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SAW Grants and GIS for Asset Management

The Michigan Department of Environmental Quality (MDEQ) established the Stormwater, Asset Management, and Wastewater (SAW) Grant Program to assist communities in developing an asset management program for stormwater and wastewater collection systems and treatment plants, storm-water management plans, and/or planning and design of storm-water and wastewater projects. MDEQ plans to release $450 million in grant money over the next few years to successful applicants. The grants have a $2 million cap per community; the first million dollars includes a 10-percent local community match and the second million dollars includes a 25-percent local match. A total of 673 grant applications totaling $541 million dollars were submitted to MDEQ on December 2, 2013. Almost $100 million dollars were awarded to 94 communities in April 2014, which was the first round of the grant. The second round of grant funds could be awarded as soon as October 2014.

Asset management programs are designed to help communities identify the desired level of service at the lowest life cycle cost for rehabilitating, repairing, or replacing the assets associated with a wastewater or storm-water system. Assets may include manholes, inlets, outfalls, pipes, pump stations, and the equipment and processes associated with treatment facilities. Asset management helps plan for future capital improvement and identifies problems before they become emergencies. It also helps communities prioritize limited funding by focusing on the systems' most critical assets. Communities are better able to establish community expecta-tions and set clear goals for their own maintenance and funding.

How do Geographic Information Systems (GIS) and asset management work together? The location and physical condition of assets are common areas where GIS plays a role in asset management. Asset management is a great oppor-tunity to pull multiple sources of information from different formats and merge them into one location - your GIS. Such formats could be: record drawings, AutoCAD© files, survey data, historic hand-written field notes, and personal knowledge. A map is the easiest way to integrate many sources of data together to get a visual representation and a better understanding of what a community owns or maintains.

Communities are given the opportunity to survey and field verify the location of sewer assets with the SAW grant.
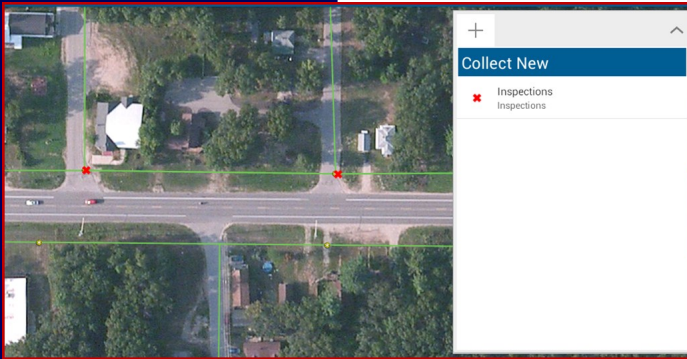
☑ **Sanitary Sewer Pipe Rating**
— Sanitary Sewer
— 0-No defects
— 1-Minor defects
— 2
— 3
— 4
— 5-Most significant defects
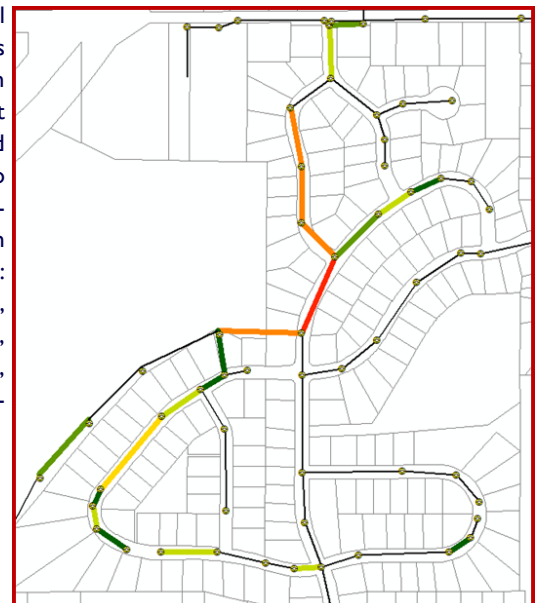
Example of a PCAP Structural Pipe Rating

SAW Grants & GIS for Asset Management

ESRI Collector App

Consequence of Failure/ Probability of Failure

Simple field map books, ArcGIS Online, ESRI's Collector app, and geo-enabled Adobe© PDF files are examples of map applications that can help field crews locate and document assets in GIS.

