Things to Know

Code of Conduct

The Free and Open Source Software for Geospatial North America Conference (FOSS4G NA) is a community conference intended for networking and collaboration in the open source geospatial community.

We value the participation of each member of the community and want all attendees to have an enjoyable and fulfilling experience. Accordingly, all attendees are expected to show respect and courtesy to other attendees throughout the conference and at all conference events, whether officially sponsored by FOSS4G NA or not.

To make clear what is expected, all attendees, speakers, exhibitors and volunteers at any FOSS4G NA event are required to conform to the full Code of Conduct found at http://foss4g-na.org/code-of-conduct. Organizers will enforce this code throughout the event.

Please report any concerns immediately to the registration desk staff or the conference chair. David Bitner can be reached at 612-424-9932 or bitner@dbspatial.com.

Birds of a Feather, Ad Hoc meetings and presentations, and Code Sprint

While there is time set explicitly aside for the Code Sprint from 9 a.m.–2:30 p.m. on Friday, the tables in the 6th floor "pre function" area are available throughout the conference for self-organized Birds of a Feather Sessions, ad hoc meetings, and working on code. Please use the white board near the entrance to this area if you would like to schedule any sessions.

Lost and Found

Please come by registration for any items you may have misplaced during the conference. Please contact the conference chair at bitner@dbspatial.com to inquire about any lost items after the conference.

Gala Event: May 23, 6 p.m.

FOSS4G-NA Gala Event will be at the historic Mill City Museum, sponsored by Urban Mapping. Registration required. Built into the ruins of what was once the world's largest flour mill, **Mill City Museum** is located on the historic Mississippi Riverfront at **704 S. 2nd St., Minneapolis**—a one-mile walk or bike ride (hop on a green NiceRide at kiosks throughout downtown) from the conference center.

Conference Leadership

David Bitner, dbSpatial, Conference Chair

David Fawcett, MN.IT Services @ Minnesota Pollution Control Agency, Program Committee Chair

Executive Committee

David Bitner, dbSpatial, Conference Chair

Nancy Read, SharedGeo, Fiscal Agent Representative

Blaine Hackett, Flat Rock Geographics, Venue Coordinator

Jeff Mckenna, Gateway Geographics, OSGeo Representative

Program Committee

David Fawcett, MN.IT Services @ Minnesota Pollution Control Agency, Chair

Paul Wickman, Flat Rock Geographics, Vice-Chair

Michael Terner, Applied Geographics, Vice-Chair

Paul Ramirez, NASA Jet Propulsion Laboratory

Eddie Pickle, OpenGeo

Cameron Goodale, NASA Jet Propulsion Laboratory

James Klassen, SharedGeo

Bob Basquez, City of St Paul

Local Organizing Committee

David Bitner, dbSpatial, Chair

Blaine Hackett, Flat Rock Geographics, Venue and Gala Coordinator

Len Kne, University of Minnesota, Student Programs Coordinator

Kari Geurts, MN.IT Services @ Minnesota Department of Natural Resources, Workshops Coordinator

Steve Swazee, SharedGeo

Steve Lime, MN.IT Services @ Minnesota Department of Natural Resources

Nancy Read, SharedGeo

Bob Basquez, City of St Paul

Brian Fischer, Houston Engineering

Sponsorship Committee

Steve Lime, MN.IT Services @ Minnesota Department of Natural Resources

Paul Ramirez, NASA Jet Propulsion Laboratory

Kate Chapman, Humanitarian Open Street Map

David Dubovsky, OpenGeo

This conference was made possible thanks to the financial backing of the Open Source Geospatial Foundation (OSGeo) and the financial management provided by SharedGeo. All proceeds from this event will go to OSGeo to be used to support their mission and to help fund future FOSS4G North America events.

WELCOME TO FOSS4G NORTH AMERICA 2013 AND TO MINNESOTA!

Ten years ago the University of Minnesota hosted the first MapServer Users Meeting. The gathering was centered around MapServer but also brought together developers and users of many other open source products. In the years following, the community built by this event coalesced with others, eventually leading to the formation of the Open Source Geospatial Foundation (OSGeo) and the first international Free and Open Source Software for Geospatial (FOSS4G) conference in 2006. OSGeo now encompasses 19 active projects and 8 more in the incubation process, and FOSS4G events have been held in six countries on four continents. This year, in addition to this event and the international event in Nottingham, there are regional events in Bucharest, Buenos Aires, Rapperswil, Paris, and Girona; many dedicated code sprints; and large presence at many other events.

One of the cornerstones of this event has always been bringing together developers, users and decision makers. Developers get to meet with their fellow developers, but also get to see all the things that their work has enabled. Users get to see the latest and greatest innovations and give direct input on the development of projects with which they work. Decision makers have the chance to find and meet with businesses that can provide services to support their goals. The interactions between all of these groups make our community stronger.

This event would not be possible without the tremendous support it has received from our many volunteers and sponsors, and I would like to extend my personal thanks to all of them. Special thanks are due to David Fawcett and the Program Committee for pulling together such a wonderful program. I would also like to thank OSGeo for their financial backing and SharedGeo for acting as fiscal agent for the event—no small task for an event of this size!

The people I have met through these events and through OSGeo have shaped my career. The technical support I have received from the community has made me a stronger developer. The relationships I have forged have led to opportunities to volunteer in the humanitarian open source movement and allowed me to branch off on my own. One of the most unique aspects of open source is this strength of community, and I encourage you to take full advantage of it. Ask questions, introduce yourselves to new people, get involved with a new project, ask others doing similar work to yours what works (or doesn't work) for them, make connections to build support for open source within your business. In short, enjoy the conference, and thank you all for coming!

David Bitner, Conference Chair
dbSpatial LLC

One of the cool things about this conference is that it is not only just for the open source geospatial community, but it is produced by the community as well. The speakers and presentations are from the community and the conference itself is planned, organized, and run by volunteers from the community.

I would like to thank the Program Committee for the hard work that they put in over the last year to assemble a great program for you. I also want to specifically recognize Michael Terner, Paul Ramirez, Paul Wickman, Eddie Pickle, and Paul Ramsey for their extra work at critical points in the process. Organizing a conference like this takes a surprising amount of work, but it is worth it when you see the synergies that develop when people are brought together, and the importance of giving people an opportunity to see how open source geospatial is being used to solve real problems and meet real needs.

Unfortunately, the conference was not able to escape the some of the effects of federal budget sequester. Paul Ramirez and others worked hard to recruit presentation abstracts that demonstrated the effective use of FOSS4G in climate studies, other sciences, and the federal government. We still have some great presentations from this category, but we had several really excellent presentations that had to be withdrawn because the presenters were unable to travel due to the sequester.

I am excited that this conference is in Minnesota so that many of my local colleagues have a chance to learn more about open source geospatial, see the innovations and cool things that are happening in this space, and for them to experience the energy that I have felt at past FOSS4G events. I also hope that you will get a chance to experience my hometown of Minneapolis. If you have some free time, I encourage you to jump on a Nice Ride bike and take a spin around the city lakes, visit a museum, or check out the exploding craft brewing and tap room scene.

Please enjoy the conference and experience it to the fullest! Don't just sit in the chairs. Seek out people and projects that you are interested in, thank the person who fixed a bug for you, go to an interest group, join the code sprint, and make face to face contacts with people you only know from their email, IRC, or Twitter handles.

David Fawcett, Program Committee Chair
MN.IT Services @ Minnesota Pollution Control Agency

KEYNOTE SPEAKERS

Erek Dyskant

Erek Dyskant was the team lead for geospatial analytics development at the Democratic National Committee during the 2012 presidential campaign. His team built a web-mapping tool that allowed field organizers to explore programmatic activity. Since it was built on an open stack, they also opened the whole stack to the field, allowing people to access the same curated and updated datasets using PostGIS, QGIS, web services, or web browsers. He is passionate about applying data to field decisions and has consulted in the field for global health NGOs.

Paul Morin

Paul is director of the NSF and NASA funded Polar Geospatial Center at the University of Minnesota. He makes maps for Wired, Scientific American and National Geographic and is co-author of "Exploring Geology" one of the best selling introductory geology textbooks. Morin contributed to David Attenborough's Frozen Planet and is the US representative for geospatial data to the Antarctic Treaty System. His group of less than two dozen people are mapping both the Arctic and Antarctic at sub-meter resolution with a combination of open source and commercial tools and a lot of imagery.

Bibiana McHugh

Bibiana McHugh is the IT Manager of Geographic Information Systems and Location-Based Services for TriMet, which provides bus, light rail and commuter rail services in Portland, Oregon. She has worked in TriMet's Information Technology Department since 1997 and currently leads a team of innovative web developers and analysts. She holds a degree in Geography from the University of Kansas.

McHugh was at the forefront of the open data initiative in 2005 when she collaborated with Google for the first release of Google Transit and helped pioneer the now worldwide open standard General Transit Feed Spec (GTFS). Expanding TriMet's developer resources since that time has led to the release of over 50 applications by third parties.

McHugh has pushed for user-friendly open data and open source solutions for passenger trip planning and customer information. She has led several successful open source initiatives, such as OpenTripPlanner, an open source, multimodal trip planner. She continues to promote cooperation between local governments and developer communities.

Eric Gunderson

As CEO of MapBox, Eric coordinates product and business development. Eric is passionate about open data and building open source data visualization tools focused on speed and design.

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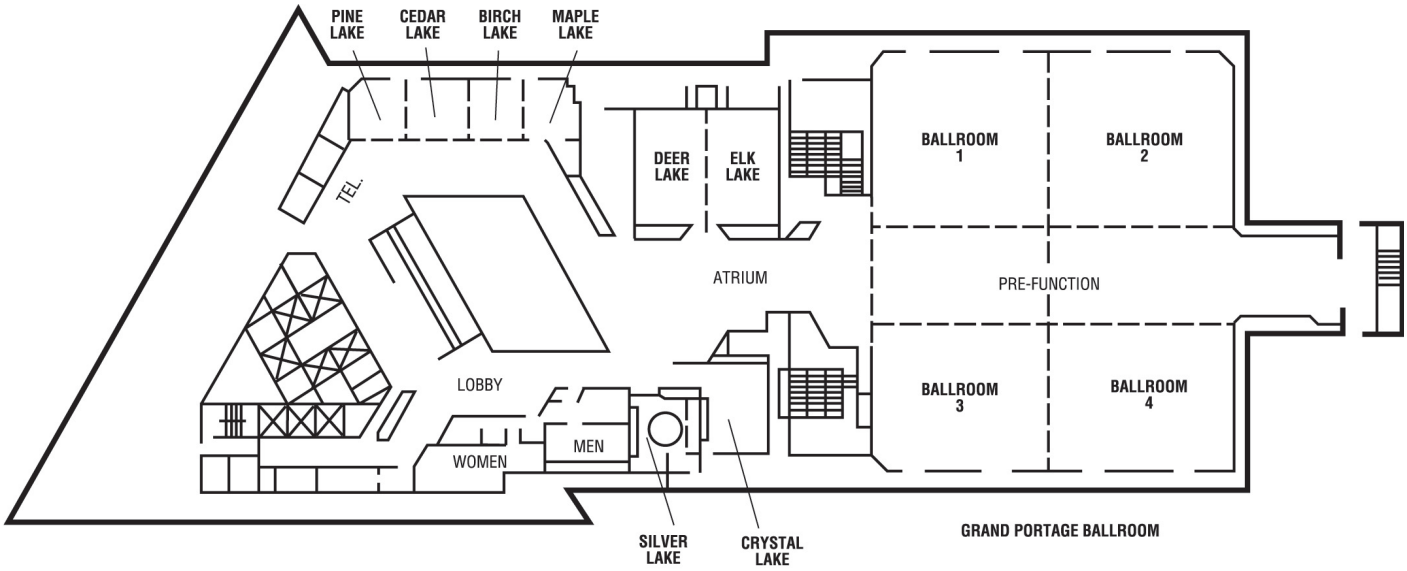
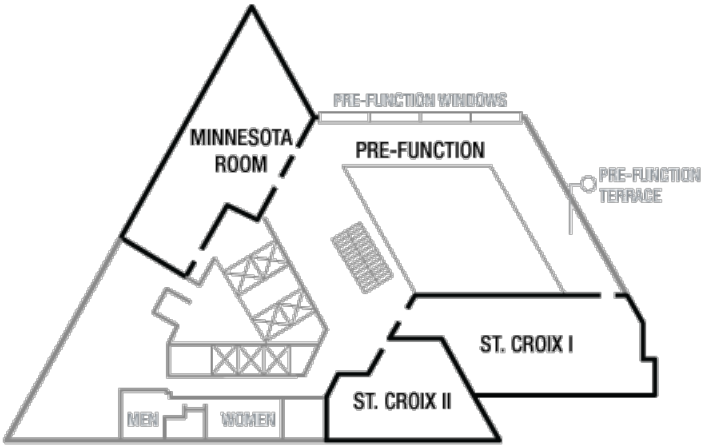
FOURTH FLOOR MAP



