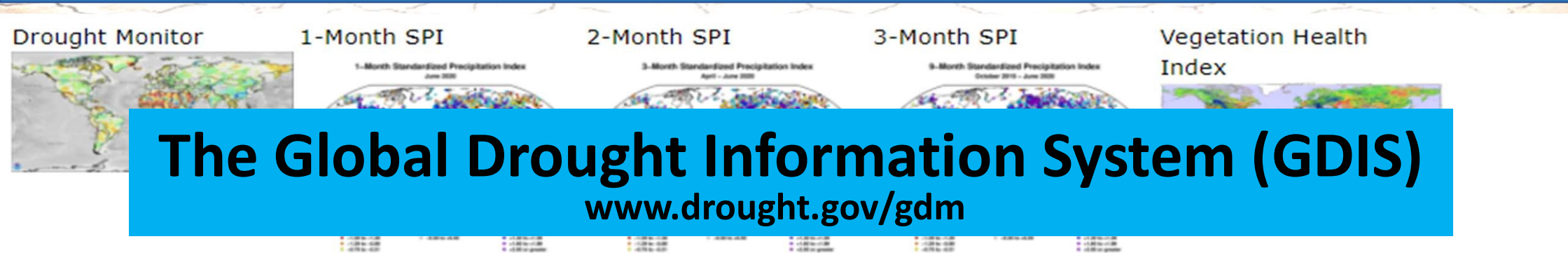


# Global Drought Information System



**Richard Heim\*, Steve Ansari\*, Will Pozzi**

*\*NOAA / NESDIS / NCEI, Asheville, North Carolina USA*

IDMP Virtual Exchange – Global and Partner Initiatives

19 August 2020



NOAA National Centers for Environmental Information

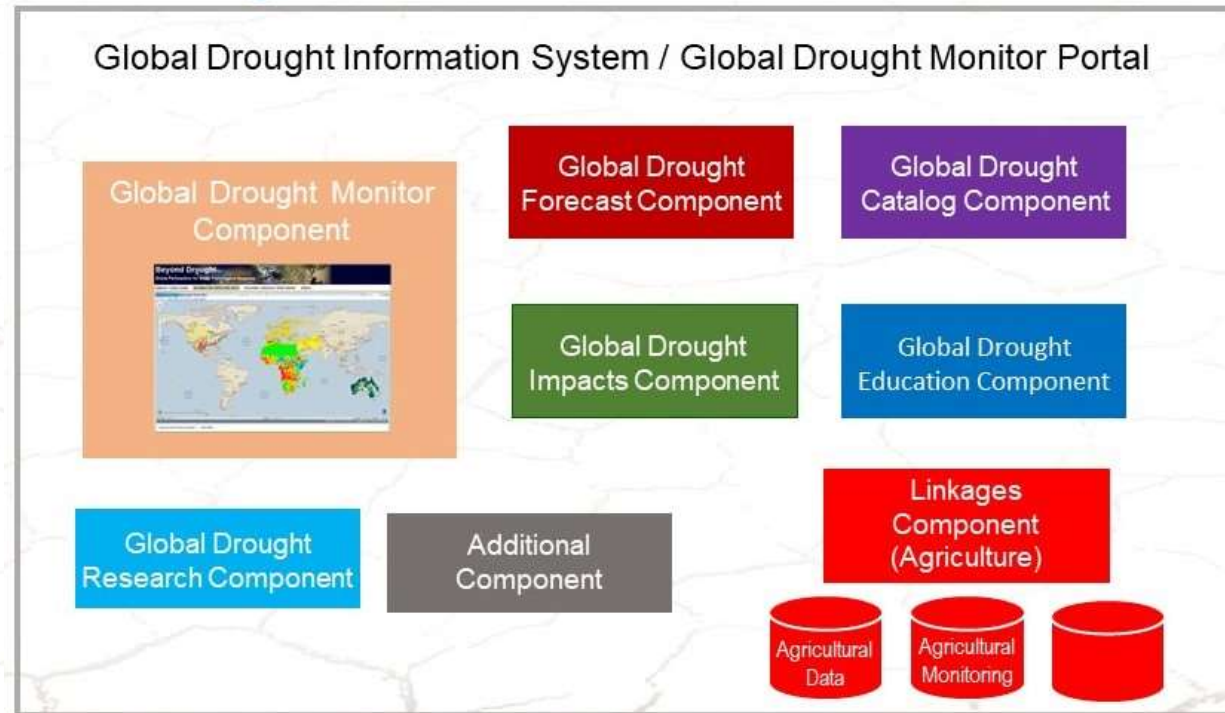


# Global Drought Information System

## GDIS is a GEO Initiative

- Resides within the NIDIS Drought Portal
  - Entire NIDIS Portal is being redesigned with enhanced functionality
- GDIS is comprised of several components or modules
  - Each developed separately from the others

## Moving Toward a GDEWS – GDIS Modules



GEO: Group on Earth Observations

NIDIS: National Integrated Drought Information System

[www.ncei.org](http://www.ncei.org)

