FALL CONFERENCE
October 28-31, 2018
The Saratoga Hilton | Saratoga Springs, NY
www.northeastarc.org
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WELCOME!
The New York Host Committee and the NEARC Board of Directors welcome you to the 33rd Annual Fall NEARC Conference. We have developed an innovative and exciting program showcasing the diversity and depth of GIS activity in the northeast, as well as emerging technologies that make our profession so interesting and exciting! This event will feature an excellent mix of user presentations, hands-on workshops, networking opportunities, and a day devoted to Esri topics on Wednesday.

WITH GRATITUDE
Thank you to the numerous people who helped make FALL NEARC 2018 possible and who worked hard to develop a unique and productive conference experience, including the team at Delaney Meeting & Event Management, Esri and the Host Committee. We’re especially grateful to our vendors and sponsors for their financial support – this event would not be possible without their participation.

HOST COMMITTEE

<table>
<thead>
<tr>
<th>Host Chair:</th>
<th>Program Chair:</th>
<th>Poster Chair</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larry Spraker, VHB</td>
<td>Carol Baker, Town of South Kingstown, RI</td>
<td>Justin Eddings, H2M</td>
</tr>
</tbody>
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<tr>
<th>Social Chair:</th>
<th>Vendor Chair:</th>
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</thead>
<tbody>
<tr>
<td>Todd Fabozzi, Capital District RPC</td>
<td>Mark Scott, Esri</td>
</tr>
</tbody>
</table>

| Eric Herman, NYS Thruway Authority | Sheri Norton, Ontario County |

NEARC BOARD OF DIRECTORS

For bios and contact information for this dedicated group of volunteers, visit www.northeastarc.org/board

<table>
<thead>
<tr>
<th>President:</th>
<th>Treasurer:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pam Brangan, Chittenden County RPC, VT</td>
<td>Jeff Amero, City of Cambridge, MA</td>
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<tr>
<th>Secretary:</th>
<th>Past President:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emily Wilson, University of Connecticut, CLEAR</td>
<td>Brett Horr, Town of York, Maine</td>
</tr>
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<tr>
<th>Mike Doyle, Hilltop Northeast Enterprises</th>
<th>Stephanie Headman, Ph.D., White Mountain National Forest</th>
</tr>
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<tr>
<th>ESRI STAFF</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Christian Carlson, Director of State, Local, and Provincial Government Sales</th>
<th>Chris Nickola, State and Local Government Sales Manager</th>
<th>Paul Rooney, State and Local Government Team Lead</th>
</tr>
</thead>
</table>

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<thead>
<tr>
<th>Krithica Kantharaj, Solutions Engineer</th>
<th>Derek Law, Product Manager</th>
<th>Mark Scott, Solutions Engineer</th>
</tr>
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<table>
<thead>
<tr>
<th>Tom Schwartzman, Solutions Engineer</th>
<th>Lauri Dafner, Solutions Engineer</th>
<th>Alison Moore, Project Manager</th>
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<thead>
<tr>
<th>Gerry Aiken, Account Manager, Local Government</th>
<th>Timothie Biggs, Account Manager</th>
<th>Mike Rink, Instructor</th>
</tr>
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<thead>
<tr>
<th>Nora Lyons Sauter, CAP, Admin</th>
<th></th>
<th></th>
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</thead>
</table>
## Conference Schedule At-a-Glance

* Starbucks = Refreshment Breaks/Meals  
* Sparkler = Social Event

### Sunday, October 28

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 a.m. – 5:00 p.m.</td>
<td>Conference Registration Desk Open</td>
<td>Lower Lobby/Gallery</td>
</tr>
<tr>
<td>8:00 a.m. – 5:00 p.m.</td>
<td>GIS Educator’s Day</td>
<td>Broadway</td>
</tr>
<tr>
<td>12:00 p.m. – 5:00 p.m.</td>
<td>Vendor Set-up</td>
<td>Lower Lobby/Gallery</td>
</tr>
</tbody>
</table>
| 5:00 p.m. – 7:30 p.m. | 🎆 Welcome Mixer at Saratoga Strike Zone  
  Sponsored by Blue Marble Geographics  
  Join your colleagues at Saratoga Strike Zone for bowling, snacks, and drinks. Additional fee of $40 and advance registration required. Fee covers shoes, ball, and lane rental as well as a beverage and snacks! | Offsite: Saratoga Strike Zone, 32 Ballston Ave. |

### Monday, October 29

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 a.m. – 9:00 a.m.</td>
<td>☕️ Attendee &amp; Vendor Breakfast</td>
<td>Foyer/Saratoga Ballroom</td>
</tr>
<tr>
<td>7:30 a.m. – 11:30 a.m.</td>
<td>Vendor Set-Up</td>
<td>Lower Lobby/Gallery</td>
</tr>
<tr>
<td>7:30 a.m. – 5:00 p.m.</td>
<td>Conference Registration Desk Open</td>
<td>Lower Lobby/Gallery</td>
</tr>
<tr>
<td>8:00 a.m. – 8:30 a.m.</td>
<td>NEARC 101: Orientation for First-Time Attendees</td>
<td>Alabama</td>
</tr>
<tr>
<td>8:45 a.m. – 10:15 a.m.</td>
<td>Welcome to Saratoga Springs by Host Committee &amp; Keynote Address by Christian Carlson, Esri</td>
<td>Saratoga Ballroom</td>
</tr>
<tr>
<td>10:00 a.m. – 4:00 p.m.</td>
<td>Poster Set-Up</td>
<td>Pavilion</td>
</tr>
</tbody>
</table>
| 10:15 a.m. – 10:30 a.m. | ☕️ Refreshment Break  
  Sponsored by CAI Technologies                                          | Foyer                           |
| 10:30 a.m. – 12:00 p.m. | Concurrent Technical Sessions I                                     |                                |
| 10:30 a.m. – 3:00 p.m. | Esri Collaboration Center  
  Users can drop-in and meet with Esri staff to answer questions/receive additional information on workflows and implementations. | Boardroom                       |
| 10:30 a.m. – 4:15 p.m. | Esri Hands-On Learning Lab  
  Users can try hands-on exercises using the latest software available. | Phila                           |
| 11:30 a.m. – 6:15 p.m. | Vendor Area Open                                                     | Lower Lobby/Gallery              |
| 12:00 p.m. – 1:30 p.m. | 🎆 Attendee & Vendor Lunch  
  Dessert and coffee in the Gallery                                       | Foyer/Saratoga Ballroom         |
### Monday, October 29 (continued)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 p.m. – 3:00 p.m.</td>
<td>Concurrent Technical Sessions II</td>
<td></td>
</tr>
</tbody>
</table>
| 3:00 p.m. – 3:15 p.m. | 🍵 Refreshment Break with Vendors  
Sponsored by Lloyd’s Register | Gallery                           |
| 3:15 p.m. – 4:15 p.m. | Annual NEARC Business Meeting  
See page 37 for agenda and details. | Saratoga Ballroom                  |
| 4:15 p.m. – 6:15 p.m. | 🎆 Vendor Reception & Poster Social  
Enjoy light hors d’oeuvres, check out the posters, and visit the vendor displays. Sponsored by VHB. | Foyer/Pavillion/Gallery            |
| 6:30 p.m. – 8:30 p.m. | 🎆 Dine Around in Downtown Saratoga Springs | Offsite: See the story map - https://arcg.is/zrqWf |
| 8:30 p.m. – 10:30 p.m. | 🎆 Social Gathering at The Parting Glass  
Darts, Pool, Shuffleboard and Live Music by Pat Decker | Offsite: The Parting Glass, 40 Lake Ave. |

### Tuesday, October 30

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
</table>
| 7:30 a.m. – 9:00 a.m. | 🍵 Attendee & Vendor Breakfast  
Coffee in the Gallery | Foyer/Saratoga Ballroom           |
| 7:30 a.m. – 1:30 p.m. | Vendor Area Open                                                                         | Lower Lobby/Gallery               |
| 7:30 a.m. – 5:00 p.m. | Conference Registration Desk Open                                                        | Lower Lobby/Gallery               |
| 8:30 a.m. – 10:00 a.m. | Concurrent Technical Sessions III                                                        |                                   |
| 10:00 a.m. – 10:30 a.m. | 🍵 Refreshment Break with Vendors  
Sponsored by PenBay Solutions | Gallery                           |
| 10:30 a.m. – 12:00 p.m. | Concurrent Technical Sessions IV                                                        |                                   |
| 10:30 a.m. – 3:30 p.m. | Esri Collaboration Center                                                               | Boardroom                         |
| 10:30 a.m. – 3:30 p.m. | Esri Hands-On Learning Lab                                                               | Phila                             |
| 12:00 p.m. – 1:30 p.m. | 🍵 Attendee & Vendor Lunch  
Dessert and coffee in the Gallery | Foyer/Saratoga Ballroom           |
| 1:30 p.m.         | Vendor Area Closes                                                                       |                                   |
| 1:30 p.m. – 3:00 p.m. | Concurrent Technical Sessions V                                                         |                                   |
| 3:00 p.m. – 3:30 p.m. | 🍵 Refreshment Break                                                                     | Foyer                             |
| 3:30 p.m. – 5:00 p.m. | Concurrent Technical Sessions VI                                                        |                                   |
| 4:45 p.m.         | NEARC Board Election Ballots Due  
Drop-off at Conference Registration Desk | Lower Lobby/Gallery               |
Tuesday, October 30 (continued)

5:30 p.m. – 6:30 p.m. 🎆 Pre-Banquet Networking Reception
Foyer/Pavilion

6:30 p.m. – 8:30 p.m. 🎆 Awards Banquet & Keynote Address by James Howard Kunstler, Author
Sponsored by Esri
Saratoga Ballroom

8:30 p.m. – 10:00 p.m. 🎆 After-Hours Networking Social
Offsite: Location TBA

Wednesday, October 31

7:30 a.m. – 9:00 a.m. 🍵 Attendee Breakfast
Foyer/Saratoga Ballroom

7:30 a.m. – 11:30 a.m. Conference Registration Desk Open
Lower Lobby/Gallery

8:30 a.m. – 11:30 a.m. Esri Session & Hands-On Concurrent Workshops
See page 29 for details
Saratoga Ballroom, Highrock & Alabama/Travers

10:00 a.m. – 10:15 a.m. 🍵 Refreshment Break
Lower Lobby/Gallery

11:30 a.m. Conference Adjourns
Safe Travels!

NEW THIS YEAR!

Download the Conference App:
New this year, the conference schedule and final program content are available in mobile format through the free ATTENDIFY app. Download “Attendify” from the app store, then search within the app for “NEARC”. To access the program details, click on “Fall NEARC Conference 2018” and then “Join”. Highlights of the app include the ability to build your personal agenda, the sponsor/exhibitor directory, an interactive map of Saratoga Springs including markers for the host hotel and offsite events, an interactive hotel floor plan, a Twitter stream, opportunities to interact with fellow app users attending the conference, and more! The app will be updated throughout the conference as changes come in. Come to the Annual NEARC Business Meeting for a discussion on the app and its future at NEARC Conferences.

Esri Day – Wednesday, October 31
Features
All Esri Programming:
User sessions will be scheduled on Monday and Tuesday ONLY. The half-day Wednesday schedule will feature Esri workshops and presentations. A BYOD workshop focusing on ArcGIS Pro has limited seating and requires free pre-registration. Note that there will also be an option to participate in the ArcGIS Pro workshop as an audience member (not hands-on), which does not require pre-registration.
KEYNOTE SPEAKERS

GIS EDUCATORS DAY - SUNDAY, OCTOBER 28 • 12:45 PM - 1:30 PM

Cary Chadwick, Geospatial Educator, University of Connecticut, Center for Land Use Education and Research (CLEAR)

Cary Chadwick joined the University of Connecticut’s Center for Land Use Education and Research (CLEAR) team in 2006 as a member of the Geospatial Training Program. As a geospatial educator, her role is to contribute to the hands-on technical training classes offered by the program on the use of geographic information systems and global positioning systems. Cary is also actively involved in a number of collaborative research projects that integrate geospatial technologies to better manage and understand natural resource systems. Cary is a graduate of Gettysburg College with a B.S. in Environmental Studies. She also holds a M.S. in Environmental Science from the University of New Haven.

Emily Wilson, Geospatial Educator, University of Connecticut, Center for Land Use Education and Research (CLEAR)

Emily Wilson is a Geospatial Educator at CLEAR. Since joining UConn in 2000, her role has been to provide GIS and remote sensing information and support to CLEAR programs including the NEMO Program, the Geospatial Training Program and other related research and outreach efforts. Emily does a significant amount of work on the CT ECO and CLEAR websites with the goal of providing easy access to geospatial information and maps. Emily is a graduate of Connecticut College with a BA in environmental science and botany. She received her M.S. in forestry and remote sensing from the University of Maine.

MONDAY, OCTOBER 29 • 8:45 AM - 10:15 AM

Christian Carlson, Director of State, Local and Provincial Government Sales, Esri

Christian Carlson is currently responsible for leading the strategic direction of Esri’s global state and local government sector. For over two decades, Christian’s work connecting technology and technology innovations to business requirements has been a catalyst in establishing what is now a pervasive use of GIS in government. Today, Christian is actively involved in applying GIS capabilities to global initiatives including Smart Cities, Resiliency, Citizen Engagement and High-Performance Government. During his 22 years at Esri, Christian has worked in virtually all GIS domains and supported its implementations covering multiple major innovation cycles, from on-premise client server, to today’s distributed cloud environment. Christian earned a Master’s of Business Administration degree from the University of North Carolina at Chapel Hill in addition to a Bachelor of Science in Geography and Economics from the University of Colorado at Boulder. Christian currently serves on the Board of Directors for AustinCityUP, the largest smart city consortium of companies, organizations and individuals in the US who have come together to collaborate on activities that advance Austin through digital technologies, data collection, analytics and modeling.

TUESDAY, OCTOBER 30 • 6:30 PM - 8:30 PM

James Howard Kunstler, Author

James Howard Kunstler is the author of The Geography of Nowhere, Home From Nowhere, The City in Mind, The Long Emergency, and Too Much Magic. All these books are concerned with the American living arrangement, the economy, and its prospects for the future. Mr. Kunstler was born and raised in New York City but has lived in the Saratoga Springs region for forty years. He is also the author of 14 novels. He was an editor at Rolling Stone Magazine before dropping out to write books. He has lectured at hundreds of colleges and universities here and abroad. He is currently working on a new book titled, Now What? Mr. Kunstler’s talk will focus on the intersection of a changing economy and the way we inhabit the landscape.
**SUNDAY GIS EDUCATORS DAY SESSION GRID**

**8:00 AM - 5:00 PM • BROADWAY**

* Be sure to bring your own device for BYOD sessions.

