



Drought monitor

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PREPARE Drought and Flood Early Warning for Central Pacific Islands
Nadi, Fiji, 15-20 July 2024

← → ↻ 🏠 [cpc.ncep.noaa.gov/products/international/drought/drought_PI.shtml](https://www.cpc.ncep.noaa.gov/products/international/drought/drought_PI.shtml) ☆ M ⋮

📁 Imported From Fire... 📄 ESDD - Bias-correct... 🌱 Global Hazards Wee... 📧 aoml.noaa.gov/pho... 🌐 NOAA uses artificial... 🌤️ Climate Prediction...

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Climate Prediction Center www.nws.noaa.gov

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Drought portal

Monitoring

- Precip. Deficiency
- Land Status
- Long-Term Drought
- Short-Term Drought
- Flash Drought
- Vegetation Health

Historical Archives


- Monthly Map
- Daily Map

Regions

- Caribbean
- Pacific Islands

Links

- CPC leaky Bucket Model
- CPC drought info page
- International Heat Hazard
- Old DM page

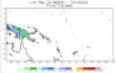
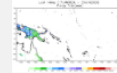
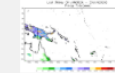
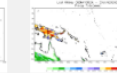
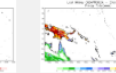
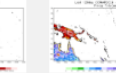
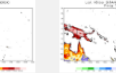
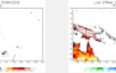
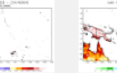
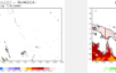
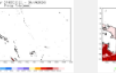
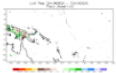
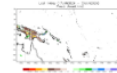
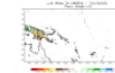
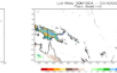
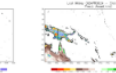
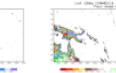
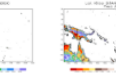
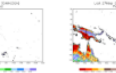
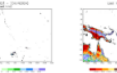
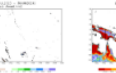
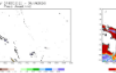
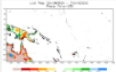
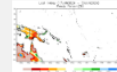
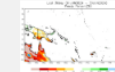
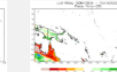
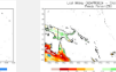
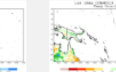
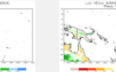
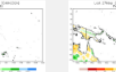
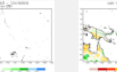
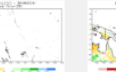
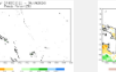


Drought Monitor and outlook for Pacific Islands


CPC International Desk

Previous Accumulated Precipitation Deficiency (Multi-scale Monitoring)

CPC CMORPH consists of satellite precipitation estimates that have been bias corrected and reprocessed using the the Climate Prediction Center (CPC) Morphing Technique (MORPH) to form a global, high resolution precipitation analysis. Data is reprocessed on a global grid with 8km-by-8km spatial resolution. Temporal resolution is 30 minutes over a 20 year period of record (January 1998–present).

	7day	14day	30day	60day	90day	120day	180day	270day	1yr	1.5yr	2yr
Total Precipitation (mm)											
Precipitation Anomaly (mm)											
Precipitation Percent (%)											

Drought Monitor

Drought Indices:	Past 1 week	Past 2 weeks	1 month	2 months	3 months	4 months	6 months	9 months	12 months
									

