, Austria 27 April–2 May ✓
 - [JpGU](#) - Chiba, Japan 25 - 30 May (next year more of a presence) ✓
 - [SRI](#) - Chicago, IL 16-19 June (2nd year) ✓
 - ~~[ESA](#) - Baltimore, MD 10-15 August~~ ✓ (did not attend this year)
 - [GSA](#) - San Antonio, TX 19-22 October
 - [AGU](#) - New Orleans, LA 15-19 December weather
 - [OSM](#) - Glasgow, Scotland 22-27 February 2026
- Internal: Note federal funding restrictions e.g., Figshare is not considered.
 - What is “open”
- Convene with Data Help Desk
- Lightning talk - September/October

Telecon 29 06/24/25 - ESIP Open Science Cluster

Participants (Name, organization, email, (optional) interests within the cluster/for upcoming meetings)

1. Lorraine Tighe ESIP Co-Chair, Esri ltighe@esri.com
2. Alycia Crall, Community Director, ESIP, alyciacrall@esipfed.org
3. Walid Ouaret, Open Science Community Fellow ESIP , University of Maryland, wouaret@umd.edu
4. Lynne Merchant, developing data help desk website
5. Tylar Murray, University of South Florida, MarineBon
6. Chandra Earl, NEON
7. B

Agenda & Notes

Food for thought:

- *Let's go through the July agenda and identify sessions that are relevant to Open Science:*
<https://2025julyesipmeeting.sched.com/>
 - *How are other clusters incorporating Open Science in their work and their sessions?*
- *What activities (unconference, FUNding Friday pitch, etc.) can the OS Cluster plan/brainstorm during the July ESIP meeting?*
- *Thoughts from representatives from other clusters: Data Help Desk*

Telecon 28 05/27/25 - ESIP Open Science Cluster

Participants (Name, organization, email, (optional) interests within the cluster/for upcoming meetings)

8. Colleen Rosales, OpenAQ (colleen@openaq.org)
9. Walid Ouaret (wouaret@umd.edu)
10. Lorraine Tighe (ESRI)
11. Megan Orlando
12. Howard Burrows, UMass Amherst (hburrows@umass.edu)
13. Nancy Ritchey (NOAA)
14. Bruce Caron
- 15.

Agenda & Notes

- EGU attendance overview from Lorraine Tighe
 - Takeaways: Collaboration and coming-together is a big topic.
 - other takeaways: Interdisciplinary collaboration; state repositories and data management; data governance and publication; data sharing standards
 - US politics was discussed - heightened discussions of the need for collaborations
 - Actual research infrastructures (technology) - workflows
 - Many folks were reinventing the wheel
 - Github is a good tool to avoid things happening in silos
 - storage and dissemination - big question
 - Open Science Help Desk (EGU + ESIP)
 - running list of questions
 - Megan has a list of questions (captured questions that there were no answers yet; some questions may not have been captured and have to go back to the folks that asked; some questions that were answered on the spot may not be here)
 - Open Science Help Desk Cluster (new cluster) -volunteer led initiative
 - OS Help Desk Cluster will be next in GSA in October
 - Q (Howard): was there web standards/semantics in EGU?
- Open Science Session: plan for Unconference
 - Can also do a poster during the Research Showcase

- Future Lightning Talks Ideas:
 - Open Science Data Help Desk collaboration
 - Topic suggestion from Walid: Control of data, algorithms (data sovereignty/digital sovereignty- e.g., national level; authority for control)
 - differences in questions being asked + definitions of terminologies
 - philosophical discussions
 - *continuity* in data, deprecation of software (universal sovereignty)
 - other available platforms e.g., CERN, eartharxiv
 - Beyond ontologies: propositional and interpretive standards
 - extend “semantic web” to an “epistemic web”
 - Use value of the science to support use and promotion
 - Determine context in which an observation becomes “data”
 - What does open mean?
 - does actionable = open (promotion vs ease of use)
 - commons
- June cluster meeting suggestion: Lightning preview agenda for other clusters for the July meeting (how can they think of/ incorporate Open Science in their sessions/cluster work?)

Telecon 27 04/22/25 - ESIP Open Science Cluster

Participants (Name, organization, email, (optional) interests within the cluster/for upcoming meetings)

Note: this meeting is being recorded

16. Rachael Blake, Intertidal Agency, rachael@intertidal.agency

17. Walid Ouaret , University of Maryland, wouaret@umd.edu

18. Althea Marks, University of Washington, amarks1@uw.edu

Agenda & Note

- Presentation of the cluster activities : 📅 April 2025 Open Science Cluster
- Plan to submit a workshop proposition to the July Annual Meeting this July
<https://2025julyesipmeeting.sched.com/> Consider the Registration Assistance is the cost of the registration is a barrier.
- The 📄 ESIP Open Science Cluster: Summer meeting Workshop proposal
- The shared Open Science Cluster Folder :
<https://drive.google.com/drive/folders/0AM7KCR6fJCHcUk9PVA>
- Suggestions on Lightning talks :
 - Open Science view from overseas point of view
 - Building Accessible Environmental Models Through Community and Open Science
 - Integrating / balancing data archiving best-practices with user distribution file-types and tools for medium-sized data (Althea possible case study)
 - Balancing Proprietary Interests with Open Science
 - Making Ecological Models Shareable, Reusable, and Open-<https://besjournals.onlinelibrary.wiley.com/doi/10.1111/2041-210X.70036>
 - ESIP Data Stewardship to present their activities.
 - Join other ESIP Cluster to invite lightning talks

Telecon 26 03/25/25 - ESIP Open Science Cluster

Participants (Name, organization, email, (optional) interests within the cluster/for upcoming meetings)

Note: this meeting is being recorded

1. Colleen Rosales, OpenAQ, colleen@openaq.org
2. Walid Ouaret , University of Maryland, wouaret@umd.edu
3. Bruce Caron, New Media Research Institute
4. Douglas Rao, CISESS-NC/NOAA NCEI, douglas.rao@noaa.gov
- 5.

Agenda & Notes

- Presentation of the Open Science Survey 2025 results :
https://docs.google.com/presentation/d/1UrAC0czOhGITYR6ORTNC6EMQAs7EDlyHAG_A-Fk08Z0/edit#slide=id.g342309d7874_1_5
- Discussion and suggestion :
 - Feedback loop/possible collaboration with Data Help Desk Cluster
 - Challenges (use cases) and “how to get started” in addition to success stories
 - Fodder for lightning talks
 - Null cases example: [link](#)

- ESIP Preprint cluster >> EarthArXiv - want to get more data papers, content including null results (*Associated OS Pillar: Dissemination Practice*)
- Another example: post-preprint reviews: [PREreview](#)
 - encourage people to provide review to pre-prints
 - more transparent “live” peer review
 - *Associated OS Pillar: Dissemination Practice*
- Learning processes in open science pillars for early-career researchers
- <https://ojs.library.queensu.ca/index.php/IEE/article/view/4628>
- How can scientists/researchers make small changes to their workflow
- Use of the terminology “Commons”
- Possibly submit more than one Open-Science-related session for the ESIP meeting based on the Open Science Pillars

Telecon 25 03/04/25 - ESIP Open Science Cluster

Participants (Name, organization, email, (optional) interests within the cluster/for upcoming meetings)

Note: this meeting is being recorded

1. Colleen Rosales, OpenAQ/UC Davis, colleen@openaq.org
2. Lorraine Tighe, ESRI, LTighe@esri.com
3. Aaron Friesz, ESIP, aaronfriesz@esipfed.org
4. Morgan Wofford, University of Michigan School of Information, mwofford@umich.edu
5. Walid Ouaret, University of Maryland, College Park, wouaret@umd.edu
6. Ghiles KACI, 6th Grain, ghiles.kaci@6grain.com

Agenda & Notes

- Round of introductions
- Background and history of the Open Science Cluster (presentation by Lorraine Tighe)
 - Blog: <https://www.esri.com/en-us/industries/blog/articles/embracing-open-science-a-journey-of-collaboration-and-innovation/>
 - Worksheet from the ESIP meeting last July:  Open Science - Worksheet
 - Five Pillars:  Five Pillars.docx

- ongoing notes doc about the paper: [☰ Open Science Community Paper](#)
- Topic suggestions to add to current pillars: Translating concepts/ideas to different languages, computational accessibility, cultural/mindset component, information science papers
- Next task: cluster leads to create and disseminate an updated survey (gain more/refine ideas from the larger open science group that can capture the additional suggestions such as above)
 - Last year's survey: [📄 2024 Open Science Cluster Survey Responses](#)
 - moving forward: focus on one pillar for each cluster meeting
- Suggestion: Data stewardship cluster's WebBook (GitHub)
- Next cluster meeting: March 25, 2025 (usual cadence)

Telecon 24 11/19/24 - ESIP Open Science Cluster

Participants (Name, organization, email, interests within the cluster/for upcoming meetings)

1. Colleen Rosales, OpenAQ/UC Davis colleen@openaq.org
2. Gerbrand Koren, Utrecht University, g.b.koren@uu.nl
3. Rachael Blake, Intertidal Agency, rachael@intertidal.agency
4. Daniel Segessenman, ESIP, George Mason University, dsegesse@gmu.edu
5. Doug Lindholm, University of Colorado Boulder/LASP, doug.lindholm@lasp.colorado.edu
6. Megan Orlando, ESIP, meganorlando@esipfed.org

Agenda & Notes

- Welcome, incoming ESIP fellow, and thanks to out-going ESIP fellow
- Community paper updates
- Qs for Peter Kalverla
 - Colleen can collate and forward questions/follow-ups to Peter
- December AGU meeting - Lorraine presenting
- January ESIP meeting - no cluster meeting in January
- 12:30 PM ET: NASA TOPS Talks: Advancing Open Science Panel Discussion
- [Community paper](#) is available online for contributions and edits

Q's for Peter Kalverla (add your contact name/info):

- 1) do people come to the Netherlands e-science center or how do you do the outreach to make open science known? 2) to use your research software, how much knowledge/what level is necessary? - Colleen Rosales colleen@openaq.org
-
-

Telecon 23 10/22/24 - ESIP Open Science Cluster

Participants (Name, organization, email, interests within the cluster/for upcoming meetings)

1. Lauren Holian, University of South Carolina, lholian@email.sc.edu

2. Bob Downs, Columbia University, rdowns@ciesin.columbia.edu
3. James Milburn, University of Alaska, jdilburn@alaska.edu
4. Gerbrand Koren, Utrecht University, g.b.koren@uu.nl
5. Colleen Rosales, OpenAQ/UC Davis colleen@openaq.org
6. Rob Casey, EarthScope Consortium, rob.casey@earthscope.org

Agenda & Notes

- **Invited talk:** “Research software in an era of open science” by Peter Kalverla
 - **Peter's bio:** Research software engineer at Netherlands eScience Center www.esciencecenter.nl
 Peter joined the Netherlands eScience Center in 2019 to develop his software engineering skills, learn about digital technologies, and contribute to open science. Peter has a background in meteorology. Pursuing his interest in the natural environment, he initially enrolled in a broad BSc programme on “soil, water, and atmosphere” and later specialized in the latter. This interdisciplinary background proves very useful in his current position as RSE in the Environment and Sustainability section, where he has led several projects revolving around geospatial problems. Peter is very passionate about open science and collaborative research software development. Engineering-wise, he is particularly interested in software solutions that enable a more accessible and transparent research process.
 - **Description:** Sustainable research software is crucial for an efficient, transparent, and reproducible scientific process. Using five examples, I will show how research software fits into a landscape of open scholarship and how best practices around data and software can help to make the most out of your code, whether it is a complex earth system model or a simple Jupyter notebook.

Telecon 22 09/24/24 - ESIP Open Science Cluster

Participants (Name, organization, email, interests within the cluster/for upcoming meetings)

7. Colleen Rosales, OpenAQ, colleen@openaq.org
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12. Gerbrand Koren, Utrecht University (Netherlands), g.b.koren@uu.nl

13. Megan Orlando, ESIP, meganorlando@esipfed.org

14.

Agenda & Notes

- Possible webinar speakers/topics in the future monthly meetings
 - Topic: Open licensing (e.g. for data, data products, code, software, etc.)
 - Suggested speaker: Dr. Peter Kalverla (Netherlands eScience Center) [Gerbrand will send email with Colleen and Lauren in CC]
 - https://www.linkedin.com/posts/orcaopen_the-call-for-participants-to-the-open-science-activity-7216122152679268352-JDzc?utm_source=share&utm_medium=member_desktop (suggestion from Megan to look into this just-hosted workshop, which may have some interesting outcomes/outputs to explore or potential webinar topic!) Also wonder if there is a list or spreadsheet somewhere to incorporate random ideas/contacts/OS projects like this.
- Esri booth meeting at AGU to discuss open science
- Community paper discussion (create an [outline](#)?)
 - Reviews of what has been done before; identify unique perspective
 - Open science practices in general - project lifecycle rather than data lifecycle
 - Identify target audience
 - What kinds of papers would our members read?
 - Topic focus of Earth science, space
 - Retaining the structure of the full lifecycle
 - Case studies of success stories of open science (Earth science focus)
 - Reach out to ESIP community for examples
 - Stories of failures/challenges people have faced
 - Ex. session “Epic failures” (supportive environment)

<https://www.esipfed.org/epic-fails-the-not-so-secret-reality-of-science/>

<https://2019esipsummermeeting.sched.com/event/PtP7>
 - Our current outline gives the impression of a linear scientific process, how can we incorporate the multiple ways science is conducted? (ie. data generators are can be separate from data users) (e.g. data reuse examples)
 - May not need to sell open science, rather focus on case studies
 - Development of infographic

Logistics

- Encouraging participation
 - Would alternate times work better for ESIP members?
 - More targeted communication - clear on ramps for participants
- Connecting with other clusters and their outputs
 - Data Stewardship Committee

- Sustainable Data Management (recent paper)
- o Timing, tasks delegation in writing and devoting time for the paper

Content

- o What is the unique perspective that we bring?
- o What are the connections/disconnects between pillars?
- o Are there seminal community papers we should be considering as we identify our unique position?
 - Reach out to ESIP community for input
 - FAIR principles: <https://www.nature.com/articles/sdata201618>
 - FAIR software: <https://www.nature.com/articles/s41597-022-01710-x>
 - Glob Env Change perspectives: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2022EA002231>
 - O3 guidelines: <https://www.nature.com/articles/s41597-024-03406-w>
- o Who (what audience) will the paper be for? What is most meaningful to the individuals involved?

