

Estimate of Fees (Work Order #2)
Braden River Watershed Management Plan
Southwest Florida Water Management District

Watershed Concepts / Earth Data

The following represents a quote of Pasco County LiDAR services received from Joe Chapman of Watershed Concepts:

Specifications

LIDAR data for the portions of Pasco County will be acquired using an ALS40 LIDAR system and will be flown with the following specifications:

- 5,000' AMT
- 30 deg field of view
- 20% side lap
- 2-meter post spacing
- 10 cm vertical accuracy in homogeneous unambiguous terrain (i.e. flat to gently rolling open areas devoid of heavy dense vegetation, heavy urban structures, steep rocky mountainous terrain, and heavily rutted terrain)

Digital orthophotography for the portions of Pasco County will be acquired using an ADS40 Digital Camera system and will be flown with the following specifications:

- Ground sample distance 1 foot
- Scale 1"=200'

Accurate 3D breaklines will be generated from aerial photography using traditional stereo photogrammetric digital data capture processes and techniques

Deliverables

Deliverables for the LIDAR and Orthophotos are:

- Ground Control Report
- Aerial Data Acquisition Report
- LIDAR-derived bare earth DEM in ASCII or .EBN format for Watershed Concepts
- LIDAR-derived bare earth DEM for non-obscured areas in .LAS format for SFWMD. File name will include "SP.PNT"
- LIDAR-derived bare earth DEM for points found in vegetative spots in vegetative void areas in .LAS format for SFWMD. File name will include "V.PNT"
- Breakline files in ArcInfo ASCII format for road centerlines in the vicinity of modeled stream crossings. File name will include "R.LIN"
- Breakline files in ArcInfo ASCII format for paved road edges. File name will include "R.LIN"
- Breakline files in ArcInfo ASCII format for soft features. File name will include "T.LIN"
- Breakline files in ArcInfo ASCII format for closed water features. File name will include "W.POL"
- Breakline files in ArcInfo ASCII format for obscured areas. File name will include "V.POL"
- Breakline files in ArcInfo ASCII format for islands within water bodies. File name will include "IS.POL"
- Breakline files in ArcInfo ASCII format for shorelines of canals and ditches (double lines for features 8' or wider and single line for all others). File name will include "IS.POL"
- Breakline files in ArcInfo ASCII format for overpasses and bridges. File name will include "BR.LIN"
- Contour files in ArcInfo coverages for Set One and Set Two as defined by the SFWMD project specifications.
- Color, digital orthophotography in .TIF format with accompanying .TFW files. Orthos will be at a 1' pixel resolution at a scale of 1"=200'.
- LIDAR QA/QC Report
- Hydrologically Correct DEM
- TIN in accordance with the SFWMD specifications

Schedule

- Acquisition of the aerial photography and the ground control will commence, weather permitting, within 2 weeks from notice to proceed.
- Delivery of digital orthos and LIDAR for Pasco County Area will occur within 60 days from notice to proceed (this includes completion of QA/QC report by Watershed Concepts).
- Delivery of contours for Pasco County Area will occur within 5 days after approval of terrain data by District.

Fees

The total cost for the deliverables listed above is as follows:

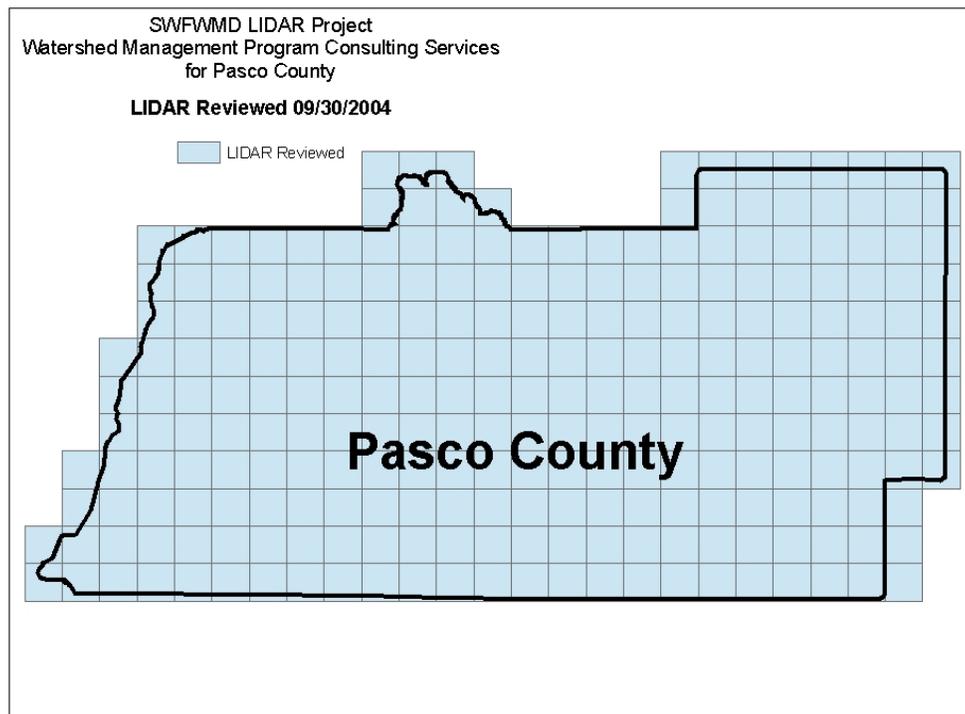
Total:

Watershed Management Program Consulting Services

LIDAR EVALUATION

Quality Control Evaluation of LIDAR Data For Pasco County, Florida

Contract: M112



Pasco County LIDAR Evaluation

Quality Control Evaluation of LIDAR DEMs

Introduction

Watershed Concepts reviewed the LIDAR data provided by Earth Data International as part of a quality control check on the data for Pasco County. Watershed Concepts was provided bare earth mass points, and imagery for areas in Pasco County

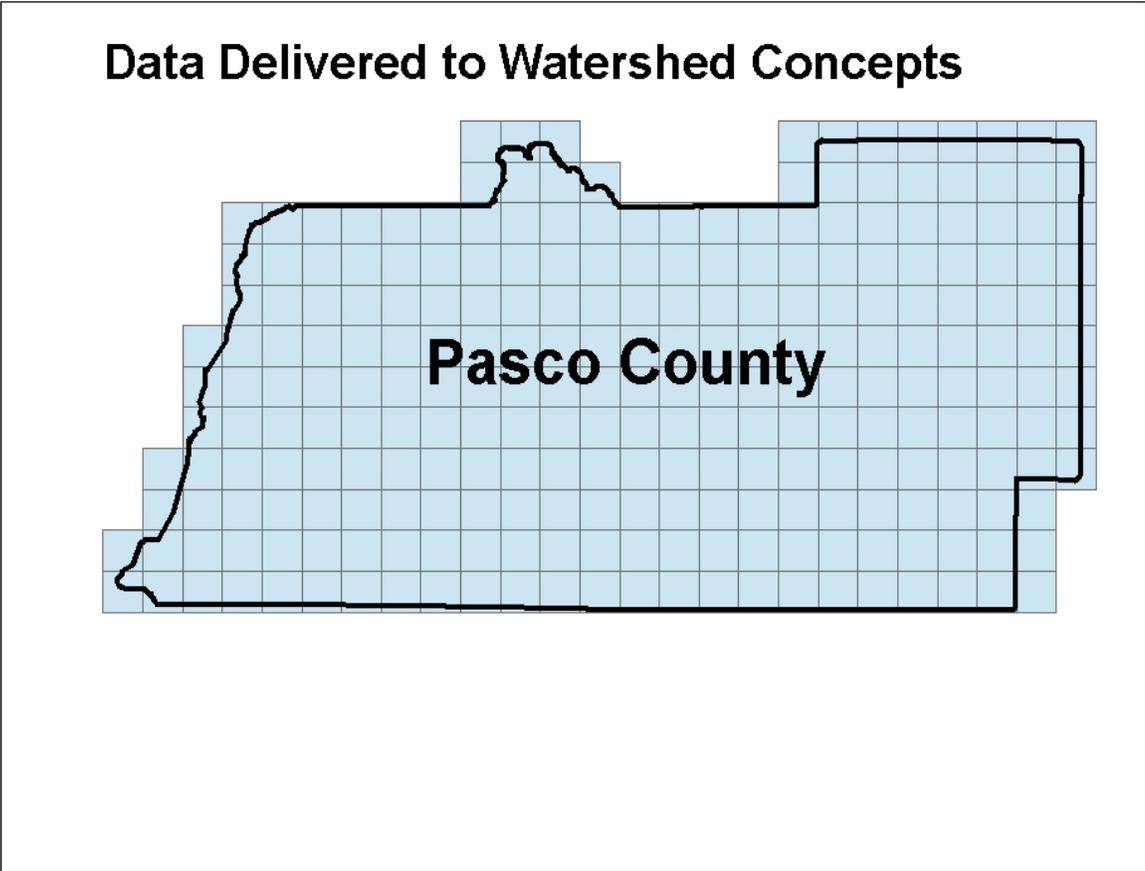


Figure 1- Area of data delivered to Watershed Concepts

Methodology

The LIDAR point data tiles were evaluated by running each tile through the Quality Control procedure developed and refined by Watershed Concepts. This procedure involves the following steps:

- 1) **Hillshade Review**
- 2) **RMSE Calculation**

Hillshade Review

- 1) A hillshade was generated using ArcInfo for each LIDAR tile delivered.
- 2) Each hillshade was then compared against available imagery.
- 3) Areas in each tile that contained possible artifacts (e.g., vegetation, noise, buildings) were delineated with polygons.
- 4) Each tile was then captured in a screenshot and a short descriptive sentence was added to the screenshot for each.

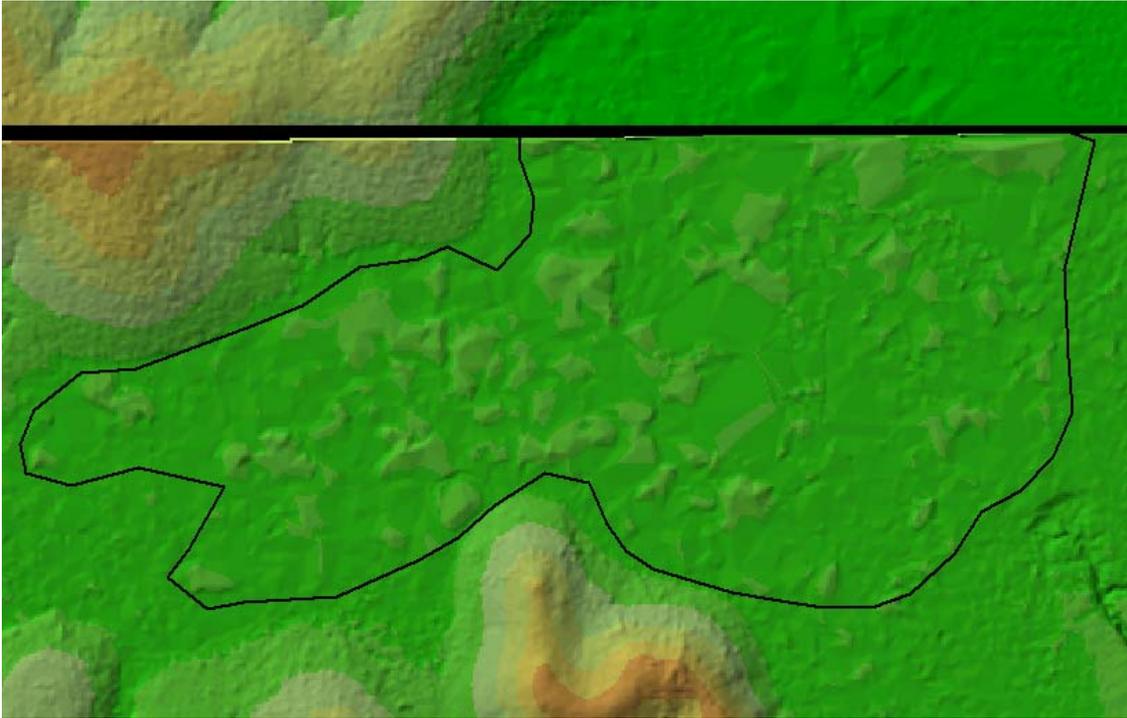
RMSE Calculation

- 1) A Triangular Irregular Network (TIN) was developed for each Task Area.
- 2) Elevation differences were calculated between the TIN elevations and the field-surveyed points provided by ESP for that associated Task Area.
- 3) In order to get rid of negative, the Error results were squared.
- 4) The average is calculated.
- 5) The RMSE result is calculated by taking the square root of the Average - Error ² result.

Overview of Selected Areas of Concern

The following shows extreme examples of questionable areas along with polygons representing an area where the Lidar data may contain artifacts such as vegetation, buildings, or noise.

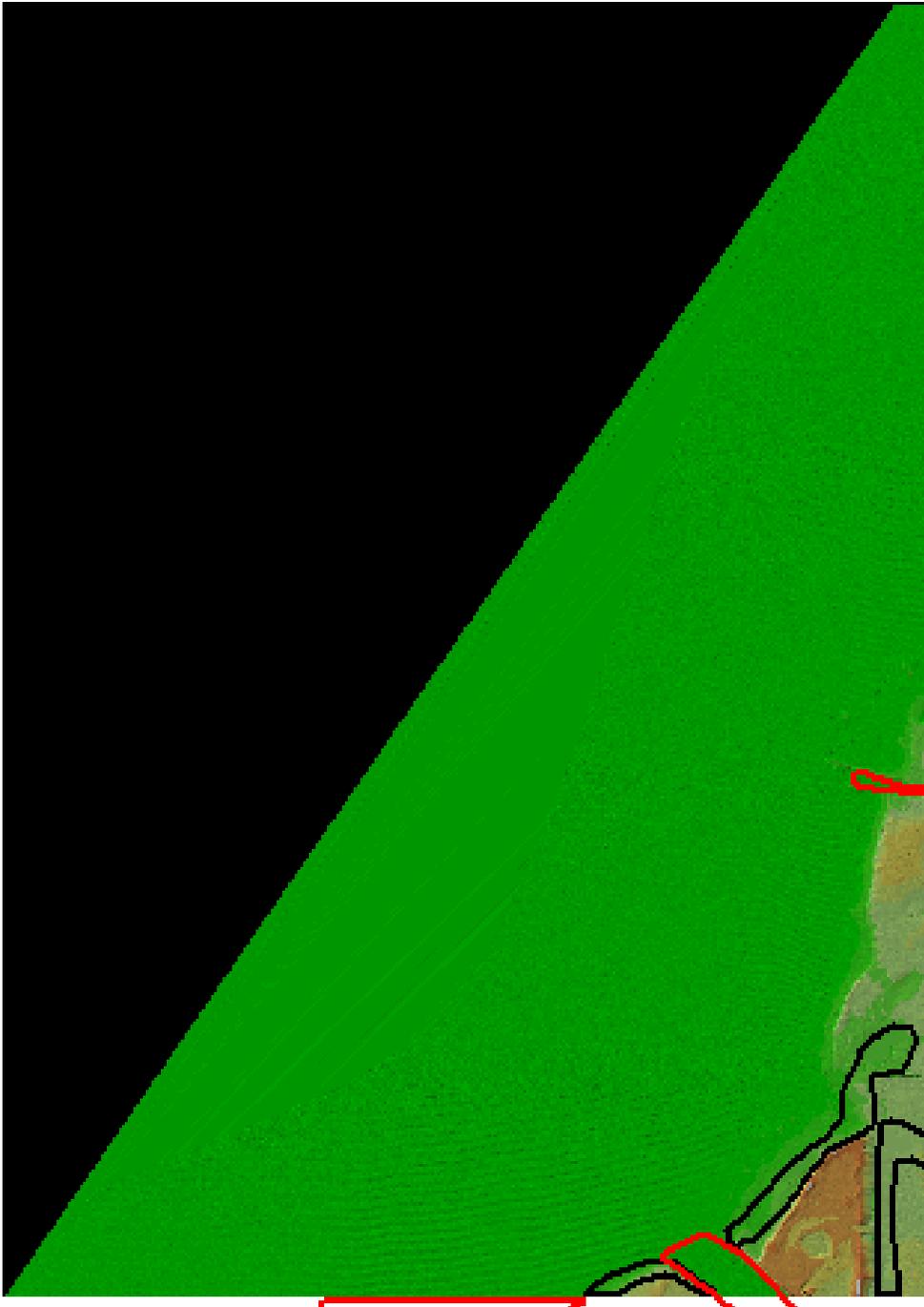
Example 1- Very light areas of vegetation.



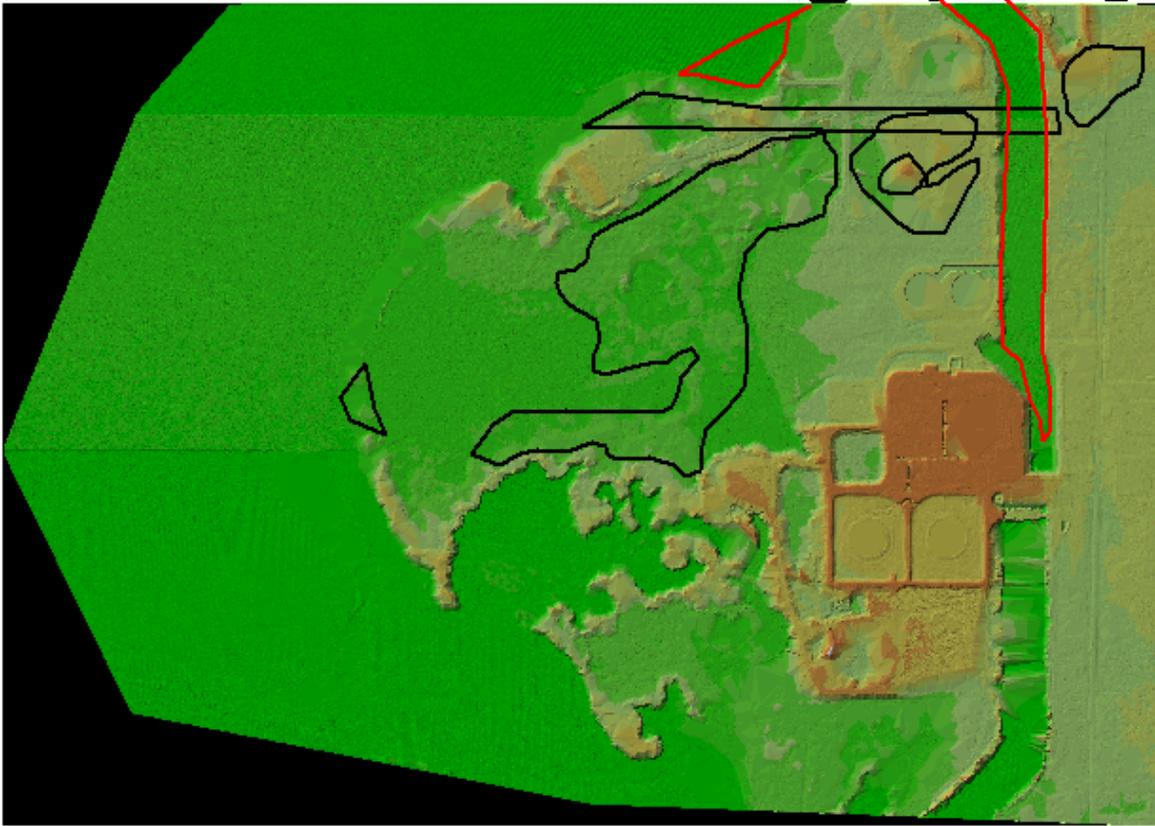
Example 2: Missing section of a raised road.



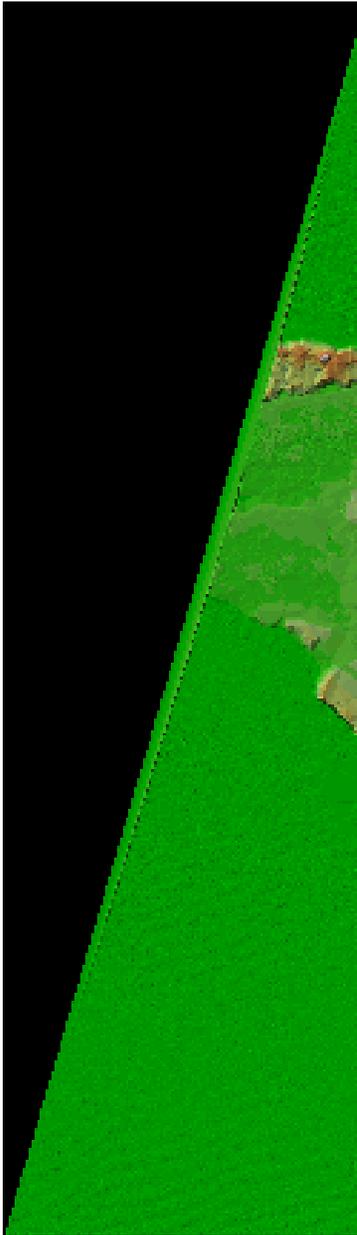
Tile: A_000011- Water points not vaporized and aggressive editing.



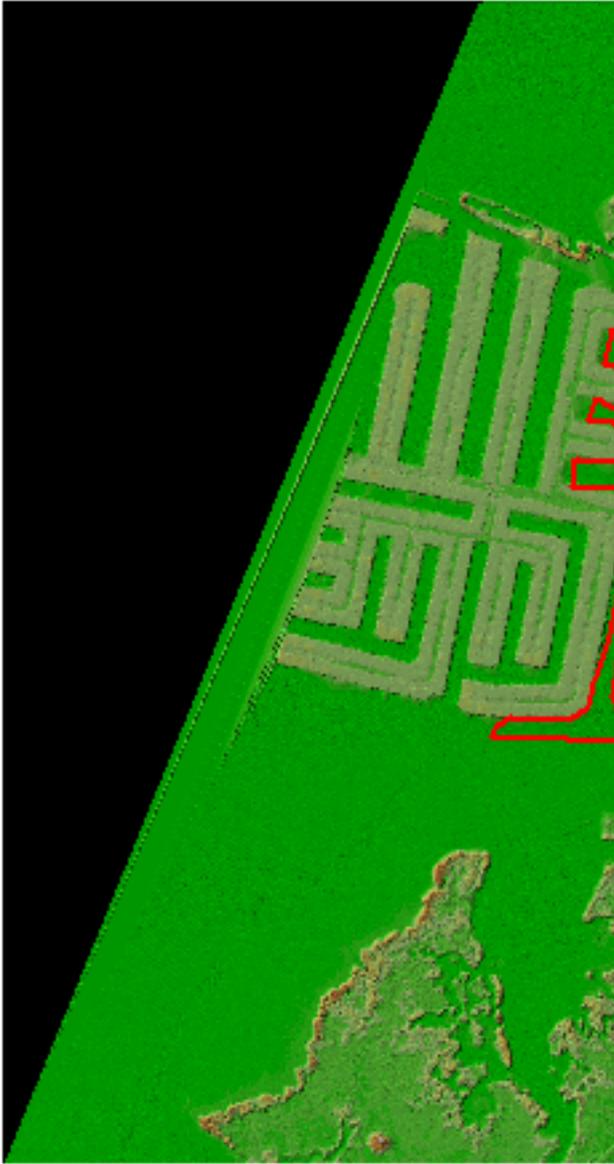
Tile: A_000012-Aggressive editing, possible flightline step and water points not vaporized.



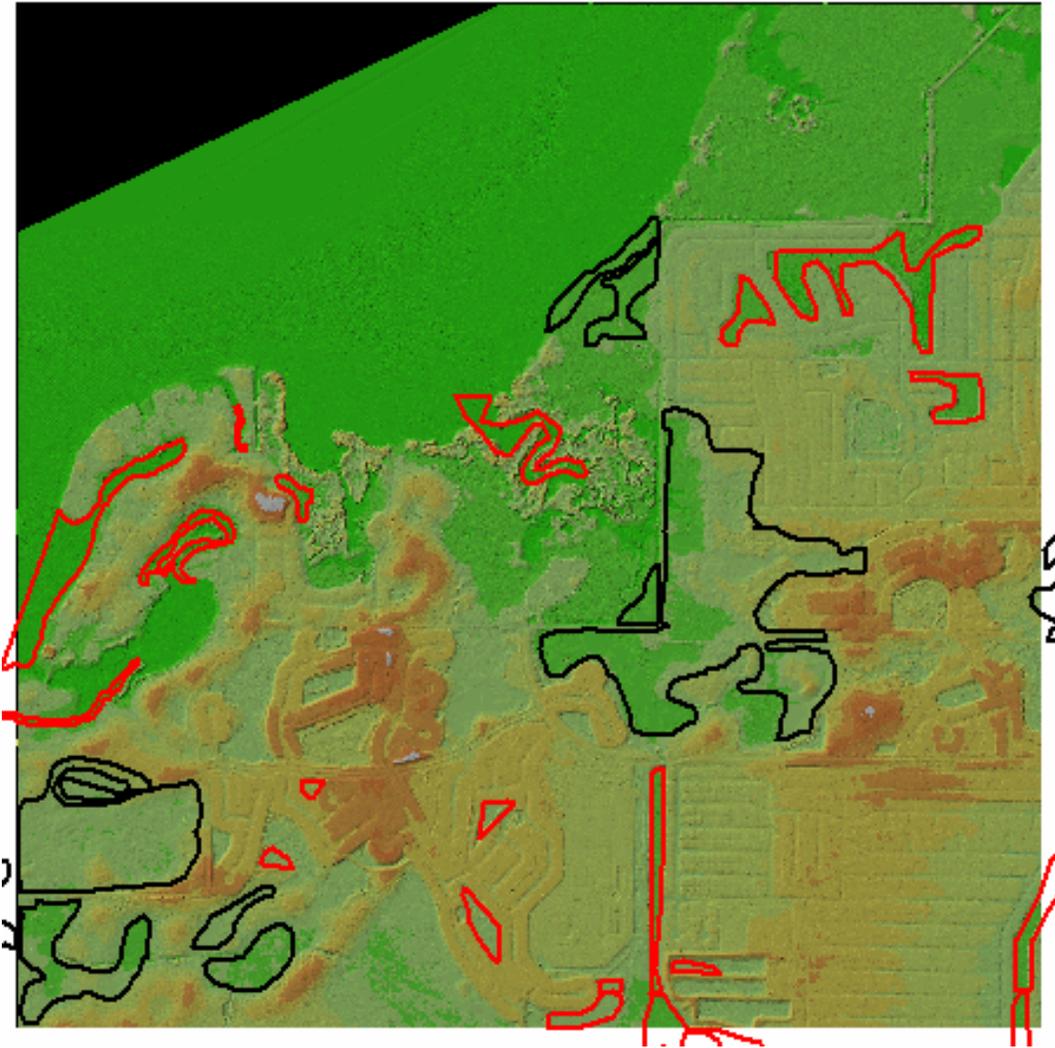
Tile: B_000009-No problems.



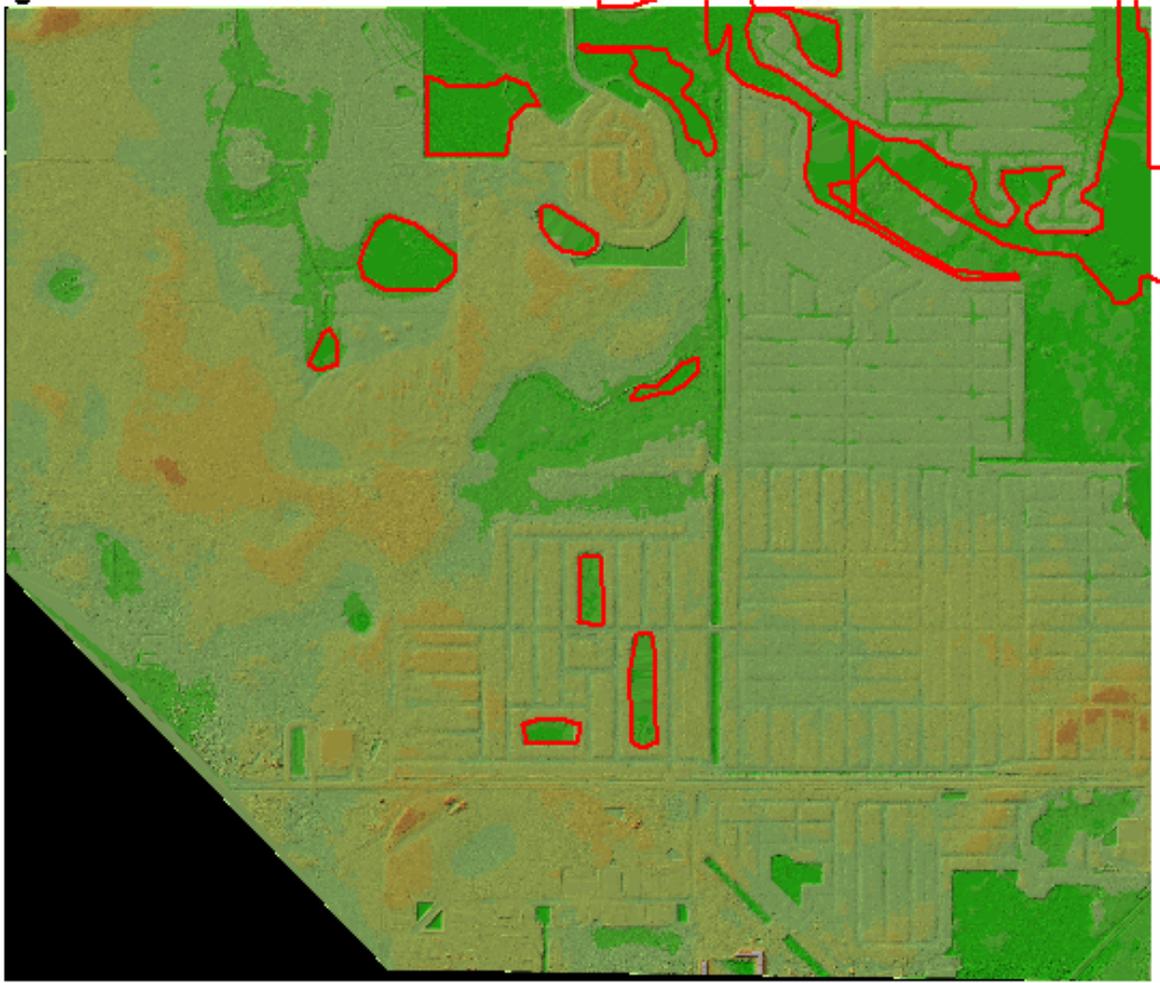
Tile: B_000010-Water points not vaporized.



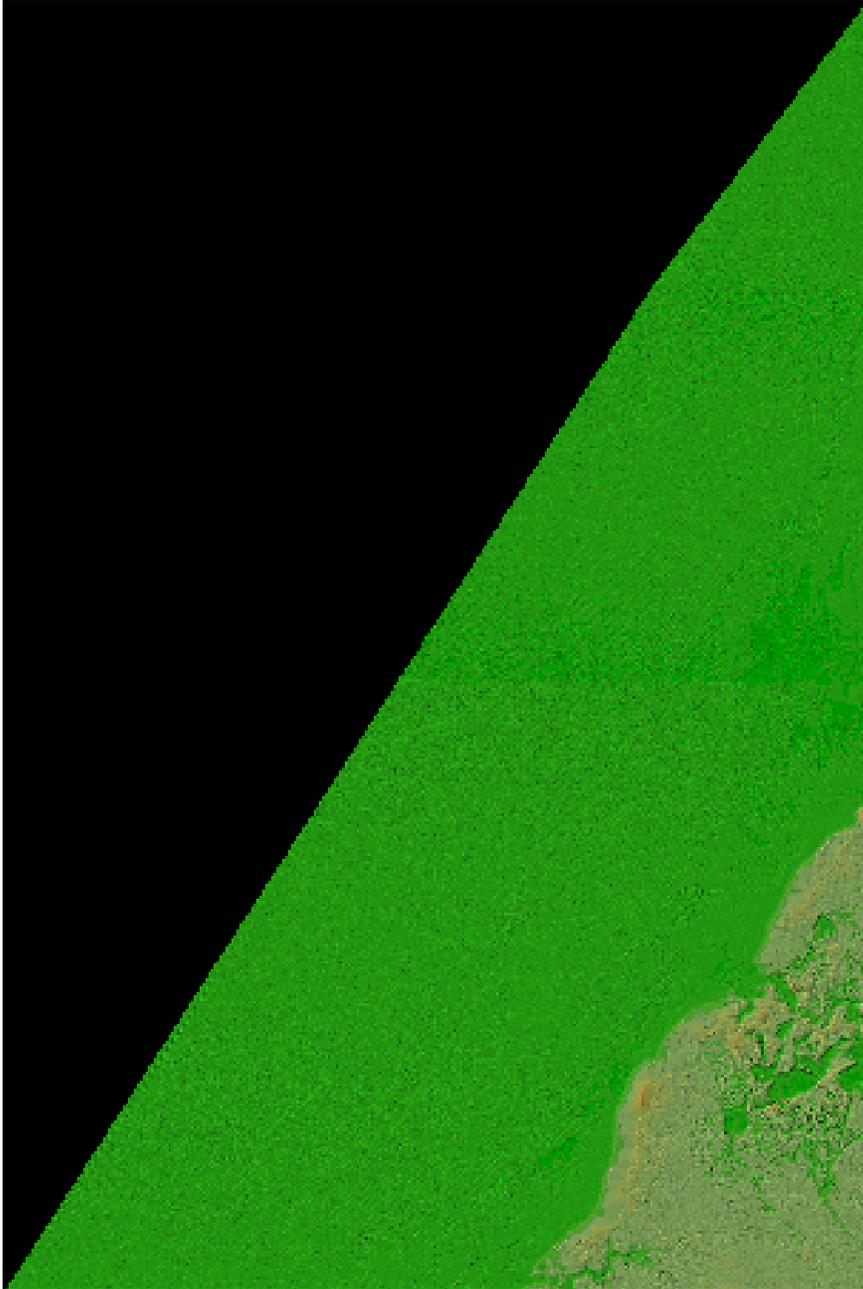
Tile: B_000011-Aggressive editing and water points not vaporized.



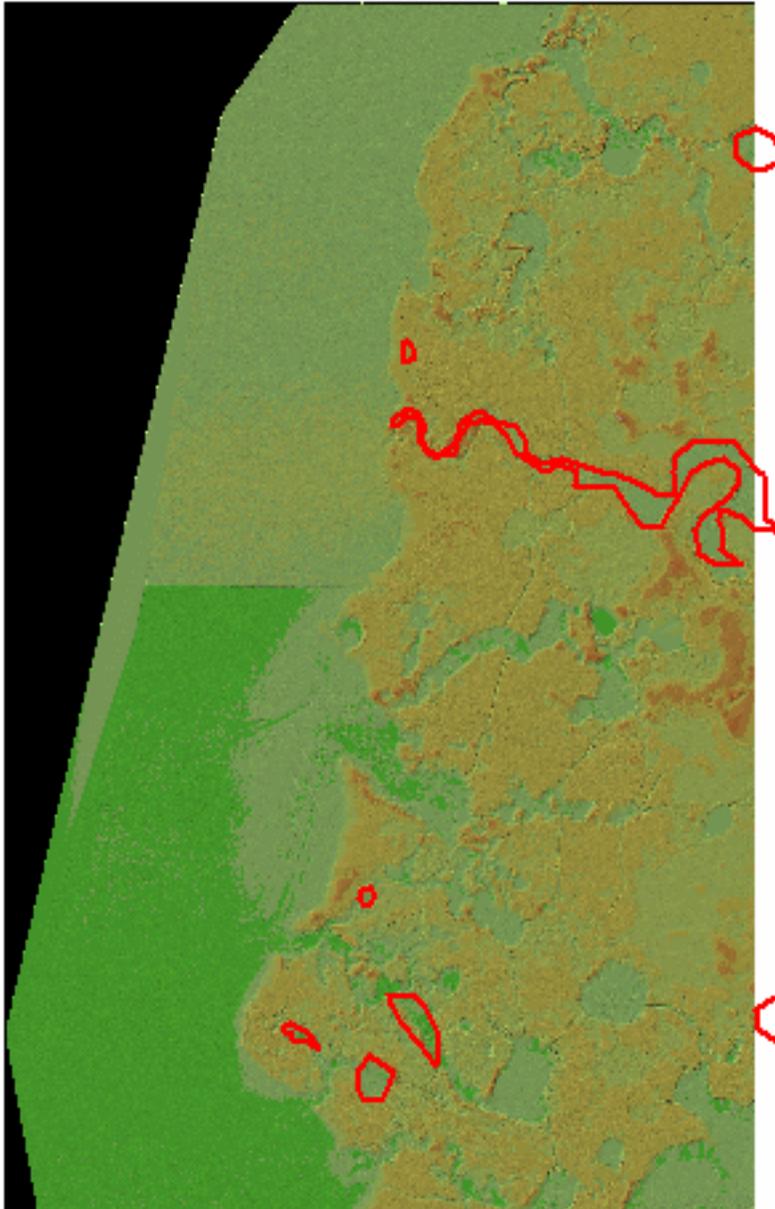
Tile: B_000012- Water points not vaporized.



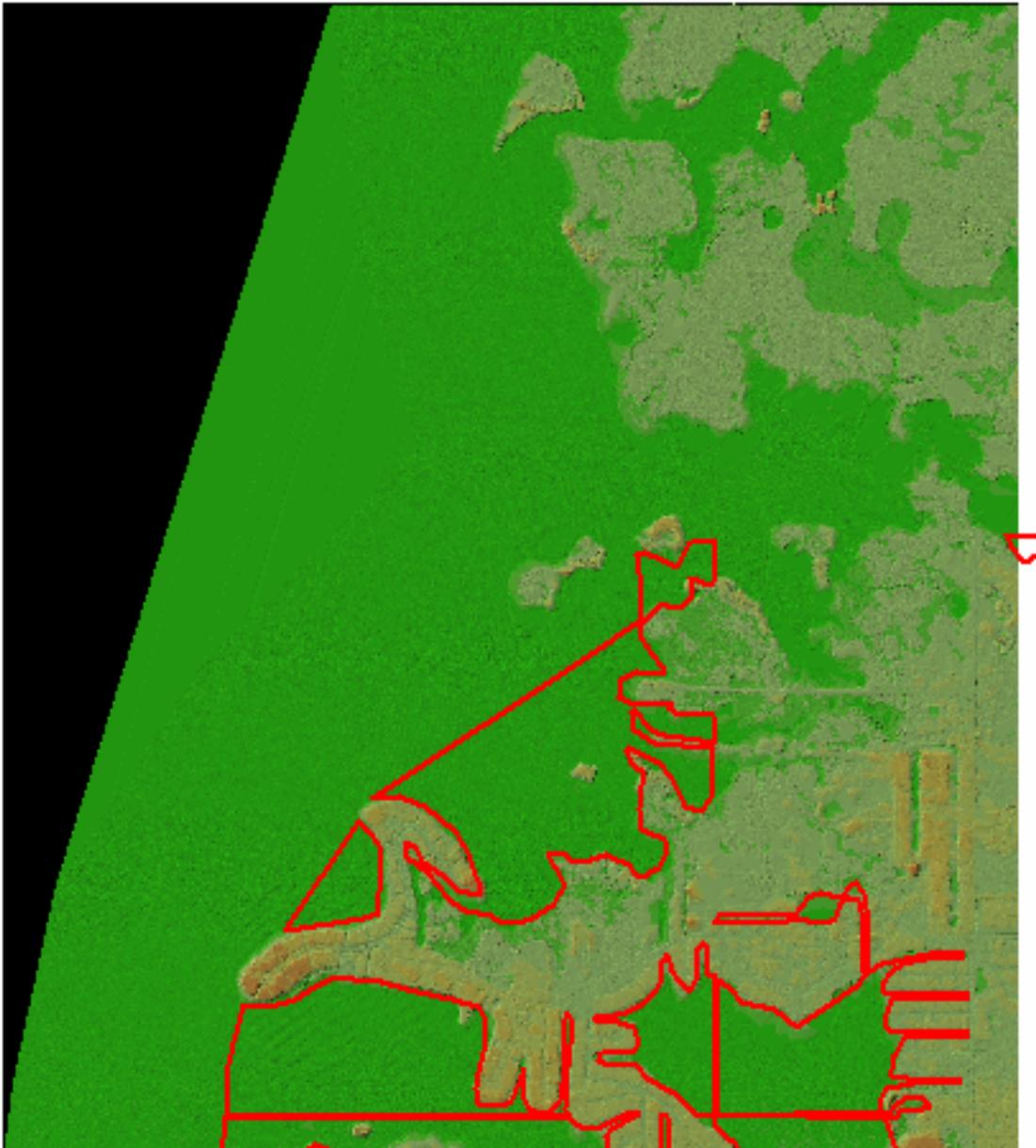
Tile: C_000006- Water points not vaporized



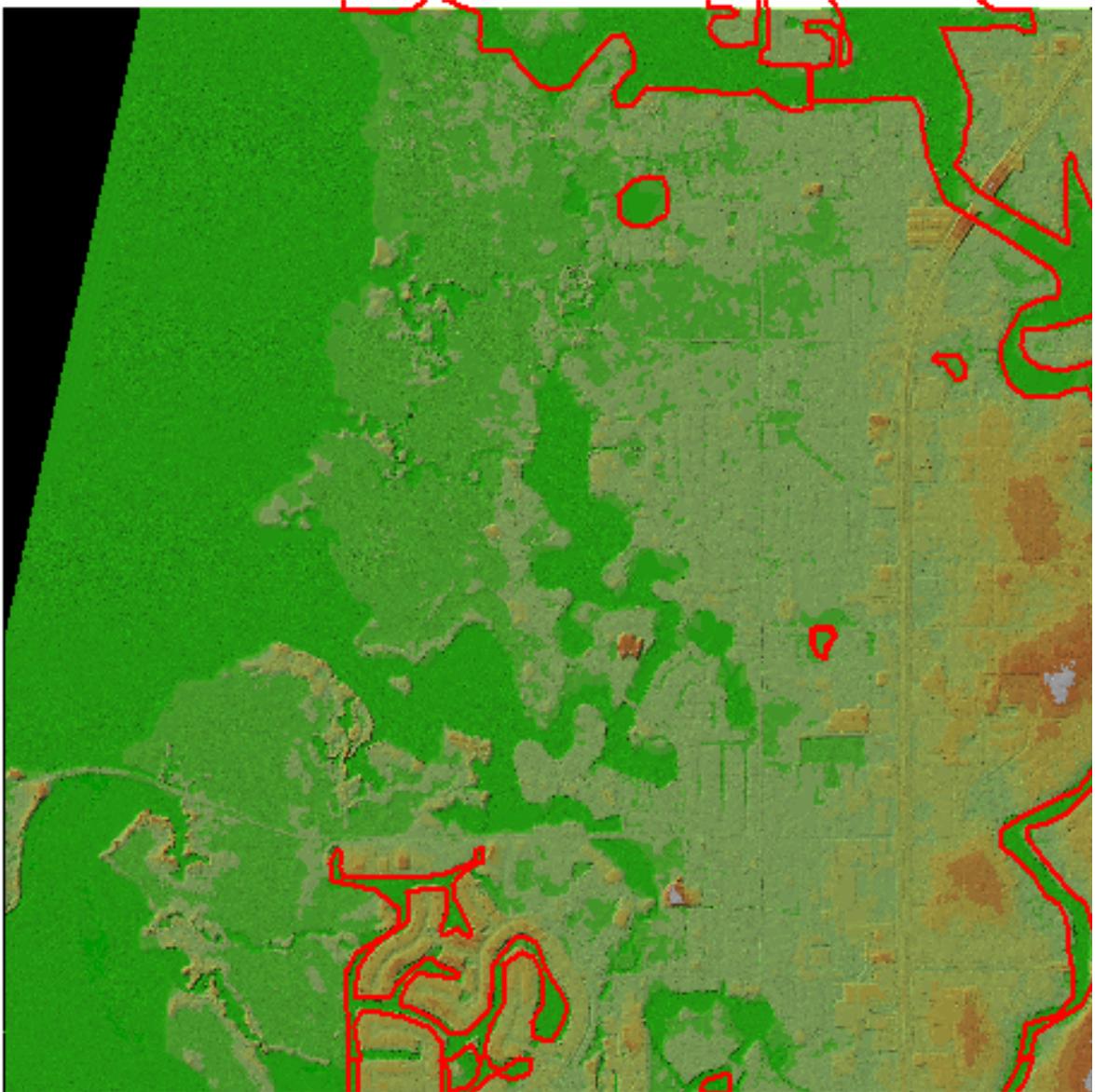
Tile: C_000007- Water points not vaporized



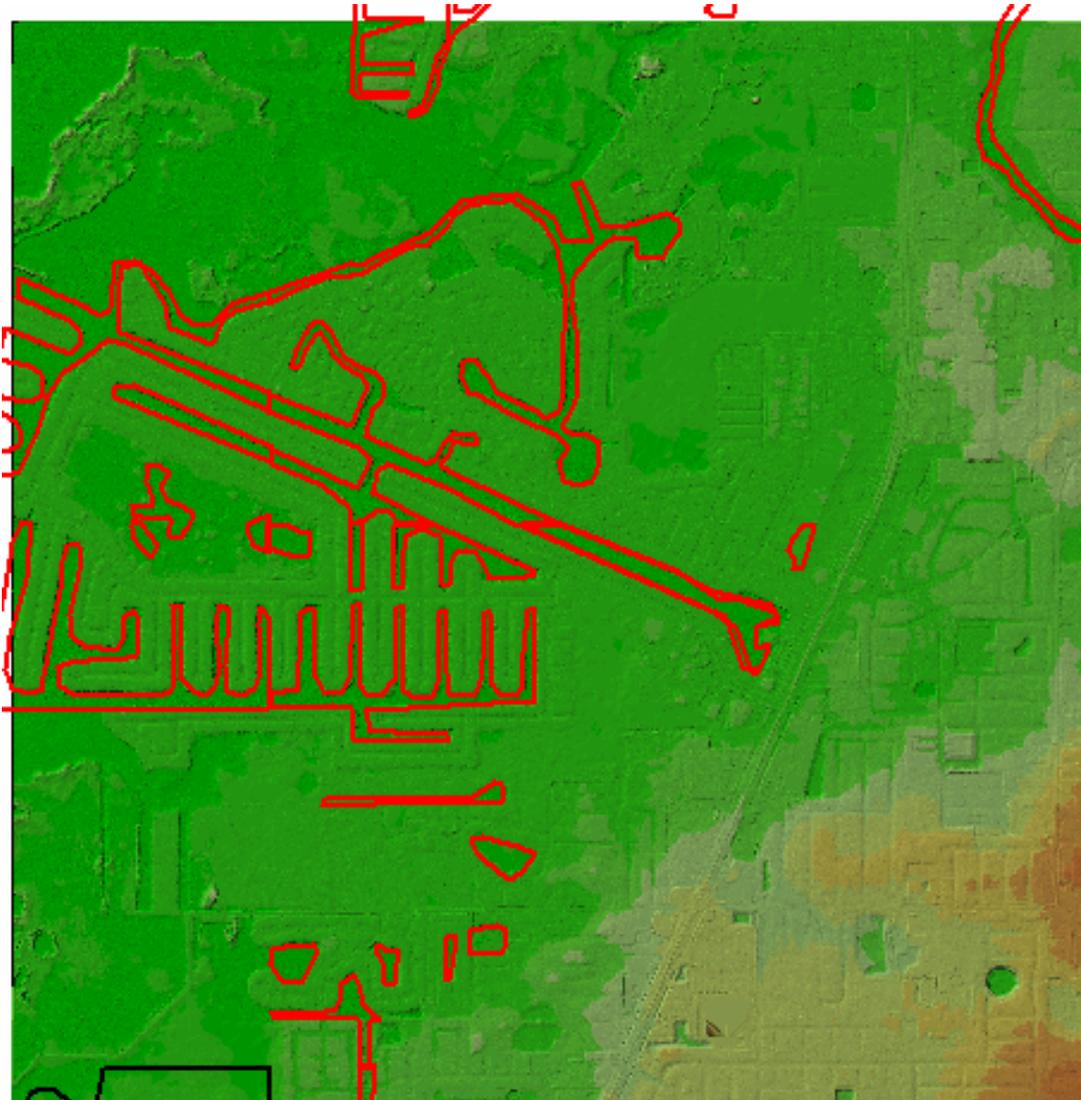
Tile: C_000008- Water points not vaporized



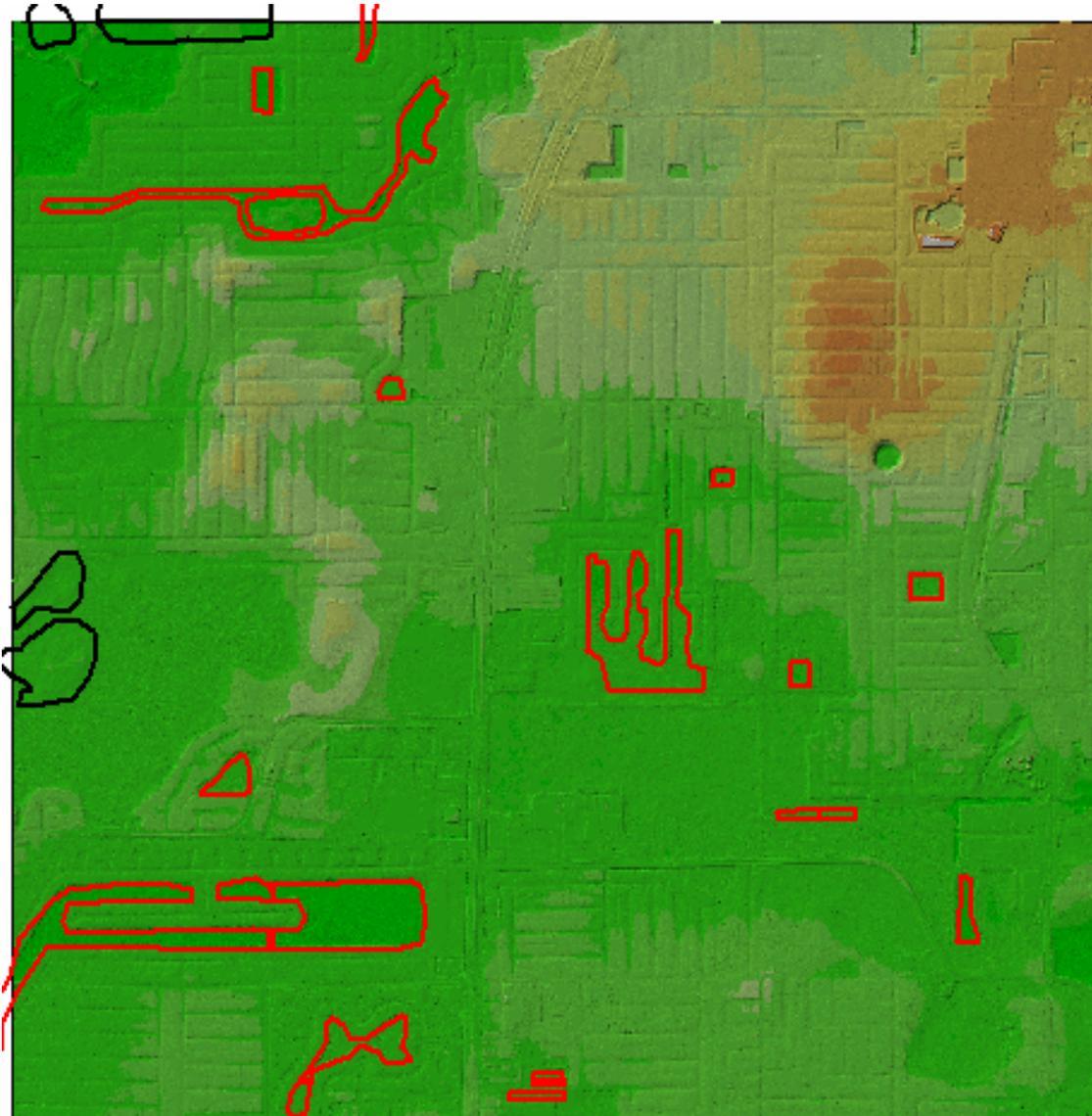
Tile: C_000009- Water points not vaporized



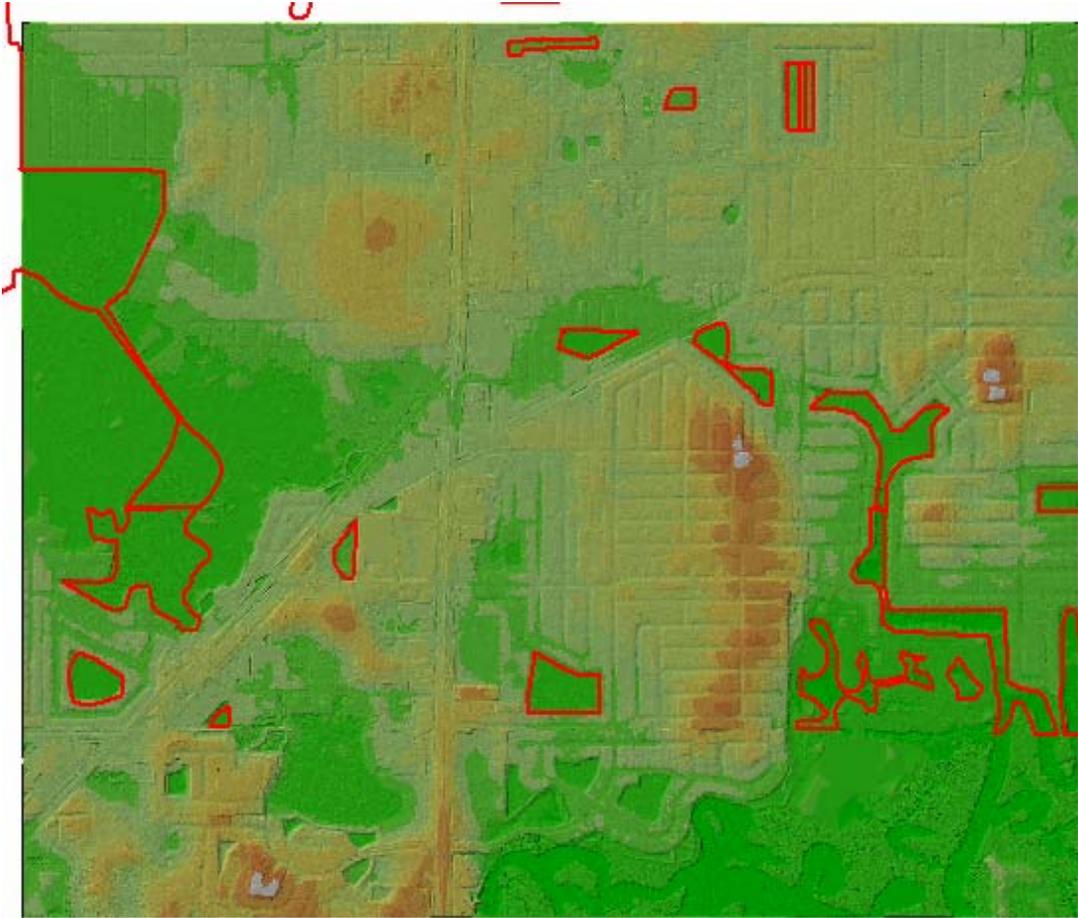
Tile: C_000010- Water points not vaporized and aggressive editing.



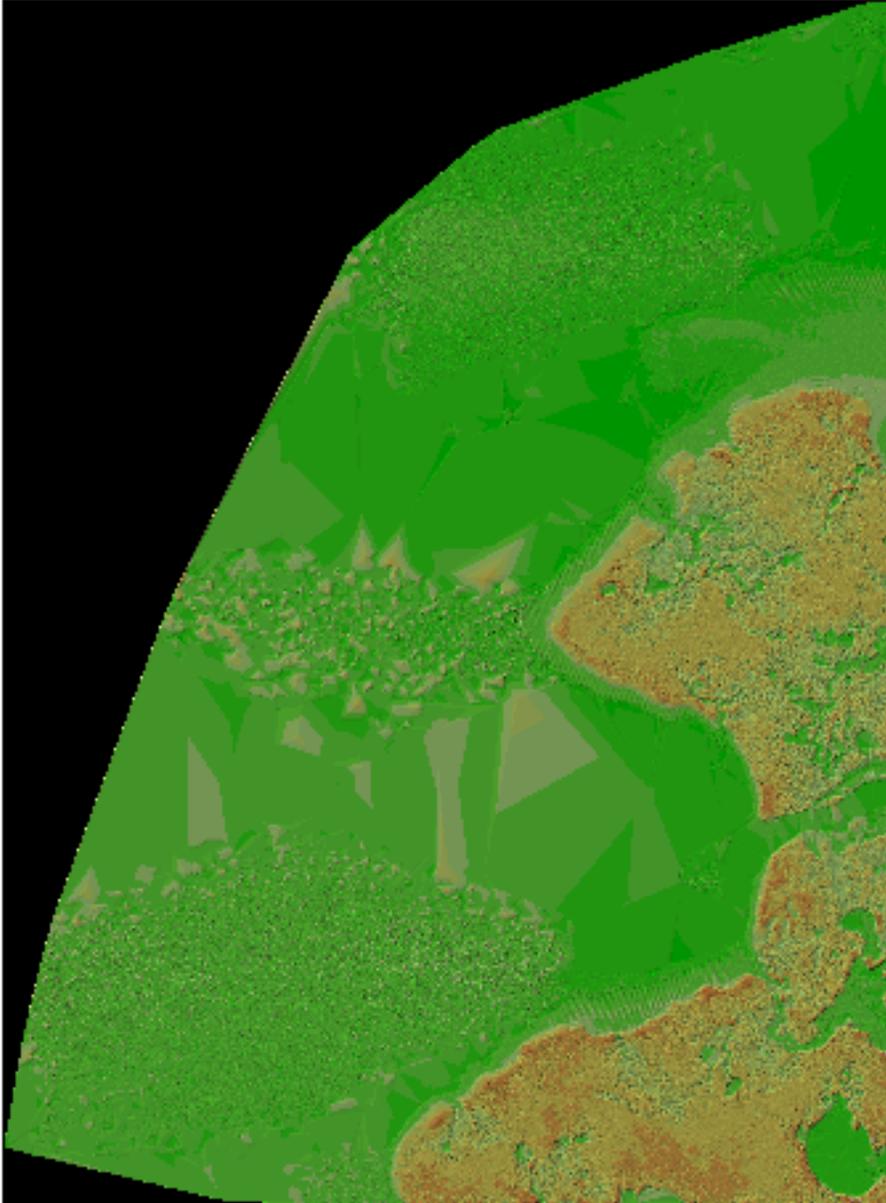
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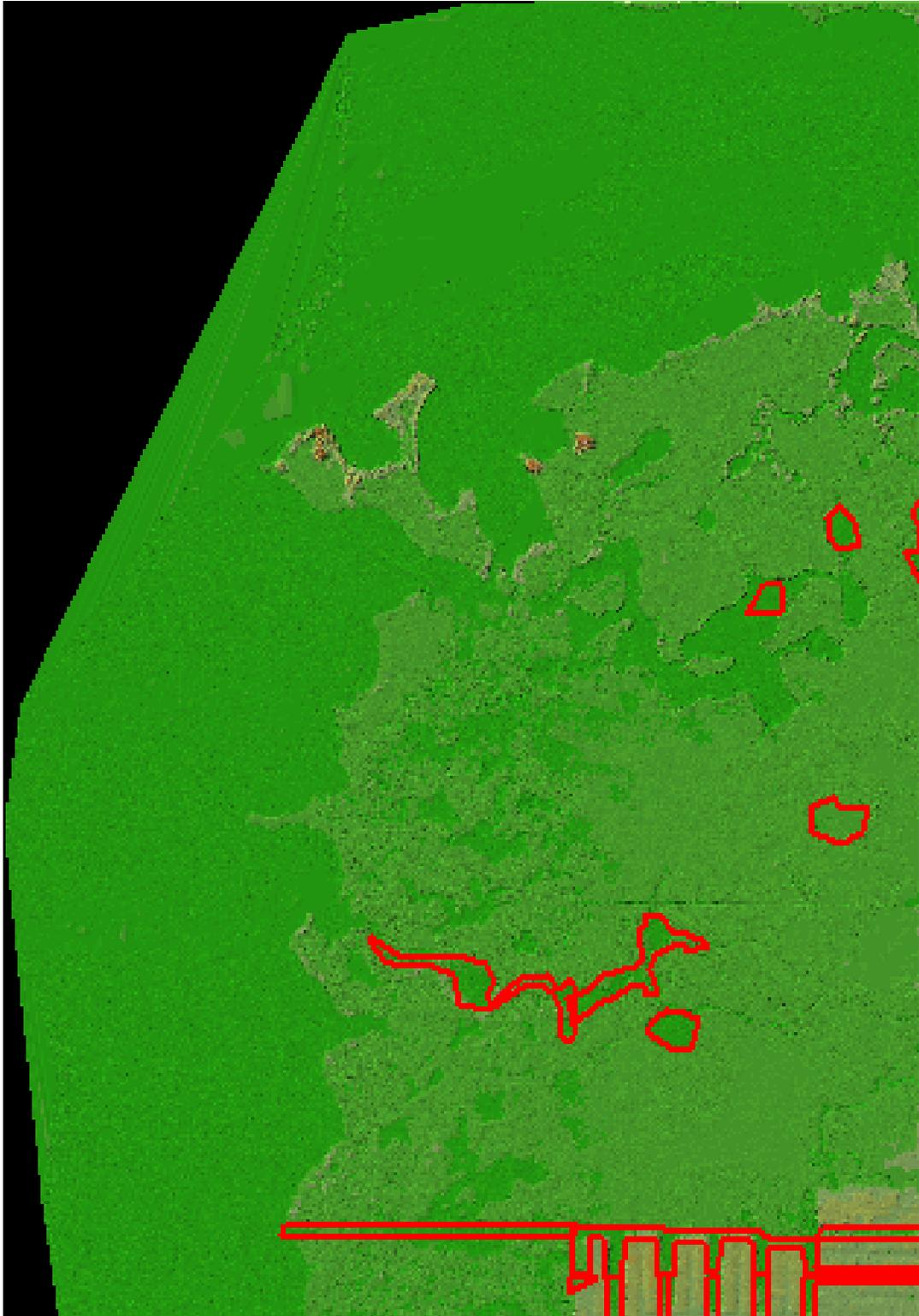
Tile: C_000012- Water points not vaporized



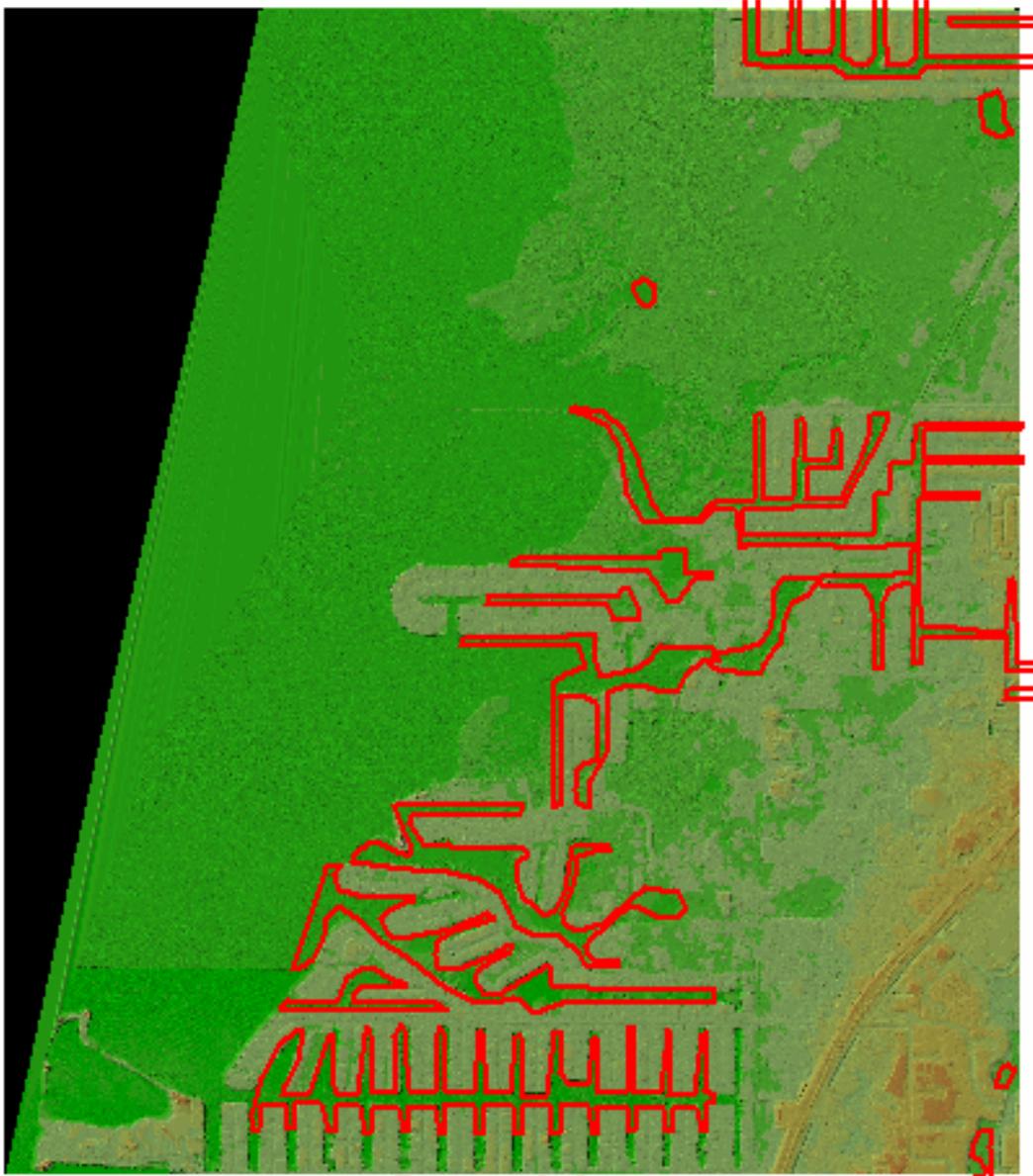
Tile: D_000003- Water points not vaporized



Tile: D_000004- Water points not vaporized

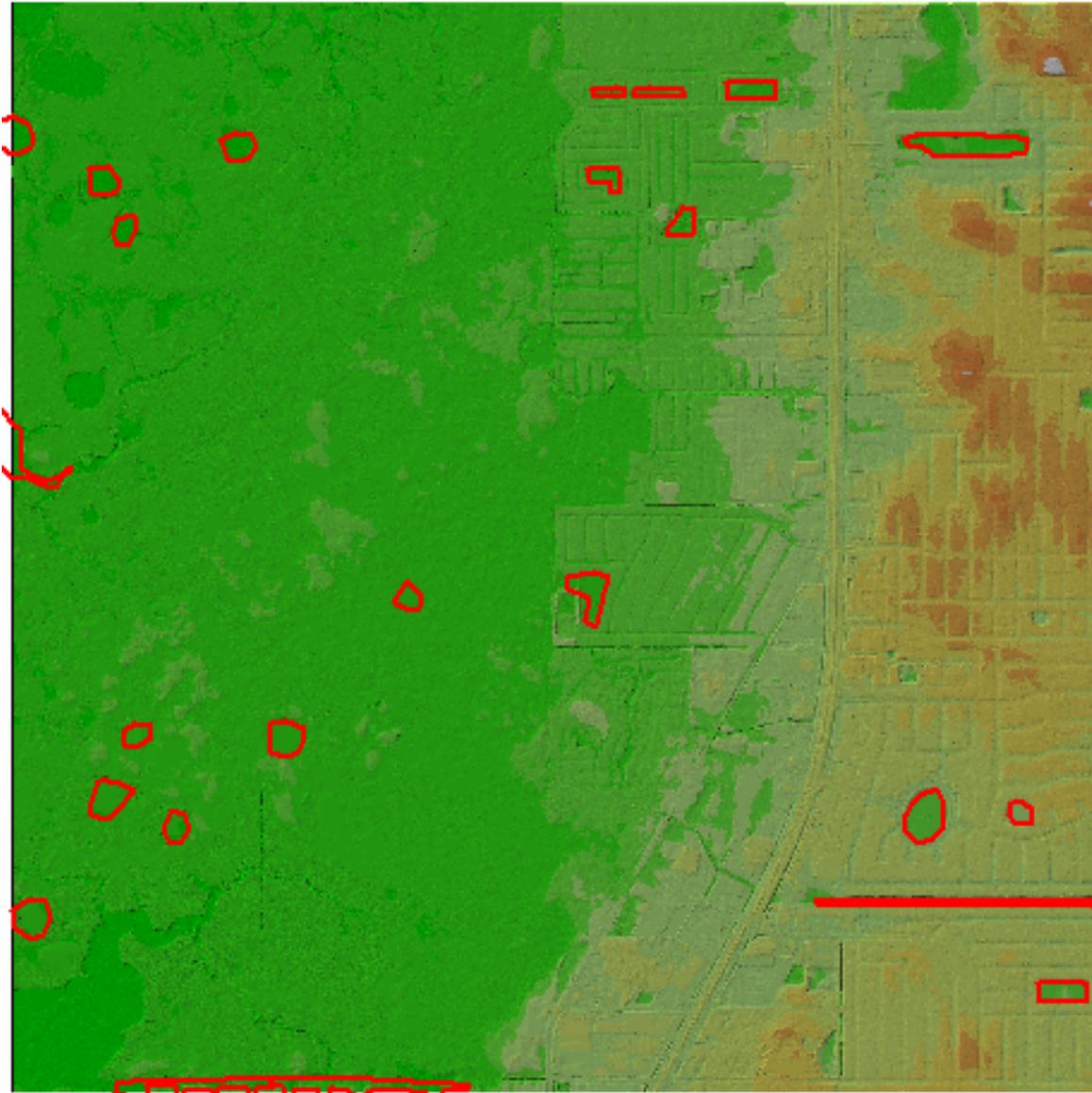


Tile: D_000005- Water points not vaporized

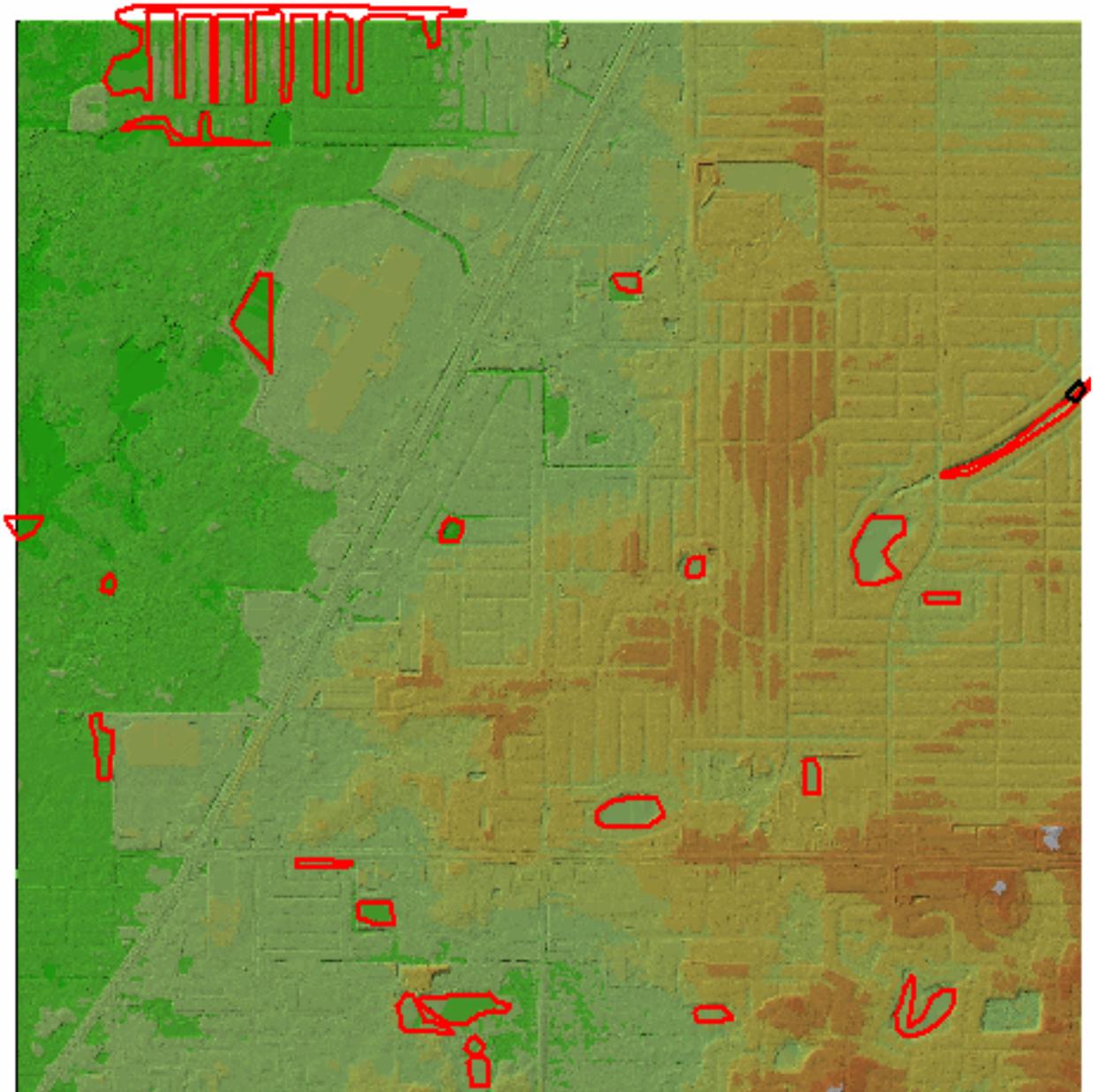




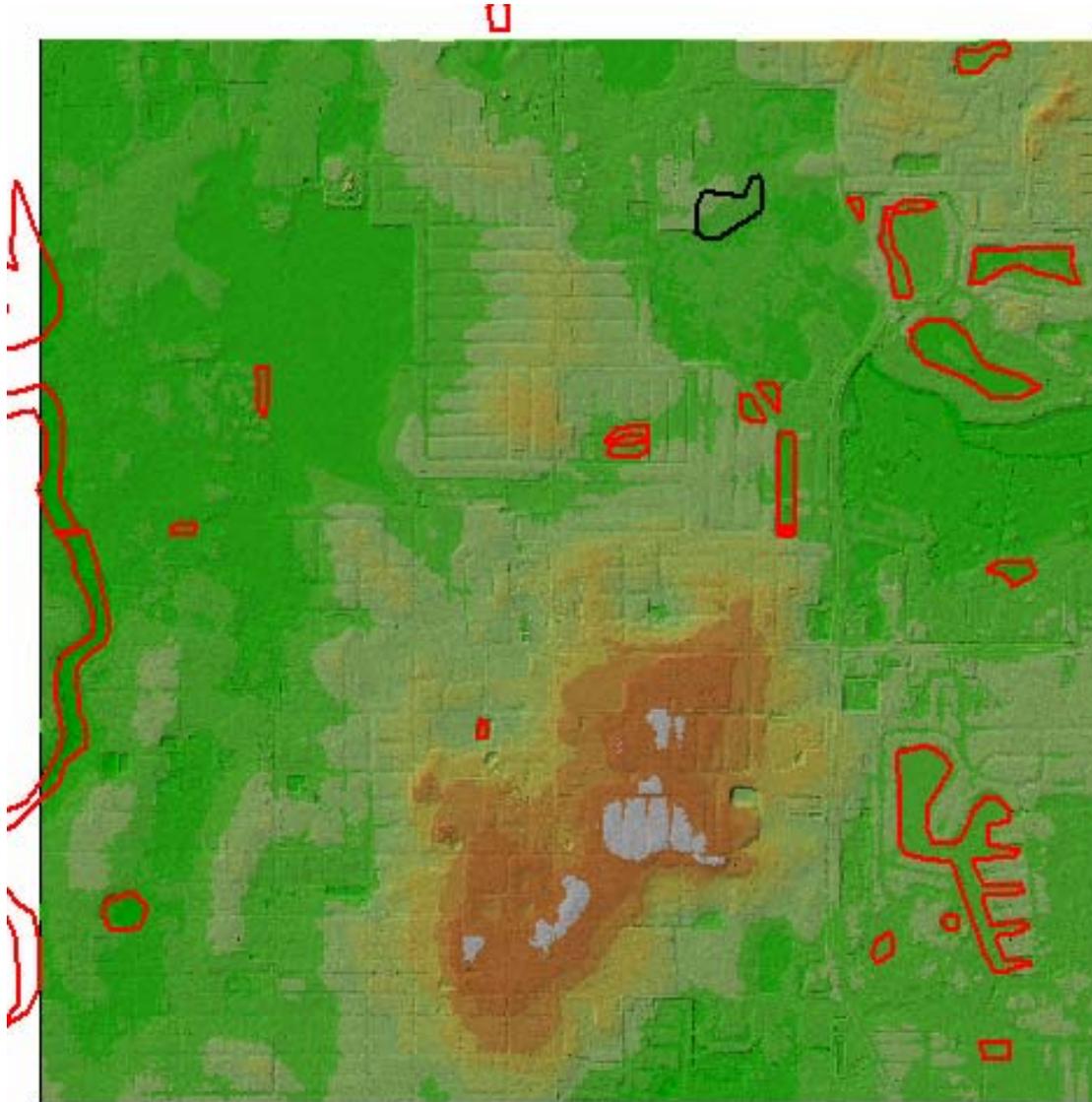
Tile: D_000007- Water points not vaporized



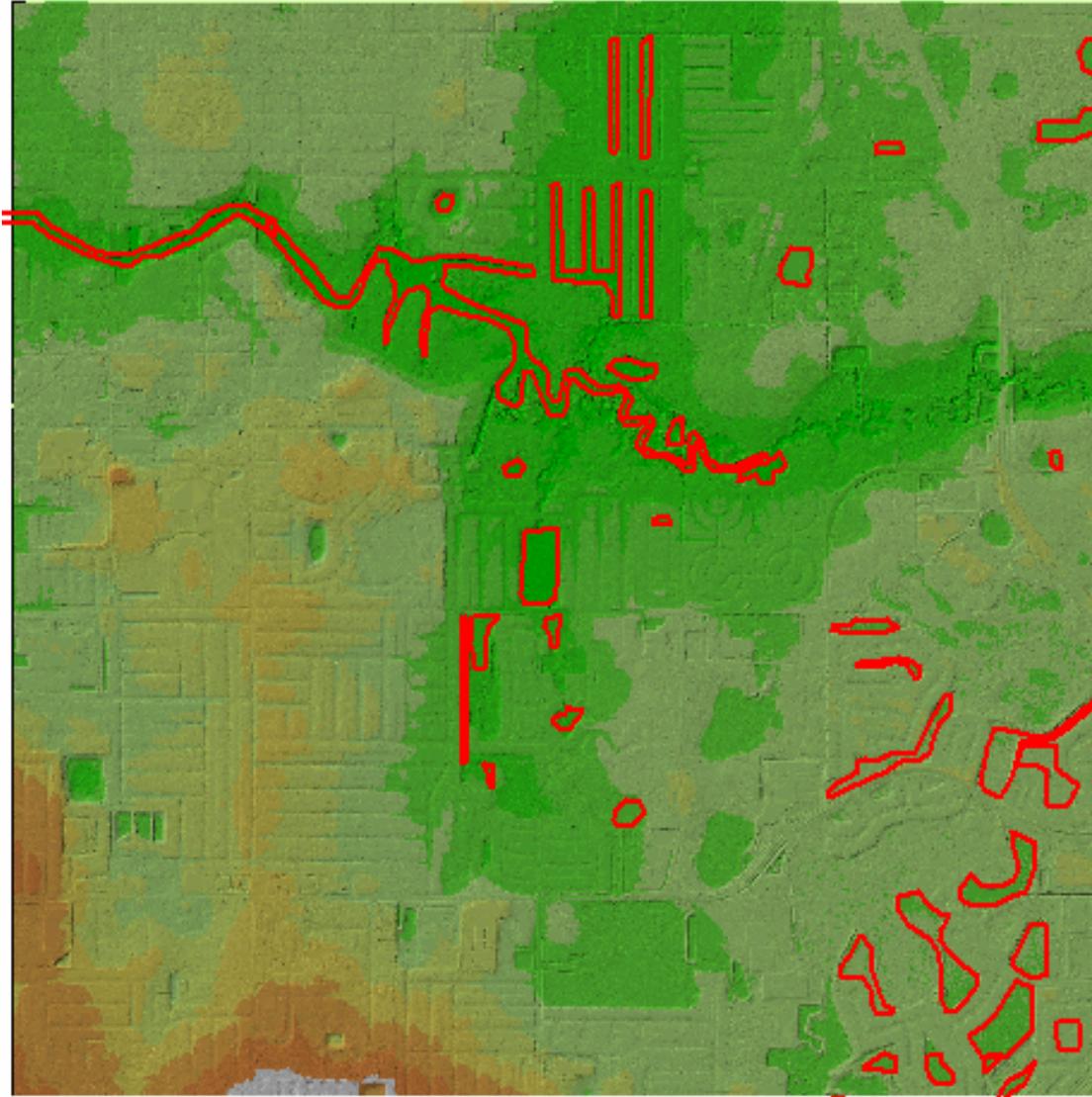
Tile: D_000008- Water points not vaporized and bridge.



