

# Forestry Management & Water Law

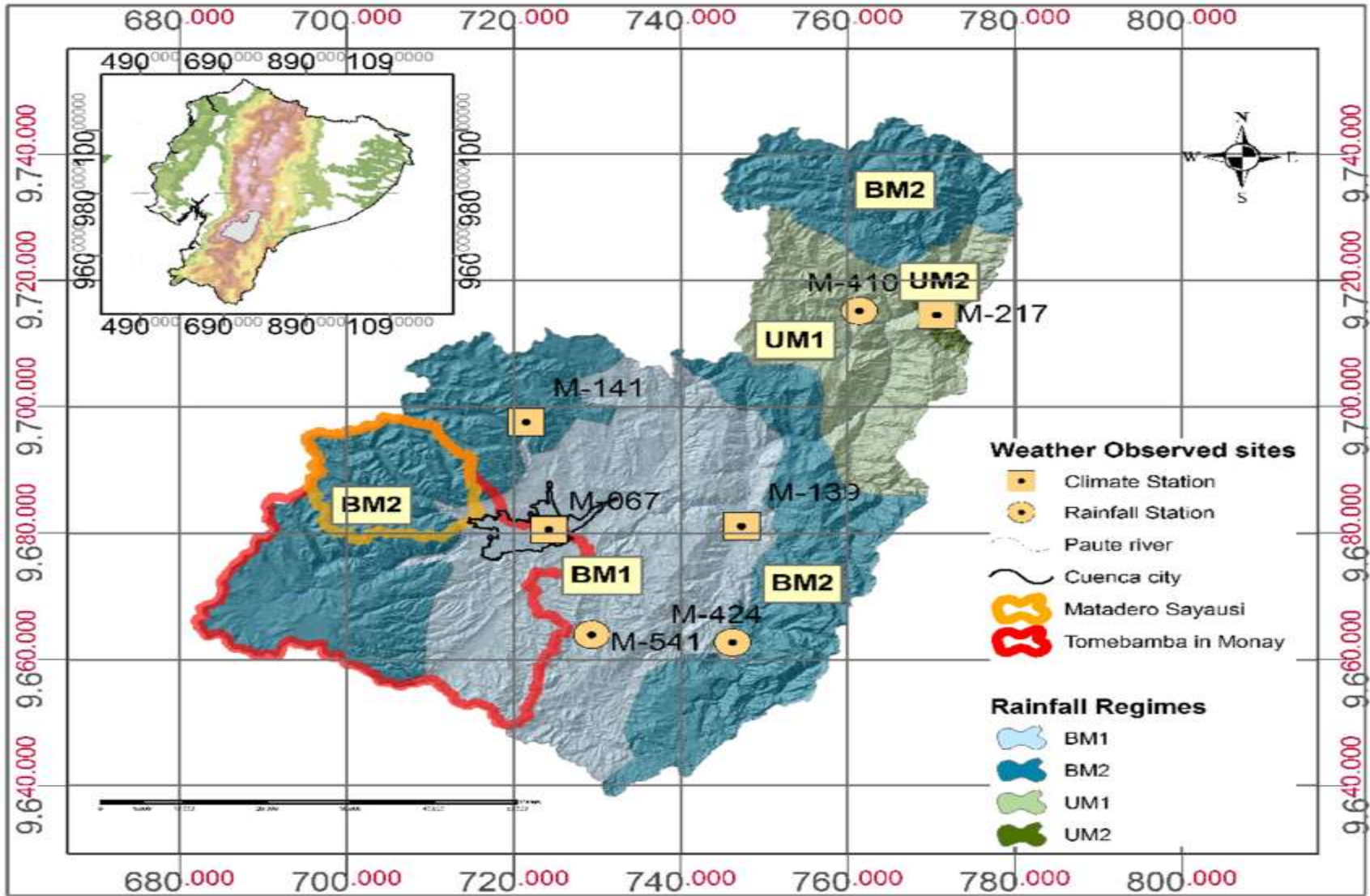
## Comparing Ecuador & Arizona



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# Ecuador's Paute River Basin



