New Mexico Water Update

Tom Blaine, New Mexico State Engineer

Tom Blaine, P.E., is the New Mexico State Engineer and is well-versed in the critical water issues facing New Mexico, bringing a career of engineering experience in the private and public sectors to the Office of the State Engineer. Blaine recently held the position of director of the Environmental Health Division in the New Mexico Environment Department. Tom's background includes extensive experience in civil and transportation engineering, with service to the City of Albuquerque as a senior civil engineer as well as to the State of New Mexico with both the Department of Transportation and the Office of the State Engineer, and in the private sector. Between his years of public service, Blaine also owned and operated his own engineering firm, focusing on surface and groundwater hydrology and water distribution systems. He holds a BS in engineering from New Mexico State University.

Greg Ridgley, Office of the State Engineer

Gregory C. Ridgley is the General Counsel for the New Mexico Office of the State Engineer. During his eighteen years at the OSE he has worked to resolve water right claims and disputes with Indian Pueblos, Tribes, and Nations, federal agencies, local governments, acequias, irrigation and conservancy districts, and private parties. He graduated from Harvard University in 1984, and from the University of California, Hastings College of the Law in 1992. He is the youngest member of the Santa Fe Stamp Club.

61st Annual New Mexico Water Conference

Where Does All The Water Go

October 2016

State Engineer

Tom Blaine P.E.

Figure 1. Introduction.

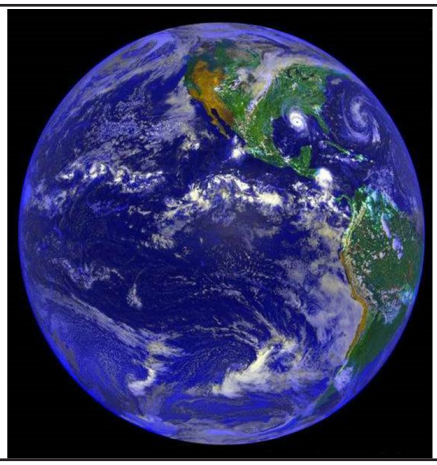


Figure 2. 71% of the Earth's surface is covered in water.

Water

- Water appears in nature in all three common states of matter (solid, liquid, and gas) and may take many different forms on Earth: water vapor and **clouds** in the sky, **seawater** in the oceans, **icebergs** in the polar oceans, **glaciers**, and **fresh water** in lakes and rivers.

Figure 3. Forms of water on Earth.

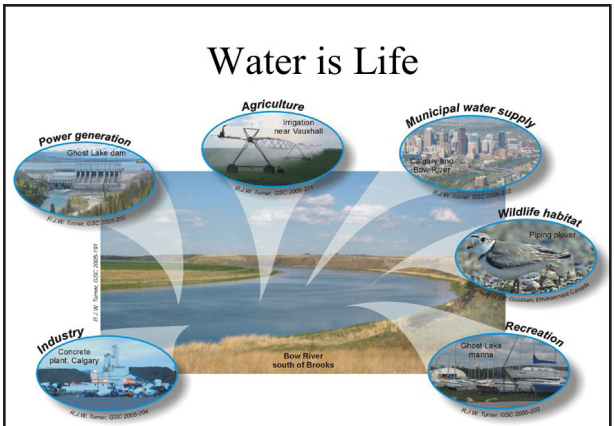


Figure 4. Water is life.

Time spent gathering water around the world translates to $24 billion in lost economic benefits each year.

Figure 5. Water issues around the world.

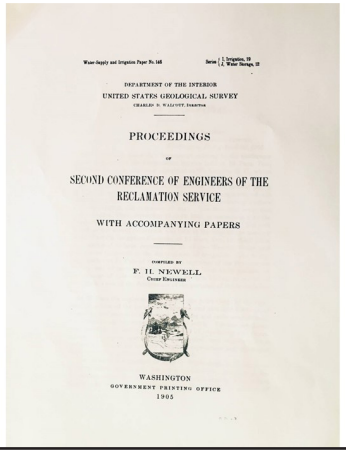
Women and children spend 125 million hours each day collecting water.

