

Nebraska's Climate Assessment Response Committee (CARC) Drought Mitigation and Response Plan (Adopted, June 26, 2000)



Background

Drought is a common feature of the Nebraska landscape and often results in significant economic, environmental, and social impacts. Although agriculture is the primary sector affected, impacts on rural and municipal water supplies, fish and wildlife, tourism, recreation, water quality, soil erosion, the incidence of wildland fires, electricity demand, and other sectors are also important. In addition, the indirect impacts of drought on personal and business incomes, tax revenues, unemployment, and other areas are also significant.

Drought differs from other natural hazards in several ways. Drought is a slow-onset, creeping phenomenon and its impacts are largely non-structural. This makes the detection or early warning of drought conditions more difficult than the detection of quick-onset natural hazards that result in more visible, structural impacts. Drought normally affects more people than other natural hazards, and its impacts are spread over a larger geographical area. This makes it more difficult to assess impacts and to provide assistance to drought-stricken areas. Largely because of these distinct characteristics of drought, society in the past has approached drought management through a response or crisis management mode, dealing with the impacts of the event during the post-impact period.

Because of the repeated and widespread occurrence of severe drought throughout the United States in the past two decades and the magnitude and complexity of the associated impacts, there has been a growing trend toward drought planning at the state and other levels of government. Drought planning has been defined as actions taken by individual citizens, industry, government, and others before drought occurs to mitigate impacts and conflicts arising from drought. Planning has been occurring at all levels—from local communities to states and river basins. As of June 2000, thirty states in the United States had drought plans in place and six states were actively pursuing plan development. Recent drought planning efforts have placed greater emphasis on risk management. As a result, mitigation has become the cornerstone of most newly initiated planning activities, and this trend is expected to continue.

Nebraska Drought Planning

The State of Nebraska first adopted a drought plan in 1986 under the leadership of Governor J. Robert Kerrey. This plan, Nebraska's Drought Assessment and Response System (DARS), was developed through cooperation between state and federal agencies and the University of Nebraska. Leadership for this activity was provided by the Natural Resources Commission. In 1988, as a result of the severe drought that affected more than 40% of the nation and much of eastern Nebraska, DARS was

revised to become the Drought Assessment and Response Team (DART) at the request of Governor Kay Orr. The Natural Resources Commission continued to provide leadership for this activity. The objectives of DART remained the same as its predecessor, and it was activated in 1988 to respond to drought conditions in the eastern portion of the state and again in 1989 in response to a statewide drought.

Largely as a result of the experiences in responding to the droughts of 1988-89, the State of Nebraska began to consider ways to improve the effectiveness of the state's drought plan. One of the recognized limitations of DART was that it functioned largely on an "ad hoc" basis with limited authority and little continuity between administrations. In 1991, Legislative Bill 274 was introduced in the 2nd session of the 92nd Legislature. The purpose of this bill was to establish the Climate Assessment Response Committee (CARC) under the leadership of the office of the Governor. LB 274 was passed by the Legislature in 1991 and replaced the functions of DART. As a result of this bill, leadership of CARC shifted to the Governor's office and chairmanship of CARC was transferred to the Nebraska Department of Agriculture. CARC broadened the range of authority to include other potential climate-related natural hazards. However, drought has received most of the attention of CARC since it was created.

The objectives of CARC as defined by LB 274 were to:

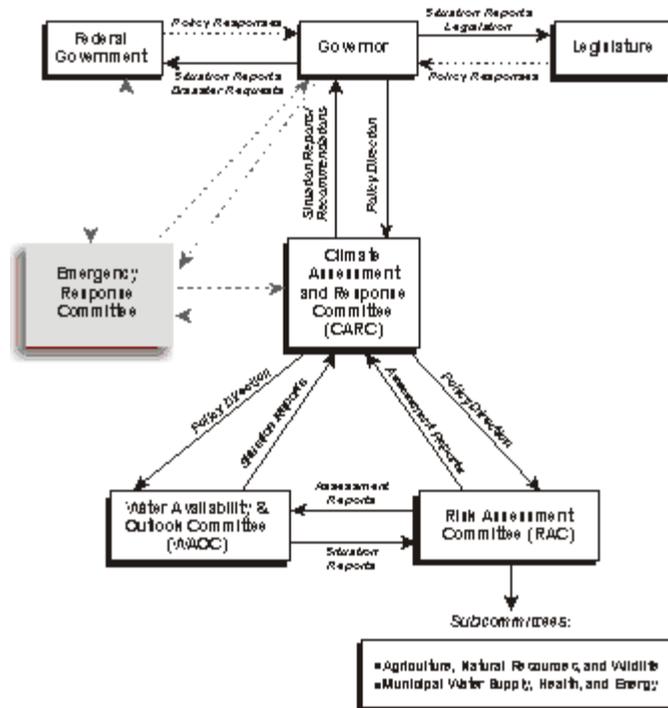
1. provide timely and systematic data collection, analysis, and dissemination of information about drought and other severe climate occurrences to the Governor and to other interested persons;
2. provide the Governor and other interested persons with information and advice relevant to requests for federal disaster declarations and to the use of funds and other types of assistance available to the state because of such declarations;
3. establish criteria for start-up and shut-down of various assessment and response activities by state and federal agencies during drought and other climate-related emergencies;
4. provide an organizational structure that assures information flow and defines the duties and responsibilities of all agencies during times of drought and climate-related emergencies;
5. maintain a current inventory of state and federal agency responsibilities in assessing and responding to drought and other climate-related emergencies;
6. provide a mechanism for the improvement of methods of assessing impacts of drought on agriculture and industry;
7. provide such other coordination and communication among federal and state agencies as is deemed appropriate by such committee; and

8. perform such other climate-related assessment and response functions as are desired by the Governor.

An organizational structure for CARC was adopted by the committee in 1993. The organizational components of CARC are shown in Figure 1. CARC serves as a steering committee for the state’s drought plan and other climate-related activities. The other principal committees associated with CARC are the Water Availability and Outlook Committee (WAOC) and the Risk Assessment Committee (RAC). The Emergency Response Committee (ERC) originally was considered a formal arm of CARC, but its role was revised in June 2000 in response to existing drought conditions and further study of Nebraska state law. By statute, the Nebraska Emergency Management Agency (NEMA) is charged with responding to emergency situations, such as drought or floods, at the direction of the Governor. To avoid any overlap of duties, the ERC’s role was folded into the NEMA organization and separated from the official CARC structure.

While not a formal part of CARC, the ERC/NEMA is mentioned in this plan, and shown in the CARC organizational flow chart, to emphasize the importance of information sharing and communication between the two groups, particularly in times of weather emergency.

Figure 1.



Organizational components of Nebraska's Climate Assessment and Response Committee (CARC)

In spring 1998, at the suggestion of the National Drought Mitigation Center (NDMC) at the University of Nebraska, CARC agreed to revise the state's drought plan. This revision process has had the full support of the Governor's office. The goal of this revision process was to derive a plan that would place greater emphasis on mitigation measures to lessen the risk (i.e., impacts) associated with the occurrence of drought and to incorporate new technologies for monitoring drought and water supply conditions that were now available to the committee.

Drought Impacts in Nebraska

Nebraska has experienced numerous drought episodes during the post-settlement period, and evidence from tree rings clearly document the occurrence of severe drought over the past 800 years. Drought produces a complex web of impacts that ripple through many sectors of the economy. This complexity is largely caused by the dependence of so many sectors on water for producing goods and providing services. Impacts from drought are commonly classified as direct or indirect and further separated into economic, environmental, and social categories. The impacts commonly associated with drought have been compiled by the National Drought Mitigation Center and are illustrated in Table 1. Although this list represents the experiences of many drought-prone regions of the world, many of these impacts are common to Nebraska. During the Nebraska drought plan revision process, this list was used to identify those impacts that were most critical to the state.

Many economic impacts occur in broad agricultural and agriculturally related sectors, including forestry and fisheries, because of the reliance of these sectors on surface and subsurface water supplies. In addition to obvious losses in yields in both crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and diseases to forests and reduce growth. The incidence of forest and range fires increases substantially during extended droughts, which in turn places both human and wildlife populations at higher levels of risk.

Income loss is another indicator used in assessing the impacts of drought because so many sectors are affected. Reduced income for farmers has a ripple effect, as their ability to purchase goods and services is limited. Thus, many retailers experience significant reductions in sales. This leads to unemployment, increased credit risk for financial institutions, capital shortfalls, and loss of tax revenue for local, state, and federal government. The recreation and tourism industries are also affected because many consumers have less discretionary income available. Prices for food, energy, and other products increase as supplies are reduced. In some cases, local supply shortfalls for certain goods will result in the importation of these goods from outside the stricken region. Reduced water supply impairs the navigability of rivers and results in increased transportation costs because products must be transported by rail or truck. Hydropower production is also significantly reduced. Demand for electricity increases substantially since droughts that occur during the summer season are often associated with above-normal temperature.

