

## Supplementary Material

### Projecting wildfire emissions over the south-eastern United States to mid-century

*Uma Shankar<sup>A,D,E</sup>, Jeffrey P. Prestemon<sup>B</sup>, Donald McKenzie<sup>C</sup>, Kevin Talgo<sup>A</sup>, Aijun Xiu<sup>A</sup>, Mohammad Omary<sup>A</sup>, Bok Haeng Baek<sup>A</sup>, Dongmei Yang<sup>A</sup> and William Vizuite<sup>D</sup>*

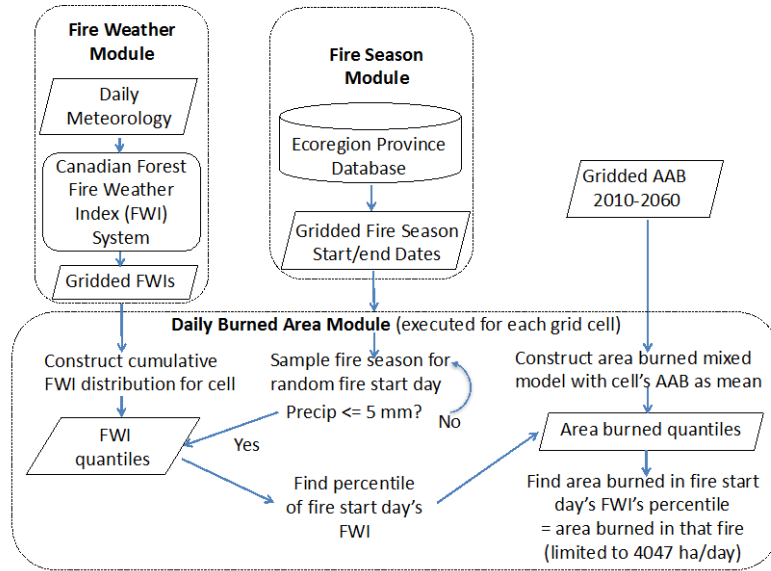
<sup>A</sup>Center for Environmental Modeling for Policy Development, University of North Carolina Institute for the Environment, Campus Box 1105, Suite 490, Europa Center, 100 Europa Drive, Chapel Hill, NC 27517, USA.

<sup>B</sup>USDA Forest Service, Southern Research Station, PO Box 12254, Research Triangle Park, NC 27709, USA.

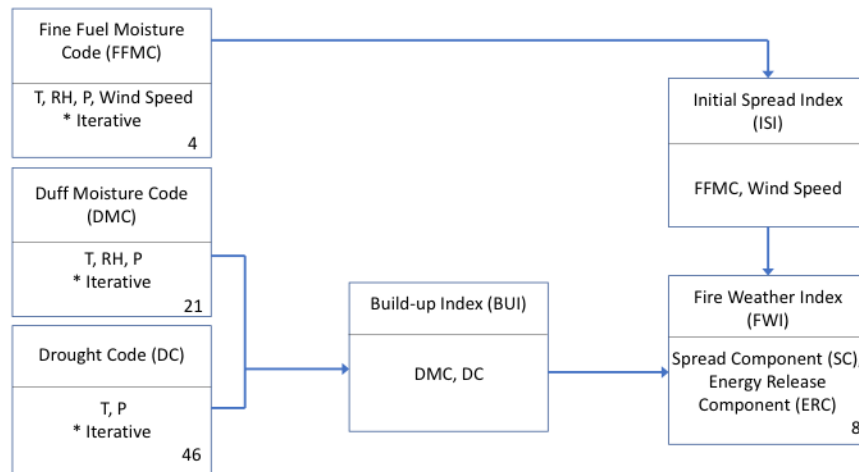
<sup>C</sup>Pacific Wildland Fire Sciences Lab, USDA Forest Service, 400 N. 34th Street, Suite 201, Seattle, WA 98103, USA.

<sup>D</sup>Department of Environmental Sciences and Engineering, University of North Carolina at Chapel Hill, Campus Box 7431, Chapel Hill, NC 27599, USA.

