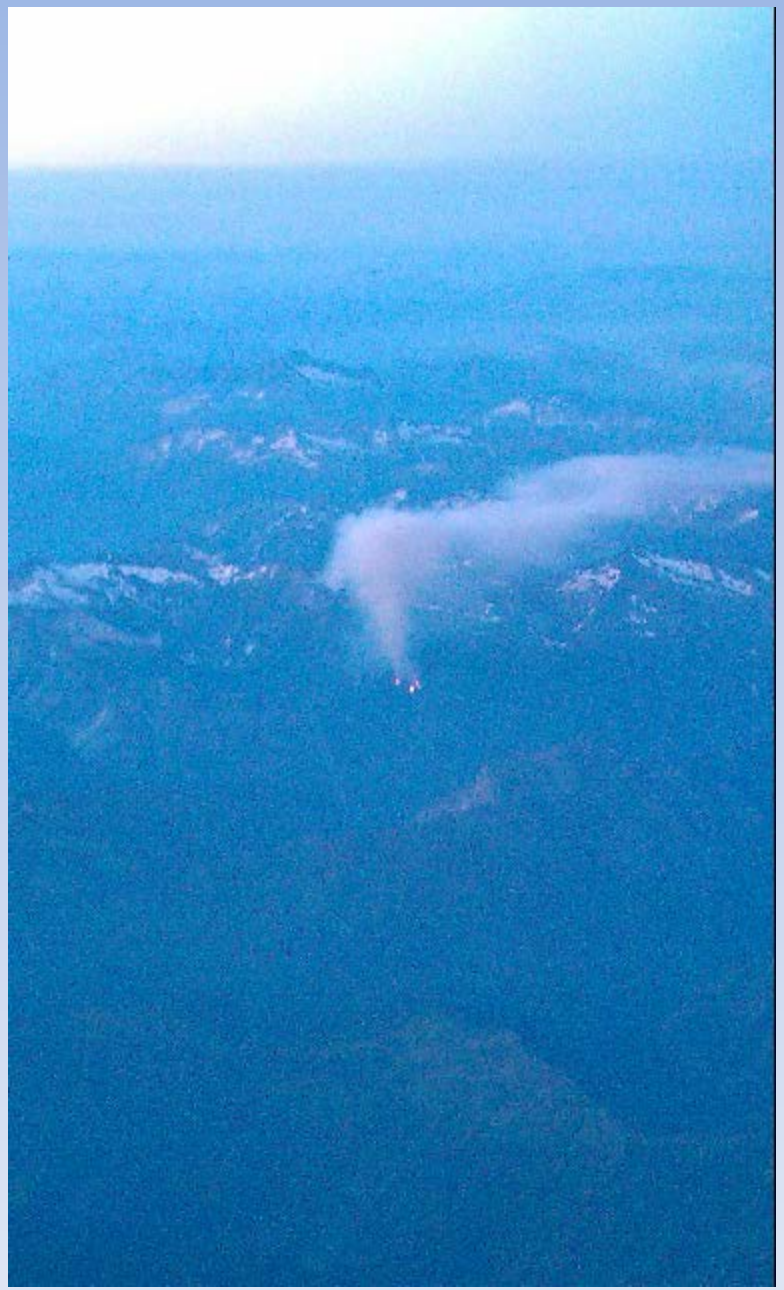


WFDSS-AQ and BlueSky-enabled Tools

Webinar, March 7, 2012

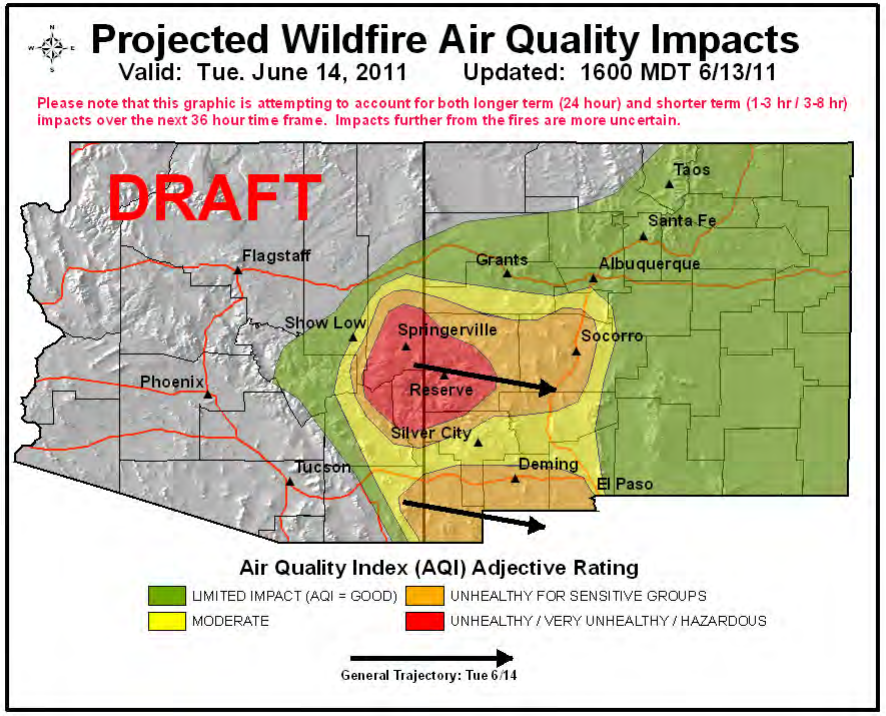
Miriam Rorig
AirFire Team
USFS, Pacific Northwest Research Station

bluesky framework

playground beta

Why be concerned about smoke?