Another part of asset management is condition assessment and rating of assets. Each asset is inspected, and the results are used to determine what needs to be repaired and/ or replaced. The National Association of Sewer and Service Companies (NASSCO) sets standards for the assessment and rehabilitation of underground infrastructure. The SAW grant requires inspections and condition ratings to meet NASSCO standards for Manhole Assessment & Certification Program (MACP) and

Pipeline Assessment & Certification Program (PACP). Both programs use a grading scale of one (minor defects) to five (most significant defects). One way FTCH is managing manhole inspections is using ArcGIS Online and ESRI's Collector app. Community data and blank inspection databases are loaded to ArcGIS Online, and data is accessed using ESRI's Collector app on smart telephones or tablets in the field. Manhole inspections are completed using the Collector app, instead of paper, and instantly uploaded to ArcGIS Online for use in the office. Once this data is uploaded back to the office network, this data can be used to generate manhole inspection reports within ArcMap. Closed circuit television (CCTV) inspection, pump station inspections, smoke testing, catch basin inspections, infiltration and detention basin inspections, and outfall evaluations are all eligible for SAW grant funds.

The SAW grant opens up new opportunities for facilities management using GIS. Mapping of treatment plants and pump stations can benefit from having an asset management plan. Documents can be stored and linked to each piece of equipment, along with photos, manuals, and reports.

GIS is used to evaluate consequence of failure (criticality) by assigning priority ratings to assets based on severity of impact if an asset should fail. Factors that might affect criticality include, diameter, failure history, critical customers (hospitals, city hall, airport), street type and proximity to wetlands. GIS is also used to evaluate probability of failure. Material, age of asset and condition are used to determine probability of failure.

The final step of the SAW grant is to create an asset management plan. A plan is developed to get the most value from assets, identify financial resources, reduce costs of unscheduled repairs, improve system reliability, and reduces risk. Many different asset management software options exist for communities of all sizes to manage their plans. For smaller systems, the MDEQ has provided a user's guide and workbook in MS Excel© format in the Forms and Guidance section of the SAW website (http://www.michigan.gov/ deq/0,4561,7-135- 3307_3515_4143-294952-- ,00.html). Larger systems may choose to implement GIS linked work order and asset management systems such as Azteca Cityworks©. Communities use maintenance history, inspection history, and condition assessment to determine the level of deterioration of an asset and likelihood of asset failure. GIS is a cost-effective tool that helps management balance the risk and cost of maintaining a system.

~ Submitted by Caryn Ashbay, GIS Specialist with Fishbeck, Thompson, Carr & Huber 616-464-3930


If you are interested in submitting an article for a future issue of the IMAGINews please contact the IMAGIN Communications Team via email at communication@imagin.org.

