

2009 DROUGHT TOOLBOX SCOPING REPORT

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Prepared for



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Colorado Water Conservation Board Drought Toolbox Scoping Report

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Colorado Water Conservation Board

Drought Toolbox Scoping Report

1. Executive Summary

Colorado state level drought planning has been developed through the preparation and implementation of the Colorado Drought Mitigation and Response Plan (DMRP). The plan was first developed in 1981, making Colorado was the first state in the nation to create a formal mechanism to identify and respond to drought. The purpose of Colorado's DMRP is to provide an effective and systematic means for the State to reduce the impacts of water shortages over the short and long-term. Colorado recognizes that to effectively respond to drought, actions are required from the state to local level. The 2007 DMRP includes goals and recommendations related to **local drought planning** (see section 2.3 of this report). To better understand water providers' drought planning needs, the State completed surveys in 2004 and 2007. The results were compiled in two Water Supply Assessment reports (see section 2.2 of this report).

Colorado updates its DMRP every three years as required by the Disaster Mitigation Act of 2000. As Colorado begins working on the 2010 plan, the State is using the opportunity to respond to previously identified drought related planning needs. Colorado is developing a comprehensive suite of planning, assessment and response resources (i.e. drought toolbox) for use at the state, regional and local levels. Key components of the drought toolbox will be geared toward helping local water providers develop drought mitigation plans. This report has two objectives:

1. To overview what other states are doing regarding local drought planning and provide recommendations for how Colorado can further support local drought planning efforts, and
2. To provide information on the types of tools that other states have available to assist local, regional, state and other entities in planning, assessing and responding to drought (drought toolbox contents). Colorado's local planning requirements and guidance materials will become part of the State's drought toolbox.

This Drought Toolbox Scoping Report is intended as a guide for use by Colorado Water Conservation Board (CWCB) staff and their consultants as they develop the State's drought toolbox in a subsequent project.

2. Project Overview

2.1. Approach

Headwaters Corporation (Headwaters Corp) was tasked to review what other states are doing regarding local drought planning and make recommendations for Colorado. The main focus of this document is on state requirements and tools provided to encourage **local drought planning**. Because of the potential for overlap with state and local level drought planning, an overview of state and regional drought planning is provided. The project scope also included a high level review of drought assessment and response tools and activities. The actual contents of Colorado's drought toolbox, which will include local drought planning regulations and guidance materials, will be developed in a successive project.

This report reviews local planning-related recommendations from Colorado's 2004 and 2007 Drought and Water Supply Assessments and the 2007 Colorado Drought Mitigation and Response Plan Update. This is followed by an overview of what Colorado and several other states are doing regarding drought planning, focusing on the local level. Planning recommendations specific to Colorado are then made, followed by a high level overview of the types of resources Colorado may wish to consider including in its "drought toolbox".

The following list of key states, in the order in which research was initiated, was identified through conversations with Dr. Michael Hayes, Director of the National Drought Mitigation Center, and CWCB staff: Colorado, Texas, California, New Mexico, Arizona, Nevada, Georgia, and South Carolina. These states were selected based upon their proximity to Colorado and/or their drought planning experience. While an attempt was made to be comprehensive in reviewing states' activities, due to the volume of material and sources, it is likely that certain information was overlooked. This report captures key and representative information, the majority of which was obtained through internet research, with follow up clarification phone interviews to several states. Brief phone notes with contact information are provided as an Attachment in section 6.

A State Summary Sheet was developed for each state, with information on state, regional, and local level drought planning. State Summary Sheets (provided as an attachment in Section 6) also include the following information regarding local drought planning:

- Statutory Context;
- Entities Completing;
- Plan Content Overview;
- Public Input and Education;
- Submittals, Reporting, Updates and Enforcement;
- Funding Mechanisms; and
- Planning Guidance Materials.

Key websites and documents are identified as well as information about drought planning, assessment, and response tools. The State Summary Sheets included as an attachment are an integral part of this report. The main body of this report provides only a high level overview and comparison of the states' activities. The State Summary Sheets should be reviewed to fully understand what other states are doing and the tools that are available. As Colorado develops its Drought Toolbox, we recommend that states be interviewed and/or state websites revisited to determine if new or different information, as compared to what is provided in the State Summary Sheets, has become available.

Water supply (including drought-related water supply planning) and water conservation planning were not investigated except peripherally in relation to drought assessment and response planning. Additionally, at the state level this project focused on drought planning by the Department of Water Resources (or similar entity). Drought may also be addressed by emergency management departments and included as a component of states' emergency management plans, but in general these plans are only discussed if no other drought plan exists.

Terminology and plan organizational differences were frequent between the states, with water planning, water conservation planning and drought planning often overlapping. This review specifically looked at drought assessment and response planning and tools required, recommended, or linked to, by the states. Drought planning undertaken by local or regional entities not guided by state requirements

or guidance are not included. Tools provided by other organizations were only reviewed if the states provided information about them. Several states also planned for water shortages, rather than drought specifically. This report refers to both drought and water shortage planning as drought planning.

2.2. Colorado's Drought and Water Supply Assessment and Update Summary

In 2004 Colorado released a report documenting the results of a drought survey of municipal, agricultural and other water users. The state completed a follow-up survey focused on municipal and urban water providers in 2007. The following are key findings related to local drought planning and the drought toolbox:

- There was a discrepancy with most large urban providers having a drought plan, while smaller rural agencies did not.
- Water providers may have replied “yes” when asked if they had a drought plan in place when they were actually referring to having drought response actions in place without a plan.
- Respondents felt the areas of greatest need for funding were project evaluations and feasibility studies followed by loans for capital projects, grants for planning activities, and grants for infrastructure management.
- 85% of agencies surveyed expressed interest in contributing to a statewide data repository project.
- Email and the internet are the preferred delivery methods for water information.
- It would be helpful if the State developed a common set of criteria for defining the start, the level of severity, and the end of droughts in the State. Adoption of common terminology would facilitate drought planning and lead to better coordination.
- Colorado municipal providers look to the State for assistance with planning for conservation, drought response and water supply, though typically more for funding than for technical information.
- State assistance with drought planning in the area of research and data generation with response to drought damages and drought response technologies could be helpful.
- Agricultural water users were interested in cooperative and operating agreements for times of drought.
- Improved ability to predict drought would be helpful.
- Additional public education and involvement programs were suggested.
- It was noted that messaging in the media is often inconsistent and/or conflicting (e.g. different municipalities have different timing and types of lawn watering restrictions).

2.3. 2007 Colorado Drought Mitigation and Response Plan Update

In 2007, Colorado developed an update to its Drought Mitigation and Response Plan. The following goals are included in the update:

1. Improve Water Availability Monitoring
2. Increase Public Awareness and Education
3. Support Substitute Water Supply Plans and Leasing Options to Augment Water Supply
4. Facilitate Watershed and Local Planning
5. Reduce Water Demand/Encourage Conservation
6. Impact Reduction
7. Develop Intergovernmental and Interagency Stakeholder Coordination
8. Evaluate Potential Impacts from Climate Change

The 2007 update also recommended the following actions that are relevant to local planning and the drought toolbox:

- Make completion of local drought plans a priority
- Develop a technical drought planning toolbox
- Develop a database to track key information in local drought plans
- Develop a process to link local plans to state plans (also recommended by FEMA)

This report and the recommendations presented herein are designed in part to respond to Colorado Drought and Water Supply Assessment results and the 2007 Colorado Drought Mitigation and Response Plan Update as Colorado begins work on its 2010 DMRP.

3. State Planning Review

3.1. Drought Planning Level

Drought planning may occur at a variety of levels. Dr. Michael Hayes, Director of the National Drought Mitigation Center at the University of Nebraska at Lincoln, advocates for state and local level planning requirements to effectively prepare for and respond to drought (personal communication on 5/11/09). Table 1 lists the various planning levels undertaken by the states reviewed as well as if plans and updates are required and if funding is available to assist in planning. Texas, California and South Carolina have the most robust state sponsored local drought planning programs. In several cases a drought mitigation plan is not a standalone document but rather is a required component of a larger water plan as footnoted in Table 1.

Table 1: Drought Planning Levels

	State Plan	State Plan Required	State Plan Updates Required	Regional Plan	Regional Plan Required	Regional Plan Updates Required	Regional Planning Funding Available	Local Plan	Local Plan Required	Local Plan Updates Required	Local Planning Funding Available
Colorado	X	X	X					X			X
Texas	X	X		X ¹	X	X	X	X	X	X	
California	X	X						X ²	X	X	
New Mexico	X ³										
Arizona	X							X ⁴	X	X	
Nevada	X							X ⁵	X	X	
Georgia	X	X ⁶	X					X	X		
South Carolina	X ⁷	X						X ⁸	X		

¹Texas Regional Water Plans are focused on water supplies but include a section on “Water Conservation and Drought Management Recommendations”.

²California requires that water suppliers complete an Urban Water Management Plan which includes a Water Shortage Contingency Plan.

³New Mexico updates its drought plans each year during drought so the plan serves also as a drought report. The most recent plan is for 2006.

⁴Arizona requires that water suppliers complete a System Water Plan which includes a Drought Preparedness Plan.

⁵Nevada requires Local Water Conservation Plans which include a Drought Contingency Plan.

⁶Currently Georgia has a State Drought Management Plan (SDMP) with required five year updates. Recent legislation in Georgia requires that the State codify drought planning, assessment and response. These activities are currently included in the SDMP, which may be replaced or strengthened with new State code (currently being developed).

⁷South Carolina’s Drought Response Act essentially serves as a state drought plan. The Drought Response Act specifies that the Department of Natural Resources shall develop a drought mitigation plan, but it has not done so, relying on the Drought Response Act instead. Additionally, the State has a Drought Response Plan included as a component of South Carolina's Emergency Operation Plan completed by the Emergency Management Division.

⁸South Carolina requires that municipalities, counties, public service districts, special purpose districts, and commissions of public works engaged in the business or activity of supplying water for any purpose shall develop and implement drought response ordinances or plans where authority to enact ordinances does not exist.

3.1.1. State Drought Planning

The states reviewed included the following types of information in their state drought plans:

- Drought Monitoring Approach (data collection, analysis and dissemination)
- Drought Indicators and Triggers
- Drought Declaration Processes including Drought Stages
- Pre-Drought Strategies (by agency, water use sector, or region)
- State Authority in Time of Drought
- Roles and Responsibilities (of local, regional, state, federal and private entities)
- Plans to Establish Communication and Reporting Processes
- Public Education Processes
- Drought Responses (by drought stage) and Impact Assessments (short and long term)
- Identification of Legislative and Resource Needs
- Inventory of Drought Programs (state and federal) and Resources
- Process for Updating State Plan

States had different interpretations regarding the content and format of a state level drought plan. For example, New Mexico's plan may be more appropriately called a drought report or update. It focuses specifically on the situation in 2006, providing current conditions, assessing drought risks and describing past and planned responses. Similarly, Arizona and Nevada developed their plans to address existing drought conditions, updating them as needed (typically during subsequent droughts). Colorado, Texas and South Carolina tie their plans directly to the states' Hazards Mitigation Plans which are required by the Federal Emergency Management Agency (FEMA). California has a 2000 Critical Water Shortage Contingency Plan that is supplemented by a 2008 California Drought Update report regarding current conditions. Georgia's state plan is very streamlined, outlining specific pre-drought strategies, drought triggers, stages and responses. Recent legislation in Georgia requires that the Department of Natural Resources codify its drought planning. Georgia code is being developed for this purpose. Georgia is unique among the states reviewed in that, through its State Drought Management Plan (SDMP) and State Code it has the statutory authority to declare drought and impose restrictions. In addition, Georgia's Rules for Outdoor Water Use (section 391-3-30) include outdoor use schedules for drought and non-drought periods. South Carolina relies on its Drought Response Act which essentially serves as the State's drought response plan.

3.1.1.1. State Drought Committees

In addition to a state drought plan, most states have some form of drought related work groups, task forces and/or technical committees as show in Table 2. Some are permanent with ongoing responsibilities, while others are convened as necessary. Several states also have committees which are focused on water supply planning and/or water conservation but this information is not included below.

Table 2: State Sponsored Drought Committees

State	Drought Planning Groups	Level	Membership	Tasks
Colorado	Water Availability Task Force	State	State and federal agencies	Monitoring and evaluation, notify governor of potential drought conditions, recommend actions including activating Colorado Drought Mitigation & Response Plan.
	Impact Task Forces	State	State and federal agencies. May focus on Municipal Water, Wildfire Protection, Agricultural Industry, Tourism, Wildlife, Economic, Health, and Review & Reporting.	Activated during drought. Assess impacts, gather and evaluate data, define and assess societal impacts, severity, loss and costs, capacity for response: determine needs, report findings and action plans, make timely reports to leadership, media, and response agencies.
Texas	Drought Preparedness Council	State	State and federal agencies	Develop and update state drought plan. Provide clearinghouse of drought-related public information and education. Provide timely and consistent drought news.
California	None			
New Mexico	Drought Task Force	State	12 members: experts in financing, water project construction, water rights, water conservation, water quality, impacts on agriculture, wildlife, economic development, tourism and wildfire.	Recommend strategies for reducing the State’s vulnerability to drought, public education, monitoring, drought reports and forecasts, assistance available.
Arizona	Governor's Drought Interagency Coordinating Group	State	State, federal, tribal and non-governmental organizations	Evaluate drought conditions and make recommendations to the governor.
	State Drought Monitoring Technical Committee	State	State, federal, research and non-governmental organizations	Gather drought, climate and weather data, disseminate to land mgrs, policy-makers, public. Produce Drought Monitor Report.
	Local Drought Impact Groups	County	Local, state, federal, tribal government, water providers, irrigation districts, non-governmental organizations	Coordinate drought public relations, provide impact assessment info to local and state leaders, implement local mitigation.

Table 2: State Sponsored Drought Committees

State	Drought Planning Groups	Level	Membership	Tasks
Nevada	Drought Review and Reporting Committee (DRRC)	State	Local, state, federal, tribal government, water providers, irrigation districts, non-governmental organizations	The State Climatologist convenes this committee as necessary. The DRRC, utilizing the various information sources of its members, assesses the hydrologic and climatic parameters and project future conditions.
	3 Drought Impact Task Forces (Agricultural, Fish and Wildlife, and Municipal and Industrial)	State	Local, state, federal, tribal government, water providers, irrigation districts, non-governmental organizations	Convened only in the Drought Alert stage. The basic purpose of the Drought Impact Task Forces is to report on drought impacts and to recommend mitigating measures to the DRRC, which then makes recommendations to the Governor.
Georgia	Drought Response Committee	State	State, federal and local agencies, universities and nongovernment organizations	Monitor and update state Drought Plan, with state climatologist determine if drought should be declared and response actions. Update state drought plan.
South Carolina	Local Drought Response Committees	Basin	State, county, regional, local government; domestic user, industry, power generation facilities, private water supplier, public service district, soil & water conservation dist., special purpose district.	Develop drought management plan including: actions to recognize and deal with drought, monitoring, response actions, education programs and demand reduction strategies, defining implementation and enforcement mechanisms, outlining review and update procedures.

3.1.2. Regional Planning

Of the states reviewed, only Texas required planning at the regional level that is specifically geared in part to address drought. Texas' Senate Bill 1 (1996) was signed into law in response to an increased awareness of the vulnerability of the State to drought as well as the limits of existing water supplies to meet increased demands resulting from population growth. Regional Water Plans (RWPs) (Texas delineated 16 regional planning areas) have a required section on "Water Conservation and Drought Management Recommendations". Texas requires that each regional water plan address the needs of all water users and suppliers, except certain political subdivisions that decide not to participate. Local Drought Contingency Plans, which are required, are referred to in developing Regional Water Plans. Several other states encouraged or required regional water supply planning, but drought planning was not a significant component of these plans. A summary of the Texas statute requiring regional plans is included in **Table 3**Table 4.

3.1.3. Local Planning

This section (3.1.3) summarizes what states are currently doing to promote planning on a local level. Section 4 then evaluates this information, making recommendations for Colorado when appropriate.

States used different methods to require or encourage water providers to develop local drought mitigation planning. Most relied on statutory language and state plan recommendations. Plan content and update requirements varied greatly. Generally if a state is not discussed in a section below it is because it does not have a relevant requirement or process in place.

3.1.3.1. Statutory Context and Entities Completing

All states with drought planning at the local level have statutory requirements mandating the plans, with the exception of Colorado. Table 3 lists local drought mitigation plan requirements. Responsibility for local level drought planning rests with a variety of agencies, though most often the Department (or Division) of Water Resources. At the local planning level most states tend to focus primarily on municipal water suppliers. Texas has the most comprehensive coverage, with all water providers required to develop plans.

Drought plans exist as separate documents for Colorado, Texas and South Carolina; as components of larger water plans for California, Arizona and Nevada; and as part of new or expanded surface water and groundwater withdrawal permit applications for Georgia. New Mexico does not require local drought plans. Most states require somewhat comprehensive drought plan content regardless of whether it was part of a larger water plan. Nevada was the exception, providing guidance that states only "Water Conservation Plans must include a contingency plan for drought conditions that ensures a supply of potable water."

Several states also allow for collaborative planning among entities serving the same geographic area or sharing a water supply. In California and Texas this occurs most frequently when large wholesale water providers collaborate with the retail providers they deliver to. In Arizona and Nevada, smaller water providers serving the same town or county sometimes choose to develop a joint plan. South Carolina encourages collaborative planning, noting that these help systems coordinate and develop alternative water supplies during periods of drought.

Table 3: Local Plan Requirements

	Local Plan	Required by Law	State Agency Responsible	Plan Type	Entities Completing	Collaborative Plan Option ¹
Colorado	X		Colorado Water Conservation Board	Drought Mitigation Plan	Water providers or state and local government	
Texas	X	X	Texas Commission on Environmental Quality ²	Drought Contingency Plan	Wholesale public water suppliers, retail public water suppliers, and irrigation districts.	X ³
California	X	X	California Department of Water Resources	Water Shortage Contingency Plan component of Urban Water Management Plan	Urban (i.e., municipal) water suppliers (including wholesalers), providing water (directly or indirectly) for more than 3,000 customers or 3,000 af/yr	X
New Mexico	None					
Arizona	X	X	Arizona Department of Water Resources	Drought Preparedness Plan component of System Water Plan	Community water systems (CWS) serving at least 15 connections used by year-round residents (or that regularly serves at least 25 year-round residents). If a CWS has a designated assured water supply, they are exempt.	X
Nevada	X	X	Nevada Division of Water Resources	Drought Contingency Plan component of Local Water Conservation Plan	Water suppliers providing water for municipal, industrial or domestic purposes	X
Georgia	X	X	Department of Natural Resources, Environmental Protection Division	Drought Contingency Plan component of Water Conservation Plan component of surface water and groundwater withdrawal permit applications	Any entity (except for agricultural water users) applying for a new or expanded surface water or groundwater withdrawal permit that will withdraw more than 100,000 gallons per day.	
South Carolina	X	X	South Carolina Department of Natural Resources	Drought Ordinance and/or Drought Response Plan	Municipalities, counties, public service districts, public work commissions engaged in supplying water for any purpose.	X

¹ States specifically allowing collaborative local level plans in the drought planning materials are identified here. Collaborations may be allowed in other states, but they were not specifically discussed.

² Drought Contingency Plans (DCP) are the responsibility of the Texas Commission on Environmental Quality (TCEQ) while water planning is the responsibility of the Texas Water Development Board (TWDB). The TCEQ requires water suppliers to complete a DCP. In addition to TCEQ requirements, the TWDB requires that providers serving more than 3,300 connections who are applying for state funding must include a DCP as a component of the required Water Conservation Plan. The DCP developed for the TCEQ is frequently submitted to meet this requirement.

³ Texas planning requirements and guidance materials do not specifically state that collaborative plans are allowed but in a conversation with the Texas Commission on Environmental Quality the State acknowledged that these are allowed and occasionally submitted (see Attachment A2 Notes for Phone Calls).

The statutes requiring local plans are summarized in Table 4 by state. Statutes relating to state level drought planning are not included. Texas also requires regional drought planning so the statute establishing that requirement was included.

Table 4: Local Planning Statutory Framework Overview

State	Local Planning Statutory Requirement
Colorado	None
Texas	<u>Title 30, Texas Administrative Code, Chapter 288</u> - In 1997 the Texas Legislature directed the Texas Commission on Environmental Quality (TCEQ) to adopt rules establishing common drought plan requirements for water suppliers. The code was amended and became effective on January 10, 2008.
	Regional Planning: <u>Senate Bill 1</u> - In June 1997 SB 1 was signed requiring that regional water plans (RWPs) be developed to map out conservation, conserve water supplies, meet future water supply needs and respond to future droughts in the planning areas. RWPs must address the needs of all water users and suppliers, except certain political subdivisions that decide not to participate.
California	<u>California Urban Water Management Planning Act (Water Code Sections 10610-10657)</u> - Since 1983, California has required urban (i.e., municipal) water suppliers that provide water to 3,000 or more customers, or that provides more than 3,000 acre-feet of water annually to develop and implement an Urban Water Management Plan.
	<u>California Water Code Sections 350-359</u> – This code establishes processes for declaring a Water Shortage Emergency. This information should be incorporated into any water shortage plans.
New Mexico	None
Arizona	<u>House Bill 2277</u> - In 2005 HB 2277 Community Water System Planning and Reporting Requirements was adopted requiring Water System Plans. HB 2277 System Water Plans include a water supply plan, water conservation plan, and drought preparedness plan. This was codified in section 45-342 of Arizona’s revised statutes.
Nevada	<u>Nevada Revised Statutes Chapter 540.131</u> - States that Water Conservation Plans must include a contingency plan for drought conditions that ensures a supply of potable water.
Georgia	George Water Quality Control Act <u>Official Code of Georgia Annotated (O.C.G.A.) § 12-5-31</u> , <u>Rules for Surface Water Withdrawal, Chapter 391-3-6</u> , and <u>Rules for Water Quality Control and Rules for Ground Water Use (O.C.G.A. § 12-5-96)</u> require that permit applications include a water conservation plan that includes a drought contingency plan component.
South Carolina	<u>South Carolina Drought Response Act of 2000</u> (amends SECTION 3. Chapter 23, Title 49 of the 1976 Code) - Requires local drought response ordinances, or local drought response plans when authority to enact ordinances does not exist.

