

Comparing EPAFIRE 2008 and Georgia EPD AERR2008 Fire Emissions Inventory

Di Tian, James Boylan, Tao Zeng and Byeong-Uk Kim

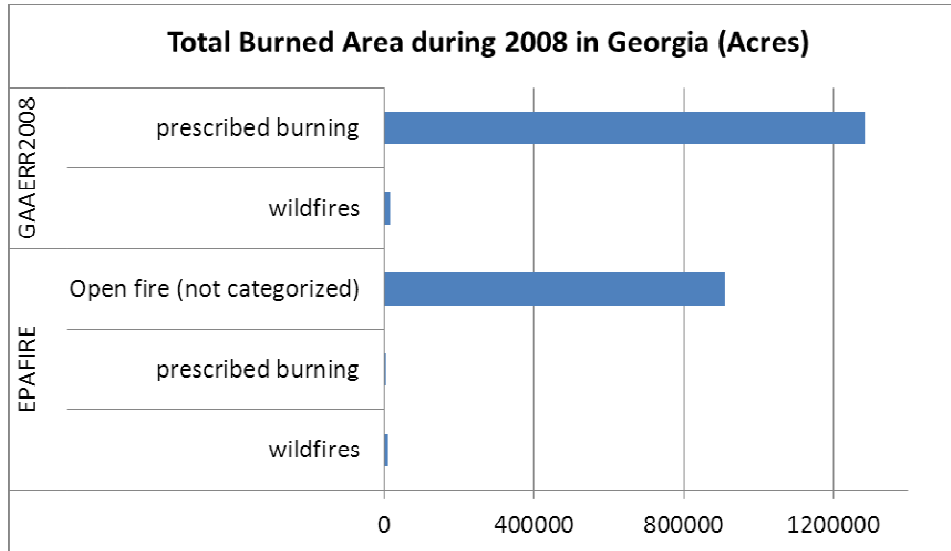
Georgia EPD

November 1st, 2011

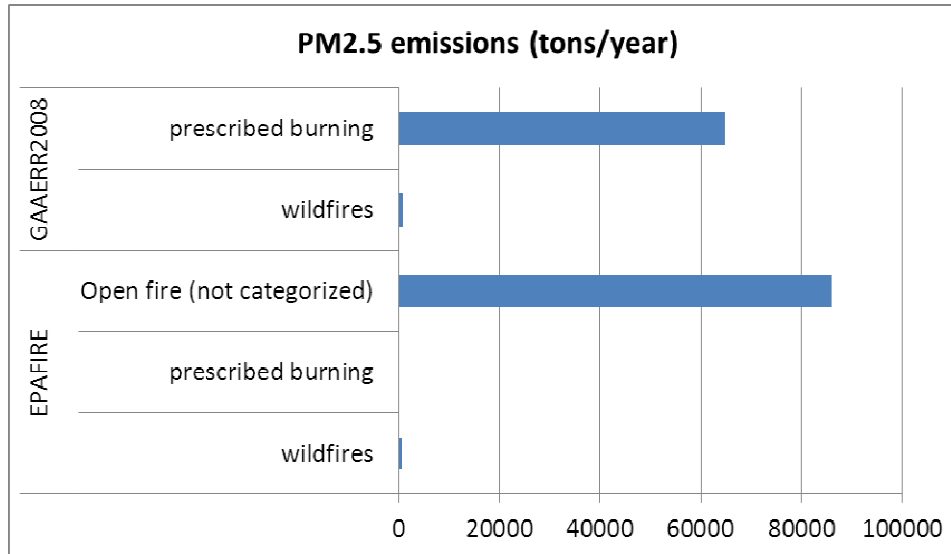
Overview

- Wildfires and prescribed fires
- Emissions = (Burned area) x (Fuel consumption) x (Emission factors)
- EPAFIRE2008
 - SMARTFIRE2008
 - Burned area: Satellite fire detects and ground reports (ICS 209)
 - Fuel consumption and Emissions factors: BlueSky (CONSUME/FEPS)
- Georgia EPD AERR2008 submittal
 - Burned area from Georgia Forestry Commission fire records
 - Fuel consumption and Emission factors: VISTAS2002 Fire Inventory

