



**SPECIAL POINTS OF INTEREST:**

- Read through our Feature Article on GIS in the Michigan Army National Guard
- Welcome to our Newest Board Members: Brodey Hill of Kent County and Andrew Giguere of Leelanau County!
- Volunteer with IMAGIN by joining one of our Teams today.

**INSIDE THIS ISSUE:**

Member Spotlight	1-3
Upcoming Events	2
Feature Article	4-5
Conference Wrap-up	6
President's Message	7
Vendor Info	7

## Member Spotlight-Southeast Michigan Council of Governments

### About SEMCOG

The Southeast Michigan Council of Governments (SEMCOG) was established in 1968 as a regional planning partnership in Southeast Michigan. SEMCOG is accountable to local governments who join as members. Membership is open to all counties, cities, villages, townships, intermediate school districts, community colleges, and public universities in Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne Counties. There are 160 current members as of June 2014. The SEMCOG region covers a 4,500-square-mile area, with 4.7 million residents. Funding is provided by federal and state grants, contracts, and membership dues. SEMCOG fills several roles in the region as:

- Designated Metropolitan Planning Organization (MPO) responsible for regional transportation planning.
- Designated planning agency for both water and air quality.
- Responsible for specific housing and land use planning elements as authorized by the U.S. Department of Housing and Urban Development.
- The Michigan State Single Point of Contact (SPOC), reviews select federal grant

applications for a variety of local, regional, and state projects in relation to regional plans and policies

SEMCOG's GIS supports a wide variety of applications throughout the region. As communities identify needs for effective planning tools, they benefit from partnerships with SEMCOG to acquire data, facilitate discussions, and explore new technologies. They can also take advantage of SEMCOG's wider vision, determining where and how they fit into the regional context. Here are

just a few projects SEMCOG is currently involved in that rely heavily on geospatial technologies.

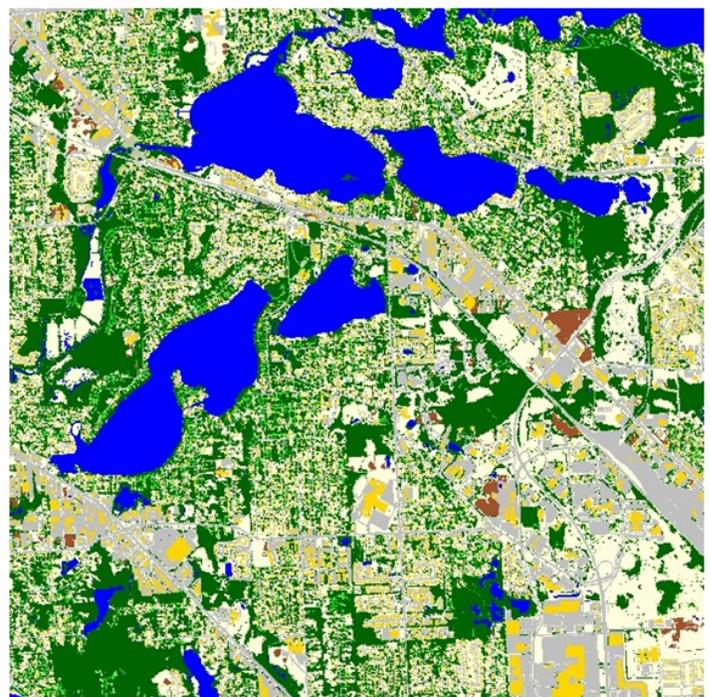
### Green Infrastructure

In 2012, SEMCOG contracted with the Sanborn Map Company to develop a land cover dataset to help create a green infrastructure vision for the region, and to serve as a basis for other planning activities and socioeconomic forecasting.

*(Continued on page 2)*

### Example of a Green Infrastructure Map

- Impervious Surfaces: Buildings/ structures
- Impervious Surfaces: Paved: Drain to sewer
- Open Space - Grass/Scattered Trees: Grass cover > 75%
- Trees: Grass/turf understorey: Ground cover 50% - 75%
- Trees: Grass/turf understorey: Ground cover > 75%
- Trees: Impervious understorey
- Urban: Bare
- Water Area