3.1.3.2. Local Drought Plan Content

The following summarizes the planning steps and content required and/or recommended for local drought plans by the states reviewed. While content and steps tend to be similar, the ways states have chosen to organize plans vary. Additional details can be found by reviewing the states' statutes and plan development guidance materials.

Colorado

The CWCB's Office of Water Conservation and Drought Planning (OWCDP) lists six steps to prepare a drought plan on their drought mitigation planning website

(<http://cwcb.state.co.us/Conservation/DroughtPlanning/DroughtMitigationPlanning/DroughtMitigationPlanning.htm>):

- Obtain Public Input and Involvement
- Define Goals and Objectives
- Assess Water Supply and Demand Conditions
- Define Drought Indicators
- Identify and Assess Drought Mitigation Measures
- Develop a Drought Index and Management Strategy

The CWCB's Drought Mitigation Plan Review Guidelines list the following plan elements (elements summarized by Headwaters Corp):

- Establish a Drought Task Force
- Perform a Vulnerability Assessment of the Water Supply
- Develop Policy to Assess and Respond to Drought
- Develop Response Actions
- Maintain Ongoing Public Education and Awareness
- Link Drought Mitigation with Water Supply and Water Conservation Planning

Texas

The Handbook for Drought Contingency Planning for Retail Public Water Supplies (the most comprehensive of the guidance materials provided by Texas) includes the following six planning steps:

- Step 1: Public Involvement
- Step 2: Assess Vulnerability to Drought and Define Triggering Criteria
- Step 3: Determine Drought Response Targets and Best Management Practices
- Step 4: Adopt the Plan
- Step 6: Periodic Review and Update.

California

California requires that Urban Water Management Plan be updated on a five year cycle. The state updates its guidance documents prior to each cycle. The Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan provides the following steps to developing a Water Shortage Contingency Plan (WSCP):

- Step 1: Stages of Action
- Step 2: Estimate of Minimum Supply for Next Three Years
- Step 3: Catastrophic Supply Interruption Plan
- Step 4: Prohibitions, Penalties and Consumption Reduction Methods
- Step 5: Analysis of Revenue Impacts of Reduced Sales During Shortages
- Step 6: Draft Ordinance and Use Monitoring Procedure

In 2008, in response to an ongoing drought, California developed the Urban Drought Guidebook 2008 Updated Edition to assist water providers who wanted to update their drought plans. This guidebook includes the following seven steps to developing a WSCP (note that these differ from the steps provided above in the 2005 guidance materials):

- Step 1: Establish a Water Shortage Response Team
- Step 2: Forecast Supply in Relation to Demand
- Step 3: Balance Supply and Demand: Assess Mitigation Options
- Step 4: Establish Triggering Levels
- Step 5: Develop a Staged Demand Reduction Program
- Step 6: Adopt the Water Shortage Contingency Plan (includes public input)
- Step 7: Implement the Water Shortage Contingency Plan.

The 2010 guidebook is expected to be released in the next several months.

New Mexico has no planning requirements or guidance materials.

Arizona

Arizona's revised statutes (Section 45- 576) specify that drought preparedness plans shall be designed to meet the specific needs of the water system for which it applies and shall include:

- Contact info for the person at the community water system who is responsible for directing operations during a water shortage emergency.
- Drought or emergency response stages and response actions.
- Plan of Action to respond to drought or water shortage conditions, including:
 - Public education;
 - Development of emergency supplies; and
 - Specific water supply or water demand management measures for each stage of drought or water shortage conditions.

Nevada

Nevada statutes say only that required Water Conservation Plans must include "A contingency plan for drought conditions that ensures a supply of potable water."

Georgia

Georgia has different requirements for surface water and groundwater permit applicants. Permit applicants may meet planning requirements by stating that they will follow Georgia's State Drought Management Plan (SDMP) which the majority of applicants choose to do. The SDMP includes specific pre-drought strategies by water use sector, triggers and drought stages, and required response actions.

Groundwater permit application requirements vary slightly depending on the type of water use (municipal, industrial or golf course). All permit applicants wishing to develop their own plans (surface water and groundwater) must include the following info information in their Drought Contingency Plan (or a statement as to why the item is not an appropriate part of the plan):

- A system for determining drought severity based on some approved indicator (e.g., system demands, groundwater levels, other, etc.);
- A potable water use priorities program (e.g., emergency use essential to life support, domestic use, lawn sprinkling, equipment, etc.); and

- Restrictions on lower priority uses and description of circumstances or events that put the priority use system into effect.

In addition, surface water permit applicants must also include sections describing:

- Low flow streamflow protection; and
- Water storage available to ensure availability of raw water to applicant through a critical drought period.

South Carolina

Local drought response ordinances and plans shall be consistent with the State Drought Response Act and shall contain at a minimum the following information:

- A description of alternate supply sources, including time, costs, and problems associated with putting alternate sources on-line.
- A water use reduction plan and schedule for moderate, severe, and extreme drought for various categories of water use (provided), as appropriate.
- An implementation plan and ordinance, as appropriate.

3.1.3.3. Public Input and Education

This section refers to public involvement and education at the local level. It does not include state or more regional efforts, though many states solicit public input and have procedures for public education in place at these levels.

Table 5 lists the states that have public input and/or educational requirements regarding drought planning and response. Colorado, Texas, California and Nevada require that public input be solicited during plan development. Texas, California and Arizona have requirements that the public be informed when declaring and responding to drought. Nearly all require that public education be included as a component of drought planning. South Carolina does not require public involvement or educational plan components.

States handle public input and education about drought declarations and/or restrictions differently. Texas requires that plans include procedures to notify the public of the initiation or termination of each drought response stage. California requires a public hearing prior to a water shortage emergency condition declaration. Arizona requires that plans include provisions to actively inform the public of a water supply shortage and a program for continued education and information regarding implementation of the drought preparedness plan. Details as to the types of educational materials provided by states are included in Section 5 Drought Toolbox Contents.

Table 5: Local Drought Planning Public Involvement or Education Requirements

State	Public Involvement During Plan Development	Public Involvement and/or Education Required when Drought Declaration and/or Restrictions Are In Place	Ongoing Public Education Related to Drought
Colorado ¹	X		X
Texas	X	X	X
California	X	X	X
New Mexico ²			
Arizona		X	X
Nevada	X		X
Georgia			X ³
South Carolina			

¹ Colorado encourages, but does not require, that local entities complete a drought mitigation plan. If an entity chooses to develop a drought mitigation plan, Colorado’s plan guidelines specify that plans include ongoing public education and that the public have the opportunity to review draft plans.

² New Mexico does not have local drought planning requirements so does not have public involvement or education requirements.

³ Georgia does not have any public input requirements for surface water permit applicants’ drought contingency plans. Groundwater permit applicants must include public involvement and education, but these requirements apply to the entire water conservation plan.

3.1.3.4. Submittal, Reporting, and Update Requirements

Submittals

Among the states reviewed, drought plan submittal requirements and processes vary greatly.

Colorado encourages but does not require drought mitigation plans at the local level. It does have plan guidelines for entities choosing to complete a plan. Colorado also provides technical assistance to help providers meet plan requirements. Upon receipt of a completed local Drought Mitigation Plan, the CWCB reviews and either approves, conditionally approves, or does not approve the plan (and requests modifications be made). Water providers may then modify plans or contest the State’s decision.

The Texas Commission on Environmental Quality (TCEQ) requires all wholesale public water suppliers, retail public water suppliers serving 3,300 connections or more, and irrigation districts to submit drought contingency plans. Retail public water suppliers serving fewer than 3,300 connections must prepare and adopt a drought contingency plan and make the plan available upon request. TCEQ staff then review the plans for compliance with state statutes, helping providers make modifications if necessary.

California requires urban water suppliers to file Urban Water Management Plans with the Department of Water Resources (CDWR), the California State Library, and any city or county within which the supplier provides water supplies. Urban Water Management Plans are reviewed by CDWR staff to determine whether or not they are complete pursuant to the Urban Water Management Planning Act. Results of the CDWR review are provided to urban water suppliers through a review letter. The agency

may wish to use the review letter to revise their UWMP for re-submittal. CDWR provides technical assistance to urban water suppliers to help them meet the requirements of the Urban Water Management Planning Act.

Community water systems in Arizona must submit System Water Plans by the due date every five years. If a plan is not submitted, the Arizona Department of Water Resources (ADWR) sends out noncompliance letters notifying providers that they have 120 days to submit the plan. If the plan is not received by the end of this period, ADWR must provide notice of noncompliance to the governing bodies of the cities, towns and counties located in the community water system's service area. Notices include a link to a list of noncompliant systems on the ADWR website at http://www.azwater.gov/AzDWR/StatewidePlanning/drought/CWS_noncompliance.htm. The list specifies if the systems plan is inadequate and/or if the system did not submit required annual reporting data.

Nevada statutes say only that "Each supplier of water which supplies water for municipal, industrial or domestic purposes shall, on or before July 1, 1992, adopt a plan of water conservation" and that plans should contain "A contingency plan for drought conditions that ensures a supply of potable water".

Georgia requires any entity that withdraws, diverts or impounds surface water so as to reduce the flow by more than 100,000 gallons per day on a monthly average to obtain a permit from the Director of the Georgia Environmental Protection Division (EPD). Groundwater withdrawals of greater than 100,000 gallons per day also require a permit from the EPD. These requirements apply to all new permit applications and permit expansion applications for municipal, industrial and golf course water user. Permit applicants must submit a drought contingency plan as part of their application package. Agricultural water users are excluded from the water conservation/drought contingency plan requirement.

The South Carolina Department of Natural Resources requires that proposed ordinances and plans be submitted to the department for consistency review within six months of the commencement of the business or activity and shall adopt the ordinance or plan within twelve months of the commencement of the business or activity.

Reporting

Once plans are in place, Colorado, California, Arizona, Nevada and South Carolina have no local drought plan reporting requirements. Texas requires that the TCEQ be notified of restrictions implemented, with reporting requirements that vary by type of water provider. Terminations of restrictions must also be reported. The TCEQ state website then lists water providers with restrictions in place. Georgia requires water conservation plan reporting, but no reporting specific to drought is required. Many of the states consider required updates to be a reporting requirement.

Updates

All of the states with plan update requirements use a five year time frame for updates. Texas Drought Contingency Plans must be updated every five years to coincide with scheduled Regional Water Planning processes. California requires urban water suppliers update their Urban Water Management Plans at least once every five years. Arizona System Water Plans are due every five years by a state established due date. Nevada also requires that Water Conservation Plan (including a drought contingency plan component) be updated every five years. Colorado, Georgia and South Carolina do not require updates.

3.1.3.5. Planning Guidance Materials

This section refers to materials developed by states that are specifically intended to assist water providers to develop a local drought mitigation plan. Materials that may be useful for water providers to refer to, such as a state drought plan, are not included unless that plan includes specific guidance or information intended for use during local drought plan development. Also, if relevant sections of statutes, state plans or other documents are compiled in a comprehensive drought planning guidance document, only the guidance document is listed. If the state intends for providers to review the statute during plan development it is included. This review found that a wide variety of planning guidance materials exist to assist local water providers develop drought mitigation plans, with materials ranging from very thorough to non-existent.

Colorado

- **Guidelines for the Office to Review and Evaluate Drought Mitigation Plans** – Colorado does not have a drought planning guidance document to assist local entities in developing a drought plan. The *Guidelines for the Office to Review and Evaluate Drought Mitigation Plans Submitted by Covered Entities and Other State or Local Governmental Entities* provides broad guidance regarding required content.

Texas

- **Texas Administrative Code** – Specifies plan requirements by type of water provider (Title 30 Environmental Quality, Part 1 Texas Commission on Environmental Quality, Chapter 288 Water Conservation Plans, Drought Contingency Plans, Guidelines and Requirements, Subchapter B Drought Contingency Plans)
- **Model Drought Contingency Plans and Handbooks** – The TCEQ has prepared model drought contingency plans geared towards different types of water providers:
 - Handbook for Drought Contingency Planning for Retail Public Water Suppliers
 - Handbook for Drought Contingency Planning for Wholesale Public Water Suppliers
 - Handbook for Drought Contingency Planning for Irrigation Districts
 - Model Drought Contingency Plan for the Investor Owned Utility
 - Model Drought Contingency Plan for the Water Supply Corporation.

The handbooks include sections on drought planning and water conservation and comprehensive water resources management (not included in the Irrigation Districts handbook). Additional sections describe steps to develop a drought contingency plan, where to go for assistance, TCEQ rules for drought contingency planning, a model drought contingency plan (focused on the type of water provider) and an example drought ordinance and resolution. Guidance documents for Water Supply Corporations and Investor Owned Utilities included only a sample plan and resolution adopting the plan. Guidance materials appear to have been designed to include a level of detail appropriate for the relevant water supplier.

California

California requires that Urban Water Management Plans (UWMPs) be updated every five years. Each cycle a new guidance document is developed to assist providers (the 2010 document is expected to be released in the next few months). In 2008, the State developed additional drought planning guidance materials to assist providers who wished to update their plans in response to an ongoing drought. (Note that the 2008 guidebook does not contain the same drought planning steps and content as the 2005 document.)

- **Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan** – In addition to other information, UWMPs contain a Water Shortage Contingency Plan (WSCP) as well as an analysis of Water Service Reliability. The Guidebook describes the six components necessary to analyze water service reliability. It also provides six steps to develop a WSCP.
- **Urban Drought Guidebook 2008 Updated Edition** – This document refers to the California Urban Water Management Planning Act as well as several other drought related regulations and planning requirements. The guidebook includes background information and definitions, relevant sections of drought related statutes, seven steps to develop a water shortage contingency plan, drought reference materials, drought-related websites, emergency drought funding, water efficient landscape websites, and sample emergency water shortage ordinance.

New Mexico

New Mexico has no local planning requirements or guidance materials.

Arizona

- **System Water Plan Form** – Includes a short Drought Preparedness Section. The system water plan form is optional, but is recommended to ensure that all plan requirements are addressed.
- **Drought Plan Help Sheet for Small Systems** – One page fact sheet with simplified drought stages and management measures intended for small water systems.
- **Fact Sheet - Conservation and Drought Planning for Community Water Systems: How do they work together?** – Fact sheet is intended to assist community water systems in developing the drought preparedness plan and conservation plan. Includes sample drought stages and responses.
- **Sample System Drought Preparedness Plans** – Provides examples of System Water Plan sections from several existing plans. Four sample Drought Preparedness Plans are provided.

Nevada

Nevada requires that water conservation plans, including a drought contingency plan, be completed but does not provide much guidance.

- **Nevada Revised Statutes Chapter 540.131 Water Conservation** - Outlines Water Conservation Plan content requirements which state only that they must “must include a contingency plan for drought conditions that ensures a supply of potable water.”
- **Existing Conservation Plans** – Plans for several entities can be downloaded from the Nevada Division of Water Resources website.

Georgia

Georgia has developed high level guidance materials to assist applicants in developing the required Water Conservation and Drought Contingency Plans. Drought Contingency Plan guidance materials for surface water permit applicants is more detailed than that provided for groundwater applications. Plan guidance is included in surface water permit application documents. Separate Water Conservation Plan overview materials were developed for groundwater permit applicants, but these contains only a few high level bullet items specific to Drought Contingency Plan requirements

South Carolina

- **Model Drought Management Plan and Response Ordinance** – The South Carolina Department of Natural Resources, in cooperation with the South Carolina Department of Health and Environmental Control, developed a model drought response plan and ordinance.
- **Drought Management Plan and Response Ordinance Inventory** – Search for and download approved plans and ordinances by city or water system.

3.1.3.6. Enforcement Mechanisms

Most states were somewhat limited regarding enforcement mechanisms. Texas, California, and Nevada require plans in order to be eligible for state funding. Georgia requires drought contingency plans be submitted with water permit applications. South Carolina has the authority to assess fines from water providers who have not submitted plans. Arizona relies on publically identifying non-compliant water providers.

Water conservation and drought contingency plans are required for loans in excess of \$500,000 from the Texas Water Development Fund. California requires urban water providers to have a current and Department of Water Resources (DWR) reviewed Urban Water Management Plan in place in order to receive drought assistance or other DWR funds. Nevada requires that water providers have an approved Water Conservation Plan in order to be eligible for funding through the State Board for Financing Water Projects. Because Georgia ties drought contingency planning to the water permitting process it has a strong enforcement mechanism in place, in that it will deny a new permit application until the drought planning requirement has been met. It also allows permit applicants to say that they will follow that state's drought plan, which can greatly simplify the process. South Carolina's Drought Response Act allows for water providers to be assessed a fine between \$50 and \$1,000 daily for not submitting the required ordinance or plan. The state has not yet used this as an enforcement mechanism. Arizona's Department of Water Resources (ADWR) must provide notice of noncompliance to the governing bodies of the cities, towns and counties located in the community water system's service area. The ADWR also maintains a list of noncompliant systems on their website.

Texas, California, Arizona and Nevada all have five year cycles when plans are due. All states with update requirements contact entities who do not submit plans on time via mail and, at times, with follow up phone calls. Georgia, South Carolina and Colorado do not require ordinance or plan updates.

3.1.3.7. Funding Mechanisms

With the exception of Colorado, none of the states reviewed had funding in place for drought planning. When California first required Urban Water Management Plans some funding was available, but those funds ran out over a decade ago and have not been replenished. The TCEQ stated that it has not seen evidence that a lack of funding for drought planning has led to smaller water providers being less likely to develop a plan. Alternatively, California and South Carolina felt that a lack of funding for plan development is an impediment for smaller providers who don't have the funds to pay for a consultant or the staff to develop a plan (see Attachment A2 Notes from Phone Calls).

Most states had funding available to assist with water supply infrastructure projects and projects specifically intended to conserve water through system improvements. Several states had funding available for regional water supply planning (Texas, California and Georgia) or master planning (Arizona).

4. Local Drought Planning Recommendations for Colorado

Colorado has a strong drought planning framework in place, with a long history of planning for drought at the state level. The State has recognized the importance of local drought planning and has taken significant strides to encourage this over the past decade. As Colorado moves forward with its 2010 DMRP update and associated drought toolbox, the following are our recommendations regarding the State's role in local drought planning.

4.1. Statutory Context

Drought Plan Statutory Requirement

Of the states reviewed that supported local drought planning, Colorado was the only state that encouraged but did not require local drought planning. Colorado's 2007 DMRP Update recommended making completion of local drought plans a priority. We recommend that Colorado develop statutory drought planning requirements similar to its Water Conservation Plan requirements. Colorado's statutes, C.R.S. 37-60-126 and 126.5, could be readily modified to this end.

Link Local Drought Plans to the State Plan

Colorado's 2007 DMRP Update recommended developing a process to link local plans to state plans (also recommended by FEMA). It also recommended that a database be created to track key information in local drought plans for use by local, state and other entities.

While none of the states reviewed directly used the information provided in local plans at the state level, two states incorporated information provided in local plans into regional planning efforts. In Texas, information provided in local Drought Contingency Plans is incorporated into Regional Water Plans. In California, Urban Water Management Plans (which include a Water Shortage Contingency Plan) are referred to when developing Regional Water Management Plans. While the State may wish to consider encouraging regional drought planning in the future, Colorado currently does not require drought planning at this level.

We recommend that the local drought planning and reporting requirements be developed so as to be useful to the State and the Water Availability Task Force in evaluating potential drought related impacts and responses. In turn, monitoring and assessment conducted by the Water Availability Task Force may assist local planners in drought assessment and response. In developing local plan requirements we suggest that Colorado consider local planning information that might be useful for state level planning, as well as local plan submittal and reporting due dates that might coincide with state planning.

Link Water Supply, Water Conservation and Drought Planning - Colorado's Guidelines for the Office to Review and Evaluate Drought Mitigation Plans Submitted by Covered Entities and Other State or Local Governmental Entities (CWCB Review Guidelines) includes the following plan element "Link drought mitigation with water supply and water conservation planning". Most of the states reviewed had some link between drought mitigation and water supply and/or water conservation planning. California requires that water providers complete an Urban Water Management Plan (UWMP) which includes a Water Shortage Contingency Plan and Demand Management Measures section (focused on water conservation). Arizona requires water providers to develop System Water Plans which also include Water Supply, Water Conservation and Drought Preparedness Plans. While we refer to Arizona as an example of an integrated plan, actual Arizona Drought Preparedness Plan contents are somewhat limited. Georgia requires that Water Conservation Plans, which include a Drought Contingency Plan

component, be included with all new or expanded surface water or groundwater withdrawal permit applications. We recommend that California UWMPs be used as the best example of linked planning.

The connections and overlaps between water supply, water conservation and drought mitigation planning are strong and many. We recommend Colorado further evaluate how to link these types of plans and how requirements, guidance and funding might be developed and integrated. This work could be completed under the Drought Toolbox project which the State will soon begin.

Drought Response Ordinances – Texas, California and South Carolina all expressed the importance of ordinances. South Carolina prefers ordinances, recommending plans be developed when an entity does not have the authority to develop an ordinance. These states are among the most advanced regarding drought planning and they feel strongly that local ordinances are extremely useful in helping water providers enforce drought mitigation requirements. We recommend that Colorado strongly encourage, but not require, local water providers to develop drought related ordinances. The development of sample ordinances will be useful towards this end.

4.2. Entities Completing

Drought may impact all categories of water providers and water users. As such, we recommended that Colorado consider developing different plan requirements geared toward the type of water provider, e.g. municipal versus agricultural and large versus small. If Colorado extends its drought planning requirements/recommendations beyond municipal water providers, this document and Texas statutes and guidance materials could provide useful information. As a first priority, Colorado could focus on municipal water providers and then address other water use sectors in a following phase. In many states, water providers who are out of compliance with drought planning requirements tend to be small providers. The State should be cognizant of the technical and resource difficulties that may face small providers when developing planning requirements and guidance materials for this class of water provider. Similar to its Water Conservation Planning requirements, Colorado may wish to set a limit based upon a minimum volume of water provided, before requiring drought mitigation plans. The State should also determine if there are groups of water providers where it would make sense to encourage collaborative plans, for example adjacent providers with similar characteristics, providers serving the same city, or providers sharing the same water supply.

