An Evaluation of Opportunities for Developing a Network for Geospatial Health Research

A report prepared by
the Secretary of Health and Human Resources
and
the Secretary of Technology

Presented to
Governor Robert F. McDonnell
and
The Senate Committees on Education and Health, Finance, and General Laws and Technology
and
The House Committees on Appropriations, Health, Welfare and Institutions, and Science and Technology

January 12, 2011

This report was prepared based on the requirements of Senate Bill 549, signed by Governor Robert F. McDonnell on April 12, 2010. This act required the Secretaries of Health and Human Resources and Technology to evaluate opportunities for developing a network for geospatial health research. Findings from this evaluation are to be reported to the Governor, the Senate Committees on Education and Health, Finance, and General Laws and Technology and the House Committees on Appropriations, Health, Welfare and Institutions, and Science and Technology.

Report Participants

The following persons were responsible for the design, preparation, review and/or approval of this report

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The above text is a snapshot of terms related to GIS, based on all abstracts presented at the American Public Health Association Conference in Denver, Colorado November 6th – 10th, 2010. The size of the text reflects how often the term was used in relation to all GIS abstracts, thus, providing a glimpse of underlying GIS themes comprising some of the latest public health geospatial research.

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Executive Summary

As directed by Senate Bill 549 (SB549) from the 2010 General Assembly session, this document reports the collaborative findings of the Secretaries of Health and Human Resources (SHHR) and Technology evaluation related to "*opportunities to partner with nonprofit organizations and institutions of higher education in the Commonwealth to develop a network for geospatial health research."* Report preparation activities and all associated meetings and data compilation was conducted jointly by the Virginia Department of Health (VDH) – Office of Epidemiology and the Virginia Information Technologies Agency (VITA) – Virginia Geographic Information Network (VGIN).

Staff from both VDH and VITA – VGIN met jointly with relevant Secretariat staff to determine the scope and implementation plan for the evaluation process. Staff from each agency were identified to assume lead/coordination activities and to ensure continuity and collaborative efforts. The overall implementation plan included three components: 1) a survey of institutions of higher education; 2) an assessment of VDH program areas; and 3) an assessment of relevant non-profit organizations.

The evaluation included a survey of Virginia's publicly funded academic institutions known to be involved in geospatial health research and GIS-related education and training. These institutions were asked to assess needs related to geospatial health research and overall views related to the various aspects of SB549.

A review of VDH programs with experience in GIS-related activities, staffing, hardware/software capacity and GIS-related grants was also conducted. This review provided an indication of the overall level of GIS infrastructure and geospatial capabilities within the agency. Issues involving the management and use of public health geospatial datasets outside of VDH were considered, including the impact from a legal and data confidentiality perspective.

An assessment of existing non-profit organizations in Virginia with GIS experience was also conducted. Two organizations were identified: Virginia Health Information (VHI) and the Virginia Network for Geospatial Health Research, Inc. (VANGHR). Meetings were conducted with the Executive Directors from both organizations. Senator George Barker, SB549 patron, also attended the VANGHR meeting as a Board member.

Excerpt from Findings and Recommendations:

See (page 34) for complete text

Report Finding 1:

Neither VDH nor VGIN have a comprehensive listing of faculty and staff at Virginia's institutions of higher education with professional interests in spatial health research.

Recommendation:

The VDH and VGIN should create a master list of all known health-related GIS faculty and staff at Virginia's institutions of higher education. This list should be used by VGIN and VDH to expand collegial relationships, form the basis for future GIS listservs, discussion groups, and partnership development, and ensure dissemination of relevant GIS-related funding and research opportunities.

Report Finding 2:

The Commonwealth of Virginia should consider development of a spatial data clearinghouse for use in furthering the scientific understanding of health and healthcare issues impacting the residents of Virginia.

Recommendation:

The VDH and VGIN should consider partnering together for development of a health-related spatial data clearinghouse. Additionally, any health-related data clearinghouses developed as part of the Virginia Health Reform Initiative should contain geo-spatial data whenever possible. Consideration of existing infrastructure under development for the VGIN clearinghouse should be reviewed to determine feasibility of use. Issues involving patient confidentiality and data security must take precedence and be thoroughly reviewed. Feasibility of state agency development should be reviewed prior to any discussion involving non-government entities.

Report Finding 3:

Collaborations and networks of staff from Virginia's institutions of higher education, state agencies (VDH and VITA/VGIN) and non-profit organizations currently exist.

Recommendation:

Because staff from all three types of institutions already work together on numerous GIS initiatives, the Secretaries of Health and Human Resources and Technology do not believe a codified approach to developing a network for geospatial research is necessary for the continued expansion of geospatial health research.

Report Finding 4:

Virginia's colleges and universities have faculty and staff with expertise in GIS technologies, including public health research activities. VDH and VGIN staff possess varied GIS expertise, including public health research, spatial data management, and IT-related skillsets. Existing non-profit organizations possess GIS expertise related to public health contracting, spatial data management, analyses and IT-related skillsets.

Recommendation:

The majority of university faculty, VDH and VGIN staff and non-profit organization staff involved in routine GIS activities do not appear to need substantial technical assistance. The continuing development of collegial GIS networks should assist other staff that desire technical assistance or training advice.

Report Finding 5:

A system of peer review related specifically to GIS research was not viewed positively by the majority of university staff. Academic faculty and staff have published many peer reviewed articles, including those related to public health GIS topics.

Recommendation:

The process of peer review is performed by specific journal editorial committees. These entities have established experts in the related fields of practice whom they call on to review manuscript submissions. In many cases, additional peer review would likely not provide sufficient added value to the process. Hence, a system of peer review is likely a redundant and unnecessary activity.

Report Finding 6:

Infrastructure related to GIS software is provided by all academic institutions surveyed. All academic institutions, related state agencies (VDH and VGIN), and both non-profit organizations use ArcGIS products from ESRI.

Recommendation:

Given that all related entities use the same vendor for GIS software (pursuant to a Virginia state contract), it is unnecessary to be concerned about supplying GIS infrastructure support. If questions arise regarding infrastructure, the ESRI helpdesk will be the likely source of contact. Additional questions or advice can be obtained from well-qualified VGIN staff.

Report Finding 7:

Hardware infrastructure for both VDH, VGIN and related state agencies is supplied through the VITA-Northrup Grumman public-private partnership. Virginia's universities maintain hardware infrastructure independently. Non-profit organizations maintain their own hardware, and also collaborate with VGIN for use of web-based GIS functionality.

Recommendation:

Hardware infrastructure operates under differing auspices among universities, state agencies and non-profit organizations. Before considering development of any alternative hardware infrastructure outside of the state information technology framework, the existing state hardware infrastructure of VDH and VGIN must first be examined for its ability to meet the hardware infrastructure needs for any proposed geospatial network.

Report Finding 8:

Many academic faculty and staff desire access to additional health-related data, including spatially-enabled data. Access to such data will require a thorough review of existing laws, and data security and confidentiality processes.

Recommendation:

The efforts related to development of a spatial data clearinghouse (Recommendation 2) should provide a forum for improved data access. However, data security and confidentiality standards and policies will be imperative to ensuring such access is used appropriately, based on existing laws and records management policies. VDH and VGIN staff should work together on the development of security and confidentiality procedures pertaining to spatially-enabled data elements. Such procedures should be shared with and followed by universities and non-profit organizations that maintain or use any VDH-specific data or for those entities that desire access to personally identifiable information.

Legislative History of Senate Bill (SB549) to establish the Virginia Network for Geospatial Health Research Authority

In the 2009 Virginia General Assembly session, Senator George L. Barker, Senate District 39 (Alexandria) introduced legislation to create the Virginia Network for Geospatial Health Research Authority. This legislation was known as Senate Bill 1497 (Appendix A). An excerpt from the SB1497 Fiscal Impact Statement summarized the bill as such:

> *Creates the Virginia Network for Geospatial Health Research Authority, as a body politic and corporate, a political subdivision of the Commonwealth, to provide for the continuity and expansion of research both within the public and private sectors using geospatial analysis of health and health care relevant data, develop economies of scale within state health agencies and within public health programs within the Commonwealth's universities, provide geospatial analytical support to other political subdivisions concerned with cost-effective targeting of public health initiatives, and engage in such other lawful activities as the Board of Directors of the Authority deems reasonable and appropriate. The bill exempts the Authority from the Virginia Personnel Act, the Workforce Transition Act, FOIA, the APA, the Public Procurement Act, and all taxation.*

The bill was referred to the Committee on Education and Health and subsequently the Finance Committee. On February 10, 2009 the bill passed the Senate 39-0. After crossover, the bill was submitted to the House and referred to the Committee on Health, Welfare and Institutions (HWI) and assigned to the Health Subcommittee. The bill was reported from HWI with amendments, and subsequently referred to the Committee on Appropriations, where the subcommittee on Technology Oversight and Government Activities recommended leaving the bill on the table.

In the 2010 General Assembly session, Senator Barker reintroduced the bill as SB549 (Appendix B). The same committees, as noted above, considered the bill with a Finance committee substitute version passing the Senate 39-0 on February 12, 2010. In the House a substitute bill from the Committee on HWI passed 100-0, with the Senate agreeing to the House Substitute 40-0, with signature by the Governor on April 12, 2010 (Appendix C). The bill history, including substitute language and General Assembly action on SB549, is available on the Legislative Information Systems (LIS) website.

The bill signed by Governor McDonnell did not create an Authority as originally proposed, rather it directed the Secretaries of Health and Human Resources and Technology to evaluate opportunities to partner with nonprofit organizations and institutions of higher education in the Commonwealth to develop a network for geospatial health research and to report the findings to the Governor, the Senate Committees on Education and Health, Finance, and General Laws and Technology, and the House Committees on Appropriations, HWI, and Science and Technology.

Direction from Health and Human Resources and Technology Secretariats

The Secretariats of Health and Human Resources (SHHR) and Technology designated the VDH – Office of Epidemiology and the VITA – VGIN as their agency respondents to the bill. Both agencies designated personnel as either the bill Lead, Coordinator, or both for their respective areas and immediately began collaborating to develop an implementation plan that would address the direction provided by SB549.

On June 30, 2010 representatives from VDH and VITA met with SHHR Secretary (William A. Hazel, Jr., MD) and Technology Deputy Secretary (Karen Jackson) to seek approval of the jointly developed and proposed implementation plan and to solicit direction and guidance from the two Secretariats. The plan approved by the Secretariats included an academic survey, and reviews of health department GIS activities and associated programs and existing non-profit organizations.

The academic survey was to be administered to Virginia's publicly funded academic institution faculty/staff known to be involved in spatial analyses, related epidemiologic studies and/or GIS-related education and training. Its purpose was intended to assess current status and needs related to geospatial health research, and overall views related to the establishment of an entity that would provide for the following:

1. Geospatial infrastructure support (hardware and software),
2. Geospatial assistance (geospatial data development, management and hosting, geospatial analysis) to state agencies, as well as others,
3. Support and coordination of academic, state agency and private sector expertise in spatial analyses,
4. Establishment of academic geospatial relationships,
5. Facilitation of geospatial educational/research opportunities, and
6. Solicitation of geospatial related grant funding.

VDH and VGIN were also charged with collaboratively reviewing the overall level of GIS infrastructure within VDH, including the identification of any gaps in its geospatial capabilities, GIS staffing expertise, hardware/software, and related GIS grants. Collective perspectives from various VDH programs were to be included as part of the overall assessment.

Meetings with existing non-profit organizations were to be conducted by VDH and VGIN in order to gain more insight into existing operations, collaborations and infrastructure. Historical public health collaborations between VDH/VGIN, academic institutions and private sector entities were to be assessed. Issues involving the management and use of

public health geospatial datasets outside of VDH, including the impact from a legal and data confidentiality perspective, were to be incorporated into the report.

Collaborative meetings were to be held ongoingly between the respective VDH and VGIN coordinators to review all aspects of the above evaluation components. The VDH and VGIN were also charged with assessing existing metadata infrastructure, any necessity for an additional health-related data clearinghouse(s), and the need for any additional technical support.

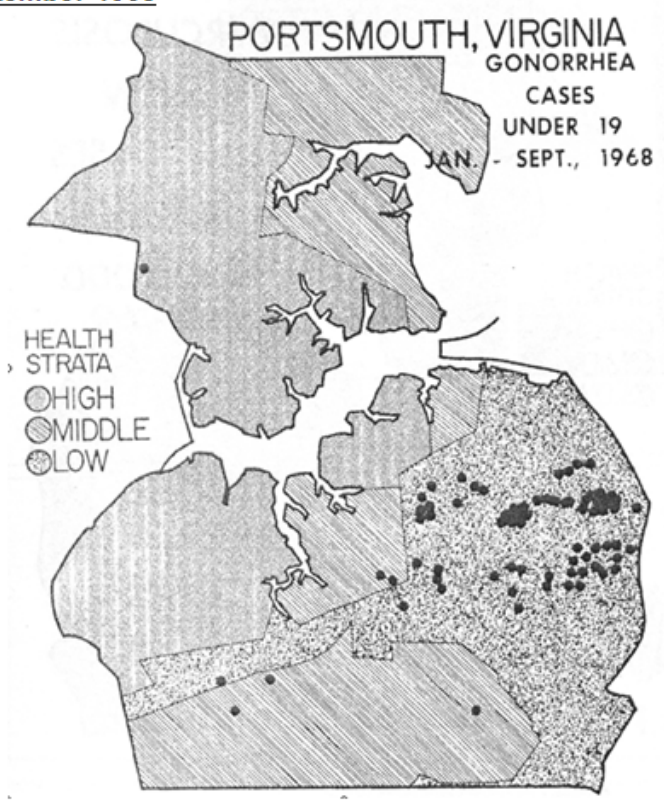
The VDH and VGIN coordinators were charged with establishing a framework for the final report. All written components of the report were to be shared between the two agencies. Feedback would be provided by both entities regarding respective report components and agreement would be obtained regarding the final version of the report. A draft version of the final report was to be submitted to respective agency staff ahead of the scheduled dues date to allow for review, comment, and editing prior to final joint submission by the Secretariats.

The History of Geospatial Health Data in Virginia

The analysis of public health data through use of geospatial technology has been a component of health-related assessments in Virginia dating back to the early 1970's. However, continuous use of geographic information systems (GIS) within the public health arena was sporadic until the late 1990's. Since that time, GIS technology has been used to increase mapping and spatial analysis capabilities, enterprise operations and geocoding capacity.

In the early 1970's, Dr. Kim Buttery, the Portsmouth Health Department Director, received the first Centers for Disease Control and Prevention (CDC) grant related to GIS initiatives. This grant focused on the relationship of socioeconomic status (SES) in relation to numerous public health issues including infant deaths, immunization rates, tuberculosis, sexually transmitted diseases and housing status (Map 1). The results of this initiative were presented at the 1972 CDC Communicable Disease Conference in Houston, Texas and showed that concentrating public health prevention and education activities within geographic areas with the lowest SES generates the best effects on outcome measures.

Map 1: Historical Map of Reported Gonorrhea Cases based on Health Stratification, Portsmouth, VA – January – September 1968



Much GIS research has been been conducted across the U.S. since 1972. In fact, in recent years, publications using GIS data from health-related research has increased approximately 26% annually[1]. Significant health research involving GIS, published over the past ten years, has included focused research related to geographic granularity and area-based socioeconomic measures, acceptance of census tracts as predictor for public health geographic analyses, and confidentiality issues involving GIS.[1-8] Virginia Department of Health (VDH) staff have added value to the scientific literature via three recent publications focused on the above GIS issues.[9-11] Faculty and staff from Virginia's inistitutions of higher education are active participants in GIS-related health research, including many peer-reviewed publications and various textbook publications (see included results from the academic survey).

Numerous programs at VDH have historically made use of GIS technologies. Through the 1980's and most of the 1990's, GIS was used solely as a means of rudimentary map making for various VDH annual and quarterly reports. In the late 1990's, the Office of Drinking Water (ODW) began using ArcIMS, allowing for greater GIS interoperability. In the early 2000's, Office of Epidemiology (OEPI) staff began geocoding sexually transmitted disease (STD) data and using GIS tools to refine understanding of epidemiologic data, including use of freely available cluster analysis tools and rendering possibilities. Many additional VDH program areas also began using GIS for exploratory analyses and enhanced visualization during this time, including the Office of Minority Health and Health Equity (OMHHE), the Office of Environmental Health Services (OEHS), the Office of Emergency Medical Services and the Office of Family Health Services (OFHS). An enterprise GIS program was initiated within the Office of Information Management (OIM) in the mid-2000's; however, funding issues resulted in program cancellation. In 2009, H1N1 activities resulted in the OEPI's development of a server-based GIS application to assist with H1N1 evaluation activities and VDH preparedness initiatives, and an online, interactive mapping application for citizen access to school-based H1N1 vaccination clinics. Activities are currently underway to re-energize enterprise GIS activities within OIM.

During this time, VDH has continued to build its level of expertise related to GIS initiatives. In 2007, OEPI staff conducted several statewide GIS training events for epidemiologists and emergency planners. More recently, the OMHHE has been performing ad hoc spatial analysis training for numerous VDH personnel. Since 2004, staff from the OEPI have authored four geospatial peer-reviewed publications, presented or coauthored more than 20 oral and poster presentations at state, national and international conferences, and lectured/taught GIS in public health on behalf of the Master of Public Heath graduate degree program at Virginia Commonwealth University (VCU). See Appendix D for a listing of various GIS-related presentations and publications completed by VDH staff.

In 2007, VDH successfully competed for one of only three GIS grants awarded by the CDC for enhancing HIV surveillance initiatives. As part of this grant, staff from Virginia and two other states assisted the CDC with the development of a "Roadmap for Using GIS in HIV Surveillance Programs." Additional GIS supplemental funding for HIV

surveillance was awarded in 2010 to refine HIV/AIDS address data for spatial analysis purposes.

The Virginia Geographic Information Network (VGIN) was established in 1997, pursuant to §2.2-2026 and 2.2-2027 of the *Code of Virginia*. Its purpose is to "foster the creative utilization of geographic information and oversee the development of a catalog of GIS data available in the Commonwealth." VGIN has a number of core functions, including the following: 1) development & recommendations of GIS policies & guidelines required to support state and local government GIS related activities; 2) compilation of a data catalog consisting of descriptions of GIS coverages maintained by individual state and local government agencies; and 3) setting priorities for the development of state digital geographic data and base maps that meet the needs of state agencies, institutions of higher education, and local governments.

Over the past several years, VDH and VGIN staff have developed a collaborative working relationship. At present, two VDH programs are actively providing data for the VGIN metadata portal. VDH also accesses aerial imagery from VGIN for enhanced data visualization and is connected to the VGIN geocoding service. As part of ongoing collaborations, VGIN assisted VDH staff with the installation of ArcGIS Server in 2009 and a subsequent upgrade in 2010. As part of H1N1 activities, VGIN prepared a portal for possible inclusion of a public-facing interactive map of school vaccination clinics. VDH decided to use the state contracted business intelligence tool (LogiXML) for this purpose, as it provided a Google interface that would have greater familiarity to Virginia's citizens. VDH worked in concert with the VITA Enterprise Applications Division (EAD) to enable this functionality using the Business Intelligence Shared Services Framework.

Public health research involving GIS has continued into 2010, as evidenced by Virginia's geospatial representation at the November 2010 American Public Health Association (APHA) Conference in Denver, Colorado. Three presentations were conducted by staff from Virginia universities, VDH and VANGHR. Virginia Tech staff presented a poster on a simulated surveillance initiative intended to design, implement, and test a flexible methodology for generating detailed synthetic surveillance data that could provide realistic geospatial and temporal clustering of baseline cases, and evaluation of outbreak detection protocols (http://ndssl.vbi.vt.edu/insilicoSurveillance). VDH staff presented data related to the geospatial analysis of stroke hospitalizations in Virginia. Staff from VCU and VANGHR provided a joint presentation related to improving the context of community understanding and the geographic disparities related to social determinants of health (see abstract at http://apha.confex.com/apha/138am/webprogram/Paper226314.html).

In 2011, the first graduate level GIS course focused on health will be offered at VCU. The course, entitle Geospatial Health, will be administered through the Center for Environmental Studies and will include issues involving GIS and health data, including cluster analyses and spatial modeling. It will be offered as a Spring 2011 course (ENVS

– 691), and was approved by the VCU Department of Epidemiology and Community Health's curriculum committee as an elective for Masters of Public Health students.

Survey of Virginia's Institutions of Higher Education

Survey Background:
The decision to administer an academic survey to assist with completing the SB549 study was a joint decision of the Secretary of Health and Human Resources and the Secretary of Technology. Input was provided from both the Virginia Department of Health (VDH) and the Virginia Information Technologies Agency/ Virginia Geographic Information Network (VITA/VGIN), herein after referred to as VGIN. A survey of university faculty with geographic information systems (GIS) expertise was determined to be an efficient means of acquiring objective information for inclusion in the report.

Survey Methodology/Design:
The survey was administered as an online instrument (Appendix E), in order to expedite survey delivery and data collection. Survey Monkey was chosen as the online survey mechanism based on existing account availability within the VDH Office of Epidemiology. Development of survey questions was a joint effort by VDH and VGIN staff. Online survey design was conducted by VDH staff with review and agreement from VGIN.

The survey consisted of 64 questions related to respondent demographics, GIS use at respective academic centers, history of GIS-related public health research, software, networks of colleagues, GIS and the health reform landscape, and the context of SB549 partnerships. The survey was separated into six sections, in order to appropriately stratify survey content. The sections were delineated as follows:

1) Introduction
2) Contact Information
3) Current GIS Activities and Opportunities
4) GIS and Health Reform
5) SB549-specific excerpts, based on the seven delineated paragraphs listed in 1.§1.1-7
6) Concluding Questions and Comments

Recipients of the survey were determined based on a manual review of Virginia's academic institution web sites, an existing VGIN listserv of GIS colleagues, and immediate email feedback from initial survey recipients some of whom recommended additional colleagues. Staff affiliated with SB549 at both VDH and VGIN approved the listing of university staff to be contacted prior to survey communication.

Email communication with survey recipients was designed as automated processes within the Survey Monkey tool. This process included six separate communications. An initial invitation was sent to 32 academicians on July 16, 2010. Four additional recipients received the survey: three on July 19, 2010 and one on July 22, 2010, respectively, based on colleague recommendations. Two reminder emails were sent to existing non-

responders on July 26 and August 2, 2010. The survey was officially closed on August 6, 2010. An email of appreciation was sent to all respondents on August 9, 2010. See Appendix F to review text from each email communication.

