Why Connecticut Needs GIS Coordination

The current situation is problematic and costly

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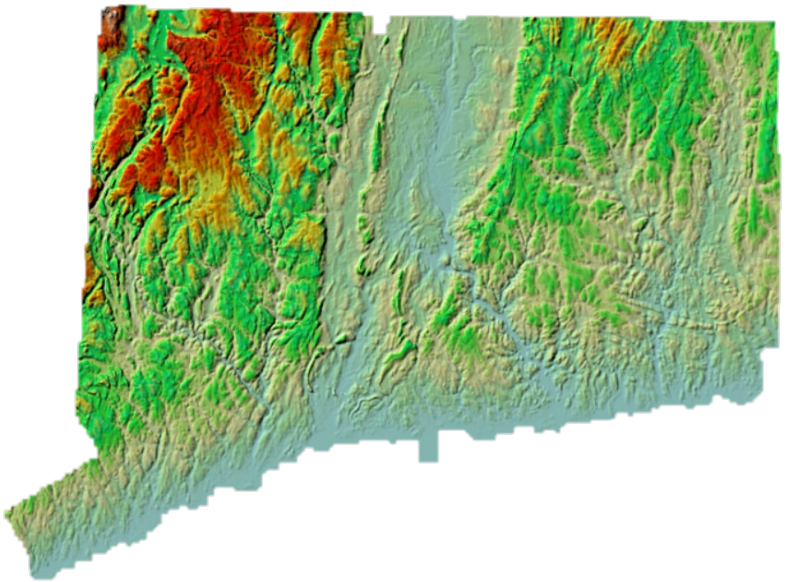
- What is GIS
- The Punchline
- GIS in Connecticut
  - past & present
- GIS Issues in Connecticut
- Legislative Working Group
  - Recommendations by Sector
  - How other states do it
- Recommendations for Connecticut
- What's next
- Eric and Erik
- Questions



Outline

https://s.uconn.edu/stategis

Geographic Information System

GIS is a System.

Not just data or software or applications. But the combination.

data + software + applications + people

GIS is a Profession.

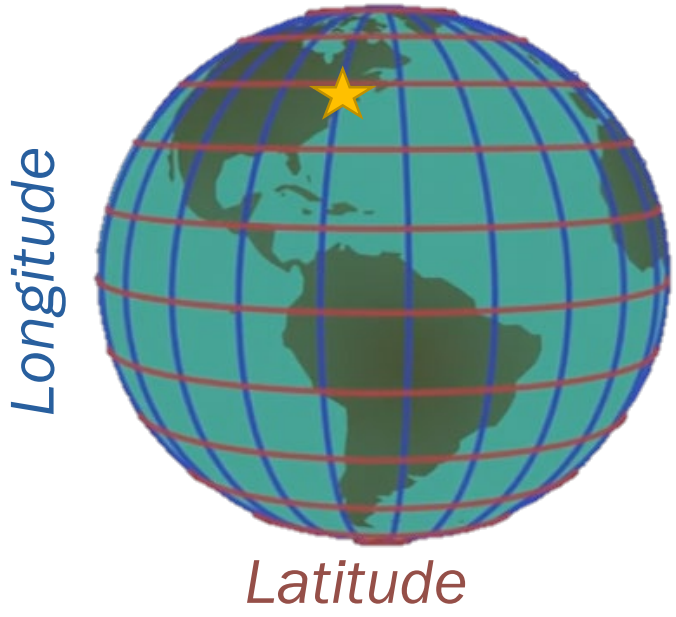
Most GIS professionals have a degree or two in GIS or a related field.

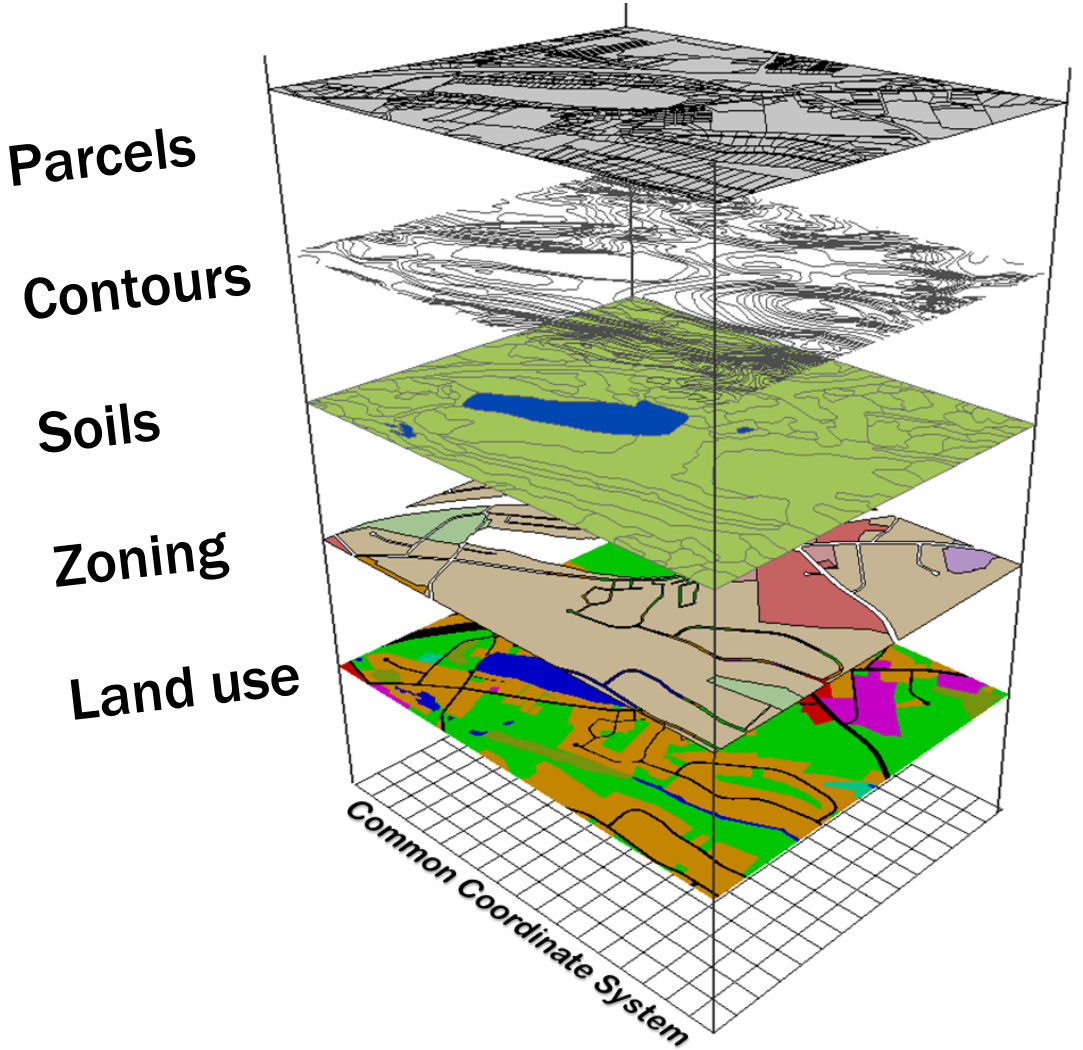
GIS is a Tool.

A tool to answer questions from all different disciplines about all different things.

How GIS Works: Layers

- Single topic data layers
- Tied together with geographic coordinates (location)

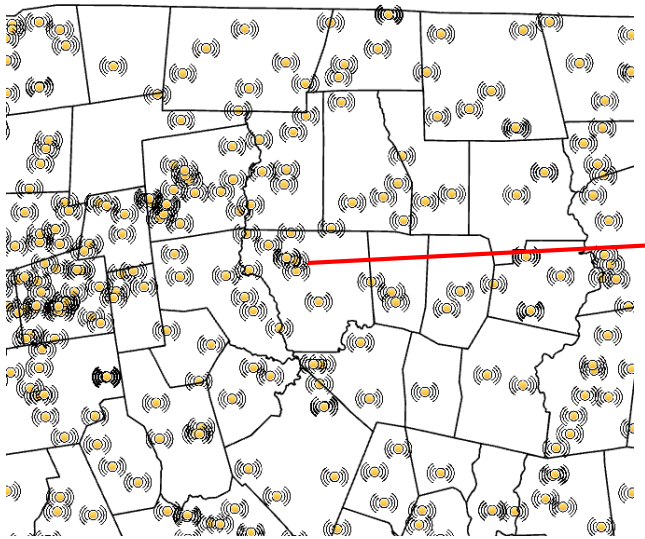




How GIS Works: Tables

Tabular (attribute) information is tied to features (which have locations)

Attributes are the key to display, answering questions, summarizing, selecting, querying, filtering, and more.



