

Fort Collins Science Center  
NASA DEVELOP 2012 Fall  
EarthZine Video Storyboard Transcripts

[Introductory music composed by Matt Luizza]

Scene 1: Program Introduction

>> [Bill Zawacki] “Welcome to the NASA DEVELOP National Program from the Fort Collins Science Center, Fall 2012 Team”

“Our study focus is Ecological Forecasting within the Colorado Rocky Mountains. Our project title is: Assessing forest resilience and vulnerability to support adaptive management and policy in Fraser Experimental Forest: Calibrating Models to Better Assess Impacts of Mountain Pine Beetle on Forest Stand Structure.”

Scene 2: Introducing the Project

>> [Amy Birtwistle] “The Fort Collins Science Center team, working out of the North Central Climate Science Center, located at Colorado State University in Fort Collins, Colorado, is charged with integrating NASA Earth Observing Systems with ancillary datasets, to create a robust decision support tool for our USDA Forest Service partners.”

>> [Kelli Groy] “For the fall term, we have focused on calibrating an accurate fine resolution forest cover classification map of FraserExperimental Forest in Fraser, Colorado.”

Scene 3: Introduction of Bill Zawacki

>> [Bill Zawacki] “Hello, I am Bill Zawacki, a second year Colorado State University Master’s student in Forest Sciences, emphasizing ecosystem restoration, geospatial analysis and public policy. I am also a first year NASA DEVELOP Intern with the Fort Collins Science Center.”

Scene 4: Introduction of Kelli Groy

>> [Kelli Groy] “My Name is Kelli Groy and I am an undergraduate student at Colorado State University where I am currently finishing my degree in Wildlife Biology. I hope to pursue a career in researching ecological changes and impacts on wildlife in conjunction with GIS mapping.”

Scene 5: Introduction of Amy Birtwistle

>> [Amy Birtwistle] “Hello, My Name is Amy Birtwistle and I am a Master’s Student studying at Colorado State University.”

“My interests are in ecological sciences with an emphasis on plant community compositions. I am interested in using geographic information systems with field data collection to explore a Master’s degree in landscape ecology.”

Scene 6: Introduction of Matt Luizza

>>[Matt Luizza] "Hi. My name is Matt Luizza and I am a PhD student in the Graduate Degree Program in Ecology at Colorado State University, and the Center Lead for the NASA DEVELOP Fort Collins Science Center. My research looks at integrating traditional ecological knowledge with geospatial mapping and modeling of ecosystem services and invasive species in east Africa and the United States.”

### Scene 7: History

>> [Amy Birtwistle] “Lodgepole pine is a well-represented tree species within the Rocky Mountain region. Due to warmer winters, homogenous age class, and stresses from drought, lodgepole has become highly vulnerable to Mountain Pine Beetle attack. Stands throughout the west have been dying off rapidly. This high speed change has and will affect ecosystem processes at all levels. Therefore understanding the effects of this recent epidemic on forest structures is key to assisting managers in post-outbreak mitigation, and assessing long term ecological impacts”.

### Scene 8: Community Concerns

>> [Bill Zawacki] “There are a myriad of concerns that mountain pine beetle infestation has contributed to. Among these are critical forest stand changes such as, increased erosion, alteration and degradation of watersheds, increased fuel loading and with it, increased wildfire risk, diminished wildlife habitat, reduced forest recovery and regeneration, and potential for widespread alteration in species composition over time.”

### Scene 9: Interview with Robert Hubbard, Rocky Mountain Research Station (Q&A)

>> [Robert Hubbard]

Question 1:

How might any long-term changes in forest structure due to the mountain pine beetle invasion, effect overall forest health?

Question 2:

What have federal, state and local community governmental agencies done to recuperate after the deterioration of Colorado Forests?

Question 3:

Do you foresee a change in the forest composition from the plant species that are regenerating?

### Scene 10: Model Input

>> [Matt Luizza] “In this project we are continuing the work started by the summer NASA DEVELOP team, to create a fine resolution (30 meter) forest cover classification model for Fraser Experimental Forest. To do this we have used the statistical modeling workhorse known as Boosted Regression Tree.

The BRT model uses Landsat imagery with topographical parameters, and ground-truthing validation plots to create a landcover classification model. To do this, the ground-truthing data has to be split up into 80% training data to train the model and 20% test data to validate the models accuracy. A successful model will have greater than 80% accuracy.”

### Scene 11: Field Data

>> [Kelli Groy] “We have increased our amount of inputs from the previous term by adding twenty additional 7.2 meter validation plots. This video is a fast forward example of one of these plots taken this fall. So as to not confuse the model, the unforested area within the study area has been removed from our inputs. Then, we added a comprehensive soils layer as well as time-series Landsat 5 imagery spanning from 1993 to 1999. This time span will allow us to investigate the period before the peak of the mountain pine beetle epidemic. With this data and the 7.2 meter validation plots, we have created a fine scale land cover classification map.”

### Scene 12: Results

>> [Amy Birtwistle] “The BRT had a model output with XX% accuracy. This model has successfully created a high resolution forest cover classification map of Fraser Experimental Forest. This output shows FEF as being XX% lodgepole, XX% spruce/fir, and XX% or the forest is aspen.”

### Scene 13: Results

>> [Bill Zawacki]  
(Show Results Here)

#### Scene 14: Boosted Regression Tree Tutorial

>> [Amy Birtwistle] “In addition to creating a fine-scale classification model of Fraser Experimental Forest, we have also documented the steps in 5 explanatory tutorials located on the ColoradoView website. This tutorial will make it easy for land managers and other researchers to use the Boosted Regression Tree model. These researchers can follow our steps to create a similar model to look at other regions or other vegetation.”

#### Scene 15: Next Steps

>> [Kelli Groy] “Our research has been distributed to the stakeholders and resource managers associated with the Fraser Experimental Forest as well as publically available on the ColoradoView website. The next DEVELOP team will continue this work with creating a post beetle landcover classification map of Fraser Experimental Forest as well as looking at hydrology related issues associated with the mountain pine beetle epidemic. These models are the ground work for producing a regional fine scale classification model.”

#### Scene 16: Acknowledgements

>> [ Matt Luizza] “We would like to acknowledge the organizations and people involved in supporting us with this research. NASA DEVELOP, USGS, Colorado State University, the Natural Resource Ecology Lab, USDA Forest Service Rocky Mountain Research Station, and Fraser Experimental Forest.”

#### Scene 17:

Scroll Credits

[Music composed by Matt Luizza]