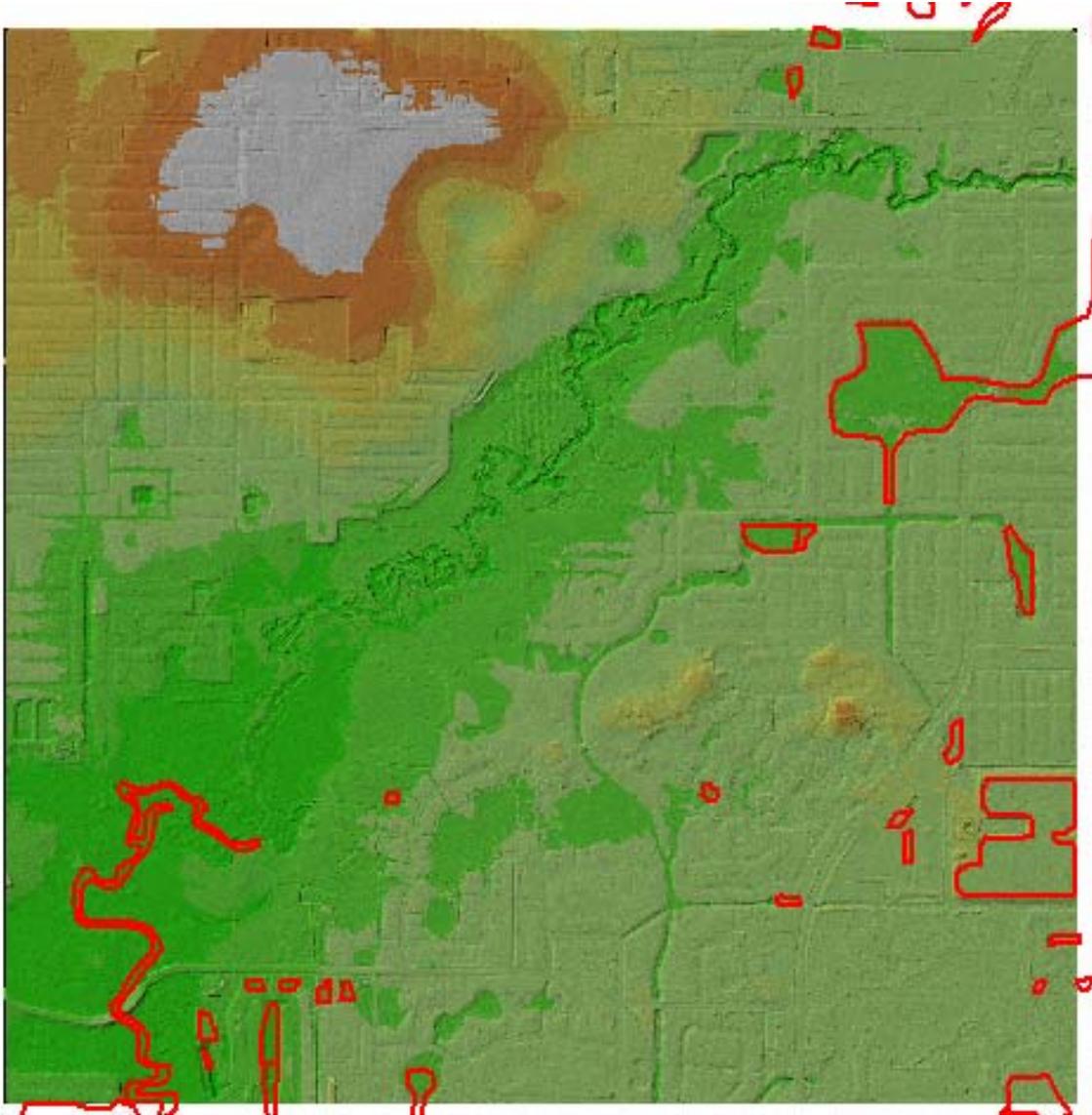
Tile: D_000009- Water points not vaporized



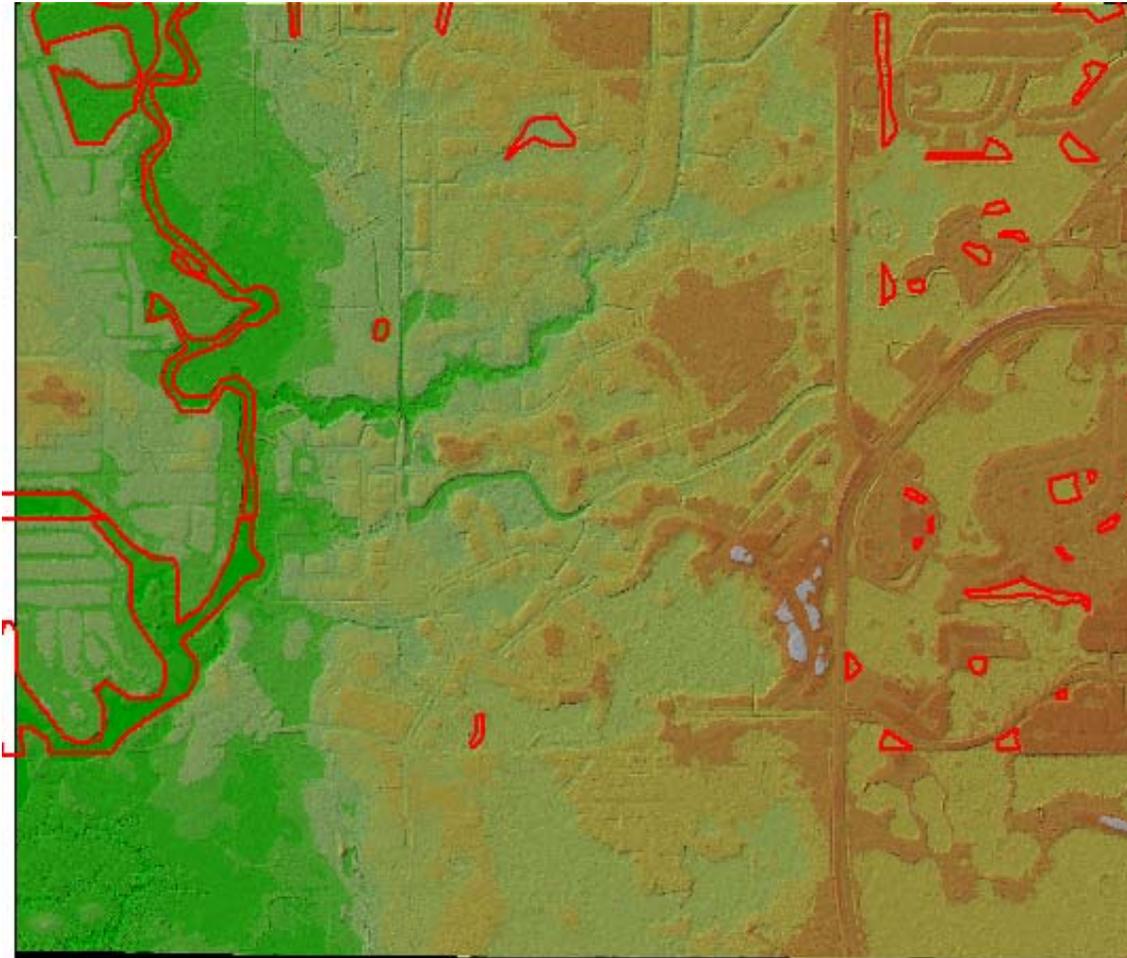
Tile: D_000010- Water points not vaporized



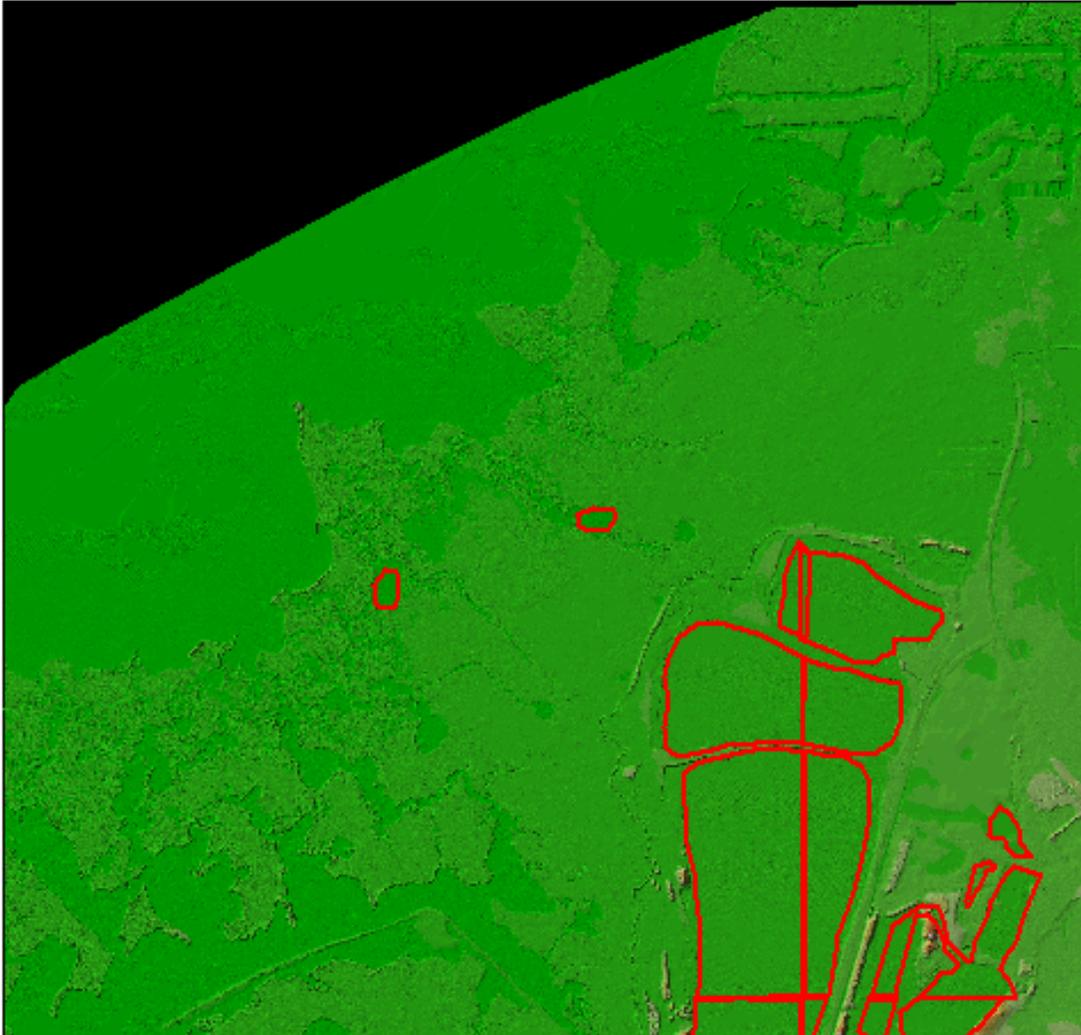
Tile: D_000011- Water points not vaporized



Tile: D_000012- Water points not vaporized



Tile: E_000003- Water points not vaporized



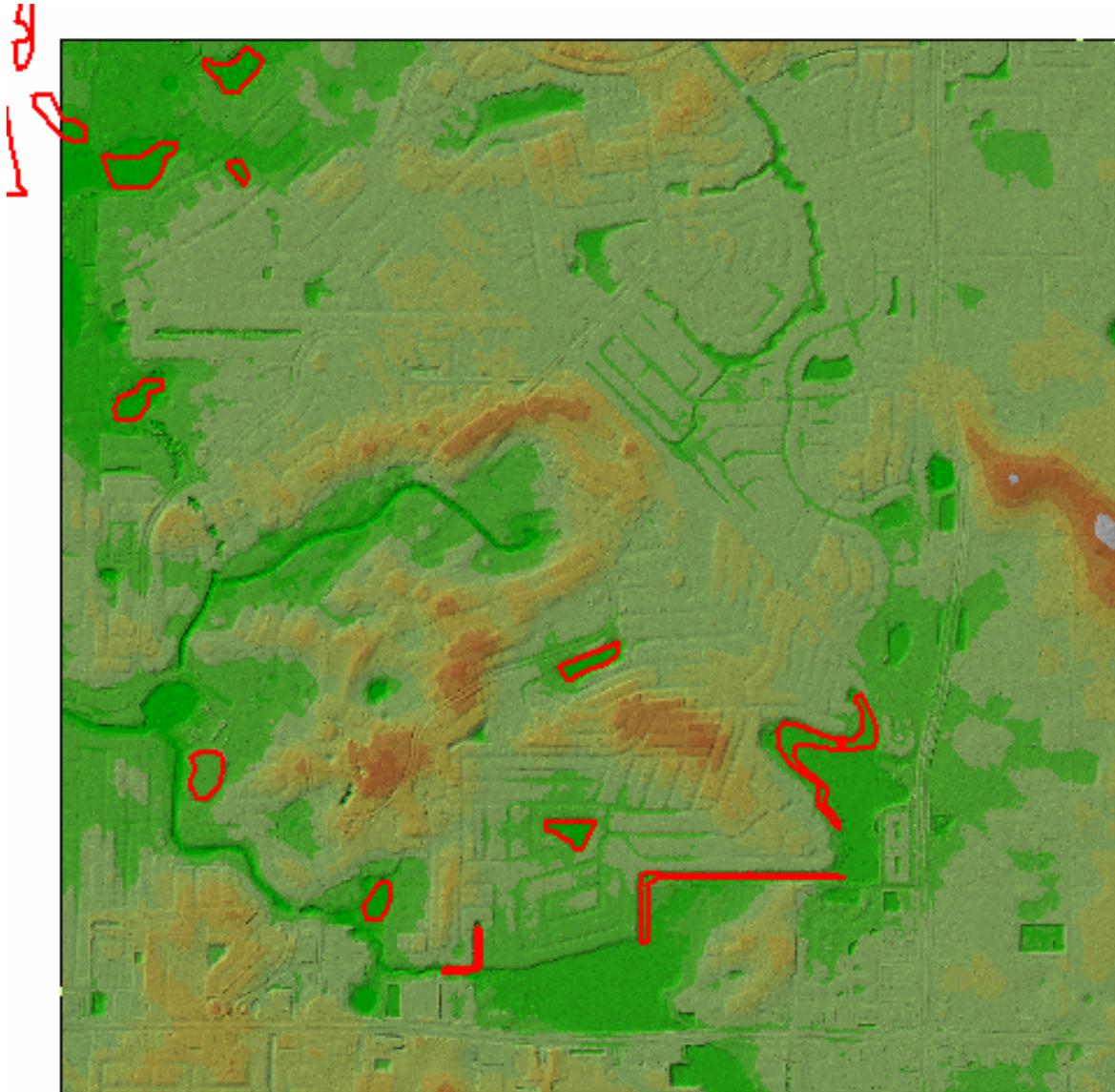
Tile: E_000004- Water points not vaporized



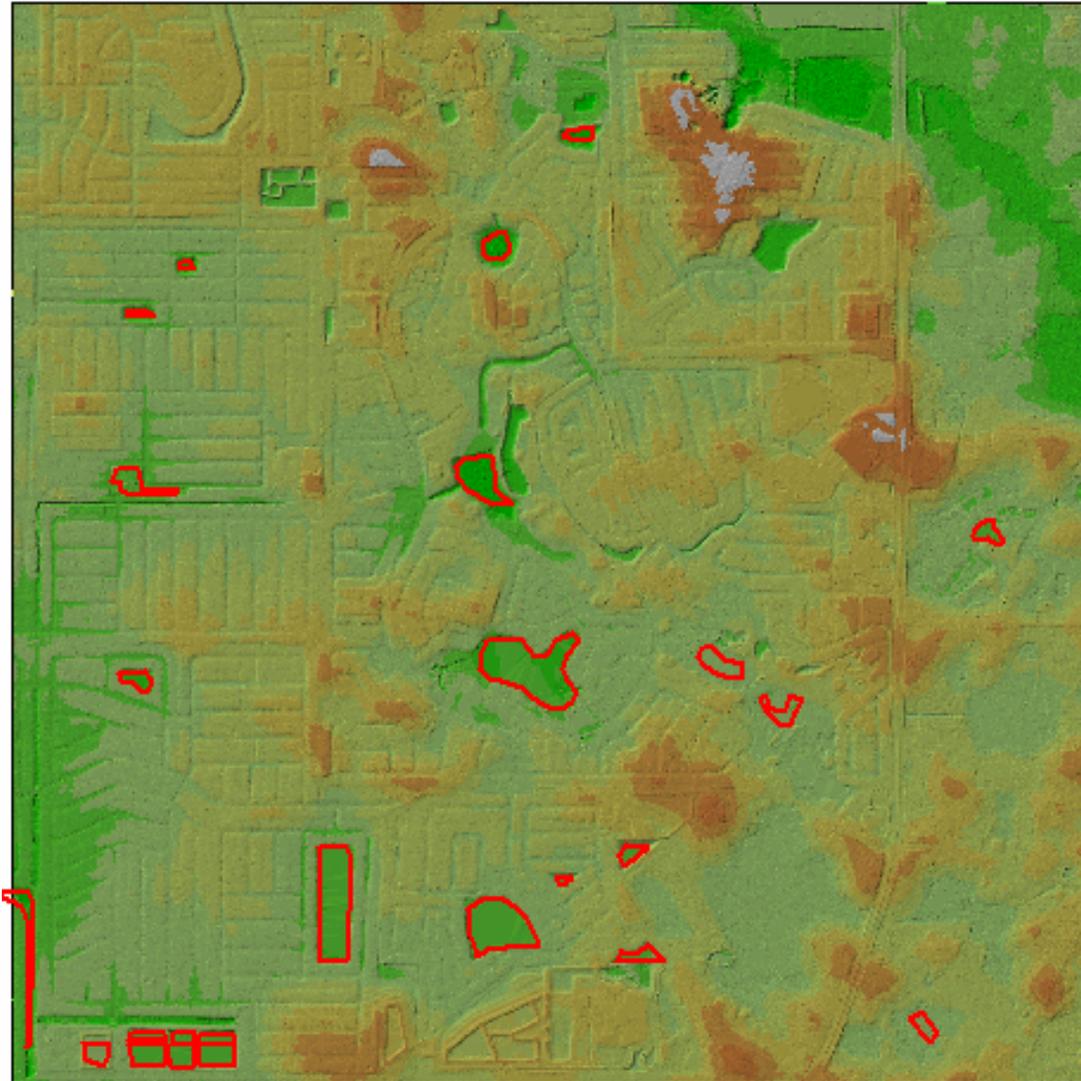
Tile: E_000005- Water points not vaporized



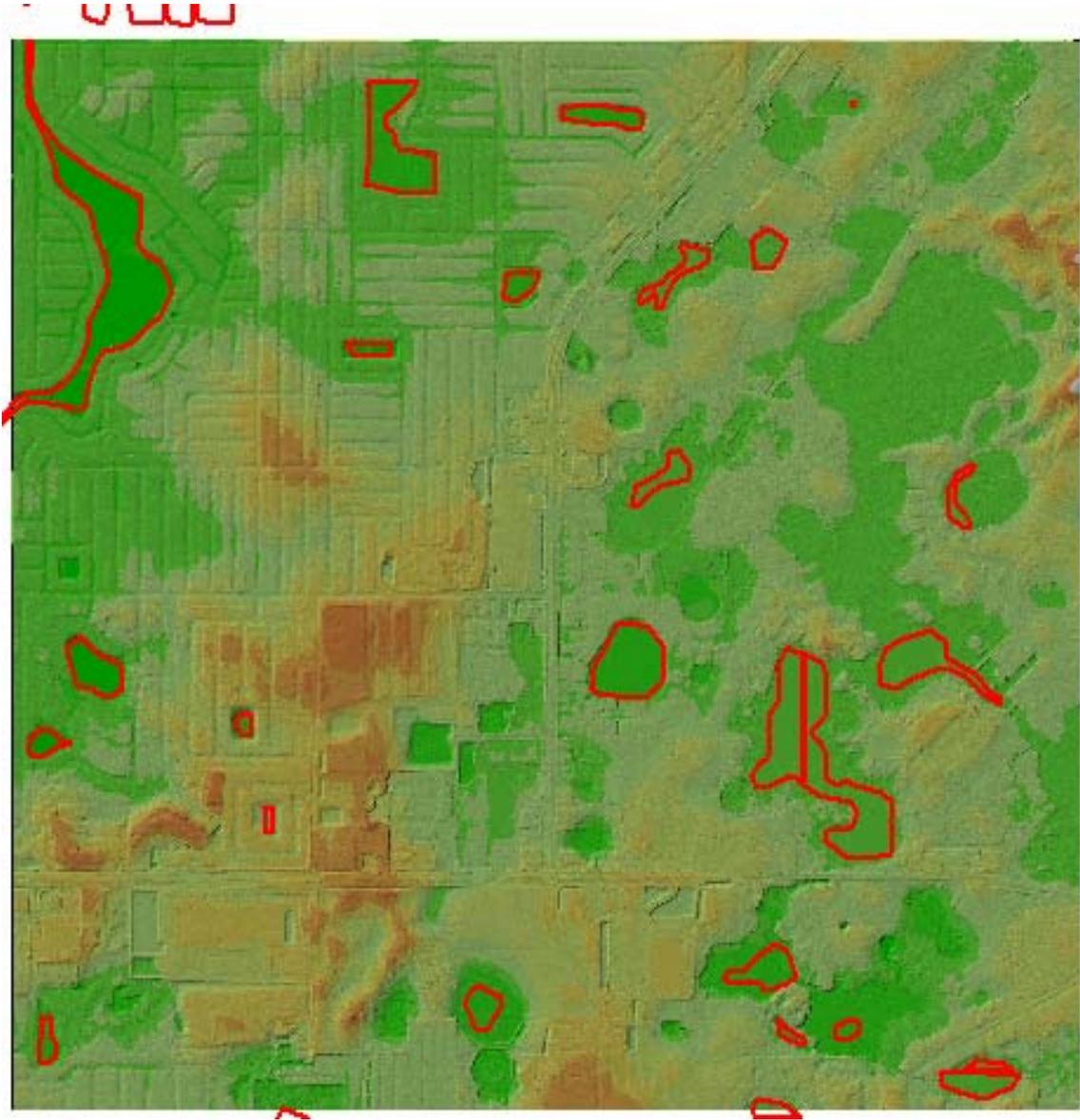
Tile: E_000006- Water points not vaporized



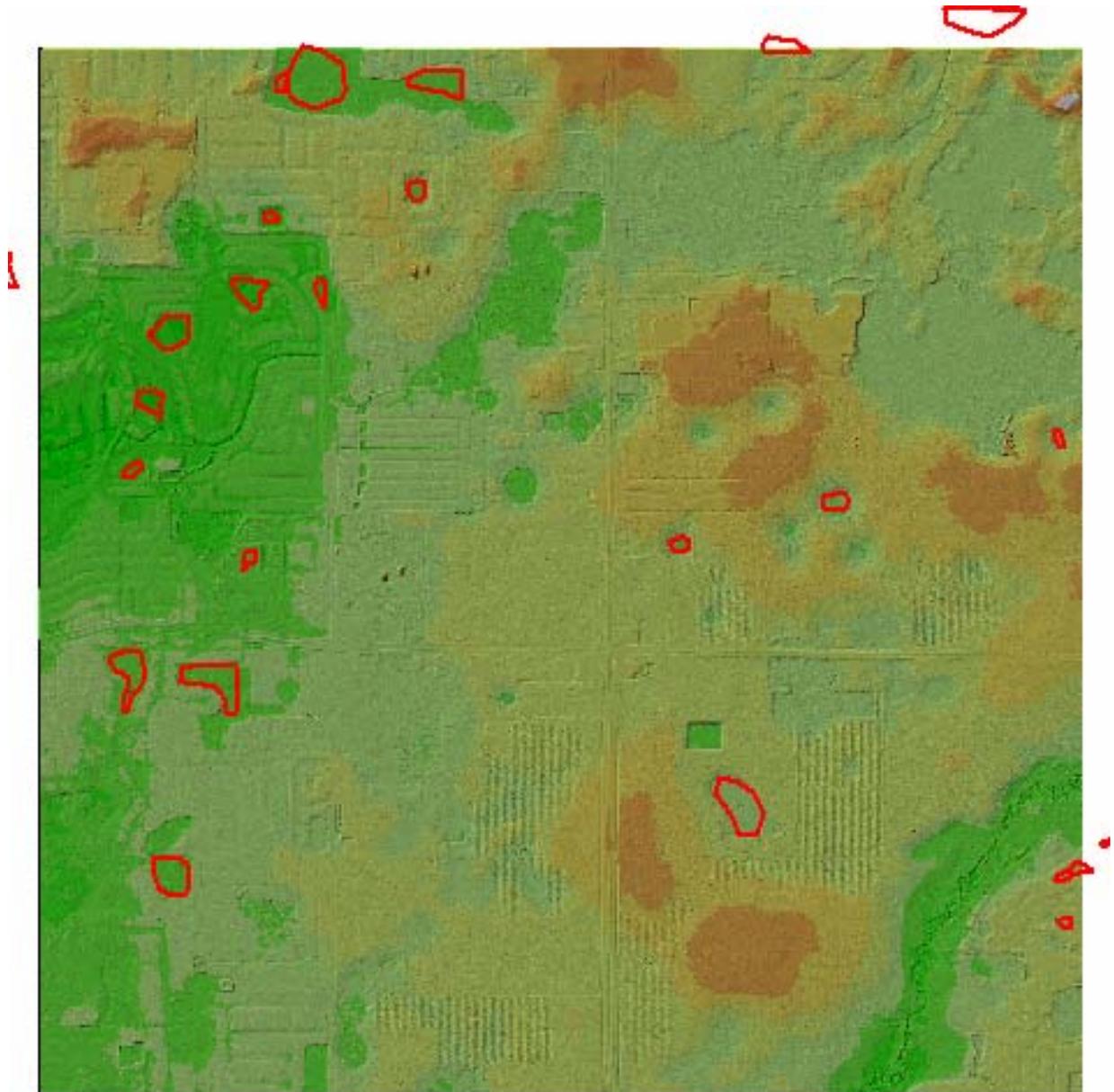
Tile: E_000007- Water points not vaporized



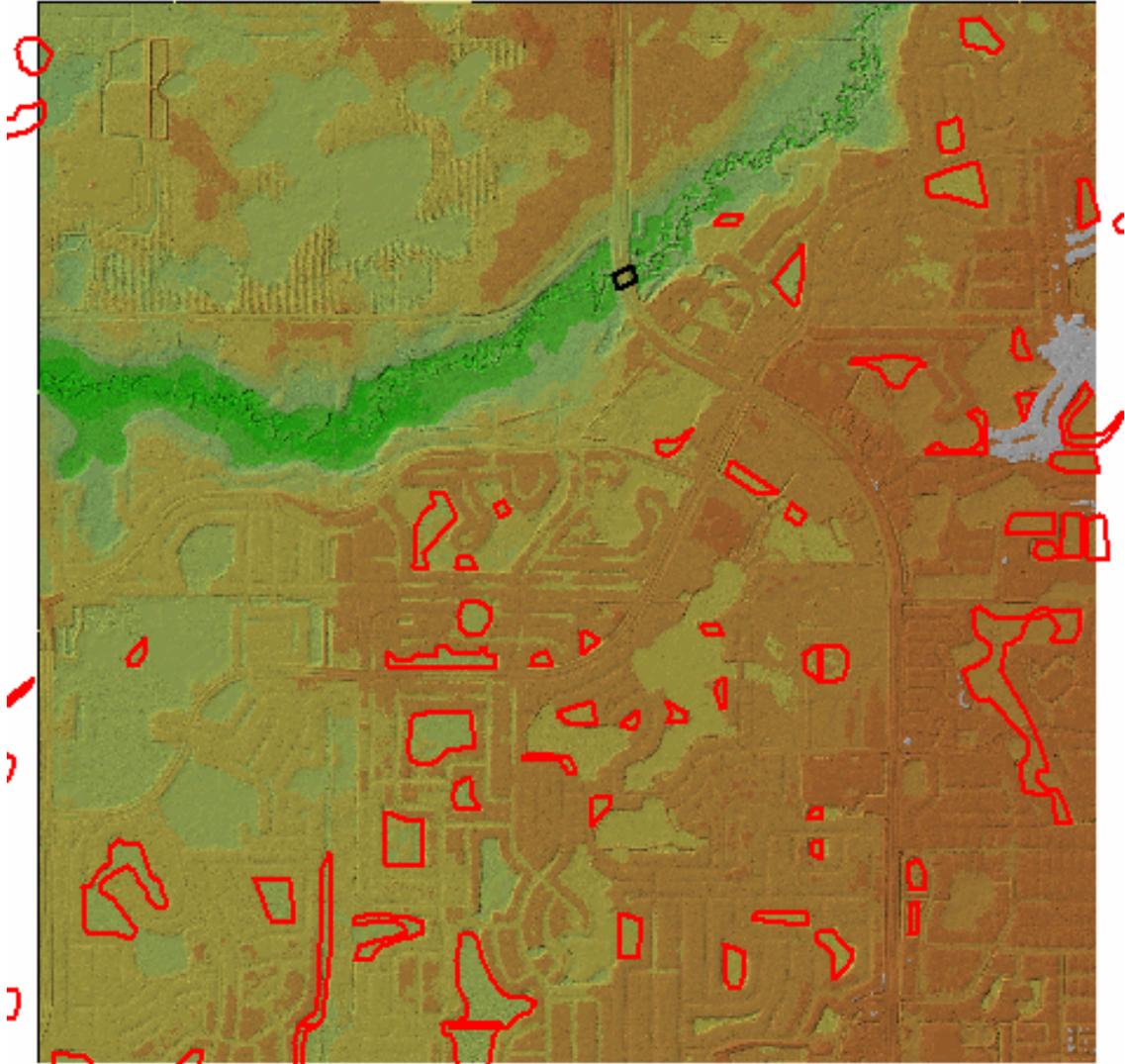
Tile: E_000008- Water points not vaporized



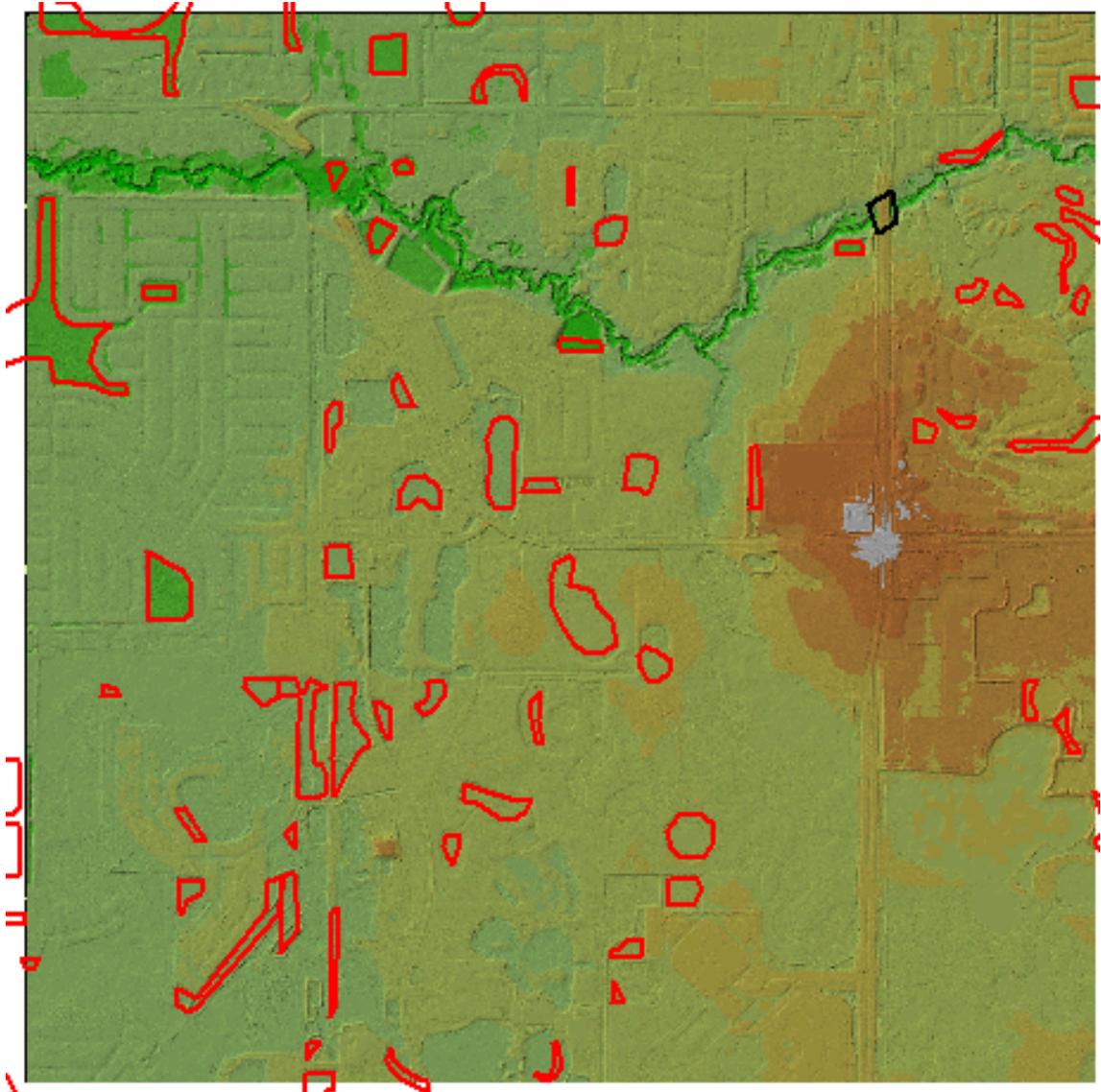
Tile: E_000009- Water points not vaporized



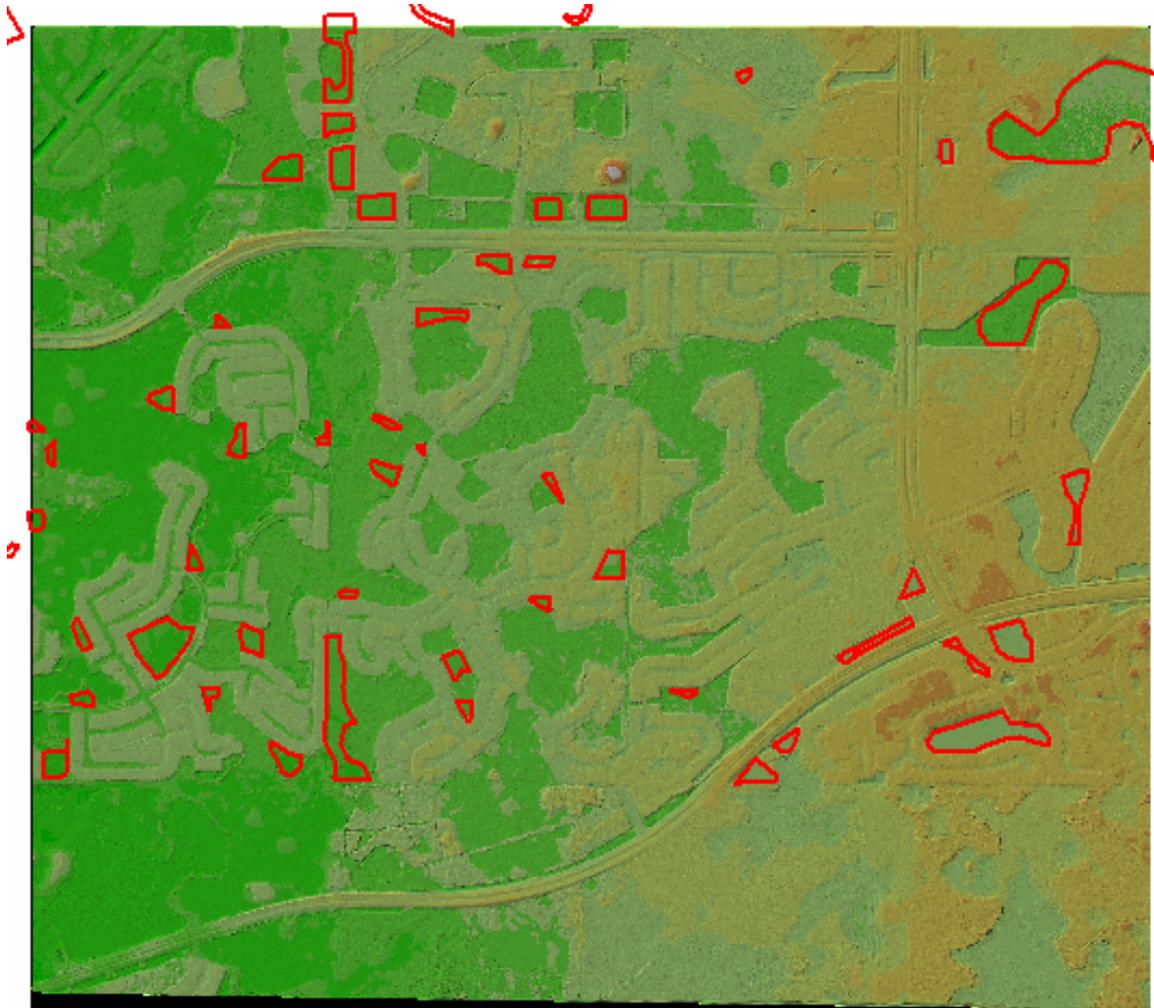
Tile: E_000010- Water points not vaporized and bridge.



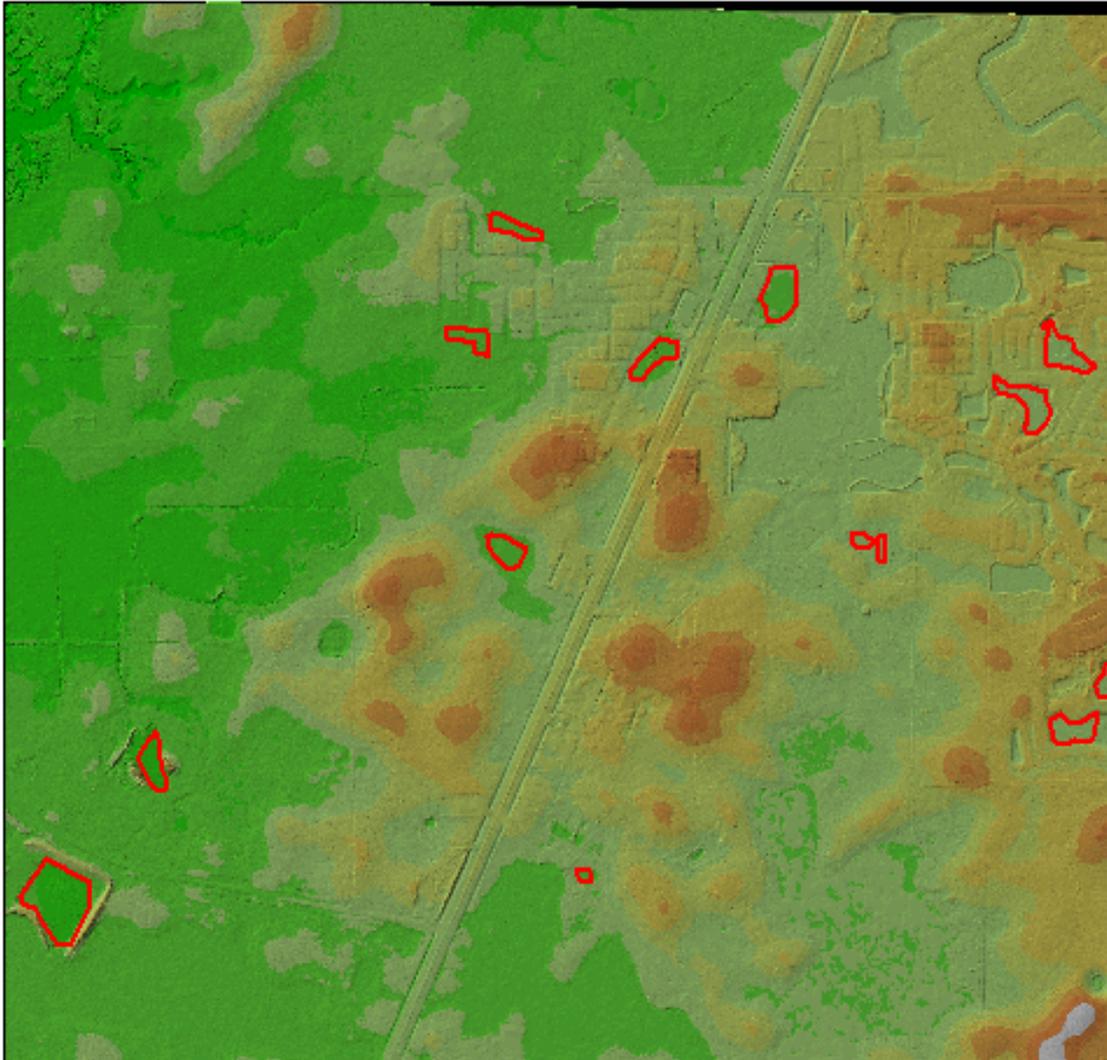
Tile: E_000011- Water points not vaporized



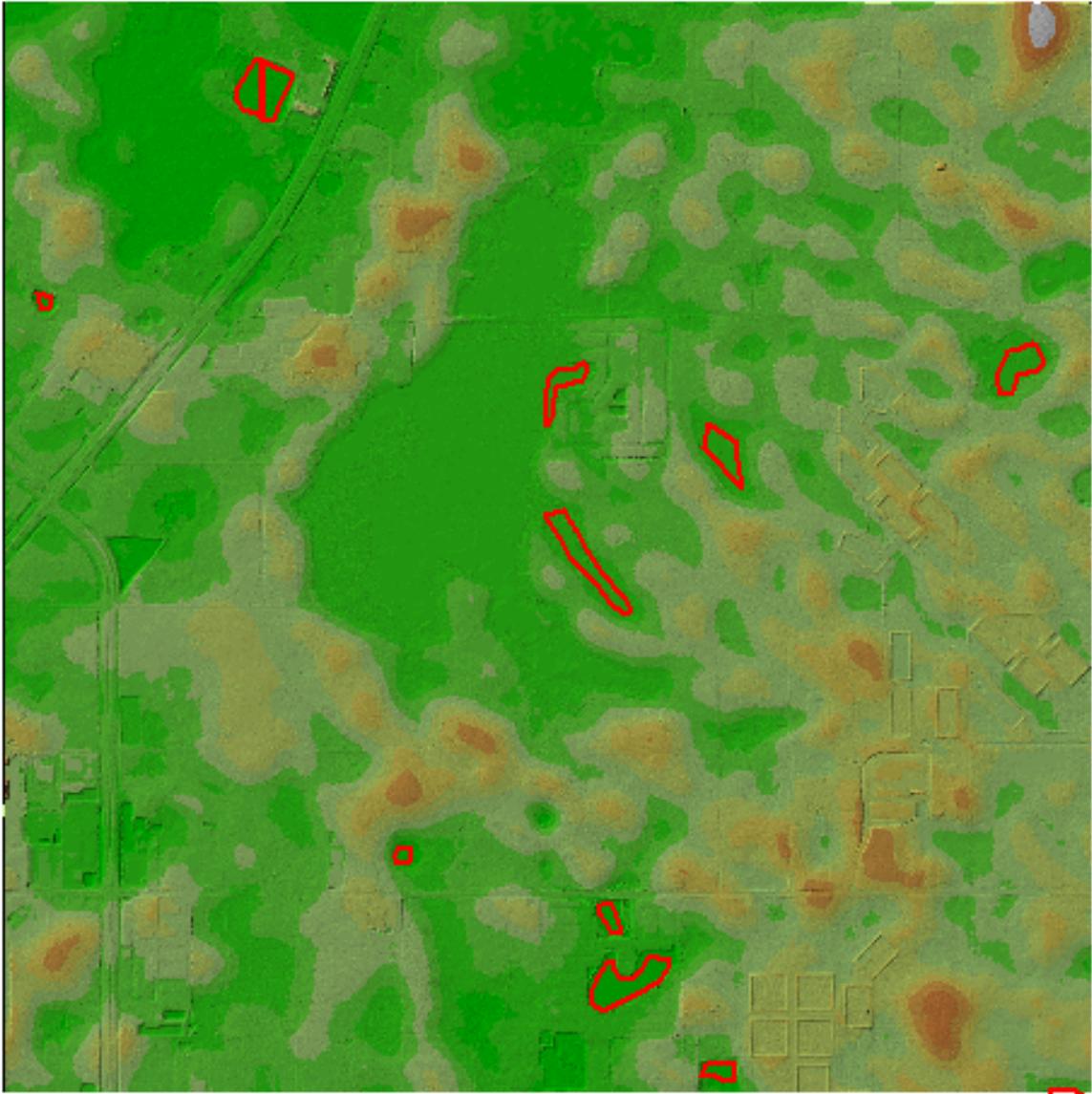
Tile: E_000012- Water points not vaporized



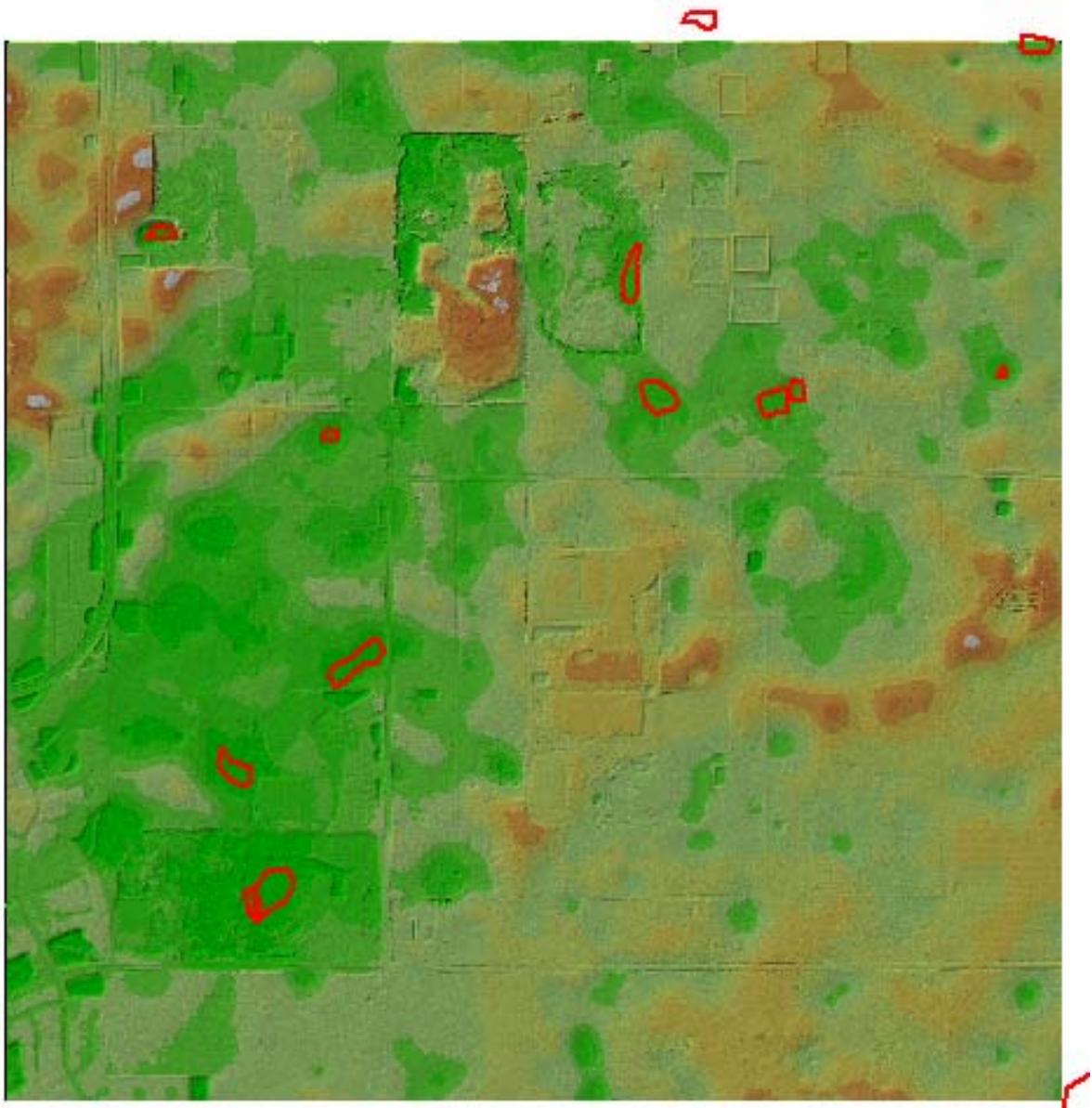
Tile: F_000003- Water points not vaporized



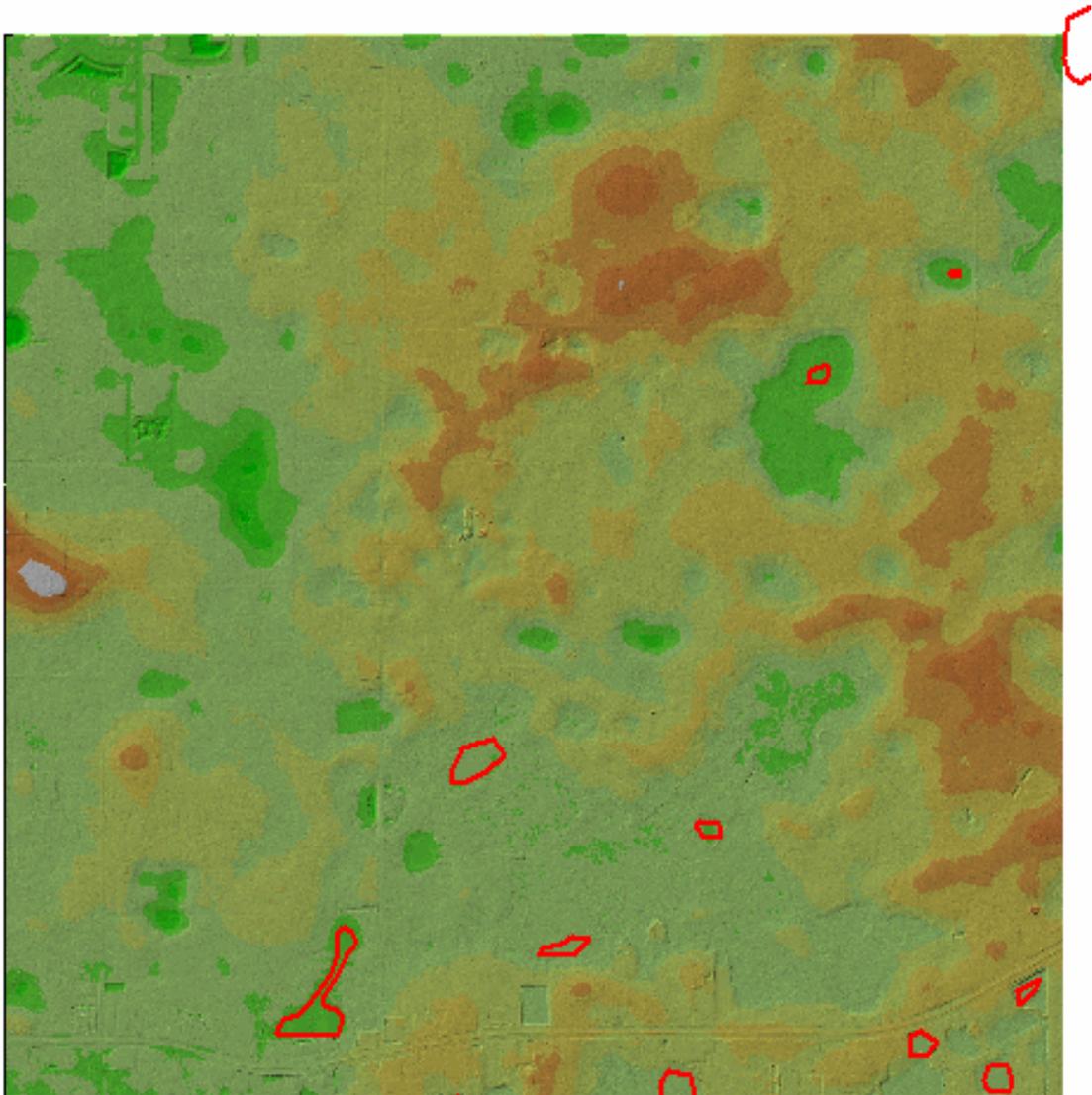
Tile: F_000004- Water points not vaporized



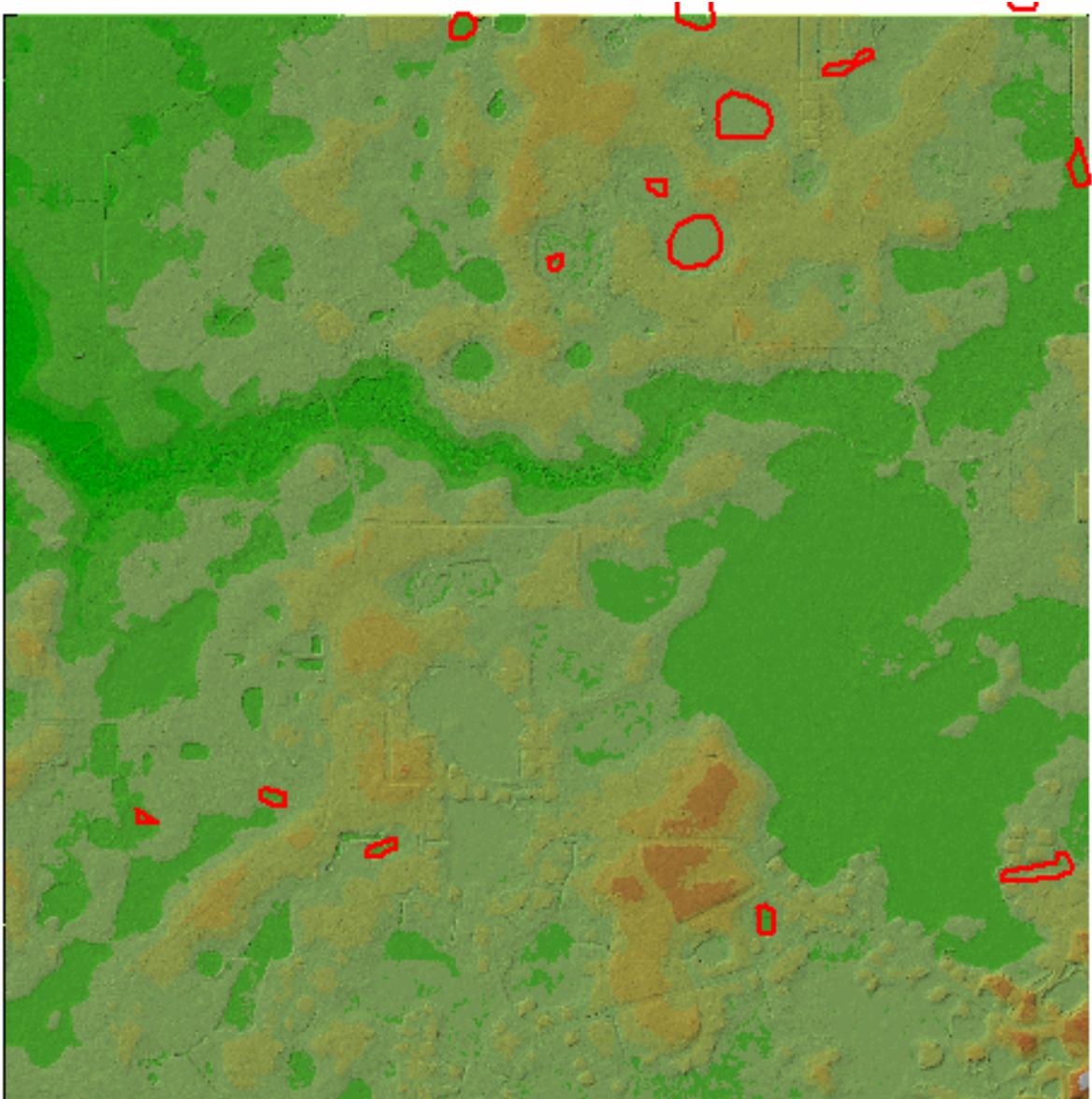
Tile: F_000005- Water points not vaporized



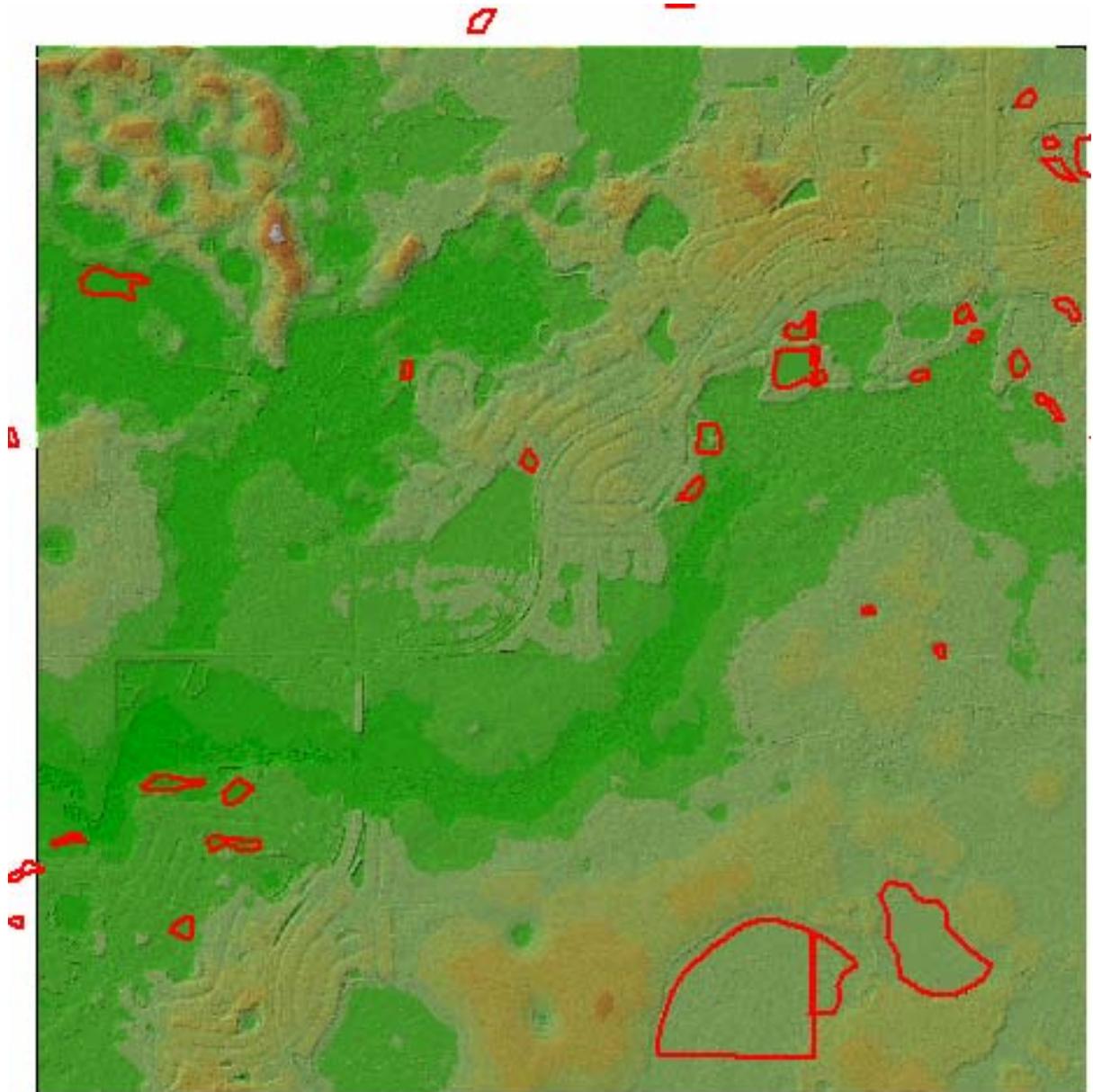
Tile: F_000006- Water points not vaporized



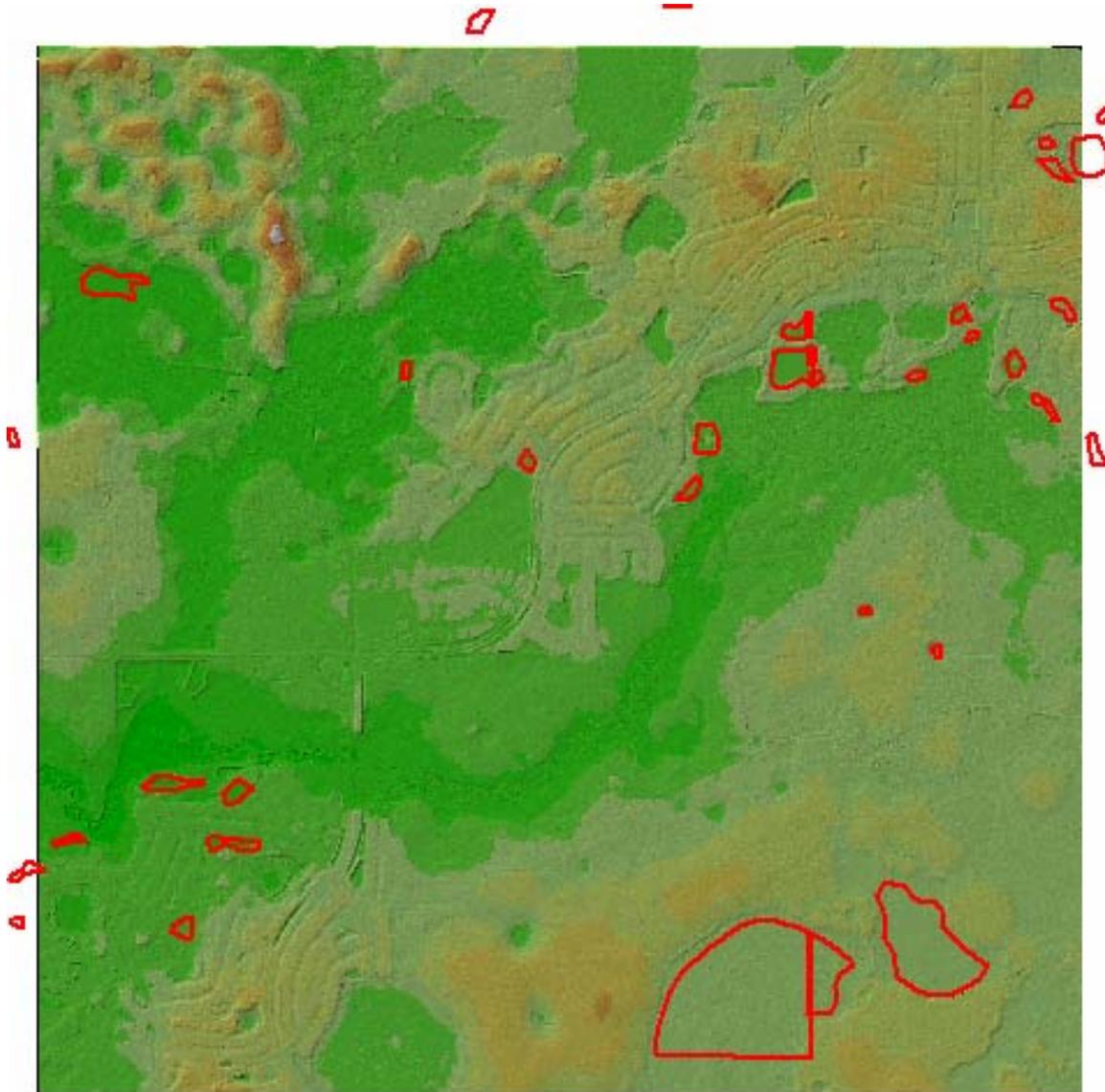
Tile: F_000007- Water points not vaporized



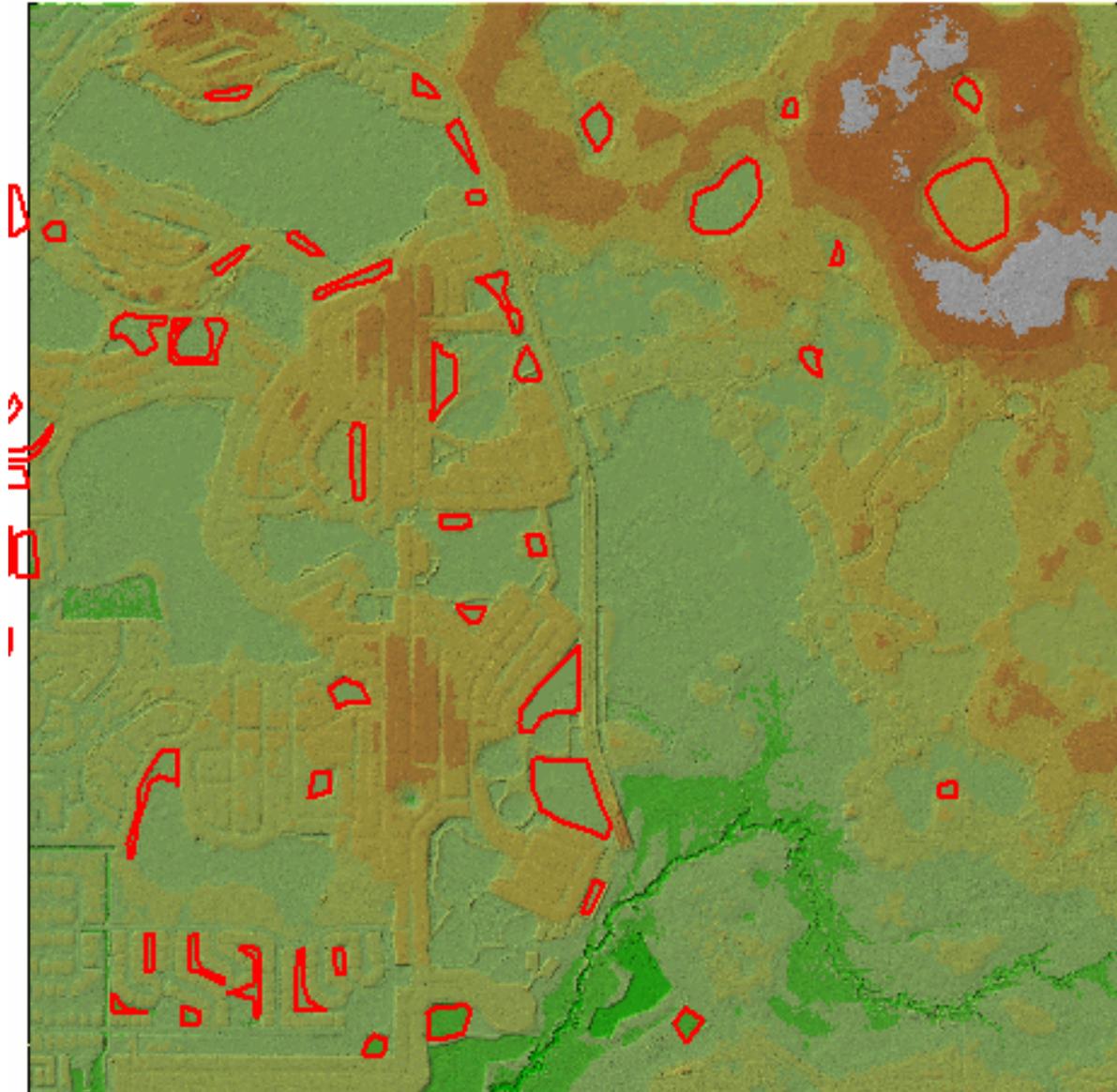
Tile: F_000008- Water points not vaporized



Tile: F_000009- Water points not vaporized



Tile: F_000010- Water points not vaporized



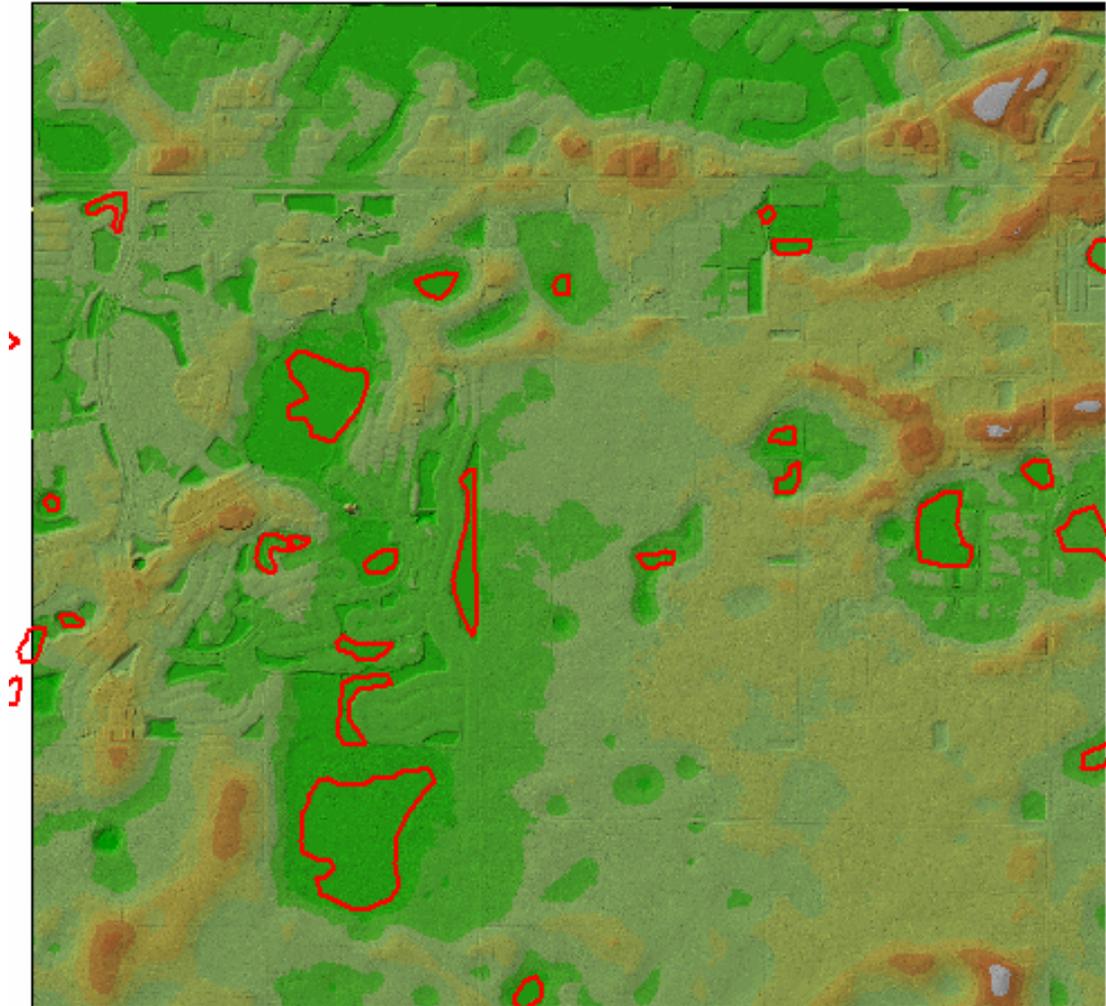
Tile: F_000011- Water points not vaporized



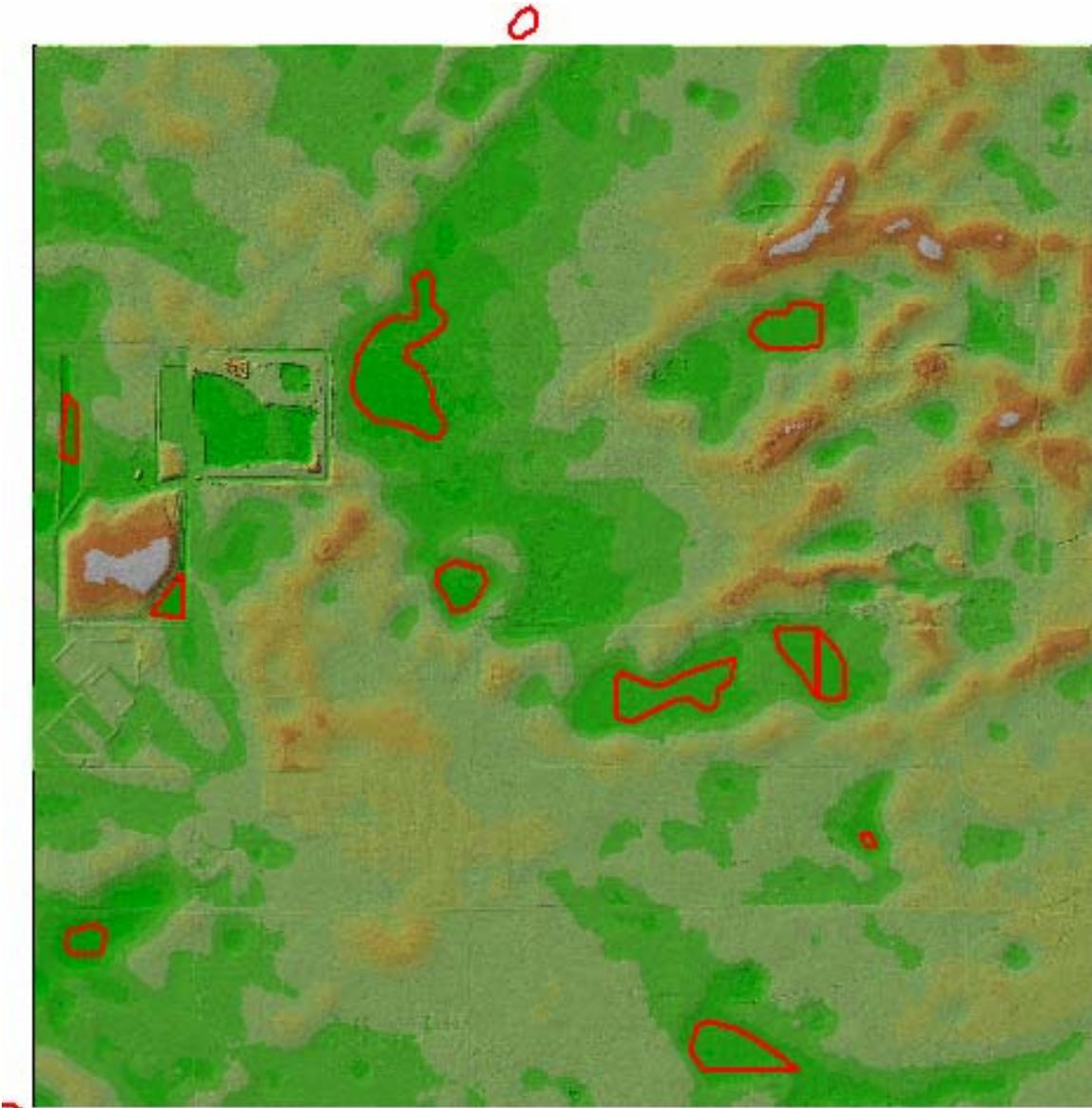
Tile: F_000012- Water points not vaporized



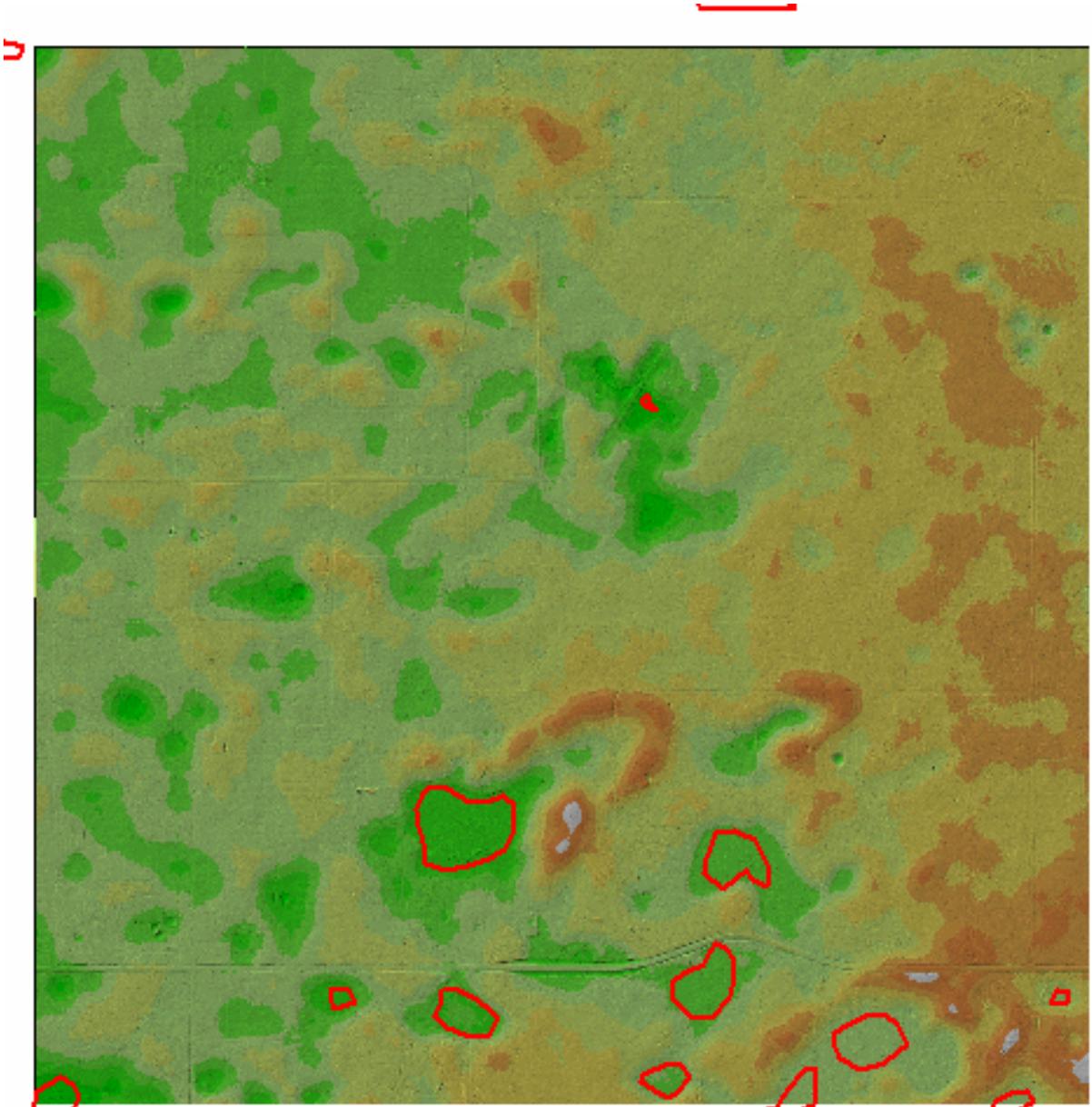
Tile: G_000003- Water points not vaporized



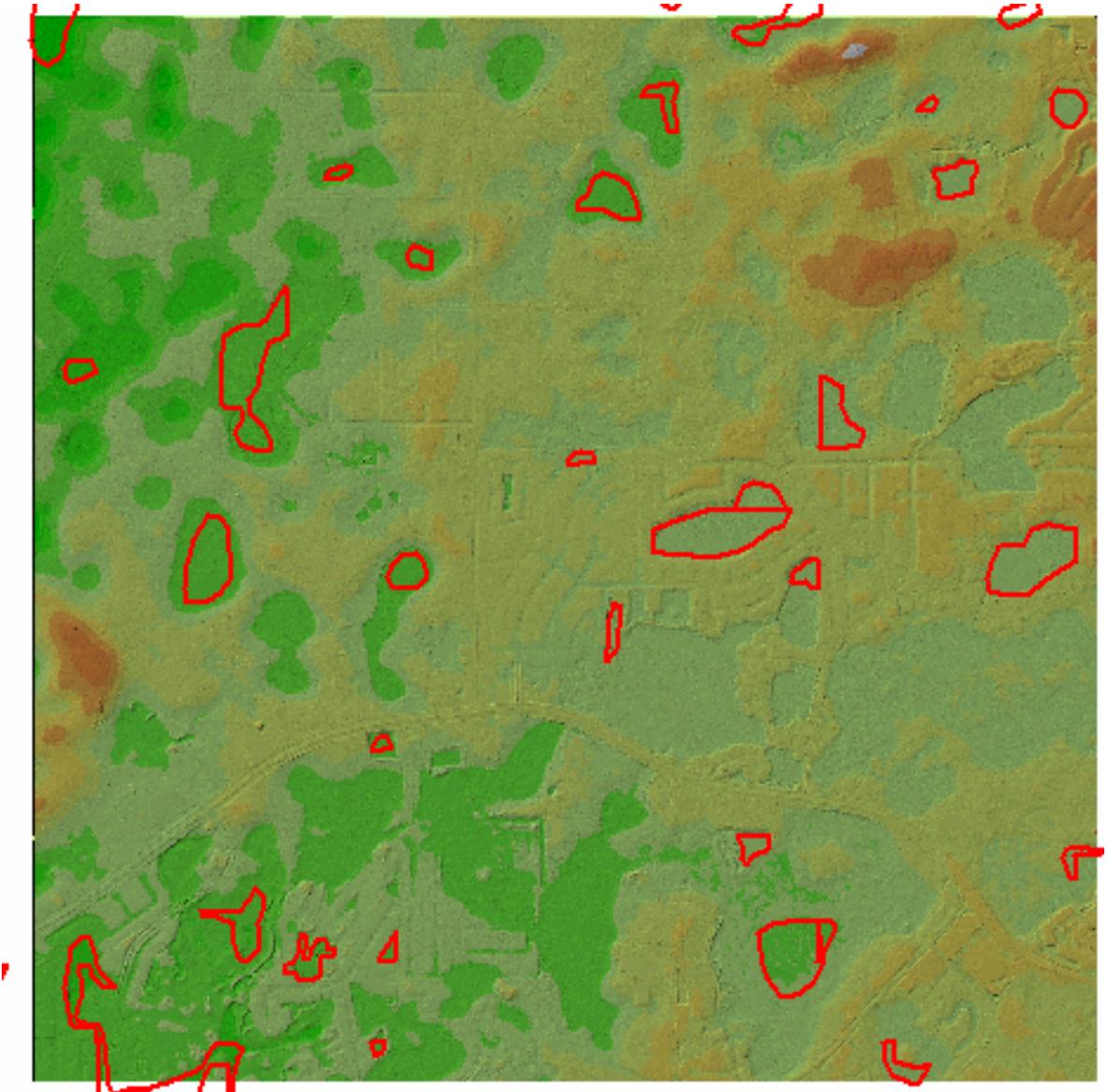
Tile: G_000004- Water points not vaporized



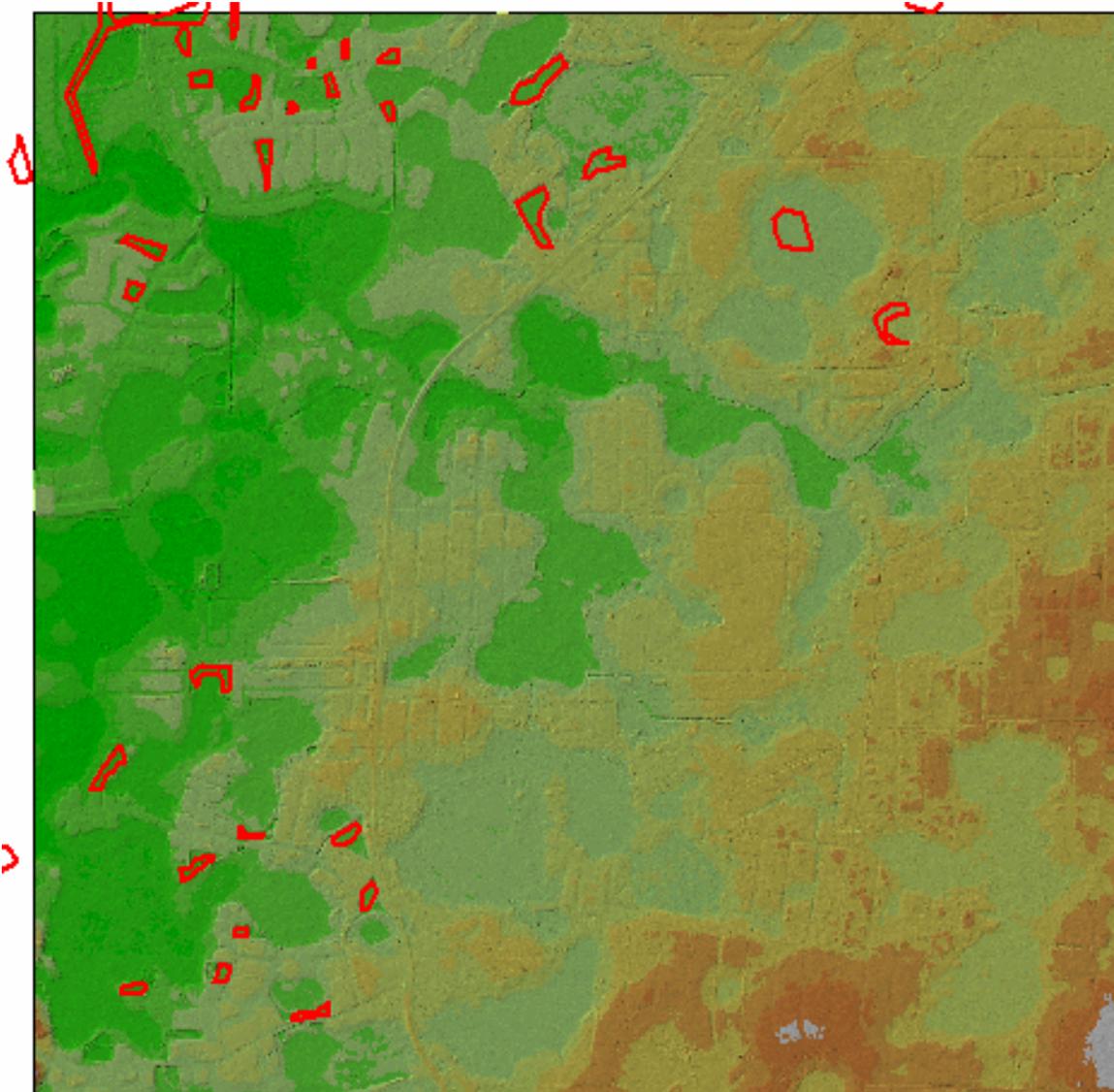
Tile: G_000005- Water points not vaporized



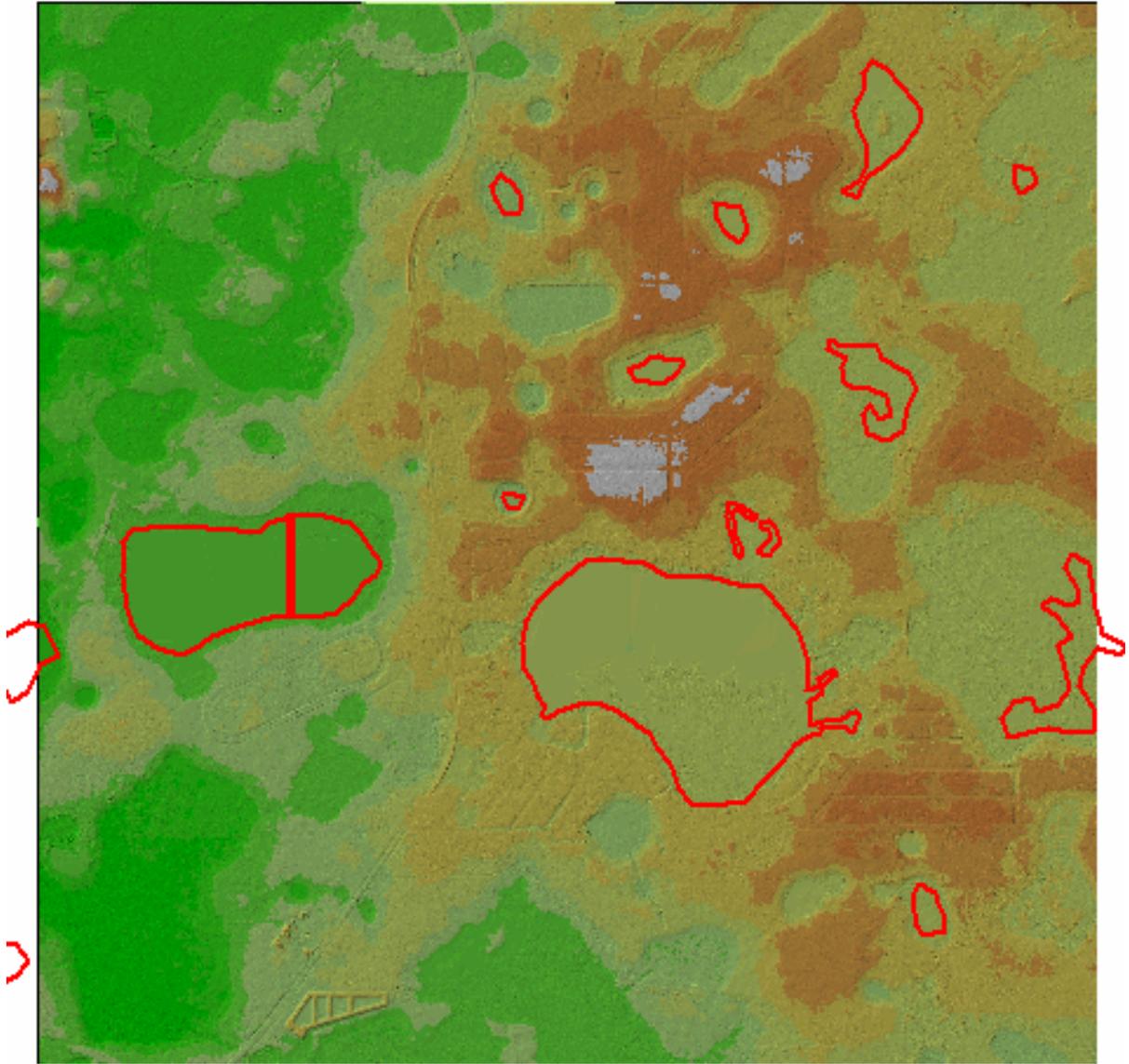
Tile: G_000006- Water points not vaporized



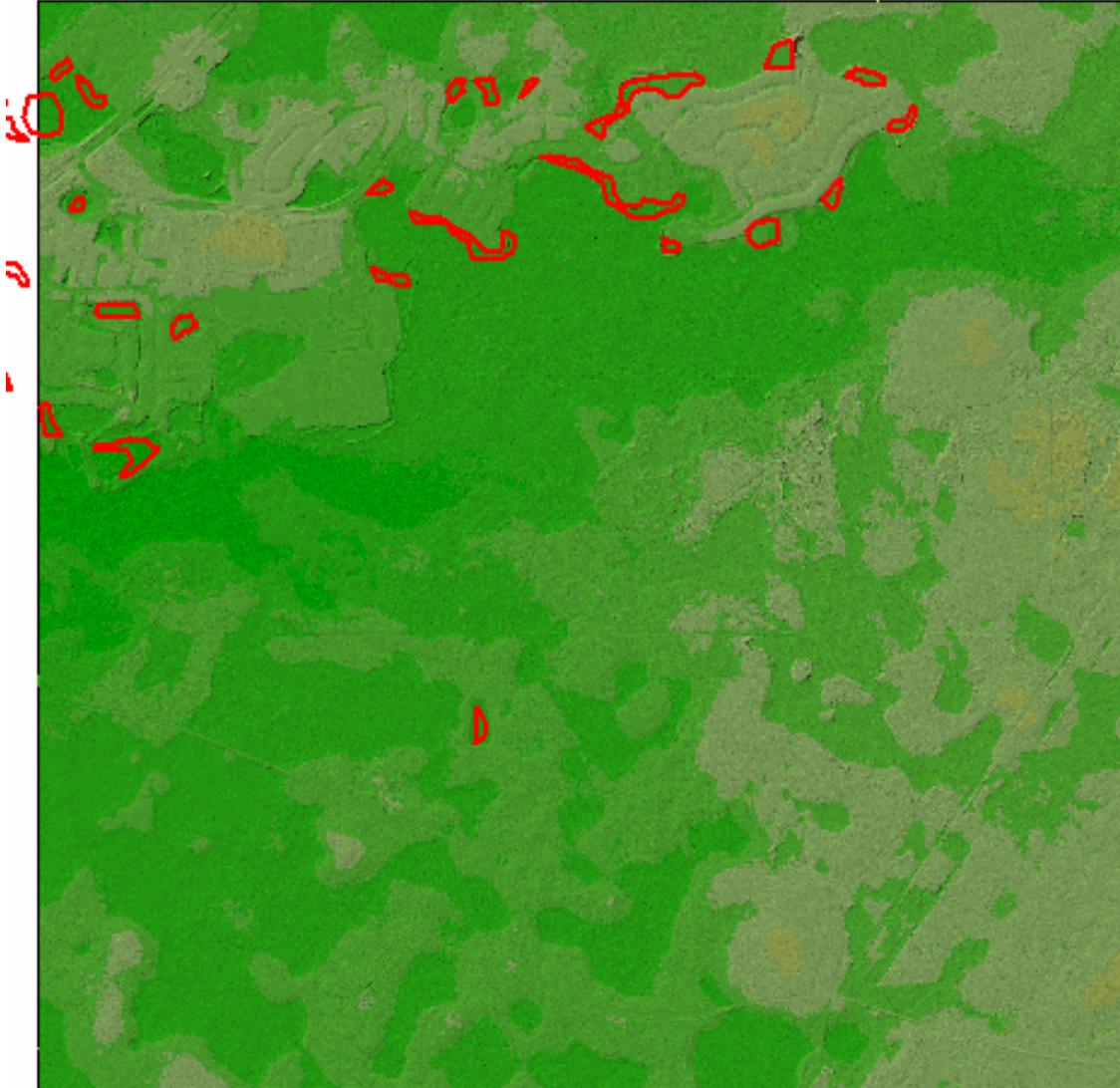
Tile: G_000007- Water points not vaporized



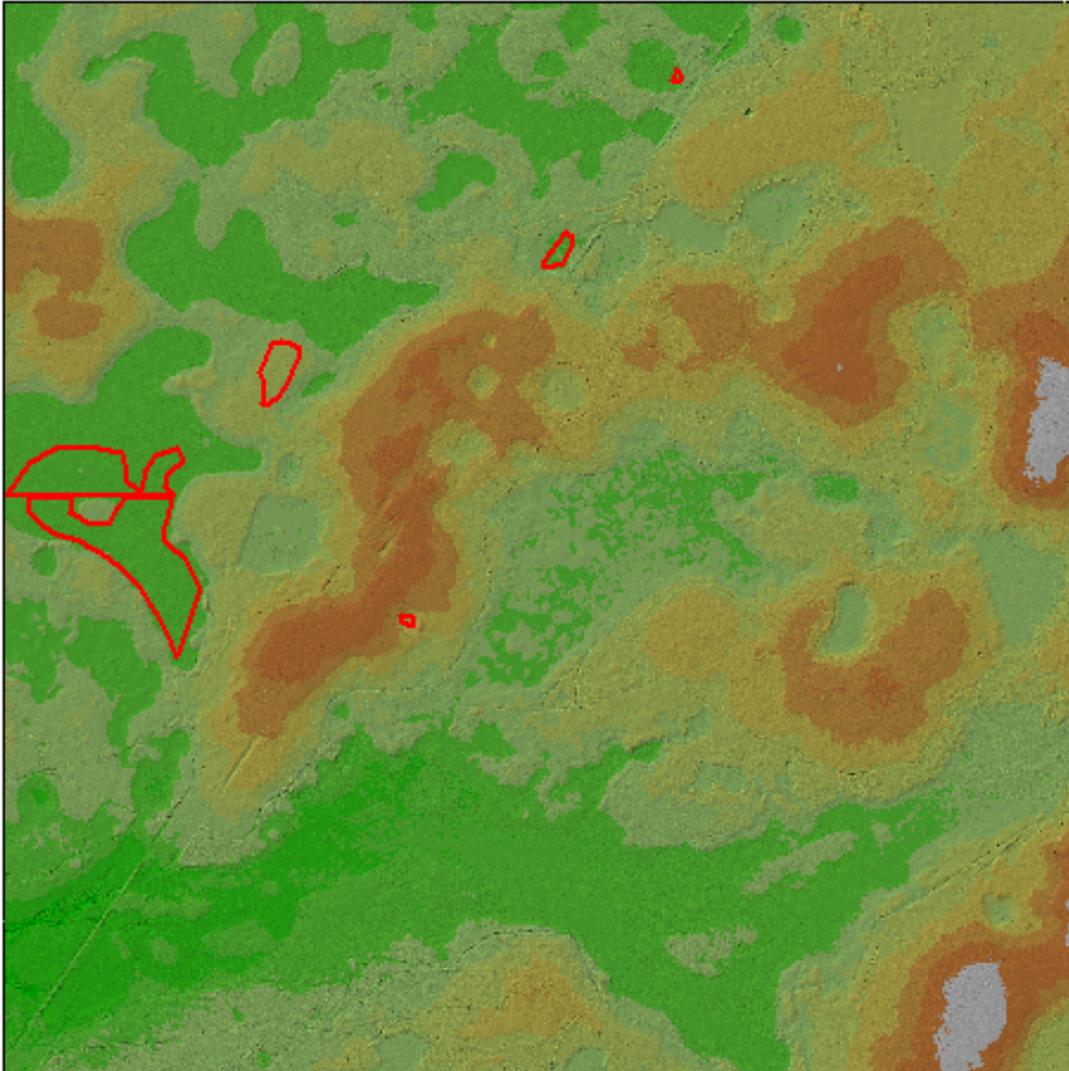
Tile: G_000008- Water points not vaporized



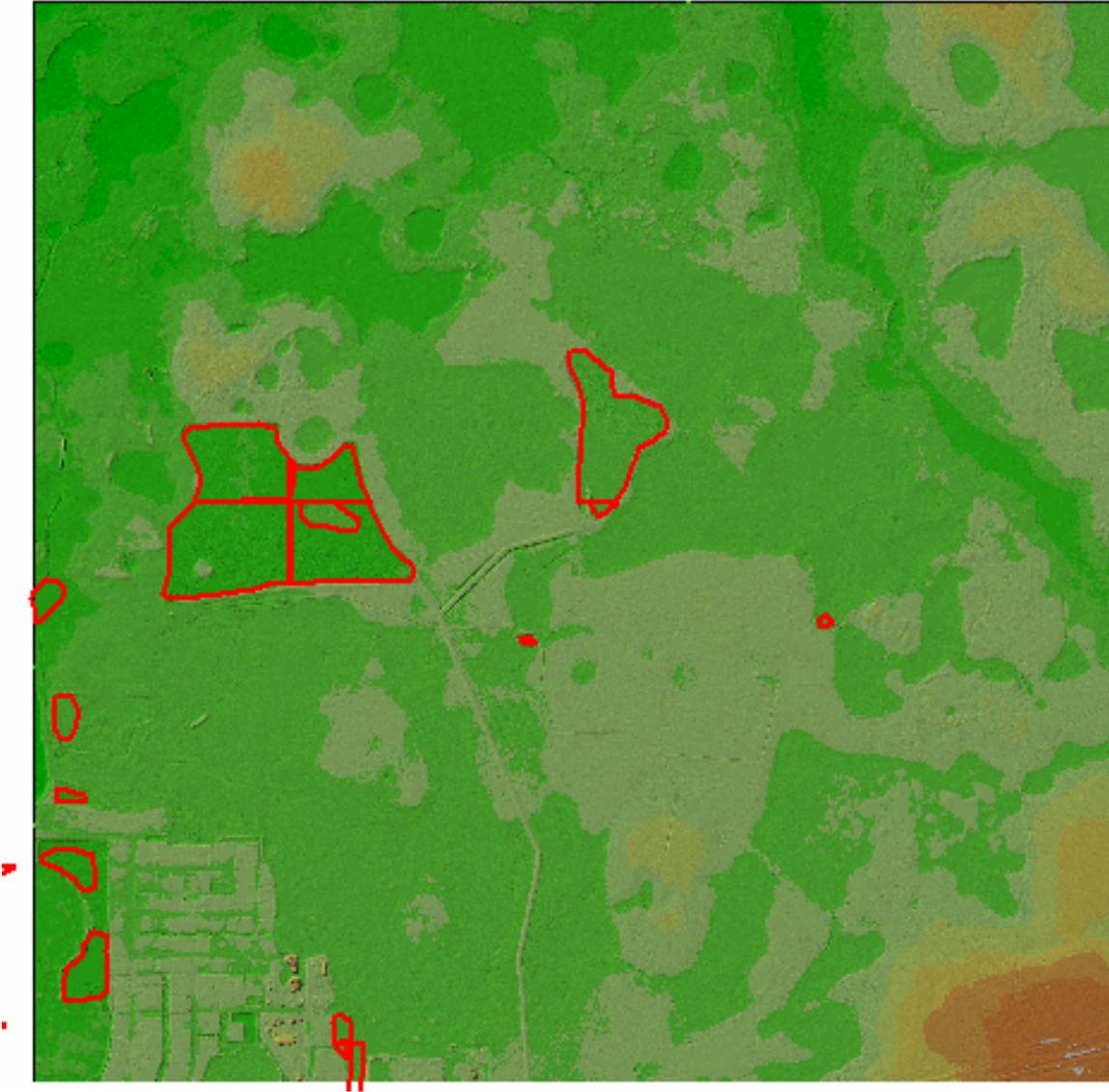
Tile: G_000009- Water points not vaporized



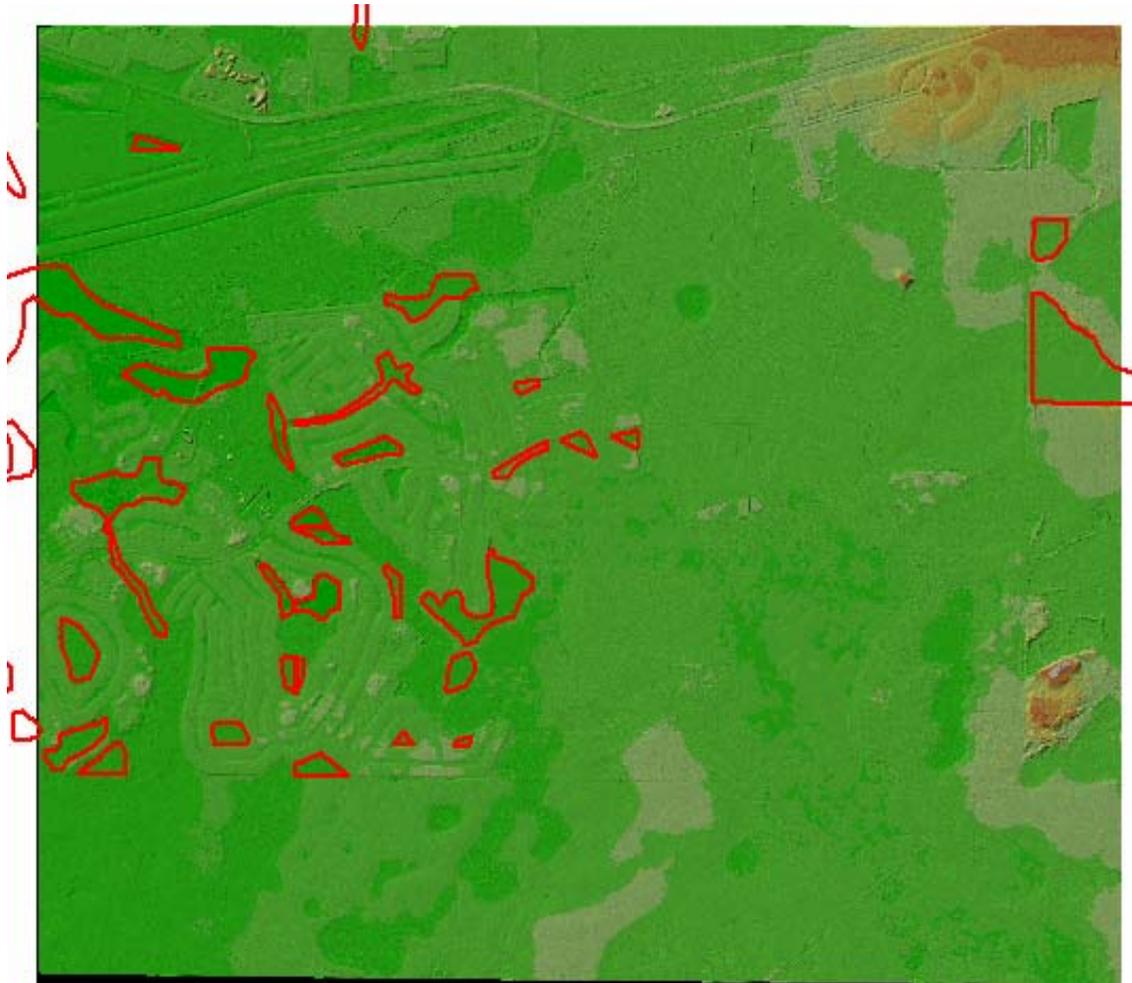
Tile: G_000010- Water points not vaporized



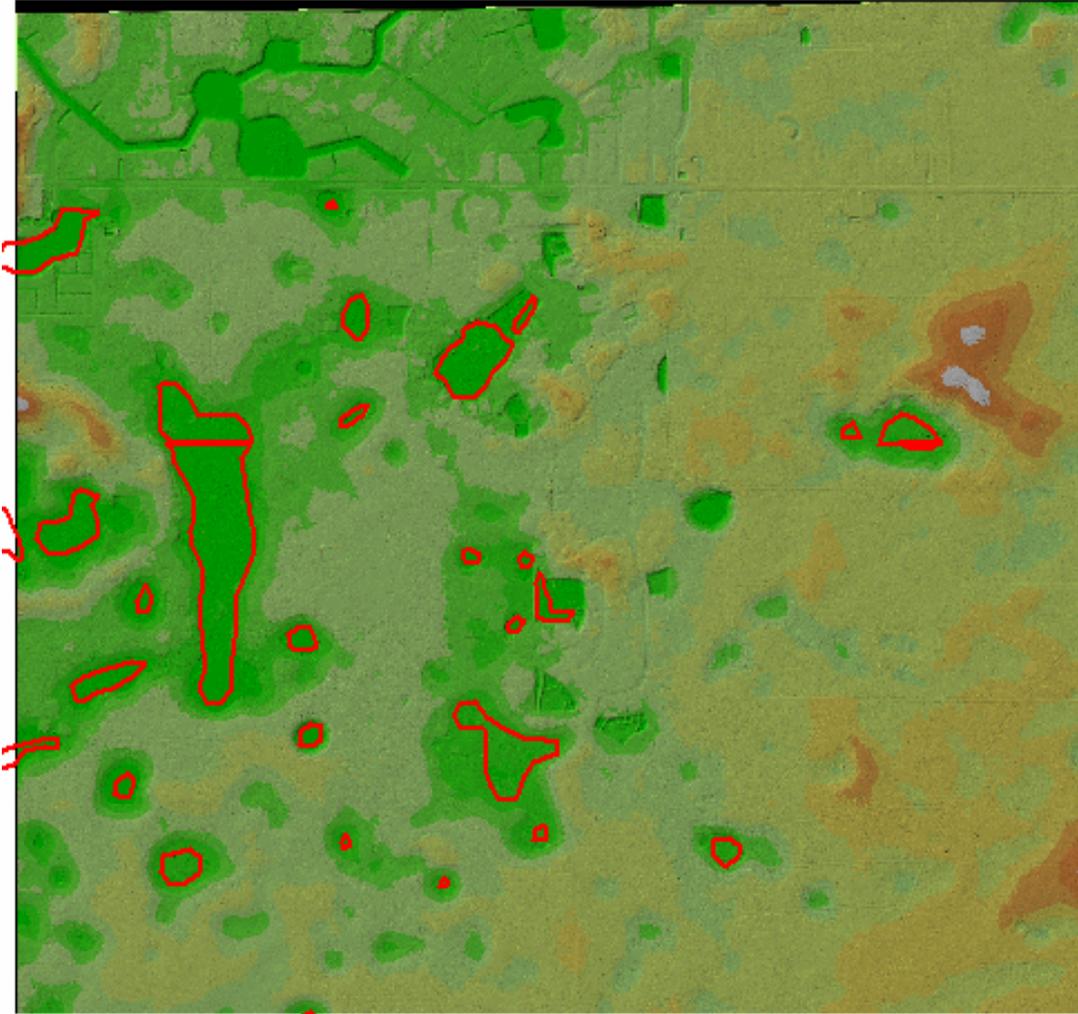
Tile: G_000011- Water points not vaporized



