Geophysical Research Abstracts
Vol. 15, EGU2013-9129, 2013
EGU General Assembly 2013

Implementation Of A Fuel Moisture Content Model Into Wrf/Fire-Chem: A Real Fire Comparison In Murcia (Spain)

Roberto San Jose (1), Juan L. Perez (1), and Rosa M. Gonzalez-Barras ()

(1) ENVIRONMENTAL SOFTWARE AND MODELLING GROUP, COMPUTER SCIENCE SCHOOL, TECHNICAL UNIVERSITY OF MADRID (UPM) (roberto@fi.upm.es), (2) FACULTY OF PHYSICS, DPT. GEOPHYSICS AND METEOROLOGY, COMPLUTENSE UNIVERSITY OF MADRID (UCM) (rgbarras@gmail.com)

Forecasting the pollution caused by wildland fires has acquired high importance. Wildland fire emissions are represented particularly poorly in air quality models, to improve the simulation of the impact of fires on air quality; a wildland fire model can be coupled into a meteorological model (WRF-Fire).

In this work, WRF-Fire/Chem has been applied and evaluated with collected data from a wildland fire in the Murcia region (Spain). WRF-Fire was employed to simulate spread and behavior of the real fire. A method for predicting the fuel moisture content is needed to support fire behavior prediction systems. A new fuel moisture content model has been developed. The new module allows each time step to calculate the fuel moisture content of the dead fuels (1hr, 10hr, and 100hr) and live fuels. Custom fuel moisture content, designed and developed for the Iberian Peninsula, provided realistic values of simulated fires. To create a database for "fuel category" data, Corine Land Cover 2006, 100 meters resolution, dataset have been "translated" to 13 different fuel models, following Anderson (1982). The results confirm that the use of accurate meteorological data and a customize fuel moisture content model is crucial to obtain accurate simulations of fire behavior.

Fire emissions are input into WRF-Fire/Chem as chemical species. The amount of the chemical species created is determined from the amount of fuel burned, simulated by the fire model. The emissions are computed at the fire resolution and the averaged to the atmospheric resolution. The chemical transport in WRF-Chem provides a forecast of the pollution spread.

The first meteorological domain is covering the area of Iberian Peninsula with a resolution of 15 Km. This domain is producing boundary and initial meteorological conditions for the inner domains. The inner domains are located in the center of the ignition point, with a resolution of 3 Km, 1Km and 200 meters. Fire grid resolution is 20 meters. Results are compared with the perimeter burned by a real fire in Murcia (Spain).