



**AmericaView: A National Remote  
Sensing Consortium  
Grant Award Number 08HQGR0157**

**Annual Progress Report for Grant Year 2011**

Work completed from July 1, 2011 through June 30, 2012 (with an extension  
through December 31, 2012)

**Submitted to the  
USGS Project Officer and Grant Administrator  
AmericaView Consortium Board of Directors**

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**August 5, 2013**

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## 1. EXECUTIVE SUMMARY

AmericaView is a nationally organized consortium of state-based partners whose mission involves promoting and supporting civilian remote sensing. Aligned closely with the U.S. Geological Survey (USGS) Land Remote Sensing Program, AmericaView promotes and supports remote sensing outreach, education, applied research, and data access activities that primarily occur at the state level, largely, but not exclusively, through StateView consortium partnerships. Partnerships and associated networks are essential because they effectively leverage funding and expertise, increasing efficiency and advancing the utility of remote sensing as a tool to support a wide range of societal benefits aligned with the USGS Land Remote Sensing Program mission.

As reported in the pages that follow, AmericaView has had a successful Grant Year (GY) 2011, the fourth in our five year grant (USGS 08HQGR0157). Despite a prolonged period of extremely limited funding per StateView consortium and national part-time staff support, AmericaView has continued to ***advance the availability and widespread use of remote sensing data and technology through education, research, outreach, and sustainable technology transfer to the public and private sectors*** (AmericaView Charter, 2002).

In GY 2011, AmericaView's core mission remained largely unchanged. Comprised of 39 StateView members, AmericaView was engaged in remote sensing education and applied research in a wide range of natural resource disciplines. These included forest, range, and wildlife management; land use/and cover monitoring; surface water resources; drought monitoring and related agricultural assessment; coastal zone management; and natural hazard and risk assessment. AmericaView brought a diversity and depth of remote sensing expertise to bear on critically important contemporary issues and challenges primarily associated with natural resource management combined with remote sensing education and outreach through the **337** projects completed in GY 2011. At a time when the federal government is advancing the nation's land imaging goals, AmericaView actively *supports* and *extends* the use of remotely sensed data at the local, state, regional, and national levels, leveraging previous federal investments to maximize the many important uses of public domain imagery and derived products. Each StateView responds uniquely to the remote sensing challenges that face its state. Appendix 1 is a compilation of Executive Summaries from each of the 31 Full Members that illustrate the breadth and variety of each state's activities. Appendix 2 illustrates, in tabular format, the program emphasis of each of these StateViews.

Through a range of highly leveraged projects in outreach, education, applied research, and data access, AmericaView continued to maintain its focus on increasing the number and diversity of technology-proficient students, professionals, and scientists prepared to apply geospatial technology to a wide range of current challenges and opportunities, as well as increasing the U.S. public's and elected official's awareness of the importance of remote sensing imagery and products.

### ***Consortium Development and Outreach Activities***

#### ***Membership***

AmericaView continued its policy of not accepting full (funded) members until additional funding is secured that would allow expansion to all U.S. states and territories. No new members joined AmericaView in GY 2011, although inquiries were made by potential future partners in Arizona and Tennessee.

AmericaView holds two annual membership meetings; a Winter Business Meeting in March in the Washington DC area and a Fall Technical Meeting hosted by a StateView or the USGS EROS Center.

### Winter Business Meeting

Forty-six AmericaView members and guests attended the AmericaView Winter Business Meeting, held on March 5-7, 2012, in Arlington, VA. All of the 31 Full Members, two Associate members, and one Affiliate attended. Highlights included sharing High Impact Activities planned for grant year FY12; sharing tips for creating high impact via outreach by presenters from USGS, NASA, and [EarthSky](#); sharing of USGS LRS goals held by the USGS; and an examination and discussion of AV's goals and objectives. At the end of the Meeting, many states visited the offices of nearly 100 elected officials to update them on the important remote sensing related activities that took place in their state during the year.

### Fall Technical Meeting

The AmericaView Fall Technical Meeting was held on September 14-15, 2012 at the USGS EROS Center and was attended by 42 AV members and guests and numerous USGS employees and contractors in Sioux Falls, SD. Eleven presentations were made by USGS employees and contractors and 15 presentations were made by AV members and guests. The goal was to share information and create synergy surrounding joint remote sensing projects and research in seven interactive sessions involving remote sensing and covering land cover mapping science and applications; ecosystem mapping and monitoring science; mapping and analysis of fire, water, and phenology; data production, archiving, distribution, and mapping products; geospatial science and technology education and outreach; and disaster response. An interactive poster session was held with 17 posters presented. Three workshops were held: Processing LiDAR Point Clouds Using eCognition, Sharing and Demonstrating Online-capable Educational Outreach Materials, and Introduction to Google Earth Engine. For a complete agenda see Appendix 3.



*AmericaView membership at Fall Technical Meeting at EROS Center, September 15, 2013*

### Consortium Outreach – the Power of Networking

Aligned with continuing growth of the national organization, StateView consortium development and outreach activities *comprised a broad set of projects* in GY 2011 that occurred both formally and informally, often as a component of related projects that involved communicating, demonstrating, and applying remote sensing technology. Both the national and state programs continued to connect with, and take thorough advantage of, their networks to strengthen and reinforce partnering, to communicate current remote sensing and related geospatial science and technology events and activities, and to share ideas that support future collaboration.

During the reporting period, for example, StateViews offered **82** presentations to local, state, and federal agencies and other organizations, sharing information and supporting remote sensing applications. These presentations reinforced and diversified the educational, applied research, and data archiving and distribution capabilities of the StateViews, their partners, and the national program. Similarly, **8** StateView personnel participated in state-level geospatial committees, strengthening geospatial capacity at the state level and bringing state-wide organizations up-to-date on remote sensing activities occurring in neighboring states and at the national level.

In more formal settings, Principle Investigators (PIs), Coordinators, and students provided **18** presentations of their StateView programs at state, regional, and national conferences. Presentations primarily emphasized StateView activities, but also provided general information on AmericaView goals and objectives. Many of the state conferences involved undergraduate student research funded in part by AmericaView through scholarships and mini-grants, helping StateViews meet outreach, education, and research objectives at the state level, while simultaneously supporting the development of the future workforce. Presentations at regional and national conferences tended to involve StateView-sponsored graduate student research, or research accomplished by the PIs and their graduate students. In both cases, benefits accrued to the StateView PI, their students, and the larger and more diverse national geospatial community in attendance, supported the critically important task of developing the future US work force.

Outreach was also accomplished by other mechanisms, many of which overlapped with research and education activities. For example, StateViews supported **1** internship, **6** faculty training projects, and **5** collaborative research projects, all of which supported U.S. workforce development. These and other education and training outreach activities resulted in a more empowered, more effective workforce, and positive public relations for AmericaView and the USGS.



*The "Satellites See Wisconsin" Exhibit filled the Dane County Airport Art Court from February 2011 through September 10, 2011. A number of the 1.5 million passengers that travel through the Airport each year were introduced to satellite imagery and the importance of such imagery in their daily lives. For more details on the exhibit, see <http://www.ssec.wisc.edu/airportexhibit>, and for more pictures see <http://www.ssec.wisc.edu/media/spotlight/seewisconsin/seewisconsinpix.html>.*

Outreach activities with kindergarten through 12<sup>th</sup> grade (K-12) and informal education partners provided another effective mechanism to support the AmericaView mission, and AmericaView continued to make significant strides in GY 2011. Indeed, despite the time, effort, and resources associated with providing quality professional development and the required follow-up necessary to sustain implementation of geospatial science and technology, K-12 and informal educational

outreach continued to grow. This was particularly true in states that had a historical presence in formal and informal education, when funding levels were higher.

### AmericaView National Consortium and Outreach Activities

The national program staff and Board of Directors performed consortium development and outreach activities in a variety of venues during GY 2011. In addition to formal presentations, the staff and Board organized, coordinated, and supported state-level and multi-state projects such as the **AmericaView Multi-State Server (AVMSS)**, support for **GY 2011 strategic mini-grants**, and support for **Earth Observation Day (EOD)**. In GY 2011 AmericaView also increased its presence on social media, effectively utilizing the **AmericaView Blog** to promote awareness of remote sensing technologies and products.

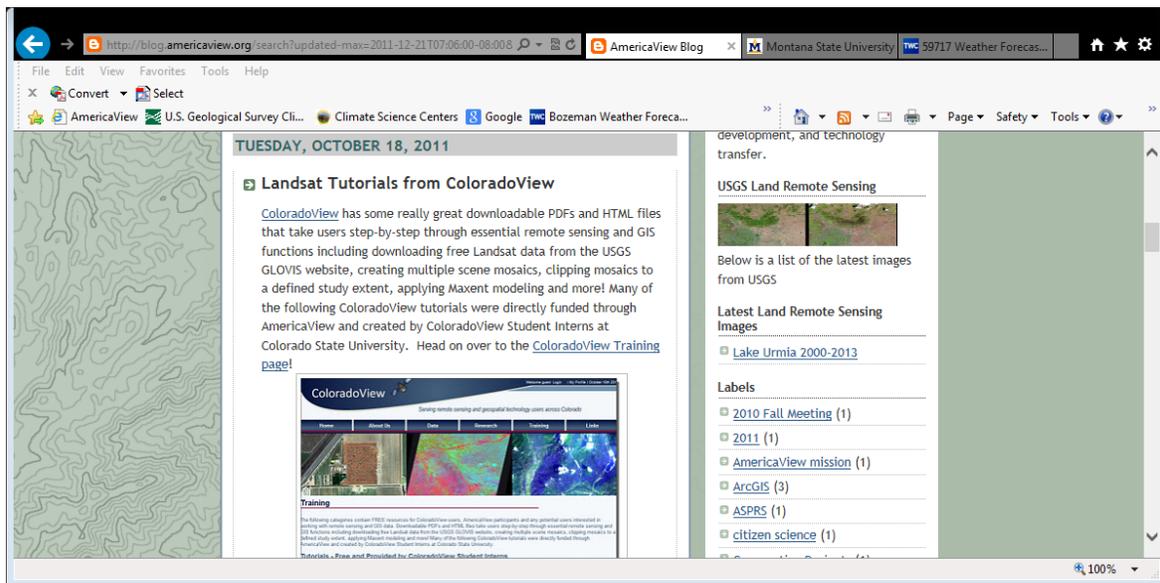
**AmericaView Multi-state Server (AVMSS):** In GY 2010, ten StateViews pooled financial and intellectual resources to develop and host a web server that serves a "best available" image layer as a WMS and tile service based on technology developed by AlaskaView. The project is now called the AmericaView Multi-State Server (AVMSS) and the primary imagery will be from the National Agricultural Imagery Program (NAIP). Individual states will be responsible for providing their data in a format that can be used by the web server to develop various products for AV-wide and specific StateView utilization. The participating states are: Alaska, Texas, Wisconsin, Indiana, Louisiana, Michigan, North Dakota, Virginia, Alabama, and Ohio. The AmericaView Multi-state Server is hosted by TexasView at the Stephen F. Austin State University. It is connected to the Internet via a Gigabit fiber optics link to the Texas Internet 2 Point of Presence (POP) in Houston. TexasView provides power, cooling and connectivity to the server and hands-on maintenance as necessary. In this grant year (2011), the AmericaView Multi-State Server (AVMSS) was put through basic testing, DNS entries setup was completed, and initial preparation to receive StateView datasets was begun. AlaskaView started work on internal StateView loading procedures and documentation.

**Strategic mini-grants:** Four mini-grants were awarded in a competitive process open to all AV members. The awardees were **GeorgiaView**, which developed four tutorials to introduce 6-12 grade students to land cover classification using MultiSpec®; **VermontView**, which distributed data and educational resources post Hurricane Irene; **NebraskaView**, which consolidated AmericaView educational resources in preparation for subsequent web distribution; and **New YorkView**, which improved and synthesized recently proposed machine learning approaches to assist with extracting information such as land use and land cover from remote sensing imagery. Full descriptions of these projects are available in Appendix 4.



**Earth Observation Day:** Earth Observation Day (EOD) was celebrated in GY 2011 on April 11<sup>th</sup>, 2012, with **11** states participating. Approximately **76** K-12 in-service and pre-service teachers participated. Along with the teachers, at least **670** students took part in the event. Although the vast majority of students were in K-12 classrooms, there were also some participants from higher education. Students were supported by a range of lessons provided on the AmericaView EOD web site and accompanied by tutorials developed by AmericaView PIs. Participating StateViews reported very positive feedback as a result of their EOD projects and activities. EOD highlights from six StateViews are presented in Appendix 5.

**AmericaView Blog:** In GY 2011, the Executive Director routinely posted to the AmericaView Blog. This activity was critically important and helped strengthen the organization’s education and outreach mission. For example, the blog received over 29,000 page views following its inception in March 2010, resulting in increased awareness of publicly available remote sensing data and technologies. Cross-posting of the AV blog by Planet Geospatial resulted in an even wider distribution. Various posts prompted both domestic and international inquiries about AmericaView activities such as Earth Observation Day and AmericaView’s online remote sensing educational resources.



[AV Blog](#) posts for GY 2011 included a summary of K-12 geospatial student poster presentations at the AV Fall Technical Meeting, availability of Landsat Tutorials on [ColoradoView’s Training page](#), and IndianaView’s posting of historic Sanborn maps via the Indiana Spatial Data Portal (ISDP).

### **Data Archive and Distribution Activities**

Due to the free availability of Landsat data since October of 2008, some StateViews discontinued providing free Landsat data through their StateView archives. However, driven by ongoing state-specific needs, **23** StateViews continued to address unique archive-related opportunities in education, outreach, training, and applied research through ongoing maintenance of their state-specific data archive and distribution systems. **One** of the 23 states hosted data for partners and **4** tracked data downloads for AV and USGS reporting purposes, data archive improvements, and as a means of providing an estimate of the breadth of data applications and additional data needs in their states. Perhaps more importantly, **6** StateViews generated user-friendly formats to accommodate the widest range of users, including K-12 teachers without access to, or knowledge of, the software necessary to utilize multi-band files. Thus, archive maintenance and growth activities continued, building on the momentum of previous years by offering an increasingly diverse and accessible set of public domain data.

**11** states downloaded 140,218 GB of remote sensing data. Of that total, 2,665 GB of Landsat data were downloaded by **9** states, and orthophoto downloads accounted for more than 88% (124,461GB) of all downloads.

**12** StateViews, responding to a continued need in their states, grew their archives, adding Landsat, ASTER, MODIS, and various aerial datasets including LiDAR and orthophotography. Of these 12 StateViews, **3** continued to leverage other projects to purchase data for their archives, while **4** collected and served free imagery from existing internet sources.

**Four** of the 12 StateViews received, processed, and distributed satellite imagery, **2** of which were involved in near real-time collection and distribution of data in collaboration with emergency responders and field operations. MODIS and Landsat imagery predominated, but other data continued to become more widely available as partner-operated reception and processing infrastructure increased in demand. These important activities supported state and federal agencies in fire management and natural disasters such as flooding and hurricanes.

With the combined StateView's web sites, along with the AmericaView web site, AmericaView hosted more than 96,848 visitors and more than 398,796 page views during the reporting period. This information greatly enhanced the ability of decision makers, educators, scientists, and the general public to utilize remote sensing data and analytical tools.

### ***Education Activities***

AmericaView's education activities have always been, and continue to be, central to the organization's mission. In GY 2011 all funded StateViews continued to support education activities of various types, including K-12, higher education, and professional development.

In part due to continuing efforts of the Education Committee, K-12 activities were a strength of AmericaView's activities in GY 2011, involving **20** projects reaching **552** teachers and **1,637** students, including **227** minority students. In K-12 classrooms, for example, **5** StateViews prepared and delivered remote sensing lectures and demonstrations, and **2** developed remote sensing lesson plans for their own uses as well as to share with other StateViews through the online AmericaView Educational Resources Sharing Project, which will be piloted in GY 2012.

At the K-12 level, **three** states provided training workshops for teachers on the uses and applications of geospatial science and technology in the classroom and **one** StateView provided pre-service geospatial science and technology training to education majors. These K-12 activities ranged from single presentations offered at teacher science and technology education conferences to week-long intensive professional development opportunities and follow-up field campaigns aimed at coordinating the collection of field data to support scientific research, such as occurs in the OhioView SATELLITES program. All such activities focused on using remote sensing as a tool to support STEM education and spatial thinking skills. Given the specific type and duration of training and the importance of follow-up support for teachers, these projects tended to require supplemental funding from external sources in order to be fully successful.

In higher education, **5** StateViews shared software licenses within their state consortia, **11** shared course materials across state consortia to improve university level instruction, and **10** encouraged the use of their StateView data archives in PI- and partner-led course and lab exercises at their home universities. **One** StateView offered applied training for students in government agencies via an "Introduction to Object-based Image Analysis" delivered at the 2011 Arkansas GIS Users Conference. **Three** StateViews funded stipends to encourage university students to pursue careers in remote sensing.

**Seven** StateViews offered short courses (either as stand-alone training or tied to a state or regional conference or meeting) for local, state, and federal government agencies. Current workforce training was provided to **545** members of the current workforce, offering excellent opportunities for StateViews to strengthen geospatial literacy in their states and the employability of their state's residents. One important aspect of professional development and training that is often lacking in other venues, but a recognized strength of StateView training, involves follow-up support after the training is completed. Because of their academic positions, StateView PI's and coordinators are generally available to answer questions, provide feedback, and otherwise provide follow-up support to those that they've already trained. The willingness to sustain contact with participants results in added effectiveness, and strengthens the partnerships that are the basis of successful professional development and training.

Included in the coursework and related data that PI's offered, **7** StateView PI's and coordinators presented lectures on remote sensing technology and applications to non-remote sensing and non-natural resources management personnel, expanding the potential uses of remote sensing across disciplines. In the K-12 environment, **5** StateViews presented lectures to science teachers to support use of geospatial science and technology in elementary, middle, and high school; **6** developed educational workshops during the school year; and **3** provided training for teachers during the summer. **One** StateView continued to offer web-based remote sensing tutorials, FAQs, and related instructional manuals.

The **16** StateViews that maintain an archive continued to encourage and enable the use of their data for teaching purposes. For example, students at the PI's institution and at partner institutions were able to access state-specific imagery from StateView archives regularly as part of remote sensing courses taught by consortium member institutions, eliminating the time required for initial processing that would be necessary if the data were accessed via Earth Explorer or GloVis. These data were used in a wide range of student-developed project applications across the country, focused mostly on natural resources management issues such as forest and range management, agricultural productivity assessment, drought monitoring, land use/land cover change analysis, and coastal zone monitoring.

Through this WyomingView internship I have learned and worked with many challenges of acquiring, organizing, and maintaining a collection of Landsat Imagery for the state of Wyoming. The Landsat data in this collection are from diverse sources over many years, some of it older imagery in forms such as nearest neighbor, which may not be available from any other source. Quality control carefully examined for errors, header information, and various other factors which determine the usefulness of this data. The goal is to encourage the use of Landsat imagery by making it available in a form easily used by people of diverse levels of expertise in working with remote sensing data.

*- Michael L Pritchard (Masters special student, University of Wyoming)*

Online education is growing in popularity for a variety of reasons, including the increasing cost of traditional education, less rigid time requirements, and the flexibility of not being tied to a specific geographic location. AmericaView has responded with the multi-state sponsored '[AmericaView University](#)' web-based project, offering a model for multi-state, collaborative online education that was launched in 2008. Currently offering 16 modules designed to cover the needs of introductory image interpretation and processing as identified by the course developers who have taught geospatial sciences at the university level for many years, the resource has the potential to include new content if funding were available or could be diverted from other projects. In GY 2011, **48**

users (including both teachers and students) accessed AmericaView University in order to improve their college-level remote sensing instruction.

In direct support of higher education students in GY 2011, **3** StateViews were involved in activities that funded stipends and scholarships that allowed students to pursue remote sensing components of their education. Grants were given to students to enhance their research by providing field or other supplies, as well as travel grants to present their research at professional meetings.

In partnership with the ASPRS Potomac Region, West Virginia University supported **12** students in an ASPRS Student Forum. This student club provided opportunities for students to organize remote sensing-related activities, including trips to conferences, hosting speakers, and organizing other events.

### ***Applied Research***

Like education projects, research projects can be expensive and time consuming relative to available support, and projects that depend *solely* on AmericaView funding are essentially non-existent due to their cost. Thus, *partnership-based research activities* predominated in GY 2011, supporting the goals of academic, government agency, and NGO partners. **Eight** StateViews collaborated with agency partners or private industry to assess the utility of remote sensing for monitoring and mapping activities. **Five** StateViews designed or otherwise contributed to pilot projects that developed new or innovative applications for remotely sensed data. Examples included VirginiaView's 'InForest' online server-based web mapping application designed to provide landowners, natural resource planners, educators, and the public with access to local forest ecosystem information.



During this grant period, Virginia View integrated Landsat imagery into a layer within the InFOREST online mapper. The InForest help manual has been updated to take into account these changes. InForest is available at [www.inforest.frec.vt.edu](http://www.inforest.frec.vt.edu).

Another pilot project example that developed new or innovative applications for remotely sensed data is the South Dakota Local Transportation Assistance Program (SDLTAP). SDLTAP acquainted new personnel with pilot project materials developed in conjunction with an AmericaView mini-grant involving the use of geospatial technologies for local transportation management and operations applications. Innovative and unique remote sensing applications continued to be the primary applied research focus and were closely aligned with the AmericaView mission. Natural resource management activities that utilize moderate resolution data dominated research activities, but an increasing number of states were involved with partners in natural disaster projects that have an applied emphasis. Additionally, several StateView PIs contributed to sensor design research to address sensor engineering and refine application utility.

Leveraging their experience and knowledge of remote sensing software engineering, **3** StateViews were involved in activities that developed software to support distribution of satellite, airborne, and geospatial data, effectively linking research with the AmericaView data archive and distribution mission. **Four** PIs collaborated with other StateView scientists, and **2** posted methodologies or tools for use by other StateView members.

Research opportunities for students continued, either through student mini-grants (as described previously) or through support of the PI via leveraged projects with partners. **Five** StateViews offered scholarships for women and minorities. In addition, **7** PI's supported student use of StateView data in classroom research projects, and **6** supported student publications or presentations in university forums. **Eight** StateView faculty members served on M.S. and Ph.D. committees, often opening doors for their students through research opportunities arising from consortium members employed by natural resources management agencies, improvement of university research through interacting with USGS scientists, and shared remote sensing scientific knowledge within the AV Consortium.

### ***Closing Observations***

On September 21<sup>st</sup>, 1966, the United States committed to launch a civilian Earth Resources Technology Satellite, later to become the Landsat series. With this commitment, the Earth observations community prepared to use satellite-based remote sensed imagery in service to society. As the United States enters the fifth decade of applied remote sensing, AmericaView, as a grantee of the USGS Land Remote Sensing Program, is committed to strengthening, diversifying, and expanding remote sensing education and applied research with local, state, and national partners. Working at the K-12, undergraduate and graduate levels, AmericaView and its partners continue to prepare students and train faculty, industry, and government professionals in applied remote sensing, thus raising awareness of the utility of moderate resolution remote sensing while simultaneously addressing timely natural resource issues at state and local levels.

As a direct result of the U.S. Geological Survey's decision to accept an internally non-competitive consortium funding model, AmericaView continues to be a cooperative, effective, and thriving network. Cooperation fosters and enables sharing of resources, encourages growth and diversity, and recognizes the increasingly complex challenges of meeting state needs with limited funding. With the current emphasis on education and applied research in partnership with governmental, educational, and non-profit organizations supported by StateViews within each state, and given the realities associated with severely limited funding, AmericaView continues to capitalize on the knowledge and flexibility of the StateViews to meet local, state, and regional needs, and to embark on a new, exciting, and increasingly challenging program of state, regional, and national-scale remote sensing education and applied research.

## 2. AMERICAVIEW CONSORTIUM LEADERSHIP AND MEMBERSHIP

The AmericaView Consortium consists of a part-time Executive Director (.72 FTE), a part-time Program Manager (.69 FTE), an eight-member Board of Directors, and PI's at academic lead institutions in each participating state. The Executive Director and Program Manager administer the program on a daily basis, and answer directly to the Board of Directors in all matters. Both the Executive Director and Program Manager are employees of their respective Universities; AmericaView has no employees.

The AV Board met monthly via teleconference or in person to provide consortium leadership. In GY 2011, the AV Board of Directors devoted approximately 762 hours in Board service to AmericaView.