OBJECT_ID	742
Town	Mansfield
Address	855 Bolton Road (Nathan Hale Inn)
Latitude	41-48-10.6
Latdd	41.802944
Longitude	72-14-56
Longdd	-72.248889
Tower_Type	rooftop
Owner	
Height	
Comments	
carrier_1	cingular @ 60'
carrier_2	verizon @ 47'

DEEP Property - Harkness Memorial

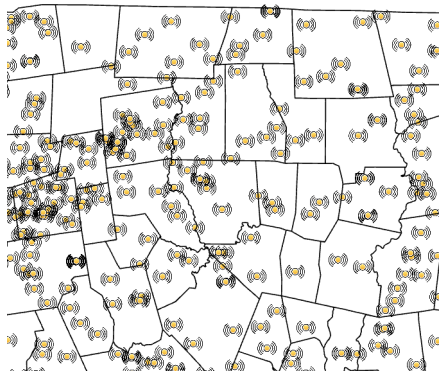
OBJECTID	151
deepgis_DEP_PARCELS.DEP_ID	209
OBJECTID_1	185
REGION_ID	279
REGION_NAME	Harkness Memorial
DEP_ID	209
MANAGEMENT_AREA	Harkness Memorial State Park
AGNCYFN_CD	EP
AV_LEGEND	State Park
IMS_LEGEND	State Park or Preserve

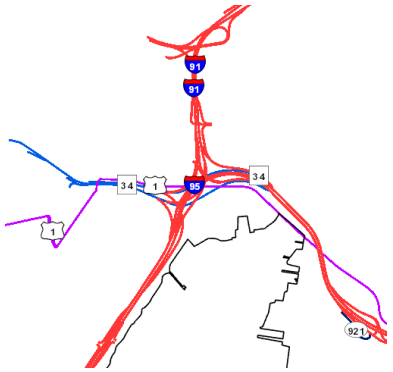
Interstates Highways - Interstates Highways

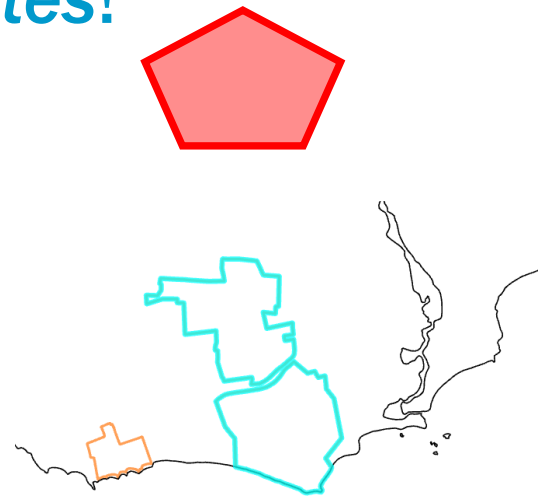
Shape.STLength()	8288.023996
OBJECTID	3501
RouteID	95-S
BeginMilePoint	45.79
EndMilePoint	49.65
RouteDirection	R
RoutePrefix	I
RouteNumber	95
RouteSuffix	Null
RampNumber	Null
RampSuffix	Null
RoadType	M
TownNumber	092
TownName	NEW HAVEN
OverlapStatus	PRI

Spatial Data: Vector

- Point, line, polygon layers *with geographic coordinates*!







- Attributes (table information tied to map features!)
- Quality concerns
  - Spatial accuracy
  - What is included or excluded (geographic features AND attributes)
  - Updates