- "Nuisance" smoke
- Health effects
  - Increased hospitalizations
  - Increased mortality
- Air quality standards
  - Tighter air quality standards mean more non-attainment areas



A logical progression

What is the weather?

Where is the fire?

What are the fuels?

How much fuel got consumed?

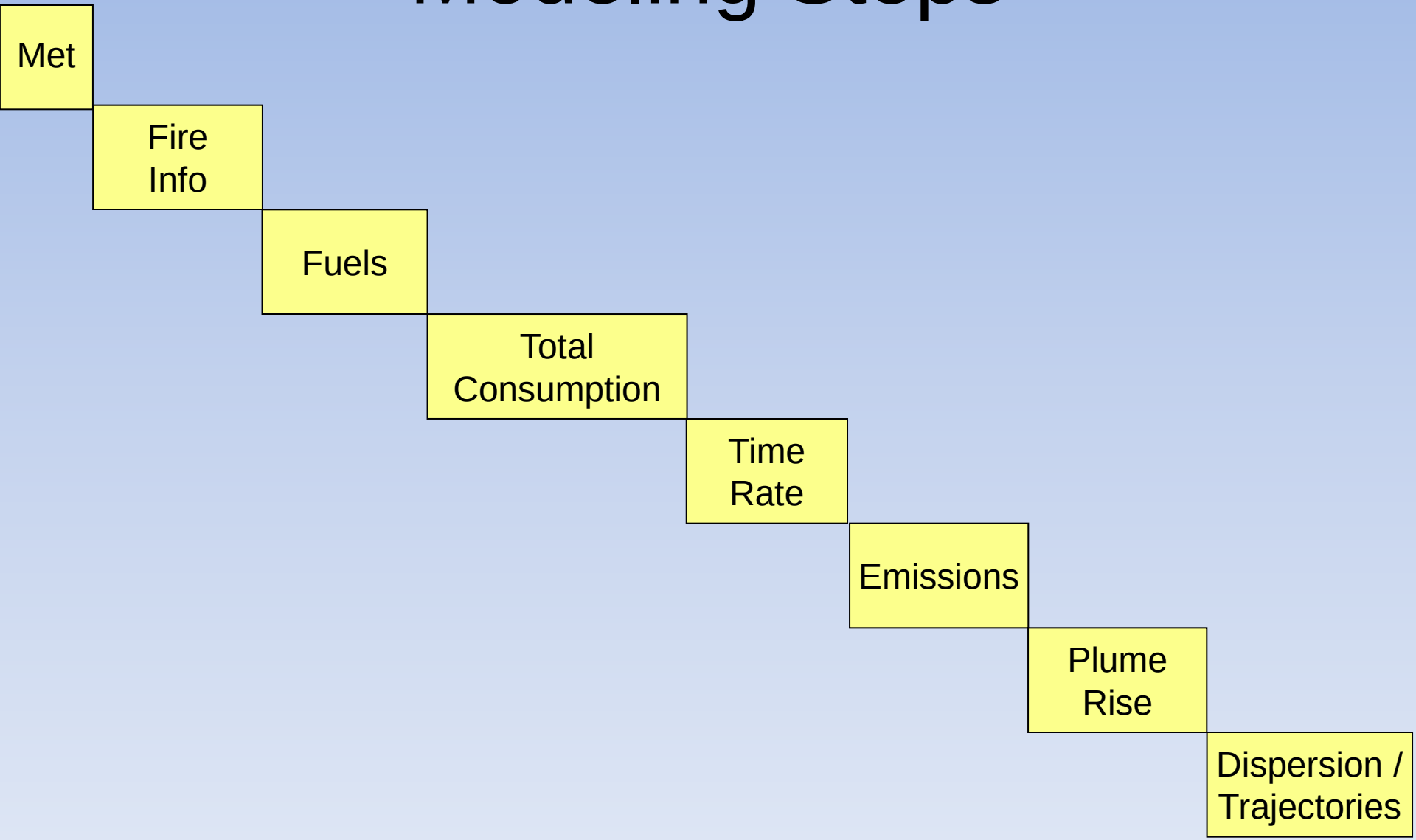
When did they burn?

What are the emissions?