Figure 6. Global water issues.

In Africa and Asia, women and children walk an average of 3.7 miles a day just to collect water.

Figure 7. Lack of water across continents.

Proceedings
Reclamation
Service
1905



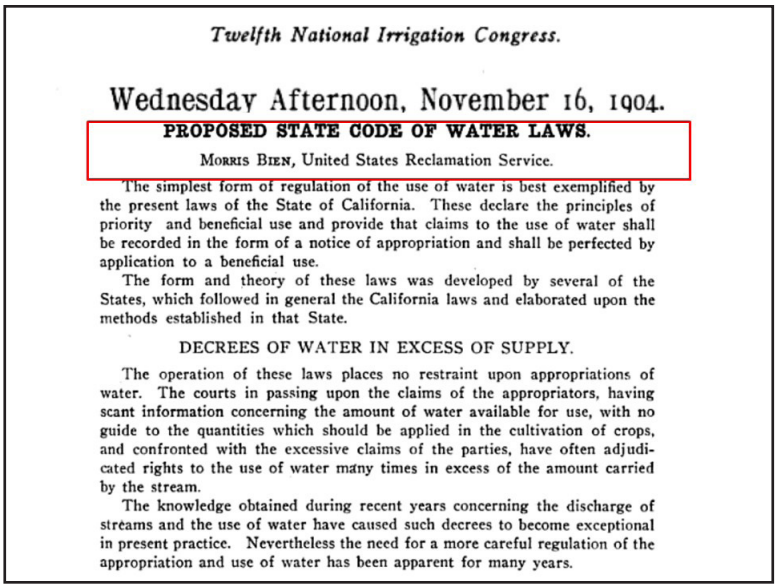
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PROCEEDINGS
OF
SECOND CONFERENCE OF ENGINEERS OF THE RECLAMATION SERVICE
WITH ACCOMPANYING PAPERS

COMPILED BY
F. H. NEWELL

WASHINGTON
GOVERNMENT PRINTING OFFICE
1905

Figure 8. 1905 Proceedings of the Engineers of the Reclamation Service.



Twelfth National Irrigation Congress.

Wednesday Afternoon, November 16, 1904.

PROPOSED STATE CODE OF WATER LAWS.

MORRIS BIEN, United States Reclamation Service.

The simplest form of regulation of the use of water is best exemplified by the present laws of the State of California. These declare the principles of priority and beneficial use and provide that claims to the use of water shall be recorded in the form of a notice of appropriation and shall be perfected by application to a beneficial use.

The form and theory of these laws was developed by several of the States, which followed in general the California laws and elaborated upon the methods established in that State.

DECREES OF WATER IN EXCESS OF SUPPLY.

The operation of these laws places no restraint upon appropriations of water. The courts in passing upon the claims of the appropriators, having scant information concerning the amount of water available for use, with no guide to the quantities which should be applied in the cultivation of crops, and confronted with the excessive claims of the parties, have often adjudicated rights to the use of water many times in excess of the amount carried by the stream.

The knowledge obtained during recent years concerning the discharge of streams and the use of water have caused such decrees to become exceptional in present practice. Nevertheless the need for a more careful regulation of the appropriation and use of water has been apparent for many years.

Figure 9. 1904 Proposed State Code of Water Laws.

Figure 10. What were they thinking?

Figure 11. Adapting methods of surface water irrigation.