### Board of Directors

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*Back row, left to right, James Campbell, Ramesh Sivanpillai, Milda Vaitkus, Christine Emrich, Brent Yantis, Rick Landenberger, Rick Lawrence. Seated left to right: Rebecca Dodge, Debbie Deagen*

## StateView Membership

As of June 30, 2012, AmericaView had 39 StateView members: 31 Full Members, three Associate Members and five Affiliate Members. AV's current StateView members are:

### Full (funded) Members - GY 2011

#### AlabamaView

<http://www.alabamaview.org>

Dr. Luke Marzen  
Department of Geography  
Auburn University

#### AlaskaView

Mr. Tom Heinrichs  
Geographic Information Network of Alaska  
University of Alaska Fairbanks

#### ArkansasView

[http://www.cast.uark.edu/cast/arkansas\\_view](http://www.cast.uark.edu/cast/arkansas_view)

Dr. Jason Tullis  
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(CAST)  
University of Arkansas

Mr. Bruce Gorham  
Center for Advanced Spatial Technologies  
(CAST)  
University of Arkansas

#### CaliforniaView

<http://cstars.metro.ucdavis.edu/education-and-outreach/californiaview>

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Pia van Benthem  
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University of California at Davis

#### ColoradoView

<http://coloradoview.org/>

Dr. Wei Gao  
USDA UV-B Monitoring and Research Program  
Colorado State University

Dr. Paul Evangelista  
Natural Resource Ecology Laboratory  
Colorado State University

#### GeorgiaView

<http://gis.westga.edu/gaview/>

Dr. J.C. Seong  
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University of West Georgia

Dr. Mark Patterson  
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Kennesaw State University

#### HawaiiView

<http://hawaiiview.higp.hawaii.edu/>

Dr. Robert Wright  
School of Ocean and Earth Science and  
Technology  
University of Hawaii

**IdahoView**

<http://www.idahoview.org/>

Dr. Temuulen (Teki) Sankey  
Department of Geosciences  
Idaho State University

Dr. Nancy Glenn  
Boise Center Aerospace Laboratory  
Department of Geosciences  
Idaho State University

**IndianaView**

<http://www.indianaview.org/>

Mr. Larry Biehl  
Purdue Terrestrial Observatory,  
Purdue University

**IowaView**

Dr. Ramanathan Sugumaran  
Department of Geography  
University of Northern Iowa

**KansasView**

<http://www.ksview.org/>

Dr. Steve Egbert  
Kansas Applied Remote Sensing Program  
(KARS)  
University of Kansas

Kevin Dobbs  
Kansas Applied Remote Sensing Program  
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University of Kansas

**KentuckyView**

<http://www.kentuckyview.org/>

Dr. Christine McMichael  
Inst. for Regional Analysis and Public Policy  
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**LouisianaView**

<http://www.rac.louisiana.edu/>

Mr. Brent Yantis  
Regional Application Center  
University of Louisiana

**MarylandView**

<http://marylandview.towson.edu/>

Dr. John (Jay) Morgan  
Dept. of Geography and Environmental  
Planning  
Towson University

**MichiganView**

<http://wiki.americaview.org/display/miview/Home>

Dr. Nancy French  
Michigan Tech Research Institute (MTRI)  
Michigan Technological University

**MinnesotaView**

<http://minnesotaview.gis.umn.edu/>

Dr. Marvin Bauer  
Department of Forest Resources  
University of Minnesota

Dr. Joseph Knight  
Department of Forest Resources  
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**MississippiView**

<http://www.msview.olemiss.edu/>

Dr. Greg Easson  
Enterprise for Innovative Geospatial Solutions  
University of Mississippi

Mr. Hal Robinson  
Geoinformatics Center  
University of Mississippi

**MontanaView**

<http://www.montanaview.org/>

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**NebraskaView**

<http://nebraskaview.unl.edu/>

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**New HampshireView**

<http://www.nhview.unh.edu/>

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**New MexicoView**

<http://Newmexicoview.Nmsu.edu>

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**North CarolinaView**

<http://www.ecu.edu/cs-cas/geog/ncview/>

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**North DakotaView**

<http://www.und.nodak.edu/org/ndview/>

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**OhioView**

<http://www.ohioview.org/>

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<http://sdview.sdstate.edu/>

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Department of Forest Resources and  
Environmental Conservation  
Virginia Tech

**West VirginiaView**

<http://www.wvview.org/>

Dr. Tim Warner  
Department of Geology and Geography  
West Virginia University

**WisconsinView**

<http://www.wisconsinview.org/>

Dr. Sam Batzli  
Environmental Remote Sensing Center (ERSC)  
University of Wisconsin

**WyomingView**

<http://www.uwyo.edu/wyview/>

Dr. Ramesh Sivanpillai  
Wyoming Geographic Information Science  
Center (WYGISC)  
University of Wyoming

## **Associate Members**

### **UtahView**

<http://earth.gis.usu.edu/>

Dr. Douglas Ramsey  
Department of Wildland Resources  
Utah State University

### **New YorkView**

Dr. Jungho Im  
Department of Environmental Resources and  
Forest Engineering  
State University of New York

### **VermontView**

<http://www.uvm.edu/vermontview/>

Mr. Jarlath O'Neil-Dunne  
Spatial Analysis Laboratory  
University of Vermont

## **Affiliate Members**

### **ConnecticutView**

Mr. James Hurd  
Center for Land use Education and Research  
(CLEAR)  
University of Connecticut

### **NevadaView**

Mr. Ronald H. Hess  
Nevada Bureau of Mines and Geology  
University of Nevada at Reno

### **OregonView**

Dr. Michael Wing  
Department of Forest Engineering, Resources  
and Management  
Oregon State University

### **Rhode IslandView**

Dr. Y.Q. Wang  
Dept. of Natural Resources Science  
University of Rhode Island

Mr. Greg Bonyng  
Dept. of Natural Resources Science  
University of Rhode Island

### **WashingtonView**

Dr. Mark Swanson  
Department of Natural Resources  
Washington State University

### **3. FINANCIAL SUMMARY FOR GY 2011**

Grant funding for GY 2011 was \$967,400.00. More than 81% of the grant went directly to support StateView Full Member sub-awards, mini-grants open to all members, and to Associate and Affiliate travel. Sub-Awards for each of the 31 fully funded members for GY 2011 was \$23,800.00.

Appendix 6 (for internal use only) shows the expenditures by category for GY 2011.

**APPENDIX 1 – StateView Executive Summaries (in alphabetical order)**

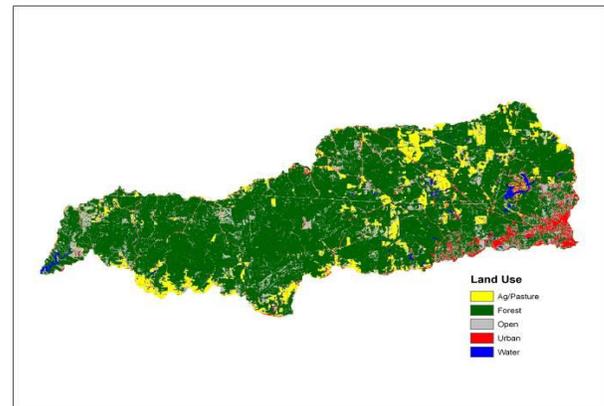
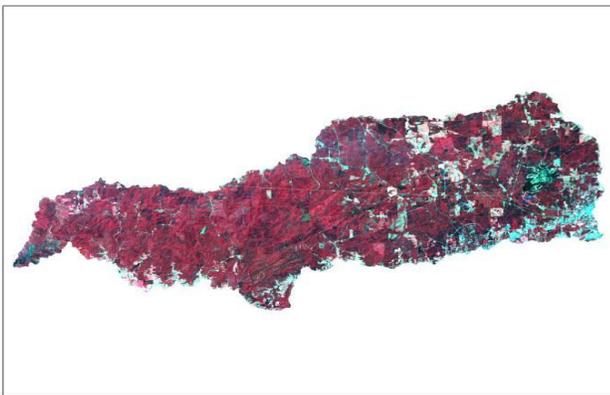


# AlabamaView Executive Summary



## Promoting the Benefits of Remote Sensing Data and Applications

- The goal of the AlabamaView program is to advance the availability, timely distribution, and widespread use of remote sensing data and technology through education, research, outreach and sustainable technology transfer to the public and private sectors. One such example **which depends heavily on moderate resolution Landsat imagery** is a research project undertaken by AlabamaView and the Auburn University Center for Water Resources to bridge gaps between science, policy and the public for better water management and development.
- Research teams are looking at past and present land use to help predict future land use and manage the watershed in the future. **The historic land use analysis dating back to 1990 is done by using Landsat 5 TM imagery.** Analysis of land use change is done to develop a model to forecast alternate scenarios of development for future land use in an impaired watershed, which will then be used as input to help manage water resources in the future.
- The study is providing resource managers with information on the condition and dynamics of land use change in the Saugahatchee watershed through the use of remotely sensed satellite imagery for such analysis. This study offers information related to the dynamics of natural resources and may provide a basis for further research on assessing impacts of future land use on water quality and quantity in watersheds.



## Partners in AlabamaView

Current partners of AlabamaView include Auburn University, Jacksonville State University, U.S. Space and Rocket Center, Alabama Natural Heritage Program, Global Hydrology and Climate Center, Alabama Cooperative Extension System, the Alabama Space Grant Consortium, and Troy University.





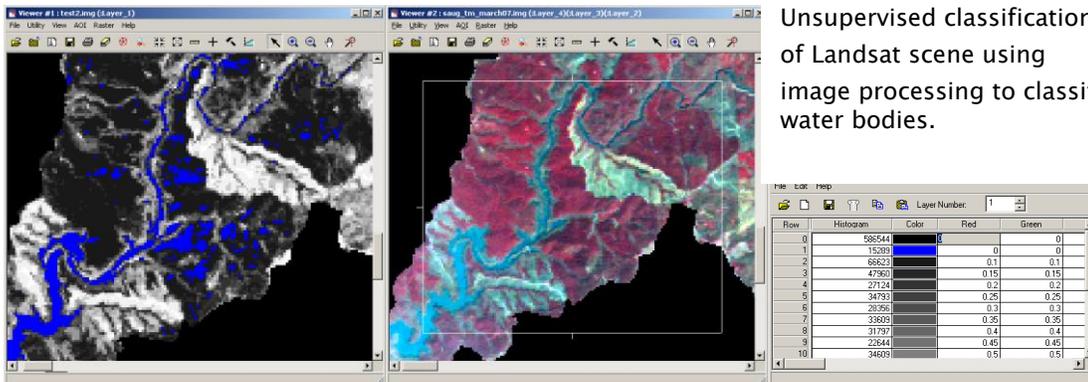
# Landsat Data for Sustainable Watershed Management



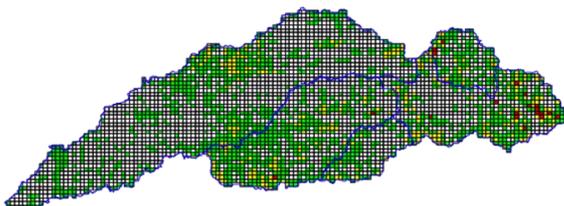
## Landsat Imagery Applications

### Research Project:

Remote sensing image analysis and classification were done using traditional pixel-based multispectral remote sensing. Land use change detection of historic remotely sensed imagery is done to quantify land use changes. The Soil & Water Assessment Tool (SWAT) model is then used to quantify the impact of land use changes on water quality. The City of Auburn and Lee County can utilize the model to help improve water quality.



Unsupervised classification of Landsat scene using image processing to classify water bodies.



**Erosion (kg/ha)**  
0 - 225  
225 - 450  
450 - 675  
675 - 963

SWAT is a hydrology/water quality model used to predict long-term impacts of management and agricultural practices on a watershed. In this case the map shows areas of high erosion. It can also help model nutrient loadings.

## Building on Landsat and Lessons

AlabamaView has created a web-based infrastructure for cost-effective and timely access to remotely sensed data for the state of Alabama. It serves as a linkage between the Alabama remote sensing community and promoting awareness of remote sensing in K-16 students. The growing interest of the research community, students and professionals across the state of Alabama has encouraged AlabamaView to develop new applications using remote sensing, and to provide applications for the user community. **Moderate resolution Landsat data provides an excellent balance between the amounts of land that needs to be observed with the adequate spatial resolution needed to monitor land resources at the regional scale.**

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Auburn University, AL 36849

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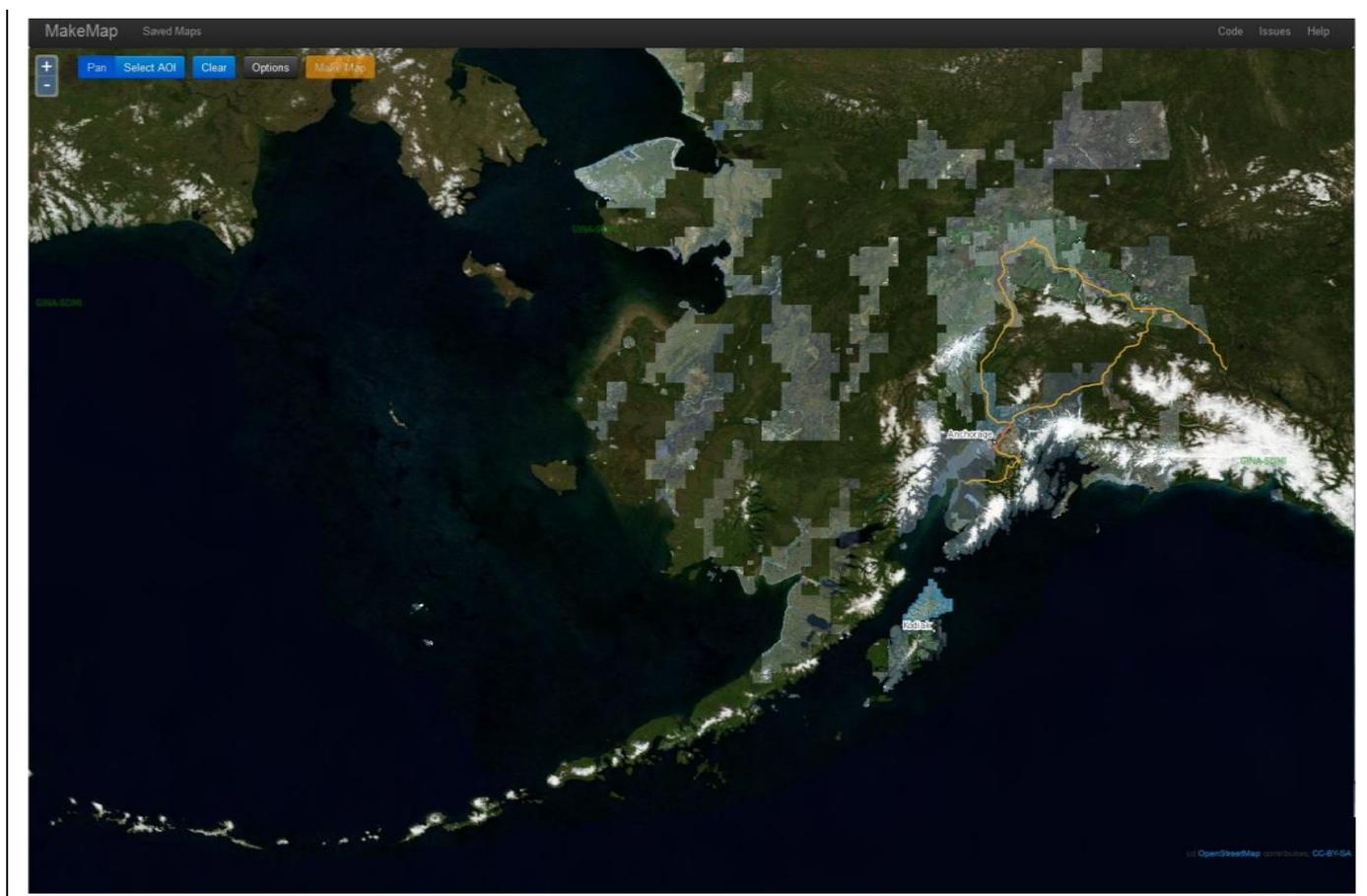
# AlaskaView Executive Summary



## Remote Sensing Resources for Alaska

Making Geospatial Data Easily Available to Alaska Residents

In GY10, AlaskaView created an open source WMS extraction tool called MakeMap. This tool is available in beta form at <http://makemap.alaskamapped.org>. MakeMap allows residents in Alaska to create custom maps of specific areas of interest using base data layers that include Landsat, as well as bathymetry and ortho imagery. In Grant Year (GY) 11 MakeMap was integrated into outreach and training materials and test-user feedback was solicited to help improve the application for wider deployment. The source code, bug tracker, and project website is open to the public at <http://github.com/gina-alaska/makemap>. The MakeMap tool will be deployed in the spring of 2013 through the AmericaView MultiState Server (AVMSS).



AlaskaView's MakeMap application lets users easily create custom maps

AlaskaView 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.



**AmericaView Web Site:** [www.americaview.org](http://www.americaview.org)

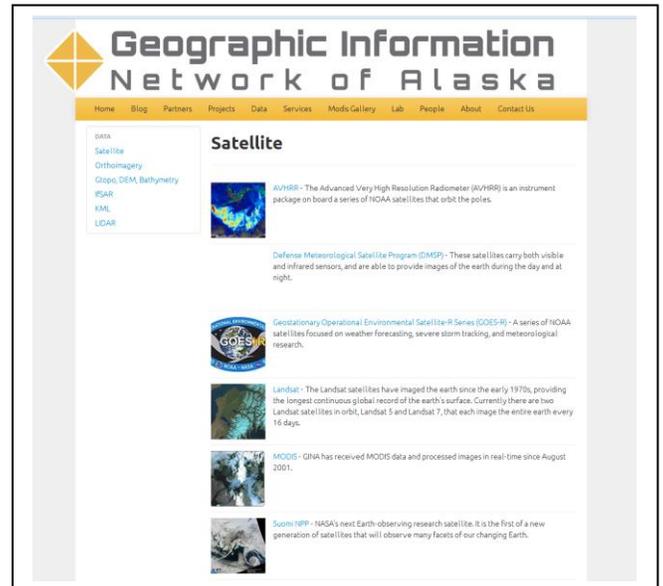
**Chair of the AmericaView Board:** Rebecca Dodge  
([rebecca.dodge@mwsu.edu](mailto:rebecca.dodge@mwsu.edu))

**Executive Director:** Rick Landenberger  
([rick.landenberger@mail.wyu.edu](mailto:rick.landenberger@mail.wyu.edu))

**Program Manager:** Debbie Deagen  
([debbie.deagen@montana.edu](mailto:debbie.deagen@montana.edu))

## Providing Easy Access to Geospatial Data

- ❖ Through the Geographic Information Network of Alaska (GINA), AlaskaView provides the public with free access to its 60+ TB archive of AVHRR, GOES, DMSP, Landsat, MODIS, aerial photography, and digital elevation models. AlaskaView heavily promotes and integrates data into Open Geospatial web services to lower the barrier to access large geospatial data archives via Web Mapping Service and Web Coverage. In GY11, AlaskaView continued to expand its delivery, **servicing more than 1,000 unique users every month**.
- ❖ In cooperation with three other StateViews, the AVMSS was put through basic testing, had DNS entries set up, and AlaskaView started work on internal StateView loading procedures and documentation.



GINA and AlaskaView provide free and easy access to a variety of imagery (<http://www.gina.alaska.edu/data>)

## Developing an Understanding of Geospatial Data Usage

- ❖ AF-GINAU/AlaskaView was a gold sponsor for the 2011 Alaska Surveying and Mapping Conference and manned a booth, made multiple educational presentations on how to use and manage geospatial data, and led a session dedicated to the implementation and progress of the SDMI SPOT5 ortho mosaic program. The goal of this program is to create a new statewide SPOT 5 2.5m orthomosaic, which is starting to be used by the USGS for integration into the US TOPO products for Alaska.



## StateView Partners / Cooperators

Some of AlaskaView's many partners



Tom Heinrichs, PI and Dayne Broderson, Coordinator  
University of Alaska Fairbanks, Geographic Information  
Network of Alaska (GINA)

AlaskaView

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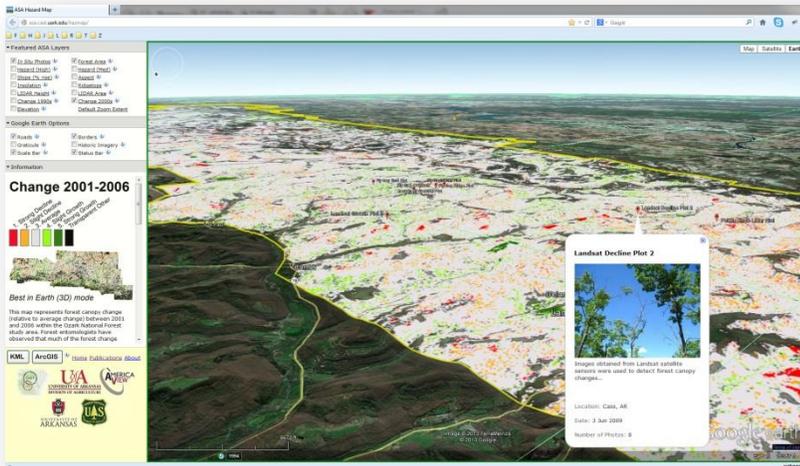
# ArkansasView Executive Summary



## Remote Sensing Resources for Arkansas

### Promoting the Benefits of Remote Sensing Data and Applications

#### Upgraded Landsat-driven Online Spatial Decision Support System



The **ASA Hazard Map** features change detection products derived from Landsat TM/ETM+ from 1990-2006. This online interface allows easy access to metadata, 2D and 3D viewing, and rapid download of satellite imagery and related GIS project data ready for use in ArcGIS 10 with the *Spatial Analyst* extension. The system is found at <http://asa.cast.uark.edu>.

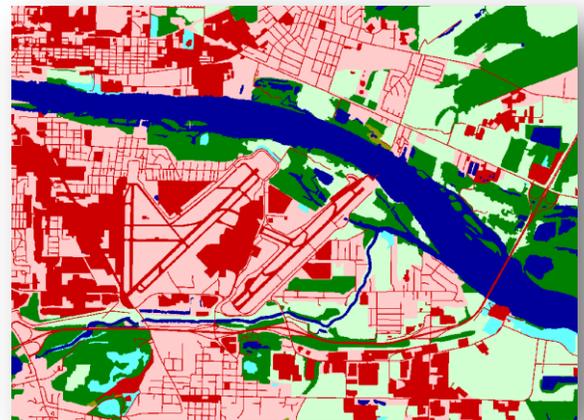
Thriving Oak-hickory forests are among Arkansas greatest treasures. Much of this land is privately owned. In recent years, drought and other pressures on the forest have resulted in unprecedented tree damage and mortality due to red oak borer. ArkansasView assisted the Forest Entomology Lab at University of Arkansas to upgrade its Landsat satellite-driven online spatial decision support system (SDSS) called the "ASA Hazard Map". This involved a complete website overhaul to increase the ASA Hazard Map's functionality and to extend its life cycle.

#### Benefits of the ASA Hazard Map

Even though the unprecedented red oak borer populations fell back to relatively normal levels after 2005, the hundreds of thousands of hectares of oak-hickory forest damaged affected the state's lumber industry and is a major concern for many forest land owners going forward. By preserving this tool for future years, ArkansasView is providing a service to educate forest owners in Arkansas about the forest changes they might expect and helps them in their silvicultural plans.

#### Other ArkansasView Projects

ArkansasView leverages existing educational, research, and data warehousing activities at the Center for Advanced Spatial Technologies (CAST) at University of Arkansas. Its focus is to enhance and improve Arkansas' application of remote sensing. Several additional activities in 2011-2012 included giving remote sensing presentations in Arkansas and around the United States, providing workshops in object-based image analysis, and training faculty and students in remote sensing design.



Combining Landsat's high spectral resolution with high spatial resolution datasets such as NAIP has improved the accuracy of land cover classification maps used throughout Arkansas.



- Remote sensing publications
- Faculty and student training
- Landsat and related archives
- Object-based image analysis
- Collaborative image processing

**PI and Coordinator**  
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Bruce E. Gorham, Remote Sensing Specialist, CAST  
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WEB SITE <http://goo.gl/L3qjM>



# CalView Executive Summary

## Remote Sensing Resources for California

### Promoting the Benefits of Remote Sensing Education and Outreach

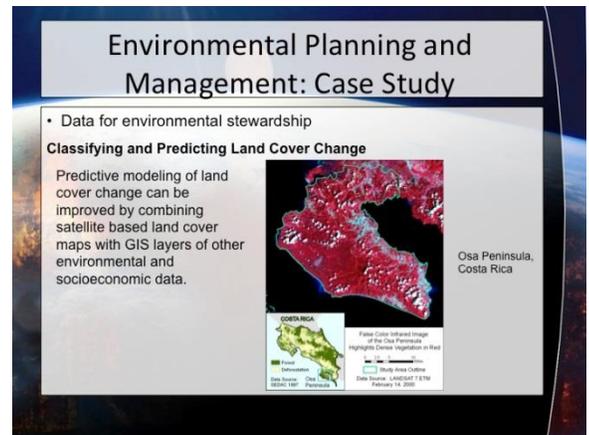
#### The online intersection of education for remote sensing career development in California

CalView is developing a remote sensing certificate program that is composed of several online modules. The Baseline Remote Sensing Certificate, or entry-level course, will be offered at no cost and provides students with basic knowledge of remote sensing and a fundamental skill set with which to launch a career as a remote sensing specialist.

