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:
Sarah Fronczak
Environmental Management Educator
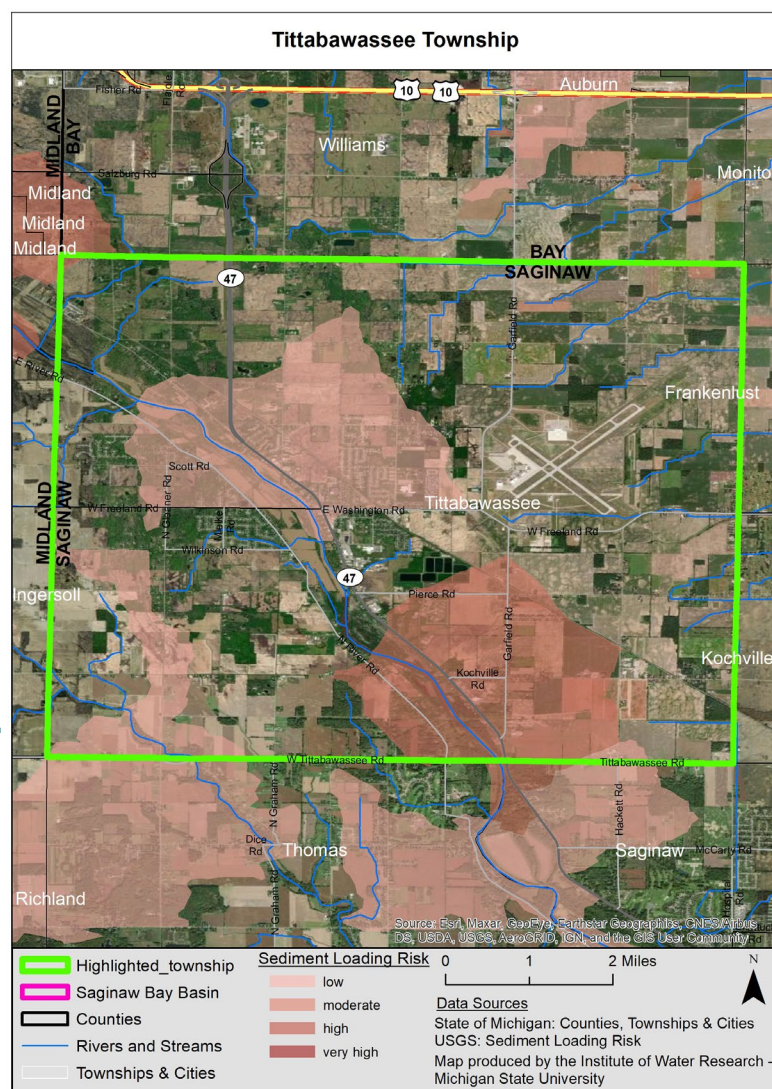Michigan State University Extension
froncza3@msu.edu

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

Tittabawassee Township

Legend

- Highlighted_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

MICHIGAN STATE | Extension   1   Michigan CREP Conservation Reserve Enhancement Program

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

Table of Contents

Arthur Township

Hamilton

Sage

Hayes

61

E Mannsiding Rd

S Bailey Lake Ave

CLARE
GLADWIN

Hatton

Grout

Bailey Lake Ave

Sheridan

S Bailey Lake Ave

Beaverton

Grant

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

Beaverton Rd

Legend

- **Arthur Township** (green outline)
- **Saginaw Bay Basin** (magenta outline)
- **Counties** (black outline)
- **Rivers and Streams** (blue line)
- **Townships & Cities** (white outline)

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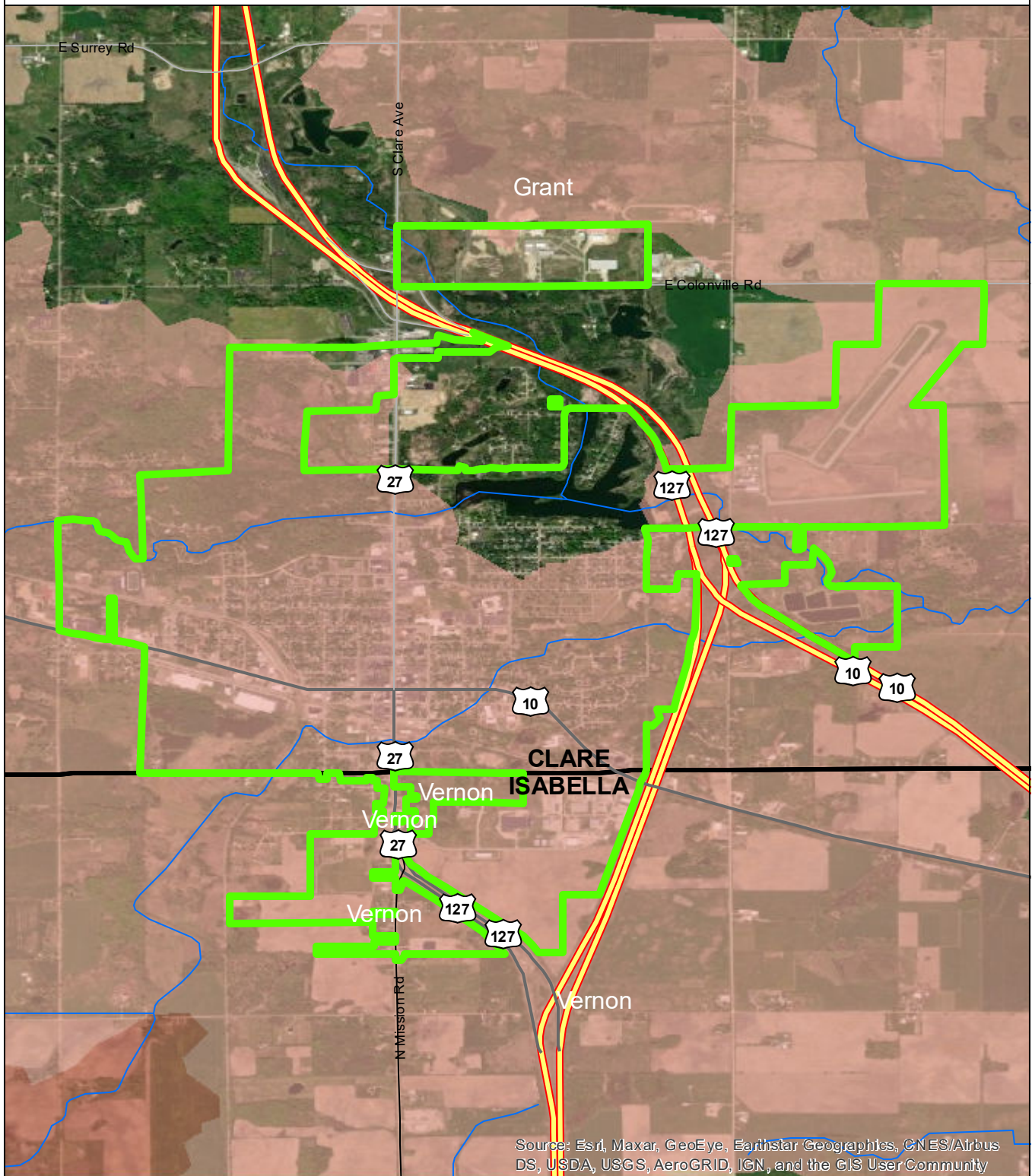- moderate
- high
- very high

