DATAS
Delaware Air Toxics Assessment Study

Division of Air and Waste

Air Quality Management

June 15, 2004

DATAS
Introduction

What is the study about?

- **A comprehensive 2003 Delaware-specific study to characterize the distribution of selected hazardous air pollutants (HAPs) statewide.**

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Introduction

The Project Goals

- Monitor toxic air pollutant concentrations
- Establish a Delaware-specific database of air toxics concentrations
- Be a resource to emissions inventory
- Provide a tool to assist with the permit granting process

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Introduction
The Project Goals (Continued)

- **Provide technical information to support the development of control strategies for reducing air toxic impacts at the communities of interest**

- **Estimate risk to affected communities based upon ambient air toxic concentrations**

DATAS Approach

Fundamental Steps

- Develop a 2003 ambient air toxics monitoring database
- Develop 2002 baseline air toxics inventory for Delaware
- Project the 2002 inventory to 2003

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Approach
Fundamental Steps (Continued)

- Conduct regional- / local-scale modeling to predict air toxic concentrations
- Perform a risk characterization for state/local communities
- Perform a marketing campaign for the project that is responsive to communities within Delaware

DATAS
Activities

The Major Five

- Monitoring
- Emissions Inventory Development
- Modeling
- Risk Assessment
- Outreach

DATAS
Activities

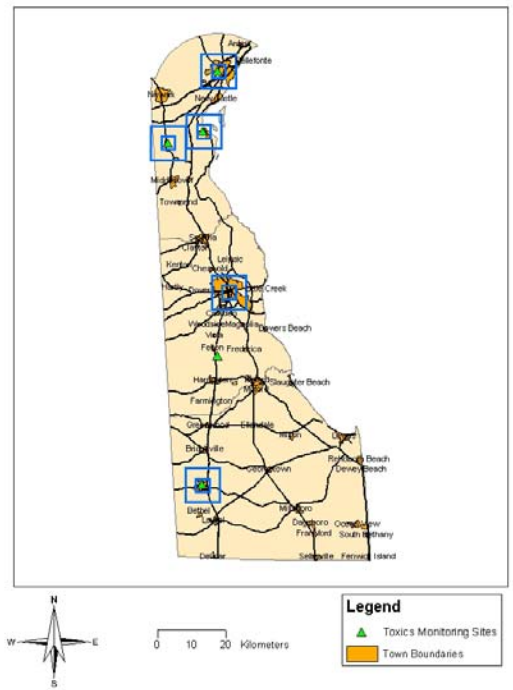
Monitoring

- **Following classes of Hazardous Air Pollutants (HAPs) measured at 5 stationary monitoring stations:**
  - Volatile Organic Compounds (VOC)
  - Dioxin/Furans (D/F)
  - Metals
  - Carbonyls
  - Polycyclic Aromatic Hydrocarbons (PAH)

DATAS Activities

Monitoring (Continued)

- Martin Luther King
- Summit Bridge
- Delaware City
- Felton
- Seaford



DATAS Activities

Monitoring (Continued)

- Summit Bridge Station - Lums Pond State Park

DATAS Activities

Monitoring (Continued)

- VOC Sampler

DATAS Activities

Monitoring (Continued)

- D/F and PAH Sampler

DATAS Activities

Monitoring (Continued)

- **Carbonyl Sampler**

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Activities
Monitoring (Continued)

- Monitoring began January 2003 and continued through December 2003
- Sampling frequency - every 6th day (Dioxin – 12 day composite sample)
- Samples were collected on media (filter, canister, foam) and sent to off-site laboratories for analysis.

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Activities
Emissions Inventory Development

- 2002 Baseline Air Toxics Inventory
  - Delaware-specific
    - 2002 VOCs from 2002 PEI
    - 2002 PM Inventory
  - Neighboring States' VOC & PM Inventory
    - 2002 NEI
    - 2002 NTI

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Activities
Emissions Inventory Development (Continued)

- Diesel PM from MOBILE6 runs
- Speciation profiles to VOC and PM emissions
- Resolution
  - Seasonal/Monthly/Weekday and weekend

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Activities
Emissions Inventory Development (Continued)

- Develop 2003 Air Toxics Inventory
  - Project 2002 baseline VOC & PM Inventory to 2003 with growth and control
  - Speciation profiles for VOC and PM emissions
- Resolution
  - Seasonal/Monthly/Weekday and weekend (Same as in the baseline)