4.3. Plan Content

The follow bullet list of possible plan content was developed by compiling the requirements and recommendations for the states which were reviewed. Drought planning guidance material recommendations are provided in section 4.6. Drought contingency plans may include:

- Water provider drought response contact person
- Purpose and background
 - Goals and objectives
 - Link drought mitigation planning with water supply and water conservation planning
- Plan for coordination with other local, regional, state planning group/agencies
- Vulnerability assessment
- Establish drought task force (or water shortage response team)
- Drought response stages
 - Drought indicators and triggers to begin and end each drought response stage (water provider specific)
 - Response actions (supply and demand management)
 - Specific, quantified targets for water use reductions

- Notification procedures
- Enforcement procedures
- Procedures for granting exceptions
- Analyze economics impacts
- Monitoring procedures
- Plan for ongoing public education
- Develop drought ordinances
- Public input process
- Schedule/plan to adopt and implement the plan
- Plan updates and revision process and schedule

None of the states reviewed included all of the items above but many included a majority of items. A plan including all of these items would be very comprehensive. While we do not have a specific recommendation for Colorado regarding plan content, and believe this more appropriately fits the scope of work Colorado will be completing later in the year, we recommend Colorado consider all of the above items as local drought plan requirements. Because every item may not be applicable to all water providers, it may be useful to give water providers the option of excluding certain items from their plan with appropriate justification. We also recommend considering developing simplified content recommendations including only the most important information for smaller water providers who may have limited resources. Plan requirements should also be developed to ensure that the information collected is useful at the regional and state level if desired.

4.4. Public Involvement and Education

Similar to Colorado’s Water Conservation Planning requirements, we recommend that the State require that the public be provided with the opportunity to comment on draft drought mitigation plans. Because enforcement of drought mitigation measures is critical to their success, local drought plans should also include procedures to inform the public when a drought is occurring or likely to occur. Plans should also include procedures to inform the public when drought measures have been terminated. Ongoing public education about drought is also important to ensure buy-in and the success of response measures when they are implemented. Drought plans should include a section outlining ongoing public drought education and awareness activities.

4.5. Submittals, Reporting and Updates

To adjust to changing conditions and situations, we strongly recommend that Colorado include a requirement that water providers periodically update their Drought Mitigation Plan. All of the states with plan update requirements use a five year time frame for updates. This is a reasonable period, not overburdening water providers but providing sufficient time for lessons to be learned and circumstances to change. Colorado currently requires that Water Conservation Plans be updated every seven years. Because water providers are familiar with this period, the State may wish to consider a seven year update requirement for drought mitigation plans. Additionally, if Colorado decides to link water supply, water conservation and drought mitigation planning, this may have an impact when determining a reasonable plan update schedule. Whatever timeframe the State selects, we recommend that providers be allowed to update plans more frequently if circumstances make this advisable.

Texas, California and Arizona have established five year cycles when all plans in the state are due. Nevada and South Carolina have update requirements that are similar to Colorado’s water conservation plan update requirements. These states require that updated plans be submitted every five years with

due dates that are dependent on when individual water providers last submitted their plans. Colorado may wish to consider establishing a set plan update cycle. This would ensure that water providers are on the same page and know when plans are due, also making it easier for the State to track and follow up with providers who have not submitted plans. This allows for the State to update guidance materials and requirements prior to each cycle to reflect lessons learned and current conditions (California is an example of this). This would ensure that all current plans contain similar and up to date content that could be useful to state and regional entities in assessing overall conditions and developing their own plans. A potential negative of a planning cycle is that the State would be responsible for providing assistance and reviewing a large volume of plans at once rather than more gradually over time. This would also be a change from what water providers are used to regarding Water Conservation Plan submittal requirements. Additionally, if water providers seek the assistance of consultants it may be difficult to secure appropriate assistance due to availability the cyclical nature of this work load.

4.6. Local Drought Planning Guidance Materials

Plan Requirements and Guidance Material Format

In documenting requirements regarding drought plan content, states relied on statutory language, state plans and/or guidance materials developed specifically for use by local water providers. Requirements provided in state statutes can be confusing and difficult to isolate from adjacent language. Similarly, if local planning requirements are provided in a state's drought plan, water providers must go through the plan to determine what information is relevant to them. While Colorado may wish to include local planning requirements in its statutes and state drought plan, we recommend that drought planning guidance materials be developed specifically for use by local water providers.

Summary Guidance Material Recommendations

Detailed guidance material recommendations are outside the scope of this project and will be developed during the drought toolbox development work later this year. In addition to the plan content recommendations provided in section 4.3, the following are high level guidance material recommendations:

- Materials should be consistent with information listed on the CWCB's Drought Mitigation Plan website and in CWCB Review Guidelines.
- Provide definitions up front to establish consistent terminology.
- Explain the importance of drought planning for the water provider and their customers.
- List State and other resources for planning, assessment and response (refer to the State's drought toolbox, once developed)
- Provide relevant portions or summaries of state statutes and the Colorado DMRP.
- In addition to statutory requirements, include relevant code/statutes to help water providers understand the types of water supply management measures that may be available (See Table 5-2: State Statutory Tools for Drought Management of the 2004 Colorado Drought Mitigation and Response Plan).
- Materials (and requirements) may be adapted to different water use sectors as well as for smaller versus larger providers.
- Guidance materials should be developed to ensure that information useful at the regional and/or state level is provided.
- Provide descriptions and give examples of required plan elements. Currently Colorado's CWCB Review Guidelines lists plan elements but does not provide templates and references as to how to address these.

- Provide templates and examples of accepted plans; ordinances; drought stages, triggers and responses; etc.

4.7. Enforcement

Enforcing that plans be completed is difficult and none of the states reviewed has a perfect system in place. Colorado requires that water providers have an approved Water Conservation Plan prior to receiving financial assistance from either the CWCB or the Colorado Water Resources and Power Development Authority (Authority). The 2007 Colorado Drought and Water Supply Update found that water providers thought the areas of greatest need for funding were projects evaluations and feasibility studies followed by loans for capital projects, grants for planning activities, and grants for infrastructure management. This expressed need for funding for project evaluations and capital projects suggests that an effective method of enforcing drought planning requirements would be extending CWCB and Authority funding requirements to include approved drought plans. We recommend the State pursue this as a primary means of enforcement.

Water providers understand the importance of being ready for and responding to drought. If local drought plan contents are reasonable and useful, and sufficient guidance is provided, this will greatly increase conformance with plan requirements. It is also important to ensure that the State continues to have sufficient staff resources to follow up with and assist non-complying water providers.

4.8. Funding Mechanisms

Colorado is the only states of those reviewed that provides funding for drought planning. The drought experienced earlier in the decade, combined with water conservation education and the availability of state funding has led to sharp increase in the number of water providers completing Water Conservation Plans. If resources allow, we recommend that the State continue to educate the public and water providers about the importance of drought planning while making planning grants available.

5. Drought Toolbox Scoping

5.1. Drought Toolbox Contents Overview

Colorado's 2007 Drought Mitigation and Response Plan Update included a recommendation to develop a technical drought planning toolbox. The following is a bullet list of the types of drought resources and information that states, including Colorado, provide on their website. These tools are geared toward drought planning, assessment, response, and education. In developing Colorado's drought toolbox, the following content should be considered. Specific tool contents will be developed by the CWCB and its consultants in a subsequent project.

Drought Toolbox High Level Content Overview

- State Drought Plan/Planning Information
- State Drought Reports
- Local Planning
 - Planning Requirements and Statutes
 - Planning Guidance Documents including Templates and Sample Drought Stages, Triggers and Response Actions

- Approved Plans
- Planning/Monitoring/Response Groups/Committees/Task Forces (state, regional, local)
- Drought Water Bank
- Drought Contacts (state, regional, local)
- Links to Relevant Federal, State, Local Governmental Agencies and Departments
- Drought Response Assistance Available (information and funding)
- Monitoring Information (as appropriate: state, regional and local focus; historical, current and forecasts; short- and long-term; daily, weekly, and monthly, etc.)
 - Drought Current Conditions
 - Types of Drought (meteorological, agricultural, hydrological, socioeconomic)
 - State Orders/Declarations and Required /Volunteer Drought Response Measures
 - Current Restrictions by Water Providers
 - Drought Update with Forecasts (short and long term)
 - Drought Indices (Standard Precipitation, Palmer Drought Index Severity, Crop Moisture, Keetch-Byram Soil Moisture, Departure from Average, Surface Water Supply Index, other)
 - Local Impacts Drought Reports
 - Economic Impacts
 - Drought Photos
 - Historical Drought Information and Data
 - Climate Information and Data
 - State Climatologist site/information
 - Resources
 - Relevant University or research programs
 - US Drought Monitor (University of Nebraska, Lincoln)
 - NIDIS (National Integrated Drought Information Center)
 - National Weather Service
 - National Drought Mitigation Center
 - Climate Prediction Center
 - National Climate Data Center
 - Others
 - Data
 - Precipitation
 - Streamflow
 - Reservoir levels
 - Snowpack
 - Groundwater
 - Soil Moisture
 - Crop Moisture
 - Temperature
 - Climate Change Information
- Education
 - Understanding and Defining Drought
 - Difference between Drought and Water Conservation
 - Drought Background Information
 - FAQs
 - What “You” Can Do

- Water Conservation Information and Guidance
- Water Education
- Glossary
- Links to Drought Related Educational Sites
- Drought Related Calendar
- Information on Pending Changes to Plans/Modifications/Due Dates/Public Processes with Calendar and Documents
- Drought Related News
- Fire Danger Ratings and Connection between Drought and Fire
- Links to Other Drought, Climate, State, Regional, Local, Other Organizations
- Education Geared Specifically to State, Local, Regional government, Water User Groups, Public Water Suppliers, Agricultural, Well Users, Commercial and Industrial, Public, Children, Others

5.2. Drought Toolbox Suggestions for Colorado

This section includes suggestions which the State may wish to consider when developing its drought toolbox. It does not discuss specific toolbox contents.

Staff Resources

Several of the states interviewed cited a lack of staff resources as a limiting factor in their ability to develop or update state plans, review local drought plans, and identify and follow up with entities who have not complied with local planning requirements. Colorado has recently had a similar experience. Given the importance of drought preparedness in the State, we strongly recommend that the State continue to adequately staff and fund its drought mitigation staff.

Water Availability Task Force and State Monitoring and Assessment

Colorado's Water Availability Task Force (WATF) is well-established and effective at drought monitoring and assessment. We recommend Colorado consider further focusing and formatting WATF data and reports that focus on the state, regional, and local level as necessary to assist relevant entities in assessing and responding to drought. The current volume of data and its format can be overwhelming and hard to evaluate for local water providers and other entities. The State can play an important role in summarizing data down to a manageable and useful scale. Summary maps of drought conditions and other visual aids can be helpful. A good example of this is South Carolina's State Climatology Office's home page (the State's portal for all drought planning and monitoring information) which has a map of the State with drought status by county. This is a useful graphic to help local entities assess the situation in their area. The home page also provides a direct link to a list of water conservation/drought activities in place by water provider.

We strongly recommend the State develop a well-organized and up-to-date website with drought toolbox contents. This will make it easy for local and regional entities to find relevant, useful and current information. The State should develop data and information that are helpful at a variety of scales, including the local level. For example, the State should evaluate drought indicators and develop reports such that local water providers can easily understand if they are or might be impacted.

Drought Mitigation Planning Tools

Specific drought mitigation planning related tool recommendations are discussed in section 4.

Promote Drought Impact Data Collection and Dissemination

Generally, the economic impacts of drought are not well understood. Research conducted under Dr. Hayes at the National Drought Mitigation Center indicates that this is in large part due to lack of funding which in turn is likely associated with lack of information regarding cost-effectiveness of drought planning and mitigation (see Attachment A3 - a thesis by Melissa J. Melvin entitled *Collecting and Reporting Drought Impacts at the State Level: Experiences, Lessons Learned, and Guidelines for Improvement*). This is further supported by Hope Mizzell, South Carolina's State Climatologist, whose graduate research disappointingly found that water providers saw little value in drought planning (personal communication on 6/29/09). Melvin promotes a web-based reporting tool (the Drought Impact Reporter, <http://droughtreporter.unl.edu/>) to facilitate collection of drought impacts, with detailed reports from various sectors under varying drought conditions being added to a drought impact database. Other suggestions by Melvin, such as standardized checklists, surveys, etc. may be helpful if Colorado decides to add drought impact reporting to the toolbox.

Promote Common Terminology

Develop clear definitions and establish the consistent use of terminology utilizing Colorado's Drought Mitigation and Response Plan or Water Availability Task Force language.

Maintain Current Information

When not in time of drought, many states left old, outdated information from past years on their website. We recommend that website content be kept as current as possible. If there is a reason the State is not updating information, or information for specific areas, it would be useful to include language with the State's update policies up front. For example, specifically say that the area "is not currently experiencing drought conditions. Drought reports are updated only in times of drought. The reports provided here are the most recent." Otherwise, if information is several years old, it is difficult to know if the State is maintaining the website and data.

6. Attachments

A1 - State Summary Sheets Attachment

A2 - Notes from Phone Calls

- Dr. Hayes, Director, National Drought Mitigation Center, University of Nebraska, Lincoln
- Texas
 - Texas Commission on Environmental Quality
 - Texas Water Development Board
- California Water Use and Efficiency branch of the Department of Water Resources
- New Mexico Water Use and Conservation Bureau of the State Engineers Office
- Nevada Division of Water Resources
- Georgia Department of Natural Resources, Environmental Protection Division
- South Carolina State Climatologist

A3 - Collecting and Reporting Drought Impacts at the State Level: Experiences, Lessons Learned, and Guidelines for Improvement, Thesis by Melissa J. Melvin, University of Nebraska, Lincoln, Nebraska. December 2006.

(Provided electronically only.)

A1 - State Summary Sheets Attachment

A summary document for each state was developed. Much of the text in each document was taken verbatim from state websites and materials, with slight modifications by Headwaters Corporation. The focus of the state summaries is local drought planning and tools designed to assist with drought planning, assessment and education. A short description of any state or regional level drought planning is also provided. Note that all attachments are provided in electronic format only.

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1 COLORADO STATE SUMMARY SHEET

Colorado Water Conservation Board's (CWCB) Office of Water Conservation and Drought Planning (OWCDP) does not require but strongly encourages local entities to complete Drought Mitigation Plans.

1.1 Colorado Drought Mitigation and Response Plan

Sources: 2007 State of Colorado Natural Hazards Mitigation Plan, Part III of the State Emergency Operations Plan; 2002 Colorado Drought Mitigation and Response Plan; and 2007 Updated Information Provided in Support of the 2002 Colorado Drought Mitigation and Response Plan.

State drought planning has been developed through the preparation and implementation of the Colorado Drought Mitigation and Response Plan (DMRP) which is an annex to Colorado's Natural Hazard Mitigation Plan (NHMP). Updates to the DMRP are the responsibility of the CWCB. Monitoring and implementation of the DMRP is coordinated through the Water Availability Task Force (WATF), which includes other federal and state agencies. The plan was first developed in 1981, and Colorado was the first in the nation to create a formal mechanism to identify and respond to drought. The purpose of Colorado's plan is to provide an effective and systematic means for the State to reduce the impacts of water shortages over the short- and long-term. The plan includes a mechanism for drought monitoring, impact assessment, response to emergency drought problems, and mitigation of long-term drought impacts. The plan is intended to better coordinate the assessment of emerging drought and its impacts, the dissemination of information about drought and alternate response options available to local governments, and the decision when the State would request federal disaster assistance.

In conformance with requirements of the Disaster Mitigation Act of 2000 (DMA 2000) and Federal Emergency Management Agency (FEMA) guidelines, Colorado updated drought portions of the State's NHMP in 2007. The update was built upon existing information contained in both the 2004 NHMP and in the 2002 Colorado DMRP. DMA 2000 requires the plan to be updated every three years.

The 2007 update recommended adding two new goals (numbers 4 and 7 below) related to local drought mitigation planning efforts:

1. Improve Water Availability Monitoring
2. Increase Public Awareness and Education
3. Support Substitute Water Supply Plans and Leasing Options to Augment Water Supply
- 4. Facilitate Watershed and Local Planning**
5. Reduce Water Demand/Encourage Conservation
6. Impact Reduction
- 7. Develop Intergovernmental and Interagency Stakeholder Coordination**
8. Evaluate Potential Impacts from Climate Change

It also recommended the following actions that are directly relevant to local planning:

- Public information/education efforts: new policy needs; coordination with DNR/EDO/Governor's Office, local; evaluate alternative funding source
- Make completion of local drought plans a priority
- Developing a technical drought planning toolbox
- Develop a database to track key information in local drought plans
- Develop a process to link local plans to state plans (also recommended by FEMA)

- Develop a plan monitoring process

Additional details about recommendations that are directly relevant to local planning are provided in the main body of the 2009 Drought Toolbox Scoping Report.

1.2 Colorado Drought and Water Supply Assessments

Source: CWCB website, 2004 Drought & Water Supply Assessment; and 2007 Colorado Drought and Water Supply Update

In 2004, the CWCB undertook the Drought & Water Supply Assessment (DWSA). It was the first statewide project to determine how Colorado has prepared for drought and identify measures that will better prepare it for the next drought. The DWSA was implemented to ascertain the opinions of Colorado's large and small water users that store or divert water for delivery to other water users (e.g. reservoir and ditch companies, state water conservancy districts) and water users that "use" the water directly (e.g. farmers and ranchers, special districts, municipalities, industries). This project was developed to plan, develop and implement a project to engage Colorado water users to (1) determine how prepared Colorado has been for drought, and (2) identify limitations and related measures to better prepare Colorado for future droughts. Through technical, policy and financial support, the CWCB can aide local water users in planning for and mitigating the affects and impacts of drought. Much of this information was also incorporated in the 2007 update to the Colorado DMRP.

In 2007, the Colorado Drought and Water Supply Update (CDWSU) was conducted to obtain new information on the current status of drought planning and preparedness, water conservation planning and programs, and water supply. The specific opinion data collected addressed characterizing those key issues that water managers and planners throughout the State are facing with respect to the short- and long-term management of their water resources:

- Limitations to current water supply.
- Current status of water supply, drought and water conservation planning and implementation within each water user organization.
- Impacts observed from the most recent drought by the different water user segments.
- Limitations to planning for future water supply.
- Water user needs for structural and non-structural projects to mitigate drought.
- Use of cooperative agreements to manage drought now and into the future.
- State role in future drought planning and mitigation efforts. Basin summaries were also developed presenting selected results of the DWSA project based on responses provided by water users within each water division.

Responses to survey questions were used to characterize the following key areas of interest with respect to water use and drought impacts, within the each river basin, within each water division.

- Current Water Use Limitations
- Current Water Management Planning
- Recent Drought Impacts (1999-2003)
- Future Water Use Planning Issues
- Drought Mitigation Needs

Additional details about recommendations that are directly relevant to local planning are provided in the main body of the 2009 Drought Toolbox Scoping Report.

1.3 Local Drought Mitigation Plans

Source: <http://cwcb.state.co.us/Conservation/DroughtPlanning/>

1.3.1 Statutory Context

In 2004, the Colorado General Assembly passed House Bill 04-1365, which expanded the mission and duties of the CWCB OWCDP to reflect the State's involvement in drought mitigation planning, including participation in the WATF, and the need to provide more information relating to drought and water conservation to water users and the public. This bill added C.R.S. 37-60-126.5, which regulates drought mitigation planning, programs, and the relationship to state assistance. Currently there is no statutory requirement that entities must have a State-approved Drought Mitigation Plan but the CWCB strongly recommends that water providers and relevant state and local governmental entities develop a plan.

1.3.2 Entities Completing

Covered entities (any municipality, agency, utility, public or private, with a legal obligation to supply distribute, or otherwise provide water at retail to domestic, commercial, industrial or public facility customers with a total annual demand of 2,000 acre-feet or more), which are mandated to develop water conservation plans are also strongly encouraged to develop drought mitigation plans.

1.3.3 Plan Content Overview

According to the OWCDP, a drought mitigation plan defines conditions under which a drought induced water supply emergency exists specifying the actions that should be taken in response. The main objective is to preserve essential public services and minimize the adverse effects of a water supply emergency on public health and safety, economic activity, environmental resources and individual lifestyles. Most important in developing a drought plan is to determine the actions and procedures for responding to a drought-related water supply emergency before an actual water shortage emergency occurs.

The OWCDP lists 6 steps to prepare a drought plan on their drought mitigation planning website:

- Obtain public input and involvement
- Define goals and objectives
- Assess water supply and demand conditions
- Define drought indicators
- Identify and assess drought mitigation measures
- Develop a drought index and management strategy

The 2005 CWCB Guidelines for the Office to Review and Evaluate Drought Mitigation Plans Submitted by Covered Entities and Other State or Local Governmental Entities (CWCB Review Guidelines) list the following plan elements (elements summarized by Headwaters Corporation):

1. Establish a drought task force
2. Perform a vulnerability assessment of the water supply
3. Develop policy to assess and respond to drought
4. Develop response actions
5. Maintain ongoing public education and awareness
6. Link drought mitigation with water supply and water conservation planning

Plan review documents also specify that the following be included:

- Information on plan adoption (including public involvement);

- A schedule for plan implementation;
- A discussion of why any of the six recommended plan elements were not included; and
- Public review procedures.

1.3.4 Public Input and Education

The 2005 CWCB Review Guidelines specify that maintaining ongoing public education and awareness program related to water supply, water conservation, and drought preparedness should be one of the Drought Mitigation Plan elements. The guidelines also specify that each submitting entity may follow its own rules, codes, or ordinances to make the Draft Plan available for public review or comment. If there are no rules, codes, or ordinances governing the entity's public planning process, then each entity may publish the Draft Plan, give public notice of the Plan, make such Plan publicly available, and solicit comments from the public for a period of not less than sixty days after the date on which the Draft Plan is made publicly available.

