

CLIME: CLimate and Integrated earth Monitoring Engine

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Motivation

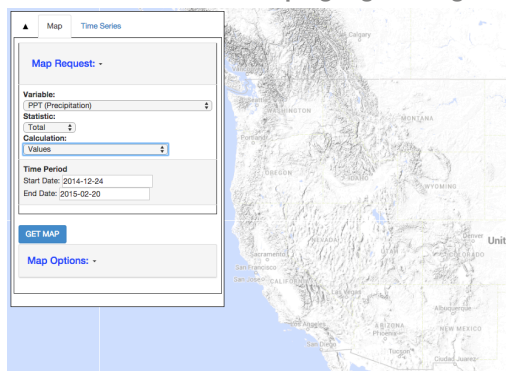
- Drought has adverse effects on society & environment including water availability, agricultural production, and wildfire risk.
- While high-resolution and near real-time climate and remote sensing datasets provide the potential to improve monitoring and planning for climate sensitive resources, these datasets are not tractable or accessible to a wide range of stakeholders.
- We are designing a web application that utilizes Google Earth Engine's parallel cloud computing platform to bridge the gap between big data and applied use by stakeholders.

Current Datasets Ingested by Earth Engine

- 4-km gridded surface meteorological data [Abatzoglou, 2013]
 - Min/Max/Mean Temperature
 - Min/Max Relative Humidity
 - Downward Solar Radiation
 - Accumulated Precipitation
 - Reference ET
 - Wind Speed
 - Energy Release Component
 - PDSI
- MODIS (500-m) and LANDSAT (30-m) remotely sensed indices
 - Normalized Difference Vegetation Index (NDVI)
 - Enhanced Vegetation Index (EVI)
 - Normalized Difference Snow Index (NDSI)
 - Normalized Difference Water Index (NDWI)
 - Land Surface Temperature

Interactive Web Interface

<http://google-drought3.appspot.com/>



Menu of options

- Variable
- Time period
- Statistic (mean, median, total)
- Observed or Anomaly*
- Period for comparison*

Current tools

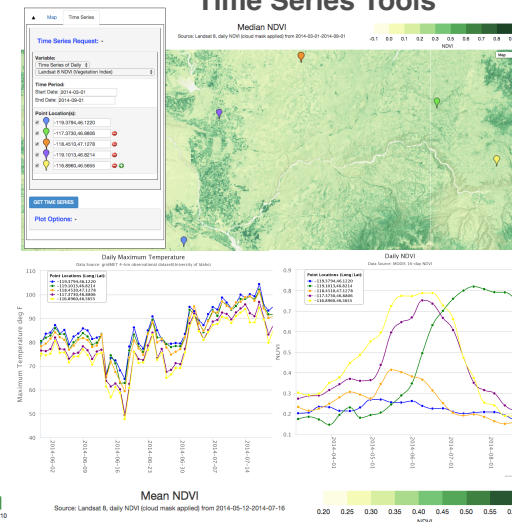
- Time series/csv extraction
- Map extraction

Potential future tools*

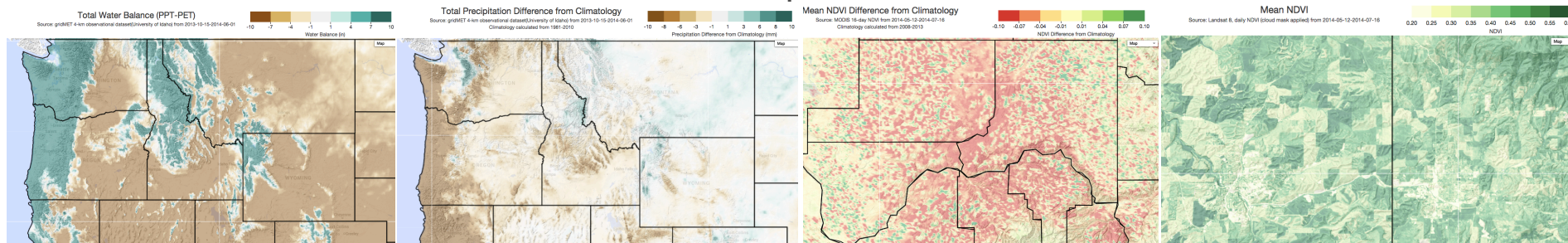
- Seasonal climate forecasts
- Climate change projections
- Polygon/layer extraction
- Targeted decision-support tools

*not funded on Google grant

Time Series Tools



Geospatial Tools



Possible Extensions for Agricultural Applications

- Degree day tracking and forecasts (user defined base temperatures) for crop maturation and pest/weed treatment scheduling
- Estimated irrigated water demand for different crop types
- Growing season metrics and cold damage risk (user defined thresholds)
- Heat stress accumulation
- Accumulated chilling hours
- Agricultural suitability zones for future climate projections
- Landscape scale tracking of crop greenness to proxy potential yields

Funded through Google Earth Engine Research Awards Program: "Google Drought - A Google Earth Engine Application for Computing and Visualizing Drought Indices at Different Timescales in Near Real Time"

Add to the wish list