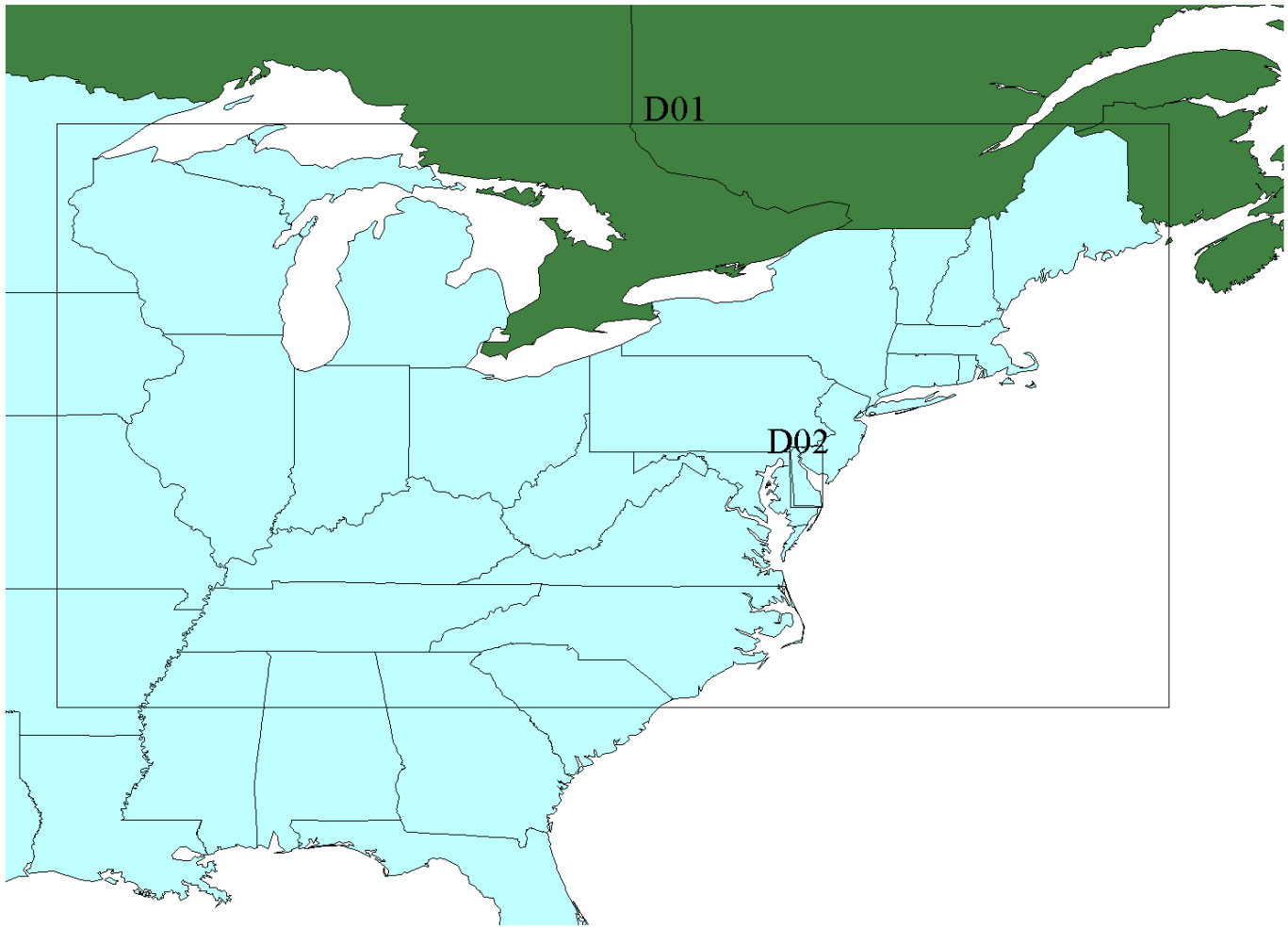
DATAS Activities

Modeling

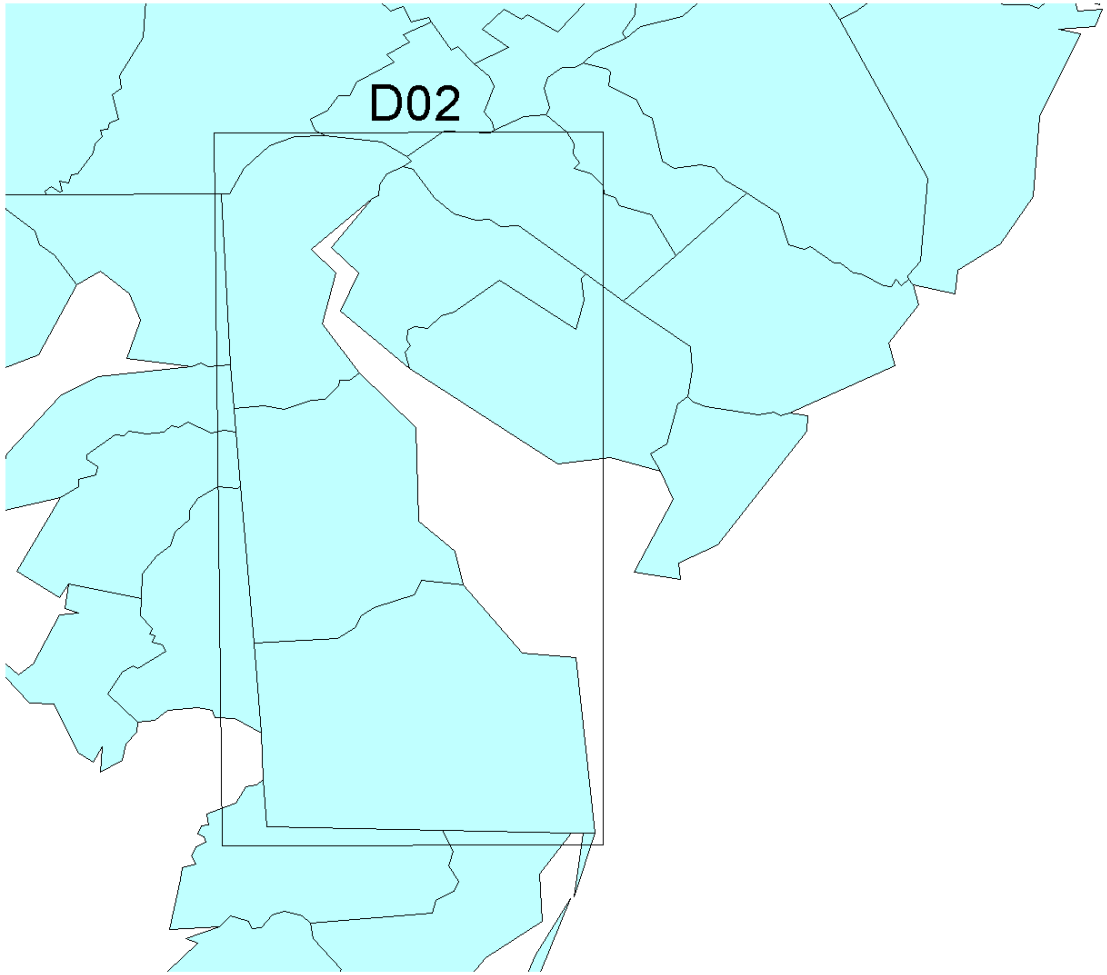
- Regional-scale Modeling (Model-3/CMAQ)
  - Addresses emissions from all sources (point, area, mobile, biogenic)
  - Estimates transport of pollutants from distant sources
  - Background concentrations

