Appendix E

Drought Contingency Plan

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Appendix E. Drought Management

Because of its dependence on surface water supplies, the Colfax County water planning region is subject to water shortages during drought periods. Based on the Palmer Drought Severity Index for New Mexico Climate Division 2 (Section E.3.2.1), in the last 50 years, droughts of at least moderate severity have occurred about 30 percent of the time. This frequency indicates that while the specific timing of severity of drought may be difficult to predict, the planning region can expect to experience droughts in the future.

Droughts can affect all sectors of water users. In Colfax County, the principal water users are farmers, ranchers, and to a lesser degree, municipal users. While the municipal sector overall is much smaller than the agricultural sector (Section 6 of this Regional Water Plan), it is nonetheless important that municipalities be prepared to address drought conditions within their water systems.

The Colfax County water supply analysis indicated that the water supply in the region is sufficient to fulfill all of the existing water rights only during the wettest years (Section 6 of this *Regional Water Plan*). Future demand projections indicate that over the 40-year planning horizon, supplies will continue to fall short of demands in the drier years. To address this challenge, the region decided to focus on drought planning as a central part of its regional water plan. This appendix to the Colfax Regional Water Plan addresses drought planning, mitigation, and response in Colfax County.

E.1 Drought Planning Overview

The overall purpose of drought planning is to develop a way to effectively identify and respond to droughts. Because many drought responses require time and financial resources, prior planning is necessary for timely implementation of certain mitigation measures during a drought.

Drought management plans typically include the following:

- The plan outlines organization and communication responsibilities to determine who will participate in drought monitoring and mitigation efforts. A drought task force or other group of responsible parties is designated to oversee declarations of drought conditions and implementation of drought mitigation measures.

- The plan defines the various stages of drought (i.e., mild, moderate, severe) and the indices that will be used identify when the region is experiencing a particular drought stage. To aid in this determination, the plan selects indices that categorize levels of drought based on climatic and streamflow conditions and identifies threshold levels of those indices, or "triggers," that will prompt declarations of drought.

- The plan identifies specific mitigation measures that are to be undertaken during each drought stage. Mitigation measures can include standard drought ordinances that define water restrictions, or they may include broader measures such as leasing of supplies during droughts.

These components are discussed in Sections E.2 through E.4. In addition, Section E.5 discusses possible sources of funding for drought planning and mitigation. The remainder of this section provides background information regarding drought vulnerabilities and resources.

E.2 Drought Management Organization and Communication

Effective responses to droughts require the involvement of many federal, state, and local agencies, as well as private sector ranchers and farmers. Those involved in drought response can be most effective when there is a clear definition of roles and responsibilities, communication channels, and resources for drought response.

E.2.1 Drought Management Task Force

Based on discussions at Colfax Regional Water Planning Steering Committee meetings, a formalized Drought Management Task Force will be created to oversee drought declarations, communication, and resources. Authority to declare drought and establish and enforce

mandatory mitigation measures may currently be held by local governmental agencies that participate in the task force. Nevertheless, it is advisable to pass a County Ordinance to establish the authority to implement and enforce the drought management plan consistently in the affected region.

The Drought Management Task Force will build on a committee that was developed as part of the regional water planning process and will include representation from:

- Colfax County government
- City governments of Raton, Cimarron, Angel Fire, Eagle Nest, Maxwell, and Springer
- New Mexico Office of the State Engineer (OSE)
- Natural Resources Conservation Service (NRCS)
- Farm Service Agency
- Colfax County Cooperative Extension Service
- Antelope Valley Irrigation District
- Vermejo Conservancy District
- Springer Ditch Company
- New Mexico State Forestry Department
- Miami Domestic Water Users
- Colfax County Soil and Water Conservation District
- Other irrigation districts and major water rights owners, such as the CS Ranch, Philmont Scout Ranch, and Vermejo Park Ranch
- New Mexico Department of Game and Fish
- New Mexico State Parks Division

This task force will work with the established Cimarron River watershed group and the developing Canadian Headwaters watershed group to capitalize on existing channels of information and communication. The consensus of the steering committee was that a feasible mechanism of managing drought was to hire a County employee to oversee this work, possibly in conjunction with another position. Accordingly, the plan outlined herein assumes that the County will hire an employee who will be responsible for coordinating and following through on drought-related public outreach efforts along with other duties. The specific job title and

combination of duties would be determined by the County. For purposes of this plan, the position is being called “water resource administrator.”

The Drought Management Task Force will be convened by the new water resources administrator. If that staff position is not created, then the Cimarron water master could convene the meetings. The drought task force will engage in the following activities:

- Meet quarterly to review the drought program, evaluate water supply conditions, and if needed, update the drought trigger analysis described in Section E.3.
- Facilitate the declaration of drought based on established thresholds and triggers.
- Distribute information and educational materials for drought planning and response.
- Coordinate implementation of the drought management plan.
- Oversee implementation of the improvements in drought monitoring discussed in Section E.4.4.
- Coordinate with the New Mexico Drought Task Force (DTF)

The purpose of the quarterly meetings is to review the findings of the hydrologic criteria and data evaluation (Section E.3) in order to assess water supply conditions and determine the probability of a drought during the coming season. If findings indicate a high potential for drought, an outreach campaign will be initiated. The notice of impending drought should be made as early as possible.

Suggested quarterly meeting focuses include:

- *Spring meeting:* Evaluate snow pack conditions with respect to upcoming snowmelt runoff. Examine and discuss NRCS snowmelt runoff forecasts for pertinent forecast points within Colfax County.

- *Summer meeting:* Evaluate water supply conditions, as well as grazing conditions and potential for forest fire. Begin planning for contingencies if drought conditions develop, persist, or end.

- *Fall meeting:* Evaluate past spring and summer conditions. Evaluate water supply conditions, as well as grazing conditions and potential for forest fire.

- *Winter meeting:* Examine and discuss current climate trends and drought indices. Evaluate current water supply conditions. Begin planning for the following spring.

During the first year, the task force will develop an outreach campaign for use in the event of a drought (Section E.2.1.1). If the new water resources administrator is not hired, an organized campaign for public education could be implemented by dividing up tasks among drought task force members.

E.2.2 Drought Management Outreach Campaign

An outreach campaign will be developed during the first year of task force operation. An initial outreach program is outlined in Attachment E1. The outreach program will be initiated whenever a high probability of drought is identified and will be ready to run when it is needed.

The following steps outline an operating procedure for drought declaration and public outreach and communication of drought mitigation measures. This list is suggested as a starting point to identify tasks and can be amended to suit the established procedure. In any case, identification of individuals or groups responsible for accomplishing the tasks is a key step.

1. Establish a list of agencies, organizations, and individuals who should be contacted when there is a high probability that a drought will be declared. (An initial suggested contact list is included in Attachment E1.) Let them know how they can help communicate the drought level and drought mitigation measures to their constituents. The contact information should include:

- Name of agency/organization
- Contact person
- Postal address
- E-mail address
- Fax number
- Phone number
- Watershed
- Their outreach role

This list should be updated on a quarterly basis.

2. Establish a list of media contacts for print, radio, and television. An initial list of media contacts is included in Attachment E1.

3. Establish a list of newsletters that will print information on drought stages and the corresponding mitigation measures. The list should include:
   - Newsletter name
   - Contact person
   - Postal address
   - E-mail address
   - Fax number
   - Phone number
   - Article deadlines
   - Format requirements

4. Establish a list of people and businesses who can post notices. This may include city clerks, grocery stores, convenience stores, feed stores, gas stations, coffee shops, and other high-traffic locations. Advise them of the process of drought declaration and the various drought stages and color codes associated with those stages.

5. Develop standard materials to post as needed, for instance, posters to display in such public areas as city halls, libraries, and stores. This information could also be posted on

local web sites commonly used by the public and irrigators. Sample materials are included in Attachment E1.

6. Develop standard press releases (for print, radio, and television) for each drought stage.

7. Develop standard public service announcements for print, radio and television for each drought stage.

8. Develop standard educational articles to publish in newsletters.

9. Develop standard materials (e.g., brochures) outlining drought stages and their associated voluntary and mandatory mitigation measures. Distribute materials to water suppliers or ditch masters to circulate and/or post.

10. Develop or use available "How-to" information for water customers.

11. Develop an easy identifier for drought stages, such as different colors associated with the drought stage. For instance:
    - Yellow: Stage I, Drought Advisory
    - Orange: Stage II, Drought Warning
    - Red: Stage III, Drought Emergency

    These identifiers could be incorporated into flags or pennants posted along with the public notices of drought. To educate the public regarding the various drought stages and their associated identifier, include an explanation of the identifiers in all media releases and other communication materials.

12. Include water conservation brochures or drought notices in public mailings such as utility bills and property tax notices.

13. Hold initial public meetings at a minimum of three locations throughout the region to get public input for the drought contingency plan and to inform the public of the drought monitoring and mitigation measures to be implemented.

Examples of materials that can be used to initiate the drought planning effort (i.e., sample press releases, lists of agencies for communication, etc.) are included in Attachment E1.

Educational materials for use in public outreach include both those developed specifically for the planning region and general drought informational materials available from various agencies:

- Materials that explain the different drought stages and associated voluntary and mandatory mitigations established in the Colfax water planning region.

- Public education materials to advise water customers on how to achieve savings. Such materials are available through the OSE and other public agencies. A listing of these materials can be found in Attachment E1, and some of these materials can be viewed on-line at http://www.seo.state.nm.us/water-info/conservation/h2o-outreach.html or can be obtained by calling 1-800-WATERNM or sending an e-mail request to waternm@seo.state.nm.us.

E.2.3 State of New Mexico Drought Task Force

In 1998 the State of New Mexico established its own drought task force through Executive Order 98-41. The role of the New Mexico DTF is to oversee the monitoring of drought conditions and implementation of drought-related activities in the State of New Mexico. The Executive Order also encourages municipalities to "identify their vulnerabilities to drought, prepare for and, where possible, take steps to minimize the impacts of drought before it occurs."

In addition to the task force, two work groups augment the program:

- The Monitoring Work Group issues a quarterly drought monitoring/status report that briefly summarizes climatic conditions in the state. When the Monitoring Work Group determines that the state has entered various stages of drought, it issues drought notices and monthly drought monitoring/status reports. The Monitoring Work Group uses the indices discussed in Section E.3.1 to assist in the determination of drought status.

- The Impact Assessment Work Group monitors and assesses the current and potential impacts of impending or ongoing drought on the State's economy, environment, and natural resources and initiates appropriate drought responses.

The New Mexico DTF has established a *New Mexico Drought Plan* that can be viewed at http://weather.nmsu.edu/drought/053102 (May 31, 2002 revision) and at http://weather.nmsu.edu/drought/Drought-plan1112002/Volume-2.pdf (Volume 2, released November 21, 2002). Colfax County can rely on the declaration of drought stages by the New Mexico DTF. However, the state monitoring does not include a detailed account for local conditions. An independent process for Colfax County as described in Section E.3 will provide more locally accurate information and allow better evaluation of local conditions.

E.3 Drought Indices and Stages

A drought index consists of a ranking system derived from the assimilation of data, including rainfall, snowpack, streamflow, soil moisture, and other water supply indicators, for a given region. Drought indices are used to define levels at which various stages of drought (i.e., mild, moderate, severe) are reached, referred to as trigger levels. Several drought indices are available to aid in monitoring and assessing drought conditions. They range from a simple percentage of normal precipitation (actual precipitation divided by the long-term average and multiplied by 100) to more complex calculations incorporating soil moisture budgets, methods to account for surface water and snowpack storage, and statistical transformations of precipitation data.

Drought indices for New Mexico and Colorado were reviewed, and selected indices were compared to historical streamflow data to determine their applicability to Colfax County. Additionally, reservoir storage data were evaluated to further define indices that were reflective of local conditions. Based on these evaluations, four drought indices were selected to define trigger levels for recognition of various drought stages in Colfax County (Section E.3.3). This section discusses the rationale and criteria used to select these drought indices.

E.3.1 New Mexico and Colorado Drought Indices

The Colfax County planning area is located along the Colorado border in northern New Mexico. Both Colorado and New Mexico have developed drought plans that identify stages of drought and the climatic and hydrologic conditions that indicate those stages of drought. As an initial step in developing drought indices for the Colfax water planning region, the Colorado and New Mexico drought indices were reviewed. The Colorado plan recognizes three drought stages: mild, moderate, and severe to extreme, while the New Mexico plan adds a category of approaching or incipient drought, for a total of four stages. In both plans, factors indicating the onset and extent of drought conditions are monitored quarterly. The proactive approach of regular monitoring to recognize developing drought conditions early on reduces the element of surprise and subsequent crisis management when serious drought impacts occur.

To determine whether a particular drought stage condition exists in a given area, the monitoring data are compared to various indices that define the climatological controls of drought. These indices, which include the Palmer Drought Severity Index (PDSI), the Surface Water Supply Index (SWSI), and the Standardized Precipitation Index (SPI), are described in Sections E.3.2.1 through E.3.2.3. Table E-1 shows the trigger levels for each of these indices that correspond to various drought conditions and associated response actions for both states.

Although the index levels that trigger the initiation of each drought stage vary somewhat, the Colorado and New Mexico plans are essentially similar in design. Both call for increased monitoring activities as worsening drought conditions are encountered. The accelerated monitoring continues until the drought ends, providing decision makers with information that helps in planning impact assessments and mitigation measures to be implemented as successively worsening drought conditions are recognized. When precipitation increases and conditions start improving, the stepped up monitoring schedule is maintained, providing the information necessary to plan for reduced mitigation efforts as conditions allow. Quarterly monitoring is resumed when the index triggers indicate a return to normal conditions.

Table E-1. New Mexico and Colorado Drought Plan Triggers
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PDSI / SWSI	Six-Month SPI	Drought Condition	Response	Action
New Mexico				
−0.9 to 5.0	Positive	Normal conditions	Regular monitoring	Quarterly monitoring by work groups; quarterly drought status reports
1-month or 4-week running average between −1.0 and −1.9, but period of less than −1.0 does not exceed 2 months	Declining and less than 0.25 for 2 months	Approaching or experiencing incipient drought	Advisory	Monthly monitoring by work group members; contingency planning
−1.0 to −1.9 for more than 2 months or −2.0 to −2.9 for 1 month	−0.99 to 0.00	Mild drought	Alert	Drought alert notices issued; monthly work group meetings; impact action report submitted
−1.0 to -1.9 for 9 months; −2.0 to −2.9 for 2 months; −3.0 or less for 1 month	Declining and between −1.00 and −1.49	Moderate drought	Warning	Drought warning notices issued; monthly drought status reports; impact action report updated; response actions implemented
−2.0 to −2.9 for 9 months; −3.0 to −3.9 for 2 months; −4.0 or less for 1 month	Declining and less than −1.50	Severe to extreme drought	Emergency	Drought emergency notices issued; response actions implemented; submit data to support emergency or disaster declarations
Greater than −2.0 for 2 consecutive months	Rising for 2 consecutive months	Drought receding	Emergency	Work groups continue monthly meetings and drought status reports
Greater than −1.5 for 2 consecutive months	Rising and at −1.00 to −1.49 for 2 months	Drought receding	Warning	Improving condition notice issued; monthly monitoring continues
Greater than −1.0 for 2 consecutive months	Rising and at −0.99 to 0.00 for 2 months	Drought receding	Alert	Monthly meetings continue; quarterly drought status reports resumed
Greater than or equal to 0.0	Greater than 0.00	Normal conditions	Advisory to normal	Resume quarterly monitoring

PDSI = Palmer Drought Severity Index
SWSI = Surface Water Supply Index
SPI = Standardized Precipitation Index

Table E-1. New Mexico and Colorado Drought Plan Triggers
Page 2 of 2

PDSI / SWSI	Six-Month SPI	Drought Condition	Response	Action
Colorado				
−1.0 to positive	−0.5 to positive	Normal conditions	Regular monitoring	Quarterly monitoring by water availability task force
−1.0 to −2.0	−0.6 to −1.0	Mild drought	Phase 1: More frequent monitoring	Monthly monitoring by water availability task force
Less than −2.0	Less than −1.0	Moderate drought	Phase 2: Impact assessment	Impact task forces activated and initial impact assessments made
−2.0 to −3.9	Less than −1.0 to −1.99	Severe to extreme drought	Phase 3: Mitigation responses	Drought emergency declared and mitigation programs implemented
−1.6 or above	−0.8 or above	Increased precipitation reduces drought impacts	Return to Phase 2	Task forces continue assessments
			Return to Phase 1	Final report issued and impact task forces deactivated
−1.0 to positive	−0.5 to positive	Normal conditions	Return to normal conditions	Resume quarterly monitoring

PDSI = Palmer Drought Severity Index
SWSI = Surface Water Supply Index
SPI = Standardized Precipitation Index

E.3.2 Selection of Drought Indices for Colfax County

Similar to the Colorado and New Mexico drought plans, the drought indices selected for use as triggers in Colfax drought planning also include the PDSI, SWSI, and SPI. These indices were judged to provide the best combination of information pertinent to Colfax County considering such factors as ease of availability and the ability to define variable climatic conditions for subregions within the County. They also had the advantage of maintaining conformance with both the Colorado and New Mexico plans, thus ensuring that County plans are consistent with the State programs. These three indices were evaluated to determine trigger levels that would be most appropriate in Colfax County. Because of the particular dependence of specific regions within Colfax County upon reservoir supplies, a fourth index that tracks reservoir storage levels was developed for this plan. Sections E.3.2.1 through E.3.2.4 provide detailed descriptions of each index and its implementation in the Colfax water planning region.

E.3.2.1 Palmer Drought Severity Index

The PDSI is a popular drought monitoring tool that has been widely used for a variety of applications across the United States since it was developed in 1965 (Palmer, 1965). The PDSI is an empirically derived meteorological index based on the water balance equation (precipitation is equal to evapotranspiration plus runoff and groundwater or soil moisture recharge plus or minus any change in soil moisture storage). It is designed to measure the degree of departure of soil moisture content from normal levels using a standardized method so that meaningful comparisons of conditions can be made between different locations and time periods. The index is generally determined on a monthly or weekly basis using a series of equations that incorporate precipitation and temperature data along with a soil's available water content to define the terms of the water balance equation. Attachment E2 explains the monthly PDSI calculation methodology.

The PDSI roughly varies between –6.0 and +6.0, where values of +4.0 or more and –4.0 or less represent extreme conditions and values close to zero represent normal conditions. Table E-2 outlines the PDSI scale and the climatic condition that is assigned to each value.

Table E-2. Palmer Drought Severity Index

PDSI Ranking	Climatic Condition
+ 4.00 or more	Extremely wet
+3.00 to +3.99	Very wet
+2.00 to +2.99	Moderately wet
+1.00 to +1.99	Slightly wet
+0.50 to +0.99	Incipient wet spell
+0.49 to –0.49	Near normal
–0.50 to –0.99	Incipient dry spell
–1.00 to –1.99	Mild drought
–2.00 to –2.99	Moderate drought
–3.00 to –3.99	Severe drought
–4.00 or less	Extreme drought

The PDSI is most effective in measuring impacts to activities that are sensitive to soil moisture conditions, such as agriculture. Drawbacks to the PDSI include:

- Sensitivity to the available water content of a soil type
- Simplification of soil horizons
- Exclusion of snowfall, snow cover, and frozen ground
- No recognition of lag between precipitation and runoff
- Approximation of potential evapotranspiration
- Inability to recognize differences in areas with large topographic variations
- Failure to consider human impacts such as irrigation usage and reservoir storage amounts
- Less effectiveness in areas with extreme variability in rainfall and runoff

In addition, it has been found that the extreme and severe PDSI classifications occur with greater frequency in some parts of the country than in others.

The PDSI computation is very complex and difficult to interpret and is based on an average period of about 9 to 12 months. However, government forecasters in the Climate Prediction Center regularly compute PDSI rankings for every climate division in the United States, and

monthly and weekly PDSI values are available on the National Oceanic and Atmospheric Administration's (NOAA) Drought Information Center web site at http://www.drought.noaa.gov.

The applicability of the PDSI to the assessment of drought conditions in Colfax County was evaluated by comparing monthly values of the index computed for New Mexico Climate Division 2 (Northern Mountains Division) to annual total streamflow for the period from 1950 through 1999 (Figure E-1). Approximately 90 percent of Colfax County falls within Climate Division 2, while the remainder, primarily encompassing the middle reaches of the Canadian River Valley and floodplain, falls within Climate Division 3 (Northeastern Plateau). Climate Division 2 data are most representative of conditions affecting surface water supply because this division covers most of the county and virtually all of the surface water source area. A qualitative visual assessment of the correlation between the PDSI and annual total streamflow indicates a reasonably strong similarity in the patterns of variation, with high streamflows occurring during periods with high positive PDSI values and low streamflows occurring during periods with low PDSI values. This and further analysis to confirm the correlation (Attachment E2) indicated that the PDSI for New Mexico Climate Division 2 is a reasonably valid indicator of drought conditions in Colfax County. However, its usage should be supplemented by other indicators that better represent variation in local precipitation conditions and surface water supplies.

E.3.2.2 Surface Water Supply Index

The SWSI was originally developed by Shafer and Dezman (1982) to complement the PDSI for monitoring moisture conditions in the state of Colorado. Other western states that have used the SWSI for drought monitoring include Oregon, Montana, Idaho, Utah, and (as discussed in Section E.3.1) New Mexico. Whereas the PDSI is basically a soil moisture index for regions with consistent hydrologic conditions, the SWSI is an indicator of surface water conditions for areas in which mountain snowpack is a major component. Attachment E2 explains the methodology for computing the SWSI; Table E-3 depicts the SWSI scale and the drought stages that are assigned to each value.

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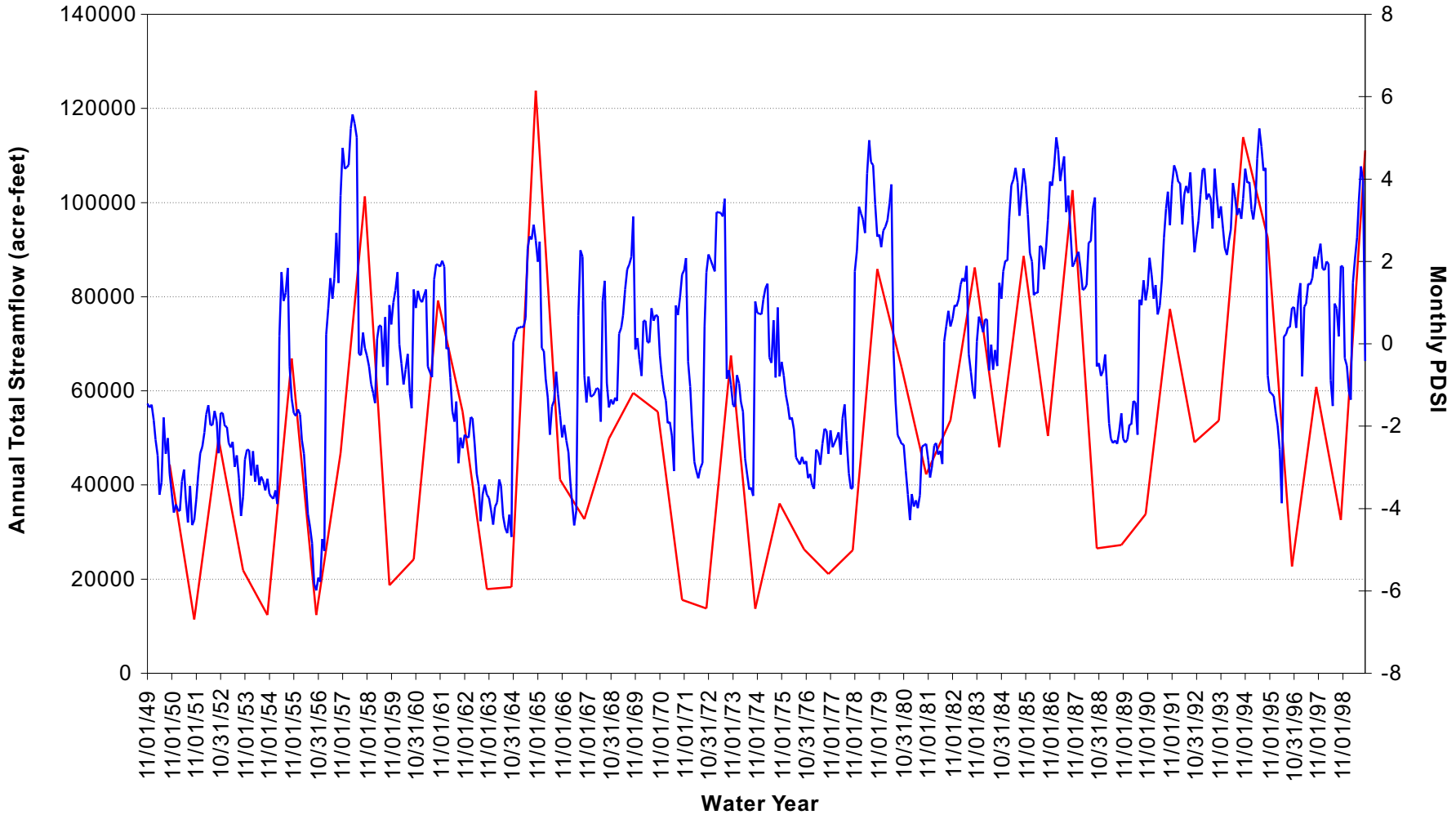

Annual total streamflow = Sum of river yields above Canadian River nr Taylor Springs, including Rayado Creek at Sauble Ranch, Cimarron River blw Eagle Nest Dam, Ponil Creek nr Cimarron, Vermejo River nr Dawson, Canadian River nr Hebron, and change in storage at Eagle Nest Lake.

Explanation

Streamflow

PDSI

Figure E-1

COLFAX REGIONAL WATER PLAN

Annual Total Streamflow and Monthly Palmer Drought Severity Index for New Mexico Climate Division 2 (Northern Mountains)

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Table E-3. Surface Water Supply Index

SWSI Ranking	Surface Water Condition
+ 4	Abundant supply
+2	Near normal
–1	Initiation of drought conditions
–2	Moderate drought
–3	Severe drought
–4	Extreme drought

The NRCS computes SWSI values monthly from January through May. Current SWSI values for the major New Mexico river basins can be obtained from the NRCS web site at http://www.nm.nrcs.usda.gov/snow/forecast/ along with basin outlook reports that include details on snowpack conditions and reservoir storage.

The applicability of the SWSI to the assessment of drought impacts to surface water supplies in Colfax County was evaluated by comparing monthly values of the index computed by the NRCS for the Canadian River Basin to annual total streamflow for the period from 1995 through 2001 (Figure E-2). The ability of the reported SWSI numbers to forecast improving or diminishing streamflow conditions in advance appeared to be reasonably good in 1995 and 1997, but much less effective in the other evaluated years. These correlation deficiencies are due to the fact that the Canadian River Basin SWSI values provided by the NRCS include Conchas Reservoir storage, which can impact the Canadian River Basin SWSI but is not relevant to conditions in Colfax County. The NRCS is planning to modify the Canadian River SWSI to exclude the Conchas Reservoir term to better represent surface water supplies in the Colfax County region. When this new procedure is implemented, the Canadian River SWSI, as modified, can be used as a more accurate drought trigger for the Colfax drought plan during the months when the NRCS SWSI data are available.

E.3.2.3 Standardized Precipitation Index

The SPI was developed by McKee et al. (1993) to quantify precipitation deficits for multiple time scales. Advantages of the SPI are that it can be computed for any single site with a long-term precipitation record and that it can be determined for multiple time scales, typically 1, 3, 6, 12,

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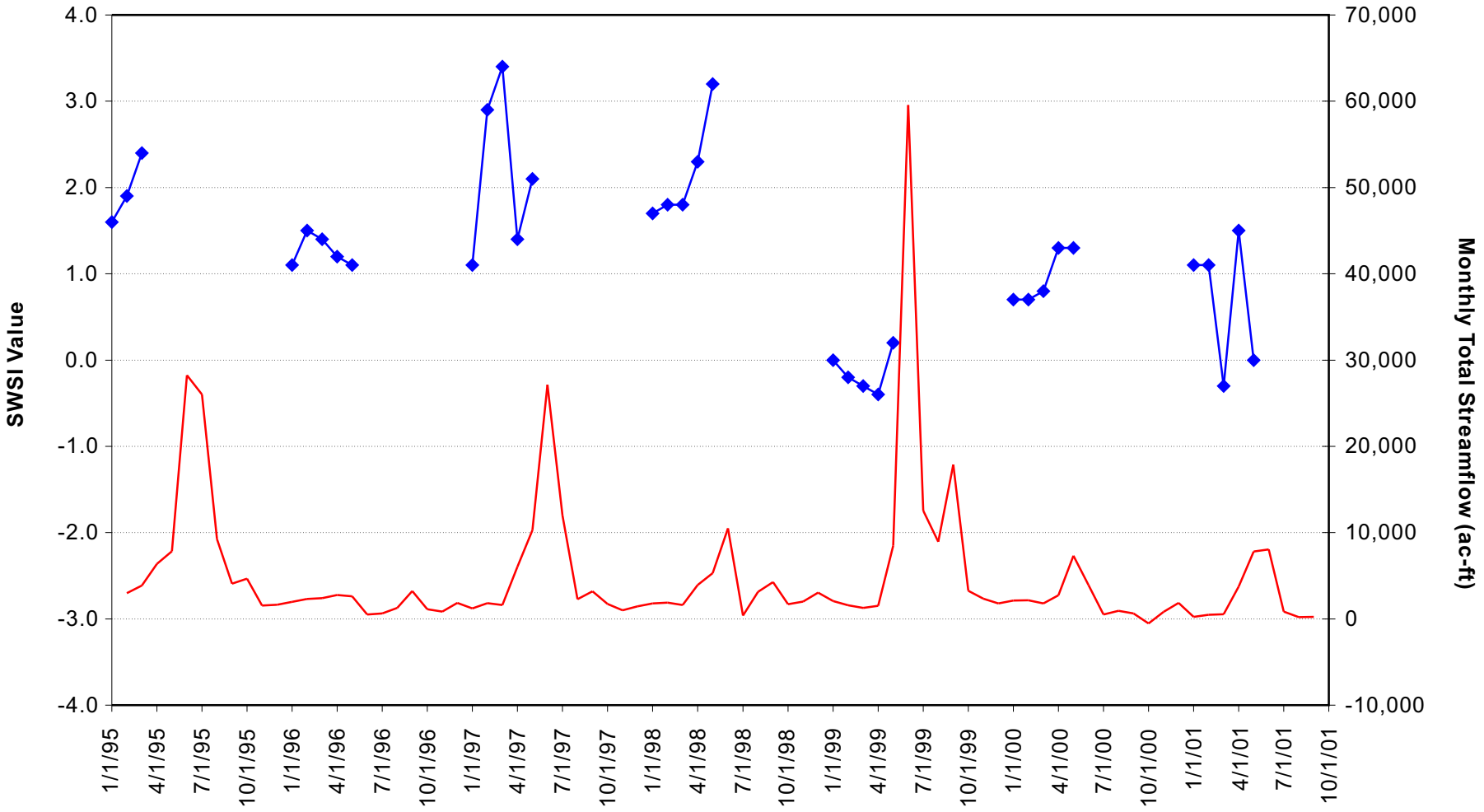

Note: Combined streamflow = summed monthly yields for the Vermejo River near Dawson, Ponil Creek near Cimarron, Rayado Creek at Sauble Ranch, and Cimarron River near Cimarron gages plus change in storage at Eagle Nest Lake.

