

FIRECAST: A Near Real-Time Monitoring System Improving Forest Management in the Tropics

NASAfacts

Challenge

The loss of the world's natural habitat through timber extraction, wildland fires, and agricultural expansion is causing wide-ranging environmental and economic impacts. Projected increases in frequency and intensity of drought conditions will increase the incidence of wildland fires. Drought and fire cause economic strain, displacement, and food insecurity while also impacting biodiversity and the provision of ecosystem services such as water availability, water quality, and pollination. In addition, fire disasters cause health problems from poor air quality and the spread of disease.

Solution

Conservation International's Firecast tool is designed to help prevent the destructive effects of fires on natural habitats and human well-being. Firecast uses emerging technologies and cutting-edge research to empower local stakeholders with timely monitoring and forecasting information. The system packages and delivers short-term fire-risk forecasting and near real-time (NRT) detection of fires, droughts, and deforestation to subscribers through a suite of delivery mechanisms customized to the needs of in-country decision makers.

Firecast aims to deliver the latest NRT Earth Observation data products through a highly customized user interface to reduce the barriers to data access, whether it be internet bandwidth, technical capacity, limited resource, or language. In addition, Firecast is using the latest technologies to enhance decision making with interactive dashboards and a mobile application.



Firecast delivers a suite of customized products to meet decision-makers' needs: email alerts, web maps, mobile apps, and interactive dashboards.

Firecast's web map displays active fires, fire risk, and forest disturbance alerts. The interactive map is used by local partners to increase public awareness of ecosystem threats.

NRT Monitoring Products

Active Fire Alerts

Firecast delivers daily MODerate Resolution Imaging Spectroradiometer (MODIS) and Visible Infrared Imaging Radiometer Suite (VIIRS) active fire alerts to subscribers who use the data for active fire control, policing of illegal forest activities, policy enforcement, Reduced Emissions from Deforestation and forest Degradation (REDD+) monitoring, and education.



Firecast allows users to select highly customized criteria for alerts that include Key Biodiversity Areas (outlined in purple) and peatlands (in yellow-green).

Firecast OnSight

Firecast's OnSight mobile app (available in the Google Store) displays active fires anywhere in the world in near real-time.



Our team from the US and Peru tested the Firecast OnSight mobile app in Ambohitantly Reserve in Madagascar.



Conservation International works directly with in-country partners and decision-makers to understand the challenges users face managing fire risk and fire incidence. The system currently operates in Bolivia, Colombia, Peru, Suriname, Madagascar, and Indonesia.

National Aeronautics and Space Administration

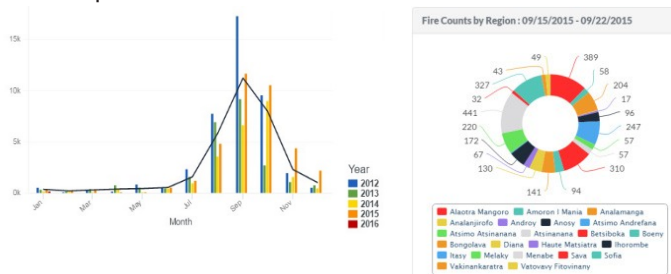
Conservation International
Principle Investigator: Karyn Tabor
 2011 Crystal Drive, Suite 500
 Arlington, VA 22202
www.conservation.org

www.nasa.gov

Publication Number: NP-2018-04-058-LaRC

Firecast Analytics

Enabled by our technology partner Logi Analytics, users can create custom visualizations to gain deeper insights into the spatial and temporal distribution of fire incidences. The fire information is continually updated so users can make real-time decisions to reallocate resources to address fires or enforce land use policies.

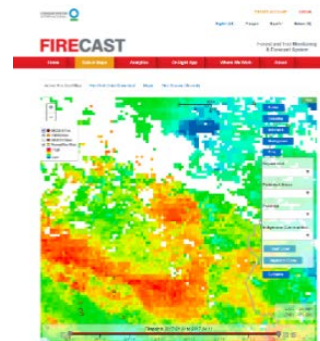


Firecast Analytics allows users to understand how current fires patterns compare to historical trends. In addition to data visualizations, users can download the relevant fire and tabular data for their own exploration.

Fire Danger Forecasting

Our model uses satellite-based estimates of weather conditions derived from the MODIS and Global Precipitation Measurement (GPM) to generate a daily forest flammability risk indicator for forested areas in the South America and Indonesia through our partnership with Global Forest Watch.

Firecast displays daily fire risk forecasts on its web map for select regions. Elevated risk of forest flammability for the Amazon region due to dry conditions is shown in orange and red in this map. (Right)



Publications

Musinsky, J., Tabor, K., Cano, C. A., Ledezma, J. C., Mendoza, E., Rasolohery, A., & Sajudin, E. R. (2018). Conservation impacts of a near real-time forest monitoring and alert system for the tropics, 1–8. <https://doi.org/10.1002/rse2.78>.

NASA Applied Sciences Program
Wildfires program area



Scan the QR code here to visit the Wildfires program area landing page