1.3.5 Submittals, Reporting, Updates and Enforcement

Upon receipt of a completed local Drought Mitigation Plan, the OWCDP reviews and either approves, conditionally approves, or does not approve the plan within 90 days by providing written notice to the submitting entity. Procedural guidelines for contesting plan disapproval are provided. There are no reporting or update requirements. Plans are not required so no enforcement mechanisms are in place.

1.3.6 Funding Mechanisms

In 2007, the Colorado General Assembly expanded the Water Efficiency Grant Program (WEGP) by passing Senate Bill 07-008 to combine previous grant programs into one. Senate Bill 07-008 provided funding for planning, which must be completed before money for implementation of plans is provided.

Under the WEGP, financial assistance is available to communities and state or local governmental entities to assist them in developing drought mitigation plans in accordance with C.R.S. 37-60-126.5. Monies may be used to offset staff and other internal costs associated with plan development by an entity or to engage the technical assistance of a water conservation professional or consultant to aid in the development of a drought mitigation plan.

The 2007 Guidelines for Financial Assistance to Develop Drought Mitigation Plans provide information for water providers regarding funding eligibility requirements, the fund application process, grant application submittal requirements, application evaluation criteria, and review and ranking.

1.3.7 Planning Guidance Materials

The OWCDP offers technical and financial assistance to water providers in their efforts to develop drought mitigation plans. Colorado does not have a drought planning guidance document to assist local entities in developing a drought plan. The *Guidelines for the Office to Review and Evaluate Drought Mitigation Plans Submitted by Covered Entities and Other State or Local Governmental Entities* provides very high level guidance regarding plan content. The CWCB has developed a fact sheet to educate and inform citizens of Colorado's role in drought preparedness. In addition to succinctly defining the roles of federal, state, and local entities in planning and managing drought, helpful information is provided identifying specific state agencies and their responsibilities for drought management.

1.4 Assessment, Response and Educational Tools

- CWCB Drought Planning Home Page - <http://cwcb.state.co.us/Conservation/DroughtPlanning/>
- CWCB Public Information and Education Home Page - <http://cwcb.state.co.us/Conservation/PublicInfo/>
- Water Availability Task Force – Drought monitoring is ongoing and accomplished, at a minimum, by regularly scheduled meetings of the Governor’s WATF. All WATF meetings are open to the public and the public is encouraged to attend. Meetings are occasionally held in conjunction with the Colorado Flood Task Force. The WATF is comprised of Colorado’s water supply specialists, emergency management professionals, federal land managers, scientists, and experts in climatology and weather forecasting. Throughout the water year (October through September) the WATF monitors snowpack, precipitation, reservoir storage, streamflow, and temperatures, and provides a forum for synthesizing and interpreting water availability information. Task force members meet quarterly or monthly to share information. When the WATF determines drought conditions are reaching significant levels, the Governor’s staff and cabinet notifies the Governor and recommends activation of the Colorado DMRP. When the DRMP is activated, the first step is impact assessment. Assessment begins with activation of the relevant Impact Task Forces (which may include Municipal Water, Wildfire Protection, Agricultural Industry, Tourism, Wildlife, Economic, Health, and Review & Reporting). Impact Task Forces convene to determine the impacts of a drought within specific sectors that affect the environment and the economy. They utilize a broad range of information sources to gather and evaluate data when the impact of drought is beyond local capabilities to cope with it. The impact assessment information coordination is assigned to the Review and Reporting Task Force, which includes chairpersons of the WATF and the Impact Task Forces, the Executive Directors of the Department of Natural Resources (DNR) and the Department of Local Affairs (DOLA). This task force assesses the drought projections, evaluates overall conditions, develops recommendations for drought response and makes timely reports to leadership, the media, and response agencies in times of serious drought conditions.
- Statewide Water Supply Initiative – (<http://cwcb.state.co.us/Conservation/Conservation/OWCDPSWSI/>) The Statewide Water Supply Initiative (SWSI) prioritized projects for both structural and nonstructural projects to provide additional water supplies to help mitigate the effects of drought. Projects are recommended by basin, county or subbasins.
- Front Range Drought Response Task Force - (<http://cwcb.state.co.us/Conservation/DroughtPlanning/FrontRangeDroughtResponseTaskForce/>) This task force is not state sponsored. The Front Range Drought Response Task Force consists of Front Range water providers and cities in the Denver media shed. The group recently met to discuss Drought responses for systems, and to coordinate information for the public and media in anticipation for a potential drought. The CWCB houses the drought response plans and keeps water providers and cities’ drought information current.
- Drought Indicators – Planning and managing for drought in Colorado requires diligent monitoring of a variety of dynamic water availability and climate factors including:
 - Monthly Water Supply Report
 - Monthly Climate Report
 - Historical Norms
 - Weather Forecasts
 - Reservoir Levels
 - Stream Flow Data

- Rain Gauge Sites
- Snow Course Sites
- Standardized Precipitation Index (SPI)
- Surface Water Supply Index (SWSI)
- Modified Palmer Drought Index
- General information and links to other organizations providing such information are included at: <http://cwcb.state.co.us/Conservation/DroughtPlanning/WaterAvailabilityDroughtOutlook/>
 - National Drought Mitigation Center at UNL and US Drought Monitor
 - Colorado's Division of Water Resources for the Colorado Water Supply Conditions Update
 - Colorado Climate Center
 - NRCS (snowpack, reservoir storage, streamflow forecasts, basin outlook reports, weekly report on snowpack/drought monitor update)
 - Colorado Surface Water Supply Index
 - Snowpack/Drought Monitor Update
 - NWS
 - NOAA Drought Information Center
- Links to other drought related information including the National Interagency Fire Center; USDA Forest Service Observed Fire Danger, and US Soil Moisture Forecast
- Colorado Drought Fact Sheet
- Colorado Drought & Water Supply Assessment: Basin Summaries
- Local Drought Plans
- Other State Planning
- Western Water Assessment (<http://wwa.colorado.edu/index.html/>)

A number of statutes were also identified in the 2004 DWSA, Table 5-2: State Statutory Tools for Drought Management, which may serve as tools for local drought mitigation planning.

1.5 Key Websites

- CWCB Drought Planning and Mitigation Home Page - <http://cwcb.state.co.us/Conservation/DroughtPlanning/>
- CWCB Water Efficiency Grant Home Page - <http://cwcb.state.co.us/Conservation/WaterEfficiencyGrantProgram/>
- CWCB Public Information and Education Home Page - <http://cwcb.state.co.us/Conservation/PublicInfo/>
- Governor's Conference on Managing Drought and Risk Site (held October 8 – 10, 2008) <http://cwcb.state.co.us/Conservation/GovernorsDroughtConference/>
- CWCB Related Information Home Page with additional resources, tools and information that are relevant to the Water Conservation & Drought Planning section <http://cwcb.state.co.us/Conservation/RelatedInformation/>
- Colorado Department of Local Affairs (Colorado Natural Hazards Mitigation Plan) - http://www.dola.state.co.us/dem/mitigation/plan_2007/2008_plan.htm

1.6 Drought Rules/Regulations/Policies/Statutes

C.R.S. 37-60-124 - Office of Water Conservation and Drought Planning – Creation, Powers, and Duties

C.R.S. 37-60-126 - Water Conservation and Drought Mitigation Planning – Programs Relationship to State Assistance for Water Facilities and Drought Planning Guidelines

C.R.S. 37-60-126.5 - Drought Mitigation Planning – Programs - Relationship to State Assistance

C.R.S. 37-60-127 - Applicability of Provisions Requiring Funding by Political Subdivisions of the State

A number of statutes were also identified in the 2004 DWSA, Table 5-2: State Statutory Tools for Drought Management, which may serve as tools for mitigation planning.

1.7 Attached Documents

Colorado Drought Mitigation and Response Plan (January 2001, updated 2002)

2007 State of Colorado Natural Hazards Mitigation Plan (relevant sections only):

- Colorado Overview
- Section 1 – Disasters and Emergencies in Colorado
- Section 2 – Hazards

2004 Drought & Water Supply Assessment (prepared by Bouvette Consulting Resolution Research & Marketing, Inc.)

2005 Guidelines for the Office to Review and Evaluate Drought Mitigation Plans Submitted by Covered Entities and Other State or Local Governmental Entities, Adopted by the CWCB on May 25, 2005

Colorado Drought and Water Supply 2007 Update (prepared for the CWCB by Aquacraft, Inc. and NRC, Inc.)

2007 State of Colorado Natural Hazards Mitigation Plan,

2007 Updated Information Provided in Support of the 2002 Colorado Drought Mitigation and Response Plan (prepared for the CWCB by Leonard Rice Engineers, Inc.)

2007 Guidelines for Financial Assistance to Develop Drought Mitigation Plans

C.R.S. 37-60-124 - Office of Water Conservation and Drought Planning – Creation, Powers, and Duties

C.R.S. 37-60-126 - Water Conservation and Drought Mitigation Planning – Programs Relationship to State Assistance for Water Facilities and Drought Planning Guidelines

C.R.S. 37-60-126.5 - Drought Mitigation Planning – Programs - Relationship to State Assistance

2 TEXAS STATE SUMMARY SHEET

Texas requires Regional Water Plans (RWP) which include a drought contingency plan component. Water planning is the responsibility of the Texas Water Development Board (TWDB). The Texas Commission on Environmental Quality (TCEQ) requires local Drought Contingency Plans.

2.1 Texas Drought Preparedness Plan (2005)

Source: <http://www.senate.state.tx.us/SRC/pdf/SL-TxDrought-web.pdf>

In 1999, a Drought Preparedness Council (DPC) was created with the enactment of House Bill 2660, 76th Legislature. The DPC was required to develop a comprehensive State Drought Preparedness Plan (SDPP) that provides for systematic data collection and analysis and the dissemination of drought related information; an organizational structure that defines the duties and responsibilities of and assures information flow among all levels of government; an inventory of state and federal programs related to drought emergencies; a mechanism to improve the timely and accurate assessment of drought impact; and provision of accurate and timely information to the media. The SDPP identifies the local, state, federal, and private sector entities that are involved with state drought management and defines their responsibilities; defines a process to be followed in addressing drought-related activities, including monitoring, impact assessment, and response; identifies long-term and short-term activities that can be implemented to prevent and mitigate drought impacts; and acts as a catalyst for creation and implementation of local drought planning and response efforts. The DPC is intended to complement the State Water Plan and ongoing water resource planning efforts. It includes the following categories among its recommendations: drought monitoring, impact assessment, research and educational programs, and drought mitigation strategies. The DPC recommends the modernization of the statewide environmental monitoring and forecasting system and the enhancement of methods for passing drought-related information on to those who are vulnerable to drought. The SDPP also includes recommendations for the coordination of efficient and timely assessment impacts, more timely economic impact assessment, and the enhancement of coordinated statewide response to drought.

Texas' SDPP is included as an attachment to the State of Texas Mitigation Plan, which was prepared in compliance with the Disaster Mitigation Act of 2000, as amended.

2.2 Regional Water Plans

Source: <http://www.twdb.state.tx.us/wrpi/rwp/rwp.htm>

2.2.1 Statutory Context

In June 1997, Senate Bill 1 (SB 1) was signed into law in response to an increased awareness of the vulnerability of Texas to drought and to the limits of existing water supplies to meet increased demands resulting from population growth. SB 1 requires that regional water plans be developed to map out conservation, conserve water supplies, meet future water supply needs and respond to future droughts in the planning areas. SB 1 designated the TWDB as the lead state agency for coordinating the regional water planning process and developing a comprehensive state water plan. To accomplish these tasks, the TWDB developed planning guidance documents to govern how regional water plans will be developed, delineated planning areas and designated planning group representatives.

2.2.2 Entities Completing

In February 1998, the TWDB adopted state and regional water planning rules, delineated 16 regional planning areas (map of 16 areas is available at <http://www.twdb.state.tx.us/wrpi/rwp/map.htm>) and selected 270 individuals from 11 SB 1-required interest groups to serve as initial members of the Regional Water Planning Group (RWPG). Each RWPG is responsible for preparing and adopting a regional water plan for their area. SB 1 requires that each regional water plan address the needs of all water users and suppliers, except certain political subdivisions that decide not to participate. RWPG members represent at a minimum: the public, counties, municipalities, industries, agricultural interests, environmental interests, small businesses, electric generating utilities, river authorities, water districts, and water utilities.

2.2.3 Plan Content Overview

RWPG members are responsible for deciding how future water needs in their respective region may be met. Each regional water plan will identify water supply threats to agriculture and natural resources. Information concerning current preparations for drought and the status of other water plans in the region will be reviewed. Among other components, RWP guidance materials include a section on "Water Conservation and Drought Management Recommendations". Planning groups must consider drought management strategies for identified water needs, and whenever applicable, drought management strategies should be consistent with guidance provided by the Texas Commission on Environmental Quality. If a planning group does not select drought management as a water management strategy, they must document the reason.

2.2.4 Public Input and Education

This section refers to public involvement and education at the local level. It does not include state or more regional efforts. Texas does not require a specific public input process but rather includes this as a first step in developing a drought contingency plan. Recommended ways to involve the public, who to involve, how to ensure buy in, and how to solicit ongoing input, are included in plan development guidance materials.

2.2.5 Submittals, Reporting, Updates and Enforcement

RWPs must be updated every five years. Participation in the regional planning process is not required. If a political subdivision or a RWPG decides not to participate, the TWDB will use existing local and regional water planning strategies identified in the TWDB-prepared 1997 State Water Plan and other study results to update the next State Water Plan. TWDB recommended water management strategies and/or recommendations for a specific entity and/or region are typically based on the least expensive solution. TWDB financial assistance for water supply projects may be provided only to projects that meet identified needs in a manner that is consistent with the approved regional water plans. In addition, the Texas Natural Resource Conservation Commission may not issue a water right permit for municipal purposes unless it is consistent with an approved regional water plan after January 5, 2002.

2.2.6 Funding Mechanisms

SB 1 provides state financial assistance administered by the TWDB to assist in paying for the preparation of RWPs. TWDB rules provide that state funds will be used to pay 100 percent of the direct planning costs, while RWPG will be required to cover 100 percent of their administrative costs. No funding for Drought Contingency Plan development is available. Funding is available for water supply projects identified in the State Water Plan or regional water plans.

2.2.7 Planning Guidance Materials

- Guidelines for Regional Water Planning Data Deliverables (2007-2012), Prepared by The Texas Water Development Board, Division of Regional Water and Flood Planning and Natural Resource Information Systems, 25 February 2008
- General Guidelines for Regional Water Plan Development (2007-2012), Prepared by The Texas Water Development Board, Division of Regional Water and Flood Planning and Natural Resource Information Systems, March 2008
- Regional Water Plans (current and past) <http://www.twdb.state.tx.us/RWPG/main-docs/2006RWPindex.asp>

Regional Water Planning Documents website - <http://www.twdb.state.tx.us/wrpi/rwp/docu.htm>

2.3 Local Drought Contingency Plans

Source: http://www.tceq.state.tx.us/permitting/water_supply/water_rights/contingency.html

2.3.1 Statutory Context

In 1997 the Texas Legislature directed the TCEQ to adopt rules establishing common drought plan requirements for water suppliers. The amended Title 30, Texas Administrative Code, Chapter 288 became effective on January 10, 2008.

2.3.2 Entities Completing

The TCEQ requires all wholesale public water suppliers, retail public water suppliers serving 3,300 connections or more, and irrigation districts to submit drought contingency plans. The TCEQ requires retail public water suppliers serving less than 3,300 connections to prepare and adopt a drought contingency plan and to make the plan available upon request.

2.3.3 Plan Content Overview

The following is what a retail water utility should include in their drought contingency plan (content requirements/recommendations vary based upon the type of water provider):

- Specific, quantified targets for water use reductions
- Drought response stages
- Triggers to begin and end each stage
- Supply management measures
- Demand management measures
- Descriptions of drought indicators
- Notification procedures
- Enforcement procedures
- Procedures for granting exceptions
- Public input to the plan
- Ongoing public education
- Adoption of plan
- Coordination with regional water planning group

2.3.4 Public Input and Education

Title 30, Texas Administrative Code, Chapter 288 states that: "Preparation of the plan shall include provisions to actively inform the public and affirmatively provide opportunity for public input."

"Provisions shall be made for a program of continuing public education and information regarding the drought contingency plan."

“The drought contingency plan must include the procedures to be followed for the initiation or termination of each drought response stage, including procedures for notification of the public.”

Texas does not have specific public input processes but rather includes this as a first step in developing a drought contingency plan. Recommended ways to get the public involved, who to involve, how to get buy in, and how to solicit ongoing input, are included in plan development guidance materials.

2.3.5 Submittals, Reporting, Updates and Enforcement

Drought Contingency Plans must be updated every five years to coincide with the RWPG process. Updates can be formatted as reports on earlier Drought Contingency Plans. Texas sends letters and makes phone calls to water providers who do submit plans.

The TCEQ must be notified of restrictions implemented, with reporting requirements that vary by the type of water provider. Terminations of restrictions must also be reported. The state website then lists water providers with restrictions in place.

Loans for the planning, design and construction of water supply, wastewater and flood control projects may be obtained from the Texas Water Development Fund (TWDF). Water conservation and drought contingency plans are required for financial assistance greater than \$500,000 (a statutory requirement).

2.3.6 Planning Guidance Materials

The TCEQ has prepared model drought contingency plans for retails and wholesale public water suppliers, irrigation districts, water supply corporations, and investor owned utilities.

- Texas Administrative Code, Title 30 Environmental Quality, Part 1 Texas Commission on Environmental Quality, Chapter 288 Water Conservation Plans, Drought Contingency Plans, Guidelines and Requirements, Subchapter B Drought Contingency Plans
- Handbook for Drought Contingency Planning for Retail Public Water Suppliers (RG-424)
- Handbook for Drought Contingency Planning for Wholesale Public Water Suppliers (RG-426)
- Handbook for Drought Contingency Planning for Irrigation Districts (TCEQ-20192)
- Model Drought Contingency Plan for the Water Supply Corporation (TCEQ-20187)
- Model Drought Contingency Plan for the Investor Owned Utility (TCEQ-20189)

Texas staff will work closely with water providers, providing them technical assistance to help them complete their plans.

2.4 Local Water Conservation Plans

Source:

<http://www.twdb.state.tx.us/assistance/conservation/Municipal/Plans/WaterConsPlanGuide.pdf>

If water providers are applying for state funding, they must include a Drought Contingency Plan in their Water Conservation Plan. If they are not applying for funding, the Drought Contingency Plan component is not required.

2.4.1 Statutory Context

In 2007, the 80th Texas Legislature amended Section 13.146 of the Texas Water Code to require that water conservation plans be submitted to the TWDB.

2.4.2 Entities Completing

Retail public utilities that provides potable water service to 3,300 or more connections must submit a water conservation plan to the TWDB.

2.4.3 Plan Content Overview

Among other items, the plan must include “a current drought contingency plan which includes specific water supply or water demand management measures and, at a minimum, includes, trigger conditions, demand management measures, initiation and termination procedures, a means of implementation, and measures to educate and inform the public regarding the drought contingency plan.”

The Drought Contingency Plan shall include:

1. Trigger conditions
2. Demand management measures.
3. Initiation and termination procedures (including procedures for notification of the public)
4. Variances and enforcement
5. Measures to inform and educate the public.

2.4.4 Public Input and Education

Plans include procedures for notifying the public of drought declaration and response measures. They also include measures to inform and educate the public about drought.

2.4.5 Submittals, Reporting, Updates and Enforcement

An annual report must be provided to the TWDB regarding the status of plan implementation.

2.4.6 Funding Mechanisms

No funding for local water conservation planning is available.

2.4.7 Planning Guidance Materials

- TWDB Water Conservation Plan Guidance Checklist (for loan applications) – includes a drought contingency plan section
- Water Conservation Program Annual Report – includes a section on Drought Contingency/Emergency Water Demand Management
- Link to Local Drought Contingency Planning guidance materials provided by the TCEQ

2.5 Assessment, Response and Educational Tools

- Drought Preparedness Council - The Drought Preparedness Council is directed by HB 2660 to collect, analyze, and disseminate drought information.
- Agricultural Drought Task Force (<http://agrillife.tamu.edu/drought/>) - The Drought Joint Information Center is a group of state and federal agency public information officers, led by Texas AgriLife Communications, who were activated by the Governor's Division of Emergency Management.
- Texas Water Info <http://www.txwin.net/>
 - Drought Preparedness Council's Situation Report and membership
 - TWDB's monthly drought conditions summary
 - Current drought indices by climatic region and by major drought categories
 - Texas Climatic Bulletin
 - Historic long-term Palmer Drought Index for various periods
 - TCEQ drought information

- Drought and Public Water Systems
- Texas monthly water conditions report (reservoirs, streamflow, and ground-water wells)
- Past drought information, understanding and defining drought
- TWDB contacts for assistance in drought-impacted areas
- Water saving ideas
- Texas Guide to Rainwater Harvesting
- Links to other water information agencies and sites
- News and Situational Reports
- Monitors/Maps/Data
 - U.S. Drought Information Portal
 - U.S. Drought Monitor
 - Daily Streamflow Conditions
 - Soil Moisture Monitoring
 - Texas Water Conditions
 - Texas Major Reservoirs
 - Public Water Systems Under Restriction
 - Texas Major Reservoirs
- Weather
 - Texas State Climatologist
 - National Weather Service Climate Prediction Center
 - National Weather Service Precipitation Analysis Page for Texas
 - USDA Weekly Weather and Crop Bulletin
 - Drought and Weather
- Agriculture/Farming/Gardening
 - Extension Disaster Education Network
 - Drought Specific Disaster Information
 - Agricultural Economics
 - Animal Science
 - Ag Engineering
 - Ecosystem Science and Management (Range & Forestry)
 - Horticulture
 - Soil & Crop Sciences
 - Veterinary Medicine
 - Drought Resource Information Packet, or D.R.I.P. (PDF)
 - Managing for Drought on Texas Rangelands
 - Hay Hotline
 - Plant Answers Drought Information
 - Drought Resource Guide
 - Dealing with Drought
 - Defending Against Drought
- Water Supply/Public Drinking Water
 - Systems Under Restriction to Limit Shortages
 - Water Rights Information
- Best Practices for Consumers
 - Water Efficient Practices for Saving your Landscapes
 - Rainwater Collection
 - Water Conservation Programs

2.6 Key Websites

- TWDB Water Resources Planning and Information Home Page - <http://www.twdb.state.tx.us/wrpi/index.htm>
- 2007 State Water Plan - <http://www.twdb.state.tx.us/wrpi/swp/swp.htm> (note that the plan must be downloaded one section at a time for multiple sections so is not included as an attachment to this document)
- TWDB Regional Water Planning - <http://www.twdb.state.tx.us/wrpi/rwp/rwp.htm>
- TWDB Regional Water Planning Rules and Regulations - <http://www.twdb.state.tx.us/wrpi/rwp/rules.htm>
- TWDB Regional Water Plans (current and past) - <http://www.twdb.state.tx.us/RWPG/main-docs/2006RWPindex.asp>
- TWDB Water Conservation Plan Home Page - <http://www.twdb.state.tx.us/assistance/conservation/Municipal/Plans/CPlans.asp>
- 2007 State Water Plan - <http://www.twdb.state.tx.us/wrpi/swp/swp.htm>
- 2006 & 2001 Regional Water Plans and Documents - <http://www.twdb.state.tx.us/wrpi/rwp/rwp.htm>
- Texas Commission on Environmental Quality Drought Contingency Home - http://www.tceq.state.tx.us/permitting/water_supply/water_rights/contingency.html
- Texas Administrative Code, Title 30, Part 1, Chapter 288, Subchapter B Drought Contingency Plans - [http://info.sos.state.tx.us/pls/pub/readtac\\$ext.ViewTAC?tac_view=5&ti=30&pt=1&ch=288&sch=B&rl=Y](http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=5&ti=30&pt=1&ch=288&sch=B&rl=Y)
- Searchable Senate Bill 1 text - <http://www.capitol.state.tx.us/tlodocs/75R/billtext/html/SB00001F.htm>
- Texas Water Information Network - <http://www.txwin.net/>
- Agricultural Drought Task Force - <http://agrillife.tamu.edu/drought/>

2.7 Drought Rules/Regulations/Policies/Statutes

HB 2660 (76th Legislature, Regular Session, 1999), Section 2, Subchapter C, Chapter 16 of the Texas Water Code. The State Drought Preparedness Plan is prepared under this.

