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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "AEGIS: a wildfire prevention and management information system" *by* K. Kalabokidis et al.

Anonymous Referee #1

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The manuscript presents a Web-GIS platform (AEGIS) for wildfire prevention and management purpose. The AEGIS platform is an integrated easy-to use decision support tool that simulates fire spread by the MTT algorithm and estimates ignition probabilities by artificial neural networks. The manuscript is overall interesting and the platform has several potential applications for fire managers and policy makers. Nevertheless, in my opinion some sections need to be better described or clarified, and some methods and results should be better explained. There is also need to better justify the selection of the MTT algorithm instead of other fire spread models, as well as the main advantages and limits of the MTT approach. In the Introduction section, and more in general in the whole manuscript, it is my believe that the references to Greek papers and studies is too high, particularly if compared to the European works cited in the manuscript. As

suggested below, some figures should be improved, since the "copy and paste" of the AEGIS graphical interface outputs did not allow to evaluate the quality of the simulations as well as the size of the fires. Some tables can be added to the manuscript with the aim of summarizing the main information of both the case studies and the study areas.

In the following lines the specific comments about the manuscript:

-In the Introduction section, there is need to further justify the selection of the MTT algorithm as fire spread model for AEGIS. What are advantages and disadvantages of this choice? Why not other fire spread models?

-The authors did not point out if the MTT algorithm was already successfully applied in Europe or if the present study is the first attempt of replicating fire spread and behavior and assessing fire damages and "danger" outside US and Canada.

-In the Introduction, as well as in the other parts of the manuscript, the references to Greek authors manuscripts and studies is very high, while references to papers of other European authors is quite limited. Is there evidence that the Greek research is the most advanced at European level for wildfire simulation purposes and prevention platforms? Or is there another justification? I recommend to enlarge the references to other studies performed in other European areas

-The authors stated that "A prototype spatial fire danger estimation system was developed and incorporated into AEGIS, that uses both ignition probability and expected burn area, thus providing an integrated fire danger metric." I wonder if this definition of fire danger is correct. I suggest to make reference to previous studies or scientific papers that proposed definitions and state-of-the-art about wildfire glossary and terminology, and to use a terminology consistent to such works. See for instance http://gacc.nifc.gov/nrcc/dc/idgvc/dispatchforms/glossary.pdf, http://nrfirescience.org/sites/default/files/documents/ScottGlossaryWildlandFireTerms.pdf or http://www.fire.uni-freiburg.de/literature/EUFOFINET-Fire-Glossary.pdf

-I recommend to use comma as separator of thousands in the text

-The authors presented a number of case studies that were used to test the effectiveness of AEGIS in simulating actual events. I do suggest to apply some statistical indicators (e.g.: Sorensen index, Dice index, etc., see for instance Filippi, J.-B., V. Mallet, and B. Nader. 2014. Representation and evaluation of wildfire propagation simulations. International Journal of Wildland Fire, v. 23, no. 1, p. 46-57. 10.1071/WF12202) to quantify the agreement between simulations and actual fires. An evaluation based on the general shape of the perimeter as derived from visual analysis is scientifically weak and can lead to misinterpretations.

-The readers could benefit from a table that summarizes the most relevant information (e.g.: size, date, duration, etc.) of the fire events selected, as well as of the main outputs (e.g.: simulated size). The same suggestion is valid for the description of the study areas, which will also benefit of the addition of the main fire regime information

-It is not clear what are the fuel models used for the fire spread simulations. Custom or standard? How many fuel models were identified on the whole? This needs to be addressed and presented with more detail. Moreover, the selection of standard or customized fuel models should be justified since fuel models greatly affect the fire model performances. Finally, do the authors previously tested the fuel models for other case studies?

-The authors stated that “The spatial data of the SKIRON model for wind speed and direction are provided as FlamMap input, while relative humidity and air temperature values are used to estimate fuel moisture values”. The fuel moisture is a key element for fire simulations, and the authors should provide more details and information for the readers. Also, the fuel moisture description should be presented in the paragraph 2.5 instead of 2.6

-It is not clear what is the meaning of the numbers (1-1.5-2, etc.) in Table 2. The table caption should be improved.

-In Figure 9, it is recommended to indicate the spatial scale of reference of the maps. The same should be addressed for the other maps, when needed.

-It is not clear what is the objective of Figure 10. The caption states “Spatial fire danger results (left column panels) of the six actual wildfires (right column panels with zoom-in of the starting points in red dots) that occurred during the summer of 2015 in four of our study areas (a: West Attica, 13 June 2015; b: Chalkidiki, 16 June 2015; c: Rhodes Island, 23 July 2015; d: Rhodes Island, 31 July 2015; e: Rhodes Island, 23 August 2015; and f: Lesvos Island, 30 August 2015)”. Since the “fire danger” metric is the result of simulated burn probability and fire size, what is the rationale of showing these maps with the actual fire ignition points? If the goal is to show the spatial fire danger maps, then the ignition point can be removed. Furthermore, in the figure caption, the authors should replace the fire dates by the actual fire size

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 6185, 2015.