EXTENDED ABSTRACT

Using NASA polar orbiting fire product record to enhance and expand the Global Wildfire Information System (GWIS)

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The proposal is responsive to the NASAResearch Opportunities in Space and Earth Sciences (ROSES) 2016 A.50 Call: Group on Earth Observation Work Programme, Element3.8: Global Wildfire Information System

The Global Wildfire Information System (GWIS), supported by the European Commission Joint Research Center, provides a portal and repository for regional and national level fire information with the goal of enabling a comprehensive view and evaluation of fire regimes and fire effects at global level.

The proposed research is responsive to the *Data Compilation and Analysis* part of the NASA call and will provide GWIS enhancements and tools for improved on-demand statistics, tabular information, and graphical information at regional (e.g. U.S. state level), national, sub-continental fire region, continental, and global scales; and at monthly, seasonal and annual time periods focused on meeting GWIS needs for supporting policy and natural resource assessment

Building on our expertise developing, quality assessing and validating fire products from the MODIS, VIIRS, Landsat, and ESA Sentinel missions, and our involvement with international fire coordination activities (GOFC-Fire IT and CEOS CalVal), we will prototype, test and integrate into the GWIS a suite of information and analytic modules. The focus will be on developing and porting to the GWIS based on the existing Collection 6 MODIS burned area and active fire data record:

* Software to generate summary statistics over different spatial regions and temporal periods:
  + total area burned (ha and km2) with uncertainty estimates
  + total number of active fire detections (counts)
  + temporal ranking of the above and the year/month that the ranked values occurred on
  + counts of the number of months or years where there was no fire (burned area = 0 km2, or number of active fires detected = 0)
* Software to generate summary statistics over different spatial regions and temporal periods:
  + start of the fire season
  + end of the fire season
  + peak month of burning
  + temporal ranking of the above and the year/month that the ranked values occurred on
* Software to generate summary statistics over different spatial regions at annual temporal scale:
  + fire size distribution
  + mean, median and maximum fire size, number and minimum fire size of the fires responsible for 25%, 50%, 75% of the total annual burned area.
* Software to generate on-demand tables, charts and plots of the above information.
* Software to generate global spatially explicit 500m raster data sets defined for different temporal periods
  + pixel burned area status: burned, unburned, unmapped
  + the number of times the pixel was detected as burned
  + the median Julian day of burning

The software development build of our previously and currently funded work and will take into account the product attributes (projections, unmapped areas, cloud obscured areas, QA flags).

The software will be provided to the GWIS technical staff in stages to ensure proper implementation and to enable them to fully understand the software functioning and structure so that it can continued to be used to support the GWIS after the NASA funding ends. The information and visualizations produced will be developed following OGC standards and guidelines and the GEOSS Data Sharing Principles.

We will work closely with the GOFC Fire IT and with the GWIS partners, with regular meetings throughout the performance of the project, to ensure that the new tools and capabilities respond to the needs of the multiple users of the GWIS system. In year three of the proposal we will pathfind how to integrate the NASA VIIRS active fire and burned area products (that are still not mature) into the above software suite.