

Statement of
Dr. Sam Batzli, Director
WisconsinView
Space Science & Engineering Center
University of Wisconsin - Madison
Before the
Natural Resources Committee Energy and Minerals Subcommittee
U.S. House of Representatives
July 23, 2009

Good morning. My name is Sam Batzli and I am a staff scientist at the Space Science & Engineering Center at the University of Wisconsin-Madison, director of WisconsinView, and a second-term member of the AmericaView board of directors. I would like to thank Chairman Costa and the committee members for giving me the opportunity to testify on behalf of the AmericaView consortium concerning HR2489, the AmericaView Geospatial Imagery Mapping Program Act. I would also like to thank Wisconsin Representatives Ron Kind, and Gwen Moore for their support and encouragement of WisconsinView and AmericaView and especially my own Representative Tammy Baldwin for her long-standing and consistent support of our efforts.

This morning I would like to offer my perspective on the importance, uniqueness, and value of AmericaView with examples from Wisconsin and my fellow StateView partners. I will touch on three topics 1) support for disaster response and recovery; 2) cooperation among StateViews; and 3) AmericaView's connection to end-users.

Support for Disaster Response and Recovery

The State members of AmericaView (StateViews) provide each state with a network of expertise both within each state and nationally to enable timely response to urgent needs.

Let me start with the story of the June 2008 floods in Wisconsin. On June 5th 2008 a severe weather pattern evolved over the Midwest. For the next 10 days much of the Midwest including all of southern Wisconsin witnessed an unprecedented rain event. Melt-off of the record 100-inches of snow from the previous winter had already saturated the soil. During those 10 days in June, areas saw upwards of 17-inches of rain, and every river system in southern Wisconsin was flooded. Many areas of Wisconsin experienced a 500 year flood event. Thirty counties were initially declared a "state of emergency" by Governor Doyle and as the situation escalated, 31 of our 72 counties received federal disaster declarations.

As the crises developed, Mr. Chris Diller of the Wisconsin Department of Military Affairs (DMA) requested the US Geological Survey (USGS) activate the International Charter. The International Charter is "An International agreement among Space Agencies to support.....relief efforts in the event of emergencies caused by major disasters." These satellite resources are provided at no cost to countries requesting help. A second related program is provided by the US Air Force known as "Eagle Vision." This program allows US States and Territories to access even more satellite resources

that are not covered under the International Charter. Both programs are coordinated by the USGS and made available to states and territories at no cost greatly enhancing access to remote sensing imagery.

Over the past few years, satellite and airborne remote sensing imagery has become a very important part of Wisconsin's disaster response and recovery activities. Remote sensing provides what no other technology can. When merged with mapping technologies, it provides emergency managers improved situational awareness, the ability to see on a map the areas that are affected, and a fuller understanding of the scope and scale of a disaster. With just a glance, managers can see what they are dealing with (Attachment A).

But remote sensing imagery is not plug-n-play. Experts require sophisticated software and processing techniques to extract useful and accurate information relevant to an end-user's needs. And that is where AmericaView comes in.

Once the International Charter was activated, radar imagery of the flooding became available from the Canadian Space Agency. Mr. Diller called me at WisconsinView for help with the processing. However, I work with optical sensors rather than radar sensors and so I tapped into the AmericaView network and coordinated the processing with radar expert Dr. Jon Chipman at NewHampshireView. Within 48 hours of the Charter activation, Mr. Diller and Wisconsin DMA had the map it needed. I am including a statement from Mr. Diller regarding this flood event and remote sensing support from WisconsinView/AmericaView (Attachment B).

Use of the International Charter in 2008 was new to Wisconsin, but WisconsinView had experience mapping tornado paths with satellite imagery in support of emergency management including mapping of the August 18, 2005 Stoughton tornado (Attachment C). Fellow stateviews in hurricane-prone areas such as TexasView and LouisianaView have been forced to utilize the International Charter more frequently and are at the center of emergency management activities in their states. In fact, a mere 10 days after the Stoughton Tornado, a disaster of larger proportions was imminent.

- **LouisianaView** found itself on the front lines of the Katrina response in 2005. Facing catastrophic infrastructure failures along the coast and in New Orleans, LouisianaView tapped into its network of resources to deliver hard copy air photo maps of New Orleans during recovery operations. Rapid deployment of a website for access to the LouisianaView archive of air photography taken both before and after the disaster proved invaluable for response and recovery operations (Attachment D).
- **TexasView** responded to multiple tropical events in quick succession during the summer of 2008: Hurricane Dolly, Tropical Storm Edouard, Hurricane Gustav, and Hurricane Ike. The University of Texas at Austin Center for Space Research (CSR), a member of the TexasView university consortium, provided geospatial support to the Texas Governor's Division of Emergency Management (GDEM)

during all four activations of the State Operations Center and Emergency Management Council. The International Charter was invoked by CSR during the three major hurricane events that impacted the Texas and Louisiana Gulf Coast (Attachment E).

- **AlaskaView** supports emergency responders include wildfire fighters who use daily satellite imagery for tracking smoke and hot spots that would otherwise be impossible to locate. This ongoing service allows wildfire managers to make informed decisions for directing resources within the vast territory of Alaska (Attachment F).
- **KansasView** has supported emergency response and preparedness activities for a variety of natural disasters and training exercises. Utilizing an aerial imaging system, KansasView was able provide emergency managers with a complete map of the aftermath of the May 2007 Greensburg tornado. KansasView staff also serve as the state project manager for the International Charter- Space and Major Disasters, and work closely with the USGS disaster response coordinator, the USGS geospatial liaison for the state, the Kansas Division of Emergency Management, and other others in all phases of disaster preparedness and response (Attachment G).

