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GeoFocus
CT's Quarterly Geospatial Newsletter

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FAA Loses Case on Drone Enforcement

By Meghan McGaffin

On March 6th a federal judge tossed out a $10,000 fine that the Federal Aviation Administration imposed upon Raphael Pirker, a drone operator who was using his remotely controlled model aircraft, to capture imagery to be used in a commercial for the University of Virginia's Medical School. These model aircraft are often referred to as drones or Unmanned Aerial Vehicles (UAV). The FAA had attempted to use advisory guidelines as an enforceable law prohibiting the commercial use of drone technology, however the judge wrote in his opinion that allowing the FAA to impose this fine could lead to the regulation of all objects intended for flight in the air. Objects such as "paper aircraft, or a toy balsa wood glider could subject the 'operator' to the regulatory provisions of the FAA." At this time the FAA is appealing the ruling and states across the country are looking at developing their own regulations of this technology.

Drones are often associated with military use in their weaponized form. However any remotely-controlled flying machine without a pilot can be called a drone. Drone use has quickly

A drone captured this image of a fire burning near a shed of explosives, allowing for informed decision-making at the scene. Credit: Peter Sachs

become a popular topic in the news as stories of drone use have made headlines.

Peter Sachs, a volunteer firefighter for the town of Branford made headlines in January when he provided drone imagery of a fire at a local quarry where explosives were stored nearby. The imagery acquired by the drone allowed the chief to determine that it was safe to send in a truck and

Don't Let the Door Hit You on the Way Out

Winter be gone! (I hope) Spring is here, slowly taking it's claim over the landscape. I've become a bit of a gardening enthusiast over the last 3 years. Last fall I became a homeowner and have a whole blank canvas in which to dig, plant and plan. I sit on 1/4 acre parcel which feels absolutely pastoral compared to the 800 square feet of shade and clay I was used to.

Gardening appeals to my inner cartographer—studying the land and choosing which color and texture should go where. The analyst in me is in thrilled to pick apart data I can glean from DIY percolation tests and excited studying. Helpful tools such as UConn's Rain Garden App and the USDA Zone finder have been indispensible for nerding out about soil composition, climate patterns and drainage issues.

My dream is to dig up the entire front yard, <u>while being mindful of underground utilities</u> , and replace that water-hungry grass that needs attentive mowing and wants fertilizer with a bird and bee friendly landscape that just might provide a few salads, berries and cups of tea. After years of subliminally absorbing the interdisciplinary nature of being a GIS Analyst I can appreciate and enjoy those skills spilling over into my home life!

Thank you,

Meg McGaffin

Vice President, CT GIS User to User Network

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http://ctgis.uconn.edu/
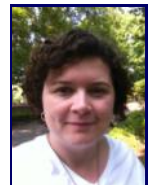
Check to make sure you have the **newly updated** User to User Network website bookmarked! For the past year the User to User Network Steering Committee has been working Emily Wilson's fingers to the bone on an updated website, with lots of help from Andrew Bowne & Cary Chadwick. The new site still has links to all of our meeting notes, information about the Steering Committee, the Network bylaws and more!

We are always looking for content that is useful to our members, especially education opportunities and links to data sources Please let us know if you would like to contribute anything to the website or the newsletter. These forums are for your benefit and we want to hear from you! Suggestions are always welcome.

Have something to add?

Get in the next issue. Submissions due by 5/31

CT GeoFocus gladly accepts:

- Articles
- Essays
- Letters
- Jokes
- Cartograms
- Book reviews
- Playlists
- Random facts
- Events
- Compliments
- Suggestions

We like short pieces. 150-500 words is great. Think of readers and use an active voice and short sentences. This isn't an academic journal. Photos or graphics are practically required.

Headshots are encouraged. You're beautiful. Or handsome. Smart too.

We don't accept:

- Ads, blatant or not
- Money
- Plagiarism

These rules can and probably will change. Email ctgeofocus @ gmail.com

The Cartography of Annexation: Where to put Crimea

By Meghan McGaffin

On March 21st Russian President Vladimir Putin signed a treaty that formalizes the annexation of the Crimean peninsula of Ukraine into the Russian Federation. On the same day, Ukrainian Prime Minister Arseniy Yatsenyuk signed a trade pact with the EU. It was the refusal of such an EU/Ukrainian partnership by former Ukrainian President Viktor Yanukovych that began the protests which led to the current political unrest in the region.