SWSI

Combined streamflow

Figure E-2

COLFAX REGIONAL WATER PLAN

Canadian River Basin Surface Water Supply Index and Combined Streamflow

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6-18-02

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24, and 48 months. The application of this index to multiple climate station sites allows for a more localized definition of drought conditions than the regional-scale PDSI and SWSI.

Like the PDSI and SWSI, the index is centered on zero, with positive SPI values indicating greater than average precipitation and negative SPI values indicating less than average precipitation over the selected time period. However, the range of the SPI scale is smaller overall, and extreme conditions occur at values above +2 and below −2. Table E-4 depicts the SPI scale and the drought stages that are assigned to each value.

Table E-4. Standardized Precipitation Index

SPI Ranking	Climatic Condition
+ 2 or more	Extremely wet
+1 to +1.99	Moderately to very wet
0 to +0.99	Near normal
0 to −0.99	Mild drought
−1 to −1.49	Moderate drought
−1.5 to −1.99	Severe drought
−2 or less	Extreme drought

A drought event is defined as a period in which the SPI is continuously negative and reaches a value of −1.0 or less (moderate drought). The drought begins when the SPI first falls below zero and ends with a positive value of SPI following a value of −1.0 or less.

The ability to express conditions at multiple time scales allows the index to reflect the impact of drought on the availability of different water resources. For example, soil moisture conditions are sensitive to precipitation deficits on a short time scale, while groundwater, streamflow, and reservoir storage are responsive to longer-term deficits. Thus a short-term drought would impact unirrigated soil conditions, but may have little effect on urban water supplies or irrigated agriculture. Conversely, a mid- to longer-term drought would affect all sectors.

The SPI also facilitates the definition of conditions where, for example, it is possible to simultaneously experience wet conditions on a short time scale but dry conditions on a long-

term time scale. An emerging drought will first appear in short time scales, and if dry conditions persist, the drought will be reflected in longer time scales. Short-term wet periods can mask a long-term drought condition for some components of water supply, but will not appreciably affect water supply components that are responsive to longer-term conditions.

The use of several time scales allows recognition of an emerging drought early on, monitoring of drought magnitudes that impact surface water supplies over longer time periods, and anticipation of an end to a drought as wetter conditions occur.

A monthly SPI is computed for every climate division by the Western Regional Climate Center (WRCC) and is available on the WRCC web site at http://www.wrcc.dri.edu/. However, the divisional data produced by the WRCC represent a regional analysis that uses average precipitation conditions determined from numerous climate stations located throughout large areas. Most of Colfax County lies within the Northern Mountains Climate Division, which also includes major parts of several surrounding counties. The WRCC-computed SPI figures thus represent generalized conditions over a large portion of northern New Mexico and are not representative of variable conditions within Colfax County

However, a site-specific SPI can easily be determined for any single precipitation station with a record of at least 40 to 50 years, permitting evaluation of varying drought conditions for smaller areas than the regional data posted by the WRCC. A FORTRAN computer code was developed by Guttman (1999) to calculate the SPI at any time scale. DBS&A has compiled this code as a DOS-based executable program that runs on a personal computer.

This program was used to determine monthly site-specific 6-month SPI values through February 2002 for eight precipitation stations in Colfax County. The site-specific SPI records were used to determine the percentage of time that each subregion represented by these 8 climate stations incurred mild, moderate, and severe to extreme drought conditions for the 6-month time scale. Percentages were determined for the entire period of record and for the 1990 to 2002 period for each station (Table E-5).

Table E-5. Percentage of Time in Drought Using Site-Specific Six-Month SPI

Climate Station	Percentage of Time in Drought					
	Entire Record [a]			1990-2002 [b]		
	Mild	Moderate	Severe/ Extreme	Mild	Moderate	Severe/ Extreme
Abbot 1 SE	33.9	9.2	6.3	22.6	5.5	0
Black Lake	34.9	9.8	5.6	21.9	2.1	0
Cimarron 4 SW	33.4	10.2	6.3	17.9	2.9	2.1
Eagle Nest	32.2	10.2	5.8	26.7	2.3	2.3
Lake Maloya	35.3	8.3	5.7	28.8	4.8	4.8
Maxwell 3 NW	32.5	10.3	6.6	23.6	7.9	5.0
Raton Filter Plant	34.2	10.0	6.7	25.7	5.7	3.6
Springer	35.6	7.8	7.2	33.6	1.5	0.7

[a] 1948 through February 2002 for all stations except Cimarron (1904 through February 2002) and Raton Filter Plant (1953 through February 2002).
[b] Through February 2002.

These data show that for the long-term records, the percentages of time for each drought stage were relatively consistent throughout the County. Mild drought conditions occurred 32 percent to 35 percent of the time, while moderate drought conditions occurred about 8 percent to 10 percent of the time and severe to extreme drought conditions occurred about 6 percent to 7 percent of the time (Table E-5).

Records of about 50 years or more are necessary for the SPI to be determined accurately. The longest precipitation record in the County is 98 years at the Cimarron 4 SW station. The fact that all the stations exhibited similar drought percentages indicates that the shorter records are long enough to provide statistically meaningful SPI values.

An analysis of the percentages of time in each drought stage for the 1990 to 2002 period indicates that over a shorter time frame, conditions are variable throughout the County. During this period, the proportions of time in mild drought conditions ranged from 18 percent to 34 percent, while times in moderate drought conditions ranged from 2 percent to 8 percent, and times in severe to extreme drought conditions ranged from 0 percent to 5 percent.

These results show that unique conditions in different subregions of the County lead to differing levels of dryness at any particular time or over a short time frame. Since 1990 moderate drought conditions occurred more frequently, by a factor of two or more, at the Abbot 1 SE, Lake Maloya, Maxwell 3 NW, and Raton Filter Plant stations. Severe to extreme conditions since 1990 were most frequent at the Lake Maloya and Maxwell 3 NW stations, but were never reached at the Abbot 1 SE and Black Lake sites. The wettest sites since 1990 were Cimarron 4 SW and Black Lake, while the driest sites were Lake Maloya and Maxwell 3 NW.

Plots of the 1990 to 2002 site-specific SPI values are presented in Figures E-3 through E-10. These plots illustrate the degree of variability in precipitation deficits that occurred within several subregions of Colfax County since 1990. For example, extreme drought conditions were seen at the Raton Filter Plant and Cimarron 4 SW stations in the late winter to early spring of 1996, but only mild to moderately dry conditions were experienced for the remaining stations. The onset of this drought was 3 months later at the Cimarron 4 SW station than at the Raton site, but both sites experienced similar rapid recoveries in the summer of 1996. It can also be seen that extreme drought was first experienced in the latter half of 2001 at the Lake Maloya and Maxwell 3 NW stations, but not elsewhere in the County through February 2002. The emerging drought of 2002 was thus first signaled at the two stations with a history of drier conditions than the rest of the County before spreading throughout most of the state.

These data illustrate the usefulness of the SPI for assessing varying drought conditions within several subregions within Colfax County. The 6-month SPI has been selected as a drought trigger for the Colfax drought plan since it represents a medium-length time scale likely to impact surface water conditions. The 6-month SPI is more sensitive to conditions at this scale than the PDSI and can be associated with anomalous streamflows and reservoir levels. Shorter or longer time scales can also be easily evaluated to assess local planning objectives, as the need arises.

The files needed to compute the SPI for the eight climate stations, along with an explanation of the process, are provided in Attachment E2. Prior to running the program recent monthly precipitation records will have to be acquired for each station and used to update the data input files. The data input files can then be updated on a monthly basis to calculate new SPI values.

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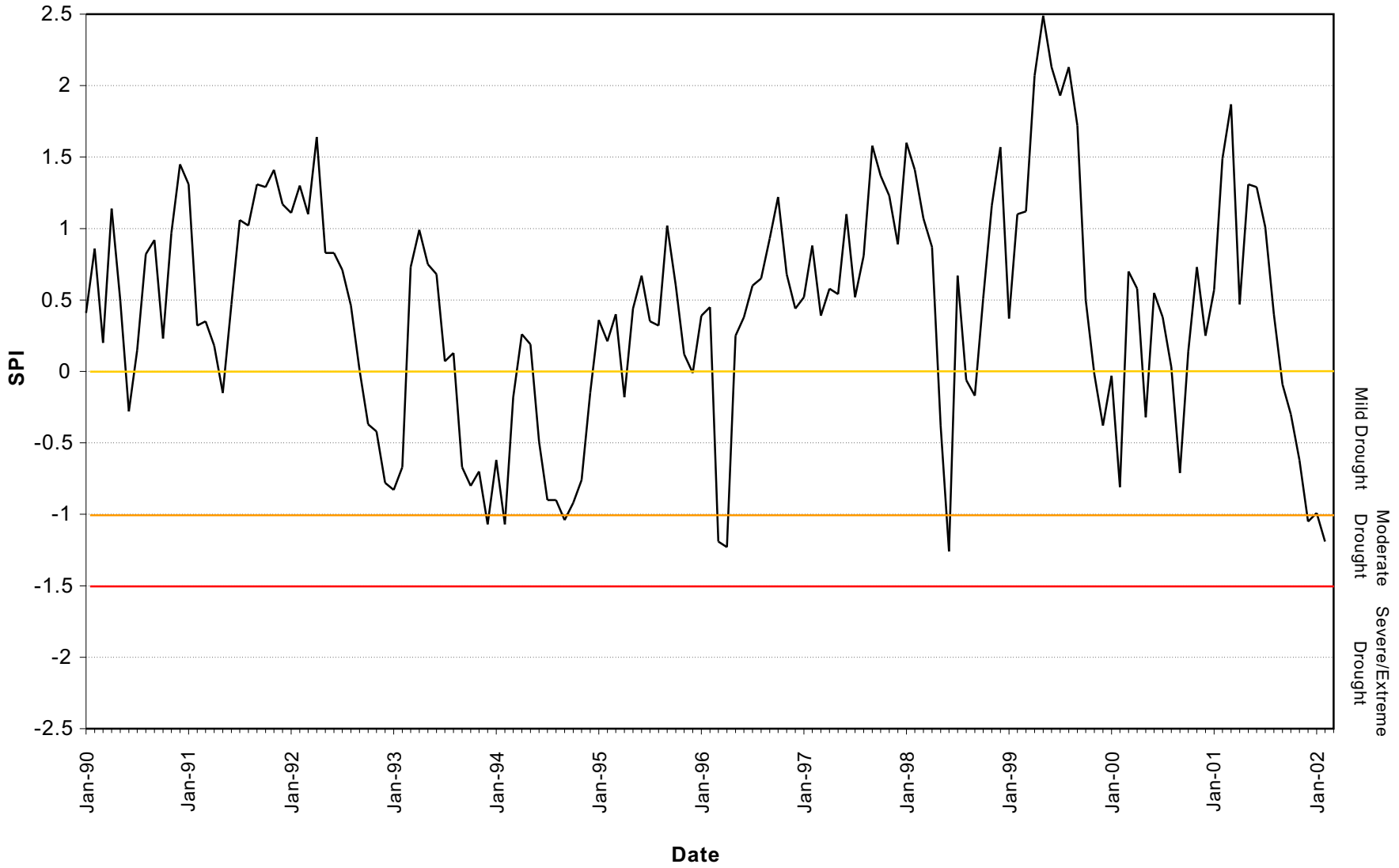

COLFAX REGIONAL WATER PLAN

Abbott 1 SE 6-Month Standardized Precipitation Index
January 1, 1990 through February 28, 2002

Figure E-3

Daniel B. Stephens & Associates, Inc.
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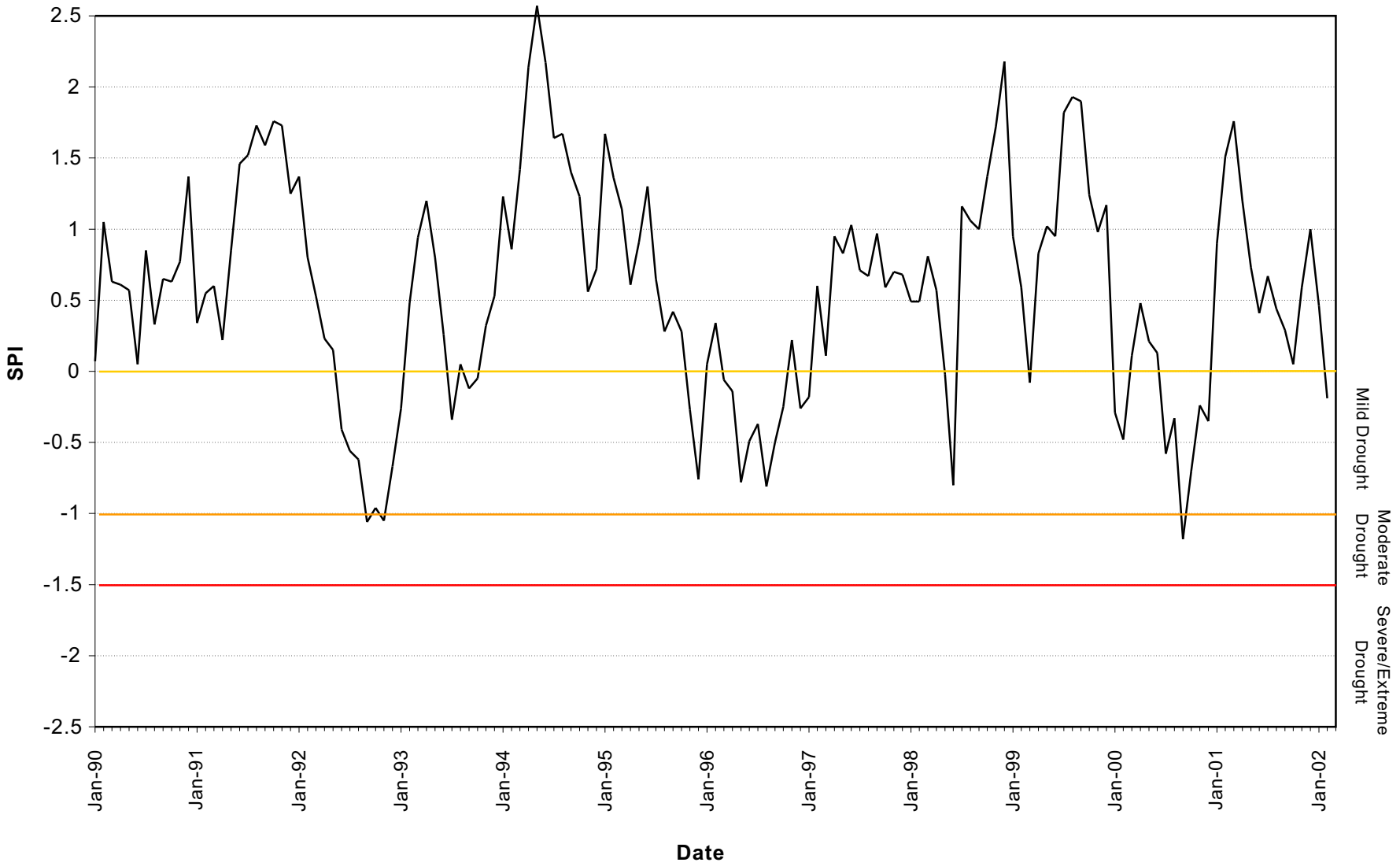

Figure E-4

COLFAX REGIONAL WATER PLAN

Black Lake 6-Month Standardized Precipitation Index
January 1, 1990 through February 28, 2002

Daniel B. Stephens & Associates, Inc.
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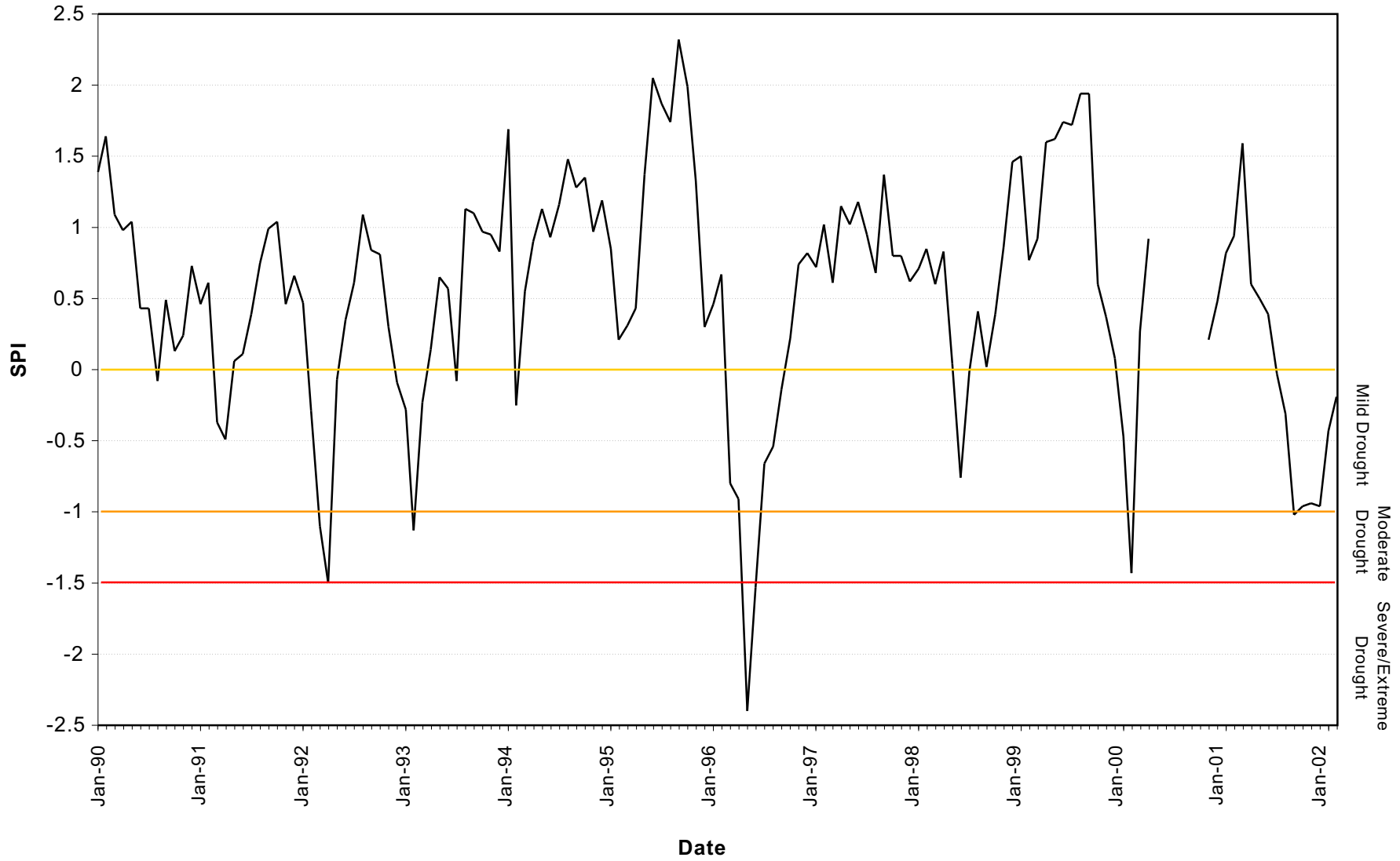

COLFAX REGIONAL WATER PLAN

Cimarron 4SW 6-Month Standardized Precipitation Index
January 1, 1990 through February 28, 2002

Figure E-5

Daniel B. Stephens & Associates, Inc.
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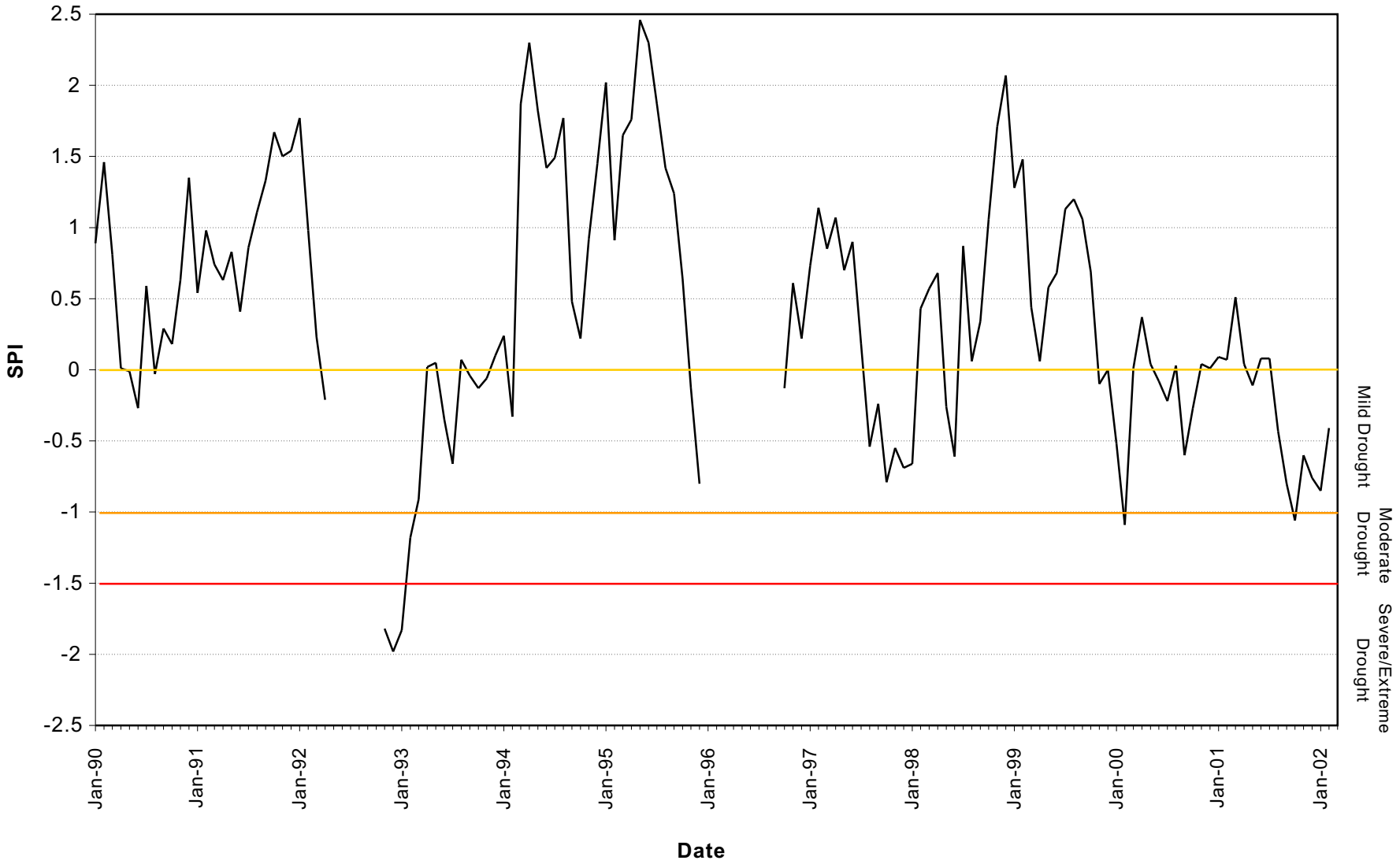

Figure E-6

COLFAX REGIONAL WATER PLAN

Eagle Nest 6-Month Standardized Precipitation Index
January 1, 1990 through February 28, 2002

Daniel B. Stephens & Associates, Inc.
6-18-02
JN 9417

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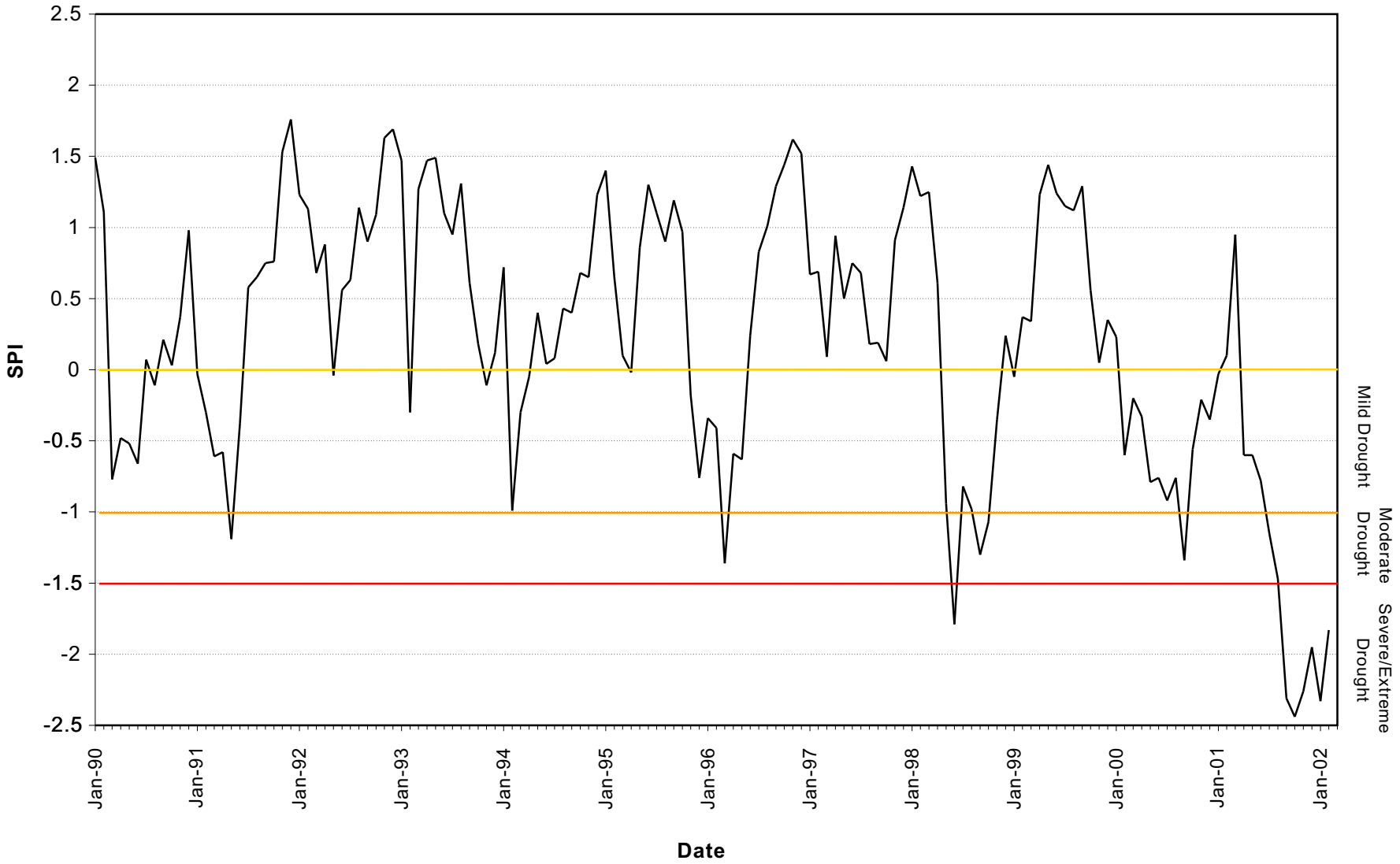

COLFAX REGIONAL WATER PLAN

Lake Maloya 6-Month Standardized Precipitation Index
January 1, 1990 through February 28, 2002

Figure E-7

Daniel B. Stephens & Associates, Inc.
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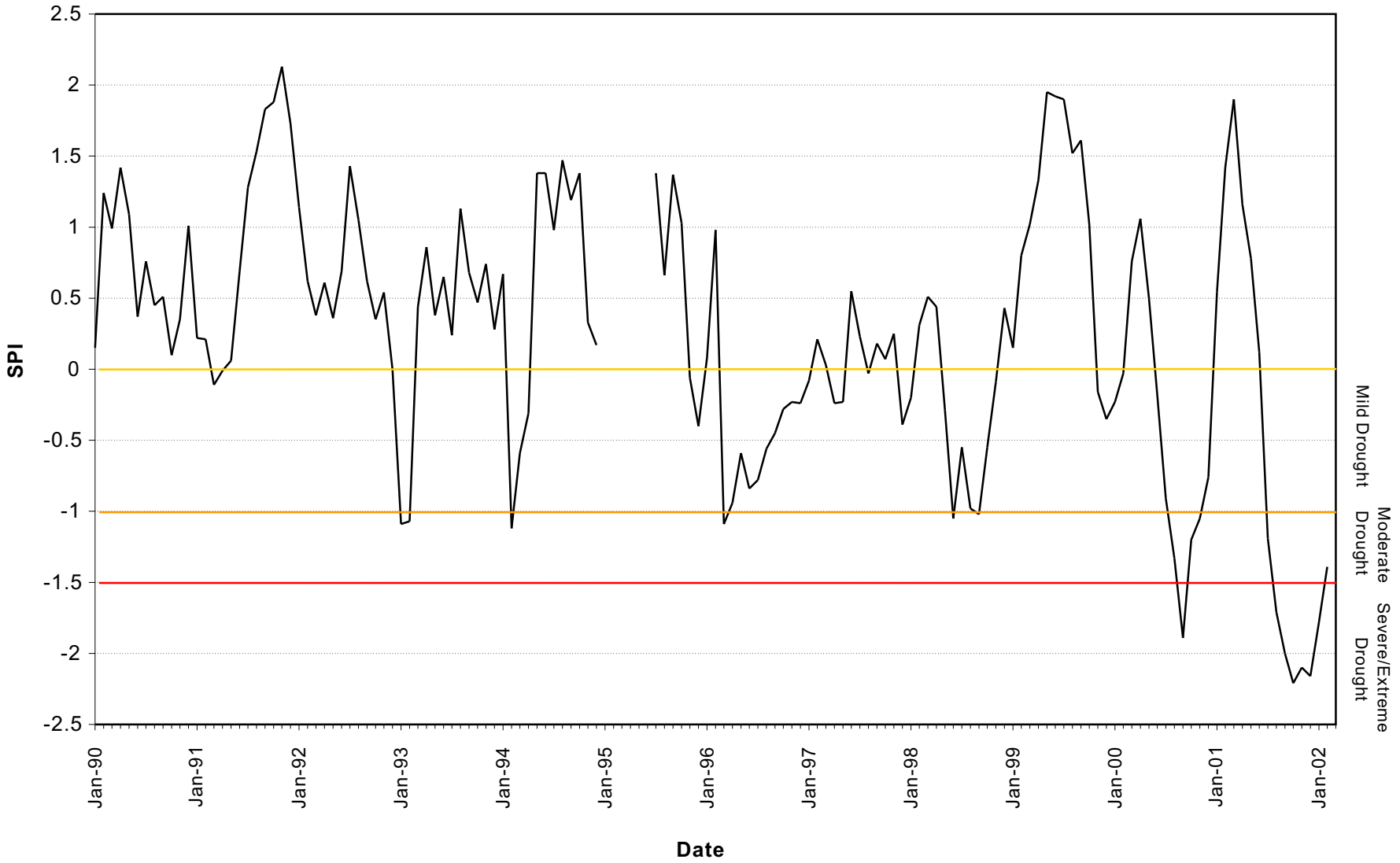