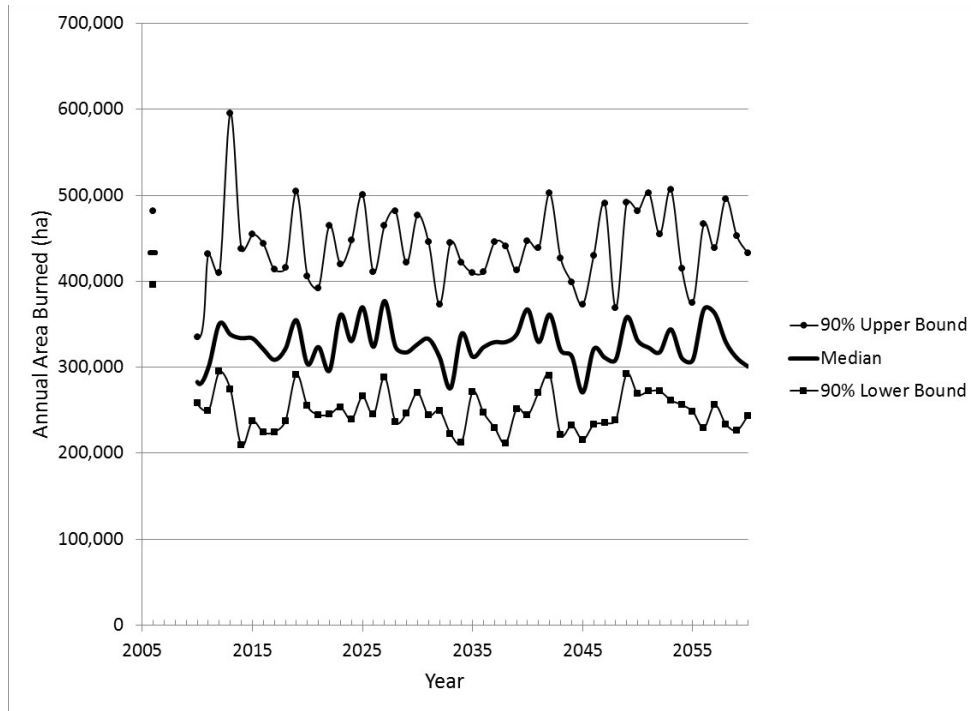
<sup>E</sup>Corresponding author. Email: shankaruma00@gmail.com