The certificate will use a wide range of software tools including ArcGIS Explorer and MultiSpec.

#### Remote Sensing Certificate education goal:

- Ensure those certified are equipped with the necessary remote sensing knowledge, tools and techniques to enable them to advance in the future geospatial workforce.



Certificate example slide Unit 1, "Application and Careers in Remote Sensing".



#### Benefits of application to the State

In this economy workforce development has become a major focus of CalView. The State of California has a growing need for remote sensing specialists. To be competitive in the job market students need to learn more than just imaging techniques. A strong theoretical foundation will enable them to cross into new platforms quickly as job needs change.

CalView is planning on releasing the workforce certificate in 2013. At the same time, the certificate will be made freely available to all AmericaView member states, filling the need of education in geospatial technologies all across the country. A first template for the certificate flyer is shown on the left.

CalView 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.

AmericaView Web Site: [www.americaview.org](http://www.americaview.org)

Chair of the AmericaView Board: Rebecca Dodge  
([rebecca.dodge@mwsu.edu](mailto:rebecca.dodge@mwsu.edu))

Program Manager: Debbie Deagen  
([debbie.deagen@montana.edu](mailto:debbie.deagen@montana.edu))

## Other Projects

CalView supports the annual AmericaView consortium Earth Observation Day celebrating the Landsat mission by hosting annual teacher workshops introducing GPS data point acquisition and its implementation into Google Earth to teach K-12 Grade students how to create land use and land cover maps. All Earth Observation Day lesson plans and resources, like the remote sensing matching game using USGS Earthshot imagery (see picture below), are available to the public for download from the internet.

<http://www.americaview.org/k-12-earth-observation-day>



The picture on the left shows a student studying change detection utilizing the remote sensing matching game developed by CalView.

CalView is presenting its education and outreach works annually at the University Open House visited by more than 90,000 people from across California.

In 2012 CalView developed and exhibited a state county puzzle utilizing USGS Landsat state imagery, as well as a city and surrounding area magnet-matching game for the public to engage in. Furthermore a middle school geospatial art project accompanied the remote sensing exhibition.

The geospatial art project developed in 2011 with 9<sup>th</sup> Grade students enabled them to explore the area surrounding their school. Students acquired GPS data points during a fieldtrip to create their individual Google Earth maps. Through voice recordings and monochromatic painting students were able to express their spatial environment using different media.



The photograph on the left is showing the geospatial art project setup at the annual University Open House.

## StateView Partners / Collaborators



CalView is housed at the Center for Spatial Technologies & Remote Sensing (CSTARS) promoting the use of Landsat data for individual research projects.



**California Space Grant**  
CONSORTIUM

The California SpaceGrant Consortium supports CalView with additional funding for the development of the 'Remote Sensing Certificate' while at the same time opening up collaborations among CalView's consortium members.

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**Coordinator: Pia van Benthem**  
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Department of Land, Air and Water Resources  
Center for Spatial Technologies and Remote Sensing  
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**WEB:** <http://cstars.metro.ucdavis.edu/education-and-outreach/californiaview/>



# ColoradoView Executive Summary



## Remote Sensing Resources for Colorado

### Promoting the Benefits of Remote Sensing Data and Applications

**ColoradoView is establishing an identity with a new web presence.** The ColoradoView web site will be a public resource for using RS data and will compliment outreach activities by the Natural Resource Ecology Laboratory. This will include free lessons on GIS and RS topics and sample data for Colorado.



Our mission is to formally establish, maintain, and promote a ColoradoView consortium to serve GIS and remote sensing data users in the Colorado region and promote the use and integration of GIS and remote sensing data and derivatives for education, research, and decision-making.

### Benefits of application(s) to the state

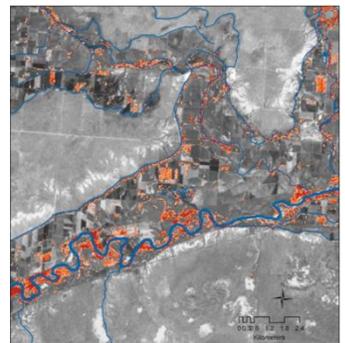
Billions of dollars have been spent by the federal government and private sector on satellite-based earth observing systems since the early 1970's. In response to this investment, the research community has developed practical applications for mapping, monitoring, and managing natural and environmental resources. Potential uses for remote sensing technology have been widely recognized over the years, yet the distribution of real-world applications have been, and continue to be, challenging issues for both the federal government and the academic research community. Our ColoradoView consortium works to bridge the gap between the research and application communities in Colorado.

Our new website facilitates education and outreach, research activities, and data distribution.

### Other Projects

ColoradoView is identifying opportunities for undergraduate and graduate internships, sponsoring three part-time students over Grant Year 2011. These students assist in research activities and are creating tutorials to document what they learn for the benefit of others. Specifically, our interns have

- tested multi-scene modeling approaches to map tamarisk at local and state scales using the Maximum Entropy modeling software.
- used Landsat and MODIS satellite imagery to model landscape heterogeneity for Colorado.
- created several tutorials, including how to download Landsat imagery, how to mosaic multiple scenes, and how to clip images.



An enlarged view of tamarisk detected along the Arkansas River and irrigation ditches near the town of Riverdale in southeastern Colorado. The results shown here are from a time-series analysis that used 72 remotely sensed data sets from Landsat 5 ETM+.



**Dr. Wei Gao, PI**  
UV-B Monitoring and Research Program  
Natural Resource Ecology Laboratory  
1499 Campus Delivery  
Colorado State University  
Fort Collins, Colorado 80523-1499



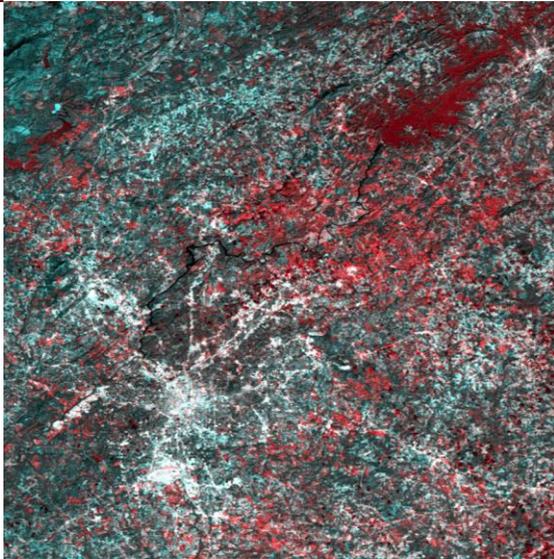
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970-491-3601  
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<http://coloradoView.org>

# GeorgiaView Executive Summary

## Collaborative Outreach with Remote Sensing & Geospatial Technology

Boosting the Awareness and Readiness of Regional Warming with Landsat Data

### Help Georgia Manage Changing Environment Effectively and Promptly!



Comparison between Oct. 26, 1984 and Oct. 15, 2003, red showing an increase in temperature tied with urban sprawl in metro Atlanta, Georgia

GeorgiaView has monitored the urban heat islands in metro Atlanta using the Landsat satellite imagery, and found a significant relationship between urban sprawl and urban heat island effects. Urban heat islands are more obvious during the summer, and they contribute to increased air pollution and greenhouse gas emission, degraded aquatic ecosystems, and negative effects on human health. GeorgiaView found that Landsat is the most effective data for making this kind of environmental monitoring possible, with available coverage of multiple decades at the regional scale.

### Benefits of Remote Sensing to Georgia

Billions of dollars have been spent by the federal government and private sector on satellite-based earth observing systems since the early 1970's. In response to this investment, the research community has developed practical applications for mapping, monitoring, and managing natural and environmental resources. Potential uses for remote sensing technology have been widely recognized over the years, yet the distribution of real-world applications has been, and continues to be, a challenging issue for both the federal government and the academic research community. Our GeorgiaView consortium works to bridge the gap between the research and application communities in Georgia.

"My students enjoyed Earth Observation Day so much! Hopefully they have learned the opportunities they can have by furthering their education past high school." (Ellen Olson, Teacher at Coweta PLC)

"I am very proud and pleased to be able to be part of a project with the objective of studying the history of an area I hold near and dear to my heart." (Adam Bowman, Gainesville State College)

### Science Education to K-16 Students and Teachers

*GeorgiaView hosts remote sensing workshops and internships every year*

### Facilitating Remote Sensing Data Distribution & Application

*GeorgiaView shares Landsat and other geospatial datasets via Website*

### Collaborative Outreach and Cooperation

*GeorgiaView provides mini-grants and collaborates with CDC and ARC*



Seniors from the Coweta Performance Learning Center learning to derive information from remotely sensed imagery on the 2012 Earth Observation Day

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## HAWAIIVIEW: EXECUTIVE SUMMARY OF ACCOMPLISHMENTS, FY11

### PROGRAM SUMMARY

HawaiiView's sole project is the development of self-contained science kits for communicating to school students how remote sensing technologies can be used to study the Earth. The kits are to include a) lesson plans that introduce students to remote sensing for earth observation, plans which map onto national and state education standards, and b) any and all specialist equipment and supplies required to execute these lesson plans. An important part of the project is to maintain HawaiiView/AmericaView/USGS branding on the project.

For the last two years the kits have generic remote sensing teaching aids. ALTA II reflectance spectrometers and handheld infrared thermometers are the core pieces of equipment as they make measurements in the region of the electromagnetic spectrum most typically used by Earth orbiting remote sensing mission, the visible/near infrared and the long wave infrared. A lesson plan for each instrument/region of the spectrum has been developed and tested (see appendix). The goal is to produce several kits with sufficient equipment in each that entire classes (at more than one school) can conduct the exercises. In FY2012 the HawaiiView RCA stipulated that, in light on the soon-to-be-launched LDCM mission, they would be converted to LDCM centric science kits. This will involve a) re-writing the lesson plans/background materials to map the measurements made by the ALTAs and IRT to those made by LDCM's OLI and TIRS sensors, respectively and b) including background materials on the Landsat and LDCM missions themselves, and the manner in which these data are used to benefit society (e.g. drought management; mitigating natural hazards; crop monitoring).

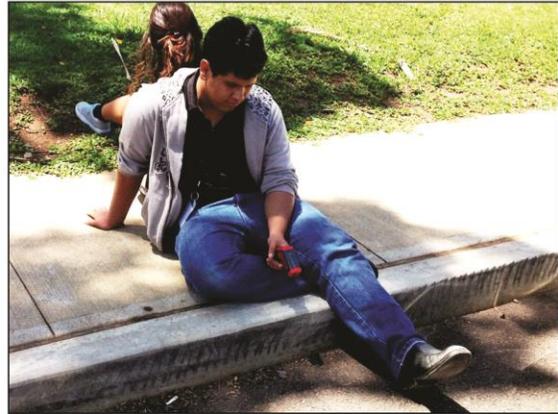
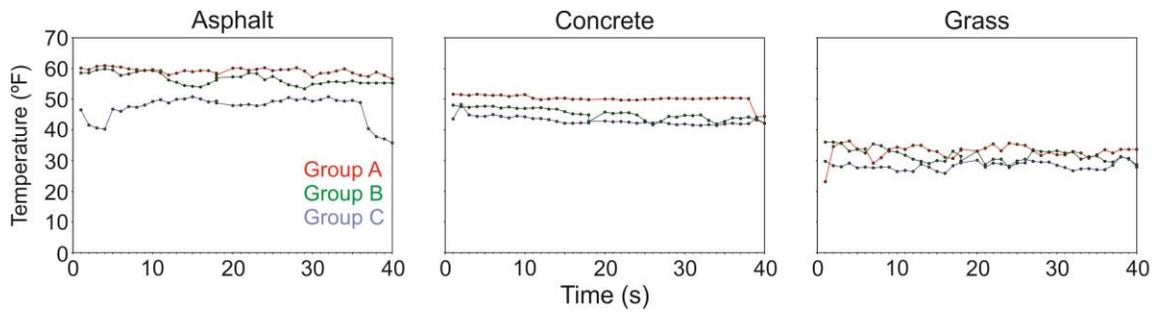
All AV funds (with the exception of those earmarked for required travel and some supplies) are used to pay an outreach specialist at ~1.3 months/year to work on the HawaiiView effort (Sarah is funded by several projects to work on outreach efforts).

### 2011 PROGRESS

Over the past several years HawaiiView has been purchasing the equipment required to make several kits. 36 ALTA II spectrometers have been acquired. A further 26 handheld thermometers will be required to complete the kits although these are much less expensive than the ALTAs and so can be acquired quickly. In order to brand the kits the HawaiiView logo has been re-drafted by the SOEST/University of Hawaii publications department (right). This logo will appear on all science kits. The logo will also appear on all supplies and stationary that will be included in each science kit (e.g. pencils, erasers, rulers, notepads, graph paper; the lesson plans involve making measurements, recording them and plotting them). Although a vendor has been identified, no order has yet been placed.



The lesson plans (although not the updated LDCM-centric plans) have been tested in high schools. In 2012 the plans were used in a high school geology course for college credit for Upward Bound students. Eligibility for Upward Bound requires that the students are predominantly from low income families in which neither parent holds a bachelor's degree, and are of Native Hawaiian and/or Pacific Islander heritage. There were eighteen students enrolled in this course, 16 of whom were female. They ranged from 9<sup>th</sup> – 12<sup>th</sup> graders.



Some of the students making measurements, as well as the data they collected.  
 (All measurements were taken in approximately the same location and at the same time.)

The lesson plans have been mapped onto the new National Science Standards. Work is currently in progress locating free domain figures for all figures in the remote sensing lessons or drafting figures that do not have free domain equivalents, and contacting potential teachers with interest in using the LDCM science kits.

# IdahoView Executive Summary



## Remote Sensing Education in Idaho

### Promoting Remote Sensing Education and Data Availability

#### Goals and objectives of a K-12 education project:



IdahoView has partnered with the University of Idaho's McCall Outdoor Science School (MOSS) to expand our remote sensing outreach activities. MOSS serves K-12 students from across the entire state of Idaho and can reach up to 250 students a year. In partnership with MOSS, IdahoView develops remote sensing curricula and a library of remote sensing lesson plans that can be used at MOSS and other schools throughout Idaho by K-12 teachers.

#### Benefits of application to the state

Over the past year, IdahoView purchased computers to support the establishment of remote sensing curricula at MOSS. This year, we worked with MOSS faculty and graduate students to develop a library of remote sensing lesson plans leveraging the existing infrastructure, resources, and staff at MOSS. The MOSS faculty and graduate students then organized a five-day geospatial summer camp "Getting Into Science" (GIS), where K-12 students were taught using these remote sensing lesson plans. Students learned about GPS, GIS, and how they create, manage, and store spatial data. During these lessons, students gained hands-on experience with the equipment and software by mapping tree species in our Ponderosa State Park. Students were then taught basic remote sensing skills including calculations of Normalized Differenced Vegetation Index and supervised classification.



#### Other Projects

**Idaho State**  
UNIVERSITY

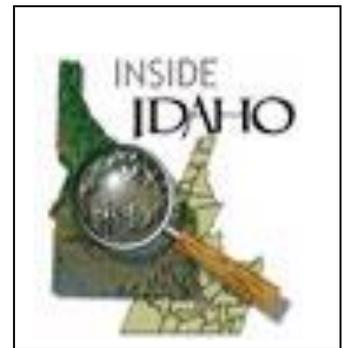
- Idaho's three major universities are actively involved in IdahoView activities and share its leadership responsibilities.

**BOISE STATE**  
UNIVERSITY

- IdahoView visits Idaho's Congressional delegates to communicate about remote sensing outreach activities.
- IdahoView continues to assist researchers and stakeholders access imagery, including Landsat data, via INSIDE Idaho geospatial repository.

**University**  
of Idaho

- IdahoView also assists in making lidar data and data processing toolkits freely available for research and teaching.



**INSIDE Idaho now acts as our main geospatial data repository.**

**PI and Coordinator**  
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**WEB SITE: [www.idahoview.org](http://www.idahoview.org)**



# IndianaView Executive Summary



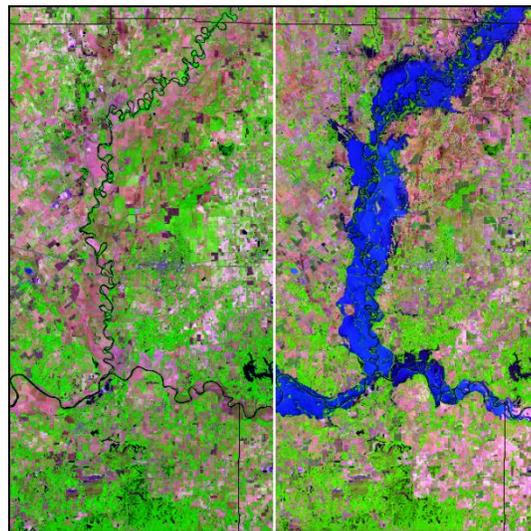
## Remote Sensing Resources for Indiana

### Promoting the Benefits of Remote Sensing Data and Applications

#### Geospatial Education Outreach Materials & Activities

The goal of a partnership with the Geography Educators' Network of Indiana (GENI) is to develop interactive class lessons directed towards high school students that utilize state-wide Landsat and orthographic images from familiar areas as they teach spatial technology skills. The lessons are being tied to the Indiana Academic Standards. This project was a result of a need identified by several IndianaView consortium members for education and outreach materials that use and highlight the state geospatial data initiatives currently underway.

The topic for the first interactive lesson is land-use/land-cover. A second topic will highlight drought. The technologies to be used for the geospatial interactives include ArcExplorer Online and MultiSpec. The data being used include that from Landsat and the aircraft orthographic and LIDAR data currently being collected for the state. The interactives will be available from the GENI web site ([geni.iupui.edu](http://geni.iupui.edu)) and will include images, map and videos along with the written lessons. Reviews of the first interactive will begin by March 2013.



The 6/9/2007 (left) and 6/11/2008 (right) Landsat 5 images illustrate land cover change due to flooding (deep blue) of the White River in southwest Indiana in June 2008. Landsat 5 bands 5, 4, 3 displayed as red, green, blue.



Illustration of the MultiSpec freeware application used for analysis of remotely sensing images by K-12, university and government educational activities. Natural color Landsat 5 image is of the construction of I-69 east of Washington, IN on Nov 11, 2011.

#### Benefits of application(s) to Indiana

Billions of dollars have been spent by the federal government and private sector on satellite-based earth observing systems since the early 1970's. In response to this investment, the research community has developed practical applications for mapping, monitoring, and managing natural and environmental resources. Potential uses for remote sensing technology have been widely recognized over the years. Partners in the IndianaView consortium work to bridge the gap between the research and application communities in Indiana. An example is the Land Use in Central Indiana (LUCI) models developed by John Ottensmann using land cover maps derived from Landsat data to estimate urban land area. The model is being used by local governments to delineate planning areas, plan storm water management and assess development impact to name a few examples. (<http://luci.urbancenter.iupui.edu/>)

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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Program Manager: Debbie Deagen  
([debbie.deagen@montana.edu](mailto:debbie.deagen@montana.edu))

## Other Projects

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 the creation of materials to promote the IndianaMap projects at statewide & national conferences.

IndianaView GloVis: <http://www.indianaview.org/glovis/index.html>. This portal provides easy access to analysis-ready images of Indiana including Landsat TM & MSS, ASTER and other image data such as MODIS LAI products and NASS crop data layers. Links are provided to a portal operated by a partner consortium member, Indiana University, which provides the aircraft-acquired orthographic image data and to IndianaMap, which provides many geospatial layers of information operated by consortium members, IGIC & the Indiana Geological Survey. A link is also provided to a subscription service called PRESTIGE for near-real time MODIS and AVHRR data from Purdue's Terrestrial Observatory.

MultiSpec (<https://engineering.purdue.edu/~biehl/MultiSpec/>) is a free remote sensing application that is used for education and research. There were six updates during 2012. The next release in early 2013 will provide the capability for users to more easily combine the separate Landsat band files provided by USGS into a single image GeoTIFF file for analysis.



IndianaView participated in a geospatial outreach event led by the Indiana Geographic Information Council (IGIC) at the 2012 Indiana State Fair. The event was part of the Boy Scouts of America exhibit and highlighted the current geo-projects including the statewide orthophotography program, IndianaMap and IndianaView.

## IndianaView Partners



INDIANA UNIVERSITY



Researchers and educators at partner institutions Indiana State University, Indiana University, Martin University, University of Notre Dame, the Indiana Geographic Information Council and CUSIS have participated in the IndianaView mini-grant program with projects involving K-12 education, general public outreach, research studies and educational lab development. Fact sheets are available at: <http://www.indianaview.org/apps.cfm>

Indiana University provides an easy access portal to the available aircraft-acquired orthographic data for Indiana (<http://gis.iu.edu/>) to augment the spacecraft-acquired data available on the IndianaView portal.

Partners have used the Landsat data available from the IndianaView GloVis portal and have shared image data from their own research libraries to be added to the portal.

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# IowaView Executive Summary



## Remote Sensing Gateway for Iowa

### Promoting the Benefits of Remote Sensing Data and Applications

#### IowaView - Goals and objectives

IowaView was established in 2007 and works with several federal, state, local and tribal agencies in Iowa to promote remote sensing activities. Some of the objectives for Grant Year 2011 include:

- develop remote sensing education and training programs;
- promote and support collaborative remote sensing application research effort;
- provide remote sensing research opportunities for students;
- develop a user-friendly web-portal to disseminate remote sensing related data in Iowa.



Students were trained in the summer of 2012 in hyperspectral Image processing.

#### Benefits of applications to the state

To promote remote sensing related activities, Iowaview accomplished the following activities.

- Partnered with several state agencies in Iowa and worked on big spatial data processing, focusing particularly on LiDAR data research.
- Members provided summer training for 10 Research Experience for Undergraduates (REU) students on hyperspectral imagery processing.
- PI and collaborators presented 3 national and international level presentations and published a journal article (Computers & Geosciences, Volume 43, June 2012, Pages 118–125, 2012)
- Two students received hands-on experience from PI on LiDAR data processing using high performance computing.

#### Other Notable Projects

- IowaView made new research collaborations and submitted and received several research grants from other federal agencies.
- IowaView was also instrumental in developing and supporting collaborations between private and academic programs particularly in internships for students.
- IowaView enhanced their LiDAR web-portal and also developed several videos related to LiDAR processing and made it available via the IowaView website for public. LiDAR web portal is available at <http://geotree2.geog.uni.edu/lidar/>



The Iowa LiDAR web-portal provides state-wide LiDAR dissemination with over 10 terabytes of imagery downloaded by the public this past year.

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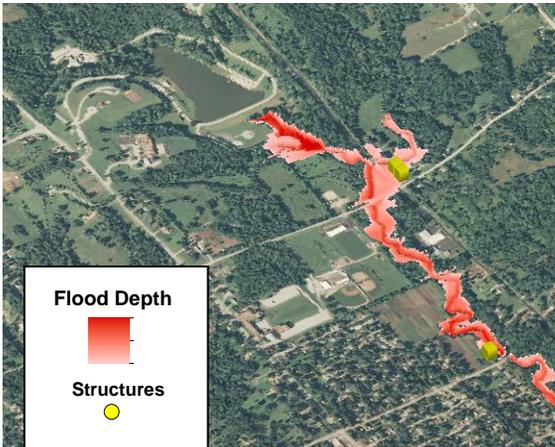
# KansasView Executive Summary



## Remote Sensing Resources for Kansas

### Dam Breach Mapping and Analysis Using Remotely Sensed Data

#### Planning for a Dam Breach - Decision Support for Kansas Emergency Managers



Map of predicted flooding in the event of a dam breach, using full breach as specified in Kansas Department of Agriculture Regulation 5-40-24 for dam breach analysis, from the reservoir in the upper left of the air photo.



Although catastrophic dam breach events are relatively rare, their impacts are immediate and powerful, representing existential threats to human life, homes, structures, livestock, and farmland. For the past two years, KansasView has conducted dam breach mapping and analysis for the Division of Water Resources of the Kansas Department of Agriculture. Illustrations to the left and below depict the predicted flooding from a dam breach on a Kansas reservoir.

