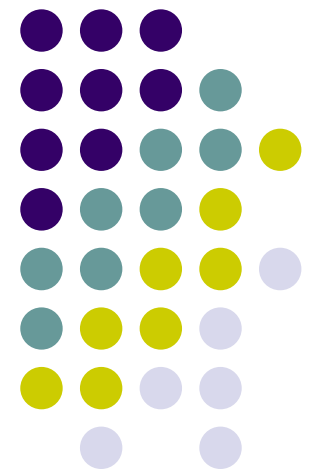


# Public Health Air Surveillance Evaluation (PHASE)

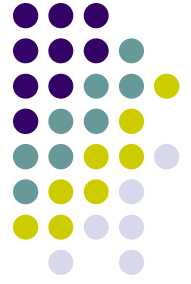
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Presentation  
for State/local/Region  
Air Monitoring & Analysts

May 2004

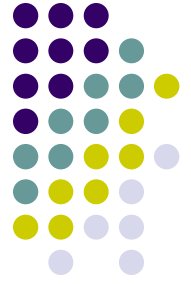


# Goals



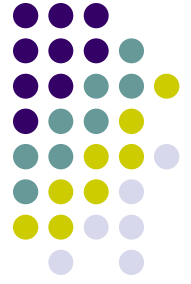
- Collaboration among EPA, CDC and State partners to link air quality data to health data
- Provide estimates of air pollutant concentrations in unmonitored locations (i.e., improve temporal and spatial resolution)
  - Improves methods for determining exposure concentrations to target population
  - Helps OAQPS characterize trends, review designations, review risk assessments, estimate benefits, and assess control strategies in unmonitored locations (OAQPS collaboration)
- Positive benefits
  - Integrates across federal monitoring programs to increase power of the data collected
  - Making air quality data available to larger community
  - Potential to demonstrate EPA's programs are improving public health by linking environmental data to health outcomes

# Environmental Public Health Tracking is...



- The *ongoing* collection, integration, analysis, and interpretation of data about the following 3 disciplines (PEW commission):
  - Human health effects
  - Exposure to environmental hazards
  - Environmental hazards
- Enriched Public Health Surveillance
- It includes dissemination of information.

# Uses of Integrated Environmental & Health Data



- Compare Trends
  - Change in Hazards & Health Effects Over Time (i.e., nationwide decline in children's blood lead levels after phase out of leaded gasoline)
- Identify Patterns – identify target populations
  - Geographical Distribution (i.e., unusually high number of cardiovascular events near areas of high PM concentrations)
- Potential predictive capabilities to inform and influence behaviors and responses
- Event tracking (such as 9/11)
- Hypothesis generation to guide health studies



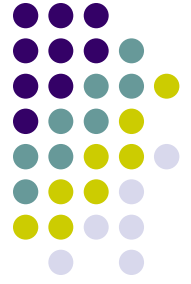
# Background

- Several congressional initiatives, and notable reports by the Pew Commission said EPHT Network is needed to link the 3 disciplines
- CDC and ATSDR develop a “Proposed Plan for (national) Environmental Public Health Tracking Network”
- EPA looked to as a primary data provider
- States - CDC appropriations (3 yr grant cycles):
  - \$17.5 mil in first year (2002) - 17 states received EPHT ‘readiness’ grants
  - \$28.5 mil in second year (2003) - 10 additional states grant agreements
  - ‘Implementation’ grants will be focus of next 3 yr cycle
- EPA - MOU between EPA (OEI) & CDC signed in 2003
- Academic Centers of Excellence established (Tulane, Cal-Berkley, John Hopkins)



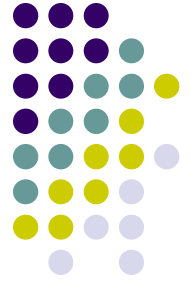
# Project Partners

- EPA-CDC (National Center for Environmental Health) Team for EPHT
  - OEI and ORD are EPA Leads (Bill Sonntag, Hal Zenick, Tim Watkins)
- October 2003 MOU Team Meeting
  - Air Quality Project proposed as pilot
- State Partners – CDC grantees, public health agencies (WI, NY, ME)
- Initial EMAD/ORD activities included:
  - Established a ORD-OAQPS spatial prediction team
  - Initiated analysis of available satellite data
  - Issued a work assignment to obtain support for developing statistical software for combining data



# AQC Project Steps

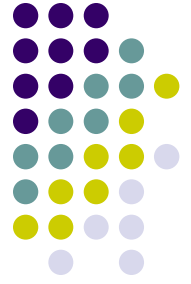
- Define health outcomes of interest for project focus (e.g., asthma, cardiovascular, birth defects) - (CDC & states)
- Determine candidate air quality characterization methods (e.g., monitor, modeling, satellite, interpolations) - (EPA)
- Define basic data linkages desired between the health and air quality data sets (e.g., county vs census tract and investigate relationships) – (All)



