Cultural Resources
“Archaeology” With GIS

Navajo Nation Archaeology Department (NNAD)
NNAD has been conducting archaeology since the 1970s through 2014.

Through the NNAD, the Navajo Nation was the FIRST tribal government to establish their own archaeology department. NNAD is very proud of this endeavor.
NNAD Before GIS
All Federal monies used for development projects require archaeological work or Section 106 to be conducted before the development occurs.

The Navajo Nation receives a majority of their monies for development projects from the Federal government.

NNAD exists because they provide a Federal, State, and Tribal cultural resource compliance service for the Navajo Nation when development occurs on the Navajo Nation.

Currently, there are numerous non-Native entities that perform the cultural resource compliance services along side NNAD.
NNAD’s Current Data

Entails thousands of archaeological site locations and project locations performed by the NNAD from the 1970s to present.

Some hard copy data has been converted to GIS format for a data base that the NNAD has been working on the last few years.

NNAD’s data is in UTM Coordinates

As a note: NAD 27 Datum versus NAD 83 Datum

Archaeologist started using NAD 83 in 2010 per NNHPD standards and guidelines for conducting cultural resource inventories on the Navajo Reservation.
One of these larger projects is the Navajo Indian Irrigation Project (NIIP) which entails approximately 200,000 acres inventoried by the NNAD in the 1970s. NNAD currently has the data for this project which was provided by the BIA–NIIP. NNAD also houses the hard copy data for the archaeological sites identified on this project. A copy of the NIIP shape files has been given to the Navajo Land Department by the NNAD.
Map showing the NIIP compiled from Arc map
Map showing all the archaeological sites identified on project
Map showing only Navajo sites in project area
Map showing Navajo sites with sweat lodge structures
Over the years, the NNAD has performed work on water lines, power lines, homesites, roads, seismic lines, chapter tracts, fence lines, forestry tracts, pipelines, water wells, business site lease tracts, coal and uranium mines, environmental projects, etc.
A Forestry Project with data collected with a Global Positioning System (GPS) and downloaded into Arc map GIS.
A road project with road and cultural resources presented as shape files. Map compiled within Arc map GIS

Note archaeological site In red circle
Archaeological Site plan view map. Data compiled in Arc map GIS
Since 2006, the NNAD has been utilizing Arc map for their projects and collecting the data in the field with a global positioning system (GPS)—Garmin since the 1990s. Recently the NNAD started to utilize a Trimble GPS.
How NNAD’s GIS Data is collected
Data gathered in the field with a GPS

Data comes in the form of waypoints and tracking files
Excavation projects
Download
DNR Garmin GPS—Extension tool to download data into Arc map

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Data is downloaded as waypoints or tracking and saved as a text file or a shape file directly into Arc map.
All Topo Pro is used as a Raster (bitmap) map file which is downloaded into GIS before data is imputed from DNR Garmin GPS extension.
Once data is downloaded with DNR Garmin Extension the data is downloaded as a Polygon, Point, or Line into Arc map.

As a note: Some of the raw data that is downloaded from DNR Garmin Extension is also put into table format for the archaeological report use.
Other Data

- Data is sometimes provided from project sponsors.

- Data is also extracted from the existing New Mexico Cultural Resource Information System (NMCRIS)—an online database which is all in GIS but is only accessible by state-approved password.

- Data is also obtained from other tribal departments such as Navajo Land Department, Fish and Wildlife—Navajo Heritage Program.

- A majority of data obtained from Navajo Land Department is in Latitude and Longitude which is converted into UTM Coordinates by the NNAD.

- Some of data also obtained from tribal entities are presented in CADD but the NNAD does not work with CADD.
Where NNAD would like to be with GIS in the upcoming future

*Would like to be able to share and access data with other Navajo Tribal departments*

*Would like to be a supporter of a GIS user network*

*Would like to be current with the latest GIS software and technology*

*Would like to see a land use data base established incorporating archaeological data for the Navajo Nation*

*Would like to be able to connect with the private sector such as IHS and NTUA*

*Would like to be able to utilize Lidar or remote sensing incorporated into archaeological projects*

*Would like to be able to complete digitizing NNAD’s existing hard copy data into electronic data for an archaeological data base*
To Conclude;

The benefits of using GIS with regard to archaeology

- Promote land management
  - areas containing high site density

- Networking
  - other tribal departments, state, etc.

- Time Manager, speeds up site recordation, records searches, report preparation

- Aide in NNAD’s training program to train the students in GIS and keeps them up to date in technology
Thank You

NNAD’s web site

dnrnavajo.org/archaeology/