

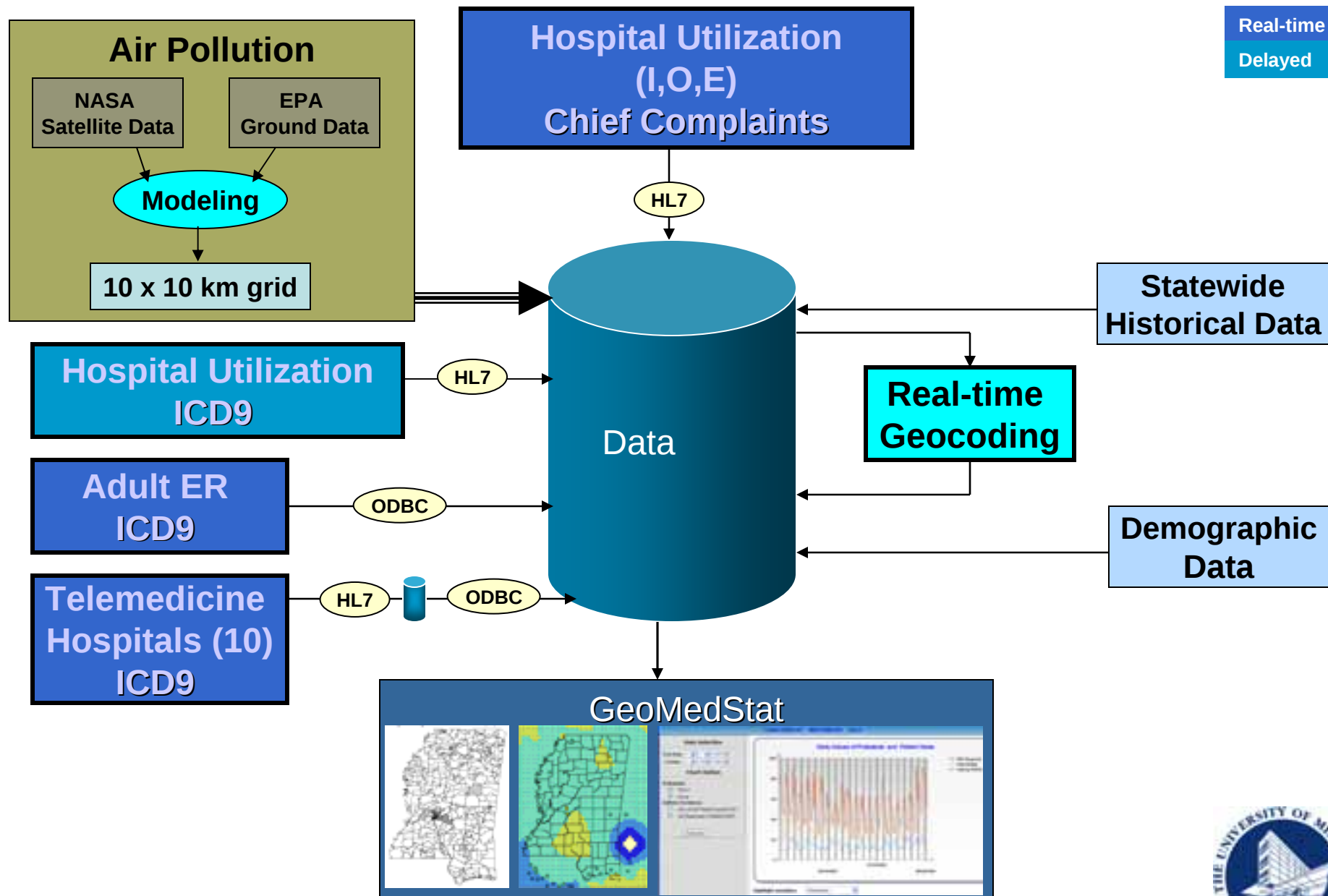
GeoMedStat: Real-time Clinical Data and Environmental Information Join to Provide Knowledge for Better Decision Making

**University of Mississippi Medical Center
Jackson, Mississippi**

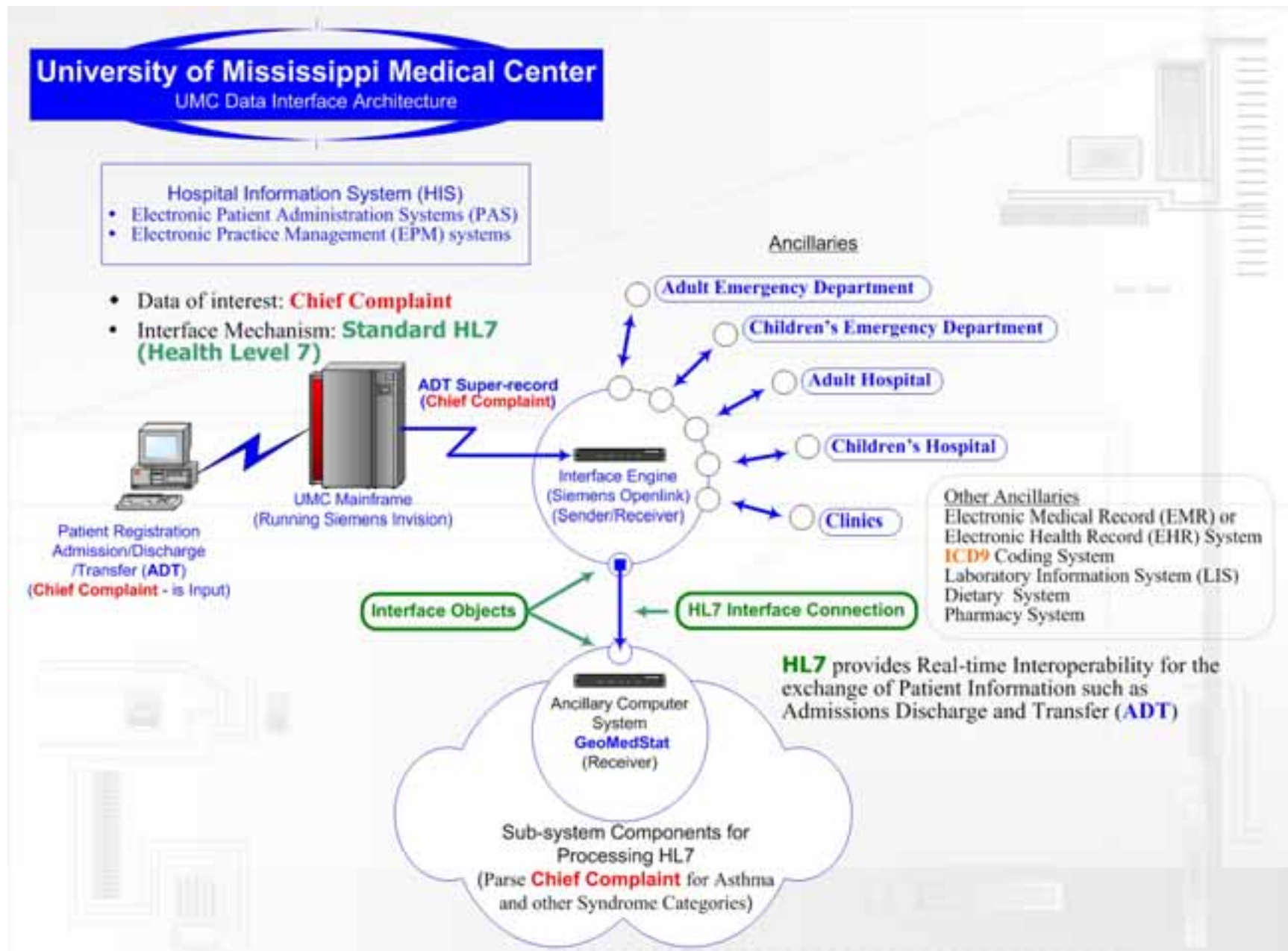
**ESRI Health GIS Conference
Scottsdale, Arizona
October 8, 2007**



Overview of GeoMedStat



UMMC Hospital Information System Overview



UMMC HL7 Listener Interface for GeoMedStat

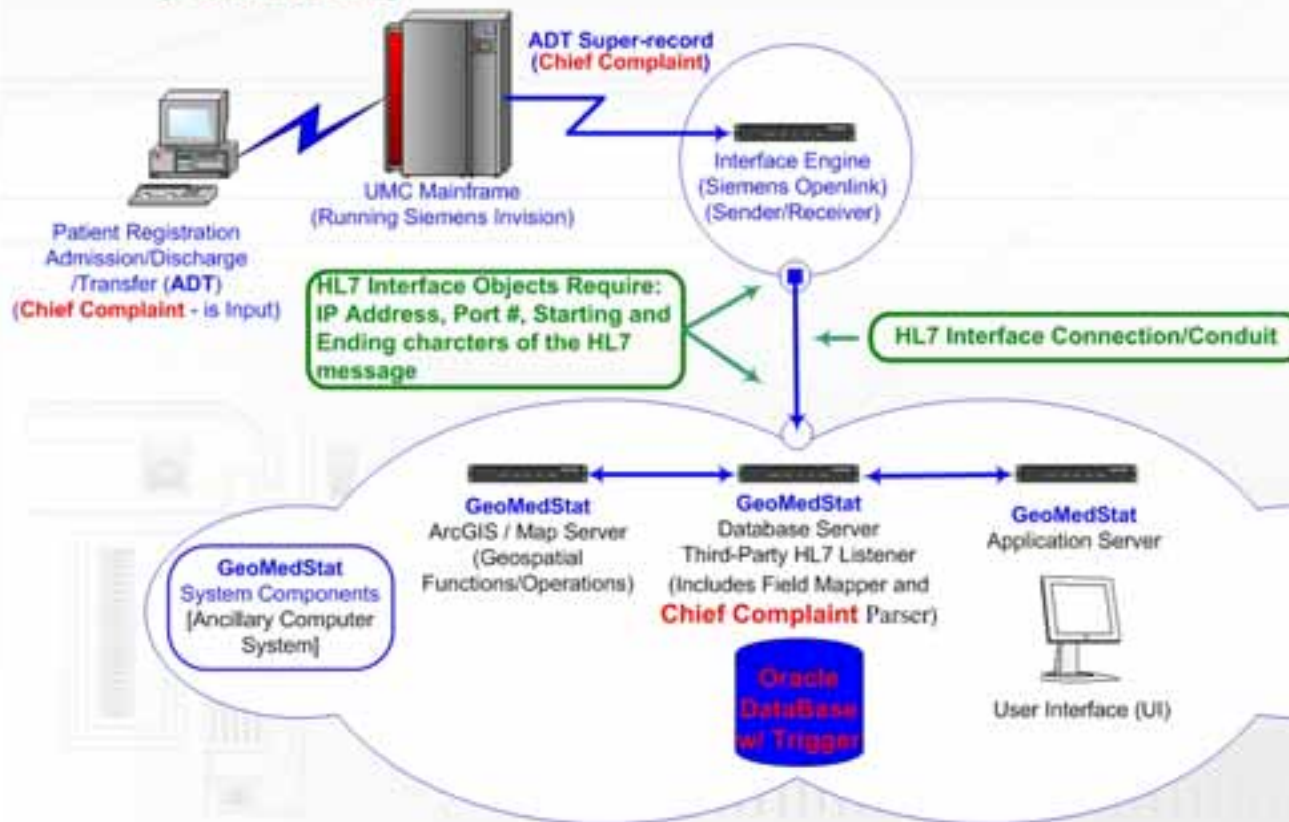
University of Mississippi Medical Center

UMC HL7 Interface to GeoMedStat

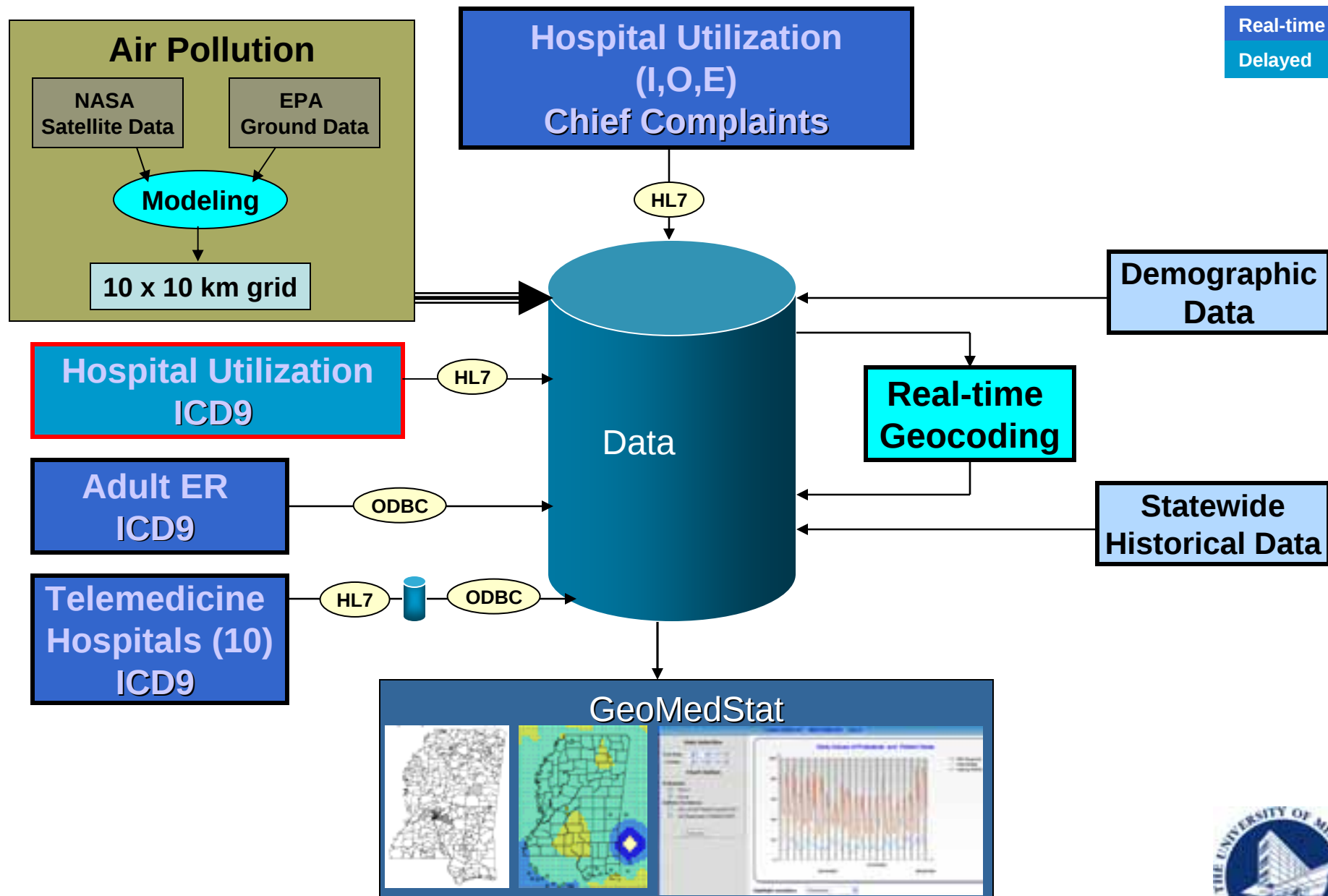
Hospital Information System (HIS)