Spotlight on the Little Traverse Bay Bands of Odawa Indians

The Little Traverse Bay Bands of Odawa Indians (LTBB) was established in 1855 through the Treaty of Detroit. The LTBB Geographic Information Systems (GIS) Department currently employs a staff of two with over 20 years' experience in GIS and Global Position System (GPS) technologies which supports a multitude of additional services within the Dep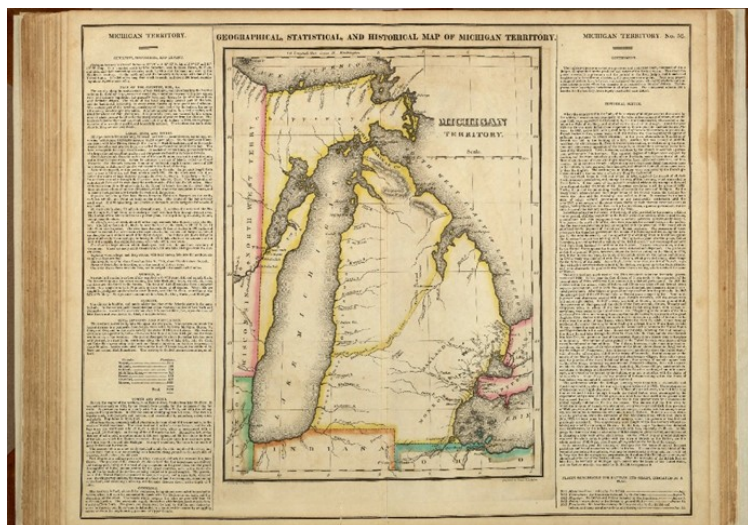artment. Performing mainly as an in-house service provider to other governmental branches, departments and programs, GIS continues to refine and interpret treaty areas that have a direct impact on many functions of LTBB. Under federal treaties with the United States Government in 1836 and 1855, hunting, fishing and gathering were retained by LTBB in order to sustain our traditional ways of life within the region. Some of these areas, although agreed upon by
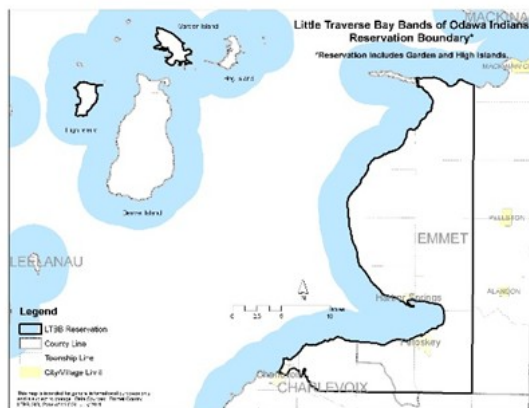
Reservation Boundary—
Source: LTBB GIS Department

parties involved, were not surveyed to modern data standards and as such create opportunities for GIS technologies to intervene for the benefit of LTBB membership. For example, at the time of the treaties our understanding for the outline of the state of Michigan was dramatically different than present day understanding (see map at left). Language within the 1855 treaty refined the LTBB reservation to include portions of modern day Emmet and Charlevoix counties mainland plus Garden and High Islands to the north and west of Beaver Island (see map above).

Source: Cartography Associates, David Rumsey Collection

LTBB At A Glance

Population:
Over 4500 tribal citizens

Reservation Area:
338 square miles

Established:
1855 Treaty of Detroit

Total Governmental Staff:
Over 200 (2 GIS Staff)

Funding:
Federal and Enterprise funds

Website:
http://www.ltbbodawa-nsn.gov/

LTBB

Spotlight on LTBB

The Natural Resources Department along with the Natural Resources Commission (NRC) is the largest user of GIS/GPS functionality and services. Per request of the LTBB NRC, GIS had been tasked with the interpolation and mapping of the Great Lakes 1836 Ceded Territory Lines as stated in 1836 language with results of the analysis to be presented at a Chippewa Ottawa Resource Authority (CORA) executive session. Many times, these treaty delineated areas are mapped by multiple agencies such as state and federal entities (tribes and US) and usually discrepancies exist with each interpolation. With advancements in technology, increased understanding of the Earth's surface and the availability of newer and more accurate spatial data increases, these type of discrepancies will naturally occur. GIS analysis such as this assist LTBB leadership with negotiations and coordinated efforts with these and other entities LTBB interacts with.

GIS is heavily used in conservation enforcement, helping to track violations and patrol routes. GIS has also been used to help determine habitat suitability for bald eagles and wolves within and around the reservation. A model has been built to aid sampling protocol with spring walleye assessments of inland lakes. Environmental Services staff uses GIS for ongoing projects such as water quality and macro invertebrate sampling, Brownfield and endangered species delineation, and wetlands inventory. A model has been constructed to perform soils erosion analysis for road ways (see map at left).

