R consortium

ANNUAL REPORT / 5 YEAR RETROSPECTIVE

Fall 2021

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A Word From Our Chair

Joseph B. Rickert

We are here to support the R Community and to help it flourish. Tens of thousands of statisticians and data scientists use R every day as the computational engine driving advances in healthcare, medicine, drug development, ecology, climate modeling, ecology and other scientific fields. Thousands more R users working in finance, insurance, education, software development, cloud computing, internet commerce, government and other industries are helping to drive our data-centric economy. All of this activity is possible because of the efforts of open source developers, the dedicated work of the R Foundation and the small group that maintains CRAN, the central R repository.

Ensuring that R continues to thrive and adapt requires a long term perspective and a commitment to the resources needed to develop technical and social infrastructure. Every year, the R Consortium cycles a considerable portion of membership fees into Community-proposed infrastructure projects. So far, R Consortium grants to individual developers, collaborative projects, user groups, conferences and other R community events have totalled well over $1.3 million dollars. Spatial statistics packages, DBI developers, the R Validation Hub project, R-Ladies, satRdays and useR! have all benefited from R Consortium grants.

This is strategic funding with a large impact.

Strategic funding of open source projects is not something that individuals can normally do, no matter how capable. And it is not typically possible for shareholder-beholden corporations, either. This is why the vendor-neutral, open governance R Consortium has continued to be strongly supported by our members over the past 6 years.

The R Consortium works to mobilize R ecosystem resources to advance the greater good. For example, the R Consortium Diversity and Inclusion Working Group sets standards for codes of conduct and assists conferences and events in creating inclusive environments. Last year, we helped the R Community respond to the pandemic by funding the RECON COVID Challenge, a project initiated by epidemiologists to organise and manage analytics resources in R to support the response to COVID-19 worldwide; worked with the Stanford Data Science Institute to initiate and produce the COVID-19 Forum, a series of online events bringing together various fields to discuss issues and possible responses to various aspects of the pandemic; and funded the COVID-19 Data Hub, a repository of worldwide COVID-19 case data gathered from original sources from over one hundred forty countries around the world and makes it readily accessible to researchers using R.

We are working with our member companies and the R Community to secure a future in which the capabilities of the R language and the statistical knowledge encoded in R packages and repositories can continue to contribute to advancing technology.

Sincerely,

Joseph B. Rickert

R Consortium Mission

We are here to support the R community and the R Foundation to help develop the infrastructure required to ensure the long-term stability and growth of the R Ecosystem. Our vision is ambitious. We are building an R ecosystem advancing 21st century computational statistics and data science.

Looking Backward

By late 2014, a number of companies working to build the foundations of data science in industry realized that the R Language, the CRAN repository of contributed packages, and the R Community were of immense importance for the advancement of data science and statistical computing. Moreover it was becoming clear that if industries wanted to share in the promise of open source software, new institutions would be required. A mechanism was needed for companies to contribute to sustaining the growth and stability of open source communities and development.

Over a relatively short period of time, a consensus was reached that a non-profit organization with a mission to support and develop infrastructure could help to provide for the future of R. Moreover, it could also bring companies with a strategic dependence on R into the greater R community. With the help of the R Foundation and the Linux Foundation, the R Consortium went live on June 30, 2015. The founding members of the R Consortium included the R Foundation, Platinum members Microsoft and RStudio; Gold member TIBCO Software Inc.; and Silver members Alteryx, HP, Mango Solutions, Google, Ketchum Trading, and Oracle.

The press releases from [Microsoft](#) and the [Linux](#) [Foundation](#), and the [Revolutions Blog post](#) from R Consortium's David Smith captured the mood of the times.

Looking Forward

The sections below outline the structure of the R Consortium and describe a number of activities that are in progress. These include:

1. Working with the R Foundation to find ways to cooperate in strengthening and expanding the R ecosystem

2. Our program to provide cash grants to individuals proposing projects that we believe will benefit significant segments of the R Community

3. Support of R conferences and user groups worldwide

4. Collaborative projects being done in R Consortium working groups. Most prominent among these is the ISC working group that is developing a series of pilot clinical trials to be submitted through the FDA's [Electronic Submissions Gateway](#). This group hopes to prototype the technology necessary for expanding the use of R in regulatory submissions. This is a major advance for R if accepted for clinical trials.

