

## **SATELLITE DATA CONTINUITY FOR DROUGHT MONITORING IN VEGDRI AND QUICKDRI MODELS AND PRODUCTS**

Jesslyn F. Brown<sup>a</sup>, Brian Wardlow<sup>b</sup>, Tsegaye Tadesse<sup>b</sup>, Danny Howard<sup>c</sup>, Karin Callahan<sup>b</sup>, and Chris Poulsen<sup>b</sup>

<sup>a</sup> presenter, Earth Resources Observation and Science (EROS) Center U.S. Geological Survey (USGS), Sioux Falls, United States - jfbrown@usgs.gov

<sup>b</sup> University of Nebraska—Lincoln, Lincoln, United States - (bwardlow2, ttadesse2, kcallahan2, cpoulsen2)@unl.edu

<sup>c</sup> Stinger Ghaffarian Technologies, contractor to USGS EROS, Sioux Falls, United States - dhoward@usgs.gov

**KEY WORDS:** satellite, sensor, vegetation, hazards, climate, monitoring

### **ABSTRACT:**

Recent U.S. droughts have resulted in billions of dollars of damage, often exceeding costs of other weather-related hazards. For example, the cost of the 2012 mid-summer drought was estimated at \$30 billion USD. The serious nature of recent droughts has driven demand for better information for decision-making. Multiple organizations have worked cooperatively to improve the availability, timeliness, and information content of drought data for assessing drought conditions as they develop.

A partnership involving the U.S. Geological Survey (USGS) Earth Resources Observation and Science (EROS) Center, the National Drought Mitigation Center, National Aeronautics and Space Administration, and others has produced operational drought decision support tools with higher spatial resolution (1 km<sup>2</sup>) than traditional climatic drought indices. Two indices developed by the partners ingest remote sensing measurements of vegetation condition from satellite sensors: the Vegetation Drought Response Index (VegDRI) and the Quick Drought Response Index (QuickDRI). These models can ingest data from the Advanced Very High Resolution Radiometer (AVHRR) and the Moderate Resolution Imaging Spectroradiometer (MODIS) sensors.

The VegDRI, which has been designed to monitor seasonal agricultural drought conditions, has been operational since 2009 and the QuickDRI, a shorter-term indicator of agricultural drought, is currently being transitioned from a prototype to an operational tool. Both VegDRI and QuickDRI provide timely, spatially continuous, relatively detailed, and understandable drought information.

As sensors and platforms age, there is a need to provide data continuity into the future and develop tools and data streams that will ingest multiple satellite data sets. Processing systems at USGS EROS provide AVHRR (biweekly) and MODIS (weekly) to produce VegDRI and QuickDRI model output with a 24 hour-lag. The Visible and Infrared Radiometer Suite (VIIRS), the follow-on instrument for AVHRR and MODIS launched in 2011, is now being tested as input to VegDRI and QuickDRI.