

PUBLICATION OF BURNED AREA INFORMATION IN NATIONAL EARTH OBSERVATION SYSTEM WEBGIS USING GEOMOOSE MAPCLIENT

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Abstract. Forest fire resulted in bare land of burned area. Information of burned area is needed to manage and handle the area. LAPAN has built National Earth Observation System as a public service information system to publish the result of remote sensing application. WebGIS of burned area information is developed based on open source software. Operating system platform using Ubuntu Server 16.04 LTS. Server basis data using PostGIS 2.0. Mapserver sing UMN MapServer 6.4. As Mapclient using GeoMoose software version 2.8.1. GeoMoose has a number of advantage features, such as modularity, configuration ability, very light for server that it can handle a large number of users, larga number of layers, and service without weighting the server. WebGIS of burned area information can be used as a spatial decision support system (DSS) to support spatial strategic decision making.

Keywords: burned area, WebGIS, GeoMoose, Spatial Decision Support System

1. Introduction

Forest fire is one of disaster faced by Indonesia, mostly in Sumatera, Kalimantan, Papua, and other islands with high forest cover. This disaster becomes stronger due to anomaly climate phenomena such as El Nino. Forest fire resulted in bare land of burned area. Remote sensing technology has been used to identify and monitor forest fire and burned area. LAPAN has done research and monitoring of forest fire and burned area based on remote sensing data.

A number of research on application of remote sensing to identify forest fire and burned area have been done by Zubaidah et. al (2014), Vetritya et. al (2014), Suwarsono et. al (2015). The procedure of satellite data processing and analysis of burned area had been documented and published (Pusfatja LAPAN 2015).

Information of burned area is needed to manage and handle the area. LAPAN has built National Earth Observation System (NEOS) as a public service information system to publish the result of remote sensing application. Sarno (2014) assessed dissemination of natural resources information in Sulawesi Island based on remote sensing and web mapping system. Sarno (2015) has assessed and built prototype of web mapping system of forest fire hot spot information to support quick response of land and forest fire in Indonesia. This paper examines the development of WebGIS prototype for burned area information.

2. Material and Methods

Data used as an input for the WebGIS prototype are burned area information, which is the result of operational activities to monitor forest fire and burned area. The prototype of burned area information webGIS was developed using open source softwares:

- (1) Operating system platform using Linux UBuntu Server 16.04 LTS
- (2) MapServer using UMN MapServer 6.4
- (3) Basis data server using PostGressql/Postgis

(4) Map Client using GeoMoose Version 2.81.

Geomoose has a number of advantage features, such as modularity, configuration ability, very light for server that it can handle a large number of users, large number of layers, and service without weighting the server (Little, 2015). GeoMoose is a webclient with Java script framework to display cartographic data. It has modularity, configuration capability and provide a number of core function in its package. GeoMoose is very light for server to handle a large number of users, layers, and services without weighting the server. GeoMoose is written using JavaScript and HTML. It can be operated from basic web server (Nginx, Apache, IIS). It has services written in PHP, which add capability to do drill-down to identify operation, selection and search data set.

Base maps of burned area information WebGIS consist of:

- (1) Administration boundaries: provincial boundary, regency boundary, coastlines
- (2) Peat map of Sumatera, Kalimantan, and Papua Islands

The grids for the burned area information WebGIS prototype are available in 1°, 2°, 3°, 4°, and 5°. As the background data for the WebGIS prototype are obtained from web services, that is:

- (1) Google Street
- (2) Google Physical
- (3) Google Hybrid
- (4) Google Satellites
- (5) ESRI World Imagery

3. Result and Discussion

Publication of burned area information in National Earth Observation System (NEOS) webGIS has been developed. The prototype will be included in the existing NEOS, which can be accessed through website <http://pusfatja.lapan.go.id>. WebGIS of burned area information provide two main information, that is burned area and fire hotspot. Based on these information, users can do data analysis, such as time series data analysis of burned area and hotspot, correlation between burned area and hotspot, distribution of burned area and hotspot by provinces, regencys, other area boundaries. Users can analyse the information in details by enlarge the data visually. Users can also use the background data to include in the data analysis. Users can export the data into other format like spreadsheet, and print the map for report. These data, function, spatial and time series analysis capability that provided in WebGIS of burned area information can be used as spatial decision support system to support spatial strategic decision making. WebGIS of burned area information, with 5° grid and Google Satellite background for all Indonesian area is shown in Figure 1. More details burned area information in West Kalimantan, Central Kalimantan, East Kalimantan, and Riau are shown in Figure 2 - 6.

