Forest Service Air Quality Research and Development

2008 update

Elizabeth Reinhardt

Smoke Research Activities

- A new newsletter, Southern Smoke Issues
- Contact: Scott Goodrich, editor.

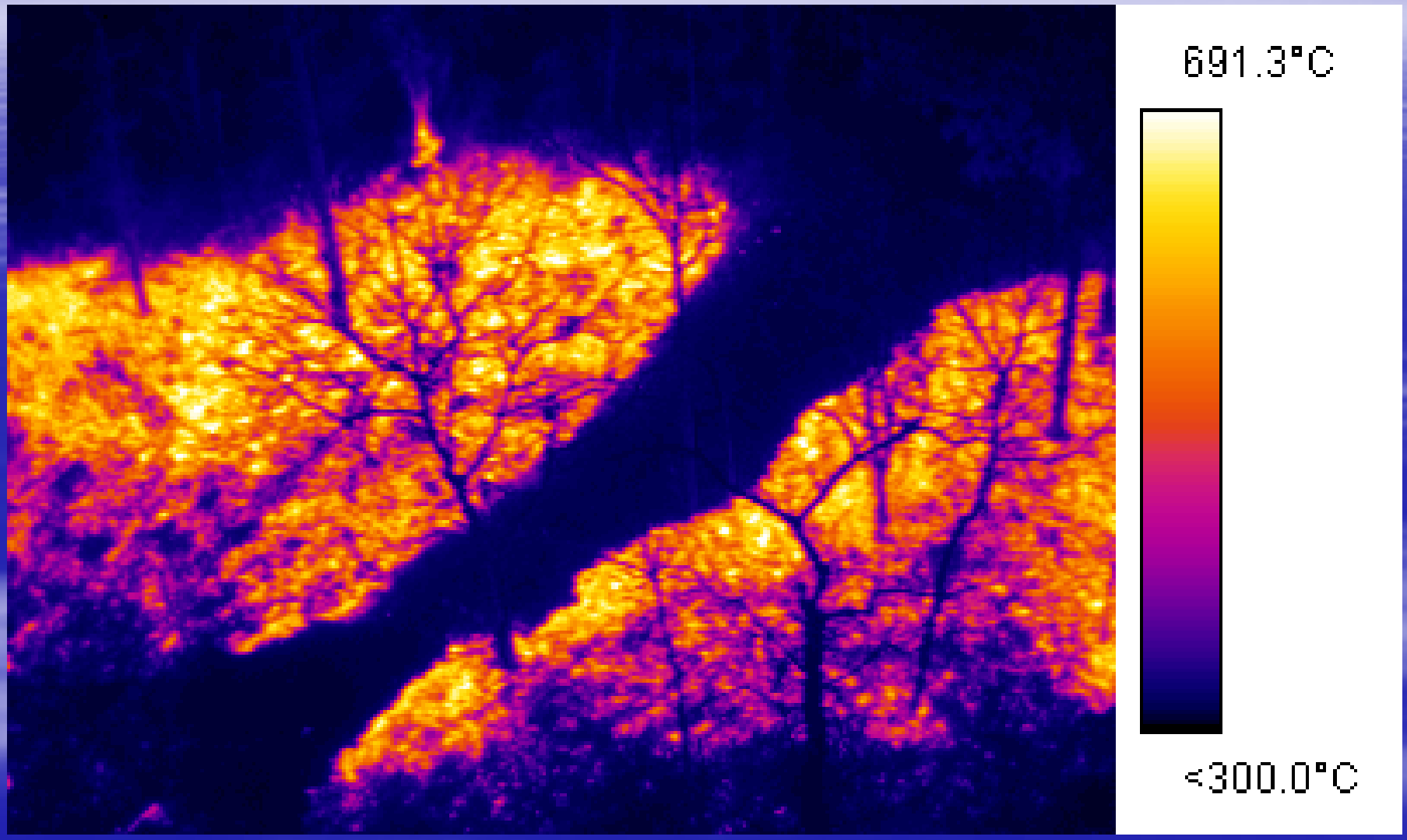
Smoke Research

Prescribed Fire Combustion – Atmospheric Dynamics Research Experiments

- Elgin Air Force Base and Jones Ecological Research Center
- 5 burns, 4500 acres

Objectives

- Compare in situ and remote sensed heat environments
- Document coupled atmospheric interactions
- Validation data for coupled fire-atmospheric dynamic models
- Relate fire behavior to first order fire effects