Survey Results:

The SB549 survey was provided to 36 faculty/staff from 12 Virginia colleges/universities (Table 1). A total of 23 respondents initiated the survey (initial response rate = 64%), with 21 completing it intirely (response rate = 58%). At least one response was received from nine of the 12 colleges/universities, accounting for survey participation from 75% of all instiutions surveyed. Among the nine universities with respondents, staff participation was best at Christopher Newport University, the College of William and Mary and Longwood University at 100%, followed by the University of Virginia at 75%, Old Dominion University and Virginia Commonwealth University at 67%, Virginia Tech at 63%, and James Madison University and the University of Mary Washington at 50%.

Table 1: SB549 Summary of Academic Institution Survey Response by Institutional Affiliation

Institution	Survey Response		No. of Staff Sent Survey	Response Rate
	Yes	No		
Christopher Newport University	1	0	1	100.00%
The College of William & Mary	5	0	5	100.00%
George Mason University^	0	2	2	0.00%
James Madison University	2	2	4	50.00%
Longwood University	2	0	2	100.00%
Old Dominion University	2	1	3	66.67%
Radford University	0	1	1	0.00%
University of Mary Washington	1	1	2	50.00%
University of Virginia	3	1	4	75.00%
Virginia Commonwealth University	2	1	3	66.67%
Virginia Military Institute	0	1	1	0.00%
Virginia Polytecnic Institute and State University	5	3	8	62.50%
TOTAL Survey Recipients	23	13	36	63.89%

^ One survey recipient is on sabattical from GMU and is employed through the United States Geological Survey (USGS)

Respondents represented a broad cross-section of academic programs, including public policy, geography, biological and social sciences, environmental studies, urban planning, health-related sciences, engineering, institutional analysis and technology (see Table 2). Seventy-eight percent of respondents indicated that their respective institution provides

undergraduate or graduate level course(s) related to GIS. At least one respondent from each of the nine colleges/universities stated that GIS courses are offered at their institution. Fewer than half of the institutions offer GIS degrees or certificates, but 67% of institutions have a GIS center located on campus (Table 3). These GIS centers are located in diverse programmatic settings similar to the program areas associated with the faculty that responded to the survey. In addition, 63% of respondents indicated public health research is conducted within their respective GIS center.

Table 2: SB549 Academic Survey Respondents^ by Institutional Affiliation

Institution	Program Area
Christopher Newport University	Biology, Chemistry, & Environmental Science
The College of William & Mary	Office of Institutional Analysis and Effectiveness
The College of William & Mary	Center for Geospatial Analysis
The College of William & Mary	Economics Dept and Public Policy Program
The College of William & Mary	Biology
The College of William & Mary	Sociology
James Madison University	Integrated Science and Technology
James Madison University	Integrated Science and Technology, Geographic Science
Longwood University	Biological & Environmental Sciences
Longwood University	Biological& Environmental Science / Sociology, Anthropology, Criminal Justice Studies
Old Dominion University	Political Science and Geography
Old Dominion University	Civil and Environmental Engineering
University of Mary Washington	Geography
University of Virginia	University Library
University of Virginia	University Library
University of Virginia	Urban and Environmental Planning/School of Architecture
Virginia Commonwealth University	Center on Human Needs
Virginia Commonwealth University	Center for Environmental Studies
Virginia Polytecnic Institute and State University	Department of Geography
Virginia Polytecnic Institute and State University	Center for Geospatial Information Technology & the College of Civil & Environmental Engineering
Virginia Polytecnic Institute and State University	Biological Systems Engineering
Virginia Polytecnic Institute and State University	Geography
Virginia Polytecnic Institute and State University	Center for Geospatial Information Technology

^ The survey collected the names and contact information for each respondent. This information is excluded from the report.

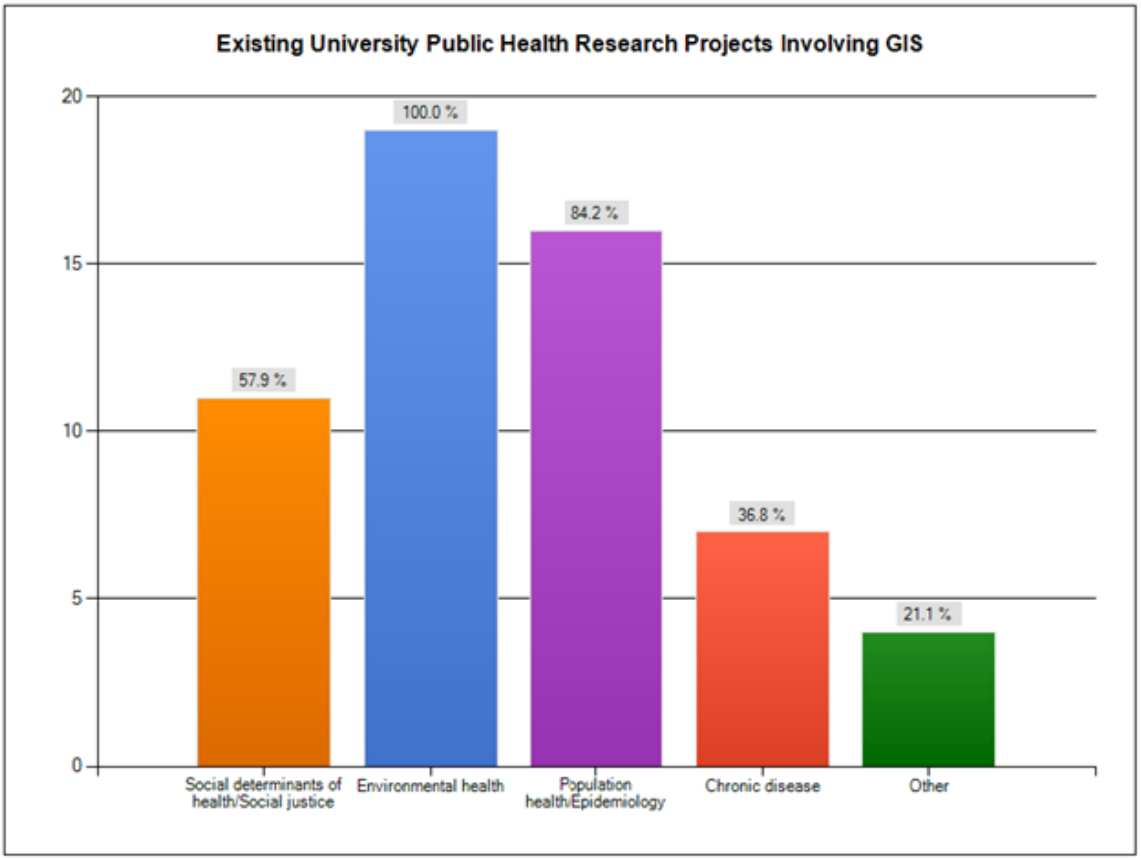
Table 3: SB549 Academic Survey Responses related to GIS Activities

	Institution of Higher Learning^								
	Christopher Newport University	The College of William & Mary	James Madison University	Longwood University	Old Dominion University	University of Mary Washington	University of Virginia	Virginia Common-wealth University	Virginia Polytecnic Institute and State University
Offer Course(s) in GIS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Offer Degree(s) in GIS	No	No	Yes	No	No	No	No	Yes	Yes
Offer Certificate(s) in GIS	No	No	No	No	Yes	Yes	No	Yes	Yes
Has Existing GIS Center	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes

^ A "Yes" response was included if any respondent from the institution of higher learning indicated that such offerings exist.

Eighty-three percent of respondents indicated that public health research projects are conducted at their institution. Of these, public health research involving environmental and population health are by far the most common at 100% and 84%, respectively. Research involving social determinants of health and chronic diseases make up the majority of additional public health research (Figure 1). More than half (56%) of the financial support for these projects is based largely on a combination of general and federal funds.

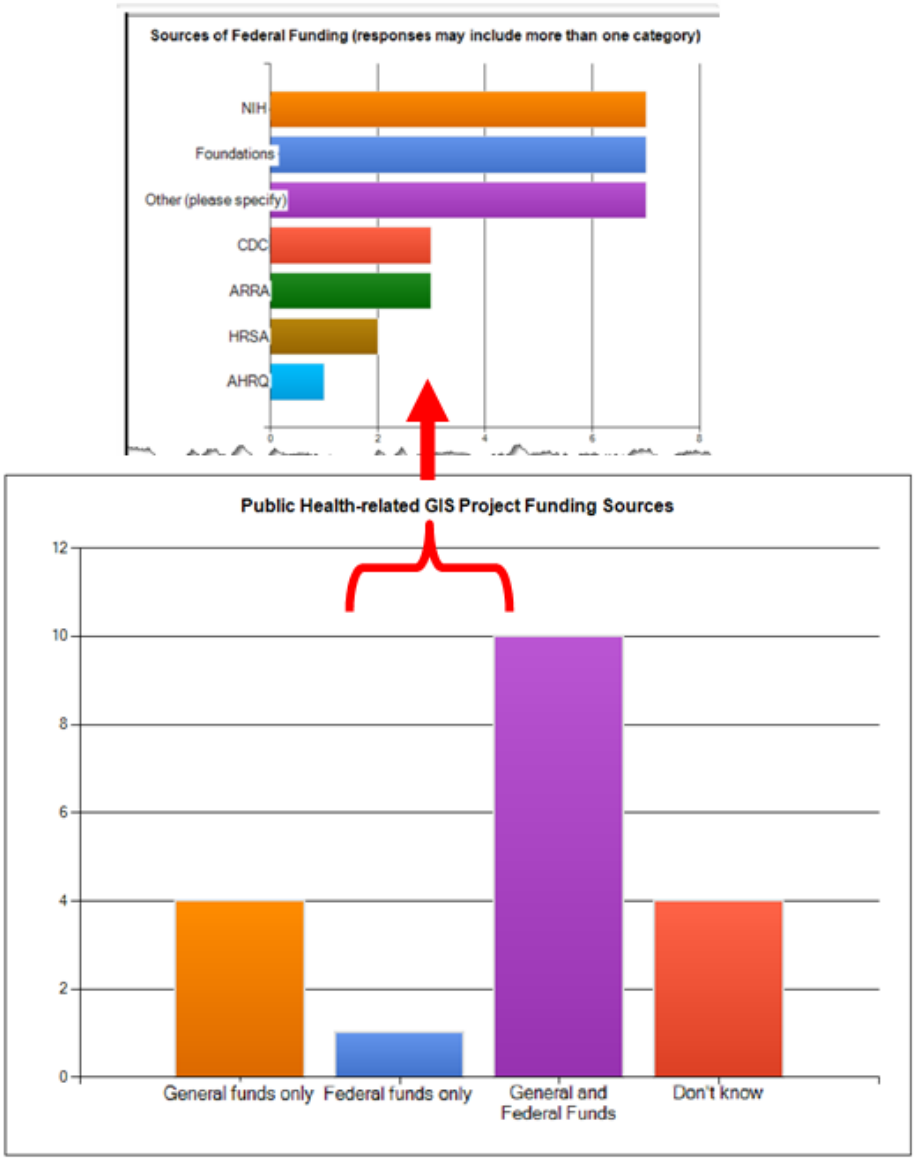
Figure 1:



The majority of federal funding comes from the National Institutes of Health and various foundations (Figure 2); however, such funding appears to be very diversified. Other sources of federal funding currently received for public health research includes:

- Centers for Disease Control and Prevention (CDC)
- American Recovery and Reinvestment Act (ARRA)
- Agency for Healthcare Research and Quality (AHRQ)
- Health Resources and Services Administration (HRSA)
- Environmental Protection Agency (EPA)
- National Aeronautic and Space Adminstration (NASA)
- United States Department of Agriculture (USDA)
- United States Geological Survey (USGS)

Figure 2: GIS-related Funding for Public Health Research Projects

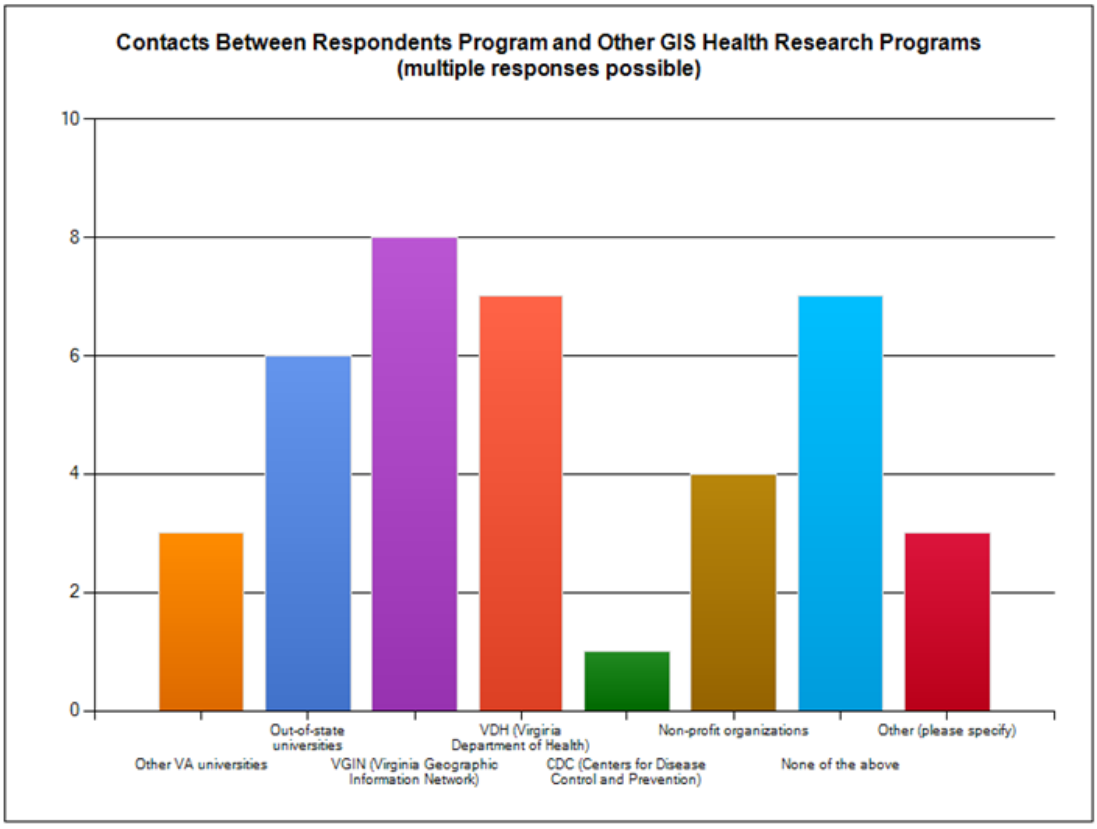


Ninety-one percent of respondents (n=22) indicated GIS-related public health research has been published through their institution, with 85% indicating peer-reviewed publications. Five additional textbook publications were identified, including one text related specifically to spatial analysis entitled "*Making Spatial Decisions Using GIS* (2008, ESRI Press, Redlands, CA)."

All respondents to the survey indicated that they use ArcGIS products from Environmental Systems Research Institute, Inc. (ESRI). All respondents are also using either ArcGIS9.3 or the most recent version, ArcGIS10. Numerous responses indicated that staff make use of varying ESRI software, including server-based and desktop software, as well as open source mapping tools. In addition to the above, Virginia Tech also develops some of its own mapping tools.

In order to gain insight into existing GIS networks of colleagues, respondents were asked about respective professional GIS contacts (Figure 3). Results indicated that the majority of respondents (62%) have various contacts, including VGIN (36%), VDH (32%), out-of-state universities (27%), non-profit organizations (18%) and other Virginia universities (14%). Thirty-two percent of respondents indicated no contacts with any of the above categories. Responses within the "Other" category indicated that some GIS projects involve nation-wide data infrastructure, as well as pending grant proposals for multi-university involvement.

Figure 3:



All respondents indicated that GIS can be a useful tool for assessing the impact of the federal healthcare reform legislation. Seventeen respondents provided feedback on how GIS can help in such efforts, including the following: 1) spatiotemporal analyses; 2) disease control and prevention targeting; 3) environmental health; 4) service, asset and resource allocation; 5) tracking and identification of health issues; and 6) determinations of geographic factors related to healthcare access, spending, behaviors and health reform outcomes. Ninety-one percent (91%) of respondents are interested in data availability from ongoing health information exchange efforts. Primary areas of interest for such data include the epidemiology of infectious and chronic conditions including cancers, environmental data with direct correlates to human consumption, healthcare service center distribution, rural health issues, healthcare utilization, access and quality, as well as healthcare treatment and costs. See Table 4 below for a listing of all survey comments related to use of GIS for assessment of health reform.

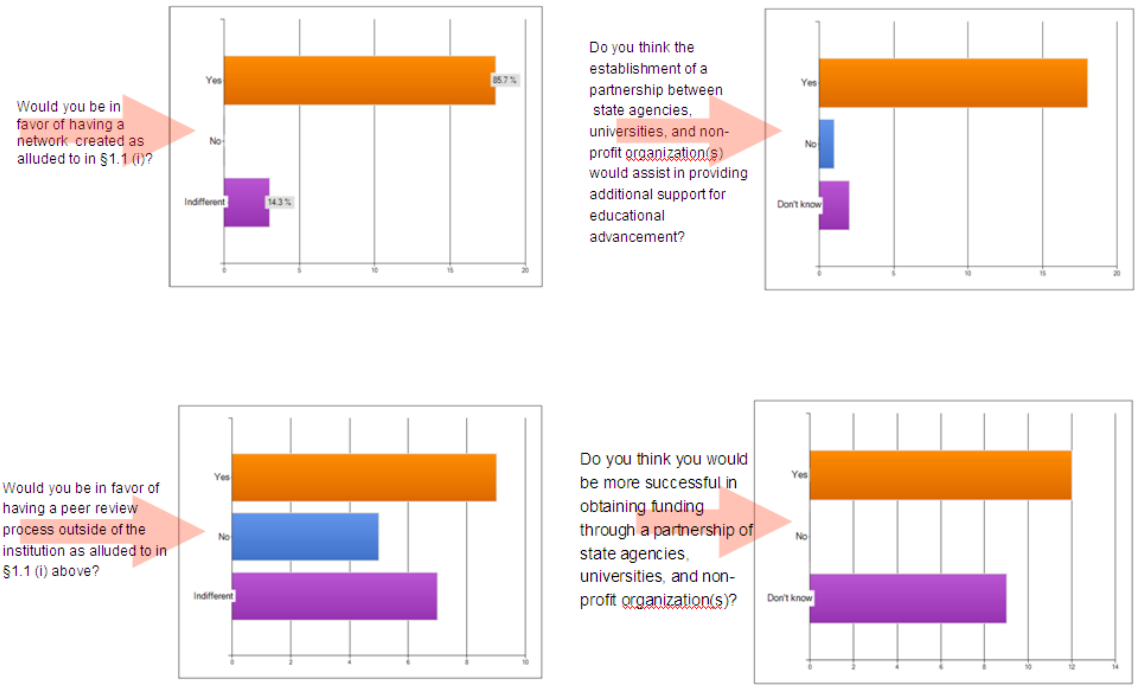
Table 4: SB549 Academic Survey Response Perspectives Related to GIS Use for Assessing Health Reform

Response #	Comment (as received)
1	Spatial analysis, disease control and prevention, epidemiology, health and telematics applications.
2	In the environmental field, spatial mapping of potential problem pollution areas (i.e. noro-virus) - especially those that could affect food sources (filter feeders such as clams or oyster populations), would be one application.
3	Most all aspects of health involve a spatial location. GIS is the best tool to visualize, analyze, and manage spatial datasets used to assess health reform.
4	Service allocation issues; identification of 'problem' areas; tracking patient; tracking outbreaks
5	Health issue is by nature spatiotemporal in its entirety. GIS is by far the most effective tool for assessing and disseminating such spatiotemporal domain. A reform is only possible if you would clearly aware which to reform -- which is also spatiotemporal.
6	Not sure why "reform" seems to be the major component of the above sentence.
7	1. Spatial models of zoonotic diseases; 2. Epidemiological studies; 3. Environmental risk assessment
8	Mapping assets and resources, determining high priority target areas, and presenting spatial information to policy makers.
9	GIS can be used to analyze various health reform issues related to access, cost containment and health outcoms and behaviors. One important application of GIS would be an examination of the spatial relationships between consumers and suppliers of healthcare. Health care reform will greatly expand access to care by expanding insurance coverage, but access limitations based on geographic location may persist. For example, GIS can be used to quantity and evaluate geographic barriers to effective use of primary care. GIS can also be used to evaluate the geographic variations in healthcare spending. An oft-mentioned critique of the US healthcare system is the existence of widespread geographic variations in per capita Medicare spending that are not linked to differences in population health. Such variations are often pointed to as evidence of wasteful spending. Various cost-containment efforts will be developed at a result of health reform, and GIS can be used to evaluate their impact on geographic variations in medical care spending.
9 (cont')	Finally, various aspects of heathcare reform may alter health behaviors (e.g. workplace health promotion efforts) and health status (expanded access to insurance). GIS can be used to assess improvements in health status and how they are distributed geographically, especially in light of widespread variations in health outcomes by socioeconomic status.
10	It brings location to the discussion at more disaggregate levels allowing targeted mitigation strategies in ways that are not available without GIS.
11	Geospatial analysis
12	We know that health care delivery, and population health vary by geography. GIS is a useful tool for comparisons, and for comparisons of change over time.
13	Health deals with people in specific locations; Health care is provided in facilities or specific locations; Both are fundamentally spatially specific keys to policy. The environment (built and natural) are partial determinants of health prospects of residents.
14	GIS offers the platform on which we can analyze and communicate information about health reform. The metaphor of the map is very powerful and needs to be used carefully.
15	Again Contact Jennifor Mellor
16	As a Medical Geographer, I promote the use of GIS in health research. Using GIS, I have collaborated with the Missouri Department of Health to examine cancer clusters and communicate difficult epidemiologic data to the broader public. GIS can help decision makers visualize health-related issues from a different perspective. Creating maps through GIS offers a unique, powerful and flexible tool for analysis of health-related geographical phenomena. With limited resources for health care, GIS can help identify areas of need that other type of information systems can not.
17	With data available, resources can be accuratly modeled and distributed. Research questions regarding health & social interactions can be properly studies... the possibilities are endless.

A key component of this survey is the assesment of partnerships between universities, state agencies and non-profit organizations. All of the 21 respondents that answered this question felt that such partnerships would strengthern GIS-related technical assistance. The vast majority also felt that such partnerships would provide support for graduate research and facilitate sharing of educational opportunities, 95% and 86%, respectively. All respondents felt that such partnerships would assist in developing a network of GIS colleagues; however, 91% indicated that they already have such networks.

