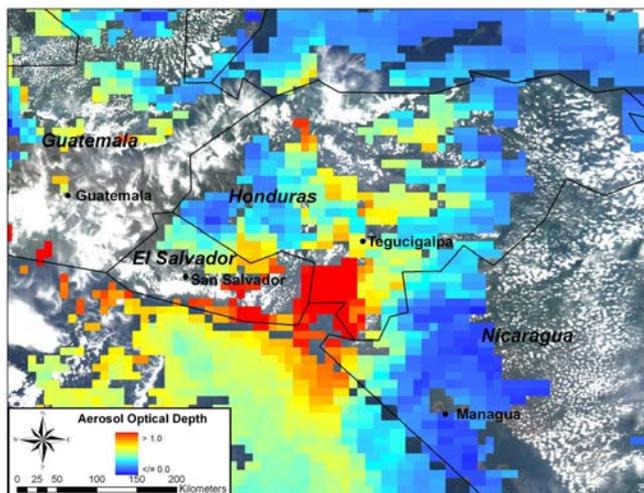


Applications of Satellite Products for Air Quality Monitoring, Analysis, Forecasting, and Visualization in SERVIR- Mesoamerica and SERVIR-Himalaya Regions



MODIS true color and Aerosol Optical Depth on April 27 2008 showing smoke in Honduras and El Salvador

Why is the AST pursuing this project? Air quality is a public health concern in both the Mesoamerican and Hindu Kush-Himalaya (HKH) regions. Decision makers in these regions need the data and technical capacity to reduce air pollution and protect public health.

What does this project do? This project helps to provide decision makers in Mesoamerica and the HKH access to the information and tools they need for daily air quality forecasting and monitoring of air pollution. It enables them to make decisions that can protect public health or support emissions control strategies.

How will the AST perform this project? The team will work with end-users to determine the most appropriate steps for generating and broadening the base of applications of Earth observations for air quality decision support. They will also enhance the air quality modeling capacity of stakeholders in Mesoamerica and build sustainability in regional modeling activities. In Mesoamerica, project tasks will focus primarily on urban air pollution, while in

the HKH, the focus will be on trans-boundary air pollution – that is, pollution that originates in one country but causes damage in another country’s environment by crossing borders in the air. Such pollution can be transported across hundreds and even thousands of kilometers.

The project will set up experimental versions of the national modeling systems using the Community Multiscale Air Quality (CMAQ) model as the foundation and incorporating meteorological inputs for Mesoamerica from the Weather Research and Forecasting (WRF) model that is being run by the NASA Short-term Prediction Research and Transition (SPoRT) Center. The project will work to incorporate the national emissions inventories from the relevant countries into the modeling systems, so that the system can produce ground-level pollution estimates to be displayed and disseminated by SERVIR. The system’s output will be verified with the end-users, and the model codes, documentation, and user guides will be transitioned to the end-users.

The team will develop daily near real-time satellite products, including a new, high-resolution NASA Moderate Resolution Imaging Spectroradiometer (MODIS) aerosol optical depth (AOD) 3-km product, for monitoring and tracking air pollution. AOD, a measure of the amount of light that aerosol particles scatter and absorb in the atmosphere, is a critical measure of air quality. The team will also work with regional end-users and SERVIR staff to develop graphic imagery, Google Earth formats, and website tools for the near real-time products.

Additional activities include

- Support expansion of the SERVIR-Mesoamerica air quality model and engage in outreach and capacity building activities to promote the use of satellite products for air quality applications.
- Conduct a scoping survey and inventory of regional air quality data and capabilities in the HKH
- Analyze the statistical relationship between PM_{2.5}/PM₁₀ monitor measurements and MODIS AOD. (PM_{2.5} particles are particulate matter air pollutants with a diameter of 2.5 micrometers or less, small enough to invade even the smallest airways. They are products of combustion, primarily caused by burning fuels. Examples of PM_{2.5} sources include power plants, vehicles, wood burning stoves, and wildland fires. PM₁₀ is coarse particulate matter and is between 2.5 and 10 micrometers. These particles can come from road dust, agriculture dust, river beds, construction sites, mining operations, and similar activities.)
- Develop a methodology to quantitatively track the sources and evolution of trans-boundary air pollution.

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Where is this project used? Mesoamerica, HKH

When will it be available? 2016 on SERVIRGlobal.net

Who are the co-developers?

Who are the contributors/partners? Battelle Memorial Institute, Pennsylvania State University, Science Systems and Applications Inc., University of Maryland, Baltimore County (UMD-BC), US Environmental Protection Agency

Who uses it? Ministerio de Medio Ambiente y Recursos Naturales (MARN), Ministry of Environment and Telecommunications (MINAE), UNA Costa Rica (National University), Ministerio de Salud (Ministry of Health in El Salvador), Central American Commission for Environment

and Development (CCAD), Univ. of Panama, CATHALAC

What Earth observations and NASA products contributed to this application?

For more information:

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