Grand Canyon Archaeology Management with GIS

Presented by Scott Kelly

Northern Arizona University,

Geospatial Research And Information Lab (GRAIL)

NORTHERN ARIZONA UNIVERSITY

GIS in Archaeology

The Project

The Grand Canyon's Archeology

"Although [the Grand Canyon] was first seen by white men eighty years before the pilgrims landed from the Mayflower, and although prospectors swarmed it for over 20 years before 1900, for all practical purposes, it is still unknown territory" - *Harvey Butchart*

Archaeology is Spatial

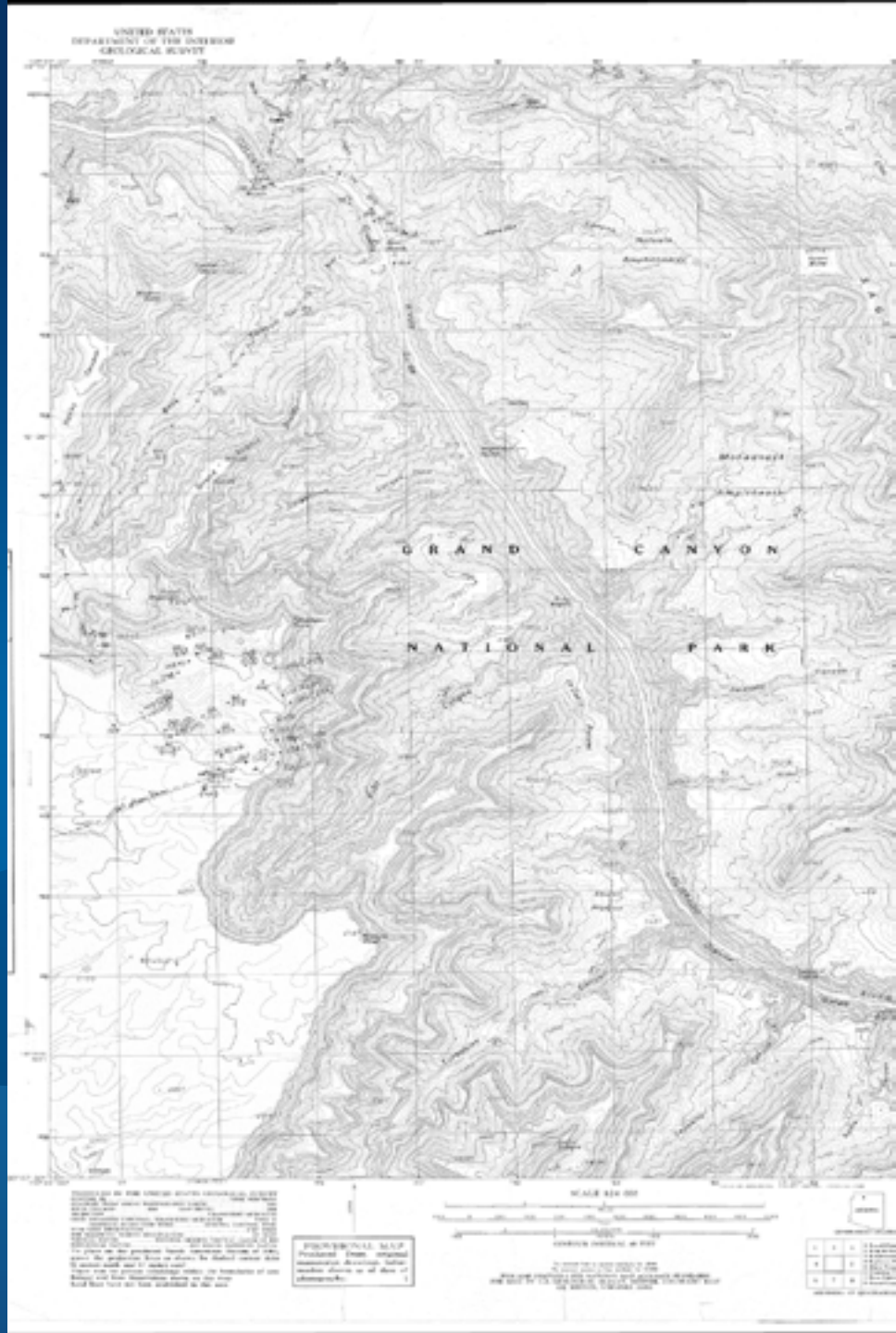
- Space and location tie human events to reality and identity[1].
- Archaeology in its most modern form is carried out through the use of Geographic Information Systems (GIS).
- GIS forms a basis for cultural heritage management.