Cooperation Among StateViews

AmericaView provides the necessary infrastructure for cooperation within the remote sensing community of expertise.

Within AmericaView, we learn from each other. We are colleagues not competitors. AmericaView funding is distributed equally to all qualified StateViews. This promotes the sharing of technical expertise, curriculum materials, and lessons learned. We exchange ideas at our twice-annual meetings and through our working groups' monthly teleconferences.

Some notable examples of cooperation and sharing include...

- **WisconsinView** has experience mapping tornado swaths with satellite imagery. These techniques have been shared with other tornado-prone states such as **KansasView**.
- After the 2008 floods in Wisconsin, **KansasView** offered to process post event data from **WisconsinView** with a special flood modeling program they had developed for **KansasView**. The results will help Wisconsin in planning for future flood events.
- **AlaskaView** and **WisconsinView** develop leading-edge web-mapping technology (using GoogleEarth and GoogleMaps) to display their imagery for end-users. They have generously shared their technical expertise to great advantage within the consortium and with USGS.
- **MississippiView** hosts the AmericaView online user forum for StateView interaction and communication.

- **MichiganView** hosts the AmericaView wiki online collaboration tool.
- **WyomingView** and **MontanaView** have hosted and managed the AmericaView website.
- **GeorgiaView** hosts the online reporting tool for AmericaView states.
- **IowaView**, **GeorgiaView**, and **CaliforniaView** have developed online introductory remote sensing courses that are shared throughout the AmericaView consortium.
- **IndianaView** and **WisconsinView** have access to in-house satellite imagery receiving stations. Both programs provide daily imagery to all of the 36 AmericaView states in user-friendly formats that are not available anywhere else.
- **TexasView**, **LouisianaView**, **AlaskaView**, **KansasView** and **WisconsinView** have shared their experience and lesson's learned in coordinating remote sensing contributions to emergency management with each other and beyond at special sessions of national conferences (such as the 2008 Pecora conference in Denver, Colorado).

Reaching End Users

AmericaView connects the network of remote sensing expertise in each member state to the citizens of the state to meet end user needs.

The final theme I would like to touch on is the reach of remote sensing to end-users and the role of AmericaView. To a significant extent, remote sensing imagery is available to the public from federal agencies like USGS. The knowledge on how to use that imagery resides with the experts in the universities, governmental agencies, and the private sector. What has been missing is the infrastructure to implement that knowledge at a local level where it can be used on a daily basis to improve the lives of people. That is, perhaps, the primary value of AmericaView: to bridge that gap, to be the conduit, to simplify the process by removing technical barriers and taking advantage of our intrastate networks and internal state consortia. This is especially valuable with regard to emergency management where local knowledge is crucial.

The federal air photos and satellite images archived and provided to the public without charge through low barrier internet access by the StateViews are used across the state for a variety of purposes. Uses include, but are not limited to, agricultural field management, construction site evaluation, environmental management, drinking water intake management, recreation planning, transportation planning, private consulting, and natural resource management.

The imagery is widely popular. At WisconsinView I have established a login system that records users and downloads. Our total number of registered users topped 8,000 earlier this year. The total volume of downloaded imagery in Wisconsin through July of 2009 alone is a staggering 5.19TB (the equivalent of nearly 7,800 CDs). Back in February I asked the most frequent of these users for feed back and received over 30 testimonials and letters of support. Here are some examples.

Agro-Industry

2/27/2009

I use the WisconsinView to download imagery which I then use to assist in making maps for Code 590 Nutrient Management Plans as well as CNMP's. The imagery is saved and loaded into our GIS program. (Farmworks Sitepro) We then can layer the field boundaries and other mapped objects on the imagery. This greatly enhances our field maps as well as maps we make to show restricted areas and other areas. Other imagery is available, but it is in black and white, and most of all, very outdated, not showing some land features that have changed.

*Mike Plucinski
MP Services
Ostby MBA Inc.
KOW Consulting Association*

Natural Resource Management

3/1/2009

[WisconsinView] is a great source for aerial photography which is needed for map making duties (management plans, demonstrations, surveying, etc). ...[It] always has worked perfectly and allows great access. Don't know what I'll do if it is removed.

*Wade Oehmichen
Wildlife Biologist
Wisconsin Department of Natural Resources*

Utility Infrastructure

3/2/2009

Access to WisconsinView digital resources has improved our efficiency and greatly reduced our costs in terms of both dollars and time. Our reviews are conducted more rapidly and at a lower cost while maintaining a high level of accuracy. Continued support for AmericaView and WisconsinView will be important in the coming years as efforts to upgrade our nation's transmission system move forward.

*William Fannucchi
Public Service Commission – Wisconsin*

K-12 Education

3/2/2009

I am a teacher and director of a school that uses GIS throughout the curriculum. We regularly visit your site for GIS data and download coverage for student use. ...Your site is easy to access, user friendly and very important to the GIS community in Wisconsin. ...This type of site has allowed our students to work on projects that help build 21st century skills and an awareness of our state that is unparalleled by other opportunities.

