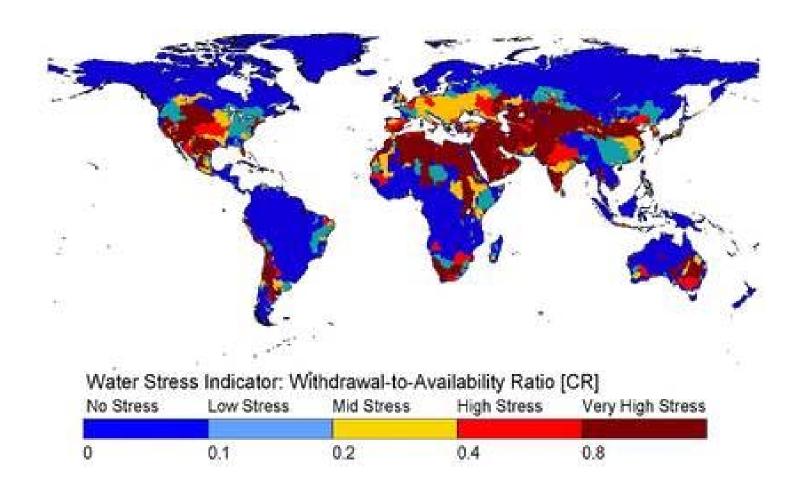
# Groundwater Policy in the Western U.S.

2001 University of Idaho Law Review Symposium

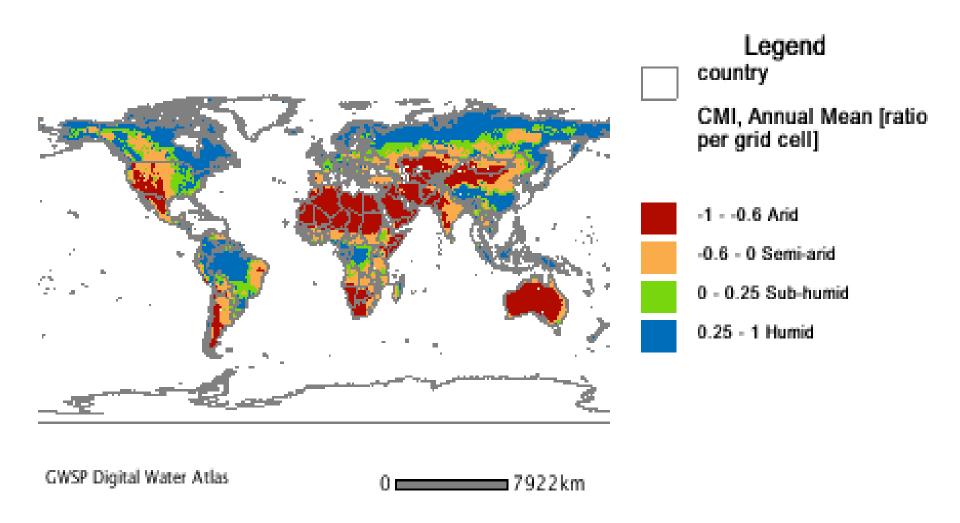
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#### Outline

- Groundwater Mining: What is the Policy?
- A global perspective
- New Mexico examples
  - City of Albuquerque
  - Navajo-Gallup
  - Eastern New Mexico
- Rescue Projects
- Governance

