

A topographic map showing a watershed boundary in blue and purple, overlaid on a grayscale terrain with brown contour lines. The watershed follows a river valley. Several black squares are scattered across the map, likely representing buildings or other features.

VSLS Conference | September 16, 2022

# Accessing GIS Resources at the Vermont Open Geodata Portal

A topographic map showing a watershed boundary in blue and purple, overlaid on a grayscale terrain with brown contour lines. The watershed follows a river valley. Several black squares are scattered across the map, likely representing buildings or other features.

Tim Terway

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[geodata.vermont.gov](http://geodata.vermont.gov)



# WHAT VCGI DOES

---



## BUILD

Foundational  
Datasets  
(Spatial Data  
Infrastructure)



## LEAD

Development and  
use of Statewide  
Geographic Information  
System (GIS) and the  
Coordination it Requires



## EMPOWER

Data access,  
visualization and  
application. "Helping  
Vermonters visualize  
choice."





**ENERGY PLANNING**



**HISTORIC RESOURCES**



**WATER QUALITY**



**SERVICE DISTRICTS**



**ASSET MANAGEMENT**



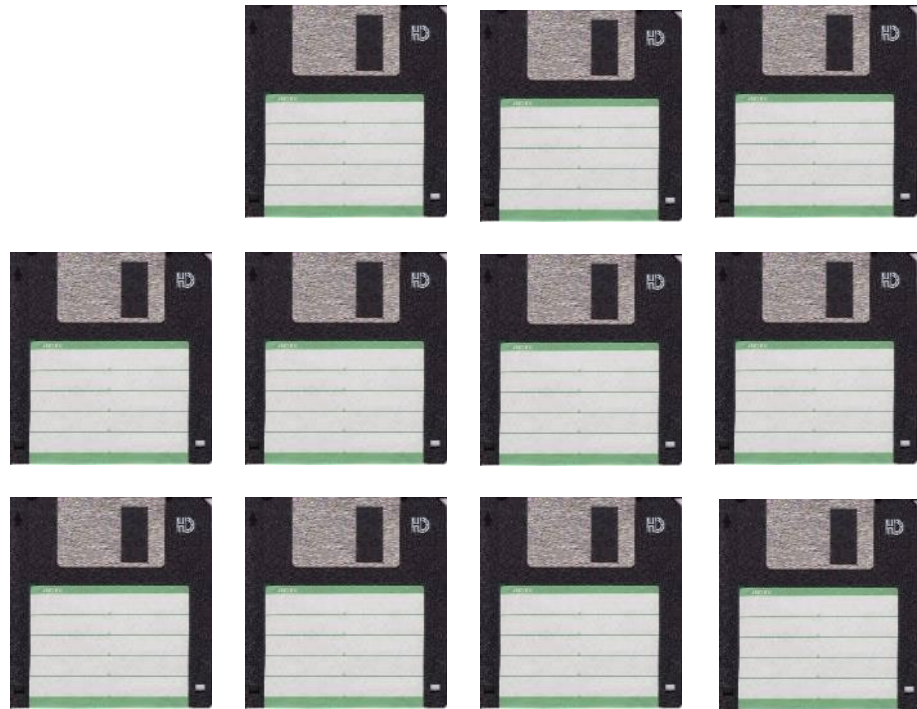
**FISCAL IMPACT MODEL**



**DEVELOPMENT SUITABILITY**



Take Home: Access to spatial information has become an essential service.



1992



geodata.vermont.gov/		Sep 14, 2021 - Sep 15, 2022	
Users	Sessions	Pageviews	Avg. Session Duration
57,406	103,356	322,551	03:15
↑ 11.1%	↑ 20.9%	↑ 18.8%	↓ -0.6%

In 2021:  
**22 partners** published **1075 open datasets** generating an astounding **502,384,064** map server requests.

Portal: In past year, roughly 900 pageviews and 157 unique users/day

\*VCGI server only. Not AGO, etc.



# FEDERATED DATA



APPS



DATA DOWNLOAD



SERVICES

VT Municipalities



Regional Planning Commissions



State Agencies



Vermont Open Geodata Portal

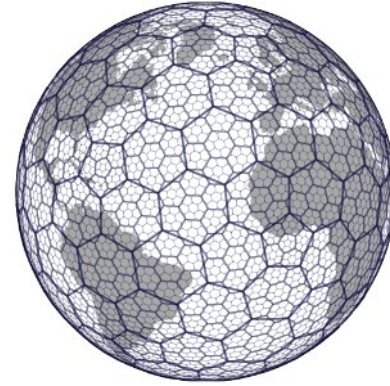


DATA.GOV

Photo Credit: Taylor Vick



Feature	Raster
Service	Vector
Filter	Query
Attribute	Clip
Field	Topology
Schema	Geoprocessing
View	Geographic Coordinate System / Projected Coordinate System / CRS
GDB	WKID / EPSG
Shapefile	Web Mercator



# GIS

# JARGON\*

*\*a tiny sample*



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(802) 585-0820

[John E. Adams](#), Director  
(802) 522-0172



VCGI is your source for the State of Vermont's  
geospatial data, information, and activities.

## News and Updates

### NEWS

13 JULY 2022

**Town Boundaries Updated to Reflect City of Essex Junction, Geographic Area Names and Codes Standard Updated**

### DATA RELEASE

23 MAY 2022

**Lake Champlain Basin Lidar-Informed Flood Inundation Layer Now Available**

### HOW-TO

22 APRIL 2022

**Improving Parcel Data Quality: Reviewing Match Status**

MORE

## Popular Datasets

[Parcels](#)

[Elevation \(Includes Lidar\)](#)

[Imagery](#)

[Land Cover](#)

## Map Applications

[Vermont Interactive Map Viewer](#)

[Vermont Parcel Viewer](#)

[Municipal Parcel Map Status](#)

[Vermont Land Survey Library](#)

[Vermont Orthoimagery Finder](#)

[Vermont Orthoimagery Status](#)

[Vermont Lidar Finder](#)

[Vermont Lidar Status](#)

[See More Here](#)

Footer of most pages at [vcgi.vermont.gov](http://vcgi.vermont.gov)



SEARCH

CONTACT

Data and Programs

Resources

Maps



Partner Agency Maps

Historic Maps

Partners

About VCGI

## PARTNER AGENCY MAPS

VCGI works with multiple state agencies through the [Enterprise GIS Consortium](#), whose own maps and mapping applications are linked below.

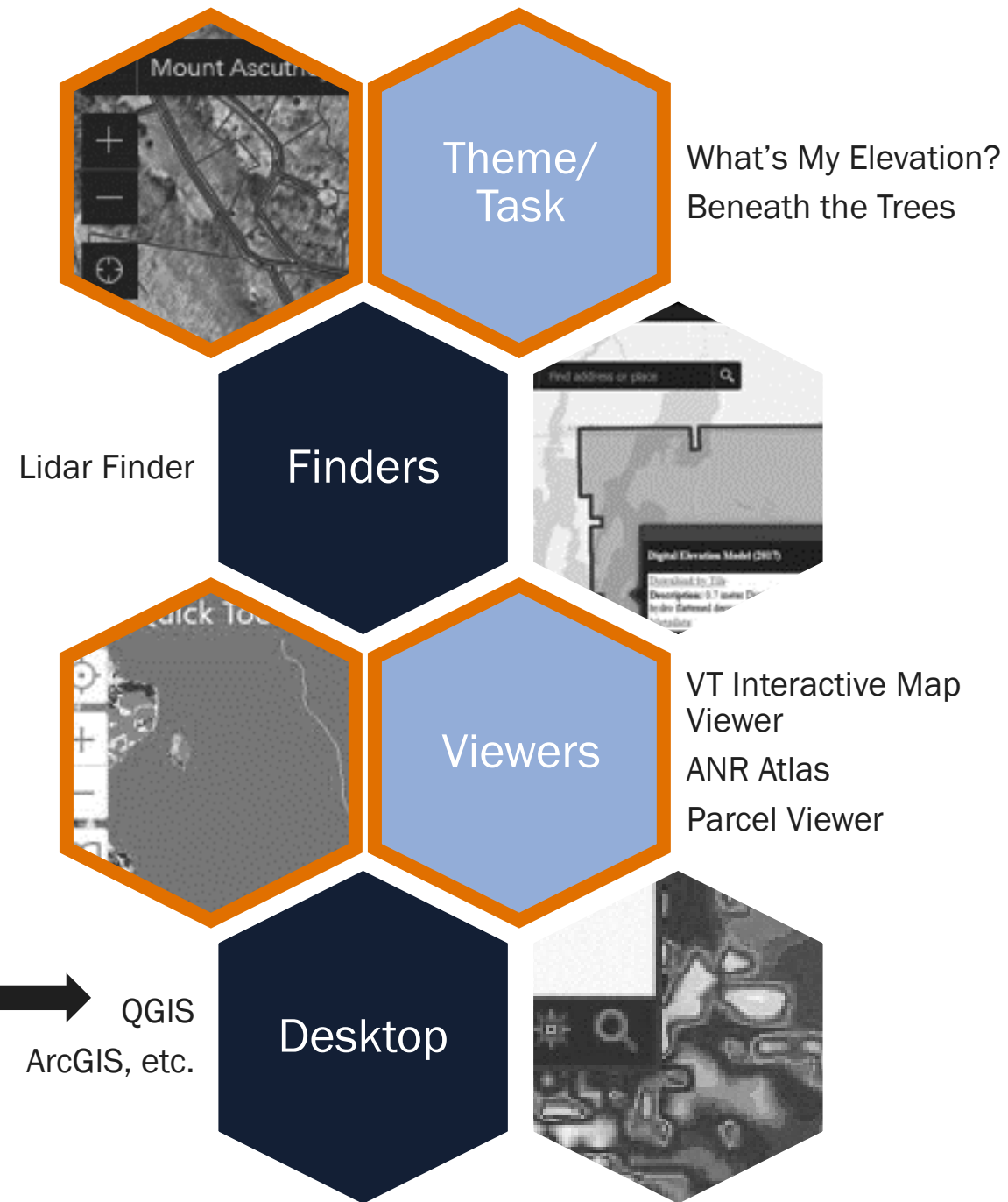
### Map Applications

AGENCY / DEPARTMENT	INTERACTIVE MAP	USES
ACCD / DHCD	<a href="#">Planning Atlas</a>	View planning, development, and historic preservation-related spatial datasets.
ACCD / DHCD	<a href="#">Municipal Planning Data Center</a>	View status of municipal plans, bylaws and designated areas through Vermont.
ACCD	<a href="#">Themed Tourism Maps</a>	View lodging, attractions, shops, events, and fun facts around Vermont.
ACCD / DED	<a href="#">Interactive Community Atlas</a>	View businesses in Vermont with 30 or more employees and across a variety of sectors.
AHS / VDH	<a href="#">Local Health Basemap</a>	View information to support local health work in Vermont.
AHS / VDH	<a href="#">Public Health Data Explorer</a>	View public health information, trends over time, and visualize health indicators on a map.
AHS / VDH	<a href="#">Community Profiles</a>	View public health information, trends over time, and visualize health indicators on a map, sortable by different health communities.
AHS / VDH	<a href="#">Environmental Public Health Tracking</a>	View data on air quality, asthma, cancer, climate and health, drinking water, and more, all by location in Vermont.





# Types of Apps



This is where raw datasets, thus, the VT Open Geodata Portal comes in





Find address or place







-73.186 43.272 Degrees  
100m



POWERED BY

[VT Parcel Viewer](#) | A “Viewer” Type App





About

### Using the Library

Zoom in and navigate the map to the location of the land survey. You can enter an address in the search bar or pan and zoom around the map with your mouse. Different layers become visible once zoomed in. **The buttons above are for the following tasks:**



Use the **Add a Survey** tool to add a survey.



Use the **Measurement** tool to measure lines or areas.



Use the **Layer List** to toggle layers on and off.



Use the **More** button to select items or change the basemap.



Use the **Select** tool to select multiple surveys and view their contents in the attribute table.



View the **Attributes** of selected items by expanding the table view at the bottom of the page.

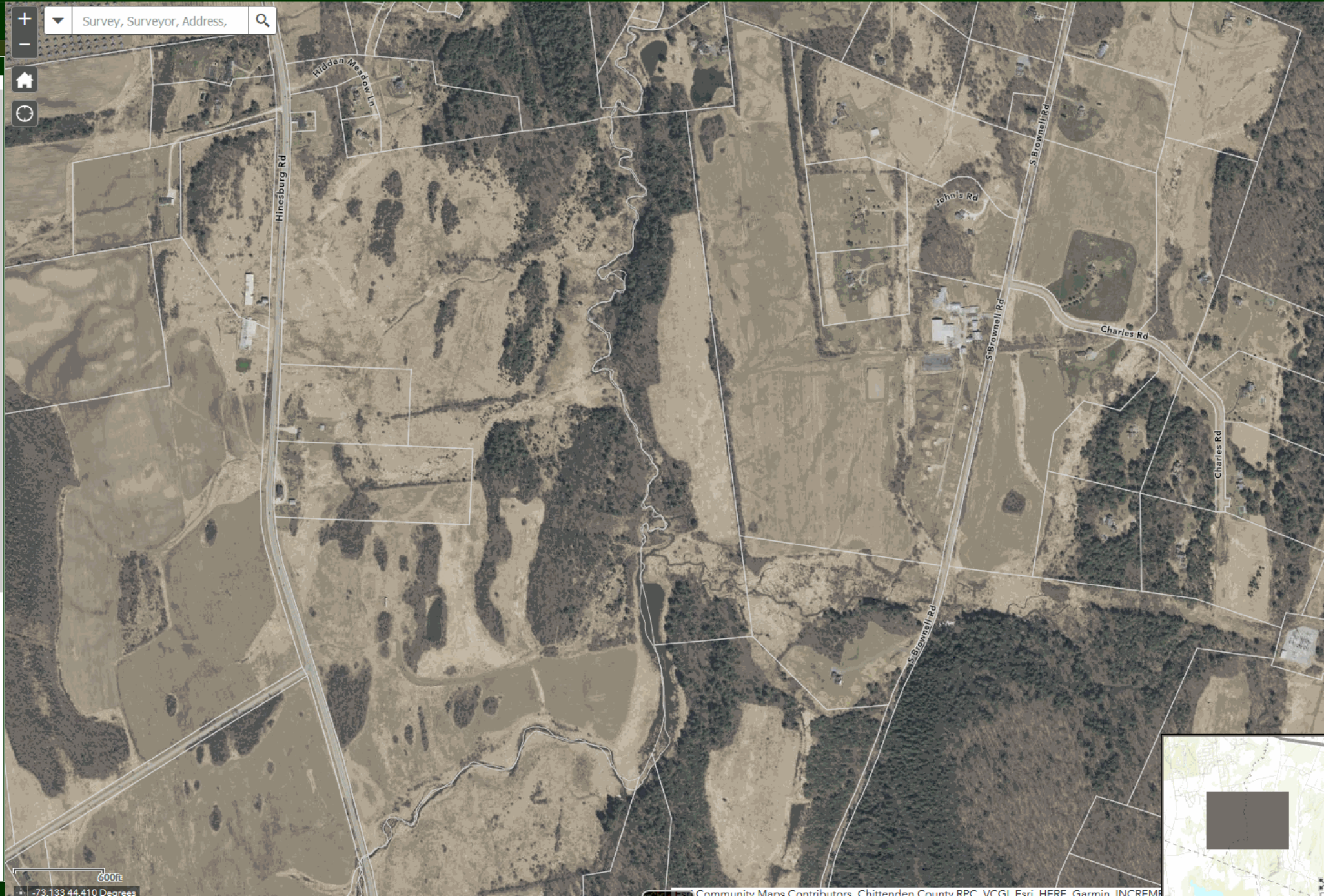
### Searching for a Survey

**By Search Bar:** Type in the name of the surveyor or address of the survey's location

**By Map:** Navigate the map to the general location of the survey and make sure the survey library layer is turned on. You may also filter available surveys by map extent using the attribute table at the bottom of the page.

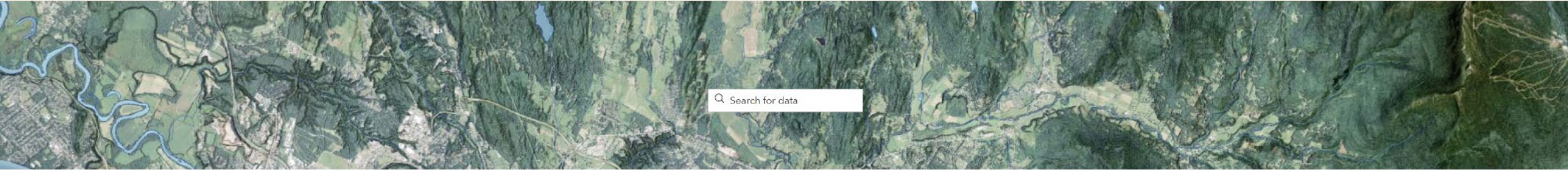
### Viewing a Survey

Click on a polygon of a survey that you've located on the map. A pop-up window will display with its associated information. **In the pop-up window, click on the linked .pdf in the Attachments field.** This will open the .pdf in a new tab. For example:





# Vermont Open Geodata Portal



Agriculture



Basemap



Boundaries



Climate



Demographic + Economic



Elevation



Environment



Geologic + Soils



Health + Public Safety



Imagery



Land Use + Land Cover



Recreation



Transportation



Utilities + Facilities



Water

## Search by Agency/Organization

- VT Agency of Commerce and Community Development
- VT Agency of Human Services
- Addison County Regional Planning Commission
- Bennington County Regional Commission

# Portal Background

Where “open” data has been, where it is, and where it is headed

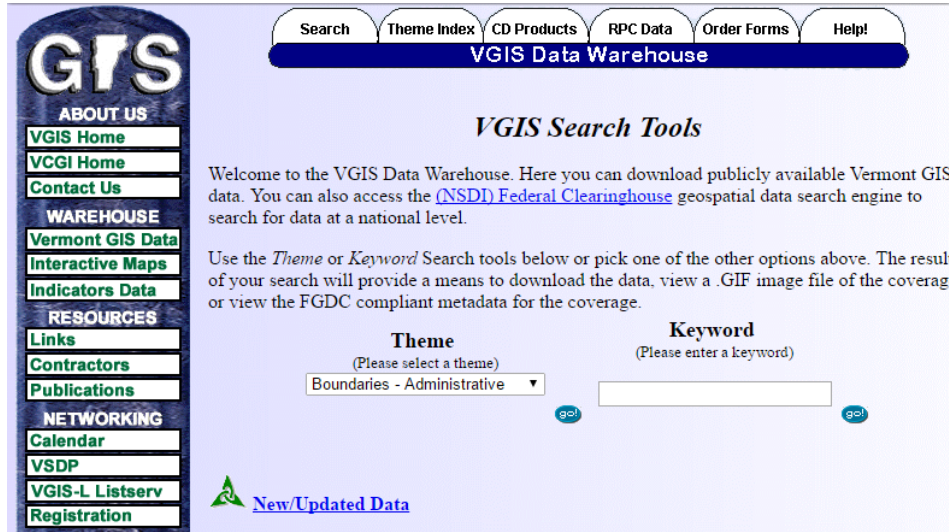


# 30 years of open data

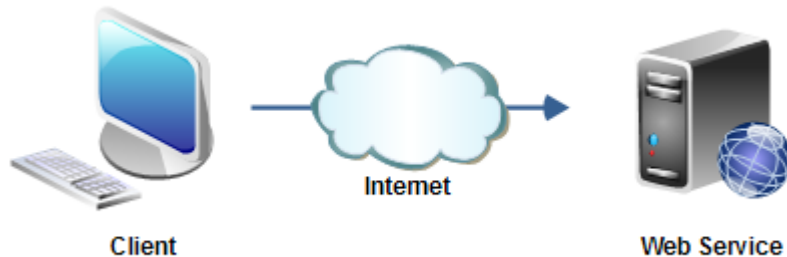
1992



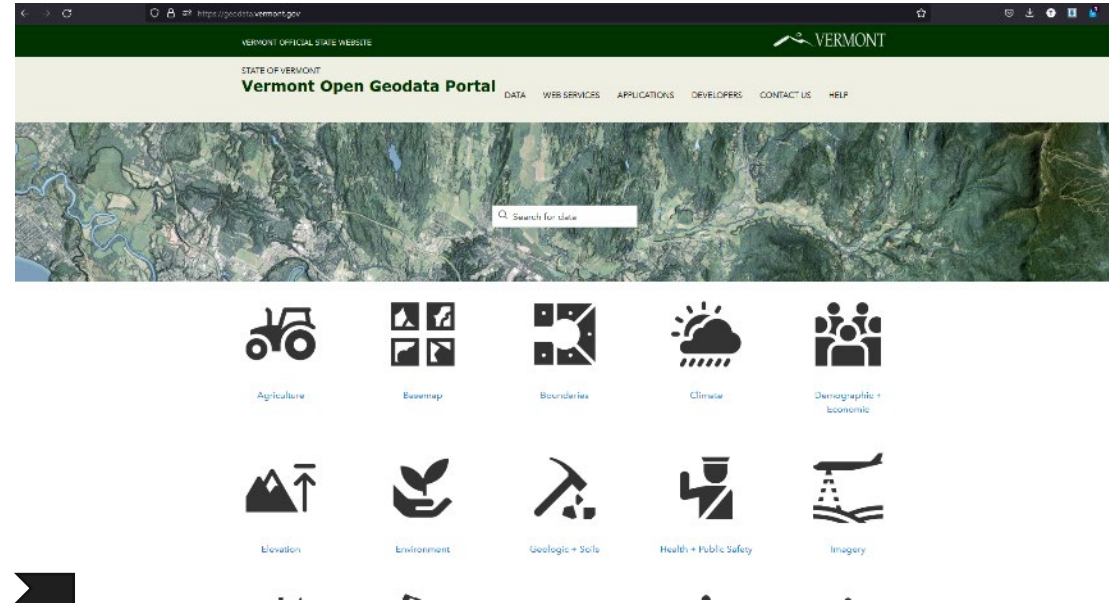
1998



2000s

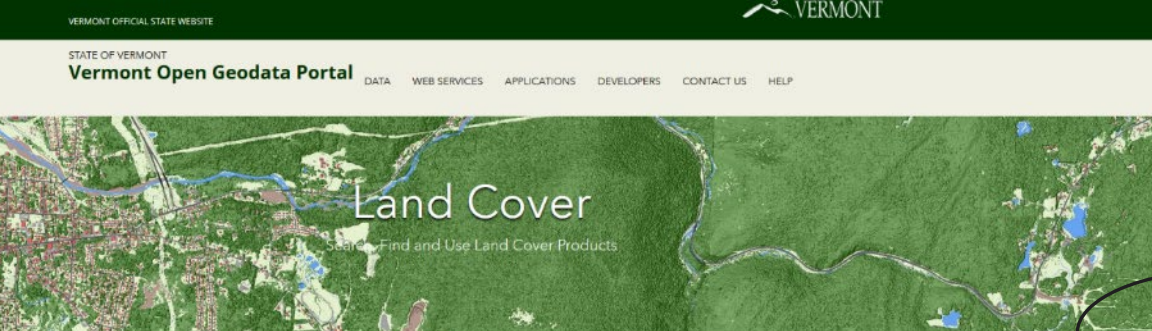


Late 2017 - Present Day



[geodata.vermont.gov](https://geodata.vermont.gov)





# 2020+

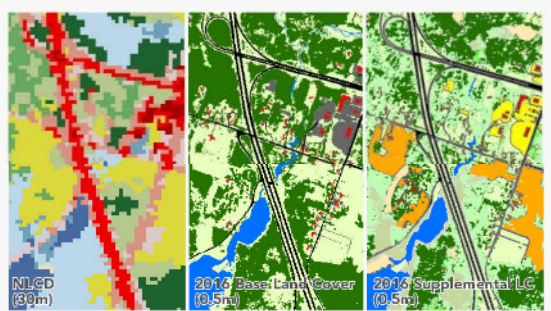
**It is now possible to construct a Virtual Vermont for reference. No floppies needed.**

**Datasets**  
Download Land Cover Products

Vermont land cover data is available from two different efforts: the National Land Cover Database (NLCD) managed by the Multi-Resolution Land Characteristics Consortium (MRLC), and Vermont-specific land cover products created over the years.

For Vermont-specific land cover products including the 2016 statewide 0.5 meter resolution set derived from a combination of 2013 - 2017 LiDAR and 2016 orthoimagery data (see [Report for details](#)), use the data download table below.

For NLCD data at 30 meter resolution with editions every 2-3 years beginning in 2001, see [this page](#).



Product + Resolution (Meters) + Type + Coverage +

1 - 14 / 14

Year	Product	Resolution (Meters)	Description	Type	Coverage	Download	Metadata
2016	Land Cover	0.5	Vermont Base Land Cover 2016	Raster	Vermont	<a href="#">Download</a>	<a href="#">Metadata</a>
2016	Forest Patch	0.5	Vermont Forest Patch Land Cover 2016	Vector	Vermont	<a href="#">Forthcoming</a>	<a href="#">Forthcoming</a>
2016	Agriculture	0.5	Vermont Agriculture Land Cover 2016	Vector	Vermont	<a href="#">Download</a>	<a href="#">Metadata</a>
2016	Wetlands	0.5	Vermont Wetlands Land Cover 2016	Vector	Vermont	<a href="#">Download</a>	<a href="#">Metadata</a>
2016	Shrublands	0.5	Vermont Shrublands Land Cover 2016	Vector	Vermont	<a href="#">Download</a>	<a href="#">Metadata</a>
2016	Tree Canopy	0.5	Vermont Tree Canopy Land Cover 2016	Vector	Vermont	<a href="#">Download</a>	<a href="#">Metadata</a>
2016	Impervious Surfaces	0.5	Vermont Impervious Surfaces Land Cover 2016	Vector	Vermont	<a href="#">Download</a>	<a href="#">Metadata</a>
2016	3D Buildings	0.5	Vermont 3D Building Rooftops 2016	Vector	Vermont	<a href="#">Download</a>	<a href="#">Metadata</a>
2013	Land Cover	Multiple	Mount Mansfield Alpine Tundra 2013	Vector	Mount Mansfield	<a href="#">Download</a>	<a href="#">Metadata</a>
2011	Impervious Surfaces	1	Lake Champlain Basin Impervious Surfaces 2011	Vector	Lake Champlain Basin	<a href="#">Download</a>	<a href="#">Metadata</a>
2003	Land Cover	Multiple	LCLU of lands next to VT streams feeding Lake Champlain 2003	Vector	Lake Champlain Basin	<a href="#">Download</a>	<a href="#">Metadata</a>
2001	Land Cover	30	Lake Champlain Basin Land Cover 2001	Raster	Lake Champlain Basin	<a href="#">Download</a>	<a href="#">Metadata</a>
1996	Land Cover	25	Vermont and Lake Champlain Basin Land Cover 1996	Raster	Vermont and Lake Champlain Basin	<a href="#">Download</a>	<a href="#">Metadata</a>
1992	Land Cover	30	Lake Champlain Basin Land Cover 1992	Raster	Lake Champlain Basin	<a href="#">Download</a>	<a href="#">Metadata</a>

1 - 14 / 14



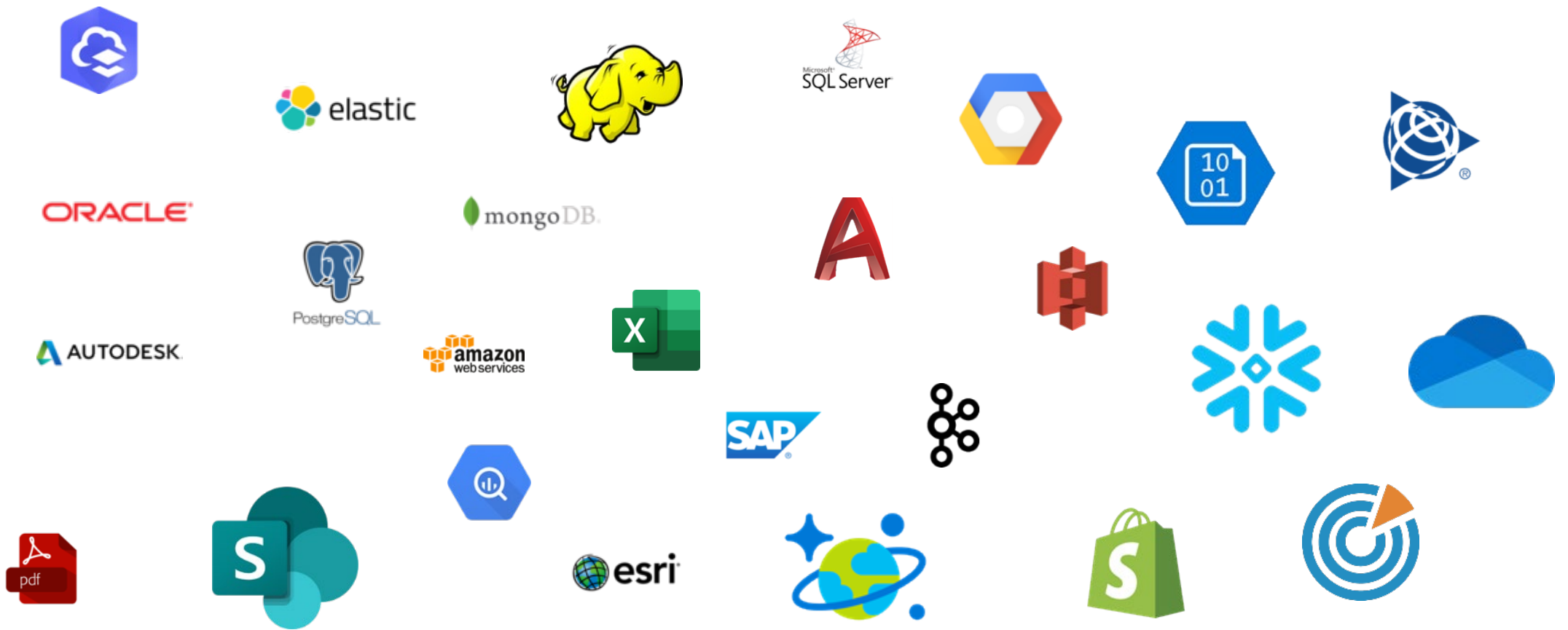
**+ 1' CONTOURS, PARCELS**



**3D Buildings, Topography  
Hydrography  
Orthoimagery  
Land Cover**







# 2022 – datatype/platform soup

There are many. There will be more. Task is thus understanding basics, integration and prep for use.

**GIS ≠ CAD**

(sorry!)

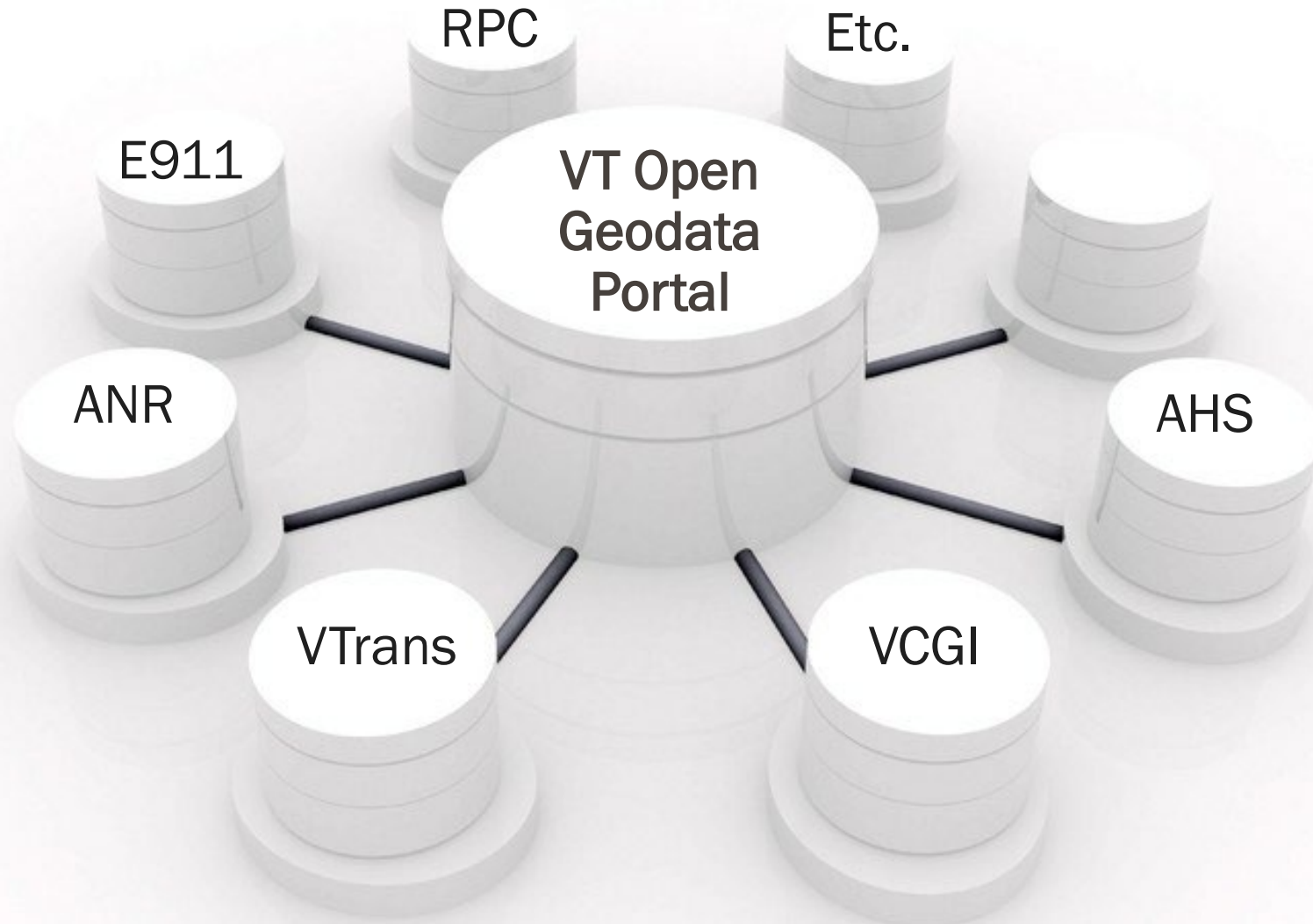


# Portal Publishing

“Federated” Model: Understanding and Finding Data, and Who/How Maintained



# Hub-and-spoke design a.k.a. “federated” model



Still, not perfect.

- No master librarian technical capabilities in current form
- Mixed adherence to data standards (e.g., Naming, tagging, metadata, etc.) – requires regular manual policing
- ESRI runs the platform backend (and changes things often, we’re along for the ride)
- Vector data: Great. Raster data: not so great.
- Hitting ceiling on current portal capabilities as configured
- A head’s up: the portal will change with time, so everything presented here will also evolve!



Current publishers.

## Search by Agency/Organization

- [VT Agency of Commerce and Community Development](#)
- [VT Agency of Human Services](#)
- [VT Agency of Natural Resources](#)
- [VT Agency of Transportation](#)
- [VT Center for Geographic Information](#)
- [VT Department of Public Service](#)

- [Addison County Regional Planning Commission](#)
- [Bennington County Regional Commission](#)
- [Central Vermont Regional Planning Commission](#)
- [Chittenden County Regional Planning Commission](#)
- [Northeastern Vermont Development Association](#)
- [Northwest Regional Planning Commission](#)
- [Rutland Regional Planning Commission](#)
- [Lamoille County Planning Commission](#)
- [Southern Windsor County Regional Planning Commission](#)
- [Two Rivers-Ottawaquechee Regional Commission](#)
- [Windham Regional Commission](#)



# STATE OF VERMONT Vermont Open Geodata Portal

DATA WEB SERVICES APPLICATIONS DEVELOPERS CONTACT US HELP

All Data Documents Apps & Maps

Filters Reset 1 - 20 of 161 results Relevance ▾

tag:nodeVCGI ×

### Content Type ^

- Apply type
- Feature Layer
  - Shapefile
  - Table
  - Feature Service
  - CSV
- [More ▾](#)

### Last Updated ^

### Source ^

- Apply source
- VT Center for Geographic Information
  - gisnvda
  - Northwest Regional Planning Commission
  - CentralVTRPC
  - BenningtonRPC
- [More ▾](#)

### Categories ^

- Apply category
- Boundaries

**Data**

[VT Data - Locations of Surveys Accessible via Vermont Land Survey Library](#)

VCGI | Publisher\_VCGI

Feature layer of locations corresponding to surveys that are produced by Vermont licensed land surveyors and submitted—as .pdf copies—to the Vermont Land Survey Library.Locations are...

---

**Type:** Feature Layer **Rows:** 1,680  
**Last Updated:** September 14, 2022 **Tags:** Survey Library, isothemeCadastral, isothemeBoundar...

