

CREP Prioritization: Mapping Sediment Loading Risk in the Saginaw Bay Basin

Background

Michigan State University Extension (MSUE) is collaborating with the State of Michigan and local stakeholders to re-establish the Conservation Reserve Enhancement Program (CREP) in Michigan. To aid in prioritizing lands eligible for CREP enrollment, the Institute of Water Research (IWR) at MSU developed township-scale maps of sediment loading risk for the Saginaw Bay basin. This book organizes those maps at the township scale.

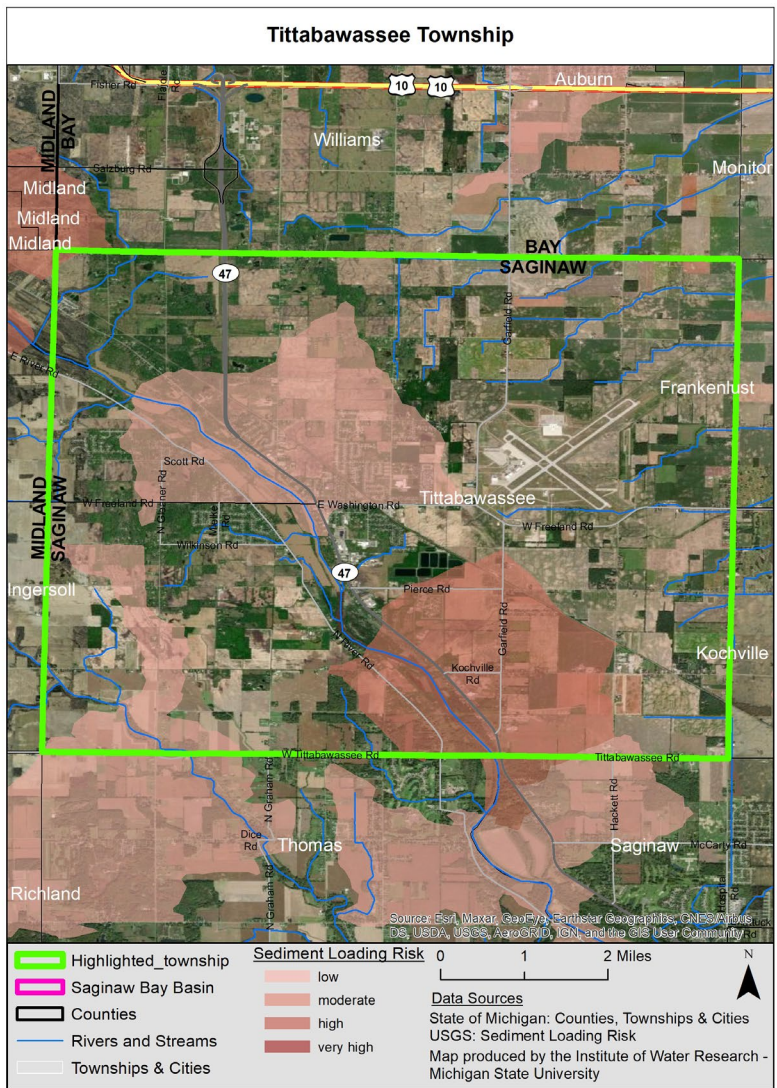
Data

The maps are based upon data from the United States Geological Survey's (USGS) SPATIally Referenced Regression On Watershed attributes (SPARROW) model*. The model uses observations, land use characteristics, and statistical relationships, among other variables, to estimate pollutant loads to streams and rivers. The data in this map book represents incremental sediment load contribution for each small catchment in the basin (see image at right), i.e. the amount of sediment load that originated in a particular area (not the total, accumulated amount moving through the stream in that area).

Contacts

Please direct questions about MSUE's project to:
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 Michigan State University Extension
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Please use the URL below to learn more about the SPARROW model, and direct questions about the maps to:
Glenn O'Neil
 Environmental Scientist
 Institute of Water Research - Michigan State University
oneilg@msu.edu

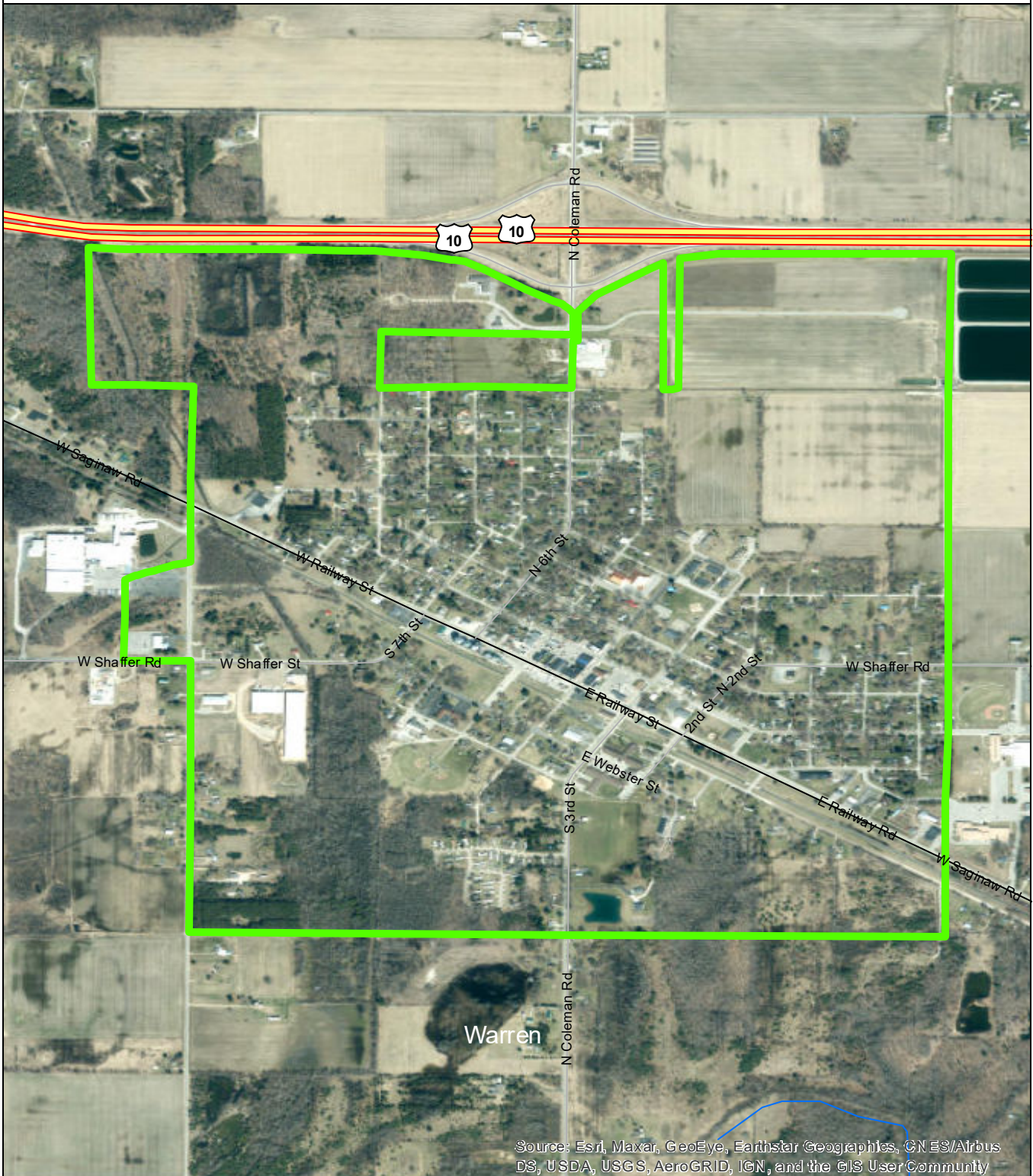


* <https://www.sciencebase.gov/catalog/item/5cbf5150e4b09b8c0b700df3>

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City of Coleman

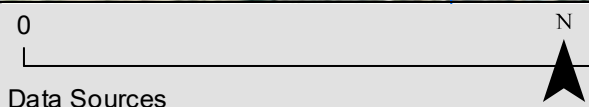


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- City of Coleman
- Saginaw Bay Basin
- Counties
- Rivers and Streams
- Townships & Cities