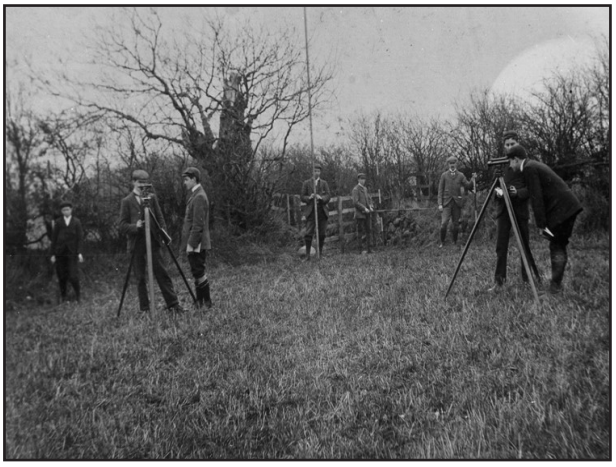


Figure 12. Engineers and surveyors, circa 1900.

What Happened In 1854

Daniel Halladay invented a windmill for pumping water and other uses. His was the first windmill that could automatically turn to face changing wind directions and could control the speed of the fan so that it did not destroy itself in high winds.

Figure 13. What happened in 1854?

Figure 14. Invention of the windmill.

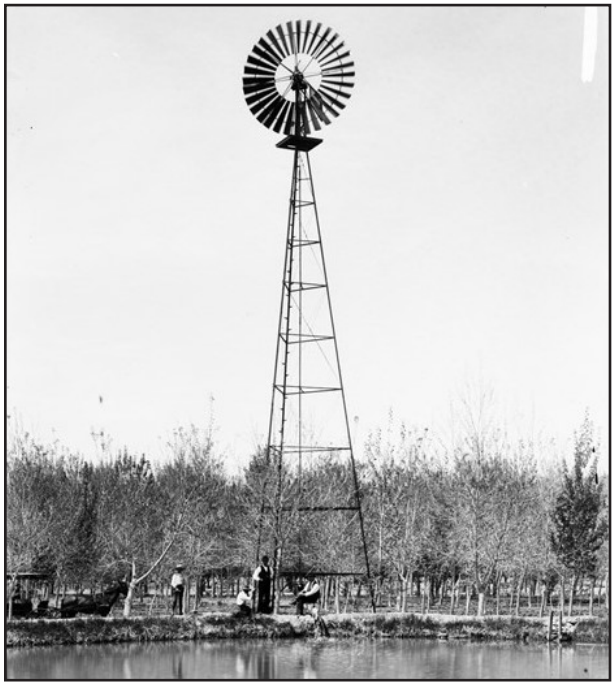


Figure 15. Windmills were used to pump groundwater into irrigation reservoirs.

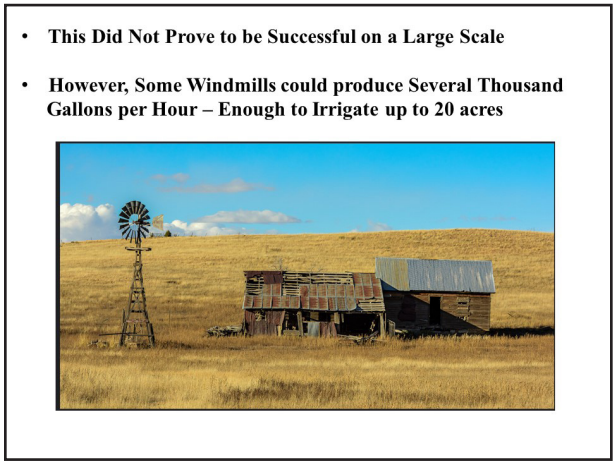


Figure 16. Windmills are not successful for large-scale irrigation.

Figure 17. Windmills changed the way we were thinking about water.

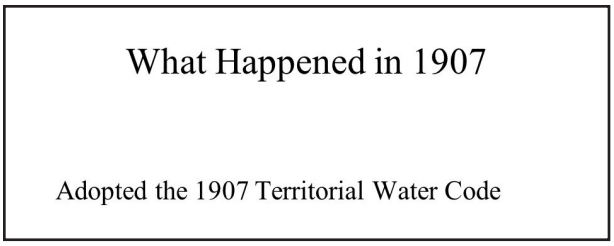


Figure 18. The Territorial Water Code was adopted in 1907.

