

# Sustainability and Stewardship of NM Water Resources



presented by

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# Total Water Withdrawals New Mexico

Approximately 4M Acre-Ft /yr  
Surface Water  $\approx$  2.1M Acre-Ft /yr (53%)  
Ground Water  $\approx$  1.9M Acre-Ft/yr (47%)

# Public Water Supplies

Total  $\approx 320\text{K Acre-Ft/yr}$

Surface Water  $\approx 42\text{K Acre-Ft/yr}$  (13.2%)

Ground Water  $\approx 278\text{K Acre-Ft/yr}$  (86.8%)

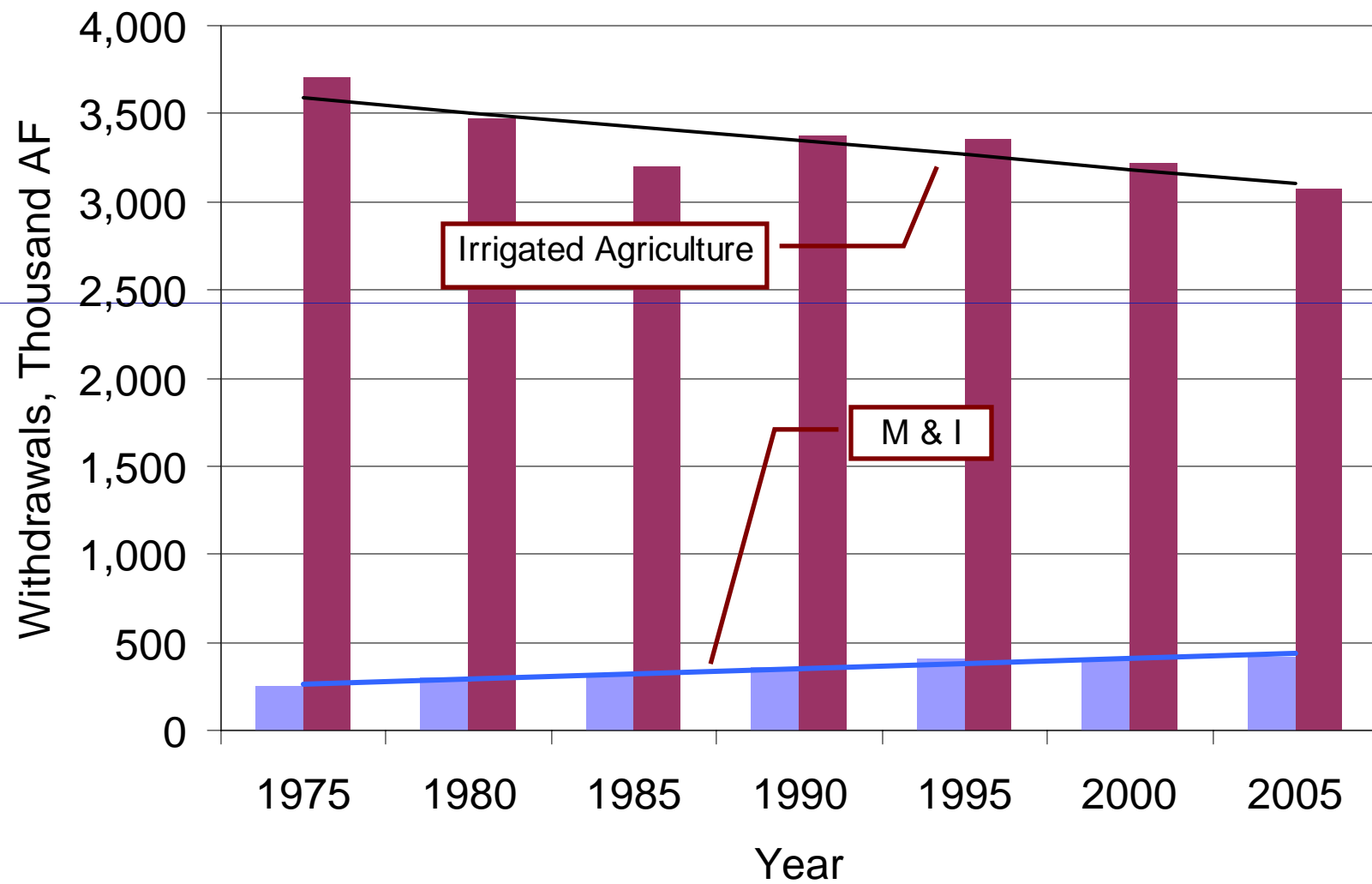
# Water Use by Categories

- Nine water use categories:
  - ◆ Public Water Supply (8.1%)
  - ◆ Self-Supplied Domestic (0.9%)
  - ◆ Irrigated Agriculture (77.9%)
  - ◆ Self-Supplied Commercial (1.0%)
  - ◆ Livestock (1.4%)
  - ◆ Industrial (0.5%)
  - ◆ Mining (1.5%)
  - ◆ Power (1.6%)
  - ◆ Reservoir Evaporation (7.0%)

