

# Public Health Distributed Geospatial Intelligence Network (PH-DGINet) Pilot



**Jim Tobias, GISP** BearingPoint Contractor to the National Center for Public Health Informatics, CCHIS, CDC

**John Stinn, MA** BearingPoint Contractor to the National Center for Public Health Informatics

**Carl Kinkade, MCRP, GISP** BearingPoint Contractor to the National Center for Public Health Informatics

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# Overview



- ❑ Background
  - ❑ The Biosurveillance Current State vs. the Future Model
  - ❑ Enterprise GIS and the Geospatial Line of Business
  
- ❑ Public Health Distributed Geospatial Intelligence Network (PH-DGINet)
  - ❑ Data Grid, Collaboration Grid, and Visualization Services
  
- ❑ Proof-of-Concept
  - ❑ Goals
  - ❑ Partners
  - ❑ Progress-to-date
  - ❑ Demonstration

# Before we talk about PH-DGInet....DGInet.

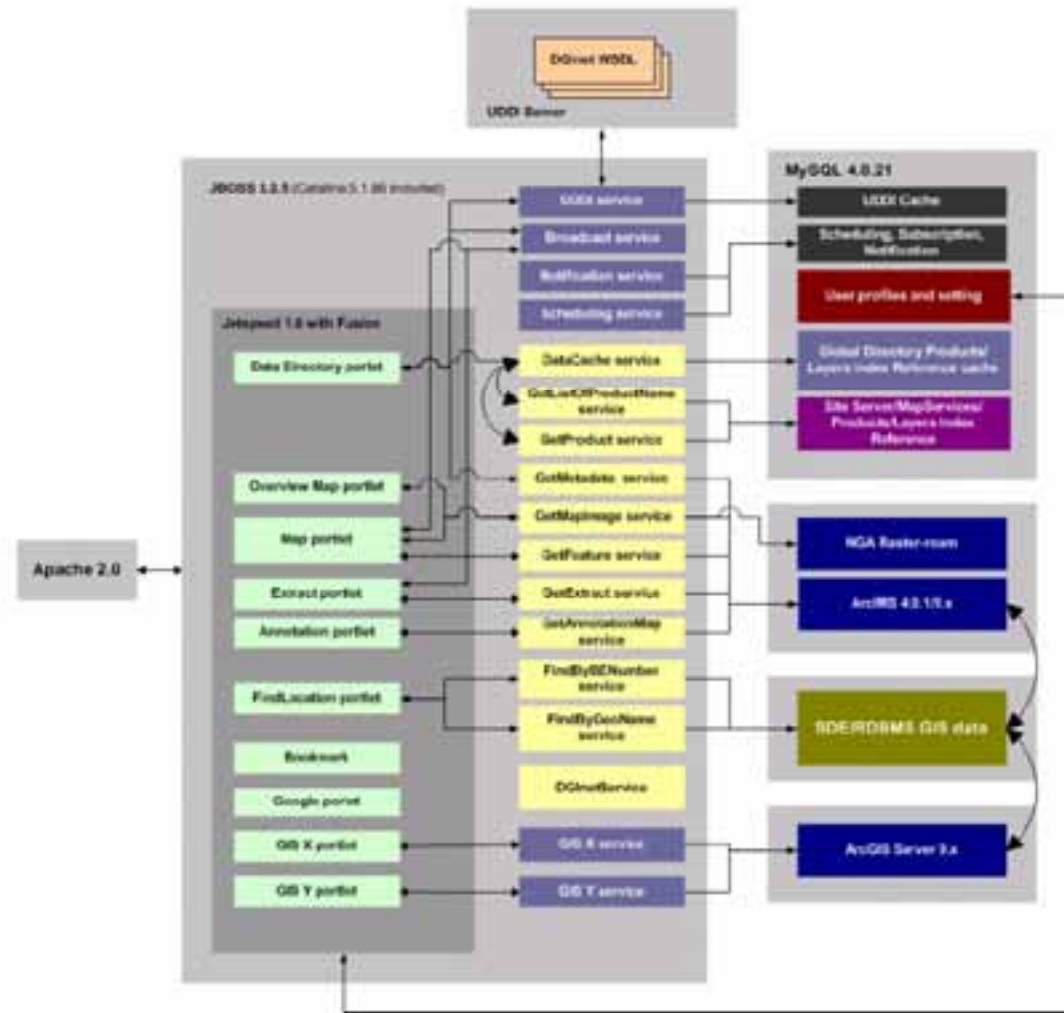


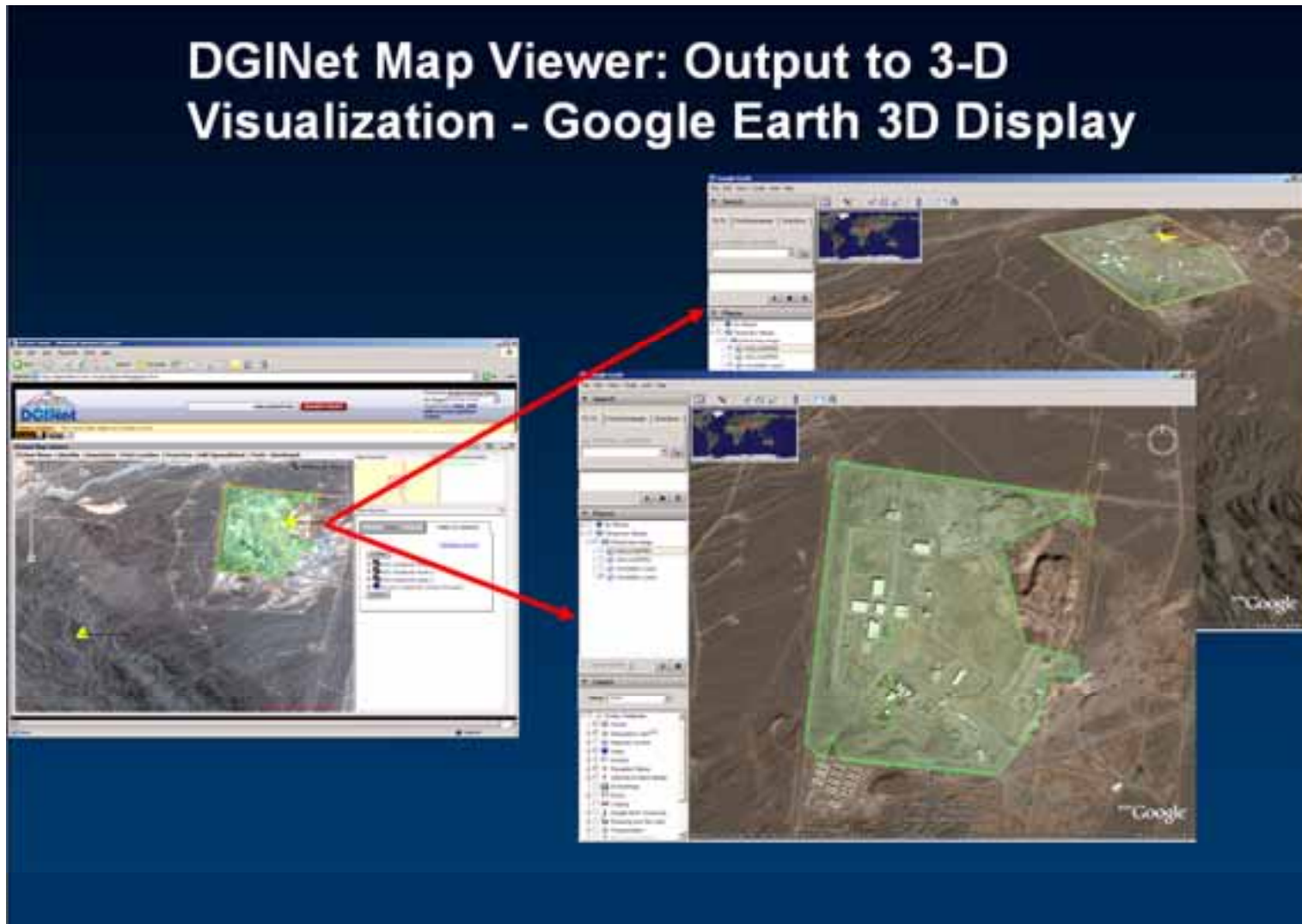
Figure 3 DGInet Architecture Detail

Apache  
JBoss  
Python  
UDDI  
WSDL

OGC Standards

OGC Viewer support

# DGINet Support for Google Earth



Source: ESRI

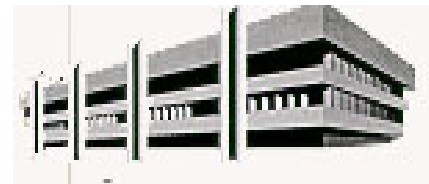
# Current State of Public Health Surveillance



- ❑ Intensive data gathering from medical facilities and state & local health departments into a giant CDC owned data warehouse



CDC



State, County, and Local Health Departments

- ❑ Heavy use of statistical algorithms to detect anomalies in the data and trigger investigations



