Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Vanishing Wetlands of Yellowstone National Park's Northern Range: Watersheds, Hydrology, Soils, and Vegetation Past, Present and Future

Discipline: Natural
Type of Project: Technical Assistance and Research
Funding Agency: National Park Service
Other Partners/Cooperators: Colorado State University
Effective Dates: 5/15/2010- 3/1/2012
Funding Amount: $27,047

Investigators and Agency Representative:
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Project Abstract: There is little known about the characteristics, dynamics or hydrologic regimes of Yellowstone's marshes. Therefore it is hard to understand the spatial and temporal affects of any climate driven characteristic on inflows and outflows to marshes. Data is needed to (1) identify the watershed for each marsh, (2) measure its surface water inflows, (3) measure surface and ground water levels, (4) measure ground water inflows and the connection of each basin to the local ground water flow system, (5) analyze soils for hydric characteristics under marsh basins, and (6) understand the historic area marsh and potential vegetation cover to understand what has occurred in the past.

This proposal is to identify, map, and characterize the watersheds and hydrologic regimes supporting marshes, their extent based upon soil signatures, flora and vegetation of marshes on the northern range. The research would occur over two years, be accomplished by the author of this proposal with one graduate student. We would produce a GIS based map of Yellowstone National Park's northern range marshes, a classification of marsh types based upon landforms, hydrologic regime, hydric soils, water chemistry and vegetation. We would also build a climate model to understand how current and past climates have produced runoff that supported marsh inflows and water levels, and use this model to determine how potential climate scenarios could influence the persistence of these marshes. The final products will be a master's thesis and a report including all data and analyses, and a paper submitted to an international journal for publication.

Outcomes with Completion Dates: December 31, 2011
The products include: 1. A GIS based map of Yellowstone National Park's northern range marshes; 2. A classification of marsh types based upon landforms, hydrologic regime, hydric soils, water chemistry and vegetation; 3. A climate model to understand how current and past climates have produced runoff that supported marsh inflows and water levels, and use this model to determine how potential climate scenarios could influence the persistence of these marshes; and 4. Upon successful completion of the requirements for a Master of Science degree, the PI and project researcher will provide Yellowstone National Park with a hardbound copy of the thesis for inclusion in the park's Research Library

Keywords: watershed characteristics, hydrologic regimes, marshes, climate change, GIS map, Northern Range, Yellowstone National Park, Colorado State University