SIXTH FLOOR MAP



	Minnesota	St. Croix 1	Deer	Elk	St. Croix 2	Terrace
7:30	**Registration and Breakfast**					
9:00	**Plenary** / Ballroom / **Keynote**: Erek Dyskant, Democratic National Committee					
10:00	**Coffee Break**					
10:30	**Say Hello to OpenLayers 3:** Eric Lemoine, Camptocamp SA, Tim Schaub and Andreas Hocevar of OpenGeo	**Shaping OpenStreetMap into Global Basemaps:** AJ Ashton, MapBox	**OMAR in the Intelligence Enterprise:** Mark Lucas, Radiantblue Technologies	**Web Delivery of Giant Climate Data Sets to Facilitate Open Science:** James Hiebert, Pacific Climate Impacts Consortium / University of Victoria	**The New Users:** Sophia Parafina, Code for America	Meet / Hack
11:00	**iD, a New Editor For OpenStreetMap:** Tom MacWright, MapBox	**Just-in-Time Spatial: Lightweight Acquisition, Storage, & Presentation of Dynamic Data:** John J Czaplewski and Maria Hart, CFIRE	**RWPS Rotary Wing Performance Surface:** Zach Rouse, Geocent	**Interactive Maps to Cryospheric Data:** Joseph Oldenburg, National Snow and Ice Data Center at University of Colorado - Boulder	**Adapting Web Mapping Curriculum to Open Source Technologies:** Carl Sack, University of Wisconsin-Madison	
11:30	**High Performance Data Visualizations in JavaScript:** Vladimir Agafonkin, Universal Mind	**ProjFinder Yo!:** Aaron Racicot, Z-Pulley Inc. and Greg Corradini, Chop Shop Geo	**Scaling ERMA: From Prototype to Production and Beyond, Challenges and Solutions in Scaling ERMA:** Chander Ganesan, Open Technology Group	**Presenting National Weather Service Digital Forecasts Using Open Source Geospatial Technology:** David T. Miller, Wyle and Marc Saccucci and Tim Kempisty, National Weather Service	**Building a Geospatially Competent Workforce with FOSS4G:** Phillip Davis, GeoTech Center	
12:00	**Lunch** / Ballroom					
1:00	**LIDAR in PostgreSQL with PointCloud:** Paul Ramsey, OpenGeo	**Get More Out of Your Web Map Service with SLD:** Matthew Wechsler and Frank Hardisty of Pennsylvania State University	**GeoServer in Production:** Juan Marin, OpenGeo	**Web Based Design Optimization for Water and Sanitation Infrastructure in the Developing World:** Glenn Vorhes, Natural Resources Engineering / Peace Corps	**MapStory: Past, Present and Future:** Dr. Christopher Tucker, MapStory	Meet / Hack
1:30	**WebGL-Enabled LiDAR Visualization with PostGIS and PDAL:** Howard Butler, Hobu, Inc	**GeoServer CSS:** David Winslow, OpenGeo	**Your Geospatial Platform Running on a PaaS:** Steven Citron-Pousty, Red Hat	**Automated High Resolution Image Mosaics of Polar Regions:** Claire Porter, Polar Geospatial Center	**An Open Source Stack for the National Geothermal Data System:** Ryan Clark and Genhan Chen of Arizona Geological Survey, and Christoph Kuhmuench, Siemens Corporation	
2:00	**Dynamic Geospatial: Polygon Indexing and GeoJSON Support in MongoDB:** Greg Studer, 10gen - the MongoDB Company	**CartoCSS for Styling Maps:** Tom MacWright, MapBox	**WMS Server Benchmarking for Large Raster Formats:** Michael Billmire, Michigan Tech Research Institute and Colin Brooks, Michigan Tech Research Institute	**Window-Shopping & Product Previews - Demonstrating NASA's Changing Paradigms for Using Satellite Imagery:** Matthew Cechini, Ryan Boller, and Kevin Murphy of NASA	**An Overview Of OpenGeoportal:** Steve McDonald, Tufts University	
2:30	**Coffee Break**					
3:00	**The Open-Sourcing of DNR GPS:** Chris Pouliot, MN.IT Services @ Minnesota Department of Natural Resources	**Understanding Epidemics through Interactive Maps:** Aashis Lamsal and Michael C. Wimberly of the Geographic Information Science Center of Excellence, South Dakota State University	**Scripting GeoServer with GeoScript:** Justin Deoliveira, OpenGeo	**OpenClimateGIS: A Python Geoprocessing Framework for Climate Datasets:** Ben Koziol, NESII/ CIRES/NOAA-ESRL		Meet / Hack
3:30	**We Know Where You Were Last Summer: Automated Vehicle Locating:** Cory Karsten and Bob Basques, City of St. Paul	**Online Mapping of Stream Habitats using Open Source Products:** Bob Bistrais, GISP, Maine Office of GIS	**Streaming Big Data Analysis with Open Source:** Andrew Turner, David Kaiser, and Stefan Novak of ESRI	**The Open Source Python Geospatial Stack in Practice:** Tom Payne, Strata		
4:00	**Plenary** / Ballroom / **Keynote**: Paul Morin, Polar Geospatial Center at the University of Minnesota					
5:00	**Cocktail Reception**					
6:00	**Lightning Talks** / Ballroom					

	Minnesota	St. Croix 1	Ballroom 1	Ballroom 2	St. Croix 2	Terrace
7:30	**Registration and Breakfast**					
9:00	**Plenary** / Ballroom / **Keynote**: Eric Gundersen, MapBox					
10:00	**Coffee Break**					
10:30	**PostGIS Feature Frenzy:** Paul Ramsey, OpenGeo	**Building a Mobile, Offline Mapping Stack Using Open Tools & Data:** Justin Miller, MapBox	**Panel: State of the Portals**	**Real-Time Data Analysis and Rendering with HTML5 Canvas Using OpenLayers and GeoServer.:** Tom Kunicki, U.S. Geological Survey	**Client-Side JavaScript Frameworks for Fun and Profit:** Scooter Wadsworth, Sanborn	Meet / Hack
11:00	**GeoJSON is Spectacularly Wrong:** Sean Gillies, New York University	**Redesigning the University of Wisconsin Campus Map:** Using open source mapping to go mobile: Bryan Shelton, University of Wisconsin and Nick Weaver, University of Wisconsin		**Visualizing Spatial, Temporal, and Social Graph Phenomena with the GeoViz Toolkit:** Frank Hardisty, Pennsylvania State University	**Going Inside with FOSS4G - Developing Interactive Building Floor Plans in HTML5:** Kristofor Carle, SYNCADD Systems, Inc.	
11:30	**Removing the Middleman: Building Geospatial Applications that Can Read and Write Data to CartoDB without Proxy:** Andrew W Hill, CartoDB and Javier de la Torre, CartoDB	**Building Mobile Mapping Applications with Enyo JS:** Travis Webb and Jesse Griffis, NBT Solutions		**Bring Cartography to the Cloud with Hadoop:** Nick Dimiduk, Hortonworks Inc	**Cesium: 3D Maps on the Web:** Patrick Cozzi, Analytical Graphics, Inc	
12:00	**Lunch** / Ballroom					
1:00	**State of GeoServer:** Justin Deoliveira, OpenGeo	**Moving up to an Enterprise Open Source Geospatial Platform:** Nancy Read, Metro. Mosquito Control District and Brian Fischer, Houston Engineering Inc.	**Diversity in FOSS4G Mailing List: An Analysis:** Alyssa Wright, OpenGeo and Georgia Bullen, Open Technology Institute, New America Foundation	**Fast, Distributed Geoprocessing with Scala and GeoTrellis:** Robert Cheetham and Josh Marcus of Azavea	**USACE Inundation Model Viewer:** Will Breitkreutz and Randy Goss, U.S. Army Corps of Engineers	Meet / Hack
1:30	**MapServer Project Status Report - Meet the Developers!:** Steve Lime, MN.IT Services @ Minnesota Department of Natural Resources and Daniel Morissette, Mapgears	**Business Decisions that Led to a FOSS4G Hosting Solution for Local Governments:** Michael Terner, Applied Geographics, Inc.	**Panel: Diversity in FOSS4G**	**Automatically Geotagging Unstructured Text with Open Source Tools:** Charlie Greenbacker, Berico Technologies	**Selling Open Source to the Census Bureau:** Dan Little, dbSpatial LLC	
2:00	**GDAL/OGR Project Status:** Frank Warmerdam, Google	**Open Source GIS at Pierce County, WA:** Jared Erickson and Michael Payne of Pierce County IT/GIS		**Foursquare's Open Geo Stack: Geocoders, Reverse Geocoders and more Reverse Geocoders:** David Blackman, Foursquare	**Open Source Geo at the U.S. Department of State:** The CyberGIS and Imagery to the Crowd Initiatives: Patrick D, U.S. Department of State, Humanitarian Information Unit	
2:30	**Coffee Break**					
3:00	**OpenLayers 3: Under The Hood:** Eric Lemoine and Tom Payne, Camptocamp SA	**FOSS Experiences in Transportation and Land Use Research:** Andrew Owen, University of Minnesota -- Nexus Research Group	**An Open Source Framework for Volunteer Field Data Collection:** S. Andrew Sheppard, University of Minnesota & Houston Engineering, Inc	**The Cloud: A Soured Love Affair with Big Data:** Dan Little, dbSpatial LLC		Meet / Hack
3:30	**Leaflet: Past, Present, Future:** Vladimir Agafonkin, Universal Mind	**A Rail Runs through It:** Spencer Gardner, HNTB	**Open Source Web and Mobile Mapping Applications in Utilities and Telcos:** Mike Tafel and Peter Batty, Ubisense	**QGIS and My So Called Life:** Randal Hale, North River Geographic Systems, Inc		
4:00	**Plenary** / Ballroom / **Keynote**: Bibiana McHugh, Portland TriMet and **Panel**: The Business of Open Source					
5:30						
6:00	**Gala Event** / Mill City Museum (704 S. 2nd St., Minneapolis)					

	OpenGeo Track	RadiantBlue Track	Code Sprint
8:00	**Registration**		
9:00	***Breakfast with OpenGeo, Technology Showcase*** **The Annual OpenGeo Update** **OpenGeo Analytics Console Beta Launch** **GeoGit: Distributed Versioning for Geospatial** **Opening up with OpenLayers 3**	**OMAR Overview With Federation** **GRID Overview** **OMAR GRID Code Sprint**	**Code Sprint**
11:00	**Panel**: Open Source for State and Local: What's Working and What Isn't? Panelists to include: Bibiana McHugh, Portland TriMet; Michael Terner, AppGeo; additional representatives from state and local governments; moderated by Eddie Pickle		
12:00	**Lunch** / Ballroom		
1:00			**Code Sprint**
2:45	**Closing remarks**		

LIGHTNING TALKS
WEDNESDAY, MAY 22 / 6 P.M.