COLFAX REGIONAL WATER PLAN

Maxwell 3 NW 6-Month Standardized Precipitation Index
January 1, 1990 through February 28, 2002

Figure E-8

Daniel B. Stephens & Associates, Inc.
6-18-02
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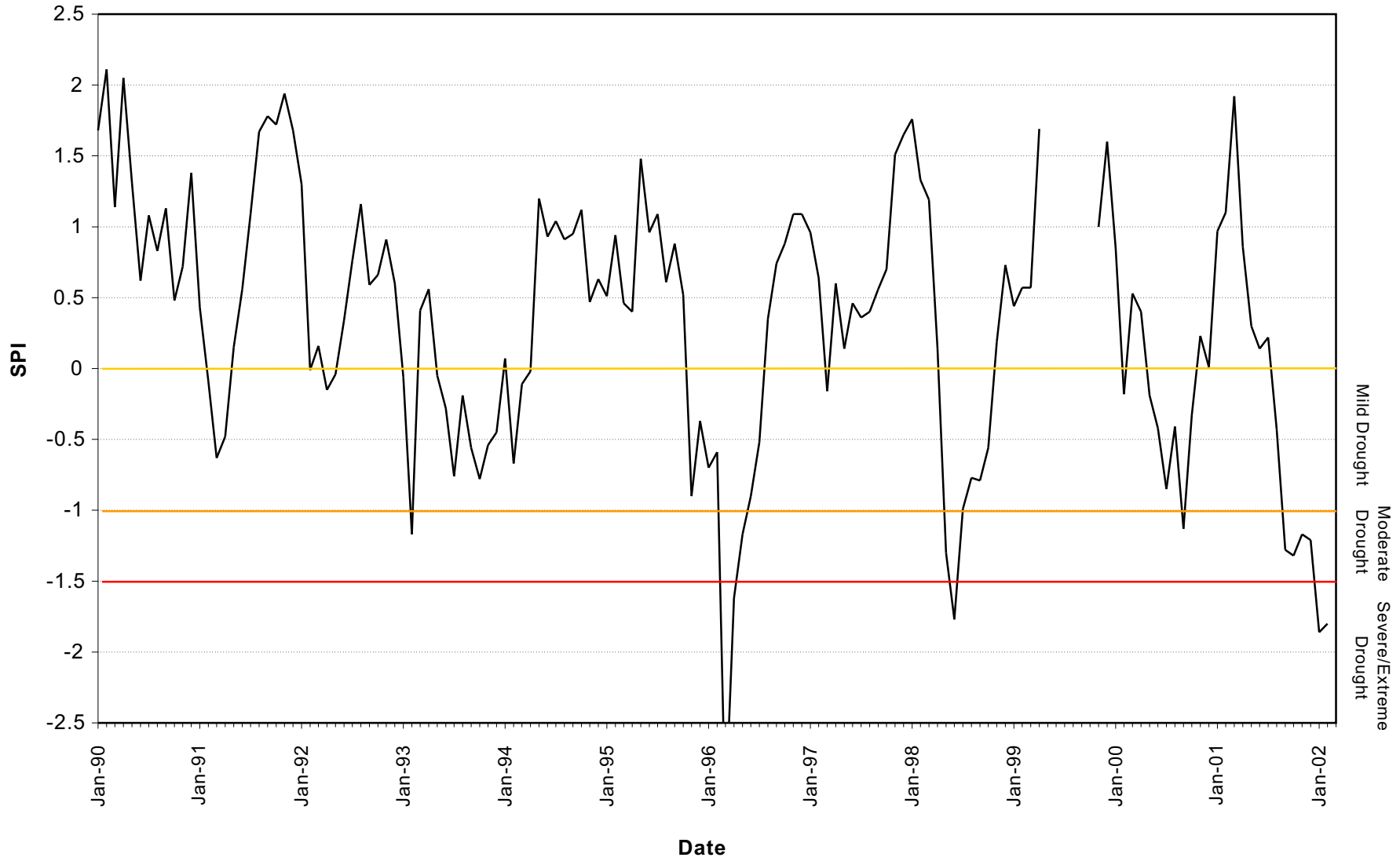

COLFAX REGIONAL WATER PLAN

Raton Filter Plant 6-Month Standardized Precipitation Index
January 1, 1990 through February 28, 2002

Figure E-9

Daniel B. Stephens & Associates, Inc.
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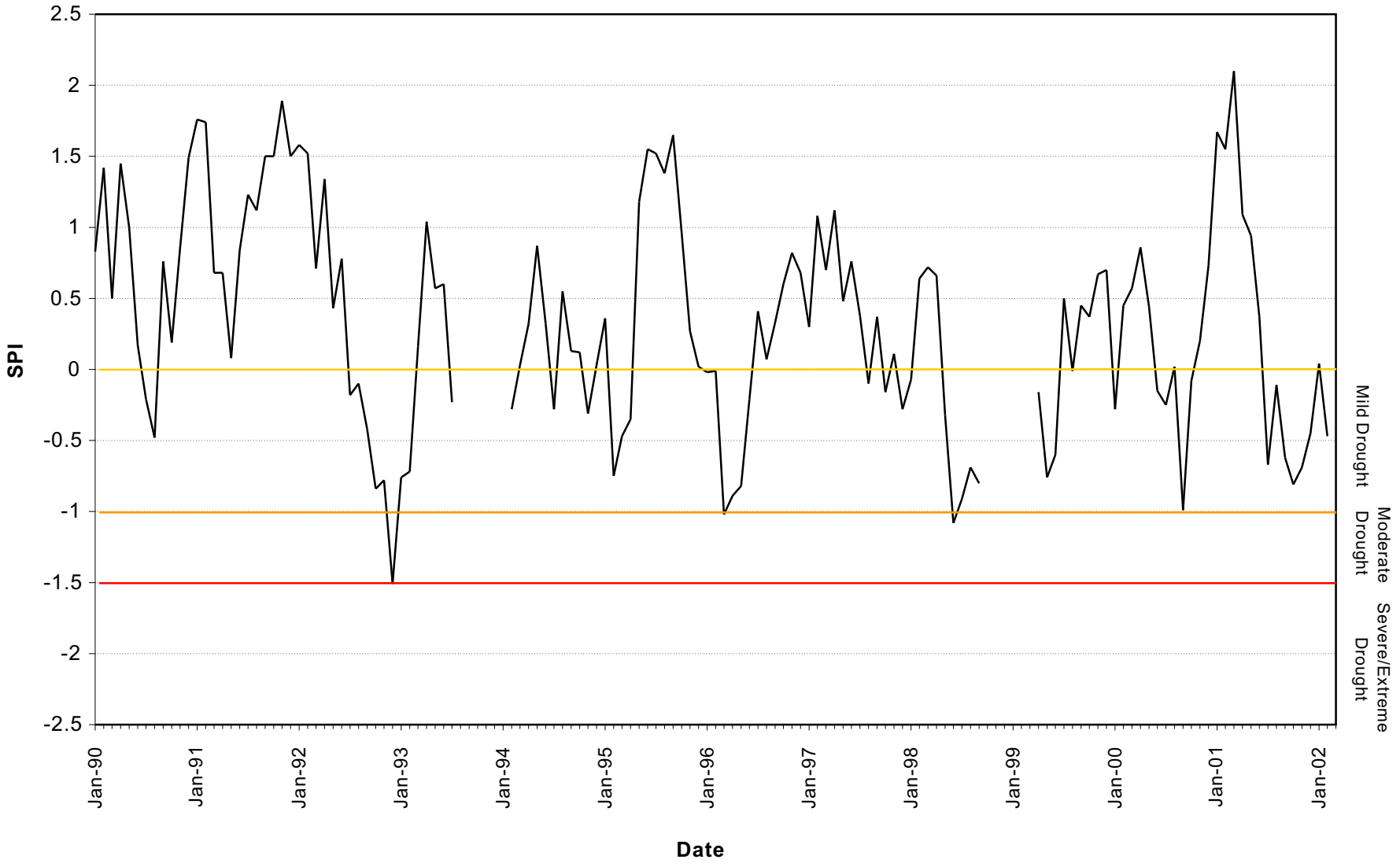


Figure E-10

COLFAX REGIONAL WATER PLAN

Springer 6-Month Standardized Precipitation Index
January 1, 1990 through February 28, 2002

Daniel B. Stephens & Associates, Inc.
6-18-02
JN 9417

Historical and current precipitation records for each station can be obtained from NOAA's National Climatic Data Center web site at http://lwf.ncdc.noaa.gov/oa/ncdc.html.

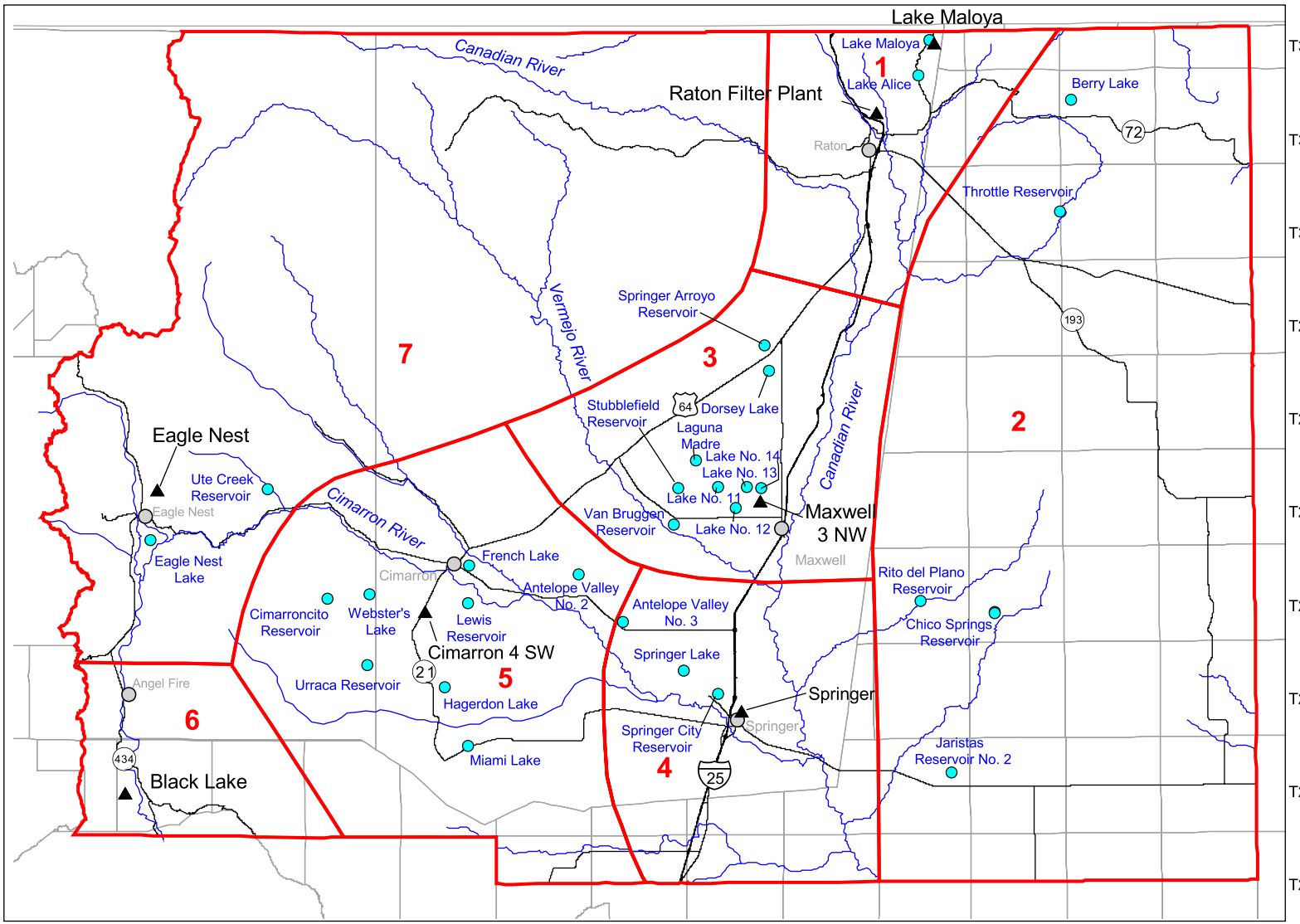
E.3.2.4 Reservoir Storage Levels

Since the main source of water supply in Colfax County is surface water, DBS&A developed an additional index to track reservoir storage levels for several subregions in the County that were identified as dependent on specific reservoirs for water supply. Some of these subregions include mostly community or private usage, while others include mostly agricultural usage or a combination of community and agricultural usage. Table E-6 shows the subregion name and numbering designations along with the reservoirs targeted for monitoring, combined total storage capacities, and the primary water usage categories in each subregion. The subregion boundaries are depicted in Figure E-11.

Table E-6. Reservoir Monitoring Subregions

Map ID	Subregion	Reservoir(s) Monitored	Total Storage (ac-ft)	Primary Usage
1	Raton	Lake Maloya	5,250	Community (Raton)
		Eagle Nest Reservoir	79,120	
2	Eastern Colfax Co.	Private reservoirs only	NA	Private
3	Vermejo	Stubblefield, Laguna Madre, Maxwell Lakes 11, 12, 13, 14	22,770	Agricultural
4	Springer	Springer Lake, Springer City Reservoirs	3,399	Community (Springer) Agricultural
		Eagle Nest Reservoir	79,120	
5	Cimarron	Antelope Valley Nos. 2 and 3, Miami Lake	4,000	Community (Cimarron) Agricultural Domestic (Miami Lake only)
		Cimarroncito Reservoir	NA	Private
		Webster's Lake	NA	Private
6	Angel Fire	None	None	None
7	Northwest Colfax County	Private reservoirs only	NA	Private

An arbitrary scale based on percentage of total storage capacity was developed to determine the reservoir storage levels that will trigger recognition of different drought stages for the pertinent end-users, as outlined below:



Explanation

- Reservoir
- Climate station

Drought monitoring subregion:

1 Raton
2 Eastern Colfax County
3 Vermejo
4 Springer
5 Cimarron
6 Angel Fire
7 Northwest Colfax County

- City
- River/stream
- Road
- Township/range

N

0 5 10 Miles

Figure E-11

Daniel B. Stephens & Associates, Inc.
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COLFAX REGIONAL WATER PLAN

Reservoirs and Drought Monitoring Subregions in Colfax Planning Region

- Less than 50 percent of total storage capacity = Mild drought
- Less than 40 percent of total storage capacity = Moderate drought
- Less than 30 percent of total storage capacity = Severe to extreme drought

Application of these drought stage designations in each subregion only applies to the end users for the associated water supplies. For example, in the case of private reservoirs, the trigger levels would serve mainly as guidance to the local recipients of that water that precautionary conservation measures should be considered. The communities of Raton and Springer receive water supplies both from local reservoirs and from Eagle Nest Reservoir. A drop in storage level of either supply source below the specified percentages would trigger recognition of the associated drought stages for these communities. Some subjective determinations of the application of these triggers are also necessary. For example, a reservoir used primarily for irrigation might normally be at a low level at the end of the irrigation season but would fill during the subsequent snowmelt runoff unless there was a significant snow pack deficit. In such cases, implementing the reservoir storage triggers should be delayed until runoff shortages are apparent.

E.3.3 Summary of Drought Indices for Colfax County

In summary, four drought indices have been selected to define trigger levels for recognition of various drought stages in Colfax County: the PDSI, SWSI, SPI, and reservoir storage levels. These four indices will be monitored within each of the seven defined subregions (Figure E-11, Table E-6), and each index will be evaluated on a monthly basis. The Northern Mountains Climate Division PDSI and modified Canadian River SWSI indices are regional valuations that apply throughout the County. The reservoir storage and SPI indices will provide trigger levels unique to each subregion.

The SPI values for each subregion will be determined using the computer code compiled by DBS&A and data from climate station(s) within the subregion (Figure E-11). Each subregion contains one climate station to be used for SPI computation except for the Raton subregion, where both the Raton Filter Plant and Lake Maloya stations will be monitored. In this case, index levels from either site will trigger recognition of drought stages.

This plan allows for local determination of varying drought conditions within seven subregions of the county. When conditions lead to declaration of differing stages of drought within the county, these conditions should be communicated to the New Mexico DTF in order to facilitate coordination of appropriate mitigation efforts.

Table E-7 defines the index levels that will trigger recognition of the three drought stages and associated response actions by County planners. Within each subregion, a drought stage will be recognized if any three of the four indices exceed the defined trigger levels.

E.4 Drought Response and Mitigation Efforts

Once trigger data have been evaluated and a drought (mild, moderate, or severe) has been declared, the next step is to define response and mitigation measures that need to occur. Some of these measures include permanent actions that will help the County prepare for any stage of drought, while others are temporary actions to be undertaken during specific stages of drought.

Drought responses currently established in the County are summarized in Section E.4.1. Recommendations for permanent and drought-specific mitigation measures are discussed in Sections E.4.2 and E.4.3, respectively. Recommendations for improvements to drought monitoring in the planning region are discussed in Section E.4.4

E.4.1 Current Drought Mitigation Practices

Some municipalities in Colfax County have established water saving policies to implement during a drought, as outlined in Sections E.4.1.1 through E.4.1.4. Presently, Maxwell and Miami do not have any conservation or drought ordinances in place.

E.4.1.1 Angel Fire

On July 19, 2001, the Village of Angel Fire passed a water conservation ordinance (2001-06, a copy of which is included in Attachment E3) that includes short-term drought mitigation measures and long-term conservation measures. The Governing Body of the Village has the

Table E-7. Colfax County Drought Plan Triggers

Palmer Drought Severity Index and Surface Water Supply Index	Six-Month Standardized Precipitation Index	Reservoir [a] Storage	Condition	Response	Actions
–0.99 or Higher	0 or higher	50% or higher	Normal	None	Normal monitoring: monthly monitoring of drought indicators; quarterly task force assessment of water supply conditions
–1.00 to –1.99	–0.01 to –0.99	40% to 49%	Mild drought	Phase 1 Drought Alert	Monthly task force assessment of water supply conditions and voluntary non-essential use restrictions
–2.00 to –2.99	–1.00 to –1.49	30% to 39%	Moderate drought	Phase 2 Drought Warning	Monthly task force assessment of water supply conditions and drought impacts. Mandatory non-essential use restrictions. Voluntary socially or economically important use restrictions
–3.00 or Less	–1.50 or less	Less than 30%	Severe/extreme drought	Phase 3 Drought Emergency	Monthly task force assessment of water supply conditions and drought impacts. Mandatory non-essential use and socially or economically important use restrictions.
–2.00 to –2.99	–1.00 to –1.49	30% to 39%	Increased precipitation reduces drought impacts	Return to Phase 2	Mandatory socially or economically important use restrictions lifted.
–1.00 to –1.99	–0.50 to –0.99	40% to 49%	Increased precipitation reduces drought impacts	Return to Phase 1	Mandatory non-essential use restrictions lifted
–0.99 or Higher	–0.49 or higher	50% or higher	Normal	Return to Normal	Normal monitoring: monthly monitoring of drought indicators; quarterly task force assessment of water supply conditions

[a] The need for storage for agricultural users lessens later in the irrigation season. The task force may choose to modify this trigger level depending on the timing of the evaluation.

authority to declare a water emergency when the water system is unable or will become unable within 30 days to supply commercial and domestic water and fire protection.

Angel Fire's short-term water use restrictions are grouped in four levels of increasing stringency:

- Stage I: "Green Flag" (voluntary measures)

- Stage II: "Blue Flag"
  - Outdoor watering is limited to two days a week (with particular days designated for even/odd street addresses). Watering is allowed only between 6:00 a.m. and 10:00 a.m. and 6:00 p.m. and 10:00 p.m.
  - Planting new turf is not recommended.
  - Filling hot tubs is not recommended.
  - Water is not allowed to run off property (Section E.4.2.1).
  - Cleaning impervious surfaces with water is prohibited (Section E.4.2.1).
  - Vehicle washing is discouraged and prohibited for fund raising.

- Stage III: Yellow Flag
  - Outdoor watering is limited to one specific day per week. Time-of-day restrictions apply.
  - All new landscaping planting is prohibited.
  - Filling hot tubs is not recommended.
  - Water is not allowed to run off property (Section E.4.2.1).
  - Cleaning impervious surfaces with water is prohibited (Section E.4.2.1).
  - Vehicle washing is prohibited.

- Stage IV: Red Flag
  - All outdoor use of water is prohibited.
  - All new landscaping planting is prohibited.
  - Residents and visitors are requested to curtail indoor use as much as possible.
  - Filling uncovered storage reservoirs and similar facilities is prohibited.

Information on drought stages and mitigation measures is published through newspapers and postings in public places. The specific level of emergency is displayed in front of the Village Hall using a colored flag that corresponds to the level of emergency.

Angel Fire's long-term water conservation measures include:

- New residential and commercial construction, remodeling, and fixture/appliance replacement must meet low-flow and low-water-use requirements.

- Defective plumbing must be repaired and maintained in good working order.

Violations of the conservation ordinance measures are misdemeanors. Each separate day of water use violation constitutes a separate offense and each additional prohibited use on the same day is considered a separate offense. The first-time offender receives a warning. For the second violation, the offender receives a citation with a fine of up to $25. Offenders are fined for third and subsequent violations up to $50 per violation.

E.4.1.2 Cimarron

A Mayor-appointed Drought Advisory Committee is developing a drought plan, which will establish incremental mitigation measures related to the severity of drought.

Under a U.S. Bureau of Reclamation grant, the City Engineer is developing a Water Management Plan. An existing ordinance allows the Water Superintendent to declare water restrictions such as prohibiting vehicle washing and reducing outdoor watering. The Cimarron water utility sends out a brochure outlining the criteria for fall watering.

Cimarron does not have any public parks or a golf course. Due to concern for low-income customers, its water rates do not include excess use surcharges.

E.4.1.3 Raton

Raton does not currently have an ordinance or policy for drought management or water conservation. The biggest effort to conserve water is in recycling municipal wastewater to irrigate public properties such as golf courses, ball fields, and parks, as the City has prohibited

the irrigation of public parks and golf courses with drinking water since 1975. The City's ultimate goal is to beneficially reuse all wastewater effluent. To that end, several efforts are underway:

- The City has applied to the New Mexico Finance Authority for a water/wastewater grant to construct a new wastewater treatment facility.

- Construction of another lake to store 250 to 300 acre-feet of recycled wastewater south of the wastewater treatment plant is scheduled for 2003.

- Additional diversion of treated wastewater for reuse for irrigation and a proposed biomass power facility is moving forward.

The water rate structure is flat, with no excess-use surcharges. However, other measures to reduce water waste are in place, including an aggressive water audit and meter replacement program to track all use and all losses. In addition, current ordinances provide for a gross receipts tax dedicated to water and the implementation of special water rates during declared droughts. Public education efforts include a public announcement program during drought periods to caution individuals to practice conservation and the provision of literature addressing conservation methods and water-wise lawn care (available at the Raton water office).

Due to extensive drought problems prior to 1985, Raton has a history of drought response and future water planning. A dedicated water franchise (Raton Water Works) was established in 1991, demonstrating Raton's commitment to water planning. The City is currently developing a 40-year water plan, independently from the *Colfax Regional Water Plan,* that includes planning for future drought periods. The plan will address future water needs based on population growth and will emphasize drought preparedness. Future rate restructuring to promote efficient use (ascending block rates) will also be included in the 40-year plan.

E.4.1.4 Springer

Springer established a Comprehensive Emergency Water Management Policy (Attachment E3) in October 2000, when Springer Lake was low and there was not enough water to fulfill 100

percent of all the lake's water rights. The restrictions outlined in the policy apply to all Springer utility customers, including the large water user associations (the Springer Tract and French Tract) and the New Mexico Boys School. Springer's Ordinance 331 provides authority for the Town Governing Body or its designee to declare a water emergency and implement emergency measures. When an emergency situation exists, individuals using private domestic wells for watering must post a notice that they are using a private well, and customers who use water "unreasonably" as to be defined in the ordinance are subject to a citation by the Police Department, with the fine determined by the Municipal Court. Other emergency water practices outlined in the ordinance include:

- *Capping water use per person.* A maximum amount of water is set per residence per billing month. The ordinance identifies 6,000 gallons per month, but the Governing Body can vary that amount as needed (in 2001 the limit was 8,000). An additional 1,500 gallons per person are allowed for households with six or more people. These restrictions apply to all customer classes, including the correctional facility and motels. Secondary suppliers such as the Springer Tract, Housing Authority multi-family meters, and French Tract are also subject to the maximum. In these cases, the maximum amount of water to be diverted is determined by multiplying the number of active residences (meters) times the cap (e.g., 6,000 gallons per month).

- *Enacting rate surcharges.* Rate surcharges are imposed as follows: $20 per 1,000 gallons for the first 5,000 gallons over the maximum (e.g., 6,001 to 11,000) and $35 per 1,000 gallons for amounts exceeding the first 5,001 gallons over the limit (e.g., usage over 11,001 gallons). Adjustments to the penalty amounts are made for entities allowed a different maximum use standard.

- *Trading water rights.* By managing diversions over a 2-year period, limitations in a given year can be avoided. For example, Springer Tract used 12.5 acre-feet of water from the Town's water system from January to December 2000. To avoid any limits and penalties on the following year's water use, Springer Tract could allow the Town of Springer to use 25 acre-feet of Springer Tract's water rights within the next 12-month

period. Of course, Springer Tract would have to forego the use of those water rights during that period.

Springer's water emergency plan also includes the following prohibitions:

- Water leaving a customer's property
- Failure to repair a leak
- Outdoor irrigation of turf and ground cover, except by (1) hand-held watering one day a week between 6:00 p.m. and 10:00 a.m. and (2) a drip or gray water system for trees, shrubs, and groundcovers
- Curbside vehicle washing
- Washing impervious surfaces with water
- Filling or adding water to pools, spas, or ponds
- Ornamental water uses
- Sale of non-reclaimed water outside the service area unless a prior contract is in place (e.g., French and Springer Tracts and New Mexico Boy's School)
- Issuance of new construction or residential meters
- Construction use of water for earthwork or road construction

Violators of these prohibitions are subject to a penalty not to exceed $500 or 90 days in jail. In addition, the Town may discontinue or limit water service to customers who willfully violate water restrictions.

In the one or two years it has been implemented, the water emergency plan has helped the Town of Springer to reach its goals. French Tract used half the amount of water previously used. The New Mexico Boys School did not reduce water use and therefore paid penalties.

E.4.2 Long-Term, Permanent Drought Preparedness Actions

Long-term drought preparedness actions may include broadly applicable water conservation programs and measures aimed at discouraging water waste at all times, not just during a drought. These long-term actions will enable the region to make better use of its limited water resources and be better prepared to address drought situations.

Since the largest user group in Colfax County is the agricultural sector, improving efficiency in agricultural water delivery is one way to ensure that more water is available to crops during dry years. Implementing a water conservation program is one of the permanent long-term drought solutions that the County can undertake, and a detailed evaluation of agricultural water conservation alternatives is included as Appendix H of this Colfax Regional Water Plan. Municipal water loss prevention is discussed in Sections E.4.2.1 and E.4.2.2.

E.4.2.1 Municipal Water Loss Prevention

Municipal water loss is water, other than natural precipitation, that flows or sprays into a public right-of-way, city storm drain, or adjacent private property. This water loss is commonly referred to as water waste and is currently prohibited by some of the municipalities in Colfax County, as briefly discussed in Section E.4.1 and summarized in more detail below:

- *Angel Fire:* When a water emergency has been declared, water is not allowed to run off property in a wasteful manner or be used for cleaning impervious surfaces (Section E.4.1.1). Violations are treated as a misdemeanor. Each separate day of water use violation constitutes a separate offense, and each separate prohibited use on the same day is considered a separate offense. First-time violators receive a warning. The second violation elicits a citation with a fine of up to $25. The third and subsequent violations are subject to fines of up to $500.

- *Cimarron:* Water waste enforcement is provided through the Police Department. Citations are given as follows:
  - First observation: A warning
  - Second observation: A citation with a $52 fine
  - Third observation: A citation with a fine of $150 plus court costs

- *Springer:* Water waste provisions are included in the drought ordinance. Enforcement depends on citizens to report water waste, which is then verified by Water Department staff. For a first offense they give the property owner a copy of the ordinance and a warning. Second-time offenders receive a citation and a fine issued by a police officer. A Court Judge assesses the fine. Currently, personnel from the Police Department are needed to cite violations and court time is needed to assess the fine.

DBS&A recommends the establishment of consistent water waste policies in Colfax County municipalities. The benefits would be to provide a consistent mechanism County-wide that reduces peak summer usage and inefficient watering throughout the County. Such policies could also have the side benefit of minimizing the release of water in the public right-of-way, thereby reducing damage to publicly owned streets (and the public expenditures necessary to repair that damage) and increasing street safety by reducing the potential of frozen water on public right-of-way.

The policies would define prohibited water waste practices and specify the method of enforcement and the penalties. Enforcement can be made more efficient if the ordinances authorize an administrative system to prepare citations and assess and collect fines, thereby avoiding the time and expense of involving the court system in every citation.

E.4.2.2 Prevention of Water Loss

The total amount of water in a water supply/delivery system can be generally divided into four categories.

- "Account water" is water for which there is a metered account.

- "Non-account water" includes water uses that are known and authorized by a utility (although the actual amounts may be estimated) but that are not metered. This category could include unmetered municipal uses or water use for fire-fighting or hydrant flushing.

- "System water losses" include water lost through theft, malfunctioning controls, and illegal connections, and differences between billed and actual use caused by meter error.

- "System leakage" covers water lost through leakage.

The latter three categories are commonly referred to as "unaccounted" water, that is, water that does not arrive at its intended destination and/or does not produce revenue. A comprehensive water audit can determine where the water in a system is going and identify inefficiencies that result in unaccounted water. Repairs, meter installations, or other system improvements can be targeted to reducing identified losses.

Water loss data collected in Angel Fire suggest that the City could benefit from further addressing unaccounted water. Although such data are not available for other communities in Colfax County, they could likely also benefit from studies to determine water losses and ongoing data collection programs to monitor and prevent them.

E.4.3 Drought Responses During Declared Droughts

This section outlines specific mitigation measures to be undertaken during each stage of drought. Stage I relies on voluntary measures, while Stages II and III impose more stringent requirements. Section E.4.3.1 addresses agricultural mitigation measures, and Section E.4.3.2 addresses municipal mitigation measures to be taken during the various stages.

E.4.3.1 Recommended Agricultural Drought Response Measures

Droughts can be particularly devastating to agriculture, particularly to the types of livestock operations common in the Colfax water planning region. Droughts substantially impact the quality of grazing land, resulting in poor growth of livestock and poor calving percentages. Poor livestock growth was evident in the decreased weight of cattle on the market during the 1996

drought. Breeding of livestock can be delayed or stopped due to a lack of spring season rain. Vegetative effects include poor forage quality and low plant vigor that can lead to death of some plant species.

