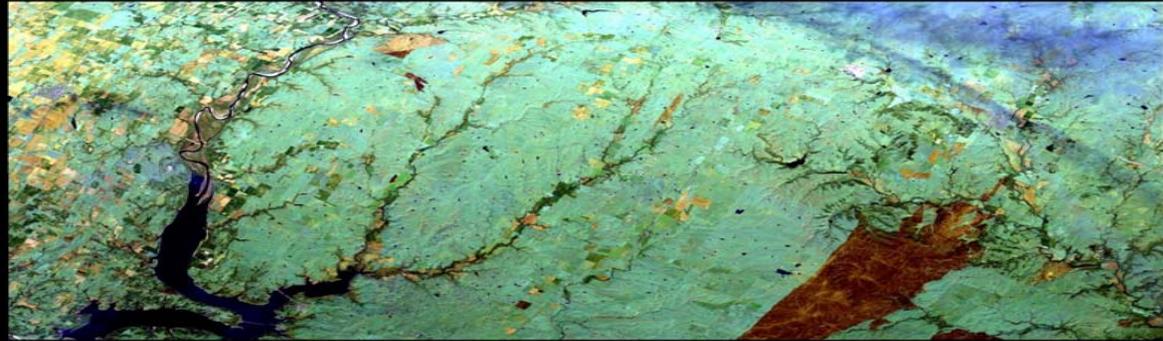
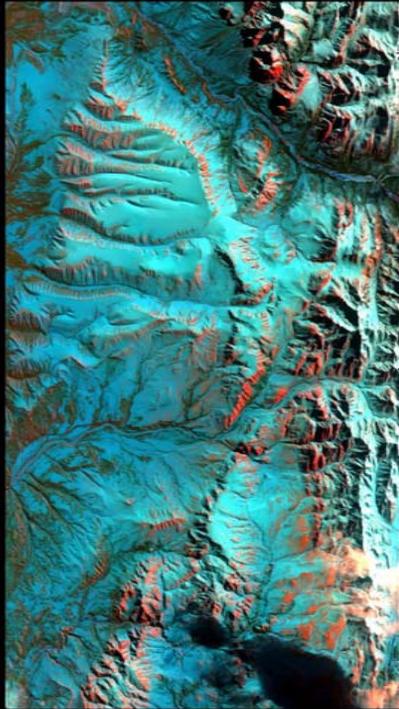
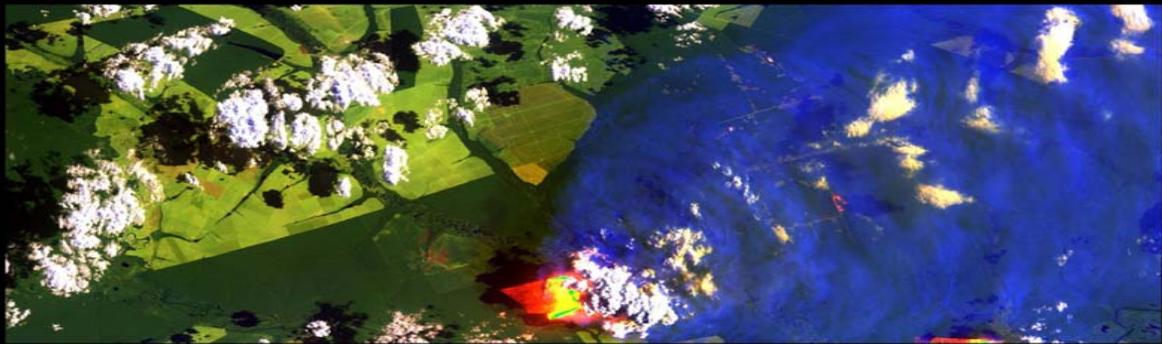
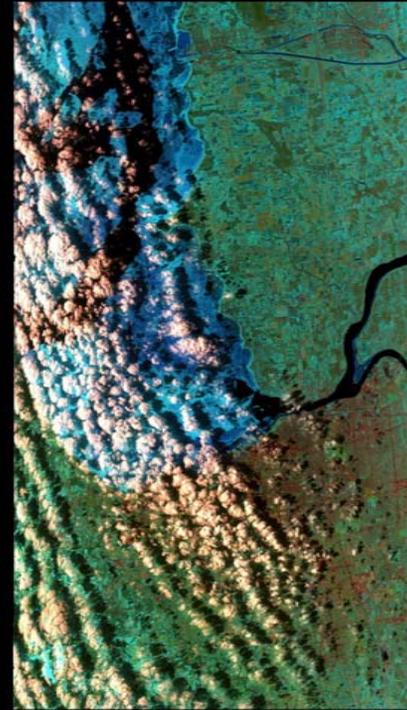




# *SCDHEC GIS Programs and Initiatives*



**Geographic  
Information  
Technology**





# Organizational Structure of GIS Within SCDHEC



Shared and Integrated Geographic Information System



South Carolina Department of Health and Environmental Control

Environmental Quality Control  
& Ocean and Coastal Resource Management

Public Health Statistics  
& Information Services



# BUREAU OF WATER

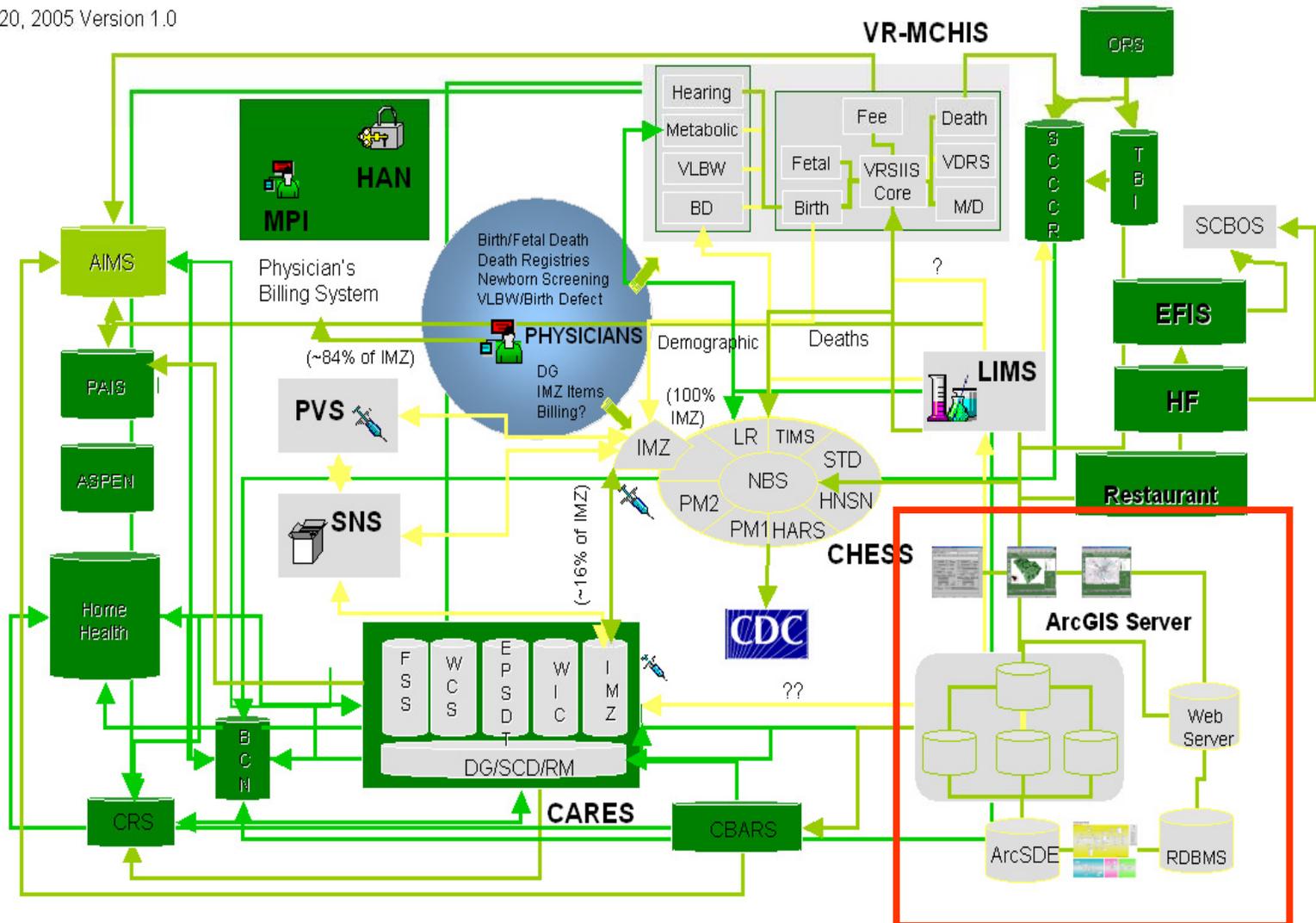




# Public Health Informatics



May 20, 2005 Version 1.0



→ Confirmed Connection (by standard interoperability)
 → Connection to be confirmed (by standard interoperability)
 → Connection should be established (by standard interoperability)

Author: Dr. Guang Zhao

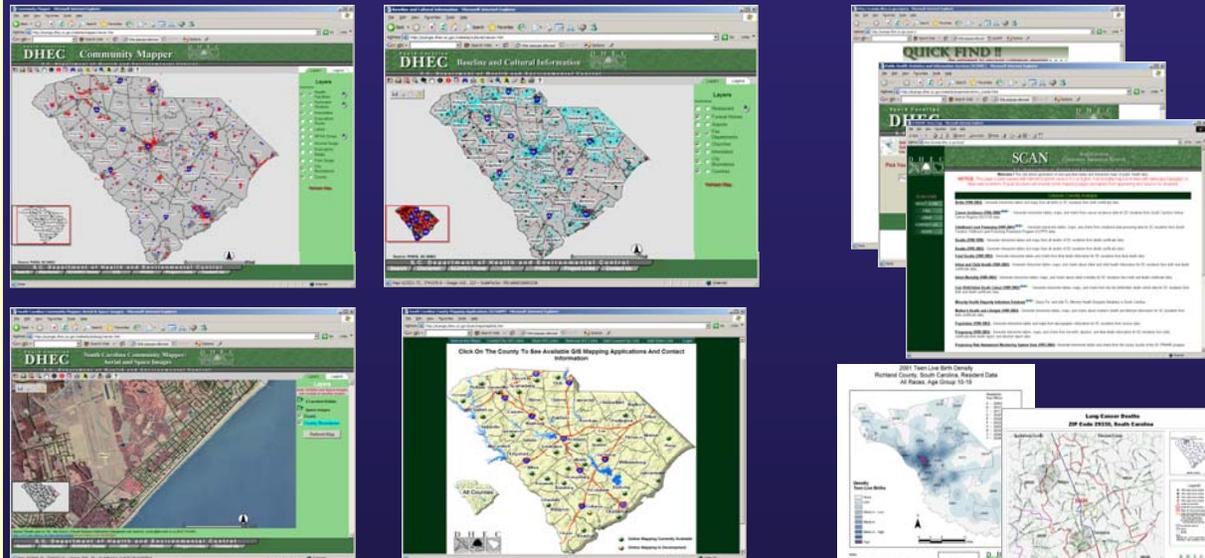


# Health Program Mandates & GIS

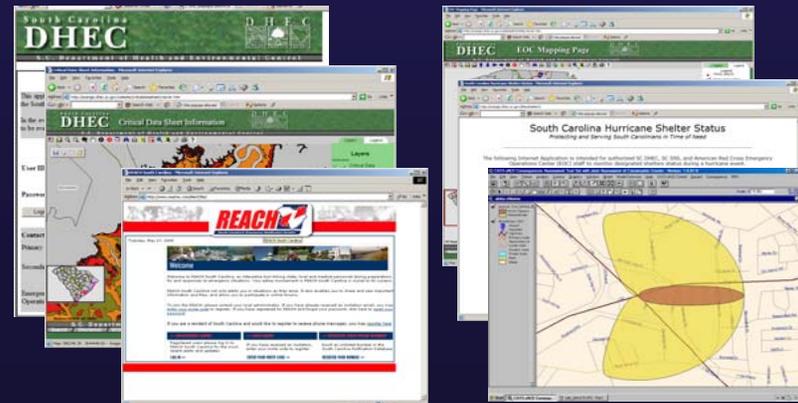


- **Data Collection and Maintenance (GPS & Geocode)**
  - Shelters & Facilities
  - Community/Cultural Information
  - Public Health Data (Births, Deaths, Cancer, etc..)
- **Spatial Analysis and Mapping**
  - Maps on Demand
  - Directions and Address Locations
  - Spatial Statistical analysis
- **EOC Drills Secured Site for Emergency Planning and Response**
- **Emergency Sheltering Application**
- **SC Community Assessment Network (SCAN)**
  - Birth Certificate Data
  - Death Certificate Data
  - Population Data
  - Pregnancy
  - Mother's Health and Lifestyle
  - Infant and Child Health
  - Infant Mortality
  - Cancer Incidence
  - Childhood Lead Poisoning
  - Fetal Deaths
  - Live Birth / Infant Death
  - Minority Health Initiative Database
  - PRAMS
  - Community Profiler
- **ArcGIS Server (Geocoding / Analysis) - SOA**
- **REACHSC – Geographic Notification**
- **Critical Data Sheets Application**
- **Disaster Modeling**
- **Mobile GIS**
- **Spatial Application Development and Integration**