In addition to grants and project specific deliverables,

Source: LTBB Environmental Services Department

Potential for Nonpoint Source Pollution
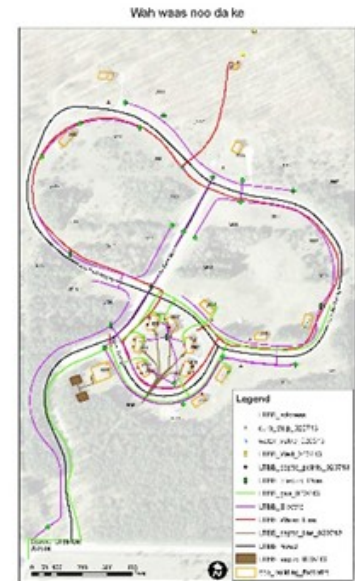
Source: LTBB GIS Department

Wah waas noo da ke

the department has initiated several ongoing projects. Continued development on both LTBB Housing sites, Mtigwaakiis in Charlevoix County and Wah waas no da ke in Emmet County, has led to a coordinated effort with Indian Health Services (IHS) and GIS for ongoing utilities mapping (see map above).

A Water Systems data dictionary loaded onto a Trimble GeoXH with external Zepher antenna gives the department a high degree of spatial accuracy for data collection. Research for potential funding sources for a Ground Penetrating Radar (GPR) system is underway. A GPR in conjunction with the GeoXH would give the department an ability to map buried utility assets without using tracer wire or earth moving equipment, and would also aid with the inventory and mapping of culturally significant areas.
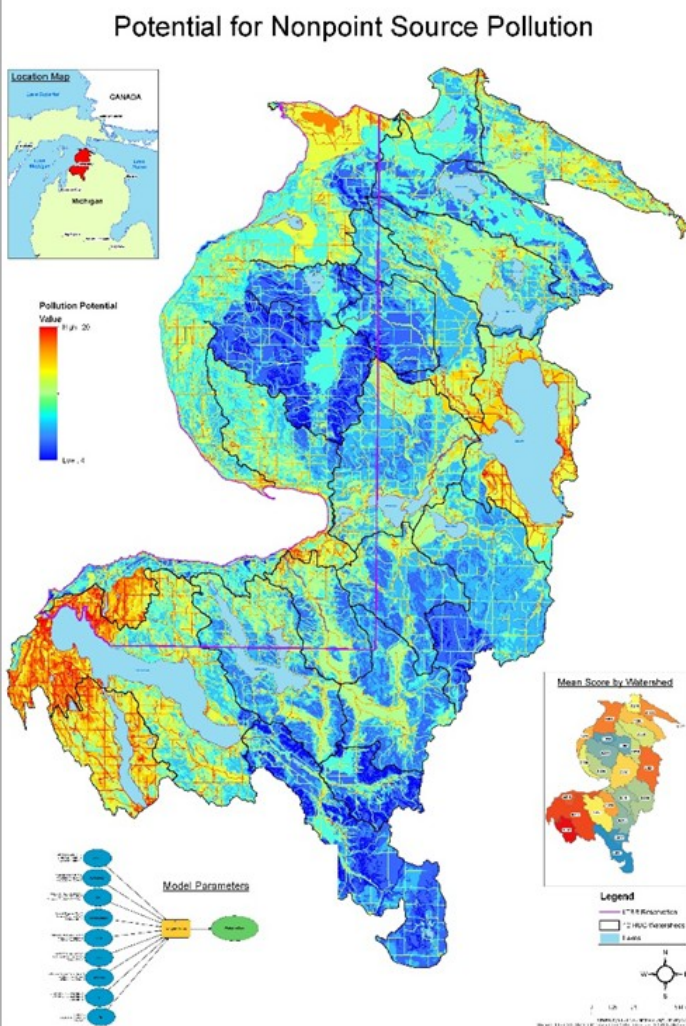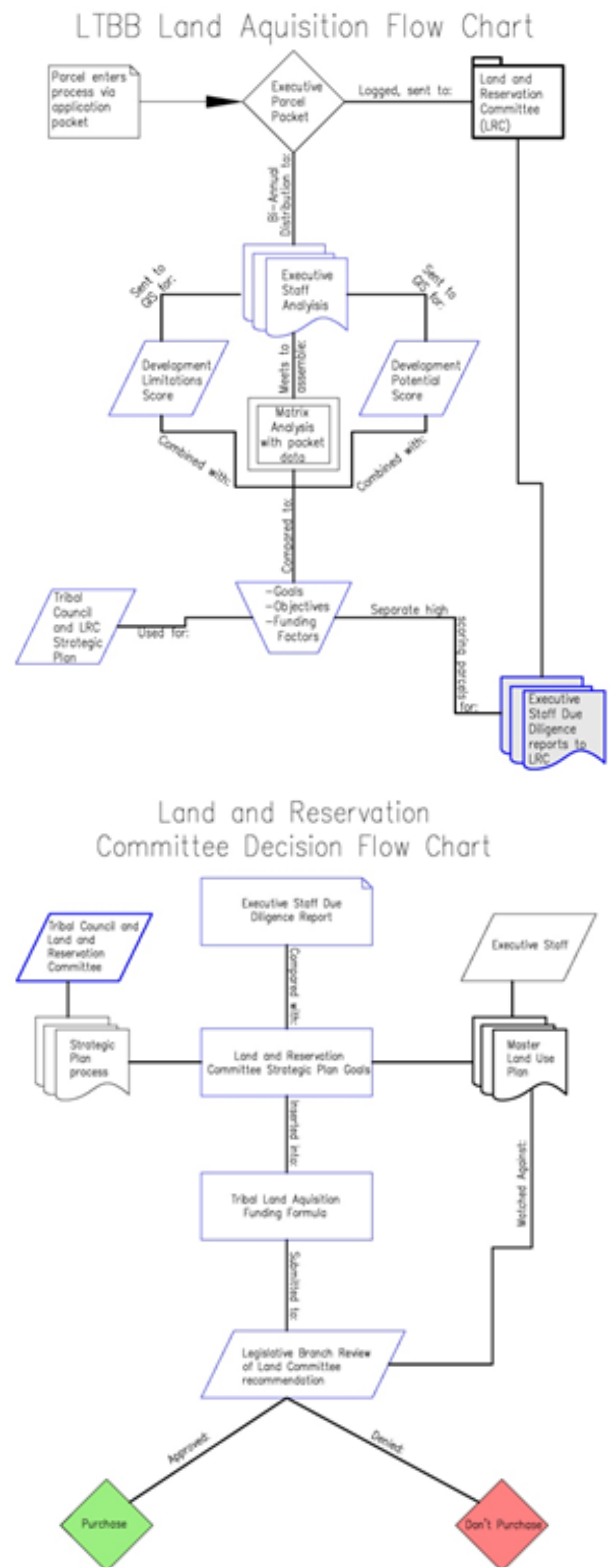
Similar to the amount of services provided to the Natural Resources Department, GIS serves many functions in the Planning Department. For example, GIS is heavily involved with the draft Zoning Regulations, Transportation Planning and Transportation Improvement Plan (using GIS analysis of roads contained within the LTBB reservation resulted in an increase of 2.5 million dollars in road construction funds), Master Plan and interpolating and mapping of land legal descriptions. A GIS model has been built to aid the Land and Reservation Committee (comprised of Tribal Council members) with potential land purchases called the "Matrix". This model includes roughly 25 different data sets designed to help classify each parcel into seven potential use categories using GIS analysis and a weighted scoring system based on the 25 inputs. Potential categories are Cultural Preservation, Conservation, Industrial Development, Housing, Government, Mixed Use and Commercial. This is included in the Planning Department's Draft Zoning Regulations. A flow chart of the process is attached.