0   1   2 Miles

N

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

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

Michigan CREP

Conservation Reserve Enhancement Program

City of Clare

Grant

E Surrey Rd

S Clare Ave

E Colonville Rd

27

127

127

10

10

CLARE
ISABELLA

Vernon

Vernon

27

Vernon

127

127

Vernon

N Mission Rd

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

Legend

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

Sediment Loading Risk
low
moderate
high
very high

0   1   2 Miles

N

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

Franklin Township
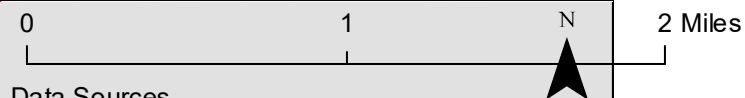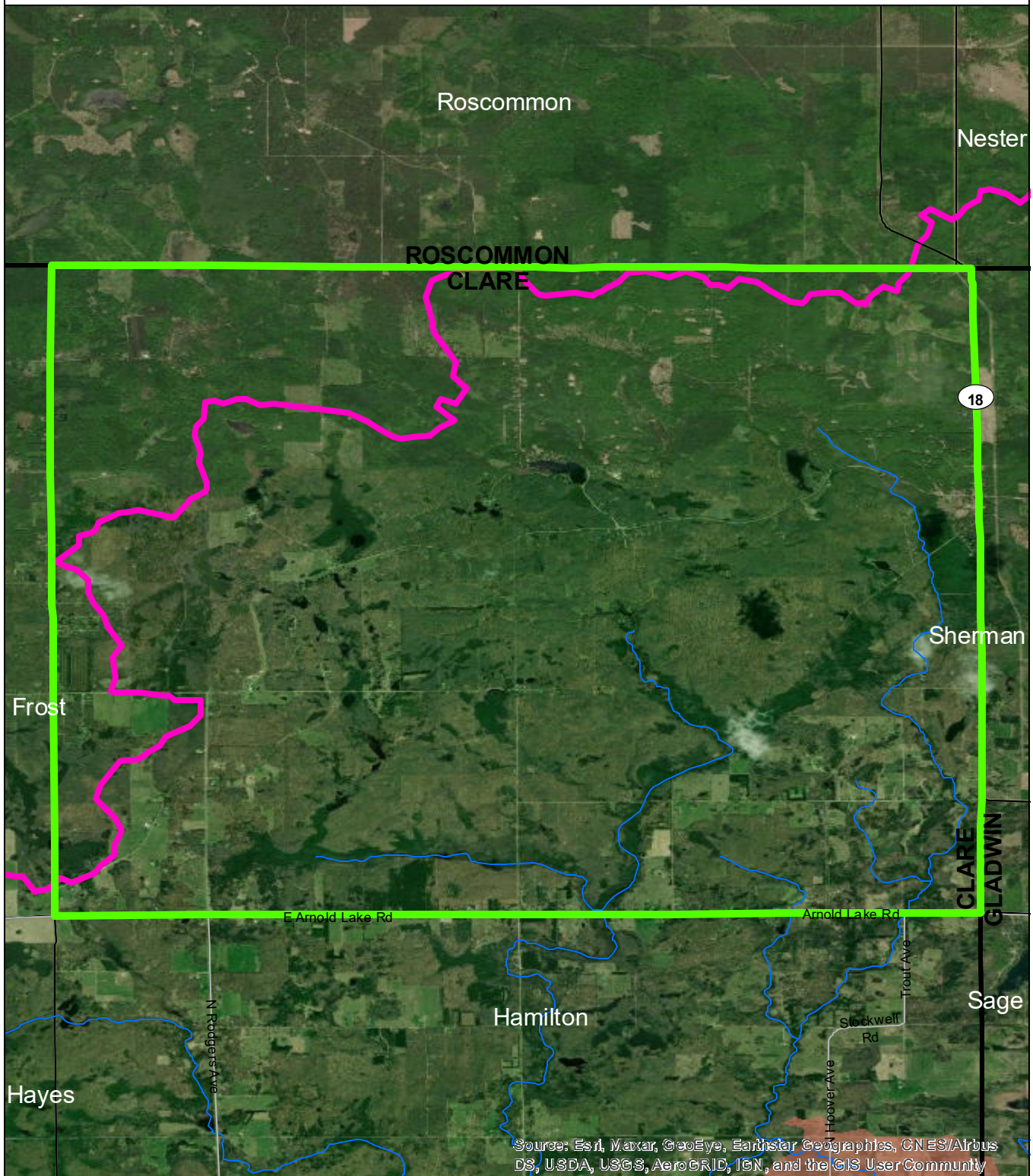

Roscommon

Nester

ROSCOMMON
CLARE

18

Frost

Sherman

CLARE
GLADWIN

Sage

E Arnold Lake Rd

Arnold Lake Rd

Trout Ave

Hamilton

Stockwell Rd

Hoover Ave

N Rodgers Ave

Hayes

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

Legend

🟩	Franklin Township
🟪	Saginaw Bay Basin
⬛	Counties
—	Rivers and Streams
▭	Townships & Cities

Sediment Loading Risk

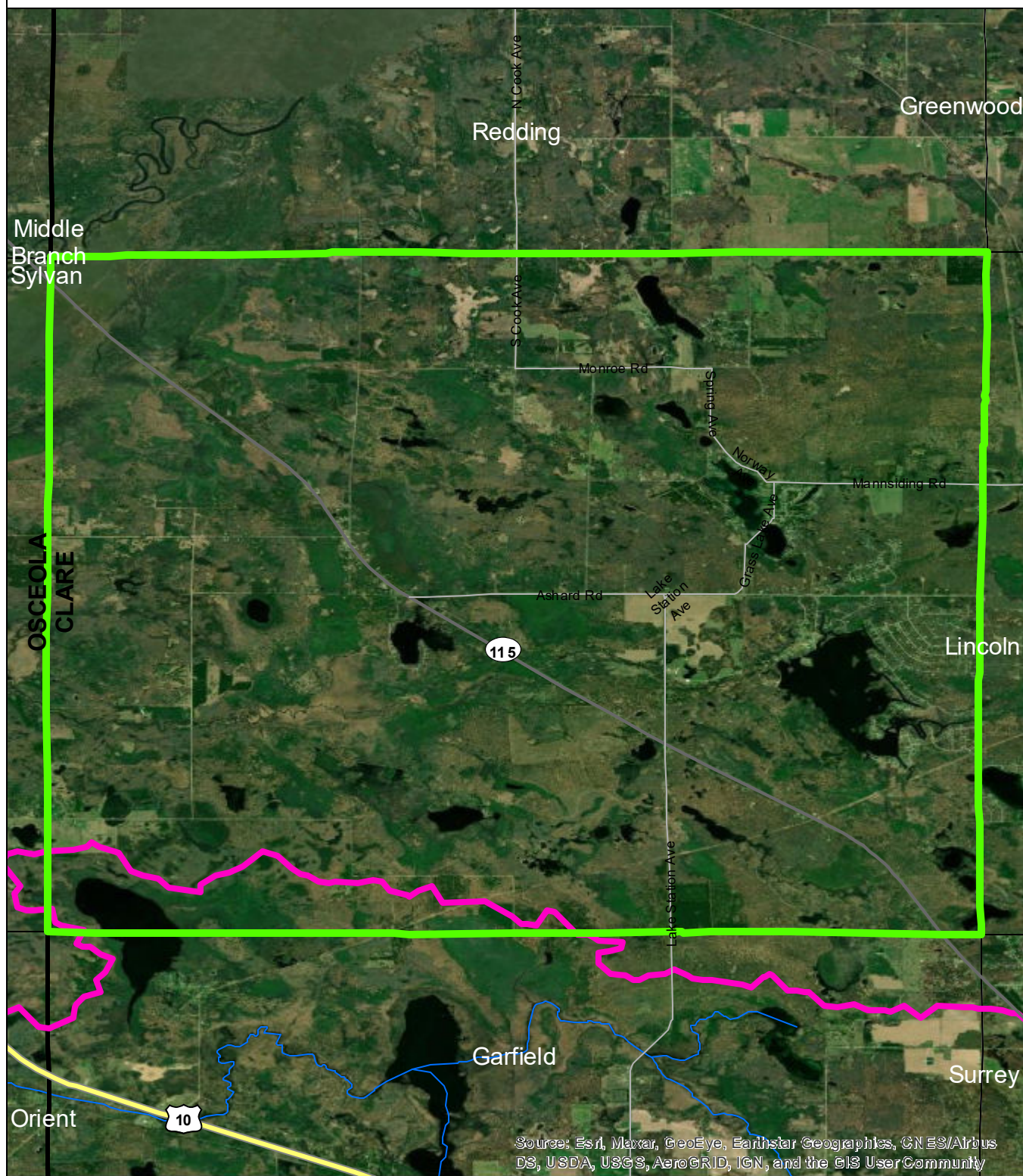|	
	low
	moderate
	high
	very high

0   1   2 Miles

N

Data Sources

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

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

Freeman Township

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

Legend

- **Freeman Township** (green outline)
- **Saginaw Bay Basin** (magenta outline)
- **Counties** (black line)
- **Rivers and Streams** (blue line)
- **Townships & Cities** (white outline)

