



## **NEURISA Day 2016**

### **Annual Conference**

### **November 14, 2016**

### **Great Wolf Lodge, Fitchburg, MA**

### **Welcome!**

The NEURISA Board of Directors would like to welcome Everyone to NEURISA Day 2016! This year we have a very exciting agenda planned, with esteemed speakers and a broad range of Geographic Information System topics that we hope you all enjoy. NEURISA would like to give special thanks to our annual sponsors whose logos can be found on this program. Without their support NEURISA Day wouldn't be possible. We would also like to thank all of the exhibitors that have registered for the conference. Exhibitor logos can be found on the NEURISA Day Agenda (We have plenty of space for additional vendors this year, please visit <http://www.neurisa.org/>). Lastly, thank you to our Keynote and all of our Speakers, who make this conference great. This year NEURISA Day will be held at a new venue and in a new location. We are very excited to have the Great Wolf Lodge in Fitchburg hosting our event. The Great Wolf Lodge is a very family friendly venue, where your kids can spend the day at the waterpark while you attend the conference! We thank you for your support and we look forward to seeing you at the conference in November!

### **Introducing our Presenters & Presentations:**

#### **Keynote Address “Transforming the Future with Geospatial Applications and Information Systems”**

This talk is designed to inspire the audience around a central theme – transforming the future with geospatial applications and information systems. In order to transform the future using technology it sometimes becomes necessary to geospatially reshape the questions being asked by planners and decision makers across municipalities, regions, and states. This presentation will provide examples from around the world that illuminate this notion of “transformation” by reshaping the questions and finding the fit. Examples will include a natural solutions toolkit that is providing a geospatial platform to inform decision makers, a regional framework for resilience in New England where a geospatial app is helping to build partnerships around nature-based solutions to hazards and climate change, and the integration of technology into urban landscapes via model builder and story maps from Bridgeport to Rio de Janeiro. The underlining message of this presentation is centered on the fact that our collective technology is increasingly captivating but it absolutely has to be useful and useable at the community level to truly transform. A further example of how geospatial tools are being integrated at the community scale with Community Resilience Building workshops across over 35 communities via a collaborative and comprehensive engagement will also be provided.



**Keynote, Adam W. Whelchel, PhD**  
**Director of Science, The Nature Conservancy, CT**

Dr. Adam Whelchel's twenty-six year career in leadership positions has catalyzed partnerships with strategic direction while with government agencies, private firms, academic institutions, and non-profits in the United States, China, Southeast Asia, Europe, Caribbean, and Africa. Adam Whelchel is an author, facilitator and dynamic communicator called upon to assist diverse groups from around the world with team building, strategic planning, and community resilience. Recent accomplishments include serving as key facilitator for the Puerto Rico Climate Action Plan, lead author for the U.S. National Climate Assessment, and architect of Community Resilience Building.

## **Advances in UAS Applications**

Advances in Unmanned Aerial Systems (UAS) have made it possible to easily map small areas, examine bridges and produce mapping grade imagery and 3D point clouds in a matter of hours. This presentation will discuss recent changes by the FAA regarding UAS regulations and examine dozens of different case studies in which they have been used.



**Tayler Engel**  
**Drone Pilot, University of Vermont Spatial Analysis Lab**

Tayler Engel is a research specialist at the University of Vermont Spatial Analysis Laboratory, where he focuses on geospatial technologies, remote sensing, LiDAR processing and Unmanned Aircraft Systems (UAS). He has been the lead pilot for the UAS Team at the University of Vermont for 2 years. He has used geospatial technology and UAS to conduct research on tree canopy, transportation networks, agriculture, and disaster response. Tayler has a diverse background working as a GIS technician mapping land cover for over 15 counties, as a Wildlife Biologist studying the impacts of wind turbines on wildlife, and in the utility industry mapping high voltage power line right of ways using LiDAR data.

## **AGOL and High School Science**

In this presentation one of my students and I will demonstrate ways that the online version of GIS is being used to teach Earth Science, Biology, Environmental Science and Forensics, including the use of story maps to demonstrate knowledge of earthquakes and volcanoes.



**Peter Stetson**  
**Science Teacher, Coventry Public Schools**

Peter Stetson has been teaching for 35 years. In 2003, he attended the NEARC conference in Newport RI and began working with GIS. Mr. Stetson first incorporated the use of handheld GPS units into a community mapping project through his school, progressing data onto storm drain mapping for the town, streetlight analysis and cell phone coverage maps of the school grounds. In 2009, Mr. Stetson was accepted into a Teachers Teaching Teachers GIS [T3G] program at the ESRI Head Quarters in Redlands, Ca. In 2012 Mr. Stetson was accepted into a remote sensing and GIS program – iGETT-RS. Since Mr. Stetson's school has gone to chrome books for all students Mr. Stetson has had to abandon the desktop version and begin with the online version. The school has an organizational account but Mr. Stetson uses the public accounts and a group organization with his Biology, Earth and Environmental science classes as well as an after school environmental club – Envirothon. Mr. Stetson has done crime mapping in a Forensics class and over the last several years has conducted several workshops for a variety of community and environmental organizations. Mr. Stetson even ran a workshop at the Newport Navy base for prospective naval cadets.