In addition to continuing and expanding the work already under way, we are looking forward to implementing some of the ideas uncovered in a recent Board initiative to better understand the needs of our member companies. We hope to enhance the ways that members can engage with the R Consortium and promote the avenues available to their employees for participating in R Consortium projects.
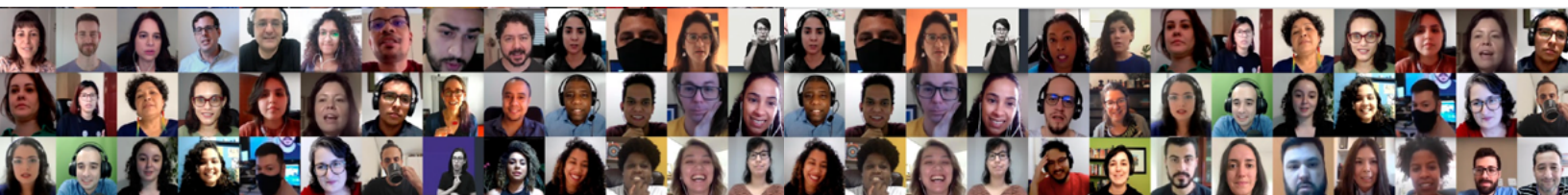
Some of the attendees during the Brazilian Conference on Data Journalism and Digital Methods (CODA.br) in 2020

R Consortium Members

Platinum Members

Silver Members

Our mission is made possible because of the generosity and leadership provided by our member companies. Our members believe in the idea of open source, the strength of the R Community, and the relevance of the R language. In addition, they value the treasury of statistical and scientific knowledge encoded in the CRAN and Bioconductor package repositories. They want to provide for the future of R.

> "We see R as the future of statistical analysis because of its flexibility and the strong active community behind it."
>
> – Alun Bedding
>   *Director of Biostatistics at Genentech*

Current R Consortium members include Alteryx, Esri, Biogen, Genentech/Roche, Esri, Google, GlaxoSmithKlein, Janssen Pharmaceuticals, Mango Solutions, Merck, Microsoft, Oracle, ProCogia, R Foundation, RStudio, and ThinkR.

Former members include The Gordon & Betty Moore Foundation, Ketchum Trading, IBM, and TIBCO. We miss them and we wish to acknowledge the debt we owe to their participation. Ketchum Trading, a small firm, and TIBCO were members of the founding team who provided not only financing but leadership when we were just getting off the ground. In addition to generous grants, we learned much about awarding and administering grants from the Moore Foundation.

R Consortium Organization

The R Consortium (RC) is organized as follows: the Board of Directors comprising representatives from member organizations provide strategic direction and financial oversight. Member companies also appoint representatives to the Infrastructure Steering Committee (ISC) which oversees all technical activities.

The 2021 R Consortium Board of Directors

Mark Hornick - Oracle

Michael Lawrence - R Foundation

Ning Leng - Genentech/Roche

Joseph Rickert - RStudio

Mehar Singh - ProCogia

David Smith - Microsoft

Hadley Wickham - RStudio

2021 ISC

Orhun Aydin - Elected Silver member representative

James Black - Appointed by Gold member Genentech/Roche

Henrik Bengtsson - R Foundation

Gábor Csárdi - R Hub Top Level Project

Michael Helbraun - Appointed by Gold member Microsoft

Saranjeet Kuar - R-Ladies Top Level Project

Joseph Rickert - RUGS Top Level Project

Mehar Singh - Elected Silver Member representative

Samantha Toet - Diversity and Inclusion Top Level Project

Hadley Wickham - Appointed by Gold member RStudio

Administration

The Information Steering Committee (ISC) oversees and manages all technical activities. The Pharma Oversight Committee, comprising individuals who are employees of R Consortium member companies, provides financial oversight and strategic direction to ISC working groups devoted to pharmaceutical industry topics. The Marketing Committee, also led by individuals employed by R Consortium member companies, manages all activities to promote R Consortium projects and activities and manages the budget to support R Community conferences and events. The Linux Foundation provides legal and financial services and business infrastructure support to the R Consortium.

The Information Steering Committee (ISC)

The ISC makes decisions on awarding community grants for infrastructure projects and oversees the administration of the grants. Additionally, the ISC oversees the work done in top level projects and authorizes and oversees R Consortium working groups.

## The Community Grants Program

Twice a year the ISC issues a call for proposals to the R Community for infra-structure projects that will benefit a significant segment of the R Community. The ISC evaluates proposals based on the likely benefits they will provide to the R Community, the technical viability of the proposed work, confidence in the proposing team, and cost. This is a competitive process and the ISC frequently provides partial funding to projects with the possibility of granting additional funding if the proposing team meets agreed upon milestones. Some examples of successful projects that were the recipient of ISC grants are described in the Appendix.

Top Level Projects

Top Level Projects manage work for which there is a continuing need. These projects receive three year commitments for funding, enabling long term planning for essential activities.