691.3°C
<300.0°C

National BlueSky Product

- PM2.5, Haines Index
- 3 day and 7 day predictions, lower 48
- http://cefa.dri.edu/FCAMMS/fcamms_home.php

FCAMMS National Prediction

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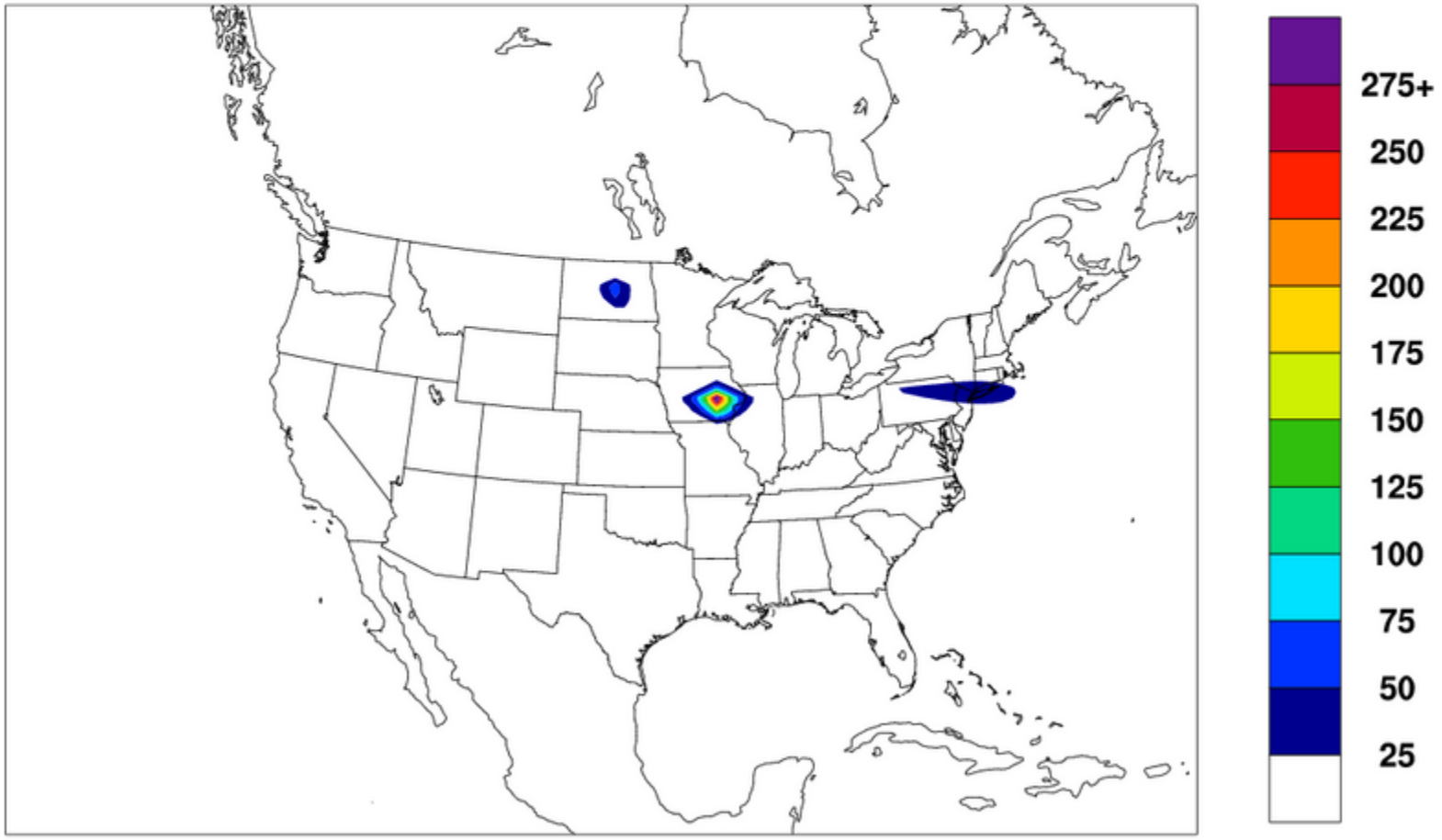