Telecon 21 08/27/24 - ESIP Open Science Cluster

Participants (Name, organization, email)

15. Colleen Rosales, OpenAQ, colleen@openaq.org - present in July Open Science session
16. Lauren Holian, University of South Carolina, lholian@email.sc.edu
17. Doug Lindholm, University of Colorado, LASP, doug.lindholm@lasp.colorado.edu
18. Daniel Segessenman, George Mason University, VA, dsegesse@gmu.edu
19. .

Agenda & Notes

- **Welcome:** Colleen Rosales and Lorraine Tighe
- **Review:** Sparking Conversations & Retrospection: Exploring Open Science Practices" workshop and AGU abstract submission
 - Notes document: bit.ly/esip24-openscience-doc
 - [Slides](#)
 - [Five pillars](#) - one pagers
 - Output - worksheets for each pillar: bit.ly/esip24-openscience-worksheet

- [Highlights webinar \(one slide\)](#)
 - [ESIP highlights playlist on Youtube](#)
- [Abstract](#)
- **Discussion and take-home questions:** Community paper output
 - What is the unique perspective that we bring?
 - What are the connections/disconnects between pillars?
 - Are there seminal community papers we should be considering as we identify our unique position?
 - Who (what audience) will the paper be for? What is most meaningful to the individuals involved?
 - Logistical considerations (timing, tasks delegation) in writing and devoting time for the paper
 - possibly survey again
 - put out an outline
 - alternate formats for meetings: assigned writing times
 - Encouraging participation
 - Would alternate times work better for ESIP members?
 - More targeted communication - clear on ramps for participants
 - Connecting with other clusters and their outputs
 - Data Stewardship Committee
 - Sustainable Data Management (recent paper:

Telecon 20 06/25/24 - ESIP Open Science Cluster

Participants (Name, organization, email)

1. Lauren Holian, University of South Carolina, lholian@email.sc.edu
2. Morgan Wofford, University of Michigan, mwofford@umich.edu
3. Lorraine Tighe (She/Her), Open Science Cluster co-chair, Esri, ltighe@esri.com
4. Colleen Rosales, OpenAQ colleen@openaq.org
5. Susan Shingledecker, ESIP, susanshingledecker@esipfed.org
6. Mike Mahoney, ESIP, any, mikemahoney@esipfed.org

Agenda & Notes

- **Welcome:** Colleen Rosales and Lorraine Tighe
- **Presentation/Discussion:** Updated ESIP session design:
 - 📅 Open Science Cluster Session

- Updated title: Sparking Conversations & Retrospection: Exploring Open Science Practices (A Workshop)
 - Session plan: Designed primarily as an in-person workshop but will have a virtual component
 - Introduction (15min)
 - Breakout session (30min):
 - Pillars
 - Project planning
 - Data generation
 - Data storage
 - Metadata
 - Dissemination (e.g. publication, etc.)
 - Themes
 - Barriers/challenges (pitfalls)
 - Mechanisms for incentives
 - “Good enough” practices - successful practices
 - e.g. NASA practices, Jupyter notebooks
 - Impacts of open science efforts
 - Logistics
 - Room will have a table for each pillar
 - Each group: Leader + scribe
 - **Volunteer to facilitate the virtual breakout room**
 - Google slide/writing material
 - Pillars and breakout themes were drawn from open science participant survey
 - Breakout summary & discussion (30min)
 - Next steps & thank you (5min)
 - Outputs from session:
 - Abstract submission to AGU (July 31, 2024)
 - Community paper
- **Logistics:** July meeting canceled due to conflict with ESIP meeting

Suggested speakers for future Open Science Cluster calls:

- TOPS
- Noam Ross - rOpenSci
- Leah Wasser -pyOpenSci
- [List of some speakers that were suggested during the last series](#)

Telecon 19 05/28/24 - ESIP Open Science Cluster

Participants (Name, organization, email)

1. Lauren Holian, University of South Carolina, lholian@email.sc.edu
2. Lorraine Tighe, Esri, She/Her, Director Earth Science Solutions, ltighe@esri.com
3. James Milburn, University of Alaska - ASF, jdmilburn@alaska.edu
4. Mike Mahoney, ESIP, any, mikemahoney@esipfed.org
5. Bob Downs, SEDAC, ESCO, Astromat, rdowns@ciesin.columbia.edu
6. Douglas Rao, CISESS-NC/NOAA NCEI, douglas.rao@noaa.gov
7. Bruce Caron, ESIP, New Media Studio bruce@tnms.org
8. Paul Lemieux, NOAA NCEI, Paul Lemieux - NOAA Federal
9. Colleen Rosales, OpenAQ colleen@openaq.org
10. Sarah Menassian, NOAA NCEI, sarah.menassian@noaa.gov

Agenda & Notes

- **Welcome:** Colleen Rosales and Lorraine Tighe
- **Presentation/Discussion:** Proposed ESIP session (90 mins)
 - **Tentative Agenda:**
 - Introduction to the session (15min): Welcome, guidelines/defining terms, goals for the workshop and future outputs, questions?
 - The MindMap workshop will structure groups following the data life cycle (45min)
 - Project planning/data generation
 - Data storage
 - Metadata
 - Dissemination (e.g. publication, etc.)
 - Within each “stage” participants will be asked to think along several themes
 - Barriers/challenges (pitfalls)
 - Mechanisms for incentives
 - “Good enough” practices - successful practices
 - e.g. NASA practices, Jupyter notebooks
 - Impacts of open science efforts
 - Discussion (25min)
 - Next steps & thank you (5min)
 - **Possible outcomes/outputs:**
 - Abstract submission to AGU from this interactive session

- Note from Douglas: *We (Lesley, Kristin, and I) have an open science session proposal at AGU this year - we welcome an abstract from the cluster*
 - Community paper—see below
 - **Recall:** the last time was *hybrid*: Jamboard online and MindMap on paper
 - June Open Science Cluster meeting - updates on session organization after session organization meetings with ESIP ([Session Design Workshop - ESIP Meeting](#))
- **Open science topics being discussed in members' workplaces**
 - Movement towards requiring open science protocols (ie. plans for data sharing) in proposals
 - Use of Jupyter notebook and the communities surrounding it
 - Funding
 - EarthArXiv preprint service
 - Best practices across research stages/barriers to open science before publication
- **Shared resources/recommendations:**
 - <https://libereurope.eu/article/open-science-meets-citizen-science-a-guide/>
 - <https://x.com/InvestInOpen/status/1795434929620164737/photo/1>
 - Consult with Charley for session organization for this July's ESIP session
 - TRIZ, Liberating Structures: [Liberating Structures - 6. TRIZ](#)
 - Lorraine, Lauren, Colleen to sign up for the Session Design Workshop with Charley Haley (June 12): [Session Design Workshop - ESIP Meeting](#)
 - [Creating a Journal on PubPub · Getting Started](#)
 - NASA TOPS Module
 - Adoption of the NASA Reuse Readiness Levels, as mentioned: Downs RR, Ramapriyan HK, Wei Y. 2019. Reuse Readiness Assessment of Data Quality Software Products (ESDS-RFC-039). NASA Technical Note, ESDIS Standards Office. <https://doi.org/10.5067/DOC/ESCO/ESDS-RFC-039V1>
- **Discussion:** Community paper output (potential topics below)
 - Mechanisms for incentives to practice open science
 - "Good enough" practices
 - Impacts of open science efforts
 - Barriers, challenges and dependencies (external to you) in practicing open science
 - Metadata
- **Other output ideas & events for the Open Science Cluster:**
 - Overlay journal for satellite data
 - Invite an individual from TOPS to share during a monthly ESIP meeting
 - AGU Open Science Help Desk

Action Items

- ☒ Leads will attend [Session Design Workshop](#) with Charley Haley on June 12, 2024
 - ☐ Further design the July session (MindMap, etc.)
 - ☐ Discuss improvements/changes in June ESIP Open Science Cluster meeting in preparation for in-person July meeting in Asheville, NC
- ☐ Leads will invite individual from TOPS to share during a monthly ESIP meeting
- ☐ AGU abstract stemming from the ESIP July session workshop

Expressed interest to be in-person in July:

- Lorrain Tighe
- Lauren Holian
- Colleen Rosales
- Robert Downs
- James Millburn
- Mike Mahoney

Telecon 18 04/23/24 - ESIP Open Science Cluster

Participants (Name, organization, email)

11. Doug Lindholm, CU/LASP, doug.lindholm@lasp.colorado.edu
12. Colleen Rosales, OpenAQ, colleen@openaq.org
13. Lorraine Tighe (She/Her), Open Science Cluster co-chair, Esri, ltighe@esri.com
14. Lauren Holian (University of South Carolina, lholian@email.sc.edu)
15. Bob Downs, SEDAC, ESDIS, Astromat, rdowns@ciesin.columbia.edu
16. James Milburn, ASF DAAC, jdmilburn@alaska.edu

Agenda & Notes

- **Welcome:** Colleen Rosales and Lorraine Tighe
- **Survey results discussion:** [Results Slide Show](#)
 - Last year's format: every other meeting was a webinar
 - Activities:
 - Hybrid
 - Possibility of lightning talks
 - ESIP session
 - Co-chairs aim to prepare a draft session proposal
 - Community Paper
 - Categories
 - (#1 Topic) Mechanisms for incentives can be connected to Barriers (#4 Topic)

- interactive ESIP session (recall: FUNding Friday)
 - FUNding Friday: May want to determine the principal individuals as this would be particularly useful for students/teachers/early career
 - Expertise from members
 - Revisit mindMap for cluster
 - Success in Open Science
 - Potential for collaborations with data science cluster
 - Inquire about open science help desk/booth at AGU/EGU
 - How do participants feel about an open science session at the summer meeting?
 - There seems to be a need
 - Participants will try to attend and assist
 - Potential conflict: Teachers workshop (1 participant)
 - Lightning talks
 - If hybrid, break up back-to-back virtual talks with in person talks
 - Intersperse virtual + in-person talks
 - Can prepare Q's in advance for speakers
 - Notes for managing hybrid attendance
 - Person monitoring chat
 - Microphone for comments
- Additional comments

Telecon 17 03/26/24 - ESIP Open Science Cluster

Participants (Name, organization, email)

17. Lorraine Tighe (She/Her), Open Science Cluster co-chair, Esri, ltighe@esri.com
18. Lauren Holian (University of South Carolina, lholian@email.sc.edu)
19. Leslie Hsu, USGS
20. Steve Moran, Google, stevemoran@google.com
21. Rachael Blake, Intertidal Agency, rachael@intertidal.agency
22. .

Agenda & Notes

- **Welcome:** Lorraine Tighe
- **Survey development updates**
- **Poll: Attendance at the Year of Open Science Culminating Conference**
- **Present upcoming survey topics**
 - *Misuse and Misconceptions about open science*

- *Barriers, challenges and dependencies (external to you) in practicing open science*
- *Addressing Inequities to Open Science (e.g. anti-helicopter, anti-colonial science, economic)*
- *Challenges in advocating for open science*
- *Mechanisms for incentives to practice open science (for funders, researchers, publishers, etc.)*
- *Universal, international and cross-institutional open science principles (e.g. individual level responsibility in open science vs. organizational/community level)*
- *“Good enough” practices*
- *Wrangling terms and definitions*
- *Protecting individual cost of open science (e.g. scooping)*
- *Putting out (e.g. publishing) your open science work (e.g. what platforms / resources are available to share open science, openness of final publication, pre-prints)*
 - *Openness in the different stages of the research process*
- **Round-table**
 - **What aspects of open science are important in your jobs now?**
 - Supporting open science and open data that enables air quality advocacy and action, and to avoid duplication of efforts
 - Choosing open/sustainable platforms for my work; Considering openness at different stages of research
 - Challenges with operational use of data intended for non-commercial use
 - What incentives work for other groups? Challenges for working outside of systems (ie. collaborations); successful examples of open science
 - Restrictions/privacy concerns/sovereignty; data and code openness
 - Concrete actions and implementation of fully open science
 - **What is one goal you would like to achieve in this cluster?**
 - To help individuals within the cluster achieve a roadmap that will help to incorporate openness in their day jobs, be not bogged down by the barriers and challenges that exist, and celebrate the progress that we all have made towards open science
 - To identify areas in which I could improve the openness of my own research and think more broadly about the different aspects of open science beyond academia
 - How does the community view Google Earth Engine? How does the community view mixed-use products?
 - Hear the broader conversation about open science? What is the conversation across sectors/organizations?
 - Get us on a focused path with tangible resources; increase awareness about open science; talk about success stories; build connections
 - Learn more about incentives for open science and changing culture in other fields

- Come up with a recommendation; say what open science looks like, with case studies

Telecon 16 02/27/24 - ESIP Open Science Cluster

Participants (Name, organization, email)

23. Lauren Holian, University of South Carolina, lholian@email.sc.edu
24. Colleen Rosales, OpenAQ, colleen@openaq.org
25. Leslie Hsu, U.S. Geological Survey, lhsu@usgs.gov
26. .
27. .
28. Gabriel Asato. Geological & Mining Survey of Argentina, gabriel.asato@segemar.gov.ar
29. Pier Luigi Buttigieg, Alfred Wegener Institute
30. Doug Lindholm, CU/LASP, doug.lindholm@lasp.colorado.edu
31. Steve Moran, Google Geo Sustainability, stevemoran@google.com
- 32.