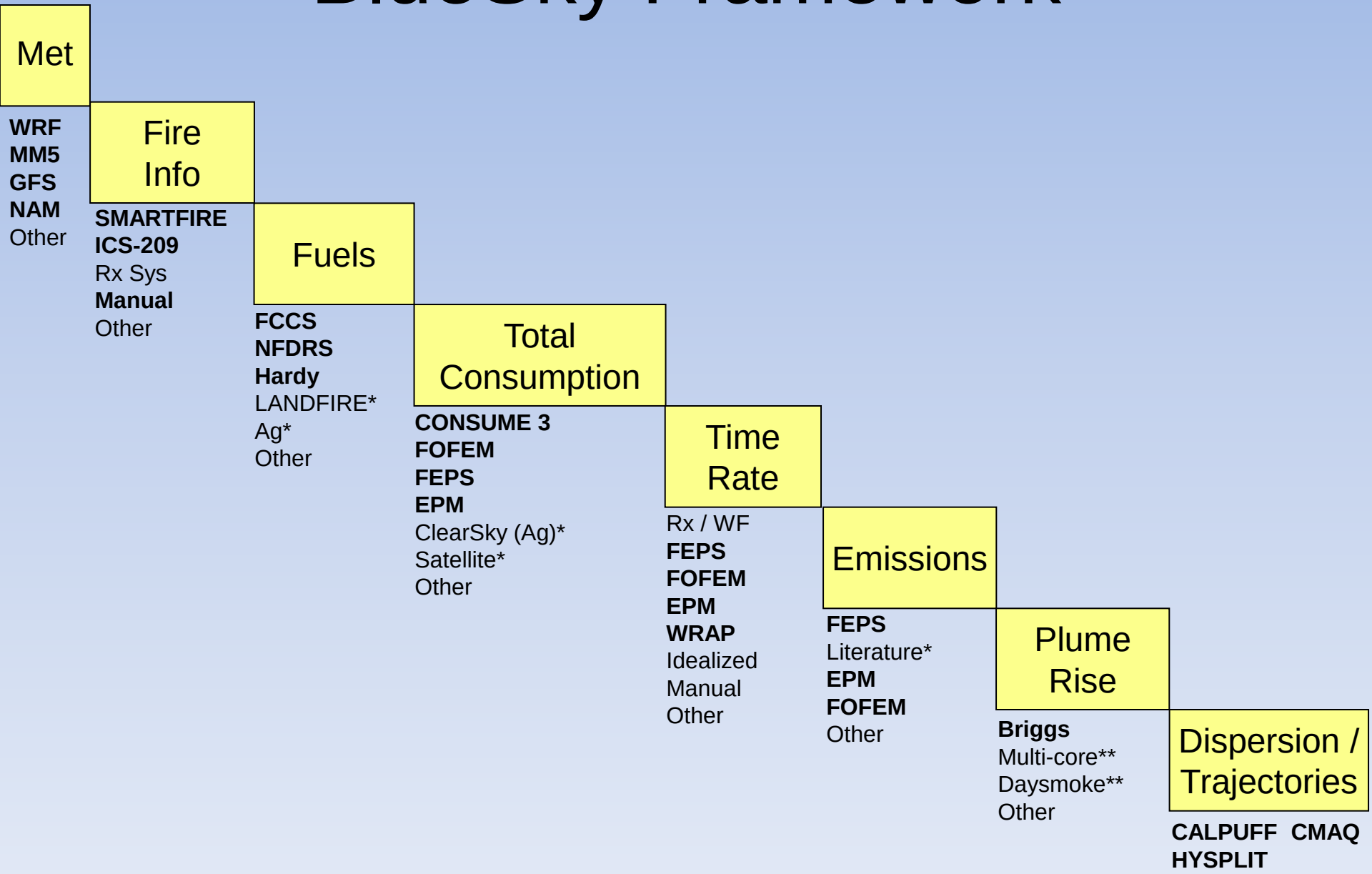
How high did the smoke go?

What are the smoke impacts?

