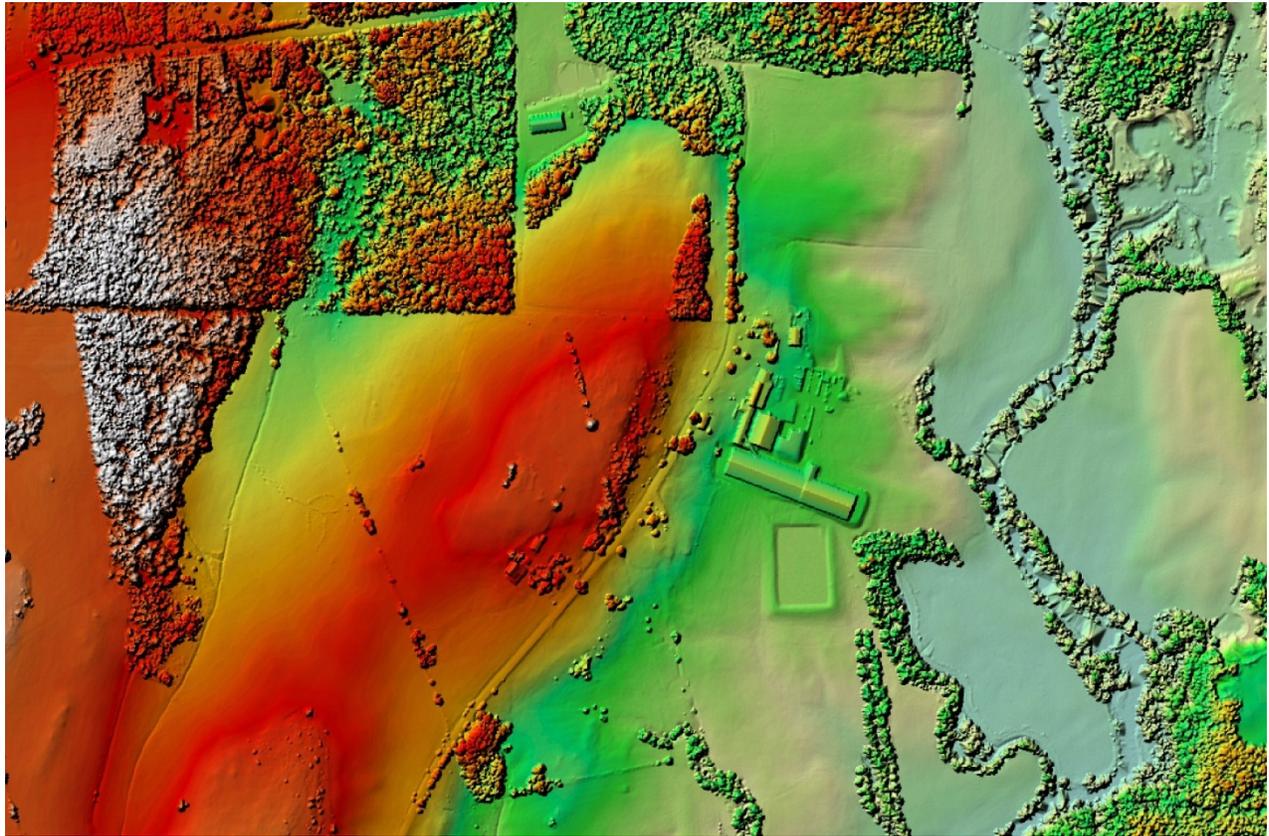


# 2014 Annual Report



## Vermont Center for Geographic Information and the Vermont Geographic Information System

# **Vermont GIS 2014**

Annual Report of the Vermont Center  
For Geographic Information, Inc. (VCGI)  
and the  
Vermont Geographic Information System (VGIS)

January 2014

For  
Governor Peter Shumlin  
And  
Vermont House and Senate  
Appropriations Committees

Provided By the  
Vermont Center for Geographic Information



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Director of GIS Enterprise Services

Dejung Gewissler  
Systems Administrator

Cover Graphic Provided by Mike Brouillette, VCGI: LiDAR Digital Surface Model of farm in Richford, VT and symbolized by elevation of “first return” points. Data collected by Photo Science Inc. of Lexington, KY in May 2010 at a “point spacing” supporting 1.4 meter resolution.

Vermont Center for Geographic Information, Inc.  
58 South Main Street, Suite 2  
Waterbury, VT 05676  
(802) 882-3000  
(802) 882-3001 (FAX)  
<http://www.vcgi.org>

January 15, 2014

Honorable Peter Shumlin  
The Statehouse  
Montpelier, VT 05602

Dear Governor Shumlin;

The following report is intended to provide a summary of the activities and accomplishments of VCGI and the VT GIS community in calendar year 2013. The GIS community in Vermont, including government, academic, non-profit, and private sector representatives is recognized as an outstanding example of cross-sector involvement in information management. In 2013 our community participated in a number of significant activities providing direct or indirect benefits to the citizens of the state.

High-resolution elevation data, in this case remotely sensed Light Detection and Ranging (LiDAR) data, is a critical data resource for the development of improved flood mitigation in the state and an important part of any local flood resiliency planning. Town parcel data across the state is inconsistent in format and availability. A statewide parcel data standard has been developed and representatives from several agencies have been involved in initial planning for a statewide parcel data collection plan.

The concept of ‘Open Data’ is generally understood as being central to government transparency efforts in that it enables open access and discoverability to government data in a way that supports automated access and analytics. Across the country, the GIS community has provided open access to geospatial data for many years and is already established as a leader in creating ‘Open Data’ implementations. As the State moves forward on implementing the principles of ‘Open Data’ it is critical that a means of governance be established to ensure consistency in the effort across agencies. The experiences of the GIS community can support the establishment of an “Open Data” governance plan for the state.

As mentioned in previous Annual Reports, the financial sustainability of VCGI as an organization is under pressure due to the increasing need to get yearly contracts and grants substantial enough to cover the approximately 40% of the organization’s budget not supported by state appropriation. The passage of Act 50 Sec E.123(a) in the FY 2014 Vermont Legislative Session required the Executive Director of VCGI to provide a report outlining options for VCGI’s support by a state entity and recommendations for long-term financial sustainability of the program. In November of 2013, a report was provided to the Legislature recommending that VCGI’s existing organizational skills, resources and responsibilities be brought into state government under the Department of Information and Innovation.

The following report provides further details on the topics mentioned above along with information on other geospatial activities within the state. Thank you for your support to VCGI and the GIS community in Vermont over the years.

Sincerely,



David F. Brotzman  
Executive Director  
*davidb@vcgi.org*

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*This report could not have been prepared without the comments and contributions of the Vermont GIS community, including Vermont’s regional planning commissions, commercial GIS firms, and numerous state and federal agencies. I would also like to acknowledge the VCGI staff for their assistance in the production of this document.*

David F. Brotzman, Executive Director

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## I. 2013 Year in Review

### a. State Agency Activities

As part of the calendar 2013 review we are including reports from agencies within state government that have active geospatial technology programs and want to showcase their activities from the past year. In future years we hope to expand this section to include the activities of the broader community thereby representing the full VT Geographic Information System (VGIS) more comprehensively.

#### ***VT Agency of Agriculture, Food and Markets – Provided by Joanna Grossman, VAAFM***

In May of 2013 VAAFM hired GIS Specialist Joanna Grossman as the new GIS lead for the agency. Since that time the Agency has made strong moves toward modernizing their GIS environment.

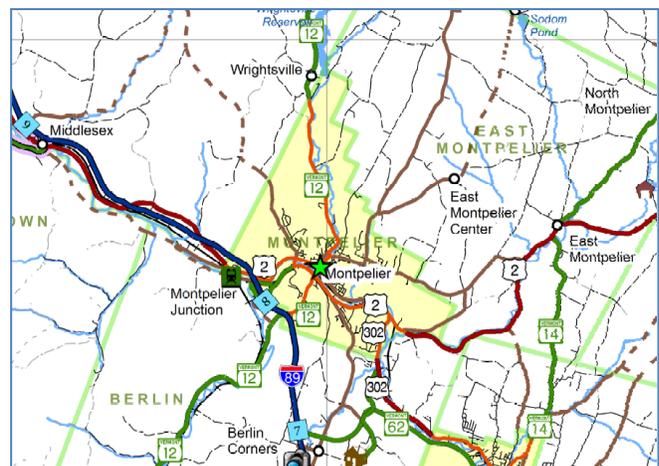
- In August VAAFM erected an active ArcGIS Online application for collaborating with the Northeast Organic Farming Association (NOFA) to map Vermont's organic farms. This was essential in protecting organic farms from insecticides sprayed after positive samples of Eastern Equine Encephalitis (EEE) were found in mosquitos.
- VAAFM has tested, and will soon roll out, its first-ever SDE environment to get all agency GIS users and GIS applications drawing from the same data sources, allowing multiple users to collaborate on the development of agency-wide datasets.
- VAAFM is currently exploring various options for offline replication and disconnected editing including the GeoCortex solution used by many other agencies.
- VAAFM is mapping the state's nearly 1000 dairy farms as well as our many other agricultural assets.

#### ***VT Transportation Department – Provided by Johnathan Croft & Rick Scott (both VTrans)***

Vermont's Transportation data layers consist of road centerline, railroad, bridge, airport, small culverts, and other transportation features, including traffic volume, crash locations, pavement condition, and others. The quality and currency of transportation data overall in Vermont continues to be high and is ever improving. The Agency of Transportation (VTrans) and the Enhanced 911 Board (E911) have embarked on a project to merge each organization's road centerline data layer into a single master, and have implemented a common data schema that includes data fields that supports both organizations missions.

VTrans continues to maintain the road centerline data and leverage this data layer as the core data behind the production of the Town Highway Maps.

More emphasis has been put on transportation assets with MAP-21 and increased performance measures, prompting the enhancement of a sign inventory, right of way delineation, rail bridge inventory, and small culvert inventory. Tools for



mobile data collection and assessment have been developed to streamline the capture of features in the field, as well as validate condition information during inspection.

The transportation data for Vermont continues to be in good condition. VTrans has maintained and improved an accurate, robust, and up-to-date repository of data. This data is becoming essential for standard business functions and relied upon by many Sections throughout the Agency. VTrans continues to collaborate with State Agencies in the development and sharing of GIS data.

### ***VT Department of Health – Provided by Pete Young, VDH***

The Vermont Department of Health (VDH) uses GIS technology for a variety of public health purposes, including public health surveillance, public health planning, health data reporting, and emergency preparedness. Currently, VDH has approximately 25 staff using GIS technology at levels ranging from basic map making to sophisticated geographic analysis to web application development. VDH GIS activities are coordinated by a department GIS Manager who works closely with a half-dozen department staff who are advanced desktop GIS software users and with one IT Systems Developer who administers the department's web GIS infrastructure.