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 a.m. – 8:30 a.m.</td>
<td><strong>Registration Desk Open &amp; Continental Breakfast</strong> - Lower Lobby/Gallery</td>
<td></td>
</tr>
<tr>
<td>8:30 a.m. – 9:00 a.m.</td>
<td><strong>Welcome Remarks &amp; Introductions/Overview of the Day</strong> - Broadway 1&amp;2</td>
<td>Broadway 1&amp;2</td>
</tr>
<tr>
<td>9:00 a.m. – 9:30 a.m.</td>
<td><strong>Lightning Previews of the Morning Sessions</strong> - Broadway 1&amp;2</td>
<td>Broadway 1&amp;2</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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<tbody>
<tr>
<td>9:45 a.m. – 10:45 a.m.</td>
<td><strong>PRESENTATIONS</strong>&lt;br&gt;• The Power of Data and Statewide Mapping Competition&lt;br&gt;• Propel GIS and Student Learning Through Community-based Research</td>
<td>Broadway 1&amp;2</td>
</tr>
<tr>
<td></td>
<td><strong>HANDS-ON, BYOD</strong>&lt;br&gt;Story Maps: Share Your Story with Maps</td>
<td>Broadway 3</td>
</tr>
<tr>
<td></td>
<td><strong>HANDS-ON, BYOD</strong>&lt;br&gt;Introducing ArcGIS Online: Teach with GIS</td>
<td>Broadway 4</td>
</tr>
<tr>
<td>11:00 a.m. – 12:00 p.m.</td>
<td><strong>PRESENTATIONS</strong>&lt;br&gt;• Tips and Tricks: Story Maps in the Classroom&lt;br&gt;• Story Maps as Assessment Tools</td>
<td>Broadway 1&amp;2</td>
</tr>
<tr>
<td></td>
<td><strong>HANDS-ON, BYOD</strong>&lt;br&gt;Survey 123: Mobile Data Collection</td>
<td>Broadway 3</td>
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<tr>
<td></td>
<td><strong>PRESENTATIONS</strong>&lt;br&gt;• What GIS Means to High School UnderGrad and Graduate Students: What They Learn and How We Teach&lt;br&gt;• Developing Geospatial Understandings Through GLOBE</td>
<td>Broadway 4</td>
</tr>
<tr>
<td>12:00 p.m. – 12:45 p.m.</td>
<td><strong>Lunch</strong> - Broadway 1&amp;2</td>
<td>Broadway 1&amp;2</td>
</tr>
<tr>
<td>12:45 p.m. – 1:30 p.m.</td>
<td><strong>Keynote Presentation: From Keyboards to Conservation: An Educational Evolution Toward Fostering Access, Understanding and Action at the Local Level</strong> - Broadway 1&amp;2</td>
<td>Broadway 1&amp;2</td>
</tr>
<tr>
<td>1:35 p.m. – 2:00 p.m.</td>
<td><strong>Lightning Previews of Afternoon Sessions</strong> - Broadway 1&amp;2</td>
<td>Broadway 1&amp;2</td>
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<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>2:15 p.m. – 3:15 p.m.</td>
<td><strong>PRESENTATIONS</strong>&lt;br&gt;• Community/Student Collaborations in an Intro GIS Context&lt;br&gt;• Virginia’s Geospatial Semester: Earn College Credits for a High School GIS Course</td>
<td>Broadway 1&amp;2</td>
</tr>
<tr>
<td></td>
<td><strong>HANDS-ON, BYOD</strong>&lt;br&gt;GIS for Historical Analysis</td>
<td>Broadway 3</td>
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<td></td>
<td><strong>PRESENTATIONS</strong>&lt;br&gt;• Where GIS is Being Taught in Higher Ed&lt;br&gt;• Transforming UNH Cooperative Extension Outreach with ArcGIS Online, Story Maps, and Mobile</td>
<td>Broadway 4</td>
</tr>
<tr>
<td>3:30 p.m. – 4:15 p.m.</td>
<td><strong>ROUND TABLE</strong>&lt;br&gt;GIS Educators Day, Next Steps</td>
<td>Broadway 1&amp;2</td>
</tr>
<tr>
<td></td>
<td><strong>ROUND TABLE</strong>&lt;br&gt;Best Practices &amp; Success Stories: Using GIS for Instruction (Teaching With GIS)</td>
<td>Broadway 3</td>
</tr>
<tr>
<td></td>
<td><strong>ROUND TABLE</strong>&lt;br&gt;Best Practices &amp; Success Stories: Teaching GIS - What Works</td>
<td>Broadway 4</td>
</tr>
<tr>
<td>4:15 p.m. – 4:45 p.m.</td>
<td><strong>GIS Educators Day Round Table Wrap-up &amp; Prizes</strong> - Broadway 1&amp;2</td>
<td>Broadway 1&amp;2</td>
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</tbody>
</table>
## MONDAY CONCURRENT SESSION GRID

### CONCURRENT SESSION I - 10:30 AM - 12:00 PM

<table>
<thead>
<tr>
<th>TRACK</th>
<th>UAV #1</th>
<th>CENSUS</th>
<th>FIELD DATA COLLECTION</th>
<th>EDUCATION</th>
<th>ESRI SESSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODERATORS</td>
<td>Mike Olkin, Springfield Water &amp; Sewer Commission</td>
<td>Esther Olson-Murphy, Unitil</td>
<td>Darren Mackiewicz, CDM Smith</td>
<td>Emily Wilson, University of Connecticut</td>
<td>ArcGIS Pro: Have You Made The Switch?</td>
</tr>
<tr>
<td>10:30 AM</td>
<td>Drones for High Accuracy Mapping and 3D Modeling, Photogrammetry, LiDAR and Beyond</td>
<td>The 2020 Census: Geographic Partnership Opportunities</td>
<td>Using GIS Field Data Collection Tools to Help Protect NY Lakes</td>
<td>Transforming UNH Cooperative Extension Outreach with ArcGIS Online, Story Maps, and Mobile Mapping</td>
<td></td>
</tr>
</tbody>
</table>

### CONCURRENT SESSION II - 1:30 PM - 3:00 PM

<table>
<thead>
<tr>
<th>TRACK</th>
<th>3D</th>
<th>WATER</th>
<th>PUBLIC SECTOR APPS</th>
<th>WEB APPS #1</th>
<th>ESRI SESSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODERATORS</td>
<td>Brett Flodine, Metro Hartford Information Service</td>
<td>Pete Steeves, USGS</td>
<td>Stu Rich, PenBay Solutions</td>
<td>Eric Herman, New York Thruway Authority</td>
<td></td>
</tr>
<tr>
<td>2:30 PM</td>
<td>3D Nation Elevation Requirements and Benefits Study</td>
<td>Who’s Down with GPV? Yeah, You Know Me!</td>
<td>Creative Applications of Spatial Analysis in Public Sector Auditing</td>
<td>You’ve Captured the Data – Now Put it to Use! NYSDOT’s System of Engagement</td>
<td>Smart Data Collection with Survey 123</td>
</tr>
</tbody>
</table>

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**3:15 PM**  
**Annual NEARC Business Meeting**—Saratoga Ballroom

**4:15 PM**  
**Vendor Reception & Poster Social** – Foyer/Pavilion/Gallery
## TUESDAY CONCURRENT SESSION GRID

### CONCURRENT SESSION III • 8:30 AM - 10:00 AM

<table>
<thead>
<tr>
<th>TRACK</th>
<th>LIDAR/3D</th>
<th>HYDROGRAPHY</th>
<th>DATA ANALYSIS VISUALIZATION</th>
<th>WEB APPS #2</th>
<th>ESRI SESSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODERATORS</td>
<td>Pam Brangan, CCRPC</td>
<td>Stu Rich, PenBay Solutions</td>
<td>Eric Herman, NY Thruway Authority</td>
<td>Jason Catelli, FM Global</td>
<td>ArcGIS Solutions for Law Enforcement and Crime Analysis</td>
</tr>
<tr>
<td>8:30 AM</td>
<td>Topo and Bathymetric Lidar Capture for the City of New York</td>
<td>Introduction to the National Hydrography Dataset and Stewardship</td>
<td>Using IoT and Dashboarding to Enhance Efficiency and Improve Sustainability</td>
<td>Data Management Tool (DMT): How a Web-based Application Helps to Manage and Inventory Multiple Internal, Private and Public...</td>
<td></td>
</tr>
<tr>
<td>9:00 AM</td>
<td>Expanding Vermont Spatial Data Infrastructure with Statewide QL2 Lidar</td>
<td>Artificial Paths and Connector Features in the National Hydrography Dataset: The Pennsylvania Experience</td>
<td>In Data We Trust? Using Data Science to Increase Locational Confidence</td>
<td>MassDOT Highway Division Interactive Mapping Portal and Crash Tracking (IMPACT) Project</td>
<td>ArcGIS Solutions for Public Works and ROW Permitting</td>
</tr>
<tr>
<td>9:30 AM</td>
<td>Vegetation Analysis in 3D</td>
<td>The National Hydrography Dataset (NHD) and National Hydrography Dataset Plus High Resolution (NHDPlus HR)</td>
<td>Exploring Jupyter: Bridging the Gap Between GIS and Data Science</td>
<td>Custom Widget Development: Making Sense of Map Widgets in ArcGIS Javascript API 4.0+</td>
<td>ArcGIS Solutions for Emergency Management</td>
</tr>
</tbody>
</table>

### CONCURRENT SESSION IV • 10:30 AM - 12:00 PM

<table>
<thead>
<tr>
<th>TRACK</th>
<th>UAV #2</th>
<th>NATURAL RESOURCES #1</th>
<th>BIG DATA WORKSHOP</th>
<th>ENTERPRISE GIS #1</th>
<th>ESRI SESSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODERATORS</td>
<td>Brett Horr, Town of York</td>
<td>Pam Brangan, CCRPC</td>
<td>Brian Hebert, Scribekey</td>
<td>Darren Mackiewicz, CDM Smith</td>
<td>ArcGIS Pro: Have You Made The Switch?</td>
</tr>
<tr>
<td>10:30 AM</td>
<td>UAS Lidar and Imagery in the NERRS: Evaluating the Effectiveness of UAS Sensors...</td>
<td>Don't Clam Up! Trend Analysis Everyone Can Use...a Shellfish Sanitation Case Study</td>
<td>Leveraging the Power of Big Data to Capture and Visualize High-Volume Vector Data Change with ArcGIS and Amazon's Redshift Database</td>
<td>Diversify Your Toolbox: How to Leverage Your Esri Data Investment with Companion Technologies</td>
<td></td>
</tr>
<tr>
<td>11:00 AM</td>
<td>Beyond the Drone</td>
<td>Creating Marine Vessel Activity Data Products from AIS</td>
<td></td>
<td>The Ups and Downs of Upgrading Hardware, Software, and Websites</td>
<td>ArcGIS Online Tips, Tricks, and New Features</td>
</tr>
<tr>
<td>11:30 AM</td>
<td>UAS Management: Integrating Drone Operations in an Enterprise Setting</td>
<td>How Interactive Online Technologies Advance the Connecticut’s Changing Landscape Study Website</td>
<td></td>
<td>Dr. Strange Locus, Or: How I Learned To Stop Worrying And Love The Common Gateway Interface</td>
<td>ArcGIS Enterprise: Architecture and Deployment</td>
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</tbody>
</table>
### TUESDAY CONCURRENT SESSION GRID

**CONCURRENT SESSION V • 1:30 PM - 3:00 PM**

<table>
<thead>
<tr>
<th>ROOM</th>
<th>SARATOGA 1&amp;2</th>
<th>BROADWAY 1&amp;2</th>
<th>BROADWAY 3</th>
<th>ALABAMA</th>
<th>HIGHROCK</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRACK</td>
<td>REMOTE SENSING</td>
<td>ENVIRONMENT</td>
<td>DATA COLLECTION</td>
<td>FACILITIES</td>
<td>ESRI SESSIONS</td>
</tr>
<tr>
<td>MODERATORS</td>
<td>Emily Wilson, University of Connecticut</td>
<td>Glenn Hazelton, Northeastern University</td>
<td>Mike Olkin, Springfield Water &amp; Sewer Commission</td>
<td>Esther Olson-Murphy, Unitil</td>
<td>Insights for ArcGIS: Getting Started with Data Analytics and Visualization</td>
</tr>
<tr>
<td>1:30 PM</td>
<td>High Resolution Land Cover for the Northeast (and Beyond)</td>
<td>Implementing an Environmental Compliance Tracking System at MBTA</td>
<td>A GIS Centric Modus Operandi for Infrastructure Improvement</td>
<td>Where Am I? Floor Plan Application Integrating Multiple Facilities and Human Resource Data</td>
<td></td>
</tr>
<tr>
<td>2:00 PM</td>
<td>Statewide High-Resolution Land Cover Mapping</td>
<td>Environmental Monitoring: Collection to Reporting</td>
<td>Mining Useful Data from Old and New Sources</td>
<td>Modeling and Managing Indoor Data in Your GIS</td>
<td>ArcGIS Online Configuration and Administration</td>
</tr>
<tr>
<td>2:30 PM</td>
<td>Estimating Percent Impervious Cover from Landsat-based Land Cover: An Evaluation of a Simple and Transferable Regression Model</td>
<td>Using ArcGIS Pro and Crowd Sourced Data to Create Habitat Suitability Models for near Threatened Bird Species</td>
<td>Leveraging Collector and Survey123 Together for Effective Field Data Collection</td>
<td>Mapping a University, Inside and Out</td>
<td>Enabling WebGIS Workflows with ArcGIS Pro</td>
</tr>
</tbody>
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### CONCURRENT SESSION VI • 3:30 PM - 5:00 PM

<table>
<thead>
<tr>
<th>TRACK</th>
<th>TOOLS</th>
<th>NATURAL RESOURCES #2</th>
<th>PUBLIC DATA</th>
<th>ENTERPRISE GIS #2</th>
<th>ESRI SESSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODERATORS</td>
<td>Brian Seaman, Unitil</td>
<td>Elizabeth Arabadjis, VHB</td>
<td>Todd Fabozzi, Capital District RPC</td>
<td>Larry Spraker, VHB</td>
<td>ArcGIS Enterprise Roles: Real-Time, Imagery, &amp; GeoAnalytics</td>
</tr>
<tr>
<td>3:30 PM</td>
<td>And Now For Something Completely Different – Python 3 and ArcGIS from Simple to Complex</td>
<td>Spatial Prioritization of Headwater Parcels for Enhanced Flood Resilience</td>
<td>New York State Parcel Map Program: Past, Present and Future</td>
<td>ArcGIS Hub: Bringing it All together</td>
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</tbody>
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**SEE PAGE 29 FOR WEDNESDAY ESRI DAY**
**MONDAY 10:30 AM - 12:00 PM**

### TRACK: UAV #1

**MEETING ROOM: SARATOGA 1&2**  
**MODERATOR: MIKE OLKIN, SPRINGFIELD WATER & SEWER COMMISSION**

**10:30 AM**

**Drones for High Accuracy Mapping and 3D Modeling, Photogrammetry, LiDAR and Beyond**  
*Tayler Engel, GIS Analyst and Drone Pilot, ARE-AirShark*  

Drones technology has advanced rapidly in the past few years allowing for LiDAR and advanced photogrammetry techniques to be readily available for a wide spectrum of projects. This presentation will dive into the world of drones and the various sensors available to create survey grade data. When to use LiDAR over photogrammetry and what benefits you can expect to receive out of both methods will be discussed in detail. A variety of projects will be displayed where multiple sensors were used, from mapping of campuses using photogrammetry to environmental mapping of shorelines with LiDAR. 3D modeling of bridges and buildings using LiDAR and photogrammetry will also be discussed in this presentation.

