



LAND &
WATER
MAKING THE
CONNECTION



THE UTTON CENTER
SCHOOL OF LAW
UNIVERSITY OF
NEW MEXICO

DECEMBER 2011



The Utton Center 

The Utton Center logo is a stylized, black, curved shape that resembles a path or a stylized letter 'U'.

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Forward

Land and Water: Making the Connection

This document addresses the disconnect between land use planning and water resources management in New Mexico. It was based on meetings among the authors beginning in 2007. The first section explores the reasons that water and land management are disconnected from each other in New Mexico. The second section contains five principles the authors believe are important to guide changes that will support the sustainability of urban and rural communities, the natural environment, agricultural lands, and the state's economy and cultural heritage. The third section outlines seven strategies for improving water and land management in New Mexico most of which require the support of public officials at the state and local levels of government.

The authors thank the Utton Center of the UNM School of Law for participating as one of the authors, providing much needed resources for its work, and for the publication and distribution of this document. The Utton Center also sponsored a day-long conference in April, 2011 (see <http://uttoncenter.unm.edu/projects/land-water-2011.php>) using the themes in the white paper as a basis for the agenda.

The Utton Center publishes an annual issue of *Water Matters!* for New Mexico legislators. An article on "Land Use and Water Supply" appeared in the 2011 issue of *Water Matters!* and can be found at http://uttoncenter.unm.edu/Water_Matters!_articles.html.

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Introduction

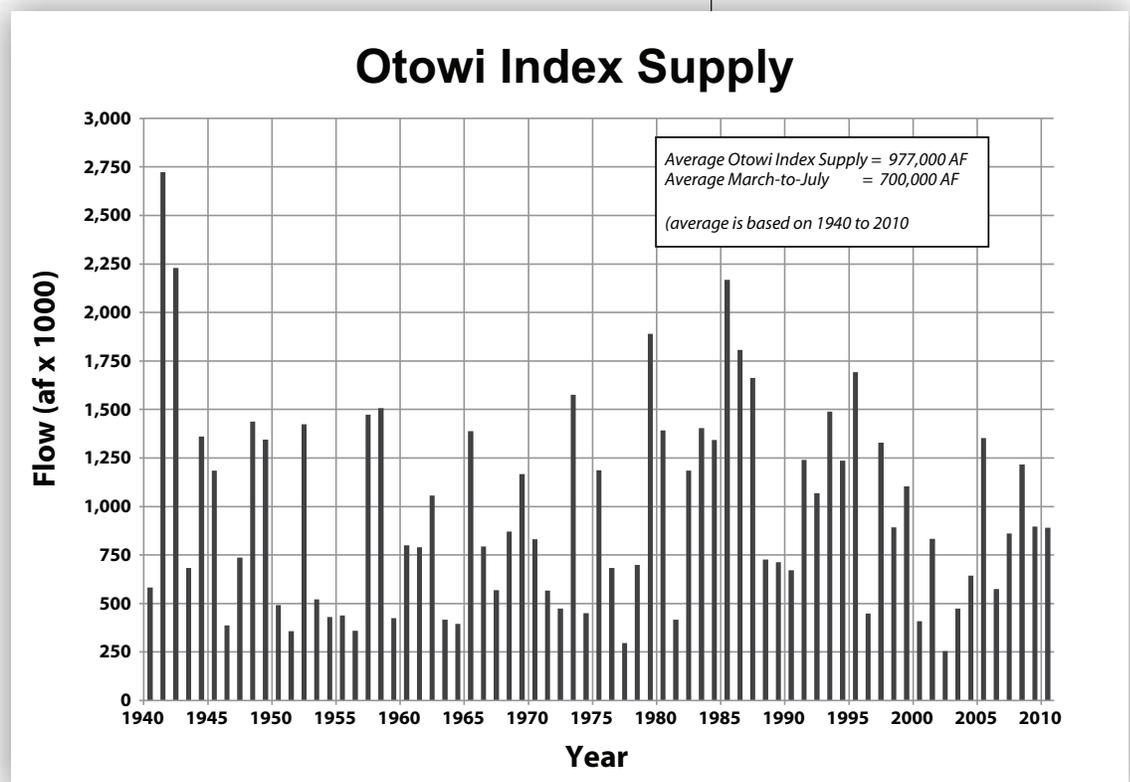
New Mexico is challenged to assure that demand for water does not exceed limited supplies and that the inherent integrity of our land is preserved for generations to come.

