NESCAUM PM2.5 Mapping Demo Project:

NE U.S. and Eastern Canada

George Allen, NESCAUM

U.S. EPA's 2003 National Air Quality Conference
San Antonio TX

February 4, 2003

NESCAUM and Eastern Canada PM2.5 Mapping

As part of NEG/ECP initiative, NESCAUM has explored PM Mapping over the NE U.S and Eastern Canada

Summer 2002:

NESCAUM produced “demo” maps of July 2002 regional haze and forest fire events for evaluation purposes with many time/color resolutions

Recently added Mid-August 2002 Haze Event maps

All on the web at: nescaum.org/datamaps.html

Issues for Discussion for NE/CAN Maps

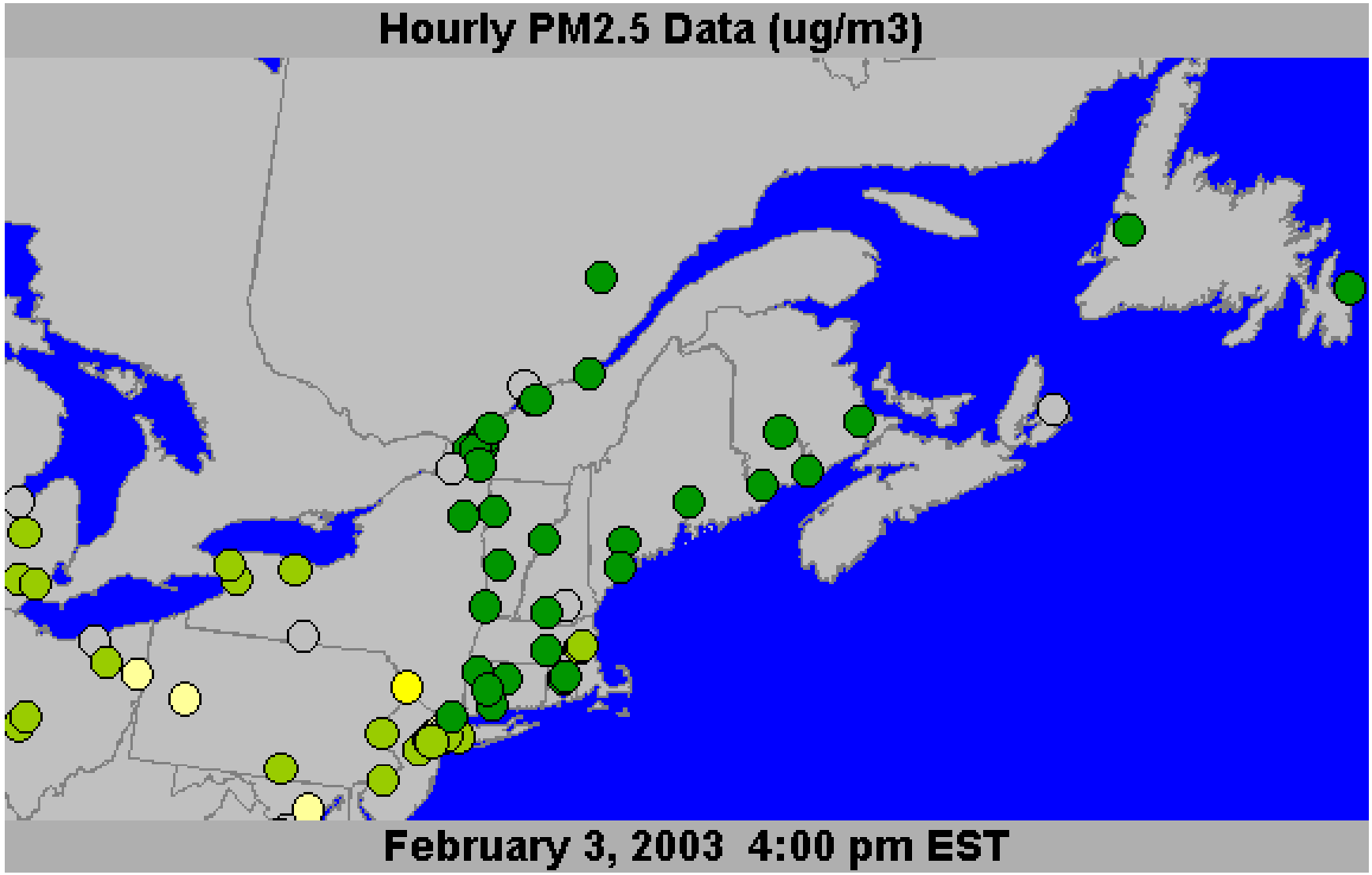
Need to get remaining Eastern Canada continuous PM2.5 sites reporting to AIRNow

Ontario... Polling issues similar to ozone – not real time

Goal is to produce a "local" map product using NE/CAN indices

- Not EPA AQI breakpoints; not EPA PM-health messaging
- AIRNow/STI produces custom map gif file for this purpose

Current example of Northeast "bulb" map shows active real-time sites as of February 3, 2003, and "custom" NE/CAN domain (additional sites coming on line this summer):



Do we want/need a similar NW transboundry map domain?

Transboundary “Correction Factors” for Continuous PM methods:

Most (all?) Canadian continuous PM2.5 monitoring sites do not use any correction (internal or external) for loss of semi-volatile PM.

This can result in under-reporting of PM2.5 by up to 30-50 % (relative to the FRM) for some locations and seasons - worse for sub-daily data intervals than daily means - a green “cliff” in the winter at the border?

U.S. EPA and NESCAUM’s Goal for PM map -- “FRM-like” data

For the NESCAUM generated demo maps for summer 2002, this is not a major issue since the methods difference is minimal for transport dominated events.

Need to resolve issue of data uniformity by fall 2003.

PM Mapping options and issues

PM maps may be generated in more than one way, using different breakpoints for AQI color (light and dark yellow break at 25 µg/m^3 for example), different standards (CARB, Canadian, US-EPA), or different averaging times (less than 24-hours).

Given that the PM-Map will be located on the EPA AIRNOW web site, the core U.S. version will presumably have AQI colors based on official EPA guidance; it is possible that other maps may be posted that are more "time-relevant" than the end-of-24-hour running average.

EPA can generate custom maps for use on other web sites; there is concern about multiple health messaging [EPA AQI vs. other].

As with ozone, there will be separate US and Canadian versions of the PM map[s] which NESCAUM and NEG/ECP will leverage.

NE/CAN Demo Map Examples

August 2002 regional haze event, 3-h 10 µg/m^3 and 24-h AQI:

http://www.nescaum.org/datamaps/Aug02Event.html

July 2002 Quebec forest fire event, 3-h 10 µg/m^3 version:

http://64.2.134.196/datamaps/PM/PM25__july6-july9--3hr.gif

This and other July 2002 PM Maps are at:
http://www.nescaum.org/datamaps/pm.html

PM2.5 AQI and Harmonized US-CAN Health Messaging:

The U.S. PM2.5-AQI and the Canadian PM2.5 CWS "guidance" is a based on a 24-hour mean health-based standard -- 65 vs. 30 µg/m^3, same form.

This sometimes leads to a severe lag in the "current" PM-AQI or running 24-hour mean value compared to current (1-hour) conditions.

Techniques have been explored (Dave Conroy and NESCAUM/Earth Tech) to minimize this lag using various techniques but stay with 24-hour mean concept.

NESCAUM states are considering a stricter PM2.5 standard – lower levels, possibly "sub-daily" time frame (3-6 hours?)