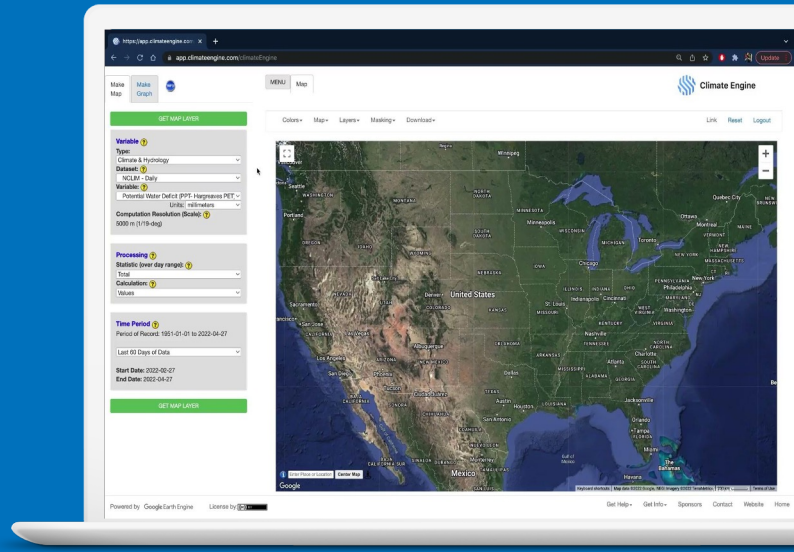
Climate Engine
Upcoming Drought Monitoring Enhancements

- Access to petabytes of climate and EO data
  - Historical, current, and forecasts
  - Multi-platform satellite products
- Google, NOAA, custom data catalogues
- On-demand data Processing
  - Values, anomalies, indices, trends, probabilities, zonal statistics
  - Interoperable calculations between climate and satellite data
- Download maps and time series data

https://app.climateengine.com



Google Cloud Partner

Desert Research Institute

Climate Engine®

NIDIS

Climate Engine

- Developed by Western Regional Climate Center (WRCC) / Desert Research Institute (DRI)
- Based on Google Earth Engine (GEE), facilitating Cloud-based production of Drought and Climate products
- More than 50% funded by NIDIS
- Provides a User Interface and REST URL-based API for creating common climate products such as:
  - Precip stats (totals, averages, min/max, diff from normal, percentiles)
  - Temp stats (averages, min/max, diff from normal, percentiles)
  - Drought Indices (SPI, SPEI, EDDI)
  - Time series, Zonal stats, Pixel counts in area
- Climate Engine generates python that is sent to the GEE API to produce products.
- In FY23, NIDIS is setting up an instance in a NOAA-managed Google Cloud project for **operational use on Drought.gov**

New Datasets

Addition of new foundational NOAA gridded datasets:

1. NOAA NCEI nClimGrid-Daily (?)
   (ConUS, Temp/Precip, 5 km, latency 3-4 days, 1951-present, SPI/SPEI/EDDI enabled)
2. NOAA NCEI nClimGrid-Monthly (?)
   (ConUS, Temp/Precip, 5 km, latency 5 days after end of month, 1895-present, SPI/SPEI/EDDI enabled)
3. NOAA NERCC ACIS Gridded Temp/Precip (?)
   (ConUS, Temp/Precip, 5 km, latency 3 days, 1950-present, SPI/SPEI/EDDI enabled)
4. NOAA CPC Global Daily Unified Temp/Precip (?)
   (Global, Temp/Precip, 0.5 deg / ~50 km, latency 3 days, 1948-present, SPI/SPEI/EDDI enabled)
5. NOAA CPC ConUS Daily Unified Precipitation (?)
   (ConUS, Precip, 0.25 deg ~25 km, latency 3 days, 1979-present, SPI enabled)
6. NOAA CPC CMORPH Satellite Precipitation (?)
   (Global, Precip, 8 km, latency 3 days, 1979-present, SPI enabled)

New Drought Indicators

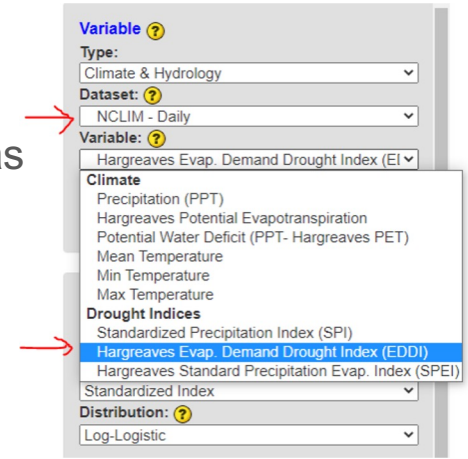
Expansion of dynamically generated drought indicators:

- Standardized Precipitation Index (SPI) (requires precip)
- Standardized Precipitation-Evapotranspiration Index (SPEI) (requires precip, min and max temperature)
- Evaporative Demand Drought Index (EDDI) (requires min and max temperature)

Climate Engine allows efficient application of general algorithms across ALL datasets that have the required variables.

Recent addition of Hargreaves Potential Evapotranspiration (PET) methods, allowing PET and EDDI calculations from any dataset that has temperature min and max values, and SPEI calculations.

- New availability of SPEI and EDDI across all new NOAA datasets!

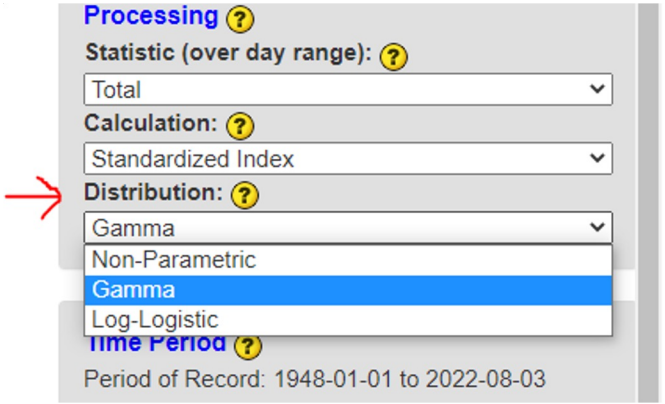


New Indicator distribution types

New distribution types are now available in Climate Engine, used for SPI, SPEI and EDDI indices:

- Non-Parametric (legacy default in Climate Engine)
- Log-Logistic (new research recommends with EDDI)
- Gamma (common with SPI implementations)

- Using Climate Engine allows consistent application of distribution types when comparing indices from different temperature and precipitation data sources.



Summary

- The new features in Climate Engine allow users to achieve *consistency* of dataset, climatology period, PET method and index distribution type when creating SPI, SPEI and EDDI drought indicators, as well as other climate monitoring products comparing current data to average historical conditions.

- **Coming Soon:** Drought.gov will use these new features in Climate Engine to generate consistent drought indices and statistics based on NOAA nClimGrid data, and make these data available on Drought.gov as maps, stats and data downloads.