Spatial Data: Raster

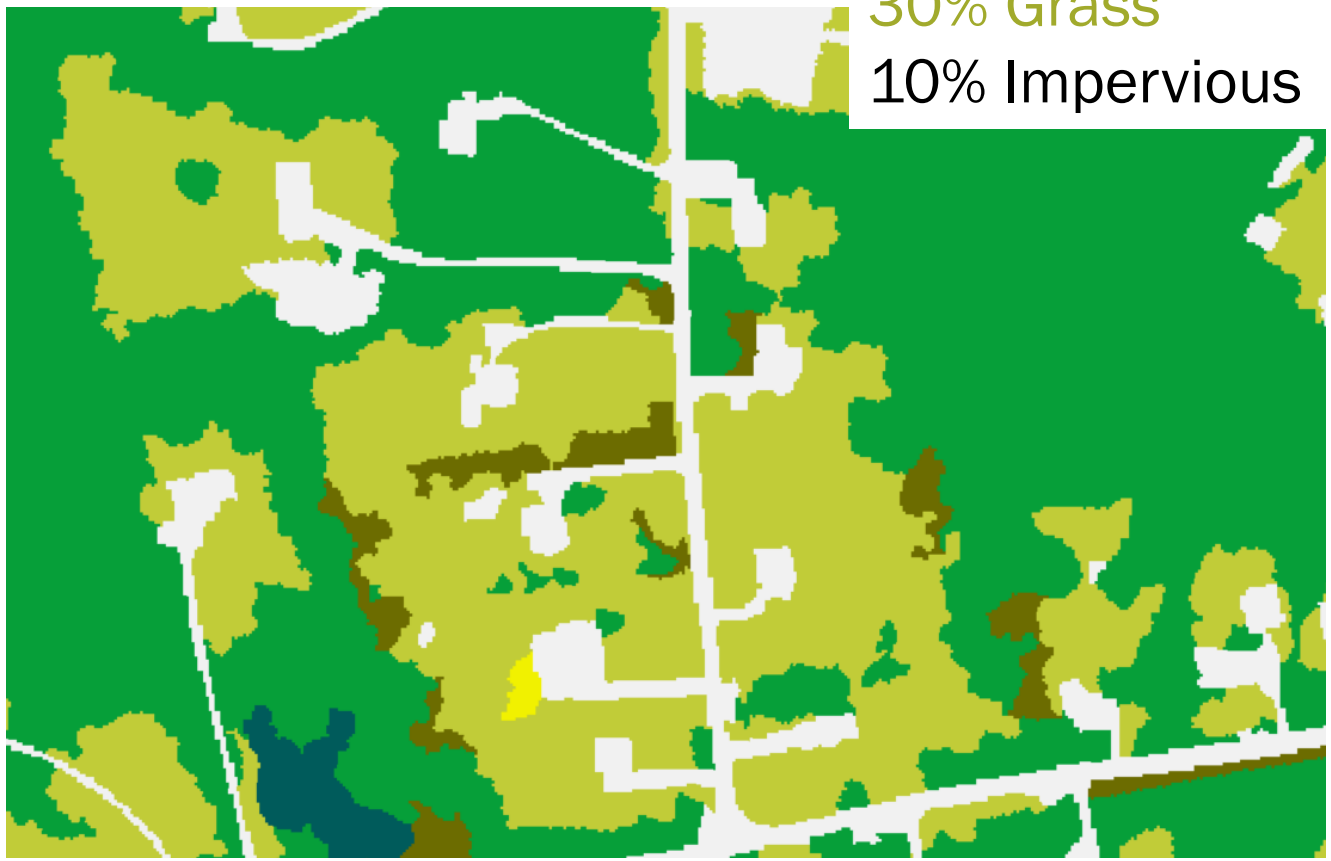
Pixels *with geographic coordinates!*

Source

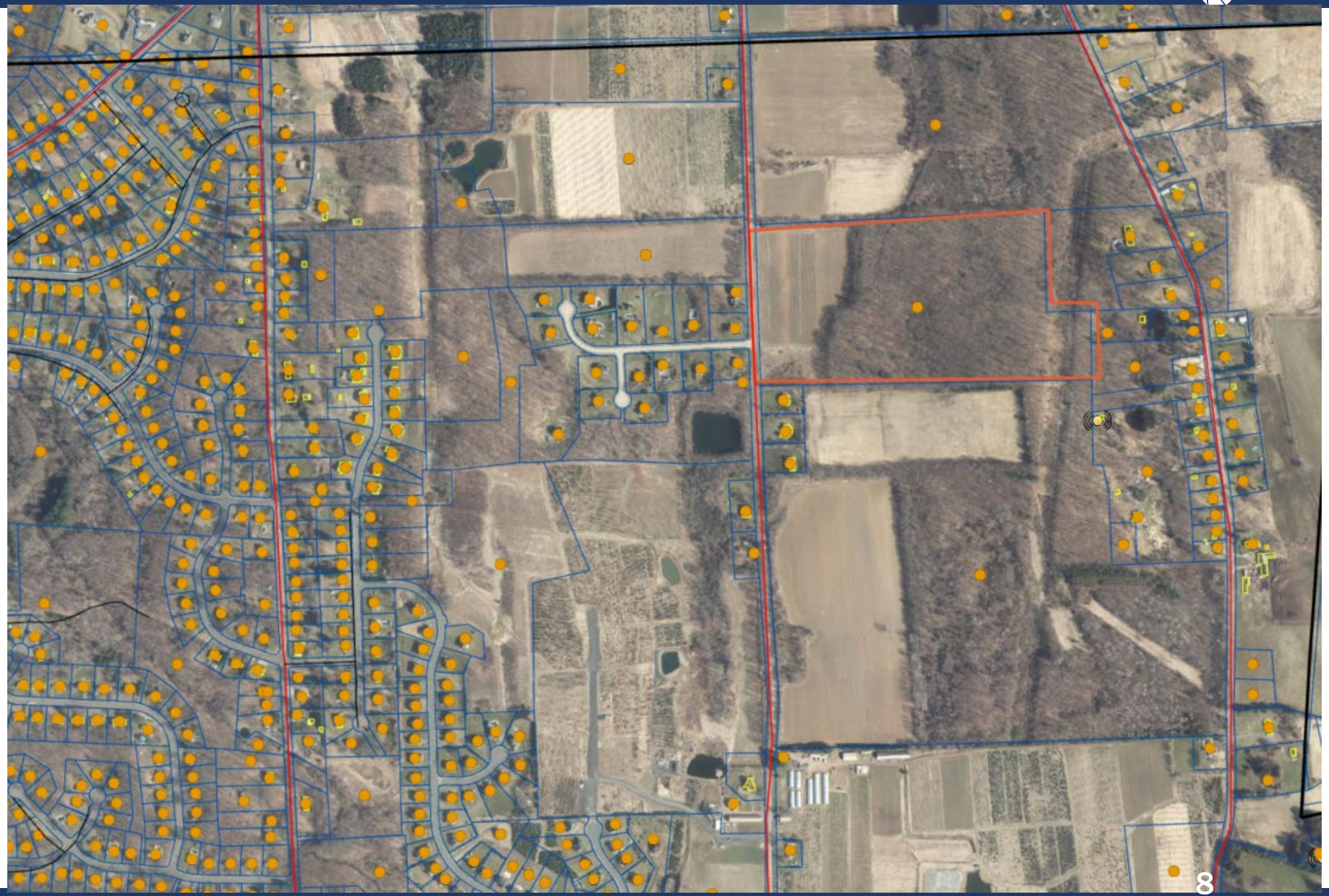
- Sensor (on airplane, satellite)
- Data analysis (image processing)

Quality concerns

- Detail, or size of pixel
  - 1km, 30m, 10m, 1m, 1ft, 6in, 3in
- other things



Bring it all together



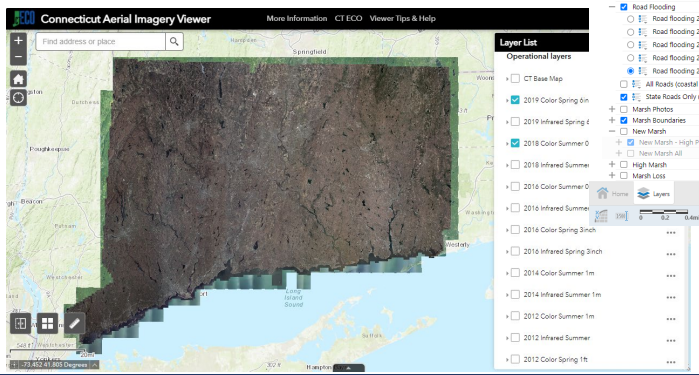
Sharing

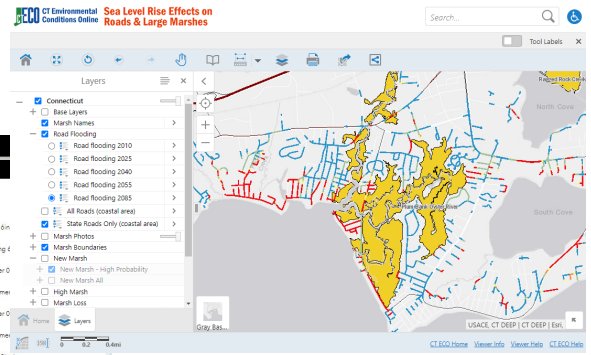
GIS Data (professionals)

- Datasets exist at all different places
- WHERE is the DATA?

Maps (everyone)

- GIS data formats cannot be opened in regular software
- Outputs are critical and require resources
  - Paper maps, pdfs (cartography)
  - Online web maps or apps
  - Dashboards or story maps





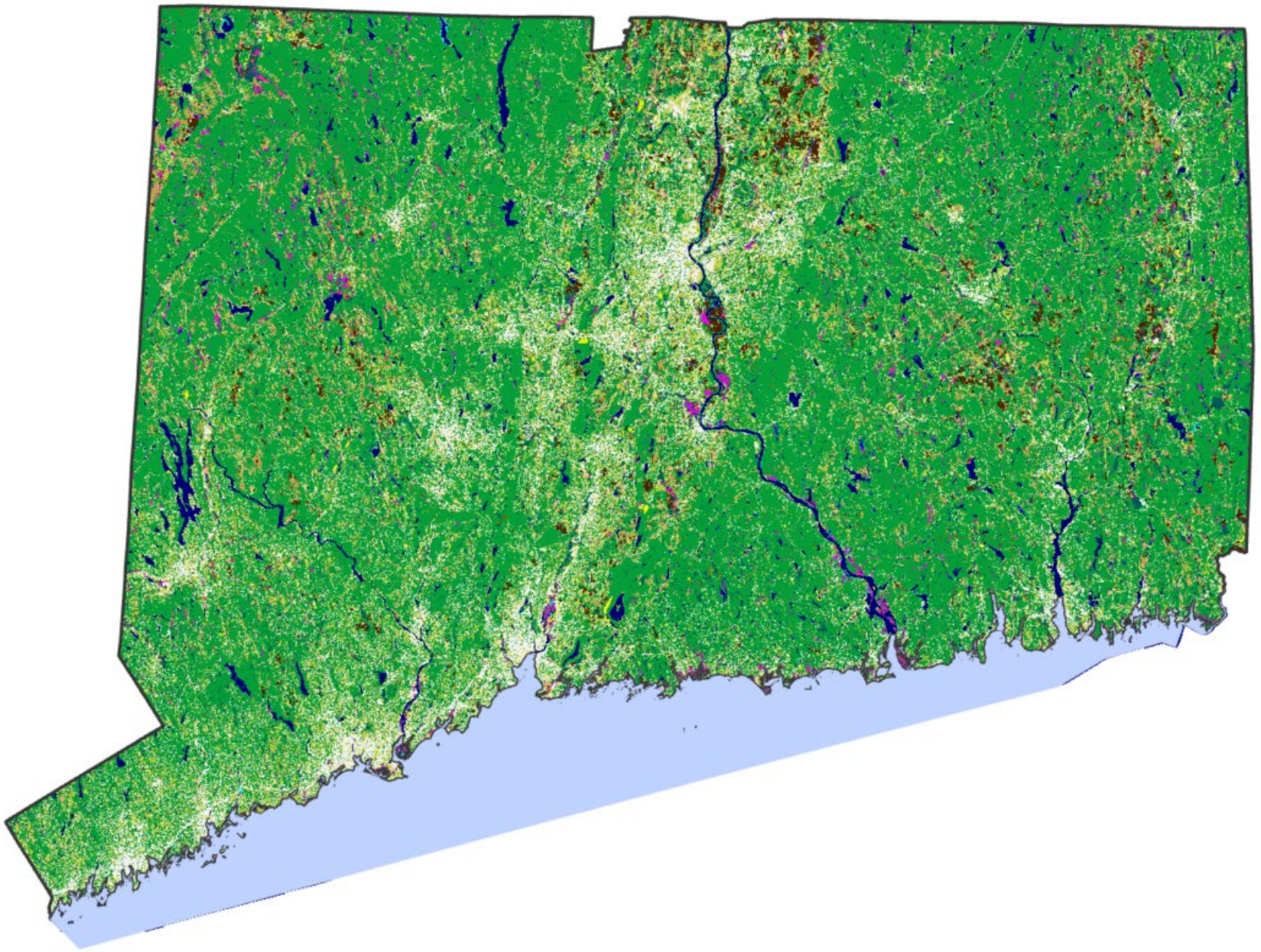
Why is GIS important?