## Information Dissemination via Public Map Services and Health Applications & Analysis



## Emergency Response GIS Applications



## Awards / Publications



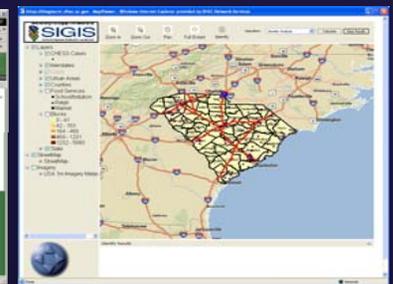
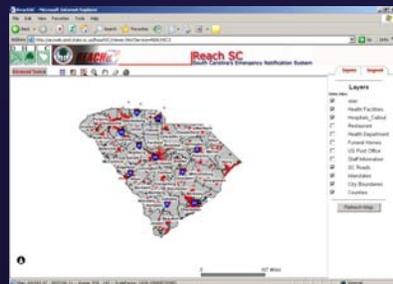


# PHSIS



# Public Health Statistics and Information Services

## Division of Public Health Informatics





# Hybrid GIS Layer Example – Health Facilities



http://scangis.dhec.sc.gov/website/mapper/viewer.htm - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address http://scangis.dhec.sc.gov/website/mapper/viewer.htm

South Carolina Health, Shelters and Evacuation Information  
 Division of Biostatistics and Health GIS

Auto-Refresh Show/Hide Overview Map

QUICK ZOOM

**Layers**

Visible Active

- Health Facilities
- Hurricane Shelters
- Health Departments
- Interstates
- Evacuation Route
- Lakes
- SFHA Zones
- Normal Surge
- Evacuation Areas
- Fast Surge

TURN ON THE LEGEND LOCATE AN ADDRESS QUICK FIND

**DISCLAIMER**

Source: PHSIS, SCDHEC

0 58mi

Search Disclaimer SCDHEC Home GIS PHSIS Project Links Contact Us

Done Internet



# South Carolina Community Assessment Network



Address <http://scangis.dhec.sc.gov/scan/> Go Links >>

Google G Go Bookmarks Popups okay Check AutoLink AutoFill Send to Settings



**SCAN** South Carolina  
Community Assessment Network  
S.C. Department of Health and Environmental Control

**Welcome !** This site allows generation of user-specified tables and interactive maps of public health data.

**NOTICE:** This page is best viewed with Internet Explorer version 5.0 or higher. Functionality may be limited with Netscape Navigator or other web browsers. Popup blockers will prevent some mapping pages and tables from appearing and need to be disabled.

### Datasets Currently Available

- Births (1990-2005)** - Generate interactive tables and maps from all births to SC residents from birth certificate data.
- Cancer Incidence (1996-2003) & Cancer Mortality (1995-2003)** - Generate interactive tables, maps, and charts from cancer incidence and mortality for SC residents from South Carolina Central Cancer Registry (SCCCR) data.
- Childhood Lead Surveillance (1999-2005)** - Generate interactive tables, maps, and charts from childhood lead poisoning data for SC residents from South Carolina Childhood Lead Poisoning Prevention Program (CLPPP) data.
- Community Profile Module (1999-2004) <sup>NEW</sup>** - Generate interactive tables, maps, and charts to profile the indicators of public health interests across South Carolina on counties and DHEC regions level. Healthy People 2010 objectives and Leading Health Indicators are incorporated in the module for guidelines.
- Deaths (1990-1998)** - Generate interactive tables and maps from all deaths of SC residents from death certificate data.
- Deaths (1999-2005)** - Generate interactive tables and maps from all deaths of SC residents from death certificate data.
- Fetal Deaths (1989-2004)** - Generate interactive tables and charts from fetal death information for SC residents from fetal death data.
- Infant and Child Health (1989-2004)** - Generate interactive tables, maps, and charts about infant and child health information for SC residents from birth and death certificate data.
- Infant Mortality (1989-2004)** - Generate interactive tables, maps, and charts about infant mortality for SC residents from birth and death certificate data.
- Live Birth/Infant Death Cohort (1989-2003)** - Generate interactive tables, maps, and charts from the live birth/infant death cohort data for SC residents from birth and death certificate data.
- Minority Health Disparity Initiatives Database** - Search For, and Add To, Minority Health Disparity Initiatives in South Carolina
- Mother's Health and Lifestyle (1989-2004)** - Generate interactive tables, maps, and charts about mother's health and lifestyle information for SC residents from birth certificate data.
- Population (1990-2005)** - Generate interactive tables and maps from demographic information for SC residents from census data.
- Pregnancy (1990-2004)** - Generate interactive tables, maps, and charts from live birth, abortion, and fetal death information for SC residents from birth certificate, fetal death report, and abortion report data.
- Pregnancy Risk Assessment Monitoring System Data (1993-2005)** - Generate interactive tables and charts from the survey results of the SC PRAMS program.

### Future Datasets



Website/Application Stats: "Hits" > ~20 million & > 1.5 Visitors Worldwide



# SCAN Community Profile



Community Profile - Introduction - Windows Internet Explorer provided by DHEC Network Services

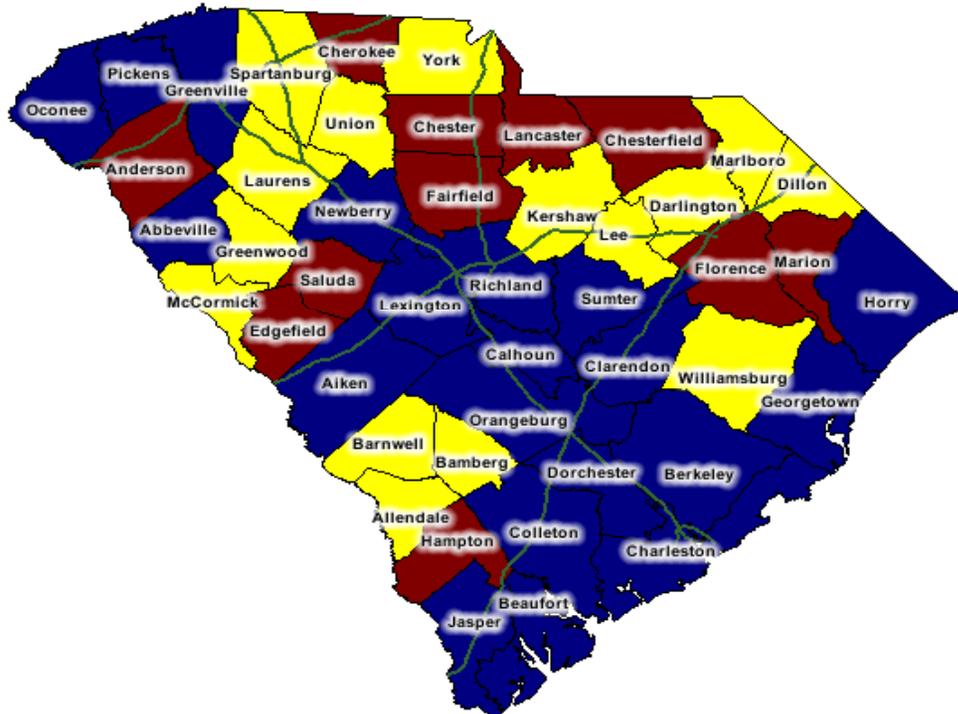


Row Variable: **Coronary heart disease death** Output: **Comparison to HP 2010 Target**

[Create Table](#)

Indicator	Rate Multiplier Description	Year	Age	Sex	Race	Ethnicity
Coronary heart disease death	per 100,000 Population	1999-2004	All	All	All	All

Coronary heart disease death HP 2010 Comparison -- Age-Adj. Rates



- SC Community Profile
  - 2002 Senate Election Districts
  - 2002 House Election Districts
  - Health Facilities
  - SC Roads
  - Interstates
  - City Boundaries
  - HP 2010 Comparison
    - No Data Available
    - Significantly Lower
    - Not Significantly Different
    - Significantly Higher

Geo Areas:

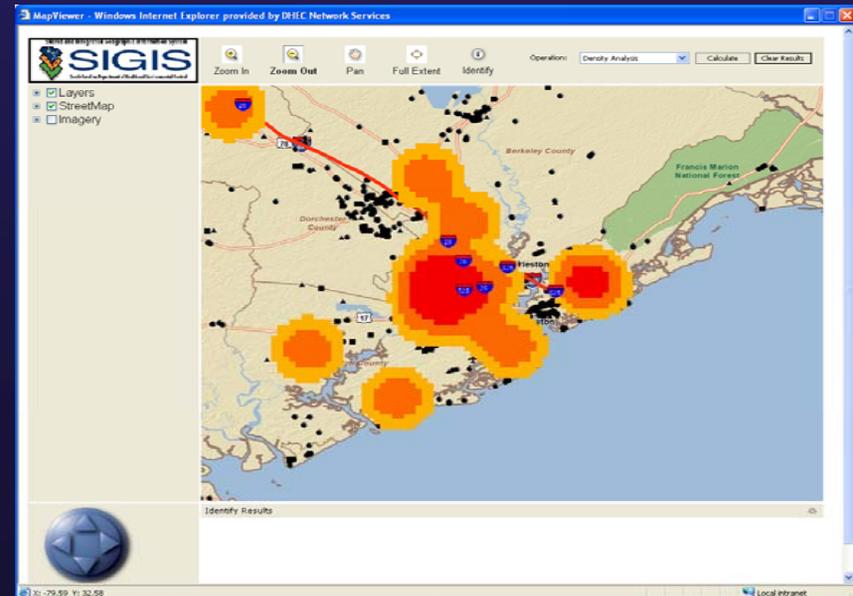
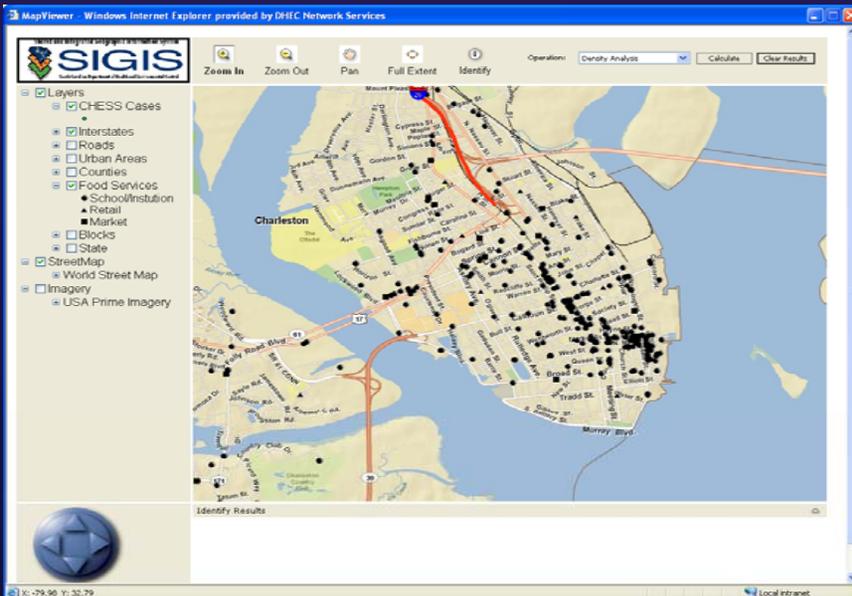
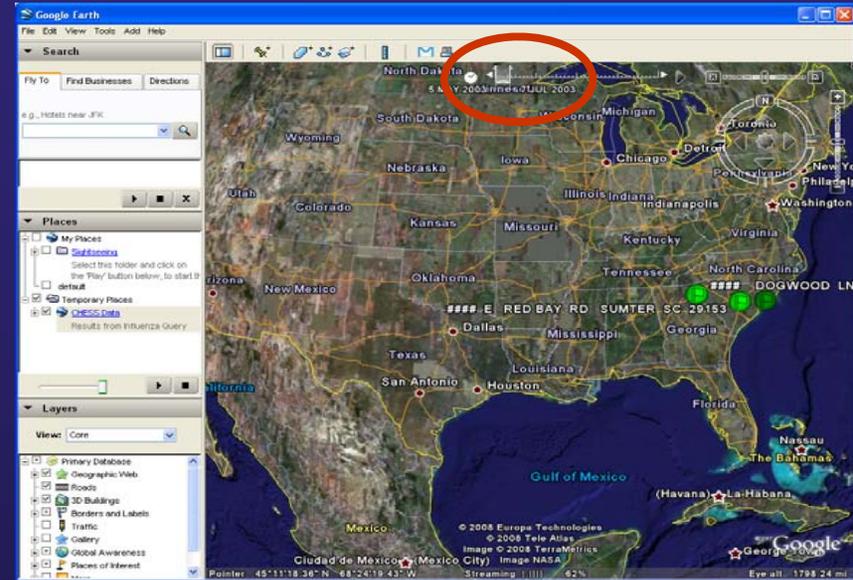
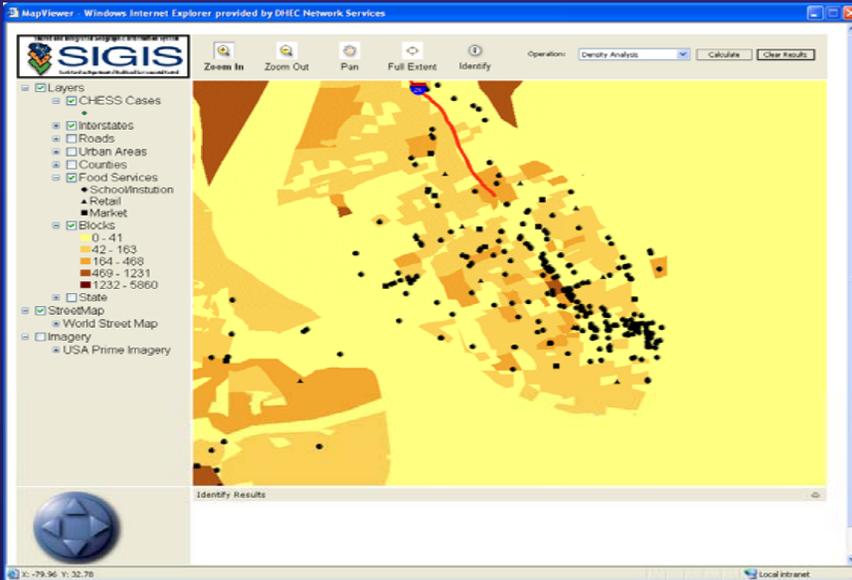
or follow this link: [table/map input page](#)

An example page (Example tab) is provided with step-by-step examples to help users get familiar with this module. A definition page (Definitions tab) is provided to

Internet



# CHESS/NEDSS Mapping





# BIOSENSE/DGINET



DGINet Home - Windows Internet Explorer provided by DHEC Network Services

File Edit View Favorites Tools Help



Address <http://phsistest.dhec.sc.gov/portal/>

IronKey My Portable Bookmarks Add Website Form Filler Settings

UNCLASSIFIED security policy

**D H E C**  
**South Carolina Health and Environment**  
 News Ticker [Link to dginetdemo2.esri.com](#)

DGINet Map Viewer 4.0.2 - Windows Internet Explorer provided by DHEC Network Services

File Edit View Favorites Tools Help



Address <http://dginetdemo1.esri.com/DGINetMapEngine/>

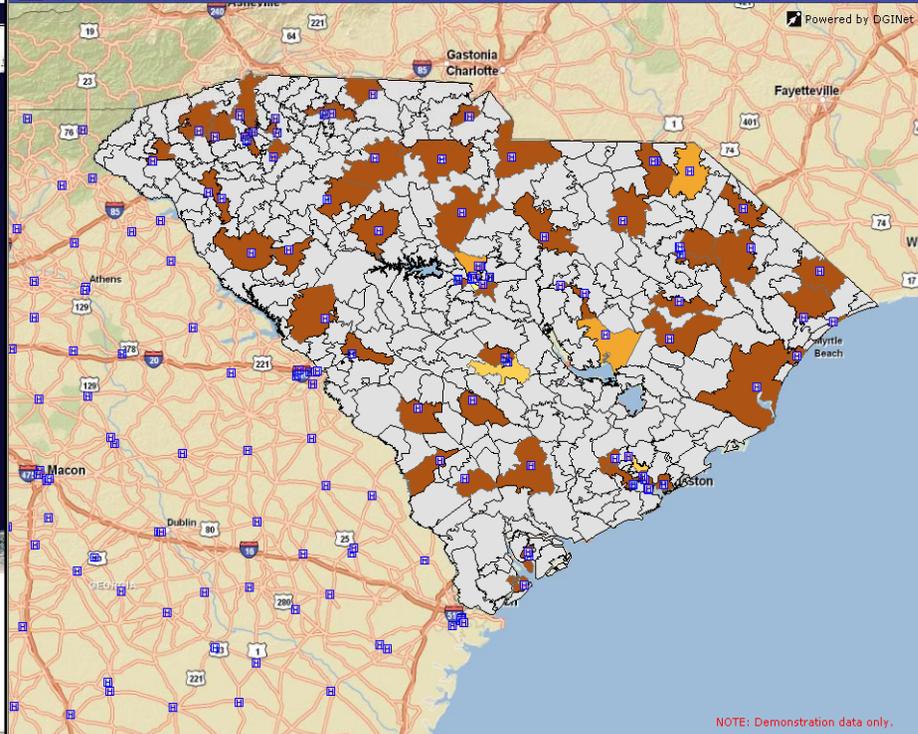
IronKey My Portable Bookmarks Add Website Form Filler Settings

CDC PH-DGINET security policy

## CDC Simulated Health Node

News Ticker Centers for Disease Control and Prevention

Navigation Overview Map Find Location Annotation Add Local Data Tools Geoprocessing Help



Security Marking  
 UNCLASSIFIED  
 Result Details  
 Map Contents

Search Table of Contents

Update

- ESRI-Redlands Node 2[U]
- SCDHEC[U]
  - Geospatial Reference[U]
  - Gazetteer[U]
  - SCDHEC[U]
    - AHA Hospital Data[U]
      - GENERAL[U]
        - AHA Hospitals[U]
        - AHA\_ROW\_LEVEL\_DATA[U]
        - AGGREGATE\_DATA\_SC[U]
- ESRI-Redlands Node 3[U]
- ESRI Simulated Health Node[U]

Update

NOTE: Demonstration data only.

Internet

lat=50°49'41"S lon=9°56'11"W

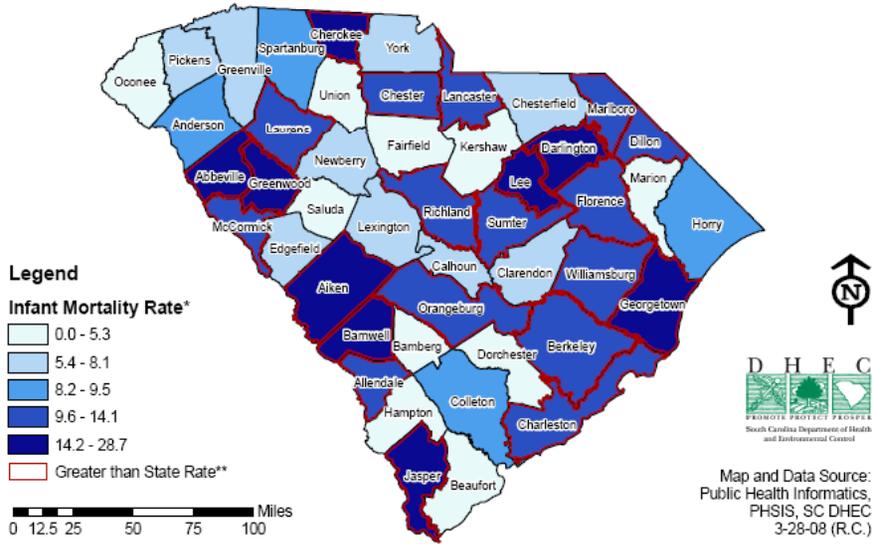
lat=32°53'38"N lon=78°52'13"W



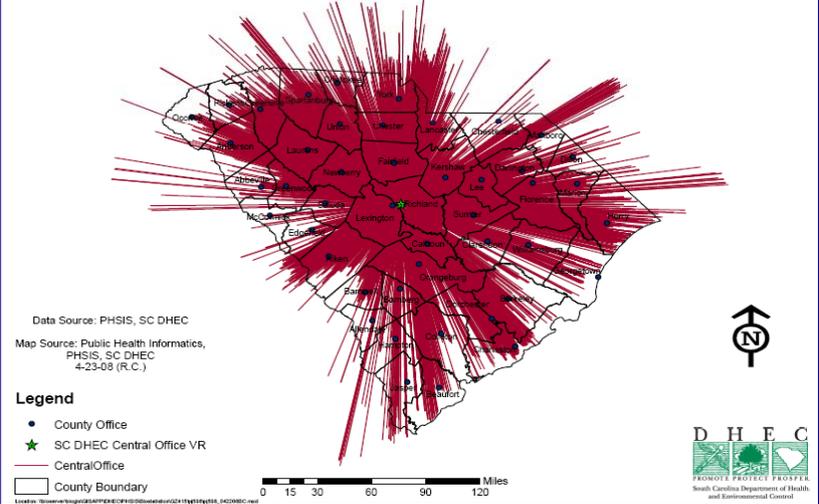
# Map Requests



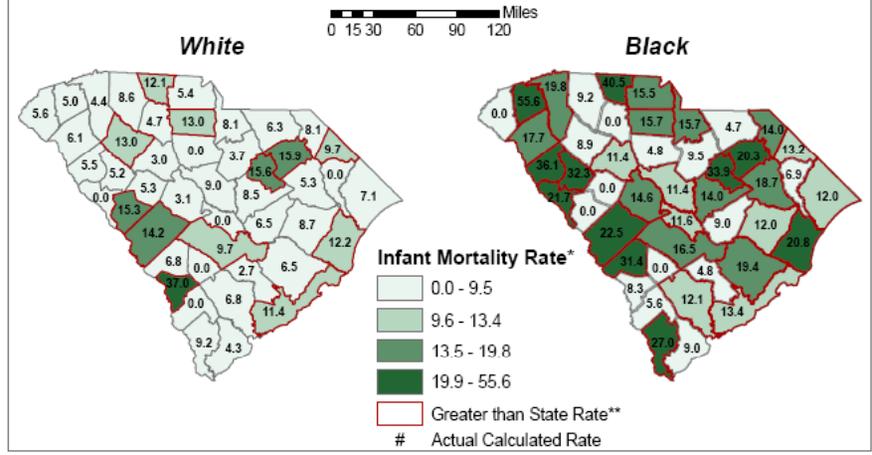
## Infant Mortality Rate by County in South Carolina, 2005\*