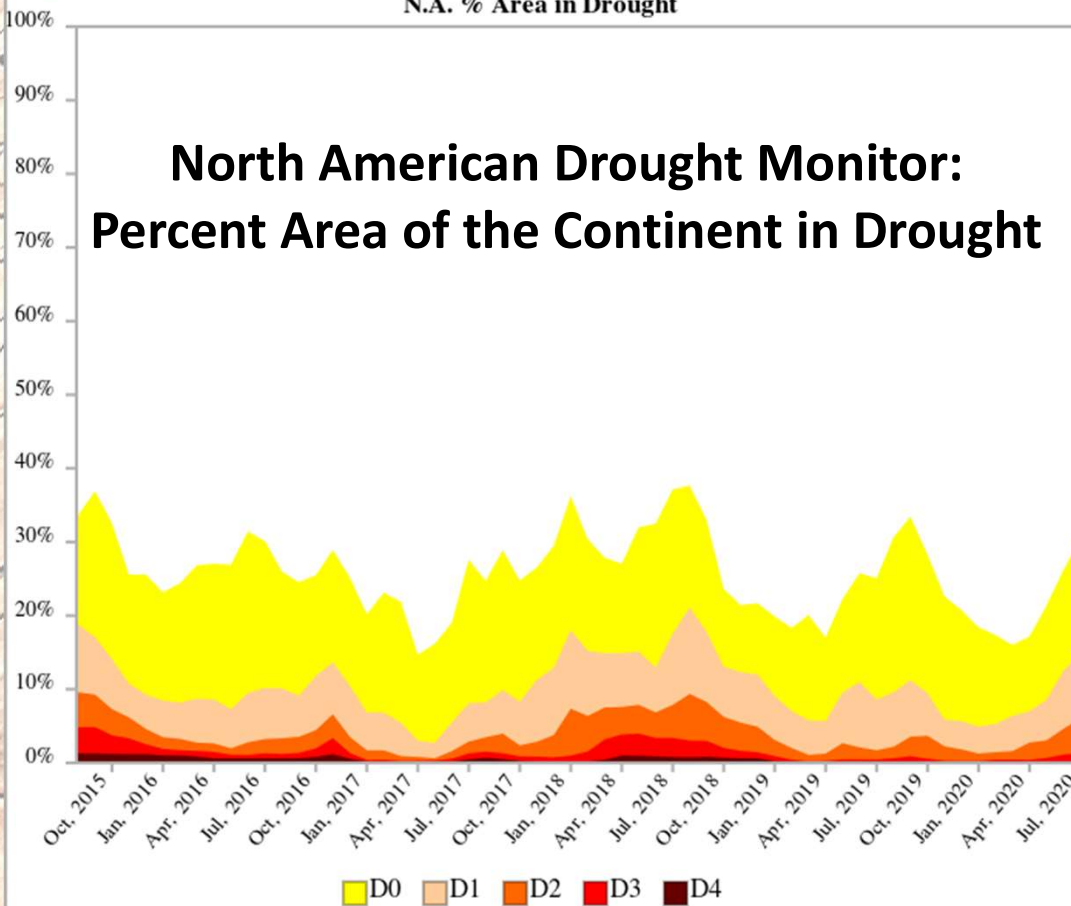
NOAA National Centers for Environmental Information



