

CRAHG UPDATE ON CULTURAL R&D PROJECT

Archaeological Site Assessment

NPS provided draft report mid January 2008; GCMRC comments returned to NPS mid June 2008, report is now being revised to address comments.

Geomorphic Attribute Assessment

USU provided draft report on geomorphic attribute data to GCMRC in February; database and report are undergoing review.

Check Dam Effectiveness/Process Study

USU provided draft report on check dam and geomorphic processes to GCMRC mid-May 2008; data and report in review.

Weather and Aeolian Transport Monitoring

- 11 weather stations and 14 sand traps currently operating in CRE (includes 2 stations and 4 traps added in February for the HFE)
- Data downloaded most recently in April '08 for most stations (May 2008 download for 24.5 mile); all stations functioning normally at last download
- Data processing is complete and up-to-date for all stations at this time (4-minute records of rainfall, temp, humidity, barometric pressure, wind speed and direction). Diurnal averaging of wind, temp, humidity, and pressure, and calculation of daily rainfall totals are also complete
- Transmitters are being swapped out on an annual basis and sent back to manufacturer (Vaisala, in Finland) for a calibration check. So far all transmitters sent back for calibration were found to be in normal operating range. Several others that we removed from the field in 2006-2008 due to malfunctions have now been repaired
- Waiting on aeolian sand data processing; sand processing has been delayed due to HFE taking priority in sediment lab and need for developing new agreement with NAU to take over sediment sample processing in 2008
- Report writing/publication contingent upon completing sediment sample processing (summer 2008)

Legacy Data Review: Geomorphic Data relevant to monitoring program development

In spring, 2008, GCMRC and USU (Jack Schmidt) initiated a review of all existing geomorphic data collected through GCES and GCMRC potentially relevant for future monitoring of archaeological sites. The purpose of this geomorphic data review is to determine what data already exists, what format they are in, and what it will take to integrate existing data in a GIS. This work is ongoing.

LIDAR vs. total station survey assessment

USGS Open-File report by Brown and Collins: underwent independent review, final review returned in late May, report is being revised to address reviewer comments.

LIDAR as a change detection tool

Data from multiple surveys from nine sites has been processed and analyzed, and a draft USGS Open-file draft report by Collins has been completed. Draft is being finalized (currently undergoing colleague review prior to submittal to GCMRC); draft will under go independent peer review prior to being finalized (~late summer 2008).

Preliminary findings from this work include:

- statistically significant change (greater than ± 8 cm) was detected at six of the nine sites
- In general, change was detected on less than 5% of the total surface area modeled for each site, exception site AZ:C:13:006 which showed deposition on ~20% of the site area
- maximum erosion depths were between 12 and 50 cm, averaged between 12 and 17 cm
- maximum deposition depths were between 15 and 35 cm, averaged between 12 and 15 cm
- When detected, erosion was typically associated with changes to gully topography, whereas deposition was typically associated with aeolian sand transport

Table 1. Summary of topographic change between May 2006 and September 2007

Site Number	Modeled surface area (m ²)	Area w/ measured erosion (m ²)	Area w/ measured deposition (m ²)	Maximum height of erosion (-) and deposition (+) (cm)	Average height of erosion (-) and deposition (+) (cm)	Total area w/ topographic change (%)
AZ:C:13:006	1280	12.0	260	-30/+35	-15/+15	21.3
AZ:C:13:336	1250	0	0.9	0/+15	0/+12	0.1
AZ:C:13:099	770	11.0	19	-20/+15	-12/+12	3.9
AZ:C:13:099 Playa	3300	0.4	0	-12/0	-12/0	<0.1
AZ:C:13:348	3000	0	0	0/0	0/0	0
AZ:G:03:041	800	0	38	0/+15	0/+12	4.8
AZ:G:03:002	1000	0	0	0/0	0/0	0
AZ:G:03:072 (US)	1200 ¹	32.0	0	-50/0	-17/0	2.7
AZ:G:03:072 (DS)	460	0	0	0/0	0/0	0