When confronted with political upheaval, cartographers around the world are inadvertently caught in the middle. Where does Crimea belong? As of March 24th, there is a variety of opinions being expressed.

As shown below in a March 2014 map found on the website of the United Nations Crimea is a peninsula on the Black Sea. The ten-mile wide Strait of Kerch separates the peninsula from the Russian Federation.

While the status of Crimea remains in flux there is no consensus on how to display the political boundaries and status of the region. Following are examples that appear to indicate differing opinions:

Google and Bing maps are in agreement that Crimea is still a part of the Ukraine:
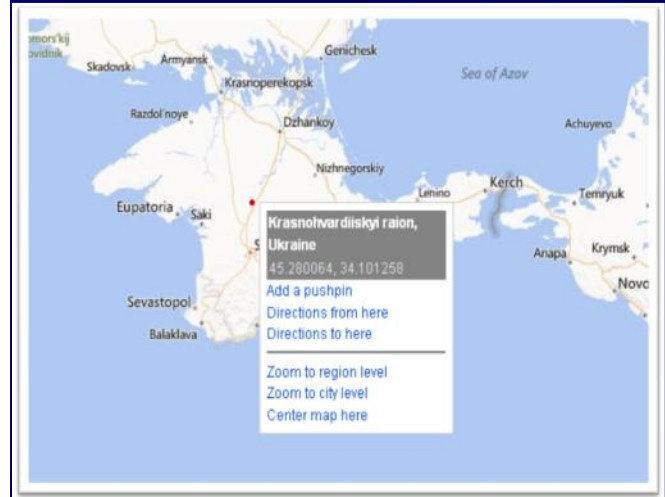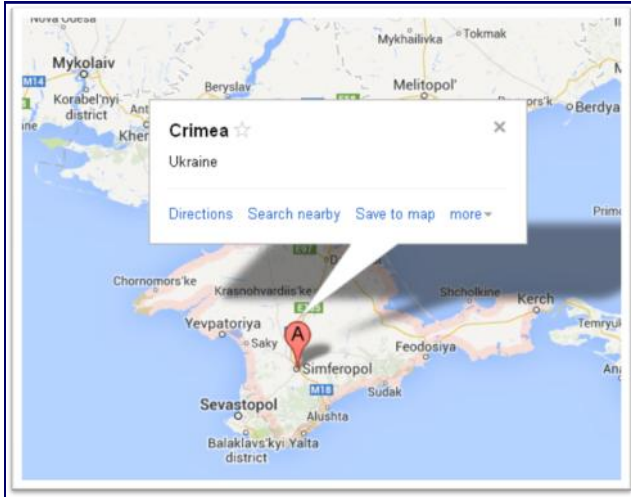
Wikipedia takes a more neutral stance, showing the region without political borders and acknowledging the disputed claims over the region:

Whereas the website of the President of Russia claims Crimea as part of the Russian Federation:

Senator Dan Coates R-Ind introduced legislation on April 8, 2014 that would prohibit the Government Printing Office from printing "any map, document, record, or other paper of the United States portraying or otherwise indicating Crimea as part of the territory known as the Russian Federation." While this provision may be symbolic, other measures such as refusing ships arriving from Crimean ports with Russian cargo would have a more significant economic impact.

However the situation in Crimea plays out, someone will be changing their maps.