Agenda & Notes

Slides:  2024 ESIP Open Science Cluster Welcome V2.pptx

- **Welcome:** Colleen Rosales & Lorraine Tighe
- Discussion of cluster transition
- Discussion of survey development and participant inputs
 - Would be good to add unintended negative consequences (often due to inequity) of open science - they are very real, but rarely discussed

Some copy-paste notes from the chat:

- Another way to phrase the question is - what is a challenge or opportunity you are currently facing in your day job that you think this cluster could potentially address or investigate? We do this work for others, but contributions will likely be stronger if there is also a personal benefit.
- The effects of open science can be surprisingly inequitable - this would be interesting to explore
- A purely theoretical curiosity question - what would an ideal open ecosystem be like and is economics the major barrier for us to get there?
- “Useful” open science activities makes me think about how do we measure impact of the open science efforts we make or degree of openness of any particular effort?
- If there were prizes for those with guts enough to be open from the earliest stage possible, it would be a step to pique institutional interest

- +1 Pier - the economics is one of the biggest systemic barriers...there is a an article coming out soon in Harvard Data Science Review it helps to get at it.
- A challenge I am facing in my day job is that organizations want Open Science to “happen” by just cultural change or knowledge sharing but without any \$ or resources dedicated!!
- To Pier's point, at the academic-individual level I have been thinking about the package dependencies my code requires and the longevity of reproducibility. Also individual level responsibility in open science vs. organizational/community level
- Another question/challenge: What does it mean to be Open when there are strict and very voluminous review processes before putting anything out? (preprints much be internally reviewed before being posted, as one example from my org)
- Can Open Science will be benefit by having a Clearinghouse of algorithms in order to avoid the libraries or software ageing? I know python is becoming more and more popular among scientist but how to take care of libraries that hide complex algortims? by using UML, maths, logics?
- Open Science is on a spectrum and anything moving things to be “more” open as opposed to “completely open” is still useful.
- National Academies work:
 - <https://www.nationalacademies.org/our-work/developing-a-toolkit-for-fostering-open-science-practices-a-workshop>
 - <https://www.nationalacademies.org/our-work/roundtable-on-aligning-incentives-for-open-science>

Telecon 15 11/28/23 - ESIP Open Science Cluster

Participants (Name, organization, email)

1. Morgan Wofford, University of Michigan, mwofford@umich.edu
2. Cyndi Hall, NASA Early Career, cynthia.r.hall@nasa.gov
3. Jim Colliander, 2i2c.org, colliand@2i2c.org
4. Jenny Hewson, NASA ESDIS, jennifer.h.hewson@nasa.gov
5. Rachel Paseka, NASA HQ, rachel.e.paseka@nasa.gov
6. Rachel Opitz, OGC, ropitz@ogc.org

7. Mark Parsons, UAH/NASA, map0046@uah.edu
8. Eli Holmes, she/her, NOAA Fisheries, eli.holmes@noaa.gov, lead [NMFS Open Science](#)
9. Lorraine Tighe (She/Her, ltighe@esri.com , @DrLTighe Esri Director of Earth Sciences Solutions
10. Mike Mahoney (any, mike.mahoney.218@gmail.com , SUNY-ESF)
11. Bob Downs, SEDAC, rdowns@ciesin.columbia.edu
12. Em Markowitz, NOAA, emily.markowitz@noaa.gov
13. Ellen Dow, KBase / Berkeley Lab, egdow@lbl.gov
14. Douglas Rao, NCSU/NOAA NCEI, douglas_rao@ncsu.edu

Agenda & Notes

- Welcome - Cyndi & Jenny
- Webinar - Caitlin Carter **"HELIOS Efforts to Advance Open Scholarship Incentives Reform."**
 - HELIOS as part of ORFG
 - roundtable on aligning incentives for open scholarship - out of NASEM

Universities	Funders	Agencies & Others
- Arizona State University - Atlanta University Center - Benedict College - Duke University - Howard University - Iowa State University - Johns Hopkins University - Massachusetts Institute of Technology - Princeton University - University of Arizona - University of California, San Francisco - University of California at Los Angeles - University of Houston - University of Southern California	- Alfred P. Sloan Foundation - American Heart Association - Andrew W. Mellon Foundation - Arcadia Fund - Bill & Melinda Gates Foundation - Coalition for Epidemic Preparedness Innovations - Gordon and Betty Moore Foundation - Health Research Alliance - Howard Hughes Medical Institute - James S. McDonnell Foundation - John Templeton Foundation - Lumina Foundation - Robert Wood Johnson Foundation - Schmidt Futures - Templeton World Charity Foundation - Wellcome Trust	- American Association for the Advancement of Science - American Geophysical Union - Association of American Medical Colleges - Association of American Universities - Association of Public and Land-grant Universities - Federation of American Societies for Experimental Biology - International Science Council - Natural Environment Research Council - National Institute of Standards and Technology - National Institutes of Health - Open Research Funders Group - National Science Foundation - Scholarly Publishing and Academic Resources Coalition - United Kingdom Research and Innovation

- Higher education leaders - free to join
- Elevate someone from senior staff to attend meetings and work with institution to promote open scholarship - took note of need and sent call to action across institutions
- Breaking down communications between scientists and public
- Need to collaborate across institutions, especially important for those at MSIs
- Openness is a accelerant for discovery
- 4 working groups:
 - Institutional and Departmental Policy - updating TNP/RPT packages was the number one need of 65 initial members; need leadership; align values with

practices; many activities that lead up to the end goal (more normative, less scary)

- Clear discrepancy between how faculty work is assessed and incentivized versus the goal of open scholarship for the public good; mentor challenge - still need to help ECRs get that one big paper, which is not equitable
 - <https://www.scholcommlab.ca/2022/05/04/findings-from-the-rpt-project/>
- Only 1 group signed on at the onset...but it did start many conversations on campus
 - Were more likely to sign on when they used the term engaging in dialogue
- Not along in pushing towards rewards - opportunity to not just be a compliance, box-checking thing but rather true reward
- NASA with Helios awarded Florida International University to conduct an open scholarships leadership workshop - over 50 presidents, deans and provosts sign up. Will engage in discussions around:

Convening presidents & provosts on RPT reform with specific intent to:

- Explore open scholarship as an enabler of equity, inclusivity, efficiency, replicability, transparency, trust, and engagement
- Commit to working to ensure that open scholarship activities are incorporated into hiring, reappointment, tenure, and promotion processes
- Engage with key campus partners-- including faculty, department chairs, students, faculty senates, deans, administration, and the library-- to develop frameworks and guidance that individual campus units (e.g., schools, departments) can adapt and adopt in accordance with institutional and disciplinary considerations and norms
- Provide the resources and training necessary to support the successful rollout and oversight of these strategies
- Meet regularly with similarly engaged colleges and universities to discuss challenges, opportunities, and best practices
- Publicly share an annual progress update on the development, deployment, and evaluation of hiring, reappointment, promotion, and tenure reform strategies.
-
- Future working group priorities:
 - All4OS (Professional Society) and Helios collaboration on training and rewards

Questions:

Have they found higher education leaders responsive? what challenges/hesitancies have they encountered?

Guidance for navigating reform on campus?

- Put together a planning meeting in October with HELIOS, and educators who have implemented reform. Putting together success stories, examples of policy language (ex: University of Maryland, Department of Psychology), recommendations on how to talk about these policies with faculty.

- Examples of success stories: Mike Dougherty at UMD, Rebecca Saxe MIT, Phil Bourne at UVA
 - Meredith Niles, Russ Poldrack, Arturo Casadevall

How do you measure the success of a dialogue vs compliance?

- Qualitative and quantitative data through a survey
- Just because you form a group doesn't mean actual progress will be made. The NASA workshop will hopefully come up with ways to track actual progress on campus.

Is AGU part of your society initiative? Answer: Yes, AGU has been a wonderful support and collaborator, and has released or will release a statement soon. <https://www.all4os.org/>

- <https://www.heliosopen.org/ourwork> - to see the statement

What was the reason for not signing on or making an actual commitment? Answer: The bureaucratic processes make signing on to anything difficult, perhaps they are a bit risk averse. They are perhaps worried about encroaching on faculty academic freedom, or instituting anything from the top down.

Re: tracking progress, what key metrics do you have in mind that you think represent positive substantive change?

- It's easy to count how many institutions change their policies, and how to change them.
- Workshop goal: Talk with leaders on how they measure success, and the impact of open scholarship changes.

Would be interesting to see if there are differences between different types of institutions (private v.s. public, R1 v.s. other types of institutions, etc).

- Every type of institution thinks they are different, but pretty much everyone didn't want to sign a statement. They all had similar difficulties in the process.
- When you actually want to implement change, it is somewhat easier at smaller institutions
- APLU - modernizing the culture of higher ed for societally impactful scholarship at large land grant universities, perhaps through openness and transparency
- <https://www.heliosopen.org/modernizing-research-evaluation-further-reading>

At lower levels, would there be a higher chance of success? Example: Looking at specific school in a university.

- We have a top down, bottom up, and middle around strategy. We have tried everything, and are not finding a lot of difference in success. They are hoping through the workshop to identify strategies, departments, and people that could lead to change.

Telecon 14 10/17/23 - ESIP Open Science Cluster

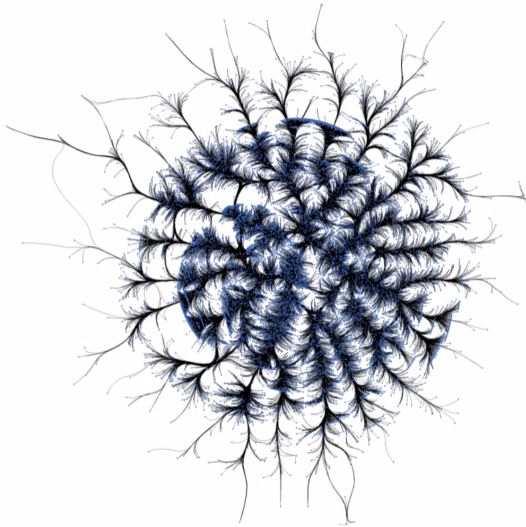
Participants (Name, organization, email)

15. Morgan Wofford, University of Michigan, mwofford@umich.edu
16. Jenny Hewson, NASA ESDIS, jennifer.h.hewson@nasa.gov (she/her)
17. Cynthia Hall, NASA Early Career Research, cynthia.r.hall@nasa.gov (she/her)
18. Stefanie Butland, Openscapes / NASA Openscapes, stefanie@openscapes.org
19. Bob Downs, SEDAC, ESCO, Astromat, rdowns@ciesin.columbia.edu
20. Colleen Rosales, OpenAQ / UC Davis
21. Chris Hagerbaumer, OpenAQ
22. Emily Lescak, Center for Scientific Collaboration and Community Engagement, emily.lescak@cscce.org
23. Rob Casey, EarthScope Consortium, rob.casey@earthscope.org (he/him)
24. Dan Stoner, EarthScope Consortium, dan.stoner@earthscope.org (he/him)
25. Doug Lindholm, CU/LASP, doug.lindholm@lasp.colorado.edu
26. Mike Folk, unaffiliated, mfolk78@gmail.com
27. Shannon Leslie, NSIDC DAAC, shannon.leslie@colorado.edu (she/her)
28. Tilo Mathes, RSpace, tilo.mathes@researchspace.com (he/him)
29. Sam Teplitzky, UC Berkeley/Open Science, samteplitzky@berkeley.edu (she/her)
30. Sarah Gibson, 2i2c, sgibson@2i2c.org, she/her
31. Amy Steiker, NSIDC DAAC, amy.steiker@colorado.edu
32. Ellen Dow, KBase / Berkeley Lab, egdow@lbl.gov (she/her)
33. Matt Fisher (he) / National Snow and Ice Data Center / mfisher87@gmail.com
34. Wai-Yin Kwan, Whirl-i-Gig, wyk@whirl-i-gig.com
35. Alejandro Paz, MIT Libraries, apaz@mit.edu
36. Ethan Davis, UCAR Unidata, edavis@ucar.edu (he/him)
37. Andy Barrett
38. Libby Mohr
39. Chris Hagerbaumer

40. Emilio Mayorga, University of Washington, emiliom@uw.edu
41. Luis Lopez
42. Jessica Hausman
43. Micah Wengren, NOAA/US IOOS
44. Juanisa McCoy
45. Kristin Rowley
46. Andy Barrett, NSIDC, andrew.barrett@colorado.edu
- 47.

Agenda & Notes

- Welcome - Cyndi & Jenny
- Webinar - Michael Mahoney, "Making Sausage: How and why open source scientific software gets made - and what keeps us from making more" [Link](#)
 - Mike maintains packages for R (esp. visualization/modeling)...bits of code for anyone to use. Mike is personally using this code BUT also shared these (with extra effort)
 - No requirement that OSS be free
 - Making open source open makes it easier for Mike to use, as well as for others to use
 - Inclusive - Includes those who don't have institutional ties or licensing access
 - Proprietary software reinforces domain silos!
- Mike cares about open science practices PLUS:
 - easier to collaborate (others can see his code and provide suggestions for improvements)
 - improvements can be cumulative
 - If no code...no paper (if you don't release the code, you are abandoning a line of evidence and requiring people to simply trust); and others can use the methods Mike is generating...good for Mike's career too.
 - *I'm not worried about being scooped, I'm worried about getting ignored!*
- There are projects attempting to standardize the process of open code review more like, R Software peer review
 - rOpenSci and pyOpenSci do reviews completely in the open, in a collegial collaborative way with reviewers bound by a code of conduct
 - <https://ropensci.org/>
 - <https://www.pyopensci.org/>



Dependency on software packages

- Open source aligns with the goals of science and scientists
 - Statisticians and computer scientists - if there is no code, there is no paper

Why do FOLKS stop sharing OS?