# Arizona's Verde River Basin



[https://en.wikipedia.org/wiki/Verde\\_River](https://en.wikipedia.org/wiki/Verde_River)

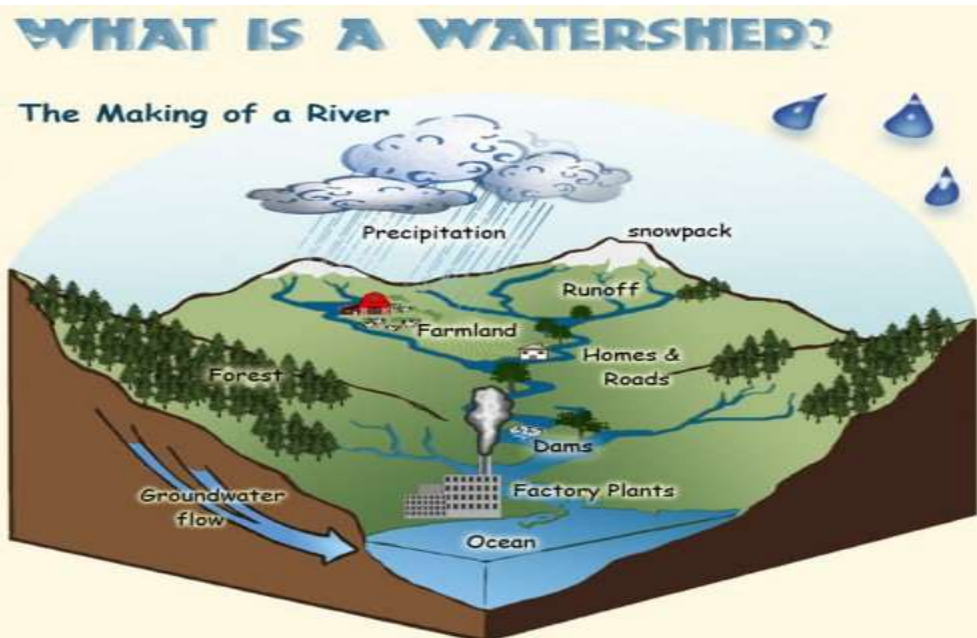
# Relationship Between Forestry Management & Water Supply

- Potential Benefits

- More Mature Forests
- Limit Wildfire & Insect Infestation Risk
- Erosion/Runoff Impacts to Water Quality
- Increase Stream Flow

- Potential Costs

- Limit key nesting areas
- Expose river banks to grazing animals
- Uncertain/Limited Return on Investment
- Burning for fuel or use in paper production have environmental impacts



# Overview of Water Law in Ecuador

- Sumak Kawsay
- SENAGUA
- Water Utilities:  
compare EPAMAPS,  
ETAPA, &  
INTERAGUA
- 2008 Constitution
- Water Juntas



# Prior Appropriation

JUNIOR USER 1970 water right →

First-in-time, First-in-right  
Beneficial Use Without Waste  
Forfeiture – use it, or lose it  
Diligence & “Relation-Back”  
Call on the River & the Futile Call Doctrine  
General Stream Adjudications