Eighty-six percent of respondents indicated that they are in favor of having a network, as alluded to in §1.1 of SB549, and believe that establishment of a partnership would assist with educational advancement. However, questions related to having additional peer review and likelihood of greater funding success were less encouraging. Only 42% of respondents favored additional peer review processes; 57% thought a partnership would increase funding success (Figure 4).

Figure 4: Partnership Development Perspective Among SB549 Respondents (n=21)

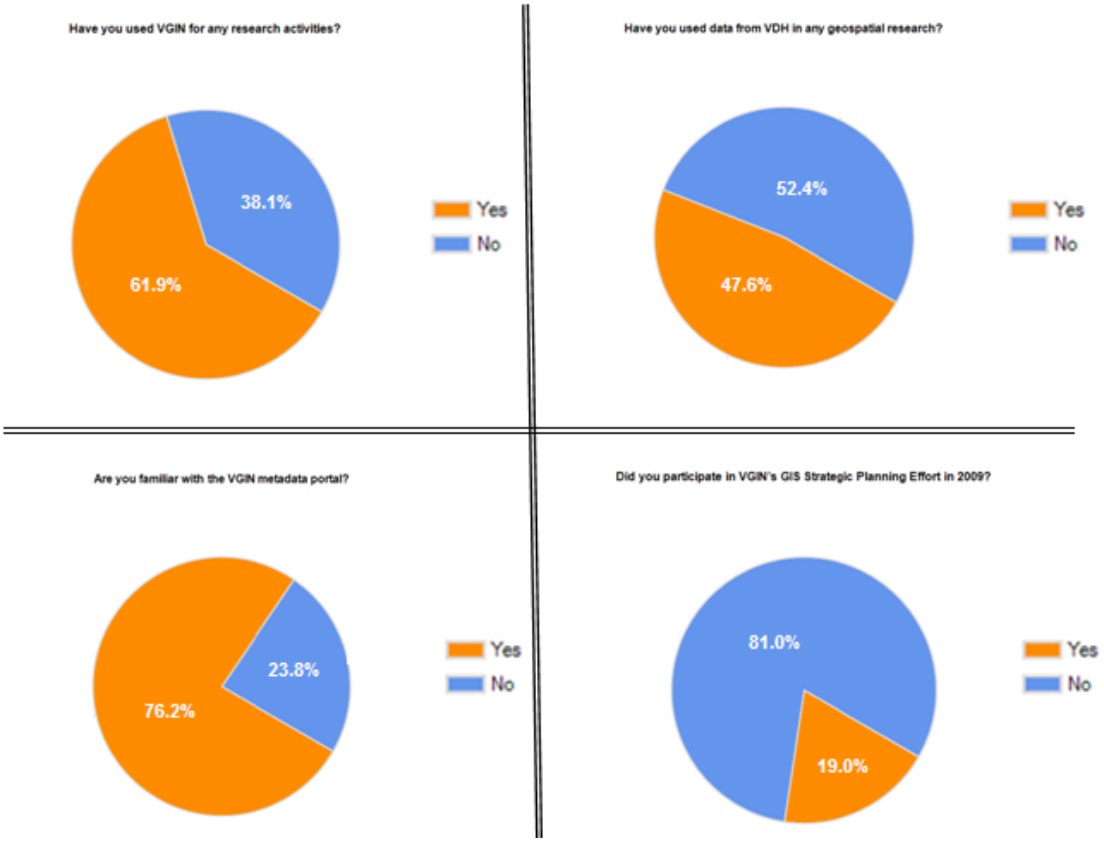


At present, all colleges and universities surveyed make ArcGIS software available to their faculty/staff; 86% of respondents indicated that such software is made available to students. Only 29% of respondents thought it would be advantageous to have an entity outside of their institution providing GIS infrastructure support. Coordination and support activities related to geospatial analysis, health policy and planning received more favorable remarks; however, one-third (33%) of respondents were not interested in having an outside entity providing any related assistance.

To gain a better understanding of existing geospatial expertise, questions were asked regarding spatial modeling and research and the desire for assistance in this area. An overwhelming majority of respondents (95%) indicated that they conduct spatial modeling in their research activities; but 76% indicated that they do not need any assistance with such activities.

Respondents were also asked about previous or existing colalborations between their respective institutions, VGIN and VDH. Sixty-two percent (62%) of respondents indicated that they have used VGIN data in their research endeavors. Approximately one-half (48%) of all survey respondents stated that VDH data had been used in geospatial research activities. The majority of persons completing the survey are also familiar with the VGIN metadata portal. However, only about one in five respondents participated in the 2009 VGIN strategic planning efforts (Figure 5).

Figure 5: Historical Collaborations Between Universities, VGIN and VDH (N=21)



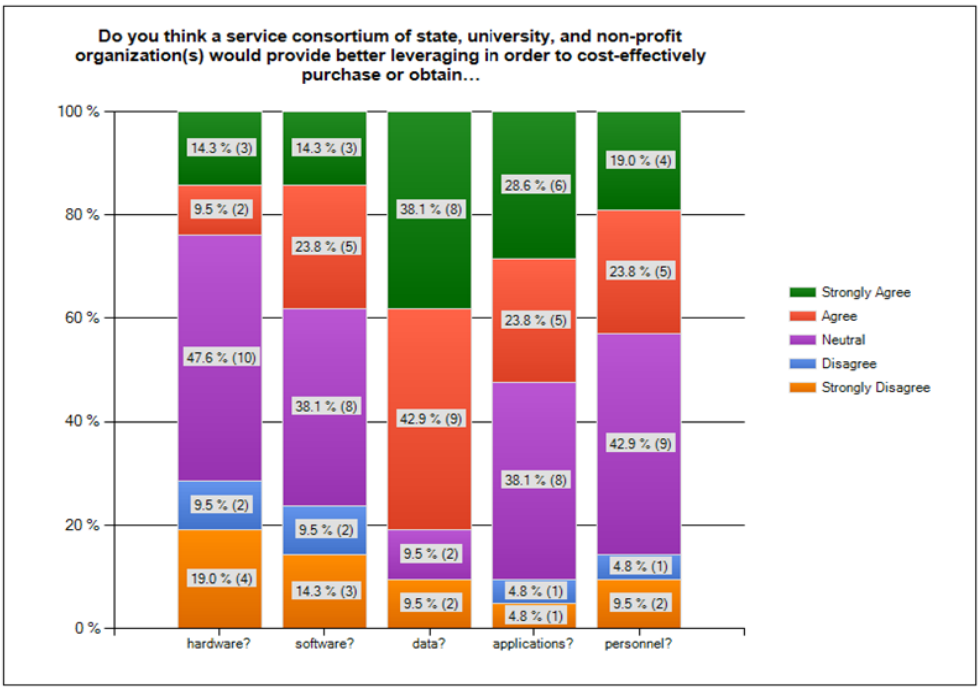
Survey respondents were asked their perspective concerning greater partnerships with VDH and non-profit organizations as they pertained to increased funding and research possibilities. Both questions were met with favorable responses; however, a larger proportion of respondents felt that greater partnerships with VDH would be more

beneficial, 81% and 67%, respectively. Eighty-one percent also support the development of a clearinghouse of geospatially referenced health data, although comments were made regarding the need to assess the type of data and confidentiality issues related to personal health information. Ninety-five percent of respondents would like access to a GIS clearinghouse of health data dedicated solely to health research.

As alluded to earlier, all respondents felt that enhanced partnerships between universities, state agencies and non-profit organizations would strengthern GIS-related technical assistance. However, 33% were not in favor when asked specifically about non-profit organizations providing technical assistance. Seventy-one percent of respondents did indicate that they would like assistance from either universities (14%), state agencies (5%) or both (52%).

This survey also asked respondents the effect that a service consortium of state agency, university and non-profit organizations would have related to acquisition of hardware, software, data, applications and personnel. Figure 6 summarizes and displays the results of these Likert scale questions as a cumulative percent per question. The results were varied, including neutral responses making up the majority of responses for four of the five categories. The exception was 'data", with an overwhelming majority in agreement (43%) or strong agreement (38%) that a consortium would be beneficial to data acquisition.

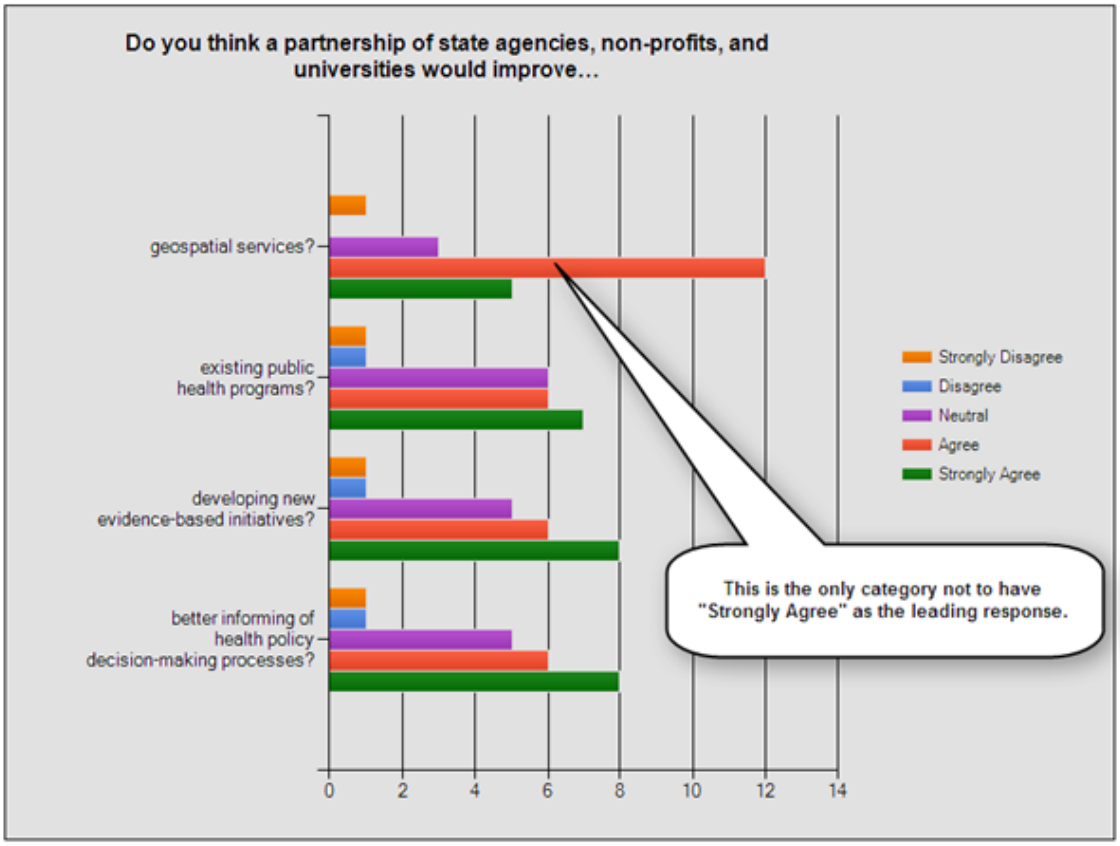
Figure 6: Survey Results of Service Consortium Leverage Related to Purchases or Acquisitions (N=21)



A Likert scale was also used to assess respondent views related to the ability of a partnership to improve geospatial services, existing public health programs, evidence-based initiatives and policy-driven decision making (Figure 7). Unlike the questions pertaining to leveraging of costs or acquisition, these responses were definitively in

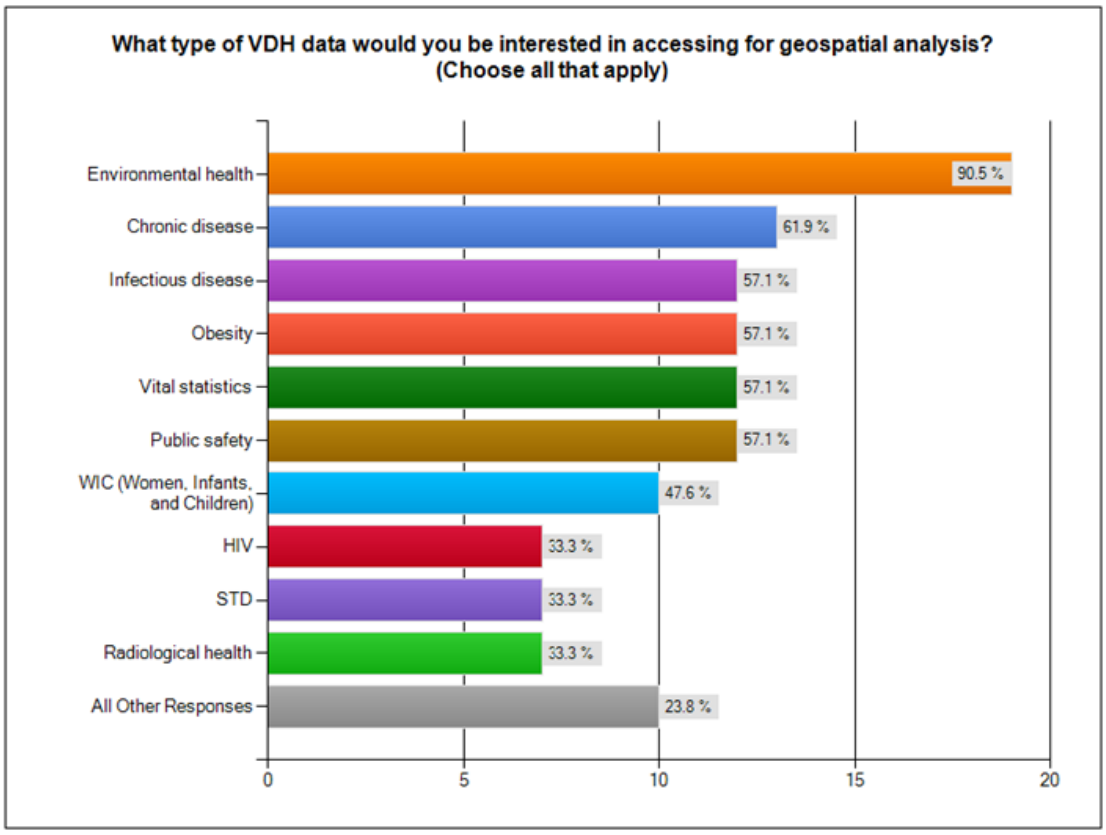
agreement across all categories. Three of the four categories all rated "strongly agree" as the leading response. Improvement of geospatial services was the only outlier. This category had a much higher "agree" response at 57% and a lower number of neutral responses compared to the other three categories.

Figure 7: Survey Results of Partnership Improvement Capacity (N=21)



To assist with the assessment of a possible health-related data clearinghouse, a question was added to the survey to ascertain the types of public health data of most interest to academic staff. Figure 8 shows the breakdown of responses, listed in descending order based on the most responses per category; percentages reflect the number of responses based on all persons that responded to the question. Environmental health data is by far the topic area of most interest for geospatial research at 95%, followed by chronic diseases (62%), and four topics each at 57%: infectious diseases, vital statistics, obesity, and public safety. Smoking cessation, zoonotic diseases and vehicular crash data made up the responses to the "all other responses" category.

Figure 8: Survey Results of Respondent Areas of Public Health GIS Interest (N=21)



Not surprisingly, and if given the choice, respondents would prefer geosptial health research data based on the lowest level of granularity. Point data received 57% of responses, followed by census block (24%) and census tract (14%). One person stated that they did not need data; zip code and city/county level data received zero responses.

All but one of the survey recipients indicated that someone at their institution would likely be interested in participating on a governing board for a GIS partnership consisting of government, universities and non-profit organizations. Survey recipients also provided additional names of colleagues involved in GIS activities. In total, 23 individual names were provided. Fourteen of these names were recipients of this survey; nine names were new and will be retained and combined with the initial colleague list to provide a more comprehensive academic listing of GIS-related faculty and staff within the Commonwealth of Virginia.

Six respondents took the time to provide additional comments related to this survey. Three of these comments reflected a direct interest in being involved in a possible partnership. Other comments included the desire to get involved in data sharing, as well as the desire to see Virginia move forward with GIS initiatives, which they felt were inferior compared to GIS initiatives in many other states. One respondent was skeptical of the survey, stating that the proposal for a partnership was very vague and wondered what and who was behind the partnership initiative, including the specific non-profit organizations.

Survey Discussion:
Survey responses were received from nine of the twelve institutions of higher education that initially received requests for participation. Hence, responses are varied and are fairly representative of Virginia's colleges and universities. The survey recipients also appear to be relatively well represented, based on experience with public health geospatial research activities, and the fact that 13 of the 22 colleagues (59%) listed by respondents as additional GIS contacts were already included in this survey.

Based on survey results, GIS is an active component of academic institutions within Virginia, with 83% of respondents indicating that GIS courses are offered at their institutions. Public health research activities are also common, with 83% of respondents stating that such research is conducted. Not surprisingly, GIS-related public health research is most commonly conducted in relation to environmental health and population health/epidemiology.

Faculty with expertise in GIS also appears to be flourishing. Ninety-one percent of those surveyed indicated GIS work has been published, including 85% through peer-reviewed journals. Five respondents indicated authorship of GIS-related texbooks, including one text focused on spatial statistics.

The above data, as well as other results from the survey, indicate that GIS is firmly embedded within Virginia's colleges and universities, as all nine institutions of higher education offer GIS-related courses and six of the nine institutions have an established GIS center on campus. Public health research is conducted in 63% of these GIS centers, and roughly one-half of respondents have used VGIN or VDH data in their research activities. Degrees and certificates in GIS are more scarce; however, it is expected that the institutional foundations being created related to coursework and GIS centers will result in additional GIS-related opportunities.

It is apparent from the survey results that access to GIS software is not a problem for any of the colleges or universities that responded. All faculty have access to current ESRI GIS products and 86% indicated that students can access GIS software. The fact that all respondents across the Commonwealth of Virginia are using ESRI software helps to assure standardization for any future opportunities for collaboration.

Colleague collaborations appear to be ongoing among the survey respondents, including contacts with VDH, VGIN, in-state universities, out-of-state universities, non-profit organizations and the CDC. There does appear to be room to improve GIS-related collaborations within Virginia, as 32% of respondents indicated no contacts and more respondents indicated contacts with out-of-state universities compared to in-state, 27% and 14%, respectively. Collectively, respondents appear to have developed relevant contacts with VDH and/or VGIN (68% combined), although a percentage closer to 100% would be preferrable.

Issues involving federal healthcare reform were met positively among survey respondents, with a majority providing information as to how GIS can be used to further

our collective understanding of numerous health and healthcare issues. Nearly all respondents would be interested in geospatial data availability through a Health Information Exchange(s) (HIE), and several mentioned specific public health topic areas that may be useful for planning purposes. The Secretary of Health and Human Resources may wish to consider such comments during HIE planning, as well as inclusion of embedded geocoding functionality within the larger HIE efforts currently underway in the Commonwealth. Both VGIN and VDH have experienced geocoding staff and software applications that may be helpful with such efforts.

Survey respondents agree that efforts to establish partnerships between state agencies, universities, and non-profit organizations, as alluded to in SB549, would be beneficial for the provision of technical assistance, as well as for sharing of educational opportunities, graduate research, and building GIS networks of colleagues. However, respondents appear to favor technical assistance from other universities and/or state agencies over non-profit organizations. Perspectives related to specific attributes of SB549 were less optimistic, such as the willingness to have additional peer review and the potential for greater funding success. At present, public health GIS funding appears to be diversified. Use of GIS software appears to be widely available to faculty and students and all institutions of higher education are using the same vendor (ESRI) software.

In general, the ability of a service consortium to provide better leveraging for purchases or data acquisition was met with a sense of neutrality, with the exception of questions pertaining to data and applications. However, respondents resoundingly agreed that establishing partnerships would likely increase data acquisition possibilities. Respondents also agreed that such partnerships would enhance geospatial services, better inform policy decision-making, and improve evidence-based initiatives and public health programs.

The development of a geospatial clearinghouse was clearly desired by survey respondents. Furthermore, most respondents were familiar with the VGIN metadata portal. At present, VGIN is working on development of a data clearinghouse. VDH and VGIN should consider a joint effort to pool physical and staff resources to create an efficient means of establishing a geospatial clearinghouse. Such a clearinghouse would serve to enhance health-related geospatial services and likely serve as an impetus towards greater collaborations and partnership development among state agencies, universities, and non-profit organizations. The listing of public health topic areas in this survey should provide a balanced starting point to determine the types of data most desired by universities.

Most survey respondents (95%) are willing to either participate or have someone from their institution participate on a governing board, if established, based on the text of SB549. Numerous comments were also made by respondents stating their desire to work with other staff on health research activities. As such, there appears to be sufficient academic personnel willing to build upon the existing collaborative relationships throughout Virginia.

Virginia Department of Health Programmatic Assessment

Program Assessment Review and Methodology:
Numerous VDH programs have been involved in GIS activities. Therefore, it was determined that input from many VDH programs with a history of GIS involvement would be necessary to adequately address the SB549 study mandate. A listing of VDH programs with known history of GIS was developed, as well as a VDH Program Assessment tool (Appendix G). This assessment included the entire enrolled text of SB549, provided as excerpts, based on the seven defined components of the bill. Specific questions pertaining to each section were included after each section. The questions were intended to gauge VDH program perspective related to SB549, as well as provide an avenue for sharing related experiences.

Relevant VDH program staff were sent an introductory email explaining the report requirement associated with SB549 and asked to participate in a joint VDH meeting (Appendix H). Follow up emails ensued, including reminders, specific date/time determination, etc. Each participant was sent the VDH program assessment tool questions as a means of determining programmatic feedback. Programs were not required to complete the questions in advance of the meeting.

VDH Program Assessment Results:
The initial invite soliciting VDH participation was emailed to relevant staff on September 29, 2010. A total of 17 VDH and one VGIN staff received the initial email, including VDH staff from the Office of the Commissioner, Office of Drinking Water (ODW), Office of Epidemiology (OEPI), the Office of Emergency Preparedness (OEP), Office of Environmental Health Services (OEHS), Office of Family Health Services (OFHS), Office of Information Management (OIM), and Office of Minority Health and Health Equity (OMHHE). The VDH Program Assessment meeting was held on October 7, 2010. A total of 14 staff attended the meeting, with representatives from all of the above offices, with the exception of the Commissioner's Office. Attendees included Office Directors, GIS Analysts, information technology staff, policy analysts, epidemiologists, and program coordinators (Appendix I).

