



PANEL 3A

OPEN-SOURCE FROM POLICY TO PRACTICE



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PANEL CHAIRS

Stefanie Lumnitz

DestinE EO Application Scientist,
European Space Agency

PANEL SPEAKERS

Steve Crawford

Science Data Officer for Policy, NASA

Codrina Ilie

Board Director, OSGeo
Project Officer, OSS4gEO

Karthik Ram

Senior Scientist, Berkeley Institute for Data
Science



Policy for Open Source Software



Steve Crawford

Open-Source Science Initiative
NASA Science Mission Directorate



Open-Source Software in NASA Science

Due to the nature of Earth and Space Science, software is integral to every step of the scientific process: from information gathering from space based detectors to sharing results.

Software as part of the scientific process

Stages of reproducibility:

1. Software is not mentioned
2. Software is mentioned, but not described
3. Software is described, but not made available or by request only
4. Software is made openly available
5. ...with a permissive license
6. ...with good documentation and testing
7. Bonus: Contributed to a generalized package

Challenges in reproducibility:

- Data and plots are shared, but it isn't clear how the plots are derived from the data
- Researcher leaves the field or the software is lost
- Algorithms are described but with insufficient detail to reproduce
- Configurations or steps are not shared.





Advantages of Open Source Scientific Software



- Increased reproducibility
- Reuse
- Curation and archiving
- Better understanding of the results
- Credit
- Sustainability

See [Open Source Software Policy Options for NASA Earth and Space Science](#) for more information, history, advantages and challenges with scientific open source software for NASA





Software Policy Highlights at NASA



NASA [Draft Public Access Plan](#) Part C focus on scientific software:

- Scientific Software underlying scholarly publications is made publicly available at time of publication
- Proposals include a Software Management Plan
- Scientific software should be released with documentation that enables reusability
- Encourage contributions to existing open source software

SMD SPD-41 a: [Scientific Information Policy](#)

- Mission scientific software is developed openly
- Recognizes scientific software as a scientific product
- Permissive open source licenses should be used

NASA [Software Release policies](#) have also recently been updated

[RFI Available](#)



The community in Open Source



Codrina Maria Ilie

Board Director, Open Source for Geospatial Foundation;
Project Officer, OSS4gEO (Open Source for Geospatial Software Resources Platform for Geospatial Data Exploitation)





Empower everyone with open source geospatial



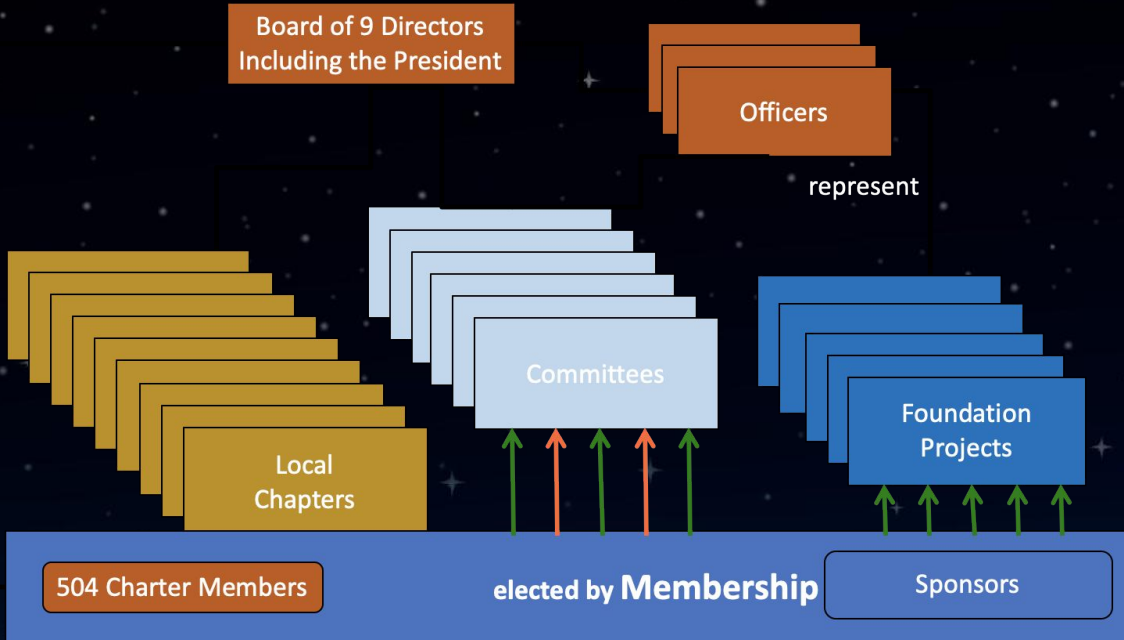
- **Provides** financial, organizational and legal support to the broader open source geospatial community.
- **Serves** as an independent legal entity to which community members can contribute code, funding and other resources, **secure in the knowledge that their contributions will be maintained for public benefit.**
- **Mission** is to foster global adoption of open geospatial technology by being an inclusive software foundation devoted to an open philosophy and participatory community driven development.

