

OPEN RIVERS :

RETHINKING WATER, PLACE & COMMUNITY



WE ARE WATER MN



http://openrivers.umn.edu

An interdisciplinary online journal rethinking the Mississippi from multiple perspectives within and beyond the academy.

The cover image is a word cloud made from narratives representing We Are Water MN. Image courtesy of Minnesota Humanities Center.

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PRIMARY SOURCES

A LAKE WITH A CROSSING IN A SANDY PLACE

By Ashley Ignatius

As a GIS (geographic information systems) analyst with the Minnesota Pollution Control Agency (MPCA), most of my work happens at my desk. This work ultimately supports Minnesota's Water Quality Framework, a high-level, collaborative approach to managing Minnesota's water resources. My primary focus is Watershed Restoration and Protection Strategies (WRAPS), which includes the synthesis of water quality data and the development of high-level strategies to

protect and restore Minnesota's lakes, streams, and wetlands. What this means on a day-to-day basis is that I'm doing everything from running spatial analyses for the purpose of answering questions about watershed characteristics (e.g., "Can you tell me the number of acres of hay grown on land with three to six percent slopes in the north branch of the Whitewater River watershed?") to creating seemingly simple, basic map graphics for outreach publications.



A map from We Are Water MN showing visitor stories. Image courtesy of Minnesota Humanities Center.

Missing Data

A few months ago, it was a typical day at work for me. I was tasked with producing a basic map graphic for an outreach brochure—nothing extraordinary. I sent off the completed graphic and moved on to another project. The next day, our local watershed partner replied to my email and asked me to "add the reservation communities of Little Rock and Ponemah to the map." Perplexed, I wondered, "Had I made a mistake?" I was certain I had access to the most up-to-date spatial data. When using GIS to make maps, real world features are represented in spatial data as different thematic layers. For example, when making a map of a park, there would be one layer of trees (represented as points), one layer of sidewalks (represented as lines) and one layer of the park boundary (represented as a polygon). To make the park map, I would stack the different layers

on top of one another: park boundary polygon on the bottom, then sidewalk lines next, then tree points on top.

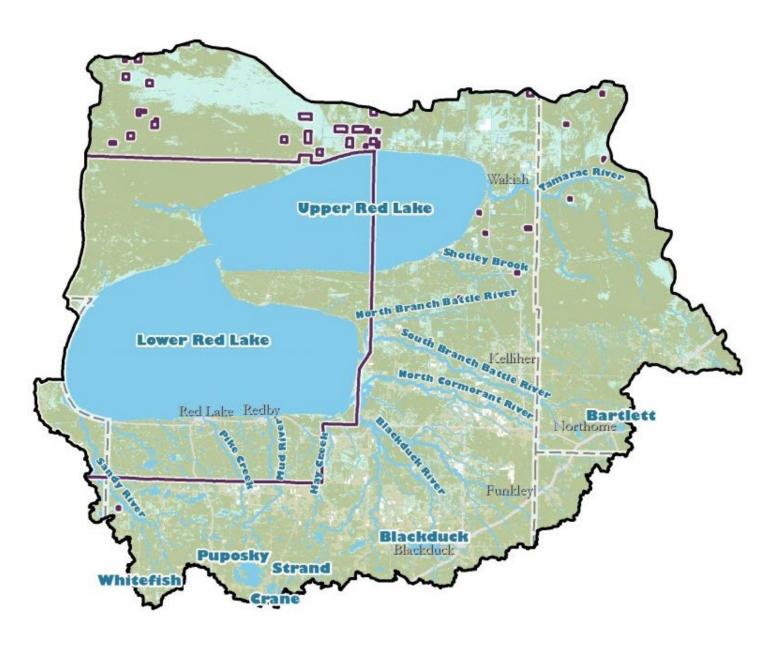
I looked through the Minnesota Cities, Townships and Unorganized Territories layer I had used, but found no polygons for the "City of Ponemah" or the "City of Little Rock."[1] The mistake I had made was assuming that this one layer I commonly use was the complete set of places. Any place that was big enough or important enough would be included in the layer, I assumed, and if it were not in the layer, I should not need to worry about it. That was far from the truth. From the isolation of my desk, in my city of 115,000 people, 350 miles away, I had inadvertently excluded entire communities, people, and their stories.



The image on the left is an aerial photograph of Goose Egg Park in Rochester, Minnesota. The image on the right illustrates how features such as trees, sidewalks, and the park property are represented in OpenStreetMap. Aerial Photograph Courtesy of Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. Map on the right courtesy of OpenStreetMap and contributors (CC-BY-SA) and Ashley Ignatius.

