Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Ecological Impacts of Hydroscape Modifications

Discipline: Natural
Type of Project: Technical Assistance/Research
Funding Agency: USGS
Other Partners/Cooperators: Colorado State University
Student Participation:
Effective Dates: 10/01/2016 - 09/30/2021
Funding Amount: $75,000.00

Investigators and Agency Representative:
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Project Abstract: The goal of this research is to evaluate the impacts of river and floodplain modifications (hereafter referred to as hydroscape modifications) on hydrologic, geomorphic, and ecological processes. This work is important for extending our knowledge of how water management activities impact hydrologic, geomorphic, and ecological processes. This knowledge can improve future management and restoration activities.

Specific objectives of this work include:
Objective 1: Compile, organize, and document national hydrologic, geomorphic, ecological, and hydroscape-modification datasets. This objective is important for understanding the spatial extent and quality of national datasets relevant to ecological flows and hydroscape modifications.

Objective 2: Review literature and generate hypotheses regarding the connections between hydroscape modification, water management, and hydro-ecological processes.

Objective 3: Conduct statistical analyses or other appropriate methods to test hypotheses.

Objective 4: Develop and apply a modeling method for evaluating the impacts of hydroscape modifications, such as levees, and hydro-ecologic processes.

This research will be conducted in close partnership with USGS scientists throughout the entirety of the project. USGS and CESU partners will work collaboratively in each major step of the project, including: 1) compile and organize national hydrologic, geomorphic, and ecological datasets and datasets of human footprints on hydroscapes; 2) collect and synthesize literature to identify and select indicators of human footprints over hydroscapes; 3) generate novel hypotheses regarding the connections between hydroscape modification, water management, and ecosystem integrity; 4) develop innovative statistical approaches, conduct statistical analyses, and test the hypotheses; 5) identify the ecologically relevant hydro-geomorphic metrics, and the linkages between, hydrologic, geomorphic, and ecological processes and patterns; 6) publish and disseminate the research results. Data and information collected during the project will be the property of USGS and may be disseminated via a variety of means, including graduate student theses, USGS series reports, and scientific publications that are jointly authored by USGS and CESU scientists. Sharing and dissemination of data will follow USGS guidelines for data management and peer review, and will be done in a collaborative manner.

Keywords: Hydroscape, human modification, ecological impact, USGS, Colorado State University