



WYOMINGVIEW REMOTE SENSING ACTIVITIES 2015 - 2016

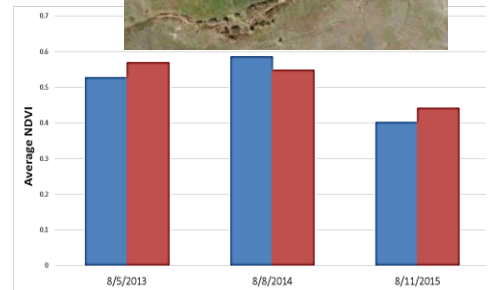


MEASURING DIFFERENCES IN PLANT GROWTH WITH LANDSAT IMAGERY

The WyomingView internship program continues to benefit University of Wyoming students interested in addressing real-world problems using remotely sensed data. Interns work with agency personnel and agricultural producers to generate geospatial information about burn severity, crop growth, land cover changes, etc. In 2015-16, five undergraduate interns worked on mapping crop growth, water bodies, and land cover changes.

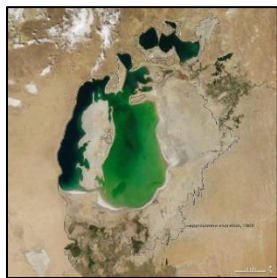
Julia Collins, one of the five interns, came from a family that owns a farm in northwest Wyoming. One of the farm's fields had variations in soil moisture (wet and dry areas), which resulted in differences in alfalfa growth and yield. As part of this internship, she used Landsat 8 images and compared alfalfa growth in the wet and dry areas of the field. WyomingView downloaded three Landsat 8 images (acquired in 2013, 14 and 15) from the USGS. Based on the vegetation vigor measured by sensors aboard Landsat 8, she noticed that wetter areas had lower vigor in comparison to drier areas in 2013 and 2015. These differences were statistically significant. However, no significant difference was noticed between these two areas in 2014 since it was a wet year.

Eric Collins, the producer, commented that *"the Landsat 8 study was helpful in solidifying my previous observations concerning problem areas in my field. With the support of this scientific data, I will feel more confident in moving forward with management practices to elevate overly dry or wet areas such as digging ditches and corrugating to divert irrigation water."*



Landsat 8 spectral measurements of alfalfa growth in the wet (blue) and dry (red) areas showed differences. Producer plans to build structures to divert irrigation water and minimize future differences in crop growth.

EOD: SATELLITE IMAGES IN K-8 CLASSROOMS



Satellite images acquired in 2000 (above) and 2016 (below) show the impact of diverting water from the rivers flowing into Aral Sea (Central Asia). Image courtesy: NASA

As Earth Observation Day (EOD) activities expand in Laramie area schools, water and environmental impact of human activities continue to be topics of high interest. Teachers are interested in satellite images depicting changes in earth surface features. Changes in the amount of water stored in reservoirs, and the disappearance of the Aral Sea in central Asia, are some of the topics covered as part of the EOD. Andy Pannell, one of the teachers mentioned *"Our class truly enjoyed the time spent with the aerial images of the Aral Sea region. The images... really help elementary students access and care about complex ecological problems. The opportunity to think critically about problems that don't have an obvious solution is what I appreciate most. My kids are more interested in geography and their changing world after our time."*

Number of students reached during 2015-2016

Indian Paintbrush ES	3 rd grade	41
UW Lab School	6 th grade	18
Laramie Junior HS	8 th grade	86
Indian Paintbrush ES	2 nd grade	46

Satellite images are valuable for illustrating how natural and human activities impact our environment. Students are able to relate how actions in one part of world can impact elsewhere and the interconnectedness of the world we live in.

WyomingView 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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BENEFITS TO WYOMING

Earth Observation Day activities are related to STEM disciplines, and therefore contribute to student learning in these critical areas of demand.

Integrating imagery such as Landsat and MODIS in classrooms helps connect human actions with their impacts on the environment. What students learn in textbooks is brought to life through the pre- and post-event satellite images.



WyomingView intern Cameron Sloan evaluated the performance of mapping small water bodies in the Powder River Basin, WY, using indices derived from Landsat images. He presented his research findings in the 2016 Wyoming Undergraduate Research Day in Laramie on April 30, 2016.

Five University of Wyoming students were part of this year's WyomingView internship program. Interns received training to process Landsat images and extract information to address resources management issues.

All interns presented their findings at the 2016 Wyoming Undergraduate Research Day.

WyomingView internships lead to training the future work force in technology (STEM) areas.



WyomingView intern Julia Collins after presenting her research findings in the 2016 Wyoming Undergraduate Research Day in Laramie on April 30, 2016.

WyomingView internships connects students with farmers and agency personnel to address real-world crop and natural resources management issues.

- End users benefit from the information derived from these images without having to process the imagery.
- Student projects highlight the value of multi-temporal Landsat images for crop growth monitoring and natural resources management in Wyoming.
- This activity is aimed at addressing the information needs in Wyoming using Landsat data and applied research.

WYOMINGVIEW CONSORTIUM MEMBERSHIP

University of Wyoming

USDOI-Bureau of Land Management, Cheyenne, WY

USDA-Natural Resource Conservation Service, Casper, WY

USDA-Forest Service, Golden, CO

State Engineers Office, Cheyenne, WY

Wyoming Game & Fish Department, Cheyenne, WY

Wind River Environmental Quality Commission, Ft. Washakie, WY

SkyTruth Inc. Morgantown, WV

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

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