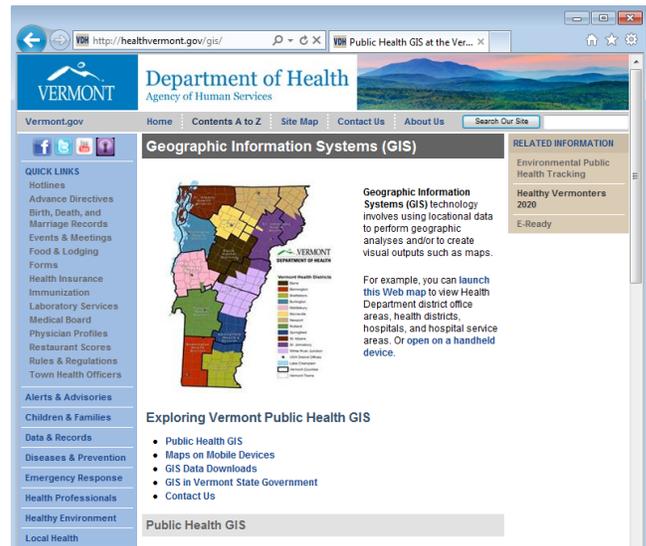
In July 2013, VDH received a Special Achievement in GIS Award at the ESRI International Users Conference:

<http://events.esri.com/conference/sagList/?fa=Detail&SID=1718>

Several new public health GIS resources were updated or added to the VDH [healthvermont.gov](http://healthvermont.gov) website during 2013:

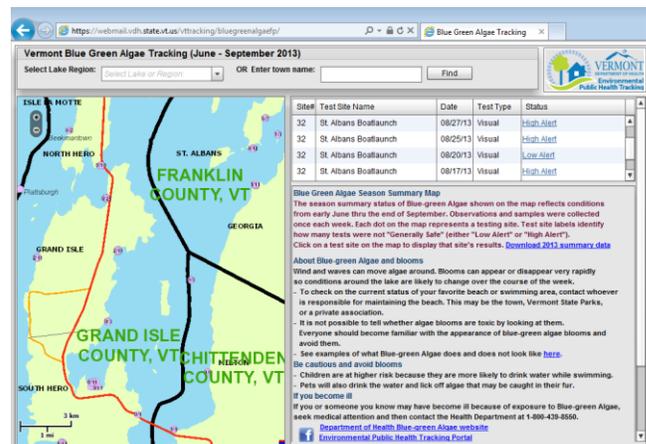
VDH now has a GIS landing page: [www.healthvermont.gov/GIS](http://www.healthvermont.gov/GIS). The page briefly describes public health GIS activities at VDH and identifies department programs that make active use of GIS technology.

The VDH Environmental Health Division continues to add new measures to its Vermont Environmental Public Health Tracking (EPHT) portal. By the end of 2013, the portal grew to include over 190 data measures that are accessed using an interactive query tool that serves dashboard-styled reports. Search for Vermont Tracking data reports by browsing to [www.healthvermont.gov/Tracking](http://www.healthvermont.gov/Tracking) and clicking on "search data".



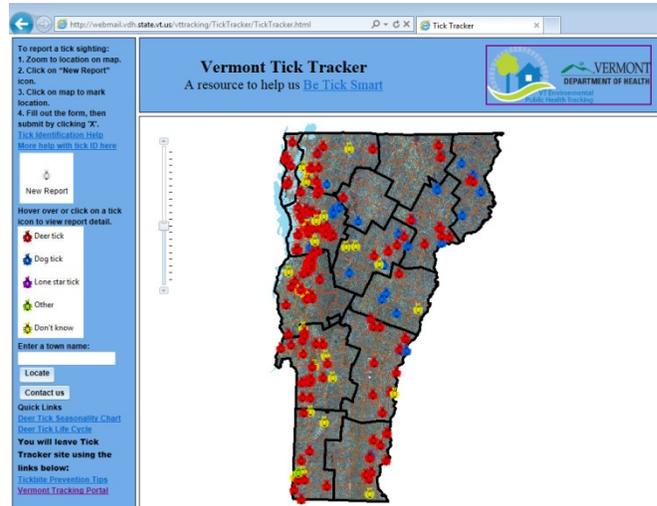
Also related to environmental health, two new mobile-device-friendly web applications were deployed in 2013:

The Blue-Green Algae Tracker, improved from 2012, reports blue-green algae weekly testing results for Lake Champlain and 5 inland lakes that are collected by the Department of Environmental Conservation, VDH, and the Lake Champlain Committee:



- The 2012 and 2013 testing results will remain accessible as archived season summaries. This application may be expanded in the future to include other frequently visited lakes and ponds across the state.
- <https://webmail.vdh.state.vt.us/vttracking/bluegreenalgae>

A new Tick Tracker interactive web map (<http://healthvermont.gov/ticktracker> ), allows website visitors to report observed tick conditions and to see the reports submitted by others. The web map also provides links to important educational information that can help people “Be Tick Smart”.



A new Healthy Vermonters 2020 webpage ( [www.healthvermont.gov/hv2020](http://www.healthvermont.gov/hv2020) ) went live in 2013. People can visit the HV2020 webpage to see maps and trend data for 121 indicators by county, health district, and hospital service area. These indicators have been identified as public health priorities and are accompanied by targets that will guide the work of public health in Vermont through 2020.

Public health GIS activities span many different areas of expertise. Looking to the future, GIS activities at VDH will involve an increasing number of applications, both PC and mobile-device based, that display maps and location-specific data. Feel free to submit feedback and suggestions to [VDH-GIS@state.vt.us](mailto:VDH-GIS@state.vt.us)

***VT Agency of Natural Resources 2013 GIS Highlights – Provided by Peter Telep, ANR***

The Agency of Natural Resources GIS Office had a fun, productive year! The ANR GIS Office is comprised of Peter Telep, Erik Engstrom, and Ryan Knox. Highlights include:

The launch of the [BioFinder](#) mapping web site! BioFinder is a map and database identifying Vermont's lands and waters supporting high priority ecosystems, natural communities, habitats, and species. The most comprehensive assessment of its kind in Vermont, BioFinder was developed by the [Agency of Natural Resources](#) and partners to further our collective stewardship and conservation efforts. At its core, BioFinder is 21 overlapping GIS data sets representing terrestrial and aquatic biological, ecological, and natural heritage data at various scales and aspects. A co-occurrence analysis then identified the locations of greatest overlap for priority ranking at the statewide scale. You can use the [BioFinder Mapping Tool](#) to explore the distribution and richness of Vermont's biodiversity and help secure Vermont's natural heritage for future generations.



The launch of the [Agency of Natural Resources Atlas](#)! The purpose of the ANR Atlas is to provide geographic

information about environmental and natural resource features and sites that the Vermont Agency of Natural Resources manages, monitors, permits, or regulates. In addition to standard map navigation tools, this mapping site allows you to link from geographic features to documents and other data,

generate reports, export search results, import data, search, measure, mark-up, query map features, and print PDF maps. This web mapping application has proven very popular with the public, consultants, attorneys, real estate agents, non-profits, and local, state, and Federal government staff who need to explore data, information and permits that ANR produces.

Ryan Knox, member of the ANR GIS Office, became the National Hydrography Dataset and Watershed Boundary Dataset Steward for the State of Vermont. Both datasets contain detailed geospatial information about the Nation's surface waters and watershed boundaries. The USGS facilitates the overall process, management, coordination, tools, and standards while the stewards make updates and are the point of contact of both datasets in the State.

ANR GIS continues to increase the availability of Agency GIS datasets to the public including further development of the ANR Lands dataset. The ANR Lands dataset represents an authoritative source of fee and non-fee interests for the Agency's three departments; the Department of Fish & Wildlife, the Department of Forest, Parks and Recreation, and the Department of Environmental Conservation.



ANR GIS and FPR staff has been working closely with the Vermont Tax Department to create a Use Value Appraisal GIS layer to complement the database being developed for the UVA program. To date, approximately 11,700 parcels have been mapped out of 17,600 parcels. When it is completed, Vermont will have a statewide layer that displays the importance of our working forested landscape in figure and picture that supports town needs for accessible information, enhances customer service and UVA program administration, and better meets reporting requirements to the Vermont legislature and USFS stakeholders.

ANR GIS developed data for the White River Tactical Planning Basin. The White River Tactical plan is the first basin completed under the new Vermont Surface Water Management Strategy. The resulting plans spell out clear, attainable goals and targeted strategies that are often identifiable on a map. Those areas are now viewable using the Natural Resources Atlas – Tactical Basin Planning theme.



The ANR GIS Office continues its proactive involvement in the state government GIS community through its participation in the Enterprise GIS Consortium and the VCGI data warehouse, LiDAR, and parcel mapping workgroups. ANR GIS provided leadership administering the shared multi-agency enterprise Geocortex Essential web mapping platform. ANR GIS continues to serve on the VCGI Board of Directors.

ANR GIS looks forward to an equally exciting and productive 2014!

## b. VCGI Activities

### I. VCGI Data, Community and Project Related Activities

#### ***Participation in the National and Regional GIS Community***

The Executive Director of VCGI, David Brotzman, continued to serve as a Committee Co-Chair on the National States Geographic Information Council (NSGIC) Technical Issues Committee. As an active Committee member David participates in the development of Federal GIS program and policy discussions. Mr. Brotzman is also Co-Chair of the NSGIC Broadband Mapping Work Group, a committee that is involved with all of the states awarded an NTIA Broadband Mapping Grant. NSGIC also works closely with many of the major geospatial solutions providers in the world to establish an understanding of state focused product needs. NSGIC is the national leader in geospatial technology serving state level interests.

David is also on the Board of Directors of the GIS Certification Institute (GISCI). The GIS Certification Institute (GISCI) is a tax-exempt, not-for-profit organization that provides the international GIS community with a GIS certification program. GISCI is the leading GIS certification opportunity for the broadly defined GIS profession. Certified GIS professionals (GISPs) must show proficiency in three areas to be awarded certification; 1.) Educational Achievement, 2.) Professional Experience, and 3.) Contributions to the Profession.

Steve Sharp, Director of GIS Enterprise Services at VCGI served as President of the New England Chapter of the Urban & Regional Information Systems Association (NEURISA) in 2013. NEURISA is a professional organization that provides a forum for: promoting and facilitating the use and integration of spatial information technology, fostering relationships, professional development, and representing the interests of Geographic Information System (GIS) practitioners and Information Technology professionals across the New England region. The New England Chapter of URISA received the most outstanding chapter award by the national organization at its Annual Conference in the Fall of 2013

Participation in national and regional organizations such as NEURISA and NSGIC provides VCGI and Vermont an awareness of the activities of other states in the geospatial business area and enables Vermont to influence the development of geospatial policy and activities on a regional and national level.

#### **Steve Sharp, Director of Enterprise GIS Services**

##### ***Vermont's Enterprise GIS Consortium (EGC)***

The EGC had another productive year, continuing efforts to foster efficient and effective use of the State's geospatial capabilities. The EGC made significant headway in a number of areas including the implementation of its Web Services Strategy, upgrade of its shared web mapping platform (Geocortex Essentials), and establishment of a sub-committee chartered with redesigning and rebuilding the State's Geospatial Data Warehouse (Warehouse Workgroup).

The EGC is a voluntary consortium of state government organizations focused on effective management of State's Enterprise Geographic Information System (GIS). The EGC was chartered<sup>1</sup> by the State of Vermont in August 2008, culminating a yearlong strategic planning effort managed by the Enterprise GIS Taskforce<sup>2</sup> (EGT). The EGC has established a realistic and effective Enterprise GIS

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<sup>1</sup> [EGC\\_Charter\\_2008A\\_final.pdf](#)

<sup>2</sup> The EGT has been replaced by the EGC.