**11:00 AM**

**UAS Applications and ArcPro 2.1: The Waugh Arboretum's Evolving Process of Tree Inventorying and Management**  
*Daniel J. Myers, GIS Technician, Physical Plant Grounds and Facilities; Christopher A. Copeland, GIS Technician, Physical Plant Landscape Management – University of Massachusetts, Amherst*  

Urban landscapes are dynamic systems inundated by physical, chemical, and biological inputs. As UMass Amherst continues its campaign for campus development, there are inherent conflicts with its urban forest. Trees are assets to any community, each with varying degrees of worth and functionality. A tree inventory is a method to monitor changes to each individual tree and detect patterns to the collective tree population. It serves as a guide to prioritize tree maintenance, preserve valuable specimens, and communicate forest functions to stakeholders. Campus arborists currently update the tree inventory using tablets equipped with ArcPad 10.2 and TreeWorks 2015. With the implementation of UAS technology and ArcPro, campus arborists can more accurately and efficiently measure trees and observe their environment. One centimeter pixel resolution RGB imagery can aid campus arborists in efficiently calculating dendrometric variables and through time series analysis. In our presentation, we will explore the benefits of ESRI Drone2Map and ArcGIS Pro 2.1 Image Analyst extension. These applications are used to create an accurately georeferenced orthomosaic and to conduct an object-oriented classification to identify tree canopy coverage and tree genus at a forty acre study area. As GIS technology evolves, our comprehensive GIS databases functionality can increase as a tool for organizing, analysis, and reporting with ancillary data collected by UAS.

**11:30 AM**

**So You Built a Multi-million Bathhouse: Assessing the Past, Present, & Future of a Beloved New England Beach Using Drones**  
*Tracy Tien, Spatial Fellow, Spatial Analysis Lab, Smith College; Jon Caris, Director, Spatial Analysis Lab, Smith College; Robert Newton, Professor of Geoscience, Smith College*  

Popham Beach, Maine experiences extreme shoreline and dune changes that pose potential threats to park facilities and private properties. For many years, students from Smith College make a spring trip to Popham to assess the dynamic beach processes and learn a field data collection methods. Professor Robert Newton’s geomorphology class conducts recurring ground-based surveys each year to discern the how, why, and what if’s of the sedimentation process at the beach. The Spatial Analysis Lab recently introduced aerial surveying with drones that complements the research with large-scale, high-resolution orthomosaics to offer analysis on beach erosion and restoration overtime. Analysis of drone imagery with ArcGIS confirms drone mapping is suitable for accurate shoreline monitoring. The UAV data collected also enhances the work by addressing the resiliency and adaptability of the state park to sea-level rise.

### TRACK: CENSUS

**MEETING ROOM: BROADWAY 1&2**  
**MODERATOR: ESTHER OLSON-MURPHY, UNITIL**

**10:30 AM**

**The 2020 Census: Geographic Partnership Opportunities**  
*James Bogart, U.S. Census Bureau*  

As part of the 2020 Decennial Census operation, the Census Bureau provides many opportunities to collaborate with state and local governments through several different geographic partnership programs. The SAID (Spatial, Address and Imagery Data) program acquires partner data for continual updating of the Master Address File (MAF) and the Topologically Integrated Geographic Encoding and Reference system (TIGER). The Participant Statistical Areas Program (PSAP) allows local governments to review and update selected statistical area boundaries (tracts, block groups, census designated places (CDPs), and census county divisions (CCDs) to allow geographic data tabulations for the 2020 Census data and ACS data for the next 10 years. The New Construction program will give governments an opportunity to submit addresses for units constructed after the 2020 Local Update of Census Address (LUCA) operation. For governments who participated in the 2020 LUCA program, the Census Bureau will be providing submission feedback and entering the appeals phase in 2019, which will provide transparency to governments regarding the result of their address list update submission, and the ability to dispute any disagreements with the Census Bureau’s decisions. The annual Boundary and Annexation Survey (BAS) will continue to collect the legal boundaries as of January 1 of each year. Local geographic knowledge obtained through these programs is essential for the Census Bureau to provide the quality data local governments rely on when making decisions that affects the lives of their population over the next ten years.
**11:00 AM**

**Synchronization and Standardization of Address Points and Street Centerline Files**  
*James Coyle, Geographic Specialist, U.S. Census Bureau*

Synchronizing and standardizing address points with street centerlines can be highly advantageous in maintaining large address databases. This presentation will advance a spatial methodology for synchronizing the 6.1 million New York State E-911 address points with the US Census Bureau TIGER line files. The methodology has a significant number of useful outputs which include a drop point on the street centerline for use in network analysis, an offset point that may be used for cartographic labeling, coding for each address point that indicates the specific standardization method used. Finally, since each address point is allocated to a specific TIGER segment, this method establishes a framework for small area analysis or spatial analysis at the block face level that can be used to advance community health analysis. Finally, this presentation will present how owner occupancy has evolved in Erie County, New York in the time period 2005-2015 utilizing the methodology advanced in this presentation.

**11:30 AM**

**THE ABCs OF CDPs: Census-Designated Places and Their Obtaining Data**  
*David Kraiker, Data Dissemination & GIS Specialist, U.S. Census Bureau*

This presentation/workshop will explain how the Census Bureau classifies “place”, allows county governments to create “census-designated places” - big or small - and then how American Community Survey data are released for places. The presentation will delve into the American Factfinder portal to illustrate how citizens and users may obtain population, economic, social and demographic data for CDPs and their accompanying shapefiles. It will also explain the logic of population thresholds, and why some data might be more readily available than others. Presenter will walk through the process of pulling data from AFF. The audience is invited to bring a device to follow along and practice searching for data.

**TRACK: FIELD DATA COLLECTION**

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<thead>
<tr>
<th>MEETING ROOM: BROADWAY 3</th>
<th>MODERATOR: DARREN MACKIEWICZ, CDM SMITH</th>
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<tr>
<td><strong>10:30 AM</strong></td>
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| **Using GIS Field Data Collection Tools to Help Protect NY Lakes**  
*John Marino, NY Natural Heritage Program; Cathy McGlynn, NYS Department of Environmental Conservation*  
Across New York state there are many boat launch steward programs (aka Watercraft Inspection Stewards). Perhaps you have spoken with a boat launch steward? Watercraft Inspection Programs are an integral part of the state’s aquatic invasive species prevention work. Over the past several years the number of organizations sponsoring boat launch stewards has grown substantially, and with that growth there has been a need to have standardized data, collected statewide, that is easily accessible. To that end, the NY Natural Heritage Program, a partnership between SUNY ESF and NYS DEC, has developed a Survey123 app (titled the “Watercraft Inspection Steward Program App” [WISPA]) with help and support from numerous partners including NYS DEC and NY Sea Grant. In 2018, 15 organizations participated with WISPA, representing over 200 boat launch stewards, and over 100,000 records were collected. Cathy McGlynn will highlight the statewide effort and the value of the standardized, centralized data. John Marino will discuss the specifics of the Survey123 app, the AGOL online map editor interface, and “dashboard”.

| **11:00 AM**              |                                          |
| **Using ARCGISOnline, Collector, and Survey123 as Field Data Collectors and Report Publishers**  
*Richard O’Gara, PEER Consultants, P.C.*  
The Massachusetts Bay Transit Authority (MBTA) is a $2.3 billion construction project to extend the Green Line from Lechmere Station in Cambridge to Union Square in Somerville and Tufts University in Medford. The Green Line Extension (GLX) Extension Project consists of construction of 7 new stations and over 4.3 miles of new Light-rail track and appurtenances. PEER Burlington was awarded the contract for providing the Pre-construction survey services in support of the GLX project. The survey requires performing damage assessment and elevation surveys for approximately 1000 properties along the project right of way. The large number of properties, separate survey crews, and varied types of data and deliverables necessitated a structured, computerized approach to field data gathering and data reporting. PEER chose to use ARCGIS, ARCGISOnline, Collector, and Survey123 to collect data in the field, check the data, and create deliverables. Mr. O’Gara has more than 25 years of experience developing, analyzing, and visualizing large infrastructure and environmental geographic data sets for the public and private sectors. He has significant experience developing geospatial data models. Mr. O’Gara has managed several data creation projects. He has also provided technical services and guidance on a wide variety of topics. Richard has been “in the field” on many occasions, but only got his work truck stuck in mud once!

| **11:30 AM**              |                                          |
| **Are You Ready Yet? ArcGIS Online: Helping to Bring the Field to You**  
*David W. Pollock, Lloyd’s Register*  
ArcGIS Online is becoming the primary hub of many organization’s GIS activities. Most computing functions are either already in the cloud or offer cloud options. ArcGIS Online provides the online foundation for your cloud-based GIS. As a focal point of Esri’s development, it continues to improve and grow at a rapid pace. As part of this growth, the “locate and capture” field applications that tie into ArcGIS Online: Collector, Survey 123, and Explorer have also matured and expanded their capabilities. This presentation will take look at the use of these field applications and ArcGIS Online on several distinctly different projects and uses to demonstrate their versatility in field and how that translates to enterprise data management. Municipal applications such as structure inspections and sign inventory, to job safety survey forms and a marketing tool for pipeline survey and construction materials tracking will be discussed. These demonstrations will show that data collection using these tools can be an easier, more streamlined process, allowing it to be applied in more field situations than ever before. The lessons learned, including on the hardware used, will be shared in the hopes that both those thinking about getting started or implementing similar solutions can take away something valuable. |
10:30 AM
Transforming UNH Cooperative Extension Outreach with ArcGIS Online, Story Maps, and Mobile Mapping

*Shane Bradt, UNH Cooperative Extension*

While geospatial technologies have been taught as a topic and employed in outreach at UNH Cooperative Extension for nearly two decades, the recent increased use of ArcGIS Online and related applications have made substantial improvements to outreach programs in New Hampshire. Once focused on desktop GIS and standard GPS units, the Geospatial Technologies Training Center now teaches a variety of workshops on online and mobile mapping technologies, including ArcGIS Online, Story Maps, crowdsourcing mapping, Survey123 and Collector. In addition to helping the NH public learn how to put these technologies to use in their lives, UNH Cooperative Extension has begun incorporating ArcGIS Online-base approaches across a variety of outreach programs, as well as, for internal communication and collaboration. While some applications of ArcGIS Online have served simply as a way to improve web-based communication with the public, others have deeply changed the way in which programming is delivered. In these cases, not only has ArcGIS Online allowed UNH Cooperative Extension to create new programming, it has allowed the organization to reach new audiences. Come join this session to learn how UNH Cooperative Extension is using ArcGIS Online for outreach and share examples of your own outreach using online mapping.

11:00 AM
Carbon for Conservation: A GIS Suitability Model for a Private-Public Partnership

Alex French, Institute for a Sustainable Environment Clarkson University; Carol Cady*, GIS Program, St. Lawrence University; Dakota Casserly, GIS Program, St. Lawrence University; Jessica Rogers, Environmental Studies Department, SUNY Potsdam

Through a collaborative effort between Clarkson University’s Institute for a Sustainable Environment, St. Lawrence Land Trust, St. Lawrence University’s GIS Program, and SUNY Potsdam’s Environmental Studies Department, forested private properties within St. Lawrence County, New York have been identified as potential sites to participate in an experimental carbon offset project through Clarkson University. These properties would be placed under conservation easements with Clarkson University paying the easement transaction costs in exchange for the University being able to claim the carbon offset benefits. The project started with an assignment in a GIS class at Clarkson, and continued in SUNY Potsdam’s introductory GIS class. The outcome was to identify large forested properties within the County. Due to the time constraints of the classroom, it was decided that the project needed to be refined before presenting the final results to the Land Trust. Data acquisition and analysis were split among the above academic programs. Four faculty and staff with several classes from these institutions created a suitability model. Over 100 properties were identified as suitable for easements. The owners of the 20 largest properties were then contacted by letter to discuss a conservation easement on their property. As of this summer SLLT has begun the easement process with one interested land owner. During our presentation we will discuss the suitability model and analyses used, the collaborative process itself, and how this process may be used with other land trusts and academic institutions in our area to create a sustainable carbon for conservation model.

11:30 AM
Teach with GIS, A New Resource for Educators from K-12 to College

Lyn Malone, World Views GIS; Mike Wagner, Loudon County Public Schools

Teach with GIS (https://learn.arcgis.com/en/educators/) is an incredible new resource for teachers, schools, and districts eager to integrate their curriculum with geospatial technologies. This session will provide an overview of the classroom version of the guide which includes Skill Builder Lessons, Tips and Tricks for Classroom practice, an interactive Curriculum Builder, and an ArcGIS Organization Management Guide for classroom teachers. As soon as you see it, you’ll want to add Teach with GIS to your GIS took kit. One comment summed it up this way, “This site [Teach with GIS] will now be my go to resource for K-12 implementation and PD planning.” BYOD so you can test drive the site during the session.
**MONDAY 1:30 PM - 3:00 PM**

## TRACK: 3D

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td><strong>1:30 PM</strong></td>
<td><strong>3D Solar Rating for Cambridge Street Trees</strong></td>
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<td><em>Katie Grillo, City of Cambridge, MA</em></td>
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<td>The City of Cambridge has nearly 30,000 street trees that are maintained by the City's Department of Public Works (DPW). DPW was interested in reviewing their watering plans and also investigating tree mortality in relation to a tree's location. ArcGIS Pro tools and models were used with both LiDAR and 3D multipatch buildings to determine how much sunlight each street tree receives throughout the summer. As a way to make the results of this study more accessible to city staff, the solar rating is incorporated into the street tree data and displayed in a 3D web scene on ArcGIS Online.</td>
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<th>Time</th>
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<tbody>
<tr>
<td><strong>2:00 PM</strong></td>
<td><strong>NYS Elevation Data: Lifecycle on Collecting, Reviewing, and Sharing Elevation Data</strong></td>
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<td><em>Jeffrey Langella, New York State Information Technology Services - GIS Program Office</em></td>
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<td>This presentation will highlight how New York State is working with other County, State, and Federal Agencies on where to collect Elevation Data. A high level overview on how the data is reviewed for quality and accuracy using several different GIS packages. The end of the presentation will focus on all the products we make available free of charge. These products include bare earth DEMs, Hillshade, Contours, and LAS Point Clouds. We will focus on how we make all of this data available to the public via direct download and web services.</td>
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<th>Time</th>
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<tr>
<td><strong>2:30 PM</strong></td>
<td><strong>3D Nation Elevation Requirements and Benefits Study</strong></td>
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<td><em>Dan Walters, USGS</em></td>
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<td>The National Oceanic and Atmospheric Administration (NOAA) and the U.S. Geological Survey (USGS) are gathering information from users across the Nation to improve the availability and consistency of 3D elevation data, including both terrestrial and bathymetric data, for the United States and its territories. The 3D Nation Elevation Requirements and Benefits Study will shape the future of Federal elevation data programs. A previous and similar study conducted by USGS in 2012, the National Enhanced Elevation Assessment resulted in the formation of the 3D Elevation Program (3DEP). The presentation will review the progress and results of 3DEP; provide detailed information about the information being gathered now; and an overview of how the information will be used to improve 3DEP in the future.</td>
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## TRACK: WATER