- Electronic Patient Administration Systems (PAS)
- Electronic Practice Management (EPM) systems

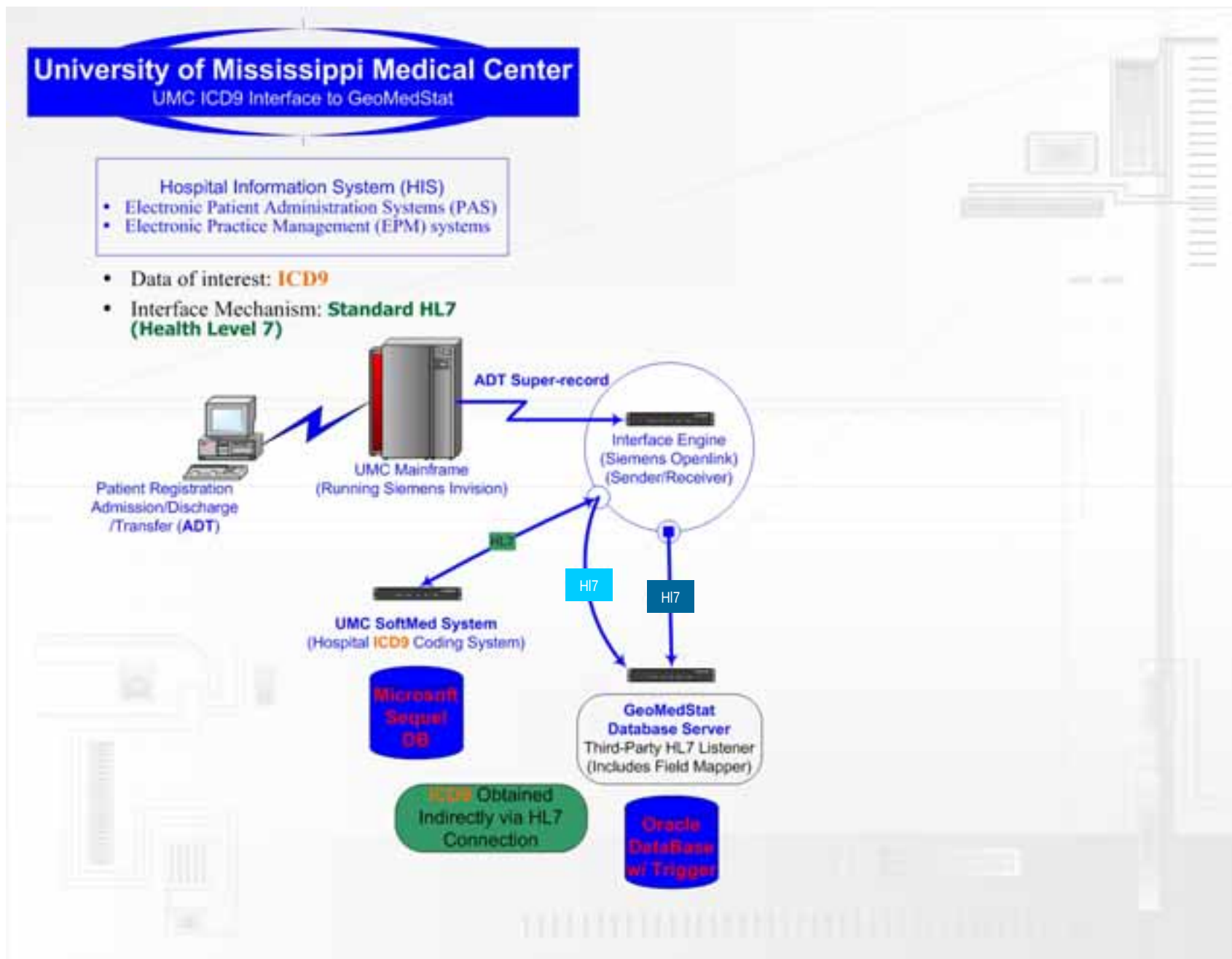
- Data of interest: **Chief Complaint**
- Interface Mechanism: **Standard HL7 (Health Level 7)**



