

Phenology/Drought Supporting Documentation

The number of unique (and total) visitors to the EROS Drought Monitoring interactive map service doubled from May to June after USGS publicly announced the 48-State expansion of Vegetation Drought Response Index maps. (http://gisdata.usgs.gov/website/Drought_Monitoring) Visitors from all domains showed increases, with significant increase from Government visitors increased by 40 percent and commercial visitors increased by 77 percent domains from May to June. In a 2-month period (May/June), over 2 million maps (in a pdf format) were rendered from the web map service.

An updated USGS EROS Web site, entitled Remote Sensing Phenology (<http://phenology.cr.usgs.gov/>) was released to the public on Friday, June 12, 2009. This Web site presents basic information about generating phenological indicators from satellite data, vegetation indices, USGS EROS phenology metrics methods, challenges, validation, etc. Most importantly, it provides links to a database of nine phenological metrics for a 19-year history for the conterminous U.S.

On July 7, Secretary Salazar distributed a press release featuring USGS historical remote sensing phenology data in connection with his testimony on climate before the Senate Environment and Public Works Committee.

***USGS Releases Remote Sensing Data on Annual Biological Cycles:
Salazar Announces Satellite Data on Nature's Timing Can
Help Track Climate Change***

This press release highlights the availability of the USGS/EROS remote sensing phenology data for the conterminous U.S. via the web (<http://phenology.cr.usgs.gov/>)

JOURNAL PUBLICATIONS

1. White, M.A., de Beurs, K.M., Didan, K., Inouye, D.W., Richardson, A.D., Jensen, O.P., O'Keefe, J., Zhang, G., Nemani, R.R., van Leeuwen, W.J.D., Brown, J.F., de Wit, A., Schaepman, M., Lin, X., Dettinger, M., Bailey, A.S., Kimball, J., Schwartz, M.D., Baldocchi, D.D., Lee, J.T., and Lauenroth, W.K., 2009, Intercomparison, interpretation, and assessment of spring phenology in North America estimated from remote sensing for 1982 to 2006, *Global Change Biology*, doi: 10.1111/j.1356-2486.2009.01910.x.
2. Gu, Y., Hunt E., Wardlow, B., Basara, J., Brown, J.F., and Verdin, J.P., 2008, Evaluation of MODIS NDVI and NDWI for vegetation drought monitoring using Oklahoma Mesonet soil moisture data, *Geophysical Research Letters*, 35 (22), L22401.

3. Brown, J.F., Wardlow, B.D., Tadesse, T., Hayes, M.J., and Reed, B.C., 2008, The Vegetation Drought Response Index (VegDRI): a new integrated approach for monitoring drought stress in vegetation: *GIScience & Remote Sensing*, 45 (1), p. 16-46.
4. Gu, Y., Brown, J.F., Verdin, J.P. and Wardlow, B., 2007, A five-year analysis of MODIS NDVI and NDWI for grassland drought assessment over the central Great Plains of the United States, *Geophysical Research Letters*, 34, L06407, doi:10.1029/2006GL029127.
5. Tadesse, T., Brown, J.F., and M.J. Hayes. 2005, A new approach to mapping drought vegetation stress: Integrating satellite, climate, and biophysical data over the U.S. Central Plains, *ISPRS Journal of Photogrammetry and Remote Sensing*, v. 59, no. 4, p. 244-253.

BOOK CHAPTERS

1. Brown, J.F., Pervez, M.S., and Maxwell, S., 2009, Mapping irrigated lands across the United States using MODIS satellite imagery. *in* Thenkabail, P.S., and others, eds., *Remote sensing of global croplands for food security*: Boca Raton, Taylor and Francis, p. 177-198.
2. Reed, B.C., White, M.A., and Brown, J.F., 2003, Remote sensing phenology, *in* Schwartz, M.D., ed., *Phenology: an integrative science*: Dordrecht, The Netherlands, Kluwer Academic Publishing. p. 365-381.