Points and Polys in an Audio-visual Environment - A Wisconsin Pronunciation Gazetteer presented by AJ Wortley, Wisconsin State Cartographer's Office and John Czaplewski, National Center for Freight & Infrastructure Research & Education (CFIRE)

A Complex Web Map for a Parks and Recreation District presented by Greg Allensworth, GreenInfo Network

mapfart.com presented by Aaron Racicot, Z-Pulley Inc

The Future of Geospatial Data Formats at CartoDB presented by Andrew W Hill, CartoDB

The Open Source Learning Curve presented by Laura Doty, Applied Geographics

Why PaaS is the Future for Programmers AND Sysadmins presented by Steven Citron-Pousty, Redhat

Open as in Goatse presented by Sophia Parafina, Code for America

The International ICA-OSGeo Research and Education Lab Network - A Status Report presented by Charlie Schweik, Associate Professor, University of Massachusetts, Amherst.

Whither the Water? Looking at Hydrologic Connectivity presented by Nathaniel Kale, Prior Lake - Spring Lake Watershed District

QONQR The World! Location-Based Multi-Player Strategy Game presented by Paul Wickman, Flatrock Geo

OpenStreetMap Growing Big presented by Alex Barth, MapBox

PANEL: THE BUSINESS OF OPEN SOURCE
THURSDAY, MAY 23 / 4 P.M.

This panel will explore a variety of issues pertaining to the business of open source. This includes, but is not limited to: money making approaches; business challenges; legal and licensing issues; and balancing proprietary interests with open source tools. The panel will be designed to maximize interactive discussion including audience questions. Help us talk about what's of interest to you. The panelists come from a variety of companies of varying sizes that represent software, consulting and web-based services industries.

The panel members are:

- Michael Terner, Executive Vice President, AppGeo, Moderator
- Eddie Pickle, CEO, OpenGeo
- Robert Cheatham, President, Azavea
- Sophia Parafina, Code for America
- Andrew Turner, Esri
- Eric Gunderson, President, MapBox
- Shane Engel, Manager Geospatial Analytics, Deloitte

WEDNESDAY, MAY 22 / 10:30–11 A.M.

Say Hello to OpenLayers 3

Eric Lemoine, Camptocamp SA, Tim Schaub and Andreas Hocevar of OpenGeo

Minnesota Room

We've rewritten OpenLayers from the ground up with the goal of offering a powerful, high-performance library leveraging the latest in web technologies. This talk will take you on a high-level tour of OpenLayers 3. We will present how OpenLayers 3 fits into the current suite of open-source web mapping tools and help you decide when to use OpenLayers 3 for your applications.

OpenLayers adopts a flexible architecture that enables using different rendering technologies. For example, OpenLayers 3 may use WebGL on modern desktop browsers, Canvas 2D on mobile browsers, and DOM on less capable browsers. We believe this architecture makes OpenLayers 3 a good choice for many types of applications and use-cases.

OpenLayers has always provided a broad range of functionality for accessing raster and vector data from a variety of different sources. In this talk we'll describe the tools that we're making available with OpenLayers 3 that let you build a compact and optimized build of the library with just the components that you need.

Big map players are also adopting WebGL as the technology for displaying maps in web pages. In this talk we will discuss what WebGL offers for maps, looking at both 2D and 3D. We, for example, expect to use WebGL to display millions of vectors, and effectively reproject vector and raster data.

Lastly, we will present the current status of the development, and the next steps.

Shaping OpenStreetMap into Global Basemaps

AJ Ashton, MapBox

St. Croix 1 Room

OpenStreetMap is an incredible project and resource powered by volunteers around the world. The community and the information we as OSM collectively curate is growing rapidly into the biggest, most complete repository of open geographic knowledge. However the breadth, precision, and organic nature of OSM data makes it a challenge to work with at scale. I will explore the main problems you will encounter working with the entire OSM Planet and detail the solutions we use for building a global basemap at MapBox.

Approaching OSM with an eye for design, one needs to grasp the free-form tagging system. Compelling cartography with this data does not come from building up layers of structured feature-classes, but instead from experimenting with different pieces, melding them together, and sculpting them into something beautiful.

All the tools we do this with are free and open-source: PostGIS, TileMill, CartoCSS, and a variety of scripting languages, geographic libraries, and helper applications. This talk will go into some of the technical aspects of bringing OSM into these tools, and some of the bleeding-edge features we are using to improve rendering performance and design aesthetics.

OMAR in the Intelligence Enterprise

Mark Lucas, Radiantblue Technologies

Deer Room. OMAR is an enterprise system built on numerous foss4g projects including OSSIM, OpenLayers, MapServer, GDAL, Postgres/Postgis, and GeoTools. The system provides remote discovery, manipulation and analysis of remote sensing data archives and ground stations. This open source solution has been integrated into mission critical operations within government agencies. The talk will provide an overview and demonstration of those capabilities.

Web Delivery of Giant Climate Data Sets to Facilitate Open Science

James Hiebert, Pacific Climate Impacts Consortium / University of Victoria

Elk Room

The world's best climate scientists are busy churning out computed projections of our planet's future atmosphere and ocean. However, major barriers exist to publishing geospatiotemporal climate data in an open and transparent manner. This is primarily due to the sheer volume of information that these data represent. A handful of variables for a handful of model realizations by dozens of models for scores of scenarios over centuries of time on tens to hundreds of thousands of grid points create big data. Secondary challenges include the novelty of high-resolution climate data and the complexity and sometimes enigmatic nature of climate data interpretation. Finally, scientific teams often lack either the background, the resources, or the mandate required to facilitate strategic data sharing, aside from dropping their output files onto an FTP site.

In the spirit of open data and open science, the Pacific Climate Impacts Consortium (PCIC), a regional climate services provider in British Columbia, Canada, has been making a concerted effort to use geospatial FOSS in order to expand the availability, comprehensibility and transparency of big climate data sets from the Coupled Model Intercomparison Project (CMIP5) experiment. This presentation will describe some of the technical challenges to serving large geospatiotemporal climate data sets over the web, including some of the nuances of climate data. Additionally, I will explain the requirements of the geospatial climate community, and outline the FOSS solutions that we have employed to serve big climate data sets over the web.

The New Users

Sophia Parafina, Code for America

St. Croix 2 Room

Democratizing mapping has come a long way with the continued development of open source tools. However, tools still require a learning curve that may inhibit adoption of certain tools. Code for America is a non-profit engaged in developing applications for local government using fellows drawn from many different professions and with different skills. Drawing from experiences at Code for America, this presentation will highlight use cases, develop user profiles of people developing civic applications, and discuss technologies used.

WEDNESDAY, MAY 22 / 11–11:30 A.M.

iD, a New Editor For OpenStreetMap

Tom MacWright, MapBox

Minnesota Room

The rise of collaborative maps and their expanding base of contributors is demanding new tools. The OpenStreetMap project, the largest collaborative map, has historically used complex tools which are less than user-friendly. To fix this, we're building iD, a new open-source editor for OpenStreetMap.

iD is the first complete, open source map editor to be written in pure Javascript, and on the cutting edge of user experience and design progress. It's also one of the largest, most active open source projects to use the D3 visualization library, which is used both as a general-purpose Javascript library and as a major part of iD's visualization of geodata and interactivity.

This talk will focus on the design decisions behind iD, the experience of writing visually and computationally difficult applications in a browser environment, and the toolchain used. The development process has featured quite a few interesting problems, like headless unit testing in Javascript and fast label placement on the client side with SVG. iD has helped to identify many strengths and weakenesses of the details of browser SVG and Javascript implementations. We'll also discuss the future of iD outside of OSM and as a reusable library for other mapping applications.

Just-in-Time Spatial: Lightweight Acquisition, Storage, & Presentation of Dynamic Data

John J Czaplewski and Maria Hart of National Center for Freight & Infrastructure Research & Education (CFIRE)

St. Croix 1 Room

The recent trend toward "open data" creates new opportunities for geographic data analysis and presentation, yet some of the most interesting data is still locked away inside imperfect formats and APIs lacking geometry. Open source scripting, storage, and front-end tools allow us to harness and explore massive amounts of traditionally inaccessible data using minimal bandwidth. By adding a layer of abstraction between the geometry of the enumeration unit and the corresponding data, developers can bind spatial strucutres and dynamic data on the client-side to drive lightweight web mapping applications.

This presentation puroposes a workflow that allows developers to scrape, manipulate, and present geographic data using open source tools such as Python, TopoJSON, and D3. Examples will focus on using these techniques in the context of freight infrastructure research, and will include addressing the truck driver shortage, finding ports of entry, and using the US Energy Information Association's (EIA) API to build a database.

RWPS Rotary Wing Performance Surface

Zach Rouse, Geocent

Deer Room

Helicopters don't fly; they beat the air into submission. You might be surprised how close the helicopter vs. gravity fight can be with active military assets. The winner can be predicted with complex equations that use aircraft performance functions, terrain elevation, weather conditions, and aircraft loaded weight. A single aircraft's maximum takeoff and hover weights can vary hundreds of pounds from place to place and day to day. Predicting this maximum load is very important to mission planning and execution. Transport pilots often want to minimize their number of sorties by carrying as much cargo as possible each time. Attack pilots surely don't enjoy running out of ammunition and often want to bring as much as the conditions and airframe support. Existing concept of operations has rotary wing pilots compute the power margins for their take-off and target locations by hand using old-fashioned-engineer style look-up curves and weather condition point forecasts.

Geocent's Rotary Wing Performance Surface efforts produced a web-based tool backed by Geoserver's WPS that computes the power margin for specific airframes using WCS weather forecast models. The resulting 4-D mapping service can be viewed in existing mission planning tools and users can have slider bars to adjust time of day and aircraft weight. Not only does this tool provide pilots a complete view of their performance battlespace, but it also provides ground commanders and mission-planners predictions of where they can count on having medevac rotary wing support.

The presentation will provide an overview of the RWPS tool and the critical Special Operations Mission Planning concerns addressed. The methods used for web based GIS performance modeling will be discussed for generalized applications.

Interactive Maps to Cryospheric Data

Joseph Oldenburg, National Snow and Ice Data Center at University of Colorado - Boulder

Elk Room

The Operation IceBridge mission, initiated in 2009, collects airborne remote sensing measurements to bridge the gap between NASA's Ice, Cloud and Land Elevation Satellite (ICESat) mission and the upcoming ICESat-2 mission. Often aircraft are able to collect more varied and larger amounts of data than satellites. For IceBridge flights, these data are stored at the National Snow and Ice Data Center (NSIDC) at the University of Colorado - Boulder, and made accessible to the public via the IceBridge data portal (nsidc.org/icebridge/portal/).

Usability and robust implementation are focal points of NSIDC's development on the portal. The design features an interactive map-based interface layered with flightlines derived from aircraft GPS. The user may manipulate the maps available to narrow down and identify data they seek based on geopgraphic and temporal properties.

Included in the interface are standard tools to manipulate the maps, but the team has also developed custom capabilities designed for the unique purposes of the data portal such as specifying a date range for flight data. With this blend, the portal is easily navigable both by users new to the data and experienced researchers.

The maps and other features of the portal are constructed with a service-oriented architecture. An in-house MapServer instance provides maps, flightlines, and other layers. Instrument data are provided through a custom, in-house service provider. This architecture promotes re-use of existing tools within NSIDC software development, and open accessibility by outside data consumers. For example, NSIDC's MapServer instance also provides the map layers for NASA's Reverb data portal.

Use of open source software, such as MapServer, allows us to leverage the use of standard tools natural to the user, while providing the flexibility to customize capabilities for our specific needs.

Adapting Web Mapping Curriculum to Open Source Technologies

Carl Sack, University of Wisconsin-Madison

St. Croix 2 Room

The current pace of technological innovation in web mapping is spectacular, with new releases of or substantial updates to web mapping technologies occurring almost daily. This increasingly complex solution space poses a special challenge for those who teach web map development in an academic setting. If we wish to equip students with the evolving skill sets necessary for the 21st-century workplace and the ability to quickly adapt to technological changes, we must learn to adapt quickly ourselves. The shift in industry-standard web mapping away from standalone, proprietary technologies (e.g., Adobe Flash/Flex) and towards open technologies that leverage HTML5/CSS3 web standards and JavaScript has at once opened vast new teaching opportunities and thrust us out of our well-known and stable comfort zone. We will report on the results of three technology-oriented studies designed to refresh the University of Wisconsin-Madison Cartography/GIS Program: (1) a competitive analysis study resulting in a comprehensive framework comparing nearly 40 extant web mapping technologies on their relative advantages and limitations; (2) a needs assessment survey conducted across the UW System eliciting past experiences with these technologies as well as future or currently ummet web mapping needs; and (3) a modified participant observation study charting the implementation of the same web mapping scenario in four candidate technologies: D3, Leaflet, OpenLayers, and the Google Maps API. The talk will provide insights about the individual technologies evaluated and offer comments on a process for keeping pace with the ever-evolving array of web mapping technologies.