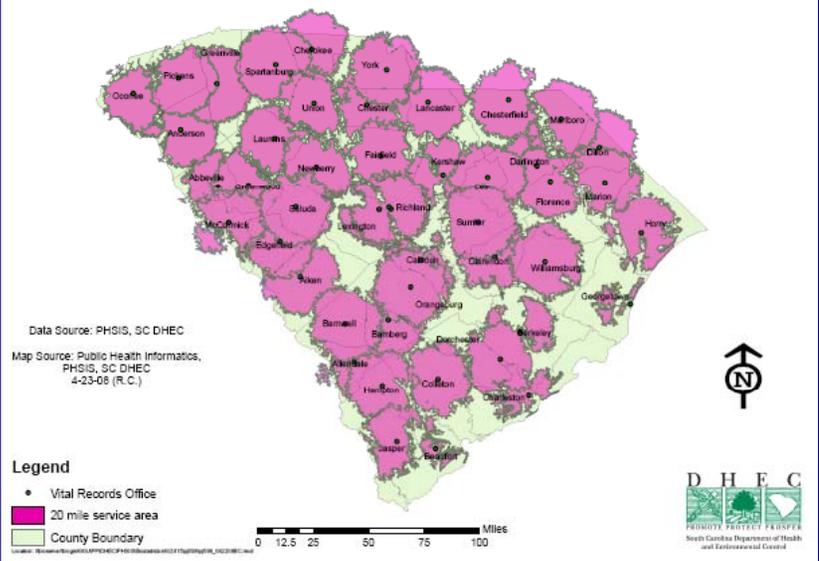
## Spider Diagram of Vital Records Counter Requests Central Office, 2007



## Infant Mortality Rate by Race in South Carolina Counties



## Twenty Mile Service Area of Vital Records Offices



Location: \\scs\server\log\GISAPP\DHEC\Health\_Service\Paratool\System\K51319\g05\9005\_002008SC\_InfMortRate.mxd

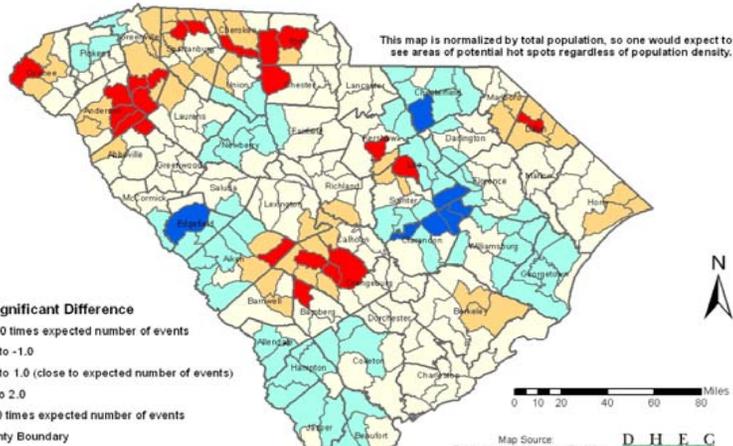




# Advanced Spatial Analysis

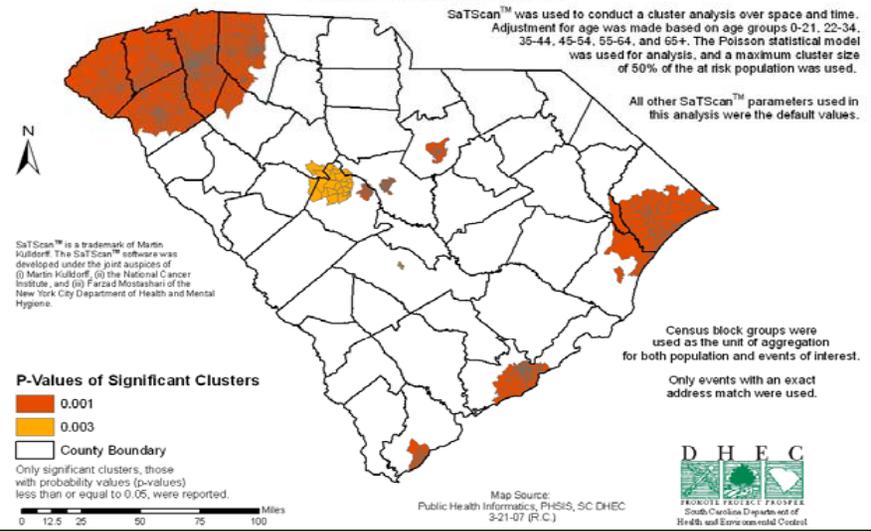


## Hot Spot Analysis of SC Violent Death Reporting System Occurrent Death Data per Population using Place of Injury Occurrence by County Subdivision in South Carolina 2004



Red Zones indicate areas where there is a "hot spot" of Events (i.e. more than expected by chance)  
Dark Blue Zones indicate areas where there is a "cold spot" of Events (i.e. less than expected by chance)

## Cluster Analysis Using Events of Interest in South Carolina from 1999 - 2003 using SaTScan™



SaTScan™ is a trademark of Martin Kulldorf. The SaTScan™ software was developed under the joint auspices of (i) Martin Kulldorf, (ii) the National Cancer Institute, and (iii) Farhad Mostafaei of the New York City Department of Health and Mental Hygiene.

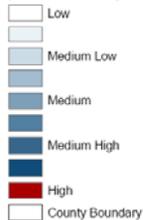
## Rate of Live Births to Mothers Who Reported Smoking During Pregnancy for 2004 in South Carolina

Only births with an exact address match were used. Addresses that were matched to a street, ZIP code centroid or county centroid were not used (e.g. Rural Routes and PO Boxes).  
Live Births: n = 45,304 out of 56,543  
Smoking Mothers: n = 6,457 out of 7,911

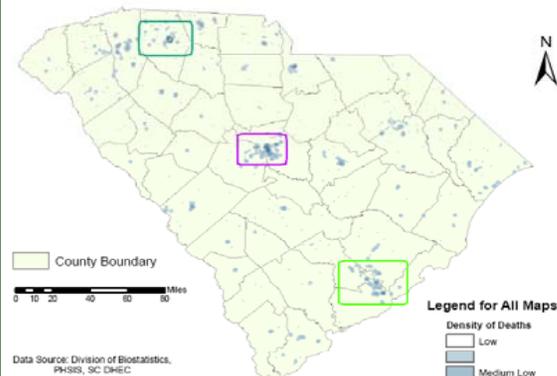
The density grid is composed of 100-meter cells. Cell values for the density grid were calculated by adding the number of events in a two-mile radius and dividing it by the search area, with the points closer to the center weighing more heavily than those closer to the edge.

Rates were calculated using the Distance Mapping and Analysis Program (DMAP) developed at the University of Iowa. A 2.5-mile grid that covered South Carolina was used to calculate the rates. Rates at each grid point were calculated by dividing the sum of numerator and denominator events within a specified radius, given by the filter size. To calculate the rate, a minimum denominator size of 40 events was required at each grid point.

### Density of Live Births to Smoking Mothers per 100m x 100m grid cell

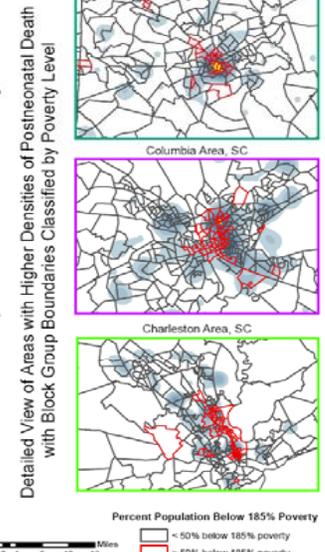


## Density of Postneonatal Deaths in South Carolina 2000 - 2004



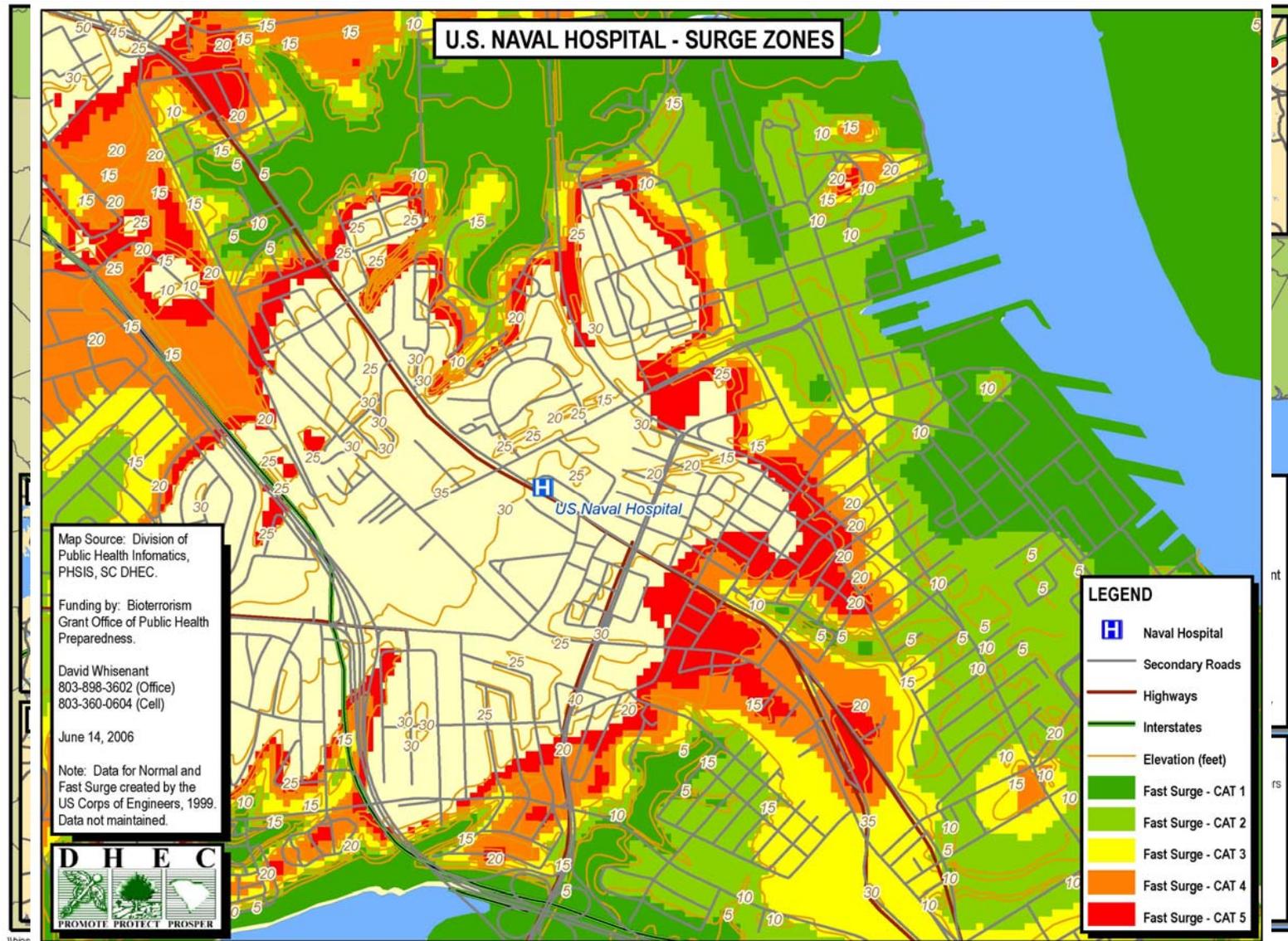
Only Postneonatal deaths that were geocoded to a street address were used. Deaths geocoded to a ZIP or County centroid were not used. Postneonatal Death is defined as the death of an infant from 28 days old to 364 days old.

Density grid is composed of 100-meter cells. Cell values for the density grid were calculated by adding the number of events in a two-mile search radius and dividing it by the search area, with the points closer to the center weighing more heavily than those closer to the edge.





