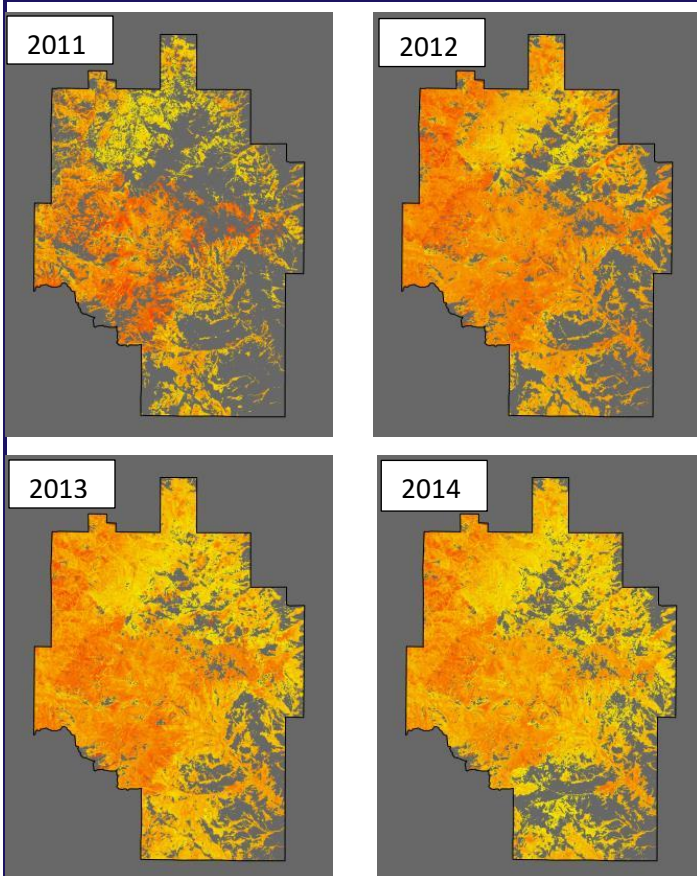




MONTANAVIEW REMOTE SENSING ACTIVITIES 2015 - 2016



MAPPING BARK BEETLE INFESTATIONS IN MONTANA'S FORESTS – EVALUATING INFESTATIONS OVER TIME



These processed Landsat images show the development of a bark beetle infestation in the Helena National Forest from 2011-2014. Darker orange colors represent higher levels of mortality.

MontanaView endeavored to create temporally robust models of bark beetle mortality for the Helena National Forest in Montana. These models will enable us to map mortality for one date and then, based on those results, create a time series that shows how mortality spread over the period of the bark beetle outbreak. Initial results evaluated creating models of mortality using 2013 Landsat OLI surface reflectance data and applying the model to other dates. The 2013 model averaged less than 1% difference between predicted and observed values. Predictions for 2009 (a date for which we had reference data) using this model had an average difference of 5% between predicted and observed values.

SUPPORTING STUDENT SERVICE LEARNING

Service learning is an important educational tool where students conduct real-world projects for agencies, non-profit organizations, and others. MontanaView supported students conducting service learning projects at Montana State University, Montana Tech, Salish Kootenai College, and the University of Montana.

Samuel Tittle of Montana State University completed a project for the Montana Research and Economic Development Initiative evaluating methods for optimal spectral band identification using the PIKA II hyperspectral sensor. Michael Oldham of Montana State University compared the use of high-resolution aerial imagery and Landsat OLI imagery for wetland mapping in the Gallatin Water Quality District. Rachel Powers from The University of Montana assessed riparian vegetative health on the North Fork of the Flathead River using NAIP imagery. Nick Kline of The University of Montana evaluated socio-economic reorganization in response to climate change in Vietnam's Mekong Delta with the aid of historical Landsat imagery. Mo Li from Montana Tech studied aeromagnetic exploration of the rare earth element (REE) deposit sites in New Mexico using high-resolution airborne gravity and magnetic data and hyperspectral imagery. Molly Stammer from Salish Kootenai (Tribal) College worked with the Flathead Lakers non-profit to evaluate channel migration of the Upper Flathead River with historical aerial imagery.



Map of Flathead River migration created using historical NAIP imagery by Molly Stammer at Salish Kootenai College.

MontanaView 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.mcginty@americaview.org

Jarlath O'Neil-Dunne, Board Chair:

Jarlath.oneil-dunne@uvm.edu

BENEFITS TO MONTANA

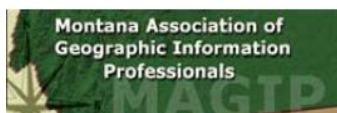
Traditional approaches to mapping bark-beetle infestations have limited utility for site-specific forest management, because they lack sufficient specificity with respect to intensity of the mortality. Mapping percent mortality using freely available Landsat data will enable improved forest management. Mapping the spread of bark beetle infestations using historical Landsat imagery will enable forest managers and ecologists to better understand and predict future infestations.

MontanaView's education efforts are fulfilling a critical goal for remote sensing in Montana. Last year, five students at three institutions had the opportunity to complete real-life remote sensing projects with tangible results for government agencies and non-profit organizations (for example, by providing information on stream changes to the Flathead Lakers non-profit in northern Montana). As a result, Montana is gaining an experienced, well-prepared workforce.



Bark beetles have ravaged large areas of Montana's forests. All stages of bark-beetle attack can be seen in this scene of the East Garnet Range of Montana. Photo: Peter Kolb, Montana State

MONTANAVIEW CONSORTIUM MEMBERSHIP



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

MontanaView Principal Investigator:

Rick Lawrence

Montana State University

(406) 994-5409

rickl@montana.edu



<http://montanaview.org>

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