WEDNESDAY, MAY 22 / 11:30 A.M.–NOON

High Performance Data Visualizations in JavaScript

Vladimir Agafonkin, Universal Mind

Minnesota Room

If you thought that building rich, interactive and mobile-friendly visualizations of high volume data with 100,000+ points just using the power of browser-side JavaScript was impossible, this talk will prove you wrong. We'll review every important aspect of achieving peak performance and responsiveness for these types of applications; including real-time data simplification, computational geometry, clustering algorithms, tree structures, fast collision detection, typed arrays, UTFGrid, TopoJSON, Web Workers, CSS Transform Transitions, requestAnimationFrame and mixing Canvas with SVG and HTML.

ProjFinder Yo!

Aaron Racicot, Z-Pulley Inc. and Greg Corradini, Chop Shop Geo

St. Croix 1 Room

Have you ever received a dataset and not known what projection the geodata is in? Download a CSV full of 'x' and 'y' and have no idea how to determine if they are UTM, State Plane, or some other obscure projection? We are here to help!

CUGOS (Cascadia Users of Geospatial Open Source), a very active OSGeo regional chapter, has been hacking on a project to help solve this problem. We have been sponsoring hack sessions and using this project as a learning tool for CUGOS members to engage in Open Source Geospatial software development.

Give us a sample of your unknown data (an x and y from your dataset) and a hint as to where you think it is (i.e. you know the data is related to 'Seattle WA') and we will give you back a list of probable projections. There are interesting cases at all scales, with capabilities to get you 'close' at large scales, and distinguish datum differences at very small scales. We use some simple techniques leveraging the EPSG database, PostGIS, and a simple web map interface to make the user experience as easy as possible.

All of the project source code is available on Github and we are using a great list of Open Source projects to make ProjFinder work including Flask, PostGIS and Openlayers. We are hosting the client app on git-pages, and the API on a small Linode, once again showing that big things can be accomplished with scarce resources.

We will be introducing the concept, showing ProjFinder in action, and talking about using projects like this to engage your local community around Open Source Geospatial. Hopefully you will leave inspired to come hack ProjFinder with us and engage your local community in developing similar learning opportunities.

Scaling ERMA: From Prototype to Production and Beyond, Challenges and Solutions in Scaling ERMA

Chander Ganesan, Open Technology Group

Deer Room

In a matter of days the Environmental Response Management System (ERMA) went from a prototype application to the common operational picture for responding to the Deepwater Horizon Oil spill in the gulf. In this session we'll talk about the performance challenges we confronted, how we solve (and continue to solve) them, and our plans for scaling to handle future environmental disasters.

Presenting National Weather Service Digital Forecasts Using Open Source Geospatial Technology

David T. Miller, National Weather Service, Meteorological Development Laborartory, Wyle Science, Technology & Engineering, Marc Saccucci and Tim Kempisty, National Weather Service, Meteorological Development Laborartory

Elk Room

National Weather Service (NWS) field offices, working in collaboration with the National Centers for Environmental Prediction (NCEP), feed data into the National Digital Forecast Database (NDFD) to produce a seamless mosaic of digital forecasts. Data from NDFD is available to the public in raw format as well as web-based displays. Currently, the public display provides only static images with minimal user-interaction, i.e. no pan/zoom or data probe capabilities. In addition, the images are created for different sectors of the United States, each containing hundreds of static images. The need for

custom sectors requires hundreds more static images, often overlapping pieces of existing sectors.

In order to overcome these limitations, a development team at the NWS Meteorological Development Laboratory (MDL) has created an updated version of the web-based NDFD data display by combining

several Open Source software packages: OpenLayers, ExtJS/GeoExt, MapServer, jQuery, PostgreSQL/PostGIS, and GDAL. The updated display dramatically reduces the number of images needed per United States region (resulting in a pre-processing time savings) and increases user interactive capabilities with the data as well via a map window on the web page. The updated display was recently released on an experimental basis to the general public for comment.

Building a Geospatially Competent Workforce with FOSS4G

Phillip Davis, GeoTech Center

St. Croix 2 Room

The publication of the Department of Labor's Geospatial Technology Competency Model (GTCM) in June 2010 heralded the arrival of a federally recognized geospatial technology 'industry'. The GTCM marked a watershed when our industry 'came of age'. Now we must build technology-enabled curriculum to match the knowledge, skills, and abilities (KSA) to meet the needs of this GTCM-defined workforce. This presentation will demonstrate one such effort to build a complete geospatial technology curriculum, directly aligned with the GTCM, that utilized the latest in FOSS4G application software, open-source learning management software (LMS), and learning theory research to create a FOSS4G Academy.

WEDNESDAY, MAY 22 / 1–1:30 P.M.

LIDAR in PostgreSQL with PointCloud

Paul Ramsey, OpenGeo

Minnesota Room

How do you store massive point cloud data sets in a database for easy access, filtering and analysis? The new PointCloud extension for PostgreSQL allows LIDAR data to be loaded, filtered by spatial and attribute values, and analyzed via integration with PostGIS. We'll discuss the extension implementation, basics of loading data with PDAL, and how to use PointCloud with PostGIS to do on-the-fly LIDAR analysis inside the database.

Get More Out of Your Web Map Service with SLD

Matthew Wechsler and Frank Hardisty of Pennsylvania State University

St. Croix 1 Room

The Styled Layer Descriptor provides is an XML based standard for Web Map Services (WMS) to symbolize geographic features. This session will explore how SLD Rules, Filters, and Booleans can be exploited to symbolize geographic features according to attribute data.

As a demonstration of this approach, we will explore how maritime Digital Nautical Charts in the Vector Product Format (VPF) can be properly rendered and displayed using SLD in lieu of the VPF native rendering rules - GeoSym.

The result of this session will be a better understanding of the power of SLD along with the ability to better use the vast amounts of data available to you via WMS.

GeoServer in Production

Juan Marin, OpenGeo

Deer Room

In this presentation, we will explore ways to configure GeoServer for different production scenarios and how to tune runtime parameters and data configuration to extract the best reliability, performance and scalability out of the software. We will also discuss additional tools and plugins that can aid in managing or troubleshooting a running GeoServer instance, including runtime analytics tools and the control flow module.

Web Based Design Optimization for Water and Sanitation Infrastructure in the Developing World

Glenn Vorhes, Natural Resources Engineering / Peace Corps

Elk Room

The project goal was to develop a web based application that would generate preliminary designs and cost estimates for small scale drinking water and sanitation infrastructure in the developing world based on user input and optimization algorithms. This idea originates from Peace Corps service experiences where I was tasked with the design and management of construction of a rural community water supply system and later, with the promotion of sanitation infrastructure for a disadvantaged urban area. I recognized the need to quickly show project feasibility, costs, and potential benefits to stakeholders including local government, donor agencies, and members of the community to be served. The web based design tool allows the user to digitize features such as houses, locations of water sources, known impediments to construction, and others either by entering real world coordinates or by using aerial imagery as a reference. The user interface was created with OpenLayers and other JavaScript libraries. Server side programming is in Python using Web.py with storage of user authentication and spatial information in PostgreSQL and PostGIS. The freely available ASTER Global Digital Elevation Map (GDEM) is stored as PostGIS rasters to generate visual representations of terrain to the user as well for input to the design generation algorithm. Subject to modeled constraints, cost path algorithms generate distribution or collection network designs using the optimization components of SciPy and NumPy. The design and cost estimate results are presented to the user through the web viewer and as downloadable files to print and present to project stakeholders.

MapStory: Past, Present and Future

Dr. Christopher Tucker, MapStory

St. Croix 2 Room

This presentation is about the past, present and future of MapStory, as a platform for crowd-sourcing spatio-temporal data, and for conveying important topics through 'geospatial narratives - what we call MapStories.

MapStory, quite literally, would not be possible without open source geospatial software. We were not limited by what closed-source software happened to be able to do given the latest version release. We

were able to engage OpenGeo on our vision, and dovetail our development goals with those of the larger, global community of OpenGeo/GeoNode developers and sponsors. As such, we were able to leverage our considerable investment against millions of dollars of others' investment to achieve our goals.

The OpenGeo stack is not just a set of world-class components. Because it is open source, it is also a platform for continual innovation. The MapStory investment in this stack has been focused on further enabling it to support the temporal, social and narrative features that MapStorytelling demands. While the stack already supported temporal encoding, it was not optimized to discover, access and visualize data in terms of 'change over time.' While the stack (particularly GeoNode) offered user-centric social features, MapStory, as a crowd-sourcing platform, required that every user be aware of every action that might be taking place on the platform related to anything they might care about.

MapStory did something simple, but powerful, by embracing the concept of geospatial narrative. We extended the concepts of layers and maps to StoryLayers and MapStories. MapStories are comprised of one or more StoryLayers, layered and styled in a particular way, and matched by annotations that superimpose a particular narrative about what was going on in this data. In the end, telling a MapStory is all about applying meaning atop the multi-dimensional data hat unequivocally demonstrates change over time - spatio-temporally.

WEDNESDAY, MAY 22 / 1:30–2 P.M.

WebGL-Enabled LiDAR Visualization with PostGIS and PDAL

Howard Butler, Hobu, Inc

LiDAR is rapidly becoming one of the foundational orienting base layers in many web and desktop applications. Software to exploit and visualize actual point cloud data, rather than interpolated digital surface (DSM) or digital terrain (DTM) models, frequently exists in the form of boutique desktop software, however. This paper will highlight the use of open source technologies such as PDAL, PostGIS, and Tornado to develop end-to-end WebGL-enabled point cloud particle visualization. We will discuss using PDAL to pre-process your data along with tips on what to expect when using the newly developed POINTPATCH support in PostGIS for storage of LiDAR data.

GeoServer CSS

David Winslow, OpenGeo

St. Croix 1 Room

An overview of the GeoServer CSS extension. What is it? How does it work? How does it compare with CartoCSS/TileMill?

Your Geospatial Platform Running on a PaaS

Steven Citron-Pousty, Red Hat

Deer Room

We all know some of the major pieces of a FOSS geospatial platform, some of the main pieces have been in place for years now. We have all heard about the cloud and how it is going to "change everything". For most of us, we haven't had a chance to use the cloud and if we have it is only a Amazon EC2 instance (which is Infrastructure as a Services - IaaS). In this talk I will actually bring up all the infrastructure needed to run GeoServer and PostGIS with two commands. I am going to give an introduction for a FOSS Platform as a Service (PaaS), explain why all developers NEED to become familiar with PaaS, and then do a tour-de-force of geospatial in the cloud: PostGIS, GeoServer, OpenLayers, GeoDjango, and CKAN, without having to administer any servers.

Automated High Resolution Image Mosaics of Polar Regions

Claire Porter, Polar Geospatial Center

Elk Room

The Polar Geospatial Center (PGC) holds over 1.5 million high resolution commercial imagery scenes in polar regions. With so much data, our users in the scientific and polar operations communities struggle with cataloging, identifying, and retrieving the images they need. We developed a method of automating the creation of tiled mosaic collections using GDAL and Python and a small 64-node compute cluster. The script first corrects the raw images for terrain displacement and radiometric differences and then sorts the images based on measurements of image quality. The script mosaics the images with the highest quality scores on top and then tiles the resulting composite image into manageable sizes. The resulting product retains the resolution and quality of the images while reducing file size and eliminating image retrieval problems. The product is also well suited to publishing as a web service. Leveraging our compute cluster, we can create mosaics for 50,000 sq. km. per day.