RUGS

The R Consortium's R User Group and Small Conference Support Program (RUGS) supports meetings around the world. Nairobi, New York City, Taipei, Philadelphia, Melbourne, Zurich… and many more. These groups receive access to Meetup.com Pro, providing a platform where they reach out to others that are just starting their journey with R or are seasoned veterans. User Groups also have access to additional funding for special events and other needs that arise. We are sharing the incredible work that organizers of User Groups are doing around the world in our blog series.
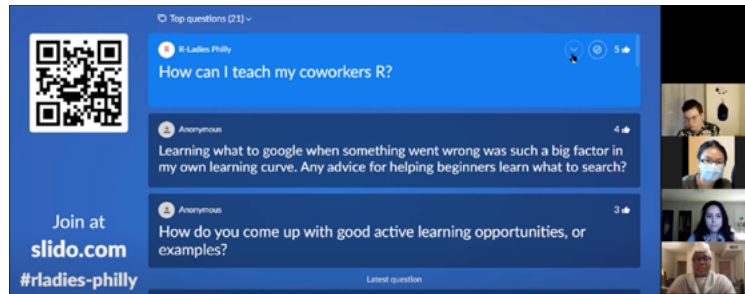

From the R-Ladies Philly series of 11 R Workshops in 2020, this one covering "From learn-R to teach-R: An expert panel on effective R instruction

Diversity and Inclusion

The Diversity and Inclusion Working Group (RCDI-WG), an ISC top level project, comprises a creative, committed team of international volunteers who are working to understand diversity issues as they play out across the many, varied cultures sustaining the worldwide R Community.

The goal of the RCDI-WG is to broadly consider how the R Consortium can best encourage and support diversity and inclusion across a variety of events and platforms. The short-term priority is to define and publicize best practices for R community events, and ensure that events funded by the R consortium adhere to those guidelines. In the long term, the RCDI-WG will think about how diversity and inclusion can be woven throughout all R Consortium activities.

R-Ladies Nairobi Organizers
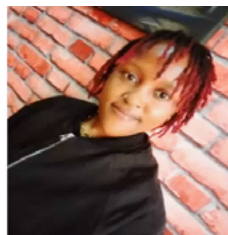
Lucy Njoki
Biostatistician
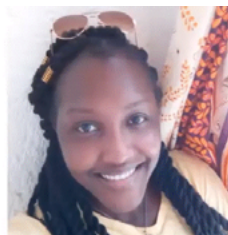
Margaret Wanjiru
Financial Risk Analyst

Faith Musili
Senior Data Analyst

Shelmith Kariuki
Senior Data Analyst

R-Ladies

R-Ladies links us with the R-Ladies Global organization. R-Ladies has grown from a handful of groups to a global organization with the support of the R Consortium - providing them the resources and access they need to continue their growth trajectory. There are currently over 74,000 members on meetup.com covering 141 groups worldwide.

R-Hub

R-hub is a collection of services to help R package development, free for all members of the community thanks to support from the R Consortium. It's most prominent service is the package builder, a multi-platform build and check service for R packages, that allows building and checking any R package on several platforms and R versions, with submission happening via a webform or an R client.

The `rhub` package uses the R-hub API to connect to the R-hub builder and start package checks on various architectures: Run `R CMD check` on any of the R-hub builder architectures, from R. `rhub` also supports accessing statuses of previous checks, and local use of the R-hub Linux platforms via Docker.

Working Groups

Working Groups are organized under the ISC and mainly staffed by volunteers from the R Community. Individuals volunteering for working groups do not need to be employed by organizations who are members of the RC. Working groups foster collaboration in key areas that attract industry interest in multiple vertical industries, and have proved to be remarkably flexible and effective for organizing and managing large scale collaborative projects that are important to various segments of the R Community.

Working groups provide safe, impartial environments where representatives from competing companies can collaborate on projects that benefit the industry as a whole. Any member of the R Community can propose a working group. If the group requires funding to accomplish its mission, the proper protocol is to propose the project in response to ISC calls for proposals, which are held twice a year. Otherwise, if the working group does not require immediate funding, then the ISC will consider proposals to form a new group on an ad hoc basis.

Once approved by a vote of the ISC and set up with a GitHub repository for recording meeting minutes and work products, the working group can begin recruiting members. All it takes is a few committed individuals willing to take on the responsibility for holding open, transparent meetings. It is a great strength of ISC working groups that they can draw on the talent and energy of the R Community.

Active working groups (WG) presently include:

- The COVID-19 WG manages the COVID-19 data hub, a repository of worldwide COVID case data.

- R for Business is working to promote the use of R in accounting and business applications.

- R Certification is developing standards for educating statisticians to become effective members of mixed programming language teams, initially focused on R and SAS.

- R / Medicine produces the annual conference focused on using R in clinical practice.

- • R / Pharma produces an annual conference focused on the use of R in pharmaceutical companies.

- R Repositories, a new working group, will investigate technical and operational issues pertaining to repositories of R packages.

- R Submissions is working on a series of pilot clinical trials to make "all R" submissions through the FDA's Electronic Submissions Gateway easy

- R Tables for Regulatory Submissions (RTRS) is working to develop strategies and guidelines for constructing tables for clinical trials and other medical documents.

- The R Validation Hub - developing risk based methods to assess the quality of R packages and their suitability for use in regulatory environments

For a complete list of R Consortium ISC working groups see the working groups tab on the R Consortium website.

The Pharma Oversight Committee

Because of the broad scope and high activity of working groups devoted to projects supporting the Pharmaceutical Industry, in 2020 the Board of the Directors authorized the creation of the Pharma Oversight Committee to coordinate the activities of the various working groups and set the overall strategic direction.