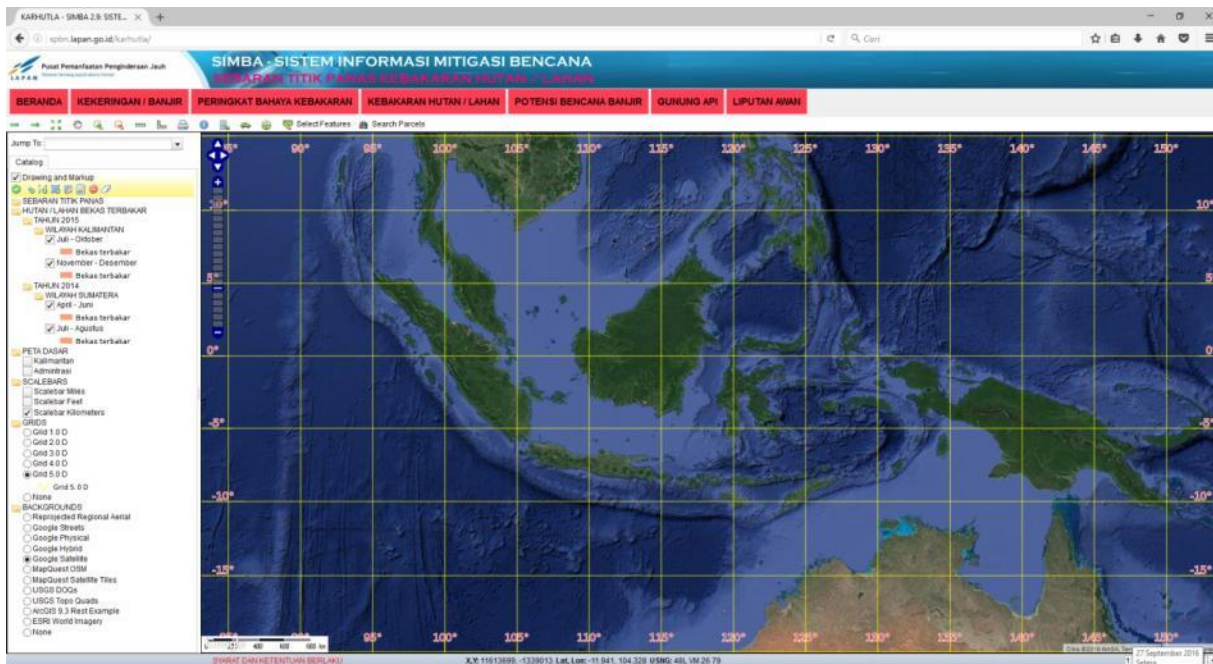


Figure 1. WebGIS of burned area information, with 5° grid, and Google Satellite background.

