The CAP LTER information management system: data management for project investigators and the scientific community

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Central Arizona-Phoenix Long-Term Ecological Research
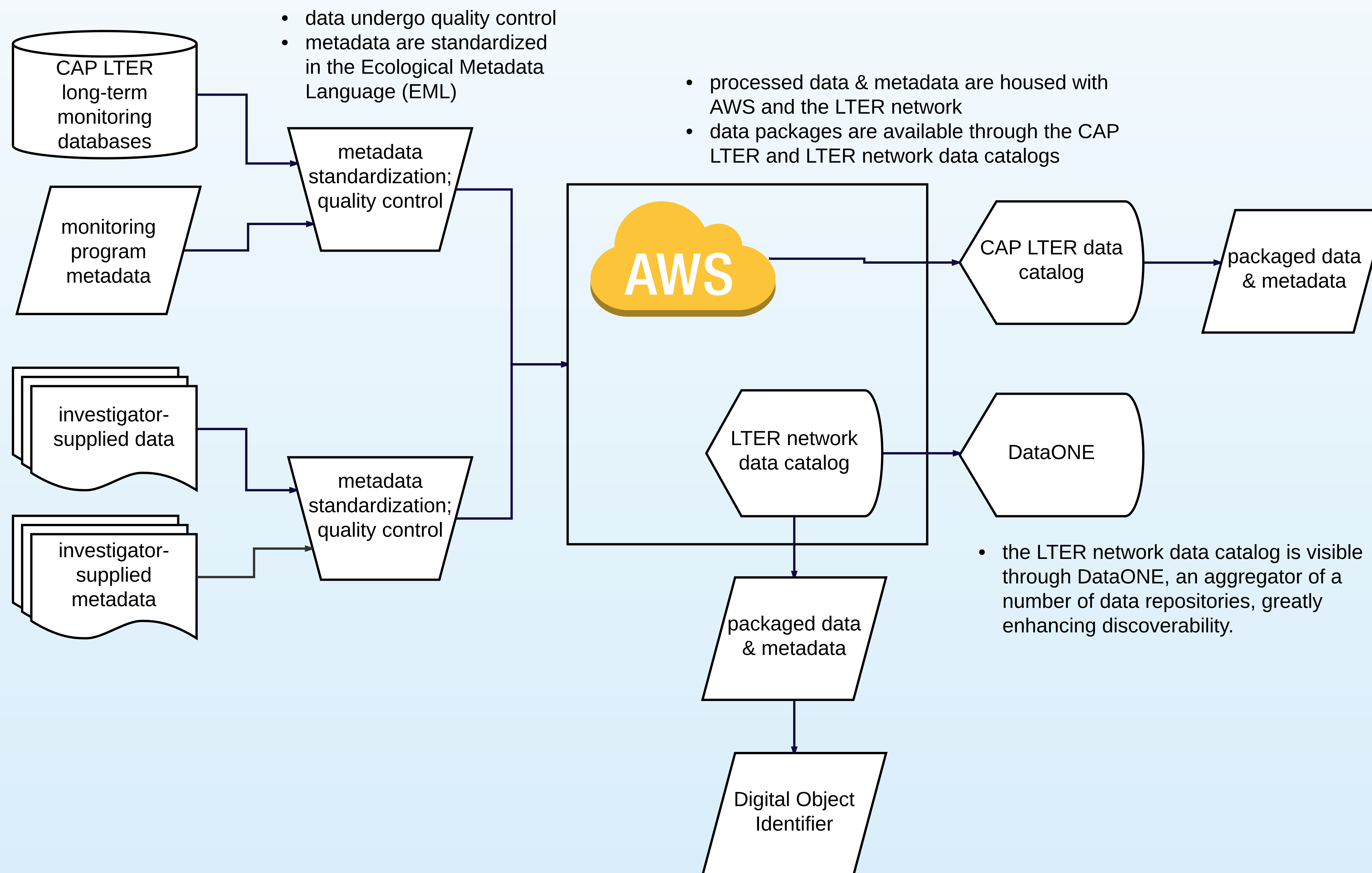**CAP LTER**

1 overview

- The CAP LTER addresses the challenges of the long-term curation and dissemination of research data with a robust Information Management System (IMS) that benefits CAP LTER investigators and the broader scientific community.
- The CAP LTER IMS facilitates the ingestion of research data and metadata that are then housed in the CAP LTER and LTER network data repositories, providing long-term storage and access to research data.
- Submitting data through the CAP LTER meets data publishing requirements set by funders and publishers, and each data set is given a unique Digital Object Identifier (DOI) that a data provider may reference.
- The CAP LTER Information Manager and the GIOS Informatics team are available to assist with the data publishing process, developing data management plans, and to provide guidance regarding effective approaches to research data management.