- Local-scale Modeling
  - For receptors located near emission sources
  - Gives detailed information on a local scale

Regional-Scale Modeling Domain



Inner Nested Modeling Domain



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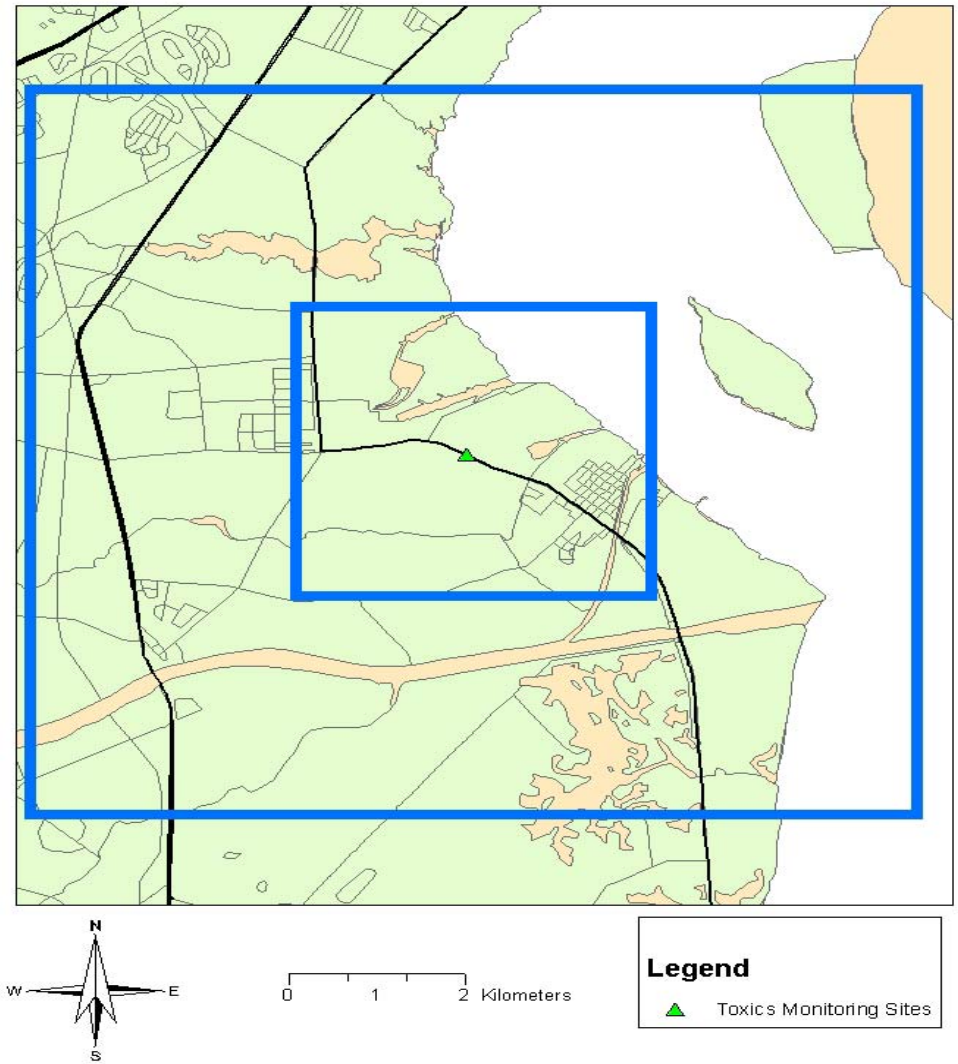
Activities

