

Integrated Mapping of Drought-Impacted Areas in the Sierra-Nevada Foothills Region of California Using Landsat Imagery

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In its fourth year, California's drought condition has seriously impacted not just the agricultural sector, but also the natural resources sector including Forestry, wildlife, and fisheries. Some of the ecological implications that are predicted to worsen include water conservation, forest health (pest and disease), fire risk and severity, and other societal implications such as farm labor, livestock, and food prices.

In the last three decades, remote sensing has provided a useful tool for drought monitoring and a variety of remotely sensed drought indices based on vegetation indices, land surface temperature (LST), albedo, etc. have been developed. Several drought indices have been proposed based on the normalized different vegetation index (NDVI) to monitor drought severity such as Anomaly Vegetation Index (AVI) and Vegetation Condition Index (VCI), Modified Perpendicular Drought Index (MPDI), Temperature Drought Vegetation Index (TDVI) and Vegetation Temperature Condition index (VTCI).

The main goal of the project is to characterize the spatio-temporal nature of the drought-impacted areas within the agro-forested regions of the Central Valley/Sierra Nevada Foothills.

Specific objectives of the project include:

- Develop a geospatial database for study area to include satellite imagery and GIS data for the pre-drought 2006 time period and the current drought year 2014.
- Analyze the geospatial database using image processing and related classification procedures involving spectral indices to delineate drought-impacted areas.
- Interpret and evaluate the severity of the drought map produced.