

The View from Above: How to Access and Use New Aerial Imagery



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RESOURCES
Extension

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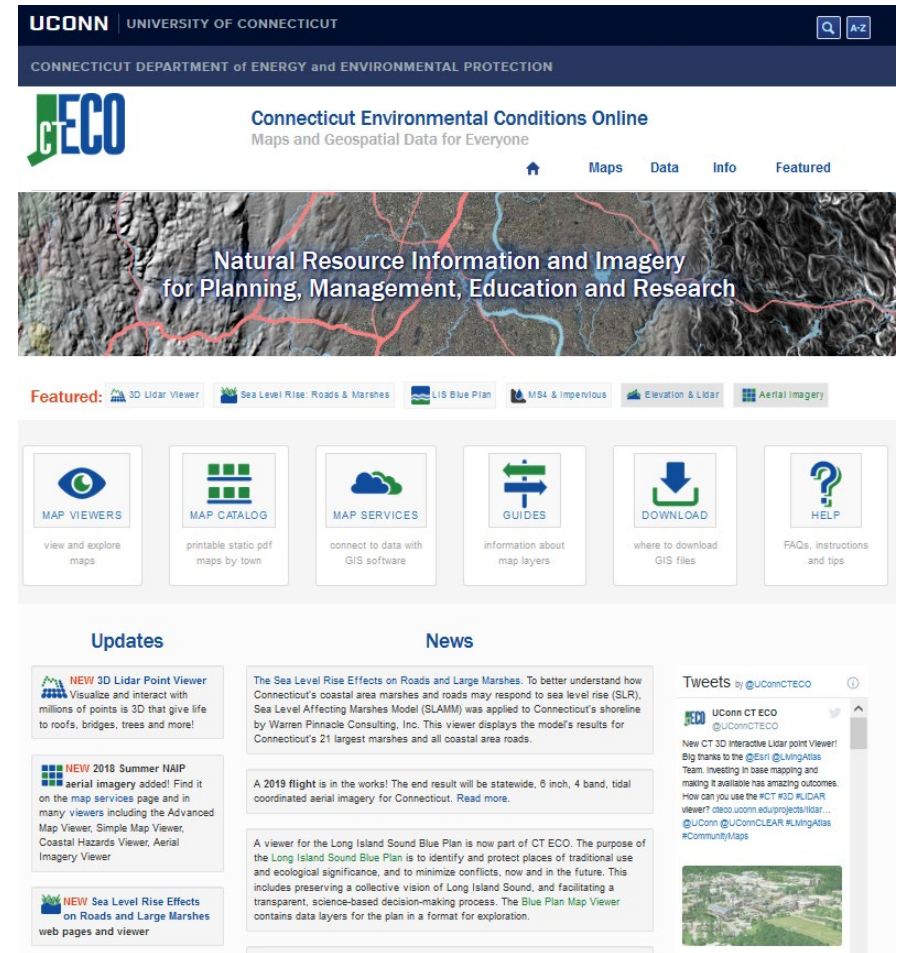
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 [@UConnCTECO](https://twitter.com/UConnCTECO)





- a **website** containing Connecticut's statewide, geospatial information
- a **partnership** between CT Dept. of Energy and Environmental Protection and the University of Connecticut



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CT ECO

cteco.uconn.edu

Outline

- **Aerial Imagery on CT ECO**
 - Info pages
 - Aerial Imagery Viewer
- **2019 Imagery**
 - Overview
 - Services
- **Connect to Services**
 - ArcGIS Online
 - ArcPro
- **Download**
- **Questions**



Aerial Imagery Datasets on CT ECO

Similarities

- Captured with a camera on an airplane
- Have requirements for
 - minimal clouds
 - high sun angles (reduce shadows)
 - NADIR (looking straight down)
- Corrected for terrain (orthophotography)

Differences

- Pixel size (spatial resolution)
- Season (leaf off vs leaf on)
- Number of bands (true color, false color near infrared)
- Year & dates of capture

20 Datasets!

Glossary

- Ortho = orthoimagery which has been corrected for terrain
- NAIP = National Agriculture Imagery Program
 - United States Department of Agriculture (USDA) Farm Service Agency
 - National coverage, flown during the growing season
 - CT digital: 2006, 2008, 2010, 2012, 2016, 2018
- NIR or IR = Near Infrared band combination
 - Near infrared band of the imagery paired with the red of the computer so healthy vegetation is red (has to do with photosynthesis and reflectance)
- Imagery naming
 - Year of capture + color or infrared + season + pixel resolution