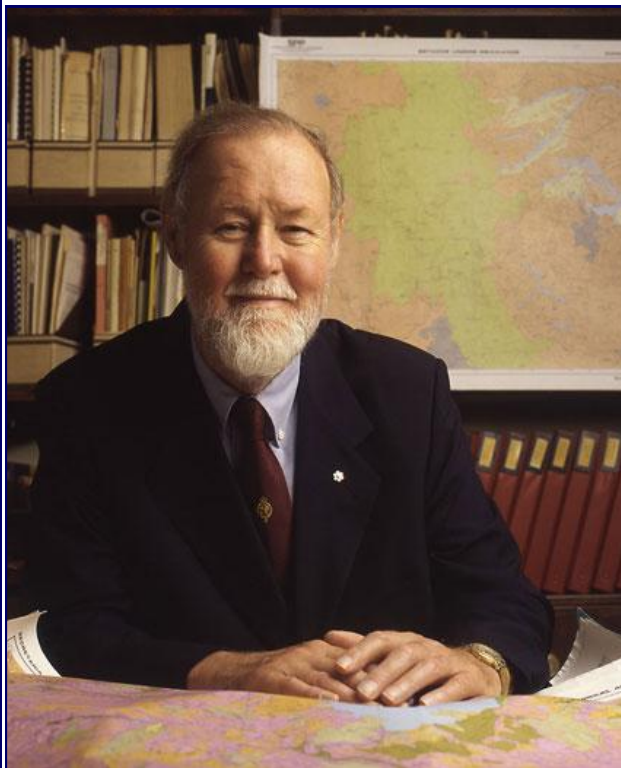# In Memoriam, Dr. Roger Tomlinsion- 1933 – 2014

By Thad Dymkowski GISP

Image Source:
http://ucgis.org/ucgis-fellow/roger-tomlinson

The GIS field as a whole recently suffered a very significant loss with the passing of Dr. Roger Tomlinson, the acknowledged "Father of GIS." Born in 1933, he was a native of Cambridge, England, where he served in the Royal Air Force as a pilot and flying officer. He attended the University of Nottingham and Acadia University for undergraduate degrees in geography and geology. He attended McGill University in Canada, specializing in glacial geomorphology for his Masters degree. For his doctoral degree, he attended the University College London. He returned to Acadia University to teach. He also spent time working for Spartan Air Services managing the computer mapping division before working for the Government of Canada.

It was during his time in the 1960's while working for Spartan Air that he postulated the very first Geographic Information System. African aid workers were looking to build pulp and paper mills and needed to figure out the best location for the timber plantations. Tomlinson imagined a "sandwich" of map data- topographic, climate, transportation, etc. At the time, transparent acetate was the typical tool for stacking data like this on a light table, but the budget was far too insurmountable to be followed through and the project fell through. He felt that if the map were reduced to numerical values, by comparing numbers would show the best locations. A chance meeting in 1962 with Lee Pratt, head of the Canada Land Inventory, brought to light the formidable task of creating maps covering the entire region of Canada's commercially productive areas that showed agriculture, forestry, wildlife, and recreation. By 1968, the Canada Geographic Information System- the world's first computerized mapping system, GIS was born. It was designed to handle large volumes of collected data quickly and accurately.

His license plate appropriately read "GIS ONE". He was the recipient of several prestigious awards over his career including, the Murchison Awared from the Royal Geographic Society, the James R. Anderson Medal of Honor from the Associations of American Geographers, ESRI Lifetime Achievement Award, and membership in the Order of Canada. He was the Principal at the consulting firm Tomlinson and Associates Ltd.

He leaves his wife, Lila; three children, Ward, Christopher and Frances; and four grandchildren; in addition to thousands of grateful GIS professionals around the world.

"I got the lady pregnant, you've got to raise the kid" ~ Roger Tomlinson as tweeted by Jill M. Terlaak (@geofemina) during the 2013 ESRI UC.

# GIS for Connecticut Agriculture Supports Farms

By Kara Alderisio, GIS Consultant

Who doesn't know how popular the "Locally Grown" food movement has become? But do you know all the reasons why?

Farms do much more than supply local farmers' markets. Agriculture contributes between $2.72 and $4.6 BILLION each year to Connecticut's economy. Production includes: grains, vegetables, tobacco, livestock, sod; logging; commercial fishing; aquaculture, Christmas trees, maple syrup, horses and MORE.

The agricultural industry also supports the existence of many related supporting businesses which contribute to a vibrant, local food system. These supporting businesses include: food manufacturers and processors, garden centers, veterinarians, farm equipment wholesalers, farm-to-table restaurants, caterers, agritourism, publications, food critics and photographers, cookbook writers, and test cooks – just to name a few.