Table 1. Classification of drought-related impacts (costs and losses)

<i>Problem Sectors</i>	<i>Impacts</i>
Economic	<ul style="list-style-type: none"> • loss from crop production <ul style="list-style-type: none"> annual and perennial crop losses; damage to crop quality reduced productivity of cropland (wind erosion, etc.) insect infestation plant disease wildlife damage to crops • loss from dairy and livestock production <ul style="list-style-type: none"> reduced productivity of range land forced reduction of foundation stock closure/limitation of public lands to grazing high cost/unavailability of water for livestock high cost/unavailability of feed for livestock high livestock mortality rates increased predation range fires • loss from timber production <ul style="list-style-type: none"> forest fires tree disease insect infestation impaired productivity of forest land • loss from fishery production <ul style="list-style-type: none"> damage to fish habitat loss of young fish due to decreased flows • loss of national economic growth, retardation of economic development • income loss for farmers and others directly affected • loss of farmers through bankruptcy • loss to recreational and tourism industry • loss to manufacturers and sellers of recreational equipment • increased energy demand and reduced supply because of drought-related power curtailments • costs to energy industry and consumers associated with substituting more expensive fuels (oil) for hydroelectric power • loss to industries directly dependent on agricultural production (e.g., machinery and fertilizer manufacturers, food processors, etc.) • decline in food production/disrupted food supply <ul style="list-style-type: none"> increase in food prices increased importation of food (higher costs) • disruption of water supplies • unemployment from drought-related production declines • strain on financial institutions (foreclosures, greater credit risks, capital shortfalls, etc.) • revenue losses to federal, state, and local governments (from reduced tax base) • deterred capital investment, expansion • dislocation of businesses • revenues to water supply firms <ul style="list-style-type: none"> revenue shortfalls windfall profits • loss from impaired navigability of streams, rivers, and canals

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- cost of water transport or transfer
 - cost of new or supplemental water resource development
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- Environmental
- damage to animal species
 - reduction and degradation of fish and wildlife habitat
 - lack of feed and drinking water
 - disease
 - increased vulnerability to predation (e.g., from species concentration near water)
 - loss of biodiversity
 - wind and water erosion of soils
 - reservoir and lake drawdown
 - damage to plant species
 - water quality effects (e.g., salt concentration, increased water temperatures, pH, dissolved oxygen)
 - air quality effects (dust, pollutants)
 - visual and landscape quality (dust, vegetative cover, etc.)
 - increased fire hazard
 - estuarine impacts; changes in salinity levels, reduced flushing

- Social
- increased groundwater depletion (mining), land subsidence
 - loss of wetlands
 - loss of cultural sites
 - insect infestation
 - food shortages (decreased nutritional level, malnutrition, famine)
 - loss of human life (e.g., food shortages, heat)
 - public safety from forest and range fires
 - conflicts between water users, public policy conflicts
 - increased anxiety
 - loss of aesthetic values
 - health-related low flow problems (e.g., diminished sewage flows, increased pollutant concentrations, etc.)
 - recognition of institutional constraints on water use
 - inequity in the distribution of drought impacts/relief
 - decreased quality of life in rural areas
 - increased poverty
 - reduced quality of life, changes in lifestyle
 - social unrest, civil strife
 - population migration (rural to urban areas)
 - reevaluation of social values
 - increased data/information needs, coordination of dissemination activities
 - loss of confidence in government officials
 - recreational impacts
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Environmental losses are the result of damages to plant and animal species, wildlife habitat, and air and water quality; forest and range fires; degradation of landscape quality; loss of biodiversity; and soil erosion. Some of the effects are short-term and conditions quickly return to normal following the end of the drought. Other

environmental effects linger for some time or may even become permanent. Wildlife habitat, for example, may be degraded through the loss of wetlands, lakes, and vegetation. However, many species will eventually recover from this temporary aberration. The degradation of landscape quality, including increased soil erosion, may lead to a more permanent loss of biological productivity of the landscape. Although environmental losses are difficult to quantify, growing public awareness and concern for environmental quality has forced public officials to focus greater attention and resources on these effects.

Social impacts mainly involve public safety, health, conflicts between water users, reduced quality of life, and inequities in the distribution of impacts and disaster relief. Many of the impacts specified as economic and environmental have social components as well. Population out-migration is a significant problem in many countries as people affected by drought choose to migrate to urban areas either within the stressed areas or to regions outside the drought area. This was certainly a major impact of droughts that occurred in Nebraska during the latter part of the 19th century and the early 20th century, particularly during the 1930s.

Drought Mitigation and Response

Preparedness emphasizes pre-disaster activities designed to increase the level of readiness or improve operational and institutional capabilities to respond to drought in its early stages as well as during the period of peak severity and recovery. Nebraska recognizes that its drought plan must address both the emergency or response element of drought and longer-term issues associated with the reduction of vulnerability and, therefore, risk. Thus, drought mitigation planning is considered to be an ongoing process that the state will need to continue to address in the long term. CARC understands that its role is to provide leadership and coordination in the pursuit of the goal to reduce the impacts of drought in Nebraska while preserving our natural and agricultural resource base for future generations.

The intent of Nebraska's drought plan is to provide government with an organizational structure to systematically address the impacts of drought in a more effective, timely, and coordinated manner. Given the slow-onset nature of drought and the myriad of state and federal agencies and other organizations involved in responding to drought at the state and federal level, this organizational structure and improved coordination is critically important. A drought plan can be an effective means to improve information flow on drought conditions, severity, and impacts, and thus the timeliness of mitigation and emergency response actions.

Nebraska's revised drought plan places more emphasis on mitigation. Mitigation is defined as short- and long-term actions, programs, or policies implemented during and in advance of drought that reduce the degree of risk to human life, property, and productive capacity. The types or forms of mitigation activities vary from one natural hazard to another. Drought-related mitigation actions are, for the most part, different from those used for other natural hazards because of the insidious nature of drought.

Mitigation actions used by states to address impacts during recent droughts in the United States can be classified into nine primary categories, as shown in Table 2. Many of these actions and programs have been and will continue to be considered by Nebraska as part of its ongoing drought planning process.

Assessment programs adopted by states range from improved criteria or triggers for the initiation of specific actions in response to drought to new data collection networks. Automated weather data networks such as the one that exists in Nebraska have significantly improved state monitoring capabilities. One of the three critical components of a drought plan is a comprehensive monitoring/early warning system. Parameters that must be monitored to detect the early onset of drought include temperature and precipitation, stream flow, reservoir and groundwater levels, snow pack, and soil moisture. Each of these parameters represents different components of the hydrologic system and, therefore, different impact sectors (e.g., agriculture, energy, transportation, recreation and tourism). To assess emerging drought conditions, these data must be integrated to provide a comprehensive snapshot of water availability and outlook.

Legislative actions taken by states included the passage of measures to protect instream flows and guarantee low-interest loans to farmers. Low-interest loans, a common federal response to drought, are not generally available from states. Many states have been reexamining aspects of water rights doctrine in response to growing water use and associated conflicts. Water banks have been used in some states (e.g., California) as a means of temporarily modifying water allocation procedures during water shortages.

Augmentation of water supplies during recent droughts included rehabilitating reservoirs to operate at design capacity and reviewing reservoir operation plans. Many cities also worked with self-supplied industrial users on programs to reallocate some water for emergency public water supplies. In the longer term, urban areas have sought to expand the capacity of their water supply system by developing new supplies or through the development of alternative supplies to lessen vulnerability.

One of the key responsibilities of state government during periods of drought is to keep the public aware of the severity of the situation through timely reports. These reports must provide a clear rationale for mitigative actions that are being imposed on either a voluntary or mandatory basis. During recent droughts, some states have organized informational meetings for the media and the public, implemented water conservation awareness programs, prepared and distributed informational materials, and organized workshops on drought-related topics. Sample ordinances on water conservation were also prepared and distributed to municipalities and rural suppliers.

Most states lack the financial resources necessary to provide drought relief to individual citizens during times of emergency. However, it is often within the mission and capacity of state agencies to provide technical assistance to municipalities and others. During recent droughts, states assisted by providing advice on potential new sources of water and evaluating the quality and quantity of those supplies. Agencies also assisted municipalities in assessing the vulnerability of water supply systems. States encouraged the adoption of voluntary water conservation measures and established stronger economic incentives for water conservation within the private sector. Water metering and leak detection programs were implemented.

Emergency response programs would not be considered by some to be mitigative actions. However, if these measures are implemented to reduce immediate impacts or the risk of future impacts as part of a long-term mitigation program, they represent a proactive approach to drought management. State responses included a wide range of measures such as lowering of well intakes on reservoirs for rural water supplies, establishing water hauling programs for livestock, extending boat ramps in recreational areas, and creating a tuition assistance program to enable farmers to participate in farm management classes.