## GDIS builds upon existing work

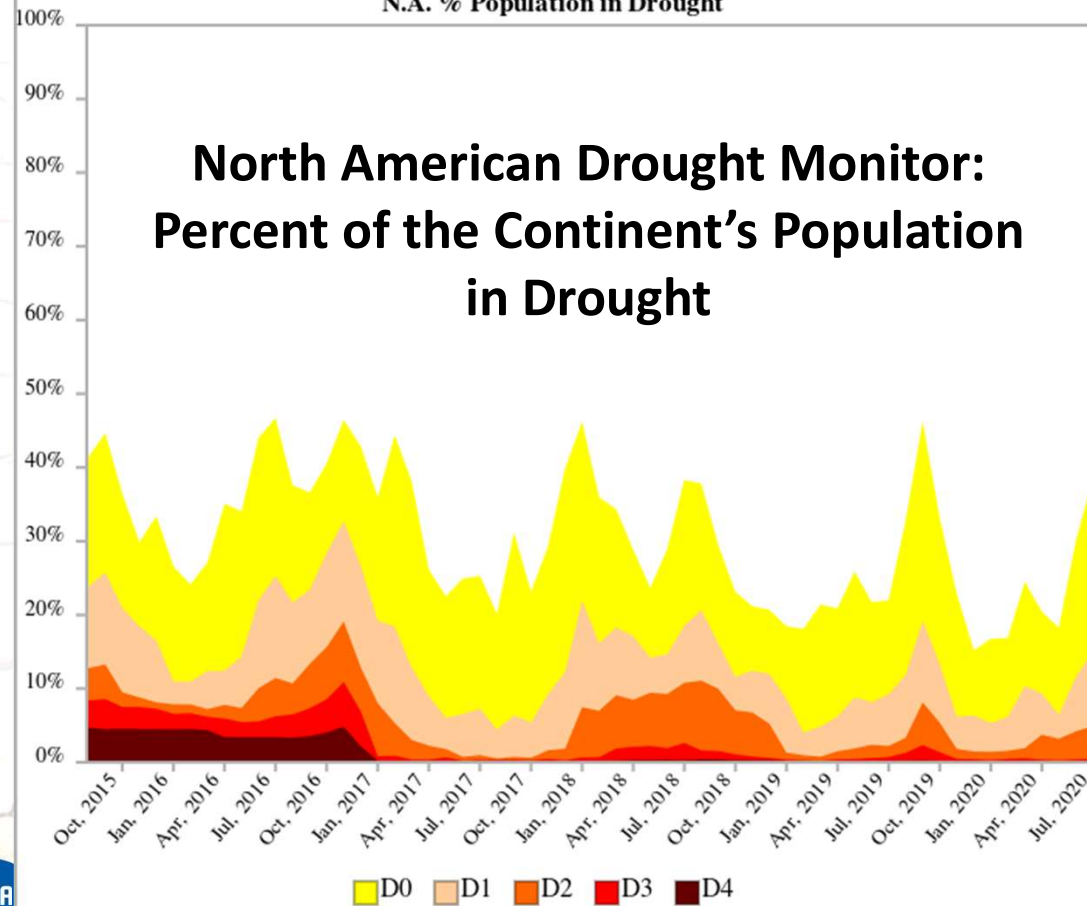
N.A. % Area in Drought

### North American Drought Monitor: Percent Area of the Continent in Drought



N.A. % Population in Drought

### North American Drought Monitor: Percent of the Continent's Population in Drought



[www.ncei.org](http://www.ncei.org)

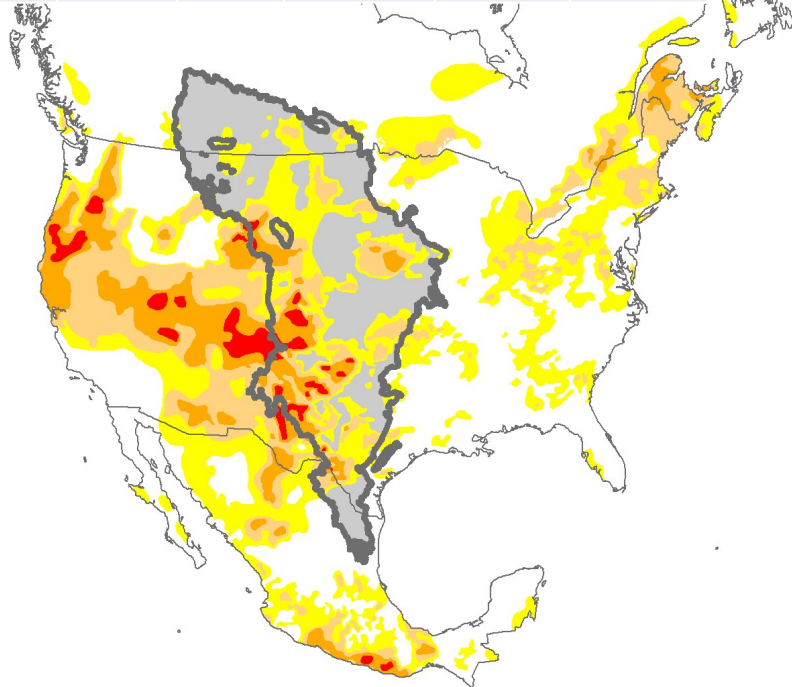
NOAA National Centers for Environmental Information



## NADM Eco-regions and Trans-Boundary Basins

### North America Great Plains

DroughtCat	Population	Pop_Pct	Year_Month	Area_SqMi	Area_Pct
D0	7134810	22.44	202007	255925	24.39
D1	4363080	13.72	202007	160811	15.33
D2	1504990	4.73	202007	91358	8.71
D3	137673	0.43	202007	26411	2.52

