

# **Institutional Obstacles to Increasing New Mexico's Water Supply**

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Sigmund Silber  
ssilber1@juno.com

# Context re New Mexico

- Fifth driest but because of low population this translates into top 20% of precipitation per capita. But large state meaning significant losses of precipitation (96%+) before precipitation enters the water supply
- Almost 90% of beneficial use is agriculture and self-supplied industrial, mining and power production

# Water Beneficial Withdrawals in New Mexico in 2005

- Public Water Supply and Domestic Wells 10%  
Self supplied private wells for commercial, industrial, mining and power production 5%
- Agriculture including livestock 85%
- Oil and gas...not reported but should be
- Total withdrawals about 4,000,000 acre feet
- Total depletions: not reported but probably about 2,500,000 acre feet
- I exclude reservoir losses as they are not beneficial use

# Water Accounting Issues that Complicate the Application of Water Law

	Existing Water	New Water
In the water supply	<p><b>A.</b> Generally water reported by the OSE comprises the water supply.</p>	<p><b>C.</b></p> <ul style="list-style-type: none"><li>• Expensive projects like desal would probably be reported as new additions to the water supply.</li><li>• Cloud seeding water that makes it to an aquifer or stream</li></ul>
Not in the water supply	<p><b>B.</b></p> <ul style="list-style-type: none"><li>• Precipitation on a farmer's land This is from 0.5 to 1.0 million acre feet per year.</li><li>• Other precipitation that does not make it to an aquifer or stream which is in the range of 95 million acre feet per year</li><li>• Both produced and other oilfield water perhaps in total about a quarter of a million acre feet per year.</li></ul>	<p><b>D</b></p> <ul style="list-style-type: none"><li>• Captured humidifier water</li><li>• Salvaged Oilfield water might be in this category if after capture, it is not reported as being part of the water supply</li><li>• Cloud seeding water on a farmer's land or otherwise not making it to an aquifer or stream.</li><li>• Roof capture water if used for outdoor applications and not sent to a wastewater treatment plant. Do we even have an estimate of the current amount of roof capture water and the potential?</li><li>• Gray water</li></ul>

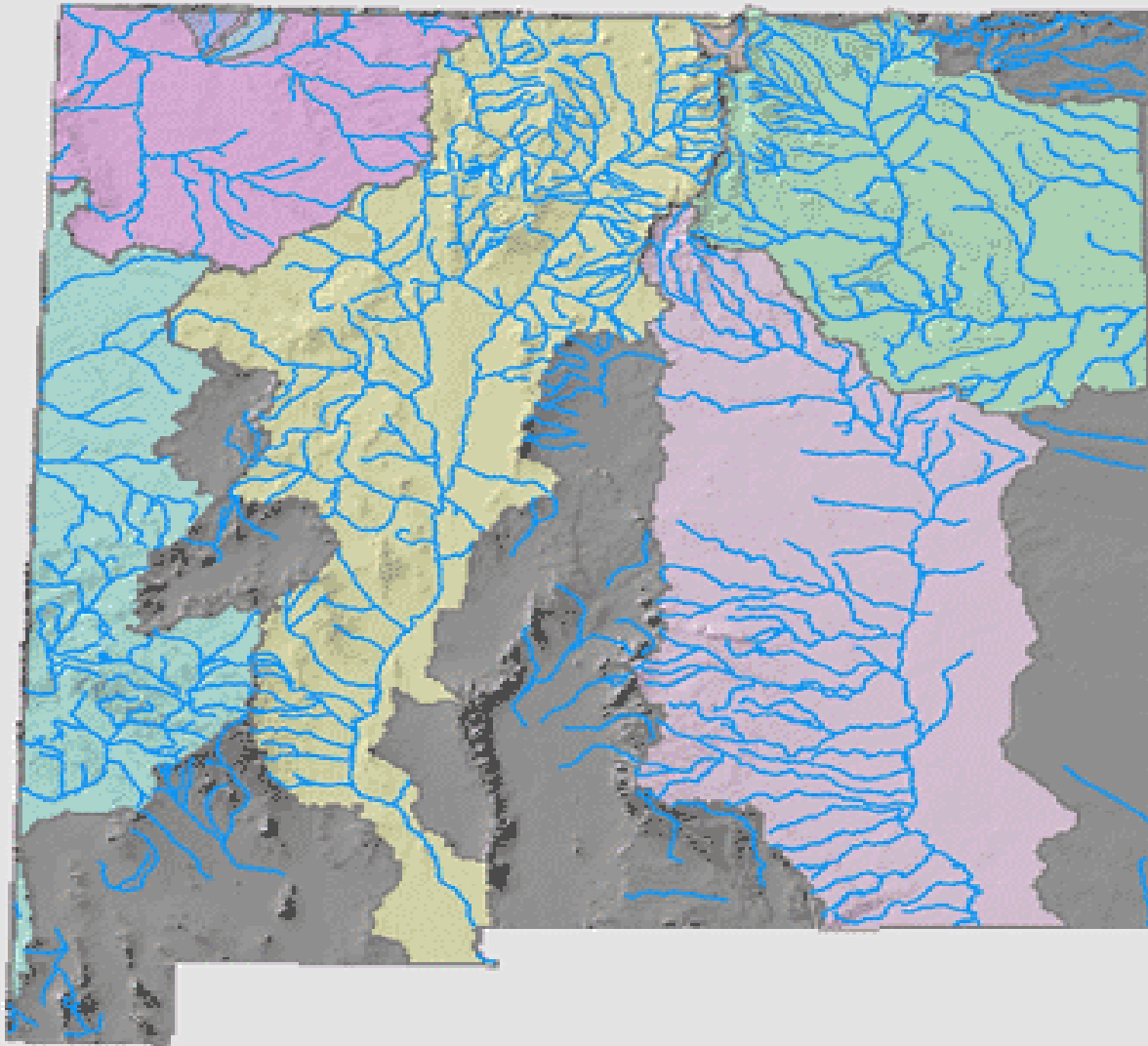
# Opportunities Blocked or Just Not Fully Exploited