https://www.cpc.ncep.noaa.gov/products/international/drought/drought_PI.shtml

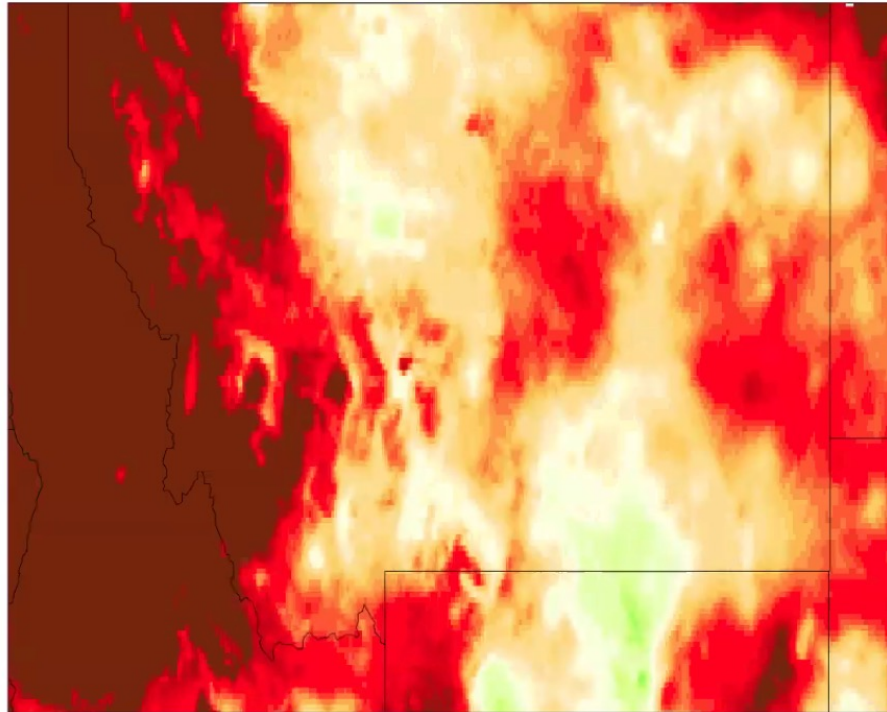


Realtime Geotiff for drought monitor

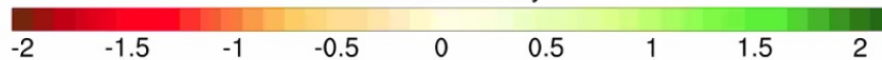
Dataset	Precipitation	Percent of Normal Precip.	Max Temperature Departure from Normal	SPI	SPEI	EDDI	Coverage and Resolution	Latency
CPC Daily Unified	<u>1-Month, 2M, 3M, 6M, 9M, 12M</u>	<u>1-Month, 2M, 3M, 6M, 9M, 12M</u>	<u>1-Week, 2W, 1-Month, 2M, 3M, 6M, 9M, 12M</u>	<u>1-Month, 2M, 3M, 6M, 9M, 12M</u>	<u>1-Month, 2M, 3M, 6M, 9M, 12M</u>	<u>1-Week, 2W, 1-Month, 2M, 3M, 6M, 9M, 12M</u>	Global 0.5 deg	1-2 days
ERA5 (Global)	<u>1-Month, 2M, 3M, 6M, 9M, 12M</u>	<u>1-Month, 2M, 3M, 6M, 9M, 12M</u>	<u>1-Week, 2W, 1-Month, 2M, 3M, 6M, 9M, 12M</u>	<u>1-Month, 2M, 3M, 6M, 9M, 12M</u>	<u>1-Month, 2M, 3M, 6M, 9M, 12M</u>	<u>1-Week, 2W, 1-Month, 2M, 3M, 6M, 9M, 12M</u>	Global 30km	3-5 days
CMORPH	<u>1-Month, 2M, 3M, 6M, 9M, 12M</u>	<u>1-Month, 2M, 3M, 6M, 9M, 12M</u>	Precip. Only	<u>1-Month, 2M, 3M, 6M, 9M, 12M</u>	Precip. Only	Precip. Only	Global 8km	1-2 days
GPM IMERG	<u>1-Month, 2M, 3M, 6M, 9M, 12M</u>	<u>1-Month, 2M, 3M, 6M, 9M, 12M</u>	Precip. Only	<u>1-Month, 2M, 3M, 6M, 9M, 12M</u>	Precip. Only	Precip. Only	Global 10km	2-4 days

Standardized Precipitation Index (SPI)

8-WK SPI



Stand. Anomaly

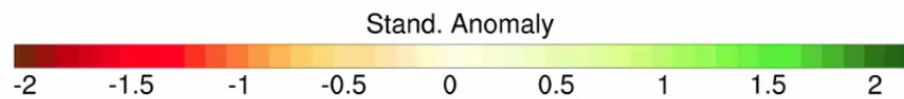
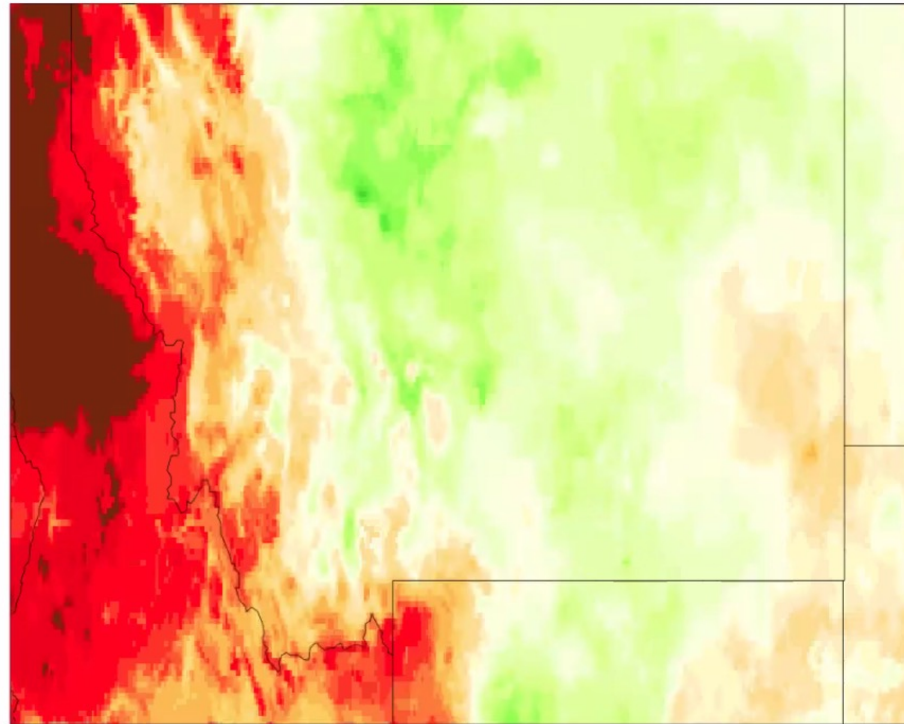