1. it can be lonely (authors committing to CAST, for example, single author (Hanna Meyer)...all development falls to Hanna); no one else in community can help; things around you die (such as links)...lots of busy work for one individual! Another example is dplyr (relatively small team working on dplyr compared to those using it...and this is backed by for-profit company)
2. As the project grows, you will get more requests for help, and these are often negative feedback (ex: found a bug, education materials are not good, software is doing something they don't want it to do).
3. Open source is a long-tailed phenomenon. The majority of projects exist in the long tail of usability.
4. Most OS developers are doing something else for a living ... so difficult to make these tools legible to institutions (in terms of tenure or how the tool is supporting the institution!)
5. Also, very difficult to track how successful OS is!! (users may cite wrapper vs code underneath)

What to do?

1. providing small/lightweight seed funding can be v impactful
2. Community groups can help with burnout , like ROpenSci
3. Value software as a research product
4. Cite your software

Questions and discussion

- Why should researchers not be afraid of scooping?
 - Posting publicly in this way makes it more likely that research questions will get answered.
- How do we advocate for these things to get included in tenure and promotion?

- The best answer Mike has heard about measuring and tracking is “we don’t really know yet, this is all so new.”
- Rob Casey: What is the most proper way to work with external supporters of software, who might be slow and deliberative in changes they employ, or have abandoned their software?
 - What are the patterns for sustainability we can see in the long term?
 - Assuming you have pieces of your stack that are not open, you maintain your own internal version or fork of the software, while still contributing to the original project.
 - There was an era where large companies were maintaining open forked versions of projects.
- Sam Teplitzky: Are centralized university open source program offices beneficial?
 - Mike has seen it go both ways
 - If legal resources are available it can be a huge benefit
 - Where these fail is when offices become more like tech transfer offices where it becomes a wall, or barrier (more interested in IP, etc.) to open source.
 - Might be useful to have these sources embedded in departments rather than a centralized organization.

References:

- NSF Funding for an Open Source Ecosystem (2023): <https://new.nsf.gov/funding/opportunities/pathways-enable-open-source-ecosystems-pose>
- <https://ropensci.org/>
- <https://www.pyopensci.org/>
- The United States Research Software Engineer Association: <https://us-rse.org/>
- <https://hidden-ref.org/>
- <https://www.youtube.com/c/esipfed>
- https://wiki.esipfed.org/Open_Science_Cluster
- <https://press.stripe.com/working-in-public>

Telecon 13 9/26/23 - ESIP Open Science Cluster

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Agenda & Notes

- Welcome - Cyndi & Jenny
- Webinar - Natasha Stavros, Open Science Cyberinfrastructure Supports Equitable Access to NASA Big Data - The ImgSPEC Case Study
 - Equal access is not the same as equitable access
- New paradigm requires:
 - ARD but 'one size fits all' very difficult to fulfill...services to enable people to get it to the point to do analysis
 - Open Science does not equal open access...needs to include culture (with security and privacy control). Equality does not equal equity (meet people where they are)
 - hardware software, and people analyzing data
 - support analysis by diverse perspectives through inclusive collaboration increasing access by removing barriers to entry
- IMGSPEC Case Study
 - This prototype refines open science use cases for using diverse open data across missions
 - Started with imaging spectroscopy which is very useful to many different communities and large

- Have to bring in data from the ground to use it. Need to calibrate algorithms with data from the ground.
- Problem
 - Hard to use the data because of a lack of expertise or interest in processing the data themselves.
 - Agencies or other product developers may not have the capacity to generate
- Objective: demonstrate end to end/on demand processing platform to create higher level information products addressing researchers' pain points (including democratizing development of value-added products and analytics)...full burden of pre-processing on USGS (democratizing invites more stakeholders in to co-develop)
- Solution: collaborative work environment and user interface for on-demand custom and standard product generation (imgspec is a plugin that points to and launches, eg, EarthData search; ability to load their own data
 - Created plugins to launch NASA Earth Data Search, and various other NASA tools rather than creating own versions.
 - Have version control functionality
 - Deploying algorithms as container on scalable back-end
 - Metadata curation & provenance
 - Having a GUI that shows what info needs to be available to be compliant with FAIR principles
- ImgSPEC provides intuitive user interface for a simplified user experience with streamlined APIs and automated Scalable backend
 - Main focus - simplifying interface to make it intuitive for the user experience
 - Try to remove barriers to entry
- Performed 6 user-acceptance tests
 - Test #1: connectivity of subsystems with no load testing
 - Test #2: Testing a default, standard workflow with registered open-source code
 - Demonstrate job submission capabilities related to duplicates, checksums, and filtering
 - Test #3: Testing of user-customized deployment of default, standard workflow with registered open-source code.
 - Modify user experience by adding a browse image and a request for added faceted algorithm search
 - Test #4 -5
 - Goal: User agility to toggle efforts between big data processing with auto-scaling and analysis
 - Feedback: Deployment with respect to costing and ownership
 - Need clear delineation of who is paying for what
 - Need benchmarking key capabilities like auto-scaling and processing against existing infrastructure
 - Why would they use this system when they could use their own?

- Test #6: User experience testing
 - Deployment
 - Assessing and setting up resource allocation
 - Auto-scaling within the capacity
 - Implement user-preferred language IDE and needed tools
- Conclusions
 - Open science infrastructure is highly desirable
 - Want a system that facilitated reproducibility and provenance for big data processing of community-generated algorithms
 - Not feasible as implemented - the cost model of such a system deployed by a single project presents an unsustainable business model that would inherently impose constraints on access.
 - **Need something more hybrid**
- User-preferred environments (IDE) and languages with streamlined data access and GUIs to facilitate use of APIs, support computing resource calculations.
 - Provision of federated services rather than constantly creating different data formats/versions etc. and presupposing what people need.
- Open science cyberinfrastructure must consider other barriers to access
 - broad-band internet
 - english language
 - ability of sense
 - financing ability
- UX services can broaden the user base and accelerate knowledge generation
 - Knowledge generation
 - no hypothesis can ever be proven right, only disproven
 - the more different approaches and analyses from diverse perspectives that are tested, the more confidence we gain in our scientific understanding
 - Services can support equitable access to data and compute
 - Enabling diverse users ranging in expertise, country of origin, experience, and perspectives to synthesize
 - Must consider FAIR (around 7 years) and CARE (~3 years) data principles
 - Data provides collective benefit; those who provide data have authority to control data (and be respectful of those providing data); be ethical in use of data
 - respects special requirements for data sovereignty or security
 - maintains authority to control users' data and knowledge
 - empowers communities
 - Access to federated services in a users environment (respects security; empowers community access of findings for themselves...**what about the risk of misuse or misinterpretation of findings**)
 - A new era necessitates a hybrid costing approach
 - Current: Allocations for access to single-sources resources
 - biased but generally cheaper

- Service-based platform deployed by the user with predefined interfaces to core/federated services
 - Assumes equal capacity to pay
 - More expensive to the user
 - Standardized interface for the user
 - Does not require affiliation and access to the internet which removes funding and policy barriers
- Cost models are a primary challenge to open science cyberinfrastructure: services share the burden
- IMGSpec is integrating with CyVerse
 - <https://docs.jetstream-cloud.org/ui/cacao/intro/>
 - <https://dl.acm.org/doi/fullHtml/10.1145/3569951.3597555>
 - <https://dl.acm.org/doi/pdf/10.1145/3569951.3597606>
- Path Forward: Create community of practice to enable parallel development by a broader community
 - OS cyberinfrastructure must become more inclusive through iterative improvements that increase access (be nimble, adaptable, etc)
 - Open source goes between making code available, creates governance for community of practice too
 - Create governance for a community of practice
 - Needs to support

OPEN SCIENCE CYBERINFRASTRUCTURE...



Serves across the user computer science experience, security, and affiliation gradients

Enables all to access and use big data without presupposing their skill, ability, resources, values, or needs



Uses a model of user-deployed systems that plugs into paid services by the government for ease of use

Finds the balance between burden of costs between users and the service provider (i.e., NASA)



Supports a community of practice for contributing to any open-source software

Provides governance and documentation of processes and procedure for contributions as a system grows in functionality, reaching the limits of one project or funding source

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- Discussion:
 - Question: What was the user base for these tests?
 - Internal science team – professors, students etc. from different universities
 - Fourth test - opened up to different personnel involved with NASA projects, NSF, and other managers.
 - Could not do this on every test
 - Biggest challenge - the way we had deployed IMGSpec was a project, and needed to onboard people to conduct testing, which was difficult.
 - People need to be able to launch within, rather than onboarded.
 - CyVerse has experience doing this, so the partnership seems like a logical next step <https://cyverse.org/collaborate>
 - re: Needs for education in open science and cloud-native computing, CyVerse teaches this course twice a year: <https://foss.cyverse.org/> – this has evolved as other groups like Carpentries, TuringWay, and NASA TOPS have created their open curricula
 - It's going to take a lot of people to create open science tools/resources/infrastructure
 - Try not to duplicate or reinvent the wheel but rather build incrementally
 - Question: Given the challenges of using containers for long-term reproducibility (e.g., container software version changes leading to broken scientific / config scripts), did the ImgSpec project reveal anything about other potential solutions for long-term reproducibility?
 - IMGSpec is still ongoing
 - Versioning of containers
 - There will probably always need to be a human in the loop to make sure the software keeps running
 - That's the value of a community to keep people engaged

Telecon 12 8/22/23 - ESIP Open Science Cluster

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- 94.

Agenda & Notes

- Welcome - Cyndi & Jenny
- Webinar - Jim Colliander - 2i2c: Building open source infrastructure for research, education, and local communities
 - Link to presentation: <https://bit.ly/2i2c-esip-2023>
- 1. Why was 2i2c founded
 - a. Interactive computing was ready
 - b. Demand was exploding
 - c. No entity should own systems for scientific information exchange
 - Jessica Hamrick blog post - transformational > March 2015
 - Callysto - delivering jupyter back education to 5-12 year olds
 - 2i2c hub service:
 - Right to replicate
 - Infrastructure is interoperable so if you move from AWS to Google Hub, it does not change
 - 2i2c provides services to to students/researchers/gov't agencies – sitting adjacent to data
- 2. What are benefits to OS from working in cloud
 - New ways to exchange information
 - The core activity of science is exchanging information so that we develop human understanding of the universe
 - This focus orients us to think about openness and transform the activities we carry out during science
 - Virtual ubiquity - essentially be everywhere at once
 - More participation in science
 - Cloud enables new ways to exchange information and new ways to communicate and for others beyond 'academic royals' ...creating new demands on social innovation
- 3. What are challenges from infrastructure perspective

- 2i2c - buffer/obstacle to large company, but must quickly find ways to capital and expertise
- massive challenges exist..historical opportunity to equip future generations
- infrastructure is advancing FAST! need UI, codes of conduct, onboarding, documentation that adapt to massive potential of infrastructure. But, how to make humans equipped to use infrastructure. Accidental complexity...eliminate tech obstacles to allow people to address essential questions, and do it faster (remove hurdles between experts and answers)
- How to prevent monopoly...wikipedia vs facebook!! Think digital public good
- Use best parts of monopoly with customizable 'build your own'. Need ways to scale and protect science from sliding to monopoly
- 4. What does the future look like?

Past	Transition	Future
Siloed data	Open data	Discoverable data with tools
Paper in journal in library	"Paper" on internet	Dynamic science object with data and tools
Elite university affiliation	MOOC	Human right to participate in science

- From Rebecca: Here is a nice example of code+paper. <https://desci.com/nodes>
- Science at elite universities - future involves something more duty-bound - human right to participate
- Governments ensure literacy - expanded notion of literacy to account for misinformation
- Heroes of past
 - Claude Shannon - quantified bit
 - Richard Feynman - aspirational but not all qualities
- Heroes of transition
 - Jane Goodall - activism through science creating a network of people thinking in a transformational way
 - Arati Prabakhar - OSTP director transforming the way we think about science similar to Vannevar Bush
 - Chelle Gentemann - NASA TOPS
- Heroes of the future
 - Sharing of the universe is the way we can move forward transformationally
- Discussion
 - Jenny - Has your thinking changed in regards to infrastructure in the past two to three years?

- Answer: When 2i2c was just an idea, Yuvi Panda would only join if there was a right to replicate. Jim was tentative about it but brought it to universities and other potential partners, and they saw 2i2c as a different service than other companies focused solely on profit. The relationships become more than vendor-customer, rather, nonprofit partners. This led him to think about bell systems and modulation between protected monopoly and release of some information to allow for the management of the monopoly. We have to place open science infrastructure on principles like the right to communicate, or the right to participate in science. Infrastructure as a means for achieving human transformation.
- Elizabeth Dobbins: Is 2i2c being actively used by individual research projects now? How do they "publish" their work? Is there a catalog?
 - Answer: Yes, like cryointhecloud.com, accelerating discovery and enhancing collaboration for NASA Cryosphere communities.
- Jenny: How does language feed into the thinking of 2i2c, especially for non-native english speakers for example?
 - Answer: A work in progress based on a principle. With funding from Chan-Zuckerberg, partners and 2i2c are seeking to improve data science capacity in Latin America and Africa. The open source ecosystem is sensitive to these issues and is creating the technology to deal with these issues. But, because of colonialism and US dominance, English often is the default. Future state we need to build towards is interoperability in technology and in terms of linguistics.

