Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Assistance for Instrument Development to Measure the Relationship of Air Quality with Night Sky Visibility

Discipline: Natural Resources
Type of Project: Technical Assistance
Funding Agency: National Park Service
Other Partners/Cooperators: Colorado State University
Effective Dates: 9/15/2011 – 8/31/2013
Funding Amount: $160,872

Investigators and Agency Representative:
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Project Abstract: The following proposal describes a cooperative effort between the National Park Service (NPS) and the Cooperative Institute for Research in the Atmosphere (CIRA) at Colorado State University (CSU) to 1) test, deploy, and evaluate new instrumentation, 2) analyze relationship between air quality and night sky brightness from the collected data.

The public visits national parks and wilderness areas to enjoy nature in an unblemished setting. These areas have been set aside for their scenic qualities and for the inspiration they provide to the American people. Daytime visibility as seen from park vistas has been well studied and is protected by various regulations such as the Clean Air Act. However, visibility at night has been less well studied. Views of the stars, other celestial phenomena, and simply the natural view of a nighttime scene unencumbered by artificial lights is a wildland value of increasing significance. Threatened by light pollution, the upward emission from outdoor lights that brightens the sky and drowns out the view of the cosmos is diminishing nighttime visibility. Atmospheric pollution such as aerosols also diminishes the nighttime scenery, as it does the daytime scenery, and interacts with artificial light in complex ways. The NPS and CSU scientists are working together to better understand the scientific basis of these issues, share knowledge and data with the public, and make that information available other agencies and collaborators.

Effective management of nighttime visibility is being catalyzed by instrumentation developed by the NPS that measures night sky brightness. Demand for baseline inventories of night sky conditions has increased sharply from within the NPS and from other agencies. The NPS Night Sky Program joined with CSU three years ago to assist with the collection, analysis, and presentation of data and to help push the state of the art to the next level. The field of study will be further enhanced by collaboration with CSU atmospheric scientists, integrating into the strong sustainability focus that CSU has seized upon, and enticing more students into putting academic effort into this topic. This new task agreement extends this scientific effort with the testing and evaluation of a new instrument called a Night Sky Brightness Meter.

Outcomes with Completion Dates: August 31, 2013

Keywords: NPS Night Sky Program , air quality, night sky brightness, instrument evaluation, Colorado State University, Cooperative Institute for Research in the Atmosphere (CIRA), National Park Service