Table 2. Drought-related mitigative actions taken by states during recent droughts

Category	Specific Action
Assessment programs	Developed criteria or triggers for drought-related actions
	Developed early warning system, monitoring program
	Conducted inventories of data availability
	Established new data collection networks
	Monitored vulnerable public water suppliers
Legislation/public policy	Prepared position papers on public policy issues
	Examined water rights statutes for possible modification during water shortages
	Passed legislation to protect instream flows
Water supply augmentation/ development of new supplies	Issued emergency permits for water use
	Provided pumps and pipes for distribution
	Proposed and implemented program to rehabilitate reservoirs to operate at design capacity
	Undertook water supply vulnerability assessments
	Inventoried self-supplied industrial water users for possible use of their supplies for emergency public water supplies
Public awareness/ education programs	Inventoried and reviewed reservoir operation plans
	Organized drought information meetings for the public and the media
	Implemented water conservation awareness programs
	Published and distributed pamphlets to individuals, businesses, and municipalities on water conservation techniques and agricultural drought management strategies
	Organized workshops on special drought-related topics
Technical assistance on water conservation	Prepared sample ordinances on water conservation for municipalities and domestic rural supplies
	Provided advice on potential new sources of water
	Evaluated water quantity and quality from new sources
	Advised water suppliers on assessing vulnerability of existing supply system
Demand reduction/water conservation programs	Recommended the adoption of water conservation measures to suppliers
	Established stronger economic incentives for private investment in water conservation
	Encouraged voluntary water conservation
	Improved water use and conveyance efficiencies
	Implemented water metering and leak detection programs

Emergency response programs	<p>Established alert procedures for water quality problems</p> <p>Stockpiled supplies of pumps, pipes, water filters, and other equipment</p> <p>Established water hauling programs for livestock from reservoirs and other sources</p> <p>Compiled list of locations for livestock watering</p> <p>Established hay hotline</p> <p>Provided funds for improvement of water systems, developing new systems, and digging of wells</p> <p>Provided funds for recovery programs for drought and other natural disasters</p> <p>Lowered well intakes on reservoirs for rural water supplies</p> <p>Extended boat ramps and docks in recreational areas</p>
Water use conflict resolution	<p>Acted to resolve emerging water use conflicts</p> <p>Negotiated with irrigators to gain voluntary restrictions on irrigation in areas where domestic wells were likely to be affected</p> <p>Established a water banking program</p> <p>Clarified state law regarding sale of water</p> <p>Clarified state law on changes in water rights</p> <p>Suspended water use permits in watershed with low water levels</p> <p>Investigated complaints of irrigation wells interfering with domestic wells</p>
Drought contingency plans	<p>Recommended to water suppliers the development of drought plans</p> <p>Established statewide contingency plan</p> <p>Evaluated worst-case drought scenarios for possible further actions</p>

Conflicts between water users increase during water-short periods. Timely intervention to resolve these conflicts will become increasingly necessary as demands on limited water supplies continue to expand in number and complexity. The best approach is to anticipate these conflicts well in advance of drought and initiate appropriate actions to avoid conflict. Many of the actions taken focused on the growing conflicts between municipal and agricultural water use.

Nebraska’s Drought Mitigation and Response Plan

Recognizing the recurring nature of drought in Nebraska and the potential risks associated with severe drought events that may persist for one or more years, the purpose of the state’s drought mitigation efforts are to:

- monitor the state’s climate and water supply conditions;
- assess the risks of and vulnerabilities to drought;
- promote the development and implementation of mitigation actions and policies; and

- respond to drought emergencies in a timely and effective manner.

The long-term goal of the plan is to provide Nebraska with an effective and systematic means of assessing drought conditions, develop mitigation actions and programs to reduce risk in advance of drought, and develop response options that minimize economic stress, environmental losses, and social hardships associated with drought. The state's drought planning activity is viewed as an ongoing process in recognition of the dynamic nature of the factors that may alter future vulnerability and risk. The objectives of the Nebraska Drought Mitigation and Response Plan are to:

1. Collect, analyze, and disseminate timely and reliable drought-related data and information in a timely and systematic manner to the Governor and other interested persons;
2. Identify sectors, communities, and population groups most at risk and work with those groups to determine mitigation and response programs to address these risks in advance of drought events;
3. Determine appropriate triggers for the initiation and termination of drought mitigation and response programs;
4. Provide an organizational structure that facilitates interagency cooperation and a delivery system that assures information flow to state and federal agencies and others;
5. Define the duties and responsibilities of state and federal agencies, the University of Nebraska, and others in preparing for and responding to the impacts of drought;
6. Compile and maintain an inventory of state and federal mitigation and response programs that can assist in lessening the impacts of and facilitating the recovery from drought;
7. Develop and maintain an information delivery system, including a CARC web site, to keep the public informed of current drought conditions and potential mitigation and response actions; and
8. Perform other climate-related mitigation, assessment, and response functions as desired by the Governor.

CARC Membership

The membership of CARC is, as defined by Legislative Bill 274, as follows:

- Department of Agriculture
- Department of Natural Resources
- Health and Human Services System, Office of Regulation and Licensure
- Nebraska Emergency Management Agency
- Cooperative Extension Service, University of Nebraska
- Conservation and Survey Division, University of Nebraska

- Livestock producer
- Crop producer
- Governor's Policy Research Office

The Nebraska Department of Agriculture currently serves as chair of CARC.

Additional CARC members can be appointed by the Governor, including:

- Chairpersons, Agriculture and Natural Resources Committees (Nebraska Legislature)
- Representatives from the federal Farm Service Agency and federal Crop Insurance Corporation
- Representatives from any other state or federal agencies he or she deems necessary

Water Availability and Outlook Committee (WAOC)

The purpose of the WAOC is to monitor current climate and water supply conditions and estimate likely future water availability. The State Climatologist of the Nebraska State Climate Office, University of Nebraska-Lincoln, will serve as chair of the WAOC. The objectives of the WAOC are:

1. To work with CARC and RAC to define drought for various applications and develop triggers that will initiate and terminate mitigation and response programs and actions;
2. To inventory current observation networks and make recommendations on the expansion or improvement of those networks;
3. To develop a comprehensive monitoring system for drought that incorporates current and emerging technologies to monitor all principal components of the hydrological system;
4. To identify, in collaboration with CARC and RAC, drought management areas of the state that reflect various levels of vulnerability to drought conditions; and
5. To recommend potential mitigation and response actions to CARC.

Those variables that the WAOC will monitor and evaluate on a routine basis include precipitation and temperature, soil moisture, stream flow, groundwater, reservoir and lake levels, and snow pack for Nebraska and in western states that supply inflow to the Platte and Missouri River systems. The committee will also use other indices such as the Standardized Precipitation Index, Palmer Drought Severity Index, Crop Moisture Index, and Standardized Vegetation Index to assess drought severity levels.

The WAOC will meet at least three times a year: spring, summer, and fall. The committee will report the status of climate and water supply conditions in writing to the chairperson of CARC and at CARC committee meetings.

Membership of the WAOC includes:

State Climatologist, Nebraska State Climate Office, UNL (Chair)
National Drought Mitigation Center, UNL
Conservation and Survey Division, UNL
Cooperative Extension Service, UNL
Department of Natural Resources, State of Nebraska
Natural Resources Conservation Service, USDA
National Weather Service, NOAA
U.S. Geological Survey, DOI
Bureau of Reclamation, DOI

Risk Assessment Committee (RAC)

The purpose of the Risk Assessment Committee (RAC) is to identify those sectors, population groups, or regions most at risk from drought and the most probable impacts. The objectives of this committee are to:

1. Conduct a drought risk assessment for Nebraska;
2. Formulate mitigation and response actions that will reduce these impacts and work with CARC on strategies to implement these actions and programs;
3. Collaborate with WAOC to develop appropriate triggers that link mitigation and response actions to the sequence of drought impacts;
4. Assist WAOC in the development of drought management areas.

The following RAC subcommittees were formed to address these objectives:

- Agriculture, natural resources, and wildlife
- Municipal water supply, health, and energy

The CARC chairperson will appoint co-chairs for these subcommittees. The membership of RAC will include the co-chairs of the subcommittees, a representative from the Nebraska Department of Agriculture, and a member of the NDMC staff. RAC will coordinate the activities of the subcommittees and report on these activities and recommendations to CARC.

The two subcommittees have conducted a risk assessment as the first step in incorporating long-term mitigation into the state's drought planning process. These subcommittees have involved a wide variety of stakeholders. Both subcommittees have prepared a list of impacts, possible mitigation actions to address particular impacts, and potential agencies and organizations to implement these actions. These subcommittees will continue to function to further define and implement mitigation and response programs.

The subcommittees will meet at least three times a year, and possibly more often during droughts or when the subcommittee tasks require more frequent meetings. During droughts, the subcommittees will help assess particular impacts and provide specific recommendations to CARC through RAC for the initiation and termination of mitigation and response actions using predefined triggers.

The list of impacts and suggested mitigation actions for each of the subcommittees is included in Appendix A. A subcommittee membership list is included in Appendix B. The agencies and organizations that have participated in the subcommittee meetings are listed in Appendix A.

Agency and Organization Responsibilities

The following agencies and organizations have an interest in and/or responsibility to deal with drought situations in Nebraska. These groups may have data and information on hand or have the capability to gather and disseminate information that is crucial to effective and timely drought management in Nebraska. Following is a brief outline of each agency's area of expertise, available information, and contact information in the event of a developing or ongoing drought situation.

AGENCIES AND ORGANIZATIONS

State Agencies

NE Department of Agriculture

The Department of Agriculture is responsible for chairing the state's Climate Assessment Response Committee (CARC); therefore, in that role it will serve as facilitator of the drought mitigation efforts of the various federal, state, university, and local entities.

It will enlist the expertise of various meteorological officials to monitor climate conditions. When it becomes apparent that drought conditions could develop or are developing, it will call a timely meeting of CARC and continue to call such meetings as conditions warrant.

The Department will encourage and coordinate the drought mitigation efforts of the various agencies based on CARC recommendations, and/or make other drought mitigation suggestions as it deems necessary.