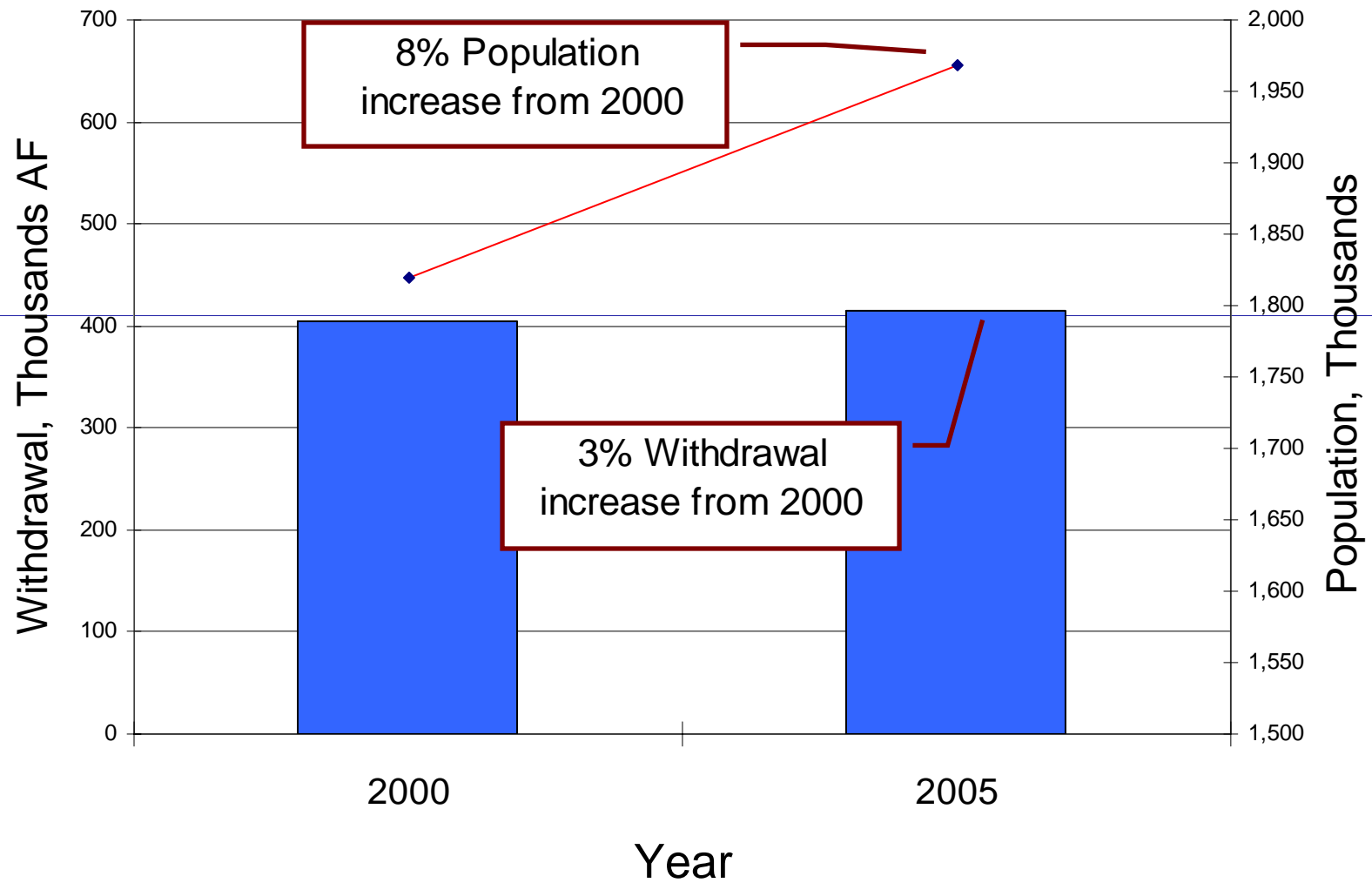
# Water Use Trends in New Mexico

- Categories evaluated for trends
  - ◆ Irrigated Agriculture
  - ◆ Municipal
    - ◆ Public Supply & Domestic
  - ◆ Commercial
    - ◆ Commercial & Industrial
  - ◆ Combined above to obtain “M&I” uses
- Results

## Trends in Water Withdrawal



## State Total M & I



# Water Use by Categories

- The 2005 WUR is available
  - ◆ Hard copy report
  - ◆ CD
  - ◆ PDF on the OSE website
    - ◆ [http://www.ose.state.nm.us/newtstweb/publications\\_technical\\_reports\\_wateruse.html](http://www.ose.state.nm.us/newtstweb/publications_technical_reports_wateruse.html)

# Water Management



# 100 Years of Water Management

- Billions of Federal Dollars spent in Western U.S. on complex water management system to sustain the current population
- Water system manipulation based on 19<sup>th</sup> and 20<sup>th</sup> century ideas and Federal Projects
- Need Infrastructure and Administrative modifications to address environmental and economic challenges of this century
- We cannot rely on the Federal Government for all of our funding needs

# The Phenomenon of Predictable Surprise

“Drought, economic collapse and pending doom”, are the predictable cries that have been coming for a long time in the Western U.S. yet the West has continued to ignore the following:

# Ignored Issues in the West

- Inappropriate Water Rights and Allocations
- Groundwater Management and Use
- Real Land-Use Planning
- Water Use Efficiency

.....**and most of the West has assumed:**

- Can Grow as Fast as Desirable
- Can Find New Water to Meet Demand

# Enormous Challenges

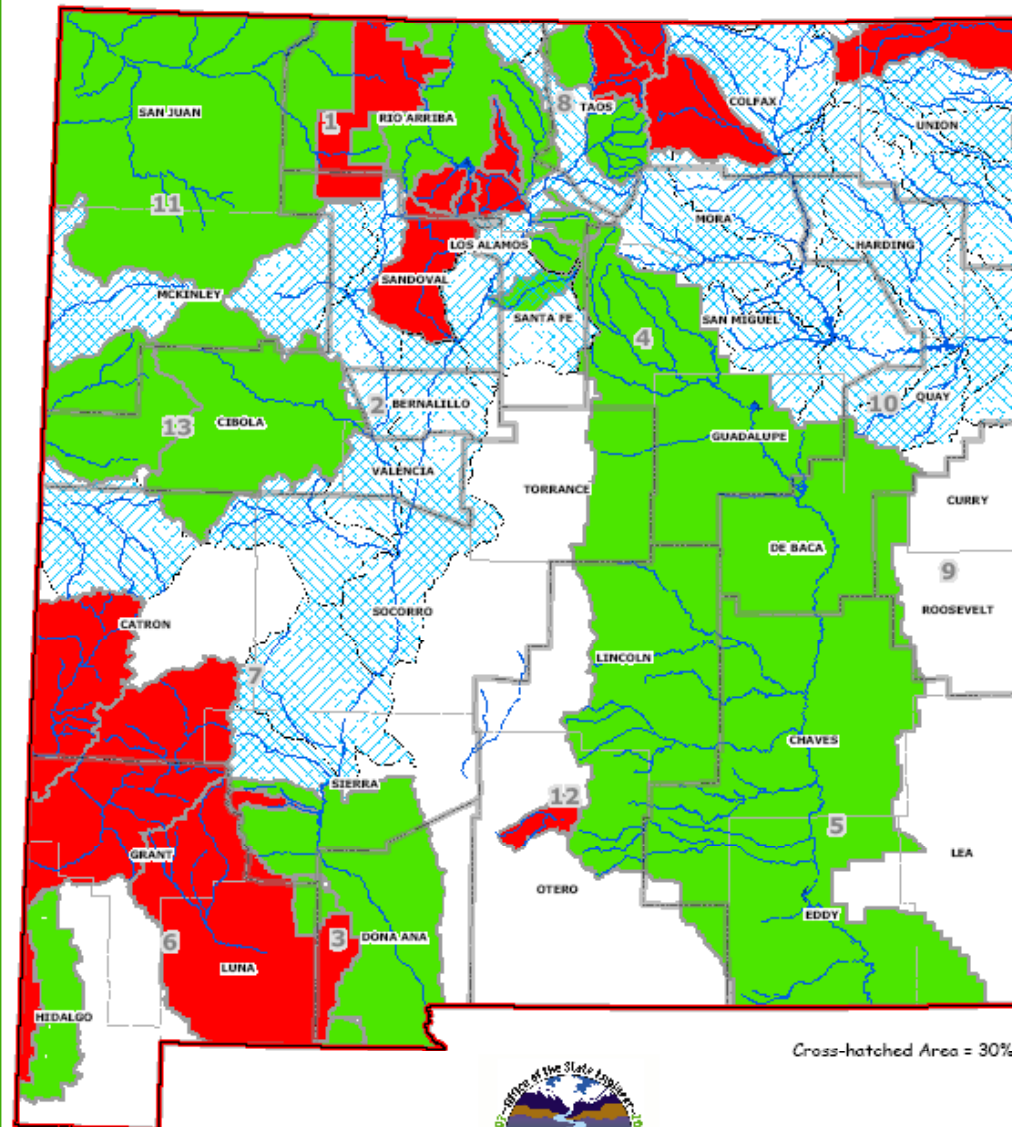
- Huge Demand for Water Infrastructure Projects
- Tremendous Cost of Repairing Old and Building New Infrastructure
- Eliminate Environmental Degradation
- Not Just Infrastructure – Need to Manage the Resource for Certainty of Supply
- What about Climate Change?