A quick Google search confirmed that these communities do indeed exist, so I sought another source of spatial data. I came across the Minnesota Geographic Names layer that includes "relatively permanent parts of the natural or manmade landscape" such as populated places, which are "places or areas with clustered or scattered buildings and a permanent human population (city, settlement, town, village)."[2]

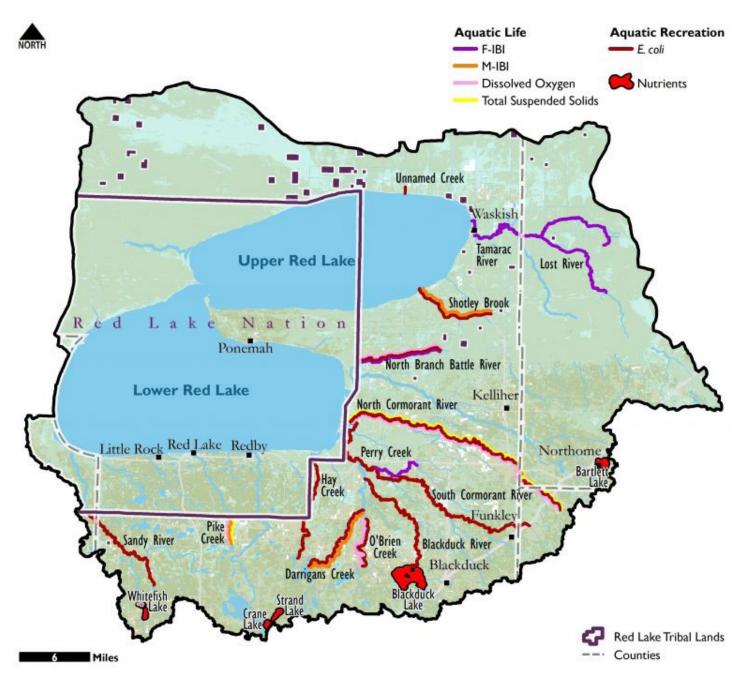
I added the two communities to the map, replied to the email with the revised map graphic, and carried on with my day. But this exchange got me thinking about what else I might be missing and the effect my inadvertent mistake and unawareness of these communities could have had on this map and others I have made. What could these mistakes mean for and to the people and places that were left off my maps?



The Upper and Lower Red Lake watershed map graphic before my edits. Map courtesy Open-StreetMap and contributors (CC-BY-SA) and Ashley Ignatius.

There are many ways that places end up missing from a map: unintentional omission, intentional removal, or perhaps most commonly, as a result of the cartographic design process. With the latter, some places are promoted to the top level and shown with high prominence on the map while others are minimized or removed.[3] With

a finite amount of space to convey information, including all places and features on a map may not provide additional benefit, but instead could result in confusion. Just as a museum curates how collections are exhibited, cartographers curate what places and features are displayed on a map.



The Upper and Lower Red Lake watershed map graphic after my edits, adding the two missing communities and other details to the map. Map courtesy OpenStreetMap and contributors (CC-BY-SA) and Ashley Ignatius.

Base Map

We Are Water MN was initially part of a larger project, Water/Ways, a traveling exhibition and community-engagement initiative of the Smithsonian Institution's Museum on Main Street. In phase one of We Are Water MN, six sites took turns hosting the exhibit: New London-Spicer, Saint Peter, Red Wing, Sandstone, Lanesboro, and Detroit Lakes. My responsibility for We Are Water MN was to create a large, seven-foot-wide-by-five-foot-tall map for the region around each host site that would serve as