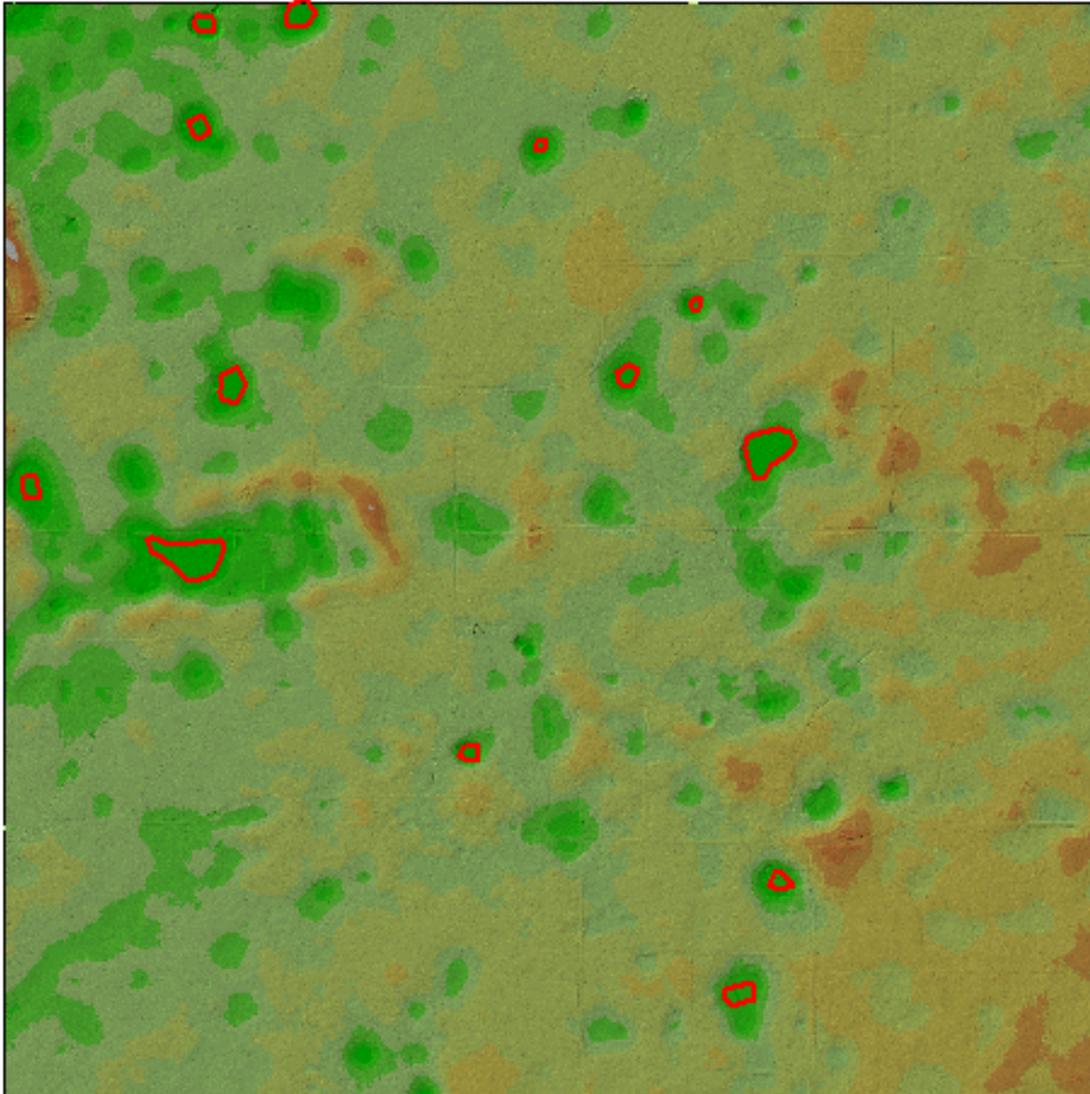
Tile: G_000012- Water points not vaporized



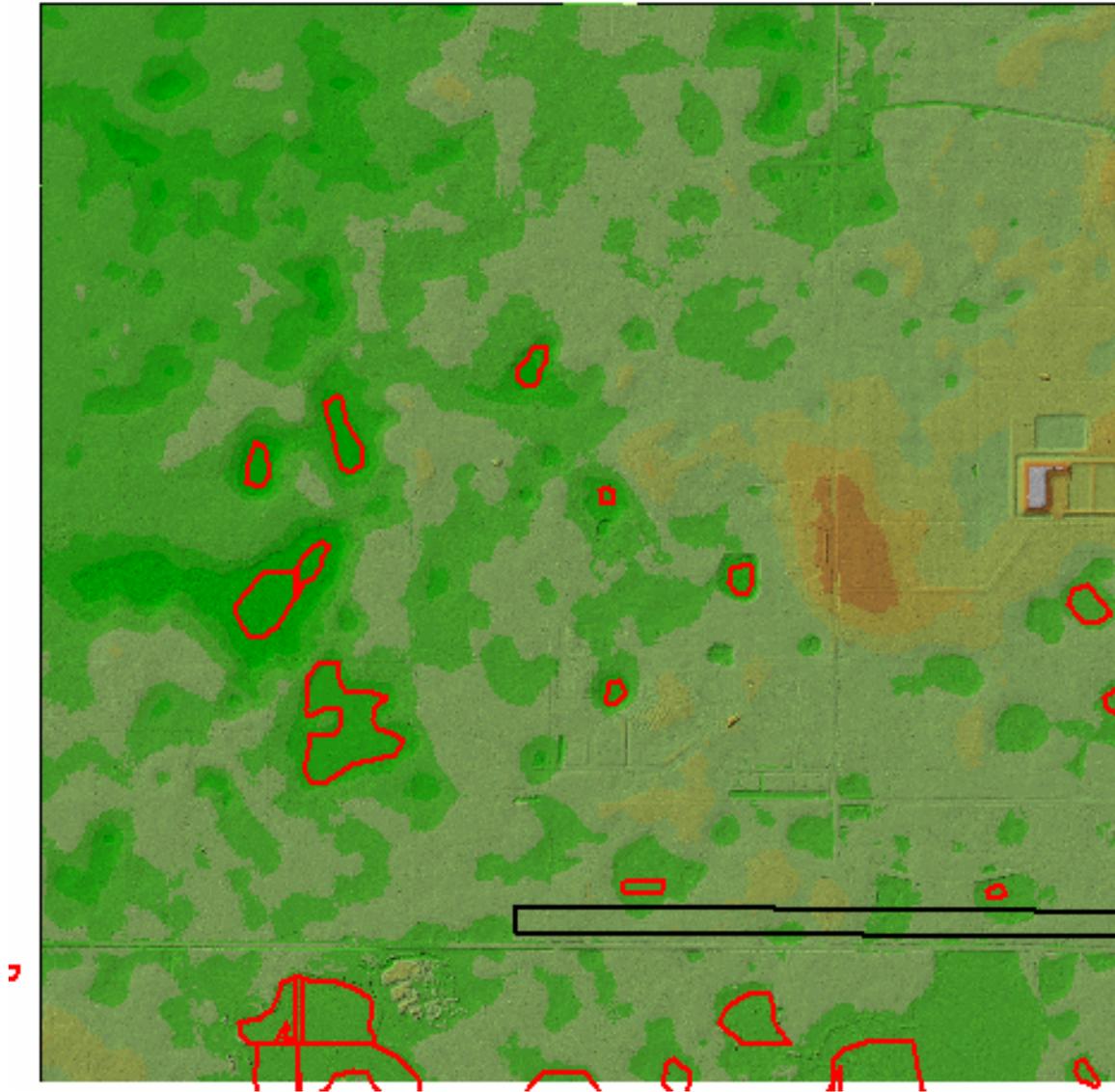
Tile: H_000003- Water points not vaporized



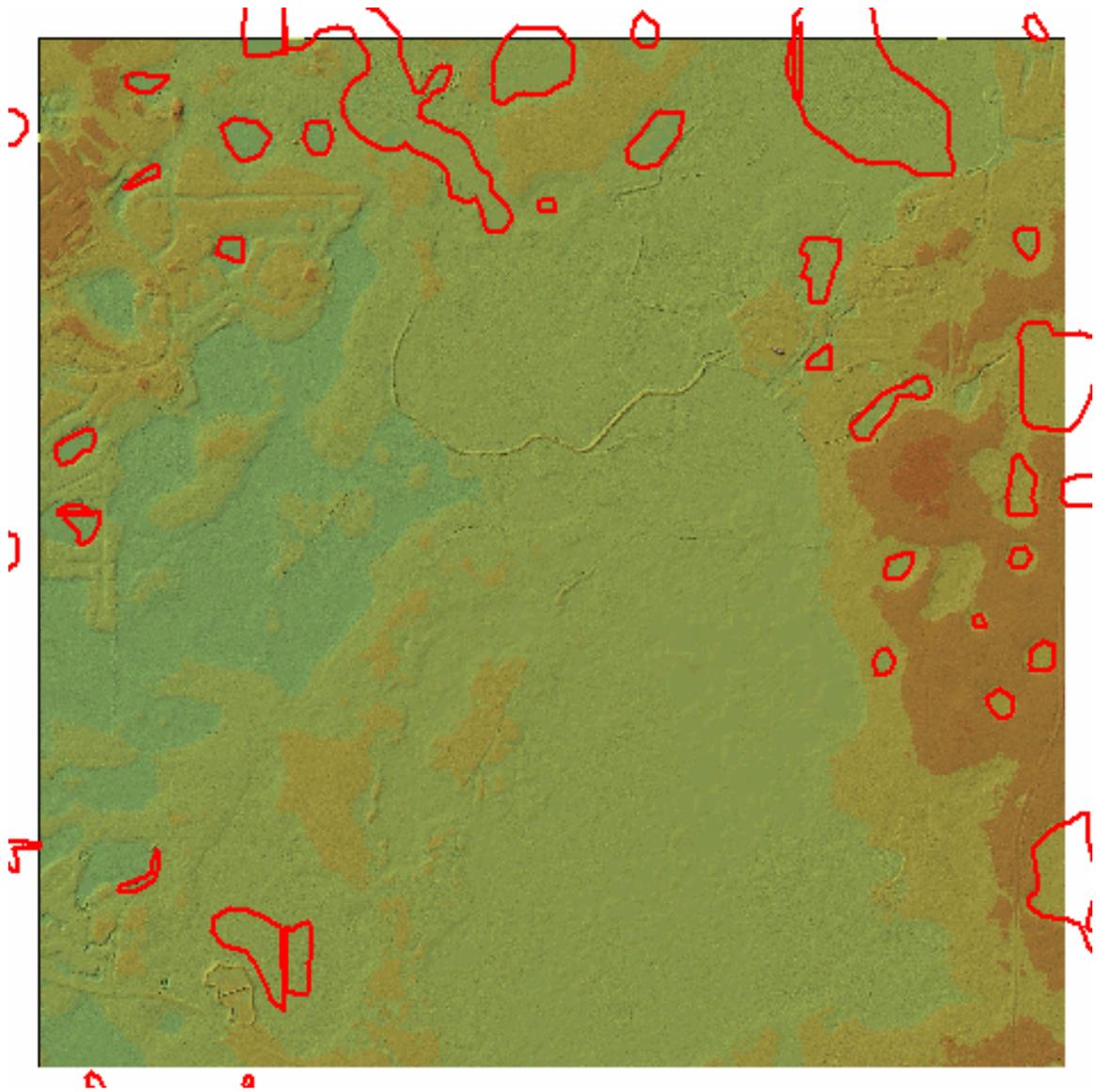
Tile: H_000004- Water points not vaporized



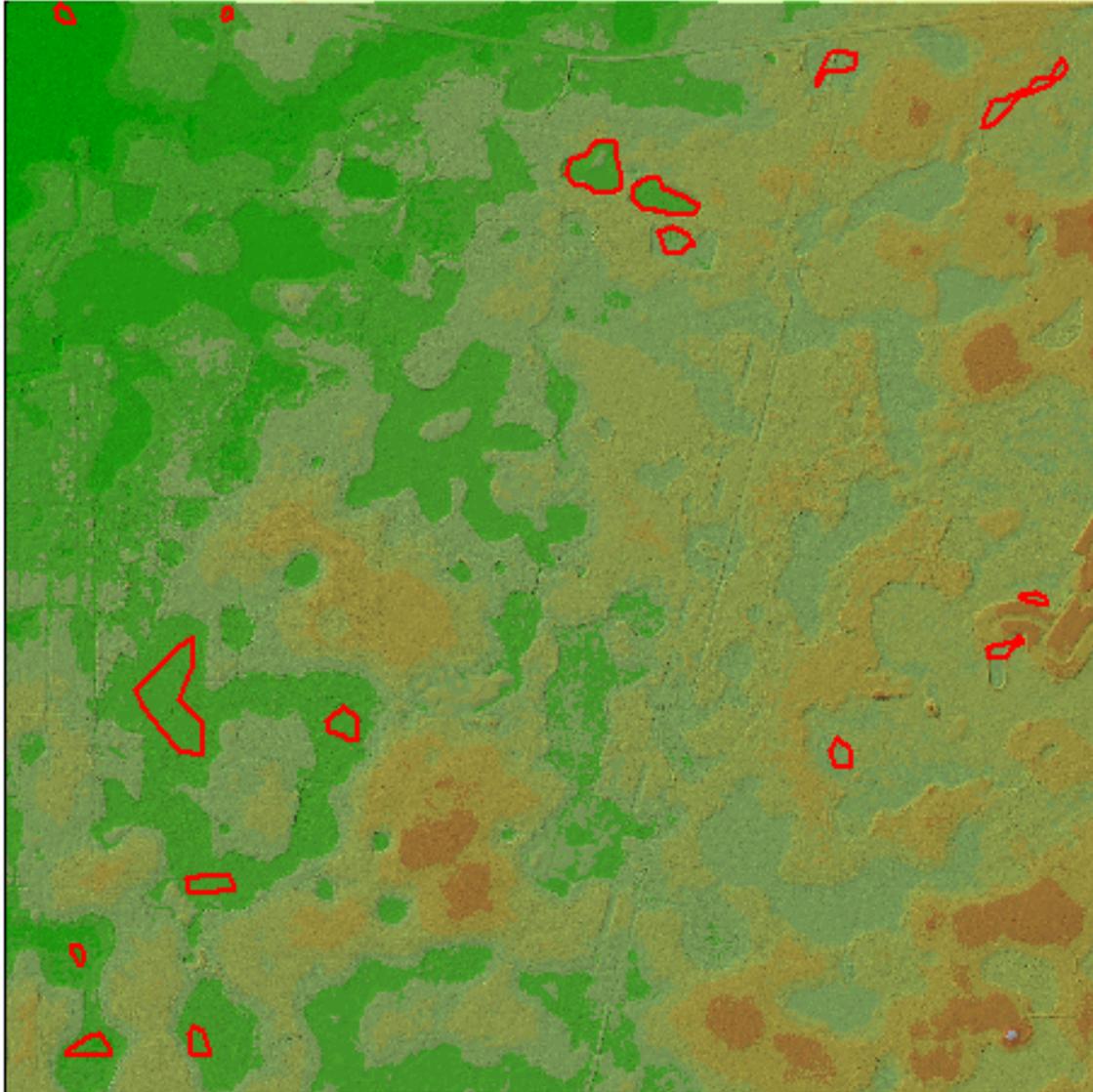
Tile: H_000005- Water points not vaporized and flightline step.



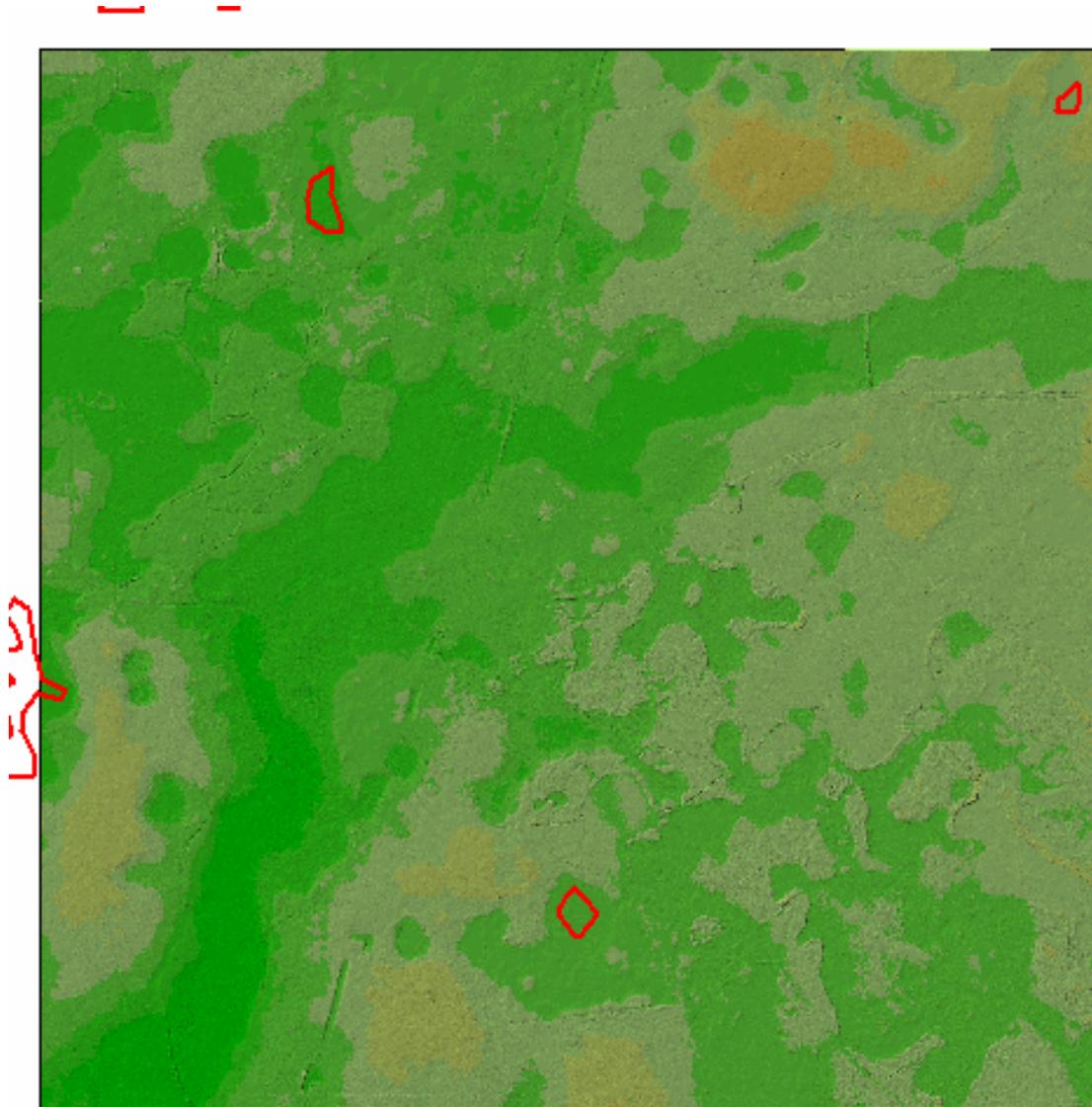
Tile: H_000006- Water points not vaporized



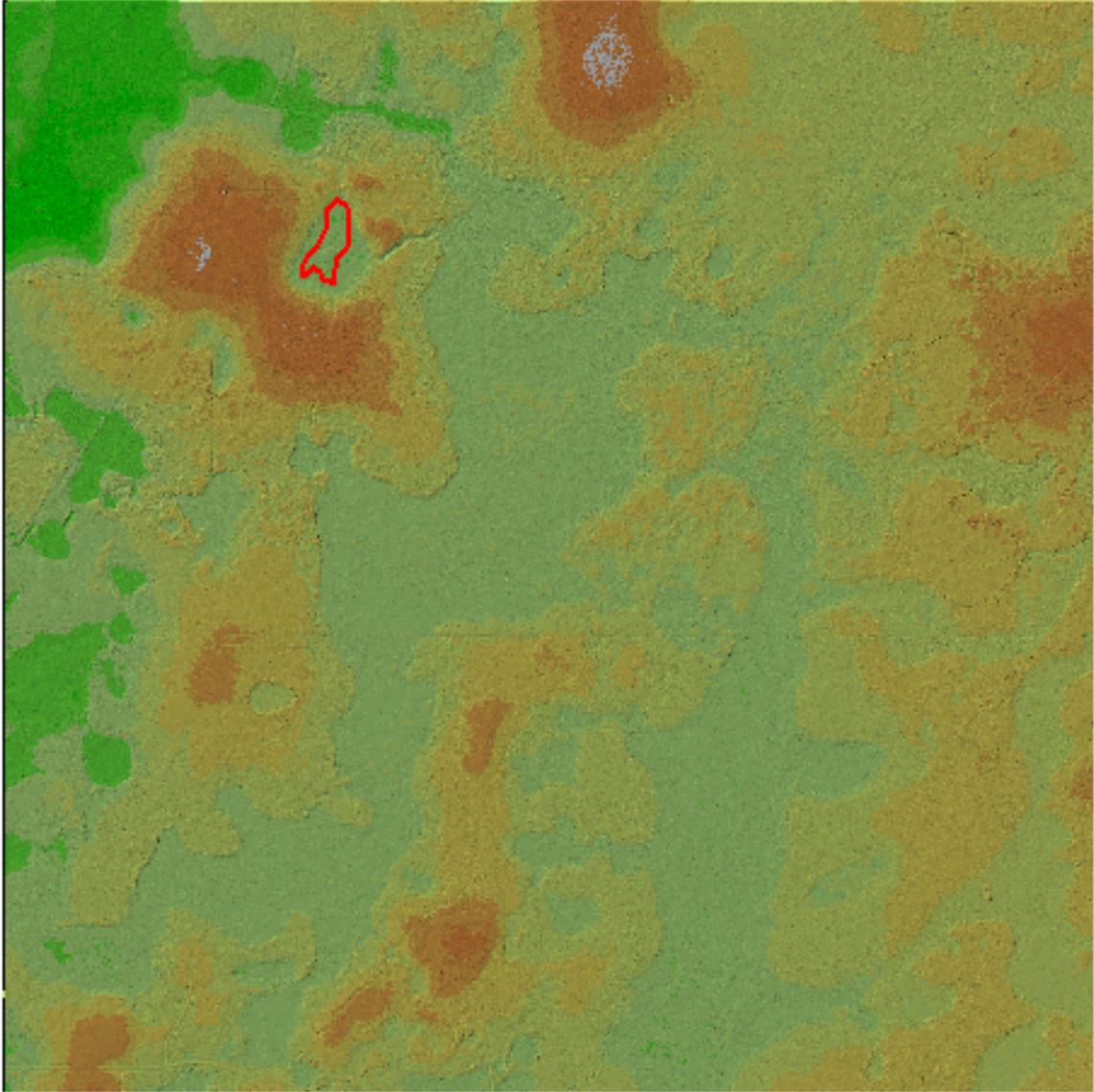
Tile: H_000007- Water points not vaporized



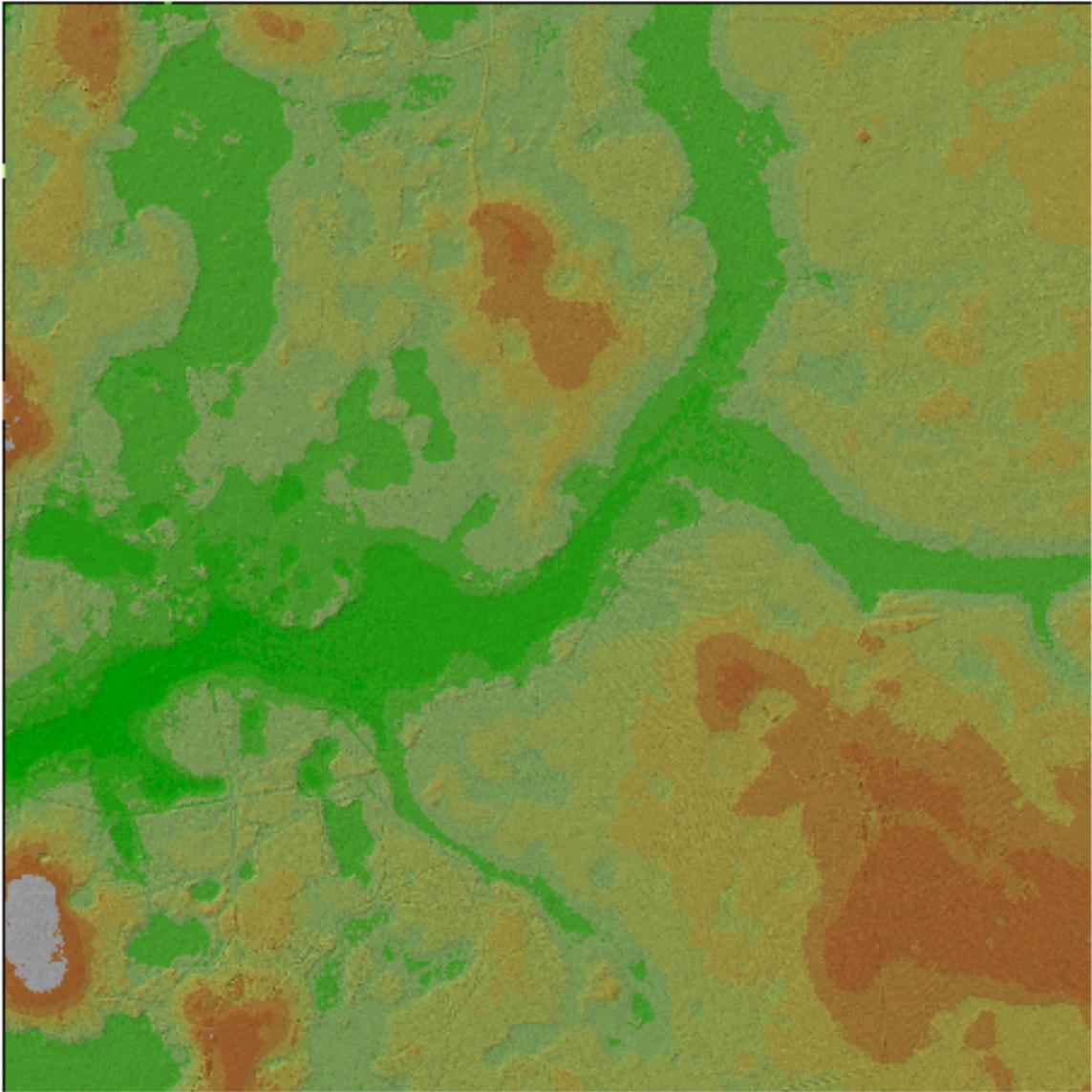
Tile: H_000008- Water points not vaporized



Tile: H_000009- Water points not vaporized



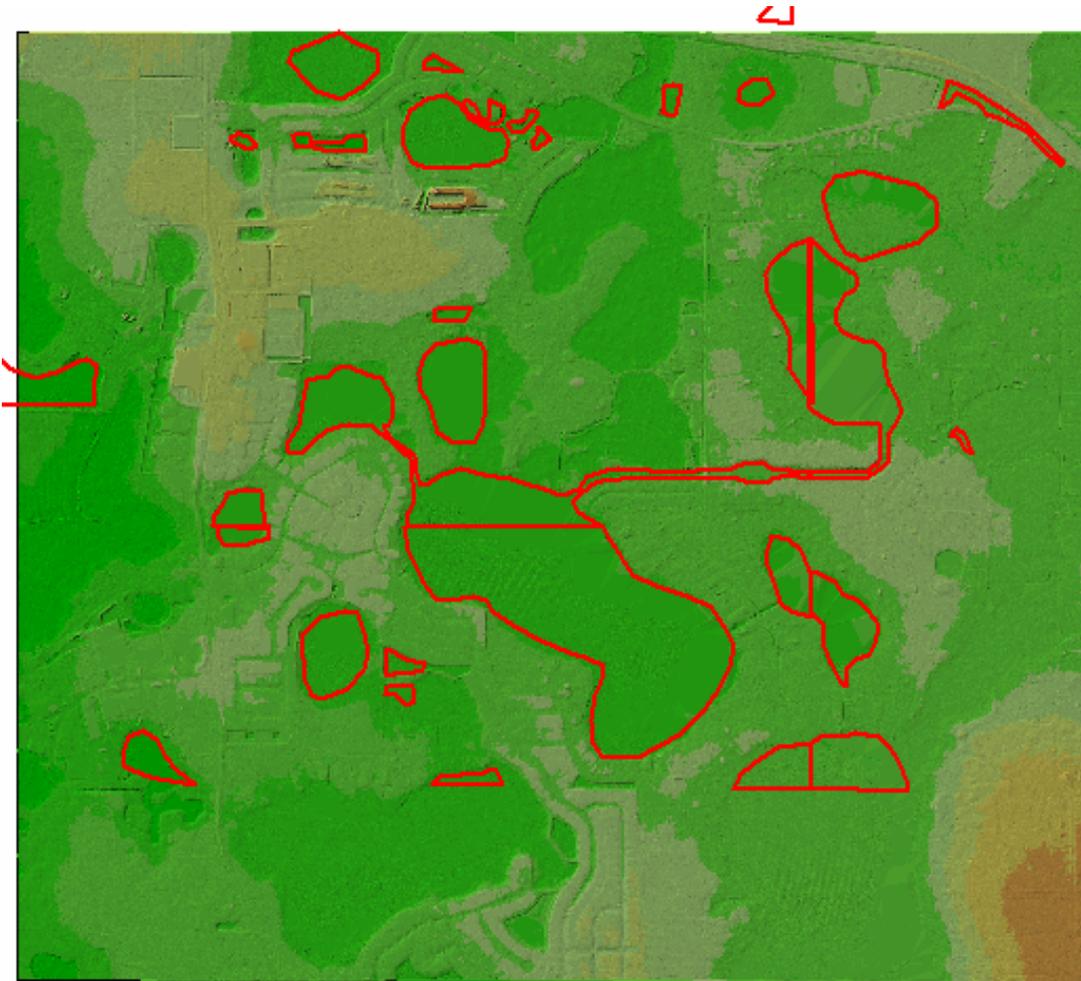
Tile: H_000010- Water points not vaporized



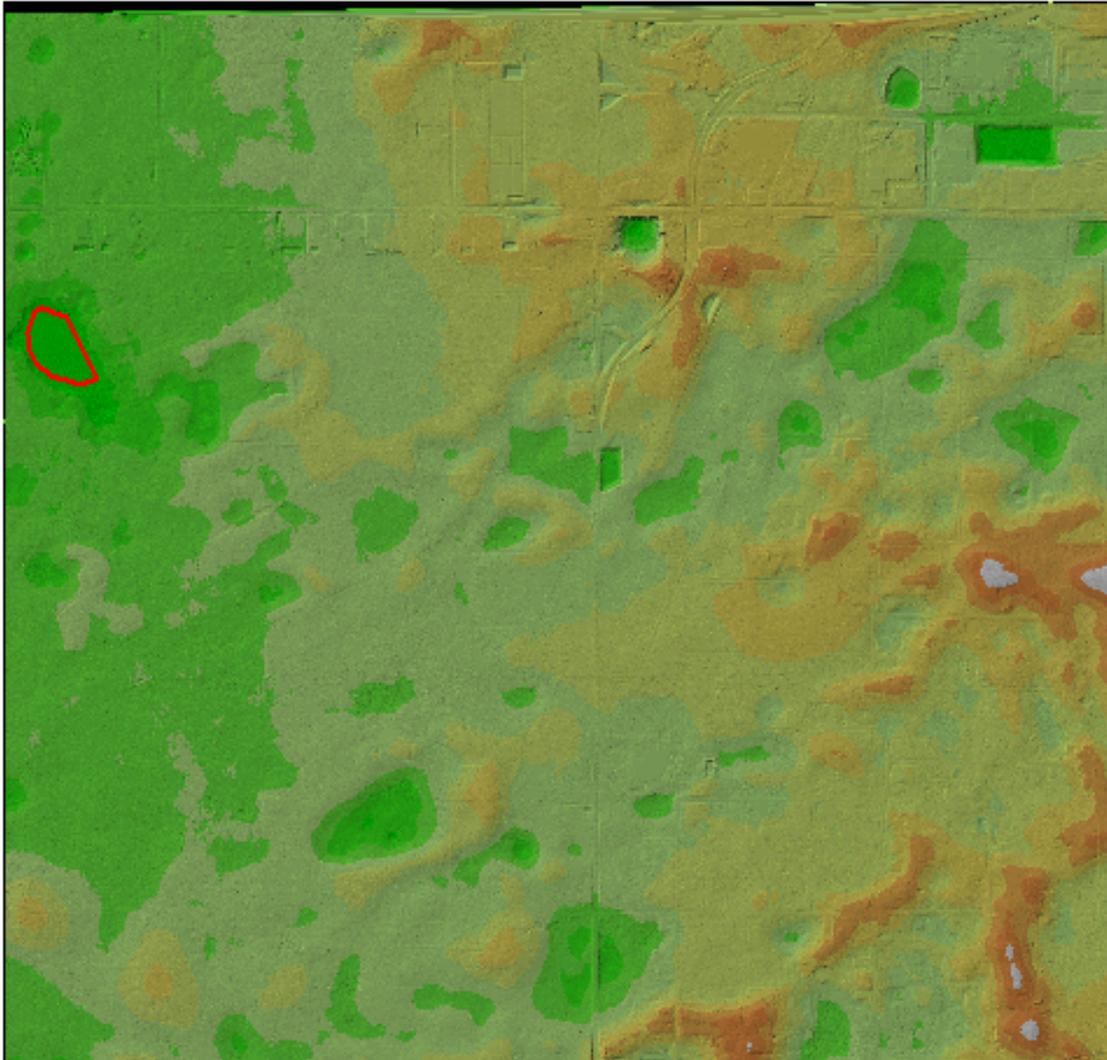
Tile: H_000011- Water points not vaporized



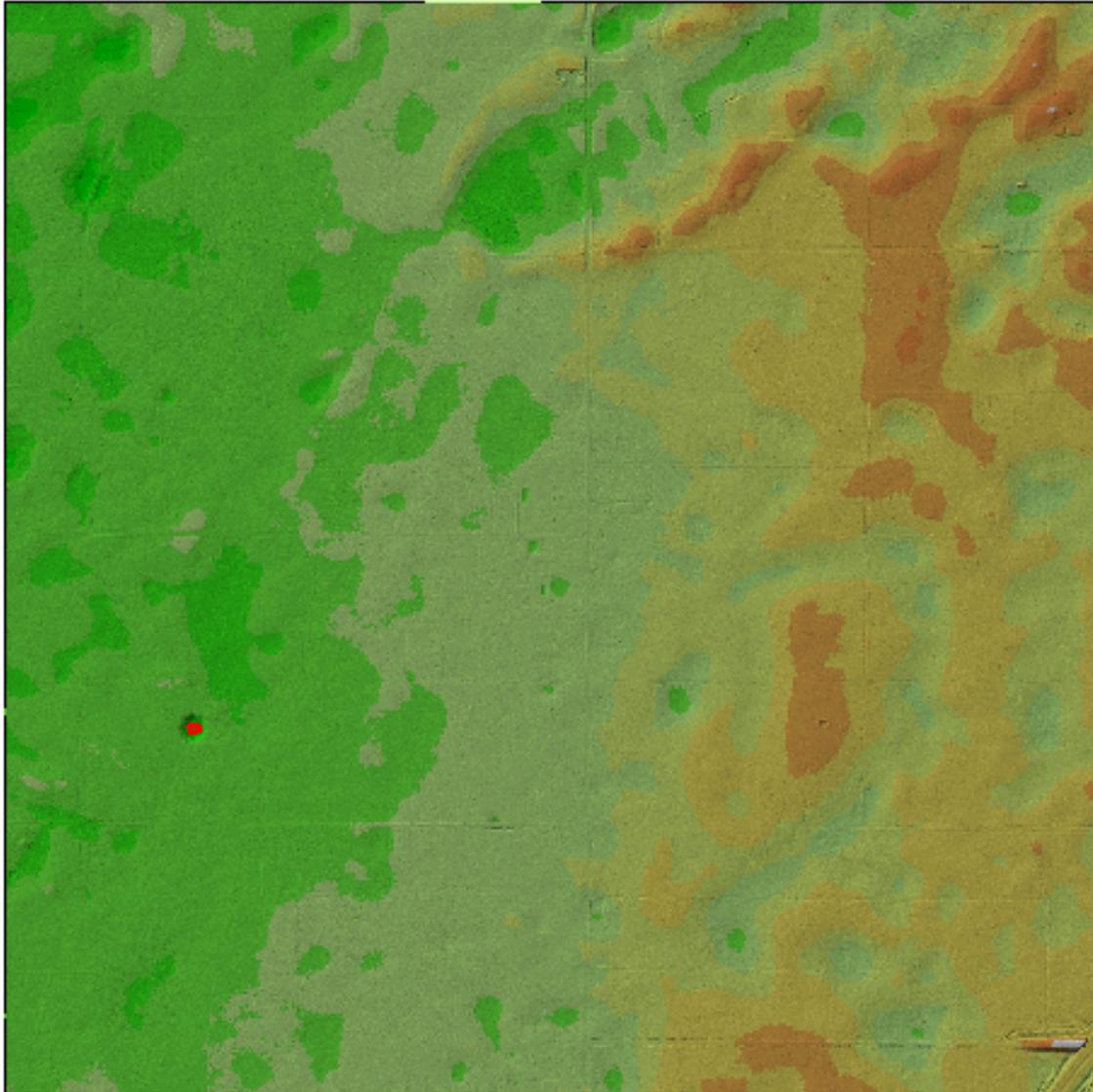
Tile: H_000012- Water points not vaporized



Tile: I_000003- Water points not vaporized



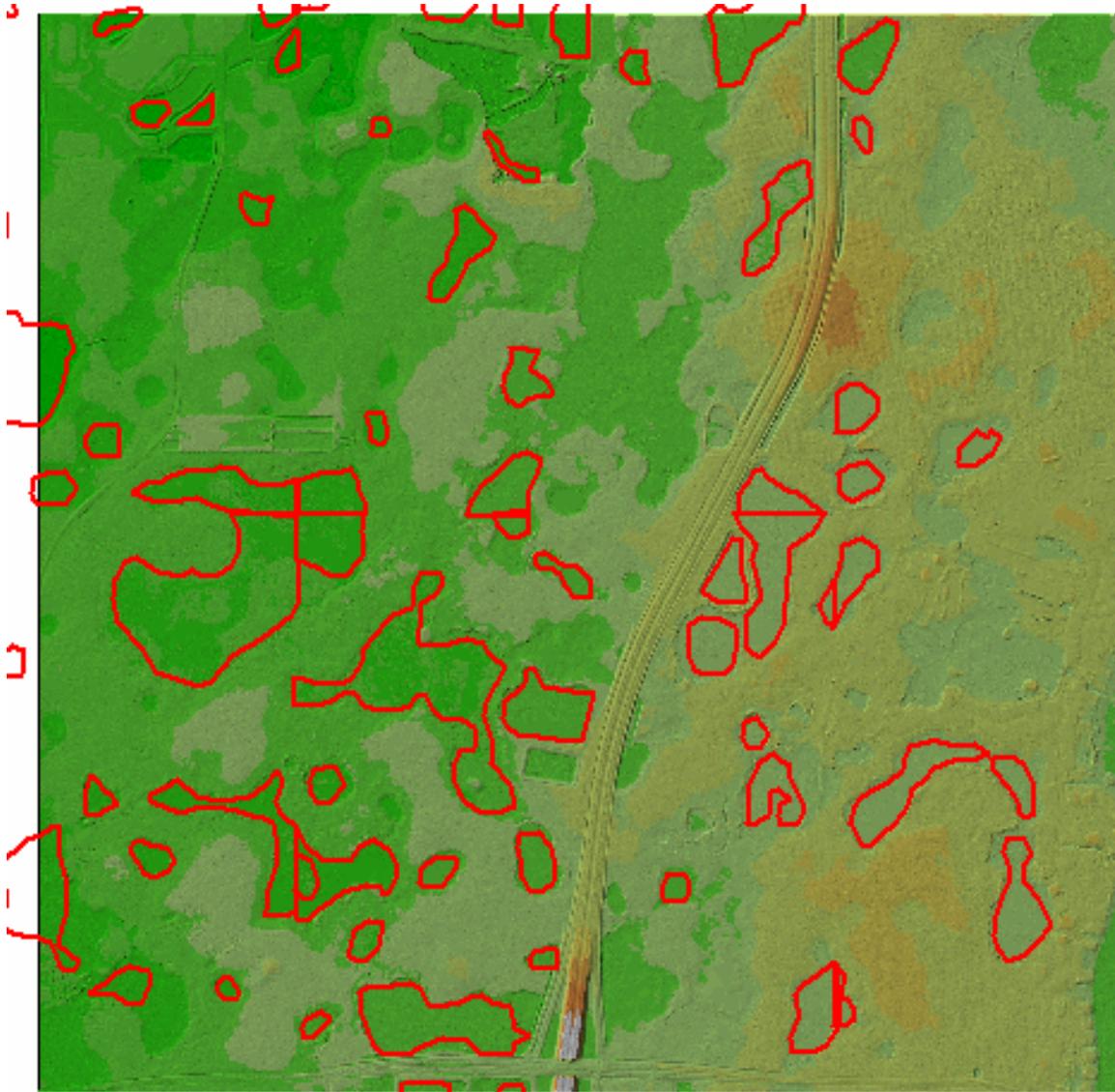
Tile: I_000004- Water points not vaporized



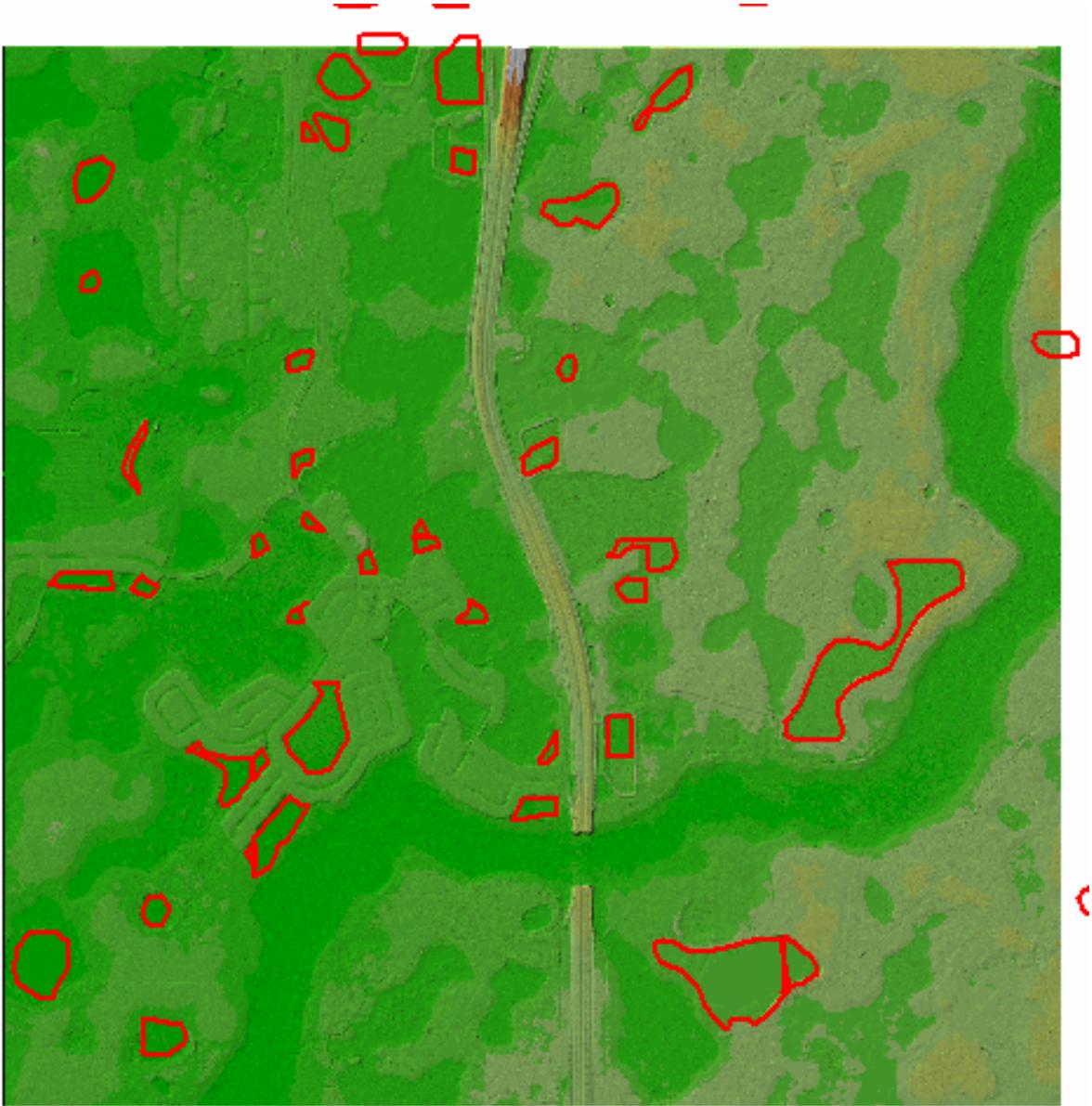
Tile: I_000005- Water points not vaporized and flightline step.



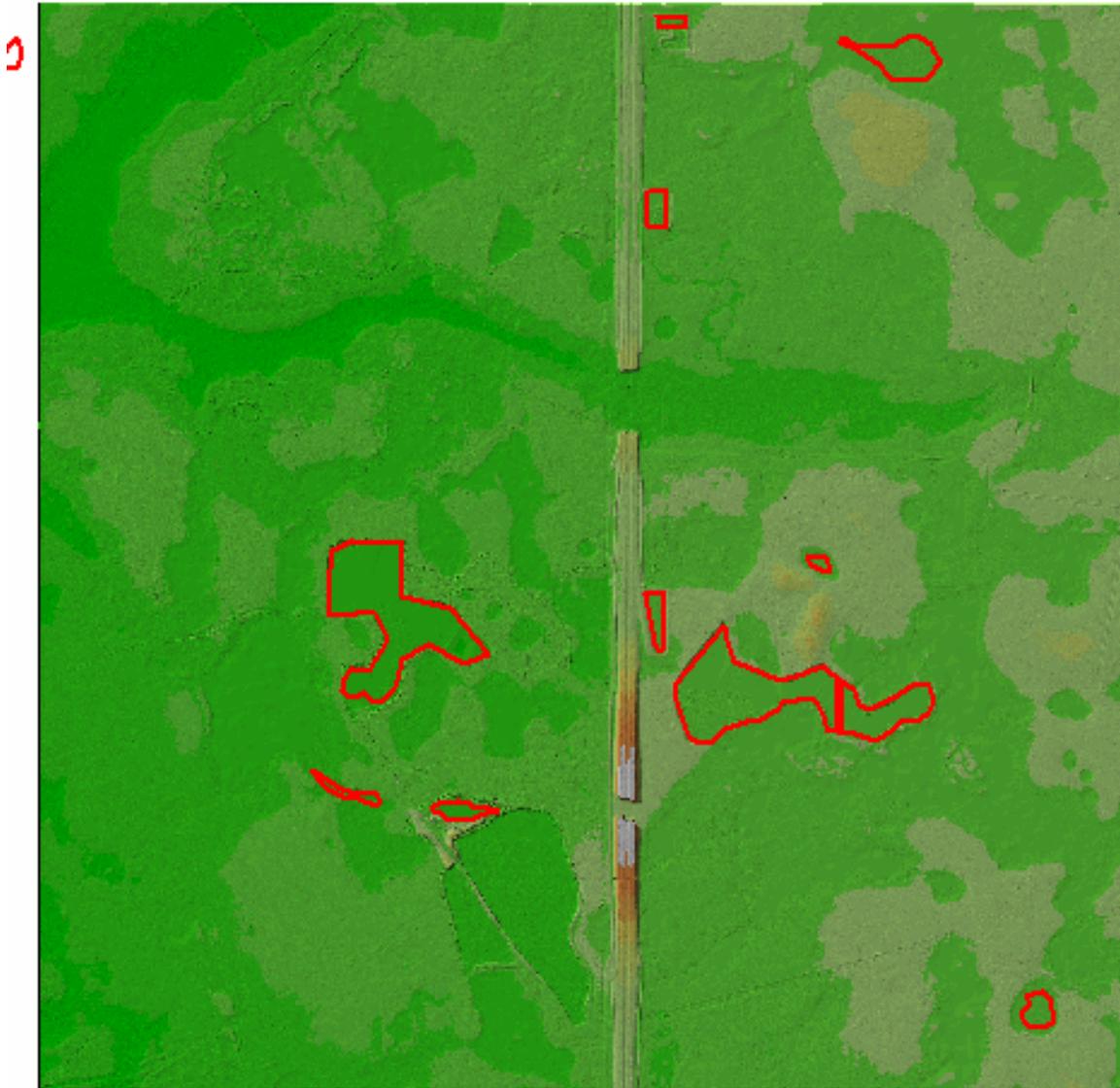
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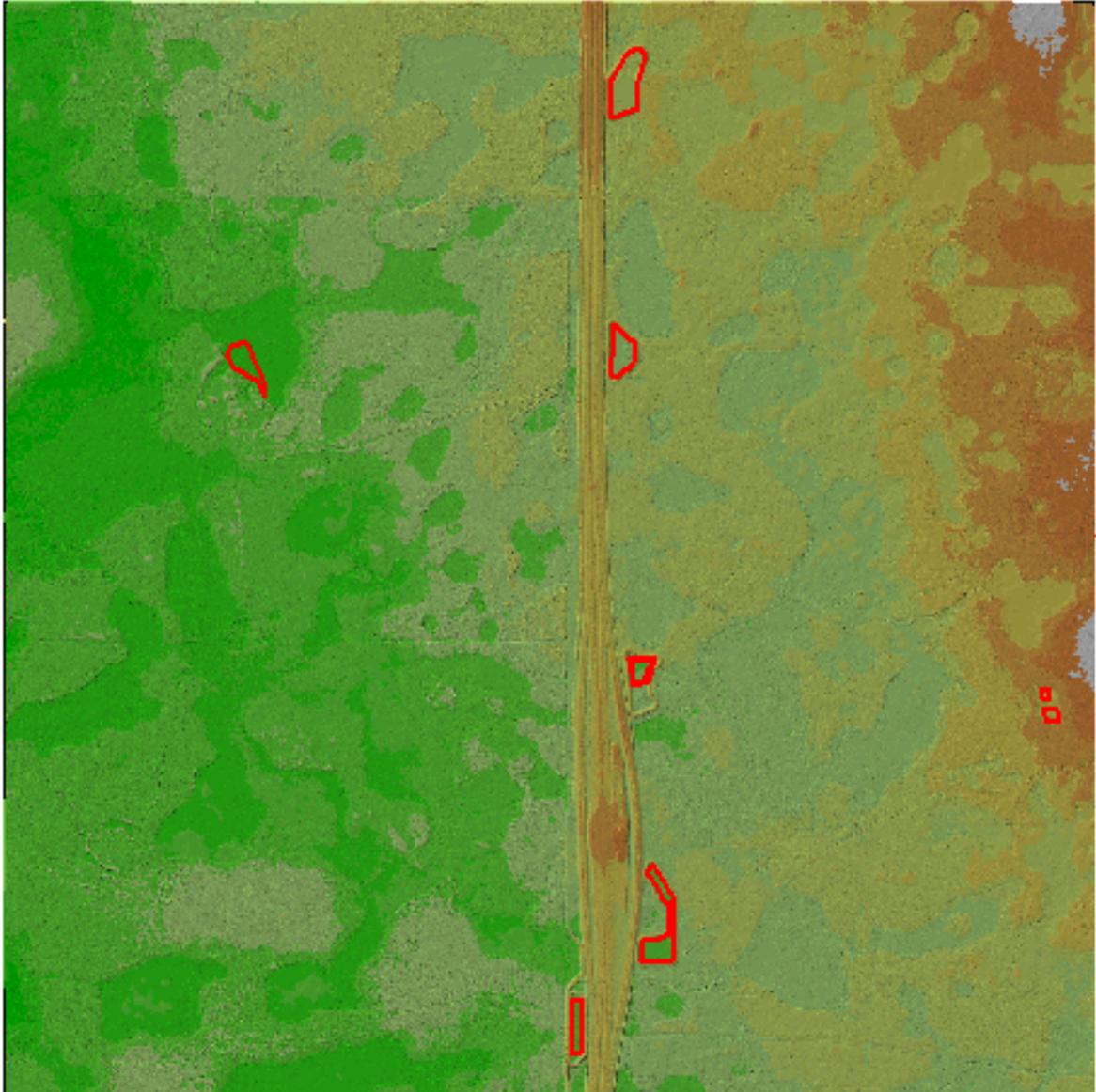
Tile: I_000007- Water points not vaporized



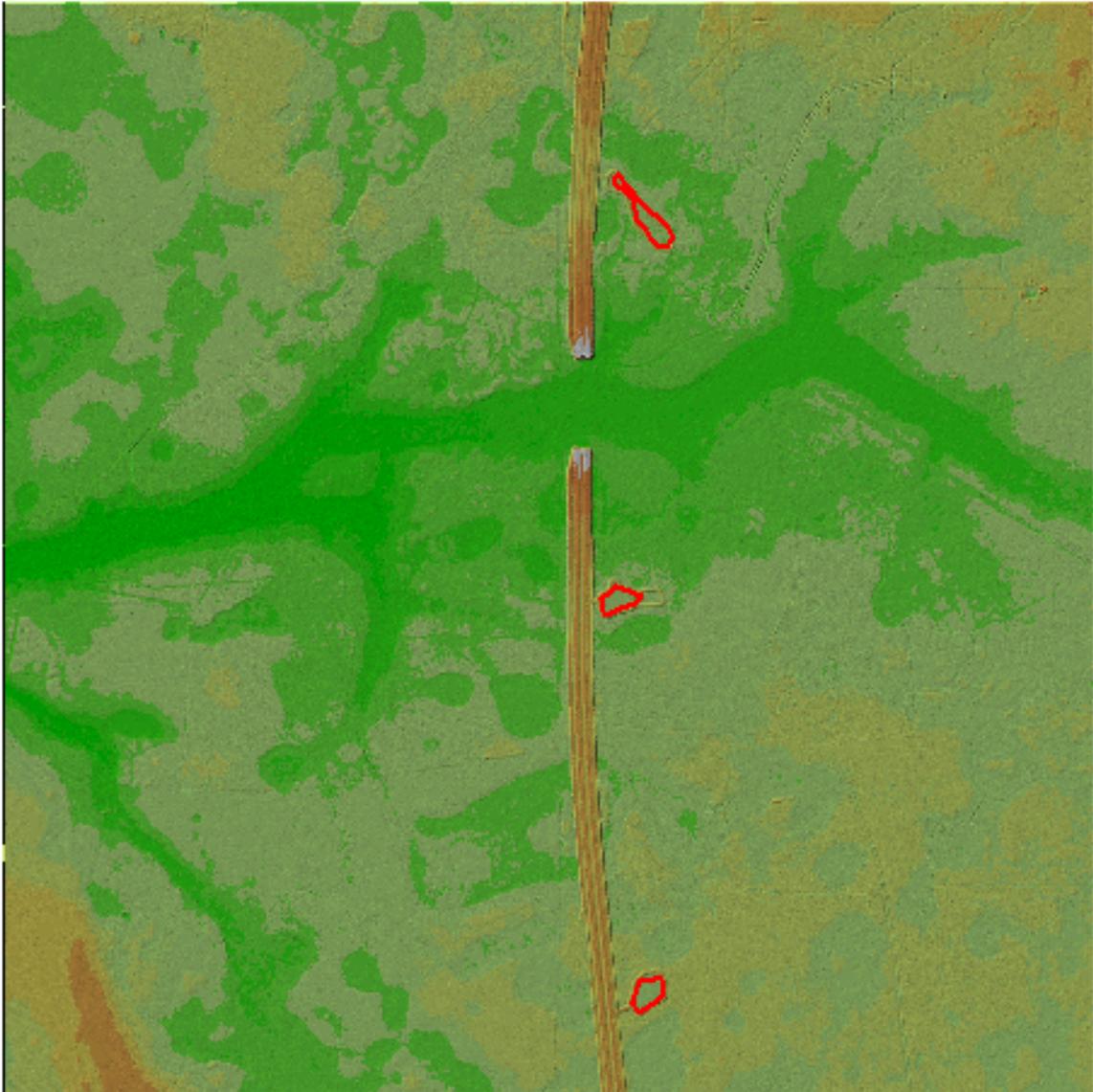
Tile: I_000008- Water points not vaporized



Tile: I_000009- Water points not vaporized



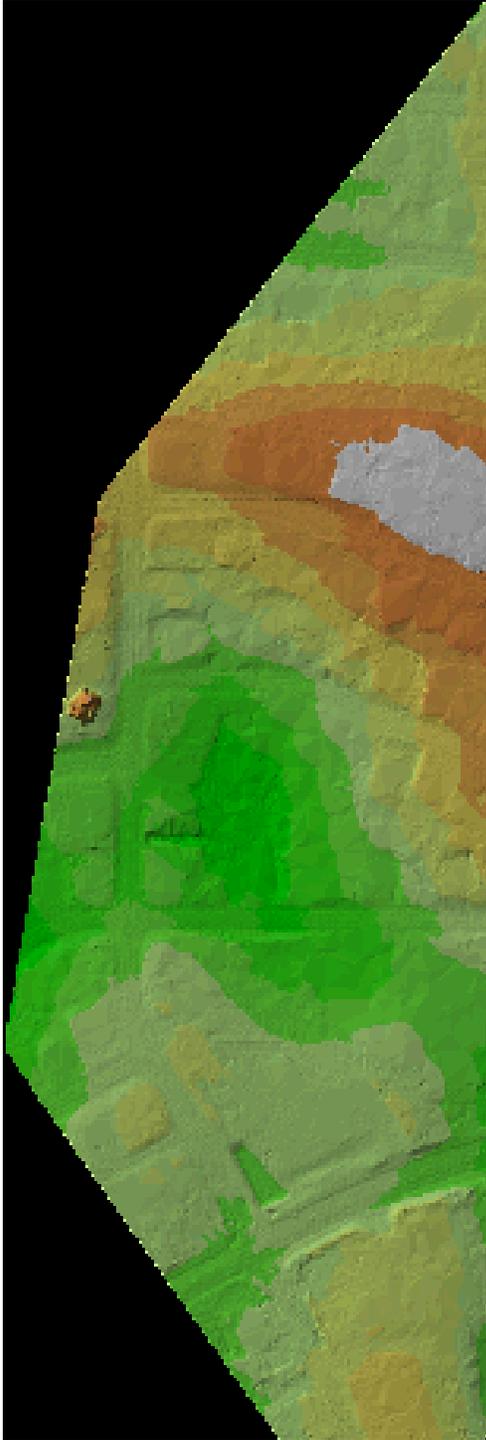
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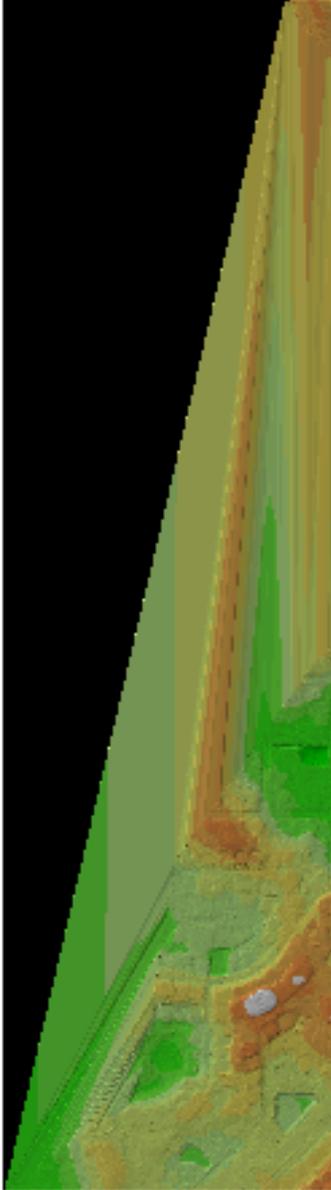
Tile: I_000011- Water points not vaporized



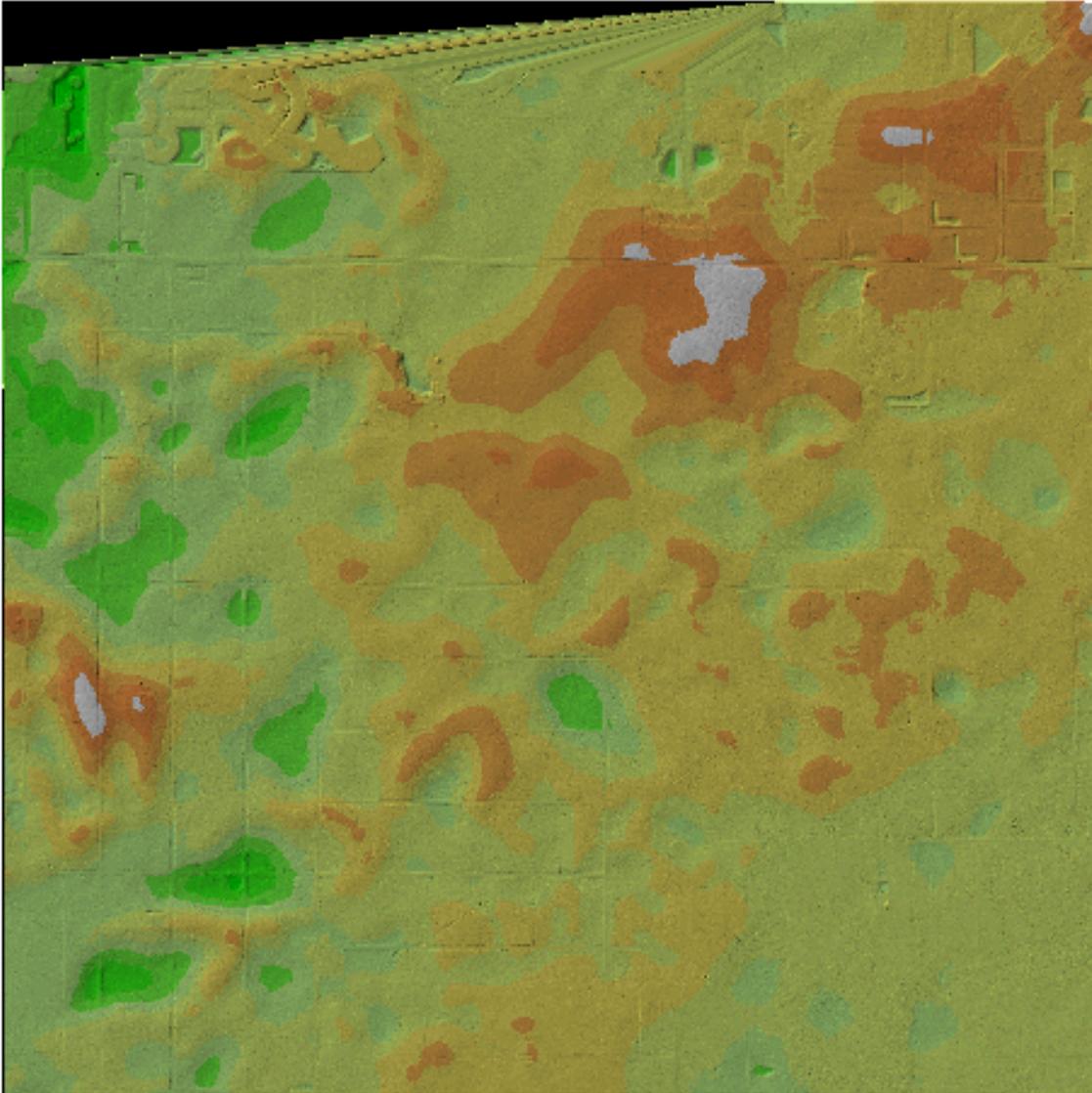
Tile: J_000001- Water points not vaporized



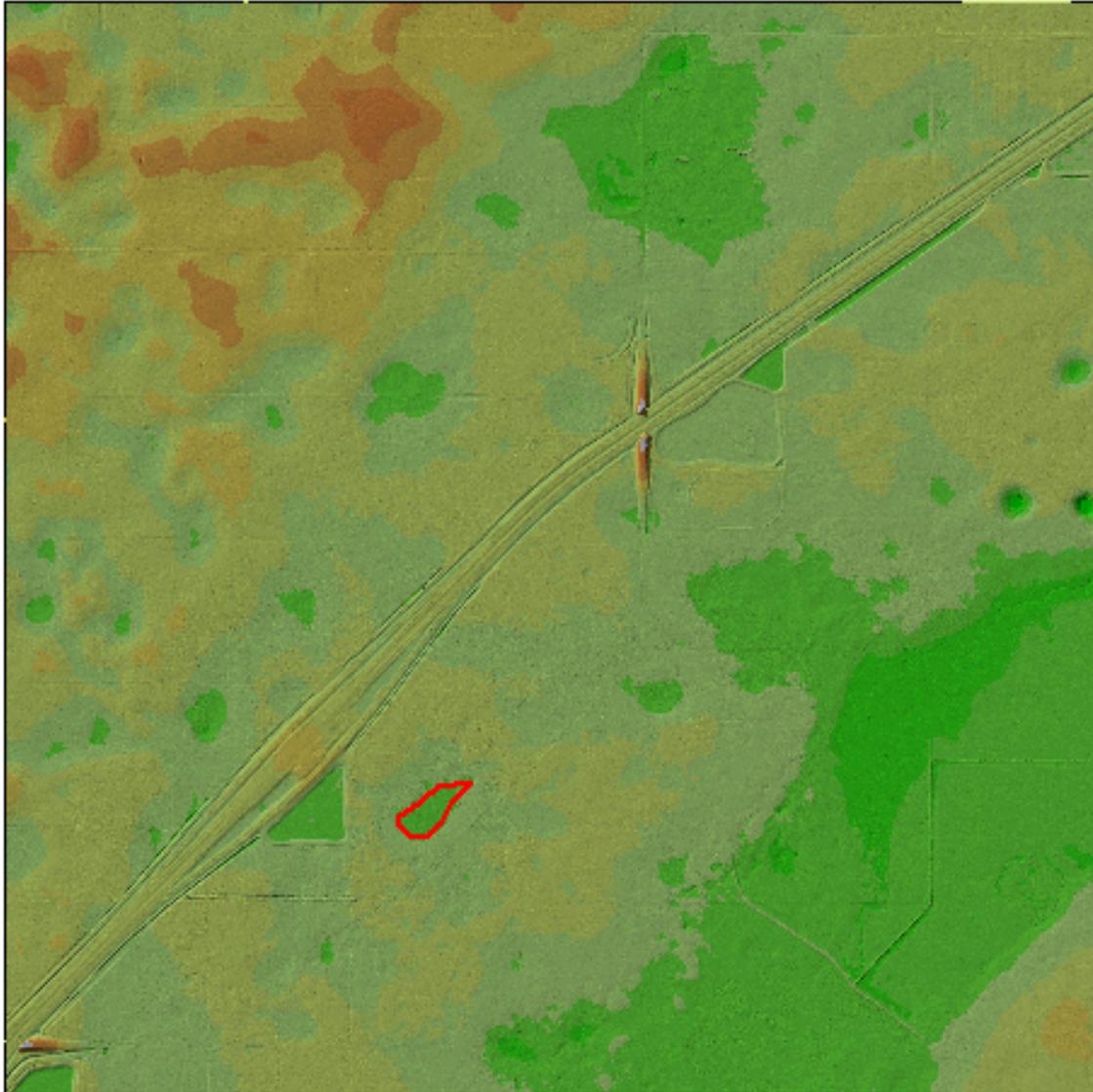
Tile: J_000002- Water points not vaporized



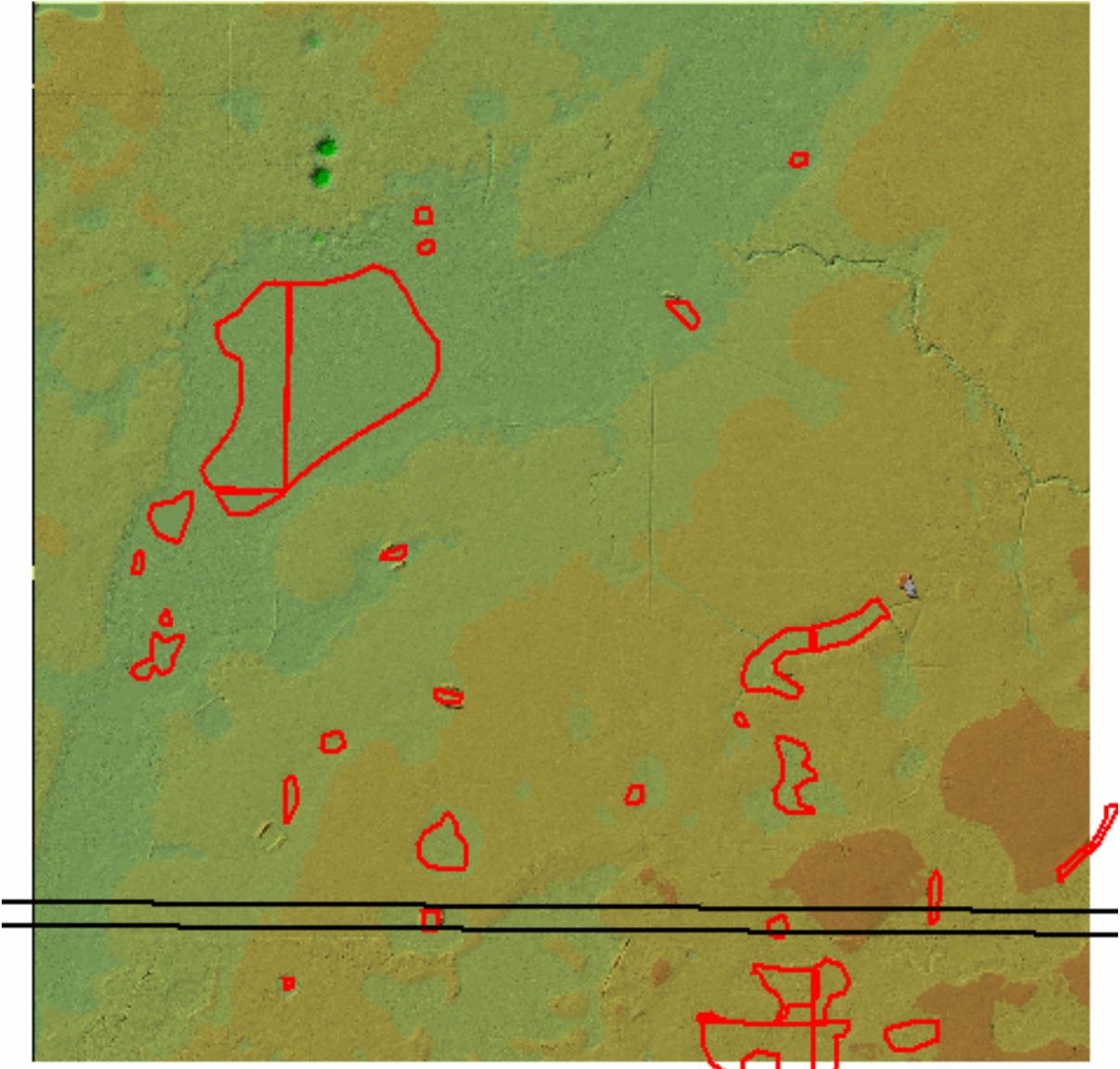
Tile: J_000003- Water points not vaporized



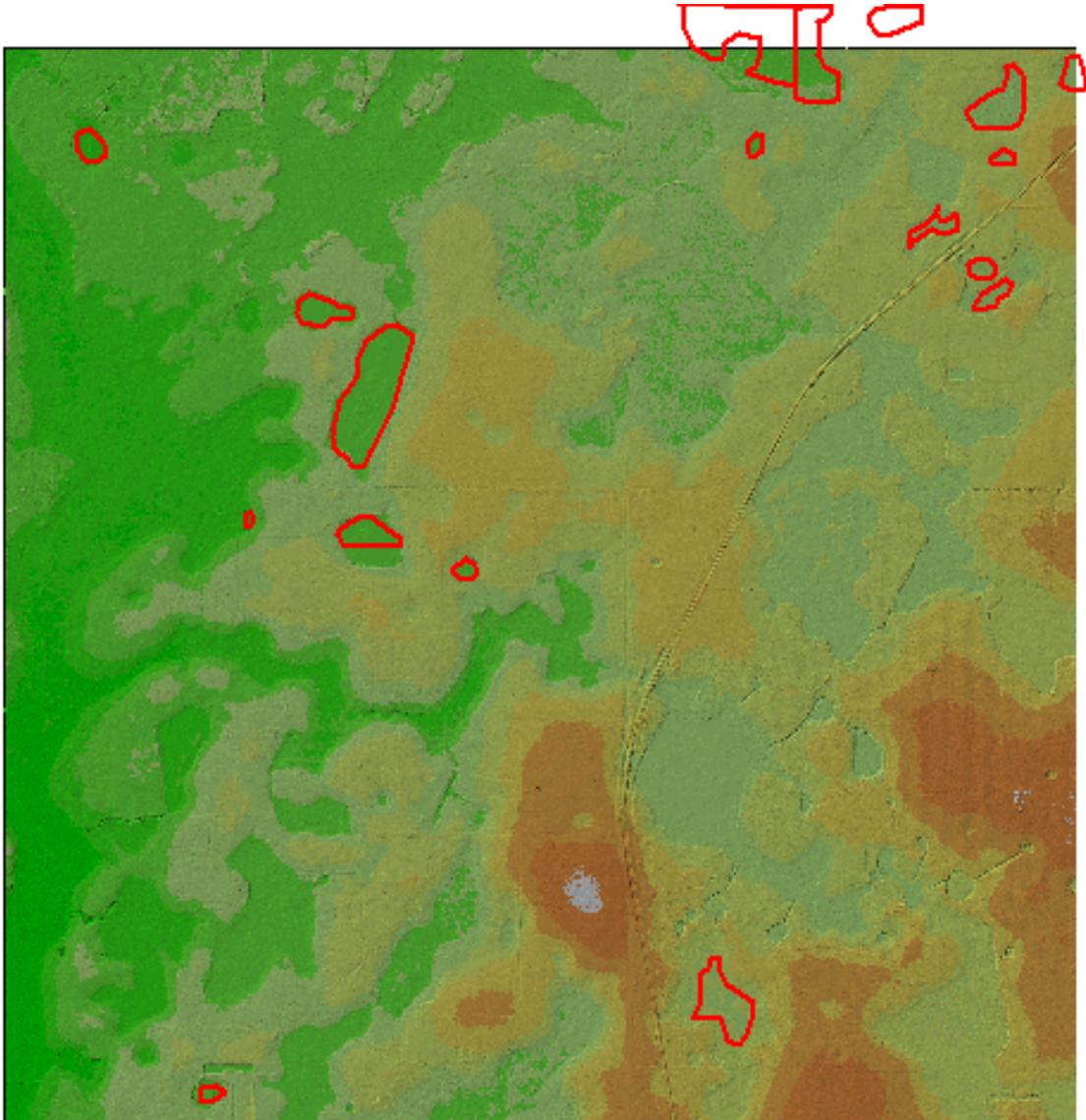
Tile: J_000004- Water points not vaporized



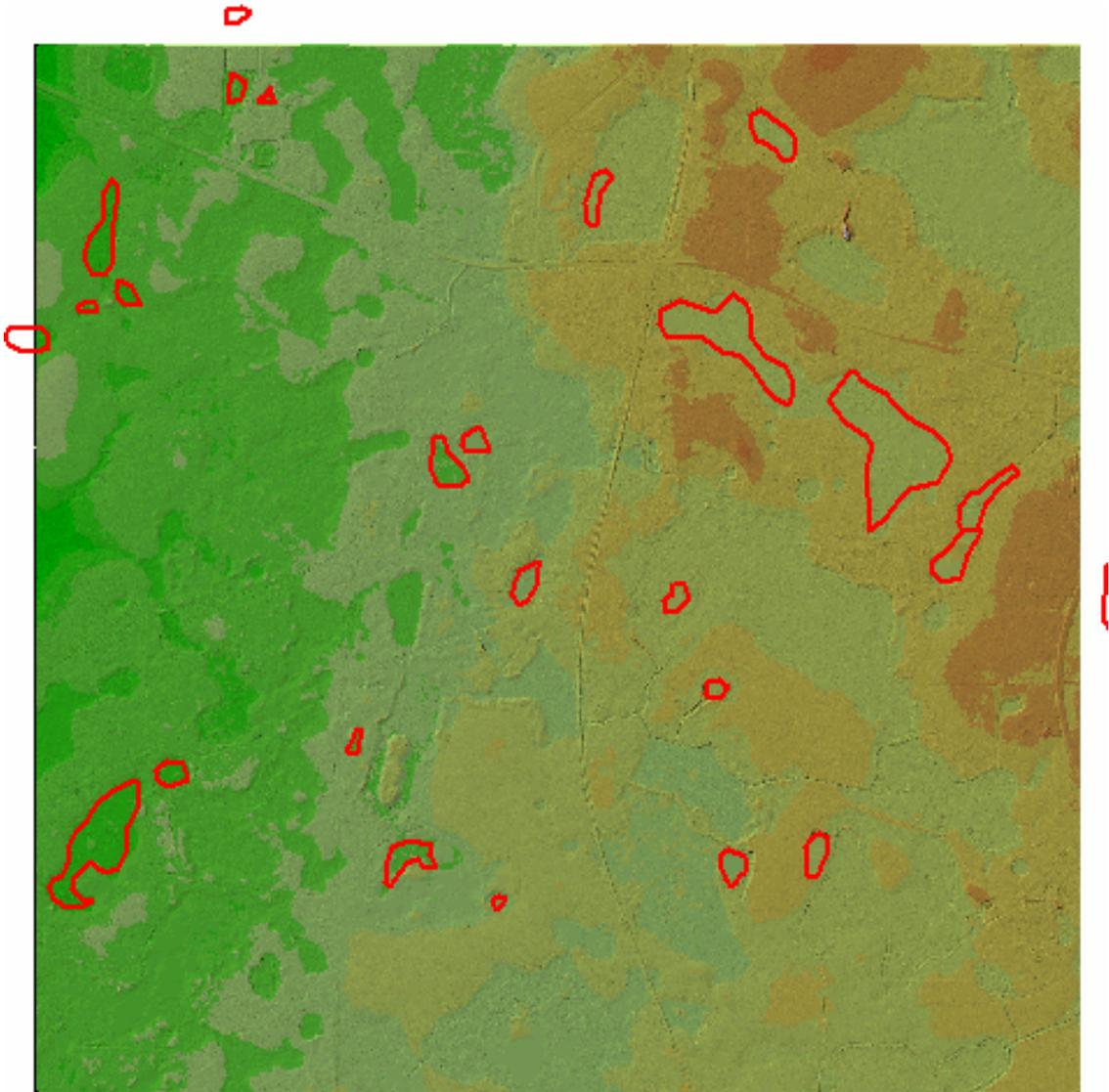
Tile: J_000005- Water points not vaporized and flightline step.



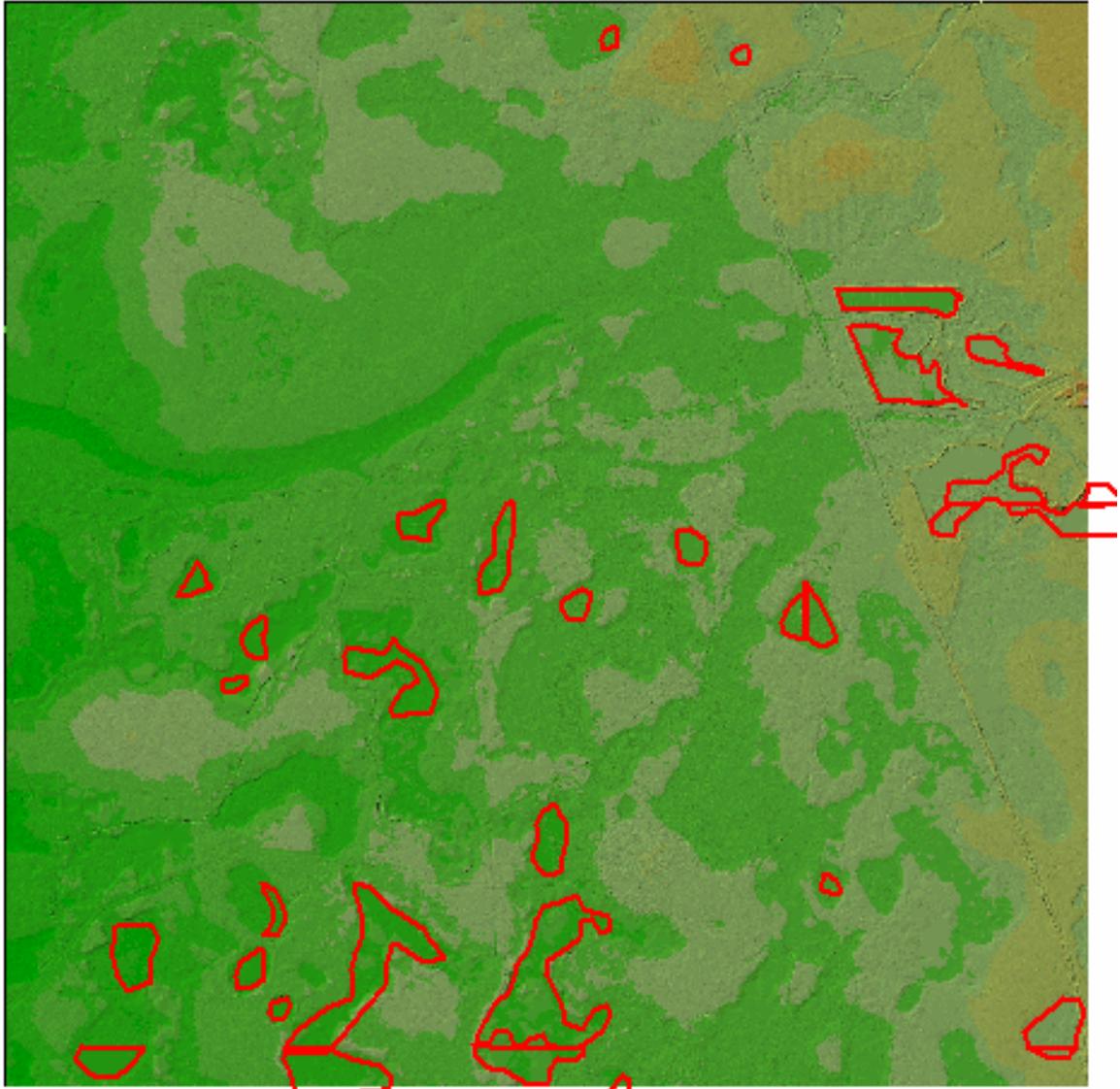
Tile: J_000006- Water points not vaporized



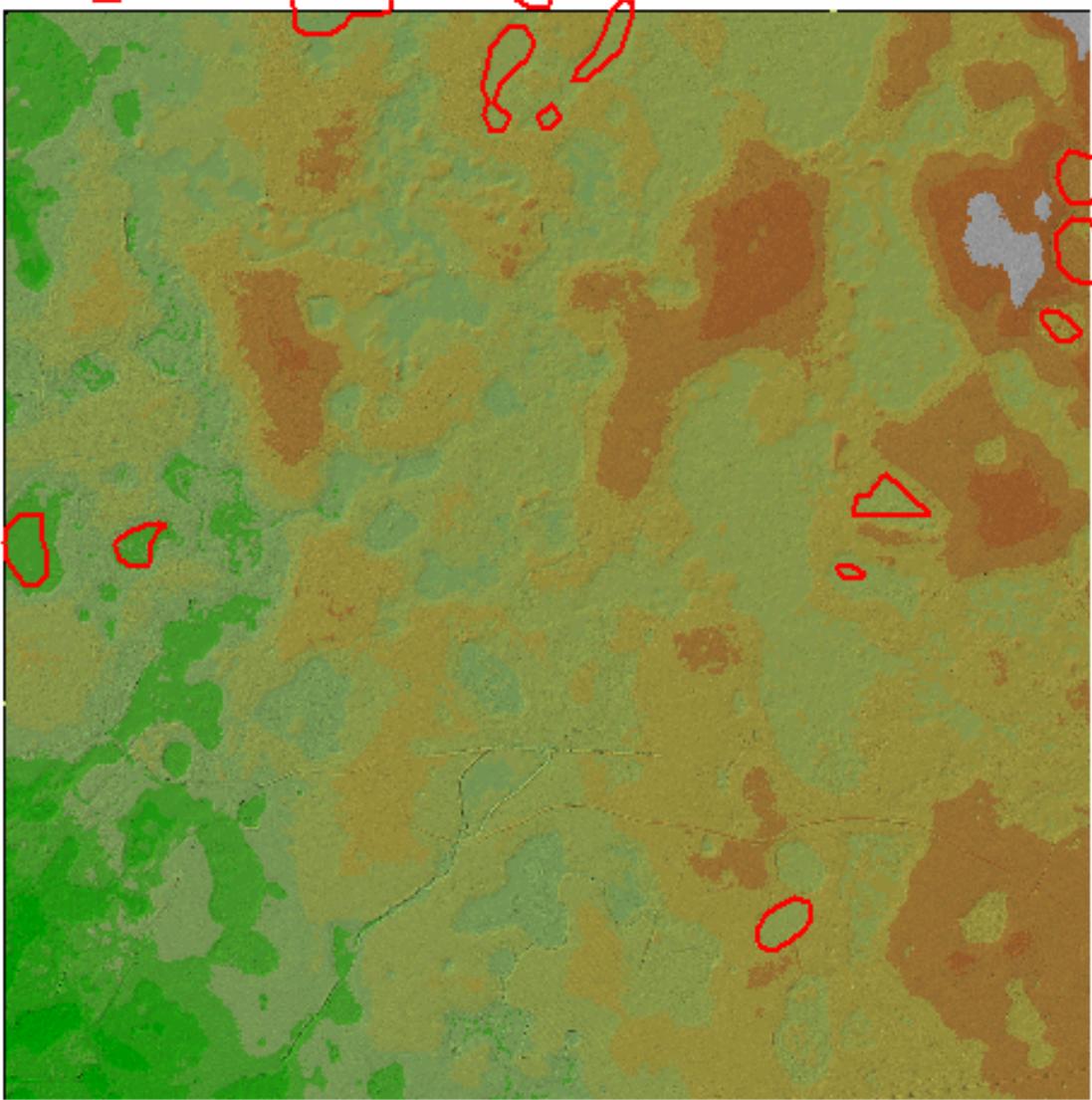
Tile: J_000007- Water points not vaporized



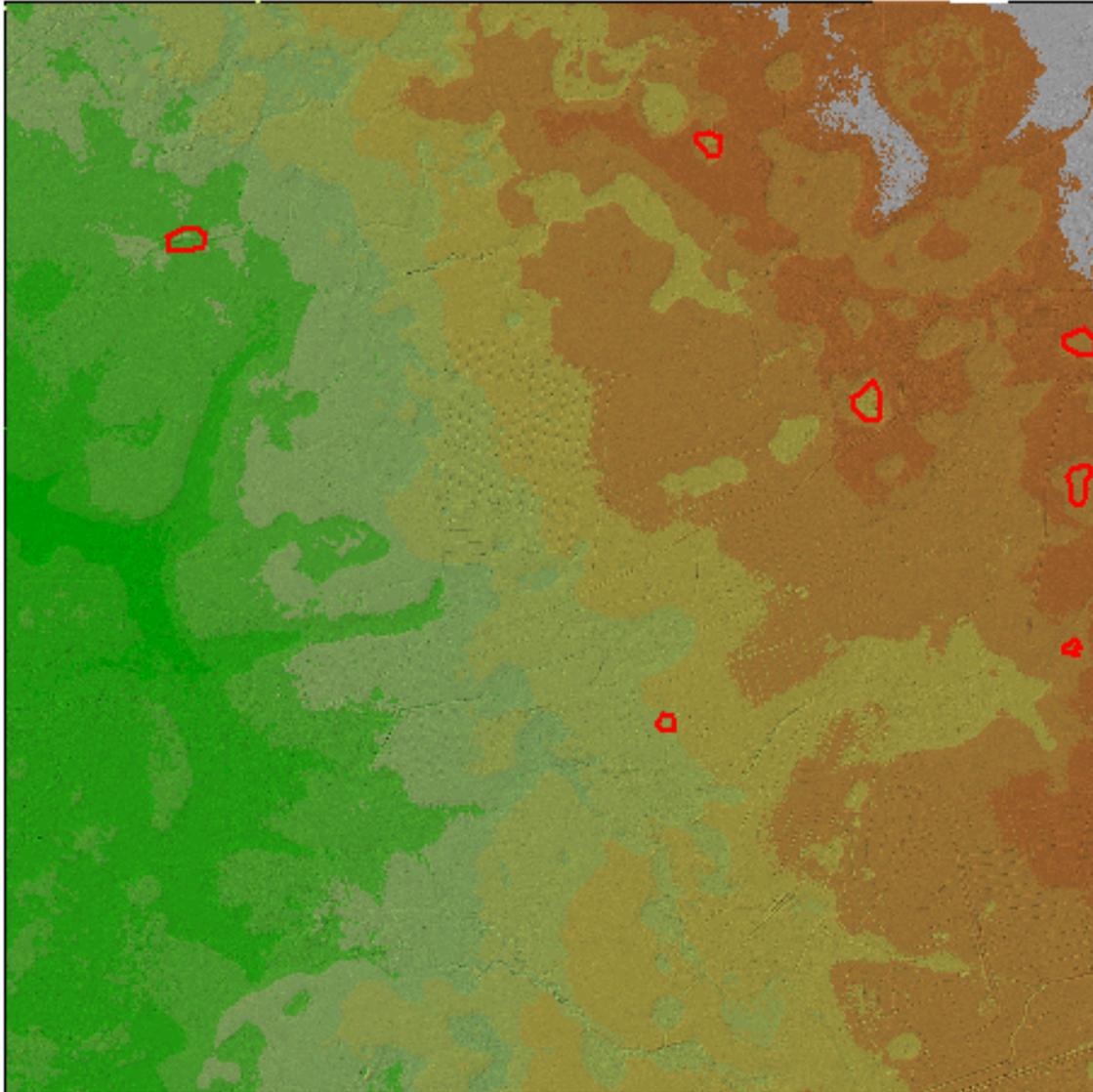
Tile: J_000008- Water points not vaporized



Tile: J_000009- Water points not vaporized



Tile: J_000010- Water points not vaporized



Tile: J_000011- Water points not vaporized



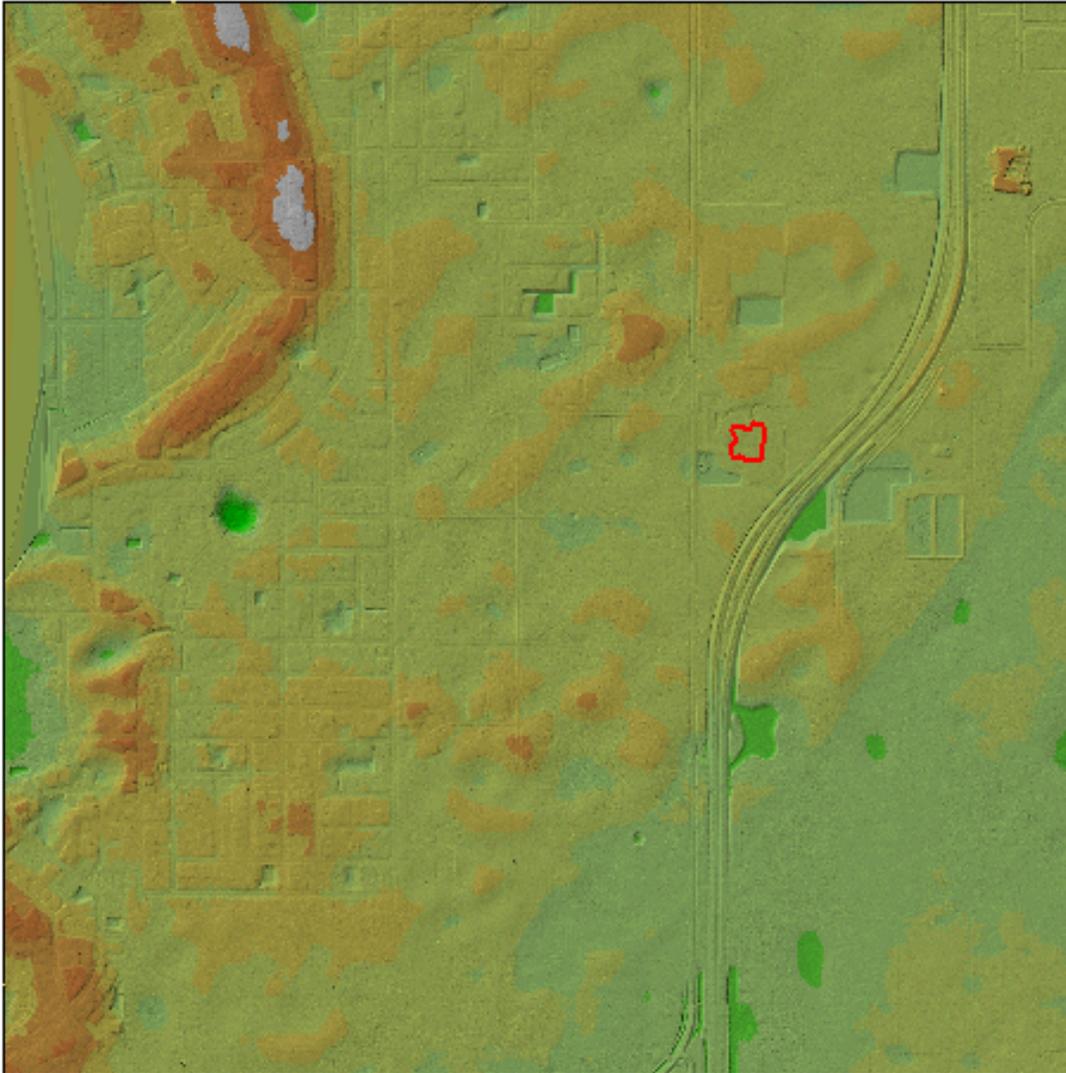
Tile: J_000012- Water points not vaporized