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<tr>
<td><strong>1:30 PM</strong></td>
<td><strong>Enabling Best Practices for Stormwater Through a Standards Based Framework</strong></td>
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<td><em>Ricardo Lopez-Torrijos, CasaAlba Consulting</em></td>
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<td>Municipalities and Stormwater Authorities confront significant challenges in getting their arms around their goals and workload. They must cover the update of asset inventories, integration of business and technical information, planning and managing improvements and maintenance, and communication with multiple partners, funding sources and regulators. Key for alignment of the diverse workload is having the base information set in a framework allowing its use in all workflows. Tools drawing data from such information framework enable the alignment. Incorporation of existing and emerging Standards and Best Practices for water related data provides the framework. Bringing experiences in stormwater system mapping projects large and small, from Washington DC to Kingston, NY, the presentation shows how standards for hydrography, stormwater, and hydrologic and hydraulic modeling are the framework that allows tying the base information to workflows, communication and funding activities. Reviewed best practices include: LiDAR based updates; road culvert and stormwater sewer system inventory and characterization; integration with surface runoff, Natural Resource Inventory and Green Infrastructure. Mapping and modeling standards covered include NAACC for culvert inventory, high resolution NHDPlus for surface and stormwater system integration, StreamStats and the National Water Model for H&amp;H modeling, and other emerging stormwater system mapping standards.</td>
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<th>Time</th>
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<tr>
<td><strong>2:00 PM</strong></td>
<td><strong>Water Analytics: Using ArcGIS Online to Integrate Stormwater Utility Models with Near Real-Time Data Feeds</strong></td>
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<td><em>Brittney Gibbons, CDM Smith; Darren Mackiewicz</em>, CDM Smith*</td>
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<td>A ‘Water Analytics’ platform was implemented by CDM Smith and the Metropolitan District Commission (MDC) of Hartford, Connecticut to empower proactive real-time geospatial decision-making—enabling a smarter infrastructure approach to monitoring, operating and improving collection system infrastructure. This is accomplished through automated integration of system data and hydraulic models for validation of expected performance, displayed through an easy-to-use geospatial web viewer. The platform is proving to be valuable in monitoring and refining the MDC’s $2 billion Clean Water Project to mitigate combined sewer overflows (CSO) and sanitary sewer overflows (SSO), and has enabled the MDC to identify and address collapsed pipes, capacity constraints and other O&amp;M issues proactively before becoming larger problems.</td>
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</tbody>
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2:30 PM
Who’s Down with GPV? Yeah, You Know Me!
Michael Olkin, Alex Hiller, Kyle Barna – Springfield Water and Sewer Commission

Water utilities of today must marry century-old infrastructure with 21st century technology to meet workflow demands and customer expectations. Due to the varied and expansive nature of the water sector, such technology must be versatile in order to realize efficiencies. GIS applications play a pivotal role in construction, maintenance, planning, communication, and daily operations at the Springfield Water and Sewer Commission (SWSC). This presentation highlights how SWSC is using AppGeo’s open source General Purpose Viewer (GPV) web mapping technology to bring GIS data, CMMS content, and other SWSC systems together to improve operations and customer experience. The SWSC GIS staff’s approach to the process of testing, implementing, providing training, and supporting the use of a new web technology will also be covered. Demonstrations will include GPV capabilities that have been leveraged to automate or enhance SWSC workflows including upstream/downstream tracing of sewer pipes, user-friendly queries that help to automate asset reporting, enhancements in emergency management communication processes, and improvements to interdepartmental communication. SWSC provides drinking water to the residents of Springfield and Ludlow, Massachusetts, while wholesaling or providing peak water service to six other communities in the Pioneer Valley. SWSC is responsible for maintaining three reservoirs with a total capacity of more than 25 billion gallons, approximately 19,000 acres of property, and over 1,000 miles of water and sewer pipe.

TRACK: PUBLIC SECTOR APPS

MEETING ROOM: BROADWAY 3

1:30 PM
Using ArcGIS Online for your Municipal Website
Mike Doyle, Founder, Hilltop Northeast Enterprises

Esri has been developing ArcGIS Online for many years now, and it is now at a point where municipalities can use it as their municipal website. Implementing this technology unleashes the power of Esri’s maps and apps for any and all departments within your organization, and can now even be used to make abutters lists! I will discuss available maps and apps, management of data in the Esri cloud, syncing strategies, and managing access.

2:00 PM
Asset Management and GIS: What Is It, Why Use It, What to Do with All That Data???
Jessica Gooch, City of Portland Maine; Gregor Wilkie, Cityworks

The City of Portland, ME has been working with ArcGIS and Cityworks to help implement their Asset Management Program for their sewer and stormwater divisions. We will talk about what Asset Management is and why we need it. Specifically, how does the City use GIS and Cityworks in both the office and the field to collect and analyze their data, and finally, what are their plans for analyzing this data in order to make better decisions and help others visualize what is going on underground?

2:30 PM
Creative Applications of Spatial Analysis in Public Sector Auditing

The Office of the New York State Comptroller’s (OSC) Division of State Government Accountability (SGA) conducts performance audits of New York State and City entities to determine if taxpayer money is being used effectively and efficiently and to help improve government operations, programs, and financial management. SGA recognizes the value of using GIS to conduct spatial analysis and enhance its audit reports by highlighting risk in public programs and increasing the impact of its audits. This presentation discusses examples of SGA audits using spatial analysis in unconventional ways – analyzing relationships between traditionally unrelated data sets and identifying gaps in services across the State – with the end goal of strengthening public health and safety. For example, in an audit of the Department of Motor Vehicle (DMV) entitled Registration and Enforcement of Automotive Services, Sales, and Salvage Facilities (Report 2016-S-71), SGA auditors identified locations where automotive businesses could potentially be operating without a valid registration by matching land use data from New York State tax parcels with DMV records. SGA’s audit of the Department of Environmental Conservation entitled Drug Management and Disposal (Report 2016-S-82) identified large areas of the State that were underserved by the program. SGA has found that the creative application of geospatial technology to diverse data sets allows public programs to more strategically and proactively focus their limited resources. We aim to engage organizations responsible for overseeing public programs in how GIS can be an innovative tool for evaluating the effectiveness of programs and improving government operations.
Concurrent Session Abstracts - Monday 1:30 PM - 3:00 PM

**1:30 PM**

How Unique (Search) Is Your Widget?

*Michael Blair, Innovate! Inc.*

The Query widget is great for predefined searches, however, what do you do when you want to find data across multiple attributes and many unique values per attribute? Innovate! solved that problem by developing a custom widget to make use of a unique value SQL view to serve the data dynamically through a service. The widget then consumes the JSON response and builds a multi-selection search interface. Additionally, there is a geographic filtering function that allows for the querying to be conducted within a drawn geometry. See how you can be unique too!

**2:00 PM**

Using GIS Tools to Better Manage Staff, Projects and Better Utilize Acquired Data

*John Diaz, Robert Nalewajk – Greenman-Pedersen, Inc.*

GPI is actively utilizing in-house UAS services for a variety of project related tasks. These can vary from obtaining simple graphics for marketing/presentation purposes to complex, surveys and infrastructure assessments. Keeping track of the flights, in terms of planning, scheduling, assigning pilots and notifying Project Managers of the completion of the flight as well as data processing was becoming more difficult as more and more applications for UAS services grew. One of the biggest issues was communicating with the UAS pilots to assign projects and for them to notify staff of the status (planning, complete, etc.). Utilizing a variety of ESRI GIS products; including Workforce, Collector, Web Apps, AGOL and Desktop, GPI was able to provide a more direct way for Project Managers to coordinate and schedule UAS flights. Through building a Web App, Managers could submit a flight request and check on the status of the flight. Through integrating the Flight Request with Workforce, the flight could be assigned to the UAS Pilot through the mobile application. Integrating the Collector application with Workforce allowed the UAV Pilot to view all details of the project as well as giving them the opportunity to edit relevant data from the field. Once the flight was completed, a dashboard was developed to provide a quick update of the flight request status. The discussion will also include GPI’s use of Collector and Survey 123 as tools to more efficiently and effectively collect field data for a variety of applications.

**2:30 PM**

You’ve Captured the Data – Now put it to Use! NYSDOT’s System of Engagement

*Steve Wilcox, Director, Maintenance Program Planning Bureau, NYSDOT*

Mike Rossi, Asset Management Program Engineer, NYSDOT

Most computer system projects are focused on collecting data for use by experts within an individual functional area. These “systems of record” include systems for safety, project tracking, fiscal management, maintenance management or asset management. This presentation will describe how NYSDOT created strategic alignment across the agency and began developing a “System of Engagement” to traverse multiple DOT and publicly available data sets to serve particular purposes. NYSDOT has begun a three-year project to build 47 apps and the infrastructure necessary to support these. The apps will be designed to be used on any device including: cell phone, tablets, laptops or desktop computers. This will provide the user access to key authoritative information without having to find a system’s “expert” to interpret, analyze and report in response to requests for information. These apps are made available through a single destination or “Portal” from where the agency can access current, authoritative and accurate information. Think of this as creating a DOT “App Store”. This first year is focused on the configuration of eleven critical apps prioritized for two purposes. The first is to create data viewers including: projects, pavement, bridge data, STIP, environmental surface waters, maintenance and safety, as these will serve as the basic web service building blocks for more complex apps. The second focus area is for emergency response, including a Winter Ops App for managing snow and ice operations and a Flood Response App for managing the response to flooding events.

ESRI SESSIONS

**MEETING ROOM: HIGHROCK**

**1:30 PM**

Field Mobility Workflows Using Workforce and Collector

*Derek Law, Product Manager, Esri-Redlands*

In this session, you will learn about Workforce for ArcGIS and Collector for ArcGIS, and how the two apps can be used together to support your mobile GIS workflows. Workforce enables you to manage and coordinate your field workers in real-time, while Collector is the premier map-centric field data collection app.

**2:00 PM**

Configuring and Deploying Operations Dashboard

*Lauri Dafner, Solutions Engineer, Esri-Philadelphia, Local Government Business Development*

Operations Dashboard for ArcGIS is a configurable web app that provides location-aware data visualization and analytics for a real-time operational view of people, services, assets, and events. In this session we will introduce the key features of dashboards, walk through examples from a variety of organizations and then finally demonstrate the configuration and deployment of an Operations Dashboard.

**2:30 PM**

Smart Data Collection with Survey123

*Tom Schwartzman, Solutions Engineer, Esri-Boston, State Government Business Development*

Survey123 for ArcGIS is a simple and intuitive form-centric data gathering solution for creating, sharing, and analyzing surveys in three easy steps. Create smart forms with skip logic, defaults, support for multiple languages, and much more. Equip field workers with mobile devices to capture data in any environment, with minimal training. Quickly analyze the results to make actionable decisions. Come learn how you can get started with this smart data collection tool.
NHD database.

Also shared will be some of the terminology used in the recently released NHDPlusHR Mark-up Tool to submit corrections into the state-specific StreamStats applications. In Pennsylvania, the impact of geometry errors in NHDPlus_Version2 and NHDPlusHR will be discussed with selected stream miles. The incorrect placement of Artificial Path or Connector features can be the main cause for stream network errors in NHDPlus datasets used in function of each dataset is the correct geometry of the stream network. Errors in the network cause miscalculations for various parameters including drainage area and to support a variety of projects such as coastal storm and sea level rise inundation, flood risk assessment, and mitigation, green infrastructure and tree canopy planning. In 2017, the City began to collect new Bathymetric and updated Topographic LiDAR data. This new data will support City operations with data analysis, policymaking, resiliency and environmental planning. In addition, the use of the 2010 and 2017 data will be used to analyze how Hurricane Sandy and human interventions have recently altered the City's landscape. Since 2010 the evolution of Aerial Bathymetric LiDAR (TopoBathy) has allowed for elevation data below certain depth of water in and around the City. In the Spring and Summer two aerial missions were set out onto the City to collect both the Topographic and TopoBathy LiDAR data. Collection was captured from 2 different planes. Coordination with the City, FAA, media, the weather and contractors required well organized procedures and systems between all involved. This abstract will look into these tasks during the scope development, coordination and acquisition stages. Direct and derived products - land cover, tree canopy change, and Digital Elevation Models - will provide an unprecedented opportunity to analyze change and to support future resiliency planning.

The National Hydrography Dataset (NHD) is a comprehensive set of digital spatial data that represents the surface water of the United States. Ongoing maintenance of the NHD is essential. The collaborative data stewardship program with State and local governments, Federal agencies, and other users of the data helps improve the NHD. Updates to the NHD are made by stewards, transmitted to the USGS, processed, and made available in the national dataset for distribution. This presentation will provide a high-level overview of the NHD and stewardship process.

Vermont has achieved statewide Quality Level 2 (QL2) lidar coverage in 2018, positioning the state to pursue robust Vermont Spatial Data Infrastructure (VSDI) goals previously out of reach. Primary among these goals is a statewide, 17-class land cover layer at 0.5m resolution with an overall accuracy of 90% or better. The geometric information in lidar along with the spectral information in various statewide imagery supports Automated Feature Extraction using an Object Based Image Analysis framework to produce this data. Increased data accuracy, reduced acquisition costs, and advancing technologies are increasingly enabling those responsible for finding innovative solutions to an array of Vermont’s challenges. A pre-release of the land cover data will be shown along with other current efforts (Statewide Property Parcel Mapping Program), as well as a brief overview of the lidar program and lidar-based services.

LiDAR data can be a powerful tool to support decision making at an organization, but simply viewing the data can be a cumbersome process that limits its usage to a handful of individuals. Vermont Electric Power Company (VELCO) has deployed tools in ArcGIS Online to empower users across the company by providing on demand access to LiDAR deliverables in a high performance 3D environment.

The National Hydrography Dataset (NHD) is a digital geospatial dataset that maps the surface water of the United States. The NHD High Resolution (HR), at 1:24,000-scale or better, is the most up-to-date and detailed hydrography dataset for the nation, supported and maintained by the U.S. Geological Survey. The NHD medium resolution, at 1:100,000-scale, is a legacy dataset with the US EPA acting as the primary custodian supporting modeling applications. Both datasets are part the national framework for NHDPlus: NHDPlus_Version2 at the 1:100,000 scale, and NHDPlusHR at the 1:24,000 scale. Critical to the accuracy and function of each dataset is the correct geometry of the stream network. Errors in the network cause miscalculations for various parameters including drainage area and stream miles. The incorrect placement of Artificial Path or Connector features can be the main cause for stream network errors in NHDPlus datasets used in state-specific StreamStats applications. In Pennsylvania, the impact of geometry errors in NHDPlus_Version2 and NHDPlusHR will be discussed with selected examples from both datasets. Also shared will be some of the terminology used in the recently released NHDPlusHR Mark-up Tool to submit corrections into the NHD database.

Introduction to the National Hydrography Dataset and Stewardship

The National Hydrography Dataset (NHD) is a comprehensive set of digital spatial data that represents the surface water of the United States. Ongoing maintenance of the NHD is essential. The collaborative data stewardship program with State and local governments, Federal agencies, and other users of the data helps improve the NHD. Updates to the NHD are made by stewards, transmitted to the USGS, processed, and made available in the national dataset for distribution. This presentation will provide a high-level overview of the NHD and stewardship process.

Artificial Paths and Connector Features in the National Hydrography Dataset: The Pennsylvania Experience

The National Hydrography Dataset (NHD) is a digital geospatial dataset that maps the surface water of the United States. The NHD High Resolution (HR), at 1:24,000-scale or better, is the most up-to-date and detailed hydrography dataset for the nation, supported and maintained by the U.S. Geological Survey. The NHD medium resolution, at 1:100,000-scale, is a legacy dataset with the US EPA acting as the primary custodian supporting modeling applications. Both datasets are part the national framework for NHDPlus: NHDPlus_Version2 at the 1:100,000 scale, and NHDPlusHR at the 1:24,000 scale. Critical to the accuracy and function of each dataset is the correct geometry of the stream network. Errors in the network cause miscalculations for various parameters including drainage area and stream miles. The incorrect placement of Artificial Path or Connector features can be the main cause for stream network errors in NHDPlus datasets used in state-specific StreamStats applications. In Pennsylvania, the impact of geometry errors in NHDPlus_Version2 and NHDPlusHR will be discussed with selected examples from both datasets. Also shared will be some of the terminology used in the recently released NHDPlusHR Mark-up Tool to submit corrections into the NHD database.
The National Hydrography Dataset (NHD) is the U.S. Geological Survey's geospatial dataset used to portray surface water in The National Map. The NHD represents the drainage network with features such as rivers, streams, canals, lakes, ponds, coastline, dams, and streamgages. The NHD also includes a linear referencing system based on reach codes that functions like a street address, and network connectivity information that enable analysis and discovery of information upstream or downstream of a point of interest. The National Hydrography Dataset Plus (NHDPlus) enhances the NHD by incorporating two other USGS datasets: seamless elevation data from the 3D Elevation Program (3DEP), and delineations of drainage divides from the Watershed Boundary Dataset (WBD). The NHDPlus comprises an integrated suite of hydrologic geospatial data sets, including a hydrographic stream network, polygonal catchment areas representing incremental drainage areas for each stream network element, and Digital Elevation Model (DEM) derivatives including flow direction and flow accumulation grids. The USGS and U.S. Environmental Protection Agency (USEPA) collaborated to produce two versions of the NHDPlus (V1 and V2) using the Medium-Resolution NHD at 1:100,000 scale, 30-meter elevation data from 3DEP, and WBD. Now the USGS is working on NHDPlus HR, which uses techniques and software from NHDPlus V2 with the NHD High Resolution (1:24,000-scale or better), 10-meter elevation data from 3DEP, and WBD. Many applications have been built upon the previous versions of NHDPlus, which we anticipate will expand with the NHDPlus HR. This presentation will provide an introduction to both NHD and NHDPlus HR.