**Data**

[VT Data - Geographic Area Names and Codes](#)

VI Center for Geographic Information | Services\_VCGI

Tables containing standard codes for various geographic areas. The codes are described in greater detail in the VT Geographic Area Names and Codes Standard. The table preview shows 1 of the...

---

**Type:** Table **Rows:** 290  
**Last Updated:** July 12, 2022 **Tags:** vcgi open data, isothemeBoundary, subthemeOther, ...

**Data**

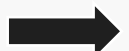
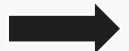
[VT Data - VT Hydrography Dataset - cartographic extract polygons](#)

VT Center for Geographic Information | Services\_VCGI

(Link to Metadata) VHDCARTO is a simplified version of the local resolution Vermont Hydrography Dataset (VHD) that has been enriched with stream perenniality, e.g., "intermittent" vs. "perennial",...

---

**Type:** Feature Layer **Rows:** 29,848  
**Last Updated:** September 24, 2019 **Tags:** nodeVCGI, vcgi open data, isothemeWater, subthem...



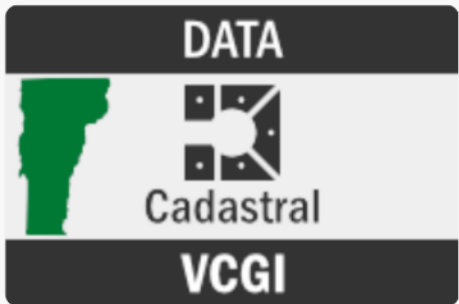
# Portal Content

Anatomy of an Open Data Item



STATE OF VERMONT  
Vermont Open Geodata Portal

DATA WEB SERVICES APPLICATIONS DEVELOPERS CONTACT US HELP



VT Data - Locations of Surveys Accessible via Vermont Land Survey Library

VCGI - VT Center for Geographic Information

View Map Download More

Summary

Locations and information corresponding to copies of surveys that are accessible via the Vermont Land Survey Library.

Feature layer of locations corresponding to surveys that are produced by Vermont licensed land surveyors and submitted—as .pdf copies—to the Vermont Land Survey Library.

Locations are attributed with information such as name of surveyor, date of survey, survey type (e.g., subdivision), and municipality. When the feature layer is opened in ArcGIS Online, the .pdf copies (as feature attachments) can be viewed/downloaded.

Boundaries Property

Looking for something else? See other datasets nearby

Attributes (16)

Name	Type	Action
CreationDate	Date or Time	
Creator	Text	
EditDate	Date or Time	
Editor	Text	

Read More

You may be interested in

Details

Dataset  
Feature Layer

January 3, 2022  
Info Updated

Weekly  
Data Updated: September 15, 2022

January 1, 2020  
Published Date

1,684 Records  
View data table

Public  
Anyone can see this content

Custom License  
View license details

Relevant Area



I want to...

### VT Data - Locations of Surveys Accessible via Vermont Land Survey Library

VCGI - VT Center for Geographic Information

#### Summary

Locations and information corresponding to copies of surveys that are accessible via the Vermont Land Survey Library.

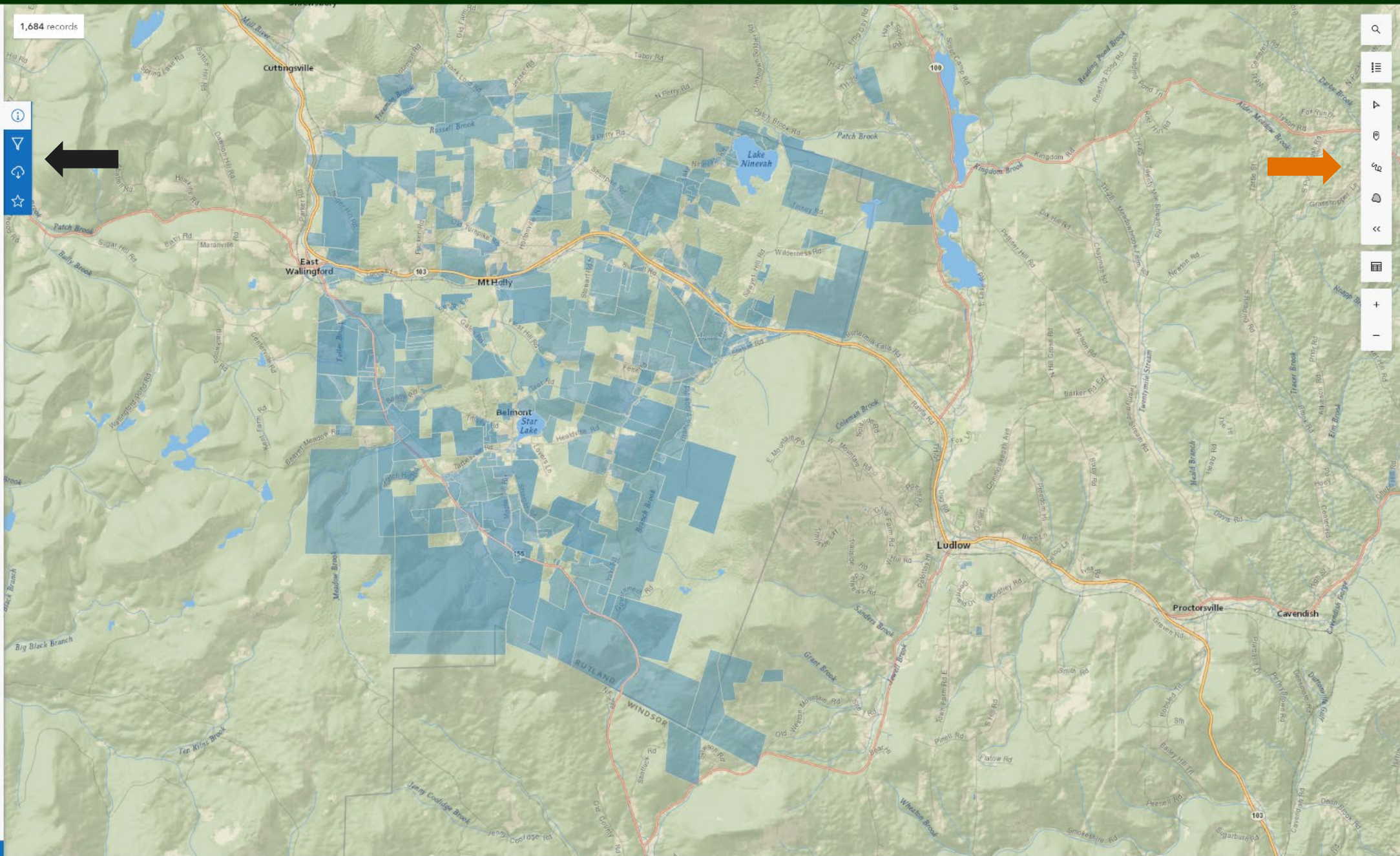
[View Full Details](#)

[Download](#)

#### Details

- Dataset**  
Feature Layer
- January 3, 2022**  
Info Updated
- Weekly**  
Data Updated: September 15, 2022
- January 1, 2020**  
Published Date
- 1,684 Records**  
[View data table](#)
- Public**  
Anyone can see this content
- Custom License**  
[View license details](#)

[I want to use this](#)



A Vector Dataset / Feature Layer Example: [Survey Library Index Polygons](#)



### Download Options

VI Data - Locations of Surveys Accessible via Vermont Land Survey Library

Toggle Filters:

**112 records ready for download**  
Extent of filtered area is used for content where hosted downloads is not enabled.

Creating a new file with your filters will take some time

**CSV**

Downloading an updated file may take some time.

[Download](#)

**KML**

Downloading an updated file may take some time.

[Download](#)

**Shapefile**

Downloading an updated file may take some time.

[Download](#)

**GeoJSON**

Downloading an updated file may take some time.

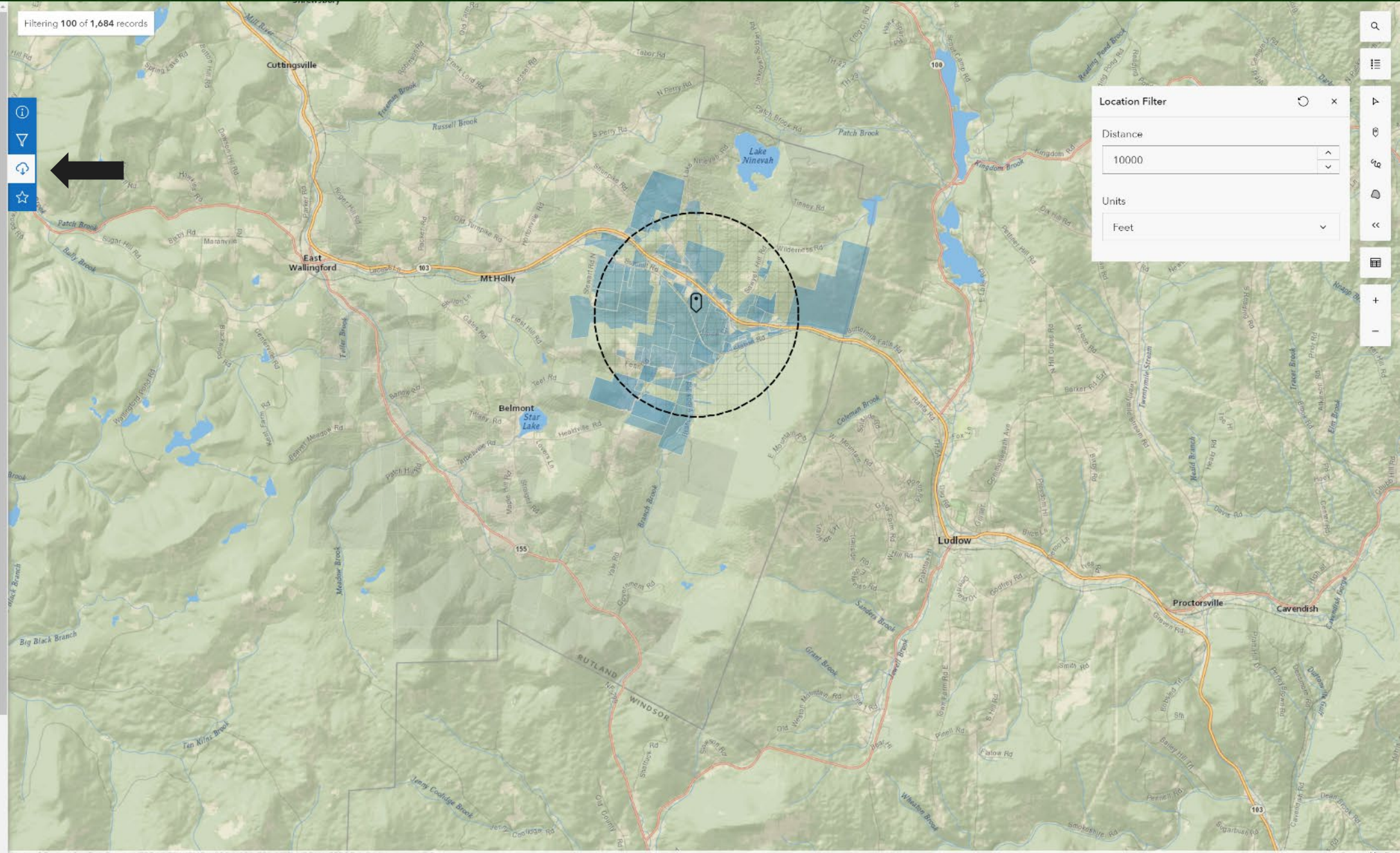
[Download](#)

**File Geodatabase**

Downloading an updated file may take some time.

Filtering 100 of 1,684 records

- 
- 
- 
- 



**Location Filter**

Distance

10000

Units

Feet



### Filters

VT Data - Locations of Surveys Accessible via Vermont Land Survey Library

Filters

Styling

Filter as map moves ⓘ

Location filter applied ←

[Remove filter](#)

Select attribute filters (16)

CreationDate  
10/31/2019 to 8/7/2022

Creator  
1 values

EditDate  
10/31/2019 to 8/9/2022

Editor  
1 values

Survey Title  
1,424 values

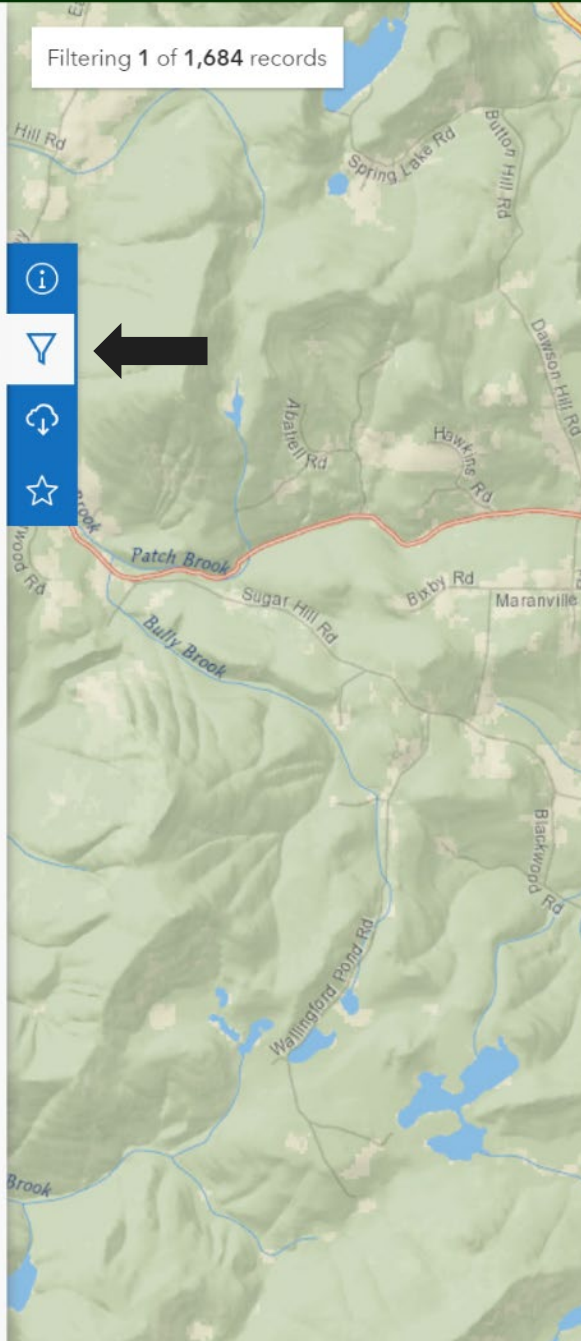
Name of Surveyor  
226 values

Uploader Email  
94 values

Date of Survey  
8/1/1924 to 7/25/2022

Survey Type  
4 values

Filtering 1 of 1,684 records





### Filters

VT Data - Locations of Surveys Accessible via Vermont Land Survey Library

#### Filters

#### Styling

Filter as map moves

#### Name of Surveyor

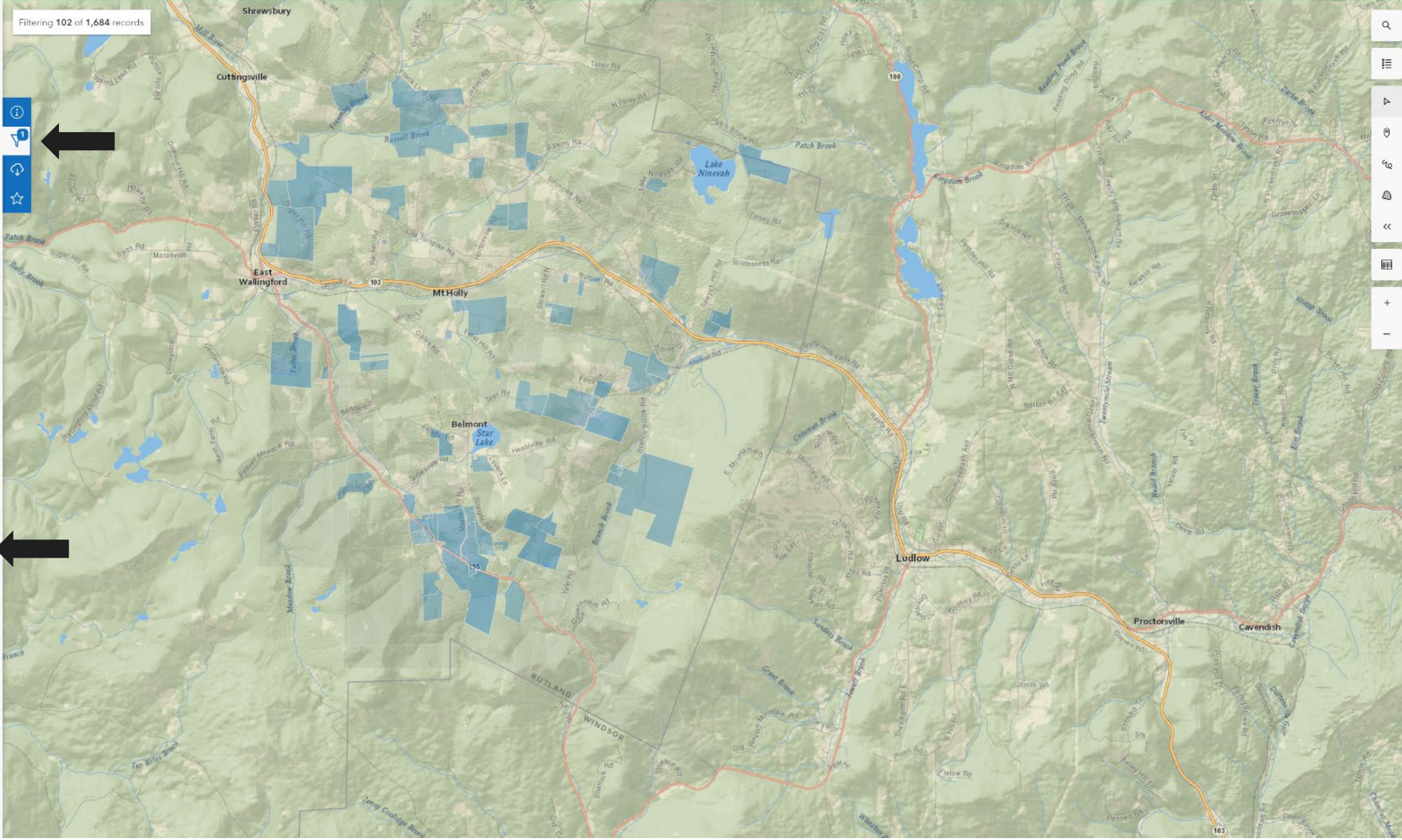
- Michael Gervais 6.25%
- Peter H. Cross, Cross Consulting Engineers 5.99%
- Nathan Nadeau 5.79%
- Ralph J Michael 5.07%
- Ronald L. LaRose 3.88%

Search 221 more values

#### Select attribute filters (16)

- CreationDate 10/31/2019 to 8/7/2022
- Creator 1 values
- CeditDate 10/31/2019 to 8/9/2022
- Editor 1 values
- Survey Title 1,424 values
- Name of Surveyor 226 values

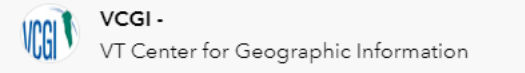
Filtering 102 of 1,684 records



- 🔍
- ☰
- 📏
- 📍
- 📄
- 📑
- ⏪
- ⏩
- +
-



# VT Data - Locations of Surveys Accessible via Vermont Land Survey Library



## Summary

Locations and information corresponding to copies of surveys that are accessible via the Vermont Land Survey Library.

[View Full Details](#)

[Download](#)

## Details

- Dataset**  
Feature Layer
- January 3, 2022**  
Info Updated
- Weekly**  
Data Updated: September 15, 2022
- January 1, 2020**  
Published Date
- 1,684 Records**  
[View data table](#)
- Public**  
Anyone can see this content
- Custom License**  
[View license details](#)

I want to use this >

Showing 25 of 1,684 rows

[Close Table](#)

	CreationDate	Creator	EditDate	Editor	Survey Title	Name of Surveyor	Uploader Email	Date of S
	10/31/2019, 2:00 PM	Publisher_VCGI	3/11/2020, 2:33 PM	Publisher_VCGI	Plat Showing subdivision of I...	Kevin R. Larose	david.n.fox@vermont.gov	7/17/201
<a href="#">i</a>	10/31/2019, 2:00 PM	Publisher_VCGI	10/31/2019, 2:00 PM	Publisher_VCGI	Preliminary Plat of Minor Sub...	BM Paul	david.n.fox@vermont.gov	8/18/201
<a href="#">v</a>	10/31/2019, 2:00 PM	Publisher_VCGI	10/30/2020, 8:34 AM	Publisher_VCGI	Lands of John M. & Julie M. E...	Michael Gervias	david.n.fox@vermont.gov	6/5/2017
<a href="#">u</a>	10/31/2019, 2:00 PM	Publisher_VCGI	10/31/2019, 2:00 PM	Publisher_VCGI	Property Line Adjustment Pla...	Merrill A. Mundell, Jr.	david.n.fox@vermont.gov	2/25/201
<a href="#">s</a>	10/31/2019, 2:00 PM	Publisher_VCGI	10/31/2019, 2:00 PM	Publisher_VCGI	Subdivision Plat for Ernest N...	Mark Day	david.n.fox@vermont.gov	6/20/201
	10/31/2019, 2:00 PM	Publisher_VCGI	10/31/2019, 2:00 PM	Publisher_VCGI	Boundary and Subdivision Pl...	Mark Day	david.n.fox@vermont.gov	3/20/201
	10/31/2019, 2:00 PM	Publisher_VCGI	10/31/2019, 2:00 PM	Publisher_VCGI	A Map of Certain Lands of Je...	Kenneth G. Weston	david.n.fox@vermont.gov	6/15/200
	12/12/2019, 2:30 PM	Publisher_VCGI	12/30/2019, 9:01 AM	Publisher_VCGI	Subdivision of th Bruce Whe...	George E. Bedard	david.n.fox@vermont.gov	12/7/201
	12/16/2019, 10:06 AM	Publisher_VCGI	12/30/2019, 9:00 AM	Publisher_VCGI	Subdivision Plat of a Portion ...	Donald A. Johnson	david.n.fox@vermont.gov	7/30/201
	12/16/2019, 10:10 AM	Publisher_VCGI	12/30/2019, 9:00 AM	Publisher_VCGI	Suvery and Subdivision of La...	Tami Bass	david.n.fox@vermont.gov	8/1/2004
	12/20/2019, 11:40 AM		12/30/2019, 11:24 AM	Publisher_VCGI	Estate of Adelbert Ames, III	Joseph DiBernardo	joedibo@comcast.net	10/2/201
	12/20/2019, 12:57 PM		10/30/2020, 8:34 AM	Publisher_VCGI	Boundary Line Adjustment of...	Keith Van Iderstine	scott@mccainconsulting.com	12/20/20
	12/20/2019, 2:17 PM		12/30/2019, 8:57 AM	Publisher_VCGI	Subdivision Plat, Lands of: B...	KML Surveying & Design, PL...	kml.surveying@icloud.com	12/12/20
	12/30/2019, 11:07 AM		10/30/2020, 8:34 AM	Publisher_VCGI	Survey and Subdivision of a ...	Keith Van Iderstine	scott@mccainconsulting.com	12/19/20
	1/2/2020, 4:21 PM		1/3/2020, 10:00 AM	Publisher_VCGI	Laquerre Subdivision	William R Chase	cdchase@chasesurveyors.com	4/1/2019
	1/6/2020, 2:35 PM		10/30/2020, 8:35 AM	Publisher_VCGI	Subdivision For THE CONSE...	Richard F. Lunna	rflunna@gmail.com	11/22/20
	1/8/2020, 11:36 AM		10/30/2020, 8:34 AM	Publisher_VCGI	LANDS OF CHAMPLAINSIDE...	Michael Gervias	rob@barnardandgervais.com	11/15/20
	1/9/2020, 9:49 AM		1/9/2020, 3:26 PM	Publisher_VCGI	Boundary Line Adjustment Pl...	Mark Day	nicole.snow@tcevt.com	11/19/20
	1/10/2020, 10:42 AM		1/13/2020, 8:58 AM	Publisher_VCGI	Survey of Lot 4 & 5 For Wesle...	William R. Creamer	wrcreamer72@gmail.com	11/13/20



# Demo

A Vector Dataset / Feature Layer Example: [Survey Library Index Polygons](#)

# Portal Content: Lidar Detail

Anatomy of an Open Data Item, Raster Content





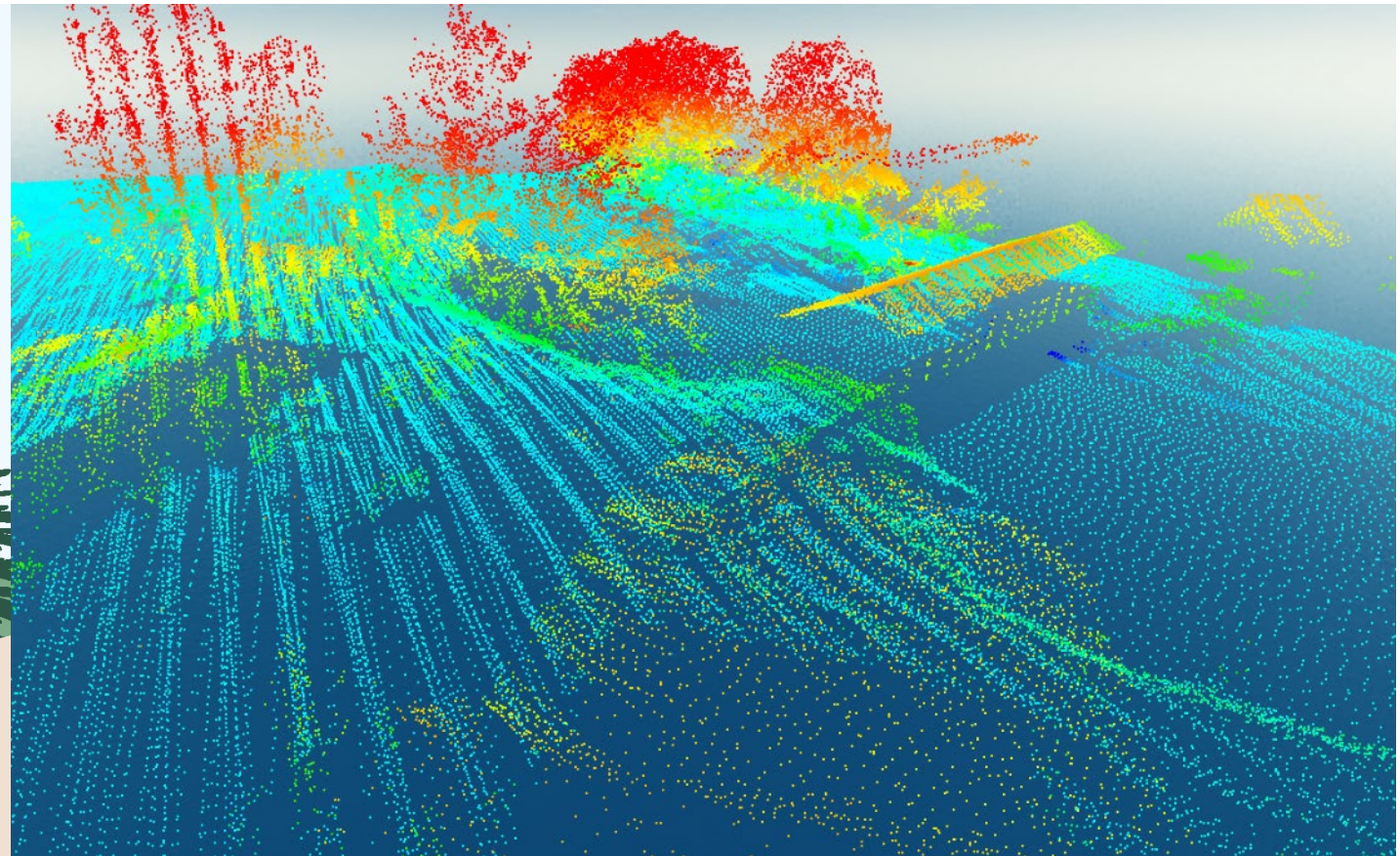
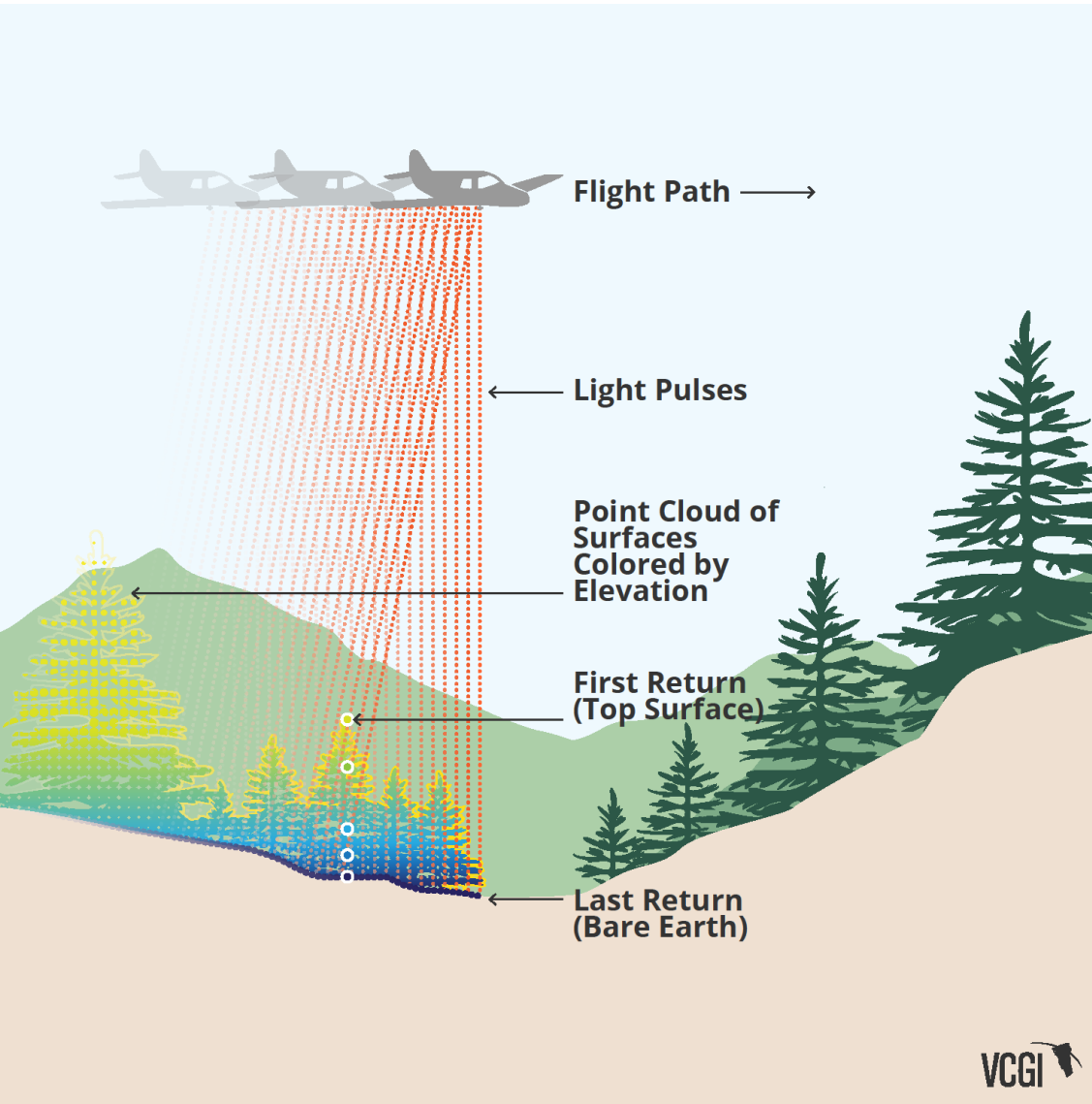
# What is Lidar?

Point clouds  
Derivatives  
Resolution











# Shooting lasers at the Earth. Getting points in return. Making useful data products from them.



Quality Levels	Data Source	Horizontal Resolution	Vertical Accuracy	
		Point Density	RMSEz in Open Terrain	Equivalent Contour Accuracy
QL 1	LiDAR	8 points/m <sup>2</sup>	9.25 cm	1 foot
QL 2	LiDAR	2 points/m <sup>2</sup>	9.25 cm	1 foot




# AT-A-GLANCE COMPARISON OF GEOSPATIAL SOLUTIONS BASED ON SIZE OF PROJECT

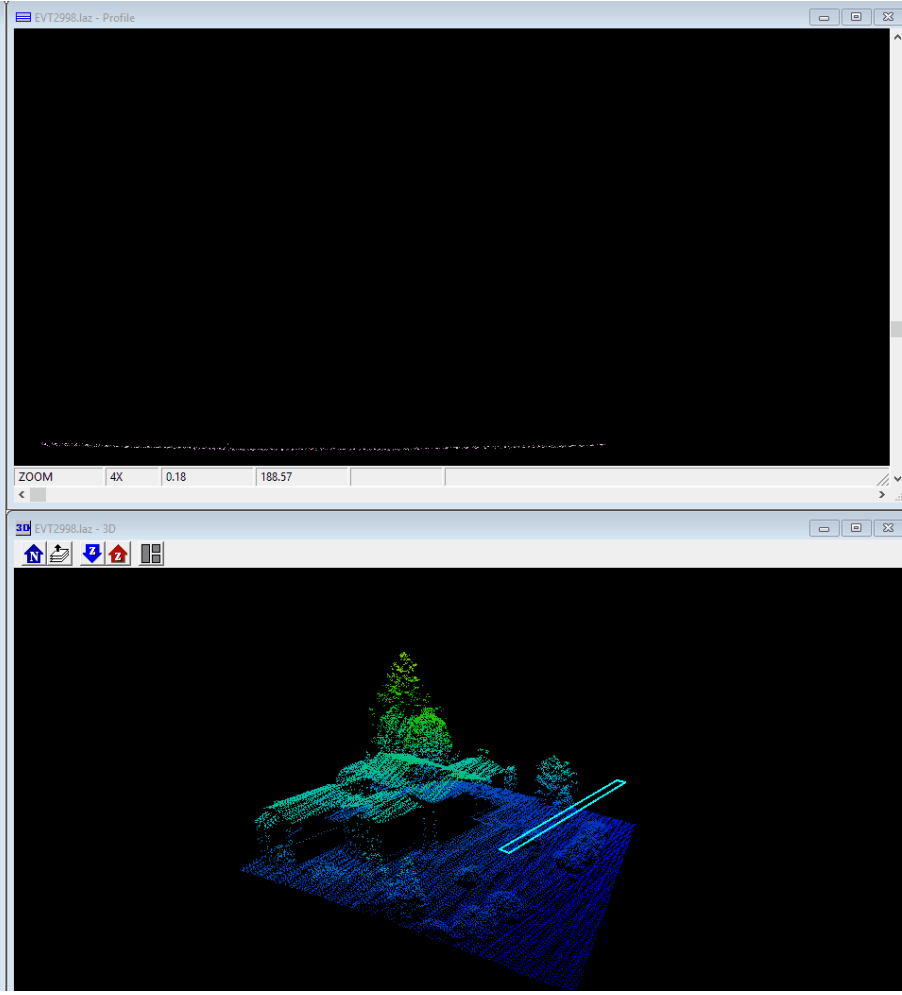
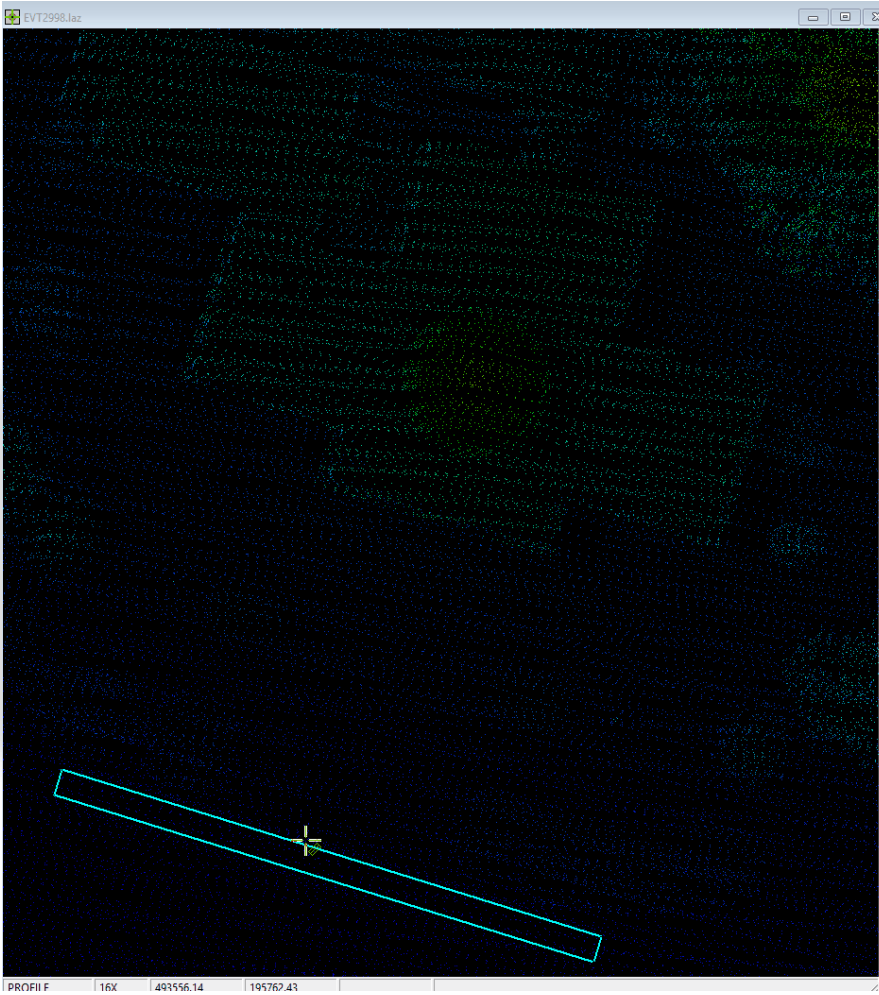
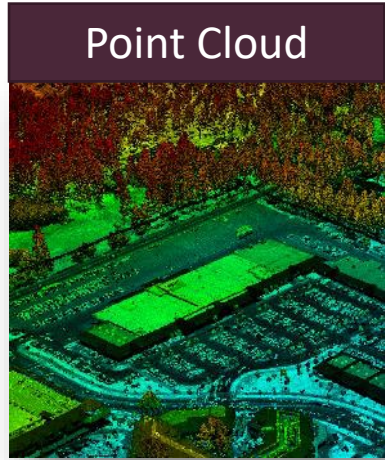
						
	SATELLITE Imagery	FIXED-WING LiDAR/Imagery	HELICOPTER LiDAR/Imagery	UAS LiDAR/Imagery	MOBILE LiDAR/Imagery	STATIC LiDAR
Large Regional Mapping (i.e. Country)	Best	✓				
Medium Regional Mapping (i.e. Large City or County)	✓	Best	✓			
Large Site (500+ Acres)		✓	✓	Best		
Medium Site (100-500 Acres)		✓	✓	Best		✓
Small Site ( <100 Acres)				Best		✓
Large Corridors ( 20+ Miles)		✓	Best Off-Road	✓	Best Roadway	
Medium Corridors ( 1-20 Miles)		✓	✓	Best Off-Road	Best Roadway	✓
Small Corridors ( <1 Mile)				Best	✓	✓
Remote Sites		✓	✓	Best		
Structural (i.e. Bridges, Dams, etc)				✓	✓	Best
Indoor (i.e. Mechanical, Architectural)						Best

### Technology Comparison

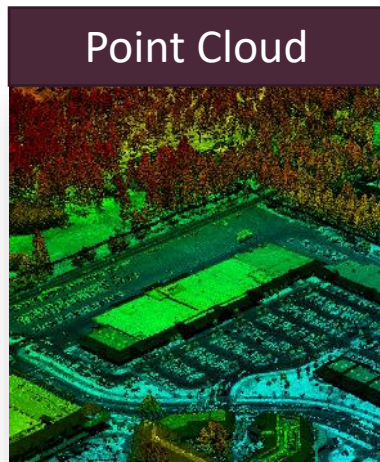
	Linear LiDAR	Geiger LiDAR
Swath	3,300 ft.	16,000 ft.