CT ECO Imagery One-stop

cteco.uconn.edu/data/imagery/

UConn | UNIVERSITY OF CONNECTICUT

CONNECTICUT DEPARTMENT of ENERGY and ENVIRONMENTAL PROTECTION

CT ECO Connecticut Environmental Conditions Online
Maps and Geospatial Data for Everyone

Home Maps Data Info Featured

Connecticut Aerial Imagery

Featured on CT ECO

- 2019 Imagery**
Leaf off, 4 bands, 6 inch pixels, tide coordinated.
- 2016 Imagery**
Leaf off, 4 bands, 3 inch pixels, tide coordinated.
- 2012 Imagery**
Leaf off, 4 bands, 1 foot pixels.

Viewers

- Aerial Imagery Viewer**
View and interact with Connecticut's digital aerial imagery going back to 1990.
- CT 2016 Imagery Viewer**
The 2016 imagery is a simple viewer

Image Services

There are four categories of imagery services on the [Map Services](#) page that include over 20 imagery services. Look for:

- Imagery - Spring Statewide
- Imagery - Summer Statewide
- Imagery - Coastal
- Imagery - Other Areas.

Download

- 2019 Aerial Imagery** (4 bands, 6 inch pixels) [Project](#) | [Help](#) | [Metadata](#)
- 2016 Aerial Imagery** (4 bands, 3 inch pixels) [Project](#) | [Help](#) | [Metadata](#)
- 2012 Aerial Imagery** (4 bands, 1 foot pixels) [Project](#) | [Help](#) | [Metadata](#)

Information and Help

- Connecticut's Digital Orthophotography.** A table listing all of the digital imagery datasets including basic facts like bands, season and pixel size.
- 2016 Orthos and Elevation Information**
- 2012 Orthos Information**
- CT Imagery Viewer Help**

Connect

The imagery is served as an image service using Esri's ArcGIS Server.

- Connect with ArcGIS Online.** ArcGIS Online is a website by Esri that provides a platform for using, creating, and sharing maps, apps, and data, and accessing authoritative basemaps. **CT ECO uses ArcGIS online** to share many of Connecticut's maps and make it possible for users to save and make changes to the maps.
- Connect with Google Earth.** Google Earth is a virtual globe, map and geographical information program.
- Connect with ArcPro.** ArcPro is the new desktop GIS software by Esri. It is not free.
- Connect with ArcGIS.** ArcGIS is a desktop GIS software by Esri. It is not free.
- Connect using WMS.**

Other Sources of Connecticut Imagery

CT State Library. Archives of aerial surveys which some online.