An Open Source Stack for the National Geothermal Data System

Ryan Clark and Genhan Chen of Arizona Geological Survey, and Christoph Kuhmuench, Siemens Corporation

St. Croix 2 Room

The National Geothermal Data System (NGDS) is a distributed network of data providers and consumers linked by standard interfaces and interchange formats for data acquisition and delivery. The primary goal of the NGDS is to provide reliable information for discovery, evaluation, and development of geothermal resources with a vision to enable all relevant geothermal data to be discovered and accessed from a single system. Although the NGDS system is defined by its interfaces and interchange formats, not a specific server implementation, in order to facilitate use by the broadest number of facilities and programs a software stack for implementing data delivery and discovery is being created using the CKAN platform. CKAN was chosen based on a comparison of platform capabilities with system requirements. The major stack components are CKAN, GeoServer, SOLR, and Postgresql with PostGIS extension; the stack supports Open Geospatial Consortium (OGC) web services, including Web Map Service (WMS), Web Feature Service (WFS), and Catalog Service for the Web (CSW). The goal of this software development is to ease the burden on data providers who wish to publish data in the system by establishing new nodes. This software package constitutes a reference implementation for the US Geoscience Information Network architecture that is the basis for the NGDS. In order to provide NGDS data consumers with a highly functional interface to access data in the system, a web map interface for CKAN is being developed utilizing Leaflet/OpenLayers open-source GUI library.

Funded by the U.S. Department of Energy (DOE), NGDS standards, protocols, and reference implementations are being developed by the Arizona Geological Survey and Siemens Corporate Research. Data are being provided by more than sixty institutions.

WEDNESDAY, MAY 22 / 2–2:30 P.M.

Dynamic Geospatial: Polygon Indexing and GeoJSON Support in MongoDB

Greg Studer, 10gen - the MongoDB Company

Minnesota Room

This talk will go through new geospatial features added in MongoDB v2.4 and outline some of the work done 'under the hood' to build out more sophisticated geospatial capabilities.

MongoDB v2.4 adds two major features to its current geospatial querying capabilities- support for GeoJSON documents and querying based on polygon and line geometries. Both of these features are based on the open-source Google S2 spherical geometry library. As the most visible JSON format for geospatial data, GeoJSON data is a natural fit to MongoDB's BSON-based document structure, and allows better interactivity with tools that understand GeoJSON.

The move to GeoJSON is coupled with a number of indexing improvements long-requested by users (true wrapping spherical searches, geo-index reordering, and searches over multiple geospatial fields). A roadmap for future development is currently being defined based off this new work, where the goal is to further integrate the current 2d and 2dsphere indexing capabilities into a general solution for flat-map and spherical-world applications.

CartoCSS for Styling Maps

Tom MacWright, MapBox

St. Croix 1 Room

The growth of cartography to new uses and new groups of people - scientists, artists, and hobbyists - has made the accessibility of map design more important than ever. Historically we've relied on complicated user interfaces and extremely domain-specific styling languages to style maps, but the expectations are being raised, and CSS-like, mature, and documented languages are on the rise.

I'd like to discuss CartoCSS, an open source language and implementation designed along with the open-source TileMill environment. It's a powerful abstraction that's familiar to users with experience in web design but also powerful for those who need to use every feature and concept in the map renderer. After two years of development, it's now at the center of an ecosystem of tools, integrations, and solid documentation. Its use has also expanded from MapBox's TileMill to Vizzuality's CartoDB tool and experimental new technologies like node-tiles.

There's also a lot on the horizon for CartoCSS: we'll discuss the opportunity of an interoperable, standardized language that could be used across platforms. Additionally, OpenStreetMap plans to switch to a standard style based on CartoCSS that will constitute a significant increase in contributability.

WMS Server Benchmarking for Large Raster Formats

Michael Billmire, Michigan Tech Research Institute and Colin Brooks, Michigan Tech Research Institute

Deer Room

Prompted by a client's need to serve ~250GB of JPEG2000 imagery, we evaluated several open source (MapServer, GeoServer) and several proprietary (ERDAS Apollo IWS, ArcGIS Server) WMS platforms for usability and speed of return of large raster datasets.

The 4 platforms were configured on virtual machines with identical system specifications. Our test data was a series of 260 Great Lake Shoreline border images that we converted into three formats for evaluation: a mosaicked TIF, a mosaicked JP2, and platform-specific virtual mosaics. Following previous FOSS4G WMS Benchmarking exercises, HTTP return metrics were evaluated using Apache JMeter. We evaluated return speed at three zoom levels in order to account for potential differences in serving highest-resolution vs. overview data.

ArcGIS Server and GeoServer had the fastest return times for the TIF formats, with MapServer also performing well. ERDAS Apollo had slow return times for TIF format but was extremely fast with the JP2 format. ERDAS Apollo was also generally the fastest returning the virtual mosaic format, although ArcGIS Server and MapServer had very comparable results.

Taking both usability and performance into account, it is difficult to identify a clear preference. ERDAS Apollo excelled in speed tests (aside from TIF format), but had many usability issues. MapServer and ArcGIS Server were well-rounded in terms of usability and performance. GeoServer's usability impressed, though the quality of virtual mosaicking was low compared to the other platforms.

Window-Shopping & Product Previews - Demonstrating NASA's Changing Paradigms for Using Satellite Imagery

Matthew Cechini, Ryan Boller, and Kevin Murphy of NASA

Elk Room

The paradigm for discovering and accessing satellite data has long been driven through drill-downs and metadata result tables with small thumbnail images as an afterthought. However, our personal consumption is facilitated by window-shopping and product previews, not just product specification sheets. Why should acquiring Earth Science data be any different?

The NASA Earth Observing System Data and Information System (EOSDIS) is now providing full resolution satellite imagery for specific products within three hours of observation. The NASA Global Imagery Browse Services (GIBS) provides this high quality imagery through publicly accessible, standards-based, tiled web mapping services. This has been accomplished by leveraging a combination of existing open source geospatial packages and standards along with newly open-sourced NASA-developed software. Unlike ever before, researchers and rapid responders can visually interact with data of interest before ever having to process it on their own. EOSDIS is changing how Earth Science data is discovered for all of its users.

The NASA Worldview (http://earthdata.nasa.gov/worldview) client provides a reference implementation based on GIBS imagery services. In this presentation, we will demonstrate the current GIBS and Worldview capabilities, provide real-world use cases, and reveal plans for future enhancements.

An Overview of OpenGeoportal

Steve McDonald, Tufts University

St. Croix 2 Room

OpenGeoportal (OGP) is a new group of geospatial professionals, developers, and librarians working together on a collaboratively developed, open source, federated web application to discover, preview, and retrieve geospatial data. It is a collaborative effort to share resources and best practices in the areas of application development, metadata, data sharing, data licensing, and data sources. This talk will provide an introduction to OpenGeoPortal's technology and its multi-institutional community. Along with a demo, the talk will review the technologies behind OGP. Its spatial search builds on Solr/Lucene and includes multiple independent spatial components to generate and rank search results most appropriate to the current map view. Visualization is provided through an OpenLayers interface, as will as existing online mapping tools. OGP provides numerous strategies for harvesting metadata using several existing protocols as well as crawling the web for spatial resources. The OGP Metadata Toolkit is under development and will support importing metadata from a variety of spatial repositories as well as authoring metadata using authority references and approved vocabularies.

WEDNESDAY, MAY 22 / 3–3:30 P.M.

The Open-Sourcing of DNR GPS

Chris Pouliot, Minnesota Department of Natural Resources

Minnesota Room

DNR GPS (formerly DNR Garmin) is a free software developed by the Minnesota Department of Natural Resources that facilitates data transfers between GPS units and various GIS data formats. It has been used worldwide for over 12 years but has just recently been upgraded to be an open source program. This talk will provide insight into the upgrade decision-making process as well as discuss lessons learned.

Understanding Epidemics through Interactive Maps

Aashis Lamsal and Michael C. Wimberly of the Geographic Information Science Center of Excellence, South Dakota State University

St. Croix 1 Room

Disseminating spatial information about health outcomes and associated risk factors enables health scientists and public health professionals to monitor epidemics, understand the processes that cause disease spread, and communicate this information to policy makers and the general public. As a result, there is a need for technologies that facilitate the development of cost-effective Web GIS applications for public health. In response, we developed two interactive geospatial visualization prototypes using open source tools to empower public health officials and decision makers to visualize and explore spatiotemporal patterns and environmental risk factors of two diseases of concern in the United States: West Nile virus and obesity.

Both applications were developed using a service oriented architecture based on the Open Geospatial Consortium (OGC) standard, which uses Web Map Service, Styled Layer Descriptor, Web Map Context, and Web Map Tile Service specifications to visualize geospatial information in the Web. In addition, freely available Google APIs, HTML5, and JQuery were incorporated to add user interactivity and control the visualization layouts.

In the first case study, West Nile virus incidence was visualized across the conterminous United States at the county level through interactive maps and time-series graphs. The interface allowed users to select a viewing region and easily map disease incidence patterns for multiple years and to quickly access pop-up time series graphs for individual counties. In the second case study, users were able to select multiple variables and map them simultaneously to facilitate visualization and exploratory analysis of the environmental determinants of obesity.

Scripting GeoServer with GeoScript

Justin Deoliveira, OpenGeo

Deer Room

GeoServer is a solid and mature implementation of a variety of OGC services including Web Feature Service, Web Map Service, Web Coverage Service, and Web Processing Service. Add to this a KML engine, integrated security framework, powerful styling language with SLD and this rich feature set makes GeoServer very appealing to the user. However it has always been somewhat lacking when it comes to the developer. Developing with GeoServer has a steep learning curve and requires expert knowledge to do simple tasks like writing new output formats, implementing new WPS processes, and adding custom filter functions. GeoScript to the rescue!

GeoScript adds spatial capabilities to popular languages such as Python, JavaScript, Scala, and Groovy. Scripting languages are the perfect tool for developers who want to do simple coding tasks quickly in a lightweight development environment. GeoScript builds on top of the very powerful GeoTools library to provide an interface to its capabilities though concise and easy to use APIs. Recent extensions to GeoServer now allow developers to write components and plugins in the scripting language of their choice, using GeoScript as the engine for spatial functionality.

This presentation is geared toward developers who are interested in developing with GeoServer but not necessarily ready to get their hands dirty with low level Java. The talk will detail the various scripting hooks available and provide examples, complete with code, of how to write some simple plug-ins. Check out this presentation and you'll be developing with GeoServer in no time.

OpenClimateGIS: A Python Geoprocessing Framework for Climate Datasets

Ben Koziol, NESII/CIRES/NOAA-ESRL

Elk Room

Working with climate data in its native format is not ideal for all types of analyses and use cases often requiring technical skills (and software) unnecessary to successfully work with other geospatial data formats. OpenClimateGIS is an open source Python package designed to operate in this grey area facilitating data access and minimizing 'data jockeying' to streamline GIS workflows. Essentially, it transforms climate datasets from local or remote NetCDF storage into internal vector representations that may then be subsetted and/or aggregated by a bounding box or collection of arbitrary vector boundaries (e.g. watershed). Furthermore, the software may handle projected climate datasets as well as geometry wrapping and unwrapping to match 0 to 360 longitudinal coordinate systems used in many climate models.

There are three other key components to OpenClimateGIS: (1) Generic iterators allow data to be streamed to arbitrary formats (relatively) easily (e.g. ESRI Shapefile, CSV, keyed ESRI Shapefile-CSV, NetCDF). (2) NumPy-based array computations may be added by extending an OpenClimateGIS functional class allowing calculations such as monthly means or heat indices - optionally on temporally grouped data slices. (3) The OpenClimateGIS API is request-based providing nearly equivalent Python and RESTful URL representations for operational calls.

This presentation provides a general overview of the OpenClimateGIS software including example use cases and a description of the open source software stack. Additional detail on the technical inner workings of the geoprocessing engine will also be given.

WEDNESDAY, MAY 22 / 3:30–4 P.M.

We Know Where You Were Last Summer: Automated Vehicle Locating

Cory Karsten and Bob Basques, City of St. Paul

Minnesota Room

Using GeoMOOSE and OpenLayers web clients, MapServer and the PostgreSQL database at the City of Saint Paul, we've built a live view of our Automated Vehicle Locating (AVL) system as well as custom geographic reporting tools. This talk will cover why we chose to build our own web viewer instead of using a commercial package, reasons to use the existing Open Source web viewers in production at the City instead of choosing a different Open Source product, challenges in translating the data feed from the commercial AVL vendor and integrating the pieces for a smooth end user experience. There will also be discussion on standards for the database tables and records in order to make the system plug and play for others interested in customizing a live AVL web viewer on their own.