Sediment Loading Risk

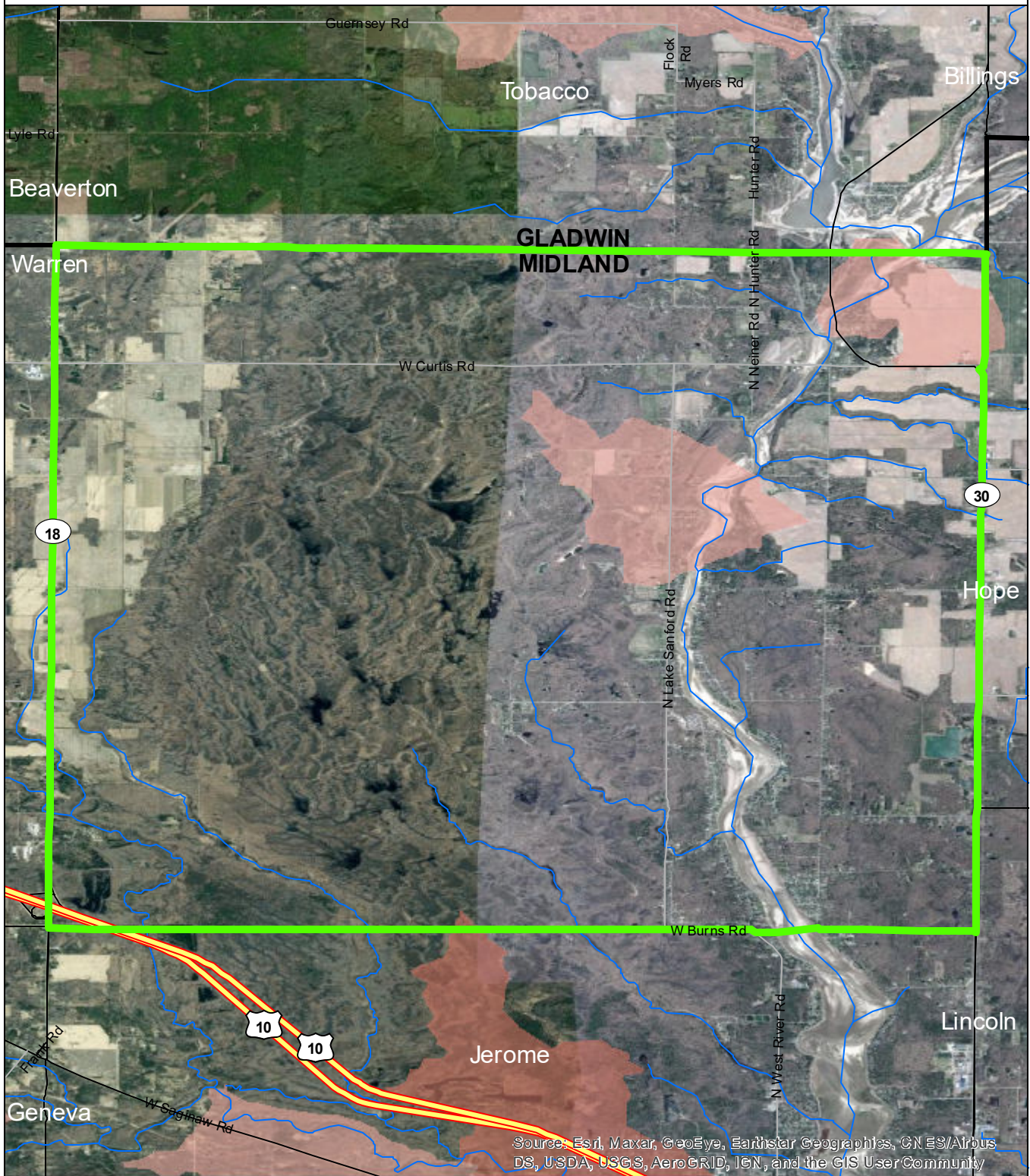
- low
- moderate
- high
- very high



Data Sources

State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk
 Map produced by the Institute of Water Research - Michigan State University

Edenville Township

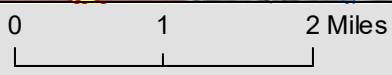


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CN ES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Edenville Township
- Saginaw Bay Basin
- Counties
- Rivers and Streams
- Townships & Cities

Sediment Loading Risk

- low
- moderate
- high
- very high

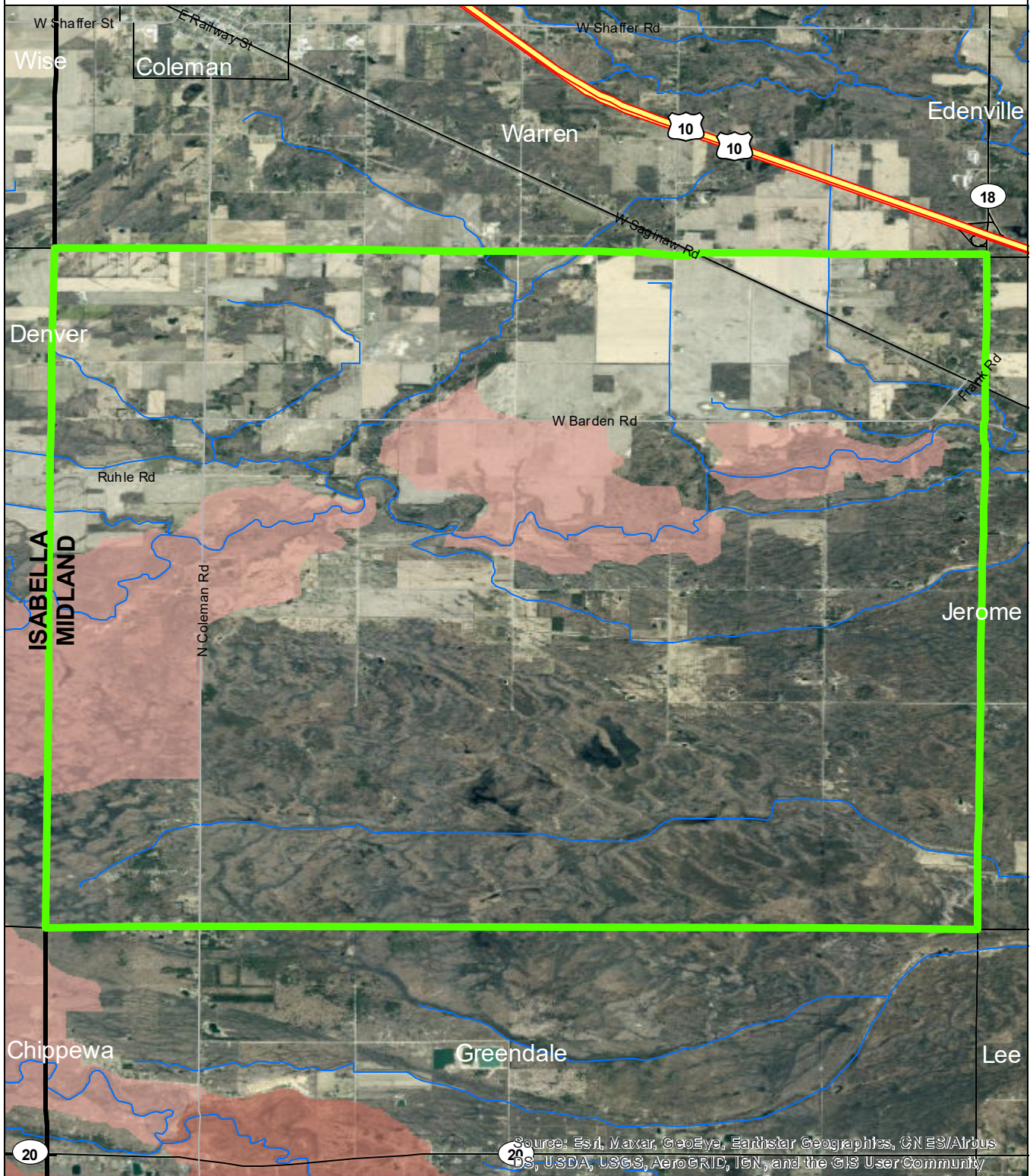


Data Sources





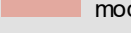

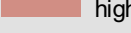
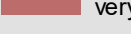


State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk
 Map produced by the Institute of Water Research - Michigan State University



Geneva Township

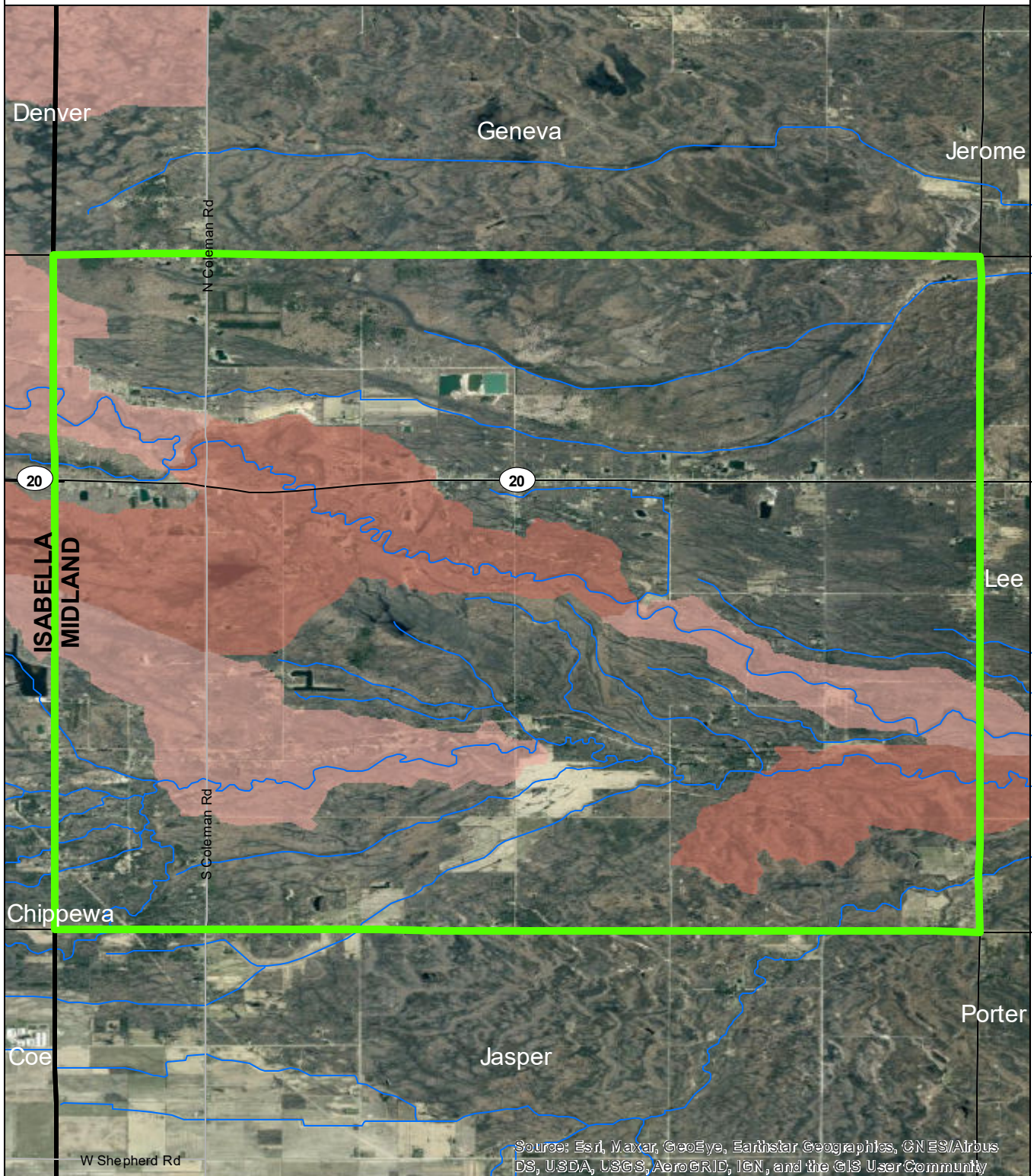


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CN ES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