Between 2007 and 2012 over 1,000 more farms - 30,000 more acres - were added to Connecticut employing 28,000 people. To municipalities, new and existing farmland represents an average of 63 cent **net gain** in revenue per dollar for the tax base. To put that in context, a typical residential development represents a **net loss in revenue** to municipalities of 19 cents per dollar. It is a clear economic benefit to preserve working lands! (1)
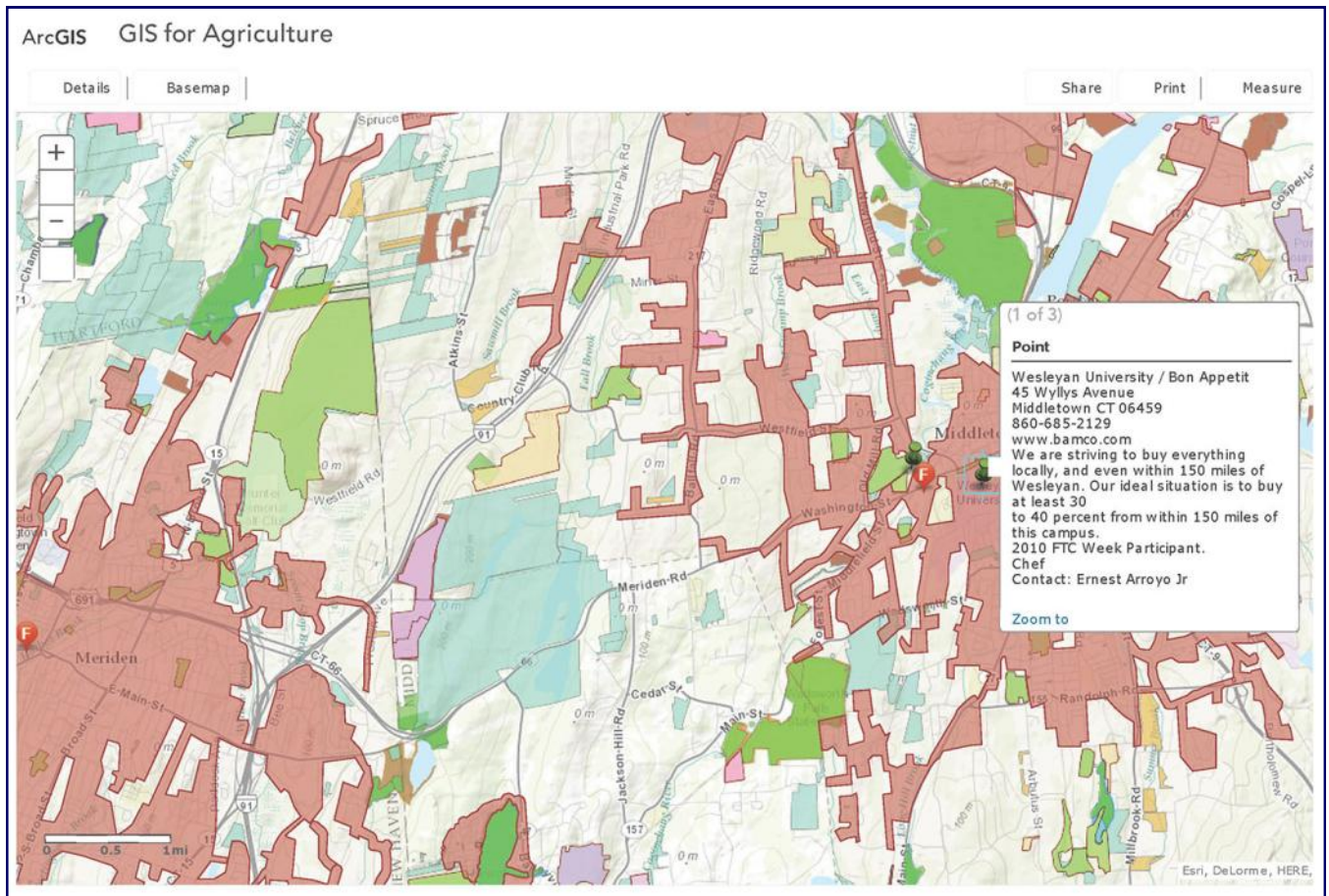
Does the good news end there? No. Farmers and the land they steward provide environmental benefits. These include:

- enhanced property values
- a valuable way of life is protected for future generations
- an adequate, fresh food supply is ensured
- increased biodiversity and wildlife habitats on our lands
- improved surface and groundwater quality by filtering water
- improved air quality by filtering air and producing oxygen
- reduced flooding by slowing runoff and providing recharge areas

GIS can be used every step of the way in preserving land for agriculture.

