

# **AIRThen, AIRNow, AIRTomorrow**

**2003 National Air Quality Conference  
February 3, 2003  
San Antonio, TX**



**Chet Wayland  
U.S. EPA Office of Air Quality Planning & Standards  
Research Triangle Park, NC  
wayland,richard@epa.gov**

# AIRThen... 135 Million Years Ago (Mesozoic Era, Jurassic Period)

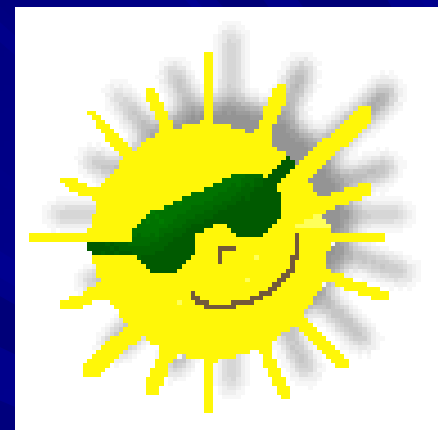
VOCs



+ NO<sub>x</sub>



+ sunlight



= ozone

**Some 134 million years later...**  
**(Cenozoic Era, Quaternary Period)**



**... the first ozone map is created**

# 1970 – The Creation of the EPA



# 1972 - Air Quality Trends Report...

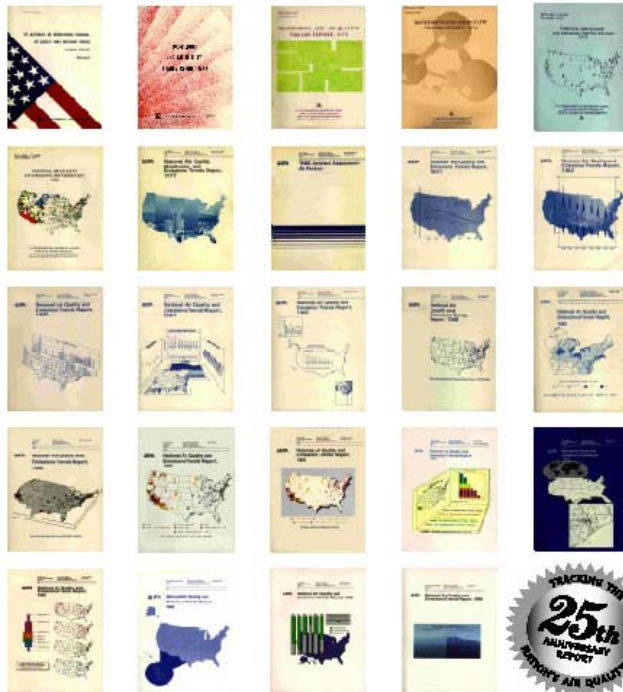
EPA 454/R-98-016  
December 1998

United States Environmental Protection Agency  
Office of Air Quality Planning and Standards  
Research Triangle Park NC 27711  
EPA 454/R-98-016  
December 1998

Air

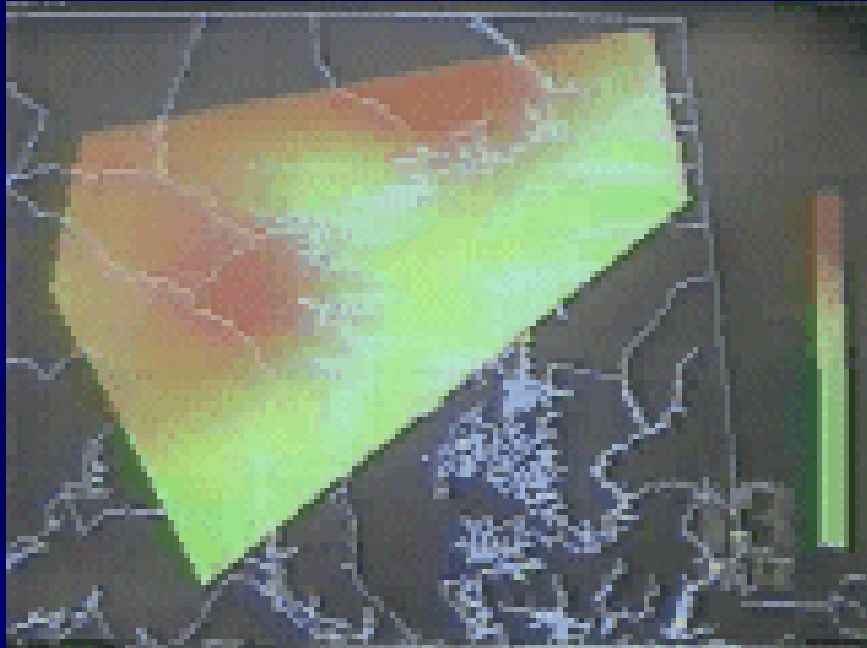


## National Air Quality and Emissions Trends Report, 1997



- Annual Report on Nation's Air Quality
- Covers multiple pollutants
- Includes maps, charts, statistics
- Historical trends analyses

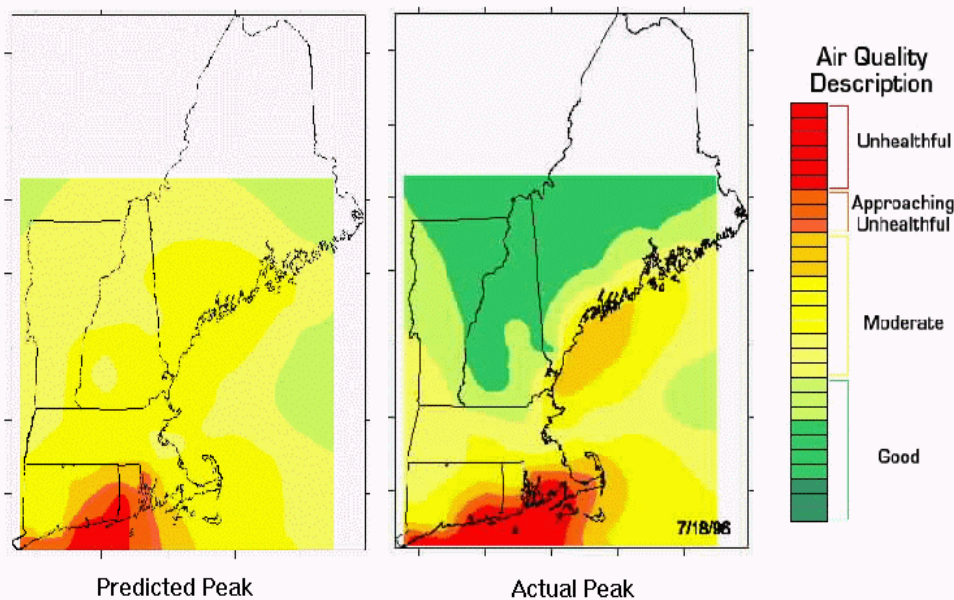
# 1995 – A napkin, a cocktail, an idea...