Depending on a drought's duration and severity, the vegetative effects can significantly impact the long-term health of rangeland. As drought conditions worsen, plant growth and vigor is reduced. Continued drought conditions can lead to a loss of some of the desirable plant species and a resultant increase in erosion rates. The duration and severity of the drought will have a direct correlation with the time necessary for the plant community to recover. Plant community deterioration is often followed by a reduction in soil fertility. As these impacts compound, opportunities to reestablish the cover and productive capacity of the range site are reduced.

Consequently, farmers and ranchers would benefit by planning ahead for droughts. Each farmer and rancher can benefit by having plans for both a mild dry year and extremely dry year. Techniques for agricultural or livestock water reduction are available through various public agencies. Staff at the NRCS are available to help develop individualized plans for possible crop or livestock reductions needed during different levels of drought. The Cooperative Extension Service is another resource for information on techniques commonly used for drought response.

Agency representatives on the Drought Management Task Force can provide a coordinated effort to improve outreach and distribution of information and resources to prepare agricultural users for drought. If there is drought potential, communication with agricultural agencies and extension services should be initiated when the Drought Management Task Force convenes in the early spring. At that point, each farmer and/or rancher can implement their individual plan.

Another alternative for addressing drought in the agricultural sector is water rights leasing or water exchanges among farmers. A water lease arrangement for trading or combining crop or livestock water needs could be established on a case-by-case and drought-by-drought basis. For example, in a drought year, a water rights holder may opt to lease the water to a downstream user rather than irrigate. Such cooperative agreements can allow water rights

holders on neighboring properties or communities to combine their efforts in order to grow crops or graze livestock more efficiently.

A lease option contract or a lease that is activated only under certain circumstances would allow users to plan ahead for drought conditions. Because leases require OSE approval and are subject to protest, the parties to the lease could consider submitting the lease application in advance. If the OSE is willing to approve a conditional lease, then the notice and protest requirements would have already been met, and the administrative obstacles for rapid transfer of water from one location to another would be avoided. Presumably the OSE would place a condition on approval of the lease such that the transfer takes place only under specific circumstances (such as low reservoir levels or flow rates in the stream where the diversion takes place).

Farmers within conservancy and irrigation districts are allowed to make agreements and move water around within the boundaries of the district without OSE approval. The Vermejo Conservancy District may have limited ability to move water freely from one location to another within the district due to the application of federal reclamation law. However, since the federal government has released title to the Vermejo Project, presumably New Mexico law would apply and the district farmers would be able to freely move water subject to whatever limitations or rules the District has established under its authority.

E.4.3.2 Municipal Drought Response and Mitigation Measures

On average, the municipalities in Colfax County use 3,100 acre-feet per year, although the per capita amounts vary widely within the County. Residential customers account for the majority of municipal water use. During the summer months, most water consumption is for outdoor uses, and outdoor uses are therefore the target of recommended water saving measures during a drought.

Utilities often find that a small number of customers account for a large portion of water use. Targeting these higher-volume users for additional conservation during drought periods provides the greatest water savings next to minimizing water waste and unaccounted water (Section E.4.2). Billing records can be examined to identify large users and develop an

outreach program, including water audits and other measures, to help these users save water. As discussed in Section 6 of this *Regional Water Plan*, per capita use in Angel Fire, Raton, Springer and Eagle Nest is relatively high. Therefore, drought mitigation measures in these locations will have the most impact.

Although the water savings are lesser, general water conservation measures are also recommended for all households, as outlined in Table E-8. Municipal and non-agricultural water use in Colfax County accounts for less than 10 percent of total use, so the savings yield from these measures is limited. Nevertheless, the measures outlined in Table E-8 will help preserve drinking water supplies during a drought. Estimated savings shown in Table E-8 are based on experience with these conservation measures and average municipal water use from 1996 through 1999 for Angel Fire, Cimarron, Eagle Nest, Maxwell, Miami, Raton and Springer. The combined total savings for each stage is reduced by 25 percent because or overlapping savings attributed to more than one measure.

If more savings are needed, additional measures may be implemented from the following options.

- Initiate school programs to provide more in-depth education on drought and water conservation.
- Increase surcharges for excess water use.
- Increase leak detection and repair activities.
- Require spot watering (water trees and shrubs using hose with nozzle attachment or bucket).
- Reduce plant nursery watering (if applicable).
- Reduce or eliminate fleet washing.

Table E-8. Municipal Drought Response Measures for Stages of Drought

Drought Measure	Estimated Municipal Savings [a]	
	Percentage	Amount (ac-ft/yr)
Stage I: Drought Advisory		
Increase public education regarding voluntary measures	6	21
Recommend 30% voluntary reduction in outdoor watering [b, c]	3	11
Total	9	32
Stage II: Drought Warning		
Increase public education, including advising the use of pool covers	4	14
Double rate surcharge for excess use	6	21
Reduce watering to 50% [b, c]	6	21
Reduce institutional turf watering by 15% [c]	1.5	5
Restrict water use on impervious surfaces	1	4
Eliminate curbside vehicle washing	1	4
Double water waste fees, and apply to all prohibited uses	2	7
Total	16 [d]	57 [d]
Stage III: Drought Emergency		
Increase public education	1	4
Triple rate surcharge for excess use	12	42
Reduce watering to 1 day per week [c]	12	42
Target institutional turf reduction of 25%	2.5	9
Prohibit planting of new turf or landscaping	1	4
Restrict water use on impervious surfaces	1	4
Require pool covers (in resort areas)	0.5	2
Double water waste fees and apply to all prohibited uses	2	7
Eliminate curbside vehicle washing	1	4
Ban continuous bleed-off swamp coolers	1	4
Prohibit aesthetic water uses (e.g., fountains, refill ponds)	1	4
Total	26 [d]	94 [d]

[a] The estimated water savings are based on general information not specific to Colfax County. Water usage records should be kept and analyzed, and the options listed under each stage should be adjusted if actual water savings do not meet targets.

[b] For instance, watering fewer days for same amount of time, watering in evening, and not watering on windy days

[c] A potential exception to watering restrictions is drip irrigation, spot watering and/or metering restrictions

[d] Because of a likely overlap of results from drought response efforts, the combined effect is 75% of the simple total.

- Reduce other water intensive processes in all sectors as much as possible.

- Monitor increased use during dry weather (by sector) and target specific conservation messages accordingly, particularly with regard to large water users (e.g., initiate or follow up on previous water audits, monitor savings and call water users to encourage progress, and monitor usage and savings to encourage target users and congratulate on progress).

- Provide water conservation information to personnel and firms who perform landscape maintenance.

- Introduce rebate packages that include xeriscaping supplies and water-saving plumbing fixtures and appliances such as toilets and washing machines.

- Implement property tax incentives for installing drip irrigation systems, xeriscaping, and other improved conservation measures.

E.4.4 Improved Monitoring

Key agencies that are involved in monitoring hydrologic data in Colfax County include the United States Geological Survey (USGS), the Office of the State Engineer (OSE), the Natural Resources Conservation Service (NRCS), and the National Oceanic and Atmospheric Administration (NOAA). The USGS collects daily streamflow data from 11 gaging stations in the region. The NRCS, with assistance from the OSE Cimarron water master, collects snowpack data from one station within the county and another station just west of the County line. NOAA collects meteorological data from 10 stations in the County. Internet addresses for these and other information resources are provided in Table E-9.

Drought triggers established in this report are based on readily available existing data. However, drought monitoring could be improved to facilitate more localized measurements of drought indicators. For example, the steering committee recommended that snowpack data be collected in additional locations to monitor localized drought conditions in all Colfax County

Table E-9. Drought-Related Resources on the Internet

Organization	Web Site Address	Information
National Drought Mitigation Center (NDMC)	http://www.drought.unl.edu/index.htm	Drought planning methods, climatology, forecasts, current conditions, and drought indices
Climate Prediction Center (CPC)	http://www.cpc.ncep.noaa.gov/	Climate/weather forecasts, highlights, and monitoring data
Western Regional Climate Center (WRCC)	http://www.wrcc.dri.edu/index.html	Climate data, climate monitoring and data analysis
National Weather Service (NWS)	http://www.srh.noaa.gov/abq/	Forecasts, doppler radar, hydrology, and climate
Western Governors' Association (WGA)	http://www.westgov.org	Western governors' initiatives and resolutions
Interim National Drought Council	http://www.fsa.usda.gov/indc/	Catalog of national drought programs and drought monitoring
Western Drought Coordination Council (WDCC)	http://www.drought.unl.edu/wdcc/council/aboutus.html	Model drought policies and management/ mitigation measures
USDA Forest Service Wildland Fire Assessment System	http://www.fs.fed.us/land/wfas	Greenness maps and fire danger
U.S. Global Change Research Program	http:/geochange.er.usgs.gov/sw	Workshop on climate variability
CLIMVIS (Climate Visualization System)	http://lwf.ncdc.noaa.gov/oa/climate/onlineprod/drought/xmgr.html	Graphic displays of precipitation, temperature, and drought data
U.S. Geological Survey (USGS), New Mexico Water Resources	http://nm.waterdata.usgs.gov/nwis http://nm.water.usgs.gov/	Water resources data; streamflow data
New Mexico Office of the State Engineer	http://www.seo.state.nm.us/	Drought information, water database, regional water planning information, hydrographic surveys
New Mexico Drought Task Force	http://weather.nmsu.edu/drought/	New Mexico drought plans and status reports
New Mexico Agricultural Statistics Service	http://www.nass.usda.gov/nm/	Agricultural and livestock reports for the entire state
New Mexico Department of Agriculture	http://nmdaweb.nmsu.edu/	Drought management workshop, agricultural statistics
Natural Resources Conservation Service	http://www.nm.nrcs.usda.gov	Seasonal snow surveys and water supply information

watersheds, and landowners requested that snowpack information be provided as early as possible so that they can adequately prepare for the upcoming season. Other monitoring that would be useful for anticipating droughts and evaluating drought impacts and mitigation measures includes:

- Soil moisture monitoring and reporting
- Monitoring and reporting of reservoir storage levels (currently, detailed records are kept only for Eagle Nest Reservoir)
- Metering of irrigation diversions and return flows to assist in evaluating agricultural conservation and drought mitigation actions

Both the National Weather Service and the NRCS support cooperator programs, which allow for residents to provide daily weather observations to their Albuquerque offices. Encouraging the participation of local residents in these programs could provide additional useful monitoring data.

E.5 Drought Mitigation Funding

Numerous federal and several state funding sources are available to local governments and communities to prepare for or alleviate the consequences of drought. Drought financing is usually triggered by a declaration from the President, Secretary of Agricultural, or Governor of the affected state. Such a declaration provides communities access to millions of dollars in drought financing. For example, in 2001, the federal government provided more than $20 million in supplemental feed assistance alone to New Mexico farmers and ranchers. Severe drought conditions in 2002 will also likely trigger large amounts of federal funding for New Mexico.

Although Congress has authorized many programs either directly to address drought or indirectly to address water supply development and improvement, no one comprehensive program for drought funding exists. Communities seeking assistance must identify their needs

and then evaluate a rather complex set of funds that address multiple natural disaster and water supply situations. Once communities have identified the funds they wish to pursue, it may take many months to complete the application process, although some short-term programs, such as emergency water hauling, are immediately available.

Many of the projects that will best ensure an adequate water supply are also some of the best measures to prepare for drought. Water supply development through acquisition of additional groundwater rights and well development as well as improvement of current water systems can make more water available to communities. Agricultural water conservation measures such as lining key canals or implementing drip irrigation in certain areas will sustain agricultural production when surface water is less available.

Generally speaking, funding can be divided into three categories: drought planning, preparedness, and mitigation:

- Drought planning includes drafting drought management plans or drought response plans.

- Drought preparedness includes more complex activities to prepare for drought such as infrastructure improvements and projects to develop and improve the water supply, to gather data to improve drought prediction tools, and to implement agricultural water conservation.

- Drought mitigation refers to measures, usually in the form of financial assistance, to relieve the distress resulting directly from a drought in a given year. These measures also include delivering water to communities and livestock.

Table E-10 summarizes available funding programs for drought planning, preparedness, and mitigation. Attachment E4 provides specific information on these programs, including the types of assistance provided, eligibility requirements, and contact information. A catalog of federal drought assistance programs is provided in Attachment E4-1.

Table E-10. Summary of Funding Sources for Drought Planning, Preparedness, and Mitigation
Page 1 of 3

Program Title	Agency	Eligible Activities
Drought Planning		
Planning Assistance to States	U.S. Army Corps of Engineers	Development of state drought contingency plans or local and regional plans that support state water plans
Reclamation States Emergency Drought Relief Act of 1991 - Title II	U.S. Bureau of Reclamation	Projects to conserve, augment, and more efficiently use water supplies
Conservation Technical Assistance	USDA NRCS	Planning and implementation of solutions to natural resource concerns, including drought
Drought Preparedness		
Clean Water State Revolving Fund Program	NMED Construction Programs Bureau	Wastewater infrastructure, agricultural runoff control, estuary restoration, and limited water conservation measures
Safe Drinking Water Act Revolving Loan Program	NMED Construction Programs Bureau	Activities to meet requirements of the Safe Drinking Water Act, including system rehabilitation or installation of new systems
Water and Waste Loans and Grants	USDA Rural Development	Development or improvement of water or wastewater disposal systems in rural areas
Snow Survey and Water Supply Forecasting Program	USDA NRCS	Monitoring of climatic and hydrologic elements necessary to produce water supply forecasts
Reclamation Wastewater and Groundwater Study Program	U.S. Bureau of Reclamation	Appraisal and feasibility studies on water reclamation and reuse projects
Small Watershed Program	USDA NRCS	Agricultural water management, municipal and industrial water supply, groundwater recharge, and watershed protection projects
Environmental Quality Incentives Program	USDA NRCS	Practices to address soil, water, and related natural resource concerns on farm and ranch lands

Table E-10. Summary of Funding Sources for Drought Planning, Preparedness, and Mitigation
Page 2 of 3

Program Title	Agency	Eligible Activities
Drought Mitigation		
Emergency Water Supplies	New Mexico Emergency Management Center	Provision of emergency water supplies to communities that may run out of adequate drinking water
New Mexico Emergency Water Funding	Department of Finance and Administration	Provision of emergency water supplies
Emergency Conservation Program	USDA Farm Services Agency	Rehabilitation of farm lands and conservation facilities
Public Assistance /Emergency Measures Program	New Mexico Emergency Management Center	Activities to alleviate consequences of the subject of a Presidential Emergency or Major Disaster Declaration
Economic Adjustment Program: Sudden and Severe Economic Dislocation Components	U.S. Department of Commerce Economic Development Agency	Prevention of serious economic dislocations or reestablishment of employment opportunities after a sudden and significant dislocation
Small Business Administration Disaster Assistance Program	U.S. Small Business Administration	Assistance for economic losses resulting from an agricultural production disaster
Small and Limited Resource Farmers	USDA NRCS	Conservation plans and rapid response actions
Disaster Unemployment Assistance	New Mexico Department of Labor	Weekly benefits to individual workers unemployed as a result of a Presidentially declared major disaster.
Emergency Community Water Assistance Grants	USDA Rural Development	Projects to alleviate a significant decline in quantity or quality of water supplies in rural areas
Emergency Watershed Protection	USDA NRCS	Emergency recovery measures to relieve imminent hazards to life and property as a result of natural disasters
Emergency Well Construction and Water Transport	U.S. Army Corps of Engineers	Construction of wells or transport of water drought-distressed areas

Table E-10. Summary of Funding Sources for Drought Planning, Preparedness, and Mitigation
Page 3 of 3

Program Title	Agency	Eligible Activities
Drought Mitigation (continued)		
Livestock Indemnity Program	USDA Farm Services Agency	Financial assistance for losses of eligible livestock from natural disasters
Tree Assistance Program	USDA Farm Services Agency	Replanting or rehabilition of eligible trees or vines lost or damaged by natural disasters
Noninsured Crop Disaster Assistance Program	USDA Farm Services Agency	Payments to farm and ranch enterprises that have suffered losses from natural disasters
Federal Crop Insurance Corporation	USDA Risk Management Agency	Risk management to improve the economic stability of acriculture
Rural Business Cooperative Service	USDA Rural Development	Loans for developing or financing business or industry in rural areas

References

Guttman, N.B. 1999. Accepting the Standardized Precipitation Index: A calculation algorithm. *Journal of the American Water Resources Association* 35(2):311-322.

McKee, T.B., N.J. Doesken, and J. Kleist. 1993. The relationship of drought frequency and duration to time scales. pp. 179-184 *In Preprints, 8th Conference on Applied Climatology*, January 17-22, 1993, Anaheim, California.

New Mexico Drought Planning Team. 2002. *New Mexico drought plan.* http://weather.nmsu.edu/drought/053102. May 31, 2002.

New Mexico Energy, Minerals, and Natural Resources Department. 2002. *New Mexico drought plan, Volume II.* http://weather.nmsu.edu/drought/Drought-plan1112002/Volume-2.pdf. November 2002.

Palmer, W.C. 1965. *Meteorological drought.* Research Paper No. 45, U.S. Department of Commerce Weather Bureau, Washington D.C.

Shafer, B.A., and L.E. Dezman. 1982. Development of a surface water supply index (SWSI) to assess the severity of drought conditions in snowpack runoff areas. pp. 164-175 *In Proceedings of the Western Snow Conference*.

State of Colorado. 2001. The Colorado drought mitigation and response plan. Colorado Department of Local Affairs, Division of Local Government, Office of Emergency Management, Department of Natural Resources. January 2001.

Attachment E1

Public Outreach Contact Information, Materials, and Resources

Attachment E1-1

Media Contact Information

Springer News Bulletin
Phone: 505-483-2276
Fax: 505-483-2473
Prefer News Releases: By Email
Deadline: Wednesday
Publication Date: Every other Friday
Display Ad Cost: $6.00 column inch
Email: theboss@springercoop.com

Raton Range
Todd, Jill, Kristi
Phone: 505-445-2721
Fax: 505-455-2723
Prefer News Releases: By Email
Deadline: Friday 1 pm for Publication on Tuesday, Wednesday 1 pm for Friday
Publication Date: Tuesday/Friday
Display Ad Cost: $52.80 (2x4) email to: margaret.massini@ratonrange.com
Email: todd.wildermuth@ratonrange.com
Web Site: www.ratonrange.com

Sangre de Cristo Chronicle
(Marsha Wood, Debbie, Jessica)
Phone: 505-377-2358
Fax: 505-377-2679
Prefer News Releases: By Email
Deadline: Noon Monday
Publication Date: Thursday
Display Ad Cost: 2 Column 3 ¼ wide $36.74
Email: news@sangrechronicle.com
Web Site: www.sangrechronicle.com

Albuquerque Journal North
Stephanie
Phone: 505-988-8881
Fax: 505-983-2523
Prefer News Releases: Fax
Deadline: Thursday
Publication Date: 7 days a week
Display Ad Cost: $135.38 (2x4)
Email: sdixon@abqjournal.com
Web Site: www.abqjournal.com

KRTN
Robi
Phone: 505-445-3652
Fax: 505-445-2911
Prefer News Releases: Fax
Deadline:

Raton Chamber of Commerce
1-800-638-6161
Fax: 505-445-3680
Prefer News Releases: By Email
Deadline: Few Days before the end of the month
Publication Date: End of Month
Email: chamber@raton.com
Web Site: www.ratonchamber.com

Angel Fire Chamber of Commerce
Sharon Floyd
1-800-446-8117
No Newsletter but will forward email to members
Email: askus@angelfirechamber.org

Angel Fire Village Hall
Lisa Sanchez
Phone: 505-377-3232
Fax: 505-377-3280
Quarterly Newsletters only
Prefer News Releases: By fax
(May post flyers for Public Meetings)

Public Meetings: Announce at City Council meetings,
Eagle Nest Village Hall (will post flyer), etc.

Attachment E1-2

Drought Initiation Contact List

Colfax County Drought Initiation Contact List
Page 1 of 4

Name	Title/Affiliation	Address	Telephone Number	Fax Number	E-Mail Address
Ackerman, Roy	Brown Hotel Colfax County Commission	P.O. Box 927 Springer, NM 87747	483-2269	483-0053	
Ballew, Mike	Executive Director NRA Whittington Center	P.O. Box 700 Raton, NM 87740-0700	445-3615	445-9418	
Barraza, Sandra	County Agent Colfax County Coop. Ext. Service	P.O. Box 370 Raton, NM 87740-0132	445-8071	445-2618	sbarraza@nmsu.edu
Boyle, Clyde	NRCS	HCR 63, Box 512 Raton, NM 87740-3800	445-9571 (W?) 445-2717 (H?)	445-4066	
Burton, Frank and Jeff	Antelope Valley Irrigation District	P.O. Box 637 Springer, NM 87747-0637	483-2897		
Caldarelli, Bob	Commissioner City of Raton	1216 South 6th Street Raton, NM 87740	445-9304	445-8225	
Campbell, Carol	Colfax SWCD	245 Park Avenue, Room 206 Raton, NM 87740	445-9571x4(MTW) 445-2085(ThF) 445-9637(H)	445-4066 445-2085	melcampbell@bacavalley.com
Campbell, Dan	Manager Raton Water Works	P.O. Box 99 Raton, NM 87740-0099	445-3861 445-8230	445-1089	dmc@raton.com
Candelario, Chris	Commissioner City of Raton	P.O. Box 910 Raton, NM 87740-0910			
Clarke, Edith	Miami Domestic Water Users	P.O. Box 7 Miami, NM 87729-0007	483-2905	483-0173	cattle@springercoop.com
Crawford, Tommy	Springer Ditch Co.	Rt. 1, Box 76 Springer, NM 87747	483-2339		
Cruz, Danny	Mayor Town of Springer	P.O. Box 488 Springer, NM 87747-0488			
Dahl, John	Mayor Village of Eagle Nest	P.O. Box 610 Eagle Nest, NM 87718			

NRA = National Rifle Association
NRCS = Natural Resources Conservation Service
OSE = Office of the State Engineer
SWCD = Soil & Water Conservation District
NMED = New Mexico Environment Department

Colfax County Drought Initiation Contact List
Page 2 of 4

Name	Title/Affiliation	Address	Telephone Number	Fax Number	E-Mail Address
Danielson, Laura	Water Supervisor Town of Springer	P.O. Box 488 Springer, NM 87747-0488	483-2682 483-2219	483-2670	cityhall@springercoop.com
Decker, Debra	Clerk Administrator Village of Cimarron	P.O. Box 654 Cimarron, NM 87714	376-2232	376-2810	
Dye, Jan	NMED	1243 S. 2nd Street Raton, NM 87740-2234	445-3621 447-0139 (cell)	445-3376	janice_dye@nmenv.state.nm.us
Fleming, Matt	Village of Maxwell Water Department	P.O. Box 282 Maxwell, NM 87728-0282	375-2752	375-2753	
Gibson, Hoot and June	Councilman Village of Angel Fire	P.O. Box 975 Angel Fire, NM 87710	377-1082	377-1735	WilliamLGibson@saic.com
Hammitt, Mike	Mayor Pro Tem Village of Cimarron	P.O. Box 654 Cimarron, NM 87714-0654			
Henson, Clint	NM Game and Fish	P.O. Box 1145 Raton, NM 87740	445-2311		chenson@state.nm.us
Hollis, Jim	Cimarron Water Master New Mexico OSE	P.O. Box 502 Cimarron, NM 87714-0502	376-2918 (W) 376-2568 (H)	376-4565	cimwater@cimarron.springercoop.com
Honeyfield, Eric	City Manager City of Raton	P.O. Box 910 Raton, NM 87740-0910	445-9551		
Hoy, Charles R.	Chairman Vermejo Conservancy District	RR 1, Box 9 Maxwell, NM 87728-9701	375-2150		
Hronich, Joe R.	Manager Vermejo Conservancy District	P.O. Box 292 Maxwell, NM 87728-0292	375-2381 (message)	375-2349	
Jump, Bill	Town of Springer	P.O. Box 73 Springer, NM 87747	483-2721		
Kern, Mary Lou	Colfax SWCD Vermejo Conservancy District	P.O. Box 303 Maxwell, NM 87728-0303	375-2969		lkern@bacavalley.com

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NRCS = Natural Resources Conservation Service
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Colfax County Drought Initiation Contact List
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Name	Title/Affiliation	Address	Telephone Number	Fax Number	E-Mail Address
Klein, Gene	Miami Domestic Water Users	P.O. Box 24 Miami, NM 87729-0024	483-2922	483-2424	
Kuchan, Roger	President Maxwell Cooperative Water Users Association	P.O. Box 207 Maxwell, NM 87728-0207	375-2349		
Liddle, Mike	Angel Fire Resort	P.O. Box 683 Angel Fire, NM 87710	377-4369	377-4236	mliddle@angelfireresort.com
Lopez, Ernie	NM State Forestry Division	P.O. Box 5 Ute Park, NM 87749-0005	376-2204	376-2384	
Lyons, Patrick H.	State Senate	IMA Rt., Box 26 Cuervo, NM 88417	279-6161		
Marchetti, James B.	Colfax County Commissioner	P.O. Box 725 Raton, NM 87740-0725	445-3068		
McFall, J.D.	Chairman, Antelope Valley Domestic Water Users	RR 1, Box 31 Springer, NM 87747-9702			
Mileta, Pete	Commissioner City of Raton	1365 Brilliant Street Raton, NM 87740	445-3367		
Montoya, Sam	P&M Coal Mining Co.	P.O. Box 100 Raton, NM 87740-0100	445-6016	445-2059	mesa@chevron.com
Montoya, Symantha	Secretary, Maxwell Cooperative Water Users Association	P.O. Box 207 Maxwell, NM 87728-0207	375-2349		
Nystul, Marlene	Maxwell Cooperative Water Users	RR1, Box 37 Maxwell, NM 87728	375-2869	445-3231	nystul@bacavalley.com
Quintana, Leroy	Mayor Village of Maxwell	P.O. Box 356 Maxwell, NM 87728-0356	375-2752	375-2753	
Rick, Steven	Councilor Village of Cimarron	P.O. Box 581 Cimarron, NM 87714	376-2449		

NRA = National Rifle Association
NRCS = Natural Resources Conservation Service
OSE = Office of the State Engineer
SWCD = Soil & Water Conservation District
NMED = New Mexico Environment Department

Colfax County Drought Initiation Contact List
Page 4 of 4

Name	Title/Affiliation	Address	Telephone Number	Fax Number	E-Mail Address
Ricklefs, Bob	Philmont Scout Ranch	RR 1, Box 35 Cimarron, NM 87714-9729	376-2281x211	376-2602	
Rivera, Mark	Village of Angel Fire	P.O. Box 536 Angel Fire, NM 87710-0610	377-3232	377-3280	markr@afgov.org
Roper, James T.	Chairman Raton Water Board	P.O. Box 638 Raton, NM 87740-0638	445-3652		
Sauble, Bill	NM Cattlegrowers	HC 62, Box 29 Maxwell, NM 87728-9601	375-2686	375-2681	circledot@bacavalley.com
Shubert, Karl		C.R. C-26 #81 Maxwell, NM 87728	375-2126		shubertkt@bacavalley.com
Sparks, Fred	Mayor City of Raton	P.O. Box 910 Raton, NM 87740-0910	445-5521		
Stafford, Julia Davis	CS Cattle Company	CS Ranch, RR 1, Box 62 Cimarron, NM 87714-9713	376-2827	376-2595	csranch@cimarron.springercoop.com
Trujillo, Kathy	Colfax County Administrator	P.O. Box 1498 Raton, NM 87740-1498	445-9661		
Walker, Charles	NRCS	245 Park Avenue Raton, NM 87740-3800	445-9571	445-4066	charles.walker@nrcs.usda.gov
Ward, Kevin	Angel Fire Resort	P.O. Drawer B Angel Fire, NM 87710	377-2778	377-4306	KWard@AngelFireResort.com

NRA = National Rifle Association
NRCS = Natural Resources Conservation Service
OSE = Office of the State Engineer
SWCD = Soil & Water Conservation District
NMED = New Mexico Environment Department

Attachment E1-3

New Mexico Drought Task Force

Drought Planning Group Members

NEW MEXICO DROUGHT TASK FORCE

MONITORING WORK GROUP

AGRICULTURAL IMPACT ASSESSMENT SUB-GROUP

DRINKING WATER, HEALTH AND ENERGY IMPACT ASSESSMENT SUB-GROUP

WILDLIFE AND WILDFIRE IMPACT ASSESSMENT SUB-GROUP

TOURISM AND ECONOMIC IMPACT ASSESSMENT SUB-GROUP

NEW MEXICO DROUGHT TASK FORCE				
NAME	**ADDRESS**	**TELEPHONE**	**FAX**	**E-MAIL**
Betty Rivera **Chair**	Energy, Minerals & Natural Resources Dept. 1220 South St Francis Drive Santa Fe, NM 87505	505-476-3200	505-476-3220	BRivera@state.nm.us
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Attachment E1-4

Public Outreach Materials and Resources

Available Print Materials on Drought and Water for the Home Business and Landscape (Non-Agricultural)

Drought Specific Print Materials

New Mexico Drought Plan
View at: http://weather.nmsu.edu/drought/drought_plan.htm

Office of the State Engineer Brochure
Drought: How Communities can Prepare for and Cope with Drought

To better meet their drinking water needs, communities can initiate certain actions and take advantage of assistance offered by New Mexico state government agencies.

Examples of Drought Plans from Other Locations in the West
Local Drought Response Information*, by the Drought Preparedness and Mitigation Working Group. Editor: Tom Phillips, United States Bureau of Reclamation*
Western Drought Coordination Council:
View at: http://enso.unl.edu/ndmc/mitigate/mitigate.htm

Designed to help municipal water suppliers compare different approaches to drought planning. Sample responses are described from twenty three locations. (74 pages).

Institutional adjustments for coping with prolonged and severe drought in the Rio Grande Basin Technical Completion Report 317 February, 2001
New Mexico Water Resources Research Institute, Texas Water Resources Institute, Colorado Water Resources Research Institute. February 2001. (~200 pages)
View at: http://wrri.nmsu.edu/publish/techrpt/tr317/downl.html

Basics of Drought Planning, National Drought Mitigation Center
View at: http://enso.unl.edu/ndmc/handbook/handbook.htm

Drought Management Planning
American Water Works Association
Available at: http://www.awwa.org/

General Water Conservation Print Materials

Many print materials are available for distribution at low or no cost. Some materials can be viewed on web sites.

The Office of State Engineer has a number of materials available. Some of these materials can be viewed on-line at http://www.seo.state.nm.us/water-info/conservation/h2o-outreach.html or may be requested by mail by calling 1-800-WATERNM. Send email requests to: waternm@seo.state.nm.us. Documents include program planning guides and manuals, plumbing retrofit information, landscaping guides and reference books, federal and state policies and laws, and public information materials. A sample copy of these materials from the OSE Water Use and Conservation Bureau are provided with the Master Copy of this Water Plan. A list of available brochures and manuals follow:

Materials available from the New Mexico Office of the State Engineer

- *Don't Waste a Drop: Finding, Fixing and Preventing Indoor Water Leaks*
  Provides basic information about some of the most common household water leaks, practical information about how to make simple repairs, and preventative maintenance tips to help reduction of water waste.
- *Agua Action*
  A colorful brochure/poster with residential indoor and outdoor water conservation tips
- *The Enchanted Xeriscape*
  Four-color introductory brochure/poster on water conserving landscaping
- *Xeriscape 101*
  A brochure outlining a 5-step process for converting a traditional landscape to a xeriscape, discusses a three-year plan for a landscape conversion, and provides tips on maintenance and irrigation.
- *Lean & Green*
  A brochure on water-wise lawn care, including maintenance tips and alternative grasses describes water-wise grasses, explains the catch-can test, and provides sprinkler maintenance, mowing, fertilizing and watering tips for a green, yet water efficient lawn.
- *Irrigation Basics*
  A brochure that describes the kinds of irrigation systems that best fit different home landscape situations, illustrates the components of efficient systems, and includes an irrigation system maintenance checklist.
- *Drought: How Communities can Prepare for and Cope with Drought*
  To better meet their drinking water needs, communities can initiate certain actions and take advantage of assistance offered by New Mexico state government agencies.