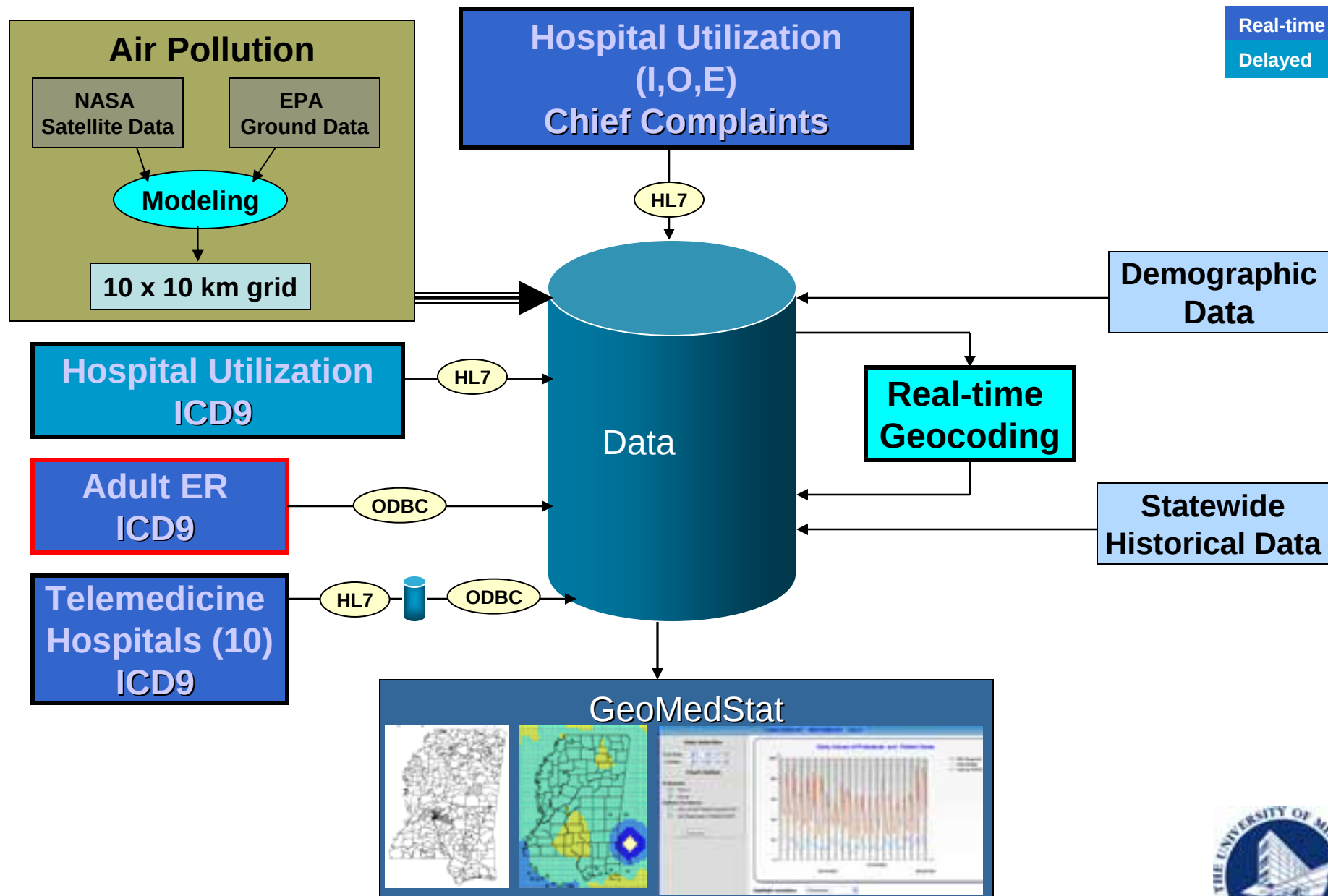
Overview of GeoMedStat



Hospital Utilization ICD9



Overview of GeoMedStat



Emergency Department At UMMC

Only Level One Trauma Center in the State

Pediatric ER

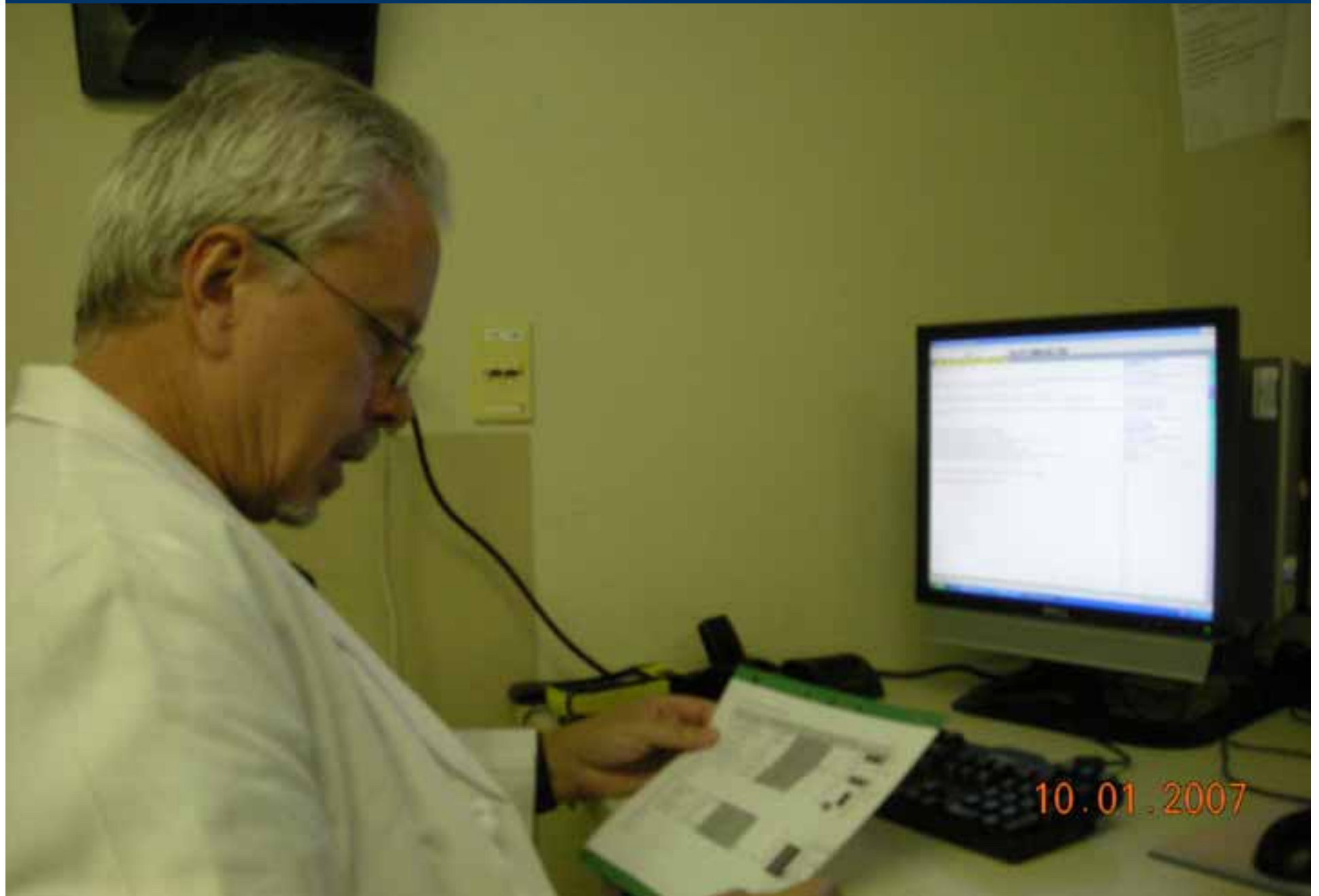
Adult ER



Adult ER



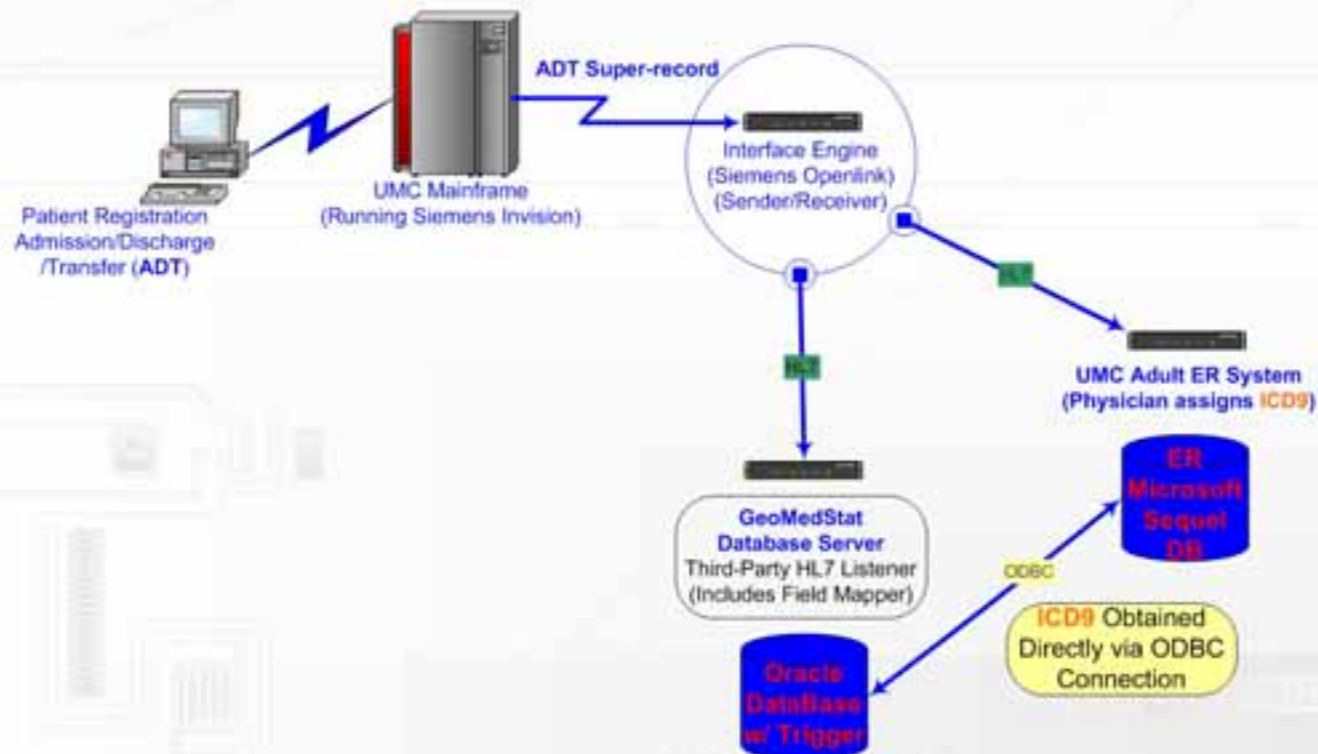
Emergency Department At UMMC



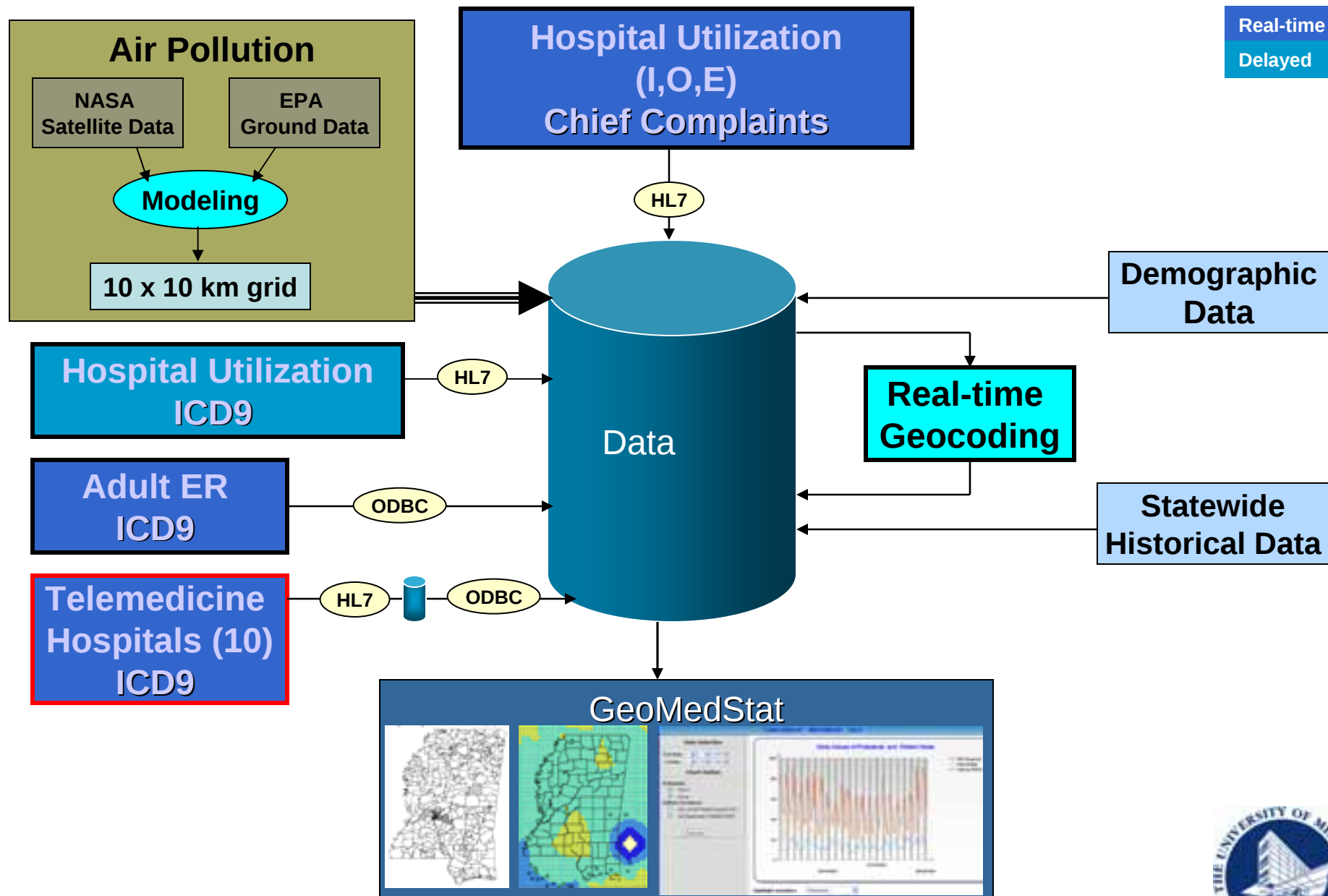
Adult ER

University of Mississippi Medical Center UMC ICD9 Interface to GeoMedStat

- Hospital Information System (HIS)
- Electronic Patient Administration Systems (PAS)
 - Electronic Practice Management (EPM) systems
- Data of interest: **ICD9**
- Interface Mechanism: **Standard HL7 (Health Level 7)** and **Microsoft ODBC**



Overview of GeoMedStat



ER Data from Telemedicine Hospitals with ICD9



PURPOSE

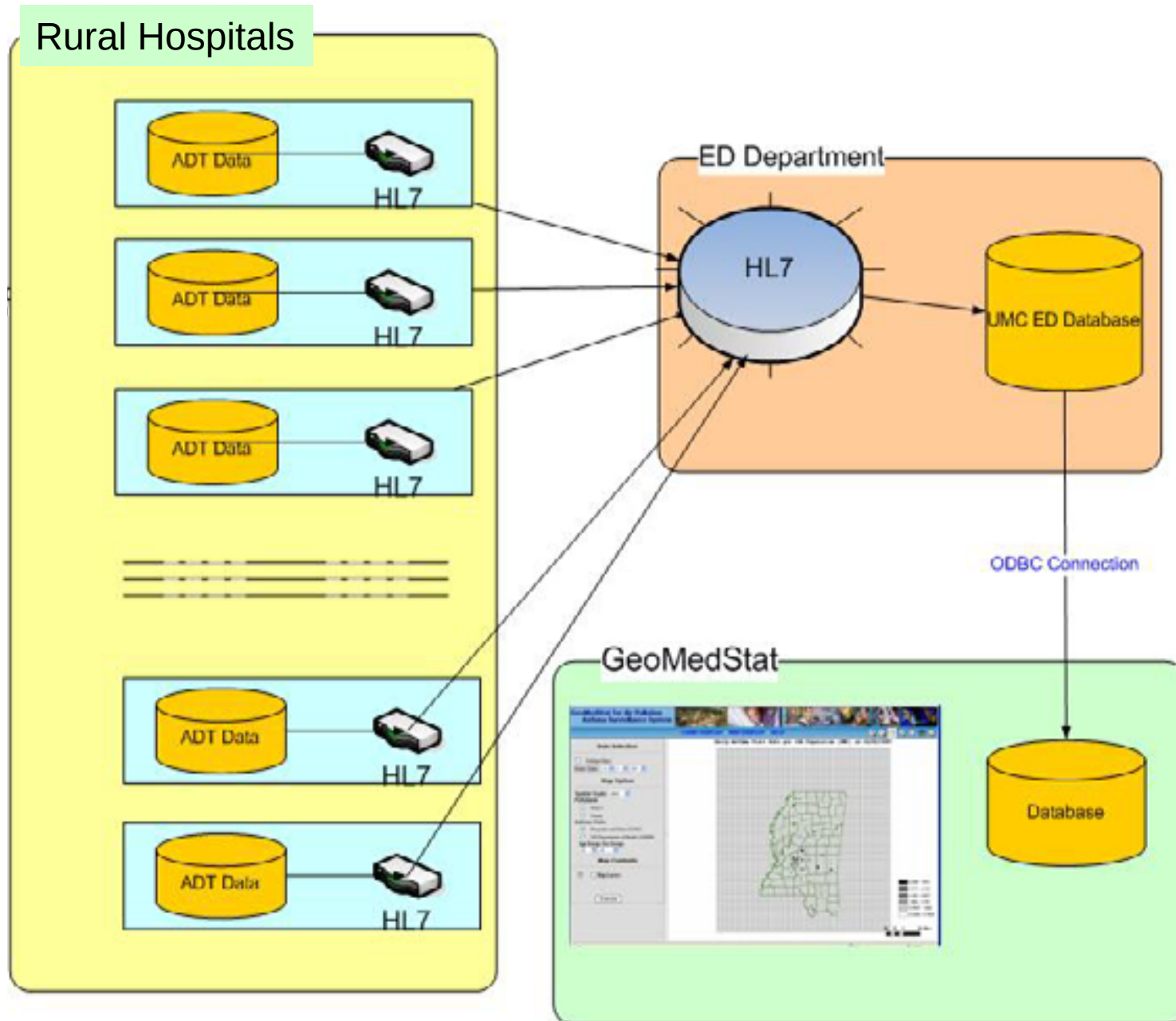
To provide improved emergency medical services and healthcare to the underserved areas of Mississippi via telemedicine technology.

OBJECTIVES

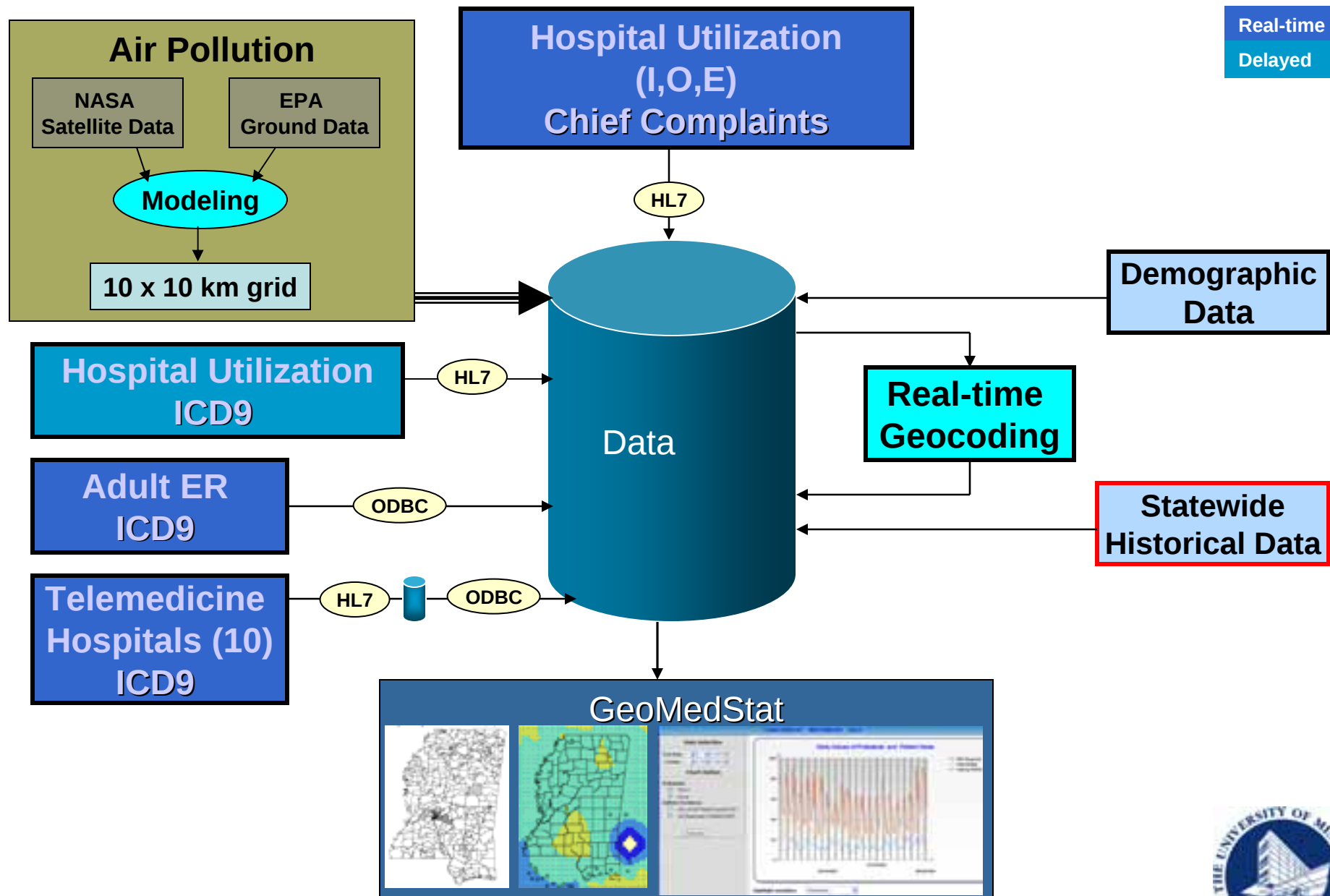
- Improve patient care
- Provide cost effective health care to the rural communities in Mississippi
- Utilize available technology via a telemedicine video link
- Provide a service to hospitals that will assist them in budget crisis while making the hospital viable
- Provide staff education via video link to UMC