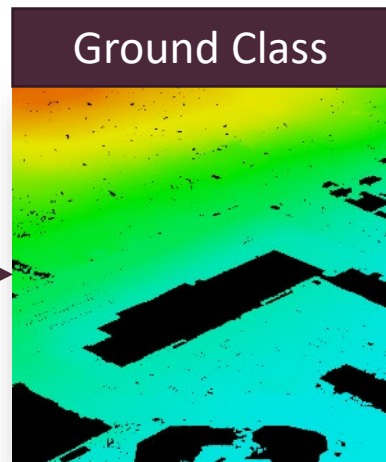
The diagram shows a red cone representing Linear LiDAR with a narrow swath of 3,300 feet, and a yellow cone representing Geiger LiDAR with a much wider swath of 16,000 feet. The Linear LiDAR is associated with the Harris logo.

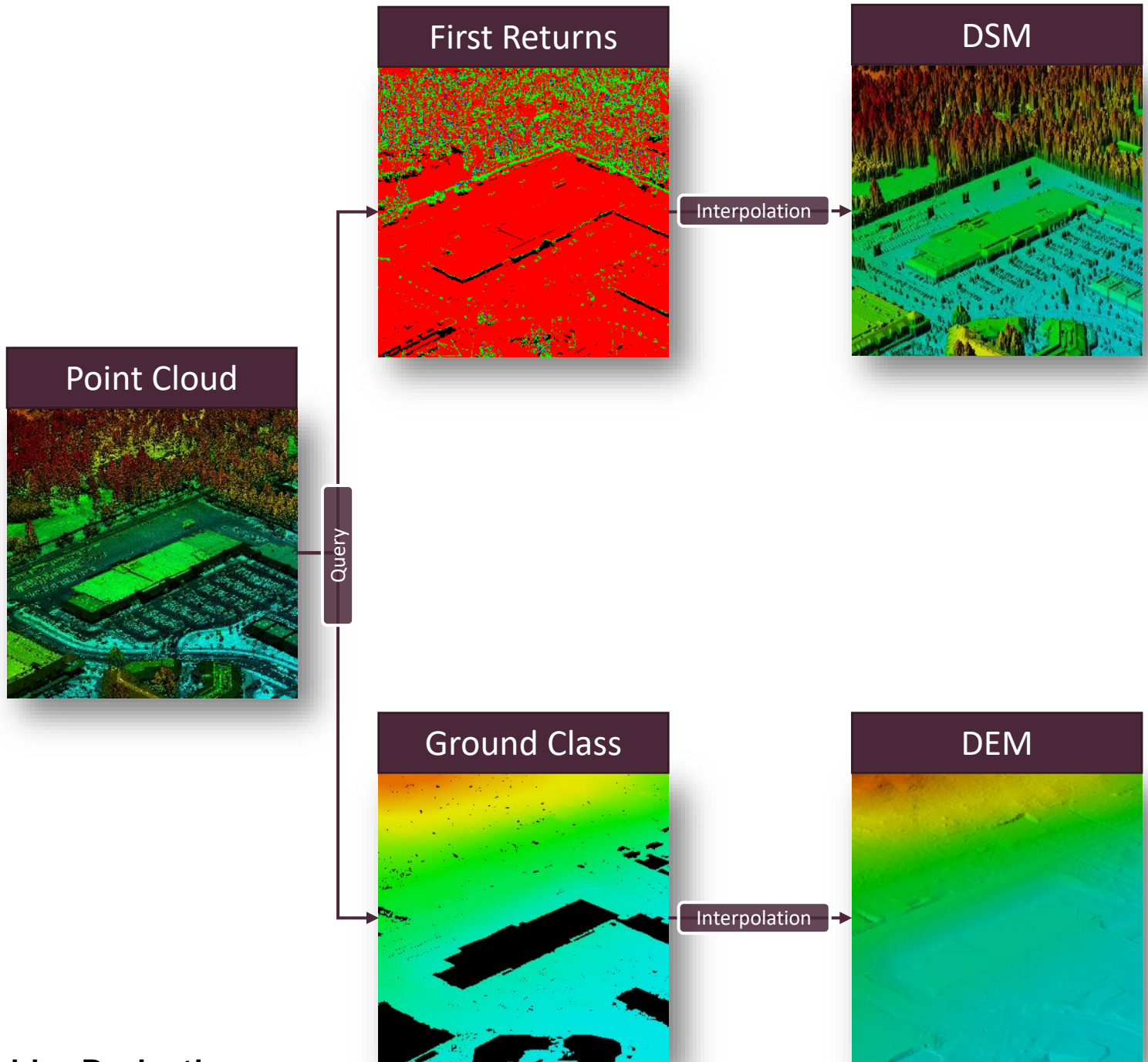




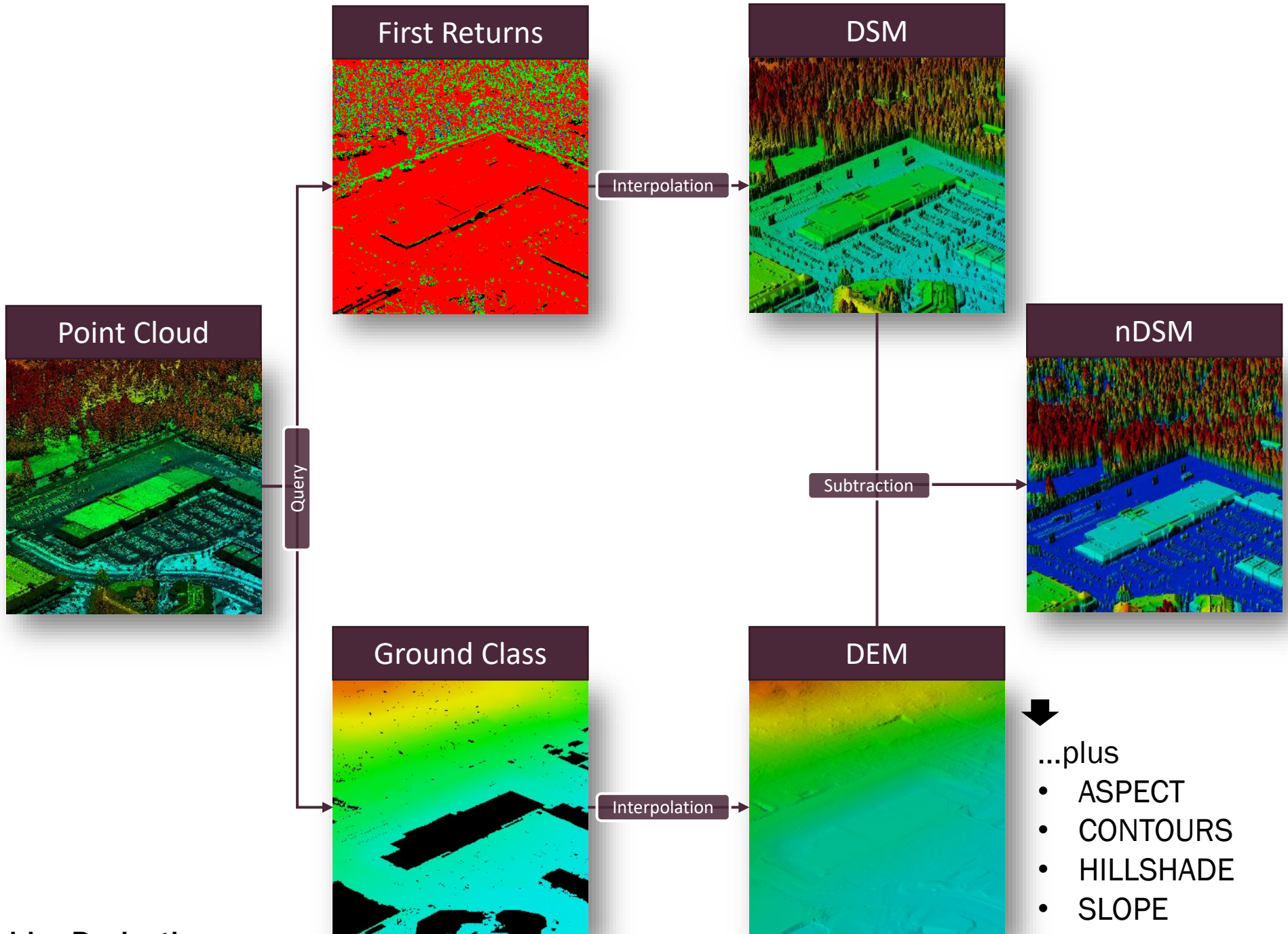


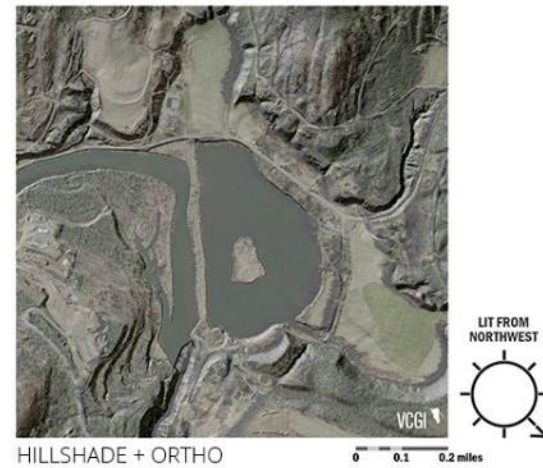
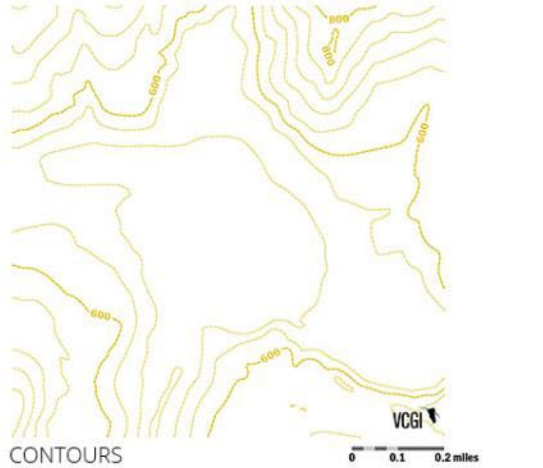
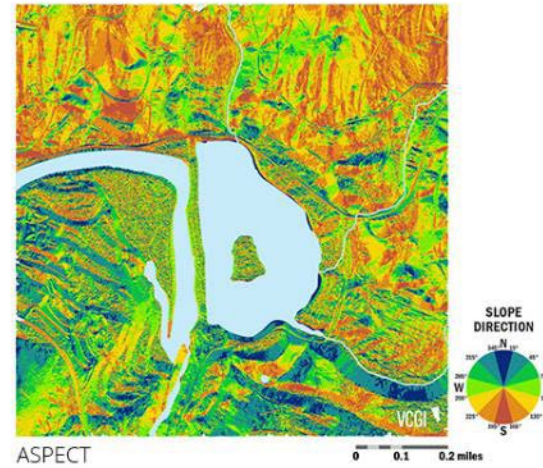
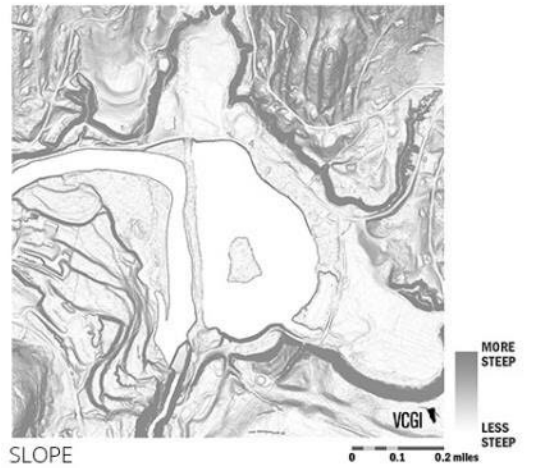
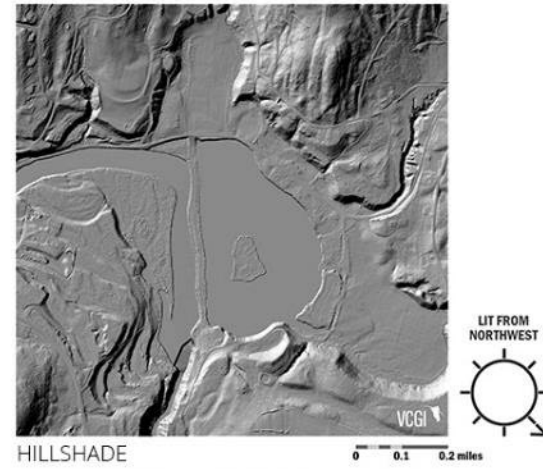
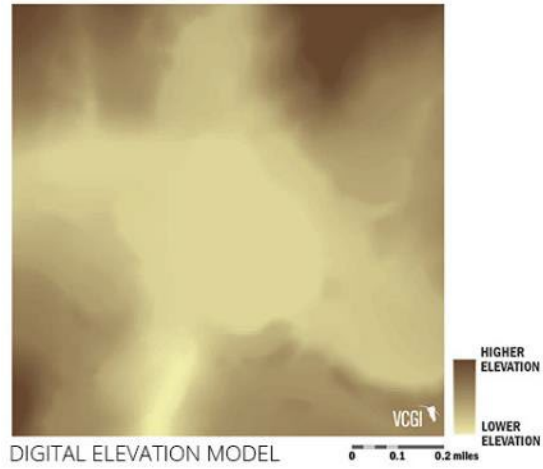
Query











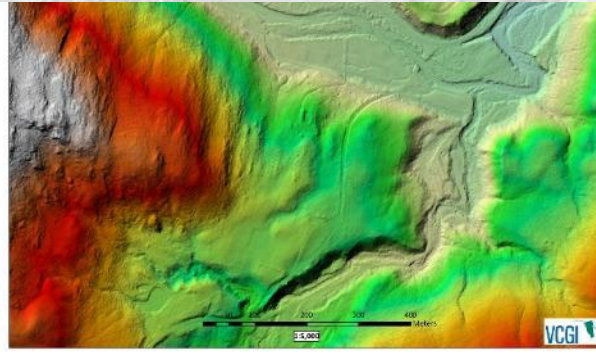
# Understanding Lidar Derivatives



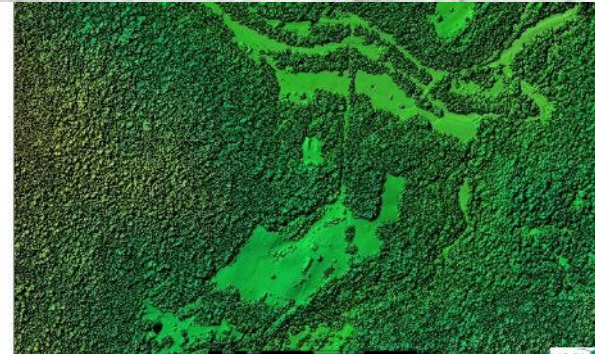
# ONE LOCATION, MANY PRODUCTS



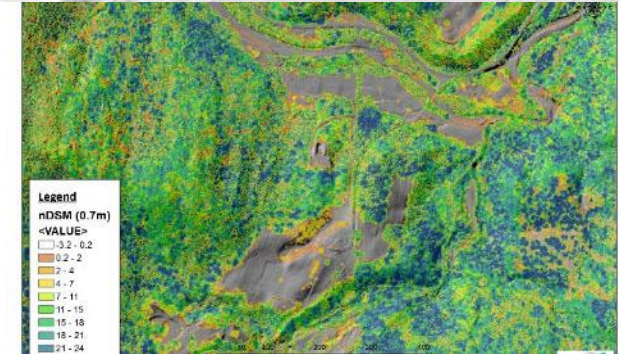
**MARLBORO, VT**



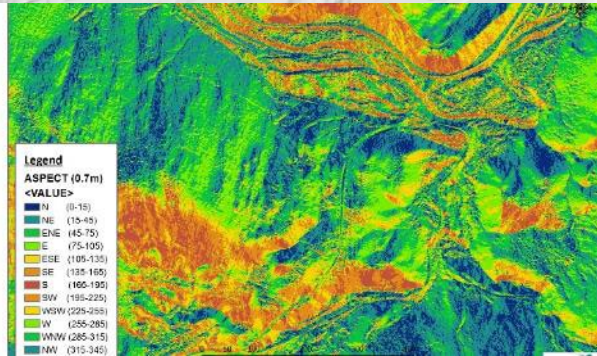
**DIGITAL ELEVATION MODEL (DEM)**



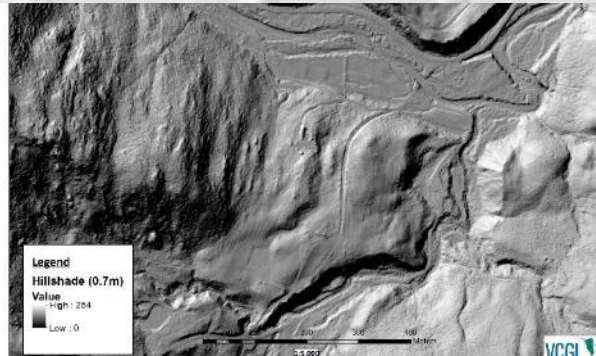
**DIGITAL SURFACE MODEL (DSM)**



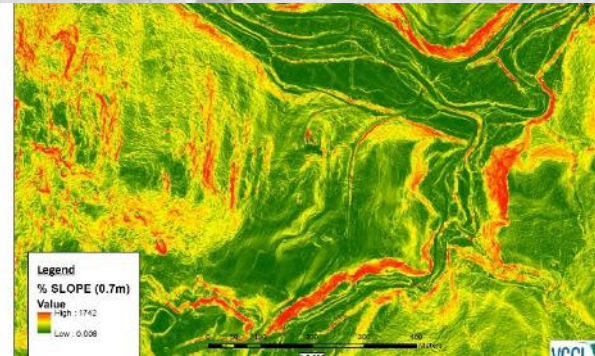
**NORMALIZED DSM (nDSM)**



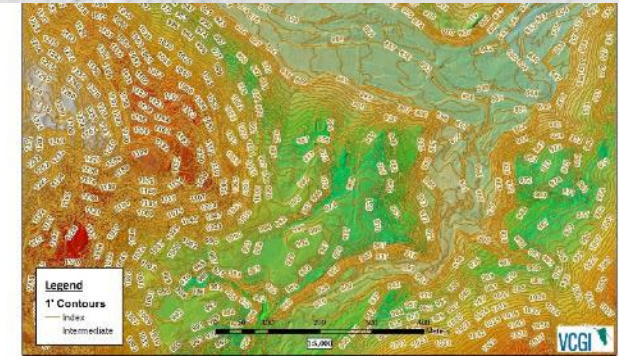
**ASPECT (AZIMUTH)**



**"BARE EARTH" HILLSHADE**



**SLOPE**

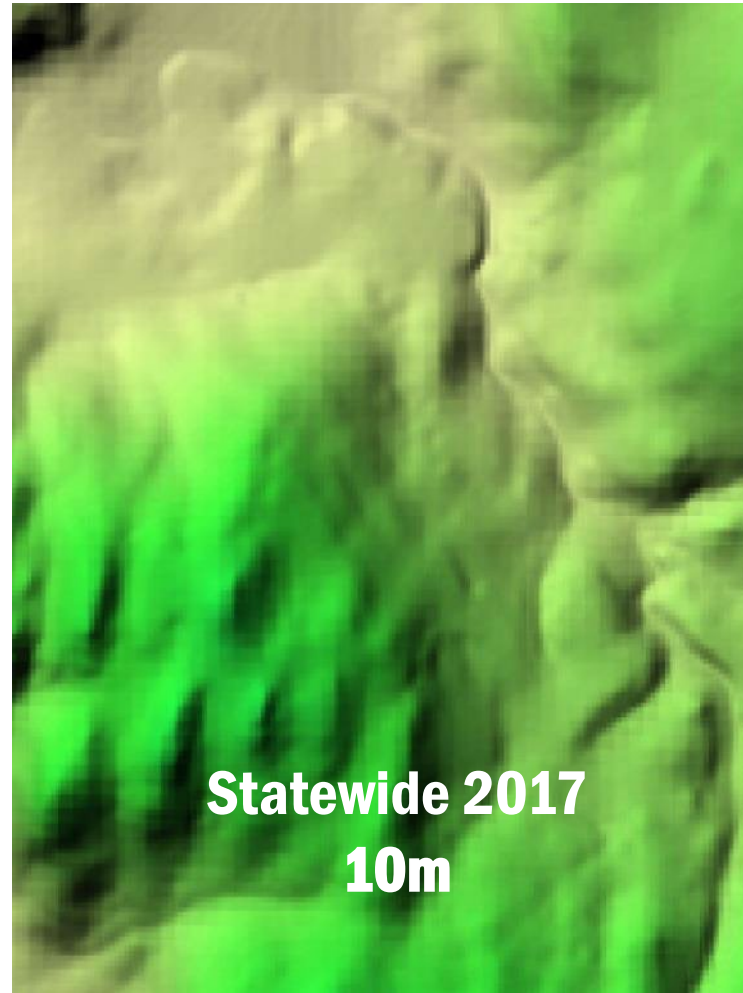
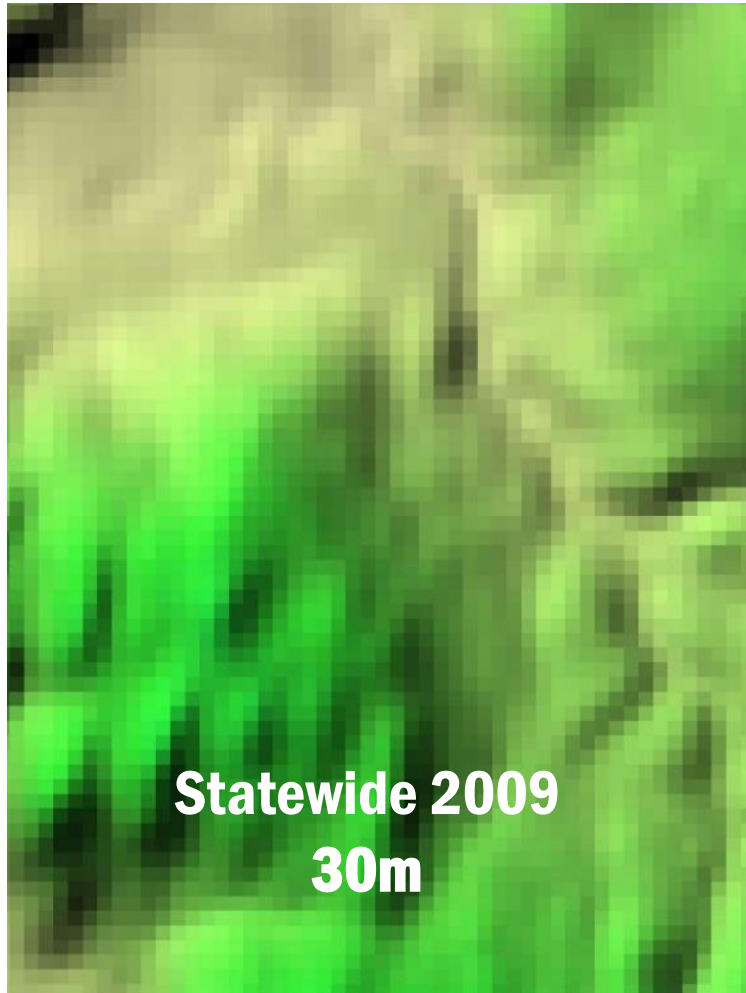


**1 FOOT CONTOURS**

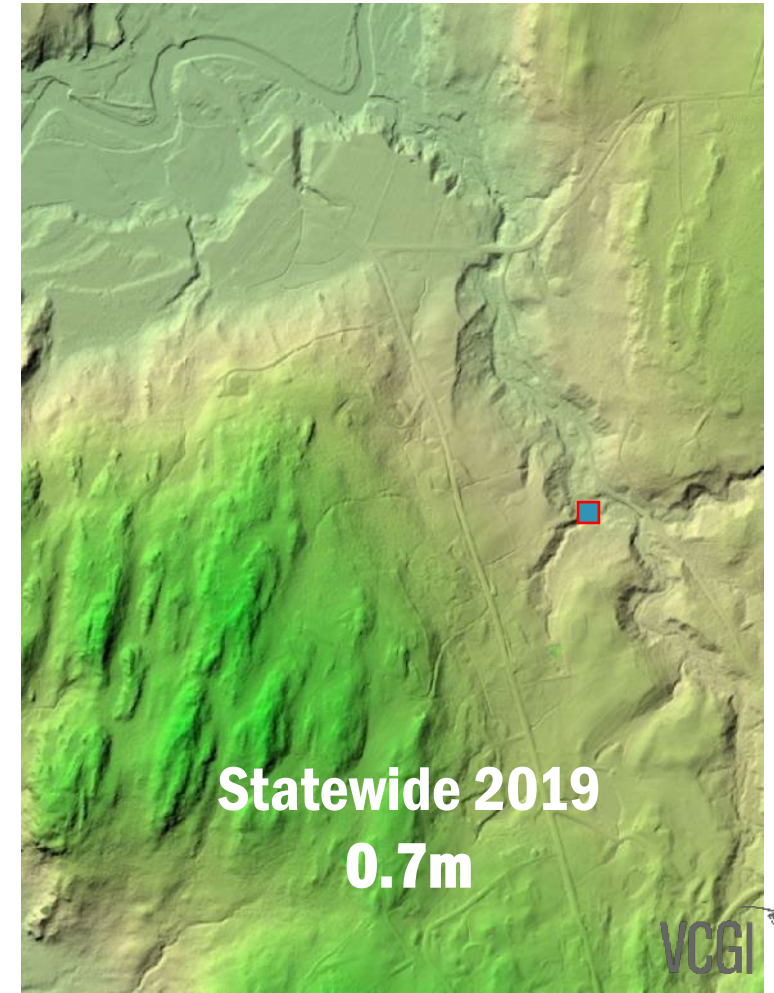


# Understanding Lidar Resolution

**National Elevation Dataset: Reported vertical accuracy= 8 ft.**

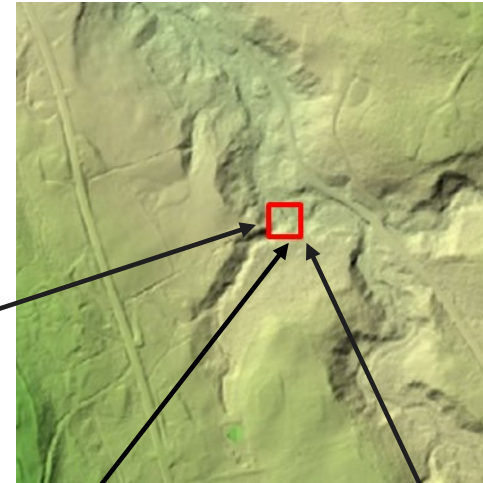


**LIDAR QL2: Vertical accuracy= 3.6 in.**





# Understanding Lidar Resolution



Cell size 9688 sq ft



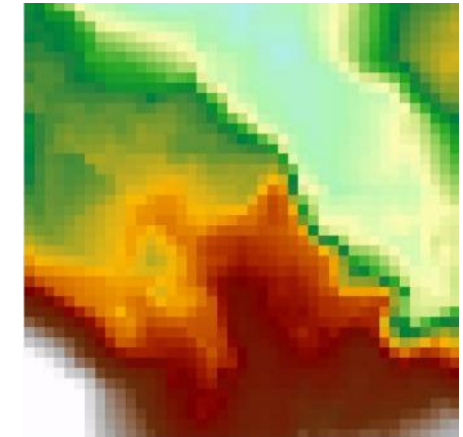
**2009  
30m DEM**

Cell size 1078 sq ft



**Statewide 2017  
10m DEM**

Cell size 5.27 sq ft

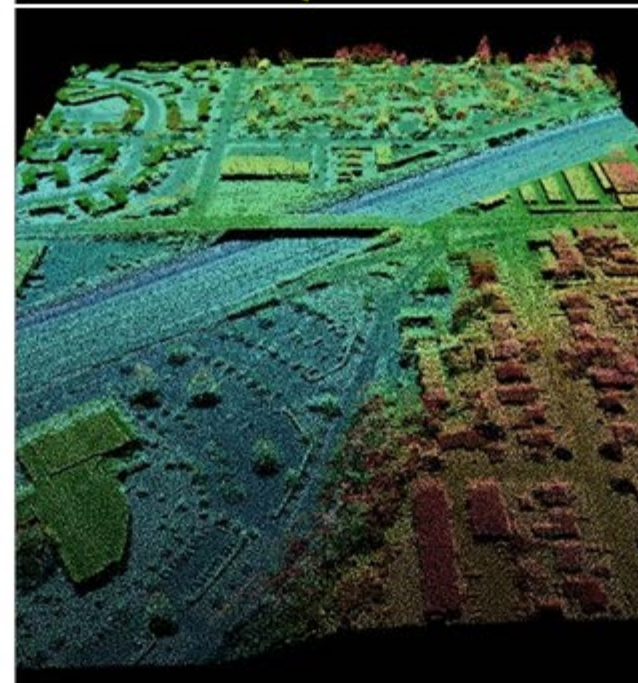
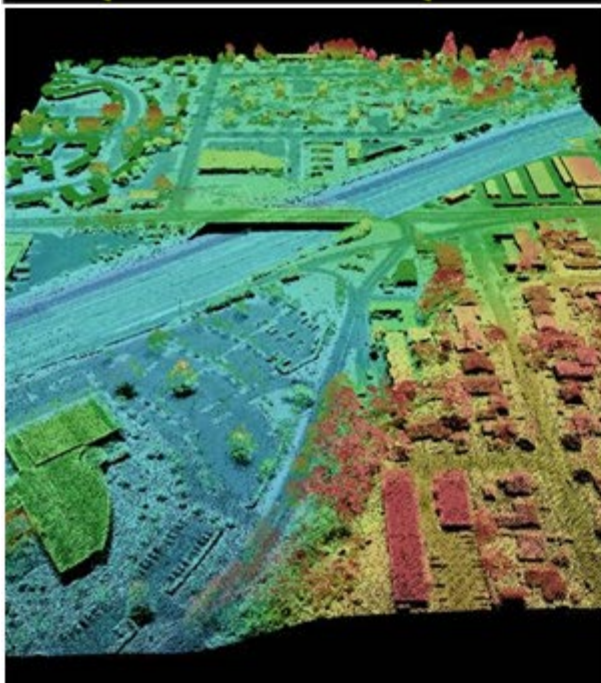
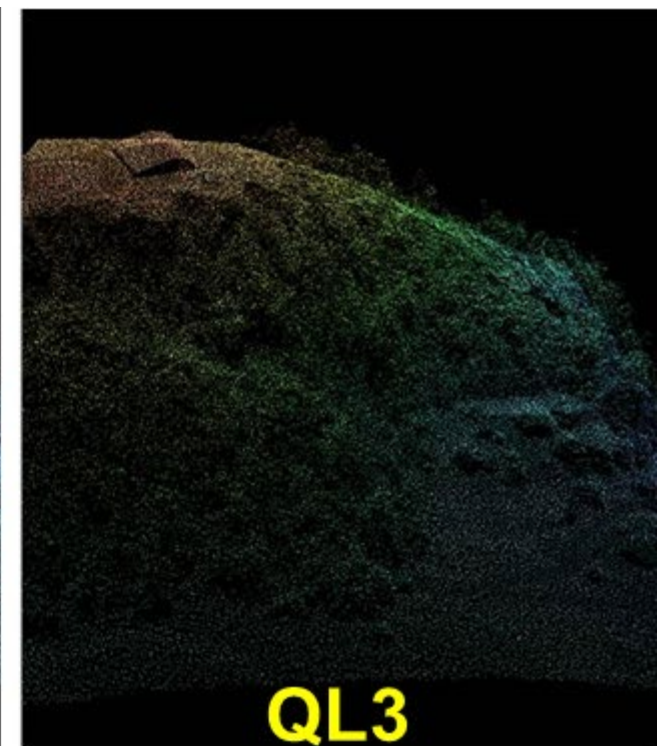
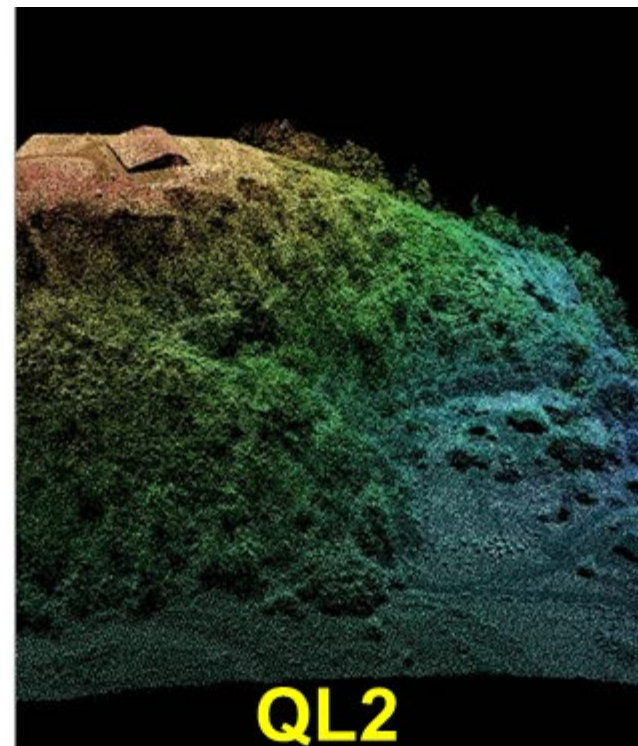
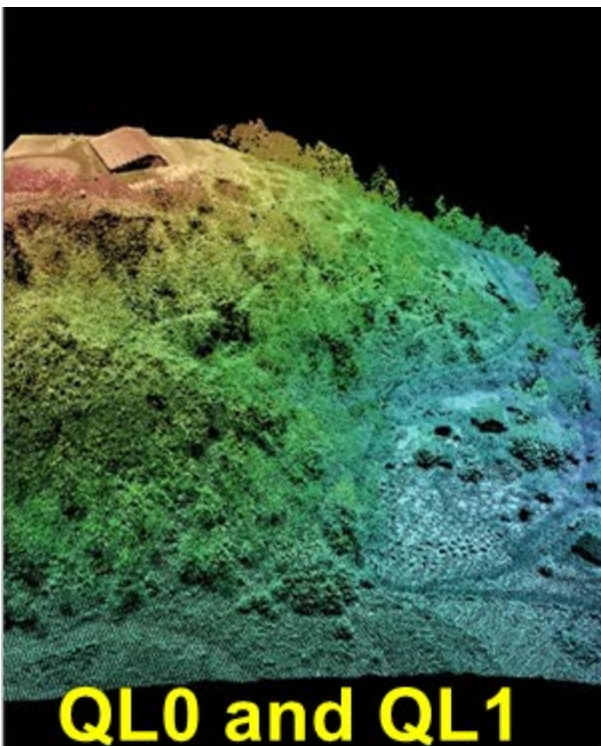


**2019  
0.7m DEM**

1836x more detail



# Understanding Lidar Resolution: What's Next?



Vermont Lidar Plan  
2023-2024  
Prepared and Overseen by the  
Vermont Center for Geographic Information

VERMONT  
LIDAR PARTNERSHIP



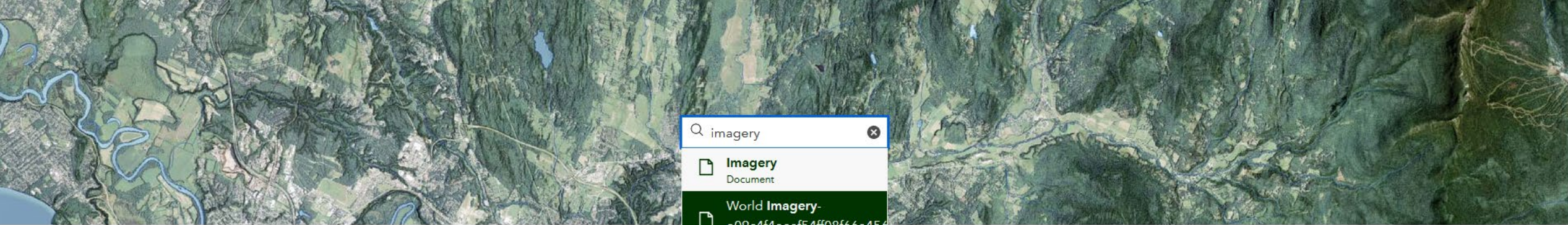
# Portal Pages

Imagery, Elevation, Parcels, Land Cover, etc.

