



HAWAI'IVIEW REMOTE SENSING ACTIVITIES 2015 - 2016

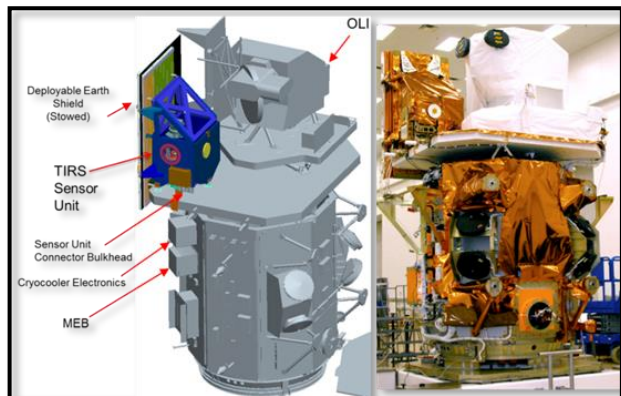


BRINGING LANDSAT INTO THE CLASSROOM

"LandSat in a Box" for All Grades

The reliable performance of the 2013-launched Landsat 8 satellite continues the 40-year program of monitoring the Earth from space. To encourage understanding of the impact of the data and the science and technology behind the mission among students, Hawai'iView developed self-contained "Landsat 8 Science Kits." The general topics addressed are: satellites, remote sensing, heat, and light.

The Landsat 8 Operational Land Imager (OLI) is a push-broom sensor with a four-mirror telescope and 12-bit quantization. OLI collects data for visible, near infrared, and short wave infrared spectral bands, as well as a panchromatic band. The Thermal Infrared Sensor (TIRS) was added to the Landsat 8 payload to continue thermal imaging and to support emerging applications, such as evapotranspiration rate measurements for water management.



The Landsat 8 spacecraft design graphic of the satellite elements (left) and prior to launch (right). Information obtained from <http://landsat.gsfc.nasa.gov>.

Replicating OLI and TIRS on the Desktop

Although the OLI and TIRS instruments are orbiting at an altitude of 705 kilometers above the Earth's surface and moving with a velocity of 7.5 kilometers per second, students can replicate the sensors' measurements on the desktop using a low cost instrument set. While having fun, they also more easily grasp the underlying sensor technology principles deployed on a sophisticated launch-and space-durable satellite system. Each of the Hawai'iView Science Kits contains a hand-held reflectance spectrometer and a hand-held infrared radiometer. Students make measurements using these instruments and plot the data themselves.

The Hawai'iView Landsat 8 science kits contain everything needed to conduct the experiments, including stationery that changes color using the heat from your hands. Landsat 8 makes measurements of the amount of light and heat reflected and emitted from Earth's surface. Heat-sensitive pencils, rulers, and diffraction glasses promote learning under the guise of play. In workshops, designed by Hawai'iView to explain how these instruments work, participants are introduced to concepts of light and heat using some simple experiments and professional instruments such as the Alta II Reflectance Spectrometer and IR Temperature Sensor.



Top: The Landsat in a Box basic kit includes a reflectance spectrometer and a thermal infrared sensor, reflection and refraction kits, filters, diffraction glasses, and mood pencils. Bottom: Students using the science tools to learn about the Landsat program in K-12 classrooms and community outreach events.

Hawai'iView 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 Website:
www.AmericaView.org
Roberta Lenczowski, Executive Director:
roberta.lenczowski@sbcglobal.net
Chris McGinty, Program Manager:
chris.mcginity@americaview.org
Jarlath O'Neil-Dunne, Board Chair:
Jarlath.ONeil-Dunne@uvm.edu

BENEFITS TO HAWAI`I

Providing students with the hands-on experience of making remote sensing measurements in the classroom is beyond the budget of the majority of classroom teachers. Each year, Hawai`iView prepares and distributes the most current version of its Landsat 8 Science kit. Those kits are available free of charge, and in the 2015-2016 school year Hawai`iView took them into the classroom to introduce 401 students (grades 2 through 12, with girls making up just over 50 percent of participants), 15 teachers, and 22 parents to the Landsat 8 mission. Hawai`iView participated in two community outreach events, Ellison Onizuka Science Day at the University of Hawai`i at Hilo and Expand Your Horizons at the University of Hawai`i at Manoa, and did seven classroom and grade-level visits to Hawai`i Island and Oahu public schools.

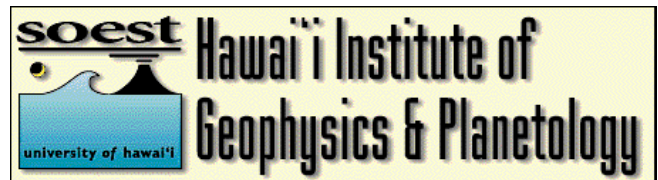
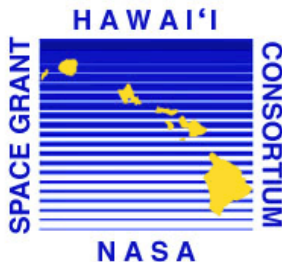


Fun with science! Students in a third grade public school classroom who participated in Hawai`iView to learn more about light, satellites, and mapping.

HAWAI`IVIEW CONSORTIUM MEMBERSHIP

Hawai`iView is based out of the Hawaii Institute of Geophysics and Planetology, which is part of the School of Ocean and Earth Science and Technology (SOEST) at the University of Hawaii at Manoa.

Dr. Robert Wright (wright@higp.hawaii.edu) is the Principal Investigator for Hawai`iView and Ms. Amber Imai-Hong (amber@higp.hawaii.edu) is the Hawai`iView outreach specialist. Hawai`iView partners with NASA's Hawai`i Space Grant Consortium. The vision of Hawai`iView is to increase public appreciation for the contribution that Earth observation makes to our nation's ability to monitor its natural resources by hosting exciting, hands-on educational workshops for school children, their teachers, and their parents.



**SCHOOL OF OCEAN AND EARTH
SCIENCE AND TECHNOLOGY**

UNIVERSITY OF HAWAI`I AT MĀNOA

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

Hawai`iView Principal Investigator:

Dr. Robert Wright

University of Hawai`i at Manoa

808-956-9194

wright@higp.hawaii.edu



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



[Facebook.com/AVHawaiiView/](https://www.facebook.com/AVHawaiiView/)

Major funding for the AmericaView Consortium is provided by the U.S. Geological Survey through Grant Number G14AP00002.