Materials published by the City of Albuquerque, but available statewide

- *The Complete How To Guide to Xeriscape*
  Contains full-color photographs of many xeric plants and details about all seven principals of xeriscape.
- *Rainwater Harvesting, Supply from the Sky*
  Details the capture, diversion, and storage of rainwater for landscape purposes.
- *Low Volume Irrigation Design and Installation Guide*
  Published by the City of Albuquerque, but available statewide; a step-by step approach to designing and installing low-volume irrigation systems for residential and commercial applications.

Other Publications

- *How to Save Water at Home* Published by the City of Albuquerque
  A step-by-step manual with practical do-it-yourself tips on how to save water in and around the home (84 pages).

- *A Water Conservation Guide for Public Utilities* Published by the NM OSE

  The guide discusses the importance of water conservation and outlines a step-by-step process that a municipal water supplier should take in preparing a water conservation program. It details actions such as: a water demand analysis, creating a water conservation education program, and developing a drought contingency plan. Includes eight New Mexico case studies. 197 pages.

- *A Water Conservation Guide for Commercial, Institutional and Industrial Users*
  Published by the NM OSE

  The guide discusses the importance of water conservation and outlines a step-by-step process for conducting a water conservation audit and preparing a water conservation plan for a commercial, institutional or industrial facility. It also includes guidelines for implementing conservation measures for indoor and domestic water use, landscaping, heating and cooling, and specific processes and industries. Case studies of New Mexico facilities which have successfully implemented conservation programs are highlighted and include statistics on the water savings achieved.

- *Analysis of Potential Water Conservation Incentives for New Mexico*

  Published by the NM OSE

  Examination of current water laws and policies to identify opportunities for implementing conservation incentives.

- The NM OSE holds a water conservation information clearinghouse of approximately 2,000 conservation documents from across the United States has been established. Documents include program planning guides and manuals, plumbing retrofit information, landscaping guides and reference books, federal and state policies and laws, and public information materials. For further information on a specific water conservation topic e-mail waternm@seo.state.nm.us or call 1-800-WATERNM.

The American Water Works Association has numerous publications available on Drought Planning and Water Conservation. Publications and information are available on their website at www.awwa.org. Of special interest are the following items available at this website:

www.h2ouse.org
A new website that walks the user through a home and provides information and water saving options. Developed by the California Urban Water Conservation Council.

www.waterwiser.org has a drip calculator to estimate water wasted through drips and leakage.

Bill Stuffers

These prepared bill stuffers have been prepared for use by any utility or water supplier by the American Water Works Association (AWWA). A free sample of these bill stuffers is provided in the Master Copy of the Plan. The brochures can be ordered from AWWA customer service at 1-800-926-7337. Most bill stuffers have the following cost per quantity: 32 – 1000 copies cost $0.29/each (e.g. 1,000 copies for $290); 1,001-5,000 copies cost $0.26/each (e.g. $1,300 for 5000); and 5001+ copies cost $0.21 each. See http://www.awwa.org/Communications/offer/conservation.cfm

Water Conservation at Home
This 13-page booklet gives consumers detailed guidelines on how to save water by monitoring toilets, showers, dishwashers, washing machines, and leaky faucets.

25 Things You Can Do to Prevent Water Waste
Nine in the bathroom, six in the kitchen, and laundry room, and ten outside: a total 25 things everyone can do to keep from wasting water.

Five Basic Ways
Give your consumers detailed descriptions of five easy ways to save water.

55 Facts, Figures & Follies of Water Conservation
This colorful bill stuffer folds out to 9" x 23" and gives your customer 55 ways they can use water more efficiently.

Conservation Slide Rule
A clever "sliding" device delivers conservation tips for inside your home and outside in your yard.

Water Saving Tips for Kids
Water saving Tips for kids written by kids.

A Consumer's Guide to Water Conservation: The Inside Story
Advice on the best ways to cause a noticeable change in monthly water consumption.

A Consumer's Guide to Water Conservation: The Outside Story

A concise guide to being water-wise outside the home including, effective watering and Xeriscaping.

Good Soil for Effective Water

Your customers will become familiar with their type of soil and how to maximize its properties for optimum water use and long-lasting lawns or gardens.

Kid's Stuff

Conserve Water Stickers

This sheet of seven vivid stickers are fun and display water-smart sayings.

Tips for Water Conservation Book Covers

Water Conservation Starts With Your Book Covers

Available Print Materials on Drought Mitigation for Agriculture and Livestock

Sample of Publications and Information Available through Federal Agencies

Natural Resources Conservation Service, National Water Management Center Briefing Sheet: NWMC Irrigation Water Management Activities - Irrigation Water Management Software
See website at: http://wmc.ar.nrcs.usda.gov/brfng-shts.dir/irrigation.html

Sample of Publications and Information Available through New Mexico Agencies

Cow-Calf Drought Information

Excerpts on file of the *Cow-Calf Management Guide*, *Second Edition,* Cattle Producer's Library – a collaborative effort by Western states cooperative extension system effort (Copies on File from NM Cooperative Extension Service Bernalillo County):

CL1100 Calf Management During Drought 1993
CL1110 Tips for Dealing with Drought in Range 1993
CL1120 Emergency Rations for Wintering Beef Cows 1996
CL1130 Beef Cattle Feed Management During a Drought 1993
CL1140 Substituting Grain for Hay 1993
CL1150 One Method of Ammoniated Straw for Beef Cattle 1994
CL1160 Feeding Value of Lightweight Barley 1993
CL1170 Nitrates in Livestock Feeding: A Particular Problem in Drought Conditions 1993
CL1180 Tax Implications of Drought Sales of Livestock 1993

Cooperative Extension Service, Las Cruces, New Mexico
"Ranching and Drought" (1-page)
"Livestock Specialist Compiles Checklist for Meeting Drouth", *Livestock Weekly* article July 21, 1988

New Mexico State University College of Agriculture and Home Economics Publications See: http://cahe.nmsu.edu/pubs/_b/

Livestock & Range Publication Listing

B-217: Beef Cow Efficiency in the Southwest
MEMOIR SERIES #1: Supplemental Feeding of Range Cattle
Circular 564 Protein and Energy Supplementation to Beef Cows Grazing New Mexico Rangelands
Chomping on Cholla Could Keep Cows Alive During Drought , October 24, 1996

Agronomy Publication Listing

A-102: Measuring Irrigation Water With a Flow Meter
A-103: Measuring Irrigation Water With a Parshall Flume
A-104: Estimating Water Flow From Pipes
A-119: Design Considerations for Drip Irrigation

Seminars provided by New Mexico State University's Cooperative Extension Service for Ranchers in 1996 Ron Parker, (505) 646-1709.
See: rparker@nmsu.edu.

Seminars covered how, under drought conditions, ranchers should evaluate supplemental feeds, evaluate and manage ranges, and manage alternatives for maintaining reproductive performance in cow herds. Other topics included the livestock market outlook, discussion of U.S. Department of Agriculture assistance programs, and tax management information for ranchers forced to liquidate all or part of their assets.

Information of Publications Available through California Agencies

State of California Department of Water Resources
Division of Planning and Local Assistance, Central District
See: http://wwwdla.water.ca.gov/cd/energytips.html

Reproductions of Selected Drought Tips Available on Website:

- Drought-Related Toxicoses in Cattle
- Leaching
- Water Quality Guidelines for Vegetable and Row Crops
- Water Quality Guidelines for Trees and Vines
- Water Balance Irrigation Scheduling Using CIMIS ET
- Furrow Irrigation
- Sprinkler Irrigation
- Irrigation Water Management Made Simple
- Assessing Water Quality for Livestock Under Drought Conditions
- Reclaiming Sodic and Saline/Sodic Soils
- Citrus Irrigation Scheduling During a Drought
- Drought Tactics for Apricots
- Field Use of Tensiometers
- Deciding How Much to Plant During a Drought
- Central Coast Crop Coefficients for Field and Vegetable Crops
- Irrigating Up Crops Efficiently With Sprinklers
- How Much Water Are You Applying with Your Low Volume Irrigation System?

Other Publications:
California's Response to Drought, 1996; Chester Bowling, United States Bureau of Reclamation; Scott Jercich, California Department of Water Resources
Preparing for California's Next Drought: Changes Since 1987-92. July, 2000, CA Department of Water Resources

State Drought Water Bank,November1993
Water Conservation Guidebook no. 6, Agricultural Drought Guidebook, June 1988
Water Conservation Guidebook no. 7, Urban Drought Guidebook, March 1988
Water Transfers in California: Translating Concept into Reality, November 1993

Sample of Publications Available through Texas Agencies

Texas Agricultural Extension Service and Texas Agricultural Experiment Station

The faculty of The Texas Agricultural Extension Service and Texas Agricultural Experiment Station developed a website to provide information and alternatives that might reduce further losses to the agricultural industry.
See: http://agnews.tamu.edu/drought/

TEXAS DROUGHT MANAGEMENT STRATEGIES Summer 1998
View at: http://agnews.tamu.edu/drought/drghtpak98/drght6.html

Range Science Information - Texas A&M Department of Rangeland Ecology and Management
Texas Forest Service
Drought Information - Texas Water Development Board
Texas Natural Resource Conservation Commission's Drought Page
Texas Drought Severity Index Map
Texas Water Resources Institute, Texas Agricultural Experiment Station
Why Droughts Plague Texas (TWRI Newsletter)
National Crop Moisture
National Temperatures

Helping landscapes through a drought, - Texas A&M University Horticultural Sciences Department

Texas Water Development Board: Agricultural Water Conservation
See: http://www.twdb.state.tx.us/assistance/conservation/agricons.htm

> The potential benefit of water conservation is most dramatically demonstrated in on-farm irrigation. While canal lining and other improvements to agricultural water transmission systems (which in some cases now lose one-third to one-half of water pumped due to leaks, seepage, and evapotranspiration) can avoid substantial water loss, the biggest water savings in the agricultural sector in the forseeable future will be achieved through the application of five major on-farm irrigation water conservation practices. These five practices include: (1) Low Energy Precision Application (LEPA) sprinklers, (2) surge flow furrow irrigation valves, (3) drip irrigation, (4) soil moisture measurement, and (5) the use of on-farm underground water distribution pipelines.

Annual On-farm Irrigation Water Use Estimates for all Counties in Texas.
See http://www.twdb.state.tx.us/assistance/conservation/ASPApps/annsurveyproc.asp
Data available for the years 1985 through 1999:
Crop Acres by County
Crop Acres by Crop

Crop Water Use by County
Crop Water Use by Crop

Sample of Publications Available through Wisconsin Agencies

The Disaster Handbook for Extension Agents, University of Wisconsin-Extension Cooperative Extension

Sample of Publications Available through North Dakota Agencies

Extension Service Coping with Droughts web site at
http://www.ag.ndsu.nodak.edu/drought/

Alternative Crops During A Drought

Sample Information Available through North Carolina Agencies

The North Carolina Cooperative Extension Service maintains a collection of drought fact sheets for agricultural producers.
View at: http://www.ces.ncsu.edu/drought/crop.html

Business & Finances

DRO-06 Drought Survival Strategies
DRO-07 Drought Sales of Timber
DRO-08 Drought-Related Income Tax Considerations
DRO-09 Financial Tips for Coping with Drought
DRO-10 Analysis of the MPCI Purchase Decision (Acrobat format)
DRO-11 Harvest Droughty Corn for Grain or Sell It for Silage?

Animals & Forage

DRO-25 Drought Management on North Carolina Cow-Calf Farms
DRO-26 Pasture Carrying Capacities in Times of Drought
DRO-28 Alternative Feeds for Beef Cattle
DRO-49 Deep Stacking Broiler Litter as a Feed for Beef Cattle

Crop Strategies

DRO-13 Drought Advisory for Vegetable Production
DRO-14 Drought Advisories for Small Fruits and Grapes
DRO-15 Federal Financial Support for Reestablishing Drought-Killed Forest Tree Plantings
DRO-16 Offsetting Drought for Small-Scale Vegetable Production
DRO-18 Managing Drought on Nursery Crops
DRO-19 Impact of Drought on Weed Management
DRO-21 Forest Management Strategies to Minimize Drought Damage
DRO-23 Drought Assistance for Tree Fruit Production
DRO-30 Drought Advisory for Corn Production (Acrobat format)

The remainder of this appendix is available in hard copies of the *Colfax Regional Water Plan*

Attachment E2

Drought Indices
Calculation Methods and
Applicability to Colfax County

Attachment E2. Drought Indices Methodology and Applicability to Colfax County

E2.1 Palmer Drought Severity Index

E2.1.1 Methodology

Soil moisture storage and loss terms are evaluated for two soil layers (surface and underlying). Water storage is assumed to equal 25 millimeters for the surface layer, and the underlying layer has an available water content (*AWC*) that depends on the soil characteristics of the site. Potential evapotranspiration (*PE*) is computed by the Thornwaite method (Thornwaite, 1948), and evapotranspiration (*ET*) losses from the soil are assumed to occur when *PE* is greater than precipitation (*P*) for the month. Soil moisture loss (*L*) is assumed to occur at the potential rate. Potential loss (*PL*) is defined as the amount of soil moisture loss to *ET* if *P* is zero during the month. When *P* is greater than *PE*, recharge (*R*) is assumed to occur. Potential recharge (*PR*) is defined as the amount of moisture required for the soil to reach its *AWC*. Runoff (*RO*) is assumed to occur when *P* is greater than *AWC*, and potential runoff (*PRO*) is defined as *AWC* minus *PR*. The difference (*d*) between actual precipitation and the climatically appropriate precipitation for existing conditions is determined by the following equation:

$$d = P - (\alpha PE + \beta PR + \gamma PRO - \delta PL)$$

where $\alpha = ET_{avg}/PE_{avg}$

$\beta = R_{avg}/PR_{avg}$

$\gamma = RO_{avg}/PRO_{avg}$

$\delta = L_{avg}/PL_{avg}$ using average values for the month

The term inside the parentheses in this equation is the water balance expression. A moisture anomaly index (*Z*) is computed by:

$$Z = K\,d$$

in which the weighting factor (K) is determined by:

$$K = \frac{17.67\ K_{avg}}{\sum_{i=1}^{12} D_i \text{ x } K_{avg}}$$

where $$K_{avg} = 1.5 \log_{10}\left(\frac{[(PE_{avg} + R_{avg} + RO_{avg})/(P_{avg} + L_{avg})] + 2.8}{D_i}\right) + 0.50$$

and where D_i = the average of the absolute values of d for the month i.

The weighting factor allows the index to have a comparable significance from location to location. Drought severity (X_i) for the ith month of a drought is determined as the sum of the values of the following formula for each month of the drought:

$$X = Z/(2.691 + 0.309i)$$

The PDSI for the ith month is then computed from the drought severity for the previous month (X_{i-1}) and the moisture anomaly for the current month (Z_i) by the formula (Alley, 1984):

$$PDSI = 0.897X_{i-1} + Z_i/3.$$

E2.1.2 Applicability to Colfax County

The applicability of the PDSI to the assessment of drought conditions in Colfax County was evaluated by comparing monthly values of the index computed for New Mexico Climate Division 2 (Northern Mountains Division) to annual total streamflow for the period from 1950 through 1999 (Figure B-1). A qualitative visual assessment of the correlation between the PDSI and annual total streamflow indicates a reasonably strong similarity in the patterns of variation, with high streamflows occurring during periods with high positive PDSI values and low streamflows occurring during periods with low PDSI values.

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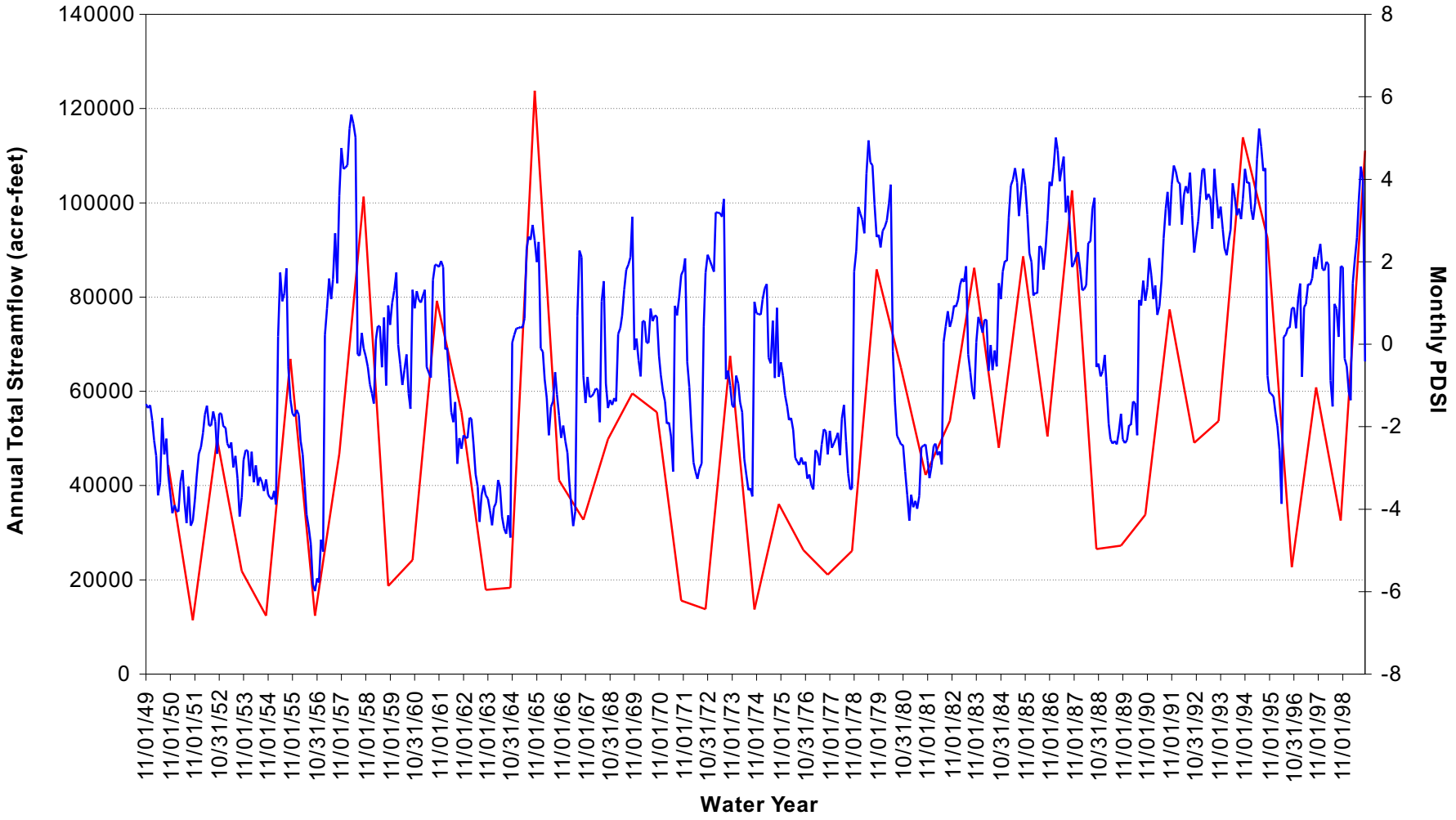

Annual total streamflow = Sum of river yields above Canadian River nr Taylor Springs, including Rayado Creek at Sauble Ranch, Cimarron River blw Eagle Nest Dam, Ponil Creek nr Cimarron, Vermejo River nr Dawson, Canadian River nr Hebron, and change in storage at Eagle Nest Lake.

Explanation

Streamflow

PDSI

Figure E2-1

COLFAX REGIONAL WATER PLAN

Annual Total Streamflow and Monthly Palmer Drought Severity Index for New Mexico Climate Division 2 (Northern Mountains)

Daniel B. Stephens & Associates, Inc.

3-18-03

JN 9417

In order to more directly compare the PDSI and annual total streamflow (based on streamflow from key gages on the Rayado, Cimarron, Ponil, Vermejo, and Canadian Rivers), the annual average PDSI values for this period were determined based on the Vermejo at Dawson and Cimarron (corrected for Eagle Nest releases) gages. A bivariate plot of these data was then produced and a linear regression was performed to quantify the correlation (Figure B-2). The regression generated an R^2 value of 0.512, which yields a correlation coefficient (R) of 0.716, indicating a fair but imperfect correlation between the two parameters. The t-test value for the regression was 7.10. This value exceeds the critical t value of 1.68 for a 95 percent confidence interval, indicating the validity of the correlation.

E2.2Surface Water Supply Index

E2.2.1 Methodology

The four parameters incorporated in the SWSI are snowpack, streamflow, precipitation, and reservoir storage. During the winter only snowpack, precipitation, and reservoir storage are used to compute the index, while streamflow replaces snowpack during the summer. Typically determined on a monthly basis, each parameter value is normalized (divided by the long-term average), and its probability of non-exceedance is determined by frequency analysis. Each term's probability of non-exceedance is multiplied by a weighting factor that accounts for the proportional contribution of each component to the surface water in a particular basin. The sum of the weighted components is centered on zero (by subtracting 50 percent) and divided by 12 to compress the scale to a range of minus 4.2 to plus 4.2, similar to the PDSI. The equation used to calculate the SWSI is (Shafer and Dezman, 1982):

$$SWSI = [(a \times PN_{SP}) + (b \times PN_{PCP}) + (c \times PN_{RS}) - 50]/12$$

where: PN = probability of non-exceedance (%)

SP = snowpack

PCP = precipitation

RS = reservoir storage

a, b, c = weights for each component where $a + b + c = 1$

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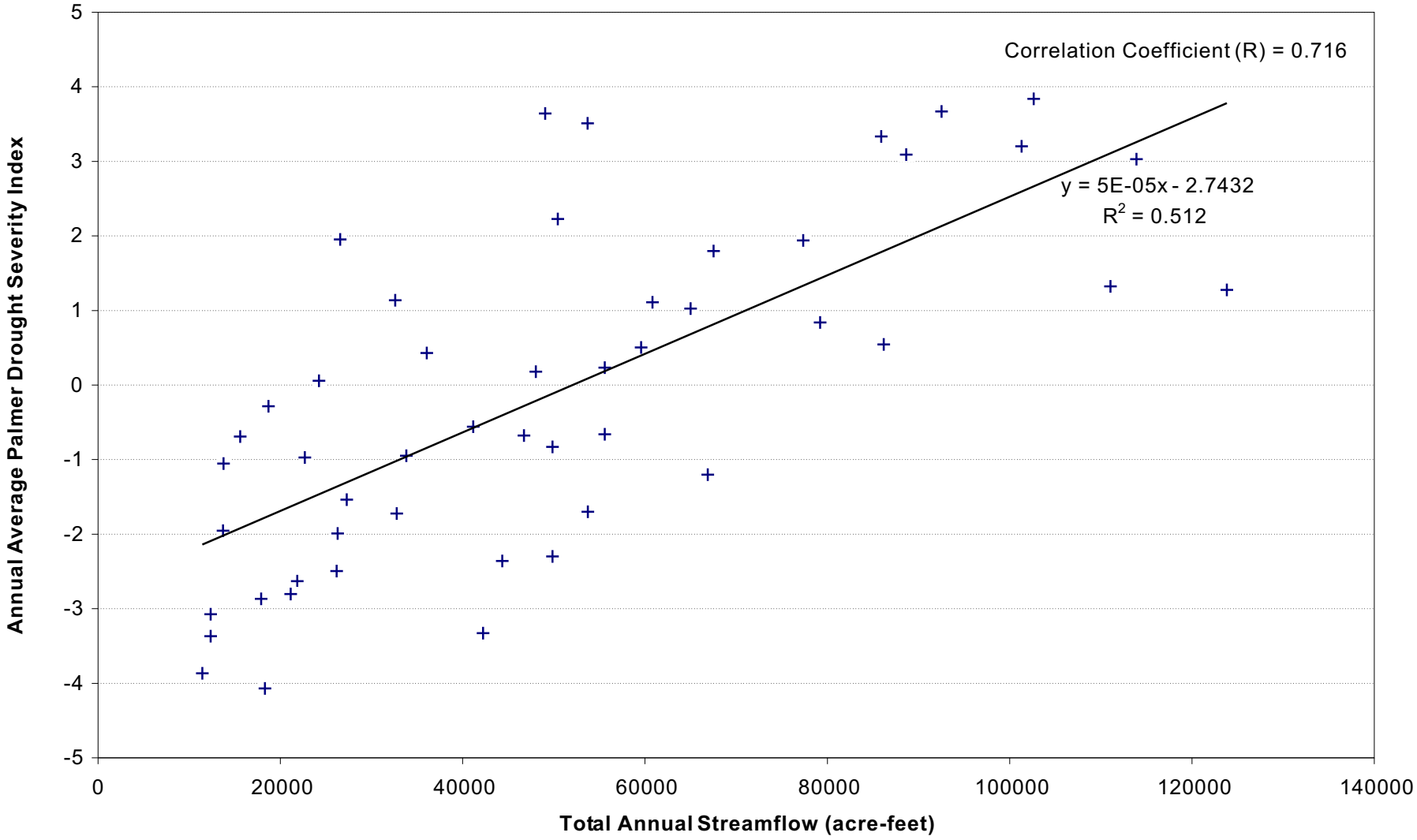

Figure E2-2

COLFAX REGIONAL WATER PLAN

1950-1999 New Mexico Climate Division 2 Annual Average PDSI and Total Annual Streamflow Correlation

Daniel B. Stephens & Associates, Inc.
6-18-02
JN 9417

During the summer, streamflow (PN_{SF}) replaces the snowpack component (PN_{SP}) in the equation.

E2.2.2 Applicability to Colfax County

The applicability of the SWSI to the assessment of drought impacts to surface water supplies in Colfax County was evaluated by comparing monthly values of the index computed by the NRCS for the Canadian River Basin to annual total streamflow for the period from 1995 through 2001. Plots of these data are shown in Figure B-3. At no time during the evaluated period did the Canadian River SWSI computed by the NRCS indicate that drought conditions existed (values of −1 or less). The ability of the reported SWSI numbers to forecast improving or diminishing streamflow conditions in advance appeared to be reasonably good in 1995 and 1997, but much less effective in the other evaluated years, based on the trends seen in Figure B-3. Correlation deficiencies for Colfax County streamflow are due to the fact that the Canadian River Basin SWSI values provided by the NRCS include Conchas Reservoir storage (located downstream of Colfax County). The NRCS is planning to modify the Canadian River SWSI to exclude the Conchas Reservoir term to better represent surface water supplies in the Colfax County region. When this new procedure is implemented, the Canadian River SWSI, as modified, can be used as a more accurate drought trigger for the Colfax drought plan during the months when the NRCS SWSI data are available.

E2.3 Standardized Precipitation Index

E2.3.1 Methodology

In technical terms, for a historical precipitation record, the SPI represents the number of standard deviations away from the mean for an equivalent normal distribution with a mean of zero and standard deviation of one. To compute the index, a standard theoretical probability distribution is fitted to a long-term time series of precipitation measurements. The gamma distribution function was applied for this purpose in the initial development of the index (Edwards and McKee, 1997), but later research determined that the Pearson Type III distribution provided the best fit (Guttman, 1999). One or more time period durations are

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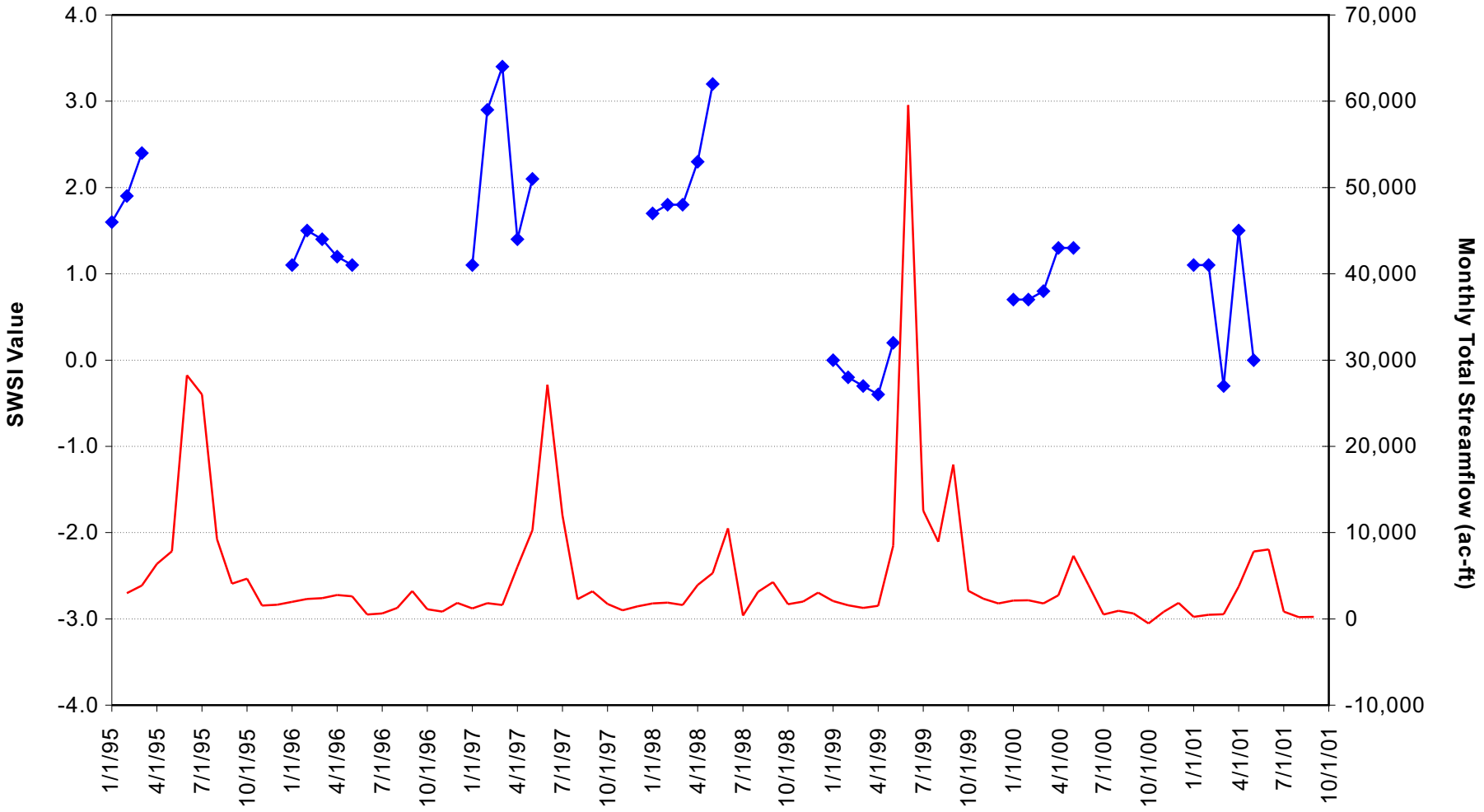

Note: Combined streamflow = summed monthly yields for the Vermejo River near Dawson, Ponil Creek near Cimarron, Rayado Creek at Sauble Ranch, and Cimarron River near Cimarron gages plus change in storage at Eagle Nest Lake.