## Upcoming Events

- July 11, 2014—IMAGIN Board meeting via Teleconference
- July 13-16, 2014—MI Association of Equalization Directors 47th Annual Conference in Bay City, MI
- July 14-18, 2014—ESRI User Conference in San Diego, CA
- July 15, 2014—3rd Annual MI Meet-up at the ESRI UC in San Diego, CA (6pm at The Yard House)
- August 3-6, 2014—MI Assessors Association Summer Conference in Plymouth, MI
- August 7, 2014—Statewide GIS Users Group Meeting in Lansing, MI
- August 8, 2014—IMAGIN Board Meeting via Teleconference
- September 12, 2014—IMAGIN Board Meeting via Teleconference
- September 14-16, 2014—MI Association of Counties Annual Conference on Mackinaw Island
- September 17-19, 2014—MiCAMP's 19th Annual Conference at Boyne Mountain Resort
- October 2, 2014—Statewide GIS Users Group Meeting in Lansing, MI

“Knowing the business activity of a building allows SEMCOG to determine the number of jobs by employment type a building can support”

## Member Spotlight-SEMCOG

The dataset was acquired through a Department of Housing and Urban Development (HUD) Sustainable Communities regional planning grant. Derived from 2010 ortho-imagery and LiDAR, it included:

- Land cover – including impervious surface, open space, trees, urban: bare, and water
- Tree canopy – leaf-on imagery
- Composite data for green infrastructure assessments

The data helped identify the

green infrastructure currently in the region, create an identifiable system, and craft benchmarks by region, county, and watershed. The *Green Infrastructure Vision for Southeast Michigan* incorporates where the region wants to go in the future and provides policy recommendations and suggestions for various levels of government, business, academia, and other stakeholders. The plan and additional information can be found at <http://www.semco.org/greeninfrastructure.aspx>

### Building Footprints

SEMCOG also acquired a region-wide building footprints layer as part of the land cover dataset. It is based on 2010 ortho-imagery (1-foot pixel resolution), and LiDAR data.

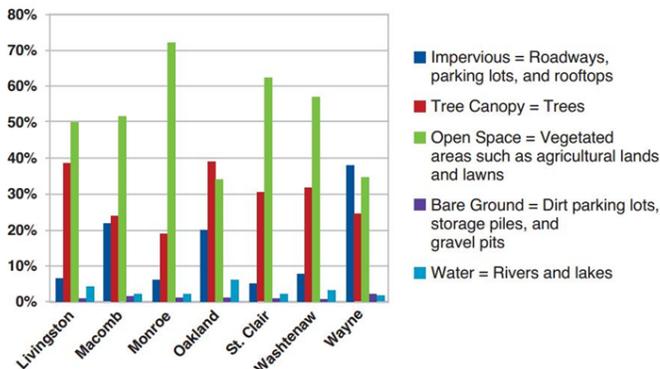
### Example of Building Footprints



The original footprints represent buildings on the ground as of spring 2010. Footprints were compiled using heads-up digitizing of 2010 ortho-imagery in a 2D environment, with a minimum size of 100 square feet required for delineating a building. Buildings were then attributed with the median height from the LiDAR points intersecting the structure, after tree canopy points were removed to eliminate over-hanging trees from affecting the height calculation.

In order to make the building footprints layer more useful for planning purposes, a variety of source data was used to add

Percentage of Land Cover in Southeast Michigan



# Member Spotlight-SEMCOG

information on each building's location, use, and physical characteristics. A building type classification was also developed to assist in forecasting and socioeconomic analysis. This building type attribute was designed to identify the type of housing for residential buildings, and the business activity for nonresidential buildings. Knowing the business activity of a building allows SEMCOG to determine the number of jobs by employment type a building can support; as well as group buildings by their trip generation characteristics or the presence of any environmental constraints that

would make a property more challenging to redevelop.

SEMCOG is currently in the process of reviewing each community's footprints; updating or assigning building types; identifying the number of housing units and stories in multiple-family and condominium developments; and correcting any parcel or attribute data as necessary. Communities will receive a copy of their footprints inventory when complete. To date, SEMCOG has processed about 2.1 million of the estimated 2.6 million buildings in the region. In



**3D Model of Footprints**

the future, plans will be made using various resources to bring the footprints inventory up to year 2015.

The building footprints provide local units of government with a wealth of information about the buildings in their community. It adds a new set of planning tools, such as 3D building model, streetscape visualization, market/neighborhood analysis, and housing assessment to every community's toolkit.

