

DROUGHT

Climatologists define drought as a period of abnormally dry and/or unusually hot weather sufficiently prolonged for the corresponding deficiency of water to cause a "serious hydrologic imbalance". More simply put, too dry and/or too hot for too long. Interpreting what is "too dry" or what is "too long" is difficult. What we do know is that when a serious hydrologic imbalance occurs in Minnesota, soil moisture reserves, groundwater supplies, lake levels and stream flows are negatively influenced. Water-dependent industries including agriculture, public utilities, forestry, and tourism are profoundly affected. Although droughts are not as sudden as floods, the economic aspects of droughts can be just as significant.

An emerging useful tool in drought mitigation is the Palmer Index. Wayne Palmer developed the Palmer Index in the 1960s, and it uses temperature and rainfall information in a formula to determine dryness. It has become the semi-official drought index. The Palmer Index is most effective in determining long-term drought—a matter of several months—and is not as good with short-term forecasts (a matter of weeks). It uses a 0 as normal, and drought is shown in terms of minus numbers; for example, minus 2 is moderate drought, minus 3 is severe drought, and minus 4 is extreme drought

Sibley County Drought Hazard Risk Assessment

Hazard:	Drought
Location	Countywide
Historic Events	Drought of 1988 (Statewide)
Likely to happen now?	Unlikely
How often?	Significant drought once per 20-30 years
Where would event occur?	Anywhere in County
Severity of event?	---
When would hazard likely occur?	Summer
What other hazards could occur at the same time?	Utility failure (water/wastewater plants) due to increased demand on system, possible instances of extreme heat
Economic impacts	Crops/agricultural losses
Loss of life impacts	Unlikely
Risk Level VH – Very High H – High L – Limited M – Minimal	Citizens/People: M Animals/Livestock: L Housing: M Critical Structures: M Infrastructure: M Total: M
<u>Risk Assessment</u>	
Unlikely – 1 Occasional – 2 Likely – 3 Highly Likely – 4	<u>Frequency of Occurrence</u> 1
More than 12 hours – 1 6-12 hours – 2 3-6 hours – 3 Minimal-None – 4	<u>Warning Time</u> 1
Limited – 1 Minor – 2 Major – 3	<u>Potential Severity</u> 2

Substantial – 4	
Minimal – 1 Limited – 2 High – 3 Very High – 4	<u>Risk Level</u> 1
(Total divided by 4) Very Low – 1 Low – 2 Moderate – 3 High – 4	<u>Overall Priority</u> 1.25 Very Low

Vulnerability to Drought

Because long-term climate variations are unpredictable, drought is largely unpredictable, but it is always wise to plan ahead in the event of a drought. Once we find ourselves in a drought, we do not know whether it is the 6th month of an 8-month drought or the 6th month of an 8-year drought!

History of Drought

On November 5, 2003 the U.S. Department of Agriculture designated 62 counties in Minnesota as primary agricultural disaster areas. The counties were declared due to losses caused by a drought that occurred from July 1, 2003, and continuing. When this occurred, Sibley County was among the counties in the region that was included within this declaration. However, despite this designation, there has been no reporting of drought Sibley County over the past 50 years, according to National Climatic Data Center records.

Although there may be only a limited history of drought events in Sibley County, there is at least one significant statewide example of drought that should be elaborated upon. This drought occurred in many areas of the state, including the Sibley County area, between 1987 and 1989. The warm, dry winter of 1986-87 was the beginning of this drought period. Drought conditions became very serious in mid-June 1988 when Mississippi River flow levels threatened to drop below the Minneapolis Water Works intake pipes at Fridley. Below normal precipitation coupled with declining lake levels, ground water levels, and stream flow created statewide concern. To facilitate coordination of drought response actions a State Drought Task Force was convened by the Director of the Division of Waters. The State Drought Task Force brought together local, state, and federal officials to share information and coordinate drought response strategies. Several actions were taken following the summer of 1988 to better prepare the state for the next drought. The Governor appointed a "Twin Cities Water Supply Task Force" specifically to make recommendations on how to meet future water demands in the event of low flow conditions on the Mississippi River. The US Corps of Engineers initiated review of its operating plans for the Mississippi River headwaters reservoirs, and the 1989 legislature charged the Metropolitan Council with preparing water use and supply plans for the metropolitan area. In the summer of 1988, rains finally came in August, but not soon enough to save agriculture crops. Sibley County is advised to reflect on this example of the serious impacts that a significant drought event can have.

Potential Impacts and Cascading Effects

Because of the low risk of droughts an occurrence may not have a severe impact on human life due to means of accessing water; however the economic impact on farmers would be significant. A drought would have a detrimental economic impact on the local economy due to stunting growth of agriculture crops and possible negative impacts on livestock as well. Extended drought conditions may also make an area more prone to occurrences of wildfire. Droughts can also be closely linked with insect infestation. Trees may be lost due to lack of moisture. In severe instances, a drought may cause Sibley County wells to dry up entirely.

Drought Gaps and Deficiencies

- Some communities have yet to enact wellhead protection measures, and have identified these areas as points of concern.
- Since droughts are so rare, communities may not be familiar with enacting and enforcing water restrictions on their residents.

