The O’odham, now split into four recognized groups (the Tohono O’odham Nation, the Gila River Indian Community, the Ak-Chin Indian Community and the Salt River Indian Community), have a history as a migratory culture. Rather than settling and farming throughout the year, they moved to where the resources were depending on the season. With the nature of the desert, depended much on wild foods. What farming they did took place during the brief monsoon. A rich history of spirituality, connection to their lands. A rich history of language, spoken by all O’odham groups, that goes back to the Uto-Aztecan language group, though each has its own dialect. Lands and culture impacted by both peaceful and confrontational interaction with the Apaches.
Have been living in the Southwest for thousands of years
Once occupied an enormous section of the Southwest desert lands, where they lead a migratory life with minimal farming
From the early 1700’s to today, the O’odham lands have been occupied by foreign governments
Most notably, the O’odham fell under Mexican rule after the Republic of Mexico became independent; their lands were then split almost in half when the Gadsden Purchase was completed
Today, the O’odham live on both sides of the US/Mexico border and are forced to deal with increasing border security and equally increasing danger to continue to pursue their traditional migratory heritage
Traditional Lands

TOHONO O’ODHAM
Traditional Lands
The second largest reservation in Arizona in both population and geographical size, third in the United States, with a land base of 2.8 millions acres (4,460 sq miles). This is approximately the same size as the State of Connecticut.

Has four non-contiguous segments; the “main” reservation, which is 2.7 million acres; San Xavier; San Lucy; and Florence Village.

Very widely dispersed communities separated by wide desert valleys and plains, which are marked by mountains that rise abruptly to nearly 8,000 ft.

Crosses three counties (Pima, Pinal and Maricopa) and the State of Sonora in Mexico.
TOHONO O’ODHAM
Current Lands
Wide spread lands make it difficult to provide services.

Especially for Police and Fire, response times are affected by many things including drive time and difficulty locating communities and homes in those communities.

No street names.

No addresses.

The population they serve faces challenges of their own:
- 40+% unemployment
- High poverty
EXAMPLES OF GIS GOALS

- With the assistance of the Planning Department, create a house numbering and street naming process
- Link GIS to CAD to improve dispatching and response times
- Create systems to improve Police Department programs, such as deceased UDA database
- Create systems to improve Fire Department programs, such as structure information database
- Create systems to improve Emergency Management programs, such as damage assessment and hazard mitigation databases
- Find ways for field workers to work disconnected
- Implement GIS web services for desktop and mobile
WILDLAND FIRE GIS

A Day in the Life of a GIS Specialist
Describes any large fire that begins in rural areas
- Differs from urban brush fires and structure fires
- In Arizona, usually start on Public Lands

Have many causes, but usually are categorized as human or natural

As has been seen in the last few years, have the potential to be very destructive and deadly

Very complex incidents that require management to protect life and property
WILDLAND FIRE CHARACTERISTICS

- Acts differently in various fuel types (forest vs. scrub vs. grass etc.)
- Can smolder or run – can be as fast as 14mph in grass
- Tend to burn “up” – uphill, up a tree, upstairs
- Can be affected by weather (Red Flag days) and can also create weather
- Burn at varied temperatures; the average is 800°C (1,472°F) but can exceed 1,200°C (2,192°F)
A Pyrocumulus Cloud being fed by the Station Fire, with the City of Los Angeles in the foreground. Shares characteristics with the "mushroom cloud" after a nuclear weapon is detonated.
Due to the danger, complexity, and risk to both the public and firefighters all fires are managed.

There is a national structure for this management.

At the heart of this is the Incident Management Team, which has five distinct levels:

- **Type 5** – local fire officers
- **Type 4** – City/County/District fire, EMS, and law enforcement
- **Type 3** – State level standing team of trained personnel from different departments, agencies and jurisdictions
- **Type 2** – National and State level interagency team
- **Type 1** – National and State level interagency team trained to operate on the largest incidents
Part of the National Incident Management system, the Incident Command System is used in all fire incidents to provide structure to management.
WHERE GOES GIS FIT?

In the planning section, under the Situation Unit Leader:

- Planning Chief
  - Resource Unit Leader
  - Documentation Unit Leader
  - Situation Unit Leader
  - Demobilization Unit Leader
  - Status/Check-in
  - Field Observer (FOBS)
  - Fire Behavior Analyst (FBAN)
  - Infrared Interpreter (IRIN)
  - GIS Specialist (GISS)
  - Incident Meteorologist (IMET)
GISS RESPONSIBILITIES

- Gather and process data from incident staff
- Create initial maps for use by Operations staff
- Revise and produce digital maps as needed
- Conduct GIS analysis as needed
- Print and collate maps for Incident Action Plan and other purposes
- Perform documentation of maps created, including maintenance of a standardized directory structure
A GISS NEEDS BASIC KNOWLEDGE OF:

- The Basic Incident Command System structure and procedures that are part of the National Incident Management System
  - Whom to go to for issues or support
  - Understanding of expectations of supervisor
- Work and rest standards
- Firefighter and public safety
A GISS MUST BE ABLE TO:

- Use off the shelf GIS software
- Work with a variety of data types and file types
- Understand GPS operation and data collection
- Be proficient in various projections and datum's
- Answer questions such as acreage burned
- Troubleshoot hardware and software problems sufficiently to keep the GISS operational
- Perform all of the above in “Incident Conditions”
INCIDENT CONDITIONS INCLUDE:

- Long hours (12 or 16 hours, day or night)
- Close quarters shared with various other personnel
- Stressful conditions
- Traveling for 14 days or longer
- Primitive fire camp conditions (sleeping on the ground, dust, smoke, port-a-johns, limited food choices)
- Working with fire camp personnel that could include agency, contract, military and prison crews
WHEN THE PHONE RINGS...

- Receive call from Dispatch Center
- Gather your mobilization kit, you have 2 hours to get out the door. Print basic maps, if you can
- Travel to base camp/incident command post
- Check-in
- Set up your equipment in a suitable location
- Begin making notes about what you’ll need
- Establish your base data, initial map project files
- Begin making your first fire maps using intelligence from various sources, such as the Situation Unit Leader
MOBILIZATION KIT DETAILS

- Laptop with ArcGIS 10, FIMT, DNRGPS
- External hard drive, USB thumb drive, CD’s, DVD’s
- Router and network cables
- Power strips, extension cords, and a UPS
- USB cables for GPS

- Ample office supplies
- Basic tool kit
- Lots of tape
- Cell phone and air card, if possible
- Data
- Personal hygiene items
- Tent, sleeping bag, cot
- Layers of clothes
A DAY IN THE LIFE OF A GISS

- Work within your chain of command
- Collect, process, and disseminate spatial data
- Maintain your filing structure
- Create new data as needed, incorporating data from GPS units, digitized data, described information, etc
- Provide maps as requested by the SITL
- Document maps and archive work
- Transfer products and data to other incident personnel or to the hosting unit
- Transfer data to and from various locations, which may include FTP site or websites
Dusty, loud, windy, bone dry, too hot, too cold, and home for up to 14 days...
THE MAPS