STATE OF VERMONT

# Vermont Open Geodata Portal

[DATA](#) [WEB SERVICES](#) [APPLICATIONS](#) [DEVELOPERS](#) [CONTACT US](#) [HELP](#)



Search: imagery

- Imagery Document
- World Imagery - e09c4f4eeaf54ff08f66a456 Other

Search: near for location



Agriculture



Basemap



Boundaries



Climate



Demographic + Economic



Elevation



Environment



Geologic + Soils



Health + Public Safety



Imagery





# Imagery

Search, View, Download and Stream Georeferenced Vermont Orthoimagery

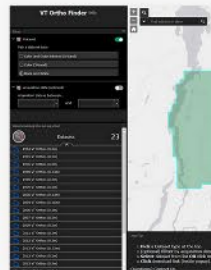
- Datasets
- Services
- Applications
- More Information

## Datasets

Download Georeferenced Orthoimagery

Imagery datasets are downloadable and contain the available georeferenced orthoimagery we have collected statewide to date.

Use the [Orthoimagery Finder](#) to search by map, navigate the extent of current acquisitions ([coverage overview map](#)), or select from all acquisitions in the data catalog table below.



### Vermont Orthoimagery Finder

The Ortho Finder allows you to search, view, and download the georeferenced orthoimagery we have available statewide through a map interface. Available imagery is searchable by type (color, color infrared, black and white), year, and extent. Poppups include links to download individual tiles from each collection, or batch download an entire collection as a .zip (caution: large file size).

[Launch Ortho Finder](#)

Search in table

Page 1 of 8

Year	Imagery	Type	Resolution	Tile Download Tool	Download Bundled Zip	Metadata
2021	2021 - NAIP Color Infrared Imagery - Statewide (0.6m)	Color, Color Infrared	0.6M	<a href="#">Download</a>	71.6Gb	<a href="#">Metadata</a>
2021	2021 - Color Imagery From Aerial Color-Infrared Cameras (0.3m)	Color, Color	0.3M	<a href="#">Download</a>	100Gb	<a href="#">Metadata</a>



# Elevation

Search, Find and Use Lidar-Derived Elevation Products


- Datasets
- Services
- Applications
- Documentation

## Datasets

Download Lidar-Derived Elevation Products

Datasets are downloadable and contain the available georeferenced lidar-derived elevation products we have collected statewide to date.

Use the Lidar Finder to search lidar-derived elevation data by map, or select from all acquisitions in the data catalog table below.



### Vermont Lidar Finder

The Lidar Finder allows you to search and download the available georeferenced lidar-derived elevation products we have collected statewide to date through a map interface. Available lidar products are searchable by type (e.g. aspect, digital elevation model, hillshade), quality level, year, and extent. Poppups include links to download individual tiles from each type, or batch download an entire dataset as a .zip (caution: large file size).

[Launch Lidar Finder](#)

Search in table

Page 1 of 5

Year	Product	Source	Resolution	Quality Level	Description	Download	Metadata
2017	Digital Elevation Model	Lidar	0.7m	QL2	Digital Elevation Model - hydro flattened derived from 2017 lidar data	<a href="#">Download</a>	<a href="#">Metadata</a>
2017	Aspect	Lidar	0.7m	QL2	Aspect derived from 2017 lidar data	<a href="#">Download</a>	<a href="#">Metadata</a>





# Parcels

Search, Find and View Available Vermont Parcel Data

## Datasets

These datasets are downloadable and contain the best available GIS parcel data we have received from each municipality to date.



Excerpt of Parcel Data

### Parcel Datasets

Vermont GIS parcel data is made available here as typically collected annually by municipalities. There are statewide datasets for parcel polygons and "inactive" parcel polygons (where available). A town by town extract of parcels is also available.

Choose which dataset you wish to use below:

[Parcel Polygons](#)

[Inactive Parcel Polygons](#)

[Parcel Data Status by Town](#)

[Parcels Available by Town](#)

## Map Services

Services stream spatial data to your machine via the internet. For an overview of how to connect to map services in desktop GIS software, [watch this video](#).



Excerpt of Parcel Data

### Parcel Map Services

Vermont parcel data are available as a statewide, web mercator service in two ways: a feature service and an OGC web feature service or WFS. The services contain both the active and inactive parcel polygon layers.

Both service types contain the same content and are updated at the same time.

Select a service to connect with below:

Web Mercator - Not Cached

[Endpoint](#)

[Overview](#)

Web Mercator - Not Cached - OGC Web Feature Service (WFS)

[Endpoint](#)

[Overview](#)



# STATE OF VERMONT Vermont Open Geodata Portal

- DATA
- WEB SERVICES
- APPLICATIONS
- DEVELOPERS
- CONTACT US
- HELP



## Land Cover

Search, Find and Use Land Cover Products

- Datasets
- Services
- Applications
- Documentation

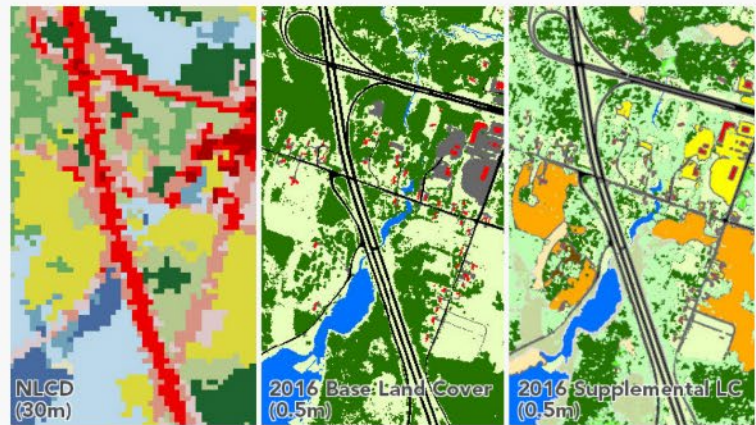
## Datasets

Download Land Cover Products

Vermont land cover data is available from two different efforts: the National Land Cover Database (NLCD) managed by the [Multi-Resolution Land Characteristics Consortium \(MRLC\)](#), and Vermont-specific land cover products created over the years.

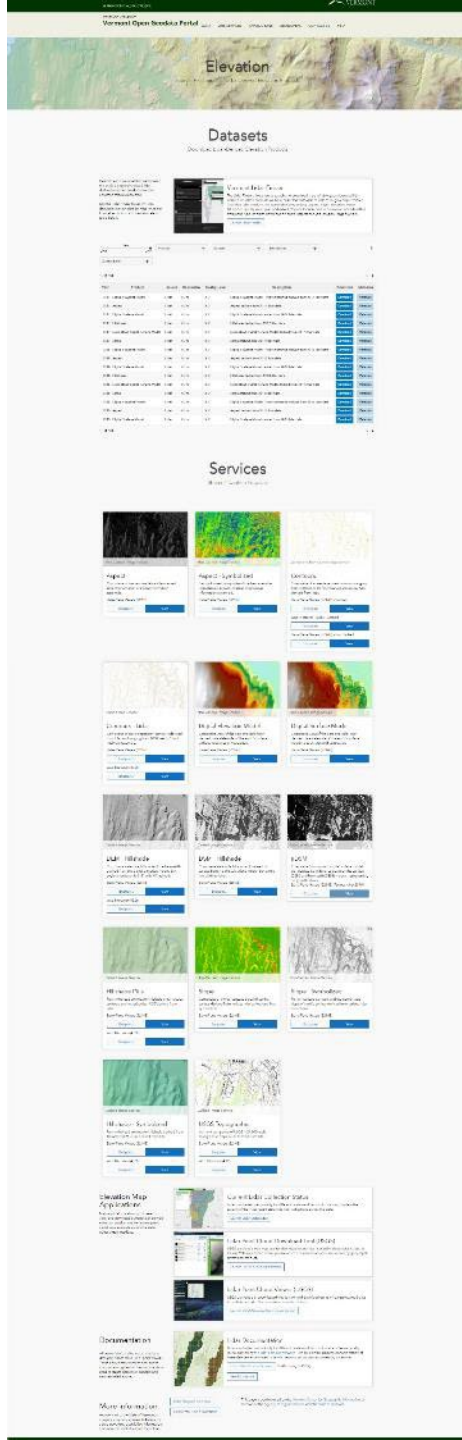
For Vermont-specific land cover products including the 2016 statewide 0.5 meter resolution set derived from a combination of 2013 - 2017 LiDAR and 2016 orthoimagery data ([see Report for details](#)), use the data download table below. Vermont specific land cover products are updated on an as-available basis.

For NLCD data at 30 meter resolution with editions every 2-3 years beginning in 2001, [see this page](#).




Resolution





Page Name/Content

Overview / Navigation

Data Downloads

Streaming Services

Related Applications

Documentation  
More Info

# **Access: Data Downloads**

Downloading data for local drive-based uses






Search in table

Page 1 of 8



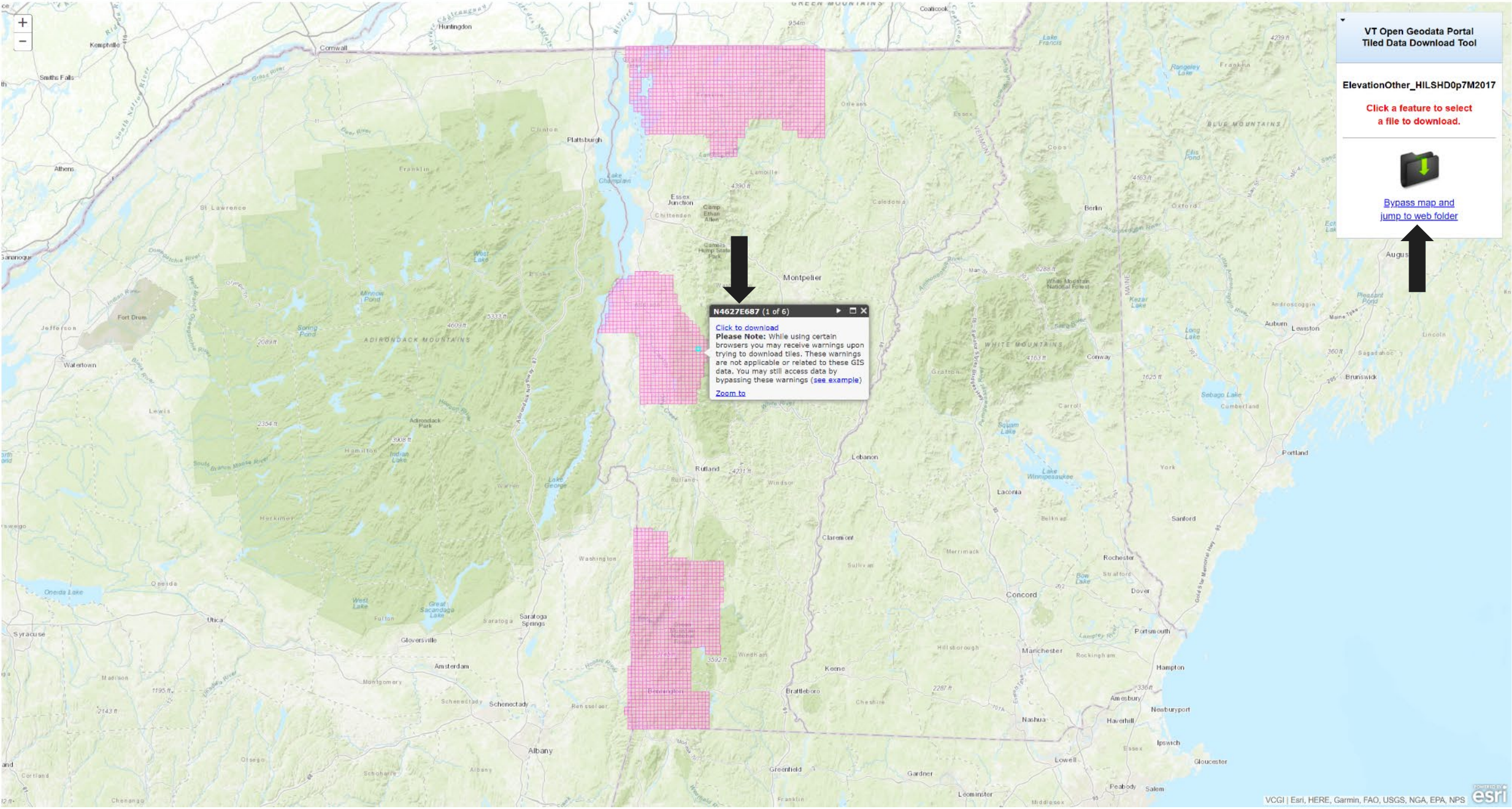
Year	Imagery	Type	Resolution	Tile Download Tool	Download Bundled Zip	Metadata
2021	2021 - NAIP Color Infrared Imagery - Statewide (0.6m)	Color, Color Infrared	0.6M	<a href="#">Download</a>	71.6Gb	<a href="#">Metadata</a>
2021	2021 - Color Imagery, Essex, Orleans, Caledonia Counties (0.3m)	Color, Color Infrared	0.3M	<a href="#">Download</a>	26Gb	<a href="#">Metadata</a>
2021	2021 - Black and White Imagery, Essex, Orleans, Caledonia Counties (0.3m)	Black and White	0.3M	<a href="#">Download</a>	8.8Gb	<a href="#">Metadata</a>
2020	2020 - Color Imagery, Bennington, Windham Counties (0.15m)	Color, Color Infrared	0.15M	<a href="#">Download</a>	4Gb	<a href="#">Metadata</a>
2020	2020 - Black and White Imagery, Bennington, Windham Counties (0.15m)	Black and White	0.15M	<a href="#">Download</a>	1Gb	<a href="#">Metadata</a>
2019	2019 - Black and White Imagery, Addison, Caledonia, Essex, Franklin, Lamoille, Orange, Orleans, Washington, Windsor Counties (0.15m)	Black and White	0.15M	<a href="#">Download</a>	1.07Gb	<a href="#">Metadata</a>
2019	2019 - Black and White Imagery, Bennington, Essex, Windham, Windsor Counties (0.3m)	Black and White	0.3M	<a href="#">Download</a>	2.91Gb	<a href="#">Metadata</a>
2019	2019 - Color Imagery, Addison, Caledonia, Essex, Franklin, Lamoille, Orange, Orleans, Washington, Windsor Counties (0.15m)	Color, Color Infrared	0.15M	<a href="#">Download</a>	4.28Gb	<a href="#">Metadata</a>
2019	2019 - Color Imagery, Bennington, Essex, Windham, Windsor Counties (0.3m)	Color, Color Infrared	0.3M	<a href="#">Download</a>	11.65Gb	<a href="#">Metadata</a>
2019	2019 - NAIP Color Infrared Imagery - portion of Vermont (0.6m)	Color, Color Infrared	0.6M	<a href="#">Download</a>	24.5Gb	<a href="#">Metadata</a>



Year	Product	Source	Resolution ▲	Quality Level	Description	Download	Metadata
Multiple	Contours	Lidar	0.7m	QL2	1' Contours derived from 2013 - 2017 QL2 lidar data - Non-Generalized - Statewide	<a href="#">Download</a>	<a href="#">Metadata</a>
Multiple	Contours	Lidar	0.7m	QL2	1' Contours derived from 2013 - 2017 QL2 lidar data - Generalized Using 0.1 meter Tolerance - Download by Municipality	<a href="#">Download</a>	<a href="#">Metadata</a>
Multiple	Contours	USGS	10m	N/A	VT 20' Contours generated from USGS 10 meter NED DEM	<a href="#">Download</a>	<a href="#">Metadata</a>
Multiple	Contours	Lidar	3.2m	QL4	10' Contours derived from lidar data - Chittenden	<a href="#">Download</a>	<a href="#">Metadata</a>
Multiple	Contours	USGS	30m	N/A	VT 100' Contours generated from USGS 30 meter NED DEM	<a href="#">Download</a>	<a href="#">Metadata</a>
Multiple	Contours	USGS	30m	N/A	VT 50' Contours generated from USGS 30 meter NED DEM	<a href="#">Download</a>	<a href="#">Metadata</a>

Created with [Datawrapper](#)





**VT Open Geodata Portal  
Tiled Data Download Tool**

**ElevationOther\_HILSHD0p7M2017**

**Click a feature to select  
a file to download.**



**[Bypass map and  
jump to web folder](#)**

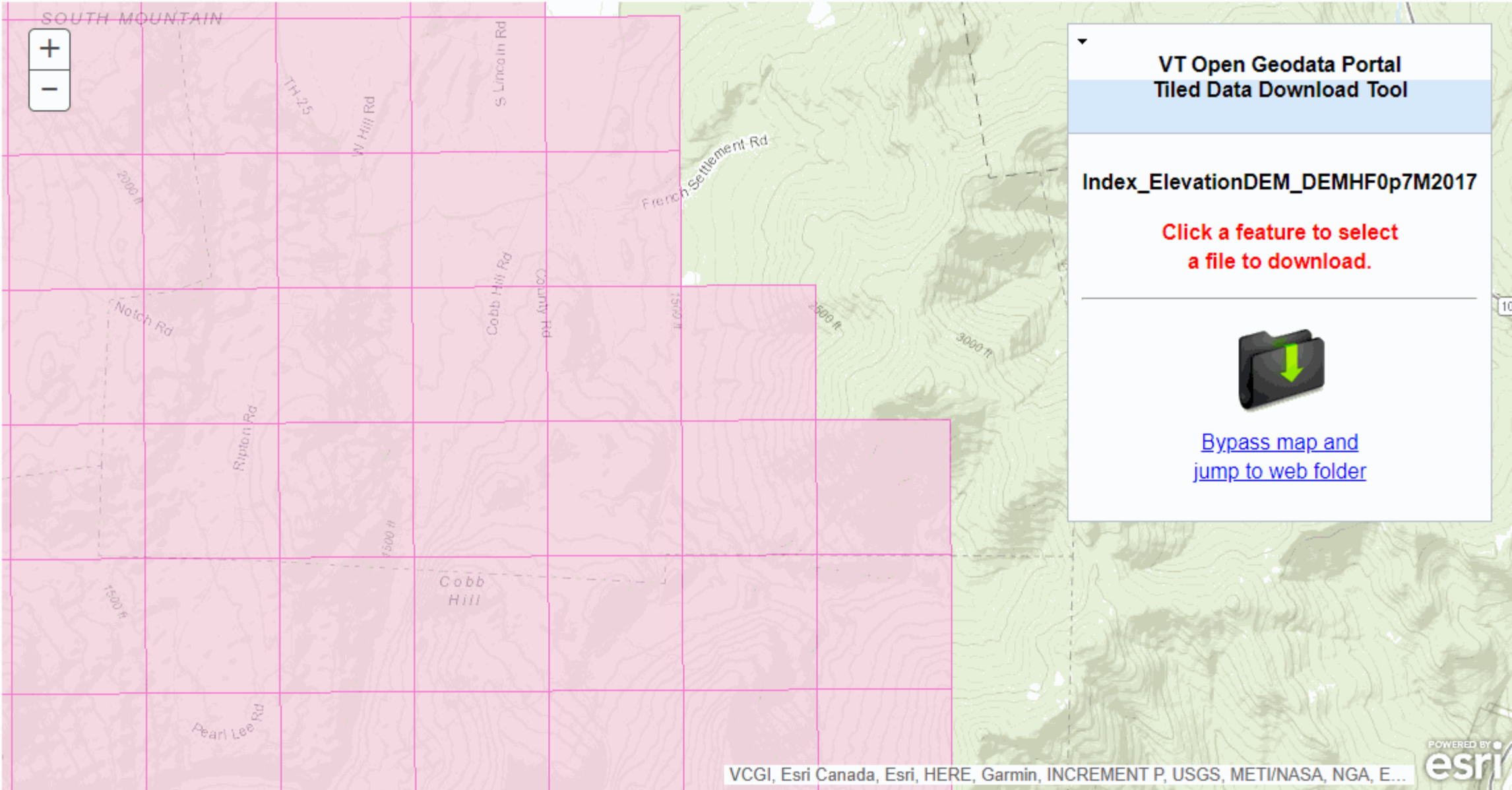
**N4627E687 (1 of 6)**

**Click to download**

**Please Note:** While using certain browsers you may receive warnings upon trying to download tiles. These warnings are not applicable or related to these GIS data. You may still access data by bypassing these warnings ([see example](#))

**[Zoom to](#)**






**VT Open Geodata Portal**  
**Tiled Data Download Tool**

---

**Index\_ElevationDEM\_DEMHF0p7M2017**

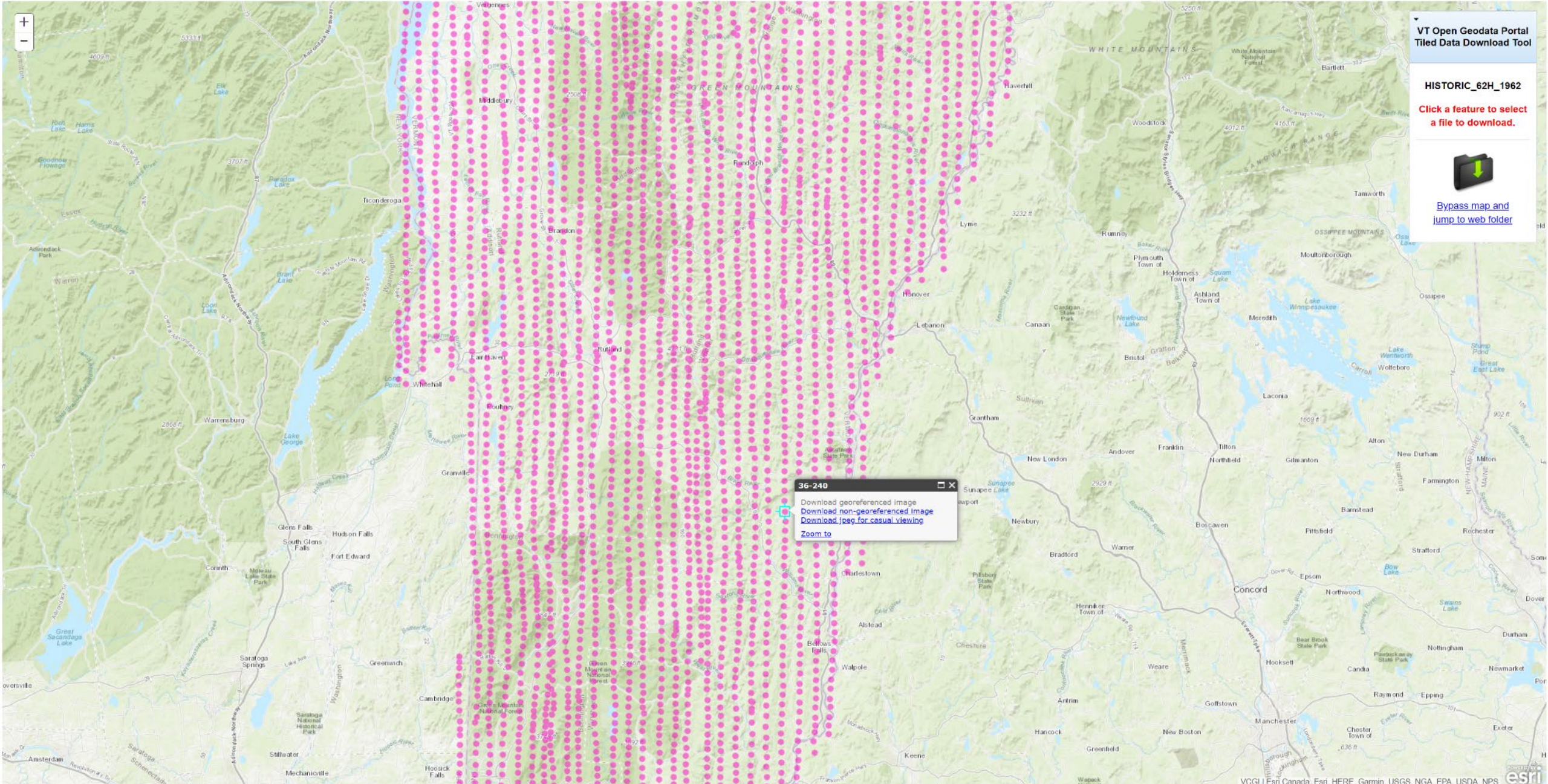
**Click a feature to select a file to download.**

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[Bypass map and jump to web folder](#)





VT Open Geodata Portal  
Tiled Data Download Tool

HISTORIC\_62H\_1962

Click a feature to select  
a file to download.



[Bypass map and  
jump to web folder](#)



11-9-62

VT-62-H 36-240







Search in Drive

- New
- Priority
- My Drive
- Shared drives
- Shared with me
- Recent
- Starred
- Trash
- Storage  
2.58 TB used

Geodata Portal > ... > 2017 Collection (0.7m - Western VT) > HILSHD



Name	Owner	Last modified	File size
Elevation_HILSHD0p7M2017_N5089E779.rrd	VCGI Data	May 7, 2019 me	854 KB
Elevation_HILSHD0p7M2017_N5089E779.img.xml	VCGI Data	May 7, 2019 me	1 KB
Elevation_HILSHD0p7M2017_N5089E779.img.vat.dbf	VCGI Data	May 7, 2019 me	8 KB
Elevation_HILSHD0p7M2017_N5089E779.img.aux.xml	VCGI Data	May 7, 2019 me	2 KB
Elevation_HILSHD0p7M2017_N5089E779.img	VCGI Data	May 7, 2019 me	2.4 MB
Elevation_HILSHD0p7M2017_N5089E765.rrd	VCGI Data	May 7, 2019 me	857 KB
Elevation_HILSHD0p7M2017_N5089E765.img.xml	VCGI Data	May 7, 2019 me	1 KB
Elevation_HILSHD0p7M2017_N5089E765.img.vat.dbf	VCGI Data	May 7, 2019 me	8 KB
Elevation_HILSHD0p7M2017_N5089E765.img.aux.xml	VCGI Data	May 7, 2019 me	2 KB
Elevation_HILSHD0p7M2017_N5089E765.img	VCGI Data	May 7, 2019 me	2.4 MB
Elevation_HILSHD0p7M2017_N5089E751.rrd	VCGI Data	May 7, 2019 me	857 KB
Elevation_HILSHD0p7M2017_N5089E751.img.xml	VCGI Data	May 7, 2019 me	1 KB
Elevation_HILSHD0p7M2017_N5089E751.img.vat.dbf	VCGI Data	May 7, 2019 me	8 KB
Elevation_HILSHD0p7M2017_N5089E751.img.aux.xml	VCGI Data	May 7, 2019 me	2 KB
Elevation_HILSHD0p7M2017_N5089E751.img	VCGI Data	May 7, 2019 me	2.4 MB
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Elevation_HILSHD0p7M2017_N5089E737.img.vat.dbf	VCGI Data	May 7, 2019 me	8 KB
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# Access: Web Services

Streaming data for internet-connected streamlined uses

# Web Services

Find web map services that allow you to stream basemaps, imagery, lidar, and other information directly into your web map or GIS desktop app.

**Popular Services:** [Best of Color](#) and [Black and White Imagery](#) | [Hillshade + Contours](#) | [Parcels](#)



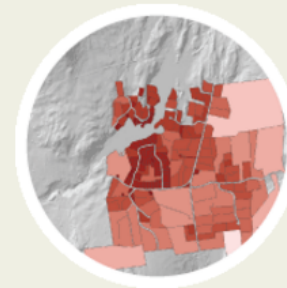
## Imagery Services

Aerial Photos



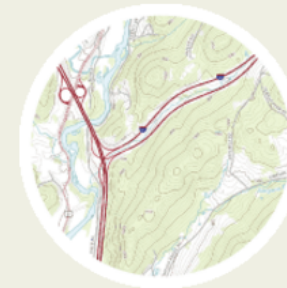
## Elevation Services

DEMs, Contours, and Lidar



## Parcel Map Services

Municipal Parcel Boundaries



## More Services

Basemaps, Geocoding, etc.

**Life Cycle Policies:** [VCGI Policy](#) | [ANR Policy](#)





STATE OF VERMONT  
**Vermont Open Geodata Portal**

Services stream spatial data to your machine via the internet. Select from statewide "best of" imagery services to the right, or from all available imagery services via the catalog below.

For an overview of how to connect to map services in desktop GIS software, [watch this video](#).



Cached Image Service

### Best of Color

Composite of the best available (most recent, highest resolution) color orthoimagery statewide.

State Plane Meters (32145)

[Endpoint](#) [View](#)

Web Mercator (4326)

[Endpoint](#) [View](#)



Cached Image Service

### Best of Color Infrared

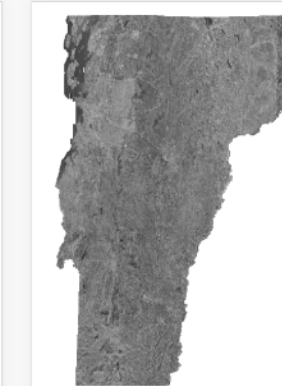
Composite of the best available (most recent, highest resolution) color infrared orthoimagery statewide.

State Plane Meters (32145)

[Endpoint](#) [View](#)

Web Mercator (4326)

[Endpoint](#) [View](#)



Cached Image Service

### Best of Black & White

Composite of the best available (most recent, highest resolution) black and white orthoimagery statewide.

State Plane Meters (32145)

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Web Mercator (4326)

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Collection / Year	Type	Service	SP Service	WM Service
All Imagery	Color	Service - MISC All Color Imagery and Indexes (mixed resolution), Not Cached - SP	<a href="#">State Plane</a>	<a href="#">Web Mercator</a>
All Imagery	Color Infrared	Service - MISC All Color Infrared Imagery and Indexes (mixed resolution), Not Cached - SP	<a href="#">State Plane</a>	<a href="#">Web Mercator</a>
All Imagery	Black and White	Service - VTORTHO All Black and White Imagery and Indexes (mixed resolution), Not Cached - SP	<a href="#">State Plane</a>	<a href="#">Web Mercator</a>
Best of Imagery	Black and White	Best of Black and White Imagery, Cached	<a href="#">State Plane</a>	<a href="#">Web Mercator</a>
Best of Imagery	Color	Best of Color Imagery, Cached	<a href="#">State Plane</a>	<a href="#">Web Mercator</a>
Best of Imagery	Color Infrared	Best of Color Infrared Imagery, Cached	<a href="#">State Plane</a>	<a href="#">Web Mercator</a>
VT 2016	Color	Color Orthos 2016, Cached	<a href="#">State Plane</a>	<a href="#">Web Mercator</a>

REST Endpoint: Fancy name for where online a streamable data layer lives. Each accessible by a unique URL.

Why stream?