	Geneva Township	Sediment Loading Risk	0	1	2 Miles	N 
	Saginaw Bay Basin			low		
	Counties		high		very high	
	Rivers and Streams					
	Townships & Cities					

Data Sources
 State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk
 Map produced by the Institute of Water Research - Michigan State University

Greendale Township



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CN ES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Greendale Township
- Saginaw Bay Basin
- Counties
- Rivers and Streams
- Townships & Cities

Sediment Loading Risk

- low
- moderate
- high
- very high



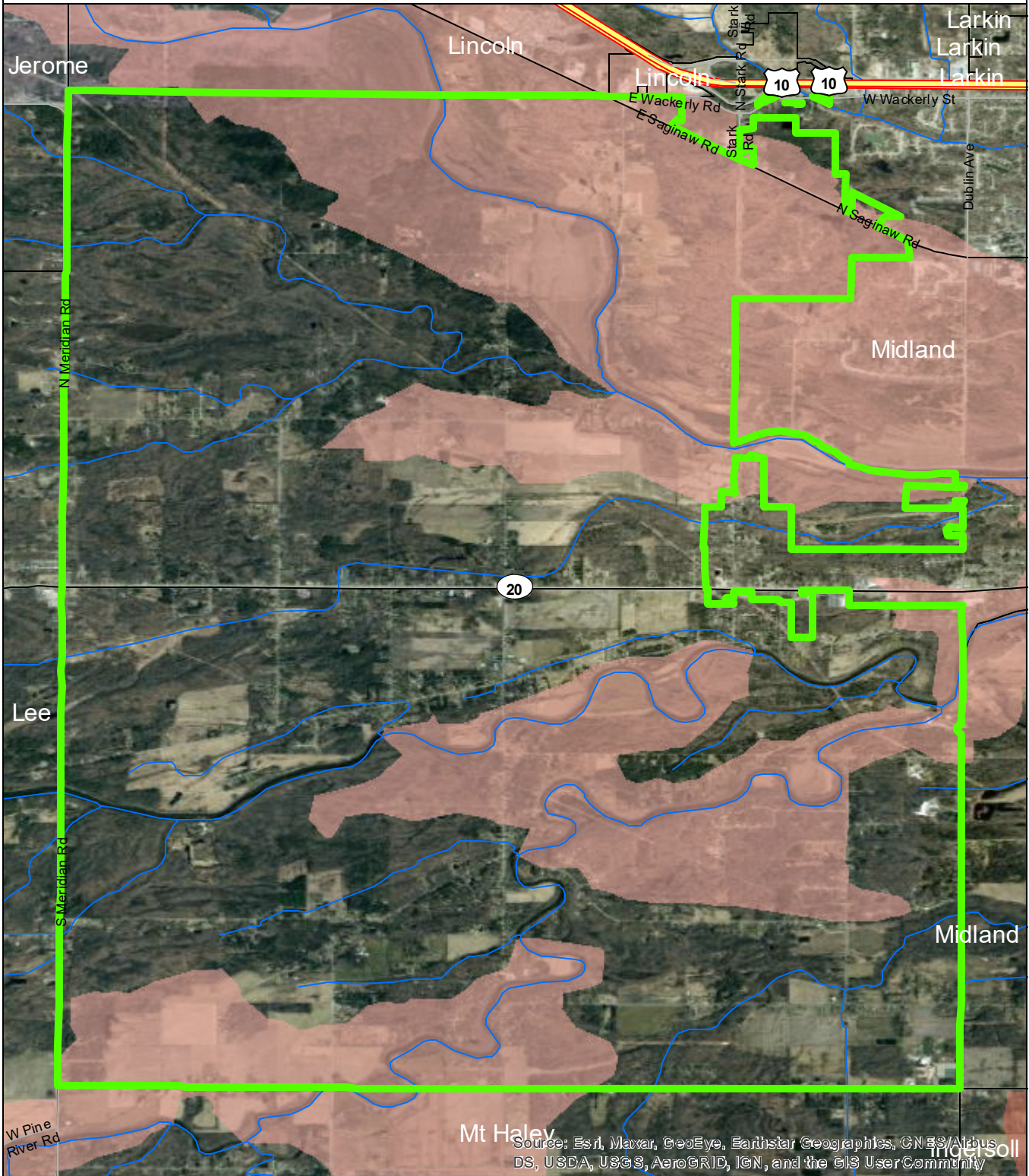
Data Sources

State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk

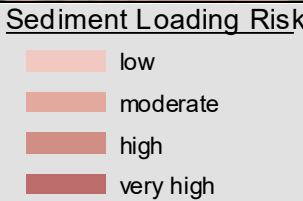
Map produced by the Institute of Water Research - Michigan State University



Homer Township

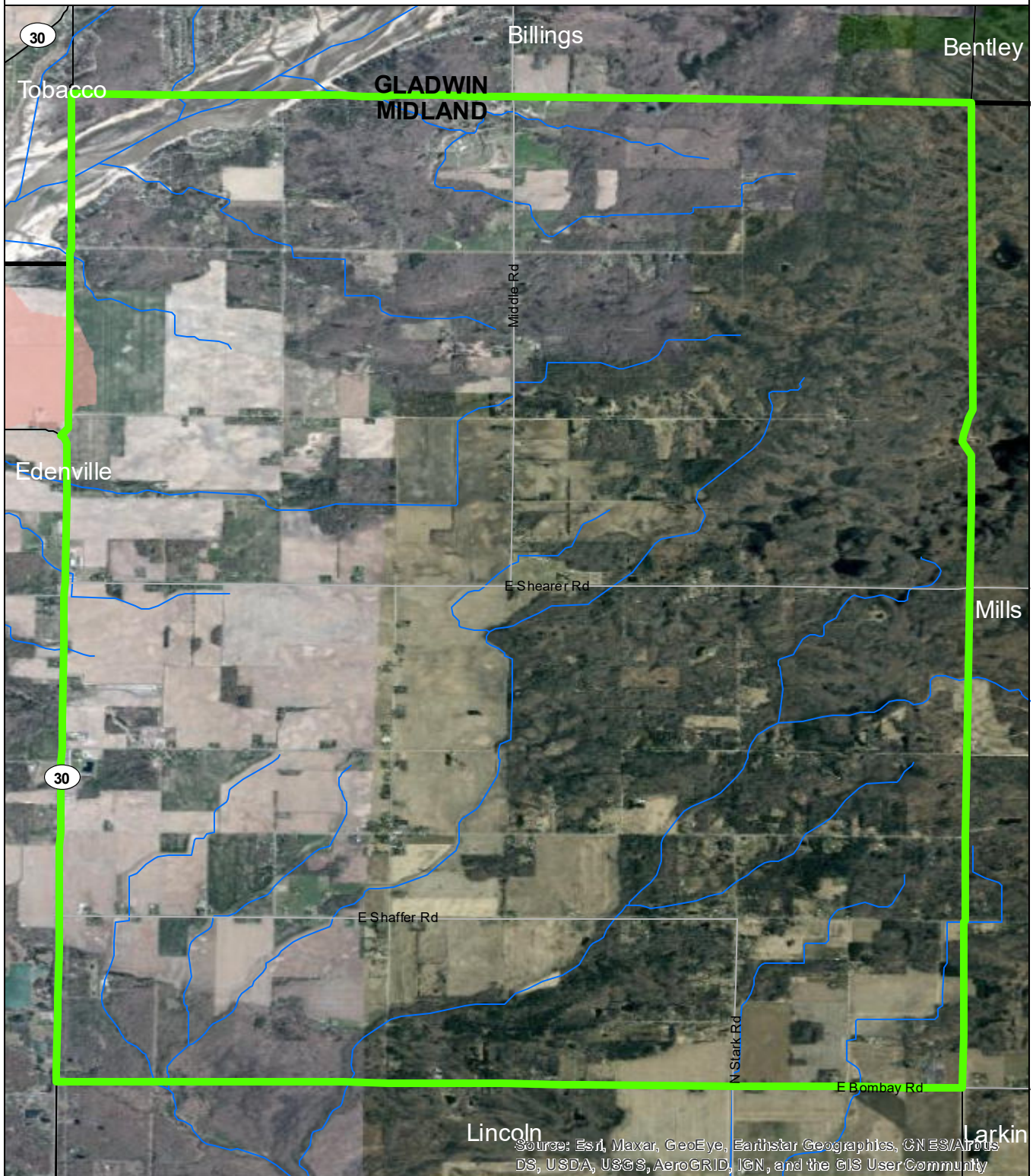


- Homer Township
- Saginaw Bay Basin
- Counties
- Rivers and Streams
- Townships & Cities



Data Sources
 State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk
 Map produced by the Institute of Water Research - Michigan State University

Hope Township



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Hope Township
- Saginaw Bay Basin
- Counties
- Rivers and Streams
- Townships & Cities

