

From Frogs to Famine to Floods: Science from The National Map

Draft 12/19/2003

Introduction: USGS is committed to applying scientific applications using the various data available, including *The National Map* base layers, and how the world can be studied. The world geography is constantly changing and these applications can provide valuable information to study and assess those changes. The applications include fire danger indexes, greenness, hydrology flows for homeland security, and amphibian population monitoring to name a few. *The National Map* base layers are divided into framework categories. They are:

- Transportation:
- Boundaries
- Hydrography
- Orthoimagery
- Land Cover
- Elevation

The support provided for scientific applications and access is through *The National Map* base layers, map services, and partnerships. Some scientific applications are:

Amphibian Research and Monitoring Initiative (ARMI)

Integrated Vegetative Mapping (IVM)

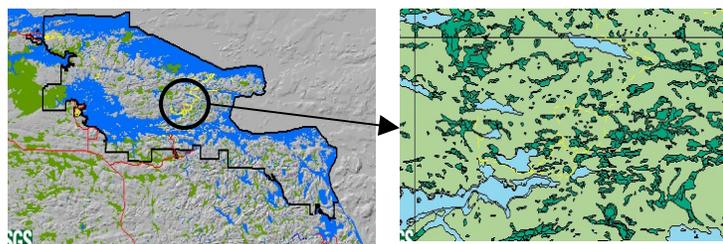
Drought Monitoring

Elevation Derivative for National Applications (EDNA)

Amphibian Research and Monitoring Initiative (ARMI)

(<http://gisdata.usgs.net/website/ARMI>)

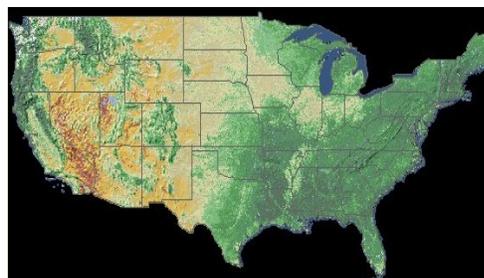
In response to indications of worldwide declines in amphibian populations, the President and Congress directed Interior Department agencies to initiate a national program of amphibian monitoring, research, and conservation. There is an urgent need to determine the scope and severity of the problem and to investigate causes. The U.S. Geological Survey is uniquely qualified to coordinate and lead a cooperative national effort because its scientists have been in the forefront of studying amphibian populations and life history traits, measuring and monitoring environmental characteristics, and conducting research into potential causes of decline. As a result, the Agency formed the National Amphibian Research and Monitoring Initiative (ARMI).



Example of ARMI study area in Northern MN. The first illustration shows the actual study area, with roads and park trails as a layer. The second illustration is an enlargement of the a part of the study area showing park landcover as a layer.

Integrated Vegetative Mapping (IVM)

<http://gisdata.usgs.net/website/IVM> The map interface uses derivatives of Advanced High Resolution Radiometer (AVHRR). Derivatives include: Fire Potential, Season , Percent Average, and NDVI Greenness. Fire science scientists can use the data, to assess over time, potential fire areas. The map service can be used to assess how fast areas are greening up for crop analysis.

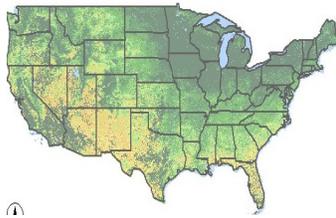


Example of NDVI (Normalization Greenness Difference Vegetation Index) Greenness for October. Viewing as a time series would show has fast areas are greening for crop assessment.

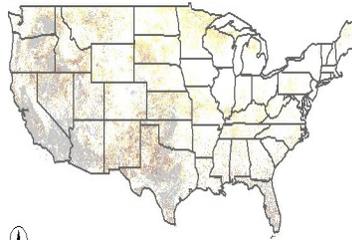
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Drought Monitoring

The USGS Drought Monitoring Viewer provides a dynamic online map interface that can be used to view a suite of satellite-derived vegetation condition datasets, integrated with information from *The National Map*.



Seasonal Greenness
10/07/03

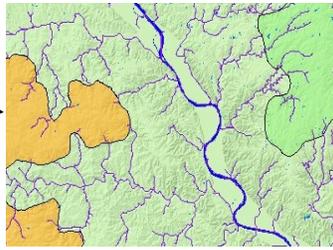
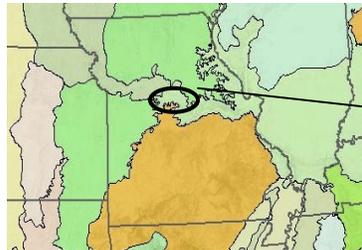


Percent Average Seasonal
Greenness 10/07/03

Elevation Derivative for National Applications (EDNA)

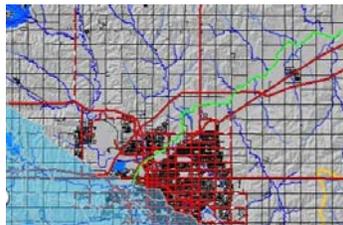
<http://edna.usgs.gov/> is a multi-layered database derived from a version of the National Elevation Dataset (NED), which has been hydrologically conditioned for improved hydrologic flow representation.

Example of EDNA Eco Regions for Missouri, then zooming into the region showing the EDNA Flow Lines along the Missouri River.



The Lincoln, NE 133 Urban Areas website (<http://gisdata.usgs.net/website/lincoln>) Utilizes the EDNA data

Example of EDNA Flow Lines Drainage through a populated Place.



Future Plans: The use of *The National Map* base layers will continue in these scientific projects and map services. With the base information established, the capability for more partner data is limitless. More tools and data will be added as they are developed.

Informative URL's:

<http://gisdata.usgs.net/>
<http://edna.usgs.gov>
<http://edc.usgs.gov>
<http://edc2.usgs.gov/armi/>
<http://gisdata.usgs.net/website/lincoln/>
<http://gisdata.usgs.net/website/ivm/>
<http://gisdata.usgs.net/website/armi>
<http://nationalmap.usgs.gov>

Contact Information:

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