- SO Many Applications!

  Public safety, public health, economic development, natural resource protection, government functions, development, planning, ….

Why is GIS coordination important?

- GIS provides the building blocks for applications across users and disciplines
- Eliminate redundancy, fill gaps
- Overlapping geography, many similar needs



- It doesn't
- Resources scattered
  - State Agencies
  - Councils of Governments
  - Municipalities
  - Universities

  - Companies
  - Utilities

- CT has GIS All-stars

GIS people work together

2016 aerial imagery & elevation

2019 aerial imagery

CT GIS Network

2012 aerial imagery

How CT Currently Organizes GIS

- Teachers
- Researchers
- GIS professionals
- Consultants
- Engineers
- Public Officials
- Municipal Staff
- Geologists
- Surveyors
- State DEEP Staff
- State Employees
- Federal Employees
- Real Estate
- Legal Professionals
- Land Trusts
- Town Planners
- Regional Government
- More

GIS Users

The Punchline

Connecticut needs a coordinating body for GIS.
The current situation is problematic and costly.

- No centralized capacity, management, or policy for GIS
- What resources do exist are scattered
- Data are created or purchased by different entities, with different standards, for different areas, and for individual purposes
- Unnecessary redundancies and critical gaps
- Leading to increased costs, decreased services, inefficiency, and a sub-par toolset for economic development, environmental protection, public health and safety, planning and prioritization
- Most states have a State GIS Center - Connecticut is well behind peer states and at a competitive disadvantage

The Punchline

Connecticut needs a coordinating body for GIS.
The current situation is problematic and costly.

GIS in Connecticut

Past and Present

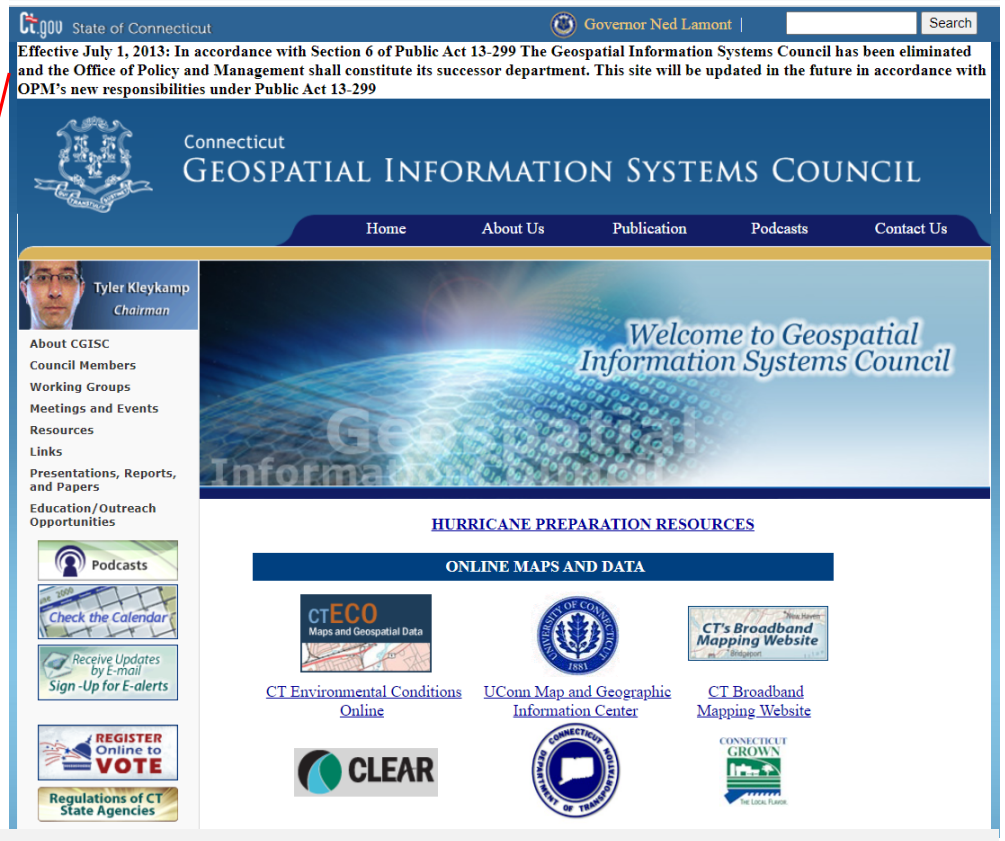
Born at ~~DEP~~ DEEP

Connecticut Geospatial Council

- Formed by Public Act 05-3 in 2005
- Mission
  - 1) coordinate a uniform geospatial information system capacity and
  - 2) promote a forum in which geospatial information may be centralized and distributed.
- 21 Members

Connecticut Geospatial Council

- Accomplishments
  - Reduced silos through communication
  - Lead to shared funding for state flights
  - Business Plan, Strategic Plan
  - Connecticut Framework Data Report
  - Started data standards



Effective July 1, 2013: In accordance with Section 6 of Public Act 13-299 The Geospatial Information Systems Council has been eliminated and the Office of Policy and Management shall constitute its successor department. This site will be updated in the future in accordance with OPM's new responsibilities under Public Act 13-299

Chapter 61b, Sec. 4d-90 2013

(a) The Office of Policy and Management shall constitute a successor department to the Geospatial Information Systems Council in accordance with the provisions of sections 4-38d and 4-39.

(b) The Secretary of the Office of Policy and Management shall coordinate geospatial information system capacity for municipalities, regional councils of governments and the state and establish policies for the collection, management and distribution of geospatial information. The secretary shall set standards for the acquisition, management and reporting of geospatial information and the acquisition, creation or use of applications employing such information by any executive branch agency. In establishing such capacity, policies or standards the secretary shall consult with municipalities, regional councils of governments, state agencies and other users of geospatial information system technology. The purpose of any such system shall be to facilitate communication and coordination regarding the use of geospatial information system technology, eliminate duplicative use of such technology and expand the use of geospatial information within the state.

(c) The secretary may apply for federal grants and may accept and expend such grants on behalf of the state.

(d) The secretary shall, within available appropriations, administer a program of technical assistance to municipalities and regional councils of governments to develop geospatial information systems and shall periodically recommend improvements to the geospatial information system provided for in subsection (b) of this section.