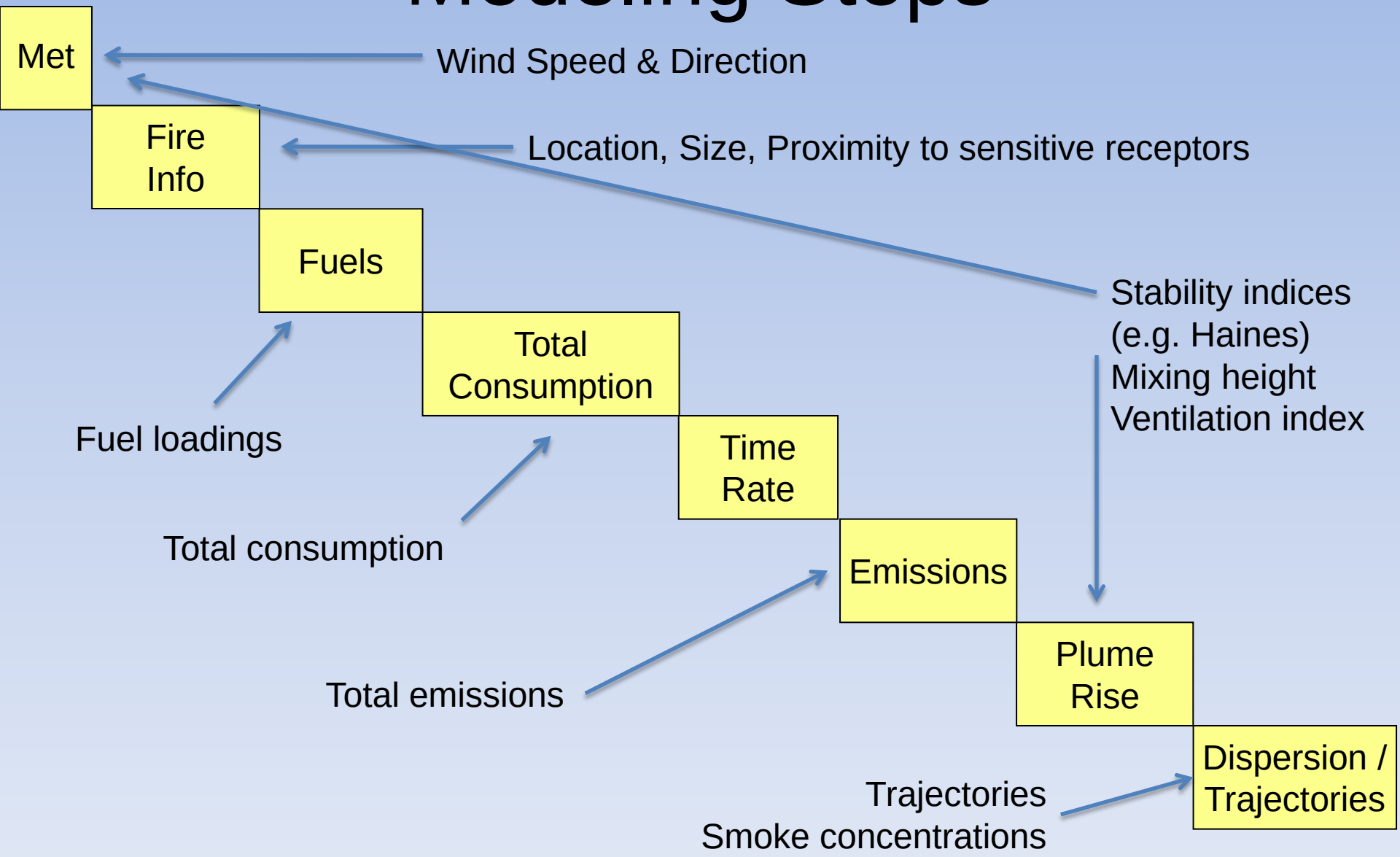
Modeling Steps



BlueSky Framework



Modeling Steps



What inputs do the models require?

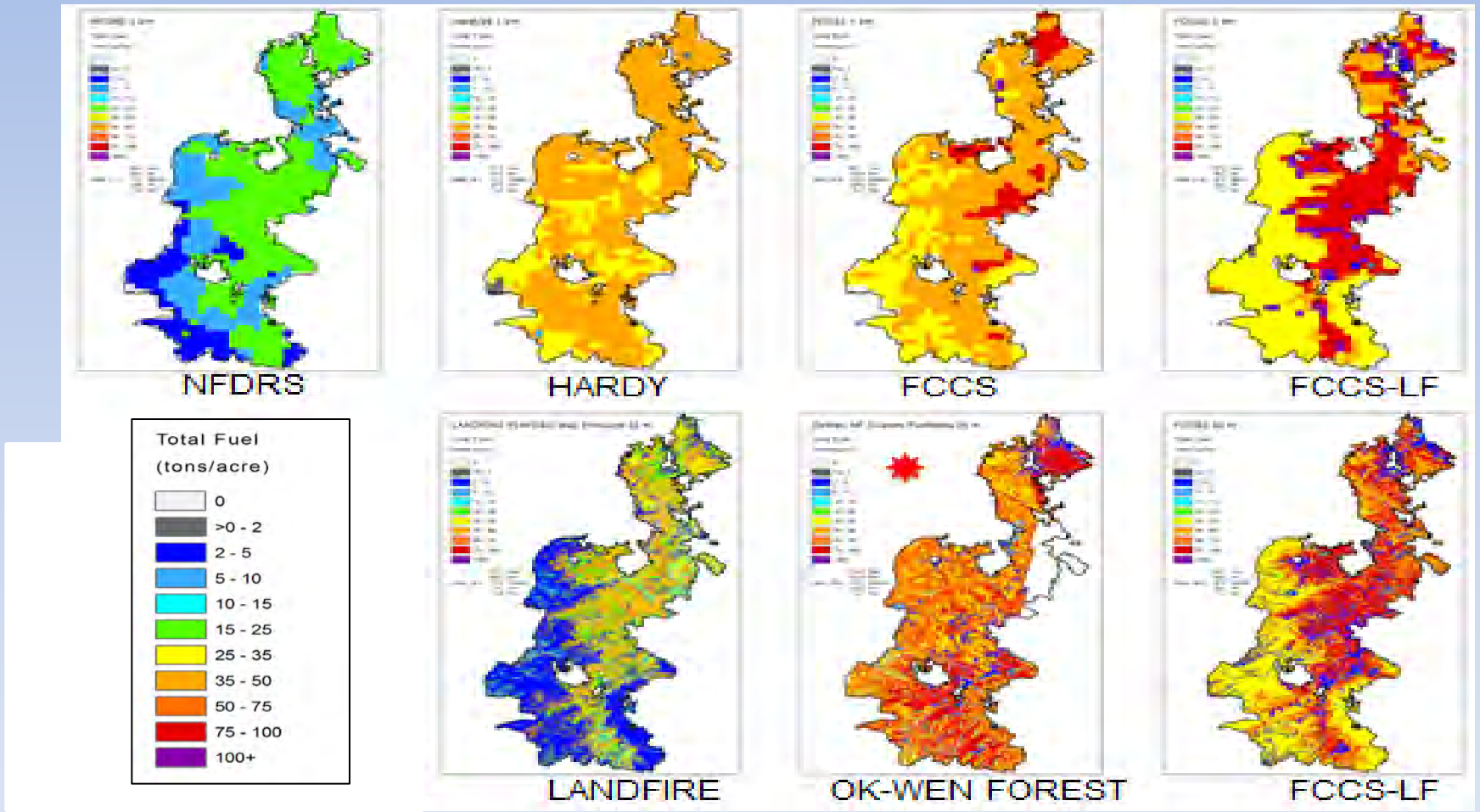
- Fire location, size, growth
- Fuel loadings (dead, live, canopy, duff)
- Fuel moistures (dead, live)
- others

Different models require different inputs:

Just because you CAN enter a variable doesn't mean the model will use it!

Remember: Models help inform your decisions, they do not make your decisions!