Laboratories

- ❑ CDC Centric Approach to developing and deploying software

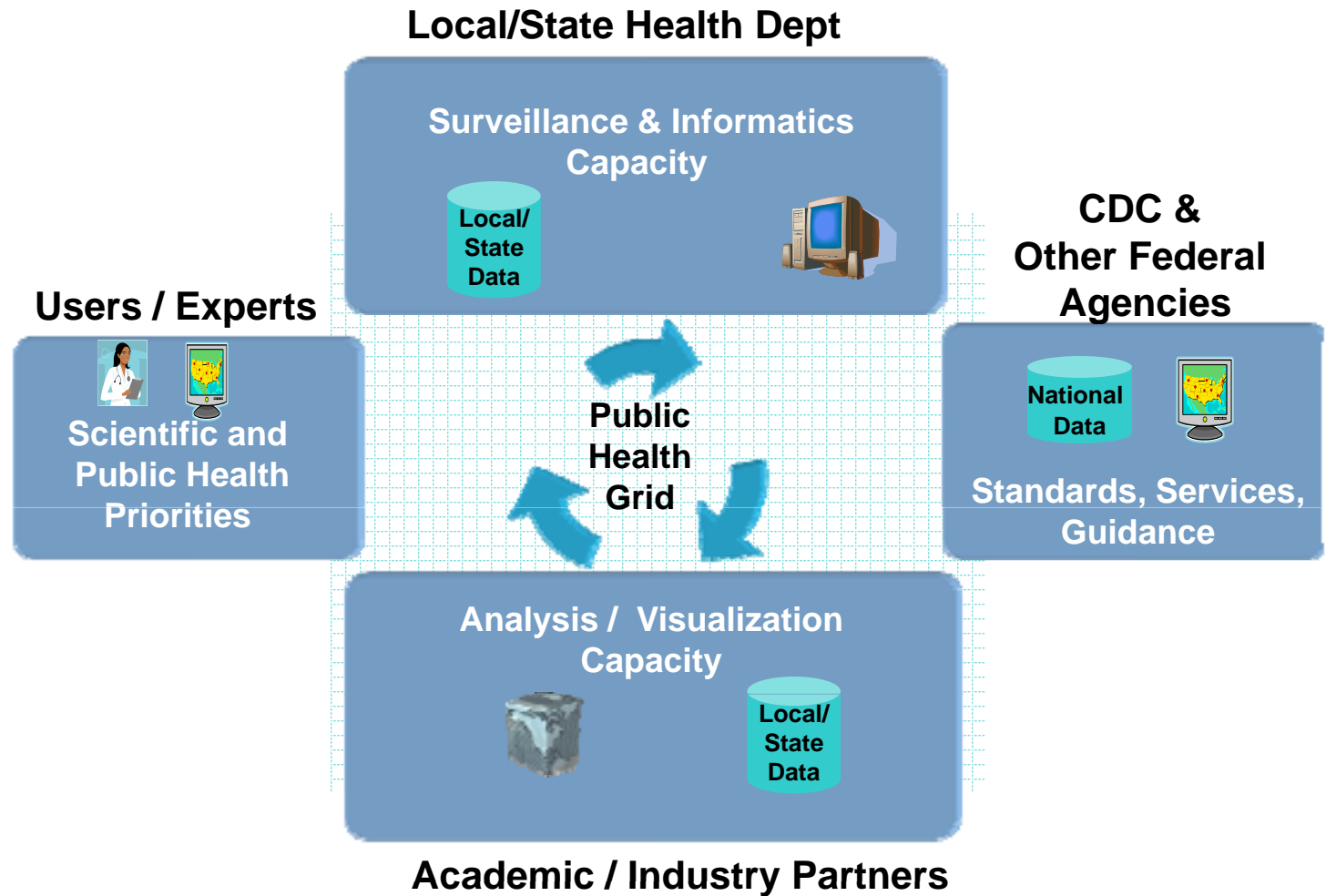


Practitioners

# Future Model: Federated Architecture



- ❑ Leverage **Existing Capacity**
  - ❑ Distribute resources and infrastructure
  - ❑ Increase flexibility and scalability
- ❑ Provide **Local Control** of data and services
  - ❑ Reduces political barriers
  - ❑ Address many privacy concerns
- ❑ Foster **Collaboration** to define requirements, priorities, develop, and deploy technology



# The Geospatial Line of Business



**Geospatial Business Planning**

**Geospatial Profile of the FEA**

**fgdc**

In 2005, the FEA sponsors recognized the special value of systematic approaches to geospatial (location-based) data and services across the government

**Agencies**

**Profiles**

**Lines of Business**

Financial  
HRM  
Health  
Social Services  
Education  
Economy  
Natural Resources  
Homeland Security

**Geospatial**  
Security & Privacy  
Records Management

national spatial data infrastructure training program

7

Source: <http://www.fgdc.gov/>

# What is PH-DGINet?



PH-DGINet is a distributed/shared SOA framework to connect data & services

- ❑ Access to data, services and tools available within a single portal per organization
- ❑ PH-DGINet portal can be customizable to organization, role, individual
- ❑ PH-DGINet supports discretionary service and data sharing

PH-DGINet provides the ability to discover, fuse and display information from across the community to a client environment

- ❑ Geospatial and geospatial intelligence data services
- ❑ Geoprocessing application services





# PH-DGINet Pilot



**Goal:** *Explore a standards based, federated framework to promote distributed data stewardship, analytical access, and collaboration between participating stakeholders. Inform NCPHI and its public health and commercial partners of best practices and potential issues to this approach, and provide a foundation to evaluate existing and emerging interoperability protocols.*

## Primary requirements

- Demonstrate the capability to **share** and visualize **biosurveillance data**:
  - Within a State
  - Between States
  - Between States and CDC
- Aggregate **data under control of state**, share results with external users
- Combine** and **visualize** results in the form of maps and simple analysis (e.g. Epi Curve)

