**DEVELOP National Program**

MSFC

**Fall 2012**

**Colombian Disasters:**

*Utilizing NASA EOS data and in-situ data for fire management in el Departamento del Valle del Cauca, Colombia*

**Squib:**

The people of Valle del Cauca, Colombia have little warning about the ignition dangerous wild fires. Thanks to the collaboration of DEVELOP and SERVIR, this project will create a map that illustrates the dynamic risk evaluation of the ignition of hazardous wild fires.

**Applied Sciences National Applications Addressed:**

Disasters and Ecological Forecasting

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**Community Concerns**

* Severe fire incidence in Colombia has increased damaging wild areas into sterile land
* A current geospatial information support system and forecast system for fire management does not exist
* Permanent monitoring mechanisms need to be in place to facilitate the management of more resources for fire management

**Study Location:** Valle de Cauca, Colombia

**Study Period:** 2003-2010

**100 Word Blurb**

Fire plays an important role in the lives of the people of Valle del Cauca, Colombia. Wild fires can cause loss of crops, ecosystems, infrastructures, and even human lives. Currently, a geospatial information support system capable to aid in fire management does not exist. With the help of SERVIR, our team plans to create a dynamic fire risk evaluation map based on social and environmental aspects. This risk evaluation map will be presented to a local university to distribute to the people of Valle del Cauca, so people can be warned when conditions are favorable for fires to occur.

**Abstract**

Fires across Colombia have imposed a significant threat to biodiversity, rural communities, and established infrastructure. NASA’s Earth Observing System (EOS) can play a major role in monitoring fires and natural disasters. SERVIR, the Regional Visualization and Monitoring Network, constitutes a platform for the observation, forecasting and modeling of environmental processes in Central America. A project by SERVIR called “The GIS for Fire Management in Guatemala (SIGMA-I)” was conducted to address fire forecasting in Guatemala, with successful results. We plan to continue our study from the DEVELOP summer 2012 term with continued use of SIGMA-I as a reference and build upon the methodology. The summer session feasibility study proved that the fire maps are a viable option. Ground data from Colombia will help distinguish between anthropogenic controlled fires used for agricultural burning and wild fires correlation matrices used to improve the statistical accuracy of the correlation matrices, as well as found ways to work with local universities and governments to make the maps widely available to the public. This study will investigate both environmental and social factors that would be used to create an ignition model and a dynamic fire risk evaluation map: (1) Using social information, such as when farms conduct prescribed burns for harvesting, fires will be identified as either anthropogenic or naturally occurring. The naturally occurring fires will be used in the models. (2) Based on the algorithms created during the SIGMA-I project, correlations between environmental factors and the number of fires will be presented in a matrix. The environmental factors studied will be the accumulated precipitation as recorded by TRMM and in-situ weather station data and the Normalized Difference Vegetation Index (NDVI) as produced by MODIS. (3) From the correlations, an algorithm will be created to produce a dynamic fire risk evaluation map. Because the map is dynamic, it will use current data. The goal of this term is to research how to appropriately incorporate MODIS and TRMM data along with in-situ data on environmental and social parameters in a fire risk evaluation model.

**Earth Observations & Parameters**

Aqua and Terra –MODIS Hot Spot detection

Aqua and Terra –MODIS NDVI product

TRMM – Accumulated Rainfall

**Future Applicable NASA Missions**

NPP - VIIRS

LDCM – Land Cover

**Ancillary Datasets Utilized**

In-situ data from National Weather Service (Colombian) and the CVC:

Weather Stations

**Decision Support Tools**

* Dynamic Fire Risk Evaluation map – This will aid in predicting the possibility of wild fires, so that the people of Valle del Cauca, Colombia are prepared for the risk of wild fires.

**Partners/Collaborators**

Universidad Autónoma de Occidente, Colombia

Centro de Monitoreo y Evaluacion (CEMEC)

Consejo Nacional de Areas Protegidas (CONAP)

Wildlife Conservation Society

Corporación Autónoma Regional Del Valle de Cauca (CVC)

Gobernación del Valle del Cauca

**Current Management Practices & Policies** - In Colombia, a geospatial information support system for fire management does not currently exist.

**Benefit to End-User:**

* Provide relevant statistics on fire risk in Colombia
* Provide a methodology for future assessment for fire disasters
* Capacity building