Online Mapping of Stream Habitats using Open Source Products

Bob Bistrais, GISP, Maine Office of GIS

St. Croix 1 Room

The Maine Office of Geographic Information Systems (MEGIS) builds GIS services and web mapping applications using open source technologies. Our current strategy combines MapServer, GeoMoose, as well as ESRI and open source data formats and services to create cost-effective web mapping solutions.

GeoMoose is built upon a number of open source projects; OpenLayers, Mapserver, and the Dojo Toolkit. The primary scripting languages used for customization are JavaScript, PHP, and SQL.

In 2012, MEGIS was contracted by the Maine Coastal Program to build a web-based viewer which would allow users to display and query stream and fish habitat data. This project is called the Maine Stream Habitat Viewer. The purpose of the viewer is to show stream crossings that may be barriers or potential barriers to fish migration, in order to aid in habitat restoration efforts.

The Maine Stream Habitat Viewer consumes both open and proprietary data formats. A number of tools and services were added or modified to suit the needs of the project. The project also required building web based forms to allow input and update of stream barrier data by field crews.

In this presentation we will discuss the history and purpose of the project, the technologies used and the reasons for selecting them, challenges and difficulties faced, and the resultant successful build of the application.

Streaming Big Data Analysis with Open Source

Andrew Turner, David Kaiser, and Stefan Novak of ESRI

Deer Room

Realtime geospatial data feeds present a unique opportunity to understand more about our dynamic world. Social media, mobile devices, and sensors are all publishing high-rate and highly variable information that doesn't work with traditional geospatial tools.

We will present a series of new open-source components that give developers the tool to perform dynamic geospatial analysis and alerting of these data streams using Storm and Hadoop. Using a mixture of low-level open-source geometry libraries as well as an interface to create and alter stream topologies users can quickly start analyzing emergent questions during an event.

Beyond just theory, these tools are being used in disaster response, security, and commercial applications to provide new insights. Through easy to use interfaces users can create, recall, visualize and collaborate with their results through open standards and web interfaces.

The Open Source Python Geospatial Stack in Practice

Tom Payne, Strata

Elk Room

Thanks to open source developers, Python has fantastic support for geospatial applications built on the industry-leading PostGIS extensions for PostgreSQL. In this talk, we'll explore the full stack of a real cutting-edge Python/PostGIS application: a revolutionary system for paragliding competitions. We'll demonstrate both how to implement the fundamentals of any rich geospatial application, and how open source tools can help you solve the hard parts.

We'll cover:

- practical use of PostGIS 2's features
- Python/PostGIS integration with SQLAlchemy, GeoAlchemy 2. and Shapely
- database/middleware balance: exploiting PostGIS
- client/server balance: REST-ful interfaces and GeoJSON
- manipulating global data
- whole-stack application design

THURSDAY, MAY 23 / 10:30–11 A.M.

PostGIS Feature Frenzy

Paul Ramsey, OpenGeo

Minnesota Room

PostGIS has over 300 functions, which in turn can be used with the many features of the underlying PostgreSQL database. This talk covers some basic and not-so-basic ways to use PostGIS/PostgreSQL to process spatial data, to build infrastructures, and to do crazy things with data. Consider the possibilities: raster, topology, linear referencing, history tracking, web services, overlays, unions, joins, constraints, replication, json, xml, and more!

Building a Mobile, Offline Mapping Stack Using Open Tools & Data

Justin Miller, MapBox

St. Croix 1 Room

Open source mapping and GIS has been exploding onto the tech scene in the past year. Combined with the equally explosive growth of powerful mobile platforms, a need is arising for rich, offline-capable mobile mapping technologies. This presentation will focus on a process for taking open data sources, turning them into beautiful custom maps, using them on mobile in an offline-capable way, and doing it all with entirely open source code. Attendees should expect to gain understanding of this process, the open source tools available for their use, and potential problems faced when mapping on mobile.

Panel: GeoPortals

Ballroom 1

Data portals act as an interface to our spatial data infrastructures. Without them, extensive data collections and sophisticated tile caches are underused. This panel will review the state of the art in open source portals, the human and technical challenges in making portals work, and explore opportunities for collaboration and better serving the needs of the community. Panel Members include Dr. Carl Reed, Open Geospatial Consortium, Steve McDonald, Tufts University (OpenGeoPortal), and representatives of GeoNode, Esri Geoportal Server, GeoNetwork, and CKAN. Moderator- Len Kne, University of Minnesota

Real-Time Data Analysis and Rendering with HTML5 Canvas Using OpenLayers and GeoServer.

Tom Kunicki, U.S. Geological Survey

Ballroom 2

The emergence of HTML5 Canvas support in browsers creates an opportunity to shift rendering and analysis tasks from the server-side to the client web browser.

Traditional workflows of distributed geospatial applications implement filtering and styling on the server requiring frequent communication between the client and server with each modification to filters or symbology.

By implementing high-throughput filtering and symbology rendering in the client web browser application responsiveness is significantly increased.

Raster representations of features and coverages can be dynamically filtered and symbolized in the browser with functionality recently developed in OpenLayers.

Recent developments in GeoServer enable customized rendering of feature attributes and coverage data into raster pixels by use of SLD utilizing WPS and Rendering Transformations. These rasters are then cacheable and in a format suitable for filtering and symbology rendering in the browser.

With the newly developed HTML5 Canvas functionality in OpenLayers, these rasters can be dynamically filtered and symbolized in the browser.

This technique is being applied at the USGS to provide real-time rendering of complex spatio-temporal hydrologic and climate model outputs with constant performance.

Sample implementations will be presented that take advantage of an OpenLayers HTML5 canvas raster pipeline utilizing data vended by GeoServer using WPS and WMS coupled with SLD Rendering Transforms and an integrated WMS tile cache.

Client-Side JavaScript Frameworks for Fun and Profit

Scooter Wadsworth, Sanborn

St. Croix 2 Room

The recent proliferation of robust client-side JavaScript frameworks has enabled us to create highly interactive client experiences in the browser that interact with lightweight APIs on the server-side with relative ease. As devices increase in power and capability, such development is likely to become more widespread. The ability to create client-side and server-side models and keep them in sync opens up many possibilities for building rich, data-driven web experiences.

In this session, we will work through the more important points of building a relatively simple client-side spatial demo application using Backbone.js, jQuery / Zepto, and Leaflet that syncs data with a prebuilt remote JSON API. We will also discuss tools and techniques for taking web apps offline while retaining user experience without losing data.

THURSDAY, MAY 23 / 11–11:30 A.M.

GeoJSON is Spectacularly Wrong

Sean Gillies, New York University

Minnesota Room

GeoJSON is not just wrong, it is spectacularly, 45-helium-weather-balloons-and-a-lawn-chair wrong. It invites coordinate order confusion. There is no language for defining schemata. It doesn't conform to ISO 191**. It is not even a real standard! And yet somehow people seem to find it good enough for everyday use, applying it to solve real problems without suffering major catastrophes. How can this be? How can something so wrong feel so right to developers?

GeoJSON is a success because it has low technical and social barriers to entry and because it is incomplete and imperfect. I will discuss these properties and their happy consequences along with the overall strengths and weaknesses of the format, and offer some new patterns for using the format.

Redesigning the University of Wisconsin Campus Map: Using Open Source Mapping to Go Mobile

Bryan Shelton, University of Wisconsin and
Nick Weaver, University of Wisconsin

St. Croix 1 Room

When the University of Wisconsin-Madison set out to redesign map.wisc.edu in early 2012, it knew it had a tough act to follow. The existing Flash-based web map, launched in 2006, had won several awards and was recognized for its exceptional design. As web technology changed, and the mobile web exploded, Flash became an increasingly hard platform to support; especially on campus, where iOS usage is high. Updating the Flash-based map was also very labor intensive.

Having worked on a handful of projects using the Google Maps API over the years in our Office of University Communications and Marketing, we initially assumed Google Maps was the only real answer for us as we contemplated a new map.wisc.edu. After doing some research, we quickly realized there existed a complete suite of open source solutions for working with geo data, as well as publicly available data in OpenStreetMap. As open source developers, and as a public university, open source technology and open map data was a perfect fit.

Starting from a background in web development, we set out to add open source geo technologies such as Leaflet.js, PostGIS, Tilemill, and OpenStreetMap, to what we already knew about creating a responsive web experience that worked as well as possible on a variety of devices, from desktop to mobile. We got a lot of feedback and guidance from our renowned cartography and GIS programs, and had a great time learning as much as we could about these exciting disciplines.

In this presentation, we'll share the lessons we've learned, as well as the challenges we still face, in leveraging a full suite of open source projects to deliver a critical resource for our campus and external audiences.

Visualizing Spatial, Temporal, and Social Graph Phenomena with the GeoViz Toolkit

Frank Hardisty, Pennsylvania State University

Ballroom 2

Being able to interactively visualize the torrents of new data, like those provided by social networks is a challenge developers of open source geospatial software are grappling with. I report here on my experiments using the open source GeoViz Toolkit as a base to create such visualizations with. I provide an overview of the design of the GeoViz Toolkit, and the methods that were used to extend it to support temporal and social graph data. I also describe the leading open source alternatives in this problem space.

Going Inside with FOSS4G - Developing Interactive Building Floor Plans in HTML5

Kristofor Carle, SYNCADD Systems, Inc.

St. Croix 2 Room

We will show how we use tools such as D3.js and Leaflet to build interactive floor plan applications. Most floor plans you find on the web are either simple image maps, custom Flash applications, or are recreated as GIS data. We are developing an open data standard for SVG-based floor plans along with a JavaScript library that makes it easier to use SVG data exported from CAD/BIM software. This allows us to build smart web applications with accurate data that can be displayed inside a map bringing FOSS4G inside the building.

THURSDAY, MAY 23 / 11:30 A.M.–NOON

Removing the Middleman: Building Geospatial Applications that Can Read and Write Data to CartoDB without Proxy

Andrew W Hill, CartoDB and Javier de la Torre, CartoDB

Minnesota Room

CartoDB provides a powerful geospatial technology stack to store, manage, and share your geospatial data. This includes a PostgreSQL/PostGIS database, SQL enabled API, and map tile server. Now, CartoDB makes it possible to write data through the SQL API without authentication. By using advanced functionality of the PostgreSQL user-management system, users can now design secure data endpoints to post form data, collections of geospatial data, or even updates and edits to existing data without comprimising the security of their database. Imagine a webpage that allows users to collectively edit geometries, hosted entirely on GitHub pages and CartoDB, or a webapp that allows users to submit location data hosted entirely on S3, those are now possible using CartoDB. In this presentation we are going to show you how it is done and demonstrate how simple it make the process of building powerful geospatial applications.

Building Mobile Mapping Applications with Enyo JS

Travis Webb and Jesse Griffis, NBT Solutions

St. Croix 1 Room

We are five years into the ongoing mobile computing revolution, and formidable software challenges stubbornly remain for both managers and developers as we work to adapt web applications and mapping tools to this new mobile paradigm. The diversity of the mobile device landscape has reincarnated old problems in new and complex ways, which our current established set of tools is ill-equipped to effectively and correctly solve. While many of our current server-side GIS technology solutions can continue to adequately support the usual crop of web mapping use cases, many of our client-side technologies languish conspicuously when implemented on mobile devices. Application support for the major mobile platforms such as Android and iOS is no longer merely useful — it is essential.