The data attributes chosen to be maintained for each building footprint are outlined in the table below:

TAX ASSESSING ATTRIBUTES	LOCATION ATTRIBUTES	PHYSICAL ATTRIBUTES
TAXID	Address Type	Median Height from LiDAR
Number of TAXID's	Building Address	Building Type
Legal Jurisdiction	Second Address	Residential Square Feet
	Mailing City	Nonresidential Square Feet
	Mailing Zip Code	Year Built
		Stories
		Housing Units
		Building Condition

For more information on SEMCOG's building footprints project, contact Janet Mocado at 313-324-3434 or [Mocado@semcog.org](mailto:Mocado@semcog.org)

If you are interested in submitting a Member Spotlight Article for a future issue of the IMAGINews please contact the IMAGIN Communications Team via email at [communication@imagin.org](mailto:communication@imagin.org).

## SEMCOG At A Glance

**Population:** 4.7 million residents

**Area:** 4,500 square miles

**Established:** 1968

**Current Membership:** 160 (As of June 2014)

**Total Staff:** 66

**Funding:** Provided by federal and state grants, contracts, and membership dues

**SEMCOG's website:** <http://www.semco.org>

**Member Counties:** Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, & Wayne



“military bases also have something most communities don’t: ranges and tank trails, firing points and targets, Middle Eastern villages and urban assault centers, all of which are mapped.”

# GIS in the Michigan Army National Guard

What goes on behind the security gates of a military base is a mystery to most civilians who have never been involved with the armed services. In reality, a military base is a small community with buildings and utilities; forests and lakes; basketball courts and gas stations. But military bases also have something most communities don’t: ranges and tank trails; firing points and targets; Middle Eastern villages and urban assault centers, all of which are mapped.

The Michigan National Guard (MING) maintains two training sites, Camp Grayling in Grayling at approximately 147,000 acres and Fort Custer in Battle Creek at approxi-

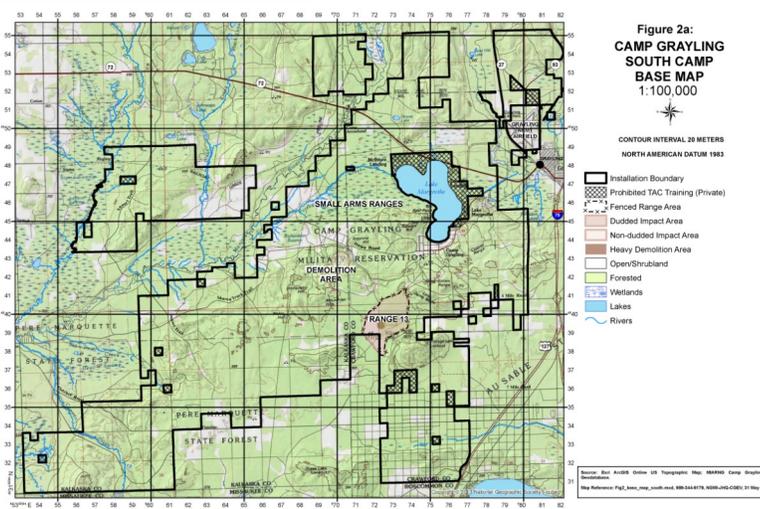
In a nutshell, every National Guard soldier is assigned to a Readiness Center, where they go to train one weekend a month. Camp Grayling and Fort Custer are training centers where each soldier goes for two weeks in the summer for their Annual Training. Their geodatabases comprise the features of these 49 armories and 2 training sites.

The MING is a state military force, and as such, is run by the Michigan Department of Military and Veterans Affairs. The MING is part of the state government, but also has requirements set by the National Guard Bureau in Arlington, VA, which reports

to the Department of Defense (DOD). So who the GIS staff works for is complicated, and often a factor in how GIS business is conducted. The MING first fielded a GIS program in 1992 in the Environmental Division using GRASS (Geographic Resources Analysis Support System). Since then, the GIS program has

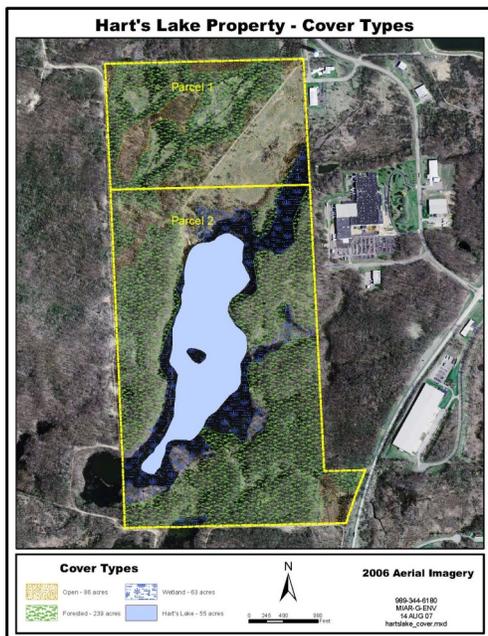
expanded to other Divisions, and is now using ArcGIS 10.2 with an SDE geodatabase. The mission of the MING is to “provide relevant and ready operational military forces, consistent with our values, in support of our state and nation.” The GIS program is here to support this mission through management of the training lands, facilities and ranges. The MING is committed to a dual goal of being good stewards of the land, while maintaining the land for realistic training experiences. The MING uses GIS to satisfy both goals.