Strategic Plan<sup>3</sup>: a vision and a plan that supports a wide range of needs within and outside of state government. The Plan is an important part of the state's '*comprehensive strategy*' for the development and use of Vermont's Geographic Information System (VGIS)<sup>4</sup>. The Plan articulates a strategic vision for the development and use of geospatial technology within state government; a critical component of the VGIS. This year the accomplishments of the EGC include:

- 1) **Vermont Enterprise GIS Consortium (EGC):** The EGC held monthly meetings throughout 2013. This allowed the EGC to maintain momentum on a number of work items identified in the 2013 Business Plan<sup>5</sup>. EGC member participation has been steady.
- 2) **GIS Careers in State Government:** As part of the IT reclassification analysis going on for all of state government, EGC representatives proposed a GIS track that expands the current GIS-specific positions in the state job classification system. The proposed track includes 3 tiers similar to the tiers used for all other IT tracks. EGC representatives will continue to work with the Department of Human Resources to move this proposal toward implementation.
- 3) **Data Warehouse Workgroup:** The EGC established the Data Warehouse Workgroup (DWW) and directed it to work with VCGI to redesign and rebuild the State's Geospatial Data Warehouse. The DWW had a kick-off meeting on May 20<sup>th</sup> to initiate the project. The DWW articulated the following vision for the project: "*Connecting publishers and consumers in a user-driven portal that facilitates finding, exploring, contributing, and consuming geospatial information.*" The Workgroup includes representatives from all State agencies and departments willing to participate, which includes all of the "big" GIS user agencies. The project will be managed using an Agile/Scrum project management approach. To date the DWW has crafted a detailed list of "user requirements", and has begun to test several platforms, including working with DII on their Socrata Open Data Pilot project.
- 4) **EGC GeoPoint GIS Portal:** The EGC's SharePoint portal (EGC GeoPoint GIS Portal) was maintained and used throughout 2013 to share data and documents. Several sub-sites were created in 2013 including; 1) Data Warehouse, 2) LiDAR, 3) and Parcel Workgroups. The EGC developed and released the SharePoint portal in FY'2011. The objective was to build an Enterprise GIS web portal that would support EGC initiatives and would act as a central reference point for Enterprise GIS data and resources. The site is available to State employees, EGC stakeholders, and the public.
- 5) **Implementation of Web Services Strategy:** The EGC focused on implementation of its web services strategy<sup>6</sup> in 2013. The strategy was crafted in FY'2012 and focuses on the coordinated provisioning of geospatial web services supporting desktop, web, and mobile applications. Several EGC members (E911, ANR, VCGI) contributed to a successful implementation (90% build-out) of this strategy. The services are being actively consumed by desktop, web, and mobile application inside and outside of state government.
- 6) **Geocortex Upgrade:** Several EGC Members (VCGI, ANR, E911, VTrans, and VDH) successfully upgraded to the latest version of Geocortex Essentials, deploying a production and development environment within DII's new Virtual environment. Geocortex Essentials is a web application development framework designed to facilitate the development and deployment of

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<sup>3</sup> [EnterpriseGIS\\_SP\\_v2008A.pdf](#)

<sup>4</sup> Vermont Statute (Title 10 VSA - Chapter 8 § 121)

<sup>5</sup> [EGC\\_BusinessPlan\\_FY2013\\_final.pdf](#)

<sup>6</sup> [EGC Web Services Strategy](#)

feature-rich browser and mobile interactive mapping applications. This collaborative venture resulted in significant efficiencies and cost savings to the State of Vermont.

The State's Enterprise GIS Consortium (EGC) has continued to make significant strides toward advancing the "efficient use of the state's Geographic Information Technology sources". It has furthered this goal by improving and simplifying access to geospatial data and services, and by providing a venue where agencies can collaborate and coordinate efforts.

### ***VCGI Web Services***

VCGI continues to host and maintain several web services that help Vermonters with their mapping efforts. These include the VT GIS Basemap service, cached imagery services, and address geocoding service. These services are used in a number of state web applications including;

- Vermont Interactive Map Viewer
- ANR Natural Resources Atlas
- VT BioFinder
- E911 Map Viewers
- Vermont Tick Tracker (VT Department of Health)

These services are also used by public and private constituents who need them to streamline the work they do. For example, VCGI cached imagery services eliminates the need to download thousands of image tiles. Instead the user can "stream" the imagery into their web browser or mapping software, saving countless hours downloading and organizing the imagery.

### **Mike Brouillette, Web Applications Administrator - State LiDAR Coordinator**

#### ***Vermont LiDAR Initiative***

The "LiDAR Workgroup" created in 2012 as a strategic response to Hurricane Irene and FEMA's recommended need for a statewide high resolution elevation model met quarterly in 2013. The group created the "Vermont LiDAR Initiative" as an official project to support the coordination, acquisition and dissemination of the statewide elevation model based on Light Distance and Ranging (LiDAR) technology. Supporting the initiative is a clearinghouse web page<sup>7</sup> that contains the state LiDAR plan, an informational brochure and other education and advocacy resources. The plan defines a set of actions required to acquire LiDAR data and derivative products that are of sufficient design, accuracy, consistency, coverage and resolution to meet the business needs of the broadest possible user community in the state.

Comprised of federal, state and local partners, each is advocating for this effort within their organizations and in public as opportunities arise. As the state GIS coordinating organization, VCGI has committed to the success and long-term support of this effort by designating a staff state LiDAR coordinator role. In the broader context, existing and future data from this program will be shared on both the VGIS and appropriate federal data portals to ensure the public, hazard mitigation, emergency, public safety and other critical state interests have multiple access points.

The coordinator role has a wide range of responsibilities related to all aspects of facilitating data dissemination, coordinating workgroup meetings and agendas, facilitating implementation of the state LiDAR plan and outreach and advocacy efforts in support of the initiatives goal of statewide coverage.

To facilitate outreach and provide a central source of information for the Vermont LiDAR Initiative the [vcgi.vermont.gov/lidar](http://vcgi.vermont.gov/lidar) web page was created for users to find the latest version of the state plan, data status and updates and other supporting information. The current inventory of available LiDAR data

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<sup>7</sup> [vcgi.vermont.gov/lidar](http://vcgi.vermont.gov/lidar)

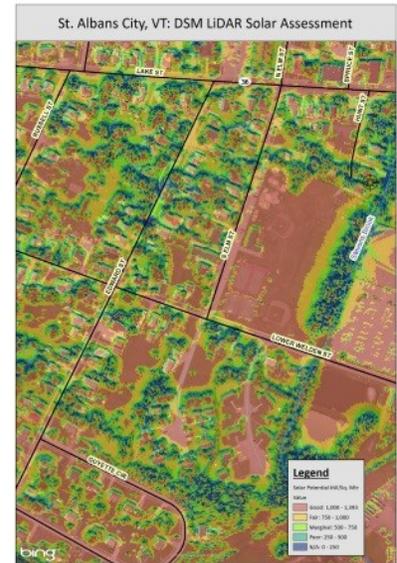
was created by a variety of vendors spanning multiple years, extents, source projections and formats required a large effort to normalize the directory structure, naming convention, data schema and projections. The majority of high priority data layers are now available on the VGIS with the remainder to be made available pending resolution of various source data issues.

Acting on a central theme that emerged from workgroup meetings partners have addressed the need to raise awareness for state support of statewide LiDAR a by advocating more actively within their respective organizations and increased the level of information sharing within the group at large. Externally, VCGI and workgroup members met with a number of state agency heads, related committees and other organizations at the executive level throughout the year finding a high level of support.

**Vermont Sustainable Jobs Fund – Renewable Energy Atlas**

The “Phase IV” scope of work draws from the surprising fact that a vast majority (99%) of the new renewable energy “sites” added in 2013, both residential and commercial, were either ground or roof mount solar Photo-Voltaic (PV) or hot water systems. As a result, VSJF reacted favorably to VCGI’s suggestion of employing high accuracy Digital Surface Model (DSM) data derived from LiDAR source data to model solar potential on all surfaces while accounting for shading, slopes, average climatic conditions and both time of day and year.

The pilot project results were well received and in a non-scientific comparison with eight operating residential sites the estimated values were within 5-15% of observed electricity generation. VSJF has requested VCGI to calculate solar LiDAR potential for all areas of Vermont with LiDAR data availability.



## **Dejung Gewissler, System Administrator**

### ***NTIA Broadband Mapping***

VCGI, as prime contractor representing a larger team from VT, was awarded a Broadband Mapping Grant from NTIA for \$3.5M for federal fiscal years 2010 thru 2014. The original award was for 5 years, but only the first 2 years were funded. Subsequent to the first award, in late September 2010, NTIA awarded additional funding for years 3 thru 5 as an Amendment to the existing grant. VCGI's partners in this grant are the VT Telecommunications Authority, UVM- Center for Rural Studies, VT Dept. of Public Service and VT E911. There is also a significant role for private sector contractors. The full grant covers broadband telecommunications, data collection, verification, and display for federal fiscal years 2010 thru 2014.

- VCGI awarded the wireless voice and data propagation mapping and verification contract to a team lead by Pericle Communications Inc.
- VCGI awarded the contract for the development of a BroadbandVT.org Website to a team lead by Applied Geographics.
- VCGI awarded the contract for marketing support for the project to Marketing Partners.
- The full deliveries of Broadband provider availability data, with limited verification, are provided to NTIA every six months during the period of the grant. Provider coverage data is being compiled and integrated by VCGI with support from DPS and the broadband providers.
- The latest data and information relating to the NTIA Broadband Mapping Grant is available at; <http://www.vcgi.org/projects/bmi/>

The initiatives that were funded thru the NTIA broadband mapping grant are as follows;

1. Data Collection, Integration, Verification, and Display – Vermont's Broadband Mapping Initiative (BMI) is a collaborative broadband data collection and verification effort involving partners from the public, private and academic sectors. The Team collects broadband availability data from the Providers and from public sources. Broadband availability data is verified by drive testing, field checking, public surveys (offline and online), and through interaction with the providers. Data and broadband related information is made available through the BroadbandVT.org website.
2. Broadband Capacity Building – The Vermont Telecommunications Authority created a position for a Director of Broadband Outreach. The Director acts as a liaison between broadband providers and government and the bodies they serve to instill the broadband vision, preserve its consistency and create an atmosphere of common mission. The liaison is a bridge between state offices and regional planning agencies to convey information in both directions about infrastructure, aggregation, adoption and policy efforts. The Director accelerates opportunities to achieve the outcomes set forth in the VT Telecommunications Plan.
3. Regional Broadband Planning - Vermont's participating Regional Planning Commissions (RPCs) developed a network of contacts in communities and local sectors to assess where promising opportunities are available to develop broadband adoption and/or access. Regional Technology Planning Teams were formed to plan and realize these opportunities. Through these partnerships, groups recognized new opportunities to access various technical assistance

programs available for others. The Regional Technology Plan offered the State and other groups a plan for rolling out broadband technologies at the local and regional levels.

The VT Broadband Mapping Team continues to maintain the BroadbandVT.org ([www.broadbandvt.org](http://www.broadbandvt.org)) website. The contract is now in the final year of the grant award. While there are still issues that need attention for every delivery the processes in place have stabilized. Project planning continues and based upon decisions about new directions in outreach, the agreement with Marketing Partners was changed to conclude on Dec. 31, 2013.

The project completed a statewide drive test of fixed and mobile wireless coverage performed by Pericle in the Fall of 2013. Pericle collected ~2.5M data points on the state's roads in an effort to provide technical data for every test connection. This is the last statewide drive test performed by the state broadband mapping team. Fixed wireless coverage is also being modeled for the state based upon the transceiver locations as submitted by the providers. Connect VT and the Dept. of Public Service has hired Stone Environmental to create maps and statistics based upon the broadband grant provider coverage data to show current and proposed availability of broadband in the state.

***VCGI Network/System Administration***

The move from server infrastructure being housed on premise at VCGI to the virtualized environment at DII has proven successful. As with any major IT deployment of this nature it was not without bumps in the road. But those bumps were normalized by the efficiencies and cost savings that have been realized from the move.

VCGI has successfully integrated all of our outward facing servers into the virtualized environment and maintains communication with DII through their Footprints ticketing system for maintenance and critical issues. Due to network limitations it was necessary to maintain one private server for use as a file server here on premise. It too has proven successful as increasingly larger files are necessary for processing and with our involvement in data rich projects our data requirements are continually increasing. The server is backed up with an automated tape library system for archive and recovery purposes.

**Ivan Brown, Database Administrator**

***GIS Data Updates***

VCGI posted many new and updated data layers which were provided by partner organizations (typically state agencies). We thank our state agency partners for their contributions. The following table lists data layers that were posted during 2013.