# Emergency Mapping





# ReachSC/CHAN Notification



ReachSC - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites

Address <http://arcweb.emd.state.sc.us/ReachSC/viewer.htm?Service=REACHSC1> Go Links

Google Search Web Site popups allowed AutoFill Options

## Reach SC

South Carolina's Emergency Notification System

Layers Legend

**Layers**

Visible Active

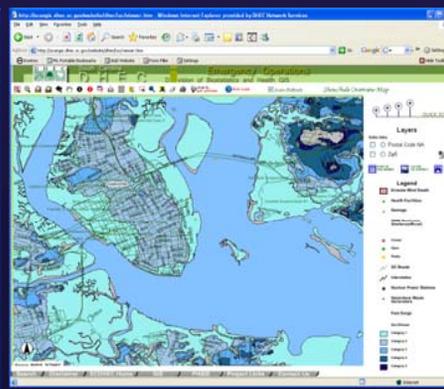
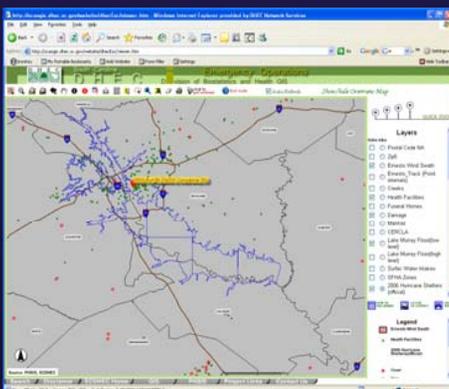
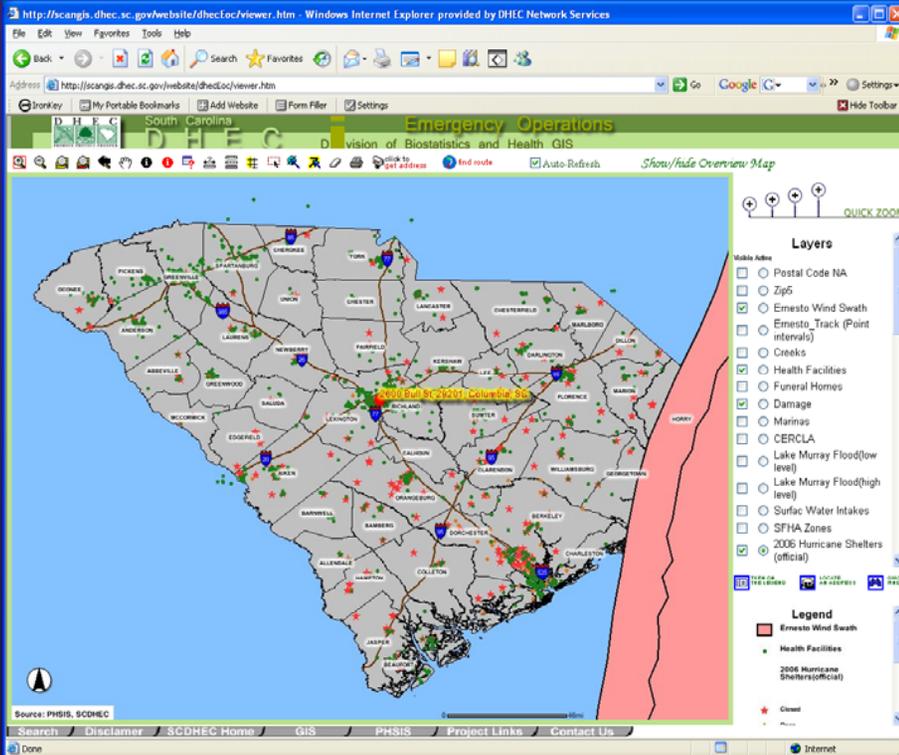
- RESIDENTIAL
- BUSINESS
- Railroads
- Interstates
- US Highways
- SC Highways
- Local Roads
- City Boundaries
- Area Codes
- Counties

Refresh Map

Print Internet



# EOC Drills Web-based Mapping



## Legend

- |   |                                   |                     |
|---|-----------------------------------|---------------------|
| Postal Code NA  | 2006 Hurricane Shelters(official) | Evacuation Areas    |
| Zip5  | Closed                            | Above I95           |
| Ernesto Wind Swath  | Open                              | Below Hwy 17 Bypass |
| Ernesto_Track (Point intervals)                                       | Ready                             | Below Hwy 17        |
| Creeks  | Evacuation Routes                 | East of I95         |
| Health Facilities   | Private Schools                   | Below ICW           |
| Funeral Homes   | Public Schools                    | Fast Surge          |
| Damage  | Census Blocks 2000                | Not Effected        |
| Marinas   | Heliports                         | Category 1          |
| Lake Murray Flood(low level)  | SC Roads                          | Category 2          |
| Surf Water Intakes  | Interstates                       | Category 3          |
| SFHA Zones  | Fire stations                     | Category 4          |
| Zone A: Inundated by 100-yr flooding; no BFE                          | Nuclear Power Station             | Category 5          |
| Zone AE: Inundated by 100-yr flooding with BFE                        | National Point Discha             | earthquake_buffers  |
| Zone AH: Inundated by 100-yr flooding (area of ponding)               | Infectious Waste                  | 10 Mile             |
| Zone ANI: area not in FIRM  | Hazardous Waste Generators        | 1 Mile              |
| Zone AO: Inundated by 100-yr flooding (sheet flow on sloping terrain) | Hazardous Dams                    | 5 Mile              |
| Zone UNDES: undesignated flood hazard                                 | Water Treatment Stations          | 2003_earthquakes    |
| Zone VE: Inundated by 100-yr flooding (with velocity hazard)          | Public Water Wells                | Counties            |



# CASPER: Community Assessment for Public Health Emergency Response



ArcPad Studio - SamplePoints7.apl

File Edit View ArcPad Tools Window Help

SamplePoints7.apl

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        - <EDIT> Contact
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      - <PAGE> Residence
      - <PAGE> Damage
      - <PAGE> Flood Water
      - <PAGE> Utilities
      - <PAGE> Health
      - <PAGE> Food

SC DHEC RNA Questionnaire

Site Residence

RNA survey date 6/26/2007

Cluster No. 18 Survey No. 12

Surveyor initial JW GIS code

Interviewee name

Additional information

SC DHEC RNA Questionnaire

Site Residence

What type of dwelling is this?

Single family  
2 to 5 family  
6 or more family  
Mobile home  
Other

How many people lived in the residence before the hurricane?

How many people slept in the residence last night?

How many younger than 2 years old?

How many 65 years or older?

SC DHEC RNA Questionnaire

Residence Damage

How much external damage was there from the hurricane to this residence?

None or minimal  
Damaged but habitable  
Damaged and uninhabitable

If damaged, do you need a tarp?

Yes  
No  
DK or I don't know

SC DHEC RNA Questionnaire

Flood/Water Utilities

How much flood water from the hurricane came into the residence?

None  
1 to 12 inches  
13 to 36 inches  
Greater than 3 feet  
Flooding unknown level  
DK or I don't know

SC DHEC RNA Questionnaire

Flood/Water Utilities

Do you have running water?

Where are you now getting your drinking water?

Do you have electricity?

If your house is hooked up to a natural gas line, is there natural gas?

Does indoor toilet work?

If no, is sanitary toilet available?

SC DHEC RNA Questionnaire

Utilities Utilities2

Do you have a working telephone?

Do you have a working battery operated radio?

Are you using a generator?

If yes, where is it?

Inside  
Garage  
Outside  
Other  
DK

Are you using charcoal indoors?

SC DHEC RNA Questionnaire

Utilities2 Health

Was anyone injured in the residence due to the hurricane?

Has anyone in the residence gotten sick since the hurricane?

Does anyone in the residence now require medical care?

Are the effects of the hurricane stopping anyone in the residence from obtaining medical care?

Has anyone in the residence suffered from significant stress since the hurricane?

SC DHEC RNA Questionnaire

Health Food

Do you have access to enough food for everyone in the residence for the next 3 days?

What is your greatest need at the moment?

SC customized application based on World Health Organization two-phase sampling method & Mobile GIS work, training, and technical support provided by Mr. Steve Ramsey and the NC Public Health Regional Surveillance Team 5

ArcPad Studio - ArcPad.apl

File Edit View ArcPad Tools Window Help

ArcPad.apl

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  - <PAGE> Health
  - <PAGE> Food

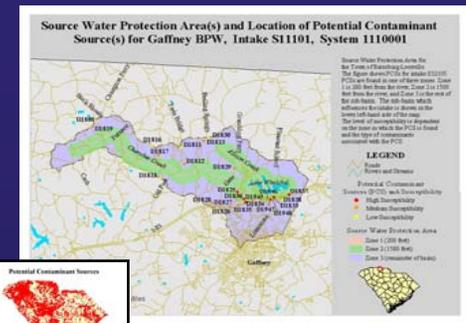
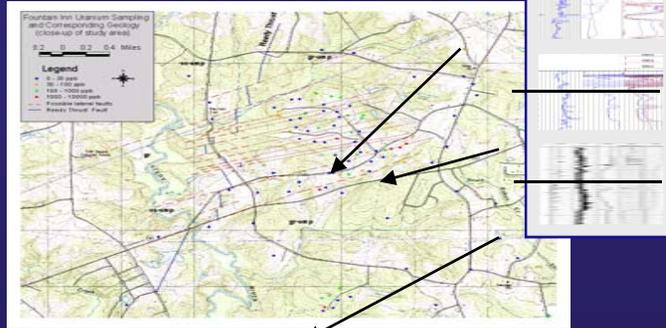


# Environmental Program Mandates & GIS



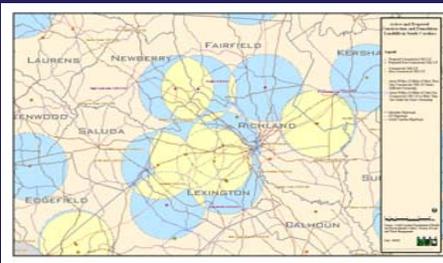
- CERCLA (*Superfund*)
- RCRA
- Brownfields
- MS4's
- Federal Facilities Agreements
- Solid Waste Permitting
- Emergency Response
- Underground Storage Tanks
- Agricultural Farm Permitting
- Sludge Applications
- Hydrogeomorphic Analyses
- Fish Advisories
- Water Quality Monitoring
- Water Use Program
- 208 Service Areas
- Air Monitoring and Modeling
- Storm Water Permitting
- Reliability Classifications
- Swimming Advisories
- 319 Mandates
- 305b Reports
- Reliability Classifications
- TMDL Development
- Watershed Strategies
- Watershed Delineations
- Shellfish Sanitary Surveys
- Beach Monitoring Activities
- Source Water Protection
- 401 Certification Reviews
- 303(d) Impaired Waters List
- Well Head Protection Areas
- Uranium/Radium Monitoring
- GIS Data Clearing House

## Contaminant Assessment

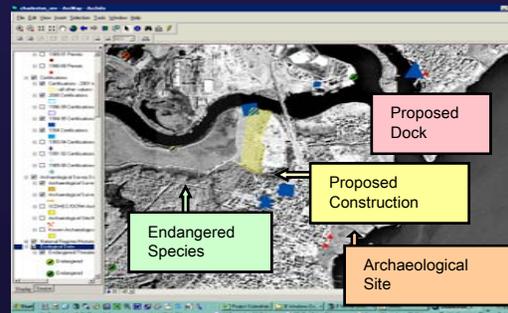


## Protection

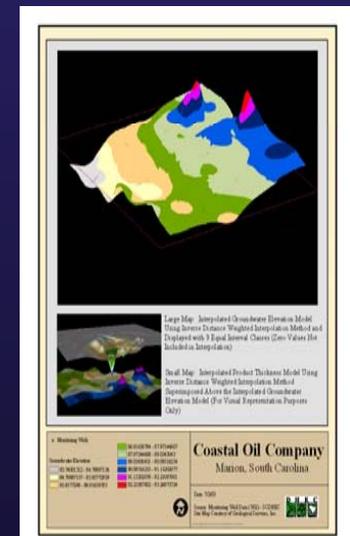
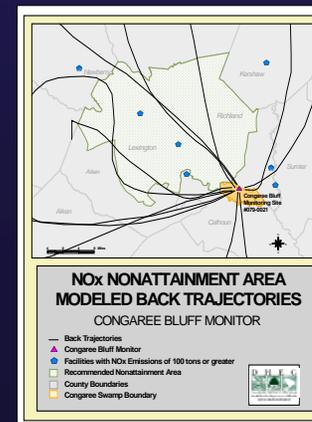
## Site Selection



## Permitting



## Construction Impact Reviews



## Modeling



# Spatial Data Collection Methods



Record	Address	Longitude	Latitude
199701986	RICHMOND RD (RT 250 E	0	0
199702733	RESERVOIR RD	0	0
199704052	BROADWAY ST	0	0
199705980	RICHMOND RD (RT 250 E	0	0
199706107	LEAKE SQUARE	0	0
199706662	RT 715	0	0
199707304	BOAZ RD	0	0
199708888	SCOTT CT	0	0
199710208	RT 618	0	0
199800639	JARMANS GAP RD	0	0
199801829	BRANCH HILL RD	0	0
199802486	5TH ST EXT	0	0
199802632	WHITEWOOD RD	0	0
199804637	RT 602	0	0
199804758	TROPHY CHASE APTS	0	0
199804898	AIRPORT RD	0	0

Current address: RT 618  
 New address: RT 618  
 City:   
 State:  Zip:   
 Coordinates:  
 Current lat:   
 New lat: 32.245  
 Current long:   
 New long: -117.790

Use mouse to highlight a specific record. Type the city, state and zip code in. Click Online Geocode or Find on Map to find the new latitude and longitude coordinates.