Attendees were initially provided a general overview of the meeting. After introductions, a VGIN overview was provided for the attendees, as well as a history of SB549 and an overview of current report preparation activities. An initial clarification of the report requirement for SB549 was required to ensure all attendees understood that the bill required an evaluation of opportunities for partnering with non-profit organizations and institutions of higher education to develop a network for geospatial health research.

In keeping with the context of SB549, VDH programs were asked about their history working with Virginia's institutions of higher education. The ODW stated a previous history working with Virginia Tech on various GIS projects; the OEPI has worked with VCU to provide educational opportunities related to GIS, including course lectures, a public health seminar entitled "Why Where Matters" in March, 2010, and a four-hour

continuing education course in June, 2010. The OEHS has worked with universities related to data layer creation, technical reviews, application development, and data sharing.

Given the historical context of SB549 and the current study requirments, VDH programs were asked to comment on the possibility of a non-profit organization serving as the coordinator and supporting entity for universities, state agencies and the private sector, related to SB549 text as stated in Chapter 679 1. § 1.2. Many attendees stated opposition to a non-profit entity providing such services. No one spoke in support of the possibility. The theme of this discussion centered around the need for VDH programs to maintain the lead for data-related initiatives, as an intimate understanding of programmatic activities are require to fully understand programmatic operations and data. Concerns related to classified and/or personal health information were also a major concern, as VDH maintains highly sensitive and classified information related to emergency preparedness and homeland security, and has confidentiality requirements pertaining to data for specific infectious diseases. One program did state that a non-profit organization could be beneficial in providing supplemental services in certain situations, assuming VDH retained control over the data and analyses. However, this would require extensive data use agreements. In general, VDH programs were strongly opposed to having a non-profit in control of their data. In addition to confidentiality concerns, access and control over multiple geocoded datasets by a non-profit entity would likely lead to inappropriate data interpretation and aggregation.

VDH program staff were also asked their perspective regarding a clearinghouse, as stated in Chapter 679 1. § 1.3. VDH staff were in agreement that a clearinghouse is worthwhile. However, there are concerns regarding the general availability of geo-referenced data and the inherent identifiable nature of point level information. It was agreed that data should be available to the public; however, the granularity of such data would need to be addressed prior to publication in a data clearinghouse. Some data have no restrictions or privacy issues, such as shellfish sanitation program data; however, other program areas have strict security access requirements. Certain VDH data is already available to the public via the VGIN metadata portal, including shellfish condemnations/closures, seawater stations, shoreline survey deficiencies/significant properties, and hospital and local health department locations. Emergency preparedness staff from VDH also access data from the Virginia Fusion Center on a daily basis. Additional discussion regarding specific public health data that should be publicly available would be required, including public data release determinations related to data granularity. VDH would also need to ensure that societal expectations related to pubic trust is maintained to the fullest extent.

VDH programs were also queried regarding any successful funding efforts related to GIS. Although various programs use GIS, only two offices have received funding specifcally for GIS efforts - OEHS and OEPI. OEHS received Coastal Zone Management funds in 2002 for data layer creation. OEPI receives ongoing funding related to the beach monitoring program, which assesses public health consequences related to waste management effluent and harmful algal blooms. OEPI successfully competed for a three-

year (2007-2009) GIS grant associated with enhancing HIV surveillance, which was awarded to only three sites nationally. This grant provided insight into the quality of HIV address data. The CDC and the three grantees (Virginia, Colorado and Washington State) also generated a "Roadmap to Using GIS for HIV Surveillance Programs" across the United States. A subsequent HIV GIS grant was awarded to Virginia in 2010 to continue data quality work related to patient addresses with the intent of performing national scale spatial analyses.

There is an array of GIS use and experience throughout VDH. As such, the types of requisite data and staff skillsets vary greatly. Some programs only use population files, whereas others use Area-Based Socioeconomic Measures and/or market segmentation data. Some additional data would be advantageous for modeling purposes (i.e. bathymetric data) but it is currently cost prohibitive. VDH also has a VGIN license, complete with established VGIN portal access for the most recent aerial imagery available. A previous version of Virginia's aerial imagery is maintained by VDH, if needed. Some program areas have staff with minimal GIS skills, although basic map production can be performed. Other programs have staff certified in GIS (OEHS) or with experience performing spatial analyses, including OEPI and OMHHE.

Staff from VDH programs do not believe any value would be added by having a non-profit organization function as a service organization for GIS hardware, software, data, applications, and personnel. Multiple rationales were provided to support this belief: 1) VDH programs stated that it would not be appropriate to release confidential data to such an entity; 2) it is unlikely that such an organization could meet rapid, ad hoc surveillance time requirements; 3) additional, and perhaps unnecessary, charges would apply for such services; 4) VDH already has many ArcGIS licenses, including ArcGIS desktop (~90), ArcInfo, ArcGIS Server Advanced and numerous extensions; and 5) the addition of a non-profit would likely add an additional and unecessary, layer for data acquisition.

Non-Profit Organizations Assessment

Staff from VDH and VGIN met with representatives from two separate non-profit organizations to discuss SB549. These organizations were the Virginia Network for Geographic Health Research, Inc. and Virginia Health Information, Inc. Information pertaining to each of these organizations, as well as meeting summaries are outlined below.

Non-Profit Organizations Background and Descriptions:

Virginia Network for Geographic Health Research, Inc. (www.vnghr.org)

The Virginia Network for Geographic Health Research, Inc. (VANGHR) is a non-profit organization located in Richmond. According to the VANGHR webpage (www.vnghr.org), their mission is, "to facilitate continuity of funding and to provide sufficient flexibility in support of both public and private sector initiatives using geospatial analysis of health and health care relevant data." The organization was initiated as a 501(c)(3) in April, 2009. Two persons make up the existing staff, including the founder/Executive Director and a data analyst/project manager hired in August, 2010. The organization also has a Board of Directors currently made up of four persons: three of these Board members are from Virginia universities, and the fourth member is the patron for SB549. See Appendix J for a complete description of all VANGHR Board members and staff.

The VDH Coordinator for the SB549 report was contacted on October 6, 2010 by Don Combs, PhD, President of the Virginia Network for Geographic Health Research, Inc. (VANGHR). Dr. Combs discussed the existing VANGHR Board and requested to set up a meeting with relevant VDH staff to provide VANGHR perspective related to SB549. A request for VDH participation on the Board was also presented. VDH staff followed up with Dr. Combs and informed him that the Health Commissioner agreed that VDH representation on the Board was appropriate; however, VDH would wait until work on the SB549 report is finalized before assigning a representative.

Virginia Health Information, Inc. (www.vhi.org)

Virginia Health Information (VHI) began in 1993 with the passage of the Patient Level Database System Act. This non-profit corporation's mission is to create and disseminate health care information to promote informed decision-making by Virginia consumers and purchasers and enhance the quality of health care delivery. Working with both the private and public sector, VHI serves as the source for various healthcare-related data reporting in Virginia, including assisted living facilities, continuing care retirement communities, health maintenance organizations, home care providers, hospitals, nursing facilities, physicians, and other providers. The Board of Directors includes representatives from the following entities: business community; consumers; health insurance; hospitals, nursing facilities; physicians; the Joint Commission on Health Care; and VDH.

VDH has a long-standing relationship with VHI, including general funds provided through VDH for hospital discharge data collection efforts. This data is provided to VDH via CDs on a quarterly basis. VDH also provides a link to VHI on the health department's public-facing webpage.

Meeting Synopses:

Virginia Network for Geospatial Health Research, Inc. Meeting

A meeting to review the current status of the SB549 report and to discuss VANGHR's partnership potential as a non-profit organization was held on October 28, 2010. Attendees included five VDH representatives from the Office of the Commissioner, Office of Epidemiology and the Office of Information Management, one representative from VGIN, and two representatives from VANGHR (see Appendix K).

The meeting began with introductions from all attendees, followed up by a meeting introduction and review of activities to date regarding the SB549 study. A discussion of the historical context of the bill, since 2009, was provided by Senator Barker, including mention of two previous presentations made to the VGIN Board. He also explained his involvement in the set up of VHI as a non-profit organization in 1992 and the desire to assess a similar venture for GIS. Senator Barker did state that the need for an authority versus a non-profit organization was uncertain; hence, the bill was changed to a study for further examination and review. The Senator had no inclination as to whether an authority or a non-profit organization would be best suited to advancing GIS activities. His primary interest is in establishing mechanisms for moving forward, providing assistance, working with VGIN and promoting research. The Senator stated that a non-profit organization can possibly help universities with GIS initiatives, but that the structure of such an organization does not necessarily need to be set up as described in SB549.

The VANGHR Executive Director stated that the first VANGHR project, started in July 2009, involves the Virgina Rural Health Resource Center. VANGHR worked with VGIN to establish the technical infrastructure necessary for interactive map creation via the rural health data portal. Funding for VANGHR's work on this project, as well as additional staffing assistance, is provided by the VDH Office of Minority Health and Health Equity. Presentations regarding this activity were conducted at the 2010 ESRI Health GIS conference, the 2009 Virginia Rural Health Association Conference, and the 2010 American Public Health Association (APHA) Conference in Denver, CO. VANGHR is also working on another project awarded to the Virginia Commonwealth University (VCU) Center on Human Needs from the Joint Center for Political and Economic Studies. The Center on Human Needs is collaborating with VANGHR to apply geographic information system (GIS) tools for mapping (for more information see the following URL: http://www.familymedicine.vcu.edu/research/other/index.html). This contract was initiated in December 2009. Information pertaining to this project was presented jointly by Steven Woolf, PhD, Director of the VCU Center on Human Needs, and the VANGHR Executive Director at the 2010 APHA Conference.

VANGHR is in the early stages of trying to bring university public health researchers together. According to the Executive Director, VNGHR has no interest in requesting general funds for operations as they desire to use an entrepreneurial approach to funding. When asked about the possibility of a fee structure for data aquisition, VANGHR stated that they would use funding from grants and the private sector as financial support.

VANGHR was asked about their perspective regarding VGIN's role. They indicated a desire to continue collaborating with and using the VGIN GIS infrastructure. They see the difference between VGIN and VANGHR as the former serving as a base repository of data, and VANGHR would leverage VGIN by using the health data. Questions were raised as to issues involving geographically-enabled personal health information and confidentiality and security concerns if any health-related data were managed by VANGHR. It was agreed that is a big issue which would likely involve Institutional Review Board reviews, and compliance with Health Insurance Portability and Accountability Act (HIPAA) provisions and/or local or state agency data standards. When asked how VANGHR would handle data, they gave an example of stroke data that was recently presented at a meeting of neurologists. It was later determined that these data were provided as maps by the VDH OMHHE, such that any issues involving data confidentiality were averted by VDH in advance.

To date, VANGHR has received funding totaling approximately $300,000 via contractual arrangements through the rural health project (VDH funding) and the VCU Center on Human Needs (National Institutes of Health [NIH] funding). An additional grant possibility is forthcoming; however, no sharable information is currently available.

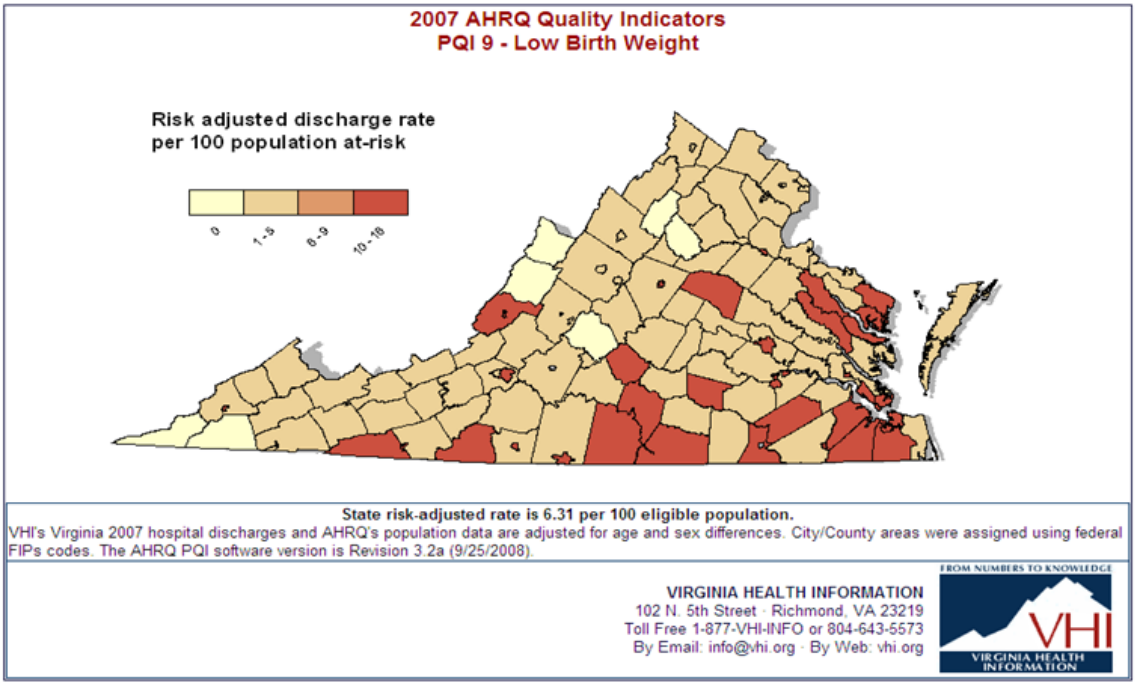
Virginia Health Information Meeting

A meeting to review the current status of the SB549 report and to discuss VHI's partnership potential as a non-profit organization was held on November 16, 2010. Attendees included the VDH SB549 coordinator and the VHI Executive Director, Michael Lundberg.

The meeting began with an introduction and review of current activities to date regarding the SB549 study. A discussion of the historical context of the bill since 2009 was provided by the VDH coordinator.

VHI provided examples of previous work involving GIS, such as a sub-contract funding through VDH OMHHE for an interactive GIS application for the Williamsburg Health Foundation, as well as hospitalization maps by zip code boundaries for Virginia's cities and counties. VHI currently has a mapping application provided through AHRQ that provides for instant mapping functionalities on the VHI website (Map 2). VHI has also mapped trauma registry data related to car accidents working VDH Center for Health Statistics data. A drive-time analysis to assess access to hospital ob/gyn services was also performed on behalf of the Warner Administration.

Map 2: Example of GIS Data Visualization Capacity at Virginia Health Information (Available at http://www.vhi.org/ahrq_county.asp)



VHI has several years of experience collaborating with VDH staff, including projects that involved low birth weight, physician age, geocoding and certificate of need information. VDH program collaborators have included the OFHS, OEPI, OMHHE and the Office of Licensure and Certification.

Staff at VHI have maintained at least one license of desktop ArcGIS software for approximately the past 10 years. However, availability of experienced staff with GIS skillsets has been sporadic. VHI employed a highly trained spatial analyst for the past two years; but, that individual left in August 2010. The Executive Director stated that VHI would be interested in participating in the type of activities alluded to in SB549, but their current capacity would need to be expanded if they were to assume a large role as a non-profit entity.

Effective July 1, 2009, the Code of Virginia was changed to allow VHI to receive patient addresses for all hospitalization data. Previously, this data was only available at the zip code level. A full twelve month's of data will be available soon. This added level of data granularity will allow VHI to provide more in depth geospatial analyses of existing hospitalization data, thus providing more informative data for healthcare analysis and delivery.

Findings and Recommendations

Report Finding 1:

Neither VDH nor VGIN have a comprehensive listing of faculty and staff at Virginia's institutions of higher education with professional interests in spatial health research.

Recommendation:

The VDH and VGIN should create a master list of all known health-related GIS faculty and staff at Virginia's institutions of higher education, including two and four year institutions. This list should be based on the personnel findings from this survey, with appropriate follow up to these faculty and staff for review and comment. The updated listing should include contact information for use in expanding collegial relationships and should form the basis for future GIS listservs, discussion groups and partnership development. This list should also be used by VGIN and VDH to ensure dissemination of relevant GIS-related research and funding opportunities and to review relevant documentation (i.e. strategic plans).

Report Finding 2:

The Commonwealth of Virginia should consider development of a spatial data clearinghouse for use in furthering the scientific understanding of health and healthcare issues impacting the residents of Virginia. Additionally, any health-related data clearinghouses developed as part of the Virginia Health Reform Initiative should contain geo-spatial data whenever possible.

Recommendation:

The VDH and VGIN should partner together to determine an appropriate course of action for development of a spatial data clearinghouse of health-related information. Consideration of existing infrastructure under development for the VGIN clearinghouse should be reviewed to determine feasibility of use for health-related data. The spatial data clearinghouse needs of non-sensitive spatial data from VDH would likely already be addressed by the VGIN spatial data clearinghouse effort. Sensitive spatial data from VDH requires extra consideration given the issues of confidentiality, security and controlled access of such data. Extra efforts should be made to satisfy legitimate health-related data access from the relevant state agencies. If such efforts are not considered feasible, then further discussion regarding non-profit organization data housing should ensue.

The confidential nature of personal health information, requirements of state and federal laws, public health ethics and social expectations regarding government's role in protecting personal information are of the utmost importance. Variable attributes pertaining to spatially-enabled data makes security and confidentiality of a geospatial clearinghouse extremely important. These components must be integrated into any clearinghouse development and include both technology and organizational process components. Additionally, a thorough review of existing policies, procedures, laws, current literature and best practices should be conducted and instituted as part of this overall process, as appropriate, to ensure the public's trust and confidence.

Report Finding 3:

Collaborations and networks of staff from Virginia's institutions of higher education, state agencies (VDH and VITA/VGIN) and non-profit organizations currently exists. Examples of such ongoing collaborations includes VDH and VGIN, VDH and the VITA Enterprise Applications Division, VDH and Virginia Tech, VDH and VHI, VDH and VANGHR, VGIN and VANGHR, College of William & Mary and other universities, VCU and VANGHR, the Virginia Hospital and Healthcare Association and VHI, UVA and VHI, and the Rural Health Resource Center and VANGHR. VANGHR has a Board of Directors that includes faculty from each of Virginia's four medical schools. VHI's Board of Directors includes representatives from VDH, the Joint Commisioner on Health Care and numerous private sector and health-related entities. These efforts and/or networks of colleagues do not constitute partnerships in the form of a formalized network for geospatial health research, as required to be evaluated by SB549.

Recommendation:

Based on the findings from this report, the Secretaries of Health and Human Resources and Technology do not believe a codified approach to developing a network for geospatial research is necessary for the continued expansion of geospatial health research. Staff from all three types of institutions currently work together related to numerous GIS and non-GIS initiatives. Both Secretaries believe that actions taken on the recommendations within this report will be sufficient to promote and share additional opportunites for multi-institutional research collaboratives, funding announcements, and education advancement, as well as opportunities for colleague networking.

Report Finding 4:

Virginia's colleges and universities have faculty and staff with expertise in GIS technologies, including course teaching, peer-reviewed publications, textbook publications, spatial analyses and modeling techniques. Many GIS-related staff are involved in public health research activities. Agency staff from both VDH and VGIN also possess various GIS expertise, including application development, course teaching/lecturing, peer-reviewed publications and spatial analyses. Existing non-profit organizations possess GIS expertise related to public health contractual assistance and/or experience, application development and spatial data management and analysis.

Recommendation:

The majority of university faculty, VDH and VGIN staff and non-profit organization staff involved in routine GIS activities do not appear to need substantial technical assistance. Numerous faculty appear to be well versed in spatial modeling and analyses, as well as use and development of open source software and related technologies. Staff from VDH have received numerous GIS-related trainings, including training developed in-house for statewide epidemiologists and emergency planners, as well as ad hoc spatial analysis training. The continuing development of collegial GIS networks should assist other staff that desire technical assistance or training advice. In addition, a GIS listserv operated out of the Centers for Disease Control and Prevention is a good resource for questions and feedback related to GIS activities. VDH and VGIN should ensure that all persons

included on the new listing of GIS users, as described on Recommendation 1, are aware of the CDC listserv.

Report Finding 5:

The development of a system of peer review related specifically to GIS research was viewed positively by less than half of the respondents. Based on survey results, faculty and staff have published many peer reviewed articles including those related to public health GIS topics.

Recommendation:

The process of peer review is performed by specific journal editorial committees. These entities have established experts in the related fields of practice whom they call on to review manuscript submissions. In many cases, additional peer review would likely not provide sufficient added value to the process. Hence, a system of peer review is likely a redundant and unnecessary activity. Authors currently share and solicit feedback on manuscript development from their colleagues, as appropriate.

Report Finding 6:

Infrastructure related to GIS software is provided by all institutions of higher education that responded to the survey, including provision to all faculty and most students. All higher education institutions, related state agencies (VDH and VGIN), and two known non-profit organizations all use ArcGIS products from ESRI. Some universities also use open source software and build custom GIS tools.

Recommendation:

Given that all related entities use the same vendor for GIS software (pursuant to a Virginia state contract), it is unnecessary to be concerned about supplying GIS infrastructure support. If questions arise regarding infrastructure, the ESRI helpdesk will be the likely source of contact. Additional questions or advice can be obtained from well-qualified VGIN staff.

Report Finding 7:

Hardware infrastructure for both VDH, VGIN and related state agencies is supplied through the VITA-Northrup Grumman public-private partnership. Virginia's universities maintain hardware infrastructure independently. Non-profit organizations maintain their own hardware; however, one non-profit organization collaborates with VGIN for use of web-based GIS functionality.

Recommendation:

Hardware infrastructure operates under differing auspices among universities, state agencies and non-profit organizations. Before considering development of any alternate hardware infrastructure outside of the state information technology framework, the existing state hardware infrastructure of VDH and VGIN must first be examined for its ability to meet the hardware infrastructure needs for any proposed geospatial network to enhance health-related research.

Report Finding 8:

Many institution of higher education faculty and staff desire access to additional health-related data, including spatially-enabled data. Access to such data will

require a thorough review of existing laws, and data security and confidentiality processes.

Recommendation:

The efforts related to development of a spatial data clearinghouse of health-related information (Recommendation 2) should provide a forum for improved data access. However, data security and confidentiality standards and policies will be imperative to ensuring such access is used appropriately, based on existing laws and records management. VDH and VGIN staff should work together on the development of security and confidentiality procedures pertaining to spatially-enabled data elements. Such procedures should be shared with and followed by universities and non-profit organizations that maintain or use any VDH-specific data or for those entities that desire access to personally identifiable information.