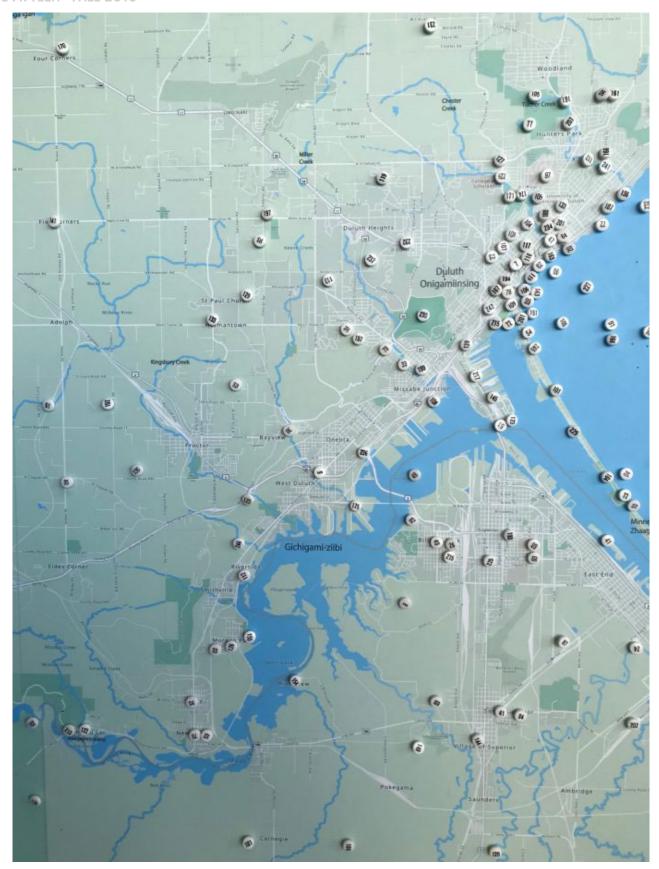
a base where exhibit visitors could share their water stories.

When asked if I could support phase two of We Are Water MN, I was excited. How great that more people would be given an opportunity to connect their community's values around water to thoughtful action and stewardship. Phase two provided the opportunity to work with two sites hosted by Native American communities—the Fond du Lac Band of Lake Superior Chippewa in Duluth and the Mille Lacs Band of



Duluth, Minnesota map from the Fond du Lac host site showing visitor stories.

Image courtesy of Minnesota Humanities Center.



Detail of the Duluth, Minnesota map from the Fond du Lac host site showing pin locations for visitor stories. Image courtesy of Minnesota Humanities Center.

Ojibwe in Onamia. Working with these host sites, it seemed like an opportunity existed to improve the map by adding the Ojibwe names of features and places.

On the other hand, I was concerned about how I would find the time to build these maps thoughtfully to reflect the diverse stories of each area. A common project management problem is to balance time, cost, and scope. I had less time allocated to work on phase two than on the previous phase, and adding Ojibwe names would change the scope of the project. It seemed important to add Ojibwe names, so we made it a priority.

My journey started as I thought about how I would create these maps of areas unfamiliar to me, and ensure that no one's place was missing from the maps. First, I needed to ask myself, "Should I do it?" Would bilingual labelling be useful to—or even welcomed by—the Native American communities hosting the exhibit? Or was this just something I wanted to do? Would I be filtering their concept of place through my own preconceived frames and experiences? Would the methods I use to make maps be able to adequately represent their concept of place? Secondly, I needed to figure out, from a technical standpoint, how to accurately source the names and place them in the correct location on the map.



Emily Buermann, the programs director at the Becker County History Museum. Image courtesy of Minnesota Humanities Center.

Becker County Ojibwe Lake Names Project

To answer the question of "Should I do it?", I wanted to have conversations with people who may be working on similar projects, and also who had a connection to Native American communities. One of the people I spoke with was Emily Buermann, the programs director at the Becker County History Museum.

Quietly tucked away next to the Detroit Lakes, Minnesota fire station, the <u>Becker County History Museum</u> hosts an impressive collection of stories about the people and places of Becker County. Wedding photo albums from the 1900s, every issue of every newspaper ever published in Becker County, and a two-headed calf specimen are among the vast array of items entrusted to Emily's care. Her work includes managing the extensive collections of artifacts housed at this museum and determining which pieces will be

displayed and how. Each piece has a story to tell inquisitive visitors and community partners about the region and its people. Another important part of Emily's job is directing camps for children, with a particular sensitivity to meeting the needs of people of all abilities.

Right away Emily saw an opportunity to close a gap in the collection when she began in her role at the museum. "We display flags; the United States flag, the Minnesota state flag, and the county flag are on display here, but we didn't have a White Earth Reservation tribal flag. I knew that there was a flag because that's where I grew up," she said. Wanting to better represent everyone, she spoke with the tribal leadership and was able to obtain and add the White Earth tribal flag to the display. "Now we represent everybody...I think that's exactly what everyone wants," she said.



Flag of the Ojibwe White Earth Nation in Minnesota.