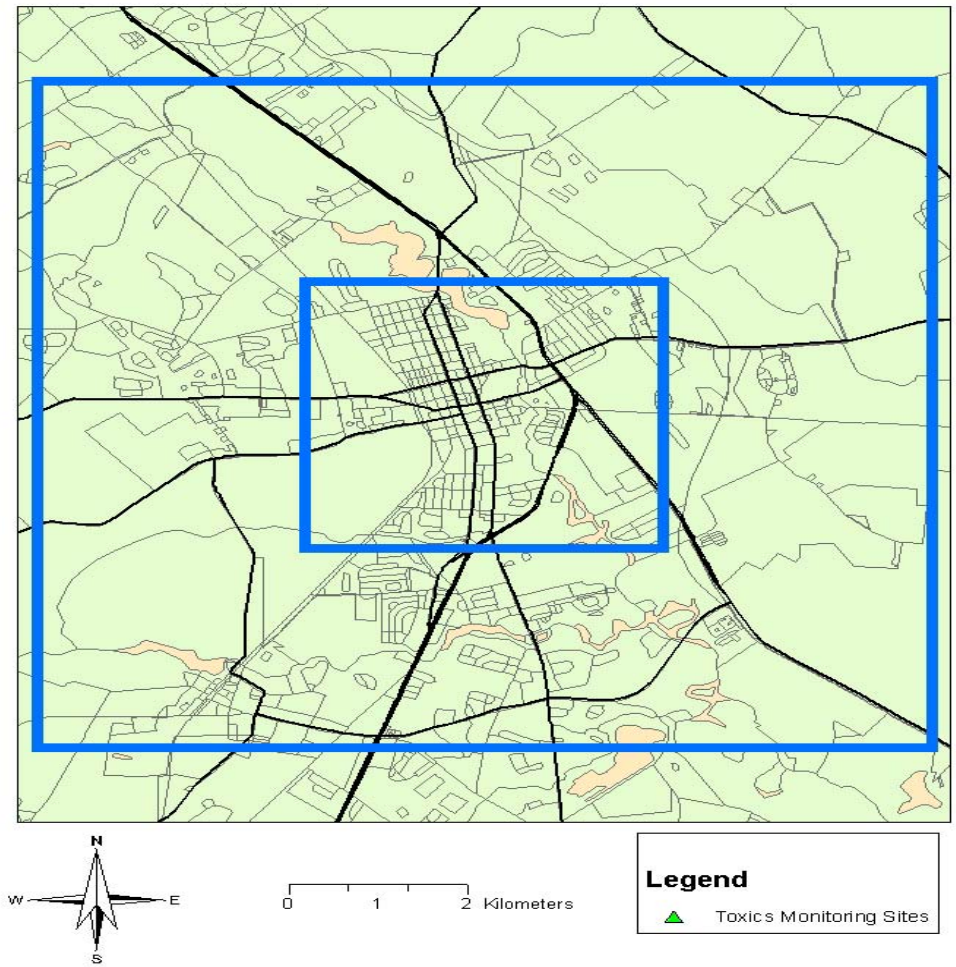
Modeling (Continued)

- HAPs recommended for modeling
  - All urban air toxics as in State Air Pollution Research Center (SAPRC99) Carbon Bond - IV
  - Other compounds as in SAPRC99 Carbon Bond – IV TOX (EPA)

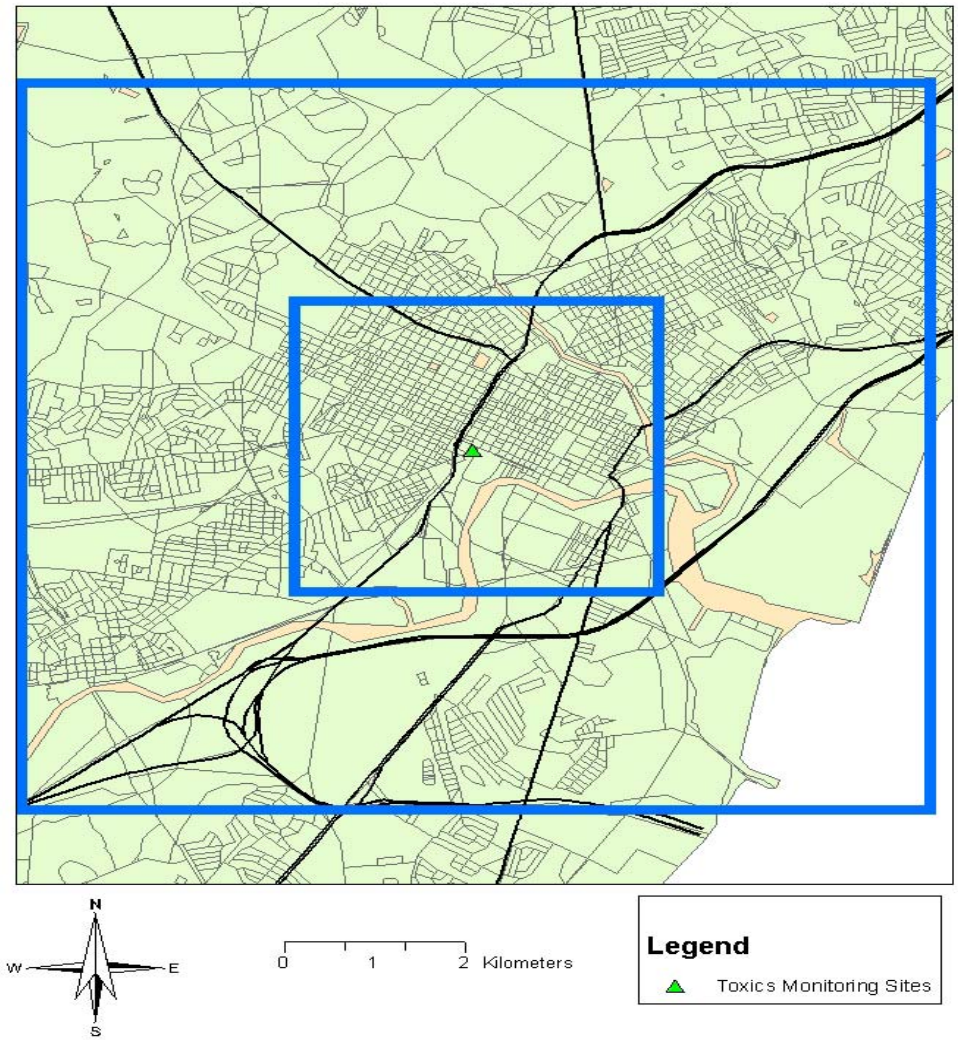
Local-Scale Modeling Domain– Delaware City