<https://chanzuckerberg.com/science/programs-resources/open-science/educationcapacitybuilding/international-interactive-computing-collaboration-2i2c/>

 - This project will produce materials in Spanish, and hopefully in different languages used in Africa.
 - Jupyter project as a whole supports different languages

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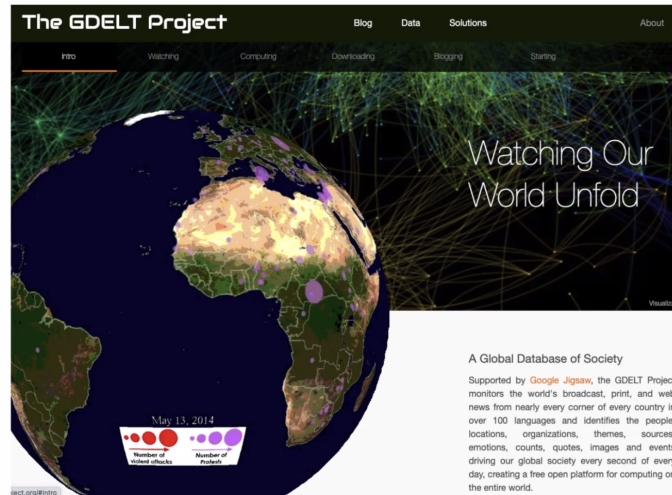
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106. Jessica Hausman
107. Jonathan Petters

Agenda & Notes

- Welcome - Cyndi & Jenny
- Webinar - Irene Pasquetto - What is research data “misuse”? And how can it be prevented or mitigated?
 - Incentivizing and sharing of research data (often mandated) but there are fears of data misuse may prevent
 - A lot of this happened as a result of COVID
- What constitutes misuse? often unintentional but can be intentional; rooted in many causes
- Estimeologically situated - what constitutes misuse from one entity may mean something to another. Must be aware and communicate openly
- Methodology:
 - open science and data sharing practices
 - critical data studies and data feminism

- fairness in algorithm and ethical data science
- information and data literacy
- history of science
- Kinds of data misuse identified
 - 1. Analytical errors in secondary analyses and meta-reviews - documented mostly from journalists and politicians, not as many scientists



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- Journalist reported events in Africa were happening at a much faster rate than actual; lack of documentation
- 2. Misinterpretations of data or analytical results - error not in analysis but in interpretation
- It is intentional but can be intentionally weaponized
- Users used this to say that wildfires were overblown and really it was normal



-
- Documentation is critical; data reusers to properly contextualize
- 3. Reputation-related data misuse
- FAIR principles represent gold standard - maximizing access and use but also help with these misinterpretations

- The principles recently have been criticized
- Refused co-authorship or missed data citation; unwarranted co-authorship
- public shaming of data creators for mistakes found in replication experiments - suggests need for ethics in replication
- 4. Privacy violations
- re-identification of biomedical data is highly regulated and mostly talked about in hypothetical terms
- Geoprivacy is often violated for animals and plants, but not well understood and regulated
- 5. Exploitation
- Limits of FAIR principles and ethical data use
- Limits of broad informed consent
- Indigenous diabetic study - data collected in 60s; used to train algorithms and the community was not consented - leads to questions of ownership, control, etc.
- CARE Principles - use of Indigenous data should result in tangible benefits to community
- 6. Uncritical use of biased and offensive data - can lead to emotional or physical harm
- Need for self-reflexivity and self-disclosure
- Example: Image recognition algorithms
- Common Themes:
 - Need information on nature of the data and how to use it, its quality, etc.
 - FAIR principles provide this type of information
 - But these are not sufficient to prevent misuse and harm; to do so...
 - Adopt self-reflexive research practices
 - Be mindful and respectful
 - understand political and social context

A (draft) definition of “data misuse”

“Data misuse is any kind of data use that **does not take responsibility for the potential harm** caused by such use, by not 1) adopting self-reflexive research practices; 2) situating secondary analyses in relation to their broader social and political context; and 3) being mindful and respectful of others’ data work.”

-
- Prevention strategies - use these in addition to FAIR/CARE principles
 - Data stewardship and curation
 - Self-reflexivity in reuse methods
 - work with communities
 - Attribute credit

- guidelines for sharing results of failed replication experiments
- Mitigation
 - assess potential risk of misuse
 - pre-bunking and debunking disinformation
 - quality standards in case of controversy

Q&A/Comments

1. How to enforce these types of practices?
 - a. Strong word - probably cannot be enforced. But when have the proper documentation and use the prevention and mitigation strategies, can be impactful
2. Pre-bunking and debunking strategies?
 - a. potential for disinformation or in response to disinformation campaign
 - b. climate data has a risk of misuse; share examples of how data can be misused (pre-bunking). Once the data have been misused, a plan in place to respond. Explain why improper use of data (debunking).
3. Is it fair to say that, with the broad definition and examples that you shared for data misuse, data that is NOT misused is “appropriately used?” Or should we consider other categories of data use/misuse
 - a. most papers were about how to properly use, but did provide examples
 - b. also what does good use look like; but that was not the focus
4. data misuse can be addressed by the research community in similar ways to addressing the misuse of other scholarly communication (articles).
5. This talk brings up some interesting questions about metadata/documentation that could make the data more robust against misinterpretation and inappropriate application/use. Are there types of information that could be incorporated into metadata schema to specifically address some of these gaps?
 - a. Yes! the point of this research is that FAIR principles are great, but not enough. There is another layer to add to curation - trying to prevent misinterpretation; curate in a way that
6. The NASA approach for data reuse is to assign a CC0 license, which has no reuse restrictions. The less restrictive the reuse policies, the more open the data is, which is one goal of open science.
7. Seems like verifiable data lineage would go a long ways to identify/address misuse by derivative works

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Agenda & Notes

- Welcome - Cyndi
- Webinar - Flavio Azevedo - Open Science 2.0 with the Framework for Open and Reproducible Research Training (FORRT): Democratizing education on Open Science while focusing on diversity, equity, and inclusion in grassroots communities.
 - <https://forrt.org/>
 - Goals of FORRT
 - incremental adoption of open science practices into higher education
 - educate on epistemic uncertainty, plurality, and humility, research integrity and credibility
 - reframe open science as inclusive scholarship
 - advocate for greater recognition of educational resources
 - Resources
 - Our website - <https://forrt.org>
 - Get involved - <https://forrt.org/about/get-involved/>

- Educational Resources - <https://forrt.org/nexus/>
- Invite to our Slack community-
https://join.slack.com/t/forrt/shared_invite/zt-alobr3z7-NOR0mTBfD1vKXn9qlOKgaQ
- Different projects
 - Glossary - <https://forrt.org/glossary/>
 - Different clusters
 - Quala Lab - Opening qualitative research
 - Lesson Plans
 - Reversals and replications
 - Neurodiversity project
 - Pedagogies
- Also, check out the NASA TOPS blog post with Flavio:
<https://science.nasa.gov/open-science/transform-to-open-science/stories/dr-flavio-azevedo>
- Chat:
 - Rachel Paseko: Because Flavio mentioned looking for support for work to advance open science practices, I want to put in a plug for NASA's F.15 High Priority Open-Source Science awards. These are 1 year, \$100k awards to advance open science technology or tools — the scope is quite broad. Please reach out to me with any questions at Rachel.e.paseka@nasa.gov
 - <https://nspires.nasaprs.com/external/solicitations/summary!init.do?sold=%7B21419978-190B-811F-35A7-6D2DEEE24E4E%7D&path=open>
 -

Telecon 9 5/23/23 - ESIP Open Science Cluster

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132. Bob Downs
133. Kim Ely

Agenda & Notes

- Welcome - Jenny
- Webinar - Andrea Thomer - "Past Global Change Research: Connecting Data Systems and Practitioners through FAIR and CARE Practices."
 - project funded by FAIROS (Findable, Accessible, Interoperable, Reusable Open Science) Research Coordination Network which:
 - builds technical and social capacity among data resources by
 - supporting the technical implementation of ethical OS applications, and developing communities of practice around FAIR and CARE
 - Operationalize both FAIR and CARE principles
 - One important part of building trust is making sure marginalized communities are not being further harmed by open science.
- Note on CARE: Fill a gap in terms of derived data from remains!

- Suggestions on potential contacts re IP representation comment (Sky Bristol):
 - I'd add OBIS to your list of biodiversity infrastructure. As a UNESCO facility, there is also a great deal of focus there on CARE, equity, and engagement with indigenous knowledge systems.
 - There are a number of researchers who engage with the American Indigenous Research Association that might be interested in engaging with your project. I'd also check in with the folks at UofA and the Indigenous Data Sovereignty group
- Are there colonial actions that repositories can enable? (ex: geology data leading to mining)
- USGS - policy towards data collection on sovereign lands has changed
 - Previously policy stated we will try to make contact with the tribe but if not we can use remote sensing.
 - Earth MRI - collects new data throughout the US, and now they don't engage in that until contact and agreement with tribes has been made.
- Bri - When data is collected from space, globally, How could we start thinking about care principles?
 - Are we making the global data of use to these communities?
 - Sky: Remote sensing data from space... That's much more the issue we've heard. It's more about working with Tribal Nations on developing capacity to make better use of "open data" that's not all that accessible when it comes down to it
- Connections within ESIP that could be leveraged
 - Esri - connection to tribal nations (Lorraine Tighe to follow up on this)
 - Sky: Maybe work with Megan Carter on a strategy for reaching out broadly across the ESIP community to work up a characterization of where we have established capacity for engaging with Tribal Governments. For instance, USGS has an active liaison office to plug in with.
 - Andrea: May start a reading group (initiative similar to unlearning racism in the geosciences)
- Thank you! Enjoyed the presentation and the comment about maybe not all things can or should be open. We have that issue in EPA in that it isn't always easy to be open. So appreciated that!

Telecon 8 3/28/23 - ESIP Open Science Cluster

Participants (Name, organization, email)

- 134. Morgan Wofford, University of Michigan, mwofford@umich.edu
- 135. Cynthia Hall, NASA TOPS, cynthia.r.hall@nasa.gov

136. Jenny Hewson, NASA ESDIS, jennifer.h.hewson@nasa.gov
137. Lorraine Tighe, Esri, (SHe/her) Ltighe@esri.com
138. Bob Downs, SEDAC & ESCO, rdowns@ciesin.columbia.edu
139. Sarah Menassian, NOAA NCEI, sarah.menassian@noaa.gov
140. Juanisa McCoy (she/her), NASA EED-3/Raytheon, juanisa.j.mccoy@nasa.gov
141. Terri Velliquette (she/her), ORNL, velliquettet@ornl.gov.
142. Daniel Howard (he/him) NCAR - dhoward@ucar.edu
143. Autumn Klongland, Esri, (she/her) aklongland@esri.com
144. Allison Mills, ESIP (she/her) allisonmills@esipfed.org
145. Douglas Rao (he/him) - douglas_rao@ncsu.edu

Agenda & Notes

- Welcome - Jenny & Cyndi
- Introductions (name + organization)
- Debrief of [ESIP open science winter session](#)
 - Telecon participants share their takeaways/thoughts on the winter session
 - Review of ESIP session & rationale
 - Takeaways from session - Jenny, Cyndi, & Morgan
 - Session resources: [Notes](#), [jamboard](#), [presentations](#)
- Introduction to webinar series - Jenny & Cyndi
 - Introduction to webinar speakers [spreadsheet](#) - Morgan
 - Participants populate spreadsheet
 - Determine potential speakers & coordinators for upcoming webinars
 - April 25th - FAIROS Project
- Closing - Jenny & Cyndi

Jenny:

- Recommendations for different stakeholder groups
- White paper around emerging trends in open science - could be useful for those interested in embarking on open science journey; or collaboration with IQ cluster around: *information quality considerations among different stakeholder groups in an open science paradigm.*

Do we want a concrete output from cluster or do we want something more of a webinar series to inform?

Lorraine

- webinar series is great to increase awareness; modular and short enough for people to be able to join regularly
- Also like the idea of white paper that could accompany the webinar series.

Allison

- ESIP can put together a playlist of our webinars
- Soil ontology group
 - 20 minute webinar series and now creating blog posts based off these webinars
 - These blog posts are lay versions of a technical paper they are also writing at the same time.

Notes:

- Questions that we have in the cluster could provide information on how we populate the webinar series
 - Yuhuan (Douglas) Rao - Large language models as a topic
- Yuhuan (Douglas) Rao - This article on the return on investment of XSEDE - a cyberinfrastructure by NSF might be of interest to the group - Stewart et al. 2023. Use of accounting concepts to study research: Return On Investment in XSEDE, a US cyberinfrastructure service. Scientometrics (2023). <https://doi.org/10.1007/s11192-022-04539-8>
- Whitepaper might be a good idea, but need to get community committed to helping write it. There is a lot of value to sharing information. Still a lot of people who do not really understand the concept - still too broad - and so having a series to help them understand how this could benefit and be relevant to them, would be ideal.