Layer Name	Description	Post Date
BasemapOther_OSTREETMAP	Open Street Map basemap data - Vermont (external link)	9/11/2013
BasemapScanmaps_TOPO24K	USGS Topographic Maps (1:24,000 - New US Topos)	2/28/2013
BoundaryOther_ANRADMIN	ANR Administrative Boundaries	4/29/2013
CadastralParcels_VTPARCELS	VT Parcel data provided by towns and RPCs	12/2/2013
EcologicOther_BIOFINDER	Tiered Contribution to Biodiversity layer	1/31/2013
EcologicOther_RTENATCOM	Rare, Threatened and Endangered Species & Significant Comm.	4/29/2013
EcologicOther_UNCOMSPOF	Uncommon Species and Other Features	4/29/2013
ElevationDEM_DEM1p4m	1.4 meter Digital Elevation Model (DEM),	11/21/2013

Layer Name	Description	Post Date
	LiDAR-derived	
ElevationOther_DSM1p4m	1.4 meter Digital Surface Model (DSM), LiDAR-derived	11/21/2013
EmergencyE911_ALPINELIFTS	E911 alpine ski lifts data layer	7/24/2013
EmergencyE911_DW	Driveways captured for E911 use	7/24/2013
EmergencyE911_ESA	E911 Emergency Service Agency Locations	7/24/2013
EmergencyE911_ESITE	E911 Site locations (buildings, hydrants, public phones, ..)	7/24/2013
EmergencyE911_ESZ	E911 Emergency Service Zone data layer	7/24/2013
EmergencyE911_FOOTPRINTS	E911 building footprints layer (limited set of buildings)	7/24/2013
EmergencyE911_GDBE911	All E911 data layers in File Geodatabase format (v10.1)	7/24/2013
EmergencyE911_HYDRANTS	E911 Fire hydrants data layer	7/24/2013
EmergencyE911_JBOUND	E911 town boundaries data layer	7/24/2013
EmergencyE911_LANDMARKS	Landmarks captured for E911 use	7/24/2013
EmergencyE911_LKUPTABLES	E911 lookup tables - tabular	7/24/2013
EmergencyE911_RDS	E911 Road centerlines from 1:5000 orthophotos and GPS	7/24/2013
EmergencyE911_SHEETS	E911 Atlas Map Sheets Boundaries	7/24/2013
EmergencyE911_TRAILS	E911 trails data layer	7/24/2013
EnvironOther_SOLAR	Potential Solar PV, SHW and Ground Mount resources	3/22/2013
TourismTrails_VASTINTRSEC	Intersection points along VAST Trail Network (for GPS use)	1/4/2013
TransRoad_PAVCON2012	Pavement condition data - 2012	11/21/2013
TransRoad_RDS	VT Master Road Centerline Dataset	10/28/2013
TransRoad_RDSMAJ1	Interstate, US, State, and Class 1 (TransRoad_RDS)	10/28/2013
TransRoad_RDSMAJ2	Interstate, US, State, and Class 1 & 2 (TransRoad_RDS)	10/28/2013
TransStats_AADT2012	Average Annual Daily Traffic: 2012 - all routes	11/21/2013
TransStats_HCL20062010	High Crash Locations: 2006 - 2010	11/21/2013
UtilityTelecom_EXCHANGE	VT Telephone Exchange boundaries	5/22/2013
UtilityTelecom_VTBB201006	Broadband Data for BroadbandVT.org (6/30/2010)	7/1/2013
UtilityTelecom_VTBB201012	Broadband Data for BroadbandVT.org (12/31/2010)	7/1/2013
UtilityTelecom_VTBB201106	Broadband Data for BroadbandVT.org (6/30/2011)	7/1/2013
UtilityTelecom_VTBB201112	Broadband Data for BroadbandVT.org (12/31/2011)	7/1/2013
UtilityTelecom_VTBB201212	Broadband Data for BroadbandVT.org (12/31/2012)	10/31/2013

Layer Name	Description	Post Date
UtilityTelecom_VTBB201306	Broadband Data for BroadbandVT.org (06/30/2013)	12/2/2013
WaterHydro_VHD	Vermont Hydrography Dataset - High Resolution NHD	7/23/2013

***Vermont Agency of Agriculture, Food, and Markets (VAAFMM)***

VCGI provided the Vermont Agency of Agriculture, Food, and Markets (VAAFMM) with a test environment that allowed VAAFMM to test GIS workflows within an enterprise-caliber GIS database. The testing demonstrated the viability of VAAFMM storing and editing data within an enterprise GIS database that is hosted by VCGI. VAAFMM then entered into a service level agreement with VCGI by which VCGI will host enterprise GIS databases and web services for VAAFMM as needed.

***Vermont Division of Emergency Management and Homeland Security (DEMHS)***

VCGI continues to have a critical role in the use of GIS technology within the Vermont Division of Emergency Management and Homeland Security (DEMHS). DEMHS relies on VCGI for provision of GIS support. VCGI participates in emergency management exercises and serves DEMHS during events.

VCGI participated in a series of Vermont Yankee exercises, which included a full-scale exercise on May 8 and a graded full-scale exercise on June 5. During the Spring, VCGI collaborated with the Vermont Department of Health (VDH), the regional planning commissions, and DEMHS for improving the state’s plume modeling workflow. The improved plume modeling workflow fostered increased efficiency and organization in the dissemination and usage of digital plume models and established standards for naming, storing, and sharing all types of GIS datasets. The improvement to GIS data organization and the plume modeling workflow fostered high-quality informative GIS products for support of state emergency operations center (SEOC) functions and successful Vermont Yankee exercises.

VCGI, with input from SEOC partner organizations, released the first edition of an SEOC-GIS manual on April 30. The manual provides critical information to SEOC staff which are serving a GIS role. It includes file naming standards, file storage standards, cartographic standards, spatial reference guidelines, workflows, procedures (how-to’s), information on accessing data resources, and contact information. The SEOC-GIS manual is a living document; VCGI will lead the process of periodically revising the manual in accordance with changes in the SEOC environment and the evolution of GIS technology.

During late June and early July, a blocking weather pattern caused frequent rain, violent thunderstorms, and flash floods in Vermont. VCGI, along with staff from the Lamoille County Planning Commission, staffed the GIS role in an SEOC activation on June 28 as a swath of heavy rain moved through the northeastern United States. VCGI continued to provide GIS support to the management of the event by producing a map on July 8 which depicted the progression of damage over time.

During late December, a major ice storm occurred in portions of Vermont, causing another activation of the SEOC. VCGI, along with staff from the Northwest Regional Planning Commission and the Central Vermont Regional Planning Commission, staffed the GIS role in the SEOC. GIS technology was utilized to support situational awareness and a common operating picture as the event evolved.

***Vermont Local Road Information (VLRI)***

VCGI continues to lead the development of an information solution for easy and efficient updating, monitoring, and disseminating hazard-related closure statuses of local roads (roads that are not maintained by VTrans). The information solution is named “VLRI” (Vermont Local Road

Information). The VLRI solution is composed of a database, a map-based data-entry interface in which staff of regional planning commissions and state organizations can update closure statuses of local roads, and a data feed (web service) for disseminating VLRI data to other systems and clients. The VLRI solution is on track for implementation during the first quarter of 2014.

## II. VCGI Outreach Activities

### Leslie Pelch, Outreach Coordinator/Web Content Manager

**VCGI has a Facebook Page:** 188 people “like” VCGI on Facebook (up 54 from last year). We post information about events, data, and resources. Search for Vermont Center for Geographic Information while in Facebook to find the site.

**VCGI has a Blog:** 48 (up 4 from last year) active subscribers receive emails letting them know when something new is posted at this web page. We post articles about events, data, links to resources and interesting information.

<http://vcgiblog.wordpress.com/>



**VCGI continues to have an active Email Listserv:** The listserv is another venue for VCGI to provide information about data and events, but also provides a forum for 694 subscribers (up 40 from last year) to post technical questions and get quick answers.

**VCGI has a Twitter Account:** We have 116 followers and a Klout of 33. VCGI tweets and retweets messages relevant to mapping and GIS in VT and beyond. @VCGI

**VCGI offers Webinars:** VCGI offered 6 webinars during the fall of 2013 and plans to offer at least 6 more in early 2014. Around 160 people participated in webinars during the fall. Presenters include VCGI staff, private sector consultants, academic staff, and state employees. Participants include people from both the public and private sectors. VCGI has also begun providing the summer Intro to GIS training that we offer as a webinar (in addition to the live training). The webinars are free to attend and are recorded and posted at our web site.

**VCGI partnered with VT Technical College to offer our own Introduction to GIS/GPS training as well as Introduction to ArcGIS 10:** The trainings were offered at the VTC campuses in Williston and Randolph. 27 people participated in these trainings to learn how to use free GIS software and a handheld GPS unit and/or ArcGIS.



**VCGI migrated to a new website:** VCGI now uses the State of Vermont Content Management System (CMS). All content from the old website was migrated over to the new website and the Outreach Coordinator/Web Content Manager has continued to update, maintain and improve the website throughout the year. The new URL is [vcgi.vermont.gov](http://vcgi.vermont.gov)

#### *Other Events and Activities*

In addition to training and online outreach, VCGI's Outreach Coordinator organizes and participates in events and activities around the state with a variety of different interest groups.

### Events and Activities VCGI Organized in 2013:

- January - March - Webinars
- April – Legislative Display on GIS/Mapping in VT in the Card Room
- April - Ignite Spatial Vermont/NH evening reception in partnership with New England URISA - a professional networking event featuring lightning presentations.
- May – VCGI Roundtable Conference in West Lebanon, NH, various GIS topics
- July/August – Introduction to GIS/GPS 2-day trainings in 2 locations
- July/August - Introduction to ArcGIS 3-day trainings in 2 locations
- September – Organized and hosted VT Open Data Summit
- November/December – Webinars

### Events and Activities in which VCGI Participated in 2013:

- February – presented at Stafford Technical Center (Rutland) Field Geology class
- April – Town Officer’s Education Conferences - 3 locations around the state
- June – presented GPS workshop at “Becoming an Outdoor Family” weekend in Groton State Forest
- June – Presented ArcGIS Online workshop for Northeast/Atlantic Chapter of the Society of Environmental Toxicology and Chemistry
- June – Attended Code for BTV event to make connection with coders community
- September – Staffed booth at VT League of Cities and Towns Town Fair Annual Meeting
- September – Presented on free mapping resources at VT Emergency Preparedness Conference
- September – Staffed booth at VT Recreation and Parks Conference
- October - Staffed booth at Tech Jam 2013
- December – Staffed booth at VT Alliance for the Social Studies Conference
- December – presented at VT Society of Land Surveyors Roundtables Conference
- Various dates – VCGI visited or supported K-12 schools 4 times this year with maps and GPS activities



### Coordination/Strategic Activities in 2013:

- Coordinated multiple meetings to discuss creation and population of Historic Aerial Imagery Index. VTTrans has started populating the index database.
- Coordinated multiple meetings to discuss future maintenance of Conserved Lands Database. Created new attribute schema with primary data creators/partners. VCGI will take on compilation of data annually.
- Helped to coordinate meetings to discuss statewide parcel data creation/improvement. Led to creation of EGC Parcel Data Workgroup which will propose a long-term parcel improvement and maintenance program for the state in 2014.
- Received grant from Northern Borders Regional Commission to create/improve parcel data for selected towns in the 6 northern counties in partnership with 3 northern RPCs.
- Participated in VT Geographic Alliance Strategic Planning Committee Meetings throughout year
- Participated in VT Society of Land Surveyors Program Committee Meetings throughout year
- Participated in Discussions with VGA and Dept. of Education re: ESRI K-12 Statewide License (still in process)

### III. VCGI Business Review

#### ***Audit***

Johnson Lambert LLP performed the yearly independent audit of VCGI's financial information. No material weaknesses or significant deficiencies were found. A full copy of the entire audit report including the Financial Statements and Supplementary Information, Management Letter and Compliance Reports is available from VCGI; contact David Brotzman, Executive Director.

#### ***Board of Directors***

- Jarlath O'Neil-Dunne was appointed to a seat on the VCGI Board of Directors to represent Higher Education, UVM Spatial Analysis Lab.
- Scott Roper Dunne was appointed to a seat on the VCGI Board of Directors to represent Higher Education, Castleton State College.

## II. VGIS – 2013 Active Geospatial Data Activities

VCGI’s 2014 Annual Report provides the Governor, the Vermont General Assembly, and our citizens with information about Vermont’s steady progress in building a high quality Vermont Spatial Data Infrastructure. This section of the Annual Report provides a status of several of the most active or most demanded statewide data acquisition efforts during 2013.

