

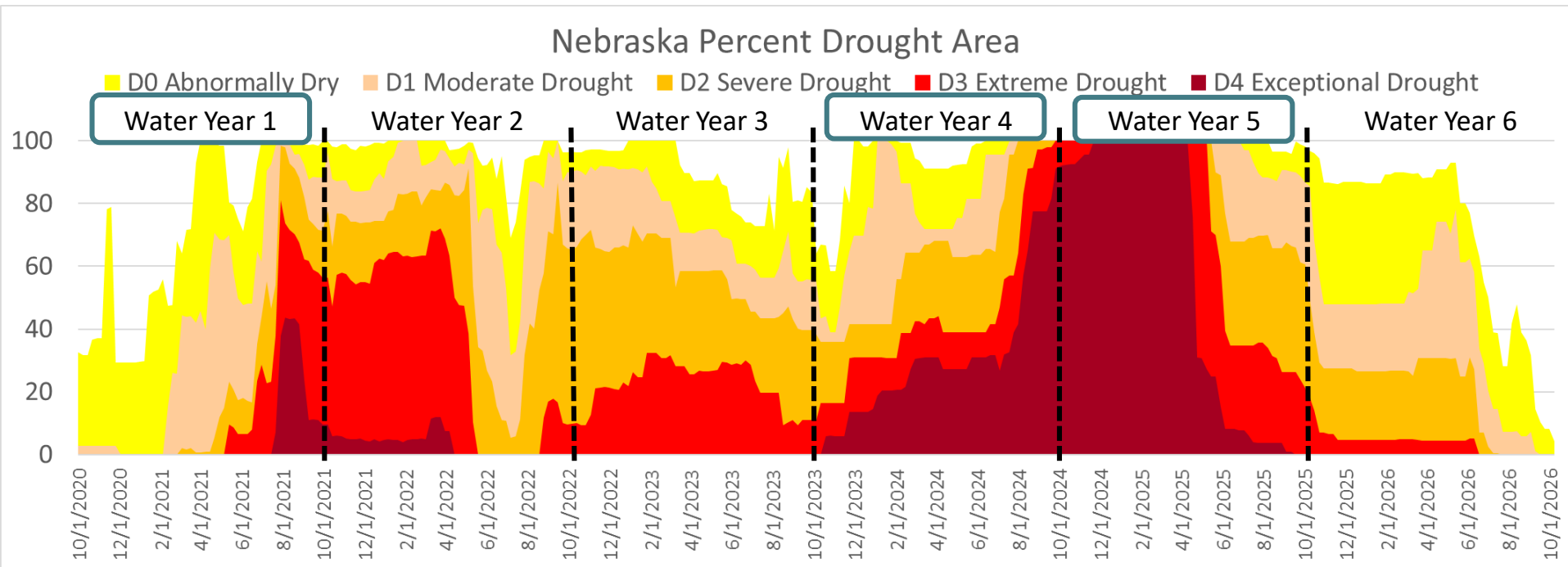
Drought Planning Using Community Threat and Hazard Identification and Risk Assessment



droughtthira.unl.edu



THIRA Exercise Scenario: Extended Drought



1-Page Story of the Drought

Multi-Year Drought Scenario for the Platte River Basin in Nebraska

Overview

An intense drought developed in the Platte River Basin in Nebraska and lasted about 5 years, causing devastating impacts to multiple sectors. It developed in the Nebraska Panhandle and gradually spread eastward throughout the basin, reaching its greatest intensity and spatial extent in Years 4 and 5 (Figure 1). Basinwide, the 5-year average temperature departure was 2-5°F above normal and precipitation was 25-70% of normal (Figure 2). During the peak of the drought, the average temperature was 8°F above normal and precipitation was 10% of normal. The information below describes the drought at three points in time throughout its duration.

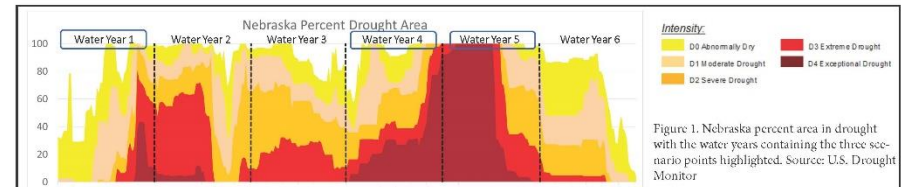


Figure 1. Nebraska percent area in drought with the water years containing the three scenario points highlighted. Source: U.S. Drought Monitor

Scenario Point 1

Drought developed during the past year in western Nebraska. Mountain snowpack in the headwaters of the North Platte River in Wyoming was 30% of normal for the season. A mild winter and early spring caused mosquito eggs to hatch early, and dry conditions throughout the spring and summer contributed to an outbreak of West Nile Virus in the area. Water supply suffered, as flows on the Platte decreased, nitrate concentration increased, and water infrastructure damage occurred in Scottsbluff. Hot, dry, and windy conditions in May caused fires to break out and spread across Garden County, threatening 50,000 acres and the Crescent Lake National Wildlife Refuge. Water supplies near the fire were lacking due to drought conditions. Pasture conditions suffered and ranchers used the hay hotline. Reductions in rain fed crop yields occurred.