In one of the newer initiatives, GIS is working with the Housing Department on the Home Inventory Tracking System (HITS) in conjunction with IHS. In the past, IHS has estimated the number of Native American homes in the Community Deficiency Profiles (CDP) with sanitation deficiencies without referencing them geographically, so "funding is subject to ambiguity and inaccurate counting." With GIS, LTBB now has the ability to map out each enrolled tribal member's home very accurately. With an accurate map, the hope is LTBB would be in line for greater funding opportunities by reporting an accurate inventory of tribal homes with sanitation deficiencies to US Congress within our Service

Area. These data will appear on the online database maintained through IHS. Protected access to this database will be provided to individual tribes upon request to ensure integrity and privacy of the data.

The department also supports a multitude of other requests in areas such as graphic design and Computer Aided Drafting (CAD), and is responsible for establishing and maintaining relationships with outside governmental entities that can help further tribal GIS operations through data sharing agreements and project collaboration. The department is fortunate to have excellent relations with surrounding governmental and nonprofit organizations and is an active participant with the CCE (Charlevoix, Cheboygan, and Emmet Counties) 911 GIS Workgroup. Current participants include: GIS staff from the counties, CCE 911 Dispatch, Little Traverse Conservancy, Tipp of the Mitt Watershed Council, and the City of Petoskey. The workgroup is always open to other organizations who have an interest and provides local organizations with a convenient platform to meet face to face twice annually for the purposes of data sharing, potential project collaboration, and exchange of technical expertise.

Lastly, GIS has begun to initiate various training avenues using GIS/GPS applications for interested LTBB departmental employees, and is always available to assist the Membership as a whole whenever possible. Many maps generated by LTBB GIS staff are consistently made use of by others such as: the State of Michigan DNR, citizens from other tribes, conservation enforcement staff from other tribes, and non-tribal citizens. GIS also provides direct services to the membership as a whole. For further information on the GIS

LTBB Land Aquisition Flow Chart

Land and Reservation Committee Decision Flow Chart

Department along with a brief departmental history and justification, please see the GIS Department online at http://www.ltbbodawa-nsn.gov/GIS/GIS.html

Source: LTBB Planning Department

~ *Article submitted by Alan Proctor and Jim Keiser*

It's Membership Renewal Time!

Keep an eye out for your 2015 IMAGIN Membership dues renewal notice, mailed the week of October 1st.

Supporting Organizations and Individual members can receive a $15.00 discount off the cost of their 2015 membership, if dues are renewed by December 31, 2014. Dues renewed after January 1st will pay the regular rate of $190 for Supporting Organizations, $40 for Supporting Organization Employees, $90 for Individuals, and Student memberships remain at $25.

Questions? Contact the Business Office at 517-338-3035 x 709 or at info@IMAGIN.org

Get ready for the 2015 SPPC

The annual Student Poster & Paper Competition is to be held on Thursday April 2, 2015 at Constitution Hall in Lansing. IMAGIN has partnered with the State of Michigan to host the competition alongside their bi-monthly GIS user meeting. Sponsorships are available for the event.

Please contact info@imagin.org for more details.

All submissions must be entered by Friday March 13, 2015. Paper participants must present their work to be eligible for prizes.

Additional information can be found at www.imagin.org/awards.phpor by emailing info@imagin.org.

Upcoming Events

- October 17, 2014—IMAGIN Board meeting in Mt Pleasant, MI
- October 21, 2014—ESRI Northern MI Users Group Meeting at the Leelanau County Offices in Lake Leelanau, MI
- November 10-13, 2014—Introduction to ArcGIS; ArcGIS II—Beyond the Basics; & Introduction to ArcGIS Online workshops hosted by MSU's RS&GIS

- November 14, 2014—IMAGIN Board meeting via teleconference
- November 19, 2014—Basics of GIS Course hosted by Oakland County Enterprise GIS
- December 4, 2014—Statewide GIS Users Group Meeting in Lansing, MI

- December 12, 2014—IMAGIN Board meeting via teleconference
- December 17, 2014—GIS Applied Course hosted by Oakland County Enterprise GIS

For Complete Details on all these events go to www.imagin.org

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