Other Projects

In response to the COVID-19 pandemic the R Consortium joined with the Stanford Data Science Institute to establish the COVID-19 Data Forum, a series of webinars and discussions about challenges related to collecting and organizing the data required to form a unified scientific response to the pandemic. So far the forum has held three events which attracted experts working on clinical data infrastructure, mobility data and data journalism.

The Marketing Committee

The Marketing Committee, managed by individuals who work for R Consortium member companies and supported by a small staff of marketing professionals, is the voice of the R Consortium. Working through the R Consortium blog, social media channels and also directly through contacts in the R Community, the Marketing Committee promotes the work of the R Consortium, its member companies, it's partner organizations, the R Foundation and other R Community organizations. The Marketing Committee makes decisions on funding R themed conferences throughout the world and often provides direct technical support for events.

R Consortium Impact

The R Consortium aims to have a positive impact on the world of data science and computational statistics through its work in the following areas:

1. Promoting the R language not only as the premier language for statistical computing, but also promoting the R ecosystem as the world's largest open and free repository of statistical knowledge.

2. Helping to ensure the stability and longevity of the R ecosystem by identifying and financing infrastructure projects that will sustain and develop R over the next twenty years. Under infrastructure, we include both hard technical and soft community assets.

3. Encouraging the adoption of ISC working groups as safe and unbiased venues for accomplishing large-scale collaborative projects.

4. Cultivating the open nature of the R Community by celebrating diversity and inclusiveness in R events, conferences, user groups and working groups.

5. Providing opportunities for our member companies to become part of the R Community and be recognized for their contributions.

Our financial goal is to effectively channel our revenue into the R Community through cash grants and through support for collaborative projects.

R Consortium Spending

The following chart showing the allocation of revenue for calendar year 2020 indicates that 55% of the money collected from membership donations either went directly to cash grants for community projects or sponsorships for R Community events. Additionally, some of the funds represented by the 13% allocated to operations went directly to support community projects such as the R / Medicine conference and ISC working groups mentioned above.
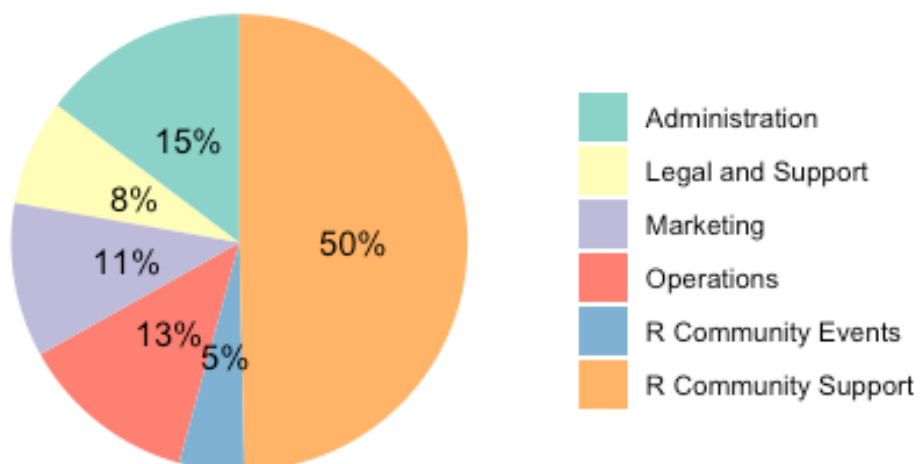
Grants and Funded Projects

Between mid 2015 when we began operations and the end of 2020 the R Consortium delivered over $1,300,000 in grants to the R Community either as ISC infrastructure grants or community events. The following chart shows the distribution of funds over the major categories.

R Consortium Grants
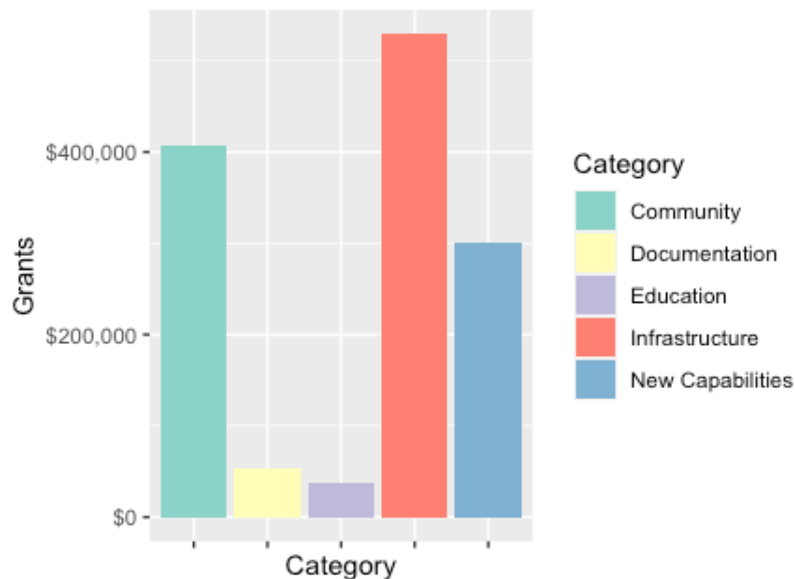
Community includes social infrastructure such as support for R-Ladies, the satRdays conferences, and editorial assistance for the R Journal.