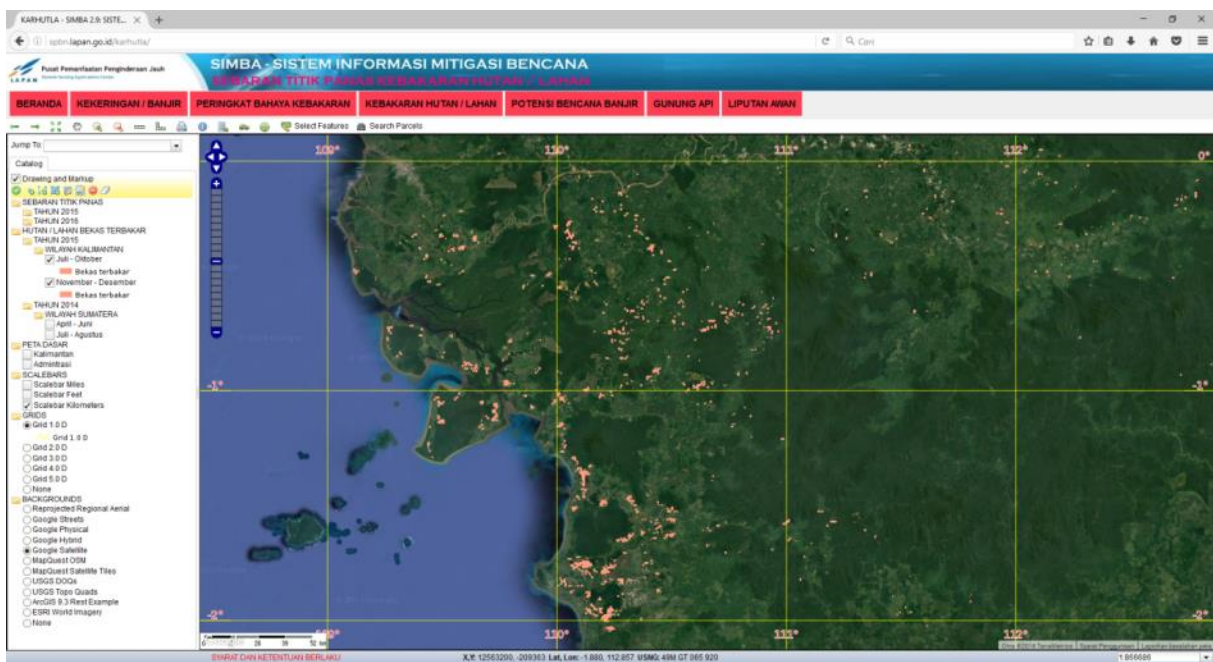


Figure 2. WebGIS of burned area information in West Kalimantan, with 1° grid, and Google Satellite background

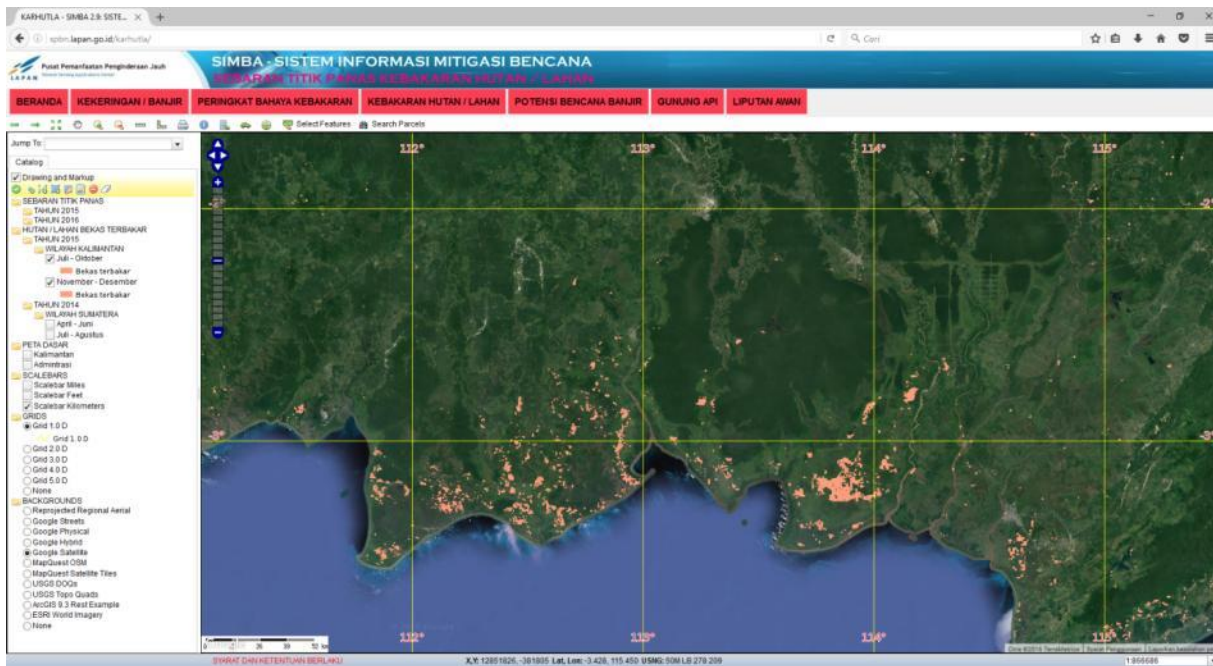


Figure 3. WebGIS of burned area information in Central Kalimantan, with 1° grid, and Google Satellite background