Prior to the establishment of any data access portal, Memorandums of Agreement should be created, as well as data sharing agreements that clearly stipulate access controls, data availability and data use requirements. Such documentation must ensure that legal requirements related to patient anonymity and data access, as described in Chapter 40 of Title 2.2 and Chapter 2 of Title 32.1 of the *Code of Virginia*, are followed and examined. A thorough review of existing *Code of Virginia* language should be performed by VDH to ensure that any data access provided via a spatial data clearinghouse is legally appropriate. In addition, VDH should examine internal interpretation of specific codified terminology (i.e. use of the term "research" in Section 32.1-36.1 and 32.1-41) to ensure data interpretation consistency across the agency. In addition, due to spatial data attributes often used in geospatial research, VDH should determine what constitutes a provider's name as alluded to in section 32.1-38.1. At present, this language may be interpreted as a practice or an individual practitioner's name. These types of legal issues must be thoroughly vetted and clearly defined prior to health research data access by entities outside of the agency.

Appendices

094122201

SENATE BILL NO. 1497

Offered January 23, 2009

A BILL to amend and reenact § 2.2-2905 of the Code of Virginia and to amend the Code of Virginia by adding in Title 32.1 a chapter numbered 16, consisting of sections numbered 32.1-368 through 32.1-377, relating to the creation of the Virginia Network for Geospatial Health Research Authority.

Patrons—Barker; Delegate: Shuler

Referred to Committee on Education and Health

Be it enacted by the General Assembly of Virginia:

1. That § 2.2-2905 is amended and reenacted and that the Code of Virginia is amended by adding in Title 32.1 a chapter numbered 16, consisting of sections numbered 32.1-368 through 32.1-377, as follows:

§ 2.2-2905. Certain officers and employees exempt from chapter.

The provisions of this chapter shall not apply to:

1. Officers and employees for whom the Constitution specifically directs the manner of selection;

2. Officers and employees of the Supreme Court and the Court of Appeals;

3. Officers appointed by the Governor, whether confirmation by the General Assembly or by either house thereof is required or not;

4. Officers elected by popular vote or by the General Assembly or either house thereof;

5. Members of boards and commissions however selected;

6. Judges, referees, receivers, arbiters, masters and commissioners in chancery, commissioners of accounts, and any other persons appointed by any court to exercise judicial functions, and jurors and notaries public;

7. Officers and employees of the General Assembly and persons employed to conduct temporary or special inquiries, investigations, or examinations on its behalf;

8. The presidents, and teaching and research staffs of state educational institutions;

9. Commissioned officers and enlisted personnel of the National Guard and the naval militia;

10. Student employees in institutions of learning, and patient or inmate help in other state institutions;

11. Upon general or special authorization of the Governor, laborers, temporary employees and employees compensated on an hourly or daily basis;

12. County, city, town and district officers, deputies, assistants and employees;

13. The employees of the Virginia Workers' Compensation Commission;

14. The officers and employees of the Virginia Retirement System;

15. Employees whose positions are identified by the State Council of Higher Education and the boards of the Virginia Museum of Fine Arts, The Science Museum of Virginia, the Jamestown-Yorktown Foundation, the Frontier Culture Museum of Virginia, the Virginia Museum of Natural History and The Library of Virginia, and approved by the Director of the Department of Human Resource Management as requiring specialized and professional training;

16. Employees of the State Lottery Department;

17. Production workers for the Virginia Industries for the Blind Sheltered Workshop programs;

18. Employees of the Virginia Commonwealth University Health System Authority;

19. Employees of the University of Virginia Medical Center. Any changes in compensation plans for such employees shall be subject to the review and approval of the Board of Visitors of the University of Virginia. The University of Virginia shall ensure that its procedures for hiring University of Virginia Medical Center personnel are based on merit and fitness. Such employees shall remain subject to the provisions of the State Grievance Procedure (§ 2.2-3000 et seq.);

20. In executive branch agencies the employee who has accepted serving in the capacity of chief deputy, or equivalent, and the employee who has accepted serving in the capacity of a confidential assistant for policy or administration. An employee serving in either one of these two positions shall be deemed to serve on an employment-at-will basis. An agency may not exceed two employees who serve in this exempt capacity;

21. Employees of Virginia Correctional Enterprises. Such employees shall remain subject to the provisions of the State Grievance Procedure (§ 2.2-3000 et seq.);

22. Officers and employees of the Virginia Port Authority;

23. Employees of the Virginia College Savings Plan;

24. Directors of state facilities operated by the Department of Mental Health, Mental Retardation and

Substance Abuse Services employed or reemployed by the Commissioner after July 1, 1999, under a contract pursuant to § 37.2-707. Such employees shall remain subject to the provisions of the State Grievance Procedure (§ 2.2-3000 et seq.);

25. The Director of the Virginia Office for Protection and Advocacy;

26. Employees of the Virginia Tobacco Settlement Foundation. Such employees shall be treated as state employees for purposes of participation in the Virginia Retirement System, health insurance, and all other employee benefits offered by the Commonwealth to its classified employees; ~~and~~

27. Employees of the Virginia Indigent Defense Commission~~.~~*; and*

28. Members of the Virginia Network for Geospatial Health Research Authority.

CHAPTER 16.

VIRGINIA NETWORK FOR GEOSPATIAL HEALTH RESEARCH AUTHORITY.

§ 32.1-368. Virginia Network for Geospatial Health Research Authority; purpose.

The Virginia Network for Geospatial Health Research Authority (the Authority), is created as a body politic and corporate, a political subdivision of the Commonwealth. The Authority shall have the powers and duties hereinafter conferred in this chapter.

The Authority is established to (i) provide for the continuity and expansion of research both within the public and private sectors using geospatial analysis of health and health care relevant data, (ii) develop economies of scale within state health agencies and within public health programs within the Commonwealth's universities, (iii) provide geospatial analytical support to other political subdivisions concerned with cost-effective targeting of public health initiatives, and (iv) engage in such other lawful activities as the Board of Directors of the Authority deems reasonable and appropriate.

§ 32.1-369. Powers and duties of the Authority.

A. The Authority is vested with all the rights, powers, and privileges conferred upon political subdivisions of the Commonwealth and such additional rights, powers, and privileges conferred under this chapter and those conferred upon corporations under the laws of the Commonwealth, including, without limitation, all the corporate powers given to nonstock corporations by the provisions of Chapter 10 (§ 13.1-801 et seq.) of Title 13.1. The Authority shall also have the power to take, hold, receive, and enjoy any gift, grant, devise, or bequest to the Authority. The Authority shall control and expend the funds appropriated to it by the Commonwealth.

B. The Authority shall:

1. Establish relationships with academic programs throughout the Commonwealth that use geospatial analysis to understand and assess environmental, public health, and health care issues to strengthen programs through technical assistance, to provide support for graduate research, and to facilitate sharing of educational opportunities across institutions. The Authority is specifically authorized to serve public health research stakeholders within the Commonwealth by (i) developing a network of experts and a system of peer review, (ii) supporting educational advancement, (iii) providing a conduit for seeking grant funding for research and practice, (iv) supplying technical geographic information system infrastructure support, and (v) assisting state health agencies, policy makers and health administrators in understanding optimal targeting and utilization of resources;

2. Support and coordinate academic, state agency, and private sector expertise in geospatial analysis, health policy, health planning, environmental health analysis, and epidemiology and facilitate the development of new approaches and methodologies to sustain effective public health and health care interventions across all health-related state agencies throughout Virginia;

3. Function as a clearinghouse for geospatially referenced health and health systems' relevant data through a web-based geospatial data-sharing system;

4. Seek to expand research opportunities and increase potential funding opportunities for relevant public health research in Virginia by seeking private sector grants and other funding to the benefit of health and healthcare stakeholders throughout the Commonwealth;

5. Provide a broad array of private and public entities with the requisite data to develop appropriate environmental health analysis, health care delivery models, and assessment within the health and health care system in Virginia and provide technical assistance in analyzing such data;

6. Function as a service organization to cost-effectively leverage existing hardware, software, data, applications, and personnel to support new research projects within its partner organizations; and

7. Make geospatial services and data available to faculty and students from educational institutions, as well as to Virginia Department of Health, public health officials and researchers, and others determined by the Authority to be appropriate, with the goal of improving existing public health programs, developing new evidence-based initiatives, and better informing the health policy decision-making process through health-related assessment activities.

C. If for any reason the Authority cannot be deemed an appropriate recipient of grant awards for a research-related program or initiative, a state entity designated by the Authority may act as agent for the Authority in carrying out its obligations under such agreement or in receiving the benefits thereunder, or both.

§ 32.1-370. Board of Directors.

A. The Authority shall be governed by a Board of Directors as described in this section. The initial Board of Directors shall be appointed as follows: two members shall be appointed by the Director of the Virginia Tech Center for Geospatial Information Technology; two members shall be appointed by the Director of the Eastern Virginia Medical School, Graduate Program in Public Health; two members shall be appointed by the Chairman of the University of Virginia, Division of Public Health Policy and Practice; two members shall be appointed by the Dean of the Virginia Commonwealth University School of Public Health; and two members shall be appointed by the Commissioner of Health in consultation with the Virginia Department of Health Office of Public Health Policy. The director for the Virginia Tech Center for Geospatial Information Technology shall convene and appoint a chair for the initial Board. The members of the initial Board shall serve for one year or until each member's successor has been appointed and qualified.

B. The Board shall make and adopt such rules, regulations, policies, procedures, and bylaws for the governance and operation of the Authority as the Board deems appropriate.

C. The Board shall develop a nonvoting advisory Board membership of Authority participants that may include: (i) state, local, and federal government agencies that analyze public health data to assess community health and develop programs and policies to effectively target populations; (ii) departments and schools of public health, environmental engineering, geography, entomology, and others conducting research in geospatial public and environmental health analysis; (iii) private healthcare organizations; and (iv) private foundations with missions involving public health analysis.

D. Prior to the expiration of the initial term of the initial Board members, the initial Board shall elect at least 18 members for the Authority Board of Directors. The Secretary of Health and Human Resources, the Virginia State Health Commissioner, the Commissioner of the Virginia Department of Mental Health, Mental Retardation and Substance Abuse Services, and a member of the Joint Commission on Health Care or their designees shall serve on the Board in an ex officio capacity. Ex officio members of the Board shall serve terms coincident with their terms of office.

E. A majority of the Board shall constitute a quorum for the transaction of the Authority's business, and no vacancy in the membership shall impair the right of a quorum to exercise the rights and perform all duties of the Authority.

F. The Board may appoint such officers as the Board may determine to be appropriate, with such officers to have such authority and to perform such duties as conferred by the Board, consistent with this chapter.

G. The terms of members of the Board shall be four years with the terms of the members elected by the initial Board being staggered by lot. No member shall be eligible to serve more than two terms; however, after the expiration of the term of a member appointed to serve three years or less, two additional terms may be served if appointed thereto. Any appointment to fill a vacancy shall be for the unexpired term. A person appointed to fill a vacancy may be appointed to serve two additional terms. Members of the Board shall receive their expenses and shall be compensated at the rate provided in § 2.2-2104 for each day spent on the business of the Board.

H. The Board shall elect from its membership a chairman and a vice-chairman, and shall also elect a secretary and a treasurer, who need not be members of the Board. The Board may also form committees and advisory councils, which may include representatives who are not members of the Board, to undertake activities as directed by the Board.

I. The Board may remove any member with or without cause. After appointment of the initial Board, the Board shall be self-perpetuating and Board members shall be elected by the existing Board.

§ 32.1-371. Audit.

The accounts of the Authority shall be audited annually by the Auditor of Public Accounts, or his legally authorized representatives, or by a certified public accounting firm, as selected by the Authority. The Authority shall select a certified public accounting firm or the Auditor of Public Accounts through a process of competitive negotiation. Copies of the annual audit shall be distributed to the Governor and to the chairmen of the House Committee on Appropriations and the Senate Committee on Finance.

§ 32.1-372. Agent for the Authority.

If for any reason the Authority cannot replace a state entity, agency, or educational institution as a party to any agreement in connection with state workforce development issues, the Authority may provide that such entities shall act as agent for the Authority in carrying out its obligations under such agreement or in receiving the benefits thereunder, or both.

§ 32.1-373. Confidential and public information.

For purposes of the Freedom of Information Act (§ 2.2-3700 et seq.), meetings of the Board may be conducted through telephonic or video means as provided in § 2.2-3708 or similar provisions of any successor law.

§ 32.1-374. Exemptions.

A. The Authority shall not be required to pay any taxes or assessments upon any project or any property or upon any operations of the Authority or the income therefrom, or any taxes or assessments upon any project or any property or local obligation acquired or used by the Authority under the provisions of this chapter or upon the income therefrom.

B. The provisions of the Virginia Personnel Act (§ 2.2-2900 et seq.), the Workforce Transition Act (§ 2.2-3200 et seq.), the Virginia Freedom of Information Act (§ 2.2-3700 et seq.), the Administrative Process Act (§ 2.2-4000 et seq.), and the Public Procurement Act (§ 2.2-4300 et seq.) shall not apply to the Authority.

§ 32.1-375. Cooperation between the Authority and other political subdivisions.

The Authority may enter into agreements with any other political subdivision of the Commonwealth for joint or cooperative action in accordance with § 15.2-1300.

§ 32.1-376. Process or notice.

Process against or notice to the corporation may be served only in the City of Richmond upon the Chairman, or Secretary of the Board, or the Executive Director if one should be appointed by the Board.

§ 32.1-377. Reporting.

The Board of Directors of the Authority shall report annually the status and progress of the implementation of the Authority's goals and objectives to the Secretary of Health and Human Resources, the State Board of Health, the deans and presidents of the respective state educational institutions, and the Governor and the General Assembly. The report shall provide in detail how the Authority has supported state agencies, state universities, and other institutions in fulfilling their missions and how private, state, and federal funds were leveraged to accomplish this purpose.

10100947D

SENATE BILL NO. 549

Offered January 13, 2010

Prefiled January 13, 2010

A BILL to amend and reenact § 2.2-2905 of the Code of Virginia and to amend the Code of Virginia by adding in Title 32.1 a chapter numbered 17, consisting of sections numbered 32.1-370 through 32.1-379, relating to the creation of the Virginia Network for Geospatial Health Research Authority.

Patron—Barker

Referred to Committee on Education and Health

Be it enacted by the General Assembly of Virginia:

1. That § 2.2-2905 of the Code of Virginia is amended and reenacted and that the Code of Virginia is amended by adding in Title 32.1 a chapter numbered 17, consisting of sections numbered 32.1-370 through 32.1-379, as follows:

§ 2.2-2905. Certain officers and employees exempt from chapter.

The provisions of this chapter shall not apply to:

1. Officers and employees for whom the Constitution specifically directs the manner of selection;

2. Officers and employees of the Supreme Court and the Court of Appeals;

3. Officers appointed by the Governor, whether confirmation by the General Assembly or by either house thereof is required or not;

4. Officers elected by popular vote or by the General Assembly or either house thereof;

5. Members of boards and commissions however selected;

6. Judges, referees, receivers, arbiters, masters and commissioners in chancery, commissioners of accounts, and any other persons appointed by any court to exercise judicial functions, and jurors and notaries public;

7. Officers and employees of the General Assembly and persons employed to conduct temporary or special inquiries, investigations, or examinations on its behalf;

8. The presidents, and teaching and research staffs of state educational institutions;

9. Commissioned officers and enlisted personnel of the National Guard and the naval militia;

10. Student employees in institutions of learning, and patient or inmate help in other state institutions;

11. Upon general or special authorization of the Governor, laborers, temporary employees and employees compensated on an hourly or daily basis;

12. County, city, town and district officers, deputies, assistants and employees;

13. The employees of the Virginia Workers' Compensation Commission;

14. The officers and employees of the Virginia Retirement System;

15. Employees whose positions are identified by the State Council of Higher Education and the boards of the Virginia Museum of Fine Arts, The Science Museum of Virginia, the Jamestown-Yorktown Foundation, the Frontier Culture Museum of Virginia, the Virginia Museum of Natural History, the New College Institute, the Southern Virginia Higher Education Center, and The Library of Virginia, and approved by the Director of the Department of Human Resource Management as requiring specialized and professional training;

16. Employees of the State Lottery Department;

17. Production workers for the Virginia Industries for the Blind Sheltered Workshop programs;

18. Employees of the Virginia Commonwealth University Health System Authority;

19. Employees of the University of Virginia Medical Center. Any changes in compensation plans for such employees shall be subject to the review and approval of the Board of Visitors of the University of Virginia. The University of Virginia shall ensure that its procedures for hiring University of Virginia Medical Center personnel are based on merit and fitness. Such employees shall remain subject to the provisions of the State Grievance Procedure (§ 2.2-3000 et seq.);

20. In executive branch agencies the employee who has accepted serving in the capacity of chief deputy, or equivalent, and the employee who has accepted serving in the capacity of a confidential assistant for policy or administration. An employee serving in either one of these two positions shall be deemed to serve on an employment-at-will basis. An agency may not exceed two employees who serve in this exempt capacity;

21. Employees of Virginia Correctional Enterprises. Such employees shall remain subject to the provisions of the State Grievance Procedure (§ 2.2-3000 et seq.);

22. Officers and employees of the Virginia Port Authority;

23. Employees of the Virginia College Savings Plan;

24. Directors of state facilities operated by the Department of Behavioral Health and Developmental Services employed or reemployed by the Commissioner after July 1, 1999, under a contract pursuant to § 37.2-707. Such employees shall remain subject to the provisions of the State Grievance Procedure (§ 2.2-3000 et seq.);

25. The Director of the Virginia Office for Protection and Advocacy;

26. Employees of the Virginia Foundation for Healthy Youth. Such employees shall be treated as state employees for purposes of participation in the Virginia Retirement System, health insurance, and all other employee benefits offered by the Commonwealth to its classified employees;

27. Employees of the Virginia Indigent Defense Commission; ~~and~~

28. Any chief of a campus police department that has been designated by the governing body of a public institution of higher education as exempt, pursuant to § 23-232*; and*

29. Members of the Virginia Network for Geospatial Health Research Authority.

CHAPTER 17.

VIRGINIA NETWORK FOR GEOSPATIAL HEALTH RESEARCH AUTHORITY.

§ 32.1-370. Virginia Network for Geospatial Health Research Authority; purpose.

The Virginia Network for Geospatial Health Research Authority (the Authority) is created as a body politic and corporate, a political subdivision of the Commonwealth. The Authority shall have the powers and duties hereinafter conferred in this chapter.

The Authority is established to (i) provide for the continuity and expansion of research within both the public and private sectors using geospatial analysis of health and health care relevant data, (ii) develop economies of scale within state health agencies and within public health programs within the Commonwealth's universities, (iii) provide geospatial analytical support to other political subdivisions concerned with cost-effective targeting of public health initiatives, and (iv) engage in such other lawful activities as the Board of Directors of the Authority deems reasonable and appropriate.

§ 32.1-371. Powers and duties of the Authority.

A. The Authority is vested with all the rights, powers, and privileges conferred upon political subdivisions of the Commonwealth and such additional rights, powers, and privileges conferred under this chapter and those conferred upon corporations under the laws of the Commonwealth, including, without limitation, all the corporate powers given to nonstock corporations by the provisions of Chapter 10 (§ 13.1-801 et seq.) of Title 13.1. The Authority shall also have the power to take, hold, receive, and enjoy any gift, grant, devise, or bequest to the Authority. The Authority shall control and expend the funds appropriated to it by the Commonwealth.

B. The Authority shall:

1. Establish relationships with academic programs throughout the Commonwealth that use geospatial analysis to understand and assess environmental, public health, and health care issues to strengthen programs through technical assistance, to provide support for graduate research, and to facilitate sharing of educational opportunities across institutions. The Authority is specifically authorized to serve public health research stakeholders within the Commonwealth by (i) developing a network of experts and a system of peer review that does not limit individual institutions' academic freedom, (ii) supporting educational advancement, (iii) providing a conduit for seeking grant funding for research and practice, (iv) supplying technical geographic information system infrastructure support, and (v) assisting state health agencies, policy makers and health administrators in understanding optimal targeting and utilization of resources;

2. Support and coordinate academic, state agency, and private sector expertise in geospatial analysis, health policy, health planning, environmental health analysis, and epidemiology and facilitate the development of new approaches and methodologies to sustain effective public health and health care interventions across all health-related state agencies throughout the Commonwealth;

3. Function as a clearinghouse for geospatially referenced health and health systems' relevant data through a web-based geospatial data-sharing system;

4. Seek to expand research opportunities and increase potential funding opportunities for relevant public health research in Virginia by seeking private sector grants and other funding to the benefit of health and health care stakeholders throughout the Commonwealth;

5. Provide a broad array of private and public entities with the requisite data to develop appropriate environmental health analysis, health care delivery models, and assessment within the health and health care system in Virginia and provide technical assistance in analyzing such data;

6. Function as a service organization to cost-effectively leverage existing hardware, software, data, applications, and personnel to support new research projects within its partner organizations; and

7. Make geospatial services and data available to faculty and students from educational institutions, as well as to the Department of Health, public health officials and researchers, and others determined by the Authority to be appropriate, with the goal of improving existing public health programs, developing new evidence-based initiatives, and better informing the health policy decision-making

process through health-related assessment activities.

C. If for any reason the Authority cannot be deemed an appropriate recipient of grant awards for a research-related program or initiative, a state entity designated by the Authority may act as agent for the Authority in carrying out its obligations under such agreement or in receiving the benefits thereunder, or both.

§ 32.1-372. Board of Directors established; duties; membership; terms; expenses.

A. The Authority shall be governed by a Board of Directors as described in this section. The Board shall make and adopt such policies, procedures, and bylaws for the governance and operation of the Authority as the Board deems appropriate.

B. The Board of Directors shall consist of 15 members, to be appointed by the Governor after receiving nominations, as follows: two members from the Virginia Tech Center for Geospatial Information Technology; two members from the University of Virginia School of Medicine; two members from the Eastern Virginia Medical School; two members from the Virginia Commonwealth University School of Medicine; two members from other colleges and universities with programs in Geographical Information Systems; two members from the Department of Health; one member from the Virginia Geographic Information Network; and two members at large. The Secretary of Health and Human Resources, the Commissioner of Health, the Commissioner of Behavioral Health and Developmental Services, and a member of the Joint Commission on Health Care or their designees shall serve on the Board in an ex officio capacity. Ex officio members shall serve with voting rights, and shall serve terms coincident with their terms of office.

C. The terms of members of the Board shall be four years. No member shall be eligible to serve more than two terms; however, after the expiration of the term of a member appointed to serve three years or less, two additional terms may be served if appointed thereto. Any appointment to fill a vacancy shall be for the unexpired term. A person appointed to fill a vacancy may be appointed to serve two additional terms.