- Maryland MDE, ALA-Maryland
- 2 Cities (Baltimore, D.C.)
- 1 Map
- Updated daily



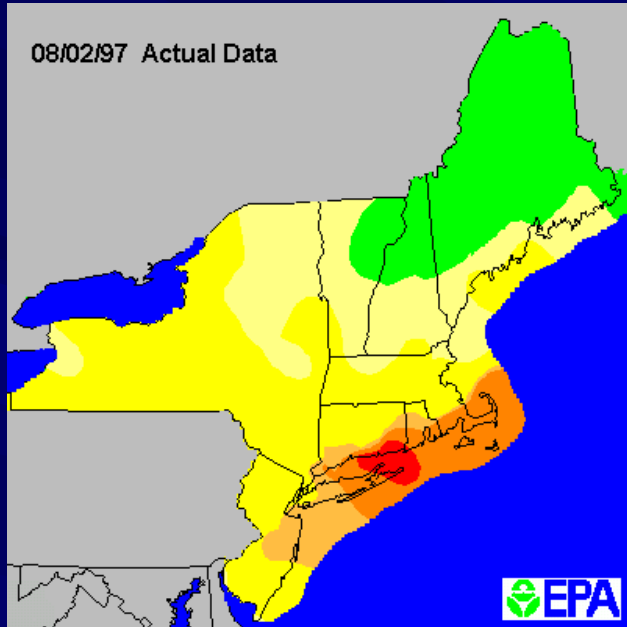
# 1996 – Regional Maps and Forecasts



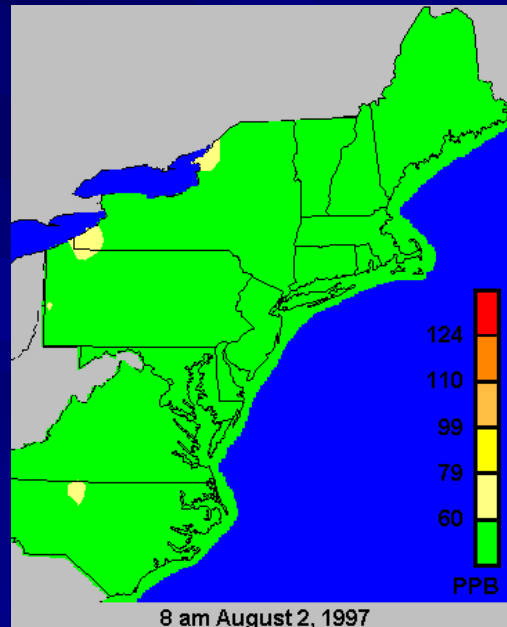
- EPA Region I & NESCAUM
- 6 New England States
- 1 Peak Map
- Based on 1-hour standard
- Updated periodically
- Regional Forecast Map

July 18, 1996

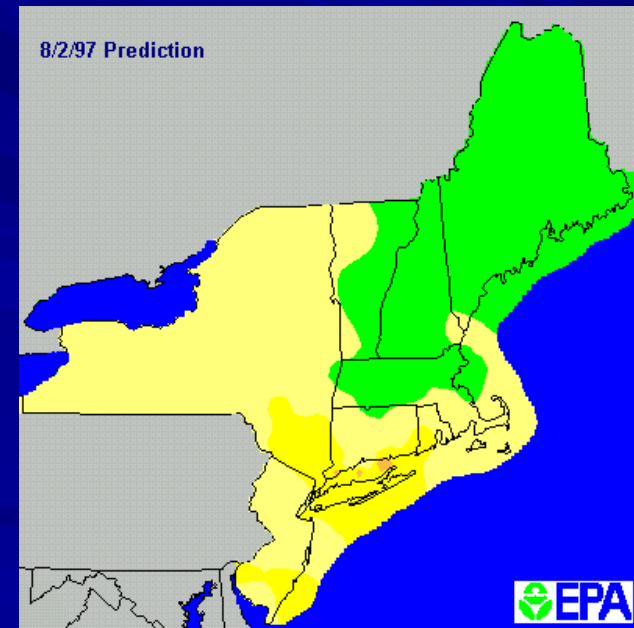
# 1997 – “Production”



1-hr Peak Maps



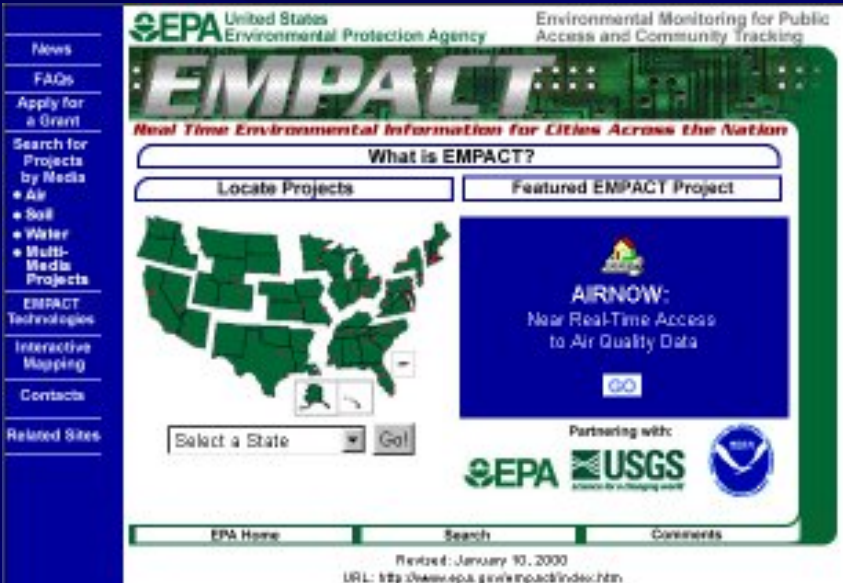
1-hr Animations



1-hr Peak Forecast Maps



# 1997 - The EMPACT of the AQI



- Environmental Monitoring for Public Access and Community Tracking Initiative
- Real-Time AQ Project Proposal
- ~\$5M awarded over 3 years
- “AIRNow”

- New Standards for ozone and particles
- New AQI, Health Messages
- Colors introduced... how many shades are there of yellow?

Air Quality Index Health Descriptors	Air Quality Index Values	Ozone Levels (ppm)
<b>GOOD</b>	<b>0 - 50</b>	0 - 0.064
<b>MODERATE</b>	<b>51 - 100</b>	0.065 - 0.084
<b>UNHEALTHY FOR SENSITIVE GROUPS</b>	<b>101 - 150</b>	0.085 - 0.104
<b>UNHEALTHY</b>	<b>151 - 200</b>	0.105 - 0.124
<b>VERY UNHEALTHY</b>	<b>201 - 300</b>	0.125(8-hr) - 0.404 (1-hr)

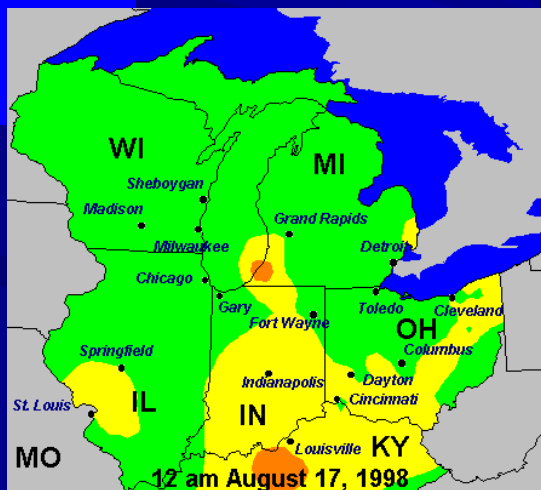
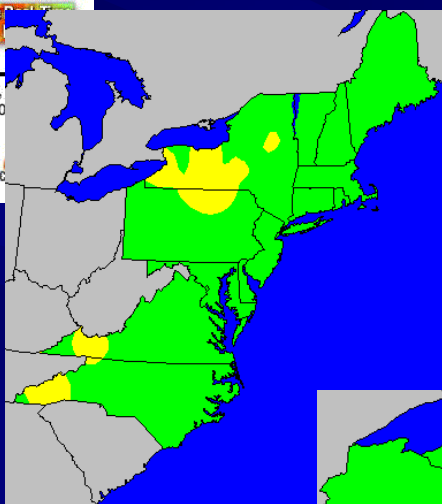
# The Birth of AIRNOW