## **Building a New Federated Geodata Portal in VT**

The State of Vermont is in the process of developing a new GIS data portal (VT Open Geodata Portal) which "federates" across multiple agencies and organizations inside and outside State government. This federated approach has required a high level of collaboration between these organizations, and a delicate balance between required standards and optional guidelines for would-be Publishers. This presentation will touch on the process of building the federated VT Geodata Portal and the benefits and challenges of this approach.



**Stephen Sharp, GISP**  
**GIS Operations Manager, VT Center for Geographic Information (VCGI)**

Mr. Sharp is a certified Geographic Information Systems Professional (GISP) and Project Management Professional (PMP) with over 20 years of experience in the GIS/IT industry. Mr. Sharp is currently GIS Operations Manager with the Vermont Center for Geographic Information (VCGI). He is responsible for planning and implementing automated information systems in support of the Vermont Geographic Information System (VGIS). Steve also a member of the GIS Certification Institute's (GISCI) Board of Directors, the organization responsible for the international GIS Professional (GISP) Certification Program.

## Geospatial Response to Disaster

The use of GIS and remote sensing in disaster response has evolved greatly in the last several years. I'll share a 4 step process of "Geospatial Response" to a disaster and how current technology can help emergency management decision makers to provide better fitting responses to disaster. The concepts will be illustrated through real examples from disasters from around the country.

### **Chad Council** **Regional Geospatial Coordinator, FEMA Region I**

Chad joined the FEMA Region One Response Division as a GIS analyst in December of 2012. During disasters, he supports the Regional response efforts as a Geospatial Information Unit Leader. When there isn't an active disaster, he supports ongoing disaster planning efforts. Prior to joining Region 1, Chad worked as a software developer and an independent technical consultant. His disaster response experience also includes 12 years as a Technical Information Specialist with MA-TF 1 Urban Search & Rescue. Chad earned his BS in Computer Science from WPI in the 1990s and more recently completed an MS in Emergency Management from Mass Maritime Academy.

## GIS in the Electric and Gas Utility Industry

With an increased demand for electric and natural gas service, this is a time of major change for the utility industry. The focus of this module is to present the GIS tools, methods, and applications used to support maintenance and/or expansion of necessary infrastructures. The speaker representing Eversource Energy, the largest electric and gas utility in New England, will review, a brief history of GIS in the utility industry, large scale data management practice, examples of GIS visual products used for permitting and construction, geoprocessing tools used to create and edit utility spatial data, how GIS is used in storm restoration efforts, and examples of unique project situations where GIS was utilized. The audience will leave this session with a clearer understanding of how GIS is used in the electric and gas utility industry, with an emphasis on the geoprocessing tools used to create visual products to support permitting for large time sensitive projects.



### **Matthew A. Waldrip, PWS, CESSWI** **Environmental Engineer, Eversource**

Matthew Waldrip is an Environmental Engineer with Eversource Energy in Westwood, MA. Mr. Waldrip's primary responsibility includes obtaining environmental approvals for numerous electric and gas utility projects in Massachusetts. His duties specific to GIS include spatial data management, development of GIS standards, and creating visual products for permitting support. Mr. Waldrip holds a dual degree in Environmental Science and Regional Planning with a minor in GIS from Westfield State University. He is a Certified Erosion Sediment and Storm Water Inspector (CESSWI) and a Professional Wetland Scientist (PWS).

## Integrating Land Records with GIS

Local Governments are responsible for the collection and perpetual storage and management of land documents such as Mortgages and Deeds. These documents provide the basis of land ownership and are of critical importance to anyone engaging in Real Estate transactions. These same Local Governments are responsible for managing all the aspects of the welfare of their constituents. More and more often, the management of all those aspects, public safety, transportation, economic development, health and social services, among others, are greatly enhanced by the application of Geographic Information Systems (GIS). Currently, Local Governments are maintaining separate systems to manage their land documents and their GIS.

Now there is a technology that provides the ability of geocoding those land documents. Once those documents are geocoded, they can be integrated with GIS applications. This new possibility is made possible through advances in Optical Character Recognition (OCR), but more importantly, through the use of powerful text search engines. Geocoded land documents facilitate the inclusion of those documents in overlay analysis, which is inherently powerful of GIS technology.



