## THE ROLE OF TECHNOLOGY IN ACTIVE WATER RESOURCE MANAGEMENT

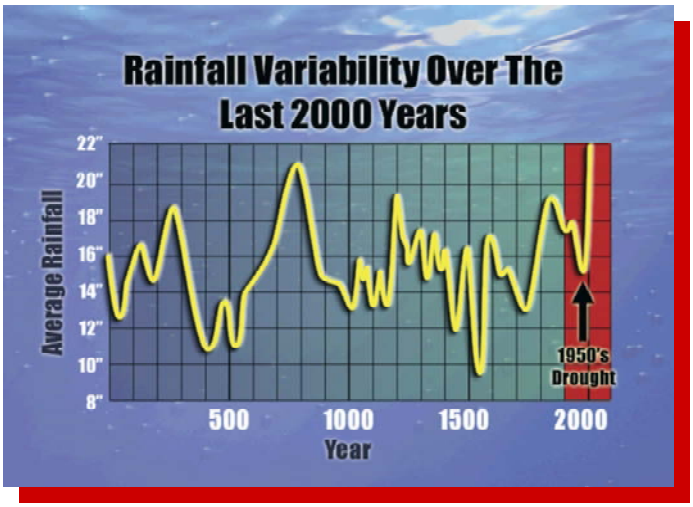
John D'Antonio, PE
New Mexico State Engineer

John D'Antonio was appointed as the New Mexico State Engineer by Governor Bill Richardson in January 2003. He also serves as Secretary of the Interstate Stream Commission; chairman of the Water Trust Board for the State of New Mexico; the New Mexico Commissioner to the Rio Grande Compact and to the Costilla River Compact. D'Antonio is a registered professional engineer in New Mexico and Colorado. He has experience in hydraulic design, acequia rehabilitation, water resource management, and water policy development. He was Cabinet Secretary of the New Mexico Environment Department in 2002; Director of the Water Resource Allocation Program for the Office of the State Engineer from 2001 to 2002; District 1 Supervisor in Albuquerque from 1998 to 2001; member of the Governor's Blue Ribbon Task Force on Water Issues from 1998-2002. Before that, D'Antonio worked 15 years with the US Army Corps of Engineers as a hydraulic design engineer, as the Chief of the Hydrology, Hydraulics, Sedimentation, and Floodplain Management Program and was the project manager for the Acequia Rehabilitation. A native New Mexican, D'Antonio received a bachelor's degree in civil engineering from UNM in 1979 and pursued graduate coursework in water resources engineering hydraulic structures, and water resource administration.

The Office of the State Engineer (OSE) and the Interstate Stream Commission (ISC) are separate but companion agencies charged with administering the state's water resources. The agencies have power over the supervision, measurement, appropriation, and distribution of almost all surface and ground water in New Mexico, including streams and rivers that cross state boundaries. The State Engineer is also secretary to the ISC and oversees the staff of both agencies. He is the primary advisor to State government on water management.

As you know…we live in an arid state…with an inconsistent water supply.
It is a challenge to manage New Mexico's water resources.

It is a challenge to prioritize our limited reserves.




Currently…we are in a period of drought. But…drought periods are a common part of the natural cycle for New Mexico…if you look at a broad timeline.

This graph displays annual tree-ring data smoothed using a 100 year moving average …which indicates drought is more the norm for this area…than it is an anomaly. It shows that drought visits the state in recurring cycles. A major drought occurred in the 1950s and again in the 1970s.

-- In the 1980s and 1990s….the state experienced uncommonly wet years.

-- In fact…we have averaged more rainfall over the last twenty years than we have had over the last twenty centuries….as this graph shows.

-- Also…most of the state's population growth occurred during the time period where there was little or no drought.

# Truchas Peak

Even though we've had a reasonable amount of snow…and rain…this past winter in many parts of the state…drought conditions are still predicted for next year…. And…they may persist for several years beyond that.

It will take several years of good snowpack and precipitation to restore reservoir levels…to the state they were in four years ago.

# Elephant Butte Reservoir

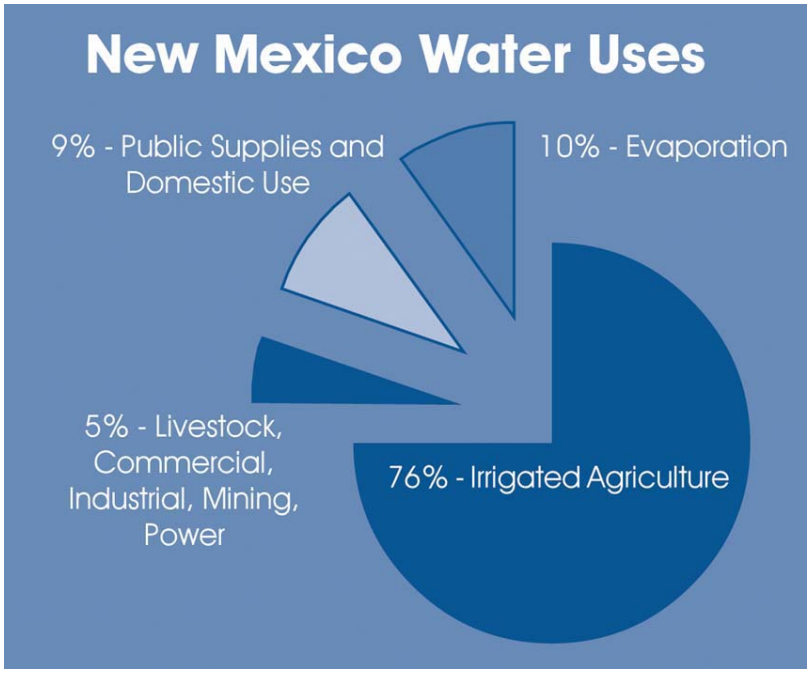
This is an aerial photo of Elephant Butte Reservoir…taken near the end of February 2004.
I just mentioned that it will take several good snowpack seasons for many of the reservoirs to fill. In some cases, such as at Elephant Butte Reservoir and El Vado Reservoir, it could take numerous years before we observe water levels similar to those of the 1980's and 90's because of the drought and storage limitations of the Rio Grande Compact, respectively.