As the lead state government agency involved in CARC, it will keep the Governor updated on conditions and offer mitigative action suggestions.

The Department will offer drought mitigation ideas regarding agriculture through its various producer networks and/or disseminate information via media contacts. It has access to heat-related animal health information through the State Veterinarian and the Animal and Plant Health Inspection Service and can provide

a variety of crop, livestock, production, and rainfall statistical information through the Nebraska Agricultural Statistics Service.

Contact: Greg Ibach, Assistant Director, P.O. Box 94947, 301 Centennial Mall South, Lincoln, NE 68509- 4947. Phone (402) 471-2341

Health and Human Services System, Office of Regulation and Licensure

Regulation & Licensure will, through data base search and confirmation in the field, develop and maintain a prioritized list of community water systems identified as being potentially at risk to extreme drought conditions. Those systems will be monitored for drought impacts, operational conditions, and drought emergency preparedness. Adjustments to the list will be made as appropriate. Information on drought management techniques and water conservation practices will be provided to water systems, news media, and other entities as necessary, for their use and dissemination to their customers. The Department will, with assistance from organizations representing public water systems in Nebraska, provide area wide informational workshops, and one-on-one contact with those systems potentially at highest risk of drought impact, to strongly encourage and assist in development of adequate drought preparedness procedures.

Contact: Jack Daniel at (402) 471-0510. Email: jack.daniel@hhss.state.ne.us

NE Department of Natural Resources

The agency maintains a data bank that has historical and current information on stream flows, crops, soil, water, well registrations, a dam inventory and weather conditions in the state. They regulate surface water use according to the prior appropriation doctrine and register new wells. Static water levels of groundwater are available through a cooperative program with USGS and CSD. DNR collects information on stream flow, water discharge from major canals, and water discharge from municipalities with transfer permits. The agency has a close working relationship with all irrigation districts and natural resources districts in Nebraska and can help coordinate drought assessment and response activities with those groups. They maintain a close working relationship with adjacent states on surface and groundwater issues and can provide assistance and coordination on a regional basis if necessary. DNR also can assist with data collection, analysis and planning and provide support for CARC as requested. The agency maintains the CARC web site.

Contacts: Roger Patterson, Agency Director, or Steve Soberski, P.O. Box 94676, 301 Centennial Mall South, Lincoln, NE 68506-4676. Roger Patterson Phone (402) 471-2363. Steve Soberski Phone (402) 471-3942

NE Emergency Management Office

The State of Nebraska concept of operations is based upon the understanding that emergency operations functions provided by state-level departments and agencies are generally similar to their normal day-to-day

functions. Day-to-day functions that do not contribute directly to the emergency operation may be redirected for the duration of any emergency or disaster.

Emergency operations will be initiated at the most local level of government capable of responding effectively to the emergency/disaster. Local governments should be prepared to manage initial emergency activities, regardless of the size and scope of the incident. State government resources may not be available in the early stages of an emergency.

When an emergency exceeds the local government's capability to adequately respond, assistance may be requested from state government. Specific state response resources may be contacted for assistance as part of their day-to-day duties or the Governor may be requested to issue a state of emergency proclamation. Issuance of a Governor's state of emergency proclamation will activate the SEOP and shall be the authority for the deployment of any state-level resources described in the SEOP.

State level resources are organized into nine (9) Emergency Support Functions (ESF), including Transportation, Communications, Public Works/Utilities, Fire Suppression, Information Planning, Mass Care, Law Enforcement, Health and Medical, and Urban Search and Rescue. One state department/agency is designated with the responsibility for coordinating planning and response activities of the assigned ESF. Each ESF annex describes a concept of operations and the responsibilities of the departments/agencies that will respond to local government requests.

- All departments/agencies having ESF responsibilities maintain standard operating procedures, including the procedures by which they will be alerted and activated for 24-hour operations if needed.
- Agencies, organizations and individuals assigned responsibilities in this plan will maintain an awareness of those responsibilities and will respond as directed in this plan.
- The NEMA director or his designee serves as the state level incident manager, supervises all emergency/disaster operations and coordinates the emergency support functions of state agencies as described in the SEOP.
- Each department/agency provides resources using its authorities and capabilities, in coordination with other ESF resources, to support its mission(s).
- Each ESF will have a designated department/agency representative (titled Emergency Support Function Coordinator (ESFC)) who will assist the NEMA Response Section Chief in the management of mission assignments, including coordination of task activities. Upon activation, the ESFC will notify ESF departments/agencies that may be called upon to provide emergency assistance.
- All departments/agencies having ESF responsibilities must be aware of their roles and be prepared to take necessary action.

Upon orders of the Governor, a state emergency response team or teams may be deployed to the stricken area(s) to reinforce local emergency management efforts.

If additional assistance is needed beyond state capability, the Governor may submit a request to the President for federal assistance. The Federal Emergency Management Agency (FEMA) will coordinate requests to the proper Federal agencies, as outlined in the Federal Response Plan.

In order to carry out its responsibilities, NEMA maintains an incident management system entitled the NEMA Operations Management System (OMS). OMS is utilized to facilitate the flow of information within the State Emergency Operations Center (SEOC); provide for organized management from the SEOC of multi-agency response to emergencies in Nebraska; and incorporate the principles of the Incident Command System (ICS) to manage response to natural and/or technological disasters. NEMA OMS incorporates the principles of the Incident Command System (ICS) to manage response to natural and/or technological disasters.

Contact: Larry Nedrow, Operations Officer, Nebraska Emergency Management Agency, 1300 Military Road, Lincoln, NE 68508-1090. Phone (402) 471-7414. Email: larry.nedrow@nema.state.ne.us

NE Game and Parks

The Game and Parks Commission serves primarily as a resource to provide technical assistance regarding Nebraska's Fish and Wildlife Resources to state, federal and local government agencies and to private landowners and the general public.

Contact: William (Bill) Baxter, Agricultural Programs Manager, Wildlife Division, Nebraska Game and Parks Commission, 2200 No. 33rd, PO Box 30370, Lincoln, NE 68503. Phone (402) 471-5449. Fax (402) 471-5528. Email: bbaxter@ngpc.state.ne.us

NE Department of Roads

The Department of Roads is charged with "the design, construction, maintenance, operation, and protection of adequate state highway facilities sufficient to meet the present demands as well as future requirements...." (Subsection 39-1301.00, Revised Statutes of Nebraska)

NDOR "is authorized to lease, rent, or permit for use, any area, or land and the buildings thereon, which area or land was acquired for highway purposes." (Subsection 39-1323.01, Revised Statutes of Nebraska)

Therefore, NDOR can issue a "LICENSE FOR THE MOWING AND REMOVAL OF HAY FROM DEPARTMENT OF ROADS' RIGHTS-OF-WAY". This permits the haying of highway rights-of-way when the Governor makes an emergency drought declaration.

Contact: Paul M. Cammack, State Maintenance Engineer, P.O. Box 94759, 5001 South 14th Street, Lincoln, NE 68509-4759. Phone (402) 479-4542. Fax (402) 479-3918. Email: pcammack@dor.state.ne.us

NE Department of Environmental Quality

DEQ regularly samples selected surface water bodies to detect sources of contamination and monitor trends.

The DEQ samples wells and surface water bodies in response to complaints or for special studies. If problems are identified, enforcement action may be initiated by the appropriate regulatory program. If groundwater contamination has resulted from non-point sources, DEQ will consider the area for potential study and designation as a Special Protection Area in cooperation with the local Natural Resources Districts.

DEQ issues point source wastewater discharge permits which limit the amount of pollutants discharged into streams.

DEQ has regional offices in North Platte, Omaha, and Chadron with additional offices scheduled to open in Holdrege, Norfolk, and Scottsbluff. Personnel in these offices can respond to emergency situations as they arise.

Contact: Patrick W. Rice, Assistant Director, Water Quality Division, or Thomas R. Lamberson, Deputy Director, Suite 400, The Atrium, 1200 N Street, P.O. Box 98922, Lincoln, NE 68509-8922. Fax (402) 471-2909. Email: Patrick Rice at deq185@mail.deq.state.ne.us or db82731@navix.net; Thomas Lamberson at deq112@mail.deq.state.ne.us

NE Forest Service

The agency coordinates the Aerial Fire Suppression Program and the State's Wildland Fire Danger rating system. They provide low-cost all-wheel drive vehicles to cooperating fire districts in Nebraska through the Federal Excess Property program and administer cost share funding to Nebraska Fire Districts for fire fighting equipment and personal protective clothing through the Volunteer Fire Assistance Program. The agency also provides wild land fire suppression training (in cooperation with the State Fire Marshal's Training Division) and planning and fire prevention assistance for Rural Fire Districts.

Contact: Don Westover, Fire Program Leader, Nebraska Forest Service, 105 Plant Industry Bldg, University of Nebraska, Lincoln, NE 68583-0815. Phone (402) 472-6629. E-mail: dwestover1@unl.edu

NE Fire Marshal's Office

The State Fire Marshal is responsible for maintaining a state of readiness in municipal and volunteer fire departments, and assists in finding maintenance services for emergency equipment.

The agency also assists in locating emergency water supplies to fight fires in the state.

A statewide burning ban is in place, with permits for burning being administered at the local level. In drought situations, when burning may be hazardous, the state office will consult with the local agencies to discuss current conditions and a possible recommendation that permits not be issued until conditions improve.