I first met Emily in 2017 through phase one of We Are Water MN where she shared her water story about her Grandma's idea of a perfect day. Serendipitously, I ran into Emily in Detroit Lakes, Minnesota last summer where she was staffing the Becker County History Museum booth at the Aqua Chautauqua, a community event centered on water. At the booth, Emily shared a map of Becker County that had lake names labeled in Ojibwe adjacent to the English names. That map was part of the Becker County Ojibwe Lake Names project on which she and her research library had been working.

<u>Hear Emily Buermann</u>'s <u>We Are Water MN</u> story, "Fish Camp." (<u>transcript</u>) See more stories in the online map.

"Every day we do a little bit of something else. We are always trying to create more, because there is always a gap...we are filling holes and blanks in our research library every day," she explained. Emily works closely with the research team to identify gaps in the collection and to acquire pieces so that everybody's story is represented, which is in part how the Becker County Ojibwe Lake Names project originated.

Detroit Lake

When you cross a river or lake in Minnesota, almost everywhere a sign marks the name in English. But once you cross onto the White Earth Reservation, the sign will be bilingual; it will say "Buffalo River and then it also has the Ojibwe name," Emily pointed out. The name Detroit Lake is French, she continued. In French, Détroit translates to "strait", which would describe the narrow channel through the sand bar in the middle of Detroit Lake connecting the two larger bodies of water that make up the lake. The Ojibwe name, Gaiajawangag, means "a lake with a crossing in a sandy place." "Whether or not that's a direct translation or whether just two people noticed the exact same thing, what sets [it] apart from other lakes is that there is a sand bar through the middle," Emily explained. Among the extensive collection held by the museum's research library is a hefty book called the Pioneer History of Becker County by Alvin H. Wilcox, published in 1907, about 50 years after the State of Minnesota and Becker County were established. [4] The book describes the plants and animals of the region, the lives of pioneers when they first arrived, and the names of features as told to the pioneers by their Indigenous guides. Emily and the research team used this book and other resources to find Ojibwe names for lakes. Within the first two weeks of the project, they

identified 20 Ojibwe names for lakes in Becker County that were outside of the White Earth Reservation. What the research team discovered was that most of the English names of lakes in Becker County are a direct translation from their Ojibwe names.

"I grew up living on the reservation, and going to school and doing everything off the reservation," Emily said. Growing up on the White Earth Reservation and attending school off the reservation, Emily experienced life in both "Native places" and "non-native places."

The most beneficial aspect of adding the Ojibwe names to features that are more commonly known by their non-native names is that "We're showing that we are all neighbors, and that we all live here together, and that being Native or having Native things is not a magical, mystical, separate, secret thing," she explained. Emily is convinced that people are interested in seeing the Ojibwe names and English names side by side and that things are no longer Native and non-native. "It's who we are as a county, and we are not just Native and non-native—we're Swedish and we're German and we're Norwegian and we're a melting pot. We are all here together," she said. "I feel like people are really open to

the idea of learning more about their neighbors, more about how we've all lived here together for hundreds of years."

Speaking with Emily and others doing similar work, it seemed like adding Indigenous names to the We Are Water MN exhibit map would be the right thing to do, but maybe we could incorporate them into other maps and other projects in the future as well.

So then I asked myself from a technical standpoint, how could I do this? Where do I find the spatial data set of Indigenous place names? Typically, I would be able to get the data from a place like the Minnesota Geospatial Commons and add it to my map. Based on my previous experiences, I knew I would have to look beyond the data sets and sources I commonly use, which led me to OpenStreetMap.

OpenStreetMap

OpenStreetMap is a free, wiki-style, crowdsourced map of the world where data, built from aerial imagery and the local knowledge of volunteers, is contributed to enhance the map. [5] The richness of the resource is not the map itself, but the data on which it is built. Not only can you edit the data in the map, but you can also download a portion of the data and create your own map from that data. The data includes every feature you might expect to find in a map: places, parks, streets, paths, buildings, waterways, and land use, as well as information that describes each of those features. I thought I could use OpenStreetMap to find the Ojibwe names and Dakota names for all the places on my map, but I wasn't sure how to do it.

When I was looking for assistance to find Indigenous names for places and features using OpenStreetMap, I knew that Brad Neuhauser would be my contact. I met Brad through my work with the State of Minnesota. Brad has lived in Minneapolis for almost 20 years and has worked as a GIS specialist for the Secretary of State's office for over 10 years. Like many State of Minnesota agency GIS specialists, he uses ESRI ArcMap software daily but says he has "always been interested in open source software and trying different things." When Brad is not busy managing the statewide voting precinct spatial database, that's exactly what he's doing-using open source tools to improve political district boundary data, wrangle large election results

files, and streamline the process of making map atlases more accessible for users who have a vision impairment and rely on screen reading technology.