New Mexico's high desert climate alternates between wet periods and droughts. The most recent wet period ended in the mid-1990s with the onset of a severe drought. Scientists believe that periodic droughts may be exacerbated by the impact of climate change on western states, due to rising temperatures and increased evapotranspiration.ⁱ

During the last 40 years New Mexico's population has more than doubled, recently surpassing two million people, and the population is expected to double again in the next 40 to 60 years.ⁱⁱ This growing population is increasing the demand for water, and expanding the edges of our cities and towns into rural landscapes.

Until recently, New Mexico's cities and towns have relied mostly on groundwater aquifers for drinking water, but now, more and more aquifers are being significantly drawn down. To offset water lost from rivers due to increased groundwater pumping, New Mexico's municipalities have been purchasing and retiring agricultural water rights. Some cities are also making significant public investment in new infrastructure to use surface water imported from the Colorado Basin via the San Juan-Chama Project in an effort to limit further depletion of aquifers so that they may be available as a drought reserve in the future.

Otowi Index Supply
Courtesy of the Office of
the State Engineer



Public opinion surveys reveal that New Mexicans highly value the availability of water for maintaining agricultural lands and preserving riparian ecosystems and wetlands.ⁱⁱⁱ Yet, finding new sources of water without sacrificing these important agricultural lands and riverine ecosystems presents a difficult challenge.

Land use changes are influenced by a multitude of factors, including the location of jobs and services, infrastructure costs, the potential economic return on investment, zoning restrictions, and tax credits or incentives. What is often not considered in proposed land use changes is whether there is sufficient water to sustain the new development without affecting existing uses.

To protect New Mexico's communities, we urge that the long-term availability of water resources be a required element of any land use decision. Stronger linkages could help to ensure the reliability of the water supply and reduce the need for costly water supply projects, while protecting the natural environment and encouraging the creation of more compact and efficient cities and towns.

Closer coordination is needed between water and land use planning at the state, regional, and local levels. In addition, planning efforts must be supported by strong implementation measures. The goal of integrated water and land use planning is to ensure that New Mexico's resources are conjunctively managed to assure that our urban and rural communities are sustainable, the natural environment is protected, cultural heritage and agricultural lands are preserved, and economic viability is enhanced for generations to come.^{iv}

In this paper we explain the problem, offer some guiding principles, and recommend a range of strategies to address the problem.

The Land and Water Connection Problem

1. Water in New Mexico is a limited and variable resource for which there is increasing demand.

- New Mexico is a semiarid state that receives on average only about 14 inches of precipitation a year,^v 96% of which evaporates.^{vi}
- Almost all surface water from lakes and streams in New Mexico has been allocated for specific uses.
- Most of New Mexico's residential water use depends on groundwater supplies that are being rapidly consumed in many areas.
- Groundwater supplies in some rural and urban areas are also limited due to water quality concerns, either because the aquifers are naturally of a low quality or they have been impacted by contamination.
- Most of New Mexico's sixteen Regional Water Plans anticipate future water deficits in relation to projected increases in demand.
- With projected population growth and the probability of greater variability in annual precipitation due to climate change, the supply-demand deficit is likely to become more problematic in the future. It is not yet clear which parts of New Mexico will experience the greatest negative impacts.^{vii}
- Treaties, Interstate Compacts, and the Endangered Species Act require New Mexico to manage surface water to ensure mandated downstream deliveries and to protect threatened and endangered species.^{viii}