The Grand Canyon National Park Archaeology Needs

- Correct spatial, geometric, and attribute errors in geodatabases
- Inventory, organize, and consolidate data
- Standardize and integrate data in collective geodatabases
- Establish data collection protocols to integrate with legacy data

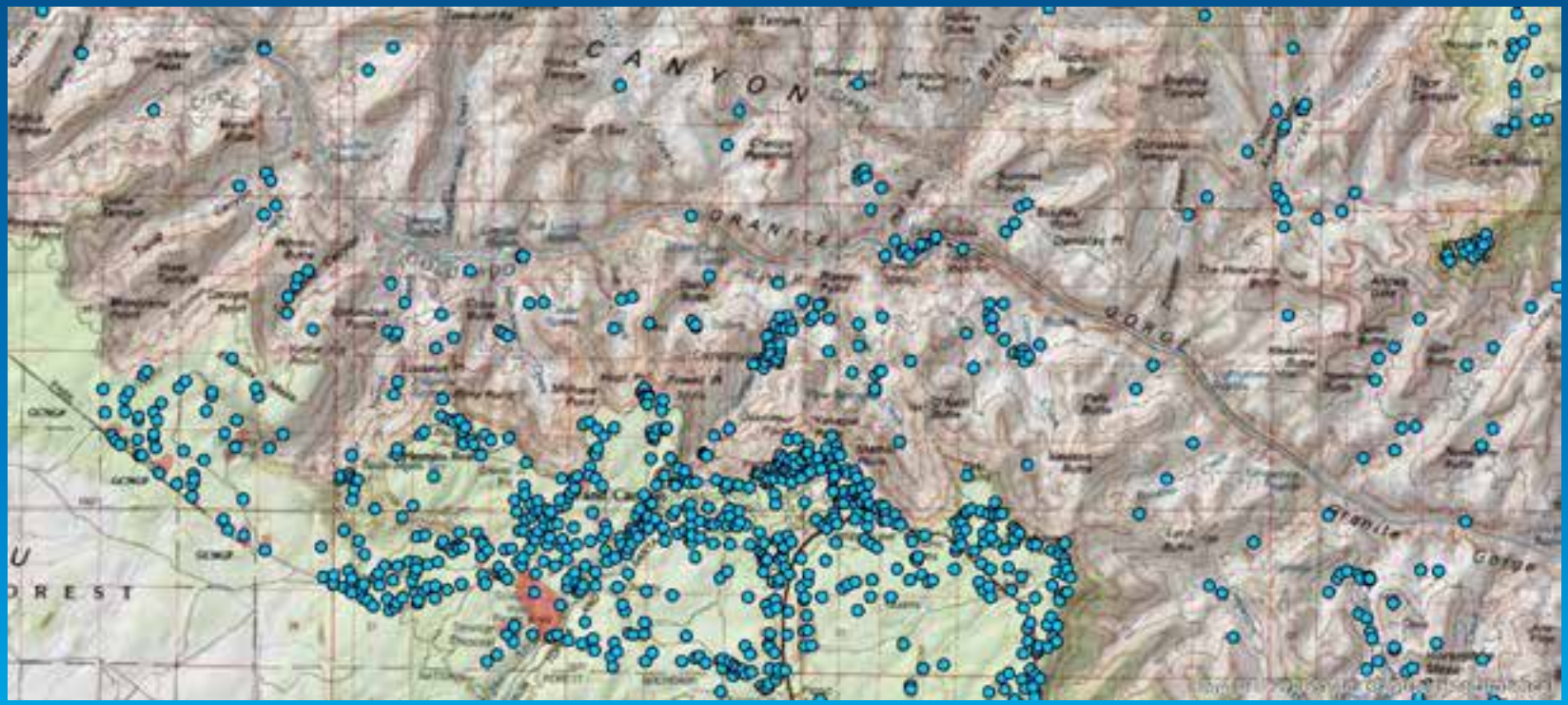
Sites and Surveys

The Methodology



Site Datum Points

- Collect and reference original maps and documents
- Define site datum points
- Clean data
- Inventory



Survey Projects

- Data fragments
- Report maps and texts
- Dangling nodes and donuts holes
- Data management