# Navajo Reservoir

And…Navajo Reservoir….
That is why we estimate…that it will take several years to emerge from the drought situation…even if we have a few years of good snow pack and precipitation.

It will take time…and likely several wet years to turn things around.

# 2003




Here is a graph…showing total water use for 2003 by humans…which still holds true for today. (please note that this graphic DOES NOT take riparian vegetation water use into account. It really reflects human water use not total water consumption within the state).
It might surprise you to learn that industry… manufacturing…mining… and power plants collectively…only use about 5-percent of the total amount of water available for use.

About 10-percent is lost to evaporation…

…9 percent is allocated to municipal and residential use…

….and 76-percent…the largest amount…is allocated to agricultural use.

# Active Water Resource Management (AWRM)

## What is it?

The Office of the State Engineer is taking proactive steps to manage our state's water resources…in all these categories.
We are calling that effort….Active Water Resource Management….or A-W-R-M.

What is A-W-R-M?

# Active Water Resource Management (AWRM)

- **Refers to a broad range of activities including permitting transfers, monitoring and metering diversions, and limiting diversion of water to the amount authorized by existing water rights**

A definition of A-W-R-M is:

-- a broad range of activities including permitting transfers of water…monitoring and metering diversions of water…and limiting diversion of water to the amount authorized by existing water rights.

# New Mexico Water Law: Doctrine of Prior Appropriation

The basis for water law in the State of New Mexico…is the Doctrine of Prior Appropriation.

That means…that senior water rights…or the first water users to "put the water to beneficial use" in our state…have priority…over more junior water users.

Under the state constitution…the senior water right holders have priority.

# Article XVI, Section 2

- **"The unappropriated water of every natural stream, perennial or torrential, within the State of New Mexico, is hereby declared to belong to the public and to be subject to appropriation for beneficial use, in accordance with the laws of the state."**
- **"Priority of appropriation shall give the better right."**

Article XVI…Section 2… of the New Mexico constitution states:

"The unappropriated water of every natural stream…perennial or torrential…within the State of New Mexico…is hereby declared to belong to the public and to be subject to appropriation for beneficial use…in accordance with the laws of the state.

"Priority of appropriation shall give the better right."

Priority administration is the tool for the use of the Doctrine of Prior Appropriation.

Priority administration is the tool for water rights administration within the state in times of drought.


In times of shortage in New Mexico…the more senior water rights can be served by the available water supply…first. The more senior water right holders in our state…typically include: Native Americans… acequias…and agricultural water users.


Junior water right holders….typically include: Industrial or commercial water users… municipalities…. residential water users…and recreational water users.

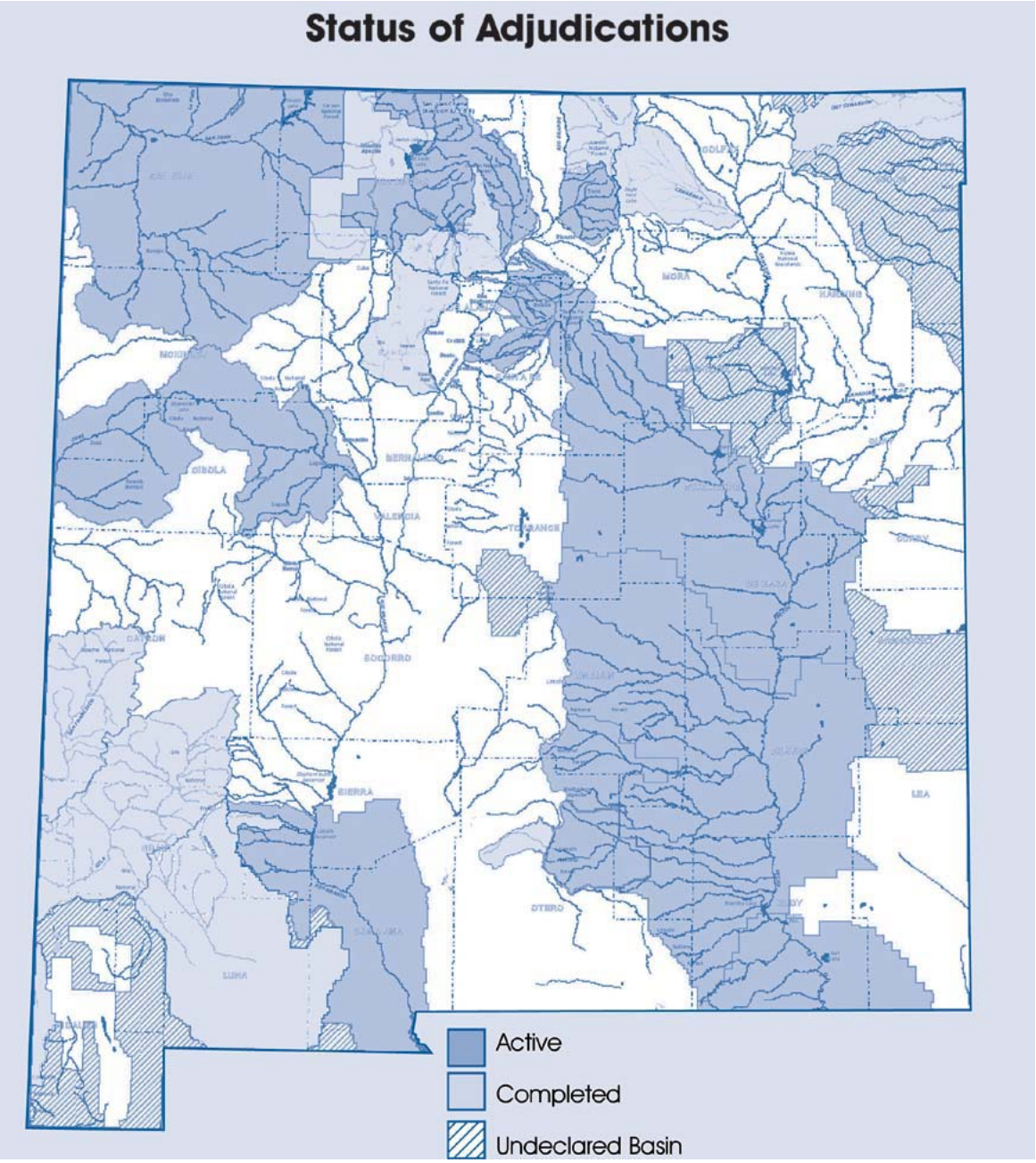
BUT…it is important that ALL WATER USERS become actively involved in the problem-solving process during periods of shortages… and to identify other options in response to drought.