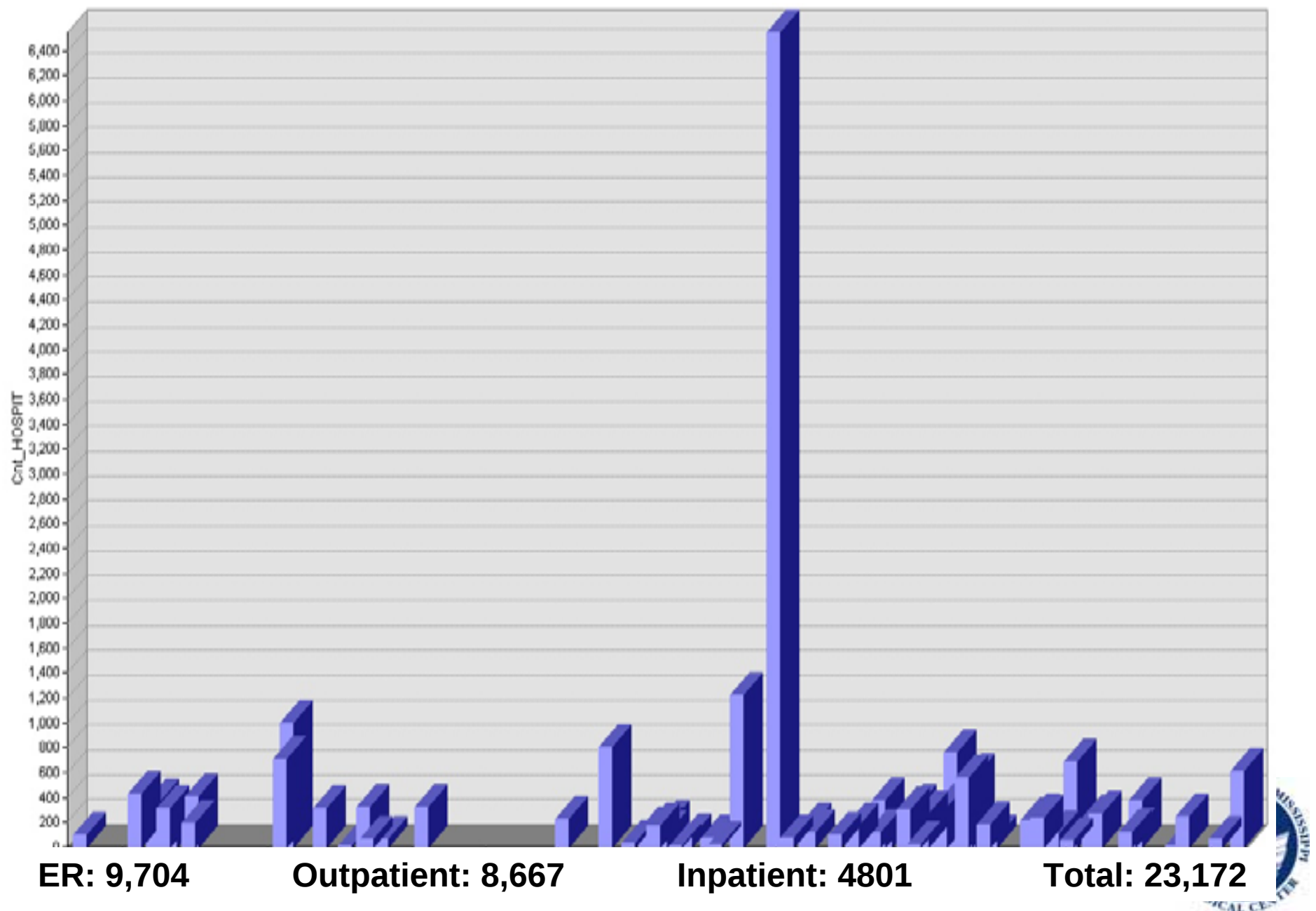
ER Data from Telemedicine Hospitals with ICD9

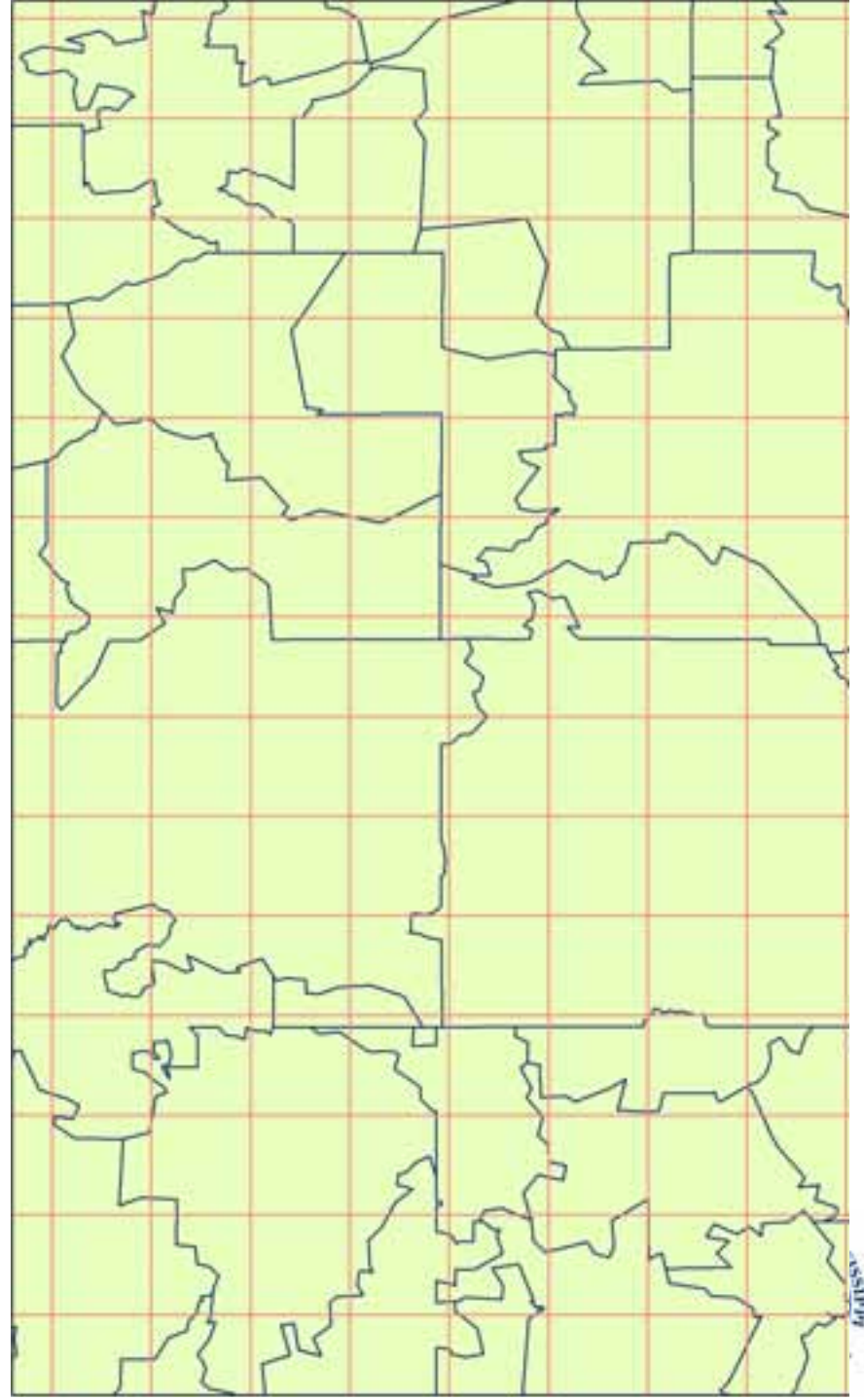
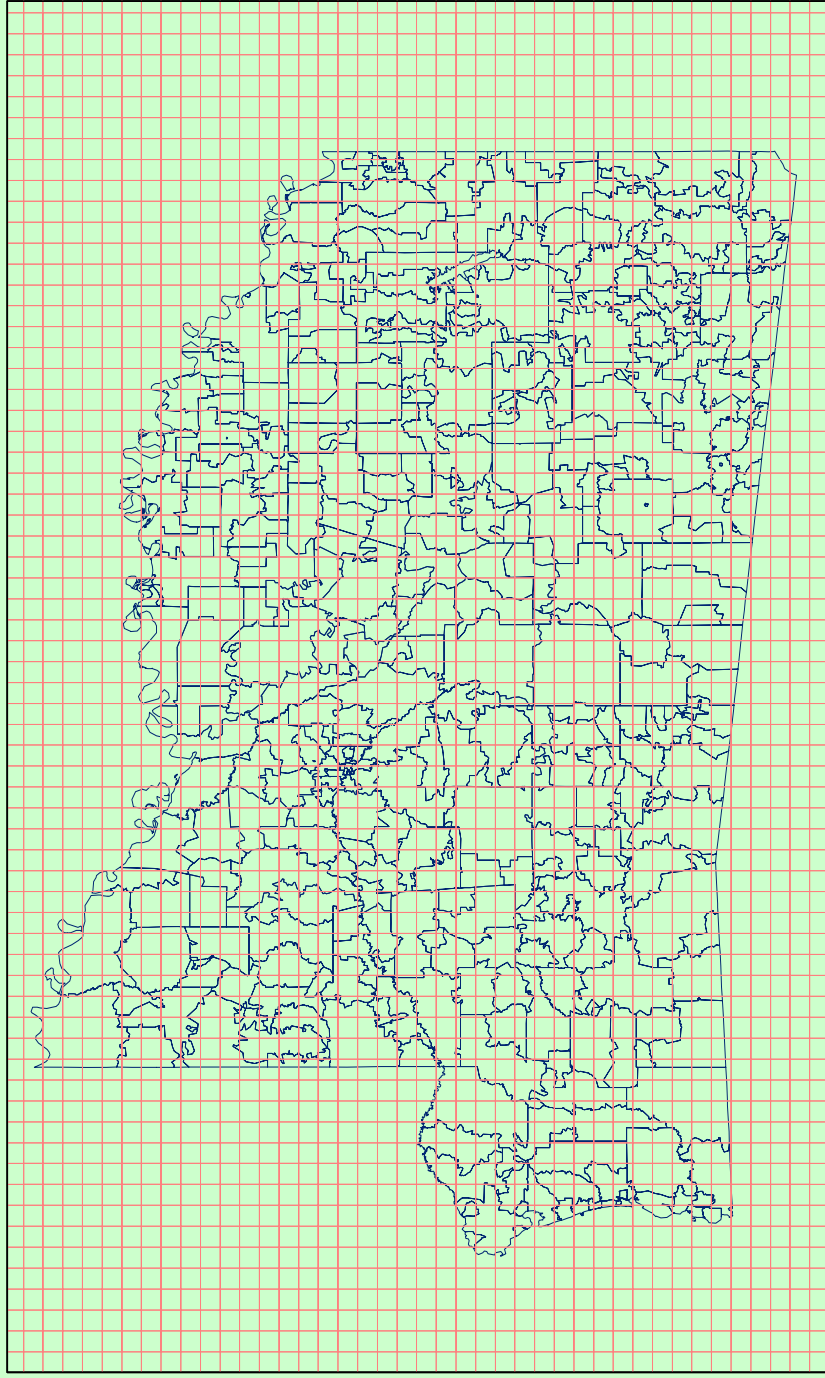


Overview of GeoMedStat



Statewide Data- Asthma Surveillance





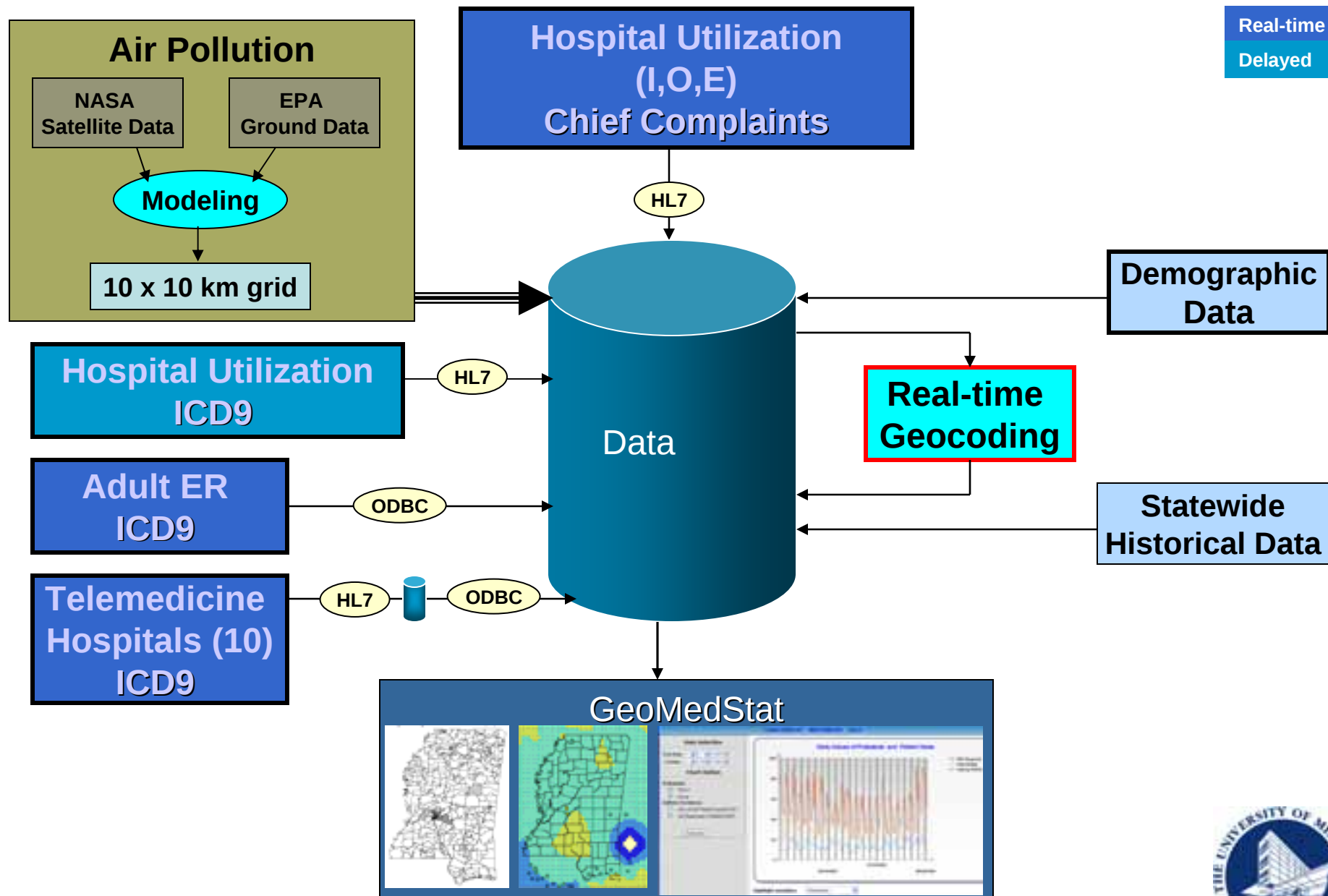
Improved Geocoding Solution

Method	Street Match	Zip Code Match	Total
ESRI	15887	4632	20,519
UMC-IGS	2620	33	2,653
Total	18507	4665	23,172
ESRI	68.56%	19.99%	88.55%
UMC-IGS	11.31%	0.14%	11.45%
Total	79.87%	20.13%	100.00%