Comparison – State and annual total



Burned areas in EPAFIRE are 29% smaller than those in GAEPD AERR2008 submittal



PM2.5 emissions in EPAFIRE are 32% larger than those in GAEPD AERR2008 submittal

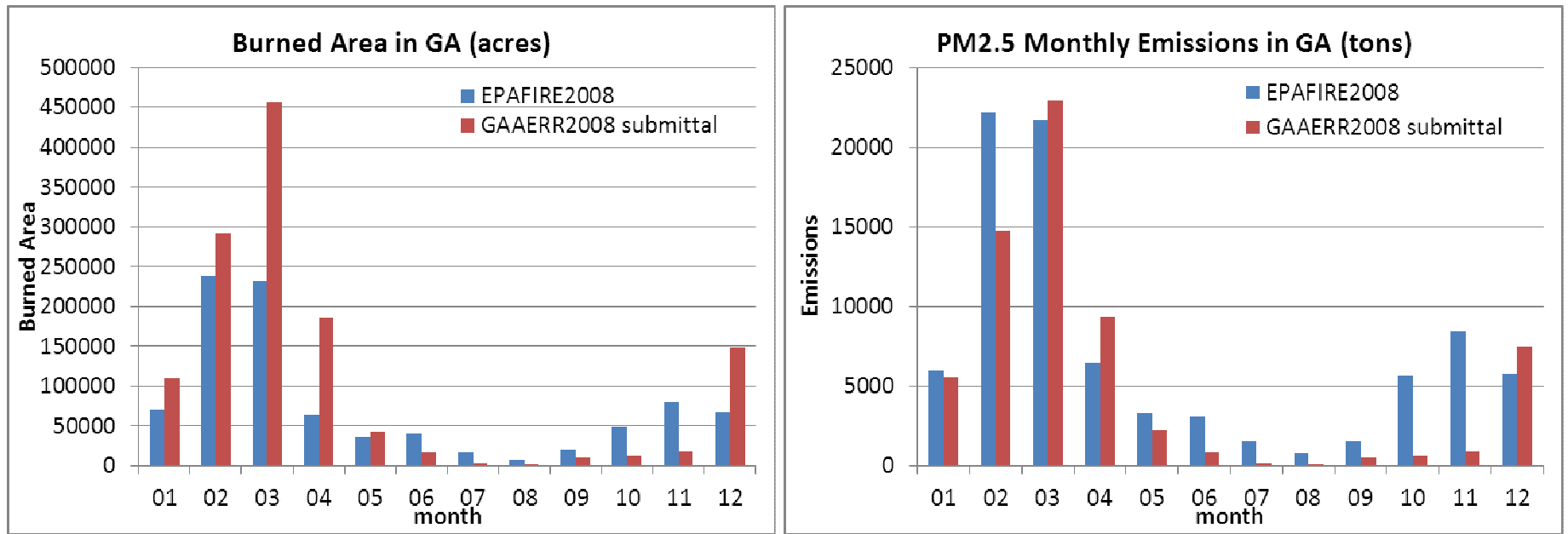
- Fuel consumption
- Emissions factors

Comparison – State and annual total – Summary

Category	SCC	Source	Acres	CO	NH3	NOx	PM10- PRI	PM25- PRI	SO2	VOC
EPAFIRE										
Events	2810001000	wildfires	8536	6338	105	130	683	579	61	1507
Events	2811015000	prescribed burning	963	616	10	13	67	56	6	147
Events	2811090000	Open fire (not categorized)	911259	949137	15684	18432	101450	85974	8809	225461
		Total	920758	956092	15799	18575	102200	86610	8876	227115
GA AERR2008 submittal										
Events	2810001000	wildfires	15162	9507	43	204	924	793	56	447
nonpoint	2811015000	prescribed burning	1284268	776723	3494	16663	75522	64772	4569	36552
		Total	1299430	786230	3537	16867	76447	65565	4625	36999
Difference between EPAFIRE and GA AERR2008 submittal										
		EPAFIRE- GA submittal	-378672	169862	12263	1707	25753	21045	4251	190116
			-29%	22%	347%	10%	34%	32%	92%	514%

Difference varies with pollutants.