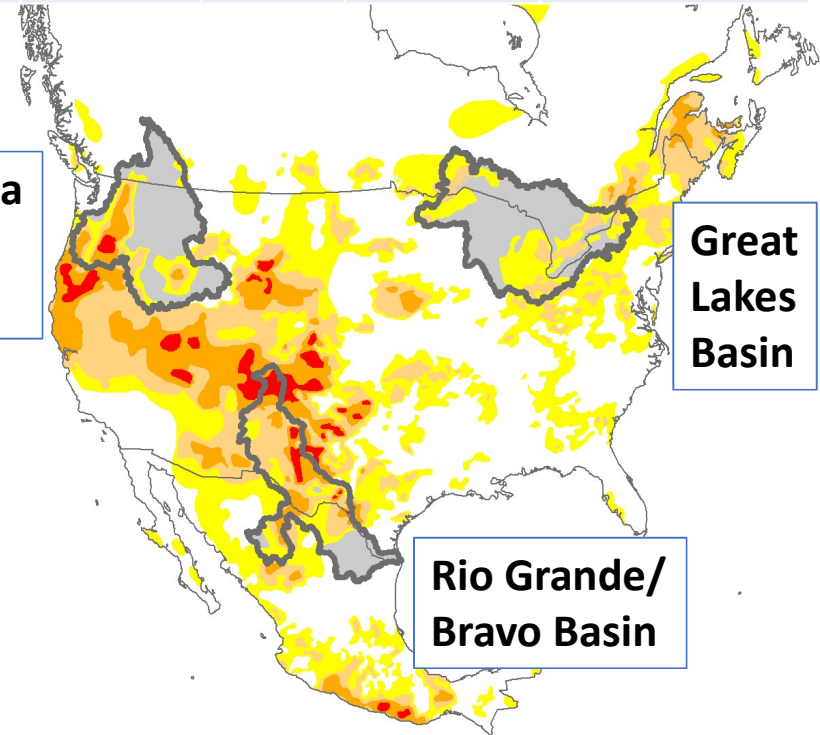


DroughtCat	Year_Month	Percent Area In Drought		
		Columbia	Great Lakes	Rio Grande/Bravo
D0	202007	16.65	29.90	19.42
D1	202007	11.89	13.11	31.91
D2	202007	10.29	0.25	20.56
D3	202007	1.73		7.32

