

UPPER PLATTE RIVER DROUGHT CONTINGENCY PLAN (UPRDCP)

DROUGHT TASK FORCE MEETING

Tuesday, May 23, 2023, 9 a.m.–12 p.m. MT

Keith County Fairgrounds Exhibit Hall
1000 W 3rd St, Ogallala, NE 69153

DROUGHT MONITORING INDICATORS AND INDICES

Indicator or Index	Type	Use	Strengths & Limitations	Input Parameters
U.S. Drought Monitor (USDM)	Composite or Modelled	Provides a weekly snapshot of current drought conditions that shows where drought is occurring, its spatial extent and severity, and the time scale of the associated impacts.	Incorporates multiple types of data across different time scales to create a comprehensive depiction of drought. However, the analysis may be weaker in areas with few inputs. Interpretation is needed.	Multiple
Palmer Drought Severity Index (PDSI)	Meteorology and soil moisture	Estimate relative dryness using precipitation and temperature and estimate of soil moisture.	The longest-used drought index in the U.S. The use of soil data and a water balance methodology makes it robust for determining drought, especially in non-mountainous areas. It has a timescale of approximately 9 months which leads to a lag in identifying drought conditions. Soil moisture aspect is calculated and not measured in field.	Precipitation, Temperature (Evaporation), Soil Available Water Content
Standardized Precipitation Index (SPI)	Meteorology	Characterizes precipitation on a range of timescales by determining the probability of recording a given amount compared to the historical record.	Uses precipitation only and is compatible across regions with different climates. Recognized by the World Meteorological Organization as the most accessible indicator.	Precipitation
Standardized Precipitation Evapotranspiration Index (SPEI)	Meteorology	Considers both precipitation and potential evapotranspiration in determining drought; an extension of the SPI.	Output is similar to SPI, but with a temperature component. Captures the effect of increased temperatures on water demand.	Precipitation, Temperature (Evaporation, Evapotranspiration)
Evaporative Demand Drought Index (EDDI)	Meteorology	Tracks atmospheric evaporation demand, often described as the “thirst of the atmosphere.”	Can provide early warning for rapidly developing drought conditions and indicate the persistence of on-going drought, particularly for plant stress. It’s a new product that has undergone less scrutiny than some of the other indicators.	Temperature (Evaporation, Evapotranspiration)
Snowpack	Water Supply	Measures maximum and average snowpack depth (NE) and Snow Water Equivalent (SWE) (WY and CO)	Indicator of potential spring river flows and reservoir refill. Knowing how much water is contained in snow is uncertain. Measurements are at specific locations that are estimated for larger areas. The water content (SWE) is not always measured (depth only is common in NE).	Snow stations (SNOTEL or NOAA)
Surface Reservoir Storage	Water Supply	Current and projected system storage in Glendo, Seminole, Pathfinder, and McConaughy	Measured on a daily basis. Reservoir performance each year is uncertain based on water supply, seasonal demands, regulations, and reservoir maintenance needs. USBR provides modeled risk-based estimated for future storage for WY. No similar risk product currently for McConaughy.	Measured storage or modeled future storage
Streamgaging	Water Supply	Measures and records the amount of water flowing in a river or stream, or its discharge. Expressed as deciles to show above or below normal flows.	Measurements generally occur automatically every 15 minutes. Provides timely indicator of the amount of surface water currently in an area. The Missouri Basin River Forecast Center has future projections of stream flow	Streamflow