← SENIOR USER  
1910 water right

# Managing Groundwater

## The AZ Groundwater Management Act of 1980

Historical Background

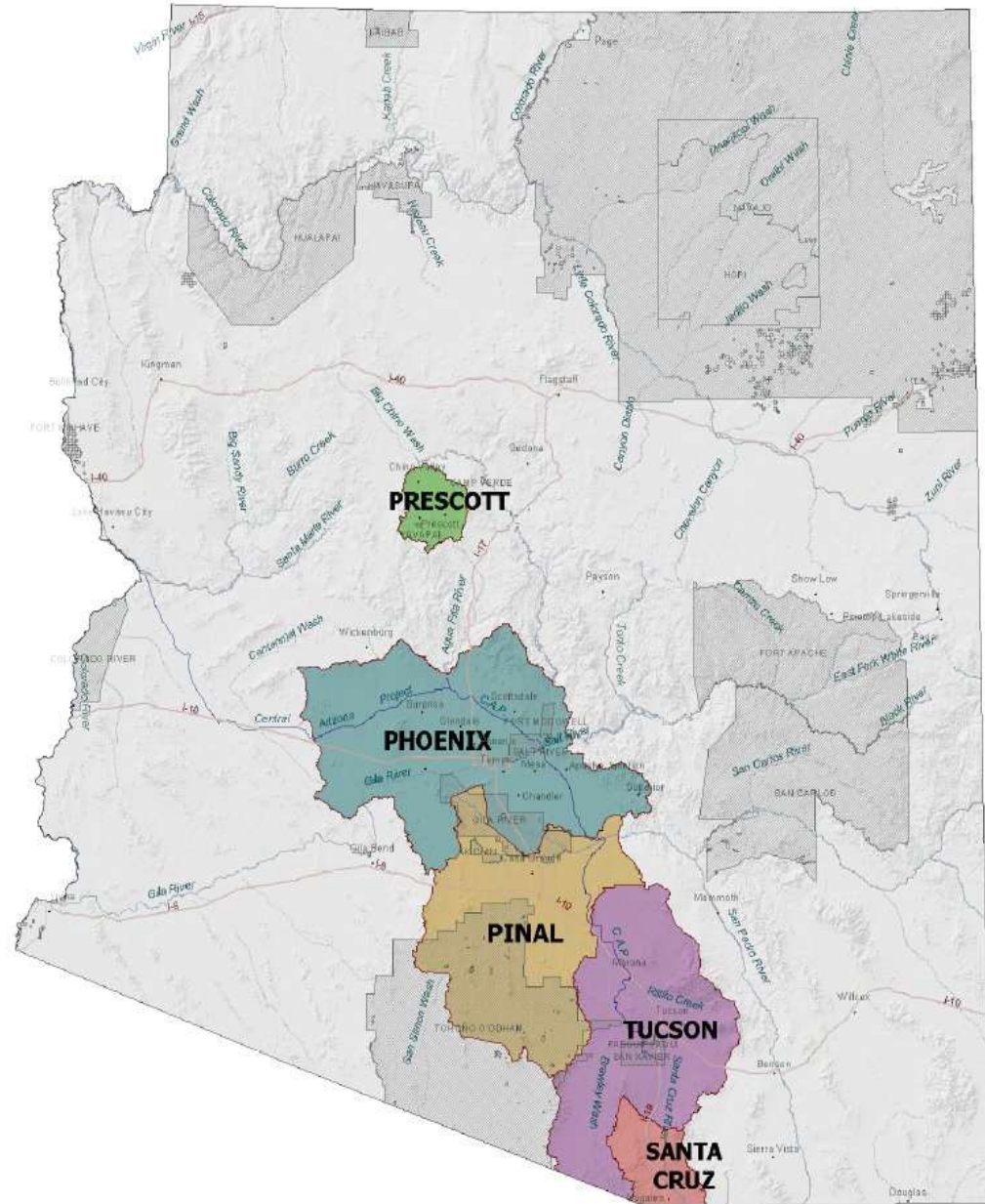
Active Management Areas

Assured Water Supply

Groundwater Rights in Active Management Areas

Groundwater Recharge