### a. Vermont Imagery Program

The statewide orthophoto imagery is made available free to the RPCs, and Towns in uncompressed format. The public has access to the same data in compressed format through VCGI’s free data download capability and anyone may purchase the data in uncompressed format on a hard drive from VCGI.



Color and infrared orthoimagery was successfully acquired in the Spring of 2013 over Chittenden, Grand Isle, Lamoille, Franklin and Washington county areas. The yearly statewide 50 cm. data collection is completed and should be available for distribution in the first two weeks of 2014.

This year VCGI had an agreement with Chittenden County (through Chittenden County Regional Planning Commission) and Dept of Homeland Security (through USGS) to perform “buy-up” acquisitions over the Chittenden and Barre-Montpelier areas in the spring of 2013. Chittenden was collected at 15 cm. and 20 cm. (depending upon terrain) Ground Sample Distance (GSD) and Barre-Montpelier was collected at 30 cm. GSD. A “buy up” acquisition is when an agency, town or RPC provides funding for all of the costs for a high resolution orthophotography acquisition over a smaller area within the states scheduled collection area. By scheduling both acquisitions over the same area and at the same time there is a cost savings to the “buy up” effort. The ability of towns or state agencies to “buy up” is defined in the state’s orthophoto acquisition contract.

Both the Barre-Montpelier 30cm data and the Chittenden County 15cm and 20cm GSD data are completed and available for distribution.

Planning for the Spring 2014 acquisition in the NW section of the state has already started. There are no “Buy-Up” acquisitions planned in that area.

The matrix below shows the vintages of the statewide orthophotos acquisition areas by county. However, the production area rarely aligns with exact county boundaries. The names generally designate a general region and not a complete county coverage. All counties are completely covered by the end of the five year acquisition period.

County	Vintage #1	Vintage #2	Vintage #3	Vintage #4	Vintage #5	Latest Update
Addison	1978	1995	2006	2012		Completed
Bennington	1974	1992	2000	2010	2015	Scheduled
Caledonia	1982	1999	2006	2012		Completed
Chittenden	1978	1988	1999	2007	2013	Completed
Essex	1982	1999	2009	2014		Scheduled
Franklin	1978	1995	2008	2013		Completed
Grand Isle	1978	1995	2008	2013		Completed
Lamoille	1979	1996	2007	2013		Completed
Orange	1979	1998	2006	2014		Scheduled
Orleans	1982	1999	2008	2014		Scheduled
Rutland	1975	1994	2006	2011		Completed

Washington	1979	1996	2006	2012		Completed
Windham	1974	1989	2000	2010	2015	Scheduled
Windsor	1975	1994	2006	2011		Completed

VCGI manages the VT statewide orthoimagery program, which includes acquisition of the imagery, quality control and dissemination of the imagery. The RPC's have volunteered to work closely with their member towns to provide the orthophotography in hard copy, as per both statute and need, while the State Archivist provides access to all historical hard copy orthophotography.

**b. Cadastral or Parcel Data – with help from Leslie Pelch, VCGI**

In 1988, Vermont's five-year GIS Plan identified digital municipal parcel boundaries as a fundamental need to support town planning and development. Since that time dozens of towns have invested in high quality parcel maps over the years, and state funding (1989-91) supported conversion of existing paper property maps into digital data. Digital parcel data help municipal officials to perform a more accurate property tax assessment. Towns link the parcel data to their Grand Lists and then are able to have detailed tax information. Municipal tax officials, realtors, planners, and property developers use this data to show taxpayers how proposed development or changes in municipal services and regulations will affect them. In many towns, parcel data helps to assure fair tax distribution, plan services, provide public notices, and many other municipal functions.



VCGI, in partnership with the northern border regional planning commissions, was successful in obtaining a grant from the Northern Border Region Commission to develop digital parcel data. This project proposes to increase the parcel data infrastructure in the northern border region in four ways:

1. Provide educational opportunities to all towns in the region so that they can learn about the importance of parcel data and best practices for hiring a contractor to create or update parcel data so that it meets or exceeds the recently created VT GIS Parcel Data Standard.
2. Provide funds to towns that apply and are chosen to receive them in order to mitigate the cost of the initial creation of parcel data or in order to bring their existing data up to the level of the state standard. These funds would be paid to mapping consultants.
3. Provide direct technical support to towns that are chosen to receive funds to guide them through the process of developing specifications, drafting a request for proposals (RFP), reviewing proposals, and drafting a contract.
4. Provide direct technical support to towns that are chosen to receive funds to help them develop a sustainable maintenance plan for their parcel data, whether on an annual or less frequent basis.

This project can serve as a prototype for a future statewide digital parcel data project. This project will also support the ongoing **sustainability** of the parcel data created, because the participating towns will increase their internal capacity to deal with parcel updates, and will develop plans for how those updates will be funded.

**Partners:**

Each Regional Planning Commission has at least one staff member who serves as a GIS specialist/planner.

This mapping expert serves as technical support to the municipalities who participate in this project.

The Outreach Coordinator at the VT Center for Geographic Information serves as project manager and education lead. The RPC GIS Specialists and VCGI's Outreach Coordinator will also work together as a steering committee.

- Vermont Center for Geographic Information (VCGI)
- Northwest Regional Planning Commission (NRPC)

- Northeast Vermont Development Association (NVDA)
- Lamoille County Planning Commission (LCPC)

Total proposed value of the grant is \$338,000 with half contributed from participating towns and half from the NBRC. The final amount will depend upon the ability of towns in the northern border region to participate. The grant will run over a two year period with over 97% of the funding to be provided to private sector businesses through an RFP process managed by each town with VCGI and RPC support.

There is a growing interest in having a statewide parcel database. Recently, a group of several agencies interested in statewide parcel data have been meeting to coordinate a statewide digital parcel data effort. VTrans has discussed possible funding to support the effort. ACCD, ANR, Dept. of Taxes, RPCs and several other agencies have voiced strong support to such an effort. There are a lot of financial, operational and political considerations that need to be considered. Clear expectations need to be developed as well as determining the role of each data user and contributor organization. The current plan is to begin the discussion about any statewide digital parcel effort in the FY2015 legislature. With the involvement of several agencies there is a real chance there will be significant movement toward creating the first iteration of a statewide digital parcel dataset in Vermont.

**c. High Resolution Elevation Data – with help from Mike Brouillette, VCGI**

Elevation data in Vermont consists of Digital Elevation model (DEM) data and land contour information. DEM data provided by the USGS has been distributed by VCGI for years. Contours were generated from the DEM and these can be effectively used to show general topography. The recent flooding and destruction from Tropical Storm Irene emphasized the impact of having an inadequate statewide digital elevation model in Vermont. Following TS Irene FEMA recommended Vermont to acquire a high-resolution elevation model in order to support future hazard mitigation efforts. The emergency and public safety community and a broad range of other critical state interests have identified significant needs for a statewide high resolution DEM.

The cost to acquire “no data” areas, store and distribute LiDAR and derivative products for the state according to the specifications that would be most useful to the community is estimated to be approximately \$2.1 million under current conditions. A multi-year phased approach affords contributing entities the ability to budget in advance and ensures a broader coalition. Coverage priorities were assigned by weighting the need and size of population served for lake shore protection, flood plain mapping and emergency management and public safety efforts. Other factors may change the prioritization of collection area needs.

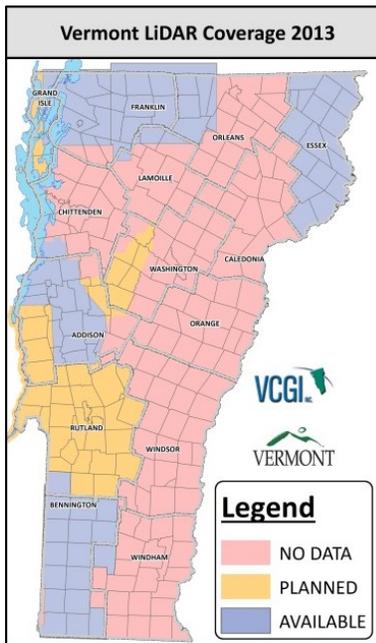
The cost of statewide LiDAR is primarily dependent upon the product specifications (i.e. accuracy, post spacing), the types of derivative products that are requested (i.e. contours, hydro-enforced DEM), and the size of the project. Cost and accuracy are further determined in Vermont by the terrain and tree cover of the collection area. Utilizing the NDEP “QL2” product specification on all future projects will ensure alignment and consistency with current projects at a horizontal point spacing of 0.7m and vertical accuracy of 9.25cm.

The “raw” LiDAR elevation point data consists of millions (possibly billions) of points and is of relatively limited use to the community without the derivative products that are created from that data. The vast majority of agencies, towns, organizations and businesses that need LiDAR data require the derivative products to do the work they want to do.

Historically, there have been partnerships of funding organizations that have come together to provide the necessary funding for regional LiDAR acquisition projects in the state. Past funding sources for regional LiDAR projects have been FEMA, USGS, USDA, VTrans, ANR, LCBP, CCRPC and MPO, This model of partnership funding will almost certainly continue. However, none of the partners listed has the funding to

be the primary contributor to a project of this size. If a primary funding contributor can be established, history has shown other partners will come forward to provide additional funding.

Existing LiDAR coverage exists within Vermont in Addison, Bennington, Essex and Rutland Counties, most of the Missisquoi subbasin and all of the Little and Mad River watersheds. Final project coverage area plans would ideally be delineated by watershed with consideration given to both stakeholder priorities and the most effective field data collection approach.



Elevation data in Vermont now includes Digital Surface Model (DSM) added to Digital Elevation model (DEM) and land contour information. This new data product is in part the result of the Vermont LiDAR Initiative effort formalized in 2013 by VCGI and its EGC partners. While statewide coverage of high accuracy LiDAR data is the ultimate goal, DEM and DSM derived data is now available for parts of the state with derivatives (2' contours) and coverage being developed. These efforts will in turn, facilitate the environmental, public safety, regional planning and other efforts in Vermont that require more accurate information to support both cartographic and analytical purposes.

**Status:** 1.4 meter resolution LiDAR based data is now available on the VGIS for the Missisquoi subbasin (most of Franklin County) and the Hudson-Hoosic subbasin (most of Bennington County) with both Essex and much of Addison Counties close behind. Even higher accuracy, 0.7 meter resolution data, will be captured in spring 2014 for Rutland County, the rest of Grand Isle County, the Mad River Valley and the Waterbury floodplain with results available by fall 2014. The only statewide elevation data remains the USGS 10 meter elevation data and its 20' contour derivative, integrated in 2012.

VCGI provides the following elevations data products to the public:

- Vermont LiDAR Initiative
  - ElevationDEM\_DEM1p4m - 1.4 meter DEM
  - ElevationOther\_DSM1p4m - 1.4 meter DSM
  - ElevationContours\_CN2T - 2 ft contours
  - ALL-LDR Product - All available LiDAR
- USGS DEM
  - ElevationDEM\_DEM10m - 10 meter DEM
  - ElevationContours\_CN20T - 20ft contours

**d. Critical Facilities Data – with help from Ivan Brown, VCGI**

VCGI is collaborating with DEMHS, the regional planning commissions, the Vermont Enhanced 9-1-1 Board (E911), and VDH to design and implement a modern data collection system for efficient and secure collection of high quality critical facility data into a centralized GIS database. The database is needed for efficient dissemination of current critical facility data to consumers of that data through appropriate filters (confidential vs. public) and data formats. VCGI is providing a leadership role to this effort. DEMHS is analyzing their business needs to provide a taxonomy to which the GIS data model will conform. The regional planning commissions are responsible for updating the critical facilities database. E911 is the provider of address point data to which critical facility site records will be related. VDH will maintain certain types of critical facility data in the sector of health and medical services.