2. Land use planning and water management are not well connected.

- New Mexico statutes assign responsibility for water administration to state agencies^{ix} and delegate land use decisions to cities and counties.^x
- There is little structure for coordinating land and water management between the two levels of government.
- Since 1995, the Office of the State Engineer (OSE) has been required by the New Mexico Subdivision Act to advise whether or not in their opinion an adequate supply exists for new larger subdivisions that are outside of municipal jurisdictions. A finding that the supply is not adequate, however, does not prevent county government approval of the subdivision.
- There are an unknown number of platted lots in New Mexico's counties (antiquated subdivisions) that were never required to show water supply or provide utilities, roads and waste water infrastructure because they were created prior to the institution of zoning/subdivision legislation in unincorporated county areas. These lots can be built upon even if there is no identified water supply; this issue is particularly problematic in counties along the Rio Grande.
- Land use approval in New Mexico allows for development with junior water rights. In dry years the junior users may not be entitled to any water, but it is politically and economically difficult to curtail municipal and industrial uses.
- To address this issue, some areas require purchase of more senior agricultural water rights to offset pumping effects on the river, which in turn leads to the loss of agricultural land.



Detail of Rio Rancho Premature Platting In Unit 10
Courtesy John Korkosz, AICP
Planning Manager, City of Rio Rancho



Downtown
Albuquerque
Photo Kenesson
Design, Inc.

Prior Appropriation

New Mexico water rights are administered using a system of prior appropriation. Under this system, the first water users are considered senior users and the newer users are considered junior users. Each water right has a priority date. The water users with the earlier priority dates (senior users) are intended to receive their allocation; if there is enough water, those with later priority dates (junior users) would also receive water. Generally, groundwater pumpers are junior to agricultural surface water users.

3. *The lack of a strong linkage between land use planning and long-term water availability affects the ability of New Mexico communities to make clear and informed choices in allocating valuable resources.*

- Often the state and local governments lack the detailed and reliable data necessary for making informed decisions regarding water supply and demand.
- Although an evaluation of the adequacy of the water supply is required for major new developments that are proposed on unincorporated county land, data and staff resources are not always available in smaller incorporated communities to fully take into account the long-term water requirements or the cumulative impact of land-use decisions on regional or local water supplies.

The accumulation of impacts from many separate development decisions often leads to loss of farmland, which impairs traditional communities, and in turn may affect environmental flows, riparian areas and wildlife habitat. Where development patterns expand into rural areas, the cost of infrastructure necessary for water delivery, wastewater treatment, and drainage, among many other essential services, also increases.

- Social, cultural, and ecological values associated with land and water may not be accounted for in land and water plans. There are few links between state and local governments to assure that those values will be considered.
- Local and regional planning tends to make broad assumptions about water availability, population growth, and water infrastructure needs, without accounting for the effects of the new water demands on existing users.^{xi}



