801 FIRE RISK DAYS

Background

- Fire risk is estimated using the Keetch-Byram Drought Index (KBDI),[1] a continuous scale for estimating the dryness of the soil and duff layers in a region and represents the net effect of evapotranspiration and precipitation. It is calculated using daily maximum air temperature and 24-hour rainfall totals on a daily basis.
- The range of the index is determined by assuming that there is 8 inches of moisture in a saturated soil that is available to vegetation; 0 means no deficit and 800 is the maximum drought possible.
- Higher values suggest higher vulnerability relative to other watersheds.

THIS INDICATOR MEASURES THE SOIL MOISTURE DEFICIT, CALCULATED BY ACCUMULATING A PRECIPITATION DEFICIT FACTOR AND INCREASES BY MAXIMUM TEMPERATURE

Data Sources

Data Source	Description	Spatial Resolution	Temporal Resolution
Coupled Model Intercomparison Project (CMIP-5) output[2]	Temperature and precipitation within 4-digit hydrologic code (HUC-4) watersheds	HUC-4 watersheds	2035-2064 and 2070-2099

This Indicator Was Used to Assess Vulnerability

Business Line	Importance Weight (Can vary from 1 to 2)
Hazards and Safety	1

Calculation

- Use daily maximum temperature and precipitation values from CMIP-5 climate models averaged over each HUC-6 watershed.
- Calculate the Keetch-Byram Drought Index (KBDI) for each day using equations in Keetch and Byram[1] (1968).
- Count the number of fire risk days per year where KBDI > 600, and determine the days for each HUC-4 watershed by weighted averaging the HUC-6 watershed values. Calculate mean heat stress days for each scenario and time period.
- Calculate the increase or decrease in fire risk days from the base historical period to each time period for each future scenario projection.

[1] Keetch. J. J., G. M. Byram. 1968 (rev. 1988). A drought index for forest fire control. Research Paper SE-38. Asheville NC: USDA Forest Service, Southeastern Forest Experiment Station.

LOW

Flathead National Forest, MT - Courtesy of USFS

LOW INDICATOR VALUE
Low fire risks on ranges, less restriction on live-fire training

HIGH INDICATOR VALUE
Higher fire risks on ranges, live-fire training restrictions and increased fire suppression efforts needed.

HIGH

Crooked River Natl Grassland - Oregon