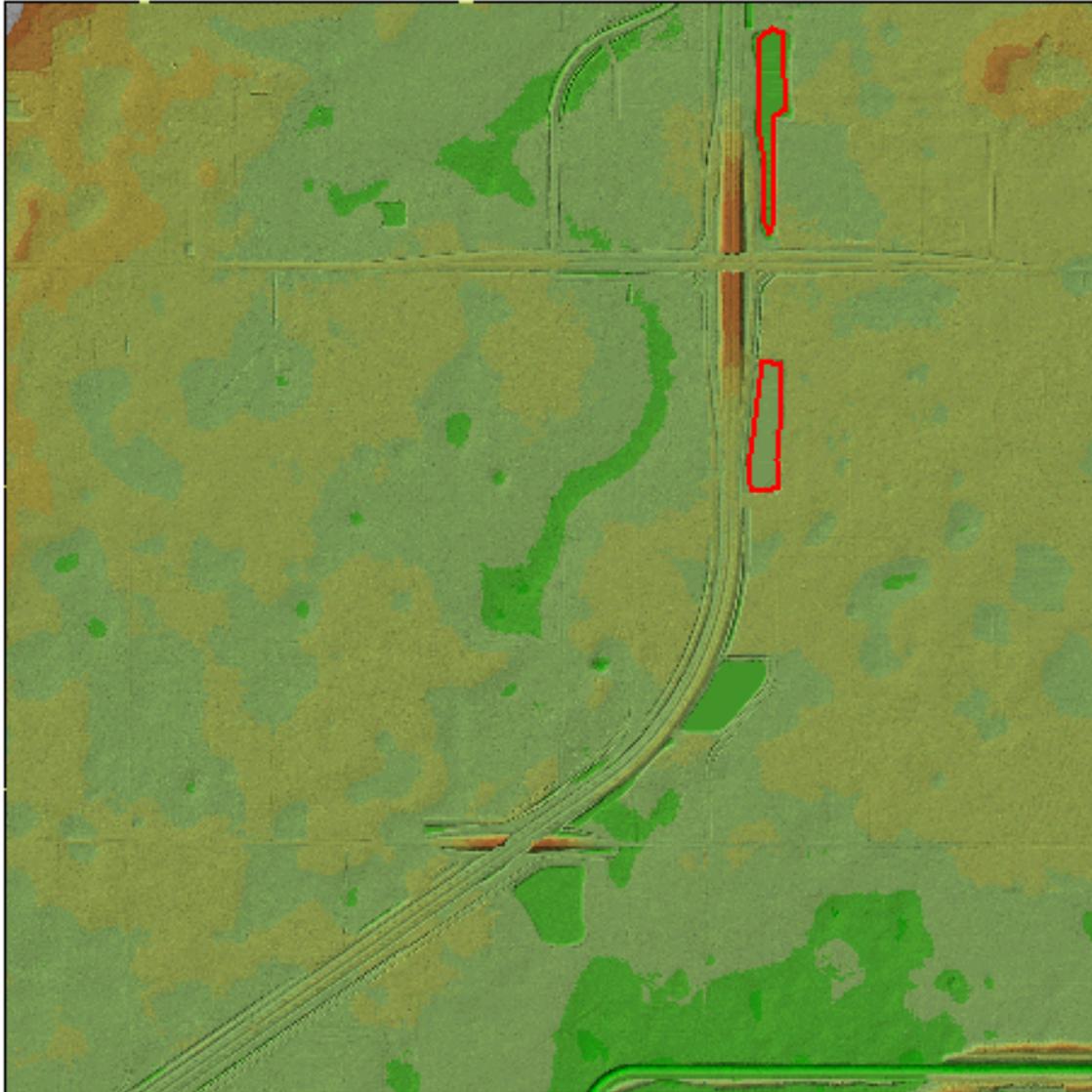
Tile: K_000001- Water points not vaporized



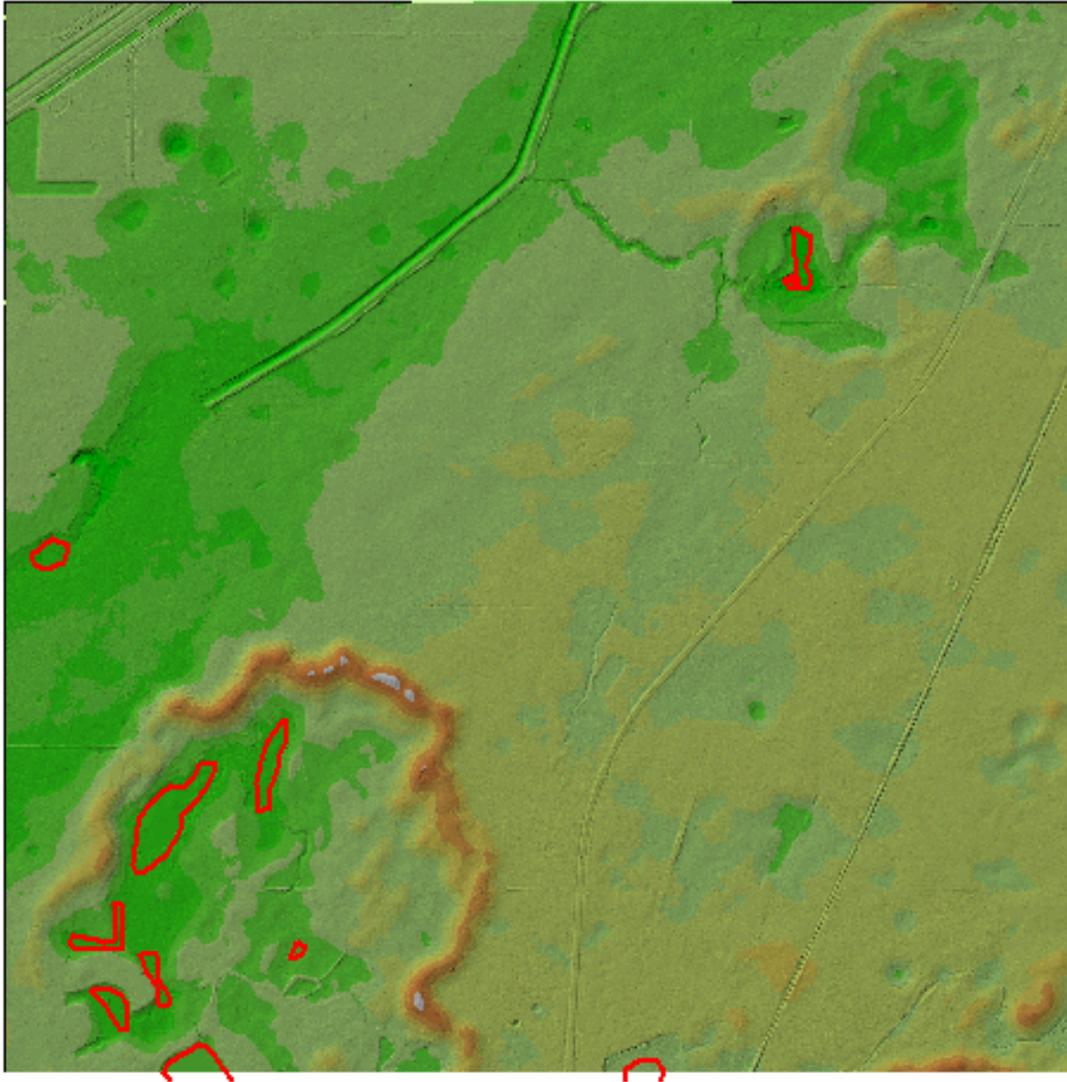
Tile: K_000002- Water points not vaporized



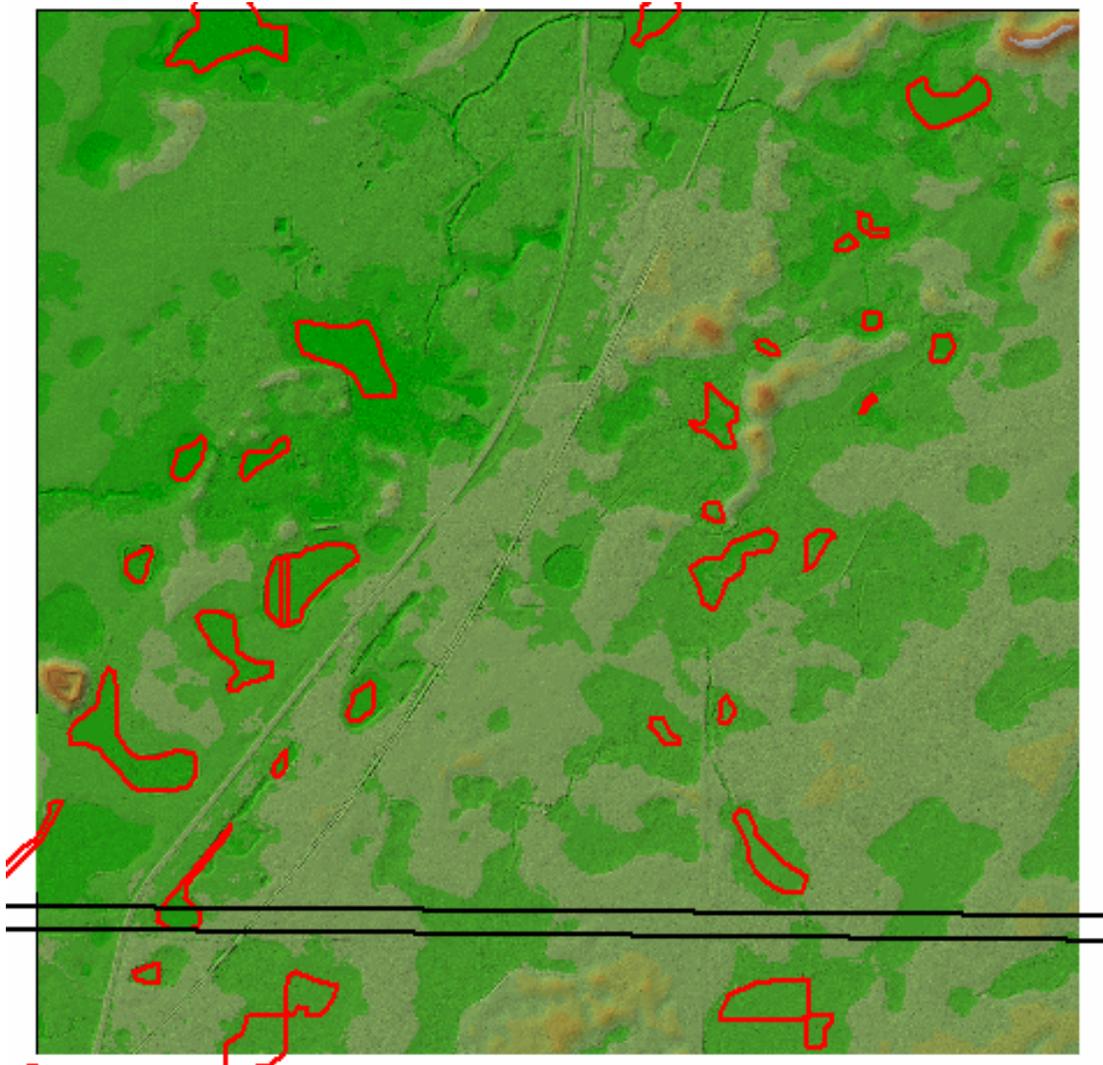
Tile: K_000003- Water points not vaporized



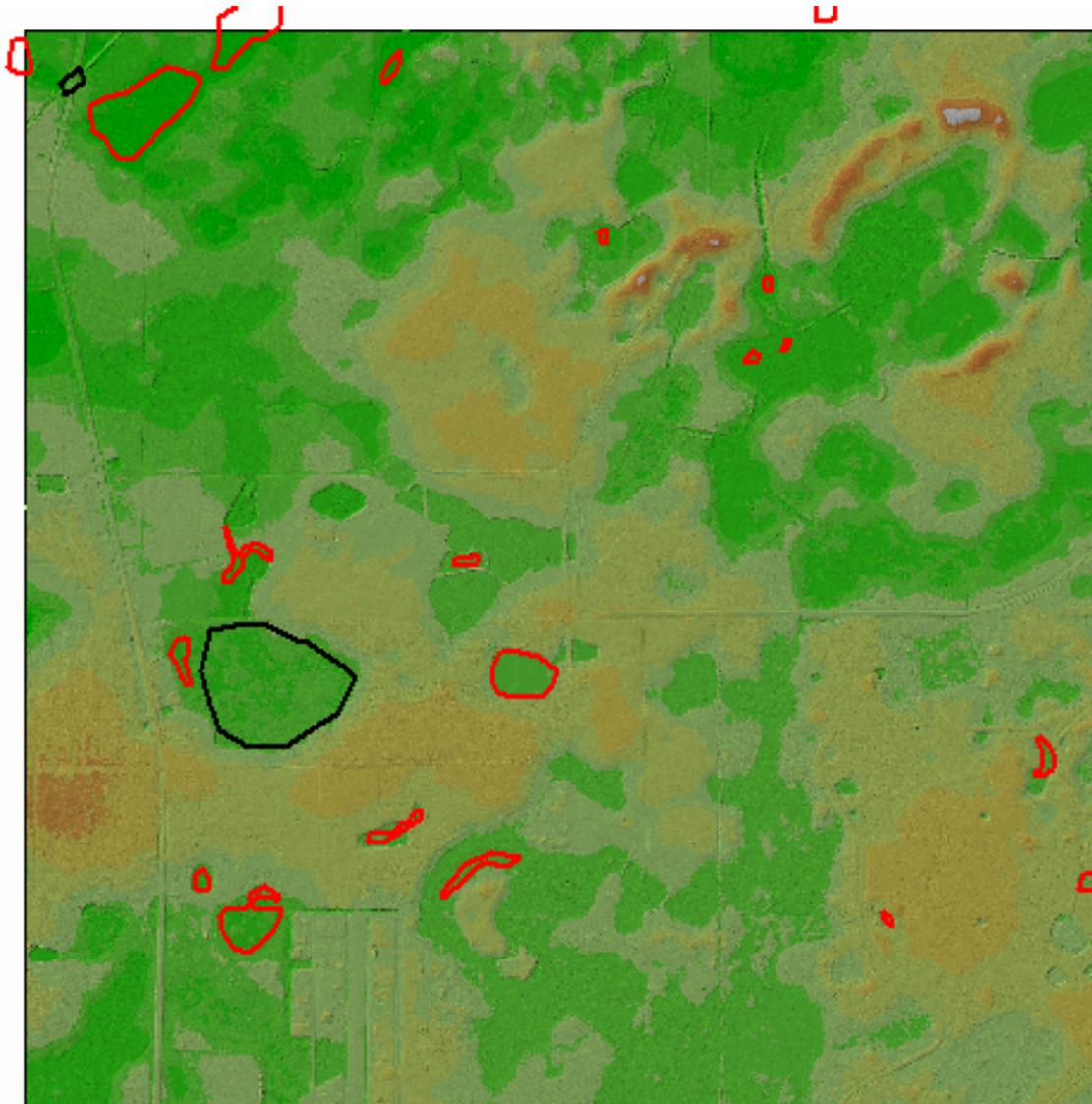
Tile: K_000004- Water points not vaporized



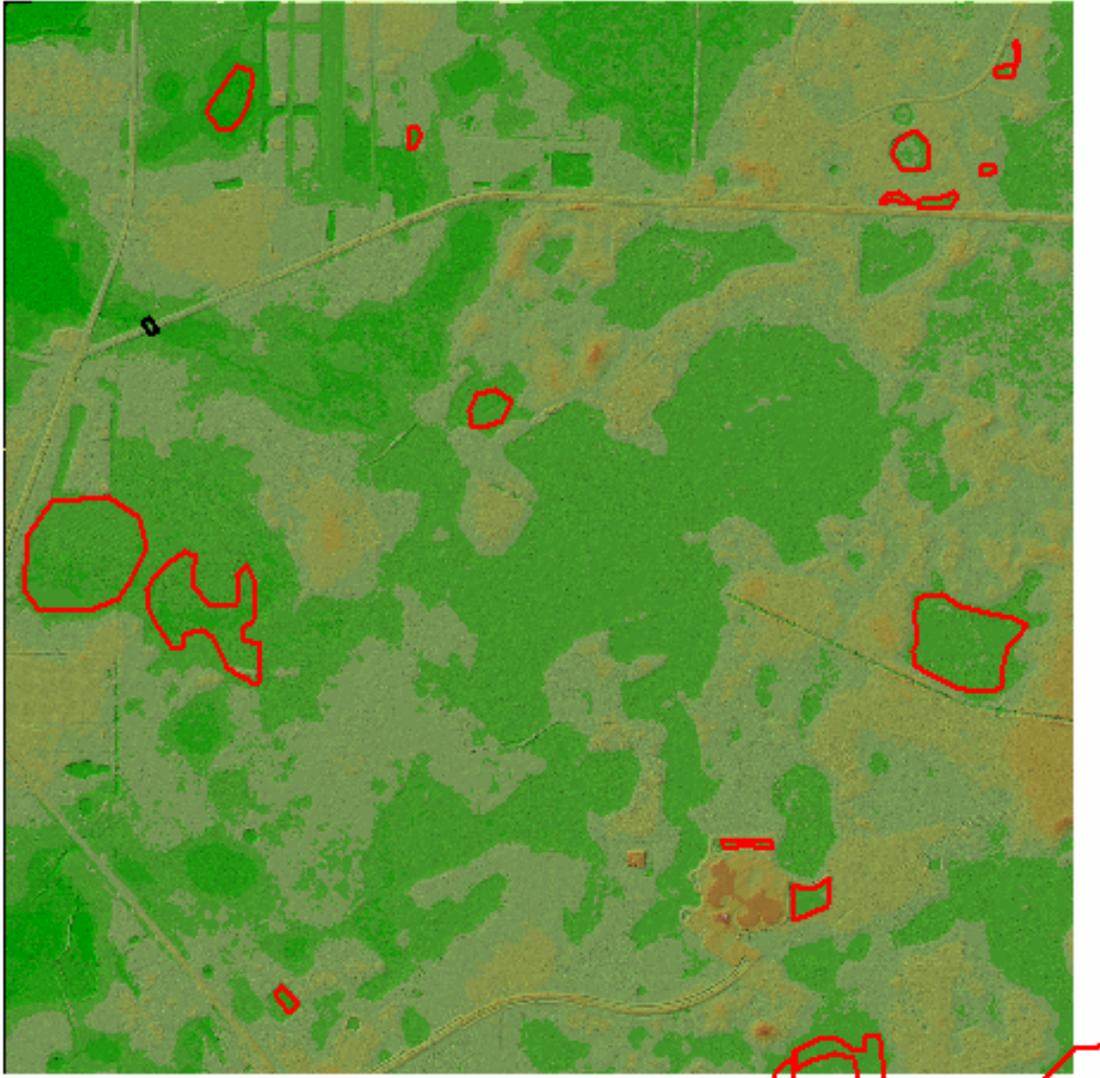
Tile: K_000005- Water points not vaporized and flightline step.



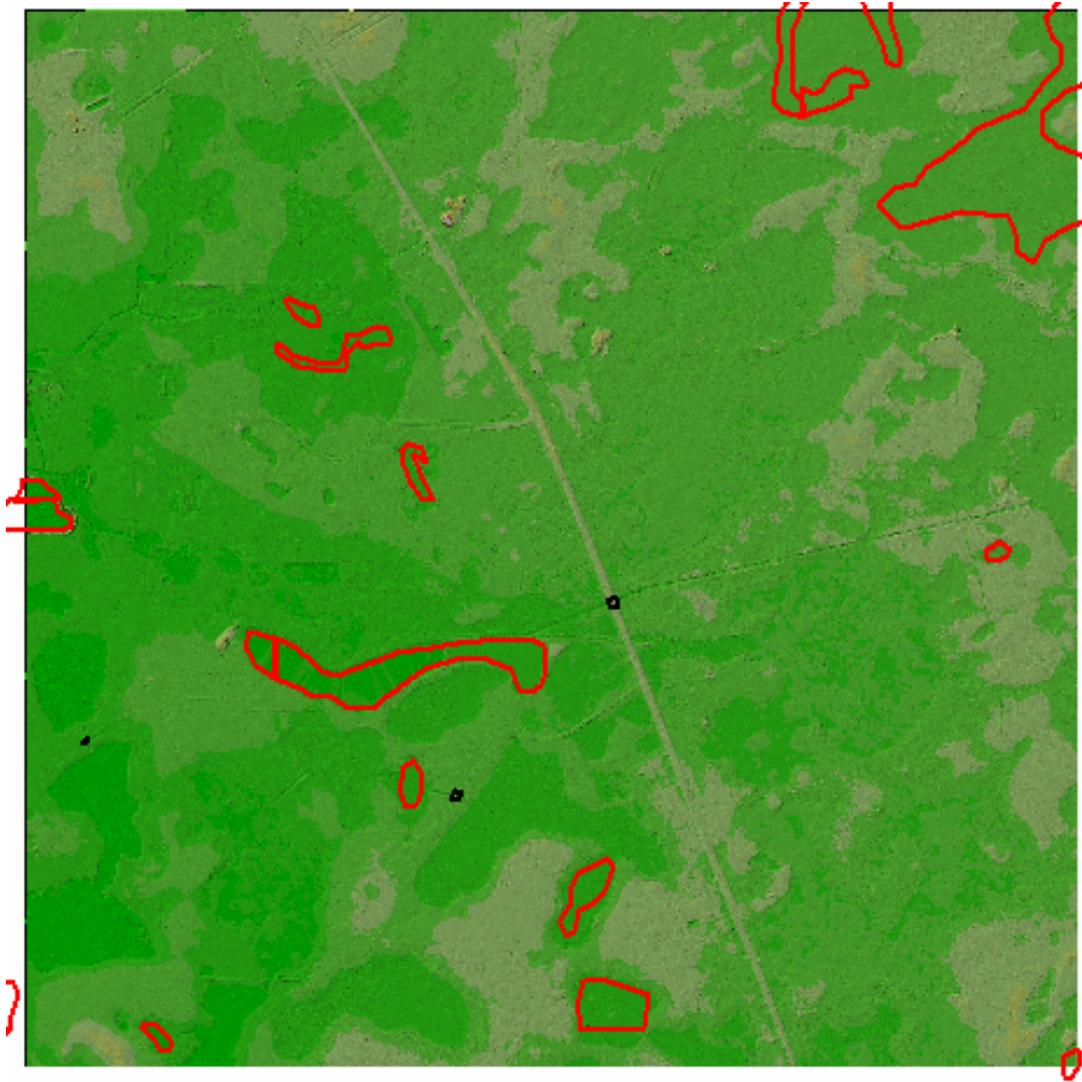
Tile: K_000006- Water points not vaporized, bridge, aggressive editing.



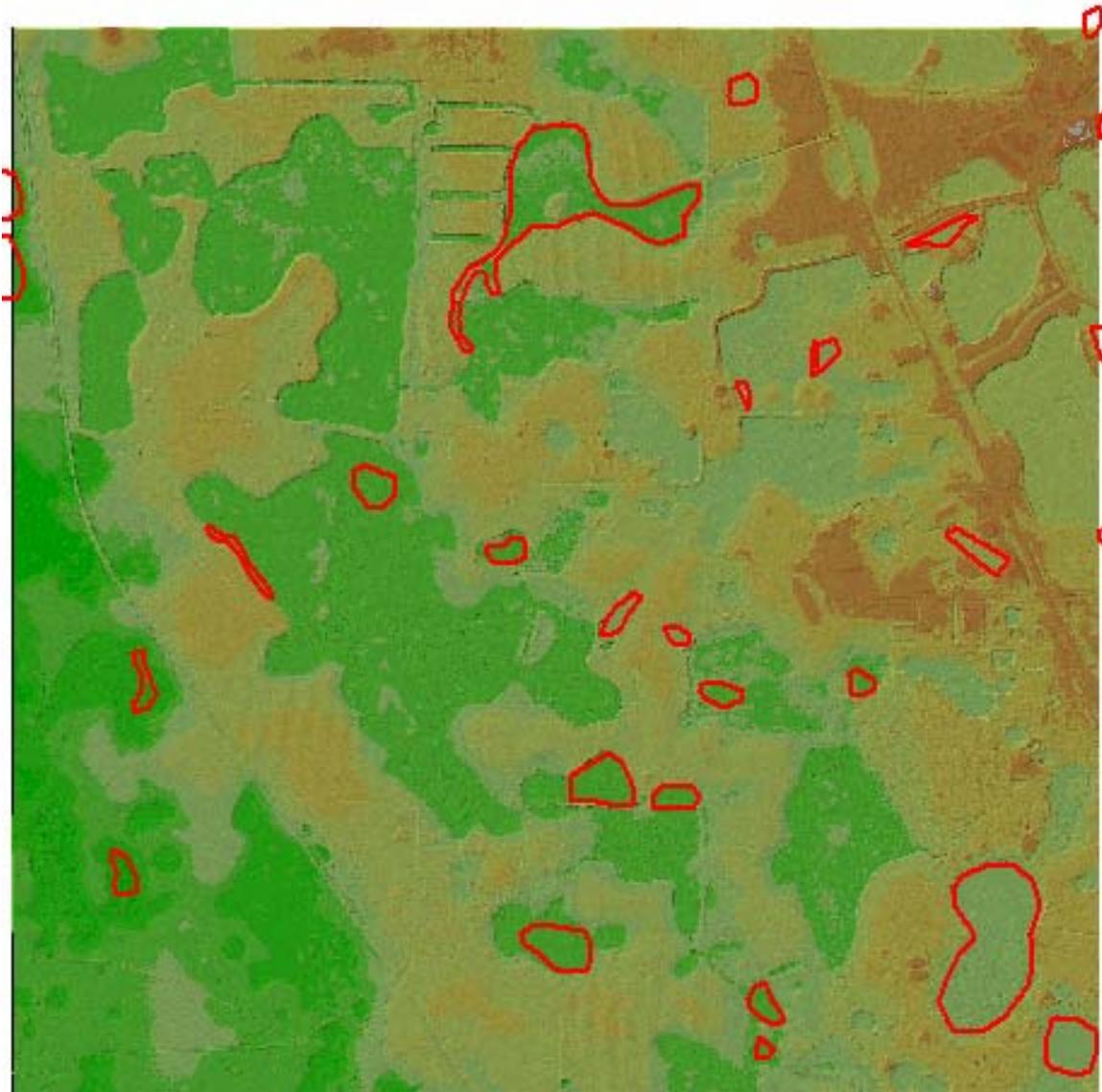
Tile: K_000007- Water points not vaporized



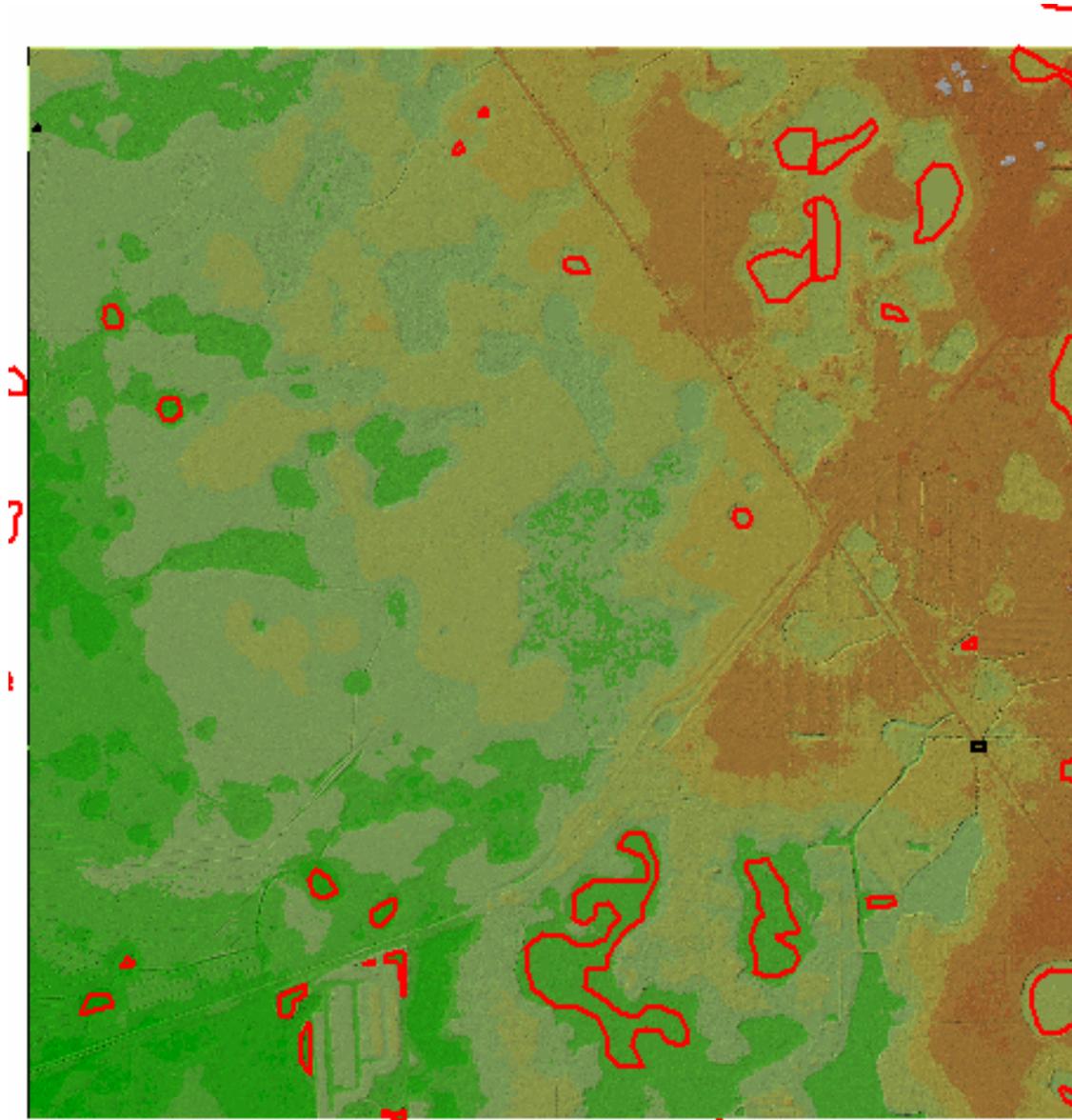
Tile: K_000008- Water points not vaporized



Tile: K_000009- Water points not vaporized



Tile: K_000010- Water points not vaporized and bridge.



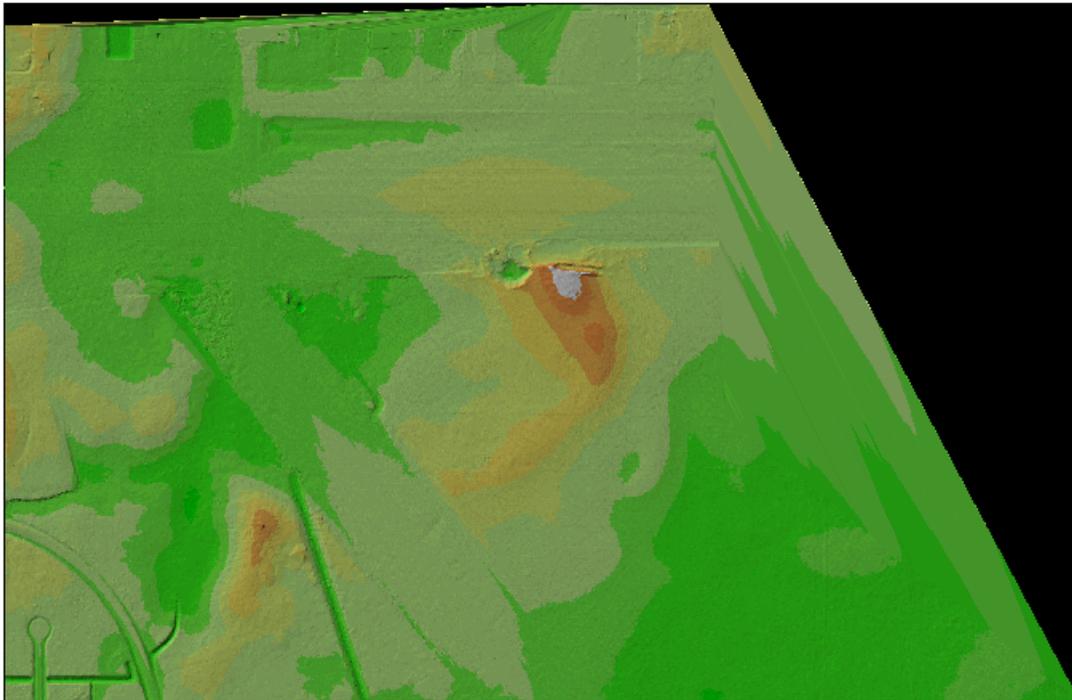
Tile: K_000011- Water points not vaporized



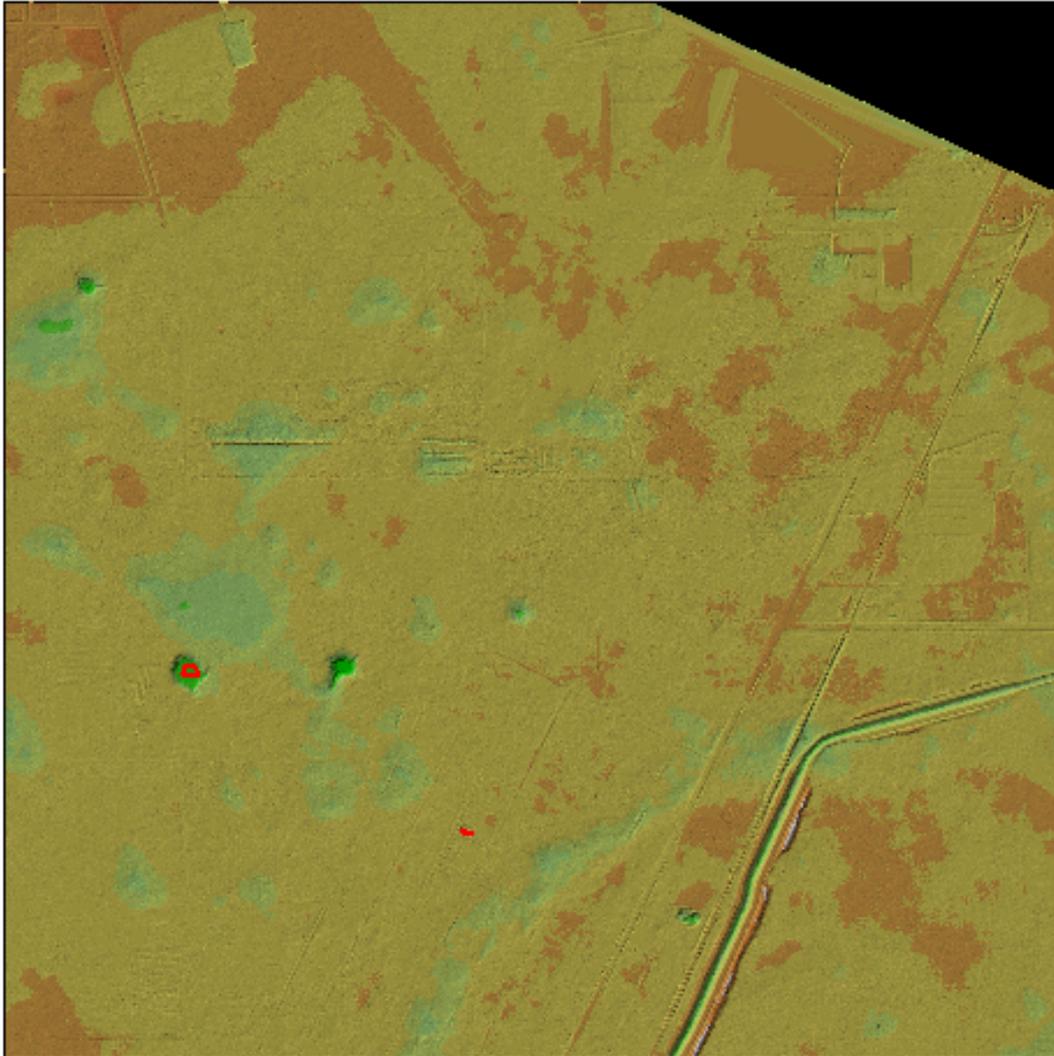
Tile: K_000012- Water points not vaporized



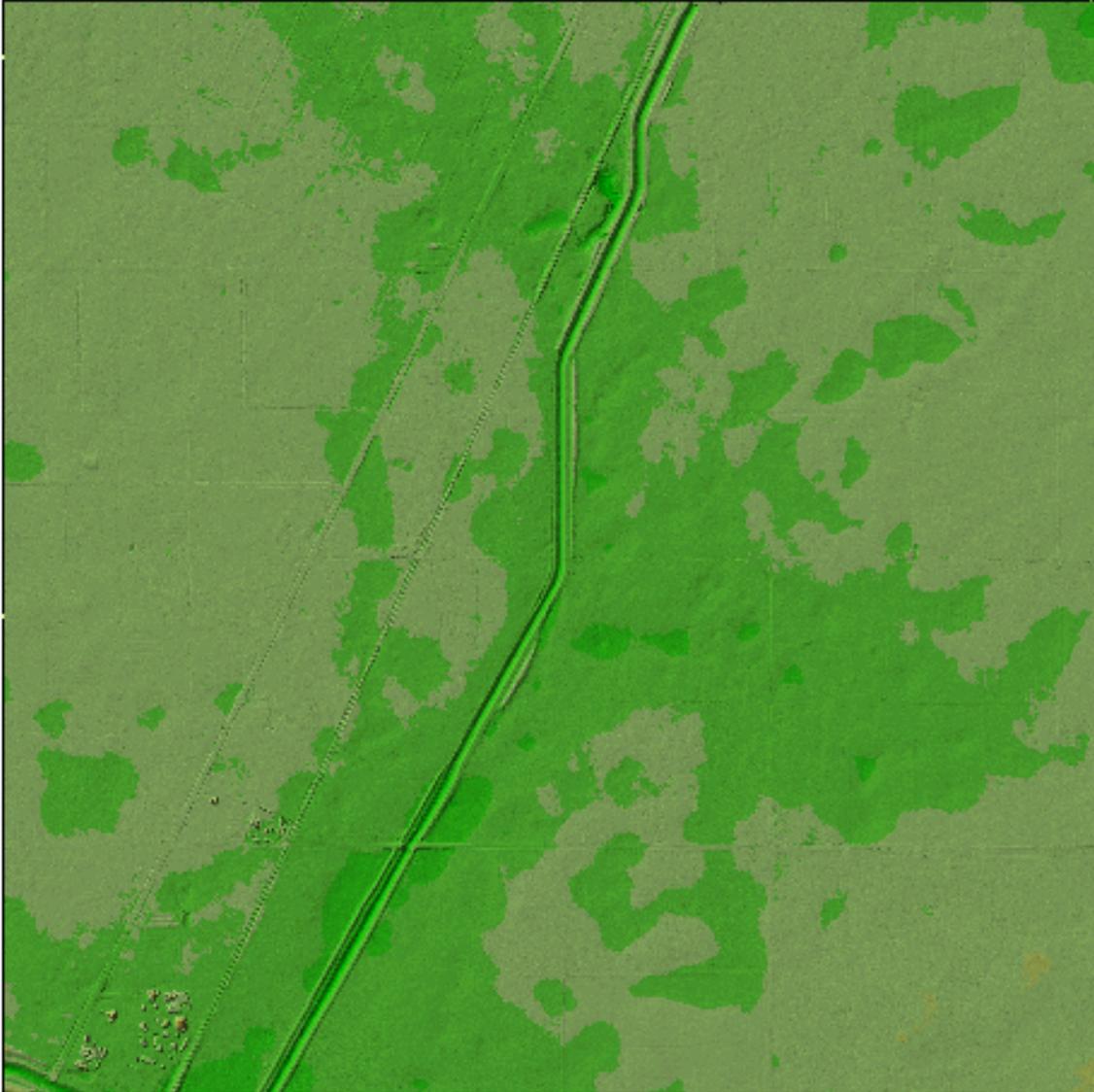
Tile: L_000001- Water points not vaporized



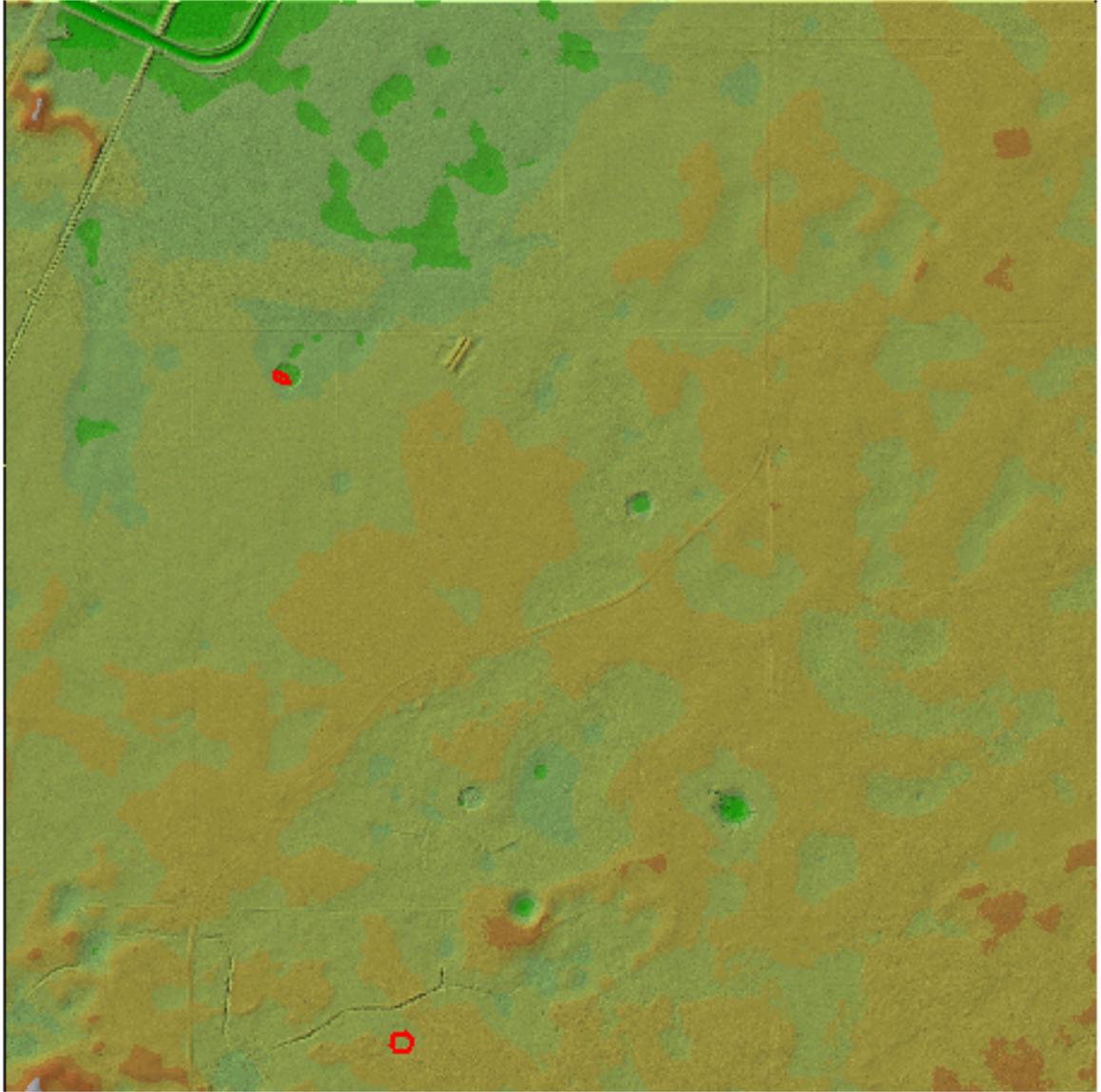
Tile: L_000002- Water points not vaporized



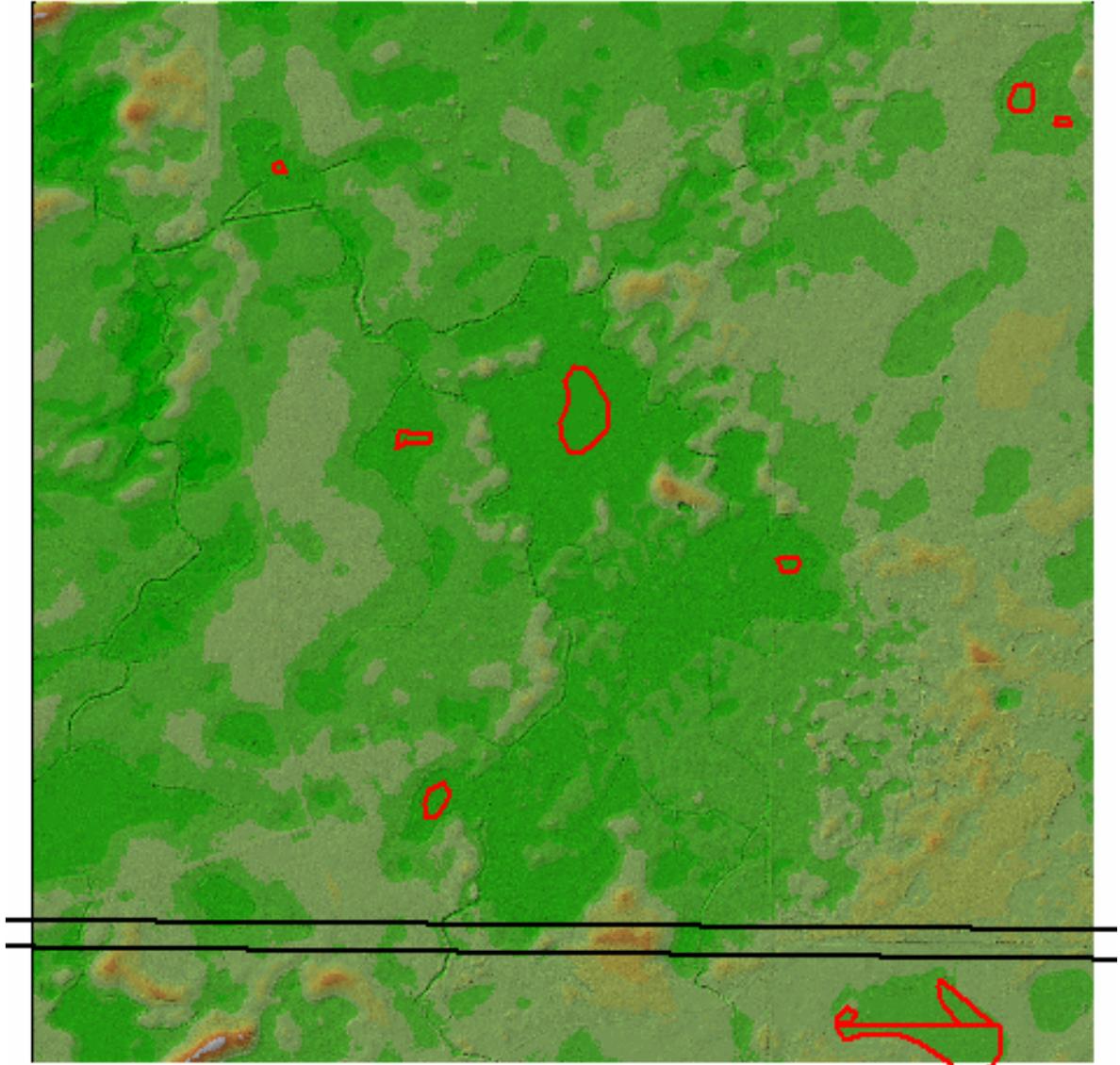
Tile: L_000003- Water points not vaporized



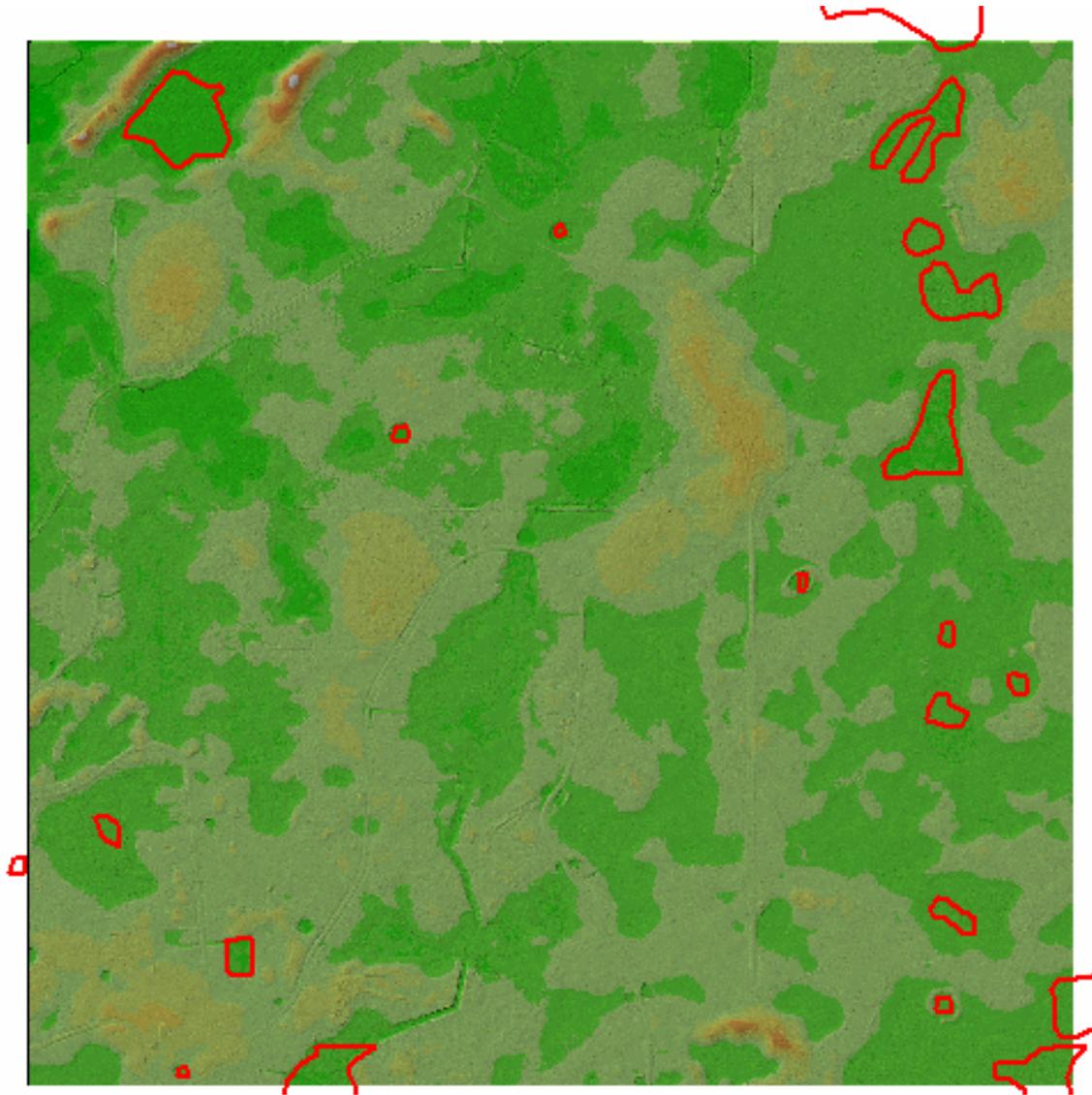
Tile: L_000004- Water points not vaporized



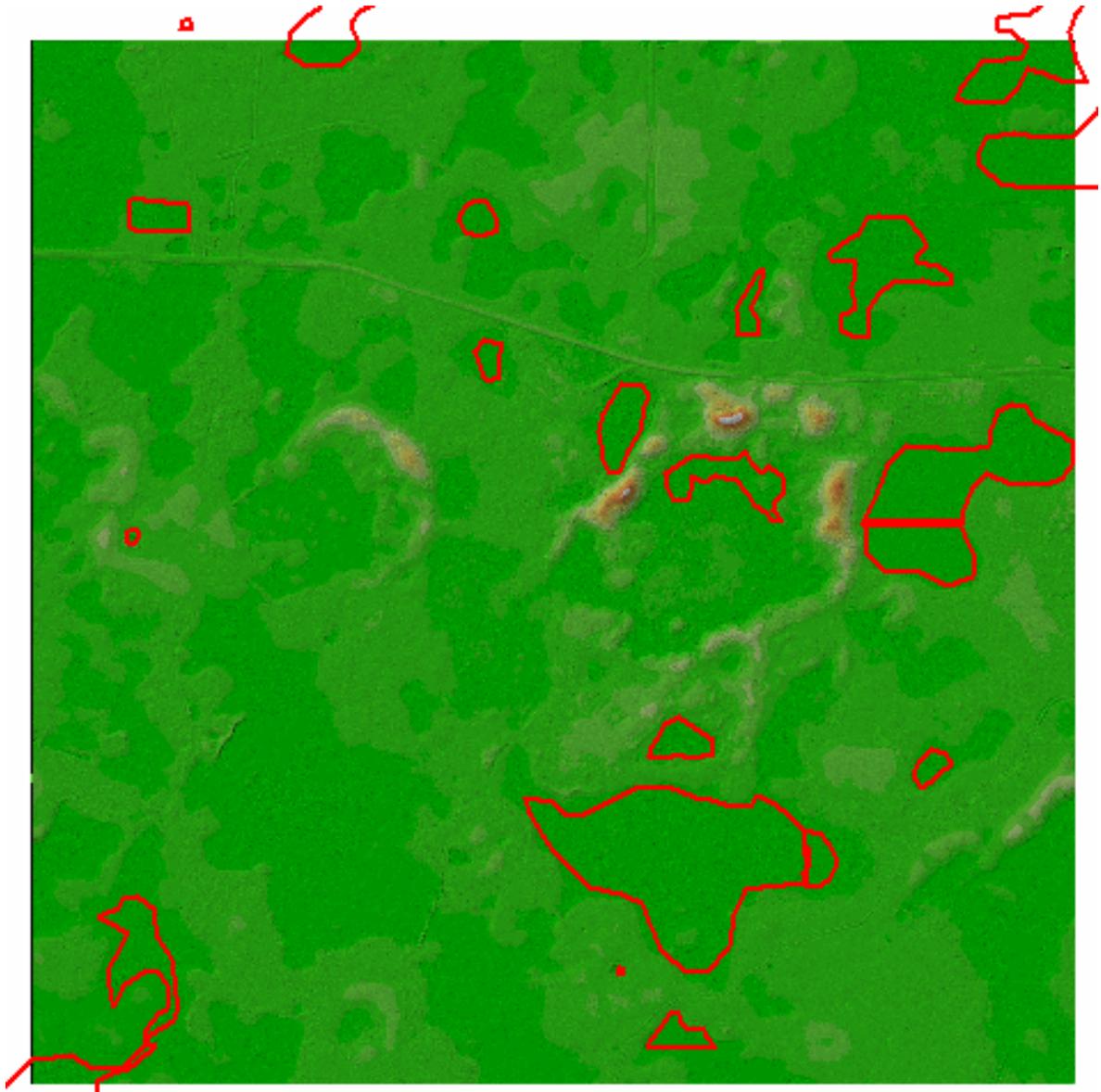
Tile: L_000005- Water points not vaporized and flightline step.



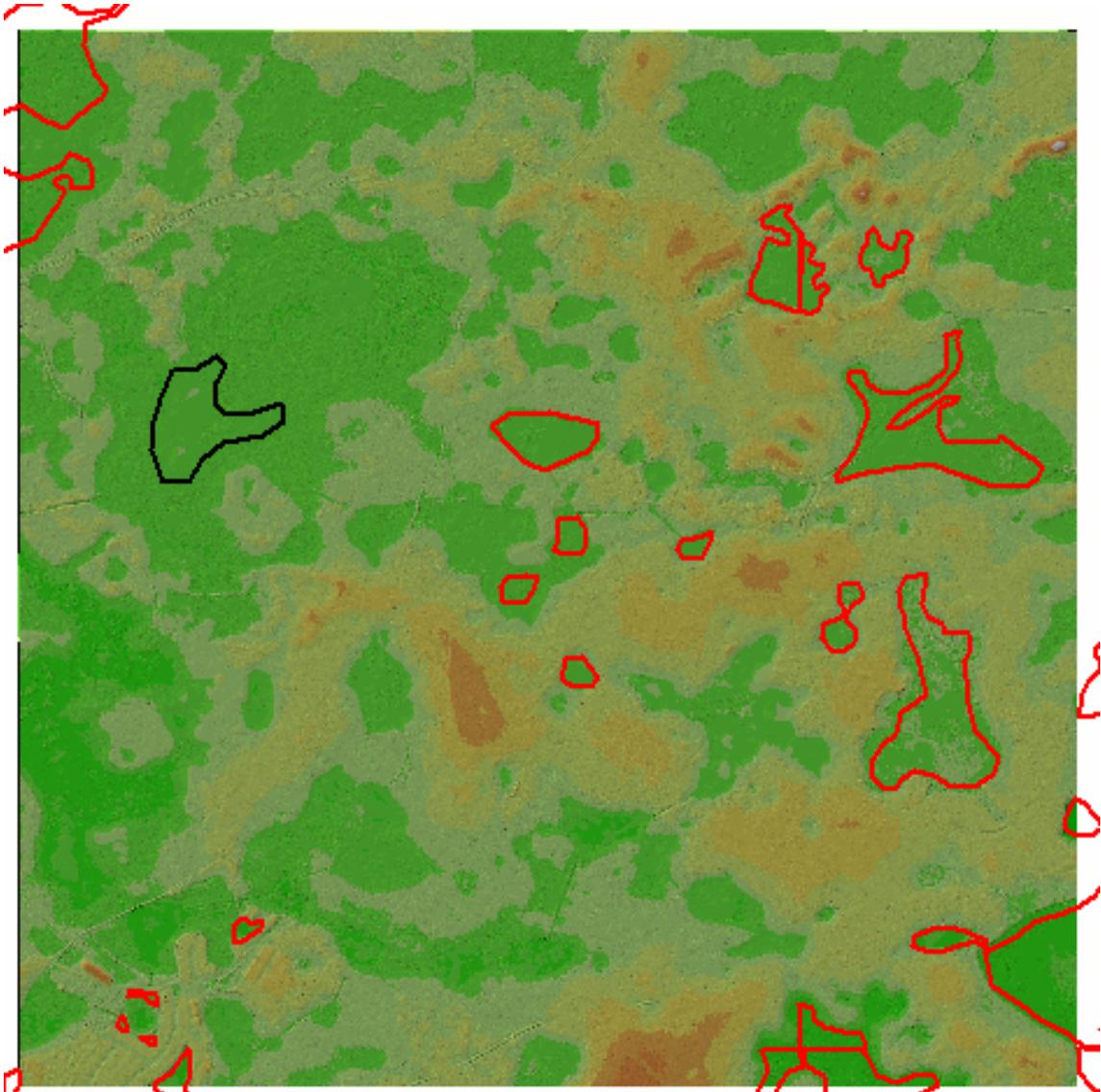
Tile: L_000006- Water points not vaporized



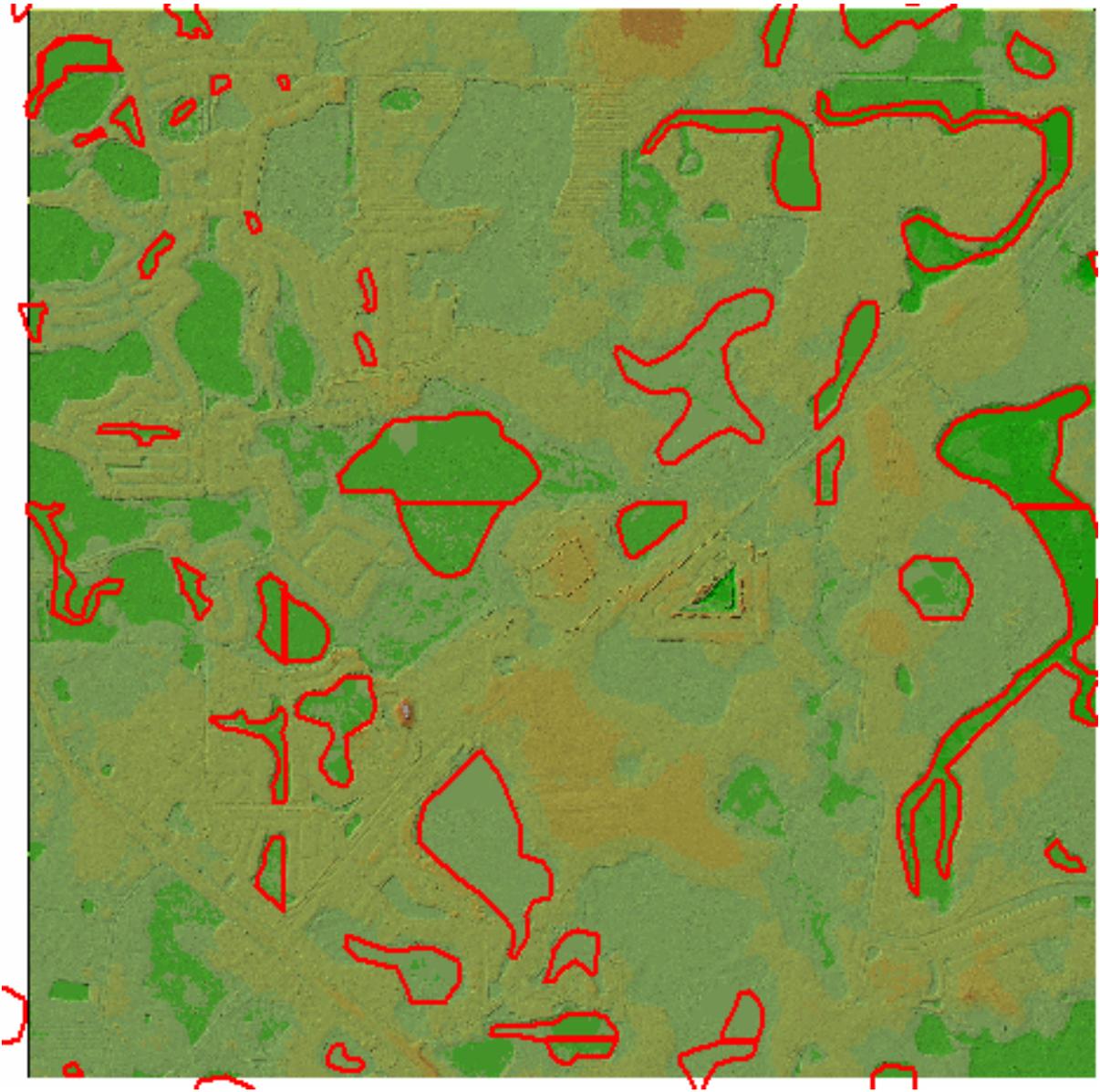
Tile: L_000007- Water points not vaporized



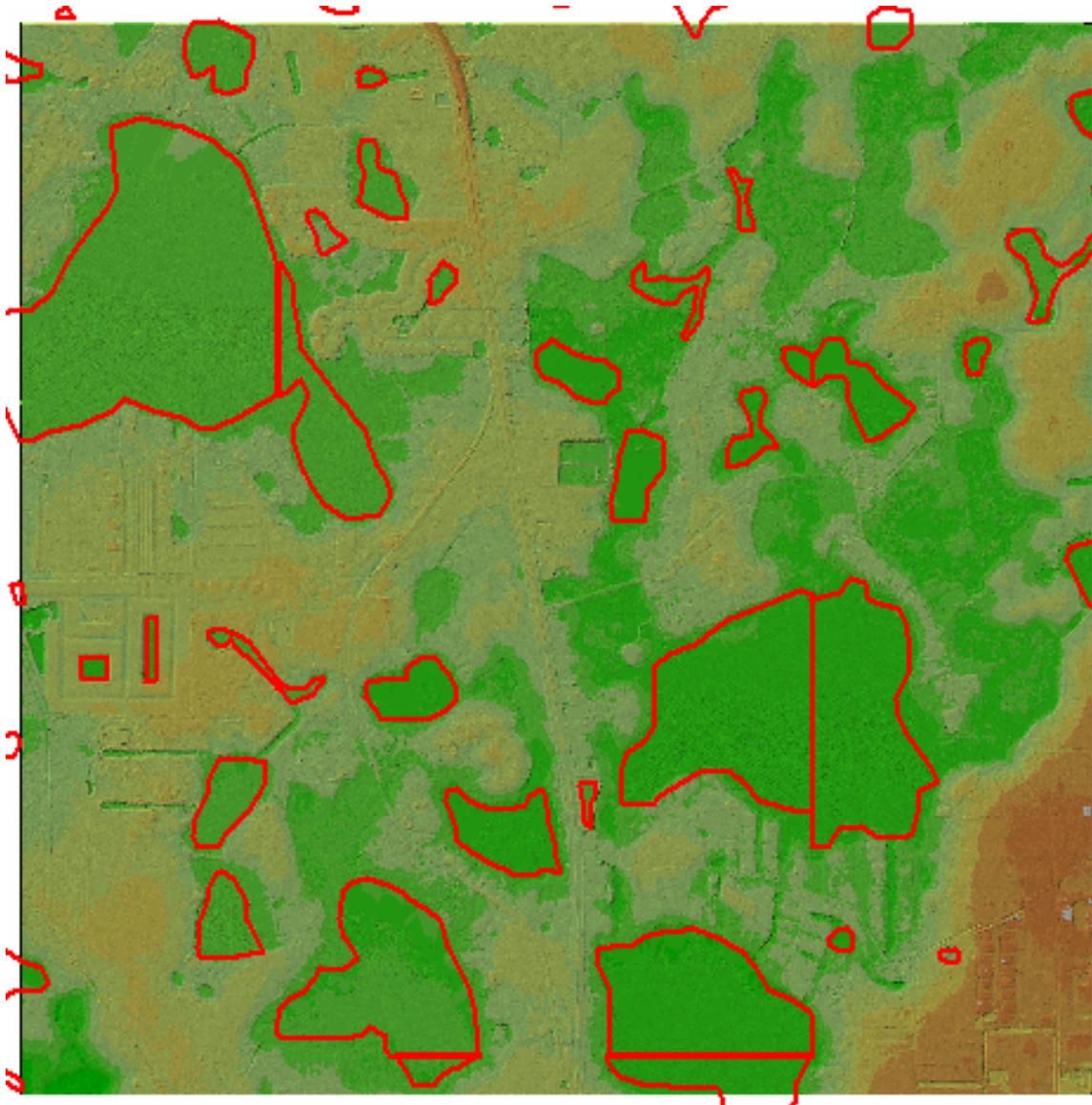
Tile: L_000008- Water points not vaporized



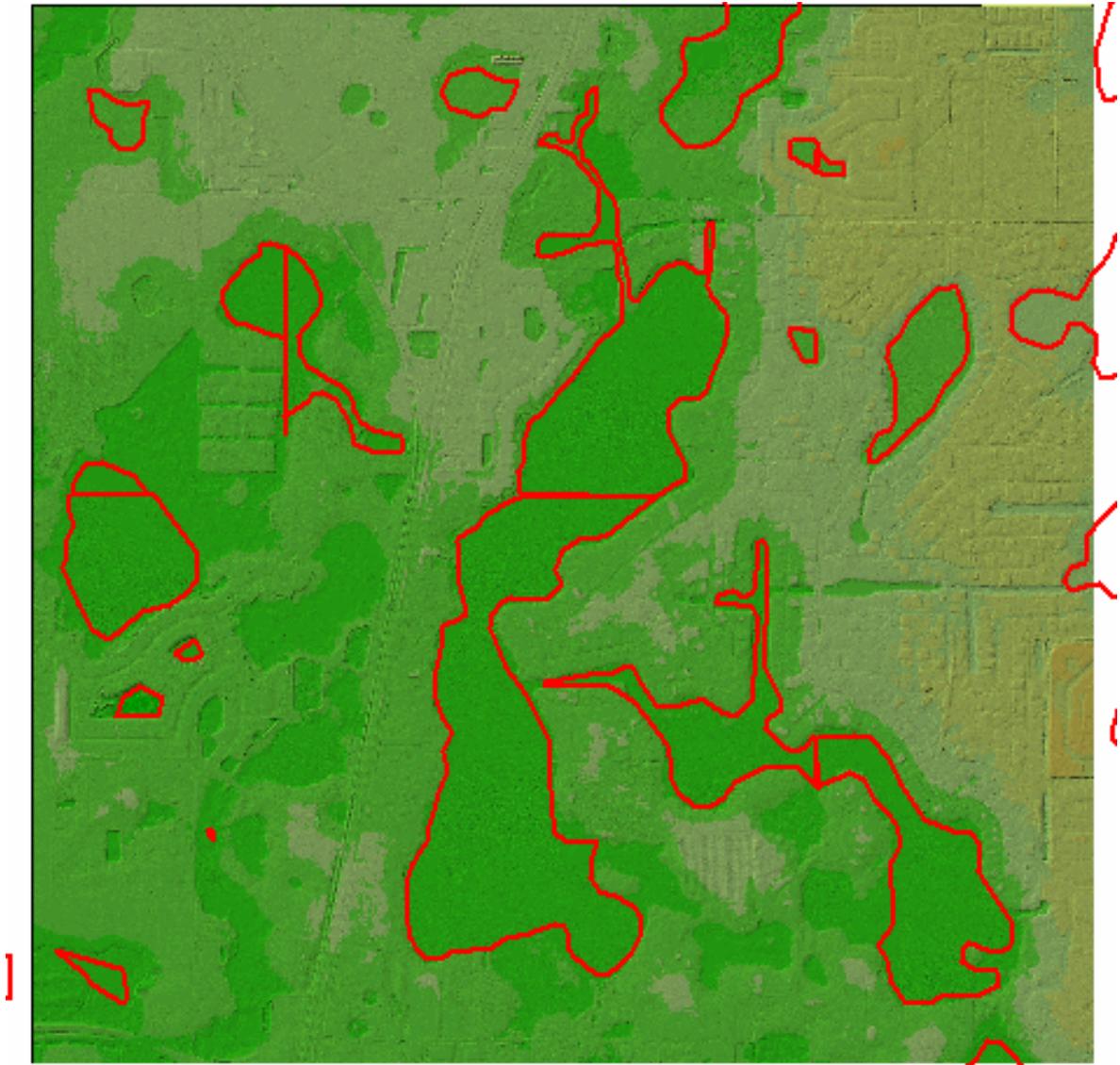
Tile: L_000009- Water points not vaporized



Tile: L_000010- Water points not vaporized



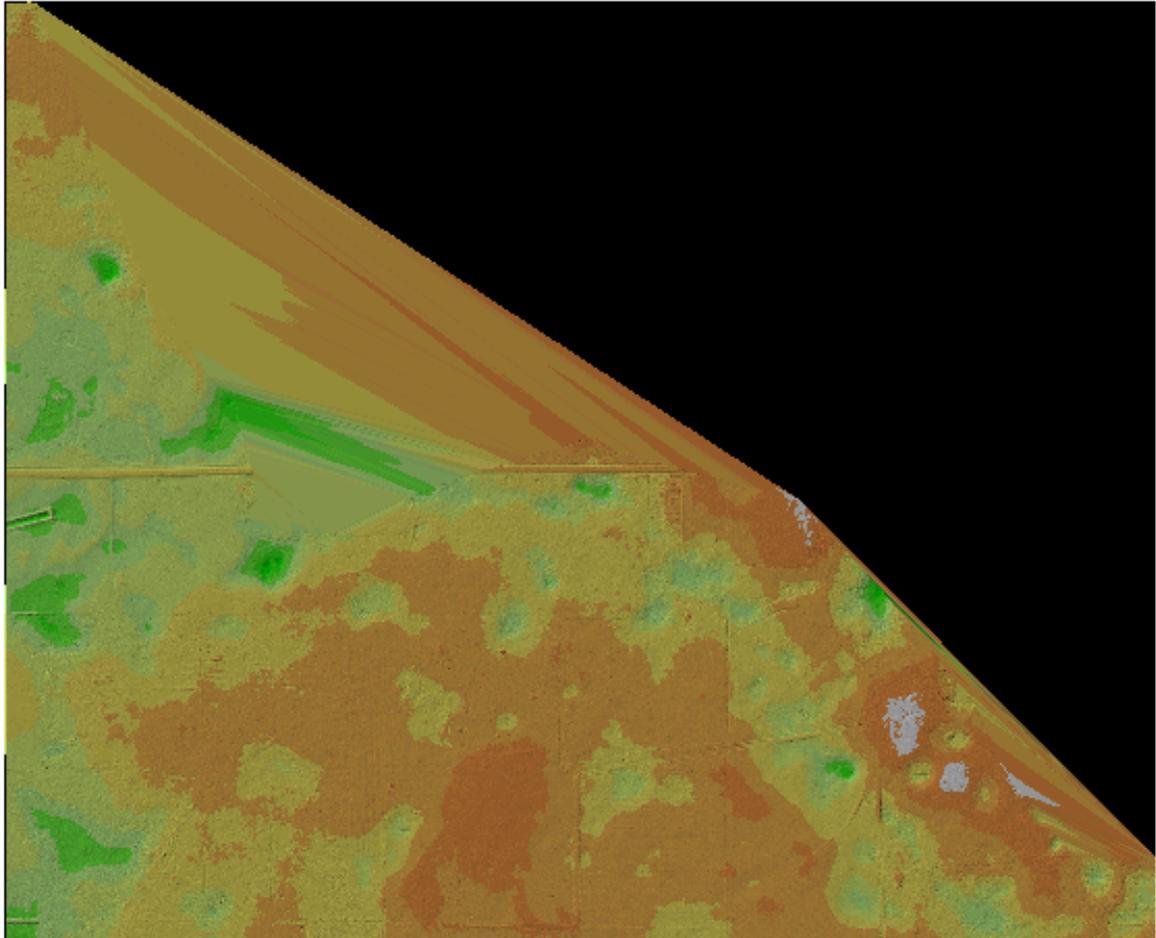
Tile: L_000011- Water points not vaporized



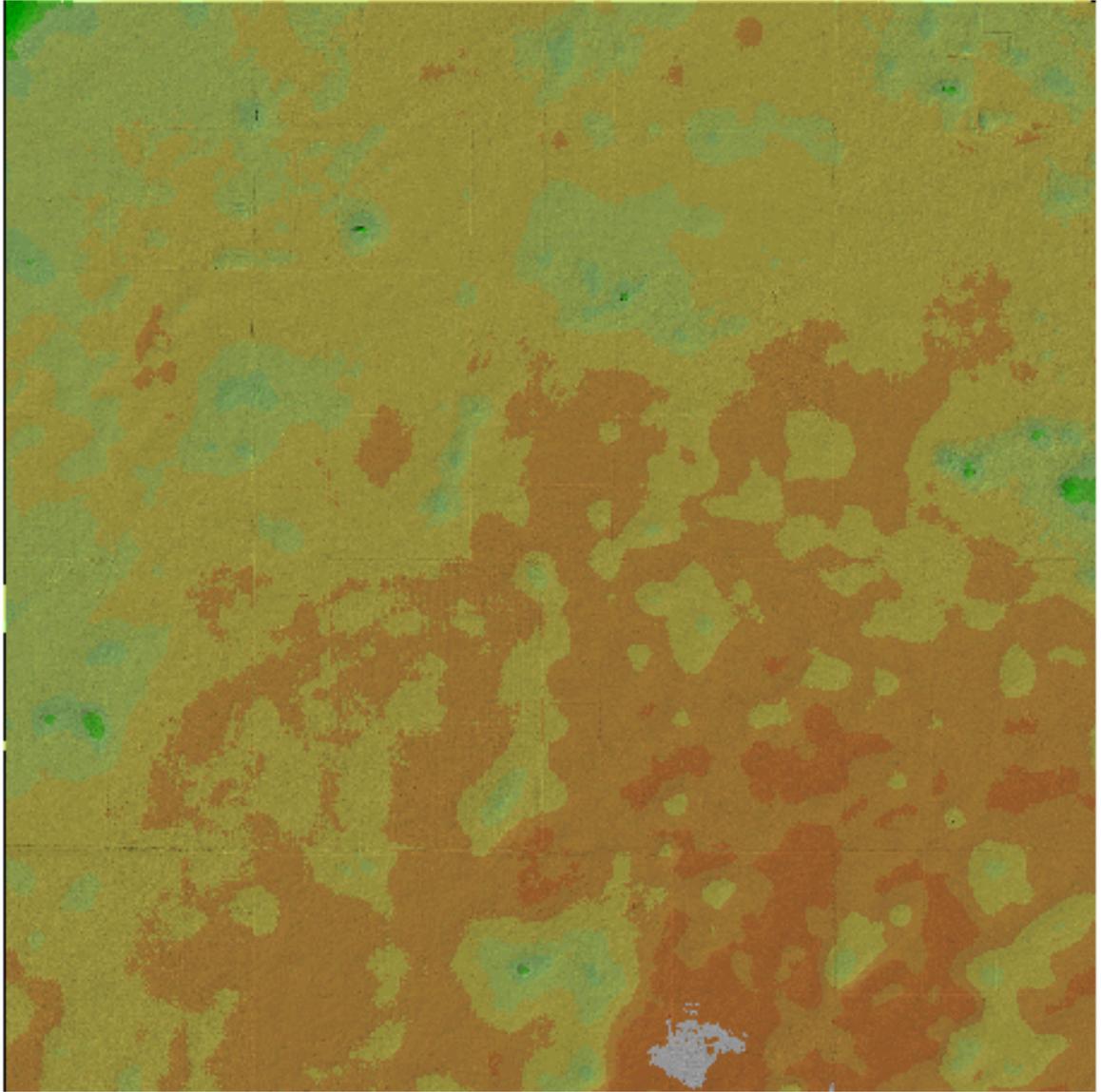
Tile: L_000012- Water points not vaporized



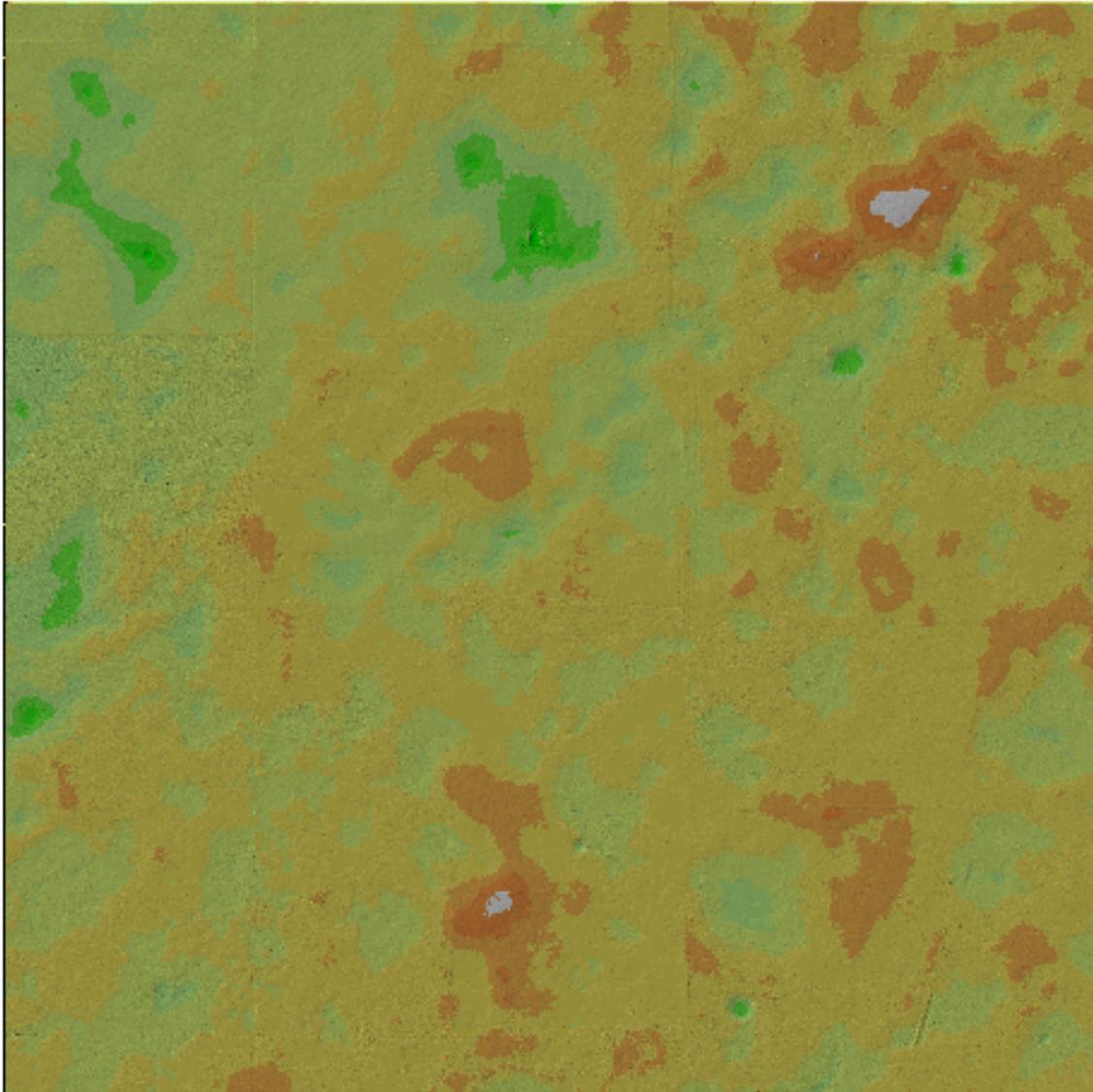
Tile: M_000002- Water points not vaporized



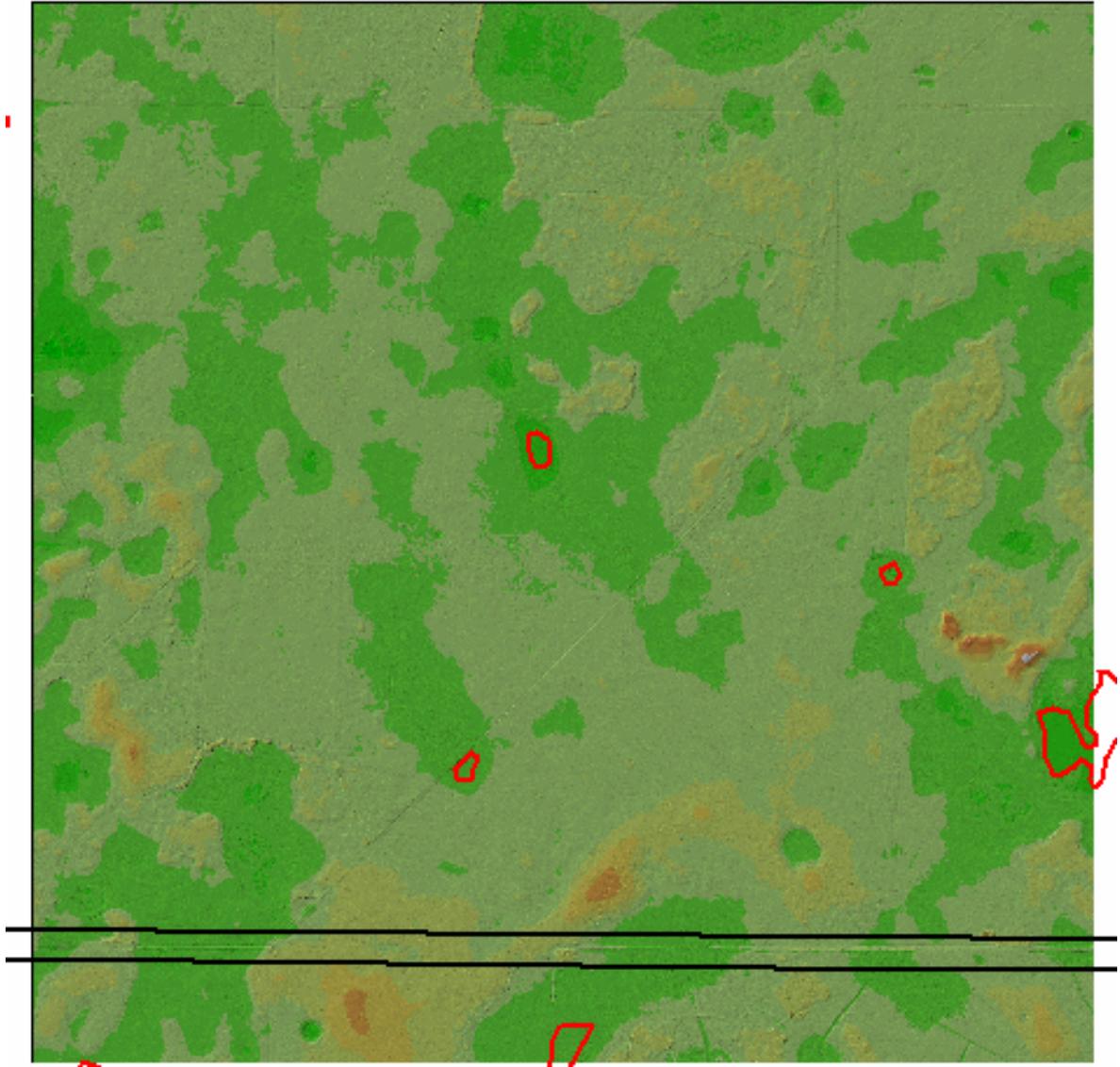
Tile: M_000003- Water points not vaporized



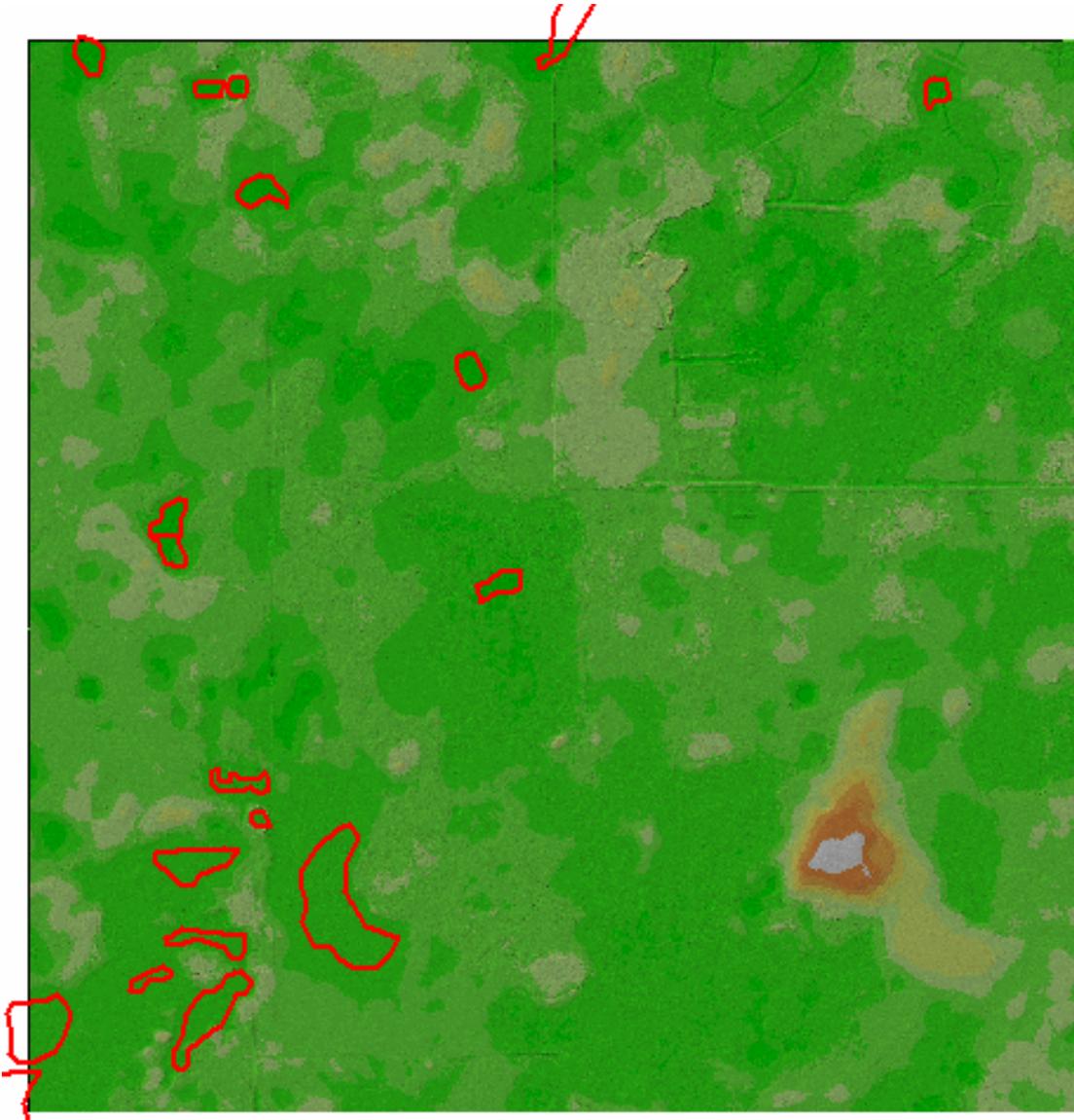
Tile: M_000004- Water points not vaporized



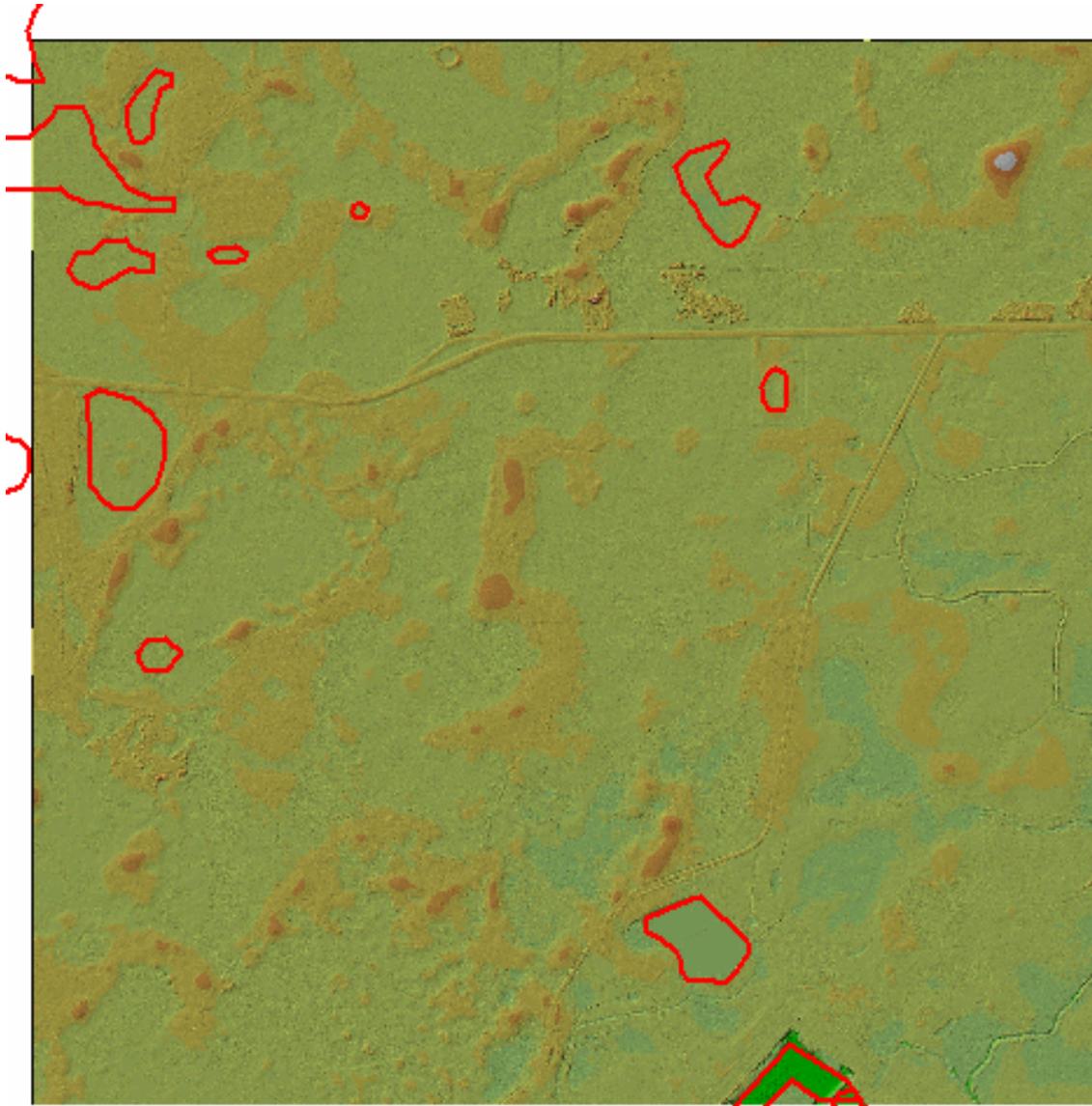
Tile: M_000005- Water points not vaporized and flightline step.