Comparison – State and monthly total

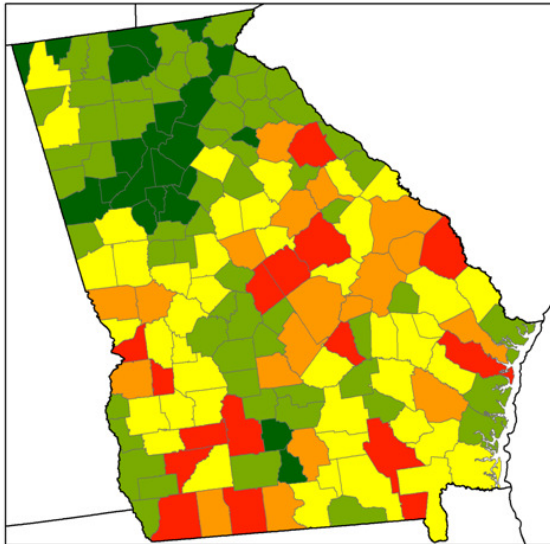


Different monthly distribution

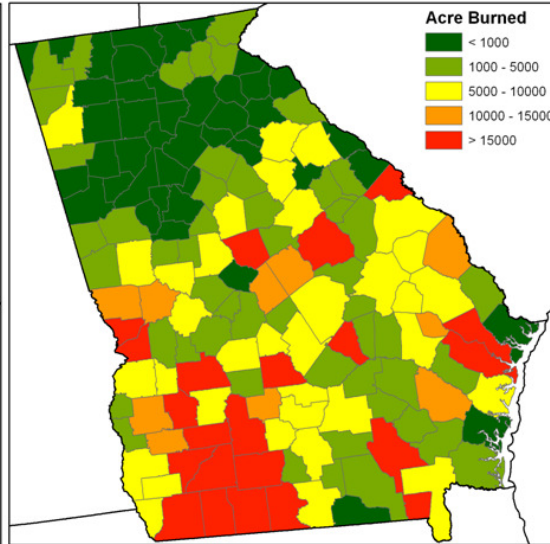
- EPAFIRE2008 underestimated burned area in Burning season (Dec, Jan, Feb, Mar and Apr) and overestimated burned area in summer and fall
- EPAFIRE2008 underestimated PM2.5 emissions in Dec, Mar and Apr, and overestimated PM2.5 emissions in other months.

EPAFIRE2008

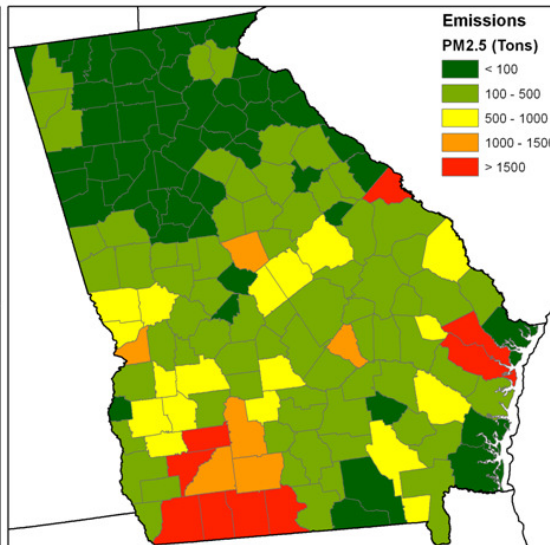
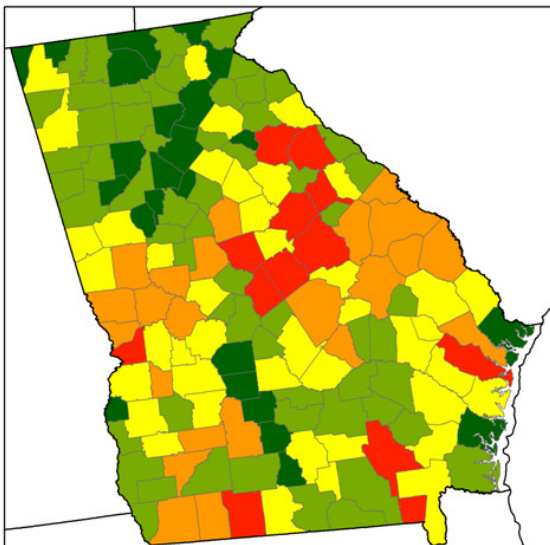
Burned area