Telecon 7 10/25/22 - ESIP Open Science Cluster

Participants (Name, organization, email)

- 146. . Michele Thornton (willing to present on DAAC topics)
- 147. . Mark Parsons
- 148. . Robert Downs
- 149. . Megan Carter
- 150. . Sara Lubkin
- 151. . Ryan McGranaghan
- 152. . Douglas Rao
- 153. . Lorraine Tighe

Agenda & Notes

- Open Science & Data Help Desk at AGU Fall Meeting
 - What is it & why should you join in?
 - What other efforts/initiatives/topics should be featured?
 - Facets of Open Science/Overview of what it means
 - Chelle?
 - Geared toward repositories making data more discoverable: Science-on-Schema.org (Adam Shepherd + Doug Fils)
 - Open Source Software (IT&I)
 - Intro to Github
 - [Fernando Perez' Git intro materials](#)
 - ohshitgit.com?!
 - Knowledge Graphs - what are they & how can they help? (Ryan)
 - What is a community KG, how do you get connected to others in your community?
 - Openscapes
 - Cloud optimized data formats (Michele)
 - Data & Software Citation (Mark will coordinate with Shelley)
 - How to Create a Data Management Plan (DMPTool folks)
 - Data Cleaning for Analysis and Publication (Karl Benedict)
 - How to Find an Appropriate Data Repository (several)
 - Office Hours?
 - Open Science Policy (Steve Crawford, NASA)
 - Virtual tools/virtual games about Data Management & Open Science
 - maybe have an iPad around for that purpose?
 - Data Management Escape Room
 - Career Advice
 - Pranoti from AGU (AGU Career Center)
 - <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2022AV000676>
 - Training opportunities, list of specific activities to engage in
 - [Volunteer Form](#)

- [Volunteer Text](#)
- Pointing to other efforts/events at AGU on this theme

Open Science Cluster Potential Invited Presentations

- Add your ideas [here](#)

Telecon 6 9/27/22 – ESIP Open Science cluster

9/27/22

Participants (Name, organization, email) [total 10 on call]

1. Jenny Hewson, NASA ESDIS, Jennifer.h.hewson@nasa.gov
2. H. K. “Rama” Ramapriyan (SSAI/NASA GSFC ESDIS)
3. Bruce Caron New Media Research Institute
4. Daniel Howard
5. Rob Casey (IRIS/SAGE) rob.casey@iris.edu
6. Yuhan “Douglas” Rao, NCICS/NCSSU, yrao5@ncsu.edu
7. Doug Newman, NASA ESDIS, douglas.j.newman@nasa.gov
8. Allison Mills, ESIP
9. **Lorraine Tighe Ph.D.** (She/Her) Director, Earth Sciences Solutions, Esri | Redlands, CA | ltighe@esri.com | @DrLTighe
10. Megan Carter, ESIP

Notes:

Open and free data policy...supported by

Trust principles

Knowledge commons...Douglas Rao noted that Ryan had a space and earth science knowledge commons project

- https://figshare.com/articles/presentation/The_Earth_and_Space_Science_Knowledge_Commons_Space_Weather_in_ESIP/18392087
- <https://knowledgestructure.pubpub.org/pub/space-knowledge-commons/release/3>

NOTE: commons discussion that came out of Force 11 and other workshops. [Science Commons](#)

Promoting all those elements are important in OS...

Accessible - is a very broad quality metric. vs available

Some references on Information quality -

- [Ensuring and Improving Information Quality for Earth Science Data and Products](#)
- [Call to Action for Global Access to and Harmonization of Quality Information of Individual Earth Science Datasets](#)

Value...jupyter notebooks (linking data to explanatory text); can mask technical details but allow people to dig down

Douglas Rao - infrastructure...jupyter notebooks to support access (UNESCO's open infrastructure)

ESIP: open science and data helpdesk (brainstorming) ..25th Oct

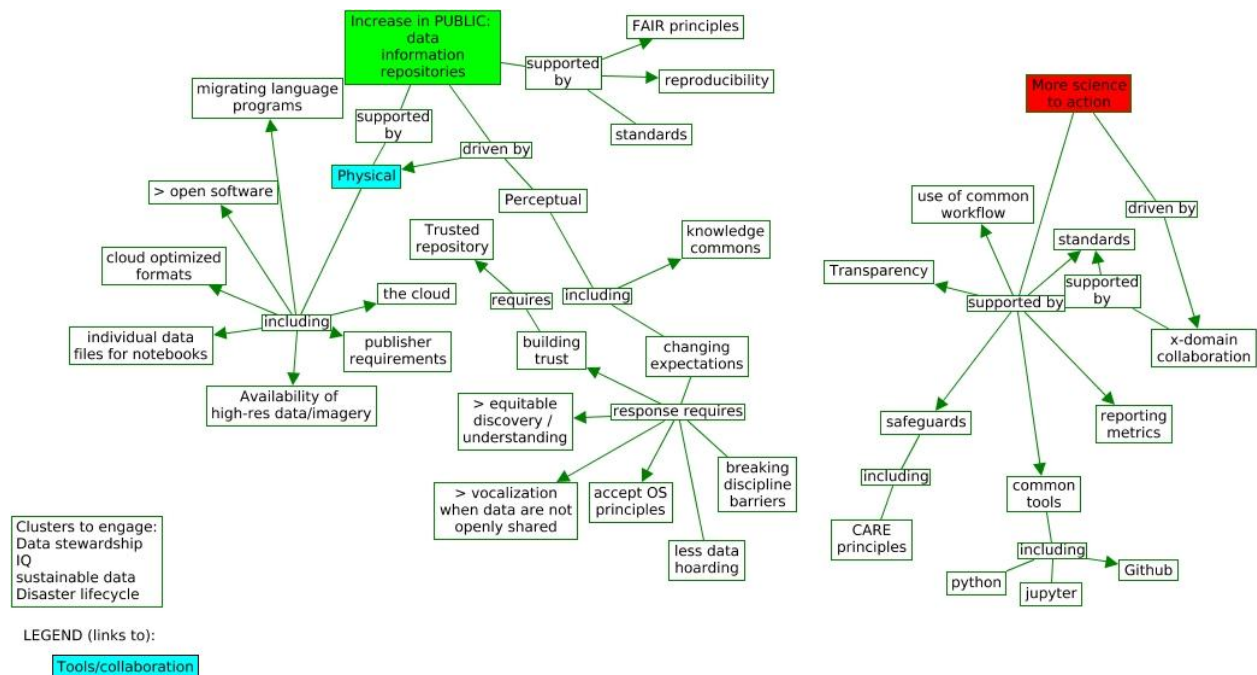
Session at winter meeting...likely due 2nd week of November?

How to frame OS / ESIP cluster in YOOS...themes around James Webb Telescope images; *open road to data; open science / open door*

Including equity in ESIP's YOOS theme (open is not accessible)

Research artifact Citation cluster

- collaboration w that cluster could be helpful
- Can we generate propositions/statements from the mindmap:
 - because of these



Telecon 5 8/23/22 – ESIP Open Science cluster

Participants (Name, organization, email) [total xx on call]

1. Jenny Hewson, NASA ESDIS, Jennifer.h.hewson@nasa.gov

2. Cynthia Hall, NASA TOPS, cynthia.r.hall@nasa.gov
3. Michele Thornton, ORNL DAAC, thorntonmm@ornl.gov
4. Stacie Robinson, NOAA NMFS, stacie.robinson@noaa.gov
5. Mathew Biddle, NOAA IOOS, mathew.biddle@noaa.gov
6. Robert Downs, SEDAC, ESCO, rdowns@ciesin.columbia.edu
7. Mark Parsons, University of Alabama in Huntsville, map0046@uah.edu
8. Charley Haley, Way Foragers, charley@wayforagers.org
9. Allison Mills, ESIP, allisonmills@esipfed.org
10. Ryan Berkheimer, NOAA NESDIS NCEI, ryan.berkheimer@noaa.gov

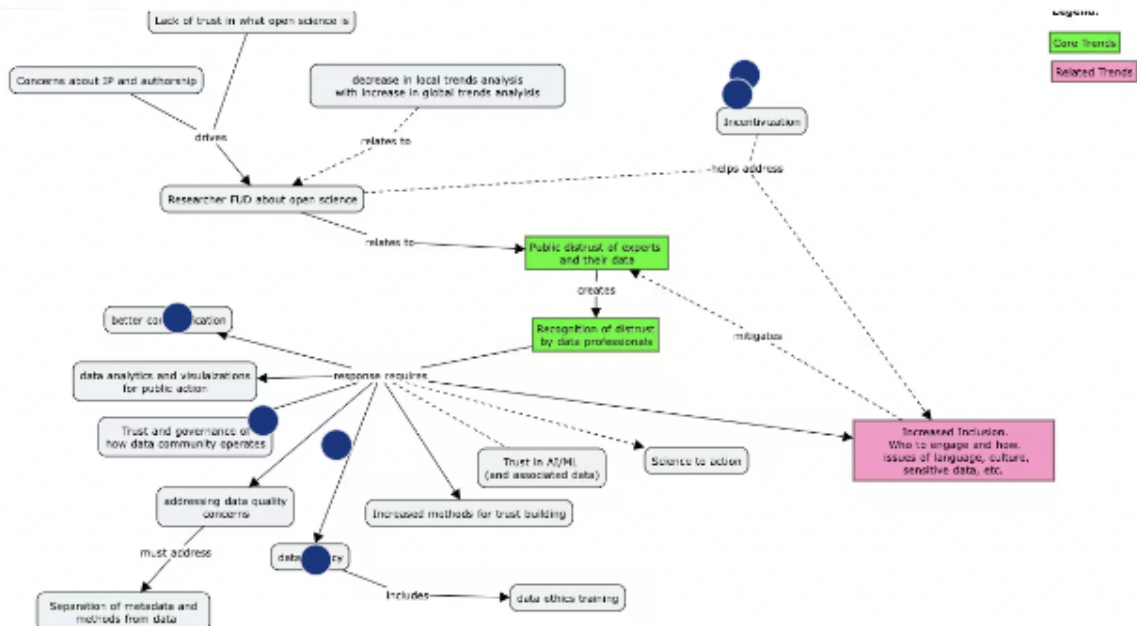
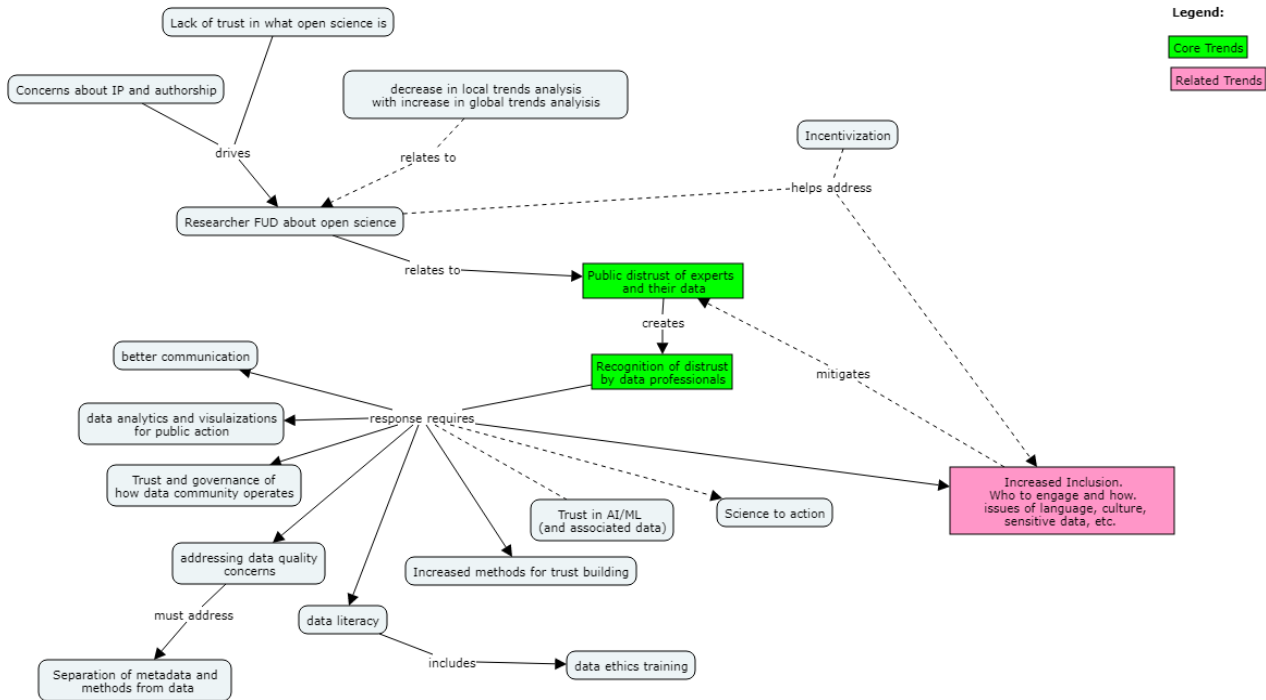
Notes:

1. Recap of session
2. Mindmap activity output
 - a. future of OS - overview
 - b. Emerging themes (quadrants)
 - i. Social Factors
 - ii. Who to Engage
 - iii. Tools and Collaboration

Future of Open Science (Emerging Trends)



