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**Park/NPS Unit:** El Malpais National Monument

**Title of Project:** Characterization of Roost Microclimate in Bat Hibernacula in the Lava Tubes of El Malpais National Monument with Microbial Sampling for the Presence of *Geomyces destructans* (White Nose Syndrome) on bats

**Administered through the:** Colorado Plateau Cooperative Ecosystem Studies Unit Cooperative Agreement Number H1200-09-0005

**CESU Partner:** University of New Mexico

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**Start Date:** August 1, 2011

**Any Other Product Milestone Dates you need to include:** none

**End Date:** July 31, 2012

**PROJECT ABSTRACT:**

El Malpais National Monument (ELMA) has many lava caves used by hibernating bats, yet little is known about the microclimate conditions chosen by these animals. Temperate bats in the family Vespertilionidae use hibernation during winter months when they face greater thermo-regulatory demands (cold temperatures), but reduced food resources. In 2006, a newly emergent fungal pathogen (*Geomyces destructans* - White Nose Syndrome) was first documented on hibernating bats in New York and by 2009 it had moved over 450 miles across eight states and had killed well over 1 million bats. By spring of 2010, White Nose Syndrome (WNS) had been found in Oklahoma on cave myotis (*Myotis velifer incautus*), the first evidence of it infecting a western bat species. Evidence suggests that *G. destructans* prefers 2-14ºC and high (nearly saturated) humidity. Unfortunately, these conditions are also preferred by many bat species for hibernation. An understanding of the microclimate conditions in sites chosen by hibernating bats will be critical for understanding which species will be at greatest risk from WNS. In order to determine if ELMA lava caves are at risk from invasion by *G. destructans*, we will quantify the microclimate in 10 hibernacula using i-Button temperature and humidity data loggers to determine if these sites are appropriate for growth by *G. destructans*. We will also conduct visual surveys to look for evidence of *G. destructans* on hibernating bats. We will swab the face and wings of a subset of bats to extract DNA, amplify, clone, and sequence select genes to look for presence of *G. destructans* on ELMA bats. This will provide baseline data to determine if *G. destructans* is present on New Mexico bats or arrives in the next year. If the fungus responsible for WNS is found, our data will help quantify and monitor its progression through the region. These data provide important baseline data for NPS management decisions concerning possible cave closures to protect bat populations and provide a baseline of whether the fungus is present in areas that have not yet seen cases of WNS.