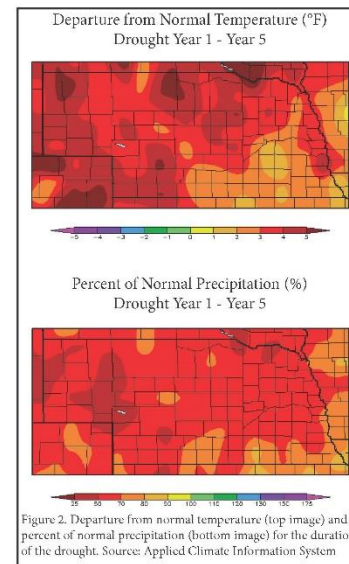


Figure 2. Departure from normal temperature (top image) and percent of normal precipitation (bottom image) for the duration of the drought. Source: Applied Climate Information System

Scenario Point 2

Drought has been present for 4 years and has spread eastward through the Platte River Basin. The drought intensified dramatically during the past year. The number of West Nile Virus cases greatly increased, and the outbreak has spread eastward with the drought. The combination of a mild winter and low water levels in the Central Platte River impacted the Sandhill Crane migration and tourism, as fewer cranes stopped along the Platte and those that did came much earlier than normal. A dust storm occurred in April on I-80 near North Platte, causing a multi-vehicle pileup and a hazmat incident. Numerous domestic wells have run dry, and many irrigators have been shut off from the Platte River. Conflicts have arisen over who to shut off due to groundwater/surface water rights issues. Crop losses are mounting due to inability to irrigate, and dryland crop yield reductions are widespread. The lack of food in rural areas has led to an overwhelming use of food pantries in locations such as Scottsbluff. The drought has impacted hydro-power in the Central Platte, as heat waves during the past summer increased energy demands. High water temperatures hindered cooling systems and caused fish kills. Summer heat was oppressive, as several heat advisories were issued and an increase in heat-related and respiratory illnesses was reported by local hospitals.

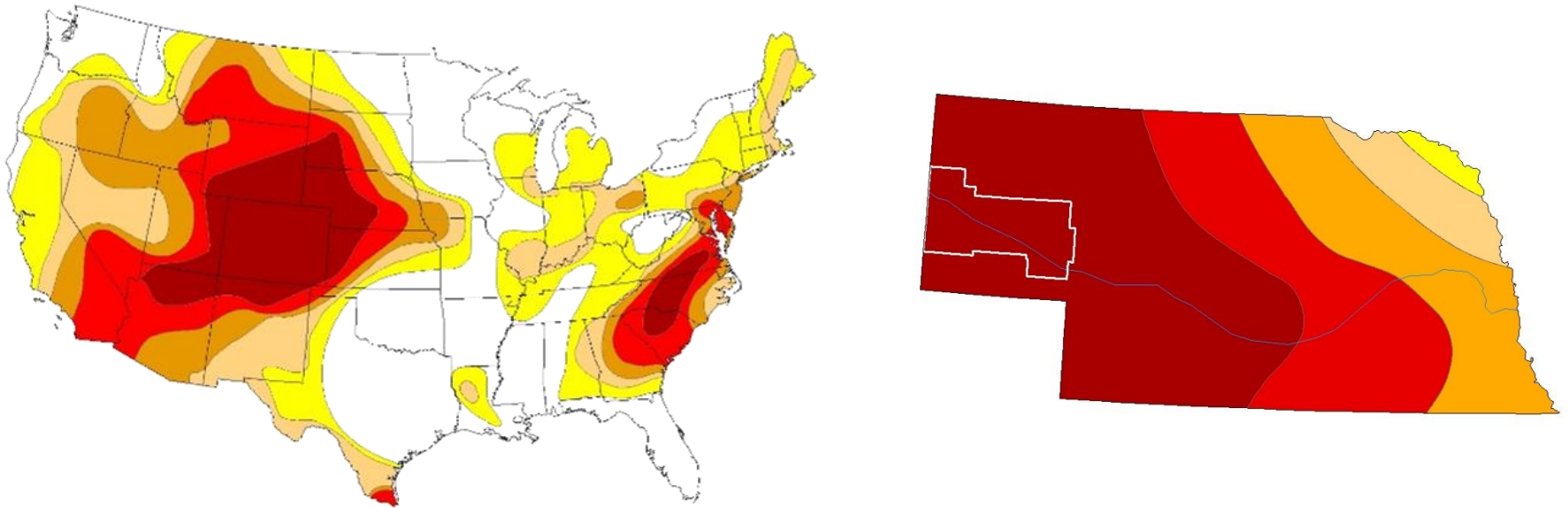
Scenario Point 3

Drought has been ongoing for 5 years, but conditions abated during the summer so that the basin is in the beginning stages of recovery. West Nile Virus continued to spread, reaching the largest number of cases reported in Nebraska. A fire broke out during April at Cedar Point Biological Station in Keith County on a warm, windy day. Lake McConaughy and the Platte River have nearly run dry, making it difficult to fight the fire. The winter wheat crop has been decimated, and reports of Prevented Planting from producers of irrigated cropland have been common. Water supply for the City of Lincoln has been threatened due to the Platte running dry, and nitrates are so high that advisories have been issued for drinking water. Excessive heat and humidity contributed to heat-related and respiratory illnesses in Lincoln,

as this location had 30 consecutive days of temperatures above 100°F during July and August. Fifteen people were taken to the hospital for heat stroke at the Cornhusker State Games. Fire danger was very high in parts of the basin during the summer, leading to a ban on fireworks on the 4th of July in Lincoln, Seward, and surrounding areas. A fire started over Labor Day Weekend and spread quickly toward Mahoney State Park, threatening hundreds of visitors. The longevity of the drought has caused foundation damage to homes in eastern Nebraska.