Contact: Ken Winters, State Fire Marshal, P.O. Box 94677, 246 South 14th Street, Lincoln, NE 68509-4677. Phone (402) 471-2027.

University of Nebraska

UNL Cooperative Extension

The primary mission of Cooperative Extension is the development and delivery of educational programs that impact individuals; their families; their farms, ranches, and businesses; and their communities. Cooperative Extension faculty are located on the University of Nebraska-Lincoln (UNL) East Campus; at Research and Extension Centers located at Clay Center, Norfolk, Lincoln, North Platte and Scottsbluff; and at 83 county or multi-county offices throughout the state. Research-based information and education provided by Cooperative Extension can help people make more informed decisions regarding drought issues. Cooperative Extension can provide information on a broad range of drought related topics, including crop production, livestock production, landscape and lawn water conservation, water conservation in the home, water resources management, and individual and family response to stress. Cooperative Extension faculty represent most of the subject matter disciplines in UNL's Institute of Agriculture and Natural Resources. Information and education programs can be delivered by written publications, meetings, media, and electronically using available technology.

Contacts: Elbert Dickey, Interim Dean and Director, Phone (402) 472-2966, Email: edickey1@unl.edu.
DeLynn Hay, Program Leader, Phone (402) 472-2966, Email: DHAY1@unl.edu

UNL National Drought Mitigation Center

The National Drought Mitigation Center at the University of Nebraska-Lincoln helps people and institutions develop and implement measures to reduce societal vulnerability to drought. The NDMC stresses preparation and risk management rather than crisis management. The NDMC will:

- continue to serve in an advisory capacity to CARC in its drought planning process;
- provide the latest information on drought planning, risk assessment, and monitoring techniques;
- serve as members of both the WAOC and RAC committees and provide advice through the RAC subcommittees on mitigation actions and programs; and
- assist in coordinating drought-related activities at the University of Nebraska.

Contact: Donald A. Wilhite, Director, National Drought Mitigation Center, 241 L.W. Chase Hall, University of Nebraska, Lincoln, NE 68583-0749. Phone (402) 472-6707. Fax (402) 472-6614. Email: DWILHITE1@unl.edu

UNL High Plains Climate Center and State Climate Office

The State Climate Office, through a memorandum of understanding with the National Climatic Data Center, is recognized as the official archive for climatic measurements taken within the state of Nebraska. It is the responsibility of the Nebraska State Climate Office to act as a warehouse for climate records, provide expertise with the dissemination of climatic observations, conduct relevant climatic analyses, and ensure timely and accurate summaries of climatic observations.

The Nebraska State Climate Office will provide members of the Climate Assessment and Response Committee with the most current climatic information possible. The timely dissemination of climatic data should ensure that criteria indicating the onset of drought conditions are revealed to interested parties before significant economic impacts are observed. The State Climate Office manager, the Nebraska state climatologist, will chair the Water Availability and Outlook Committee (WAOC) and report the committee's findings directly to the full membership of CARC.

Contact: Allen Dutcher, State Climatologist, High Plains Climate Center, University of Nebraska, 15 L.W. Chase Hall, Lincoln, NE 68583-0728. Phone (402)-472-5206. Fax: (402)-472-8763. Email: adutcher@hpccsun.unl.edu or internet website: <http://www.nebraskaclimateoffice.unl.edu>

UNL Conservation and Survey Division

The Conservation and Survey Division has a groundwater-level monitoring program that assists the natural resources districts in gathering water-level data. Its full-time water-level monitoring coordinator has helped them and other groups rebuild their water-level monitoring "infrastructure." This has included introducing sophisticated electronic monitoring equipment that saves them time and money.

This water-levels information goes into a data base co-managed by the U.S. Geological Survey and the state Department of Natural Resources (DNR) that can be accessed through the DNR website, with links from the CSD web site. It includes a statewide map of groundwater-level changes since predevelopment and for the past year that can zoom in on local conditions as needed. CSD also publishes the map of changes since predevelopment in hard copy.

The division keeps data from more than 4,700 test holes drilled in every county in the state to assist the understanding of groundwater occurrence and dynamics and in preparing management models of the groundwater geology of specific areas. This drilling has been done in every county in the state.

CSD's water survey personnel respond to requests for information and technical assistance pertaining to groundwater availability (for example, well siting), water-well design, potential yields of wells, and hydraulic properties of aquifers.

To support this effort, CSD maintains extensive files of well records, test hole logs, geotechnical borings, well and aquifer production tests, water quality analyses, and various kinds of reports. The division's researchers

generate computer models of groundwater and surface-water dynamics and of the interaction between the two. Decision makers can use these models to better understand pressure on water resources.

The Center for Advanced Land Management Information Technologies (CALMIT), a joint program of the division and the UNL School of Natural Resource Sciences, has developed an award-winning, seasonally and locally specific data base on vegetative cover and land use that has assumed a global scope, becoming the first such detailed data base. The data base has been used extensively in research on global environmental change, drought monitoring and watershed management, among other applications.

The division, in conjunction with the UNL Department of Geology, has been involved for more than two decades in studies of regional climate change and drought as reflected in the geological history of the Sand Hills and western Nebraska generally. These examinations of past climate patterns are some of the best information available about the implications of possible future climate shifts.

Contact: Mark Kuzila, Director, 113 Nebraska Hall, University of Nebraska-Lincoln, 68588-0517. Phone (402) 472-7537. Email: mkuzila1@unl.edu

Department of Agronomy

Faculty in the Agronomy Department at the University of Nebraska conduct teaching, research and extension in crop physiology, cropping systems, crop genetics and breeding, weed science, soil science, and range and forage sciences. Faculty expertise in the following areas contribute to efficient utilization of water resources in crop and forage production, as well as to mitigation of drought impact: (1) water and soil conservation through minimum- and no-tillage systems, (2) selection of appropriate crop rotations and variety/hybrids for water-limited conditions, (3) range and pasture management to optimize productivity during drought periods, (4) weed management concerns during drought periods, including herbicide effectiveness, (5) soil fertility and fertilizer management under water-limited conditions, (6) life-saving irrigation tactics to maximize water use efficiency in irrigated systems.

Contact: Kenneth G. Cassman, Professor and Head, Department of Agronomy, University of Nebraska, P.O. Box 830915, Lincoln, NE 68583-0915. Phone (402) 472-1555. Fax (402) 472-7094.

Federal Agencies

Farm Service Agency/USDA

Conservation Reserve Program - Emergency Haying and/or Grazing

- The FSA has the authority to grant haying and grazing privileges on cropland placed in the Conservation Reserve Program (CRP). The croplands, which have been removed from agricultural production of annual crops, may be grazed or hayed under a county-by-county emergency drought authorization from the Secretary of Agriculture. The intent is to alleviate a livestock emergency when pasture or forage crop

production has been substantially reduced because of a natural disaster. CRP participants are required to request haying or grazing from the FSA Service Center and pay the costs as determined by the Secretary.

Conservation Reserve Program - Grass Fire Prevention

- The Secretary of Agriculture allows CRP participants to use a controlled burn of the certain CRP acreage to remove excess growth and to establish firebreaks. Participants must receive a fire prevention plan from the local fire department. Participants may receive FSA approval to mow or use shorter grass varieties around building sites to prevent a fire from destroying farmstead sites. FSA will not approve a controlled burn unless the participant has an approved CRP conservation plan from the Natural Resources Conservation Service allowing the burn and a current burn permit from the local fire department. FSA encourages participants to make every effort possible to protect property in case of an actual fire. FSA does not approve controlled burning during the primary nesting season. During long periods of drought, the old CRP grasses are very susceptible to fire and can create an extreme hazard to people, property and wildlife.

Emergency Conservation Program

- FSA administers the Emergency Conservation Program (ECP) which provides cost share funds to farmers with livestock. The purpose is to carry out emergency water conservation and enhancement measures on farmland suffering from severe drought. The measures are used to permit grazing of range, pasture, or forage by livestock and to provide emergency water for confined livestock operations. Some restrictions do apply, and farmers should contact the local FSA Service Center for more details.

Livestock Assistance Program

- The Farm Service Agency administers a Livestock Assistance Program which provides a payment to eligible livestock producers where the producer has suffered a 40 percent or greater grazing loss for at least three consecutive months as a result of damage because of drought, hot weather, disease, insect infestation, flood, fire, hurricane, earthquake, severe storm, or other disasters. The County Committee may request the program be implemented on a part of a county basis. Payment is based on the lesser of the feed allowance for the eligible livestock or the value of the pasture and grazing loss. The statutory authority for the program is Public Law No. 106-78, and it requires appropriated funding; a national factor may be applied to the appropriated funds after a sign up period.

Noninsured Assistance Program

- The Noninsured Assistance Program (NAP) is designed to reduce financial losses that occur when natural disasters cause a catastrophic loss of production or prevented planting of an eligible crop by providing coverage equivalent to CAT insurance. Statute limits NAP to each commercial crop or agricultural commodity, except livestock, for which CAT is not available and is produced for food or fiber.

Crop Loss Disaster Assistance Program

- The Secretary of Agriculture will make disaster payments under disaster programs available to certain producers who have incurred losses in quantity or quality of their crops due to disasters. Producers will

be able to receive benefits under this part for losses to eligible crops as determined by the Secretary. Crop disaster programs are available when authorized by Congress.