GIS has a wide variety of uses across the multiple divisions in the department. The MING creates buffers around lakes, rivers and wetlands, to delineate the area in which troops are not allowed to train. The MING maps protected animal and plant species and historical and Native American cultural sites for consideration in management decisions. GIS is used as a tool to conduct environmental assessments on new construction or training activities to satisfy the requirements of the National Environmental Policy Act (NEPA), which takes into account factors such as wetlands, lakes and streams, threatened and endangered species, potential runoff, cultural sites, prime farmland, noise and proximity to churches, schools and hospitals. The MING also uses GIS to review timber harvest proposals to ensure that they are consistent with planned uses of the land for training. All physical assets, such as buildings, roads, and utilities are tracked and managed by GIS, which is a requirement of



Base Map showing Camp Grayling’s South Camp with Artillery Ranges and Prohibited Training Areas

mately 7,000 acres. There are also 49 Readiness Centers (armories), scattered around the state from Calumet to Adrian. Everyone has probably seen these while traveling around the state, and wondered what goes on there.



**Cover Types around Hart Lake**

the National Guard Bureau.

The Range Operations and Training Division (O&T), which manage the training activities, has some GIS applications which are unique to the military. Between Camp Grayling and Fort Custer, there are training opportunities for many of the scenarios that our troops may meet when called to national defense. The MING O&T has mapped range footprints for firing ranges of multiple caliber weapons, tank maneuver courses, and an air to ground bombing range. There are drop zones to practice dropping supplies, MEDEVAC (Medical Evacuation) points to practice evacuating the injured, a land navigation course to practice navigation with topographic map and IED (Improvised Explosive Device) courses to help soldiers recognize the ways insurgents may plant IEDs. There is a Forward Operating Base (FOB) similar to the ones that troops live in while in Afghanistan and a Middle Eastern village complete with Mosque and Market-place. The MING's newest training facility is an urban training facility

consisting of 26 structures representing a complete city with government buildings, industrial/commercial facilities, churches, schools, hotels and homes and the associated infrastructure. These are all wired with computer sensors which simulate enemy actions and record troops' response to be played back later for evaluation. This allows soldiers to train for engaging the enemy in an urban situation, building entry, room clearing techniques and subterranean maneuvers.

The DOD has developed a special tool for ArcGIS to calculate Surface Danger Zones. A Surface Danger Zone, or SDZ, is the exclusion area that could contain projectiles, fragments or components from firing, launching or detonating weapons and explosives, and is thus strictly controlled when a range is active. For every type of weapon fired on each range, an SDZ is calculated, which is published in the range regulations and given to the range officer in charge. Before GIS, SDZs were drawn on a paper map with a pencil. On a 1:50,000 scale map, it took great patience and precision to draw an accurate and safe area. Now with GIS, that laborious process can now be done quickly and accurately. GIS is also used to design and place new ranges, calculate noise generated from firing and determine where roads need to be

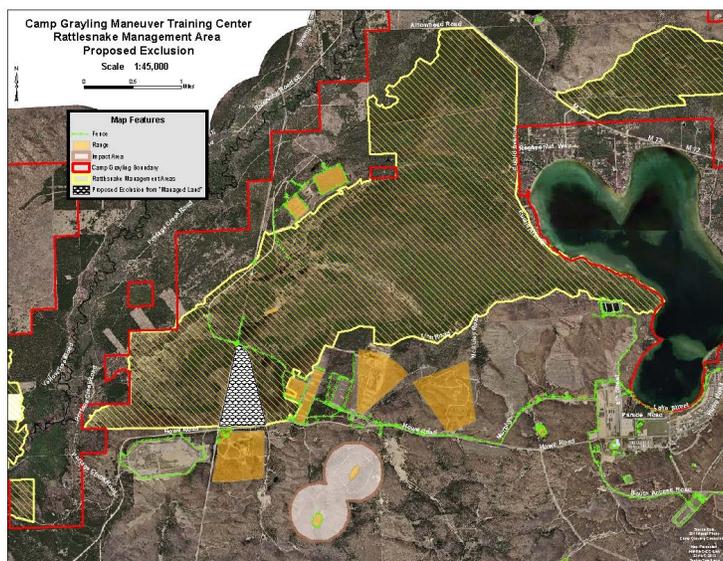
blocked during active exercises.