Scenario Time Point 1: 1st Year of Drought

Focus: North Platte NRD

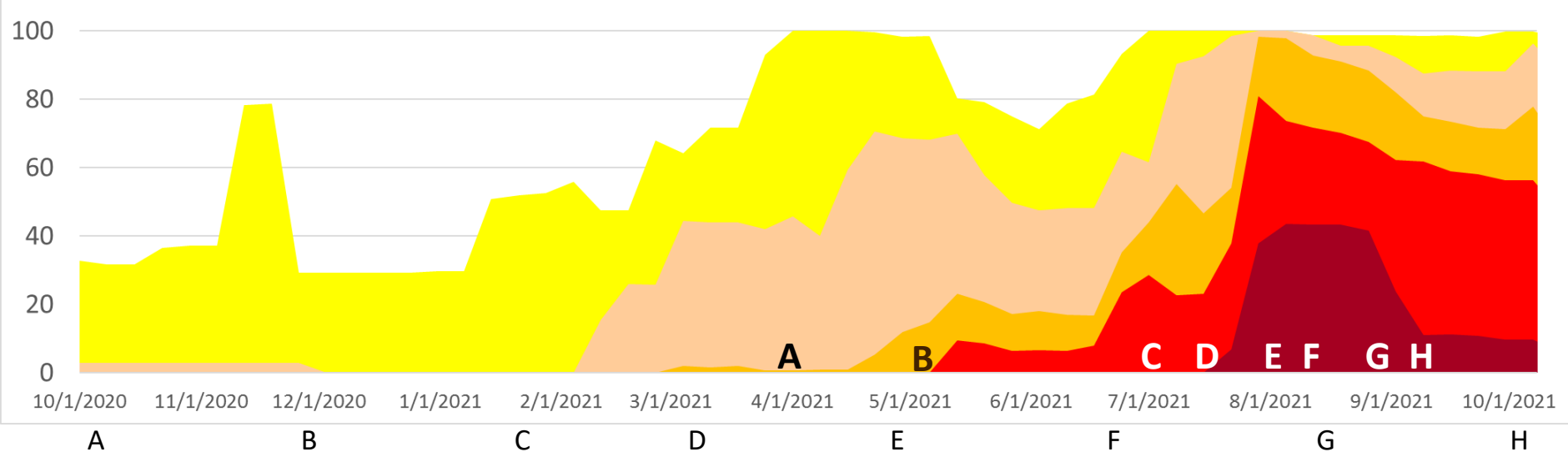


U.S. Drought Monitor at peak severity in Nebraska (August 6)

North Platte NRD

Nebraska Percent Drought Area Scenario Time Point 1: 1st year in a multi-year drought

■ D0 Abnormally Dry ■ D1 Moderate Drought ■ D2 Severe Drought ■ D3 Extreme Drought ■ D4 Exceptional Drought



Snowpack is 30% of normal in headwaters of the North Platte River in Wyoming.

Multiple fires cause over 50,000 acres to burn in Garden County. Crescent Lake Wildlife Refuge & thousands of cattle are at risk. Volunteer Fire Departments experiencing strain.

Poor pasture conditions lead to culling of herds. Reduced rain fed crop yields projected.

West Nile outbreak. 185 clinical cases reported across the NRD.

Scottsbluff municipal pump failure. Repair takes 3 days. Loss of 6MG pumping capacity.

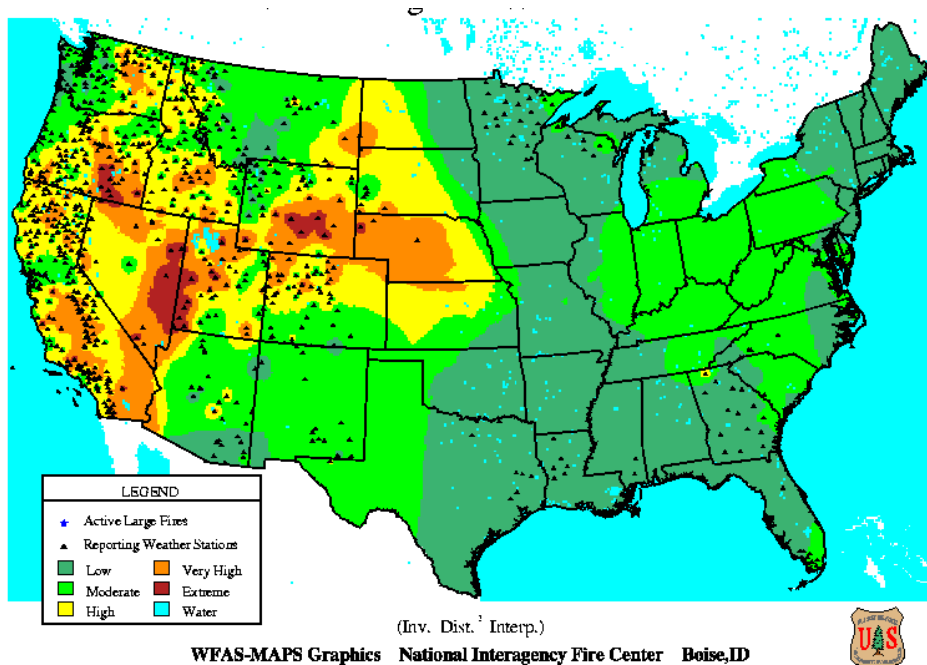
30 day streak of temps over 100 °F ends. People & animals suffer heat stress.

Ground water levels decline & wells test positive for nitrate impairments.