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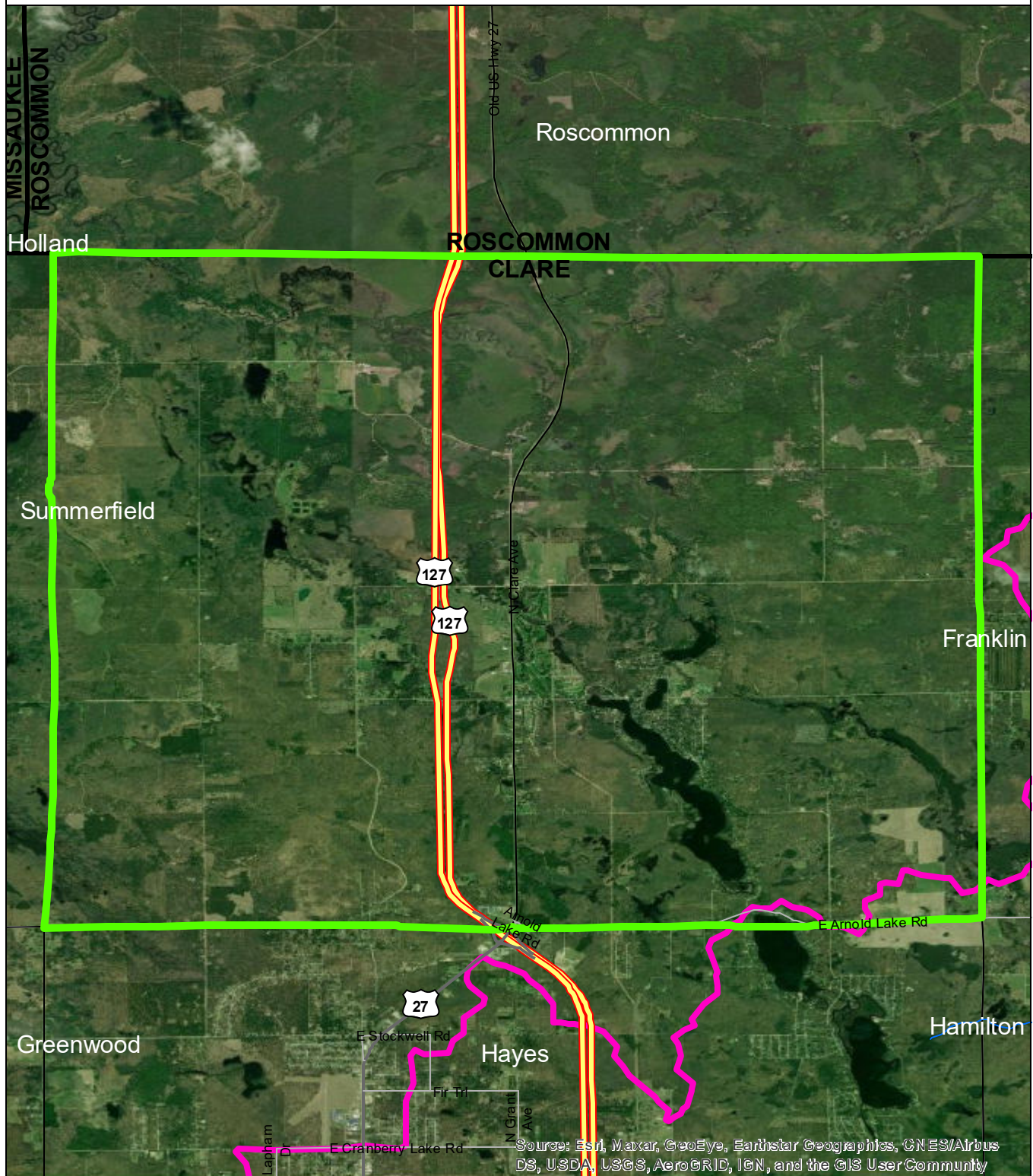- moderate
- high
- very high

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

Michigan CREP
Conservation Reserve Enhancement Program

Frost Township

MISSAUKEE
ROSCOMMON

Holland

Roscommon

Old US Hwy 27

ROSCOMMON
CLARE

Summerfield

127
127

N Clare Ave

Franklin

Arnold Lake Rd

E Arnold Lake Rd

Greenwood

27

E Stockwell Rd

Hayes

Fir Trl

N Grant Ave

Lapham Dr

E Cranberry Lake Rd

Hamilton

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

Legend

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

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

0   1   2 Miles

N

Data Sources

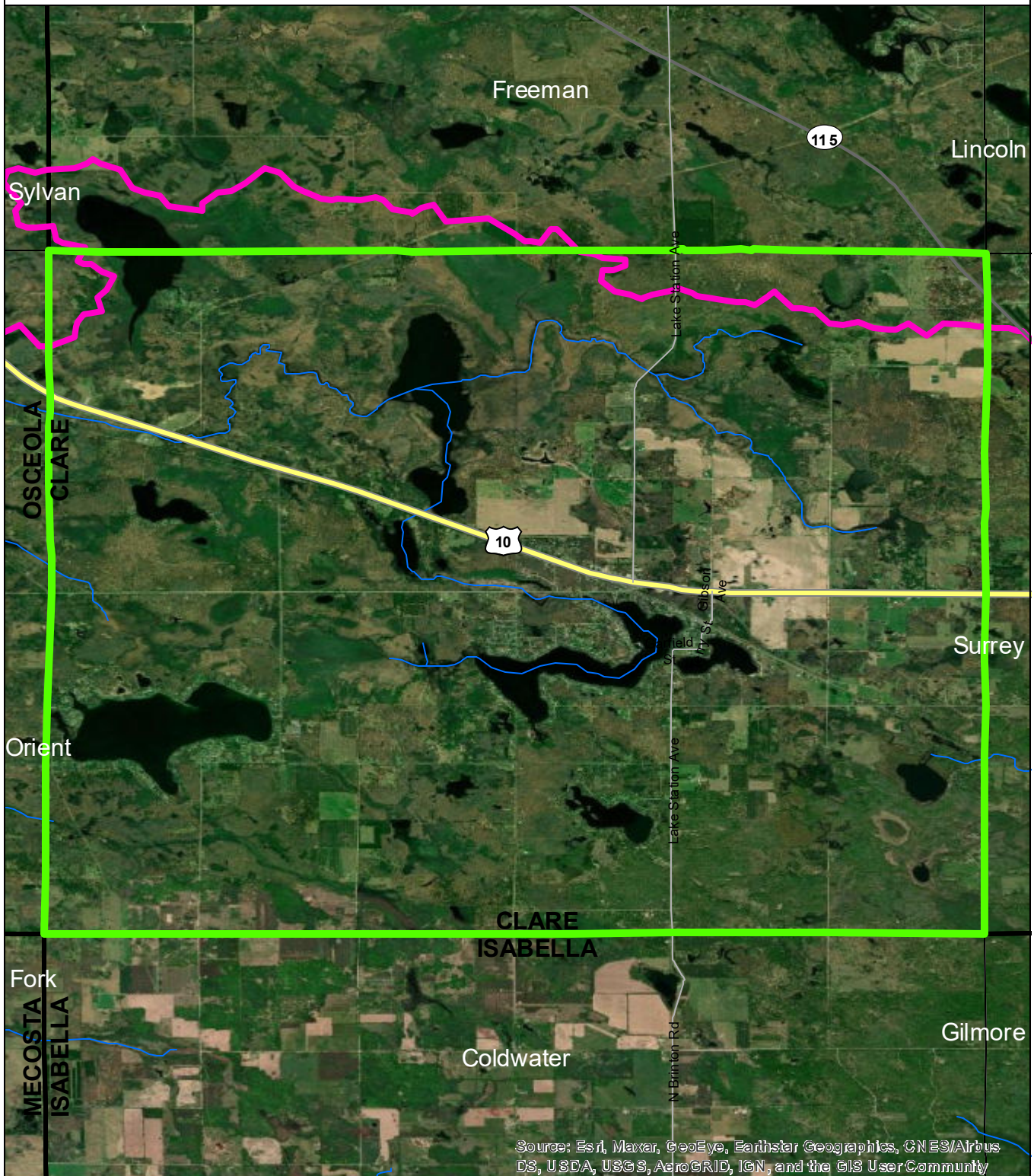State of Michigan: Counties, Townships & Cities
USGS: Sediment Loading Risk