2 data management infrastructure and processes

The CAP LTER employs a robust internal infrastucture and system processes to facilitate resilient storage of research data and metadata. Data and metadata undergo quality control before achiving through Amazon Web Services and with the LTER network. Data are discoverable and available through the CAP LTER and LTER network data catalogs, the latter providing a Digital Object Identifier (DOI) for data packages that can be referenced in the same manner as a manuscript. The LTER network data catalog is also visible through DataONE, an aggregator of a number of diverse data repositories, which greatly enhances data discoverability.
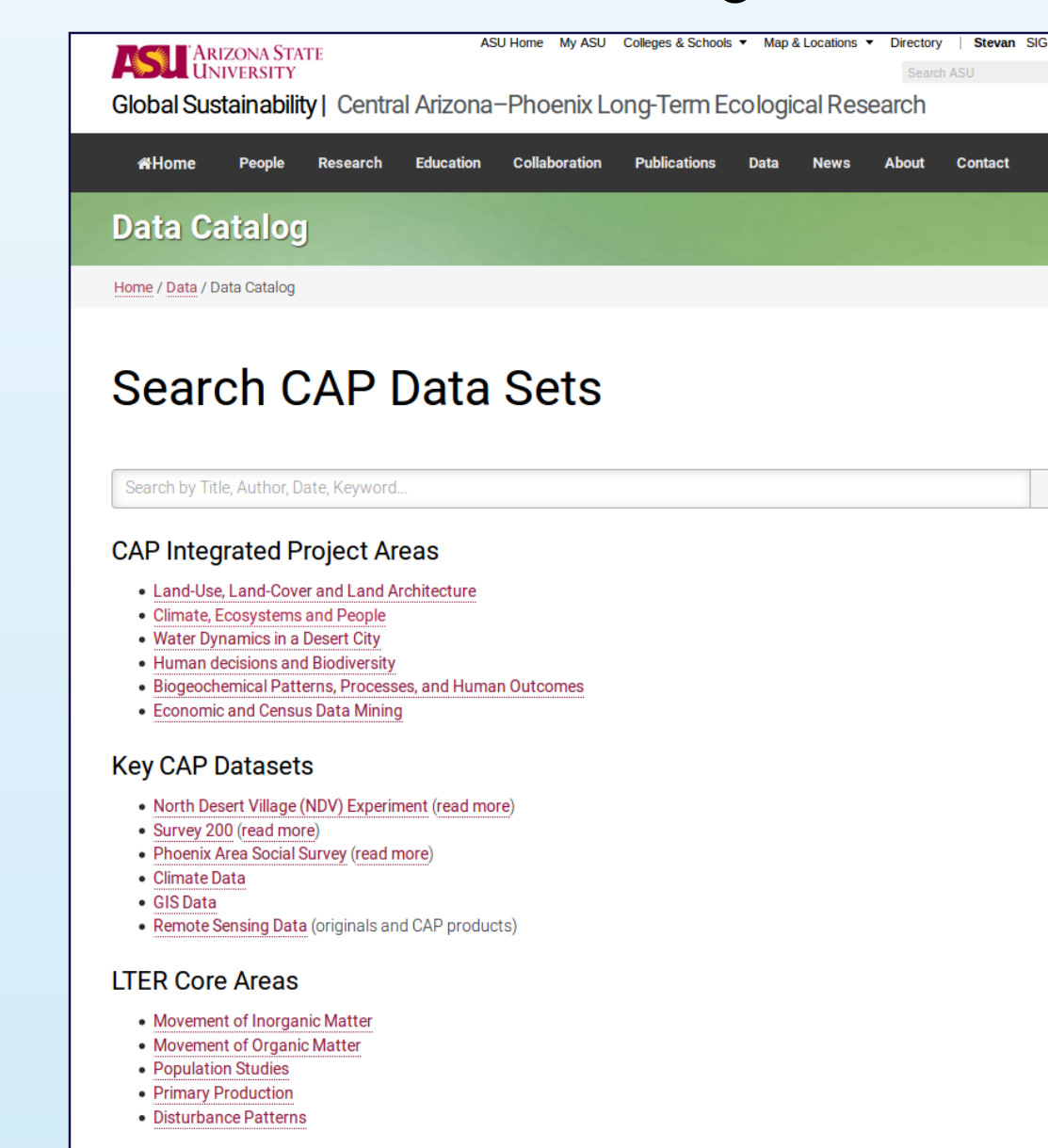
data archiving & publishing

data discovery

- data undergo quality control
- metadata are standardized in the Ecological Metadata Language (EML)

- processed data & metadata are housed with AWS and the LTER network
- data packages are available through the CAP LTER and LTER network data catalogs