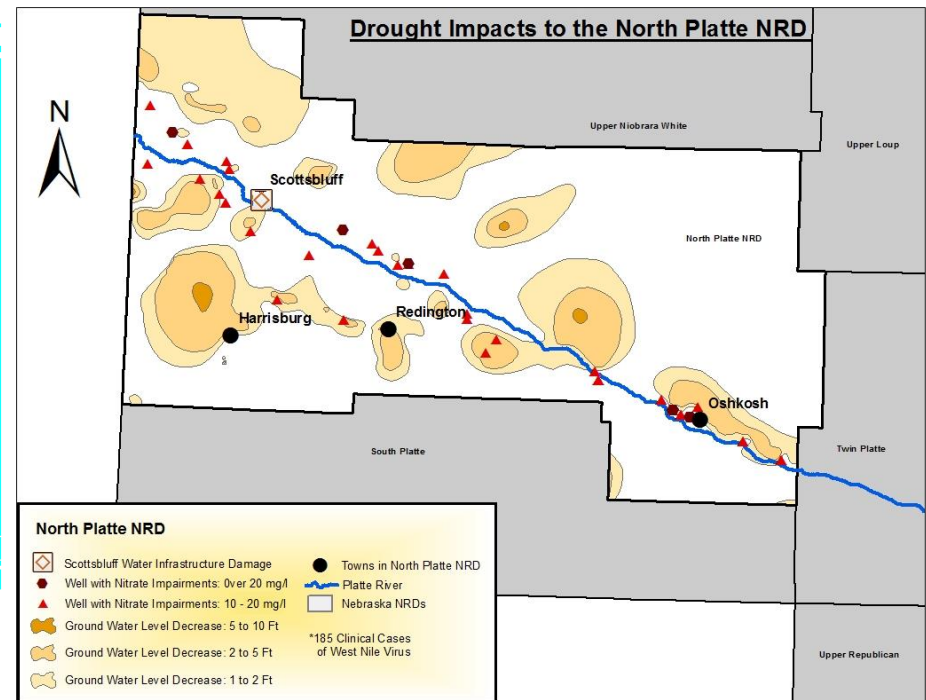
Hay hotline used as pasture conditions continue to suffer & hay prices increase.