Sediment Loading Risk

- low
- moderate
- high
- very high

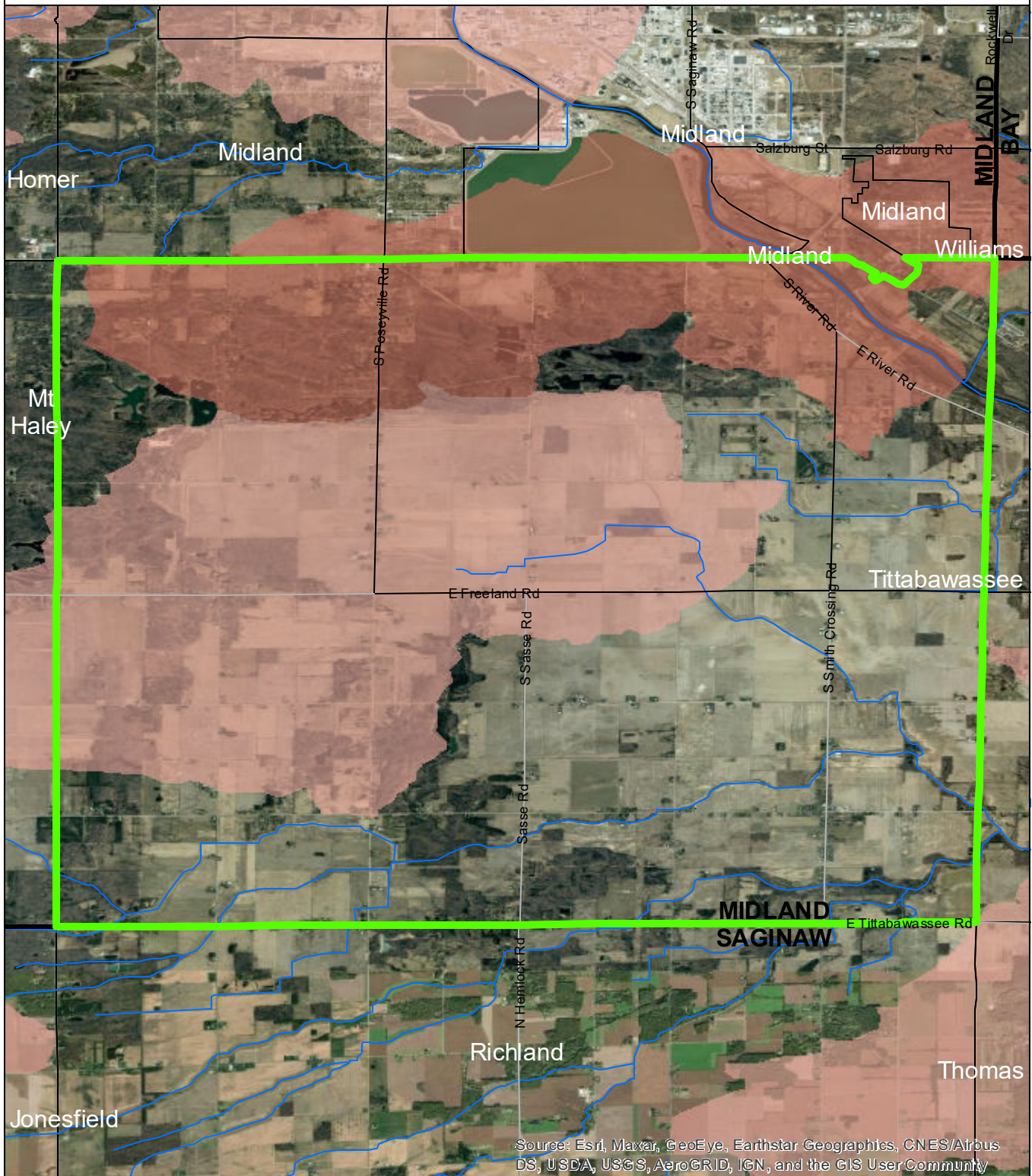


Data Sources




State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk

Map produced by the Institute of Water Research - Michigan State University



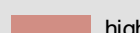

Ingersoll Township



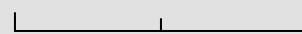
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

-  Ingersoll Township
-  Saginaw Bay Basin
-  Counties
-  Rivers and Streams
-  Townships & Cities

Sediment Loading Risk

-  low
-  moderate
-  high
-  very high

0 1 2 Miles



Data Sources

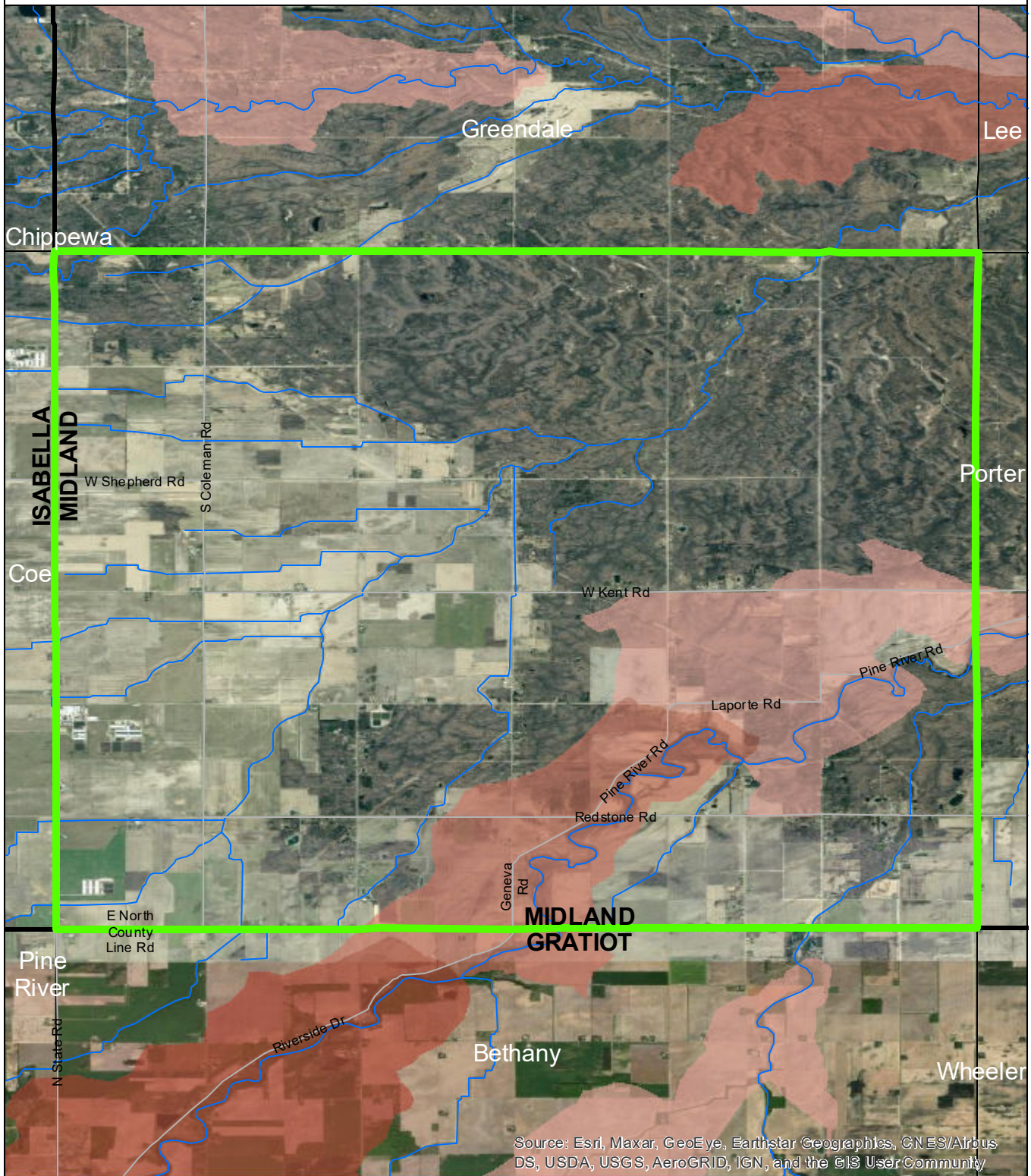
State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk

Map produced by the Institute of Water Research - Michigan State University

N



Jasper Township

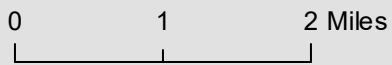


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Jasper Township
- Saginaw Bay Basin
- Counties
- Rivers and Streams
- Townships & Cities