## Adjudication of Water Rights

### Who owns what water and in what amount

So every water user gets their fair share….it is important that all the state's water be adjudicated.

A simple definition of adjudication is…to determine…who owns what water…and in what amount.




At the present time…only 20 percent of New Mexico's water rights have been fully adjudicated…as indicated in light blue on this map.

But…we are actively involved in adjudication of water basins that comprise about 60 percent of the state….indicated in dark blue on the map.

However, a more pressing need is preparing our critically water-short basins with rules and regulations and enforcement capabilities…to enact active water management administration.

# Other Options

- **Shortage Sharing**
- **Rotation**
- **Water Banking**

All water users are encouraged by the State Engineer to become actively involved…in the problem solving process to find a way to SHARE in the SHORTAGES…and to discover other options during this time of drought…

So requiring the state Engineer to make a "priority call" would be a measure of last resort.

Other options to priority administration
include:
…voluntary shortage sharing…
…voluntary rotation…
…even the concept of water banking
…could be explored in times of drought.

# Other Options

- **Shortage Sharing – voluntary agreement among multiple water right owners (farmers, municipalities, businesses, Native Americans, and others)**
- **Has worked successfully in the San Juan Basin**

Shortage sharing is a voluntary agreement among multiple water right owners – for
example between farmers… municipalities
…businesses…Native Americans…and others – to share available water supplies under existing conditions.

A shortage sharing agreement has worked successfully in the San Juan Basin…for example.

Water banking is where senior water right holders retain their water rights…but agree to lease water for another purpose…(be it municipal use, recreational use, industrial use)..while getting paid for the use of water during times of drought. It makes sense, especially if a farmer for example would only get a marginal crop one year, he could opt to lease some of his water… and let his field go fallow one year.

# Other Options

- **Rotation – agreements work when water users take water only on certain days, according to a set schedule that is agreed upon by all water users sharing a source**
- **Successful in agricultural communities along the Jemez River, where non-Indians and Pueblos share water**

--Voluntary rotation agreements work when water users take water only on certain days… according to a set schedule…that is agreed upon by all water users…sharing a source.

--Agricultural communities…have used rotation successfully on the Jemez River…where non-Indians and Pueblos share water supplies.

# Other Options

- **Water Banking – allows the expedited, short-term reallocation of water through a market-based system, while protecting the senior status of water right holders**
- **Pilot Projects – planned for northern and southern irrigation districts**

-- Water banking…allows the expedited, short-term or temporary reallocation of water through a market-based system…while still protecting the senior status of water right holders.

-- Pilot projects are planned…in northern and southern irrigation districts

-- If the pilot projects prove effective…the water banking concept could be expanded to assist municipal… industrial…recreational… and drinking water uses in addition to providing water for endangered species and compact delivery requirements…especially during periods of drought.

-- With limited water supplies during the drought…if a farmer knows he may only have a marginal crop…he could opt to fallow…some tracts…and "bank" the water he does not use for other uses…for loan to another water use in need of water. The farmer would receive fair compensation for the lease of his water…and would still retain his senior water rights status.

# Technologies Needed

- **Accurate Data Collection and Dissemination**
- **Prediction and Evaluation of Alternatives**
- **Communication**
- **Implementation**

-- In order to effectively and efficiently conduct AWRM, in addition to priority of water right information, we need technologies that will improve the quality of collected data and timeliness of its use. In many AWRM situations, near real time data is required.

We also need technologies that will help us better predict upcoming river flow conditions (snowmelt runoff and summer thunderstorm induced river flows), have the ability to evaluate various possible water management alternatives given the probable flow conditions, and develop strategies to implement preferred alternatives.

We need to then be able to effectively communicate the range of alternatives and the preferred alternative(s) to decision makers, stakeholders, and the general public.

Finally, we need to be able to implement the alternatives and quickly evaluate their effectiveness such that changes can be made as needed. Technologies that help us implement water banking/marketing are needed here.

# Technologies Needed (Cont'd)

- **Accurate Data Collection and Dissemination**
  - **Aerial Distribution of Snowpack and Soil Moisture**
  - **Surface water (SW) flow**
  - **Cropping Patterns and Types**
  - **Crop and Riparian Area ET**
  - **Open Water Evaporation**
  - **Groundwater (GW) Conditions and Pumping**
  - **SW/GW Interactions**

--These are general areas in which the State Engineer currently collects or supports the collection of basic data to aid in water management, water salvage or habitat restoration projects, permitting, and adjudications.

The distribution of snowpack and antecedent soil moisture conditions are important in better estimating snowmelt runoff (the major source of surface water for irrigation. I know that remote sensing and land surface modeling research are being conducted to aid in this and I support those types of efforts. Unfortunately, it seems to me that one of the bigger variables in estimating snowmelt runoff is weather (rain, snow, and wind). I'd sure like to have a better feeling in January of what the weather holds for us over the next 4 months then I do today. As things sit now, we have limited faith in snowmelt runoff predictions until April or latter. Given that most irrigation and municipal water use has started by that time, it doesn't give us much, if any, room to develop alternative plans. We almost always have to assume the worst and hope things don't get that bad.