### Columbia River Basin

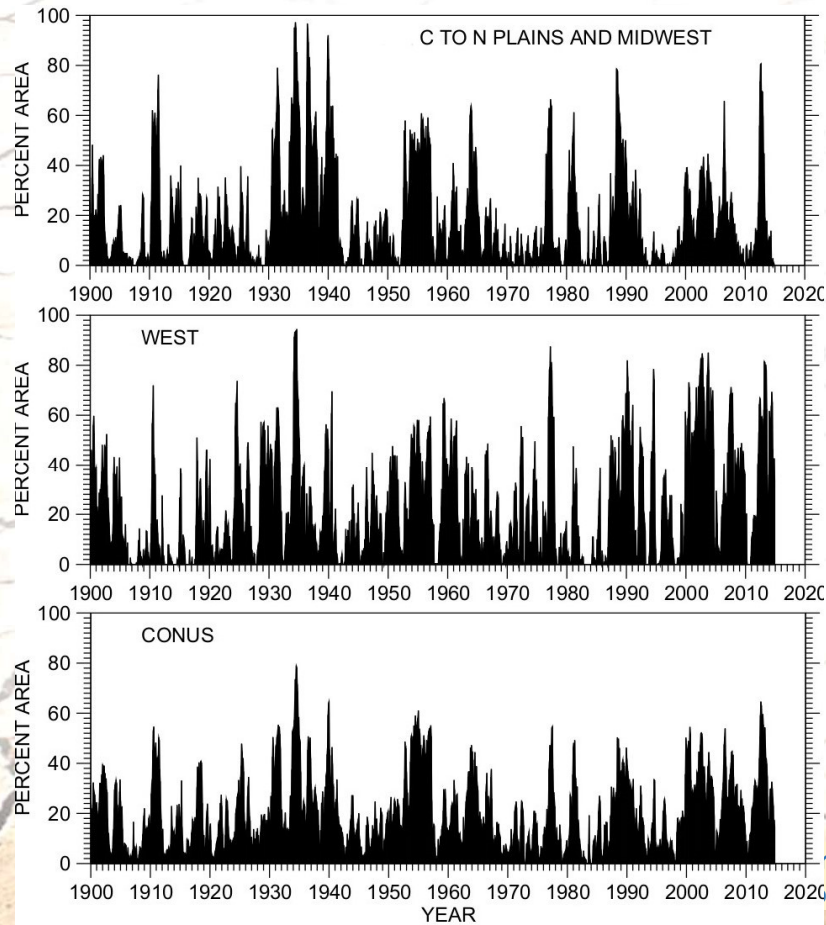
### Great Lakes Basin

### Rio Grande/Bravo Basin

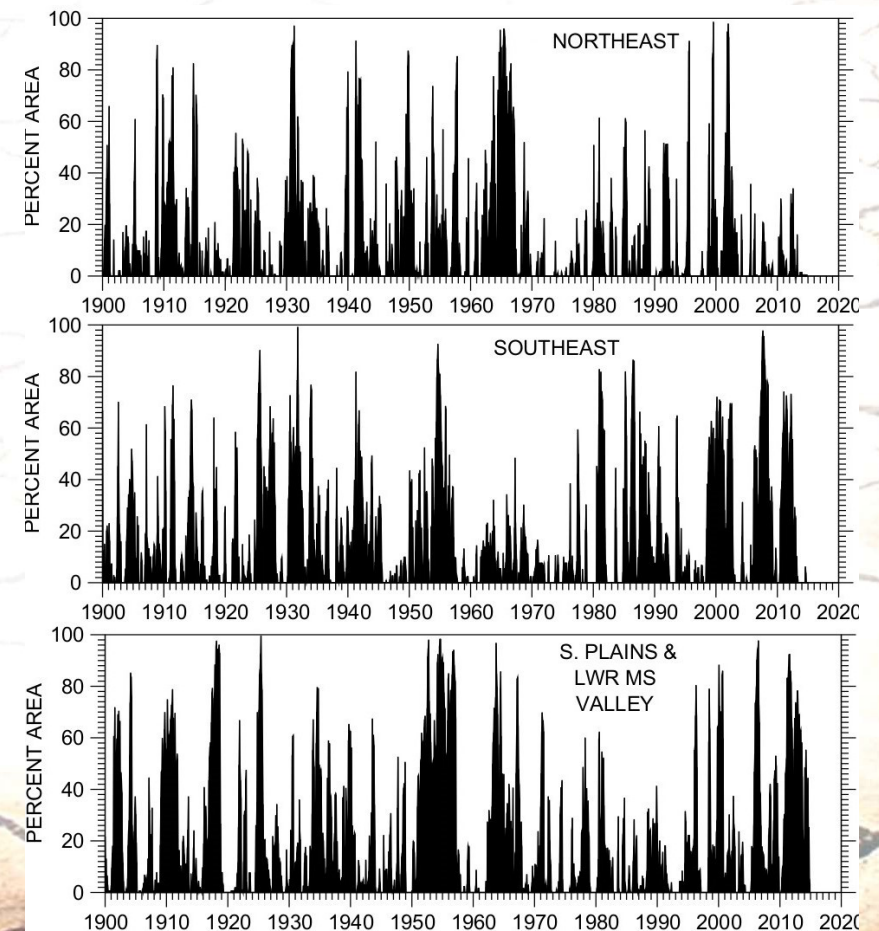


# Global Drought Information System

## With Global Gridded Drought Indices, Expand These Ideas Globally – Global & Sub-Region Percent Area/Population



Heim, BAMS,  
Dec 2017





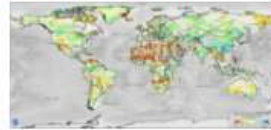
# Global Drought Information System

## We Are Developing Needed Global Gridded Drought Indices

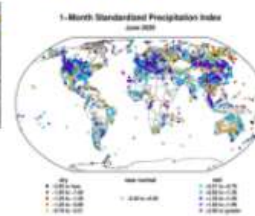
We are currently using  
GHCN SPI, VHI,  
and GPCC DI