Forecast Hour 2

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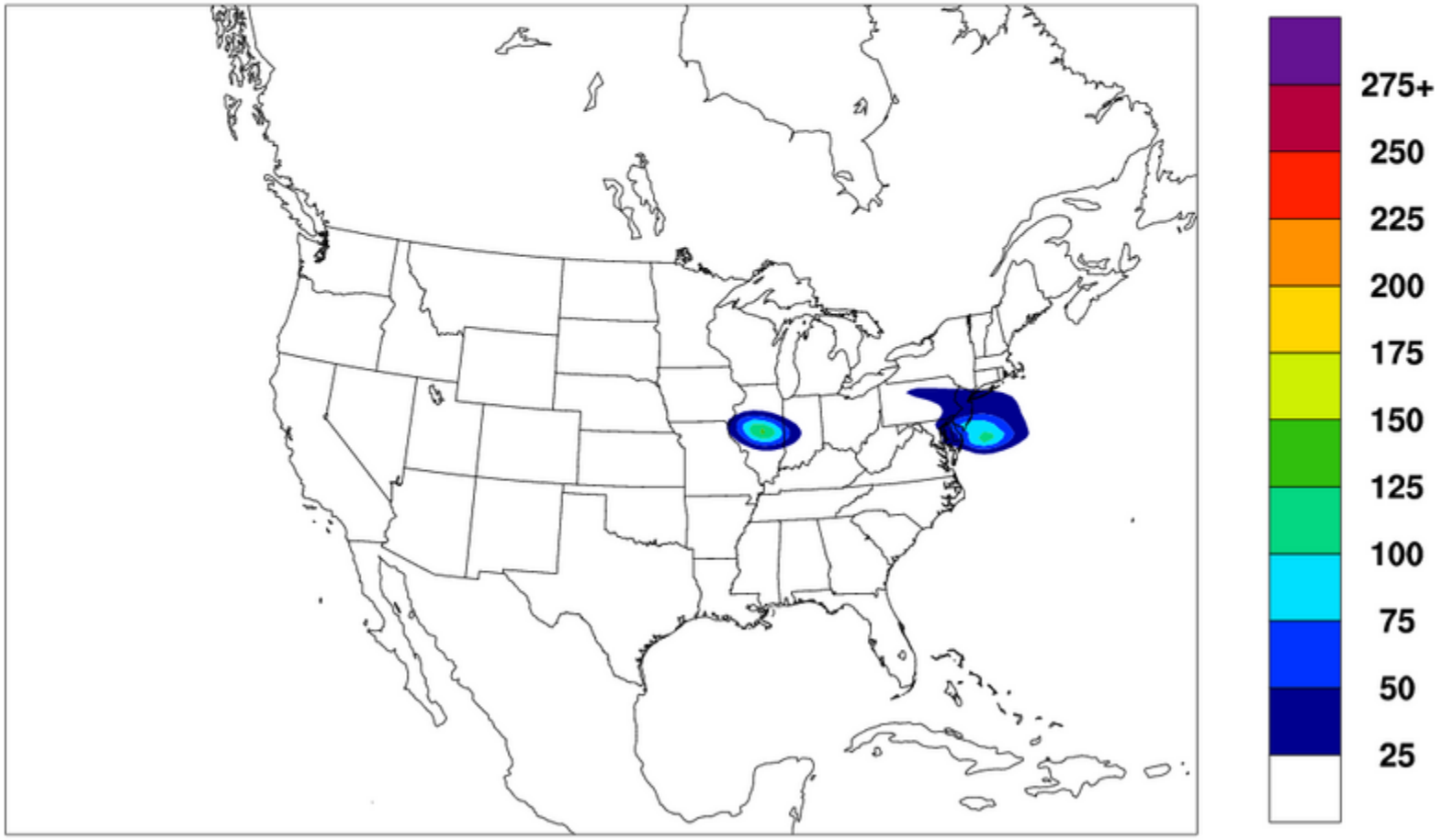