Online geocoding provided by [MapBlast.com](http://MapBlast.com)

## GEOCODED RECORDS

Address Matching to Known Coordinates  
 Accepted Methodology for Health Records  
 Does Not Meet FGDC standards

## GPS COLLECTION

Meets FGDC standards  
 Layer Generation-Data Dictionary

Shore Survey

Site Details | NPS Info

NPS ID: 6 SF Area: 02  
 Primary Officer: Kinsey, Marshall  
 Secondary Off.: Newell, Charles  
 Date Visited: 5/17/2005  
 Station No.: 02 Suffix: B  
 Harvest Class: Approved  
 Collection Method: GPS-DC

OK Cancel



MiraMon: Land Cover Map (1993), Map sheet 420-2-1, Rubi. (CREAF-DARP)

Digitize/Edit vector... F2  
 Undo BKSPACE  
 Connect upon previous vector... F3  
 End object Right button  
 Change digitizing attribute F4  
 Copy object and attribute Ctrl+K  
 Copy object (current attribute) Ctrl+C  
 Highlight copied objects  
 End digitizing/editing F5  
 Edit vector  
 Build topology (1)

## DIGITIZING

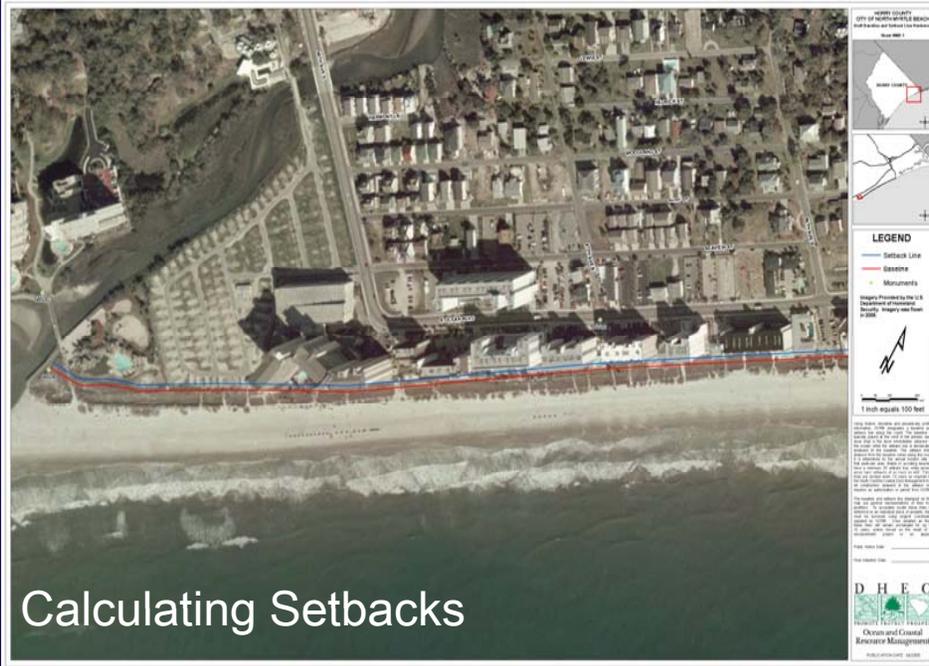
Meets FGDC standards

- Obtain location maps from permit application
  - Tabular coordinates from applicant often not reliable
  - Request additional maps/digital files from applicant as needed
  - Digitize data





# Imagery for Digitizing, Analysis and Permitting



Calculating Setbacks



Pictometry





# Layers Developed & Maintained by SCDHEC



## **PUBLIC HEALTH STATISTICS & INFORMATION SERVICES** *(GPS, Geocoded)*

American Red Cross & Hurricane Shelters  
Helicopter Pads (559)  
Health Facilities – Hospitals (1,454)  
SC Live Births (1990-2004) ~ 55,000/yr  
Food Service Facility (~16,000)  
SC Deaths (1990-2004) ~35,000/yr  
Cancer Incidence/Mortality (SEER)  
Health Departments / Clinics (67)  
Lead Incidence (~40,000)  
Radon Incidence (~5000)  
Postal Facilities (350)  
Potential/Official Shelters (7,222 / 280)  
Funeral Homes (~500)  
NVDRS Data  
Licensed Daycare Facilities  
SNS Locations/Armories/Tier II/Model Runs/  
Staff / EMS / etc...

## **OCEAN AND COASTAL RESOURCES MANAGEMENT** *(GPS, Digitized)*

Boat Ramps (45)  
Certifications (4,466)  
Coastal Barrier Act Units (24)  
Critical Area Boundary Line (1)  
Dock Master Plans (197)  
Intra-coastal Waterway Boundary (1)  
Marinas (145)  
Navigations Channels (9)  
OCRM Boundaries (1)  
National Estuarine Research Reserves (4)  
Permits (7,899) Port Locations (8)

## **BUREAU OF WATER** *(GPS, Digitized)*

Agricultural Facilities and MUA's (25,954)  
Ambient Ground Water Quality Stations (114)  
Macroinvertebrate Stations (370)  
Capacity Use Monitoring Wells (570)  
Fish Tissue Monitoring Sites (221)  
Water Quality Monitoring Stations (910)  
Hazardous Dams (2,275)  
Known Ground Water Contamination Sites (2,899)  
NPDES (4,273)  
Potential Ground Water Contamination Sites (432)  
401 Certifications (5,949)  
Source Water Protection Areas (SWPA) (2,681)  
Public Water Supply Wells (5,037)  
SWPA Potential Contamination Sites (15,000+)  
Recreational Waters (54)  
Well Head Protection Zones (226)  
Navigable Water Permits (738)  
Shellfish Harvest Classifications (1,815)  
Shellfish Monitoring Sites (547)  
Modeled Stream Segments (State Waters:1:100K)  
Surface Water Intakes (80)  
Fish Advisories (State Waters:1:100K)  
Mitigation Banks/ Sites (983)  
Water Quality Classifications (State Waters:1:100K)  
Beach Monitoring Sites (120)  
Navigable Waters (State Waters:1:100K)  
Nationwide Permits (369)  
Watershed Boundaries (1,032)

## **BUREAU OF LAND AND WASTE MANAGEMENT** *(GPS, Geocoded)*

SAR (NPL & State) Sites (834)  
Drycleaning Sites (779)  
Mining Sites (855)  
Aboveground Storage Tanks (869)  
Comprehensive, Env Response, Compensation  
Compliance and Enforcement Sites (5,329)  
Municipal SW Transfer Stations (42)  
Solid Waste Processing Sites (23)  
Infectious Waste Generators (4,600)  
Tire Recycling/Collection Sites (25)  
Used Oil Collection/Processing Sites (11)  
Radiological Waste Generators (464)  
Compost/Wood Chipping/Shredding Sites (164)  
TSD Sites (72)  
Waste Land Application Sites (16)  
Public Recycling Centers (766)  
Hazardous Waste Generators (6,572)  
Underground Storage Tank Sites (11,331)  
Construction & Demolition Landfills (348)  
Municipal and Industrial SW Landfills (565)  
Nuclear Power Stations (6)

## **BUREAU OF AIR** *(GPS, Digitized)*

Air Monitoring Stations (215)  
Inactive Air Monitoring Stations  
Air Regulated Facilities (2,979)

*Not complete listing.....*



# Level of Spatial Accuracy



## GIS Data Accuracy Tiers

Method	Apparatus	Process	Highest Possible Tier Shown
Column Width: 15 Column Type: Text Column Name: Method	Include in Metadata	Include in Metadata	Column Width: 2 Column Type: Short Integer Column Name: Tier
<b>GPS1</b>			
	Survey Grade GPS	Real Time Differential Correction Post Processed Correction with (Roving Base Station)	1
	Trimble Pro XRS	Real Time Differential Correction Post Processed Correction (Radio Link Up)	2
	Trimble Pro XRS	Real Time Differential Correction Without Post Processing (Radio Link Up)	2
	Trimble Pro XRS	Post Processed Data Radio Link Down	2
	Trimble Pro XL	Post Processed Data	2
	Trimble Pro XL	Without Post Processing	5
	Teletype	WAAS Enabled Real Time Differential Correction without Post Processing (PDOP set and averaging)	2
<b>GPS2</b>			
	Magellan	Without Post Processing	6
	Garmin Etrex	WAAS Enabled Real Time Differential Correction Without Post Processing (#SV above On Screen Accuracy of 10 mete or better	3
	Garmin Etrex	WAAS Disabled or Limited Satell	
<b>Survey</b>			
	Total Station (Theodolite)	Licensed Tier A Surveyor Using Known Benchmark	
	Manual Survey	Licensed Tier A Surveyor Using Known Benchmark	
	Imported CAD Files	Surveyed by Licensed Tier A Surv	
	Manual Survey	Non Licensed Surveyor or Not Using a Known Benchma	
<b>Manual</b>			
	Digitizing Tablet	Digitize map features Using a high quality digitizer	
	On-Screen Digitizing	Digitize map features Using other GIS layers as base	
	Computed Coordinates	Computed coordinates from hardc map entered into GIS Using on-screen digitizing or dire coordinate entry	

	Coordinate Entry	X, Y Coordinate entry via a database (dependent on data source)	3
<b>Geocode</b>			
	Address Match	Match to the exact address using an address data source of known accuracy	5
	Address Match	Match to the nearest Street Range or Nearest Intersection using an address data source of known accuracy	7
	Address Match	Match to the Street	8
	Address Match	Match to the Zip Code Centroid (5 digit zip, Zip plus 2, Zip plus 4) PO Box	9
	Address Match	Match to the County Level Centroid	10
*Address matching is dependent upon many variables including the density of the roads, the spelling sensitivity of the software, the match criteria, etc. A GIS developer should determine the accuracy on a case by case basis, but in most instances, the Tier would not exceed 8.			
<b>Raster</b>			
	Spot Imagery	Coordinates or features derived from SPOT Imagery - Using on-screen digitizing or image itself	3
	Landsat Imagery	Coordinates or features derived from Landsat Imagery - Using on-screen digitizing or image itself	5
	High Resolution Commercial Imagery	Coordinates or features derived from EarlyBird, IRSC, etc. - Using on-screen digitizing or image itself	2
	NAAP	Coordinates or features derived from NAAP photography - Using on-screen digitizing or image itself	2
	DOQQ	Coordinates or features derived from DOQQ imagery - Using on-screen digitizing or image itself	2