Currently, VCGI is leading the critical facility data partners through the process of migrating existing critical facility data to a suitable new data model. DEMHS is defining critical facility sectors to provide a taxonomy which will guide the design of the new data model. During late Summer, VCGI established a web mapping application that allowed the regional planning commissions to link the critical facility records on hand to E911's address points; Aligning critical facility information to address points is a first step toward achieving the new data model. During 2014, the critical facility partners will complete the migration of critical facility data to a new data model per the taxonomy to be provided by DEMHS. Over the long term, the critical facilities database will continue to be maintained by the regional planning commissions and VDH through a modern web mapping application. A well-organized and centralized critical facilities database will be a valuable resource to the process of risk assessment, sector-specific planning, and dynamic hazard analysis.

***e. Conserved Lands Database – with help from Leslie Pelch, VCGI***

Representatives from the VT Land Trust, The Nature Conservancy, Green Mountain National Forest, VHCB, VT Agency of Natural Resources, VCGI and the UVM Spatial Analysis Lab have all been engaged in an effort to update the attribute schema of the Conserved Lands database in preparation for development of a procedure (hosted by VCGI) to update the data itself on an annual basis. The group has almost finished updating the data to current standards with clarification of the attribute values. When completed, VCGI staff will design a data update procedure for approval by the group. The data creators listed above have agreed to provide the data in a format that meets the schema they have all worked on developing, so that the actual compilation will be as easy as possible for VCGI.

The value in this effort is that all of the data creators benefit from the data provided by the others and the organizations wish to avoid data distribution. As a result, it is worth their while to contribute their section of the data to VCGI to distribute. Other users of the data include land managers around the state and land use planners.

### **III. VCGI's Vision, Mission Statement and Strategic Plan**

#### **a. Organization**

In January 1992, Governor Howard Dean, M.D. issued an executive order establishing VCGI as a non-profit corporation under the authority of a Board of Directors. The Board includes twelve directors appointed for two-year terms to represent state agencies, regional planning commissions, local government, higher education, private sector and both chambers of the Vermont General Assembly. The Board has the responsibility for general management of and authority over the property, business and affairs of the center.

VCGI is located in Waterbury, VT. It is currently staffed by six full-time employees, a part-time GIS Technician and an independent contractor that performs the duties of business manager.

#### **b. Vision**

VCGI is the nexus of GIS in the VT GIS Community.

#### **c. Mission Statement**

Vermont Center for Geographic Information, Inc. (VCGI) will deliver high quality geospatial data, standards, services, solutions and information to our customers and stakeholders using methods that are innovative, client-focused and consistent with our enabling legislation.

VCGI will provide strategic leadership and promote awareness and open communication in support of the VT GIS community.

VCGI will establish the infrastructure necessary to support financially responsible business activities and challenge all employees in an engaging and supportive environment.

#### **d. Strategic Plan 2012 -2015**

#### **Strategic Objectives**

##### **Objective 1**

1.0 VCGI is the recognized clearinghouse for GIS data in the state.

1.1. Activity - Improve data warehouse architecture.

Metric - Monitor percent complete and survey feedback.

1.2. Activity - Improve marketing of our capabilities.

Metric - Monitor web stats.

1.3. Activity - Make it easier to use the warehouse for publishers and consumers.

Metric - Monitor web stats of consumers.

Metric - Track submissions and updates of publishers.

1.4 Activity - Assist consumers and publishers using the clearinghouse.

Metric - Use of customer surveys.

1.5 Activity - Improve turnaround time for release of new updated data and services.

Metric - Monitor and measure turnaround on data and services.

1.6 Activity - Become best and most useful data portal solution.

Metric - Monitor web stats.

Metric - Use of customer surveys.

- 1.7 Activity - Expand warehouse to include web service.  
Metric - Monitor percent complete.
- 1.8 Activity – Provide data and web service hosting options to EGC partners.  
Metric – Publish and maintain data and web service hosting offerings that are used by 1 or more EGC partners

## **Objective 2**

### 2.0 VCGI is the foundation of GIS activity in the state

- 2.1 Activity – Become a recognized GIS policy resource in the state.  
Metric - Increased involvement with legislative activities and administrative task forces and groups.
- 2.2 Activity – Provide primary support to EGC & Enterprise GIS initiatives  
Metric – Measure completion of tasks in the EGC strategic plan
- 2.3. Activity - Market VCGI role as state GIS Coordinator  
Metric - Monitoring level of involvement with legislature and administrative initiatives
- 2.4 Activity - Build & maintain relationships with GIS partners & identify important committees  
Metric – Increased involvement with GIS partners and important committees.
- 2.5 Activity - Advocate for geospatial leadership position w/CIO  
Metric - Established and recognized position created at the state level

## **Objective 3**

### 3.0 VCGI uses all avenues available to effectively communicate relevant geospatial information

- 3.1 Activity – Make outreach a shared responsibility  
Metric - Monitor contributions by staff members to outreach efforts.
- 3.2 Activity – Develop and implement an outreach and marketing plan  
Metric – Plan has been drafted, approved and implemented.  
Metric - Conduct comprehensive reevaluation of VCGI’s Outreach/feedback/solicitation efforts and report findings to group for action.
- 3.3. Activity - Make outreach a shared responsibility  
Metric - Monitor contributions by staff members to outreach efforts focused on GIS and IT trends..
- 3.4 Activity - Develop and implement an outreach and marketing plan  
Metric – Plan has been drafted, approved and implemented.
- 3.5 Activity - Improve marketing of VCGI capabilities and services to state government  
Metric – Develop a State Marketing Plan
- 3.6 Activity - Establish support mechanism(s), e.g., help desk.  
Metric - Help desk or other mechanism has been established and customers are aware of it.

#### **Objective 4**

4.0 VCGI has extensive and forward looking geospatial expertise

4.1 Activity – Employees devote time to learning more to keep our expertise current, e.g., training.  
Metric - Employees attend at least one training each year.

4.2 Activity – Cross Train Employees  
Metric – Primary and secondary POC for each technical role supported by sufficient skills to execute roll.

4.3. Activity - GISP certification for technical staff  
Metric - Technical staff maintain GISP certification

4.4 Activity - Maintain awareness of GIS and IT trends relevant to users  
Metric – Level of staff contribution to outreach efforts focused on GIS and IT trends.

4.5 Activity – Professional Involvement  
Metric - Track professional involvement by staff

#### **Objective 5**

5.0 We are proud to be part of this organization

5.1 Activity – Pursue team building opportunities  
Metric - One team building opportunity per year.

5.2 Activity – Customers are satisfied with products and services  
Metric – 50% or more of all feedback is at level “highly satisfied” or greater.

5.3. Activity - Motivated and engaged staff pursuing the organizational mission  
Metric - One or more innovative solutions per year  
Metric - Performance based compensation

5.4 Activity - Staff engaged in decision making  
Metric – Regular staff meetings  
Metric - One or more staff present at every board meeting

#### **Objective 6**

6.0 We anticipate the needs of our clients, transforming them into opportunities

6.1 Activity – National, regional and state community involvement  
Metric - Engaged in professional activities identified by GISP ongoing certification

6.2 Activity – Research and identify the needs of our customers  
Metric – Customer survey provides clearly identified needs  
Metric - One-on-one meetings with key constituents, e.g., EGC partners  
Metric - Outreach coordinator identifies needs at outreach events

6.3. Activity - Research and testing of new and/or promising solutions  
Metric - Quarterly internal presentations on new and promising solutions

6.4 Activity - Integrate emerging solutions with customer needs

Metric – Implement one or more new solutions per year

Metric – Each employee presents on one or more new solutions at staff over the course of a year.

6.5. Activity - Identify priorities for an annual Work Plan

Metric - Integrate one or more priorities into an annual Work Plan

**Objective 7**

7.0 Our clients are highly satisfied with our products and services.

7.1 Activity – Conduct exit interviews and/or satisfaction surveys with project clients

Metric - Receive greater than 50% “highly satisfied” response.

7.2 Activity – Continue outreach surveys (for issues “actionable” by VCGI)

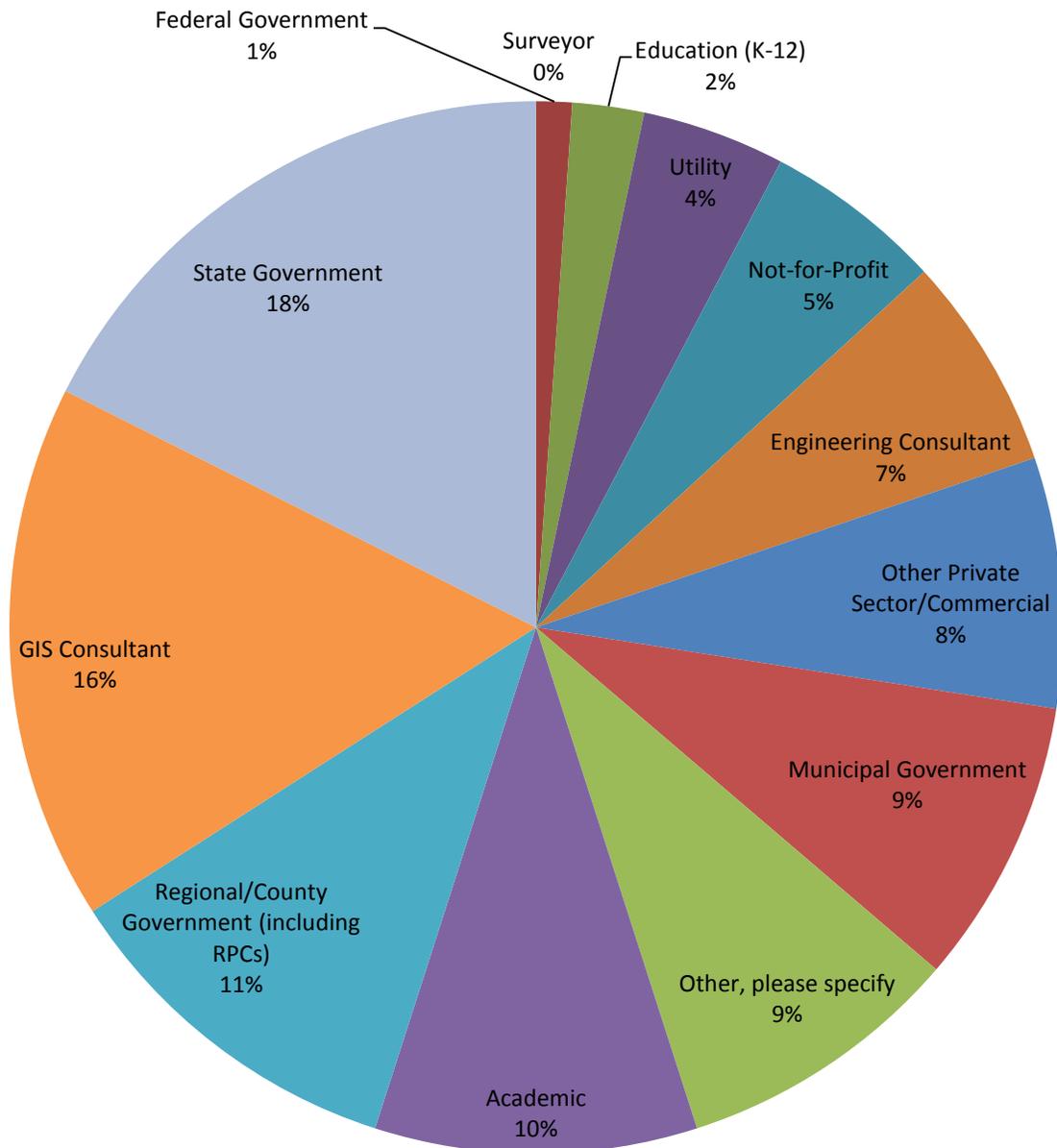
Metric – 50% or more of all feedback is of level “highly satisfied” or greater.