# Climate Change in New Mexico

- Evidence is clear – Warming over land and at higher altitudes and latitudes – Changes in snow-pack reducing snowmelt and timing of run-off
- This last decade of drought is now the drought of record in much of the West. (eclipses the 1950's drought)
- Unclear on how temperatures affect our summer monsoons which is extremely important for future water management in New Mexico
- Correlation between Green House Gas emissions from fossil fuels and warming temperatures?

## Water Rights Adjudication in New Mexico

NEW MEXICO ACTIVE (GREEN) & COMPLETED (RED) ADJUDICATIONS  
AND SURFACE BASINS FOR FUTURE ADJUDICATION (CROSS-HATCHED)



Cross-hatched Area = 30%



# Adjudication Reform

- Collaboration with the Administrative Office of the Courts for future adjudications
  - ◆ Best of existing procedures
  - ◆ Evaluation of other states procedures

Goal: Make future adjudication suits faster, more efficient and less intimidating for water rights claimants

# Water Right Licensure

- ◆ Licensing of water rights will greatly facilitate the eventual adjudication
- ◆ Licensed rights are typically recognized by an adjudication court to full extent
- ◆ Reduces contested sub-files in future adjudication, expediting its conclusion
- ◆ Closer to *Certificate of Transferability or Marketability*

# Active Water Resource Management (AWRM)



# Drought Opened Our Eyes



# What is AWRM in Layman's Terms?

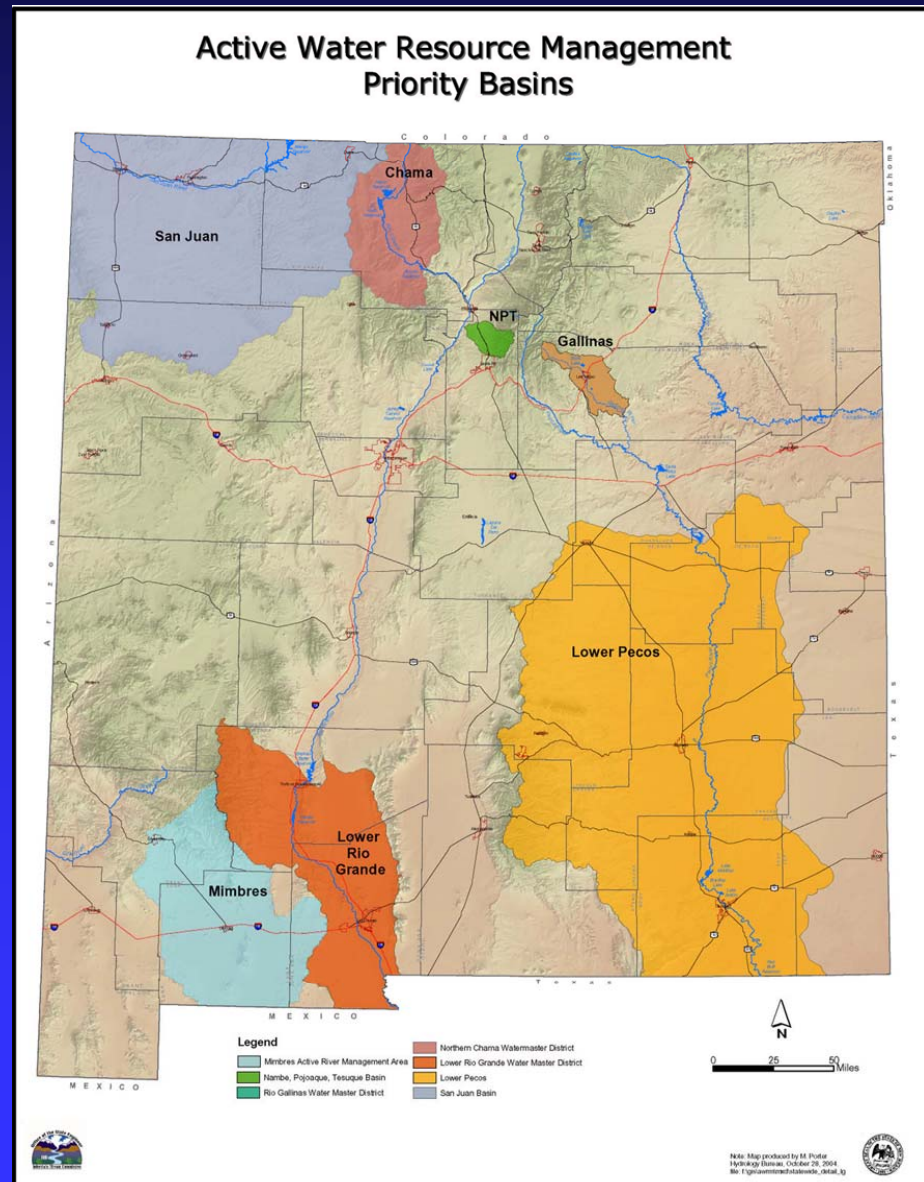
- An Emergency Action Plan to prepare for the inevitable drought cycles in our future as illustrated by our past experiences
- Drought is a slowly evolving natural disaster that requires tools be put in-place ahead of time

“Dig your well before you’re  
thirsty”

- Harvey Mackay

# Active Water Resource Management

- Lower Pecos
- Lower Rio Grande
- San Juan River
- Mimbres River
- Nambe-Pojoaque-Tesuque
- Rio Chama
- Rio Gallinas



# Progress on AWRM

- 84% Statewide Readiness to implement AWRM in 7 key basins (composite)
  - 96% Water Masters and Districts
  - 86% WATERS Database Abstracting
  - 85% Metering and Measuring
  - 69% Technical and Legal Preparation