Surface water flow. Even the best gages have accuracies on the order of 5% over the course of a year and some of the worst (sand bed channels) can be way off (20-35%). On daily basis, some of our sand bed channel gages (San Marcial) can be off by 50%. When you are trying to manage water delivery to a farmer on the order of 1 cfs or manage flow at San Marcial to meet a target flow of 50 cfs, having accurate data and being able to utilize that data on a near-real time basis is critical. We, the federal government, and several irrigation districts have spent and continue to spend a lot of money improving data collection and dissemination but more work is needed (especially on accuracy).

Cropping patterns and types plus ET – We collect and utilize this type of data today (aerial photography, remote sensing) for adjudications and estimates of ET affects on the water balance. But, currently, this type of data is costly; only available for certain selected periods of time; and those time periods are usually widely separated (multiple years if not tens of years). Right now it can take a decade or more for an adjudication to be finalized. While that adjudication is wending its way through the courts land uses are changing and people can't stop what they are doing to wait on the outcome of the court proceeding. Therefore, In order to better conduct and track adjudications, we need to track changes in land use (consumptive use) on a more frequent basis and make that information more readily available to the water managers.

In order to implement effective water banks, we need to track the changes in water use to ensure that the water use under the agreement is in fact that planned.

The other data collection areas are used by the OSE/ISC to track compliance with interstate stream delivery obligations, to evaluate projects to aid in meeting delivery obligations, and to ensure that junior groundwater pumping impacts to the river system are offset.

# Technologies Needed (Cont'd)

- **Prediction and Evaluations of Alternatives**
  - **Physical System**
    - **Snowmelt runoff**
      - **Surface Water routing (reservoirs, rivers, and use areas)**
    - **Surface Water/Groundwater Interaction**
    - **Consumptive Use**
  - **Institutional Controls**
    - **Compacts**
    - **Priority of Rights**

-- Here let me just say that we need tools (models, spreadsheets, etc.) that allow us to link the physical system and the institutional systems such that AWRM alternatives can be evaluated and predictions can be made as to how much water a water right holder may receive under varying hydrologic situations.

These tools can range from sets of rules to EXCEL spreadsheet models to surface water routing models to linked surface water groundwater models. We are using many tools today and I understand that Rolf and Nabil have given presentations on a couple of specific tools my office uses. I'm proud of the work we have done and are doing but I think area where more work is needed is to link the physical system and institutional controls in such a way that they can be used to make daily water management decisions.

# Technologies Needed (Cont'd)

- **Communication**
  - **Tools that help us describe complex situations in a manner that is readily understandable to decision makers and the public**

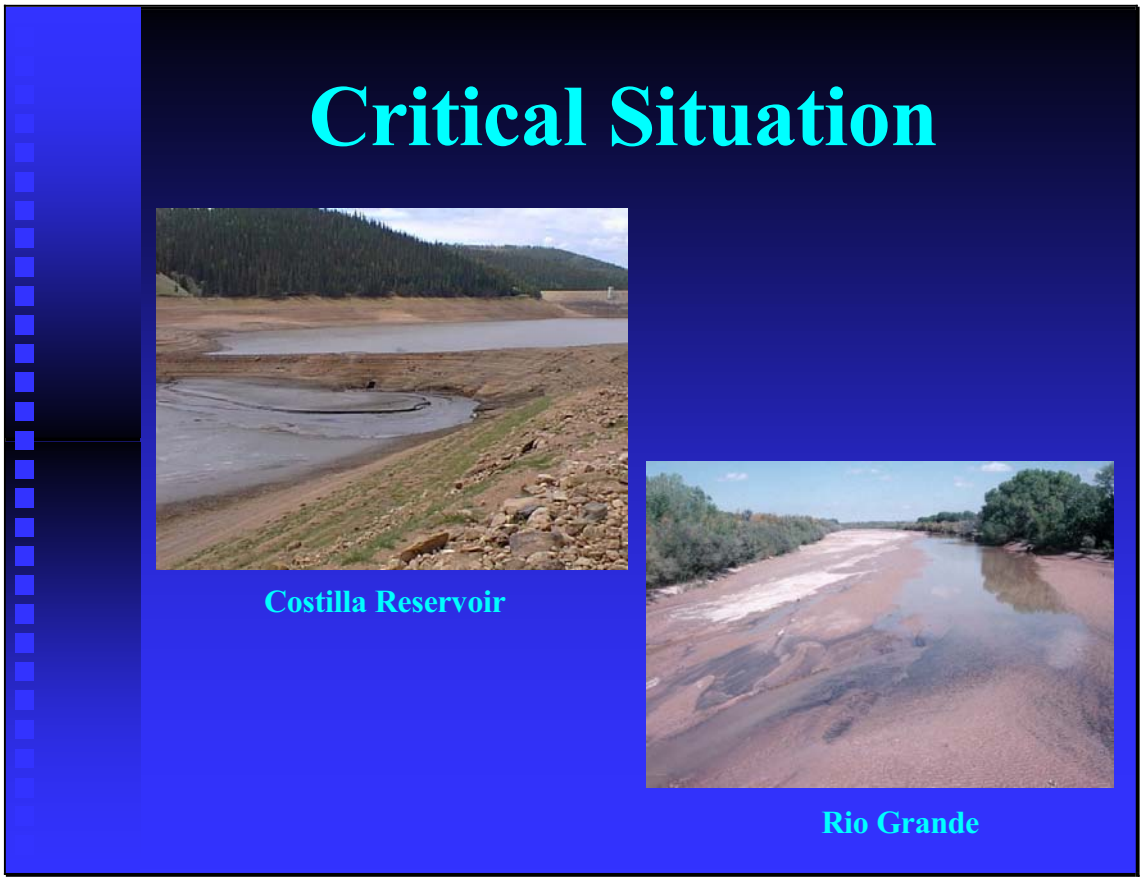
-- Based upon my experiences to date, a lack of ability to communicate the relative differences between alternatives, the risks or legal constraints associated with the alternatives, and why a particular alternative was selected can have significant detrimental effects.