Emergency Loan Assistance

- FSA provides low-interest Emergency (EM) loan assistance to eligible farmers and ranchers to help cover production and physical losses in counties declared as disaster areas by the President or designated by the Secretary of Agriculture. The FSA administrator may also authorize EM loan assistance to cover physical losses only. Farmers and ranchers that operate in counties contiguous to a disaster-designated county may also be eligible for EM loan assistance. EM loan assistance is only available to family-size farm or ranch operations. Applicants must provide evidence the loan being requested is not available from other sources.

Direct and Guaranteed Farm Operating Loans and Guaranteed Farm Ownership Loans

- FSA makes and guarantees loans to family-size farmers and ranchers who are temporarily unable to obtain private commercial credit. Operating loans may be used to purchase livestock, farm equipment, feed, seed, fuel, and other farm operating expenses and also refinance farm operating debts. Guaranteed Farm Ownership Loans may be used to refinance real estate type debts.

Disaster Set-Aside Program

- The Disaster Set-Aside (DSA) Program is available to existing FSA Farm Loan Program (FLP) borrowers, who suffered losses as a result of a natural disaster. Borrowers who are current or not more than one installment behind on any FLP loan may be permitted to move the scheduled annual installment for each eligible FLP load to the end of the loan term. The intent of the program is to relieve some of the immediate financial stress caused by the disaster.

Contact: Mark J. Wilke or Doy Unzicker, Nebraska State FSA Office, P.O. Box 57975, Lincoln, NE 68505-7975. Phone (402) 437-5581.

Risk Management Agency/USDA

RMA, through private insurance companies, provides a means for farmers to insure their operations to mitigate a loss of income when disasters, such as drought and other perils, damage their crops. The USDA subsidizes the insurance premiums for the policy the farmer chooses to cover the crops grown. RMA provides 5 different insurance plans for 15 crops which are commonly grown in Nebraska.

Contact: Clarence E. Manning, 3401 SW Van Buren, Topeka, KS 66611-2227. Email: rsoks@rm.fcic.usda.gov or www.rma.usda.gov

Natural Resources Conservation Service/USDA

The NRCS has 10 field soil scientists that are collecting soil moisture samples near the 16 climatological stations located throughout Nebraska. This sampling is used to check the calibration of the instrumentation at these

sites. These samples measure the moisture in the soils that is available to the plant. These measurements are then related to the field capacity (the point at which the soil is saturated) and the wilting point (the point at which the plants are in stress due to low soil moisture levels). The samples are taken at the surface, at 10", 20", and 40".

The NRCS also works with farmers and ranchers by designing and installing conservation systems such as reduced tillage, terraces, and buffer systems that improve soil quality and enhance the ability of the soil to store water.

Contact: State Soil Scientist, USDA-Natural Resources Conservation Service, 100 Centennial Mall North, Lincoln, NE 68502. Phone (402) 437-4113.

US Geological Survey/DOI

USGS can provide stream flow data and statistical analyses from approximately 85 gaging stations around the state. Real-time stream flow data is available at website: <http://www.ne.cr.usgs.gov>.

USGS has water-level records from over 80 continuous-recording wells and also periodically monitors water levels or receives water-level readings from other agencies to store in a water-level data base from thousands of other wells across the state.

USGS can provide water-quality data from various stream flow sites and numerous ground-water wells.

USGS has hydrologic models developed for some areas that can be used to estimate stream flow and groundwater levels under hypothetical drought conditions.

Contact: Glenn B. Engel, Room 406, Federal Building, U.S. Court House, 100 Centennial Mall North, Lincoln, NE 68508. Phone (402) 437-5082. Email: gbengel@usgs.gov

Bureau of Reclamation/DOI

The Bureau of Reclamation (Reclamation) coordinates drought assistance and mitigation funding through Public Law 102-250 by providing drought contingency planning and specific limited construction funding to areas impacted by a drought. These funds are contingent upon Congressional authorization, and after the Commissioner of Reclamation accepts a request from the state for drought assistance. The projects must also meet the guidelines established under the law.

Reclamation's Great Plains Region hosted a drought contingency planning workshop in the fall of 2000. This workshop was intended for local, state, and tribal agencies and provided drought planning tools and processes. Participants increased their ability to identify opportunities to improve planning, mitigation and responses to drought.

Reclamation operates a network of automated hydrologic and meteorologic monitoring stations located throughout the 17 western states. The Hydromet System collects remote field data from reservoirs, river gages, and canals, and transmits it via satellite to provide real-time water management capability. Reclamation's AgriMet System is a satellite-linked, weather and evapotranspiration reporting network used to assist irrigators in scheduling irrigation applications. Reclamation also provides water supply forecasts for Reclamation projects in the form of Annual Operating Plans and Monthly Water Supply Reports.

Reclamation's Water Conservation Program helps agencies develop and coordinate water conservation programs, contingency plans for drought-induced water shortages, and voluntary water transfers. Through Reclamation's Water Conservation Field Services Program (WCFSP), Reclamation works with municipalities, irrigation districts, tribes, and other local, state, and federal agencies to lessen the effects of drought through water conservation planning and implementation. The WCFSP is designed to provide technical and financial assistance with water management planning, conservation education, demonstration of innovative technologies, and implementation of conservation measures. By conserving existing water supplies through efficient management or by developing new water supplies where needed, the potential effects of drought are reduced and mitigation needs are diminished.

Contacts: Jack Wergin, Bureau of Reclamation, Nebraska-Kansas Area Office, P.O. Box 1607, 203 West 2nd, Grand Island, NE 68802-1607. Phone (308) 389-4622, x202. Fax (308) 389-4780. Email: jwergin@gp.usbr.gov. Rick DeVore, Great Plains Regional Drought Coordinator, Bureau of Reclamation P.O. Box 36900, Billings, MT 59107-6900. Phone (406) 247-7757. Fax (406) 247-7793. Email: rdevore@gp.usbr.gov. Roseann Gonzales, Reclamation Drought Coordinator, Bureau of Reclamation, D-5010, P.O. Box 25007, Denver, CO 80225-0007. Phone (303) 445-2787. Fax (303) 445-6693. Email: rgonzales@do.usbr.gov

National Weather Service/NOAA/DOC

The National Weather Service provides weather and flood forecasts and warnings to protect life and property. The day-to-day forecasts extend out to 7 days with more generalized outlooks extending out to 13 months.

The National Weather Service coordinates programs with state, local, and federal agencies involved with meteorology and hydrology to attain maximum cost effectiveness.

The National Weather Service works closely with the mass media as the chief means of communicating weather and flood warnings and forecasts to the public.

Nebraska is served by six National Weather Service Forecast Offices, three within the state and three outside the state. They are located at Valley, Hastings, and North Platte in Nebraska, and Goodland KS, Cheyenne WY, and Sioux Falls SD outside the state.

Contact: Dave Theophilus, Meteorologist in Charge, National Weather Service, PO Box 719, Valley, NE 68064-0719. Phone (402) 359-5166, ext 642

Corps of Engineers/DOD

The U.S. Army Corps of Engineers is authorized to supplement state and local authorities in providing emergency supplies of drinking water to any locality confronted by drought or with a source of contaminated drinking water causing or likely to cause a substantial threat to public health and welfare. The Governor or his authorized representative must request the assistance from the Corps. The request should outline the impact and resources committed by state and local governments to combat the situation. State and local authorities must commit all available resources prior to requesting federal assistance. During a drought event, the Assistant Secretary of the Army must declare the area a “drought distressed area” before federal emergency water assistance can be provided.

The forms of assistance are as follows: technical assistance to state and local officials for identification of any and all options to restore the source of water supply; transportation of emergency supplies of drinking water and limited well drilling when commercial firms are unable to provide water in a timely manner. Assistance is normally limited to 30 days for contaminated water sources.

Contacts: Jack D. Rose, Chief, Emergency Management, Omaha District. Phone (402) 221-4148. Fax (402) 221-4257. Marjorie DeBrot, Chief, Emergency Management, Kansas City District. Phone (816) 983-3535. Fax (816) 426-6138.

Other Agencies and Organizations

NE Association of Resource Districts

Natural Resources Districts (NRDs) are local political subdivisions charged with properly conserving and developing the state’s natural resources. The activities of NRDs include the management of surface water and groundwater resources, the construction and operation of flood control structures, and the administration of land management plans to prevent soil erosion and sediment problems. NRDs also work with municipal and domestic water supplies to protect the quality and quantity of water for the citizens of the state. The Nebraska Association of Resources Districts is a statewide association created by NRDs to provide administrative services, legislative representation, statewide communication and coordination of the 23 independent districts.

Contact: Dean E. Edson, Executive Director, 601 South 12th, Suite 201, Lincoln, NE 68508. Phone (402) 471-7674. Email: dedson@alltel.net

League of Municipalities

The League of Nebraska Municipalities is an association whose members are Nebraska cities and villages. Information from state agencies regarding drought conditions and effects can be provided to city and

village officials through League publications, newsletters and mailings.

