

The inventory of forest fires in Europe from satellite images

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Abstract. Satellite remote sensing has supplied many techniques for mapping the extent of the burned areas, as well as analyzing post-fire and cover changes. As a quick and low-cost method it is used for detecting and monitoring forest fires on a large scale. This work presents a list of forest fires of the area bigger than 1000 hectares in Europe in 2011 and the main causes of this natural disaster. Following the document concerned with burnt areas issued European Forest Fire Information System (EFFIS) an analysis of the basic climatic and height characteristics impact was prepared.

Keywords. remote sensing, Modis, forest fire.

1. Methods

To prepare a list of definite areas some considerations of method were performed. Total burnt forest areas including broad leaves forests, coniferous, mixed forests, sclerophyllous vegetation and transitional woodland scrubs (based on the Corine legend) bigger than 1000 hectares were separated. The territories situated out of Europe were removed. As a result of the analysis the list of 17 burnt forest areas was created.

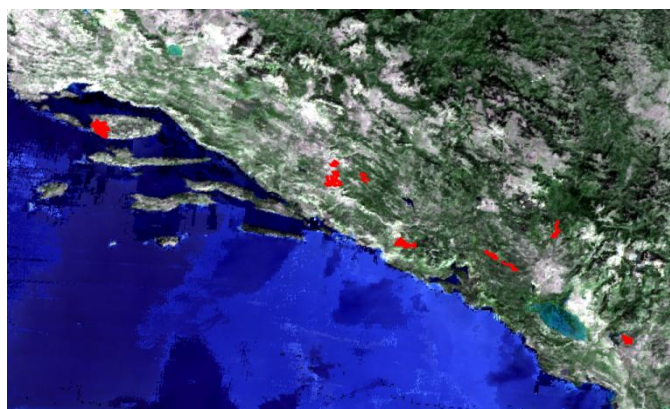


Figure 1. Satellite images taken by MODIS presenting the north-west coast of the Balkan Peninsula. Composition 1,4,3.

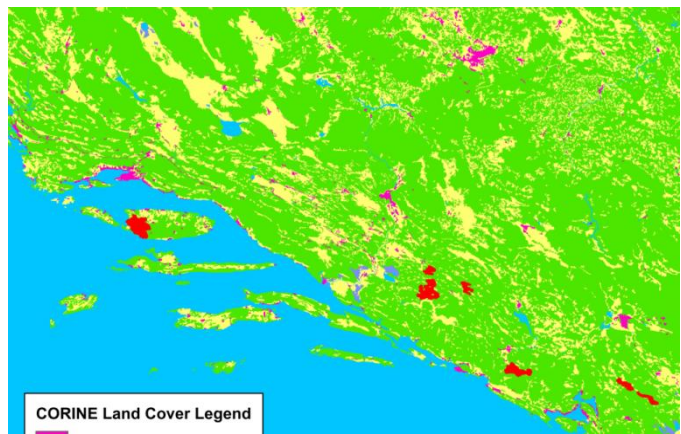


Figure 2. Distribution of urban areas (artificial surfaces) located near the burnt areas on the north-west coast of the Balkan Peninsula (CORINE Land Cover)

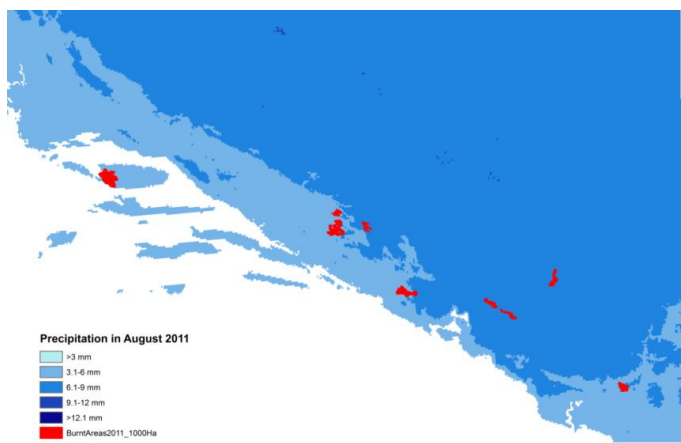


Figure 3. Example image of climatic map presenting average monthly precipitation on the north-west coast of the Balkan Peninsula in August 2011

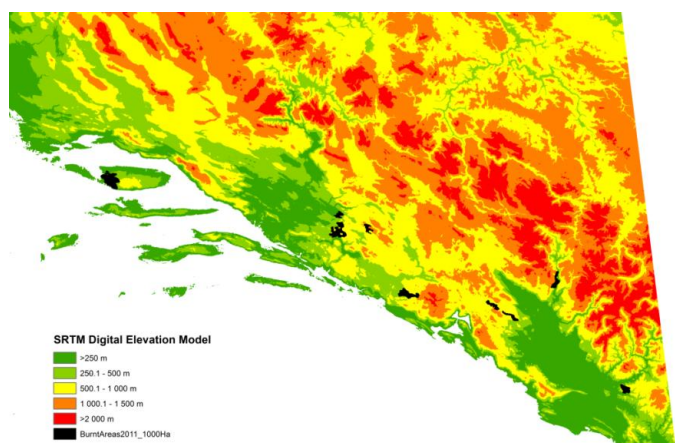


Figure 4. Digital Elevation Model of the Balkan Peninsula

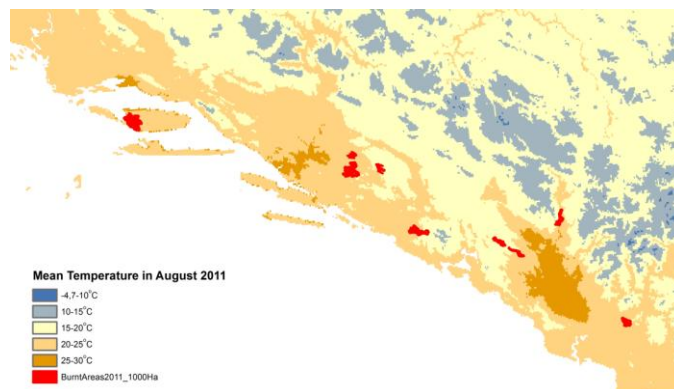


Figure 5. Example image of climatic map presenting average monthly air temperature on the north-west coast of the Balkan Peninsula in August 2011

2. Conclusions

1. Large scale forest fires in 2011 occurred closer than 100 kilometers from the shore.
2. Based on the collected data, forest fires dominated on the south-west hillside, on the insolated slope.
3. Forest fires in Europe in 2011 of area bigger than 1000 hectares occupied nearly 30.000 hectares of which almost 12 000 hectares of transitional woodland scrubs.
4. The most dangerous month of the fire season is August.
5. Most of the forest fires appeared close to anthropogenic zones (roads, cities, resorts)
6. Well-organized monitoring and rapid response of the local services help in fire prevention in many countries. That causes a lack of large scale forest fires in Italy (Italian Air Force assists endangered territories with an aerial support) and France.