## May 14, 1998

-AIRNow Website

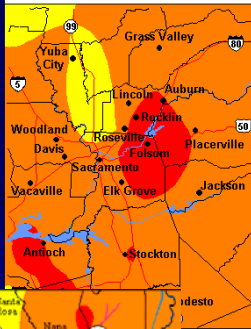
- 14 States
- 5 Domains
- Maps updated 7 times/day
- Data Collection Center (DCC) at MCNC
- Animation, 1-hr & 8-hr Peak Maps
- Forecasts for 35 Cities

- August 17, 1998
- Midwest States added
- 20 States
- 12 Domains



# 1999 - The Early Years

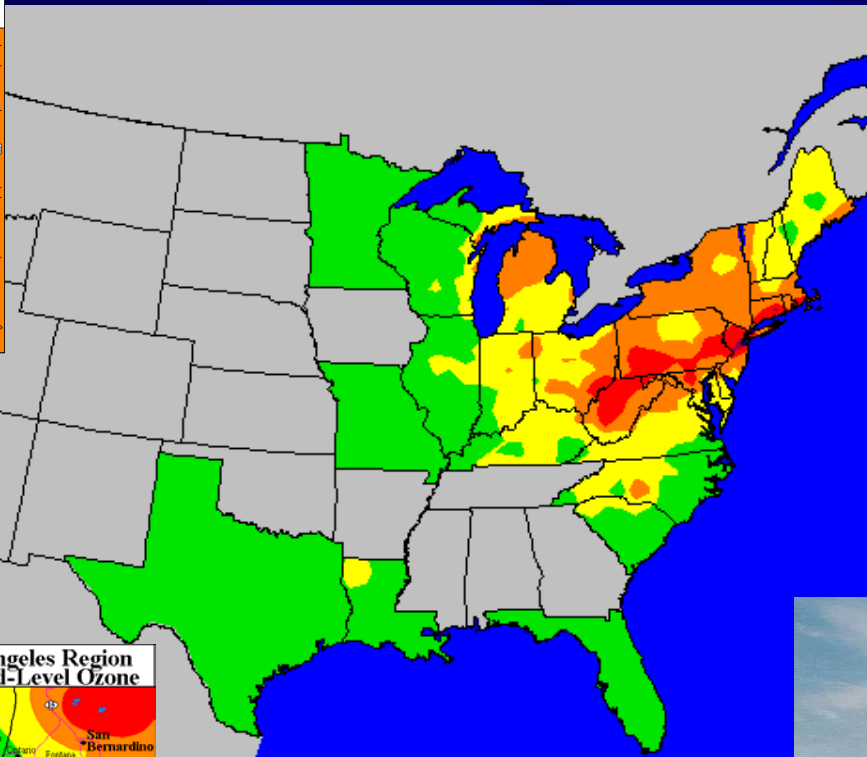
Sacramento Region  
Ground-Level Ozone  
July 11, 1999  
Peak 8-hr Average



San Francisco  
Bay Area  
Ground-Level  
Ozone  
July 11, 1999  
Peak 8-hr Average



July 29, 1999  
Peak 8-hr Average



July 16, 1999

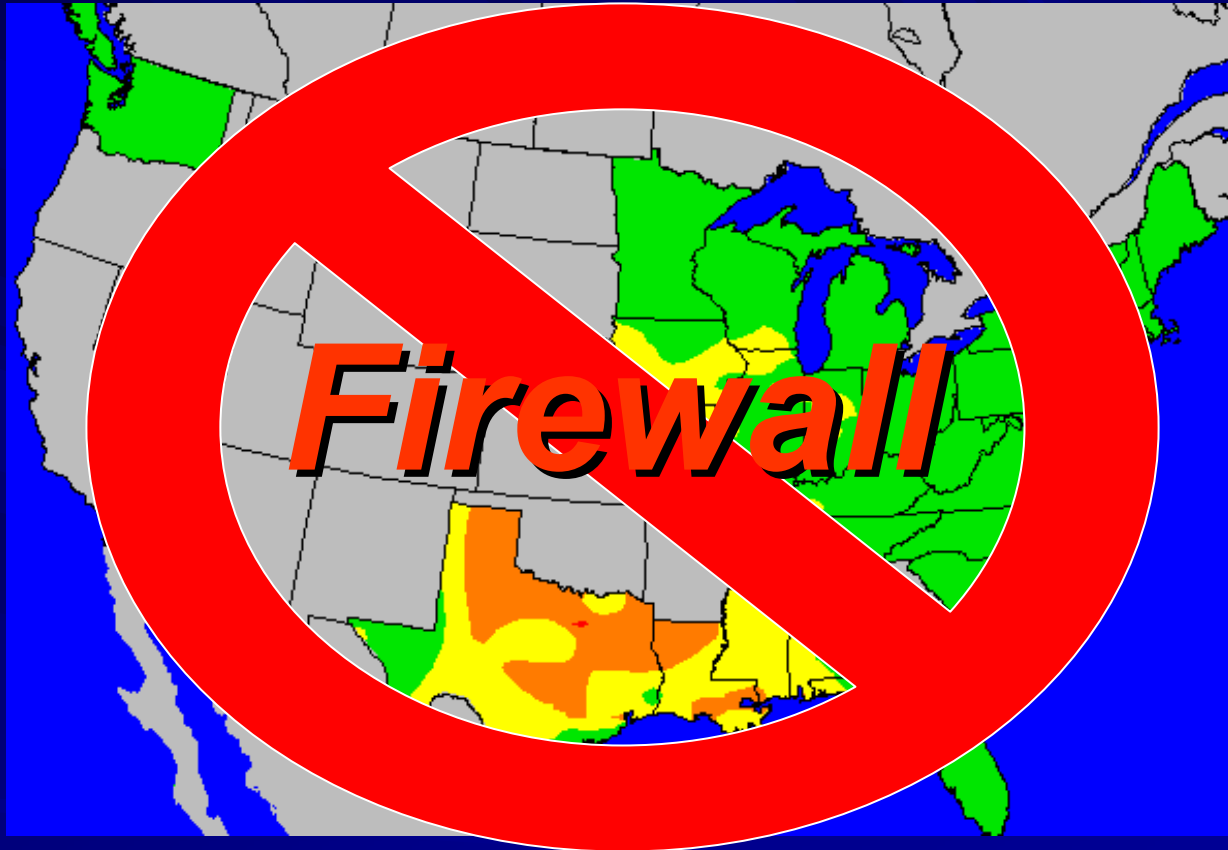
- Florida, Louisiana, Minnesota, Missouri, South Carolina, and West Virginia added
- West Coast DCC (California) added
- 27 States
- 26 Domains
- 71 Forecast Cities



-Real-time Visibility  
Images (Web Cams)



