The following research resources and services are available at SESYNC. Most of these resources are not allocated by default to our teams. More detailed guides and tutorials are available at https://sesync-ci.github.io/. Please contact the SESYNC cyberinfrastructure team at cyberhelp@sesync.org for more information or if you require assistance.

1   PRE-PROPOSAL DISCUSSION

Prior to submitting a proposal to SESYNC, we strongly encourage communicating with the cyberinfrastructure team to ensure that your expectations for cyber support are in line with our services. If you anticipate requiring significant software or personnel resources beyond basic IT and file storage support, please contact our team at cyberhelp@sesync.org to discuss your needs.

2   LAUNCH CALL

Once funding has been awarded, SESYNC staff will conduct a launch call with PIs prior to the start of a project. The call includes a brief overview of the collaborative resources available to each team, followed by as-needed discussion of data and research support needs, required tools and software, and technical capacity of the team.

3   OFFICE HARDWARE

SESYNC provides a suite of commonly used office devices including copies, printers, scanners, and fax machines which are available to guests and researchers. Center IT staff and administrative personnel are available to assist in using these technologies as needed.

4   NETWORK

SESYNC provides wireless coverage throughout the entire center and gigabit wired connectivity in every office and conference room. Wireless instructions are posted around the center, and wired connections can be supplied with notice given five business days in advance of a meeting. Use of the SESYNC network is subject to the University of Maryland Policy on the Acceptable Use of Information Technology Resources (http://www.it.umd.edu/aup.html).

5   ACCOUNT AND PASSWORD POLICY

Your SESYNC account is used to access research resources allocated to your team. Our IT staff will provide each user with details on account information and how to set account passwords once the account is created. Forgotten passwords or usernames can be found at https://pwm.sesync.org. A SESYNC account may only be used by the user it is assigned to. Please contact cyberinfrastructure support at cyberhelp@sesync.org if your group has additional collaborators that require access to resources.

6   CONFERENCE ROOMS

All conference rooms are equipped with teleconferencing equipment and either large HD displays or HD projectors. All whiteboards are equipped with eBeam capture devices for recording whiteboard content. Instructions for using teleconferencing equipment are available in each room, but please feel free to seek out anyone from the IT staff for in-person assistance.

7   FILE STORAGE

SESYNC has a large (50+TB) file server for research data storage that can be used to share files with a team and to other hosted services (see below). Each project is assigned a shared *research data directory*, or workspace, accessible to all team members. Your *research home directory* (i.e., the folder open when you log in at https://rstudio.sesync.org or SSH to ssh.sesync.org) is **not shared** and **incapable** of storing lots of data. Your research home directory is ideal for code repository linked to GitHub or https://gitlab.sesync.org.

- **Web portal:** Use https://files.sesync.org to upload/download files in your research data directory.
- **Directory paths on SESYNC servers:** Research data directories are available to other SESYNC servers at "/nfs/PROJECTNAME-data", where "PROJECTNAME" is the project short-name assigned by SESYNC. The "~" is a shortcut to your research home directory.

8   COMPUTE RESOURCES

SESYNC's cyberinfrastructure is designed to be powerful and flexible to meet your group's computing needs. If your team requires specific infrastructure, services, or software not listed below, please contact cyberhelp@sesync.org to discuss your research computing needs.

8.1   PYTHON SUPPORT

SESYNC ensures the latest version of Python and several core Python packages are available on our compute cluster and on our Jupyter server at https://jupyter.sesync.org. The browser-based Jupyterlab application can be used to develop, test and run jobs with relatively low resource needs that access your research data. If you need to run a task which requires multiple CPUs or will run for an extended period please contact cyberhelp@sesync.org for friendly guidance on cluster computing.

8.2   R SUPPORT

SESYNC ensures the latest version of R and several core R packages are available on our compute cluster and on our RStudio server at https://rstudio.sesync.org. The browser-based RStudio application can be used to develop, test and run jobs with relatively low resource needs that access your research data. If you need to run a task which requires multiple CPUs or will run for an extended period please contact cyberhelp@sesync.org for friendly guidance on cluster computing.

8.3   SHINY SERVER

SESYNC maintains a Shiny server at https://shiny.sesync.org to host Shiny apps designed by SESYNC researchers. Please contact cyberinfrastructure support for help developing or deploying an app that allows the public to interact with and visualize your data and research results.