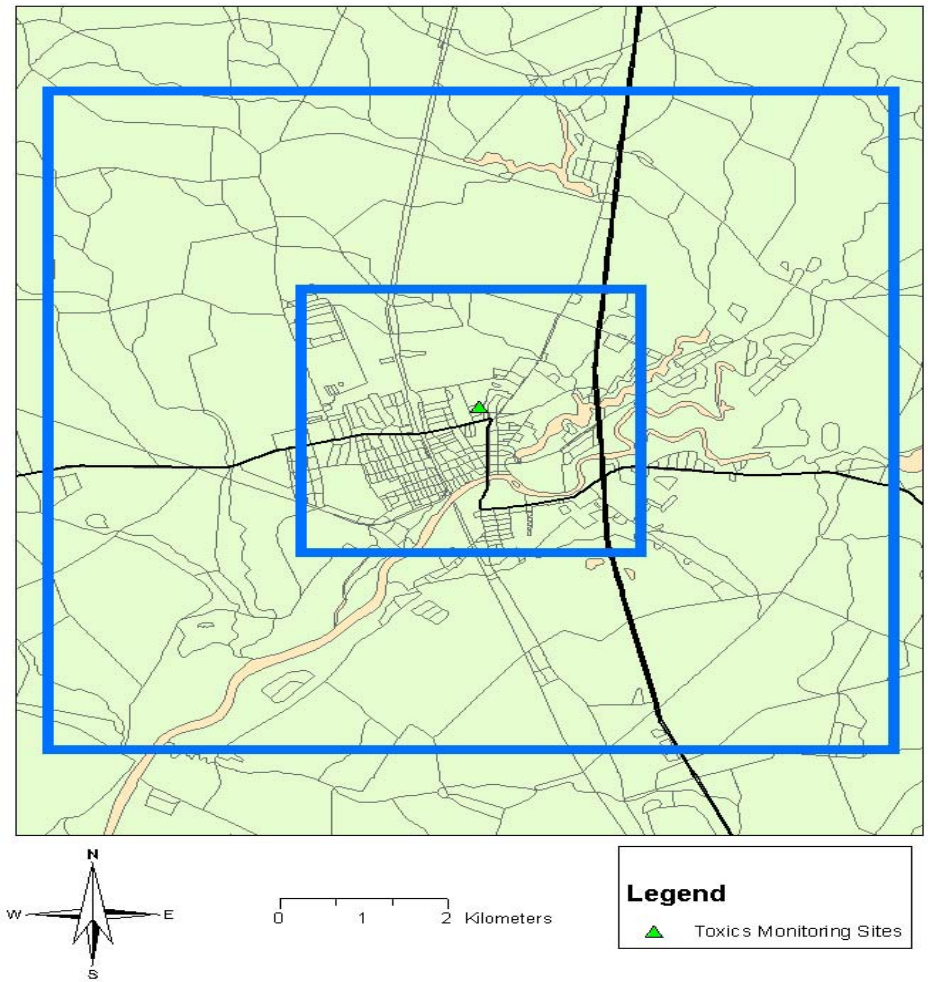
Local-Scale Modeling Domain– Dover Area



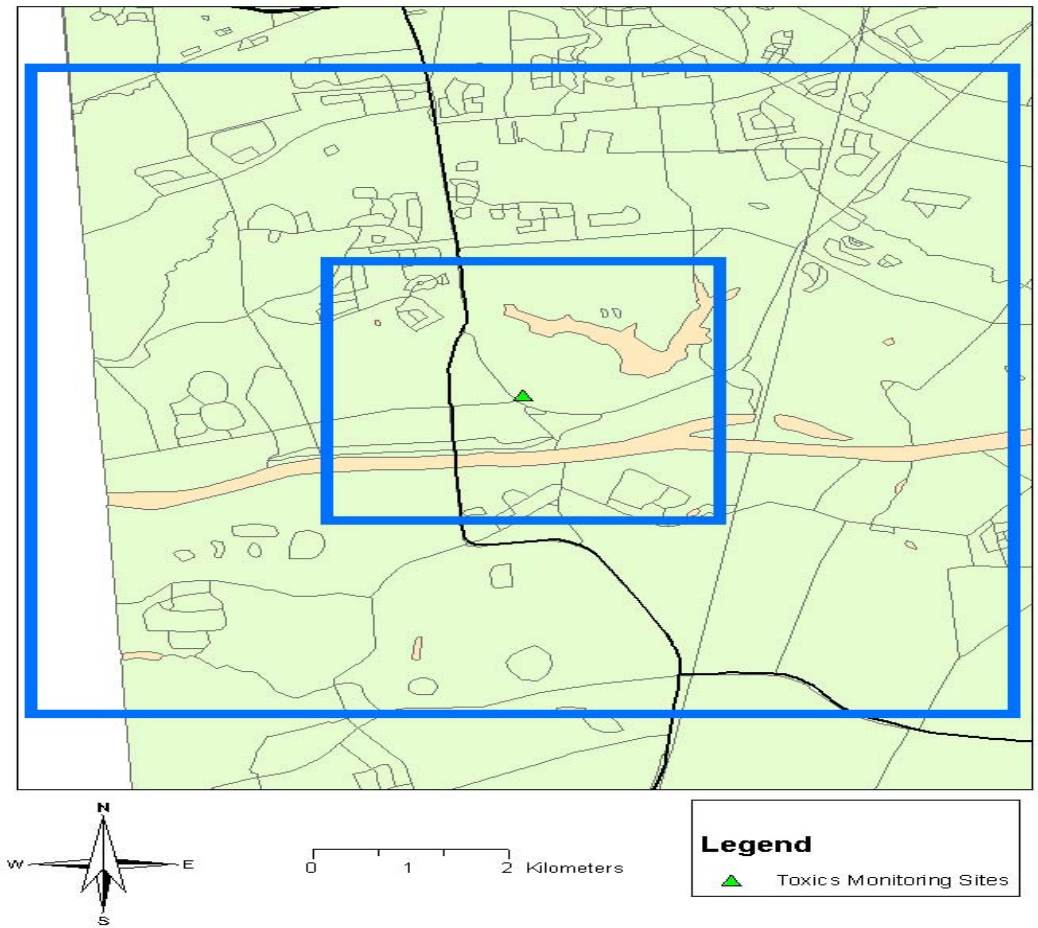
Local-Scale Modeling Domain– MLK Area



Local-Scale Modeling Domain– Seaford



Local-Scale Modeling Domain– Summit Bridge



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Activities

Risk Assessment

- Individual and cumulative carcinogenic and non-carcinogenic risk will be estimated
  - For selected ambient HAP compounds
  - From modeling at all the network receptors

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Activities
Risk Assessment (Continued)

- Risk Calculation Methodology
  - Identify Unit Risk Factors (URFs) for compounds selected for regional- / local-scale modeling
  - Concentration multiplied with unit risk factors – appropriate for comparing monitored data
  - Cumulative risk: addition of individual risk from selected compounds
- Analysis
  - Determine major pollutants contributing to cancer risk
  - Inter-site comparison of monitored and modeled risk
  - Species and source apportionment.

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Activities

Outreach

- Conduct community workshops in response to community concerns
- Develop and maintain a web page for the project
- Establish an e-mail address for the project:
  - DATAS@State.DE.US
- Represent the project at specified environmental functions (Coast Day)

Introducing the
Delaware Air Toxics Assessment Study (DATAS)
Modeling
Risk Assessment
DATAS
COMING TO A LOCATION NEAR YOU