**Alfredo Frauenfelder**  
**Account Executive, Xerox**

Mr. Frauenfelder has extensive experience in the implementation of applied information technology initiatives. This experience includes the design, deployment, and management of Geographic Information Systems supporting local, regional, State, and Federal agencies. More recently, this experience is being applied to provide Account Management services to local government customers in the North East from the standpoint of Land Records Management and supporting workflows. Mr. Frauenfelder is a member of the Xerox Services Group. Mr. Frauenfelder received his Bachelor's in Geology with a minor in Geography from Western Kentucky University, Bowling Green, Kentucky in 1985 and his Master's in Urban and Regional Planning from Virginia Commonwealth University, Richmond, Virginia in 1989.

## **Leveraging the Power of Off-the-Shelf Software**

In 2014, the Boston Water and Sewer Commission decided to utilize an off-the-shelf GIS-centric software program, Cityworks, to replace their previous highly customized Work Order Management System. This presentation will illustrate how the combination of organizational decisions and the configurability of Cityworks allowed the migration of established workflows along with the conversion of over 1.3 million work orders.



**Kathryn Brewer**  
**Project Manager, Boston Water and Sewer Commission**

Kathryn Brewer has over 20 years of experience *leading change* in the Information Technology field. Her unique application of *knowledge, processes* and *people* has greatly benefited the organizations with which she has partnered as a GIS Professional.

Her *game-changing* contributions include *leading roles* in operational and process improvement, project and change management, as well as instructional design & training delivery. Kathryn is currently a partner at Spatial Relationships where she is a Change Consultant.

## **Neighborhood Property Mapping & Analysis using GIS - Embracing Community Revitalization Project in Building GIS program at Fitchburg State University**

GIS students and faculty at Fitchburg State are playing an active role in a multi-agency effort to improve the quality of life in local community since January 2016. A coalition of agencies is working to revitalize a key section of Fitchburg with the Reimagine North of Main project. Through the university's Crocker Center for Civic Engagement, Dr. Jane Huang, a GIS professor, and her three student interns are helping reinvigorate the diverse and densely populated neighborhoods north of the Main Street in Fitchburg. The goals of the GIS project are 1) to thoroughly investigate the spatial distribution of the neighborhood properties and improve the understanding of the neighborhood conditions; 2) to help the university and its local partners thrive and develop competencies in best practices; and 3) to engage students through service-learning and community-based research activities. Comprehensive property surveys have been carried out in the field where one of the surveys was in collaboration with an architecture professor and his students. The field survey results have been mapped and analyzed in a GIS. In-depth investigation and spatial analysis of the community properties are being conducted in the current semester.



**Dr. Jane Huang**  
**Professor, Fitchburg State University**

Dr. Jane Huang joined Fitchburg State University in 2006. She is a broadly-trained geographer with a specialty in GIS. Her wide-ranging interests in the application of geospatial technologies has brought many research and internship opportunities to her students in and beyond the Earth and Geographic Sciences Department. Dr. Huang has been the main professor responsible for the development of the Geographic Science & Technology degree program in the department.

Working with the Douglas and Isabelle Crocker Center for Civic Engagement, a Fitchburg State community outreach program, Dr. Huang and her research interns have been using GIS to assist the City of Fitchburg, MOC (Montachusett Opportunity Council) and NewVue Communities with their on-going community revitalization project, Reimagine North of Main, since early 2016.



**Samuel Gallagher**  
**Research Intern, Fitchburg State University**

Samuel Gallagher is a sophomore Earth Systems Science major at Fitchburg State University with a minor in GIS. He worked on the ReImagine North of Main project during the Spring 2016 semester when he was a freshman. Sam is one of the student leaders of the GIS Club, a newly established interdisciplinary student organization at Fitchburg State University.



**Jacob Hogue**  
**Research Intern, Fitchburg State University**

Jacob Hogue is a junior Earth Systems Science major at Fitchburg State University with a minor in GIS. His research interests include diverse topics, such as community mapping utilizing GIS and remote sensing of lobate debris aprons on Mars. Jacob has been working on the ReImagine North of Main project since September 2016. In his spare time, he enjoys hiking, camping, and exercising.



**Kayla Kress**  
**Research Intern, Fitchburg State University**

Kayla Kress is a senior Geographic Science & Technology major at Fitchburg State University with a minor in GIS. Originally an Earth Systems Science major, she is interested in community development, sustainability, and planetary science. Kress has been working on the ReImagine North of Main project since January 2016. Before that, in summer 2015, she utilized GIS to aid a NASA-funded research project about Mars.

## **Real-Time Monitoring of the Boston Marathon using Operations Dashboard**

The ability to quickly assess situations, prioritize tasks and distribute resources during emergency situations in the state is critical. Starting with the 2015 Boston Marathon, the Massachusetts Emergency Management Agency (MEMA) turned its focus to web maps and began uploading event-specific information into products available through the ArcGIS Online platform. Using one of those products, Operations Dashboard, as the central tool for monitoring the Boston Marathon event, MEMA was able to create a real-time Common Operating Picture (COP) for weather, runner progress, suspicious activity, medical situations and emergency vehicle movement, and quickly share it out to hundreds of public safety officials from more than 50 local, state and federal agencies.