# 2000 – Strange things happen when you're gone...

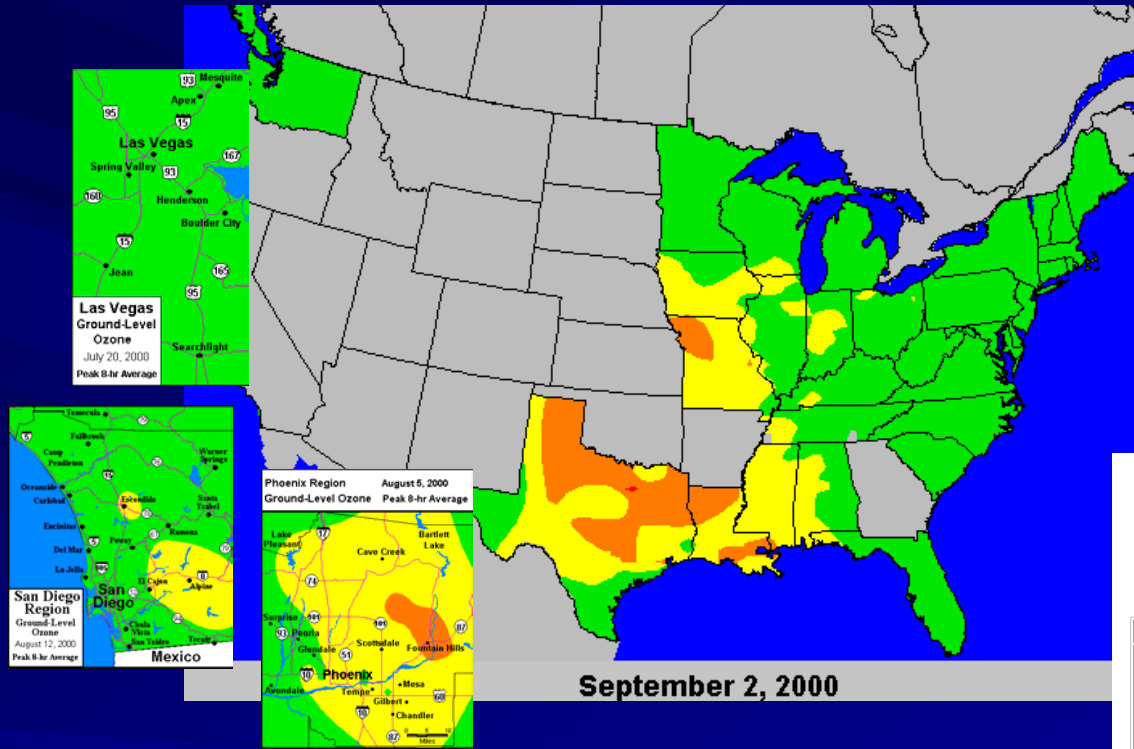


February 17, 2000... a date that will live in infamy

# 2000 - The Rebound Half Year




## May 1, 2000

- 33 States
- 37 Domains
- 7 updates/day
- EPA & West Coast DCC's merge



-125 Forecast Cities

... and National Outreach

### Ozone Forecasts

Ozone Forecasts For Metro Areas		
City	Today	Tomorrow
Albany	63 <b>Moderate</b>	55 <b>Good</b>
Akron	130 <b>Unhealthy for Sensitive Groups</b>	155 <b>Unhealthy</b>
Atlanta	63 <b>Moderate</b>	55 <b>Good</b>
Boston	98 <b>Moderate</b>	123 <b>Unhealthy for Sensitive Groups</b>
Albany	63 <b>Moderate</b>	55 <b>Good</b>
Akron	130 <b>Unhealthy for Sensitive Groups</b>	155 <b>Unhealthy</b>
Atlanta	63 <b>Moderate</b>	55 <b>Good</b>
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Akron	130 <b>Unhealthy for Sensitive Groups</b>	155 <b>Unhealthy</b>
Atlanta	63 <b>Moderate</b>	55 <b>Good</b>

- **Northeast Forecast Maps**
  - [Today's Forecast Map](#)
  - [Tomorrow's Forecast Map](#)
- **State and Local Forecasts**
  - [California](#)
    - [Bay Area](#)
    - [Los Angeles](#)
    - [Sacramento](#)
    - [San Diego](#)
  - [Michigan](#)
  - [Kansas City](#)
  - [Maryland](#)
  - [New Jersey](#)
  - **New England**
    - [Connecticut](#)
    - [Maine](#)
    - [Massachusetts](#)
    - [New Hampshire](#)
    - [Rhode Island](#)

# 2000 - Media Outreach

**USA TODAY**

**Weather**

Events  
South Dakota  
Hiker

**Pittsburgh**

More clouds than sun 90/71  
**Thursday:** Isolated thunderstorms 85/68  
**Friday:** Scattered thunderstorms 88/68  
**Saturday:** Isolated thunderstorms 83/68  
**AQI: Unhealthy**

Weather Information  
Weather Maps  
US City Forecasts  
World Weather

News Center  
Weather Headlines  
Tropical Update  
Storm Watch

Weather and...  
Travel  
Health  
Golf  
Dining  
Outdoors  
Home & Garden  
Events  
Aviation  
School/day Forecast  
Holidays

Interact  
Boards/Chat  
Photo Gallery

- AQI Forecast for 36 Cities

**weather.com**

Go Shopping | Interact | Inbox Weather | Wireless Weather | Weather on Your Site | Audio/Video Forecast

Featured This Week: Vulnerable Cities | Travel Destinations | U.S. Open Weather

Customize My Weather

Local Weather  
Any City or US Zip

**HEALTH**  
Air Quality

Raleigh, NC  
As of Wed Jun 14 16:00:16 2000

**Current Air Quality**  
AIR QUALITY: Unhealthy for Sensitive Groups  
Pollutant Principal: Ozone

**Forecast**  
Today: Unhealthy for Sensitive Groups  
Tomorrow: Moderate (updated daily at 4:30pm EST)

Air pollution can affect your health and the environment. There are actions every one of us can take to reduce air pollution and keep the air cleaner, and precautionary measures you can take to protect your health. Learn [more](#).

**EPA**  
United States Environmental Protection Agency

Back to Top  
Back to Health Index

**LOCAL LINKS**

**North Carolina**  
• Raleigh-Durham Weather  
• Winston-Salem Weather

**South Carolina**  
• Greenville Weather  
• Columbia Weather

-AQI Forecasts for 125 Cities



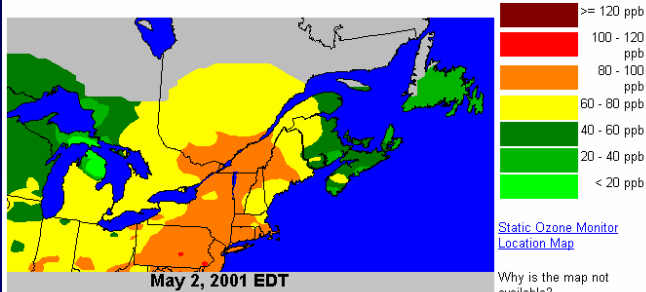
-Maps and Forecasts delivered to major WSP's



# 2001 – AIRNow Goes International

## Ozone Peak Values

1-hour Peak Concentration Canada - Wednesday, 02 May 2001



Why is the map not available?  
See [FAQ](#).

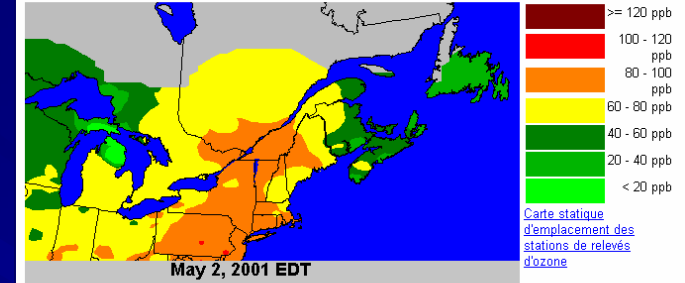
This map shows the highest ozone concentrations that were reached throughout the region during the day. It does not represent a snapshot at any particular time, but is more like the daily high temperature portion of a weather forecast. The peaks are based on one hour average concentrations in parts per billion (ppb) as shown in the legend.

This information is provided through an international co-operative effort between state, provincial, and federal governments in both the US and Canada.