ACTIONABLE MITIGATION STEPS:

Actionable Mitigation Steps are more elaborately explained with project, timeframe, responsible jurisdictions/staff, possible funding sources, and priority level in the Action Plan section of this document.

1. Utilization of Water Conservation Strategies (Countywide) – Water conservation provisions and use restrictions in times of drought are generally included in city ordinances. Staff of all Sibley County cities is encouraged to periodically review these ordinances and enact them when deemed necessary.
2. Water Access (Countywide) - The County and city members of the hazard mitigation task force would work cooperatively to identify water access points should a drought occur for human and animal consumption.
3. Create and Maintain Mutual Aid Agreements for All Sibley County Communities (Countywide). Mutual Aid Agreements between communities can assist in ensuring that supplies and resources are adequately available to neighboring communities during a serious drought event. If such agreements are already in place, then they shall be continually reviewed and maintained to ensure their continued viability. The need for Mutual Aid Agreements may be increased in the event of a serious drought when the available water supplies to fight a wildfire or structural (urban) fire may be depleted.
4. Undertake Community Education to Educate Residents About Drought and What it May Mean to Them and the Community (Countywide). This could take the form of public education classes/seminars, presentations to schools and community groups, and creation/distribution of informational literature regarding drought events. These may be implemented as a serious drought is in its early stages so residents will know how then can work through it with the community.

INFECTIOUS DISEASE

An infectious disease is defined as an organism or matter that has the potential to spread or affect a population in adverse ways. Infectious diseases have the potential to affect any form of life at any time based on local conditions, living standards, basic hygiene, pasteurization and water treatment. Despite medical breakthroughs and technology, infectious diseases continue to pose an important public health problem. Today, the issue of emerging and re-emerging infectious diseases is at the forefront of public health concern. The very young, older adults and hospitalized and institutionalized patients are at increased risk for many infectious diseases. Changes in demographics, lifestyle, technology, land use practices, food production and distribution methods, and child care practices, as well as increasing poverty, have a role in emerging infections.

The primary infectious diseases identified by the Sibley County Health Department include the following:

Tuberculosis

Tuberculosis is a disease that is spread from person to person through the air. TB usually affects the lungs, but it can also affect other parts of the body, such as the brain, the kidneys or the spine. TB germs are put into the air when a person with TB of the lungs or throat coughs or sneezes. When a person inhales air that contains TB germs, he or she may become infected. People with TB infection do not feel sick and do not have any symptoms. However, they may develop TB at some time in the future. The general symptoms of TB include feeling sick or weak, weight loss, fever and night sweats. The symptoms of TB of the lungs include coughing, chest pain and coughing up blood. Other symptoms depend on the part of the body that is affected.

Hepatitis A

Hepatitis A is an enterically transmitted viral disease that causes fever, malaise, anorexia, nausea, and abdominal discomfort, followed within a few days by jaundice. The disease ranges in clinical severity from no symptoms to a mild illness lasting one and two weeks to a severely disabling disease lasting several months. In developing countries, hepatitis A virus is usually acquired during childhood, most frequently as an asymptomatic or mild infection. Transmission can occur by direct person-to-person contact; through exposure to contaminated water, ice or shellfish harvested from sewage-contaminated water; or from fruits, vegetables, or other foods that are eaten uncooked, and which can become contaminated during harvesting or subsequent handling.

West Nile Virus (WNV)

West Nile virus is a mosquito-transmitted virus that can cause encephalitis in some people. This virus usually circulates between mosquitoes and birds in Africa and Europe. However, in 1999, an outbreak of WN encephalitis was reported in New York City. Since then the virus has spread throughout much of the eastern United States, and was found as close as Madison, Wisconsin, and east-central Iowa in 2002.

Influenza (Flu)

Influenza is a contagious disease that is caused by the influenza virus. It attacks the respiratory tract in humans (nose, throat and lungs). The flu is different from a cold. The flu usually comes on suddenly and may include these symptoms: fever,



headache, tiredness (can be extreme), dry cough, sore throat, nasal congestion and body aches.

Chronic Wasting Disease (CWD)

CWD naturally occurs in North American deer and Rocky Mountain Elk, however it can have rippling effects on livestock. It belongs to a group of infectious diseases known as "transmissible spongiform encephalopathies" (TSEs). It is caused by an abnormal protein called a prion that affects the animal's brain, and it is invariably fatal. Usually, months to years pass from the time an animal is infected to when it shows signs of the disease.