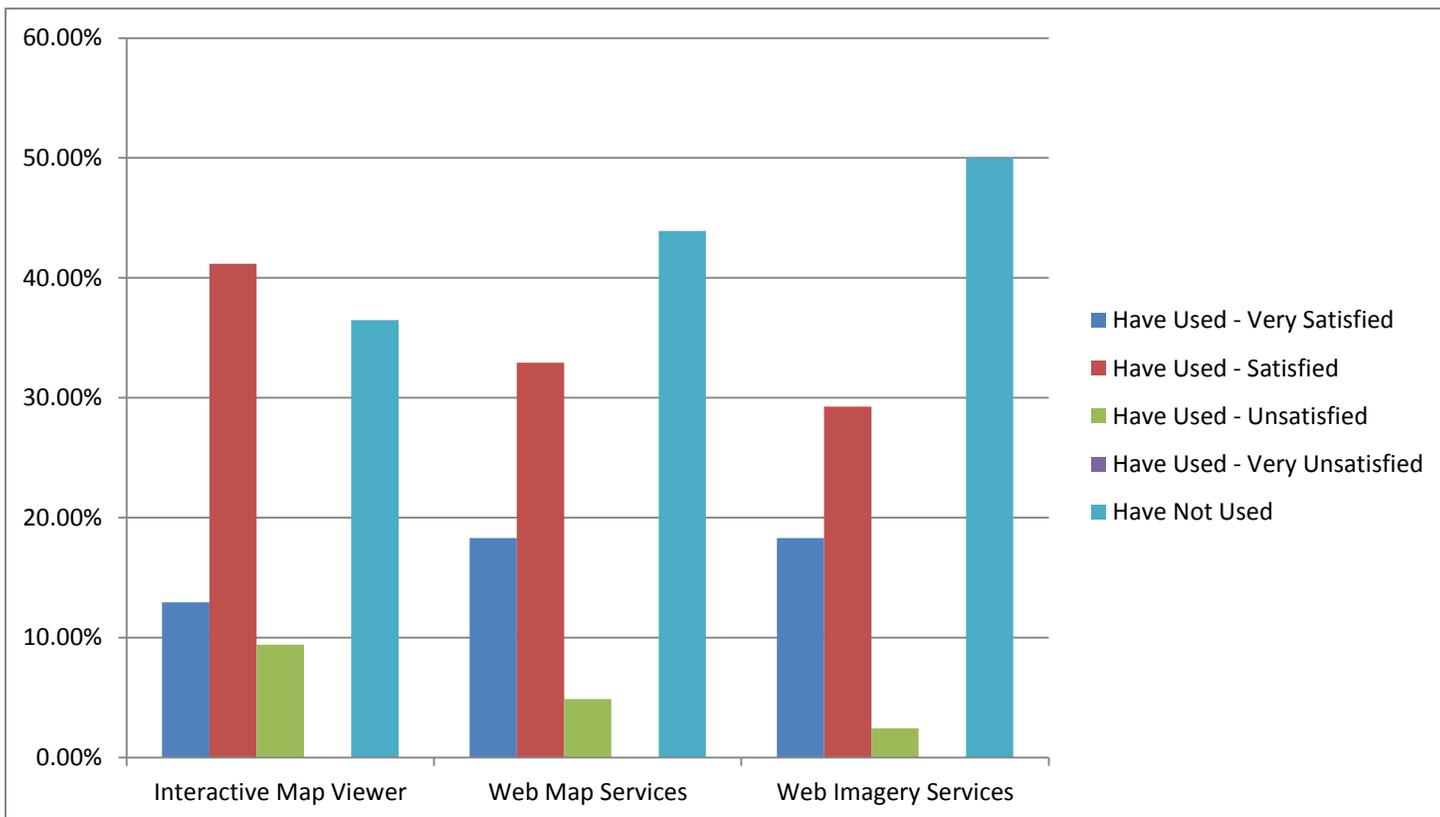
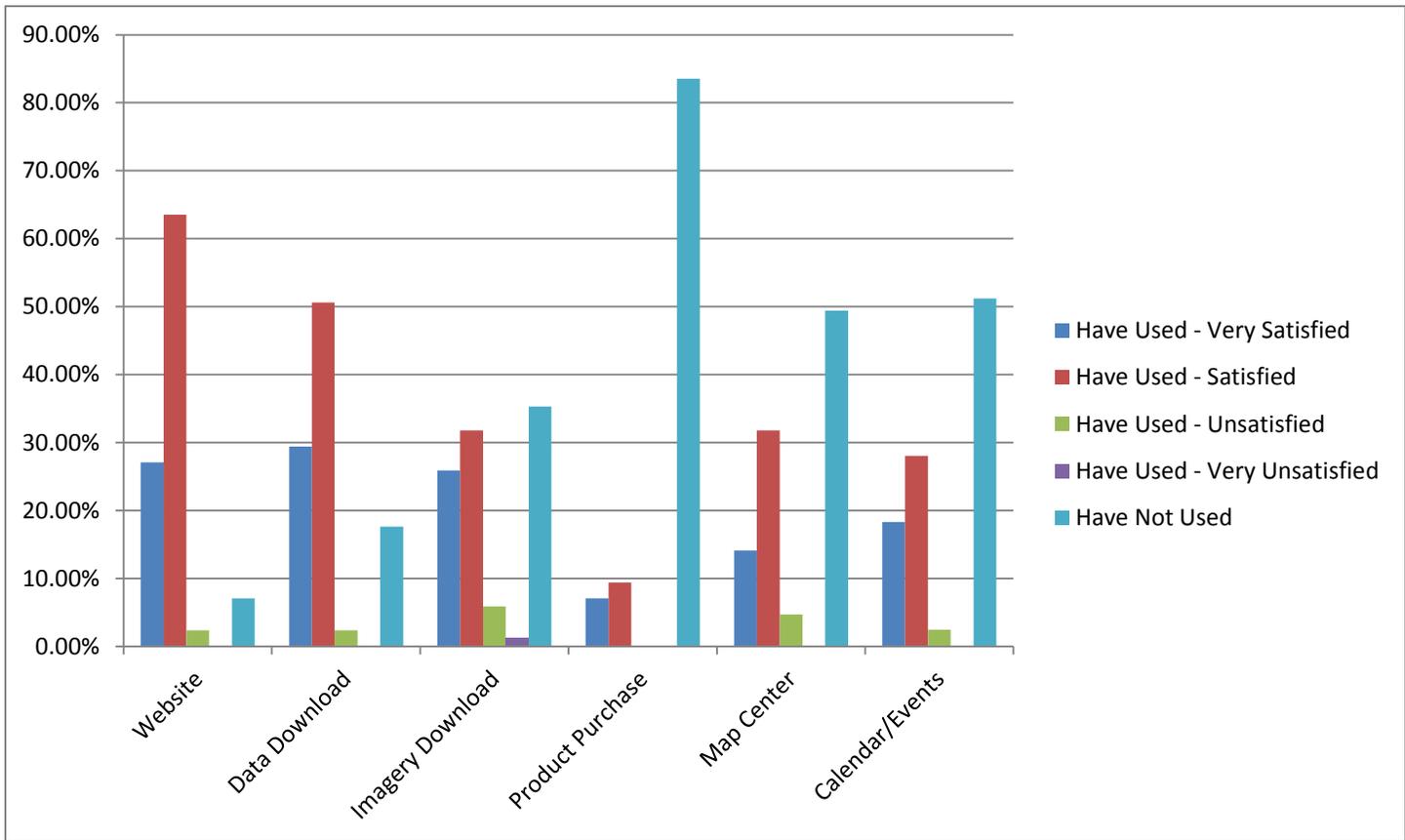
7.3. Activity - Integrate customer feedback into improving products and service(s)

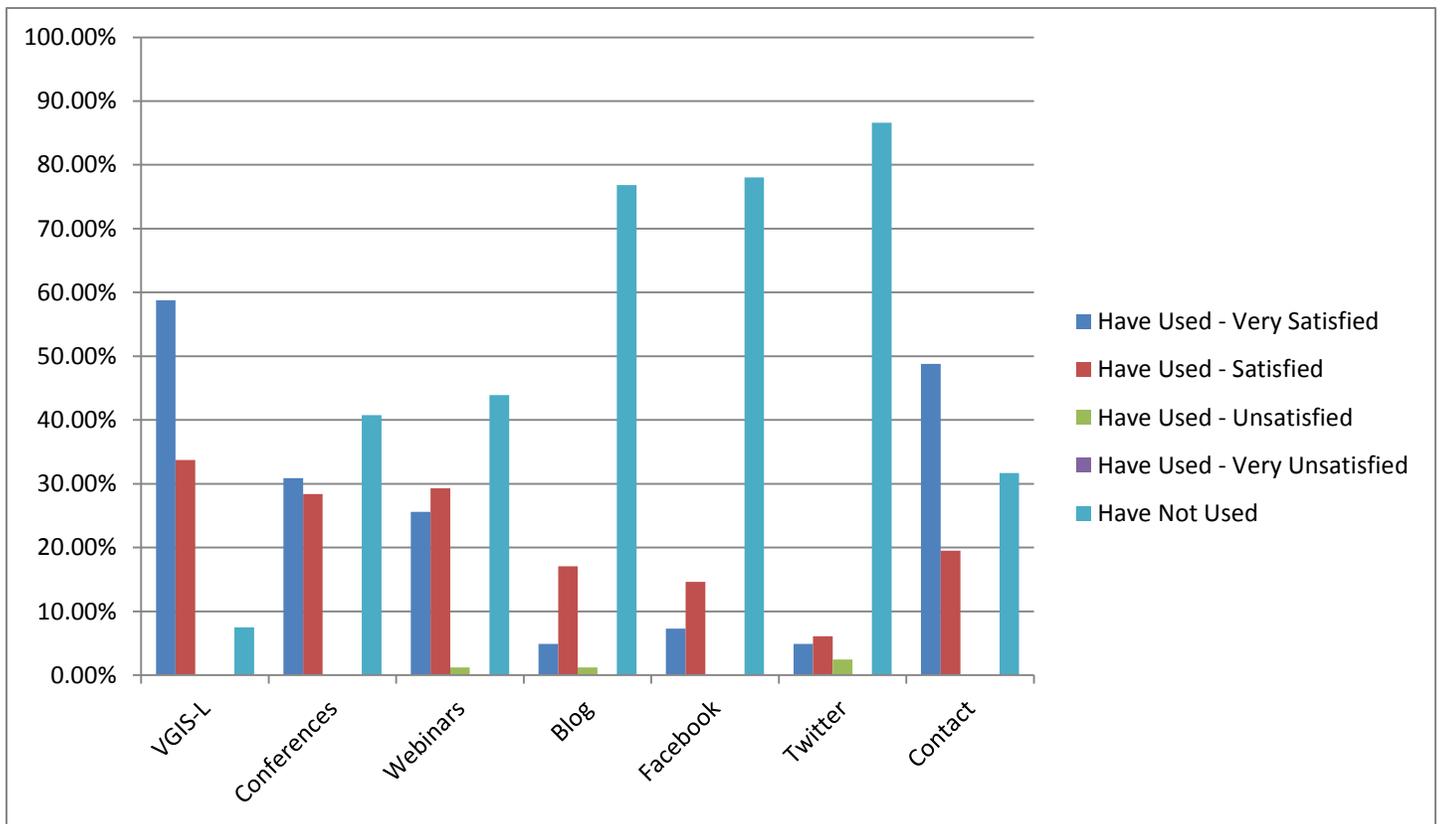
Metric - Document and track feedback and action.

## IV. VCGI's Biennial Customer Survey Results

Every two years, in accordance with our statutory requirements, VCGI takes a public poll of its user community in an effort to help determine customer satisfaction. VCGI uses this feedback to help inform our project planning efforts for the two years following the survey. During the summer and fall of 2013, VCGI made our survey available as a web-enabled form for the public to respond. We then sent out repeated notices through different means to the community for them to take advantage of this opportunity to provide feedback to us. This section contains an objective summary of the responses we received. The full record of the response from the public is available through Leslie Pelch at VCGI.