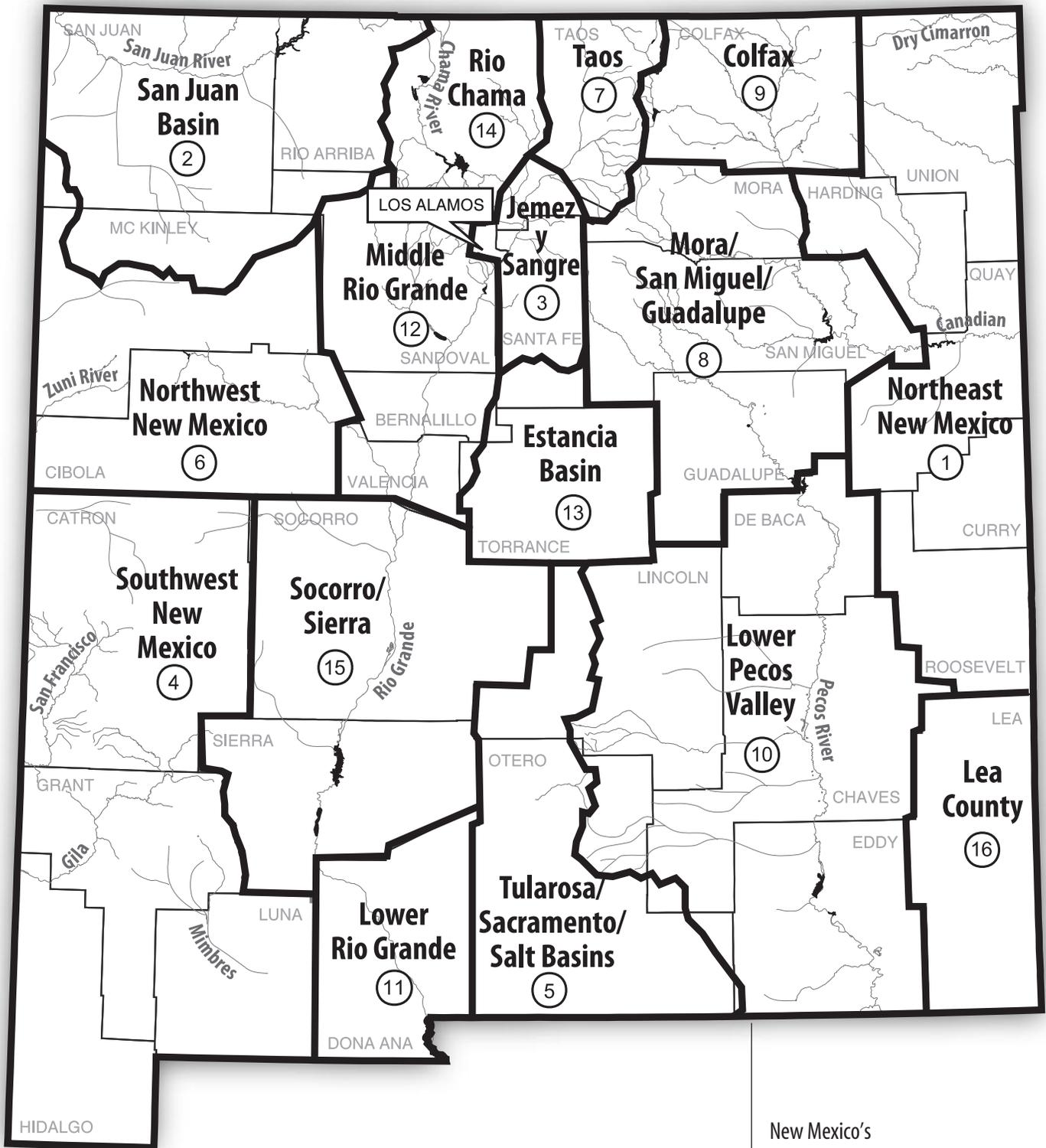
Albuquerque north valley acequia
Photo Kenesson Design, Inc.

4. Land use, economic development plans, and statewide and regional water plans are not linked and may conflict with one another.

- There are few opportunities to coordinate water, land use, or economic development between the different levels of government, or among governments at the same level.
- Land use planning is conducted mainly by New Mexico's larger municipalities and counties. Most small municipalities and rural counties do not have the staff resources to expedite comprehensive planning and regulation.^{xii}
- Both water and land use plans, including those developed with extensive public participation, are often not implemented by appropriate regulations, development decisions, and actions to ensure conformity with carefully considered plans.
- Local and regional governments are not required to take regional water plans into account. In many cases, local governments are not aware of statewide or regional water plans as a resource for decision-making.
- Land use and water plans and codes are often outdated after a period of years due in part to incremental decision making and changing conditions.
- New Mexico's domestic well statute allows anyone to drill a domestic well regardless of the impact on existing users. When the statute was passed in the 1950's, these wells were considered to have a "de minimus" impact. With growth, domestic wells are now widespread and in many cases are concentrated in subdivisions in more densely populated areas. Given the limited supply, these wells often have significant, unanticipated impacts. The domestic well statute has been contentious and there is ongoing litigation regarding its constitutionality.



Untreated area in paired Ojo Encino watershed study. For a couple of years, gauges have been collecting data on the differences between the treated and untreated areas. The collected information will help to determine whether the treated areas are holding back sediment and retain more moisture in the soil than the untreated areas. Courtesy of the Rio Puerco Alliance



New Mexico's Sixteen Water Planning Regions with Rivers and Counties.

Prepared for the Utton Center's 2011 Edition of *Water Matters!* Kenesson Design, Inc.

