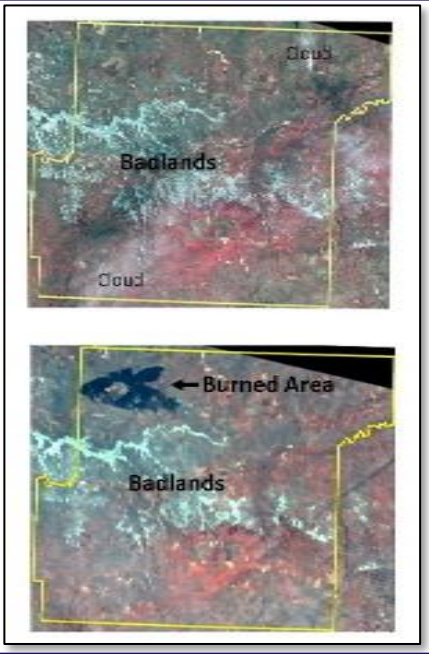
South DakotaView Remote Sensing Activities 2015 - 2016

Remotely Sensed Imagery for Agricultural Heritage Museum Display of Extreme Weather Events

South DakotaView (SDView) worked with the South Dakota Agricultural Heritage Museum, located on the campus of South Dakota State University, to plan a traveling exhibit that includes satellite imagery and aerial photography. This photography documents extreme weather and weather-related events in South Dakota such as fires, tornados, blizzards, droughts, hailstorms and floods. This exhibit, when completed in 2017, will be available for display in schools, libraries, museums, community centers and county fairs across South Dakota. A classroom discovery kit that will offer activities and curriculum for various age groups that correlate with the information presented in the exhibit will accompany the display. It will additionally offer teachers the opportunity to enhance their STEM learning initiatives in a non-traditional format.

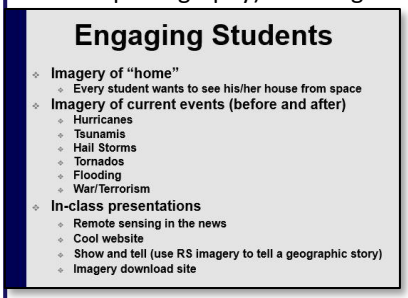
SDView and South Dakota Agricultural Heritage Museum personnel and educators worked together to research the weather events and locations that will be included in the exhibit and curriculum materials. SDView personnel acquired and processed imagery for the identified events and locations, and will continue to do so until the completion of the exhibit in 2017.



The pair of images on the right shows Jackson County in west central South Dakota before and after a rangeland fire in the northwestern portion of the county during the period of October 16-18, 2016. The upper image, a Landsat 8 false-color image, was acquired on October 13, before the start of the fire. The extent of the wildfire can be clearly seen on the October 21st bottom Landsat 7 false-color image.

Geospatial Technologies in the Classroom

A breakout session entitled "Geospatial Technologies in the Classroom" was presented at the Technology and Innovation in Education (TIE) conference in Sioux Falls, SD, on April 12, 2016. In the conference session, teachers learned basic information about remote sensing, GIS, and GPS. They also learned about the various types of remote sensing imagery available for their use (including Landsat, NAIP, and historical aerial photography). Throughout the session, information was presented on how geospatial technologies can be used to enhance classroom instruction in various discipline areas. The material used during the session was made available to TIE for their use and dissemination. TIE is now conducting GIS workshops as an SDView consortium member.



An excerpt of information presented in the "Geospatial Technologies in the Classroom" session at the April 12, 2016, TIE conference.

Benefits to South Dakota

As part of the AmericaView organization, SDView works synergistically with the other AmericaView states to **expand the utilization of remotely sensed imagery and technology for the benefit of its citizens, scientists, researchers, and educators**. Each AmericaView state has different needs and thus undertakes different projects to service those needs. **Educating the current workforce as well as the workforce of tomorrow (K-16 students) about the benefits of remote sensing and related geospatial technologies is a major area of emphasis for SDView**. This year's activities – the Agricultural Heritage Museum display, the TIE conference session for educators, the Big Sioux Water Festival interactive display for 4th graders, and the graduate-level evapo-transpiration project – are examples of those education efforts. In previous years the SDView education efforts have included workshops for K-12 teachers and 4-H educators and a statewide geospatial conference for current and potential remote sensing data users. All of these events create awareness of remote sensing products and their use for practical applications that are of benefit to the state's economy and the environment.

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

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Additional South DakotaView Activities

South Dakota Lakes: A Look from Above

The 24th annual Big Sioux Water Festival was held on the campus of South Dakota State University on May 10, 2016, with 1,151 fourth-grade students, 167 parents, and teachers from 30 area schools in attendance. SDView provided an interactive exhibit entitled "South Dakota Lakes: A Look from Above" at the Festival. This exhibit used remotely sensed imagery to show students, parents, and teachers what South Dakota lakes look like from space. By clicking on a lake, additional information about the lake appeared in a popup window. ArcGIS Online software was utilized to display several other mapping layers for the state such as rivers, highways, cities, railroads, county boundaries, and a latitude/longitude grid. Students could also see what their school or home looked like from space by typing an address into the ArcGIS Online software. Handouts included an ArcGIS Online worksheet, a listing of geospatial websites, a Landsat mosaic of South Dakota, and a shaded relief map of the state.

Fourth-grade students viewing the "SD Lakes: A Look from Above" interactive display at the Big Sioux Water Festival.

Remotely Sensed Imagery for Estimating Evapotranspiration from Crops

A study to compare actual crop evapotranspiration (ET_a) estimated from the satellite remote sensing-based METRIC model and from in situ measurements using an atmometer was carried out at three locations in eastern South Dakota by graduate student Arturo Reyes-Gonzalez and researchers at South Dakota State University, Minnesota, and Iowa. Nine corn fields were used to estimate ET_a. Clear sky imagery from Landsat 8 and Landsat 7 was processed using the METRIC model. The atmometer readings were recorded every morning between 8:15 and 8:30 a.m. The comparison between METRIC-based ET estimates and the atmometer readings was encouraging, showing a coefficient of determination of 0.88 and an index of agreement of 0.86. The results of this study can be used by policy makers, researchers, and producers for estimating ET_a and improving irrigation water management at local and field scales.

South DakotaView Consortium Membership

The SDView mission of **expanding the utilization of remotely sensed imagery and technology for the benefit of its citizens, scientists, researchers, and educators** is accomplished via a consortium of partners from throughout the state. The entities listed below in addition to many universities, technical institutes, and tribal colleges in the state have worked with SDView during 2015-2016 in a variety of activities that further the mission and goals of SDView.

- South Dakota State University Agricultural Heritage Museum
- SD Bureau of Information and Telecommunications
- City of Sioux Falls
- SDSU Extension - STEM
- Technology & Innovation in Education
- SD Dept. of Environment and Natural Resources
- SD Department of Education
- EROS Center SD/ND/WY/MT Liaison

Federal consortium members identified above do not receive funding from AmericaView.

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