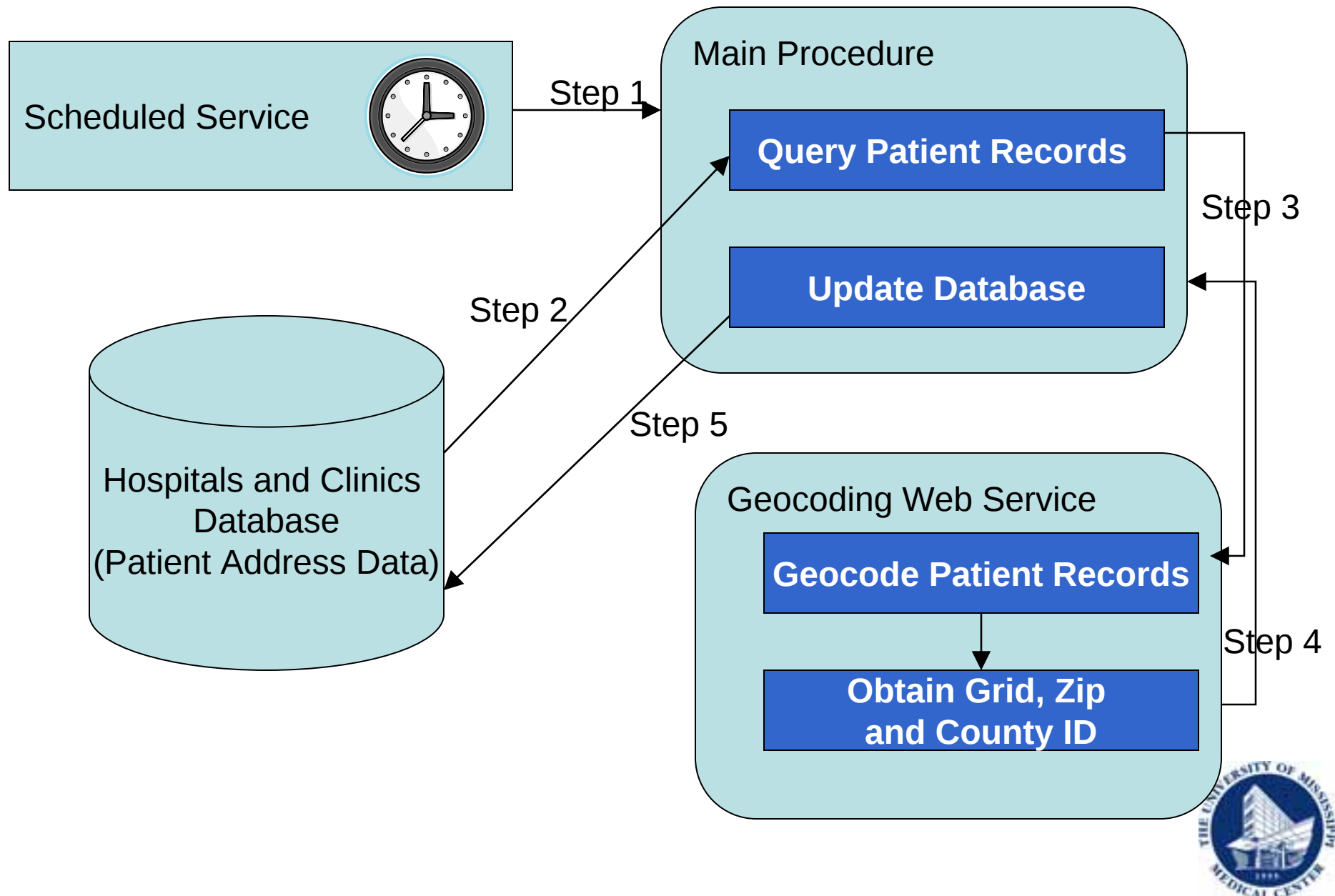
Total = 23172, M = 18197, T = 310, Z = 4665



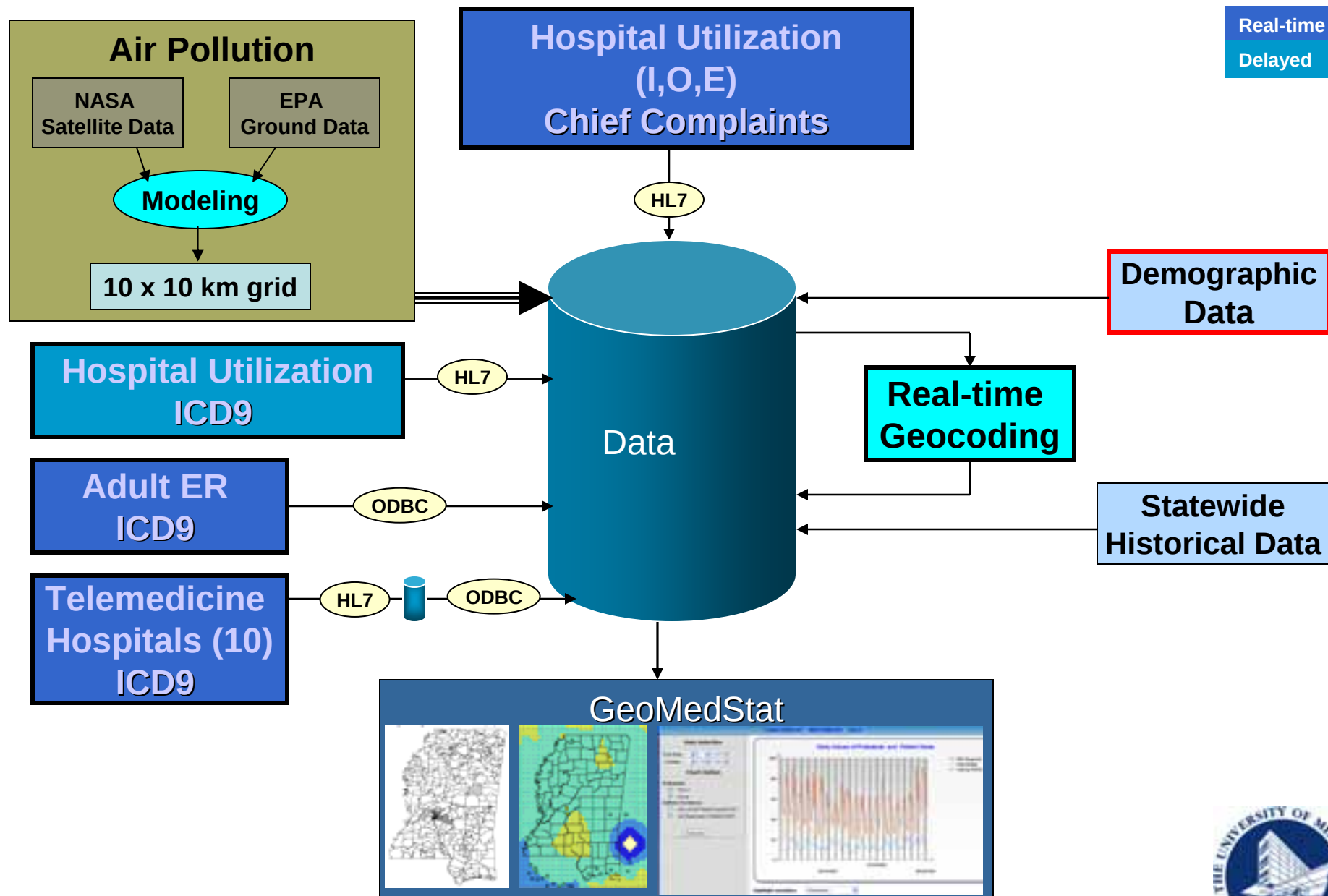
Overview of GeoMedStat



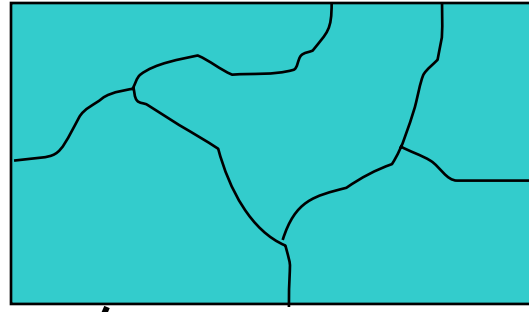
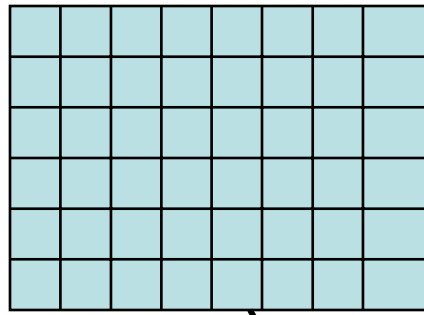
Real-time Geocoding



Overview of GeoMedStat



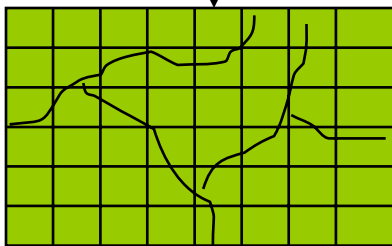
Demographic Data



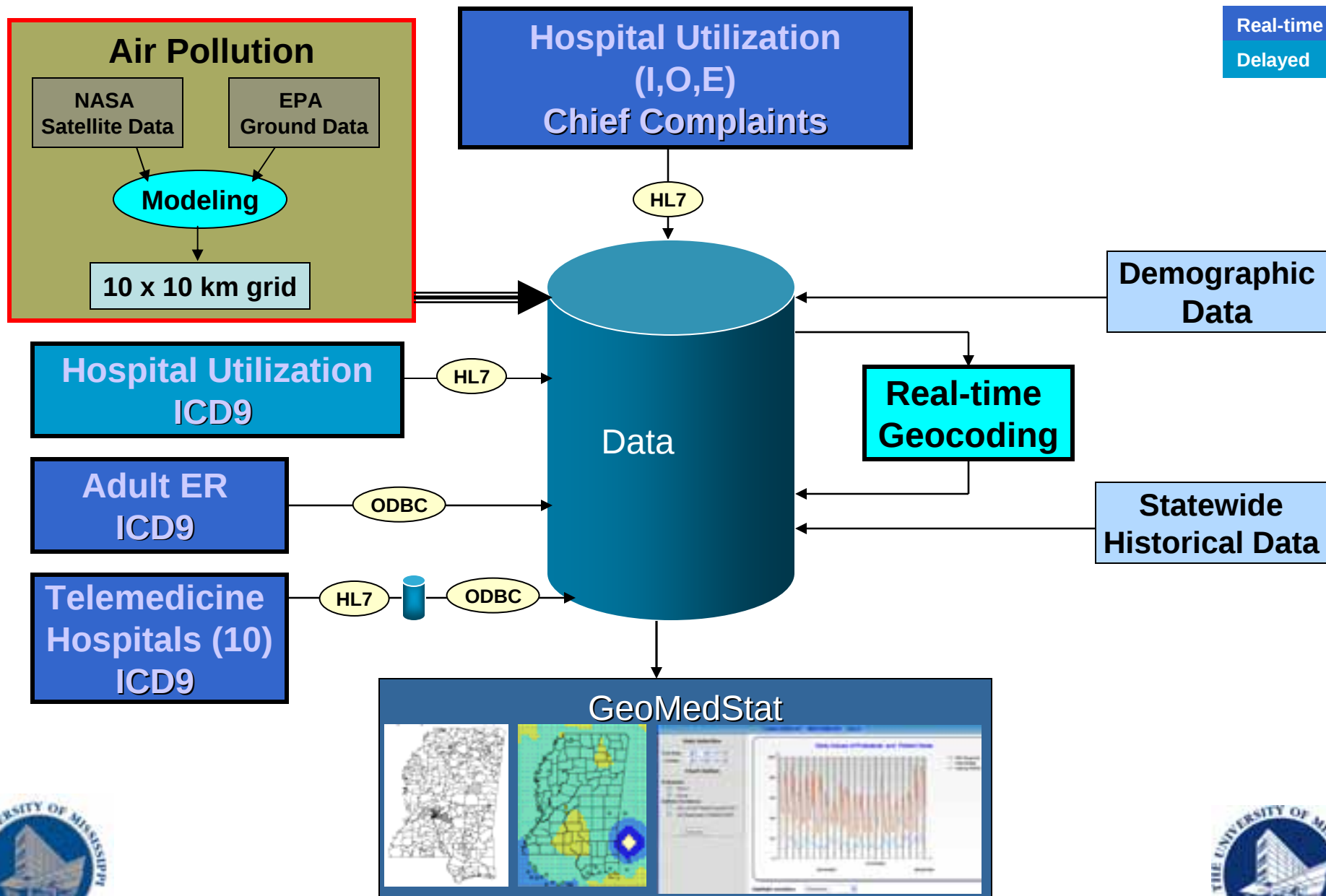
Spatial Operation

- Purpose: Interpolate demographic data from census block level to grid level
- Data Source: ESRI TAPESTRY