Sediment Loading Risk

- low
- moderate
- high
- very high



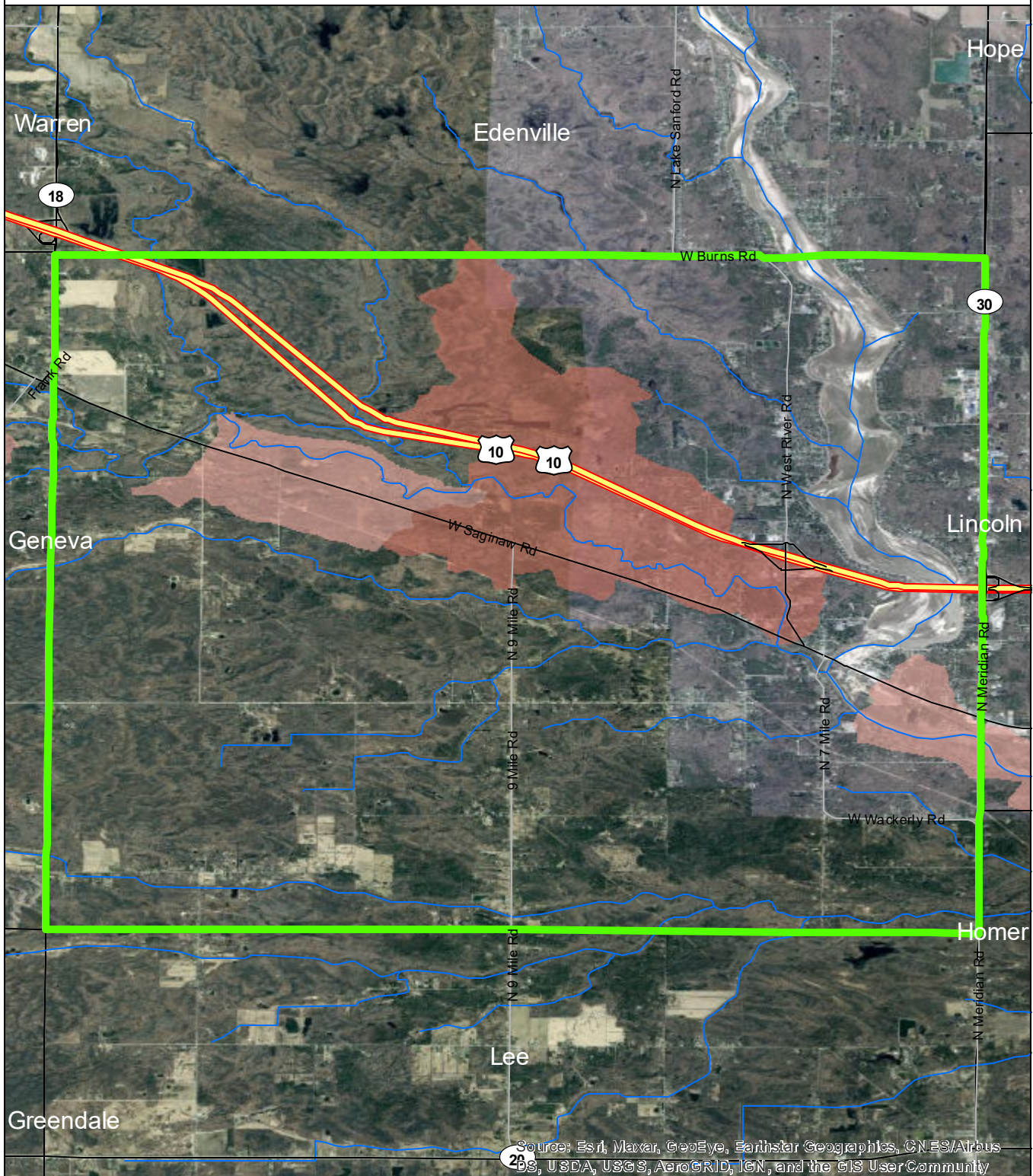
Data Sources

State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk

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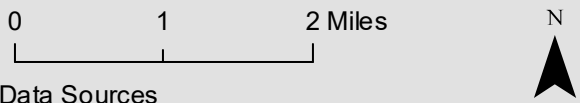
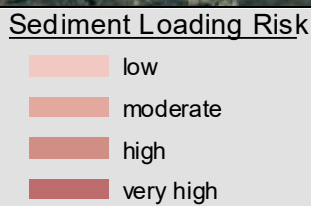


Jerome Township



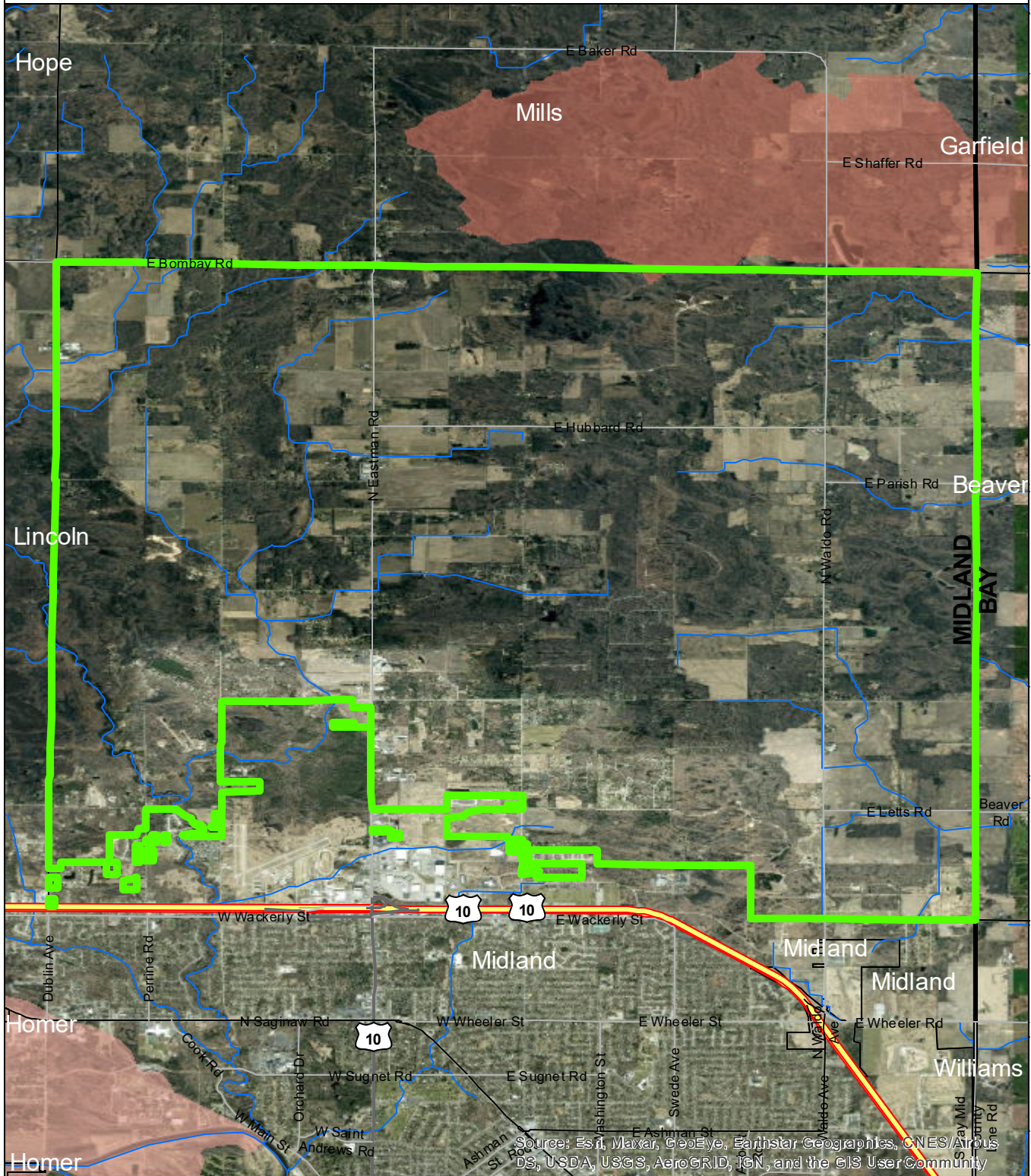
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Jerome Township
- Saginaw Bay Basin
- Counties
- Rivers and Streams
- Townships & Cities



State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk
 Map produced by the Institute of Water Research - Michigan State University

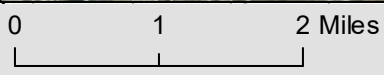
Larkin Township



- Larkin Township
- Saginaw Bay Basin
- Counties
- Rivers and Streams
- Townships & Cities

Sediment Loading Risk

- low
- moderate
- high
- very high

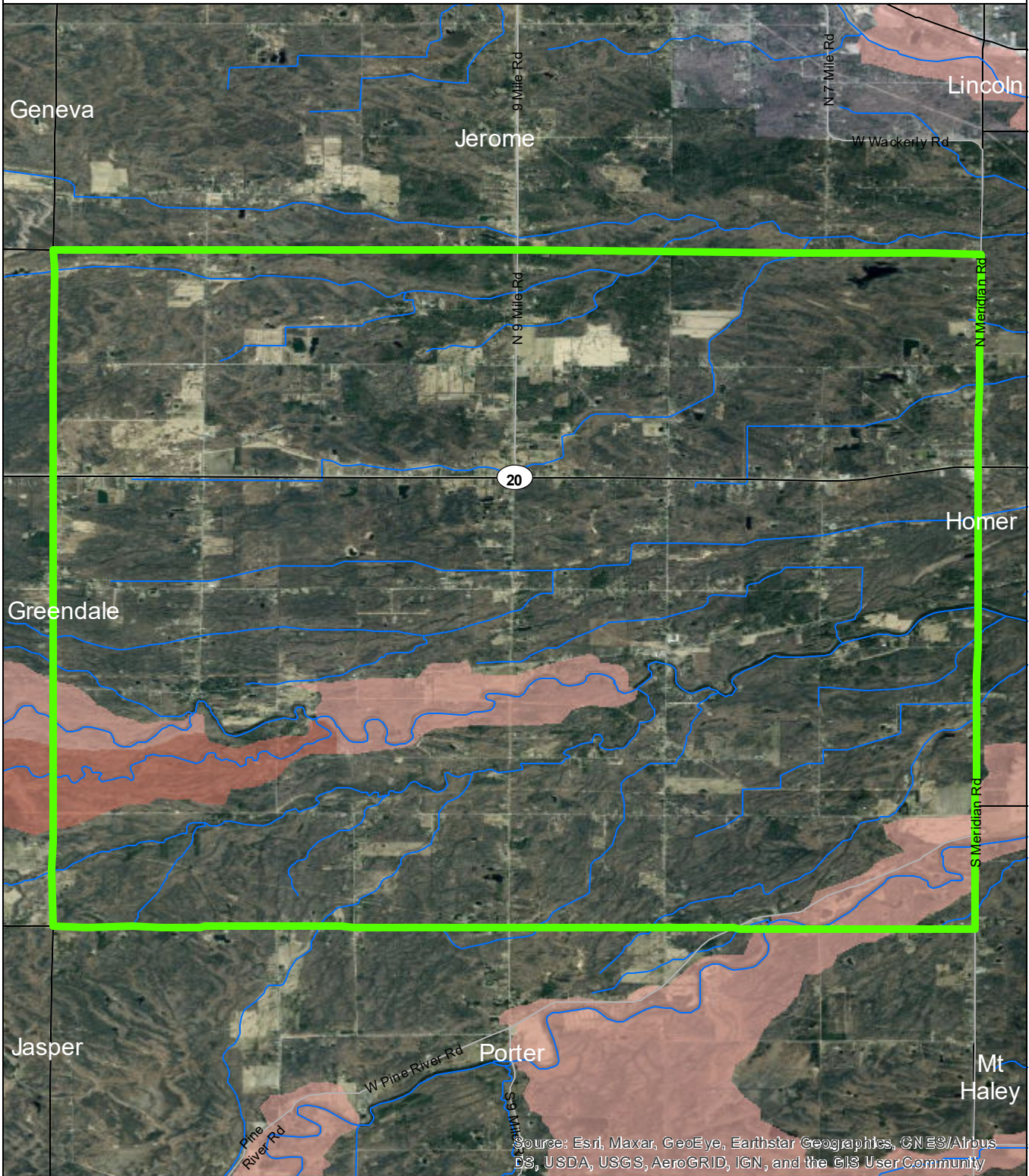


Data Sources

State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk

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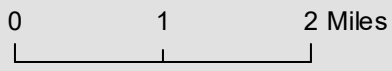
Lee Township