Sibley County Infectious Disease Hazard Assessment

Hazard:	All Infectious Diseases
Location	Countywide
Historic Events	Very limited instances of serious disease outbreaks over the past 50 years
Likely to happen now?	Unlikely
How often?	Infrequently
Where would event occur?	Any area within Sibley County, though likely to affect certain groups of people most vulnerable (the very young or the elderly, for example) or in places with high density of persons in a smaller area (such as nursing homes or apartment complexes)
Severity of event?	Could be a major outbreak of life-threatening disease in a worst-case scenario
When would hazard likely occur?	Any time of year
What other hazards could occur at the same time?	Widespread panic, riots, etc.
Economic impacts	Loss or reduction of local business, costs incurred to deal with outbreak (medical personnel, medicine/vaccines, facilities)
Loss of life impacts	Potentially major if a large-scale outbreak occurs
Risk Level VH – Very High H – High L – Limited M – Minimal	Citizens/People: VH Animals/Livestock: VH Housing: M Critical Structures: M Infrastructure: M Total: H
<u>Risk Assessment</u>	
Unlikely – 1 Occasional – 2 Likely – 3 Highly Likely – 4	<u>Frequency of Occurrence</u> 1
More than 12 hours – 1 6-12 hours – 2 3-6 hours – 3 Minimal-None – 4	<u>Warning Time</u> 1
Limited – 1 Minor – 2 Major – 3 Substantial – 4	<u>Potential Severity</u> 4
Minimal – 1 Limited – 2 High – 3	<u>Risk Level</u> 2

Very High – 4	
(Total divided by 4)	<u>Overall Priority</u>
Very Low – 1	
Low – 2	2
Moderate – 3	Low
High – 4	

Vulnerability to Infectious Disease

Many infectious diseases are preventable and are controllable, limiting the vulnerability of Sibley County to an epidemic so long as measures are taken. Prevention and control of infectious diseases involve collection of accurate assessment data (such as surveillance data for specific conditions), outbreak detection and investigation, and development of appropriate control strategies (both short and long term) based on specific epidemiologic data. These activities require close collaboration between clinical providers (especially infection-control practitioners within hospitals), clinical laboratories, state and local health departments, and federal agencies. Furthermore, a need exists for continued education of industry (particularly food producers and food-service industries), health-care students and providers, along with research to improve immunizations, diagnostic methods, and therapeutic modalities. Thus, the prevention of infectious diseases requires multidisciplinary interventions involving public health professionals, medical practitioners, researchers, community-based organizations, volunteer and private groups, industrial representatives, and educational systems.

History of Infectious Disease

Minnesota has not had an infectious disease outbreak reach epidemic proportions in decades. Sibley County experienced individual cases of infectious diseases over the last 50 years that have been considered isolated occurrences or minor exposures.

Potential Impacts and Cascading Effects

Instances of an infectious disease can have very severe impacts in a worst-case scenario, including the possibility of a large loss of life. Infectious disease can also lead to long-term sickness and bodily impairment/disabilities as well. An outbreak or epidemic could feasibly impact the ability of resources, such as medical facilities, to meet the increased demand for services. Additionally, since southern Minnesota's economy is heavily impacted by the animal/livestock industry, which can also be susceptible to infectious disease, implications of such an outbreak can negatively affect the local economy. In the event of a large-scale epidemic, deaths, fears, and misinformation could also trigger public panic, lawlessness, and riots.

Infectious Disease Gaps and Deficiencies

- The City of Winthrop has expressed concern that the exposed city wells could lead to possible contamination (accidental or intentional) of the public water supply.

ACTIONABLE MITIGATION STEPS:

Actionable Mitigation Steps are more elaborately explained with project, timeframe, responsible jurisdictions/staff, possible funding sources, and priority level in the Action Plan section of this document.

1. Safe Animal/Livestock-Handling Processes and Facility Structure (Countywide) - Through zoning and inspections animal operations can be properly design and maintain that reduce risks of disease among livestock, which ultimately impact humans.
2. Media Outreach (Countywide) – In the event of an infectious disease outbreak, local radio, television, and print media should be utilized to ensure that proper and factual information regarding the disease event is being disseminated throughout Sibley County communities. This may assist in calming fears that may lead to negative secondary effects, as described earlier.
3. Health Education for Youth and Parents (Countywide) – The County and school public health nurses can provide educational material to young adults and parents on the impact of infectious diseases.
4. Health Education for Private Businesses (Countywide) – The county public health department will provide educational material, as well as, periodic site visits to aide food establishments in being educated on safe food handling processes.
5. Secure Water Systems and Eliminate Low Windows (Winthrop) – City public works and police chief will assess water system safety and implement measures to maintain safety and protect equipment, including elimination of low windows that provide access to facilities.
6. Cooperation with State Health Department (Countywide) – Sibley County clinics and hospitals will continue to cooperate and share information regarding infectious disease occurrences with the Minnesota State Health Department, and information flow between the two will assist in alerting Sibley County agencies to the possibility of an outbreak event.
7. Participation in Vaccination Programs (Countywide) - All Sibley County residents (particularly children) should remain up-to-date with all required and recommended vaccinations. Programs assisting those who either do not have insurance or are unable to afford vaccinations should be identified and utilized in local jurisdictions.
8. Encourage Sick Employees to Stay Home (Countywide) – Businesses and organizations throughout Sibley County should encourage all personnel to stay home if at all possible for the duration of their illness if they believe they are sick. This will help mitigate the spread of the infectious disease that may be impacting the area.
9. Quarantine/Isolation Plan (Countywide) – If the need for an officially designated quarantine arises, the State is ultimately responsible for the designation and implementation of quarantine procedures.