Strengths: 1) Precipitation is a major driver of all types of drought, 2) can be computed over a range of time scales (one month to many years), 3) long data record allows for better estimates of precipitation anomalies

Weaknesses: 1) Sparse in situ observations in many regions, 2) radar-derived precipitation estimates can be biased, and there are gaps in radar coverage, 3) it is not a direct indicator of drought impacts and can be misleading depending upon how precip. occurred

Standardized Precip. Evap. Index (SPEI)

4-WK SPEI

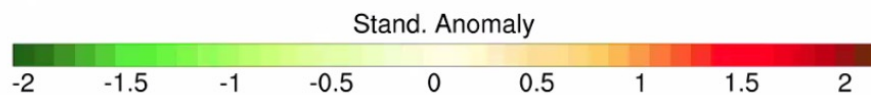
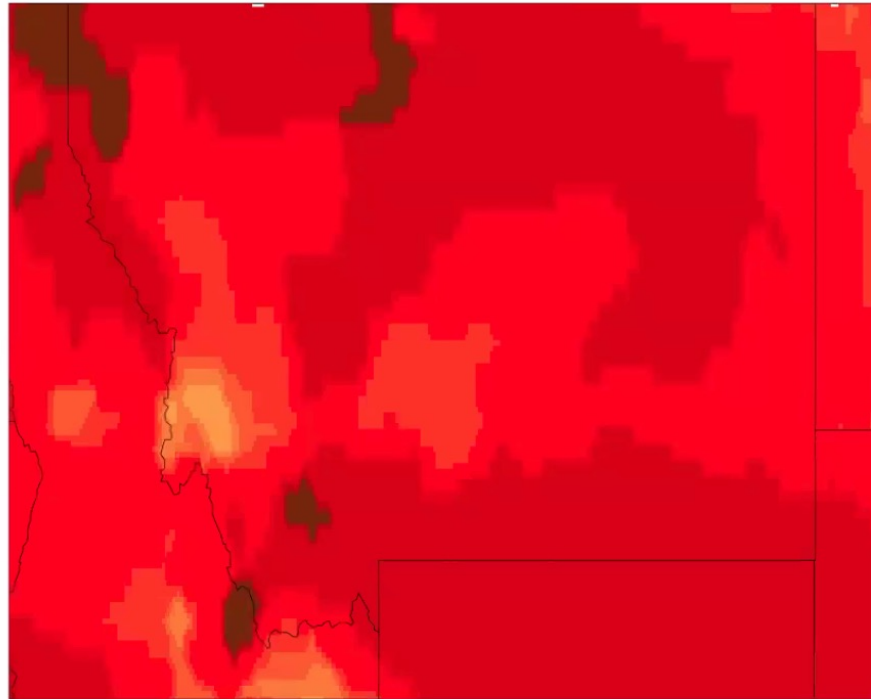


Strengths: 1) Combines anomalies in precipitation and evaporative demand into a single indicator, 2) can be computed over a range of time scales, 3) long data record

Weaknesses: 1) It is not a direct indicator of drought impacts

Evaporative Demand Drought Index (EDDI)

