

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Ice Patch Archeology: Orthorectification of Aerial Photography for Glacier National Park, Montana

Discipline: Cultural
Type of Project: Technical Assistance
Funding Agency: National Park Service
Other Partners/Cooperators: University of Colorado, Boulder
Effective Dates: 4/1/2012 - 12/31/2013
Funding Amount: \$23,042

Investigators and Agency Representative:

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Project Abstract: This agreement continues work on the Ice Patch Archeology project. In the winter of 2011-12, Craig Lee of INSTAAR and the Ice Patch Archeology project team determined that aerial photograph diapositives from flights in 1998 (a high-melt year) are needed to select ice patches for survey and mapping. However, the diapositives require orthorectification before they can be used. The high-resolution imagery, in a year of minimum snow cover, needs to be viewed and analyzed in GIS to accurately locate the extent of small ice patches, and to identify specific locations for coring and other field research.

This new agreement specifically addresses the INSTAAR QGIS Lab orthorectification of 1998 aerial photography covering parts of Glacier National Park. Orthorectification of aerial photography involves geospatial processing to remove distortions inherent in the scanned frames due to the position and orientation of the camera, properties of the camera lens, and especially the topographic relief of the area. Orthorectification turns a simple picture with pixel coordinates into a detailed map layer with UTM (or lat/long) coordinates. INSTAAR will use industry standard software to run bundle block adjustment (processing adjacent frames for better horizontal control), the best available Digital Elevation Model (DEM), and best available reference imagery (for image-to-image control points) to reduce output errors as much as possible. Experts in the GIS lab at INSTAAR specialize in creating user-friendly, GIS-ready, FGDC documented geospatial datasets and analyses for scientific use. The lab contains state-of-the-art Photogrammetric, Remote Sensing, and GIS software and hardware.

Outcomes with Completion Dates: August 1, 2012

Keywords: Ice Patch Archeology, aerial photography, paleoecological data, climate change, Glacier National Park, University of Colorado at Boulder, INSTAAR QGIS Lab