CAP LTER long-term monitoring databases

monitoring program metadata

metadata standardization; quality control

investigator-supplied data

investigator-supplied metadata

metadata standardization; quality control

AWS

CAP LTER data catalog → packaged data & metadata

LTER network data catalog → DataONE

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packaged data & metadata
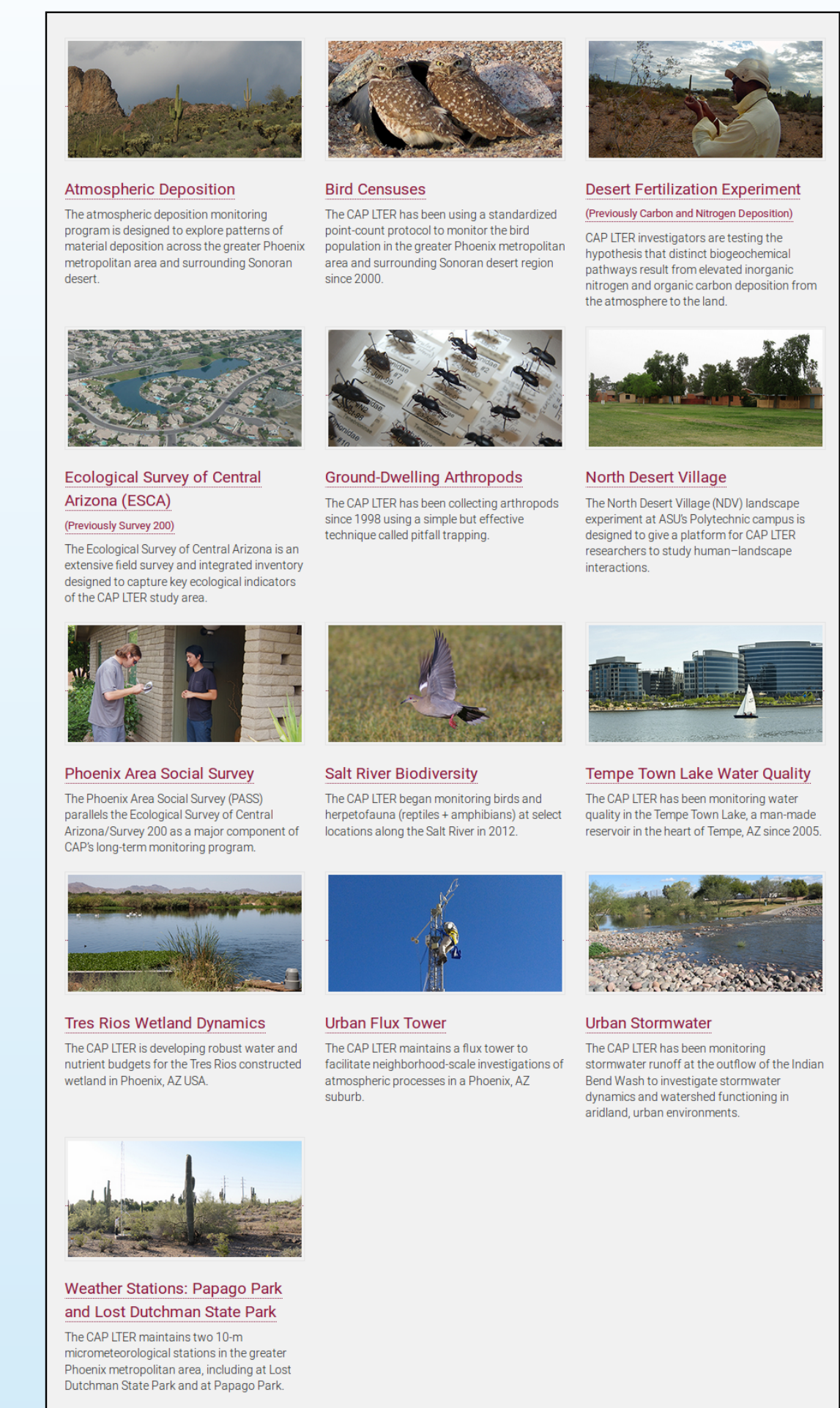
Digital Object Identifier

3 data resources

CAP LTER project data are publicly available. Resources include data from current and historic long-term monitoring programs, and investigator-provided data. The CAP LTER website features vignettes that provide broad overviews of the project's long-term monitoring programs. All project data are searchable by author and keywords through the CAP LTER data catalog.

CAP LTER long-term monitoring programs

CAP LTER data catalog

4 data services

A **Data Management Plan** (DMP) is a mandatory and integral component of NSF and other agency proposals. The GIOS Informatics team makes available a boiler-plate DMP, and the team is available to provide technical advice regarding DMP development.

Data publishing services are available for all GIOS research initiatives. Most projects are eligible for publication in the LTER network data catalog that is expanding to accommodate scientific investigations beyond the LTER program.

Groffman, Peter; Grove, J. Morgan; O'Neill-Dunne, Jarlath; Ogden, Laura; Heffernan, James; Hall, Sharon; Larson, Kelli; Hobbie, Sarah; Cavender-Bares, Jeanine; Nelson, Kristin; Pataki, Diane; Polsky, Colin; Chowdhury, R. Roy; Neill, Chris (2016-05-20): *Ecological Homogenization of Urban America: residential microclimates.* Long Term Ecological Research Network.
http://dx.doi.org/10.6073/pasta/a8634a2739eb7aa4bba3132380f2d65d

5 best practices

We encourage investigators to employ sound research data management practices. There are countless web-based resources that address all aspects of data management from naming conventions to dataset publishing, or please reach out to the GIOS Informatics team for guidance.

Please consider adopting these few, basic approaches:
- beginning the process of documenting your methods and data from the outset of the project
- developing and implementing a plan to back up your data
- securing your ORCID ID, an identifier unique to you that will link all of your professional products (manuscripts, data publications, grants)