4-WK EDDI

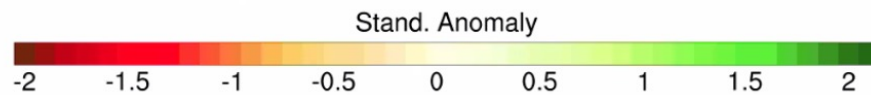
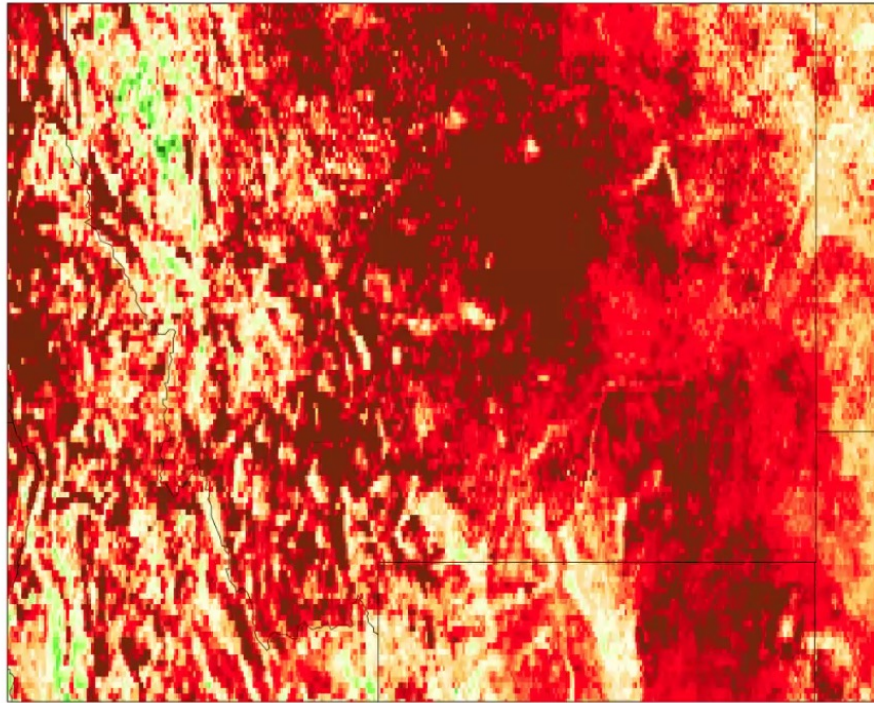


Strengths: 1) Evaporative demand is a key driver of flash drought onset and intensification, 2) can be computed over a range of time scales (one week to months), 3) long data record allows for better estimates of evaporative demand anomalies

Weaknesses: 1) Relatively coarse resolution, 2) it is not a direct indicator of drought impacts, 3) can lead to false alarms because high temperatures by themselves may not lead to drought if precipitation is adequate

Evaporative Stress Drought Indicators

4-WK ESI



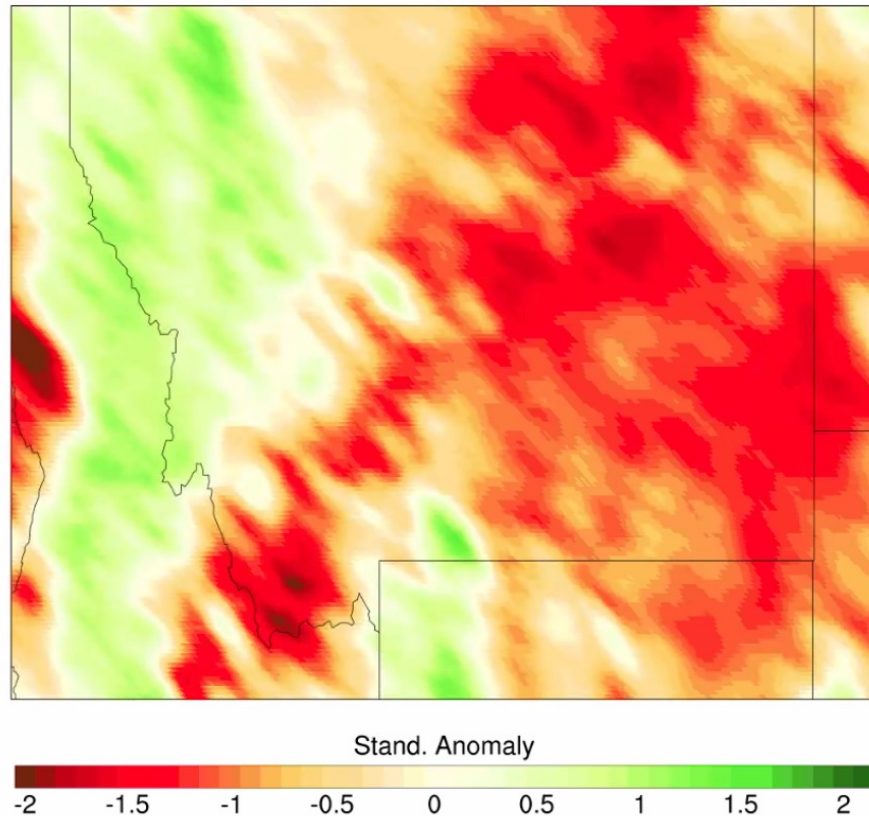
Examples: Evaporative Stress Index (ESI),
Stand. Evaporative Stress Ratio (SESR)