[Français](#)

## Concentration maximale en ozone

Concentration maximale sur une heure Canada - Mercredi, 02 mai 2001



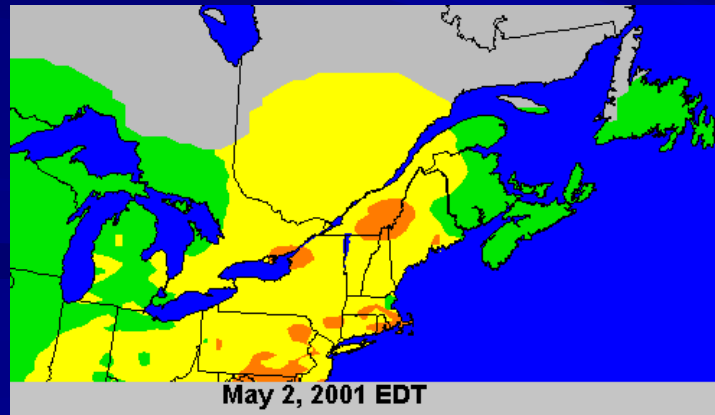
Cette carte montre les taux de concentration les plus élevés qui ont été atteints dans la région au cours de la journée. Elle ne donne pas un aperçu de la situation à un moment en particulier, mais exprime un maximum comme dans les bulletins météorologiques qui présentent les températures maximales pour une journée donnée. Les taux culminants sont basés sur la concentration moyenne mesurée sur une période d'une heure en parties par milliard (p.p. 10<sup>9</sup>) (voir la légende).

Cette information est disponible grâce à une collaboration entre les gouvernements provinciaux, les États américains, le gouvernement fédéral canadien et le gouvernement des États-Unis.

[English Version](#)

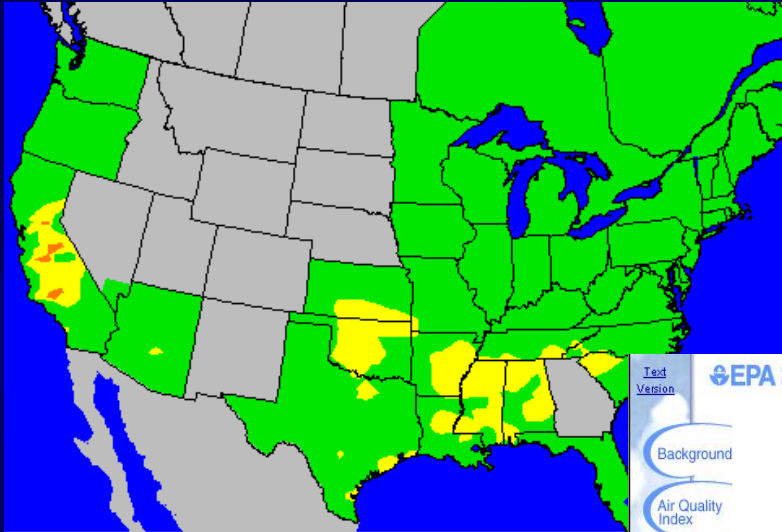
## Canada 1-hr AQI - English

## Canada 1-hr AQI - French



## U.S. 8-hr AQI

# 2001 – Fill in the Blanks...



September 14, 2001

- 38 States
- 5 Provinces
- 42 Domains
- 7 Updates/day
- 165 Forecast Cities

8/20/01 Cover Story



Why is the **BLANK** mirror down again!?!



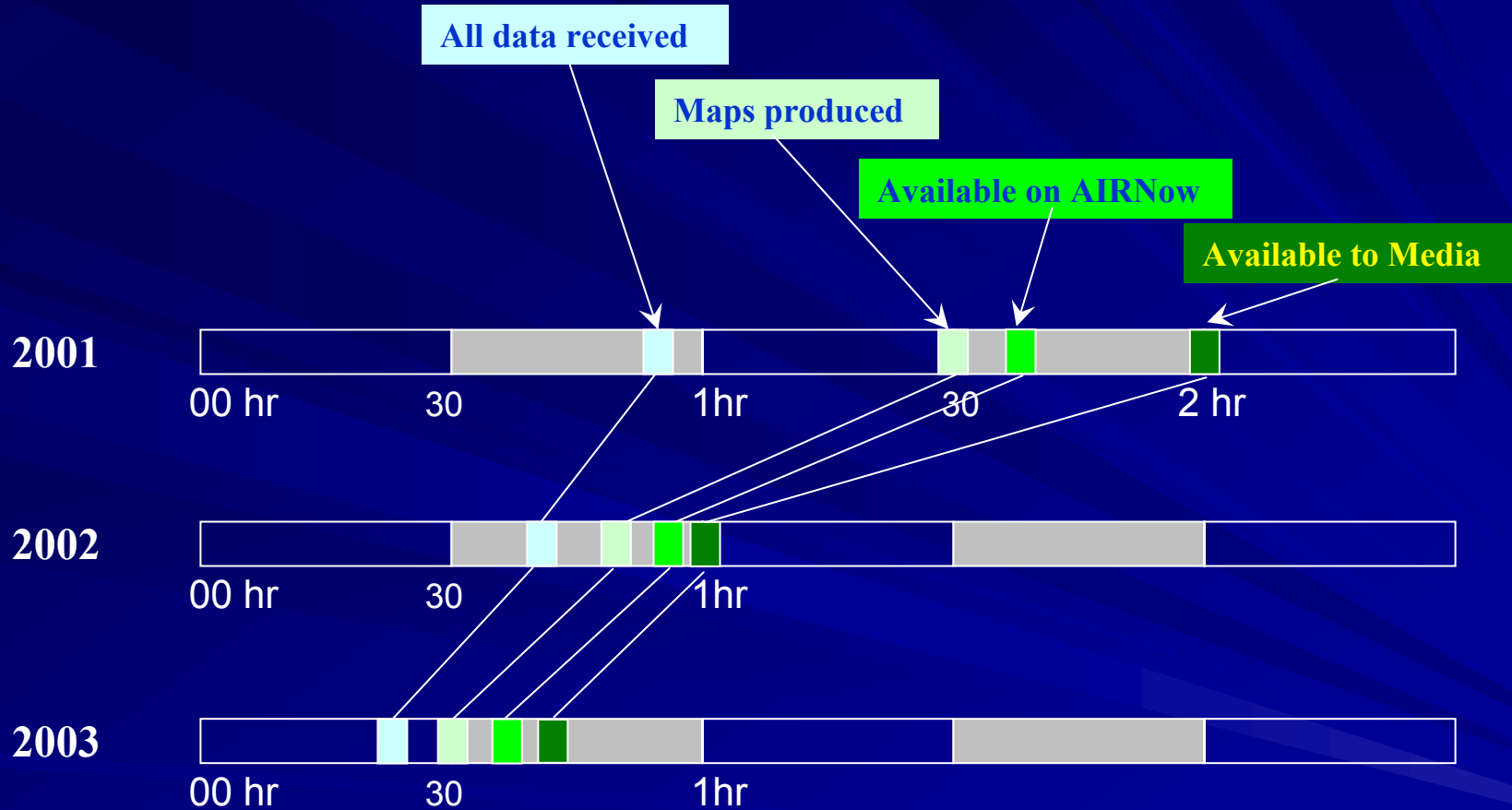
# 2002 – AIRNOW: A Defining Year

Metric	2001	2002
Participants	38 States 5 Canadian Provinces	44 States 6 Canadian Provinces Mexico (3 sites) National Park Service
Agencies	62	79
Monitors	~1000	~1200 – Ozone ~ 230 PM <sub>2.5</sub> ~ 40 PM <sub>10</sub>
Maps	32 DCC 10 WCMC	50 for Ozone 10 for PM <sub>2.5</sub>
New Maps	Canada, GSMNP, Las Vegas, SouthCentral US, Northwest, Tuscon	Colorado, Utah, New Mexico, Kansas, Oklahoma, Nevada, Louisiana, Arkansas, NPS