Texas Administrative Code, Title 30 Environmental Quality, Part 1 Texas Commission on Environmental Quality, Chapter 288 Water Conservation Plans, Drought Contingency Plans, Guidelines and Requirements, Subchapter B Drought Contingency Plans

Texas Administrative Code, Title 31 Natural Resources and Conservation, Part 10 Texas Water Development Board, Chapter 363 Financial Assistance Programs, Subchapter A, General Provisions, Diversion 2 General Application Procedures, Rule §363.15 Required Water Conservation Plan

HB 2663 - Relating to the establishment of quantifiable goals for drought contingency plans
Related Resources (78th Legislature, Regular Session, 2003)

SB 1 - Relating to the development and management of the water resources of the State;
providing penalties (75th Legislature, Regular Session, 1997)

SB 657 - Relating to the development of water management strategies for periods of drought.
Related Resources (76th Legislature, Regular Session, 1999)

SB 1301 - Relating to water conservation measures required in a county during a declared drought disaster (76th Legislature, Regular Session, 1999)

2.8 Attached Documents

State of Texas Drought Preparedness Plan (2005)

Guidelines for Regional Water Planning Data Deliverables (2007-2012), Prepared by the Texas Water Development Board, Division of Regional Water and Flood Planning and Natural Resource Information Systems, 25 February 2008

General Guidelines for Regional Water Plan Development (2007-2012), Prepared by the Texas Water Development Board, Division of Regional Water and Flood Planning and Natural Resource Information Systems, March 2008

Handbook for Drought Contingency Planning for Retail Public Water Suppliers (RG-424)

Handbook for Drought Contingency Planning for Wholesale Public Water Suppliers (RG-426)

Handbook for Drought Contingency Planning for Irrigation Districts (TCEQ-20192).

Model Drought Contingency Plan for the Investor Owned Utility (TCEQ-20189).

Model Drought Contingency Plan for the Water Supply Corporation (TCEQ-20187).

Texas Administrative Code, Title 30 Environmental Quality, Part 1 Texas Commission on Environmental Quality, Chapter 288 Water Conservation Plans, Drought Contingency Plans, Guidelines and Requirements, Subchapter B Drought Contingency Plans

HB 2660 (76th Legislature, Regular Session, 1999), Section 2, Subchapter C, Chapter 16 of the Texas Water Code.

HB 2663 - Relating to the establishment of quantifiable goals for drought contingency plans Related Resources (78th Legislature, Regular Session, 2003, enrolled version)

SB 657 - Relating to the development of water management strategies for periods of drought. Related Resources (76th Legislature, Regular Session, 1999)

SB 1301 - Relating to water conservation measures required in a county during a declared drought disaster (76th Legislature, Regular Session, 1999)

3 CALIFORNIA STATE SUMMARY SHEET

California requires local Urban Water Management Plans (UWMPs) which include a Water Shortage Contingency Plan (WSCP) component. Water planning is the responsibility of the California Department of Water Resources (DWR).

3.1 California Water Plan (2009)

Source: <http://www.waterplan.water.ca.gov/cwpu2009/index.cfm#highlights>

A California Water Plan summary document states “California is facing one of the most significant water crises in its history—one that is hitting hard because it has so many aspects. Growing population and reduced water supplies are worsening the effects of a multi-year drought.” The plan contains resource management strategies and recommendations, many of which are designed to improve drought preparedness. Among other purposes, California needs to act on these recommendations to improve drought contingency planning, flood management improvements, and climate change adaptations.

3.2 California Critical Water Shortage Contingency Plan

Source: http://www.water.ca.gov/drought/docs/Contingency_Plan-text.pdf

In 2000 the Governor’s Advisory Drought Planning Panel developed a Critical Water Shortage Contingency Plan for the State. The California Drought Contingency Plan was prepared in response to a commitment in the CALFED¹ Bay-Delta Program’s Record of Decision that the Governor would convene a panel to develop a “contingency plan to reduce the impacts of critical water shortages primarily for agriculture and urban water users.”

3.3 Integrated Regional Water Management Plans

(This section is included for informational purposes only. Water shortage/drought planning is not specified as a component of Integrated Regional Water Management Plans (IRWMP).)

Source: http://www.grantsloans.water.ca.gov/grants/irwm/integregio_rap.cfm.)

IRWMPs are being developed and implemented throughout the State, partly in response to Proposition 50 (November 2002) and Proposition 84 (November 2006) statewide bonds that provide funding to encourage a regional approach to water management. Regions have distinct identities and hydrologic and ecologic connections. Water supply reliability is a primary water management objective to be considered in these integrated plans. *Meeting dry year demands is an important component of water supply reliability.* UWMPs and the associated WSCPs prepared by local water suppliers provide an important foundation for Integrated Regional Water Management Plans.

¹ The CalFed Bay Delta Accord is an agreement signed in December 1994 under the Clinton administration in an attempt to work toward a resolution of water use within California. The accord was signed between state and federal agencies with management responsibilities over the delta. The CALFED Bay-Delta Program is a unique collaboration among 25 state and federal agencies that came together with a mission: to improve California’s water supply and the ecological health of the San Francisco Bay/Sacramento-San Joaquin River Delta.

3.4 Local Urban Water Management Plans (Water Shortage Contingency Plan Component)

Source: Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan and Urban Drought Guidebook 2008 Updated Edition.

Urban Water Management Plans are required to include a Water Shortage Contingency Plan component.

3.4.1 Statutory Context

Since 1983, the California Urban Water Management Planning Act (Water Code Sections 10610-10657) has required urban (i.e., municipal) water suppliers that provide water to 3,000 or more customers, or that provide more than 3,000 acre-feet of water annually to develop and implement a UWMP.

The law requires a supplier to report on the reliability of its water service and whether it is sufficient to meet the needs of its customers during normal, dry, and multiple dry years. The Urban Water Management Planning Act describes the contents of UWMPs as well as how urban water suppliers should adopt and implement the plans. A complete UWMP could be a foundation document and source of information for a Water Supply Assessment and a Written Verification of Water Supply. An UWMP also serves as:

- A long-range planning document for water supply,
- Source data for development of a regional water plan,
- A source document for cities and counties as they prepare their General Plans, and
- A key component to Integrated Regional Water Management Plans.

California Water Code Sections 350-359 establishes processes for declaring a Water Shortage Emergency. This information should be incorporated into water shortage plans.

3.4.2 Entities Completing

All urban water suppliers (including wholesalers), either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet annually are required to prepare an UWMP. An urban water supplier may satisfy the requirements of this part by participation in area wide, regional, watershed, or basin wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

In the Urban Drought Guidebook 2008 Updated Edition, California notes that water suppliers, as described above, are required to complete a WSCP as part of the UWMP. Others (regional entities, for example) may also find it useful to develop WSCPs, but this is not required.

3.4.3 Plan Content Overview

California updates its WSCP guidance for each five year planning cycle. In 2008 the State developed an Urban Drought Guidebook 2008 Updated Edition for providers who wanted to update their plans to respond to an ongoing drought. A new UWMP Guidebook is being developed for the 2010 planning cycle and should be available soon. Plan content from the 2005 and 2008 documents is described below.

In addition to other information, UWMPs contain a WSCP as well as an analysis of Water Service Reliability. The Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan provides the following steps to developing a WSCP:

- Step 1: Stages of Action
- Step 2: Estimate of Minimum Supply for Next Three Years
- Step 3: Catastrophic Supply Interruption Plan
- Step 4: Prohibitions, Penalties and Consumption Reduction Methods
- Step 5: Analysis of Revenue Impacts of Reduced Sales during Shortages
- Step 6: Draft Ordinance and Use Monitoring Procedure

The Urban Drought Guidebook 2008 Updated Edition highlights the need to prepare for a drought or other water shortage. Contingency planning before a shortage allows selection of appropriate responses consistent with the varying severity of shortages. WSCPs have specific mandatory requirements and penalties that become effective when certain shortage conditions or triggers occur. Water shortage planning is dynamic. It evolves as conditions change and new information becomes available. Seven steps to developing a WSCP are provided (which differ from the steps identified in the UWMP guidance):

- Step 1: Establish a Water Shortage Response Team
- Step 2: Forecast Supply in Relation to Demand
- Step 3: Balance Supply and Demand: Assess Mitigation Options
- Step 4: Establish Triggering Levels
- Step 5: Develop a Staged Demand Reduction Program
- Step 6: Adopt the Water Shortage Contingency Plan
- Step 7: Implement the Water Shortage Contingency Plan.

3.4.4 Public Input and Education

Water Code section 10631 states that UWMPs must consider informational and educational programs (note that this does not specifically refer to drought). It also requires that providers make draft UWMPs available for public inspection and hold a public hearing.

Additionally, California Water Code Chapter 3 specifies that “A public hearing is required prior to a water shortage emergency condition declaration.”

3.4.5 Submittals, Reporting, Updates and Enforcement

California requires urban water suppliers to file UWMPs with the DWR, the California State Library, and any city or county within which the supplier provides water supplies. UWMPs are reviewed by DWR staff to determine whether or not they are complete pursuant to the Urban Water Management Planning Act (Act). Results of the DWR review are provided to urban water suppliers through a review letter. The agency may wish to use the review letter to revise their UWMP for re-submittal. DWR provides technical assistance to urban water suppliers to help them meet the requirements of the Act. Water suppliers update their UWMPs at least once every five years. Agencies subject to the Urban Water Management Planning Act must have adopted a complete UWMP that meets the requirements of the law and submitted it to DWR to be eligible for drought assistance or to receive funds through DWR.

3.4.6 Funding Mechanisms

The State does not provide funding specifically for urban water management planning or water shortage contingency planning. The DWR has a funding webpage listing available funding at <http://wwwdwr.water.ca.gov/nav/nav.cfm?loc=t&id=103>.

Funding is available for the development of IRWMPs as well as water conservation and other projects to mitigate water shortage. Some of this funding is held due to current economic conditions.

3.4.7 Planning Guidance Materials

Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan

Urban Drought Guidebook 2008 Updated Edition - This document not only refers to the California Urban Water Management Planning Act, it also refers to several other drought related regulations and planning requirements. It includes information on drought reference materials, drought-related websites, emergency drought funding, water efficient landscape websites, and sample emergency water shortage ordinance.

California Public Utilities Commission, Division of Water and Audits, Instructions for Water Conservation, Rationing and Service Connection Moratoria, Standard Practice U-40-W, March 2009 <http://docs.cpuc.ca.gov/published/REPORT/99158.htm>

3.5 Assessment, Response and Educational Tools

- <http://www.water.ca.gov/drought/>
- Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan
- Guidance provided in the Urban Drought Guidebook 2008 Updated Edition
- 2008 California Drought Report Update
- Drought background information
- 2008 State Drought Update Report
- 2008 Urban Drought Workshop Webcast
<http://cawater.rmxpres.com/webcast/data/cawaterudw2008/msh.htm>
- 2000 California Critical Water Shortage Contingency Plan
http://www.water.ca.gov/drought/docs/Contingency_Plan-text.pdf
- California Water Plan <http://www.waterplan.water.ca.gov/cwpu2009/index.cfm>
- Drought assistance funding (DWR, CalEMA)
- **Drought Water Bank:** DWR has established a 2009 Drought Water Bank. DWR will purchase water from willing sellers primarily from water suppliers upstream of the Sacramento-San Joaquin Delta. This water will be transferred using State Water Project (SWP) or Central Valley Project (CVP) facilities to water suppliers that are at risk of experiencing water shortages in 2009 due to drought conditions and that require supplemental water supplies to meet anticipated demands. DWR has initiated dry year water purchasing programs in the past, including drought water banks during the early 1990s, and dry year water purchase programs in 2001-2004.
- Water conservation information and guidance
- Current and historical conditions: precipitation, snowpack, reservoirs, groundwater, economic impacts
- Monthly drought updates
- Drought news
- Governor's declarations
- Local impacts reports
- Information for well owners

- Historical drought archive
- Drought related videos and photos
- Drought related calendar
- Drought information contacts for the State
- Links to local, federal, state agencies
- FAQs

3.6 Key Websites

California DWR Drought Home Page <http://www.water.ca.gov/drought/>

California DWR Drought Assistance Page <http://www.water.ca.gov/drought/assist/>

Urban Drought Guidebook 2008 Updated Edition
<http://www.water.ca.gov/drought/docs/DroughtReport2008.pdf>

Drought Links <http://www.water.ca.gov/drought/links.cfm>

DWR Funding <http://www.dwr.water.ca.gov/nav/nav.cfm?loc=t&id=103>

3.7 Drought Rules/Regulations/Policies/Statutes

Water Code Sections 10610-10657, California Urban Water Management Planning Act

Water Code Sections 350-359

Government Code Section 8550-8551, California Emergency Services Act

California Public Utilities Commission, Division of Water and Audits, Instructions for Water Conservation, Rationing and Service Connection Moratoria, Standard Practice U-40-W, March 2009

3.8 Attached Documents

Urban Drought Guidebook 2008 Updated Edition, State of California, Department of Water Resources, Office of Water Use Efficiency and Transfers (**includes** Water Code Section 350-359, Water Code Section 10632 and Government Code Section 8550-8551, and California Public Utilities Commission, Division of Water and Audits, Instructions for Water Conservation, Rationing and Service Connection Moratoria, Standard Practice U-40-W, March 2009)

Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan, California Department of Water Resources, 2005 (includes Water Code Sections 10610-10657)

Critical Water Shortage Contingency Plan, Governor's Advisory Drought Planning Panel, 2000

2008 California Drought Update Report

4 NEW MEXICO STATE SUMMARY SHEET

New Mexico does not currently require drought plans at the regional or local level, nor does it have guidance materials to assist entities in doing so. Recent Executive Orders signed by the Governor have created a Drought Task Force and recognize that sufficient guidance and funding is not currently in place.

4.1 State Drought Plan

Source: <http://www.ose.state.nm.us/DroughtTaskForce/2006-NM-Drought-Plan.pdf>

The most recent drought plan posted on the State's website is for 2006. The report says that "The purpose of this report is to provide information on the status of drought in New Mexico and the activities of the Governor's Drought Task Force over the past year, outline the goals of the Task Force for the coming year, and provide an assessment of risk that drought presents to our state."

4.2 State Water Plan

Source: http://www.ose.state.nm.us/publications_state_water_plans.html

The New Mexico Office of the State Engineer and Interstate Stream Commission are required to undertake a review of the New Mexico State Water Plan every five years and to subsequently update the plan as needed. The State Water Plan Act also requires that the plan be reviewed, updated, and amended in response to changing conditions. A 2009 update is currently being developed. The State Water Plan Act specifies that the Water Plan include a drought management plan designed to address drought emergencies, promote strategies for prevention of drought-related emergencies in the future and coordinate drought planning statewide. The drought management section of the 2003 plan is five pages long and does not include any local or regional planning, assessment or implementation requirements.

4.3 Regional Water Plans

Source: <http://www.ose.state.nm.us/doing-business/water-plan/rwp-handbook.html#purpose>

This section is included primarily for informational purposes as Regional Water Plans address drought only very broadly. Their main focus is on 40 year water development planning but in the Regional Planning Template (1994) there is a bullet item in the plan guidebook for "Emergency Contingency Plans" that includes both drought and flood considerations.

New Mexico has taken a unique approach to planning to protect and preserve its water supply. The legislature recognized and directed that water planning is most effectively done at the local level. Regions, self-defined through hydrological and political common interests, have begun to study their most precious resource. This effort, overseen by the Interstate Stream Commission and funded through the Commission and local entities, now blankets the State.

The original impetus for regional water planning came in 1987, when a federal court ruled that New Mexico's prohibition against out-of-state transfer of New Mexico ground water was unconstitutional. As a result of this ruling, it became evident that New Mexico must actively plan for its water future. The resulting plans, with their forty-year horizon, help to insure the continuity of the water supply.

4.4 No Local Plan Requirements or Guidance

Source: <http://www.ose.state.nm.us/DroughtTaskForce/index.html>

New Mexico does not have any drought planning requirements or guidance materials. A brochure entitled “How Communities can Prepare for and Cope with Drought” includes as item #1 “Prepare water conservation and drought contingency plans”. Using water wisely is important at any time; however, water conservation becomes even more critical during a drought. Communities should prepare both long-term and short-term water conservation plans. For information and technical assistance on how to do this contact the Office of the State Engineer at 1-800-WATER-NM.” This will put water providers in touch with OSE staff who may be able to assist them, but no specific process or guidance is in place to do this.

In a March 6, 2006 press release, the Governor urged water utilities across the State to implement drought plans and monitor use, setting more advanced drought restrictions as warranted by available supplies and levels of usage. The Governor said “We must plan for the future with the possibility that the drought will be with us for some time,” He called upon citizens, businesses, schools, institutions of higher learning, local governments and federal agencies to all redouble their efforts to conserve water.

4.5 Assessment, Response and Educational Tools

- **Governor’s Drought Task Force** (<http://www.nmdrought.state.nm.us/taskforce.html>)
Website includes meeting information (calendar, agendas, minutes). Governor Richardson signed Executive Order 2003-019 creating a twelve member Drought Task Force in May 2003. The New Mexico Drought Task Force recommends strategies for reducing the State's vulnerability to drought. The Drought Task Force is chaired by the State Engineer and includes experts in financing, water project construction, water rights, water conservation, and water quality as well as officials who understand drought's impact on agriculture, wildlife, economic development, tourism, and wildfire. The Drought Task Force originally (in 2003) included a Strike Team with six work groups (Monitoring; Drinking Water; Agriculture; Wildlife and Wildfire; Recreation, Economic Development, and Tourism; and Water Development work groups). Currently the Task Force focuses on climate monitoring and forecasting and the other work groups have been disbanded.

The Task Force has been and is continuing to work cooperatively to ensure that areas affected by drought have the necessary assistance. This effort has been ongoing over the past four years, but began to take focus as a result of implementation of the 2005 House Joint Memorial 86. That effort instructed the Office of the State Engineer and the New Mexico Environment Department (NMED) to work with other agencies to develop criteria for water system planning, performance and conservation as a condition of state financing. This effort has culminated in Executive Order 2007-50 which, amongst other direction, established the Water Cabinet and the Water and Wastewater Infrastructure Development Division at NMED. These efforts have lead to the development of water and wastewater infrastructure evaluation plans, a uniform application implementation plan, and recommendations for efficient and effective use of water and wastewater funds. EO 2007-50 also requested the collaborations of the Department of Finance and Administration and the New Mexico Finance Authority. The coordination between these agencies provides drinking

water suppliers in need with one-stop-shop opportunities to obtain capital funding. These efforts are ongoing and will continue.

