Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Climate Reconstruction from Tree Rings of Populus

Discipline: Natural
Type of Project: Research
Funding Agency: USGS
Other Partners/Cooperators: Colorado State University
Effective Dates: 9/15/2014 – 9/14/2019
Funding Amount: $34,000

Investigators and Agency Representative:
USGS Contact: Johathan Friedman, Fort Collins Science Center, 2150 Centre Avenue, Building C, Fort Collins, CO 80526; 303-541-3017; friedmanj@usgs.gov

Investigator: Sara Rathburn, Colorado State University, Fort Collins, CO 80523; 970-491-6956; sara.rathburn@colostate.edu

Project Abstract: The goal of this project is to enable water managers to quantify drought and flood risks and will provide the relations between flow and riparian tree growth necessary for federal managers to predict the effects of global change. The proposed research addressed the goal of expanding this approach to other ecosystems in three ways. 1) Flow reconstruction on ephemeral streams. 2) Flow reconstruction along desert rivers and 3) Use of stable isotopes of carbon to enhance flow reconstruction for Populus tree rings.

In FY2014-FY2015 research will include the following:
1. Reconstruct climate using Populus *rings along 3 ephemeral streams in eastern Colorado.*
2. Reconstruct channel movement and flow using tree rings from Populus *cores already collected along the Tarim River, China.*
3. Test the feasibility of reconstructing river flow using stable isotopes of carbon in cores
collected along the Little Missouri River in Theodore Roosevelt National Park, ND.

In FY2016-FY2018, if additional funding is provided, future research will include the following:
1. Expand flow reconstruction using stable isotopes of carbon in cores collected along the Little Missouri River, the Yellowstone River and elsewhere.
2. Publish 3 peer-reviewed articles, one for each of the items listed in FY2014-FY2015.

Outcomes with completions dates: September 14, 2019

Keywords: drought, flood, risk, climate reconstruction, tree rings, USGS, Colorado State University