Documentation includes projects such as The R Documentation Task Force and the histoRicalg project to preserve and transfer algorithmic knowledge embedded in the Fortran routines called by R code.

Education includes a Software Carpentry Grant for R instructor training and a grant for developing tools for teaching materials.

Infrastructure includes the R-hub package build system, the DBI project, and ongoing work to build infrastructure for building packages on MacOS and Windows.

Finally, New Capabilities includes several grants to develop simple features based packages for spatial statistics, database interoperability, CVXR support, doing symbolic mathematics and more.

See the Appendix for more complete descriptions of some of the projects called out here and a table of all ISC grants awarded.

The following table and chart shows cash disbursed either through ISC grants or ISC top-level projects by year. The grand total is $1,327,102.

R Consortium Grants

Year	Infrastructure	Community	Documentation	Education	New Capabilities	Total
2015	$80,000	$0	$0	$0	$0	$80,000
2016	$136,000	$20,000	$10,000	$10,000	$19,100	$195,100
2017	$103,500	$76,349	$0	$11,200	$25,000	$216,049
2018	$134,950	$112,488	$6,772	$10,000	$75,000	$339,210
2019	$22,800	$65,426	$19,912	$6,699	$115,171	$230,008
2020	$52,232	$132,815	$16,000	$0	$65,688	$266,735
Total	——	$529,482	$407,078	$52,684	$37,899	$299,959	———

R Consortium Grants
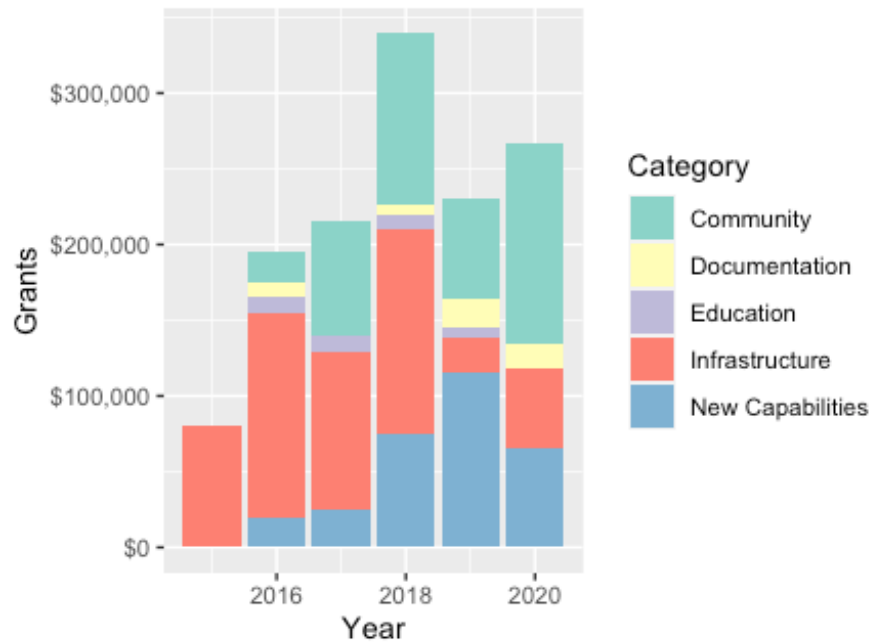
Working Groups and Collaboration

ISC working groups have been particularly effective in addressing issues important to the pharmaceutical industry. The R Validation Hub, comprising volunteers from over forty-five companies, is leading an industry effort to develop risk metrics for validating R packages for use in clinical trials and regulatory environments. The RTRS working group is addressing the nitty-gritty issues involved with programmatically generating tables that meet the exacting standards for regulatory submissions.

The Submissions Working Group is taking a systems approach to addressing the challenges inherent in submitting clinical trial submission packages built entirely with resources from the R ecosystem through the FDA's Electronic Submissions Gateway. As part of this effort the R Consortium has received the credentials required to submit pilot clinical trial submissions through the gateway. The R Consortium is pleased and grateful to be in a position to facilitate an effort that promises to be an important milestone for expanding the role of the R language in industry.

These three working groups have benefited from the active participation of several representatives from organizations such as Amgen, Atorus Research, Bayer, Biogen, ClinBAY EMD Serono, Flatiron, Genentech, GSK, the FDA, Janssen, J&J, Julius Clinical, Kite Pharma, Lilly, Merck, Novo Nordisk, Novartis, Phuse, PPD, RStudio, Roche, and Yale University. The R Validation Hub has attracted an even broader list of members.