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Lee Township
- Saginaw Bay Basin
- Counties
- Rivers and Streams
- Townships & Cities

- Sediment Loading Risk**
- low
 - moderate
 - high
 - very high



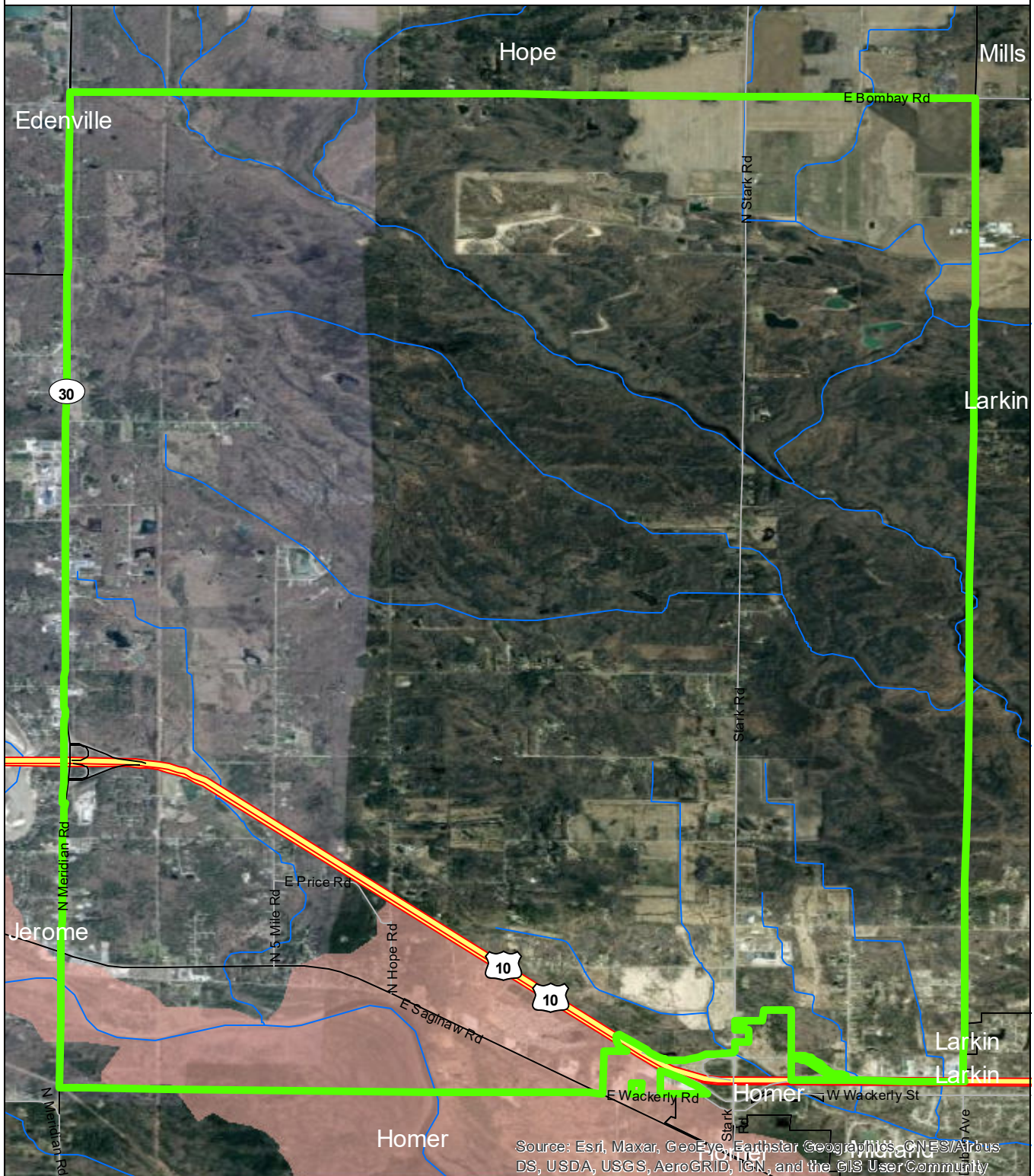
Data Sources

State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk

Map produced by the Institute of Water Research - Michigan State University



Lincoln Township



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Lincoln Township
- Saginaw Bay Basin
- Counties
- Rivers and Streams
- Townships & Cities

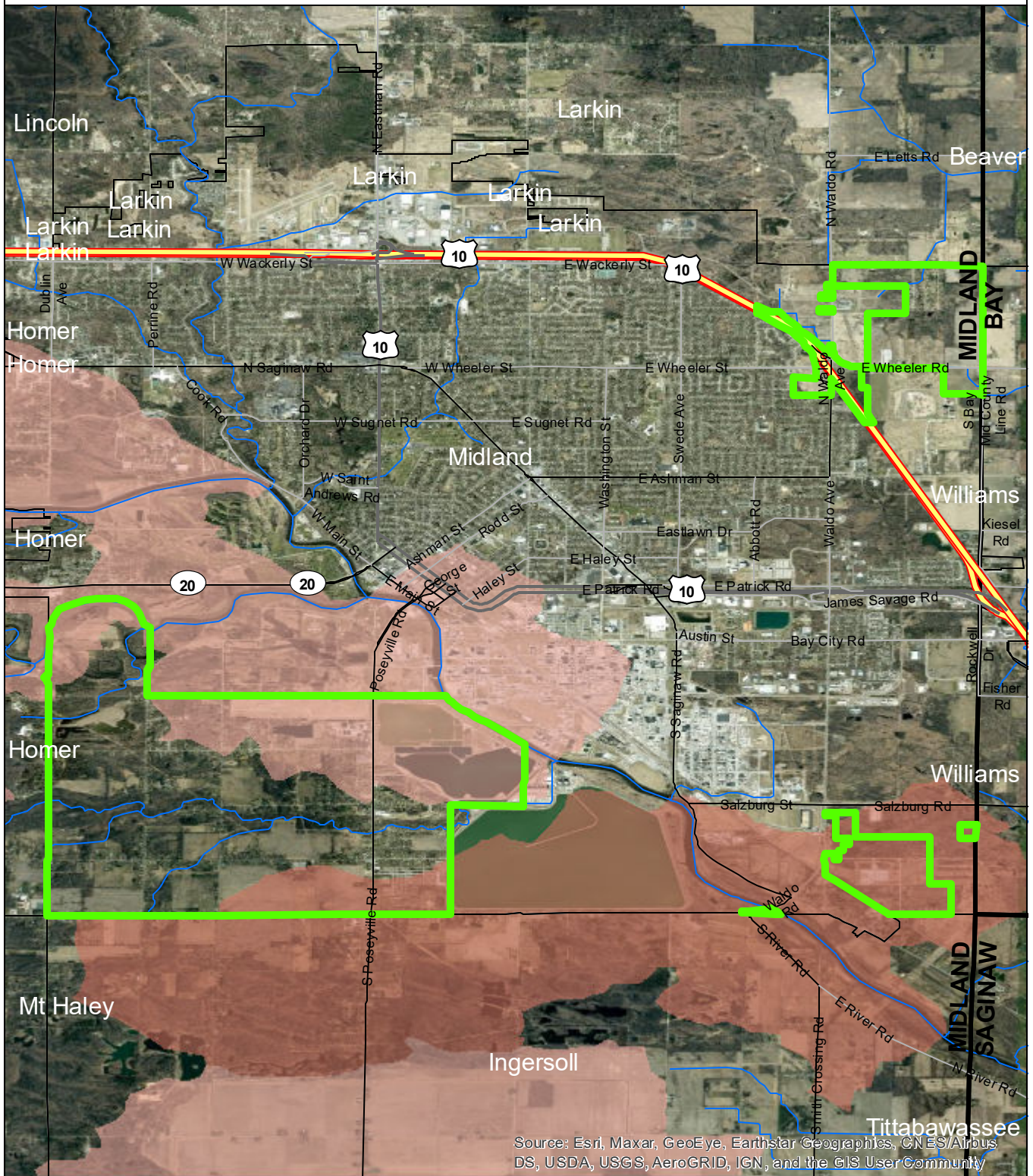
- Sediment Loading Risk**
- low
 - moderate
 - high
 - very high



Data Sources

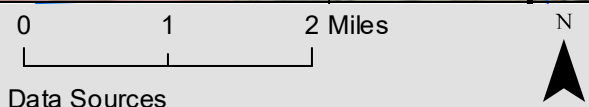
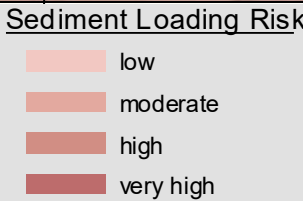
State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk
 Map produced by the Institute of Water Research - Michigan State University