- Agriculture Efficiency
- Reuse of Oil and Gas-field Produced Water
- Expanded Capture and Use of Precipitation
- Developing Deep Water and Shallow Brackish Water
- Cloud Seeding
- Urban Conservation (e.g. greywater, roof capture, wastewater, landscape practices)

# **Types of Obstacles to Increasing the Water Supply**

- Interstate Compacts
- Constitution and Statutes
- Administrative Decisions
- Lack of Support for Increasing the Water Supply
- Insufficient Creativity

# New Mexico River 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

# Agriculture Efficiency

Interstate  
Compacts

Constitution  
and Statutes

Administrative  
Decisions

Lack of  
Public  
Support

Insufficient  
Creativity

Conserved  
water reverts  
to the State of  
New Mexico  
in trust for  
future  
appropriation

Contract with  
farmers to  
conserve  
water and pay  
them with  
some of the  
conserved  
water

# Reuse of Oil and Gas-field Produced Water

Interstate  
Compacts

Constitution  
and Statutes

Administrative  
Decisions

Lack of  
Public  
Support

Insufficient  
Creativity

Permits to use distilled oil-field water for beneficial use can now be issued which is a recent improvement.

Simplifying the procedure and consistency with other States would be very helpful.

Use Solar  
Create an industry based on recovering and using oil- and gas-field water

# Expanded Capture and Use of Precipitation

Interstate  
Compacts

Unwarranted  
fear that  
captured  
water will  
compromise  
an interstate  
compact

Constitution  
and Statutes

Administrative  
Decisions

Reluctance to  
tackle this issue

Lack of  
Public  
Support

Insufficient  
Creativity

Potential  
impairment  
can be  
charged to  
those doing  
large scale  
water capture  
and they must  
return a  
suitable  
fraction of  
captured  
water to  
streams or  
aquifers or  
have a water  
right for that  
fraction

# Developing Deep Water and Shallow Brackish Water

Interstate  
Compacts

Always  
concerns  
about  
impairing  
streams  
and  
aquifers  
and thus  
interstate  
compacts

Constitution  
and Statutes

Jurisdiction of  
deep  
brackish  
water was  
recently  
taken out of  
the public  
domain and  
transferred to  
the State  
Engineer