## Open-ended Questions & Responses – A Representative Sample

### What data layers or imagery products should VCGI develop or help to develop?

- LIDAR
- Statewide parcels
- Statewide parcel map
- High resolution contour data for areas where Lidar data are available.
- Town parcel maps. Some towns are not online at all and others are very outdated.
- Parcels and conserved lands
- Parcels
- Tilestache or tilestream services would be awesome for base layers. XYZ endpoints are much faster than WMS.
- Statewide parcels, Statewide lidar
- I know VCGI has remained out of parcel mapping, but it would be nice if there was a parcel layer.
- State wide parcel data....(i know that is to much to ask)
- Creating a combined roads centerline layer from the VTRANS and E911 layers would be helpful.

## **What do you think should be our top priority for the next couple of years (if different from what you indicated above)?**

- LIDAR, conferences and events
- Statewide parcels
- Providing data and data packages in geodatabase format. Coordinate with VT Geological Survey to ensure that all geologic GIS data available through VGS is also available through VCGI.
- I find the Open Data trend alarming and would prefer VCGI back away from it. VCGI already serves as a clearing house for data. The farther data goes from its original source, the more likely it is to be corrupted, accidentally or otherwise.
- Continue to work towards high quality statewide datasets.
- Collaboration, education, outreach. Helping [individual] users make use of the technology and data. Expand and try to get more people involved outside the VCGI.
- A high speed delivery system to all towns.
- Perhaps add a few more layers to the Vt. Interactive Base Map. I usually steer people to the Natural Resources Atlas, which has much more, but perhaps too much for the beginner.
- Developing statewide datasets where they are missing
- I think the top priority should be revising the data warehouse. As it stands now (theme search or keyword search) I have the hardest time locating the data I'm interested in.
- I find it very difficult to download imagery. there should be a tool allowing the user to select a town and get the imagery for a given town (such as MassGIS has).
- Test routinely to make sure the data download portion of your website is robust for users of various operating systems or browsers.
- Keep pushing open data & open GIS.

## **What products, services, or events would you like VCGI to provide/host?**

- Workshops showing what people are doing, like the Lebanon NH event in Spring 2013
- IGNITE
- Continue with the round tables. I think some sort of data hacks to get a certain large chunk of work done that benefits everyone. Taking parcels as an example, 20 people working on stitching together parcels would yield a dataset that everyone could use.
- Option to download data in file geodatabase format.
- ArcGIS, specifically ArcMap, courses for various applications and skill levels.
- Love the short webinars. Create some sandbox for small municipalities to toy with on-line parcel data.
- Arc mapping services that can be contracted for smaller towns who do not have staff
- I think working with the state and DII on the Open Data initiative is a great project for VCGI . . . especially because they've been doing Open Data for so long as it is.
- I really appreciate the Webinars as I can learn new things and feel connected without having to make time to leave the office.
- Please keep hosting the Roundtables.
- Make parcels official. Demographics.

## **What would you like VCGI's web site to do or provide – that it doesn't currently?**

- Allow publishers to upload their data.
- Tutorial/information on method(s) to download multiple files concurrently.

- Historic sites and districts
- Not much more for the website but perhaps start some more targeted services that could be wrapped into apps and the like.
- Preview all available layers fast
- Index of web/map services

### **How else can VCGI support you in your use of GIS?**

- Doing a very good job currently. Keep being proactive and ahead of the curve.
- VCGI should evangelize inside state government and help agencies and the like create realistic demands for the technology and data.
- Consult with us on how to set up our town systems
- Continuing to help support the agencies utilize GIS.
- Nothing-- you folks are great!
- You're doing fine!
- Satisfied with current services.

### **Do you have any additional comments or suggestions?**

- I primarily use ANR's GeoPoint site for data but everynow and again VCGI has something that I need that GeoPoint does not.
- I LOVE VCGI!
- IT IS A WONDERFUL SERVICE!!!!
- Do you still have the VHD layers by watershed? I couldn't find them when I last looked...
- VCGI Rocks!
- We need answers for small town not what bigger towns are doing unless those towns will contract for services to help us.
- As always, VCGI staff are great. Very helpful, and always responsive. Thank you for hosting Roundtables in West Lebanon, Fairlee, Randolph, etc. for those of us down south. I'm not on Facebook, but I looked at your page once or twice.
- As an employee of a regional planning agency in New York State's Capital District, I am a member/participant in GIS groups within NYS, Vermont and other parts of New England. I love the VCGI listserv!! Keep it up!
- I see QGIS on the calendar and I am very excited for it! Continue to support open source solutions!
- Test your website regularly with various operating systems and browsers to make sure that it is working well with all of them.

- **IV. Financial Overview**

Act 204 of 1994 (10 VSA Chapter 8) calls for the development of a comprehensive GIS strategy for Vermont, and established the Vermont Center for Geographic Information, Inc.

*§ 122. VERMONT CENTER FOR GEOGRAPHIC INFORMATION, INCORPORATED; ESTABLISHMENT*

*(a) The State of Vermont shall support a comprehensive strategy for the development and use of a geographic information system. . .*

*In order to develop and implement that strategy, and to ensure that all data gathered by state agencies that is relevant to the VGIS shall be in a form that is compatible with, useful to, and shared with that geographic information system, there is hereby established a nonprofit public corporation to be known as the Vermont center for geographic information, hereinafter called the center, as a body corporate and politic and a public instrumentality of the state.*

*§ 126. REPORTS AND AUDITS*

*On or before January 15 of each year, the center shall prepare and submit to the governor a three-year work plan which describes the goals, objectives and activities of the center and cooperating state agencies and other public and private organizations. The plan also should include estimated cost of each major activity of the center, and a report concerning data gathered, documents generated, and problems and opportunities for use of VGIS information.*

10 VSA 126 require that *“The books of account of the center shall be audited annually and a report filed with the secretary of administration not later than October first of each year.”*

A full set of the Financial Statements are available from VCGI, contact David Brotzman, Executive Director.

**VERMONT CENTER FOR GEOGRAPHIC INFORMATION, INC.**  
**STATEMENTS OF ACTIVITIES**  
**FOR THE YEARS ENDED JUNE 30, 2013 AND 2012**

<b>REVENUE</b>	2013	2012
State of Vermont grant	\$378,700	\$378,700
Project income	\$719,498	\$729,245
Imagery program income	\$5,085	\$1,110
Interest and miscellaneous income	\$7,748	\$17,765
Annual Conference income	-	\$4,200
Insurance recovery	-	\$32,337
<b>TOTAL REVENUE</b>	<b>\$1,111,031</b>	<b>\$1,163,357</b>
<b>DIRECT COSTS</b>		
Direct Labor	\$272,143	\$195,655
Payroll taxes and employee benefits	\$108,806	\$88,396
Subcontract costs	306,661	469,545
Costs of projects and reproductions	\$44,269	\$45,635
Cost of imagery program	\$3,014	\$1,793
Cost of outreach program	\$13,051	\$20,893
<b>TOTAL DIRECT COSTS</b>	<b>\$747,944</b>	<b>\$821,917</b>
<b>OPERATING EXPENSES</b>		
Indirect salaries and wages	\$110,203	\$158,880
Payroll taxes and employee benefits	\$45,476	\$70,231
Rent	\$30,789	\$30,184
Depreciation	\$16,308	\$9,695
Loss on disposal of fixed assets	\$2,913	\$13,621
Computer support and maintenance	\$14,799	\$20,289
Professional Fees	\$60,279	\$12,182
Travel and Training	\$8,566	\$8,471
Office Expense	\$13,970	\$14,318
Utility Expense	\$1,842	\$2,273
Insurance	\$3,945	\$3,953
Miscellaneous	\$1,306	\$1,019
Flood Recovery Expenses	-	\$7,115
Telephone Expense	\$3,485	\$3,227
<b>TOTAL OPERATING EXPENSES</b>	<b>\$313,881</b>	<b>\$355,458</b>
<b>TOTAL DIRECT &amp; OPERATING EXPENSES</b>	<b>\$1,061,825</b>	<b>\$1,177,375</b>
<b>CHANGE IN NET ASSETS</b>	<b>\$49,206</b>	<b>(\$14,018)</b>

Unaudited Financial Statements

**VERMONT CENTER FOR GEOGRAPHIC INFORMATION, INC.**  
**STATEMENTS OF FINANCIAL POSITION**  
**JUNE 30, 2013 AND 2012**

	ASSETS	2013	2012
<b>CURRENT ASSETS</b>			
Cash - undesignated		\$192,522	\$131,622
- capital reserve		\$30,000	\$30,000
Certificate of deposit		\$175,000	-
Accounts receivable		\$29,907	\$39,688
Unbilled receivable		\$15,157	\$50,559
Prepaid expenses		\$10,088	\$10,773
<b>TOTAL CURRENT ASSETS</b>		<b>\$452,674</b>	<b>\$262,642</b>
PROPERTY AND EQUIPMENT, NET		\$33,689	\$41,373
<b>TOTAL ASSETS</b>		<b>\$486,363</b>	<b>\$304,015</b>
	<b>LIABILITIES AND NET ASSETS</b>		
<b>CURRENT LIABILITIES</b>			
Accounts payable		\$89,088	\$1,023
Accrued expenses		\$17,987	\$51,990
Accrued wages		\$16,902	\$13,048
Accrued vacation		\$11,045	\$14,230
Funds held – VT Orthophoto Buy-Up Program		\$78,684	-
Deferred project income		-	\$273
<b>TOTAL CURRENT LIABILITIES</b>		<b>\$213,706</b>	<b>\$80,564</b>
<b>NET ASSETS</b>			
Unrestricted - Board designated for capital reserve		\$30,000	\$30,000
Unrestricted - Undesignated		\$242,657	\$193,451
<b>TOTAL NET ASSETS</b>		<b>\$272,657</b>	<b>\$223,451</b>
<b>TOTAL LIABILITIES AND NET ASSETS</b>		<b>\$486,363</b>	<b>\$304,015</b>

Unaudited Financial Statements

# VERMONT CENTER FOR GEOGRAPHIC INFORMATION, INC.

## BUDGETS FY 2014 AND Proposed FY 2015

	<b>FY14</b>	<b>FY15</b>
<b>INCOME</b>	<b><u>Budget</u></b>	<b><u>Budget (Proposed)</u></b>
State of VT Grant	\$378,700	\$378,700
Project Income	\$925,000	\$375,000
Imagery Income	\$ 2,500	\$ 2,500
Interest & Miscellaneous Income	\$ 1,100	-
Other Income	\$ 10,500	\$ 10,500
<b>TOTAL INCOME</b>	<b>\$1,317,800</b>	<b>\$766,700</b>
<b>DIRECT COSTS</b>		
Direct Labor	\$241,436	\$241,436
Payroll Taxes & Benefits	\$104,149	\$104,149
Project Costs	\$ 33,310	\$ 33,310
Imagery Program Costs	\$ 12,500	\$ 12,500
General Direct Costs	\$ 17,500	\$ 17,500
Outreach Costs	\$ 14,700	\$ 14,700
Subcontract Costs	\$525,000	\$100,000
<b>DIRECT COSTS</b>	<b>\$948,595</b>	<b>\$523,595</b>
<b>OPERATING COSTS</b>		
Indirect Salaries & Wages	\$152,322	\$152,322
Payroll Taxes & Benefits	\$ 56,760	\$ 56,228
Rent	\$ 31,404	\$ 31,718
Depreciation	\$ 16,000	\$ 16,000
Computer Support & Maintenance	\$ 15,748	\$ 15,748
Insurance	\$ 4,040	\$ 4,618
Professional Fees	\$ 65,900	\$ 67,877
Travel & Training	\$ 9,500	\$ 10,450
Office Expense	\$ 12,525	\$ 13,464
Utility Expense	\$ 4,000	\$ 4,200
Miscellaneous Expense	\$ 500	\$ 500
Telephone Expense	\$ 3,000	\$ 3,000
<b>TOTAL OPERATING COSTS</b>	<b>\$371,699</b>	<b>\$376,125</b>
<b>NET INCOME(LOSS)</b>	<b><u>\$ (2,494)</u></b>	<b><u>\$(133,020)</u></b>