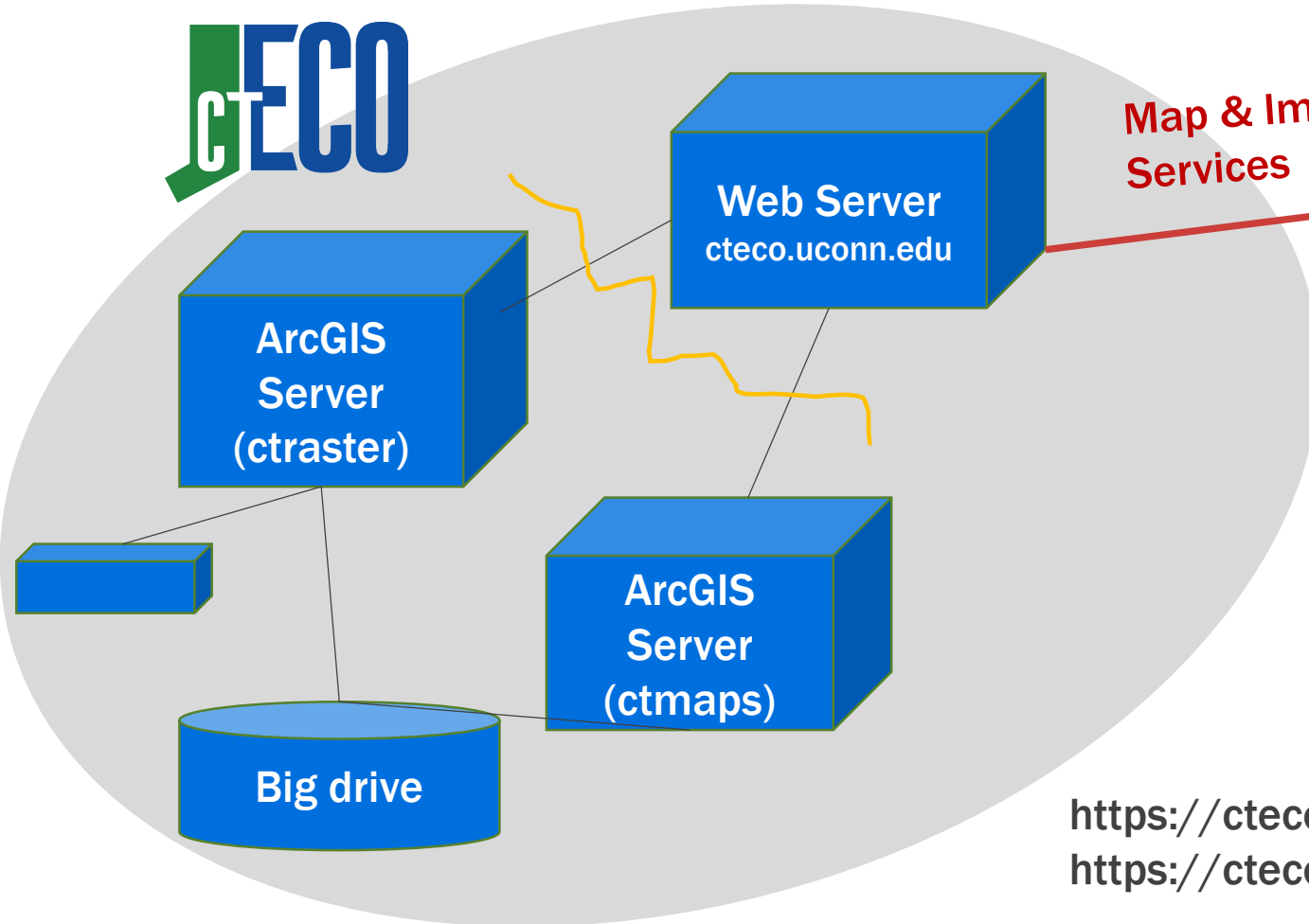
DEMO

CT ECO Aerial Imagery Viewer

<http://cteco.uconn.edu/viewers/index.htm#aerial>

<http://s.uconn.edu/aerialviewer/>

Services



Map & Image Services



Cloud: ArcGIS Online



Desktop GIS: ArcPro, ArcMap
Open Source: WMS



Viewers

Others

<https://cteco.uconn.edu/ctmaps/rest/services/>
<https://cteco.uconn.edu/ctraster/rest/services/>

Services

- **Map service**

ArcGIS server service to make maps available via the web.

- **Image service**

ArcGIS server service to make pixel-based imagery available through the web.

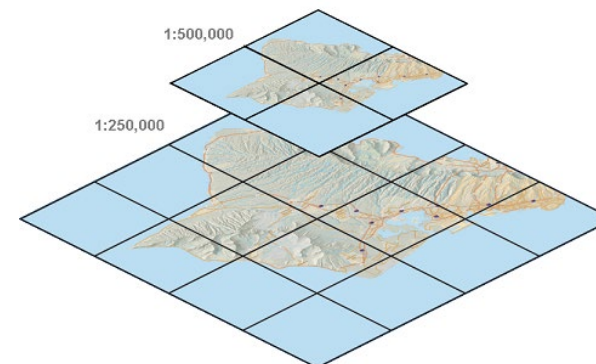
Image services support on-the-fly processing such as symbology and raster functions.

- **Dynamic service**

data access through a service.

- **Tiled or cached service**

pre-created tile access through a **service**. How: many, many pre-made tiles (pictures) of the data are created and stored. The result is faster access.



Map and Image Services

Map and Image Services are a means of dynamically accessing GIS data over the Internet. This is an advanced section of the CT ECO website meant for GIS software users interested in using services from CT ECO with their own GIS software and geographic data. Scroll down the list for [imagery](#).

Notice that most Map Services contain multiple layers. After adding the map service to your GIS, expand the group and turn on (check) the data layers.