Strengths: 1) Direct indicator of moisture stress on vegetation health, 2) satellite-based tools have high resolution, 3) can be computed over a range of time scales (one week to several months)

Weaknesses: 1) Satellite-derived ET can only be retrieved when skies are clear, 2) short data record for satellite-based tools (generally starting in 2000), 3) not useful indicator outside of the growing season

Vegetation Conditions

4-WK EVI



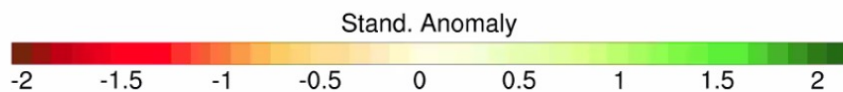
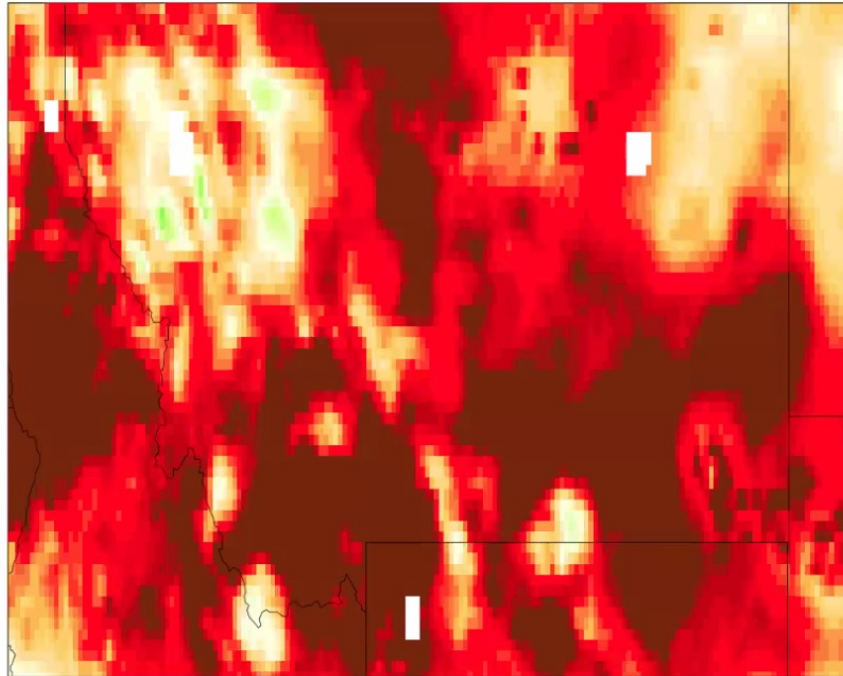
Examples: Enhanced Vegetation Index (EVI), Solar Induced Fluorescence (SIF)

Strengths: 1) Direct indicator of impacts of moisture stress on vegetation health and functioning, 2) EVI has high spatial resolution

Weaknesses: 1) Can only be retrieved when skies are clear, 2) irregular updates, 3) short data record (~20 years or less), 4) SIF has coarse resolution

Soil Moisture

4-WK NMV_TS



Ex: NLDAS, SPORT LIS, in situ obs., SMAP

Strengths: 1) Important indicator of potential moisture stress, 2) can be computed over different time scales, 3) available over a long time period (1979-present) from model reanalyses

Weaknesses: 1) Coarse spatial resolution and potentially large model biases, 2) in situ obs may not be representative, 3) coarse resolution limits utility of model analyses, and 4) need to use appropriate soil layers (not topsoil layer)