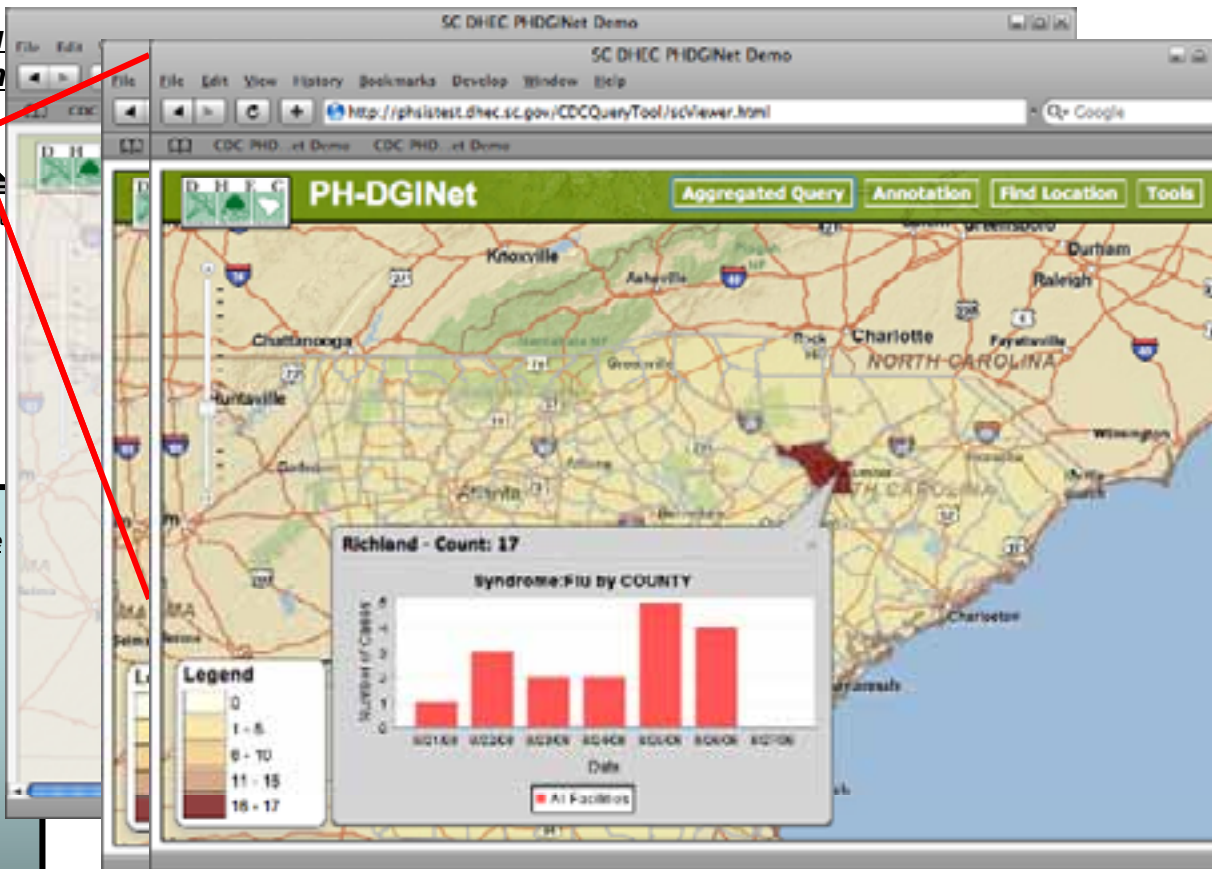
## Approach

- Form collaborative demonstration between SC, NC, ESRI, CDC
- Install PH-DGINet demonstration nodes in SC, ESRI, NCPHI research lab
- Test the ability to share data and services using mock biosurveillance data and ESRI developed webservice
- Fuse data and services from nodes in portal viewer
- Document utility of this type of shared service framework for public health.