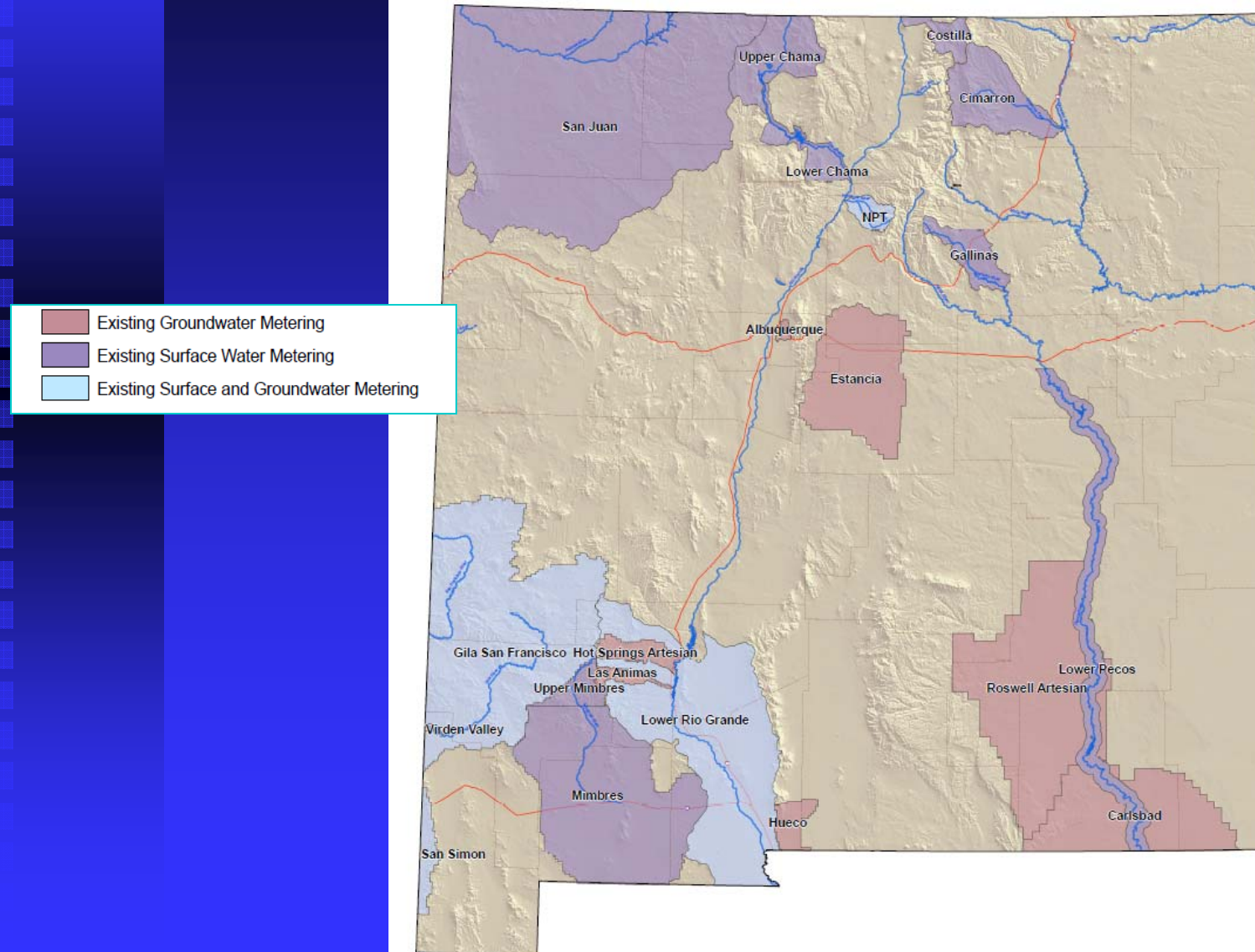
Steps Toward Active Water Resource Management	Lower Pecos	Lower Rio Grande	Mimbres	San Juan	Rio Chama	Nambe- Pojoaque- Tesuque	Rio Gallinas
➤ Designate basin managers and project teams	✓	✓	✓	✓	✓	✓	✓
➤ Develop schedules for implementation of AWRM	✓	✓	✓	✓	✓	✓	✓
➤ Develop district-specific regulations	💧	💧	💧	💧	💧	💧	💧
➤ Establish a budget of metering costs and implementation of metering devices	💧	✓	✓	✓	✓	✓	✓
➤ Develop a plan for communication with the public	✓	✓	✓	✓	✓	✓	✓
➤ Hire water masters for each area of critical concern	✓	✓	✓	✓	✓	✓	✓
➤ Provide training for water masters and other personnel	✓	✓	✓	✓	✓	✓	✓
➤ Develop water master manuals	💧	💧	💧	💧	💧	💧	💧
➤ Abstract water rights files into WATERS database	💧	✓	✓	✓	✓	✓	✓

Key   💧 = Work in Progress   ✓ = Complete

# Metering & Measuring

# Real Time Water Measurement Systems

## Groundwater and Surface Water



# Proposed Metering Process

- Select preliminary locations for meters
- Field inspection with land owners to finalize meter locations
- Ditch agreements in-place to secure state funding
- Construction period during non-irrigation season (Dec. to Mar.)

# Water Masters



**Rio Costilla**



**Cimarron River**



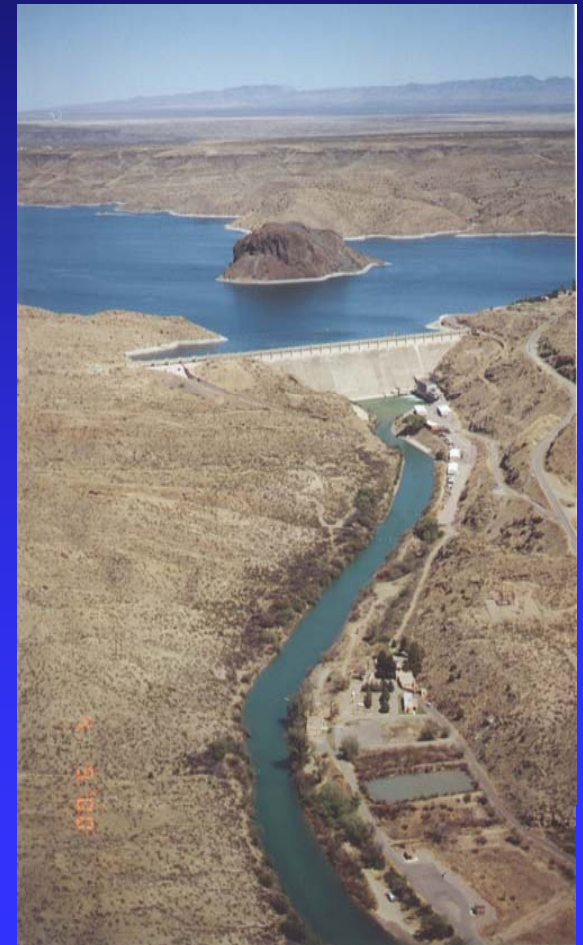
**Pecos River**



**Rio Chama**

# AWRM Regulations

- Are a tool to help State Engineer --
  - ◆ Protect senior water rights
  - ◆ Assure compliance with interstate water compacts
  - ◆ Curtail illegal diversions and over-diversions



# District-Specific Regulations

- District-specific regulations provide the specific forms of priority administration that will be used in each district
- Administration will be conducted by water master



# Priority Administration

- When supply is adequate, no priority administration is necessary
- When supplies are short, junior water right owners are curtailed while seniors receive the full amount of their right
- Priority administration is the only method the law provides

# Alternative Administration “Repartamiento”

- Alternative administration is an alternative to strict priority administration
- Alternative administration plans are based on agreements among affected water right owners and must be approved by the State Engineer

# Alternative Administration “Repartamiento”

## Other options:

- shortage sharing
- rotation
- other agreements
- water banking

# Ditch Inefficiencies















# Surface Water Meters

## Construction Process

### Key Construction Milestones

1. Acequia, Ditch, or Canal Association signs metering agreement
2. Select location of measurement station
3. Prepare site for construction
4. Construct measurement station (place equipment, build forms, pour concrete, connect and enclose instruments)
5. Calibrate newly installed measuring device (develop rating curve)