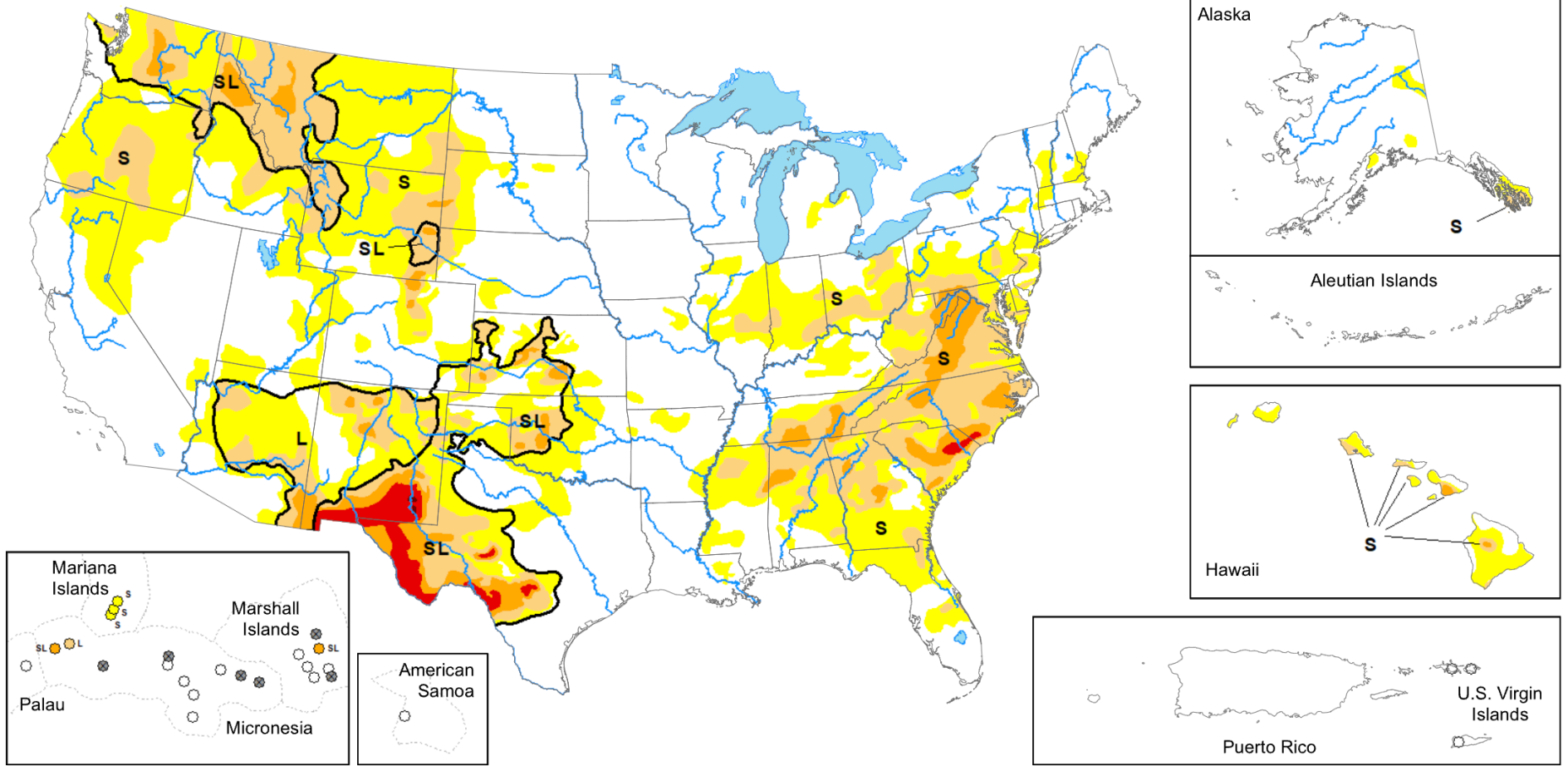
QGIS practical

- Vector layer: QGIS/WMO_Basemap_EPSG_3832.zip
- Raster layer: tiff/
- CMORPH prcp monitor
 - Pmean : CMORPH_Pmean_90day.tif
 - Panom : CMORPH_Panom_1yr.tif
 - PanomPct: CMORPH_PanomPct_180day.tif
- CPC unified data:
 - SPI: GLOBAL-NOAA_CPC_DAILY_GLOBAL-spi-12mo.tif
 - SPEI: GLOBAL-NOAA_CPC_DAILY_GLOBAL-speih-6mo.tif
- ERA5 EDDI: GLOBAL-ERA5-eddih-1mo.tif
- GPM IMERG: GLOBAL-GPM_DAILY-spi-2mo.tif
- SMP: smp_glb.tif, smp_glb_monthly.tif, smp_glb_weekly.tif
- SRI: sri1_glb.tif, sri3_glb.tif
- ESI: esi_glb.tif
- VHI (1km): GVH1kmInitialVH_VHI_geotiff_v2r01_j01_s202407010000000_e202407072359590_c202407080341410.tif

Map released: July 11, 2024

Data valid: July 9, 2024

View grayscale version of the map



Intensity and Impacts

None

D0 (Abnormally Dry)

D1 (Moderate Drought)

D2 (Severe Drought)

D3 (Extreme Drought)

D4 (Exceptional Drought)