*Paul Tweed
Wildands School
Augusta School District
Augusta, WI 54722*

Summary

Why AmericaView Works:

I became involved with AmericaView in 2004 and have served on the board of directors since 2006. Right away I discovered that there was something different going on here, that the collegial spirit and optimism of this organization goes beyond business as usual in government or academia. I think there are two reasons for this: 1) the equality-based funding philosophy promotes cooperation, and 2) AmericaView is an education and service-based endeavor that attracts like-minded people who want to share technology and knowledge for the benefit of others.

We take great pride in our work because we see the tangible benefits. We are on the front lines of workforce development, at the earliest stages, when at our outreach events we see our young students, inspired and awed by the magic of science and technology. We are there giving the lectures and workshops for undergraduates and graduate students, helping as they develop skills for the geospatial information technology job sector. We are there running the professional workshops and conferences where early- and mid-career professionals incorporate new techniques and technologies that enable their companies or agencies to improve and optimize their access and use of the rich and indispensable remote sensing imagery resources provided by USGS (as well as NASA, USDA and other federal agencies). And we are there, fostering cooperation among state and federal agencies within our states, making government more efficient and responsive to the people it serves.

To reiterate what my colleagues have already said this morning, AmericaView is built on the knowledge that there are remote sensing needs best understood and addressed at the national level, while other aspects are best addressed at the state level. Operating satellites and maintaining centralized national and global data archives are critical national priorities well handled by USGS. Education, emergency response, and support of local natural resource managers, for example, are more state and local issues that are not well handled by a centralized effort, but that require local knowledge and adaptation. AmericaView is the only organization established to do this throughout the country. This is how AmericaView effectively extends the reach of the Department of the Interior and the USGS.

It is a well-known paradox that the process of making things easy and simple can be very hard and complex. But we are good at that; AmericaView is a university-based consortium, experts in technology but also education-based, working in cooperation with governmental agencies and private sector members of our state consortia. And by removing technical and financial barriers, AmericaView extends the value of federal remote sensing investments, reaches across the final mile to the end-users. We are

coordinated nationally and implemented locally. And the flexibility each StateView has to adapt to the needs of its locale is the key to our success.

But AmericaView is in a sense becoming a victim of its own success. As we have grown in the number of member states, with the goal of ultimately including the full 50 states and six territories, we are slicing our budget pie into thinner and thinner wedges. Over the past three years our per-state allocation has diminished to critical levels.

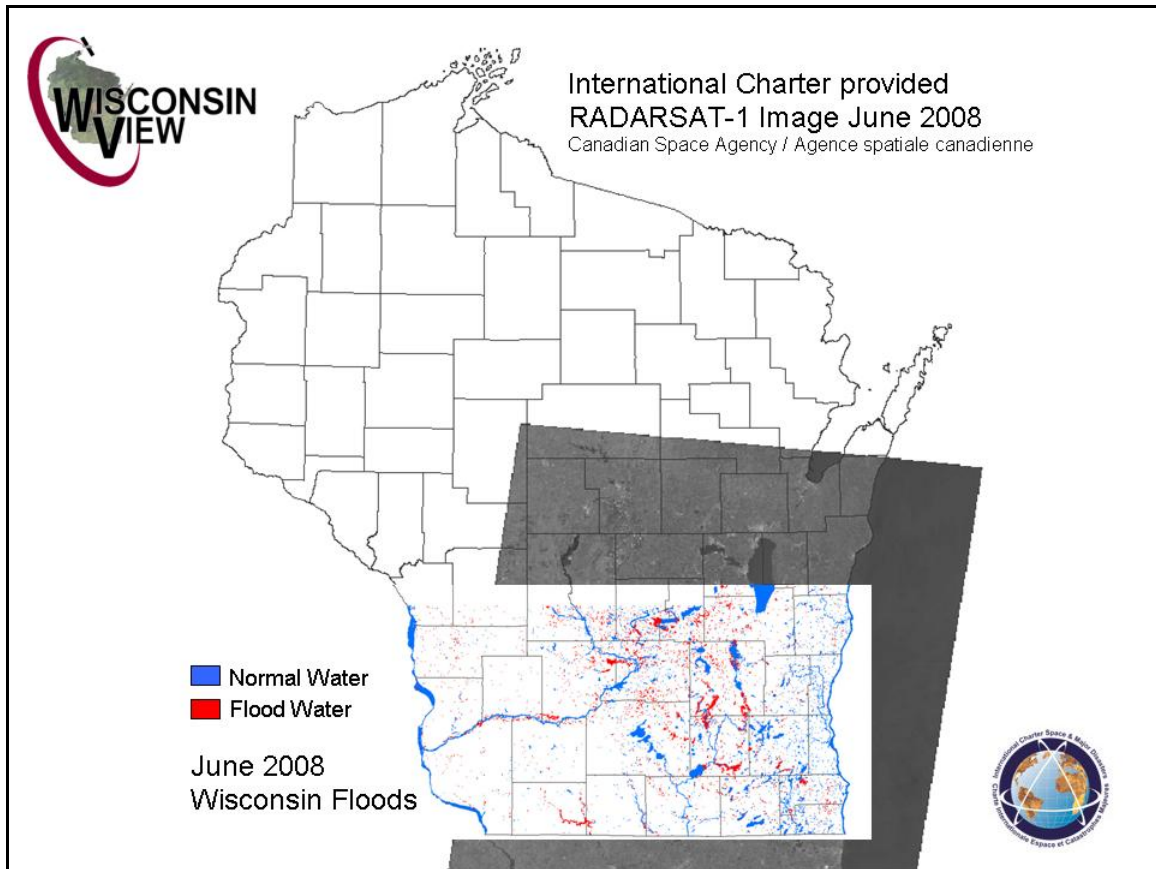
HR2489 and this hearing today gives me hope because I see that the importance of our contributions are now being recognized and understood by those who can help shape our future. I have hope that we will be able to continue inspiring awe for science and technology in our young students, preparing our college students and current workforce to assist our country with the geospatial challenges it faces, and making our government work better by “paving” that final mile between our federal remote sensing investments and our classrooms and worksites all across America. In the end, AmericaView is about connecting remote sensing science and technology with American citizens for the greater good (Attachment H).