Exploring Jupyter: Bridging the Gap Between GIS and Data Science
Mark Zito, CDM Smith
Geospatial Analysis can be considered a subset of Data Science. To consider yourself a data scientist, you need to be skilled at programming, data visualization, statistics, machine learning, linear algebra and data wrangling. You also need to know the tools that make all this possible and Python and Jupyter notebooks are leading the pack. Through Esri's ArcGIS API for Python, Jupyter notebooks are now baked into your desktop software package. In this talk, we will cover the basics of using the notebook with your organizations GIS data and even explore some machine learning models that push the boundaries of what you can do in GIS. You may be asking, why Jupyter notebooks? These notebooks allow you to create and share with live code, markdown text, visualizations including maps, statistical models and more. They are all the rage in the data science community and offer a simple way to share and document your code.

Data Management Tool (DMT): How a Web-based Application Helps to Manage and Inventory Multiple Internal, Private and Public Geodatabases, Map Services and Online Items Throughout an Enterprise
Michael Blair, Innovate! Inc.
Innovate developed a custom application, or Data Management Tool (DMT) to improve the quality, consistency, and transparency of US EPA Region 9 geospatial resources. As background, the US EPA Region 9 utilizes a wide range of Esri products in multiple internal, sensitive, and public environments. Maintaining an up to date and accurate inventory of data in enterprise geodatabases, ArcGIS Server services, and ArcGIS Online items is both arduous and complex. Further, a historical focus on project-centric operations tended to silo data by project area or support division, often resulting in data and metadata replication. While EPA Region 9 has deployed previous data management systems, their faults were often in the reliance of manual inventory updates and user input. The DMT application provides a searchable, sortable, user-friendly interface that not only relates all of the content but checks for the existence of and completeness of related documentation, including hosting environment, metadata, unique identifiers, update cycles, and sharing settings. The application serves as a live, single point of entry for all analysts to find resources, and immediately identify their location, accuracy, and relevance. The new DMT leverages the backends of enterprise geodatabases in Microsoft SQL Server, ArcGIS for Server, and the ArcGIS Online API to harvest and relate features in all three Esri products. The system is deployed in each environment and automatically harvests items in the enterprise geodatabases and those related to map service layers, including the metadata for all ArcGIS Online items to identify if any contain rest services.
The Massachusetts Department of Transportation (MassDOT) Highway Division is tasked with collecting crash data and providing timely, accurate vehicular crash information to Federal, State and Local authorities in addition to ensuring the information is publicly available. The data is also critical to supporting Highway's roadway safety management process. In 2018 the Highway Division embarked on an effort to streamline its existing crash data collection, geocoding, review and validation, and reporting processes by designing, developing, and deploying a modern, stable, extensible, scalable, and integrated enterprise system titled Interactive Mapping Portal and Crash Tracking (IMPACT). Deploying a methodology steeped in collaboration, the project has resulted in a suite of process improvements by developing streamlined workflows and integrating new functionality as elicited through a comprehensive requirements elicitation phase coupled with an agile development process. Balancing a desire for commercial off the shelf (COTS) based solutions with unique workflow requirements, IMPACT achieves the goals of replacing the existing system, leveraging Esri’s Roads and Highways, enhancing critical workflows, realizing an updated and integrated data model, and deploying a comprehensive reporting and analytical toolset. This presentation will outline process improvements, system design patterns, management challenges, and ultimate success realized through this important effort.
UAS Lidar and Imagery in the NERRS: Evaluating the Effectiveness of UAS Sensors and Platforms for Multi-Purpose Mapping of Marshes and Beaches in the NERRS Sentinel Site Network

Kirk Waters, NOAA OCM; Sue Bickford, Wells NERR; Jamie Carter*, TBG at NOAA OCM; Nina Garfield, NOAA OCM; Andrea Habeck, Jacques Cousteau NERR; Nate Herold, NOAA OCM; Jared Lewis, San Francisco Bay NERR; Jonathan Pitchford, Grand Bay NERR; Melissa Rosa, TBG at NOAA OCM

There is a near universal need within the National Estuarine Research Reserve System (NERRS) and by other natural resource stakeholders for accurate Digital Elevation Models (DEMs) and habitat maps to support a diversity of applications. Applications include supporting sea level rise research and management and flood forecasts; evaluating the impact of specific vegetation management practices on elevation in marsh micro-environments; assessing beaches after storms for damage assessment and restoration purposes; and identifying high priority invasive and sensitive vegetation. Our intent with this project was to evaluate the effectiveness of unmanned aerial system (UAS) platforms to produce multiple mapping data and products for elevation and vegetation mapping in marshes and dune systems. We sought a UAS solution that could fly multi-spectral and lidar elevation instruments sequentially on the same platform. We contracted UAS data collection to the private sector (Quantum Spatial, Inc., and PrecisionHawk) and conducted the ground truth ourselves (NERRS and NOAA staff). We used multiple NERRS sentinel sites as test beds. Data from multiple high-resolution multi-spectral sensors and lidar elevation were acquired for three NERRS sites: Jacques Cousteau, NJ; Grand Bay, MS; and Rush Ranch in San Francisco Bay, CA. The data were evaluated on their ability to meet specifications, primarily positional accuracy and resolution, and their potential to improve habitat mapping.

Beyond the Drone
Ted Covill, WSP USA

Small Unmanned Aerial Systems (sUAS) aka. Drones have been in use for several years and users have found many uses for data that can be produced using these systems. These applications range from basic imagery for marketing or personal use to more advanced applications such as orthophoto rectification or topographic modeling. This presentation will focus on the photogrammetric application known as Structure for Motion (SfM) and how sUAS imagery can be used to create ground surface model and 3D models of other objects such as tanks, towers and piers.

UAS Management: Integrating Drone Operations in an Enterprise Setting
Nate Ward, Terracon

Managing your Unmanned Aerial System (UAS) fleet, flight crews, authorizations, batteries, and records can be time consuming and tricky. Coordinating drone operations across an organization requires these aspects to be done in a management system. As a case study on choosing a management platform, we will look at the current options on the market and how they can help your organization simplify its UAS management.
### TRACK: NATURAL RESOURCES #1

<table>
<thead>
<tr>
<th>TIME</th>
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<tbody>
<tr>
<td>10:30 AM</td>
<td><strong>Don't Clam Up! Trend Analysis Everyone Can Use...a Shellfish Sanitation Case Study</strong></td>
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<td><em>Melissa Albino Hegeman</em>, Matt Richards – NYSDEC Division of Marine Resources*</td>
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<td>Using ArcGIS Online allows the Shellfish Bureau at NYSDEC to easily keep an eye on all aspects of their operation. Marine Resources has been using ArcGIS to keep track of station locations, shellfish harvest zones and shellfishing closure locations for years. We are now using the analysis tools available through ArcGIS Online to add value: the data is easier to find, easier to understand, and more up to date. The operations dashboard allows staff to look at water quality trends both over time and across space. The ArcGIS Online tools allow all staff to work with the data from any computer without installing any extra software. The new &quot;Shellfish Dashboard&quot; integrates with existing water quality analysis, temperature and salinity readings to show everything in one view. It also allows staff to keep track of the number of sampling runs occurring and where, so they can quickly determine any deficiencies. This visual representation also allows decision makers to better understand shellfish closures in the context of other activities and proposed activities in the nearby area.</td>
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| 11:00 AM   | **Creating Marine Vessel Activity Data Products from AIS**                                    |
|            | *Fontenault Jeremy, RPS; Daniel Martin, NOAA Office for Coastal Management; Jenna Ducharme*, RPS* |
|            | Maritime commerce in our oceans is a critical resource for supporting domestic and international transportation, trade, and recreation. Understanding marine transportation patterns is an important step to ensure safety and commercial viability while avoiding any potential use conflicts with other activities. To this end the U.S. Coast Guard implemented the Nationwide Automatic Identification System program, which leverages the Automatic Identification System (AIS), a global standard for ship communications that mandates certain vessels carry AIS transponders. These transponders broadcast vessel identity, position and other information to track and monitor ship transits. This presentation will discuss the creation of vessel transit counts of commercial cargo, tanker, tug-tow, passenger, fishing, recreation, other, or all vessels from the raw AIS data. These data products were recently updated for years 2013 – 2017 and are being presented on the Northeast Ocean Data Portal, among other data portals. This presentation will highlight tools that have been developed to better understand, and use these complex data. Finally, it will show how this data is being displayed and methods that can be used to understand patterns of marine vessel traffic for ocean use planning initiatives. |

| 11:30 AM   | **How Interactive Online Technologies Advance the Connecticut's Changing Landscape Study Website** |
|            | *Emily H. Wilson, James Hurd, Chet Arnold – University of Connecticut*                        |
|            | The University of Connecticut Center for Land Use Education and Research (CLEAR) has added a new date to the Connecticut's Changing Landscape (CCL) land cover and land cover change study. The study now covers 30 years with 7 dates (1985, 1990, 1995, 2002, 2006, 2010 and 2015) of land cover. CLEAR has a long history of making the results of the study available on the web to all users in a variety of ways. Previous versions of the website used pdfs, static images and ArcIMS to name a few. Today, the information is being shared using the new geospatial technologies. ArcGIS server services are available to users, populate a story map and are consumed by a web app builder viewer with multiple, user-friendly tools. New, slick and interactive data visualizations tools, such as Tableau and Esri Insights, were assessed and are now part of the website. The presentation will show these tools, discuss how they are being used to share land cover and how their dynamic nature improves user experience. [http://clear.uconn.edu/projects/landscape](http://clear.uconn.edu/projects/landscape). |

### TRACK: BIG DATA WORKSHOP

<table>
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<th>TIME</th>
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<tbody>
<tr>
<td>10:30 AM</td>
<td><strong>Leveraging the Power of Big Data to Capture and Visualize High-Volume Vector Data Change with ArcGIS and Amazon's Redshift Database</strong></td>
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<td><em>Brian Hebert, ScribeKey, LLC</em></td>
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<td>Leveraging ArcGIS tools and the high performance computing power of Amazon Web Services Redshift big data cloud database platform, Brian Hebert of ScribeKey, LLC, will demonstrate capturing and visualizing high volume vector data change. Metrics will be captured, presented, and analyzed to describe changes to the full national US TIGER Line street network layer (All Lines - EDGES), between 2013 and 2017, involving comparisons of tens of millions of individual street line features' geometry and attributes. Participants will gain a solid understanding of how big data engines can be leveraged and integrated with ESRI's GIS Desktop applications.</td>
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## TRACK: ENTERPRISE GIS #1

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<th>Time</th>
<th>Session</th>
<th>Presenter(s)</th>
<th>Description</th>
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<tbody>
<tr>
<td>10:30 AM</td>
<td>Diversify Your Toolbox: How to Leverage Your Esri Data Investment with Companion Technologies</td>
<td>Michele Giorgianni, Jessica Chen – Applied Geographics</td>
<td>Ensuring the greatest return on your geospatial data investments may well require your database infrastructure to communicate with a variety of modern mapping and cloud-based platforms. Are you prepared? This session will focus on methods that allow your existing ArcGIS for Server infrastructure or database content to communicate with the broader ecosystem of spatial resources that exist in the market today. You will learn about the communication protocols for transferring spatial data to Google, Carto, and Open platforms. The methods will be presented through a series of use cases that show you how to leverage your Esri managed content on these platforms.</td>
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<tr>
<td>11:00 AM</td>
<td>The Ups and Downs of Upgrading Hardware, Software, and Websites</td>
<td>Dan Goodrich, Connecticut Water Company; Mike Doyle, Hilltop Northeast Enterprises</td>
<td>The Connecticut Water Company aims to be a world-class water utility, which is why our GIS group has been working to elevate our enterprise GIS platform to world-class levels. This means saying goodbye to ArcGIS 10.3 and our Flex based website in favor of ArcGIS Enterprise 10.6 and Portal for web delivery. It also means upgrading our virtualized editing environment from Citrix to a new hardware stack running VMWare VSphere to provide better speeds for editors across all parts of New England. We will review our process, our pain, and our eventual success! We will focus on our preparation for the project and our testing throughout.</td>
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<td>11:30 AM</td>
<td>Dr. Strange Locus, or: How I Learned To Stop Worrying And Love The Common Gateway Interface</td>
<td>Stephen Washburn, GZA GeoEnvironmental; Justin Ivas, GZA GeoEnvironmental</td>
<td>This presentation will cover the automated mapping platform we have developed using python, JS, CGI, and ESRI API that we have dubbed “GZA Automap”. It provides an easy to use front end or “user interface” on our company SharePoint. The platform allows users to interact with the front end on SharePoint to automatically generate project specific maps derived from information stored in our SQL enterprise databases. We have begun with the most commonly used and simplest to automate, the Site Locus Map and the Site Plan. As the platform progresses we hope to add support for the automation of textual reporting, exploration location plans, geotechnical or environmental sub-surface profiles and much more!</td>
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## ESRI SESSIONS

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<tr>
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<tbody>
<tr>
<td>10:30 AM</td>
<td>ArcGIS Pro: Have You Made The Switch?</td>
<td>Krithica Kantharaj, Solutions Engineer, Esri-Boston, State Government Business Development</td>
<td>Are you an ArcMap user preparing to migrate to ArcGIS Pro? There are many things to love about ArcGIS Pro, and this session will help you be productive right away. You will learn essential ArcGIS Pro terminology and get familiar with the ribbon-based user interface. This session will cover key differences in mapping, editing, and geoprocessing workflows, new and streamlined capabilities that will help you complete your GIS work more quickly and easily than ever before.</td>
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<td>11:00 AM</td>
<td>ArcGIS Online Tips and Tricks</td>
<td>Lauri Dafner, Solutions Engineer, Esri-Philadelphia, Local Government Business Development</td>
<td>ArcGIS Online gives you the ability to create interactive web maps and apps that you can share with anyone. With ready-to-use content, apps, and templates, you can be productive right away. From sharing your work with others to preventing accidental deletion of items and more, this session will provide tips and tricks that will help you maximize your use of ArcGIS Online.</td>
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<td>11:30 AM</td>
<td>ArcGIS Enterprise: Architecture and Deployment</td>
<td>Derek Law, Product Manager, Esri-Redlands</td>
<td>This session provides an overview of the product, its components (ArcGIS Web Adaptor, Portal for ArcGIS, ArcGIS Server, and the ArcGIS Data Store), and typical deployment options. It will also discuss the Web GIS pattern and its advantages.</td>
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Implementing an Environmental Compliance Tracking System at MBTA

Dale Abbott, Sam Berg - VHB

VHB is assisting the MBTA Environmental group in the design and implementation of a GIS-based Environmental Compliance Tracking System that can support tracking of various environmental assets on MBTA-owned property. In support of the Environmental Compliance Tracking System, VHB is assisting MBTA in adopting data collections standards, inspection protocols, and documentation of existing workflows, which will be leveraged by the system. VHB and the MBTA are focusing on designing and building out the application for monitoring wells and Activity and Use Limitations (AULs) for disposal sites. The architecture of the Environmental Compliance Tracking System is a highly configured deployment of Esri’s ArcGIS Online web mapping system, using the full suite of ArcGIS Online software (Collector, Workforce, Operations Dashboard). The system includes mobile data collection tools and desktop applications for viewing and editing data. The system will also integrate with MBTA’s LandTracker property management system, which MBTA uses for property management purposes. Implementing an Environmental Compliance Tracking System will allow MBTA to leverage GIS technology to improve the way environmental assets are managed, and develop a robust environmental asset inventory that supports business requirements at multiple levels.