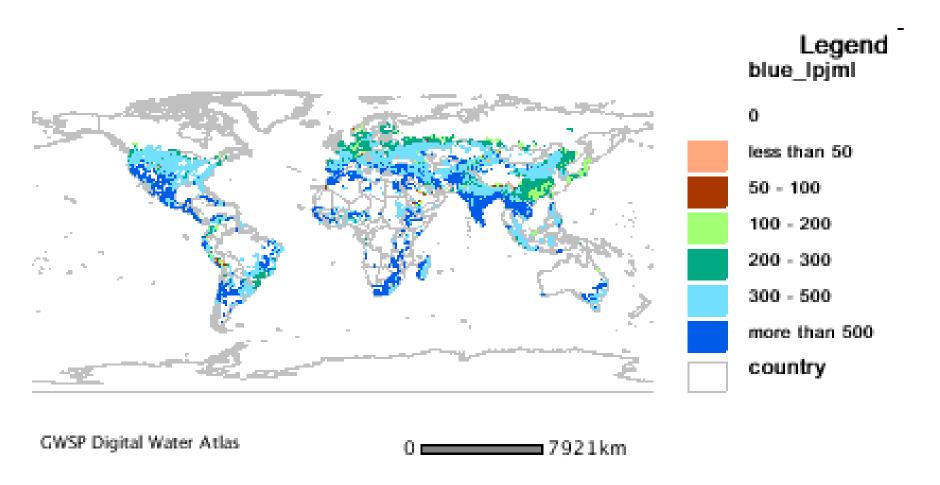


source: Center for Environmental Systems Research; found at http://www.worldwatercouncil.org

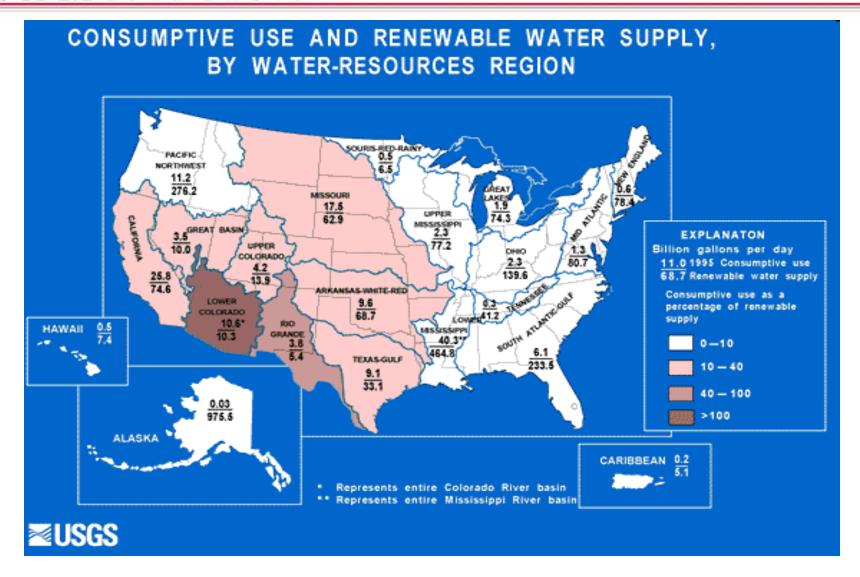


source: GWSP Digital Water Atlas (2008). Map 40: Climate Moisture Index (V1.0); http://atlas.gwsp.org. Water availability as function of climate

#### Blue Water Consumption on Cropland



source: GWSP Digital Water Atlas (2008). Map 64: Blue Water Consumption on Cropland (V1.0); http://atlas.gwsp.org.

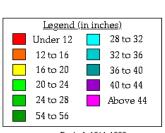


Source: U.S. Geological Survey, 1984, National Water Summary 1983-Hydrologic events and issues: U.S. Geological Survey Water-Supply Paper 2250

## NM Overview: Climate and Groundwater

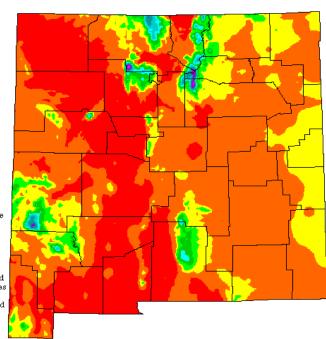
- Climate: arid to semiarid
- Groundwater use:
  - 87% of drinking water
  - Irrigation (esp. alfalfa)
- No charge for use
- Statewide regulation

#### Average Annual Precipitation New Mexico



Period: 1961-1990

This map is a plot of 1961-1990 annual average precipitation contours from NOAA Cooperative stations and (where appropriate) USDA-NRCS SNOTEL stations. Christopher Daly used the PRISM model to generate the gridded estimates from which this map was derived; the modeled grid was approximately 4x4 km latitude/longitude, and was resampled to 2x2 km using a Gaussian filter. Mapping was performed by Jenny Weisburg. Funding was provided by USDA-NRCS National Water and Climate Center.