During the training season, the MING's GIS office is a thoroughfare of soldiers coming in for maps to aid in training, such as training areas, ranges, firing points or communication towers. Commanders stop in to have GIS personnel lay out a training scenario; where to drive, where will they engage in a fire fight, where will they bivouac (camp out) for the night. The MING GIS can map out company, battalion, and brigade level exercises designed to give full battlefield experience.

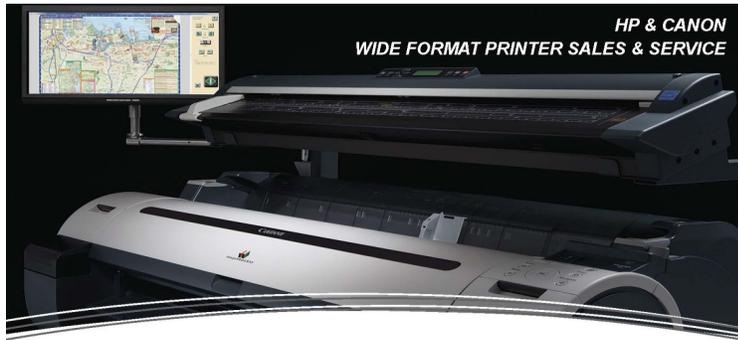
GIS in the Michigan National Guard has grown in the last 20 years from an unheard of program in the Environmental Office into a functional tool that allows the department to leverage spatial data and information for efficient and accurate decisions. Currently, there are three full time GIS staff in the MING providing assistance to the various full time and weekend soldiers and civilians that work for the National Guard. They are in the process of building an inward facing web viewer which will allow users to analyze, create and print their own maps. It will allow the MING to disseminate spatial data and specific geoprocessing tools or widgets for use by various divisions for specialized applications throughout the state. The soldier at his/her home armory who is coming to train at Camp Grayling will be able to zoom to his/her training area, plan out his/her exercise and come to training prepared and ready to go to the field. By putting GIS into the hands of every soldier it will streamline decision making, provide spatial visualization of the training exercise, and allow troops to concentrate on training for the critical mission of protecting and defending the United States.

~ Article submitted by Carla J. Elenz, GISP; GIS Manager, Michigan National Guard Environmental Office, Camp Grayling

**Map showing Rattlesnake Management Areas around some Artillery Ranges**



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Map Gallery



Keynote James Fee

Vendor Networking Lunch



# IMAGIN's 2014 Conference Wrap-Up

IMAGIN's 23rd annual education conference offered numerous opportunities to learn, network, and get energized to put new ideas into practice. The conference featured great keynotes, fascinating educational sessions, and fun social events.

The keynotes both put the future in focus. James Fee discussed a bit of GIS history and offered his impressions of where the profession is headed. Eric Brady demonstrated the potential of 3D GIS, particularly for visualization in urban planning.

The educational session topics varied widely from unmanned aerial vehicles to parcel fabrics to predicting permafrost. The variety and quality of presentations made choosing which sessions to attend difficult. Many of the presentations are available in the past conferences section of the IMAGIN website at [www.imagin.org](http://www.imagin.org).

The awards ceremony featured many deserving individuals and organizations.

Frank Sobie was selected to receive the Geospatial Achievement Award for his contributions to IMAGIN and GIS. Additional award winners include:

- GIS for Everyone – Kent County;
- GIS Innovation – State of Michigan;
- Volunteer of the Year – Brooks Kelley
- Jim Living Scholarship – Lamees Mohammed.



**Frank Sobie: Geospatial Achievement Award Winner**

A beanbag toss tournament kicked off the social events Sunday night. The Ottawa County duo of Pete Schneider and Marshall Boyd dominated the rest of the field. Monday night featured the 2nd annual euchre tournament with 32 participants. Nicole Scholtz and Thomas Derezewski placed

first and second. Our keynote speaker, James Fee, was awarded most outstanding player of the tournament. Both events offered great opportunities to enjoy an evening with colleagues whether participating in the tournaments or as spectators.