Thank you again for the opportunity to share my views on AmericaView and HR2489. I am happy to answer any questions the Committee may have.

Attachment A



On June 5th 2008 a severe weather pattern evolved over the Midwest. For the next 10 days much of the Midwest including all of southern Wisconsin witnessed an unprecedented rain event. Melt-off of the record 100-inches of snow from the previous winter had already saturated the soil. During those 10 days in June, areas saw upwards of 17-inches of rain, and every river system in southern Wisconsin was flooded. Many areas of Wisconsin experienced a 500 year flood event. Thirty counties were initially declared a “state of emergency” by Governor Doyle and as the situation escalated, 31 of our 72 counties received federal disaster declarations.



As the crises developed, Mr. Chris Diller of the Wisconsin Department of Military Affairs (DMA) requested the US Geological Survey (USGS) activate the International Charter. The International Charter is “An International agreement among Space Agencies to support.....relief efforts in the event of emergencies caused by major disasters.” These satellite resources are provided at no cost to countries requesting help.

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Date: 17 July 2009

Chairman Jim Costa
Subcommittee on Energy and Mineral Resources Committee on Natural Resources
US House of Representatives
1324 Longworth House Office Building
Washington D.C. 20515

Subject: Support for the AmericaView Geospatial Imagery Mapping Program Act

Dear Representative Costa:

Hello, my name is Chris Diller. I am the Geospatial Coordinator for the Wisconsin Department of Military Affairs (DMA). I am writing to express my support for House Resolution 2489: The AmericaView Geospatial Imagery Mapping Program Act.

The Department of Military Affairs is home to the Wisconsin National Guard and Wisconsin Emergency Management. The primary state mission of the Department of Military Affairs is to help civil authorities protect life and property and preserve peace, order, and public safety in times of natural or human-caused emergencies. My job is to oversee and coordinate the department's mapping activities.

Over the past six years my agency's computerized mapping capabilities, more commonly known as a Geographic Information System or GIS, have evolved to a point where the State Emergency Operations Center and the Wisconsin National Guard's Joint Operation Center not only create and use maps, but depend on them to make effective and efficient decisions. For example, knowing the best location to safely insert a disaster strike team into an affected area is critical. Maps can show access points, critical infrastructure locations such as dams, and tell us who should be evacuated in case there is a breach in that dam.

Our GIS capabilities continue to evolve, and remote sensing has become a very important part of Wisconsin's response and recovery activities. Remote sensing provides what no other technology can provide. It provides emergency managers improved situational awareness, the ability to see affected areas on a map, and gain a full understanding of the gravity of a situation. It gives everyone geographic context during a disaster.

The relationship between DMA and the WisconsinView program began in 2005 when Dr. Sam Batzli (Executive Director of WisconsinView) and I worked on ways to support emergency operations with remote sensing. In August of 2005, our theories were put to the test when Stoughton, Wisconsin was hit by a F3 tornado.

With the assistance of Dr. Batzli and his students, we investigated ways in which we could identify not only the tornado path, but the extent of the damage. With the assistance of the USGS and NASA we were able to access additional satellite resources. Through the combination of the WisconsinView staff expertise, and access to new satellite resources Dr. Batzli was able to provide an after action analysis of the damage extent. Without the WisconsinView program in place, it's likely we would not have been able to generate this valuable product.

Two years later, in 2007, Wisconsin was inundated by floodwaters that resulted in 14 counties being declared a federal disaster area. Again I called on the WisconsinView program to help provide analysis assistance. With the use of Landsat and MODIS satellites we were able to provide detailed maps of the affected areas in Southern Wisconsin. We learned a great deal with how remote sensing can apply to a flood disaster. Little did I know how valuable that experience would become starting in June of 2008.

On June 5th 2008 a severe and lengthy weather pattern evolved over the Midwest. For the next ten days much of the Midwest, including all of southern Wisconsin, witnessed a 500 year flood event. Some areas saw upwards of 17 inches of rain, and every river system in southern Wisconsin was flooded. Many rivers set records for high water marks. Some records that were set in the floods of 2007 were broken again in 2008.

I again called on Dr. Batzli and the WisconsinView program to provide support. This time Dr. Batzli and I had two previous experiences to draw from, and we now had access to a wider range of satellite resources made available to us through two programs provided to states by the USGS Disaster Response Team based in Sioux Falls, SD.

It's important to note the significance of these two programs and why the AmericaView program is an important partner. The International Charter is "An International agreement among Space Agencies to support.....relief efforts in the event of emergencies caused by major disasters." These satellite resources are provided at no cost to countries requesting help. The Eagle Vision program is a domestic program operated by the Air Force National Guard that allows states to access even more satellite resources during emergencies that are not covered under the International Charter. While the USGS provides excellent access to raw satellite data, they do not have the capacity to offer remote sensing expertise.