#### Benefits to Kansas

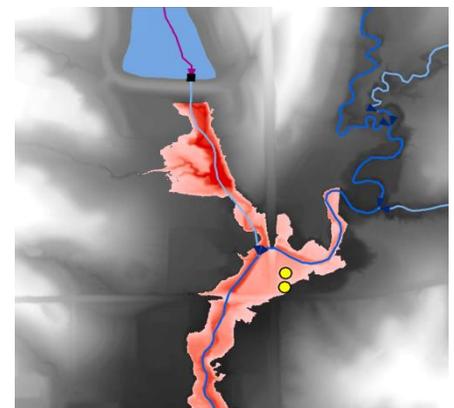
In Kansas, severe flooding caused by strong rainfall events occurs with unpredictable but relatively high frequency, especially in eastern portions of the state. One of the consequences of these rainfall events is that the integrity of dams in the region are threatened, potentially leading to structural failure. KansasView, in partnership with the Division of Water Resources of the Kansas Department of Agriculture, has been mapping predicted flood extents in the event of dam breach events using LiDAR elevation data, high-resolution aerial photography, and mapping methods developed by scientists at the Kansas Applied Remote Sensing (KARS) Program, a key KansasView partner. The resulting maps and analyses provide emergency managers with a valuable decision support asset that benefits all Kansans.

#### The KansasView Consortium

KansasView is a consortium of higher educational institutions – the University of Kansas, Haskell Indian Nations University, Kansas State University, Emporia State University, and Fort Hays State University – partnering with state agencies and promoting the benefits of remote sensing through applied research, education, and outreach.

Some past and current efforts co-sponsored by KansasView include:

- Mapping inundation extents along Kansas rivers
- Statewide remote sensing conferences
- Research grants to undergraduate and graduate students
- Statewide imagery databases – Landsat, MODIS, and ASTER
- Project GeoHawk – a balloon-mounted aerial camera system designed and launched by students.



Predicted flood areas on a map of elevation, with reservoir (light blue) in upper center – lower elevations are shown in dark gray while higher elevations are in white.

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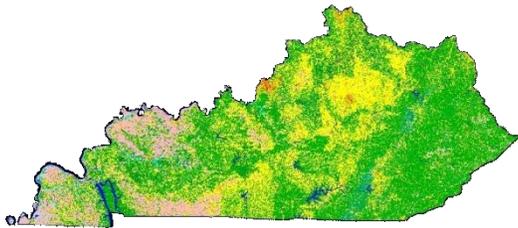
# KentuckyView Executive Summary



## Remote Sensing Resources for Kentucky

### Promoting the Benefits of Remote Sensing Data and Applications

This KentuckyView Mini-grant Project - Moderate Resolution Anderson Level I 2010 Kentucky Land Cover Classification - sought to use publicly available Landsat 5 Level 1 data and ERDAS Imagine software to create a 2010 land cover GRID for the Commonwealth of Kentucky.



An existing 'ground-truth' data set for state- and national-based land cover mapping in Kentucky was expanded this past grant year from 1,290 sites to 2,458 sites- with the ultimate goal of 40 ground locations per land cover class for each Landsat path across the Commonwealth. Publicly-accessible sites, including all existing locations in the official Kentucky Mesonet weather and climate network, were utilized as much as possible.

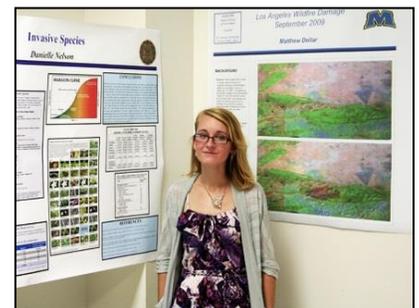
This project adopted a retrospective approach, in that Farm Service Agency - National Agriculture Imagery Program (NAIP) data available as an ArcGIS Service via the Kentucky Geography Network were used to derive the 'ground truth' data. The Landsat scenes were classified on a path-basis since each path had high-quality scenes all available within about a one month timeframe late in the growing season. Overall, this project enhanced researchers' and technicians' knowledge and skills in preparation for continuing this type of work in conjunction with the Landsat Data Continuity Mission set to launch in February 2013.

### Benefits to the Commonwealth

Billions of dollars have been spent by the federal government and private sector on satellite-based Earth observing systems since the early 1970's. In response to this investment, the research community has developed practical applications for mapping, monitoring, and managing natural and environmental resources. Potential uses for remote sensing technology have been widely recognized over the years, yet the distribution of real-world applications have been, and continue to be, challenging issues for both government and the academic community. Our KentuckyView consortium works to bridge the gap between the research and application communities by addressing real world issues such as land cover change - which impacts not only environmental conditions, wildlife habitat, and natural resources, but also urban and rural planning and development.

### Other Projects

KentuckyView, led by the Institute for Regional Analysis and Public Policy (IRAPP) at Morehead State University, has partnered with all of the Commonwealth's universities, as well as a campus of the KCTCS and several state government agencies, to promote the benefits of remote sensing, especially Landsat, data in a variety of ways including via real world environmental and resource applications, developing educational materials, and facilitating student research.



KentuckyView sponsors a semi-annual geospatial-themed poster session for undergraduate students.



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Website: [www.kentuckyview.org](http://www.kentuckyview.org)



# LouisianaView Executive Summary



## Remote Sensing Resources for Louisiana

Promoting the Benefits of Remote Sensing Data and Applications

### American Landscapes – Pecan Island Community of Coastal Louisiana

The landforms of southern Louisiana have been shaped by the wanderings of the lower Mississippi River but with modern engineering of where the river flows, the salt marshes of the Chenier Plain are in a losing battle against the open ocean forces which are eroding the coastline. The University of Louisiana (UL) Coastal Community Resilience Studio, working with the LouisianaView program, has taken on the challenge of telling the story of the changing coastline along these Southwestern Coastal Chenier Plains utilizing Landsat Imagery as its foundation.



Above: Landsat Satellite Image taken in 1973 depicting healthy marsh and land forms in southwestern coastal Louisiana at Pecan Island.



Above: Landsat image taken in 2003 helps to illustrate the changes in landcover with increased areas of water covering the Chenier just to the south of White Lake, a freshwater lake, sited in the center of the image. This area, as identified in the 1973 image highlights the ever-changing coastal community of Pecan Island.

### Benefits to Louisiana

Billions of dollars have been spent by the federal government and private sector on satellite-based Earth observing systems since the early 1970's. In response to this investment, the research community has developed practical applications for mapping, monitoring, and managing natural and environmental resources. Potential uses for remote sensing technology have been widely recognized over the years, yet the distribution of real-world applications have been, and continue to be, challenging issues for both the federal government and the academic research community. Our LouisianaView consortium works to bridge the gap between the research and application communities in Louisiana.

LouisianaView 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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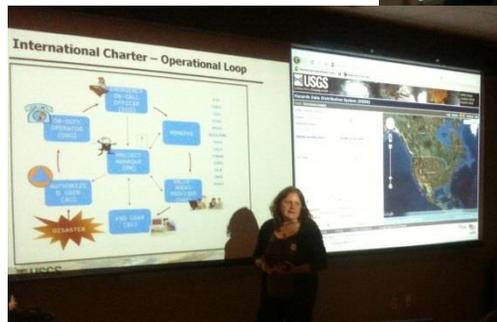
## Louisiana Hurricane Season GeoSpatial Data Mining Workshop

This annual workshop, held in early June each year, is now entering its twelfth (12) year. Through the cooperation of LouisianaView consortium members and co-sponsored with local USGS representatives, this workshop is offered free to those in Louisiana and surrounding states interested in up-to-date information on data availability for the geospatial emergency responder.

This workshop highlights geospatial data sets related to hurricane season preparation, emergency response operations, and ongoing recovery efforts. Presentations include an overview of the data clearinghouses, applications, and data acquisitions of federal and state agencies that collect and host geospatial data, as well as operations and planning updates for the upcoming hurricane season. Participants follow along on desktop computers identifying, locating, and viewing geospatial data and information.



Above: Graphic Image of the Orbiting Landsat Satellite System above the Gulf of Mexico



3 pictures showing some of the participants and agency representatives taking part in the workshop.

### LouisianaView Partners / Cooperators

- UL Lafayette Regional Application Center
- Louisiana Army National Guard – GeoSpatial Center
- USGS Louisiana Mapping Partnership Office
- USGS National Wetlands Research Center
- Louisiana Dept. of Environmental Quality
- Corp of Engineers - New Orleans District
- Louisiana State University
- UL Coastal Community Resiliency Studio
- USDA Natural Resources Conservation Service–Louisiana
- Louisiana Dept of Agriculture
- Louisiana State GIS Council
- Louisiana GOHEP GeoSpatial Data Division



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# MarylandView Executive Summary



## Remote Sensing Resources for Maryland

### Promoting the Benefits of Remote Sensing Data and Applications

#### Developing a Balloon Aerial Photography Platform and Program

As part of its Grant Year 2011 activities, the MarylandView Consortium developed a balloon mapping program. The purpose of this activity was to design a low-cost balloon mapping platform that could be used by secondary school, community college, and college and university teachers in their education programs. The platform consists of a 5 foot neoprene weather balloon, Canon digital camera, picavet suspension system, Dacron line, and a kite reel. Low (~\$250) and higher (~\$1,000) cost options are available. The platform uses a Canon digital camera. By writing a BASIC programming-like script, a Canon camera can be "rigged" to trigger the shutter automatically every few seconds. Moored balloon platforms can be launched by anyone provided the balloon is less than 6 feet in diameter, has a capacity of less than 115 cubic feet, is not operated higher than 500 feet above ground level, and is not operated within 5 miles of the boundary of any airport (14 C.F.R. Part 101).



Mosaicked image of Towson University's new College of Liberal Arts Building. A total of 168 aerial photographs were mosaicked to create this image.

After a balloon mapping mission, the aerial photographs can be mosaicked, and digital orthophotographs and point clouds can be developed. A variety of open source and proprietary desktop software and online Web tools are available for processing the imagery.

### Benefits of Application within the State of Maryland



Students and Geography Department staff ready the balloon mapping platform for launch.

In recent years, there has been a growing interest by teachers, students, and the public in capturing aerial photography via balloon platforms and UAV's. Much of this interest has been generated by the efforts of the Public Laboratory for Open Technology and Science (<http://publiclaboratory.org/home>).

We have discovered our balloon mapping program has the potential to engage teachers and students from secondary school through college, and across the curriculum. The program provides teachers and students with the tools and techniques to acquire, process, analyze and classify true color and false color infrared aerial photographs. By doing so, the program supports Earth Science education in Maryland's secondary schools. When work on this project is completed this fall, information will be available on the MarylandView and PennsylvaniaView Web sites.

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Program Manager: Debbie Deagen

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## Other MarylandView Projects

In addition to the balloon aerial photography project, the MarylandView Consortium undertook other activities in Grant Year 2011. These included downloading 2011 Landsat 5 imagery for Maryland, mosaicking the imagery, and clipping the imagery to county borders. In addition to the Landsat imagery, we assembled other geospatial data for Maryland's counties in raster and vector format. These products will be available on the MarylandView Web site by September 30, 2013.

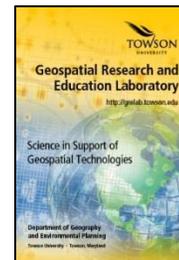
One final noteworthy activity of the MarylandView Consortium in FY2011 was an effort to develop a web mapping application using an open source Javascript mapping API called Leaflet (<http://leafletjs.com>). The application we are developing is known as *MarylandViewer* and uses many of the web map services developed by the U.S. Geological Survey for *The National Map*. These services include NLCD land cover, impervious surfaces, and tree canopy. When completed, this application will be made available to AV Consortium members at no cost. One of the benefits of the application is that it can be easily deployed for a state, county, or other geographic area without having to maintain additional software licenses.



A portion of *MarylandViewer* output for the Baltimore-Washington corridor. The map shows 2006 NLCD land cover, roads, and watersheds from U.S. Geological Survey web map services made available as part of *The National Map*.

## StateView Partners / Cooperators

The MarylandView Consortium has the support of several key organizations, including the Towson University Center for Geographic Information Sciences, the Maryland State Geographic Information Committee (MSGIC), and the Maryland Space Grant Consortium. MSGIC represents 600 members of Maryland's GIS community. The Maryland Space Grant Consortium consists of: The Johns Hopkins University (lead institution); The Johns Hopkins University Applied Physics Laboratory; Morgan State University; The Space Telescope Science Institute; Towson University; Hagerstown Community College; The University of Maryland Eastern Shore; The University of Maryland College Park; The University of Maryland Baltimore County; The United States Naval Academy; Capitol College; and the National Center for Earth and Space Science Education.



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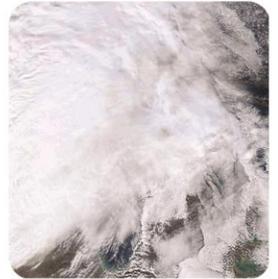
# MichiganView GY11

## Executive Summary



### ***Michigan in a Year***

It can be difficult for us to see the changes in our surroundings in a season, not only because the change is so slow, but because the Earth's surface grades smoothly from one state to the next, regardless of the hard divisions between spring, summer, fall and winter that we imagine. Satellite images provide a synoptic view of the landscape as it changes, but looking at any one image of the Earth from space doesn't reveal much about the landscape in transition. A series of such images, however, allows you to see these subtle changes, and that's just what MichiganView has created in the "Michigan in a Year" animation, available for download at MichiganView.org



Using freely-available, open-source software, MichiganView members created a series of "time lapse" views of the Great Lakes State. Michigan is imaged daily by the MODIS sensor aboard both the Aqua and Terra satellites; each frame of the animation(s) is stitched together from the imagery of these satellites for one day out of the year. These animations reveal interesting changes in Michigan's landscape: the drift of lake ice in nearshore areas, receding snow cover, the steady spread of springtime greens, and the swirling aquamarine of an algal bloom in Lake Michigan.

***Learn how to create your own animation and view those from 2008 to 2011 at MichiganView.org***

[www.MichiganView.org](http://www.MichiganView.org)

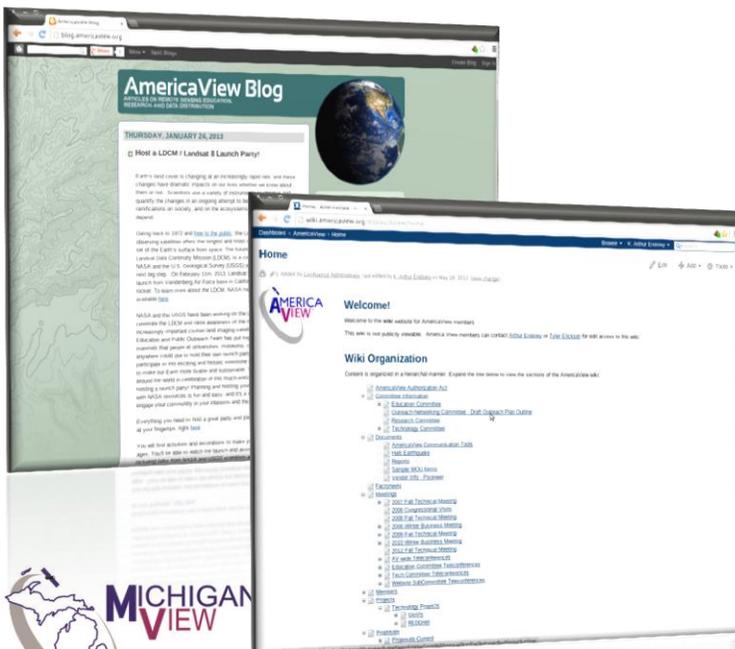
# AmericaView Blog

MichiganView continues to maintain the AmericaView Blog ([blog.AmericaView.org](http://blog.AmericaView.org)), an invaluable resource for StateViews to share their knowledge and accomplishments with each other and with the general public. In GY11, these and other topics were posted to the Blog:

- Introducing Laramie Junior High School students to remote sensing concepts...
  - Virginia middle school students view the Earth's surface in time and space
  - GPS workshop for "citizen scientists" at Whitegrass Ski Touring Center
- To date, the AmericaView Blog has garnered more than 36,900 page views

# AmericaView Wiki

MichiganView continues to host and maintain the AmericaView Wiki ([wiki.AmericaView.org](http://wiki.AmericaView.org)), a collaboration tool for StateView consortiums to use to share remote sensing algorithms and other methodologies.



[www.MichiganView.org](http://www.MichiganView.org)

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**Primary Investigator:** Nancy French  
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**Co-Investigator:** K. Arthur Endsley  
(<mailto:kaendsle@mtu.edu>)

*A view of Michigan provided by the MODIS sensor aboard the Terra satellite, taken August 28, 2010.*





# MinnesotaView

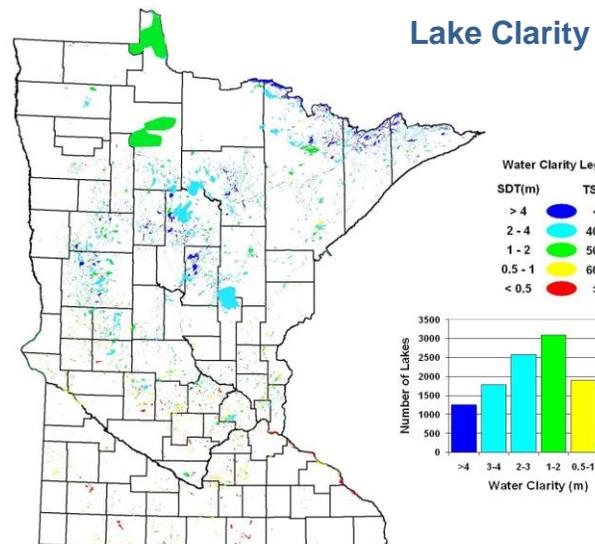
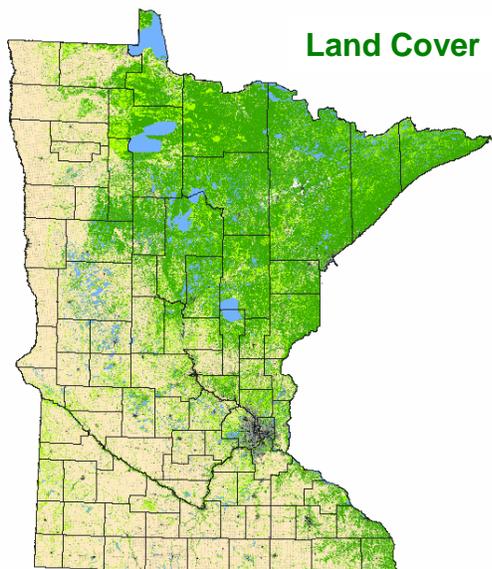
## Executive Summary

### Remote Sensing Resources for Minnesota



#### Bridging the Gap between Landsat Research and Applications

MinnesotaView supports the development, distribution and application of geospatial information derived from Landsat data for mapping, monitoring and analysis of land and water resources in Minnesota.



Statewide Landsat classifications of land cover (left) and impervious surface area (<http://land.umn.edu/>) are being used for planning and management by Minnesota agencies at state and local levels. Classification of lake clarity (<http://water.umn.edu/>) (right) a key indicator of water quality, using Landsat satellite imagery, has proven to be an accurate and economical method to monitor the condition of lakes in Minnesota.

#### Updating the Remote Sensing Core Curriculum

We are updating the content of the web-based Remote Sensing Core Curriculum (<http://www.r-s-c-c.org/>) and making it compliant with web/HTML standards and consistent in look and feel. It will provide an additional resource for remote sensing educators and users.

#### Partners

University of Minnesota, Minnesota Geospatial Information Office, Minnesota Department of Natural Resources

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MISSISSIPPI VIEW

# MississippiView Executive Summary



## MississippiView Website Migrated to a Content Managed System:



Website management and information distribution is often a problem for any organization that isn't large enough to employ web-tech savvy staff with the knowledge and resources to maintain a dynamic site. Technology and program advances have made things easier through resources called Content Management Systems (CMS). It may look the same but the underlying foundation of the MississippiView (MSView) Website has finally been converted to a CMS. In grant year 2011, MSView deployed a free and open CMS called Drupal ([www.drupal.org](http://www.drupal.org)), which provides for the easy and routine management and updating of content on a website. We can now add news items, posters and learning resources without the aid of a person skilled in HTML or other common website scripting languages.

The new website ([www.msview.olemiss.edu](http://www.msview.olemiss.edu)) with scrolling news items and rotating pictures.

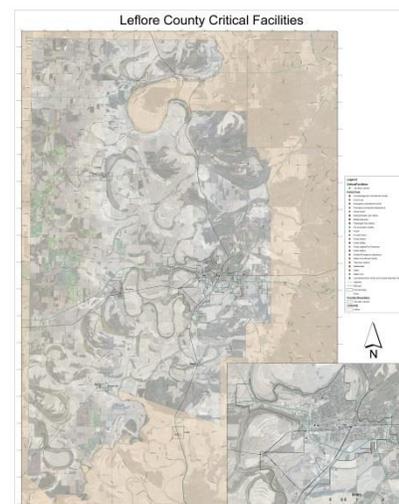
## International Education Week 2012

International Education Week 2012 was part of a U.S. State Department initiative to promote programs that prepare Americans for a global environment and attract future leaders. MSView participated in activities with the University of Mississippi Office of International Programs. AmericaView-branded images were produced and utilized in a "Where is this" type event where university students and staff attempted to guess where each of the images were. MSView produced a 2012 image of the University of Mississippi Oxford campus that was used as the contest prize.



## Ongoing Projects

MSView and the University of Mississippi Geoinformatics Center (UMGC) are currently working to produce high-resolution imagery and data maps for counties located in the Mississippi Delta. The Delta is an economically depressed region of the country consisting of the Mississippi River flood plain extending across parts of Louisiana, Arkansas, Missouri and Mississippi. As part of a Mississippi Mineral Resources Institute (parent organization of UMGC and MSView) project, the Emergency Management Offices in the Mississippi counties in the Delta were discovered to have little or no mapping resources. Using a list provided by the Mississippi Emergency Management Agency (MEMA), each of the Mississippi Delta counties is being provided with high quality map products identifying major features and MEMA-listed Critical Infrastructure. All of the county maps will be available through the MSView website when the project is completed in grant year 2012(summer of 2013.)



Draft image™ of the Leflore County Critical Facilities map.

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WEB SITE: [www.msview.olemiss.edu](http://www.msview.olemiss.edu)

# Executive Summary



## MONTANAVIEW

Bridging the Gap between Remote Sensing Research and Application

The mission of MontanaView is to assist Montana in using remote sensing resources to improve the health, safety, and prosperity of all Montanans. MontanaView pursues this mission through support for applied research, K-12 and higher education, workforce training, preparation for emergency response, and improved data availability.

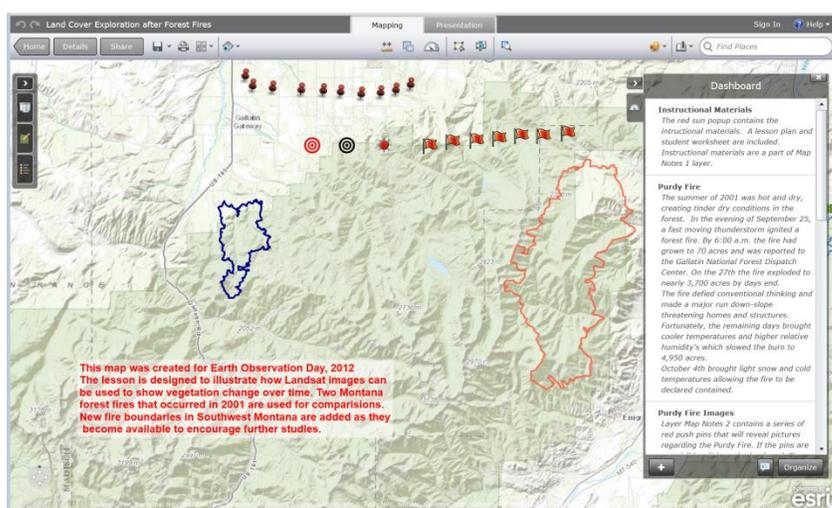
### Educating Tomorrow's Remote Sensing Workforce



Participants in MontanaView's Remote Sensing Institutes.

- Much of MontanaView's efforts during the 2011-2012 grant period focused on providing training for our state's K-12 educators to enable them to incorporate remote sensing and geospatial technologies into their classrooms.
- Our efforts were highlighted by multi-day Remote Sensing Institutes, which train K-12 teachers to incorporate remote sensing into their curricula. Institutes were held in Belgrade, MT, in August 2011, Livingston, MT in October 2011, and Helena, MT in August 2012.