**Desiree Kocis, GISP**  
**GIS Coordinator, Massachusetts Emergency Management Agency (MEMA)**

Desiree Kocis, GISP, is currently the GIS Coordinator for the Massachusetts Emergency Management Agency (MEMA). She has Bachelor degrees in Geography and Anthropology, and a Masters in Geography. Her early career was spent working as an Archaeologist/GIS Specialist at a research lab in Tennessee. Outside of working down in the MEMA bunker, Desiree is also a private pilot, Secretary of the Eastern New England Chapter of the Ninety-Nines (an international organization of women pilots), and a recently published author in AOPA Flight Training magazine. She lives in Oxford with her husband and two amazing children.

## **Safety-enabled apps: using Boston crime data to make Pokemon Go a safer space**

Governments are increasingly making their data available freely in machine-readable format, which is great. A drawback, however, is that government data is organized and produced in a way that's most useful to government operations, and it's not offered in an app-developer or data scientist friendly way. I talk about a project to harvest crime data daily and make it available for web apps and analytics as part of a larger effort to deliver ready-to-use open data sets on the cloud. The importance of adding contextual data to apps -- whether it be crime or weather or something else -- is underscored by recent news that thieves have been "luring" Pokemon Go players into secluded areas.



**Raj Singh**  
**Developer Advocate, IBM Analytics**

Raj is a Developer Advocate and Open Data Lead at IBM Cloud Data Services. He specializes in all things geospatial and hacks on analytics in R and Spark and iPython notebooks. He's currently driven to make CDS the best place to obtain and exploit comprehensive, curated open data sets for business. Raj pioneered Web mapping-as-a-service in the late 1990s with Syncline, a startup he co-founded. After that he finished his PhD at MIT, which explored the potential of web services to power urban information systems. Prior to joining IBM in 2014, Raj worked on geospatial data interoperability challenges for the Open Geospatial Consortium, an international standards body. He's a frequent speaker on interoperability and geo-location services

## **The Parcel Fabric, Deconstructed**

The parcel fabric was introduced by ESRI in ArcGIS 10. It has been adopted by many municipalities for improving, enforcing, and maintaining an increased level of spatial accuracy in their land records data. Despite the benefits, there are still many who are slow to adopt or hesitate implementing because of the perceived complexity of the process and supporting maintenance. This presentation will provide information to demystify the parcel fabric and all the moving parts and pieces involved.



**Thad Dymkowski, GISP**  
**GIS Manager, PRIME 3SG**

Thad is a passionate certified GIS Professional with over 16 years of experience, having achieved his baccalaureate and master's degrees in Geography and GIS from Central Connecticut State University. He successfully completed GIS projects for municipal, academic, and civil/environmental engineering organizations. He possesses comprehensive knowledge of data creation and analysis, GIS server management, application design, database administration, web mapping, and 3D digital model creation. Throughout his career, he has performed a multitude of GIS analyses from inception to completion for data management and analysis functions, as well as multiple standard databases, reports, and cartographic maps. He is currently part of the Connecticut State GIS advisory committees to the Connecticut Office of Policy and Management, responsible for updating the State Parcel and Address data standards. In addition, he has authored and teaches the GIS Certificate Program at Central Connecticut State University when not playing with his twin 4 year olds in the back yard.

## **Using Publicly Available LiDAR Data for Terrain Analysis and Volume Calculation**

In recent years, high-resolution elevation data has become increasingly available, resulting in more precise analytical tools. Much of this trend can be attributed to the expanded availability of LiDAR point clouds and the development of inexpensive software tools that can utilize this data. In this presentation, we explore the process of transforming raw LiDAR data into a usable commodity for analyzing and measuring patterns in the terrain. The workflow begins by identifying and isolating ground points within a LiDAR dataset, which are subsequently gridded to create a 3D surface. Variances in this surface model are then identified and measured using a series of volumetric calculations that can be used as the basis for engineering, change detection, or site planning projects.



**Patrick Cunningham**  
**President & CEO, Blue Marble Geographics**

Patrick Cunningham offers two decades of experience in software development, marketing, sales, consulting, and project management. Under his leadership Blue Marble has become the world leader in coordinate conversion software (the Geographic Calculator) and low cost GIS software with the 2011 acquisition of Global Mapper. Cunningham is Chair of the Maine GIS Users Group, a state appointed member of the Maine Geolibrary Board, a member of the NEURISA board, a GISP and holds a masters in sociology from the University of New Hampshire.

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