- Always latest/greatest data
- No need to download, size savings
- Performance for referencing tasks

[https://maps.vcgi.vermont.gov/arcgis/rest/services/EGC\\_services](https://maps.vcgi.vermont.gov/arcgis/rest/services/EGC_services)

ArcGIS REST Services Directory

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JSON | SOAP

**Folder: EGC\_services**

**Current Version: 10.91**

**View Footprints In:** [ArcGIS Online Map Viewer](#)

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- [EGC\\_services/GCS\\_E911\\_ESITE\\_SP](#) (GeocodeServer)
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# STATE OF VERMONT Vermont Open Geodata Portal

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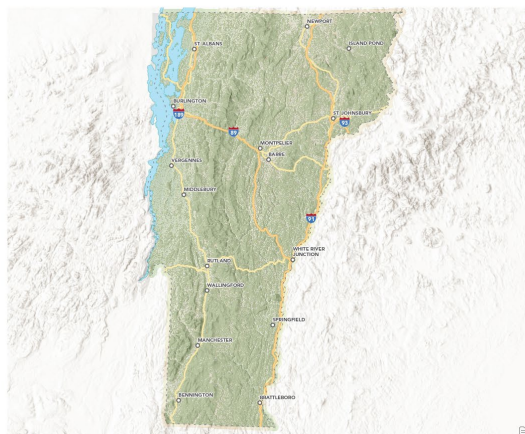
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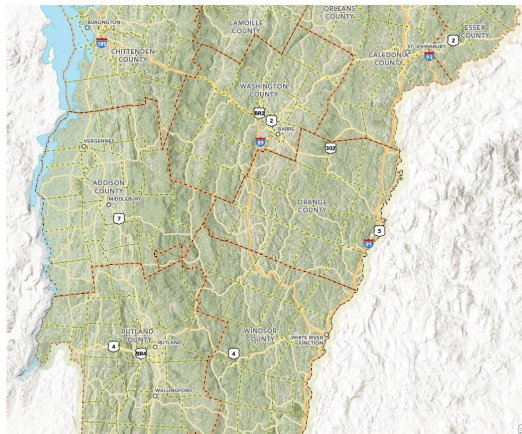
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- Open in ArcGIS Online**  
Select to open in a new tab



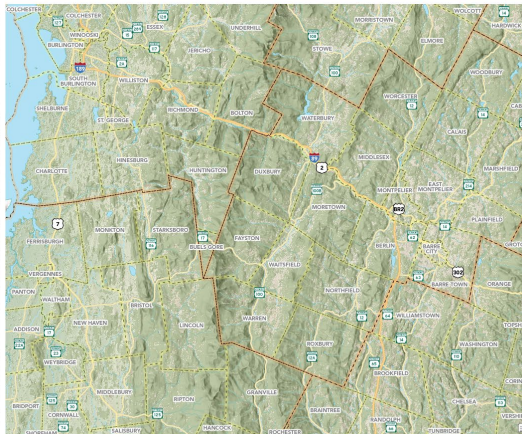




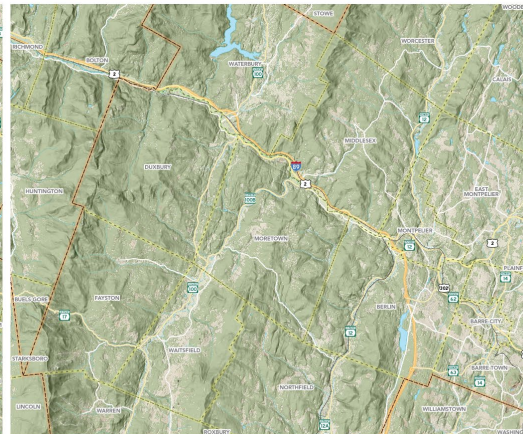
Level 9  
1:1,155,581



Level 10  
1:577,790



Level 11 (Bpt Towns)  
1:288,895



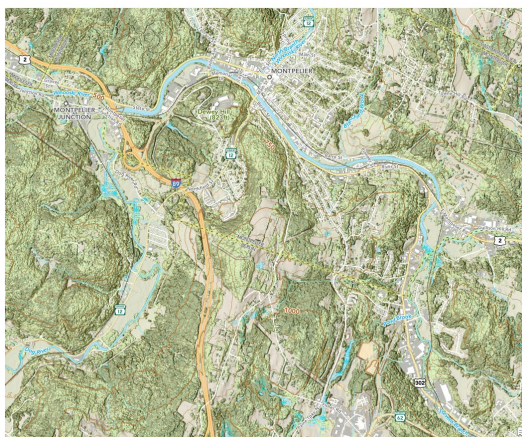
Level 12  
1:144,447



Level 13  
1:72,223



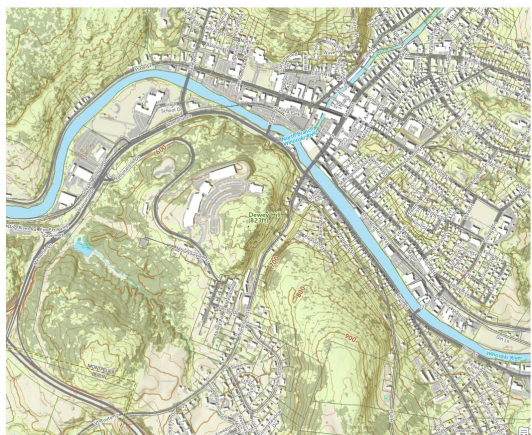
Level 14  
1:36,112



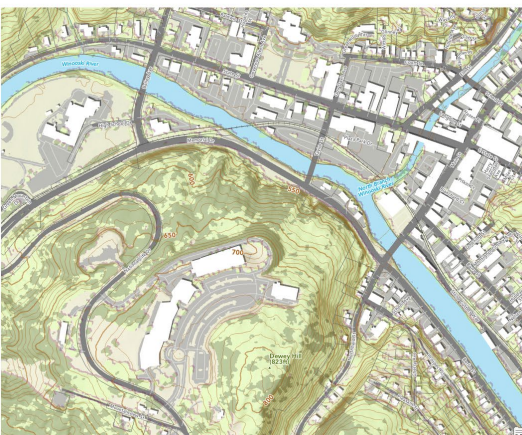
1:24,000



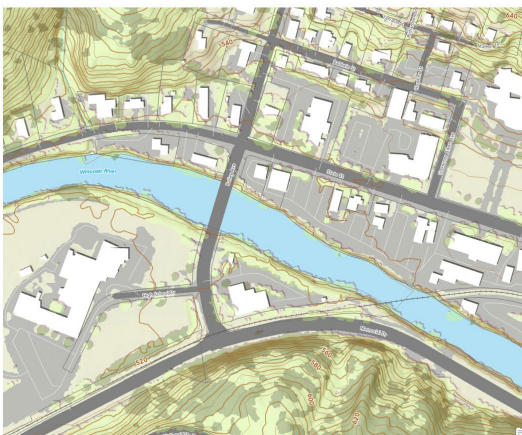
Level 15  
1:18,055



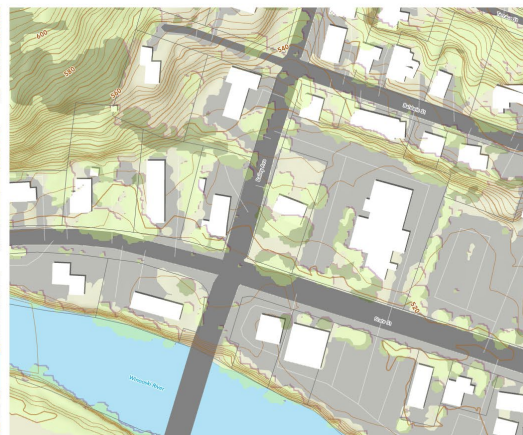
Level 16  
1:9,027



Level 17  
1:4,513



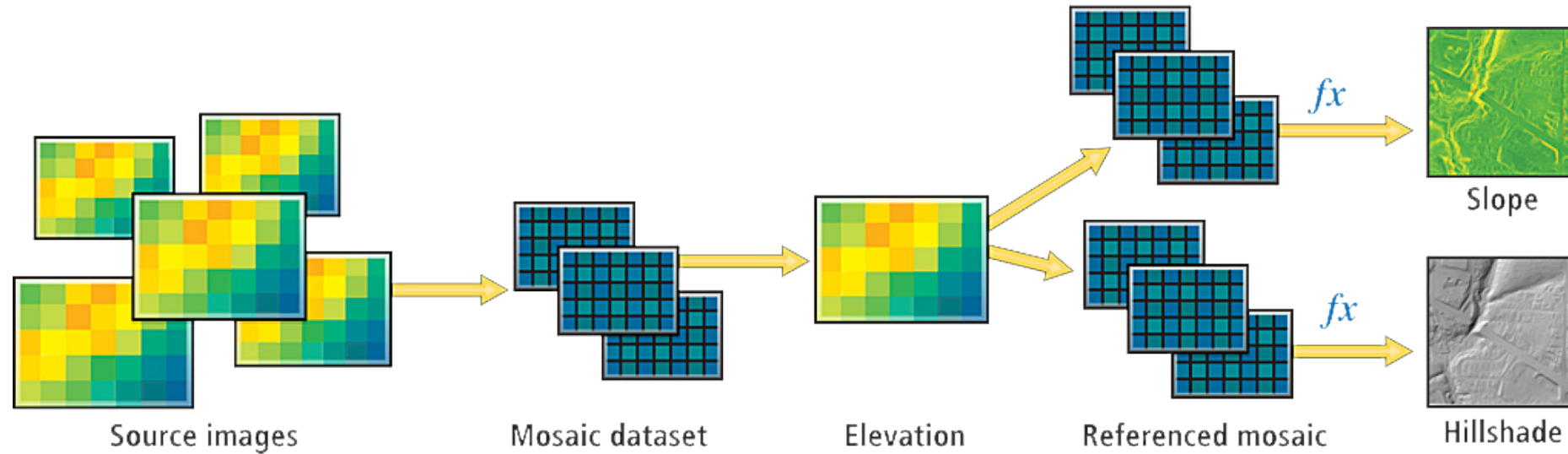
Level 18  
1:2,256



Level 19  
1:1,128



# Mosaic Datasets



## Mosaics:

DEM (last returns)

DSM (first returns)

nDSM (DSM-DEM; height of feature)

## Referenced Mosaics:

ASPECT

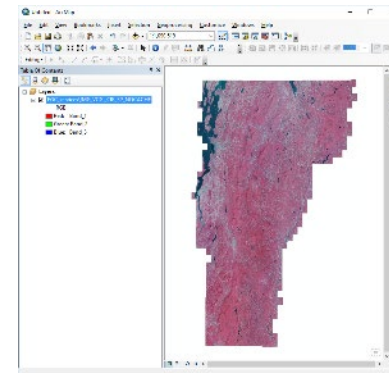
HILLSHADE

SLOPE

# Types of geospatial web services

ESRI

- **Map Services** = access map data via web
- **Image Services** = access to raster data w/ pixel properties
- **Feature Services** = access to vector data w/ attributes
- **Geoprocessing Services** = perform geoprocessing task
- **Geocoding Services** = find addresses on a map
- **Etc...**

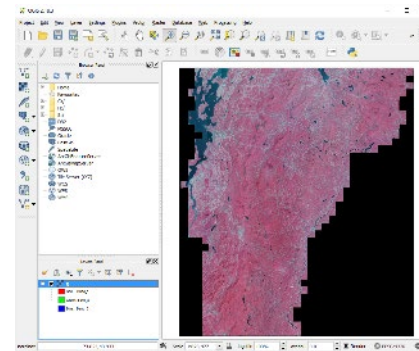




# Types of geospatial web services

OGC -> Open Geospatial Consortium (e.g., for use in QGIS)

- **WMS** = Web Map Service (like an Esri Map Service)
- **WCS** = Web Coverage Service (like an Esri Image Service)
- **WFS** = Web Feature Service (like an Esri Feature Service)
- **WPS** = Web Processing Service (like an Esri Geoprocessing Service)



# Finding services



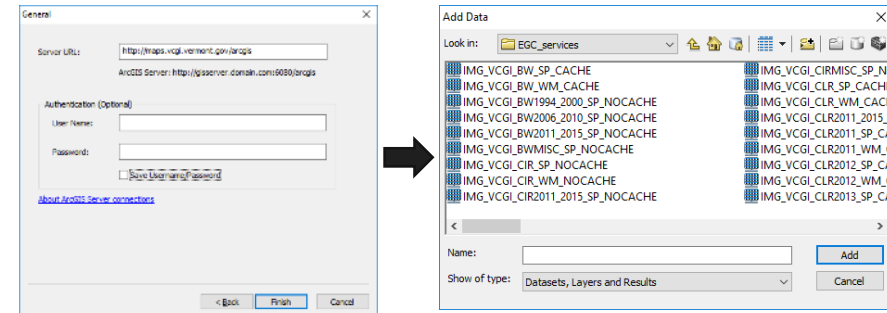
## Geodata Portal

- [Web Services section](#)
- Item page



## ArcGIS Desktop

- Add “ArcGIS Server” connection



## REST endpoint

- [http://maps.vcgl.vermont.gov/arcgis/rest/services/EGC\\_services](http://maps.vcgl.vermont.gov/arcgis/rest/services/EGC_services)





STATE OF VERMONT  
**Vermont Open Geodata Portal**

- DATA
- WEB SERVICES
- APPLICATIONS
- DEVELOPERS
- CONTACT US
- HELP

Services stream spatial data to your machine via the internet. Select from statewide "best of" imagery services to the right, or from all available imagery services via the catalog below.

For an overview of how to connect to map services in desktop GIS software, watch [this video](#).



Cached Image Service

### Best of Color

Composite of the best available (most recent, highest resolution) color orthoimagery statewide.

State Plane Meters (32145)

[Endpoint](#) [View](#)

Web Mercator (4326)

[Endpoint](#) [View](#)



Cached Image Service

### Best of Color Infrared

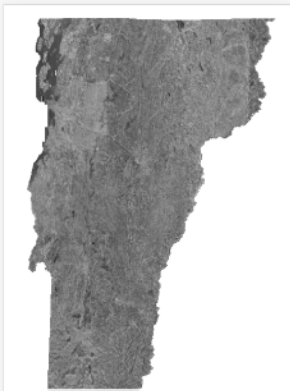
Composite of the best available (most recent, highest resolution) color infrared orthoimagery statewide.

State Plane Meters (32145)

[Endpoint](#) [View](#)

Web Mercator (4326)

[Endpoint](#) [View](#)



Cached Image Service

### Best of Black & White

Composite of the best available (most recent, highest resolution) black and white orthoimagery statewide.

State Plane Meters (32145)

[Endpoint](#) [View](#)

Web Mercator (4326)

[Endpoint](#) [View](#)

Search in table

Page 1 of 3

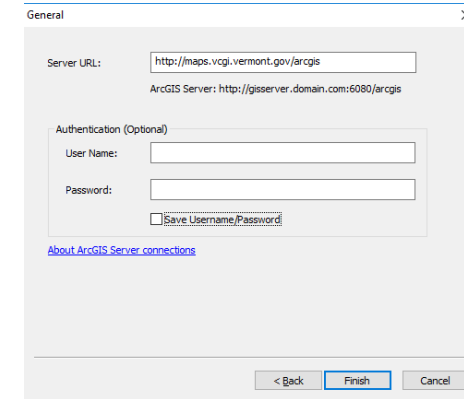
Collection / Year	Type	Service	SP Service	WM Service
All Imagery	Color	Service - MISC All Color Imagery and Indexes (mixed resolution), Not Cached - SP	<a href="#">State Plane</a>	<a href="#">Web Mercator</a>
All Imagery	Color Infrared	Service - MISC All Color Infrared Imagery and Indexes (mixed resolution), Not Cached - SP	<a href="#">State Plane</a>	<a href="#">Web Mercator</a>
All Imagery	Black and White	Service - VTORTHO All Black and White Imagery and Indexes (mixed resolution), Not Cached - SP	<a href="#">State Plane</a>	<a href="#">Web Mercator</a>
Best of Imagery	Black and White	Best of Black and White Imagery, Cached	<a href="#">State Plane</a>	<a href="#">Web Mercator</a>
Best of Imagery	Color	Best of Color Imagery, Cached	<a href="#">State Plane</a>	<a href="#">Web Mercator</a>
Best of Imagery	Color Infrared	Best of Color Infrared Imagery, Cached	<a href="#">State Plane</a>	<a href="#">Web Mercator</a>
VT 2016	Color	Color Orthos 2016, Cached	<a href="#">State Plane</a>	<a href="#">Web Mercator</a>

Imagery Page:  
[Services List](#)

# Using in Arcgis (ArcMap...going the way of the dodo!)

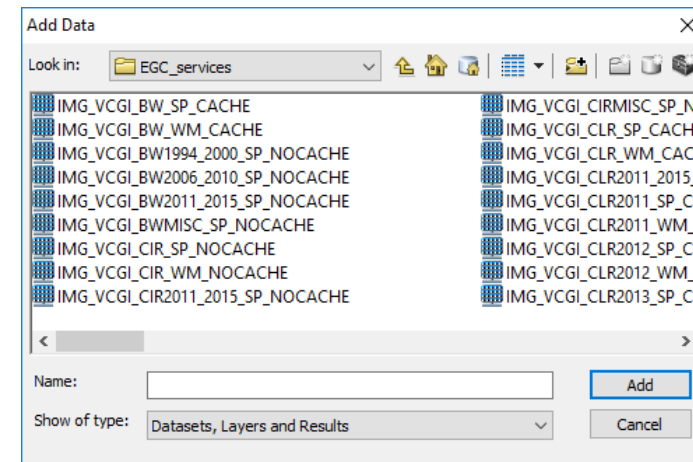
## Add Connection to VCGI Web Services

- ArcMap → Add Data → GIS Servers → Add ArcGIS Server
- <http://maps.vcgi.vermont.gov/arcgis>



## Browse ./EGC\_services folder

- [Add “ArcGIS Server” connection](#)





Project Map Insert Analysis View Edit Imagery Share

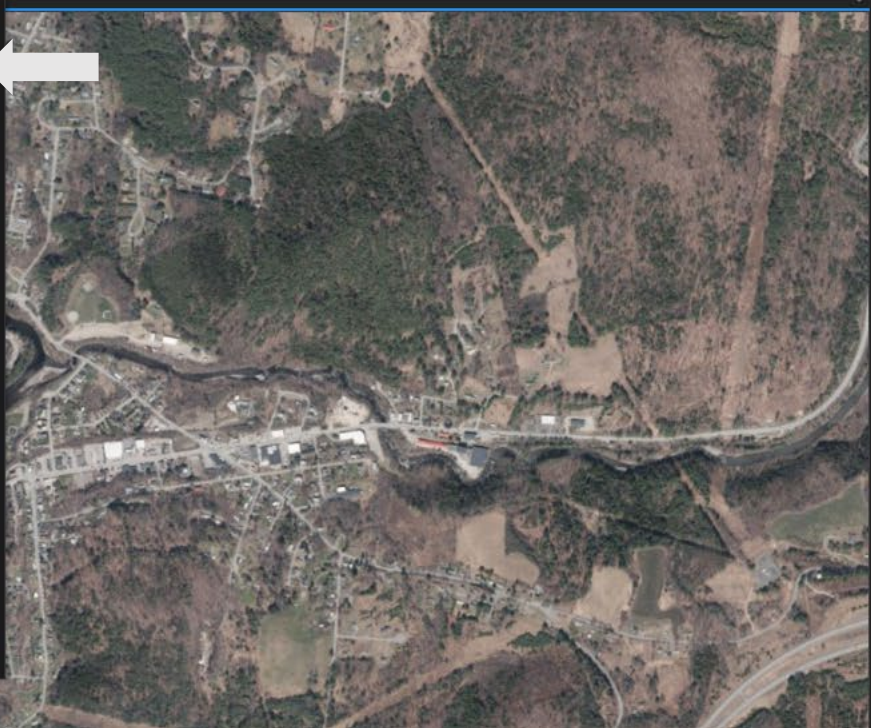
Clipboard: Paste, Copy, Copy Path  
Navigate: Explore, Bookmarks, Go To XY  
Imagery: Add Preset, Add Graphics Layer, Add Data

Selection: Select, Select By Attributes, Select By Location  
Inquiry: Measure, Locate, Infographics, Coordinate Conversion  
Labeling: Pause, Lock, View Unplaced, More  
Offline: Convert, Download Map, Sync, Remove

Contents

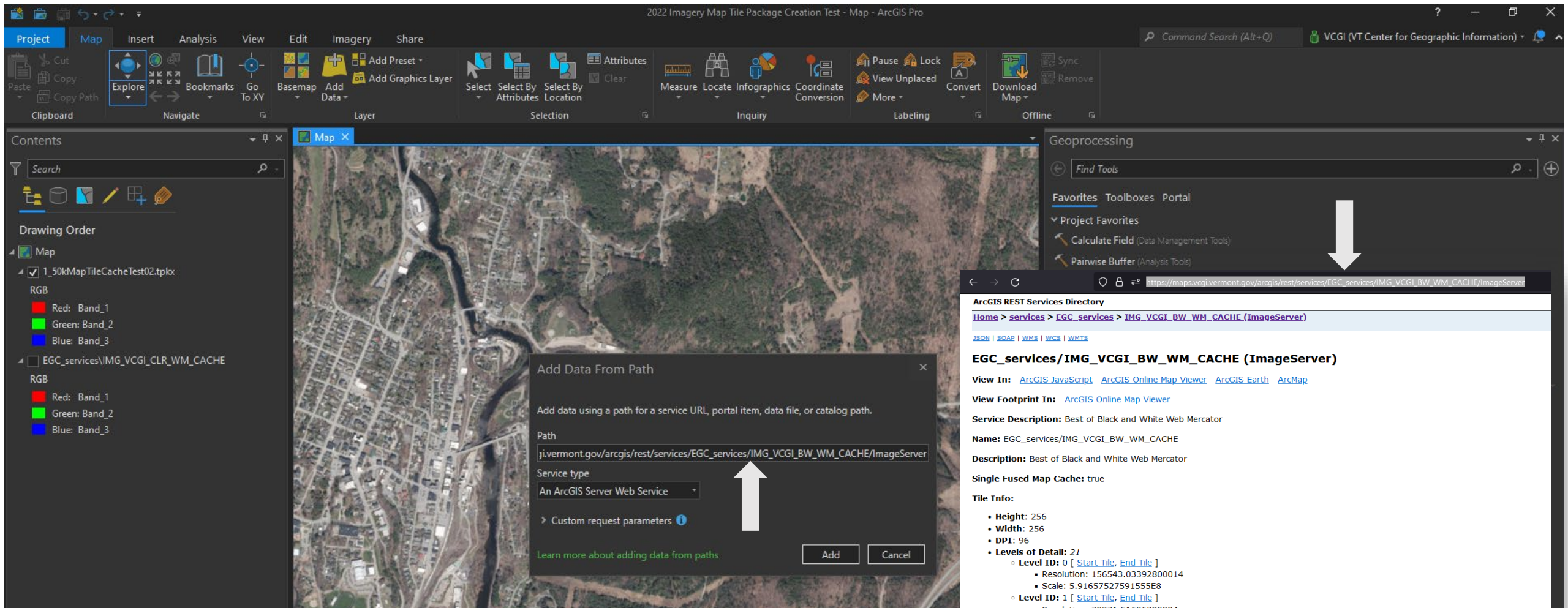
Search  
Drawing Order  
Map  
1\_50kMapTileCacheTest02.tpkx  
RGB  
Red: Band\_1  
Green: Band\_2  
Blue: Band\_3  
EGC\_services\IMG\_VCGI\_CLR\_WM\_CACHE  
RGB  
Red: Band\_1  
Green: Band\_2  
Blue: Band\_3

- Data  
Add data to the map.
- Data From Path  
Add data using a local path or URL.
- XY Point Data  
Add x,y point data to the map.
- Route Events  
Add route event layer to the map.
- Query Layer  
Add query layer to the map.
- Address and Place Layer  
Convert a table to places on the map.
- Multidimensional Raster Layer  
Add multidimensional raster layer to the map.
- Elevation Source  
Add an elevation source to the ground.
- Extract Locations  
Add data extracted from documents to a map



Geoprocessing

Find Tools  
Favorites Toolboxes Portal  
Project Favorites  
Calculate Field (Data Management Tools)  
Pairwise Buffer (Analysis Tools)  
Near (Analysis Tools)  
Pairwise Dissolve (Analysis Tools)  
Spatial Join (Analysis Tools)  
Pairwise Intersect (Analysis Tools)  
Recent  
Create Map Tile Package (Data Management Tools)



**Add Data From Path**

Add data using a path for a service URL, portal item, data file, or catalog path.

Path  
ji.vermont.gov/arcgis/rest/services/EGC\_services/IMG\_VCGI\_BW\_WM\_CACHE/ImageServer

Service type  
An ArcGIS Server Web Service

> Custom request parameters ⓘ

[Learn more about adding data from paths](#)

Add Cancel

https://maps.vcgi.vermont.gov/arcgis/rest/services/EGC\_services/IMG\_VCGI\_BW\_WM\_CACHE/ImageServer

**ArcGIS REST Services Directory**

Home > services > EGC\_services > IMG\_VCGI\_BW\_WM\_CACHE (ImageServer)

[JSON](#) | [SOAP](#) | [WMS](#) | [WCS](#) | [WMTS](#)

**EGC\_services/IMG\_VCGI\_BW\_WM\_CACHE (ImageServer)**

View In: [ArcGIS JavaScript](#) [ArcGIS Online Map Viewer](#) [ArcGIS Earth](#) [ArcMap](#)

View Footprint In: [ArcGIS Online Map Viewer](#)

**Service Description:** Best of Black and White Web Mercator

**Name:** EGC\_services/IMG\_VCGI\_BW\_WM\_CACHE

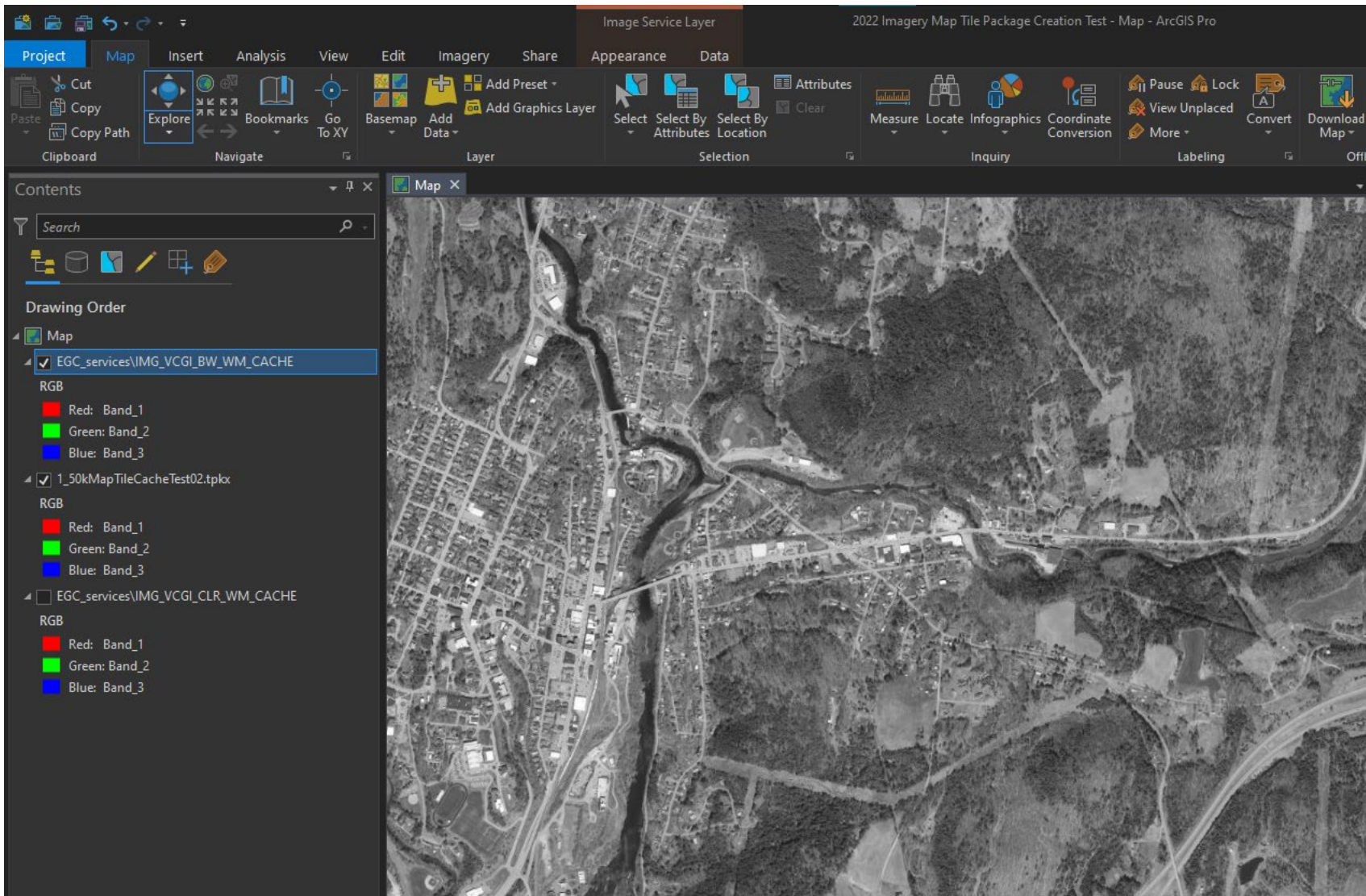
**Description:** Best of Black and White Web Mercator

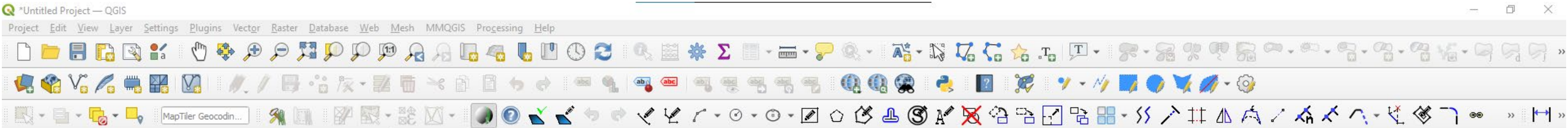
**Single Fused Map Cache:** true

**Tile Info:**

- **Height:** 256
- **Width:** 256
- **DPI:** 96
- **Levels of Detail:** 21
  - **Level ID:** 0 [ [Start Tile](#), [End Tile](#) ]
    - Resolution: 156543.03392800014
    - Scale: 5.91657527591555E8
  - **Level ID:** 1 [ [Start Tile](#), [End Tile](#) ]
    - Resolution: 78271.51696399994
    - Scale: 2.95828763795777E8
  - **Level ID:** 2 [ [Start Tile](#), [End Tile](#) ]
    - Resolution: 39135.75848200009
    - Scale: 1.47914381897889E8
  - **Level ID:** 3 [ [Start Tile](#), [End Tile](#) ]
    - Resolution: 19567.87924099992
    - Scale: 7.3957190948944E7
  - **Level ID:** 4 [ [Start Tile](#), [End Tile](#) ]
    - Resolution: 9783.93962049996
    - Scale: 3.6978595474472E7
  - **Level ID:** 5 [ [Start Tile](#), [End Tile](#) ]
    - Resolution: 4891.96981024998
    - Scale: 1.8489297737236E7
  - **Level ID:** 6 [ [Start Tile](#), [End Tile](#) ]
    - Resolution: 2445.98490512499







**Browser**

- Favorites
- Spatial Bookmarks
- Home
- C:\
- GeoPackage
- SpatialLite
- PostGIS
- SAP HANA
- MSSQL
- Oracle
- ArcGIS REST Servers
  - FS\_VCGI\_VTPARCELS\_WM\_NOCACHE\_v2 (FeatureServer)
- GeoNode
- MapTiler
- WMS/WMTS
  - IMG\_VCGI\_LIDARHILLSHD\_SP\_CACHE\_v1
  - IMG\_VCGI\_LIDARHILLSHD\_SP\_CACHE\_v1
- Vector Tiles
- XYZ Tiles
- WCS
- WFS / OGC API - Features

**Create a New WMS/WMTS Connection**

Connection Details

Name: IMG\_VCGI\_LIDARHILLSHD\_SP\_CACHE\_v1

URL: ices/IMG\_VCGI\_LIDARHILLSHD\_SP\_CACHE\_v1/ImageServer/WMSServer

Authentication

Configurations: Basic

Choose or create an authentication configuration

No Authentication

Configurations store encrypted credentials in the QGIS authentication database.

HTTP

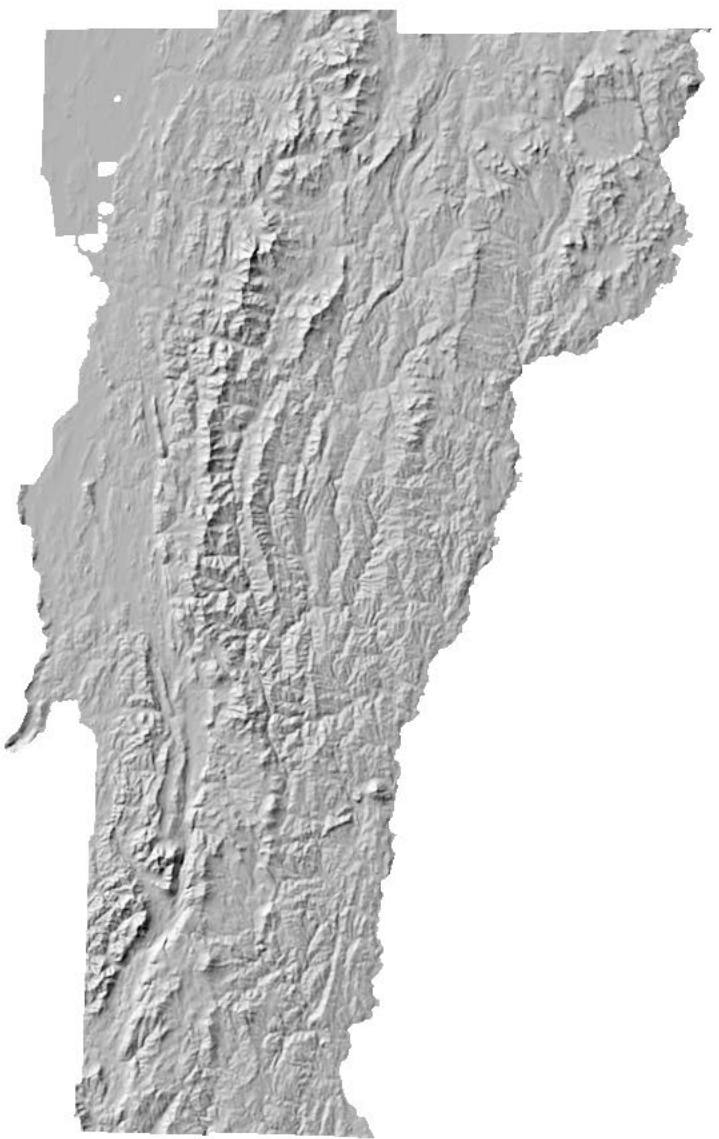
Referer:

WMS/WMTS Options

DPI-Mode: all

- Ignore GetMap/GetTile/GetLegendGraphic URI reported in capabilities
- Ignore GetFeatureInfo URI reported in capabilities
- Ignore axis orientation (WMS 1.3/WMTS)
- Ignore reported layer extents
- Invert axis orientation
- Smooth pixmap transform

OK Cancel Help



**QGIS**  
Example



## EGC\_services/MAP\_VCGI\_LIDARCONTOURS\_WM\_CACHE\_v1 (MapServer)

View In: [ArcGIS JavaScript](#) [ArcGIS Online Map Viewer](#) [ArcGIS Earth](#) [ArcMap](#) [ArcGIS Pro](#)

View Footprint In: [ArcGIS Online Map Viewer](#)

**Service Description:** VCGI Lidar Program (VLP) Orthometric contour data extracted from Quality Level 2 (QL2) DEMs, collected from 2013 to 2017, covering the entire state of Vermont. Various contour intervals display according to pre-set AGO/Google zoom scales. To acquire detailed surface elevation data for use in conservation planning, design, research, floodplain mapping, dam safety assessments, and hydrologic modeling. USGS LIDAR Base Specification 1.2, QL2. 19.6 cm NVA. Data can be downloaded on a tile-by-tile basis from the Vermont Open Geodata portal ([geodata.vermont.gov/datasets?q=contours](http://geodata.vermont.gov/datasets?q=contours)). For additional information on VLP, go to [vcgi.vermont.gov/data-and-programs/lidar-program](http://vcgi.vermont.gov/data-and-programs/lidar-program).

**Map Name:** Contours\_Web Mercator

[Legend](#)

[All Layers and Tables](#)

[Dynamic Legend](#)

[Dynamic All Layers](#)

### Layers:

- [ElevationContours\\_CN1T\\_1ft\\_WM\\_L20](#) (0)
  - [ElevationContours\\_CN1T\\_1ft](#) (1)
- [ElevationContours\\_CN1T\\_250ft\\_WM\\_L13](#) (2)
  - [ElevationContours\\_CN1T\\_250ft](#) (3)
  - [ElevationContours\\_CN1T\\_1000ft\\_Major](#) (4)
- [ElevationContours\\_CN1T\\_500ft\\_WM\\_L12](#) (5)
  - [ElevationContours\\_CN1T\\_500ft](#) (6)
  - [ElevationContours\\_CN1T\\_1000ft](#) (7)
- [ElevationContours\\_CN1T\\_2ft\\_WM\\_L19](#) (8)
  - [ElevationContours\\_CN1T\\_2ft](#) (9)
- [ElevationContours\\_CN1T\\_5ft\\_WM\\_L18](#) (10)
  - [ElevationContours\\_CN1T\\_5ft](#) (11)
  - [ElevationContours\\_CN1T\\_20ft\\_Major](#) (12)
- [ElevationContours\\_CN1T\\_10ft\\_WM\\_17](#) (13)
  - [ElevationContours\\_CN1T\\_10ft](#) (14)
  - [ElevationContours\\_CN1T\\_50ft\\_Major](#) (15)
- [ElevationContours\\_CN1T\\_20ft\\_WM\\_L16](#) (16)
  - [ElevationContours\\_CN1T\\_20ft](#) (17)
  - [ElevationContours\\_CN1T\\_100ft\\_Major](#) (18)
- [ElevationContours\\_CN1T\\_50ft\\_WM\\_L15](#) (19)
  - [ElevationContours\\_CN1T\\_50ft](#) (20)
  - [ElevationContours\\_CN1T\\_250ft\\_Major](#) (21)
- [ElevationContours\\_CN1T\\_100ft\\_WM\\_L14](#) (22)
  - [ElevationContours\\_CN1T\\_100ft](#) (23)
  - [ElevationContours\\_CN1T\\_500ft\\_Major](#) (24)
- [ElevationContours\\_CN1T\\_1000ft\\_WM\\_L11\\_19](#) (25)
  - [ElevationContours\\_CN1T\\_1000ft](#) (26)

### Description:

**Copyright Text:** VCGI

**Spatial Reference:** 102100 (3857)

**Single Fused Map Cache:** true

### Tile Info:

- **Height:** 256
- **Width:** 256
- **DPI:** 96
- **Levels of Detail:** 24
  - **Level ID:** 0 | [Start Tile](#) | [End Tile](#) |

- Contents
- MAP VCGI LIDARCONTOURS WM CACHE v1
  - Imagery
    - World Imagery

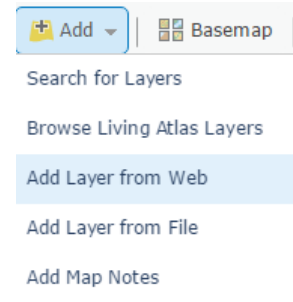




# Create a web map with AGO

## ArcGIS Online

→ Add → From Web



→ Adjust settings

→ Save Map and Share

→ Can combine with many other services/layers

# Life Cycle Support Policy

## Web Services

Find web map services that allow you to stream basemaps, imagery, lidar, and other information directly into your web map or GIS desktop app.