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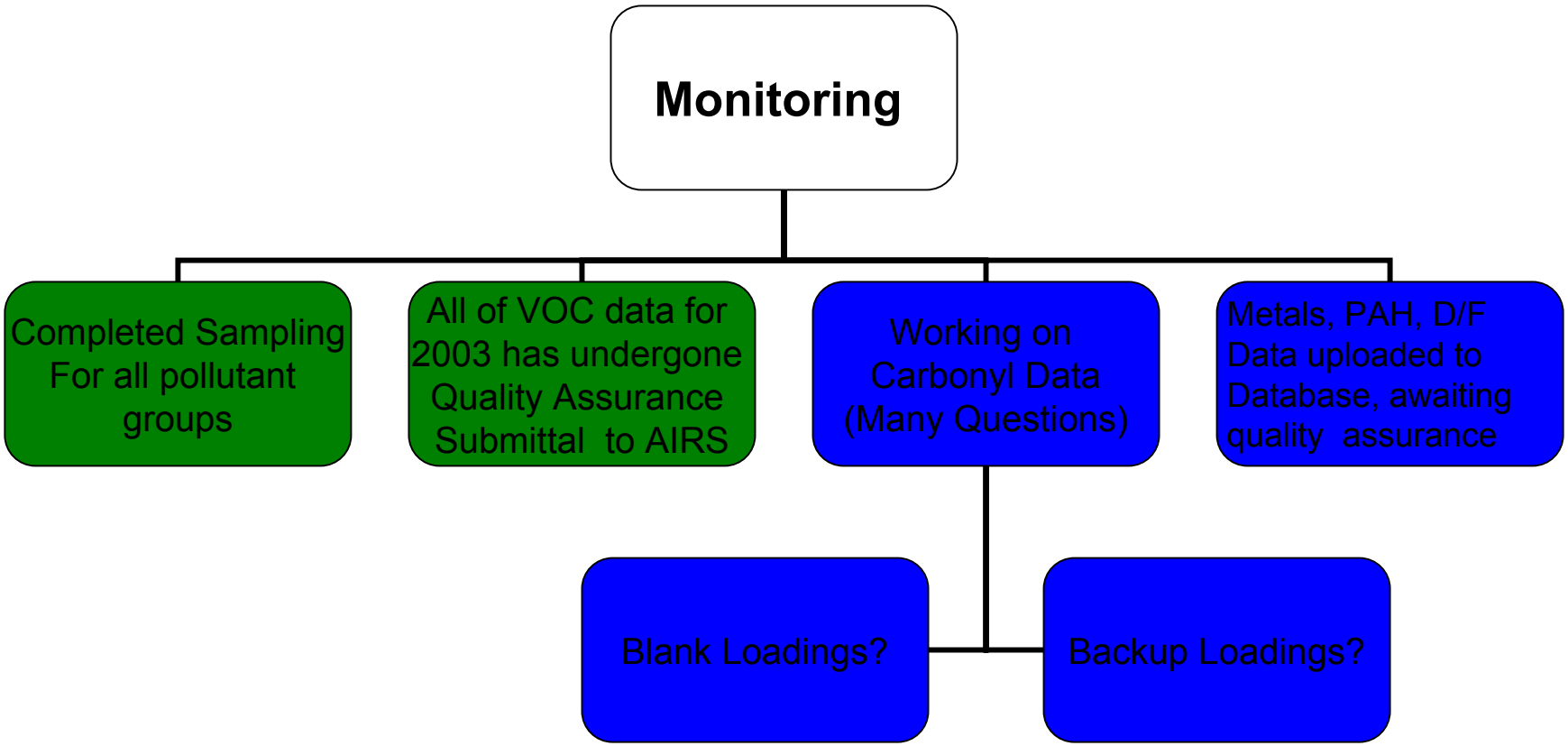
Progress to-date