As the flood waters began to rise we knew there was a need to fully understand the extent of the flooding. What does the landscape look like when 17 inches of rain fall over a large area of the state? While we knew it was technically possible to map flood extents, no one in Wisconsin knew how to properly process and analyze data we received. Dr. Batzli reached out to the AmericaView community and found an expert who specialized in radar-based remote sensing. Not only did Dr. Batzli find someone who specialized in radar data, but the work was done in less than 48 hours. We developed a map showing floodwaters, thereby giving emergency managers a much better picture of the situation.

Wisconsin is not the only state to incorporate remote sensing technology into disaster response activities. We are seeing this in many other states. After hurricane Katrina, states became

resourceful in finding ways they can better prepare for and respond to disasters. While remote sensing is a proven technology, it is also a highly-specialized field. AmericaView provides an important network of expertise and access to data that would not otherwise exist. I can say with confidence that our response and recovery activities have been enhanced through the assistance provided by WisconsinView, and the AmericaView Consortium.

Thank you,

A handwritten signature in black ink, appearing to be 'CD', written in a cursive style.

Chris Diller
GIS coordinator
Wisconsin Department of Military Affairs

Attachment C

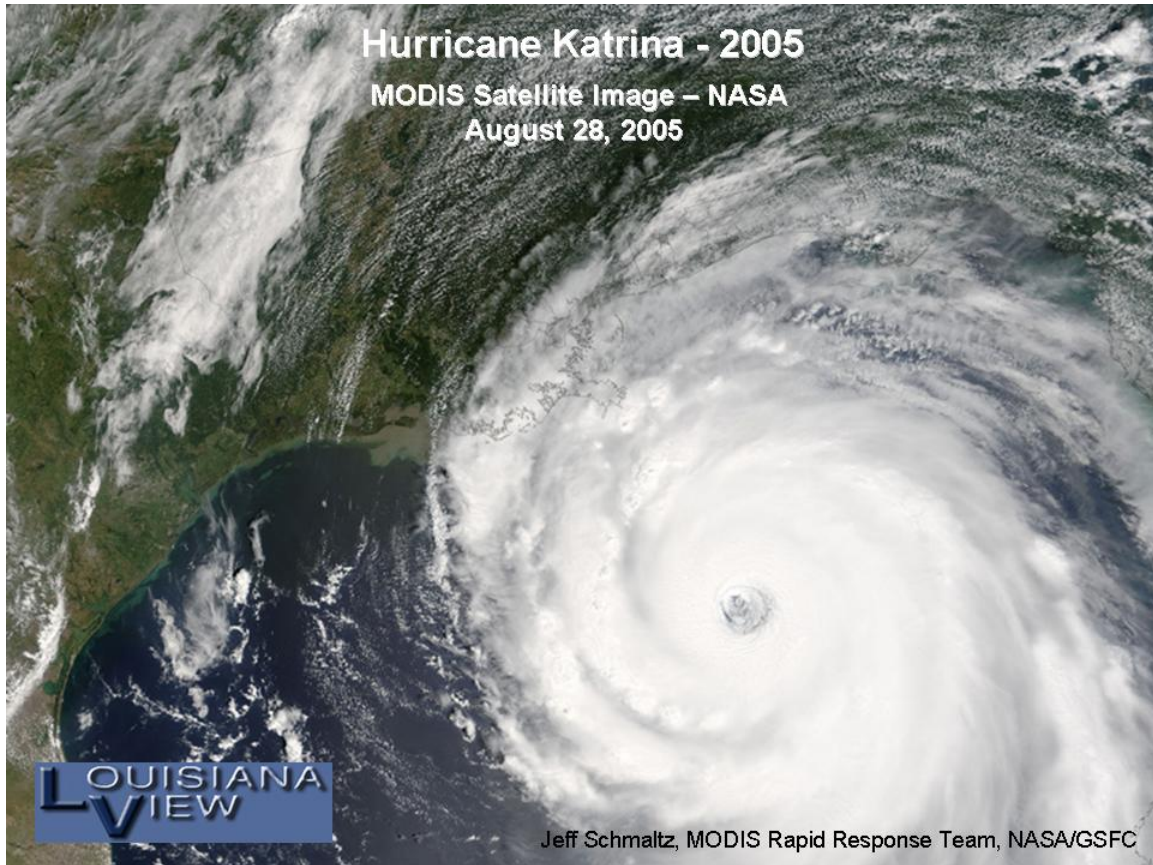


“Before” image of Stoughton, WI composed of satellite imagery from Landsat TM.



“After” image Satellite map of tornado path from the Stoughton, WI Tornado of August 18, 2005 composed of satellite imagery from Landsat TM and Terra ASTER showing damage path in red.

