Mozilla Science Lab
End of Year Report
December 2015

The Mozilla Science Lab empowers the scientific community - researchers, coders, funders, and others - to make research more efficient and reliable by promoting accessibility, openness, and interoperability. Mozilla works to integrate these attributes of the Open Web into scientific practice. We support project-based learning to further data sharing and open source, provide fellowships and mentorship to empower the next generation of leaders, and support and advocate for a growing number of researchers working openly.

In the past year, we shipped working prototypes, welcomed our first class of Mozilla Fellows, and put the staff and programmatic supports in place to both catalyze collaborative, open source software development as well as sustain those communities through leadership training and mentorship. In addition to direct service to our stakeholders, this first phase of work enabled us to learn more about what our community needs, how we can best address those gaps, and how we can develop scalable learning pathways for researchers. Through that work, we have learned firsthand the need for skills training and mentorship in research if we are going to shift practice. We have also seen the challenges in scaling and making sustainable volunteer efforts, as well as assessing their long-term impact. This has greatly influenced our second phase of work to build learning resources and pathways for “working open” to serve researchers, project-based events such as sprints to spur innovation and prototyping, and community models such as fellowships and study groups to sustain engagement.

The following details our 2015 activities, specifically our efforts to connect with the community, build capacity, and develop prototypes with the community. It also includes a brief update on the Lab's staffing and evolution.

Connecting with the Community

We provide members of the research community with the supports needed to advance open science practice in their communities. In 2015 we built out additional programmatic and technical supports to facilitate this, from advances to our website to running our second global sprint. In 2016, we’ll continue this work and explore models for incentivizing and engaging researchers worldwide to join us in furthering open science.

- **Global Sprint:** In June, we hosted our second annual Mozilla Science Global Sprint. Over 170 community members came together in more than 30 cities around the world for over 53 consecutive hours of collaboration on tools, lesson materials, and resources for open science. The Global Sprint has become one of our flagship events, serving as a way to introduce community members to one another as well as spur innovation on tools and learning resources. This year, we also saw an increase in the number of projects and project leadership as well as activity, with over 40 leads joining us, and over 100 meaningful code contributions made (measured through pull requests on projects) in the course of two days. The outputs of the sprint included:

- **GeoTagX:** Over 420 images were classified, helping the project better understand relief efforts for disaster-affected areas.
- **Phage Parser:** This project works to accelerate our understanding of disease immunity by leveraging open genetic data. At the sprint, participants hacked on a means to extract CRISPR location in bacterial genome from CRISPR database.
- **Applied Bioinformatics Intro Course** (in IPython Notebook): The team worked to simplify the submission and review process for this Sloan-funded course.
- **Diversibee**: Contributors helped add additional crop types to this browser game designed to increase the awareness of long-term effects of land use on agricultural profitability.
- **Contributorship Badges:** 23 pull requests were filed (and 21 merged) for this project alone, helping to create and implement improvements such as badge issuing to a verified ORCID, implementing unit test framework, and a simpler development setup, significantly advancing the project.
- For a full look at projects and what they worked on at the sprint, check out the summary of participating projects and event Storify
    - https://forum.mozillascience.org/t/mozsprint-projects-where-to-start/239
    - Storify: https://storify.com/MozillaScience/mozilla-science-global-sprint-2015

- **Local Sprint:** In addition to the global sprint, we also piloted a smaller, local sprint in the Mozilla Toronto offices in March 2015. This sprint was deliberately smaller in scope, featuring five local open source projects, bringing together researchers, designers, and developers for two days of hacking. The aim was to foster city-based/regional community building and project-based work for use throughout the year.

- **Mozilla Festival ("MozFest")**: This year's MozFest hit landmark registration with over 2,000 participants joining us in London on November 6-8. The team curated the Open Science track (this time, with the help of our Mozilla Fellows), holding project sprints, trainings, and an Open Research Accelerator. This year, we had 67 session leads from a range of backgrounds including CERN, ProPublica, the Berkeley Institute for Transparency in Social Sciences, Hypothes.is, and GitHub running participatory sessions, trainings, and mentoring events over the course of the weekend. From that, we saw over 180 participants sign up to our mailing list, indicating they wanted to work with us to advance and contribute to open science.

- **Community Call:** We continue to run monthly public calls around open science, featuring the work of the community and exploring ways to bridge efforts and increase awareness around new projects in the research space. Over the course of this year, we had over 290 participants join us for these calls, 164 for the very first time, and will work to increase these numbers in 2016. Our lead developer Abby Cabunoc Mayes also started monthly project calls, initially focused on the Badges project, and now more tailored to community based open source projects. The project calls are recorded and posted online, with the most recent call viewed over 330 times.

- **Collaborate**: Since we launched Collaborate in September 2014 as the main project repository, we've worked to grow the number of projects on the site, as well as better understand what makes for a successful open source project and how we can support that. We currently have 41 projects listed on the site, predominantly community-led endeavors, with over 280 contributors across the platform. This year, we worked to post Global Sprint projects on Collaborate to streamline discovery and contribution, both during the event as well as after. We also added a number of projects following an open call. In 2016, we'll be re-evaluating our approach in soliciting and supporting projects on the platform, with new selection criteria, as well as trainings and workshops to support project leads looking to open source their work.

Building Capacity for Open Research Practice

Both as a philosophy and as a strategy, the Science Lab meets its respective communities where they are in terms of skills and levels of awareness. Our greatest successes come when we work with community to support and amplify their work. This is echoed in Mozilla-wide strategy, which focuses on fostering a network of leaders to fuel the open movement across various communities of practice such as science, journalism, advocacy, and education.