Administrative  
Decisions

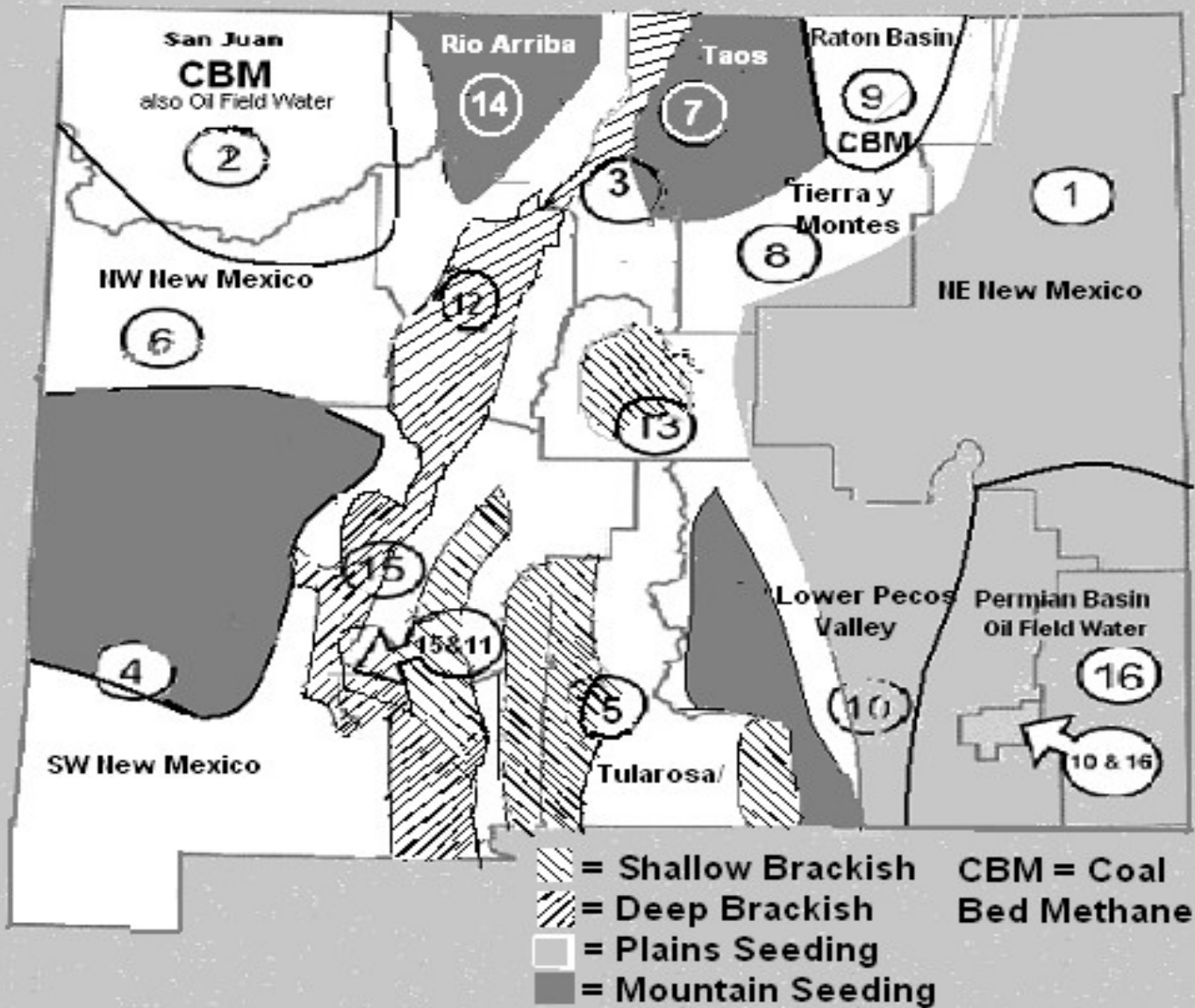
Lack of  
Public  
Support

Reverence  
for ancient  
water

Insufficient  
Creativity

Create private  
public  
partnership  
  
Scale of  
available deep  
and brackish  
water means  
that any  
impairment  
can be dealt  
with

## MAJOR WATER RESOURCES IN Regional Water Planning Areas



# Cloud Seeding

Interstate  
Compacts

More stream  
flow from  
northern  
mountains  
generates  
increased  
delivery  
requirements  
to downstream  
users which  
complicates  
things for New  
Mexico

Constitution  
and Statutes

Administrativ  
e Decisions

Cloud  
seeding does  
not result in a  
water right so  
there can  
not be  
entrepreneur-  
ship, so local  
or state  
government  
funding is  
usually  
required  
other than for  
ski resorts.