Scenario Time Point 1: Spatial Maps of Impacts

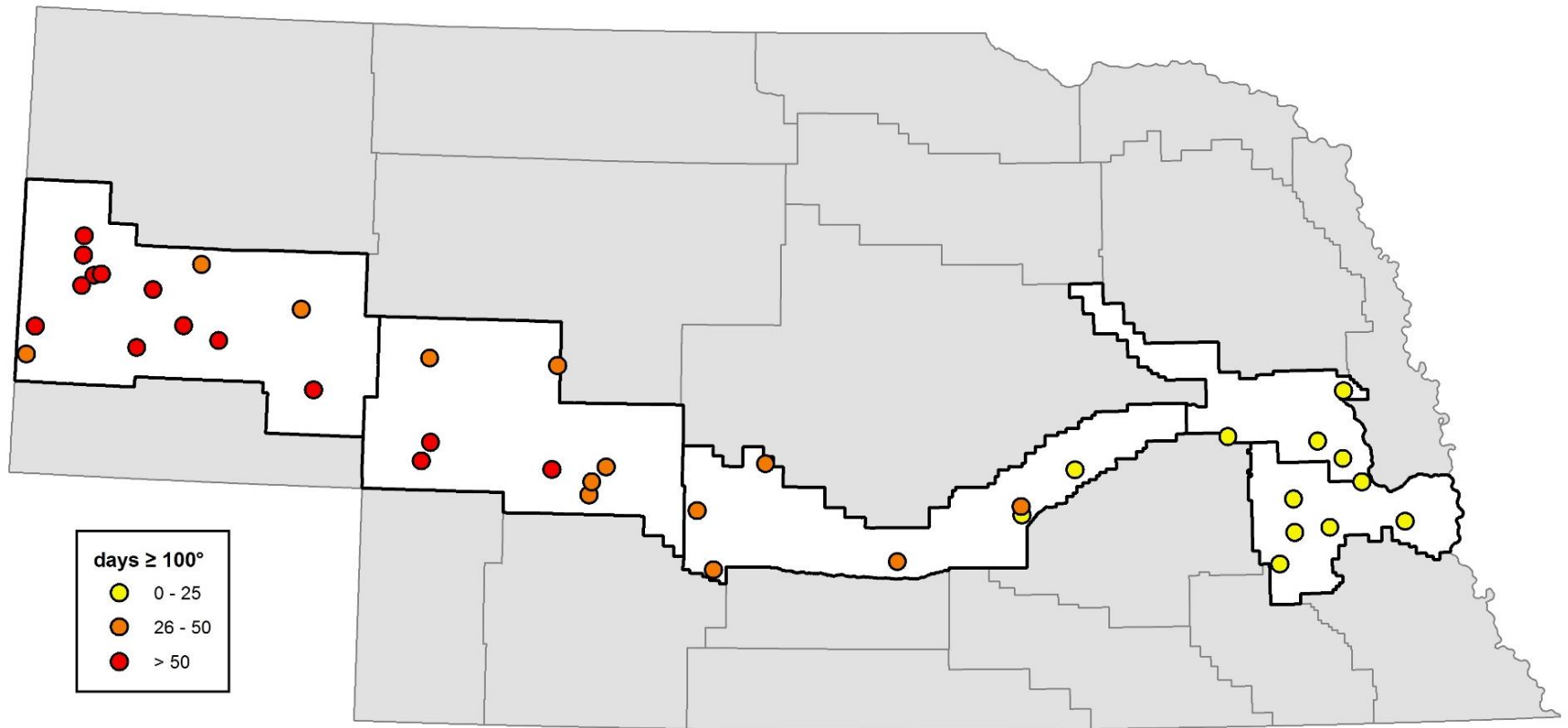
Wildfire danger



Ground water levels & water quality

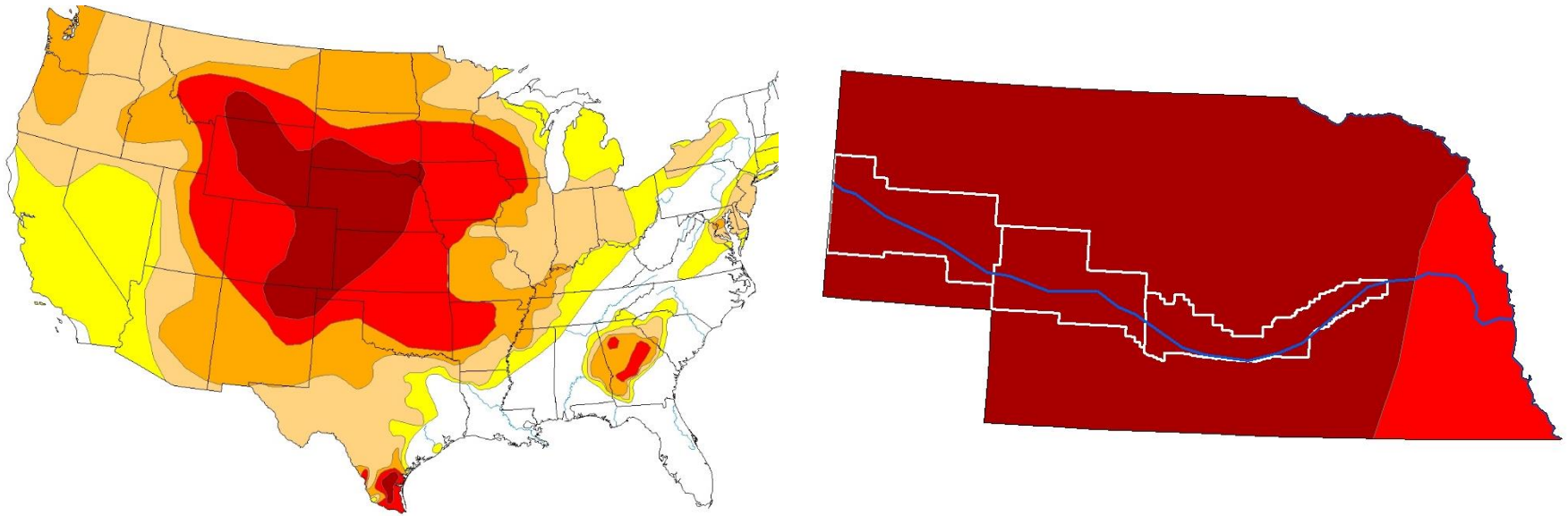


Scenario Time Point 1: Days over 100 degrees F



Scenario Time Point 2: 4th Year of Drought

Focus: North, Twin, & Central Platte NRDs

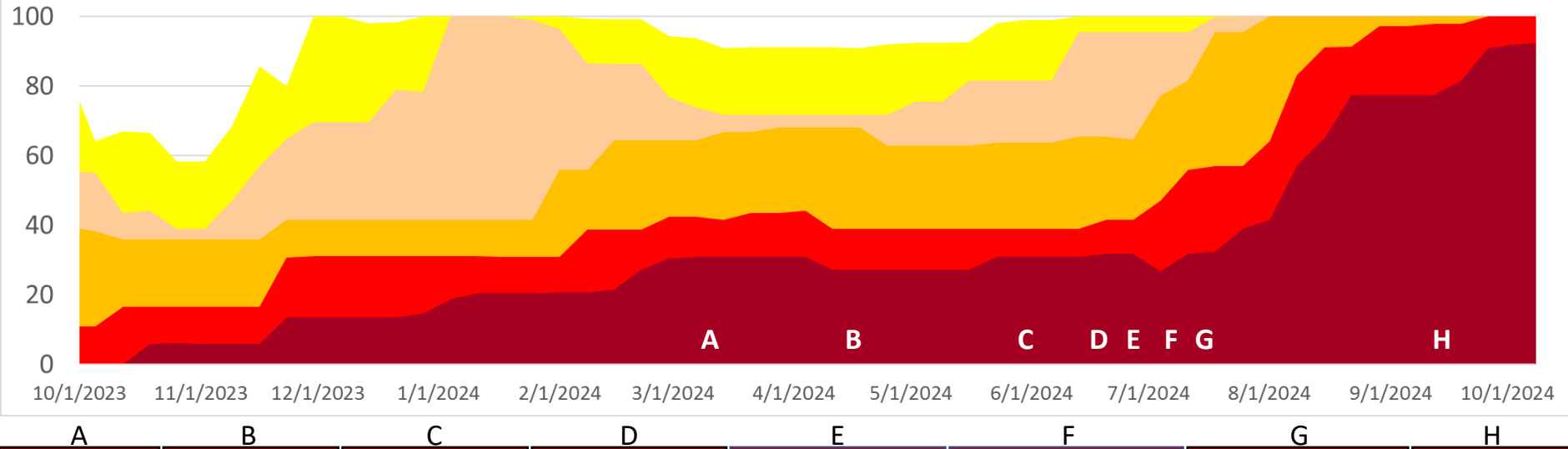


U.S. Drought Monitor at peak severity in Nebraska (September 26)

North, Twin, &
Central Platte NRDs

Nebraska Percent Drought Area
Scenario Time Point 2: 4th year in a multi-year drought

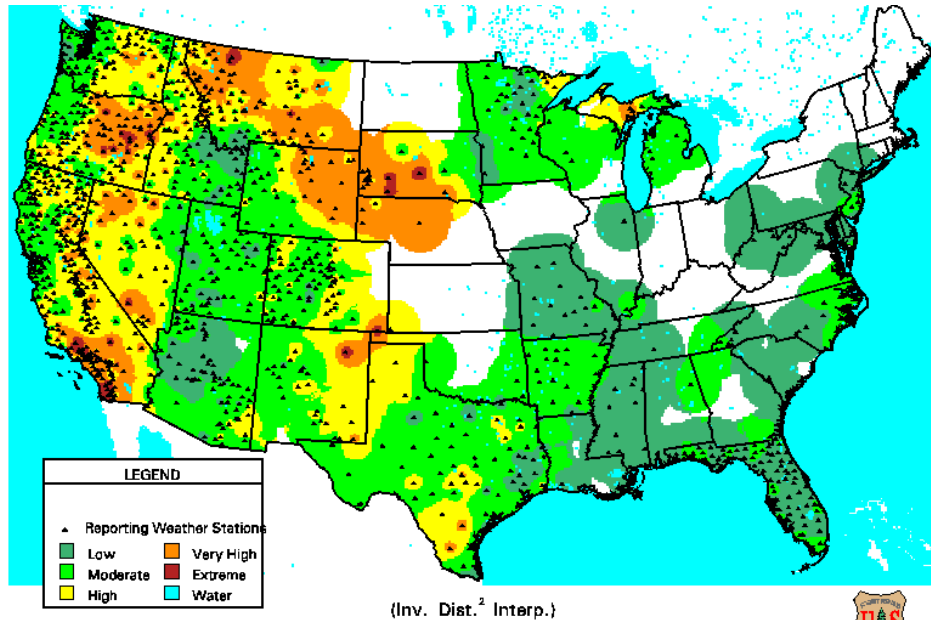
D0 Abnormally Dry D1 Moderate Drought D2 Severe Drought D3 Extreme Drought D4 Exceptional Drought