### Attributes of bw.SDE.NPDES

FEATURE	NPDES	PIPE_	NAME	Activity	Fac_Type	Method	Tier
▶ ENDPipe	ND0068179	001	DAUFUSKIE ISLAND CLUB & RESORT	Active	Domestic	GPS1	2
BLDG	ND0068179		DAUFUSKIE ISLAND CLUB & RESORT	Active	Domestic	GPS1	2
▶ ENDPipe	ND0062286	001	HAIG POINT/MELROSE WWTP	Active	Domestic	GPS1	2
BLDG	ND0062286		HAIG POINT/MELROSE WWTP	Active	Domestic	GPS1	2
▶ ENDPipe	SC0042501		SOUTH ISLAND PSD WWTP	Active	Municipal	GPS1	2
BLDG	SC0042501		SOUTH ISLAND PSD	Active	Domestic	GPS1	2
▶ ENDPipe	ND0064033	001	SOUTH ISLAND PSD	Active	Domestic	GPS1	2
BLDG	ND0064033		SOUTH ISLAND PSD	Active	Domestic	GPS1	2
▶ ENDPipe	SC0042501	002	SOUTH ISLAND PSD WWTP	Active	Municipal	GPS1	2
▶ ENDPipe	SC0048127	001	BJW&SA/HARDEEVILLE-DELTA PLANT	Inactive	Municipal	Manual	4
BLDG	SC0048127		BJW&SA/HARDEEVILLE-DELTA PLANT	Inactive	Municipal	Manual	4
▶ ENDPipe	SC0047724	001	SOUTH ISLAND PSD RO WTP	Active	Municipal	Manual	4
BLDG	SC0047724		SOUTH ISLAND PSD RO WTP	Active	Municipal	Manual	4
▶ ENDPipe	SC0042501	003	SOUTH ISLAND PSD WWTP	Active	Municipal	GPS1	2
▶ ENDPipe	SC0042501	001	SOUTH ISLAND PSD WWTP	Active	Municipal	GPS1	2
BLDG	SCG750023		ISLAND CARWASH	Inactive	Industrial	Manual	4
▶ ENDPipe	SCG750023	002	ISLAND CARWASH	Inactive	Industrial	Manual	4

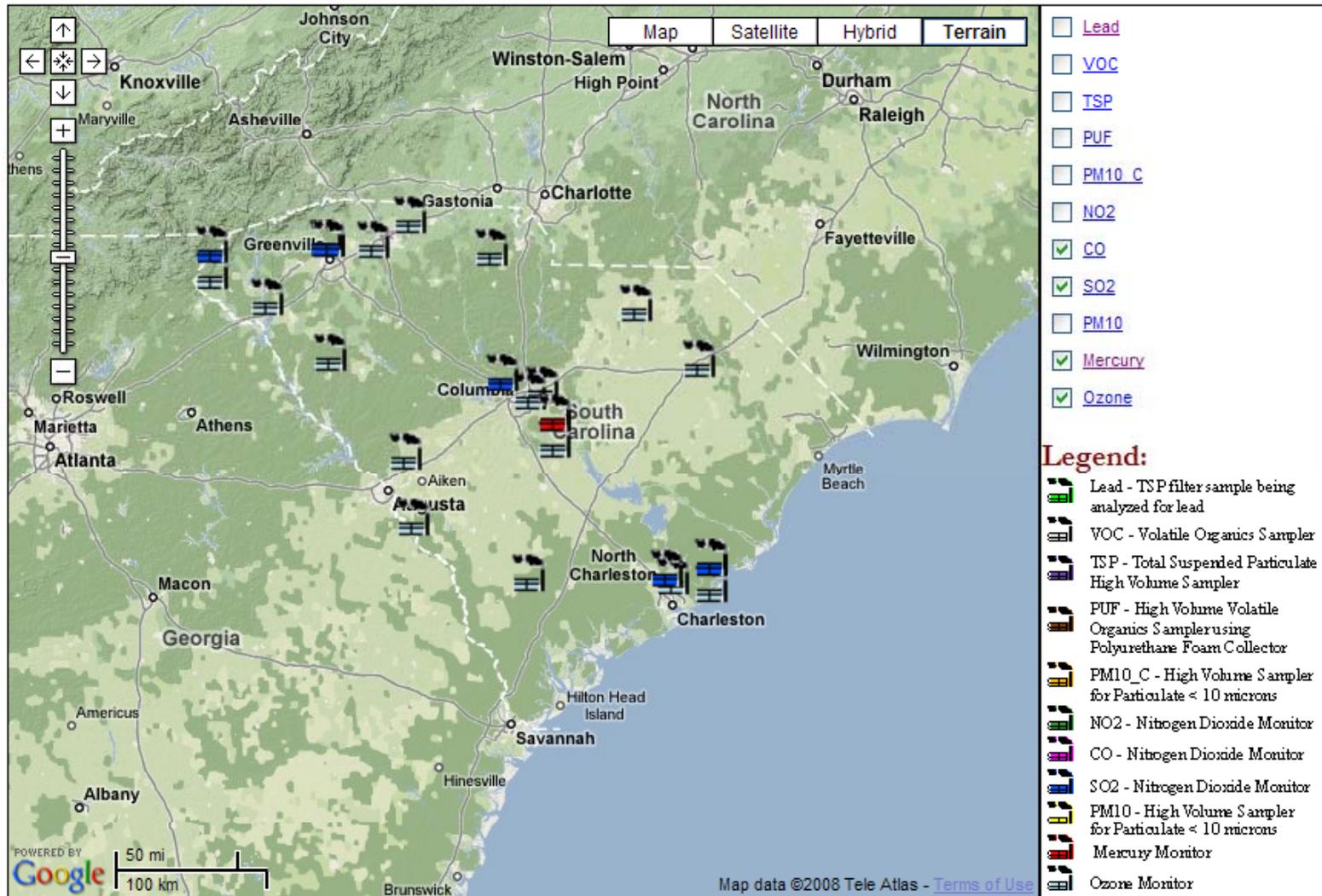


# Mash Up with Google API – AIR

Application Programming Interface



## Ambient Air Monitoring Network - South Carolina





# Mash Up with Google API - UST



## Underground Storage Tanks - Search Application

Search for UST by county name

Search for UST by site number

Search for UST by address

COUNTY:

Site Number:

Address:

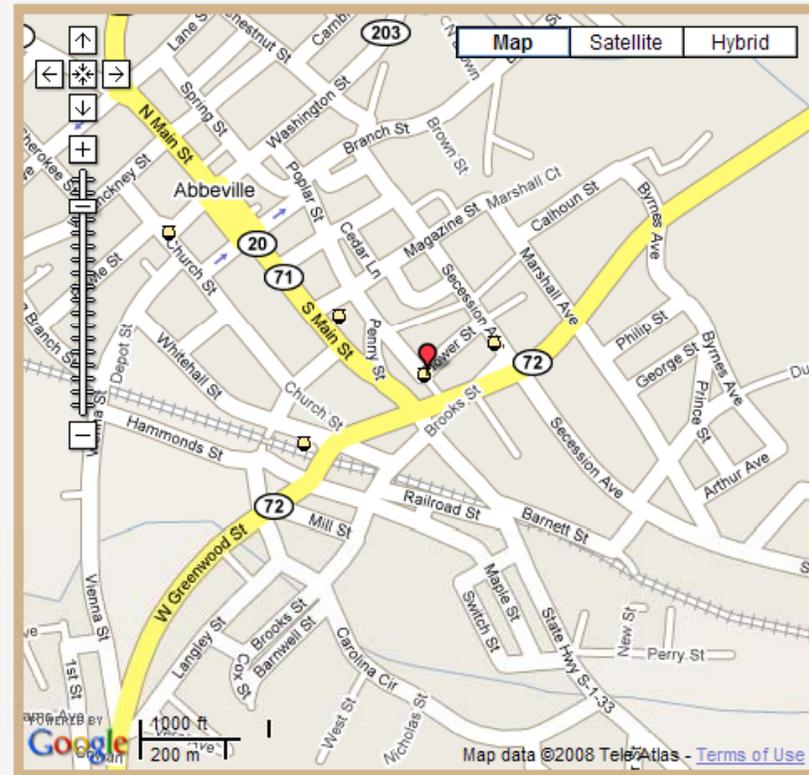
### Underground Storage Tanks Information

Site Number	Company Name	Address	City	State	Zip	County	
14925	DILLS QUICK SHOP	406 CHURCH ST	HONEA PATH	SC	29654	Abbeville	<input type="button" value="Mapit"/>
00037	O'DELLS GROCERY	212 COLLEGE ST	DUE WEST	SC	29639	Abbeville	<input type="button" value="Mapit"/>
18260	CARLISLE SHELL	HWY 72 & 81	CALHOUN FALLS	SC	29	Abbeville	<input type="button" value="Mapit"/>
00046	ROCKET SERVICE STATION	RTE 5 PO BOX 310	ABBEVILLE	SC	29620-9329	Abbeville	<input type="button" value="Mapit"/>
00029	FARM STORE	GREENWOOD HWY & MAIN ST	ABBEVILLE	SC	29620	Abbeville	<input type="button" value="Mapit"/>
00025	CORNER STOP 26	305 S MAIN ST	ABBEVILLE	SC	29620	Abbeville	<input type="button" value="Mapit"/>
15709	RONDY & CO INC	584 HWY 28 BYPASS	ABBEVILLE	SC	29620	Abbeville	<input type="button" value="Mapit"/>
04720	HALLS GROCERY	5497 HWY 252	DONALDS	SC	29638	Abbeville	<input type="button" value="Mapit"/>
00441	PIT ROAD	845 HWY 178 N	HONEA PATH	SC	29654	Abbeville	<input type="button" value="Mapit"/>
17761	KENNEDYS EXXON STATION	477 E SAVANNAH ST	CALHOUN FALLS	SC	29628	Abbeville	<input type="button" value="Mapit"/>

[1](#) [2](#) [3](#) [4](#) [5](#)

### Release Information

RELEASE	1
RELEASE_DATE	12/30/1991 12:00:00 AM
CLEANUP_COMP	11/19/2002 12:00:00 AM
QUALIFIED_IND	Y
RBCA_CLASS_CODE	CLASS4BC





# Web Map Services and Applications



## ArcIMS Watershed Management Information

SCDHEC Watershed Management Information - Microsoft Internet Explorer

Address: <http://dhecnetgis.dhec.sc.gov/website/water/viewer.htm>

SCDHEC Watershed Management Information

Water Monitoring Sites is now the Active Layer

Health and Environmental Control  
GIS EQC Project Links Contact Us

### EMR Mapping Application

EMR Mapping Application

Map Contents

- emrall
  - Primary Sites
    - Nuclear Power Stations
    - Hazardous Dams
    - Surface Water Intakes
    - Public Water Supply Wells
    - Tier II Facilities
  - Emergency Response Infrastructure
    - Health Dept. Clinics
    - Health Facilities
    - Fire Department Stations
    - Hurricane Shelters
    - National Guard Sites
    - COBRA Advanced Teams
    - COBRA Basic Teams
    - EQC District Offices
  - Regulated/Permitted Sites
  - Monitoring Sites
  - Cultural Sites
  - Transportation
  - Utilities

Done Local Intranet

ArcGIS Server will be used to deploy 'Monitoring' and 'Environmental Public Health Tracking' Applications.



# Layer Creation and Permit Reviews



**DHEC Bureau of Water: GIS Update v 1.5**

**Reports**

**EFIS GIS Maintenance**

Search Criteria

Permit Number: 2003-1E-158-P

Permit ID: WQC-06688

Applicant Name: FOLLY BEACH UNITED METHC

Permit Manager:

Permit Type: WTR-401CERTIFICATION

Utilities

Coord. Conv.

Bureau of Water

Basin: Santee Basin Num: 3

Watersd. Unit - Level 5: 03050202070 Quad: JAMES ISLAND

County Number: 019 GIS Date: 6/9/2003 7:39:26 PM

Waterbody: FOLLY RIVER VERIFICATION NEEDED

Stream Classification: SFH VERIFICATION NEEDED

Mapping Coordinates

UTM UTM North: 3614025.72398755 UTM East: 598959.002039849

Decimal Degrees Longitude: -79.944722 Latitude: 32.659444000001

Deg Min Sec Longitude: 79 56 40.999 Latitude: 32 39 33.998

Plot Point

14882.53 Meters

Zoom in by clicking a point or dragging a box

form  
tes  
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rect,  
teates  
e.

info.