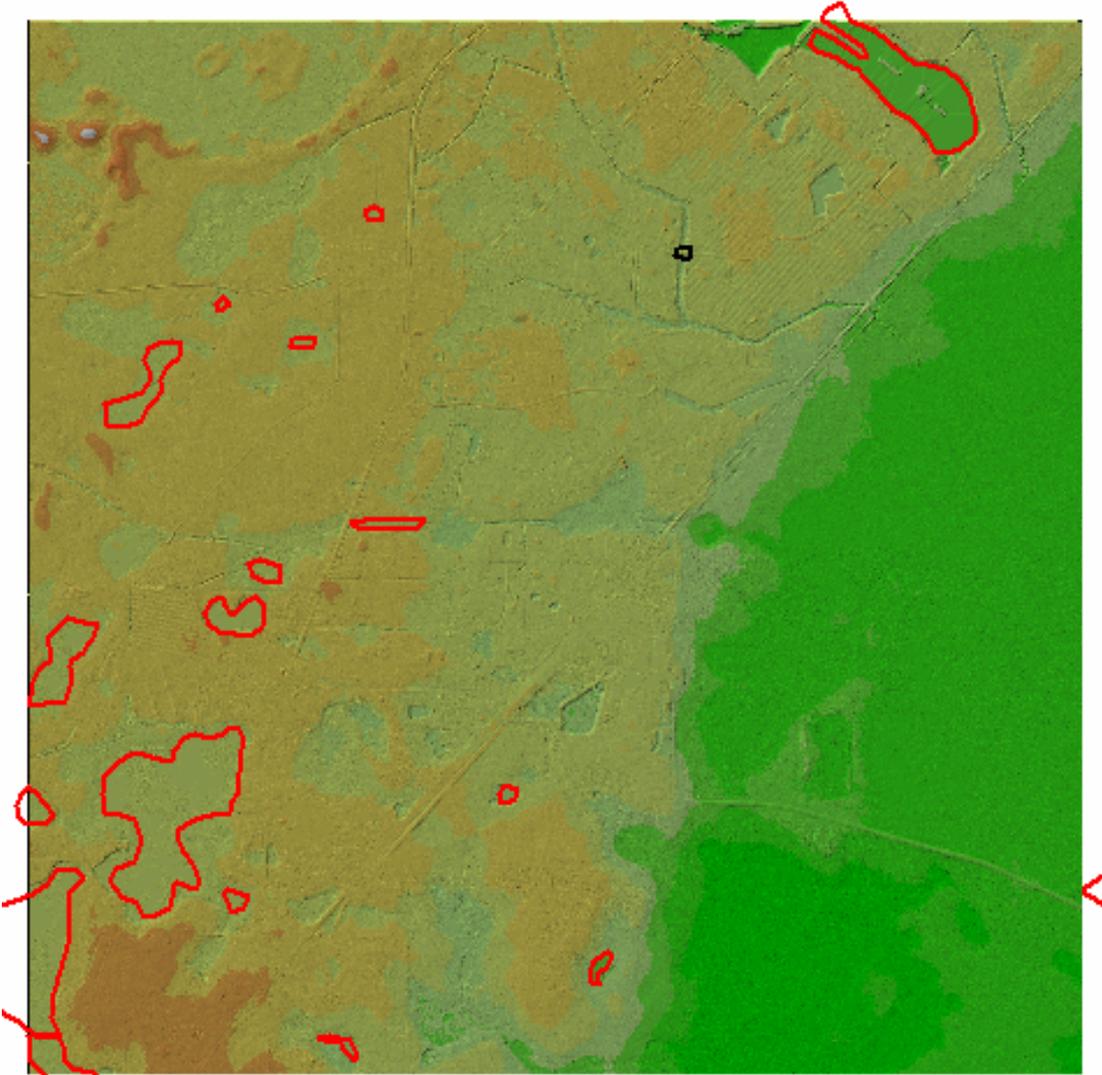
Tile: M_000006- Water points not vaporized



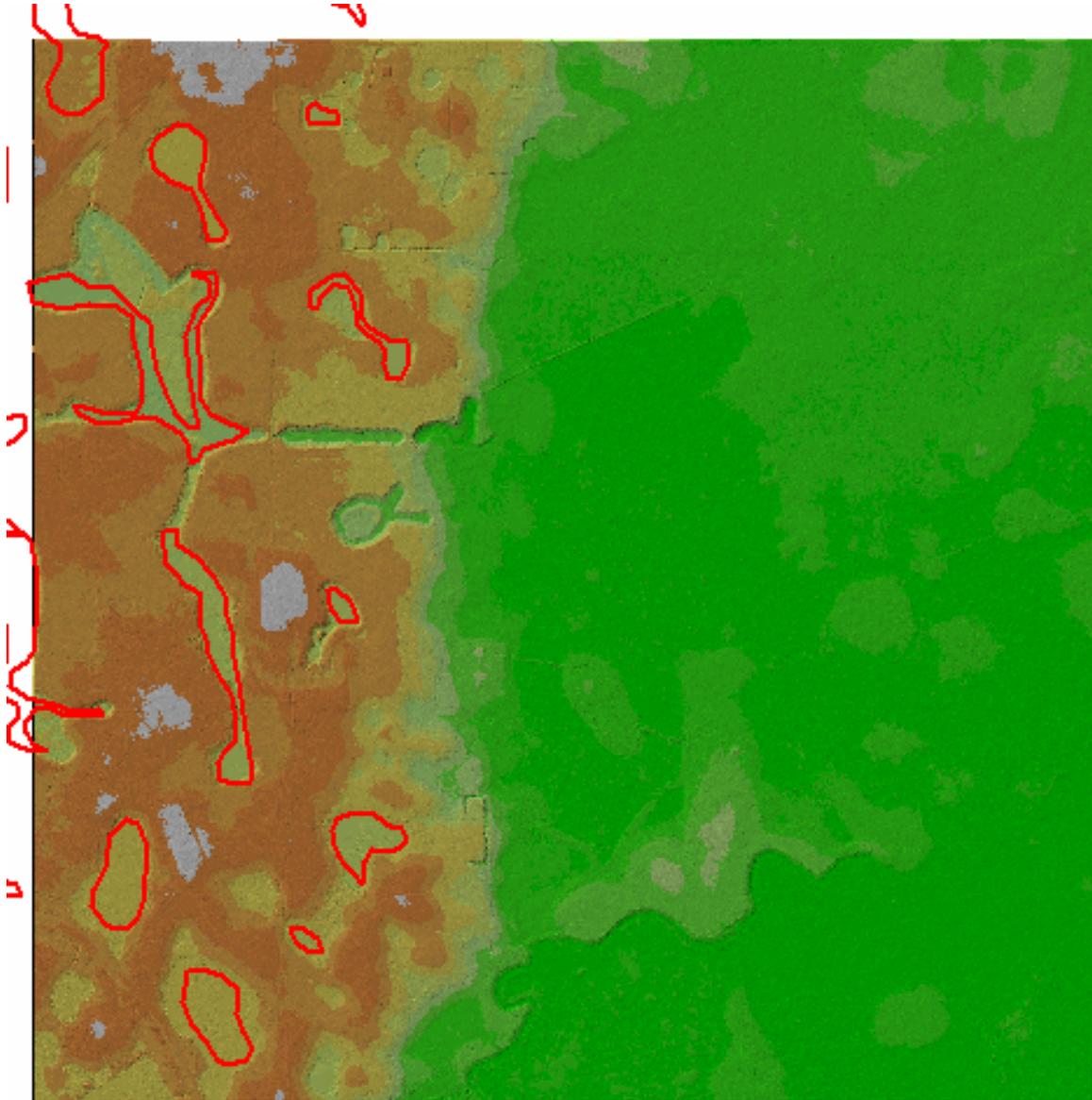
Tile: M_000007- Water points not vaporized



Tile: M_000008- Water points not vaporized



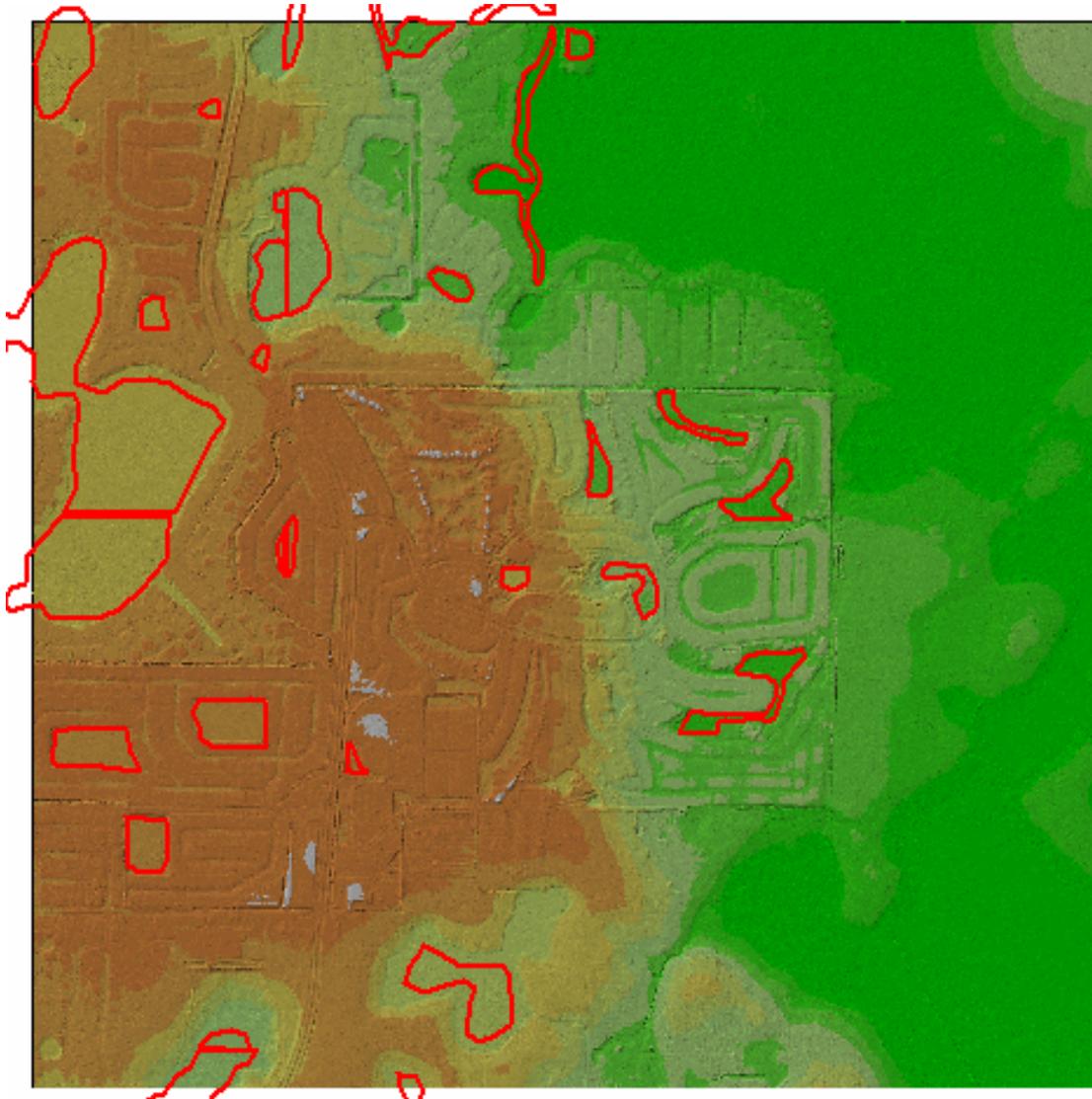
Tile: M_000009- Water points not vaporized



Tile: M_000010- Water points not vaporized



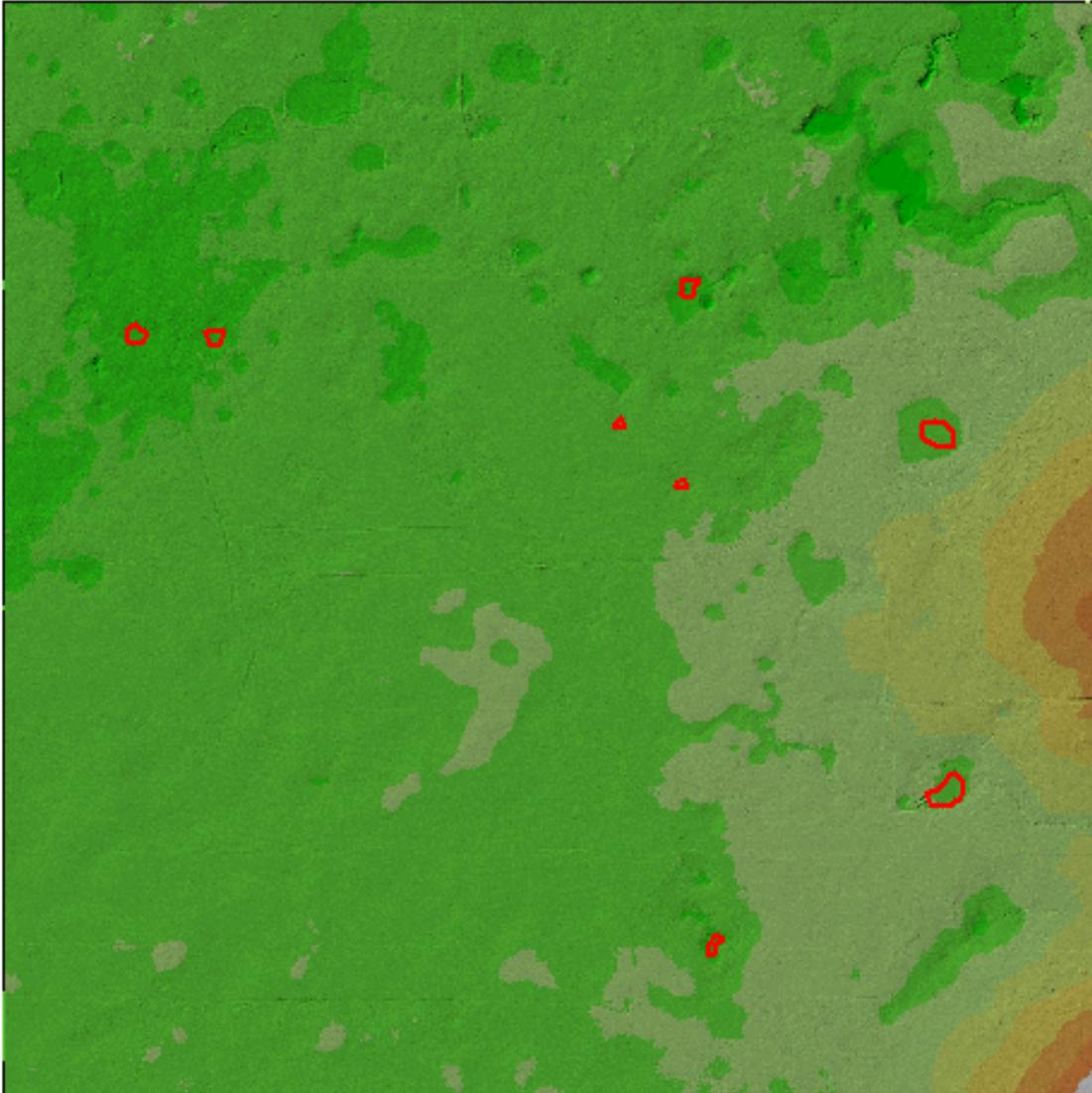
Tile: M_000011- Water points not vaporized



Tile: M_000012- Water points not vaporized



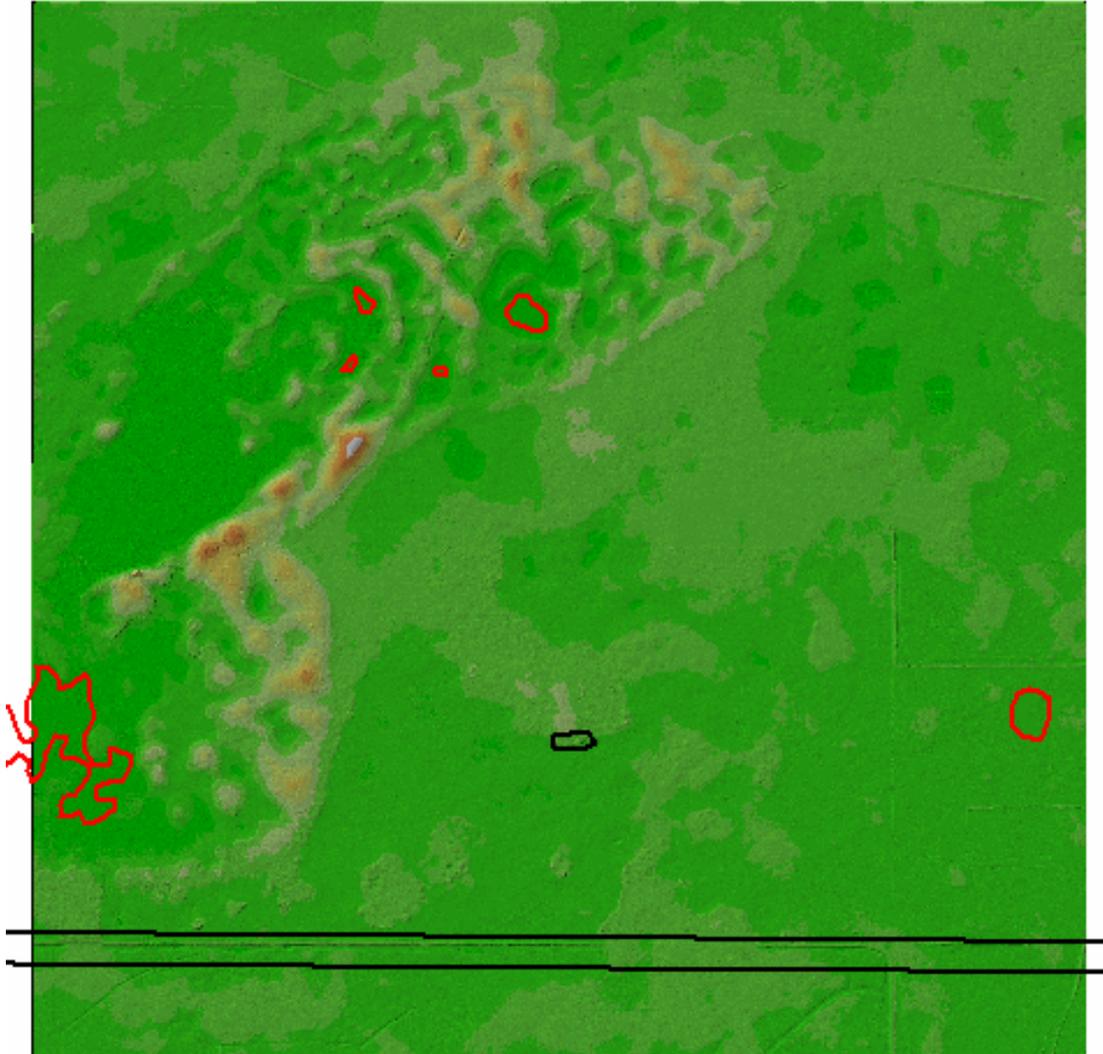
Tile: N_000003- Water points not vaporized



Tile: N_000004- Water points not vaporized



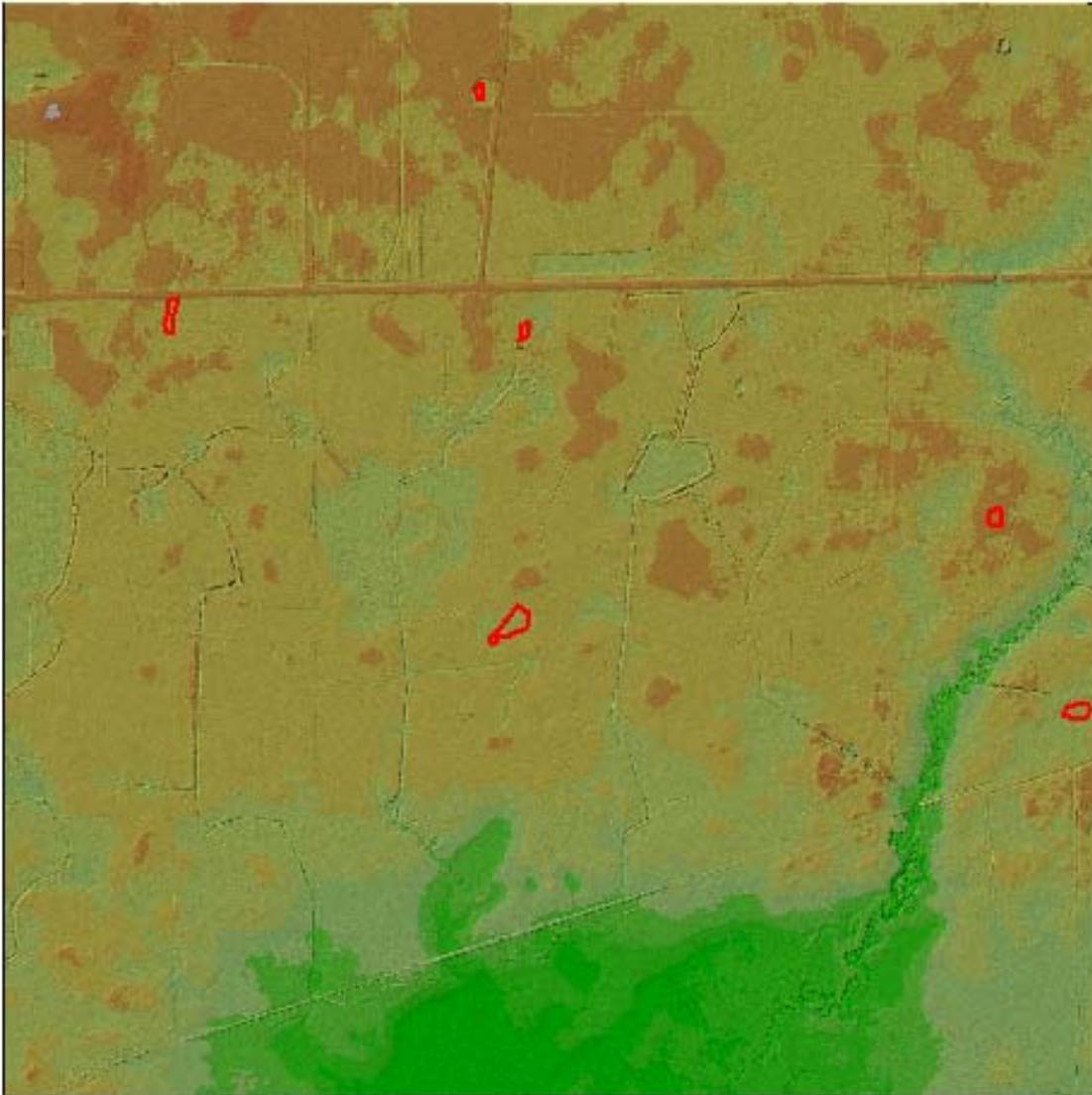
Tile: N_000005- Water points not vaporized, vegetation, and flightline step.



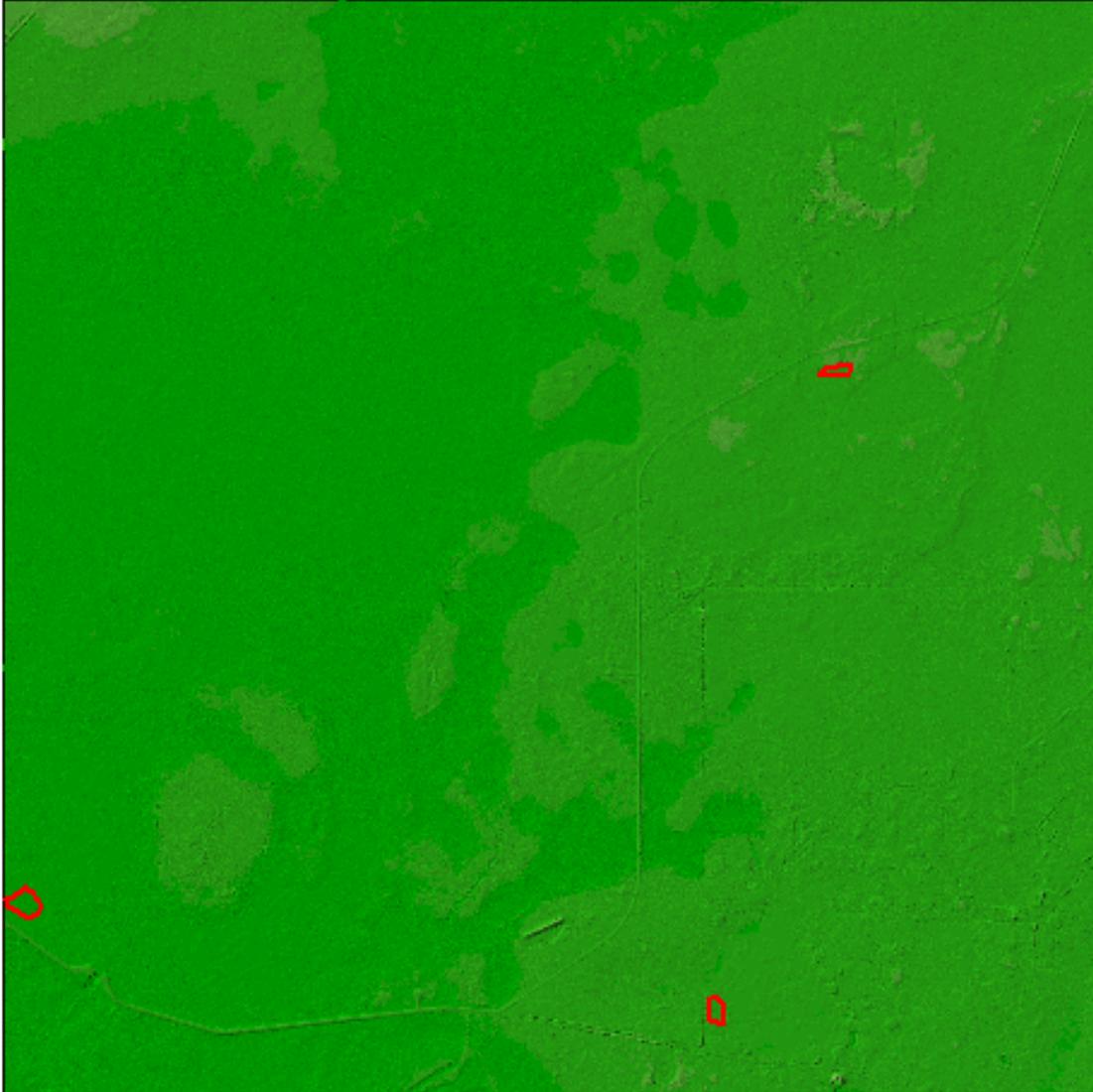
Tile: N_000006- Water points not vaporized



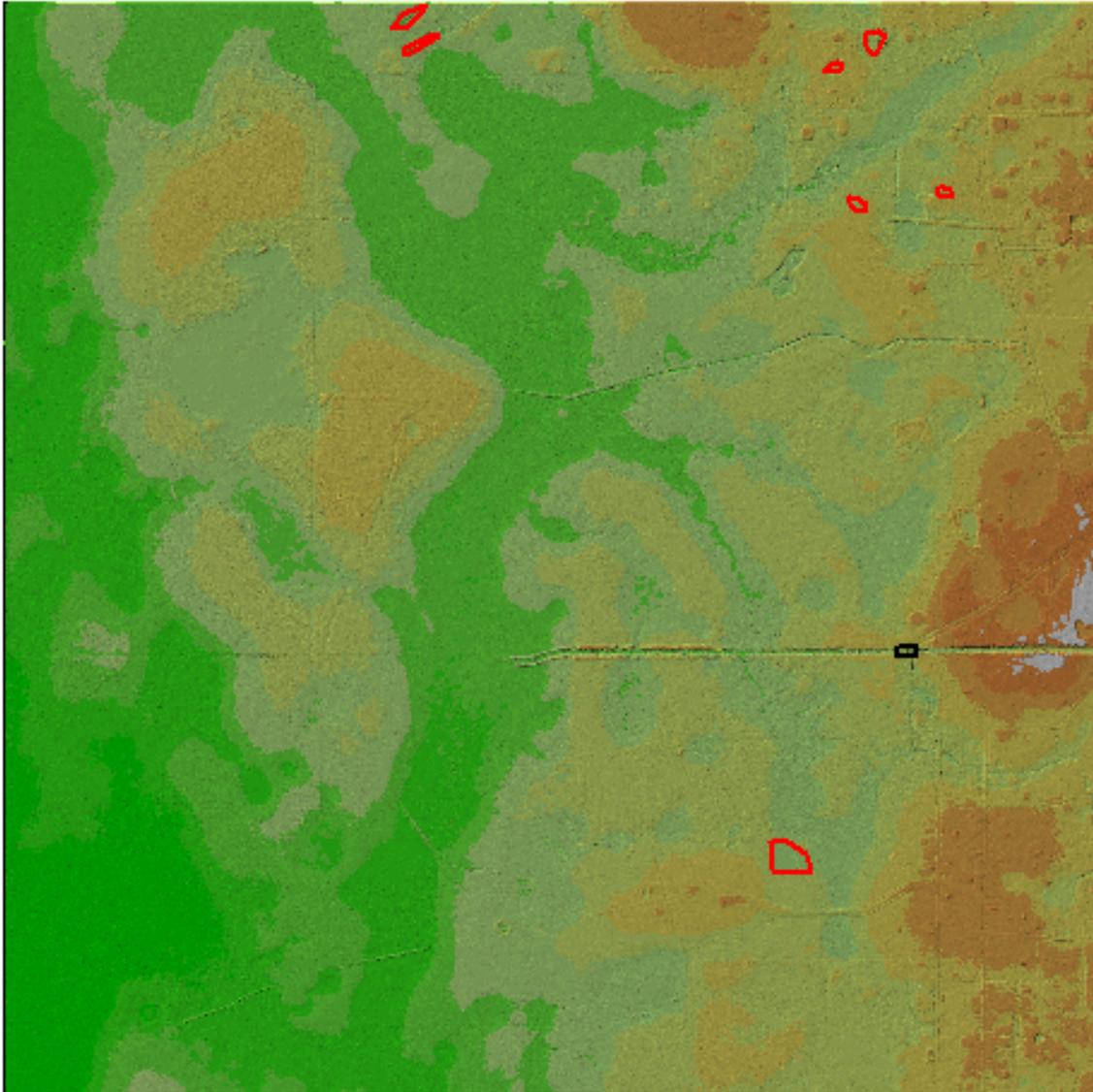
Tile: N_000007- Water points not vaporized



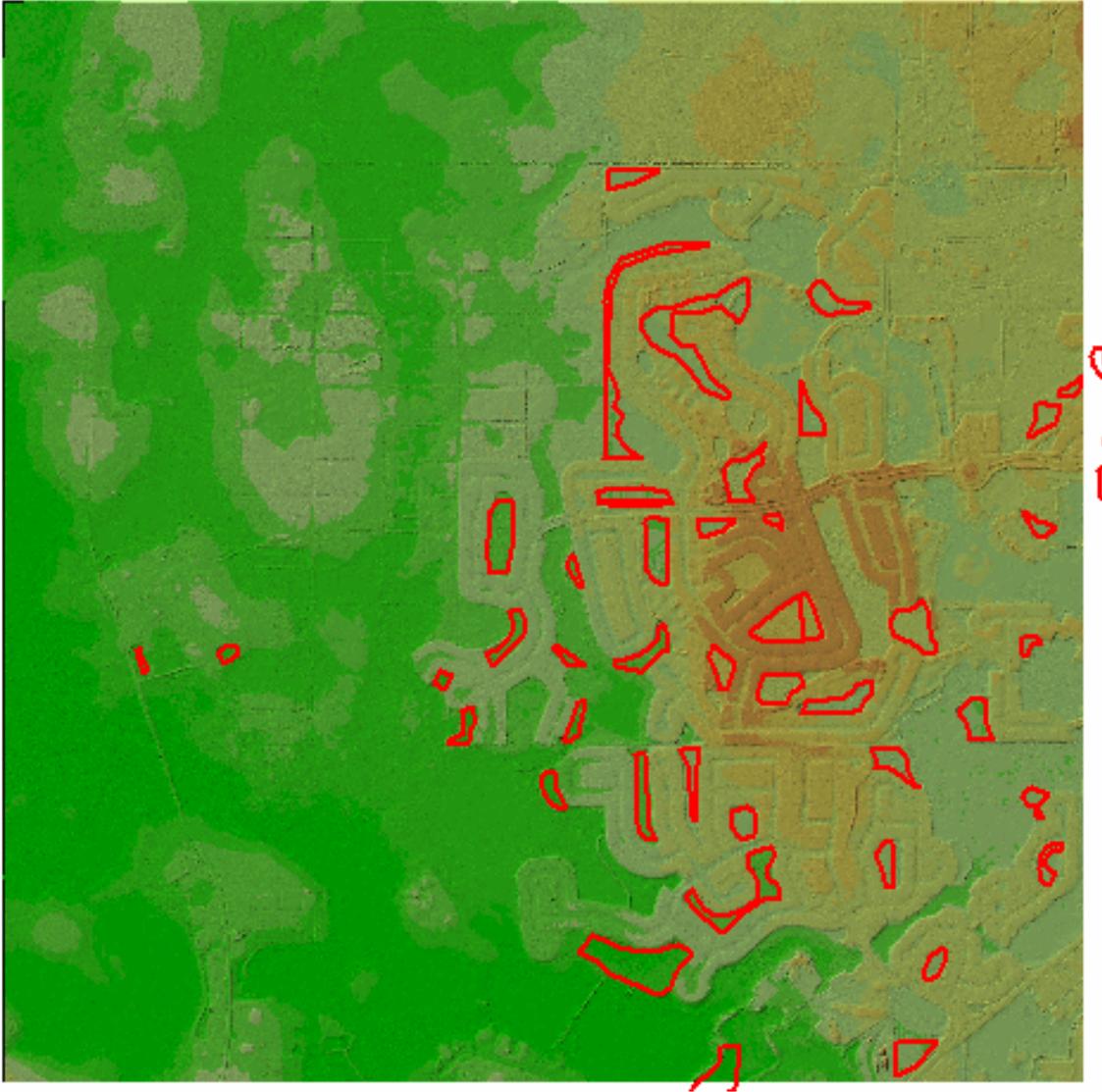
Tile: N_000008- Water points not vaporized



Tile: N_000009- Water points not vaporized and partial remnant of bridge.



Tile: N_000010- Water points not vaporized



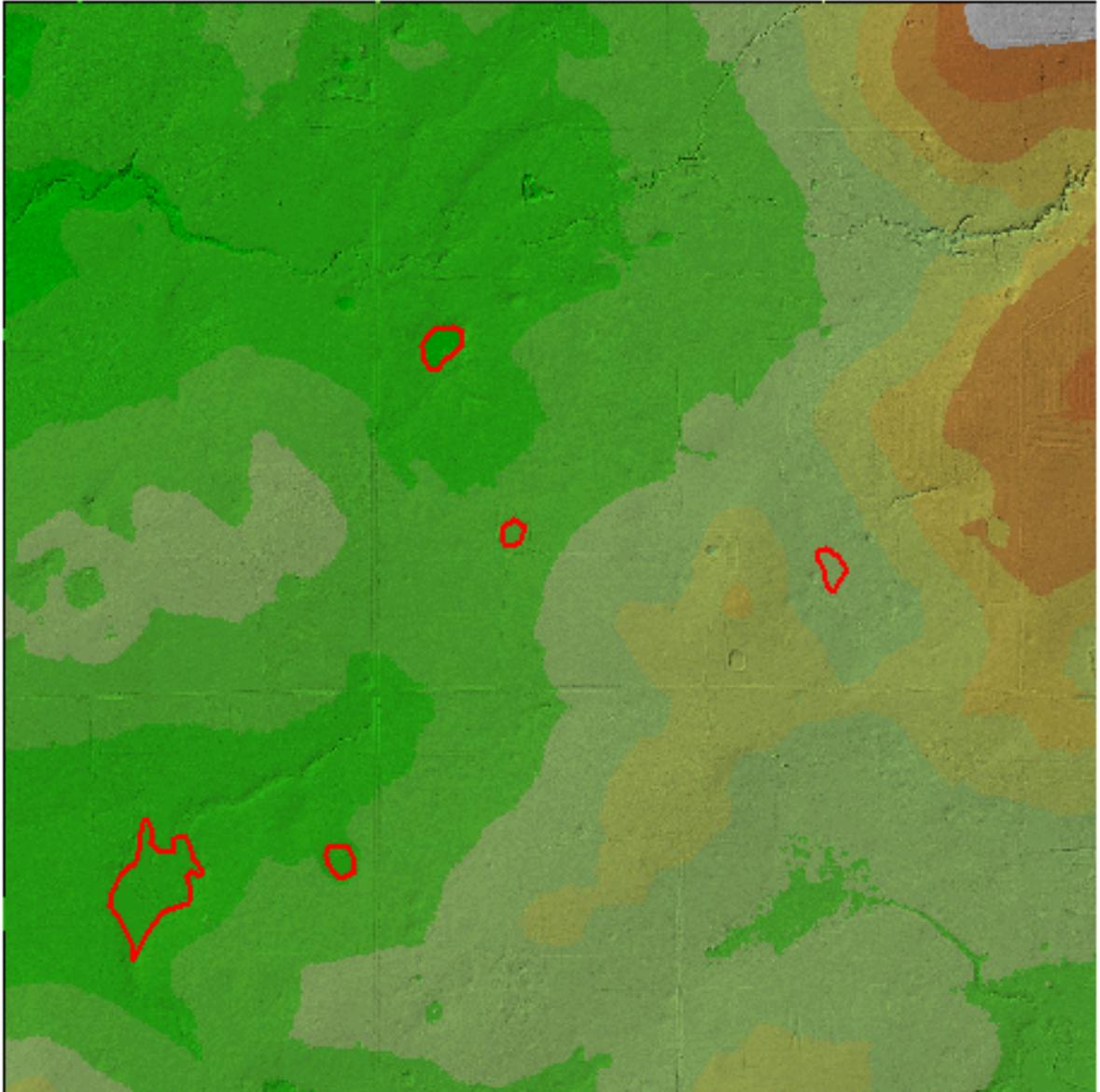
Tile: N_000011- Water points not vaporized



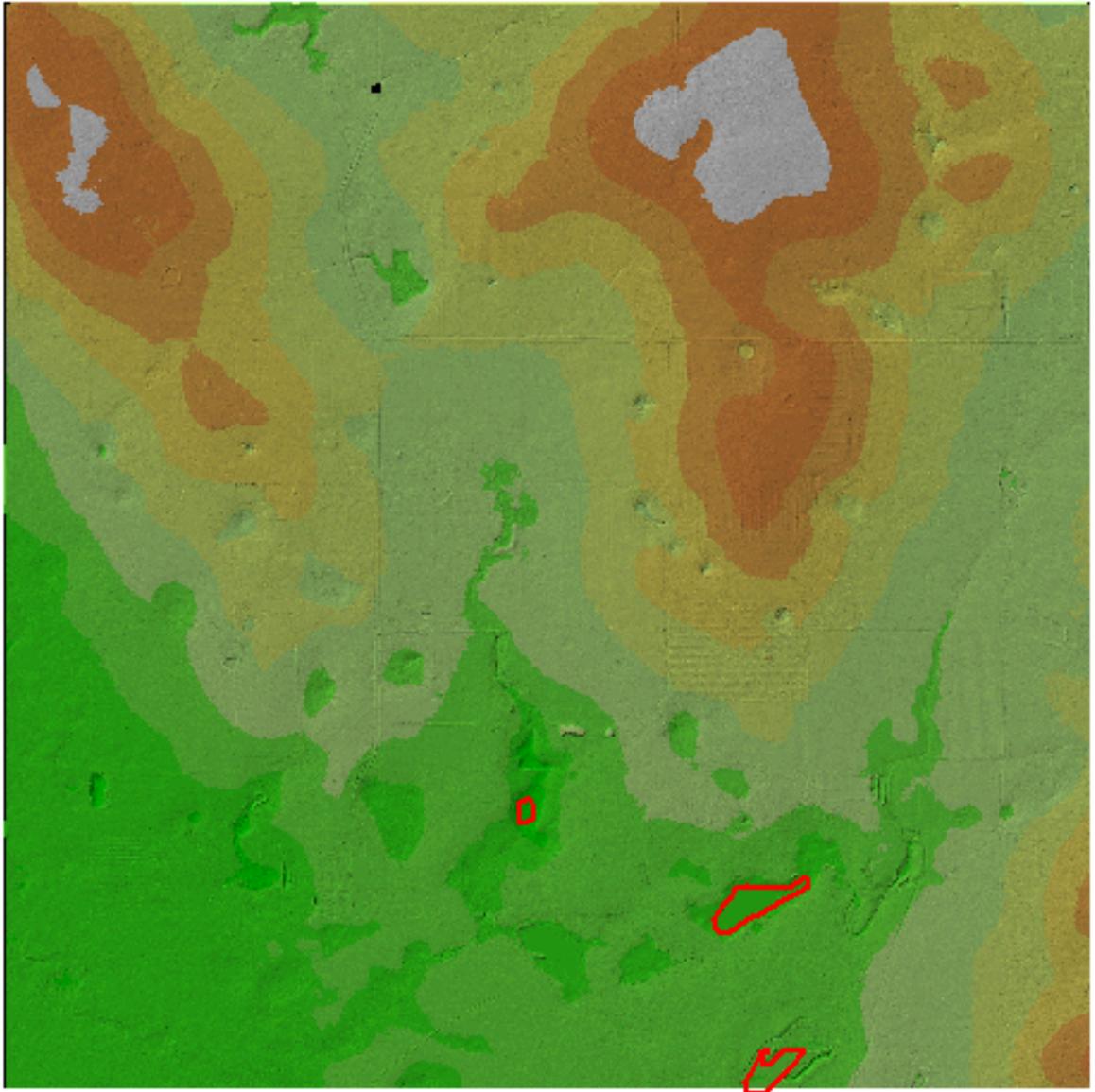
Tile: N_000012- Water points not vaporized and partial remnant of bridge.



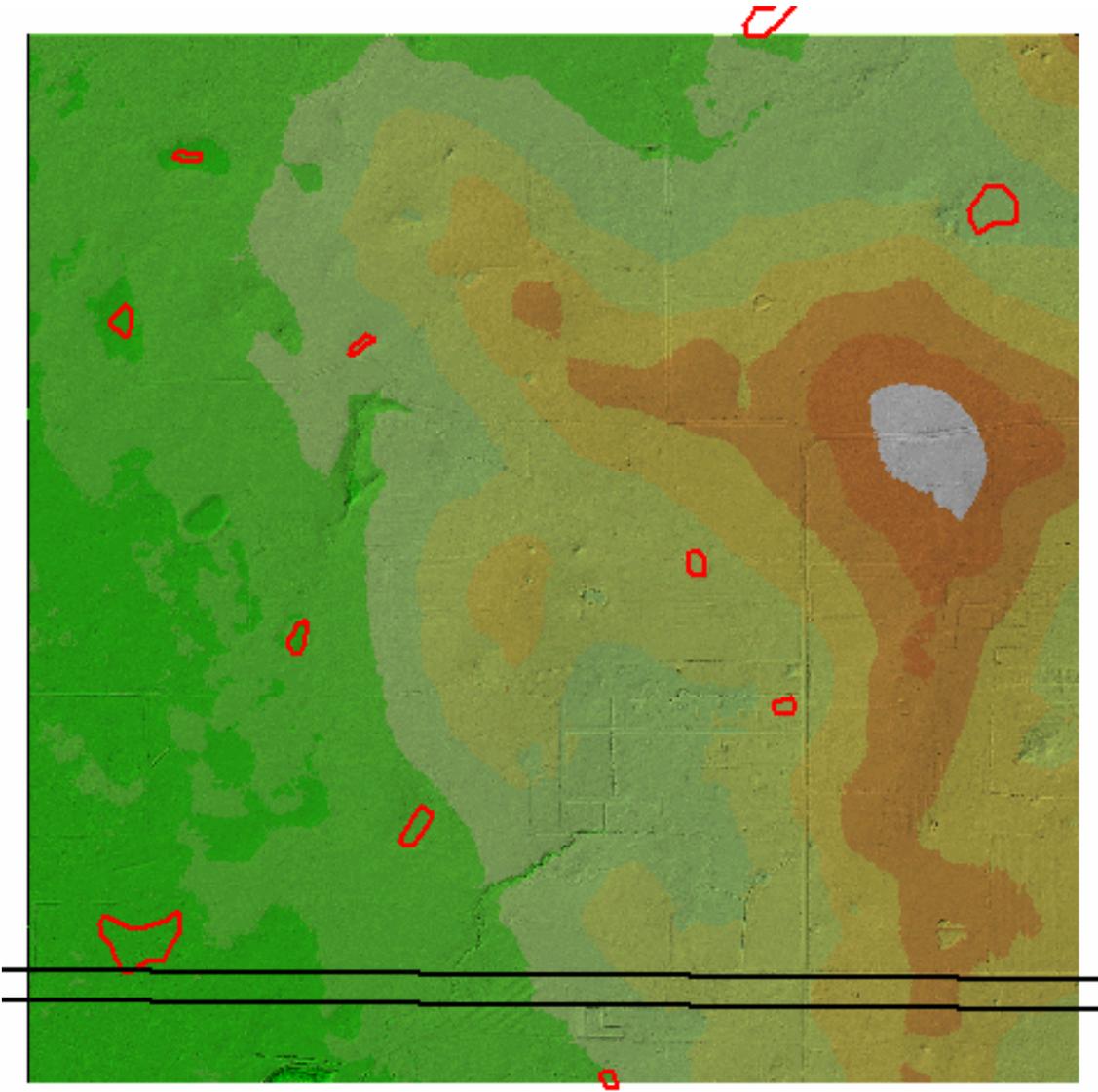
Tile: O_000003- Water points not vaporized



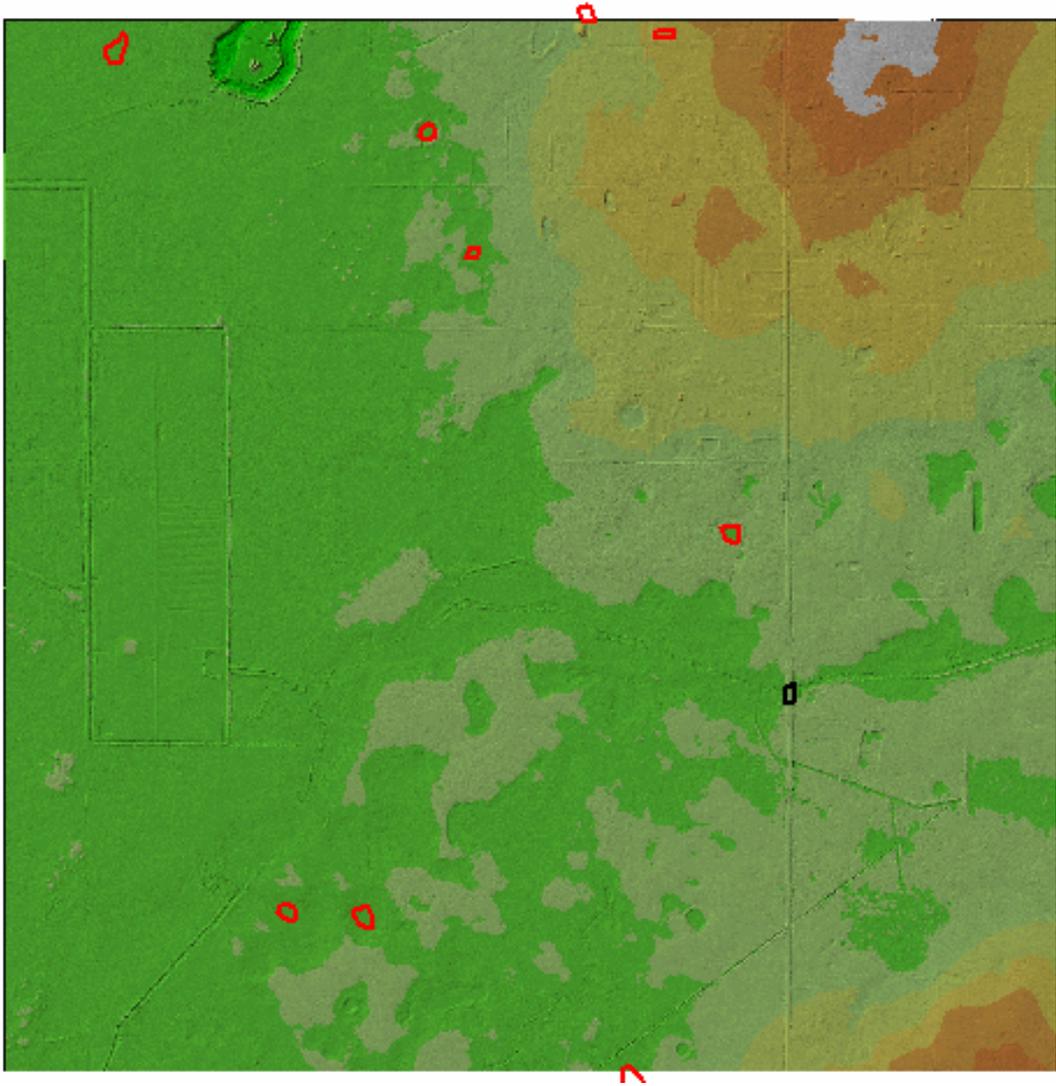
Tile: O_000004- Water points not vaporized and bridge.



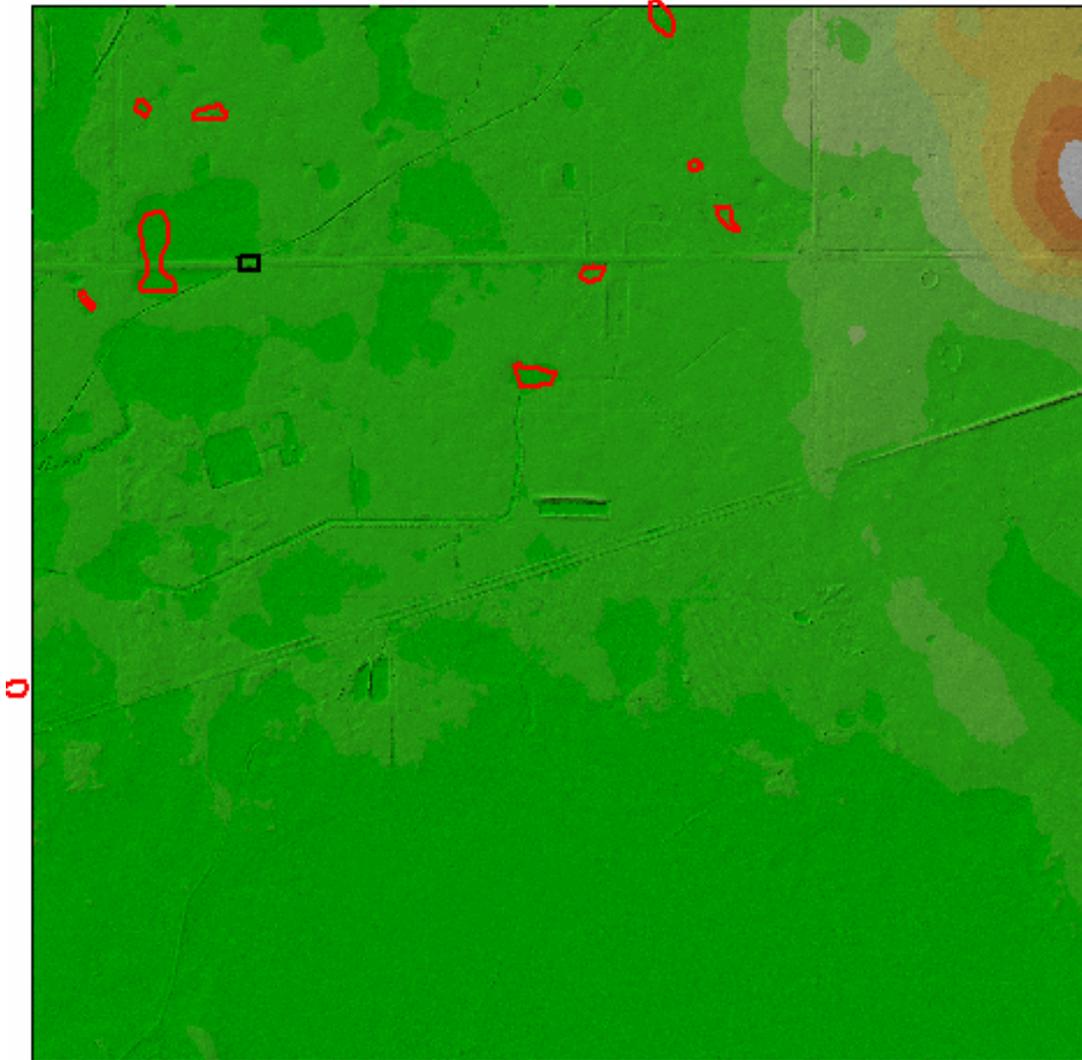
Tile: O_000005- Water points not vaporized



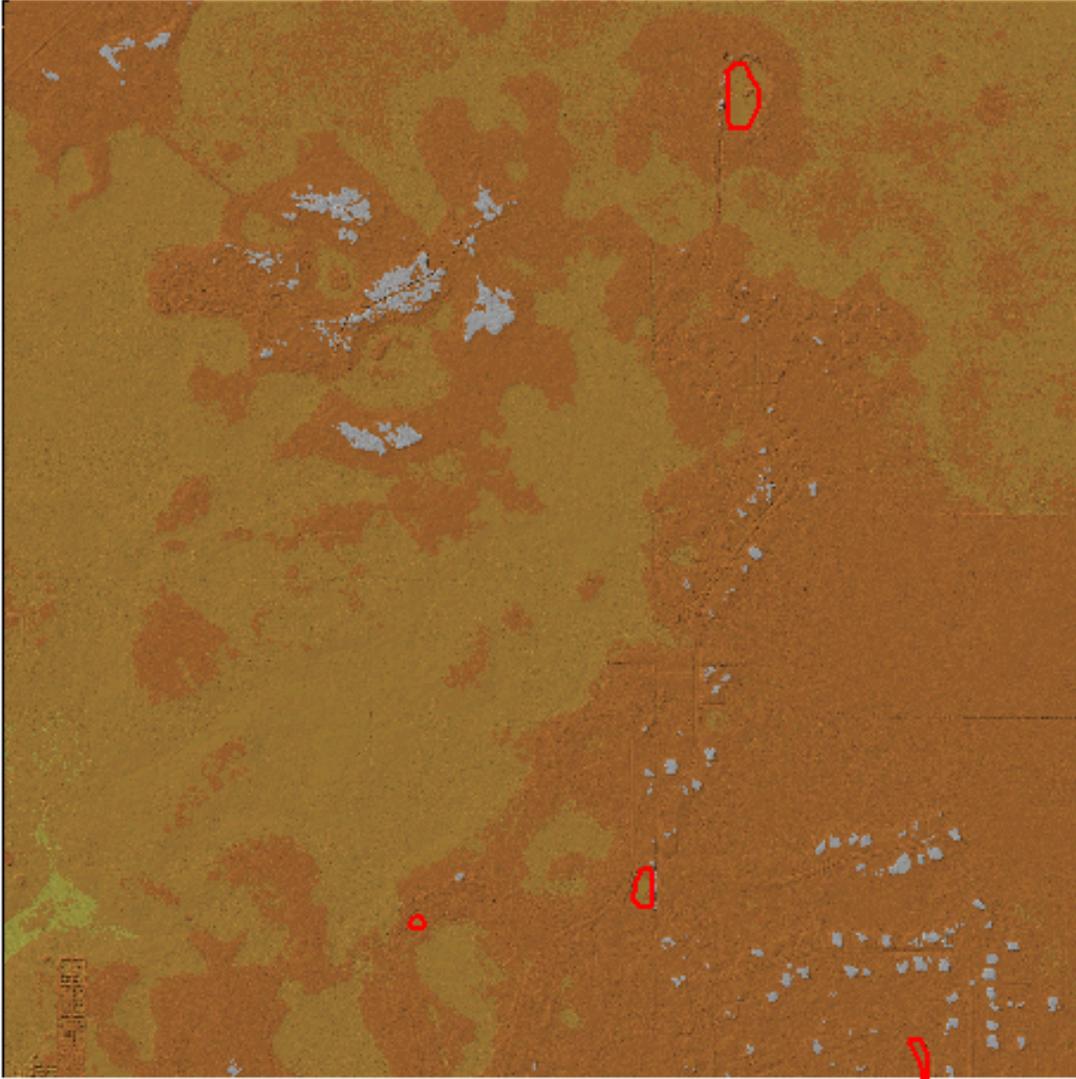
Tile: O_000006- Water points not vaporized and bridge.



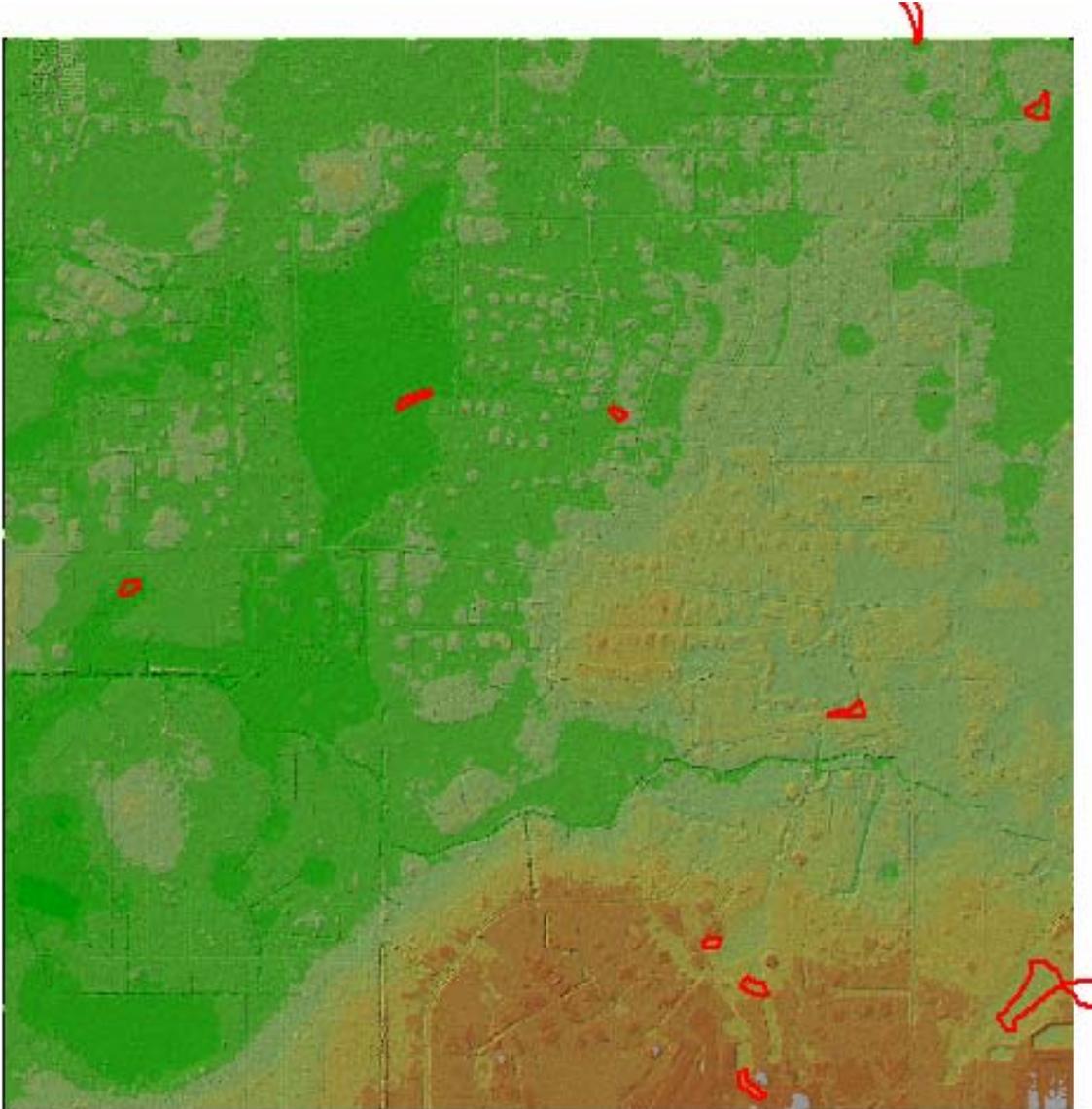
Tile: O_000007- Water points not vaporized and bridge.



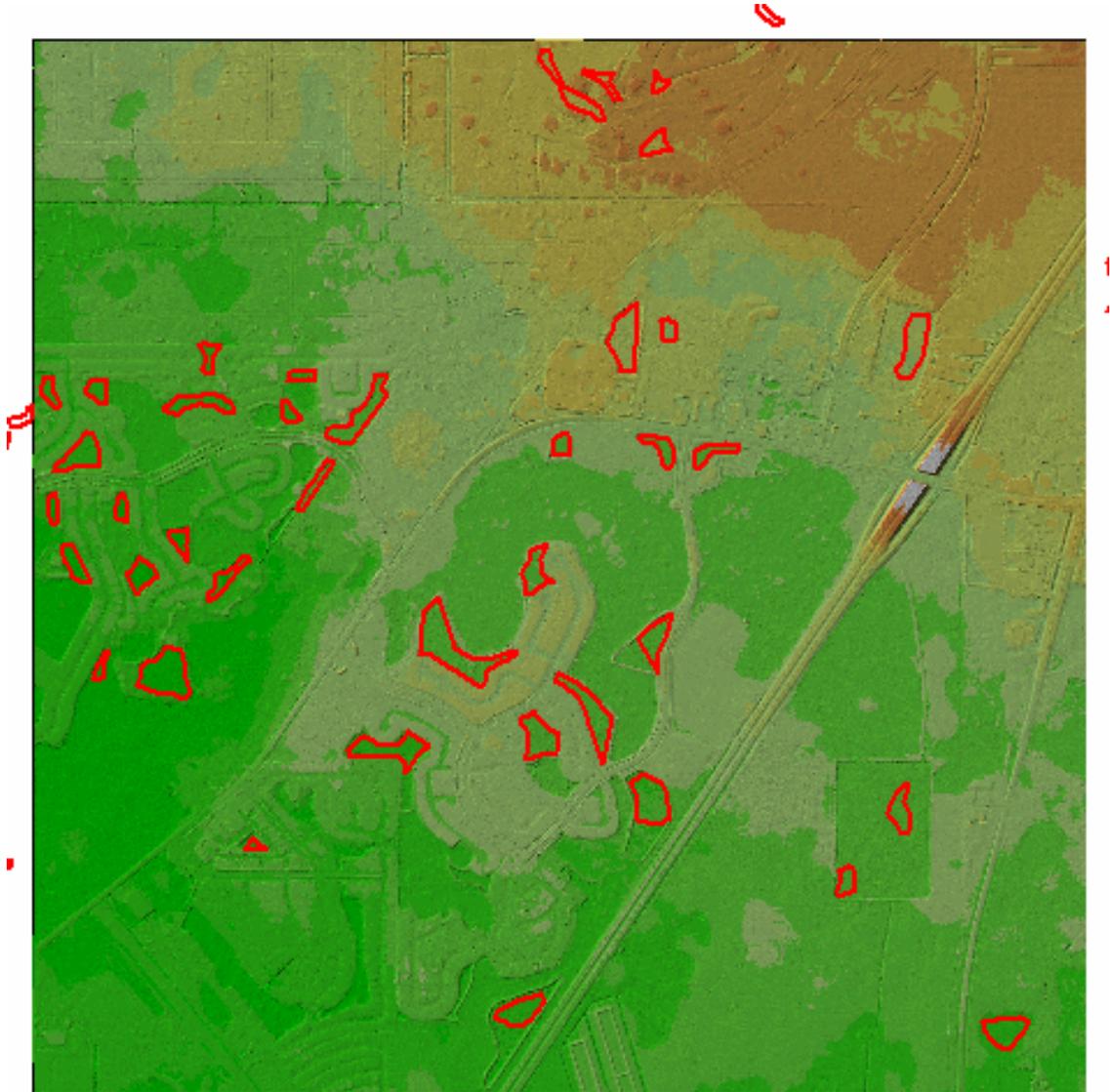
Tile: O_000008- Water points not vaporized



Tile: O_000009- Water points not vaporized



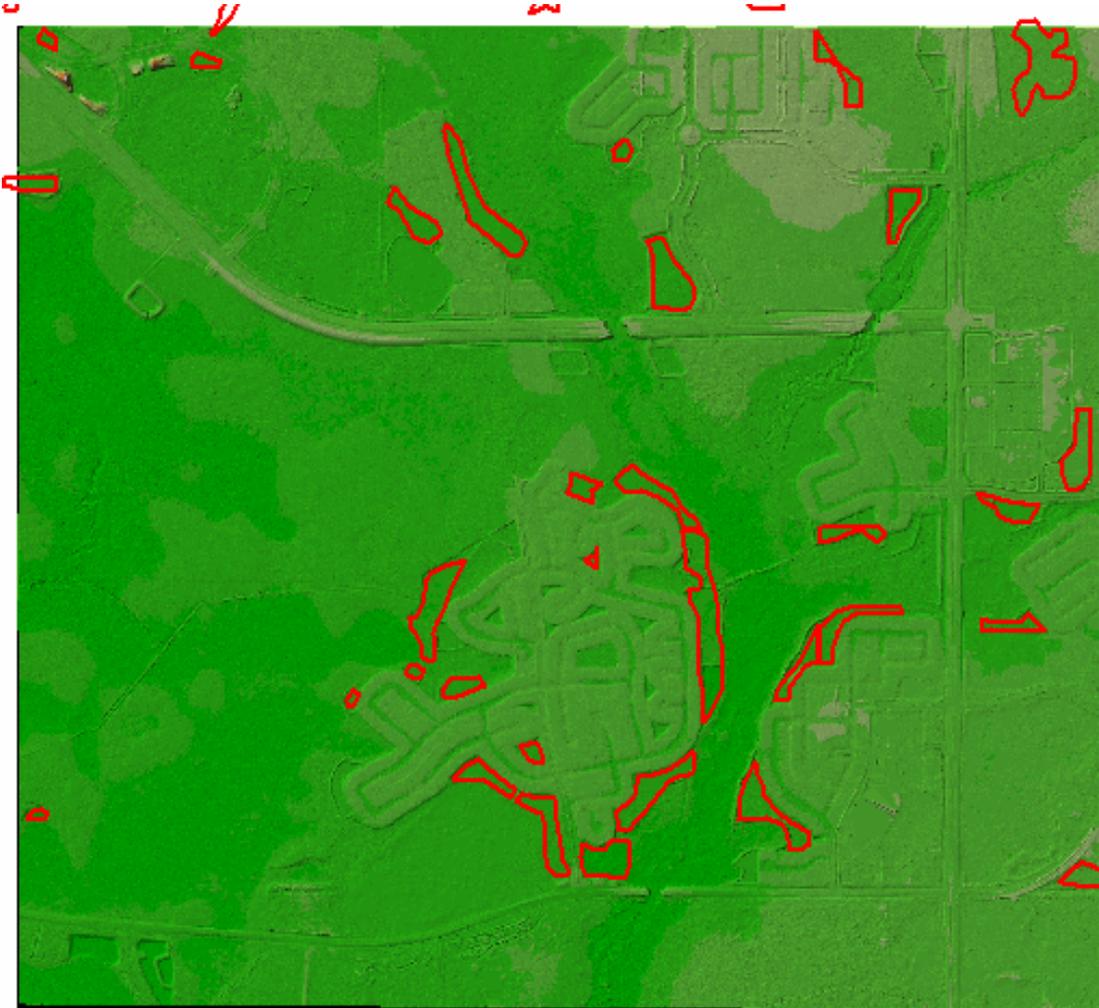
Tile: O_000010- Water points not vaporized



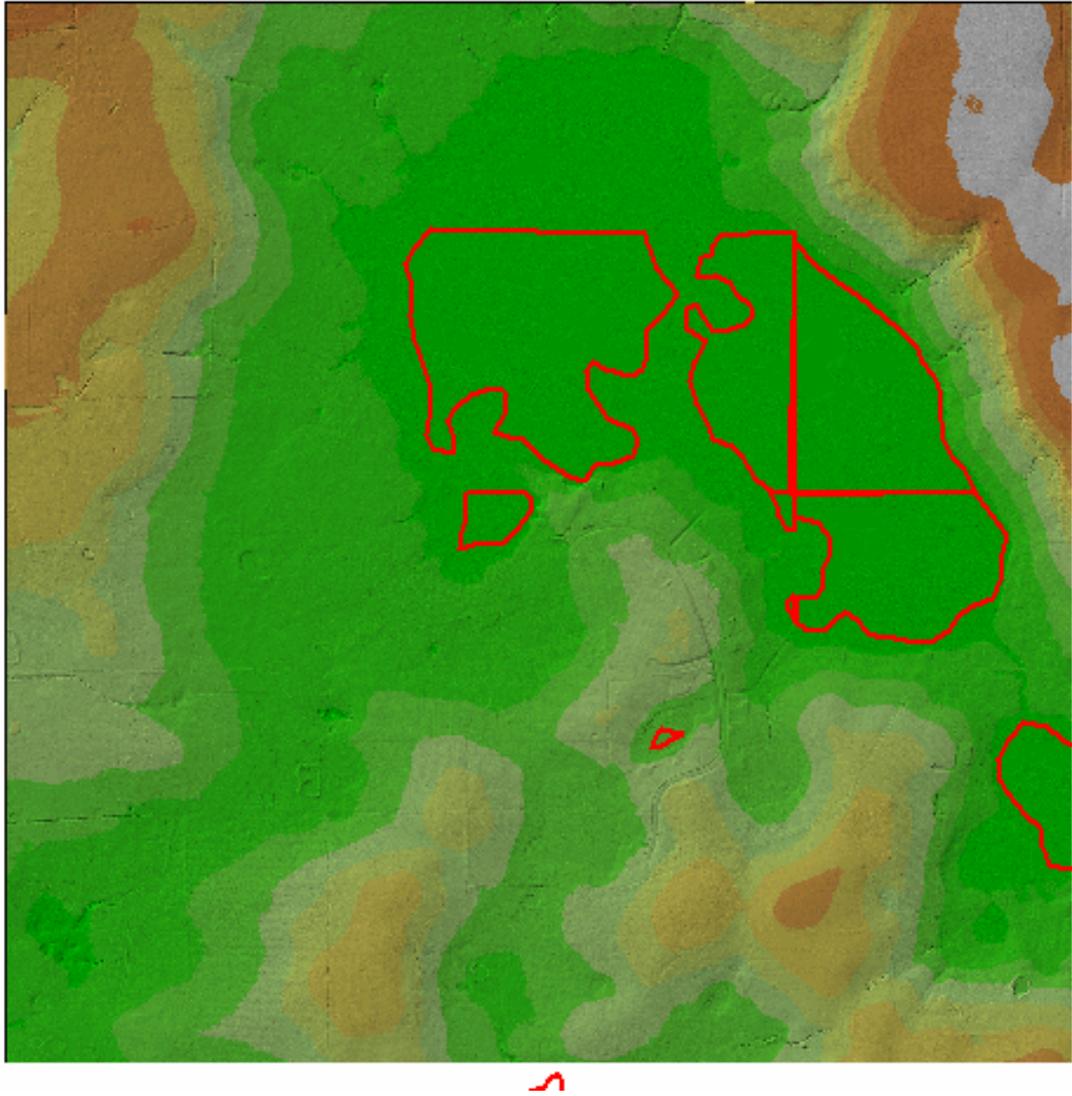
Tile: O_000011- Water points not vaporized



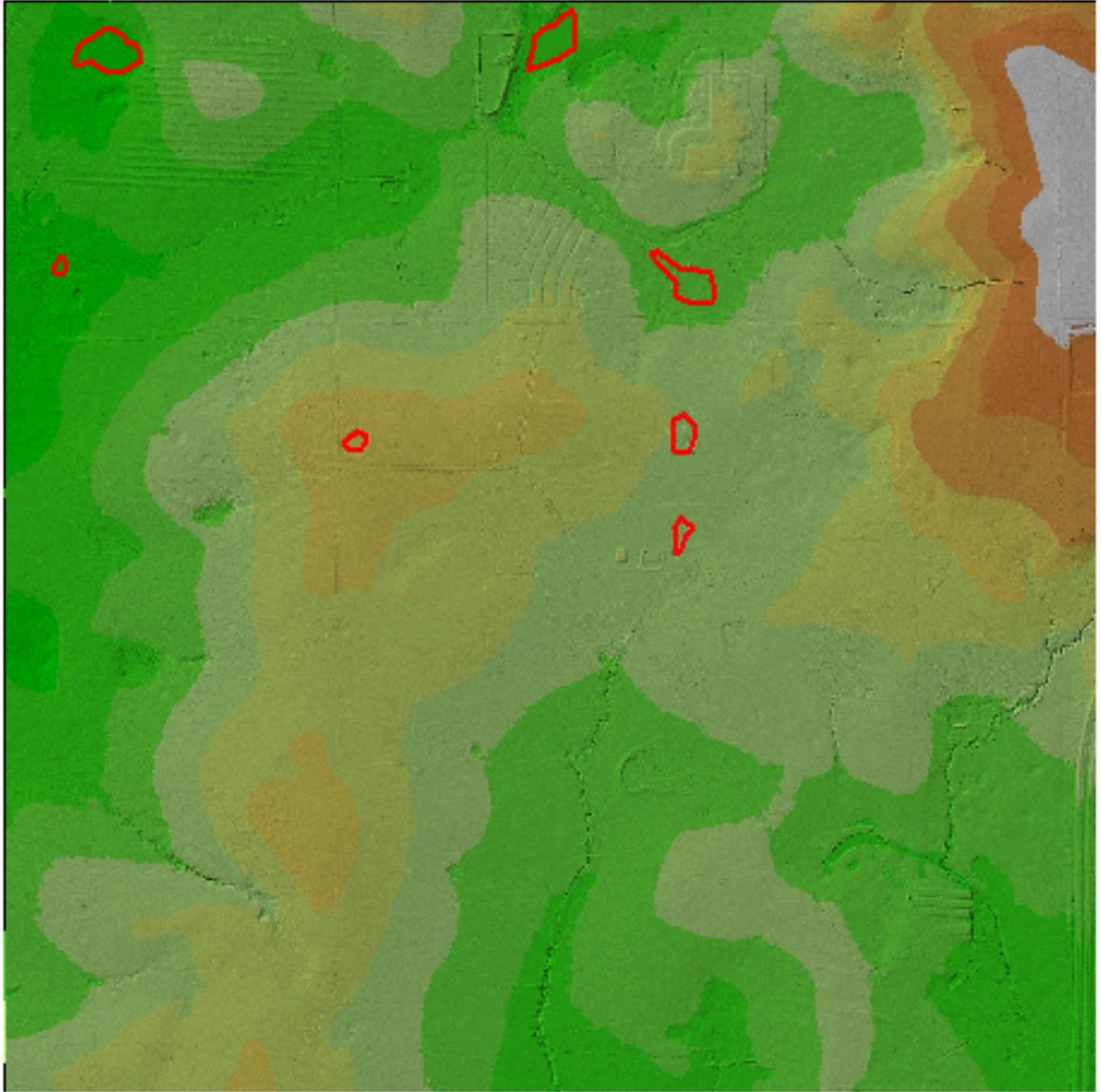
Tile: 0_000012- Water points not vaporized



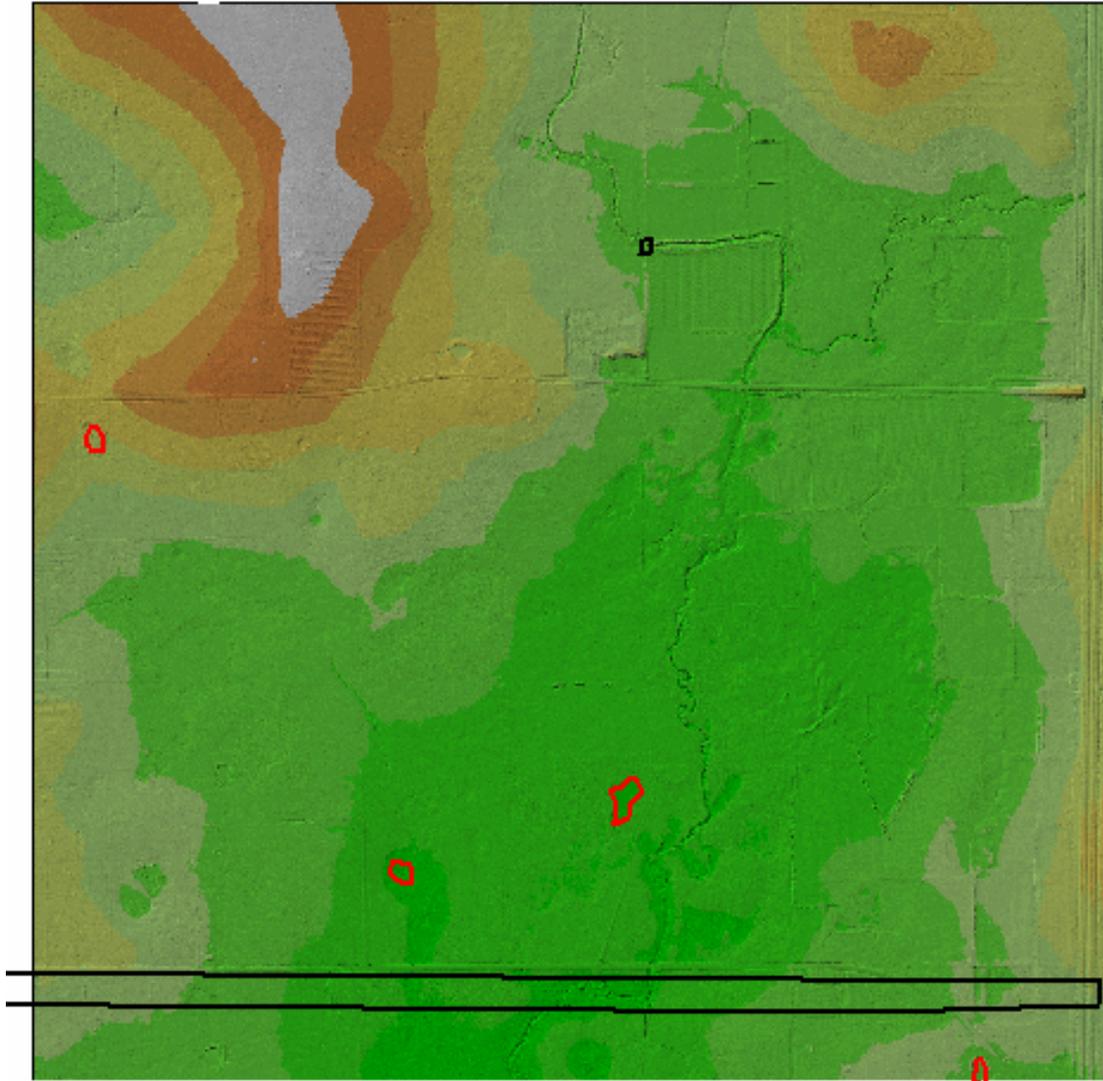
Tile: P_000003- Water points not vaporized



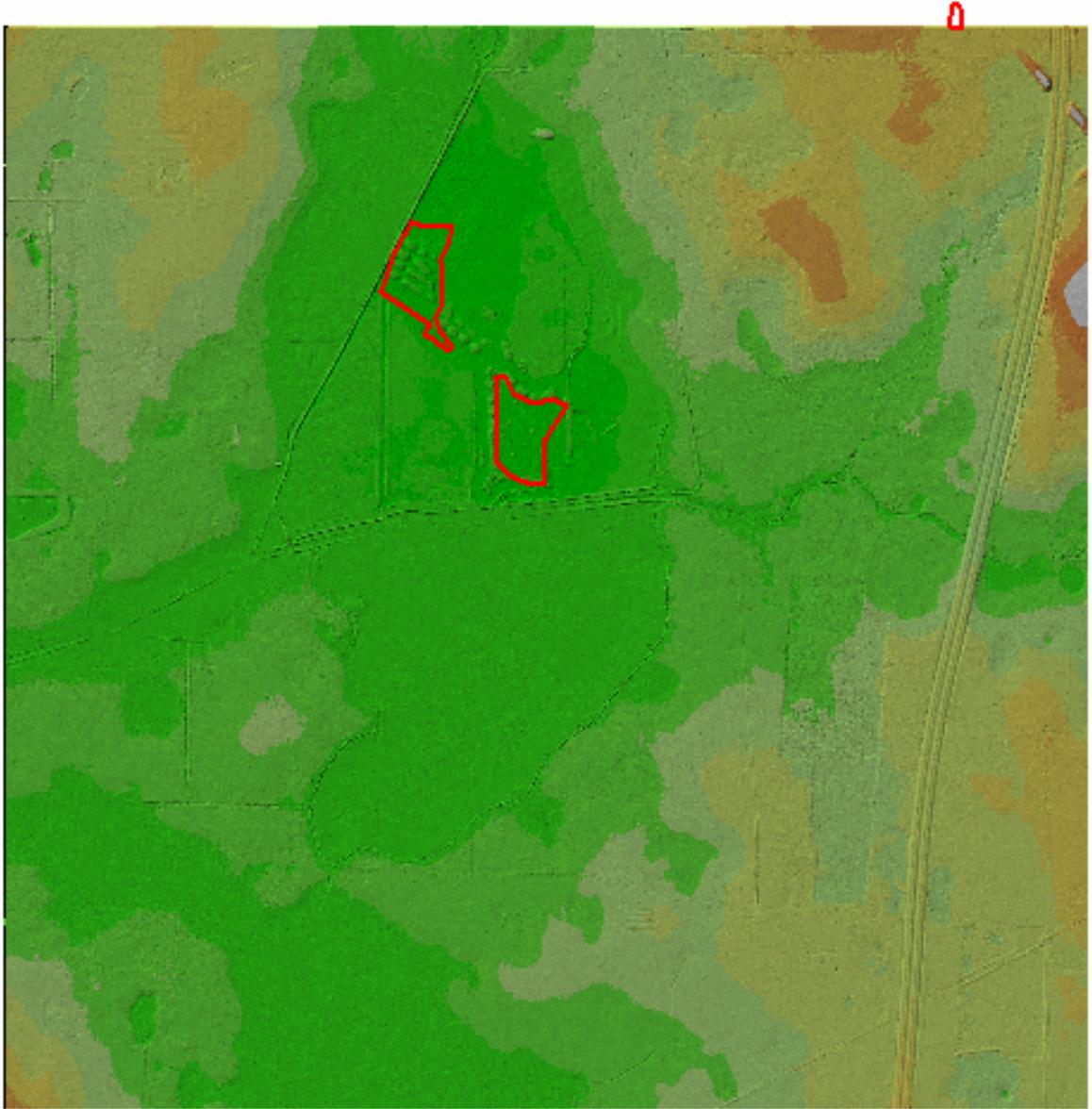
Tile: P_000004- Water points not vaporized



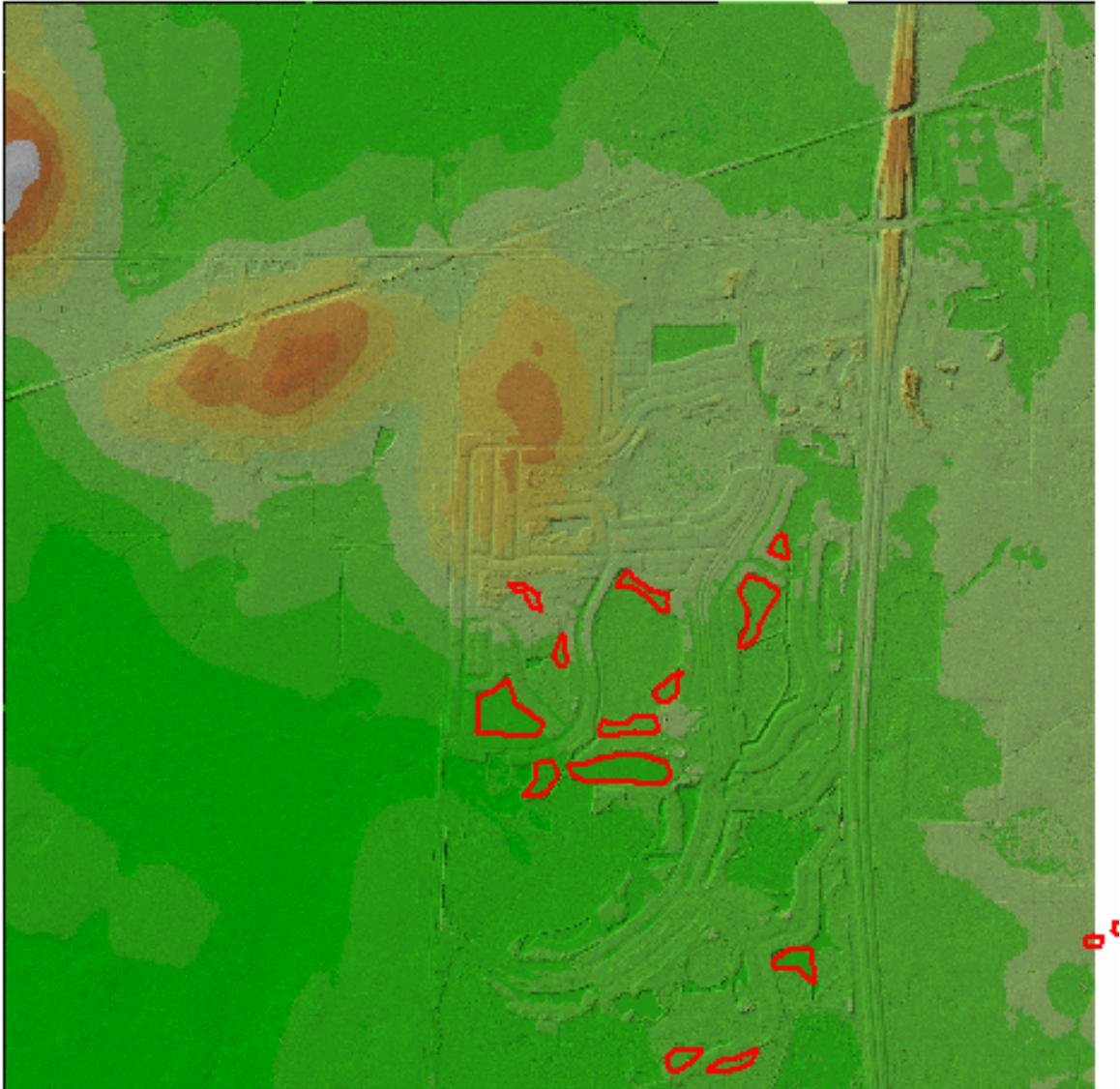
Tile: P_000005- Water points not vaporized, bridge, and flightline step.