### Earth Observation Day



- For Earth Observation Day 2012, MontanaView partner GeoEssentials created an on-line lesson using ArcGIS Explorer (<http://www.arcgis.com/explorer/?open=087dbb9a2fa348a8bdef3dc3061791f5&extent=-12401295.9207745,5668703.16705952,-12300085.2858809,5721868.87259145>)
- The lesson was designed to illustrate how Landsat images can be used to show vegetation change over time.
- Forest fires that occurred in southwest Montana were used to illustrate the power of the Landsat archive.

## Web Resources for Montana Remote Sensing

home | contact list  
education | research | resources

# MONTANAVIEW

**What is MontanaView?**  
MontanaView is a consortium of universities, non-profit organizations and government agencies working within Montana to advance the availability and timely distribution of remotely sensed data.

## Supporting Remote Sensing Goals

- To advance the availability and timely distribution of data by maintaining an **archive** of publicly available satellite imagery for Montana.
- To advance remote sensing through **education and outreach** in the public and private sectors.
- To advance remote sensing and sustainable technology transfer through **research**.
- To build the MontanaView consortium through development activities that increase the organization's visibility and draws new members.

### Hot Topics

- Earth Observation Day**  
April 11, 2012 -- The 2nd Wednesday in April is officially established as the annual EO Day! The fourth annual Earth Observation Day is sponsored by AmericaView and MontanaView in cooperation with the USGS. AmericaView's Earth Observation Day is supported by a **website** that offers a wealth of educational resources. Listen to a **podcast** about Earth Observation Day here.

### Recent News

- Remote Sensing Teacher Institute**  
June 27 -- June 30, 2011  
Learning and applying remote sensing technologies: This four day workshop introduced and taught the principles and hands-on applications of remote sensing that can be incorporated into classrooms. The Remote Sensing Teacher Institute was held in Livingston, MT at Park County High School. For more information or future trainings, email either [Van Shelton](#) or [Christine Semmes Austin](#).

**GET DATA**  
AMERICA VIEW  
America View

- MontanaView continued to maintain a website designed to provide remote sensing resources to meet the needs of the Montana geospatial community
- Among other things, the MontanaView site provided breaking news relevant to Montanans, data resources for free download, and a list of remote sensing experts in Montana.

## Partners





# NebraskaView



## Remote Sensing Resources for Nebraska

<http://nebraskaview.unl.edu/>

### Promoting the Benefits of Remote Sensing Data and Applications

**Remote Sensing**  
lets you *Get a Different View...*

For more information, check out  
NebraskaView at  
<http://nebraskaview.unl.edu>

UNIVERSITY OF  
**Nebraska**  
Lincoln

**NEBRASKA**  
**VIEW**

Since the early 1970s, billions of dollars have been spent by the federal government and the private sector on satellite-based Earth observing systems. The **goal** of NebraskaView geospatial outreach activities is *to educate Nebraskans about the great variety of geospatial products and applications that are available to them.*

NebraskaView is active in **K-12 Educational Outreach**. We support middle and high school Geoscience and Earth System education goals in the state by providing free resources and expertise to teachers through the **Nebraska Association of Teachers of Science (NATS)** conferences, the **Geographic Educators of Nebraska (GEON)** summer institutes, and **Teacher's Night Out** events.

### Increasing Access to Publicly-Available Geospatial Data

NebraskaView provides on-line access to over 500 satellite and aerial images, and other geospatial data for Nebraska through its **website** at <http://nebraskaview.unl.edu/>. NebraskaView and its partners are currently working with the Nebraska Office of the Chief Information Officer (CIO), the Nebraska Information Technology Commission (NITC) and the Nebraska GIS Council to develop a **statewide geospatial data portal**, NebraskaMAP, (right) expected to be operational in 2013.



NebraskaView also uses various public venues to educate the general public about geospatial technologies and how they are intertwined with daily life. These include the annual **NaturePalooza** at the Nebraska State Museum, **Geography Awareness Week** and **Weatherfest**, held at the University of Nebraska.

NebraskaView supports Nebraska government agencies by assisting with training and data. In the past we've worked with the **Nebraska Game & Parks Commission**, as well as the **Nebraska Department of Natural Resources**, to facilitate applications of geospatial data.

*Dr. James Merchant, PI and Milda Vaitkus,  
Program Coordinator  
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<http://nebraskaview.unl.edu>



# New Hampshire View Executive Summary

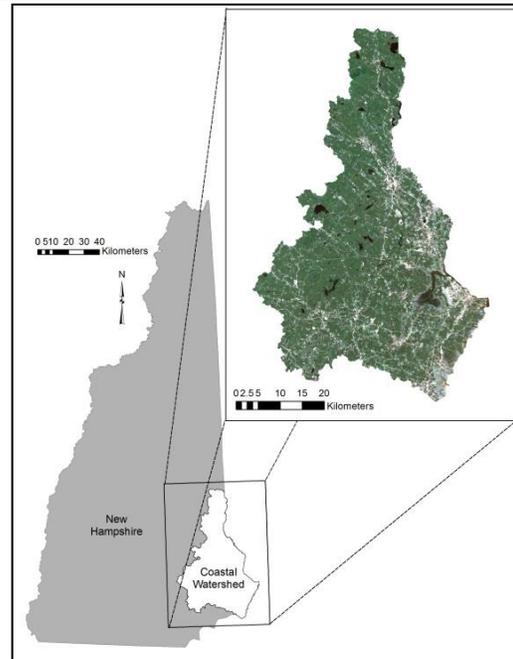


## Remote Sensing Resources for New Hampshire

### Promoting the Benefits of Remote Sensing Data and Applications

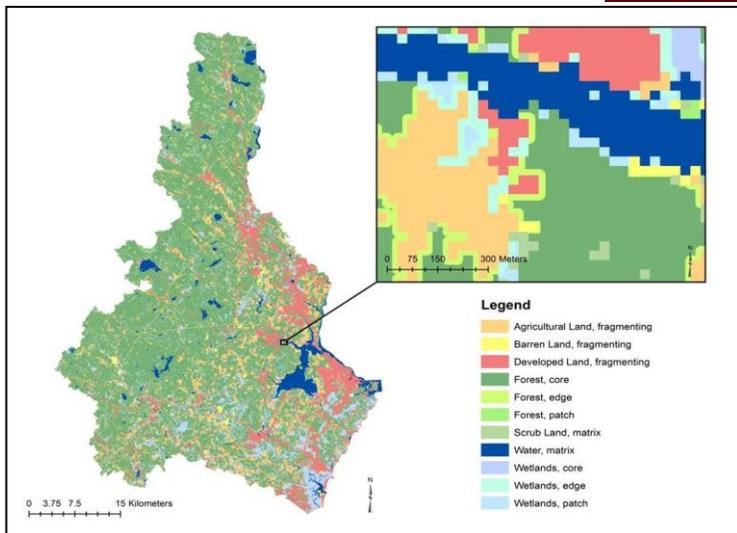
#### Land Cover Change Detection and Landscape Fragmentation Analysis in the Coastal Watershed of New Hampshire

Landsat Thematic Mapper (TM) satellite imagery was used to create land cover maps of the Coastal Watershed of New Hampshire every three years from 1986-2010. Traditional pixel-based image analysis techniques were compared to new object-based methods. Also, a single date of imagery was compared to using multiple dates of imagery for a single year. A quantitative accuracy assessment was performed and the most accurate maps selected for further analysis. These maps were then used to investigate change in land cover type over this 24 year period. Additionally, a fragmentation analysis was performed for each map. Fragmentation occurs when a uniform land cover area is split into different parts by some other cover type (e.g., a forest being divided by an agricultural field). A new software program called PolyFrag (<http://www.unh.edu/unhtoday/2012/08/maps-environmentalists>) was developed to conduct the fragmentation analysis



Project study area including a Landsat Thematic Mapper image showing the extent of the Coastal Watershed.

### Benefits of application(s) to New Hampshire



Fragmentation analysis of the Coastal Watershed with the insert showing the detailed results.

A great deal of money has been spent by the federal government and private sector on satellite-based Earth observing systems since the early 1970's. In response to this investment, the research community has developed practical applications for mapping, monitoring, and managing natural and environmental resources. The potential of remote sensing technologies has been widely recognized over the years, yet the distribution of real-world applications has and continues to be problematic. The New Hampshire View consortium works to bridge the gap between the research and application communities in NH.

Change detection is extremely useful for monitoring land cover change and investigating the impacts of our management decisions on the environment. Our new software program, By using PolyFrag, policy and decision makers will be provided additional insight into the impacts of urban development and habitat loss on the landscape.

New Hampshire View 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.



AmericaView Web Site: [www.americaview.org](http://www.americaview.org)

Chair of the AmericaView Board: Rebecca Dodge ([rebecca.dodge@mwsu.edu](mailto:rebecca.dodge@mwsu.edu))

Executive Director: Rick Landenberger ([rick.landenberger@mail.wvu.edu](mailto:rick.landenberger@mail.wvu.edu))

Program Manager: Debbie Deagen ([debbie.deagen@montana.edu](mailto:debbie.deagen@montana.edu))

## Other New Hampshire View Activities (Grant Year 2011)

### Education / Outreach:

- Guest Lectures on Remote Sensing & Geospatial Technologies
- Presentations at AmericaView, American Society for Photogrammetry and Remote Sensing (ASPRS), and other conferences
- Workshops taught on Accuracy Assessment and Object-Oriented Image Classification at ASPRS conferences
- NHView Director Congalton honored with Estes Memorial Teaching Award (ASPRS)

### Applied Research:

- Supported 2 Undergraduate Research Internships & 1 Graduate Student
- Accuracy Assessment Tools on NHView website

### Data Provision / Support:

- Supports faculty by sharing software licenses and survey-grade GPS units
- Geospatial data and remotely sensed imagery archived by our partners



New Hampshire View Director Russ Congalton was awarded the 2012 Estes Memorial Teaching Award by ASPRS in honor of his commitment to teaching geospatial technologies.

**New Hampshire View** provides a means to bring many groups that use remotely sensed imagery and other geospatial data together in a formal way to aid communication and the pooling of resources. In addition, the consortium provides a single point of access for anyone in the state needing imagery or wishing to learn more about geospatial technology resources within New Hampshire. For its members, the consortium provides networking and collaboration infrastructure, educational support and outreach.



New Hampshire View Director:  
Dr. Russell G. Congalton  
Professor of Remote Sensing and GIS  
Department of Natural Resources & the Environment  
56 College Road, 114 James Hall  
University of New Hampshire  
Durham, NH 03824

## StateView Partners / Cooperators

### **Department of Natural Resources & the Environment, UNH**

The Basic and Applied Spatial Analysis Lab (BASAL) for basic research on spatial data uncertainty/map accuracy and applied research applying the tools of remote sensing, GIS, and spatial data analysis to solving natural resource problems.

### **NH GLOBE Partnership, UNH**

Carries out GLOBE teacher training in the areas of atmosphere, land cover, hydrology, soil and earth system science data collection and analysis with a focus on land cover mapping and geospatial technologies.

### **EOS-WEBSTER, UNH**

A digital library of Earth science data that serves scientists, educators and the general public.

### **NH GRANIT, UNH**

A cooperative project to create, maintain, and make available a statewide geographic data base serving the information needs of state, regional, and local decision-makers.

### **Civil Technology Program, UNH**

The Thompson School of Applied Sciences provides a 2-year Associates Degree in the geospatial technologies.

### **Diamond Library, UNH**

The library maintains an extensive map and aerial photo collection for NH.

### **Forest Watch, UNH**

A New England-wide environmental education activity using field, laboratory, and satellite data analysis methods for assessing the state-of-health of local forest stands.

### **Cooperative Extension, UNH**

Offers a series of short courses in geospatial technologies including GIS, GPS, and field mapping.

### **Dartmouth College**

Department of Geography and others

### **NH Planning Commissions**

### **NH GIS Conservation Collaborative**

### **NH Fish and Game Department**

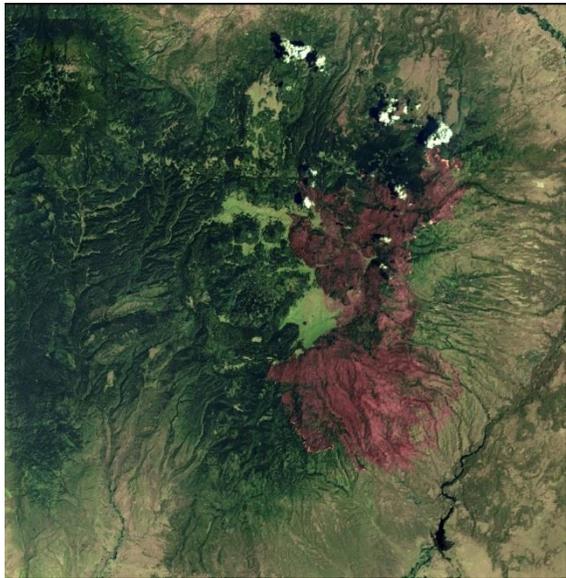


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## Remote Sensing Resources for New Mexico

Promoting the Benefits of Remote Sensing Data and Applications

### Bridging the gap between research and application in New Mexico



Landsat 5 Satellite Image of active Los Conchas Fire (in red) in 2011 near Los Alamos, New Mexico

New Mexico View seed funding has focused on providing training to professional land managers and future natural resource managers. Funded projects have provided basic remote sensing training and use of satellite imagery. Of recent particular interest are applications using satellite imagery to quantify changes in land cover based on historically large fires. Courses such as those created by the New Mexico Forest & Watershed Restoration Institute, New Mexico Highlands University (NMHU) fulfill this need.

### Benefits to New Mexico

Remote sensing has been used in New Mexico by a wide variety of state and federal agencies, universities, private entities and non-profit organizations. Uses have focused on natural resource management activities including fire and range management, and species conservation. A challenge for the New Mexico remote sensing community is to get the many developed applications for mapping, monitoring, and managing natural resources into the hands of managers in a format that can be applied on the ground. These applications have developed by USGS, USDA, and University partners. Our New Mexico View consortium is working on methods to bring the research and application communities together in New Mexico.

### About New Mexico View

New Mexico View is a consortium of public, private, and non-profit organizations that are promoting remote sensing in New Mexico through sharing of resources, developing a remote sensing infrastructure and supporting remote sensing research and education in the state.

### New Mexico View Partners

New Mexico State University (NMSU)  
Department of Animal and Range Sciences  
Department of Fish, Wildlife, and Conservation Ecology  
Department of Geography  
New Mexico Space Grant Consortium (NMSGC)  
U. S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Jornada Experimental Range (JER)

U.S. Geological Survey, N.M. Cooperative Fish and Wildlife Research Unit (USGS)  
Bureau of Land Management (BLM)  
Human Systems Research Inc.  
New Mexico Forest & Watershed Restoration Institute, New Mexico  
Highlands University (NMHU)  
Northern New Mexico College  
Asombro Institute for Science Education



#### PI and Coordinator

Ken Boykin

New Mexico Cooperative Fish and Wildlife Research Unit  
Department of Fish, Wildlife, and Conservation Ecology  
New Mexico State University  
Box 30003, MSC 4901, Las Cruces, NM 88003



Phone: 575.646.6303

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WEB SITE: [NewMexicoView.nmsu.edu](http://NewMexicoView.nmsu.edu)



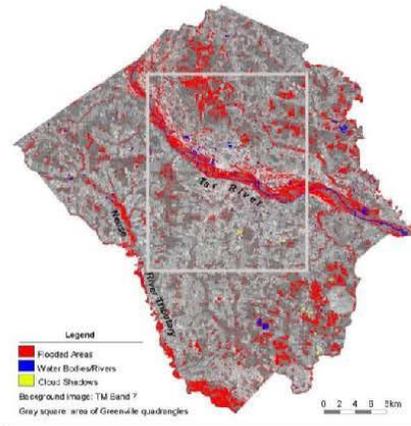
Since 2009, the North CarolinaView (NCView) consortium has been a network of North Carolina remote sensing users from universities, community colleges, and local governments. The primary goal of the NCView consortium is to foster and promote the uses of remotely sensed datasets and technologies in educational institutions; state, county, and local government agencies; and the private sector.

**NCView Objectives**

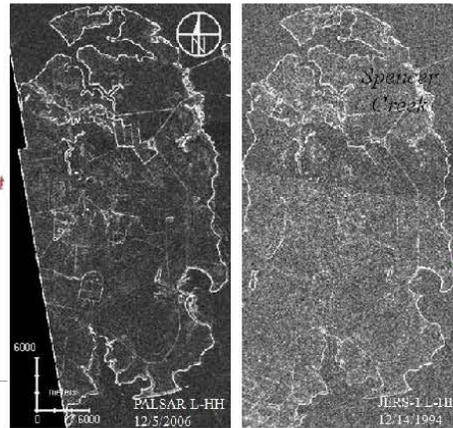
- Further the use of remote sensing in North Carolina to address critical issues facing the State
- Enhance remote sensing educational opportunities in North Carolina
- Develop and enhance collaborative relationships of academic, federal, state, county, city, and public and private sector users
- Locate, access, and retrieve remotely sensed data and applications statewide
- Increase consortium membership

**Current NCView Membership**

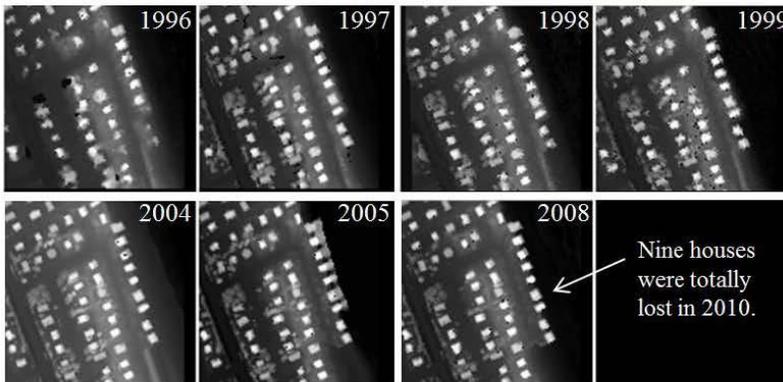
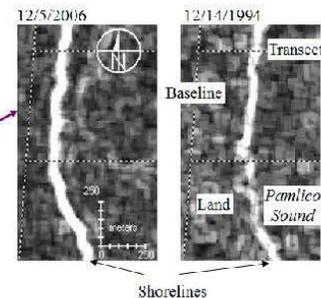
- East Carolina University (Lead Institution)
- University of North Carolina at Chapel Hill
- University of North Carolina at Wilmington
- Central Piedmont Community College
- Pitt County Management Information Systems
- Information Technology Services of the City of Wilson, NC
- Appalachian State University
- University of North Carolina at Pembroke



Flood mapping using Landsat data. The 1999 flood event occurred in Pitt County, NC.



Shores with noticeable shoreline erosion derived from satellite data, Albemarle-Pamlico Sounds, NC



Lidar data and beach erosion from 1996 to 2008, Outer Banks, NC



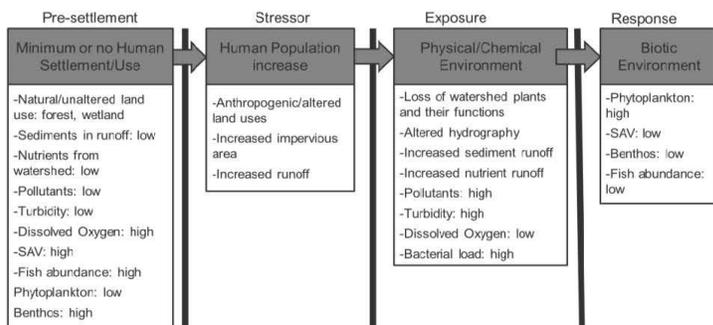
Mapping seagrass, dark patches located parallel to the shoreline of Jarrett Bay, Core Sound, NC.

### Effects of Land Use Change on Juvenile Fishes, Blue Crab, and Brown Shrimp Abundance in the Estuarine Nursery Habitats of North Carolina

**Background info:** Coastal regions of the U.S. are home to more than half of the American population. The coastal counties' populations are growing much faster than that of inland counties. With a high density and an increasing population, there are rapid changes in land-use and land-cover (LULC) types, characterized mostly by the increase in areal coverage of anthropogenic land uses (agriculture and developed), while "natural/unaltered" land uses (forest and wetland), as documented by Landsat Global Land Cover products between 1980 and 2005, are in decline. The human population growth and LULC type changes caused by humans generate nutrients and pollutants to coastal waters, which can affect water quality and aquatic life.

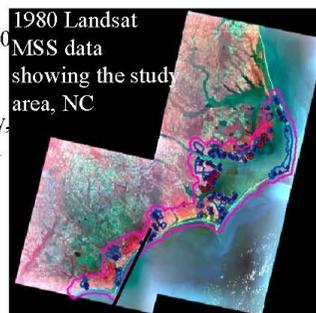
**Hypotheses:** 1. LULC type change affects estuarine juvenile fish and invertebrate abundance, 2. Developed and cultivated lands are associated with lower abundance of targeted species as shown in the NC Division of Marine Fisheries (NCDMF) juvenile sampling program.

#### Conceptual Model of Land use change Impacts on Estuaries

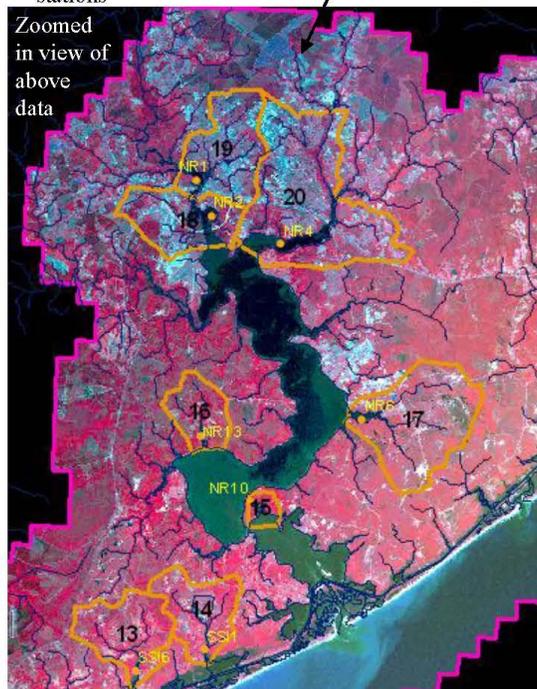
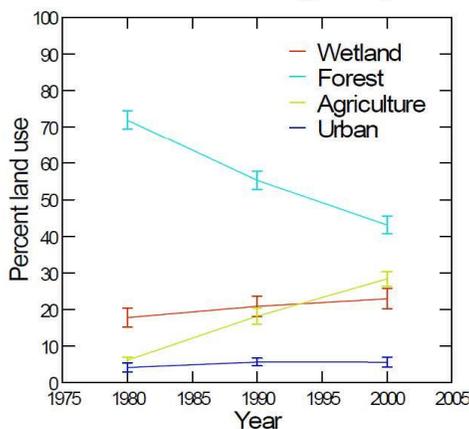


#### Datasets for Land Use Land Cover Change

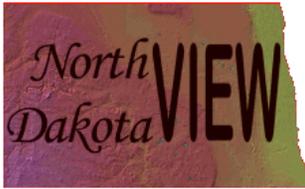
- Landsat data of 1980, 1990 and 2000
- GIS layers of watersheds, water bodies, hydrography, roads, Concentrated Animal Feeding Operations, US census data, inlets
- GPS points for NCDMF sampling stations



**Result:** LULC type changes that might impact fish and invertebrate species abundance at 71 selected estuarine stations sampled by program 120 were analyzed. Interested land use categories were forest, wetland, agriculture, and developed areas. The fish and invertebrate species were: Atlantic croaker, Atlantic menhaden, pinfish, southern flounder, spot, blue crab, and brown shrimp. Between 1980 and 2000, within the immediate NC coastal watersheds, forest lost about 30.1% of its total area to the increase (~24.1%) of agriculture area. The long-term trends in abundance of juveniles of selected fish and invertebrate species indicated declines at certain sampling stations, and increases at others. LULC type change impacts were observed for blue crab at 66% of the NCDMF stations, 42% of stations for southern flounder, and 8% of stations for Atlantic croaker. These three species were ranked first, second, and fourth in commercial value in NC fisheries. Thus, LULC type change had the greatest impact on species that were targets of intensive commercial fishing.