# Aggregation Query: State accessing CDC (VA)



**PH-DGINet Sou  
Consum**



**South Carolina  
PH-DGINet Node**

DGINet SERVER



Event Database

**CDC  
PH-DGINet  
Node**

DGINet SERVER



Event Database

**Aggregate Row  
Level Data**

**Other State  
PH-DGINet  
Node**

DGINet SERVER



Event Database

# Aggregation Query: State access it's own (AHA) and CDC (VA)

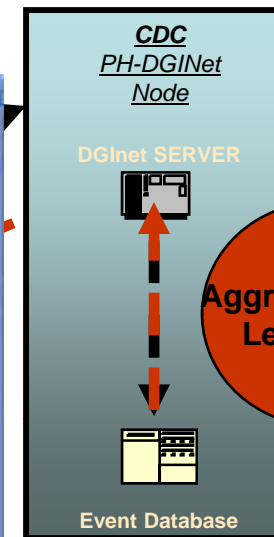
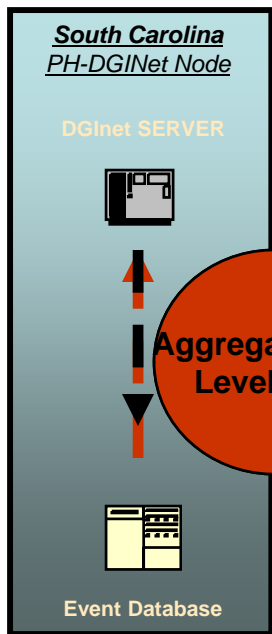
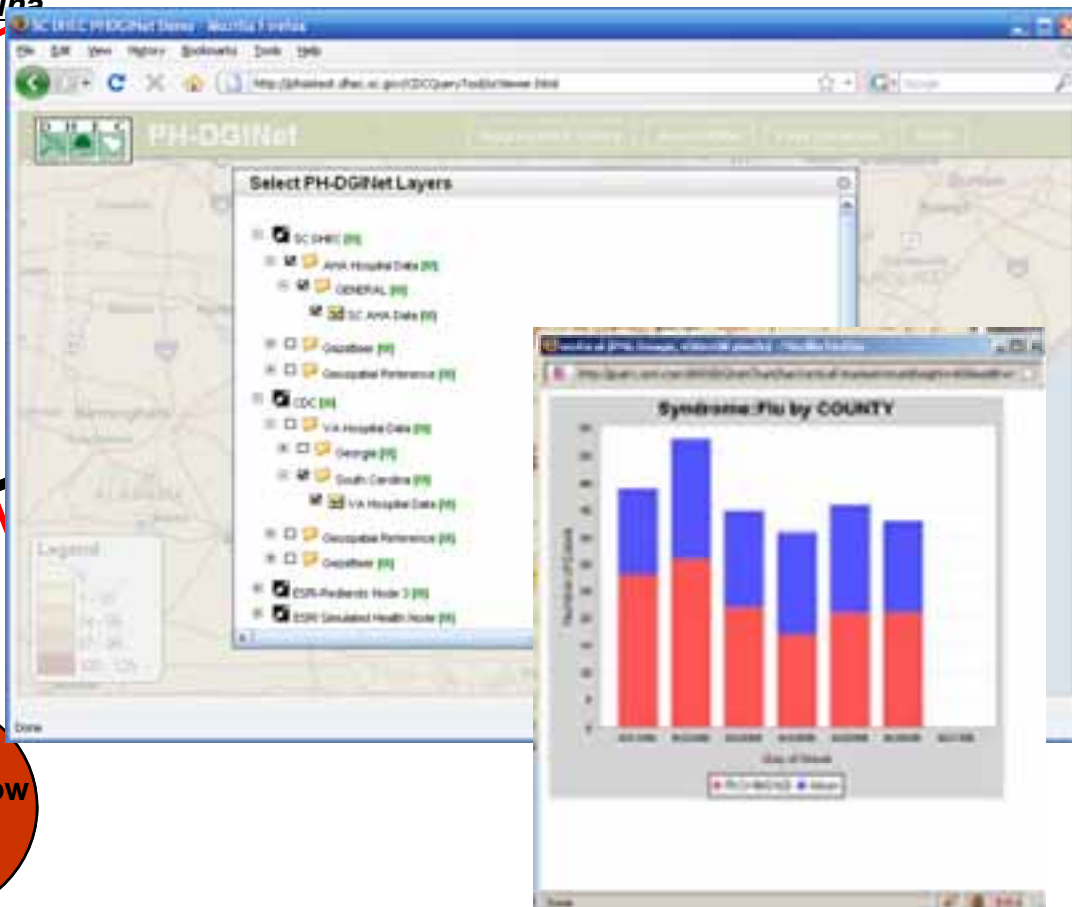