Midland Township



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

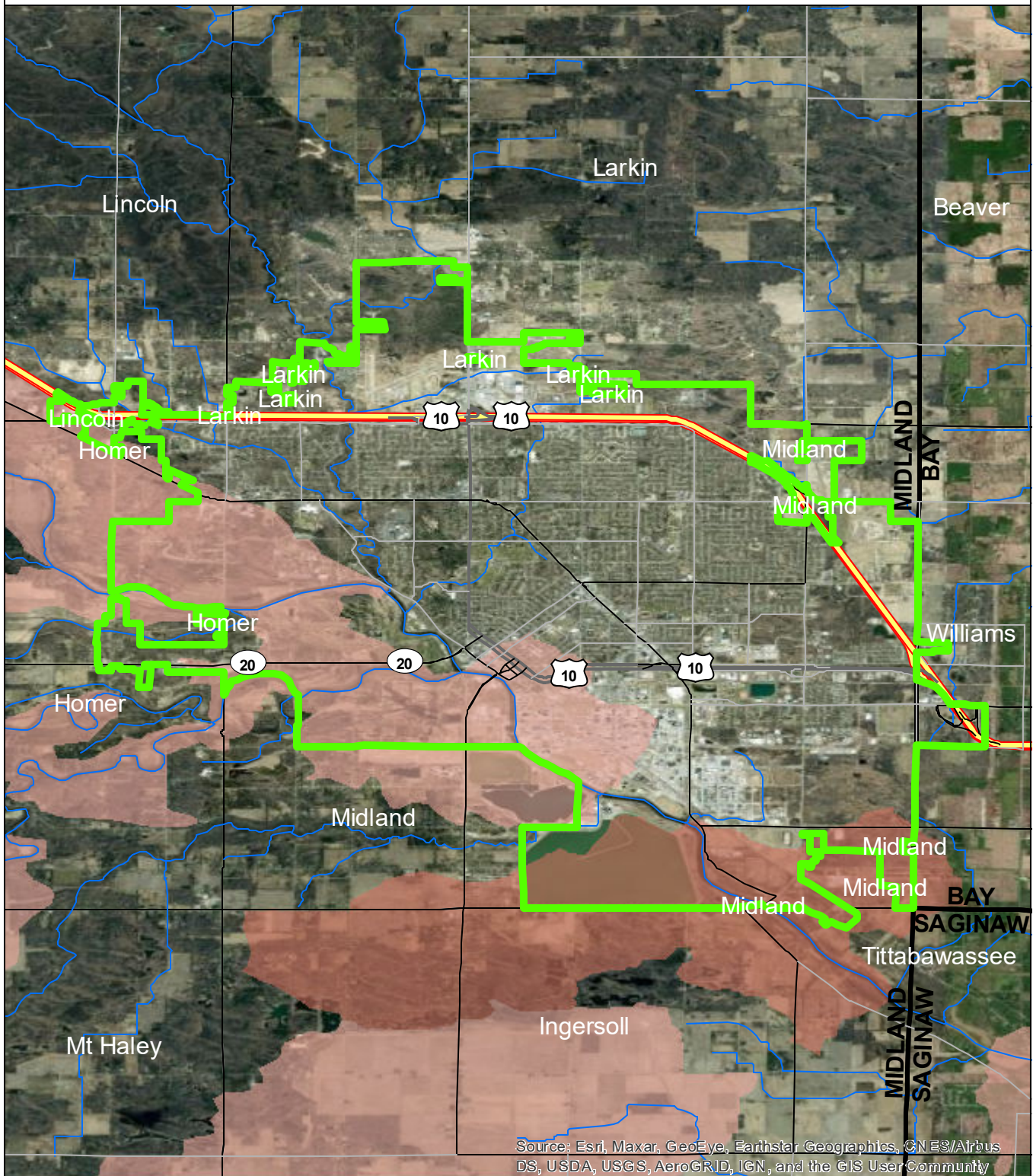
- Midland Township
- Saginaw Bay Basin
- Counties
- Rivers and Streams
- Townships & Cities



Data Sources

State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk
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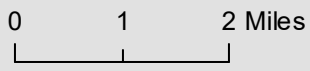
City of Midland



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- City of Midland
- Saginaw Bay Basin
- Counties
- Rivers and Streams
- Townships & Cities

- Sediment Loading Risk**
- low
 - moderate
 - high
 - very high

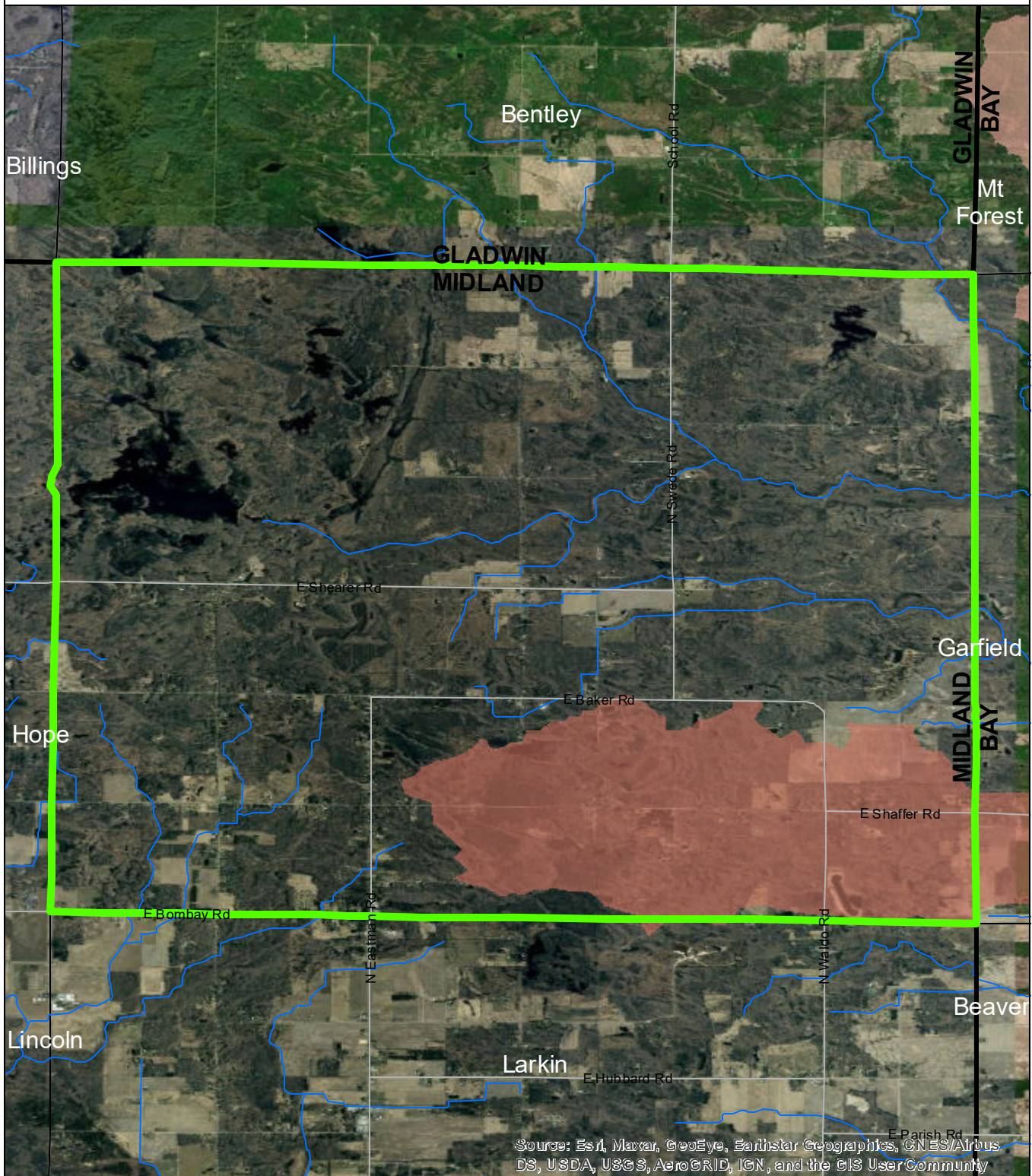


Data Sources

State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk
 Map produced by the Institute of Water Research - Michigan State University



Mills Township



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Mills Township
- Saginaw Bay Basin
- Counties
- Rivers and Streams
- Townships & Cities

Sediment Loading Risk

- low
- moderate
- high
- very high

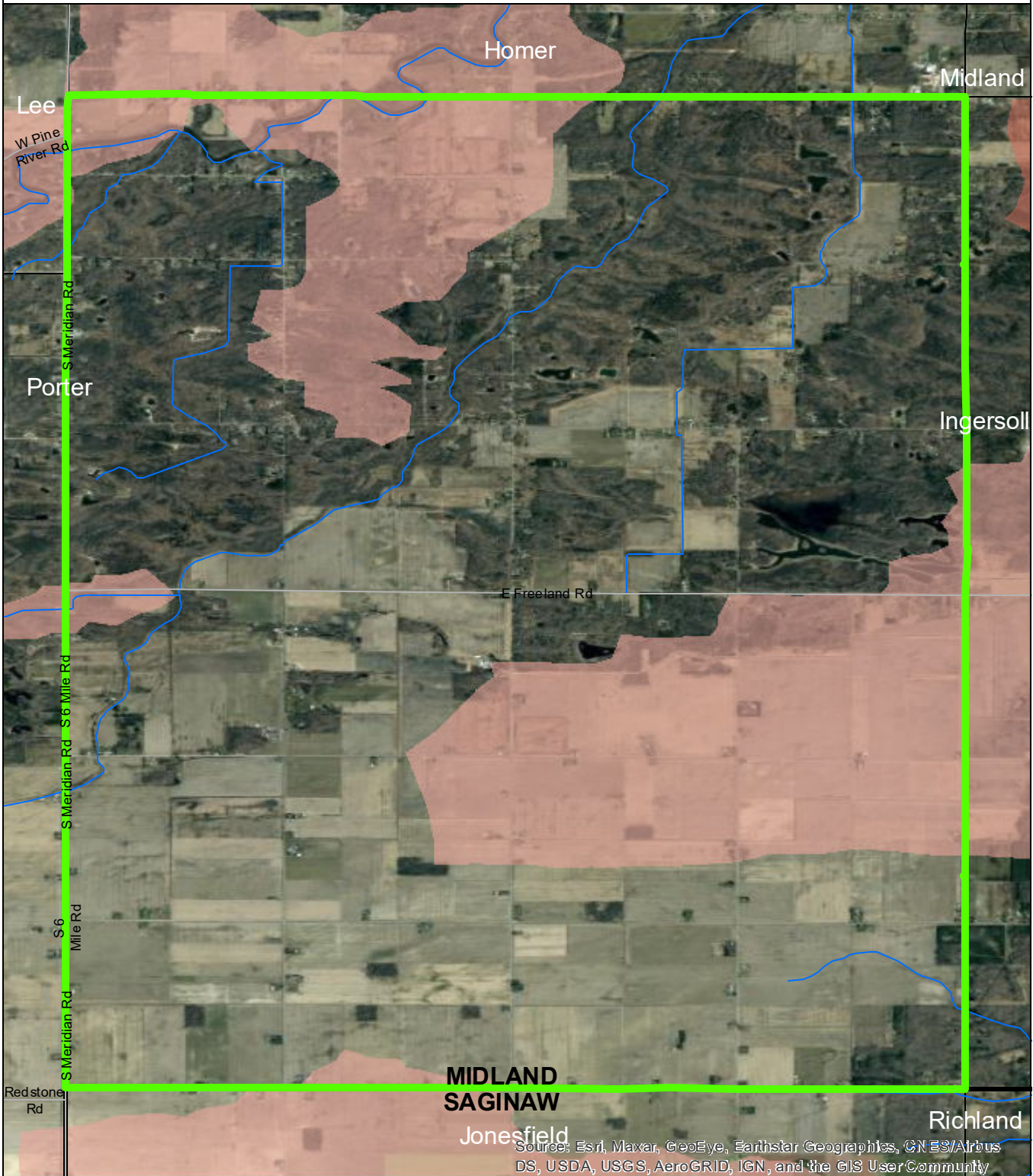


Data Sources




State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk





Map produced by the Institute of Water Research - Michigan State University

Mt Haley Township



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CN ES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