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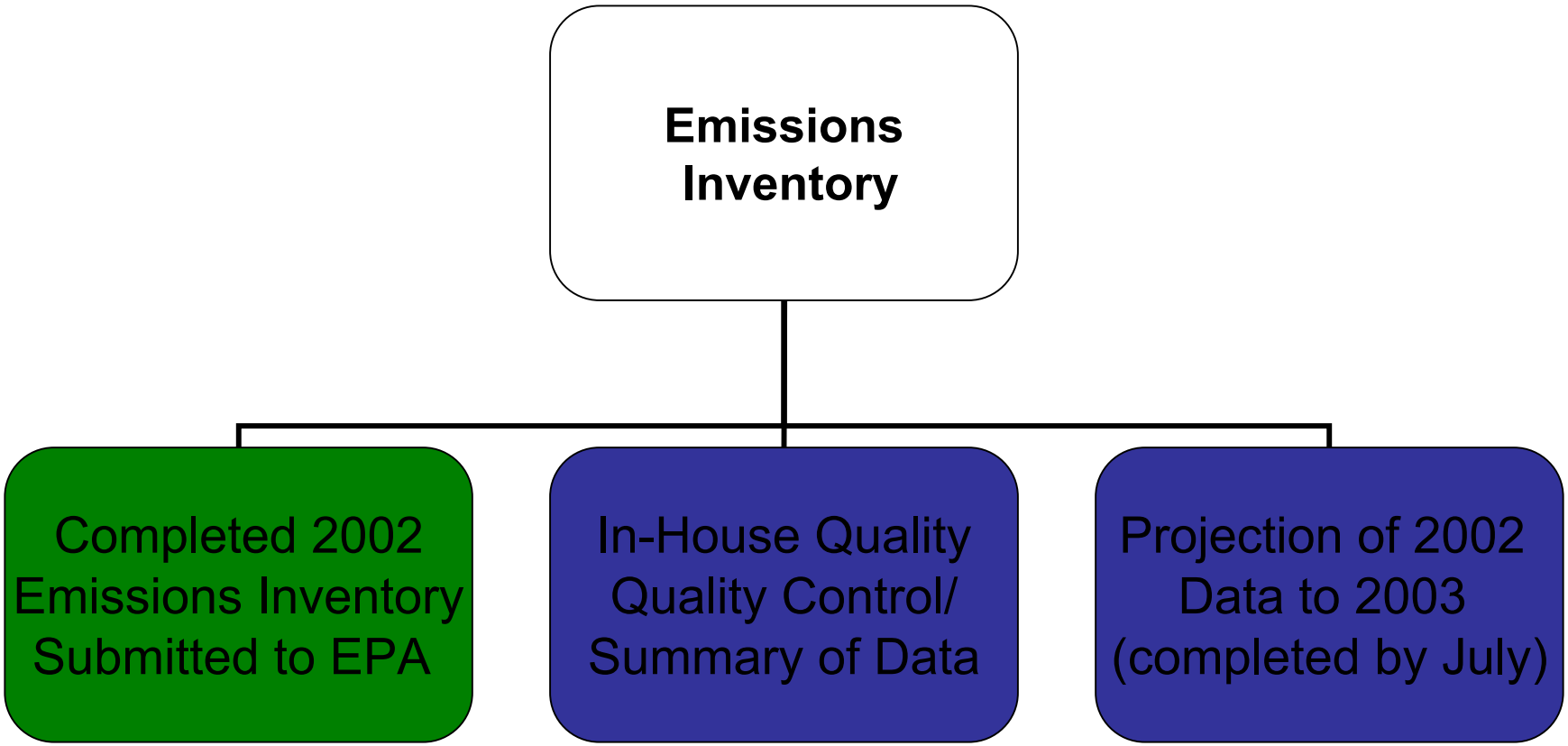
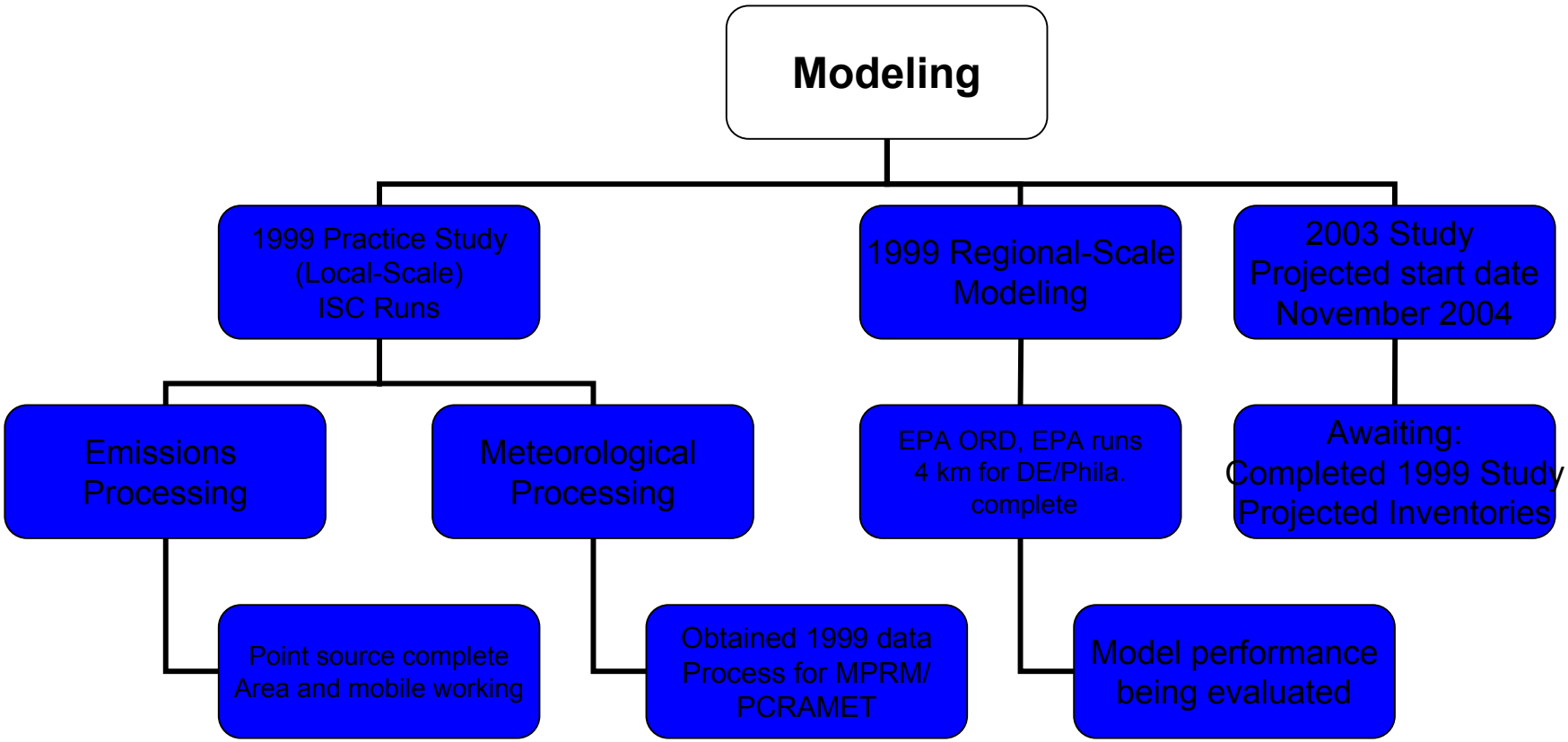
Progress to-date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Progress to-date