# AQC Methods/Tools

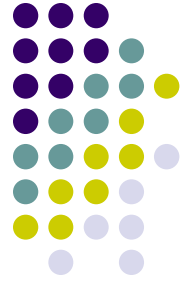
- Ambient Air Monitoring
  - Monitoring only
  - Spatial interpolation using available monitoring data
    - kriging
    - IDW (inverse distance weighting)
    - hierarchical bayesian approach for combining approaches
- Air Quality Modeling (CMAQ)
  - air quality (ozone, PM2.5 and component species)
  - emissions
  - meteorology
- Satellite data
- Use statistical techniques to “combine” data from various sources





# Ambient Air Monitoring

- Intended application dictates what is “usable” or needed
  - Example: sampling frequency
    - Public Information - continuous real-time
    - NAAQS attainment - 1 in 3 or 6 day sampling
    - Health Studies - depends upon study objective
- Research versus Surveillance
  - Data to support research can be more complex and does not necessarily need to be routinely available
  - Data to support surveillance needs to be routinely available and, in general, less complex
- Data access is also an issue
  - How is the data stored and disseminated?
  - Air Quality System (AQS)



# Air Quality Modeling

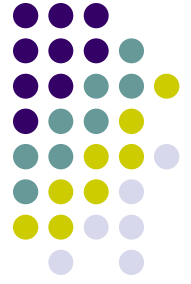
- Traditionally used to develop and evaluate alternative control strategies
  - Results not routinely available
  - 2001 results should be available this summer
- Emerging **Air Quality Forecasting** applications will generate routinely available data
  - EPA/NOAA MOU
  - Predicted air quality concentrations available on a daily basis
    - Progression
      - Ozone in the Northeast US starting in 2004
      - Nationwide Ozone
      - Nationwide PM2.5
      - Other pollutants



# Satellite Data

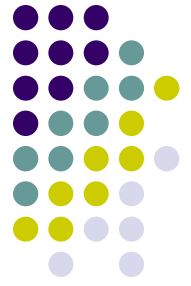
- EPA is working with NASA to develop air quality applications for satellite data
  - PM2.5 (almost ready)
  - Ozone (later)
- Routinely available data
- Establishing relationships to ground level measurements to develop more complete spatial distributions

# Initial AQC Targets for Data Linkage

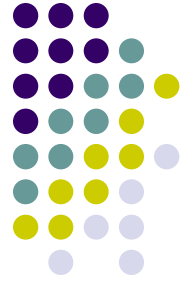


- Pollutants (toxics later)
  - Ozone
  - PM2.5
- Temporal
  - 2001
  - Daily PM2.5, Max 8 hr ozone
  - Real time (2004 forecast)
- Spatial
  - County
  - 36 km grid Continental U.S. and 12 km NE

# EPA Team Draft Action Plan



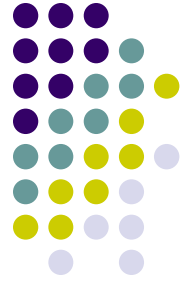
- Evaluate characterization methods & data
  - Ambient monitoring alone (EMAD Team)
  - Spatial interpolation using available monitoring data (EMAD & ORD/NERL)
  - Air Quality Modeling – emissions, meteorology, and predictions (EMAD, ORD/NERL)
  - Satellite data (ORD/NERL, NOAA, NASA)
- Develop protocol for comparing methods & data outcomes (i.e., linkage to health outcomes)
  - Limitations/ best utility in methods and data
- Apply methods for each study area (WI, NY, ME) & generate air quality data sets for comparison
- Use protocol to determine best methods



# EMAD Team Activities

- To Date, includes:
  - Several team meetings with ORD/NERL, Mar – now
  - Attended CDC-EPA-State project kick-off meeting, RTP, Mar 11-12
  - Attended CDC's EPHT Conference, in Philadelphia, Mar 24-26
    - co-sponsored poster session with EPA/ ORD
    - provided peer input to ORD plenary presentation
    - session presentation on air quality characterization data
  - Developed matrix tool and criteria for methods evaluation
  - Assigned team members to evaluate specific methods
  - Prepared draft EPA Action Plan
  - Conference call with EPHT Project Team, Apr 16, (exchange info across teams & focus project protocol)

# Preliminary Schedule



- **May 2004:** Revise & finalize EPA Action Plan
  - Agree on milestone dates & deliverables / & by whom
  - Determine resources – available / needed
  - Attend meeting of EPHT Project Team in NYC to present respective team action plans and confirm confluence of intended deliverables & joint activity schedules
- **July 2004:** Apply and evaluate air quality characterization methods for study areas
- **August 2004:** Provide State partners with alternative measures to characterize environmental exposures (Monitoring, Modeling, Satellite, and Statistical interpolations)
- **September 2004:**
  - States link the alternative exposure metrics to available health surveillance data
  - Analyze results - Evaluate and compare the use of various exposure characterizations and health metrics