

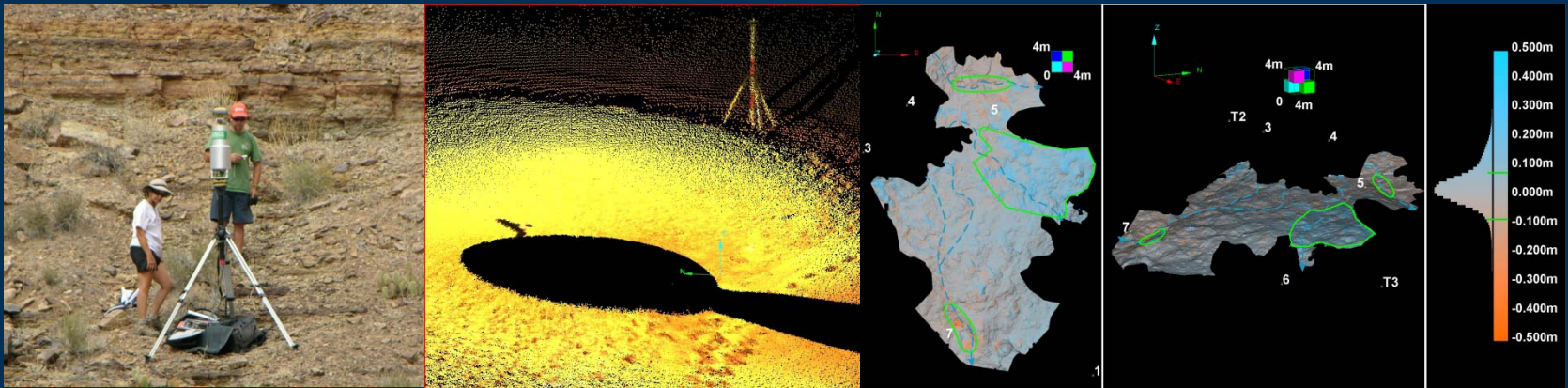


Update on the Cultural Monitoring Research & Development Project

Helen Fairley
TWG Meeting, Phoenix, AZ
November 16, 2010

Monitoring Protocol R&D Objectives

- objectively document where and how much has eroded/deposited/changed
- provide accurate measurements & direct comparisons of change over time
- find methods that are cost effective, efficient, culturally sensitive, relatively low impact



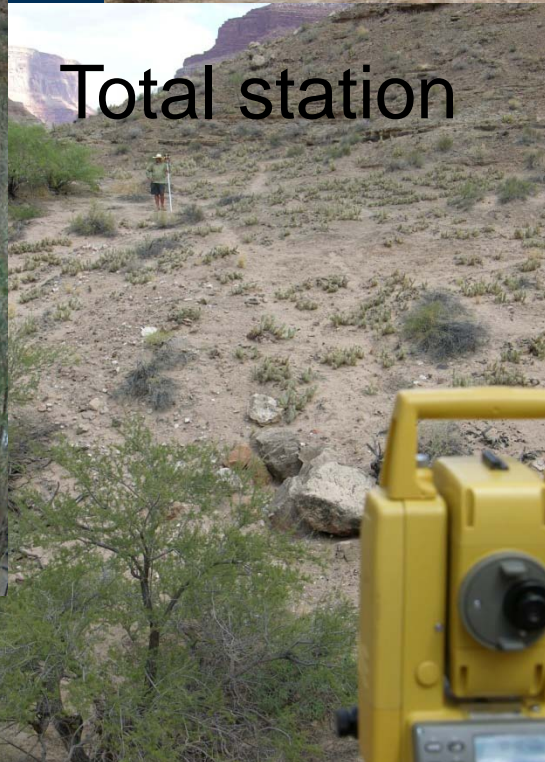
Evaluation of Monitoring Tools



Terrestrial
lidar



Weather stations



Total station



RTK GPS

Change Measured between 2006-2007:

4 sites w/ significant change, 2 sites with very minor change (< .1 cubic m), 3 with no measurable change

| Site Number | Area w/ measured erosion (m ²) | Area w/ measured deposition (m ²) | Total % site area modeled w/ topo change | Average, maximum height of erosion (cm) | Average, maximum height of deposition (cm) | Volume of erosion (-) and deposition (+) (m ³) |
|---------------------------|---|--|--|---|--|---|
| AZ:C:13:006 | 12.0 | 260 | 21.3 | 15, 30 | 15, 35 | -0.7/+26.9 |
| AZ:C:13:336 | 0 | 0.9 | 0.1 | 0, 0 | 12, 15 | 0/+0.1 |
| AZ:C:13:099 | 11.0 | 19 | 3.9 | 12, 20 | 12, 15 | -0.8/+2.3 |
| AZ:C:13:099 playa area | 0.4 | 0 | <0.1 | 12, 12 | 0, 0 | -0.1/0 |
| AZ:C:13:348 | 0 | 0 | 0 | 0, 0 | 0, 0 | 0/0 |
| AZ:G:03:041 | 0 | 38 | 4.8 | 0, 0 | 12, 15 | 0/+3.5 |
| AZ:G:03:002 | 0 | 0 | 0 | 0, 0 | 0, 0 | 0/0 |
| AZ:G:03:072 US | 32.0 | 0 | 2.7 | 17, 50 | 0, 0 | -8.1/0 |
| AZ:G:03:072 DS | 0 | 0 | 0 | 0, 0 | 0, 0 | 0/0 |

FY2010 Objective: Complete Phase I

- **Complete instrument evaluations (Lidar, RTK GPS)**
 - Evaluate capability of new lidar instrument (Riegl Z420I)
 - Can we improve change detection measurement accuracy from 8cm to less than ~5cm?
 - Can newest lidar technology quantify other key indicators of site stability – e.g., artifact movement, biocrust cover, architectural stability?
- **Develop random sample for future pilot program**
- **Conduct workshops**
 - Tribal monitoring protocol integration workshop
 - Geomorphic workshop



Riegl Z420I

FY2010 Accomplishments

- NPS permitted GCMRC to complete Phase I field work in 2010 – conducted April and September 2010
- GCMRC hired independent consultant (NAU) to analyze existing data & select random sample for future pilot program – in progress now
- Geomorphic workshop planned for summer 2010 to review geomorphic data & discuss conceptual model to guide future monitoring - deferred
- Workshop to explore integration of tribal monitoring protocols deferred due to EA & SDM workshops
- 2 Reports published, 3 in progress



Weather Stations in FY2010

- 11 weather stations operating consistently at 9 sites in 2010
- 2007-2009 Data Reports completed & published; 2010 report in progress
- Data review/reformatting completed in FY2010
- Draft Technical Manual



FY2011 Plan

- **Propose CRAHG meeting – winter 2011**
 - **Review FY2010 accomplishments**
 - **Review Preliminary Phase I results**
 - **Discuss tribal monitoring integration**
- **Analyze FY2010 data, prepare report-
winter/spring 2010-2011**
- **Prepare pilot monitoring plan –
spring/summer 2011**
- **Geomorphic Workshop – winter 2011?**
- **Implement pilot monitoring program –
spring 2011**

FY2012-2013 Plan

- Continue pilot monitoring 2012-2013
- PEP review of pilot results – fall/winter 2013
- Refine monitoring program; prepare core monitoring report for TWG review – winter 2013-2014
- Implement core monitoring - spring 2014

Questions?

