

In This Issue

Tools & Technology

- New State Imagery

Teaching/Outreach

- NRCA

Program Updates

- New Impervious Layer

- MS4 Program

Announcements

- CLEAR Website

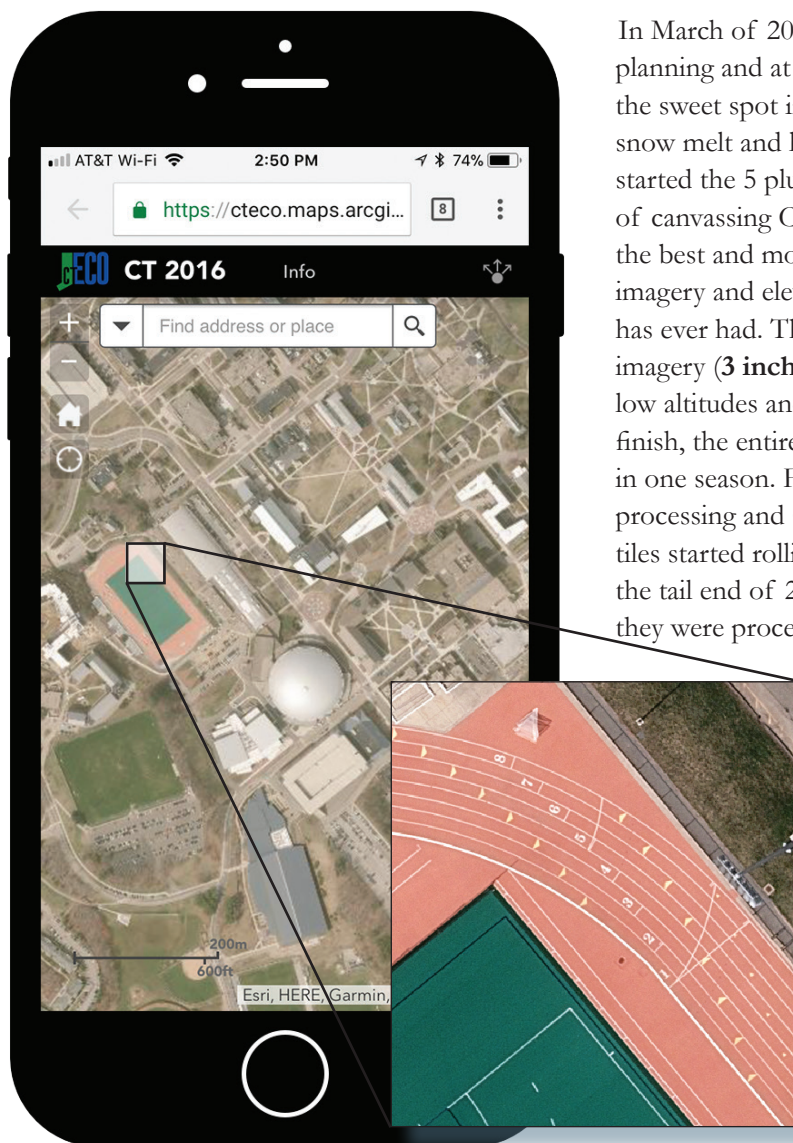
CLEARSCAPES



A Newsletter of the Center for Land Use Education and Research at the University of Connecticut.

Tools & Technology

High Resolution Statewide Imagery & Elevation is Here!



In March of 2016, after extensive planning and at the beginning of the sweet spot in the spring between snow melt and leaf out, airplanes started the 5 plus week long process of canvassing Connecticut to collect the best and most consistent aerial imagery and elevation that the state has ever had. The high resolution imagery (**3 inch pixels!**) requires low altitudes and after a nail-biting finish, the entire state was collected in one season. Following extensive processing and QA/QC analysis, the tiles started rolling in to CLEAR at the tail end of 2016. Block by block, they were processed and served

on CT ECO in dynamic maps and for download. Now complete, Connecticut

2016 aerial imagery of the UConn campus in the CT ECO CT 2016 viewer on a mobile device. High resolution means loads of detail!

has the imagery and elevation at its fingertips on CT ECO.