ISC working groups have also proved to be effective in organizing and managing industry events. Both the R / Pharma and R / Medicine conferences are in the process of producing their third annual international conferences.

Marketing Activities

Blogging and Social Media

Weekly R Consortium marketing activities include blogging and engaging with social media. This year the Marketing Committee is working to expand the R Consortium's following on both Twitter and Linkedin. The committee regularly posts interviews with R user group organizers that highlight both social and technical issues.

We regularly highlight user group and conference activities by interviewing organizers and publishing the interviews on the R Consortium blog. A few recent examples include:

- Working with Databases in R – Video Presentation from NairobiR and R-Ladies Nairobi
- New York City's R Community's Diverse Population Provides a Depth of Speakers

- [Bioconductor Asia Membership Increasing Due to Going Virtual](#)
- [R-Ladies Philly – Building our Online Community During the Pandemic](#)
- [Tidyverse Overtakes For Loops in Melbourne, Australia](#)
- [Brazil's R Community is Vibrant and Active](#)
- [Checking in with R-Ladies Taipei](#)
- [Spectacularly Prescient – satRday South Africa Covered COVID Data Before Pandemic Hit](#)
- [Find out about the R Community in Zurich, Switzerland](#)

Webinars

We recently started an R Adoption Webinar series that will explore the challenges and rewards of adopting R as a major data science computational platform. The first webinar [Scaling R at GSK](#) was delivered by Andy Nicholls, the head of Data Science within GSK Biostatistics, and lead organizer of the R Validation Working Group.

Events

The COVID-19 pandemic shut down live events worldwide, but the R Community adapted to produce a large number of virtual events and the R Consortium was there to provide financial support, and in some cases, by sending speakers and providing technology and hands-on expertise. Events we supported in 2020 included useR!, BioConductor, Latin R, Coda Brazil, Data Fest Tbilisi, satRdays and 20+ more.

R User Groups

2020 was also a difficult year for R user groups. Unable to meet in person they also adapted to holding virtual meetings. As part of the benefits of participating in the 2020 R User Group and Small Conference Program (RUGS) the R Consortium paid the meetup.com fees for each group in the program allowing organizers to keep in touch with their members and plan for the future. We are currently supporting 95 groups across 38 countries. Through this program we have the ability to reach nearly 70,000 R users.

R User Groups

Members	Groups	Countries
69,561	95	38

Looking Towards 2022

The R Consortium explosively expanded the scope of its activities over the past year, increasing the pace and reach of marketing activities, providing support for conferences and users groups, expanding the activity of ISC working groups and engaging with partner organizations. Additionally, we expended considerable resources improving and upgrading internal processes and member benefits.

For example, we have strengthened our financial controls and launched a directed funding program that enables R Consortium members to earmark a portion of their membership dues to be spent on Board-approved R Consortium projects and activities. We expect the balance of 2021 to be devoted to completing our internal improvements and making progress on the projects active in our working groups. We expect to close the year with a strong cash position and a successful second round of ISC grants.

The primary goal for 2022 will be to increase our membership both through demonstrating the value of the collaborative work being done by working groups centered in the pharmaceutical industry, and by expanding our reach into industries such as finance, insurance, health services and other industries in which R is firmly established. Also, as the world recovers from the COVID pandemic, we will be there to help the R Community re-engage with in-person, R-related events. This means helping to grow the network of user groups and R Conferences and reaching out to establish new communities in underserved areas across the globe.

The presence and reach of the R Consortium continues to expand. We expect both to accelerate in 2022 and that we will be in an even better position to help support people and technology working with R by 2022.

Photo credit: CODA.br 2020

Appendix

Descriptions of ISC Projects

Simple Features

Among its initial batch of grants funding community projects in 2016 the ISC awarded a grant to Edzer Pebesma of the Institute for Geoinformatics at the University of Munster to implement the OGC Simple Features Standard for spatial statistics in R. This standard which governs the representation of geographic vector data is widely used by GIS systems including PostGIS, GeoJSON, and ArcGIS. The resulting sf R package helped to make R the premier computing language for spatial statistics. As the authors of Geocomputation with R explain: although there are excellent resources for learning geocomputation without R, none of these provide the unique combination of package ecosystem, statistical capabilities, visualization options, powerful IDEs offered by the R community. Motivated by the success of the sf package, the R Consortium awarded several subsequent grants to community driven projects in spatial statistics.

Sources:

An Explosion of Simple Features for R by Jesse Sadler
Simple Features for R Proposal by Edzer Pebesma
Geocomputation with R by Robin Lovelace, Jakub Nowosad and Jannes Muenchow

DBI

The first tranche of grants also included funding for Kirill Müller's DBI project to improve R database interfaces. The DBI project and resulting eponymous R package substantially improved R's low level connectivity to several databases including RPostgres, RMariaDB, RSQLite, odbc, bigrquery and several other database backends. The impetus behind the project has been a long term effort from the project to do distributed statistical computing. Please see David James History of DBI for an account of the history and significance of the project, and visit the DBI project site for technical details.