Screening tools, such as the Sandia PowerSim modeling work, that attempt to link and describe the covariance between multiple critical parameters in a communication friendly way can prove very helpful in this effort. But, before doing so, you the scientists need to ensure the background work (be it basic data or models) and interrelations between variables are sufficiently understood that the results of the communication friendly tools are defensible or that the limits of accuracy are described.

# Technologies Needed (Conc.)

- **Implementation**
  - **Day-to-day actions**
  - **Documentation**

--Here, we need tools that will help my water masters conduct AWRM in a legally defensible manner. These tools can be as simple as sets of rules given an input flow regime but may extend to complex models such as those that can allow water banking to occur on a daily basis in a manner that does not impair senior rights or compact deliveries and that links the water management actions of the state to the actions of other water managers.




The Office of the State Engineer HAS NOT FACED such a critical situation before…where ever increasing demand is putting such a strain on our state's water supplies.

Balancing the needs of all water users…is more difficult now than ever before.

With all stream systems running extremely low …measuring and metering…are key to making sure all water users get their fair share during times of drought…and that is going to take money…time…and people to make it happen.


With all of the problems on New Mexico's rivers and streams…including drought-related issues…the State Engineer has an administrative dilemma.

Due to budgetary and resource constraints…we need to come up with a way to provide services out in the field.

The State Engineer decided to use a bill…
recently passed by the state legislature…in
conjunction with existing statutes to attempt to provide real time administrative services in the field.

# Active Water Resource Management

## What is the plan as we move forward?

What is the plan…as we move forward.

It is important for the Office of the State Engineer to be prepared for the challenge…of continued drought conditions…and that our agency have a plan in place for Active Water Resource Management.

Some of the proactive steps the State Engineer is taking include:

# Proactive Steps to AWRM

- **To organize selected staff members into teams in each of the critical basins**
  - **Project Manager**
  - **Attorney**
  - **Hydrologist**
  - **Water Rights Expert**

It is important that the Office of the State Engineer be prepared for the challenge of continued drought conditions…and that our agency take proactive measures toward Active Water Resource Management… or AWRM.

Already….I have organized selected staff members into teams…in each of the critical basins…including:
-- a project manager…familiar with the area
-- an attorney familiar…with water law in the area
-- a hydrologist…
-- an expert in water rights for each area

# Proactive Steps to AWRM, con't.

- **Critical Basin Teams also include:**
  - **Financial Manager**
  - **Personnel Manager**
  - **Communication Manager**
  - **Database Manager**
  - **Legal Manager**
  - **Coordinator with State Water Plan implementation**

Each team also includes global members that serve a resources for each of the basins.

They include:
-- a financial manager…who is familiar with state finances and water master district budgets…
-- a person responsible for hiring and filling water master positions…
-- a communication expert…who is responsible for public communication needs…
-- a person to make sure critical information makes it into databases…
-- a legal resource…
-- and…someone to coordinate these efforts with the implementation of the State Water Plan

# Proactive Steps to AWRM, cont'd.

- **To develop and implement a schedule for creating water master rules and regulations**

It is important that the Office of the State Engineer be prepared for the challenge of continued drought conditions…and that our agency take proactive measures toward Active Water Resource Management…or AWRM.

AWRM includes implementation of water rights administration in New Mexico…under Prior Appropriation Doctrine.

1. To organize selected staff members into teams…in each of the critical basins
2. To develop and implement a schedule for creating water master rules and regulations

# Proactive Steps to AWRM, cont'd.

- **To establish a realistic budget of metering costs, rules and regulations, and field implementation and enforcement**
- **To develop a plan to communicate with the public**

3. To establish a realistic budget of metering costs…rules…and regulations…and field implementation and enforcement…
4. To develop a plan to communicate…with the public…

# Proactive Steps to AWRM, cont'd.

- **To create and hire a water master for each critical basin**
- **To train water masters and other personnel**
- **To administer water in each critical basin**
- **To set feasible short-term and long-term objectives**

5. To create and hire a water master for each critical basin…
6. To train water masters and other personnel…
7. To administer water in each critical basin…
8. To set feasible short-term and long-term objectives..

# Proactive Steps to AWRM, Cont'd.

- **To create a Project Review Board charged with:**
  - **Periodic review and oversight of implementation progress**
  - **Establishing policy to provide fair, consistent, and workable solutions to policy decisions made**

And finally…to create a Project Review Board…that is charged with:

- Periodic review and oversight of the implementation progress in each of the basins where we have established a water master district…and water master operations by the end of 2005…
- Considering alternatives and establishing policy needed to provide fair, consistent, and workable solutions to the numerous policy decisions we will make along the way…

# Proactive Steps to AWRM, Concluded

- **Project Review Board agenda will be**
  - **Review of tasks, schedules, and implementation responsibilities**
  - **Identification and initial discussion of overarching policy**
  - **Consideration of proposed rules**

The Project Review Board agenda will be:

- To review tasks, schedules, and implementation responsibilities…
- The identification and initial discussion of overarching policy issues and decisions that must be made
- And…the consideration of the proposed general rules.