SWSI

Combined streamflow

Figure E2-3

COLFAX REGIONAL WATER PLAN

Canadian River Basin Surface Water Supply Index and Combined Streamflow

Daniel B. Stephens & Associates, Inc.

6-18-02

JN 9417

selected for analysis. The duration defines a running series of total precipitation for that period over the entire precipitation record (for example, 1-month, 2-months, 6-months, 1-year, etc). After the probability function is defined, the cumulative probability of an observed precipitation amount is computed. The inverse normal (Gaussian) distribution function with a mean of zero and variance of one is then applied to the cumulative probability (Guttman, 1999). This results in an average SPI of zero for the location and selected time period. Positive SPI values indicate greater than average precipitation, and negative SPI values indicate less than average precipitation over the selected time period.

E2.3.2 Applicability to Colfax County

A site-specific SPI can easily be determined for any single precipitation station with a record of at least 40 to 50 years, permitting evaluation of varying drought conditions for smaller areas than the regional data posted by the WRCC. A FORTRAN computer code was developed by Guttman (1999) to calculate the SPI at any time scale. DBS&A has compiled this code as a DOS-based executable program that runs on a personal computer. This program was used to determine monthly site-specific 6-month SPI values through February 2002 for eight precipitation stations in Colfax County. The files needed to compute the SPI for the eight climate stations are included on a disk provided to the Colfax Soil and Water Conservation District (and available to others upon request) and include:

- spicomp.exe: The DOS-based executable program file.
- spicomp.for: The original FORTRAN code.
- specs.dat: An example control file with explanatory text for each parameter.
- abbotspi.dat, blackspi.dat, cimarspi.dat, eanstspi.dat, maloyspi.dat, maxwlspi.dat, ratonspi.dat, sprgrspi.dat: The precipitation data input files for each station (complete monthly records current through February 2002).

- abbotspi.in, blackspi.in, cimarspi.in, eanstspi.in, maloyspi.in, maxwlspi.in, ratonspi.in, sprgrspi.in: The program control files for each station.

- spireadme.txt: Program documentation.

The monthly precipitation records subsequent to February 2002 will have to be acquired for each station and used to update the data input files prior to running the program. The data input files can then be updated on a monthly basis to calculate new SPI values. Historical and current precipitation records for each station can be obtained from NOAA's National Climatic Data Center website at http://lwf.ncdc.noaa.gov/oa/ncdc.html.

References

Alley, W.M. 1984. The Palmer Drought Severity Index: Limitations and assumptions. *Journal of Climate and Applied Meteorology* 23:1100-1109.

Edwards, D.C. and T.B. McKee. 1997. *Characteristics of 20th century drought in the United States at multiple time scales.* Colorado State University Climatology Report No. 97-2, Department of Atmospheric Science Paper No. 634. Fort Collins, Colorado.

Guttman, N.B. 1999. Accepting the Standardized Precipitation Index: A calculation algorithm. *Journal of the American Water Resources Association* 35(2):311-322.

Shafer, B.A. and L.E. Dezman. 1982. Development of a Surface Water Supply Index (SWSI) to assess the severity of drought conditions in snowpack runoff areas. pp. 164-175 *In Proceedings of the Western Snow Conference*.

Thornwaite, C.W. 1948. An approach toward a rational classification of climate. *Geography Review* 38:55-94.

Attachment E3

Municipal Drought-Related Ordinances

Attachment E3-1

Village of Angel Fire

VILLAGE OF ANGEL FIRE

WATER CONSERVATION ORDINANCE
2001-06

ARTICLE 1. PURPOSE

The purpose of this ordinance is to ensure that the Village water system always has a sufficient volume of water to meet requirements for fire protection and other commercial and domestic water needs for public health, safety, and welfare.

ARTICLE 2. RESTRICTION OR PROHIBITION OF USE

Whenever an emergency exists by reason of a shortage of water due to inadequate supply, limited treatment of distribution capacity or failure of equipment or materials; and that the Village's water system is unable to or will within thirty (30) days become unable to supply the full commercial and domestic needs of the users thereof, including adequate fire protection as determined by the Water Department; the Governing Body is authorized to restrict or prohibit the use of the water from the Village's water system by emergency proclamation.

ARTICLE 3. EMERGENCY PROCLAMATION

Upon the determination that a water shortage emergency exists, the Governing Body shall issue a proclamation declaring the emergency and setting out with an order restricting use of water from the Village system. Depending on the severity and duration of the water shortage; restrictions and prohibitions shall be tiered on four levels:

LEVEL ONE, GREEN FLAG. Water levels are marginally adequate, but without voluntary measures, are anticipated to drop below the critical level.

LEVEL TWO, BLUE FLAG.

1) Two days per week outdoor watering restrictions. Odd street addresses are allowed outdoor watering on Wednesdays and Saturdays; even street addresses are allowed outdoor watering on Thursdays and Sundays. Outdoors watering on designated days shall only be allowed between the hours of 6 and 10 a.m. and 6 and 10 p.m.
2) Planting of new sod or turf is not recommended.
3) The filling of hot tubs is not recommended.
4) Water is not allowed to run unattended or to run off property in a wasteful manner.

5) Cleaning of outdoor hard surfaces (streets, driveways, sidewalks, buildings) is prohibited.
6) Vehicle washing is discouraged and prohibited for fund raising events.

LEVEL THREE, YELLOW FLAG.

1) One day per week permitted outdoor watering restrictions. Odd street addresses are allowed outdoor watering on Saturdays and even street addresses are allowed outdoor watering on Sundays. Outdoors watering on designated days shall only be allowed between the hours of 6 and 10 a.m. and 6 and 10 p.m.
2) The planting of all new outdoor landscaping is prohibited.
3) The filling of hot tubs is not recommended.
4) Water is not allowed to run unattended or to run off property in a wasteful manner.
5) Cleaning of outdoor hard surfaces (streets, driveways, sidewalks, buildings) is prohibited.
6) Vehicle washing is prohibited.

LEVEL FOUR, RED FLAG.

1) All outdoor uses of water is prohibited.
2) The planting of all new outdoor landscaping is prohibited.
3) Residents and visitors are requested to curtail as much indoor water use as possible.
4) The filling of uncovered earthen water storage reservoirs and similar facilities is prohibited.

ARTICLE 4. PUBLICATION AND POSTING PROCLAMATION; PROCEDURES AND DURATION.

A. The proclamation required by Article 2 of this ordinance shall be published in a newspaper of general circulation in the Village or, if there is no such newspaper in which the proclamation may be published within twenty-four (24) hours after the emergency arises, publication shall be by posting a copy of the proclamation in seven (7) prominent places in the Village and publish as soon as possible in a newspaper of general circulation in the Village of Angel Fire. The emergency shall be in full force and effect upon publication. Substantial compliance with this article is sufficient to effect the emergency.

B. Subsequent to initial posting of proclamation, the specific level of the emergency shall be posted daily in front of the Village Hall at 3388 Hwy 434 by use of a colored flag corresponding to the level of the emergency as described in Article 3.

C. Length of Emergency situation. A duly proclaimed emergency shall continue and terms of the proclamation shall be in force until such time as the Governing Body shall cause to be published a proclamation that the emergency has ended.

ARTICLE 5. NON-EMERGENCY WATER CONSERVATION MEASURES

A. All new residential construction, remodeling, and fixture & appliance replacement shall meet the following requirements;

1). Low-flow toilets – 1.6 gallons/flush or less
2). Low-flow shower heads – 2.5 gallons per minute (gpm) flow or less
3). Low-flow faucets.
4). Automatic dishwashers using less than 13 gal/cycle or less.
5). Cut-off valves for showerheads.
6). Kitchen faucet aerator shut-offs, or steam/spray aerators.
7). Low-flow clothes washing machines; no more than 43 gallons in regular cycle, and reduced water level adjustments for reduced loads.

B. All new commercial construction, remodeling, and fixture & appliance replacement have the same requirements as residential where applicable, along with the following requirements:

1). Public restroom faucets shall be limited to 2.5 gpm flow or less
2). Automatic shut-off valve for public restroom faucets.
3). Public showers shall be equipped with self-closing valves.
4). Recirculating lines on hot water lines with over 100 feet development length between heater and fixture.
5). Automatic flush valves (flushometers)
6). Submittal of a water conservation plan for uses other than bathrooms.

C. All defective plumbing shall be repaired and subsequently maintained in good working order.

D. The information in this section, article 5, will be provided to all contractors and real estate offices for delivery to new owners.

ARTICLE 6. EXEMPTIONS

The provisions of this ordinance shall not apply to those businesses and industries declared by resolution of the Village to be necessary for the public health, safety, and welfare.

ARTICLE 7. DEFINITIONS

Cleaning outdoor hard surfaces: The washing of sidewalks, driveways, filling station aprons, porches and other outdoor surfaces.

Defective Plumbing: The escape of water through defective plumbing, which shall mean the knowing permission for defective plumbing to remain out of repair.

Outdoor Watering: The sprinkling, watering or irrigating of shrubbery, trees, lawns, grass, ground covers, plants, vines, gardens, flowers or any other vegetation.

ARTICLE 8. VIOLATION; PENALTY

A. Any person who in any manner, directly or indirectly violates or permits others under his supervision, custody or control to violate any term of a duly published proclamation shall be guilty of a misdemeanor. Each separate day of water use in violation of such proclamation shall constitute a separate offense and each separate offense and each separate prohibited use on the same day shall constitute a separate offense.

B. First violation will receive a warning.
Second violation will receive a citation with a fine up to, but not more than $25.00.
Third and subsequent violations will receive a citation with a fine up to, but not more than $500.00.

After approval by the Village Council this Ordinance shall become effective five days after publication.

PASSED, APPROVED AND ADOPTED BY THE VILLAGE COUNCIL OF ANGEL FIRE, NEW MEXICO, THIS 19th day of July 2001.

_____
Alvin L. Clanton, Governing Body

ATTEST:

_____
Lisa Sanchez, Village Clerk

Attachment E3-2

Town of Springer

TOWN OF SPRINGER ORDINANCE NO. 331

EMERGENCY WATER MANAGEMENT

AN ORDINANCE TO PROVIDE THE TOWN THE MEANS TO IMPLEMENT MEASURES FOR CONTROLLING WATER USE IN RESPONSE TO WATER-SYSTEM RELATED EMERGENCIES OR CATASTROPHIC EVENTS THAT MAY DISRUPT SYSTEM OPERATIONS; ESTABLISHING A TOWN OF SPRINGER EMERGENCY MANAGEMENT PLAN THAT WILL APPLY TO ALL CUSTOMERS OF THE TOWN'S WATER SYSTEM; AUTHORIZING FUTURE ACTIONS IN RESPONSE TO WATER SHORTAGES; PROVIDING FOR POSSIBLE PENALITIES.

Be it ordained by the Governing Body, the Town Council of the Town of Springer, New Mexico that:

Section 1. Declaration of Policy

It is hereby declared that, because of conditions prevailing in the Town of Springer, the general welfare requires that the Town maximize the beneficial use of its available water resources to the extent to which it is capable, and that the waste or unreasonable use of water should be prohibited and the conservation of such water is to be required with a view to the reasonable and beneficial use thereof in the interest of the citizens of the Town of Springer and for the public health, safety and welfare.

The Governing Body may find and determine that a water service emergency exists based upon the occurrence of one or more of the following conditions:

A) A general water supply shortage due to increased demand or limited supply.

B) Distribution or storage facilities of the Town water utility are inadequate to meet demand or minimum quality standards.

C) A disruption of the supply, storage, and distribution facilities of the Town water utility occurs.

Section 2. Authorization

A) The Governing Body of the Town of Springer is authorized to determine and declare that a water emergency exists in any and/or all parts of the Town or area that is served by the municipal water system, and upon such determination, to promulgate such regulations, rules and conditions relative to the time of using water, the purpose or purposes for which it may be used and such other necessary limitations as will, in the discretion of the Governing Body relieve the water shortage in any such section or sections of the water service area.

B) The Governing Body, or its designee, following public notice, is hereby authorized and directed to implement the water emergency management plan through the applicable provisions of this section, upon the Governing Body's determination that such implementation is necessary under the following conditions:

1) In the event of an unforeseeable disaster or water emergency such as an earthquake, or other catastrophic event affecting the Town of Springer's water supply, the Governing Body shall authorize implementation of a water emergency plan. Public notice will follow enactment of said provision.

2) In the event of a foreseeable water emergency, such as extended drought conditions, the Governing Body or its designee, shall be authorized to implement the applicable provisions of this ordinance, upon public notice.

Section 3. Application

The provisions of this ordinance shall apply to all persons, customers and property served by the Town water utility wherever situated. During the time the emergency water management plan is in place, all individuals within the corporate limits of the Town of Springer using private domestic wells for watering shall post notification that watering is from a private well.

Section 4. When an Emergency Water Management Plan is Adopted by the Governing Body

No customer of the Town of Springer water utility shall make, cause, use or permit the use of water from the Town for residential, commercial, agricultural, governmental or any other purpose in a manner contrary to any provision of this section, or in an amount in excess of that use permitted by the following water emergency management plan or other plan which is in effect pursuant to action taken by the Town Governing Body. In the event that any person or entity willfully violates any provision listed in the emergency water management plan when the plan has been enacted, such person or entity will receive a citation from the Springer Police Department, with the fine to be determined by the Municipal Court.

At no time shall water be used unreasonably. Unreasonable use of water shall include, but are not limited to the following practices:

A) A customer shall not let water leave the customer's property by drainage onto adjacent properties or public or private roadways or streets due to excessive irrigation and/or uncorrected leaks.

B) A customer will not fail to repair a water leak upon initial notification.

C) A customer will not use water to wash down sidewalks, driveways, parking areas, patios or other paved areas, except to alleviate immediate safety or sanitation hazards.

D) Upon implementation by the Governing Body and publication of notice, the following measures shall apply except when reclaimed water is used:

1) **6,000 gallon maximum** water use per residence per billing month, with the following case-by-case exceptions, appeals to be made formally, in writing, to the Mayor and Board of Trustees and reviewed at a regular council meeting.

- Residences with 6 or more people in the household: An allowance of 1,500 additional gallons per person per month.

- Water leaks between the meter and the building as long as it has been repaired or is in the process of being repaired and completion of repairs is to be immediately completed.

2) All government, agricultural and business entities, except food establishments (as licensed by the State), laundries, long-term care facilities, correctional facilities, and motels, shall be under the same restrictions as residences – **6,000 gallon maximum** water use per entity per billing month. *Note: A business is determined by such entity having a "business license" on record with the Town of Springer, having paid all license fees as established by Ordinance No. 301.*

3) Food establishments, laundries, long-term facilities, correctional facilities, and motels shall have their maximum gallon usage determined by taking the average monthly billing cycle use for a three-month period from the previous billing year for the season affected by the water restrictions (Example: For winter water restrictions, the 3-month period averaged shall be January, February and March from the previous year).

4) Springer Tract, the Housing Authority, mobile home parks and apartment buildings or other multiple residences on single meters, shall have their maximum gallon usage per billing month determined by taking the number of active* residences (meters) times 6,000 gallons (Example: 50 households x 6,000 gallons = 300,000 gallons maximum per billing month).

5) French Tract shall have its maximum gallon usage per billing month determined by taking the number of active* residences (meters) times 6,000 gallons (Example: 100 residences x 6,000 gallons = 600,000 gallons maximum per billing month) plus the average of the truck stop's water usage from the established seasonal three-month period

* Note: Active means meters showing water consumption billed over and above any standard service charge.

from the previous billing year as determined from French Tract's billing records, (Example: households @ 600,000 gallons + 20,000 gallons average per month from the truck stop = French Tract's maximum gallon usage of 620,000 gallons per billing month).

6) All outdoor irrigation of turf and ground cover is prohibited with the exception of limited watering for trees, shrubs and ornamental plants only, and only on Wednesdays before 10:00 a.m. and after 6:00 p.m. This watering is permitted only by hand-held hose equipped with a positive shut-off nozzle, hand-held container, or drip irrigation system, grey water may be used in accordance with regulations to irrigate fruit trees, ground covers and ornamental trees and shrubs. Grey water is defined as household wastewater other than toilet and kitchen sink waste.

7) The washing of automobiles, trucks, trailers, boats, airplanes and other types of mobile equipment is prohibited except at established car washes, unless for business-related purposes such as the washing down of heavy equipment due to safety procedures and precautions.

8) The filling, refilling or adding of water to swimming pools, spas, ponds and artificial lakes is prohibited except where this use is storage for a water supply.

9) Use of water for the operation of ornamental fountains or ponds is prohibited.

10) Water shall not be used to wash down sidewalks, driveways, parking areas, patios or other paved areas, except to alleviate immediate fire or sanitation hazards.

11) All sales of non-reclaimed water outside of the water service area shall be discontinued, with the exception of sales previously approved by the governing body, such as those contracts in place for French Tract and Springer Tract, as well as the New Mexico Boy's School.

12) No new construction meters will be issued within the Town of Springer. Construction water within the Town limits shall not be used for earthwork or road construction purposes. Construction projects necessary to maintaining the health, safety and welfare of the public (as determined in the sole discretion of the Town Council) are exempts from these regulations.

13) No new meters will be allotted for the Town of Springer, and no adjustment increases will be made to the allowed maximum gallons per billing month for French Tract, Springer Tract, or the New Mexico Boy's School during the implementation of the emergency water management plan.

14) ***The Governing Body hereby reserves the right, during any time an emergency water plan is in place, to reduce the 10,000 gallon per month water use limitation as necessary, in its discretion, to address a water shortage within its water service area or any part thereof upon publication of notice of such water use limitation.***

Section 5. Deviations from Maximum Gallons Per Billing Month

A) For "long" billing months, where the time between meter readings exceeds 31 days, adjustments to the maximum gallons per billing month will be made by the utility billing department, as necessary, with regard to penalty assessment for overuse.

B) **Alternatives to maximum gallons per billing month.** For any individual or entity owning irrigation (water) rights, such as French Tract, Springer Tract, Springer Ditch, New Mexico Boy's School, etc., the Town of Springer offers the following alternative to the maximum gallons per billing month and will agree that the individual or entity will not be subject to penalty for overuse if such individual or entity agrees by written, legal contract to give the Town of Springer double the acre feet or gallons of water used by that individual or entity from the Town's water system from the previously billing year (January through December), said water to be delivered to the Town of Springer at a mutually agreed upon time within a twelve-month period commencing from the date of the contract. (Example; Springer Tract uses 12.5 ace feet of water from the Town's water system, as billed, from January through December 2000. In lieu of being subject to penalties for any overuse during the declared emergency water management plan period, Springer Tract will guarantee to give the Town of Springer 25-acre fee of water within the next twelve-month period). Should said individual or entity be unable to meet the obligations of the contract to provide the specified amount of water to the Town, any penalties that would have been imposed during the emergency water management plan period will be immediately imposed on that individual or entity and payment of any penalties will be due to the Town of Springer with the next regular billing cycle.

Section 6. Mandatory Conservation Plan Implementation

The Town water utility shall monitor the projected supply and demand for water by its customers on a daily basis during periods of emergency or drought and shall recommend to the Governing Body the extent of the conservation required through the implementation or termination of water conservation methods, to prudently plan and supply water to its customers, thereafter, the Governing Body may order the implementation or termination of the appropriate water conservation methods in accordance with the applicable provisions in this ordinance. The declaration of any water conservation emergency shall be made by public announcement and shall be published a minimum of one time for two consecutive weeks in a weekly newspaper of general circulation and be posted at Town Hall and other public areas, as is customary for public notification. The water conservation requirements shall become effective immediately upon announcement.

Section 7. Unlawful Acts/Penalty

It shall be unlawful for any person, firm, corporation, governmental entity or any other legal entity to violate any provisions of this ordinance or to refuse to abide by any order issued pursuant to this Ordinance or emergency water plan and anyone found guilty thereof shall be fined an amount not to exceed $500 and 90 days in jail. In addition to any other remedies that the Town may have for the enforcement of this ordinance, service of water may be discontinued or appropriately limited to any customer who willfully uses water in violation of any provisions thereof. In addition to citation and prosecution for violation of this Ordinance, the following penalties will be applied to any customer's account for any and all violations of this Ordinance.

A) After the standard **6,000-gallon maximum** allowed water use is registered, a $20.00 charge will be assessed for every 1,000 gallons used from 6,001 gallons to 11,000 gallons. For businesses and other entities that are allowed a different standard maximum gallon usage, the maximum gallons allowed before penalties are assessed will be adjusted as needed.

B) A $35.00 charge will be assessed for every 1,000 gallons used over 11,000 gallons. For businesses and other entities that are allowed a different standard maximum gallon usage, the maximum gallons allowed before penalties are assessed will be adjusted as needed.

Section 8. Severability

If any provision, section, subsection, sentence, clause or phrase of this Ordinance, or the application of same to any person or set of circumstances is, for any reason, held to be unconstitutional, void, or invalid, the invalidity of the remaining portions of this Ordinance shall not be affected, it being the intent of the Governing Body in adopting this Ordinance that no portions, provisions, or regulations contained herein shall become inoperative, or fail by reason of the unconstitutionality of any other provision hereof, and all provisions of this Ordinance are declared to be severable for that purpose.

Section 9. Emergency Water Regulations; Publication of Terms of Water Use

Upon such emergency declaration by the Governing Body, it shall be the duty of the administration to give public notice by publishing a notice giving the extent, terms and conditions respecting the use and consumption of water, at least once in a newspaper of general circulation in Springer; that upon such declaration and publication of notice due and proper notice shall be deemed to have been given each and every consumer supplied with water by the municipal water system.

Effective Date. This Ordinance shall become effective five days after adoption and publication as provided by law.

Passed, Approved and Adopted this 17th day of __October_, 2000.

_____

Danny J. Cruz, Mayor

Attest:

_____

Joy B. Swartz, Clerk-Treasurer

Attachment E4

Funding Sources for Drought Planning, Preparedness, and Mitigation

Attachment E4. Drought Funding Sources

Numerous federal and several state funding sources are available to local governments and communities to prepare for or alleviate the consequences of drought. Drought financing is usually triggered by a declaration from the President, Secretary of Agricultural or Governor of the State of New Mexico. The declaration process provides New Mexico communities access to millions of dollars in drought financing. For example, in 2001, the federal government provided over $20M in supplemental feed assistance alone to New Mexico farmers and ranchers. Severe drought conditions in 2002 will likely trigger large amounts of federal funding for the State.

Generally speaking, funding can be divided into three categories: drought planning, preparedness, and mitigation. For purposes of this section, drought planning includes drafting drought management plans, or drought response plans. Drought preparedness includes more complex activities to prepare for drought such as infrastructure and projects to develop and improve water supply, to gather data to improve drought prediction tools, and to implement agricultural water conservation. Drought mitigation refers to measures, usually in the form of financial assistance, to relieve the distress resulting directly from a drought in a given year. These measures also include delivering water to communities and livestock.

Although Congress has authorized many programs either directly to address drought or indirectly to address water supply development and improvement, no one comprehensive program for drought funding exists. Communities seeking assistance must identify their needs and then evaluate a rather complex set of funds that address multiple natural disaster and water supply situations. Once these funds are appropriated, it may take many months to complete the application process. The emergency water hauling programs, however, are immediately available, but short-term.

Many of the projects that will best ensure an adequate water supply are also some of the best measures to prepare for drought. Water supply development through acquisition of additional groundwater rights and well development as well as improvement of current systems can make more water available to communities. Agricultural water conservation measures such as lining

key canals or implementing drip irrigation in certain areas will sustain agricultural production when surface water is less available.

This appendix presents a brief overview of the funding programs available for drought planning, preparedness and mitigation. Additional information regarding federal drought assistance programs is provided in the attached *Catalog of Federal Drought Assistance Programs,* prepared by the Interim National Drought Council (Attachment E4-1). The objective of this appendix is to provide local water resource managers with sufficient information to decide which funds to pursue and who to contact in order to begin the application process.

E4.1 Financial Assistance for Drought Planning

Developing drought management plans allow communities to identify priority projects to pursue to protect waters supplies and ensure that key water uses can continue during times of drought with little economic dislocation. Water conservation programs are an important aspect of this type of planning. Certain federal programs assist local governments and communities by providing funding for planning activities. Even in communities with drought plans, it is useful to update those plans once every five years to reflect changes in local conditions such as reservoir status, project implementation, changes in local government structure or administrative agencies.

E4.1.1 Planning Assistance to States

Contact Information

U.S. Army Corps of Engineers Albuquerque District Office
4101 Jefferson Plaza N.E.
Albuquerque, New Mexico 87109-3435
Phone: (505) 342-3109
Fax: (505) 342-3179
http://www.spa.usace.army.mil

Eligibility

States and local governments. This program can be used to develop state drought contingency plans, or local and regional plans that support state water plans.

Type of Assistance

Army Corps of Engineers staff can assist the states, local governments, and other non-federal entities in the preparation of comprehensive plans for the development, utilization, and conservation of water and related land. The program is a 50-50 cost share and is generally managed through a state agency. However, counties can also interact directly with the Corps. In New Mexico, the Office of the State Engineer or the Interstate Stream Commission has usually submitted requests to the Corps for funds since most projects must in some way be related to the overall state water plan.

E4.1.2 Reclamation States Emergency Drought Relief Act of 1991 - Title II

Contact Information

United States Bureau of Reclamation
Albuquerque Area Office
505 Marquette N.W., Suite 1313
Albuquerque, New Mexico 87102-2162
505-248-5323

http://www.uc.usbr.gov/progact/waterconsv/wtr_wmp.html

Eligibility

Any of the 50 States and US Territories including tribal and local entities.

Type of Assistance

Under Title II, the Secretary is authorized to conduct studies to identify opportunities to conserve, augment, and make more efficient use of water supplies available to Federal Reclamation projects and Indian water resource developments. Any project, as long as it meets the construction/temporary guidelines, is eligible for funding consideration. Sample projects include drought planning documents as well as temporary construction projects. Projects are evaluated for funding based upon need, the ability to alleviate impacts to municipalities and fish and wildlife concerns, and to aid in the overall reduction of drought impacts in a stricken area. Reclamation's Office of Policy in Denver, Colorado, provides the final approval for project funding.

E4.1.3 Conservation Technical Assistance

Contact Information

USDA Natural Resource Conservation Service
Raton Service Center
245 Park Avenue
Raton, New Mexico 87740-3800
445-9571

Albuquerque Office
6200 Jefferson NE
Albuquerque, NM 87109
505-761-4407
1-800-410-2067

Eligibility

Private land users, communities, state and local government, and other Federal agencies.

Individual landowners request assistance. Assistance provided is for planning and implementing natural resource solutions to natural resource concerns that could include drought.

Type of Assistance

Technical assistance to implement state and local financial assistance programs, other state, local and federal conservation initiatives, technology development, disaster preparedness, technical assistance training for NRCS, state and local personnel, and administration. Technical assistance provided is in the form of soil erosion control, grazing entities, water conservation quantity and quality, wildlife habitat development, soil survey interpretations and data collection and interpretation.

E4.2 Financial Assistance for Drought Preparedness

Preparing for drought requires multiple activities from municipal governments and agricultural producers. Improving water supply through conservation, infrastructure projects, well field development, installation of drip irrigation structures, and water conservation programs will allow municipalities and agricultural producers to continue supplying water and producing agricultural

products even in times of drought. Many federal programs are designed to help urban and rural stakeholders implement measures that will lessen vulnerability to drought conditions. The programs and types of eligible activities are listed below.

E4.2.1 Clean Water State Revolving Fund Program

Contact Information

New Mexico Environment Department
Construction Programs Bureau
1190 St. Francis Dr.
Santa Fe, NM 87502-0110
505-827-2806
http://www.nmenv.state.nm.us/cpb/cpbtop.html
http://www.nmenv.state.nm.us

http://www.epa.gov/region6/water/at/index.htm

Eligibility

Municipalities, counties, and owners of public drinking water systems in the State of New Mexico.

Type of Assistance

This program provides low interest loan for wastewater infrastructure, including reclamation and reuse, agricultural runoff control, estuary restoration, and limited water conservation measures. In 1991, California initiated an agricultural water conservation program using their SRF allocation. State agricultural districts use SRF loans to purchase irrigation equipment that is then leased to farmers so that they can convert to more water-efficient irrigation methods.

Wastewater system, others can receive loan funding for publicly owned structural water conservation/reuse improvements and some non-structural measures.

E4.2.2 Safe Drinking Water Act Revolving Loan Fund

Contact Information

New Mexico Environment Department
Construction Programs Bureau
1190 St. Francis Dr.
Santa Fe, NM 87502-0110
505-827-2806
http://www.nmenv.state.nm.us/cpb/cpbtop.html
http://www.nmenv.state.nm.us

http://www.epa.gov/region6/water/at/index.htm

Eligibility

Municipalities, counties, and owners of public drinking water systems in the State.

Type of Assistance

The fund provides low interest loans (0-4 percent) over 20 years to assist communities in meeting the requirements of the Safe Drinking Water Act. Drought preparedness activities, such as system rehabilitation, or installation of new systems could qualify under this program.

E4.2.3 Water and Waste Loans and Grants

Contact Information

USDA Rural Development
6200 Jefferson St., NE, Room 255
Albuquerque, NM 87109
505-761-4955

Raton Field Office
245 Park Avenue
Raton New Mexico 87740-0038
404-445-9471

http://www.rurdev.usda.gov/nm/index.html

Eligibility

Entity is determined eligible by need for developing or improving water system. Municipal applicants must have a population limit of 10,000. The program is not specifically oriented

toward drought, but when drought vulnerability creates a need for additional or different source of supply, it can serve as the justification for a project.

Type of Assistance

Financial assistance to utilities serving of rural areas that demonstrate a need to develop or improve water or wastewater disposal systems.

E4.2.4 Snow Survey and Water Supply Forecasting Program

USDA Natural Resource Conservation Service
Raton Service Center
245 Park Avenue
Raton, New Mexico 87740-3800
445-9571

Albuquerque Office
6200 Jefferson NE
Albuquerque, NM 87109
505-761-4407
1-800-410-2067

http://www.nrcs.usda.gov.

This program supports the snow surveys conducted by the NRCS in Colfax County. No funding is available to individual applicants. However, it may be possible to increase the scope of the snow survey activities to include additional survey locations. Financial contribution from the local stakeholders would likely be required for additional measurements or data analysis that exceeds the scope of the regular program. Nevertheless, given that Colfax County is 90% dependent on surface water for drinking water as well as agricultural water supply, it may be possible to augment the scope of the program. Political support for expanding the program would enhance the likelihood of success.