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

Garfield Township

Sylvan

Freeman

Lincoln

115

OSCEOLA
CLARE

Lake Station Ave

10

Gibson Ave

Hy St

field
St

Surrey

Orient

Lake Station Ave

CLARE
ISABELLA

Fork

MECOSTA
ISABELLA

N Brinton Rd

Gilmore

Coldwater

	Garfield Township
	Saginaw Bay Basin
	Counties
	Rivers and Streams
	Townships & Cities

Sediment Loading Risk

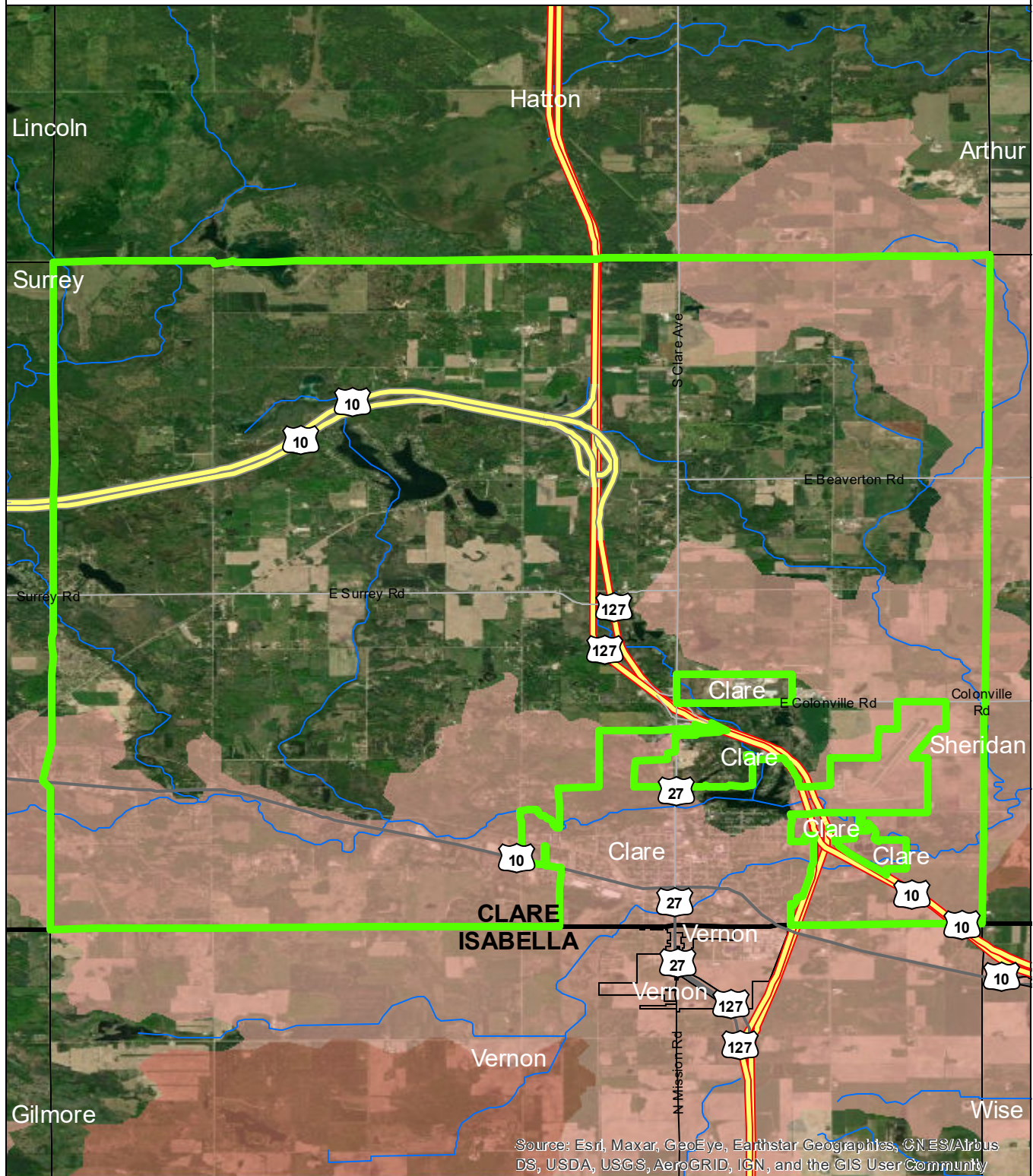|	
	low
	moderate
	high
	very high

0   1   2 Miles

N

Data Sources

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

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

Grant Township

Legend

- **Grant Township** (green outline)
- **Saginaw Bay Basin** (magenta outline)
- **Counties** (black outline)
- **Rivers and Streams** (blue line)
- **Townships & Cities** (white outline)

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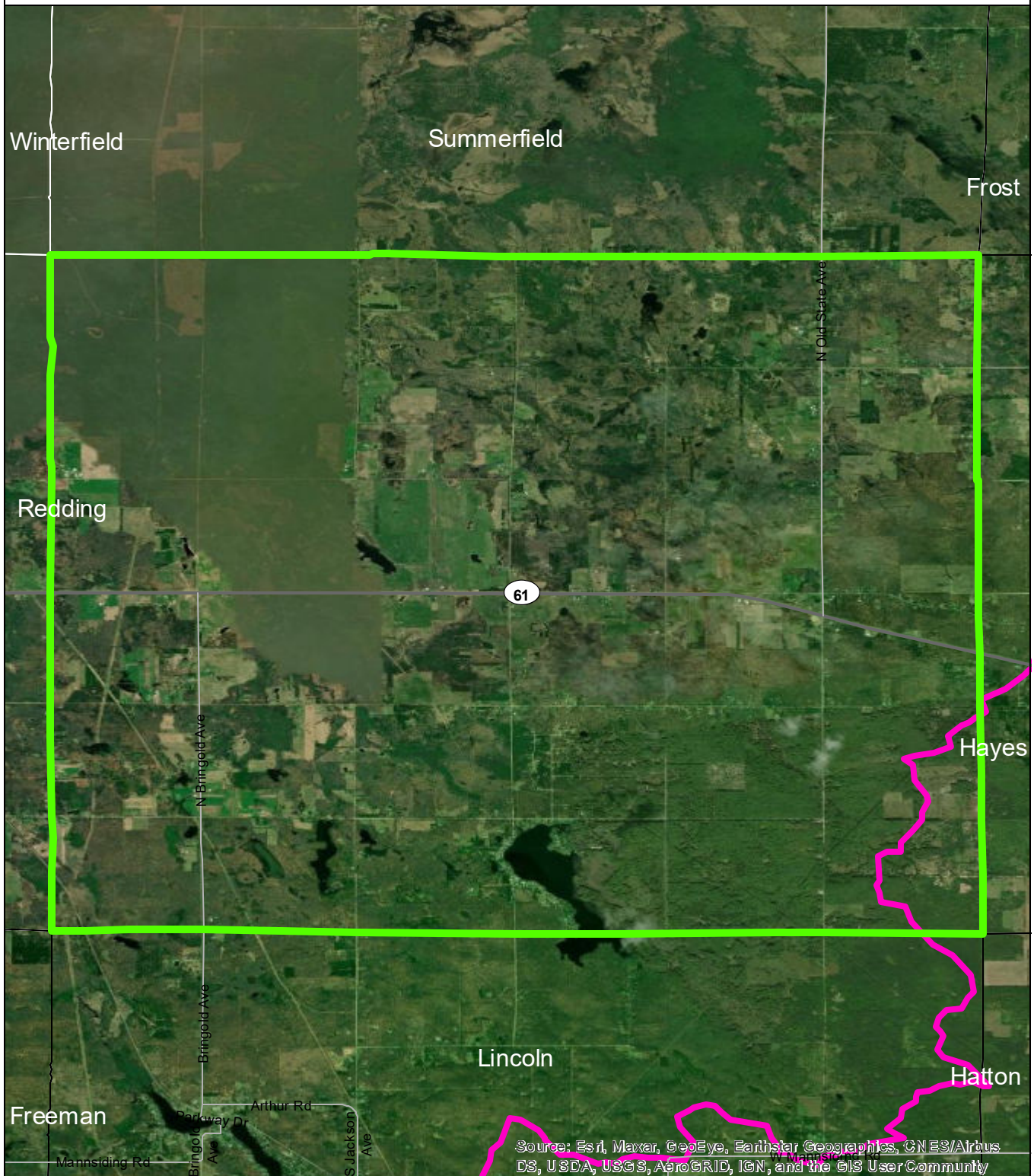- high
- very high