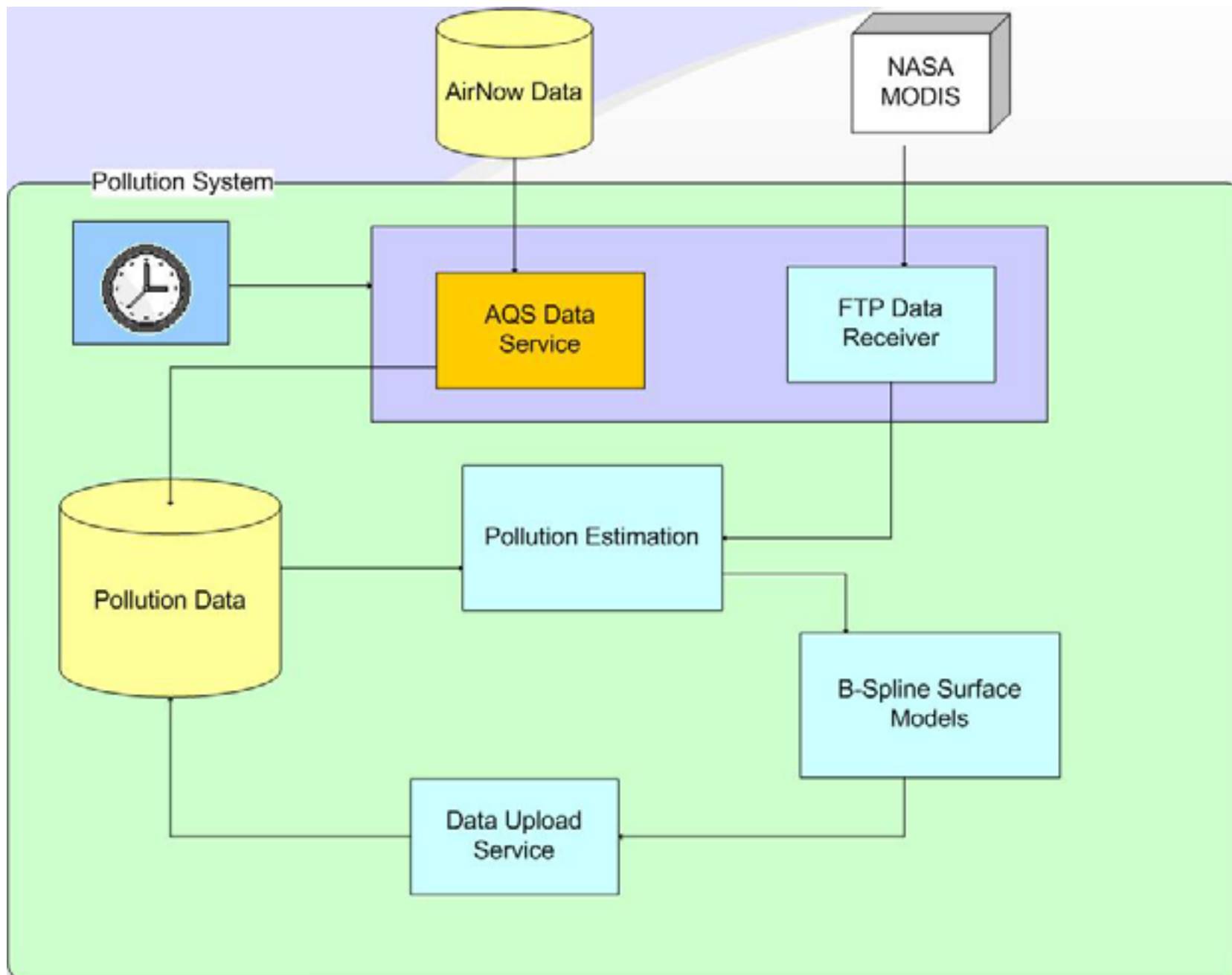
Calculate grid-based population
based on the ratio of grid to block area