- Regional Plan Home Page http://www.ose.state.nm.us/isc_regional_plans.html
- Regional Planning Guidebook <http://www.ose.state.nm.us/doing-business/water-plan/rwp-handbook.html#purpose>
- Monitoring Work Group of the DTF with monthly drought status reports
- Drought/Climate Factoids for New Mexico
- Link to CLIMAS website (Climate Assessment for the Southwest)
- Climate Change Information:
 - Climate Change Report
 - Potential Effects of Climate Change on New Mexico
 - New Mexico Climate Change Advisory Group
 - New Mexico Stakeholder Process Relating to Possible Mandatory Reporting/Voluntary Registry for Greenhouse Gases
 - 2006 New Mexico Drought Summit - "Climate Change: What Does It Mean For New Mexico"
 - US Drought Monitor
 - Reservoir and Stream Level Projections with links to outside organizations
- Assistance Available
- Drought Monitoring Work Group
- Drought in the News (latest entry is from 2006)
- State Drought Plans (2006 update and earlier)
- Drought Summits (latest summit posting is from 2006)
- Drought Forecasts
- Current Drought Conditions
- Site for Kids
- Other Drought Links (links to a few outside organizations)

4.6 Key Websites

Governor's Drought Task Force - <http://www.ose.state.nm.us/DroughtTaskForce/index.html>

New Mexico Office of the State Engineer Water Use and Conservation - http://www.ose.state.nm.us/conservation_index.html

New Mexico Office of the State Engineer State Water Plan - http://www.ose.state.nm.us/publications_state_water_plans.html

Regional Planning Guidebook (1994) <http://www.ose.state.nm.us/doing-business/water-plan/rwp-handbook.html#purpose>

4.7 Drought Rules/Regulations/Policies/Statutes

Executive Order 2003-019 creating the 12-member Drought Task Force

Executive Order 2007-50 which, amongst other direction, established the Water Cabinet and the Water and Wastewater Infrastructure Development Division at NMED

4.8 Attached Documents

2006 New Mexico Drought Plan

2009 DROUGHT TOOLBOX SCOPING REPORT
State Summary Sheets Attachment

State Water Plan Act

2003 State Water Plan

Executive Order 2003-019

Executive Order 2007-50

Drought Brochure

5 ARIZONA STATE SUMMARY SHEET

The Arizona Department of Water Resources (ADWR) Drought Program coordinates drought preparedness and response activities through monitoring, state agency coordination, and facilitation of local-level planning. ADWR's Drought Program takes a statewide approach to drought preparedness and response, but assistance is especially focused on rural areas through a variety of programs and activities. The ADWR is also responsible for local System Water Plans which are required to include a Drought Preparedness component.

5.1 Arizona Drought Preparedness Plan

Source: <http://www.azwater.gov/dwr/drought/ADPPlan.html>

The principal intent of the Arizona Drought Preparedness Plan is to establish a flexible framework to refine Arizona's drought monitoring process, understanding of drought impacts, and mechanisms for limiting future vulnerability. The principal components of the Arizona Drought Preparedness Plan include:

- Drought monitoring approach
- Identification of the stages of drought and expected responses
- Roles of government agencies, non-governmental organizations and drought-related
- Citizen's groups
- Communications process
- Annual calendar of activities
- Identification of legislative and resource needs
- Process for updating the Plan
- Suggested programs and activities that will limit vulnerability to drought within regions and sectors

5.2 Local System Water Plans (Drought Preparedness Plan Component)

Source:

<http://www.azleg.state.az.us/FormatDocument.asp?inDoc=/legtext/47leg/1r/bills/hb2277s.htm>

5.2.1 Statutory Context

In 2005, House Bill (HB) 2277 Community Water System Planning and Reporting Requirements was adopted requiring System Water Plans be developed. System Water Plans include a water supply plan, water conservation plan, and drought preparedness plan. Water providers are required to develop a plan to ensure they reduce their vulnerability to drought and prepare to respond to potential water shortage conditions. Section 45-342 of Arizona's revised statutes contains these requirements.

5.2.2 Entities Completing

All community water systems (large and small) are required to complete a System Water Plan. A community water system is one that serves at least 15 connections used by year-round residents of the area served, or that regularly serves at least 25 year-round residents. A community water system that has been designated as having an assured water supply pursuant to Arizona revised statutes section 45- 576 is exempt from the requirement to submit a Water Supply Plan. Additional exemptions for water conservation planning exist. If more than one community water system serves water to residents within a city or town they may coordinate their efforts in preparing the plans required by this section and may submit a joint plan that

contains the information required in this section for that portion of the community supplied by the community water system instead of submitting individual System Water Plans.

5.2.3 Plan Content Overview

Source: Section 45- 576 of Arizona's revised statutes

A drought preparedness plan includes drought and emergency response strategies, a plan of action to respond to water shortage conditions and provisions to inform and educate the public. The drought preparedness plan shall be designed to meet the specific needs of the water system for which it applies and shall include:

1. The name, address and telephone number of the community water system and the names of the officers or other persons responsible for directing operations during a water shortage emergency.
2. Drought or emergency response stages providing for the implementation of measures in response to reduction in available water supply due to drought or infrastructure failure.
3. A plan of action that the community water system will take to respond to drought or water shortage conditions, including:
 - (a) Provisions to actively inform the public of the water supply shortage and a program for continued education and information regarding implementation of the drought preparedness plan.
 - (b) Development of emergency supplies, which may include identification of emergency or redundant facilities to withdraw, divert or transport substitute supplies of the same or other types of water.
 - (c) Specific water supply or water demand management measures for each stage of drought or water shortage conditions, subject to approval by the corporation commission if the community water system is a public service corporation. This requirement may be met by providing a curtailment tariff on file with the corporation commission.

5.2.4 Public Input and Education

Arizona requires that System Water Plans include provisions to actively inform the public of a water supply shortage and a program for continued education and information regarding implementation of the drought preparedness plan.

5.2.5 Submittals, Reporting, Updates and Enforcement

Plan updates are due every five years. If community water systems do not submit plans by the due date, ADWR sends them a noncompliance letter notifying them that they have 120 days to submit the plan. If the plan is not received by the end of this period, ADWR must provide notice of noncompliance to the governing bodies of the cities, towns and counties located in the community water system's service area. The ADWR maintains a list of noncompliant systems on their website at http://www.azwater.gov/AzDWR/StatewidePlanning/drought/CWS_noncompliance.htm. The list specifies if the System Water Plan is inadequate and/or if the system did not submit required annual reporting data.

5.2.6 Funding Mechanisms

No funding is available for the development of Water Supply Plans. The Arizona Water Infrastructure Finance Authority (WIFA) has funds for master planning and infrastructure planning and development. WIFA is an independent agency of the State of Arizona and is authorized to finance the construction, rehabilitation and/or improvement of drinking water, wastewater, wastewater reclamation, and other water quality facilities/projects.

5.2.7 Planning Guidance Materials

- System Water Plan Form (Includes Drought Preparedness Section. Note - this form is optional, but ADWR recommends it to ensure that all plan requirements are addressed.)
- Drought Plan Help Sheet for Small Systems - simplified drought stages and management measures for small water systems
- Fact Sheet - Conservation and Drought Planning for Community Water Systems: How do they work together?
- Sample System Drought Preparedness Plans. ADWR provides specific components from several existing plans with varying levels of complexity.
- 2008 Arizona Drought Preparedness Annual Report

5.3 Assessment, Response and Educational Tools

Source: various Arizona web pages accessed via <http://www.azwater.gov/dwr/drought>

- Governor's Drought Interagency Coordinating Group - The Interagency Coordinating Group is an advisory body to the governor on Arizona drought issues. Comprised of state, federal, tribal and non-governmental organizations, this group meets twice a year to evaluate drought conditions and consider recommendations to the governor.
- State Drought Monitoring Technical Committee - The Monitoring Technical Committee is responsible for gathering Arizona drought, climate, and weather data and disseminating that information to land managers, policy-makers, and the public. This committee meets quarterly to discuss drought conditions throughout the State and produce the Arizona Drought Monitor Report. This report includes short- and long-term drought status maps for each of Arizona's major watersheds, which is calculated using precipitation and streamflow data. The Drought Monitor Report also includes data on vegetation health, snowpack, temperature and reservoir levels. On a monthly basis, the committee publishes a Drought Status Update.
- Local Drought Impact Groups - Local Drought Impact Groups (LDIGs) are county-level groups that will coordinate drought public awareness, provide impact assessment information to local and state leaders, and implement and initiate local mitigation and response options. These groups are coordinated by local representatives of Arizona Cooperative Extension and County Emergency Management and supported by ADWR's Drought Program. The objectives of LDIG's are to:
 - Identify local drought-related impacts
 - Define and assess societal impacts, severity, loss and costs associated with impacts
 - Identify response options
 - Identify unmet needs or needs for response
 - Identify and facilitate efforts to mitigate impacts focusing on preparedness and reducing drought vulnerabilities
- Drought Status Webpage with short and long term drought status, including maps and previous reports
- Community Water System FAQs (<http://www.azwater.gov/dwr/drought/FAQs.html>)
- 2008 Arizona Drought Preparedness Report
- Links to:
 - National Drought Mitigation Center at the University of Nebraska-Lincoln
 - Arizona Firewise Communities
 - Arizona Water Atlas
 - Arizona Water Education and Outreach website

5.4 Key Websites

Arizona Department of Water Resources Drought Program Home Page - <http://www.azwater.gov/azdwr/StatewidePlanning/Drought/default.htm>

Arizona Drought Preparedness Plan - <http://www.azwater.gov/dwr/drought/ADPPlan.html>

Sample System Drought Preparedness Plans. - http://www.azwater.gov/dwr/drought/CWS_spotlight.html

Arizona Water Infrastructure Finance Authority - <http://www.azwifa.gov/>

5.5 Drought Rules/Regulations/Policies/Statutes

Arizona revised statutes, Section 45-342 System water plan; components; exceptions

Arizona revised statutes, Section 45-576.01 Determining consistency with management goal in a replenishment district, conservation district and water district (referred to in 45.342)

5.6 Attached Documents

State Drought Plan:

- Drought Preparedness Operational Plan
- Drought Preparedness Plan Background Section
- Statewide Water Conservation Strategy

Interagency Coordinating Group Fact Sheet

Arizona revised statutes, Section 45-342 System water plan; components; exceptions

Arizona revised statutes, Section 45-576.01 Determining consistency with management goal in a replenishment district, conservation district and water district (referred to in 45.342)

Implementing the Arizona Drought Preparedness Plan: A Case Study of Potential Impediments, Garfin G. and Gilber A., University of Arizona, Institute for the Study of Planet Earth (CLIMAS)
Local Drought Impact Groups Fact Sheet

6 NEVADA STATE SUMMARY SHEET

Nevada requires a State Drought Plan and local Water Conservation Plans which include a drought contingency section. Planning is the responsibility of the State Division of Water Resources (DWR).

6.1 2003 State Drought Plan

Source:

<http://water.nv.gov/WaterPlanning/wat-plan/PDFs/July%202003%20Drought%20Plan.pdf>.

This State Drought Plan establishes an administrative coordinating and reporting system between agencies that should be involved in providing assistance to help mitigate drought impacts. The intent of this document is to establish a system for determining drought severity, for establishing a framework within which agencies would function, and to establish a process for obtaining federal assistance if required. This plan does not establish specific conservation measures for local entities nor does it affect existing water rights. This plan answers the question, "What is the state's response during a drought?" Plan Organization: The plan is centered around 3 stages of drought response: The Drought Warning Stage, Drought Alert Stage, and Drought Emergency Stage.

6.2 Local Water Conservation Plan (Drought Contingency Plan Component)

Source: <http://www.leg.state.nv.us/NRS/NRS-540.html>.

6.2.1 Statutory Context

Nevada Revised Statutes Chapter 540.131 states that Water Conservation Plans must include a contingency plan for drought conditions that ensures a supply of potable water.

6.2.2 Entities Completing

Nevada Revised Statutes Chapter 540.131 states that "Each supplier of water which supplies water for municipal, industrial or domestic purposes shall, on or before July 1, 1992, adopt a plan of water conservation." Joint plans may be completed by suppliers who provide service to a common geographical area.

6.2.3 Plan Content Overview

Water Conservation Plans must include a contingency plan for drought conditions that ensures a supply of potable water.

6.2.4 Public Input and Education

Nevada Revised Statutes Chapter 540.121 states that "As part of the procedure of adopting a plan, the supplier of water shall provide an opportunity for any interested person, including, but not limited to, any private or public entity that supplies water for municipal, industrial or domestic purposes, to submit written views and recommendations on the plan." The plan must include public education components.

6.2.5 Submittals, Reporting, Updates and Enforcement

All water providers are required to complete a Water Conservation Plan (there are fourteen water conservation plans posted on the DWR website from counties, improvement districts, water providers and water authorities). Providers are required to update the plans every five years as required by statutes. Water providers must have an approved Water Conservation

Plan in order to be eligible for funding through the State Board for Financing Water Projects. The state follows up with out-of-compliance providers via mailings.

6.2.6 Funding Mechanisms

Funding is not available for drought (or water conservation) planning. Funds are available to assist with the costs of capital improvements to adhere to water quality standards and the Federal Safe Drinking Water Act. Funding is also available for projects that involve the management, control, delivery, use or distribution of water. Grants may also be made to eligible recipients to pay for the cost of improvements to conserve water such as in the case of irrigation districts.

6.2.7 Planning Guidance Materials

Nevada Revised Statutes Chapter 540.131 Water Conservation outlines plan requirements

Existing conservation plans for several entities are available on the DWR's website (<http://water.nv.gov/WaterPlanning/>)

6.3 Assessment, Response and Educational Tools

- State Climate Office <http://www.climate.unr.edu/> Provides a variety of climate monitoring information and links to outside organizations but doesn't specifically focus on drought.
- Drought Review and Reporting Committee (DRRC) The State Climatologist convenes this committee as necessary. It hasn't been convened in several years. The DRRC, utilizing the various information sources of its members, assesses the hydrologic and climatic parameters and project future conditions.
- Drought Impact Task Forces During Drought Alert Stage the DRRC continues to meet, but is assisted by 3 Drought Impact Task Forces which are then convened. The basic purpose of the Drought Impact Task Forces is to report on drought impacts and to recommend mitigating measures to the DRRC. In response to the impacts, the DRRC will make recommendations to the Governor for action. The 3 task forces are the Agricultural Task Force, the Fish and Wildlife Task Force, and the Municipal and Industrial Task Force.

6.4 Key Websites

State of Nevada Department of Conservation and Natural Resources, Division of Water Resources Home - <http://water.nv.gov/WaterPlanning/>

Nevada State Water Plan Main Page - <http://water.nv.gov/WaterPlanning/wat-plan/con-main.cfm> (Note that the document is in numerous sections so would be very cumbersome to review and/or download. Also it does not cover drought planning).

Nevada Revised Statutes Chapter 540: Planning and Development of Water Resources - <http://www.leg.state.nv.us/NRS/NRS-540.html>

6.5 Drought Rules/Regulations/Policies/Statutes

Nevada Revised Statutes Chapter 540 – Planning and Development of Water Resources

6.6 *Attached Documents*

2003 State Drought Plan

Nevada Revised Statutes Chapter 540 – Planning and Development of Water Resources

7 GEORGIA STATE SUMMARY SHEET

Drought planning is the responsibility of Georgia Department of Natural Resources (DNR) Environmental Protection Division (EPD). Recent legislation requires the DNR to codify the types of drought planning activities that are currently included in the State Drought Management Plan. Local drought planning is required as a component of new or expanded surface water or groundwater permit applications.

7.1 2003 State Drought Management Plan

Source: 2003 Georgia Drought Management Plan

The State Drought Management Plan (SDMP) is a guidance document for state, regional and local governments; water providers; and others to prepare for drought. The SDMP provides guidance on water conservation and drought strategies for various economic sectors. It also establishes procedures for the State to follow to assess and respond to drought. The following sections are included in the plan:

- 1) Drought Declaration Process
- 2) Agencies and Organizations
- 3) Pre-Drought Strategies
- 4) Drought Responses
- 5) Drought Indicators and Triggers
- 6) Climate Divisions Map

Georgia's Drought Response Committee is responsible for reviewing the plan at least every five years, and after each drought event, to evaluate the performance and suitability of the drought indicators, the effect of the pre-drought and drought responses, and to what extent the plan is being followed. Based on this evaluation, the Drought Response Committee shall make appropriate changes.

Georgia is unique among the states reviewed in that the DNR declares drought and imposes restrictions with the authority provided in the permitting sections of the State's Water Quality Control Act and (Official Code of Georgia Annotated (O.C.G.A.) §12-5-31) and Groundwater Use Act (O.C.G.A. § 12-5-96). The SDMP divides Georgia into nine climate divisions. The State monitors and evaluates data at that level. The guidance provided in the SDMP is used by the State to determine drought states and impose drought responses and restrictions at the climate division level. Recent legislation (see section 7.2) may result in the SDMP being replaced by new state drought code.

7.2 2009 State Drought Rules and Regulations (Being Developed)

Source: House Bill 1281 and phone call with Tim Cash, Assistant Branch Chief, Watershed Protection Branch, Georgia Environmental Protection Division

Codify Drought Management - In response to the recent drought, in 2008 the Georgia General Assembly passed legislation (House Bill 1281, which was codified in O.C.G.A. § 12-5-8 Rules and Regulations Relating to Drought Management) requiring the State to codify the types of drought planning activities that are currently included in the SDMP. O.C.G.A. § 12-5-8 states that "Not later than June 30, 2009, the board shall adopt new rules and regulations relating to drought management consistent with this chapter and any state-wide water management plan under Article 8 of this chapter. Such rules and regulations shall include but not be limited to

provisions for a drought response committee; drought indicators and triggers; a drought declaration process; and state and local pre-drought mitigation strategies and drought response strategies. Such pre-drought mitigation strategies shall be designed to minimize the potential effects of drought. Such drought response strategies shall be measures or actions to be implemented during various stages of drought. Such rules and regulations shall replace any previous drought management plan adopted by the board and shall be revised from time to time as the board deems appropriate.” The State has missed the June 20, 2009 deadline but is actively working on the new rules and regulations.

DNR Rules for Outdoor Water Use, Chapter 391-3-30 - Under these rules, Georgians are required to follow schedules for outdoor water use during both non-drought periods and during periods of declared drought. The rules are consistent with drought responses included in the Georgia Drought Management Plan, which the Board adopted in 2003. The rules apply to any entity, and its customers, permitted by EPD for water withdrawal or for the operation of a public drinking water supply system.

7.3 2009 State Water Conservation Implementation Plan

Source: <http://www.conservewatergeorgia.net/documents/planning.html>

In May 2009, Georgia released its first Water Conservation Implementation Plan (WCIP). The WCIP establishes goals for all water users and recommends best practices. These practices constitute a toolbox of activities that may help water users achieve sector-specific goals. While the bulk of the plan is focused on water conservation, it does include practices designed to minimize impacts and respond to drought.

7.4 Surface Water and Groundwater Water Withdrawal Permit Applications (Drought Contingency Plan Component)

Georgia’s surface water and groundwater permitting process requires the development of Water Conservation Plans which include a Drought Contingency Plan component.

7.4.1 Statutory Context

Surface Water

The Georgia Water Quality Control Act, Section 12-5-31 and the Rules for Surface Water Withdrawal, Chapter 391-3-6, require that Surface Water Withdrawal Permit petitioners file a letter of intent to the Georgia EPD Director (director) and submit to EPD certain information pertaining to the desired Permit. Permit applications must include a water conservation plan approved by the director and prepared based on guidelines issued by the director. The guidelines issued require a drought contingency plan component.

Ground Water

The Georgia Board of Natural Resources adopted revised Water Conservation Rules as amendments to Rules for Water Quality Control and Rules for Ground Water Use. O.C.G.A. §12-5-96 requires that Groundwater permit applications (agriculture is excluded) must include a water conservation plan approved by the director and prepared based on guidelines issued by the director. The guidelines issued require a drought contingency plan component.

The majority of permit applicants meet drought contingency planning requirements by stating that they will follow the SDMP. Applicants that do this do not need to develop their own plans.

7.4.2 Entities Completing

Georgia requires any entity that withdraws, diverts or impounds surface water so as to reduce the flow by more than 100,000 gallons per day on a monthly average to obtain a permit from the Director of the Georgia Environmental Protection Division (EPD). Groundwater withdrawals of greater than 100,000 gallons per day also require a permit from the EPD. These requirements apply to all new permit applications and permit expansion applications for municipal, industrial and golf course water user. Permit applicants must submit a drought contingency plan as part of their application package. Agricultural water users are excluded from the water conservation/drought contingency plan requirement.

7.4.3 Plan Content Overview

Surface Water

Surface water permit applicants must provide a drought contingency plan to the Director of the EPD for approval. The plan should include alternative system and resource management strategies to be implemented under drought conditions that may severely reduce the availability of the resource.

Surface Water permit applications must provide the following information in their Drought Contingency Plan (or a statement as to why the item is not an appropriate part of the plan):

- A system for determining drought severity based on some approved indicator (e.g., system demands, groundwater levels, other, etc.);
- A potable water use priorities program (e.g., emergency use essential to life support, domestic use, lawn sprinkling, equipment, etc.) including restrictions on lower priority uses and description of circumstances or events that put the priority use system into effect;
- Low flow streamflow protection; and
- Water storage available to ensure availability of raw water to applicant through a critical drought period.

Groundwater

Groundwater permit application requirements vary slightly depending on the type of water use (municipal, industrial or golf course) but generally include the following information in the Drought Contingency Plan section:

- Develop a system for determining drought severity based on some approved indicator (e.g., system demands, groundwater levels, other, etc.)
- Provide a potable water use priorities program (e.g., emergency use essential to life support, domestic use, lawn sprinkling, equipment, etc.)
- Provide restrictions on lower priority uses and description of circumstances or events that put the priority use system into effect.

7.4.4 Public Input and Education

Surface Water

There are no public input and education requirements for surface water applicants' Drought Contingency Plans.

Groundwater

Georgia's Golf Course and Industrial groundwater permit applications must contain the following items (or contain a statement why the item is not an appropriate part of the plan):

- Description of plan for employee involvement; and

- Description of golf course or industry's participation in any industry-wide organizations that promote water efficiency, new technologies.

Municipal groundwater permit applications must contain the following items (or describe why they are not included):

- Description of plan for public involvement; and
- Description of community/employee involvement in the goals-development process.

These public input and education requirements apply to the entire Water Conservation Plan, not just the Drought Contingency Plan component.

7.4.5 Submittals, Reporting, Updates and Enforcement

Drought Contingency Plans are a required component of new or modified surface water and groundwater permit applications. While water withdrawal and water conservation plan reporting is required, no Drought Contingency Plan reporting is required. No updates are required.

The State of Georgia has the ability to declare drought stages and impose response activities and restrictions. DNR Environmental Protection Rules and Regulations 391-3-30 (Authority O.C.G.A. Secs. 12-5-90 et seq.) apply to any entity, and its customers, permitted by the Georgia Environmental Protection Division (EPD) for water withdrawal or for operation of a drinking water system. 391-3-30 sets outdoor water use requirements that must be followed during drought and non-drought periods. The State has the ability to enforce these requirements. Additional enforcement mechanisms are not identified.