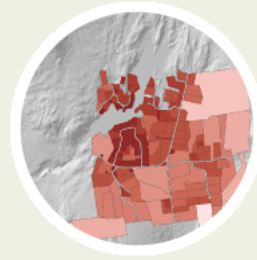
### Imagery Services

Aerial Photos



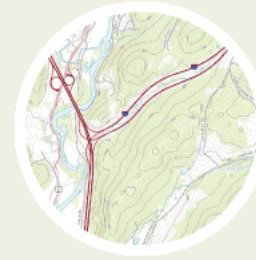
### Elevation Services

DEMs, Lidar Rasters, Contours, etc.



### Parcel Services

Municipal Parcel Boundaries



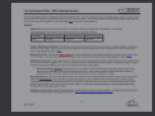
### More Services

Basemaps, Geocoding, etc.

Life Cycle Policies: [VCGI Policy](#) | [ANR Policy](#)







1



2



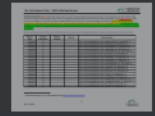
3



4



5



6



7

### Life Cycle Support Policy - VCGI's Web Map Services



<b>KEY – Service Status</b>
TARGETED FOR RETIREMENT
NEWLY RELEASED SERVICE

SERVICES REGISTRY (ArcGIS Server): VCGI's ArcGIS Server web map services\*1 are available at <https://maps.vcgi.vermont.gov/arcgis> (HTTPS).

Table 1

Release Date	General Availability	Mature Support	Retire Date	Service Name
12/1/2013	X			VCGI_services/VCGI_BASEMAP_SP_v2
12/1/2013	X			VCGI_services/VCGI_BASEMAP_WM_v2
12/1/2013	X			VCGI_services/VCGI_BASEMAP_WM_CACHE_v2
5/1/2013	X			EGC_services/GCS_E911_COMPOSITE_SP
5/1/2013	X			EGC_services/GCS_E911_ESITE_SP
9/11/2019	X			EGC_services/IMG_VCGI_BASELANDCOVER2016_WM_CACHE_v1
5/1/2013	X			EGC_services/IMG_VCGI_BW1994_2000_SP_NOCACHE
5/1/2013	X			EGC_services/IMG_VCGI_BW2006_2010_SP_NOCACHE
11/1/2015	X			EGC_services/IMG_VCGI_BW2011_2015_SP_NOCACHE
3/27/2017	X			EGC_services/IMG_VCGI_BW2016_2020_SP_NOCACHE
5/1/2013	X			EGC_services/IMG_VCGI_BW_SP_CACHE
5/1/2013	X			EGC_services/IMG_VCGI_BW_WM_CACHE
11/1/2015	X			EGC_services/IMG_VCGI_CIR2011_2015_SP_NOCACHE
3/27/2017	X			EGC_services/IMG_VCGI_CIR2016_2020_SP_NOCACHE
9/19/2018	X			EGC_services/IMG_VCGI_CIR_SP_CACHE
9/19/2018	X			EGC_services/IMG_VCGI_CIR_WM_CACHE
11/1/2015	X			EGC_services/IMG_VCGI_CLR2011_2015_SP_NOCACHE
2/1/2017	X			EGC_services/IMG_VCGI_CLR2016_SP_CACHE
2/1/2017	X			EGC_services/IMG_VCGI_CLR2016_WM_CACHE
6/1/2018	X			EGC_services/IMG_VCGI_CLR2017_SP_CACHE

\*1 All web services listed are supported under this VCGI Life Cycle Policy. All other VCGI web map services discovered by users on our ArcGIS Server instance are not explicitly supported by this policy.

July 25, 2022

2



### Life Cycle Support Policy - VCGI's Web Map Services



6/1/2018	X			EGC_services/IMG_VCGI_CLR2017_WM_CACHE
1/7/2019	X			EGC_services/IMG_VCGI_CLR2018_SP_CACHE
1/7/2019	X			EGC_services/IMG_VCGI_CLR2018_WM_CACHE
2/20/2020	X			EGC_services/IMG_VCGI_CLR2019_SP_CACHE
2/20/2020	X			EGC_services/IMG_VCGI_CLR2019_WM_CACHE
3/15/2021	X			EGC_services/IMG_VCGI_CLR2020_SP_CACHE
3/15/2021	X			EGC_services/IMG_VCGI_CLR2020_WM_CACHE
3/1/2022	X			EGC_services/IMG_VCGI_CLR2021_SP_CACHE
3/1/2022	X			EGC_services/IMG_VCGI_CLR2021_WM_CACHE
3/27/2017	X			EGC_services/IMG_VCGI_CLR2016_2020_SP_NOCACHE
5/1/2013	X			EGC_services/IMG_VCGI_CLR_SP_CACHE
5/1/2013	X			EGC_services/IMG_VCGI_CLR_WM_CACHE
5/1/2017	X			EGC_services/IMG_VCGI_LIDARASPECT_SP_NOCACHE_v1
5/1/2017	X			EGC_services/IMG_VCGI_LIDARASPECTSYM_SP_NOCACHE_v1
4/5/2017	X			EGC_services/IMG_VCGI_LIDARDEM_SP_NOCACHE_v1
1/1/2019	X			EGC_services/IMG_VCGI_LIDARDSM_SP_NOCACHE_v1
1/1/2019	X			EGC_services/IMG_VCGI_LIDARDSMHILLSHD_SP_CACHE_v1
4/5/2017	X			EGC_services/IMG_VCGI_LIDARHILLSHD_SP_CACHE_v1
4/5/2017	X			EGC_services/IMG_VCGI_LIDARHILLSHD_WM_CACHE_v1

# Access: Data Status

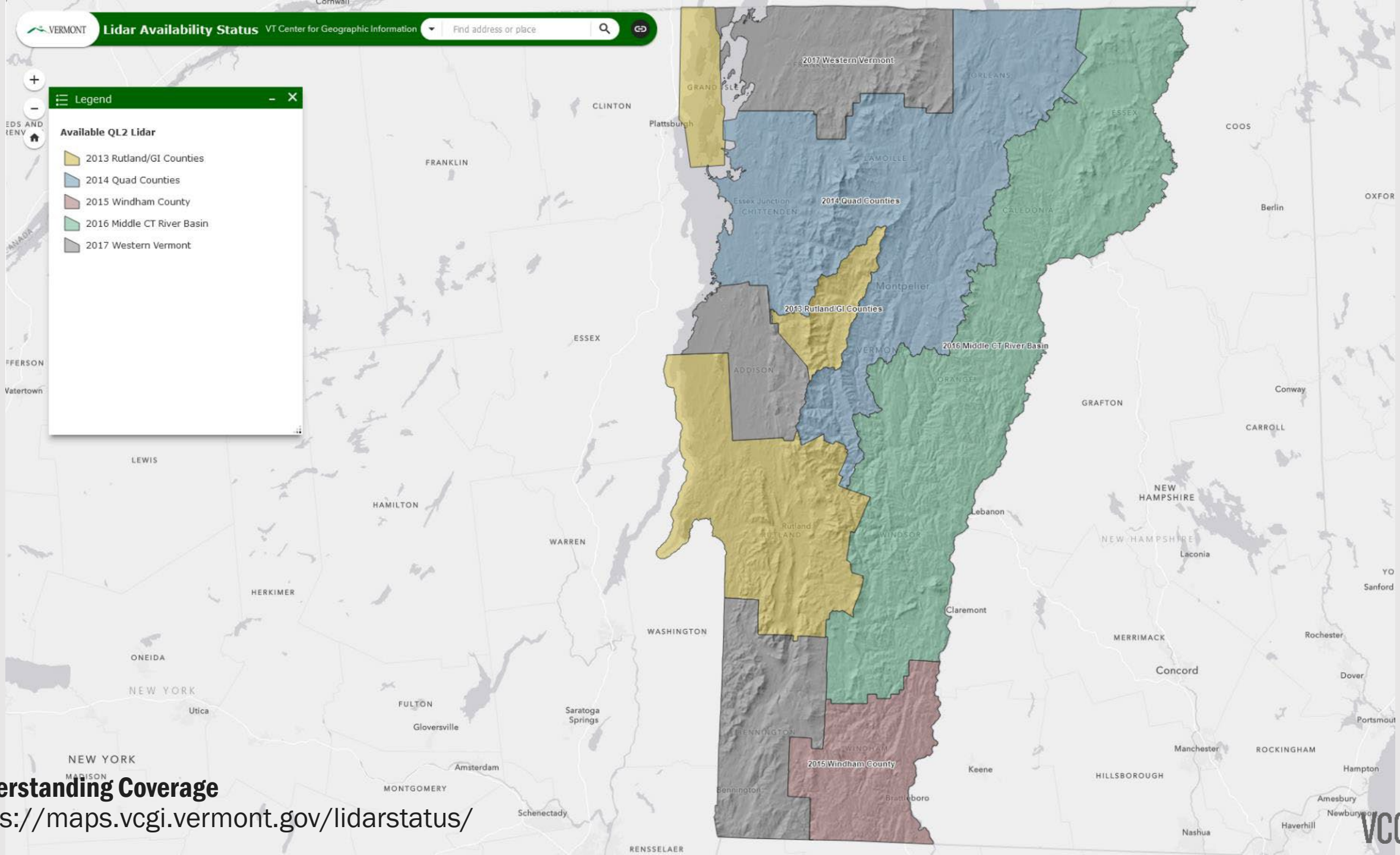
Streaming data for internet-connected streamlined uses



**Legend**

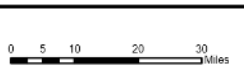
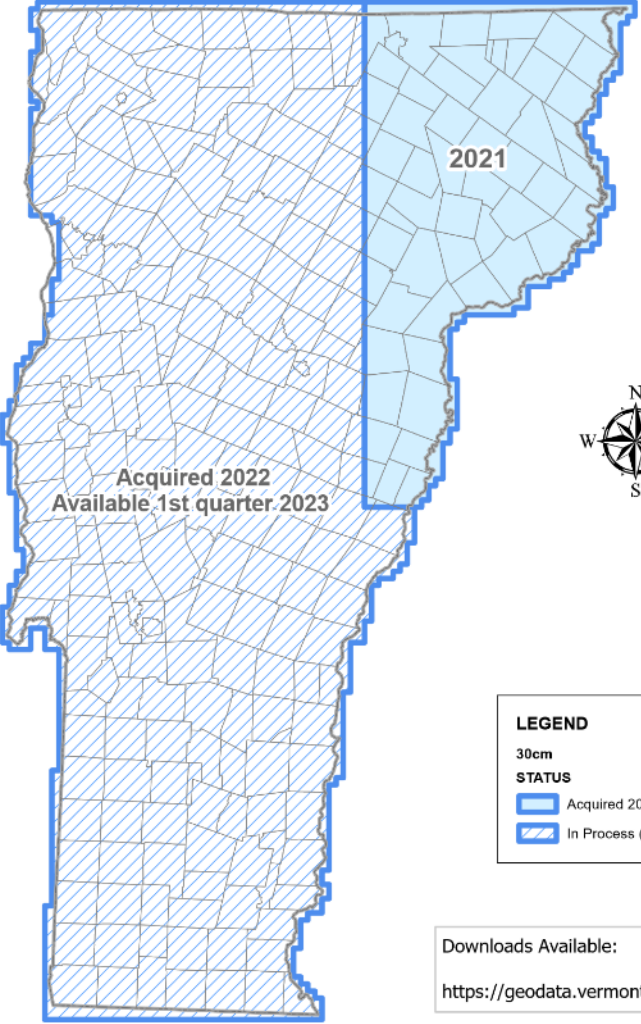
**Available QL2 Lidar**

- 2013 Rutland/Gl Counties
- 2014 Quad Counties
- 2015 Windham County
- 2016 Middle CT River Basin
- 2017 Western Vermont



**Understanding Coverage**  
<https://maps.vcgi.vermont.gov/lidarstatus/>

# VT Ortho Status 2021-2025 Acquisition Cycle



  
VERMONT  
STATE OF VERMONT  
DISCLAIMER: VCGI and the State of Vermont make no representations of any kind, including but not limited to the accuracy or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

Data Sources:  
- VT Acquisition Status 30cm 2021-2025: VCGI  
- Town boundaries: VCGI  
Map Author: VT Center for Geographic Information (VCGI)  
Date: 8/23/2022  
Path: S:\ImageryProgram\Orthos\StatusMaps\Vintage5



## Data and Programs

## Resources

## Frequently Asked Questions

General Mapping FAQ's

Imagery Program FAQ's

Lidar Program FAQ's

Parcel Program FAQ's

Using VT GIS Data and Services FAQ's

VT GIS Standards and Guidelines

How-To and Education Resources

Events

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Maps

Partners

About VCGI

## FREQUENTLY ASKED QUESTIONS

General Mapping Info  
FAQ'sAnswers to frequently asked  
questions about digital mapping.

## Imagery Program FAQ's

Answers to frequently asked  
questions about the imagery  
program

## Lidar Program FAQ's

Answers to frequently asked  
questions about the lidar program

## Parcel Program FAQ's

Answers to frequently asked  
questions about the parcel  
programUsing VT GIS Data and  
Services FAQ'sAnswers to frequently asked  
questions about using VCGI's  
geospatial data and services

## Data and Programs

## Resources

## Frequently Asked Questions

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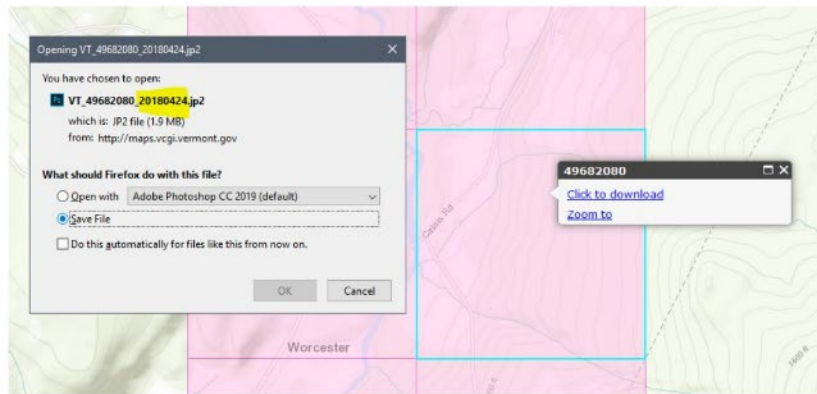
About VCGI

## IMAGERY PROGRAM FAQ'S

- [What is aerial orthoimagery?](#)
- [What is the Vermont Imagery Program \(VIP\)?](#)
- [How often is imagery updated?](#)
- [In what types and formats are orthoimagery made available?](#)
- [How can I view orthoimagery made available by VIP?](#)
- [Where can I find historical Vermont aerial imagery?](#)
- [What are the differences between imagery data and imagery services?](#)
- [What is different about imagery collected and published by the program relative to other web map imagery?](#)
- [What are the differences in compressed and uncompressed files?](#)
- [How do I find out the date in which a specific image was taken?](#)
- [How do I find out what dates and types of imagery are available for a location?](#)
- [How do I obtain the coordinates for a point on the image?](#)
- [How do I obtain the tile number of a particular imagery tile?](#)
- [How do I measure an area and export it as a shapefile?](#)
- [Can orthoimagery be combined with other map data?](#)

## How do I find out the date in which a specific image was taken?

Imagery collected by the program has the date taken in the file name of each respective tile. For example:



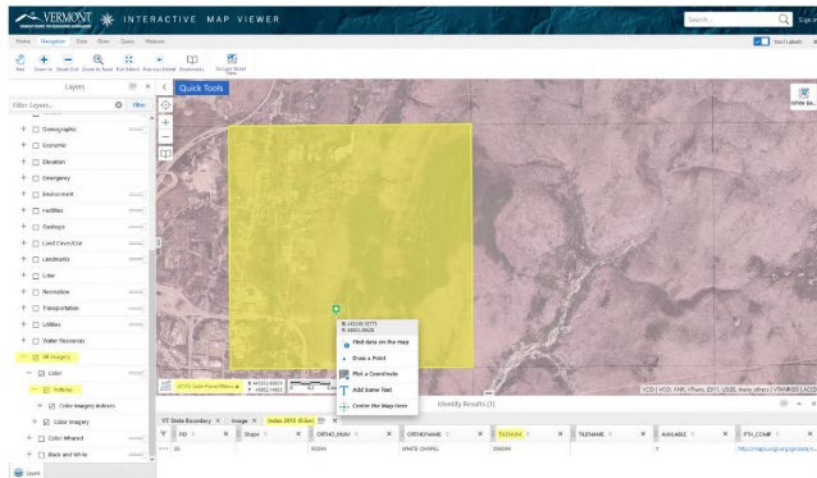
The "20180424" in the file name follows a YYYY/MM/DD format. The image in this example tile was taken on April 24, 2018. Tiles are available for their respective collection linked from the [VT Orthoimagery Finder](#), and from the [Imagery page at the VT Open Geodata Portal](#).

## How do I find out what dates and types of imagery are available for a location?

The [Vermont Orthoimagery Finder](#) presents all available digital, georeferenced imagery going back to 1994 for locations throughout the state. It is a map-based view of seeing what is available where, in what types, and when they were taken.

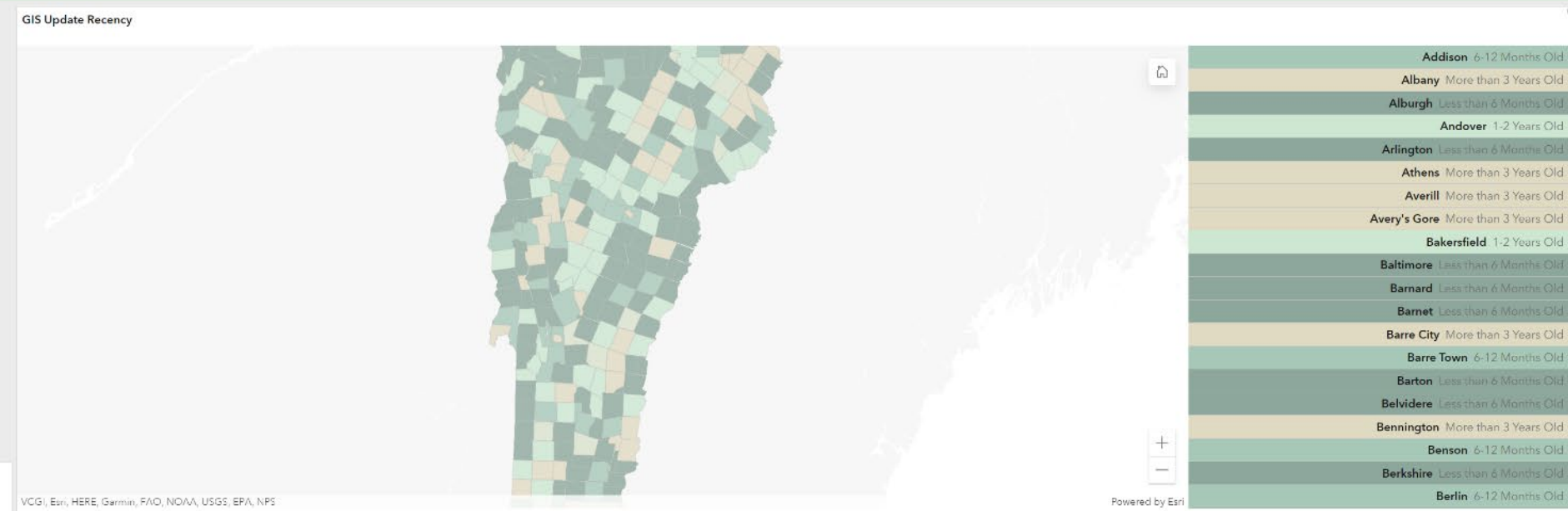
## How do I obtain the coordinates for a point on the image?

You can use the X,Y tools in desktop GIS platforms, but for most users a web mapping application such as the [Vermont Interactive Map Viewer](#) is a way to do this. See the images below for reference:



Quick, dirty, inexact way - Useful for when there is no other geometry overlaid on image to snap to:

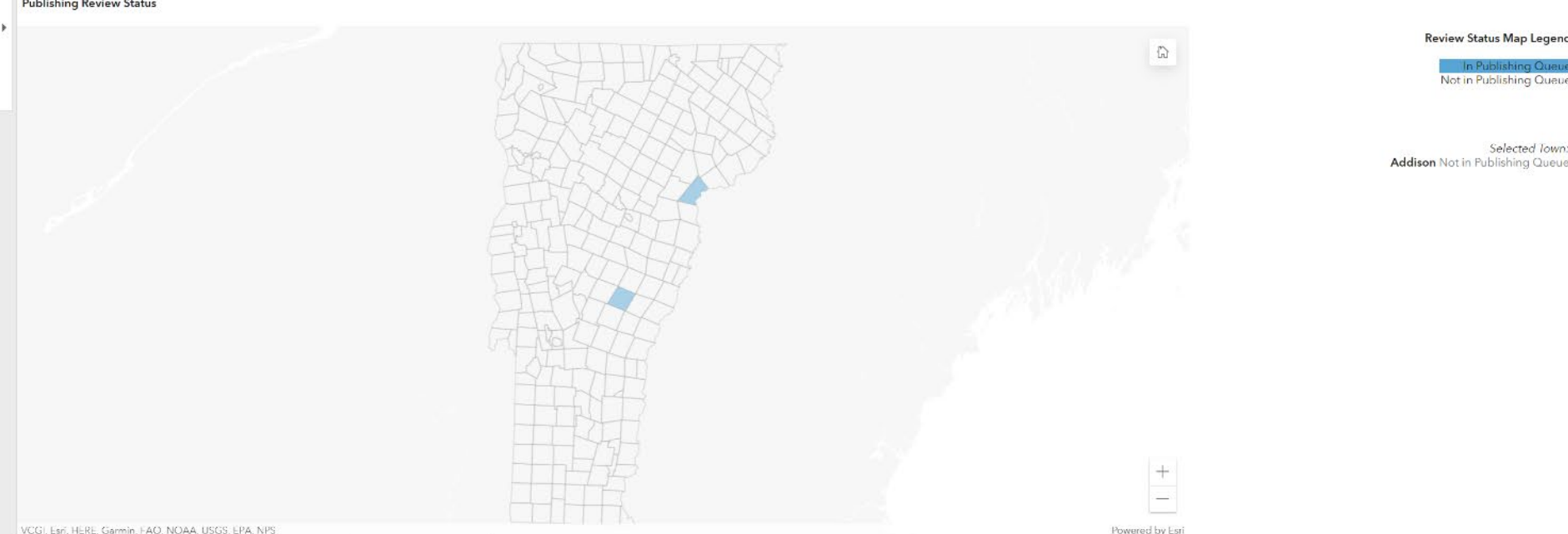
Under the layer "All Imagery" in the left-hand layer list, there is a sub-layer for "Indexes". These are the bounds of the respective image tiles per each collection. If you toggle on this index layer by clicking the checkbox, and



Select a town from the drop down menu above.

## Addison

Published GIS Date	2022-01-20
Current Map Capacity	Contract GIS Vendor
Current Vendor	CAI
Update Month if Known	
Update Frequency if Known	Annual
Contract Length	
Next Estimated GIS Update	
Status Last Updated	3/5/2021
Most Recent Geometry Submittal	2021-09-08
Submittal Reviewed by Town	No
Submitting Entity	CAI
Submitted By	Laura Batchelder
Submission ID	Addison 2021-09-08T13:13:24.000Z
Regional Planning Commission	Addison County Regional Planning Commission
Published GIS Notes	
Parcel Project (2017-19) Vendor	CAI



### Review Status Map Legend

- In Publishing Queue
- Not in Publishing Queue

Selected Town:  
Addison Not in Publishing Queue

All Towns Currently Joined With  
**2021**  
Statewide Grand List  
\*Statewide grand list represents the owner on record on April 1 annually.

Status Last Updated: 9/15/2022, 11:49 AM  
Status updated weekly.





Active Parcels | Most Recent Publish

# 3,228

Inactive Parcels | Most Recent Publish

# 1,884

Unmatched Active Parcels | Most Recent Publish

# 206

Select a town from the drop down menu above.  
Select town information below to isolate it on the map.

## Wilmington

Published GIS Date	2020-11-13
Current Map Capacity	Contract GIS Vendor
Current Vendor	CTI
Update Month if Known	October
Update Frequency if Known	Annual
Contract Length	
Next Estimated GIS Update	
Status Last Updated	10/1/2020
Most Recent Geometry Submittal	2021-10-06
Submittal Reviewed by Town	No
Submitting Entity	CTI
Submitted By	
Submission ID	Wilmington 2021-10-06T13:47:53.000Z
Regional Planning Commission	Windham Regional Commission
Published GIS Notes	
Parcel Project (2017-19) Vendor	CTI

**Grand List Unmatched Active Parcels**

Select a town at top right. Then select one or more records to locate them on the map. More than one record can be selected by holding control key. Unclick record(s) to deselect.

TOWN	GIS SPAN	Grand List SPAN	MAPID	PARCEL ID	PROPTYPE	MATCHSTAT
WILMINGTON	C-25105-17	762-242-10060	HSSPYGLA.LND	HSSPYGLA.C24	PARCEL	UNMATCHED
WILMINGTON	C-25105-5	762-242-10009	HSMPOND.LND	HSMPOND.C21	PARCEL	UNMATCHED
WILMINGTON	C-25105-17	762-242-10103	HSSPYGLA.LND	HSSPYGLA.C19	PARCEL	UNMATCHED

All Towns Currently Joined With

# 2020

Statewide Grand List  
\*Statewide grand list represents the owner on record on April 1  
Status Last Updated: 2022-02-16  
Status updated weekly.

# Application-Specific Examples

QGIS, ArcGIS Pro, Other Useful Tools





# ArcGIS for AutoCAD

Free Plug-In for AutoCAD Connects You to ArcGIS

Download now →

ArcGIS for AutoCAD is a free plug-in that simplifies the way you share and synchronize GIS content between AutoCAD and ArcGIS. Enrich your CAD drawings with ArcGIS hosted maps, imagery, and geographic features. Edit geographic features within AutoCAD and use them for navigating the drawing through location.



ArcGIS for AutoCAD users can do the following:

- Edit ArcGIS geodatabases through a feature service
- Add Esri map and imagery services, such as from ArcGIS Online
- Add maps from enterprise or cloud servers
- Navigate within drawings by using a street address
- Create ArcGIS feature classes in AutoCAD
- Extract GIS data from feature services





# Carlson GIS

By Carlson Software

## Solution details

**Platform:** Desktop

**Description:** With tools for data capture and linking, data labeling, import/export of SHP files, polygon topology creation and analysis. The GIS editor also supports the import and export of the Esri® geodatabase and provides a smoother workflow with Esri® ArcGIS® services. In addition, with the ability to utilize higher resolution web images, Carlson GIS enhancing the workflow of for the surveyor or engineer in the office.

**Industries:** Architecture, Engineering & Construction, Electric & Gas, Forestry, GIS, Highways & Roads, Land Records, Pipeline, Public Works, Water, Wastewater & Stormwater

[About this partner](#)

## Other Solutions



## Contact us

Carlson Software  
33 E 2nd St  
Maysville KY 41056-1158  
United States  
T: (606) 564-5028  
[www.carlsonsw.com](http://www.carlsonsw.com)

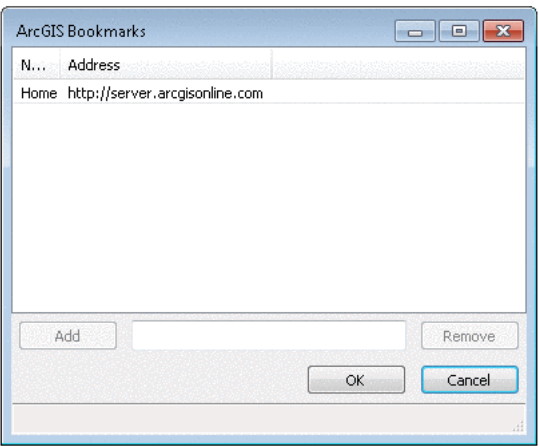


Click [here](#) to show toolbars of the Web Online Help System: [show toolbars](#)

## Esri ArcGIS Services - Retrieve Map

The Retrieve Map command allows the user to select from a list of Esri ArcGIS map services or user defined map services from other public and private sources. Upon execution the ArcGIS Map Services dialog is displayed. The default "home" service is ArcGIS online. Additional map services can be added by clicking the **Browse** button to the right of the Map service dropdown list.

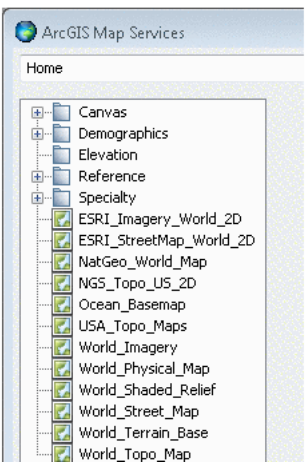
### ArcGIS Bookmarks



To add a map service type the url in the **Add** field and press enter, then click the **Add** button. After adding all the services desired click the **OK** button. All map services that have been added will be displayed in the Map Service dropdown list.

### Map Tree

Example: [Carlson's documentation on using GIS web services](#)

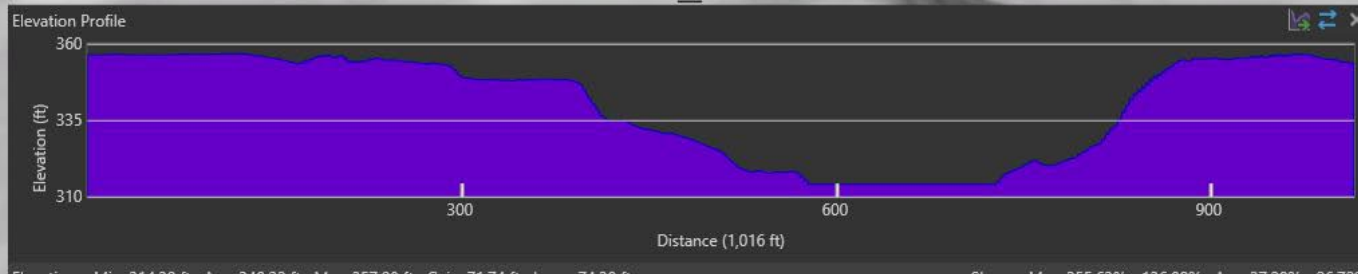
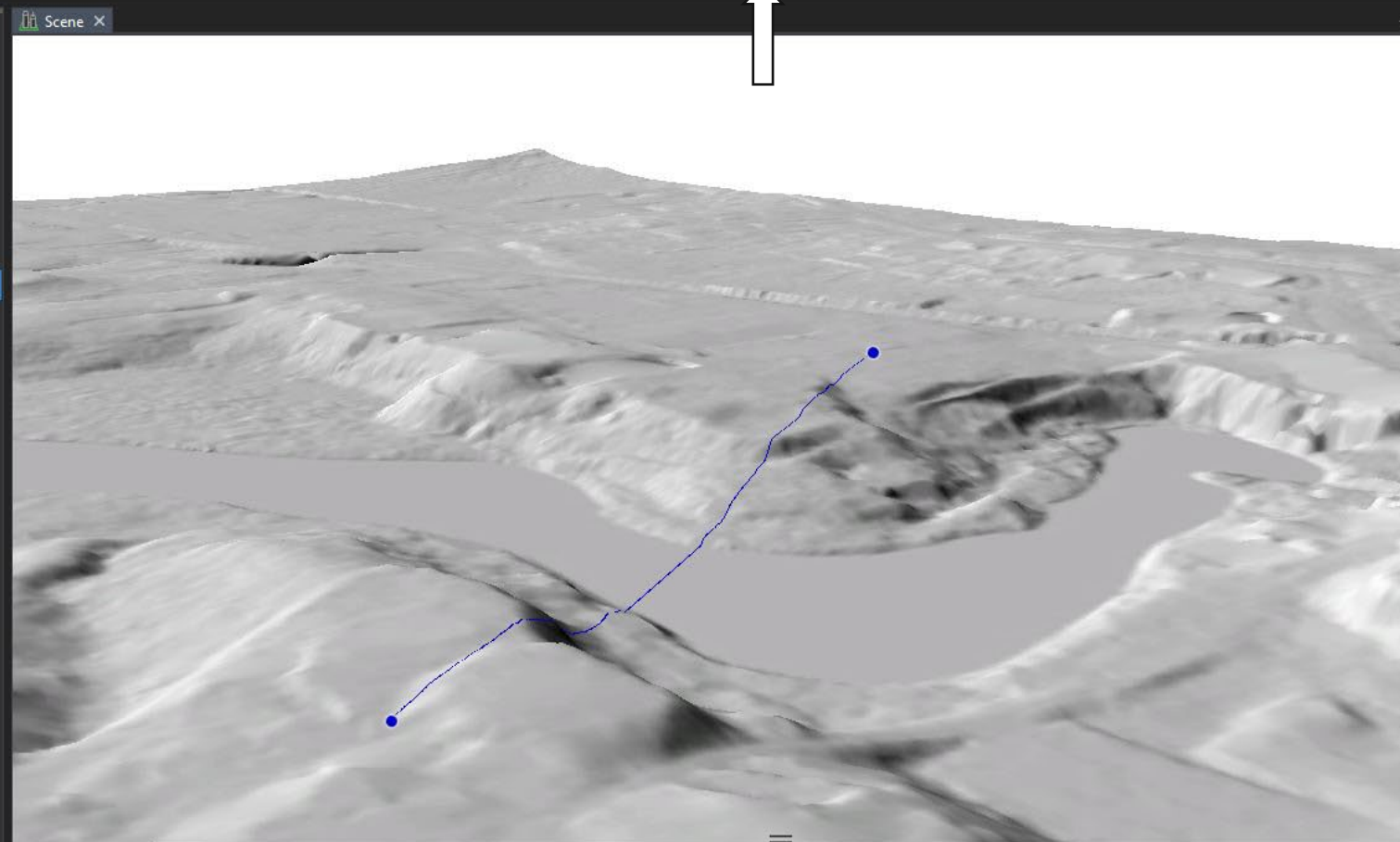


Contents

Search

Drawing Order

- Scene
  - 3D Layers
  - 2D Layers
    - EGC\_services\IMG\_VCGI\_LIDARHILLSHD\_SP\_CACHE\_v1
      - RGB
        - Red: Band\_1
        - Green: Band\_2
        - Blue: Band\_3
    - EGC\_services\IMG\_VCGI\_CLR\_SP\_CACHE
      - RGB
        - Red: Band\_1
        - Green: Band\_2
        - Blue: Band\_3
      - World Topographic Map
      - World Hillshade
    - Elevation Surfaces
      - Ground
        - Elevation\_DEMHF0p7m2017\_N4459E687.img
        - EGC\_services/IMG\_VCGI\_LIDARHILLSHD\_WM\_CACHE\_v1
        - WorldElevation3D/Terrain3D



Elevation Min: 314.30 ft Avg: 340.22 ft Max: 357.08 ft Gain: 71.74 ft Loss: -74.38 ft Slope Max: 255.63% -136.09% Avg: 37.29% -26.72%

73.1662171°W 44.0220326°N 416.504 ft Selected Features: 0

Exploratory Analysis

Elevation Profile

Create Properties

Elevation Profile

Distance Units: Feet

Creation Method

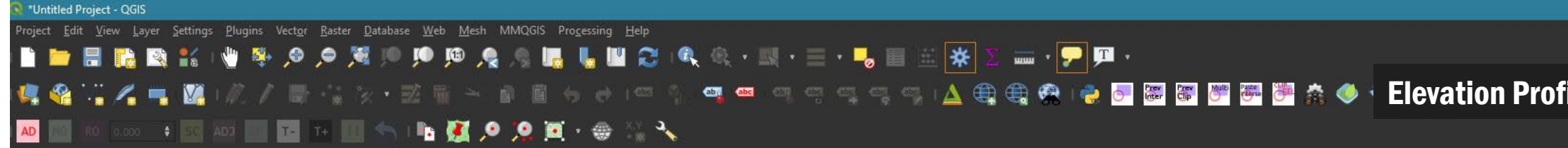
- Interactive Placement
- From Layer

218 ft

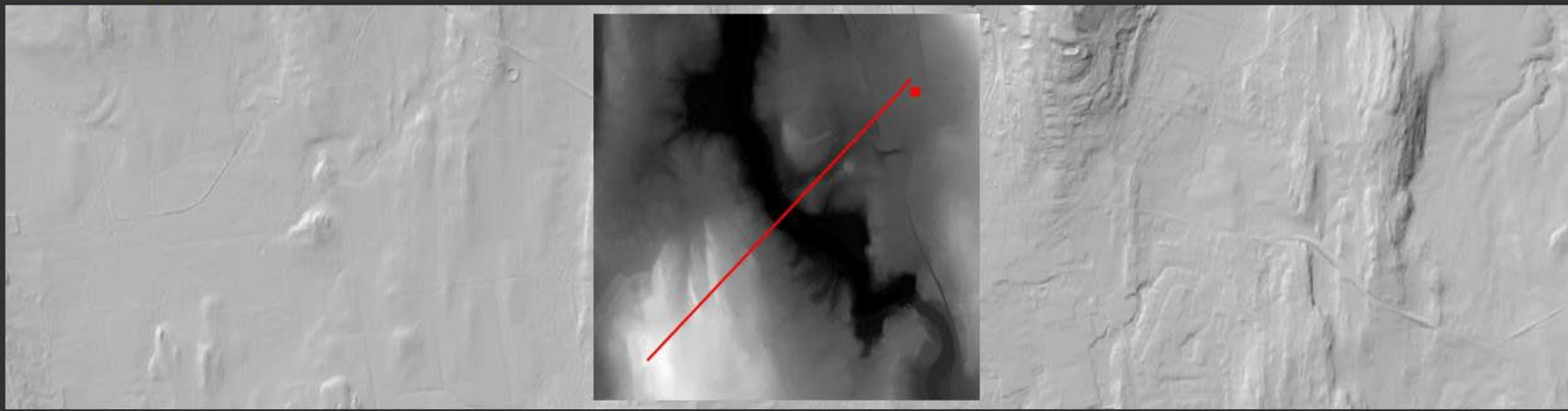
Cat... Lab... Ge... Sy... Ele... Ch... Exp... Exp... His...