Estimating Percent Impervious Cover from Landsat-based Land Cover: An Evaluation of a Simple and Transferable Regression Model

Jason R. Parent, Qian Lei – University of Connecticut

Percent impervious cover (PIC) is often estimated from moderate-resolution satellite data which is known to overestimate PIC in urban areas and underestimate PIC in rural areas. Regression-based models (e.g. ISAT, ETIS) have been developed to calibrate Landsat-based PIC estimates to improve accuracy. However, it is unknown how these models perform if they are used outside of the geographic area for which the models were developed or if the size of the analysis units (e.g. watershed) affects model performance. Furthermore, these models tend to be applicable only for specific land cover datasets and may require ancillary data such as population estimates. This study evaluated the robustness of a simple regression model, based solely on Landsat-based impervious land cover, to estimate PIC for different geographic areas, land cover datasets, and analysis units. We tested the model for analysis units ranging in size from 2 to 100+ ha for four locations in Connecticut, Massachusetts, and Ohio. The model was developed in southwestern CT and validated in the three other locations. Model RMSE values ranged from 1.5% to 10.0% with the performance improving as the analysis unit size increased. The model had slightly lower performance (0.0 to 2.7% higher RMSE) when applied outside the area in which it was developed. Overall, this study showed that a simple PIC estimation model, based only on Landsat-based land cover datasets, can be effective for a variety of analysis unit sizes and for locations outside of the model calibration regions.

High Resolution Land Cover for the Northeast (and Beyond)

Nate Herold, NOAA Office for Coastal Management; Jamie Carter, The Baldwin Group, Inc. on contract for NOAA’s Office for Coastal Management

Understanding current land cover patterns and past change trends is essential to comprehensive management, assessment, and future planning. For more than two decades, NOAA’s Office for Coastal Management has been producing consistent, accurate land cover and change information for the coastal U.S through its Coastal Change Analysis Program (C-CAP), with the goal of continually updating these maps every 5 years. In recent years, NOAA has been working to establish an operational higher resolution land cover product line, bringing the national C-CAP framework to the local level and allowing for more site specific applications. This work has been possible because of the wealth of available imagery and lidar data, improved software and hardware capabilities, and artificial intelligence classification techniques. This talk will highlight the results of this work in the Northeast, with particular emphasis on products recently released for Massachusetts and Connecticut.

Statewide High-Resolution Land Cover Mapping

Jarlath O’Neill-Dunne, University of Vermont

From statewide orthos to NAIP imagery to LiDAR, we are awash in high-resolution remotely sensed data. While these data can serve as great basemaps, the investment in these data truly pays off when we turn them into information. This presentation will discuss several statewide land cover mapping projects that are currently underway in New England. Participants will gain insight into the tools and techniques used to transform terabytes of high-resolution imagery and LiDAR data into land cover information, along with the challenges of doing so when datasets vary with respect to quality, acquisition date, and specifications. Prepared to be amazed at how far automated feature extraction techniques have come and how this technology can be leveraged to help resource managers make more informed decisions.

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High Resolution Land Cover for the Northeast (and Beyond)

Nate Herold, NOAA Office for Coastal Management; Jamie Carter, The Baldwin Group, Inc. on contract for NOAA’s Office for Coastal Management

Understanding current land cover patterns and past change trends is essential to comprehensive management, assessment, and future planning. For more than two decades, NOAA’s Office for Coastal Management has been producing consistent, accurate land cover and change information for the coastal U.S through its Coastal Change Analysis Program (C-CAP), with the goal of continually updating these maps every 5 years. In recent years, NOAA has been working to establish an operational higher resolution land cover product line, bringing the national C-CAP framework to the local level and allowing for more site specific applications. This work has been possible because of the wealth of available imagery and lidar data, improved software and hardware capabilities, and artificial intelligence classification techniques. This talk will highlight the results of this work in the Northeast, with particular emphasis on products recently released for Massachusetts and Connecticut.

Regression Model

Estimating Percent Impervious Cover from Landsat-based Land Cover: An Evaluation of a Simple and Transferable Regression Model

Jason R. Parent, Qian Lei – University of Connecticut

Percent impervious cover (PIC) is often estimated from moderate-resolution satellite data which is known to overestimate PIC in urban areas and underestimate PIC in rural areas. Regression-based models (e.g. ISAT, ETIS) have been developed to calibrate Landsat-based PIC estimates to improve accuracy. However, it is unknown how these models perform if they are used outside of the geographic area for which the models were developed or if the size of the analysis units (e.g. watershed) affects model performance. Furthermore, these models tend to be applicable only for specific land cover datasets and may require ancillary data such as population estimates. This study evaluated the robustness of a simple regression model, based solely on Landsat-based impervious land cover, to estimate PIC for different geographic areas, land cover datasets, and analysis units. We tested the model for analysis units ranging in size from 2 to 100+ ha for four locations in Connecticut, Massachusetts, and Ohio. The model was developed in southwestern CT and validated in the three other locations. Model RMSE values ranged from 1.5% to 10.0% with the performance improving as the analysis unit size increased. The model had slightly lower performance (0.0 to 2.7% higher RMSE) when applied outside the area in which it was developed. Overall, this study showed that a simple PIC estimation model, based only on the impervious cover classes of Landsat-based land cover datasets, can be effective for a variety of analysis unit sizes and for locations outside of the model calibration areas.
Environmental Monitoring: Collection to Reporting
Andrew Flynn, VELCO
Environmental monitoring and reporting is an essential component of maintaining compliance on construction projects. Vermont Electric Power Company (VELCO) has adopted a streamlined data collection and reporting process using esri’s Collector application and GeoCortex web maps. We will focus on how VELCO incorporates ArcGIS Online, Collector, and GeoCortex to make data acquisition simple, and produce regulatory quality deliverables.

Using ArcGIS Pro and Crowd Sourced Data to Create Habitat Suitability Models for Near Threatened Bird Species
Jesse M. Rubenstein, University of Connecticut’s Center for Land Use Education and Research (CLEAR)
The Golden-winged Warbler (GWWA) is a near-threatened bird species that has been significantly affected by habitat loss, with international decreases of approximately two-thirds since the 1960s. GWWA are important because they are an umbrella species for 38 bird species of conservation concern, as well as endangered mammals, all of which would benefit from the protection of GWWA habitat. To help address this problem, a study using ArcGIS Pro, including new tools, which were previously unavailable in ArcMap, was conducted to create a habitat suitability model (HSM) for GWWA in New York. HSMs are powerful tools commonly used by ornithologists when identifying locations to concentrate conservation efforts for a species. HSM parameters utilized in this study were created from GWWA management reports and peer reviewed literature. Land cover data came from the most recent National Land Cover Database. Important raster and vector tools used for analysis were Focal Statistics, Summarize Within, and Raster Calculator. The model was validated using recent GWWA sightings from Cornell’s eBird Program, which is a citizen science/crowd sourced based program. Hotspot analysis results identified clusters of towns containing habitat that are not currently part of the GWWA conservation focal area, which is a designated zone laid out by organizations and government agencies monitoring the species. These unmonitored regions should be considered for inclusion in the conservation focal area, as they may contain large amounts of unprotected habitat that could benefit the species.

A GIS Centric Modus Operandi for Infrastructure Improvement
Kevin Gildea, Melissa Ennella, Christopher Kobos, William Selders – H2M Architects and Engineers
The components of a public water distribution system are commonly designed with a 100-year lifetime which requires water purveyors to replace approximately one-percent of their system annually to ensure optimal functionality and water quality. However, capital improvements in historically urban areas routinely encounter obstacles that make the projects difficult to execute. To compound the issue, constructed and existing assets are subsurface assets that are only visible for a timeframe of hours throughout their 100-year lifetime. Additionally, the 2017 enactment of the Water Quality Accountability Act (WQAA) in New Jersey requires all water purveyors to have a comprehensive asset management plan and geographic coordinates of all installed valves and fire hydrants based on GPS or other location technology. To solve the multitude of issues that water purveyors are faced with, H2M created a GIS-centric method of managing water distribution construction projects using ArcGIS Online, ArcMap, Survey123, and Collector by ESRI. The mobile technology provides H2M field engineers an interactive map to update on-site as assets are ‘daylighted’, structured field report generation via Survey123, and a file geodatabase with the client’s data schema for the addition of new assets with geographic coordinates to seamlessly enter into the client’s asset management system. The workflow and data schema can be modified to benefit a variety of clients working on infrastructure projects across multiple verticals.

Mining Useful Data from Old and New Sources
Samuel Lingeman, University of New Hampshire Facilities Campus Planning GIS
We are all familiar with the modern data collection techniques of today. LiDAR, Drones, RTK GNSS, GPS, Total Stations, remote sensing, smart phone apps etc. all provide valuable information for the now. But this data will become archived, obsolete at some point. Are you thinking about how someone 10 even 20 years or beyond might be able to use the data for something you haven’t thought of? Are you getting the best available data format for future use? This presentation will examine efforts by the University of New Hampshire Facilities GIS group to find and utilize data from historical or obscure sources for use in our GIS system as well as other facilities uses. We’ll examine some of the data we’ve created from multiple sources such as old drawings, maps and plans, old aerial imagery and historical documentation. We’ll also examine efforts to archive data currently being collected as well as look at standards and deliverable requirements for projects.

Leveraging Collector and Survey123 Together for Effective Field Data Collection
Scott Manley, GIS Analyst, VHB
Did you know you can call a Survey123 (S123) form from within a Collector application? This process of invoking S123 from Collector means you can pre-populate portions of your S123 form, including a further-refined set of domains. Users can take advantage of the map-centric nature of Collector along with the robust, easy-to-use data entry forms available in Survey123. In this presentation, we will walk through the steps of building out a service to be used in a Collector map and then demonstrate how the submitted survey’s results build on other data collection efforts.
## MEETING ROOM: ALABAMA
### MODERATOR: ESTHER OLSON-MURPHY, UNITIL

**1:30 PM**

### Where am I? Floor Plan Application Integrating Multiple Facilities and Human Resource Data

*Michael Blair, Innovate! Inc.*

Innovate! Inc. developed a web-based Floor Plan application tool for US EPA Region 9 that provides access to information about Region 9 people, places, and resources. It displays the current list of all Region 9 employees, including contractors, grantees, volunteers (if any), and other EPA and federal agency staff stationed in R9. It also provides detailed floor plans for each space at EPA R9 Headquarters, other regional offices and place-based individuals. There are many layers that can be turned on that offer details of resources and emergency information for the building. The application was built using Esri JavaScript API and ArcServer and integrates AutoCAD floor plan data. Innovate was honored with a Federal Small Business Specialty (FSBS) Award during the Esri FedGIS Conference. Innovate! was named Esri’s 2018 Innovation Partner for our innovative usage of Esri technology in support of our client's operations (https://www.innovatestore.com/innovate-inc-honored-at-esri-fedgis-conference-as-2018-innovation-partner/).

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**2:00 PM**

### Modeling and Managing Indoor Data in Your GIS

*Stu Rich, PenBay Solutions*

Indoor GIS is gaining a lot of interest due to the great value that can be gained by applying the power of GIS to indoor problems. There are a number of factors that make developing and managing an indoor GIS a bit different than your typical outdoor GIS. We will discuss lessons learned about modeling and managing information about the indoor environment gathered through years of experience. We will compare and contrast some of the more prevalent information models and best practices for getting started with your indoor GIS. You should come away with an appreciation of some of the success factors involved and a basic roadmap for how to get started.

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**2:30 PM**

### Mapping a University, Inside and Out

*Rylee Wrenner, Alexander Okscin – University of Massachusetts Amherst*

Creating geodatabases and visually representing their attributes enables more effective management of campus furnishings and infrastructure. At the University of Massachusetts Amherst, we have used ArcCollector to inventory bike racks, benches, waste bins, and other outdoor assets over the past year. Our ultimate goal was to map all campus spaces. As we transitioned from outdoor to indoor mapping, we switched from ArcOnline to ArcPro, using georeferenced CAD floor plans and 360 photos rather than aerial imagery. Locating indoor assets is not a trivial undertaking, as it requires greater attention to measurement accuracy and a higher level of security than outdoor assets. In our presentation, we will describe our experience using ArcPro and its AutoCAD integration to inventory indoor campus assets and create a Campus Network for pedestrian accessibility. We will discuss our successes and challenges in developing an efficient data collection methodology and assisting campus stakeholders with mapping indoor assets within 12.9 million gross square feet of building space on the flagship campus of Massachusetts.

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### ESRI SESSIONS

**MEETING ROOM: HIGHROCK**

**1:30 PM**

### Insights for ArcGIS: Getting Started with Data Analytics and Visualization

*Krithica Kantharaj, Solutions Engineer, Esri-Boston, State Government Business Development*

Insights for ArcGIS is a web-based, data analytics workbench that focuses on simpler ways to explore spatial and non-spatial data to answer questions and share results. Insights for ArcGIS is designed to make interactive and exploratory analysis fast and intuitive, so you can gain understanding from your data in a spatial context. Capabilities that make Insights more intuitive including visualization first, drag and drop analytics, as well as on-the-fly filtering and aggregations from multiple sources on maps, charts, tables, and more. This session will provide an overview of techniques for data exploration and analysis with Insights for ArcGIS.

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**2:00 PM**

### ArcGIS Online Configuration and Administration

*Tom Schwartzman, Solutions Engineer, Esri-Boston, State Government Business Development*

ArcGIS Online is a collaborative Web GIS deployment that allows you to use, create, and share maps, apps, scenes, layers, and analytics, helping to connect you to your organization and other GIS users around the world. This session will focus on guidance and tips for configuring and administering your ArcGIS Online organization.