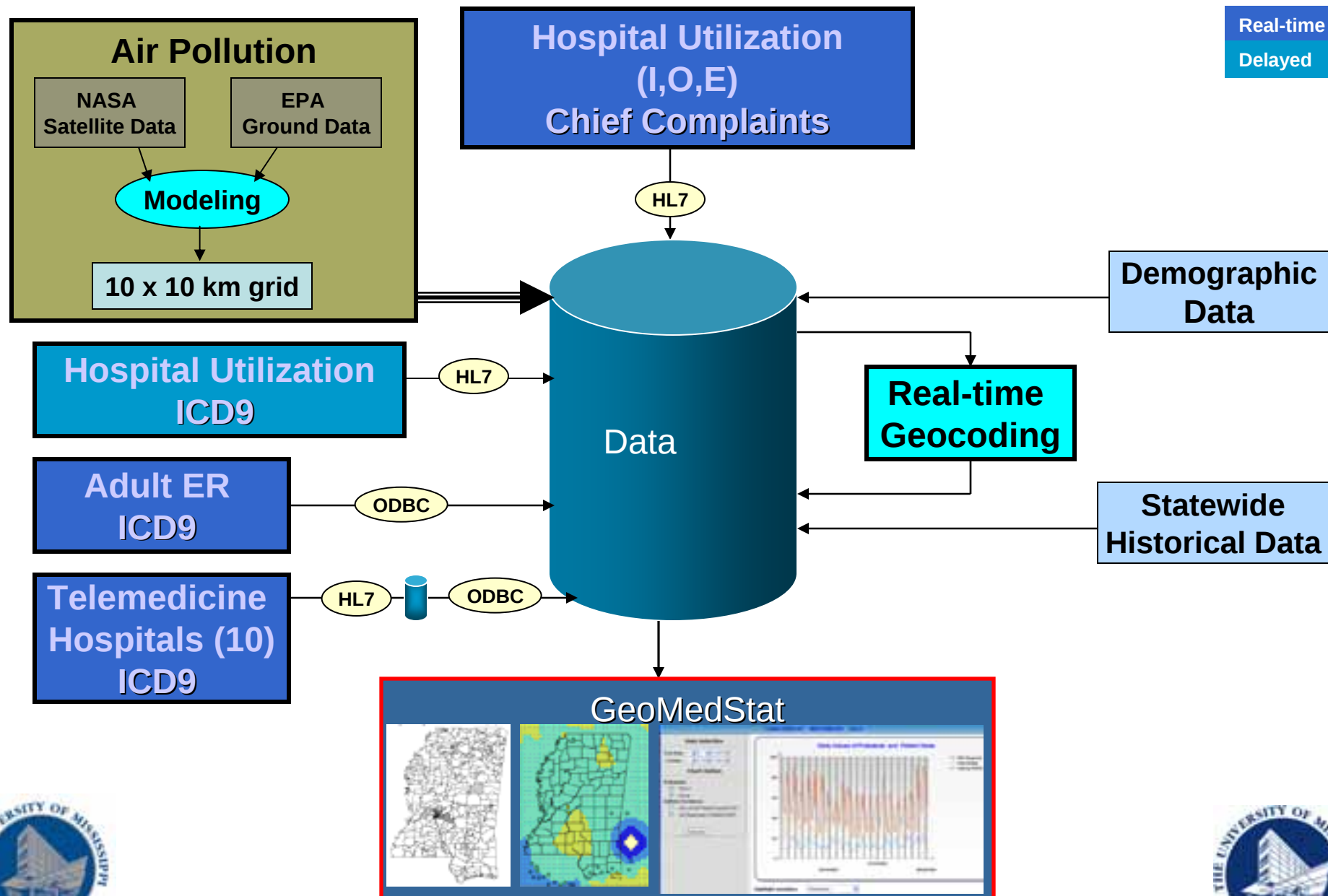
Overview of GeoMedStat



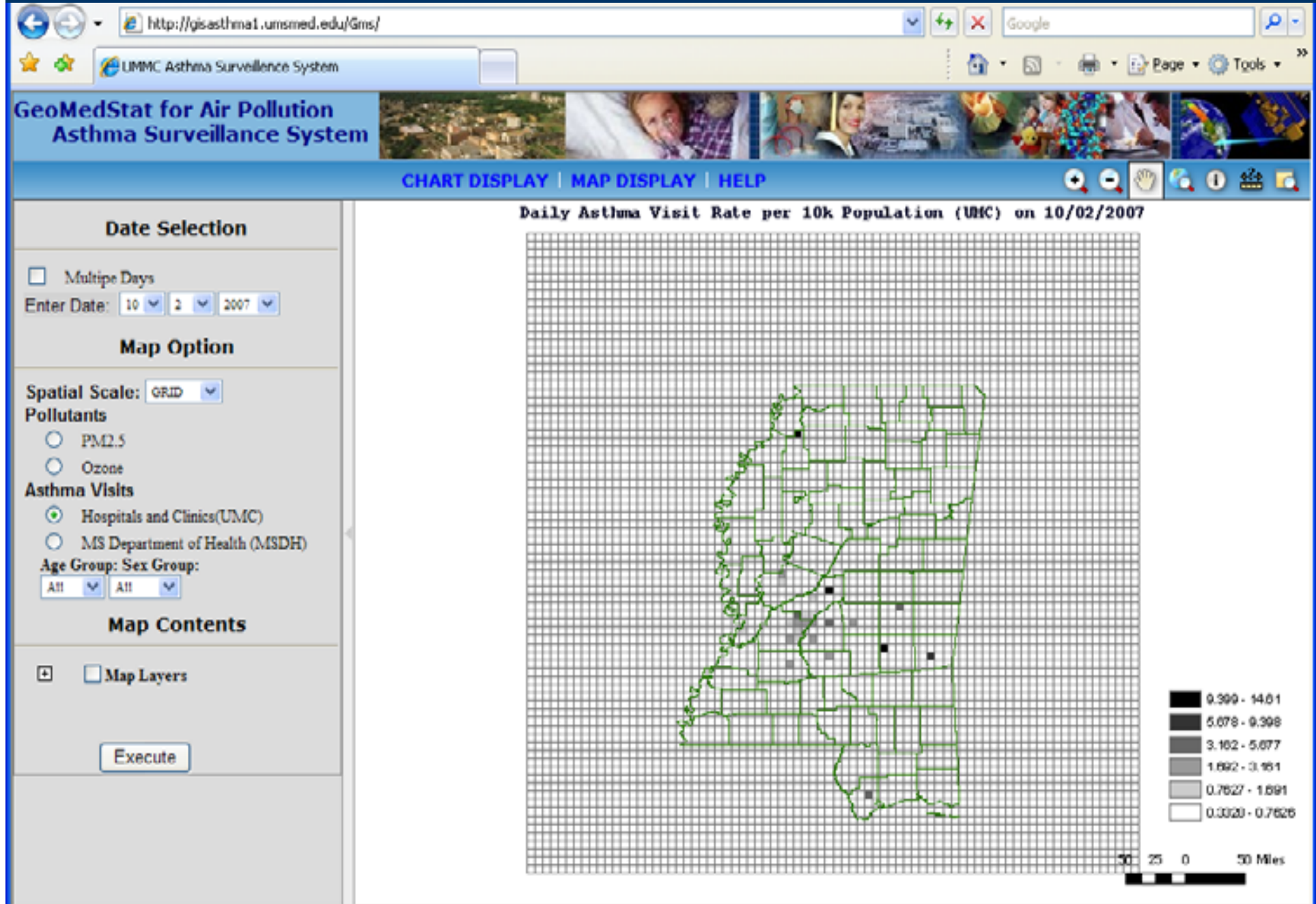
Air Pollution



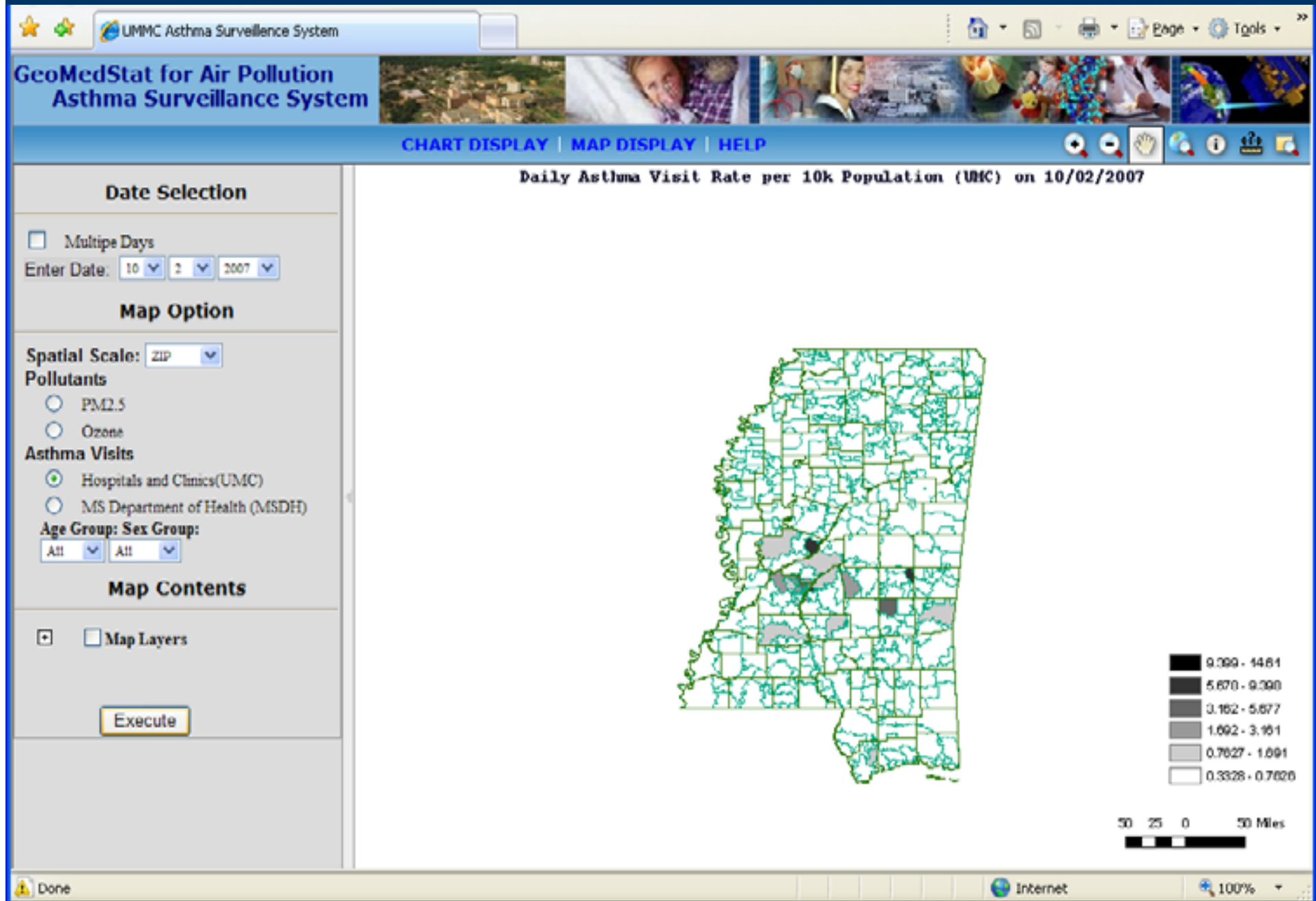
Overview of GeoMedStat



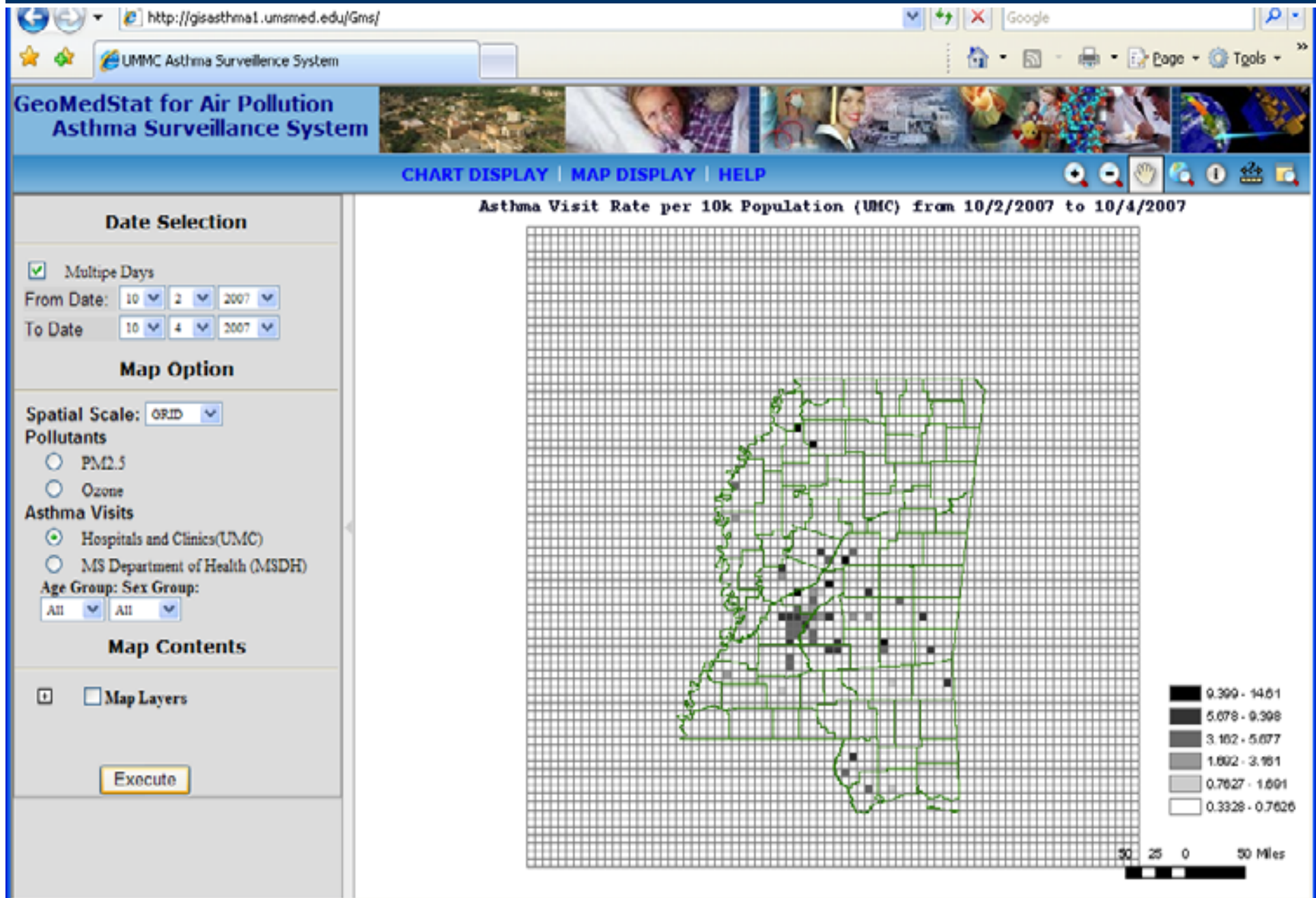
User Interface



User Interface



User Interface



GeoMedStat for Air Pollution Asthma Surveillance System

CHART DISPLAY | MAP DISPLAY | HELP

Date Selection

☐ Multiple Days

Enter Date: 10 2 2003

Map Option

Spatial Scale: GRID

Pollutants

☒ PM2.5

☐ Ozone

Asthma Visits

☐ Hospitals and Clinics(UMC)

☐ MS Department of Health (MSDH)

Age Group: Sex Group:

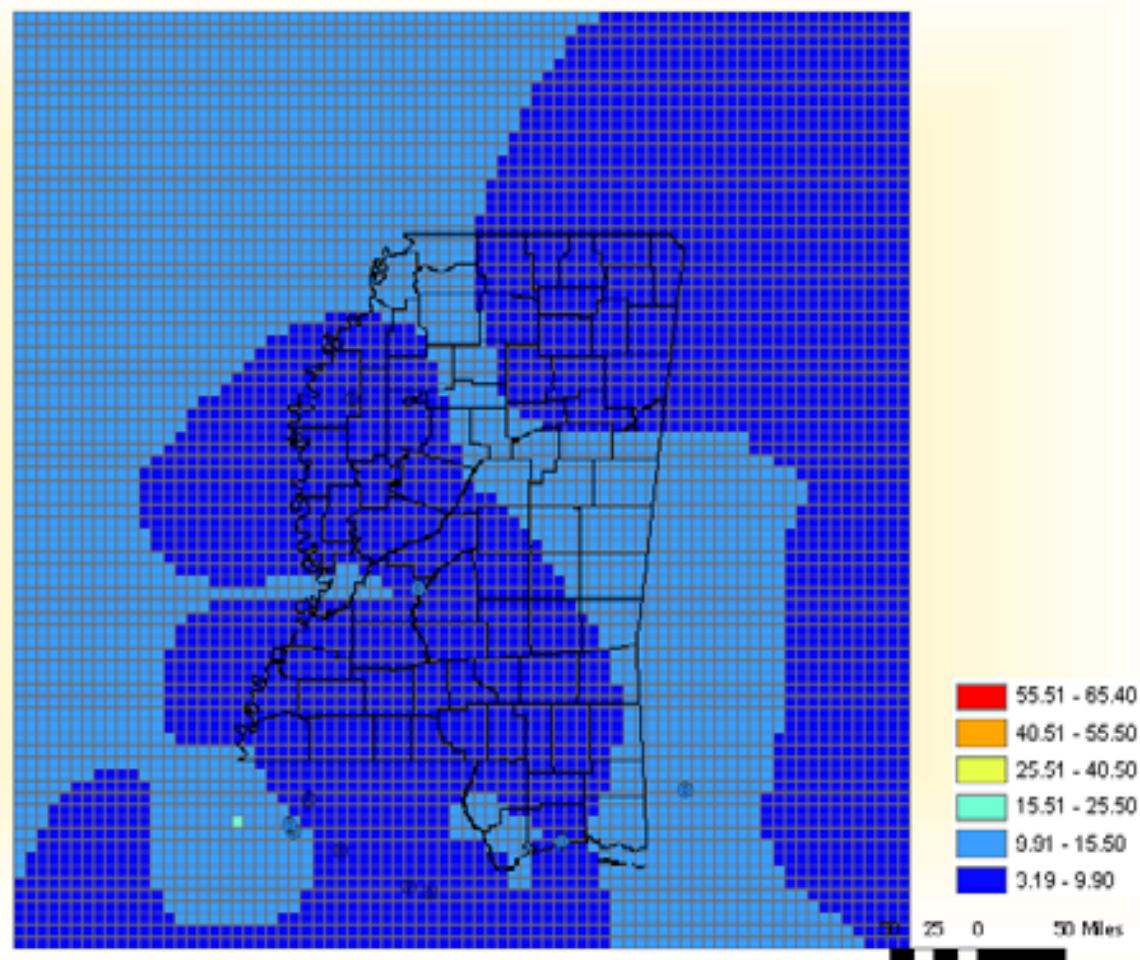
Child All

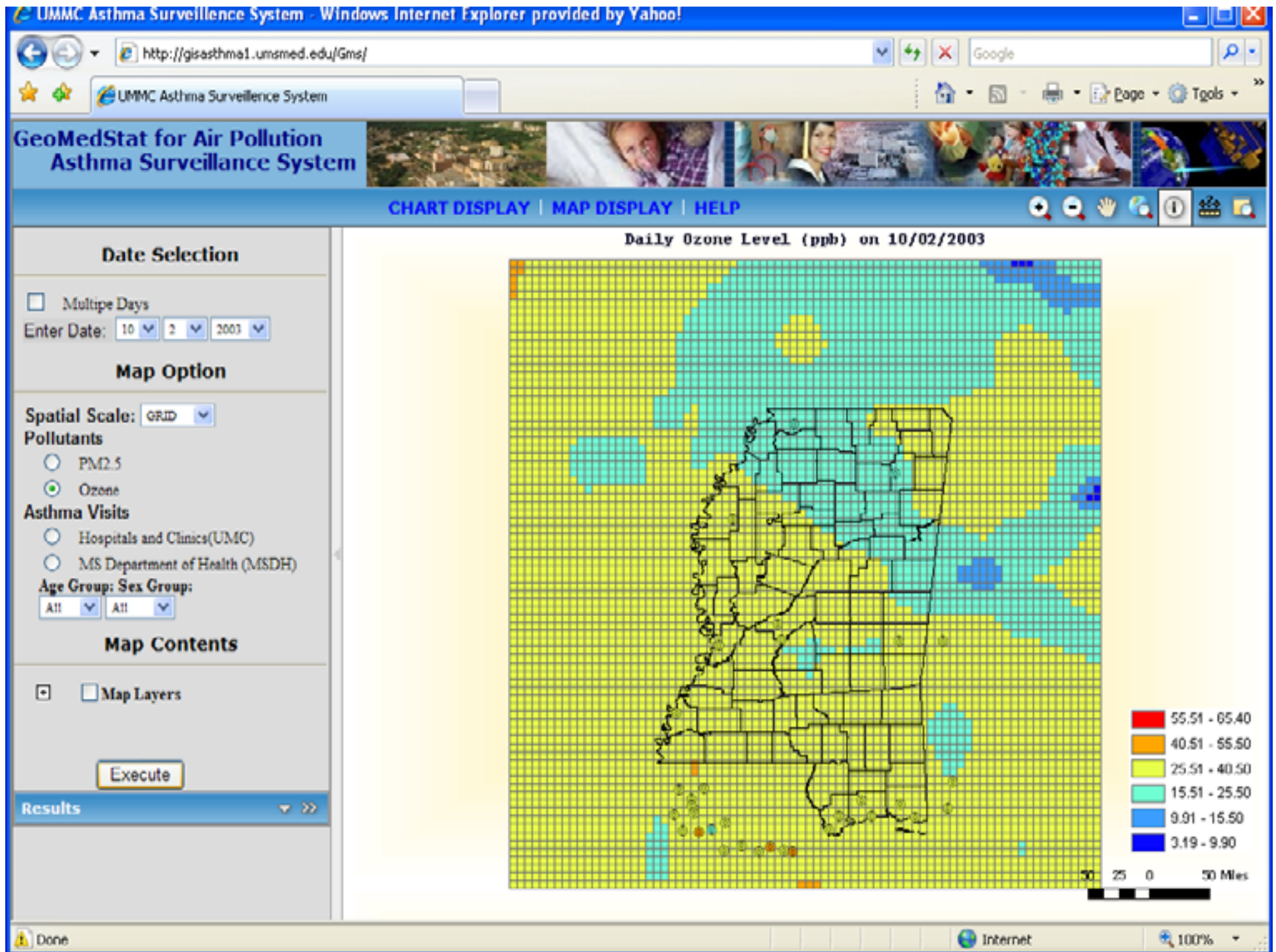
Map Contents

☐ Map Layers

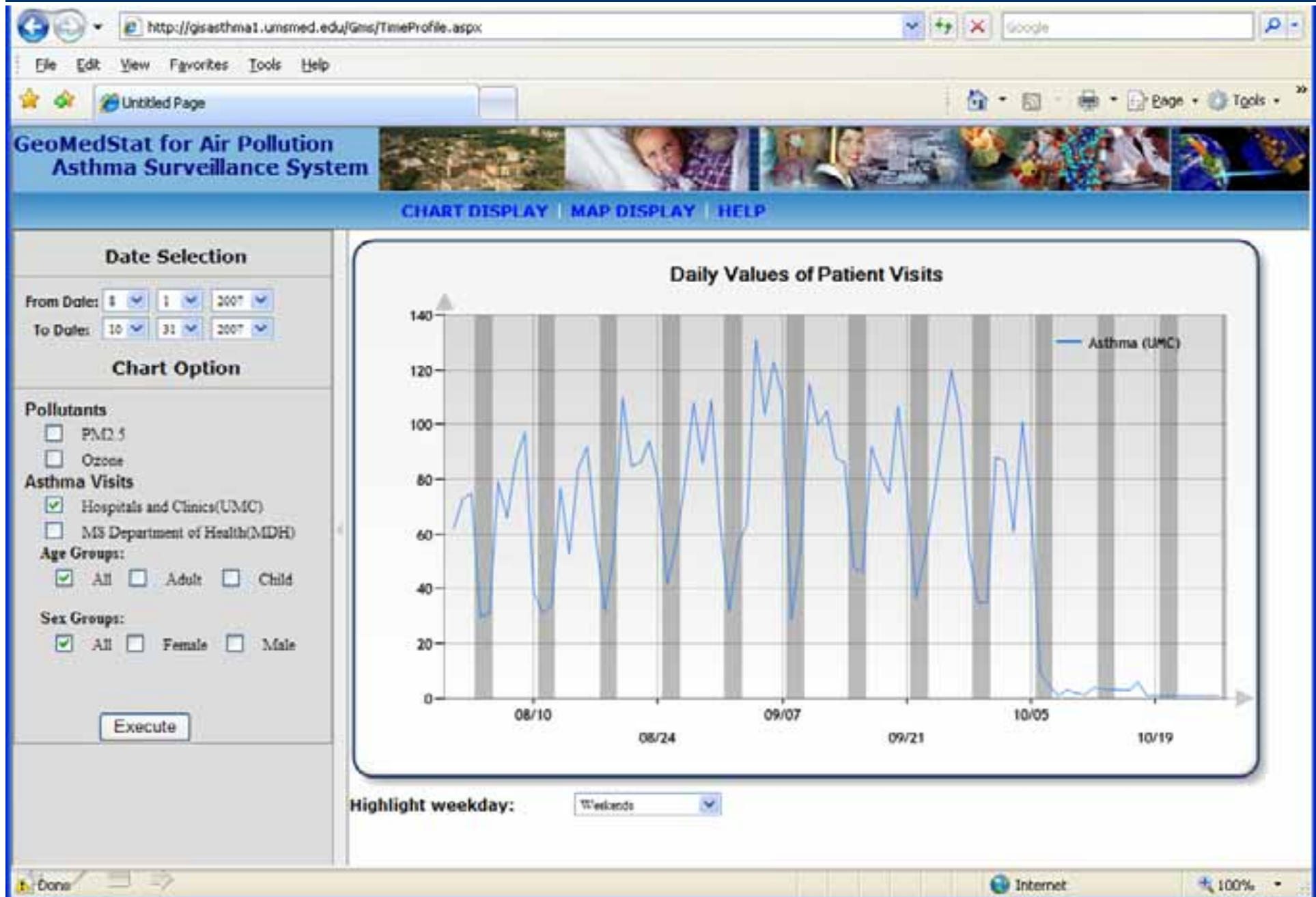
Execute

Daily PM2.5 Level (ug/m3) on 10/02/2003

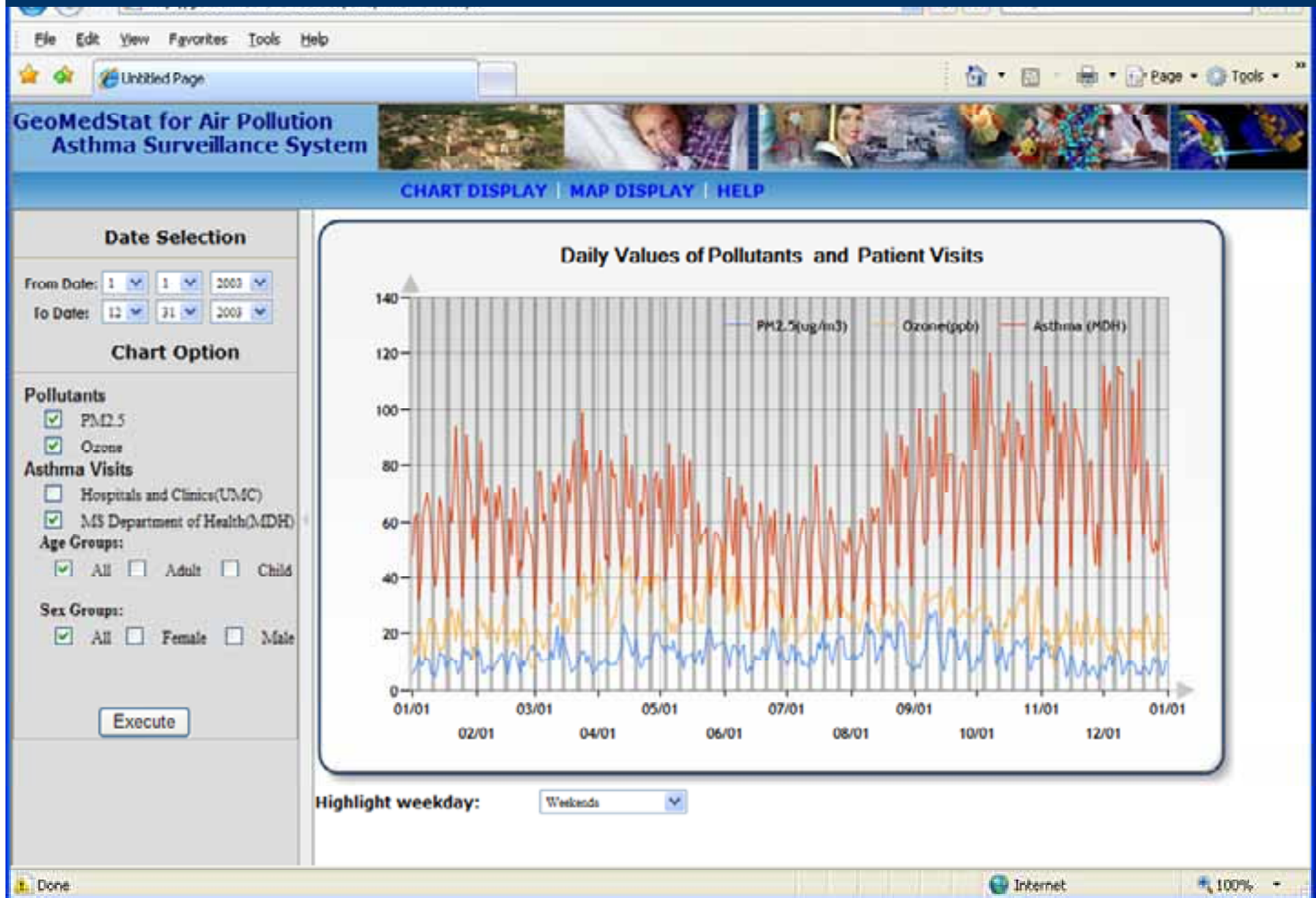




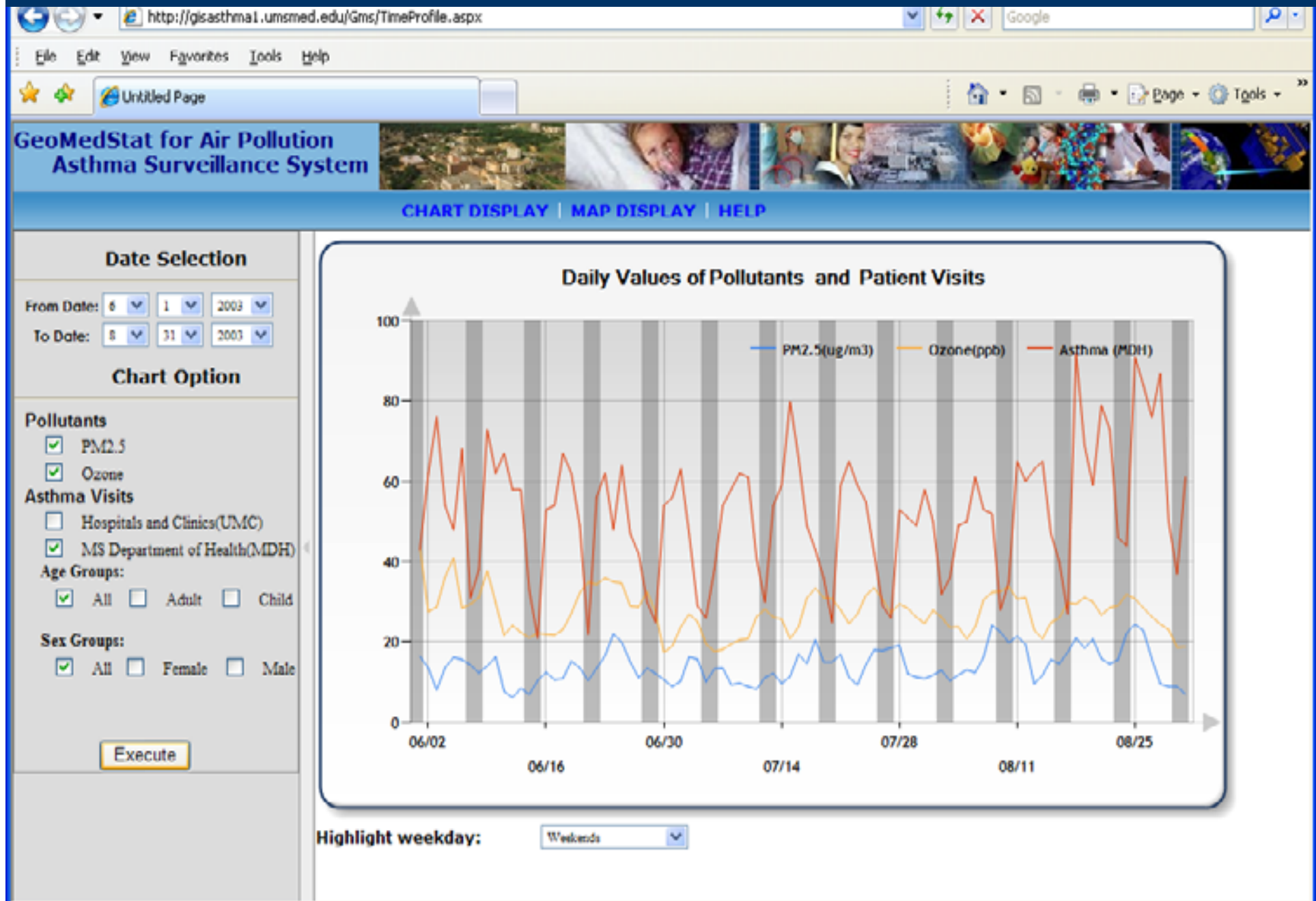
User Interface



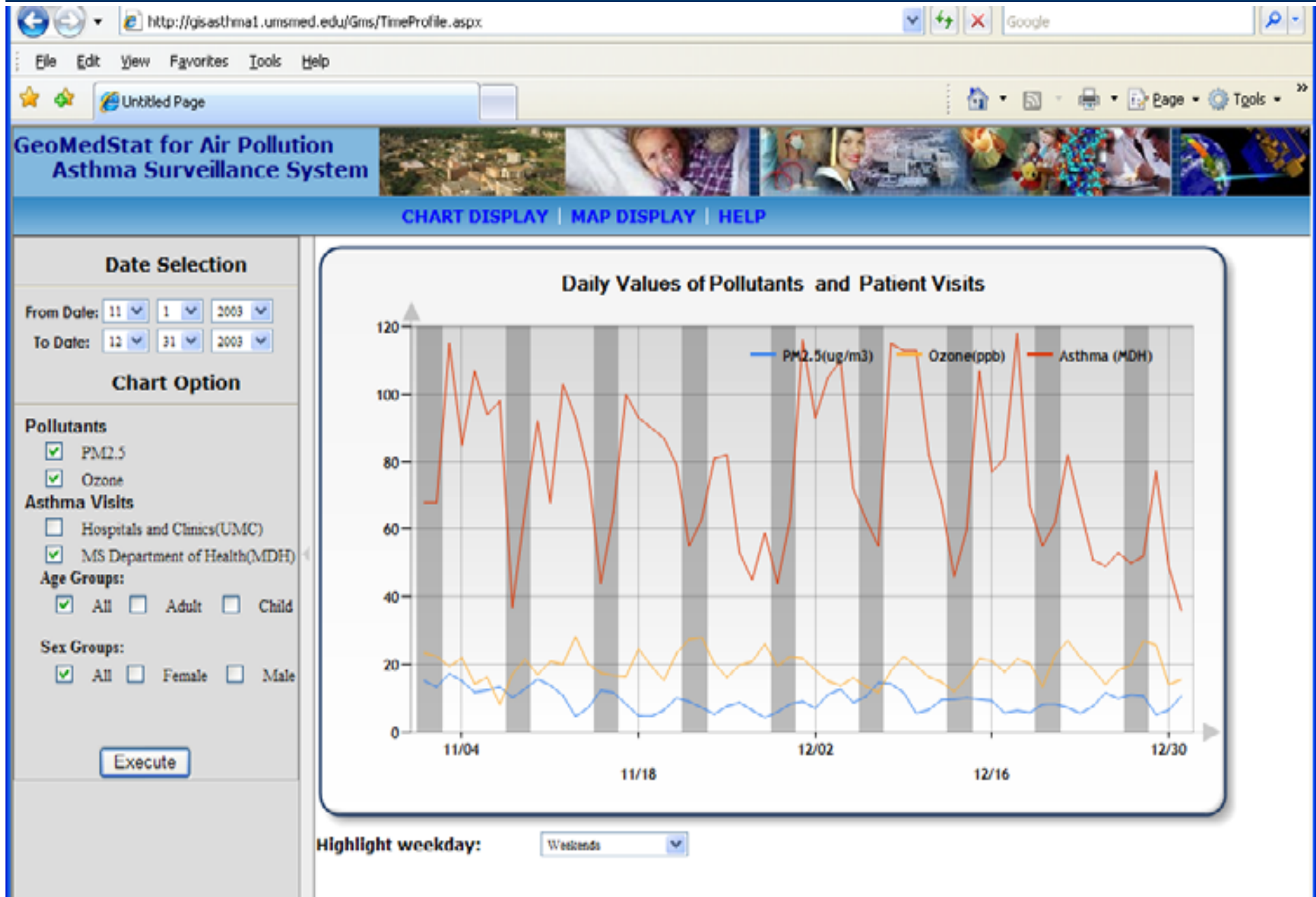
User Interface



User Interface



User Interface



Conclusions

GeoMedStat, being able to access and display environmental data and asthma visit data both at same temporal and geographic frame, can track asthma rates and environmental risks



Acknowledgements

- **CDC/MDH:** Spatial Data Visualization and Electronic Surveillance of Patient Database
- **NASA/MRC:** Integration of NASA Research Results to Enhance Decision Support Tool for Asthma Surveillance, Prediction, and Intervention



Team Members

UMMC:

Bruce Brackin, MPH – Epidemiologist

Fazlay Faruque, PhD - Director of GIS and Remote Sensing (PI)

Richard Finley, MD - Professor, Dept. of Emergency Medicine / Division of Infectious Diseases

Hui Li, PhD – Research Scientist

Gailen Marshall, MD, PhD - Prof, Dept. of Medicine/Dir for Div of Clinical Immunology and Allergy

Worth Williams - Sr. Programmer/Analyst

Consultants:

Amal K. Mitra, MD, MPH, DrPH – Prof., Epidemiology & Biostatistics, Univ.of Southern Mississippi

Lance Waller, PhD - Prof, Dept. of Biostatistics, Rollins School of Public Health, Emory University

.

Collaborators:

NASA Marshall Space Flight Center

Mississippi Department of Health

Asthma Coalition of Mississippi / American Lung Association of Mississippi

Mississippi Department of Environmental Quality



Thank You



601-984-4993

ffaruque@son.umsmed.edu