Imagery

The 2016 aerial imagery is leaf off (captured before summer leaf out), ortho rectified (corrected for variations in elevation), tide coordinated (captured at low tide in coastal areas), has four bands (blue, green, red near-infrared) and 3 inch pixels. Ways to get the imagery on CT ECO:

- **CT 2016 Viewer** – simplest view of the imagery in a browser or on your phone.
- **Aerial Imagery Viewer** – compare the 2016 imagery with imagery from other years and seasons.
- **Image Services & Data Download** for advanced users.

Elevation

The 2016 elevation was captured using Lidar, a remote-sensing technique where a sensor on an airplane uses laser light to densely sample the surface of the earth, producing highly accurate elevation. The 2016 Connecticut Lidar has a

... continued on pg 2



Tools & Technology continued...

[High Resolution Statewide Imagery & Elevation is Here! pg 1...](#)

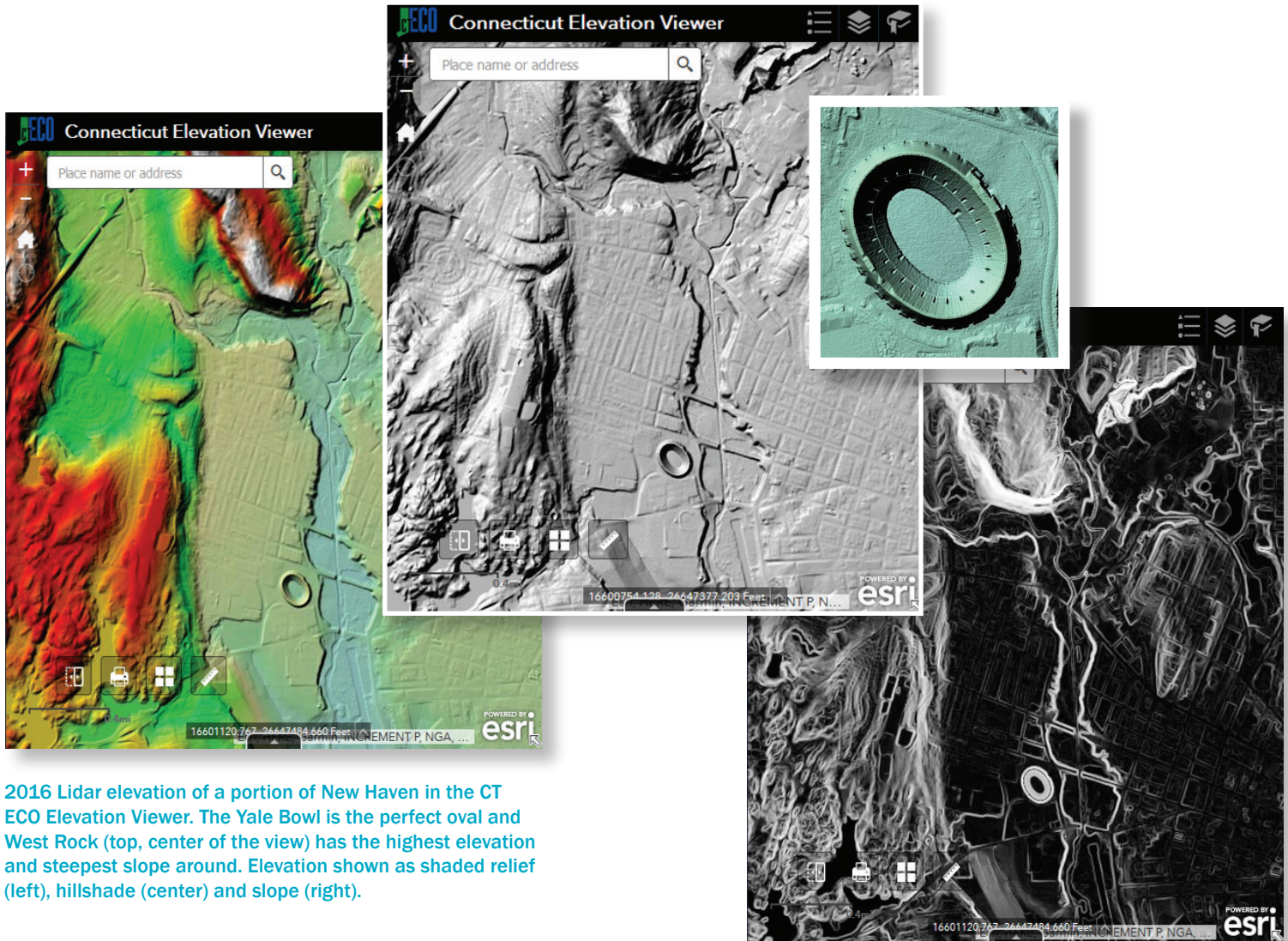
minimum of 2 points per square meter, is tide coordinated and classified. The points were converted to raster (pixel) bare earth elevation as well as contours. Ways to get the elevation:

- **Elevation Viewer** – explore the hillshade, shaded relief, slope and aspect of this amazing dataset.
- **Elevation Interact** – compare the 2016 elevation with other datasets and manipulate image display.

- **Contours** – 1 foot contours available for download with online service coming soon.
 - **Image Services & Download** (contours, DEM tiles, LAS tiles) for advanced users.
- cteco.uconn.edu/data/flight2016 has all the details and data.

The flight and its products were the result of years of work and planning by a dedicated project team. The project was

managed by the Capitol Region Council of Governments (CRCOG), on behalf of the Connecticut regional councils of governments, and funded by the Connecticut Office of Policy and Management (OPM) with contributions from the Connecticut Department of Transportation (DOT) and the Connecticut Department of Emergency Services and Public Protection (DESPP). The project management team includes municipal, regional, state and university representatives. ●

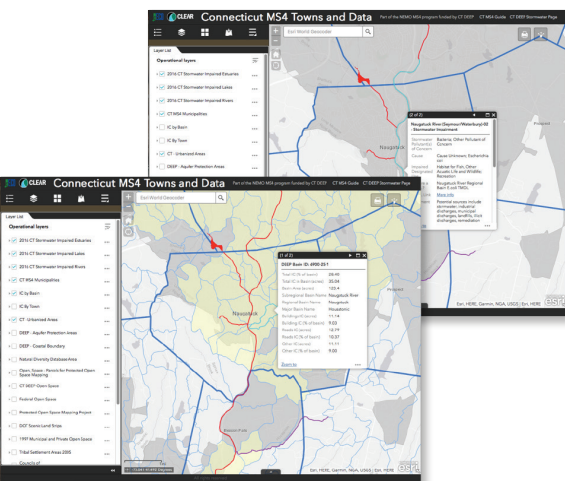


2016 Lidar elevation of a portion of New Haven in the CT ECO Elevation Viewer. The Yale Bowl is the perfect oval and West Rock (top, center of the view) has the highest elevation and steepest slope around. Elevation shown as shaded relief (left), hillshade (center) and slope (right).

Program Update - MS4 Support

NEMO's MS4 Map (<http://s.uconn.edu/ctms4map>)

► The NEMO program, with support from CT DEEP, is providing outreach and support to communities faced with new stormwater regulations under DEEP's MS4 general permit. In addition to a dedicated MS4 educator, workshops, and a listerv, NEMO has created a MS4 map viewer on cteco.uconn.edu. The viewer helps towns identify their priority areas, target areas of high impervious cover, and locate stormwater impaired waterbodies. It includes:



NEMO's MS4 Map Viewer showing the amount of impervious cover by basin (left) and waterbodies impaired for stormwater (right).

New Statewide 1 Foot Impervious Cover Data (also see below article)

This high resolution statewide data set provides impervious cover data by town and by watershed basin. It can be used to determine the areas of high directly connected impervious area as required by the permit.

Stormwater Impaired Waters

This data set highlights those waters from the 2016 Connecticut Integrated Water Quality Report that are considered impaired by stormwater. This is a subset of all of the State's impaired waters.

Map Services Downloads

If you speak GIS, the MS4 data layers can be accessed as map services or download on cteco.uconn.edu. Look for the "Featured" section. ●

clear.uconn.edu, Now Mobile-friendly!