# Active Water Resource Management

## What are the priority areas around the state?

In anticipation of the drought continuing…I have identified the following priority stream systems…around the state:

## Priority Stream Systems

- **Rio Gallinas**
- **San Juan River**
- **Rio Pojoaque**
- **Rio Chama**

The top four priority stream systems are:

1) Rio Gallinas
2) San Juan River
3) Rio Pojoaque Stream System…which includes four Pueblos of Nambe, Pojoaque, Tesuque, and San Ildefonso
4) And… the Rio Chama

## Priority Stream Systems

- **Lower Rio Grande**
- **Pecos River**
- **Mimbres River**
- **Rio Peñasco**
- **Rio Hondo**

Other priority stream systems to be addressed …in coming years include:

…1) The Lower Rio Grande
…2) The Pecos River
…3) The Mimbres River
…4) Rio Peñasco
…5) Rio Hondo

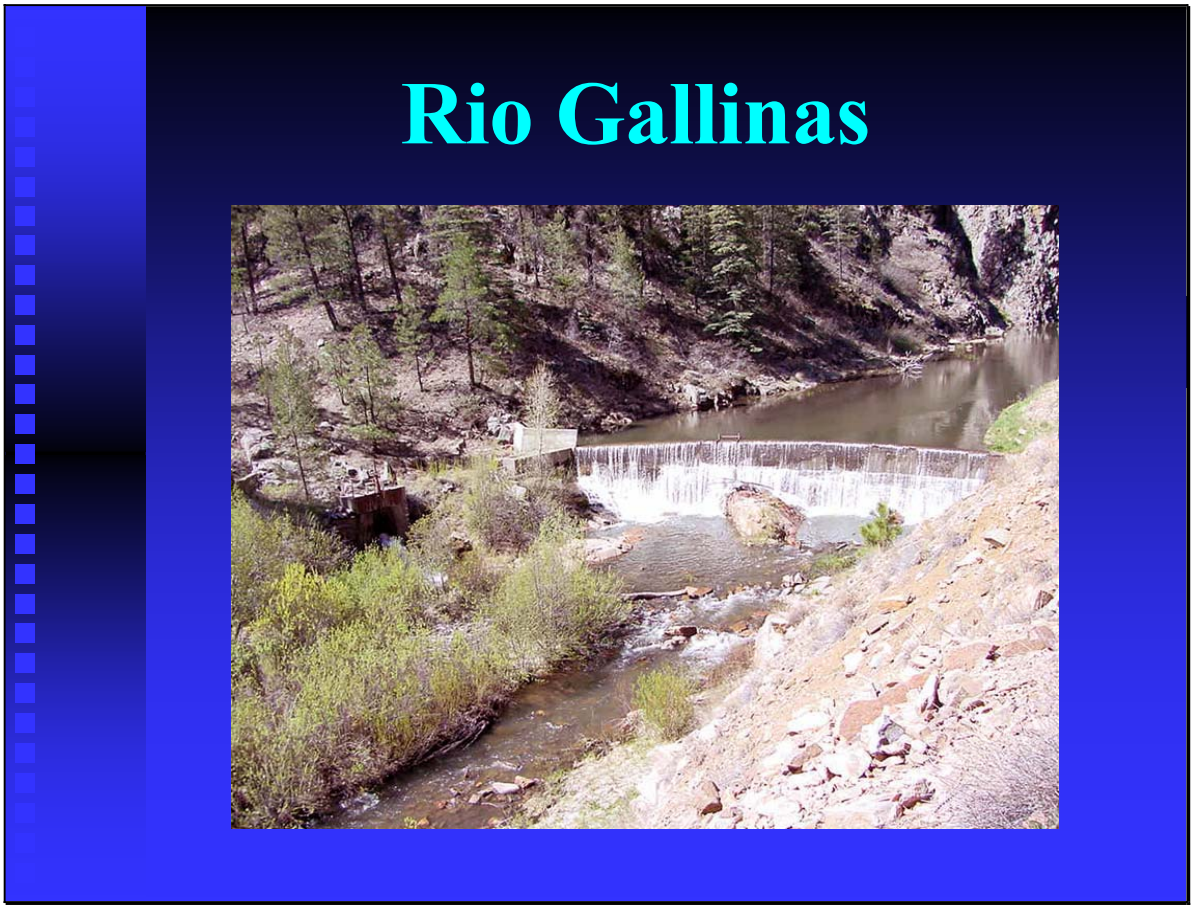
# Rio Gallinas

- **Las Vegas, Rio Gallinas acequias, and Storrie Project Water Users are discussing division of water**
- **Administrative rules, regulations, and water master discussions taking place**

In the Rio Gallinas area….(near Las Vegas and Mora):
-- The Rio Gallinas is a surface-water-dominated area…which is highly susceptible to drought.
-- The City of Las Vegas….the Rio Gallinas acequias…and the Storrie Project Water Users….have been discussing the division of the water supply for the last 100 years.
-- We are much further along in establishing administrative rules and regulations and a water master on the Rio Gallinas.

# Rio Gallinas

- **Active Water Resource Management will begin in spring 2004**



# San Juan River

- **Experiencing water shortage**
- **Shortage-Sharing Agreements**
- **Active Water Resource Management may be necessary by fall of 2004**

…In the San Juan River Basin:

## -- San Juan is experiencing a water shortage that has put the State Engineer in the position of impending priority administration and enforcement.

-- In response to this threat…the State Engineer has already attempted to negotiate shortage-sharing agreements among water users.

-- Active Water Resource Management may be necessary as soon as the fall of 2004, if negotiation of agreements fail.


Here is a picture of Navajo Reservoir…in the San Juan Basin.

# Rio Pojoaque

- **Aamodt lawsuit area**
- **Water Master Program will likely be part of a settlement agreement**

In the Rio Pojoaque Stream System:
-- You've probably all heard about the Aamodt suit…the oldest lawsuit on the federal court docket…will that affects this area. The lawsuit was filed in 1966. Presently negotiations are going on between parties to settle the case. This area includes four Pueblos.
-- A water master program…will likely be part of any settlement agreement that is reached.


Here is a picture of the Rio Pojoaque Stream System.