Forecast Hour 9

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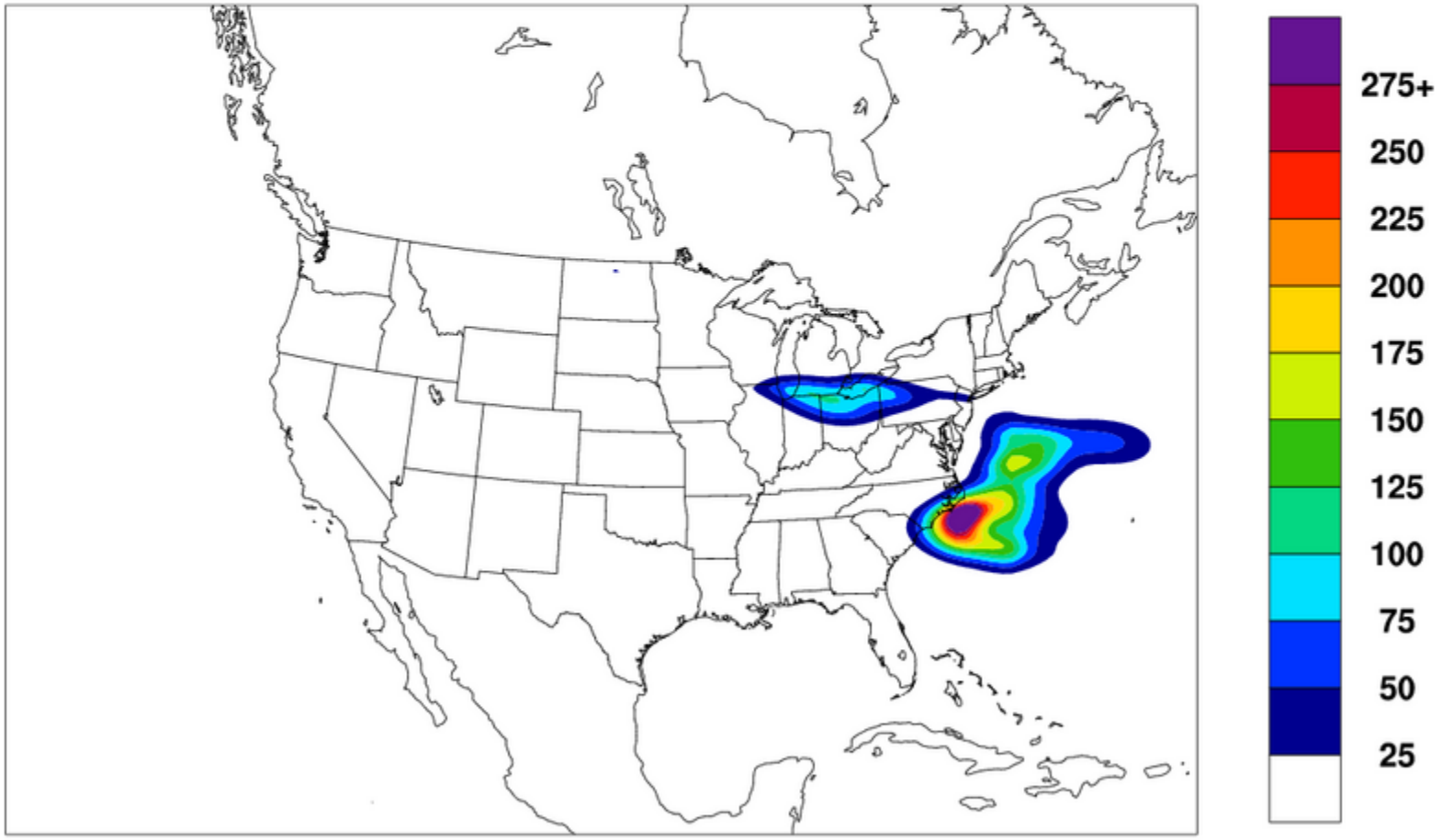