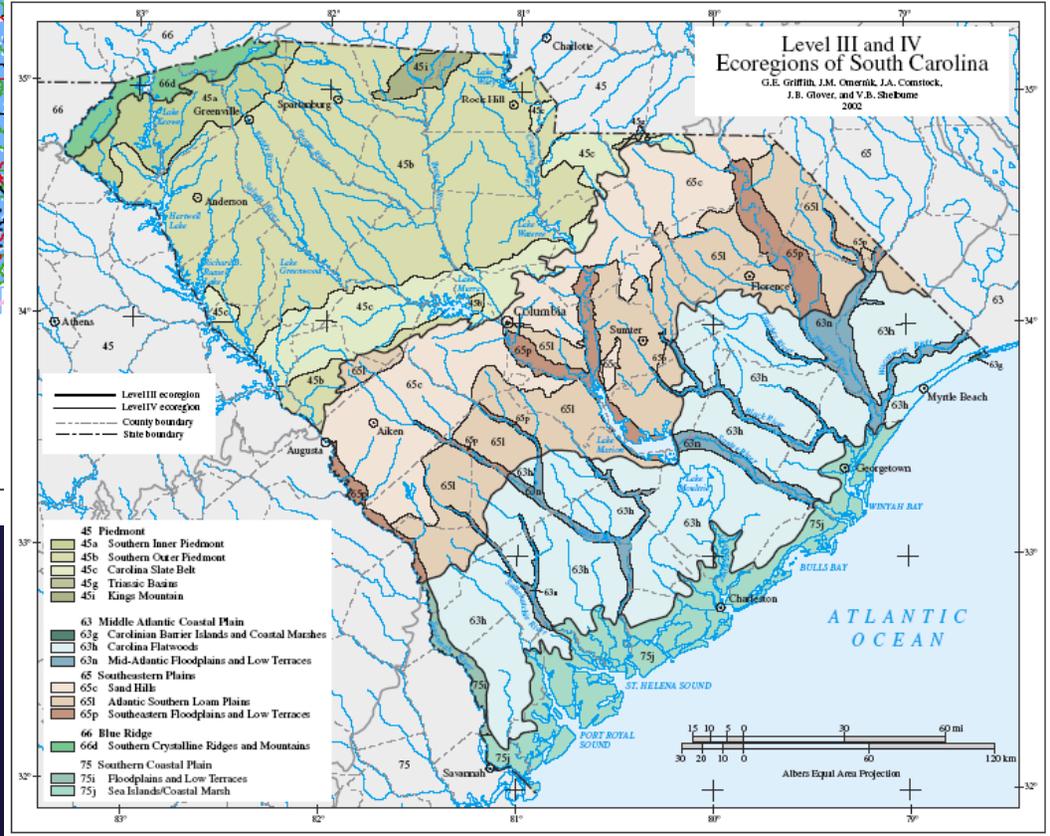
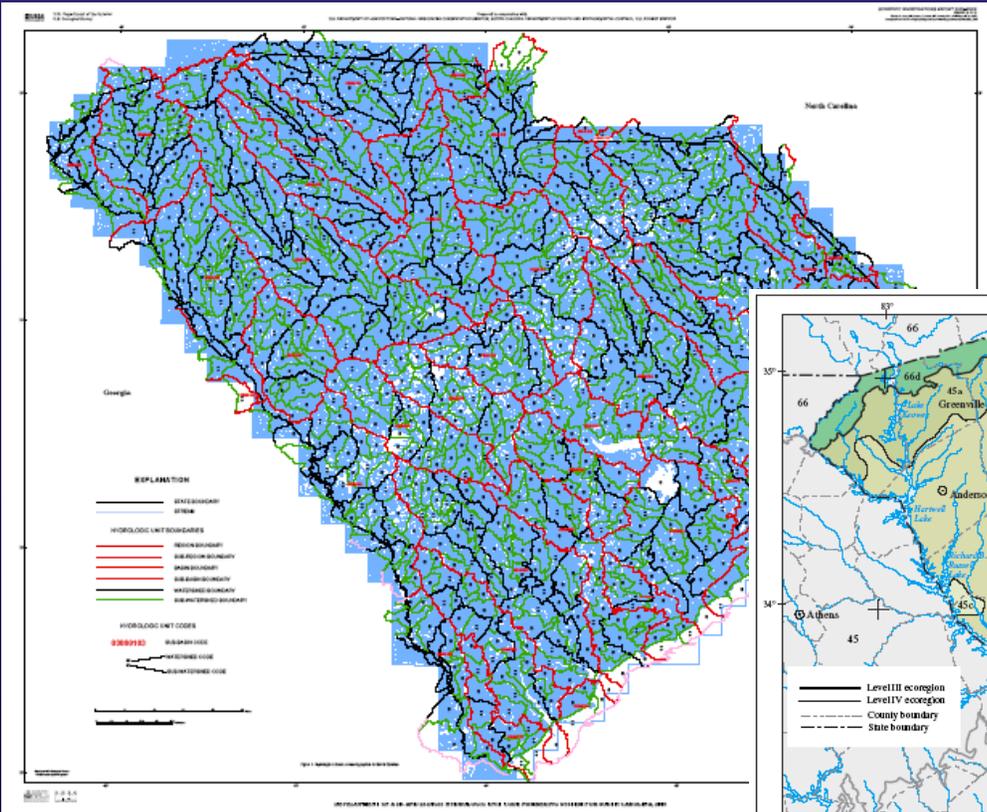
Populates form with information from Environmental Facility Information System (EFIS).  Note graphic to display potential site location



# National Mandates



## Watershed Boundary Dataset (WBD)



## Level III and IV Ecoregions

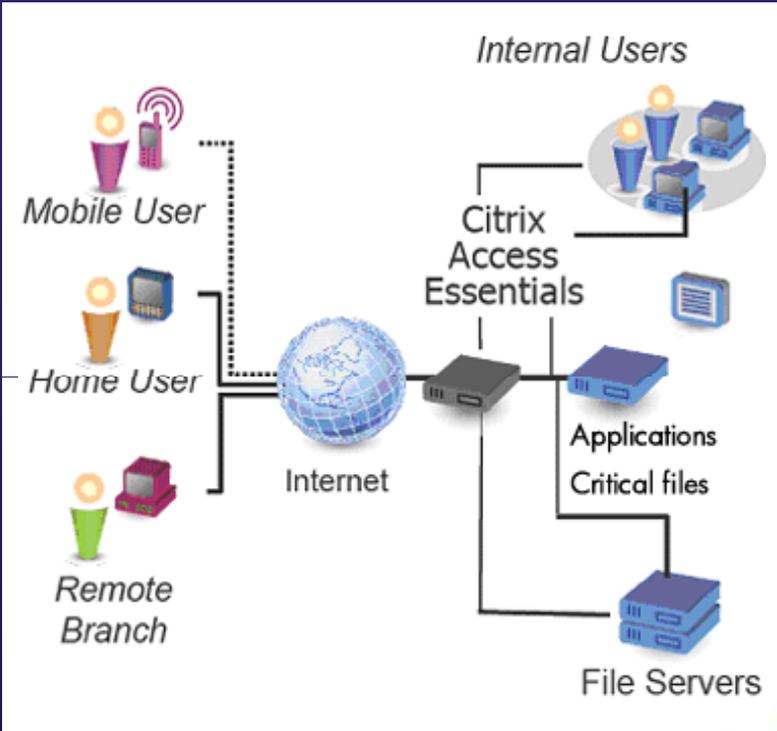


# Citrix Presentation Server

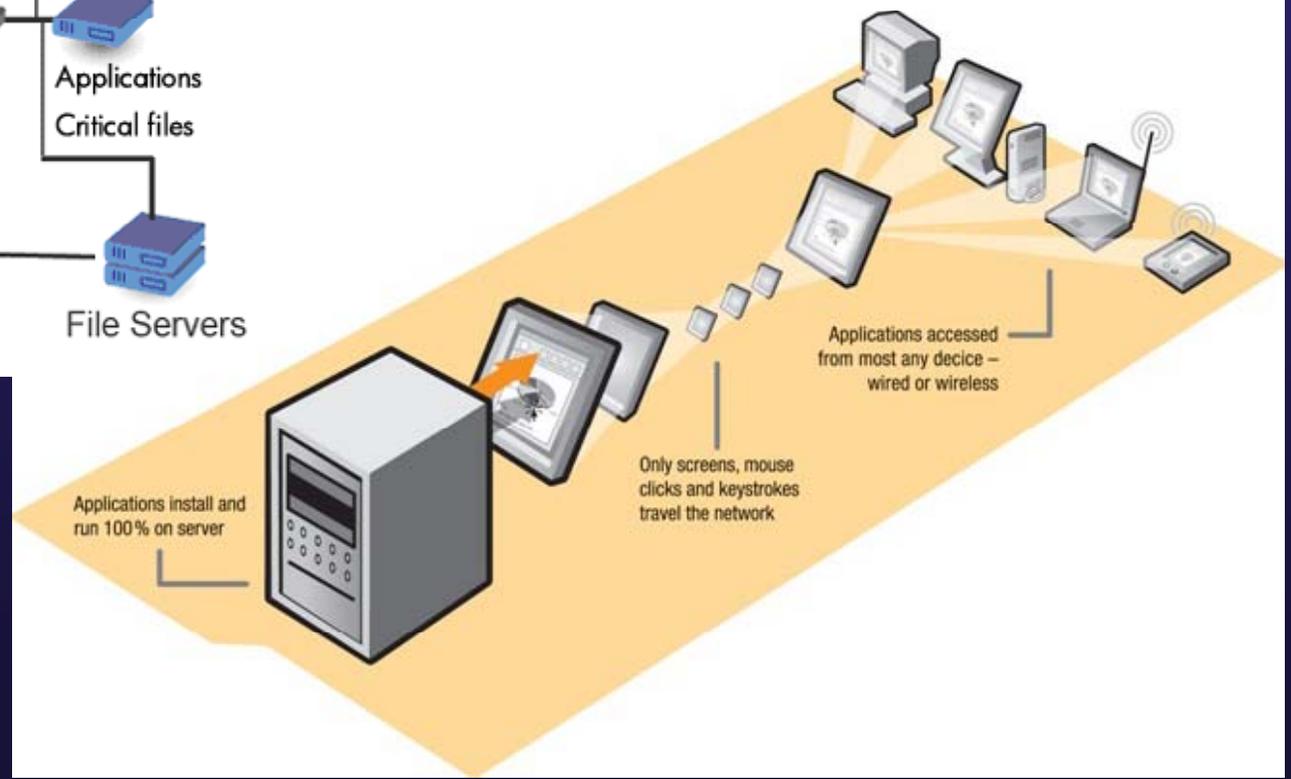


55 ArcView 9.3 Licenses  
 10 ArcInfo 9.3 License  
 480 User Accounts

- Simplification of Updates
- Reduced Network Bandwidth
- Enhanced User Support through Remote Control



4 Application Servers  
 1 File Server  
 1 Database Server  
 1 Printer Server  
 1 ArcIMS Server  
 2 Web Servers



Citrix and GIS Accounts



# Citrix Presentation Server



Web Interface Log In - Windows Internet Explorer provided by DHEC Network Services

http://webintraface.dhec.sc.gov/Citrix/AccessPlatform/auth/login.aspx

**CITRIX** Web Interface For Intranet

**Log in**

User name:

Password:

**Welcome**

**Please log in**

To log in, enter the credentials required, and then click Log In.

If you do not know your log in information, please contact your help desk or system administrator.

**Message Center**

The Message Center displays any information or error messages that may occur.

**i** If you wish to use the latest Citrix Presentation Server Client, you can install it. After installation, you must restart your browser.

[Download the Citrix Presentation Server Client for 32-bit Windows](#)

Other clients are available from [the Citrix client download site](#)

This site contains confidential information protected by state and federal law. Access is restricted to authorized users who agree to protect the security and privacy of this information. Unauthorized access or misuse of this information is prohibited and may subject you to civil and criminal penalties.

Citrix Access Platform - Windows Internet Explorer p

http://webintraface.dhec.sc.gov/Citrix/AccessPlatform

**CITRIX** Web Interface For Intranet

**Applications**

Top Up

ArcInfo 9.3	ArcView 9.3	Active Directory Users and Computers
ArcIMS - Author	ArcIMS - Designer	ArcInfo 9x - Arc
ArcInfo 9x - ArcCatalog	ArcInfo 9x - ArcCatalog - BLWM	ArcInfo 9x - ArcGlobe
ArcInfo 9x - ArcMap	ArcInfo 9x - ArcMap - BLWM	ArcInfo 9x - ArcScene
ArcPad 7	ArcPad Application Builder 7	ArcReader 9x
ArcView 3x	ArcView 9x - ArcCatalog	ArcView 9x - ArcMap
Citrix Management Console	Command Prompt	Crystal Reports for ArcGIS



# Questions



[Click Here](#)