R-Hub

R-hub, the initial infrastructure that helped to launch the R Consortium, is a collection of services to facilitate R package development. It is free for all members of the community.

The most prominent servicer, the R-hub builder, complements the services offered by the CRAN repository by allowing R package builders to check their packages on several platforms against multiple versions of R. Additionally, it allows package developers to build their package binaries and the binaries for all (source) dependencies, on several platforms, and R versions.

stars: Scalable, spatiotemporal tidy arrays for R

ISC awarded a grant to Edzer Pebesma in 2017 for an R package for representing spatio-temporal data as tidy arrays in R. Space-time representation in the R language has been bifurcated into many niche packages. Stars offers a unified approach to space-time data, representing time and space effectively with intuitive visualization, subsetting abilities with the ability to support both vector-based and raster data.

satRDays

Community building requires infrastructure too! A small investment in a lightweight conference management system triggered satRdays, a tsunami of pop-up, Saturday conferences that brought big league R training and expertise to underserved locations around the world.

R Journal

The open access R Journal is the official, refereed journal of the R project for statistical computing. It features short to medium length articles covering topics R related topics of interest to statisticians, data scientists and R users and developers. In 2018 the ISC awarded the R Journal a substantial grant to upgrade their production infrastructure and improve their editorial operations. The new submission system based on GitHub, Netlify and R Markdown went operational in April 2020. Work is ongoing, however, the new system should be fully operational soon.

Ongoing Infrastructure Development for R on Windows and MacOS

The majority of R users rely on precompiled installers and binary packages for Windows and MacOS that are made available through CRAN. The excellent quality of these binaries tremendously improves the usability of R on these platforms, and helps to make R accessible to students and researchers from any background. Maintaining and building the Windows and MacOS installers and binary packages along with maintaining up-to-date builds for the hundreds of external C/C++ libraries used by R packages is relentless highly technical work.
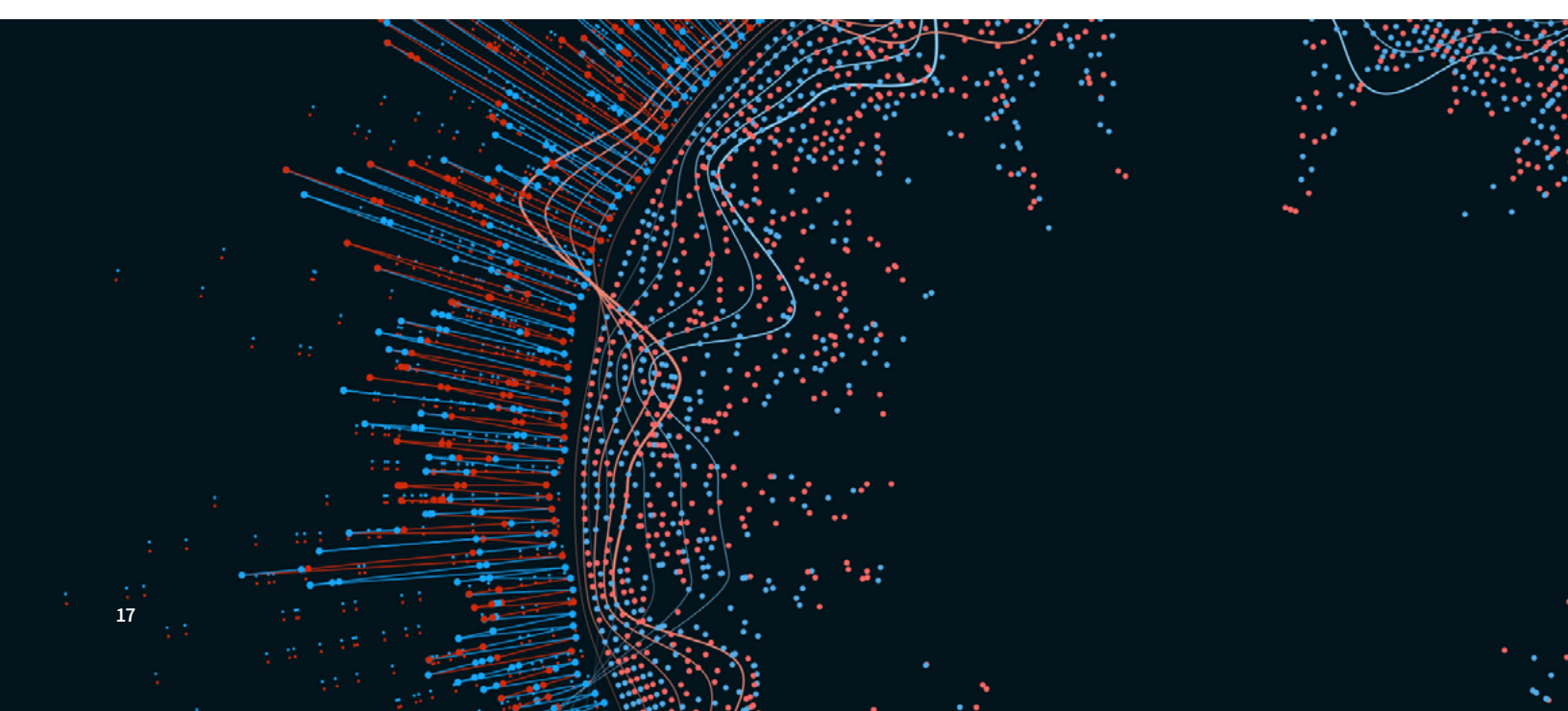
ISC Grants 2015 through 2020