7.4.6 Funding mechanisms

No funding is available for the development of Drought Contingency Plans. The State is paying for a cadre of consultants to assist regional entities in the development of Regional Water Management Plans (not discussed here).

7.4.7 Planning Guidance Materials

Georgia has developed high level guidance materials to assist applicants in developing the required Water Conservation and Drought Contingency Plans. Drought Contingency Plan guidance materials for surface water permit applicants is more detailed than that provided for groundwater applications. Plan guidance is included in surface water permit application documents. Separate Water Conservation Plan overview materials were developed for groundwater permit applicants, but these contains only a few high level bullet items specific to Drought Contingency Plan requirements (included above in section 7.4.3).

7.5 Assessment, Response and Educational Tools

- 2003 State Drought Management Plan - Georgia's state drought plan defines drought and a declaration process. Each of the nine climate divisions has several indicators. If any one of the indicators in any one or more of the nine climate divisions reaches or passes a certain prescribed condition for two consecutive months, a preliminary evaluation by the State climatologist and the EPD director is triggered.
- Guidance for Drought Response Modification Petition Process
- Drought Response Committee – convened as needed
- Regional Water Planning Councils
- Office of the State Climatologist (housed at the University of Georgia) - <http://www.caes.uga.edu/topics/disasters/drought/>

- Statewide Outdoor Water Use Schedules
- State Orders
- Climatological Data (daily and/or weekly)
 - Georgia Precipitation Amount, Deviation From Normal Precipitation, Soil Moisture, Soil Moisture Anomaly Map, High Resolution Soil Moisture Models, Georgia Active Groundwater Level Network, Georgia Stream Flows, Groundwater data from USGS, Georgia Lake Levels, Georgia Keetch-Byram Drought Index, KBDI Deviation from Normal, Fire Danger Rating, Crop Moisture Index Map, Georgia Palmer Value and Rain Needed to End Drought, Palmer Drought Severity Index Map, Palmer Drought and Crop Moisture Data for the Southern Region, Georgia Crop Progress & Condition Report, National Drought Monitor)
- Climate Outlooks
- Glossary
- News Articles including archive
- Photo Gallery
- CoCoRaHS
- Conserve Water Georgia
- GeorgiaWeather.net
- Hot Topics: Water and Drought
- Drought Info
 - Home & Garden
 - Commodities
 - Economics
- Links and Contacts
- University of Georgia Resources (College of Agricultural and Environmental Sciences Cooperative Extension publications, Georgia Automated Environmental Monitoring Network, Georgia Forages - Drought management information, News from Georgia FACES, State Climatology Office, Stripling Irrigation Research Park, Warnell School of Forestry and Natural Resources)
- State and National Resources (Georgia Agricultural Statistics Service, Georgia Department of Agriculture, Statewide Outdoor Water Use Schedule, Water Conservation Program, Georgia Emergency Management Agency, Georgia Forestry Commission, National Weather Service)
- Conserve Water Georgia - <http://www.conservewatergeorgia.net/>

7.6 Key Websites

Georgia Department of Natural Resources, Environmental Protection Division (EPD) - <http://www.gaepd.org/>

EPD Forms, Watershed Protection Branch (permit applications and reporting forms are located here) - http://www.gaepd.org/Documents/epdforms_wpb.html

Georgia DNR Environmental Protection Rules and Regulations - http://rules.sos.state.ga.us/cgi-bin/page.cgi?g=GEORGIA_DEPARTMENT_OF_NATURAL_RESOURCES%2FENVIRONMENTAL_PROTECTION%2Findex.html&d=1

EPD Watershed Protection Branch - http://www.gaepd.org/Documents/index_water.html

Office of the State Climatologist (housed at the University of Georgia) - <http://www.caes.uga.edu/topics/disasters/drought/>

7.7 Drought Rules/Regulations/Policies/Statutes

O.C.G.A. § 12-5-8 Rules and regulations relating to drought management

O.C.G.A. §12-5-31 Water Quality Control Act, Permitting Requirements Section

O.C.G.A. § 12-5-96 Groundwater Use Act, Permitting Requirements Section

DNR Rules for Outdoor Water Use, Chapter 391-3-30 - These rules provide drought and non-drought outdoor use schedules.

7.8 Attached Documents

2003 Georgia Drought Management Plan

2009 George Water Conservation Implementation Plan

O.C.G.A. § 12-5-8 Rules and regulations relating to drought management

O.C.G.A. §12-5-31 Water Quality Control Act, Permitting Requirements Section

O.C.G.A. § 12-5-96 Groundwater Use Act, Permitting Requirements Section

DNR Rules for Outdoor Water Use, Chapter 391-3-30 - These rules provide drought and non-drought outdoor use schedules.

New or Modified Municipal Surface Water Withdrawal Permit Application

Industrial Surface Water Withdrawal Permit Application

Groundwater Permit Application Water Conservation Plan overview (includes a Drought Contingency Plan Component) for Municipal Applicants

Groundwater Permit Application Water Conservation Plan overview (includes a Drought Contingency Plan Component) for Industrial Applicants

Groundwater Permit Application Water Conservation Plan overview (includes a Drought Contingency Plan Component) for Golf Course Applicants

8 SOUTH CAROLINA STATE SUMMARY SHEET

The South Carolina Drought Response Act requires that local entities develop and implement Drought Response Ordinances and/or Plans. Local Drought Response Plans are the responsibility of the Department of Natural Resources.

8.1 South Carolina Drought Response Plan (component of the State's Emergency Operation Plan)

Source: <http://www.scemd.org/plans/SCEOP09/SC%20Drought%20Response%20Plan.pdf>

The State Drought Response Plan is the responsibility of the South Carolina Emergency Management Division. This plan establishes policies and procedures to be followed by the State and counties when responding to a drought situation. The focus of this plan is on the State and federal consequence management of the drought. To provide statewide planning and response strategies that allow state and county emergency management officials to effectively and efficiently plan and coordinate the application of local, state, and federal resources in response to a severe or extreme drought event to prevent loss of life, minimize damage, lessen the economic impact, and protect the environment.

8.2 South Carolina Drought Response Act (1985, amended in 2000)

Source: http://www.dnr.sc.gov/climate/sco/Drought/drought_act_reg.php

This Act essentially serves as a drought response plan for South Carolina, though it also specifies that the Department of Natural Resources “shall formulate, coordinate, and execute a drought mitigation plan. The plan must be developed consistent with the South Carolina Water Resources Planning and Coordination Act, as provided in Chapter 3 of Title 49, to the extent that the plan is compatible with the comprehensive state water plan.” No DNR drought mitigation plan has been developed due to a lack of resources and staff time.

8.3 South Carolina Water Plan (2004)

Source: <http://www.dnr.sc.gov/water/admin/pubs/pdfs/SCWaterPlan2.pdf>

The 2004 2nd Edition of the South Carolina Water Plan was developed by the Land, Water and Conservation Department of the Department of Natural Resources. Perhaps the most important elements introduced in this edition of the Water Plan are the recommendations to regulate surface and ground water withdrawals, and the proposed water-sharing strategy that relates lake inflows and lake levels to downstream releases and other lake withdrawals as a way to balance and mitigate the impacts that water shortages have on all surface-water users. This strategy emphasizes the need for all users to share the burden of water shortage during prolonged droughts.

Because much of its surface water is shared with neighboring states, it is important that South Carolina establish formal mechanisms with Georgia and North Carolina for the equitable apportionment of all water shared with these states in order to reduce potential disputes between the states, protect the flow regime of many of South Carolina's rivers, and extend the availability of water during severe droughts. The Plan includes a short section on “Drought Management and Mitigation” as well as other drought planning recommendations.

8.4 Local Drought Ordinances and/or Drought Response Plans

Source: http://www.dnr.sc.gov/climate/sco/Drought/drought_response_program.php

Local Drought Ordinances and Plans outline a comprehensive program of action that enables communities to recognize and deal with drought. An effective plan should be developed before drought occurs. Planning should involve the public and appropriate Federal, State, and local agencies to insure that it is politically, economically and socially workable. An effective plan provides for monitoring water supplies and uses; identifying alternative water sources, including arranging hookups to neighboring water supplies; developing education programs and demand reduction strategies; defining implementation and enforcement mechanisms; and outlining review and update procedures.

8.4.1 Statutory Context

The South Carolina Drought Response Act of 2000 (amends SECTION 3. Chapter 23, Title 49 of the 1976 Code) requires that drought response ordinances, or plans where authority to enact ordinances does not exist, be developed and implemented. The ordinances or plans must be consistent with the State Drought Response Plan.

8.4.2 Entities Completing

All municipalities, counties, public service districts, and commissions of public works engaged in the business or activity of supplying water for any purpose shall develop and implement local drought response ordinances, or local drought response plans when authority to enact ordinances does not exist. Cooperation among adjacent water suppliers is encouraged to develop alternate water supply sources and back-up systems and to develop compatible plans and ordinances.

8.4.3 Plan Content Overview

Local drought response ordinances and plans shall be consistent with the State Drought Response Act and shall contain at a minimum the following information:

- (a) A description of alternate supply sources, including time, costs, and problems associated with putting alternate sources on-line.
- (b) A water use reduction plan and schedule for moderate, severe, and extreme drought for various categories of water use (provided), as appropriate.
- (c) An implementation plan and ordinance, as appropriate.

8.4.4 Public Input and Education

South Carolina does not require public involvement or educational components for local drought response plans or ordinances.

8.4.5 Submittals, Reporting, Updates and Enforcement

Proposed ordinances and plans were required to be submitted to the South Carolina Department of Natural Resources for consistency review within twelve months of the effective date of the South Carolina Drought Response Act of 2000. Proposed local drought response ordinances and plans were required to be adopted within eighteen months of the effective date of Drought Response Act. New water suppliers are required to submit a local drought response ordinance or plan to the South Carolina Department of Natural Resources within six months of their commencement of business and to adopt the ordinance or plan within twelve months of their commencement of business.

The Drought Response Act states that “A person violating a provision of this chapter [the Drought Response Act chapter of South Carolina’s State Code] is guilty of a misdemeanor and, upon conviction, must be fined not less than fifty dollars and not more than one thousand dollars for each violation. In addition, if a person is adjudged to have committed the violation willfully, the court may determine that each day during which the violation continued constitutes a separate offense.” These fines may be assessed against water providers not submitting the required ordinance or plan, though the State has not yet used this as an enforcement mechanism.

8.4.6 Funding Mechanisms

No funding is available for drought planning. Funding is available to assist with water and sewer infrastructure costs and projects associated with estuary and nonpoint source programs.

8.4.7 Planning Guidance Materials

The South Carolina Department of Natural Resources, in cooperation with the South Carolina Department of Health and Environmental Control, developed a model drought response plan and ordinance.

- Model Drought Management Plan and Response Ordinance
- Drought Management Plan and Response Ordinance Inventory (Search by City or Water System)

8.5 Assessment, Response and Educational Tools

• Drought Management Areas and Local Drought Response Committees

There are four Drought Management Areas (DMA) in South Carolina based on river basin boundaries instead of climate divisions and geopolitical boundaries. Establishment of DMAs in no way limits the department's or the Drought Response Committee's authority to act in an area smaller than a drought management area, such as a county or watershed. In order to prevent overly broad response to drought conditions, drought response measures shall be considered within individual drought management areas, as applicable. Insofar as practicable, within an individual drought management area, drought response measures shall be considered and administered in individual counties. During a drought, upon determination that action in addition to local measures is necessary to insure adequate supplies of water in drought management areas, the Drought Response Committee shall prepare recommendations to reduce or alleviate drought impacts and submit the recommendations to the South Carolina Department of Natural Resources for implementation. If the recommendations involve the curtailment of water use, the local drought response committee shall determine which categories of non-essential water use must be curtailed.

- Current Restrictions and Water Conservation Actions by County and Water Supplier
- Drought Response Committee Members
- Drought Response Meeting Minutes
- Drought Information and Response Suggestions for Community Members
- Archived Drought Status
- Drought Indices
 - Current US Drought Monitor
 - Standardized Precipitation Index
 - Palmer Drought Severity Index
 - Crop Moisture Index
 - Regional Drought Monitor

- Current Fire Weather from SC Forestry Commission
- National Keetch-Byram Soil Moisture Drought Index - USDA Forest Service
- Southeast Keetch-Byram Soil Moisture Drought Index : Map / Data
- Departure From Average Greenness
- South Carolina Groundwater Data (DNR)
- Water Resources of SC - USGS
- Savannah River Lake Levels-US Army Corps of Engineers
- USGS Duration Graphs for Selected Lakes and Streams
- USGS Real-Time Daily Streamflow Conditions Map
- Real-time Provisional Hydrologic Data
- Groundwater Climate Response Network
- Real-time Groundwater Data
- Current Precipitation Accumulation Maps
- Current Temperature Maps
- Current Soil Moisture Ranking Percentile
- Climate Prediction Center
- National Climate Data Center
- Drought Mitigation Center
- South Carolina Precipitation Analysis
- Drought Pictures
- DNR's Dynamic Drought Indices for Basin (<https://www.dnr.sc.gov/drought/>)

8.6 Key Websites

State Climatologist's website -

http://www.dnr.sc.gov/climate/sco/Drought/drought_login.php

State Drought Response Act http://www.dnr.sc.gov/climate/sco/Drought/drought_act_reg.php

Department of Natural Resources - <http://www.dnr.sc.gov/water.html> (note that drought link is to the State Climatologist's website)

South Carolina 2009 Emergency Operation Plan (includes a Drought Response Plan) -

<http://www.scmd.org/plans/sceop.html> (Drought Response Plan Component - <http://www.scmd.org/plans/SCEOP09/SC%20Drought%20Response%20Plan.pdf>)

South Carolina Water Plan <http://www.dnr.sc.gov/water/admin/pubs/pdfs/SCWaterPlan2.pdf>

8.7 Drought Rules/Regulations/Policies/Statutes

South Carolina Drought Response Act (amends SECTION 3. Chapter 23, Title 49 of the 1976 Code)

Water Resources Planning and Coordinating Act Section 49-3-10

8.8 Attached Documents

Model Drought Management Plan and Response Ordinance

South Carolina Drought Response Act

South Carolina 2009 Emergency Operation Plan, Drought Response Plan Component
South Carolina Water Plan (2004) and errata

A2 - Notes from Phone Calls

Headwaters Corporation made phone calls to the National Drought Mitigation Center and several states. Calls to states were made for clarification purposes only. As a result call notes do not cover all of the content provided in the State Summaries sheets. The questions and answers below are paraphrased and not direct quotes.

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National Drought Mitigation Center

5/11/2009 call with Dr. Michael Hayes, Director of the National Drought Mitigation Center at the University of Nebraska at Lincoln (UNL) (402- 472-4271, mhayes2@unl.edu)

States need to require or incentivize drought planning. UNL advocates a state level and local level requirement. Quite a few states have drought plans but many are outdated. Usually the opportunity and interest in drought planning happens during periods of drought and then interest and resources drop off when the drought ends. States tend to look at other states' plans as models.

Colorado's drought plan is pretty detailed about how to identify drought and then documenting what happens at certain stages. The state may need to start requiring drought planning at a local level to ensure things are in place for response. If they do this, they will need to have tools to assist with this.

Texas – Texas Water Bill 1 is about 5 years old. It requires planning at the water provider level. Drought plans have been developed because of this. It is a good model.

South Carolina – Has a long history of having a law requiring local plans which has changed over time. He recommended we contact Hope Mizzell at 803-734-9568. She used to be the drought coordinator and is now the State Climatologist. The State plan was very restrictive but Hope worked to relax the language. The state is broken into four or five drought mitigation areas. This is a good model.

California – California doesn't have drought planning at the state level but they do require municipalities to have drought plans. Their "Urban Drought" Planning Guidebook was just redone in 2008. He doesn't think this is a good model for Colorado. A lot of it is driven by the needs of large water providers in the State.

Nebraska – This state's statutes have a commitment for a drought task force to meet two times per year in non-drought years and as needed in drought years. Sub-committees meet more often if needed (similar to Colorado's Water Availability Task Force). There are no requirements for local water providers. The State Department of Health and Human Services has been aggressive about approaching water suppliers around the State to look at vulnerability and plan ahead. They have been successful in recent years due to drought conditions. He is unsure if this will be sustained. It is more likely to be sustained if it is a law.

New Mexico – They were innovative in the 1990's. They received funds from the Bureau of Reclamation and the University of Nebraska to include mitigation in their drought plan. Then they lost some key people in the State Engineer's Office as well as this focus. He doesn't think their drought coordinator position has been refilled. The Assistant State Climatologist is now at UNL. New Mexico has a Drought Monitoring Task Force.

Kentucky – Kentucky requires local water providers to have plans. A good contact there is Bill Caldwell (502-564-3410) at the Division of Water.

Arizona – They started drought planning in 2002 and developed a state-level plan. They used Georgia's plan as a model. They were going to do more monitoring at a county level but don't have the financial

resources. He thinks their approach was a good one to start focusing on the county level for monitoring and impact assessment.

Missouri – Missouri followed Kentucky and has done mitigation but not local level planning. They don't have a statutory planning requirement.

Hawaii – Hawaii is most active currently. The state and counties (each island is a county) are required to have plans. In 2007 they got funding from the legislature to implement mitigation activities that were identified in the plans. They are in the process of developing strategies. A good contact is Neil Fujii at 808-587-0264.

Washington – A good contact is Anne Steinemann at 206-616-2661 at the University of Washington in Seattle. She is contemplating where to go next regarding Washington's drought plan. She's looked at what other Western states have done. She's working on a paper that is in review that looks at the state of drought planning in 17 western states and may be able to provide a copy. All 17 states do something well but they could learn a lot from each other. Ann used to be at Georgia.

Georgia – Georgia, where Anne Steinemann was at the time, put together a great, detailed drought plan. They say they still use it and are happy with it.

National Integrated Drought Information System (NIDIS) – The National Oceanic and Atmospheric Administration (NOAA) has led a federal effort to coordinate and improve drought related information sharing across the US. Colorado could be a model for other states to follow and set the standard. There's a pilot project on the upper Colorado basin that could provide an opportunity for the State to show how the State Plan could work at a basin level.

Texas

Texas is unique in that water supply related regional water plans and local water conservation plans are required by the Texas Water Development Board (TWDB) while local drought contingency plans are required by the Texas Commission on Environmental Quality (TCEQ). Calls were made to both departments.

Texas Commission on Environmental Quality

6/26/2009 call with Trent Jennings (direct line is 512-239-6857, Water Rights Permitting Section. Main TCEQ line is 512-239-4691.)

TCEQ Question 1: Do you have any funding available for local drought contingency planning (DCP)? Funding is available for required regional water planning? If you don't have funding, do you find large providers tend to complete plans while smaller ones do not due to a lack of resources?

TCEQ Answer 1: There is funding through the TWDB for water conservation planning, which may include a drought contingency plan component. There is no funding available for drought planning through the TCEQ. The TCEQ can, however, help water providers develop their plans. They have developed forms (templates) for water providers and provide technical assistance. They do not have a problem with smaller utilities having trouble developing plans as the templates they've developed are relatively easy to complete.

TCEQ Question 2: What enforcement mechanisms do you have in place to ensure plans are completed as required? Water conservation and drought contingency plans are required for loans in excess of \$500,000 from the Texas Water Development Fund. Do you have other enforcement mechanisms in place?

TCEQ Answer 2: Local DCPs are required by law. Retail water suppliers with 3,300 connections or more, wholesalers, investor owned and small providers, and irrigation districts if water rights are 10,000 acre-ft (af) or more must submit a DCP to the TCEQ. Retail water suppliers serving fewer than 3,300 connections must develop a plan to be made available upon request to the TCEQ (but they do not need to submit the plan). Every five years plans must be updated. May 1, 2009 was the latest deadline. They received about 50% of the plans that are required. They have an enforcement division that sends a mass mail out to suppliers who didn't submit a plan. They will also make calls and help providers develop plans. No one is "thumbing their noses at us". The compliance rate is pretty good. Many providers may not realize they need a new plan every five years.

TCEQ Question 3: Your documentation says that the information provided in local Drought Contingency Plans is incorporated into Regional Water Plans. Does this really happen? Do you have thoughts or suggestions regarding the utility of this?

TCEQ Answer 3: Yes, this does happen, especially for large water users. Information from small or medium size towns may not get included. All providers must send a copy of their DCP to their regional planning group. How they use this information is then up to the planning group.

TCEQ Question 4: Do you allow for entities to develop collaborative plans? If so, are there any guidelines about this and do you think there are pros and cons to collaborative plans?

TCEQ Answer 4: Sometimes they will receive a collaborative plan if someone overlaps or there is a regional water group. Providers can collaborate. If you are a wholesaler, you and who you're selling to

must have comparable plans so it makes sense to collaborate. Groundwater conservation districts, if on well water, need to make sure DCPs work with them.

TCEQ Question 5: Do folks need to use/comply with the Handbooks and sample plans you've developed? What if they don't?

TCEQ Answer 5: The Handbooks are guidelines but the rules are what providers must ultimately follow.

TCEQ Question 6: Have you received feedback on your DCP guidance materials? Have providers given you any feedback on them?

TCEQ Answer 6: The guidelines were introduced in 2005. They have received no feedback on them. He feels they are better for smaller to mid-sized provider to use as a guide. They contain pointers.

TCEQ Question 7: Texas requires that the TCEQ be notified of restrictions implemented, with reporting requirements that vary by the type of water provider. Terminations of restrictions must also be reported. Is this required by law?

TCEQ Answer 7: Yes, this is required by law. Providers must notify them.

TCEQ Question 8: Do you feel that local drought ordinances are necessary or are DCPs sufficient? Would just a DCP allow for more flexibility and easier adjustments over time? What are the benefits of an ordinance?

TCEQ Answer 8: Texas is a diverse state regarding rainwater, well water, and dry areas. Ordinances are very important. They have been in drought for the past 22 months. The state needs to know where providers are at regarding drought planning and plans must be adopted. He doesn't think ordinances decrease flexibility. It helps to have public water supply within a city's limit as this is helpful for enforcement on the part of the water provider.

TCEQ Question 9: How do you interact with the TWDB?