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**2:30 PM**

### Enabling WebGIS Workflows with ArcGIS Pro

*Mark Scott, Solutions Engineer, Esri-Boston, Local Government Business Development*

From its original design concept, ArcGIS Pro was designed to facilitate interaction with modern WebGIS Patterns, be they via ArcGIS Online, or ArcGIS Enterprise. See how to use tools like the ArcGIS Solutions Deployment Tool to publish the suite of industry solutions. Learn how editing data hosted on an Enterprise or ArcGIS Online portal is seamless using Pro. Also this session will discuss the various ways that users can share Web Maps, Feature Layers, and more by using ArcGIS Pro.
### TRACK: TOOLS

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>3:30 PM</td>
<td>And Now For Something Completely Different – Python 3 and ArcGIS from Simple to Complex</td>
<td>Ian Sleeper, Stephen Patterson – Terracon Consultants</td>
<td>Python 3 and ArcGIS Pro are here to stay, and with deprecation of ArcMap and Python 2 looming on the horizon, it’s time to make the move. Fear not! Despite the title of our talk, the differences are subtle and only enhance the thrills that Python can bring to your GIS at any level. This presentation will showcase uses of Python 3 with ArcGIS Pro and Portal/ArcGIS Online; starting with simple scripts run within ArcGIS Pro’s Python Window, then with custom geoprocessing tools in a Python toolbox, and culminating with web tools built for ArcGIS Online and Portal using the new ArcGIS API for Python. Presented from the perspectives of both a trained developer (Stephen) and a GIS Analyst (Ian), we will touch on many facets of the Python-GIS ecosystem, such as Conda, ArcPy, custom libraries, and hosted geoprocessing services.</td>
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<tr>
<td>4:00 PM</td>
<td>Python, Pro, and Portal: Deploying Geoprocessing Tools for a Complex Workflow</td>
<td>Jason Wise, Terracon</td>
<td>We needed to deploy geoprocessing tools to multiple offices and automate a workflow involving ArcGIS Pro, ArcGIS Online, ArcGIS Collector, and multiple in-house applications. At the same time, we were weaning ourselves off ArcMap, starting to use ArcGIS Portal, and responding to changes in Pro’s Python management functionality. Learn how we deployed our own conda packages, used the Python API to manage portals, used Python to wrangle challenging Excel files, and streamlined tool installation and configuration for users and developers.</td>
</tr>
<tr>
<td>4:30 PM</td>
<td>ArcGIS Techniques for Obtaining Reliable Measurements in Web Mercator</td>
<td>Eric Herman, NYS Thruway Authority</td>
<td>Over the past several years, the Web Mercator projection has become the de facto standard for global web mapping services. Consequently, it’s also become a standard for many web GIS applications. Although this projection offers a number of benefits, users should be aware of the significant measurement distortions in that can arise when using this projection. Earlier iterations of Esri’s web application development tools required explicitly dealing with measurement corrections. However, the current out-of-the-box application development tools go a long way to helping ensure end users get more reliable measurements. This presentation will review the issue, and how the Thruway Authority’s use of the evolving Esri tools has helped deal with it.</td>
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### TRACK: NATURAL RESOURCES #2

<table>
<thead>
<tr>
<th>Time</th>
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<tr>
<td>3:30 PM</td>
<td>Spatial Prioritization of Headwater Parcels for Enhanced Flood Resilience</td>
<td>Pam DeAndrea, Senior GIS Planner, Central Vermont RPC</td>
<td>In 2011, Central Vermont experienced significant flood damage from storms including but not limited to Tropical Storm Irene. These storms have prompted Vermont and its communities to become more flood resilient to protect buildings, infrastructure, and the environment. The project team (Central Vermont Regional Planning Commission (CVRPC), the Friends of the Winooski River (FWR), and the Winooski Community Partnership) secured funding through the High Meadows Fund for an outreach and demonstration project aimed at forested landowners in the Winooski River headwaters communities of Cabot, Marshfield and Plainfield, Vermont. The goal for this project (“Water Wise Woodlands”) is to work with landowners, forest industry representatives, municipal groups, and interested community members to demonstrate how upland forest conservation and management can be a tool for downstream flood resilience and water quality protection. In order to reach the forested landowners that would be best to include in the outreach from a flood resilience perspective, the CVRPC conducted a GIS analysis and prioritization based on several factors that would increase runoff from a forested parcel. The Water Wise Woodland project team will be promoting attendance to workshops and demonstration projects specifically to these targeted landowners. The spatial analysis was an integral tool for this study to use science based information in outreach to landowners who could become model stewards for upland forest management for both water quality improvement and flood resilience.</td>
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<td>4:00 PM</td>
<td>Markup Application for Hydrography Datasets</td>
<td>Tatyana Dimascio, USGS</td>
<td>The U.S. Geological Survey has created a new web application, called Markup App, as a user-friendly communication tool for the public and partners to submit suggested corrections to the national datasets. The first phase of the Markup application is focused on the refinements for the hydrography datasets: National Hydrography Dataset (NHD), a National Hydrography Dataset Plus High Resolution (NHDPlus HR), and the Watershed Boundaries Dataset (WBD). This presentation will introduce the new application and discuss its role in the workflow for editing national hydrography features.</td>
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Change Detection in Coastal Geomorphology using LiDAR Data
Patrick Cunningham, Blue Marble Geographics

Technology improvements over recent years have seen the cost of LiDAR data acquisition decrease and consequently the coverage and availability expand dramatically. As a consequence, point cloud data is increasingly used as the raw material for precise measurement and visualization of change over time. Nowhere is this process more evident than in coastal areas where shifting patterns of erosion and deposition can have devastating effects on shoreline communities. In this presentation, we will examine an area on the coast of the state of Maine that has been subject to significant beach erosion. Using point cloud data collected over a five-year time period, we will explore the procedure whereby the raw data can be edited, filtered, reclassified, and gridded to create a time series of precise bare-earth models. These DTM files form the basis of the subsequent terrain analysis procedures, which can be conducted using a number of different tools, including ArcGIS 3D Analyst and Global Mapper. In the final step of this workflow, we will calculate the volume difference between two surface models representing the beginning and end of the time series and visually represent these differences to show areas of significant erosion or deposition. This difference model can ultimately be rendered as a 3D display in ArcScene.

New York State Parcel Map Program: Past, Present and Future
Katherine Kiyantisa, NYS Office of Information Technology Services GIS Program Office
The NYS GIS Program Office has a program to develop and share a statewide GIS tax parcel file. The objective is to assemble a single layer of tax parcel polygons with a standardized and robust set of assessment roll attributes that can be shared among all state agencies, other government entities, and the public. The presentation includes a brief history of the program; benefits of the use of the data; challenges in broadening public access to the data; and the future direction of the program.

Out of Many, One: Vermont’s Statewide Parcel Mapping Project
Tim Terway, VCGI
Parcel data in Vermont comes in over 200 flavors that vary widely in completeness, content, and age. Led by the Vermont Center for Geographic Information and Agency of Transportation (VTrans) with support from eight other state agencies and the Federal Highway Administration, the State of Vermont has undertaken the creation of a statewide parcels layer for Vermont’s 255 municipalities. This presentation will share experience of the project’s productive multi-agency collaboration, as well as challenges that need to be overcome in a small, rural New England state to ensure a successful, standardized parcel dataset.

Census Business Builder: Mapping Business and Demographic Data for Economic Development
Ana Maria Garcia, U.S. Census Bureau
Learn how to access, map, and analyze data from the U.S. Census Bureau about businesses and consumers in your area for economic development analysis. During this workshop you will access business, demographic, economic, and housing data utilizing the Census Business Builder which is an online data mapping application.

ArcGIS Hub: Bringing it all together
Pam Brangan, Melanie Needle, Chris Dubin - Chittenden County Regional Planning Commission
GIS is integral to much of what we do at CCRPC, whether it is maps, data development, or analysis. Using ArcGIS Hub we will highlight our work and offer one-stop shopping of our data and online maps as well as develop Initiative pages for specific projects. This presentation will cover the design and development of CCRPC’s Hub, how we will integrate it within our existing website as well as how we plan to utilize Initiative Pages to engage our partners.

Implementing an ArcGIS Hub: Tips and Tricks and Lessons Learned
Nicholas Floersch, Katie Budreski, David Healy – Stone Environmental, Inc.
The ArcGIS Hub is a new data-driven approach to frame a community’s open data, and engage with that community, and its constituents, around specific community initiatives and goals. Stone is working with a Vermont community to develop an ArcGIS Hub solution within their ArcGIS Online environment. We will share our approach to gaining interest from non-GIS audiences, defining a framework for outlining initiative content, collecting and centralizing a community’s data, developing stories around the community’s data, and using the contextualized data to engage the community towards its initiatives. We will also discuss strategies for ongoing maintenance.
4:30 PM
The 4th Industrial Revolution and the Role of the Geospatial Professional
James Gaynor, Terracon

Many organizations across a wide spectrum of industries seek to radically transform the way information is collected, analyzed, and communicated throughout all levels of their organization. Geospatial professionals have a unique opportunity to facilitate this digital transformation by demonstrating practical data integration workflows and implementing spatial technologies to help solve specific business challenges. This presentation will show how a location-first approach is helping to shape the conversation of digital transformation within a large multi-disciplinary engineering consulting firm in the AEC industry. Using examples of successful and unsuccessful initiatives, we will highlight some of the challenges in digital transformation and where geospatial professionals have the greatest opportunity for professional growth and the facilitation of organizational change.

ESRI SESSIONS

MEETING ROOM: HIGHROCK

3:30 PM
ArcGIS Enterprise Roles: Real-Time, Imagery, & GeoAnalytics
Tom Schwartzman, Solutions Engineer, Esri-Boston, State Government Business Development

ArcGIS Enterprise offers several licensing roles for its ArcGIS Server component. These licensing roles provide a range of powerful functions to the ArcGIS platform as deployed in your own infrastructure. Each licensing role has different capabilities and system requirements. In this session we will discuss the different roles and how they can increase the power of your ArcGIS Enterprise.

4:00 PM
Web AppBuilder: No Code Required
Tom Schwartzman, Solutions Engineer, Esri-Boston, State Government Business Development

Web AppBuilder for ArcGIS is an intuitive what-you-see-is-what-you-get (WYSIWYG) application that allows you to build 2D and 3D web apps without writing a single line of code. It includes powerful tools to configure fully featured HTML apps. As you add your map and tools, you can see them in the app, and use them right away. Come to this session to learn how to get started with this easy-to-use, powerful tool.

4:30 PM
GeoAI: Machine Learning Meets ArcGIS
Mark Scott, Solutions Engineer, Esri-Boston, Local Government Business Development

This session will serve as an introduction as to how Esri is developing tools to use machine learning with ArcGIS. Predictive tools, analytic workflows, and capture workflows can facilitate the ability of ArcGIS to perform tasks such as accident probability prediction, using Spatial Statistics. Learn how ArcGIS supports integration with open frameworks to solve spatial problems.

**SEE NEXT PAGE FOR WEDNESDAY ESRI DAY GRID & ABSTRACTS**
### Wednesday ESRI Day

**Concurrent Sessions • 8:30 AM - 11:30 AM**

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<th>HIGHROCK</th>
<th>ALABAMA</th>
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<td><strong>ArcGIS Pro: An Introductory Workshop for ArcMap Users</strong></td>
<td><strong>ArcGIS Field Mobility Apps: An Overview</strong></td>
<td><strong>ArcGIS Online/Web App Sessions - another chance to hear top Esri sessions from the week!</strong></td>
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#### ArcGIS Pro: An Introductory Workshop for ArcMap Users

**Krithica Kantharaj, Solutions Engineer, Esri-Boston, State Government Business Development**

**Meeting Room:** SARATOGA 1&2

ArcGIS Pro is a project-based desktop GIS for the GIS Professional. With it, you can build projects from your maps, data, analytical models, as well as collaborate with others in your organization and share your work with everyone on the web. In this workshop, you will learn the essential concepts you need to jumpstart your productivity with ArcGIS Pro and tackle essential workflows such as editing, querying, basic analysis, and sharing. Limited seating is available to participate in this workshop with your own laptop (pre-register for Hands-On, Bring your own Device). You will need to download and install ArcGIS Pro on your laptop prior to the workshop. Please refer to the ArcGIS Pro system requirements before installing ArcGIS Pro on your Laptop. If you are an existing ArcGIS user current on maintenance, download ArcGIS Pro from your MyEsri Portal. If you are a new ArcGIS user, you can download a free trial version by signing up here. Follow the instruction in this link to complete the install. Additional seating will be available for those who wish to participate as an audience member (not hands-on)!

#### ArcGIS Field Mobility Apps: An Overview

**Derek Law, Product Manager, Esri-Redlands**

**Meeting Room:** HIGHROCK

This session provides an overview of the ArcGIS Field Apps which includes: Workforce for ArcGIS, Navigator for ArcGIS, Collector for ArcGIS, Survey123 for ArcGIS, and Explorer for ArcGIS. It will also present the general field apps workflow and how these apps can be deployed in a unified workflow.

#### ArcGIS Online/Web App Sessions - another chance to hear top Esri sessions from the week!

**Meeting Room:** ALABAMA

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<td>ArcGIS Online Tips, Tricks, and New Features (see description, page 13)</td>
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<tr>
<td>9:15 AM - 10:00 AM</td>
<td>Configuring and Deploying Operations Dashboards (see description, page 16)</td>
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<tr>
<td>10:00 AM - 10:45 AM</td>
<td>ArcGIS Online Configuration and Administration (see description, page 25)</td>
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<tr>
<td>10:45 AM - 11:30 AM</td>
<td>Web AppBuilder: No Code Required (see description, page 28)</td>
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Joining GIS Datasets to Help Protect NY from Aquatic Invasive Species
John Marino, NY Natural Heritage Program
In the world of invasive species, early detection is crucial – for instance, finding a water-chestnut infestation at a lake when the infestation is only a few plants and manageable by hand-pulling not only saves time and resources, but also helps preserve New York’s biodiversity by preventing the infestation from growing to the point of being unmanageable. This year, NYNHP has conducted a pilot GIS analysis using data from two different datasets to help guide on-the-water survey work by staff and volunteers at organizations across New York next summer. The pilot project focused on 14 key aquatic invasive species. The Watercraft Inspection Program Application (WISPA) data contains: (1) the waterbody from which a watercraft was retrieved, (2) which invasive species were observed on the watercraft (if any). The statewide iMapInvasives platform contains data about the spatial distribution of invasive species. Analyzing these data in a geospatial environment allows us to compare waterbodies in which watercraft are exiting with certain aquatic invasive species attached, but no known records of the same species exist in the waterbody. These waterbodies could thus be considered “suspicious” in their possibility of containing an infestation of the invasive species and should possibly be further examined for presence. The results of this analysis will be made available to the NY’s eight Partnerships for Regional Invasive Species Management (PRISMs) for their use in planning 2019 field work.

Mapping an Invasive Species (Lythrum salicaria) and Its Biological Control in Northern NY
Jessica Rogers*, Matthew King, Robert Luckman, Randy Monica Jr., Nolan Rishe – SUNY Potsdam
Purple loosestrife (Lythrum salicaria) is an invasive species in North America. Though it has been in the US for over a century, its invasiveness has increased in the last 50 years, particularly in Northern NY. In July 2017, I began a project to map the invasion of purple loosestrife (Lythrum salicaria) in the North Country. Four student interns who worked on this project as. We had several goals – to document the invasion, to examine the best methods for managing the invasion, and to understand if it might be possible to release a biological control agent. Because biological controls, a beetle in this case, require large infestations to establish their own breeding colony, we needed to map the size of invasions. We spent 4 weeks (mid-July to mid-August) gathering data on locations and coexisting invasive species. The NY DEC agreed to catch and allow us to release a biological control, a beetle known to eat almost solely loosestrife, at the Upper and Lower Lakes Wildlife Management Area (one of the largest infestations). In June 2018, we went out to the largest infestations from 2017 to see if there were existing populations of beetles eating the loosestrife. The beetles arrived and were released in July 2018. We were able to repeat the mapping work in the summer of 2018, and document changes and add layers of known beetle herbivory and sightings. Ultimately, we hope to advocate for management of this species after spatially demonstrating need.