YEAR	PROJECT	TYPE
2015	R-Hub	Infrastructure
2016	R-Hub 2	Infrastructure
2016	Improving DBI	Infrastructure
2016	A unified framework for Distributed Computing in R	Infrastructure
2016	RL10N: R Localization Proposal	Infrastructure
2016	satRdays	Community
2016	R Implementation Optimization Tooling (RIOT) Workshops	Community
2016	Software Carpentry R Instructor Training	Education
2016	Simple Features for R	New Capabilities
2016	R Documentation Task Force	Documentation
2016	Interactive data manipulation in mapview	New Capabilities
2017	Establishing DBI	Infrastructure
2017	Continued Development of the R API for Distributed Computing	Infrastructure
2017	Conference Management System for R Consortium Supported Conferences	Community
2017	Forwards Workshops for Women and Girls	Community
2017	School of Data Material Development	Education
2017	Adding Linux Binary Builders to CRAN	Infrastructure
2017	An infrastructure for building R packages on MacOS Abstract with homebrew	Infrastructure
2017	Joint profiling of native and R code	Infrastructure
2017	stars: Scalable, spatiotemporal tidy arrays for R	New Capabilities
2017	Refactoring and updating the SWIG R module	Infrastructure
2017	Quantities for R	New Capabilities
2017	Future Minimal API: Specification with Backend Conformance Test Suite	Infrastructure
2017	An Earth data processing backend for testing and evaluating stars	New Capabilities
2017	PSI application for collaboration to create online R package validation repository	Infrastructure
2018	Maintaining DBI	Infrastructure
2018	A unified platform for missing values methods and workflows	New Capabilities
2018	Proposal to Create an R Consortium Working Group Focused on US Census Data	Community
2018	histoRicalg -- Preserving and Transferring Algorithmic Knowledge	Documentation
2018	Developing Tools and Templates for Teaching Materials	Education
2018	Ongoing infrastructural development for R on Windows and MacOS	Infrastructure
2018	serveRless	New Capabilities
2018	Symbolic Formulae for Linear Mixed Models	New Capabilities

ISC Grants 2015 through 2020 (cont'd)

2018	Editorial assistance for the R Journal	Community
2018	Data-Driven Discovery and Tracking of R Consortium Activities	Community
2018	Licensing R - Guidelines and tools	Documentation
2018	Catalyzing R-hub adoption through R package developer advocacy	Infrastructure
2018	Strengthening of R in support of spatial data infrastructures management : geometa and ows4R R packages	New Capabilities
2018	Next-generation text layout in grid and ggplot2	New Capabilities
2019	Expanding the 'metaverse'; an R ecosystem for meta-research	New Capabilities
2019	Enhancing usability of sample size calculations and power analyses in R with a Task View page and accompanying tutorials	Documentation
2019	R-global: analysing spatial data globally	New Capabilities
2019	sftraj: A central class for tracking and movement data	New Capabilities
2019	Symbolic mathematics in R with SymPy	New Capabilities
2019	CVXR	New Capabilities
2019	webchem: accessing chemical information from the web	Documentation
2019	Flipbooks	Education
2019	R Package Risk Assessment Application	Infrastructure
2019	RcppDeepState, a simple way to fuzz test compiled code in R packages	New Capabilities
2019	An External R Sampling Profiler	New Capabilities
2019	Tidy spatial networks in R	New Capabilities
2019	d3po: R package for easy interactive D3 visualization with Shiny	New Capabilities
2020	The RECON COVID-19 challenge: leveraging the R community to improve COVID-19 analytics resources	Community
2020	Consolidating R-Ladies Global organisational guidance and wisdom	Community
2020	HTTP testing in R Book	Documentation
2020	MATTER 2.0: larger-than-memory data for R	New Capabilities
2020	Spatiotemporal Data and Analytics	New Capabilities
2020	Database interoperability for spatial objects in R	New Capabilities
2020	sftrack v1.0: Stable API for a broad adoption	New Capabilities
2020	Interactive visualisations in R via R-to-JavaScript-transpilation	New Capabilities
2020	Why R? Foundation Webinar and Video Funding Project	Community
2020	Development and maintenance of the Windows build infrastructure (Top level project proposal)	Infrastructure