Attachment D

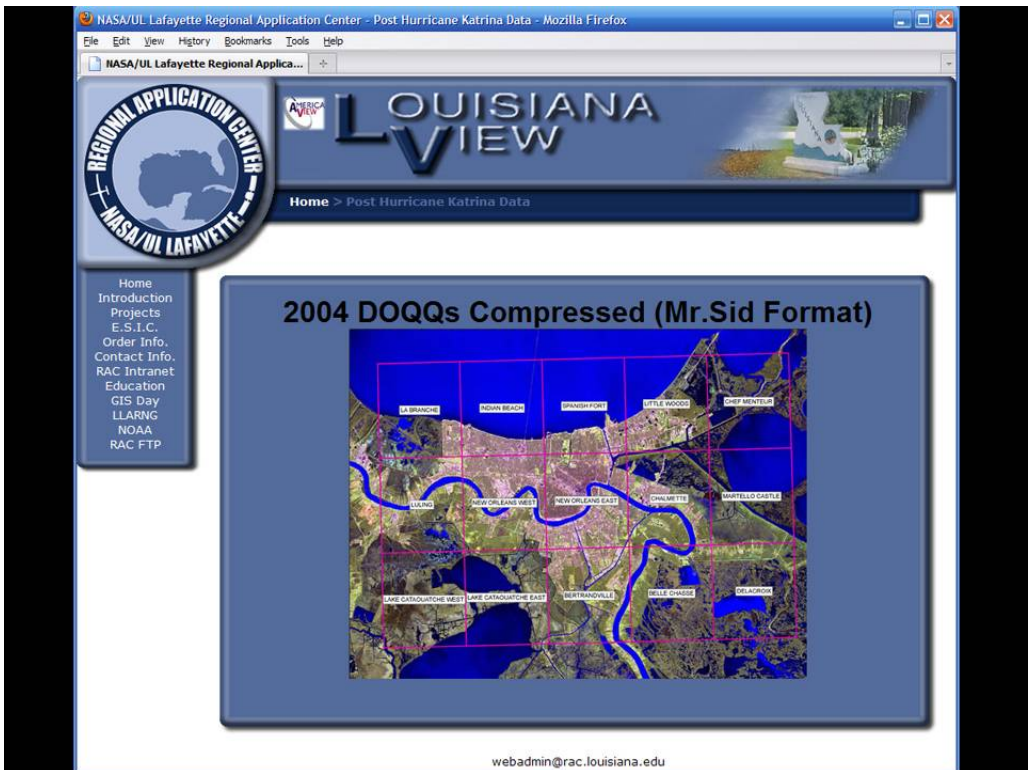


LouisianaView found itself on the front lines of the Katrina response in 2005. Facing catastrophic infrastructure failures along the coast and in New Orleans, LouisianaView tapped into its network of resources to deliver hard copy air photo maps of New Orleans during recovery operations.

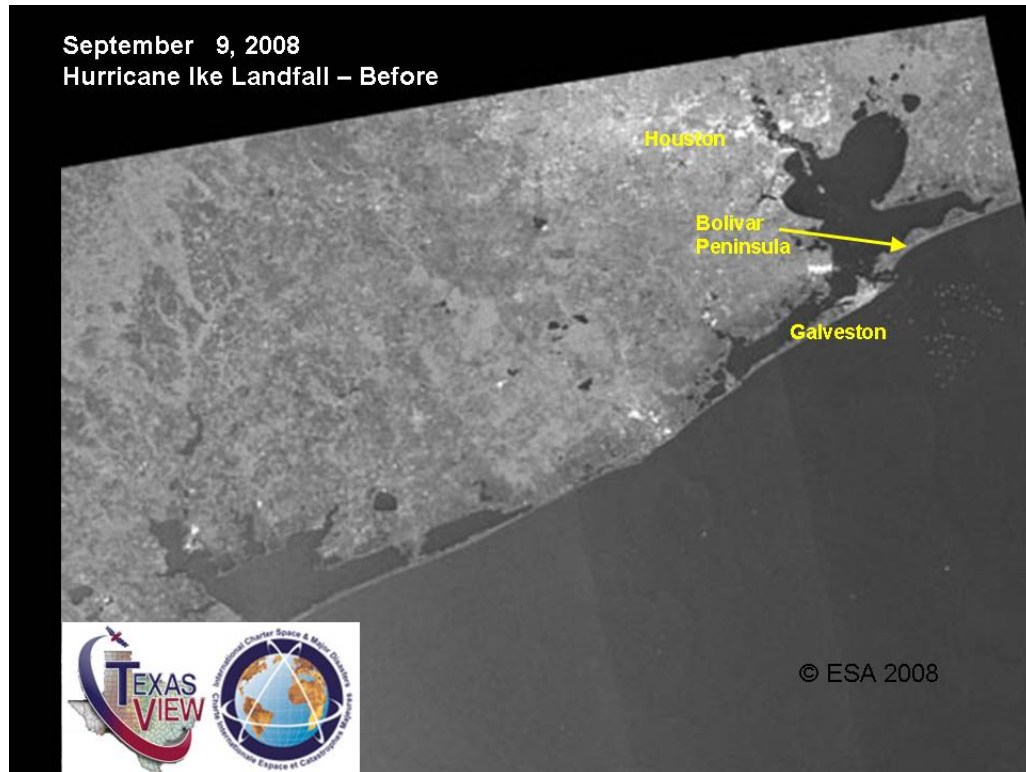
[Side note: the individual responsible for preparing the famous image of Katrina above, Jeff Schmaltz, is a graduate of the remote sensing program at University of Wisconsin-Madison where WisconsinView is headquartered.]



