

National Data Service (NDS) Project Description

The NDS Vision

It is widely believed that ubiquitous digital information will transform the very nature of research and education. The reasons for this excitement are clear: In essentially every field of science, simulations, experiments, instruments, observations, sensors, and/or surveys are generating exponentially growing data volumes. Information from different sources and fields can be combined to permit new modes of discovery. Data, including critical metadata and associated software models, can capture the precise scientific content of the processes that generated them, permitting analysis, reuse, and reproducibility. By digitizing communication among scientists and citizens, discoverable and shareable data can enable collaboration and support repurposing for new discoveries and cross-disciplinary research enabled by data sharing across communities. Open, shareable data also promise to transform education, society, and economic development.

The NDS Framework

While some communities are making progress in developing discipline-specific data services, the U.S. and international scientific communities lack a unified framework and supporting services for storing, sharing, and publishing data; for locating data; or for verifying data. More specifically, we are lacking standard means of accessing data, software, tools, metadata, and other project materials that can span across disciplines. These capability gaps make it difficult to build on prior research or to reproduce the results of a scientific publication. Hence, the promise of the data revolution—for rapid discovery, cross-disciplinary research, and increased reproducibility—remains largely unfulfilled. To break this logjam, the nation urgently needs an open framework that supports an integrated set of national-scale services to individually and collectively enable the efficient, convenient, and secure storage, sharing, publication, discovery, verification, and attribution of data by individuals, groups, and large collaborations. This framework and services will constitute a National Data Service (NDS). If these services are embedded within an extensible NDS architecture allowing numerous tools and community-specific services to enhance NDS over time, then we can realize a research environment where access to and citation of data is as useful and necessary as it is for published literature.

How will this help researchers?

- We can provide a generic data portal for allows one to work with data from across different disciplines
- Discipline-specific portals can enhance their capabilities by accessing data and services from related disciplines
- Researchers will have common practices for publishing data that engage interoperable and interchangeable repositories and tools
- Interoperable tools can be created to automate much of our current data handling chores