8.4   SSH GATEWAY

For security and simplicity, SESYNC maintains a single SSH server open to SSH clients (e.g. Putty on Windows or Terminal.app on macOS) on external networks. Connect to the gateway as <username>@ssh.sesync.org for shell access to files in research data, files in research home, the compute cluster, and database servers. The SSH gateway should not be used to run long analysis, which should instead be run on the compute cluster.

8.5   VIRTUAL MACHINES

Custom Windows and Linux virtual machines can be built to meet your group's needs, e.g. shared access to licensed software including ArcGIS and MaxQDA. Windows machines are accessed from a browser-based RDP gateway at https://desktop.sesync.org. Linux machines can be access via the SSH gateway.

8.6 COMPUTE CLUSTER

SESYNC runs a Slurm job scheduler that distributes long running or parallel compute tasks across a cluster with 24 nodes, 192 CPU's, and 1.5TB memory. Job submission is presently enabled from the SSH gateway and the RStudio server. Please see our research support site for more information on creating and submitting compute tasks requiring R, Python, Stata, or other dependencies as needed.

8.7 GITLAB SERVER

An open source, GitHub-like cloud platform called GitLab is available for centralized hosting of private, version-controlled code repositories. Log in at https://gitlab.sesync.org.

8.8 DATABASES

Dedicated MySQL and PostgreSQL servers are available for teams that need a relational database management system. Cyberinfrastructure staff can help design and prototype new databases or import existing database dumps, as well as demonstrate database connections from SESYNC compute resources.

8.9 SOFTWARE

SESYNC can obtain software licenses for most commonly used scientific software packages to be run on our cyberinfrastructure (usually via a VM your group can access).

9 DISPOSITION OF DATA AND SOFTWARE

As an NSF-supported center, SESYNC is committed to public dissemination of data and to open source software development and distribution. To this end, investigators, fellows, collaborators, and others receiving financial or in-kind support from SESYNC acknowledge and agree to the terms below. SESYNC personnel are available throughout the life of a project (via cyberhelp@sesync.org) to assist investigators with these matters via discussion and identification of appropriate licenses, repositories, documentation methods, and other relevant tools and procedures.

9.1 Data products resulting from SESYNC sponsored activities will, insofar as possible, be made accessible with no restrictions for use and dissemination through explicit use of a Creative Commons Zero waiver or its equivalent and will be deposited in a public repository or established open database. Such data will be adequately documented for validation and reuse, including appropriate attribution of its original source.

9.2 All software source code developed with SESYNC funding or participation will be made freely available via an FTP or code repository service such as GitHub and will be licensed under an OSI-approved Open Source license (see opensource.org). Such source code is to be sufficiently documented, and at a minimum, state purpose, copyright and license, and acknowledge and attribute any other software or software libraries that the SESYNC-sponsored software uses or depends on, as required by the licenses of such software.

9.3 Both data and source code will be made available in a timely manner, no later than two years after the conclusion of the SESYNC award, or immediately upon publication of an associated article, whichever comes earlier.

9.4 As in the case with publications, datasets and software generated or created as the result of a SESYNC-supported activity will appropriately and conspicuously acknowledge SESYNC and the National Science Foundation by including the following: "This work was supported by the National Science Foundation DBI-1052875 to the National Socio-Environmental Synthesis Center."

9.5 PIs may be asked to provide a Data Management Plan of no more than one page in length describing 1) plans for meeting the above requirements, 2) identification of data and/or source code repositories and mechanisms for providing open access, and 3) identification of areas the investigator requests SESYNC's assistance to meet these requirements.

9.6 If for any reason, any of the above terms cannot be met, the investigator or fellow will notify SESYNC immediately upon discovery of this situation and will discuss possible alternatives and solutions with SESYNC personnel.

10 VISITOR OR COLLABORATOR ACCESS

Access to project resources may be granted to additional researchers to enable remote collaboration on SESYNC funded projects. In a request to cyberhelp@sesync.org, please include the name and email address of the collaborator, the project name, and which resources the collaborator needs to access.

11 BACKUP AND RETENTION

SESYNC research data and research home directories are backed up nightly to an offsite backup service. Backup data is kept for 30 days, after which old backups will expire and be overwritten. If you need to retrieve deleted or overwritten data, please contact SESYNC cyberinfrastructure staff at cyberhelp@sesync.org as soon as possible.

12 MISCELLANEOUS SUPPORT

SESYNC Cyberinfrastructure support is available by e-mailing cyberhelp@sesync.org.