Lack of  
Public  
Support

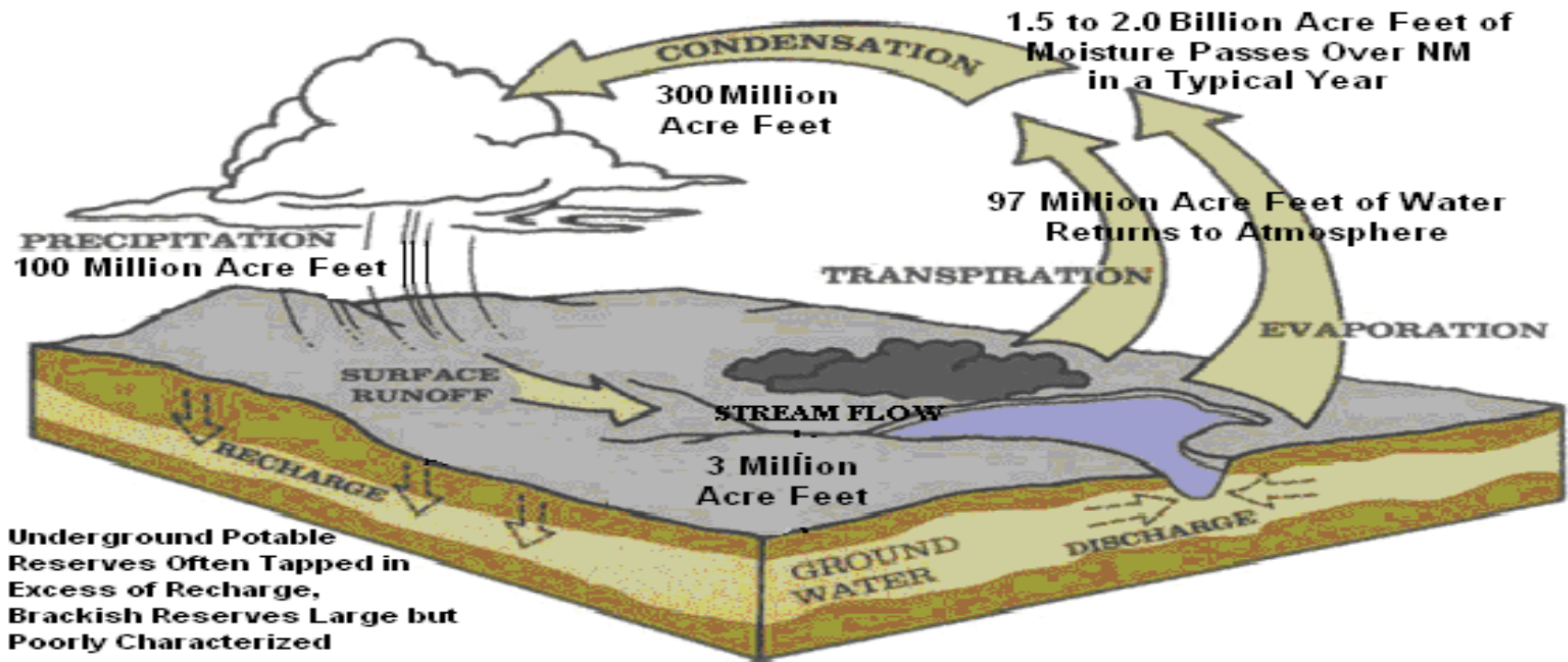
Nervousness  
about  
tampering  
with nature  
  
Failure to  
observe that  
many  
Western  
States and  
many other  
nations  
routinely  
utilize cloud  
seeding for  
precipitation  
enhancement  
and hail  
suppression

Insufficient  
Creativity

North south  
cooperation  
can deal  
with the  
interstate  
compact  
problem

# Hydrologic Cycle

Hydrologic Cycle  
The Atmosphere Provides and is in Turn Replenished



Depiction of the hydrologic cycle. **Precipitation is not "lost"**, but is recycled through runoff, evaporation, and transpiration. New Mexico data added to a drawing created by B. Hove, of the ND State Water Commission. Precipitation of 100 million af is an approximation derived by multiplying the area of the state times annual precipitation. If less than one-third of moisture in clouds falls as precipitation, then 300 million af of moisture passes over the state annually as clouds. If only 20% of atmospheric moisture condenses into clouds, then 1.5 to 2.0 billion af of moisture passes over New Mexico annually.

# Conclusion

- New Mexico has slowly increasing water requirements
- Self-imposed or inadvertent obstacles result in water being transferred out of agriculture
- Generally these obstacles can be overcome with creativity and effort
- This would tend to preserve agriculture, keep New Mexico green and inviting, and in some cases reduce the cost of cities acquiring water

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Contact  
Sigmund Silber  
ssilber1@juno.com

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