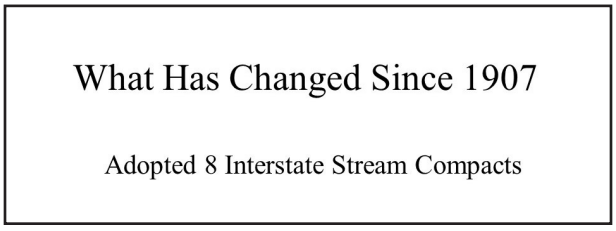


Figure 19. Eight Interstate Stream Compacts have been adopted since 1907.

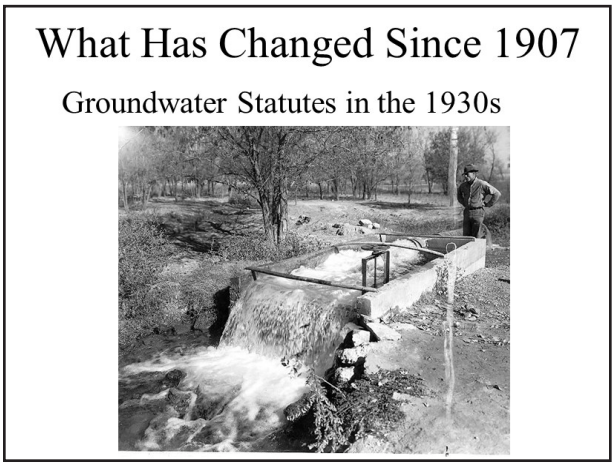


Figure 20. Groundwater statutes in the 1930s.

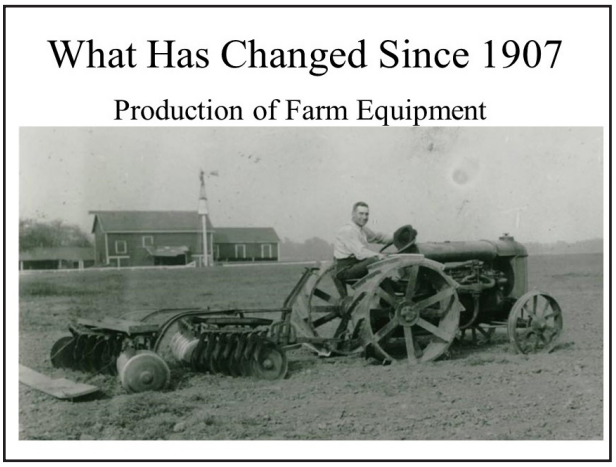


Figure 21. Production of farm equipment.

Figure 22. Modernization of farm equipment.

Figure 23. Irrigation efficiencies since 1907.

Figure 24. Double cropping and cropping patterns.

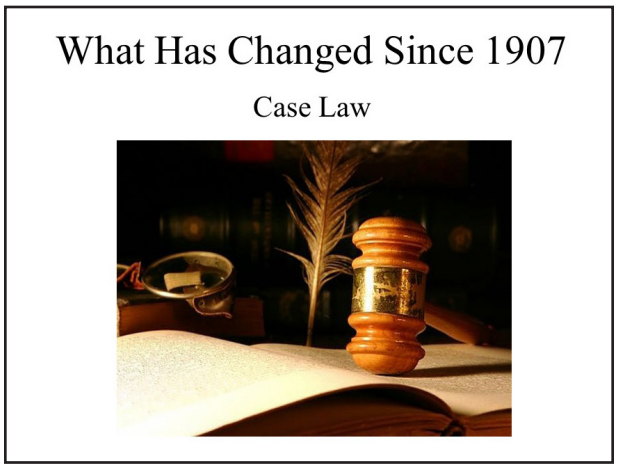


Figure 25. Case law.