Principles

To support the sustainability of urban and rural communities, protect the natural environment, maintain agricultural land, preserve our cultural heritage, and ensure economic viability, we suggest implementation of the following principles, recognizing that there is no easy solution and that multiple tools are needed to integrate land use with water availability:

- Comprehensive, long-term planning must be instituted to better integrate land use with water availability.
- Land and water management decisions must be based on accurate accounting, sound science, and reliable projections.
- Conservation of water and preservation of the integrity of our land are priorities for New Mexico.
- Transparency and public involvement in decision-making at all levels of government are necessary for making good decisions about the future.
- A reliable water supply is essential for a robust economy.



Aerial View of Albuquerque and Rio Grande River
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Strategies

In order to implement the principles listed above, some key actions to be undertaken include:

- ✓ ***Revise state and local laws and/or current procedures to establish strong, coordinated water availability requirements for all new development, in order to ensure no new development without an adequate long-term sustainable water supply.***

The State Water Plan recommends strengthening the OSE water availability review process, for instance, by standardizing the methodology for determining if water is available to meet the annual water requirement as defined in the subdivision statute. Consistent technical methods, standards and criteria are needed to assure that there will be no cumulative long term impacts from proposed new development. These methods should be included in revisions to the Subdivision Act and Municipal Code.

The current process under the Subdivision Act allowing counties to approve subdivisions even when the OSE has issued a negative opinion regarding water availability should be examined. At a minimum, a policy should be established requiring counties to report to the OSE regarding whether they adhered to OSE recommendations regarding water supply availability. If OSE recommendations were not followed (i.e. a development was approved when OSE said there was insufficient water) an explanation would be required.

Other actions to consider as part of updating county and municipal subdivisions statutes include:

- extend provisions requiring that developers demonstrate water supply availability to areas that are not currently covered by existing statutes (i.e. extend the requirement to municipalities, water authorities, and extra territorial zones as well as counties;
- encourage better communication among multiple jurisdictions, including Pueblos, though notification;
- survey counties to see how the Subdivision Act could be improved to help them regulate development in a more sustainable way;
- review existing local ordinances and state-level guidance and criteria; then develop specific written criteria for determining if there is an adequate water supply considering existing and planned water uses and the potential for drought;
- use new tools such as GIS mapping and overlay of community and water planning models.

✓ *Coordinate municipal, county, regional, and statewide planning functions.*

New Mexico needs to take steps to coordinate land and water planning functions that now occur at many different levels of government. To achieve better results, the state should:

- develop standard guidelines for the use of population projections, data collection and reporting to improve consistency between plans;
- revise state planning, zoning and subdivision statutes to assure linkage of comprehensive plans with local ordinances;
- provide technical assistance to local government to assure that they can evaluate sustainable water supplies for land development;
- create a state planning function that would promote coordination and consistency of statutes, regulations and plans;
- strengthen the state's regional water planning program by supporting an active and continued membership of the regional planning steering committees, requiring specific updates and implementation recommendations, discouraging reliance on water from other regions, and integrating watershed management into the program;
- institute an interagency collaboration at the cabinet level to coordinate and implement policies that strengthen the connection between land use and water availability.



Albuquerque Skyline
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✓ **Support Initiatives to improve quantitative understanding of the water supply, water use and land use in New Mexico.**

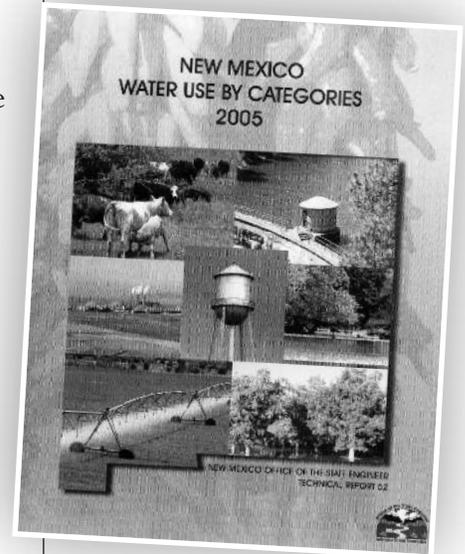
Better decision-making occurs when there is a clear understanding of the interrelationship of water supplies, existing and projected water demands, and impacts to changing land use.^{xiii} New Mexico needs accurate water supply and land use data, including accurate water accounting and reliable water use projections.