Parcel Legislation

2018

Public Act 18-175 in 2018

Section 6 of that act requires

- Each municipality to submit a digital parcel file, and some assessment data, to the Council of Governments (COGs) of which it is a member on an annual basis.
- The Office of Policy and Management (OPM) subsequently asks the COGs to voluntarily share the data so it can be made available for public consumption.

Connecticut GIS Network

- Established in 2001, bylaws approved in 2004
- Voluntary association of Connecticut geospatial professionals

The Network shall have as its purpose:

a) To provide opportunities, through a variety of venues including workshops, meetings and the Internet, for members to share ideas, to learn about GIS activities, to explore collaborative opportunities and to discover geospatial information resources;

b) To promote the free exchange of geospatial knowledge and information among members and to promote geospatial knowledge with the general public;

c) To encourage the growth of the field of geospatial technology in the State of Connecticut;

d) To serve as a geospatial technology resource;

e) To communicate the needs and issues affecting Connecticut GIS users to the state agencies and elected officials responsible for developing GIS policy and acquiring geospatial data.

Decades of working towards coordination

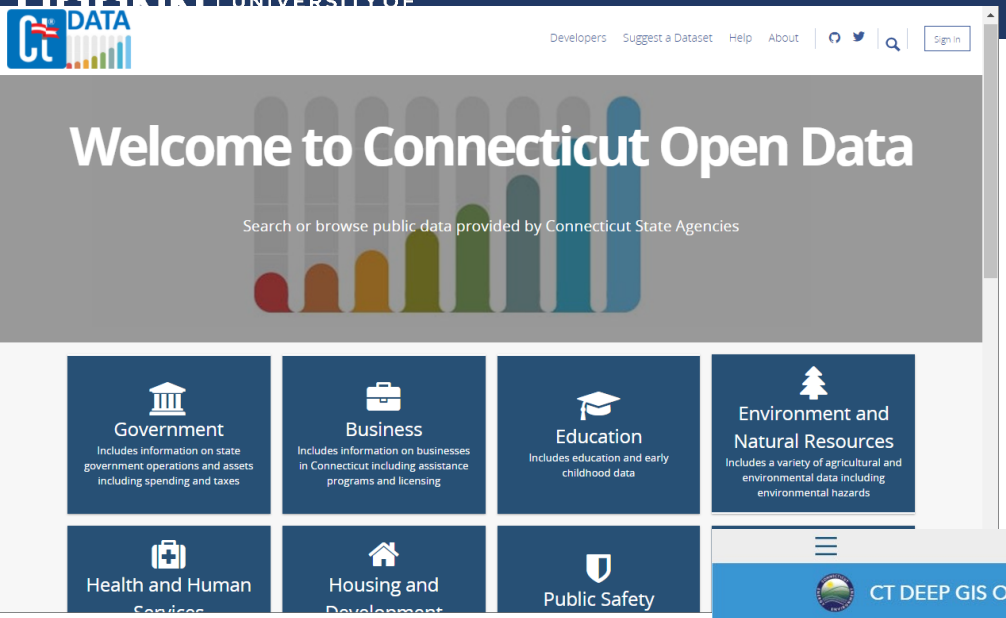
Current lack of coordination does not mean lack of need