Forecast Hour 16

FCAMMS National Prediction

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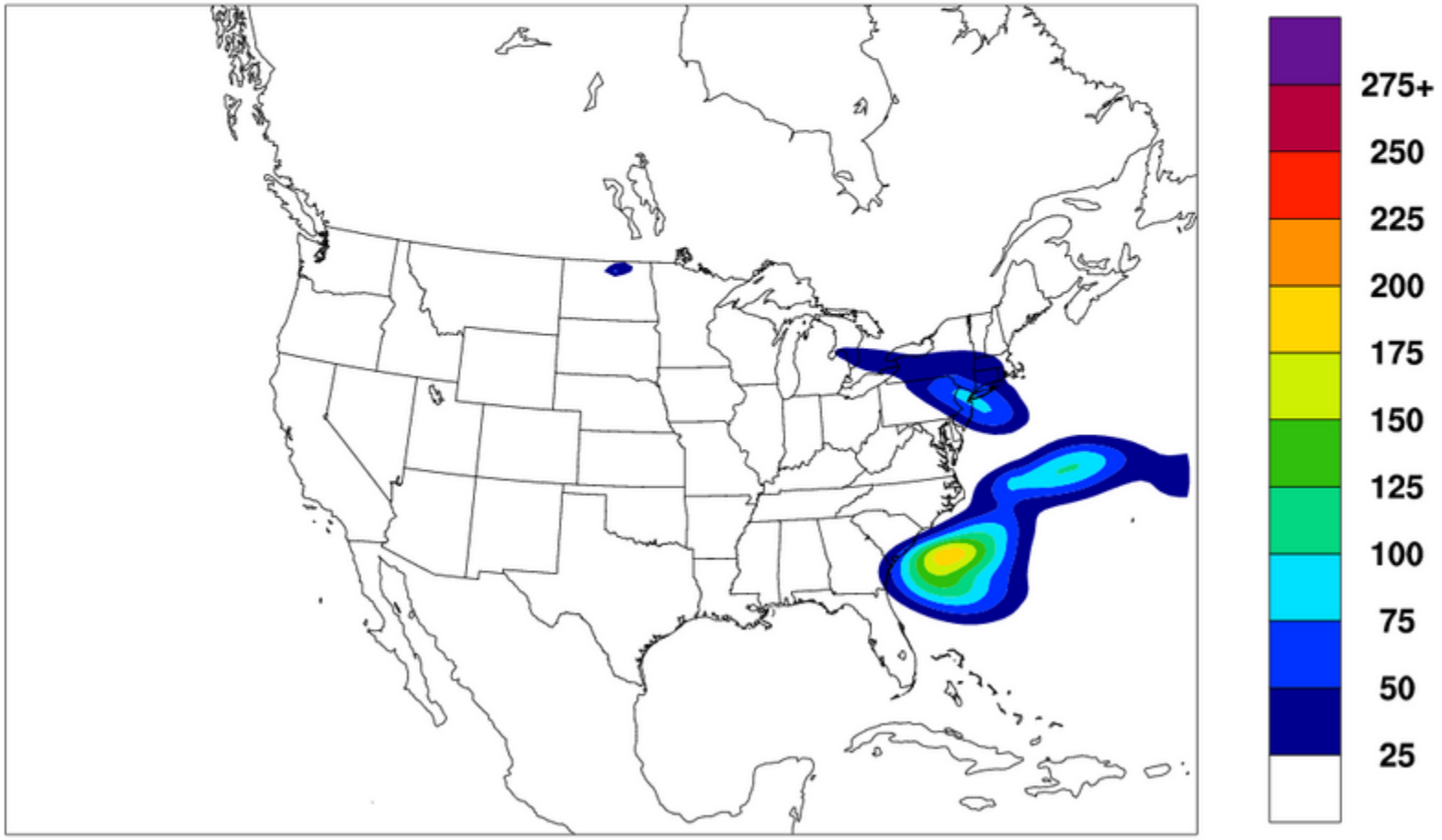