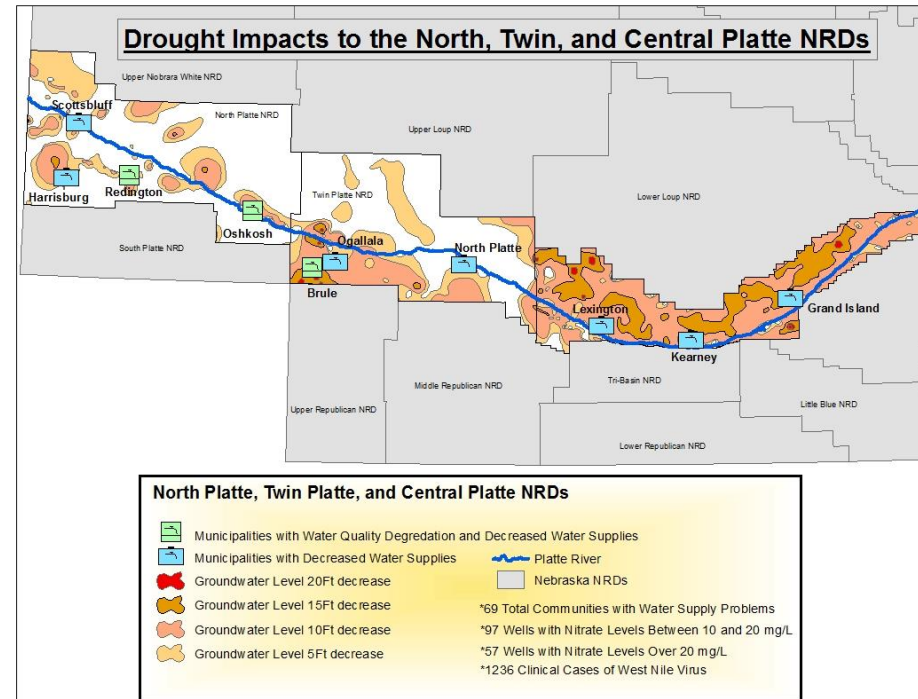
A Reduction of cranes and loss of tourism revenue.	B Dust storm on I-80. Multiple vehicle accidents, including haz-mat. I-80 closes.	C West Nile outbreak. 1236 clinical cases reported across the NRD.	D Lake McConaughy falls to 20% capacity.	E Power outages occur in Kearney as demand increases from hot weather.	F Heatwave causes stress to people & animals. High water temperatures cause fish kills.	G Domestic wells run dry and/or test positive for nitrate impairments.	H Increased food pantry visits in Scottsbluff due to lack of food in rural areas.
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Scenario Time Point 2: Spatial Maps of Impacts