We are developing new  
indices

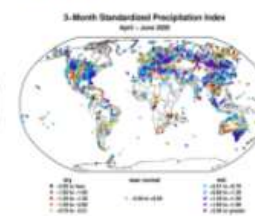
Drought Monitor



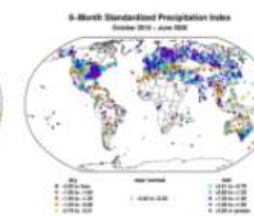
1-Month SPI



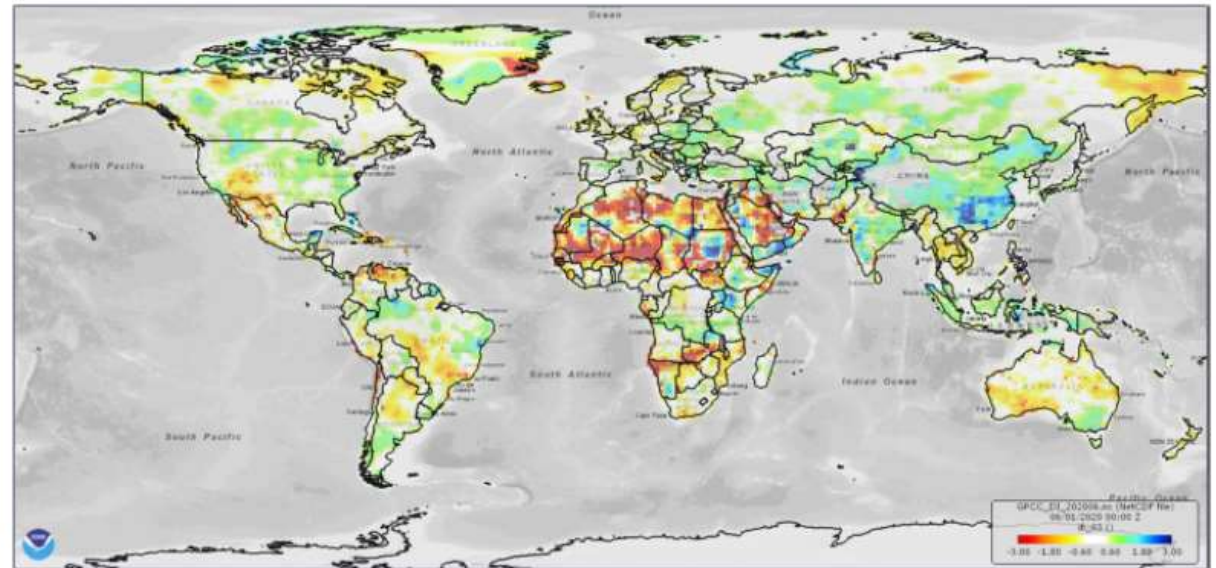
2-Month SPI



3-Month SPI



Vegetation Health  
Index

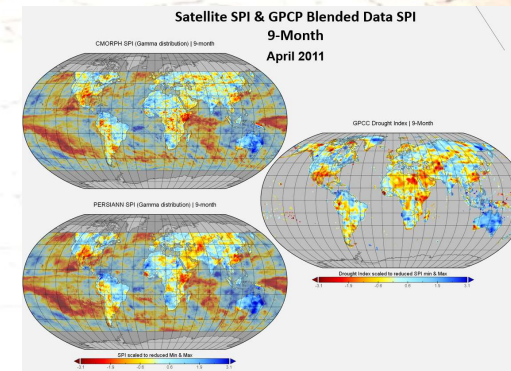


## New Development

- New global drought products:

- Satellite-based Drought Indices:

- Example using NIDIS maintained Python Drought Indices code, collaboration with N.C. Institute for Climate Studies
  - NIDIS enhanced SPI code to run on daily data
  - Daily Standardized Precipitation Index (SPI)
  - Based on NOAA 'gold standard' satellite precipitation products (cMORPH and PERSIANN)
  - Global coverage
  - cMORPH is updated within 48 hours of real-time.



North Carolina Institute  
for Climate Studies



**Drought.gov**  
U.S. Drought Portal



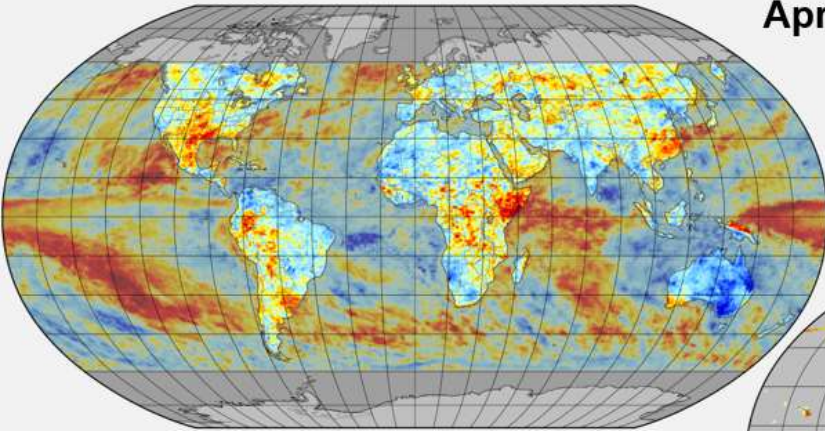
# Global Drought Information System

## Satellite SPI & GPCP Blended Data SPI

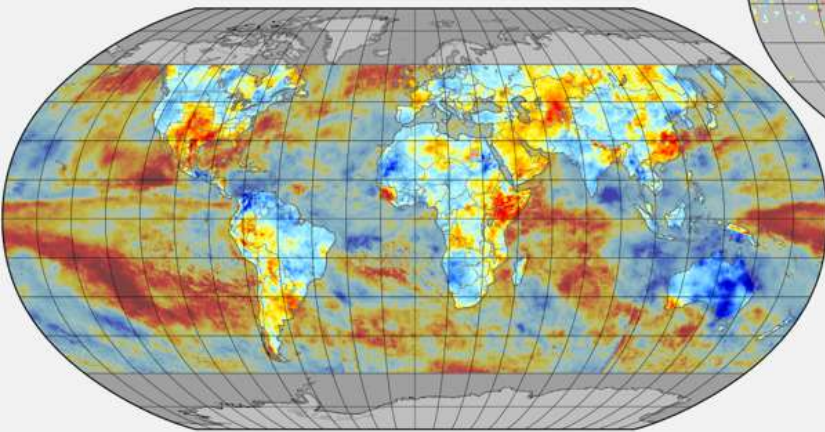
9-Month

April 2011

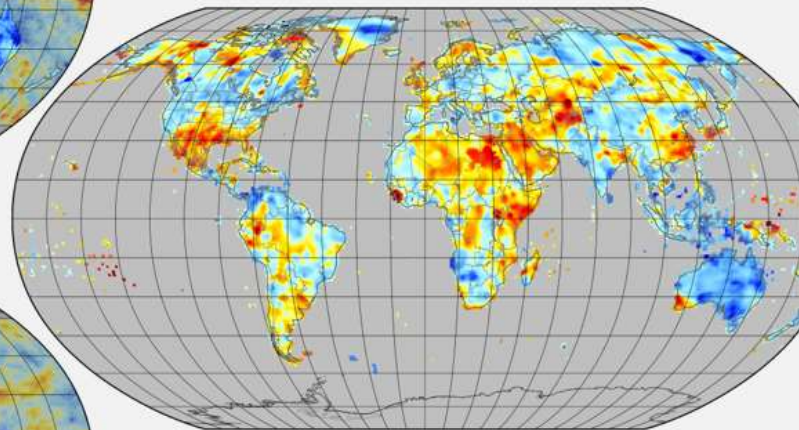
CMORPH SPI (Gamma distribution) | 9-month