**PH-DGINet South Carolina Consumers**



(Web Client)

Aggregate AHA and VA



Aggregate Row Level Data

# Results & Lessons Learned



## Results

- ❑ Successfully deployed nodes in 3 locations
- ❑ Demonstrated the fusion of biosurveillance data from different nodes without physically transferring data
- ❑ Distributed query results can be displayed in maps and epi curve.

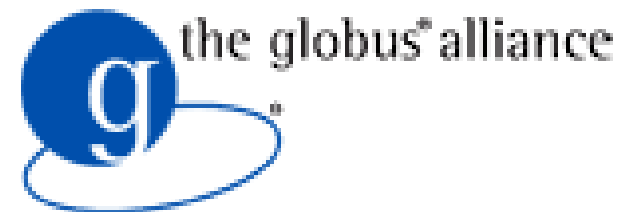
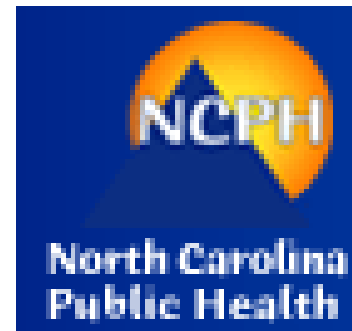
## Lessons Learned

- ❑ Collaboration is key to driving requirements and resolving issues
- ❑ Installation is more time and labor intensive than originally estimated
- ❑ Weakest hardware or connection in a federated model can be the bottleneck for data visualization and analysis

## Next Steps



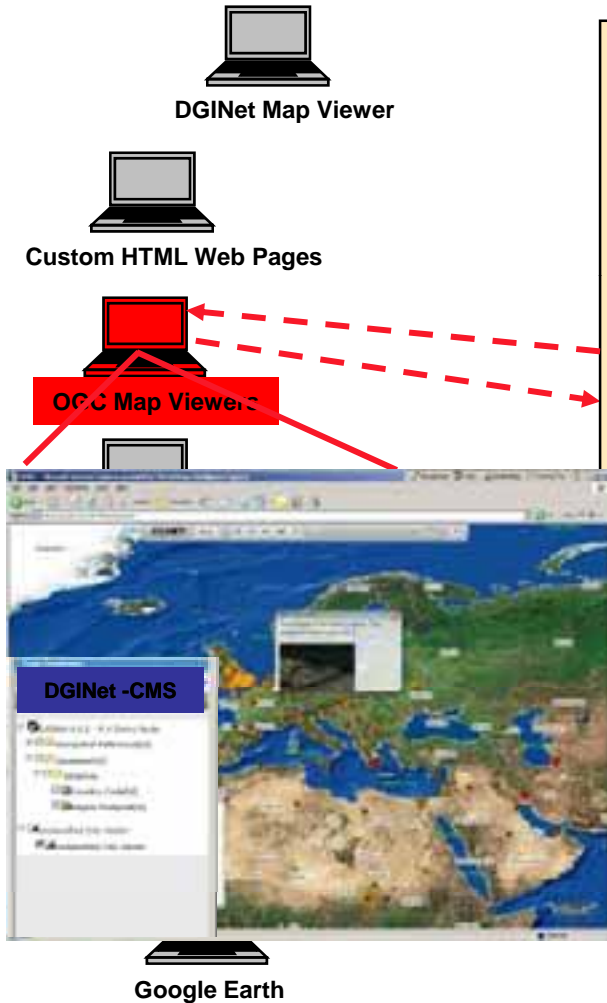
- ❑ Develop Community of Practice and engage more partners as nodes
  - ❑ Potential nodes include North Carolina, Georgia, Florida, VA, FDA, USDA
- ❑ Explore security and interoperability with other frameworks (e.g. Globus) and other map viewers (e.g. Google Earth)
- ❑ Determine Features, Functions, and Priorities for Distributed Geospatial and Analytic Services
  - ❑ Develop Ability to fuse and analyze data from heterogeneous data models