Enyo JS is a prodigiously elegant open source mobile development framework which offers a tactically sound approach to solving the strategic problem of emerging mobile device ubiquity and diversity. Conceived in order to smooth the disruptive effect of the grand migration to mobile, Enyo is itself a disruptor. Its primary design goal is allowing the developer to write one application for multiple mobile operating systems, and succeeds where other similar tools have failed. The framework provides clever apparati through which developers can rapidly stand up layout-responsive mobile applications. Managers can take solace in the discipline that Enyo encourages through sensible design patterns. In this presentation I will not only convincingly demonstrate that Enyo is the right tool for developing mobile mapping applications, I will live-code a mobile mapping application using Enyo and Leaflet on stage in order to showcase Enyo's straightforward development logos and rapid prototyping ability. Enyo is a relatively new tool that is rapidly gaining traction for mobile app development, and its flexibility and extensibility makes it a perfect companion framework for mobile GIS and mapping applications.

Bring Cartography to the Cloud with Hadoop

Nick Dimiduk, Hortonworks Inc

Ballroom 2

If you've used a modern, interactive map such as Google or Bing Maps, you've consumed "map tiles". Map tiles are small images rendering a piece of the mosaic that is the whole map. Custom tiles can also be made to provide the same experience over a custom dataset. Using conventional means, rendering tiles for the whole globe at multiple resolutions is a huge data processing effort, spanning 100s of TB and consuming 100s of days of compute time. Aggressive laziness in implementation and copious use of data compression can bring this down to a couple TBs and a few days. In the end, it's still a computation spanning multiple TBs and multiple days.

Luckily, Hadoop is an excellent tool for making huge data processing efforts manageable. The computation is broken into many discrete chunks that can be executed in parallel. Thus your data pipeline can be run across 10s of thousands of CPU cores simultaneously. What once took days can now be completed in hours. Hadoop computations are also easily moved to dynamic compute cloud infrastructure, such as Amazon's EC2. In this talk, I'll show you how to generate your own custom tiles using Hadoop.

Cesium: 3D Maps on the Web

Patrick Cozzi, Analytical Graphics, Inc

St. Croix 2 Room

With WebGL, it is now possible to have hardware-accelerated 3D maps in a web browser without a plugin. In this talk, we present Cesium, an open-source JavaScript library for 3D web maps. In addition to being a standalone library, Cesium provides 3D for OpenLayers 3.

With live demos, we show Cesium's major geospatial features including high-resolution global-scale terrain, map layers, and vector data; support for open standards such as WMS, TMS, and KML; and smooth 3D camera control. In addition, we show Cesium's first-class support for temporal georeferenced data with CZML.

We also discuss our open-source development culture, our experience with github, and development tools for automated testing and optimizing deployment.

THURSDAY, MAY 23 / 1–1:30 P.M.

State of GeoServer

Justin Deoliveira, OpenGeo

Minnesota Room

GeoServer continues to grow with an active community and expanding user base. This presentation takes the pulse of the project with a status report of how GeoServer is doing and what to expect in the coming future.

The presentation will start with a 'year in review' overviewing some of the new and noteworthy of the past year. This past year saw the coming of GeoServer 2.2, a major milestone for the project that brought some exciting new features along with it. Time and Elevation support, WFS 2.0, Rendering Transformations, a Security/Authentication overhaul, and Virtual Service settings, styles, and layer groups are just a few of the highlights of 2.2. Attend this presentation to get the entire report of what happened this past year.

The GeoServer developer community continues to remain active with a number of exciting features in the pipeline. The remainder of the presentation will focus on the future with a report of the new developments currently being worked on and what new features and improvements users can expect in 2013.

Whether you are an expert user, a developer, or simply someone who wants to know what GeoServer is and what it can do for you, this talk is for you.

Moving Up to an Enterprise Open Source Geospatial Platform

Nancy Read, Metro. Mosquito Control District and Brian Fischer, Houston Engineering Inc.

St. Croix 1 Room

The Metropolitan Mosquito Control District (MMCD) is a regional government agency in the 7 County metro area of Minneapolis and St. Paul, MN, that manages work done in 70,000 wetlands. A few years ago MMCD embarked on a strategic plan to move from dispersed information management silos into a centralized enterprise system built from open source software and accessible from any device with a web browser. This presentation will discuss the business case for moving to an open source platform, the economic aspects of the choice and the overall return on investment, including the benefits of mobile access. Come see how the Mosquito Control District is using open source software such as PostGIS, MapServer and GeoMoose, as well as jQuery Mobile. This enterprise system is being used to manage and integrate surveillance, inspections, treatments, citizen requests, work orders, helicopter tracking activities and more. It also has enabled MMCD to make a wealth of data available directly to citizens through web map access.

Diversity in FOSS4G Mailing List: An Analysis

Alyssa Wright, OpenGeo and Georgia Bullen, Open Technology Institute, New America Foundation

Ballroom 1

From vendor independence to code replicability, standard protocols to agile strategies, local governments find great value in open source. One of the most important aspects of open source in local governance is the different way government can engage with the public. Open source projects come from contributory communities of local citizens donning the hats of among others — developer, designer, tester and user. Open source methodologies of agile transparency, participation, and collaboration bridge geographies to create passionate global communities. This combination of strong technical communities with proven strategies, provide local governments powerful avenues for public engagement. Initiatives such as government sponsored hackathons, open data competitions, and crowdsourced issue-tracking (open311) are changing how government and citizen relate.

When forwarding this type of technologically mediated engagement, governments would do well to investigate the nature of technical communities. If "the public" is a diverse demographic than "the services" governments provide should mirror that same diversity. This talk would be a step towards that investigation. The approach is twofold — first a (never been done before) analysis of language and gender in open source mailing lists. Second, a review of innovative government strategies that use open source to engage diverse communities.

Fast, Distributed Geoprocessing with Scala and GeoTrellis

Robert Cheetham, Azavea and Josh Marcus, Azavea

Ballroom 2

What got you hooked on geospatial? For me it was more than just being able to see stuff on a map - it was the ability to transform geographic data in ways that enabled me to see something new, make a better decision or shed new light on some aspect of my environment.

Whether you use GDAL, ArcGIS ModelBuilder, GRASS or IDRISI, we have usually done this type of data transformation with a variety of desktop software tools. So why have these types of capabilities been relatively rare in web and mobile applications? Speed and scalability. It has generally required too much time to calculate a viewshed, combine a pile of rasters into a weighted overlay, compute a watershed or generate slope and aspect from elevation data.

We have been working on this problem - fast, scalable geoprocessing - for the past few years. At FOSS4G-NA 2012, we released a new project called GeoTrellis, an open source framework for high-performance and distributed geoprocessing. Built using the Scala programming language, GeoTrellis is designed to create scalable, fast geoprocessing web apps; build distributed services that can act on large data sets; and parallelize geoprocessing operations to take full advantage of distributed, multi-core architectures.

We will give an overview of the GeoTrellis framework; how it leverages features of Scala, Akka and other frameworks; and how it can be integrated with GeoServer, OpenLayers and Leaflet to create apps that are more than just dots on a map. We will also review some of the applications where GeoTrellis is being used since its release, including: stormwater modeling, education games, infrastructure prioritization, climate change and transportation.

USACE Inundation Model Viewer

Will Breitkreutz and Randy Goss, U.S. Army Corps of Engineers

St. Croix 2 Room

Map production teams, H&H modeling teams and consequence analysis teams, located in districts across USACE are the core of the US Army Corps of Engineers Modeling Mapping and Consequences Production Center (MMC). From the output of hydraulic models, they produce standardized dam failure inundation maps and complex consequence analyses. This presentation will review some of the map production tools developed for and in use by the distributed MMC map production teams and highlights the software development methods and principles used to rapidly prototype, maintain and incrementally evolve them to meet the requirements of dam failure inundation mapping. Leading the suite of tools developed for MMC production is the new MMC on-line data viewer which enables highly technical review workflows and data dissemination. The data viewer allows the MMC to publish all of the geographic output information in a complex, but user friendly user interface available to the project stakeholders throughout USACE as well as to the internal MMC team members. The results of this work demonstrate that software development utilizing open source technology, properly applied and managed can add substantial benefits to productivity, quality, consistency and portability to an established workflow while minimizing cost and ensuring on-time delivery.

THURSDAY, MAY 23 / 1:30–2 P.M.

MapServer Project Status Report - Meet the Developers!

Steve Lime, Minnesota DNR and Daniel Morissette, Mapgears

Minnesota Room

This session starts with a status report of the MapServer project, followed by an open question/answer session to provide a opportunity for users to interact with members of the MapServer project team.

We will go over the main features and enhancements introduced in MapServer 6.2 released in November of 2012, including the addition of the new TinyOWS and MapCache components, the current and future direction of the project, and finally discuss contribution opportunities for interested developers and users.

Don't miss this chance to meet and chat face-to-face with the members of the MapServer project team!

Business Decisions that Led to a FOSS4G Hosting Solution for Local Governments

Michael Terner, Applied Geographics, Inc.

St. Croix 1 Room

Applied Geographics has been hosting geospatially enabled websites on behalf of our local government customers since 2001. The company continues to utilize a variety of commercial and open source technologies and this presentation will outline the use cases that best fit different technological solutions. The presentation will then provide the business case that has led to increasing use of FOSS4G technologies in combination with cloud-based deployment.

Panel: Diversity in FOSS4G

Alyssa Wright, OpenGeo and Georgia Bullen, Open Technology Institute, New America Foundation

Ballroom 1

One of the main tenets of open source is that of inclusion and nondiscrimination. Indeed under the ethos of open, many people have moved web mapping into a space more accessible to technologists and the public alike. But what does inclusive and nondiscrimination look like in FOSS4G? And how does the diversity of such inclusive principles influence what's next for open geospatial?

In this session, we plan to explore how the inclusive tenets of 'open' support sustainable innovation. How does it matter (or not) and what are we doing in a community to create inclusive and nondiscriminatory environments. Georgia Bullen and Alyssa Wright will facilitate an open discussion with the community. Additional panelists will be announced.

Automatically Geotagging Unstructured Text with Open Source Tools

Charlie Greenbacker, Berico Technologies

Ballroom 2

As the demand for geospatial analytics continues to grow, most of human knowledge remains "trapped" in text documents. Proprietary solutions for extracting geo data from unstructured text are expensive and difficult to scale. As an alternative, we've developed an open source software package for document geotagging and geoparsing that's fast, accurate, easy to use, and scales to accommodate big data using Apache Hadoop. It identifies location names in unstructured text using a machine learning-based model, and resolves these names against the GeoNames.org gazetteer to produce rich geographic data. Our innovative solution combines various open source tools (e.g., Lucene, OpenNLP) with natural language processing techniques to extract and resolve geospatial entities from text documents, intelligently and automatically. It also handles misspellings, alternate names, and ambiguous references like "Springfield" or "Portland."

By performing geographic entity resolution based on semantic context, and subsequently enriching documents with structured geo data, we enable advanced geospatial analytics on unstructured text. Our open source geoparsing system has been integrated into a next-generation analytics platform supporting the discovery and exploitation of trends, patterns, and relationships from diverse data repositories in the cloud. By powering map-based visualizations and hierarchical geospatial search across large amounts of text documents, it ultimately helps unlock the geospatial potential of big data — with zero licensing costs.

In October 2012, we released the source code to the public under the Apache License as our company's first official open source project. Doing so allows our users to deploy it on as many Hadoop nodes as are required to fit their big data needs without having to worry about expensive enterprise licenses or costly usage fees.

This talk will cover how our open source software works, how we've used it to enable geospatial analytics on unstructured text, and will include a live interactive demonstration.

Selling Open Source to the Census Bureau

Dan Little, dbSpatial LLC

St. Croix 2 Room

The twitter verse is crowded with complaints of closed data from the U.S. Census Bureau. We have been working with them for over 10 years and have a team legitimately concerned about data accessibility. We have pushed for the inclusion of a MapServer, PostGIS, Python, and C-based stack for major applications. We have been very successful using, deploying, and gaining acceptance for our solutions because they work. This has been an evolutionary process and we've met basic road blocks along the way. This presentation will provide some insight to that process and describe ways we were able to offer proof to our clients that allowed them to take the "risk on open source."

THURSDAY, MAY 23 / 2–2:30 P.M.

GDAL/OGR Project Status

Frank Warmerdam, Google

Minnesota Room

An overview of the capabilities of the GDAL/OGR (Geospatial Data Abstraction Library) project will be covered, followed by a focus on new developments in the last two years and future directions for the project.