D. The Governor shall appoint a chairman of the Board, and the initial meeting shall be convened with assistance from the Virginia Tech Center for Geospatial Information Technology.

E. The Board shall elect from its membership a vice-chairman, and shall also elect a secretary and a treasurer. The Board may also form committees and advisory councils, which may include representatives who are not members of the Board, to undertake activities as directed by the Board.

F. The Board may appoint such officers as the Board may determine to be appropriate, with such officers to have such authority and to perform such duties as conferred by the Board, consistent with this chapter. The Board shall also have the authority to hire staff to carry out its duties.

G. A majority of the Board shall constitute a quorum for the transaction of the Authority's business, and no vacancy in the membership shall impair the right of a quorum to exercise the rights and perform all duties of the Authority.

H. Members of the Board shall receive their expenses and shall be compensated at the rate provided in § 2.2-2104 for each day spent on the business of the Board.

§ 32.1-373. Audit.

The accounts of the Authority shall be audited annually by the Auditor of Public Accounts, or his legally authorized representatives, or by a certified public accounting firm, as selected by the Authority. The Authority shall select a certified public accounting firm or the Auditor of Public Accounts through a process of competitive negotiation. Copies of the annual audit shall be distributed to the Governor and to the chairmen of the House Committee on Appropriations and the Senate Committee on Finance.

§ 32.1-374. Agent for the Authority.

If for any reason the Authority cannot replace a state entity, agency, or educational institution as a party to any agreement, the Authority may provide that such entities may act as agent for the Authority in carrying out its obligations under such agreement or in receiving the benefits thereunder, or both.

§ 32.1-375. Confidential and public information.

For purposes of the Freedom of Information Act (§ 2.2-3700 et seq.), meetings of the Board may be conducted through telephonic or video means as provided in § 2.2-3708 or similar provisions of any successor law.

§ 32.1-376. Exemptions.

The Authority shall not be required to pay any taxes or assessments upon any project or any property or upon any operations of the Authority or the income therefrom, or any taxes or assessments upon any project or any property or local obligation acquired or used by the Authority under the provisions of this chapter or upon the income therefrom.

§ 32.1-377. Cooperation between the Authority and other political subdivisions.

The Authority may enter into agreements with any other political subdivision of the Commonwealth for joint or cooperative action in accordance with § 15.2-1300.

§ 32.1-378. Process or notice.

Process against or notice to the corporation may be served only in the City of Richmond upon the Chairman, or Secretary of the Board, or the Executive Director if one should be appointed by the Board.

§ 32.1-379. Reporting.

The Board of Directors of the Authority shall report annually the status and progress of the implementation of the Authority's goals and objectives to the Secretary of Health and Human Resources, the State Board of Health, the deans and presidents of the respective state educational institutions, and the Governor and the General Assembly. The report shall provide in detail how the Authority has supported state agencies, state universities, and other institutions in fulfilling their missions and how private, state, and federal funds were leveraged to accomplish this purpose.

2. The initial staggering of the terms of the Board of Directors of the Virginia Network for Geospatial Health Research Authority created pursuant to this act shall be as follows: one appointee from each category of representation shall serve a one-year term, and the other appointee from each category shall serve a two-year term. The initial member of the Virginia Geographic Information Network shall serve a two-year term.

VIRGINIA ACTS OF ASSEMBLY -- 2010 SESSION

CHAPTER 679

An Act to require the Secretaries of Health and Human Resources and Technology to evaluate opportunities for developing a network for geospatial health research.

[S 549]

Approved April 12, 2010

Be it enacted by the General Assembly of Virginia:

1. *§ 1. That the Secretaries of Health and Human Resources and Technology shall evaluate opportunities to partner with nonprofit organizations and institutions of higher education in the Commonwealth to develop a network for geospatial health research. Such evaluation shall include consideration of opportunities for:*

1. Establishing relationships with academic programs throughout the Commonwealth that use geospatial analysis to understand and assess environmental health, public health, and health care issues, to strengthen programs through technical assistance, provide support for graduate research, and facilitate sharing of education opportunities across institutions, including (i) developing a network of experts and a system of peer review that does not limit individual institution's academic freedom; (ii) supporting educational advancement; (iii) providing a conduit for seeking grant funding for research and practice; (iv) supplying technical geographic information system infrastructure support; and (v) assisting state health agencies, policy makers, and health administrators in understanding optimal targeting and utilization of resources;

2. Supporting and coordinating academic, state agency, and private sector expertise in geospatial analysis, health policy, health planning, environmental health analysis, and epidemiology and facilitating the development of new approaches and methodologies to sustain effective public health and health care interventions across all health-related state agencies throughout the Commonwealth;

3. Coordinating, with the Virginia Geographic Information Network Division, the development of a clearinghouse for geospatially referenced health and health systems' relevant data through a web-based geospatial data-sharing system;

4. Expanding research opportunities and increasing potential funding opportunities for relevant public health research in Virginia by seeking private sector grants and other funding to the benefit of health and health care stakeholders throughout the Commonwealth;

5. Providing a broad array of private and public entities with the requisite data to develop appropriate environmental health analysis, health care delivery models, and assessment within the health and health care system in Virginia and providing technical assistance in analyzing such data;

6. Functioning as a service organization to cost-effectively leverage existing hardware, software, data, applications, and personnel to support new research projects within its partner organizations; and

7. Making geospatial services and data available to faculty and students from educational institutions as well as to the Department of Health, public health officials and researchers, and other appropriate persons, with the goal of improving existing public health programs, developing new evidence-based initiatives, and better informing the health policy decision-making process through health-related assessment activities.

§ 2. That the Secretaries of Health and Human Resources and Technology shall report their findings to the Governor; the Senate Committees on Education and Health, Finance, and General Laws and Technology; and the House Committees on Appropriations, Health, Welfare and Institutions, and Science and Technology no later than December 1, 2010.

SB549 Example Listing of VDH Staff Presentations and Publications related to GIS Initiatives^

Year	Description	Event	Type	Authors (VDH staff in bold
2008	Monitoring Health Inequities and Planning in Virginia: Poverty, Human Immunodeficiency Virus, and Sexually Transmitted Infections.	Sexually Transmitted Diseases. Dec 2008, Vol. 35, No. 12.	Peer Reviewed Publication	**C. Dolan, C. Delcher**
2009	Practical Considerations for Matching STD and HIV Surveillance Data with Other Data.	Public Health Reports. Volume 124. Supplement 2. Nov/Dec 2009. pp 7-17.	Peer Reviewed Publication	L. Newman, M. Samuel, M. Stenger, T. Gerber, K. Macomber, **J. Stover**, W. Wise
2009	Variability and Use of Geographic Information Systems and Data Confidentiality Guidelines in Sexually Transmitted Disease Programs.	Public Health Reports. Volume 124. Supplement 2. Nov/Dec 2009. pp 58-64.	Peer Reviewed Publication	**J. Bissette, J. Stover**, L. Newman, **C. Delcher**, K. Bernstein, **L. Matthews**
2009	Improving Surveillance of Sexually Transmitted Infections Through Geocoded Morbidity Assignment.	Public Health Reports. Volume 124. Supplement 2. Nov/Dec 2009. pp 65-71.	Peer Reviewed Publication	**J. Stover, K. Kheirallah, C. Dolan, C. Delcher, L. Johnson**
2004	Enhancing Surveillance Data via GIS-related Jurisdictional Morbidity Reassignment, Case Report Visualization and inherent Confidentiality Issues	2nd Annual PHIN Stakeholders Conference, Atlanta GA	Oral Presentation	**J. Stover**
2004	Enhancing Surveillance via GIS-related Approaches to Data and Analyses	Virginia Epidemiology Response Team Lecture Series, Richmond, VA	Oral Presentation	**J. Stover**
2004	Geocoding Communicable Disease Morbidity and the Effect on Jurisdictional Reassignment	Virginia Epidemiology Seminar, Charlottesville, VA	Oral Presentation	**J. Stover**
2006	Who's Using Geographic Information Systems (GIS): A Survey of STD Programs - (Symposium: Challenges in Information Management)	National STD Prevention Conference. Jacksonville, FL	Oral Presentation	**J. Bissette, J. Stover, C. Delcher**
2006	Strategic Aberration Monitoring (SAM): Using AVR Mechanisms to Improve STD Surveillance. – (Session: Improving Utility and Adding Value to Data)	4th Annual Public Health Information Network Conference, Atlanta, GA	Oral Presentation	**C. Delcher, C. Dolan, J. Stover**
2007	Who's Using Geographic Information Systems (GIS): A Survey of STD Programs: Results of the GIS/Geocoding and Data Confidentiality Survey. GIS and Privacy in Public Health - webcast.	Association of State and Territorial Health Officials (ASTHO). Webcast	Oral Presentation	**J. Stover**, D. Stinchcomb
2007	Using GIS to Improve Decision-Making Practices - (Pre-meeting Workshop: OASIS: Using Surveillance Data to Inform STD Programs).	National Coalition of STD Directors (NCSD) Annual Meeting, New Orleans, LA.	Oral Presentation	**J. Stover**
2008	Using Geocoding to Improve Data Quality	(Webinar: GIS and local health department business processes). Environmental Systems Research Institute (ESRI)	Oral Presentation	**J. Stover**
2008	GIS in Public Health.	VCU Public Health Lecture Mini-Series. Tompkins-McCaw Library – Medical College of Virginia Campus. Richmond, VA.	Oral Presentation	**J. Stover, C. Delcher**

2008	Integrating GIS into HIV Surveillance: Issues and Challenges.	(Moderated Exchange Session). ESRI Health GIS Conference: GIS Shaping Global Health. Washington, D.C.	Oral Presentation	**J. Stover**, K. Elmore
2009	GIS Health Data Management & Analysis Techniques (requested panelist).	ESRI Federal User Conference. Washington, D.C.	Oral Presentation	**J. Stover**
2009	Updating the SAM application: A collaboration between the Virginia Department of Health (VDH) and the Virginia Enterprise Application Development (VEAD) Program.	2nd Annual Business Intelligence Competency Center Summitt. Richmond, VA.	Oral Presentation	**J. Stover**
2009	Public Health Geocoding at the Virginia Department of Health.	The Geocoding Workshop. ESRI GIS Health Conference. Nashville, TN.	Oral Presentation	**J. Stover**
2009	VA H1N1 Integrated Efforts (Panelist).	Homeland Infrastructure Foundation-Level Data (HIFLD) Working Group Meeting, Reston, VA.	Oral Presentation	**J. Stover**
2010	Geocoding and Surveillance Data – Why Where Matters.	Public Health Seminar Series. Department of Epidemiology and Community Health. VCU, Richmond, VA.	Oral Presentation	**J. Stover**
2010	Using GIS to Inform Program Policy	National STD Prevention Conference. Atlanta, GA.	Oral Presentation	**O. Vasiliu**
2010	GIS Use in Public Health	Continuing Education Course - Department of Epidemiology and Community Health. VCU, Richmond, VA.	Oral Presentation (4 hour technical course)	**O. Vasiliu**
2010	GeoSpatial Analysis of Stroke Hospitalizations in Virginia 1994-2008: A Methodological, Analytical and Policy Perspective	American Public Health Association Conference, Denver, CO	Oral Presentation	**R. Anson-Dwamena, M. Royster, K. Wibberly, K. Studer**
2004	Geographic and Spatial Regression Analysis of Sexually Transmitted Diseases in Richmond, Va.	GIS Open House – Centers for Disease Control and Prevention. Atlanta, GA.	Poster Presentation	**C. Delcher, J. Stover**
2005	Aberration Detection in Sexually Transmitted Diseases (STD) Surveillance.	International Society of STD Research - 16th Biennial Meeting - Program. Amsterdam.	Poster Presentation	M. Samuel, **J. Stover**, **C. Delcher**, D. Gilson, J. Chase, T. Aragon, G. Bolan
2005	Geographic and Spatial Regression Analysis of Sexually Transmitted Diseases in Richmond, Va.	Virginia GIS Conference. Richmond, VA.	Poster Presentation	**C. Delcher, J. Stover**
2006	Geographic and Spatial Regression Analysis of Sexually Transmitted Diseases in Richmond, VA	National STD Prevention Conference. Jacksonville, FL.	Poster Presentation	**C. Delcher, J. Stover**
2006	Aberration Detection in Sexually Transmitted Diseases (STD) Surveillance.	National STD Prevention Conference. Jacksonville, FL.	Poster Presentation	**C. Delcher**, M. Samuel, **J. Stover**, D. Gilson, J. Lachance
2006	Utility of Geographic Information Systems (GIS) Within State Public Health STD Programs.	4th Annual Public Health Information Network (PHIN) Conference. Atlanta, GA.	Poster Presentation	**J. Bissette, C. Delcher, J. Stover**
2010	The Association Between Neighborhood Characteristics and Gonorrhea Incidence.	National STD Prevention Conference. Atlanta, GA.	Poster Presentation	**R. Pugsley, O. Vasiliu, J. Stover**
2010	"Yes, Virginia, there is a Santa Claus": Use of a Business Intelligence Shared Services Framework to Improve STD Preparedness and Situational Awareness.	National STD Prevention Conference. Atlanta, GA.	Poster Presentation	**J. Stover, J. Bissette, R. Pugsley**

^ This listing is only a sample of VDH presentations, primarily from the Office of Epidemiology.

Appendix E

SB 549 Survey Questions

Senate Bill 549 Exit this survey

1. Introduction

On April 12, 2010, the Governor approved Senate Bill 549 requiring the Secretary of Health and Human Resources and the Secretary of Technology to evaluate opportunities to partner with nonprofit organizations and institutions of higher education in the Commonwealth to develop a network for geospatial health research, and to report on their findings to the Governor; the Senate Committees on Education and Health, Finance, and General Laws and Technology; and the House Committees on Appropriations, Health, Welfare, and Institutions, and Science and Technology no later than December 1, 2010.

As a part of this initiative, the Virginia Department of Health (VDH) and the Virginia Information Technologies Agency - Virginia Geographic Information Network (VGIN) are requesting your participation in completing a survey of Virginia's public institutions of higher education. Information obtained as a part of this survey will provide supporting documentation for the report due to the Governor on December 1, 2010.

The text, as well as history, of the enrolled bill can be accessed through the Legislative Information System (LIS) at http://leg1.state.va.us/ by searching for SB549. The text of the bill is also included below for your reference.

CHAPTER 679

An Act to require the Secretaries of Health and Human Resources and Technology to evaluate opportunities for developing a network for geospatial health research.

[S 549]

Approved April 12, 2010

Be it enacted by the General Assembly of Virginia:

1. *§ 1. That the Secretaries of Health and Human Resources and Technology shall evaluate opportunities to partner with nonprofit organizations and institutions of higher education in the Commonwealth to develop a network for geospatial health research. Such evaluation shall include consideration of opportunities for:*

1. Establishing relationships with academic programs throughout the Commonwealth that use geospatial analysis to understand and assess environmental health, public health, and health care issues, to strengthen programs through technical assistance, provide support for graduate research, and facilitate sharing of education opportunities across institutions, including (i) developing a network of experts and a system of peer review that does not limit individual institution's academic freedom; (ii) supporting educational advancement; (iii) providing a conduit for seeking grant funding for research and practice; (iv) supplying technical geographic information system infrastructure support; and (v) assisting state health agencies, policy makers, and health administrators in understanding optimal targeting and utilization of resources;

2. Supporting and coordinating academic, state agency, and private sector expertise in geospatial analysis, health policy, health planning, environmental health analysis, and epidemiology and facilitating the development of new approaches and methodologies to sustain effective public health and health care interventions across all health-related state agencies throughout the Commonwealth;

3. Coordinating, with the Virginia Geographic Information Network Division, the development of a clearinghouse for geospatially referenced health and health systems' relevant data through a web-based geospatial data-sharing system;

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6. Functioning as a service organization to cost-effectively leverage existing hardware, software, data, applications, and personnel to support new research projects within its partner organizations; and

7. Making geospatial services and data available to faculty and students from educational institutions as well as to the Department of Health, public health officials and researchers, and other appropriate persons, with the goal of improving existing public health programs, developing new evidence-based initiatives, and better informing the health policy decision-making process through health-related assessment activities.

§ 2. That the Secretaries of Health and Human Resources and Technology shall report their findings to the Governor; the Senate Committees on Education and Health, Finance, and General Laws and Technology; and the House Committees on Appropriations, Health, Welfare and Institutions, and Science and Technology no later than December 1, 2010.

Next

Senate Bill 549 Exit this survey

2. Contact Information

✱1. Please provide your contact information:

Name:
Title:
Department:
School:
Phone:
Email:

Prev Next

Senate Bill 549 Exit this survey

2. Contact Information

✱This question requires an answer.
1. Please provide your contact information:

Name:
Title:
Department:
School:
Phone:
Email:

Prev Next

Senate Bill 549 Exit this survey

3. Existing GIS Opportunities

This portion of the survey will analyze current GIS activities and opportunities at your university.

✱2. Does your university offer courses in GIS (Geographic Information Systems)?

- Undergraduate courses
- Graduate courses
- Undergraduate and Graduate courses
- Don't know

Please include Department/Faculty contact information

✱3. Does the university offer a degree in GIS?

- Yes
- No
- Don't know

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Senate Bill 549 Exit this survey

4. Existing GIS Opportunities

*4. Does your university offer a certificate in GIS?

- Yes
- No
- Don't know

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Senate Bill 549 Exit this survey

5. Existing GIS Opportunities

*5. Does your university have a GIS center?

- Yes
- No
- Don't know

Prev Next

Senate Bill 549 Exit this survey

6. GIS Center Follow-up

6. What is the GIS facility called?

7. In which department is the GIS center located?

*8. Is public health research conducted within the GIS center?

- Yes
- No
- Don't know

Prev Next

Senate Bill 549 Exit this survey

7. Existing GIS Opportunities

*9. Does your department offer courses in GIS?

- Yes
- No
- Don't know

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Senate Bill 549 Exit this survey

8. Deptartment Courses Follow-up

*10. Does your department offer: (Choose all that apply)

- [ ] Graduate courses
- [ ] Undergraduate courses
- [ ] Health-related courses

Prev Next

Senate Bill 549 Exit this survey

9. Existing GIS Opportunities

*11. Is your university conducting any research projects related to public health?

- ○ Yes
- ○ No
- ○ Don't know

Prev Next

Senate Bill 549 Exit this survey

10. Public Health Research Follow-up

*12. What topics are the projects focused on? (Choose all that apply)

- [ ] Social determinants of health/Social justice
- [ ] Environmental health
- [ ] Population health/Epidemiology
- [ ] Chronic disease
- [ ] Other

*13. How are these projects funded?

- ○ General funds only
- ○ Federal funds only
- ○ General and Federal Funds
- ○ Don't know

Prev Next

Senate Bill 549 Exit this survey

11. Federal Funds Follow-up

*14. What are the sources of federal funds? (Choose all that apply)

- [ ] HRSA
- [ ] CDC
- [ ] NIH
- [ ] ARRA
- [ ] Foundations
- [ ] AHRQ
- [ ] Other (please specify)

Prev Next

Senate Bill 549 Exit this survey

12. Public Health Research Follow-up

15. If known, provide names and contact information for faculty and subject of research

Prev Next

Senate Bill 549 Exit this survey

13. Existing GIS Opportunities

*16. Have publications with a GIS component been published by staff at your university?

- ( ) Yes
- ( ) No
- ( ) Don't know

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Senate Bill 549 Exit this survey

14. GIS Publication Follow-up

*17. Have publications included journal articles?

- ( ) Yes
- ( ) No
- ( ) Don't know

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Senate Bill 549 Exit this survey

15. Journal Article Follow up

18. If known, please provide citations or journal names

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Senate Bill 549 Exit this survey

16. GIS Publication Follow-up

*19. Have publications included textbooks?

- Yes
- No
- Don't know

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Senate Bill 549 Exit this survey

17. Textbook Follow-up

20. If known, please provide titles, publication dates

Prev Next

Senate Bill 549 Exit this survey

18. Existing GIS Opportunities

*21. Do YOU have a GIS software package?

- Yes
- No

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Senate Bill 549 Exit this survey

19. Software Follow-up

*22. What GIS software and version do you use?

- ArcGIS (ESRI)
- MapInfo (Pitney Bowes)
- AutoCad (Autodesk)
- MapServer
- Open Source
- None of the above

*23. Please enter the version of your software package. If your package is not listed, enter the name and version.