# Rio Chama

- **Administration of the Rio Chama acequias below Abiquiu Dam and releases and delivery of San Juan-Chama water downstream**
- **Entire Rio Chama including area above Abiquiu would need to be administered**

In the Rio Chama Stream System:
-- On the Rio Chama…we are tasked with administration of the Rio Chama acequias below Abiquiqu Dam…and the releases and delivery of San Juan-Chama water downstream.

**-- In the evaluation of the system…in order to properly administer the river…it was determined that the entire Rio Chama…including the area above Abiquiu would need to be administered.**


Here is a picture of the Rio Chama area.

# What is a "water master"?

## Water Masters

- **State Engineer can create special water districts and appoint water masters for specified stream systems**
- **People in the field who ensure water is distributed equitably**

The State Engineer has the authority to create special water districts and appoint water masters for specified stream systems…as the State Engineer determines is necessary for the administration of water rights.

Water master serve an important function for the Office of the State Engineer because they are the people in the field who ensure that water is distributed to users equitably…if not by priority.

## Funding of Water Masters

- **If not funded directly by the legislature, state law provides a means for funding**
- **State Engineer provides a budget for water masters to the county or counties involved**
- **Counties add a tax to those on their tax rolls**

If not funded directly by the legislature…state law provides a means for funding of water masters.

The law gives the State Engineer the authority to provide a budget for water masters to the county or counties involved.

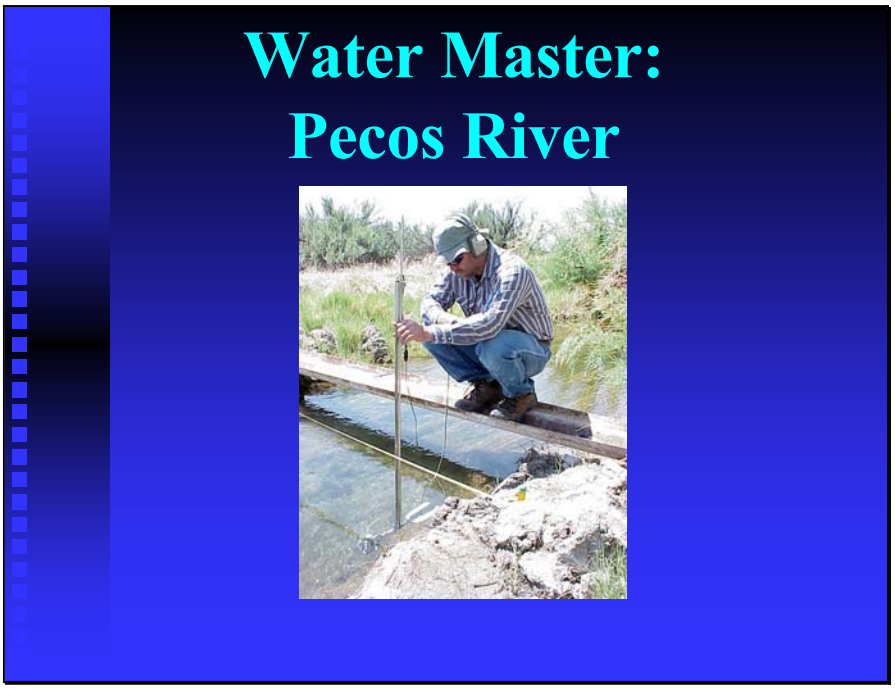
The counties then add a tax to those on their tax rolls for the purpose of providing the funds necessary to pay for a water master…and the costs related to his/her administration of water rights.

## Section 72-3

- **State Engineer always had authority to create special water districts and to provide water masters**
- **Law was seldom used**

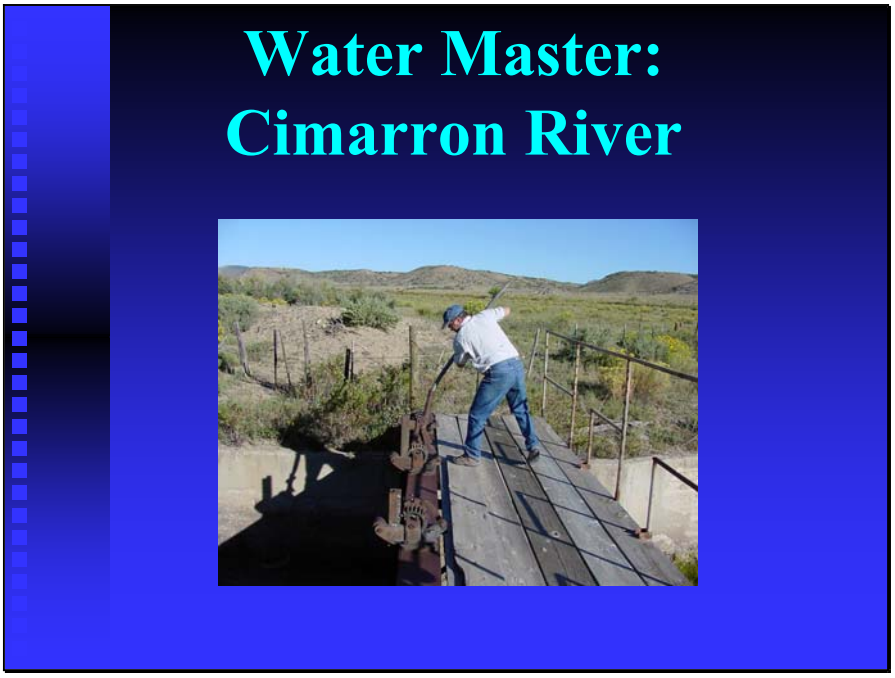
The State Engineer has always had the authority to create special water districts…and to provide water masters for administration under Section 72-3. However…the law was seldom used.

At the present time…there is only one declared special water district on the Pecos River. A water master is employed….whose primary responsibility is measurement of the diversions off the river in four counties.




This is the water master…on the Pecos River….doing his job out in the field.

His primary responsibility is measurement of the diversions off of the river to make sure water is distributed fairly to all water users.




In other critical management areas…it may be necessary to hire Water Masters, too if the drought continues.