Data Dictionary

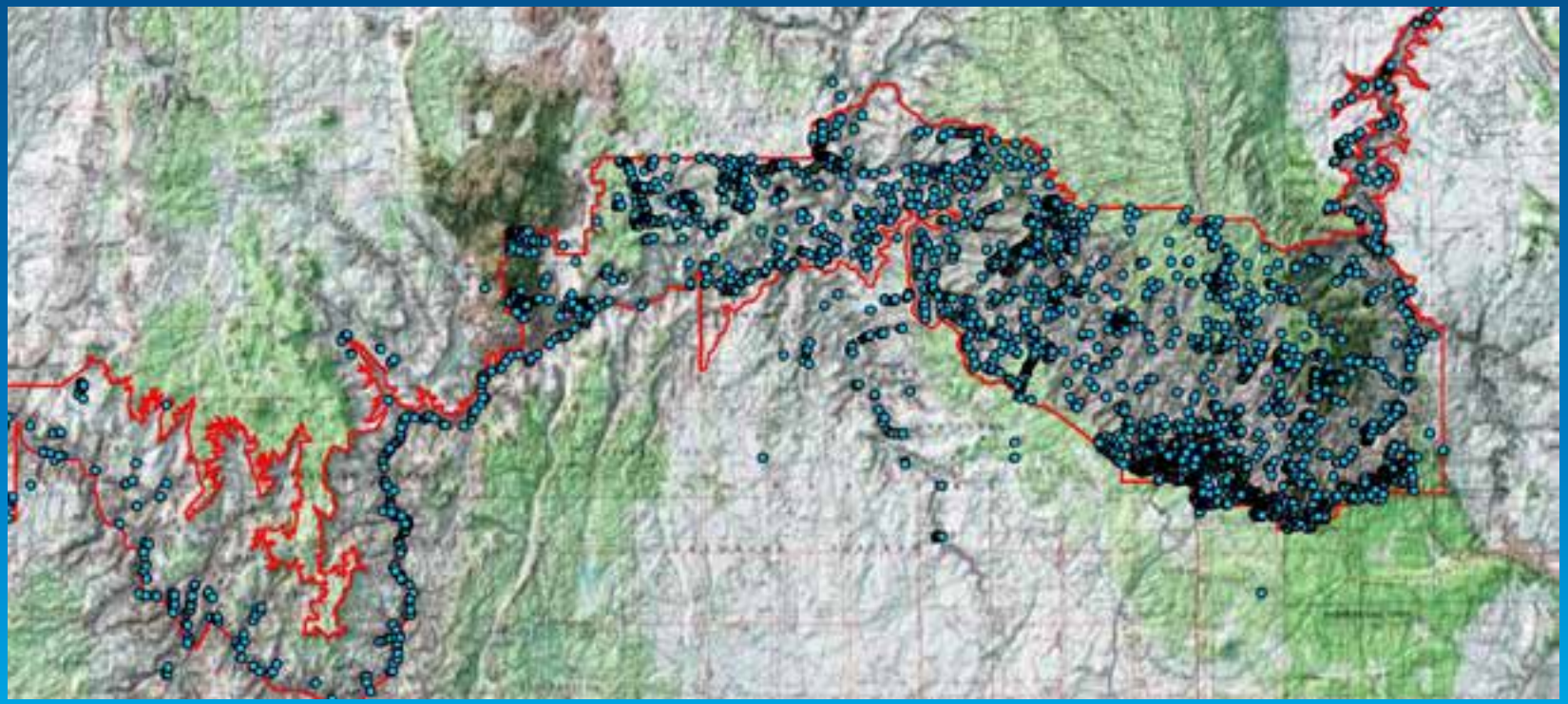
- Set up ArcPad
- Create a geodatabase with the right domains
- Field test and check compatibility

The Impact

Outcomes and Improvements

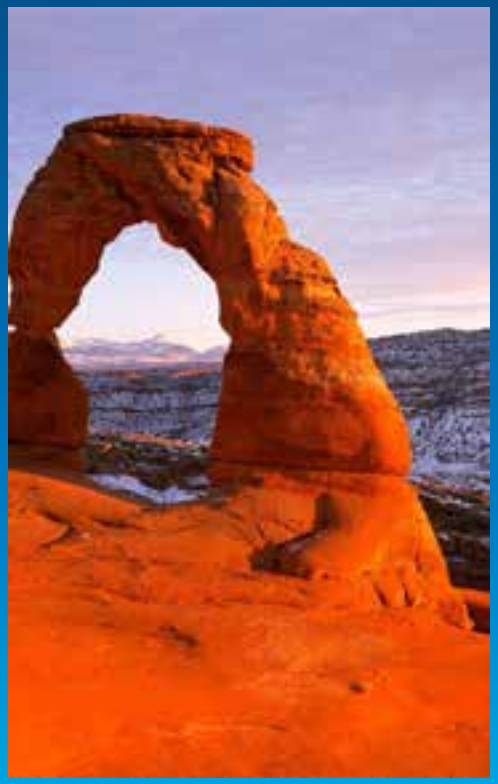
The Results and GRCA Benefits

The expertise and professionalism of the GRAIL at Northern Arizona University allowed the personnel and other resources at the Grand Canyon National Park (GRCA) to focus more on their primary mission of archaeological work.



Further Applications

- Partnership continuation for expansion of GRCA archeology work
- Use of the GRAIL's methodology and services in other National Park Service units and similar agencies and organizations
- Community identity through the use of GIS and archaeology



Thank you

Credits:

[1] Dimitris, K., Stella, S., Olga G., & Petros, P. (2010). GIS of Landmarks Management. *Journal of Cultural Heritage, 12*(2011), 65-73.; Ebert, D. (2004). Applications of Archaeological GIS. *Canadian Journal of Archaeology*, (28), 319-341.; Fletcher, R., Johnson, I., Bruce, E., & Khun-Neay, K. (2007). Living with Heritage: Site Monitoring and Heritage Values in the Greater Angkor and the Angkor World Heritage Site, Cambodia. *The Archaeology of World Heritage, 39* (3), 385-405.

Slide titled “The Grand Canyon’s Archaeology” photo and slide titled “Further Applications” center photo by Scott Kelly.

Slide titled “The Grand Canyon National Park Archaeology Needs” photo: Shutterstock.com.

Slide titled “Sites and Surveys” scanned image of original marked up topographic map

All other photos courtesy of the National Park Service

Bases Maps for site datum points and survey foot prints maps: USGS Topographic maps from ArcGIS Online

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