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Senate Bill 549 Exit this survey

20. Existing GIS Opportunities

*24. Are there contacts between your program and other GIS health research programs at... (Choose all that apply)

- [ ] Other VA universities
- [ ] Out-of-state universities
- [ ] VGIN (Virginia Geographic Information Network)
- [ ] VDH (Virginia Department of Health)
- [ ] CDC (Centers for Disease Control and Prevention)
- [ ] Non-profit organizations
- [ ] None of the above
- [ ] Other (please specify)

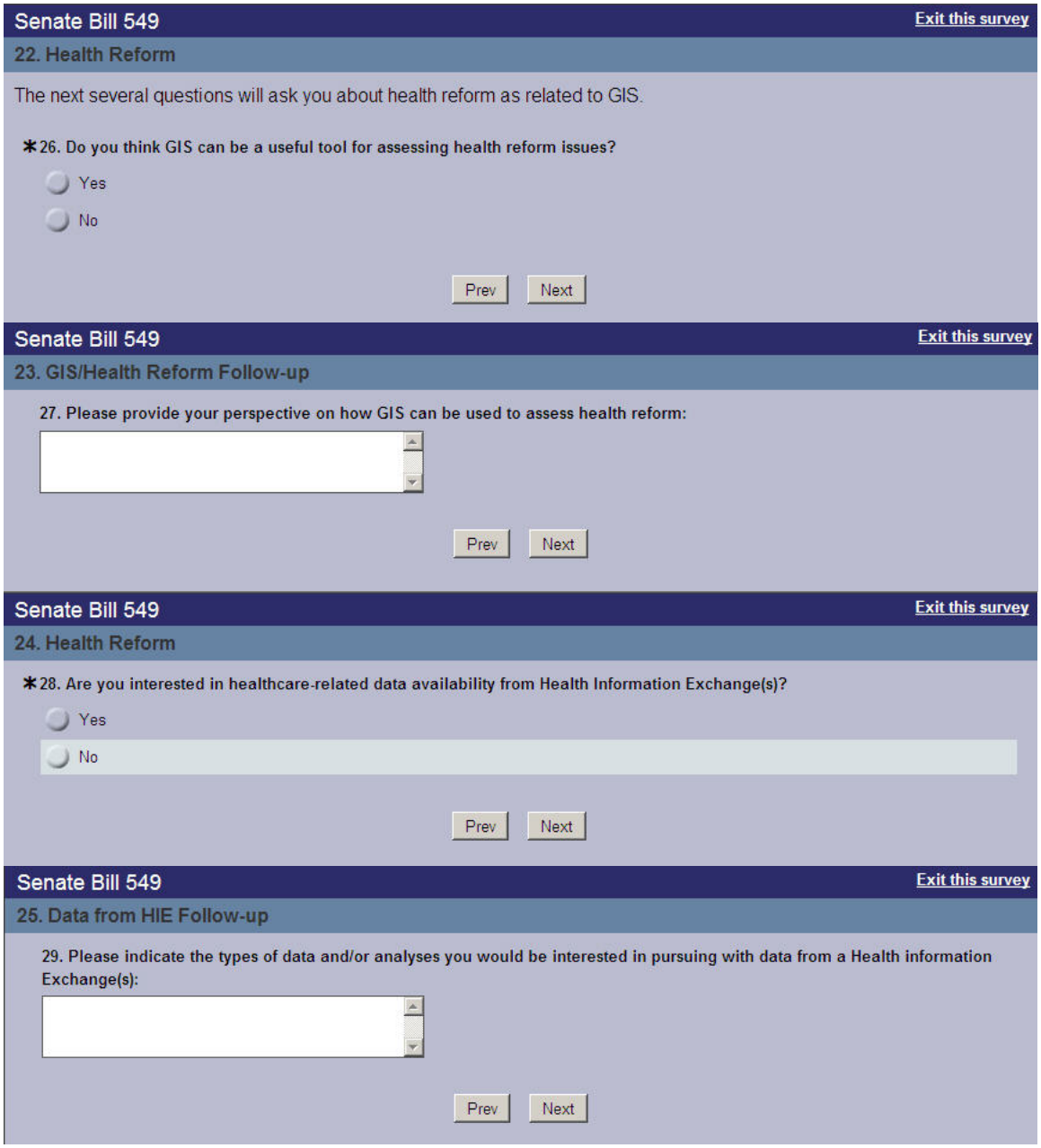
Prev Next

Senate Bill 549 Exit this survey

21. University Contacts Follow-up

*25. Please list the in-state or out-of-state universities

Prev Next


Senate Bill 549
Exit this survey
22. Health Reform
The next several questions will ask you about health reform as related to GIS.
*26. Do you think GIS can be a useful tool for assessing health reform issues?
Yes
No
Prev
Next
Senate Bill 549
Exit this survey
23. GIS/Health Reform Follow-up
27. Please provide your perspective on how GIS can be used to assess health reform:
Prev
Next
Senate Bill 549
Exit this survey
24. Health Reform
*28. Are you interested in healthcare-related data availability from Health Information Exchange(s)?
Yes
No
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Senate Bill 549
Exit this survey
25. Data from HIE Follow-up
29. Please indicate the types of data and/or analyses you would be interested in pursuing with data from a Health information Exchange(s):
Prev
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Senate Bill 549

Exit this survey

26. Questions Relating to Bill Part 1

This portion of the survey will ask you questions directly related to specific parts of the bill.

The following questions relate specifically to this excerpt from SB549:

An Act to require the Secretaries of Health and Human Resources and Technology to evaluate opportunities for developing a network for geospatial health research.

[S 549]

Approved April 12, 2010

Be it enacted by the General Assembly of Virginia:

1. *§ 1. That the Secretaries of Health and Human Resources and Technology shall evaluate opportunities to partner with nonprofit organizations and institutions of higher education in the Commonwealth to develop a network for geospatial health research. Such evaluation shall include consideration of opportunities for:*

1. Establishing relationships with academic programs throughout the Commonwealth that use geospatial analysis to understand and assess environmental health, public health, and health care issues, to strengthen programs through technical assistance, provide support for graduate research, and facilitate sharing of education opportunities across institutions, including (i) developing a network of experts and a system of peer review that does not limit individual institution's academic freedom; (ii) supporting educational advancement; (iii) providing a conduit for seeking grant funding for research and practice; (iv) supplying technical geographic information system infrastructure support; and (v) assisting state health agencies, policy makers, and health administrators in understanding optimal targeting and utilization of resources;

***30. Is it worthwhile to establish a partnership between state agencies, universities, and non-profit organization(s) in order to... (Choose those that are worthwhile)**

- [ ] strengthen GIS related programs through technical assistance?
- [ ] provide support for graduate research?
- [ ] facilitate sharing of education opportunities across institutions?
- [ ] None of the above

***31. Do you think that a partnership between state agencies, universities, and non-profit organization(s) would be helpful in developing a network of GIS experts?**

- ( ) Yes
- ( ) No
- ( ) Don't know

***32. Do you have an existing network of GIS colleagues?**

- ( ) Yes
- ( ) No

***33. Would you be in favor of having a network created as alluded to in §1.1 (i) above?**

- ( ) Yes
- ( ) No
- ( ) Indifferent

***34. Would you be in favor of having a peer review process outside of the institution as alluded to in §1.1 (i) above?**

Senate Bill 549 Exit this survey

27. Questions Relating to Bill Part 2

The following questions relate specifically to this excerpt from SB549:

> *2. Supporting and coordinating academic, state agency, and private sector expertise in geospatial analysis, health policy, health planning, environmental health analysis, and epidemiology and facilitating the development of new approaches and methodologies to sustain effective public health and health care interventions across all health-related state agencies throughout the Commonwealth;*

***40. Would you be interested in having non-academic organization(s) providing support and coordination for academic... (Choose all that apply)**

- [ ] public health geospatial analysis?
- [ ] health policy?
- [ ] health planning?
- [ ] None of the above

***41. Do you incorporate spatial modeling in GIS research activities**

- ( ) Yes
- ( ) No

***42. Do you need assistance from an outside entity in analyzing models and conducting research?**

- ( ) Yes
- ( ) No

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Senate Bill 549 Exit this survey

28. Questions Relating to Bill Part 3

The following questions relate specifically to this excerpt from SB549:

3. Coordinating, with the Virginia Geographic Information Network Division, the development of a clearinghouse for geospatially referenced health and health systems' relevant data through a web-based geospatial data-sharing system;

✱43. Are you familiar with the VGIN metadata portal?
(Link: http://www.vita.virginia.gov/services/default.aspx?id=3109)

- Yes
- No

✱44. Have you used VGIN for any research activities?

- Yes
- No

✱45. Did you participate in VGIN's GIS Strategic Planning Effort in 2009?

- Yes
- No

✱46. Have you used data from VDH in any geospatial research?

- Yes
- No

✱47. Would you be supportive of the development of a statewide clearinghouse of the following types of health data to be made available to you via a web-based system?

- Geospatially referenced health data
- General health data, including non-geocoded data
- Both
- Neither

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Senate Bill 549 Exit this survey

29. Questions Relating to Bill Part 4

The following questions relate specifically to this excerpt from SB549:

4. Expanding research opportunities and increasing potential funding opportunities for relevant public health research in Virginia by seeking private sector grants and other funding to the benefit of health and health care stakeholders throughout the Commonwealth;

✱48. Do you think academic partnerships with non-profit organization(s) would increase your research opportunities and potential funding?

- Yes
- No
- Don't know

✱49. Would you prefer a greater partnership with VDH to increase research opportunities and funding?

- Yes
- No
- Don't know

Prev Next

Senate Bill 549

Exit this survey

30. Questions Relating to Bill Part 5

The following questions relate specifically to this excerpt from SB549:

5. Providing a broad array of private and public entities with the requisite data to develop appropriate environmental health analysis, health care delivery models, and assessment within the health and health care system in Virginia and providing technical assistance in analyzing such data;

***50. Do you believe it is a good idea to provide geocoded health data to a broad array of private and public entities throughout the state?**

- Yes
- No
- Don't know

If no, please include your reasoning:

***51. Would you be interested in having non-profit organization(s) provide technical assistance in the analysis of geospatial data?**

- Yes
- No

***52. Would you like assistance in the analysis of geospatial data from...**

- Other Universities
- State Agencies
- Both
- None of the above

***53. Would you be interested in having a GIS clearinghouse dedicated solely to providing you with health geospatial data for research purposes?**

- Yes
- No

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Senate Bill 549

Exit this survey

31. Questions Relating to Bill Part 6

The following questions relate specifically to this excerpt from SB549:

6. Functioning as a service organization to cost-effectively leverage existing hardware, software, data, applications, and personnel to support new research projects within its partner organizations; and

***54. Do you think a service consortium of state, university, and non-profit organization(s) would provide better leveraging in order to cost-effectively purchase or obtain...**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
hardware?					
software?					
data?					
applications?					
personnel?					

Prev Next

Senate Bill 549

Exit this survey

32. Questions Relating to Bill Part 7

The following questions relate specifically to this excerpt from SB549:

7. Making geospatial services and data available to faculty and students from educational institutions as well as to the Department of Health, public health officials and researchers, and other appropriate persons, with the goal of improving existing public health programs, developing new evidence-based initiatives, and better informing the health policy decision-making process through health-related assessment activities.

***55. Do you think a partnership of state agencies, non-profits, and universities would improve…**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
geospatial services?	○	○	○	○	○
existing public health programs?	○	○	○	○	○
developing new evidence-based initiatives?	○	○	○	○	○
better informing of health policy decision-making processes?	○	○	○	○	○

***56. What type of VDH data would you be interested in accessing for geospatial analysis? (Choose all that apply)**

- ☐ Chronic disease
- ☐ Infectious disease
- ☐ HIV
- ☐ STD
- ☐ Environmental health
- ☐ Obesity
- ☐ Vital statistics
- ☐ Smoking cessation
- ☐ Public safety
- ☐ WIC (Women, Infants, and Children)
- ☐ Radiological health
- ☐ Other (please specify)

***57. What level of data granularity would you find most helpful for GIS-related research?**

- ○ City/county

Senate Bill 549 Exit this survey

33. Concluding Questions

*58. If a partnership of government, universities, and non-profit organization(s) were to exist, would you or someone at your university be interested in being a part of the governing board?

- Yes
- No

*59. Are there other contacts within your university that are knowledgeable in GIS and/or are doing research in the field?

- Yes
- No

60. Please list other faculty names and titles:

61. What other services would be helpful in expanding GIS health-related research at your university?

62. Any additional comments?

Prev Next

Senate Bill 549 Exit this survey

34. Thank You

Thank you for completing this survey on Senate Bill 549. Your time and perspectives with respect to GIS are greatly appreciated.

Once again, VDH and VGIN will host a post-survey conference call for you and other survey participants in order to share initial findings. We will contact you with a date and time for this call via email.

Thank you again,

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

VGIN

Prev Done

Appendix F

Email Solicitations for SB549 Survey

Listing of emails sent during survey period

Sent/Scheduled Messages

Message Subject	Send Date	Sent
Thank You for Completing the Survey for Senate Bill 549	Mailed on August 9, 2010 8:00 AM	21
FINAL REMINDER: Survey for Senate Bill 549	Mailed on August 2, 2010 8:00 AM	22
REMINDER: Survey for Senate Bill 549	Mailed on July 26, 2010 11:00 AM	24
Survey Request for Senate Bill 549	Mailed on July 22, 2010 8:03 AM	1
Survey Request for Senate Bill 549	Mailed on July 19, 2010 11:19 AM	3
Survey Request for Senate Bill 549	Mailed on July 16, 2010 3:29 PM	36

Email sent on 7/16/2010, 7/19/2010 and 7/22/2010

To: [Email]
From: Jeff.Stover@vdh.virginia.gov

Subject: Survey Request for Senate Bill 549
Body:

To see how the HTML in this message will look, you will need to send a test message.

Dear [FirstName] [LastName]:

On April 12, 2010, Governor Bob McDonnell approved Senate Bill 549 requiring the Secretary of Health and Human Resources and the Secretary of Technology to evaluate opportunities to partner with nonprofit organizations and institutions of higher education in the Commonwealth to develop a network for geospatial health research.

As a part of this initiative, the Virginia Department of Health (VDH) and the Virginia Information Technologies Agency - Virginia Geographic Information Network (VGIN) are requesting your participation in completing a survey of Virginia's public institutions of higher education. Information obtained as a part of this survey will provide supporting documentation for the final report due to the Governor on December 1, 2010.

You were chosen to participate in this survey based on an internet search identifying you as having performed GIS-related research, teaching or other relevant GIS activities at your university, and/or through a GIS listserv maintained by VGIN.

The survey will take approximately 15-20 minutes of your time. The instrument contains questions about your university's programs, research and capacity with respect to GIS, as well as questions specific to the content of Senate Bill 549.

We are requesting completion of all surveys by August 6, 2010. We are hopeful that you will take the time to share your experience and perspectives in order to ensure a representative survey and development of a comprehensive final report.

VDH and VGIN will host a post-survey conference call with survey participants to share initial findings. A date and time for this conference call will be sent to you via email at a later date.

You may access the survey at any time by following the link below. This link is uniquely tied to this survey and your email address. You may exit the survey and return to complete it at a later date, as needed.

 http://www.surveymonkey.com/s.aspx

We thank you, in advance, for your assistance.

Best regards,

Jeff Stover
Director, Health Informatics & Integrated Surveillance Systems
Division of Disease Prevention – Office of Epidemiology
Virginia Department of Health
804-864-7961
jeff.stover@vdh.virginia.gov

Keri Hall, MD
Director, Office of Epidemiology/State Epidemiologist
Virginia Department of Health
804-864-7554
Keri.Hall@vdh.virginia.gov

Dan Widner
VGIN Coordinator
Virginia Information Technologies Agency
804-416-6198
dan.widner@vita.virginia.gov

If you do not wish to receive further emails related to this survey, please click the link below, and you will be automatically removed from our participant list.
 http://www.surveymonkey.com/optout.aspx

Email sent on 7/26/2010

To: [Email]
From: Jeff.Stover@vdh.virginia.gov

Subject: REMINDER: Survey for Senate Bill 549
Body: To see how the HTML in this message will look, you will need to send a test message.

Dear [FirstName] [LastName]:

On July 16, 2010, an email was sent to you requesting your participation in an electronic survey on Senate Bill 549, a bill with the goal of evaluating opportunities to partner with nonprofit organizations and institutions of higher education in the Commonwealth to develop a network for geospatial health research.

We want to remind you to complete the survey; your input is extremely valuable to us at VDH and VGIN. The survey will close on August 6, 2010. For your convenience, the initial email has been attached below. Once again, you may exit the survey and return to complete it at a later date, as needed. The link for the survey is provided for you below.

 http://www.surveymonkey.com/s.aspx

We thank you for your participation.

Best regards,

Jeff Stover
Director, Health Informatics & Integrated Surveillance Systems
Division of Disease Prevention – Office of Epidemiology
Virginia Department of Health
804-864-7961
jeff.stover@vdh.virginia.gov

Keri Hall, MD
Director, Office of Epidemiology/State Epidemiologist
Virginia Department of Health
804-864-7554
Keri.Hall@vdh.virginia.gov

Dan Widner
VGIN Coordinator
Virginia Information Technologies Agency
804-416-6198
dan.widner@vita.virginia.gov

If you do not wish to receive further emails related to this survey, please click the link below, and you will be automatically removed from our participant list.
 http://www.surveymonkey.com/optout.aspx

Email sent on 8/2/2010

To: [Email]
From: Jeff.Stover@vdh.virginia.gov

Subject: FINAL REMINDER: Survey for Senate Bill 549
Body: To see how the HTML in this message will look, you will need to send a test message.

Dear [FirstName] [LastName]:

On July 16, 2010, an email was sent to you requesting your participation in an electronic survey on Senate Bill 549, a bill with the goal of evaluating opportunities to partner with nonprofit organizations and institutions of higher education in the Commonwealth to develop a network for geospatial health research.

This is a final reminder requesting you to complete the survey; your input is extremely valuable to us at VDH and VGIN. The survey will close on this Friday, August 6, 2010. For your convenience, the initial email has been attached below. Once again, you may exit the survey and return to complete it at a later date, as needed. The link for the survey is provided for you below.

 http://www.surveymonkey.com/s.aspx

We thank you for your participation.

Best regards,

Jeff Stover
Director, Health Informatics & Integrated Surveillance Systems
Division of Disease Prevention – Office of Epidemiology
Virginia Department of Health
804-864-7961
jeff.stover@vdh.virginia.gov

Keri Hall, MD
Director, Office of Epidemiology/State Epidemiologist
Virginia Department of Health
804-864-7554
Keri.Hall@vdh.virginia.gov

Dan Widner
VGIN Coordinator
Virginia Information Technologies Agency
804-416-6198
dan.widner@vita.virginia.gov

If you do not wish to receive further emails related to this survey, please click the link below, and you will be automatically removed from our participant list.
 http://www.surveymonkey.com/optout.aspx

Email sent on 8/9/2010

To: [Email]
From: Jeff.Stover@vdh.virginia.gov

Subject: Thank You for Completing the Survey for Senate Bill 549
Body: To see how the HTML in this message will look, you will need to send a test message.

Dear [FirstName] [LastName]:

We wish to thank you for completing the electronic survey for Senate Bill 549. Your input is valuable to us at VDH and VGIN. Once again, VDH and VGIN will host a post-survey conference call with survey participants to share initial findings. A date and time for this conference call will be sent to you shortly via email.

Best regards,

Jeff Stover
Director, Health Informatics & Integrated Surveillance Systems
Division of Disease Prevention – Office of Epidemiology
Virginia Department of Health
804-864-7961
jeff.stover@vdh.virginia.gov

Keri Hall, MD
Director, Office of Epidemiology/State Epidemiologist
Virginia Department of Health
804-864-7554
Keri.Hall@vdh.virginia.gov

Dan Widner
VGIN Coordinator
Virginia Information Technologies Agency
804-416-6198
dan.widner@vita.virginia.gov

Survey Link: http://www.surveymonkey.com/s.aspx
Opt-out Survey Link: http://www.surveymonkey.com/optout.aspx

Appendix G

SB549 Report Preparation - VDH Program Assessment

VDH Program Area:_____

VDH staff completing this assessment:_____

This document is intended to serve as an informal assessment of VDH programs that make use of GIS. It includes the entire text of SB549, as approved on 4/12/2010, separated into blue italicized excerpts to facilitate the assessment. We will review this info during the upcoming SB549 meeting. Please feel free to comment and return this to Jeff Stover in advance of the meeting.

CHAPTER 679

An Act to require the Secretaries of Health and Human Resources and Technology to evaluate opportunities for developing a network for geospatial health research.

[S 549]

Approved April 12, 2010

Be it enacted by the General Assembly of Virginia:

1. *§ 1. That the Secretaries of Health and Human Resources and Technology shall evaluate opportunities to partner with nonprofit organizations and institutions of higher education in the Commonwealth to develop a network for geospatial health research. Such evaluation shall include consideration of opportunities for:*

1. Establishing relationships with academic programs throughout the Commonwealth that use geospatial analysis to understand and assess environmental health, public health, and health care issues, to strengthen programs through technical assistance, provide support for graduate research, and facilitate sharing of education opportunities across institutions, including (i) developing a network of experts and a system of peer review that does not limit individual institution's academic freedom; (ii) supporting educational advancement; (iii) providing a conduit for seeking grant funding for research and practice; (iv) supplying technical geographic information system infrastructure support; and (v) assisting state health agencies, policy makers, and health administrators in understanding optimal targeting and utilization of resources;

1) Has your program historically collaborated with any Virginia institutions of higher education related to GIS initiatives? If so, please indicate which institutions, the subject of such collaborations and approximate timeframes.

2. Supporting and coordinating academic, state agency, and private sector expertise in geospatial analysis, health policy, health planning, environmental health analysis, and epidemiology and facilitating the development of new approaches and methodologies to sustain effective public health and health care interventions across all health-related state agencies throughout the Commonwealth;

2) What is your opinion of having a non-profit organization serve as the coordinator and supporting entity for universities, state agencies (VDH and others) and the private sector related to the above functions? Please include rationale regarding your perspective.

3. Coordinating, with the Virginia Geographic Information Network Division, the development of a clearinghouse for geospatially referenced health and health systems' relevant data through a web-based geospatial data-sharing system;

3) Are you in favor of a clearinghouse, as stated above? Why or why not?

4) Are you familiar with the VGIN Metadata portal?

4a) Have you used the Metadata portal for data dissemination, access or retrieval?

4b) If yes, please provide examples of the types of data placed on the Metadata portal or types of data you have used for health-related planning, policy or practice.

5) VGIN has identified the need for a statewide GIS Clearinghouse in its Five Year Strategic Plan http://www.vita.virginia.gov/isp/default.aspx?id=12092 Do you believe that others could benefit from the geospatial data you manage if it were accessible through a Clearinghouse and if so, would you support it?

5a) Would there be any restrictions or privacy issues to consider if your business data were accessible via a statewide GIS clearinghouse? If so, please provide references or summarize reasons.

4. Expanding research opportunities and increasing potential funding opportunities for relevant public health research in Virginia by seeking private sector grants and other funding to the benefit of health and health care stakeholders throughout the Commonwealth;

6) Has your program successfully competed for, or been a collaborator with others, on any grants or cooperative agreements that included a GIS component?

If yes, please provide:

6a) a brief description of each grant(s) purpose

6b) the name of the grantor

6c) an approximation of funding received

6d) an approximate timeframe (i.e. 1998-2002).

5. Providing a broad array of private and public entities with the requisite data to develop appropriate environmental health analysis, health care delivery models, and assessment within the health and health care system in Virginia and providing technical assistance in analyzing such data;

7) Do you possess the requisite data necessary to perform appropriate geospatial analyses for your program?

If not,

7a) please state what type of data you are lacking and include any barriers to the acquisition of such data.

8) Do you have staff with the knowledge and skills to perform analysis of geospatial data?

If no,

8a) what are the barriers?

9) Would you be willing to allow a non-profit organization to maintain control and dissemination of your public health data, assuming the establishment of appropriate Data Use Agreements?

9a) Why or why not?

6. Functioning as a service organization to cost-effectively leverage existing hardware, software, data, applications, and personnel to support new research projects within its partner organizations; and

NOTE: Hardware and software are determined based on existing state contracts with Northrop Grumman and ESRI, respectively.

10) If a non-profit organization was established, would you prefer to use GIS contractual services solely through this organization?

10a) Why or why not?