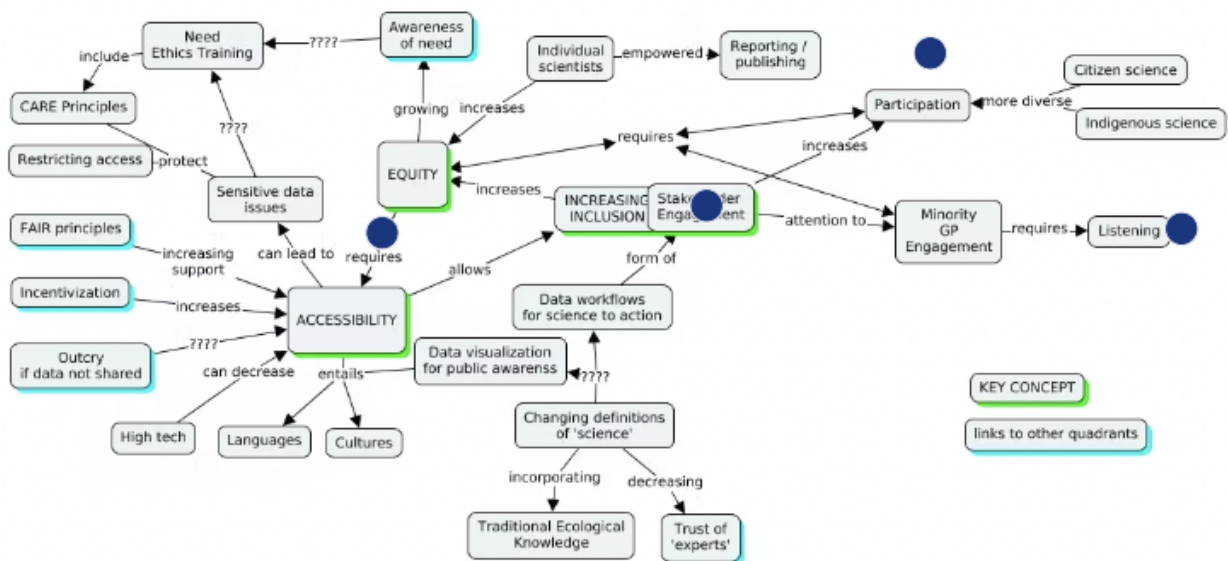
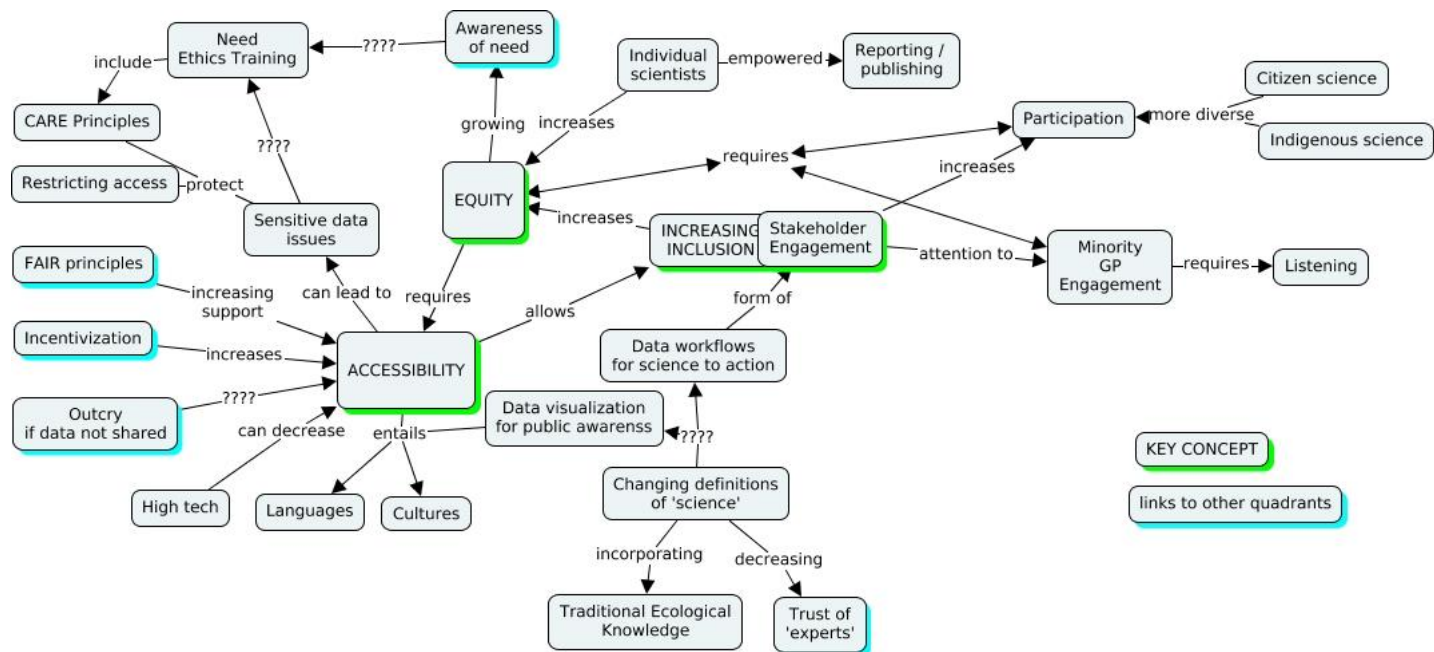
Social Factors



As you listen to the *social factors* quadrant, please consider these questions and provide your thoughts (please include your initials)?

Question	OS Cluster Thoughts MT (Michele)
What is missing, what gaps do you see?	Part of trust might also include the trust in being on a/the learning curve to do work outside of a traditional workflow (mt). drivers for researcher's FUD - appropriate use of data. Incentivization could be fleshed out more
Was anything misinterpreted from the conference and unconference sessions?	Not misinterpreted, but I heard a lot of concern over/about intellectual credit. There are lots of parts of that in Mark's cmap diagram (MT).
What other elements should be considered?	

Who to Engage

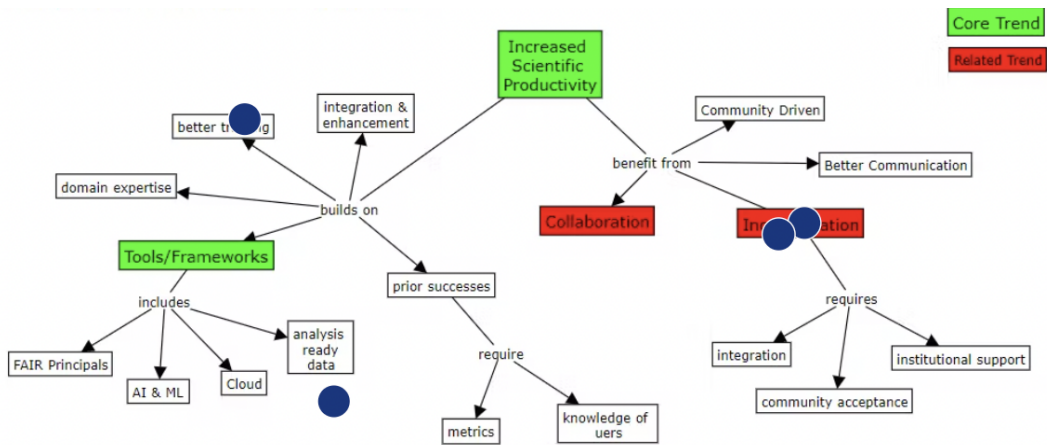
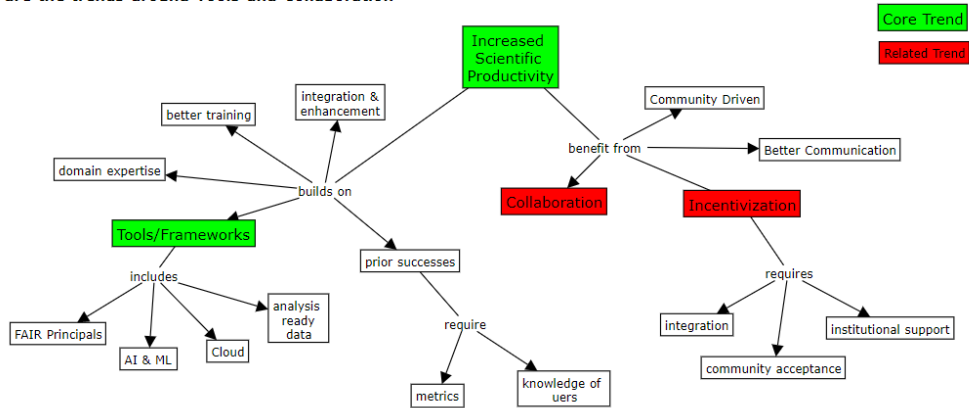


As you listen to the *Who to Engage* quadrant, please consider these questions and provide your thoughts (please include your initials)?

Question	OS Cluster Thoughts
What is missing, what gaps do you see?	Perhaps a broader consideration of “stakeholders”. Indigenous communities generally prefer the term “rights holders”. <i>Who</i> are we missing?
Was anything misinterpreted from the conference and unconferenced sessions?	
What other elements should be considered?	Accessibility could be its own diagram ;-) (MT) +1

Tools and Collaboration

Open Science: What are the trends around Tools and Collaboration



As you listen to the *Tools and Collaboration* quadrant, please consider these questions and provide your thoughts (please include your initials)?

Question	OS Cluster Thoughts
What is missing, what gaps do you see?	open source tools +1, +1
Was anything misinterpreted from the conference and unconfereced sessions?	

What other elements should be considered?	citizen science

Now you've seen all quadrants, where would you like to contribute (what quadrant do you have energy around?)

Question	OS Clusterers MP: Mark
Where would you like to contribute (what quadrant do you have energy around)?	Listening leading to incentivization (MP) Social Factors: Trust and governance & data literacy (Ryan McGranaghan)

Telecon 4 6/28/22 – ESIP Open Science cluster

Participants (Name, organization, email) [total xx on call]

1. Jenny Hewson, NASA ESDIS, jennifer.h.hewson@nasa.gov
2. Cynthia Hall, NASA TOPS, cynthia.r.hall@nasa.gov
3. H. K. (Rama) Ramapriyan, NASA ESDIS/SSAI, Hampapuram.Ramapriyan@ssaihq.com
4. Lorraine Tighe, Esri, ltighe@esri.com
5. Bruce Caron, NMRI, bruce@nmri.org
6. Allison Mills, ESIP, allisonmills@esipfed.org
7. Robert R. Downs, SEDAC, ESCO, rdowns@ciesin.columbia.edu
8. Lucas Sterzinger, UC Davis, lsterzinger@ucdavis.edu
9. Abby Benson, USGS, albenson@usgs.gov
10. Steve Olding, NASA ESDIS/SSAI, stephen.w.olding@nasa.gov
11. Sara Lubkin sara.h.lubkin@nasa.gov
12. Ryan McGranaghan
13. Sydney Neugebauer, NASA Capacity Building Program, sydney.e.neugebauer@nasa.gov

Notes:

Mira board or jamboard to do a virtual mindmapping but need a wrangler to control and make attendees feel part of the session.

Megan - offer opportunity for further engagement with attendees - at a happy hour, coffee break, unconference (Thursday)

Telecon 3 5/23/22 – ESIP Open Science cluster

Link to jam board: [Telecon 3 - Google Jamboard](#)

Participants (Name, organization, email) [total 23 on call]

1. Jenny Hewson, NASA ESDIS, jennifer.h.hewson@nasa.gov
2. Cynthia Hall, NASA TOPS, cynthia.r.hall@nasa.gov
3. Kathe Todd-Brown, University of Florida (Soil Cluster), ktoddbrown@ufl.edu
4. H. K. (Rama) Ramapriyan, NASA ESDIS/SSAI, Hampapuram.Ramapriyan@ssaihq.com
5. Mathew Biddle, NOAA/IOOS, mathew.biddle@noaa.gov
6. Mark Parsons, University of Alabama in Huntsville, map0046@uah.edu
7. Rob Casey, IRIS Data Services, rob.casey@iris.edu
8. Ben Roberts-Pierel, Oregon State University, robertsb@oregonstate.edu
9. Lucas Sterzinger, University of California Davis, lsterzinger@ucdavis.edu
10. Sara Lubkin, NASA ESDIS, sara.h.lubkin@nasa.gov
11. Doug Newman, NASA ESDIS, douglas.j.newman@nasa.gov
12. Michele Thornton, ORNL DAAC, ESCO, thorntonmm@ornl.gov
13. Robert R. Downs, CIESIN, SEDAC, ESCO, rdowns@ciesin.columbia.edu

14. Curt Hammill, Esri support for NASA/JPL, chammill@esri.com
15. Lorraine Tighe, Science Industry Team Leader at Esri, ltighe@esri.com
16. Douglas Rao, he/him, CISESS/NCSU/NOAA NCEI, yrao5@ncsu.edu
17. Colin
18. Don Sullivan

Name Change:

Open Source Science Cluster -> Open Science Cluster

Open-source Science came out of NASA - open up from project initiation to project implementation. Wanted to distinguish and indicate that although open science/data has been practiced at NASA before now, NASA is truly moving forward with it now, in all aspects.

Recap from Telecon 2

Importance of community and collaborative effort

Leverage repositories

Broaden beyond data

Leverage metrics and incentivizing

Cluster Engagement

Cloud Computing, Agriculture and Climate, Air Quality, Disaster Lifecycle, and Community Resilience

- Matt Biddle (NOAA/Carpentries) - marine data cluster
- Mark Parsons - Research Artifact Citation cluster
- Kathe Todd-Brown - Soil Cluster
- Bob Downs - Information Quality Cluster

Several opportunities to collaborate - see Frontier article at

<https://www.frontiersin.org/articles/10.3389/fclim.2022.761499/full>. This was written by the Community Resilience cluster

New EOS article is also relevant <http://dx.doi.org/10.1029/2022eo220239>

Potential open science definition for cluster to use: Ramachandran, Bugbee et al.

<https://doi.org/10.1029/2020EA001562>

Suggestion by Douglas Rao: Given the cluster's goal of open science, maybe we should also discuss if we want to move towards Github-based presence under ESIPfed github org?