# DGINet 5.x: Increased Interoperability



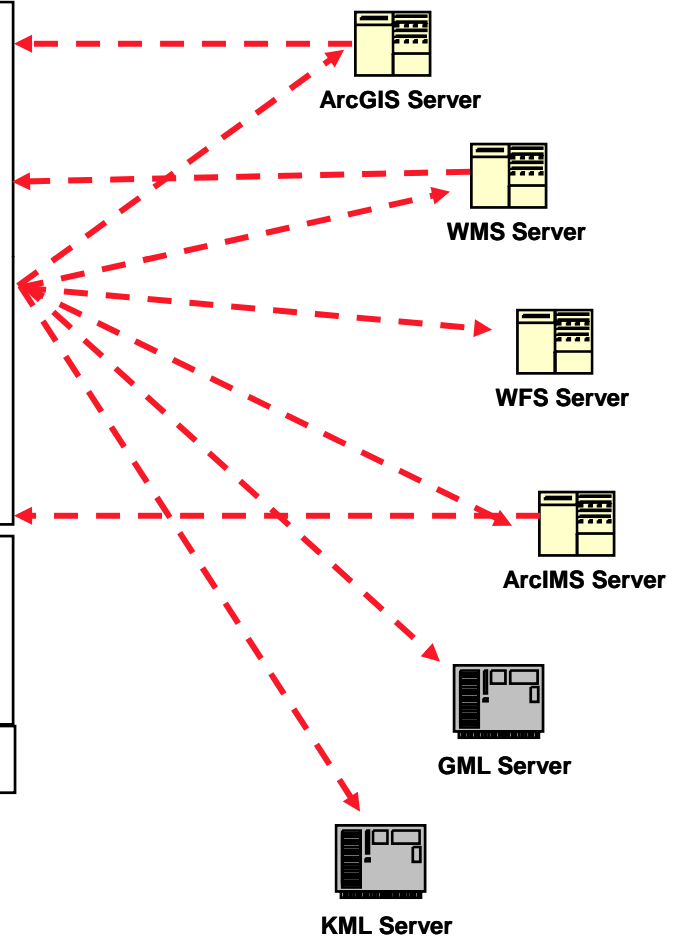
## Clients



## DGINet Services



## Data Service Providers



# PH-DGINet Team / Acknowledgements



## ❑ *South Carolina Department of Health and Environmental Control*

- ❑ Emily Cheng, Himal Dhotre, Jared Schoultz, Mehdi Khan

## ❑ *North Carolina Division of Public Health*

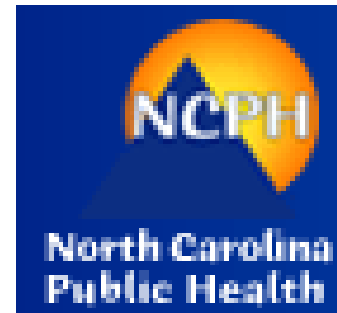
- ❑ John McLamb, Larry Forrister

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- ❑ Tom Savel, Terry Boyd, Crystal Watson, Chris Childs (SAIC), Hua Lu (Emergint), Carl Kinkade (BearingPoint), John Stinn (BearingPoint)



# Questions ?



- **Jim Tobias** [jtobias@cdc.gov](mailto:jtobias@cdc.gov); 404-498-6649 (Office)
- **John Stinn** [jstinn@cdc.gov](mailto:jstinn@cdc.gov); 404-386-8734