He has been adding features to OpenStreetMap on and off since 2007 and informally has been working on a project to research Dakota names, and one of the eventual goals is to add those names to OpenStreetMap.

I asked Brad what inspired him to research Dakota names. He explained that while on a trip to Scotland with his partner five years ago to celebrate their wedding anniversary, he noticed that "everything [there] is labeled in at least two languages and sometimes three." Signs he saw in Scotland were in English, Scots, and Scottish Gaelic.

Speaking with him, he was quick to bring the discussion back to Minnesota and point out that the City of Bemidji has been increasing the use of bilingual labeling, placing Ojibwe alongside English. Seeing multi-lingual labeling in Scotland and in places such as Bemidji got him thinking about the importance of adding Indigenous names to Minnesota maps. This process has been slow because of his desire to reflect on the relationships (past and present) between Indigenous people and European settlers and the importance of accurate name sourcing. He said he wanted to put Indigenous names into OpenStreetMap

but that he got stuck on starting as he thought about some of the difficult issues: broken treaties, removing Indigenous people from their land, sending Indigenous children to boarding schools, and outlawing Indigenous religions and languages.

Getting Unstuck

In his research about Dakota names and culture, Brad referred to the book *Mni Sota Makoce: The Land of the Dakota* by Gwen Westerman and Bruce White, which describes how the Dakota lived in pre-European times and the different ways and places they lived. [6] The book discusses places such as Wabasha County and the City of Shakopee, both named for Dakota leaders in the area. "Something that just kind of fascinates me is that this history in some ways is so obvious," Brad reflected. "It's right in front of you; it's on every map, but yet we don't see it or don't know its significance."

Reflecting on his intentions about adding Dakota names to OpenStreetMap, Brad explained, "You'd be able to present a more complex, richer view of history by providing names of these features" because "some of them are literally describing the place in some way and some might have a story behind it."

By encouraging people to research and add Indigenous names to OpenStreetMap, Brad hopes that people will learn how the names fit into history, and in doing so, will gain "a deeper understanding of or respect for what the land is about, what's been there, what should be there, what could be there, and what might be there in the future."

Optimism

I asked Brad about how I could use OpenStreetMap to obtain a spatial data layer of Dakota names and Ojibwe names for places. He explained that OpenStreetMap uses "key value tagging" so a house in OpenStreetMap would be tagged as such: building (key) = house (value). To describe features in more complex ways, additional tags could be added, for instance Goose Egg Park would be tagged as leisure = park and name = Goose Egg Park. Additionally, the key that describes a feature can be qualified with a prefix like the language. For example, the Mississippi River has many name tags, including that for the Dakota language, name: dak = Haha Wakpa, and the Ojibwe language, name: oj = Misi-ziibi.

To find features based on their tags, Brad recommended <u>Overpass Turbo</u>, which is a webbased data filtering tool used to query data from

OpenStreetMap based on attributes and location. Overpass Turbo has a query wizard, so anybody can enter a tag for a certain type of feature, and the wizard will build and run the query, and display the resulting data. Additionally, the resulting data can be downloaded directly from the web-browser. Once built, the query can easily be shared with other people. That is what Brad did: he built a query to show features with Dakota language names and a query to show features with Ojibwe language names and shared those queries with me.

Optimistically, I ran the queries, thinking I could get all of the Ojibwe names and all of the Dakota names for features (because that information would be in OpenStreetMap) which I could then add to the maps for the exhibit. To my surprise, in Minnesota I only found about five dozen features with Ojibwe names or Dakota names in the

OpenStreetMap data. It was then I realized that this might be more complicated than I thought. Adding the Ojibwe and Dakota names to the maps for We Are Water MN would involve stepping away from my desk and talking with people. Ultimately, the solution to adding Indigenous names to the maps would not be a technical one.

