Predicting the Impacts of Appalachian Fires
Dynamic Air Quality Management: Applications of Forecasting Fire Impacts

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November 2016 Fires in Southern Appalachian Mountains

• Fires erupted in drought stricken Southern Appalachian Mountains in November 2016

• 24-hour average PM$_{2.5}$ standard (35 µg/m$^3$) exceeded in populated areas of the Southeast

November 14, 2016: fire and smoke observations by MODIS
Gatlinburg Fires

- 14 deaths
- 191 injured
- 2,460 structures damaged or destroyed

- The storm: 80 miles per hour winds
Prescribed fire to reduce wildfire risk and dynamic management of air quality

- Attended the Southern Group of State Foresters Fire Chiefs’ Meeting
- More prescribed (Rx) fire ahead of a severe wildfire season is a proposed strategy
- Air quality can be managed dynamically: More Rx fires with smaller air quality impacts
- Currently being conducted in Georgia: [https://forecast.ce.gatech.edu](https://forecast.ce.gatech.edu)

**PM$_{2.5}$ Forecast**

![PM$_{2.5}$ Forecast](image1)

**PB Impact Forecast**

![PB Impact Forecast](image2)
Simulations of Appalachian Fires

• Exposure assessments: Wildfire versus Rx fire

• Challenges of complex terrain
Incorporating NASA Science

- Fuel loads
- Fire emissions
- Plume heights
- Smoke dispersion
- Model evaluation
- Fire detection
- Fire season severity forecast
- ...

Earth Observing Constellations