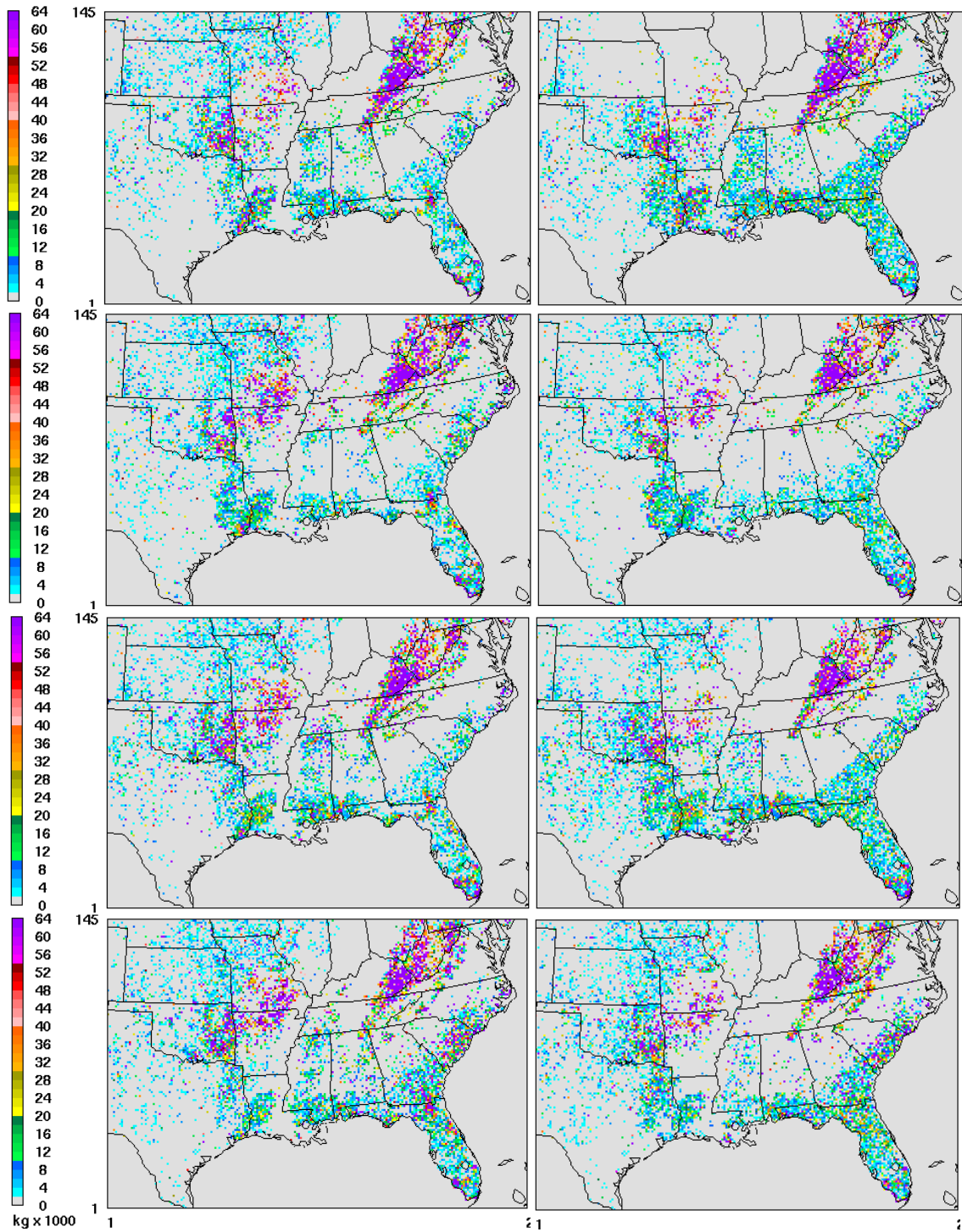
**Fig. S1.** Schematic of the Fire Scenario Builder; FWI, Fire weather index; AAB, annual area burned.



**Fig. S2.** Schematic of the Canadian Forest Fire Danger Rating System's Fire Weather Index System. Reproduced from Stavros *et al.* (2014). Numbers at the lower right corner of the modules denote the number of days that any given calculated index has an effect on subsequent calculated indices. (Note: T, temperature; P, pressure; RH, relative humidity.)



**Fig. S3.** From Prestemon *et al.* (2016) (fig. 4). Projections of all wildfires combined for the south-eastern US in aggregate (i.e. sum of all areas burned for all counties in the region) for 2006, and 2010–2060, including upper and lower 90% bounds of 2250 Monte Carlo iterations of models under nine climate model realisations. Note: no projections were made for 2005, 2007, 2008, or 2009.



**Fig. S4.** Spatial distribution of annual column total wildfire PM<sub>2.5</sub> emissions ( $10^3$  kg) based on two annual area burned (AAB) estimation methods: historical means (left panels), and statistical d-s, for the future years: 1st row, 2043; 2nd row, 2048; 3rd row, 2053; 4th row, 2058.

## References

Prestemon JP, Shankar U, Xiu A, Talgo K, Yang D, Dixon E, McKenzie D, Abt K (2016) Projecting wildfire area burned in the south-eastern United States, 2011–2060. *International Journal of Wildland Fire* **25**, 715–729. <http://dx.doi.org/10.1071/WF15124>

Stavros EN, Abatzoglou J, Larkin NK, McKenzie D, Steel EA (2014) Climate and very large wildland fires in the contiguous western USA. *International Journal of Wildland Fire* **23**, 899-914. <http://dx.doi.org/10.1071/WF13169>