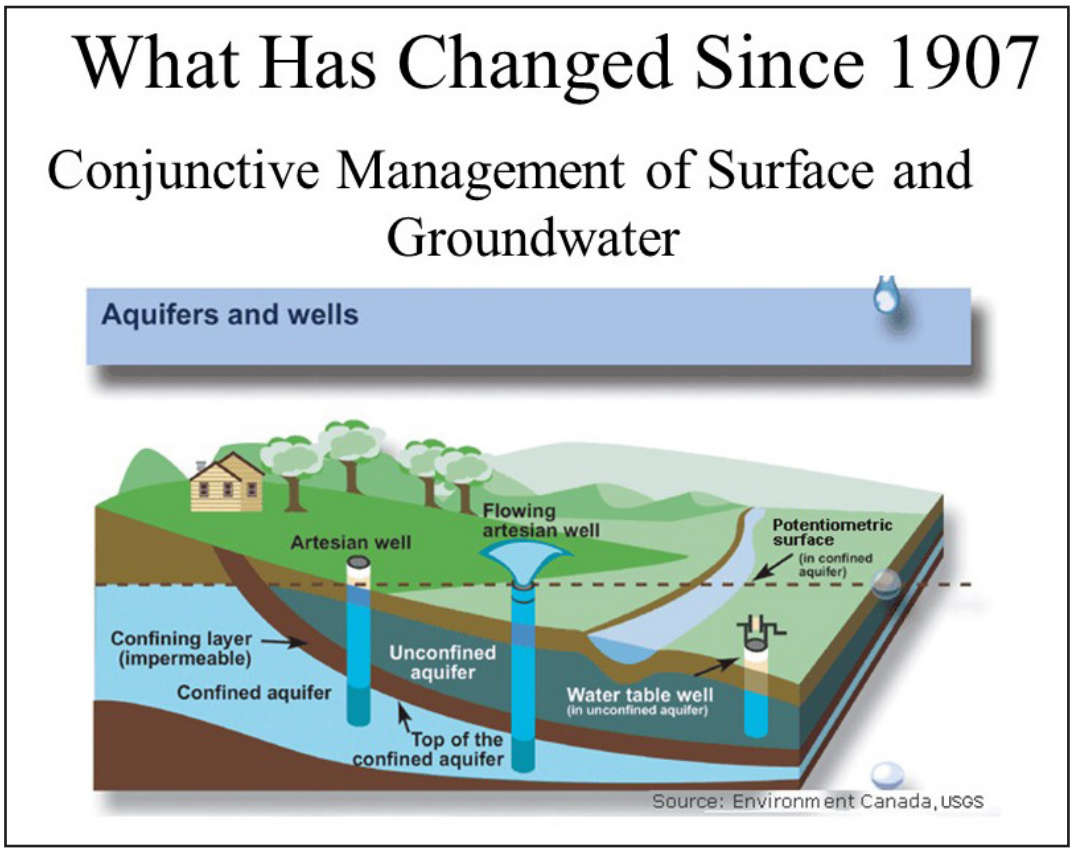


Figure 26. Conjunctive management of surface and groundwater.