GIS Analysis of Search and Rescue Incidents in the Adirondack Park from 2015 and 2016
Ethan Collins ’18, Environmental Studies; Peter Pettengil, Environmental Studies; Carol Cady*, GIS Program – St. Lawrence University
The Adirondack State Park is an extensive park within New York State that is utilized for a range of recreational activities including, but not limited to, hiking, paddling, hunting, fishing, climbing, and skiing. Numerous opportunities for outdoor activities also creates the potential for parties to become overwhelmed due to injury or illness and require a search and rescue (SAR). Reports of SAR incidents from 2015 and 2016 within the Adirondack Park were obtained and analyzed. There were 528 SAR operations involving 639 victims with 350 searches (54.86%), 268 rescues (42.01%), 18 recoveries (2.82%), and one prison escape involving 2 fugitives (0.31%). Geospatial analysis of the data was conducted to determine areas of high SAR occurrence and seasonal locations of SAR incidents. A model was constructed to analyze SAR incidents involving lost individuals in order to determine the average distance travelled from requesting a SAR to their found location. Finally, weighted raster analysis was utilized to determine areas in the ADK that are the most isolated from rescuers and medical care. Recent concerns have been voiced as the number of SAR incidents continue to grow with stagnant or decreasing numbers of responding personnel. Through geospatial analysis of SAR incidents, future management methods can be tailored to reduce the number of SAR incidents, improve victim outcomes, and reduce rescuer hazard.

Connecticut Statewide (1 Foot) Impervious Surface to Support Stormwater Mapping
Emily H. Wilson, Cary Chadwick, David Dickson – University of Connecticut
The MS4 (Separated Storm Sewer System) General Permit is a regulation issued by the State of Connecticut that applies to 121 of Connecticut’s 169 municipalities. In Connecticut, towns are required to focus their efforts on three priority areas, one of which is areas of high impervious cover (basins greater than 11% directly connected impervious). Percent impervious area within each small watershed identifies the areas of town that should be the focus of stormwater management activities. The impervious surface area was determined from statewide, 1 foot impervious surface data. The thematic raster layer includes three classes: building, roads and other impervious and is available on CT ECO, a website that makes Connecticut’s geospatial information available. It is available for raster and vector download as well as a map service. http://cteco.uconn.edu/projects/ms4. The impervious surface data have been used by Esri and the state of Connecticut for related products that have already saved the state hundreds of thousands of dollars proving, once again, that investing in base data lays the foundation for all sorts of further data development. Making the layers accessible means that EVERYONE can benefit, sometimes in very unexpected ways.
Planning Trails for People and Wildlife  
*Rachel Stevens, Great Bay NERR; James Oehler, NH Fish and Game; Catherine Callahan*, NH Fish and Game* 
Funded by the U.S. Fish and Wildlife Service, the New Hampshire Fish and Game Department developed a statewide model that can be used to assess existing recreational trails and site new trails in the most wildlife-friendly way. The results highlight areas particularly important for wildlife and areas that would be more suitable for trail development. Accompanying documents will explain how to use the tool, and provide some real-world examples of how conservation organizations have used it to make their trail planning efforts most effective. Guided by findings in a literature review, and using the most relevant scientific research for New Hampshire, this model is based on the following principals: Keep unfragmented trail-free areas as large as possible; Avoid small patches of high quality or special habitats; Avoid riparian areas, permanent features in the landscape that serve as important wildlife corridors; Avoid locations of rare wildlife. https://wildlife.state.nh.us/trails/index.html

Statewide Imagery (3 Inch) and Elevation – a First for Connecticut  
*Emily H. Wilson, Cary Chadwick – University of Connecticut* 
In 2016, the state of Connecticut flew, for the first time, 3 inch statewide aerial imagery and statewide Quality Level 2 Lidar. The flight was a cooperative effort that increased efficiency and reduced redundancy ultimately saving the state money. The project was managed by Capitol Region Council of Governments (CRCOG) on behalf of the state’s councils of governments. It was 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 data are available on CT ECO, a website that provides access to Connecticut’s natural resource GIS information including aerial imagery and elevation. The aerials are available in the Aerial Imagery Viewer which uses Esri’s Web App Builder to provide access to 18 imagery datasets (and growing). The Lidar is available in the Elevation Viewer as a digital elevation model which uses Esri’s Web App Builder to provide access to statewide contours and elevation layers including hillshade, shaded relief, slope and aspect. All of the layers are also available as image services and for download. CT ECO is a partnership between the University of Connecticut and Department of Energy and Environmental Protection. http://cteco.uconn.edu/dataflight2016/

Tech Savvy Teens + Local Conservation Leaders + Mobile Mapping = Environmental Action  
*Cary Chadwick*, David Dickson, Chester Arnold, Laura Cisneros, John Volin, Todd Campbell, David Moss, Laura Rodriguez, Jesse Rubenstein, Emily Wilson – University of Connecticut  
A team of educators from the University of Connecticut obtained National Science Foundation (NSF) funding to create the Conservation Training Partnerships (CTP) program, a new branch of the University’s Natural Resources Conservation Academy (NRCA). The CTP is an innovative program in conservation and land use planning that engages intergenerational learners - high school students and adult conservation volunteers - in informal geospatial STEM learning. A two-day, immersive workshop focuses on intergenerational teamwork and learning and employs geospatial technologies to teach practical approaches to conservation stewardship. The workshops introduce free smartphone apps (Track Kit, Epicollect) for collecting field data including GPS data and digital field surveys. Participants are also taught how to showcase their data on interactive web maps and story maps. The teams then go on to complete a conservation project together in their community. Both the projects and participants benefit from intergenerational partnerships because of the different approaches to learning and varied skill sets each age group contributes. This poster describes the methods used in the program to bridge these two groups of learners to produce effective, efficient conservation and education outcomes.

The USGS National Geospatial Program: Current Activities and Highlights  
*Craig Neidig, Doug Freehafer, Dan Walters, Lin Neifert, Scott Hoffman, Pete Steeves – USGS*  
Presenter: Doug Freehafer, USGS  
The poster will provide an overview of several major current activities of the the U.S. Geological Survey (USGS) National Geospatial Program (NGP) including the 3D Elevation Program (3DEP) and the 3D Nation survey effort, Hazards programs, mapping products such as the USTOPO, the National Map, and highlight various projects of interest ongoing in the NEARC region.

Whither Industrial Land? Examining the Intersection Between Industrial Land Decline and Urban Policy in New York City  
*Jenna Davis, University of Massachusetts-Amherst*  
As planners face increasing pressure to rezone industrial land to more lucrative residential and commercial uses, policymakers have called attention to the declining stock of industrial land in urban centers. In response, cities have adopted industrial land preservation policies that aim to mitigate the decline of industrial land. However, the decision to convert or preserve industrial land carries considerable tradeoffs. While industrial land preservation advocates argue that industrial land provides space for critical urban service infrastructure and houses businesses that offer middle-class jobs for workers with minimal formal educational credentials, industrial land can provide space for residential development in tight housing markets and contribute more to the tax base. This presentation will use GIS to explore the scope of industrial land decline in NYC from the early 2000s to the present, examining which neighborhoods have faced the steepest decline in industrial land. In addition, this poster presentation will examine the extent to which existing economic development policies have supported industrial uses on the city’s remaining stock of industrial land. In particular, this presentation will examine the extent to which businesses that are located on industrial land and have received economic development incentives from the NYC Economic Development Corporation are industrial versus non-industrial companies. As planners take stock of industrial land in their own communities, this presentation will examine what factors might be driving the conversion of industrial land to other uses and the extent to which existing urban policies encourage the preservation or conversion of industrial land.
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Kathryn Brewer
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The Annual NEARC Business Meeting will be held on Monday, October 29 from 3:15 p.m. - 4:15 p.m. in the Saratoga Ballroom. The agenda for the meeting is below. Everyone is strongly encouraged to attend and help us chart the course for future NEARC events and activities! Come discover what NEARC can do for you, and how you can get more involved and connected with fellow GIS professionals. And if that isn’t enticement enough, all attendees will get a complimentary drink ticket to use at the Vendor Reception & Poster Social. Please note: Nominations for two open Board seats (each serving a three-year term) will be solicited during this meeting. Please fill out the NEARC board election ballot and return to the conference registration desk by 4:45 p.m. on Tuesday, October 30. Winners will be announced at the Awards Dinner. Thank you! Every vote counts!

AGENDA

• Welcome and Introductions

• Reading of the Minutes of the Business Meeting from November 6, 2017

• Treasurer’s Report

• Nominations for 2 open NEARC board seats

• Report out on:
  • 2018 Spring NEARC
  • Esri UC NEARC meetup
  • Scholarships

• GIS Educators Day

• Conference Program - Paper vs. App

• 2019 Conferences

• Other Business
2018 NEARC TREASURER’S REPORT
AS OF JULY 31, 2018

Starting Balance August 1, 2017

Beginning Balance $84,467.52

Income

Fall NEARC 2017 (Vendors & Sponsors) $18,603.68
Fall NEARC 2017 & Ed Day (Users) $96,939.76
Fall NEARC 2017 (Other Income) $6,000.00
Spring NEARC 2018 (Vendors & Sponsors) $4,405.99
Spring NEARC 2018 (Users) $12,158.87
Fall NEARC 2018 NEURISA $500.00

Total Income $138,608.83

Expenses

Spring NEARC 2018 $7,424.10
Operational Expenses $3,358.71
Fall 2017 Conference & Ed Day $115,698.41
Event Management $27,998.82
Website, Reimb. Expenses, Misc. $1,771.67
Fall 2018 $1,068.03

Total Expenses $157,319.74

Ending Balance 7/31/2018 $65,756.61

Note: Some of the Fall 2017 income came in prior to August 1, 2017. Newport was one of the more expensive locations for NEARC due to the hotel costs.

Note: Some Spring 2018 expenses came after July 31, 2018. Spring NEARC usually comes close breaking even. This year it was up $2,803.92

Submitted by Jeff Amero, NEARC Treasurer 2017-2018
NEARC BUSINESS MEETING MINUTES
NOVEMBER 6, 2017 | NEWPORT, RI

Board Members Present:
Jeff Amero  Brett Horr  Emily Wilson
Pam Brangan  Esther Olson-Murphy  Stephanie Headman
Leslie Pelch

Meeting began at 3:18pm

Welcome and Introductions
Pam Brangan welcomed all attendees, thanked the host committee, vendors and sponsors. NEARC Board introductions. Pam explained that by being at the conference, you are part of NEARC.

Reading of the Minutes of the Business Meeting from October 17, 2016
Motion - Angelo Marino made a motion to wave the reading of minutes. Stu Rich seconded the motion. Darren Mackiewicz amended the motion that the reading of the minutes be waved and accepted.

Treasurers Report
Jeff Amero gave a quick overview of the Treasurer’s Report. He stated that it is hard to separate fall and spring monies, but overall NEARC was pretty much even this year. Spring NEARC was a small loss due to lower attendance.
Motion - Stu Rich moved to accept the Treasurers Report as written in the program. Darren Mackiewicz seconded the motion. All in favor. Motion passed.

Nominations for 2 Open NEARC Board Seats
Pam explained the responsibilities of a board member including having a passion for GIS and an interest in the community. There are two conferences per year and it is a 3 year term.
Heidi Blank nominated Mike Doyle. Angelo Marino seconded the nomination. Mike accepted the nomination.
Nate Ward nominated Jason Wise. Stu Rich seconded the nomination. Jason accepted the nomination.
Dan Bradley nominated Emily Wilson. Larry Spraker seconded the nomination. Emily accepted the nomination.
Kristin Ponack nominated Brittany Hoffnagle. Jim Touchet seconded the nomination. Brittany accepted the nomination.
Motion - Larry Spraker moved to close nominations. Stu Rich seconded the motion.
Each nominee stated why they are qualified and interested in being on the NEARC Board of Directors. Pam explained that the voting is open and asked people to vote for two nominees at registration desk by 4:00pm on Tuesday. Each nominee will post a write-up by the ballot box.

Review of GIS Educators Day
Lyn Malone gave an overview of GIS Educators day and said it was the classic example of “it takes a village.” She said that she received support from the Board, had help getting computers there, that the host committee was great, that Esri provided books and sent Joe Kerski as keynote and that DMEM was extraordinary. The day was decidedly a success although there was good news and bad news. The good news is that the turnout was good (even someone from Virginia!), the presentations were tremendous, and the hands on activities were excellent. The bad news is that K-12 educator’s numbers are declining. How do we get more people to attend? Attendance could be declining due to professional development in schools or other factors. She is thinking of ways to increase attendance and possibly modify the format.

Spring NEARC THANK YOU
HUGE thank you to the host committee members of spring NEARC. They worked for years to put on a tremendous conference year after year after year. Special thanks to Andy Anderson, Niels la Cour, Tim LeDoux, Mike Olkin, Carsten Braun, Jon Caris, Forrest Bowlick, Jane Garb, Scott Gilman.
Pam and Niels gave a brief history of Spring NEARC. It started in the late 80s and then there was long absence after which the Rhode Island folks kick started it again at UConn Avery Point campus. It quickly grew and moved to Smith College where it grew some more and was then moved to UMass Amherst.
Future Spring NEARC Conferences
After spring NEARC this year, the survey was sent to all of NEARC, not just attendees. The survey revealed overall high marks from those who attended. It also asked why people didn’t come - was it the date, the distance, etc.? One question asked if those that didn’t attend would be more likely to attend if it was at a different location. 43% stated that they would be more likely to come if it moved locations while 15% didn’t want to see the conference move.
The Board had been doing some research and looking into educational institutions that could host our group. The Board considered where attendees are coming from, presence of institutional event coordinators, parking, amenities, cost and likelihood of forming a host committee. Pam announced that spring NEARC 2018 will be University of Connecticut in Storrs, CT on Tuesday, May 8. Emily Wilson will be organizing a host committee and needs helpers.
Spring NEARC will not be at UConn indefinitely and the Board is working towards a Spring NEARC rotation. Ideally the conference in 2019 will be in southern New Hampshire and back in Massachusetts in 2020. The rotation spreads out the work load and also the distance that some attendees have to travel every year.
Niels la Cour thanked the NEARC Board for being involved the past few years and stated that it had been really helpful.

Fall NEARC 2018, October 27-31 in Saratoga, NY
Larry Spraker will be host chair and is looking for volunteers. Larry stated that Saratoga is a great place and NEARC had a wonderful time there in 2011 and 1996. There is a nice convention center right next to the City Center and its lots of fun. Bring your costume!

Other Business
• Survey. Please fill it out! The Board relies heavily on the responses and comments.
• Vendor location. This year the vendors were in new locations along the main hallways. Another thank you to vendors for coming – couldn’t do the conference without you/ them.
• New Website launched this year. Let any Board member know of any comments or suggestions.
• Scholarships. NEARC offers scholarships for students and professionals. This year 15 scholarships were awarded totaling about $3400. Brett Horr has drafted some scholarship guidelines to improve the process.
• NEARC Archives. When Jeff Amero became treasurer, Angelo gave him a tote containing the history of NEARC in bills. Jeff has been scanning all of these records along with documents about NEARC’s non-profit status, history and incorporation paperwork. There are some missing pieces including the fun parts, pictures and other history. He requested that anyone send other materials that they have. He especially needs Educator Day records.
• Esri User Conference Party. The Board authorized expenditure to have a social in San Diego at the Esri User Conference. Over 50 people attended. NEARC provided some drinks and food. It was a good time with good conversations. Two thumbs up!
• Thank you. Thank you to sponsors, vendors, host committee, and everyone for coming to the conference.

Motion - Angelo Marino moved to adjourn. Pete Steeves seconded. Motion passed.

Meeting adjourned at 4:19pm
Minutes Respectfully submitted by Emily Wilson, Secretary
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