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Hydroclimate Variability and the Evolution of Socioecological Complexity in Dryland Farming Communities

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Data Management Plan

1.0 Data to be managed

Our project produces nine types of new archaeological, geomorphological, and dendrochronological reconstruction data and computational code. We manage the following data: (1) radiocarbon dates from five Fremont villages; (2) OxCal code for Bayesian chronological models from five Fremont villages; (3) tree-ring data from multiple study locations; (4) R code for tree-ring analyses; (5) geoarchaeological profiles from four drainage basins; (6) grainulometric data from sedimentary profiles from four drainage basins; (7) radiocarbon data data from four drainage basin study locations; (8) OxCal code for Bayesian age-depth modeling of the four drainage basin study locations; (9) R code for integration and analysis of posterior probabilities from the different work packages. Co-PI Dr. Erick Robinson will serve as our data management coordinator.

2.0 Data access and sharing policies

Final data and code produced by this project will be shared under a GNU GPLv3 open source license, which is a copyleft license that requires anyone who distributes our data or code, or a deliverable work, to make the data available under the same terms. The entire data, code and publications from this project will be made available as a single GitHub (<https://github.com/erickrobinson>) and Zenodo (<https://zenodo.org/>) file within 1 year of the completion of this project. Both repositories are part of the higher-level data aggregator DataONE (<https://dataone.org/>), which facilitates data discovery across different repositories. We use GitHub and Zenodo because they enable our data and code to be made searchable and accessible in the most sustainable way possible. This project will produce data in the range of 10-20GB, and Zenodo accepts large datasets up to 50GB. In order to enhance the accessibility of project deliverables, we will also make our different datasets available on more specialist databases.

All newly acquired radiocarbon dates will be uploaded to the Canadian Archaeological Radiocarbon Database (<https://www.canadianarchaeology.ca/>). CARD is the largest open access archaeological radiocarbon database in the world.

New geomorphological data will be uploaded to the NSF-funded open access paleoecological database Neotoma (<https://www.neotoma.org>). Neotoma stores fossil and other stratigraphic data for the past 5 million years, and provides tools for finding, visualizing, downloading and updating data. Metadata stored in Neotoma include site locations and descriptions, sediment data, information about original workers, associated publications, geochronological data, and age depth models. Neotoma is well-prepared for sustainability issues, as data is stored on an enterprise-class network storage appliance that is mirrored to a secondary off-site appliance for disaster recovery purposes.

Chronologies developed from newly or previously collected tree-ring data used to develop stream discharge reconstructions in this project will be submitted to the International Tree-Ring Data Bank—the International standard for tree-ring data storage (<https://www.ncdc.noaa.gov/data-access/paleoclimatology-data/datasets/tree-ring>). All raw geomorphological and tree-ring data (increment cores and cross-sections) will be housed in the laboratories of PI Dr. Judson Finley and Co-PI Dr. R. Justin DeRose.