Type of Assistance

Technical assistance to monitor the climate and hydrologic elements necessary to produce Water Supply Forecasts for the West 1. Elements monitored include snow packs, soil moisture and temperature, precipitation, air temperature, and associated climate information. 2. This information is combined with other water resource data such as streamflows, and reservoir

storage to forecast the seasonally variable water supplies (amounts and timing) and to make drought risk assessments.

E4.2.5 Reclamation Wastewater and Groundwater Study Program

Any non-Federal entity is eligible; however, municipalities are the most common.

Contact Information

United States Bureau of Reclamation
Albuquerque Area Office
505 Marquette N.W., Suite 1313
Albuquerque, New Mexico 87102-2162
505-248-5323

Eligibility

Non federal entities including irrigation districts or municipalities. The applicant must be located in one of the 17 Reclamation states (includes New Mexico). Generally, a feasibility report is required. The non-Federal entity must demonstrate capability to finance the non-Federal share of the project costs.

Type of Assistance

Financial cost shares or grants to conduct appraisal and feasibility studies on water reclamation and reuse projects. Examples of potential sources of water for recycling and reuse are agricultural drainage, municipal and industrial wastewater, brackish surface and groundwater, and sources that contain toxins and/or other contaminants. Sample projects in New Mexico include: Arsenic Wellhead Demonstration Project in Albuquerque, NM, and the Albuquerque Metropolitan Area Water Reclamation and Reuse Project.

E4.2.6 Small Watershed Program

States and political subdivisions of state government are the applicants. However, projects are often sponsored on behalf of residents in a given watershed.

Contact Information

USDA Natural Resource Conservation Service
Raton Service Center
245 Park Avenue
Raton, New Mexico 87740-3800
445-9571

Albuquerque Office
6200 Jefferson NE
Albuquerque, NM 87109
505-761-4407
1-800-410-2067

Eligibility

The Small Watershed Program contains several eligible purposes that would allow for funding of projects to mitigate the effects of drought. These statutory purposes include agricultural water management, municipal and industrial water supply, groundwater recharge and watershed protection. Agricultural water management projects could be used to address potential drought.

Type of Assistance

Technical and financial assistance for a variety of watershed project. For agricultural water management, public recreation and fish and wildlife purposes, the program provides 50 percent match. All of the applicants' installation costs are eligible for program loans.

Requires sponsors that have legal authority to obtain property rights, water rights and permits, and provide operation and maintenance.

E4.2.7 Environmental Quality Incentives Program

Contact Information

USDA Natural Resource Conservation Service
Raton Service Center
245 Park Avenue
Raton, New Mexico 87740-3800
445-9571

Albuquerque Office
6200 Jefferson NE
Albuquerque, NM 87109
505-761-4407
1-800-410-2067

Eligibility

The program can be used by farmers and ranchers to apply natural resource conserving practices, such as improved irrigation water management, which provide long-term benefits that may reduce impacts from future droughts.

Type of Assistance

Technical, education, and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. This program provides assistance to farmers and ranchers in complying with Federal, State, and tribal environmental laws, and encourages environmental enhancement. The purposes of this program are achieved through the implementation of structural, vegetative, and land management practices on eligible land.

E4.3 Financial Assistance for Drought Mitigation

In some communities, drought conditions can quickly affect drinking water supplies. Water users on municipal systems are usually insulated from direct effects as a result of the water supply planning of the city of private water company. Individual well owners, however, can see wells go dry or water levels drop so low that the well pump cannot function or simply burns out. Even in a first year of drought, residents can find themselves without water supplies. Federal emergency programs allow for purchase and transport of water supply to alleviate these conditions.

When severe and prolonged, drought conditions can result in economic dislocation by causing businesses and farms to fail resulting in unemployment and generally impairing the economy in the areas affected by the drought. The federal government has numerous aid programs to

alleviate the economic impact of drought. Many of these measures are short-term; however, they provide some mitigation of losses sustained as a direct result of drought conditions.

E4.3.1 Emergency Water Supplies

For communities that cannot meet local water demand, and may run out of adequate drinking water, the National Guard can transport water for limited periods of time to alleviate the acute emergency.

Contact Information

New Mexico Emergency Management Center
13 Bataan Boulevard
P. O. Box 1628, Santa Fe, NM 87504-1628
505-476-9600
http://www.dps.nm.org/emergency/em_index.htm

Chief Dave Pasquale, EM Coordinator
P.O. Box 910
Raton, New Mexico 87740
Office # (505) 445-2708
Fax # (505) 445-2709
e-mail: rfd@raton.com

Residents must bring their water containers directly to the tanker truck to obtain water for human consumption only. To use this service, contact:

New Mexico Emergency Water Funding
Department of Finance and Administration
New Mexico Board of Finance
Bataan Memorial Building, Suite 181
Santa Fe, NM 87503
505-827-4980

New Mexico Finance Authority
409 St. Michaels Drive
Santa Fe, NM 87505
505-984-1454

Eligibility

Municipalities, counties, and subdivisions of the State.

Type of Assistance

The New Mexico Board of Finance has $45,000 for emergency water funding. The New Mexico Finance authority has $600,000 for all emergencies (not just water shortages). Funds are available on a first come first serve basis. New Mexico Statutes and agency rules define which situations would qualify for funding. Generally, an unforeseeable lack of drinking water would qualify as an emergency for the purposes of these two funding sources.

E4.3.2 Emergency Conservation Program

Contact Information

USDA Farm Services Agency
Raton Service Center
245 Park Avenue
Raton, New Mexico 87740-3800
445-9571

Albuquerque Office
6200 Jefferson NE
Albuquerque, NM 87109
505-761-4407
1-800-410-2067

Eligibility

This program provides funding for addressing a variety of natural disaster related problems. For drought conditions, it provides cost share funding to farmers to implement emergency conservation measures. For Colfax County ranchers, this funding would provide farmers with financial assistance for providing water to livestock in extreme drought conditions. This program covers up to 64 percent of the cost of a particular initiative.

In order to be eligible, the natural disaster (drought) must create new conservation problems, which, if not treated, would:

- Impair or endanger the land
- Materially affect the productive capacity of the land

- Represent unusual damage which, except for wind erosion, is not the type likely to recur frequently in the same area

- Be so costly to repair that Federal assistance is or will be required to return the land to productive agricultural use

Type of Assistance

In the event of a natural disaster, the emergency conservation program can assist in rehabilitating farmlands and conservation facilities. The program provides cost-share assistance to eligible produces to implement emergency measures to rehabilitate farmlands damaged by wind erosion, floods, hurricanes or other natural disasters including drought.

E4.3.3 Public Assistance /Emergency Measures Program

Contact Information

New Mexico Emergency Management Center
13 Bataan Boulevard
P. O. Box 1628, Santa Fe, NM 87504-1628
505-476-9600

EM Coordinator
P.O. Box 910
Raton, New Mexico 87740
Office # (505) 445-2708
Fax # (505) 445-2709
e-mail: rfd@raton.com

http://www.dps.nm.org/emergency/em_index.htm

http://www.fema.gov/reg-vi/

Regional Office Main Number (940) 898-5399

Eligibility

State and local governments apply for the funding which is available only when a Presidential Emergency or Major Disaster Declaration are in place. Significant previous funding has been allocated due to drought emergencies.

Type of Assistance

Financial assistance in the form of Cost-shared grants, technical assistance.

After receiving a Presidential declaration, the State enters into an agreement with FEMA which outlines the conditions for receiving assistance and cost-sharing arrangements. Once signed, local governments and other State organizations may apply through the State for subgrants.

E4.3.4 Economic Adjustment Program: Sudden and Severe Economic Dislocation Components

Communities which could or have experienced sudden major permanent job losses.

Contact Information

DOC-EDA

Eligibility

Disaster declaration.

Type of Assistance

Grants to qualified economically distressed areas, a nonprofit organization, an economic development district, or a State or political subdivision thereof to prevent serious economic dislocations or to reestablish employment opportunities after a sudden and significant dislocation occurs. Grants can fund public infrastructure business loans or technical assistance.

Grants usually provide 50% of project cost. Additional supplemental grants depend on level of distress.

E4.3.5 Small Business Administration Disaster Assistance Program

Contact Information

U.S. SBA
Disaster Area 3 Office
4400 Amon Carter Blvd., Ste. 102
Ft. Worth, TX 76155
1-800-366-6303
http://www.sba.gov/disaster/

Eligibility

When the Secretary of Agriculture has declared an agricultural disaster, small non-farm businesses and small agricultural co-operatives may apply for assistance for economic losses directly resulting from the agricultural production disaster.

Type of Assistance

SBA offers low-interest working capital loans to small businesses and small agricultural cooperatives which have suffered substantial economic injury as a result of an agricultural production disaster. Agricultural enterprises are NOT eligible. Loan amount is limited to the amount needed to meet necessary financial obligations which the business could have met under normal conditions, but is unable to meet as a direct result of the disaster. Maximum loan amount is $1.5 million. Only those businesses determined to be unable to obtain credit elsewhere are eligible.

E4.3.6 Small and Limited Resource Farmers

Contact Information

USDA Natural Resource Conservation Service
Raton Service Center
245 Park Avenue
Raton, New Mexico 87740-3800
445-9571

Albuquerque Office
6200 Jefferson NE
Albuquerque, NM 87109
505-761-4407
1-800-410-2067

National Coordinator for Program
Larry Holmes
202-720-1853

Eligibility

Small and limited resources farmers can apply for financial or technical assistance.

Type of Assistance

Financial and technical assistance for conservation plans and rapid response that should address drought impacts and corrective actions.

E4.3.7 Disaster Unemployment Assistance

Contact Information

New Mexico Department of Labor
Workforce Development Center
201 South Second Street
Raton, NM 97740
Tel. 505-445-2784
http://www.dol.state.nm.us/dol_UIclaims.html

http://www.cfda.gov/public/viewprog.asp?progid=934

Eligibility

Individual workers unemployed as a direct result of a Presidentially declared major disaster.

The Department of Labor administers this program for FEMA. In order to receive benefits, all unemployed individuals must contact and register with the State Employment Security Agency which is the Workforce Development Center in Raton for Colfax County. This program provides assistance to those whose employment has been terminated by drought such as migrant workers, or employees of businesses who must downsize due to drought.

Type of Assistance

This program provides weekly benefits to individuals who are not otherwise eligible for unemployment benefits. The program will also provide re-employment services.

E4.3.8 Emergency Community Water Assistance Grants

Contact Information

USDA Rural Development
6200 Jefferson St., NE, Room 255
Albuquerque, NM 87109
5505-761-4955

Raton Field Office
245 Park Avenue
Raton New Mexico 87740-0038
404-445-9471

http://www.rurdev.usda.gov/nm/index.html

http://www.usda.gov/rus/water/programs.htm#EMERGENCY

Eligibility

Public bodies and private nonprofit corporation serving rural areas can apply for assistance from the Rural Utility Service. Grants for repairs, partial replacement, or significant maintenance on an established water system are NOT eligible.

Type of Assistance

Financial assistance to the residents of rural areas that have experienced a significant decline in quantity or quality of water to obtain adequate quantities of water that meet the standards set by the Safe Drinking Water Act. Grants can be made to alleviate a significant decline in quantity or quality of water available from the water supplies in rural areas that occurred within two years of filing an application for assistance.

E4.3.9 Emergency Watershed Protection (EWP)

Contact Information

USDA Natural Resource Conservation Service
Raton Service Center
245 Park Avenue
Raton, New Mexico 87740-3800
445-9571

Albuquerque Office
6200 Jefferson NE
Albuquerque, NM 87109
505-761-4407
1-800-410-2067

Eligibility

Local governmental agencies can apply when the Farm Services Agency declares a drought.

Type of Assistance

Technical and financial assistance to undertake emergency recovery measures to relieve imminent hazards to life and property created by natural disasters. Fund is often used for fire.

Requires sponsors that have legal authority to obtain property rights, water rights and permits, and provide operation and maintenance.

E4.3.10 Emergency Well Construction and Water Transport

Contact Information

U.S. Army Corps of Engineers Albuquerque District Office
4101 Jefferson Plaza N.E.
Albuquerque, New Mexico 87109-3435
Phone: (505) 342-3109
Fax: (505) 342-3179
http://www.spa.usace.army.mil

Eligibility

A written request for assistance may be made by any farmer, rancher, or political subdivision within a distressed area. The cost of transporting water is provided by the Corps, but the cost of

purchasing and storing water is the nonfederal sponsor's responsibility. Federal costs associated with well construction must be repaid.

Type of Assistance

Secretary of the Army can authorize the construction of wells or the transport of water to farmers, ranchers, and political subdivisions of those areas determined to be drought distressed. The authorities are not to be used to provide drought emergency water assistance in cases where an owner of livestock has other options, including raising funds from private sources through a loan, selling all or part of the herd, or relocation of the animals to an area where water is available.

E4.3.11 Livestock Indemnity Program

Contact Information

USDA Farm Services Agency
Raton Service Center
245 Park Avenue
Raton, New Mexico 87740-3800
445-9571

Albuquerque Office
6200 Jefferson NE
Albuquerque, NM 87109
505-761-4407
1-800-410-2067

Eligibility

Livestock producers who suffered livestock losses due to Secretarial or Presidentially declared natural disasters including drought.

Type of Assistance

Financial assistance for losses of eligible livestock from natural disasters occurring during specific periods.

E4.3.12 Tree Assistance Program

Contact Information

USDA Farm Services Agency
Raton Service Center
245 Park Avenue
Raton, New Mexico 87740-3800
445-9571

Eligibility

Individual owners or producers that have lost eligible trees and vines due to natural disasters including drought.

Type of Assistance

Financial assistance for eligible owners who replant or rehabilitate eligible trees or vines lost or damaged by natural disasters during the qualifying period. The 2002 Farm Bill reauthorized the program. Owners of eligible trees or vines must have suffered qualifying tree or vine losses of 20 percent or greater due to an eligible natural disaster. Eligible trees include nursery tree stock, Christmas trees, and orchards for commercial production. Eligible vines are grape, passion fruit, and kiwi.

E4.3.13 Noninsured Crop Disaster Assistance Program

Contact Information

USDA Farm Services Agency
Raton Service Center
245 Park Avenue
Raton, New Mexico 87740-3800
445-9571
www.fsa.usda.gov

Eligibility

Farming and ranching enterprises that have suffered losses from natural disasters, including drought. Losses must amount to at least 35 percent (due to low yield or prevented planning) of production of one or more crops. This does not include livestock.

Type of Assistance

Assistance is equivalent to the catastrophic risk protection otherwise available under Section 508 (b) of the Federal Crop Insurance Act. Any crop in the recognized area that has at least a 35% loss is an eligible crop for payments under this program. Any producer of the approved crop, which has a 50% or greater loss, can apply for payments. Payments are calculated for losses in excess of 50% of an approved yield at 55% of approved market price.

E4.3.14 Federal Crop Insurance Corporation

Contact Information

USDA Risk Management Agency
205 NW 63rd Street, Ste. 170
Oklahoma City, OK 73116
405-879-2741
www.rma.usda.gov
www.rma.usda.gov/tools/agents

Eligibility

All farmers are eligible for this program. The program has expanded its efforts to reach beginning, minority, small farmers, and limited-resource farmers. Applicants must have purchased crop insurance prior to sales closing date established for the 70+ crop insurance programs covered in order to be eligible for payments. RMA provides a risk management program that protects against production losses due to unavoidable causes such as drought, excessive moisture, hail, wind, hurricane, volcano, tornado, and lightening.

Type of Assistance

Financial assistance to manage risk for agricultural producers in order to improve the economic stability of agriculture. Crop insurance helps farmers recover from crop losses, secure operating loans, and market a portion of their crop aggressively. RMA also provides education and educational grants in production risk, legal risk, marketing risk, financial risk, and human resources risk.

E4.3.15USDA-RD, Rural Business Cooperative Service

USDA Rural Development
6200 Jefferson St., NE, Room 255
Albuquerque, NM 87109
5505-761-4953

Raton Field Office
245 Park Avenue
Raton New Mexico 87740-0038
404-445-9471

http://www.rurdev.usda.gov/nm/index.html

This program is available for drought aid but is not limited to drought or other emergencies. The program does not require a major disaster declaration by the President or Secretary of Agriculture to be triggered.

Financial assistance for direct and guaranteed loans for developing or financing business or industry, increasing employment and controlling or abating pollution. Funds may be used for real estate, operation expenses, and purchases of equipment for support of businesses.

Loans must be used to assist businesses in rural areas. Rural areas are generally outside of cities more than 50,000 inhabitants and their immediately adjacent urbanized areas. Priority is given to projects located in communities of 25,000 or less population. Business and Industry Guaranteed Loans are limited to $25 million; Business and Industry Direct loans are limited to $10 million.

Attachment E4-1

Catalog of Federal Drought Assistance Programs

Catalog of Federal Drought Assistance Programs

June 2001
Prepared by the Interim National Drought Council

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This Catalog of Federal Drought Assistance Programs has been compiled by the Interim National Drought Council (INDC), as a replacement for the production of the Western Drought Coordination Council, to help individuals and governments determine what programs are available to help reduce the effects of drought. Many of these programs are also available as a result of other natural disasters.

The Catalog of Federal Drought Assistance Programs has been categorized by types of assistance and gives a brief description of each program. Included is the name of the Agency that administers the program, a national and local contact person, type of assistance, who is eligible, and some eligibility rules.

For help in finding out whether you are eligible, call or visit the local contact. The local contact will know what programs have been authorized for your area. If you are not able to get help at the local level, the national contact will be able to provide guidance.

For general information about the catalog, please contact:

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U.S. Department of Agriculture
Farm Service Agency
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CONSERVATION RESERVE PROGRAM (CRP)

Emergency Haying or Grazing

Administering Agency Farm Service Agency (FSA)
United States Department of Agriculture

Contact

National: Robert Stephenson, Director, Conservation and Environmental Programs Division, (202) 720-6221
E-mail Address: Robert.Stephenson@usda.gov
Local: County FSA Service Center

Statute

Sections 1231-1236 of the Food Security Act of 1985, as amended by Federal Agriculture Improvement and Reform Act of 1996.

Form of Assistance

Haying or grazing privilege.

Assistance Available

During periods of severe drought (or other similar emergency), FSA may permit farmers with Conservation Reserve Program (CRP) contracts to hay or graze land enrolled in CRP.

Beneficiaries

Owners and operators of CRP land that have livestock or livestock producers who lease haying or grazing privileges on CRP land.

Qualifying Requirements

Producers must have eligible CRP acreage or may lease the haying or grazing privilege on eligible CRP acreage in approved counties.

Limitations

Counties or parts of counties must meet certain loss requirements to be eligible for designation. Producers seeking to hay or graze under emergency conditions agree to a reduction in annual rental payment. Further, a portion of the acreage must remain undisturbed for the benefit of wildlife. Other conditions and limitations may apply.

Availability

It does not require a major disaster determination by the President or Secretary of Agriculture to provide assistance. Once the Secretary announces emergency haying or grazing is available due to disaster conditions, the County and State FSA committees may request designation of a county or partial county.

Comments

Contact local FSA Service Center for further information.

AGRICULTURAL MARKET TRANSITION ACT (AMTA) PROGRAM

Administering Agency	Farm Service Agency (FSA) United States Department of Agriculture.
Contact	National: Diane Sharp, Director, Production, Emergencies, and Compliance Division, (202) 720-7641 E-mail Address: dsharp@wdc.fsa.usda.gov Local: State FSA Office
Statute	Public Law 104-127.
Form of Assistance	Direct payments to eligible producers.
Assistance Available	The purpose of AMTA is to help producers who have been earning deficiency payments transition from government driven planting decisions to market driven planting decisions.
Beneficiaries	Producers on farms who comply with AMTA program requirements.
Qualifying Requirements	Participation in AMTA, compliance with fruit and vegetable planting restrictions on contract acreage; agreement to protect idle contract acreage from erosion and weeds; compliance with highly erodible land conservation and wetland conservation provisions.
Limitations	A $40,000 per person per fiscal year limitation on the payments made to a person under one or more production flexibility contracts.
Availability	Availability to all producers on farms with 1996 crop acreage bases if they enrolled in the AMTA program by August 1, 1996, and to producers with Conservation Reserve Program Contracts with protected crop acreage bases which will expire or terminate before September 20, 2002.
Comments	Under AMTA eligible producers may earn payments whether or not a crop is planted on the contract acreage.

NONINSURED CROP DISASTER ASSISTANCE PROGRAM (NAP)

Administering Agency Farm Service Agency (FSA)
United States Department of Agriculture

Contact

National: Steve Peterson, Chief, Noninsured Assistance Program Branch, Production, Emergencies, and Compliance Division, (202) 720-2657
E-mail Address: steve.peterson@wdc.fsa.usda.gov
Local: County FSA Service Center

Statute

Public Laws 103-354 and 104-127

Form of Assistance

Direct payments.

Assistance Available

The Noninsured Crop Disaster Assistance Program (NAP) provides assistance to reduce financial losses that occur when natural disasters cause a catastrophic loss of production prevented planting of an eligible crop.

Beneficiaries

Eligible persons sharing in the proceeds of an eligible crop at the time of loss with annual qualifying gross revenues less than $2 million.

Qualifying Requirements

Each commercial crop or other agriculture commodity (except livestock) for which catastrophic risk protection under section 508 (b) of the Federal Crop Insurance Act is not available that is produced for food or fiber. Effective with P.L. 103-354 eligible crops also include floricultural, ornamental nursery, and Christmas tree crops, turfgrass sod, and industrial crops. Effective with P.L. 104-127 eligible crops also include seed crops and aquaculture (including ornamental fish).

Payment eligibility is based on an expected yield for the area and the producer=s approved yield based on actual production history, or a transitional yield if sufficient production records are not available. Production for the applicable area expected yield must be reduced by more than 35 percent because of a natural disaster and the individual producer unit must suffer greater than a 50 percent loss of yield or be prevented from planting more than 35 percent of intended acreage due to a natural disaster reasonably related to the basis for the area designation.

Once the area loss requirement for a crop is met, direct payments are calculated based on the loss of yield in excess of 50 percent of a producer=s approved yield, or acreage prevented from being planted in excess of 35 percent of intended times the producer=s approved yield, as applicable, times 60 percent (55 percent for 1999 and subsequent years) of the average market price determined by Commodity Credit Corporation (CCC), or any comparable coverage determined by the Secretary, times a payment factor for decreasing cost incurred in the production cycle of a crop that is harvested, planted but not harvested, and prevented from being planted.

Limitations

Producer must report acreage and production by specified deadlines and furnish timely notice of loss within 15 days of the disaster occurrence. Additionally, applications for NAP payments must be filed with the local office no later that the first acreage reporting date for the crop in the crop year immediately following the crop year in which the loss occurred.

Availability

Assistance will be made available for each approved crop in an area approved by CCC for a natural disaster.

Comments

No person shall receive payments for a crop year in excess of $100,000. If a producer is eligible to receive NAP assistance and benefits under any other program administered by the secretary for the same crop loss (excluding FSA emergency loans), the producer must choose whether to receive the other program benefits or NAP assistance. The producer is not eligible for both.

WETLANDS RESERVE PROGRAM

Administering Agency	Natural Resources Conservation Service (NRCS) United States Department of Agriculture
Contact	National: Leslie Deavers, National Program Manager, Wetlands Reserve Program (202) 690-0848 E-mail Address: leslie.deavers@usda.gov Local: NRCS State Office
Statute	Public Law 101-624 (104 Stat. 3584; 16 U.S.C. 3837, et seq.), 7 CFR, Part 620.
Form of Assistance	Technical and financial assistance through the purchase of easements or cost-share agreements.
Assistance Available	Assistance in reducing flood damage, preventing soil erosion, recharging ground water, improving water quality, and wildlife habitat improvement.
Beneficiaries	Public and private landowners.
Qualifying Requirements	To offer a conservation easement, landowner must have owned the land for at least 1 year prior to enrollment.
Limitations	120,000 acres in FY 99 with the three types projects (i.e., permanent and 30-year easements and cost-share agreements) to be enrolled in proportion to the level of land owner interest.
Availability	This is an ongoing program.

EMERGENCY CONSERVATION PROGRAM (ECP)

Administering Agency	Farm Service Agency (FSA) United States Department of Agriculture
Contact	National: Robert Stephenson, Director, Conservation and Environmental Programs Division, (202) 720-6221 E-mail Address: Robert.Stephenson@usda.gov Local: County FSA Service Center
Statute	Agricultural Credit Act of 1978, as amended.
Regulations	7 CFR Part 701
Form of Assistance	Cost-sharing.
Assistance Available	Provide financial assistance through the sharing of costs of restoring farmland damaged by wind erosion, floods, hurricanes, or other natural disaster, or for emergency water conservation measures during severe droughts. Practices include providing water for livestock, restoring structures, and water conservation measures.
Beneficiaries	Agricultural producers.
Qualifying Requirements	Conservation problems which existed prior to disaster are not eligible for assistance.
Limitations	Assistance limited to solving conservation problems caused by natural disaster that impair land or productive capability. Damage must be unusual and not likely to occur frequently in the same area. Payments are limited to $200,000 per person per disaster.
Availability	This program is available for drought aid but is not limited to drought or other emergencies. It does not require a major disaster determination by the President or Secretary of Agriculture to provide local assistance. Except for drought, the County FSA committee may implement the program with the concurrence of the State FSA committee. Severe drought designations must be approved by the FSA Deputy Administrator.
Comments	Contact local FSA Service Center for further information.

ENVIRONMENTAL QUALITY INCENTIVES PROGRAM (EQIP)

Administering Agency	Natural Resources Conservation Service (NRCS) United States Department of Agriculture
Contact	National: Anthony Esser, EQIP Program Manager, (202) 720-1834 E-mail Address: Anthony.Esser@usda.gov Local: NRCS County Office
Statute	Federal Agriculture Improvement Reform Act of 1996, P.L. 104-127, 7 CFR, Part 1466.
Form of Assistance	Cost-sharing.
Assistance Available	Necessary technical, educational, and financial assistance to assist owners and operators and to comply with Federal, State, and tribal environmental laws on a voluntary basis to encourage environmental enhancement.
Beneficiaries	Owners and operators of agricultural lands.
Qualifying Requirements	Land must meet land eligibility requirements and be in a conservation priority area or under a Statewide natural resource concern initiative.
Limitations	This program is not an emergency conservation program. The program is designed for long term planning and contracting to address natural resources concerns.
Availability	Program practices could address drought situations. It is an ongoing program slated for funding through fiscal year 2002.
Comments	This program is not a drought assistance program, however, practices could be used to address particular drought impacts upon the land.

FEDERAL CROP INSURANCE

Administering Agency
Risk Management Agency
United States Department of Agriculture

Contact
National: Phyllis Honor, Acting Administrator, (202) 690-4526
E-mail Address: Phyllis.Honor@usda.gov
Local: Local Crop Insurance Agency or Regional Service Offices in Billings, MT; Jackson, MS; Oklahoma City, OK; Raleigh, NC; Sacramento, CA; Springfield, IL; Spokane, WA; St. Paul, MN; Topeka, KS; and Valdosta, GA.

Statute
Federal Crop Insurance Act, as amended, 7 U.S.C 1501-1502

Form of Assistance
Insurance

Assistance Available
The Risk Management Agency (RMA) administers the programs of the Federal Crop Insurance Corporation (FCIC). The mission of the RMA is to provide and support cost-effective means of managing risk for agricultural producers in order to improve the economic stability of agriculture. Crop insurance is USDA=s primary means of assisting farmers following a crop loss. Crop insurance helps farmers recover from crop losses, secure operating loans, and market a portion of their crop aggressively.

Crop insurance coverage is widely available on all major commodities, such as corn, wheat, and cotton. Coverage is also available on a growing number of fruits, nuts, and vegetable crops. Nationally, 80 crops are insurable, though not everywhere they are grown.

Beneficiaries
Insured producers.

Qualifying Requirements
Any owner or operator of farmland who has an insurable interest in a crop in county where insurance is offered on that crop is eligible.

Limitations
The insured producer must have suffered a loss below the guarantee level for the particular crop insured. Producers are not indemnified for losses resulting from negligence or failure to observe good farming practices.

Availability
Multiple peril crop insurance is available only through private insurance agents selling for private companies reinsured by FCIC. Check with your local Farm Service Agency Service Center for a listing of agents in your area. Premiums for the catastrophic risk protection (CAT) level of crop insurance are fully subsidized and available to producers for $60 in administrative fees per crop, per county, not to exceed $200 per county, or $600 for all crops and all counties. A portion of the premiums are subsidized for higher Abuy-up@ levels of crop insurance coverage and for other plans of insurance such as the Group Risk Plan or Revenue Insurance Plans.

Comments
For more information about the Federal Crop Insurance Program, contact a local crop insurance agent or access the Risk Management Agency Website at Ahttp:/www.act.fcic.usda.gov.@

EMERGENCY LOANS (EM)

Administering Agency	Farm Service Agency (FSA) United States Department of Agriculture
Contact	National: Mike Hinton, Chief, Direct Loans Branch, Loan Making Division (202) 720-1472 E-Mail Address: mhinton@wdc.fsa.usda.gov Local: County FSA Service Center
Statute	7 U.S.C. 1961; 5 U.S.C. 301; CFR 2.23; 7 CFR 2.70.
Form of Assistance	Loans.
Assistance Available	Emergency loans to family farmers, ranchers, or aquaculturists for physical damage or severe production losses.
Beneficiaries	Family farmers, ranchers, and aquaculturists (owners or tenants.)
Qualifying Requirements	Must have suffered qualifying physical loss or production loss of at least 30 percent. Must be unable to obtain suitable credit from other sources and have repayment ability.
Limitations	Loan ceiling is 80 percent of production loss and 100 percent of actual physical loss.
Availability	Farmers can apply for assistance under this program when they have suffered losses in a county that has been named by FEMA as eligible for federal assistance under a Presidential major disaster declaration or under a Secretary of Agriculture disaster declaration. Farmers operating in adjacent counties are also eligible.
Comments	Applications must be filed within eight months of disaster declaration by the President, Secretary of Agriculture, or the Administrator of Farm Service Agency. The maximum indebtedness under the program is $500,000, and the funds can be used for restoring or replacing damaged property, purchasing machinery and equipment, reorganizing the farm, or paying production costs.

FARM OWNERSHIP LOANS

Administering Agency	Farm Service Agency (FSA) United States Department of Agriculture
Contact	National: Mike Hinton, Chief, Direct Loans Branch, Loan Making Division (202) 720-1472 E-mail Address: mhinton@wdc.fsa.usda.gov Local: County FSA Service Center
Statute	7 U.S.C. 1922, Consolidated Farm and Rural Development Act.
Forms of Assistance	Loans and loan guarantees.
Assistance Available	Funds can be used to acquire or enlarge a farm or ranch, to make capital improvements, and to promote soil and water conservation and protection.
Beneficiaries	Family-sized farmers and ranchers.
Qualifying Requirements	Available to borrowers who are unable to obtain sufficient credit at reasonable rates elsewhere. Loans available to individuals, partnerships, cooperatives, and corporations.
Limitations	Loans limited to family-sized farmers.
Availability	This is an ongoing program and does not require a major disaster declaration by the President or Secretary of Agriculture to provide local assistance.
Comments	Maximum loan is $200,000 and maximum loan guarantee is $700,000.