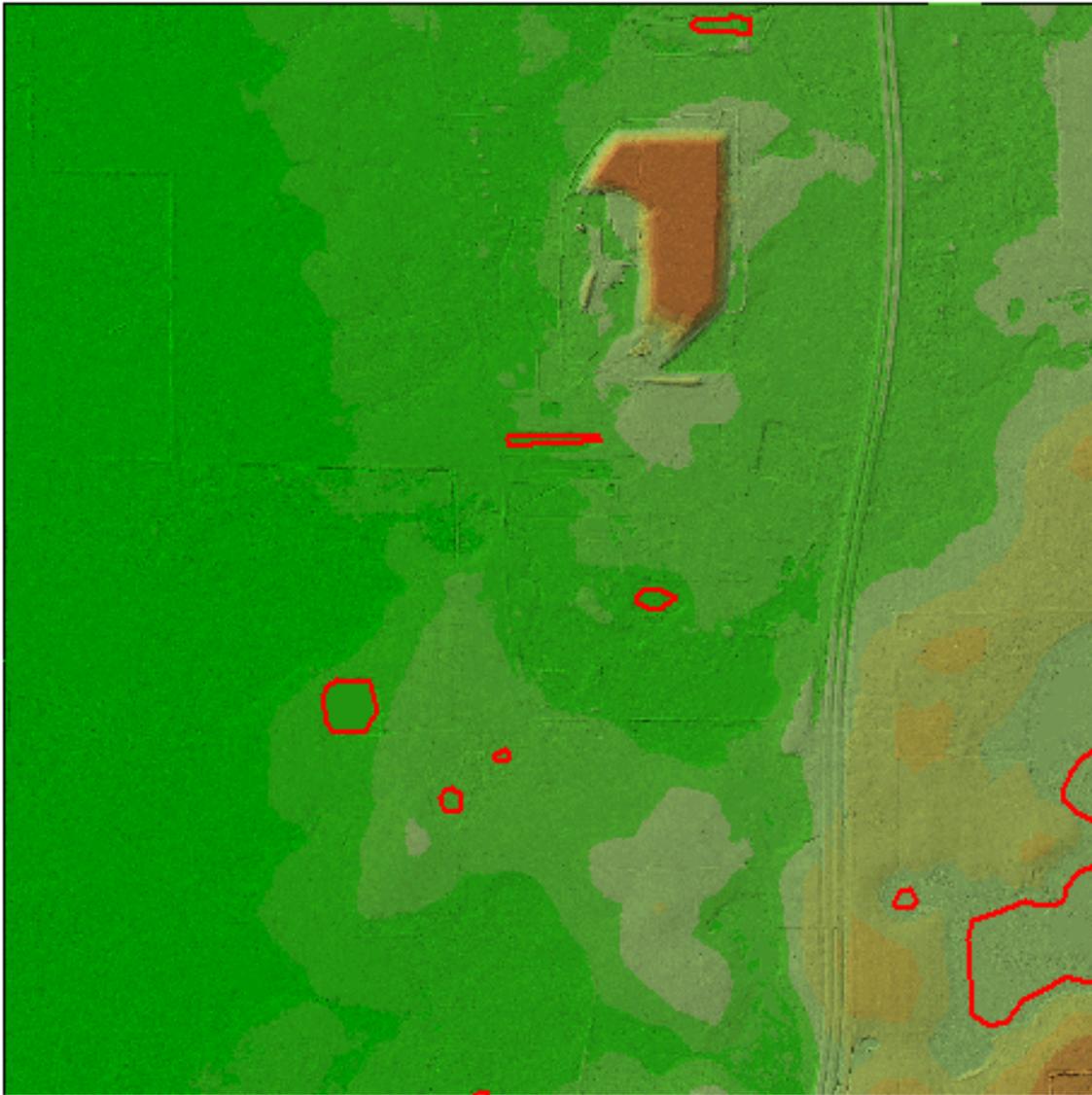
Tile: P_000006- Water points not vaporized



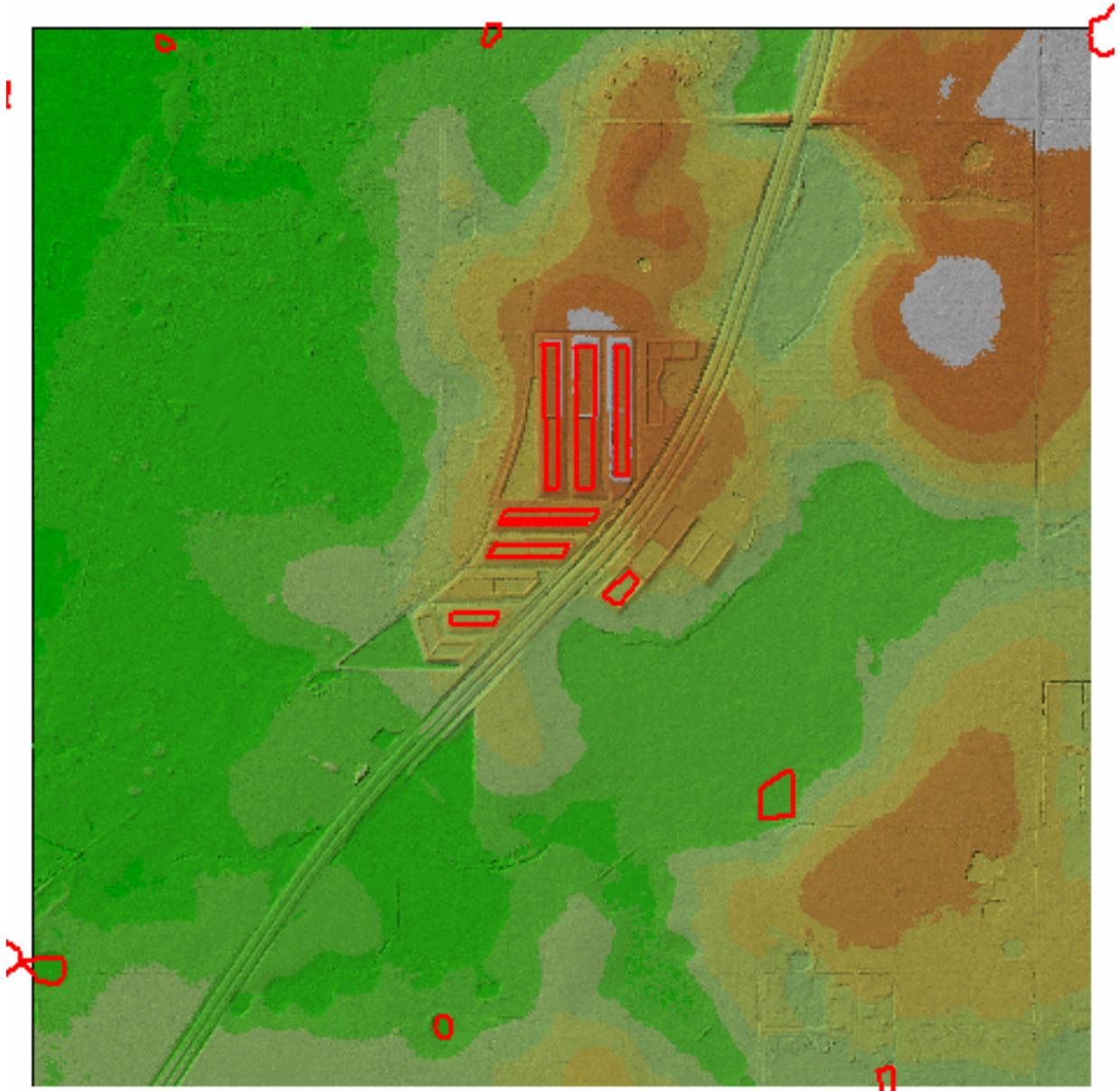
Tile: P_000007- Water points not vaporized



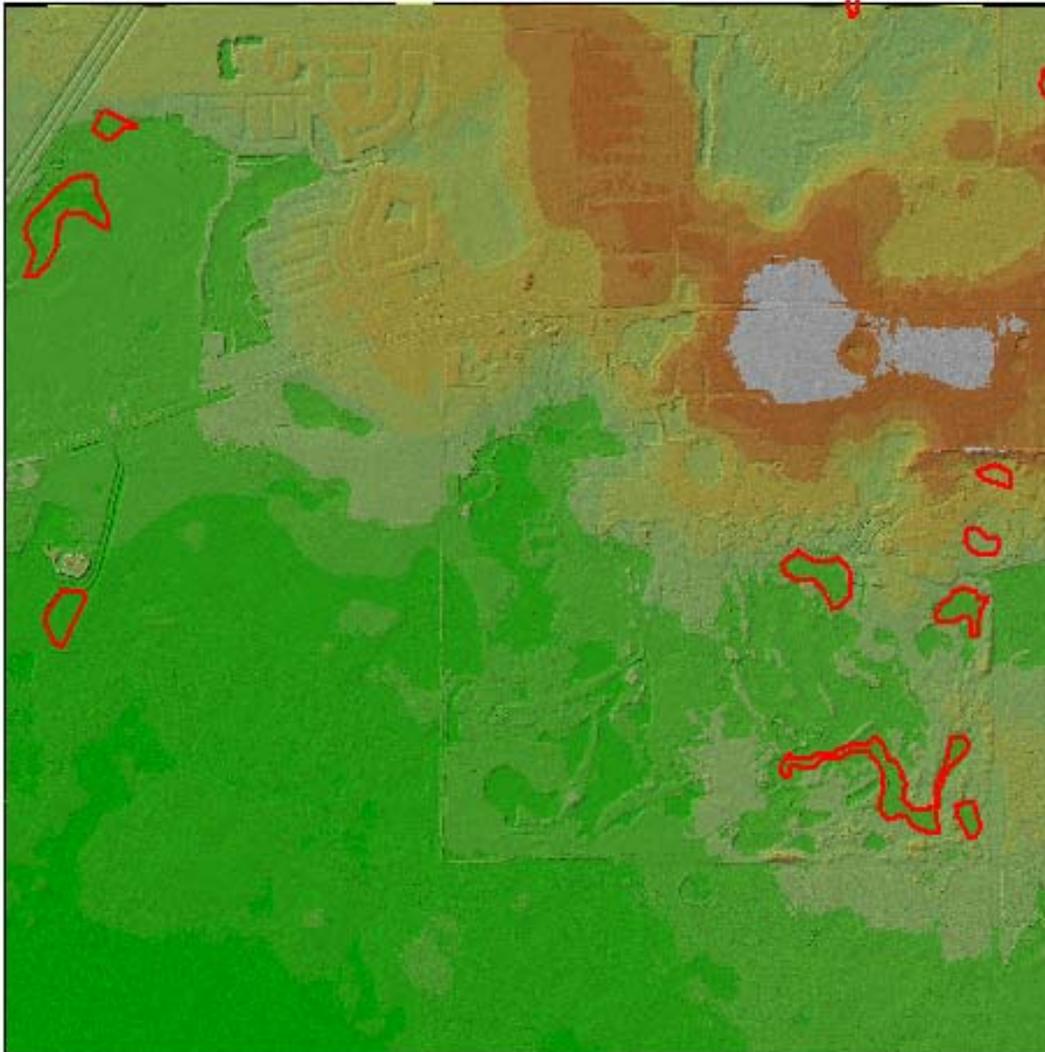
Tile: P_000008- Water points not vaporized



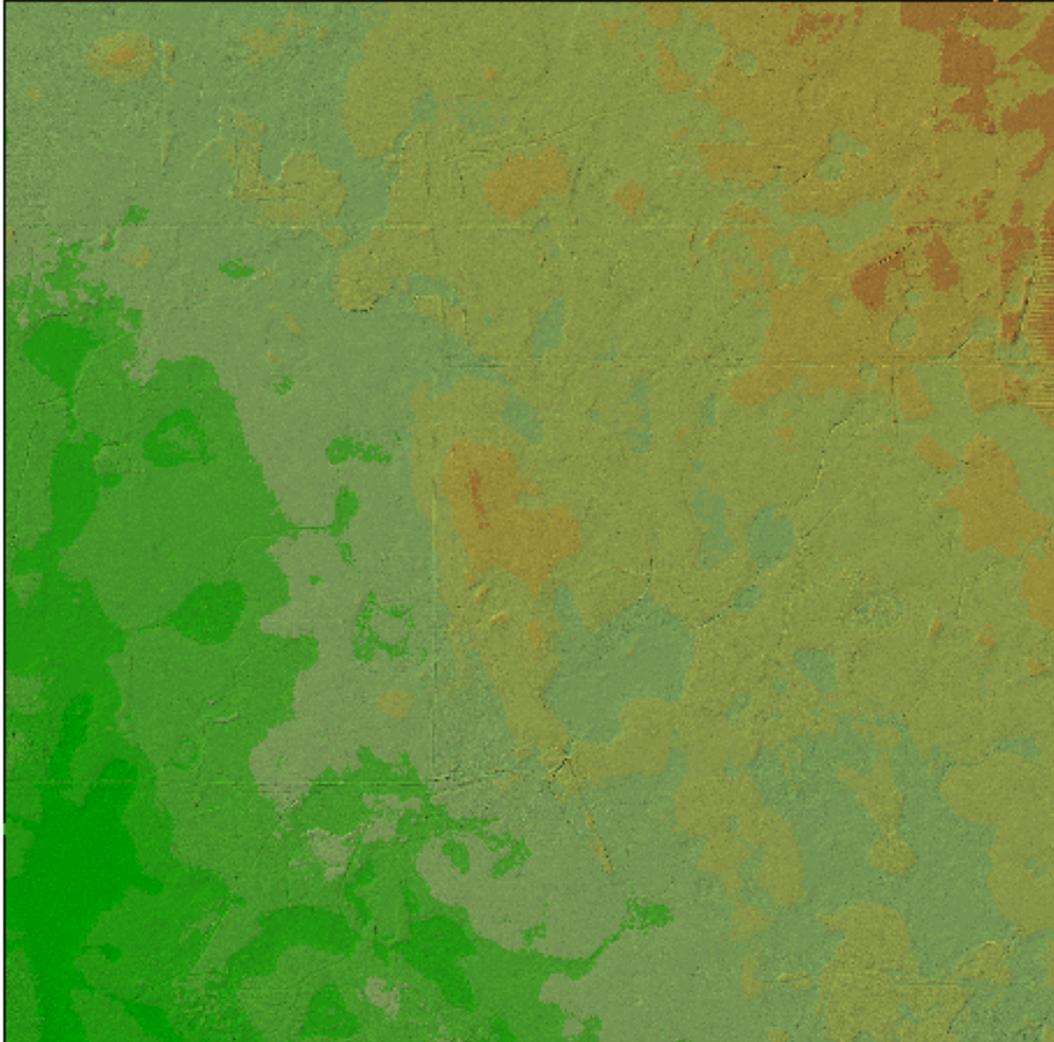
Tile: P_000009- Water points not vaporized



Tile: P_000010- Water points not vaporized



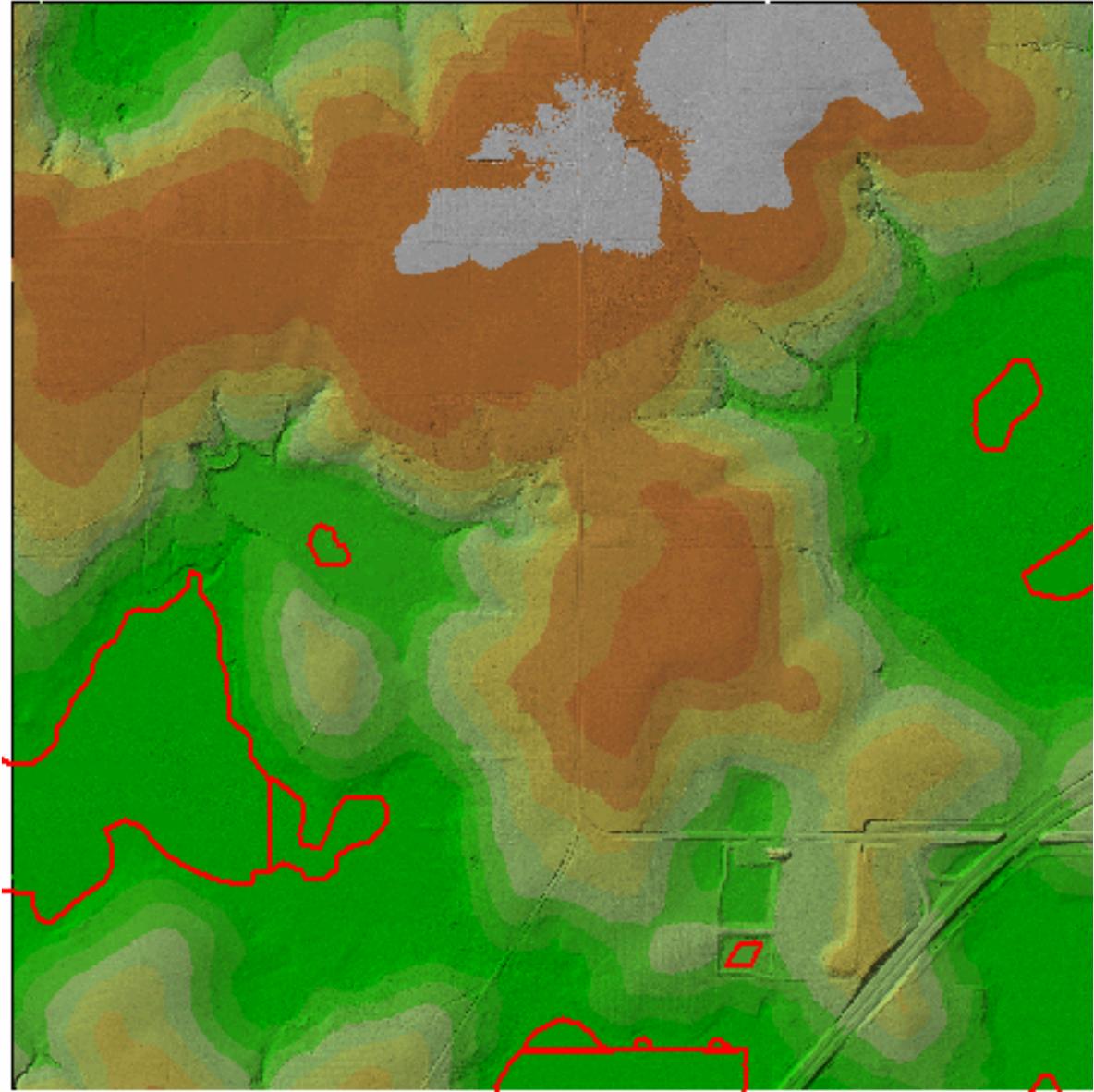
Tile: P_000011- Water points not vaporized



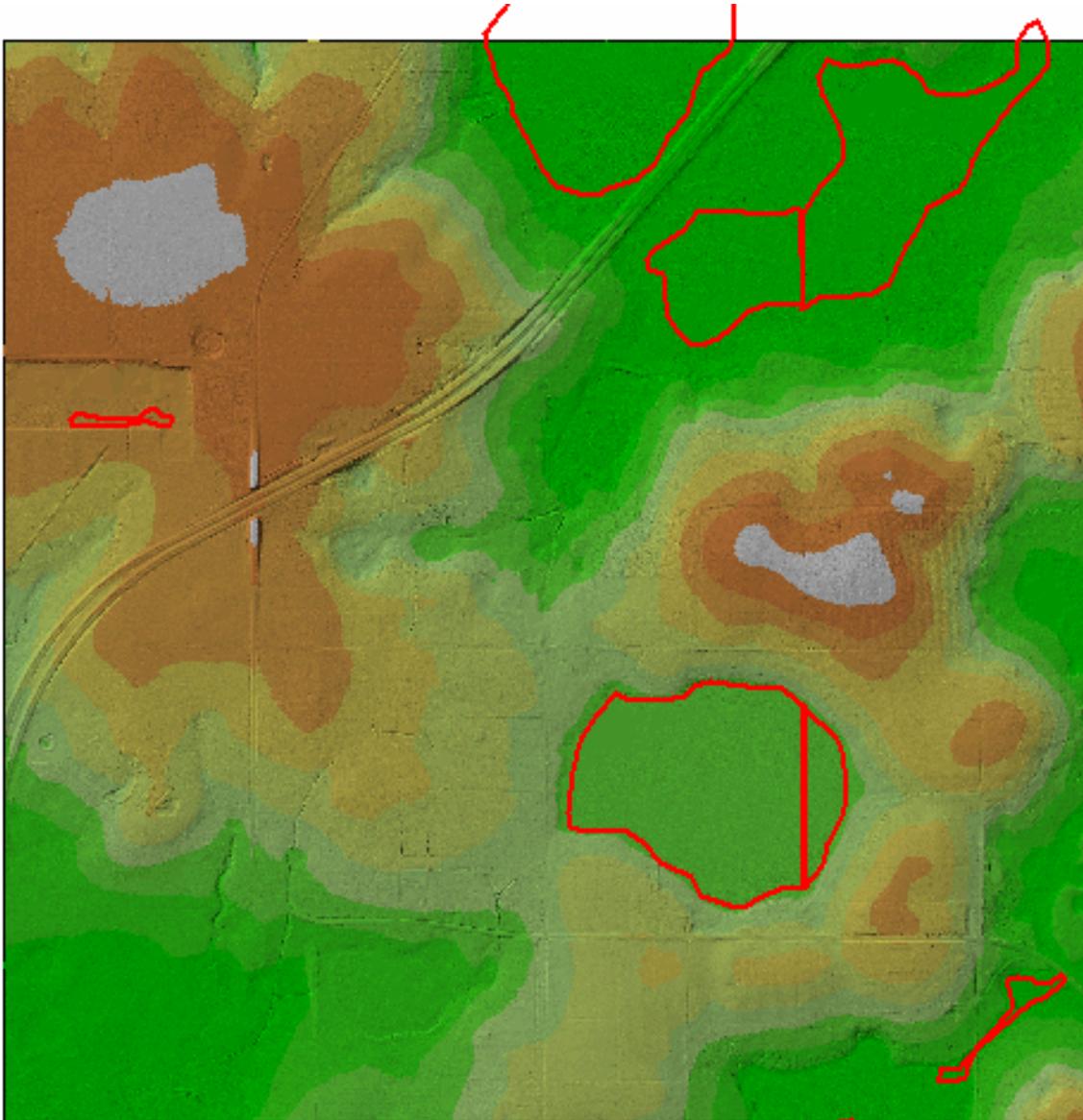
Tile: P_000012- Water points not vaporized



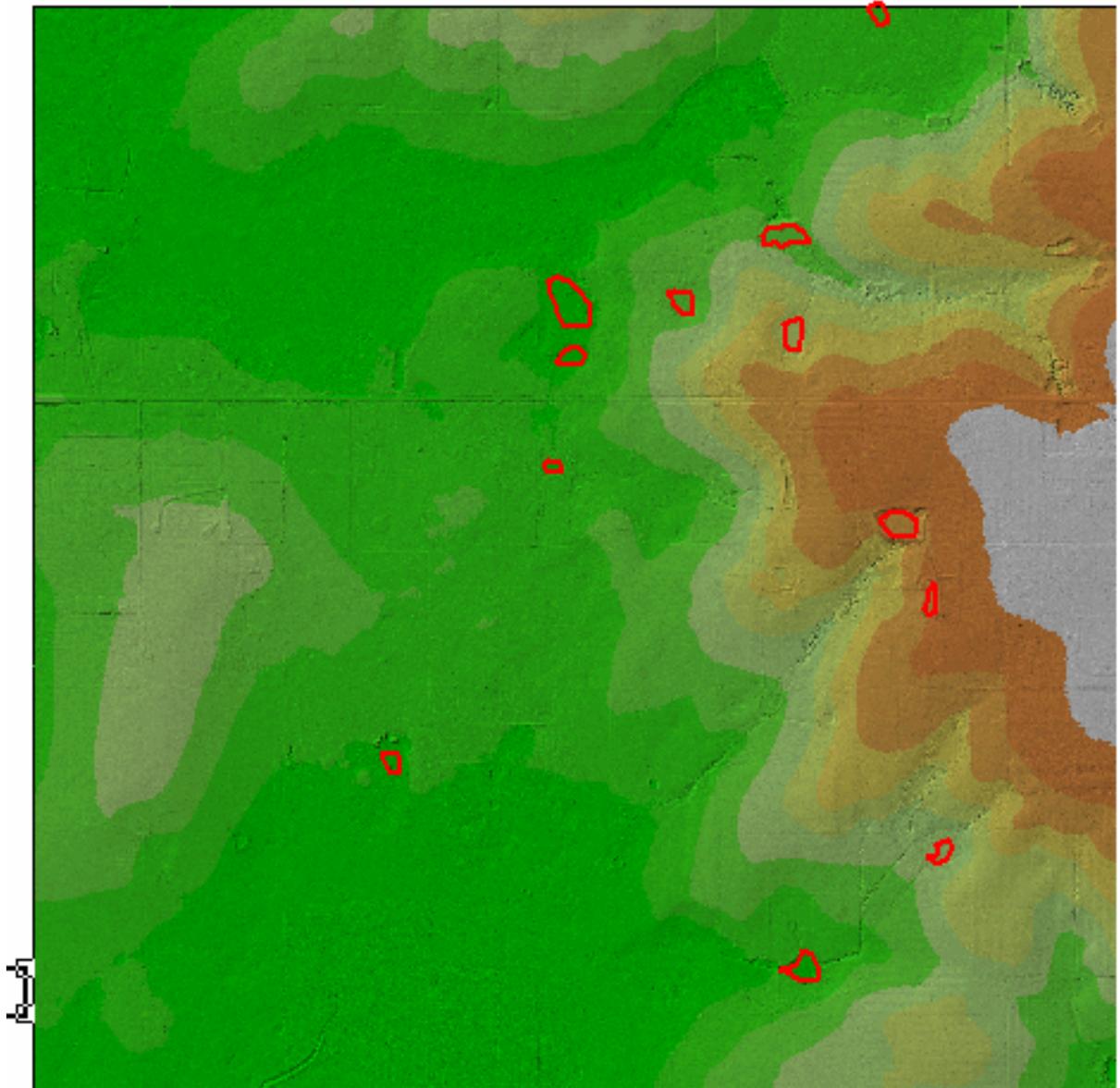
Tile: Q_000003- Water points not vaporized



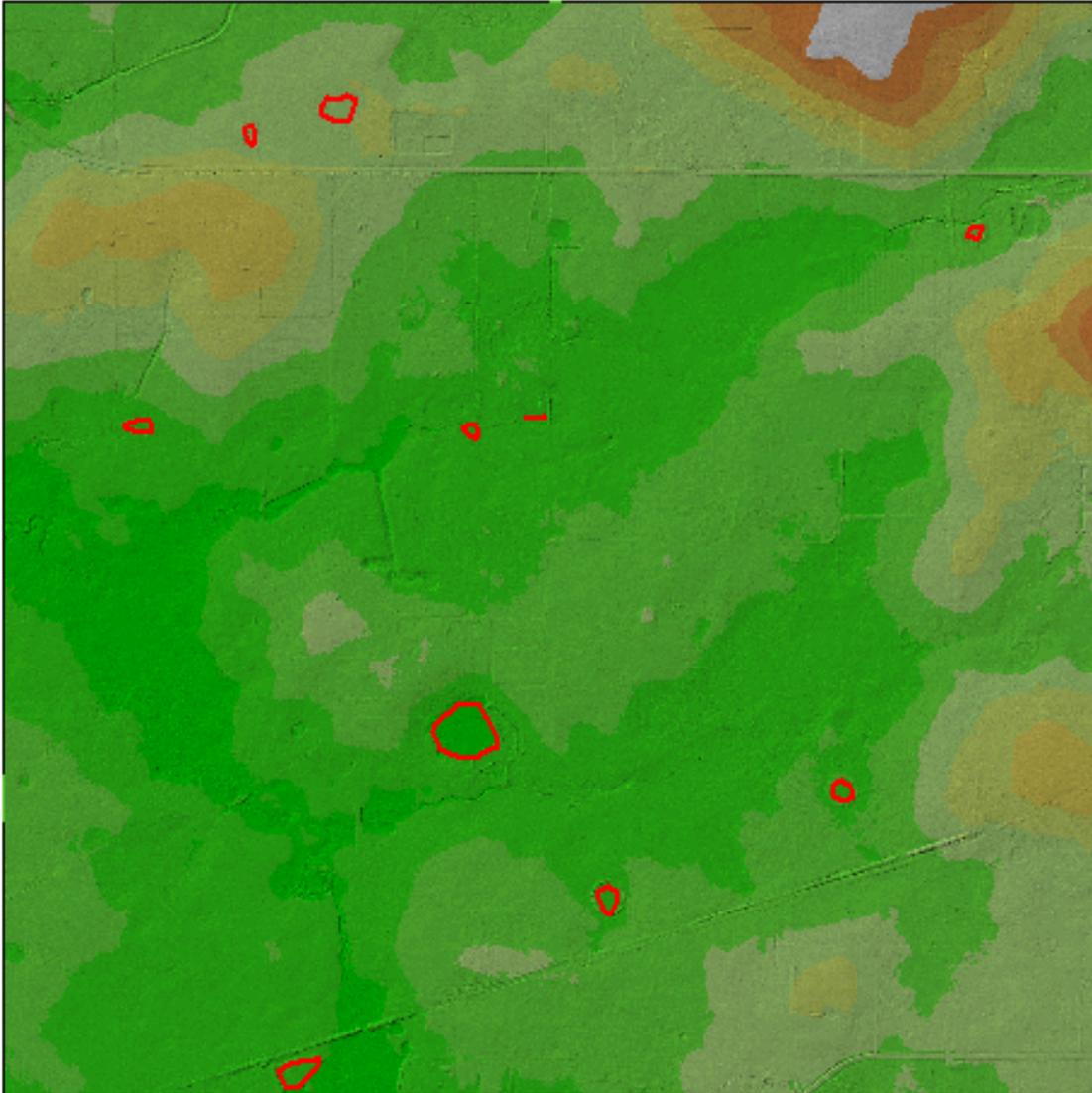
Tile: Q_000004- Water points not vaporized



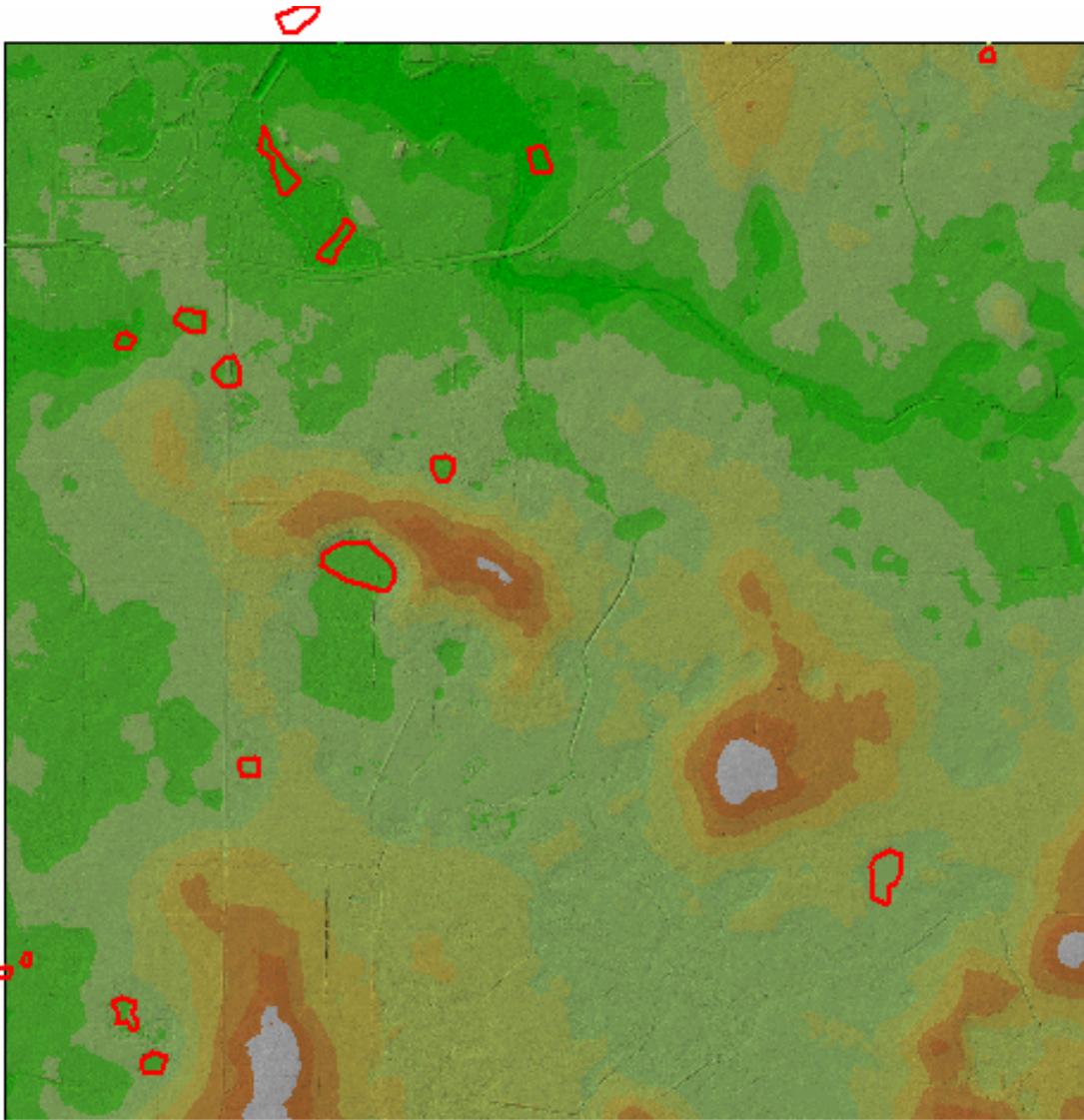
Tile: Q_000005- Water points not vaporized



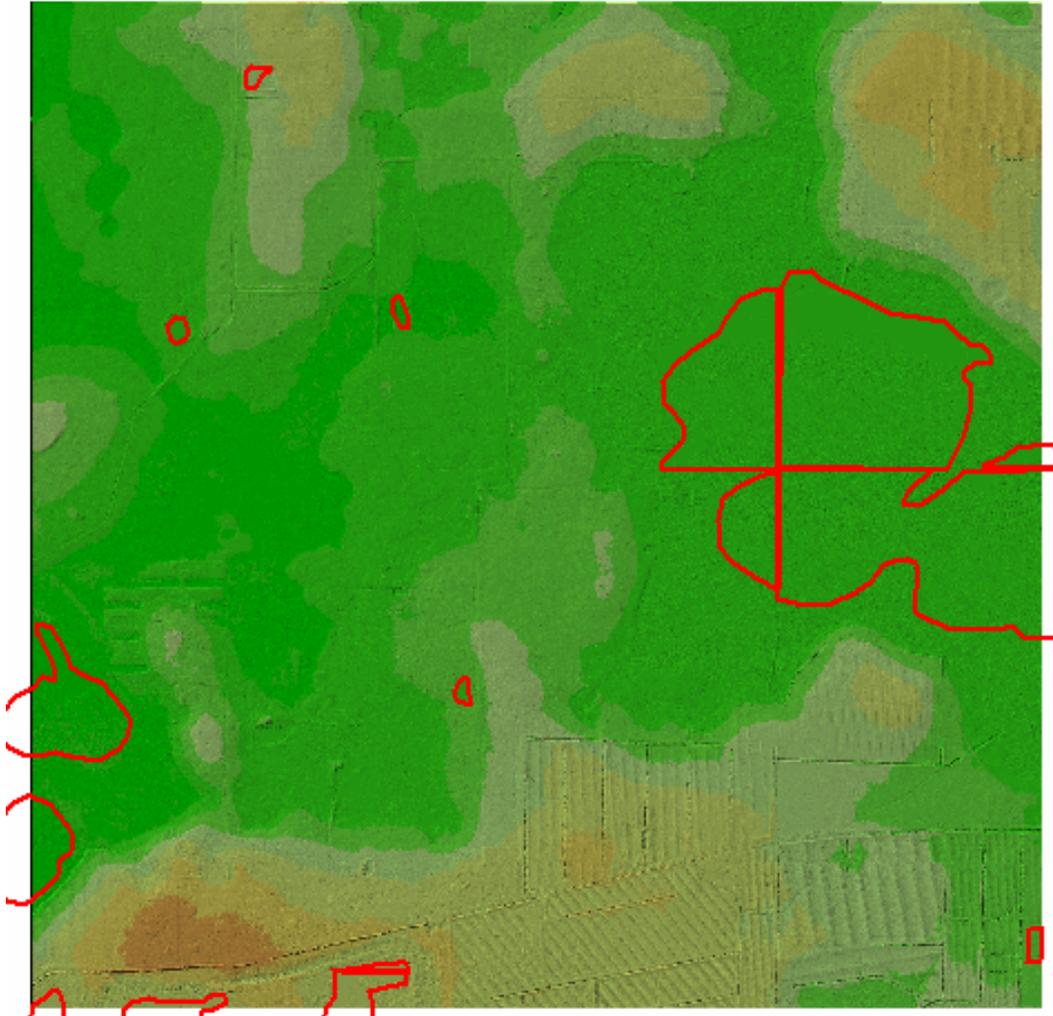
Tile: Q_000006- Water points not vaporized



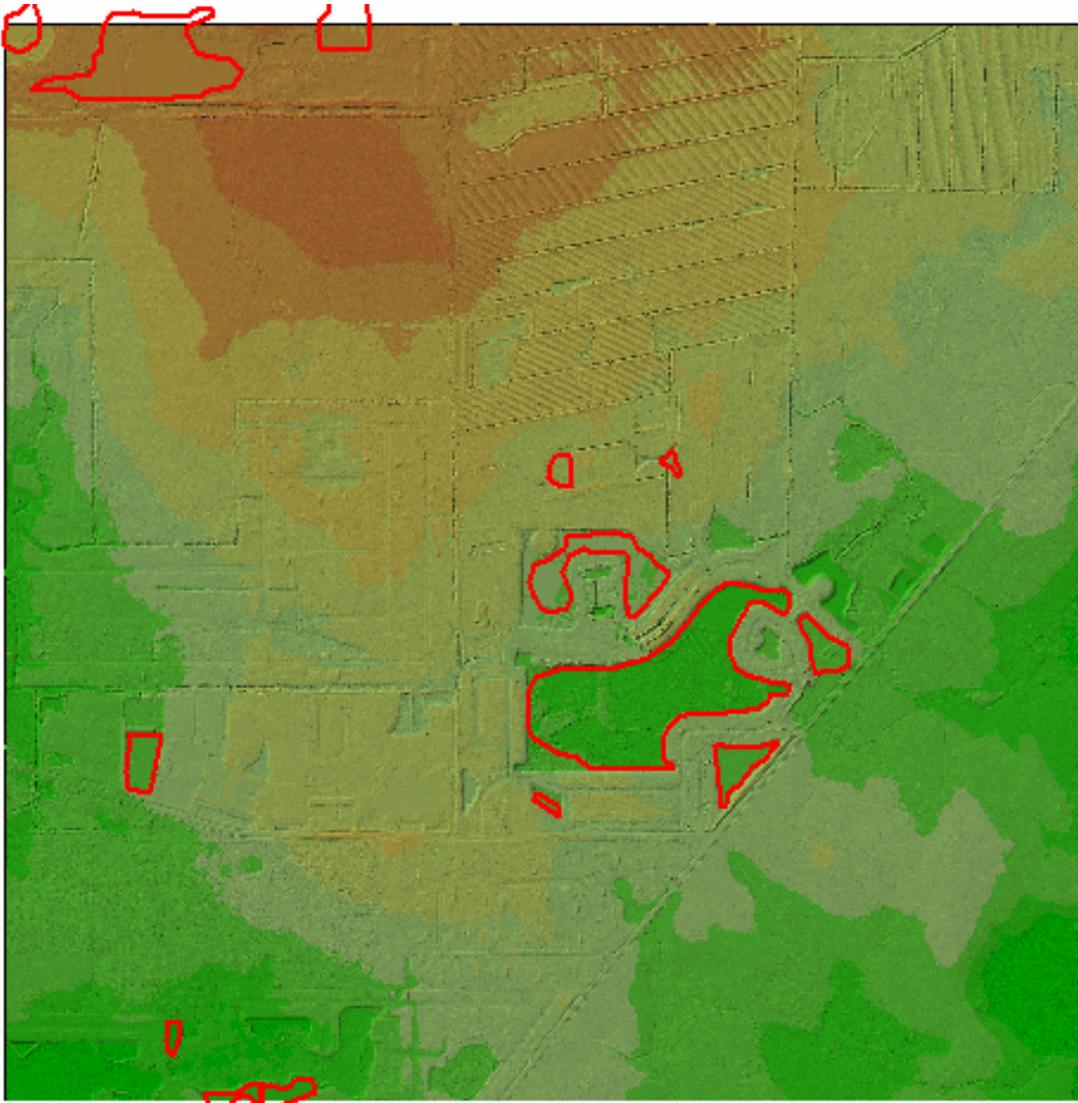
Tile: Q_000007- Water points not vaporized



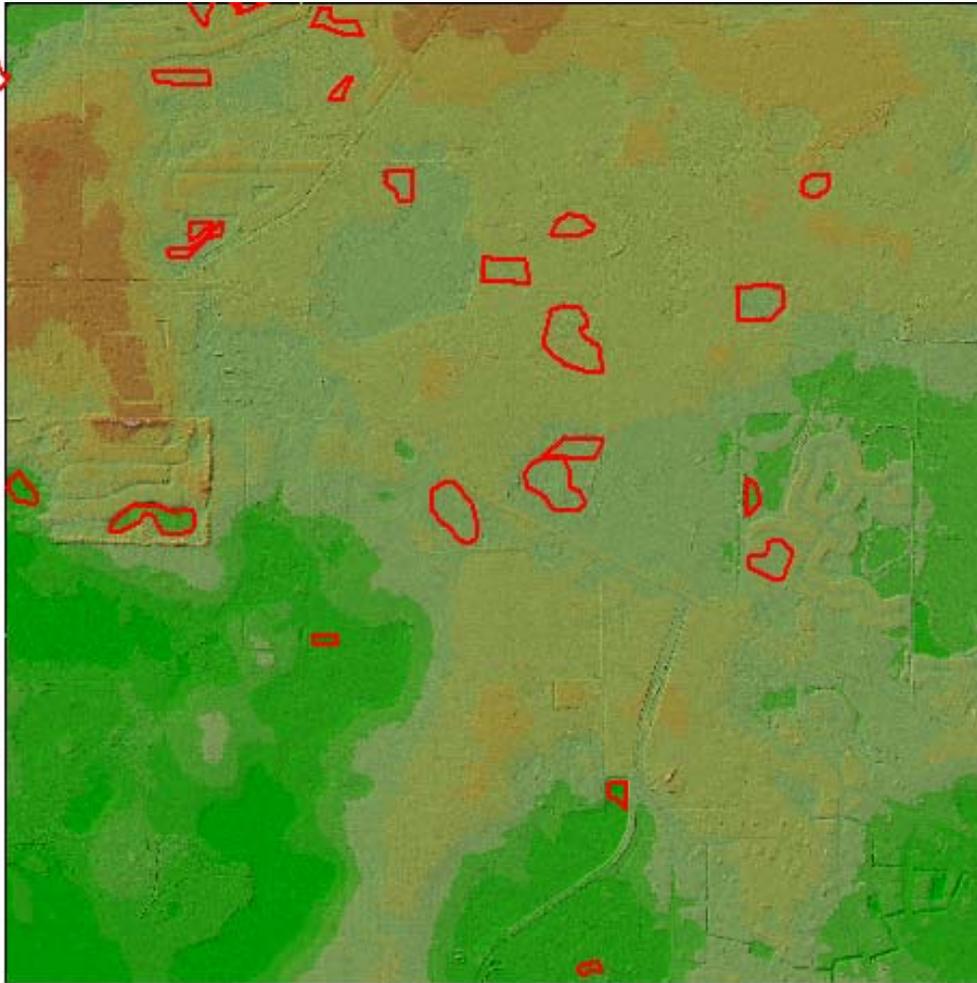
Tile: Q_000008- Water points not vaporized



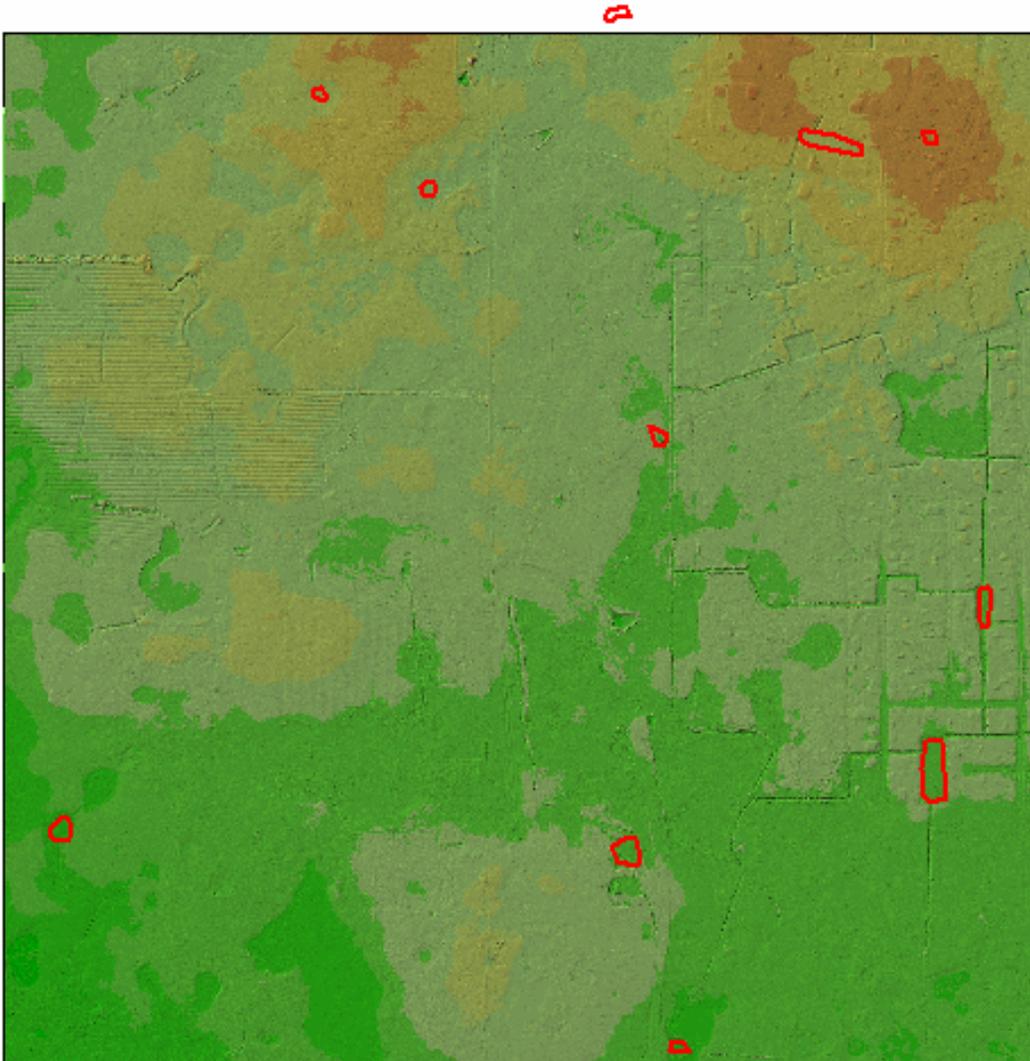
Tile: Q_000009- Water points not vaporized



Tile: Q_000010- Water points not vaporized



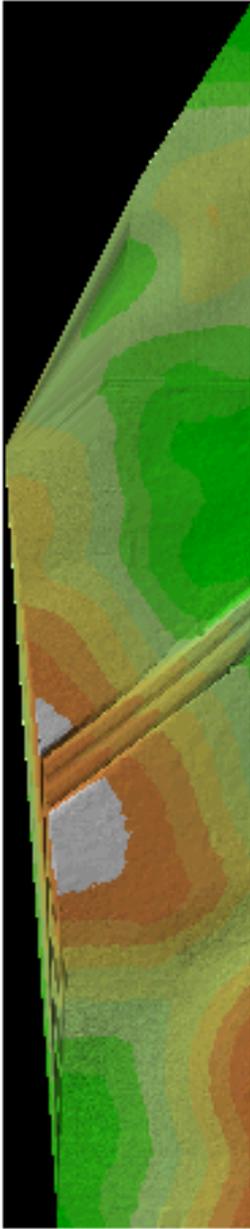
Tile: Q_000011- Water points not vaporized



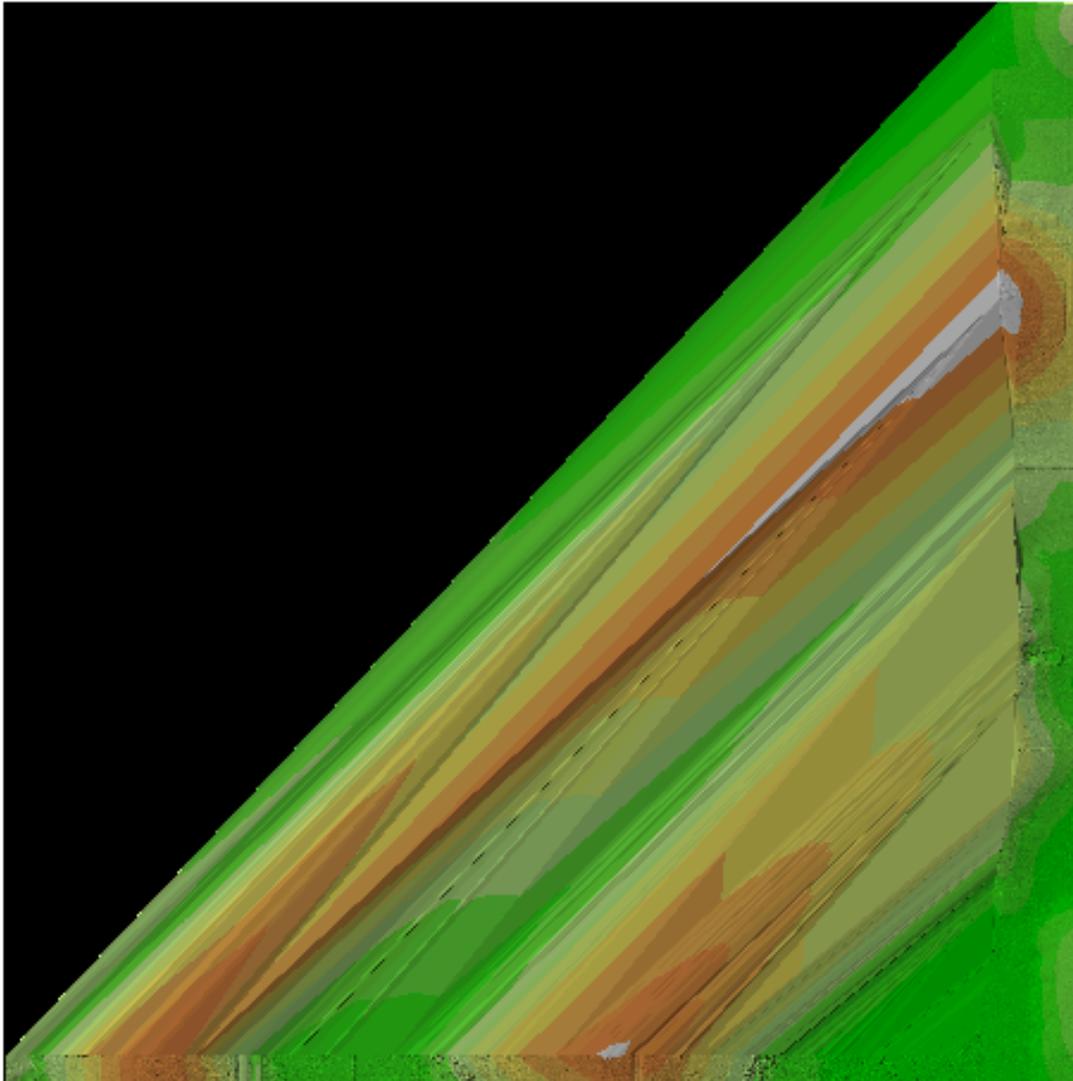
Tile: Q_000012- Water points not vaporized



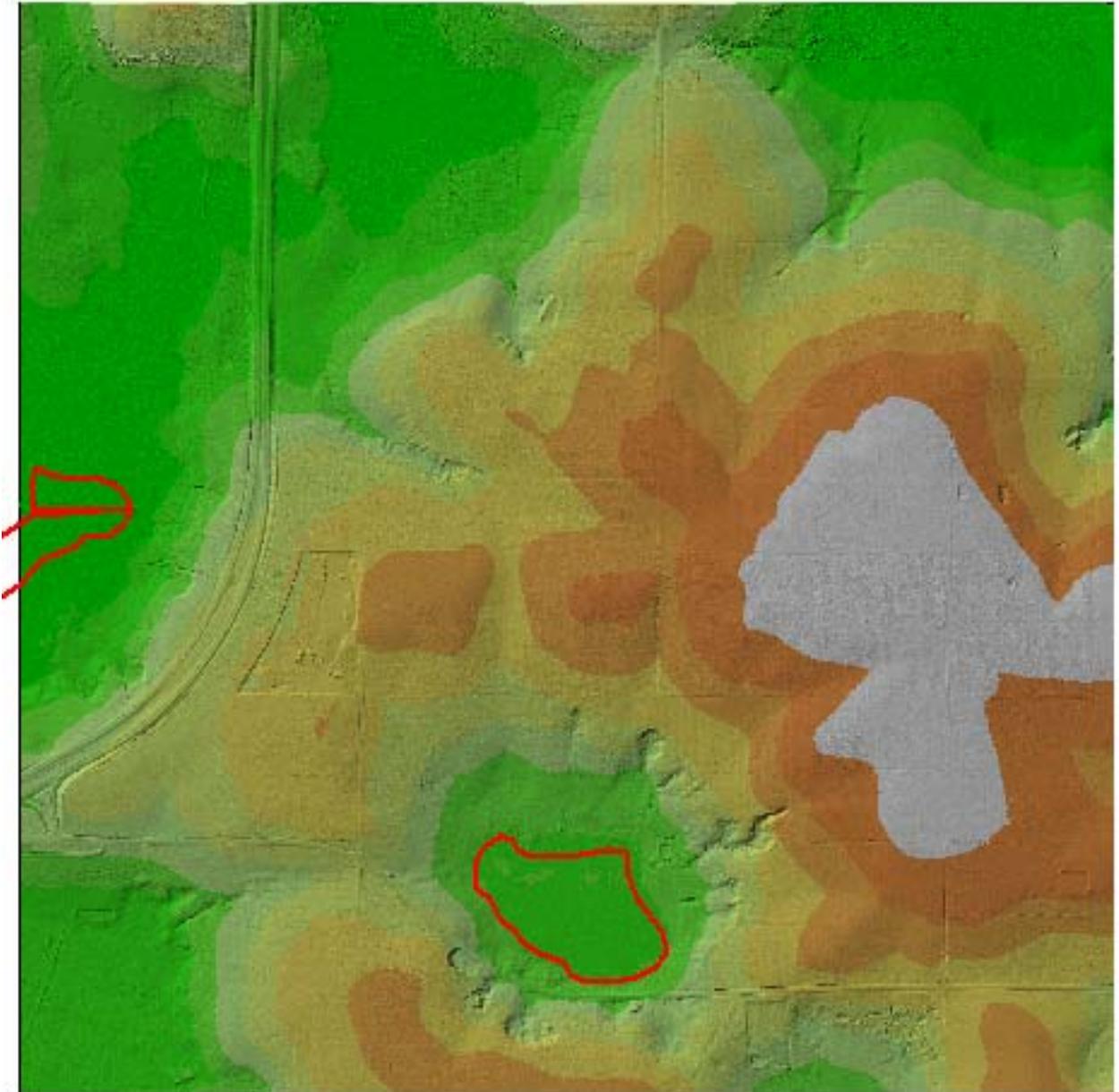
Tile: R_000001- Water points not vaporized



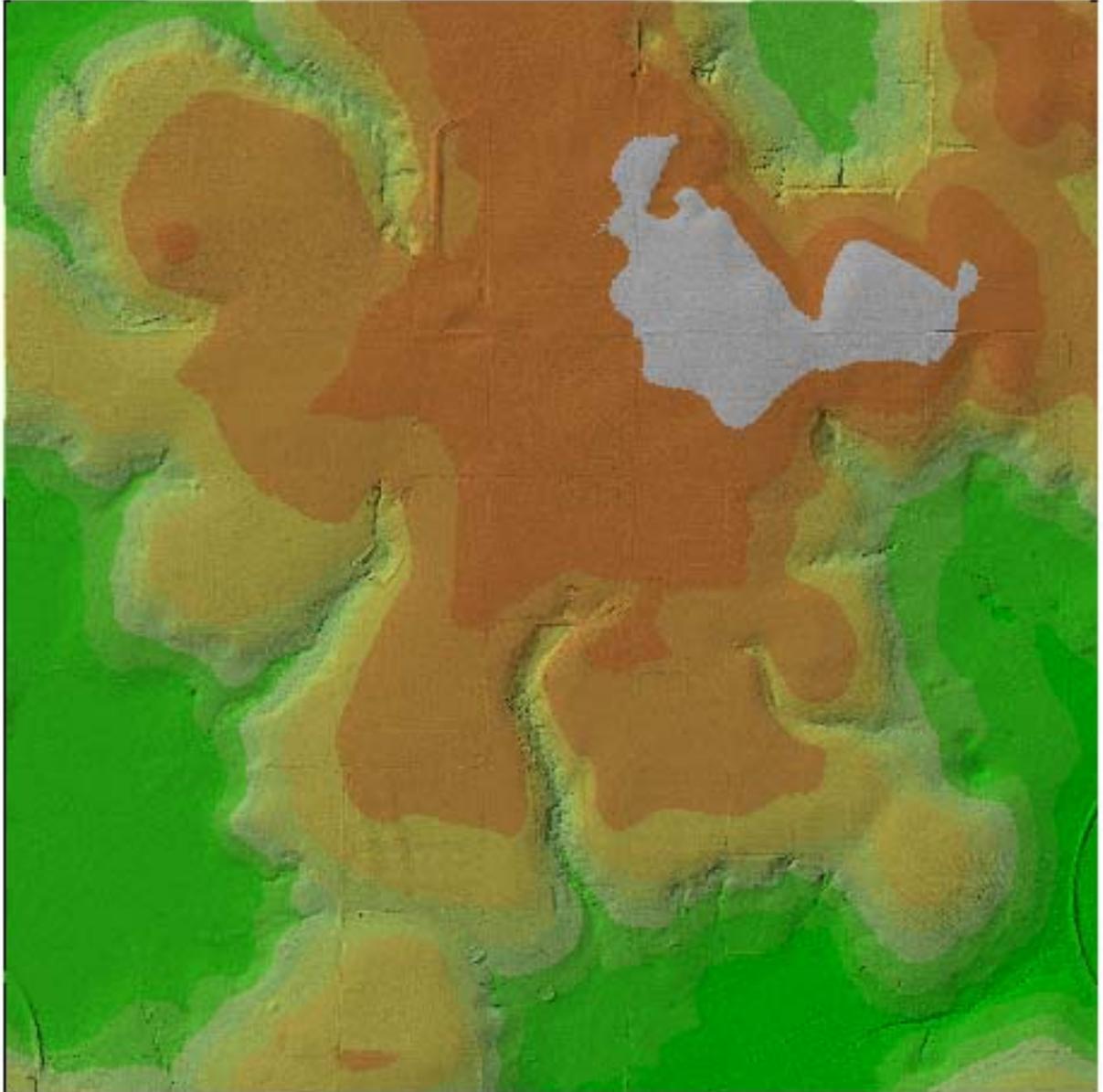
Tile: R_000002- Water points not vaporized



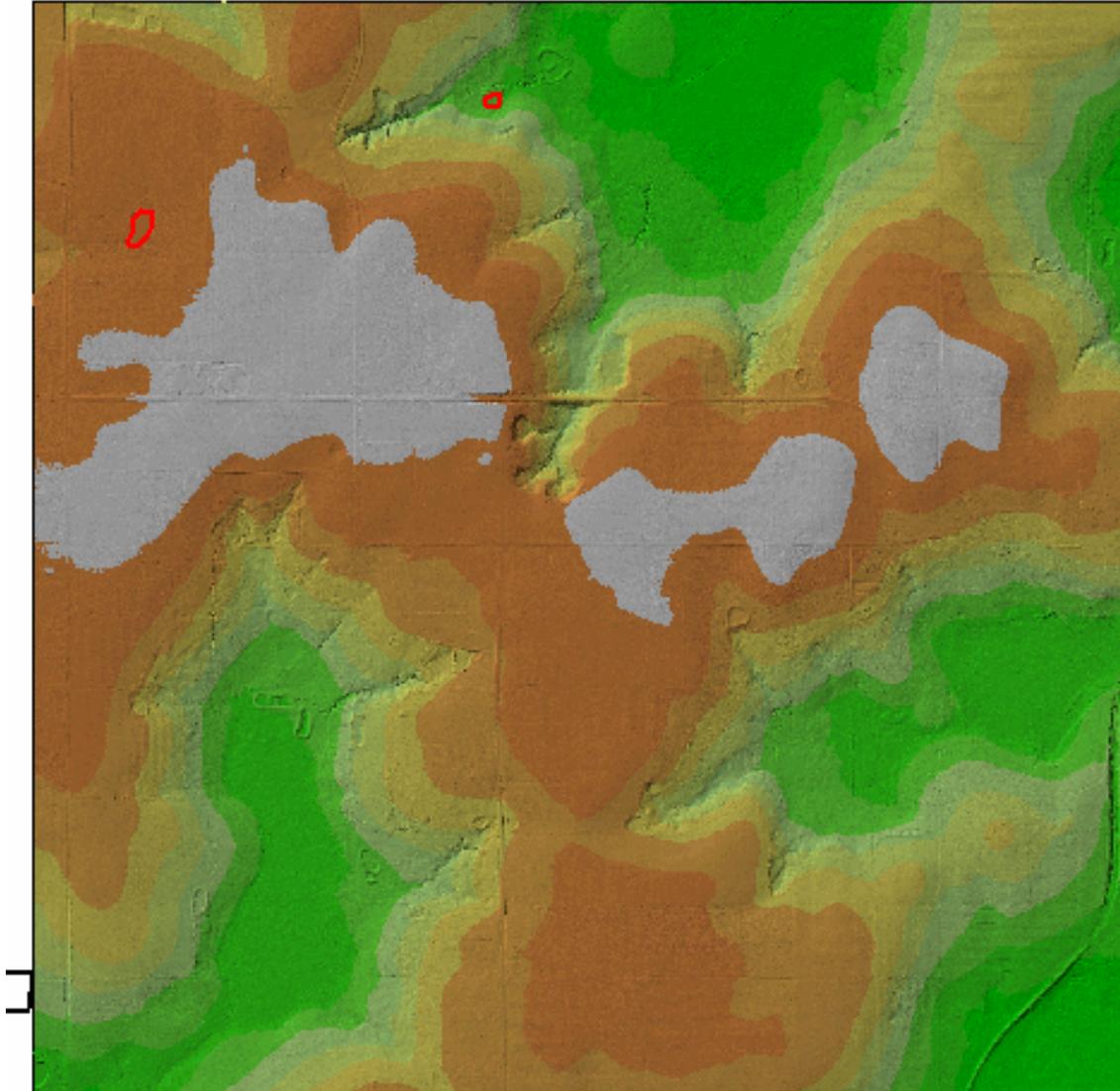
Tile: R_000003- Water points not vaporized



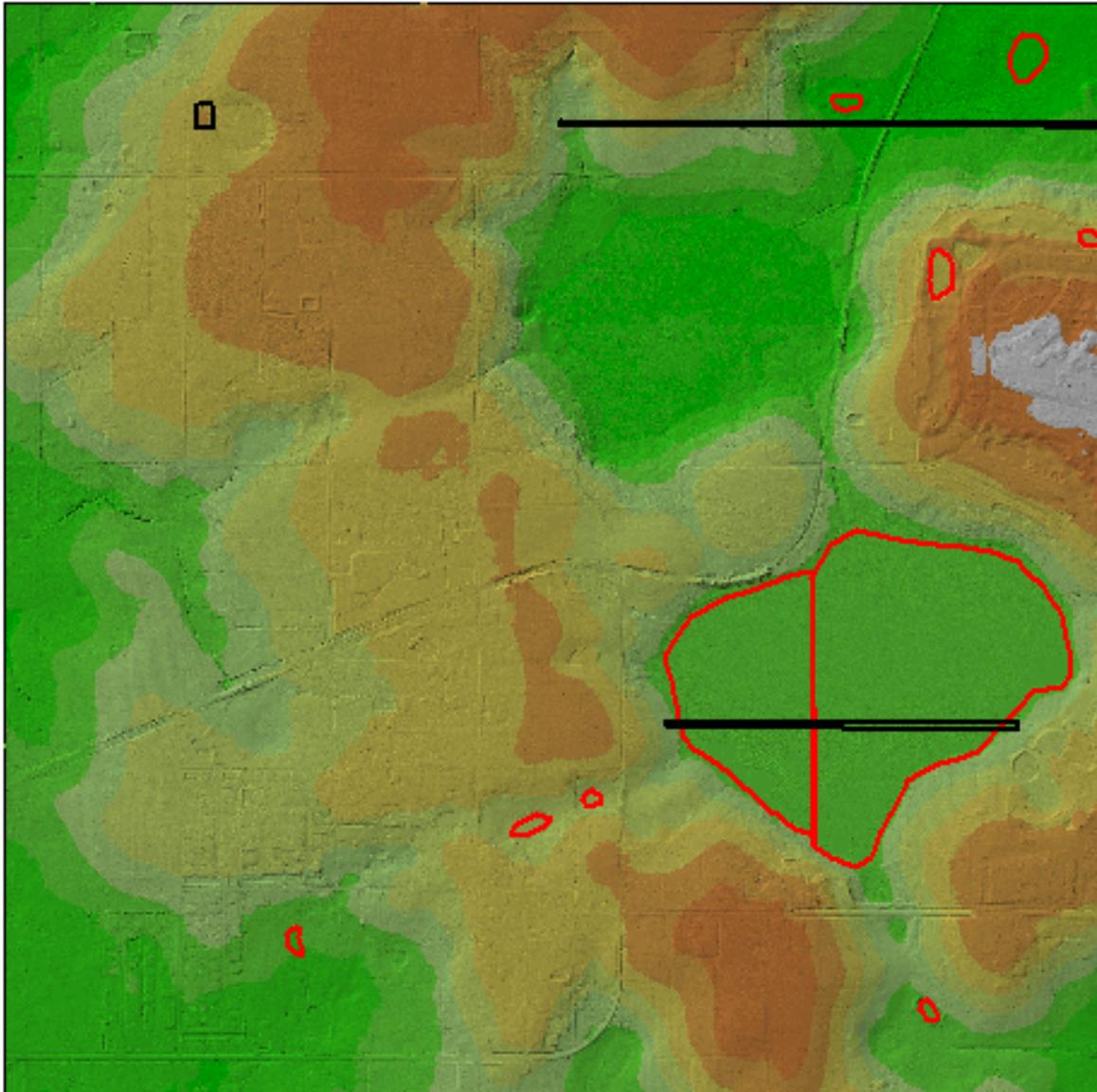
Tile: R_000004- Water points not vaporized



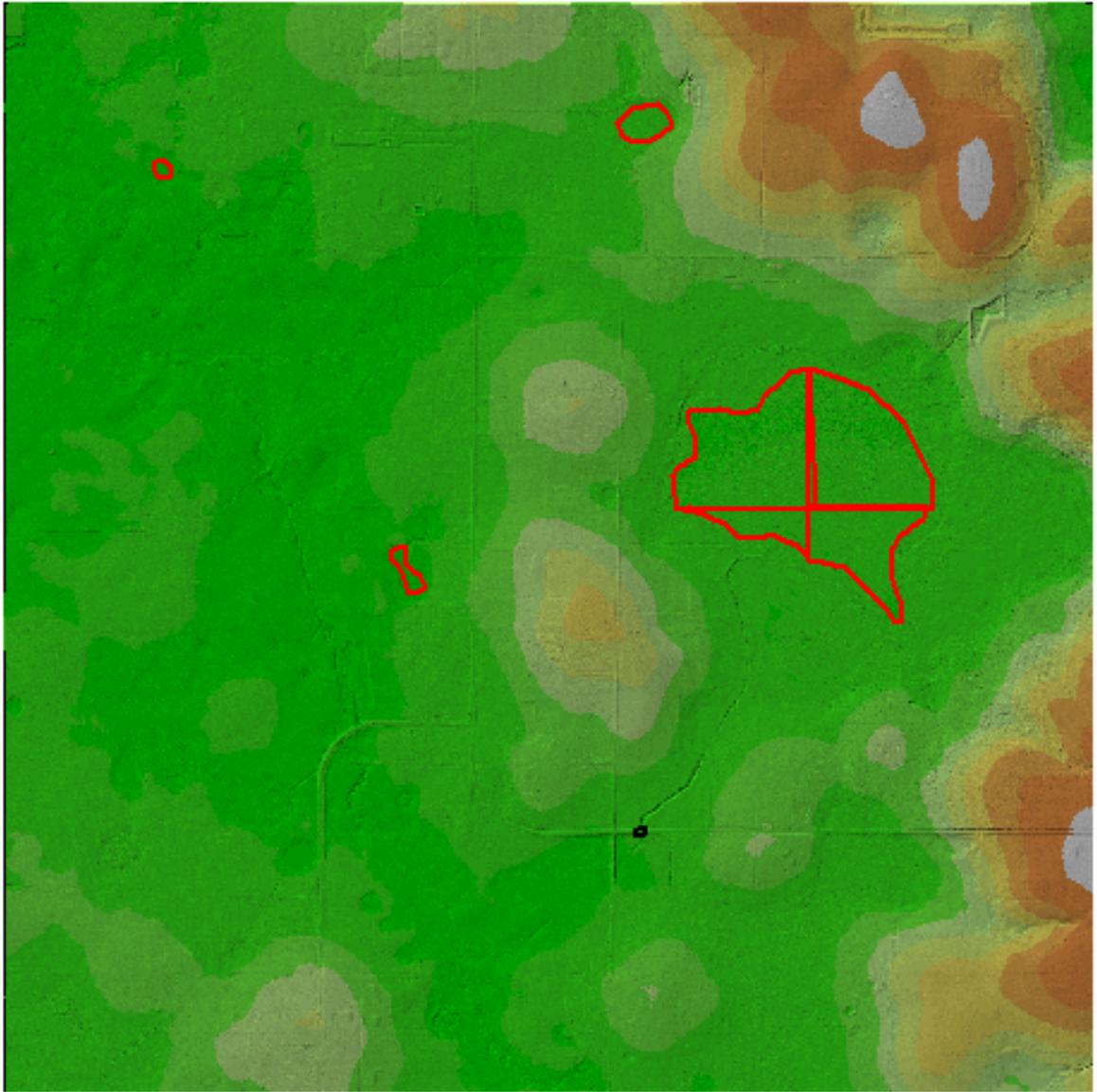
Tile: R_000005- Water points not vaporized

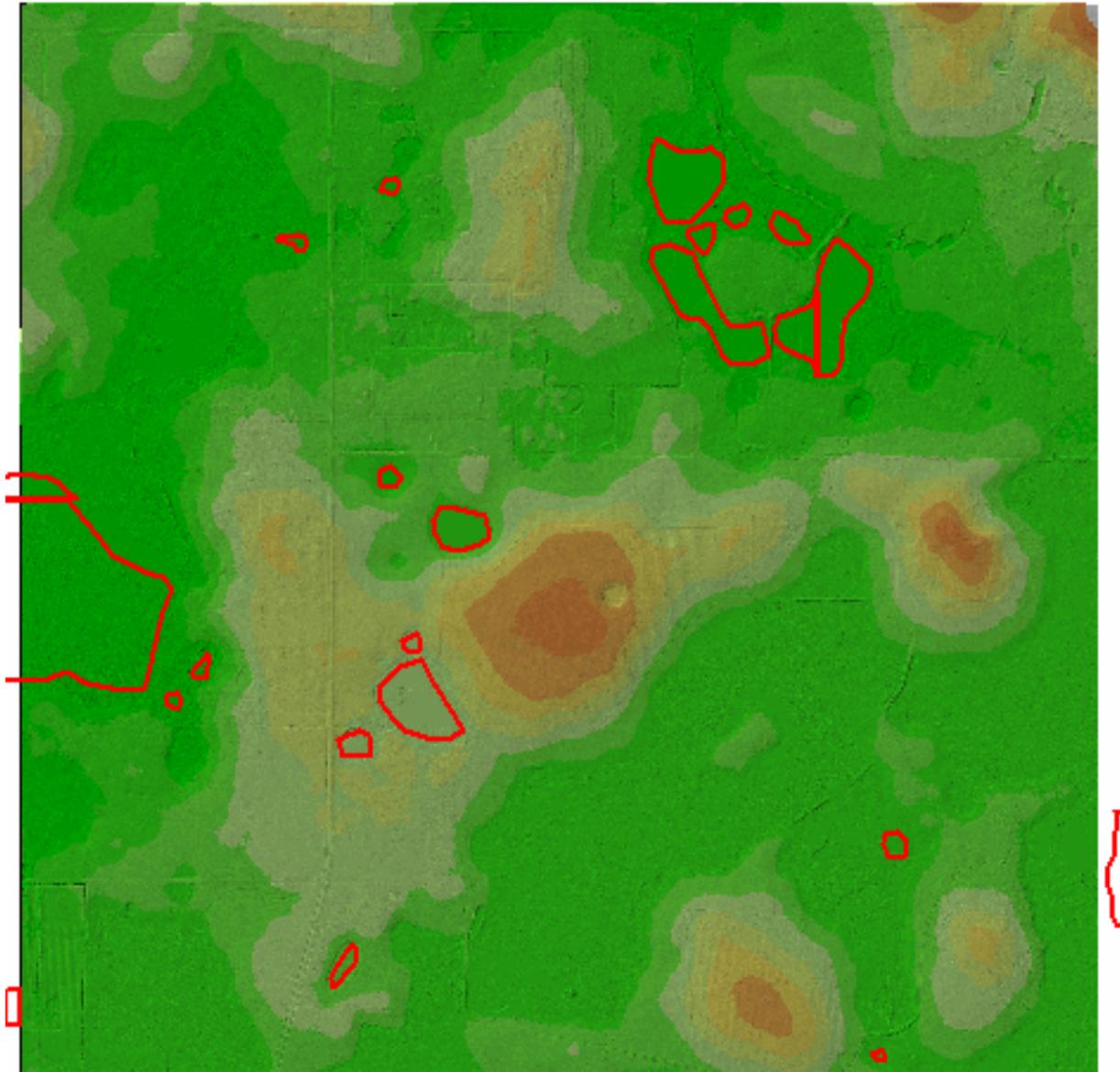


Tile: R_000006- Water points not vaporized

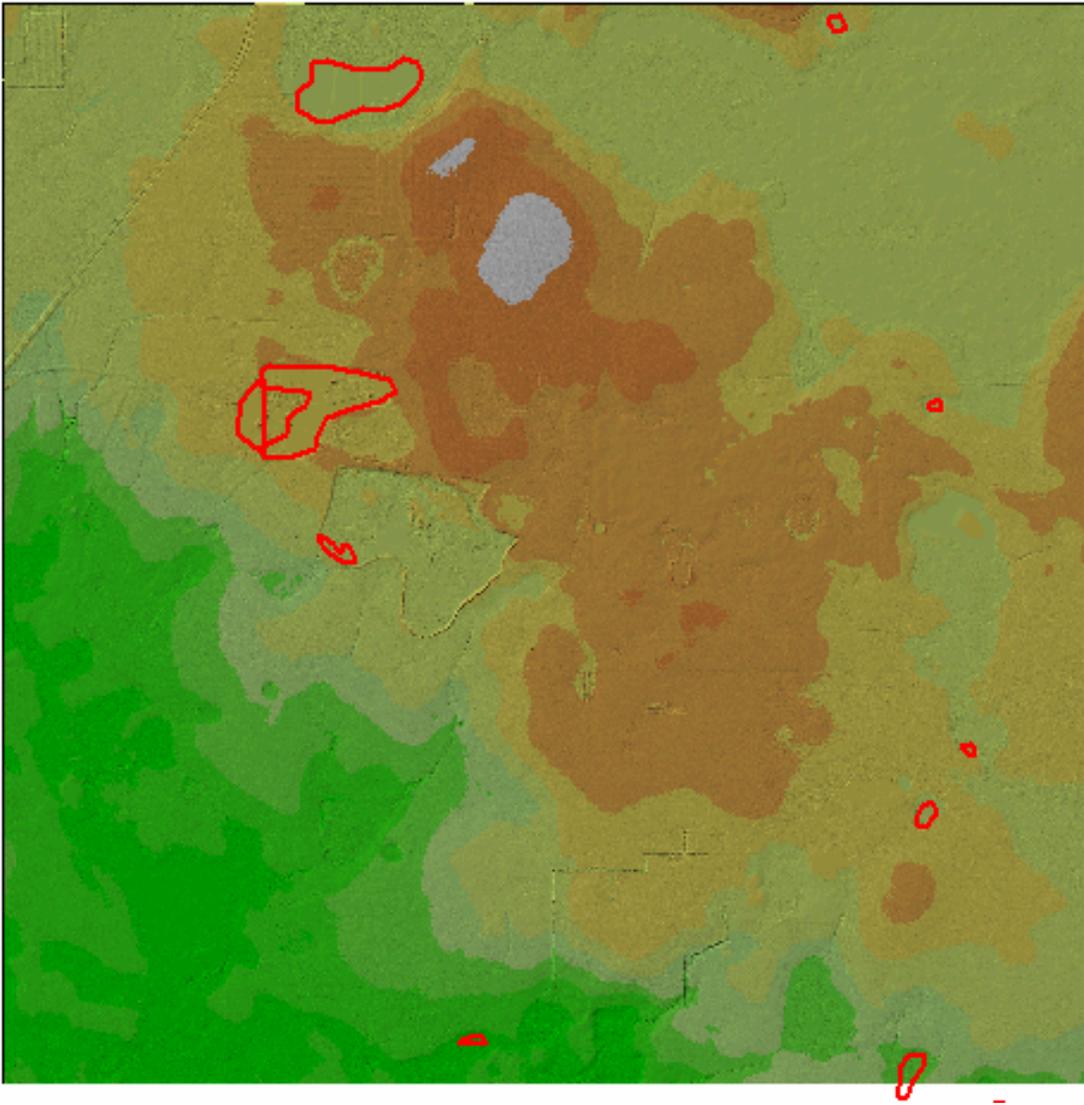


Tile: R_000007- Water points not vaporized

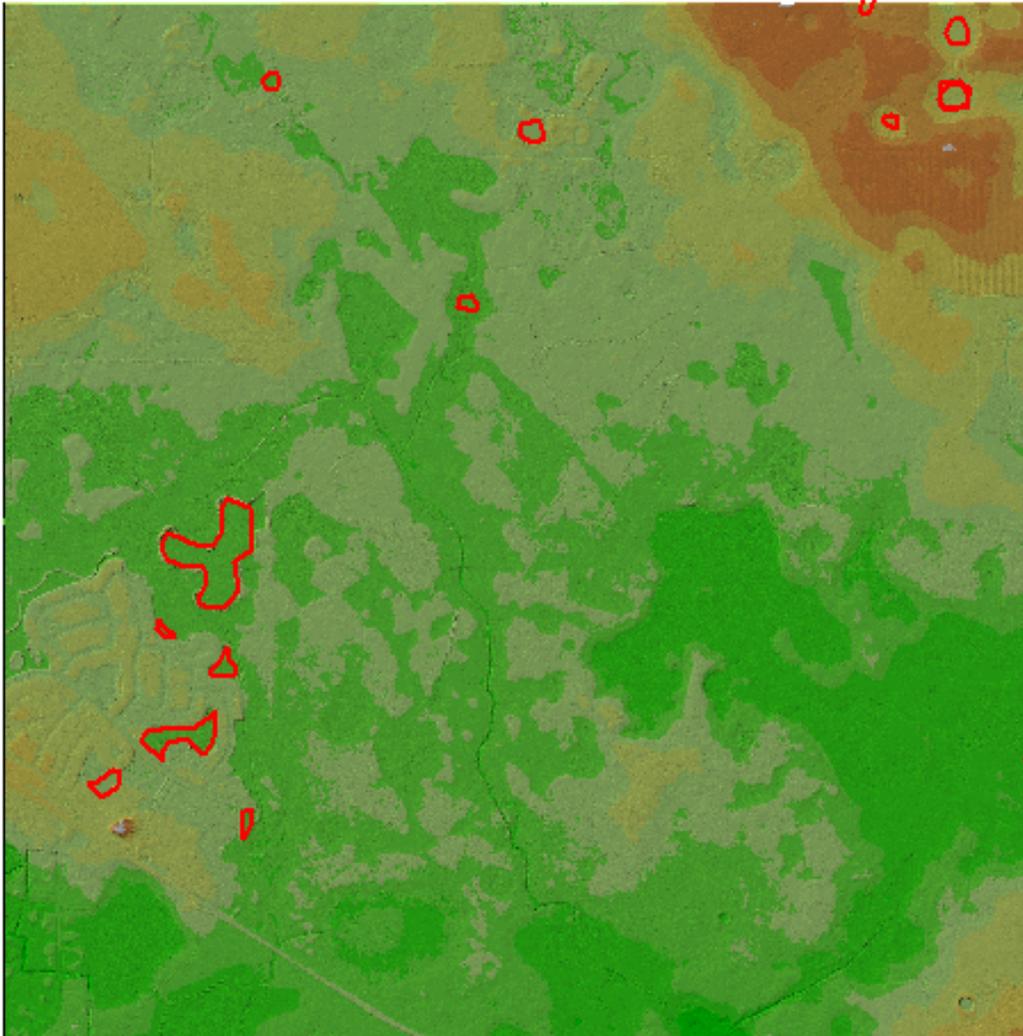




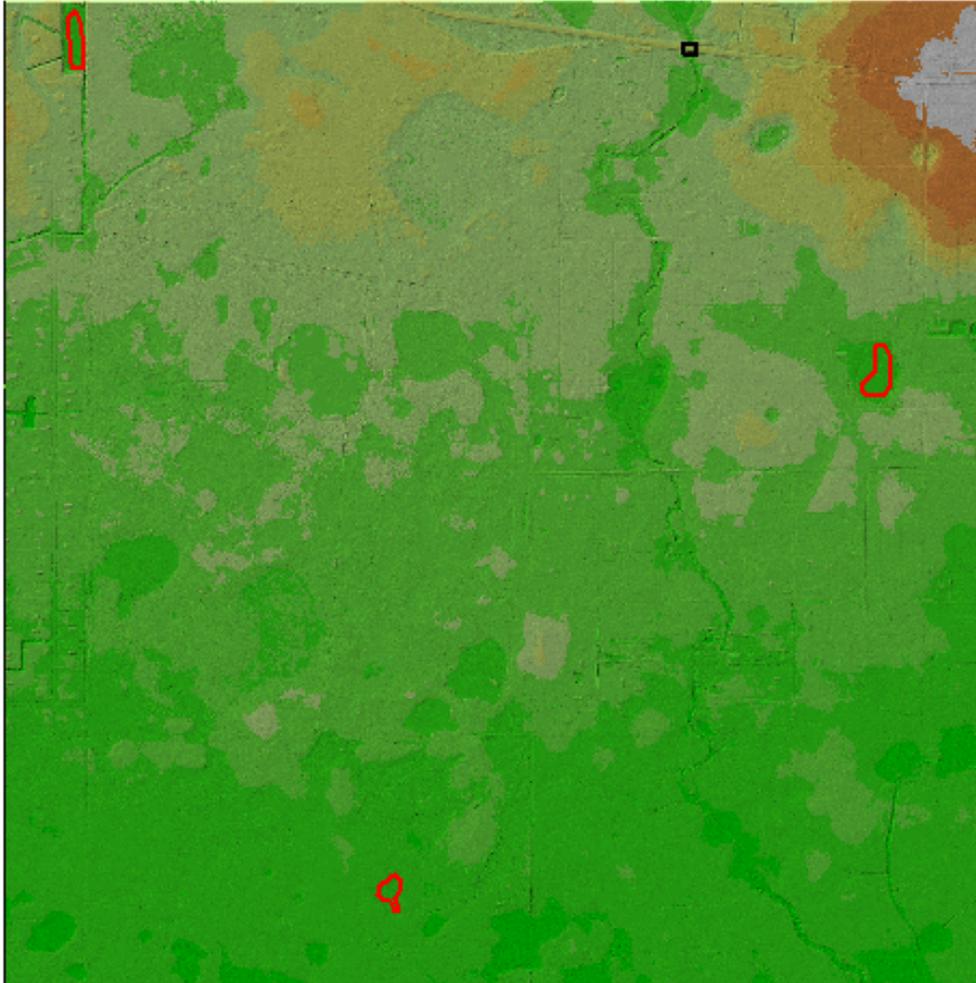
Tile: R_000009- Water points not vaporized



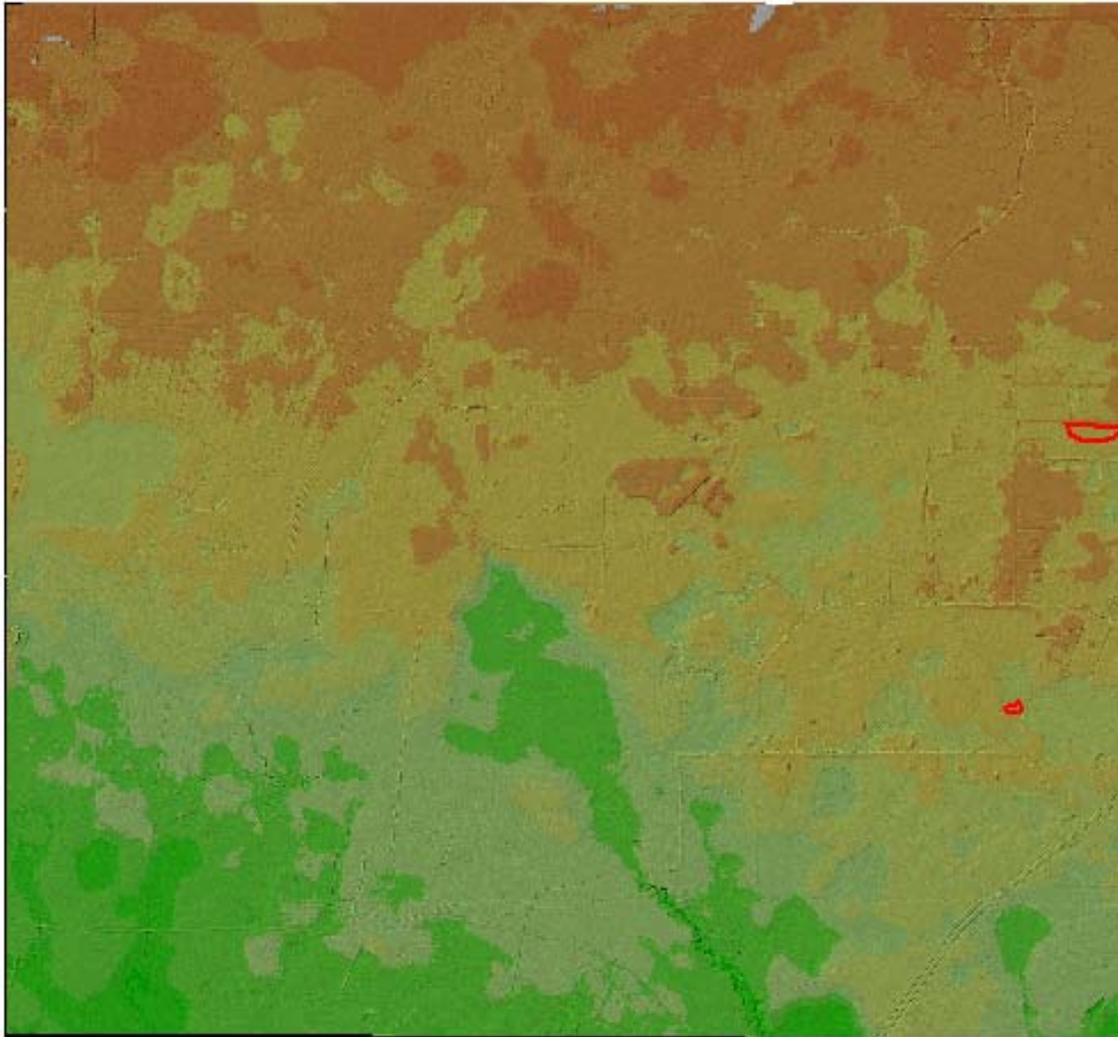
Tile: R_000010- Water points not vaporized



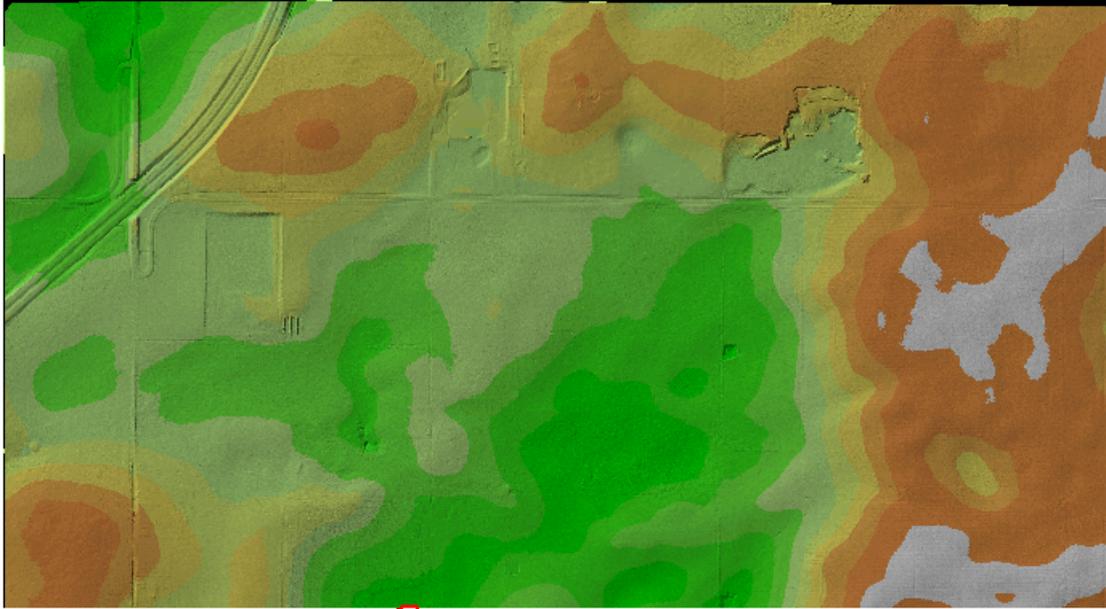
Tile: R_000011- Water points not vaporized and bridge.



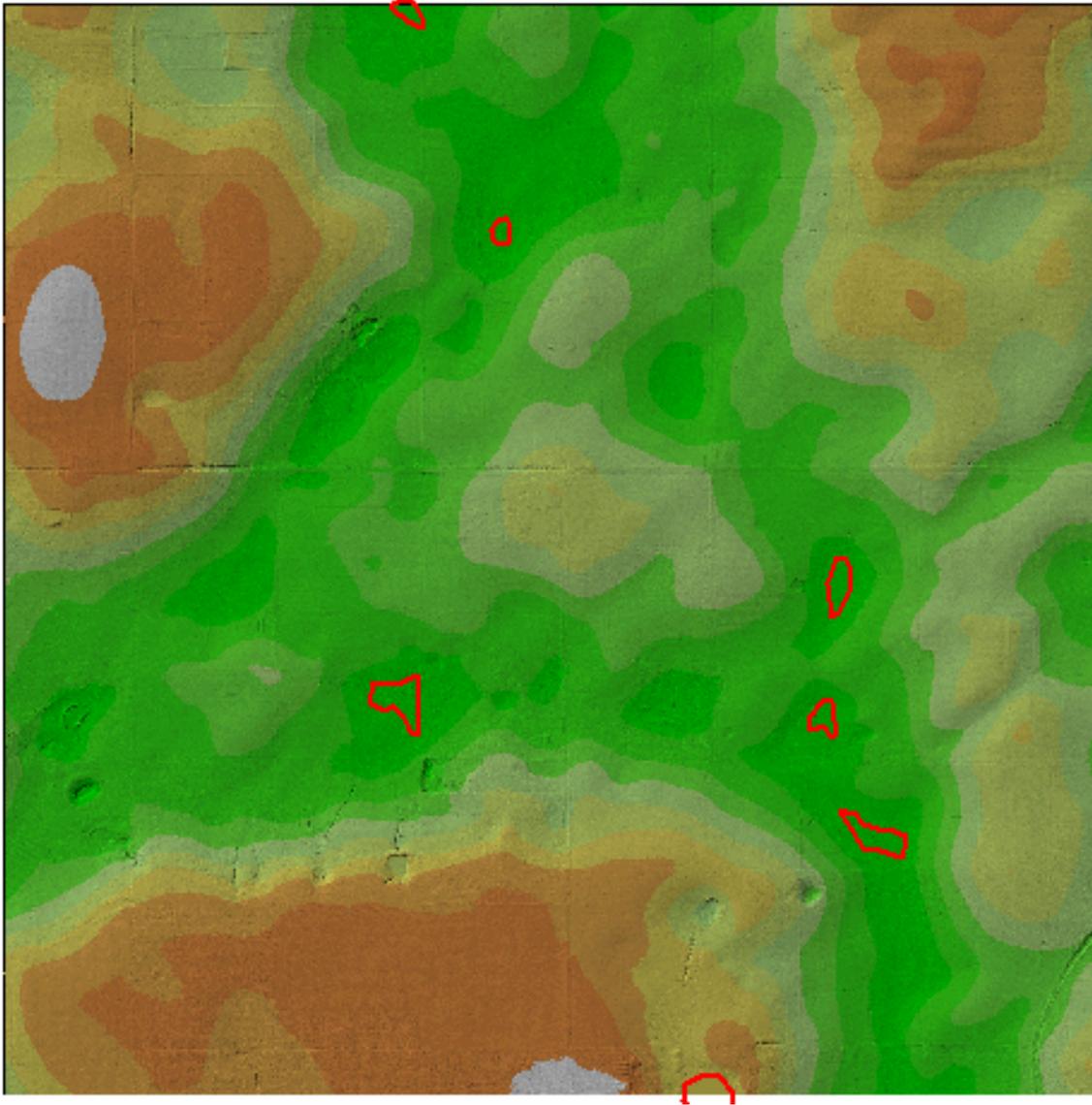
Tile: R_000012- Water points not vaporized



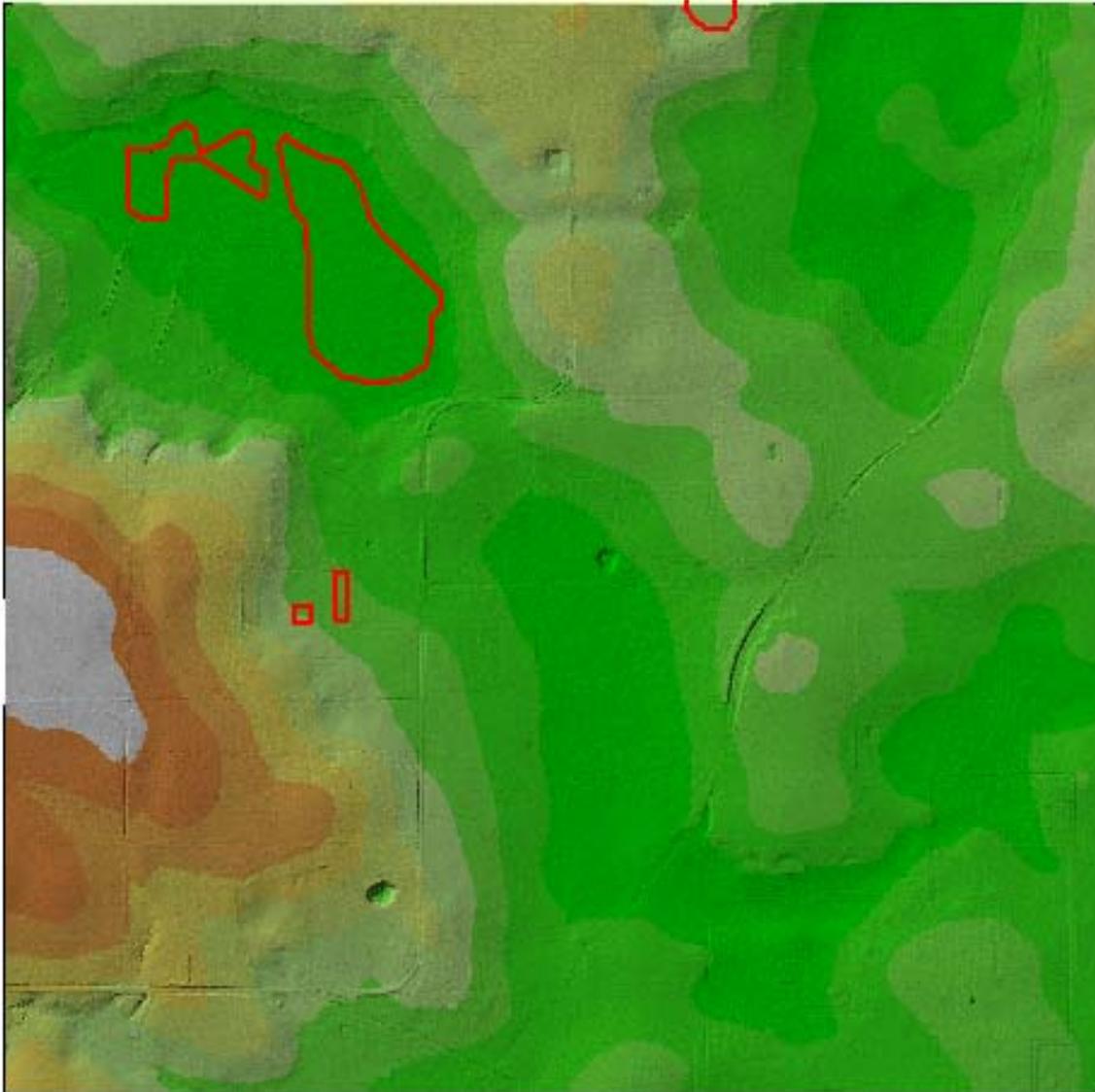
Tile: S_000001- Water points not vaporized



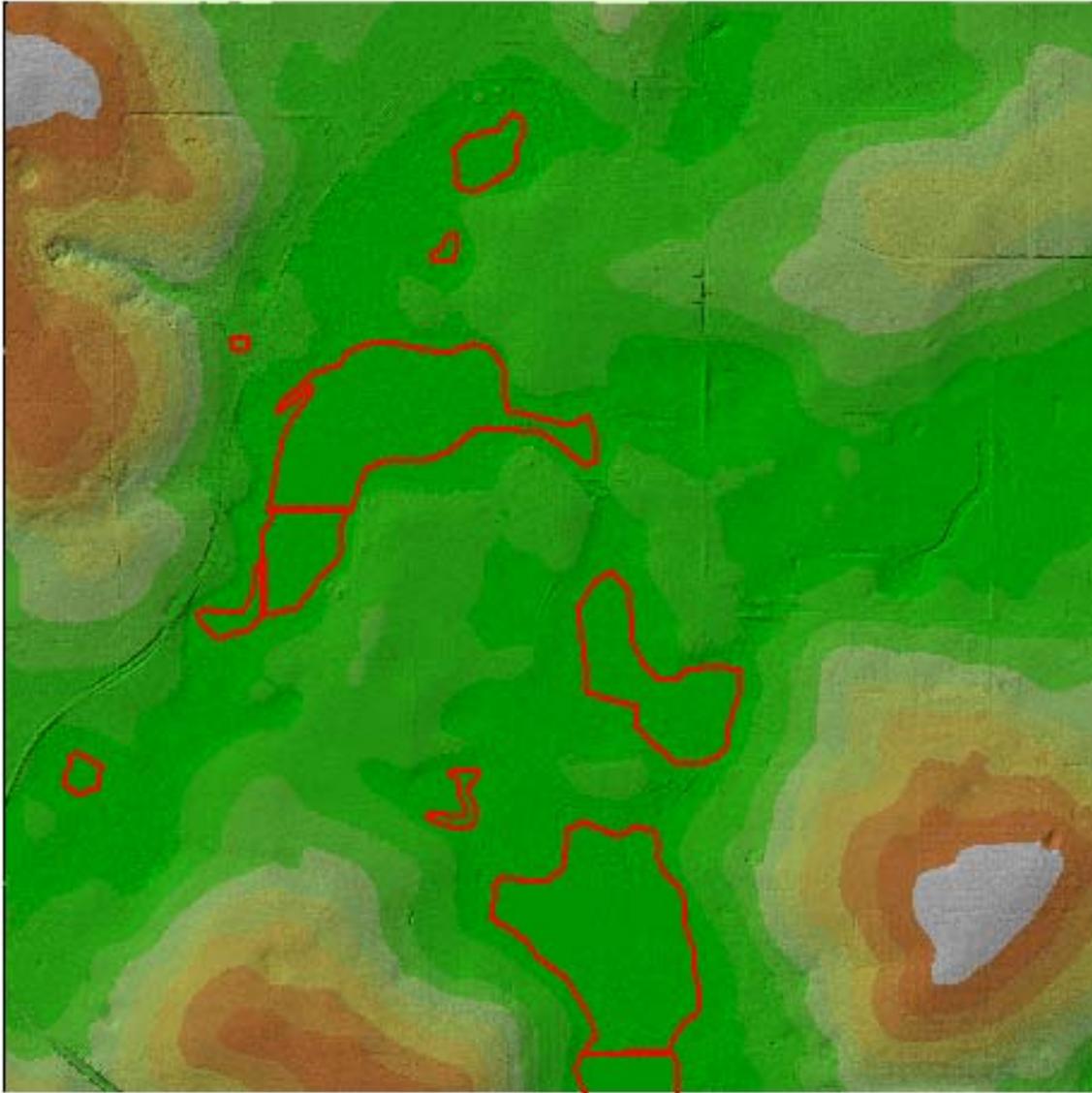
Tile: S_000002- Water points not vaporized



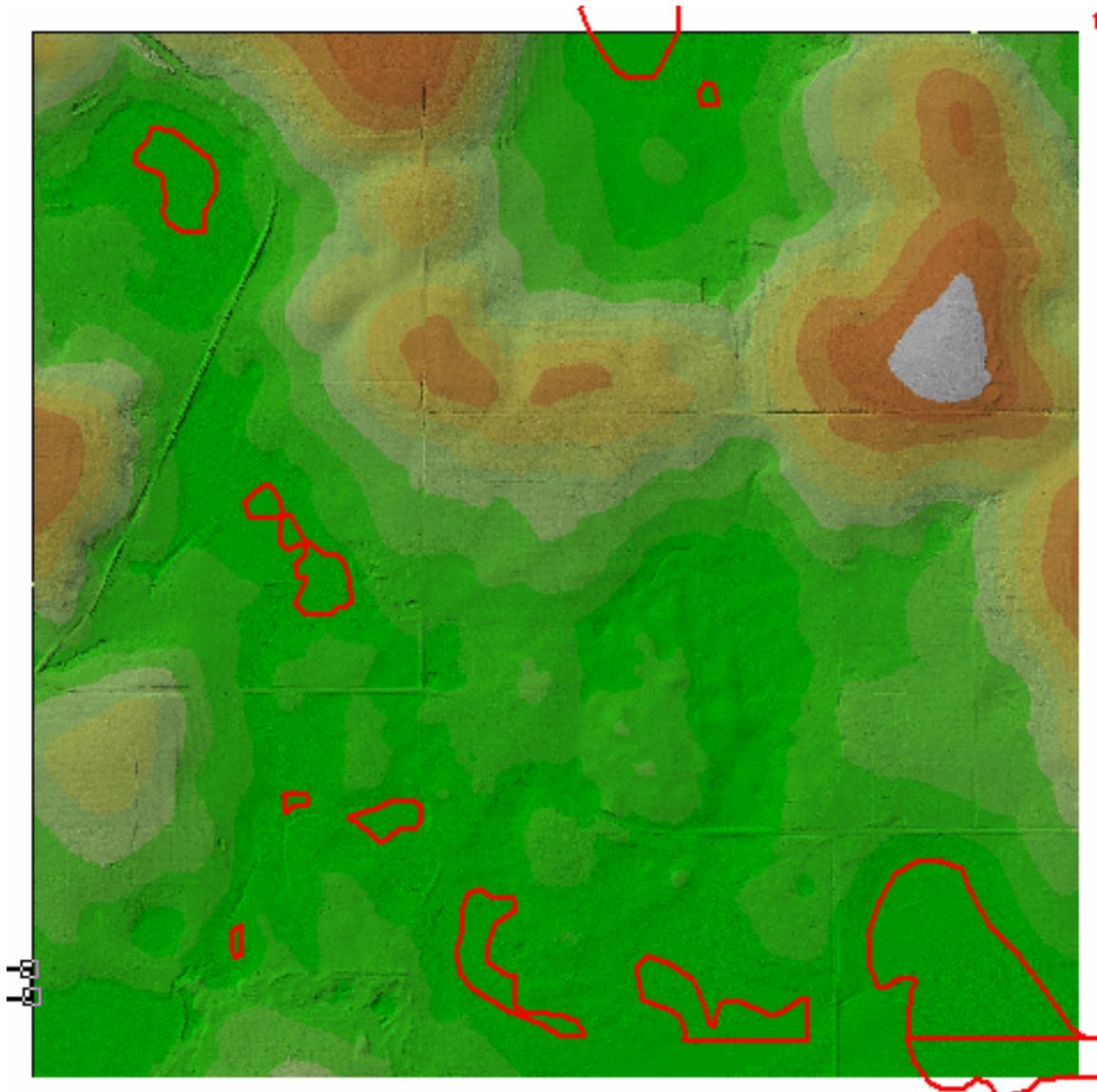
Tile: S_000003- Water points not vaporized



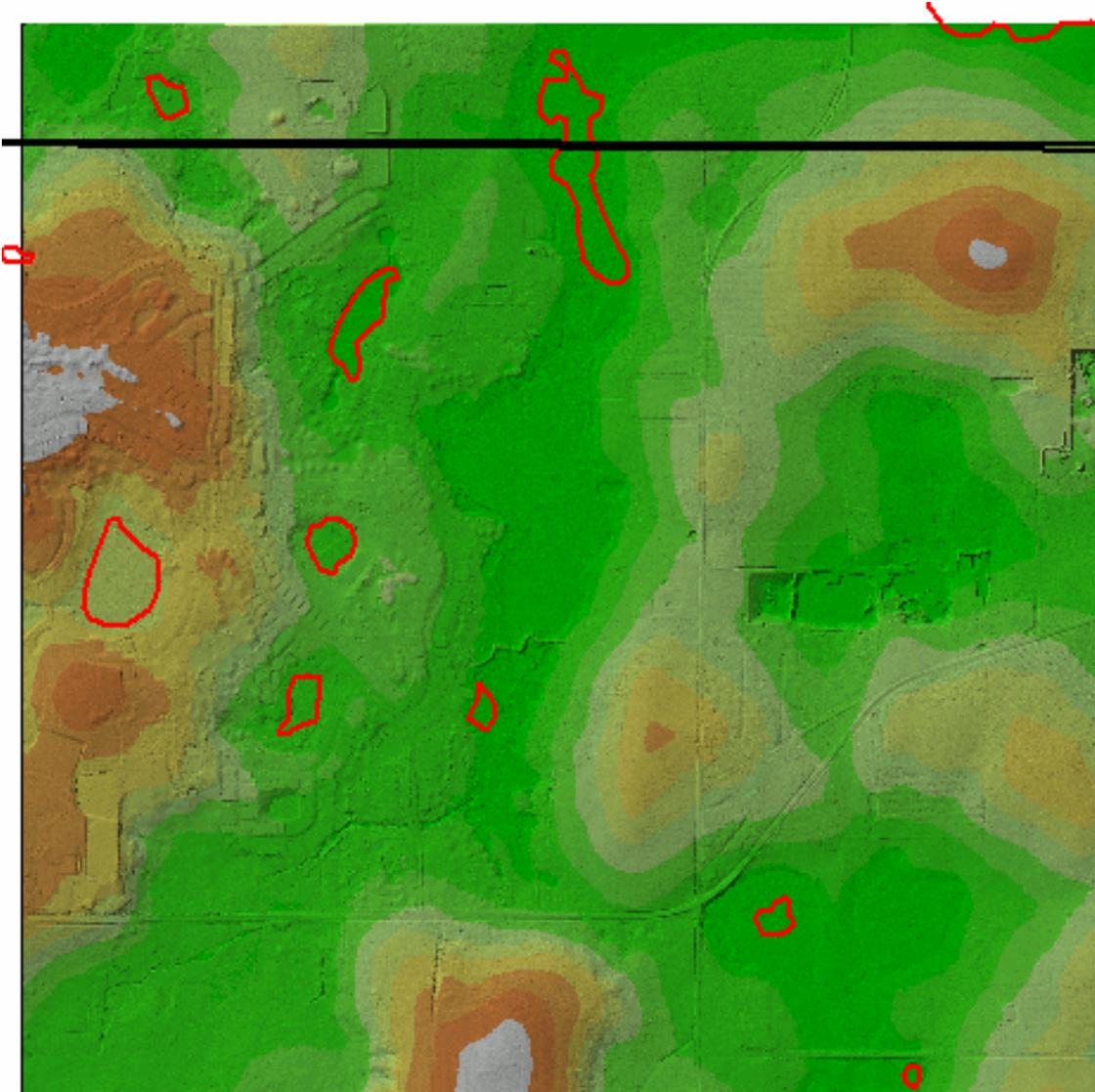
Tile: S_000004- Water points not vaporized



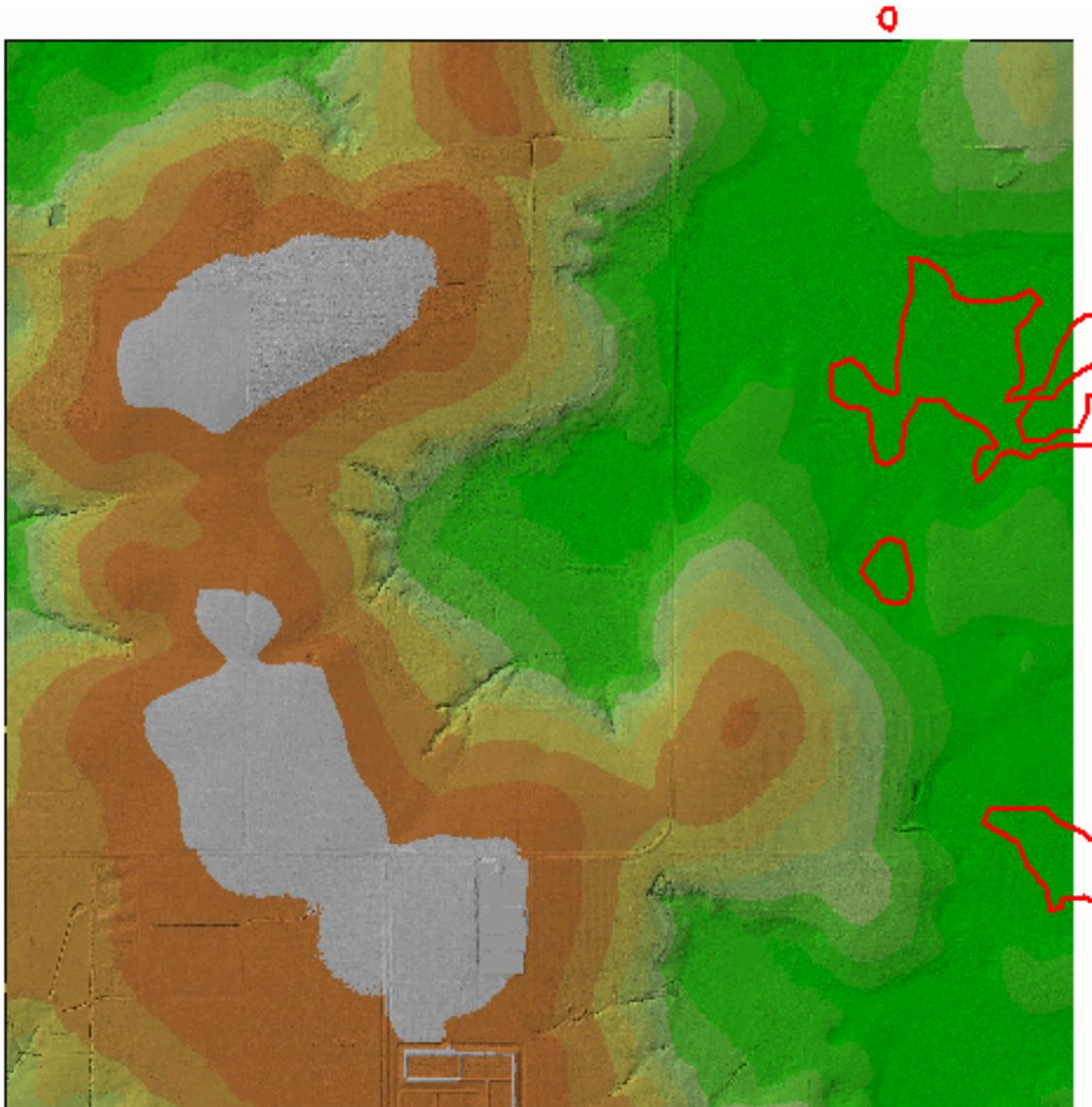
Tile: S_000005- Water points not vaporized



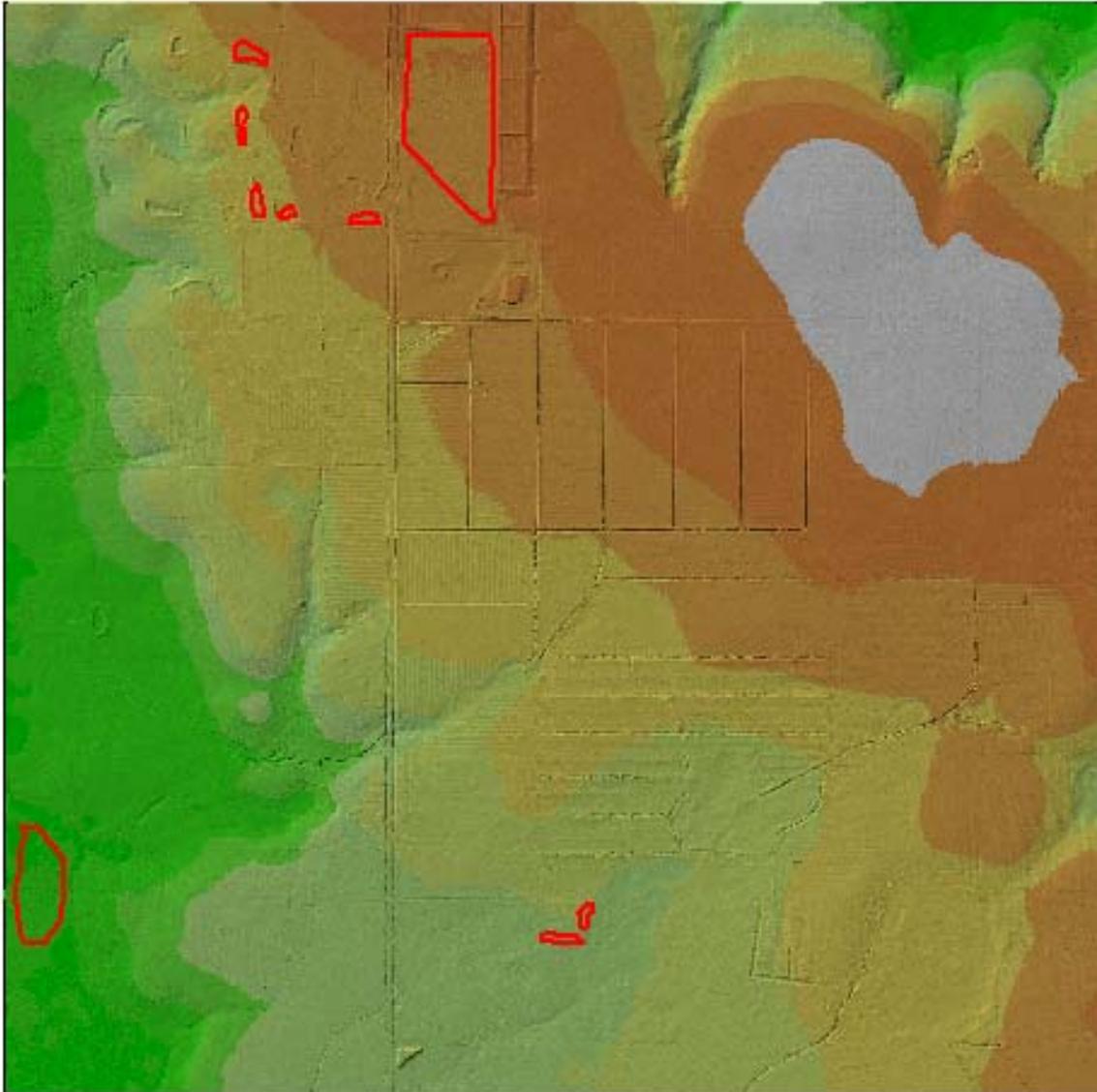
Tile: S_000006- Water points not vaporized and flightline step.