Water masters are people who actively administer water on a ditch or stream system around New Mexico on a daily basis…during irrigation season.

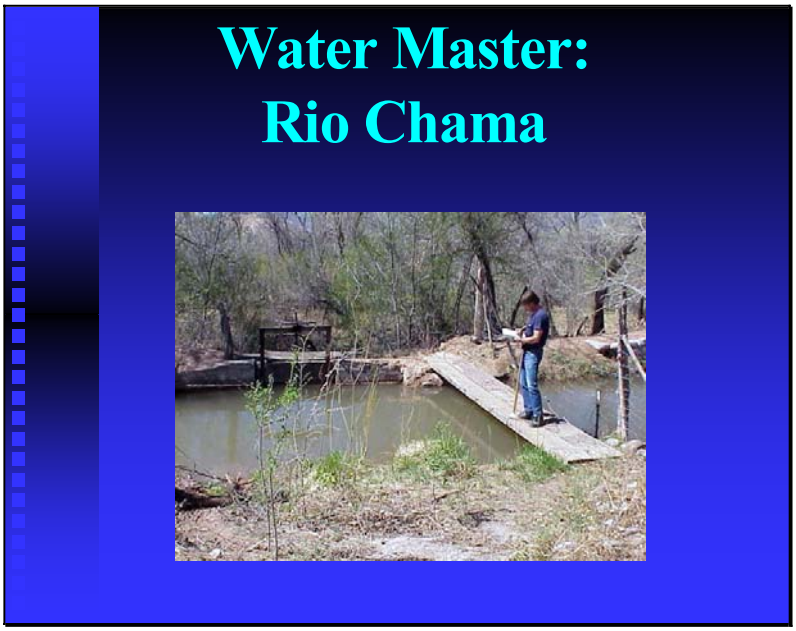
The State Engineer has the authority to create special water districts…and to provide water masters to specific rivers…to allow for priority administration…if need be…without adjudication.

This is a Water Master working on the Cimarron River in northwestern New Mexico.


Water masters serve an important function for the Office of the State Engineer…because they are people in the field…who would ensure that water is distributed fairly to users.

This is a water master along the Rio Costilla.

The photo was taken at the Rio Costilla gauging station.




State law provides a means for funding of water masters.

The law gives the State Engineer the authority to provide budgets of water use to the county or counties involved. The counties…in-turn…would place those water users on their tax rolls for the purpose of water master administration.

This is a picture of the water master for the Rio Chama.

*The water master position….in this region is crucial because…that region directly conveys water to the City of Albuquerque… and therefore…must be closely monitored.*

# Specific Milestones/Deliverables

- **Promulgation of regulations regarding the formulation of water districts, duties of water masters, and guidelines for priority administration and expedited transfers**
- **Development of legal analyses to support the regulations**

Specific milestones and deliverables we plan to have included:

1. Promulgation of general, statewide regulations regarding the formation of water districts, duties of water masters, and guidelines for priority administration and expedited transfers of water.
2. Development of legal analyses to support these regulations, including treatment of the development of water courts through these procedures

# Specific Milestones/Deliverables, Cont'd

- **Creation of a chart showing required tasks and status in urgent areas of the state**
- **Determination of a sequence for administration as among these areas**
- **Drafts of orders creating water districts in urgent areas**

Specific milestones and deliverables we plan to have included:

3. Creation of a chart showing required tasks and status in urgent areas of the state
4. Determination of a sequence for administration as among these areas
5. Drafts of order creating water districts in urgent areas

# Specific Milestones/Deliverables, Concluded

- **Development of a comprehensive outline of the content needed for regulations or orders in specific areas**
- **Development of basin-specific direction**
- **Appointment of water masters**
- **Development of water master manuals**

Development of a comprehensive outline of the content needed for regulations or orders in specific areas…

- Development of basin-specific direction…whether in the form of proposed orders for a court to adopt…further regulations…or orders of the State Engineer…
- Appointment of water masters…
- And…development of water master manuals…

# Progress Made


## Gallinas water master named

OPTIC STAFF REPORT

A 1971 New Mexico Highlands University graduate has been hired as water master for the Rio Gallinas in San Miguel County, according to New Mexico State Engineer John D'Antonio.

Max Chavez will begin his duties as water master April 12.

Water masters "actively administer water on a stream system," according to a press release from the engineer's office.

San Miguel County was declared a "special water district in response to requests by water right users in the area."

Water rights users asked that the Gallinas be administered the diversions and water use of water on a day-to-day basis.

Chavez serves in the state engineer's office as an engineer in the Litigation and Adjudication Program. From 1996 to 2001, he was a project manager in the agency's Adjudication Bureau in Las Cruces.

Chavez had been a unit supervisor for the Hydrographic Survey Bureau in Santa Fe from 1990 to 1996. He was the Costilla Creek water master from 1979 to 1985.

"Water masters serve an important function for the Office of the State Engineer because they are our people in the field who can make sure that water is equitably distributed to water users in a particular area," said D'Antonio.

Chavez's duties will include working with water users to develop a master manual to fit the area.

According to the release, D'Antonio said he "views the declaration of the special water district as a means to a solution to avoiding conflict over water during this lengthy period of drought.

The Office of the State Engineer is charged with administering the state's water resources. The state engineer has power over the supervision, measurement, appropriation and distribution of all surface and groundwater in New Mexico, including streams and rivers that cross state boundaries.

We have already made some progress:

We have hired a water master for the Rio Gallinas…and have launched our communication efforts.`

And…have set up a public meeting on April 26th …in Las Vegas, New Mexico….to gather input on our proposed rules and regulations for the Rio Gallinas.

Here are some of the news clippings that came out in area newspapers about the new water master….who will start work in the area on April 12th.

We have plans in the works to hire water masters for the Rio Chama…the San Juan Basin…and the Nambe-Pueblo-Tesuque areas within the next couple of months.