GAAERR2008



PM2.5 emissions



Comparison – County and annual

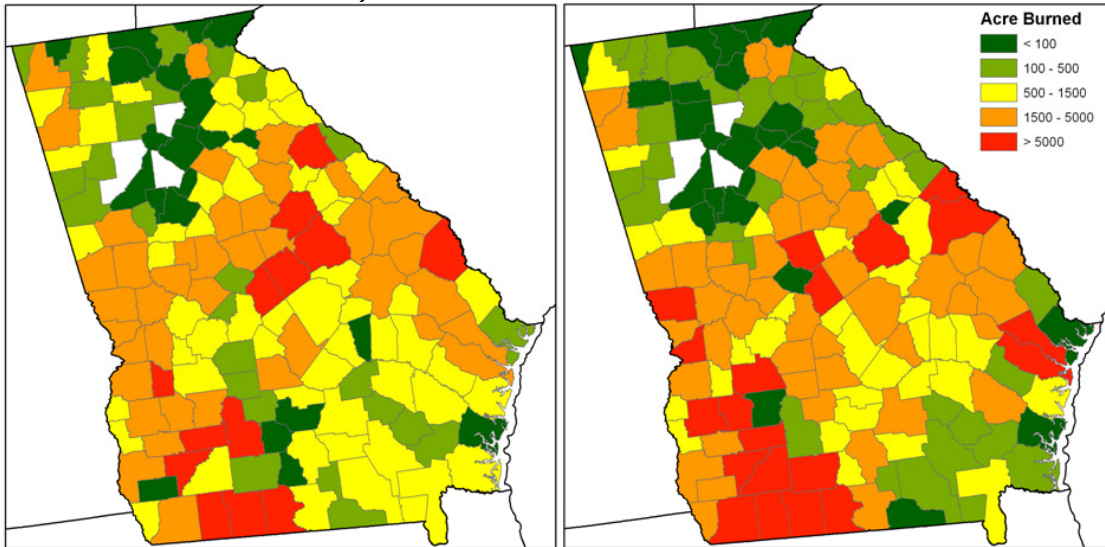
Burned area:
EPAFIRE2008 catch some major fire activities, but also missed some

PM2.5 emissions:
EPAFIRE2008 underestimated emissions in southwest GA, and overestimated emissions in central GA.