Conversations

For the last host site during phase two, conversations between MPCA staff and the Mille Lacs host site resulted in me opening my email box one day to find a thoughtfully crafted spreadsheet of Ojibwe names for features and their English names from Charlie Lippert, Air Quality Specialist for the Mille Lacs Band of Ojibwe and Ojibwe language expert. I was excited! I planned to proceed with adding all the names to the map, but very quickly, I became overwhelmed. My limited knowledge of the region and lack of knowledge of the Ojibwe language required me to carefully copy and paste the Ojibwe names from the spreadsheet into the map because mistakes would not be apparent to me. Within the study area are about 900 lakes, of which 17 are named Mud, 13 are named Bass, 9 are named Rice, 7 are named Round, and 7 are named Long. I had to make sure to match the correct Ojibwe name with the correct lake and not make assumptions that all Mud Lakes would have the same Ojibwe name. The Ojibwe name and English name may not be

a direct translation of each other; later residents may have bestowed new names. I soon realized that I alone could not label all the features, but rather should work with the host site to label the features for which I was provided information. Working with Charlie and the Minnesota Historical Society's Mille Lacs Indian Museum, we were able to label over 150 features in both Ojibwe and English. This does not represent all of the features, but the consolation is knowing that these 150 bilingual labels were reviewed and contributed by someone who has direct knowledge of the region, language, and history. This information, if added, could represent a four-fold increase in the number of features with Ojibwe names in OpenStreetMap. More importantly, adding Ojibwe names to the We Are Water MN map and potentially OpenStreetMap represents communities working together, sharing their knowledge and skills, learning from one another, and protecting and preserving one another's stories.

Where Do We Go from Here?

Designing a map is a delicate balance of choosing what information to include and how to include it. What is shown on a map and how it is displayed can have a profound impact on the message conveyed and the response of those who see it. Thus, cartographers truly have a great responsibility. When designing a map, the importance of conversation and developing personal relationships cannot be underestimated. Learning about the places on the map (and those places that might be missing from the map) from the people who live there—the primary sources—is

critical to creating maps that truly represent everyone. My responsibility when designing a map is to conscientiously recognize that I need to use my skills to help my neighbors to accurately document, protect, and share their places and stories. One of the tools that could be used to do just that is OpenStreetMap.

Over the course of this journey, I have learned that the task of adding bilingual labels to a map was not to be solved by technology, or by one person who is removed by distance and culture from

the places and people represented on and by the map. Rather, I learned that to make a map that is trying to demonstrate the complexity of multiple ways of knowing a place, I needed to invest time cultivating relationships, having honest, open conversations, and collaborating with Indigenous people to learn about their culture, history, language, and places. This investment may not only lead to Indigenous places and place names being added to OpenStreetMap—one way to document, protect and share their places and subsequently their stories—but also to meaningful relationships and reflections on my own work as a strategy for inclusion and change.

How You Can Help

How can you help your neighbors document, protect, and share their places and stories?

- Add your place to OpenStreetMap; help others do the same.
- Find or become a <u>GeoMentor</u>.
- Get teachers involved creating curriculum that connects geography and humanities.

- Reach out to Indigenous people and embrace opportunities to learn from them.
- Encourage, support, and assist Indigenous communities to share their GIS data, as appropriate, perhaps through the Minnesota Geospatial Commons.
- Have a conversation with your neighbors.

Footnotes

[1] In later conversations with Brad Neuhauser, I learned that the City, Township, and Unorganized Territory (CTU) layer and the Populated places layer are two different datasets with two different purposes. The CTU layer shows administrative boundaries that have a governing body where as the "Populated places tend to be what a collection of people call themselves. So there may be different populated places within a township that feel distinct and have their own locally used names, but all have the same governing body," Brad explained.

[2] U.S. Geological Survey, "GNIS: Geographic Names Information System," *Digital Gazetteer* (Reston, VA: U.S. Geological Survey, National Mapping Division., n.d.).

[3] Common cartographic methods for showing the importance of a feature may be to:

- · increase the size a symbol or width of a line
- choose colors that have cultural significance or meaning (e.g., red) or use brighter or more saturated colors
- use boldface type or increase the font size

[4] Alvin H. Wilcox, and Jessie C. West, A Pioneer History of Becker County, Minnesota: Including a Brief Account of Its Natural History as Embraced in the Mineral, Vegetable and Animal Kingdoms, and a History of the Early Settlement of the County, (St. Paul, MN: Pioneer Press Co., 1907).

[5] The OpenStreetMap data set is massive, currently over 1,000 GB (in an uncompressed OSM XML format), and is governed by the Open Database License (ODbL 1.0). https://wiki.osmfoundation.org/wiki/Licence

[6] Gwen Westerman, and Bruce White, *Mni Sota Makoce: The Land of the Dakota*, (St. Paul, MN: Minnesota Historical Society Press, 2012).

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