Adhocracy

The problems with Adhocracy

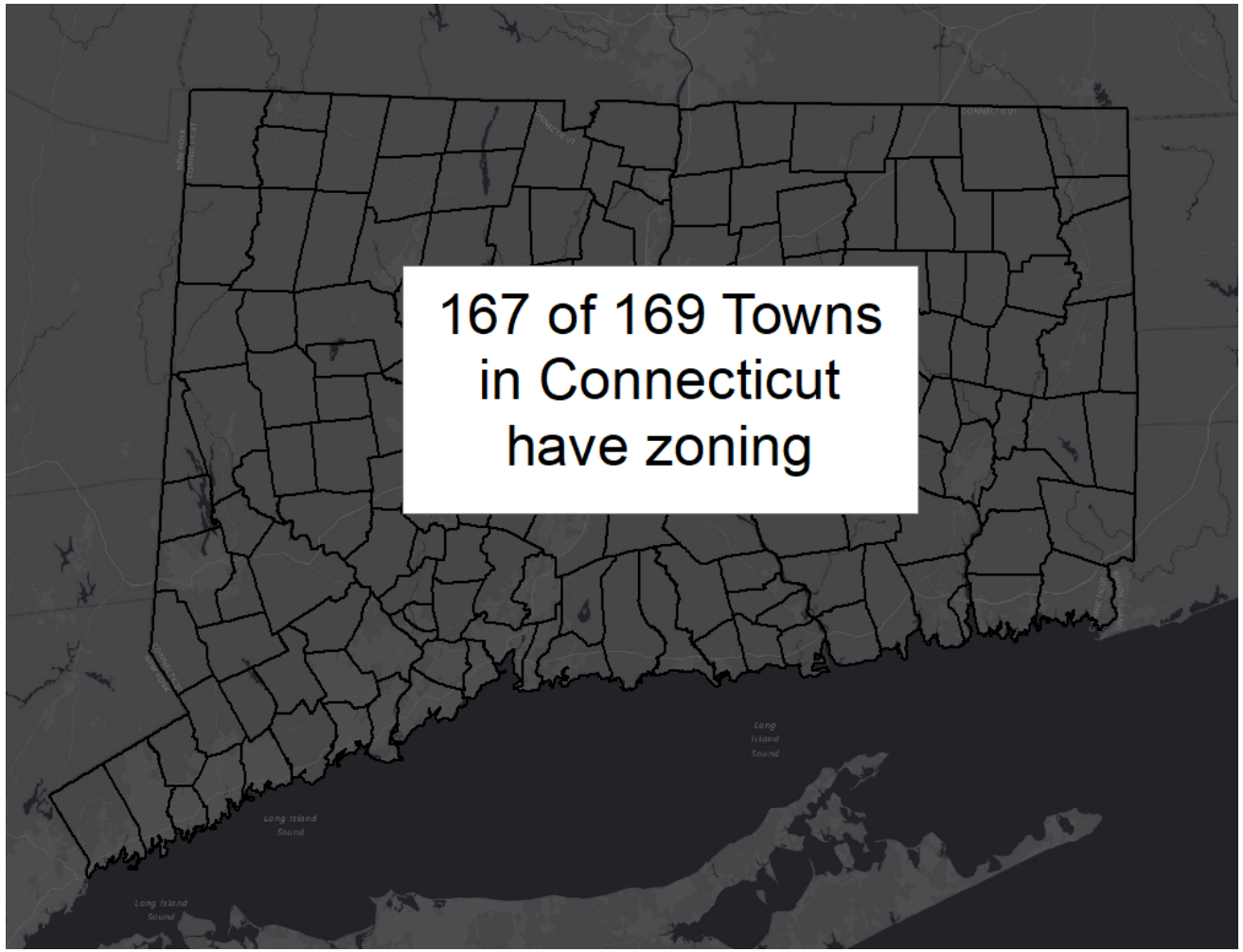
Example GIS Deficiencies in Connecticut

https://s.uconn.edu/stategis



→ **Difficult to find data and maps**

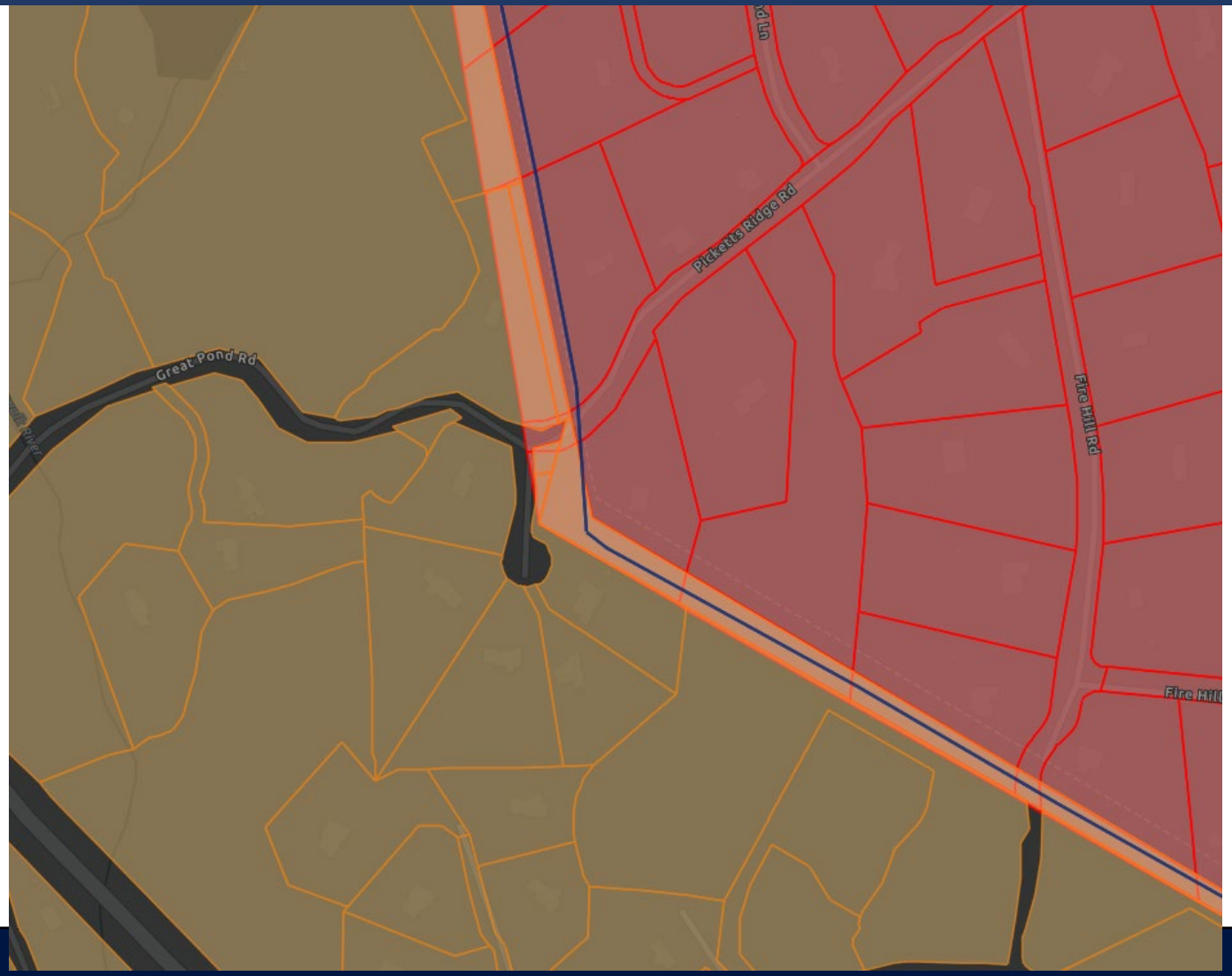
→ Multiple Versions of the same layer exist and they don't jive



"It is REALLY difficult to even know who to contact for data. Honestly, it's been a wild goose chase. And I benefit from having GIS friends who I can ask. It would be impossible for some people to get this data."
CT GIS professional

→ Finding Local Data

Parcel_ID	G10-0034
Feat_type	PARCEL
Map	G10
Lot	G10-0034
Sublot	
OtherIDTex	
OtherIDNum	0
StreetName	
StreetAddr	24 GREAT POND RD
Size_Lgl	2.00
Size_Units	AC
Size_Text	2.00 AC
Size_Map	1.99
Size_Diff_	0.00
Owner_Type	
Restrictio	
Subdivisio	
CondoAssoc	
CommonName	
Descriptio	
Survey	
SurveyRef	
SurveyDate	0
metaDatecr	20,070,102
metaEntryM	SCANNED



TOWN	Redding
TOWN_NO	117
MBL	18 44
PIN	
LOCATION	87 FIRE HILL RD
ACRES	2.29
COUNT	993
AREA	99,300.00
SUM	580.00
UNIQUE_ID	
EDIT_DATE	
EDITOR	
ENTITY	
COMMENT	
EDIT_TYPE	
METHOD	
SOURCE_TYP	
SOURCE_ID	
ACCOUNT_TY	
RECORD_COU	
ACTION_	
ACCOUNT	
GIS_LINK	
MBL2	
MAP	
BLOCK	

Local layers are created differently

Connecticut GIS Legislative Working Group

House Bill 5476

- HB 5476, *An Act Concerning a St graphic Information System Task Force* was introduce 6, 2020

- Create a working group to
  - examine GIS expertise and mapping within the state
  - examine GIS centers in other similar states (all of which have GIS coordination to some degree)
  - develop recommendations for establishing a GIS Center in Connecticut.

- Convene working group anyways

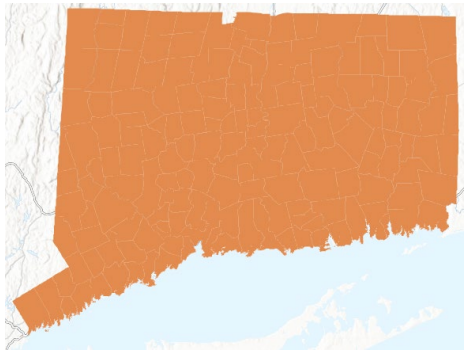
What's Happening in Connecticut

Recommendations by Sector

https://s.uconn.edu/stategis

State Agencies

- Work more efficiently and effectively when GIS is used
- Are the authoritative source of a myriad geospatial datasets
- Some employ GIS to solve problems



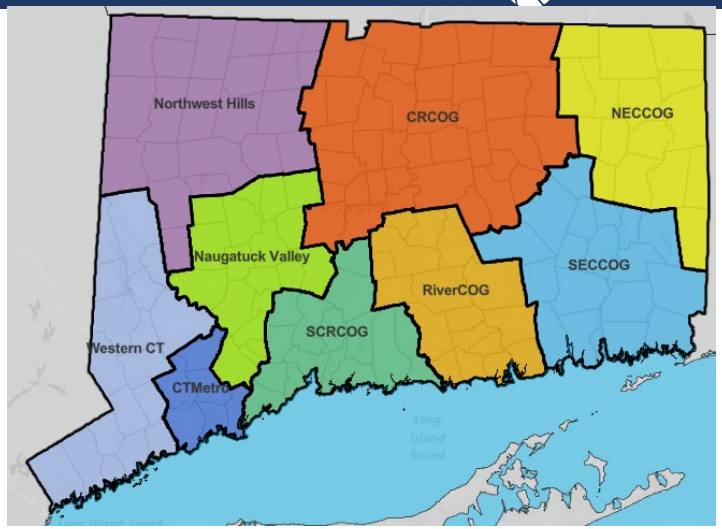
Suggestions/Needs for CT

- A centralized, accessible “hub” or “clearinghouse”
- Expand UConn’s CT ECO as a provider of web-based viewers, tools, applications, and hosting very large, high-value framework datasets
- Create a program for regular acquisition of high-value datasets
- Change job classifications to enable hiring GIS expertise
- Offer regular training

State Agencies

Councils of Governments

- Develop and distribute regional datasets
- Provide GIS services to municipalities that do not have GIS capabilities
- Have knowledge of member municipalities data needs and strengths



Suggestions/Needs for CT

- Data standards and authoritative coordinating body
- Reliable periodic aerial acquisition program (every 3 years)
- Development and hosting of statewide authoritative datasets

Councils of Governments (COGs)

Utilities

- Have a high reliance on GIS for operations
- Create and maintain their own data and rely on state data (i.e. aerial imagery)
- Have heavy use of GIS by many employees

Suggestions/Needs for CT

- Need up-to-date aerial imagery and accurate base data
- State agencies provide useful GIS data but layers are not updated and are therefore far less useful
- MassGIS should be the goal - it is so much easier to work in MA where they can get all of the information they need

Utilities

Higher Education

- Multiple institutions in CT offer GIS courses and degrees
- Universities explore and harness new technologies
- University Centers & Institutes partner with State Agencies to fill needs
- University entities have filled some of the need of making Connecticut's geospatial information widely available