A GIS system can evaluate the agricultural viability of a parcel of land based on soil types and analysis of the agricultural productivity ratings of USDA soils data. GIS can also evaluate suitable for farming by analyzing site environmental features such as wetlands, streams, contours and rock outcrops.

Additionally, GIS can identify lands that are a high priority for preservation by evaluating the amount of development pressure a parcel is under. This is done by analyzing local municipal factors such as: distance to public water and sewer, zoning, and surrounding land use. The entire evaluation process is much more time-consuming if performed manually using conventional hardcopy maps.

GIS is also used for protecting agricultural land with a conservation easement. For the land trust or other entity holding the easement, GIS is used to determine conservation easement boundaries, prepare baseline maps to document conservation value and management plan maps for responsible stewardship.

GIS online mapping presents more opportunities and is starting to be used for the development of local food systems by depicting the locations of existing agricultural lands, farm-to-table restaurants, and farmers markets in relation to supporting service industries. It is a great tool for evaluating land for agricultural preservation especially for land trusts and other conservation groups without access to the full GIS software. Farmers may also find it useful when evaluating which farmland is optimal for them to purchase or lease. Related supporting businesses can efficiently evaluate potential new locations. These decisions are imperative in order for agriculture and the local food system to expand to its full potential and contribute the maximum benefit to local economies. These decisions are best arrived at via the full utilization of GIS data.

GIS for Agriculture ArcGIS Online map can be found at http://bit.ly/1iSdx4E. If you would like to contribute GIS data, please contact Kara at kara@GISforLandTrusts.com

More reading:
http://mdfoodsystemmap.org/
http://landtrustgis.org/best-practices/best-practices/impact/lft
http://lal.cas.psu.edu/publications/publicationDocuments/farmland.pdf
"GIS Becomes Indispensable for Managing Agriculture"
  http://gcn.com/articles/2013/10/18/usda-gis.aspx

1.*"PLANNING FOR AGRICULTURE: A GUIDE FOR CONNECTICUT MUNICIPALITIES,"* 2012, A PUBLICATION OF AMERICAN FARMLAND TRUST and CONNECTICUT CONFERENCE OF MUNICIPALITIES

NASA Visualization Explorer Now Available For All iOS Devices

Reprinted from http://www.nasa.gov/

Image credit: NASA/ Scientific Visualization Studio

The popular NASA Visualization Explorer app, first launched for the iPad in July 2011, is now available for the iPhone and all Apple iOS devices. The app, which features the data visualization work of NASA's Scientific Visualization Studio, Earth Observatory, Science @NASA and others, publishes two stories per week about the full range of NASA's astrophysics, planetary, heliophysics and Earth science missions.

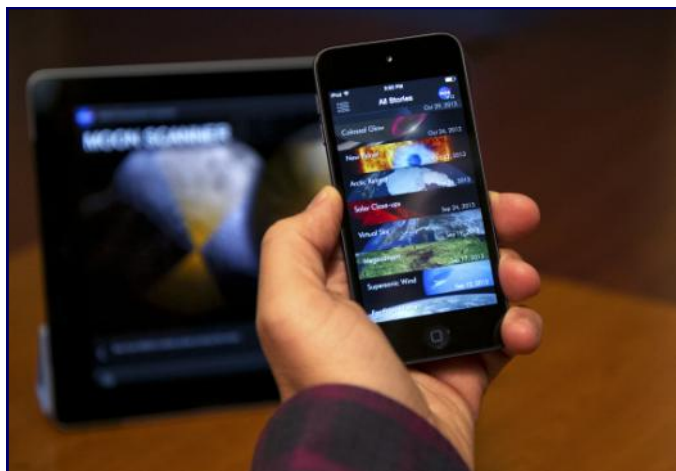A new universal version of the app is now avail-

Image credit: NASA Goddard

able for download in the iTunes app store. Since its original launch and through multiple previous updates to the iPad version, NASA Visualization Explorer has recorded about 1 million unique downloads.

The app's design has been modified to optimize it for viewing on the iPhone and the iPod Touch, as long as they are running iOS 5.1 or newer.