Central Arizona Groundwater Replenishment District



# Resolving Water Rights Uncertainties

## Federally Reserved Water Rights

- McCarran Amendment

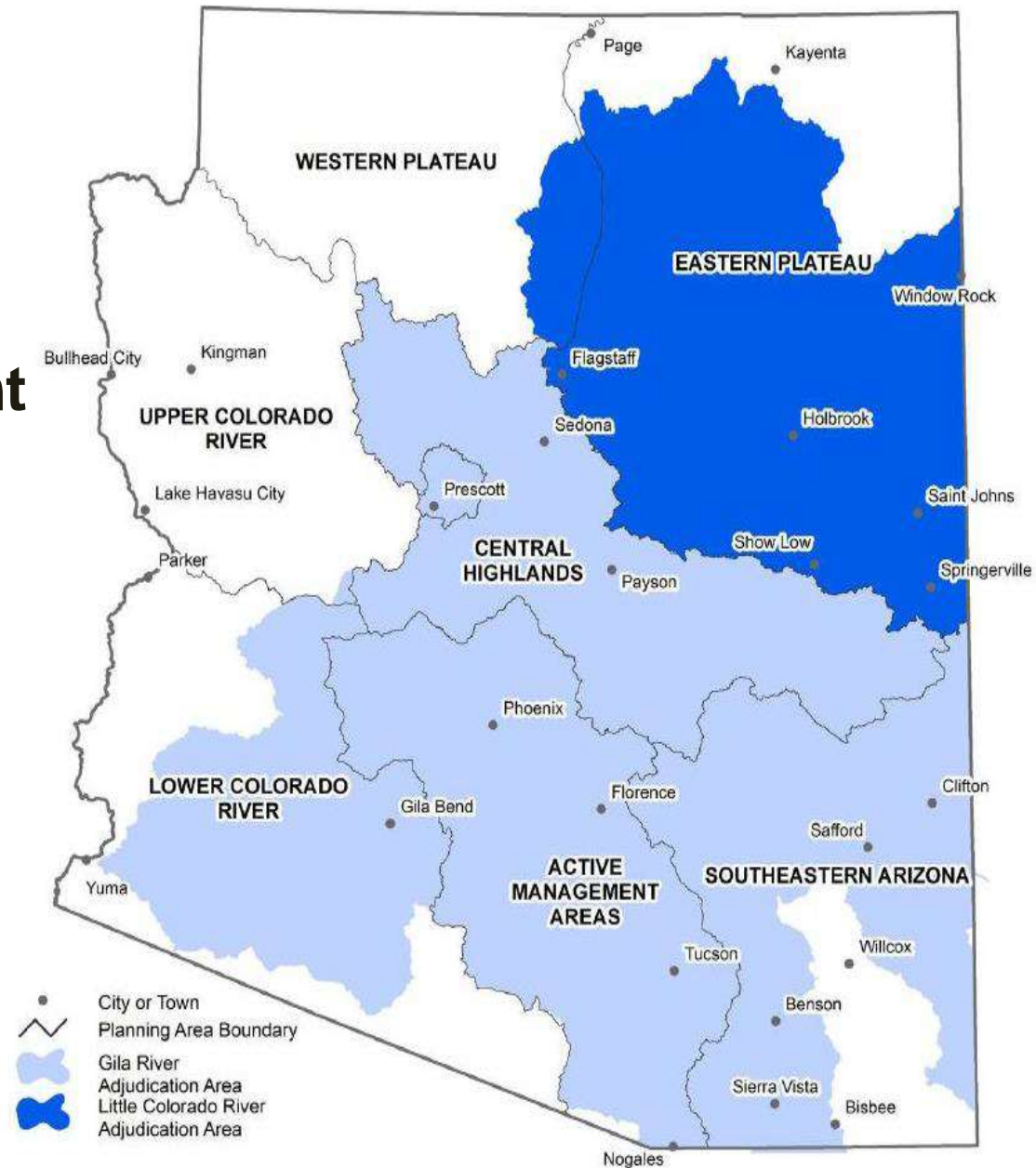
## General Stream Adjudications

## Major Obstacles to Resolution

- Institutional Competency
- Transaction Costs