The OSE conducts an inventory of water use in the State every five years. However, in much of the State, water used for agriculture is not metered, and the amount must be estimated. In some areas of the state, the groundwater resources have been well characterized with field tests and numerical models that can evaluate cumulative impacts of development. But in other areas, there is a poor understanding of water supply availability. There is a need for continued scientific study and consistent guidelines for the reporting of information. Some key needs for research and/or communication of existing research include:

- investigations of changes in temperature, precipitation and evaporation patterns and their potential impacts;
- guidance for consistent accounting and terminology for all regional plans and other state and local plans;
- water budgets and periodic reviews of the balance between supply and demand at state, local and regional levels, with an increased emphasis on real-time data;
- additional studies to analyze and quantify groundwater resources;
- studies that lead to understanding how water conservation can be maximized, accompanied by quantitative assessments of water saved;
- identification of stream reaches most susceptible to degradation and efforts to protect stream flow and riparian habitat using scientific data and appropriate management.

Such studies could be done by the OSE and the Interstate Stream Commission (ISC). At a minimum OSE/ISC should provide standardized methodologies. The OSE/ISC and the state's universities have the knowledge and capacity to perform these functions.

Increases in water supply^{xiv} and decreases in water consumption are potential tools for balancing supply and demand; however not all options are equally appropriate for all locations. In many instances decision-makers may not have enough information on anticipated results. In rapid growth areas, supply-demand deficits may be very expensive to resolve.



New Mexico Water Use report
published by the New Mexico
Office of the State Engineer
available online at:
<http://www.ose.state.nm.us/PDF/Publications/Library/TechnicalReports/TechReport-052.pdf>.

✓ *Promote Conservation of Land.*

The sustainability of our communities and rural landscapes depends on many factors including adoption of development regulations that promote more compact development, and respect important cultural, economic, and environmental factors such as farm land, wildlife corridors and other valued open space. Development on our agricultural lands, floodplains, watersheds, wildlife corridors, and culturally sensitive areas can erode the integrity of New Mexico's natural and cultural heritage.

- Land use and water planning should consider the economic, cultural, and environmental implications of any proposed development.
- Planning for more compact and mixed use development minimizes the costs of extending infrastructure (roads, water and sewer lines) into rural areas. This approach is often called "smart growth". Community plans should include policies on extension of infrastructure, annexation, infill, and mixed use development to ensure that more compact and sustainable development is achieved.
- Preserving agricultural lands can be achieved by designating agricultural districts and adopting specific subdivision and zoning criteria.^{xv}
 - Voluntary land conservation easements are one useful tool in helping preserve the state's rural landscapes. Significant conservation values that may qualify for State and Federal tax credits/deductions include agriculture, scenery, history, ecology (wildlife habitat) or recreation. With a conservation easement the landowner agrees to restrictions to preserve and protect the unique value of the land. The land owner retains ownership of the property and can sell, mortgage or bequeath it, but the easement remains with the property in perpetuity. The tax benefits of conservation easements on irrigated farm lands provide an alternative to selling water rights for farmers who need to realize the value in some of their assets.



Albuquerque north valley acequia
Photo Kenesson Design, Inc.

✓ Promote Conservation of Water.

Water conservation is one of the most efficient mechanisms for balancing gaps between supplies and demand.

- Important conservation measures include: retrofits with water and energy-efficient appliances, gray water use, rooftop harvesting, limits on landscaping, incentives for waste-water reuse, green building codes, incentives for more water efficient irrigation methods and changes in crops.^{xvi}
- Municipal and industrial water conservation is fairly well understood. Agricultural water conservation, however, is more complicated. Recent studies^{xvii} indicate that, contrary to initial expectations, agricultural water conservation measures such as drip systems may improve crop yields, but do not reduce the amount of water used by the crop. It is possible to reduce losses and incidental depletions related to agricultural delivery systems, but since the water saved is not available as a water right that can sold or leased for other purposes by the farmer, the farmer has no incentive to make a financial investment to prevent those losses or depletions. If New Mexico is to take advantage of agricultural water conservation, it will be necessary to devise a process to resolve the legal and practical obstacles.
- Watershed restoration programs may improve both local water supplies and quality. Local watershed groups have formed in many parts of the state. There is a need for ongoing support and expansion of watershed initiatives.