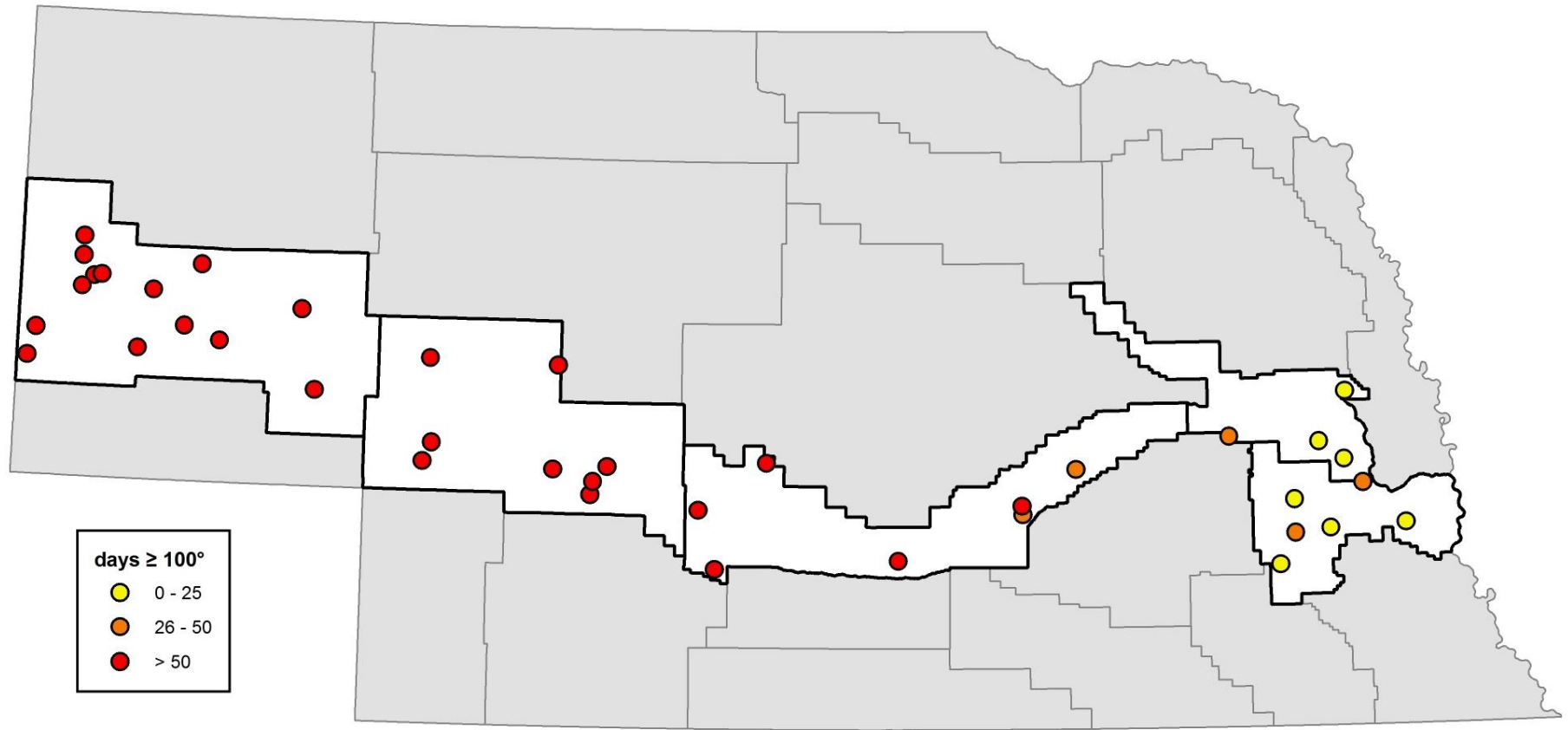
Wildfire danger



Ground water levels & water quality

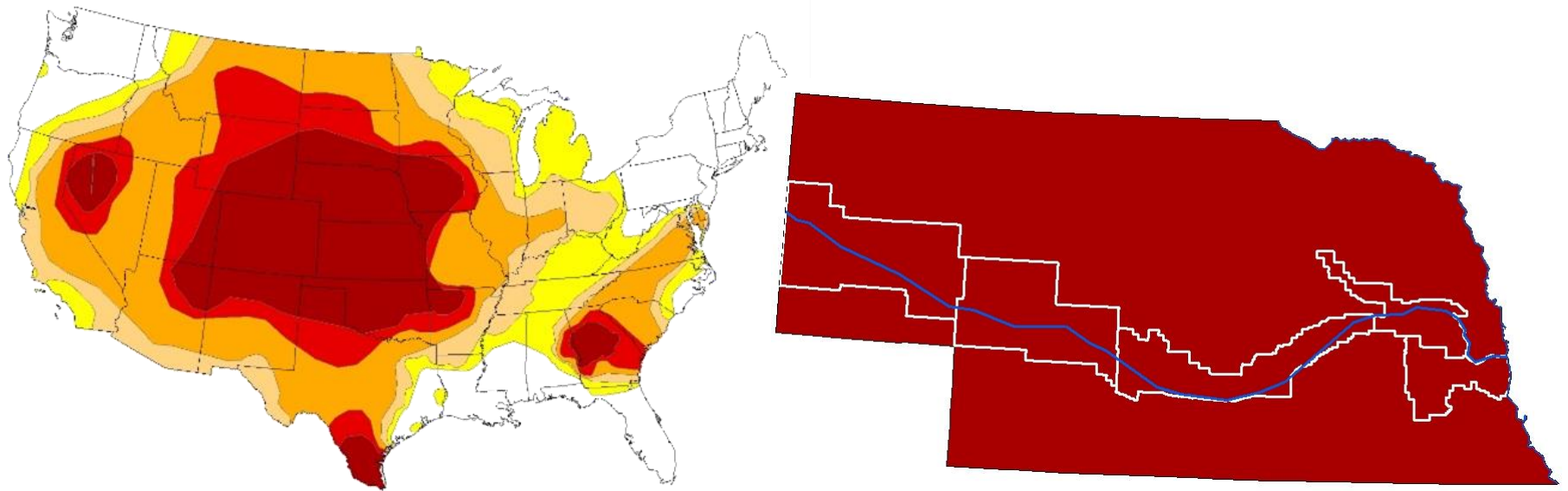


Scenario Time Point 2: Days over 100 degrees F



Scenario Time Point 3: 5th Year of Drought

Focus: All Platte NRDs

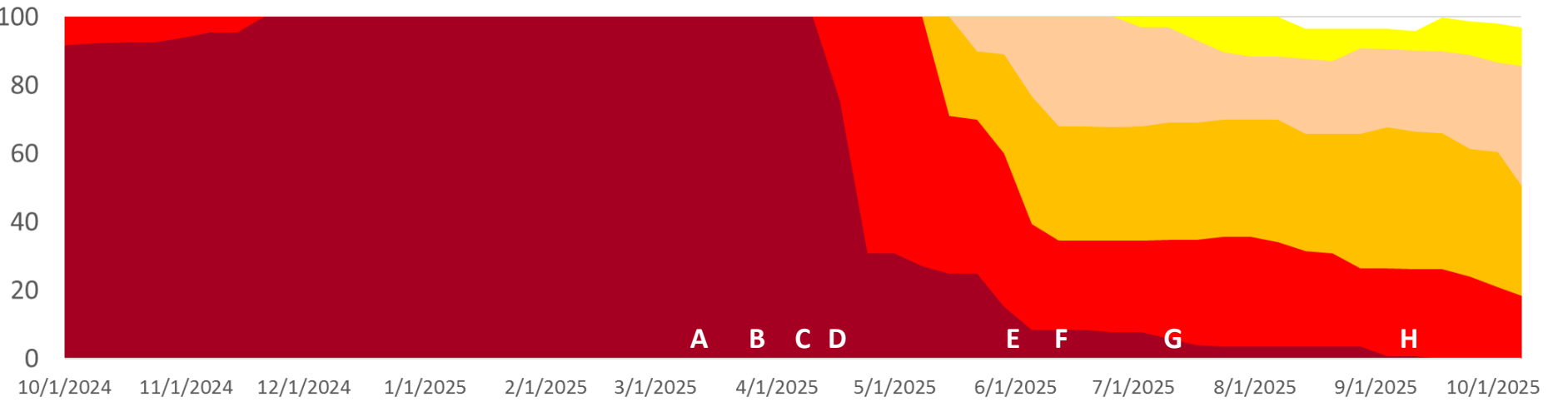


U.S. Drought Monitor at peak severity in Nebraska (April 1)