The app's archive of 274 stories – covering NASA
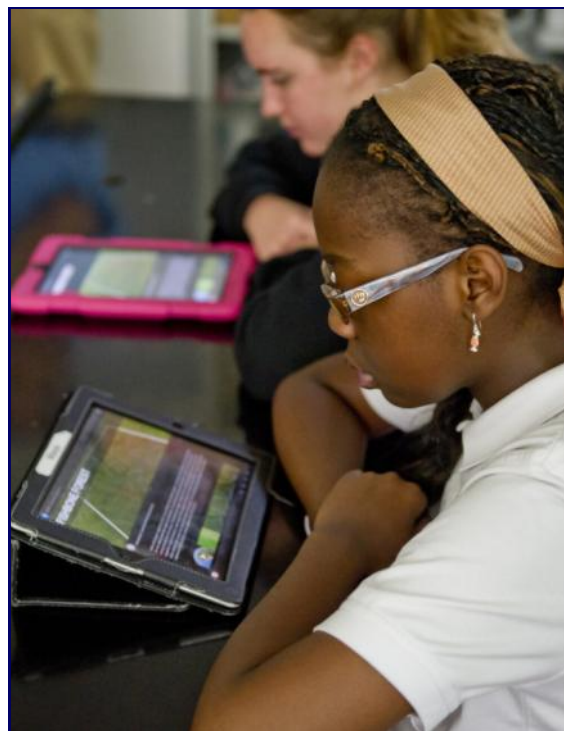
The app's rich archive of visual stories are used in educational settings as well. Image credit: NASA Goddard/Maryvale Preparatory School, Baltimore, MD

scientists' studies of the sun, planets, Earth's climate change and deep space – will be immediately available in the new version. The app's editorial team will continue to publish a new story every Tuesday and Thursday.

"I am very excited at the opportunity to turn millions of iPhone and iPod Touch users worldwide into fans of the app," said Helen-Nicole Kostis, the app's project manager. "We worked hard to maintain the quality of interaction within the visual story on smaller screens. With this release we welcome new users to enjoy the experience and to follow the fascinating world of NASA science and research through our stories and data visualization work."

You can download the NASA Visualization Explorer app at: http://svs.gsfc.nasa.gov/nasaviz/

personnel to extinguish the fire, rather than allow to fire to burn itself out. Sachs is a private investigator with a law degree and operates a website, dronelawjournal.com. His story garnered heavy media attention about the use of drones.

The Phantom Image Source:http://www.dji.com

Sachs purchased his drone, the Phantom, in December of 2013. The manufacturer calls this a "flying camera". The Phantom can fly between 1200-1500 feet up with a flight time of about 25 minutes. A 14 mega-pixel camera sends imagery to an iPhone mounted on a remote control. Sachs typically uses his drone for aerial photography and videography. When asked if this was the first time he used his drone outside of personal use he replied "Yes, and I have been told it was also the first time a drone was ever used anywhere, for actual decision-making at a fire incident, as opposed to using one for obtaining video of firefighting or the aftermath of a fire."

In Connecticut a controversial bill, HB-5217 "**An Act Concerning Use Of Unmanned Aircraft**" was opened for public testimony before the Judiciary Committee last February. The bill attempts to address the use of drone technology by law enforcement agencies – currently a warrant is not needed to collect evidence through the use of drone technology, as well as identifying the Commissioner of the Dept. of Transportation as the intended office in charge of drone regulation. Sachs testified against the bill that would effectively criminalize the use of unmanned aircraft in the State of Connecticut, calling instead for a task force to be assembled to study the effects of legislation on drone use.

His testimony to the state outlines that the bill, as it is written, would attempt to supersede federal regulation over aviation. Also it would prohibit law enforcement agencies from conducting test flights. The bill would be in conflict with a private citizen's right to capture imagery in a public place of what is in plain view, which "flies in the face of both the U.S. Constitution and the Connecticut Constitution."

When I emailed Sachs and asked what he would suggest to legislators looking to develop regulations he replied "At the federal level, common-sense, safety oriented regulations. At the state level, regulation regarding the requirement of a warrant for searches with a drone, and no more. (States cannot regulate beyond that as they are preempted by federal law (or rather future federal laws))." I asked Sachs if he was aware of any federal regulation over drone use and he stated that "It is my legal opinion (and so far the NTSB Law Judge has agreed) that the FAA has no authority over "model aircraft" drone[s]. However, I've gone one step further and have stated publicly that it is also my legal opinion that the FAA has no authority over <u>any</u> unmanned aircraft at this time, regardless of type or size."