Forecast Hour 22

FCAMMS National Prediction

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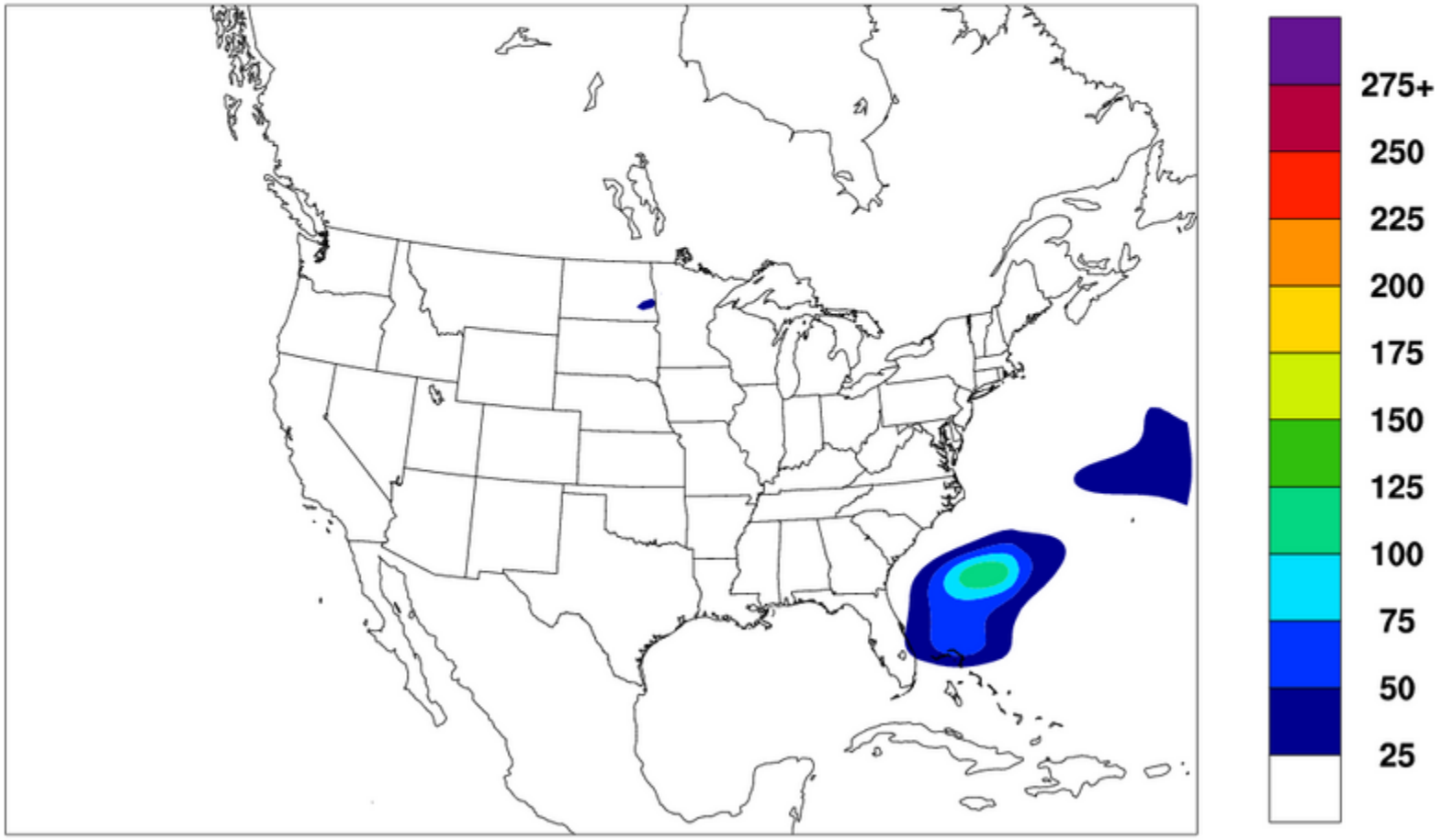