Contact: Lash Chaffin, Utilities Section Director, League of Nebraska Municipalities, 1335 L Street, Lincoln, NE 68508. Phone (402) 476-2829. Email: lashc@lonm.org

Appendix A

See attached subcommittee matrices

Appendix B

See attached subcommittee membership lists

Appendix C

CARC members, year 2000

Greg Ibach, chair, Department of Agriculture

Barbara Cooksley, livestock producer

Elbert Dickey, Cooperative Extension, UN-L

Merwin Fricke, crop producer

Stanley Heng, Emergency Management

Mark Kuzila, Conservation and Survey, UN-L

Richard Nelson, Health and Human Services, Regulation and Licensure

Roger Patterson, Department of Natural Resources

Dave Vogler, Governor's Policy Research Office

Don Wilhite, National Drought Mitigation Center

Dayle Williamson, Department of Natural Resources

Appendix A
Nebraska Risk Assessment Committee
Nebraska Agricultural, Natural Resources, and Wildlife Subcommittee
Planned Mitigation Actions

IMPACT	PLANNED ACTIONS	ASSISTANCE AGENCIES
<p>Reduced range and pasture forage and livestock water results in poor animal health, soil erosion, and possible economic loss to ranchers</p>	<p>1. Encourage the use of range and pasture management techniques such as reduced stocking rates, reserve pastures, rotational grazing, removing competitive plants and stored feed to improve sustainability of rangelands under drought conditions.</p>	<p>National Grassland Association, Nebraska Cattlemen, UNL Extension, NRCS, NRDs, Sandhills Cattle Association</p>
	<p>2. Prior to and during drought, use public information programs and on-site visits to emphasize importance of rangeland management and planning to equalize stocking rates with available forage and the need for permanent water storage and distribution systems.</p>	<p>UNL Extension, NRDs, NEDA, DNR, NRCS, NDMC</p>
	<p>3. Monitor forage supplies and conditions around the state and facilitate information exchange between interested parties. A) If conditions warrant, a meeting of a forage advisory committee will be organized early in the spring to determine haystock availability, forage conditions, and wildlife concerns. B) Also, at that meeting, the procedure for emergency roadside haying through the Department of Roads could be discussed to determine need and value of this procedure. C) Also, at that meeting, it could be determined if a letter to the federal office of FSA is warranted to forewarn them of drought conditions and impending requests for CRP emergency release; this group would pass that recommendation on to CARC, who would then pass the request for the letter on to the Governor and the Director of Agriculture.</p>	<p>UNL Extension, NRDs, NEDA, NRCS, DNR, NDMC, FSA, Nebraska Cattlemen, Farm Bureau, Alfalfa Association, Nebraska Department of Roads</p>
	<p>4. Investigate needs of economically stressed ranchers who now rely on federal and state grazing leases to sustain their herds. Develop a coordinated plan of action to be taken by land management agencies to provide grazing and/or supplemental feed assistance to lessees. Investigate changing federal and state grazing regulations during drought.</p>	<p>Nebraska Forest Service, BLM, US Fish and Wildlife, Nature Conservancy</p>
	<p>5. Assist ranchers in obtaining supplemental income by connecting them with employment opportunities, and during drought, by holding job fairs and raising general awareness of job opportunities and ranchers' work skills.</p>	<p>Nebraska Department of Labor, NEDA, UNL Extension, NRDs, Center for Rural Development</p>

IMPACT	PLANNED ACTIONS	ASSISTANCE AGENCIES
	<p>6. Explore alternatives for establishing state funded cost-share program for water conservation measures on rangeland.</p> <hr/> <p>7. Establish and activate a statewide and nationwide hotline system for locating economical feedstock sources.</p> <hr/> <p>8. Explore/create incentive program for long-term conservation grazing practices.</p> <hr/> <p>9. Develop indemnity plan crop insurance for grazing land/livestock operations.</p>	<p>DNR</p> <hr/> <p>NEDA, UNL Extension, Nebraska Cattlemen, National Guard, Fam Bureau, NEMA, NRDs, NRCS, Alfalfa Association</p> <hr/> <p>NEDA, UNL Extension, NE Cattlemen</p> <hr/> <p>NEDA</p>
<p>Reduced soil moisture on dry cropland poses economic loss to farmers and possible increased soil erosion and blowing dust</p>	<p>1. Evaluate effectiveness of crop insurance and suggest changes.</p> <hr/> <p>2. Use public information programs to emphasize installation of soil and water conservation systems (i.e, terraces, crop residue use, and contour planting).</p> <hr/> <p>3. Emphasize additional measures regarding crop residue management, grassing terraces and emergency tillage to control soil blowing.</p> <hr/> <p>4. Investigate use of rainfall enhancement projects in targeted areas.</p> <hr/> <p>5. Investigate and promote alternative crops and drought-resistant seeds for drought-prone areas of the state.</p> <hr/> <p>6. Create incentive program for drought-resistant practices.</p> <hr/> <p>7. Develop insect and plant disease assistance.</p>	<p>Crop Insurance Groups</p> <hr/> <p>NRCS, SARE, DEQ, UNL Extension, NRDs</p> <hr/> <p>NRCS, SARE, DEQ, UNL Extension, NRDs</p> <hr/> <p>NEDA, DNR, NRDs</p> <hr/> <p>UNL Agronomy</p> <hr/> <p>NEDA, UNL Extension</p> <hr/> <p>NEDA, UNL Extension</p>

IMPACT	PLANNED ACTIONS	ASSISTANCE AGENCIES
Decreased irrigation water from surface water sources prevents achievement of crop harvest potential	<ol style="list-style-type: none"> <li data-bbox="466 172 1398 198">1. Emphasize a adjustment of irrigated acre age to meet expected water availability. <hr/> <li data-bbox="466 295 1045 321">2. Emphasize the use of crop insurance programs. <hr/> <li data-bbox="466 360 1570 412">3. Develop alternatives for increasing available irrigation water supply by use of temporary water transfers. <hr/> <li data-bbox="466 451 1495 503">4. Develop a funded loan program to encourage installation of on-farm water conservation measures. 	<p data-bbox="1621 172 1974 256">DNR, NRDs, NRCS, Irrigation Districts, UNL Extension, USBR</p> <hr/> <p data-bbox="1621 295 1965 321">FSA, Crop Insurance Groups</p> <hr/> <p data-bbox="1621 360 1684 386">DNR</p> <hr/> <p data-bbox="1621 451 1927 477">USBR, DNR, DEQ, NRDs</p>
Water storage may not be adequate in long-term drought	<ol style="list-style-type: none"> <li data-bbox="466 561 1201 587">1. Evaluate water storage necessary for long-term sustainability. <hr/> <li data-bbox="466 652 1108 678">2. Improve monitoring of water levels in state reservoirs. <hr/> <li data-bbox="466 717 1528 769">3. Investigate drought component within water compacts between Nebraska and neighboring states. 	<p data-bbox="1621 561 1894 613">DNR, Attorney General, USBR</p> <hr/> <p data-bbox="1621 652 1873 678">DNR, USBR, USACE</p> <hr/> <p data-bbox="1621 717 1894 743">DNR, Attorney General</p>
Increased irrigation pumping from underground water sources may lower water levels and decrease pumping rates resulting in less capacity to meet crop needs and decreasing the profitability of an irrigated cropping system	<ol style="list-style-type: none"> <li data-bbox="466 828 1570 880">1. Continue to emphasize irrigation water management techniques and develop emergency loan program to promote installation of on-farm water conservation measures. <hr/> <li data-bbox="466 919 1390 945">2. Maintain water-level measurement program to monitor declining aquifer levels. <hr/> <li data-bbox="466 984 1495 1010">3. Maintain ground water metering efforts and establish an emergency allocation program. <hr/> <li data-bbox="466 1049 1360 1075">4. Emphasize use of crop insurance program in high-probability drought years. <hr/> <li data-bbox="466 1114 1360 1140">5. Develop appropriate crop insurance to meet needs of all areas of the state. 	<p data-bbox="1621 828 1957 880">NRDs, USBR, DEQ, NRCS, UNL Extension, FSA, NEDA</p> <hr/> <p data-bbox="1621 919 1822 945">NRDs, UNL CSD</p> <hr/> <p data-bbox="1621 984 1696 1010">NRDs</p> <hr/> <p data-bbox="1621 1049 1894 1075">Crop Insurance Groups</p> <hr/> <p data-bbox="1621 1114 1978 1140">NWR, Crop Insurance Groups</p>