## City of Albuquerque: Setting

- North-central NM
- Underlying Santa Fe Basin Aquifer
- Recharge:
  - Mountain runoff and infiltration
  - Rio Grande River and its tributaries

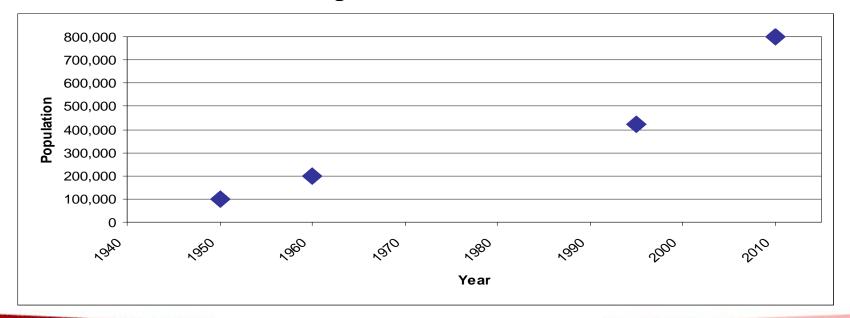


#### City of Albuquerque: History

- Pre-European contact: Indian Pueblos
  - Irrigation ditches used as early as A.D. 1000
- 1700s: Spanish settlements
  - Surface water reliance for irrigation and domestic uses
  - Ditches and possibly shallow wells
- WWII: Kirtland AFB and atomic weapons complex
  - Accelerated recent growth
  - Eight-fold population increase since WWII

## City of Albuquerque: History

- Growth enabled by groundwater use
- 1875: 1<sup>st</sup> modern municipal well
- 1950s: several municipal wells went dry
  - Pumping continued on belief that aquifer size was equal to that of Lake Superior



# City of Albuquerque: Early Groundwater Policy

- 1950s shrinking supply led to:
  - Federal approval to import surface water from another basin
  - Increased rates
  - State and Federal \$\$ for new diversion
- 1956 state administrative control:
  - "Declaration" of Rio Grande Basin groundwater
  - Groundwater and surface water believed to be directly linked; needed surface water for downstream compact obligations

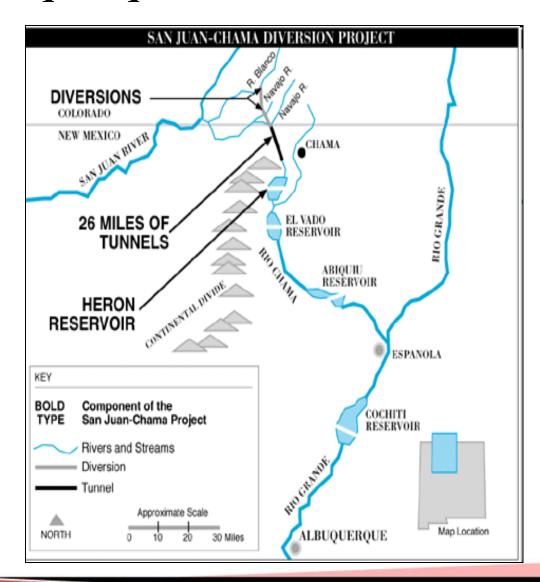
# City of Albuquerque: Recent Groundwater Policy

- 2001: New groundwater permits must be offset by acquiring/retiring surface water rights
- 2007: Groundwater remained only municipal drinking water source

City of Albuquerque: Solutions

- Conservation
  - 30% reductionbetween 1994 and2004
- Water imports
  - Interbasin transfer from ColoradoRiver
  - 1950s 1971
     construction
  - 2008 SJ-C water delivery began

map source: Albuquerque's Environmental Story: Educating for a Sustainable Community (2006). http://www.cabq.gov/aes/s5water.html



## City of Albuquerque: Policy Gaps

- Is water delivery from another basin hundreds of miles away the best solution?
- Will the City of Albuquerque be able to manage population growth, climate change (increased drought), and endangered species protection?