At Connecticut GIS Day in 2012, Joel Stocker of UConn gave a presentation on An Analysis of Shoreline Change in Connecticut. Included in his presentation was a segment on capturing pre-and-post Superstorm Sandy imagery of shoreline homes. Stocker used his own personal drone to capture images that tell the story of the ravages Sandy left in her wake.

Other uses of drone technology could include traffic reporting, emergency incident response, asset management, agriculture and a number of other remote sensing applications.

Drones are able to be outfitted with a multitude of sensors for capturing data. Remote sensing hardware may include sensors that capture the electromagnetic spectrum, gamma radiation, as well as the standard visual spectrum, infrared and near infrared. A French company, L'Avion Jaune, has recently developed YellowScan, a lidar sensor small and light enough to be attached to a drone. Lidar systems for capturing data from the air have typically been attached to helicopters or airplanes. YellowScan boasts of 30 cm accuracy in a system weighing less than 5 pounds and only 6 inches high and wide.

This technology is a new horizon. The applications for public good are wide reaching, as are the concerns about privacy and safety. It will remain to be seen over the next few years how the use of this technology will impact society, culture and government – much the way other sources of imagery have been processed by society – Google Earth, Google Street view and Freedom of Information concerns about statewide ortho-imagery flights. As with all new technology, only time will tell the differences between speculation and reality.

Other Drone Use in the News:

- Recently the Washington Nationals made headlines for using a drone to capture publicity photos during spring training. A drone was filmed hovering around the site of an explosion in New York City earlier in March. Senator Dianne Feinstein (D-CA) is now calling for regulation of drone technology after seeing a drone or toy helicopter (depending on which account you read) hovering outside her home window during a protest on NSA surveillance.

- Pedro Rivera, an off-duty journalist in Hartford used his drone to capture imagery of a fatal motor vehicle accident in early February. Rivera works for WFSB but was not on duty at the time of the accident. Officers at the scene questioned Rivera and let him leave. A call from the police department to WSFB resulted in a week's suspension for Rivera who is reported to have filed a suit against the Hartford Police Department. It is important to note that journalists and private citizens often take photos and video at crime scenes.

- Forbes.com reports that a group of volunteers in Texas who search for missing persons has been involved with a dispute with the FAA over their use of a personally-owned drone. The drone in question was used to find the body of a missing toddler in 2012. The FAA argues that they must authorize any one who wishes to use drones outside of recreational use.

- On April 8th a 27 year old Moroccan man, El Mehdi Semlali Fahti, was arrested in Bridgeport and detained without bail after Federal Agents charged him with plotting to attach bombs to model aircraft. Investigators allege that the suspect intended to target an out-of-state school and federal building in Connecticut.

Geo Tidbits

> "Everything is related to every-thing else, but near things are more related than distant things."
>
> *Tobler's First Law of Geography*

Image source: www.hasbrotoyshop.com

"Geocache" First Word Added to Scrabble by Fans

On Thursday April 10th Hasbro announced the winner of the first-ever contest to add a word to the Official Scrabble Dictionary. "GEOCACHE" was the winning entry after the Geocache.com twitter feed rallied it's 58,000 followers for votes.

While smaller words like EW and ZEN would have a greater impact on competitive game play the GEO-CACHE fans should enjoy this victory.

Online Call for Support Creates Map for Guinea's Ebola Outbreak

Newscientist.com reports that Médecins Sans Frontières (MSF), also known as Doctors Without Borders, arrived in Guinea to fight a deadly Ebola outbreak and found them-selves with no way to map the spread of the virus. The only maps available were topog-raphic maps.

The Guinea Ministry of health Reports that there have been 157 suspected and confirmed cases of the virus which has claimed 101 lives.

On March 24th a call was placed to the Humanitarian Open Street Map Team. Within 12 hours over 200 volunteers sprang into action, digitizing buildings and roads in three major population centers. Now MFS is mapping infected persons, following rumors of infection into villages and hamlets that would otherwise be in unknown territory. With the assistance of the mapping community it is ex-pected that MSF will be able to pinpoint and identify patient zero, and important step for under-standing and controlling the outbreak.