# 2002 – AIRNOW: A Defining Year

Metric	2001	2002
Forecast cities	165	273
Turn-around time	2 hours	10 to 45 minutes

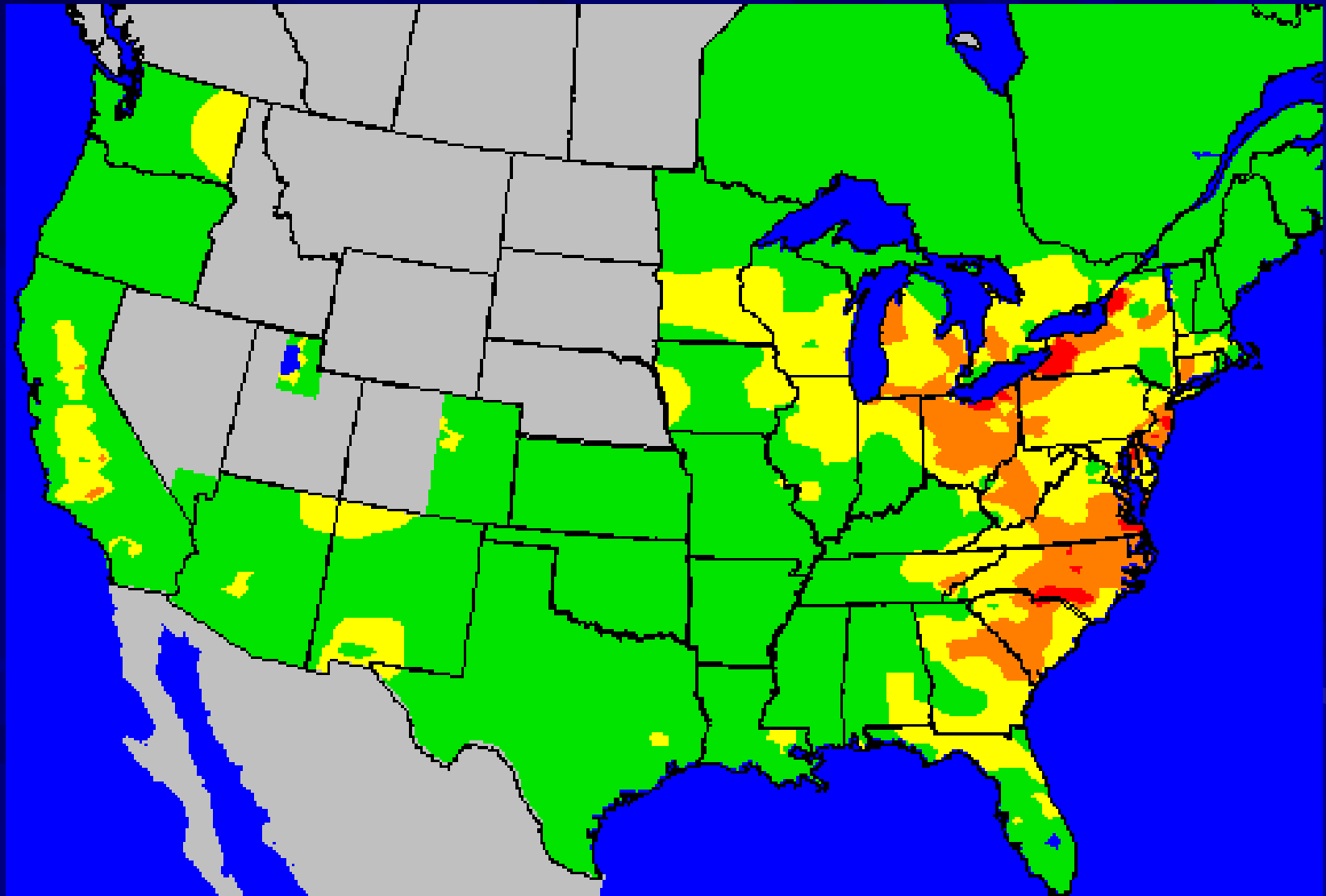
# Hourly Timeline of DMC activities



# 2002 – AIRNOW: A Defining Year

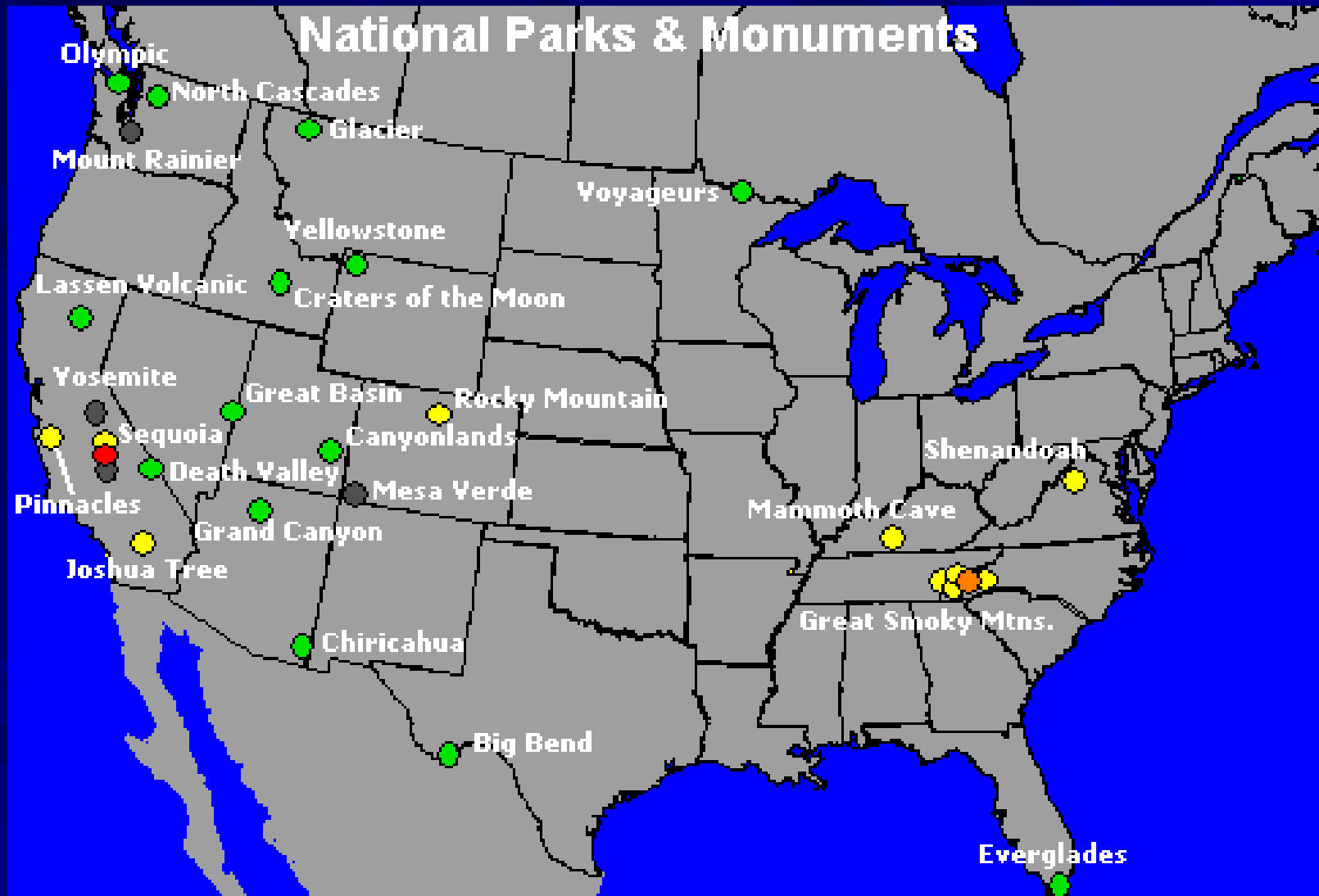
Metric	2001	2002
Forecast cities	165	273
Turn-around time	2 hours	10 to 45 minutes
Update frequency	7 times per day	Hourly (8am to 10pm) Some areas 24 hrs/day
Media/WSP partners	Weather Central, WSI, Meteorologix, USAToday, Weather.com	Weather Central, WSI, Meteorologix, AccuWeather, WeatherBank (AP), Weatherunderground.com, USAToday, Weather.com, The Weather Channel, CNN
Infrastructure	ASCII files, MapGen	Oracle Database, MapCon & MapGen
Uptime of DMC		98.8% (3628 hrs/3672 hrs)