# Flume Siting and Ditch Preparation



# Flume Construction



# Metering Device Completion



# Real Time Equipment

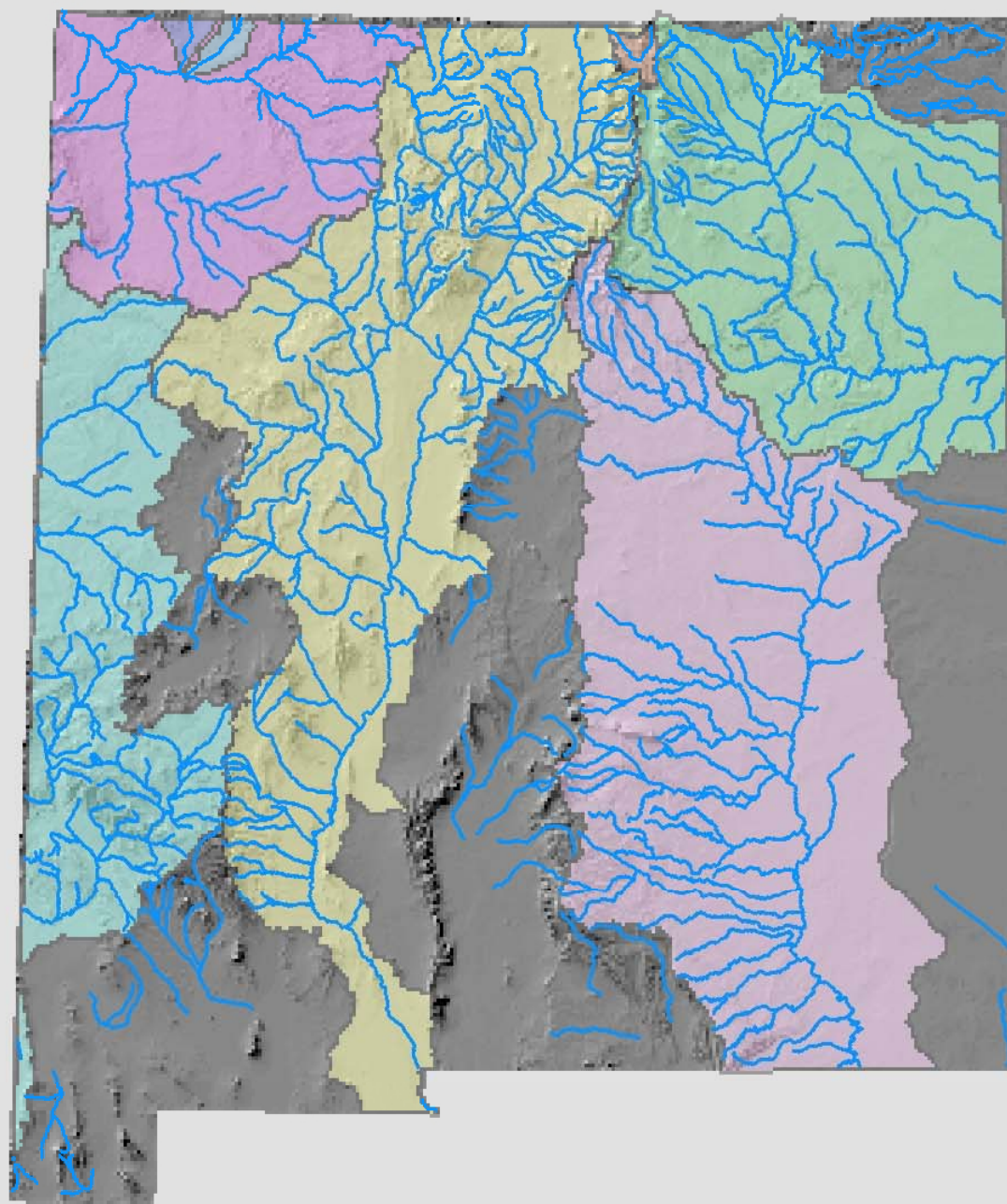


# Construction Complete



# Interstate Compacts





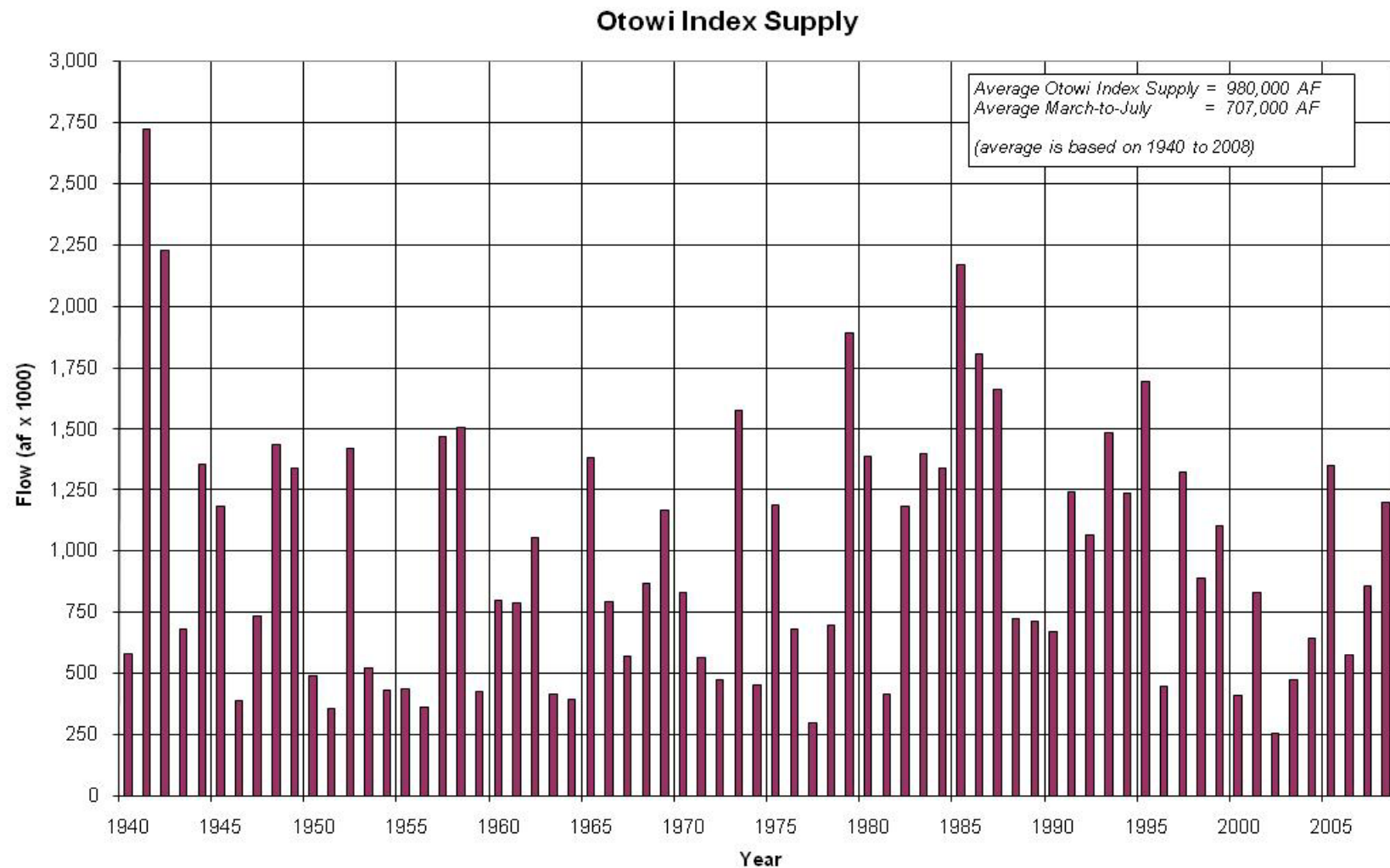
