

Rwanda Agriculture:  
**Monitoring Agricultural Practices and Soil  
Erosion in the Republic of Rwanda for  
Enhanced Land Management**

by

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## RWANDA AGRICULTURE - EARTHZINE VIDEO TRANSCRIPT

"Accralate" plays.

(Suzanne does a voiceover.)

SUZANNE

Rwanda.

In Kinyarwanda, "Rwanda" means "land".

Situated between the ecosystems of the Congo Basin and the Great Rift Valley of Eastern Africa, the land of Rwanda is home to great beauty and unmatched bio-diversity.

The land is vital to Rwanda, as many people depend on agriculture for their survival.

But in the rugged landscape of the aptly named "Land of A Thousand Hills," the more mountainous regions of Rwanda are not always the best suited for growing.

Efficient use of land is a major concern - for one of the smallest countries in Africa, Rwanda happens to be the most densely populated. However, the lack of flat terrain, combined with unsustainable farming practices and deforestation further reduces the amount of available land for agricultural use. Soil erosion is especially heavy in the Western Province, where the Gishwati Forest lies.

At the National Aeronautics and Space Administration Research Center in Langley, Virginia, a group of DEVELOP interns decided to use remote sensing to solve the problem.

Comprised of six team members from across the states and two international students from Rwanda, the team worked to help improve agriculture in Rwanda.

(Sarahtalks about the objectives of the team.)

SARAH

Our team focused on two major problems that the Rwandan government faces, and they were 1. Soil erosion and 2. Unsustainable agricultural practices.

To address these concerns we created methodologies for conducting land cover classifications and an erosion model. We gathered recent, July 8, 2011, Landsat 5 satellite imagery from the USGS's visualization viewer. Also, we got Digital Elevation data from TERRA's Aster sensor. Both of these satellites are part of the NASA EOS suite.

Using Multispec QGIS, Arcgis, and Erdas, we classified this imagery by land cover types, and used Google Earth as a reference for ground-truthing. The result was one image, classified three times, through four different software programs.

We did this to show that using free and open source software, such as MultiSpec and QGIS can still produce effective results comparable to those conducted through industry standards such as ArcGIS and Erdas.

(Keith talks about the results of the classifications.)

KEITH

Here are our three land cover maps from Multispec, ArcGIS, and Erdas. The maps are similar and show the remnant Gishwati Forest in their lower left corners. This area, which was once part of the forest, is now rangeland. However, there are differences among the maps, including the extent of obscuring cloud cover and the amount of subsistence agriculture, with more in the Multispec map than in the ArcGIS and Erdas maps. Nevertheless, all three classification methodologies created effective and similar land cover maps.

(Suzanne does a voiceover.)

SUZANNE

Along with the classification maps, the team also produced an erosion susceptibility map.

(Jeff talks about the erosion susceptibility map.)

JEFF

Our erosion susceptibility map is designed to highlight the areas of Rwanda most likely to be negatively impacted when cleared for agriculture. It's based on three key factors known to drive erosion: slope steepness, rainfall, and soil type. Data from these factors were then combined to make the erosion susceptibility map.

Future projects can include the influence of current or proposed land cover on erosion rates to aid in sustainable land use decision-making.

(Suzanne does a voiceover.)

SUZANNE

We presented our methodologies to representatives from the Rwandan Embassy, who will then pass it on to those who can make decisions in agriculture, such as the workforce in charge of doing land cover change analyses for the country.

Through cooperation between the Rwandan government and NASA, we can help build a better Rwanda.

## CREDITS

UNDP

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Poverty and Environment Initiative (PEI) in Rwanda

<http://youtu.be/dvuqoqSgV8E>

Rwanda - Reaching New Heights

<http://youtu.be/3WtoYSG3AGA>

NASA:

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**Earth in full HD**

<http://www.youtube.com/watch?v=aFBGi77gJKk&feature=related>

Landsat flyby

<http://svs.gsfc.nasa.gov/vis/a010000/a010500/a010513/>

NASA logo, animated by Mike Banom:

<http://www.youtube.com/watch?v=cubQ9is4rHc&feature=related>

Google Earth

Music:

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Kevin MacLeod. "Accralate."

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