**Euchre Tournament**



# A Message from the IMAGIN President

IMAGIN would like to thank all attendees and sponsors for making the 23rd Annual Conference a success.

Welcome to summer IMAGINews readers, and welcome from your 2014-2015 IMAGIN Board of Directors. As your new President, I would like to take a moment to introduce myself to you.

My name is Thomas Van Bruggen, and I am the GIS Administrator for Muskegon County, Michigan. I am a 1997 graduate of Central Michigan University's geography program and have spent my entire professional career with Muskegon County. In the sixteen years I have spent at Muskegon, I have built the GIS program from the ground up, starting with hand drafting parcel maps through the enterprise system in place today. I have been involved with IMAGIN since attending my first conference in 1999, was appointed to the board in early 2008, and served as Secretary from 2008 until 2014.

Your Board of Directors held a planning session on June 6, 2014 to chart the course of IMAGIN for the next year. Guided by our existing mission and vision, the Board set out to focus our efforts on identifying and prioritizing focus areas for IMAGIN for the 2014-2015 year and have established the following goals for the next year.

## The Mission of IMAGIN

IMAGIN enhances professional development of Michigan's Geospatial community by providing an annual conference, educational events, and networking opportunities.



**IMAGIN President  
Thomas Van Bruggen**

## The Vision of IMAGIN

To improve Michigan's Access to Geospatial Technologies and to provide opportunities for professional interaction by fostering collaboration and networking.

## IMAGIN's 2014-2015 Goals

- Goal 1: Provide professional development networking opportunities for Michigan's geospatial community
- Goal 2: To improve communication to the membership
- Goal 3: To host a student paper and poster competition with awards ceremony
- Goal 4: To improve collaboration with other statewide organizations
- Goal 5: To recognize the contributions of geospatial professionals
- Goal 6: To increase membership in IMAGIN

Your Board is working on restructuring the teams (aka: committees) that are tasked with various objectives in meeting these goals, and we are going to be looking to YOU for help. I have charged the Board to engage the membership directly to involve members, as we are a better and stronger organization when we work together. There is much to be done over the summer.

And in the spirit of engaging our membership, let me start by asking you to give me feedback. What do you want or need IMAGIN to be? How can IMAGIN best serve your professional needs? I truly welcome any input you would like to share. You can send me your thoughts via email to [vanbruggenth@co.muskegon.mi.us](mailto:vanbruggenth@co.muskegon.mi.us) or feel free to give me a call and share directly, my number is 231-724-4458.

In this ever-changing media-driven world we live in, we need to remember that our greatest asset is each other. We learn the best and grow the most through direct interaction with our colleagues, so I encourage you to stay informed, get involved and help shape IMAGIN into a great professional GIS organization. We are better together.

Have a wonderful summer!

~ Thomas Van Bruggen

# Vendor Advertising Opportunity

Would you like to advertise your business or agency in our newsletter? IMAGIN will once again be publishing their printed newsletter (IMAGINews) on a quarterly basis. Take advantage of the opportunity to reach all of its members for a minimal fee. Right now you can get a business card-sized ad for \$75 per issue or \$200 for 4 issues. If you purchase 4

issues worth of ads at one time you will also be eligible for a half page Vendor Spotlight article (on a first-come, first-served rotation), where you can highlight anything related to your business.

To purchase an ad or for more information please contact the IMAGIN Communication Team at [communication@imagin.org](mailto:communication@imagin.org)



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### Improving Michigan's Access to Geographic Information Networks

**Thomas VanBruggen**, *IMAGIN President & Coeditor*  
**Sarah Merz**, *IMAGIN Vice President & Communications  
Team Lead*  
**Lori Schultz**, *Coeditor*  
**Michael Woods**, *Coeditor*  
**Maryellen Jansen**, *Coeditor*

**IMAGIN is a non-profit professional development organization committed to providing opportunities for its members to network with professionals who are using, creating, or maintaining spatial resources within Michigan. IMAGIN serves as a crossroads for spatial information users/developers at all levels of government, business, and non-profit organizations by providing its members partnership opportunities to recognize, share, and create spatial data resources for both traditional and new application.**

IMAGINews publishes original, timely, and innovative articles and news items that advance knowledge regarding GIS, related technologies, and their use within Michigan. IMAGINews welcomes submissions from IMAGIN members and others. Please send article submissions in Microsoft Word format to [communication@imagin.org](mailto:communication@imagin.org).

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