### Legend

#### INTERSTATE COMPACT BASINS

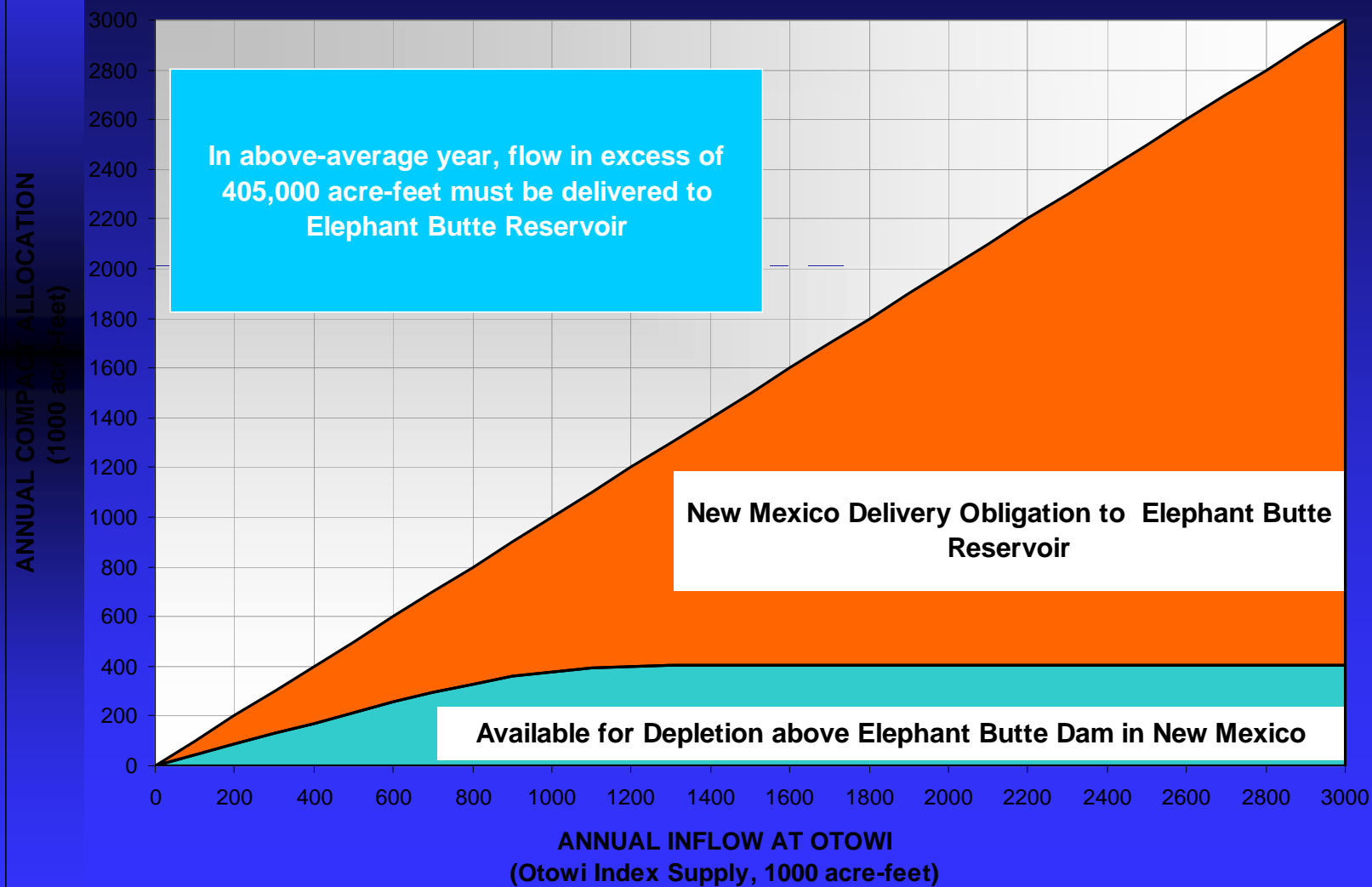
##### REGION

- ANIMA-LA PLATA
- CANADIAN RIVER COMPACT
- COLORADO RIVER COMPACT
- COSTILLA CREEK COMPACT
- LA PLATA
- PECOS RIVER COMPACT
- RIO GRANDE COMPACT
- UPPER COLORADO COMPACT