# 2002 – National Maps



July 17, 2002

# 2002 – National Parks



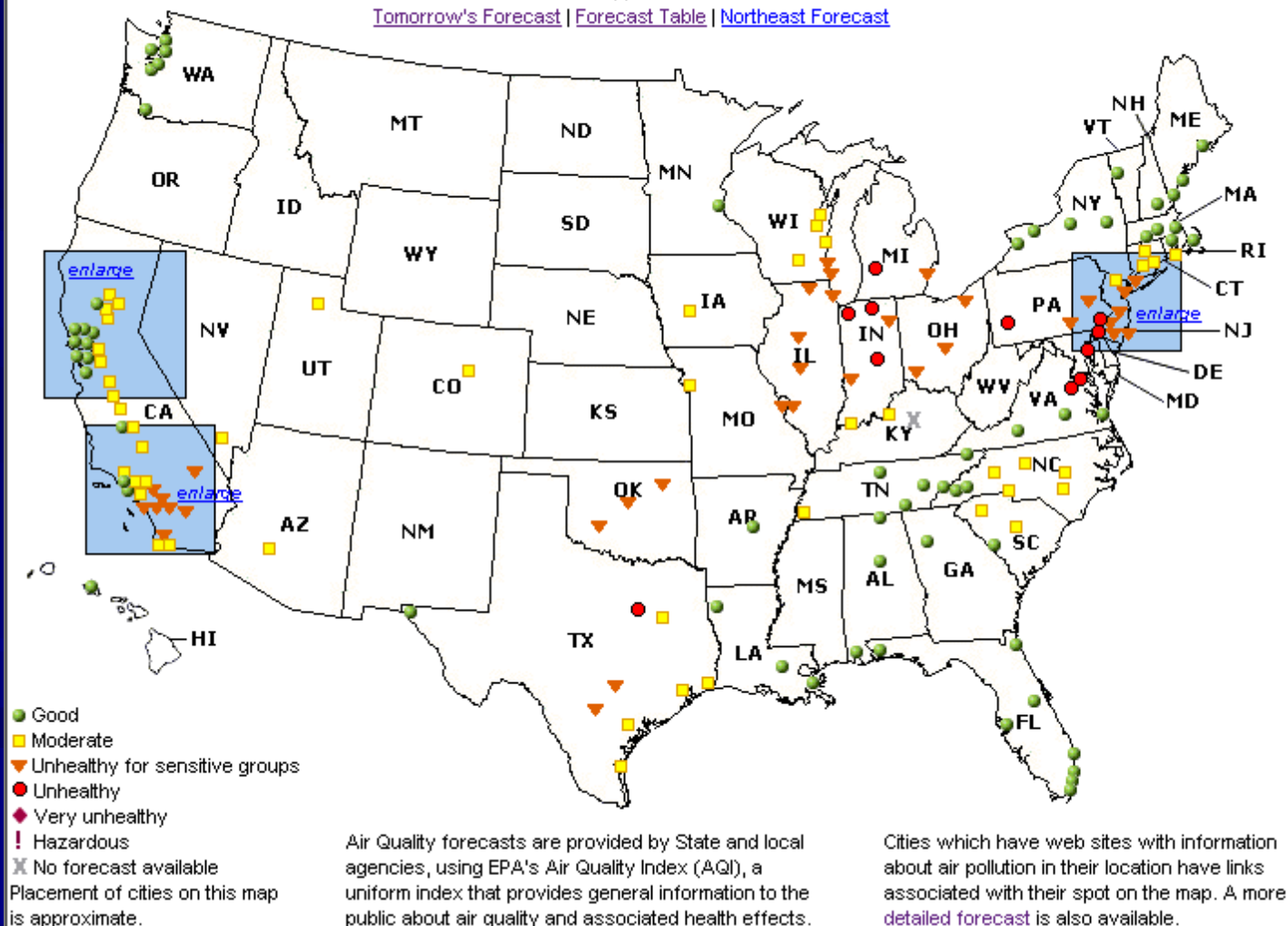
July 9, 2002

# 2002 – National Forecasts

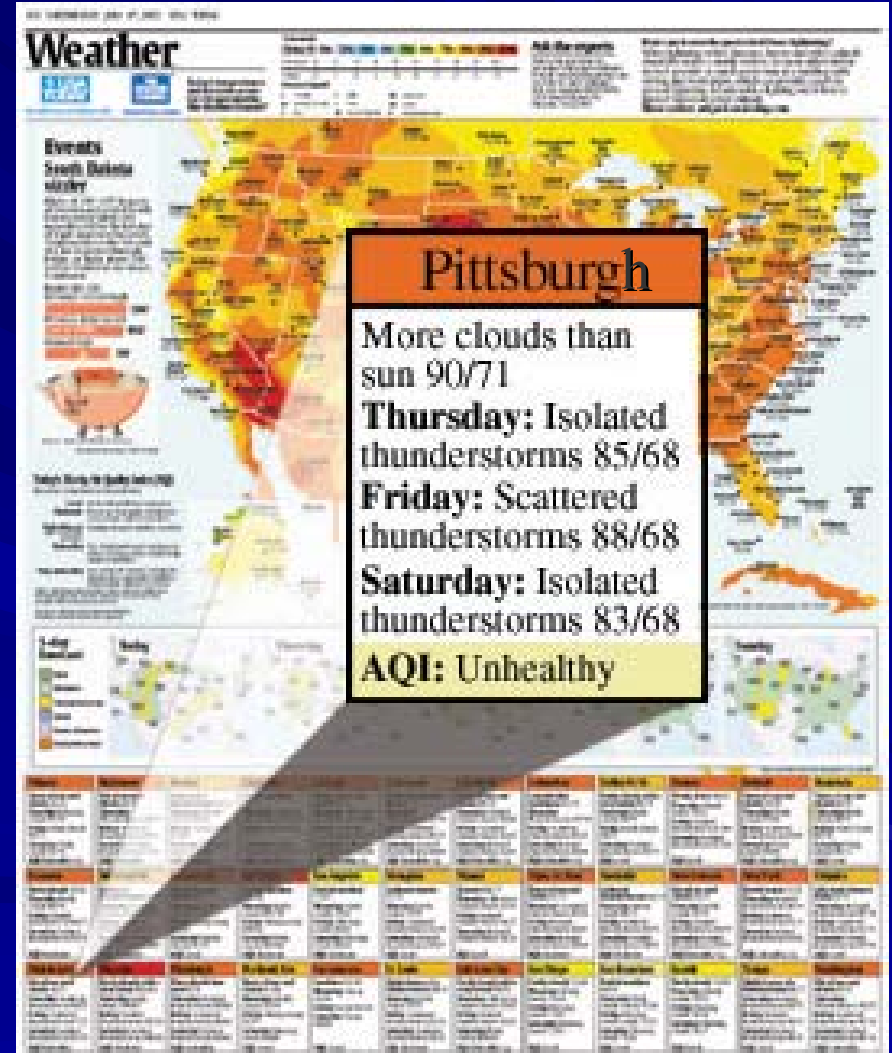
## Today's Air Quality Forecast

Monday, 24 Jun 2002

[Tomorrow's Forecast](#) | [Forecast Table](#) | [Northeast Forecast](#)