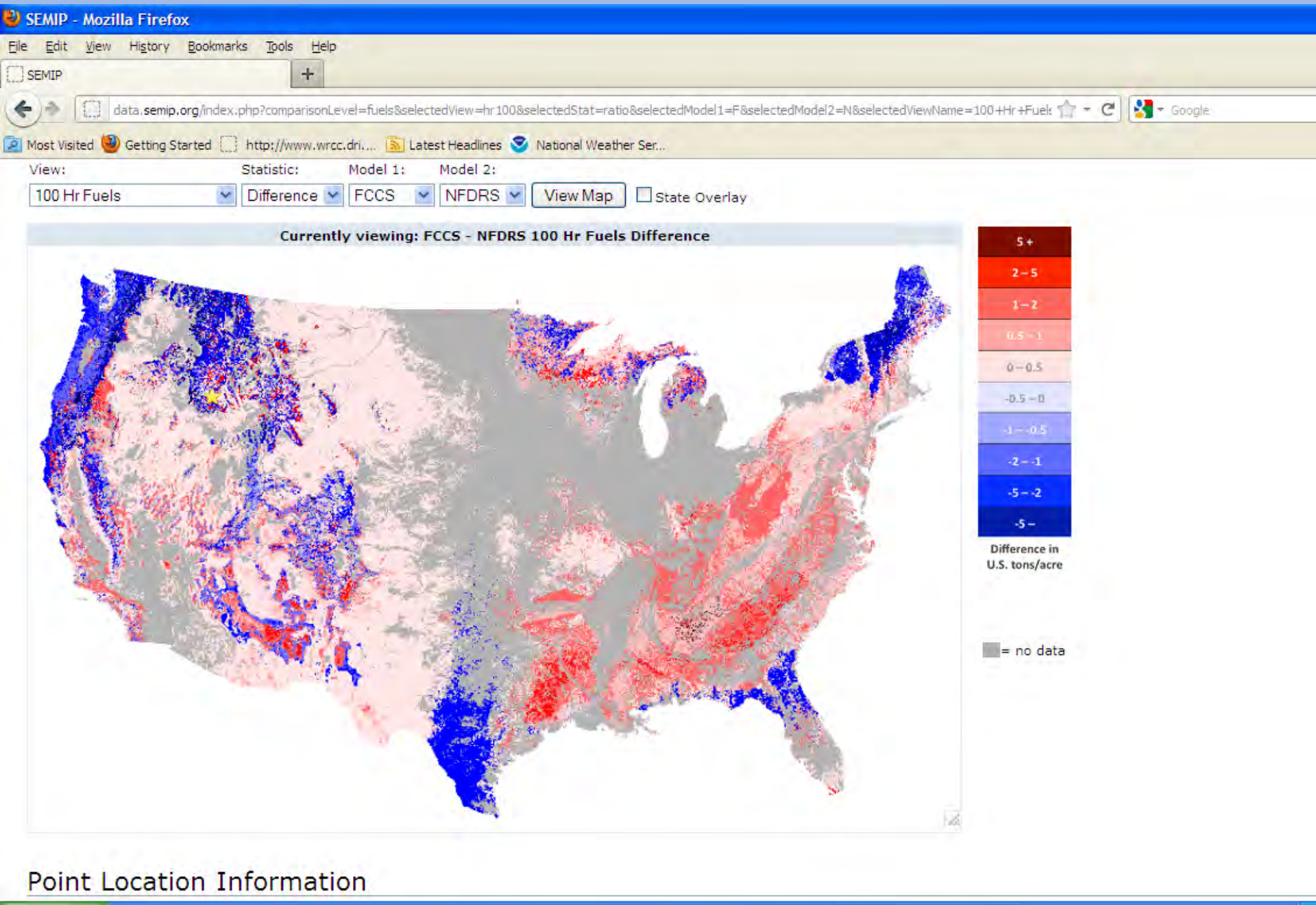
Fuel loadings vary by source and resolution (1km, top; 30m, bottom)