EPAFIRE2008

GAAERR2008

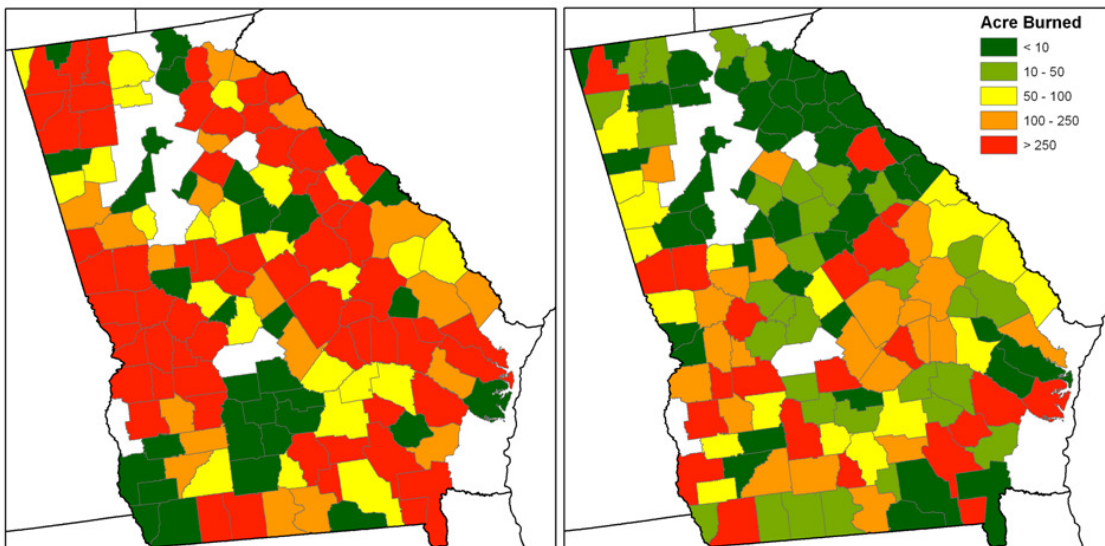
Burned area, March 2008



Comparison – County and monthly

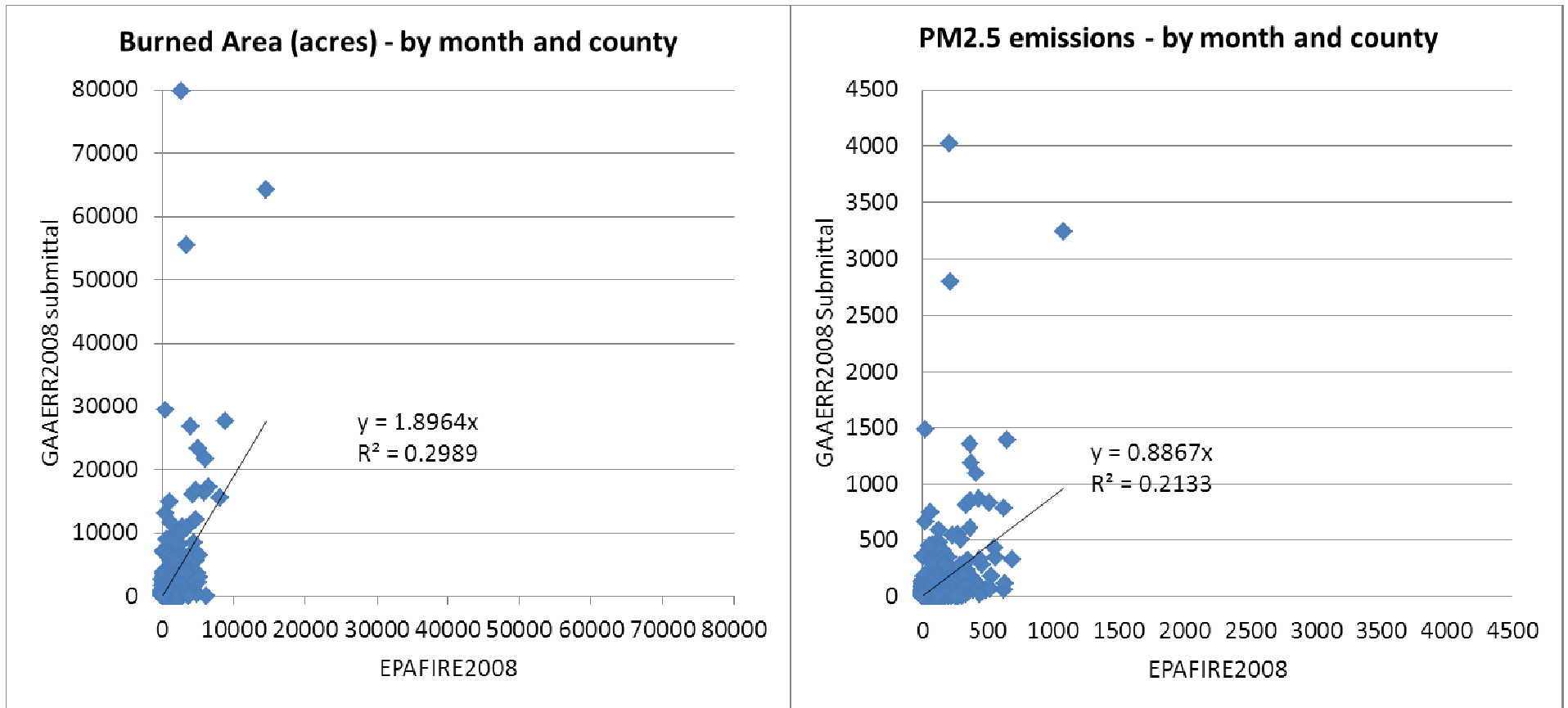
Burned area in March:
EPAFIRE2008 missed some burning activities.

Burned area, October 2008



Burned area in October:
EPAFIRE2008 overestimated burned areas throughout GA

Comparison – County and Monthly – Scatter Plots



Each point refers to the burned area or PM2.5 emissions in a county during a month

Summary

- Burned areas in EPAFIRE are 29% smaller than those in GAEPD AERR2008 submittal
- Emissions in EPAFIRE are higher than those in GAEPD AERR2008 submittal.
 - Vary with pollutants
- Monthly variation.
 - EPAFIRE underestimates burned area in months with more fire activities, while overestimates burned area in months with less fire activities
- Spatial distribution
 - Poor correlation between EPAFIRE and GAEPD AERR2008 submittal
- Suggestions
 - Burned area: use state records when available
 - Fuel consumption: develop more representative values for the Southeast
 - Emissions factors: need more evaluation

Dr. Di Tian

Senior Environmental Modeler

Georgia Environmental Protection Agency

Email: di.tian@dnr.state.ga.us

Phone: 404-363-7092