# 2002 – National Coverage





# 2002 – National Awareness

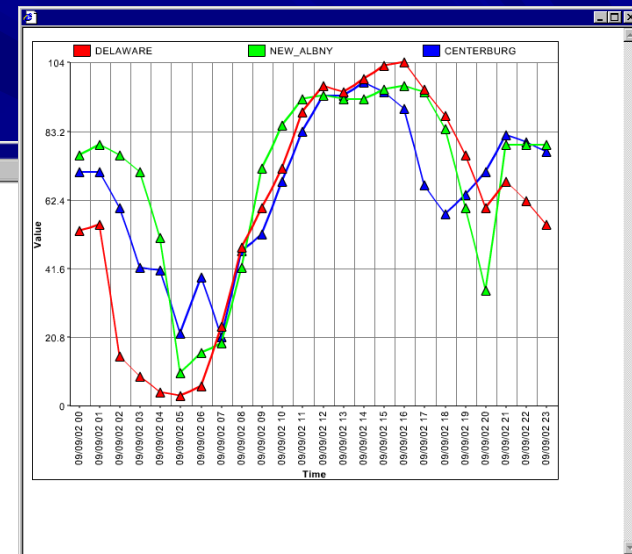
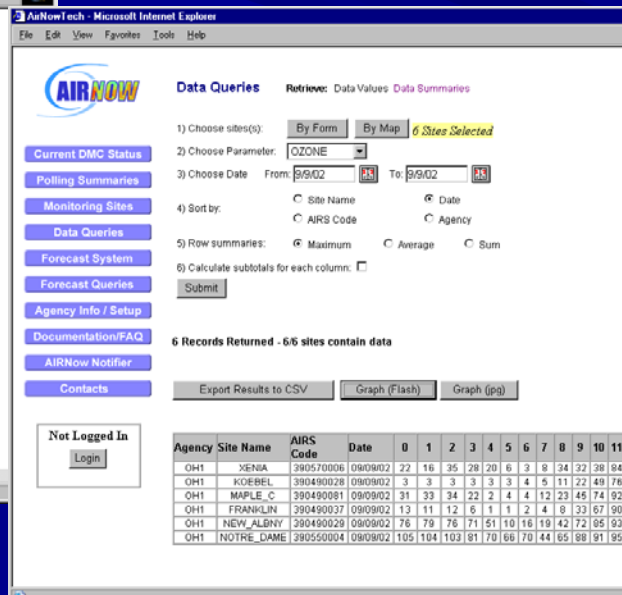
<b>2002 Green Gauge Reports by RoperASW</b>	<b>“Yes” Response</b>
<b>Have you ever heard of ozone action days or code orange / code red air quality days?</b>	<b>52%</b>
<b>Have ozone action days or code orange / code red air quality days ever caused you to change your daily activities by reducing amount of air pollution (e.g., car pooling, driving less)?</b>	<b>37%</b>
<b>Have ozone action days or code orange / code red air quality days ever caused you to change your daily activities by reducing exposure to air pollution (e.g., modifying outdoor exercise / work habits)?</b>	<b>46%</b>

# 2002 – Where are we?

- **We have near national coverage for real-time ozone mapping**
  - **There are other pollutants that need to be covered**
- **We have 273 cities forecasting next-day ozone AQI levels**
  - **There are other pollutants and non-urban areas that need to be covered**
- **We have successful outreach to the media and public on ozone health effects**
  - **There are serious health effects from other pollutants**
- **We have extremely successful ozone “action” day programs**
  - **We must keep these programs strong in spite of the resource challenges related to other pollutants**

# 2003 – AIRTomorrow AIRNow Tech

- Stakeholder access to the AIRNow database
- Data value, statistical, and polling status queries
- Time series graphs of data values and statistical query results
- Monitoring site information and QC criteria configuration
- Completion date of May 1, 2003



# 2003 - AIRTomorrow

- **Real-Time Reporting & Mapping of PM<sub>2.5</sub>**
  - Increasing scientific evidence pointing to PM<sub>2.5</sub> as a serious health concern
  - Over 230 continuous PM<sub>2.5</sub> monitors reporting data to AIRNow DMC
  - Various mapping approaches being developed, analyzed and implemented
  - Air quality (esp. PM<sub>2.5</sub>) is a year-round problem
  - Target: Maps for the public by October 1, 2003

# 2003 - AIRTomorrow

- **AQI Forecasting for PM<sub>2.5</sub>**
  - Provides year-round coverage, health protection
  - EPA pilot effort focusing on 36 major cities across the U.S.
  - Over \$500K allocated to develop PM<sub>2.5</sub> forecast tools for State and Local Agencies
  - Many Agencies already forecasting for PM<sub>2.5</sub>
  - Target: PM<sub>2.5</sub> forecasts for the public for all 36 cities by October 1, 2003

# **2003 - AIRTomorrow**

## **■ AQI Forecasting Model**

- Provides national coverage for both urban and rural areas**
- Provides another quantitative tool for use by experienced and inexperienced forecasters**
- NOAA and EPA partnership under way to develop numerical air quality forecast model**
- Brings premier forecasting agency in the world together with EPA to provide better forecasting tool for State and Local agencies**
- Target: Testing and Evaluation to begin summer 2003**

# **2003 - AIRTomorrow**

## **■ AQI Outreach for PM<sub>2.5</sub>**

- Provides year-round coverage of AQI**
- Provides year-round health awareness & protection**
- Provides new and useful information for State and Local agencies as well as the media**
- Enhances existing partnerships with media partners and broadcast meteorologists**
- Target: National Year-Round AQI Kick-Off in Fall 2003**

# 2003 - AIR Tomorrow

## ■ Ozone Outreach Programs

- Key to success of air quality programs – Public Awareness
- Ozone is still a significant air quality concern
- Not all areas have a PM<sub>2.5</sub> problem
- For those that do have both pollutants... how do we incorporate new information without degrading existing successful ozone program?
- Target: Build stronger ozone programs through collaboration with partners and other agencies... ongoing



# 2003 - AIRTomorrow

## ■ Resources

- AIRNow is a voluntary program
- Resources are limited... but
- There are opportunities
  - EPA NEIEN Grants (\$25M in FY-03)
  - New initiatives for monitoring network (?)
  - Cost savings through automation (monitor to system)
- Target: Explore use of NEIEN grant in FY-03, seek out other funding initiatives, look for automation savings, build upon success to seek funding.

# **AIRTomorrow**

**“Look at a day when you are supremely satisfied at the end. It's not a day when you lounge around doing nothing; it's when you've had everything to do, and you've done it.”**

**-- Margaret Thatcher**

# **AIRTomorrow**

**“Someone doing it often interrupts the person saying it cannot be done.”**

**---Anon**