FARM OPERATING LOANS

Administering Agency	Farm Service Agency (FSA) United States Department of Agriculture
Contact	National: Mike Hinton, Chief, Direct Loans Branch, Loan Making Division (202) 720-1472 E-mail Address: mhinton@wdc.fsa.usda.gov Local: County FSA Service Center
Statute	7 U.S.C. 1941, Consolidated Farm and Rural Development Act.
Forms of Assistance	Loans and loan guarantees.
Assistance Available	Funds can be used to pay annual farm operating expenses, to purchase livestock and farm equipment, and to pay costs associated with land and water development.
Beneficiaries	Owners and operators of family-sized farms and ranches.
Qualifying Requirements	Available to borrowers who are unable to obtain sufficient credit at reasonable rates elsewhere. Loans available to individuals, partnerships, cooperatives, and corporations.
Limitations	Loans limited to family-sized farmers.
Availability	This is an ongoing program and does not require a major disaster declaration by the President or Secretary of Agriculture to provide local assistance.
Comments	The maximum loan is $200,000 and maximum loan guarantee is $700,000.

EMERGENCY WATER SUPPLY/DROUGHT ASSISTANCE PROGRAMS

Administering Agency
U.S. Army Corps of Engineers (USACE)

Contact
National: Ed Hecker, Chief, Civil Emergency Management Branch, HQUSACE, (202) 761-4601
E-mail Address: edward.j.hecker@hq02.usace.army.mil
Local: USACE, District Office

Statute
Public Law 84-99, as amended.

Forms of Assistance
Emergency supply of clean drinking water for human consumption, and construction of wells if not commercially possible.

Assistance Available
USACE is authorized to transport emergency supplies of clean drinking water for human consumption to any designated area as a drought distressed area, and to construct wells in such drought distressed areas. Water normally provided by tank trucks or small diameter pipelines. Assistance will be to meet minimum public health and welfare requirements.

Beneficiaries
Any locality faced with a threat to public health and welfare from a drought situation affecting the water system.

Qualifying Requirements
Water distribution system may be publicly or privately owned. State and local agencies must make full use of their own resources, including the National Guard. Requests for assistance to the Corps must be initiated by the Governor or his/her authorized representative.

Limitations
Assistance is limited to work which is the most economical means of furnishing a temporary drinking water supply. Water will not be furnished to a business firm except as incidental to the use of the existing water distribution system, but drinking water can be provided for employees and on-site customers. Water is provided only for human consumption, not for livestock.

Availability
Application for program assistance will be made to USACE District, but assistance is subject to approval at higher level. The impacted area must be designated as a Adrought distressed@ area by Assistant Secretary of the Army for Civil Works.

Comments
USACE assistance is supplemental to State and local efforts. Permanent restoration of water supply is a local responsibility. Applicants must furnish land, easements, and rights-of-way; make necessary relocations; and hold the U.S. free from damages. Purchase and storage costs are not eligible for USACE assistance.

EMERGENCY COMMUNITY WATER ASSISTANCE GRANTS

Administering Agency
Rural Development (RD), Rural Utilities Service
United States Department of Agriculture

Contact
National: Howard Kelly, Branch Chief of Water Programs Division, (202) 720-9589
E-mail Address: dkelly@rudev.usda.gov
Local: State RD Office

Statute
Title V of the Disaster Assistance Act of 1989 (PL 101-82, 103 Stat. 570, Aug 14, 1989).

Form of Assistance
Grants.

Assistance Available
The objective of the Emergency Community Water Assistance Grant Program is to assist the residents of rural areas that have experienced a significant decline in quantity or quality of water to obtain adequate quantities of water that meet the standards set by the Safe Drinking Water Act (42 U.S.C. 300f et seq.) (SDWA): (a) Grants can be made to alleviate a significant decline in quantity or quality of water available from the water supplies in rural areas that occurred within two years of filing an application for assistance. Grants cannot exceed $500,000. (b) Grants for repairs, partial replacement, or significant maintenance on an established water system cannot exceed $75,000.

Beneficiaries
Public bodies and private nonprofit corporations serving rural areas.

Qualifying Requirements
In the case of grants made to alleviate a significant decline in quantity or quality of water available from the water supplies of rural residents, the applicant must demonstrate that the decline occurred within two years of the date the application was filed with Rural Utilities Service. This would not apply to grants made for repairs, partial replacement, or significant maintenance on an established water system.

Limitations
Grant funds may not be used to: (1) Assist any city or town with a population in excess of 10,000 inhabitants according to the most recent decennial census of the United States. (2) Assist a rural area that has a median household income in excess of the Statewide non-metropolitan median household income according to the most recent decennial census of the United States. (3) Finance facilities which are not modest in size, design, and cost.

Availability
Authorization for this program comes at the State level by the Rural Development State Office and are subject to the availability of funds.

Comments
Must compete nationwide for funding.

RESOURCE CONSERVATION AND DEVELOPMENT (RC&D)

Administering Agency	National Resources Conservation Service (NRCS) United States Department of Agriculture
Contact	National: Joan Comanor, Director, Resource Conservation and Community Development Division, (202) 720-2241 E-mail Address: joan.comanor@usda.gov Local: State NRCS Office
Statute	Reauthorized with the passage of Federal Agriculture Improvement and Reform Act of 1996.
Form of Assistance	Technical assistance.
Assistance Available	Technical assistance available for projects that were developed under the RC&D Program. Projects must benefit community or RC&D area.
Beneficiaries	Public agencies or nonprofit corporations with activities reviewed and approved by the RC&D council serving the RC&D area.
Qualifying Requirements	None.
Limitations	None.
Availability	This program is not strictly a drought program, but it is available for drought aid. It is an ongoing program and does not need a major disaster declaration by the President or Secretary of Agriculture.
Comments	This program is not a drought financial assistance program, and could take several years to develop and implement a project. However, as an example of possible drought related use, the program could be used to develop a water supply reservoir project to supplement or replace a drought impacted water supply. NRCS typically provides the needed technical expertise.

NATIONAL STREAMGAGING PROGRAM

Administering Agency
U.S. Geological Survey (USGS)
United States Department of the Interior

Contact
National: Mike Norris, Assistant Chief, Office of Surface Water, (703) 648-5304
E-mail Address: mnorris@usgs.gov
Local: USGS District Office

Statute
The Organic Act of March 3, 1879, the Sundry Civil Bill of 1888, the Appropriation Acts of 1894 and 1896, and the Joint Resolution of May 16, 1902 (Pub. Res. 13, 54th Congress).

Form of Assistance
Information.

Assistance Available
Monitoring of streamflow, ground-water levels, and reservoir contents. Comparison with previous droughts, drought studies, and service on drought-emergency committees. Information and advice concerning hydrologic conditions.

Beneficiaries
Cooperators (partners) in the NSP, national weather service, emergency managers, planning agencies, reservoir operators, media representatives, and the public.

Qualifying Requirements
None.

Limitations
None.

Availability
Streamflow information are available from district offices in nearly every State. Real-time and historic streamflow data are available on the World Wide Web for 3,000 gaging stations.

Comments
The USGS operates a national network of 7,000 streamgages that continuously measure the stage and flow at key points on streams and rivers. The Agency also monitors ground-water levels, reservoir contents, and water quality. Flow data from about 4,600 stream-gages are available via satellite telemetry in nearly real time. The data available from the USGS are used in responding to drought emergencies, characterizing a drought, finding alternative supplies of water, and allocating water resources.

EMERGENCY WATERSHED PROTECTION PROGRAM (EWP)

Administering Agency	Natural Resources Conservation Service (NRCS) United States Department of Agriculture
Contact	National: Lee Bensey, Director, Watershed and Wetlands Division, (202) 720-3534 E-mail Address: Lee.Bensey@usda.gov Local: State NRCS Office
Statute	Section 216, Public Law 85-516; Section 403, Title 4, Agricultural Credit Act of 1978, Public Law 95-334, 7 CFR 624.
Form of Assistance	Technical and financial assistance (cost-share).
Assistance Available	Assistance to local organizations for planning and implementing watershed projects in relieving an imminent threat to life and property as a result of a sudden impairment of a watershed caused by a natural occurrence including drought. The threat must significantly exceed that which existed before the impairment.
Beneficiaries	Public and private landowners, but they must be represented by a project sponsor.
Qualifying Requirements	Project sponsor must be a public agency of the State, county, city, or special district that has authority to acquire needed land rights, water rights, and permits.
Limitations	None.
Availability	The State NRCS Conservationist has the authority to implement this program.
Comments	Program is much more applicable to emergency actions required due to sudden natural disaster, such as earthquakes and floods, than due to droughts. However, droughts result in blowing soils, and loss of visibility is a threat to the driving public. Able to cost-share emergency tillage and treatment of other critical areas.

WATER AND WASTE (WW) DISPOSAL LOANS AND GRANTS

Administering Agency	Rural Development (RD), Rural Utilities Service United States Department of Agriculture
Contact	National: Howard Kelly, Branch Chief of Water Programs Division (202) 720-9589 E-mail Address: dkelly@rudev.usda.gov Local: State RD Office
Statute	Consolidated Farm and Rural Development Act, as amended, 7 U.S.C.1926 (a).
Forms of Assistance	Loans and grants.
Assistance Available	Funds are to provide financial assistance for water and waste disposal facilities. Available in rural areas and incorporated communities up to 10,000 people. Priority is given to areas with no more than 5,000 people to restore deteriorating water supplies to improve or enlarge water facilities or inadequate waste facilities.
Beneficiaries	Public entities such as counties, municipalities, special districts, Indian tribes, and nonprofit corporations for water and waste disposal facilities in rural areas and incorporated communities up to 10,000 people.
Qualifying Requirements	Applicant must be unable to obtain needed funds from other sources on reasonable terms. Commercial interim financing is normally used for construction, with program funds available when project is completed.
Limitations	Applicant must have legal authority and capability to repay funds (based on taxes, assessments, or revenues) and operate and maintain facilities.
Availability	This program is available for drought aid but it is not limited to drought or other emergencies. It does not require a major disaster declaration by the President or Secretary or Agriculture to be triggered.
Comments	Priority is also given to small facilities serving low-income communities. Funds may be used to (1) construct, repair, improve, expand, or modify rural water supply facilities (reservoirs, wells, pipelines, pumping stations), (2) acquire a water supply or water right, (3) fund waste water and storm drainage facilities, and (4) pay legal, engineering, and right-of-way costs of these facilities. Grants are made for facilities in the most financially needy communities.

RECLAMATION STATES EMERGENCY DROUGHT RELIEF ACT OF 1991

Administering Agency
Bureau of Reclamation
United States Department of the Interior

Contact
National: Roseann Gonzales, Reclamation Drought Coordinator, (303) 445-2787
E-mail Address: rgonzales@do.usbr.gov
Local: Regional Office

Statute
Reclamation States Emergency Drought Relief Act of 1991, P.L. 102-250. This act authorizes a variety of activities and measures that will minimize, or can be expected to have an effect minimizing and mitigating, losses and damages resulting from ongoing drought conditions.

Forms of Assistance
Drought mitigation and contingency planning activities; loans, nonfinancial assistance to willing buyers and sellers.

Assistance Available
Purchase of water for fish and wildlife purposes; Use of project facilities to store and convey water. Temporary drought assistance could include construction, management, and conservation activities undertaken by Reclamation on a nonreimbursable basis and are subject to applicable state and Federal laws, including the National Environmental Protection Act. Specific activities might include: (1) drilling of wells, (2) diking and dredging to improve river channel flow efficiency, (3) lining of canals to maintain proper water temperature through the installation of temporary materials, (4) installation of temporary fish screens (5) installation of temporary equipment to maintain proper water temperature levels, (6) temporary installation of pumps in reservoirs and canals in order to lift water to outlets, (7) improved measurements, and reporting of conditions and deviations, (8) participation in State established water banks, and (9) changes in diversion schedules. Short term (in no cases no more than 15 years) loans to water users for construction, management, conservation activities, and the acquisition and transportation of water as outlined in Title I of PL 102-250.

Beneficiaries
Activities and loans would be available to Indian Reservation governing bodies, States and Federal agencies, and nonprofit entities, e.g. irrigation districts, municipal water utilities, private or public fish and wildlife facilities.

Qualifying Requirements
Title I. Assistance During Drought
Programs and authorities under this title are applicable to the geographic areas within the Reclamation States (from North Dakota south to Texas and west to the Pacific coast) and Hawaii. The programs and authorities are only applicable during times of actual declared drought, after the Commissioner of the Bureau of Reclamation has determined that a request from the Governor of any state or the governing body of any Tribe has merit.
Title II. Drought Contingency Planning Programs and authorities under this title pertaining to identification of opportunities for water supply conservation, augmentation and use are applicable to the Reclamation States. The drought contingency planning authority is applicable to the geographic areas within the United States and all of the territories. Programs and activities under this title may be initiated after consultation with Reclamation and the appropriate funding for the activities is determined to be available.

Limitations
The geographical area can be parts of a State, or Indian reservation, and are not limited to Reclamation project areas, or to water provided by Reclamation projects.

Availability
Subject to annual appropriations being provided.

FARM LABOR HOUSING LOANS AND GRANTS

Administering Agency
Rural Development (RD), Rural Housing Service
United States Department of Agriculture

Contact
National: Tracee Lilly, Loan Specialist, Multi-Family Housing Processing Division, (202) 720-9729
E-mail Address: tlilly@rurdev.usda.gov
Local: State RD Office

Statute
Housing Act of 1949, as amended, Section 514 and 516, Public Laws 89-117 and U.S.C 1484 and 1489.

Forms of Assistance
Loans and grants.

Assistance Available
Project grants; guaranteed/direct loans to provide decent, safe and sanitary low-rent housing and related facilities for domestic farm laborers.

Beneficiaries
Family partnerships, family farm corporations, or an association of farmers.

Qualifying Requirements
Grants are available to eligible applicants only when it is doubtful that such facilities could be provided unless grant assistance is available. The applicant must furnish factual evidence of the following: (a) the number of domestic farm laborers currently being used in the area; (b) the kind of labor performed; (c) the future need for domestic farm labor in the area; (d) the kind, condition, and adequacy of housing presently used for such labor; (e) ownership of presently occupied housing; (f) ability of workers to pay necessary rent; and; (g) with the exception of State and local public agencies, be unable to provide housing from its own resources or credit on terms and conditions that would enable the applicant to provide labor housing.

Limitations
The housing must be of practical type and must be constructed in an economical manner and not of elaborate material or extravagant design; loan and grant funds and any funds furnished by the applicant may be placed in a supervised bank account.

Availability
No deadlines.

Comments
The loans and grants may be used for construction, repair, or purchased all year around or seasonal occupied housing; and developing related support facilities including recreation areas, central cooking and dining facilities, small infirmaries, laundry facilities, day care centers, and other essential equipment and facilities.

HOME OWNERSHIP LOANS

Administering Agency	Rural Development (RD), Rural Housing Service United States Department of Agriculture
Contact	National: William M. Toney, Director, Single Family Housing Processing Division, (202) 720-1474 E-mail Address: wtoney@rurdev.usda.gov Local: County RD Office
Statue	Title IV, Housing Act of 1949 (Act of July 15, 1949, 63 Stat. 413, 42 USC 1441 et seq.)
Form of Assistance	Loans.
Assistance Available	Funds can be used to pay, buy, build, repair, or rehabilitate rural homes and related facilities, including water and waste disposal systems. Homes may be on individual sites or in subdivisions.
Beneficiaries	Very low to moderate income individuals in rural areas.
Qualifying Requirements	Must be a U.S. citizen or legally admitted for permanent residency. Must personally occupy the property and demonstrate both the willingness and ability to repay the loan.
Limitations	Homes must be modest in size, design, and cost, and be located on desirable sites with an assured supply of safe drinking water and suitable arrangements for sewage disposal.
Availability	This is an ongoing program which does not require a major disaster declaration by the President or Secretary of Agriculture to provide local assistance.
Comments	Loans may be made for up to 100 percent of RD=s appraised value of site and home.

RURAL RENTAL HOUSING LOANS

Administering Agency
Rural Development (RD), Rural Housing Service (RHS)
United States Department of Agriculture

Contact
National: Carl Wagner, Director, Multi-Family Housing Processing Division, (202) 720-1604
E-mail Address: cwagner@rdmail.rural.usda.gov
Local: State RD Office

Statute
Public Law 10415, Housing Act of 1949, (Act of July 15, 1949, 63 Stat. 413, 42 USC 1441 et seq.) Section 515 Rural Rental Housing.

Form of Assistance
Loans.

Assistance Available
Funds can be used to buy, build, or repair apartments, duplexes, and multi-unit rental housing for very low and moderate-income families or senior citizens in rural areas. Funds can be used to provide water and waste disposal systems and other uses.

Beneficiaries
Loans may be made for housing in communities of up to 10,000 people and, under certain conditions, towns and cities between 10,000 and 20,000 people. Loans can be made to builders, including individuals, trusts, associations, partnerships, limited partnerships, State and local public agencies, nonprofit organizations, corporations, and cooperatives.

Qualifying Requirements
Loan recipients must have good credit, experience, proven ability to manage, and demonstrate a need.

Limitations
Funds may not be used for nursing, special care, or institutional housing. Housing must be occupied by people with very low or moderate incomes or senior citizens age 62 or over. Communities of 10,000 to 20,000 people have some limitations.

Availability
Loans are approved by the State Director and are not subject to a disaster declaration by the President or Secretary of Agriculture.

Comments
Loans are made to nonprofit organizations at up to 102 percent of appraised value; others receiving loans receive up to 97 percent. RHS publishes a Notice of Funding Availability each year in the Federal Register announcing the places in which loan proposals will be requested.

RURAL HOUSING SITE LOAN

Administering Agency Rural Development (RD), Rural Housing Service
United States Department of Agriculture

Contact
National: Lucia McKinney, Single Family Housing Direct Loan Division,
Rural Housing Service, (202) 720-1474
E-mail Address: lmckinne@rdasun2.rurdev.usda.gov
Local: RD State Office

Statute
Housing Act of 1949, as amended, (Act of July 15, 1949, 63 Stat. 413, 42 U.S.C. 1441 et seq.), Section 523 and 524, Public Law 89-117; Public Law 89-754, Rural Housing Amendments of 1983 (PL 98-181, November 30, 1983, 97 Stat. 1240, 42 U.S.C. 1490c) and U.S.C. 140d.

Form of Assistance
Loans.

Assistance Available
Direct loans for the purchase and development of adequate sites, including necessary equipment which becomes a permanent part of the development; for water and sewer facilities if not available; payment of necessary engineering and legal fees, and closing costs.

Beneficiaries
Public or private nonprofit organizations or state and local governments interested in providing sites for housing.

Qualifying Requirements
A private or public nonprofit organization that provides the development sites to qualified borrowers on a cost of development basis in own county and towns of 10,000 population or less and places up to 25,000 population under certain conditions.

Limitation
Loan limitation of $100,000 without national office approval; loan funds cannot be used for refinancing of debts, payment of any fee or commission to any broker negotiator, or other person for the referral of a prospective applicant or solicitation of a loan; no loan funds will be used to pay operating costs or expenses of administration other than actual cash cost of incidental administrative expenses if funds to pay those expenses are not otherwise available. Repayment of loan is expected within two years.

Availability
No deadline limit.

Comments
Sites developed within Section 524 loans must be for housing low and very low income families and may be sold to families, nonprofit organizations, public agencies and cooperatives eligible for assistance under and Section of Title V of Housing Act of 1949, or under any other law which provides financial assistance. Sites developed with Section 523 loans must be for housing to be built by the self-help method.

WORKFORCE INVESTMENT ACT

Economic Dislocated Worker Adjustment Assistance Act (EDWAA)
National Reserve Account (NRA)

Administering Agency Employment and Training Administration
Department of Labor

Contact National: Shirley Smith, Administrator, Office of Adult Services, (202) 693-3501
E-mail Address: smiths@doleta.gov
Local: DOL Regional Office

Statute Job Training Partnership Act of 1982, as amended, Title III(PL 97-300, Oct 13, 1982, 96 Stat. 1322, (29 USC 1501 et seq.).

Form of Assistance Grant.

Assistance Available Funds to be used by States to provide temporary jobs (cleanup, rescue, repair, renovation and rebuilding activities) associated with such a major disaster. The State may submit an application for assistance in response to disaster events either Presidentially declared natural disasters or other situations in which the Secretary of
Labor determines that an occurrence has caused massive deviation and economical dislocation to a community, under Title III B of 9 TPA.

Beneficiaries Primarily are workers affected by the disaster, other eligible dislocated workers, and the long-term unemployed.

Qualifying Requirements To qualify individuals must have become unemployed as a consequence of the disaster or meet other eligibility criteria as defined above.

Limitations None.

Availability Projects are funded from the Secretary=s National Reserve Account which is equal to 20 percent of the total funds allocated for the EDWAA Program.

Comments Temporary jobs created under this type of grant must be in public or private nonprofit agencies for up to six months= duration. An individual worker may not receive more than $12,000 in temporary job wages paid with NRA grant funds.

DISASTER UNEMPLOYMENT ASSISTANCE (DUA)

Administering Agency	Employment and Training Administration Department of Labor (DOL)
Contact	National: Robert Gillham, Team Leader, Federal Programs, (202) 693-3207; Darryl Bauman, (202) 693-3218; Sterling Green, (202) 693-3266 E-mail Address: gillhamr@doleta.gov Local: DOL Regional Office
Statute	Section 410 of the Stafford Act, 42 U.S.C. 5177, 5189a; DOL Regulations at 20 CFR 625.
Form of Assistance	Grants from Federal Emergency Assistance Agency via DOL.
Assistance Available	Under section 410, weekly cash benefits for unemployed workers and unemployed self-employed workers and re-employment assistance.
Beneficiaries	Unemployed workers and unemployed self-employed workers.
Qualifying Requirements	Individuals who have either 1) exhausted their regular State unemployment compensation or 2) are otherwise not eligible for regular State unemployment compensation and who are unemployed as a result of a major disaster.
Limitations	None.
Availability	The program is implemented only upon a Presidential declaration of a major disaster designated for Individual Assistance.
Comments	DUA weekly payment amounts do not exceed the maximum weekly amount paid under the State unemployment compensation law. Payments may be made for up to 26 weeks after declaration. Payments are not based on need nor designed to replace all income loss due to unemployment or damage to property.

MIGRANT AND SEASONAL FARM WORKERS

(Migrant and Other Seasonal Farmworkers Program)

Administering Agency

Employment and Training Administration
Department of Labor

Contact

National: Alicia Fernandez-Mott, Chief, Division of Seasonal Farmworker Programs, (202)693-3729
E-mail Address: afernandez@doleta.gov
Local: DOL National Office

Statute

Job Training Partnership Act of 1982, as amended, Title IV, Part A, Section 402, Public Law 97-300, 96 Stat. 1369, 29 U.S.C. 1672, and Workforce Investment Act (WIA) of 1998, Title I, Section 167.

Forms of Assistance

Formula and project grants for job training activities and other assistance.

Assistance Available

Grant assistance is made available to (1) Public agencies and units of government. (2) Private nonprofit organizations authorized by their charters or articles of incorporation to operate employment and training programs.

Under Section 167 of WIA (402 of JTPA), farm workers and their dependents may be offered services such as classroom training, on-the-job training, work experience, job development, job placement, and relocation assistance, education assistance, health services, and other supportive services.

Beneficiaries

Ultimate beneficiaries are farm workers who suffer chronic seasonal underemployment in the agricultural industry, and their dependents.

Qualifying Requirements

Limited to those individuals and their dependents who have, during any consecutive 12 months in the 24 month period preceding their application for enrollment, been a seasonal farm worker or migrant farm worker, and (a) received at least 50 percent of their total earned income or (b) been employed at least 50 percent of their total time in farm work, and (c) been identified as member of a family which receives public assistance or whose annual family income does not exceed the higher of either the poverty level or 70 percent of the lower-living standard income level.

Limitations

None.

Availability

This is an ongoing program and no one event triggers its implementation. Grantees are ultimately approved through a limited competition process by the Grant Officer, Division of Acquisition and Assistance, Employment and Training Administration, Department of Labor, Washington D.C.

Comments

Currently transforming from JTPA to WIA, to be effective no later than July 1, 2000.

ECONOMIC ADJUSTMENT PROGRAM

(Section 209 - 42 U.S.C. 3149)

Administering Agency

Economic Development Administration (EDA)
United States Department of Commerce

Contact

National: David Witschi, Director, Economic Adjustment Division,
(202) 482-2659
E-mail Address: dwitschi@doc.gov
Local: EDA Regional Office

Statute

Public Law 105-393, Public Works and Economic Development Act of 1965, as amended.

Form of Assistance

Grants.

Assistance Available

Grants to a designated redevelopment area, a nonprofit organization, an economic development district, or a State or political subdivision thereof to prevent serious economic dislocations or to reestablish employment opportunities after a dislocation occurs. Grants can fund public infrastructure, business development (including funding of a revolving loan fund), planning/technical assistance, and any other assistance to alleviate long-term economic deterioration and sudden and severe economic dislocation.

Beneficiaries

Communities which will or have experienced major permanent job losses, due to a disaster or other economic downtrend.

Qualifying Requirements

The area eligibility criteria for economic adjustment grants can be any one of three basic distress factors: low per capital increase, high unemployment, or Aspecial need.@ Eligibility requirements are waived if there is a Presidentially declared disaster.

Limitations

Grants usually provide up to 50 percent of project cost.

Availability

The Assistant Secretary, Department of Commerce, has the authority to authorize this program. A Presidential disaster declaration is not required.

Comments

Communities can apply for strategy grants or implementation grants for drought-caused job losses, but must meet permanent job loss threshold level.

ECONOMIC INJURY DISASTER LOAN (EIDL)

Administering Agency

U.S. Small Business Administration (SBA)

Contact

National: Herbert Mitchell, Associate Administrator for Disaster Assistance
(202) 205-6734
E-mail Address: herbert.mitchell@sba.gov
Local: Regional Office

Statute

Section 7 (b) (2) of the Small Business Act (PL 85-536, July 18, 1958, 72 Stat. 384, 15 USC 631 et seq.)

Form of Assistance

Loans.

Available Assistance

Low-interest working capital loans to small nonfarm business and small agriculture cooperatives to help meet financial obligations arising from natural disasters.

Beneficiaries

Small nonfarm business and small agricultural cooperatives without credit elsewhere available.

Qualifying Requirements

Economic injury must be the direct result of disaster losses to farmers and eligibility is restricted to agri-dependent businesses in declared disaster areas.

Limitations

Assistance is limited to the amount necessary to carry the concern until resumption of normal operation, and is limited to an amount beyond the capacity of the concern or its owners to provide. Only economic injury caused by the declared disaster is eligible; refinancing of pre-disaster debts or other purposes not related to the disaster are not eligible. Agriculture enterprises (including farmers and ranchers) are not eligible for SBA disaster assistance (except for nurseries in drought).

Availability

When the Secretary of Agriculture declares a natural disaster due to agriculture losses, the SBA EIDL program is automatically available to small business adversely affected as a result of the agricultural losses to agricultural enterprises. That is, small businesses dependent on the agriculture producers would be eligible for assistance for the adverse economic effects of the loss of business or increased costs resulting from the crop or livestock losses to the producers. Such businesses might include suppliers to farmers and ranchers, packers, shippers, food processors, and others directly dependent on trade with the agricultural enterprises.

If the President were to declare a major disaster due to drought, with individual assistance included, then both the SBA physical disaster loan program and EIDL program would be automatically made available. The EIDL assistance would be available to any small businesses suffering economic injury from the drought itself rather than only the impacts stemming from agricultural losses. Thus, small businesses dependent on water supplies, including marinas, resorts, and others, would be eligible. Additionally, businesses of all sizes, homeowners and renters would be eligible for any direct physical property damage caused by the drought.

Comments

Maximum total loan to any one business is $1,500,000, except for businesses determined by SBA to be major sources of employment.

BUSINESS AND INDUSTRIAL LOAN PROGRAM (B&I)

Administering Agency	Rural Development (RD), Rural Business-Cooperative Service United States Department of Agriculture
Contact	National: Carolyn Parker, Director, Business and Industry Division, (202) 690-4103 E-mail Address: carolyn.parker@usda.gov Local: State RD Office
Statute	Consolidated Farm and Rural Development Act, as amended. Section 310B, (Public Law 92-419, Aug 30, 1972, 86 Stat. 663, 7 USC 1932)
Form of Assistance	Direct and Guaranteed Loans.
Assistance Available	Basic uses are for developing or financing business or industry, increasing employment, and controlling or abating pollution. Funds can be used for real estate, operation expenses, and purchases of equipment for support of businesses. As examples, funds can be used to acquire businesses, construct buildings, purchase or fabricate equipment and fixtures, and working capital.
Beneficiaries	Rural businesses (see comments).
Qualifying Requirements	Loans and loan guarantees are not available to charitable institutions, church-sponsored or fraternal organizations.
Limitations	Business and Industry Guaranteed Loans are limited to $25 million. Business and Industry Direct Loans are limited to $10 million.
Availability	Subject to the availability of funds, this program is available for drought aid but it is not limited to drought or other emergencies. This program does not require a major disaster declaration by the President or Secretary of Agriculture to be triggered.
Comments	Loans must be used to assist businesses in rural areas. Rural areas are generally outside cities of more than 50,000 inhabitants and their immediately adjacent urbanized areas. For information on a specific site you should contact the Rural Development State Office in the State in which the project is to be located. Priority is given to projects located in communities of 25,000 or less population.

DISASTER RELIEF AND EMERGENCY ASSISTANCE PROGRAM

Administering Agency

Federal Emergency Management Agency (FEMA)

Contact

National: Robert Adamcik, Deputy Executive Associate Director, Response and Recovery
(202) 646-3162
E-mail Address: robert.adamcik@fema.gov
Local: FEMA Regional Office

Statute

The Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288, as amended.

Forms of Assistance

Cost-shared grants and technical assistance.

Assistance Available

Cost-shared grants to State and local agencies to meet threats to life and property from major disasters and to save lives, protect property, public health and safety, and to reduce threats from catastrophes. Assistance includes repairing and restoring public and private nonprofit facilities and providing community services (including water and fire suppression). Assistance to individuals includes disaster housing (including mortgage and rental assistance), unemployment assistance, crisis counseling, and grants for unmet needs. Federal agencies may be directed to provide technical assistance and advisory personnel to assist State and local agencies.

Beneficiaries

Local and State governments, private nonprofit facilities, Indian tribes, families, and individuals.

Qualifying Requirements

Requires declaration by Governor that an emergency or a major disaster exists which is beyond the capability of the State and local agencies and a Presidential declaration of a major disaster. A major disaster is normally one which requires Federal assistance beyond the normal assistance available under other Federal agency authorities, e.g., Secretary of Agriculture, Secretary of the Army, United States Army Corps of Engineers.

Limitations

The President may make an emergency declaration unilaterally in areas of primary Federal responsibility. Grants to individuals and families are limited to $13,100 (FY97) each in the Individual and Family Grant (IFG) program. IFG and Public Assistance cost share is normally at 75 percent Federal share/25 percent State share.

Availability

Drought is specifically included in the Act as a type of event which may cause a major disaster. The Act is very broad, but droughts may not produce emergency conditions and physical damage which the Stafford Act is primarily intended to address.