

Project Completion Report

Rocky Mountains Cooperative Ecosystem Studies Unit (RM-CESU)

Project Title: Tracking, Assessing, and Understanding National Park System Impaired Water Resources

Project Code: NPS: P11ATW0755 (became P11AC91365), CSU: 5310140

Type of Project (Research, Technical Assistance or Education): Technical Assistance

Funding Agency: National Park Service

Partner University: Colorado State University

NPS Agreement Technical Representative (with complete contact information):

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Start Date of Project: September 25, 2011

End Date of Project: September, 30, 2014

Funding Amount: \$207,000

Project Summary:

CSU provided research associates and a graduate student to work with the National Park Service (NPS) Water Resources Division (WRD) to better understand the magnitude and distribution of Clean Water Act Section 303(d)-impaired water resources in the National Park System. National park units are typically regarded as pristine areas generally unaffected by water pollution and other anthropogenic impacts. Previous work has revealed that more than one hundred national park units contain 303(d)-listed impaired waters. This project built upon previous joint cooperative efforts between CSU and the NPS WRD by updating the various project databases with the latest park boundary, National Hydrography Dataset (NHD) coverage, and state Clean Water Act impairment data; refining and enhancing the project website; and providing additional water quality assessment-related information. Additionally project staff helped flow NPS physical, chemical, and biological data into the Environmental Protection Agency's (EPA) STORET Data Warehouse from parks so that states could use this information for their Clean Water Act impairment assessments.

As part of this project, CSU research associates and graduate students helped ameliorate the state of knowledge about impaired national park water resources and communicate this knowledge more broadly to the public through the Hydrographic and Impairment Statistics website. CSU project staff also assisted in identifying, acquiring, quality assuring, digitizing, and making publicly accessible physical, chemical, and biological water quality datasets through the EPA's STORET Data Warehouse to assist the states with their assessments. CSU staff also worked closely with the U.S. Geological Survey and state NHD stewards to improve the NHD's

representation of surface water hydrography over national park lands.

Number of students participating in this project: undergraduates, graduate students, degrees conferred.

Three research associates (including two who were former CSU graduate students) participated directly in this project. One graduate student was involved on this project while working on a related thesis.

Lessons Learned from this project:

This agreement provided a mutual benefit to the NPS and CSU. CSU students, staff, and researchers gained invaluable experience, training, and research opportunities while working in close cooperation with WRD staff on real-world issues and concerns. The data uploaded to the EPA STORET Data Warehouse can be downloaded from <http://www.epa.gov/storet/dbtop.html>. State regulatory authorities have used these data in their Clean Water Act 305(b) reports and 303(d) lists. The NPS Hydrographic & Impairment Statistics website can be accessed at <http://nature.nps.gov/water/his/>. According to this website and the work completed as part of this project, there are approximately 170,251 miles of perennial, intermittent, or ephemeral waterway (rivers, streams, canals, etc.) within or adjacent to national park units. Of these 170,251 miles, approximately 7,765 miles (4.5%) are listed as impaired by states, meaning they fail to attain one or more state-designated beneficial uses. There are approximately 4,452,176 acres of waterbodies (lakes, reservoirs, oceans, etc.) within national park units. Of these 4,452,176 acres, approximately 1,429,030 acres (32%) are listed as impaired by states. These numbers fluctuate from year-to-year as the amount of hydrography in a park may change (e.g. new parks or boundary changes) and states' impairment assessments are updated.