The CLEAR website recently had an overhaul, and is now mobile-friendly. While this may seem pretty standard for 2018, it was a big lift for our rather hefty website! The site has hundreds of pages of information, hosts multiple project websites, and is bursting at the seams with tools, interactive maps, webinars, blogs, videos and photos. Users can register for our training events, find presentations and publications, find links to related websites, and access our social media sites. So, now you are free to take CLEAR with you wherever you go. You will never need Candy Crush, Fruit Ninja or Angry Birds again!



New Statewide Impervious Cover Layer

► With funding from CT DEEP as part of NEMO's MS4 support, CLEAR has acquired and made available on CT ECO a new statewide, high-resolution (1foot), impervious cover data layer. The new data layer is based on 2012 statewide aerial imagery and is classified into three categories: buildings, roads and other impervious. Several towns and regional governments contributed their own detailed GIS data that was incorporated into the layer. The layer is available in raster and vector

formats and can be accessed on the website cteco.uconn.edu via (1) the MS4 Map Viewer, (2) as a map service or (3) as a download by town.

While acquired to support new "MS4" stormwater regulations, the layer can be used for other purposes as well. According to Connecticut's Office of Policy and Management the data was already used to create a buildings and address layer that saved the State over \$500,000 (more than the cost to acquire the IC data)! ●



The new Statewide Impervious Cover data distinguishes buildings, roads, and other impervious.

Teaching & Outreach



(Photos, left) Attendees of the two-day field CTP Workshop learn conservation and innovative mapping and web tool techniques. Teens and adult conservation volunteers are paired together to carrying out a conservation-based community project.

A Successful Summer of STEM

The Natural Resources Conservation Academy (NRCA) is a family of UConn programs that focus on using geospatial technology and conservation science to connect high school students, teachers, and conservation volunteers to STEM (Science, Technology, Engineering and Math), and in the process bolster local conservation efforts. NRCA is a partnership between a number of UConn entities (see below), including CLEAR. The foundational NRCA program, the **Conservation Ambassadors Program** now finishing its sixth year, was joined this past summer by two new sister programs.

The **Conservation Training Partnership (CTP)** pairs land trust members and other local conservation volunteers with high school students for a two-day program that goes over basic conservation science while also focusing on specific smart phone mapping applications useful to local conservation work. The teams are then charged with conducting conservation projects in their community. The first two CTP workshops were held in the summer of 2017, one on the UConn main campus in Storrs and one at a STEM Magnet school in New Haven. The

workshops brought together 15 adults and 17 teens ranging in age from 14 to 73 years old and representing 25 towns. The adult/teen teams are currently engaged in a wide variety of conservation projects.

In future years workshops will be conducted four times a year in different locations across the state, in order to reach a broad range of urban and rural communities, with special consideration paid to reaching underserved populations.

The third NRCA program, **Teacher Professional Learning (TPL)**, is a teacher training class that focuses on the connection between land and water. 21 teachers from 20 different schools participated this past August in the three-day program, which explores the relationship of waterways to the land and land use surrounding them. The workshop takes advantage of the area around the Storrs campus, which includes watersheds that are urban, rural, and agricultural, allowing the participants to compare. The campus itself is also used as a living classroom, with a special focus on the large complement of low impact development (LID) practices that have been installed in recent years. TPL is designed to align with the Next Generation Science

Standards, a new framework for teaching that has been adopted by Connecticut and 18 other states. Teachers leave the workshop with an NGSS-compliant curriculum unit on Water and Land, which they themselves have adapted during the course of the workshop.

With all three programs in full swing over the summer, summer was a very busy time for CLEAR faculty and their NRCA partners at NRE, CESE and Neag. The NRCA partnership is expecting the impact of these programs, both in schools and communities, to grow ever larger as the programs mature and expand. ●

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The UConn Center for Land Use Education and Research (CLEAR) provides information, education and assistance to land use decision makers, in support of balancing growth and natural resource protection. CLEAR is a partnership of the Dept. of Extension and the Dept. of Natural Resources and the Environment at the College of Agriculture, Health and Natural Resources, and the Connecticut Sea Grant College Program. Support for CLEAR comes from UConn and from state and federal grants.

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Information on all three NRCA programs can be found at nrca.uconn.edu.



The NRCA is a partnership of the Department of Natural Resources and the Environment, CLEAR, the Center for Environmental Science and Engineering (CESE), and the Neag School of Education.