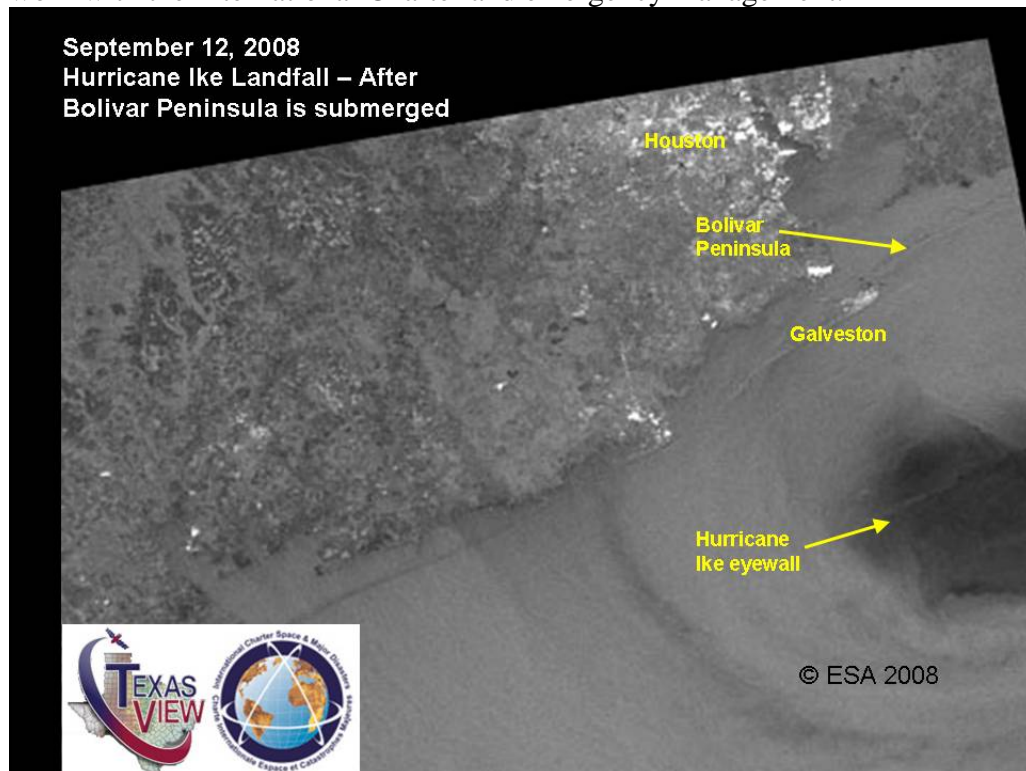
Rapid deployment of a website (below) for access to the LouisianaView archive of air photography taken both before and after the disaster proved invaluable for response and recovery operations.