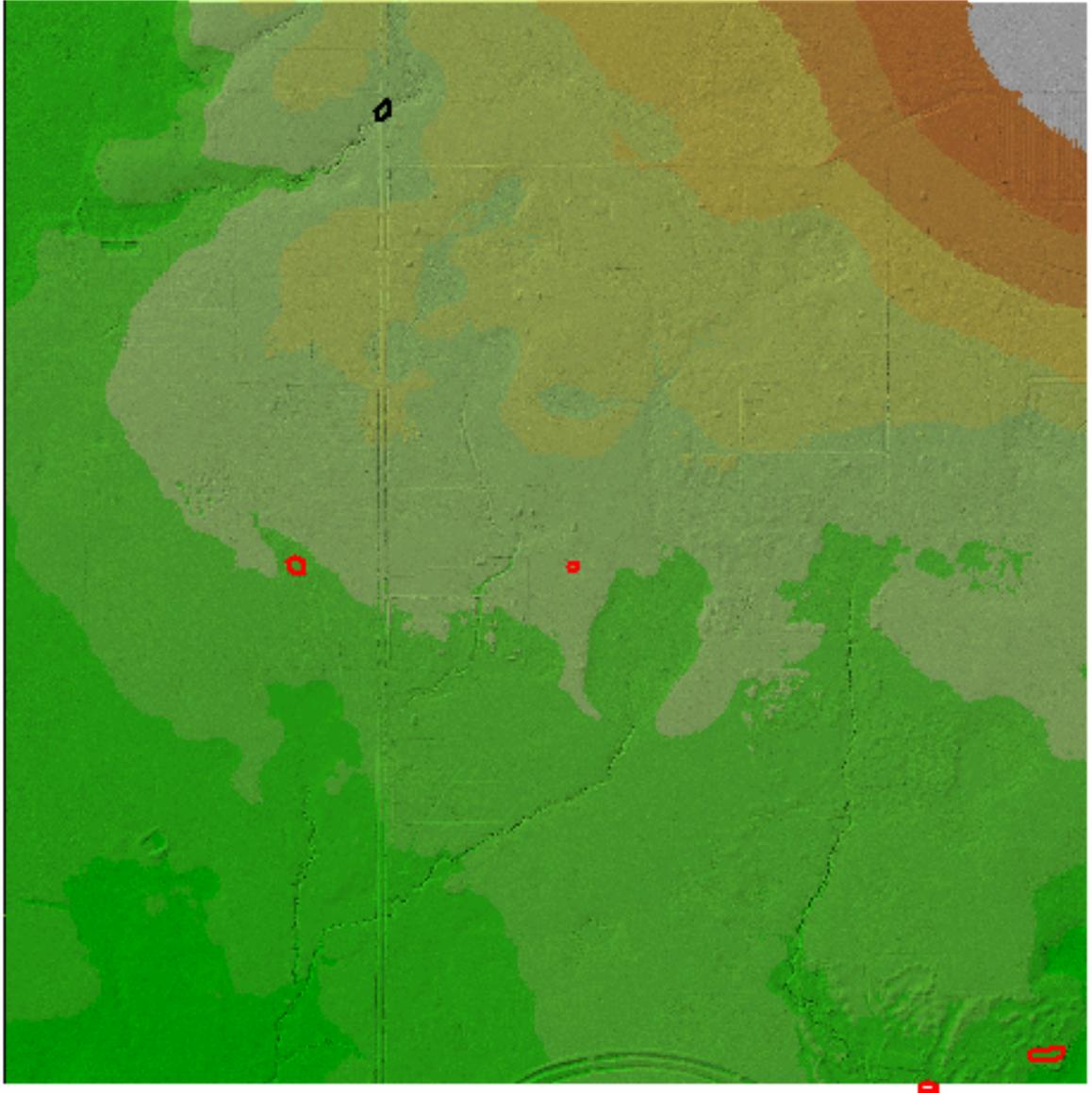
Tile: S_000007- Water points not vaporized



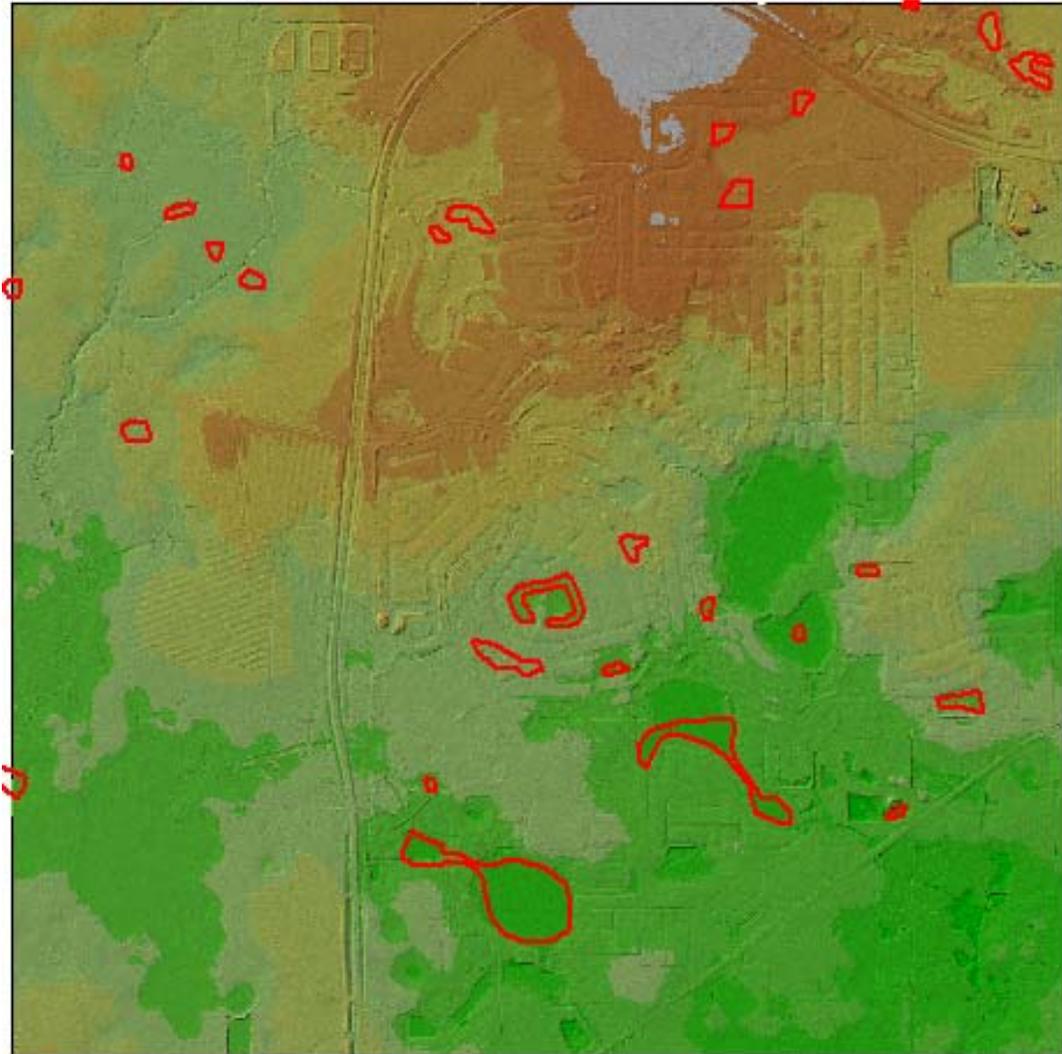
Tile: S_000008- Water points not vaporized



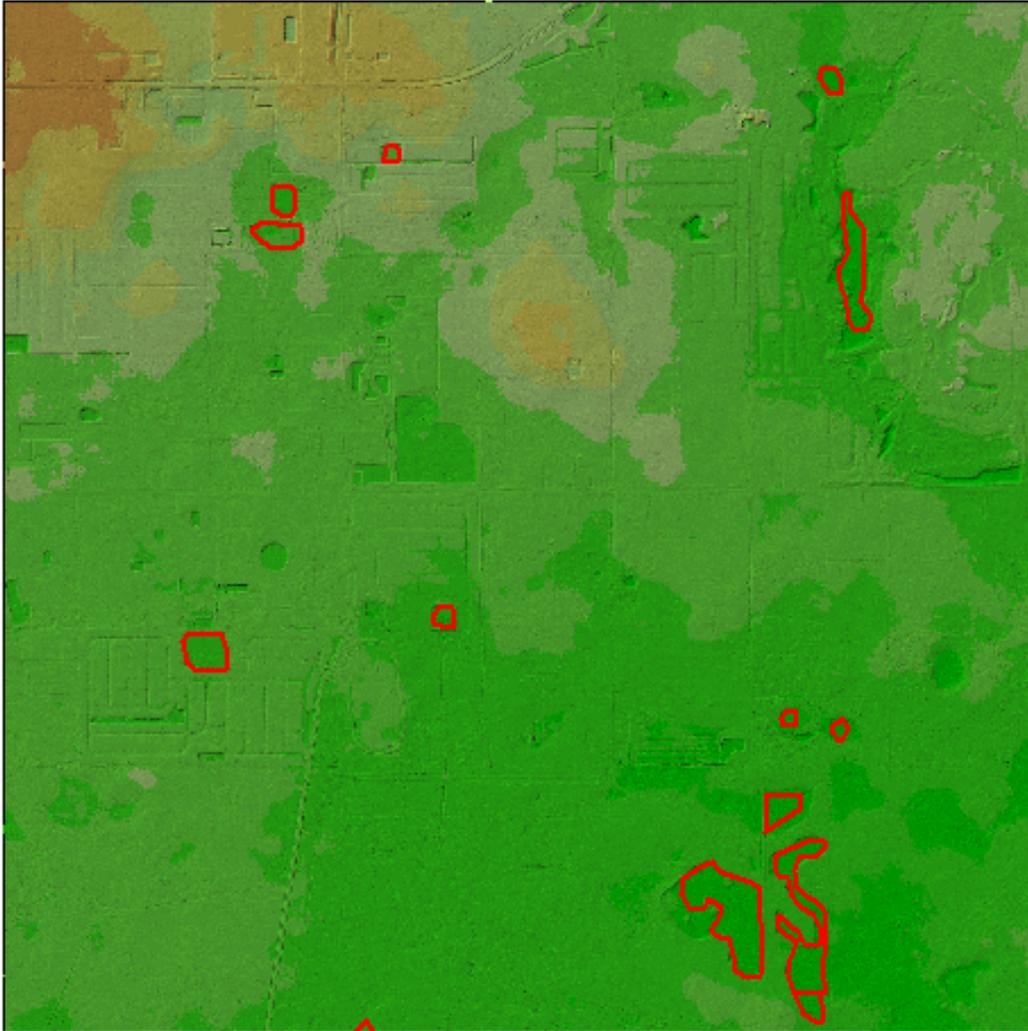
Tile: S_000009- Water points not vaporized and bridge.



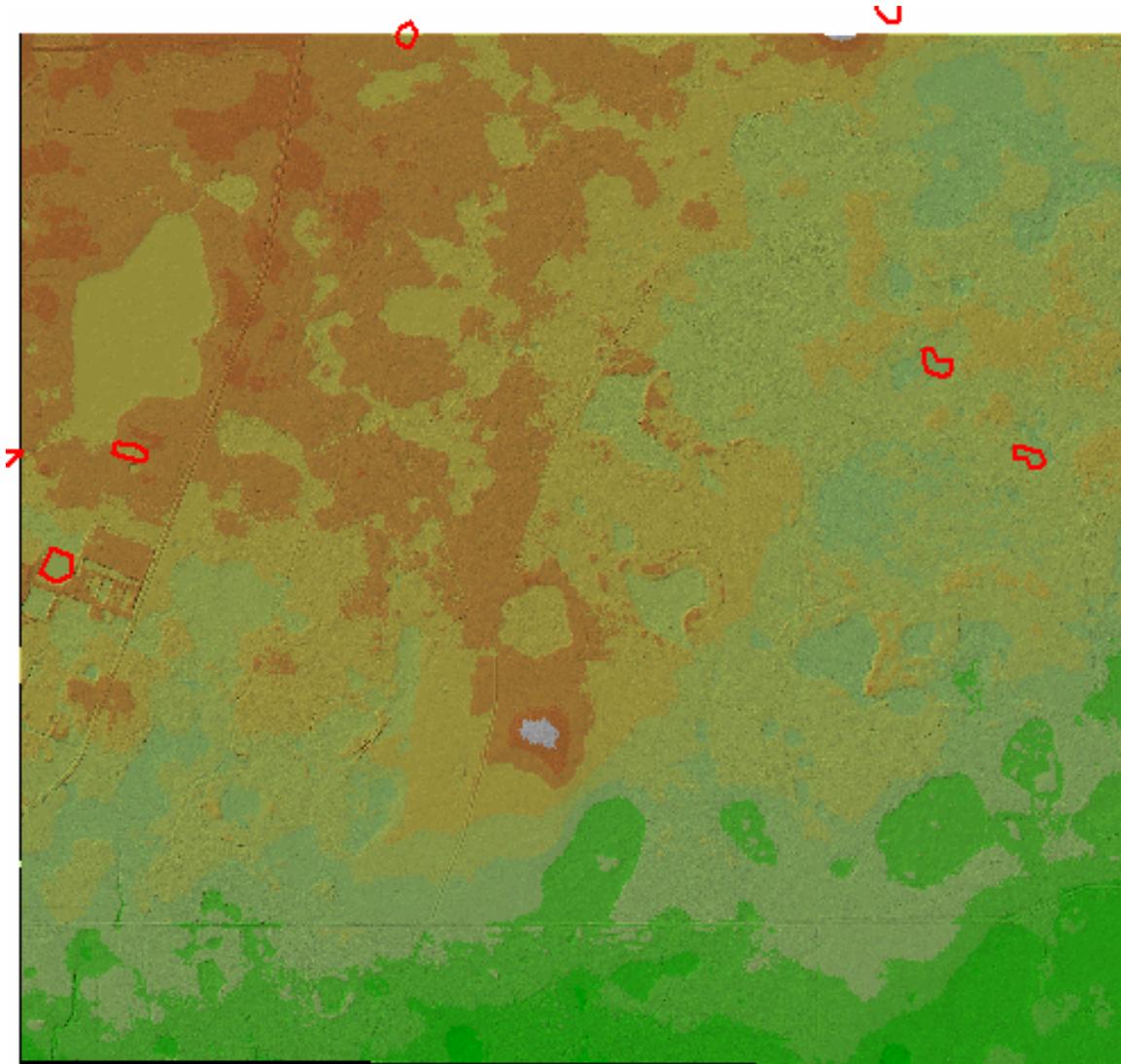
Tile: S_000010- Water points not vaporized



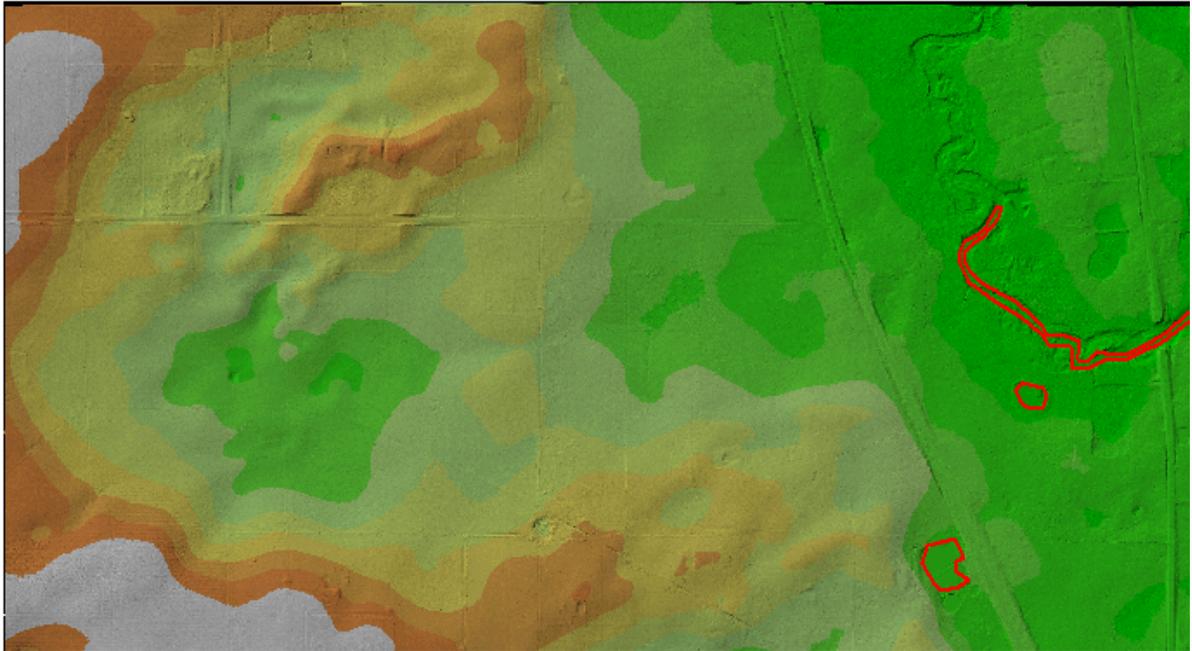
Tile: S_000011- Water points not vaporized



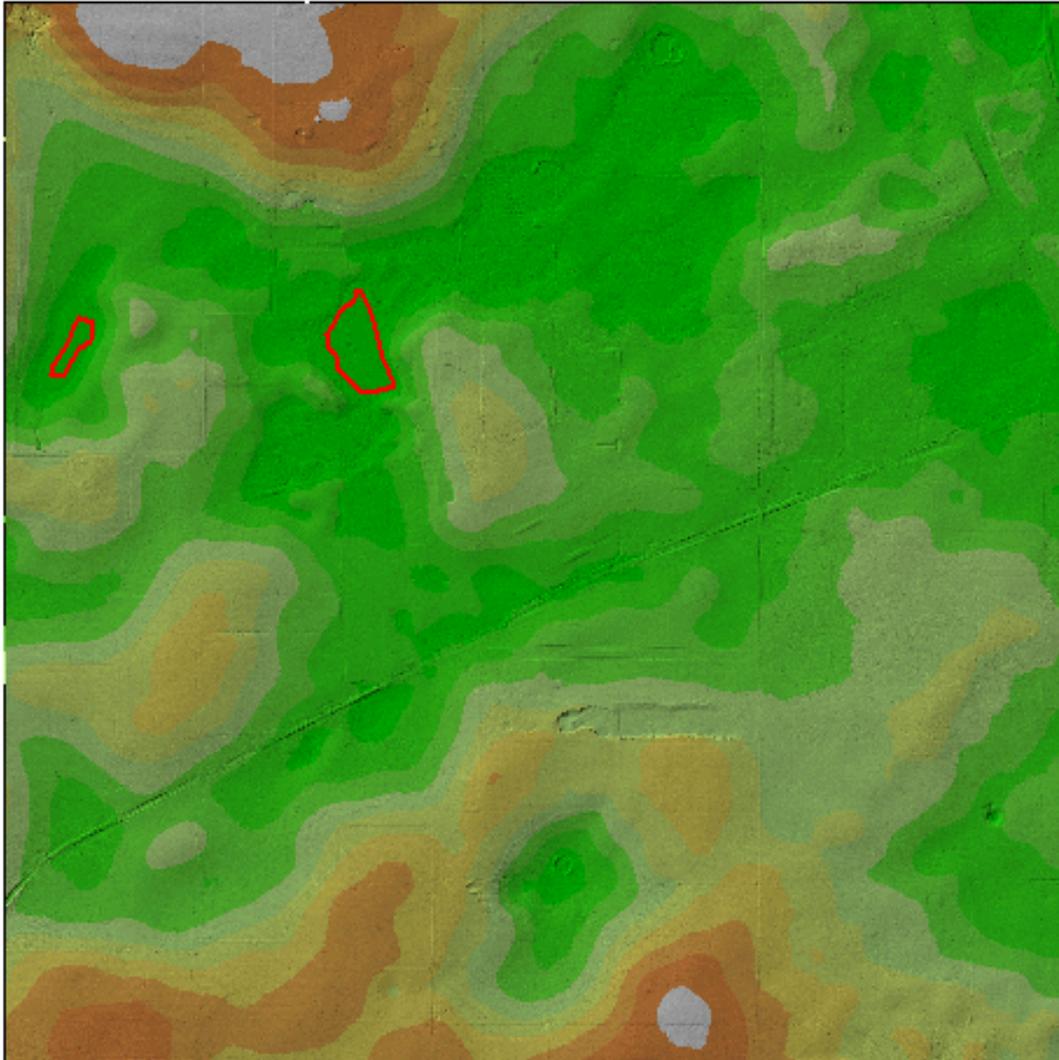
Tile: S_000012- Water points not vaporized



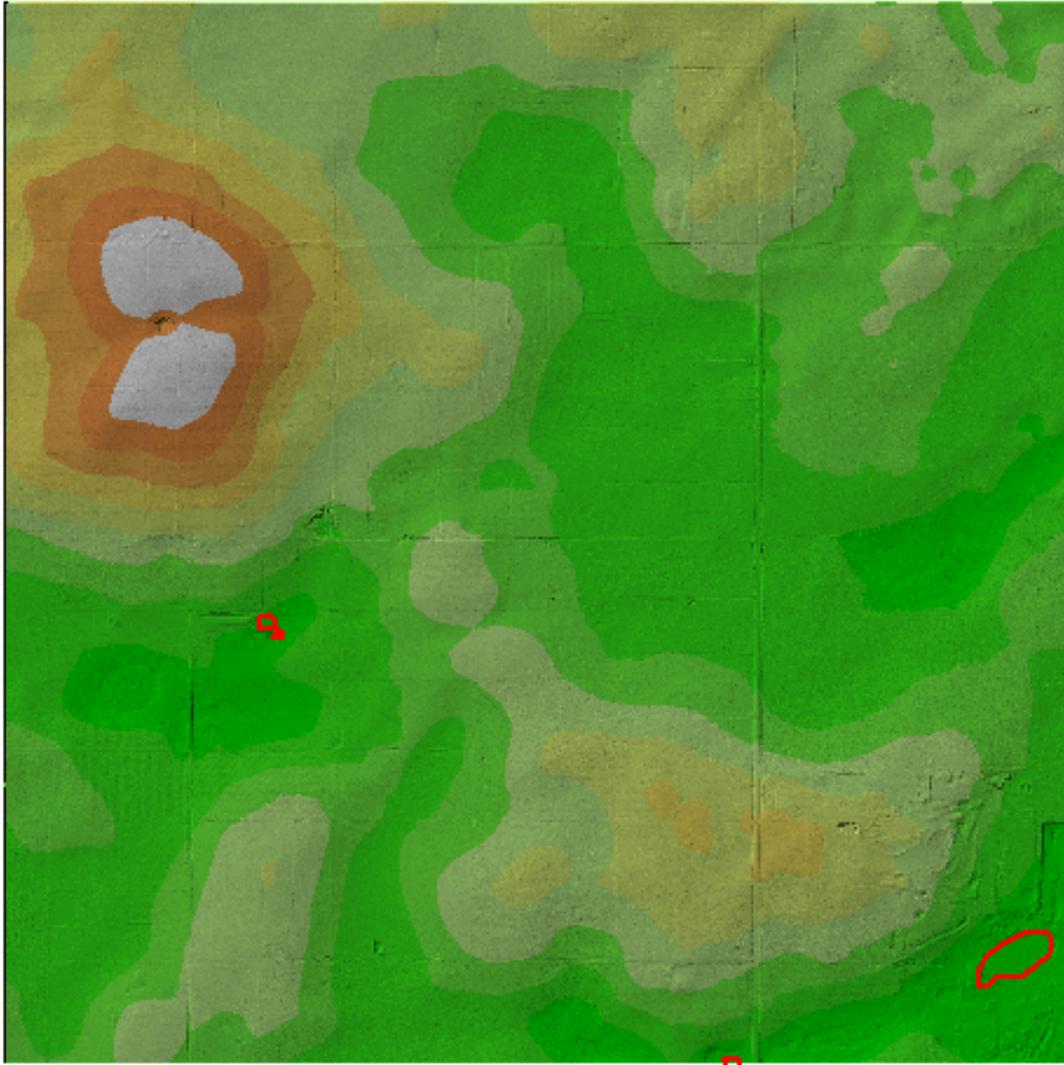
Tile: T_000001- Water points not vaporized



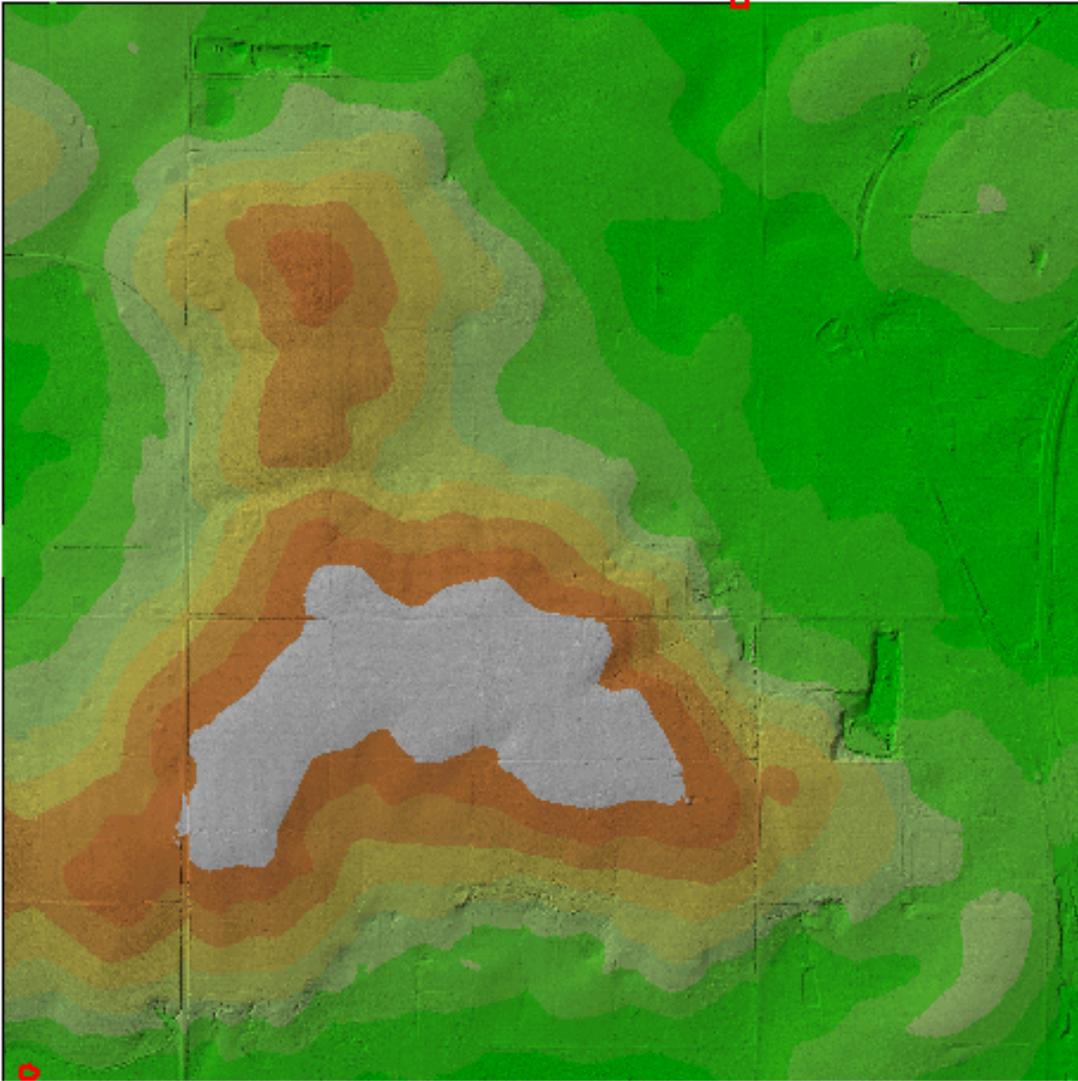
Tile: T_000002- Water points not vaporized



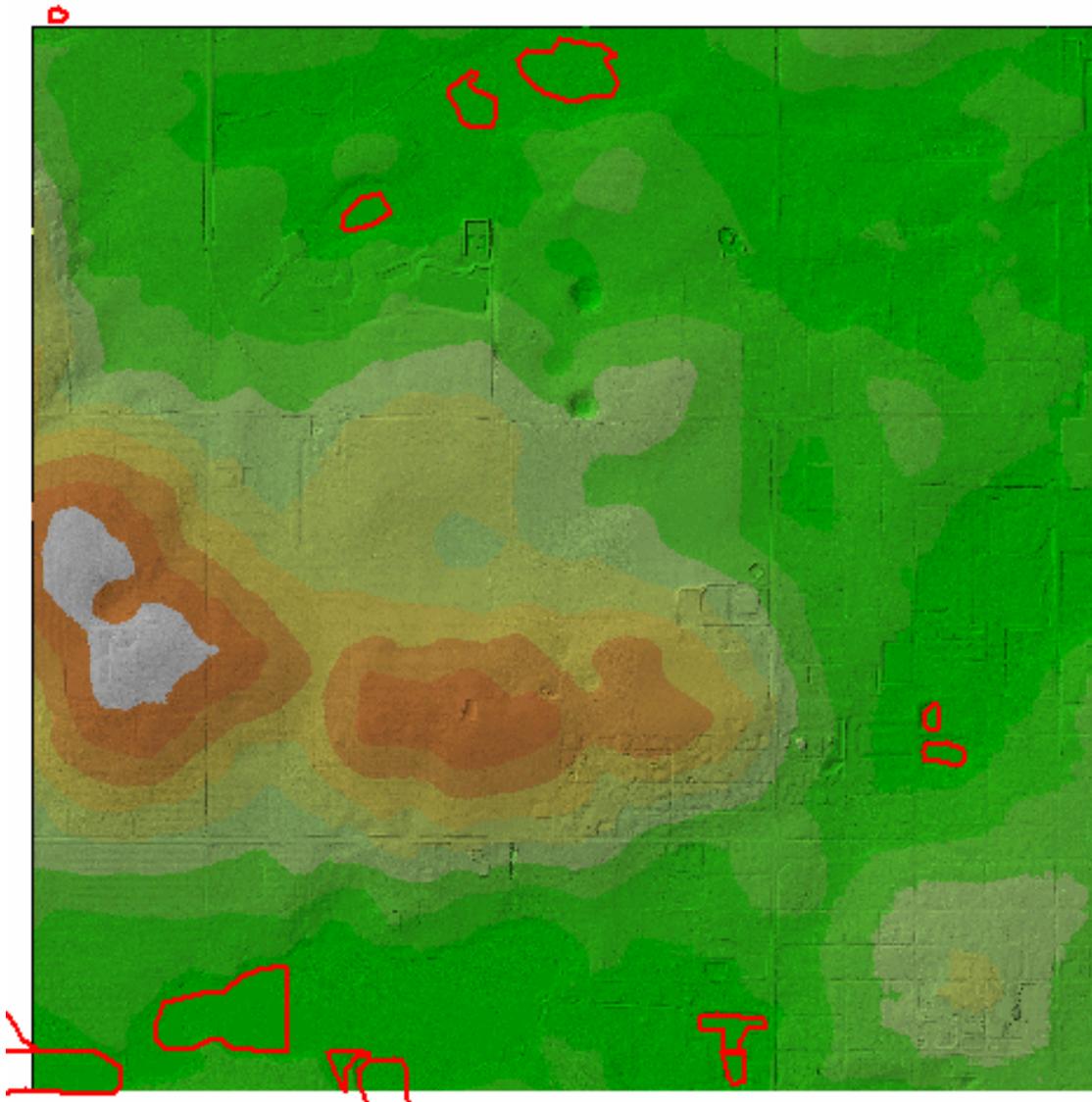
Tile: T_000003- Water points not vaporized



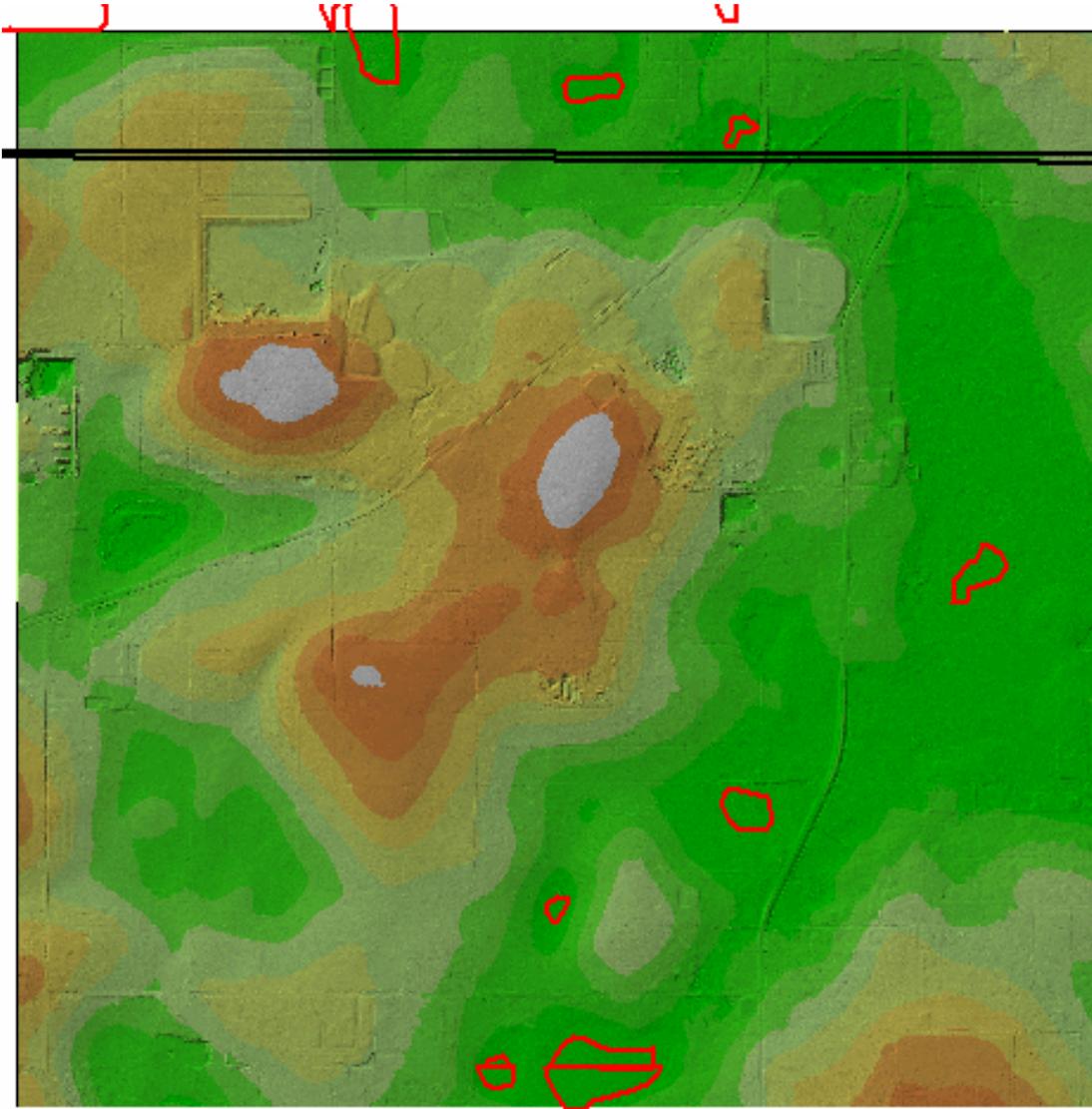
Tile: T_000004- Water points not vaporized



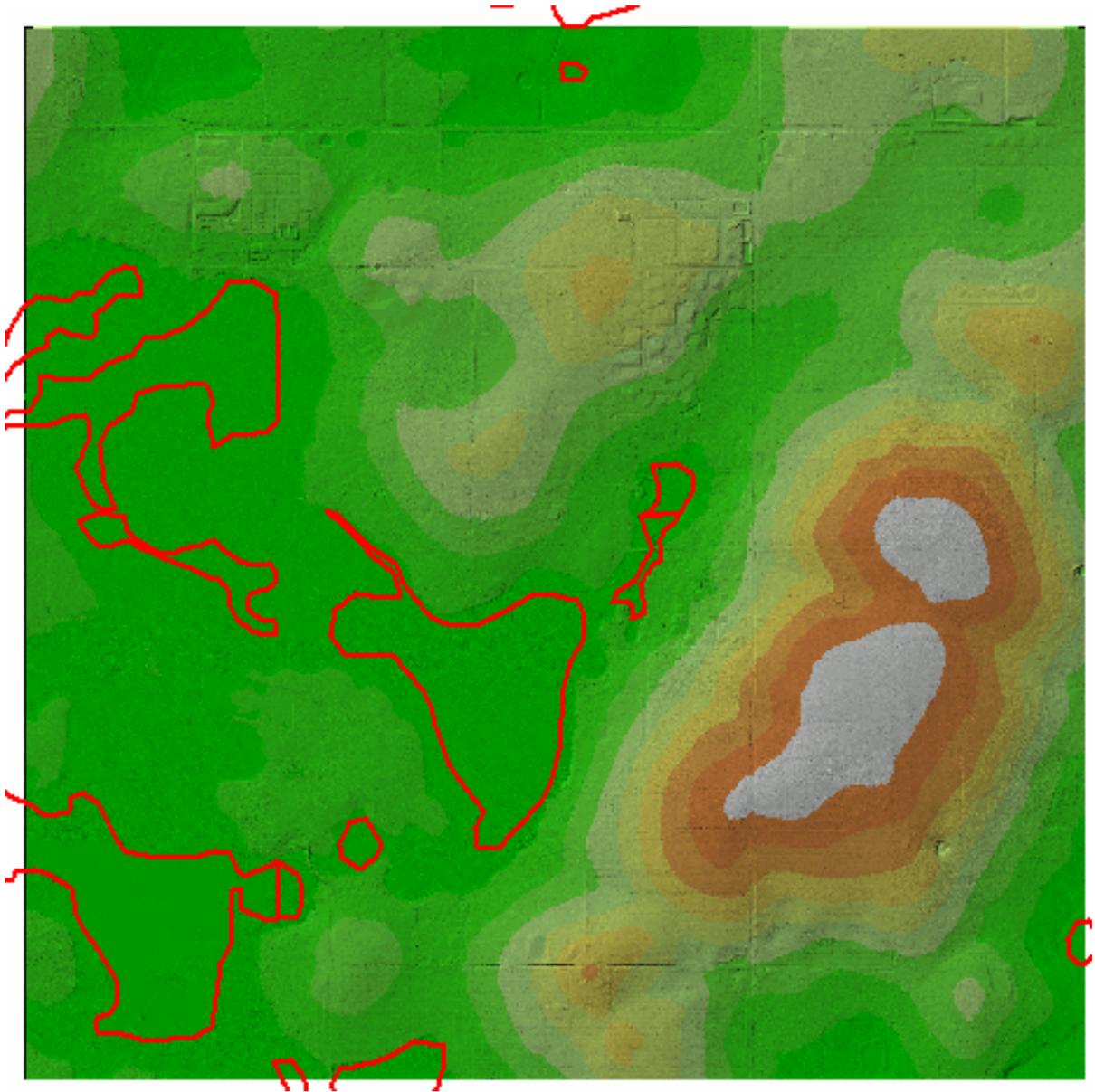
Tile: T_000005- Water points not vaporized



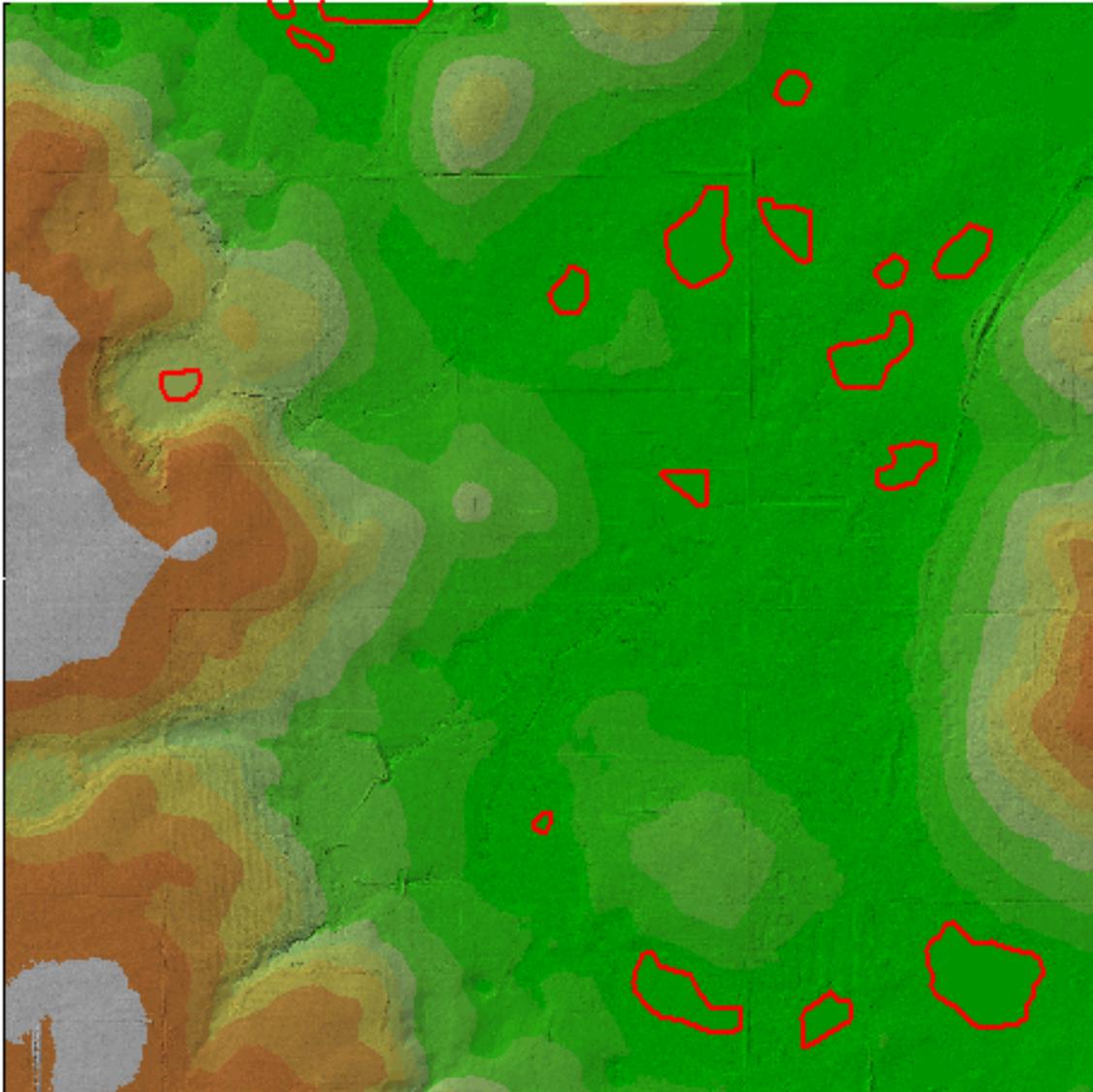
Tile: T_000006- Water points not vaporized



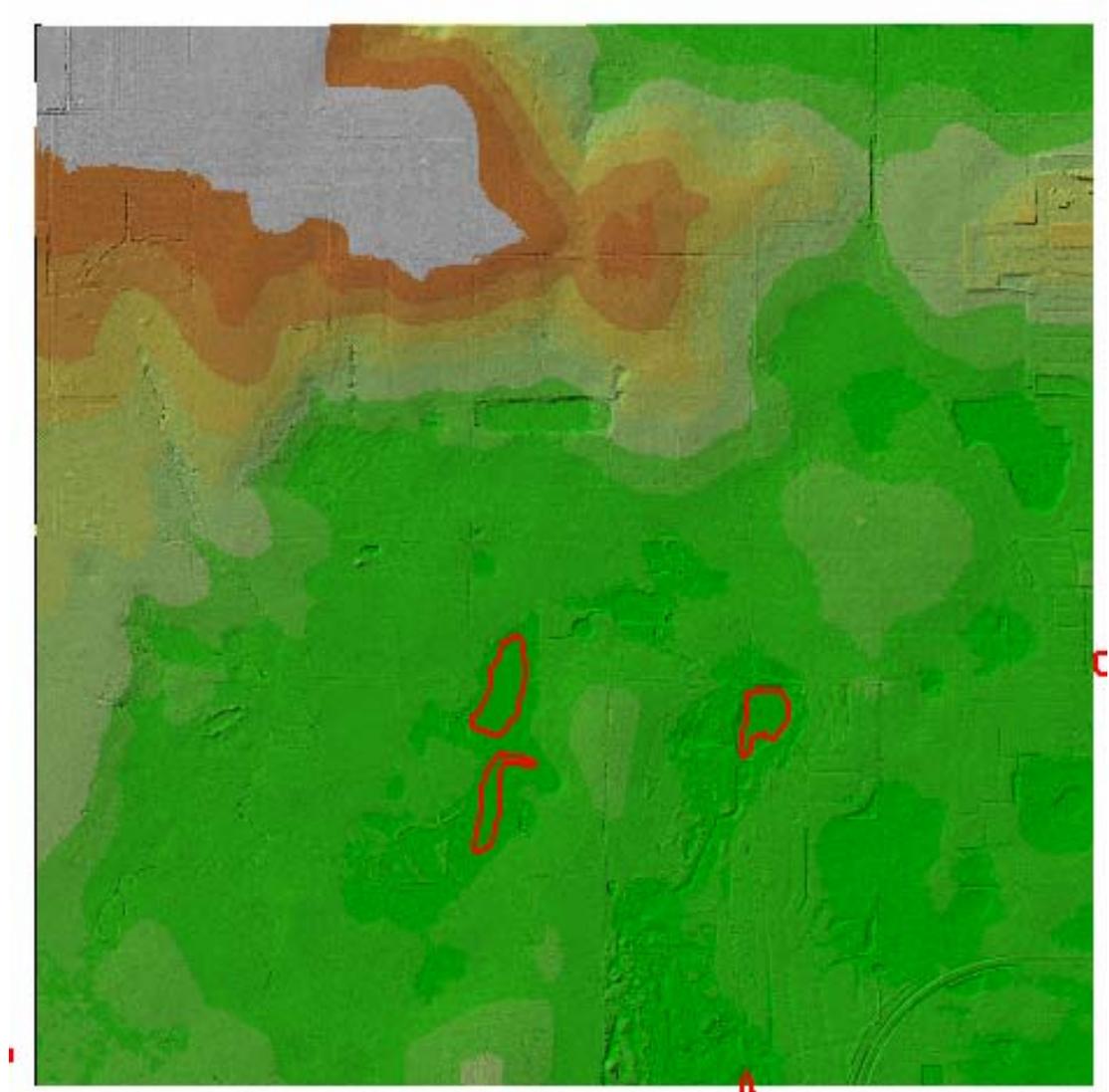
Tile: T_000007- Water points not vaporized



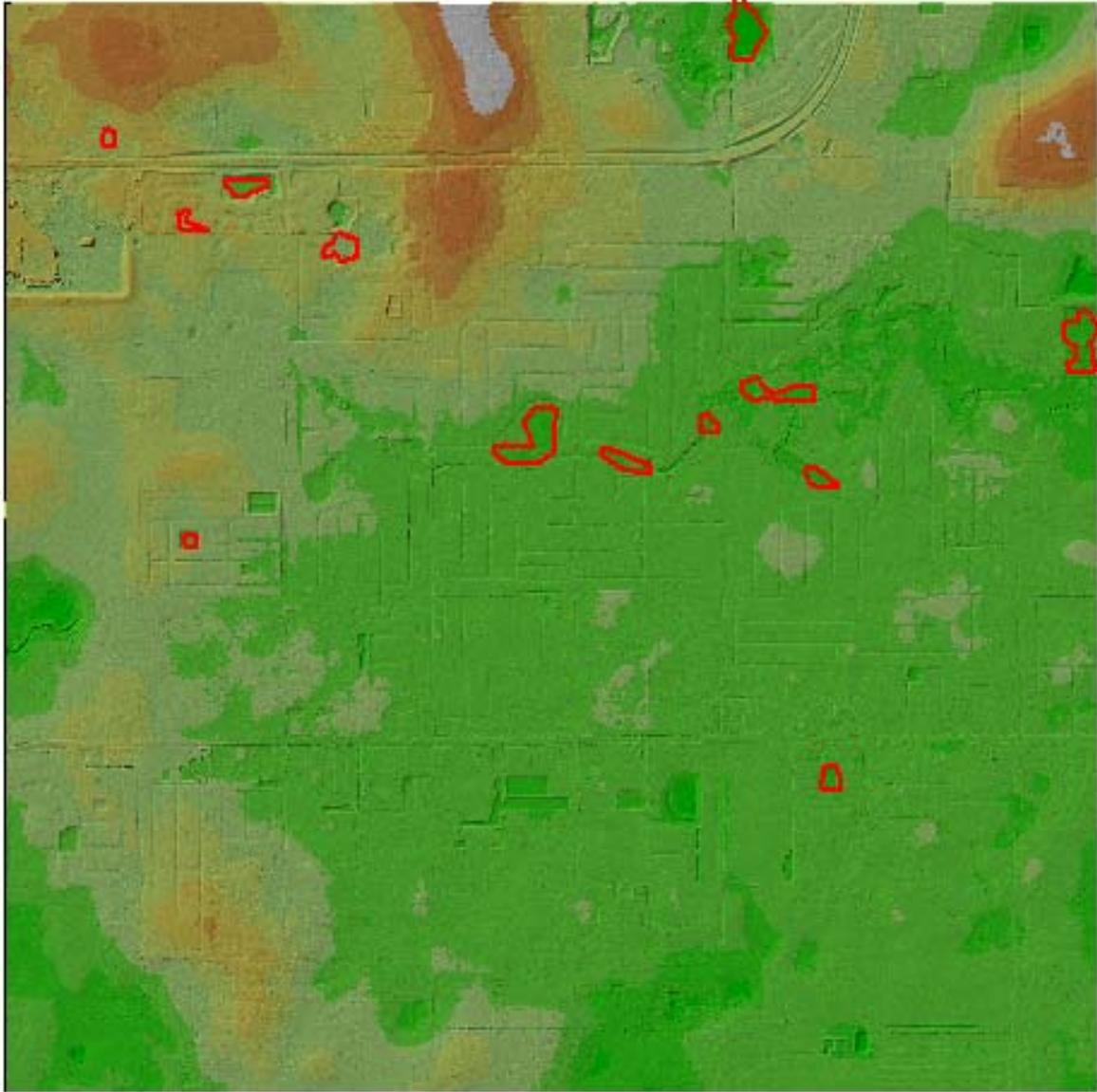
Tile: T_000008- Water points not vaporized



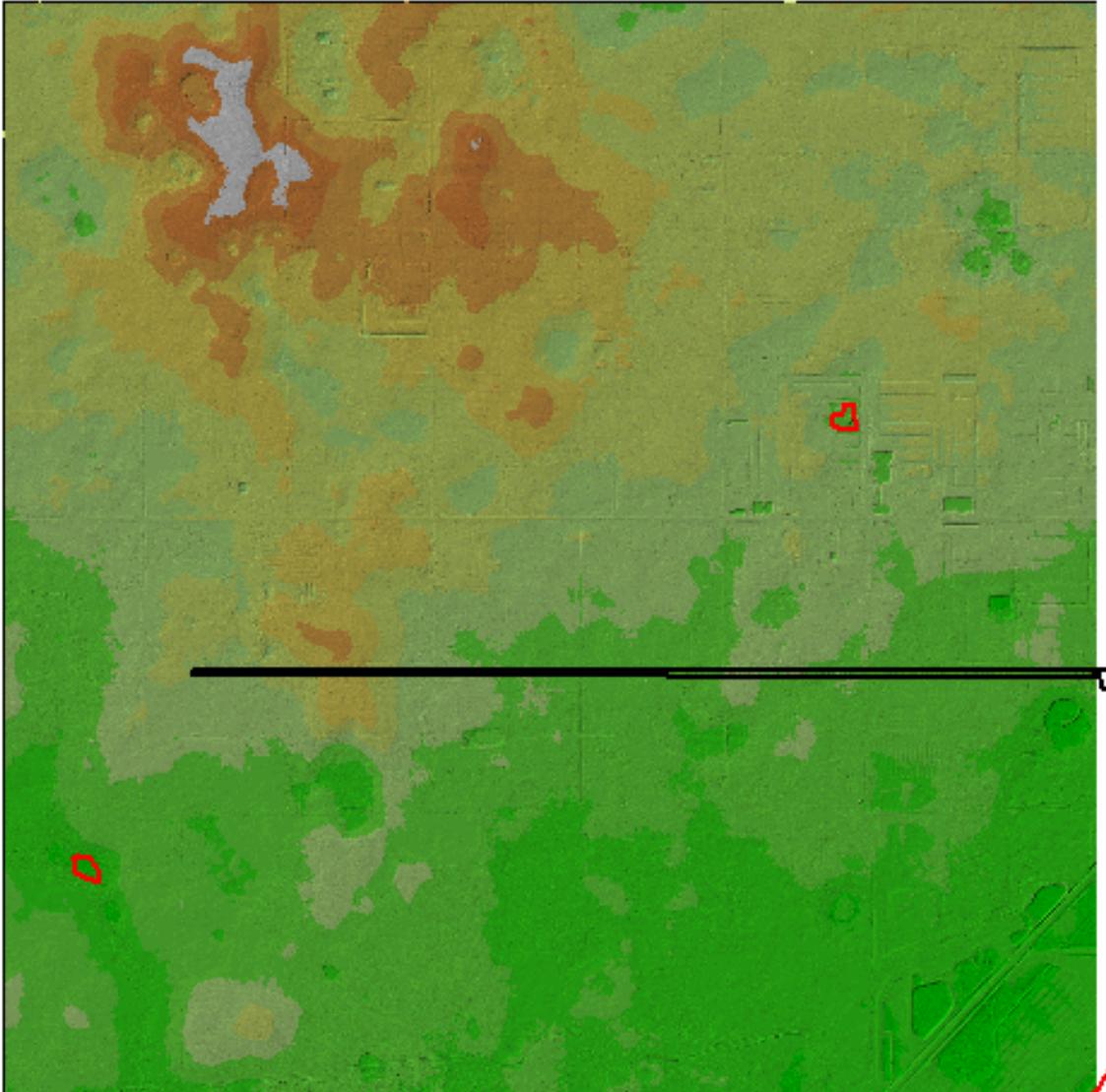
Tile: T_000009- Water points not vaporized



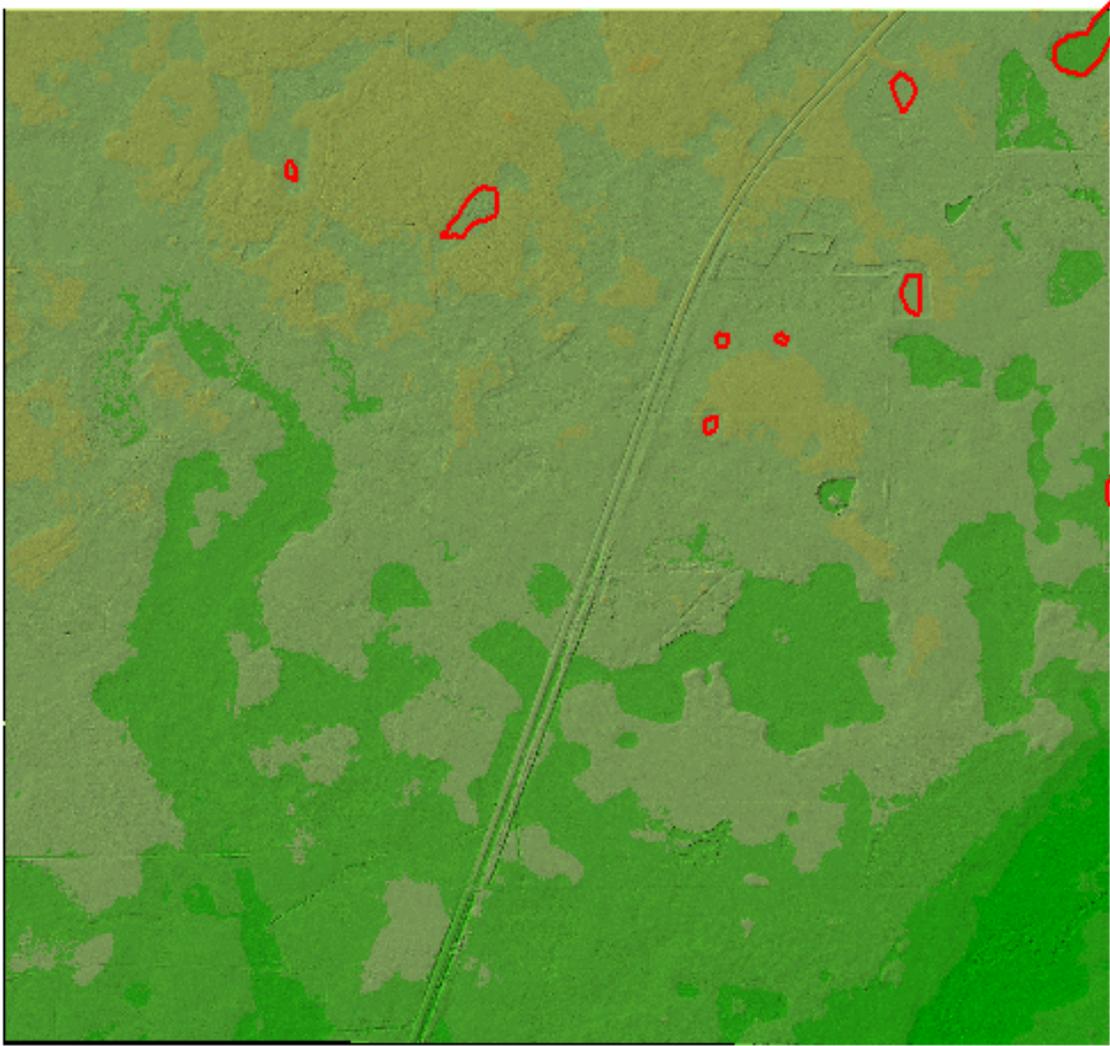
Tile: T_000010- Water points not vaporized



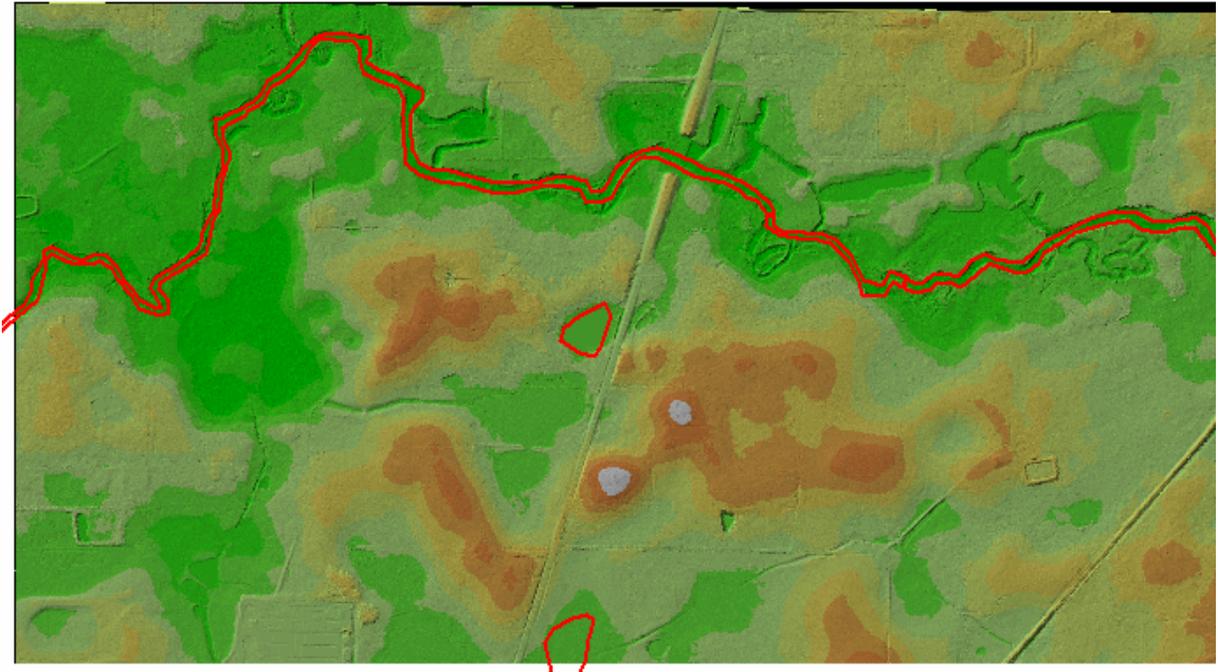
Tile: T_000011- Water points not vaporized and flightline step.



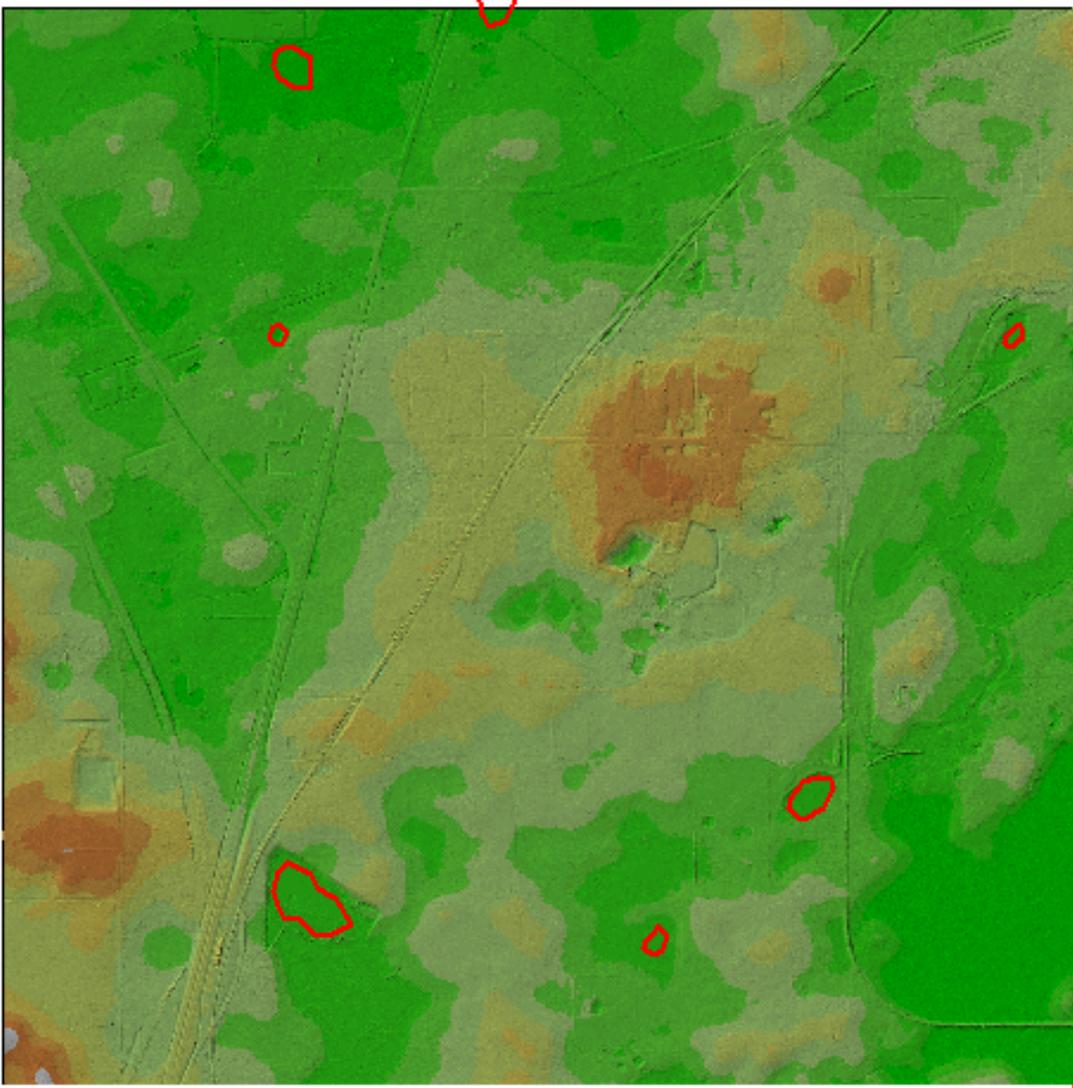
Tile: T_000012- Water points not vaporized



Tile: U_000001- Water points not vaporized



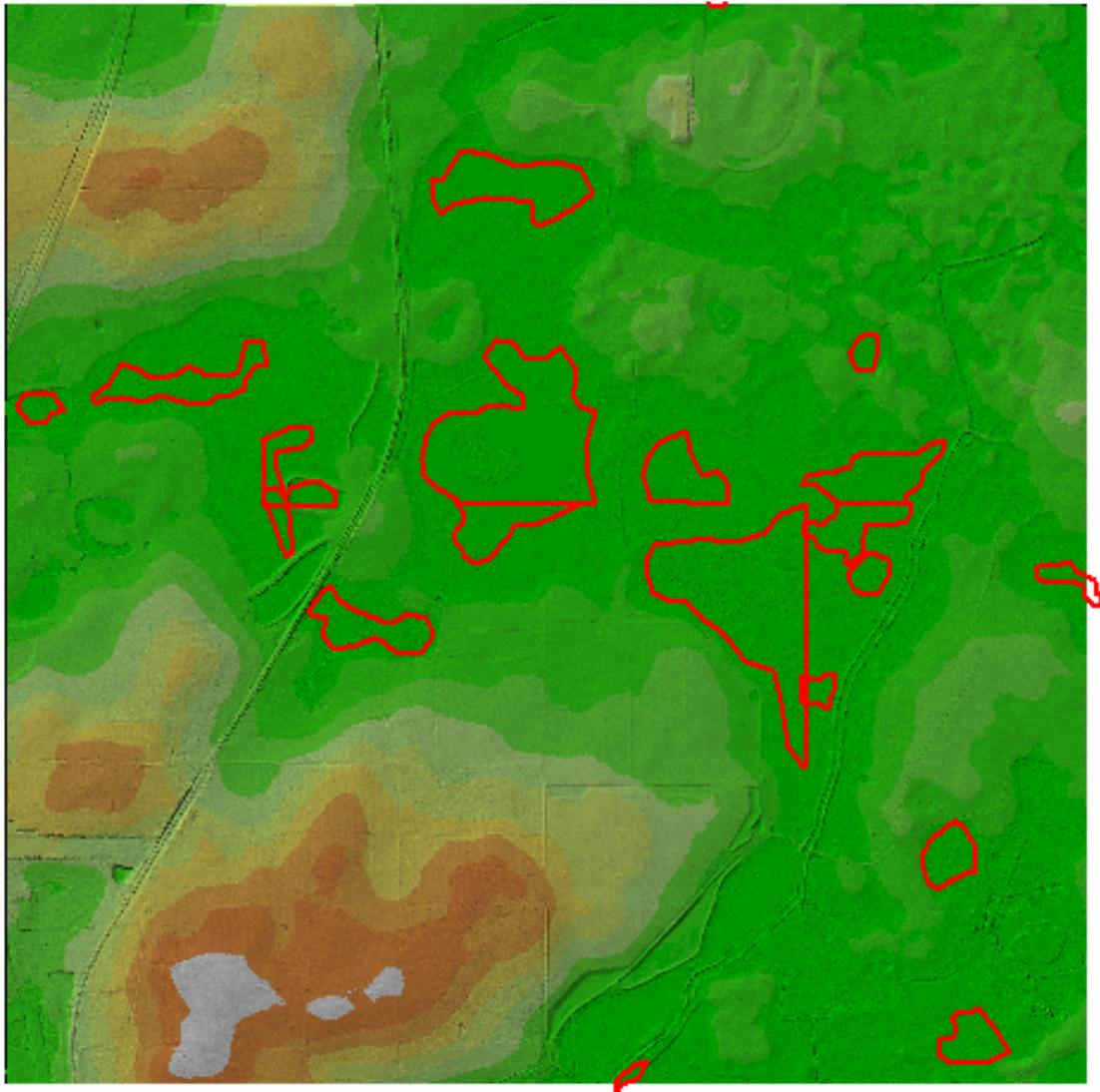
Tile: U_000002- Water points not vaporized



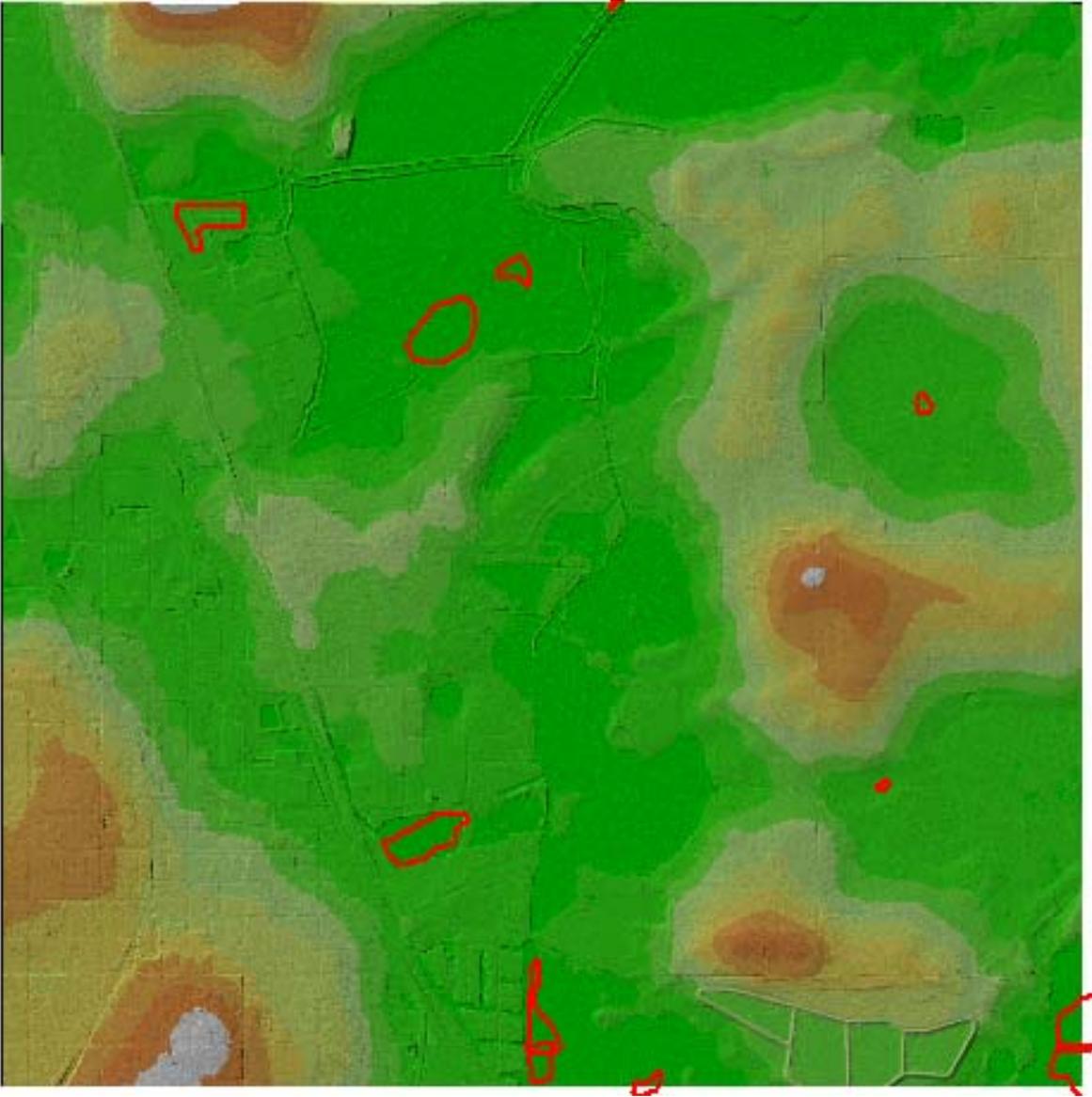
Tile: U_000003- Water points not vaporized



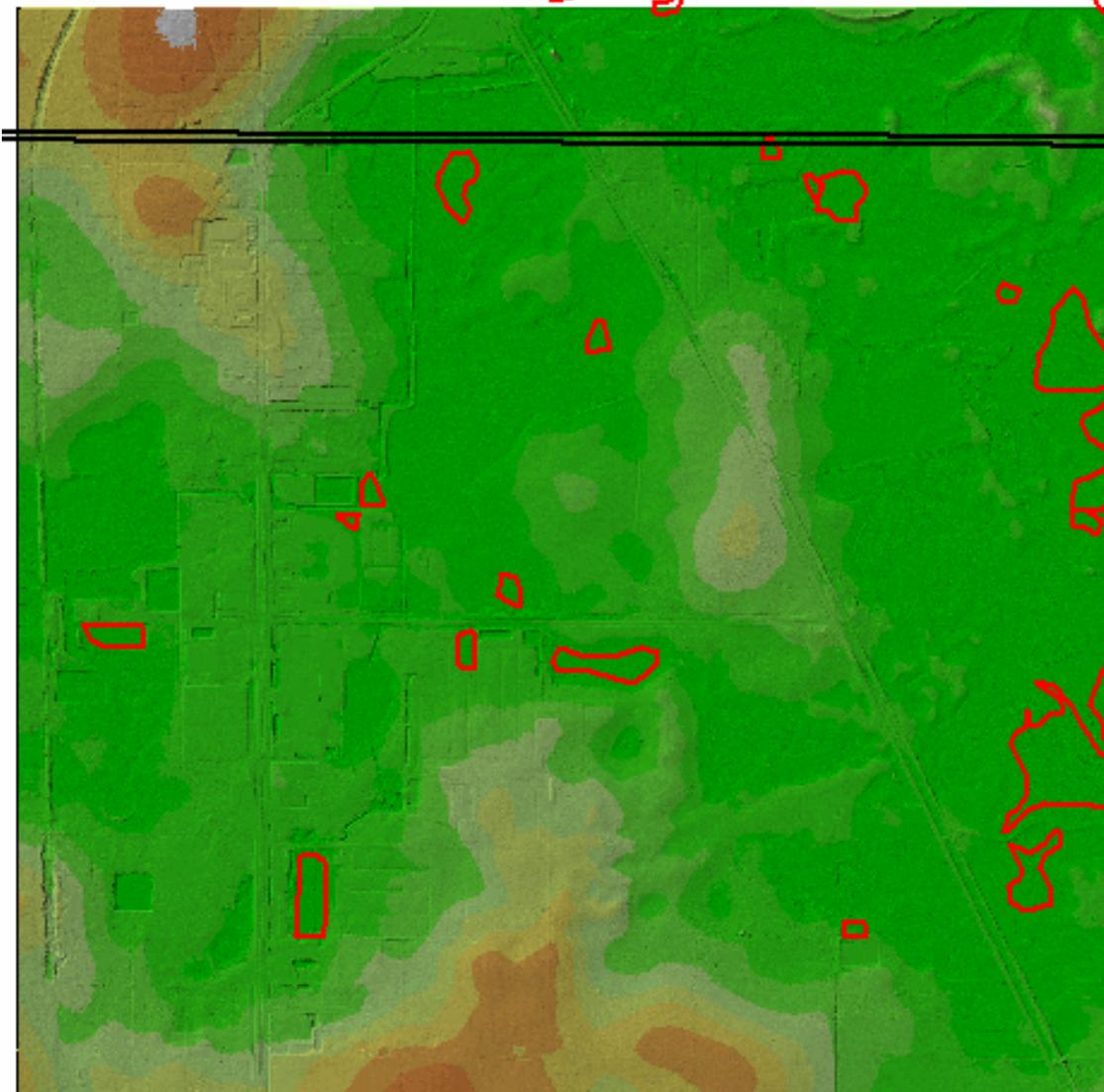
Tile: U_000004- Water points not vaporized



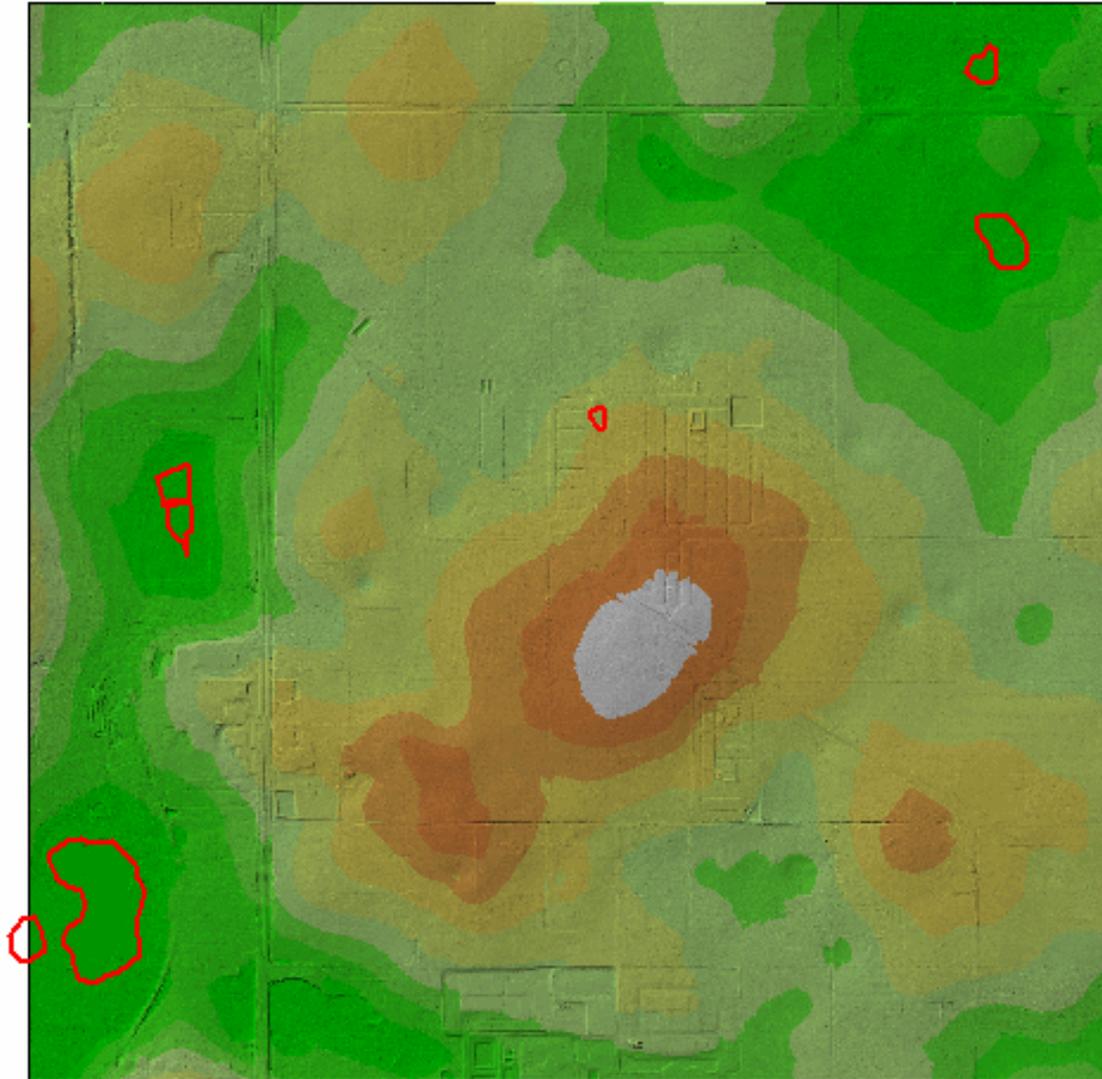
Tile: U_000005- Water points not vaporized



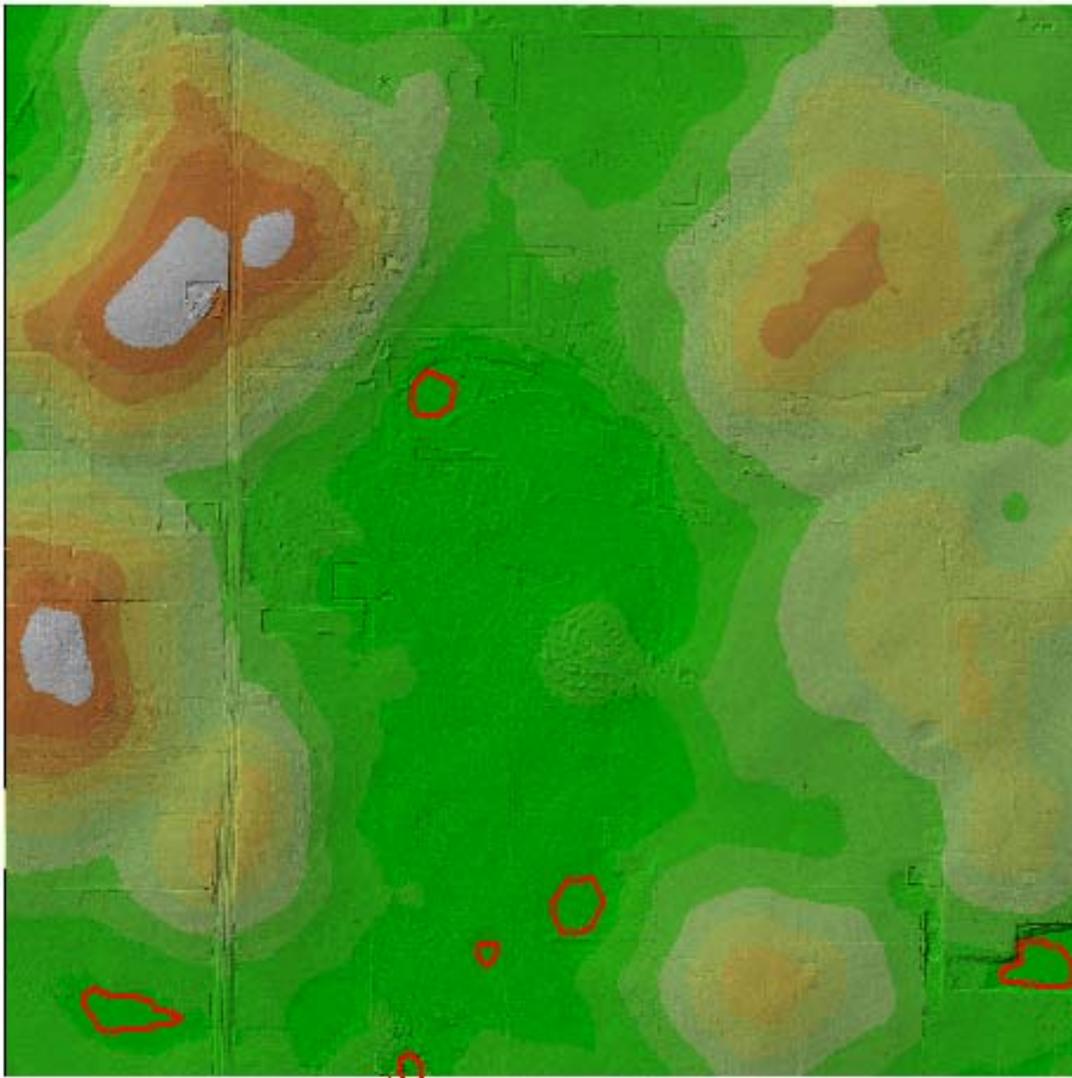
Tile: U_000006- Water points not vaporized and flightline step.