*For additional information contact:  
Dr. Yong Wang @ (252) 328-1043 and wangy@ecu.edu*



# North Dakota View

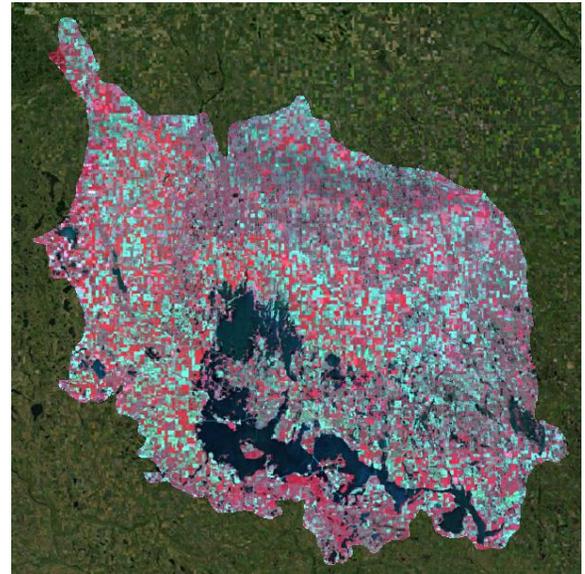


## Executive Summary

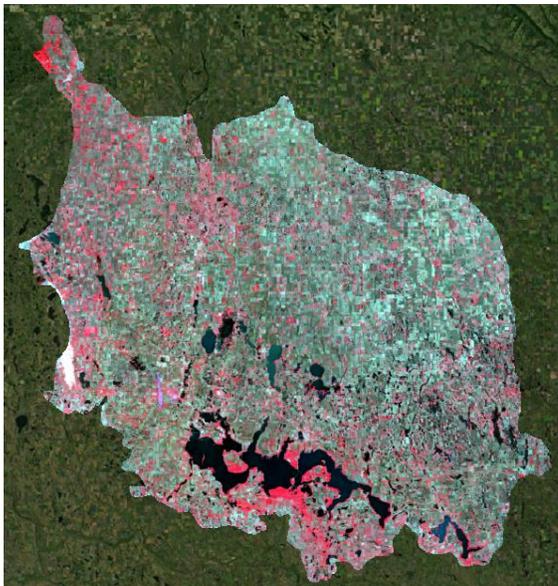
### Remote Sensing Resources for North Dakota

#### Promoting the Benefits of Remote Sensing Data and Applications

The North Dakota View consortium works to raise awareness about remote sensing and geospatial technologies among the citizenry of North Dakota through various outreach and training efforts. We provide training and informational workshops to interested groups, with a focus on K-12 educators and students. We also provide technical expertise to academic and citizen scientists using geospatial technologies. Scholarships are available to students at North Dakota View partner institutions to assist with their development as geospatial professionals. Consortium members do research of interest to the citizenry of North Dakota and present results through oral presentations and written publications. We currently focus on the use of remote sensing to monitor landscape changes associated with flooding in the Devils Lake Basin and the oil boom in western North Dakota.



July 2011 Landsat mosaic of the Devils Lake Basin. Note the extent of lake and wetland flooding when compared to the image at left below.



July 1996 Landsat mosaic of the Devils Lake Basin.

#### Benefits of applications to the state

Billions of dollars have been spent by the federal government and private sector on satellite-based earth observing systems since the early 1970s. In response to this investment, the research community has developed practical applications for mapping, monitoring, and managing natural and environmental resources. Potential uses for remote sensing technology have been widely recognized over the years, yet the distribution of real-world applications has been, and continues to be, a challenging issue for both the federal government and the academic research community. Our North Dakota View consortium works to bridge the gap between the research and application communities in North Dakota by providing access to value-added remotely sensed data, and materials and software developed for remote sensing education; and assistance acquiring and processing remotely sensed imagery.

North Dakota View 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.



AmericaView Web Site: [www.americaview.org](http://www.americaview.org)

Chair of the AmericaView Board: Rebecca Dodge  
([rebecca.dodge@mwsu.edu](mailto:rebecca.dodge@mwsu.edu))

Executive Director: Rick Landenberger  
([rick.landenberger@mail.wvu.edu](mailto:rick.landenberger@mail.wvu.edu))

Program Manager: Debbie Deagen  
([debbie.deagen@montana.edu](mailto:debbie.deagen@montana.edu))

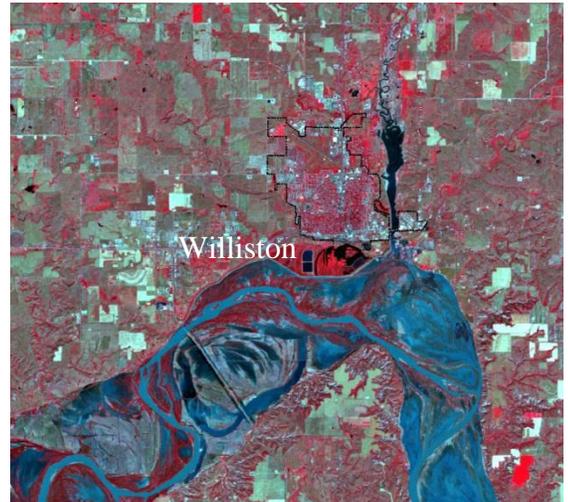
## Dedicated to Education, Outreach, and Research

North Dakota View is headquartered in the Geography Department at the University of North Dakota (UND). Affiliated faculty and students at UND work with partners across the state to develop or update geospatial technology courses and programs. We also share software educational licenses among consortium members, eliminating the cost barrier that many potential users of the data face. North Dakota View develops curriculum for and provides workshops to K-12 educators and students.

Applied research focuses on timely issues of interest to the citizenry of the state of North Dakota. We are currently working to monitor the impacts of persistent lake flooding in the Devils Lake Basin and to monitor and map landscape changes associated with tremendous population growth in northwestern North Dakota as the result of the state's oil boom.

North Dakota View maintains a data archive, NDViewer, to make selected value-added datasets readily available. The URL for NDViewer is <http://134.129.192.253/apps/ndview/>.

If you would like more information about North Dakota View please contact us using the information provided below.



Another area being monitored for change is Williston and the surrounding landscapes of northwestern North Dakota, the heart of the state's oil boom. The area exhibiting a blue tone south of the City of Williston is the Missouri River floodplain. This Landsat 5 color-infrared image was acquired in August 2011, near the end of a prolonged period of record-breaking floods in the Missouri River corridor.

### North Dakota View Partners / Cooperators



Department of Geography  
University of North Dakota



Dakota Science Center  
Grand Forks, ND



North Dakota State Government  
Information Technology Department  
Geographic Information Systems Office



Sitting Bull College  
Fort Yates, ND



Turtle Mountain Community College  
Belcourt, ND

For a complete list of partners and cooperators see [http://www.und.nodak.edu/org/ndview/index\\_files/Page490.htm](http://www.und.nodak.edu/org/ndview/index_files/Page490.htm)

**Bradley C. Rundquist, Consortium Director**  
Department of Geography  
University of North Dakota  
Grand Forks, ND, 58202



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[bradley.rundquist@und.edu](mailto:bradley.rundquist@und.edu)  
<http://www.und.nodak.edu/org/ndview>

## Remote Sensing Resources for Ohio

### Promoting Benefits of Remote Sensing Data and Applications Through...

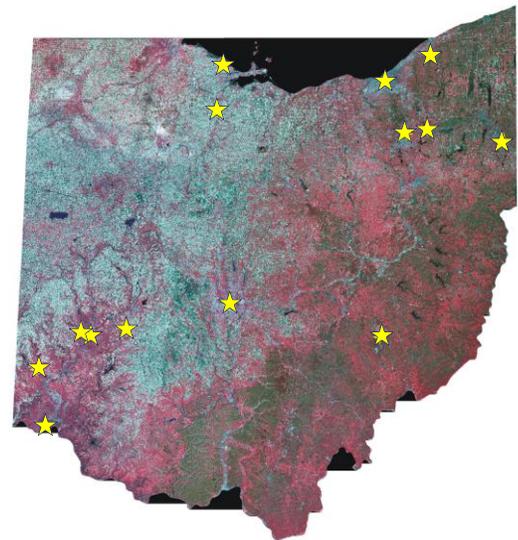
#### Collaborative Software Pool Program

OhioView, with its 14 diverse and geographically spread members, provides a robust, statewide foundation for leveraging university faculty and departmental budgets (technology/lab fees, other grant funds) to continue and enhance education, activities, and research using Geospatial Technologies.

For the past 12 years OhioView has operated a cooperative software pool. This has allowed the consortium to negotiate substantially reduced costs on the most widely used remote sensing software products, thereby enabling the consortium universities to offer a range of courses and degree programs and carry out extensive research.

The pool is open to all members and requires an annual payment of \$3,500. In grant year 2011, 11 of the 14 OhioView universities contributed to the cooperative pool, allowing for more community access of software products to support remote sensing research and education. The software products currently purchased are: eCognition, ENVI+IDL, ERDAS Imagine (including ER Mapper), and Idrisi. Many universities are offering courses in and/or carrying out research using all four of the above products, and in grant year 2011 a conservative estimate of 676 students (representing 8 universities) were trained in utilizing the software!

The Collaborative Software Pool has been an unalloyed success which is conveyed in the attached testimonials and is a key factor in the long-term success and viability of OhioView as a consortium.



False Color-IR Landsat7 Satellite Mosaic of Ohio using scenes from 2000-2001.

Yellow stars indicate location of the 14 OhioView members denoting its strength in geographically spread partnerships!



Students presenting their research project on "Vegetation Effect on Deer Population in 4 Ohio Counties" using Landsat Imagery at the 2012 SATELLITES Conference!

#### SATELLITES Program

"Students And Teachers Exploring Local Landscapes to Interpret The Earth from Space" has been in existence for over 10 years!

The program has established an excellent reputation of teacher professional development and engaging K-12 students in real-world science. The program consists of: teacher/student/scientist partnerships, a week-long teacher institute, training on geospatial technologies and field observation techniques, hands-on student field work linked to climate change, inquiry-based lessons and research projects, and a conference where students present their poster projects. The entire program is mapped to the Ohio Education Standards.

In the past two years, three groups of students have presented their projects at the White House Science Fair to President Obama.

During this reporting period, OhioView leveraged AmericaView funds & obtained an additional ~\$70,000 in outreach grants awarded to Kevin Czajkowski (University of Toledo) for SATELLITES.

AmericaView Web Site: [www.americaview.org](http://www.americaview.org)

Chair of the AmericaView Board: Rebecca Dodge  
([rebecca.dodge@mwsu.edu](mailto:rebecca.dodge@mwsu.edu))

Executive Director: Rick Landenberger  
([rick.landenberger@mail.wvu.edu](mailto:rick.landenberger@mail.wvu.edu))

Program Manager: Debbie Deagen  
([debbie.deagen@montana.edu](mailto:debbie.deagen@montana.edu))

OhioView 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.

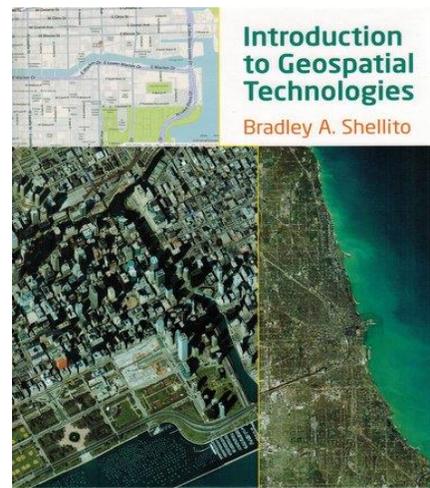
## **Introduction to Geospatial Technologies (textbook)**

by Bradley A. Shellito (Youngstown State University)

This textbook was published in 2011, went into its 4<sup>th</sup> printing in 2012, and its second edition is scheduled for 2013.

The book is aimed at a beginner level audience presenting the topics of remote sensing, GIS, and GPS and their real-world applications. Each chapter has two sections: an introduction to the technology and a hands-on lab activity utilizing free online resources and software. There is a chapter on satellite imagery (including Landsat and its applications), and the final chapter has sections on OhioView, AmericaView, and the SATELLITES Program.

The book has been adopted at over 80 colleges & universities in the United States and Canada, including eight OhioView institutions!



Textbook cover showing a Landsat Satellite Image!

### **Benefiting the Workforce through Applications and Outreach...**

OhioView imagery and/or pooled software were used in at least 58 projects including funded research projects, graduate theses and dissertations, and student and faculty paper and poster presentations!

At any given time there are numerous student internships existing with OhioView and its partners or private sector.

#### **Applied Research:**

- \* Glacial Landform Analysis in the Great Lakes Region
- \* Prehistoric/historic Land Use in Ohio
- \* Developing an Operational Tillage Information System
- \* Monitoring Agricultural Sewage Sludge Application
- \* Climate Change Education: Engaging Teachers and Students and Correcting Misperceptions using NASA Data
- \* Interdisciplinary Science Applications to Glacier and Alpine Hazards in Relation to Development and Habitation in the Hindu Kush-Himalaya
- \* Subglacial Landform Analysis at Skeiderarsandur, Iceland
- \* Understanding Ancient Maya Land Use in Yucatan, Mexico for workforce personnel

#### **Data Provision / Support:**

- \* For ease of access, data archives are moving to a centralized location – OhioLink (The Ohio Library and Information Network)
- \* Data provides base layer for applications & learning
- \* Aggregate Ohio Landsat dataset exists since 1999
- \* Data processed at higher precision than USGS
- \* Entire data archive is COST-FREE to everyone!

#### **Education / Outreach:**

- \* Workshops conducted at Ohio GIS Conference

### **OhioView Members and Partners / Cooperators**

#### **14 Members Include:**

Bowling Green State University  
Central State University  
Cleveland State University  
Kent State University  
Lakeland Community College  
Miami University  
Ohio University  
The Ohio State University  
University of Akron  
University of Cincinnati  
University of Dayton  
University of Toledo  
Wright State University  
Youngstown State University

#### **Partners Include:**

Cleveland Metroparks  
NASA (various centers/divisions)  
OGRIP (Ohio Geographically Referenced Information Program)  
OhioLink (The Ohio Library and Information Network)  
Ohio Space Grant Consortium  
The GLOBE Program  
USGS EROS Center

In an ongoing fashion, OhioView collaborates with various, significant partners to leverage cost-sharing of faculty, personnel, data, and software to support its mission of increased Ohio public awareness and education of geospatial technologies.

#### **Principal Investigator:**

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#### **State Coordinator (as of 12/2012):**

*Terri Benko*  
Visions & Passions Program Management  
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Kirtland, Ohio 44094  
Voice: 419-277-1434



## Remote Sensing Resources for Pennsylvania

### Remote Sensing Data and Applications

**Remote Sensing Survey** - PennsylvaniaView and Dr. Sader (University of Maine) were interested in examining remote sensing education. Their research examined the number and type of remote sensing courses that are being offered at the undergraduate level in North American universities utilizing a survey.

### Benefits to the state and country

This research helped set a baseline of undergraduate remote sensing courses that will hopefully lead to future research on this topic. For example, there are a variety of different courses being taught under remote sensing. The research was published in the December 2012 edition of the *Photogrammetric Engineering and Remote Sensing journal*. Our PAView consortium works to bridge the gap between remote sensing and the public in our state through education and service.

### Other Projects from our Partners

**Penn State** continues to maintain and update the PAView website and data collection. The collection is constantly being updated with LIDAR, MODIS, NAIP, etc.

<http://www.paview.psu.edu/data.html>

**Villanova** purchased remote sensing imagery (GeoEye) and received training (ESRI) for its new course - *Geography of Brazil and South America*. This imagery helps illustrate deforestation and is available to the public.

**Wilson College** provided monthly GPS lab experiences to students and educators. The goal was to increase their knowledge of geo-spatial technology and expand collaboration between Wilson and other schools.

**Clarion University** assisted in creating an accurate and up-to-date land cover classification map (Spring 2012). The aim of this project was to conduct a detailed land cover classification of a selected set of municipalities in Clarion County using a hybrid method that involves the use of Landsat Enhanced Thematic Mapper (ETM) satellite imagery in combination with the available aerial photography from both PAMAP and the USDA's National Agriculture Imagery Program (NAIP).



PENNSYLVANIA STATE UNIVERSITY





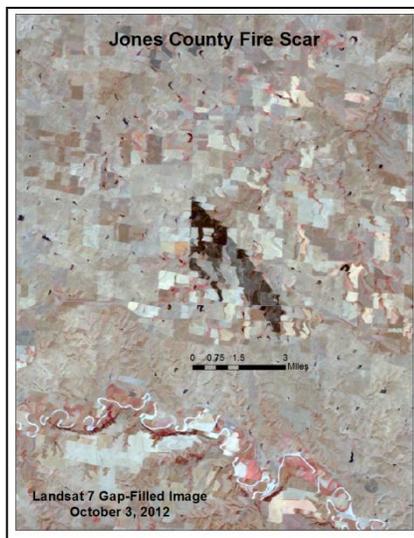
# South Dakota View Executive Summary



## Remote Sensing Resources for South Dakota

### Promoting the Benefits of Remote Sensing Data and Applications

#### Using Landsat Imagery to Determine the Extent of a Fire in Jones County, South Dakota



October 3<sup>rd</sup>, 2012, Landsat 7 false-color image showing the extent of a September 19<sup>th</sup>, 2012 (dark area in center of image), fire in Jones County, South Dakota.

South Dakota was one of many states that experienced a severe drought in 2012. One of the many devastating effects of the drought was fires that destroyed many acres of cropland and rangeland in the state. One such fire occurred in Jones County on September 19, 2012. The Landsat 7 image shown on the left was acquired on October 3, 2012. It clearly shows the area affected by the fire. Landsat imagery can be similarly used to document the extent of fires in forested areas.

#### Benefits of Remote Sensing in South Dakota

Billions of dollars have been spent by the federal government and the private sector on satellite-based Earth observing systems since the early 1970s. In response to this investment, the research community has developed practical applications for mapping, monitoring, and managing natural and environmental resources. Potential uses for remote sensing technology have been widely recognized over the years, yet the distribution of real-world applications have been, and continue to be, challenging issues for both the federal government and the academic research community. Our South Dakota View consortium works to bridge the gap between the research and application communities in South Dakota. **Educating the current workforce as well as the workforce of tomorrow (K-16 students) about the benefits of remote sensing and related geospatial technologies (such as geographic information systems [GIS] and global positioning systems [GPS]) is a major area of emphasis for South Dakota View.**

#### Remote Sensing Education in South Dakota

A *Geospatial Technology for Educators* workshop was held May 29 - June 1, 2012, at USGS EROS with 16 K-12 educators in attendance. The geospatial topics of remote sensing, GPS and GIS were presented during the workshop by the instructors (3), EROS personnel (3), and the GIS director for the City of Sioux Falls. Each attending educator received a GPS unit, a \$175 stipend, GIS books and software, reduced tuition for university credit, and other related materials. Lesson plans involving geospatial technologies were prepared by each of the attendees for use in their classrooms. The total number of students impacted by these educators for the 2012-2013 school year is estimated to be 1600.

##### Other SDView Educational Efforts:

- Hands-on classroom experience with Dell Rapids High School agriculture students
- Three Flandreau Indian School Success Academy hands-on sessions
- Three *Geospatial Adventures* sessions for high school girls as part of the Ready, SET, Go! workshop at South Dakota State University (SDSU)
- *Geospatial Adventures* session with Youth Engineering Adventures campers at SDSU
- *Spatial Data Access and Use* workshop as part of the Eastern SD Water Conference



K-12 educators (16) and instructors (3) at the SDView *Geospatial Technologies for Educators* workshop held May 29 - June 1, 2012, at the USGS Earth Resources Observation and Science (EROS) Center near Sioux Falls, SD.

##### **SDView Principal Investigator:**

**Mary O'Neill**  
**Water Resources Institute**  
**211 Ag Engineering**  
**South Dakota State University**  
**Brookings, SD 57007**



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**Website: <http://sdview.sdstate.edu>**



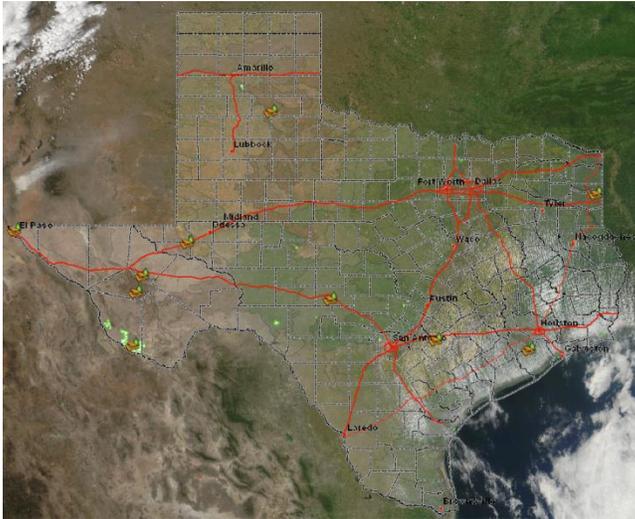
# TexasView Executive Summary



## Remote Sensing Resources for Texas

Promoting the Benefits of Remote Sensing Data and Applications

### Incorporating Satellite Imagery in the Texas Essential Knowledge and Skills (TEKS)



Education is the key to the future and TexasView is taking an active role in leveraging America's investment in satellite imagery to educate our young people. Working with five teams of educators from Texas institutions of higher education, TexasView is incorporating remote sensing technology into the TEKS for high school students in Texas using web-based mapping technology and a variety of satellite data.

### Investing in the future

The federal government and private sector have spent billions of dollars on satellite-based Earth observing systems since the early 1970's. Now TexasView is helping to incorporate that investment into the educational experiences of high school students across the State. The resulting "scope and sequence" blueprints will guide teachers in how to teach all of the TEKS in high school Earth and Space Science classrooms across Texas. Activities built around the TexasView EODay Website integrate satellite imagery into the daily classroom lessons.

The TexasView EODay Website is an interactive web-mapping application offering a variety of satellite imagery overlaid with ecological data. Links to Texas Park Service web sites allow students to go on virtual field trips without leaving the classroom.



The Davis Mountains are revealed in rugged relief in this detail from the Texas EODay Website Landsat data layer.

### Other TexasView Projects

- Introduction to Image Processing Workshop
- AmericaView Multi-state Server (<http://wms.americaview.org>)
- TexasView Remote Sensing Archives (<http://www.texasview.org>)
- Texas Today Daily MODIS Images (<http://www.texasview.org/TexasDaily.aspx>)
- Research and Education Data Depot Network (REDDnet) (<http://www.reddnet.org>)

### Texas View Consortium Member Universities



Stephen F. Austin State University



The University of Texas at Austin



Midwestern State University



Texas Tech University



Texas A&M University



The University of Texas at El Paso



Lamar University



Texas A&M at Corpus Christi



Texas State University



The University of Texas at San Antonio



Sul Ross State University



Texas A&M International University



The University of North Texas



Rice University

PI: PR Blackwell

Stephen F. Austin State University

Coordinator: Rebecca Dodge

Midwestern State University

Data Steward: Teresa Howard

The University of Texas Center for Space Research



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<http://www.texasview.org>

# VirginiaView 2011 Executive Summary



VirginiaGeospatial  
EXTENSIONPROGRAM  
cnre.vt.edu/gep



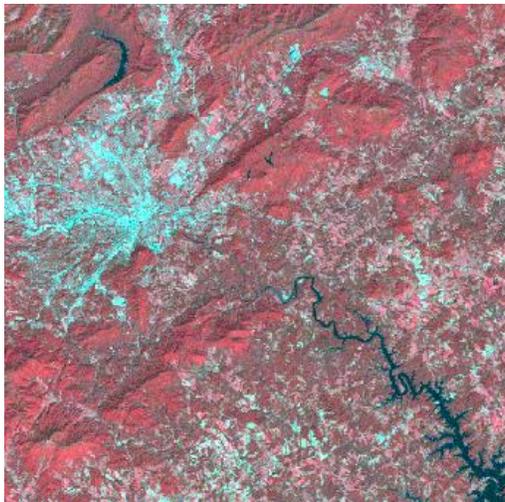
[www.virginiaview.net](http://www.virginiaview.net)

## Program Highlight: – Geocoins for STEM Education in K-12 and CC Educational



A *geocoin* is a distinctive coin created as a signature item that can be used in outdoor navigation activities. Trackable geocoins each have individual tracking codes, which allow participants to monitor the movements of coins as they are transferred from one geocache to another. The VirginiaView geocoin is intended to be used as a teaching aid in STEM education to illustrate the capabilities and applications of GIS and GPS technologies. VirginiaView geocoins have been distributed to community colleges, K-12 institutions, educators, 4-H leaders, and other organizations to encourage interest and provide hands-on experience with these technologies. These activities are supported by VirginiaView lesson plans, available on-line at: [virginiaview.cnre.vt.edu/](http://virginiaview.cnre.vt.edu/).