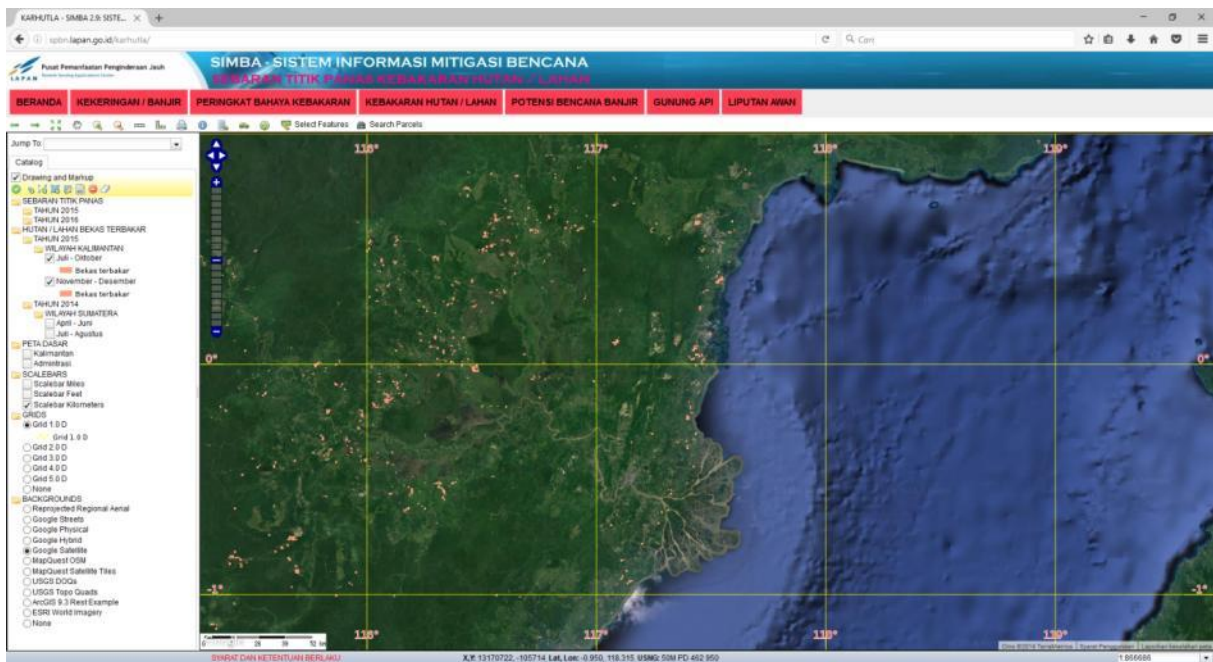


Figure 4. WebGIS of burned area information in East Kalimantan, with 1° grid, and Google Satellite background