Suggestions/Needs for CT

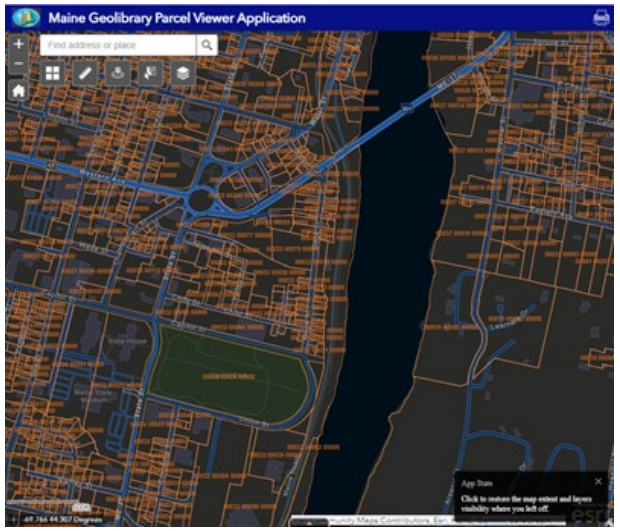
- A primary data portal/clearinghouse for Connecticut
- A clearinghouse should capitalize on expertise at Universities
- Universities have capacity but lack consistent funding

Higher Education

State GIS Centers

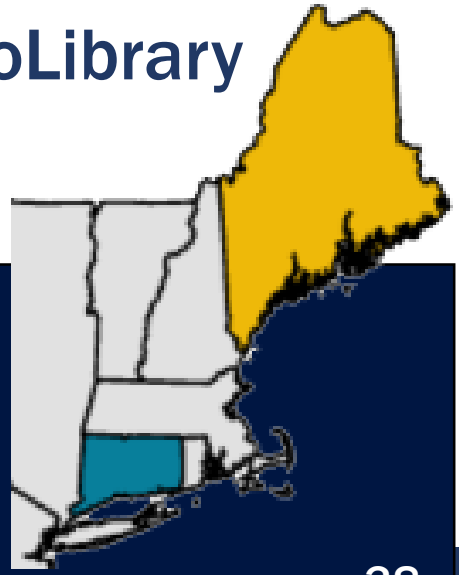
How other states do it (better)

Maine Office of GIS (MEGIS) and the Maine Geolibrary Board



Things to Emulate

- Established by statute which ensures continuity
- Staff manage technology for statewide deployment
- Participation of state, local, and private partners on the GeoLibrary Board helps meet needs of all stakeholders



Maine

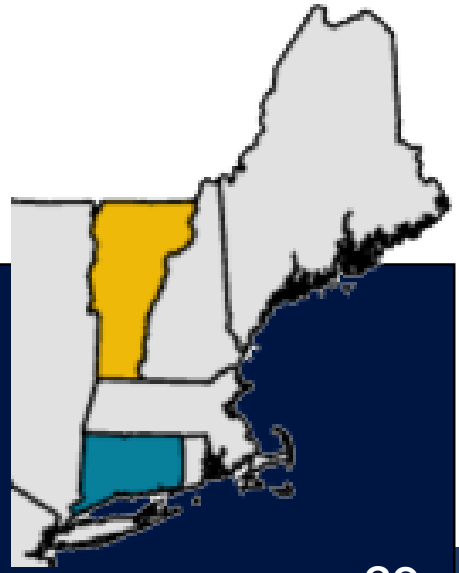
https://www.maine.gov/megis/

Staff: 5
Annual budget: $1.4 million

Vermont's Center for Geographic Information (VCGI)

Things to Emulate

- Legislative support from the governor's office was a key factor
- As a publisher of data, VCGI partners with agencies who maintain and own their own data
- A regular, predictable data acquisition & update schedule



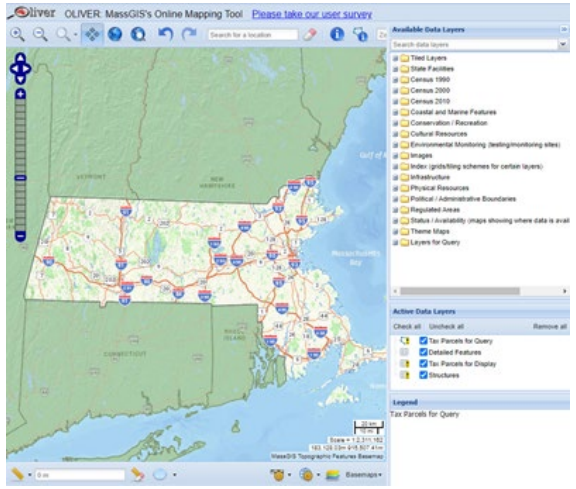
Vermont

https://vcgi.vermont.gov/

Staff: 8 +UVM support
Annual budget: $800,000

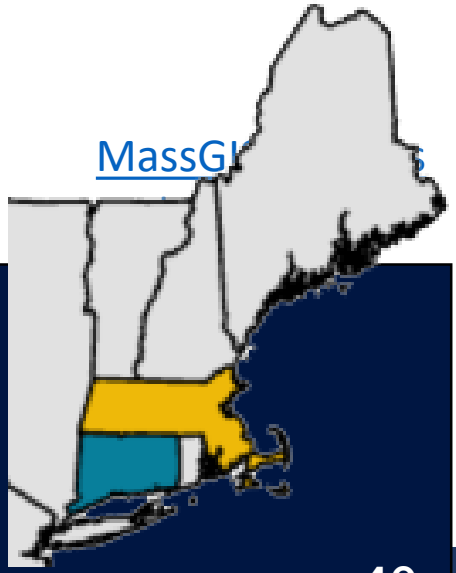
MassGIS

"The resources MassGIS hosts make it substantially easier to do business in Massachusetts."



Things to Emulate

- The MassGIS portal is an excellent one-stop shop for standardized, easy-to-access data
- A staffed entity with someone in charge (MassGIS Director) is very important
- Having an incentive (911 grant eligibility) is critical for municipal partners to participate in data updates



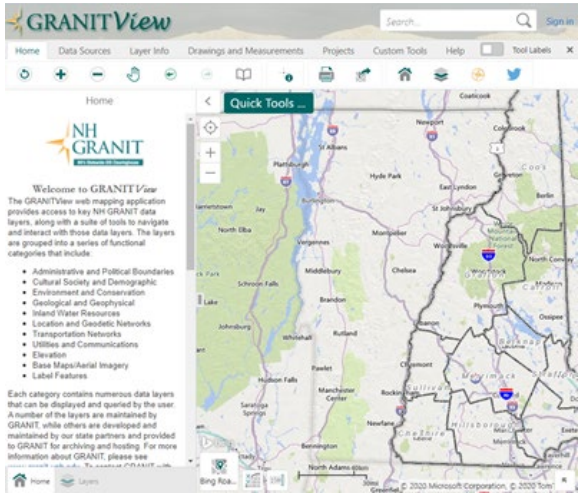
Massachusetts

https://www.mass.gov/orgs/massgis

Staff: 15
Annual budget: $2 million

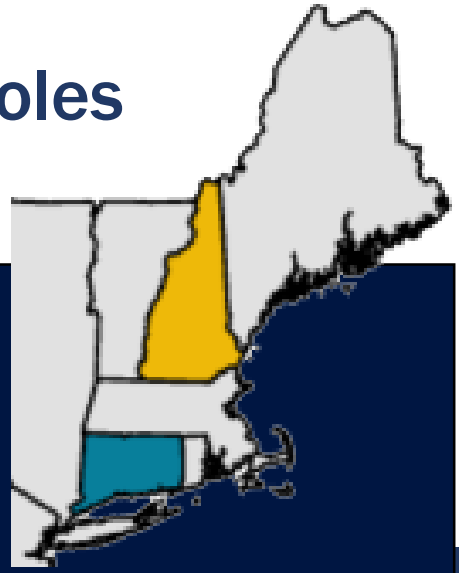
NH GRANIT

New Hampshire Geographically Referenced Analysis and Information Transfer System



Things to Emulate

- University home means lower software cost, expertise on campus for research collaboration, ability to received external funds and get work done quickly
- Being a valuable and widely used resource
- Three Advisory committees at different levels fill different roles and ensure needs are met



New Hampshire

https://www.granit.unh.edu/

Staff: 2.5

Annual budget: $350,000 +grants

Recommendations for Connecticut

From Legislative Working Group Research in alignment with NSGIC* research

*National States Geographic Information Council

Framework

Goal: The CT GIS Center will oversee the coordination, procurement, processing, storage, and distribution of free and public GIS data.