Doug Newman's suggestion on general objectives of the cluster: "Therefore, we define open science as a collaborative culture enabled by technology that empowers the open sharing of data, information, and knowledge within the scientific community and the wider public to accelerate scientific research and understanding"

Don Sullivan suggested we reach out to, at the very least:

African Open Science Platform

<https://codata.org/initiatives/decadal-programme2/global-open-science-cloud/african-open-science/>

Open Access in Australasia

<https://oaaustralasia.org/>

The EU's open science policy

https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/our-digital-future/open-science_en

European Open Science Cloud

https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/our-digital-future/open-science/european-open-science-cloud-eosc_en

Session Proposal

July 19 11AM-12:30PM in Pittsburgh, PA

Introduce cluster, raise awareness around open science, opportunity for participation

definition of OS cluster...mission statement (include definition in there)

We can borrow from another definition or make our own. Bob suggested a survey of different accepted sources for defining Open Science could be conducted.

We need to get a group of people together to help define Cluster Plan, but we decided today might be best spent on the session. Proposal is at

https://wiki.esipfed.org/Open_Source_Science_Transformation.

Balance between seeing themselves as part of the cluster and discrete activities being done.

Megan speakers list suggestion: <https://2022esipjulymeeting.sched.com/directory/speakers>

Section 1: Lay groundwork for what practitioners are doing around open science, as well as the barriers in implementing open science practices. Who could participate as panelists in this discussion to help lay this groundwork. We need participants, if at all possible, to be physically present at the meeting.

Suggestion from Megan: Could see the ESIP Meeting session as Part 1 of a session and your next (August?) cluster telecon as part 2 - to try to include more folks who maybe won't want to register for ESIP

To accommodate hybrid, could do a parallel mind map in room and 'duplicate' jam board

Potential Panelist Pool

Organization - suggested by	Panelist Name	Contact	Notes
Environmental Data Governance Initiative (EDGI) - Mark Parsons & Douglas Rao			
Open Geospatial Consortium (OGC)			
World Data System ¹			
NASA ² - Rama	Kevin Murphy / Katie Baynes		
Invest in Open Infrastructure (IOI) ³	Kaitlin Thaney, ED		
Pangeo community	Ryan Abernathy / Joe Hamman		
Academia			to discuss 'how to do OS (open call papers, research deliverables, etc)
NSF or AAAS			
ENVO, SWEET (participatory governance of semantic resources			
AGU	Chris Erdmann?		
Professor from HBCU			
SPARC (Space Policy & Research Center)	Kristi Morgansen, Saadia Pekkanen (CO-dirs)		
Industry representative	Dr Satish Sankaran ⁴		
International Open Science communities			African Open Science Platform https://codata.org/initiatives/decadal-programme2/gl

¹ Executive Director, International Program Office

<https://www.worlddatasystem.org/organization/international-programme-office>

² discuss successes from NASA's open and free data and information policy since 1990s and Open Science vs Open Source Science

³ <https://investinopen.org>

⁴ Team leader for Open technology section at ESRI, chair in OGC sub-committee

			obal-open-science-cloud/af-rican-open-science/ Open Access in Australasia https://oaaustralasia.org/ The EU's open science policy https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/our-digital-future/open-science_en European Open Science Cloud https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/our-digital-future/open-science/european-open-science-cloud-eosc_en Above suggestions from Don Sullivan COS, Foster, OCED Above suggestions by Dana Ostrenga
rOpenSci or pyOpenSci			
representative(s) from minority groups			emphasis the important and benefits of OS for DEI
commercial software representative	Curt Hammill	chammill@esri.com	
Carpentries			
eScience Institute	Anthony Arendt	arendta@uw.edu	
Data 4 Black Lives (D4BL)			
Research Data Alliance & CODATA	Mark Parsons		
Openscapes			
DoE OSTI			
OSTP Open Science Group			
Cyverse			

Google Earth Engine			
SUNY-ESF			
Academic Data Science Alliance			
Oregon State University			

Part 2: Mindmapping activities around emerging trends in open science

Part 3: Ranking/Prioritization of trends by different stakeholder groups.

Who are the main stakeholders and how do we ensure there is representation from those?
Would there be missing ones?

Part 4: Are there commonalities? Develop timeline and action plan

Considerations:

Do we want to move toward Github-based presence under ESIP's?

what is the problem space...getting clarity on this from the session would be helpful!

Describe the current and trend (emerging)...any description of movement. This avoids 'problems'...if it is a problem, what is the underlying trend? And provide examples too. Novel trend or existing

Trends will lead to the defini of problem space.

Dot voting...may not be important to do this prioritization. What do we mean by OS? What are some of the problems and challenges? Some participants may not have even thought about open science

Mind mapping activity could take 30-45 minutes

stakeholder groups

- minority serving institution
- commercial/industry-based
- activist groups
- 'professional society, like AGU or AAAS
- federal government
- non-profits

Planning subgroup: We need people to serve. We want this to be representative of the entire cluster.
However you would like to participate - jamboard slide 6

How will mindmapping work with hybrid meeting setting? Megan said that they will share ideas for how ESIP is going to do that. More details coming soon.

Telecon 2 4/26/22 – ESIP OSS cluster

Link to jam board:

<https://jamboard.google.com/d/1g3N7qiTx67JqwrnYyTdG5ykB6UQ7glfQvaqcBE178w0/viewer>

Participants:

Mike Mahoney - PhD (OS tooling for creating VR representations of real world places) at SUNY (college of enviro science and forestry); also: an ESIP community fellow w machine learning cluster; Rstudio developer (over summer); member for curriculum advisory board for Carpentries educating researchers on OS geospatial technologies

Allison Mills

Arthur Endsley - University of Montana, science applications for SMAP level 4 carbon, porting MODIS ET algorithms to VIIRS platform

Michelle Thornton - ORNL DAAC, new member of ESCO - within DAAC do a lot of hands on data standardization

Mike Parsons - Univ of Alabama, Huntsville - working with new search application across NASA SMD

Doug Newman - NASA ESDIS, 2023 Year of Open Science

Chris Erdmann - AGU Data Steward, 10 years in open science, guidance

Lucas Sterzinger - PhD candidate at UC Davis; interested in open science

Jeff Siarto - EE3 - working as a contractor for ESDIS; open science for ESDSWG

Sara Lubkin - NASA ESDIS science operations office at GSFC, works with all DAACS but especially PO.DAAC

Robert Downs - CIESIN SEDAC, ESCO team

Douglas Rao - machine learning, NC State

**ESCO = ESDIS Standards Coordination Office (ESCO)

Feedback Telecon 1: What will keep you coming back?

Megan - working with other clusters - so many big picture ideas and activities that we could take on; what is one activity on this slide that you would like to get involved in...what are you most passionate about?

Mark - community aspect; open science requires a collaborative effort. Mark is working across all divisions - connect this to other disciplines (may be out of scope but want to keep finger on pulse). As broad as possible.

Chris - repositories: come in all shapes and sizes...could be an interesting space to work in. Overlap with other work too. Metrics area - goFAIR software group - rethinking discovery of software. Think of it as filtering and finding research and getting metrics from that. Yes, thinking about notebooks would really align with how we want to advance them

Attendee from 1st cluster telecon highlighted an AGU example

Niche that this could fill rather than replicating

I agree that repositories/archives are key hubs. No data = no software = no science

Mike - knowledge sharing and metrics - how do you address the heavy lift that open science requires and how do you incentivize. These are things that we agree are a good goal, but massive unfunded mandate. How can we lower the burden and ensure the remaining burden is worth it.

Douglas - most people in the 'data realm' on this telecon. How can we expand outreach to broader community?

Open Science versus OSS

Mark - open source means there is a license. Distracting because it makes people think about software only; not only one thing but all - broad collaborative workflow; whole different paradigm

Sara - I agree. The initiative is great, but the name doesn't work.

Chris - Agrees but could this be a component of every talk beforehand to get the name across

Foster Open Science > FAIR OS - combined terms - tied in definitions - talk more about inclusive open science -

Opening slide needs to connect all of these things so that people

Lucas - I agree w/ Mark - The term Open Source is very specific already and pushing OSS dilutes both Open Source and Open Science's meanings

Doug - hang on success of open source software model

Bob - open science also has different interpretations; needs to be a balance there as well, as to how we define open science; think of licenses and people misuse the term

Session Proposal

Douglas - NOAA Fisheries have a very vibrant open science (mostly R) community who have participated with OpenScapes. I believe one of them presented at the January meeting session.

Mike - Julia Stewart Lowndes

Mark - interactive piece is key; make use of that

exchange in learning; leverage the participants

Michelle - are we saying that these groups are doing open science well; how are we defining where it worked

hear from both - those that worked and those that did not

Douglas - Also, inviting people sharing some unsuccessful experiences would be helpful! I liked a past session organized by Lesley Wyborn called “epic failures”

Megan - Invite them to share successes and challenges - we need to hear both. Keep in mind that this is our debut - so people will want us to introduce ourselves. Why does it have to be in person and if there are folks in Pittsburgh

Another session - open source science from Air Quality cluster

May need to think about a longer session

Chris - software related projects at AGU - Chris can draw from those - identify some groups in use of software

Mark - Cool stuff going on at the ISchool at Drexel

Chris - Jane Greenberg at the Metadata Research Center could be a good person to invite

Megan - this discussion could have the in-person/ESIP Meeting component and then a part 2 online maybe in August or something like that to have more sharing from those who couldn't make it.

Douglas - There are some good people at CMU as well

Telecon 1 3/31/22 – ESIP OSS cluster

Link to jam board: [ESIP Open Science Cluster Introductions - Google Jamboard](#)

Participants

19. Mike Mahoney
20. Bruce Caron
21. Brendan McAndrew
22. Matthew Biddle
23. Ben Roberts-Pierel
24. Lorraine (Lorie) Tighe
25. Anthony Arendt
26. Max Grover
27. Charlie Haley
28. Melinda Minch
29. H. K. “Rama” Ramapriyan - SSAI/NASA GSFC (ESDIS)
30. Nancy Hoebelheinrich – Knowledge motifs LLC
31. Steve Olding
32. Ryan McGranaghan
33. Bob Downs
34. Jeff Siarto
35. Sydney Neugebauer
36. Cyndi Hall

37. Jenny Hewson

Mike Mahoney – PhD (OS tooling for creating VR representations of real world places) at q SUNY (college of enviro science and forestry); also: an ESIP community fellow w machine learning cluster; Rstudio developer (over summer); member for curriculum advisory board for Carpentries educating researchers on OS geospatial technologies

Bruce Caron – host organization is Earth Archive (spawned by ESIP)- community led preprint service for ES, hosted by California Dig Library. Interested in seeing how ESIP data, software, products, ideas can be more used more in Earth Archive

Brendon McAndrew – GSFC (hydrological sciences lab), EIS project (which has > emphasis on OS/OSS, cloud tools). Interested in OSS, TOPS, making science more inclusive

Matthew (Matt) Biddle ☞ NOAA's integrated ocean observing office; encourages oceanographic community to use Open source science to communicate/leverage/share oceanographic scientific processes. Certified instructor w Carpentries, recently hosted workshop on mobilizing biological data using Carpentries open science process. Melding of Minds

Ben Roberts- Pierel ☞ community fellow w ESIP lab; post-doc (college of earth, ocean, atmos sciences – Oregon State U); working w NASA SERVIR; park service in Alaska. Interested in...> accessibility to OS and BPs for publishing data sets, useable, accessible by community

Dr. Loraine Tighe (Lorie) – Dir of OS solutions w ESRI; big focus on OS; large OS/S group within ESRI; set of OS tools available to publish notebooks and not dependent on ArcGIS. Melting of minds

Anthony Arendt – research scientist @ U of Wash's eScience institute (background: cryosphere science). Leads Uquib program ...welcoming space for collaborative open science. Interested in evolving that model and educational opportunities

Max Grover – Argonne national lab, DOE...open source tools related to observational meteorological data; Project Pythia (earthcube-funded project) to develop education materials and cookbooks to work w different ES data. Interested in collaborating on education materials and x-collab across agencies.

Charlie Haley – collaboration architect (help ES and data scientists develop communities and understand how to collaborate better to do better science together. Here to *give and get (bring experience/insights from working w other groups and to learn)*

Melinda Minch – making software for 17 years, involved in world data system's international technology office, hosted @ Ocean Networks Canada. New to working in scientific community. Hoping to bring software knowledge and understand OS. People want to use software to further their goals...particular interest

H. K. "Rama" Ramapriyan – works for SSAI in support of NASA GSFC; xtensive history with ESIP. NASA has always had a free and open source science policy. Interested in what is happening in OSS

Nancy Hoebelheinrich – knowledge Motifs LLC

Steve Olding – EDSWG and ESDIS/SCO. Interested in what are the implications of OSS for data standards and application of those standards. WG on Open source software and FAIR data principles for NASA

Ryan McGranaghan – Orion Space aerospace company, majority of work through NASA/GSFC, in part on TOPS and leading pockets ...*earth-space knowledge commons*...combo on new infrastructure/data needed but also social/cultural elements (of trust and thriving communities around theme).

Bob Downs – CIESIN (part of Columbia Climate @ Columbia U), operates SEDAC

Jeff Siarto – UX director at Element84/UIUX design lead on NASA EED3 (support contract for ESDIS). Interested in cluster...wk w EDSWG and their opensource software community guide – looking at overlap between open source software and open science; building communities around these. What does and does not work for both!

Sydney Neugebauer – NASA capacity building program. Interested in cluster due to NASA shift to OSS and programs working in this space, what are BPs and how to adapt what they are already creating, opportunities to be more involved in community

What success looks like:

4 main ‘themes’

1. Need for repository/library of resources
2. Knowledge sharing (of barriers/solutions for OS; why/how OS communities thrive; successful applications of practices x-discipline)
3. Development of metrics (to account for LoE around implementing OSS, to recognize ‘early initiators’)
4. Development of best practices (for building communities around OS software; facilitating replication of tool ‘user uptake)

Take Aways:

Lots of expertise in cohort around:

- Education/tools
- OSS experience
- Building communities
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