## Navajo-Gallup: Setting

- Western NM
- Southern portion of Navajo Reservation
- 23,000 Gallup residents
- 100,000 Navajo in surrounding areas



#### Navajo-Gallup: Water Use

- Gallup
  - 100% dependent on groundwater
  - Extremely limited recharge
  - Drastically declining water levels
    - Last 10 years: 200 ft
    - Since 1970s: 800 ft
  - 9 producing wells (down from 15)
- Navajo Reservation
  - 40% + households haul all their domestic water
  - 80% + poverty rate

Navajo-Gallup: Solutions

- 2009: Omnibus Public Lands Management Act
- Navajo-Gallup Water Supply Project
  - 260-mile pipeline
  - 24 pumping stations
  - 2 water treatment plants
  - \$864,000,000
  - 37,376 AF yearly transfer from San Juan River

**JICARILLA APACHE** INDIAN RESERVATION

map source: Water Matters! Navajo-Gallup Water Supply Project. http://uttoncenter.unm.edu/pdfs/WM\_Navajo-Gallup\_Project.pdf

#### Eastern New Mexico: Setting

- Overlies western edge of Ogallala Aquifer
- Clovis and Portales predict exhaustion of usable groundwater by 2040
- Clovis wells from 28 to 54 to maintain production in last 10 years



#### Eastern New Mexico: Solutions

- 2009: New groundwater permits closed for large users
- 2009: Omnibus Public Lands Management Act
- Eastern NM Rural System authorization
  - 180-mile pipeline
  - 75% Federal funding, up to \$327,000,000
  - 16,450 AF/year transfer from Ute Lake on Canadian River
  - Failed to address reduction of groundwater use by agriculture

#### **Public Interest**

- Water law needs to include public interest
  - Rights of individual users may come at the expense of public interest
  - Sustainability and long-term solutions much broader than interest of single permit holder
- Consequences of mining to future:
  - Higher costs for water, pumping, and treatment
  - Energy intensive solutions
  - Creation of ghost towns and abandonment of population centers
- "New water": uncertain, costly, short term

#### Policy Changes: Broader Approach

- Groundwater policy change is ultimately linked to:
  - Surface water use/policy
  - Population growth
  - Addressing climate change, carbon emissions
  - Economics (local, national, global)
  - Agricultural practices and what we eat
- Need expanded definitions
  - Think like ecologists in terms of systems and interconnectedness

#### Policy Changes: Sustainability

- When is depletion of non-renewable resource acceptable?
- Sustainable? Leaving next generations with less than we have.

### Policy Changes: End Rescue Projects

- Rescue projects:
  - Relieve local and state decision-makers from mismanagement consequences
  - Remove conservation incentives, providing instead political rewards for keeping water costs low, encouraging new development, and creating jobs through infrastructure projects

#### Policy Changes: Better Governance

- Use lessons learned from surface water
  - Include multiple stakeholders
  - Regional water management
- Federal Aquifer Commission for interstate aquifers?
  - Regulation of drawdown rates
  - Water quality oversight
  - Fee setting
- More scientific data

#### Conclusions

- Future of West should not be built on mining of groundwater
- Find sustainable, long-term solutions: efficiency, conservation, agricultural forebearance
- Better governance in which community addresses
  - Purposes of use
  - Time period over which groundwater is used

# Denise Fort Professor of Law