IMPACT	PLANNED ACTIONS	ASSISTANCE AGENCIES
Loss of farmers and ranchers due to drought-induced bankruptcy	<ol style="list-style-type: none"> 1. Encourage existing agricultural finance advisory committees to develop emergency repayment guidelines with banks due to drought-induced conditions. <hr/> 2. Use Public Service Announcements to advertise emergency repayment guidelines, crop insurance programs, hotline numbers, and mediation services. <hr/> 3. Encourage continuation of federal emergency indemnity plans for crop and livestock agriculture. 	<p>NEDA</p> <hr/> <p>NEDA, Mediation Service, Farm Crisis Council, UNL Extension</p> <hr/> <p>NEDA, FSA, NRDs</p>
Drought-induced mental anguish of farmers and ranchers resulting in increased suicides, social, and family problems (Also included within the Municipal Water Supply, Health, and Energy Subcommittee plan)	<ol style="list-style-type: none"> 1. Develop working partnerships with local ministerial alliances and local health offices to develop social counseling and support programs. <hr/> 2. Implement and/or maintain farm/crisis hotline(s). <hr/> 3. Use local TV and radio outlets to implement public information program directed at reducing drought-induced mental stress and for announcements for hotline numbers and mediation services. 	<p>Local health offices, local ministerial alliances, UNL Extension, NEDA, Center for Rural Affairs, HHS, national public health services, Mediation Service, Farm Crisis Council</p>
Increased health problems for residents of areas experiencing problems from blowing dust (Also included within the Municipal Water Supply, Health, and Energy Subcommittee plan)	<ol style="list-style-type: none"> 1. Communicate with state medical allergy and asthma experts to develop recommendations. <hr/> 2. Establish education programs to increase awareness of dust-related respiratory problems and how proper land management can improve air quality. <hr/> 3. Develop funded initiatives to explore mitigation of health effects. 	<p>UNMC, UNL Extension, NRDs, NRCS, local health offices, environmental health fund, NEMA, HHS</p>
Damage to cropland and rangeland due to intrusion of wildlife species	<ol style="list-style-type: none"> 1. Develop emergency guidelines for the emergency feeding and watering of native wildlife in their original habitat. <hr/> 2. If needed, implement emergency control guidelines for invasion species on private cropland and rangeland. <hr/> 3. Make funds available to reimburse farmers who lose crops from invasion of wildlife. 	<p>NEDA, Fish and Wildlife Service, Forest Service</p> <hr/> <p>UNL Extension</p> <hr/> <p>NEDA</p>

IMPACT	PLANNED ACTIONS	ASSISTANCE AGENCIES
Decreased income from local dairy and feedlot operations due to drought-induced high cost of feedstocks.	1. Develop statewide and nationwide hotline system for locating feedstock sources. <hr/> 2. Investigate possible system of subsidized purchases of replacement stock from "Limited Resource Producers".	NEDA, UNL Extension, producer organizations
Decline in stability of local economy and tax base due to decreased sales of agricultural support equipment	1. Develop statewide and regionwide agricultural support services hotline which would emphasize outside area purchases of agricultural services and equipment from local distributors. <hr/> 2. Add agricultural production as recipient of tree assistance programs at the state level. <hr/> 3. Provide tax credits to agricultural producers. <hr/> 4. Create some plan to decrease property tax or establish payment plans when the ability to pay is greatly reduced. <hr/> 5. Provide assistance for emergency feed and water transportation.	NEDA, USDA, Nebraska Department of Economic Development <hr/> Game and Parks Commission, Nebraska Forest Service <hr/> NDR <hr/> County commissioners, NDR <hr/> NEDA
Reduced tourism due to misperceptions about the effects of drought	1. Let potential tourists and travelers know what recreational opportunities exist, even in drought, via public relations, marketing, brochures, and the pre-established hotline and visitor centers.	Nebraska Division of Travel and Tourism

Assistance Agency Abbreviations and Acronyms

BLM	Bureau of Land Management	NEMA	Nebraska Emergency Management Agency
CSD	Conservation and Survey Division	NRCS	Natural Resources Conservation Service
DEQ	Nebraska Department of Environmental Quality	NRDs	Nebraska Natural Resource Districts
DNR	Nebraska Department of Natural Resources	SARE	Sustainable Agriculture Research and Education Program
FSA	Farm Service Agency	UNL	University of Nebraska-Lincoln
HHS	Nebraska Department of Health and Human Services	UNMC	University of Nebraska Medical Center
NDMC	National Drought Mitigation Center	USACE	United States Army Corps of Engineers
NDR	Nebraska Department of Revenue	USBR	United States Bureau of Reclamation
NEDA	Nebraska Department of Agriculture	USDA	United States Department of Agriculture

Appendix A

Nebraska Risk Assessment Committee
Nebraska Municipal Water Supply, Health, and Energy Subcommittee
Planned Mitigation Activities

PRIORITIZED IMPACTS	PRIORITIZED PLANNED ACTIONS	ASSISTANCE AGENCIES
1. Due to drought, many public water supply systems experience potable water demand problems.	<ol style="list-style-type: none"> 1. Emphasize, and evaluate, long and short-term drought contingency plans for all systems. 2. Emphasize indoor and outdoor water conservation measures. 3. Maintain list of “problem systems”, with history or potential for drought-related problems. 4. Develop programs and educate the public on the potential uses of wastewater. 5. Develop partnerships with utility companies and others who can help distribute drought-related information. 	NHHS, League of Municipalities, NRDs, Nebraska Rural Water Association, NDEQ, AWWA, CED/UNL.
2. Many rural water districts and small public water systems (under 10,000 population) develop operational (mechanical) problems when operating for extended periods of drought.	<ol style="list-style-type: none"> 1. Maintain list of “problem systems” with history or potential for drought-related problems. 2. Continue work with systems to develop a plan of long-term drought mitigation and short-term drought response actions. 3. Maintain communication means and use NeRWA newsletter and training sessions to address drought-related issues. 4. Explore, as needed, emergency funds. 	NRWD, NEMA, Nebraska Section of AWWA, Nebraska Department of Economic Development (NDED), USDA Rural Development, League of Municipalities, NHHS, Midwest Assistance Program, NDEQ, UNL Extension, NRDs, Groundwater Foundation, Nebraska Department of Natural Resources, Nebraska Rural Water Association (NeRWA), EPA.
3. Due to drought, private wells experience water quality and quantity problems.	<ol style="list-style-type: none"> 1. Encourage NRDs to evaluate situation. 2. Emphasize indoor and outdoor water conservation measures. 	NRDs, CSD/UNL, CED/UNL
4. Increased irrigation may overdraft available aquifer and affect municipal and rural water supplies during drought.	<ol style="list-style-type: none"> 1. Promote groundwater-metering efforts and establish an emergency allocation program. 2. Encourage statewide water level measurement program to effectively monitor aquifer levels. 	NRDs, Bureau of reclamation, DOE, CSD/UNL, CED/UNL, USGS.

PRIORITIZED IMPACTS	PRIORITIZED PLANNED ACTIONS	ASSISTANCE AGENCIES
5. Drought induced mental anguish of farmers and ranchers resulting in increased suicides, social and family problems.	<ol style="list-style-type: none"> 1. Use local TV and radio outlets to implement public information program directed at reducing drought-induced mental stress. 2. Implement and/or maintain farm/crisis hotline(s). 3. Develop working partnerships with local ministerial alliances and local health office as to develop social counseling and support programs. 4. Public service announcements for hotline numbers and mediation services. 	NHHS, local health offices, local ministerial alliances, CED/UNL, NEDA, Centers for Rural Affairs, national public health services, Mediation Service, Farm Crisis Council.
6. Increased presence of large, industrial, independent water users may overdraft available aquifers during drought.	<ol style="list-style-type: none"> 1. Maintain a list of large, industrial, independent water users. 2. Enhance communication between large, independent water users and municipal suppliers to implement water conservation and drought-preparedness guidelines. 	NRDs, NDED, CSD/UNL, Nebraska Department of Natural Resources, League of Municipalities, CED/UNL.
7. Increased health problems for residents of areas experiencing blowing dust problems from drought-affected agricultural lands.	<ol style="list-style-type: none"> 1. Communicate with state medical allergy and asthma experts to develop recommendations. 2. Establish education programs to increase awareness of dust-related respiratory problems and how soil and land conservation practices can improve air quality. 3. Develop funded initiatives to explore mitigation of health effects. 	NHHS, UNMC, CED/UNL, NRDs, NRCS, Nebraska Emergency Management Agency (NEMA), local health offices, environmental health fund.
8. Drought-induced temperature extremes produce extreme living conditions for both rural and urban residents. Increased electrical usage may create overloads on available electrical grid network.	<ol style="list-style-type: none"> 1. Develop information program to provide living guidelines and alternatives to enable residents to cope with extreme conditions. 2. Develop working partnerships with local urban and rural power suppliers to cooperate in providing energy and water conservation guidelines to public. 3. Develop an education program. 4. Learn about electrical bill assistance programs. 5. Learn about fan distribution programs 	NHHS, HUD, CED/UNL, Nebraska Energy Office, Salvation Army, League of Women Voters, medical professionals, local utility companies, Nebraska Rural Electric Association, Nebraska Power Association, Nebraska Energy Office, League of Municipalities.

PRIORITIZED IMPACTS	PRIORITIZED PLANNED ACTIONS	ASSISTANCE AGENCIES
9. General impacts.	1. Promote plumbing guidelines that emphasize use of water efficient plumbing fixtures and appliances.	AWWA, League of Municipalities, Builders and Plumbers Associations, EPA.

Assistance Agency Abbreviations and Acronyms

AWWA	American Water Works Association	HUD	Housing and Urban Development
CED/UNL	Cooperative Extension Division – University of Nebraska-Lincoln	NEDA	Nebraska Department of Agriculture
CSD/UNL	Conservation and Survey Division – University of Nebraska-Lincoln	NEMA	Nebraska Emergency Management Agency
NDED	Nebraska Department of Economic Development	NHHS	Nebraska Health and Human Services
NDEQ	Nebraska Department of Environmental Quality	NRCS	Natural Resource Conservation Service
DOE	Department of Energy	NRDs	Natural Resource Districts
EPA	Environmental Protection Agency	NRWD	Nebraska Rural Water Districts
		UNMC	University of Nebraska Medical Center
		USGS	United States Geological Survey