Not for profit organization, since **2006**





- Clear structure (governance)
- Framework collaboration with like-minded organizations and institutions: MoUs
- Traceability and accountability
- Projects guidelines to join OSGeo (incubation)
- Events: FOSS4Gs conferences and code sprints



The screenshot shows the OSGeo website page for the **OSGeo Budget 2023**. The page includes a navigation menu with options like **Page**, **Discussion**, **Main page**, **Current events**, **Recent changes**, and **Random page**. The main content area displays the following information:

- Final budget for 2023, see [OSGeo Budget 2022](#) and [Finance Committee#Documents](#) for prior years.
- Total Approved Budget for 2022: \$146,550 USD
- Total spending for 2022: \$83,395 USD
- Total Approved Budget for 2023: \$171,650 USD



International Cartographic Association
Association Cartographique Internationale



and many more!

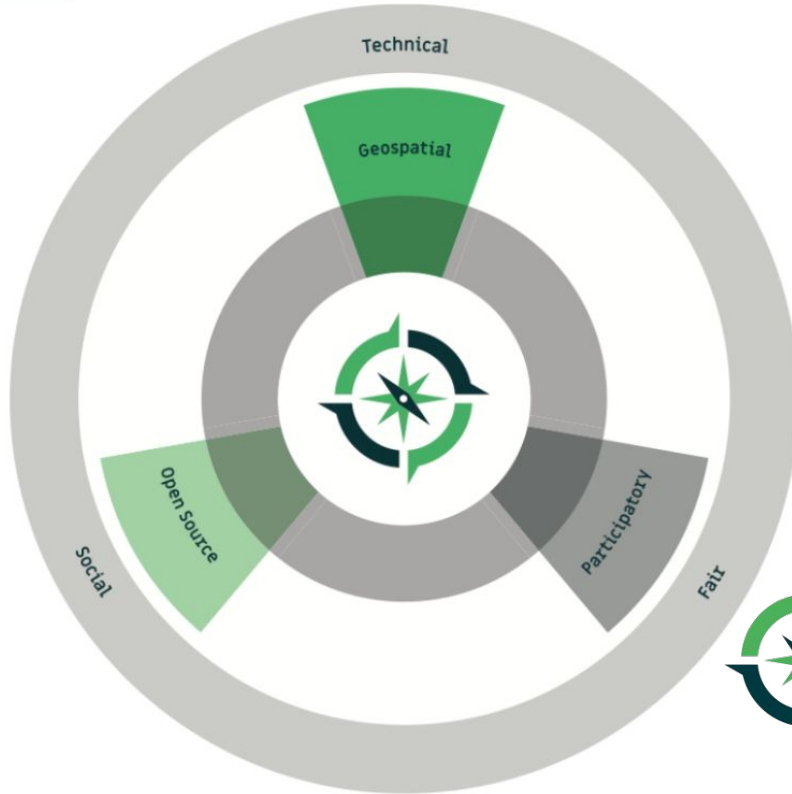




Open Source projects metrics?



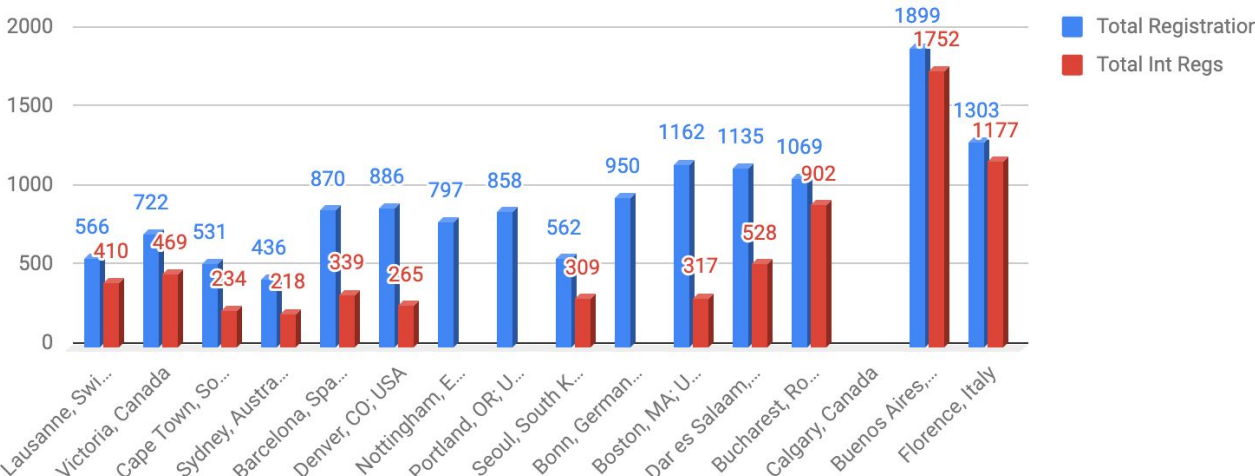
OSGeo Community



OSGeo Project



Total Registration and International Participation



FOSS4G 2006, Lausanne, Switzerland



FOSS4G 2019, Bucharest, Romania

Open Source Sustainability



Karthik Ram

UC Berkeley's Institute for Data
Science



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**The Research software
landscape has come a long way...**

