


Supplement of Atmos. Chem. Phys., 14, 6301–6314, 2014  
<http://www.atmos-chem-phys.net/14/6301/2014/>  
doi:10.5194/acp-14-6301-2014-supplement  
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Atmospheric  
Chemistry  
and Physics  
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*Supplement of*

## **10-year spatial and temporal trends of PM<sub>2.5</sub> concentrations in the south-eastern US estimated using high-resolution satellite data**

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Table S1. Model structures.

Year	Model
2001	$PM_{2.5,st} = (\beta_0 + \beta_{0,t}) + (\beta_1 + \beta_{1,t})AOD_{st} + (\beta_2 + \beta_{2,t})Boundary\ Layer\ Height_{st} + (\beta_3 + \beta_{3,t})Wind\ Speed_{st} + \beta_4 Elevation_s + \beta_5 Major\ Roads_s + \beta_6 Forest\ Cover2001_s + \beta_7 Point\ Emissions2002_s + \varepsilon_{st}$ $(\beta_{0,t}, \beta_{1,t}, \beta_{2,t}, \beta_{3,t}) \sim N[(0,0,0,0), \Psi]$
2002	$PM_{2.5,st} = (\beta_0 + \beta_{0,t}) + (\beta_1 + \beta_{1,t})AOD_{st} + (\beta_2 + \beta_{2,t})Relative\ Humidity_{st} + (\beta_3 + \beta_{3,t})U - Wind_{st} + (\beta_4 + \beta_{4,t})V - Wind_{st} + \beta_5 Elevation_s + \beta_6 Major\ Road_s + \beta_7 Forest\ Cover2001_s + \beta_8 Point\ Emissions2002_s + \varepsilon_{st}$ $(\beta_{0,t}, \beta_{1,t}, \beta_{2,t}, \beta_{3,t}, \beta_{4,t}) \sim N[(0,0,0,0,0), \Psi]$
2003	$PM_{2.5,st} = (\beta_0 + \beta_{0,t}) + (\beta_1 + \beta_{1,t})AOD_{st} + (\beta_2 + \beta_{2,t})Relative\ Humidity_{st} + (\beta_3 + \beta_{3,t})U - Wind_{st} + (\beta_4 + \beta_{4,t})V - Wind_{st} + \beta_5 Elevation_s + \beta_6 Major\ Roads_s + \beta_7 Forest\ Cover2001_s + \beta_8 Point\ Emissions2002_s + \varepsilon_{st}$ $(\beta_{0,t}, \beta_{1,t}, \beta_{2,t}, \beta_{3,t}, \beta_{4,t}) \sim N[(0,0,0,0,0), \Psi]$
2004	$PM_{2.5,st} = (\beta_0 + \beta_{0,t}) + (\beta_1 + \beta_{1,t})AOD_{st} + (\beta_2 + \beta_{2,t})Relative\ Humidity_{st} + (\beta_3 + \beta_{3,t})U - Wind_{st} + (\beta_4 + \beta_{4,t})V - Wind_{st} + \beta_5 Elevation_s + \beta_6 Major\ Roads_s + \beta_7 Forest\ Cover2006_s + \beta_8 Point\ Emissions2005_s + \varepsilon_{st}$ $(\beta_{0,t}, \beta_{1,t}, \beta_{2,t}, \beta_{3,t}, \beta_{4,t}) \sim N[(0,0,0,0,0), \Psi]$
2005	$PM_{2.5,st} = (\beta_0 + \beta_{0,t}) + (\beta_1 + \beta_{1,t})AOD_{st} + (\beta_2 + \beta_{2,t})Relative\ Humidity_{st} + (\beta_3 + \beta_{3,t})Wind\ Speed_{st} + \beta_4 Elevation_s + \beta_5 Major\ Roads_s + \beta_6 Forest\ Cover2006_s + \beta_7 Point\ Emissions2005_s + \varepsilon_{st}$ $(\beta_{0,t}, \beta_{1,t}, \beta_{2,t}, \beta_{3,t}) \sim N[(0,0,0,0), \Psi]$
2006	$PM_{2.5,st} = (\beta_0 + \beta_{0,t}) + (\beta_1 + \beta_{1,t})AOD_{st} + (\beta_2 + \beta_{2,t})Relative\ Humidity_{st} + (\beta_3 + \beta_{3,t})U - Wind_{st} + (\beta_4 + \beta_{4,t})V - Wind_{st} + \beta_5 Elevation_s + \beta_6 Major\ Roads_s + \beta_7 Forest\ Cover2006_s + \beta_8 Point\ Emissions2005_s + \varepsilon_{st}$ $(\beta_{0,t}, \beta_{1,t}, \beta_{2,t}, \beta_{3,t}, \beta_{4,t}) \sim N[(0,0,0,0,0), \Psi]$
2007	$PM_{2.5,st} = (\beta_0 + \beta_{0,t}) + (\beta_1 + \beta_{1,t})AOD_{st} + (\beta_2 + \beta_{2,t})Relative\ Humidity_{st} + (\beta_3 + \beta_{3,t})Wind\ Speed_{st} + \beta_4 Elevation_s + \beta_5 Major\ Roads_s + \beta_6 Forest\ Cover2006_s + \beta_7 Point\ Emissions2008_s + \varepsilon_{st}$ $(\beta_{0,t}, \beta_{1,t}, \beta_{2,t}, \beta_{3,t}) \sim N[(0,0,0,0), \Psi]$
2008	$PM_{2.5,st} = (\beta_0 + \beta_{0,t}) + (\beta_1 + \beta_{1,t})AOD_{st} + (\beta_2 + \beta_{2,t})Relative\ Humidity_{st} + (\beta_3 + \beta_{3,t})Wind\ Speed_{st} + \beta_4 Elevation_s + \beta_5 Major\ Roads_s + \beta_6 Forest\ Cover2006_s + \beta_7 Point\ Emissions2008_s + \varepsilon_{st}$ $(\beta_{0,t}, \beta_{1,t}, \beta_{2,t}, \beta_{3,t}) \sim N[(0,0,0,0), \Psi]$

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2009  $PM_{2.5, st} = (\beta_0 + \beta_{0,t}) + (\beta_1 + \beta_{1,t})AOD_{st} + (\beta_2 + \beta_{2,t})Relative\ Humidity_{st} + (\beta_3 + \beta_{3,t})Wind\ Speed_{st} +$   
 $\beta_4 Elevation_s + \beta_5 Major\ Roads_s + \beta_6 Forest\ Cover2006_s + \beta_7 Point\ Emissions2008_s + \varepsilon_{st}$   
 $(\beta_{0,t}, \beta_{1,t}, \beta_{2,t}, \beta_{3,t}) \sim N[(0,0,0,0), \Psi]$

2010  $PM_{2.5, st} = (\beta_0 + \beta_{0,t}) + (\beta_1 + \beta_{1,t})AOD_{st} + (\beta_2 + \beta_{2,t})Boundary\ Layer\ Height_{st} + (\beta_3 + \beta_{3,t})U - Wind_{st} +$   
 $(\beta_4 + \beta_{4,t})V - Wind_{st} + \beta_5 Elevation_s + \beta_6 Forest\ Cover2006_s +$   
 $\beta_7 Point\ Emissions2008_s + \varepsilon_{st}$   
 $(\beta_{0,t}, \beta_{1,t}, \beta_{2,t}, \beta_{3,t}, \beta_{4,t}) \sim N[(0,0,0,0,0), \Psi]$

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