0   1   2 Miles

N

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

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

Greenwood Township

Winterfield

Summerfield

Frost

Redding

61

Hayes

N-Bringold-Ave

N Old State Ave

Lincoln

Hatton

Freeman

Bringold Ave

Arthur Rd

S Jackson Ave

Parkway Dr

Bringold Ave

Mannsiding Rd

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

Legend

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

Sediment Loading Risk

- low
- moderate
- high
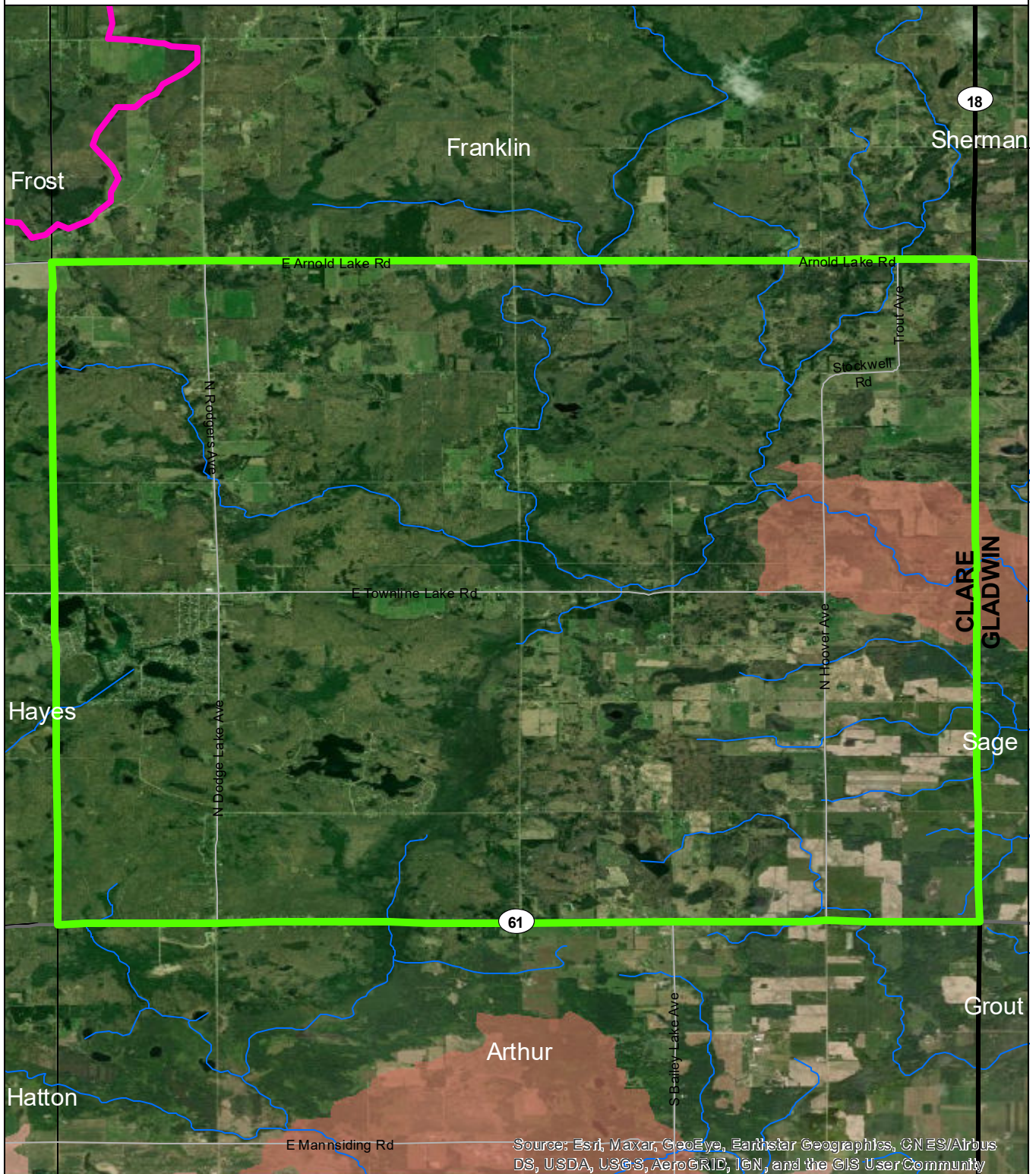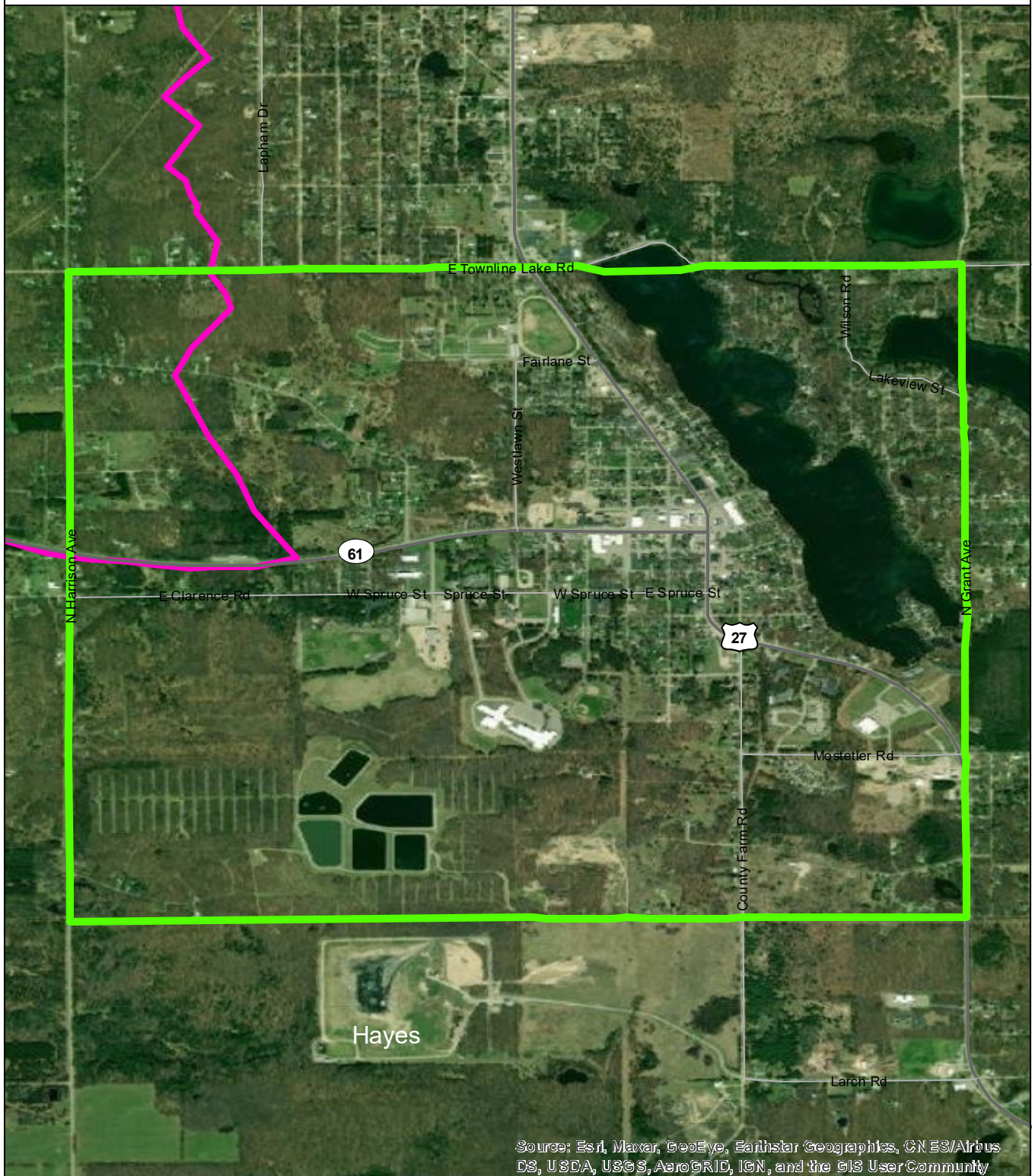- very high

