Using Earth Observations to Assess the Socioeconomic Impact of Human Decision Making during the Suppression of a Wildland Fire

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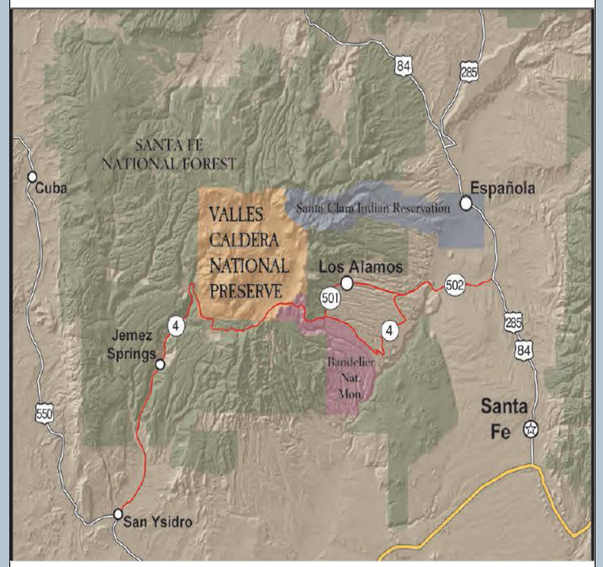
Summary

- The fire simulation system based on WRF-SFIRE and assimilation of satellite Active Fires detection is being used to estimate the socio-economic impact of Earth observations and fire behavior modeling for the 2011 Las Conchas fire in New Mexico.
- Multiple scenarios will be developed with the WRF-SFIRE simulation based on value of information (VOI) provided by retired incident commanders, whose decision inputs will steer scenario development and simulation.
- The scenarios will differ according to the Earth observations available through NASA and then deemed useful to incident commanders. Each scenario will be evaluated in terms of its socio-economic impact as specified by NASA (2012) for its wildland fire program.

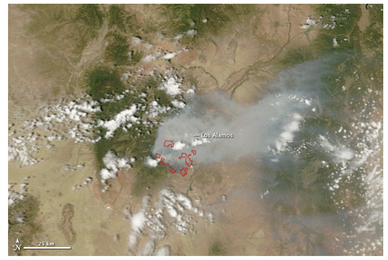
The Location



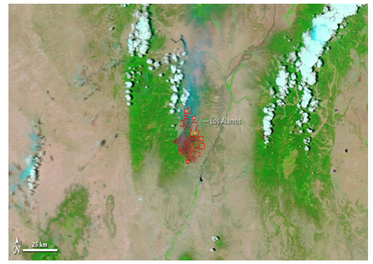
The Las Conchas Fire Observations

The Las Conchas fire began on 26 June 2011 at approximately 1:30pm and eventually consumed 156k+ acres. The following images show its location, ignition, and rapid development.

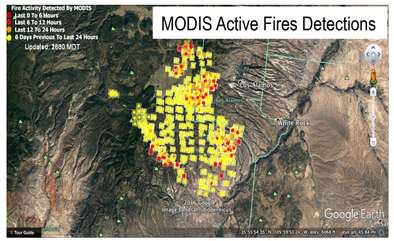
June 26th



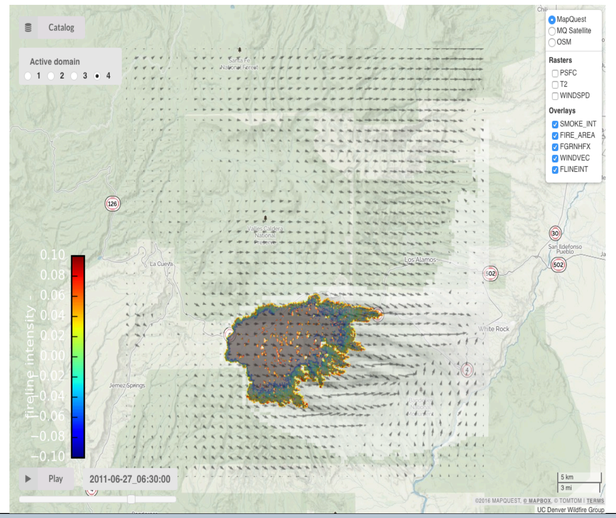
June 27th

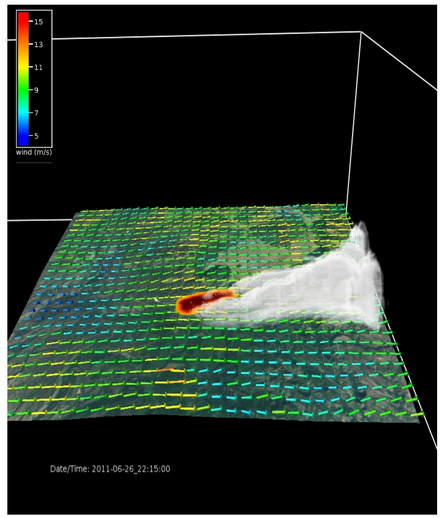


June 29th



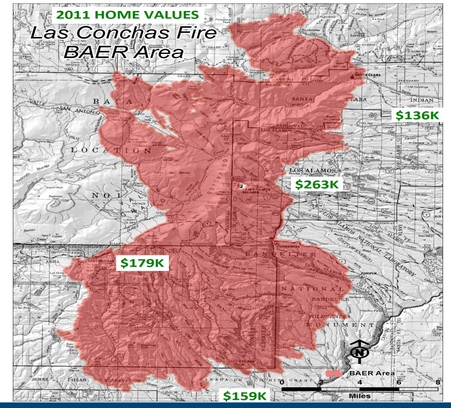
Simulating the Las Conchas Fire





The Aftermath

- Subsequent to the fire, lawsuits, representing 300 plaintiffs, were filed in NM district court and then consolidated in 2012.
- In late 2015, a NM jury found the three defendants liable. The consolidated cases have been split, and the awards trial for the Cochiti and Jemez Pueblos is now scheduled for early 2017. The trial for the remaining plaintiffs will occur later.



The Analysis

- Using the known Las Conchas footprint and property values along with trial awards to the plaintiffs, we can estimate the fire's direct economic impact. Indirect socio-economic impacts will also be estimated, e.g. lost tourist days.
- To perform the socio-economic impact analysis, NASA (2012) suggests the Value of Information (VOI) method.
- Relying on their earth images, we utilize expert(s) to view those images and recreate firefighting scenarios for daily resource allocations.
- The scenarios represent the human input into the simulations of the fire and provide the basis for determining its hypothetical impact if the earth images had been available to the IC decision makers.
- The hypothetical impact(s) will then be contrasted with the actual impact.

Acknowledgement

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