7. Making geospatial services and data available to faculty and students from educational institutions as well as to the Department of Health, public health officials and researchers, and other appropriate persons, with the goal of improving existing public health programs, developing new evidence-based initiatives, and better informing the health policy decision-making process through health-related assessment activities.

11) Do you think a non-profit organization's role as the provider of geospatial services and data would improve your existing public health program?

11a) Why or why not?

§ 2. That the Secretaries of Health and Human Resources and Technology shall report their findings to the Governor; the Senate Committees on Education and Health, Finance, and General Laws and Technology; and the House Committees on Appropriations, Health, Welfare and Institutions, and Science and Technology no later than December 1, 2010.

Thanks for your time and willingness to assist with data collection for the above report preparation. It is greatly appreciated.

ADDITIONAL COMMENTS:

Appendix H

Email Solicitation to VDH Program Staff

From: Stover, Jeffery (VDH)
Sent: Wednesday, September 29, 2010 10:48 AM
To: Kleene, Wes (VDH); Woolard, Diane (VDH); LePrell, Rebecca (VDH); Hafford, Kathryn (VDH); Mauskapf, Robert (VDH); Hicks, Robert (VDH); Croonenberghs, Robert (VDH); Helentjaris, Diane (VDH); Chapman, Derek (VDH); Secor, Debbie (VDH); Moen, Dennis (VDH); Royster, Michael (VDH); Wibberly, Kathy (VDH); Reed, Karen (VDH)
Cc: Hall, Keri (VDH); Widner, Dan (VITA); Hilbert, Joseph (VDH)
Subject: SB549 meeting request

Hi all,

On April 12, 2010, the Governor approved Senate Bill 549 requiring the Secretary of Health and Human Resources and the Secretary of Technology to evaluate opportunities to partner with nonprofit organizations and institutions of higher education in the Commonwealth to develop a network for geospatial health research, and to report on their findings to the Governor, as well as relevant Senate and House Committees no later than December 1, 2010.

As a part of this initiative, the following Offices and programs have been identified as entities known to have historically used GIS for programmatic use and/or enhancement and, as such, may have staff with valuable insight. We are planning a meeting(s) with relevant staff from as many of the program areas listed below as possible. Information obtained through this meeting(s) will provide supporting documentation for the above referenced report.

Proposed Offices/Divisions for inclusion in SB549 discussions:

Office of Drinking Water

Office of Epidemiology
- Division of Surveillance & Investigation
- Division of Environmental Epidemiology
- Division of Disease Prevention

Office of Emergency Preparedness

Office of Environmental Health
- Division of Shellfish Sanitation

Office of Family Health Services
- Policy Assessment Unit

Office of Information Management
- Data Warehouse

Office of Minority Health and Health Equity
- Division of Primary Care and Rural Health
- Division of Health Equity

You will receive a separate email meeting request via Meeting Wizard with the proposed dates (Oct. 7 and/or Oct 11). Please be on the lookout for this impending email and let us know if you or a relevant member of your staff will be available during either of these dates/times. The meeting location will be room 1218.

The text, as well as history, of the enrolled bill can be accessed through the Legislative Information System (LIS) at http://leg1.state.va.us/ by searching for SB549.

We look forward to your comments and input into this process. Please feel free to contact me with any questions.

Jeff

Appendix I

SB549 Attendee List at VDH Program Assessment Meeting - October 7, 2010

Attendee	VDH Program Area
Barry Matthews	Office of Drinking Water - Financial and Assistance Construction Programs
Bob Mauskapf	Office of Emergency Preparedness
Tim Powell	Office of Epidemiology - Division of Surveillance and Investigation
Michelle White	Office of Family Health Services
Ken Studer	Office of Minority Health and Health Equity
Wes Kleene	Office of Drinking Water
Kathryn Hafford	Office of Epidemiology - Division of Disease Prevention
Chris Bradley	Office of Information Management - Data Warehouse
George Simpson	Office of Information Management - Data Warehouse
Bob Hicks	Office of Environmental Health Services
Daniel Powell	Office of Environmental Health Services - Division of Shellfish Sanitation
Jeff Stover	Office of Epidemiology - Division of Disease Prevention
Keri Hall	Office of Epidemiology
Dan Widner	Virginia Information Technologies Agency - Virginia Geographic Information Network

VANGHR
Changing the view on public health

The Virginia Network for
Geospatial Health Research, Inc.

PO Box 15818
Richmond, VA 23227-5818
804-264-3325 phone
804-266-1541 fax
www.vnghr.org

The Virginia Network for Geospatial Health Research (VANGHR) is a collaboration of the geospatial and public health researchers in the Commonwealth of Virginia. VANGHR works with researchers at the four medical schools (UVA, EVMS, VCU, VT); public health officials and epidemiologists at the Virginia Department of Health; physicians with interest in applying geospatial analysis to improve understanding of disease; and geospatial and geographic researchers with expertise in spatial autocorrelation, spatial regression, dasymetric mapping, and raster analysis.

Leadership Experience:

- Don Combs, PhD – President

  Don serves as Vice Provost for Planning & Health Professions of Eastern Virginia Medical School (EVMS). His responsibilities include direction of all EVMS health professions programs, academic planning, oversight of medical modeling and simulation, program development, governmental and community relations, and directing educational outreach programs.

  Don holds senior faculty appointments with the EVMS School of Health Professions, the EVMS Department of Family and Community Medicine, and the Department of Modeling, Simulation and Visualization Engineering at Old Dominion University. He has long-standing research interests in health and human services management, emergency response, health workforce research, health professions regulation, organizational development, strategic planning, and medical modeling and simulation. These interests are reflected in his professional publications and conference presentations; many consultancies with federal, state and local agencies, non-profit services organizations and businesses; and $115 million in external funding.

  He currently serves on several regional, state, and national boards and task forces that address national and international health policy. Don is active in both the Association of American Medical Colleges (AAMC) and the Association of Academic Health Centers (AHC) and in national policy discussions addressing health workforce planning, emergency medical response to WMD, applied information systems and medical modeling and simulation.

  In the international arena, Don has worked with colleagues at the Naval Postgraduate School to develop and implement the International Health Resource Management executive education program that has served some 20 nations, including Moldova, Bulgaria, Macedonia, Nepal, Botswana and El Salvador. He holds degrees received with distinction from South Plains

College, Texas Tech University and the University of North Carolina - Chapel Hill. He was awarded an honorary doctoral degree from Moldova's State Medical and Pharmaceutical University in 2002 for his service in reforming their primary care health system.

Since 2009, Don has been president of VANGHR and is instrumental in establishing VANGHR as the subject-matter experts in geospatial analysis applied to public health research. VANGHR has partnered with EVMS on key pursuits in the areas of predictive modeling of cancer and infant mortality. Don has also worked toward growing VANGHR's board of directors to its current membership. As his primary role, he provides oversight and direction to the executive director.

- Jim Bohland, PhD – Vice President

Jim serves as vice president and executive director of Virginia Tech's National Capital Region (NCR) Operations. In this position, he works with the NCR senior management team to develop and implement new strategic directions and to help coordinate services and program initiatives for the university's six sites in the region. He reports directly to the president, provost, and executive vice-president and chief operating officer of Virginia Tech. He is also a full professor in Urban Affairs and Planning.

Jim served as chair of the Urban Affairs and Planning program from 1984 to 1995. He was the founding director of the School of Public and International Affairs and served in that capacity until the spring of 2001. From August 2000 to August 2001 he served as interim provost for Virginia Tech and in September 2001, he was appointed Senior Fellow for Biomedical, Bioengineering, and Health Projects by the university, a position he held until 2005. From 2000 to 2008, he served as director of the Institute for Community Health.

He earned a Ph.D. in geography from the University of Georgia, and accepted a position at the University of Oklahoma, where he stayed until joining the faculty at Virginia Tech in 1980. During the last two years of his tenure in Oklahoma, Jim served as chairman of the Geography Department.

With primary research interests in health policy and planning, community and population health, and in the social aspects of information technology, particularly as it relates to health, Jim has authored more than 75 referred articles, book chapters and technical reports on topics ranging from community health, digital divide, and Community Technology Centers. He also edited the SUNY Albany series on urban and housing policy. He has received grants from NSF, Exxon, National Telecommunications and Information Agency, NIH and NASA.

Jim was founder and president of Health Services Research, Inc., a company specializing in planning and data analysis services to organizations in the health and social service fields. He is past president of the Board for Montgomery Regional Hospital, of the Health Systems Board for Southwest Virginia, and of the Regional Planning Commission for the New River Valley. He has served on NSF panels, and is currently is a councilor for the Community Health, Planning and Policy Development Section of the American Public Health Association.

Jim has been vice-president and treasurer of VANGHR since 2009. He is instrumental in establishing VANGHR's board development, and providing guidance on internal company policy. Jim's primary role at VANGHR is to provide financial oversight of revenues and expenses.

- State Senator George Barker – Board Member

  Senator Barker represents the 39th Senate District of Virginia, which encompasses southern Fairfax and northern Prince William counties. Elected to office in 2007, he serves on the Senate Committees for Education and Health, General Laws and Technology, Privileges and Elections, and Rehabilitation and Social Services. He also serves as a member of the Joint Commission on Health Care.

  Senator Barker introduced Senate Bill 549, which became law in April 2010. The law authorizes the study of the need for a geospatial health network in the commonwealth.

  Prior to his election, Senator Barker worked for thirty years at Northern Virginia's regional health planning agency, the Health Systems Agency of Northern Virginia. He earned two degrees from Harvard University, receiving undergraduate honors in Economics and Public Health and a master's in Health Policy and Management.

  Senator Barker has served on the VANGHR board since 2009. He is instrumental in establishing VANGHR as the subject matter experts on geospatial analysis to the local and state government health organizations, as well as physicians and health foundations.

- Ruth Gaare-Bernheim, JD, MPH – Board Member

  Ruth is director of the Division of Public Health Policy and Practice and of the Master of Public Health Program in the School of Medicine, as well as associate director of the Institute for Practical Ethics and Public Life, at the University of Virginia. She currently serves on the Center for Disease Control and Prevention's (CDC) Ethics Subcommittee and Virginia's State Pandemic Flu Advisory Board. She also is president of the Virginia Public Health Association from 2009-11.

  Ruth teaches courses in the Medical School, Law School, and College on public health law and policy, including the required fourth-year medical school course on health policy. She is co-director of the new Certificate Program in Public Health Sciences for Graduate Medical Education and recently led university-wide efforts to develop the undergraduate Global Public Health Minor.

  Ruth works on numerous community public health projects at the local, state, and national level, and serves on the national board of the Association for Prevention Teaching and Research (APTR) and the governing board of the American Journal of Preventive Medicine. As co-director of ethics for the Public Health Leadership Society, she also works with public health leaders in practice across the country on ethical and legal education, including developing educational modules for the CDC's Public Health Law Program. In addition, she was a faculty consultant on the Association of Schools of Public Health (ASPH)'s Model Curriculum on Public Health Ethics, and previous chair of the Ethics Section SPIG of the American Public Health Association (APHA).

  Her research interests focus on ethics, law and public health policy, health disparities and public-health community needs assessment.

Ruth previously was on the faculty of the Johns Hopkins School of Public Health and Johns Hopkins Bioethics Institute, where her projects included a Robert Wood Johnson-funded grant with the Maryland Attorney General's Office on End-of-Life Care and a PEW-funded grant on Managed Care and Public Health. She also served on the Johns Hopkins Hospital Ethics Committee and the Johns Hopkins Health Care Scientific and Benefits Assessment Committee.

Ruth education includes a law degree from the University of Virginia School of Law, a master's of public health degree from Johns Hopkins Bloomberg School of Public Health, certificates in mediation from Boston University and the Harvard School of Public Health, and coursework as a research scholar at the Kennedy Institute of Ethics.

Ruth accepted an invitation to the VANGHR board in July 2010.

- Steve Sedlock, MURP, GISP – Executive Director

Steve is the founder and full-time executive director for VANGHR. He oversees all operations and finances for the company, and manages all projects and business development pursuits. Through Steve's direction, VANGHR has established itself as a successful, non-profit business entity through successful projects involving spatial autocorrelation, spatial regression, and web-based application development.

With twenty-four years of experience in the field of geographic information systems, Steve has been involved in the technical development and management of a wide array of geospatial projects. These include federal, state, local, and private enterprise projects in the industries of public health, epidemiology, water monitoring, urban and regional planning, defense and homeland security, forestry, telecommunications, water/sewer management, transportation, and emergency response. Steve's specific technical expertise is in geospatial application development, database management, geospatial data processing management, and geospatial analysis.

Since 1999, Steve has been focused on the application of geospatial technology within the public health arena. He has implemented the ESRI suite of software products (desktop and/or server-based) to users in the fields of drinking water management, waterborne hazards control, health policy, dental health, rural health, and wastewater management. As part of his primary mission at VANGHR, he has begun to introduce the use of spatial autocorrelation and spatial regression to public health academics within the Commonwealth.

Prior to the founding of VANGHR, Steve was a research faculty member for the Center for Geospatial Information Technology (CGIT) at Virginia Tech (2006-2009). He was a principal GIS consultant with Keane, Inc., working on-site with its client at the Virginia Department of Health (1999-2006). He was a project manager at TIMMONS Group (1997-1999) and a programmer and project manager at MAPCOM Systems (1986-1997).

Steve earned his bachelor's degree in geography from Virginia Tech, and his master's degree in urban and regional planning from VCU. He is a certified Geographic Information Systems Professional (GISP).

Staff Experience:

- Elizabeth Manghi – Data Analyst and Project Manager

  Beth is a full-time data analyst and project manager for VANGHR, having arrived at the company in August 2010. Beth expertise is in the areas of geospatial analysis, particularly spatial autocorrelation and spatial regression. She has strong competency and knowledge on the analytical study of health outcomes and social determinants using this technology. She also has expertise in cartographic design and production, and linear and non-linear statistical analysis.

  Prior to coming to VANGHR, Beth worked at the Chickahominy Health District of the Virginia Department of Health as an environmental health specialist, on-site technical consultant, and emergency planner. She has eight years of experience in public health, which provided proficient skills in GPS technology and ArcGIS (as well as other geospatial software).

  Beth earned her bachelor's degree (cum laude) in Health Sciences, Public Health, and Nutrition from James Madison University. She earned her graduate certificate in geographic information systems from VCU.

Appendix K

Appendix K: SB549 Attendee List at VDH/VANGHR Meeting- October 28, 2010

Attendee	Affilation
George Barker	Senator - 39th Senate District of Virginia
Steve Sedlock	Executive Director - VANGHR
Joe Hilbert	Director of Governmental and Regulatory Affairs
Keri Hall	Director - Office of Epidemiology and State Epidemiologist
Jeff Stover	Office of Epidemiology - Division of Disease Prevention
Debbie Secor	Director - Office of Information Management and CIO
Dennis Moen	Data Warehouse Supervisor
Dan Widner	Coordinator - Virginia Geographic Information Network

VIRGINIA HEALTH INFORMATION
102 N. 5TH STREET • RICHMOND, VA 23219 • TOLL FREE 1-877-VHI-INFO OR 1-804-643-5573

VHI
On the web: vhi.org
E-mail: info@vhi.org
Fax: 1-804-643-5375

BACKGROUNDER

updated September 21, 2010

VIRGINIA HEALTH INFORMATION

A nonprofit Virginia corporation (FEIN 54-1671355) established in 1993

CONTACT

Michael T. Lundberg, Executive Director
Phone: 1-804-644-7026
E-mail: Michael@vhi.org

BOARD OF DIRECTORS

Executive Committee: David A. Adams, CentraHealth, *President*; Jodi L. Fuller, Meadwestvaco, *Vice-President*; James L. Kammert, *Treasurer*; Rome H. Walker, MD, Anthem BlueCross and BlueShield, *Secretary*; Charles O. Frazier, MD, Riverside Health System, *Past President*;

Listed at left, VHI Directors represent both public and private stakeholder groups.

MISSION: EDUCATION AND RESEARCH

Since 1993, VHI's vision is an environment where credible, unbiased and timely information is readily available to consumers and purchasers to make informed health care decisions. Toward that goal, VHI's mission has been to create and disseminate health care information to promote informed decision-making by Virginia consumers and purchasers and enhance the quality of health care delivery.

Pursuant to Virginia Code, Chapter 7.2, §32.1-276.2, whereas: "The General Assembly finds that the establishment of effective health care data analysis and reporting initiatives is essential to the improvement of the quality and cost of health care in the Commonwealth, and that accurate and valuable health care data can best be identified by representatives of state government and the consumer, hospital, nursing home, physician, insurance and business communities."

- Develops, administers and distributes the patient level database (PLDB) on all licensed Virginia hospitals and state mental health hospitals —a dataset with over 860,000 records per year
- Collects, analyzes and disseminates select outpatient procedures from all ambulatory surgical centers, hospitals and practitioner offices
- Maintains the only financial and utilization database on hospitals, ambulatory surgical centers and nursing facilities; collects annual survey of hospitals, nursing facilities, ambulatory care and mental health facilities (EPICS)
- Sorts, categorizes and groups valuable information on care received, patient outcomes and charges for services
- Collects, analyzes and disseminates quality, performance and member satisfaction information on Virginia HMOs
- Serves as Virginia's Consumer Health Information Portal

VIRGINIA HEALTH INFORMATION BACKGROUNDER

Uses data as springboard to or foundation for various educational health-related publications both in print and on the web at www.vhi.org .

- INDUSTRY REPORT ON VIRGINIA HOSPITALS AND NURSING FACILITIES—provides corporations and consumers with annual efficiency and productivity information; based on data collected for the Commonwealth of Virginia; books are presented in full-color and includes electronic data provided on CD-ROM
- PAY FOR PERFORMANCE—VHI collects, analyzes, evaluates and scores hospitals on Anthem's Quality-In-Sights®: Hospital Incentive Program for hospitals in the following 10 states—VA, GA, TN, NY, CT, ME, NH, CO, MO and WI
- CODES—VHI, in collaboration with the Virginia Department of Motor Vehicles (DMV) Highway Safety Office and other organizations, has developed a Crash Outcome Data Evaluation System with crash, emergency services (ambulance, etc.,) trauma, hospital and vital statistics data to help inform consumers, policy makers and state agencies via www.vacodes.org
- OBSTETRICS—consumer guide helps the public understand the birthing process, delivery choices, rates of cesarean delivery, episiotomy and other physician and hospital performance information; details on hospital obstetrical programs, capabilities, quality practices and staffing
- CARDIAC CARE MORTALITY INFORMATION—on-line, information for consumers comparing Virginia hospitals on their treatment of open heart surgery, medical and invasive cardiology services
- HMO QUALITY AND PERFORMANCE DATA—verified HMO consumer information on quality, enrollees, premiums, cities and counties served, national accreditation standings and other information; an interactive format of 70+ measures on www.vhi.org allows consumers to obtain information on HMOs in their area; five years of data are valuable to employers and others interested in HMO trends
- HOSPITAL PATIENT SATISFACTION—rankings of Virginia hospitals by patients. Would they recommend the hospital to others? Was their pain well managed? Did they get help when they wanted? And seven other measures important to consumers
- HEALTH CARE PRICES—helping the uninsured and those in high deductible health plans with information on pricing for 31 health care services
- INSURANCE OPTIONS—consumer guide to understanding insurance options ranging from indemnity to managed care to government provided such as Medicare and Medicaid; first printing sold out, revised and expanded second printing
- VIRGINIA HOSPITALS—provides consumers with information on how to evaluate and choose hospitals with details on regional market share by types of care provided
- LONG-TERM CARE—includes a consumer-focused online resource section and online statewide directory of licensed/certified providers of home care, adult day care, continuing care retirement communities, assisted living and nursing facilities; a comprehensive statewide publication validated by Virginia agencies and departments responsible for programs provided for the aging and disabled

FUNDING

VHI is a true public/private partnership with revenues reflecting diversity in those benefiting from VHI heath information and diversity in funding sources. Fiscal year 2010 revenues included 67% from product sales, services and partnerships; 15% from general appropriations and 17% from provider fees supporting the EPICS system.

Appendix M

Glossary of Terms

AHRQ - The Agency for Healthcare Research and Quality

ARRA - The American Recovery and Reinvestment Act

ArcGIS – the name of the GIS software suite provided by ESRI. ArcGIS allows users to analyze, model, author and publish maps and data.

CDC – Centers for Disease Control and Prevention

EAD – Virginia Information Technologies Agency – Enterprise Application Division

EPA - The Environmental Protection Agency

ESRI (Environmental Systems Research Institute, Inc.) – a privately held company that is the leading provider of GIS software. Their suite of GIS software is called "ArcGIS" and is utilized by the majority of all levels of government and the private sector.

Geospatial Metadata - commonly document geographic digital data such as Geographic Information System (GIS) files and geospatial databases. Geospatial Metadata records include core library catalog elements such as Title, Abstract, and Publication Data; geographic elements such as Geographic Extent and Projection Information; and database elements such as Attribute Label Definitions and Attribute Domain Values.

GIS (Geographic Information Systems) - is a set of tools that captures, stores, analyzes, manages, and presents data that are linked to location(s). GIS integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information.

HIE – Health Information Exchange

HIPAA – Health Insurance Portability and Accountability Act

HWI – Virginia House of Delegates Committee on Health, Welfare and Institutions

HIV – Human Immunodeficiency virus

HRSA - The Health Resources and Services Administration

Metadata - is a file of information which captures the basic characteristics of a data or information resource. It represents the *who, what, when, where, why* and *how* of the resource.

NASA - The National Aeronautic and Space Adminstration

NIH – National Institutes of Health

ODW – Virginia Department of Health - Office of Drinking Water

OEMS - Virginia Department of Health -Office of Emergency Medical Services

OEPI - Virginia Department of Health - Office of Epidemiology

OFHS - Virginia Department of Health - Office of Family Health Services

OIM - Virginia Department of Health - Office of Information Management

OMHHE - Virginia Department of Health - Office of Minority Health and Health Equity

SES – socio-economic status

SHHR – Secretary of Health and Human Resources

STD – Sexually transmitted disease

USDA - The United States Department of Agriculture

USGS - The United States Geological Survey

VANGHR – Virginia Network for Geospatial Health Research, Inc. A 501(c)(3) non-profit organization initiated in April 2009. VANGHR currently has 2 staff.

VCU - Virginia Commonwealth University

VDH – Virginia Department of Health

VGIN – Virginia Geographic Information Network

VHI – Virginia Health Information. A non-profit corporation established in 1993, pursuant to the *Code of Virginia*, Chapter 7.2, §32.1-276.2. VHI currently has 9 staff.

VITA – Virginia Information Technologies Agency

Appendix N

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