- Subflow

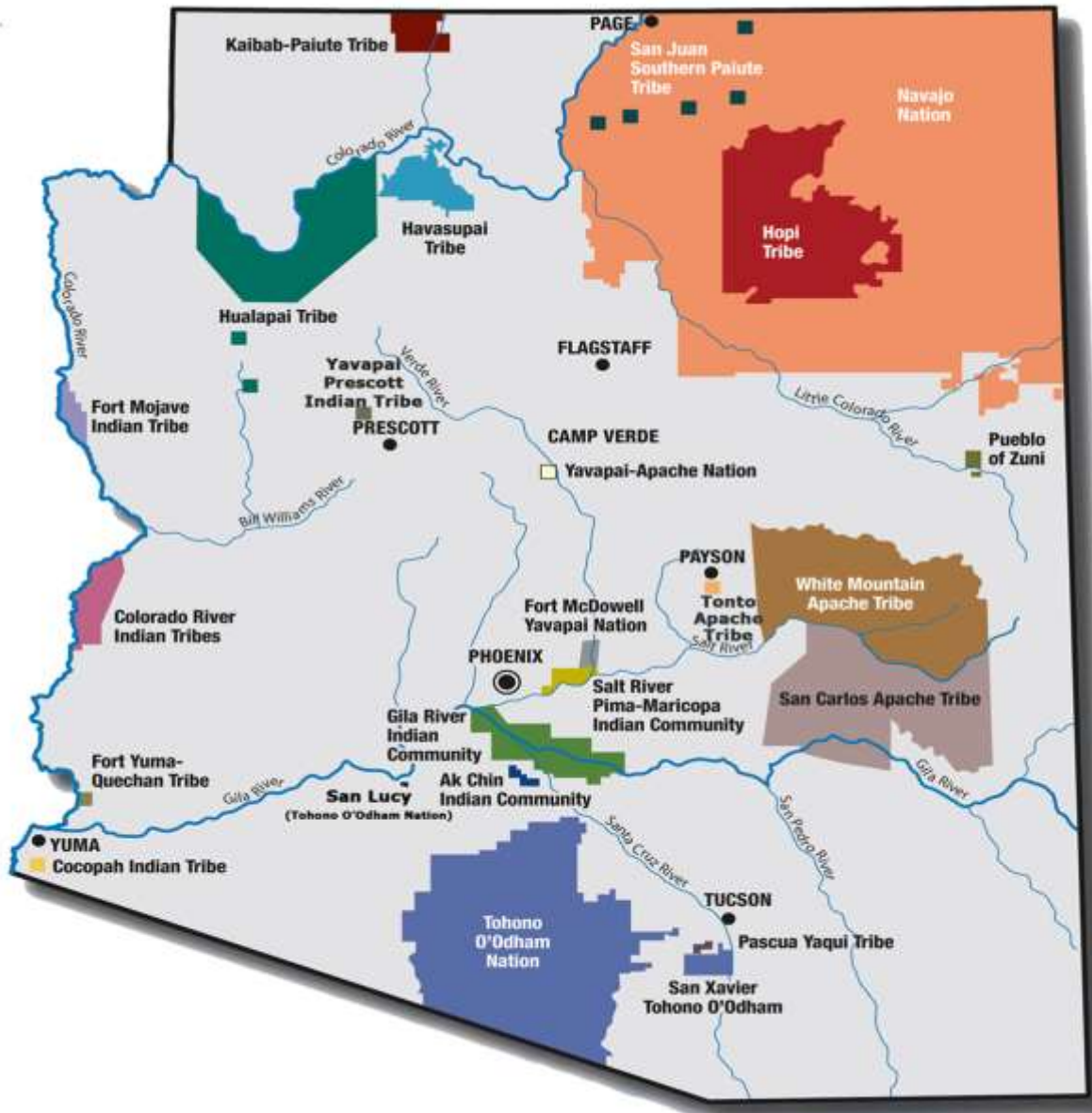
## Why It Matters

courtesy: Arizona Department of Water Resources



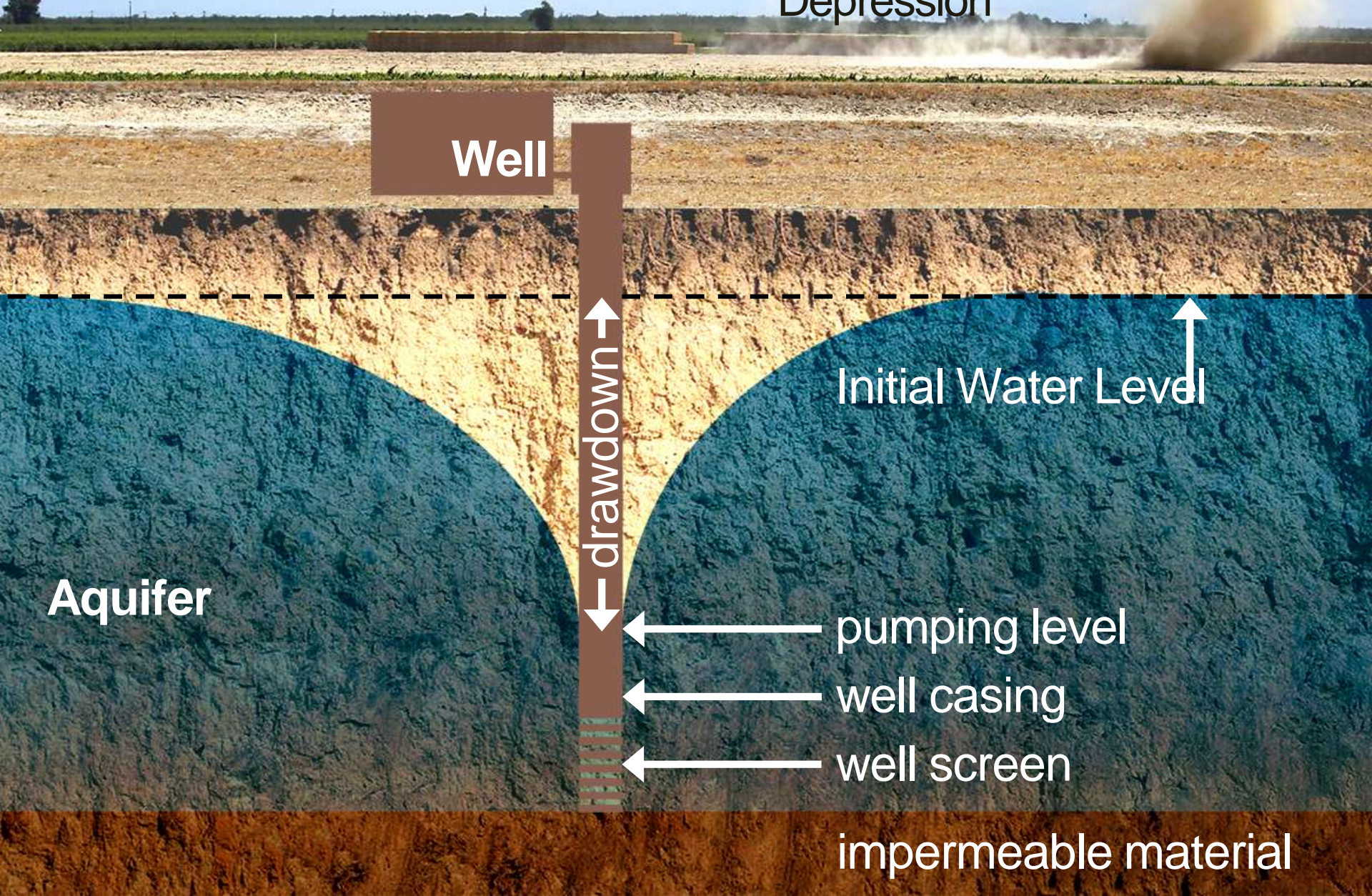


# Tribal Reservations in Arizona



# Pumping Groundwater

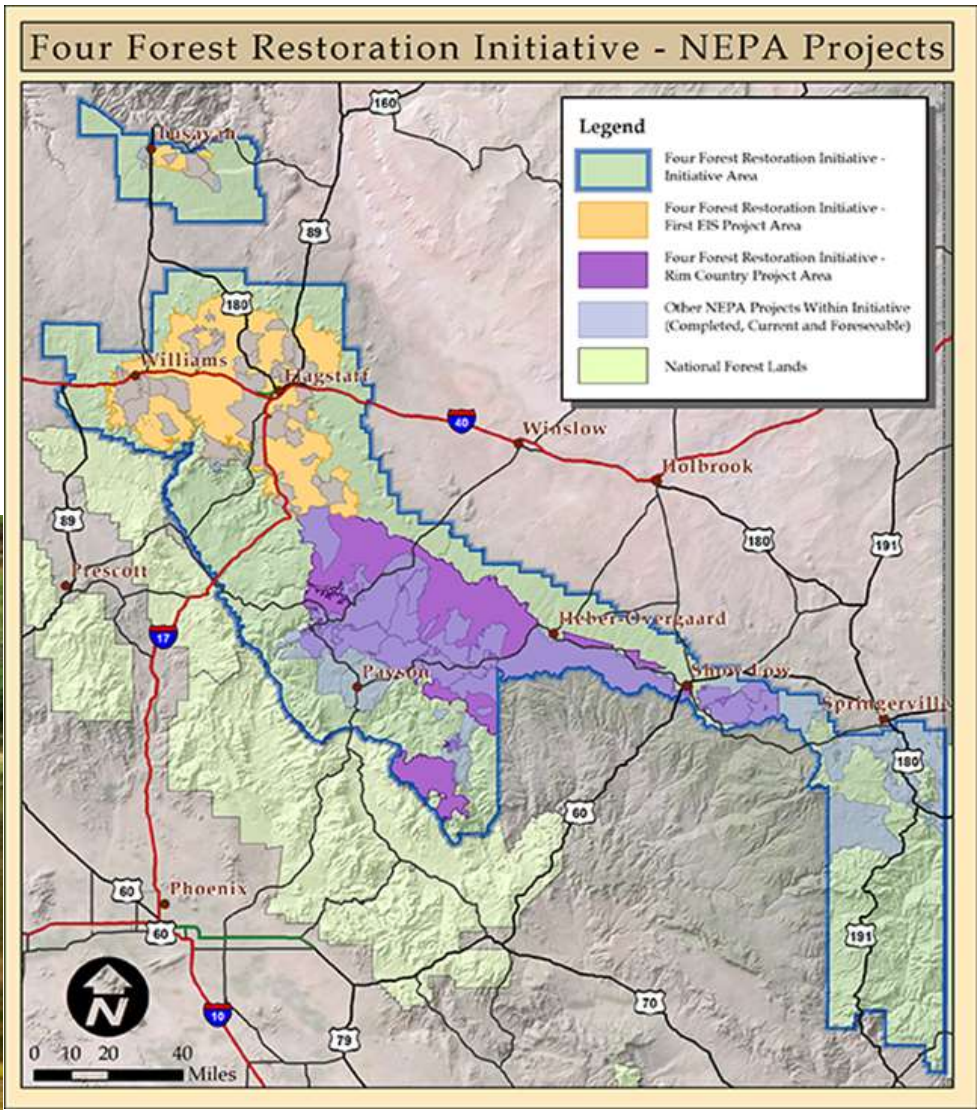
Subflow & Cone of Depression



# WATERSHED MANAGEMENT IN THE PAUTE RIVER BASIN IN ECUADOR



# WATERSHED MANAGEMENT IN THE VERDE RIVER BASIN IN ARIZONA



# Lessons from Arizona & Ecuador's Watershed Management Projects

- Arizona
  - Good Samaritan Permits
  - Tribal Water Settlements
  - State Water Trust
  - Verde River Exchange Program
  - De Minimis Exemptions & Grandfathering
  - Regional Water Mitigation Authorities
    - Developed vs. Salvaged Water Distinction
- Ecuador
  - Local Water Quality Ordinances
  - Stakeholder Participation
  - Municipal Government Engagement
  - Funding Public Independent Trusts