

## The INPE Program for Vegetation Fires

Alberto Setzer<sup>1</sup> and Fabiano Morelli<sup>1\*</sup>

**ABSTRACT** – A summary of INPE's Wildfire Program and its current products is presented. In the mid-1980s 1 km resolution NOAA-9/AVHRR images received at INPE showed smoke plumes from deforestation fires in Amazonia spreading for hundreds of kilometers and contaminating an airborne NASA-INPE air-chemistry experiment. Among the consequences, biomass burning emissions were first related to global warming and, 3.7 $\mu$ m satellite imagery became a tool for detecting vegetation fires worldwide. Since then, space technology, data processing and internet, particularly when combined, evolved to a new dimension, creating unprecedented applications; INPE's Wildfire system for Latin-America [www.inpe.br/queimadas](http://www.inpe.br/queimadas) results from this evolution along three decades, adapting to constant-changing technologies and answering requests from users. Eight operational modules exist: 1) "BDQueimadas", a webGIS for spatial and temporal analysis of the fire pixel database with ~250 million fire detections, including layers of political meteorological, fire risk, deforestation etc. 2) "CIMAN", a management tool for forest fires using satellite data to locate the main events, where fire brigades add information from the field and managers upload reports. 3) "TERRAMA2Q", a digital platform that allows anyone to create his/her own monitoring center with at least the same capabilities of INPE's. 4) "Burned Area 30m" that automatically maps burned area annually in the country's Cerrado/Savanna using Landsat 30 m resolution data; it is currently being expanded to other biomes. 5) "Burned Area 1km", that produces 01km resolution (MODIS & VIIRS sensors) burned area data on a monthly basis. 6) "Fire Risk", that from a weather perspective calculates the susceptibility of the vegetation to burning; forecasts up to 5 days are produced by CPTEC/INPE using models of NWF. 7) "SISAM", a platform developed for the Ministry of Health to analyze the effects of smoke on human health. 8) "GGT", an interactive tool developed for ANEEL to monitor fires and vegetation removal along power transmission lines. Various customized reports and alerts are sent to ~3,000 registered users, and the number of visitors since 2018 is ~310,000. On average the media publishes two articles/day and hundreds of scientific and technical publications exist, all referring to the Program's data. Details of the above tools are presented in other papers/posters at this WildFire-2019 conference.

**Keywords:** Wildfire; satellite monitoring; fire risk; burned area; fire management; GIS; alerts

---

<sup>1</sup>Instituto Nacional de Pesquisas Espaciais (INPE) – Programa Queimadas, S.J.Campos, SP, Brasil, \*contact e-mail: [fabiano.morelli@inpe.br](mailto:fabiano.morelli@inpe.br)