# Variable and Limited Surface Water Supply

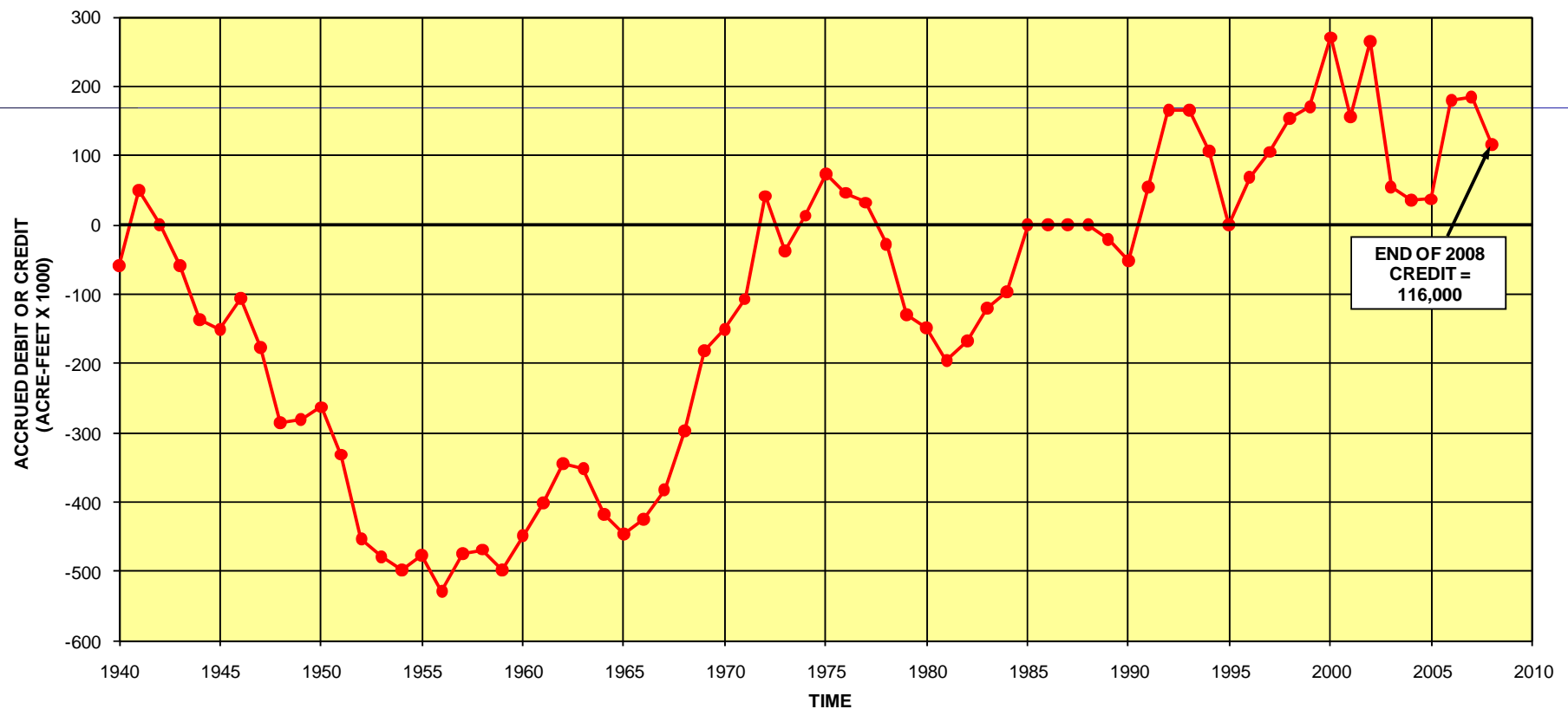


# New Mexico's MRG Compact Delivery Obligation



# New Mexico's Accrued MRG Compact Compliance

NEW MEXICO'S END-OF-YEAR RIO GRANDE COMPACT COMPLIANCE STATUS



# Clogged Rio Grande Floodway (1952)



Looking downstream from south boundary of Bosque del Apache

## The Bosque del Apache Sediment Plug (2008)



# The Elephant Butte Delta Pilot Channel

Pilot channel construction



Aerial view of pilot channel



Pilot channel construction

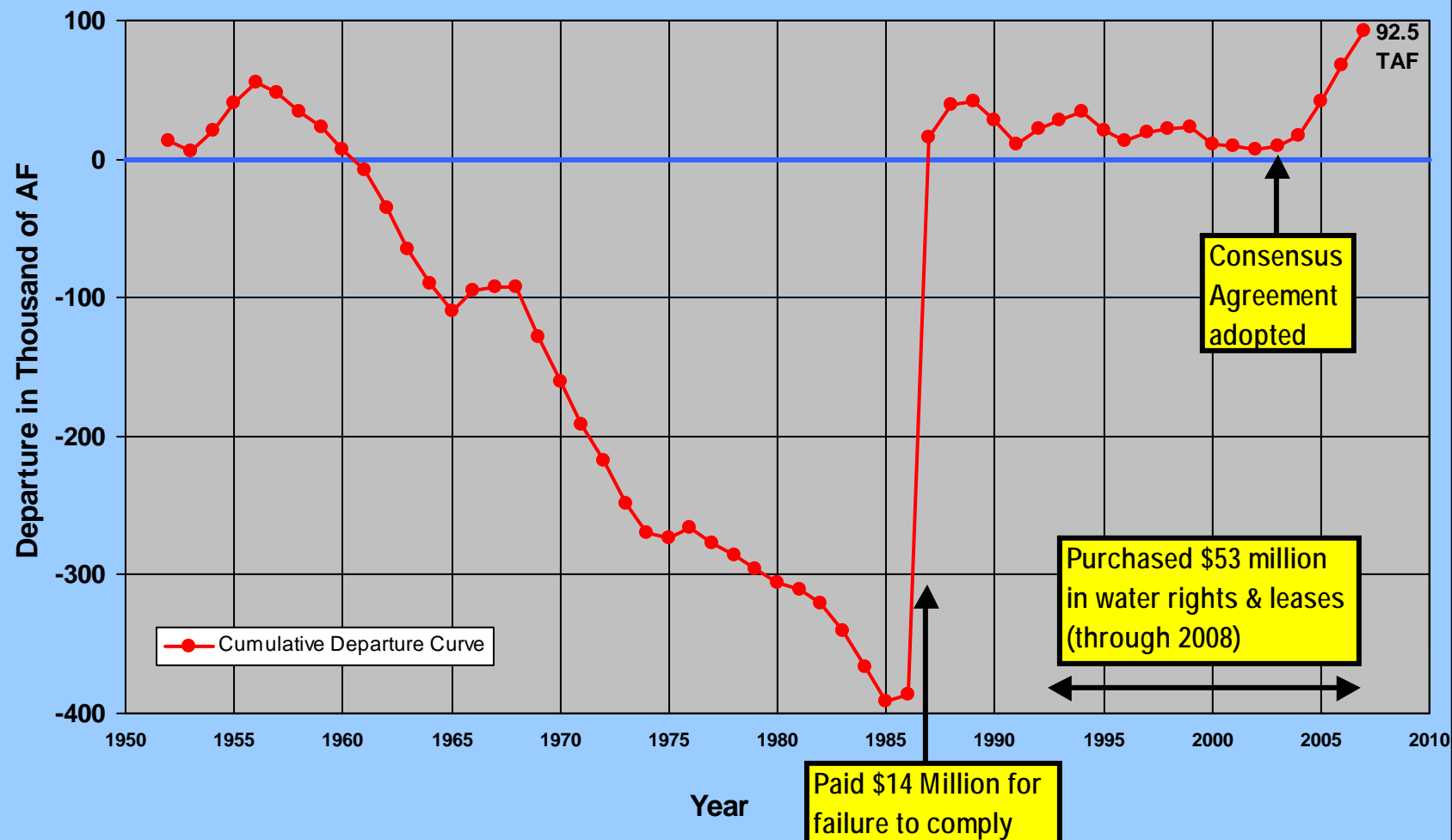
# Settlement Agreements



# Pecos Settlement



## Pecos River Cumulative Delivery Departures from Obligation 1952 - 2007



# Colorado River

## Seven Basin States Agreement

NM, CO, WY, UT, AZ, NV, CA

- Lower Basin shortage/surplus guidelines
- Coordinated operations through 2026
- Storage of Lower Basin Conserved water
- Snowpack augmentation, conservation activities, and augmentation of supplies
- State Department coordination with Mexico

# Three Settlements – Six Tribes

- Navajo Settlement
  - ◆ San Juan Stream System
  - ◆ Navajo Nation
- Aamodt Settlement
  - ◆ N-P-T Stream System
  - ◆ Four Pueblos: Nambé; Pojoaque; Tesuque; and San Ildefonso
- Taos Settlement
  - ◆ Taos/Hondo Stream System
  - ◆ Taos Pueblo



# Local Agreements Signed

- Navajo: April 19, 2005

- *Aamodt*: May 3, 2006

- Taos: May 31, 2006



Navajo



Aamodt

# Indian Water Right Settlements

## ■ Navajo Settlement

- ◆ Federal authorization included in the Omnibus Land Management Act Signed by President Obama on March 30, 2009