All Platte NRDs

Nebraska Percent Drought Area
Scenario Time Point 3: 5th year in a multi-year drought

D0 Abnormally Dry D1 Moderate Drought D2 Severe Drought D3 Extreme Drought D4 Exceptional Drought



A B C D E F G H

Winter wheat crop decimated, reports of prevented planting of irrigated crop land.

Snowpack is 10% of normal in the headwaters of the North Platte.

Lake McConaughy is essentially dry.

Wildfire near Cedar Point while UNL students are present for field work.

Municipal & Rural water supply & water quality issues continue. Lincoln & Omaha under critical water shortages.

West Nile outbreak. 1483 clinical cases reported across the NRD.

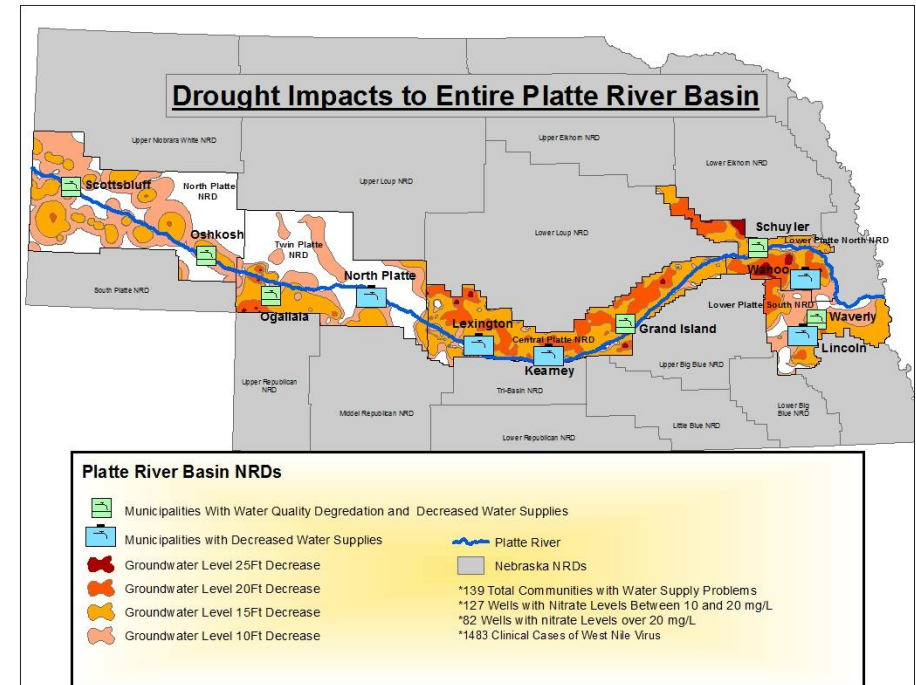
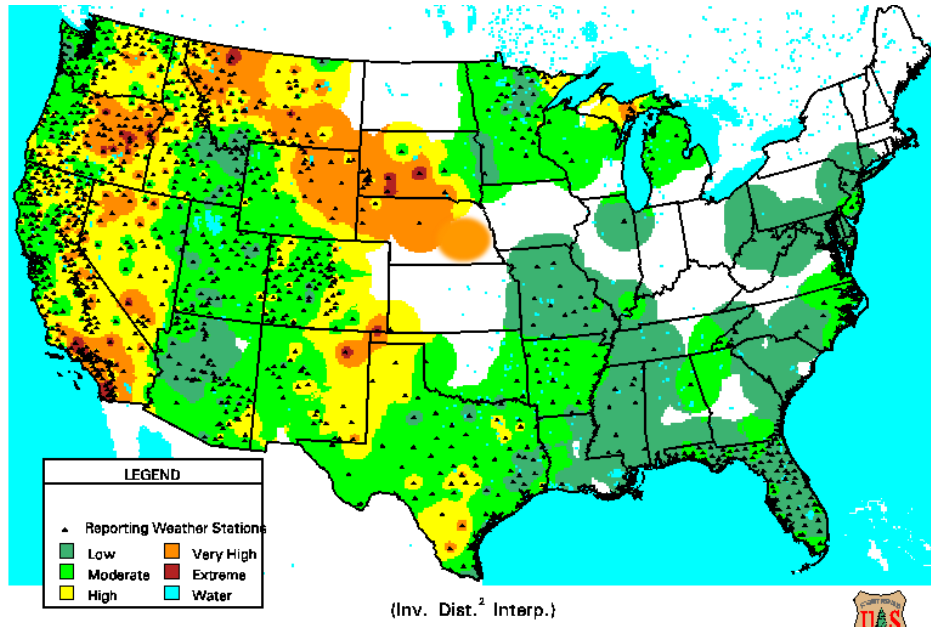
High temperatures in Lincoln cause 15 heat related illness at the Cornhusker State Games.

Fire at Mahoney State Park over Labor Day weekend, threatens 100s of visitors.

Scenario Time Point 3: Spatial Maps of Impacts

Wildfire danger

Ground water levels & water quality



Scenario Time Period 3: Days over 100 degrees F