TCEQ Answer 9: TWDB permitting and water rights can get held up if WCPs and DCPs aren't in place. The TCEQ and TWDB work together with the TCEQ being the stick and the TWDB the carrot. The TWDB is in the business of handing out loans to folks to help develop plans.

TCEQ General Thoughts/Comments for Colorado

- It is nice to have staff that can assist people in creating plans and give them suggestions based on what nearby entities are doing.
- Look at Texas' materials and follow their lead.

Texas Water Development Board

6/29/2009. Spoke briefly with Ethan Hamm 512-463-4292 who recommended Adolf Stickelbault as being more knowledgeable about drought. Spoke to Adolf (direct line is 512-936-2391).

TWDB Question 1: You require retail public utilities that provide potable water service to 3,300 or more connections to submit a water conservation plan to the TWDB. When do you require a drought mitigation plan as a component of this?

TWDB Answer 1: Any provider applying for a loan of over \$500,000 from the TWCB has always had to submit a DCP as a component of their WCP, previously referred to as an "emergency demand management plan". The TWDB doesn't require the DCP component of WCPs for other providers.

Those applying for loans tend to submit the same DCP to the TCEQ and the TWDB, which they encourage. The TWDB points people to the TCEQ plan guidance materials but they also include a shorter checklist for DCPs that can be used.

TWDB Question 2: Do you have funding available for local drought contingency planning? If so, specifically what fund?

TWDB Answer 2: There is no funding for DCP. When a provider comes in for a loan they typically work with an engineering firm, and they hire them to do the water conservation and drought plans. The TWDB requires an approvable DCP that contains guidance checklist items (the checklist for loan applicants is available on their website). The plan is submitted with the loan application. Many have an older plan, so the TWDB works with them to bring it up to compliance. If a provider wanted to, they could submit a plan that met the requirements and then use some of the loan they receive to build upon that.

TWDB Question 3: What enforcement mechanisms do you have in place? Water conservation and drought contingency plans are required for loans in excess of \$500,000 from the Texas Water Development Fund. Do you have other enforcement mechanisms?

TWDB Answer 3: TCEQ is the agency in charge of water rights and they have to have a water conservation plan before they'll even look at a new water rights application. DCPs are not required so are not required for water rights processing. The TWDB's DCP requirement for all loans over \$500,000 is the enforcement mechanism.

TWDB Question 4: HB 2660 created a Drought Preparedness Council (DPC) to create a State Drought Plan. All DPC weblinks now take you to an Agricultural Drought Task Force (ADTF) website but Texwin.net has a list of DPC members but then links to the ADTF site. Is the ADTF a successor group? Does the DPC still exist?

TWDB Answer 4: The ADTF includes many of the same members as the DPC. The DPC still exists but that website is being redone. The ADTF site contains a lot of the same information. While the ADTF has good information and includes state organizations, it is not a state group but rather a Texas A&M University sponsored group.

California

6/26/2009 call with Chris Fakunding of the Water Use and Efficiency branch of the Department of Water Resources (DWR) (916-651-9673, cfakund@water.ca.gov. Main 916-653-5791). If need to contact again and Chris is out, David Todd is a backup (916-651-7027, dtodd@water.ca.gov).

CA Question 1: Do you have any regional drought planning requirements?

CA Answer 1: There are no regional requirements. Regions can do this, and may want to especially with integrated groundwater management plans, but this would be voluntary. Such a plan would satisfy Urban Water Management Plan (UWMP) drought planning requirements for the local entities involved.

CA Question 2: Do you have any state or regional level drought task forces/committees?

CA Answer 2: Drought is usually addressed through the DWR at state level and through the State Water Plan (see the 2009 Update).

CA Question 3: Is it only municipal providers who must develop water shortage contingency plans (WSCP)? Agricultural Districts and others are not required to?

CA Answer 3: "Urban" water suppliers are required to develop water shortage contingency plans as part of the UWMP. "Urban" means water delivered to homes. Urban providers can be county, private, or public. Agricultural districts have agricultural water management plans through the California Agricultural Water Council.

CA Question 4: Your water code says DWR can only review but doesn't have any regulatory or other authority over the plans. But you can deny plans and require modifications?

CA Answer 4: The DWR reviews plans to determine if all requirements of the Water Management Planning Act have been met. If not, DWR can send plans back and say they aren't complete. All drought plans must include response actions that are handled via local ordinances but mandated by the State.

CA Question 5: What enforcement mechanisms do you have? Water suppliers must have a current and DWR reviewed UWMP in place in order to receive drought assistance or other DWR fund? What about other state funds? What if plans are out of date?

CA Answer 5: The state has water use efficiency requirements (demand management measures) that the providers must have met in order to receive state funding but these are geared towards water conservation rather than drought mitigation. The state has about 450 water suppliers that should have plans in place. Each cycle (every 5 years) their compliance rate increases. Once a provider has a UWMP in place, they are easy to update. The DWR sends reminder letters to all providers who have not submitted, but the only enforcement they have is the requirement that plans be in place prior to receiving funding. There is no other penalty for not submitting.

CA Question 6: You have funding to develop Regional Management Plans. Do you have any funding for UWMP or local drought planning? Do you find large providers complete plans while smaller ones don't because of resource issues? Do you have any other funding related to drought preparation, assessment and response?

CA Answer 6: The state did have funding initially, but now does not. The state is focusing on water use efficiency and getting demand management measures implemented. Funding is geared towards

implementation. There was funding in 1992 when plan requirements were first adopted but that funding ran out. Some providers are small so do not have the staff or financial resources to develop a plan. They estimate it costs around \$50,000+ for a consultant to help with a plan. Smaller providers are having the most difficult time because of financial limitations.

CA Question 7: You allow urban water suppliers to meet the local plan requirements if they participate in “area-wide, regional, watershed, or basin wide” planning. Do many water providers do this? Do you have an opinion as to whether regional or local drought planning is more effective? Are their situations in which one is more appropriate? Recommend allowing for collaborative planning?

CA Answer 7: They find that in northern California planning usually occurs at the local level. In southern California where there are 1 or 2 large wholesalers pushing water out to LA, Orange County, etc, they tend to have one plan which includes information from each retailer. There is a large amount of regional planning. As more water is funneled from the north to the south, the north is starting to do more of this. Managing surface water and ground water supplies is also leading to more regional water supply planning.

CA Question 8: California’s UWMP must include a Water Shortage Contingency Plan (WSCP). 2005 UWMP guidance materials describe the six steps for the WSCP. California then developed a 2008 Urban Drought Guidebook which then describes seven steps for water shortage contingency planning which are different from those in the 2005 guidance materials. The 2008 document does not state that it supersedes the 2005 materials. This is confusing. What should providers follow?

CA Answer 8: The 2005 was for the UWMP specifically. The 2008 document is for drought only for this cycle of drought which came after the 2005 plan book was written. They will be releasing the guidebook for the 2010 UWMP soon (check back in a few weeks). So each planning cycle the State releases guidance materials specific to that cycle.

CA Question 9: The State of California Multi-Hazard Mitigation Plan includes a short section on drought under “other hazards”. This is not tied to your state drought plan. Do FEMA requirements play into your state drought plan in any way?

CA Answer 9: No, they are not tied in. They leave it more to the local or regional areas to handle.

CA DWR General Thoughts/Comments for Colorado

- Maybe look to see what Florida is doing. They’ve had quite a few issues lately.
- See East Bay Municipal Utility District and what they are doing with their water conservation program. They do a good job.
- See the DWR water use financial assistance page to see what they are doing.
- One issue they have run into is that if a provider wanted to apply for implementation funds to put water conservation measures in place, they first need to complete an UWMP. For some providers, financially it made sense just to skip funding the plan and rather to fund the water conservation activity.
- California has just mandated a landscape ordinance for all new development. Colorado could do something like this and point towards California. They built a state water project from north to south California which everyone has stuck a straw into. Now they are building everywhere. They need to slow this down.

New Mexico

7/7/09 call with Cheri Vogel, Water Use and Conservation Bureau of the State Engineers Office (505-827-4272, cheri.vogel@state.nm.us).

NM Question 1: Is your state drought plan required by law and are updates required?

NM Answer 1: The state water plan is required by statute but not the drought plan. The Drought Task Force was created via an Executive Order by the Governor but the drought plan was not mandated.

NM Question 2: Does the State Water Plan deal with drought?

NM Answer 2: Drought it not addressed in the Water Plan.

NM Question 3: The Drought Task Force originally (2003) included a Strike Team with six work groups (Monitoring; Drinking Water; Agriculture; Wildlife and Wildfire; Recreation, Economic Development, and Tourism; and Water Development work groups). These work groups do not appear to be in place currently. Is that correct?

NM Answer 3: The Strike Team and work groups are not in place any more. These were used initially to make recommendations regarding what the State needed to do. Since then they have streamlined the group to focus on monitoring and forecasting, to have a climatologic focus

NM Question 4: Does New Mexico have any regional or local drought planning requirements or guidance materials?

NM Answer 4: There are no drought planning requirements but Regional Plans slightly address drought. The main focus is on 40 year water development planning but in the planning guidelines (<http://www.ose.state.nm.us/doing-business/water-plan/rwp-handbook.html#purpose>) there is a bullet item for "Emergency contingency plans" that includes both drought and flood considerations. These plans are focused more on the regulatory side of things.

Also, if a municipality wants to hold an unused water right, they need to file a water development plan with water conservation and drought plan components. Go to website under Hot topics, see House Memorial 42, there is a draft planning template. Provides the State with some enforcement because a water provider can be out of compliance with their permit conditions and could lose their water right if they don't have a water development plan in place. The New Mexico Office of the State Engineer is understaffed so don't tend to follow up unless the provider files for another permit and they can say they aren't in compliance with existing permit(s). Each district office writes their own permit requirements so this is confusing as some may require annual reporting on water cons and drought planning but others may not. So unless a permit is pending, they don't tend to notice if a provider is out of compliance. They only notice when there is a problem.

Follow Up Note: Headwaters located House Memorial 42 and searched the NM website. There are requirements for water development plans, but the drought and water conservation component requirements were not documented. As a result, this information is not provided in the State Summary document or main report body.

NM Question 5: Recent Executive Orders signed by the Governor have created a Drought Task Force (which developed the drought plan) and recognize that sufficient guidance and funding is not currently in place. What is that status of guidance and funding changes?

NM Answer 5: The Drought Task Force was made up of the secretaries of all the major state agencies. They decided that monitoring and forecasting was most important. In the beginning there was a small budget but it was basically an unfunded mandate.

General Suggestions?

They defer to Texas which has great guidelines, including sample triggers and conditions.

Nevada

7/7/09 call with Kelvin Hickenbottom, Division of Water Resources (775-684-2800)

NV Question 1: Is your state drought plan (2003) required by law?

NV Answer 1: It is not required by statute but probably is needed by the State Climatologist who declares droughts.

NV Question 2: Do you know when you update the plan?

NV Answer 2: There is no set time frame. It's probably based on the State Climatologist and direction given by the Governor.

NV Question 3: The State Drought Plan refers to the Drought Review and Reporting Committee (DRRC) that assesses the hydrologic and climatic parameters and project future conditions. The plan also states that three Drought Impact Task Forces are convened during the Drought Alert stage. What's the status of these groups?

NV Answer 3: The State Climatologist convenes the DRRC if he determines the situation warrants. Otherwise they are not convened. He also has the ability to call them together to rework the drought plan.

NV Question 4: You require Local Water Conservation Plans (WCP) which include a drought contingency plan component. How do you enforce this requirement? Do water providers submit these plans? Are there required updates?

NV Answer 4: Some water providers submit WCPs and some don't. The larger communities try to keep them updated every 5 yrs as required by statute. There are hundreds of small providers that don't submit plans. The state notifies out of compliance providers via mail, but they receive only a handful of responses. If a provider needs a grant through the State board for financing water projects, then they need a water conservation plan in place. This is their main hammer. Most smaller providers can't afford to complete a WCP, which must include a DCP (the State has a checklist based on the statute). They return plans if they don't comply with the statute.

NV Question 5: Do you have any water conservation guidance materials for water providers? The water conservation statute and existing plan are on your website.

NV Answer 5: That's correct. There is no model plan. The statute spells out all the plan requirements pretty directly. There are 13 or 14 required Water Conservation Plan elements.

NV Question 6: Do providers submit joint plans as allowed by your statute. Are there pros and cons to these?

NV Answer 6: Yes they do. If a county has multiple small systems, they can submit one plan. Most components are the same for these small systems. Joint plans are also less work for the State to review. They used to have one person to review the plans, but they cut that position so now this has been added to his list of job responsibilities. Most of these small systems hire the same consultant who must market to them. Their plans are similar but the consultant does a good job.

NV Question 7: Is there funding for water conservation planning?

NV Answer 7: There are no grants through their office. There may be through the board for financing small projects but he doesn't think so.

Final Notes:

Grants available via the board used to require that a provider be a public system but now they can be a not for profit purveyor or a mutual company.

Up until 2003 or 2005, the Division of Water Resources was supposed to update the State water plan but was removed from their statute. Now their main job is to support local communities in water conservation planning.

Georgia

7/15/09 call with Tim Cash, Assistant Branch Chief, Watershed Protection Branch, Georgia Environmental Protection Division (cell 404-308-8189, office 404-675-1776, main 404-656-4713)

GA Question 1: You have a State drought plan. Do you have any regional or local drought planning? Georgia's State Drought Management Plan does break down pre-drought strategies and drought responses by water sector and then by state and local/regional actions. The State plan also recommends regional and local drought planning. Are local drought plans developed? If so, are they submitted to the State? Are there any requirements for water providers to do this?

GA Answer 1: There are State rules for water quality (WQ) control which authorize the Environmental Protection Division (EPD) to require new permittees or anyone requesting an expansion of their water withdrawal to have a drought contingency plan (DCP). DCPs should include what water providers will do in declared drought conditions. In 2003, after the 2001 and 2002 drought, the Board of Natural Resources (BNR) adopted the State Drought Management Plan (DMP) which includes specific information on pre-drought strategies, drought triggers and stages and responses. Most of their permittees have changed their DCPs to say that they'll follow what is required under the State DMP. The only water providers who must complete DCPs are if they are applying for a new or expended permit. The permit application must include a DCP, though they can say they've adopted that State's DMP, which is what most say. Because of the connection between drought planning and permitting, some of their largest water providers done have DCPs in place because they haven't applied for new permits. Atlanta and Gwinnett County are examples of this. The legal requirement for DCPs is in the WQ Control Rule in the Permit section.

GA Question 2: Do you have any plans to require all water providers to have DCPs?

GA Answer 2: The State has just gotten through the worst drought on record. They just declared the drought over. During that time, in 2008, the General Assembly passed House Bill (HB) 1281. HB 1281 requires the BNR (which governs the EPD) to adopt rules for drought management including pre-drought management strategies, triggers, responses, and establish the drought response committee - all the things that are currently in the Drought Management Plan. The DMP is currently guidance but is not a rule. HB 1281 has asked them to codify many of these things. The rules they are working on (which were supposed to be in place by end of June 2009) will likely be quite different from what's currently in the DMP due to their recent experiences. The key centerpiece of their drought response strategy is their outdoor water use rules (on their website). These are applicable to anyone who has a State drinking water permit or water withdrawal permit who withdraws over 100,000 gals/day (this is in the rules for WQ control and the GW Use Act (same for GW, 100,000 gals/day). They have to comply with the State's requirements during a drought. The State dictates what can and can't be done outdoors. They are reconsidering if having the State impose restrictions is a good method or not. It's very effective to get water use down but is a hard fought battle to get these requirements in place. Mr. Cash has been working on this for the last few years. They've found that some water systems are much better equipped to respond to drought than others. Some systems wouldn't have seen an impact but they were under the same restrictions as others who weren't so well prepared. He feels this punishes water providers who had done a good job in preparing. They are looking at an approach to take this into consideration. They have encouraged interconnection with other systems, but they've found that it's very difficult for a large water system to replace another systems water supply. Physically you can't move enough water to do that. Even if they systems are connected, it's still very difficult get sufficient

water to a large system that's in trouble. It's easier for large systems to help smaller systems. They had some water systems in pretty dire situations in 2007. Some just about completely ran out of water.

GA Question 3: Your State plan breaks the State into nine climate divisions and then State monitors and evaluates data at that level to assist regional and local entities in assessing and responding to drought? So you evaluate and declare drought stages by climate division. Then are the responses in the State plan recommendations or requirements?

GA Answer 3: Yes. They are taking another look at that. They don't consider this be a great model. For instance if you're assessing conditions for a climate division, one portion might be in decent shape while another area in it may be in poor condition. But then they impose the same restrictions over the entire division. So they may be applying restrictions that are overly stringent than needed in one area while not stringent enough in another. He recommends having the flexibility to evaluate down to whatever level makes sense. Look at the watershed level/hydrologic units or by water supply. For example Lake Lanier wasn't ready to come out of drought while others in that climate division were ready but they had to keep everyone on restrictions. Look at where people get their water from.

Regarding planning go to State water planning website Georgiawaterplanning.org. They are in the midst of three year statewide water planning process. In 2008 they developed a Comprehensive Water Management Plan. This established ten Regional Planning Councils plus another for regional Atlanta (so 11 planning regions). The goal is for the Regional Planning Councils to develop regional plans to discuss how they will meet supply during drought years. They will look at what kind of practices they need to put in place to meet needs in dry years. The EPD is providing the oversight to that planning process. They will be looking at a variety of flow regimes for certain hydrologic conditions and assessing water supply needs and assimilative capacity. The State water supply process will yield a set of practices that need to be put in place over the next 50 years (the identified planning horizon). The Regional Planning Councils will develop the plans and EPD will approve by the end of June 2011.

Follow Up Note: Headwaters Corporation reviewed the Regional Water Development and Water Conservation Plan requirements and they do not include drought assessment or response.

GA Question 4: The State drought plan states that the Drought Response Committee (DRC) shall review the State drought plan at least every five years. Is this a legal requirement? Does the DRC have other responsibilities? Is the latest version from 2003?

GA Answer 4: Because of HB 1281, they are in the process of developing and adopting rules which will take place of the State drought plan. HB 1281 requires a DRC so the new rules will include this.

GA Question 5: Do you have any funding available for drought planning?

GA Answer 5: He doesn't think there is money available for local planning. The State will spend over \$30 million over the next few years to help regions during the regional water planning process. The Regional Planning Councils (Councils) are advisory committees. They don't have legal authority. Council members are appointed by the Governor, Speaker of the House and Lieutenant Governor. The Council can only advise and develop the plan. The State has consultants doing the technical work for the Councils. The State pays for a cadre of contractors: write the plan, resource assessment, data compilation, population and economic forecasting, etc. The Councils review the information the State collects and provides local insight/envisioning to direct the planning consultants. Then the regional plans go to the EPD. Once adopted, the management practices in plans will be used to issue water withdrawal and discharge permits.

South Carolina

6/29/09 call with Hope Mizzell, the State Climatologist in the Department of Natural Resources (803-734-9568, main 803-734-9100). (Dr. Hayes gave us this contact.)

SC Question 1: Do you have regional drought planning? You have Local Drought Response Committees.

SC Answer 1: Drought planning at a regional level is typically done when a hydropower plant needs to be relicensed as they need to complete a drought plan per the Federal Energy Regulatory Commission (FERC). The three primary basins in South Carolina are doing this now. Each plan is unique.

SC Question 2: You allow Collaborative plans among local entities. Do you find these plans are helpful and do you have concerns or thoughts on pros and cons of collaborative plans? When are such plans applicable and when aren't they?

SC Answer 2: South Carolina encourages collaborative planning. It helps systems to coordinate and develop alternative water supplies. Hope did a survey (while getting her doctorate – or maybe masters degree) on the importance of consistent drought planning with upstream water users and alternative water providers. The results weren't as positive as she wanted. Water users didn't think drought planning was important though she had expected that they would. Up until this most recent drought, collaboration was rare, now there is more.

SC Question 3: South Carolina requires local drought ordinances and/or drought plans. How is this enforced?

SC Answer 3: In their legislation there is a penalty section. Water providers not complying can be fined not less than \$50 and not more than \$1,000 for each infraction, during each day of the violation. This is provided in the very last section of drought response. They have not used this enforcement mechanism. Only 8% of providers are currently out of compliance. They have about 366 plans in place. Providers have to develop drought plans and ordinances because it's the law and they are doing it. The 8% who haven't complied are small systems. Commissions of Public Works can't enact an ordinance because they don't have the right to they just enact a plan. Others must all have a plan and an ordinance. Ordinances are very important regarding local enforcement.

SC Question 4: Do irrigation districts/agricultural water users have to develop drought ordinances or drought plans?

SC Answer 4: No. They don't work with them. They do have a lot of golf courses and they are encouraging them to develop plans. The golf courses have come to the State asking for help.

SC Question 5: Do you have funding for drought planning? Do you find large providers complete plans while smaller ones don't because of resource issues?

SC Answer 5: They do not have funding for planning. Mostly the non-complying 8% of providers are small to medium systems. They don't know why they haven't complied.

SC Question 6: Do you have public input requirements during plan development?

SC Answer 6: No, there are not requirements for local utilities regarding public input during plan development. When the drought planning requirements were developed by the State, they requested public input.

SC Question 7: Do you have any plan update or reporting requirements?

SC Answer 7: No. There are no plan updates or reporting requirements.

SC Question 8: The South Carolina Drought Response Act (1985, amended in 2000) seems to essentially serve as a drought response plan for South Carolina. This Act specifies that the Department of Natural Resources (DNR) “shall formulate, coordinate, and execute a drought mitigation plan. The plan must be developed consistent with the South Carolina Water Resources Planning and Coordination Act, as provided in Chapter 3 of Title 49, to the extent that the plan is compatible with the comprehensive state water plan.” Had a DNR drought mitigation plan been developed?

SC Answer 8: No, the DNR drought mitigation plan hasn’t been developed. They have focused on including drought components in the State water plan. This plan was originally developed in 1989 and then led to the development of the Drought Response Act. Since then all changes have been made to the act and legislation. The Drought Response Act is like their drought plan. They need more resources to really do this in a plan format.