HOW TO CONNECT

FAQS

CT IMAGERY INFO

- Base Maps ▾
- Bioscience ▾
- Built Environment ▾
- Coastal ▾
- Elevation ▾
- Geology ▾
- Hydrography ▾
- Land Cover ▾
- Open Space ▾
- Political Boundaries ▾
- Soils ▾
- Watershed ▾
- Water Resources ▾

Imagery - Spring Statewide ▾

- Imagery - Summer Statewide ▾
- Imagery - Coastal ▾
- Imagery - Other Areas ▾

2019 Spring 4 band, 6inch

Server URL for dynamic service: https://cteco.uconn.edu/ctraster/rest/services/imagery/Ortho_2019/ImageServer

This service has a stretch applied for better viewing. Change to NIR or remove stretch with raster functions in ArcGIS Online, ArcMap or ArcPro.

Server URL for cached service: https://cteco.uconn.edu/ctraster/rest/services/imagery/Ortho_2019_tiled/ImageServer

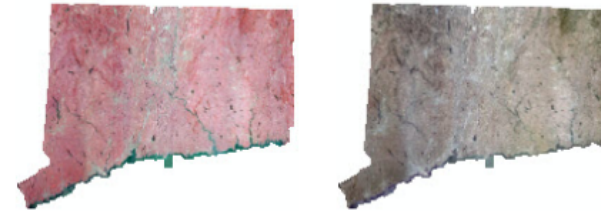
help: dynamic vs tiled/cached service

Server URL for 4-band dynamic service: https://cteco.uconn.edu/ctraster/rest/services/imagery/Ortho_2019_orig/ImageServer

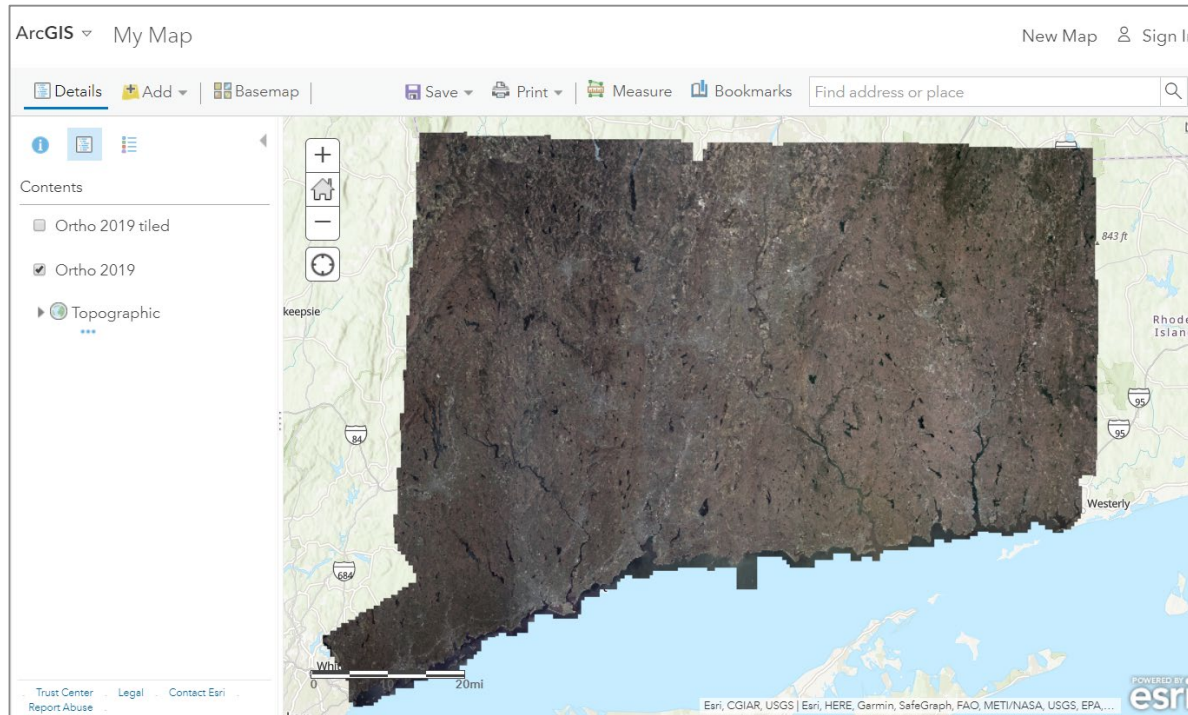
This service is the original, 4-band imagery and is best for connecting in a GIS.