0   1   2 Miles

N

Data Sources

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

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

Hamilton Township

Sediment Loading Risk

- low
- moderate
- high
- very high

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

0   1   2 Miles

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

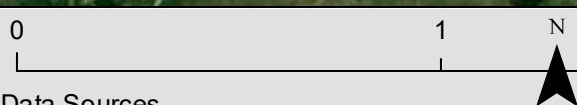Map produced by the Institute of Water Research - Michigan State University

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

City of Harrison

Legend:
- City of Harrison
- 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

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

Hatton Township

Legend:

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

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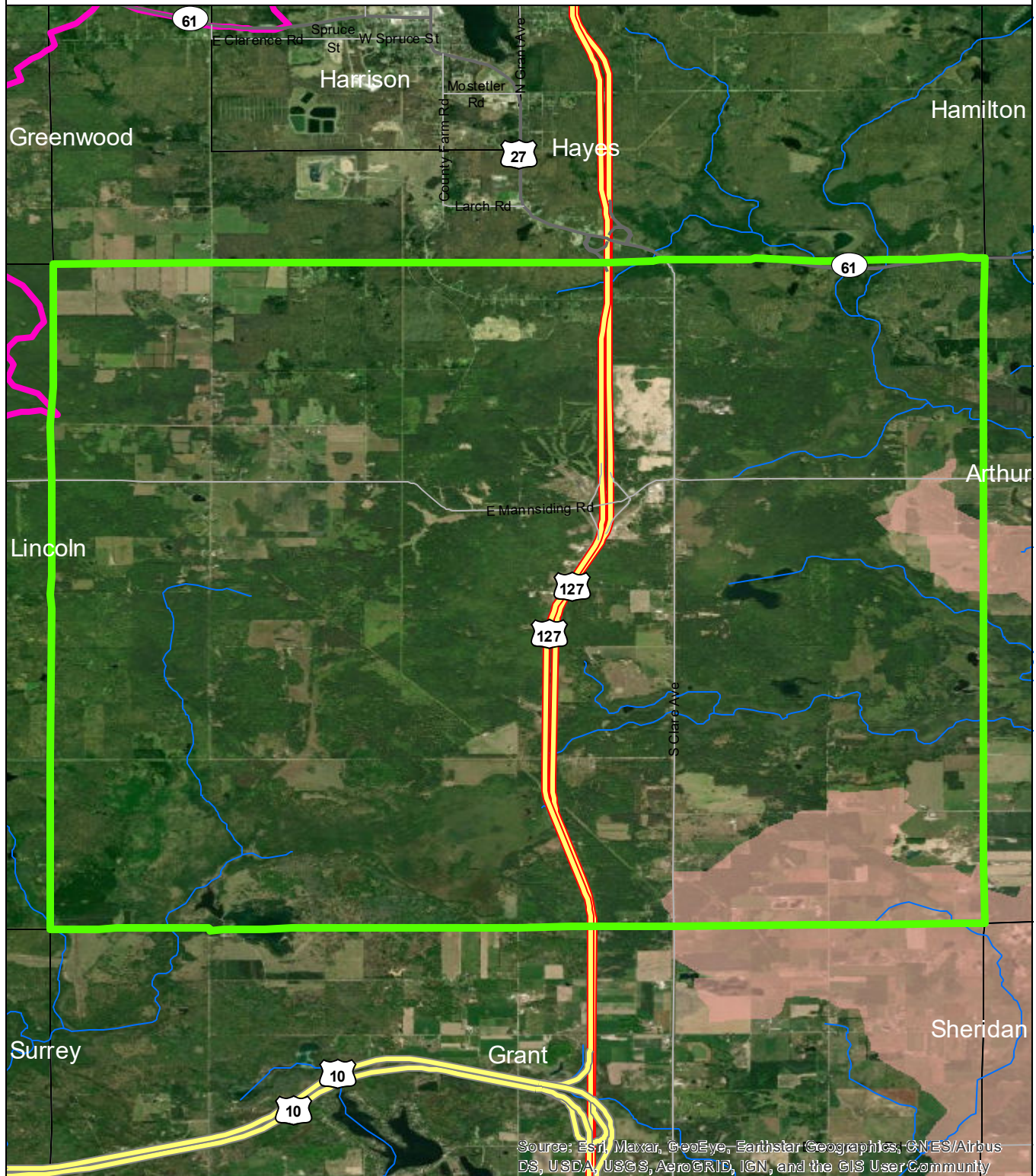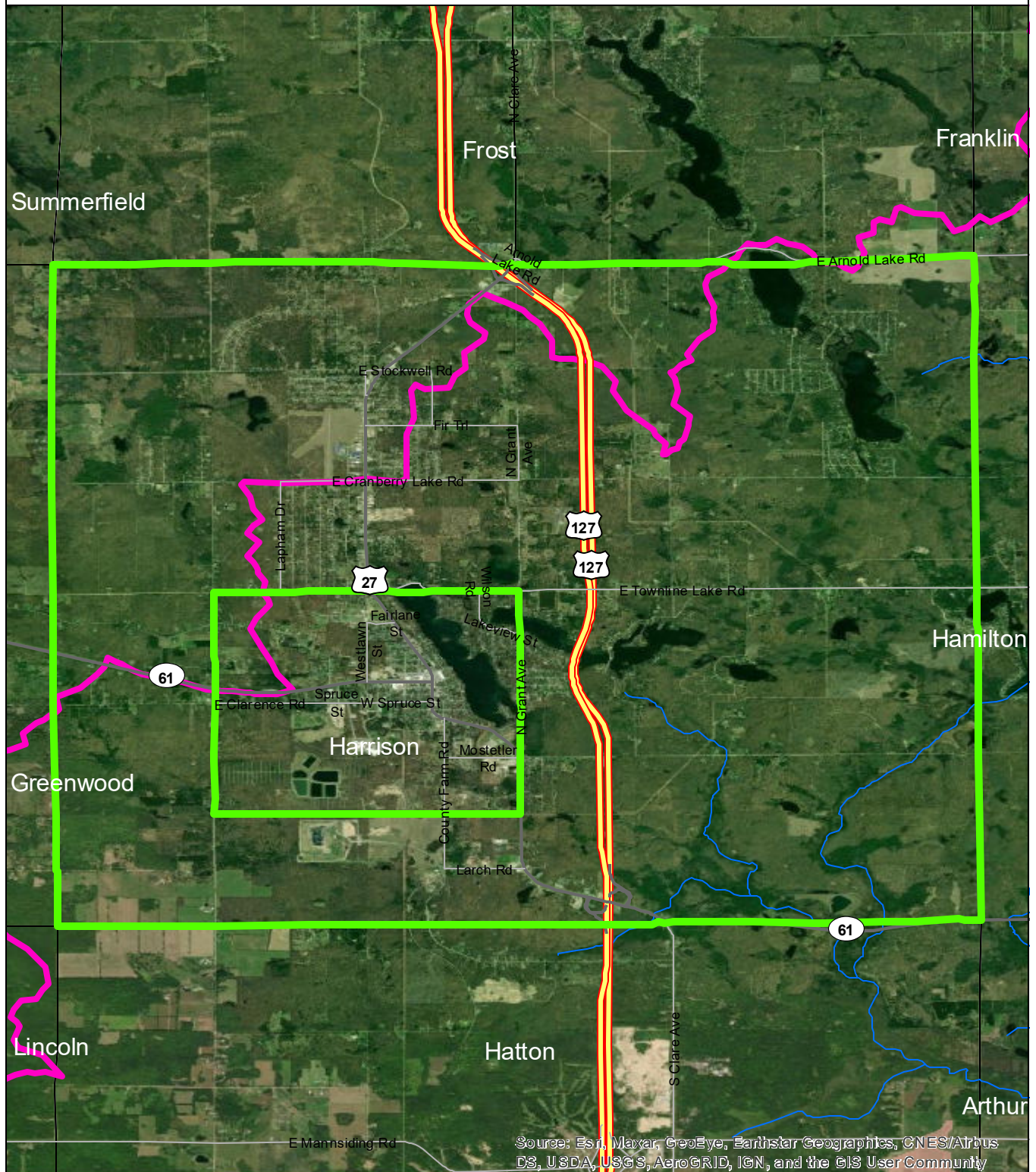- high
- very high