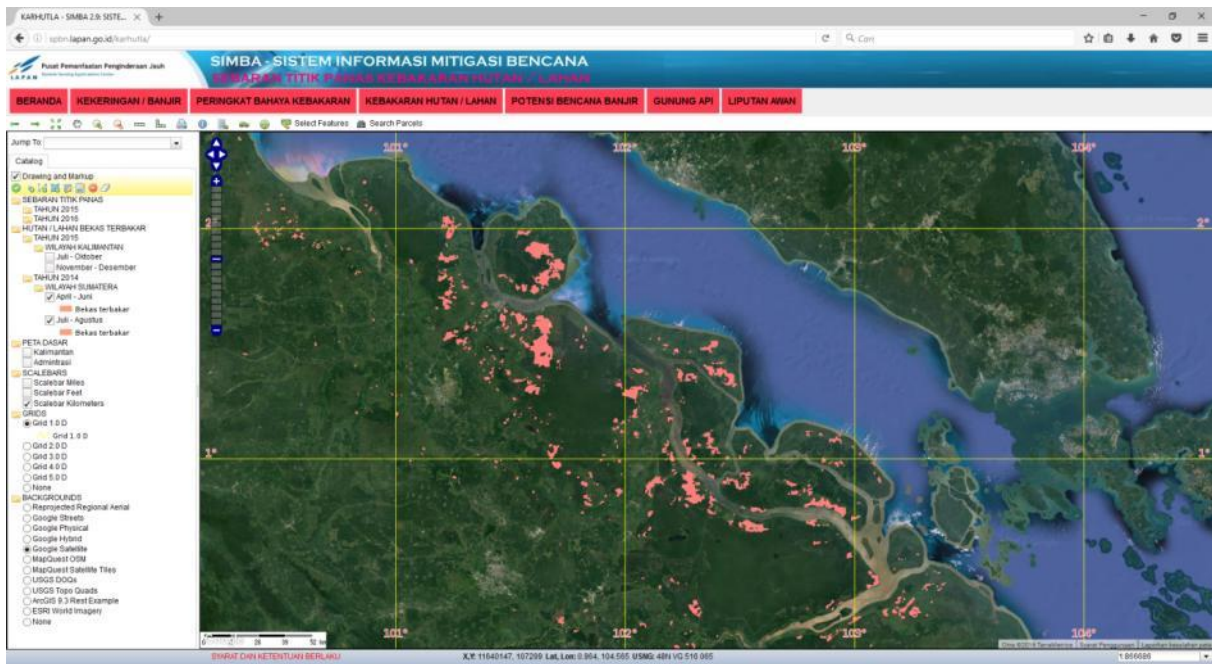


Figure 5. WebGIS of burned area information in Riau, with 1° grid, and Google Satellite background.

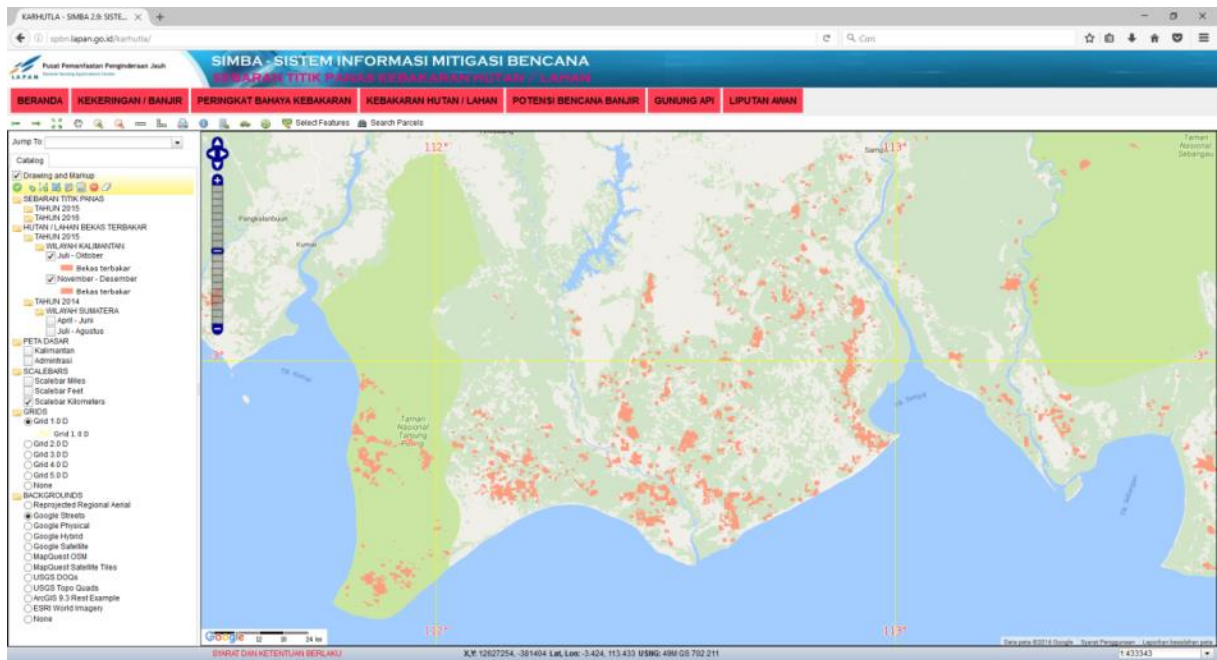


Figure 6. WebGIS of burned area information in Central Kalimantan, with 1° grid, and Google Street background.

4. Conclusion

Publication of burned area information in National Earth Observation System (NEOS) webGIS has been developed. Data, function, spatial and time series analysis capability that provided in WebGIS of burned area information can be used as spatial decision support system to support spatial strategic decision making.

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**IMAGE AND SPECTRAL
DATA ACQUISITION**