No Data

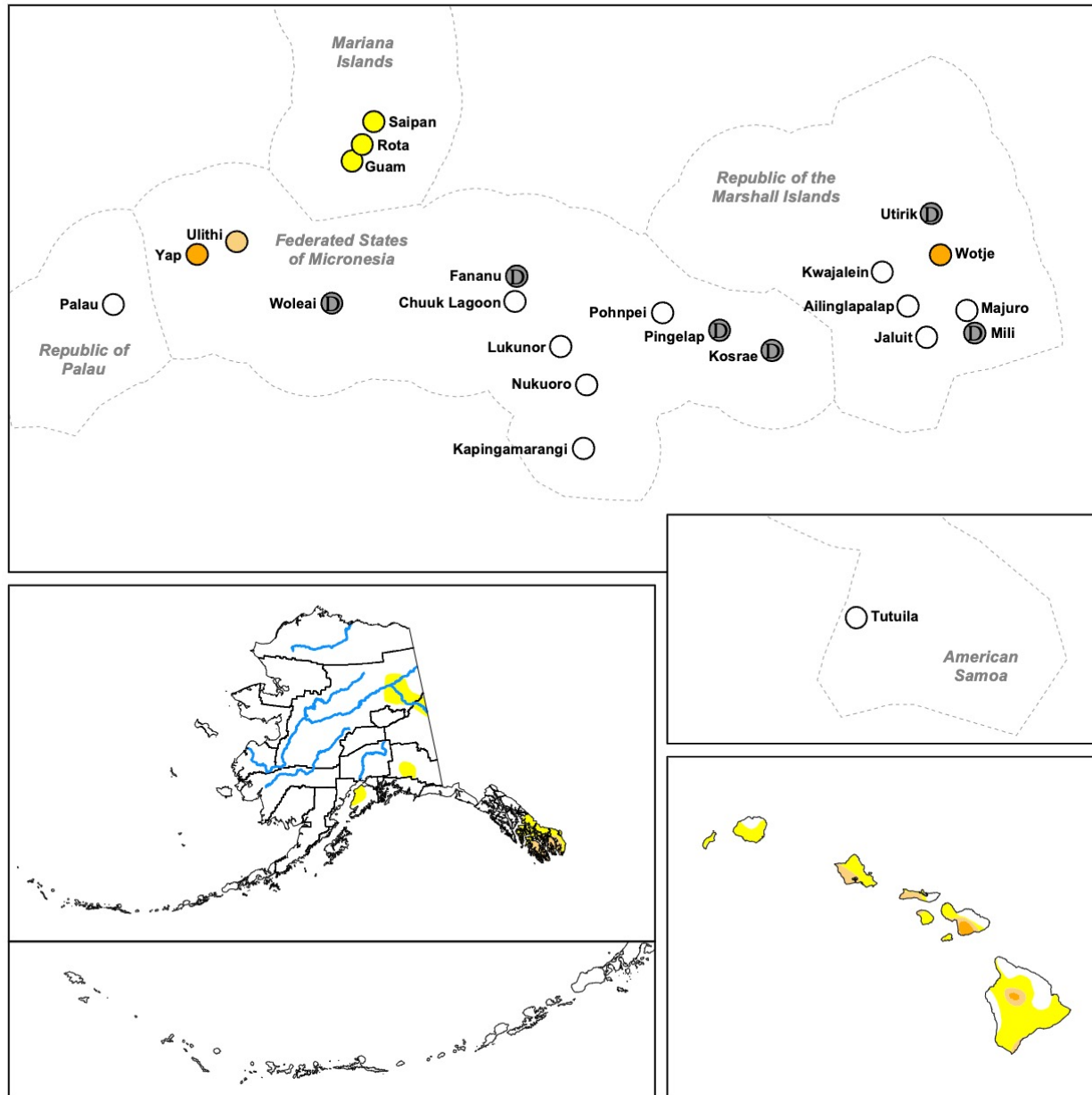
~ - Delineates dominant impacts

S - Short-term impacts, typically less than 6 months (agriculture, grasslands)

L - Long-term impacts, typically greater than 6 months (hydrology, ecology)

SL - Short- and long-term impacts





Map released: Thurs. July 11, 2024

Data valid: July 9, 2024 at 8 a.m. EDT

Intensity

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)
- No Data

Authors

United States and Puerto Rico Author(s):

