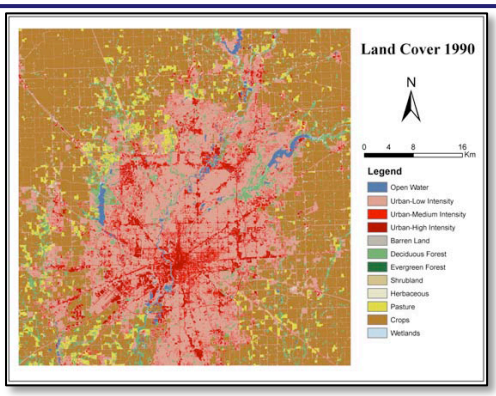
IndianaView Remote Sensing Activities 2014 - 2015

Mini-grant: Long-Term Reconstruction of Urban Expansion in Indianapolis, 1984-2015

Mini-grants are used to fund projects conducted by the consortium partners to promote the use of remote sensing image data. The most recent mini-grant funded a research project conducted by Prof. Qihao Weng of Indiana State University. 501 Landsat images from 1984 to 2015 were used to generate a time series classification and change detection algorithm for continuous land cover mapping in the Indianapolis Metropolitan region during this time period.

The land cover change maps are being used in further research by Prof. Weng and his students to address the drivers for urban growth in the Indianapolis region. In the near term, the maps will be used in weather research forecast models to simulate the land surface and air temperatures to evaluate the impact of future urban growth on the thermal environment and assess heat related risks. These results will be helpful for future urban planning and management.

A fact sheet about the project is available on the IndianaView web site at: www.indianaview.org/pdf/IndianaView_FS_Indianapolis_Urban_Expansion_15.pdf.



Land cover map of Indianapolis for 1990. The identified land covers include water, urban-low intensity, urban-medium intensity, urban-high intensity, barren, deciduous forest, evergreen forest, shrub land, herbaceous, pasture, crops and wetlands.

Geospatial Scholarships for Students

The scholarship program provided opportunities for undergraduate and graduate students to participate in remote sensing projects that are relevant to the state and/or their community. Seven scholarships were provided to students representing four of the educational institutions in the IndianaView consortium.

Each of the students provided a testimonial about how the scholarship helped them. Examples of activities that the students completed include: a summer project titled "Improving Global Models of Remotely Sensed Aquatic Chlorophyll Content ...", research on developing soil property and landscape feature maps from crop production fields, and attendance at geospatial conferences such as Kentucky's GIS Conference and the Association of American Geographers Annual Meeting. The students also completed a 1-page fact sheet about the activities completed with the scholarship funds.

Three classes of algal blooms in the Landsat 8 RGB image of a portion of the Eagle Creek Reservoir Scholarship awardee, Igor Ogashawara, Indiana University – Purdue University at Indianapolis

Benefits to Indiana

The urban expansion maps, derived from the 30-year time series of Landsat remote sensing data for the Indianapolis region, as a result of the mini-grant have direct applications to urban management and planning.

The scholarship program provided several students with remote sensing application experiences such as conducting their research, presenting research results at conferences and interfacing with remote sensing experts.

The MultiSpec remote sensing desktop software application and tutorials that are available on the MultiSpec web site benefits students within and outside of Indiana. There were several thousand downloads of the application and tutorials in 2014-15 from throughout the world.

IndianaView is a member of the AmericaView Consortium, a nationally coordinated network of academic, agency, non-profit, and industry partners and cooperators that share the vision of promoting and supporting the use of remote sensing data and technology within each state.