Layer List

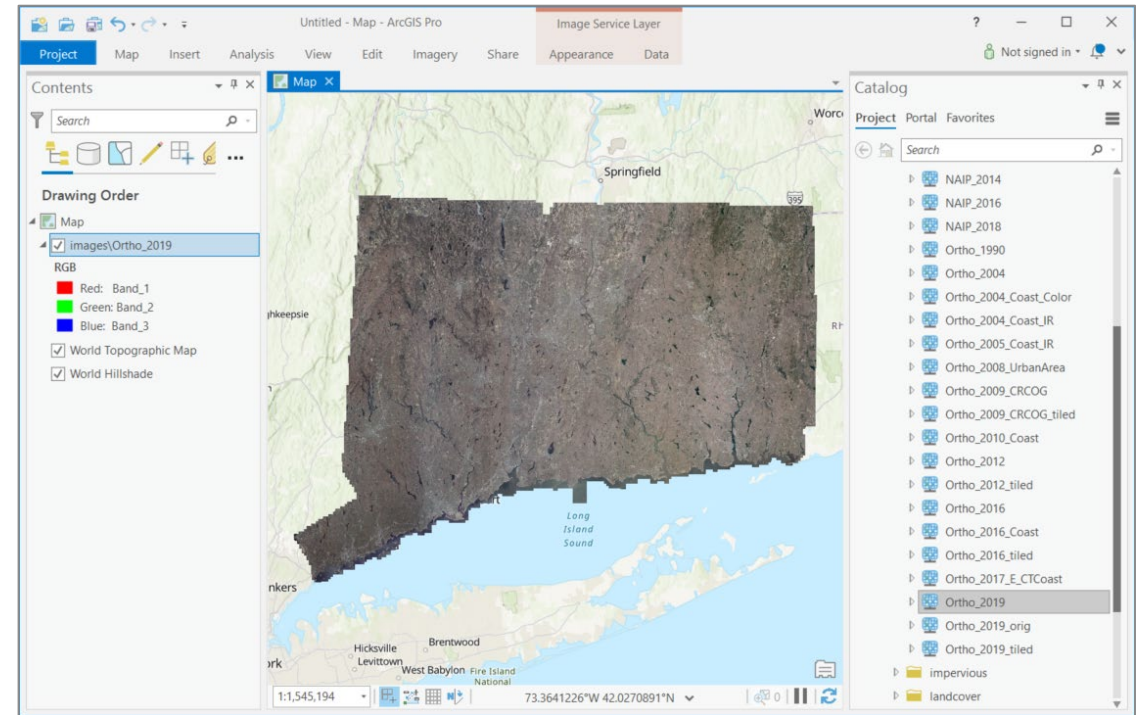
2019 Spring Imagery [Metadata](#) | [Download](#)



ArcGIS Online



ArcGIS Pro



DEMO
Add Services

2019

6 inch pixels

- **Tiles** (23,381)
Tif (195Mb)
- **Town mosaics**
MrSID (615Mb - 5.8Gb)

2016

3 inch pixels

- **Tiles** (23,381)
Tif (391Mb)
MrSID tiles (14Mb - 20Mb)
- **Town mosaics**
MrSID (1Gb - 12Gb)
- **Elevation files**

2012

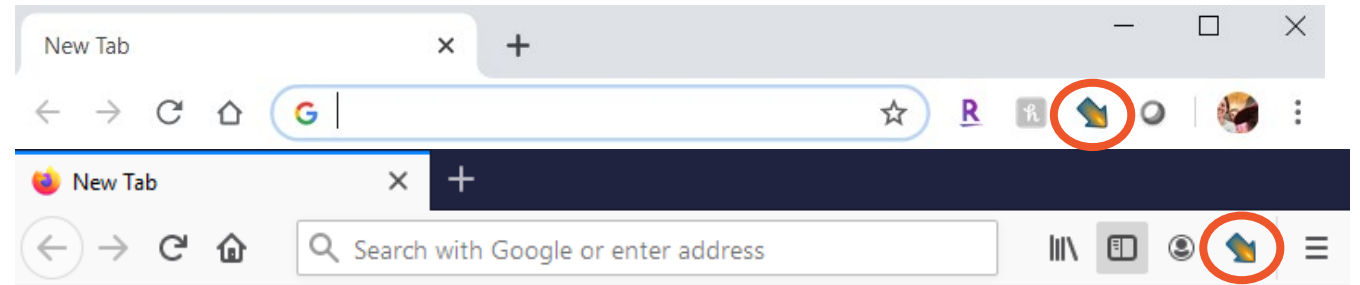
1 foot pixels

- **Tiles** (6131)
Tif (97Mb)
MrSID tiles (14Mb - 20Mb)