Open Source GIS at Pierce County, WA

Jared Erickson and Michael Payne of Pierce County IT/GIS

St. Croix 1 Room

Pierce County Washington is increasingly using Open Source GIS in combination with commercial software. Through a series of case studies this presentation will highlight how and why open source GIS was adopted and the specific problems it solved. Learn now Pierce County WA is using OpenLayers, GeoServer, PostGIS, GeoTools, and the Java Topology Suite to create compelling mobile and web applications for county departments as well as providing enterprise-wide solutions.

Foursquare's Open Geo Stack: Geocoders, Reverse Geocoders and More Reverse Geocoders

David Blackman, Foursquare

Ballroom 2

Almost all data at Foursquare is tagged with geographic coordinates — from our tens of millions of places to our billions of check-ins. To make sense of this data, we've developed and open sourced a number of tools on top of a mostly open set of geographic data.

Foursquare needs to be able to geocode (and split) incoming queries to our local search engine.. To solve this, we've created Twofishes, a coarse, splitting geocoder that combines geonames data with other sources of polygon and ranking data. It ingests all geographic data at foursquare and outputs a standardized thrift representation that we use both as a wire format and as the basis of our other geographic tools.

That canonicalized geographic data repository is further processed into an in-memory reverse geocoder used in the mapreduces that build the data that powers our local search ranking. This allows us to both normalize ranking signals and provide listings curated around intuitive, human boundaries such as neighborhoods and cities. Additionally we can provide more context to our users around the requests generated by their sometimes unreliable phone GPS readings.

The tools to power this that we will demo are a country/timezone polygon simplifier, a geographic data ingestion pipeline, a coarse splitting geocoder and reverse geocoder, a blazing fast in-memory reverse geocoder designed to keep up with mapreduces, a slower but still awesome shapefile based reverse geocoder and a visualization tool for the s2 spherical geometry library. Additionally, we'll show integration with the Quattroshapes project, a set of unencumbered locality and admin2 polygons we're developing for many countries in the world without open government data.

Open Source Geo at the U.S. Department of State: The CyberGIS and Imagery to the Crowd Initiatives

Patrick D, U.S. Department of State, Humanitarian Information Unit

St. Croix 2 Room

The U.S. Department of State, Humanitarian Information Unit (HIU) is leveraging new investments in a wide range of open source geospatial software to build web mapping applications and data sharing platforms for the U.S. Department of State and the wider humanitarian community. HIU, in addition to serving as deputy transition manager on ROGUE and investing in the addition of rasters to PostGIS 2.0, has been developing a sophisticated geographic computing architecture referred to as the CyberGIS. The CyberGIS infrastructure provides highly available, scalable, reliable, and timely geospatial services capable of supporting multiple concurrent projects. The CyberGIS is hosted in a cloud environment and is built from GeoServer, PostGIS, TileCache, GeoTools, TileMill, GeoNode, and OMAR. Several challenges face the U.S. Department of State in deploying the CyberGIS infrastructure - including a narrative text culture, a restricted technical environment, and general lack of geospatial awareness. Unique customizations have been developed to address HIU's specific requirements. These include custom data integration tools that can ingest data from both static flat files and dynamic web services; track data sources at the most granular level; and conflate data using a geographic thesaurus. Additionally, HIU has embedded temporal capabilities at the application and database tiers, including custom OpenLayers controls and Java EE web applications. As part of the Imagery to the Crowd Initiative the CyberGIS infrastructure is used to publish high-resolution commercial satellite imagery web services. The crisis mapping community has used these services to generate OpenStreetMap (OSM) data in support of humanitarian operations. HIU's future plans to leverage innovative open source geospatial technologies for collaboration and data-sharing will also be discussed.

THURSDAY, MAY 23 / 3–3:30 P.M.

OpenLayers 3: Under The Hood

Eric Lemoine and Tom Payne, Camptocamp SA

Minnesota Room

OpenLayers 3 is the next generation of web mapping. A radical new architecture and the use of cutting edge JavaScript techniques, libraries, and tools enables a full suite of previously unimaginable functionality while maintaining a compact, high performance library.

In this talk we'll show you how to use this functionality in your applications, and peek under the hood to see how OpenLayers 3's architecture makes it possible. We'll include:

Virtual globe (Cesium) integration: a carefully designed camera and data source abstractions permit close integration with the virtual globes. Switch between 2D and 3D views of the same data, or display synchronized 2D and 3D views side by side.

Multiple rendering back-ends: a pluggable rendering architecture supports multiple renderers for maximum performance and portability. A Canvas 2D renderer provides fast, reliable rendering on current devices, a DOM renderer provides fall-back capabilities for older browsers, and a WebGL renderer opens the door to the next generation of performance for the most demanding applications.

Rich data sources: generic and powerful core data representations of tiled, single image, and vector data make it easy to add support for a wide range of geospatial data sources.

Smooth and flexible interaction and animation: an optimized rendering path ensures that interaction remains smooth at all times.

Compact library size: use of the Closure suite of tools creates keeps the build size small while keeping the source code readable.

FOSS Experiences in Transportation and Land Use Research

Andrew Owen, University of Minnesota — Nexus Research Group

St. Croix 1 Room

The Nexus Research Group at the University of Minnesota focuses on understanding the intersections of transportation and land use. In this presentation, we will examine case studies of how open-source geospatial software has fit into specific research projects. We will discuss why and how open-source software was chosen, how it strengthened our research, what areas we see as most important for development, and offer suggestions for increasing the use of open-source geospatial software in transportation and land use research. Over the past two years, we have begun incorporating open-source geospatial data and analysis tools into a research workflow that had been dominated by commercial packages. Most significantly, we implemented an instance of OpenTripPlanner Analyst for calculation of transit travel time matrices, and deployed QGIS and PostGIS for data manipulation and analysis. The project achieved a completely open research workflow, though this brought both benefits and challenges. Strengths of open-source software in this research context include cutting-edge transit analysis tools, efficient parallel processing of large data sets, and default creation of open data formats. We hope that our experience will encourage research users to adopt open-source geospatial research tools, and inspire developers to target enhancements that can specifically benefit research users.

An Open Source Framework for Volunteer Field Data Collection

S. Andrew Sheppard, University of Minnesota & Houston Engineering, Inc.

Ballroom 1

As budgets tighten and geographic and environmental data procurement becomes difficult, organizations are looking to alternative sources of information to help achieve their objectives. Fortunately, the widespread availability of GPS-enabled internet-connected devices (e.g. smartphones) makes it feasible to collect location-dependent data from volunteers at a relative fraction of the cost. However, there are still two key challenges:

- There is a need to validate the *quality of data* contributed by volunteers - a task that is necessarily domain-specific.

- There is a need for *sustainable software* platforms that can be re-used between small projects in the face of limited and intermittent funding.

Navigating these two challenges can lead to a difficult trade-off. Generalized 'form builder' platforms may be re-usable, but can lead to vendor lock-in and don't provide the flexibility needed to encode domain-specific QA workflows. On the other hand, custom software is inherently more expensive to maintain.

To address this trade-off, we assembled a number of modules that address common app deployment tasks - without enforcing any particular workflow or data model. Our open-source framework builds upon and extends a number of state-of-the-art platforms, including (Geo)Django, jQuery Mobile, RequireJS, d3, and Leaflet. We supplemented these with our own modules that facilitate:

- creating robust offline-capable HTML5 apps

- publishing domain-specific REST services to integrate the apps with GIS databases

- generating text and binary geographic data formats to share the collected data between organizations.

The framework serves as a distillation of our experience building inspection apps for local government agencies, and a suite of applications allowing citizen scientists to help monitor water quality, precipitation, and flooding in their area. This talk will provide a brief overview of the framework and underlying technologies, as well as some initial lessons learned from our deployment of the framework for these project-specific workflows.

The Cloud: A Soured Love Affair with Big Data

Dan Little, dbSpatial LLC

Ballroom 2

We are storing more than 21 Terabytes a month. In PostGIS. It's not imagery. We serve it from the EC2 and the insanity is getting nearly out of control. We are on the back side of this love-story and are looking at what it will take in real costs to bring home some of the same capabilities.

THURSDAY, MAY 23 / 3:30–4 P.M.

Leaflet: Past, Present, Future

Vladimir Agafonkin, Universal Mind

Minnesota Room

Leaflet, a JavaScript library for mobile-friendly interactive maps, has come a long way since its inception. The library started as a one-night hack and evolved over the next two years as a closed proprietary API, developed by one person, and then was finally rewritten from scratch as an open source library in 2011. Leaflet is now the most popular open source solution for publishing maps on the Web.

What's the story behind Leaflet? How did it became so successful so quickly despite strong competition and lack of features? This talk will be presented by its lead developer and will cover lessons learned, the current state of the project and future challenges.

A Rail Runs through It

Spencer Gardner, HNTB

St. Croix 1 Room

Many cities are turning to improvement of their public transportation infrastructure as a means of mitigating transportation gridlock. The introduction or expansion of a transit line requires years and sometimes decades of analysis, planning and design. Given the significant investment required to build and operate transit service coupled with shrinking transit budgets, it is more important than ever to make sure that an agency invests in those projects which offer the greatest degree of access to the people, places and jobs that fuel demand for transportation.

In the United States, most transportation funding is funneled through Metropolitan Planning Organizations (MPO), a regional body that coordinates planning and construction of major transportation investments. MPOs maintain travel models which are intended to approximate the actual usage of the transportation system. These datasets often provide the most reliable basis for studying travel demand throughout a metropolitan area.

Using PostGIS and Quantum GIS, we have developed a unique spatial methodology for analyzing travel demand datasets. Our techniques allow us to visualize the flow of trips along pre-defined corridors through a metropolitan area and quantify the level of travel demand at different locations. The results allow us to better understand the position and importance of major nodes of activity along a given corridor.

Open Source Web and Mobile Mapping Applications in Utilities and Telcos

Mike Tafel and Peter Batty, Ubisense

Ballroom 1

This presentation will discuss enterprise web mapping applications that we've been developing for large utilities and communications companies, based on a number of open source geospatial components. At this time last year the main elements of our solution were PostGIS, MapFish and Google Maps. Since then we've added GeoServer into the mix, and we're just finishing a migration from Google Maps to Leaflet on the front end (but still able to pull in data from Google as well as OpenStreetMap, Bing and other sources).

We'll talk about examples of what our customers have been doing, including how we helped one of them with recovery from Hurricane Sandy, and how we're handling some very large volumes of near real time data from cable networks using PostGIS and GeoServer. And we'll talk about various technical architecture issues including our approach to offline mobile web applications on various platforms, our experience of moving to Leaflet, and best practices on updating PostGIS with large volumes of near real time data.

QGIS and My So Called Life

Randal Hale, North River Geographic Systems, Inc

Ballroom 2

QGIS (htpp://www.qgis.org) is a user friendly open source GIS that runs on linux, mac, windows, and unix. North River Geographic Systems is a small geospatial consulting company located in the southeast US owned by Randal Hale. QGIS has become the favorite piece of software for NRGS over the last year and a half. It provides a user friendly interface and about 90% of the functionality of most expensive proprietary packages. It's become the go to package for our clients (where applicable), non profits, and schools. It's currently at version 1.8 and is soon to have it's 2.0 release.

Google is not a conventional company, and we don't intend to become one. At Google, we know that every employee has something important to say, and that every employee is integral to our success.

There's always more information out there, and often, the information that matters most is what's nearest to you. The Geo team is made up of our geography and e-commerce experts. When we're not mapping the Amazon rainforest, we're helping you buy a bike, recommending the best slice of pizza within pedaling distance, providing directions on how to get there, and letting you pay for it via your phone. From Google Maps and Google Places, the Geo team helps our users navigate the world around them.

GIS Data Engineer
Mountain View, CA
Ground Truth is seeking an experienced Software Engineer to help develop the tools, software and processes to prepare vector and/or raster data to launch new maps across the world. Geographic Information System (GIS) Engineers are the mapmakers of the 21st century. Working with massive data sets, you write scripts to process, compress and analyze imagery and vector data collected from the air, land and sea.

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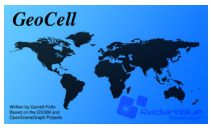

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