# Elevation Profile: QGIS

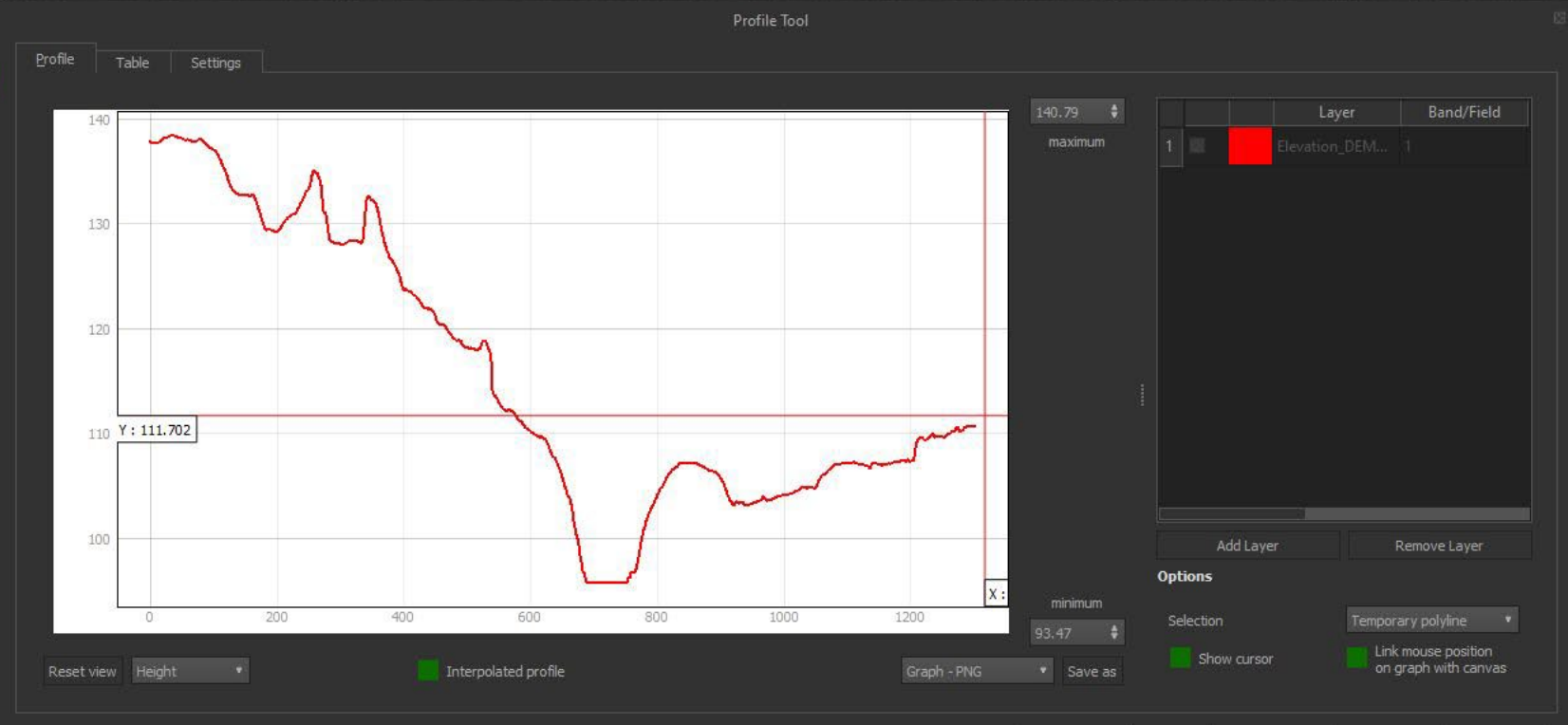


- 2016 Impervious Surfaces WM
- Act250 Permits
- ALL Imagery BW SP
- ANR Land Dataset (Parcel)
- ANR Open Data - Water SP
- e911 Emergency Services
- Fishing Access Areas
- IMG\_VCGI\_BW\_SP\_CACHE
- IMG\_VCGI\_BW\_WM\_CACHE
- IMG\_VCGI\_CLR2018\_SP\_CACHE (ImageServer)
- IMG\_VCGI\_LIDARASPECT\_SP\_NOCACHE\_v1
- IMG\_VCGI\_LIDARHILLSHD\_SP\_CACHE\_v1**
- Lidar DSM SP



Layers

- Elevation DEMHF0p7m2017 N4459E687**
  - 95.7761
  - 140.469
- IMG\_VCGI\_LIDARHILLSHD\_SP\_CACHE\_v1
  - Style: 14789
  - 140.469




# Datasets

Download Lidar-Derived Elevation Products

Datasets are downloadable and contain the available georeferenced lidar-derived elevation products we have collected statewide to date.

Use the Lidar Finder to search lidar-derived elevation data by map, or select from all acquisitions in the data catalog table below.



### Vermont Lidar Finder

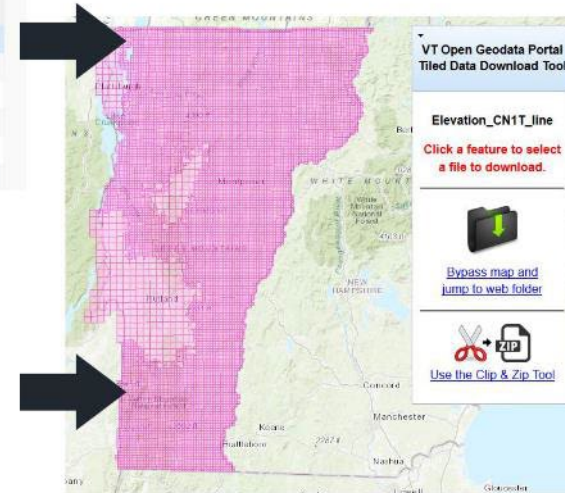
The Lidar Finder allows you to search and download the available georeferenced lidar-derived elevation products we have collected statewide to date through a map interface. Available lidar products are searchable by type (e.g. aspect, digital elevation model, hillshade), quality level, year, and extent. Popups include links to download individual files from each type, or batch download an entire dataset as a zip (caution: large file size).

[Launch Lidar Finder](#)

Year: 2004 - 2017  
Product: X Contours  
Source: +  
Resolution: +  
Quality Level: +

1 - 6 / 6

Year	Product	Source	Resolution	Quality Level	Description	Download	Metadata
	Contours	Lidar	0.7m	QL2	1' Contours derived from 2013 - 2017 QL2 lidar data - Statewide	<a href="#">Download</a>	<a href="#">Metadata</a>
	Contours	Lidar	3.2m	QL4	10' Contours derived from lidar data - Chittenden	<a href="#">Download</a>	<a href="#">Metadata</a>
	Contours	USGS	30m	N/A	VT 100' Contours generated from USGS 30 meter NED DEM	<a href="#">Download</a>	<a href="#">Metadata</a>
	Contours	USGS	10m	N/A	VT 20' Contours generated from USGS 10 meter NED DEM	<a href="#">Download</a>	<a href="#">Metadata</a>
	Contours	USGS	30m	N/A	VT 50' Contours generated from USGS 30 meter NED DEM	<a href="#">Download</a>	<a href="#">Metadata</a>
	Contours	Lidar	Varies	Multiple	7' Contours derived from lidar data - 35 percent of VT	<a href="#">Download</a>	<a href="#">Metadata</a>



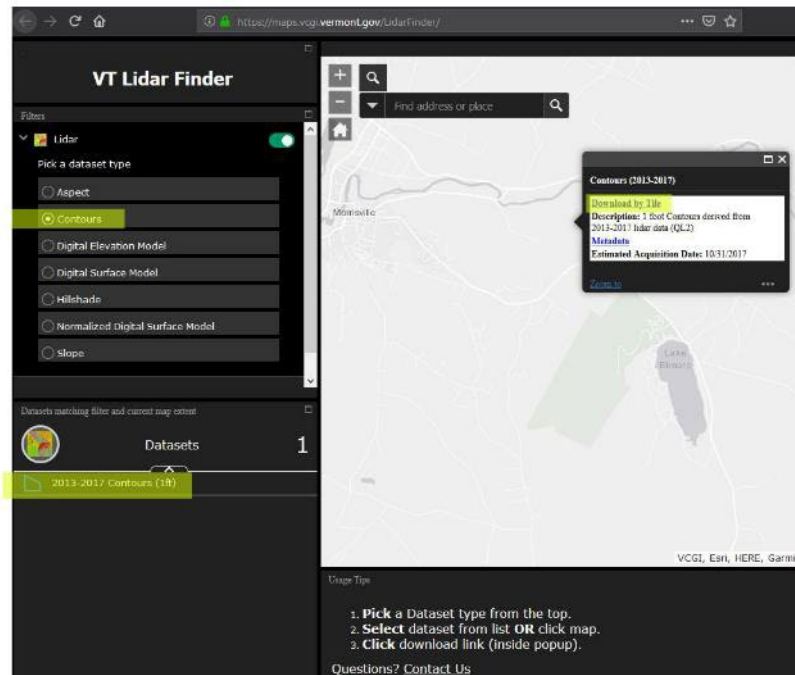
### VT Open Geodata Portal Tiled Data Download Tool

Elevation\_CN1T\_line

Click a feature to select a file to download.

[Bypass map and jump to web folder](#)

[Use the Clip & Zip Tool](#)



### VT Lidar Finder

Filters: Lidar (checked)

Pick a dataset type:

- Aspect
- Contours**
- Digital Elevation Model
- Digital Surface Model
- Hillshade
- Normalized Digital Surface Model
- Slope

Datasets matching filter and current map extent:

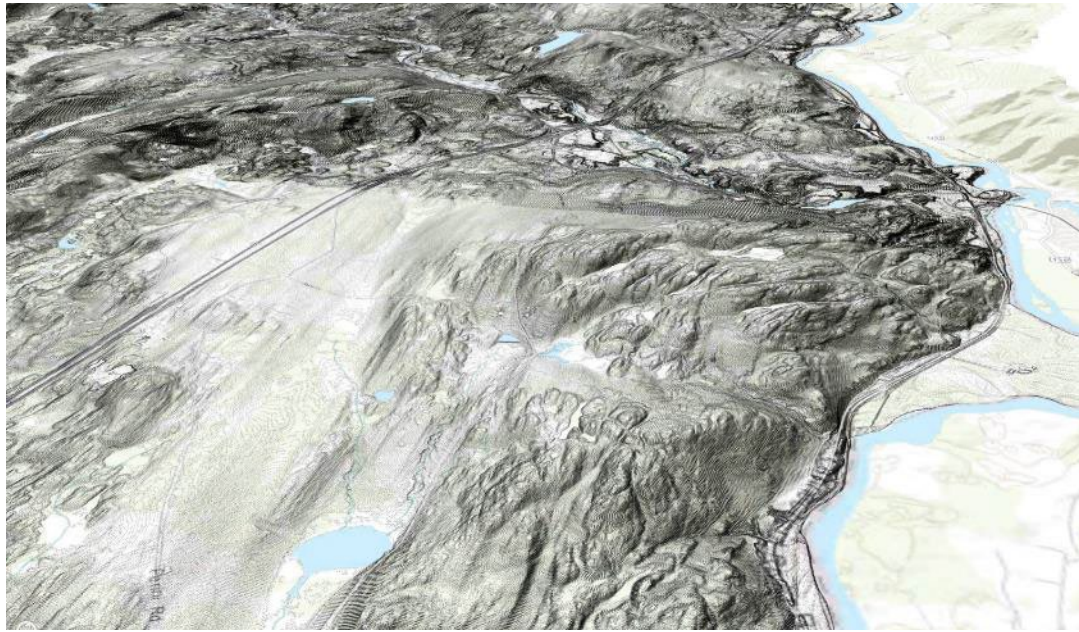
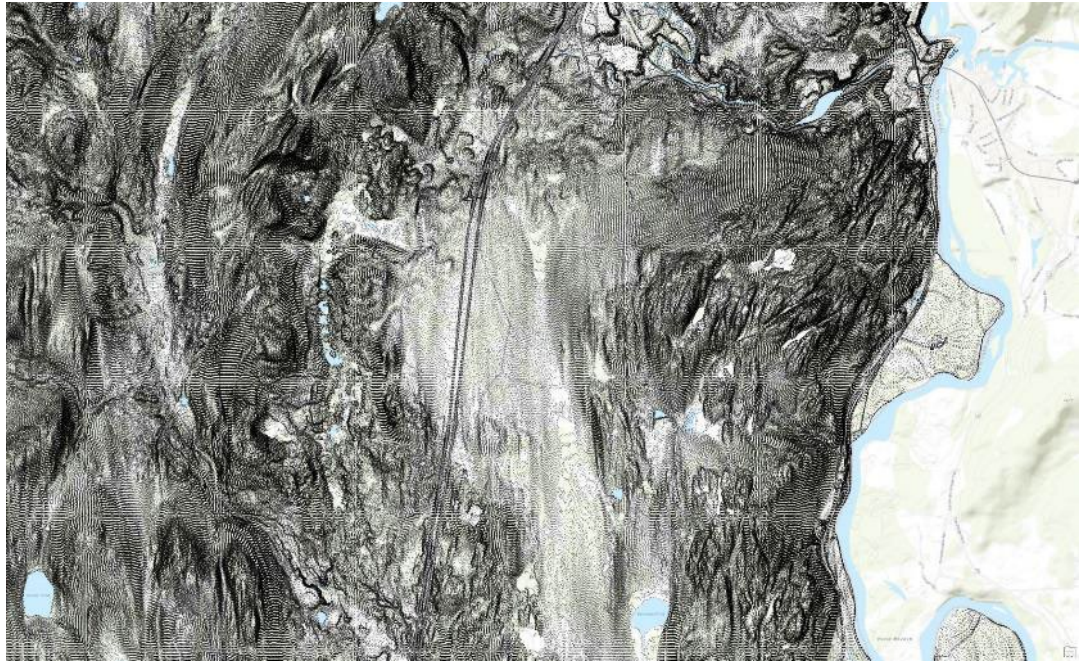
- 2013-2017 Contours (18)

Usage Tip:

- Pick a Dataset type from the top.
- Select dataset from list OR click map.
- Click download link (inside popup).

Questions? [Contact Us](#)





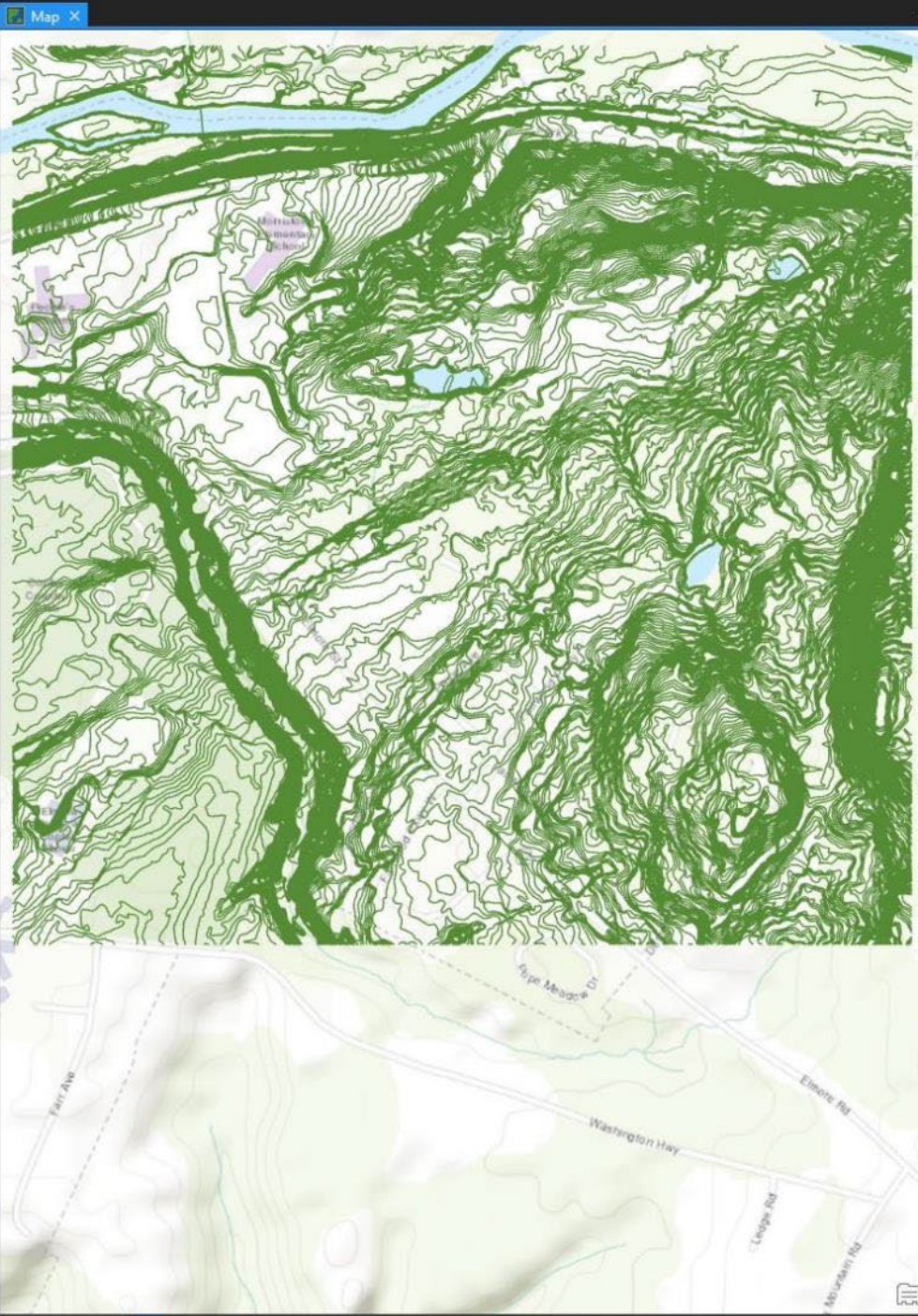


Contents

Search

Drawing Order

- Map
- Elevation\_CNIT2014\_EVT1592
- Topographic



Elevation\_CNIT2014\_EVT1592

Field: Selection:

FID	Shape	OBJECTID	Type	Elevation	Shape_Leng
0	Polyline	1	Contour Line, Intern...	635	921.810633
1	Polyline	2	Contour Line, Intern...	636	945.699603
2	Polyline	3	Contour Line, Intern...	637	947.468723
3	Polyline	4	Contour Line, Intern...	638	1079.85789
4	Polyline	5	Contour Line, Index...	640	1250.471931
5	Polyline	6	Contour Line, Intern...	638	354.042087
6	Polyline	7	Contour Line, Intern...	637	353.627242
7	Polyline	8	Contour Line, Intern...	641	1171.129536
8	Polyline	9	Contour Line, Intern...	638	896.857216
9	Polyline	10	Contour Line, Intern...	638	75.582553
10	Polyline	11	Contour Line, Intern...	635	373.819629
11	Polyline	12	Contour Line, Index...	640	416.074502
12	Polyline	13	Contour Line, Intern...	639	1273.896316
13	Polyline	14	Contour Line, Intern...	639	77.916336
14	Polyline	15	Contour Line, Intern...	636	358.876985
15	Polyline	16	Contour Line, Intern...	642	356.46155
16	Polyline	17	Contour Line, Intern...	642	329.978972
17	Polyline	18	Contour Line, Intern...	642	197.993198
18	Polyline	19	Contour Line, Intern...	642	320.844987
19	Polyline	20	Contour Line, Intern...	643	118.032483
20	Polyline	21	Contour Line, Intern...	643	198.375699
21	Polyline	22	Contour Line, Intern...	643	155.38152
22	Polyline	23	Contour Line, Intern...	643	80.581278
23	Polyline	24	Contour Line, Intern...	643	20.809862
24	Polyline	25	Contour Line, Intern...	643	123.656544
25	Polyline	26	Contour Line, Intern...	643	319.610558
26	Polyline	27	Contour Line, Intern...	639	108.725355
27	Polyline	28	Contour Line, Index...	640	1332.994298
28	Polyline	29	Contour Line, Index...	640	81.902846
29	Polyline	30	Contour Line, Intern...	631	787.753692
30	Polyline	31	Contour Line, Intern...	632	401.867937
31	Polyline	32	Contour Line, Intern...	644	18.435862
32	Polyline	33	Contour Line, Intern...	644	116.256787
33	Polyline	34	Contour Line, Intern...	644	109.881005
34	Polyline	35	Contour Line, Intern...	644	45.891013
35	Polyline	36	Contour Line, Intern...	644	132.482413
36	Polyline	37	Contour Line, Intern...	644	286.685942
37	Polyline	38	Contour Line, Intern...	641	1222.173574
38	Polyline	39	Contour Line, Intern...	641	83.743317
39	Polyline	40	Contour Line, Intern...	645	2.486874
40	Polyline	41	Contour Line, Intern...	645	82.170641
41	Polyline	42	Contour Line, Intern...	645	232.325767
42	Polyline	43	Contour Line, Intern...	641	208.926403
43	Polyline	44	Contour Line, Intern...	632	855.514662
44	Polyline	45	Contour Line, Intern...	632	806.522966
45	Polyline	46	Contour Line, Intern...	646	47.4792
46	Polyline	47	Contour Line, Intern...	646	721.496042

Geoprocessing

Export to CAD

Parameters Environments

Input Features

Elevation\_CNIT2014\_EVT1592

Output Type

DWG version 2018

Output File

Elevation\_CNIT2014\_EVT1592\_E.dwg

Ignore Paths in Tables

Append to Existing Files

Seed File

Run



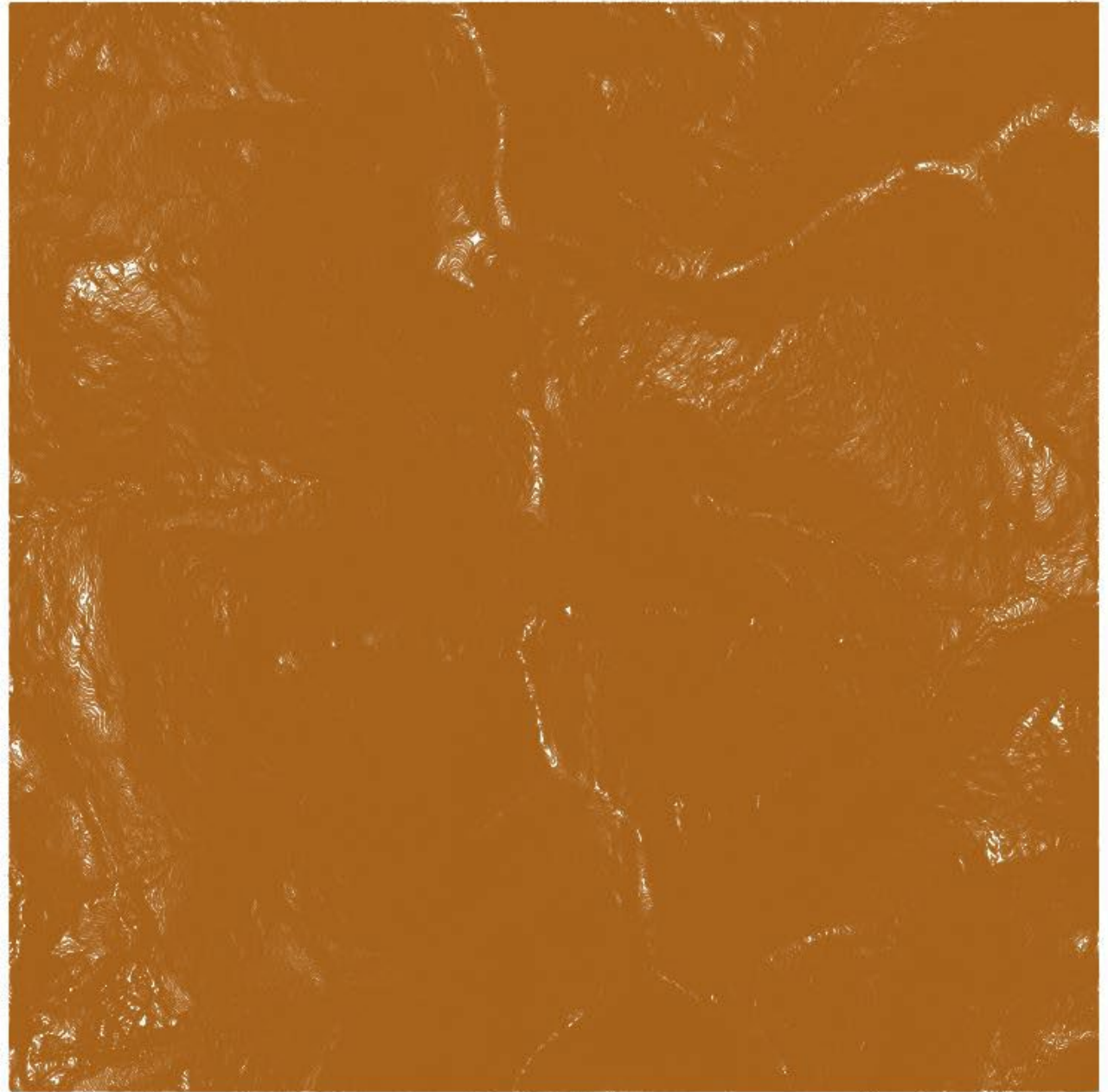
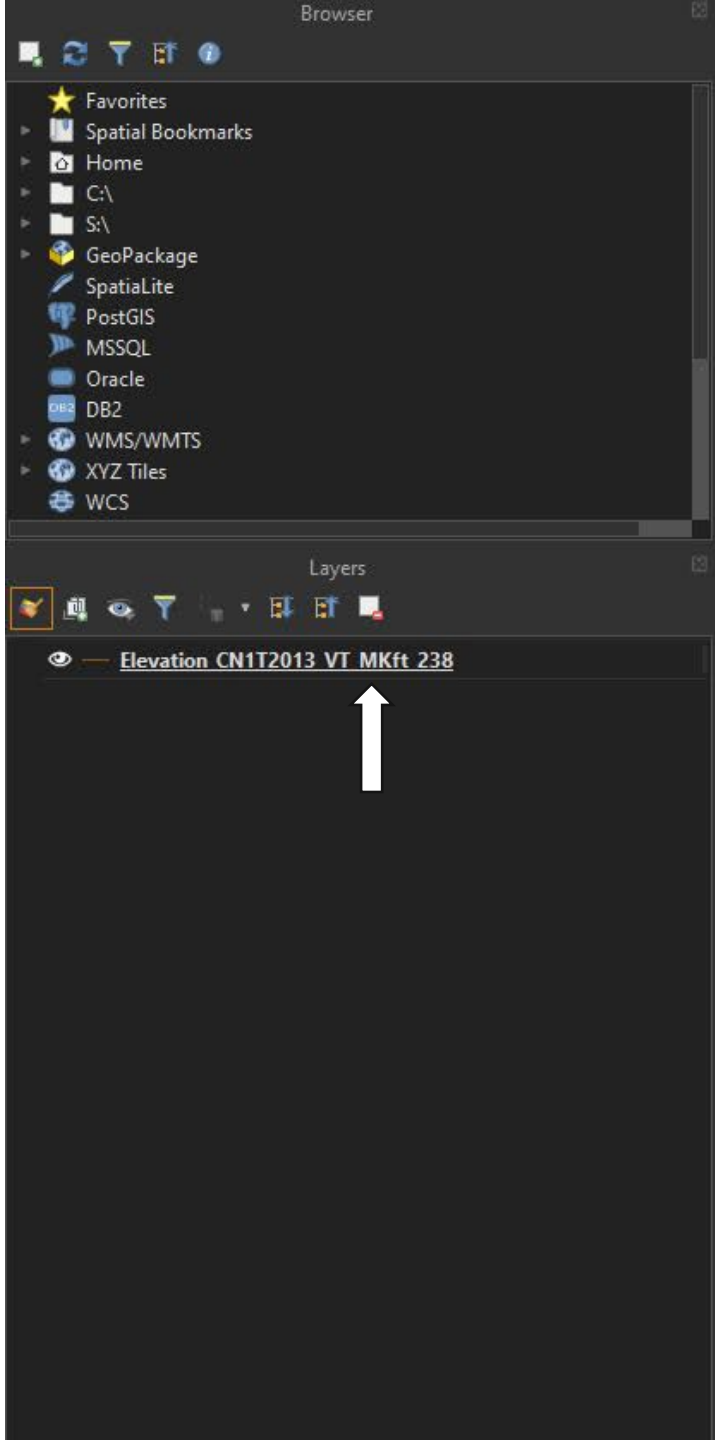
Browser

★ Favorites

- Spatial Bookmarks
- Home
- C:\
- S:\
- GeoPackage
- SpatiaLite
- PostGIS
- MSSQL
- Oracle
- DB2
- WMS/WMTS
- XYZ Tiles
- WCS

Layers

👁️ — Elevation CN1T2013 VT MKft 238



QGIS interface showing Favorites, Spatial Bookmarks, Home, C:\, S:\, GeoPackage, SpatialLite, PostGIS, MSSQL, Oracle, DB2, WMS/WMTS, XYZ Tiles, WCS, Layers, and Elevation CN1T2013 VT MKft 238.