Forecast Hour 29

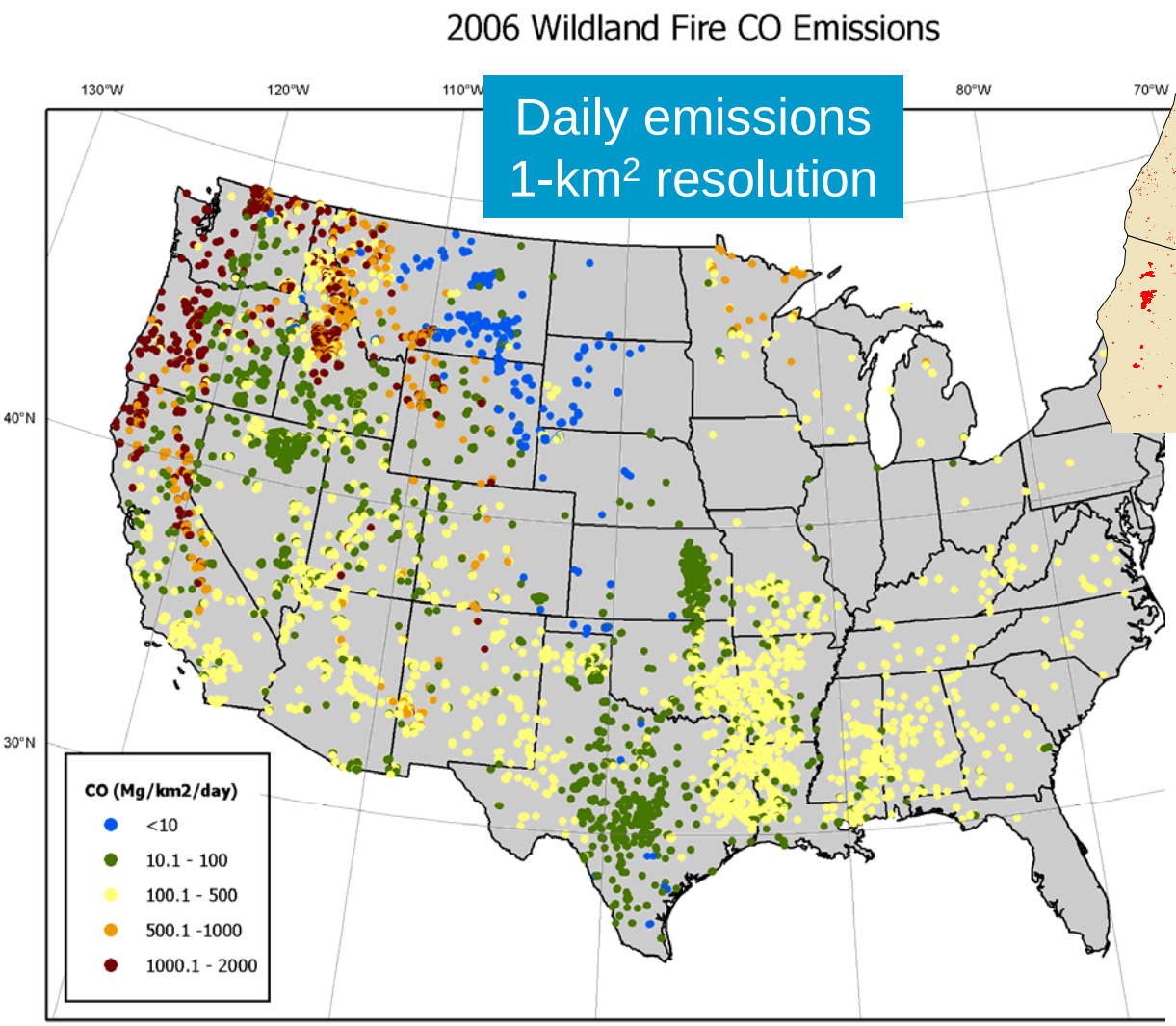
National PM2.5 Map

Source is estimated from mapped fuels and satellite detection of fires (usually around 100 acres or larger).

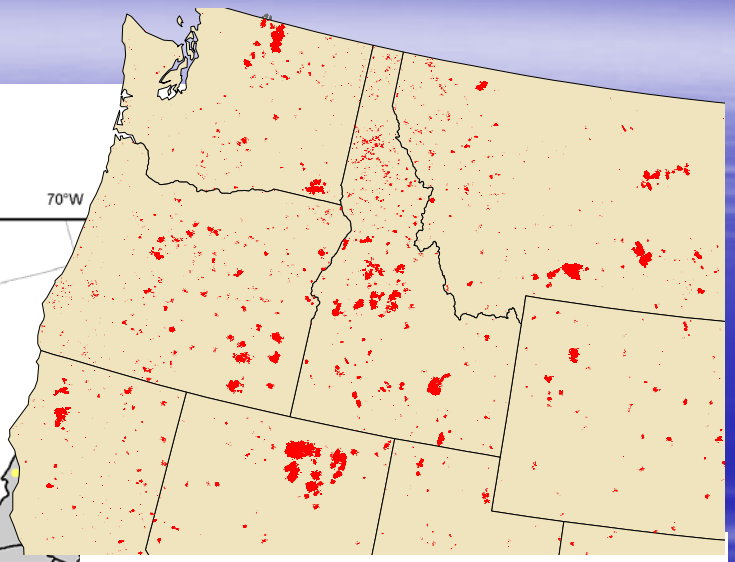
Agricultural burns often don't show up due to low intensity or short duration. But can be entered in manually for planning/forecasting if desired.

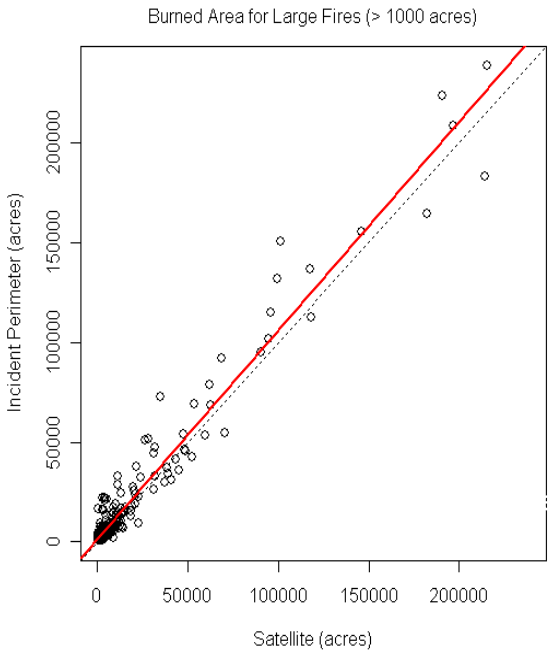
Dispersion is estimated using NWS forecasts, 12 km resolution.