0   1   2 Miles

N

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

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

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

MICHIGAN STATE UNIVERSITY Extension

13

Michigan CREP
Conservation Reserve Enhancement Program

Hayes Township

Frost

Franklin

Summerfield

E Arnold Lake Rd

Arnold Lake Rd

N Clare Ave

E Stockwell Rd

Fir Trl

N Grant Ave

E Cranberry Lake Rd

Lapham Dr

127

127

27

E Townline Lake Rd

Wilson Rd

Hamilton

Fairlane St

Lakeview St

Westlawn St

61

N Grant Ave

Spruce St

E Clarence Rd

W Spruce St

Harrison

Mostetler Rd

County Farm Rd

Greenwood

Larch Rd

61

Lincoln

Hatton

S Clare Ave

Arthur

E Mannsiding Rd

Legend

- ▭ Hayes Township
- ▭ Saginaw Bay Basin
- ▭ Counties
- — Rivers and Streams
- ▭ Townships & Cities

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

0   1   2 Miles
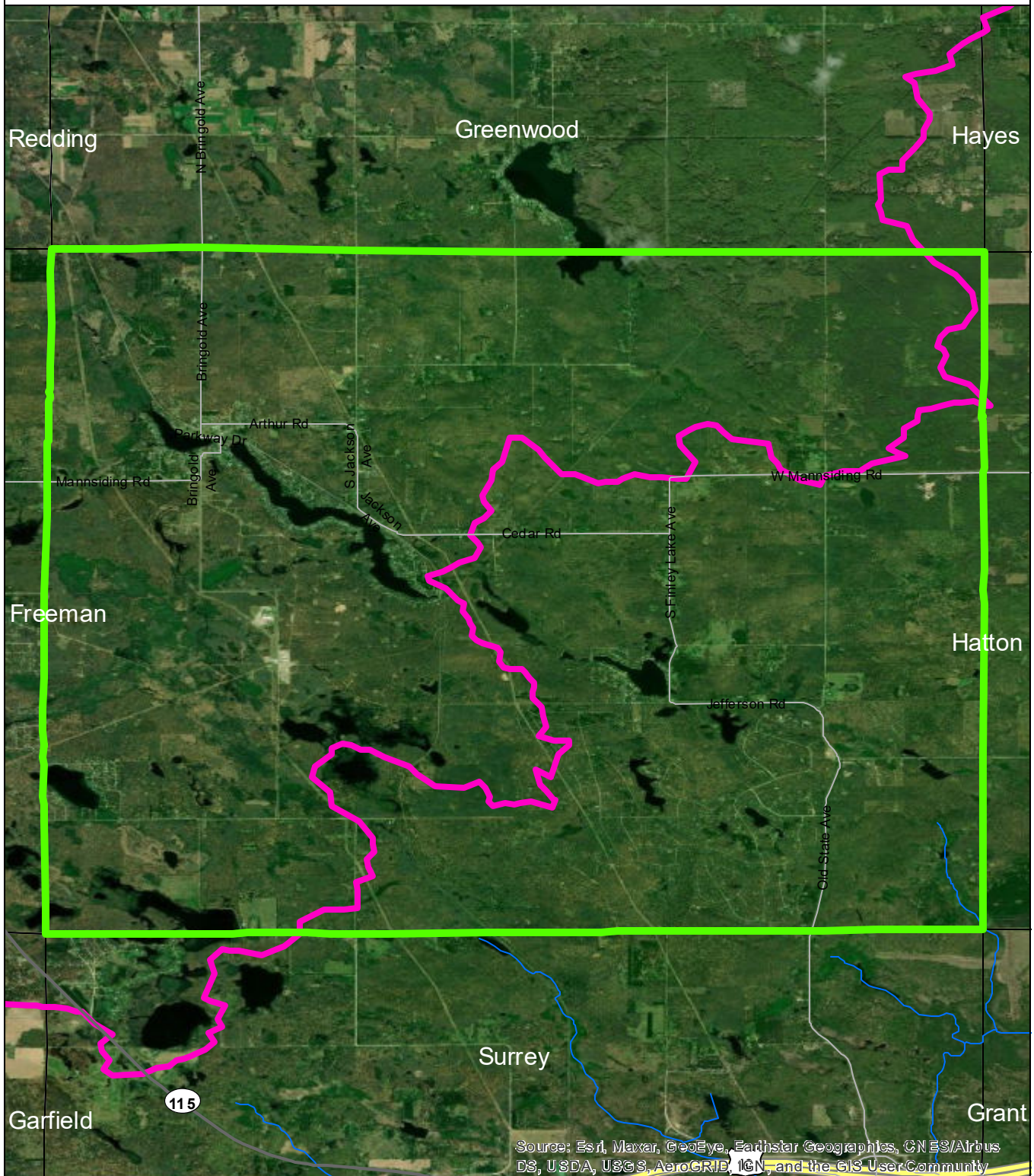
N

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

Redding | Greenwood | Hayes

N Bringold Ave

Bringold Ave

Arthur Rd

Parkway Dr

Mannsiding Rd

Bringold Ave

S Jackson Ave

Jackson Ave

Cedar Rd

W Mannsiding Rd

S Finley Lake Ave

Freeman | Hatton