### Save Vector Layer as...

Format: AutoCAD DXF

File name: C:\Users\tim\_terway\OneDrive - State of Vermont\Publications\2019 - GIS to CAD Medium Article\Data\CAD\CN1T2013\_238.dxf

Layer name: [Empty]

CRS: EPSG:32145 - NAD83 / Vermont

Encoding: [Empty]

Save only selected features

Symbology export: [Empty]

Scale: [Empty]

**Geometry**

Geometry type: [Empty]

Force multi-type

Include z-dimension

**Extent (current: layer)**

West: 462534.9250

Current Layer Extent

**Datasource Options**

HEADER: [Empty]

TRAILER: [Empty]

**Custom Options**

Data source: [Empty]

### Save Vector Layer as...

Format: AutoCAD DXF

File name: C:\Users\tim\_terway\OneDrive - State of Vermont\Publications\2019 - GIS to CAD Medium Article\Data\CAD\CN1T2013\_238.dxf

Layer name: [Empty]

CRS: EPSG:32145 - NAD83 / Vermont

Encoding: UTF-8

Save only selected features

Symbology export: No symbology

Scale: 1:1000000

**Geometry**

Geometry type: LineString

Force multi-type

Include z-dimension

**Extent (current: layer)**

West: 462534.9250

North: 146304.2926

East: 466344.9333

South: 142494.2843

Current Layer Extent

Calculate from Layer

Map Canvas Extent

**Datasource Options**

HEADER: [Empty]

TRAILER: [Empty]

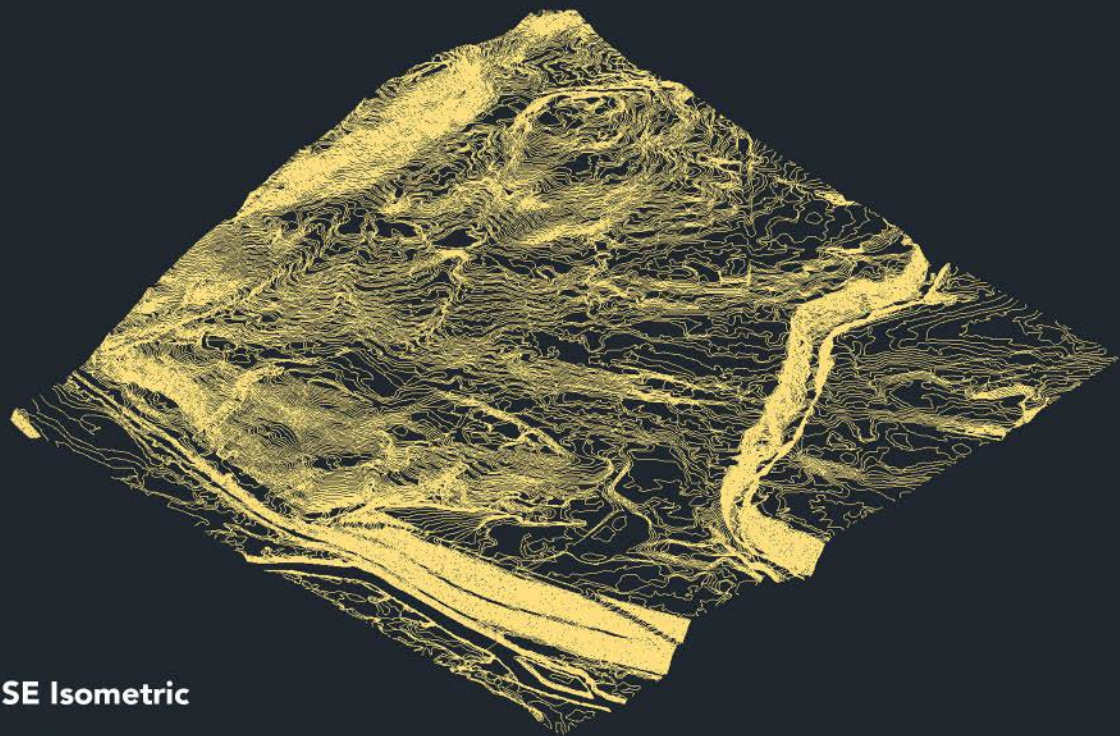
**Custom Options**

Data source: [Empty]

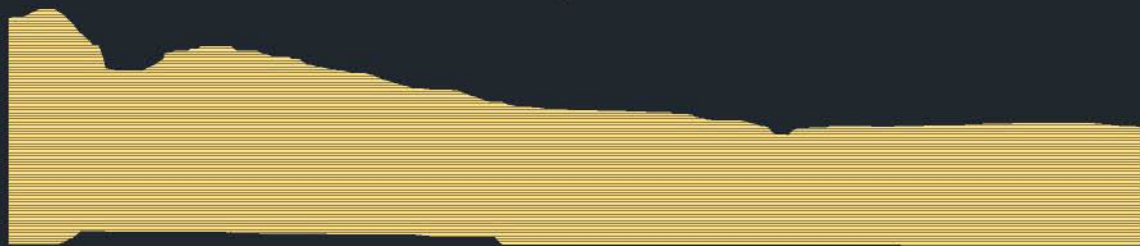
Add saved file to map

OK Cancel Help

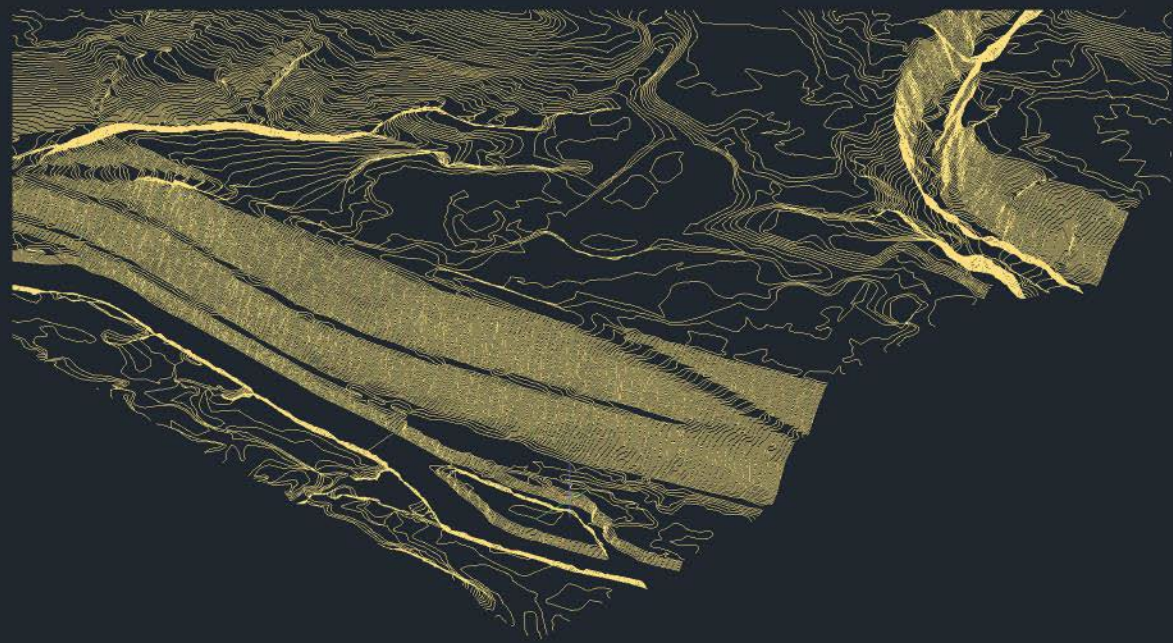




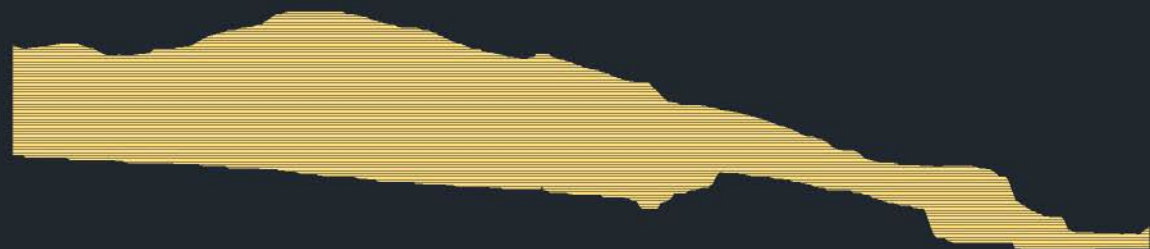
SE Isometric



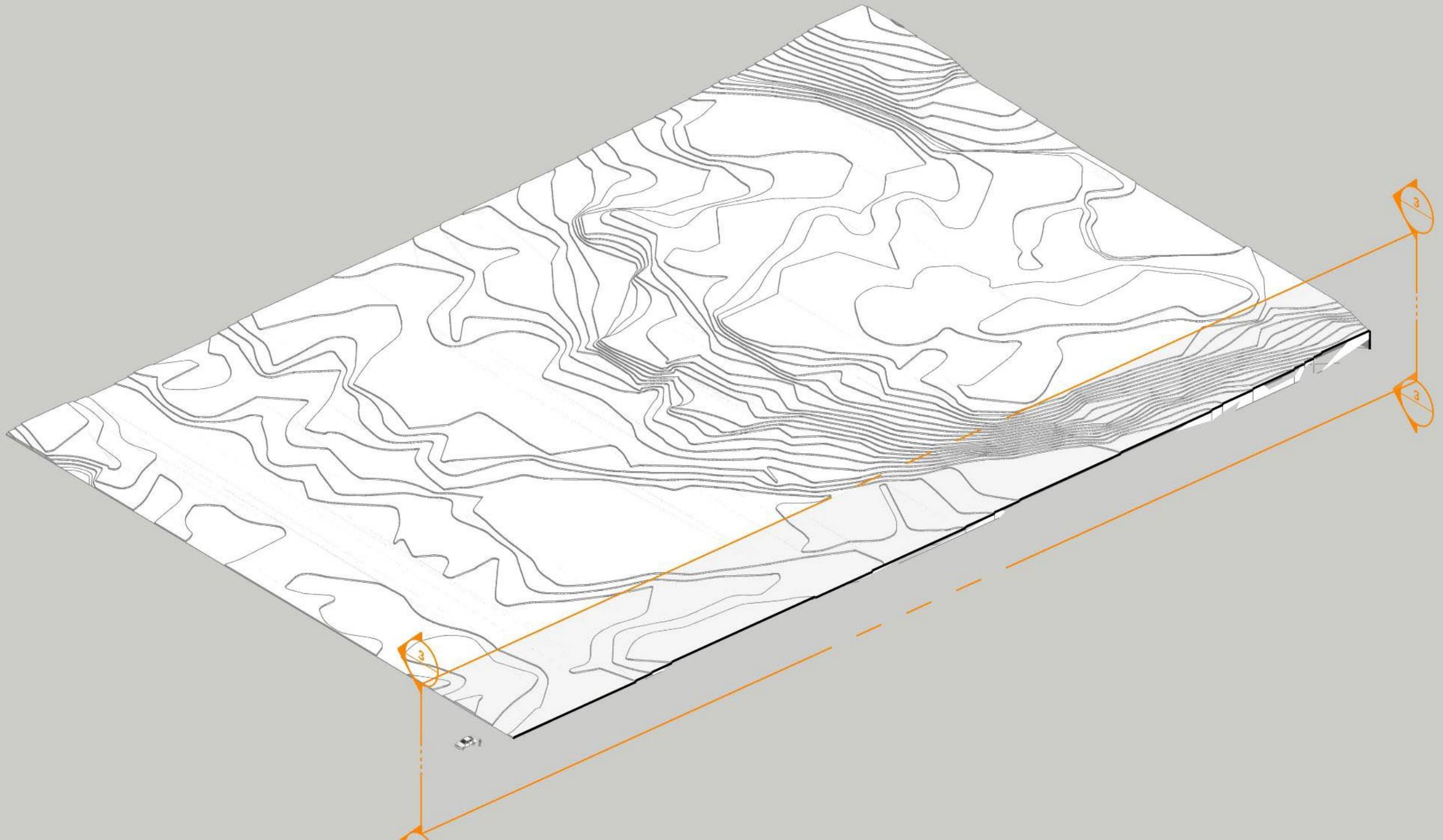
S Elevation



SE Isometric | Zoom



N Elevation







# 1' Contours: Downstream Planning, Design & Engineering Uses



[Data and Programs](#)[Resources](#)[Frequently Asked Questions](#)[VT GIS Standards and Guidelines](#)[How-To and Education Resources](#)[Events](#)[History of GIS in VT](#)[Maps](#)[Partners](#)[About VCGI](#)

## HOW-TO AND EDUCATION RESOURCES

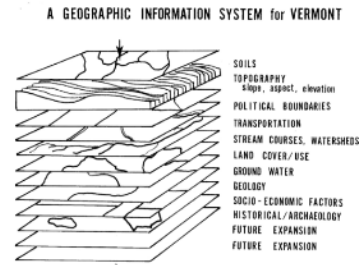
The pace of change in geographic information system (GIS) technology and applications is often difficult to keep up with. The resources linked below are good starting points for learning more about GIS, whether you are an absolute beginner or an advanced user with specific questions.

### Training and Support

#### GIS Concepts and Practices

[List of GIS software](#)[Basic Comparison of GIS Software](#)[Introduction to GIS \(from QGIS\)](#) \*Excellent overview for those just starting to understand GIS.[Introduction to GIS Fundamentals](#) \*Similarly excellent overview for newcomers, this time in slide deck, day-long workshop format.[How to Learn GIS resources from GIS Lounge](#)[QGIS Tutorials and Tips](#)[GIS@Tuft's Tutorials \(comprehensive\)](#)[GIS Manual \(Paul Cote, comprehensive\)](#)[GIS&T Body of Knowledge](#) - University Consortium for Geographic Information Science (comprehensive overview of GIS-related concepts)[ESRI Map Book Library](#) \*Excellent resource for inspirational examples of different mapping techniques and mappable content.[Common Design & Engineering Operations](#) (including GIS to CAD conversion of contour data [in QGIS](#) and [older Arc platforms PDF](#))[Geospatial and Statistical Data Resources](#) (Harvard GSD) \*Includes links to free GIS resources, common operations

#### Software & Platform Focused

[ESRI \(ArcGIS\) Training Offerings](#)[QGIS Training Directory](#)[QGIS Training Manual](#)[QGIS 3 for Absolute Beginners](#) \*Video link, ideal companion to Introduction to QGIS resources linked above.[QGC Geopackage Documentation](#) \*A potential successor to the shapefile[How to Export SHP to CAD Without Losing Elevation Value Using QGIS](#) \*Useful for working with elevation data such as 1' contours

## [How-To and Education Resources](#)





# VT Land Survey Library

Using tools at [landsurvey.vermont.gov](https://landsurvey.vermont.gov)

- About
- How It Works
- FAQ
- Professional Board
- VT GIS Data
- Contact



# Vermont Land Survey Library

Search, View and Add Vermont Land Surveys

## A Public Library for Vermont's Land Survey Records

[Enter the Land Survey Library](#)

The library hosts copies of land surveys of boundary line adjustments and subdivisions as prepared by Vermont licensed land surveyors.

### Digital Survey Plats

Effective January 1, 2020 and as stated in [27 V.S.A. § 341](#), surveys are required for property line changes in Vermont. Licensed land surveyors who produce the surveys are to submit a digital copy of them to the library in [.pdf format](#) (see [27 V.S.A. §1401](#) and [27 V.S.A. §1403](#)).

The copies of surveys are for public reference only, with the signed and stamped mylars that

### What is it?

The library consists of a web map that displays the general locations of .pdf copies of surveys produced by Vermont licensed land surveyors. For new surveys produced from January 1, 2020 onward, surveyors upload the .pdf copies to the map when the surveys are to be filed with the Town Clerk. The library's content is open to the public for viewing and reference.

### Submit a Survey

Are you a Vermont licensed land surveyor completing a survey of a property line change on land in Vermont? Are you a town official with recorded surveys that you'd like to make available on a map? If yes to either, then use the survey library application linked from this page to submit a .pdf copy of these documents. Learn more about how and when to use the library in [the User's Manual](#).



## FAQ's

## Why was the land survey library created?

The library provides an easy and open way for surveyors to share information about property line changes in Vermont. Among other uses, these public documents are helpful for maintaining an up-to-date [parcel data layer](#) throughout the state.

## When is the land survey of line changes requirement effective?

January 1, 2020. Property line changes from that date onward are subject to the requirement.

## Who can I contact if I need a land survey?

The [Vermont Society of Land Surveyors \(VLS\)](#) is a professional organization of licensed land surveyors in Vermont. VLS [maintains a list of active surveyors working in the state](#).

## Where can I obtain the official survey document?

The official survey document is the signed and stamped mylar that is filed with the Town in which it applies. The digital copies of surveys as displayed in the survey library are not official documents and are for reference purposes only.

## What does the library contain?

The land survey library contains digital .pdf copies of land surveys as produced by Vermont licensed land surveyors. Associated info such as name of surveyor, date of survey, and municipality is included. It does not contain site plans or informal sketches of property line adjustments.

## Are .pdf's in the library georeferenced?

No. A goal of the library is to provide easy use for all surveyors, and that precludes georeferenced .pdf's at this time.

## What if I have to submit a corrected version of a land survey in the library?

Email [VCGI](#) if you need to replace an existing survey in the library with a corrected version. Updated surveys that are not corrections should be added as new entries.

## How can I view surveys in the library?

The animation below provides an example of viewing a reviewed and approved survey already in the library.

## Where is the land survey requirement in statute?

Passed in 2019, Act 28 amends [27 V.S.A. § 341](#) which requires a survey for changes in property lines effective January 1, 2020.

The two sections that require submitting a .pdf copy of the survey to the survey library are: [27 V.S.A. §1401](#) and [27 V.S.A. §1403](#).

## How do I know if I need a land survey?

Are you subdividing land in Vermont? Adjusting a boundary line in Vermont? If the answer is yes to either, then a survey is required as stated in [27 V.S.A. § 341](#).

## What is different relative to past practices?

Before the passing of Act 28 in 2019 that creates the requirement for surveys of line changes to be created and submitted to the library, many municipalities in Vermont required a survey of a property line change. This now applies to all Vermont towns, with the additional task that a .pdf copy of the new survey be sent to the online library by the land surveyor who created the document. The standard practice of creating the signed and stamped mylar that goes to the Town as the recorded official document remains the same.

## Are land surveys recorded prior to January 1, 2020 able to be submitted to the library?

Yes. .Pdf copies of surveys recorded prior to January 1, 2020 by licensed land surveyors may be added to the library, but are not required.

## Can a surveyor not working digitally still create and submit a .pdf copy to the library?

Yes! [Please email VCGI](#) if you are a surveyor working in analog and are having troubles creating .pdf copies of your documents.

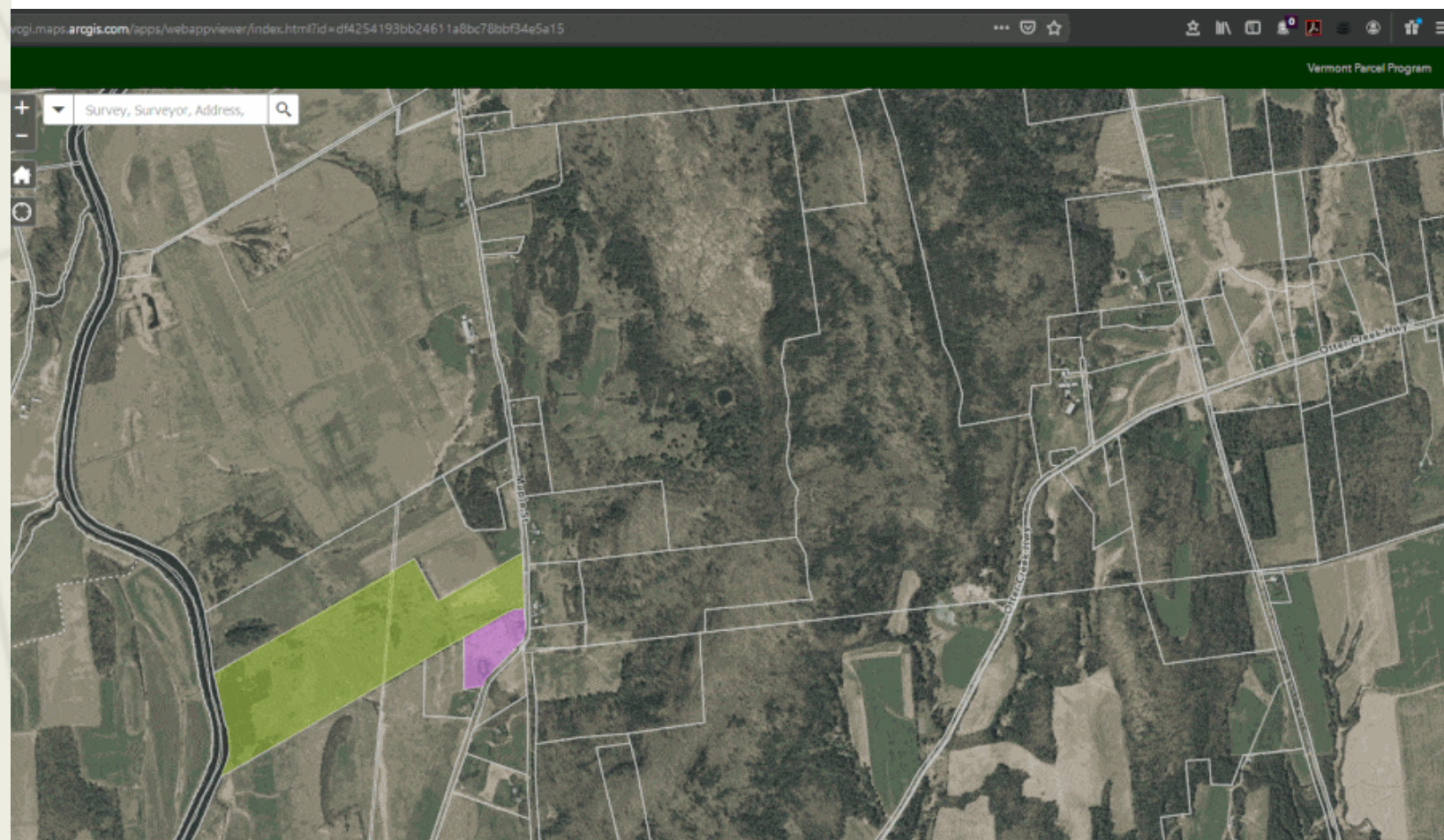
## When are land surveys to be submitted to the library?

PDF copies of land surveys subject to recording in the land records are recommended to be submitted to the library by the authoring surveyor at the time of their completion for their client and when ready for filing in the municipal land records. While the client submits the document to the town for official recording, the surveyor may still submit the digital copy of the survey to the library when the official plat is ready for recording.

## What if there are conflicting land surveys?

There possibly are!

A purpose of the library is to make it easier to understand where property lines are located and how they're documented. Conflicts should be resolved by the authoring surveyors.







About

Using the Library

Zoom in and navigate the map to the location of the land survey. Entered surveys are marked by colored polygons. You can enter an address in the search bar or pan and zoom around the map with your mouse. Different layers become visible once zoomed in. **The buttons above are for the following tasks:**



Use the **Add a Survey** tool to add a survey.



Use the **Measurement** tool to measure lines or areas.



Use the **Layer List** to toggle layers on and off.



Use the **More** button to select items or change the basemap.



Use the **Select** tool to select multiple surveys and view their contents in the attribute table.




View the **Attributes** of selected items by expanding the table view at the bottom of the page.

Searching for a Survey

**By Search Bar:** Type in the name of the surveyor or address of the survey's location

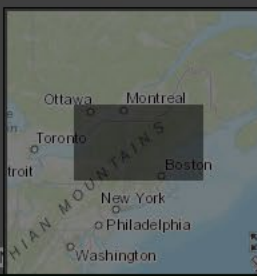
**By Map:** Navigate the map to the general location of the survey and make sure the survey library layer is turned on. You may also filter available surveys by map extent using the attribute table at the bottom of the page.

**VERMONT**  
VERMONT CENTER FOR GEOGRAPHIC INFORMATION

PDF copies of land surveys presented in the library are for reference purposes only. Many of the original signed and stamped mylars depicted in this library are available in the land records of the Municipality in which the survey is located. For questions or comments about the contents of a survey, please contact the authoring licensed land surveyor.

OK







About

### Using the Library

Zoom in and navigate the map to the location of the land survey. You can enter an address in the search bar or pan and zoom around the map with your mouse. Different layers become visible once zoomed in. **The buttons above are for the following tasks:**



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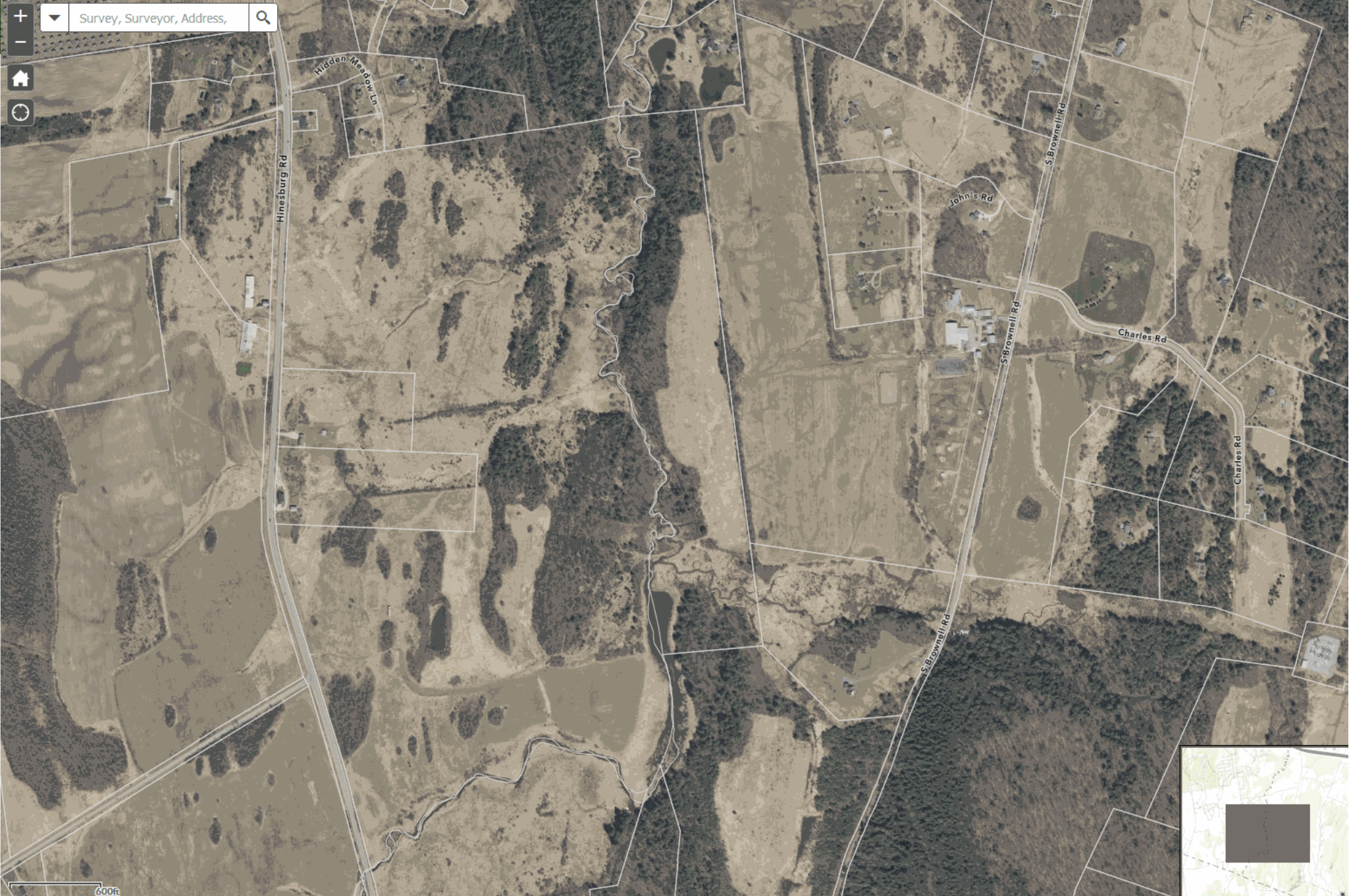
### Searching for a Survey

**By Search Bar:** Type in the name of the surveyor or address of the survey's location

**By Map:** Navigate the map to the general location of the survey and make sure the survey library layer is turned on. You may also filter available surveys by map extent using the attribute table at the bottom of the page.

### Viewing a Survey

Click on a polygon of a survey that you've located on the map. A pop-up window will display with its associated information. **In the pop-up window, click on the linked .pdf in the Attachments field.** This will open the .pdf in a new tab. For example:





Unreviewed **3** Reviewed **1,684** Pending **4**

9/15/2022, 3:16 PM  
SOUTHERN VERMONT SURVEYS (JEREMIAH SUND)  
EVERGREEN LANE DEVELOPMENT

9/15/2022, 2:30 PM  
STUART DAUCHY (JEREMIAH SUND)  
JANET CLOUTMAN JOYCE ROWLEY & ALTA ROBERST

9/15/2022, 2:22 PM  
NICHOLAS P NOLAN (JEREMIAH SUND)  
SUBDIVISION PLAN FOR JOYCE A ROWLEY

9/15/2022, 12:39 PM  
DONALD STEIN  
RIDGEVIEW ASSOCIATES

9/14/2022, 5:26 PM  
William R. Chase  
Subdivision Survey, Jon Jewett & Sylvia Vaillancourt, 130 Quaker Road, East Montpelier, VT

9/14/2022, 5:22 PM  
William R. Chase  
Boundary Line Adjustment, Land of Nelson & Rhonda Steiner for Jeremy Judkins & Stacey Boivin, 2845 North Wolcott Rd, Wolcott, Vermont

9/12/2022, 3:47 PM  
HEMAN CHASE  
MAGIC VIEWPOINT

9/12/2022, 7:42 AM  
William Creamer  
Micheal H & Rosemary E Bulkin

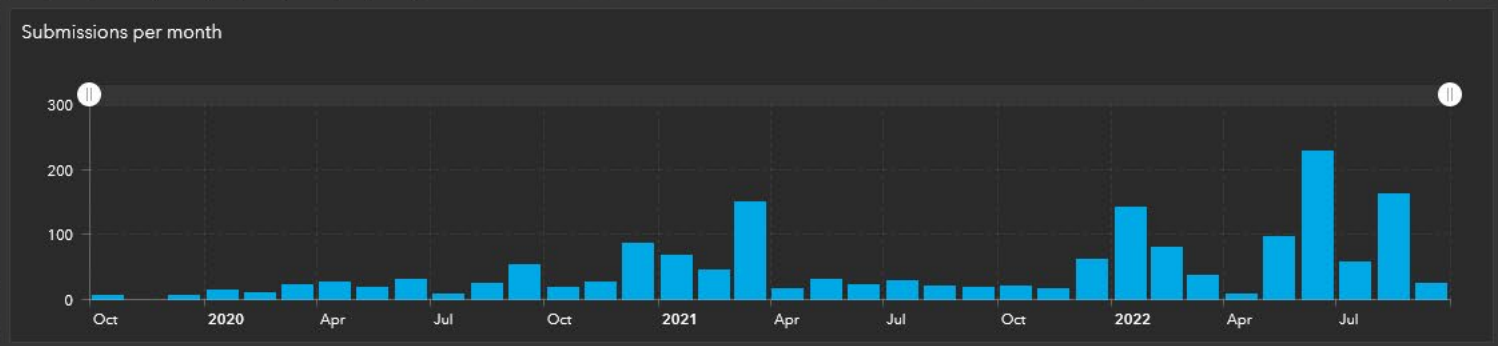
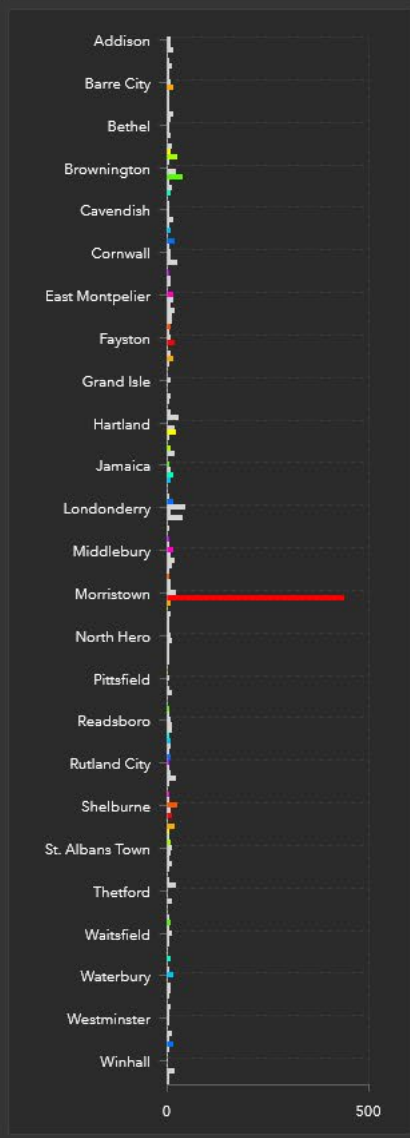
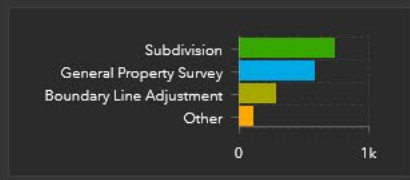
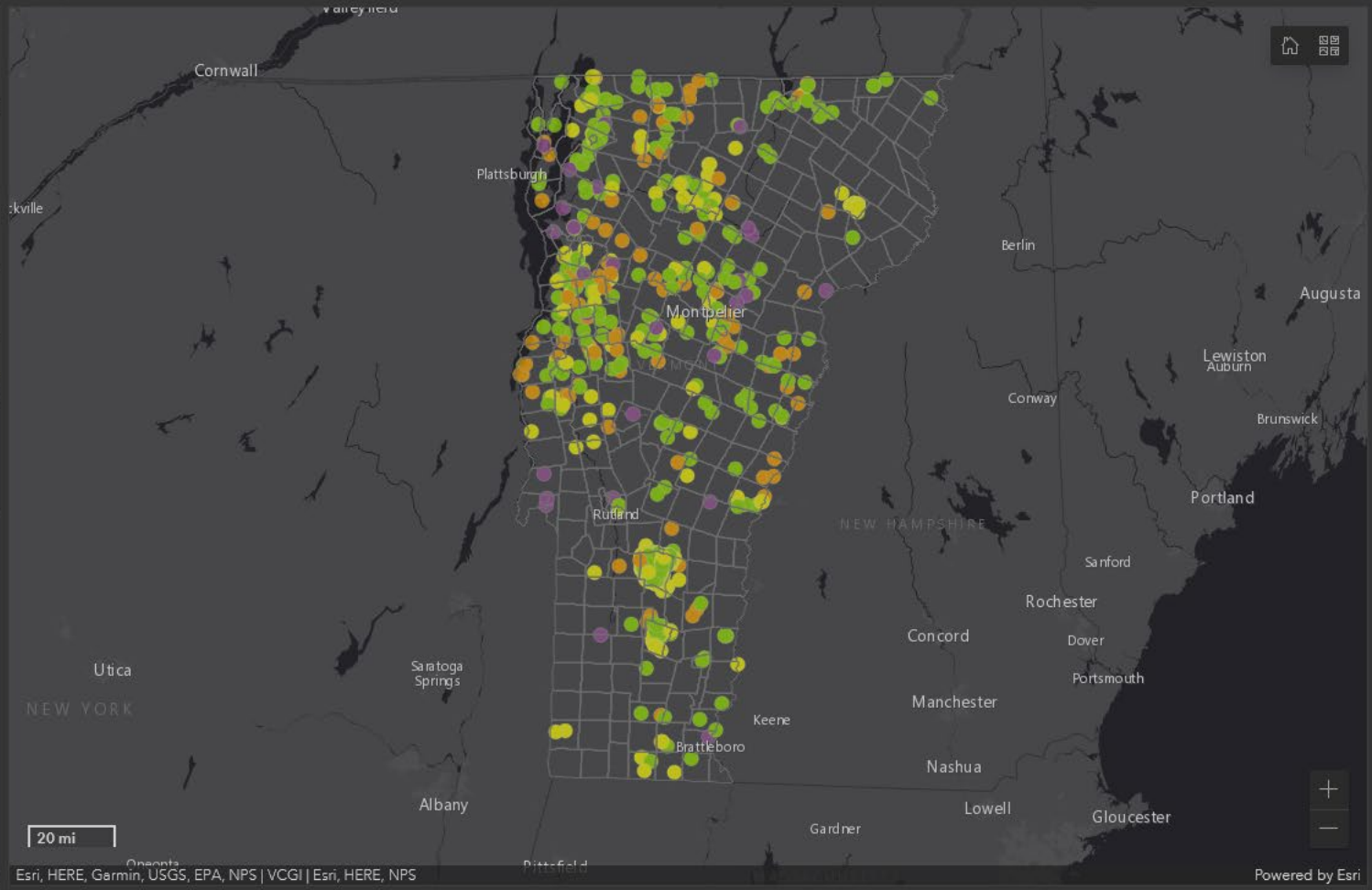
9/12/2022, 7:39 AM  
Gary Rapanotti  
George L Brill Salma S Brill

3/17/2021, 2:51 PM  
Gerald M. Stockman (up loaded by surveyor)  
Existing Conditions

3/12/2021, 2:29 PM  
Gerald M. Stockman (up loaded by surveyor)  
Patriquin Monument Reset

3/11/2021, 2:55 PM  
Gerald M. Stockman (up loaded by surveyor)  
Brisee Plot Plan

3/11/2021, 2:50 PM  
Kenneth W. Pinkham LS 203 (up loaded by surveyor)  
Plat of Lots 1-60 Vermont National Bank Formerly Landmark Dev.





SEARCH  
CONTACT

**Open Geodata Portal** >  
Find map data from State Agencies and Regional Planning Commissions.

- Parcel Polygons
- Parcel Lines
- Inactive Parcels
- Parcels Available by Town

**Contours - Lidar**  
Composite of contours derived from lidar data from 2007 and 2010. Contour interval is 100 feet. State Plane Meters (32148).  
[Endstate] [View]

**Digital Elevation Model**  
Composite of the best available most recent, highest resolution color infrared orthorectified imagery. State Plane Meters (32148).  
[Endstate] [View]

**Digital Surface Model**  
Composite of the best available most recent, highest resolution color infrared orthorectified imagery. State Plane Meters (32148).  
[Endstate] [View]

**Best of Color**  
Composite of the best available most recent, highest resolution color infrared orthorectified imagery. State Plane Meters (32148).  
[Endstate] [View]

**Best of Color Infrared**  
Composite of the best available most recent, highest resolution color infrared orthorectified imagery. State Plane Meters (32148).  
[Endstate] [View]

**Best of Black & White**  
Composite of the best available most recent, highest resolution black and white orthorectified imagery. State Plane Meters (32148).  
[Endstate] [View]

**DEM - Hillshade**  
Composite of the best available most recent, highest resolution color infrared orthorectified imagery. State Plane Meters (32148).  
[Endstate] [View]

**DEM - Hillshade**  
Composite of the best available most recent, highest resolution color infrared orthorectified imagery. State Plane Meters (32148).  
[Endstate] [View]

**DEM - Hillshade**  
Composite of the best available most recent, highest resolution color infrared orthorectified imagery. State Plane Meters (32148).  
[Endstate] [View]

# Thank you!

More resources at [vcgi.vermont.gov](http://vcgi.vermont.gov)

Data and Programs  
Resources  
Maps  
Partners  
About VCGI

Use the Vermont Open Geodata portal to find free spatial data, services, and applications  
**FIND MAP DATA**

Use map applications to create maps in your browser with data from multiple agencies  
**USE MAP DATA**

Learn about events, activities, and resources for advancing your GIS mapping knowledge and skills  
**MAPPING RESOURCES**


Find out the current status and coverage of key program datasets  
**DATA STATUS**

View frequently asked questions about our mapping products and services  
**FAQ'S**

Learn about contributing your group or town's geospatial data  
**SHARE MAP DATA**

**Tweets from @VCGI**


VCGI @... · 5h  
New sticker commemorating 30 years of 'clippin', 'zippin', & 'shippin'! Check out what we were up to in 1992: [cctv.org/watch-tv/progr...](http://cctv.org/watch-tv/progr...) Thank you @TownMeetingTV for making this incredible

Contact us: 

Vermont Center for Geographic Information  
One National Life Drive  
Dewey Building 2nd Floor  
Montpelier, VT 05620-2001  
[Email VCGI](mailto:Email VCGI)

**Tim Terway**, Helpful GIS Professional  
(802) 585-0820

**John E. Adams**, Director  
(802) 522-0172



VCGI is your source for the State of Vermont's

**News and Updates**

**NEWS**  
13 JULY 2022  
**Town Boundaries Updated to Reflect City of Essex Junction, Geographic Area Names and Codes Standard Updated**

**DATA RELEASE**  
23 MAY 2022  
**Lake Champlain Basin Lidar-Informed Flood Inundation Layer Now Available**

**HOW-TO**  
22 APRIL 2022  
**Improving Parcel Data Quality: Revising Marsh Codes**

**Popular Datasets**

- [Parcels](#)
- [Elevation \(Includes Lidar\)](#)
- [Imagery](#)
- [Land Cover](#)

**Map Applications**

- [Vermont Interactive Map Viewer](#)
- [Vermont Parcel Viewer](#)
- [Municipal Parcel Map Status](#)
- [Vermont Land Survey Library](#)
- [Vermont Orthoimagery Finder](#)
- [Vermont Orthoimagery Status](#)
- [Vermont Lidar Finder](#)
- [Vermont Lidar Status](#)





VSLs Conference | September 16, 2022

# Accessing GIS Resources at the Vermont Open Geodata Portal



Tim Terway

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[tim.terway@vermont.gov](mailto:tim.terway@vermont.gov)

[vcgi.vermont.gov](http://vcgi.vermont.gov)

[geodata.vermont.gov](http://geodata.vermont.gov)