This past year, with the help of the community and support from both the Alfred P. Sloan Foundation and the Helmsley Charitable Trust, we shifted our focus to supporting open source and open data training, building on our learnings from previous collaborations with the Software Carpentry Foundation and members of the community. We brought on our first Instructional Designer in August (Zannah Marsh) as well as our first Open Data Training Lead in September (Stephanie Wright), as part of setting the foundation (and team) up for this work. We're also testing curriculum that targets those looking not only for training on how to open source their work, but also for the community and project management support necessary to foster contributorship and sustain engagement for open science projects.

- **Software Carpentry Support and Transition:** Following the establishment of the Software Carpentry Foundation in October 2014, we continued to support event coordination for the project through May 2015, supporting 54 workshops and over 1500 participants. We also supported a train-the-trainers event in Australia at the University of Melbourne for over 40 participants, and offered travel support for Data Carpentry instructors along with CODATA for an event in India.

- **Study Group Program:** We launched our Mozilla Science Study Groups, a community-based event series run by researchers to support open science training and relationship building within their institutions. These are regular, often weekly events, varying over the course of the semester from programming lessons to communal working sessions and drinkups. We provide monthly calls, mentorship, and scaffolding for creating event sites that come with Codes of Conduct and a handbook and lessons for getting started. To date, we have 19 Study Group Leaders around the world, and will be working in 2016 to further support this community of mentors. In total, this group led over 140 events and 46 open lesson plans at over 20 sites in less than a year.

- **“Working Open” & the Open Science Leadership Summit:** To better support project leads on Collaborate and at sprints, our lead developer Abby Cabunoc Mayes created a guide to “working open” to introduce researchers, grad students, professors, and citizen scientists to the project and community management essentials needed for open source development. The Working Open guide provides a framework and resources for running successful open source projects, both software and curriculum based. We also wanted to test the materials in this guide in a live workshop setting, which we did in September 2015. The 2.5 day event - called the “Open Science Leadership Summit” - brought together 15 project contributors, study group leads, and librarians to collaboratively craft and test workshop resources and better understand their needs. We’re currently incorporating feedback from that event into the resources and workshop model, and will be running our next event in February 2016.

- **Mozilla Fellows for Science:** With support from the Helmsley Charitable Trust, we launched a fellowship program for researchers to support code, curriculum and community building around open data and open source. This program expands Mozilla’s existing fellowships for open Web advocates and journalists. The fellowships are paid, 10-month positions for researchers with healthcare, childcare, training, and other benefits. For more, visit: https://www.mozillascience.org/fellows

Building Prototypes for Web-based Science Tools

The Science Lab has historically partnered with community members and organizations to build technical prototypes that advance science on the web. We prioritize finding and developing solutions that make existing tools and technology work together, rather than starting from scratch. This leverages previous investments in the technology and speeds adoption through extant communities of practice.

- **Contributorship Badges for Science:** Our most recent prototyping effort explored the use of digital badges for crediting contributors to scholarly papers for their work. This work is a collaboration with publishers BioMed Central and the Public Library of Science; the biomedical research foundation, The Wellcome Trust; the software and technology firm, Digital Science; and the registry of unique researcher identifiers, ORCID.

- **Catalyzing Development Through Project-Based Learning:** This year, we invested more time on 1-on-1 mentorship for project leads and community members, in order to help them build more prototypes and expand their contributorship base. This included mentorship in the lead up to the Global Sprint and MozFest, as well as the Open Science Leadership Summit and Fellows onboarding. What we learned from those events is that there’s a strong desire for community and project management support, for tasks such as roadmapping, facilitation, managing contributors and understanding your community. In 2016, we’ll move towards supporting prototyping in the community

rather than leading our own, through in person workshops, a cohort-based model, and mentorship.

Funding

- **Sloan Foundation** (continuation): Our Sloan funding supports our lead developer (Abby Cabunoc Mayes), participation coordinator (Arliss Collins), community lead (Aurelia Moser) and director (Kaitlin Thaney), as well as the bulk of the Science Lab's prototyping and training initiatives as well as assessment. This funding has been extended to June 2016.

- **Helmsley Charitable Trust:** At the end of 2014, Mozilla was awarded a two-year $1.76 million grant from the Helmsley Charitable Trust to build our educational offering at the Science Lab. The funding supports a dedicated open data training lead (Stephanie Wright), an instructional designer (Zannah Marsh), part core support and two rounds of fellowship support for early career researchers to serve as lead open science trainers, which launched in October 2015.

Sustainability and Evolution

- **Staff additions:** Since September, we've added three new team members. Zannah Marsh joined as our first Instructional Designer and Stephanie Wright joined as our first Open Data Training Lead. Aurelia Moser joined as our Community Lead to spearhead mentorship of the community lead tiers (fellows, study group leads, project leads) for the Science Lab as well as across the Foundation.

- **Staff transitions:** Bill Mills, our Community Manager, left the Science Lab in August 2015 to return to his previous post as a scientific software developer.

Media Coverage & Publications:

- The open research value propositon: How sharing can help researchers succeed: https://figshare.com/articles/The_open_research_value_proposition_How_sharing_can_help_researchers_succeed/1619902

- Software engineering students work with Mozilla to help researchers worldwide: https://www.rit.edu/news/story.php?id=53679

- Mozilla creates web tools and resources for open science: https://opensource.com/life/15/9/ato-interview-abby-mayes-mozilla-science-lab

- Putting credit back into the hands of researchers: http://blogs.biomedcentral.com/gigablog/2015/09/28/putting-credit-hands-researchers/

- Rule rewrite aims to clean up scientific software: http://www.nature.com/news/rule-rewrite-aims-to-clean-up-scientific-software-1.17323

- 'Open Source, Open Science' meeting report: http://blogs.plos.org/tech/open-source-open-science-meeting-report-march-2015/