Download

Download Manager

- *DownThemAll* but use what you like
- Firefox, Chrome, Opera



- Puts download files in line

The screenshot shows a download manager interface with a toolbar at the top containing icons for adding, playing, pausing, stopping, and deleting downloads, along with a 'Donate!' button and a download icon. Below the toolbar is a table with the following columns: Name/URL, Progress, %, Size, Est. Time, and Speed.

Name/URL	Progress	%	Size	Est. Time	Speed
125860_nw.zip		100%	187.98MB	Done	
125860_nw.zip		58%	109.52MB of 187...	00:34	2.27MB/s
125860_nw.zip		17%	32.88MB of 187.9...	01:36	1.60MB/s

2019 Orthophotography Download

[2019 Flight Home](#) [Info/Help](#) [Download](#)

These are LARGE files! Please use the Interactive Select Mode with a [Download Manager](#) if you will be downloading more than a few files.
Aerial imagery is available by tile as GeoTiffs or by town as MrSID4.

[Metadata](#) | [Tile grid](#) | [Help](#)

The screenshot displays a web-based interface for downloading orthophotography. On the left, a map shows a grid of tiles over a geographic area. A red outline highlights a specific town, Haddam, CT. A 'Results' popup window is open over the town, showing options to download a 'Mosaic for Haddam' or a 'MrSID4 Mosaic File'. The right side of the interface features a list of 242 tiles, each with a checkbox, a thumbnail, a tile number, and the file format (Tiff).

	Tile Number	Imagery
<input type="checkbox"/>	070750_se	Tiff
<input type="checkbox"/>	070745_sw	Tiff
<input type="checkbox"/>	070745_se	Tiff
<input type="checkbox"/>	070745_nw	Tiff
<input type="checkbox"/>	070745_ne	Tiff
<input type="checkbox"/>	070740_nw	Tiff
<input type="checkbox"/>	070740_ne	Tiff
<input type="checkbox"/>	065745_sw	Tiff
<input type="checkbox"/>	065745_se	Tiff
<input type="checkbox"/>	065745_nw	Tiff
<input type="checkbox"/>	065745_ne	Tiff
<input type="checkbox"/>	065740_nw	Tiff
<input type="checkbox"/>	065740_ne	Tiff
<input type="checkbox"/>	060745_sw	Tiff
<input type="checkbox"/>	060745_se	Tiff
<input type="checkbox"/>	060745_nw	Tiff
<input type="checkbox"/>	060745_ne	Tiff
<input type="checkbox"/>	060740_nw	Tiff
<input type="checkbox"/>	060740_ne	Tiff
<input type="checkbox"/>	055745_sw	Tiff
<input type="checkbox"/>	055745_se	Tiff
<input type="checkbox"/>	055745_nw	Tiff
<input type="checkbox"/>	055745_ne	Tiff
<input type="checkbox"/>	055740_nw	Tiff
<input type="checkbox"/>	055740_ne	Tiff
<input type="checkbox"/>	050745_sw	Tiff

DEMO

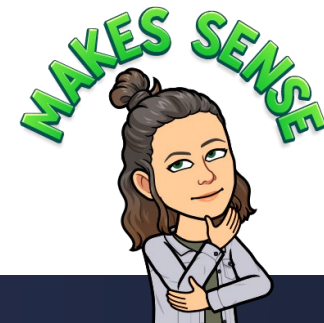
Team Effort, again

- CT Office of Policy and Management (OPM)
- United States Geologic Survey (USGS)
- US Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS)
- CT Department of Transportation (DOT)
- CT Department of Emergency Services and Public Protection (DESPP)
- CT Department of Energy and Environmental Protection (DEEP)

There are real people in each of these agencies making this happen.

Take Home Message

- Each flight happens when mapping folks at different agencies are able to find enough money.
- The imagery benefits each of these agencies along with other state, regional and municipal government, businesses, non-profits, utilities, education and many others.
- A more predictable funding mechanism and data collection cycle would
 - Reduce redundant data collection by different entities
 - Provide predictability and planning
 - Save money!



Questions & Thank you

Take Care



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