## ■ Taos Settlement

- ◆ Federal legislation introduced : Senate May 4, 2009; House July 17, 2009

## ■ Aamodt Settlement

- ◆ Federal legislation introduced : Senate May 20, 2009; House July 24, 2009

# Indian Water Right Settlements

## ■ Challenges

- ◆ Aamodt and Taos – Passed House in Jan. 2010 now stuck in Senate
- ◆ Continued need for state cost-share funding through the Indian Water Rights Settlement Fund (Estimated need of \$105 Million over the next 10 years)
- ◆ Federal Appropriations of nearly \$ 1.2 Billion for all three settlements

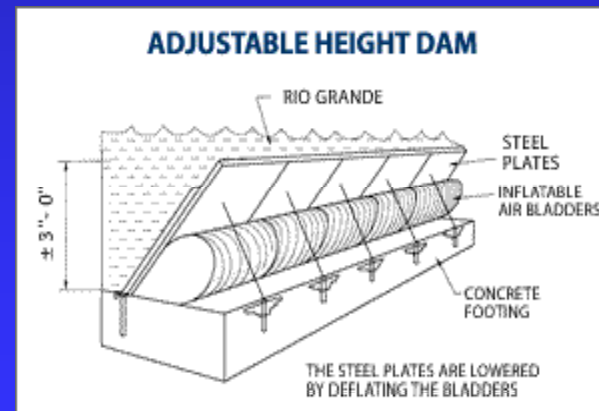
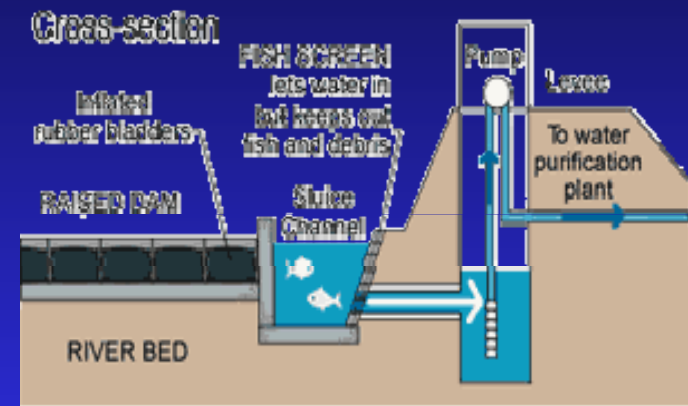
# Large Infrastructure Projects



# ABCWUA-San Juan Chama Drinking Water Project

- Construction cost estimate \$385 M
- Completely rate payer funded
- Consumptive use of water 48,200 ac-ft/yr
- Project to supply water to Albuquerque residents by the end of 2008

# The ABCWUA Surface Water Diversion



# **City of Santa Fe – Buckman Direct Diversion (San Juan-Chama Water)**

- Construction cost estimate \$215 M - \$230 M
- City and County of Santa Fe will pay majority of construction and start-up costs
- Funding and loans received to-date:
  - ◆ \$15M loan NMFA
  - ◆ \$6M Water Trust Board
  - ◆ \$400 K other grants
- San Juan-Chama Diversion – 5,605 ac-ft /yr (64%)
- Permitted capacity – 8,730 acre-feet

# **ENMRWA – Ute Pipeline Project (Canadian River)**

- Federal authorization included in the Omnibus Land Management Act Signed by President Obama on March 30, 2009
- State funding appropriated to date \$16.6M
- Ute Dam const. 1962 – present day cost \$140M
- Completed project to provide 16,000 ac-ft/yr to New Mexico eastern communities

# ENMRWA – Ute Pipeline Project

## ■ Challenges State and Federal Appropriations

- ◆ Construction cost estimate \$436 Million

- ◆ State \$65.4M (15%)

- ◆ Local \$43.6M (10%)

- ◆ Federal \$327M (75%)

# Gila Project (Gila River)

- Construction cost estimate - To Be Determined
- 2004 Arizona Water Right Settlement Act provides potential benefits to New Mexico
  - ◆ 14,000 ac-ft/yr of water
  - ◆ \$66-\$128M federal funding
- State funding appropriated to-date \$800 K
- Federal funding appropriated to-date \$600 K

# Gila Project

## ■ Challenges

- ◆ How to develop additional water in the Gila Basin without impairing its unique and valuable ecology
- ◆ On-going studies: economic, demographic, ecological, and hydrologic
- ◆ NEPA/ESA analysis conducted on all AWSA activities

# Animas - La Plata Project (Animas River)

- Construction cost estimate - \$552M (Oct. 2006)  
\$338M (at authorization ) - \$500M (2003)
- Cost sharing/Repayment for non-tribal entities (NM)
  - ◆ San Juan Water Commission 3.18% \$6.92M
  - ◆ La Plata Conservancy District 1.64% \$3.57M
- Allowable New Mexico Depletions
  - ◆ Navajo Nation 2340 ac-ft/yr
  - ◆ San Juan Water Commission 10,400 ac-ft/yr
  - ◆ La Plata Conservancy District 780 ac-ft/yr

# Navajo-Gallup Pipeline (Navajo Reservoir)

- Construction cost estimate \$984 M
  - ◆ State share \$50M
  - ◆ Local \$48-67M
  - ◆ Federal \$867-886M
- State funding appropriated to-date \$31.2 M
  - ◆ Cutter lateral (\$16.6M)
  - ◆ Gallup Regional Water Supply System (\$14.6M)
- Completed project to provide ~21,000 ac-ft/yr C.U.
- Federal legislation pending to authorize construction

# Other Issues



- Strategic Water Reserve
- ESA Issues
- Deep Aquifers – Brackish Water
- Energy/ Water Nexus (bio-fuels, solar, wind, geothermal)
- State/Regional Water Planning
- Dam Safety
- Domestic Wells

# ESA Projects: COA BioPark and Alameda Restoration

Construction of off-channel refugia



In-channel habitat restoration



Fish propagation and habitat restoration

# ESA Projects: The Los Lunas





# State Water Planning

- Identify water resources needs – protect water from exportation
- Put water to Beneficial Use by building infrastructure: points of diversion, dams and storage facilities, pipelines and open channel conveyance structures, pumps, water treatment facilities, etc.
- Most large projects, especially rural, should include as many smaller community needs (regional systems) and will require federal cost share assistance

# State Water Plans

- Periodically updated (5yrs)
- Include water supply/water demand updates
- Include population projections
- “Gap Analysis” to identify growing gap between water supply and water demand
- Water supply should require a conjunctive use analysis (address the affects of groundwater pumping to surface water supplies)

# Addressing the Water Supply Gap

- Fully appropriated river basins should be closed to new appropriations
- New uses accommodated through administrative transfers from Ag to M&I
- Best conservation practices and per capita use restrictions for municipalities –limit outdoor watering and utilize re-use water
- Develop new sources of supply such as desalination of brackish water
- Bulk transfers into higher demand areas
- Identify infrastructure requirements

# Desired Federal Assistance

- Peer reviewed technical support
- Funding Support for:
  - ◆ State's water planning efforts
  - ◆ Development of IWRM criteria (to include avoidance of crisis and conflict)
  - ◆ Accountability tools to verify compliance with IWRM readiness to proceed criteria
  - ◆ Design and construction of prioritized infrastructure projects that meet criteria

“ In politics, strangely enough, the best way to play your cards is to lay them face upward on the table”

- H. G. Wells