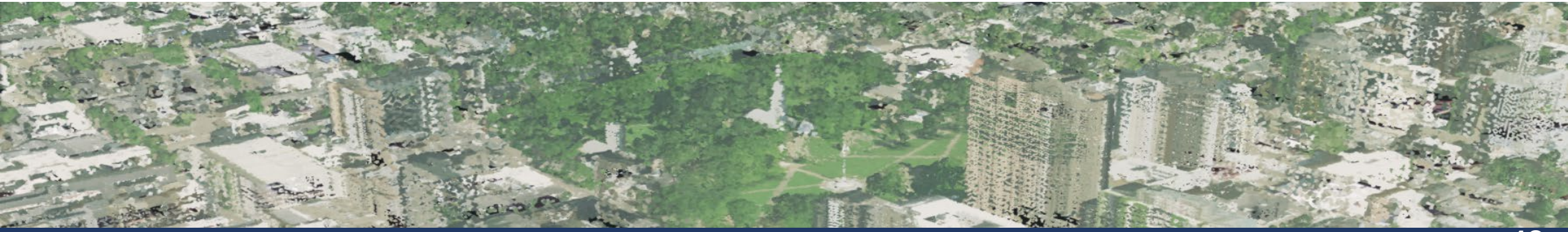
→Established via State Statute

→Be a stand-alone entity with a Geographic Information Officer (GIO)

→Dedicated staff

→Directed by an Advisory Council

→Funded



→Established via State Statute

Augment Sec. 4d-90 to support a GIS Center, Advisory Council, funding

Sec. 4d-90. Geospatial information. Capacity, policies and standards. Assistance to municipalities and regional councils of governments. Grants. Report. (a) The Office of Policy and Management shall constitute a successor department to the Geospatial Information Systems Council in accordance with the provisions of sections 4-38d and 4-39.
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Successful state GIS centers are established by statute

- forms a policy basis
- strong foundation and predictable funding translates to a functional agency

→ Be lead by Geographic Information Officer (GIO)

- Lead the CT GIS Center
- Report to the Governor
- Have influence over state and federal policies
- Input to budget and financial matters
- Input to technology decisions at the state enterprise level
- Coordination responsibility of activities within and across all levels of government

45 states!

Work with "primary custodians"

→Dedicated staff

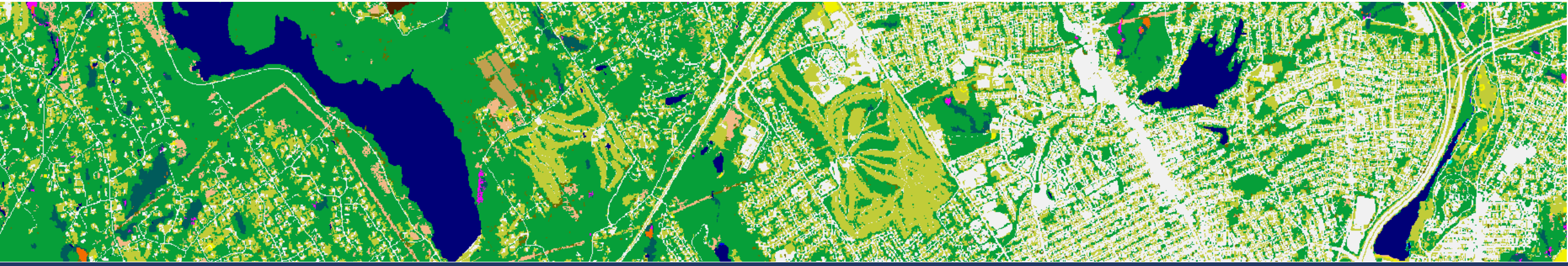
Lead by the GIO, staff responsibilities, at a minimum:

- organize spatial data creation and acquisition
  - such as aerial imagery, elevation, parcels, foundational datasets
- oversee GIS data clearinghouse/portal to provide public access
- create data standards, guidelines and procedures
  - to ensure consistency and quality
- provide or oversee training and outreach
- perform technical data processing
  - to aggregate existing GIS datasets and create new ones

→Be directed by an Advisory Council

- Set priorities
- Communicate efforts
- Create multi-year work plan
- Diverse membership to assure diverse needs are met

43 states!



→Funded

Stable funding is critical

- staffing
- reliable data acquisition, especially statewide aerial flights

- Ability to accept grants for specific projects and data needs
- Budget should include funds to collaborate with universities to capitalize on their expertise in data processing, technology innovation, training and outreach

Remember!

→ Return on Investment

→ Increased efficiency, decreased redundancy

- Cost avoidance
- Save money across the board
- Increase services

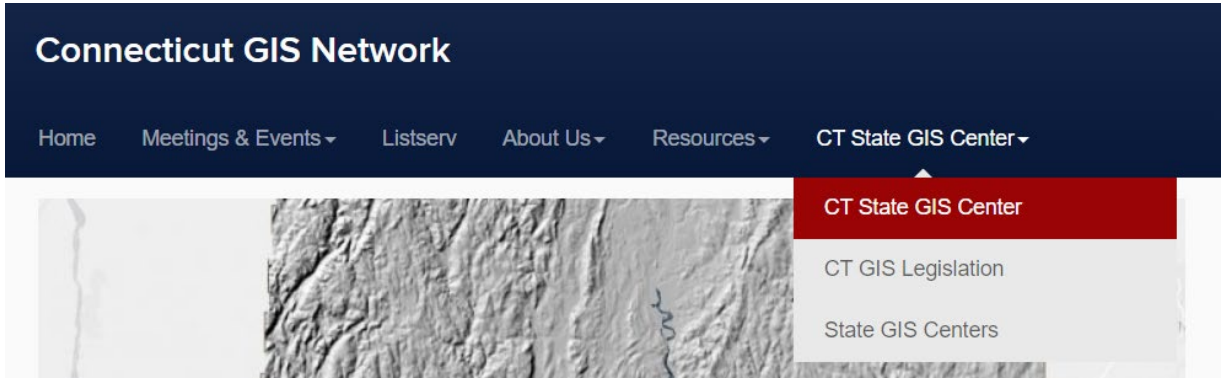
- Proactive, not reactive
- When the high quality building blocks are in place, there is so much potential for applications, efficiencies, and improved capabilities
- The result is decreased costs, increased services, improved efficiency, a useful toolset for economic development, environmental protection, public health and safety, planning and prioritization
- Connecticut can be on an even playing field with peer states and no longer at a competitive disadvantage, maybe even an advantage
- Maximizing the available resources provides paramount value to taxpayers

The Punchline

Connecticut needs a coordinating body for GIS.
The current situation is problematic and costly.

Next Steps

- **Keep an eye on https://ctgis.uconn.edu/ & the GIS Listserv**



- **Once there is a Bill**
  - Submit testimony
  - Contact your legislators

Next Steps

https://ctgis.uconn.edu/ct_gis_center/

Lots of questions

Me

"That analysis is tough because Connecticut doesn't have _____"

"Sorry, that layer hasn't been updated for years and no, there are no plans to."

"No, sorry, that agency doesn't make that layer available to the public."

"Yes, you will have to contact each town separately and see if they will give you what they have. No, it will not be consistent between towns."

Someone else

"You should look at what other states do cause they do a lot more than you."

Lots of questions

Me

"It's in the works!"

"Yes, it will improve …

- Public safety
- Economic development
- Natural resource protection
- ….."

"Yes, you can find that _____"

Someone else

"Connecticut really has it's act together."

Thank you

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https://s.uconn.edu/stategis