Jefferson Rd

Old State Ave

Surrey

115

Garfield | Grant

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

Legend

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

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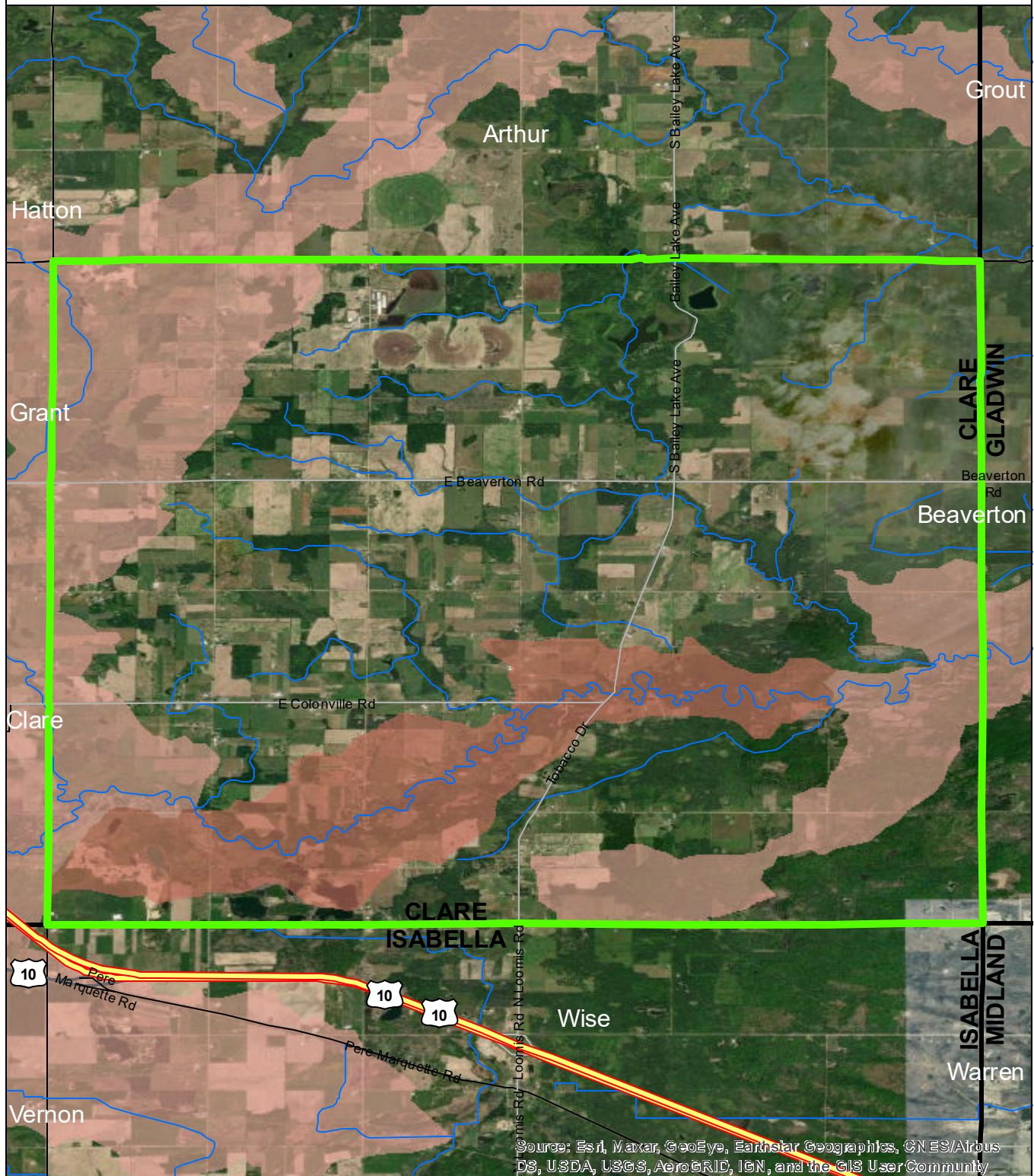- very high

0   1   2 Miles

N

Data Sources

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

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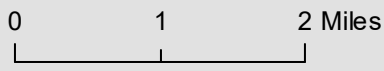
Sheridan Township

Legend:
- Sheridan 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

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

MICHIGAN STATE UNIVERSITY Extension

Michigan CREP Conservation Reserve Enhancement Program

Surrey Township

Legend:

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

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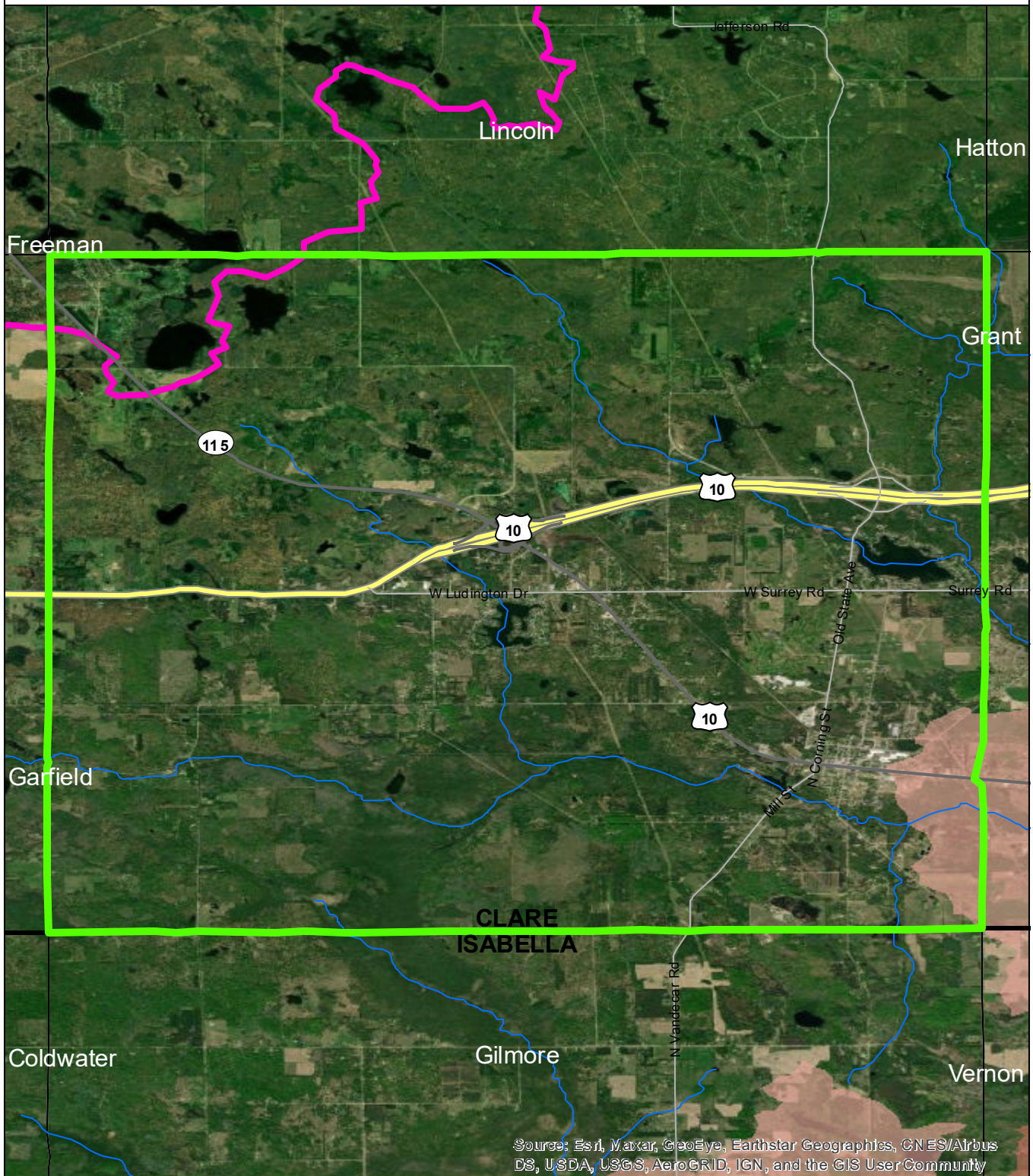- moderate
- high
- very high

0   1   2 Miles

N

Data Sources

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

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

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

MICHIGAN STATE UNIVERSITY Extension

Michigan CREP
Conservation Reserve Enhancement Program