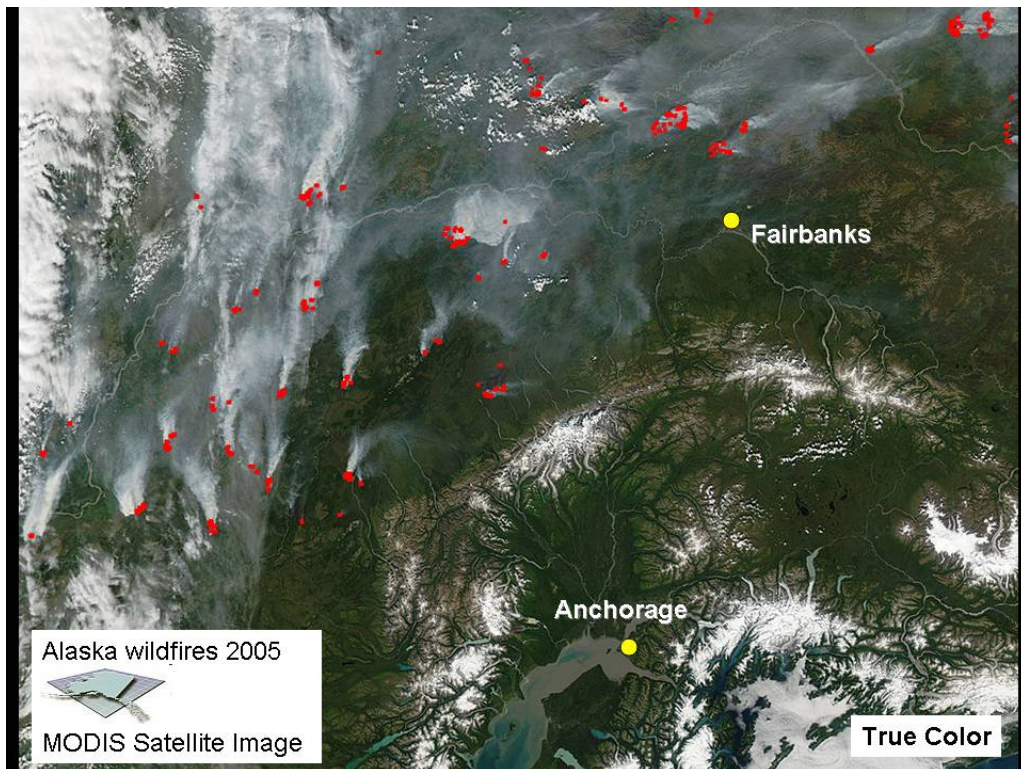
Attachment E



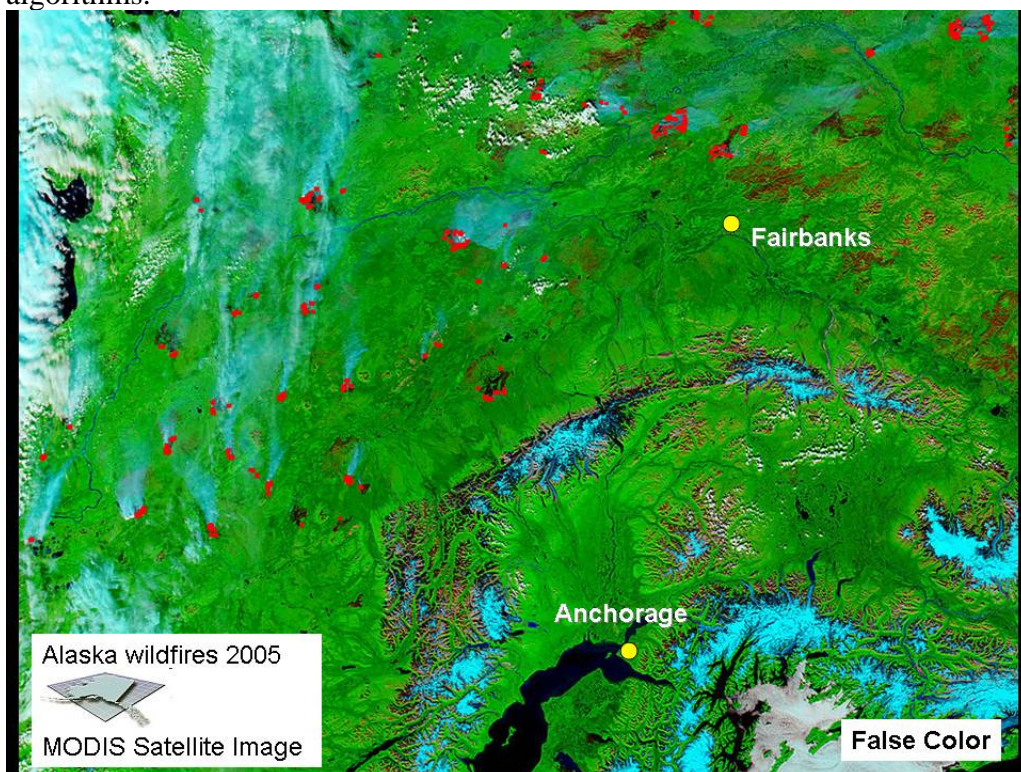
Before (top) and after (bottom) images of the Texas coast representing TexasView's work with the International Charter and emergency management.



Attachment F



AlaskaView uses satellite images to map fires. False color removes haze and shows burn scars from previous fires. Red dots are calculated hot spots based on detection algorithms.



Attachment G



Photo by Melanie Metz



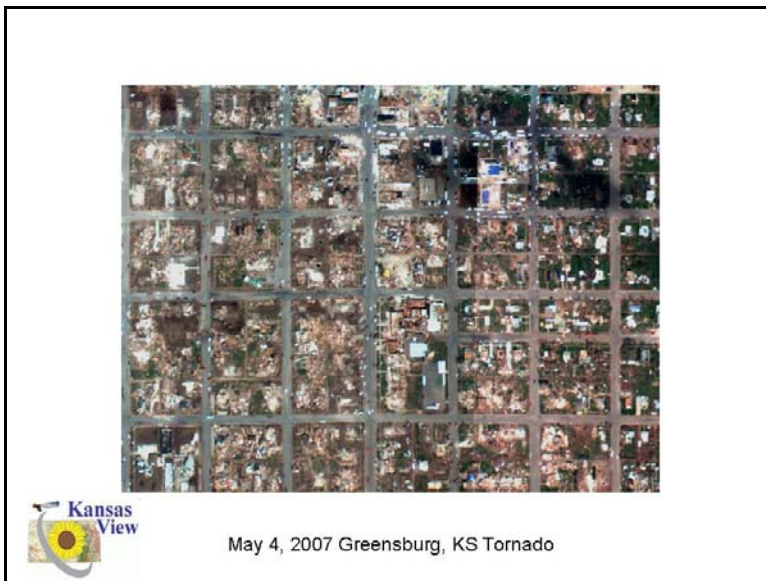
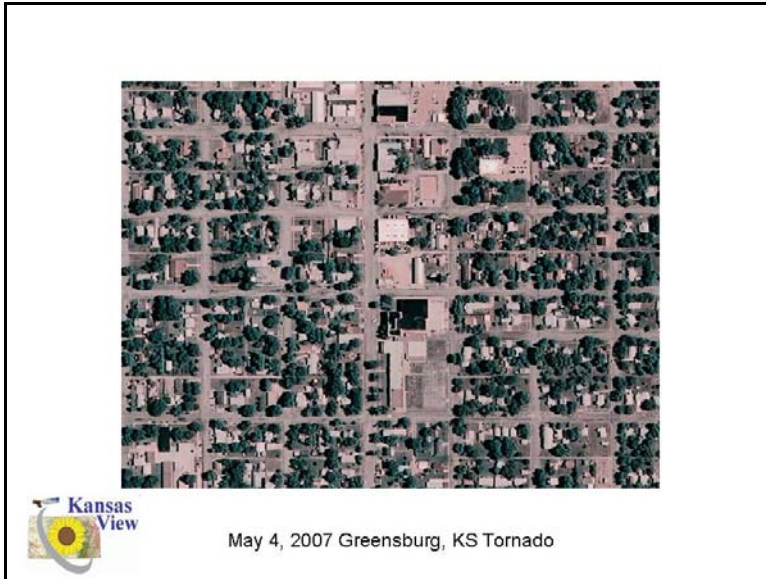
May 4, 2007 Greensburg, KS Tornado



Photo: Jaime Oppenheimer/The Wichita Eagle



May 4, 2007 Greensburg, KS Tornado



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Attachment H

AmericaView is on the front lines of workforce development, at the earliest stages, when at our outreach events we see our young students, inspired and awed by the magic of science and technology.