-  Mt Haley Township
-  Saginaw Bay Basin
-  Counties
-  Rivers and Streams
-  Townships & Cities

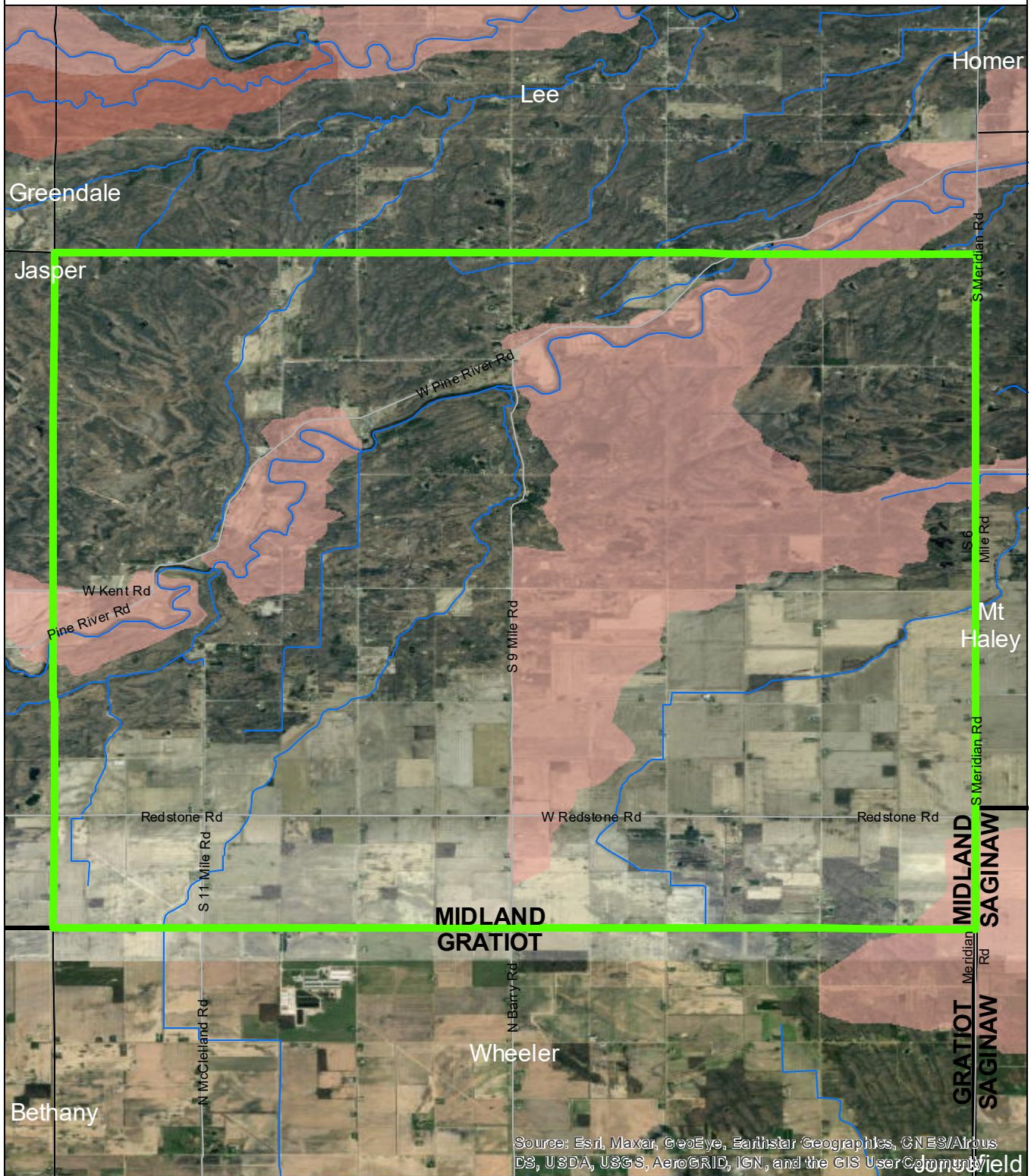
- Sediment Loading Risk**
-  low
 -  moderate
 -  high
 -  very high



Data Sources

State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk
 Map produced by the Institute of Water Research - Michigan State University

Porter Township



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Porter Township
- Saginaw Bay Basin
- Counties
- Rivers and Streams
- Townships & Cities

Sediment Loading Risk

- low
- moderate
- high
- very high



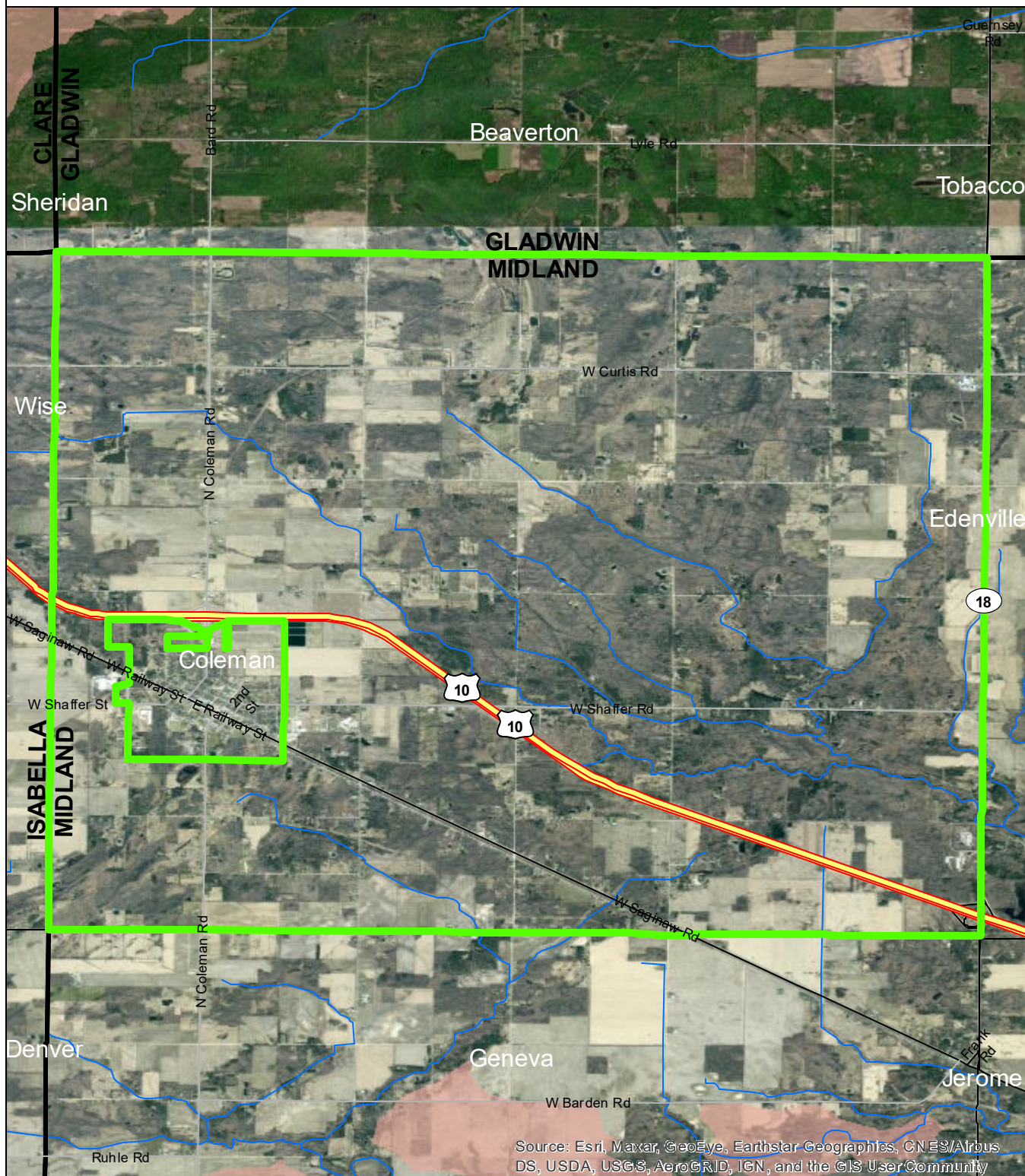
Data Sources

State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk

Map produced by the Institute of Water Research - Michigan State University



Warren Township



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Warren Township
- Saginaw Bay Basin
- Counties
- Rivers and Streams
- Townships & Cities

- Sediment Loading Risk**
- low
 - moderate
 - high
 - very high

0 1 2 Miles

Data Sources
 State of Michigan: Counties, Townships & Cities
 USGS: Sediment Loading Risk

Map produced by the Institute of Water Research - Michigan State University