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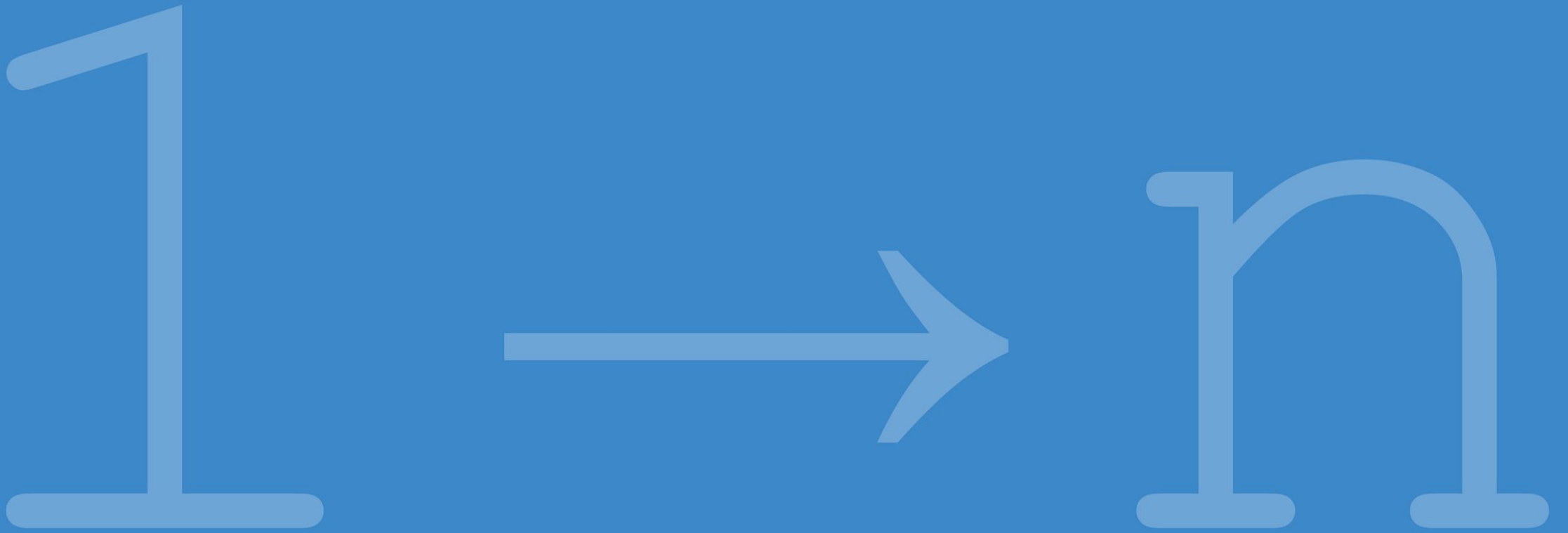


1

It is much easier to develop software, find support & community, and not (always) explain what an RSE means



**It's still very hard to demonstrate
the impact of software**



ii

There is a lot of support for creating software, but very little to sustain them after reaching product market fit

Software Sustainability

Software is sustainable as long as the people behind it have the resources to continue fulfilling its mission

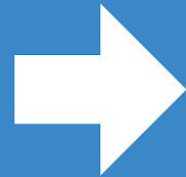


Analysis
code

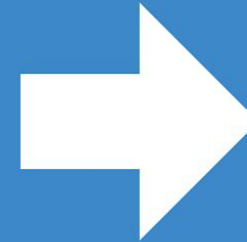
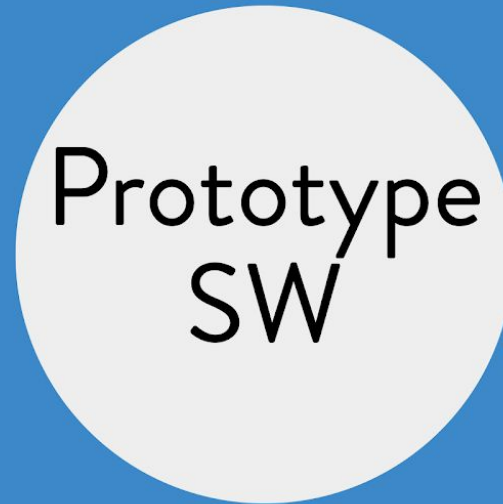
Prototype
SW

Research
SWI

Software projects that need to think about sustainability



A few with generalities make it over to a prototype



Ones that find product-market fit





Dimensions of Software Sustainability



**Governance &
Org structure**



**Security &
metrics**



Community



**Business
perspectives**



THANK YOU