## Program Highlight – Adding Landsat Imagery to the InForest Mapping



**A Landsat TM Color-IR image of the Roanoke, VA area**

InForest is an online server-based web mapping application designed to provide landowners, natural resource planners, educators, and the public with access to local ecosystem information. This online system enhances the user's ability to explore land management scenarios to assess environmental impacts of varied options and thereby make informed decisions about local ecosystem management activities. Users access InForest's ecosystem calculator by entering geographic boundaries and related information. The ecosystem calculator can then estimate nutrient and sediment runoff, and carbon sequestration for varied land use alternatives. VirginiaView has integrated Landsat TM imagery within InForest, to improve the context for delineating ecosystems and other regions, and has developed a user guide for InForest. InForest is available at: <http://inforest.frec.vt.edu/>.



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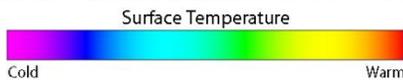
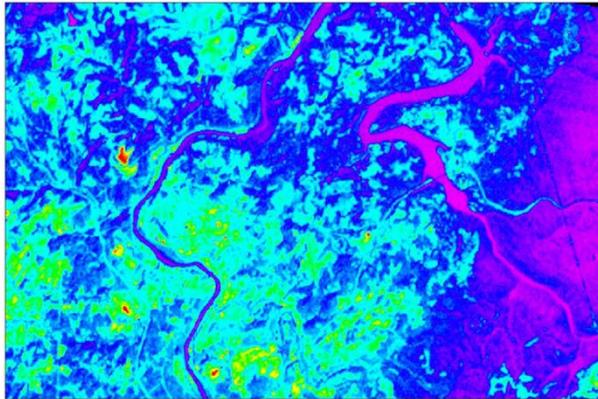
# West Virginia View Executive Summary



## Remote Sensing Resources for West Virginia

Promoting the Benefits of Remote Sensing Data and Applications

Advancing science, technology, engineering and mathematics (STEM) K-12 education in West Virginia



*Landsat Enhanced Thematic Mapper Plus (ETM+) image of surface temperature of Morgantown, WV and vicinity. Note warmer temperatures to the SW, indicating the urban heat island of Morgantown, and the cooler temperatures to the East, in the mountains.*

West Virginia View seed funding has led to a National Science Foundation project that is training teachers across West Virginia in innovative approaches to science education. Teachers participate in a week-long workshop, and then during the subsequent year design and implement their own problem-based learning projects with their students. In addition, West Virginia View annually supports Earth Observation Day, in which teachers use satellite images, such as the one shown here, to study the effects of different ground materials on surface temperature.

### Benefits to West Virginia

West Virginia View, through its support for K-12 STEM education, as well as projects in supporting college education and research, is developing the knowledge and high-tech economy of West Virginia. West Virginia View's strategy is to leverage the large Federal Government investment in space-related technology to foster improved K-12 STEM education, workforce development, applied research, and access to Earth observing satellite data in the state of West Virginia. A central component of West Virginia View's strategy is to promote access to the array of taxpayer-funded satellite-acquired data, and to provide training in the underlying technology and applications of relevance to public and private organizations in West Virginia

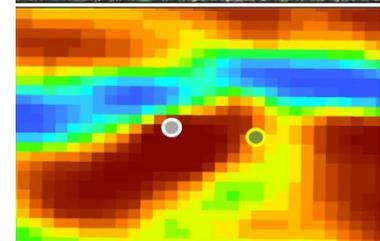
### West Virginia View: A Statewide Consortium

West Virginia View is a consortium of public, private, and non-profit organizations that team to promote remote sensing in West Virginia through sharing of resources, developing a remote sensing infrastructure and supporting remote sensing research and education in the state.

#### West Virginia View Partners

West Virginia University  
Department of Geology and Geography  
Department of Biology  
Natural Resources Analysis Center  
Marshall University  
Alderson Broaddus College  
West Virginia Wesleyan College  
Davis and Elkins College  
Glenville State College

West Virginia GIS Technical Center  
West Virginia Department of Environmental Protection  
NASA IV&V Facility Educator Resource Center  
US Forest Service Northeast Area State and Private Forestry Field Office  
Canaan Valley Institute  
SkyTruth



*Comparison between aerial photo (top) and surface temperatures (bottom) around Grafton High School.*

**PI and Coordinator:**  
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URL: [WVView.org](http://WVView.org)



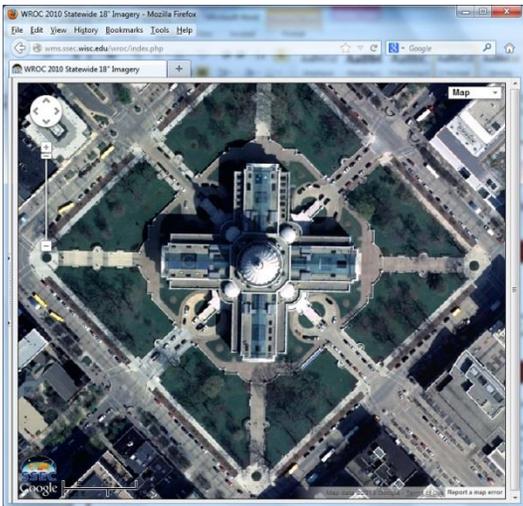
# WisconsinView Executive Summary



## Remote Sensing Resources for Wisconsin

Promoting the Benefits of Remote Sensing Data and Applications

### WisconsinView Brings Newest Statewide Imagery Online



WisconsinView is the only online source for many of the most popular remote sensing imagery collections of the state. This WROC example shows the Wisconsin State Capitol.

WisconsinView provides public access to the highest resolution comprehensive imagery sets ever created for the state. The 2010 Wisconsin Regional Orthophotography Consortium (WROC) 18-inch resolution statewide imagery went online in July of 2011. <http://wms.ssec.wisc.edu/wroc/index.php>

### Benefits to the state

In March of 2012 WisconsinView released an interface providing access to four aerial imagery collections optimized for use on iOS devices and desktop browsers. This had a positive effect on data awareness. Between March and June of 2012, the number of registered data users grew from 11,000 to 12,000. This imagery supports a wide variety of applications including utility surveys, forest management, agricultural management and urban planning. It is viewable at: [http://wisconsinview.org/imagery/imagery\\_preview.php](http://wisconsinview.org/imagery/imagery_preview.php)

### Future Projects

- WisconsinView works to identify user needs. Demand for easy access to LiDAR data has led to a proposal coordinated by the USGS, private contractors, and State agencies in which WisconsinView hosts county-based LiDAR collections. As a result, digital elevation models (DEMs) for twenty counties will be online at WisconsinView by mid-2013 and available for download at: <http://www.wisconsinview.org/form.php>
- WisconsinView is working with colleagues at the Cooperative Institute for Meteorological Satellite Studies (CIMSS) at the UW Space Science & Engineering Center (SSEC) to make imagery such as the Day Night Band from NOAA's recently launched Suomi NPP VIIRS instrument easily available to AmericaView states.



Example of the VIIRS Day Night Band image over Texas and Louisiana showing city lights.

*PI and Coordinator*  
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*University of Wisconsin-Madison*  
*1225 W Dayton Street*  
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*<http://wisconsinview.org>*



# WyomingView

## Executive Summary

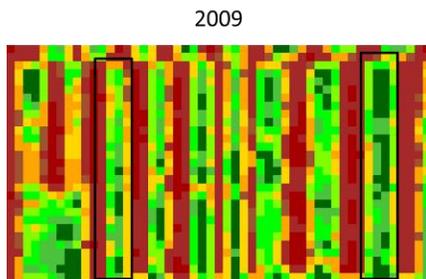
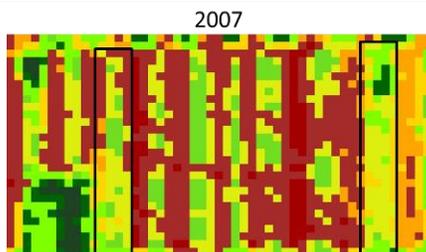


### Promoting the Benefits of Remote Sensing Data and Applications

Landsat images are an invaluable resource for natural resource management. Since each Landsat satellite is capable of collecting an image every 16 days, it allows us to monitor natural and man-made changes.

WyomingView (WYView) interns used Landsat images for monitoring and mapping Wyoming's agricultural and natural resources. Opportunities for conducting such research increased after Landsat images became available at no cost for users.

### Landsat images for monitoring crop growth



**Matthew Thoman** (*BS Rangeland Ecology & Watershed Management & WYView intern*) worked in a dryland farm in southeast Wyoming. His duties included harvesting and tilling.

After completing the *Agriculture remote sensing* course in fall 2011, he decided to compare the effect of fertilization on crop growth.

He obtained Landsat images from April, May and June of 2007 and 2009 to coincide with the growing season of winter wheat. After deriving the normalized difference vegetation index, a measure of vegetation vigor, he generated growth patterns such as low-, medium-, and high-growth.

He noticed that the growth or vigor (*figure above*) was higher in 2009 in comparison to 2007. Specifically, in one of the sub-fields (*highlighted box in the figure*) he computed that area under medium-growth increased from 5.8 to 10 acres, and high-growth increased from 1.3 to 6 acres. At the same time, area under low-growth decreased from 20 acres to less than an acre.

However, in other sub-fields he noticed different trends, which led him to conclude that factors such as soil moisture, differences in the start of growing seasons between the two years, and presence of weeds dictated how crop growth was depicted in these images. Nevertheless, he could see how Landsat was able to capture the differences in crop growth in this field.

"The knowledge I acquired by learning and using ERDAS and GIS mapping in this course has been new and exciting in this everyday monotony of school. Not only has it been fun but stimulating and useful as well. There are many applications for remote sensing that I can use, such as mapping growth on our family farm/ranch and a skill that will be useful in the workplace. With a degree in Rangeland Ecology/Watershed management the newer technology of remote sensing will be very applicable and will hopefully make me more employable."

- Matthew Thoman, WyomingView intern, spring 2012



Matthew Thoman is recognized by University of Wyoming's Vice President for Special Projects, Dr. Carol Frost, for his presentation on crop growth monitoring using Landsat data at the 2012 Wyoming Undergraduate Research Day.

### Value of no-cost Landsat data

Starting Dec 2008, USGS began providing the entire Landsat collection at NO COST to users worldwide.

This has resulted in an unprecedented opportunity for students interested in using satellite images for monitoring and mapping agricultural resources. Previously, each Landsat scene would cost up to \$800/scene, which limited widespread usage.

WyomingView offers 5 internships every year to students interested in using remotely sensed images for natural resource monitoring and mapping applications. With the availability of no-cost Landsat images, students are able to obtain data for multiple years/seasons and have monitored crop growth, wildfires, lakes and reservoirs, and invasive species. Please visit our websites for more examples and student testimonials.

## APPENDIX 2 - StateView Activity Emphasis for GY 2011

### Program Area Key

C= Consortium Development

D= Data Delivery

E= Education

R= Research

A **bold** letter indicates that the state proposed more than five activities in the Program Area, regular font indicates that 1-4 activities were proposed. A dash represents zero activities.

<b>State</b>	<b>Activity Types</b>
Alabama	<b>C D E R</b>
Alaska	C <b>D</b> E -
Arkansas	C D E R
California	<b>C</b> - <b>E</b> R
Colorado	<b>C D E R</b>
Florida	C D - -
Georgia	<b>C D E R</b>
Hawaii	- D E -
Idaho	<b>C D E R</b>
Indiana	C D E R
Iowa	C D E R
Kansas	C D - R
Kentucky	C D E R
Louisiana	<b>C D E R</b>
Maryland	<b>C D E R</b>
Michigan	C D - R
Minnesota	C D E R
Mississippi	C D E R
Montana	C D E R
Nebraska	<b>C D E R</b>
New Hampshire	<b>C D E R</b>
New Mexico	- D E -
North Carolina	<b>C</b> D - R
North Dakota	C <b>D</b> E R
Ohio	<b>C D E R</b>
Pennsylvania	C D E R
South Dakota	C D E R
Texas	C D E R
Virginia	C - E R
West Virginia	<b>C D E R</b>
Wisconsin	C <b>D</b> E R
Wyoming	C <b>D E R</b>

## APPENDIX 3 – AmericaView Fall Technical Meeting

### 2012 AmericaView Fall Technical Meeting

September 24<sup>th</sup> and 25<sup>th</sup>

USGS EROS Center, Sioux Falls, South Dakota

*“What We’re Doing and Where We’re Going”*

**Conference Hotel:** Country Inn and Suites by Carlson; 200 E. 8th St; Sioux Falls, South Dakota

#### Sunday, September 23

**9 a.m. to 5 p.m.** Board meeting (Meeting Room at the Country Inn and Suites)

**6 to 7 p.m.** – Welcome reception at the Falls Landing (restaurant and lounge inside the Country Inn and Suites). Dinner on your own.

#### Monday, September 24

**6 to 7 a.m.** Continental breakfast at Country Inn (provided)

**7:15 a.m. -- Bus departs from in front of conference hotel**

**8:00 a.m. -- Check-in at EROS Center. You will need a government issued picture ID** (see additional guidelines at the bottom of the Program)

**Morning Welcome, Introductions, and Meeting Overview – AV Board and Staff, USGS**

Location: Auditorium

**8:30 a.m.** –*Rick Landenberger, AmericaView Executive Director* – Welcome, Overview, and Logistics

*Frank Kelly, Director, EROS Center* – Future Directions of the EROS Center

**9:00 a.m. – Session I Introduction, Rick Landenberger (moderator)**

#### **Session I – USGS / AmericaView Land Cover Mapping Science and Applications**

Session I will provide background and current information on USGS initiatives in land cover mapping and change detection, and offer examples of AmericaView land cover mapping projects. Presenters will emphasize the utility of the various products for practical decision-making.

**9:05 – 9:30 a.m.** – *Collin Homer, EROS Center, Update on the USGS National Land Cover Data (NLCD)*

**9:30 – 9:40 a.m.** – *Jeffery Eidenshink, EROS Center, USGS Approaches to Change Detection and Analysis*

**9:40 – 9:50 a.m.** – *Brad Rundquist, North DakotaView PI, Mapping and Analyzing Conservation Reserve Program Enrollment Patterns from 1991 to 2011 Using Remote Sensing and GIS Techniques in Nelson County, North Dakota*

**9:50 – 10:00 a.m.** – *Kevin Dobbs, KansasView Coordinator, Automated Georeferencing of Historic General Land Office Survey Maps for Kansas using eCognition, MATLAB, and Python*

**10:00 – 10:20 a.m.** – *Panel discussion (Homer, Eidenshink, Rundquist, Dobbs)*

**10:20 – 10:40 a.m.** – *Break (coffee, etc.) in Atrium*

**10:45 a.m.** – *Session II Introduction, Rick Landenberger (moderator)*

### **Session II, Ecosystems I**

Session II will provide background and current information on USGS initiatives in ecosystem mapping and monitoring science, and offer examples of AmericaView mapping and related initiatives. Presenters will emphasize how the science relates to current and predicted future ecosystem conditions and the relationships between the science and practical decision-making.

**10:50 – 11:00 a.m.** – *Tom Loveland, EROS Center, Landsat Science Team*

**11:00 – 11:10 a.m.** – *Bruce Wylie, EROS Data Center, Ecosystem Performance in Yukon Ecosystems*

**11:10 – 11:20 a.m.** – *Jim Vogelmann, EROS Center, Monitoring Subtle Ecosystem Changes using Landsat*

**11:20 – 11:30 a.m.** – *Russ Congalton, New HampshireView PI, Evaluating Multi-Date Land Cover Mapping from Landsat 5 Imagery in the Northeastern US*

**11:30 – 11:40 a.m.** – *Rick Lawrence, MontanaView PI, Hyperspectral Remote Sensing as a Monitoring Tool for Geologic Carbon Sequestration*

**11:40 a.m. – 12:00 p.m.** – *Panel discussion (Loveland, Wylie, Vogelmann, Congalton, Lawrence)*

**12:00 -1:10 p.m. – Lunch**

**1:10 p.m. – Session III Introduction, Rick Lawrence (moderator)**

### **Session III, Ecosystems II**

Session III will highlight examples of USGS and AmericaView science related to mapping and analysis of fire, water, and phenology. Presenters will emphasize how the science relates to current and predicted future ecosystem conditions and the relationships between the science and practical decision-making.

**1:15 – 1:30 p.m. – Jeff Eidenshink, EROS Center, Fire Science Activities at EROS**

**1:30 – 1:45 p.m. – Ross Evelsizer, EROS Center, USGS Phenology Research and Data Products**

**1:45 – 2:00 p.m. – Gabriel Senay, EROS Center, The USGS Watersmart Project**

**2:00 – 3:15 p.m. – Optional VIP tour of EDC: Radome, Film Archive, Computer Room II, Large Format Camera, NED and NLCD displays, UNEP, and Globe. Meet at the EROS Center front desk. Tour details are provided at the end of the agenda.**

**2:00 – 2:12 p.m. – Nancy French, MichiganView PI, Mapping the extent of Cladophora green algae in the Laurentian Great Lakes**

**2:12 – 2:25 p.m. – Eunmok Lee, KansasView student, Analysis of MODIS 250 m NDVI Using Different Time-Series Data for Crop Type Separability**

**2:25 – 2:40 p.m. – Panel discussion (Eidenshink, Evelsizer, Senay, French, Lee)**

**2:40 – 3:10 p.m. – Break (coffee, etc.) location**

**3:10 p.m. – Session IV Introduction, Sam Batzli**

### **Session IV – Data and Mapping Products**

Session IV will provide current information on initiatives in data production, data archiving and distribution, and data mapping products. Presenters will emphasize the accessibility of the products and services, and their utility with respect to practical decision-making.

**3:15 – 3:30 p.m. – Ryan Longhenry, Update on EROS Data Distribution and Dissemination**

**3:30 – 3:45 p.m. – John Dwyer, EROS Center, USGS Essential Climate Variables**

**3:45 – 4:00 p.m. – David Roy, South Dakota State University, The WELD Project: Web-enabled Landsat Data**

**4:00 – 4:10 p.m. – Tyler Erickson, Developer Advocate for Google Earth Engine, Google Geo Tools for Remote Sensing**

**4:10 – 4:20 p.m.** – *Ramanathan Sugumaran, IowaView PI, Web-based LiDAR Data Processing using a High Performance Computing Environment*

**4:20 – 4:45 p.m.** – *Panel discussion (Longhenry, Dwyer, Roy, Erickson, Sugumaran)*

**4:45 p.m.** – *Wrap-up – Rick Landenberger*

**5:00 p.m.** – Board bus for return to Sioux Falls

**6:00 – 6:30 p.m.** No host cash bar at **Leonardo's Cafe** in Washington Pavilion at 301 South Main, Sioux Falls (for our event, please enter in the Southeast corner of the building, which is closest to the 12th & Main entrance)

**6:30 – 7:30 p.m.** AV Business Dinner at Leonardo's Cafe. Presentation on utilization of remote sensing technologies to aid local planning efforts by Steven Van Aartsen, GIS Supervisor, City of Sioux Falls

**7:30 – 9 p.m.** Dessert, continued networking, and self-guided exploration of Kirby Science Discovery Center

## **Tuesday, September 25**

**6 to 7 a.m.** Continental breakfast at Country Inn (provided)

**7:15 a.m. -- B u s** departs from in front of conference hotel

**8:00 a.m. -- Check-in at EROS Center.** **You will need a government issued picture ID** (see additional guidelines at the bottom of the Program)

The morning technical sessions will feature Education / Outreach and Disaster Response presentations. These will be followed by the poster session from 11:30 to 12:15 p.m., then lunch. The afternoon workshops will run from 1:15 to 4:30 p.m.

**8:00 a.m. to 10:20 a.m.** – Presenters place posters for poster session (in Atrium)

**Morning Session** – Auditorium

**8:30 a.m. – Session V Introduction, Rebecca Dodge**

### **Session V – Education and Outreach**

Session V will provide current information on initiatives in remote sensing / geospatial science and technology education and outreach. Presenters will emphasize their target audience(s), the science content, and lessons learned from related education and outreach initiatives.

**8:30 – 8:50 a.m.** – *Tom Adamson, Stinger Ghaffarian Technologies (USGS contractor), Tracking Change over Time – a USGS Landsat Education Resource*

**8:50 – 9:05 a.m.** – *Robert Wright, HawaiiView PI, HawaiiView’s Landsat Science Kits: A K-12 Remote Sensing Education project*

**9:05 – 9:15 a.m.** – *Rebecca Dodge, AmericaView Board Chair and Co-I of TexasView, AmericaView’s Earth Observation Day*

**9:15 – 9:30 a.m.** – *JB Sharma, GeorgiaView Co-I, Enabling Web Based Historiography with Remote Sensing – The ‘Hall County Spaces and Places’ Project*

**9:30 – 9:40 a.m.** – *John A. McGee, Tammy Parece, and James B. Campbell, VirginiaView, VirginiaView’s Geospatial Workshops*

**9:40 – 10:00 a.m.** – *Panel discussion (Adamson, Wright, Dodge, Sharma, McGee)*

**10:00 – 10:20 a.m.** – **Break**

**10:20 a.m.** – **Session VI Introduction, Moderator Ramesh Sivanpillai**

#### **Session VI – Disaster Response**

Session VI will provide background and current information on recent disaster response experiences of USGS and AmericaView partners.

**10:25 – 10:40 a.m.** – *Rynn Lamb, Emergency Response Activities at EROS*

**10:40 – 10:55 a.m.** – *Ramesh Sivanpillai, WyomingView PI, Assessing, acquiring and distributing remotely sensed data for natural disasters: The WyomingView experience*

**10:55 – 11:10 a.m.** – *Brent Yantis, LouisianaView PI, Hurricane Response in Louisiana*

**11:10 – 11:25 a.m.** – *Panel discussion (Lamb, Sivanpillai, Yantis)*

#### **11:30 a.m. – Poster Session and new Landsat Viewer Demonstration in EROS Center Atrium**

Posters will highlight remote sensing research, technology / archive / distribution, and educational and outreach projects by AV, AV students, USGS scientists and their students. Only the lead authors of posters are listed.

*How Urban Features in Laramie, WY Absorb Heat in Summer? Sarah Arulsamy, Laramie Junior High School, WyomingView*

*Monitoring Changes in the Spectral Reflectance Values of Deciduous Leaves, Mrudhula Baskaran, Laramie High School, WyomingView*

*Using Mobile Devices to Map, Overlay, and Animate Atmospheric and Earth Science Data and Imagery, Sam Batzli, WisconsinView*

***Comparison of Absolute and Relative Radiometric Corrections for Atmospheric Attenuation***, T. Bidgoli, University of Kansas student, KansasView

***Development of Geospatial Outreach Lessons & Activities for the High School Level***, Larry Biehl, IndianaView

***Forecasting Land-Use and Land-Cover in the Great Plains using Scenario-based Modeling***, Michelle Bouchard, ARTS, Contractor to EROS Center

***Infrastructure and Capacity Building: Creating an Enterprise GIS for Multi-scale, Interdisciplinary Analysis of Farmers' Land Use Decisions***, Chris Brown, Kansas Applied Remote Sensing Program, KansasView

***Utilizing Landsat Imagery in Model Building: Developing an Accurate Forest Cover Classification Map for Fraser Experimental Forest, Colorado***. Jonathan Burnett, Colorado State University, ColoradoView

***The Importance of Geographic and Spatial Scales for Species Prediction: A Case Study Using the Invasive Phragmites***. Lane Carter, Colorado State University, ColoradoView student

***Hail Swath Assessment from Satellite Data: A Case Study from Iowa in 2009***, Kevin Gallo, NOAA / NESDIS / EROS

***An Interagency Partnership with AlabamaView for Sharing LiDAR Data Products and High-Resolution Orthoimagery with the Public***, Luke Marzen, AlabamaView

***Engaging Educators through the Virginia Geocoin Adventure***, John A. McGee, Virginia Tech, VirginiaView

***Dispersion, Population Structure, and Growth of the Newly Invasive Castor Aralia (Kalopanax septemlobus) in Durham, NH***, John Passero, University New Hampshire student, New HampshireView

***Forecasting Land-Use and Land-Cover in the Western U.S. Using Scenario-based Modeling***, Kristi Saylor, USGS EROS

***Urban Heat Islands and the Importance of Green Spaces in Metro Atlanta, Georgia***, Jeong C. Seong, University of Western Georgia, GeorgiaView

***Promoting Remote Sensing in Middle School Classes***, Ramesh Sivanpillai, University of Wyoming, WyomingView

***Are Man-Made Surfaces in a City Hotter than Natural Surfaces?*** Arundathi Sreejayan Nair, Spring Creek Elementary School, WyomingView

**12:15-1:15 p.m. – Lunch** – provided outside the EROS Center Cafeteria

**1:15 – 4:45 p.m. Workshops**

### **Tuesday Afternoon Workshops**

**There are two workshop ‘tracks’:**

**1. Data Processing and Analysis using eCognition and Google Earth Engine; and**

**2. Educational Resources for StateViews**

Each workshop will last approximately 90 minutes. All are open to AV members, USGS colleagues and students of both.