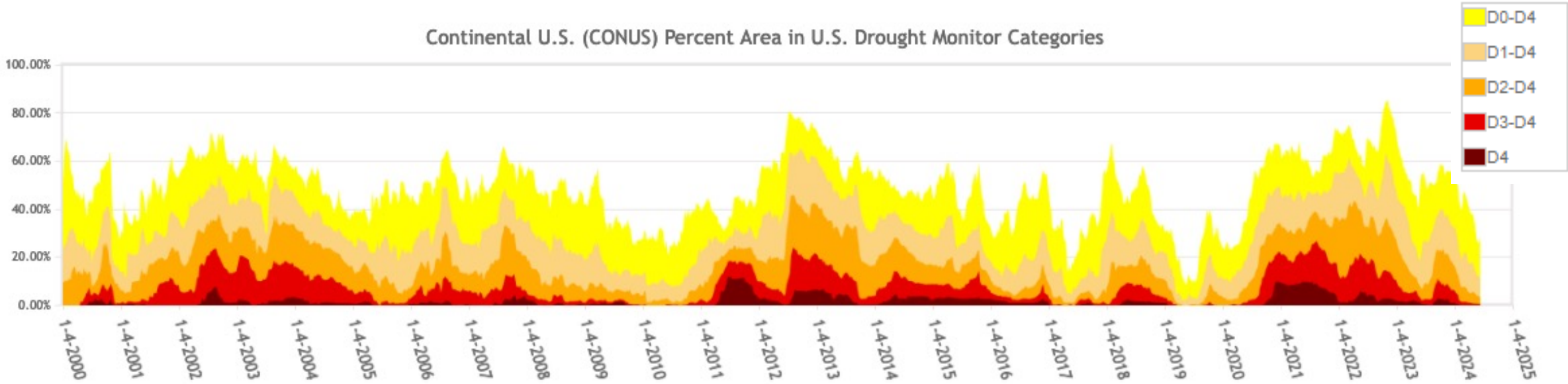
[Brian Fuchs](#), National Drought Mitigation Center

Pacific Islands and Virgin Islands Author(s):

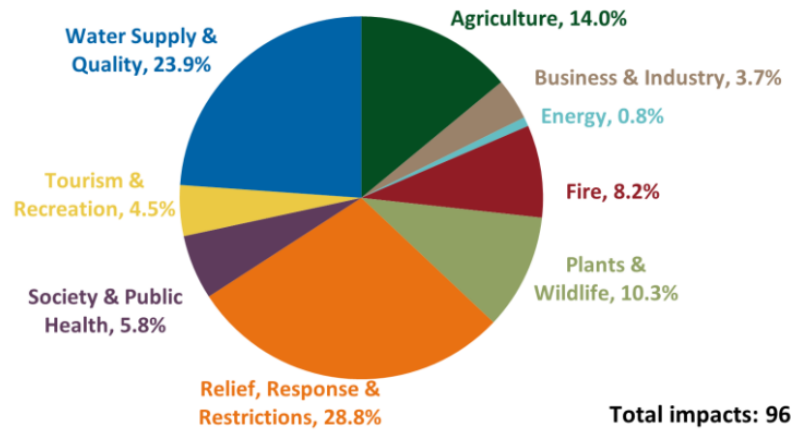
[Lindsay Johnson](#), National Drought Mitigation Center



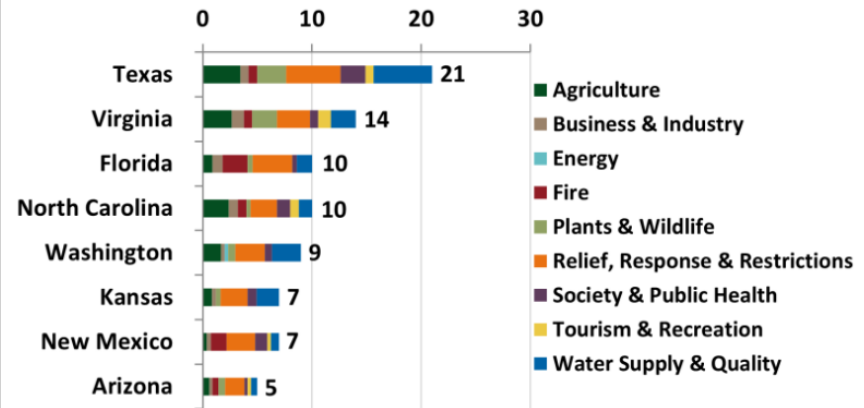
Continental U.S. (CONUS) Percent Area in U.S. Drought Monitor Categories



Impacts in the Drought Impact Reporter, June 2024








Impacts in the Drought Impact Reporter, June 2024



June 2024 impact summaries by category (left) and top states (right).



Operational USDM schedule

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- Monday: collect obs. data and review figures
 - Tuesday: draft drought monitor map and sent to the local stakeholder for feedback
 - Wednesday: revise and improve map based on feedback
 - Thursday: release official USDM
 - Friday: drought impact and early warning