Sample water conservation options. Photos courtesy of Santa Fe Permaculture

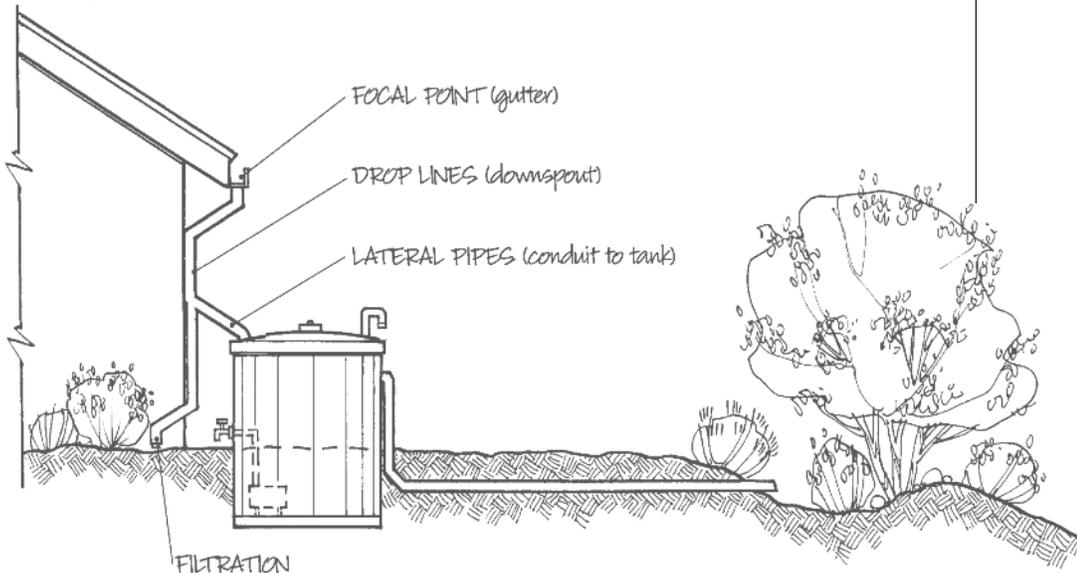


Diagram of rain gutter water catchment system.

Illustration George Lawrence

 ***Conduct education and public participation programs to inform decision-makers and the public regarding land and water-use planning issues and the value of long-range planning.***

Although many New Mexico citizens are better informed about water issues now than in the past, there is a continuing need to support public education programs, meaningful public participation, and open debate regarding development decisions and regulation. When citizens are better informed about New Mexico land use and water issues and the cost of uninformed decisions, they are more likely to understand the need for increased water rates or revised water rate structure, water budget allocations, and policies that support comprehensive water and land use management.

Open, participatory decision processes can foster meaningful deliberation about the long-term tradeoffs and choices inherent in water management (and related land-use) decisions.

 ***Land use and water planning must be a budget priority to sustain the economic welfare of our communities.***

Land use planning and water planning must be a budget priority to sustain the economic welfare of our communities. It is in New Mexico's strategic interest to assure our communities have planned for adequate infrastructure and a secure water supply. Although the New Mexico State Water Plan urges the recognition of the relationship between water availability and land use decisions, New Mexico spends considerably less on water planning than other Southwestern states, such as Colorado, Wyoming and Texas. Planning programs can result in long-term fiscal savings because they lead to more efficient expenditures. Options for New Mexico could be studied with an executive order or a legislative memorial creating a task force to bring New Mexico up to a level commensurate with neighboring states that face similar water shortages.

Conclusion

Coordination of land and water use decision-making will optimize and protect our economic welfare and limited resources. This will require the cooperation of many governmental entities, legislative changes and financial support. Given what we know about New Mexico's future water supply and its variability, and the need to maintain the integrity of our landscapes, we have a responsibility to direct our activities towards the most feasible, cost effective and sustainable strategies.