PERSIANN SPI (Gamma distribution) | 9-month



GPCC Drought Index | 9-Month



Drought Index scaled to reduced SPI min & Max



SPI scaled to reduced Min & Max

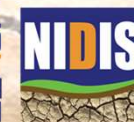


Comparison of 9-month SPI using CMORPH (top-left), PERSIANN (bottom-left) and GPCC (right).

PERSIANN is another satellite-based precipitation product, but is only available with several months delay.



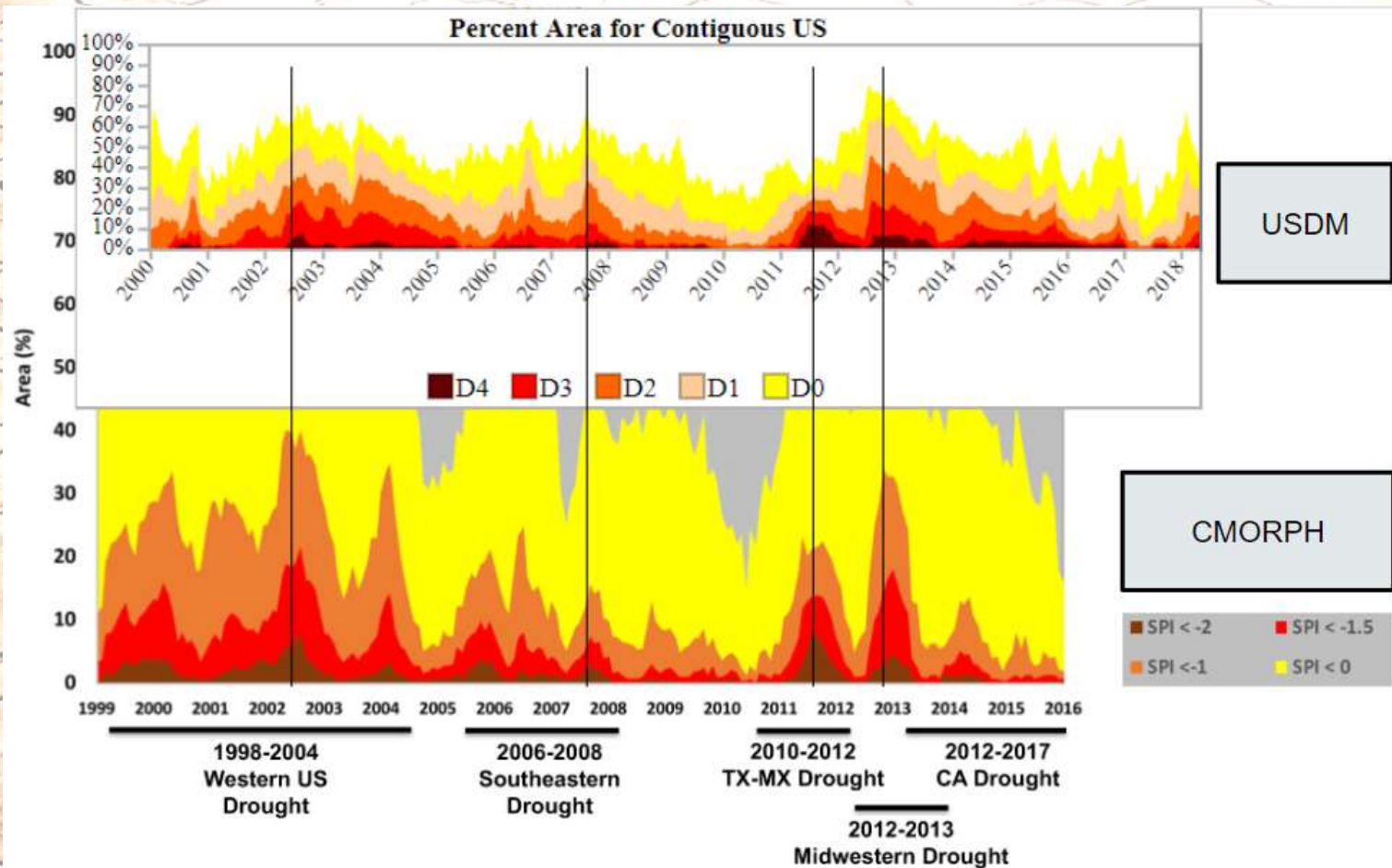
NATIONAL  
INTEGRATED  
DROUGHT  
INFORMATION  
SYSTEM



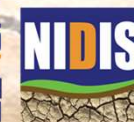
Drought.gov  
U.S. Drought Portal



# Global Drought Information System



Comparison of percent area of U.S. land area in drought between the U.S. Drought Monitor and CMORPH 9 month SPI.