**Session I – 1:15 – 3:00 p.m.**

**Workshop Ia – Processing Lidar Point Clouds Using eCognition** – Jarlath O’Neil-Dunne (VermontView PI)

**Location:** Computer Lab 1 and 2 (combined for the workshop)

**Description:** This workshop will introduce participants to object-based approaches to feature extraction using LiDAR point clouds and multispectral imagery. Particular attention will be paid to how object-based techniques can be employed to derive unique characteristics from LiDAR point clouds. Workshops participants should have a basic understanding of LiDAR and other remotely sensed data. Some experience with object-based classification is recommended, but not required. The workshop will consist of a brief overview, live demonstration, and finally a self-paced tutorial. eCognition 8.7.2 will be used.

**Workshop Ib – Sharing and Demonstrating *Online-capable* Educational Outreach Materials** – Rebecca Dodge (TexasView Co-I and AV Board Chair)

**Location:** Executive Conference Room

**Description:** We will first describe existing StateView *online-capable* educational outreach materials as a group, and then focus as a group on a few specific resources in more detail. We will explore how each resource could be adapted to and/or applied in various formal and informal K-12 and higher education environments.

**Session II – 3:00 – 4:45 p.m.**

**Workshop IIa – Introduction to Google Earth Engine** – Tyler Erickson (Google Earth Engine Developer Advocate)

**Location:** Computer Lab 1 and 2 (combined for the workshop)

**Description:** Google Earth Engine is a platform designed to enable petabyte-scale, scientific analysis and visualization of geospatial datasets. Earth Engine provides a consolidated environment that co-locates a massive data catalog with thousands of computers for analysis. The user-friendly front-end provides a workbench environment to allow interactive data and algorithm development, exploration and provides a convenient mechanism for scientists to share data, visualizations and analytic algorithms via URLs.

The Earth Engine catalog contains a wide variety of popular, curated datasets, including the world's largest online collection of Landsat scenes (>1.5M), numerous MODIS collections, DEMs, and many vector-based data sets. The platform provides a uniform access mechanism to a variety of data types, independent of their bands, projection, bit-depth, resolution, etc..., facilitating easy multi-sensor analysis.

Google Earth Engine is publicly accessible at <http://earthengine.google.org>, where users can view source datasets and featured results. The analysis capabilities of Earth Engine are currently available to a limited set of scientific users. This workshop will give an introduction to several Earth Engine client tools that can be used for remote sensing analysis.

**Workshop / Breakout Session IIb – Earth Observation Day**– Ramesh Sivanpillai (WyomingView PI)

**Location:** Executive Conference Room

**Description:** The purpose of this breakout session to identify the reasons behind Earth Observation Day's success and challenges. PIs will be requested to provide input on their current activities, including what worked well and the barriers encountered. The outcome of these discussions (what works well, what common barriers exist, etc.) will help those interested in starting EOD activities and provide insights for enhancing current activities.

**5:00 p.m.** – Board bus for return to Sioux Falls

**5:45 p.m.** – Arrive at Country Inn and Suites via bus. Dinner on your own or return home.

## **Logistics and Contact Information**

**Conference Hotel:** Country Inn and Suites by Carlson; 200 E. 8th St; Sioux Falls, South Dakota  
<http://www.countryinns.com/sioux-falls-hotel-sd-57104/sdsfalls>.

Tips for check-in at EROS Center:

- Be prepared to provide a picture ID that is a Government issued ID. You will need it both at the entrance gate and once inside EROS at Security (don't leave it in the car).
- If anyone has a pacemaker, let EROS Center know in advance.
- Do not carry pocket knives or anything else that could be considered a weapon.
- Minimize bringing in personal items; it will just slow the check-in process.
- All laptops and hand held computers must be checked in and registered with Security.

- All external drives (USB thumb drives) used in EROS Center computers need to be scanned.

Emergency Contact Information

Hotel Front Desk: (605) 373-0153  
 EROS Center Front desk: (605) 594-6151  
 Rick Landenberger – (304) 692-6172 (cell phone)  
 Debbie Deagen – (406) 579-0728 (cell phone)

Security Notice for EROS Center

All public visitors' vehicles and persons will need to be screened prior to being allowed access onto Federal property. Visitors age 16 or older will be required to present valid government-issued photo identification (federal, state, or local) for example, driver's license or passport, or be accompanied by an adult (parent, sponsor or guardian) that can verify identities. All public visitors driving a vehicle must have a valid driver's license to be able to drive on property. All visitors are required to check in at the main facility and process through security check point. All public visitor vehicles will be searched by EROS Security before being allowed entry onto the Federal property. Only bring in items that are necessary. Cameras and video recorders are allowed inside the facility with some restrictions. Taking pictures outside the Center is not authorized without permission. Items that will not be permitted on property are drugs, drug paraphernalia, weapons, knives with blades longer than 6", animals (unless they are a service animal and have proof of service).

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**U.S. GEOLOGICAL SURVEY  
 EARTH RESOURCES  
 OBSERVATION AND SCIENCE  
 (EROS) CENTER**

**TOUR AGENDA Monday,**

**September 24, 2012**

2:00 p.m.	Radome	Tom Senden
2:30 p.m.	Film Archive	Tim Smith
2:45 p.m.	Computer Room II, Large Format Camera, NED and NLCD displays, UNEP, and Globe	Tom Adamson
3:15 p.m.	Tour complete	

## APPENDIX 4 – GY 2011 AmericaView Strategic Minigrant Details



**GeorgiaView's** Dr. Marguerite Madden worked with a team of five college students at the University of Georgia to develop four tutorials for use in Earth Observation Day. The MultiSpec© Earth Observation Day Tutorial Series was designed to introduce 6-12<sup>th</sup> grade students to land cover classification using [MultiSpec©](#), a free image data analysis system developed by Larry Biehl at Purdue University. The lessons are particularly well suited for middle and high school students in science and math courses. The tutorials reference which National Science Education Standards and National Educational Technology Standards are met by each lesson. A review by teachers was completed under Institutional Review Board Approval in grant year FY12. Tutorials are available for both PC and Macs. To download tutorials for teachers and students, and a glossary of terms, visit the [AV Earth Observation Day website](#) and open the "2013 Lessons and Activities tab". An overview of the four tutorials follows:

### **Tutorial 1: Viewing Remote Sensing Imagery**

This lesson guides students (grades 6-12) in the process of opening and observing a Landsat Thematic Mapper (TM) image. Students use MultiSpec© software to display and inspect a section of a Landsat satellite image around their schools. Students investigate how local surface features are represented by Landsat Thematic Mapper imagery.

### **Tutorial 2: Unsupervised Land Cover Classification**

This lesson is designed primarily for middle school students (grades 6–9, but can be used in higher grades as well). The lesson guides students in the process of classifying a section of a Landsat Thematic Mapper (Landsat TM) image into several land cover classes. Students use MultiSpec© software and an unsupervised image classification method. The classification process is followed by the verification of classification quality and an accuracy assessment.

### **Tutorial 3: Supervised Land Cover Classification**

This lesson is designed primarily for high school students, but can be used in middle school advanced classes as well. The lesson guides students in the process of classifying a section of a Landsat Thematic Mapper (Landsat TM) image into several land cover classes via a 'supervised' classification method using MultiSpec© software. The classification process is followed by the verification of classification quality.

### **Tutorial 4: Land Cover Change Analysis**

This lesson is designed primarily for high school students but can be used in middle school advanced classes as well. In this exercise, students use the MultiSpec© image processing software to display and inspect sections of two Landsat Thematic Mapper (Landsat-TM) satellite images showing their school and surroundings. They investigate how the ground elements around the school are represented by Landsat-Thematic Mapper imagery and how things have changed between two time periods.

**VermontView** completed a project on Post-Hurricane Irene Data Distribution and Education. Outcomes of the project included:

1. Students mapped damage and inundation areas for the "priority" satellite scenes identified by FEMA. An AmericaView blog post (<http://bit.ly/WivXmx>) detailed this activity.

2. A complete inventory of publicly available LiDAR in Vermont was carried out. All Vermont data are now housed at both the University of Vermont and the Vermont Center for Geographic Information (VCGI). As a result, VCGI now offers a “LiDAR bundle”, which provides the Vermont LiDAR collection to end users on a single external hard drive. The “bundle” can be viewed at: [http://vcgi.vermont.gov/warehouse/products/ALL-LDR\\_MIX\\_LIDAR\\_STATE\\_ALL](http://vcgi.vermont.gov/warehouse/products/ALL-LDR_MIX_LIDAR_STATE_ALL).
3. A webinar was conducted by the PI to help end users in Vermont better understand the state’s LiDAR data. A recording is available for download - <http://vcgi.vermont.gov/events/archive>.
4. The Missisquoi/Rock River LiDAR data set was provided to the NSF Open Topography Facility (<http://www.opentopography.org/>) for long-term storage and download.
5. A video was developed to show how to use USGS’ Hazard Data Distribution System (HDDS) and how to display data downloaded from HDDS. The video is available on the AmericaView blog (<http://bit.ly/XMEg5X>).
6. Funding was provided to VCGI to assist with the long-term storage of Hurricane Irene related imagery. VCGI consolidated all Irene-related resources on a dedicated web site (<http://vcgi.vermont.gov/warehouse/irene>).

**NebraskaView** completed a project entitled “Consolidation of AmericaView Educational Resources for Web Distribution”. This project collected and organized the many resources (tutorials, workshops, videos etc.) that have been developed by individual StateViews over the past eight years, and generated a final product that could be easily integrated into the web-based dissemination system being developed by VirginiaView as part of their *Development and Implementation of the AV Curriculum Dissemination Web Portal* minigrant (to be implemented in grant year FY12). This AV educational web resource will be available to AV educators, partners, and the general public and it will:

- highlight the skills of the entire AV consortium,
- promote collaboration between consortium members in creating and updating resources,
- assist AV in identifying gaps in currently available resources,
- reduce redundancy through avoiding development of duplicate materials,
- allow authors to locate and update existing materials easily, and
- assist geospatial educators all across the U.S. in improving their geospatial-related instruction.

In response to an AV-wide solicitation by NebraskaView for educational materials, 201 resources were collected. These were divided into two separate categories - course materials (125), which included syllabi and lab exercises, and non-course (76), which included materials such as videos, tutorials, public outreach and Earth Observation Day (EOD) activities. In consultation with VirginiaView, a list of relevant metadata was drafted to ensure the architecture of a database that would also fulfill the goals of the web project. Using these parameters, a database of AV-generated educational resources was developed. To obtain a copy of the summary report or copies of the educational resources collected, contact Milda Vaitkus at [mvaitkus1@unl.edu](mailto:mvaitkus1@unl.edu).

**New YorkView** completed a project entitled “Development of Tools Synthesizing Advanced Machine Learning Approaches for Remote Sensing Classification”. This project improved and synthesized recently proposed machine learning approaches such as random forest, artificial immune networks, and support vector machines through algorithm fusion and ensemble approaches to improve transferability of the methods. The improved/developed classification methods were assessed using existing multi-sensor data in different site conditions to evaluate the transferability of the methods across a multitude of applications. A standalone software package integrating the improved machine learning-based methods for remote sensing

classification was developed using the C# programming language and several external open-source libraries, such as Geospatial Data Abstract Library (GDAL) and Library for Support Vector Machine (LibSVM). The end product, the Advanced Remote Sensing Information Extractor (ARSIE) is a tool designed for extracting information such as land use and land cover from remote sensing imagery. The first version of ARSIE (v. 0.1.0) was developed and consists of the following major functionalities: 1) raster dataset visualization; 2) unsupervised classification; 3) supervised classification; and 4) change detection. The integrated tools will be extremely beneficial to remote sensing scientists but can also form the basis for various education and outreach activities. The current package is under review by the AV Research Committee and following journal publication on the product, it is anticipated that the products will be distributed free to remote sensing scientists, students, and general users via the New YorkView website. For more information on the ARSIE package contact Dr. Jungho Im at [ersgis@unist.ac.kr](mailto:ersgis@unist.ac.kr). To assist with the ARSIE tool review process, contact AV Research Committee chair, Dr. Jason Tullis (ArkansasView) at [jatullis@uark.edu](mailto:jatullis@uark.edu).

## APPENDIX 5 – Highlights of 2012 Earth Observation Day

### AlaskaView Earth Observation Day - University of Alaska Fairbanks Science Potpourri

The University of Alaska Fairbanks conducts the Science Potpourri every Spring to showcase the quality of its science programs and to stimulate young students' interest in the sciences using real-world examples (e.g. ongoing research programs, scientific tools and techniques). This year, on April 14th, 2012, AlaskaView developed the *What-Where* project. Using remotely sensed data that highlight a particular phenomenon of interest, students are quizzed on: "What" they are seeing and "Where is this?". A laptop kiosk running Alaska imagery allowed students to interactively explore Alaska real-world data.



Students at the University of Alaska-Fairbanks Science Potpourri examine various types of imagery.



Students use GIS to interactively explore Alaska geospatial imagery.

### CaliforniaView's EOD Activities

CaliforniaView developed three separate activities that attracted participants ranging from junior high school students to senior citizens.

#### Geospatial Art Project

**GEOART** allowed remote sensing researchers from the **Center of Spatial Technologies and Remote Sensing (CSTARS)** to integrate their research projects with 9<sup>th</sup> grade art students from **Emerson Junior High School** in Davis, CA.

High school students were taken on a fieldtrip in and around the Davis area, all the while acquiring GPS data and photographs of their chosen respective locations. These data sets were then used in two computer lab courses using Google Earth to create simple land cover maps of the area. At the same time the art teacher guided his students in representing these locations on color panels. The final product, presented at a University Open House event, was a mural

depicting an abstract map of Davis, CA that incorporated orthoimagery, land cover maps and monochromatic color panels.



The picture above shows the *GEOART* project setup at the annual University Open House event in April 2012.

### Landsat State Mosaic & City Puzzle

UC Davis Picnic Day is an annual University Open House. In April 2012, it was attended by more than 50,000 visitors. CaliforniaView presented Earth Observation Day activities to the public in the form of a California Landsat mosaic map puzzle. The objective was to match California county maps to a displayed Landsat mosaic of California



Visitors match county maps to the California Landsat mosaic.

### Earth Observation Day celebration

CaliforniaView celebrated Earth Observation Day hosting a Landsat “Jeopardy” luncheon for the Center for Spatial Technologies and Remote Sensing (CSTARS) consisting of undergraduate and graduate students from various majors and remote sensing researchers. Participants were challenged to answer “Jeopardy-like” questions related to remote sensing.

### **GeorgiaView's Earth Observation Day**

GeorgiaView invited high school students and teachers from the Performance Learning Center (PLC) in Coweta County, Georgia to celebrate EOD and to recognize the value of remote sensing. (PLC is an alternative school geared toward students who are not succeeding in a traditional school setting.) Presentations focused on real-world remote sensing applications such as how remote sensing is used for helping disease control and prevention in cases of vector-borne diseases and traffic noise-health relationships; military applications; and vegetation and urban heat island relationships. Students also explored a variety of remotely sensed imagery through several exercises using Google Earth.



Presentation by Dr. Minho Kim from the Centers for Disease Control and Prevention in Atlanta, GA



Students doing a hands-on Google Earth exercise.

### **IdahoView – McCall Outdoor Science School (MOSS) Earth Observation Day**

The McCall Outdoor Science School celebrated Earth Observation Day with a series of remote sensing activities for students that focused on monitoring change over four days. The students were given a set of tools to use (digital cameras, computers, iPads and a digital laser thermometer) and, working in teams; they came up with a plan to monitor a "system" for change. Exercises included baseline data collection and analysis techniques. Other EOD activities included a pixel puzzle of a satellite image and a presentation on Landsat imagery and NDVI.



Students compare their new images with images from the previous day to find changes.

### West VirginiaView's Earth Observation Day

One of three EOD events in April and May involved four teachers at four different schools, and approximately 100 students from across the state (Figure 2). Dr. Rick Landenberger, the teachers and their students gathered simultaneous surface temperatures of grass-covered areas and asphalt-covered areas, and compared their measurements with a thermal image that Rick created using April 2010 and April 2011 Landsat scenes covering the four schools and surrounding areas (Figure 3). The teachers used the GLOBE Surface Temperature protocol developed by OhioView scientist and SATELLITES PI Dr. Kevin Czajkowski. Using GPS units provided by previous SATELLITES and National Science Foundation grants (aimed at training teachers to use geospatial technology and spatial thinking skills), Rick and the teachers recorded land cover and associated surface temperatures to complete a shared analysis of the patterns of variation in grass and asphalt temperatures at each school location. Teachers and students explored the variation in their collective measurements and Landsat-derived temperatures (Figures 4 and 5), and explored possible explanations.

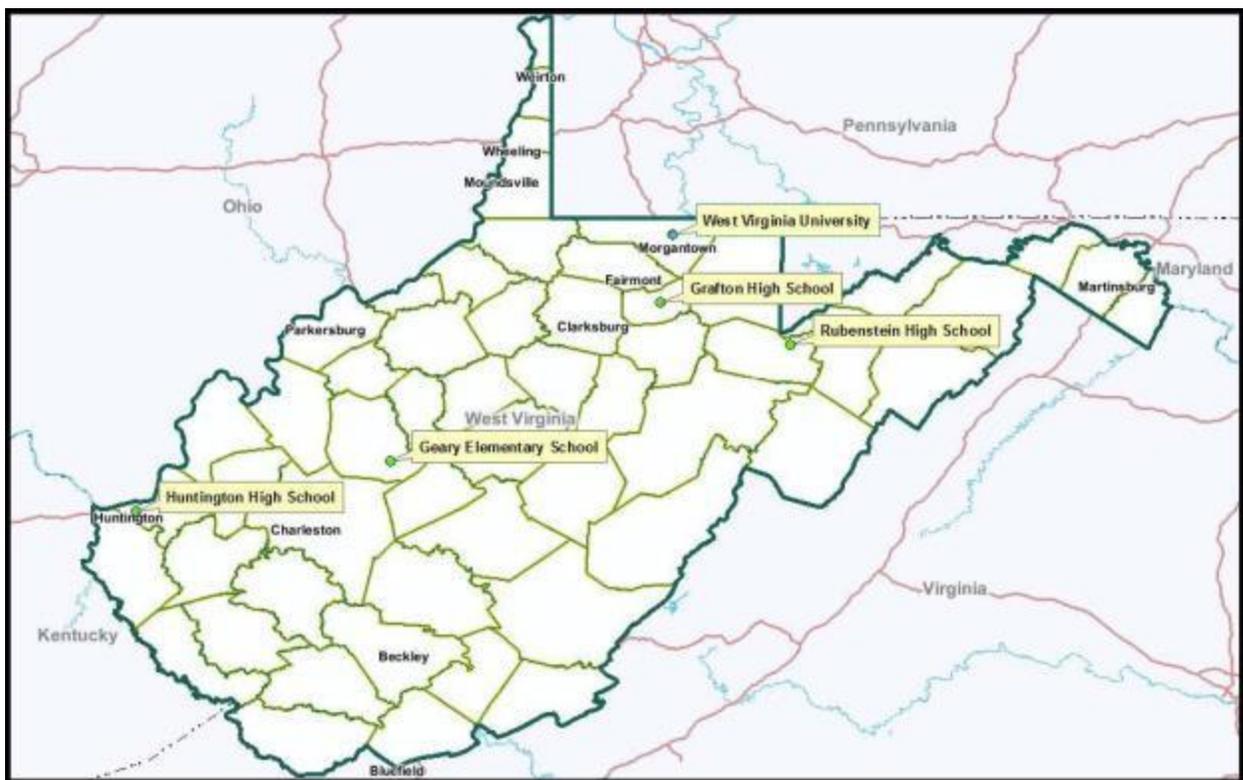
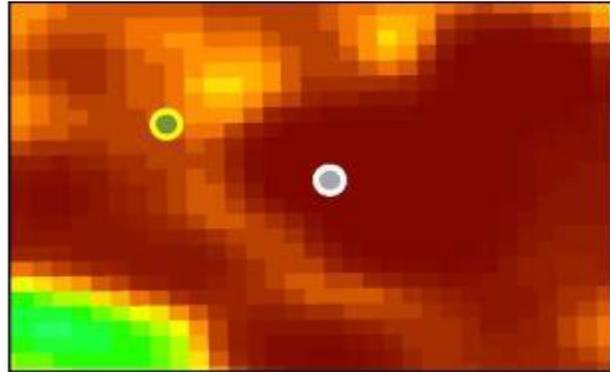


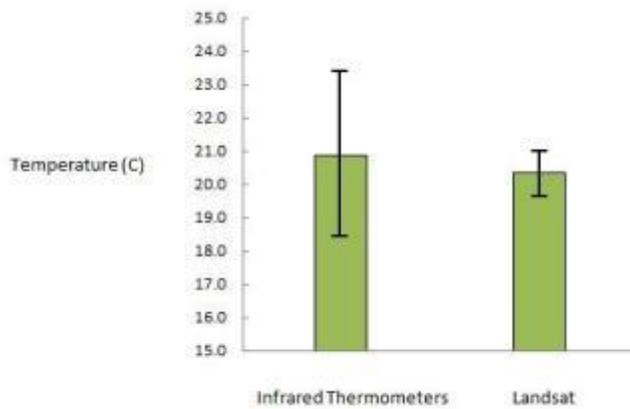
Figure 2. Locations of West Virginia schools where surface temperatures were collected

**Figure 3** (below). Earth Observation Day 2012 sample school and associated sample areas (mapped at ~1:15,000)

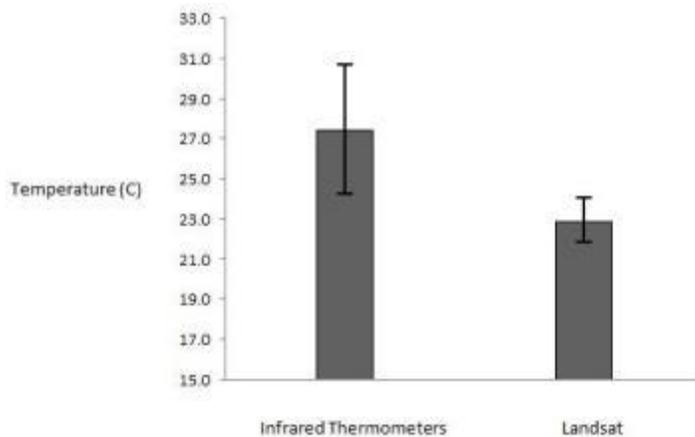


**Huntington HS**  
*In situ* Grass – 26.6 (C)  
*In situ* Asphalt – 32.7

**Huntington HS Landsat Thermal**  
 Landsat Grass – 20.1 (C)  
 Landsat Asphalt – 25.7



**Figure 4.** Plots of mean temperature (C) and standard errors acquired using infrared thermometers and Landsat data for grass-covered areas.



**Figure 5.** Plots of mean temperature (C) and standard errors acquired using infrared thermometers and Landsat data for asphalt-covered areas.

## **WyomingView's Earth Observation Day --Sixth graders learn the value of satellite images for highlighting changes in urban areas and water bodies**

Fifty-one students at Laramie Junior High School (LJHS) saw how satellite images collected since the 1970s can be used to monitor changes in cities and water bodies such as rivers and lakes. In Jared Long's social science class, students learned about urban growth and changes in water bodies caused by natural processes and human actions. In particular, they compared these changes in developed, developing and under-developed countries.

WyomingView coordinator Ramesh Sivanpillai described how satellites and aircraft are used to acquire these birds-eye images. Using images acquired by Landsat and TERRA satellites, he demonstrated the growth of cities in the U.S., Mexico, Uganda and middle-East. These images were acquired 10-30 years apart. Students saw how cropland and forests were converted to urban areas to accommodate urban growth. Students also saw a video created by NASA that showed the yearly expansion of Las Vegas from 1974 – 2011. This video highlighted the mushrooming of Las Vegas and the addition of subdivisions, golf-courses and commercial areas. Satellite images also showed the new dams and reservoirs, changes in their water storage over time, and impacts of catastrophic events, such as flooding, can have on cities.



*Dr. Ramesh Sivanpillai (University of Wyoming) introduces remote sensing to a 6th grade class*

“Our students greatly benefited from this presentation” said Jared Long, social science teacher at LJHS. “The presentation had been tailored to topics that have been addressed in our class over the course of the year, specifically how water bodies and urban areas change over time ... our students' knowledge and engagement with these topics increased substantially.”

**APPENDIX 6 – For Internal Government Use Only**