Integrating Land Use and Water Planning in New Mexico Conference

Following completion of a draft of this report, the Utton Center sponsored a conference using the themes in the White Paper as a starting point and expanding the discussion to incorporate the views of others working on this problem. The conference, titled Integrating Land Use and Water Planning in New Mexico, took place on April 8, 2011 and was attended by about 120 people. It was clear from the interest level on the part of the participants and their input in the last part of the day, that there is broad recognition of the importance of the issues presented in the White Paper. Go to: <http://uttoncenter.unm.edu/projects/land-water-2011.php> for the conference agenda, short summaries of the panels and key note talks, power points used by the speakers, a summary of priorities and approaches identified by the participants for better integration of land and water planning, and background papers provided to the conference participants.

Photos on this page taken at the Integrating Land Use and Water Planning in New Mexico Utton Center April 8, 2011 Seminar



James Glover and Tim Karpoff



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Joe Quintana and Rolf Schmidt-Petersen



Susan Kelly and Dale Dekker



John Longworth and Alan Hamilton



Rosemary Glenn, Ashleigh Morris, and Dominique Work



Kathy McCoy and Bob Wessely



Kyle Harwood and Gretel Follingstad



John Shoemaker and Dan McGregor

Endnotes

- i Agency Technical Work Group, http://www.nmenv.state.nm.us/aqb/cc/Potential_Effects_Climate_Change_NM.pdf (December, 2005)
- ii BBER, A Report on Historical and Future Population Dynamics in New Mexico, August 2008
- iii University of New Mexico Institute for Public Policy; Vol. 12/No. 2, Summer 2000.
- iv The State Water Plan (2003) recommends strengthening the coordination between land use and water planning, including taking steps to obtain accurate water supply and land use data, including accurate water accounting and reliable water use projections.
- v U.S. Geologic Survey, National Atlas of the United States, 2000. Precipitation data from 1961-1990. http://www.nationalatlas.gov/printable/images/pdf/precip/pageprecip_nm3.pdf.
- vi Bureau of Reclamation, NM Water Resource: Assessment for Planning Purposes, 1976, pp. 10-12.
- vii Agency Technical Work Group, http://www.nmenv.state.nm.us/aqb/cc/Potential_Effects_Climate_Change_NM.pdf (December, 2005)
- viii Middle Rio Grande Water Supply Study, S S Papadopoulos and Asso., Inc., New Mexico Interstate Stream Commission and USA CoE; and Middle Rio Grande Regional Water Plan, New Mexico Interstate Stream Commission, 2004
- ix NMSA 72-1-1, et. seq.
- x NMSA 3-21-1, et. seq. and NMSA 47-6-1 et seq.
- xi For example, issues such as amount and location of agricultural land that will be retired to accommodate projected urban growth are generally not addressed. Projects that could increase supply are often included in regional water plans, but the impact of these projects is often not integrated into land use planning.
- xii Some assistance may be provided by Councils of Governments or through grants from the Department of Finance Administration (DFA) Local Government Division
- xiii For example, agricultural land taken out of production results in a loss of open space and also affects river flows to downstream users, etc.
- xiv Projects that potentially increase water supply include weather modification, water importation, aquifer storage and recovery (ASR), water re-use (sewage and produced water), desalinization, roof top capture, and diversion of certain flood waters.
- xv *Rio Arriba County Design and Development Ordinance, 2000-01, 2011-02*, Section 4.1, Rural County Agricultural District (CRUD) and Section 5.4, Irrigated Agricultural Overlay Zoning District (IAOZD), pp.33-36; *Rio Arriba County Land Subdivision Regulations, 1996-01*, Appendix Q, Agricultural Protection and Enhancement Ordinance. www.rio-arriba.org
- xvi In Santa Fe, for example, a toilet retrofit program is credited as the main reason water demand remained flat for some years despite growth
- xvii Dr. Zohrab Samani, NMSU and John Longworth, PE, Office of the State Engineer, Conservation of Water and Agricultural Water Use, Third Meeting of the Water and Natural Resources Committee, August 30-31



The Utton Center 