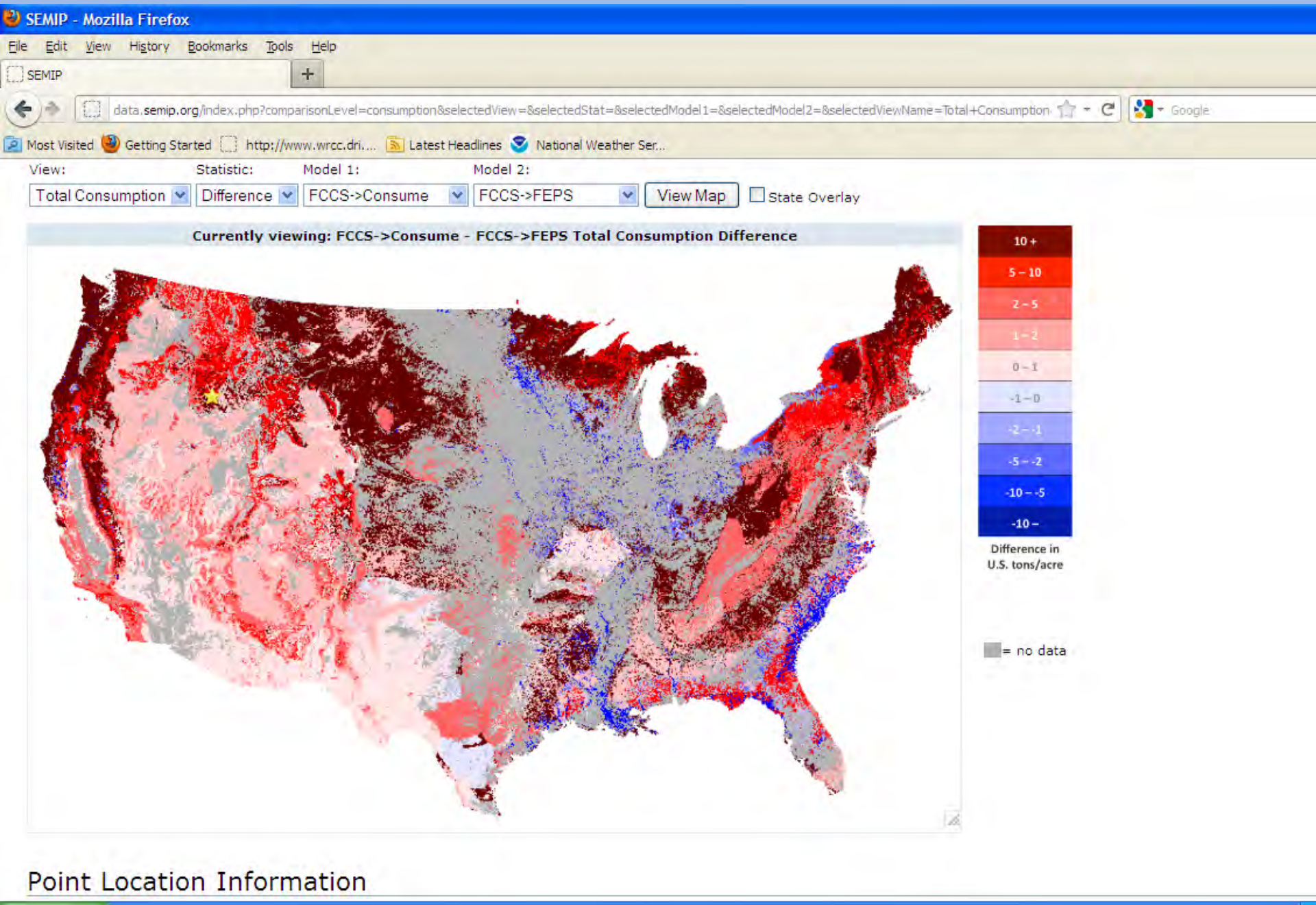
Drury et al. 2011

Tripod Fire – WA state

Differences in 100-hr fuel loadings: FCCS - NFDRS



Differences in total consumption: Consume - FEPS

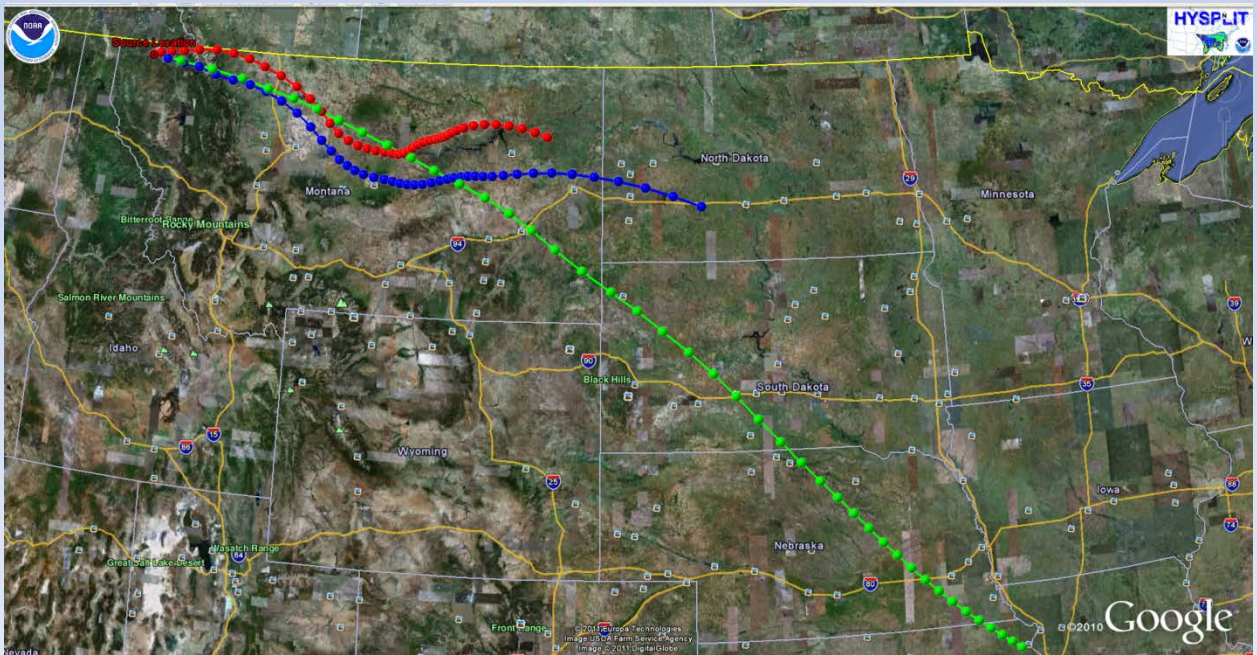


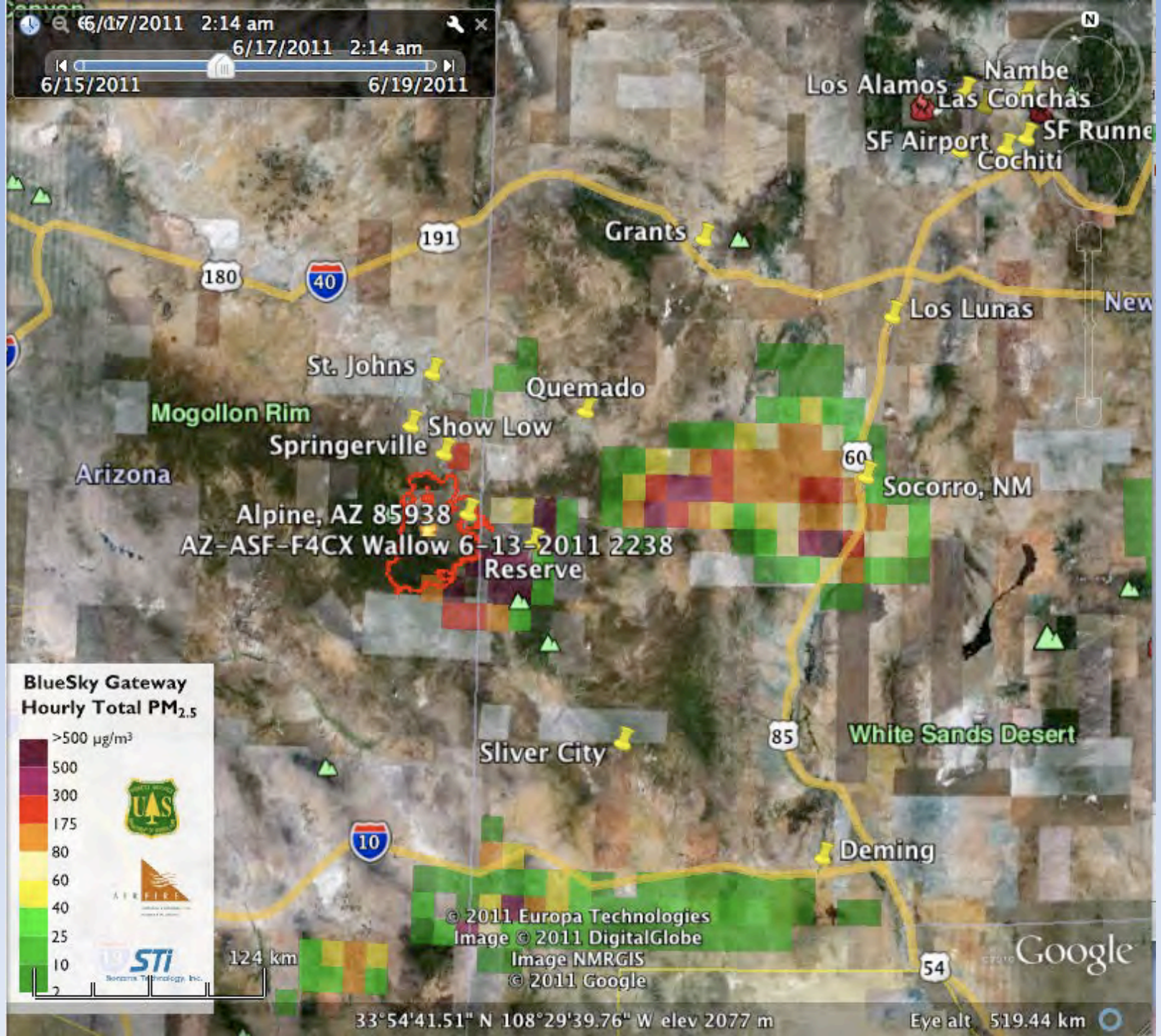
Interpreting Model Output

- Need to understand what went into the models
- Need to understand some basics about how the models work (e.g. what shortcuts are being taken?)
- Need to understand the resolution of the model – can it see important terrain features?

Trajectories vs. Dispersion

- Trajectories:
  - depict centerline movement of a parcel of air released at a specified time and height
  - show the path of the parcel as it is carried by the 3-D wind field
- Trajectories do not:
  - Provide any information about smoke concentrations
  - Account for the plume widening both vertically and horizontally
  - Tell you if smoke is predicted to reach a location