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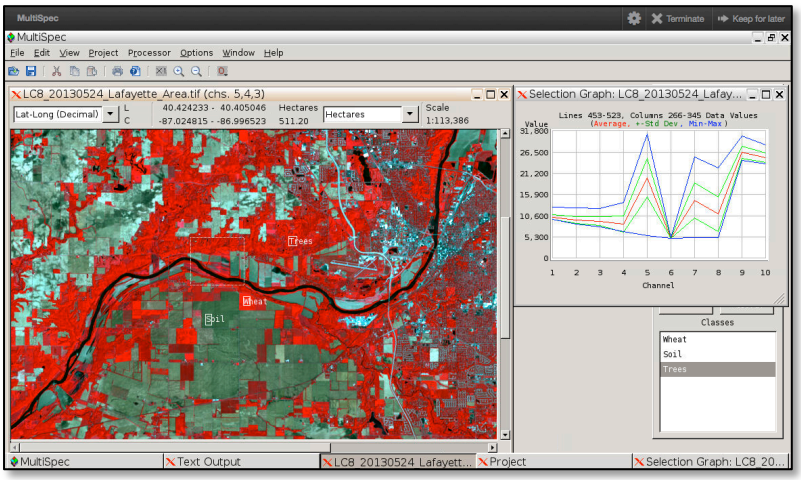
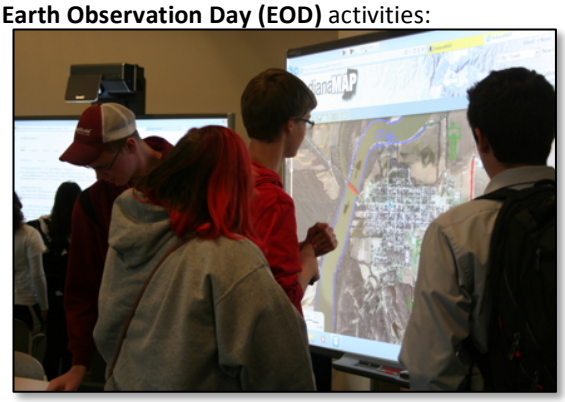
Additional IndianaView Activities

MultiSpec (engineering.purdue.edu/~biehl/MultiSpec) is a free remote sensing software application that is used for education and research. A recently added feature is the ability to allow only the menu options for basic capabilities to be available to users. This feature is in response to a request from the K-12 sector for the ability to have fewer menu options for their students. Another significant product during 2014-15 (with additional support from a NSF funded project name Geospatial Data Analysis Building Blocks) has been a web-enabled version of MultiSpec (mygeohub.org/tools/multispec). The current version includes the ability to display multispectral/hyperspectral images and conduct unsupervised classifications. Additional features continue to be added.

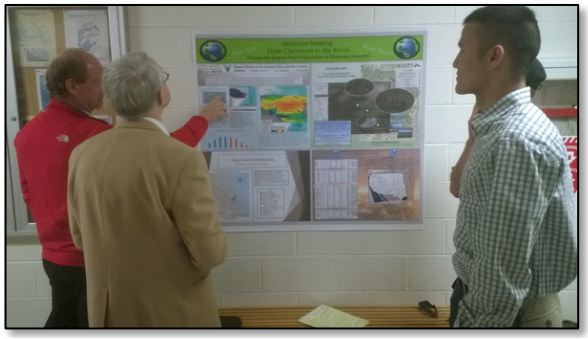


MultiSpec session from within a web browser illustrating a color infrared Landsat 8 image of the greater Lafayette area and a graph of response of a selected area.

Earth Observation Day (EOD) activities:



High School students use IndianaMap to work on 'Zombie Apocalypse' activity during Purdue's 2014 GIS Day.



Vincennes University students describe their geospatial class project after IndianaView PI, Larry Biehl, gave a remote sensing presentation at EOD activity.

IndianaView Consortium Membership

University of Notre Dame; IUPUI Indiana University Purdue University Indianapolis; Indiana University; Indiana State University; Ball State University; Purdue University; Vincennes University; Purdue University Calumet; GENI; Martin University; Indiana Geological Survey; Indiana Geographic Information Council

Others:

- **Indiana University – South Bend**
- **Consortium of Universities for Spatial Information**

Researchers and educators at partner institutions Indiana State University, Indiana University, Indiana University - Purdue University at Indianapolis, Martin University, University of Notre Dame, Geography Educators' Network of Indiana, Indiana Geographic Information Council and the Indiana Space Grant program have participated in the IndianaView mini-grant and scholarship programs with projects involving K-12 education, general public outreach, research studies and educational lab development. Fact sheets are available at:
www.indianaview.org/fact_sheets.html

Partners have used and provided the Landsat data available on the IndianaView GloVis portal.

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IndianaView

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