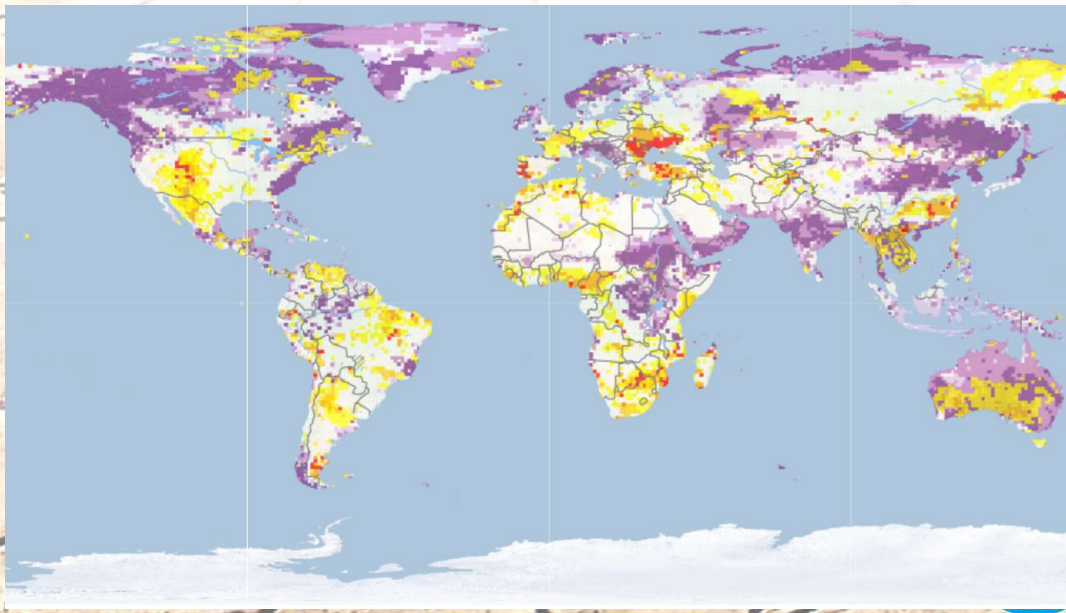
**Drought.gov**  
U.S. Drought Portal

## Working on a Global Drought Forecast

A Precipitation forecast is *not* a drought outlook.

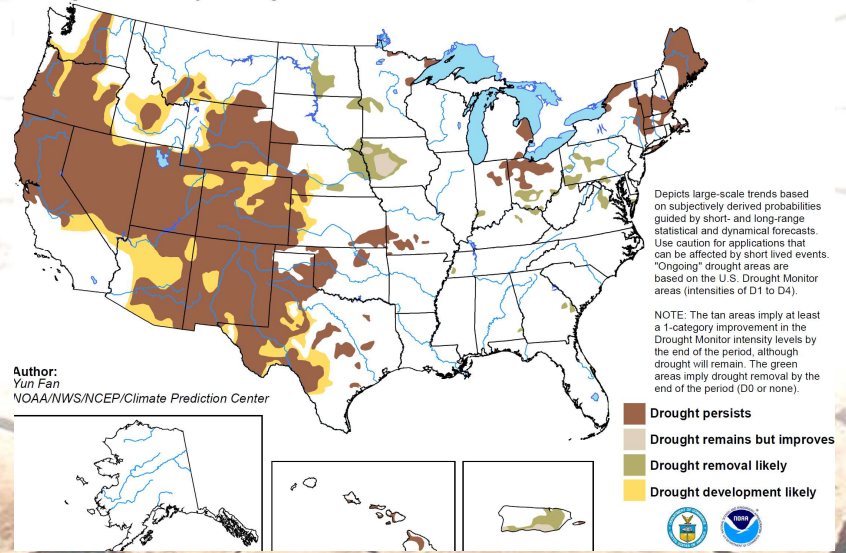
Droughts are extreme outliers (that may become semi-permanent during aridification).

August 2020 Global Drought forecast prepared from the ECMWF SEAS5 forecast, courtesy of Copernicus, as prepared by the European Union Joint Research Center Global Drought Observatory (left) and NOAA CPC Drought Outlook from the North America Multi-model Ensemble (NMME). The regional CPC mapping (right) can be extended globally, as well.



**U.S. Monthly Drought Outlook**  
Drought Tendency During the Valid Period

Valid for August 2020  
Released July 31, 2020





# Thank you!

GDIS: <https://www.drought.gov/gdm/>

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# Global Drought Information System