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Los Alamos
Nambe
Las Conchas
SF Airport
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Cochiti
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180
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Los Lunas
New
St. Johns
Quemado
Mogollon Rim
Show Low
Springerville
Arizona
60
Socorro, NM
Alpine, AZ 85938
AZ-ASF-F4CX Wallow 6-13-2011 2238
Reserve
BlueSky Gateway
Hourly Total PM2.5
>500 µg/m³
500
300
175
80
60
40
25
10
2
Sliver City
85
White Sands Desert
10
Deming
124 km
© 2011 Europa Technologies
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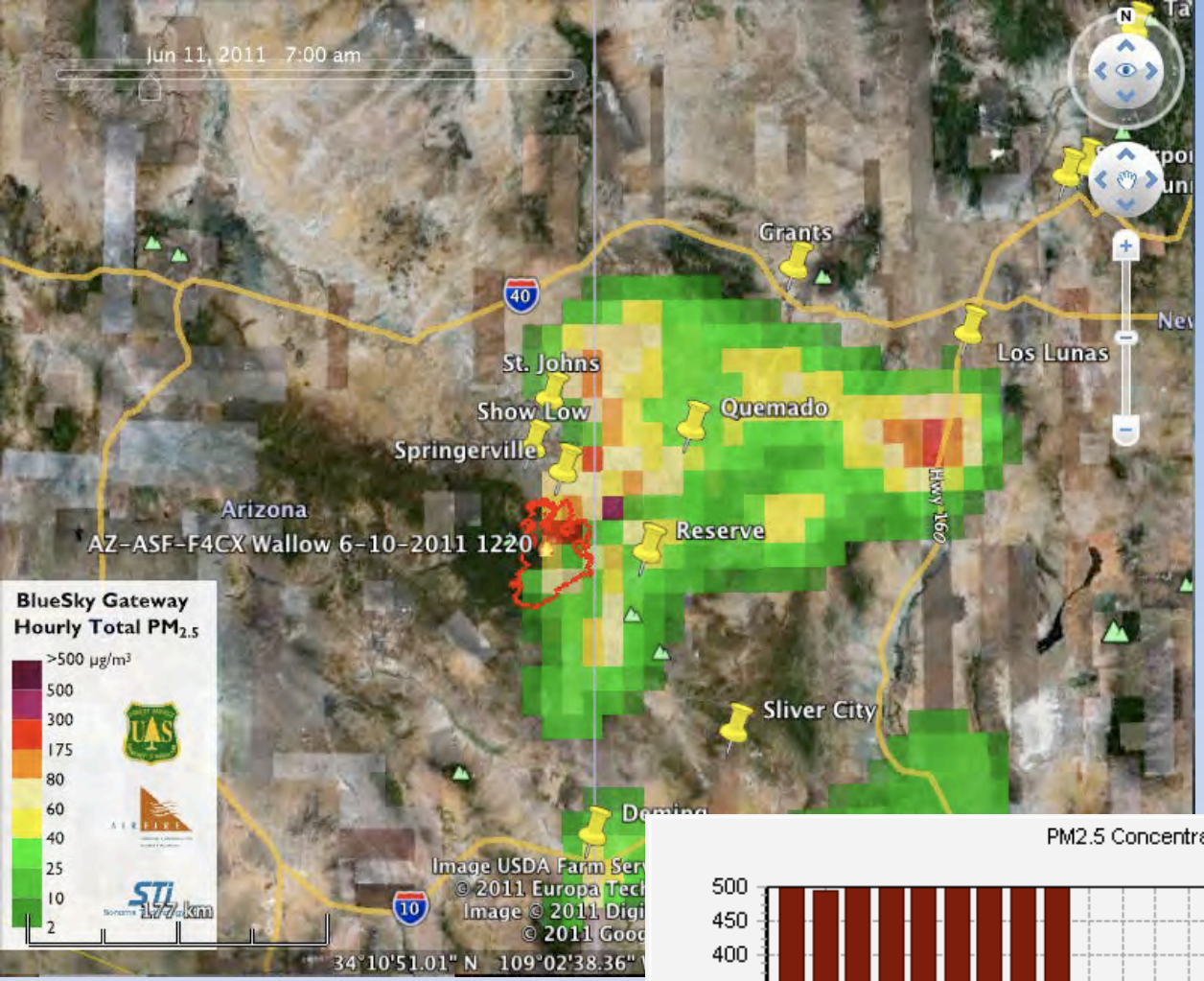
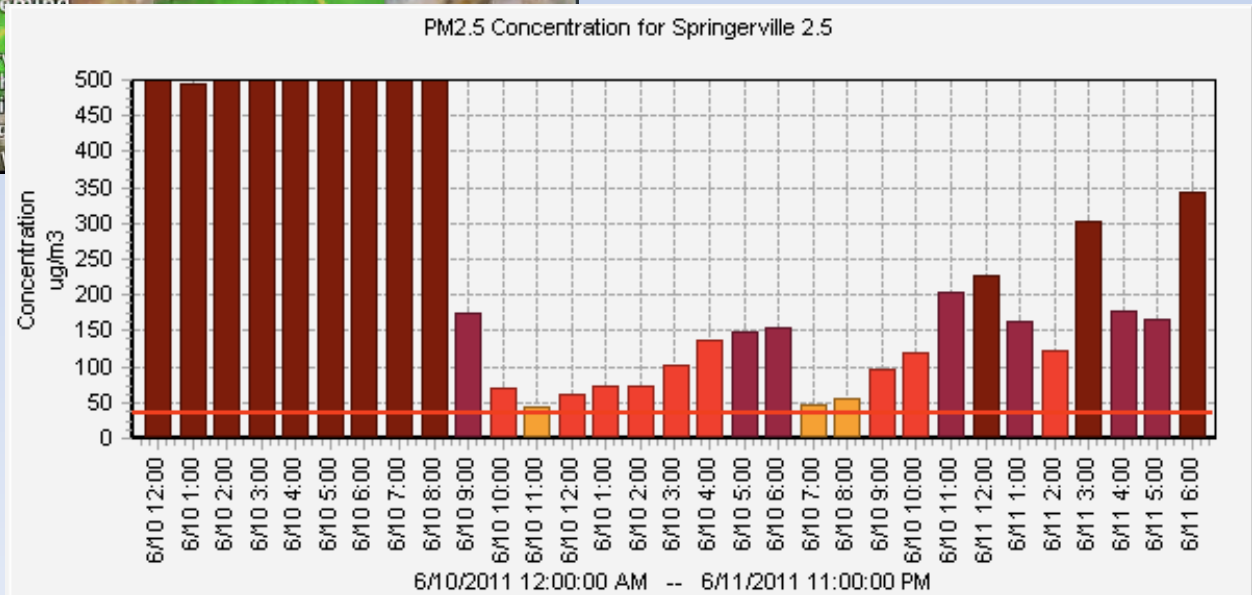
© 2011 Google
54
Google
33°54'41.51" N 108°29'39.76" W elev 2077 m
Eye alt 519.44 km

When possible, compare model output with observations – don't disregard "close misses" in time and space





Multiple model runs – vary inputs

- Change fuel loadings
- Change fuel moistures
- Change area burned

Compare the outputs – do small changes to the inputs result in large changes to the results?