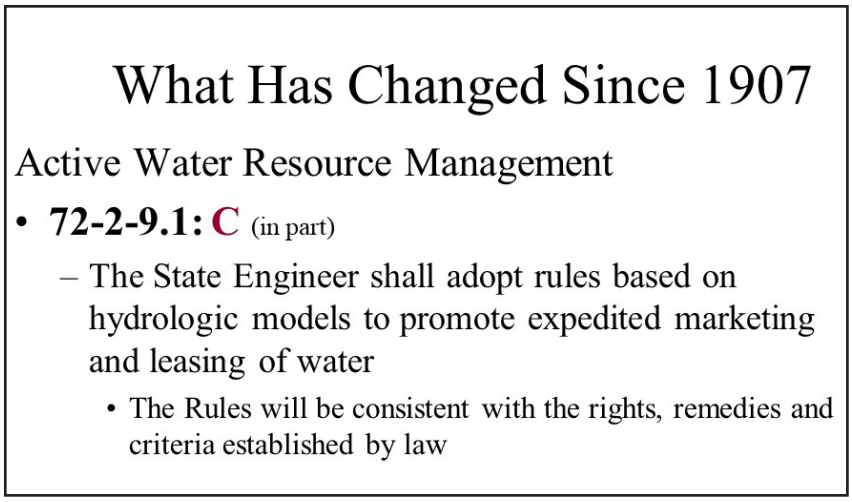


Figure 27. Active Water Resource Management.

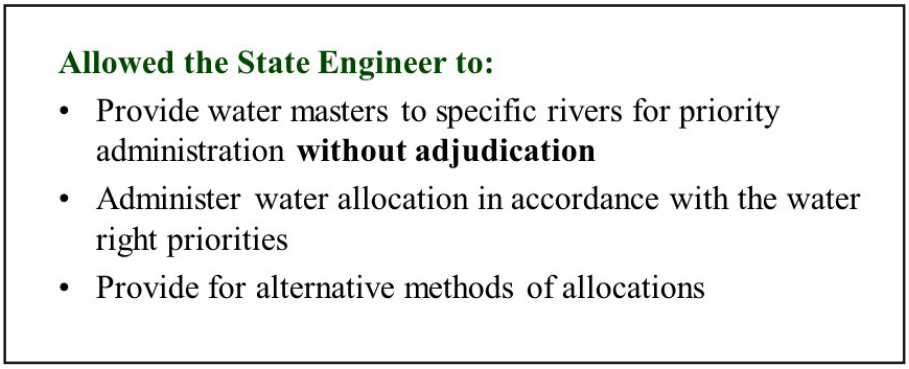


Figure 28. Advancements due to Active Water Resource Management.

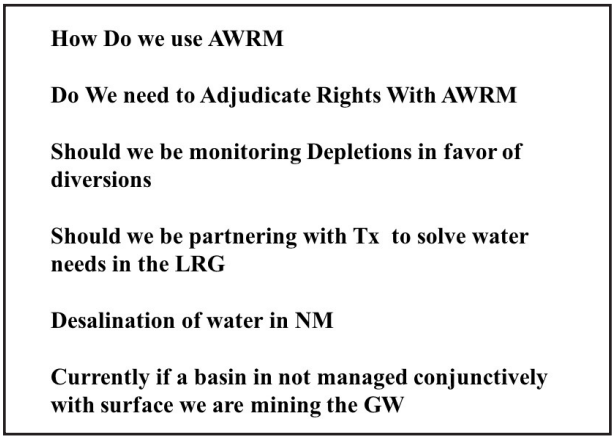


Figure 29. How Active Water Resource Management is used.

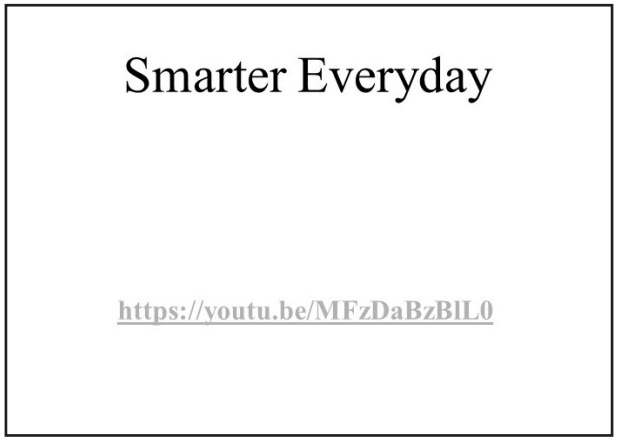


Figure 30. Smarter every day. "Knowledge is not understanding."

"Learn from yesterday, live for today, hope for tomorrow. The important thing is not to stop questioning."

-Albert Einstein