Emissions Inventories from Remote Sensing



Daily emissions
1-km² resolution





International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests

- Monitor spatial and temporal variation of forest condition in relation to stress factors including air pollution (large scale systematic network)

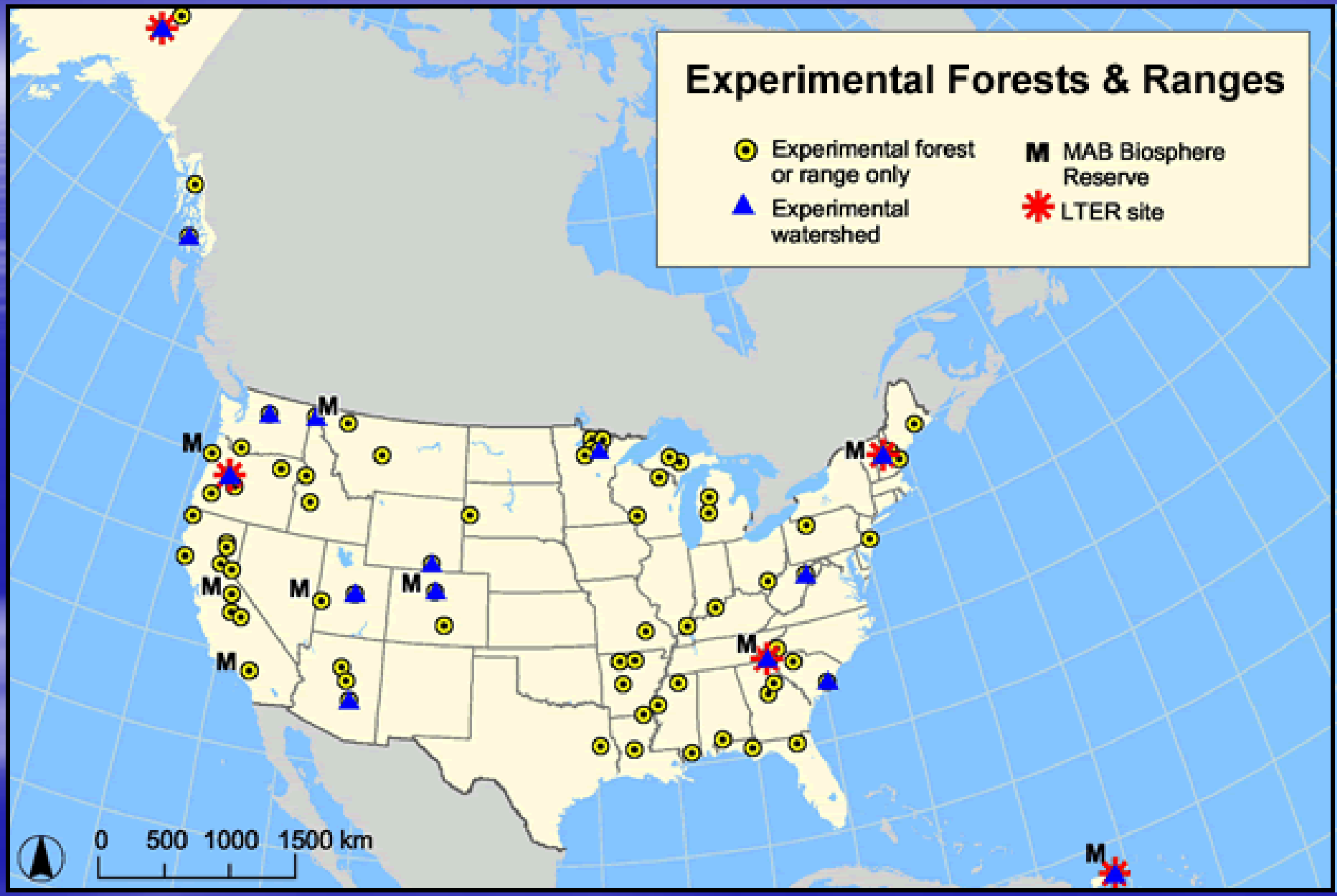
- Understand causal relations between stress factors including air pollution and forest condition (Level II plots – permanent observation plots

F.S. Additions to ICP Network

- Existing strong European Program – more than 20 years of data, 800 sites
- Bring U.S. sites up to 21 (Level II) by equipping Experimental Forests
- Select a range of sites covering gradients of urban to rural, east to west, etc.

Measurements include:

- Critical loads and critical levels of deposition of pollutants
- Loads: acidity, nitrogen, sulpher
- Levels: ozone
- Meteorological parameters: wind speed, direction, solar radiation, temperature, humidity and precipitation


Experimental Forests & Ranges
Experimental forest or range only
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