Tile: U_000007- Water points not vaporized



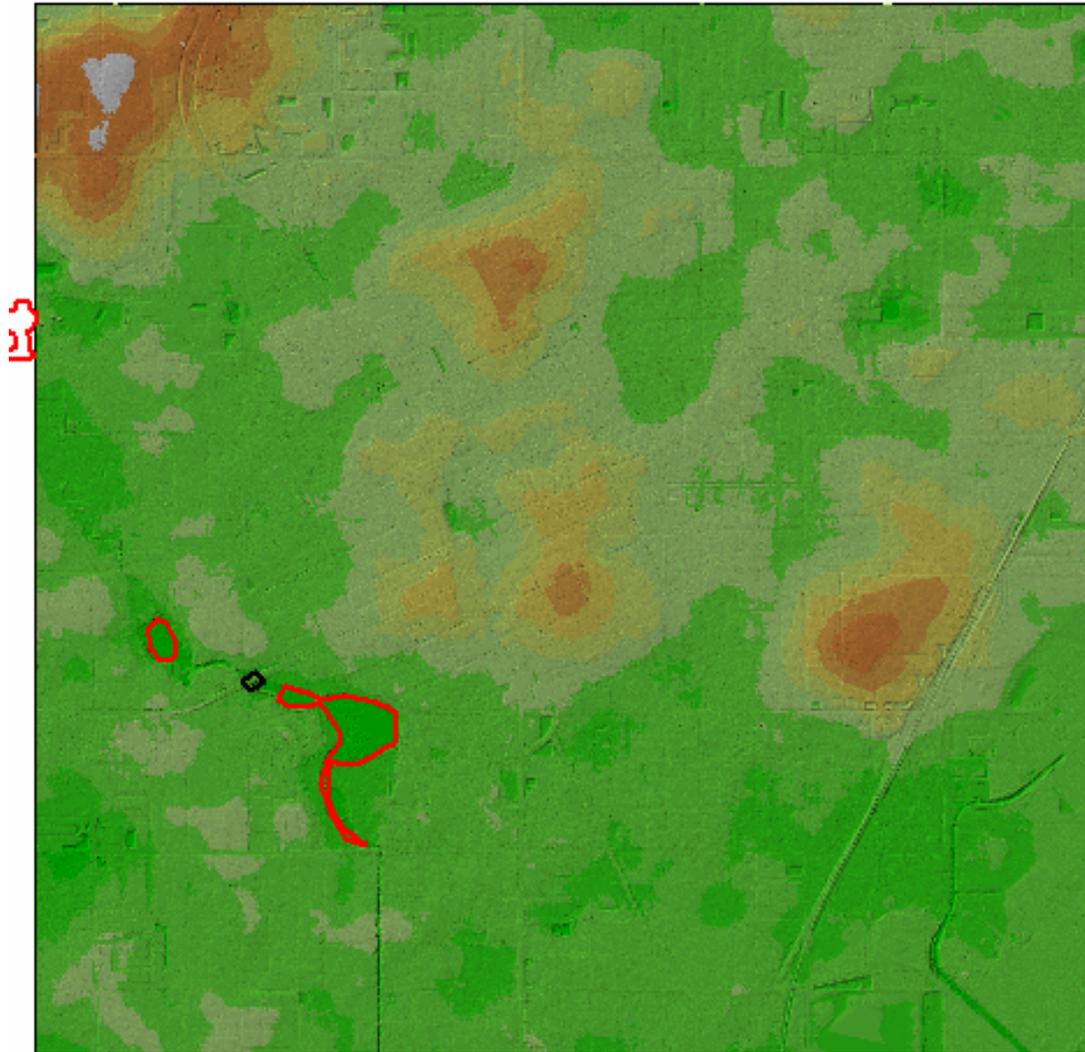
Tile: U_000008- Water points not vaporized



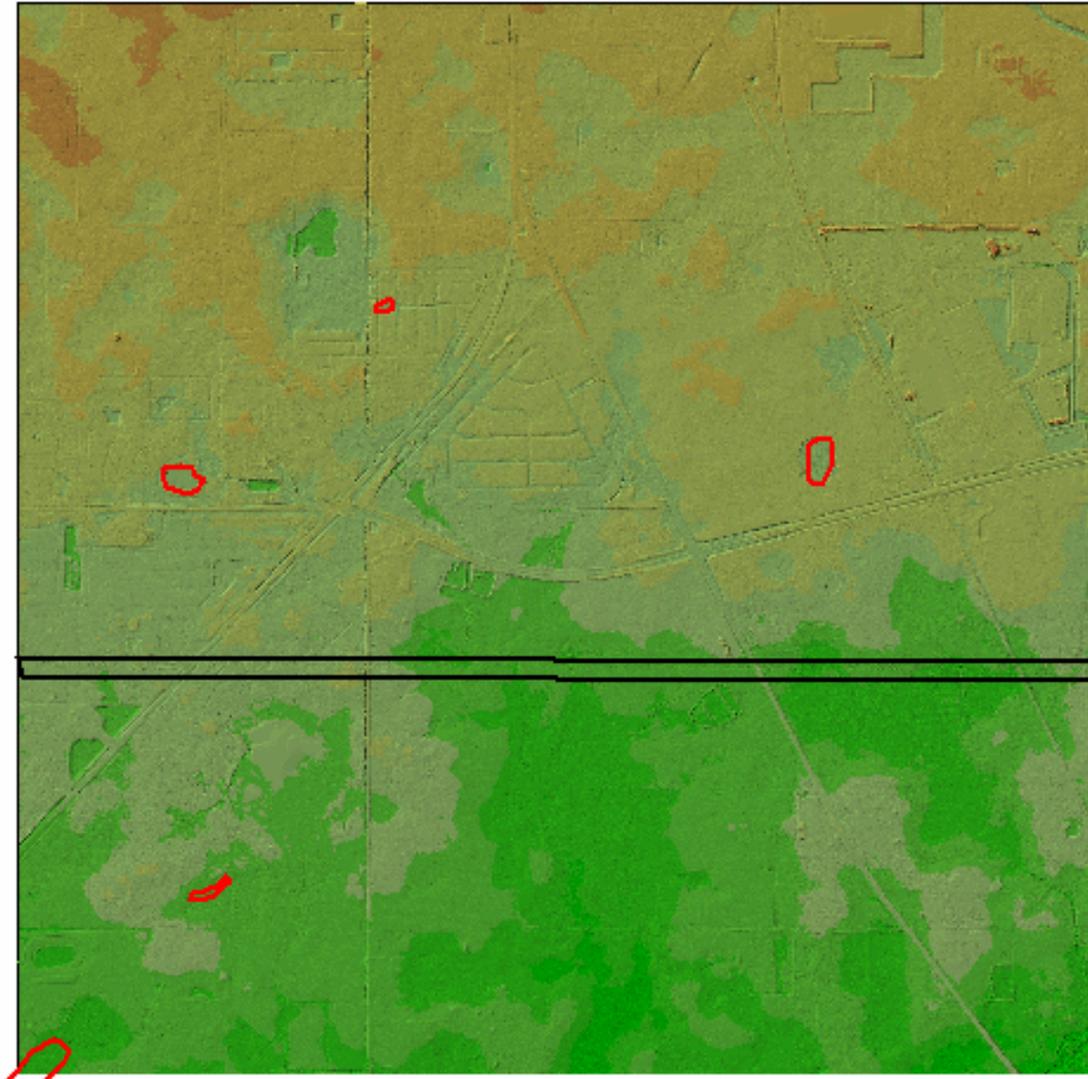
Tile: U_000009- Water points not vaporized



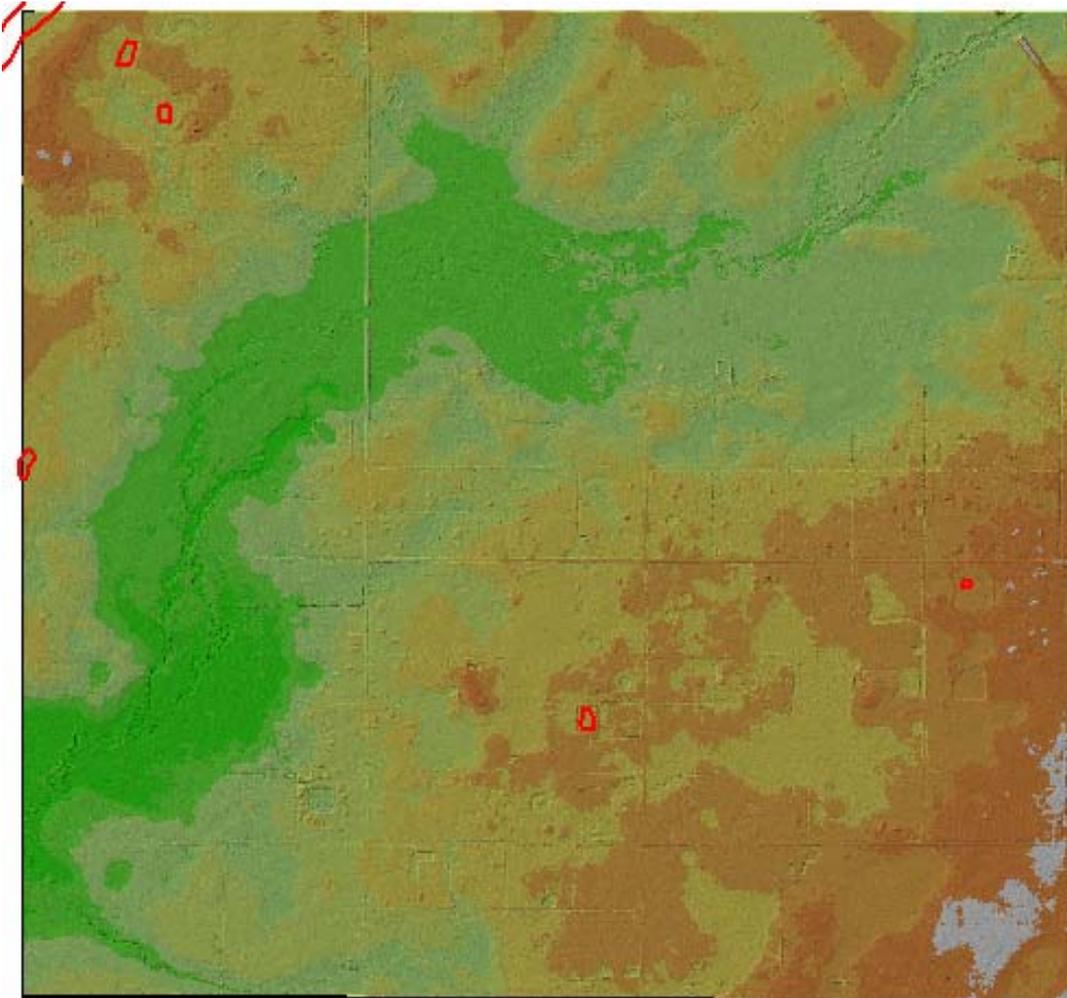
Tile: U_000010- Water points not vaporized and bridge.



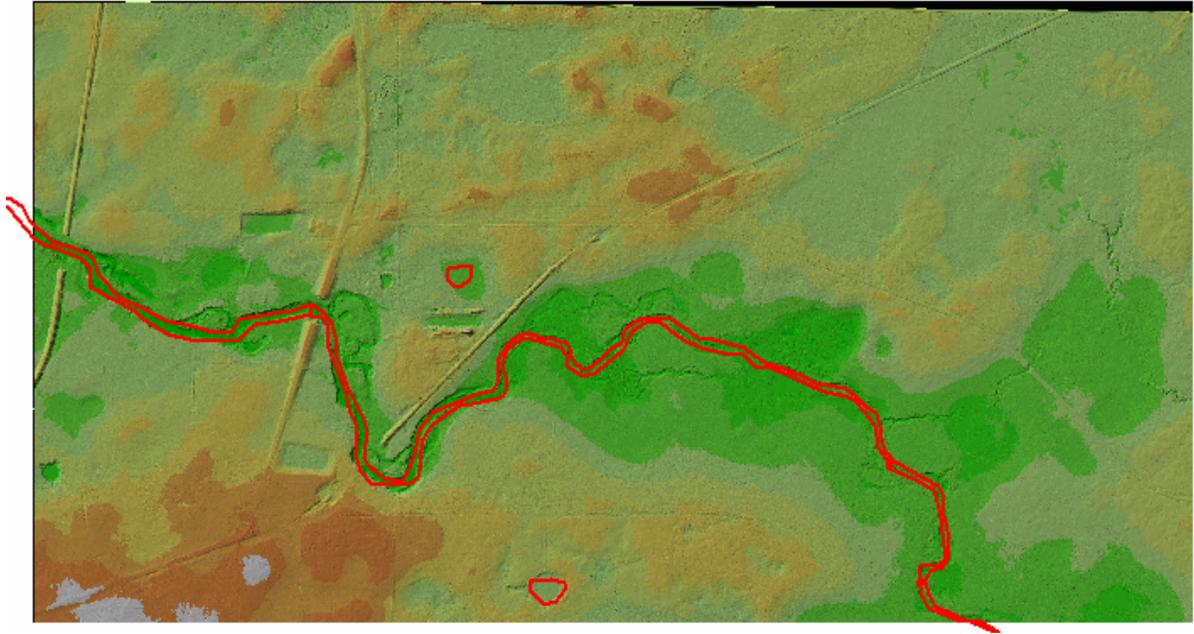
Tile: U_000011- Water points not vaporized



Tile: U_000012- Water points not vaporized



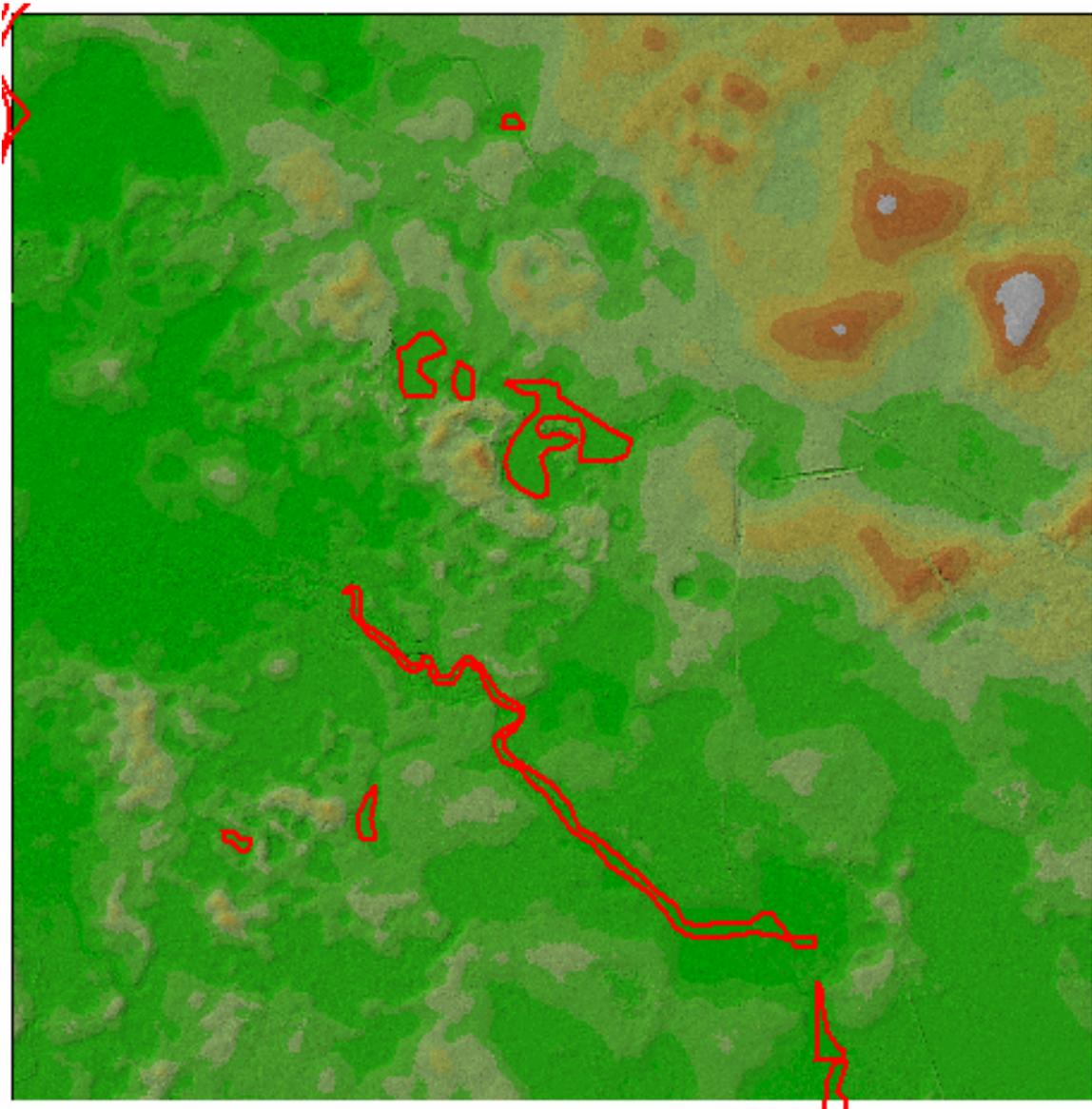
Tile: V_000001- Water points not vaporized



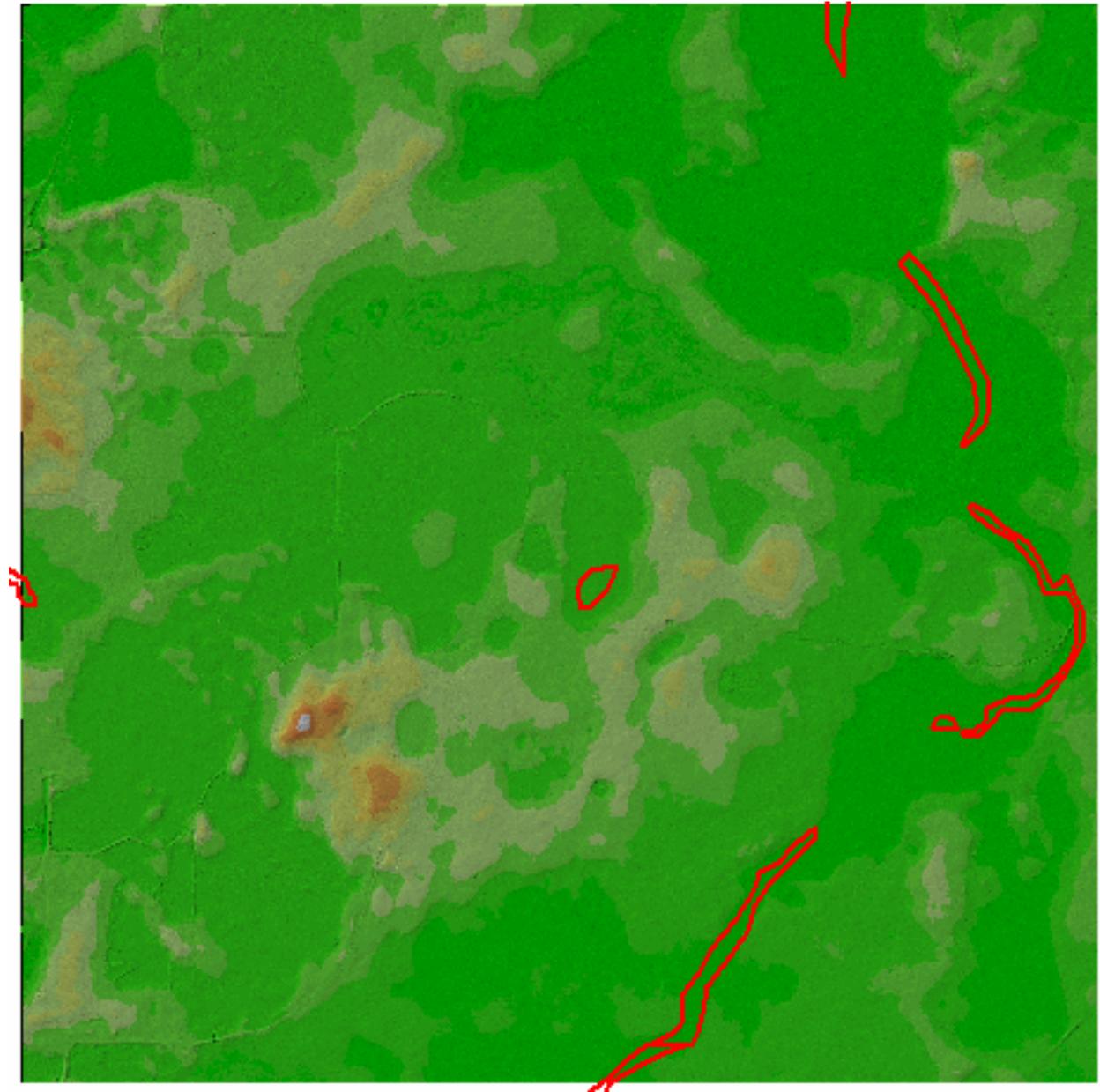
Tile: V_000002- Water points not vaporized



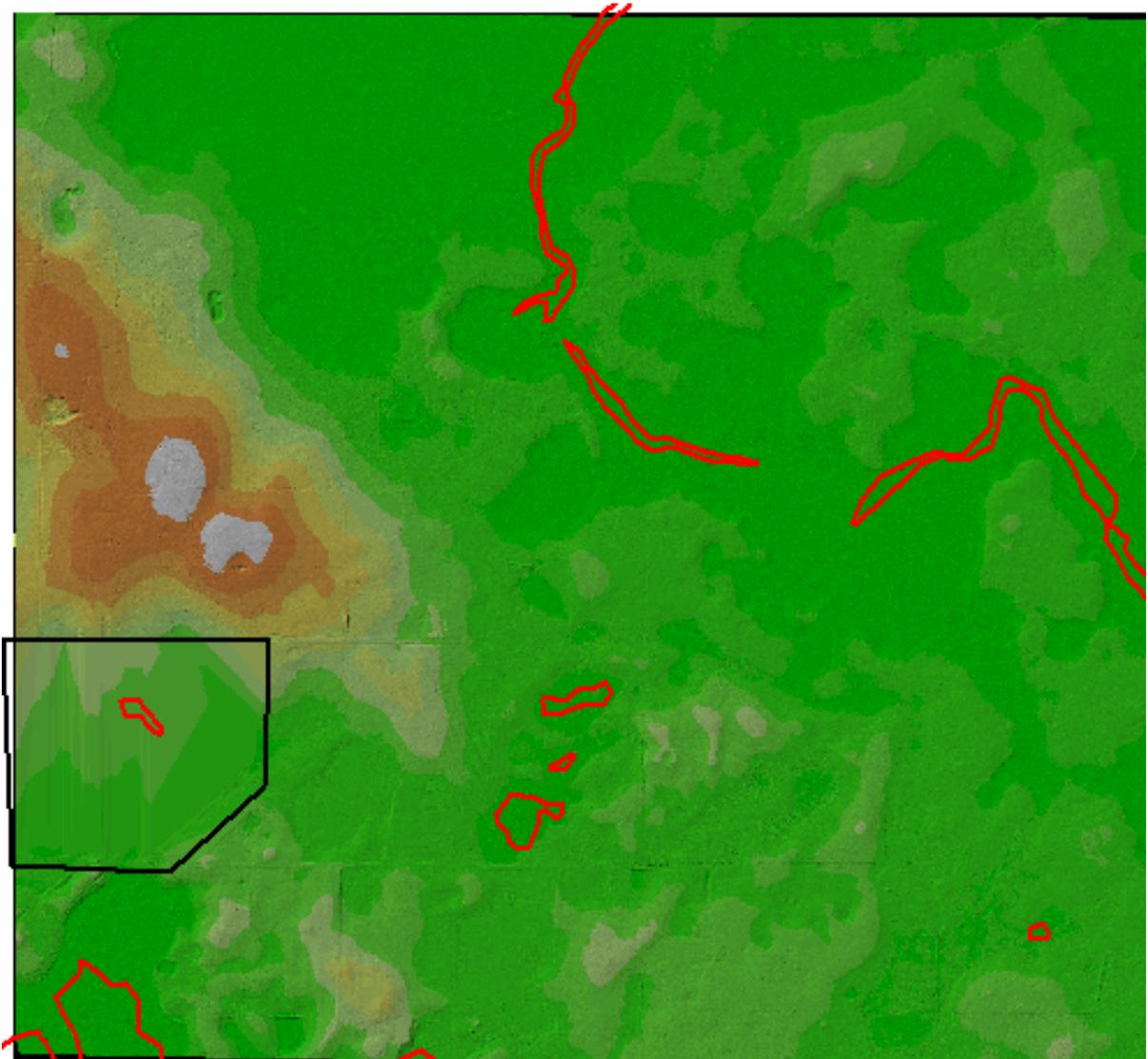
Tile: V_000003- Water points not vaporized



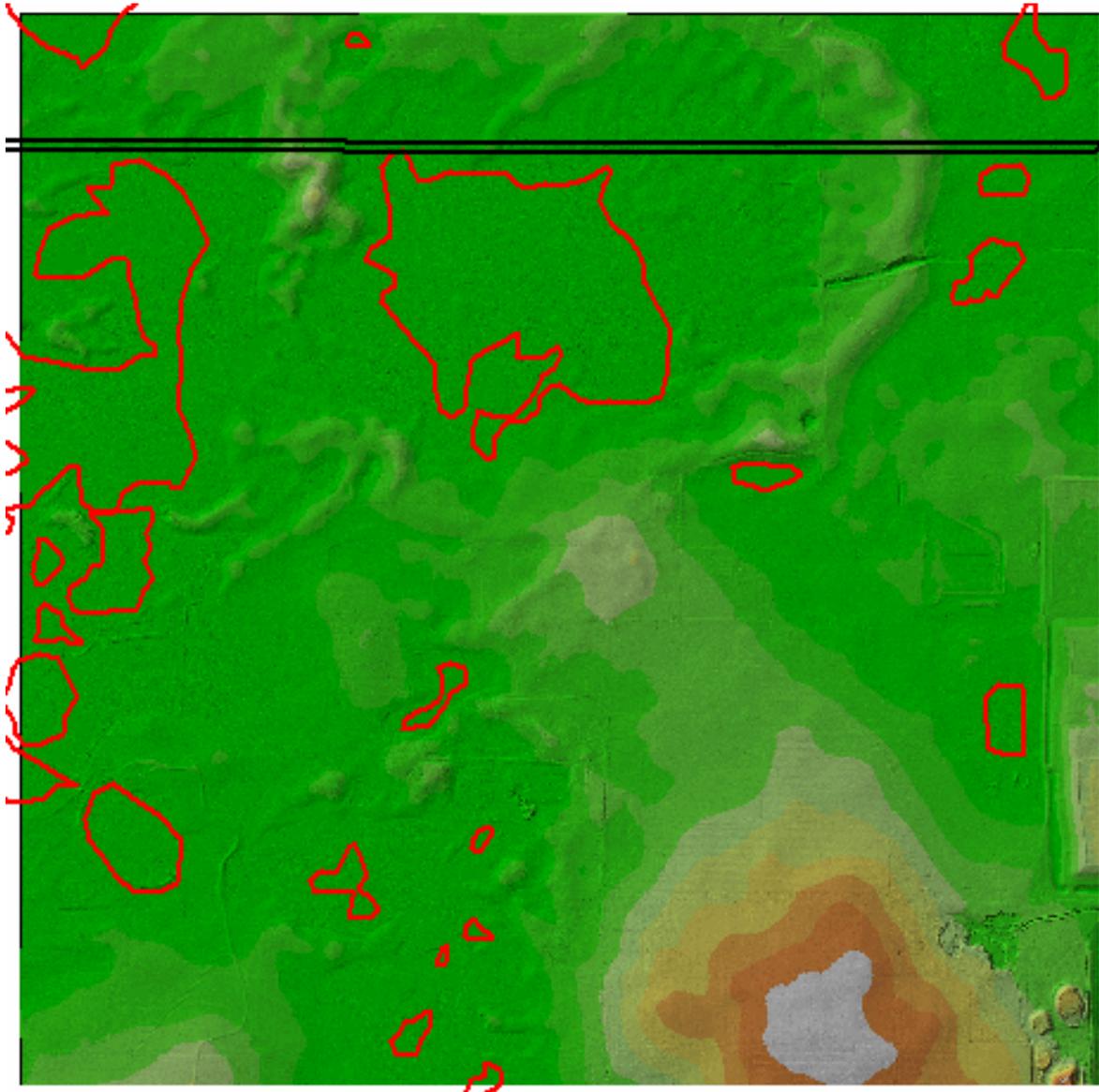
Tile: V_000004- Water points not vaporized



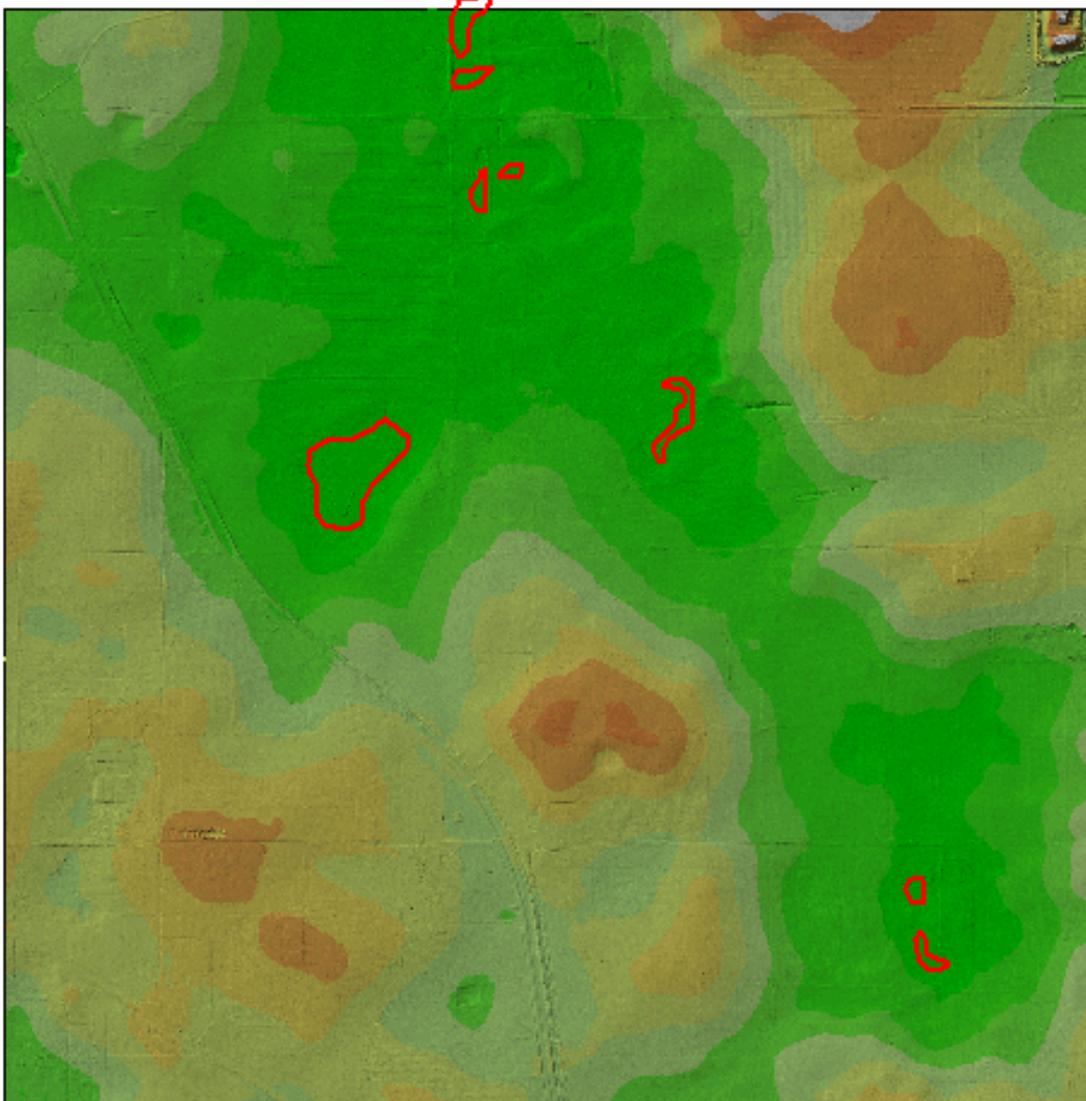
Tile: V_000005- Water points not vaporized and aggressive editing.



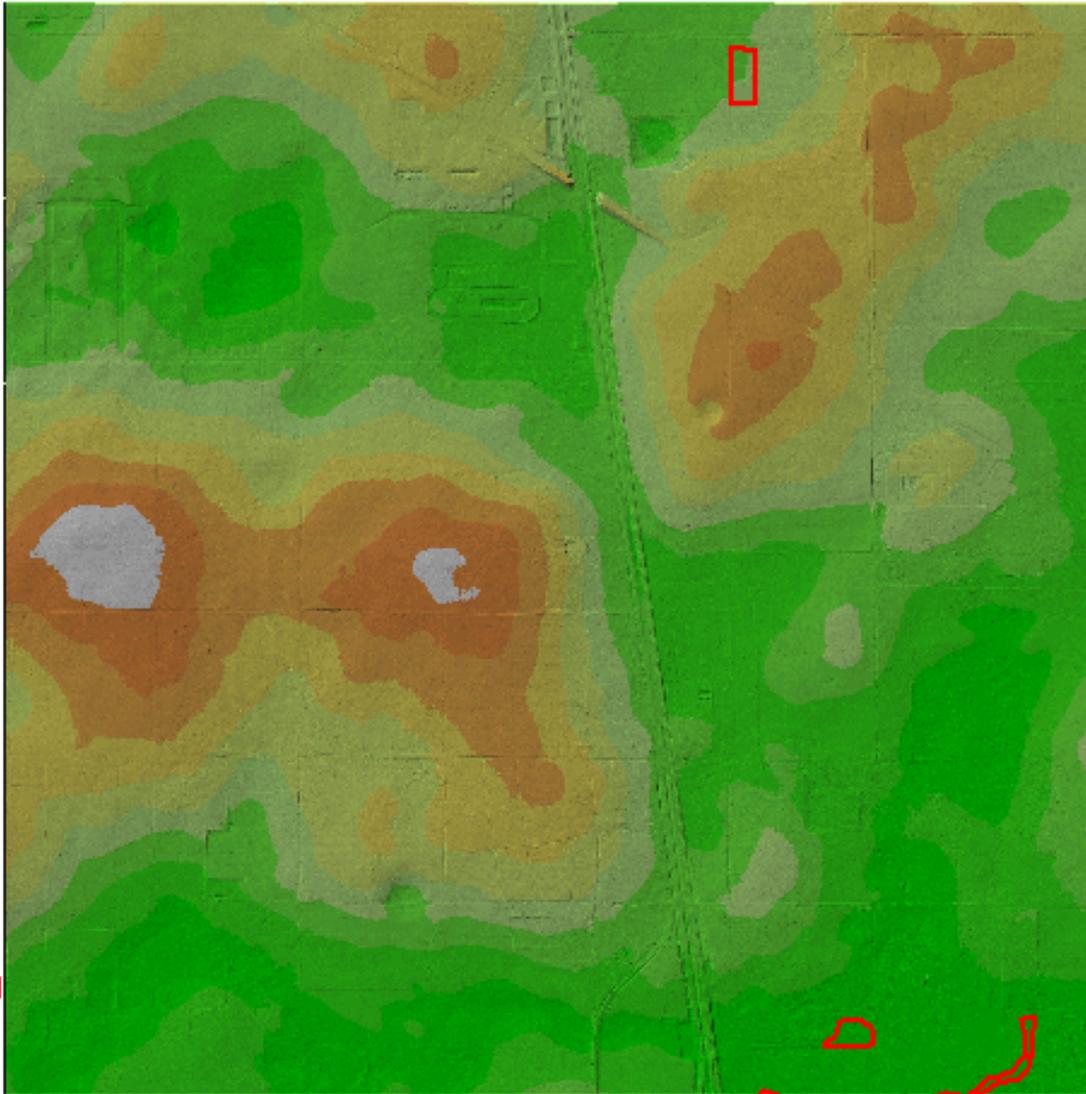
Tile: V_000006- Water points not vaporized and flightline step.



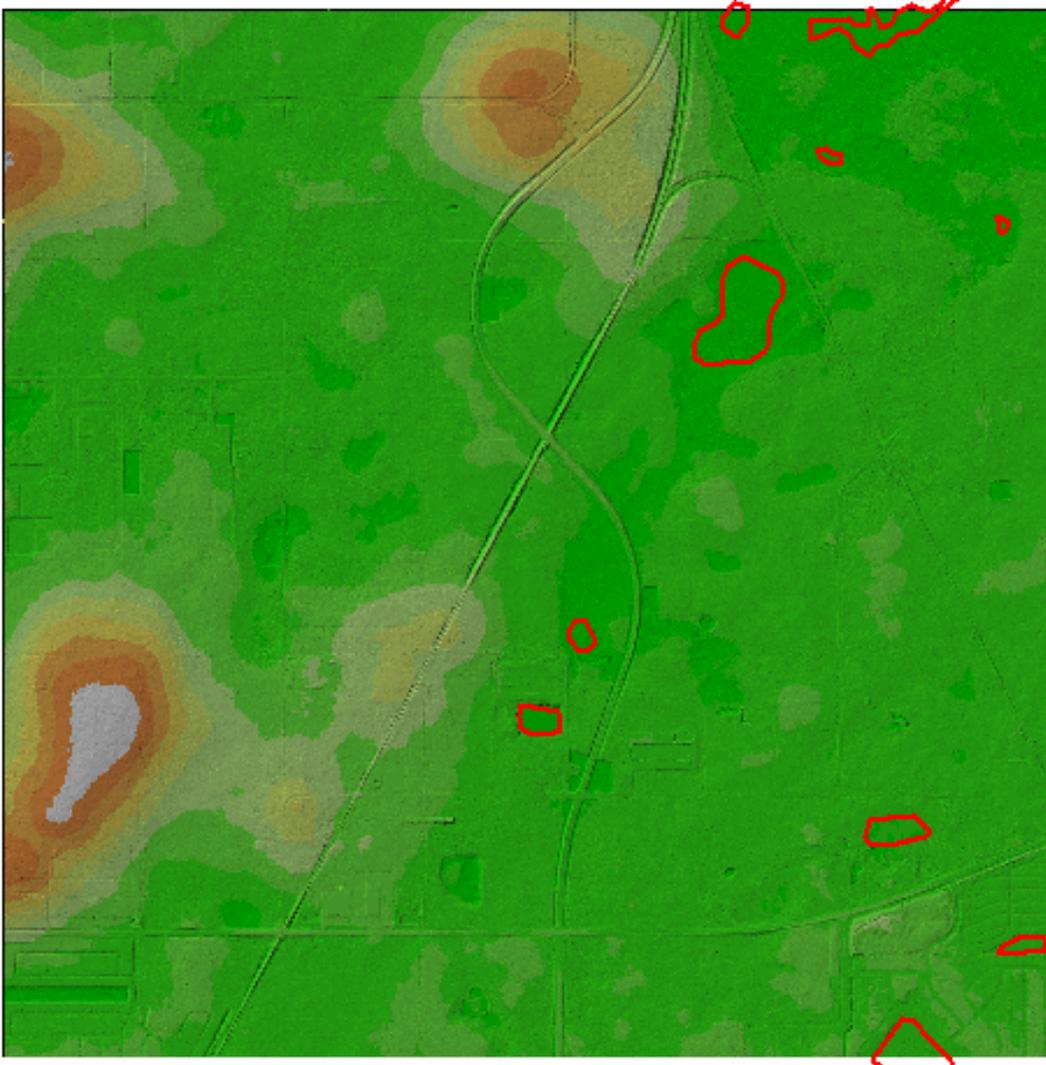
Tile: V_000007- Water points not vaporized



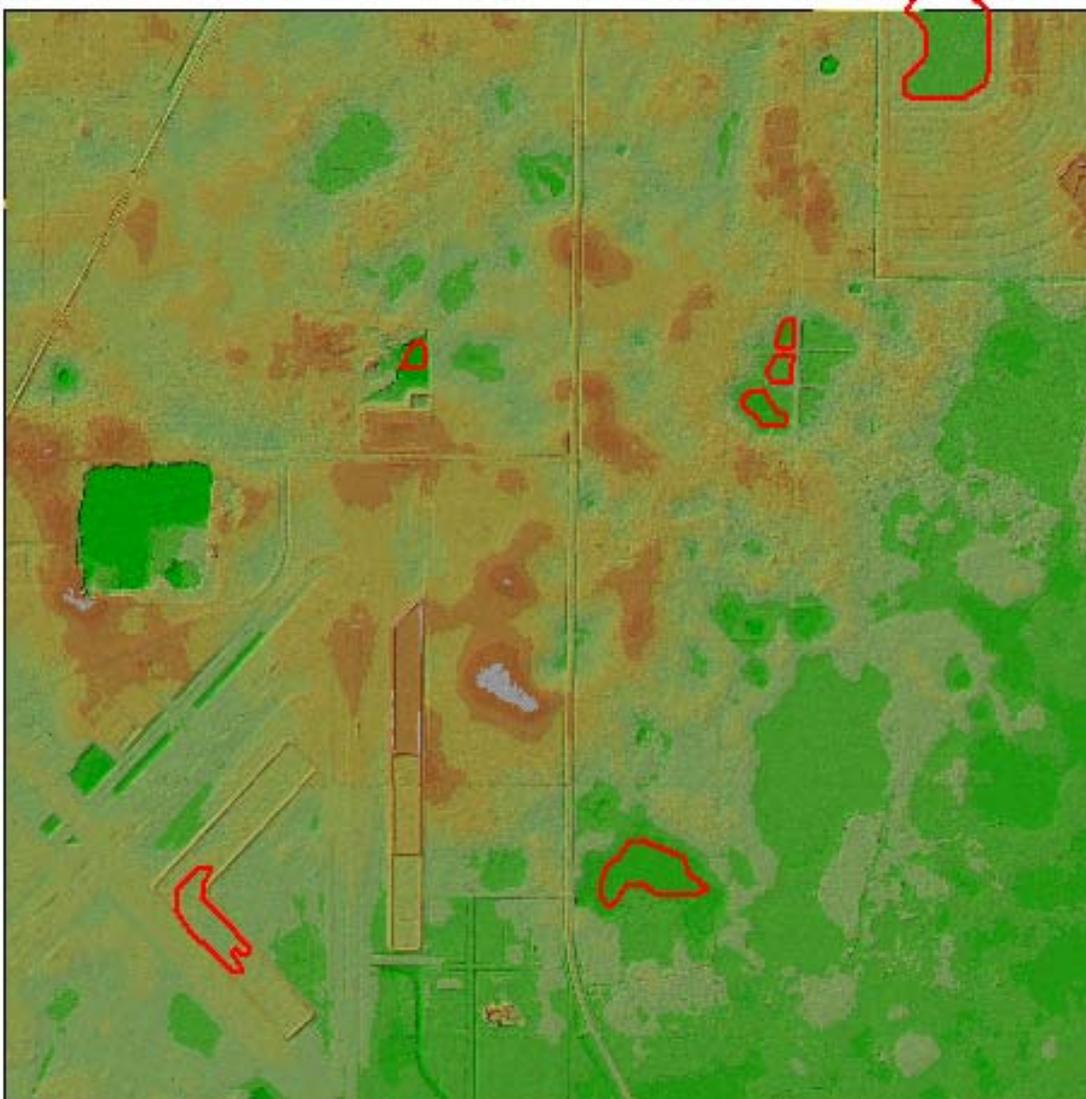
Tile: V_000008- Water points not vaporized



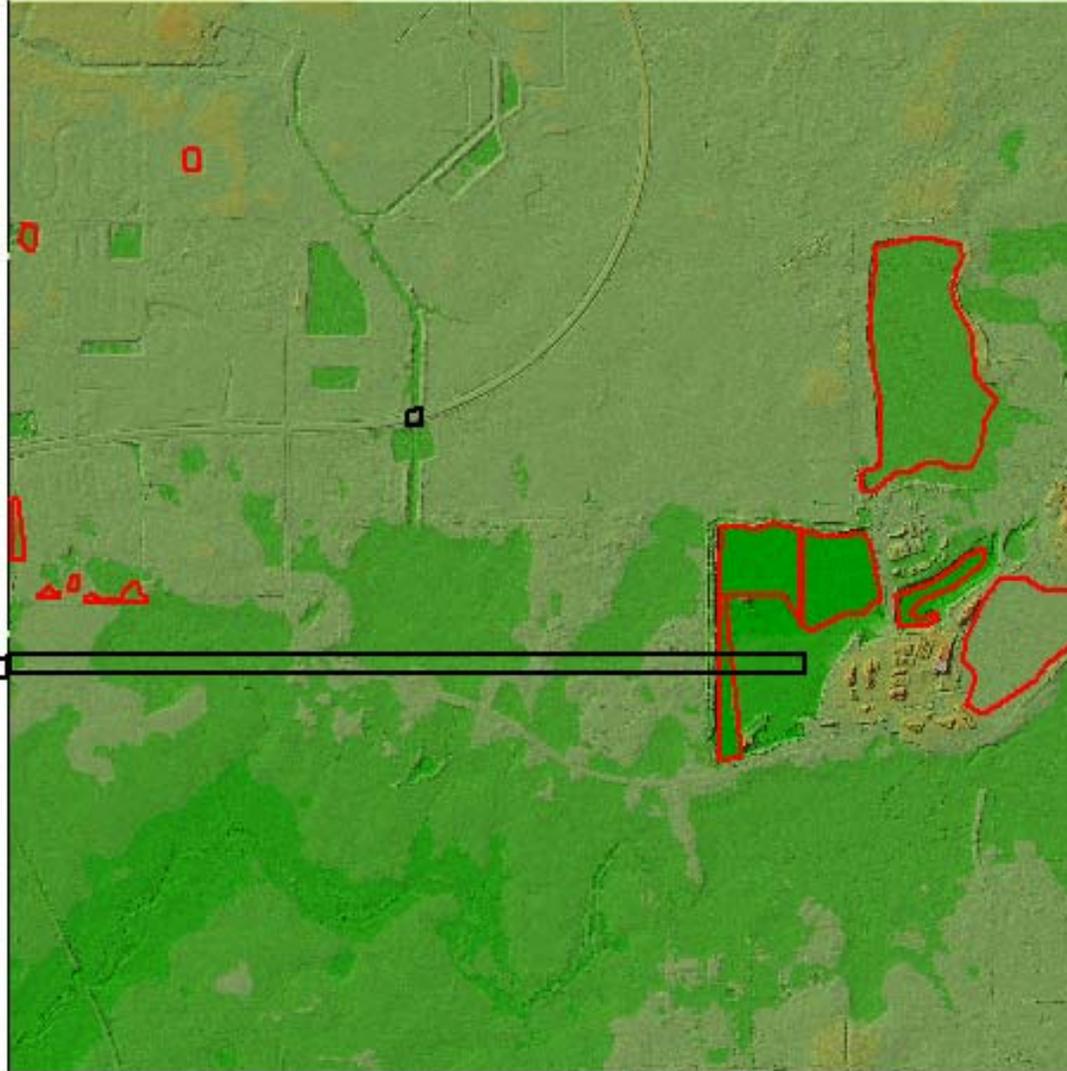
Tile: V_000009- Water points not vaporized



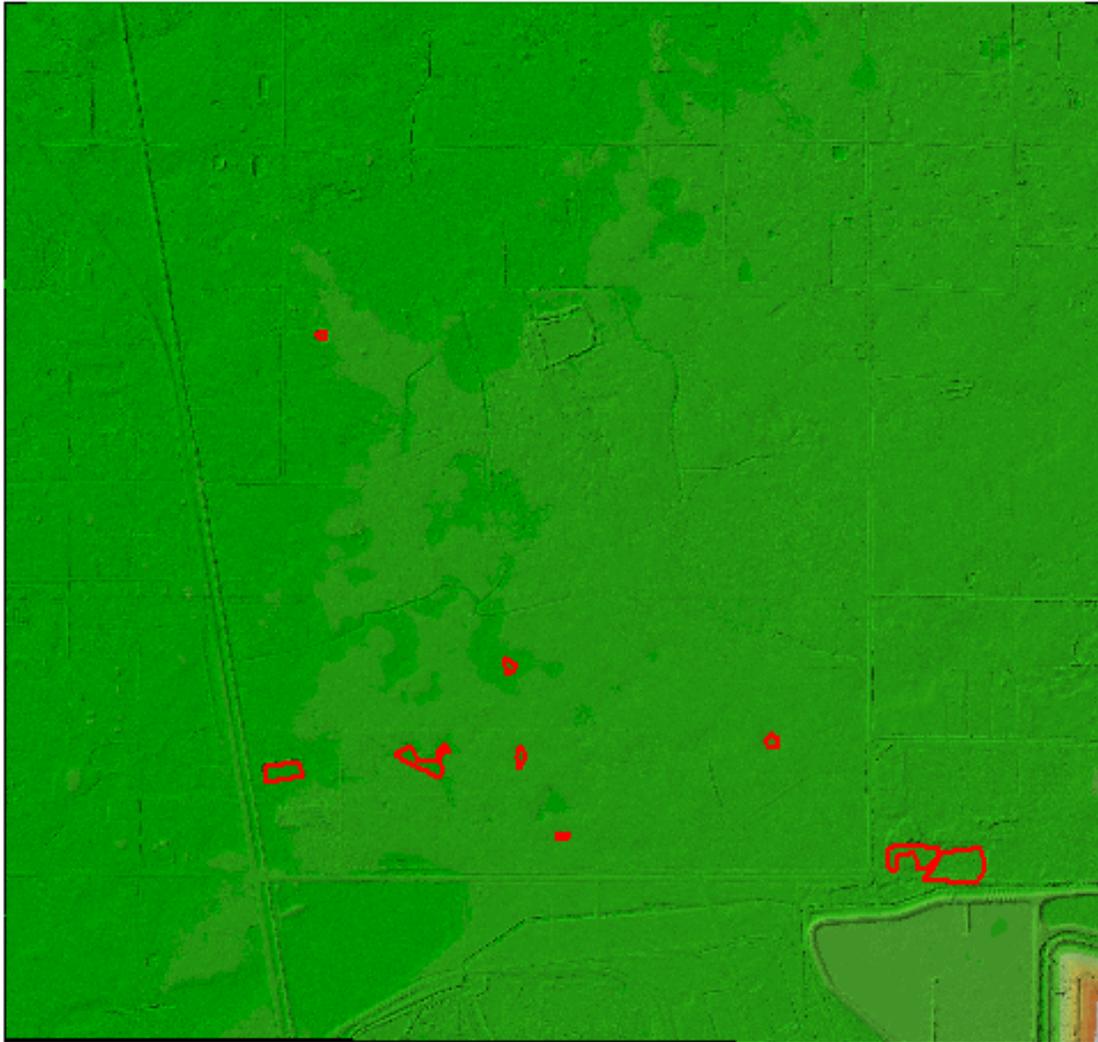
Tile: V_000010- Water points not vaporized



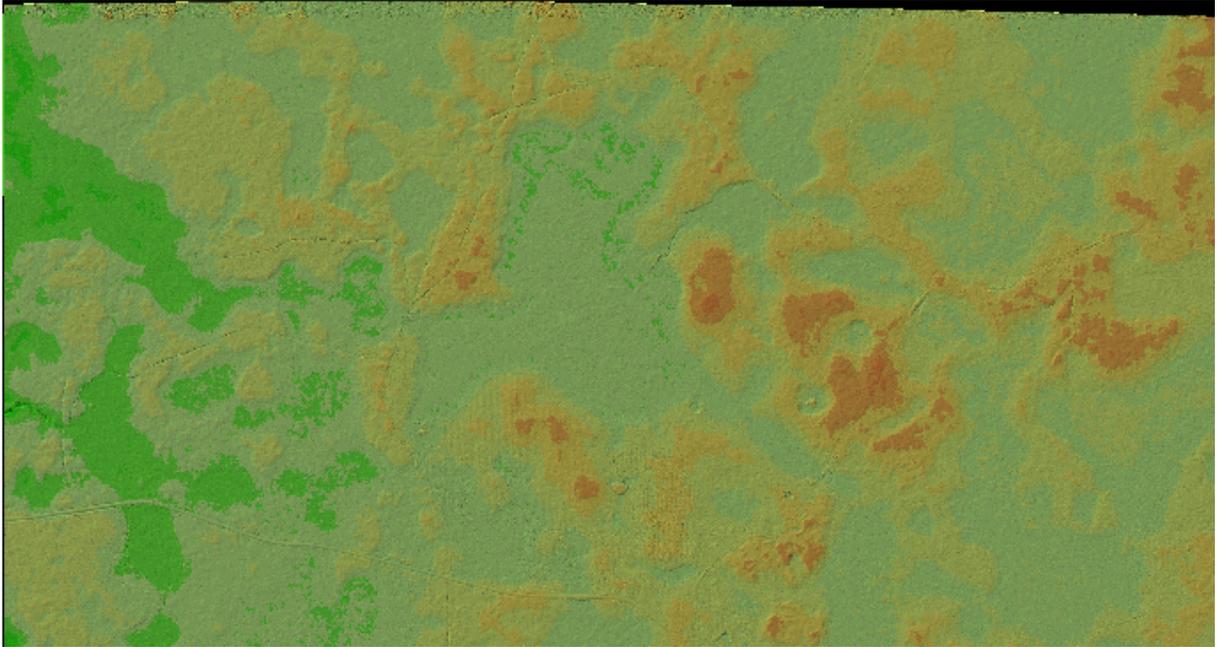
Tile: V_000011- Water points not vaporized and bridge.



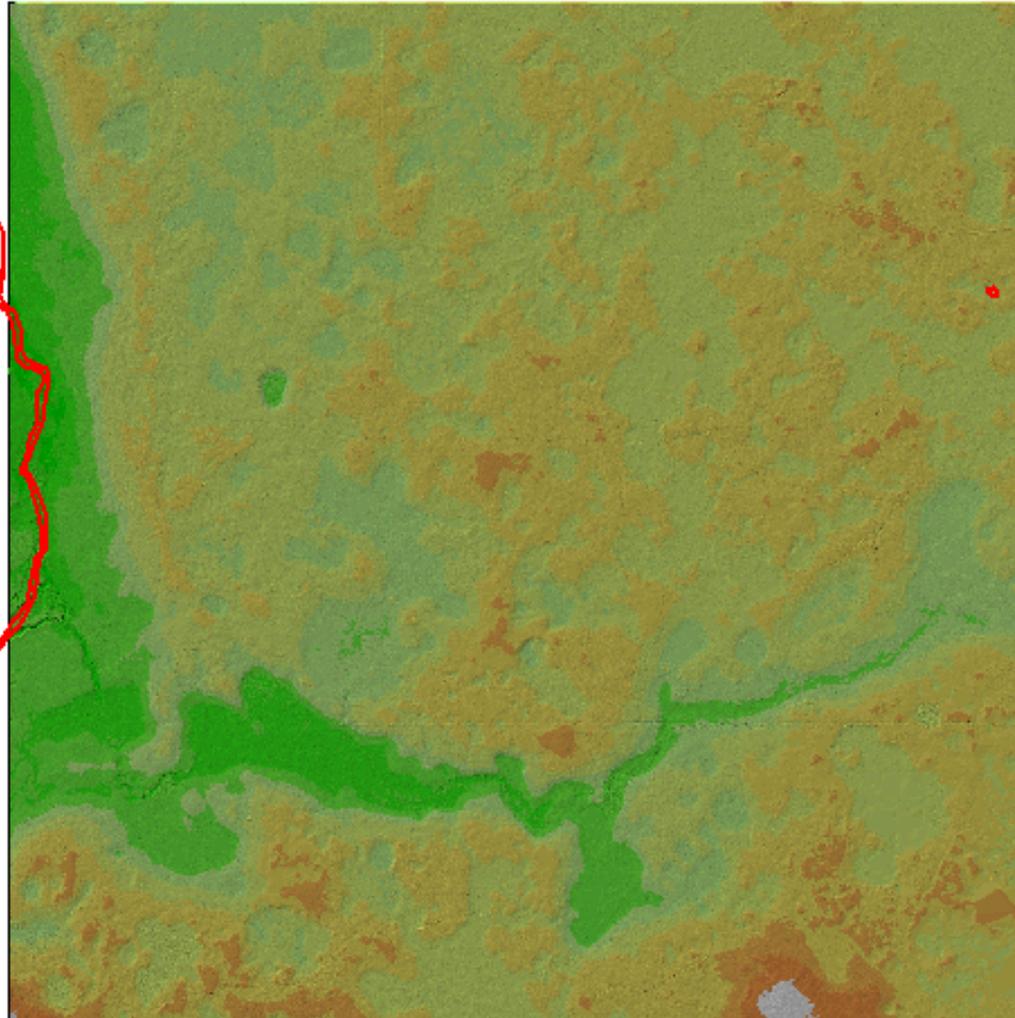
Tile: V_000012- Water points not vaporized



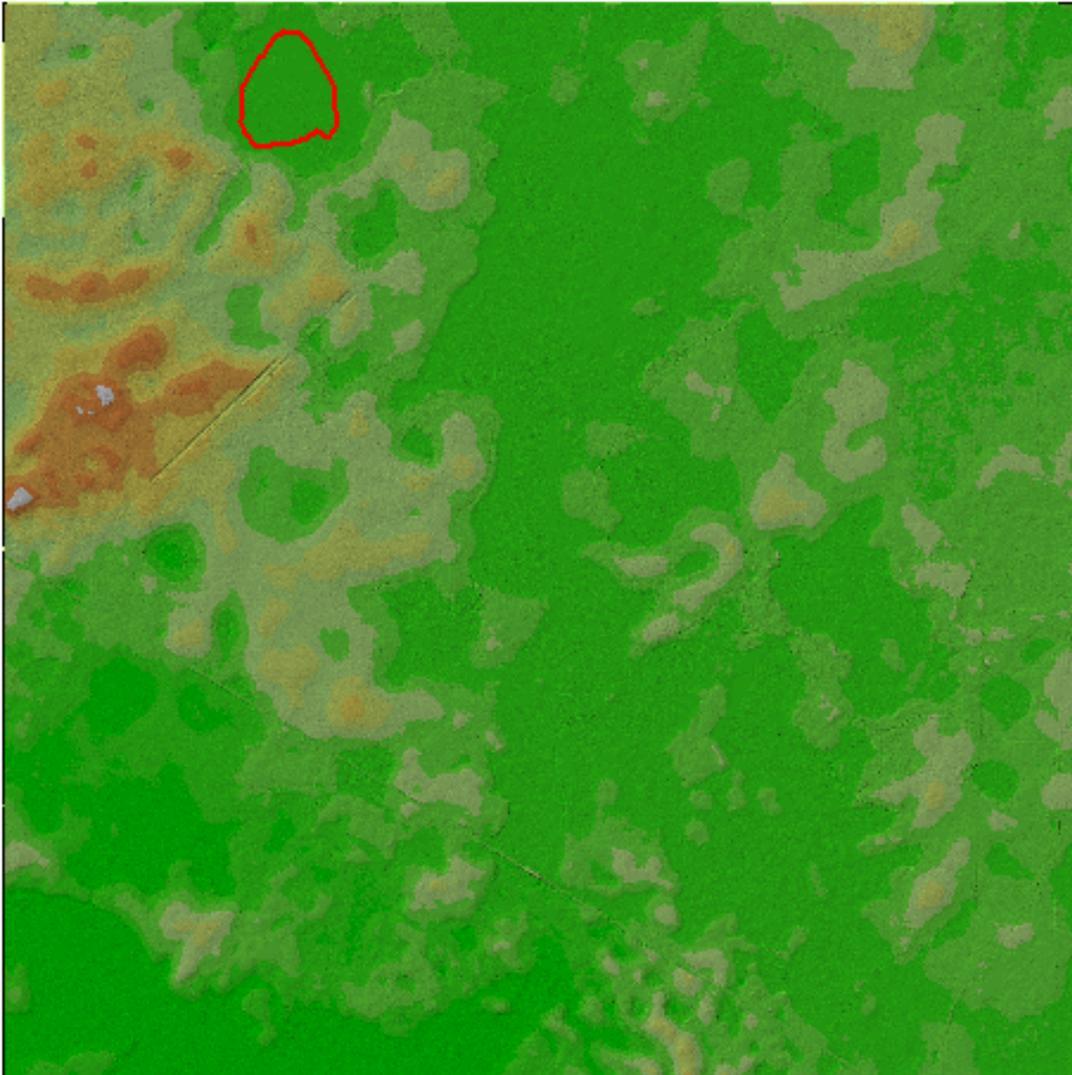
Tile: W_000001- Water points not vaporized



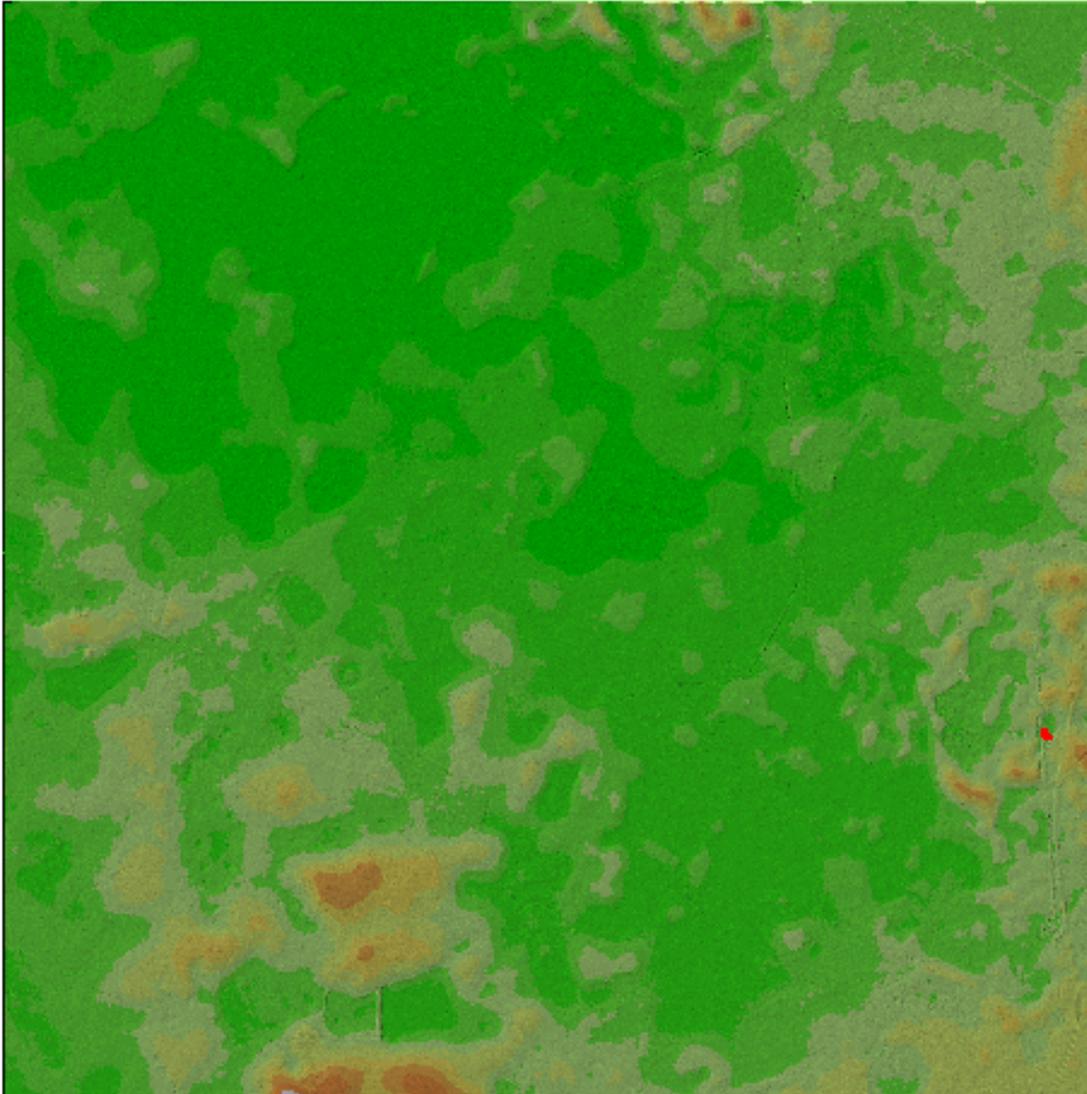
Tile: W_000002- Water points not vaporized



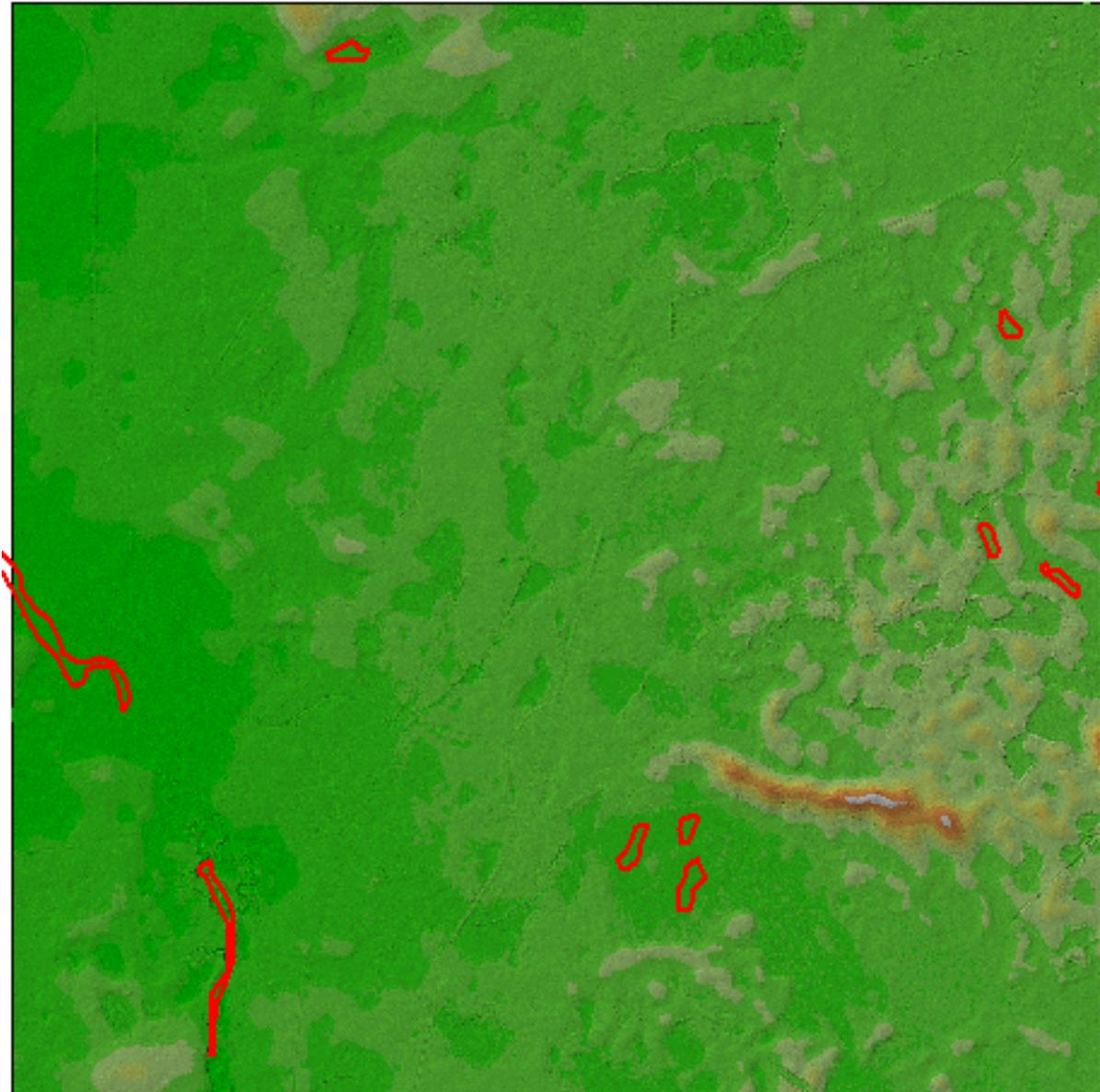
Tile: W_000003- Water points not vaporized



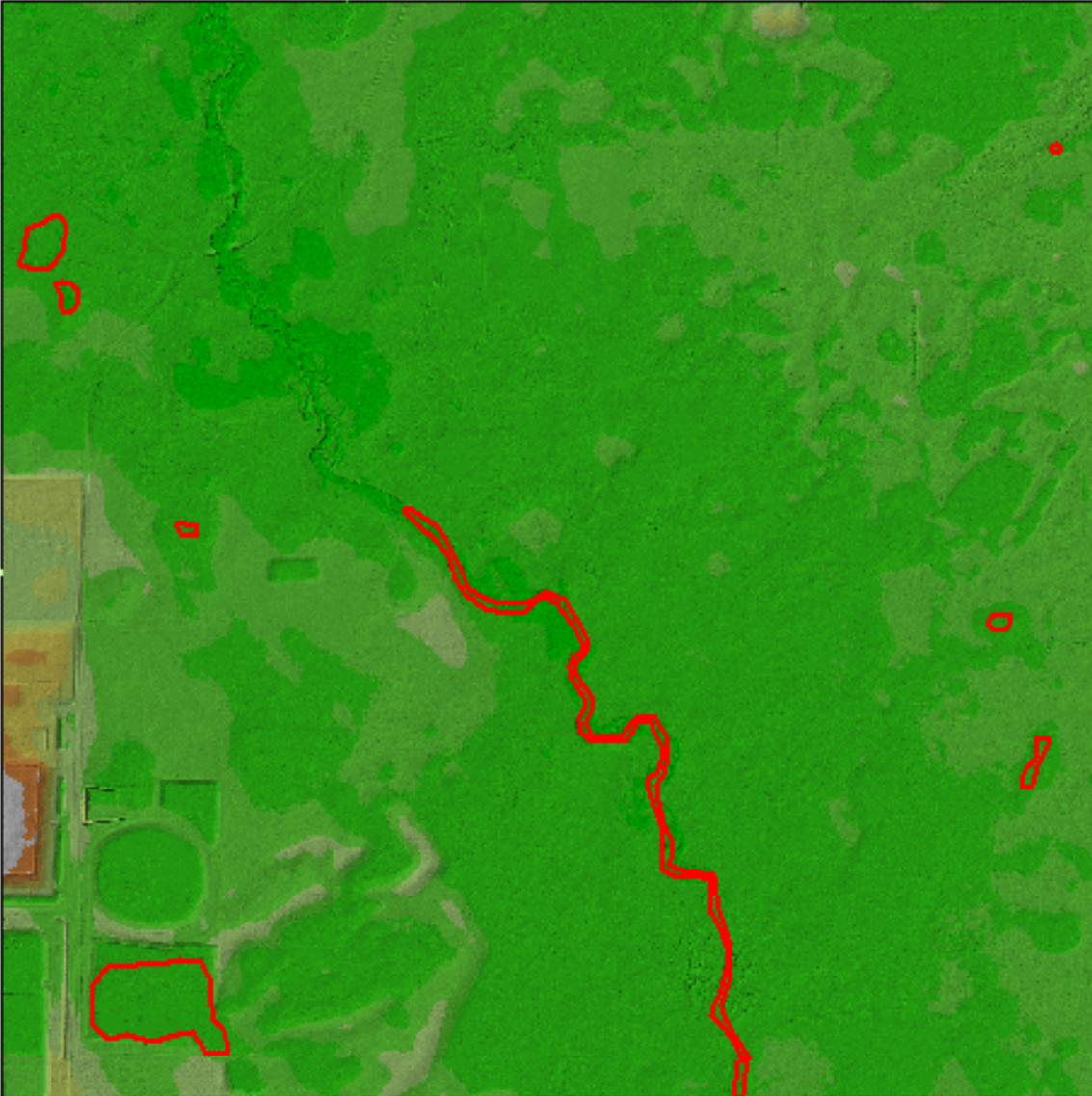
Tile: W_000004- Water points not vaporized



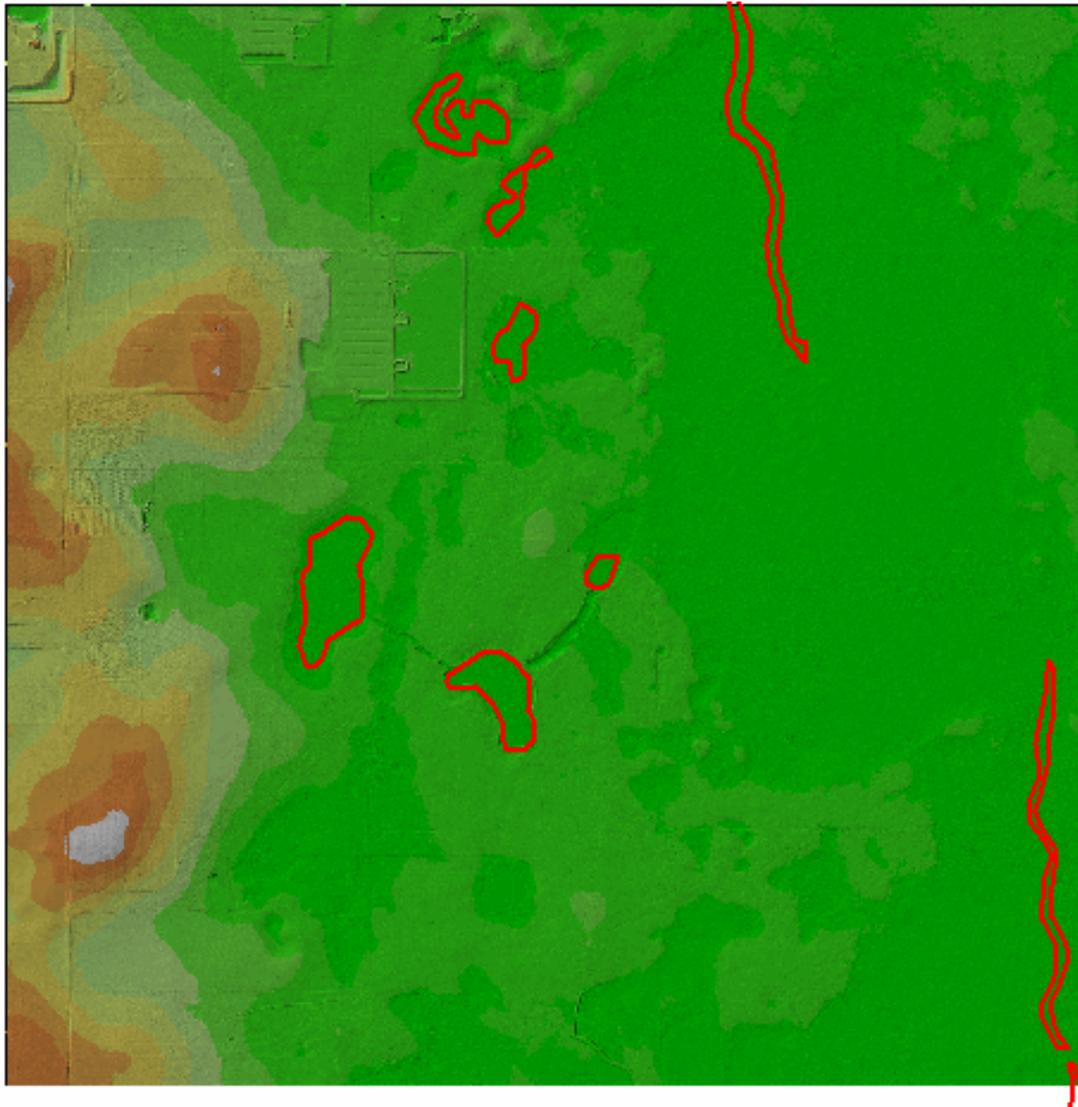
Tile: W_000005- Water points not vaporized



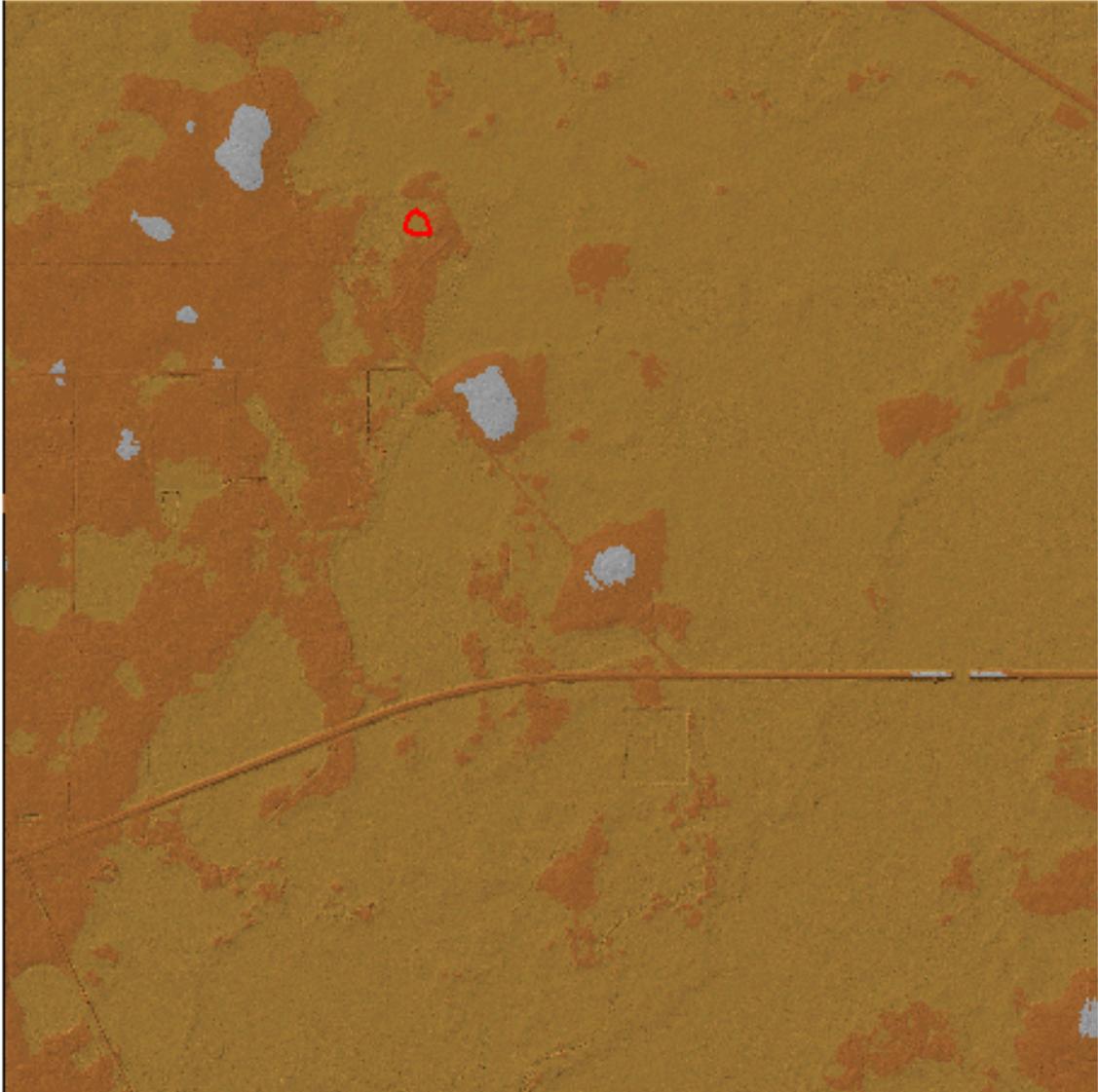
Tile: W_000006- Water points not vaporized



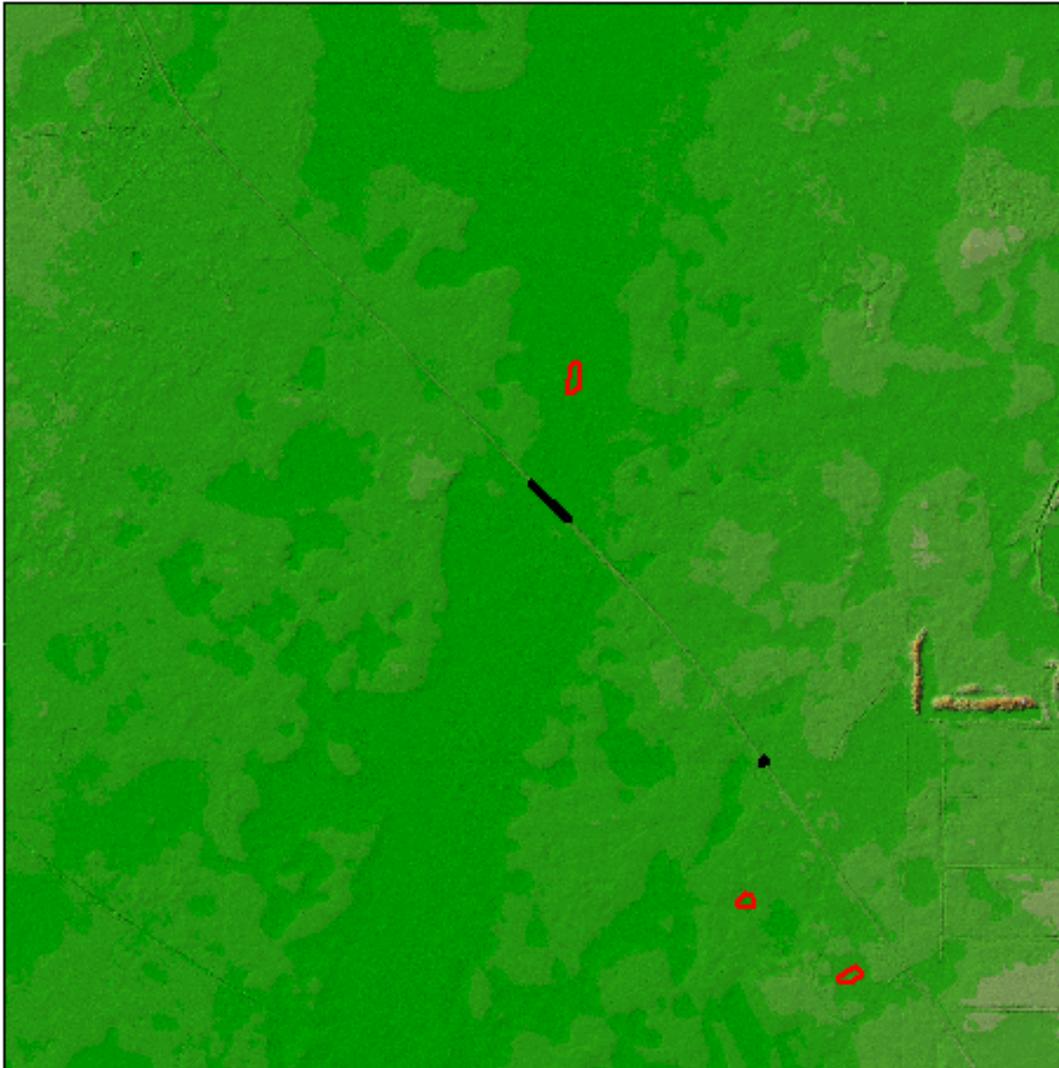
Tile: W_000007- Water points not vaporized



Tile: W_000009- Water points not vaporized



Tile: W_000010- Water points not vaporized and bridge.



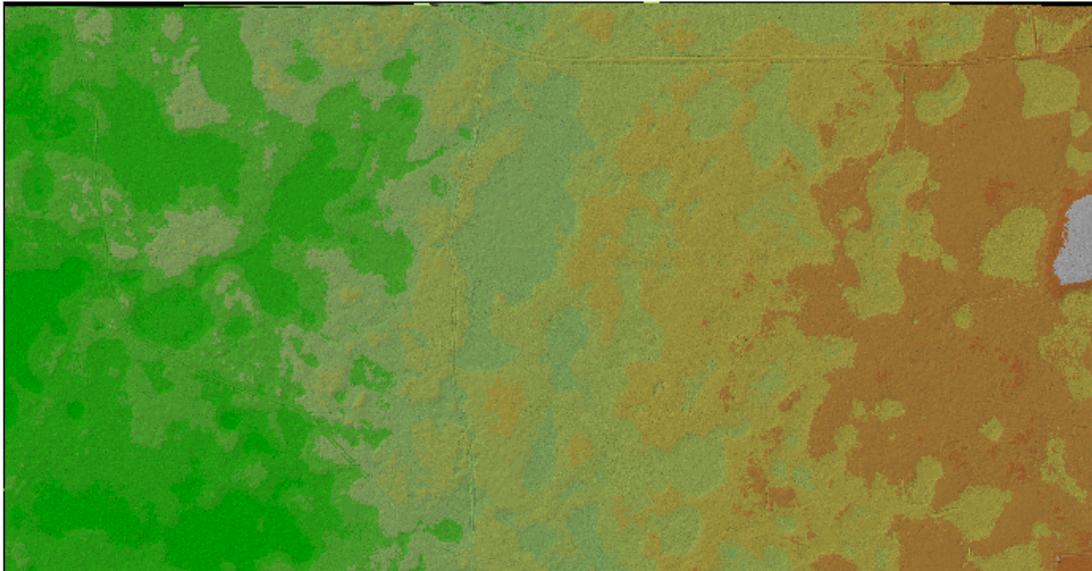
Tile: W_000011- Water points not vaporized



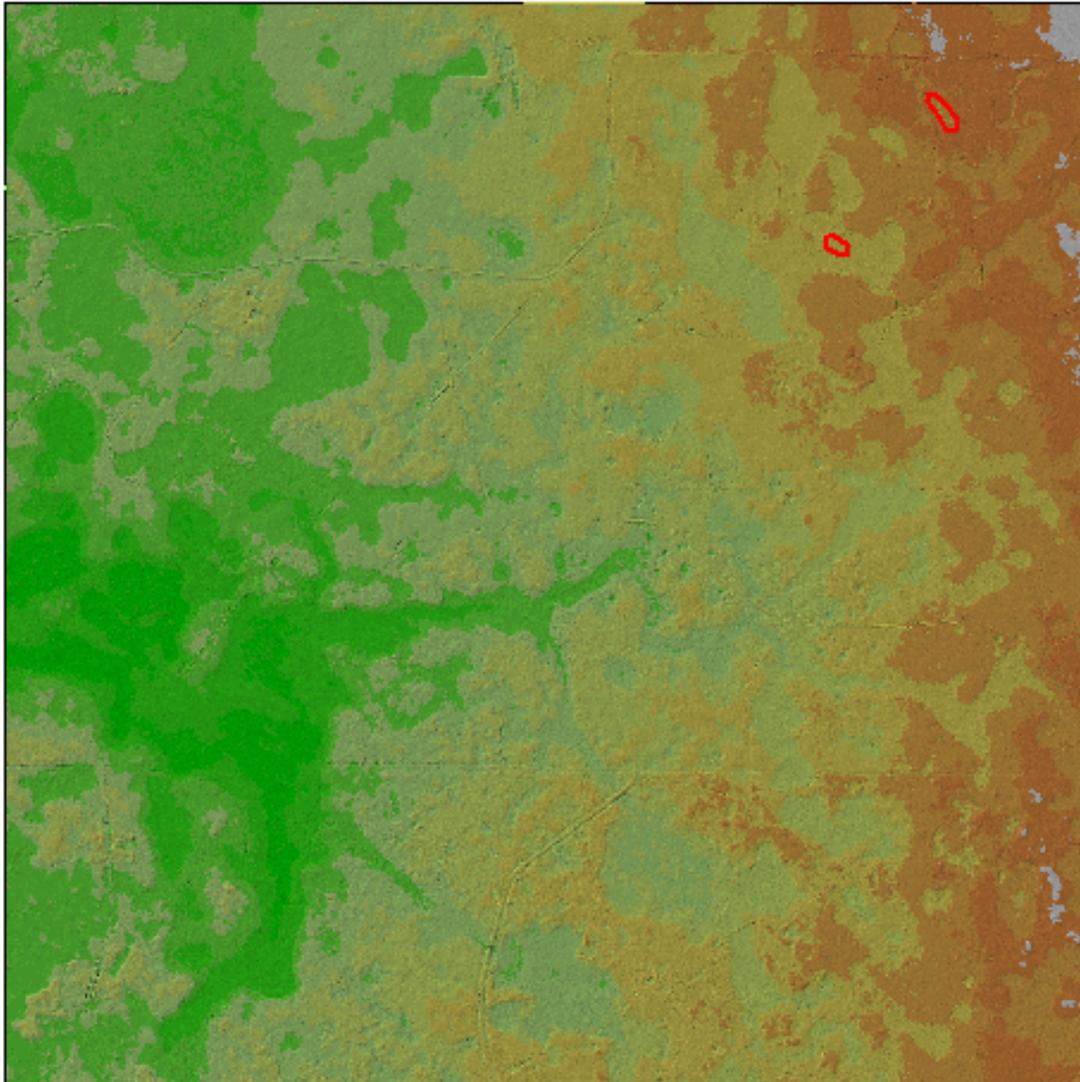
Tile: W_000012- Water points not vaporized



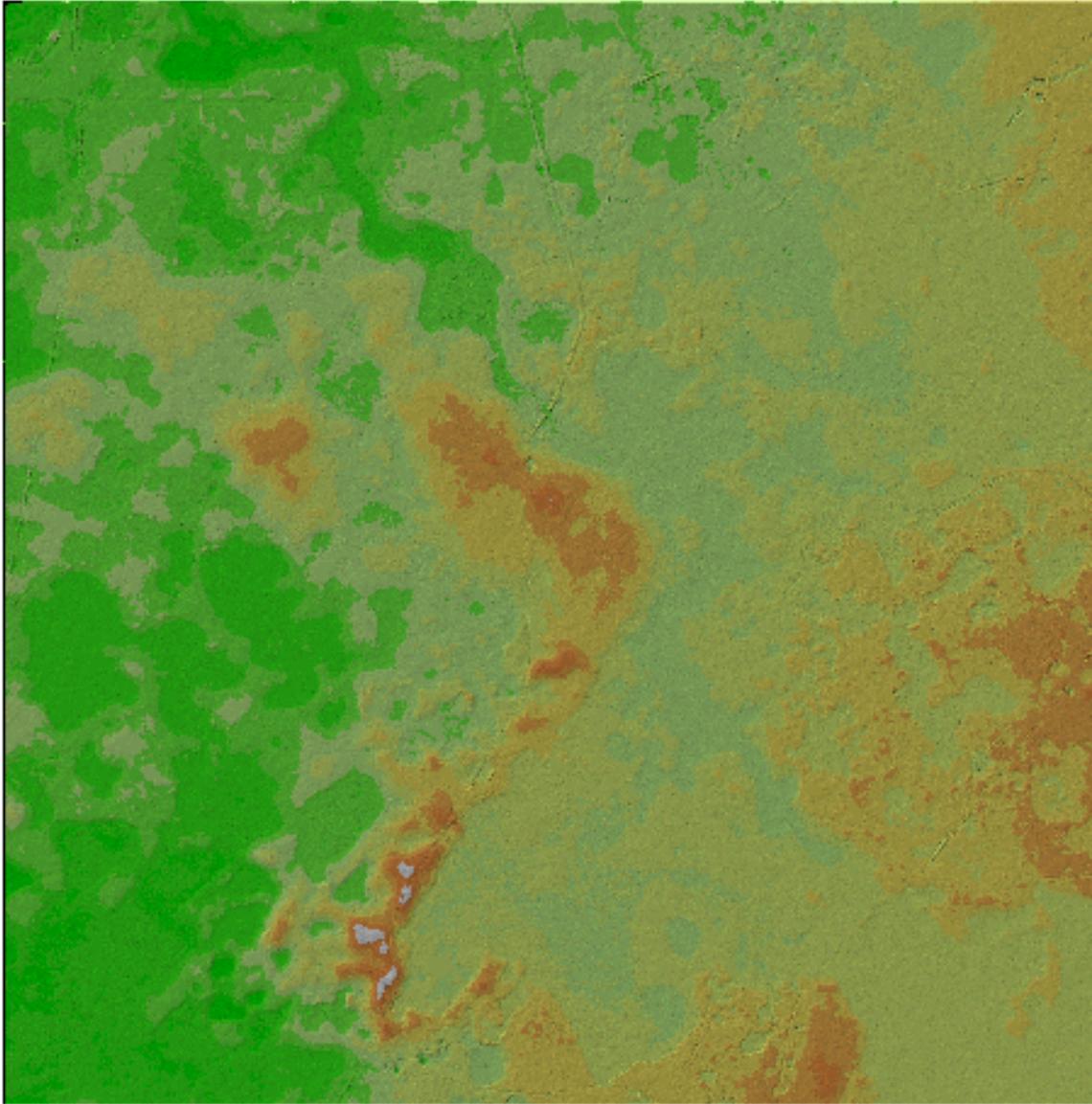
Tile: X_000001- Water points not vaporized



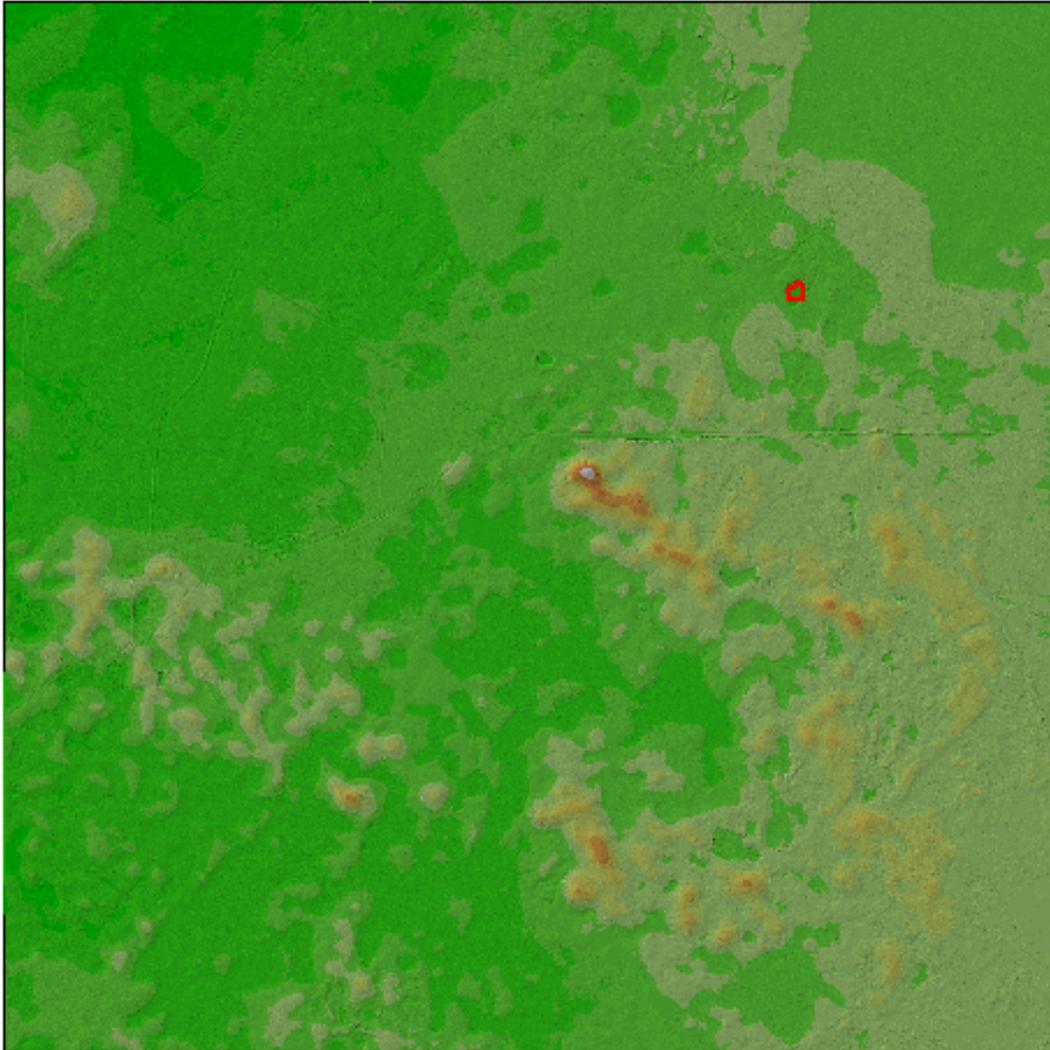
Tile: X_000002- Water points not vaporized



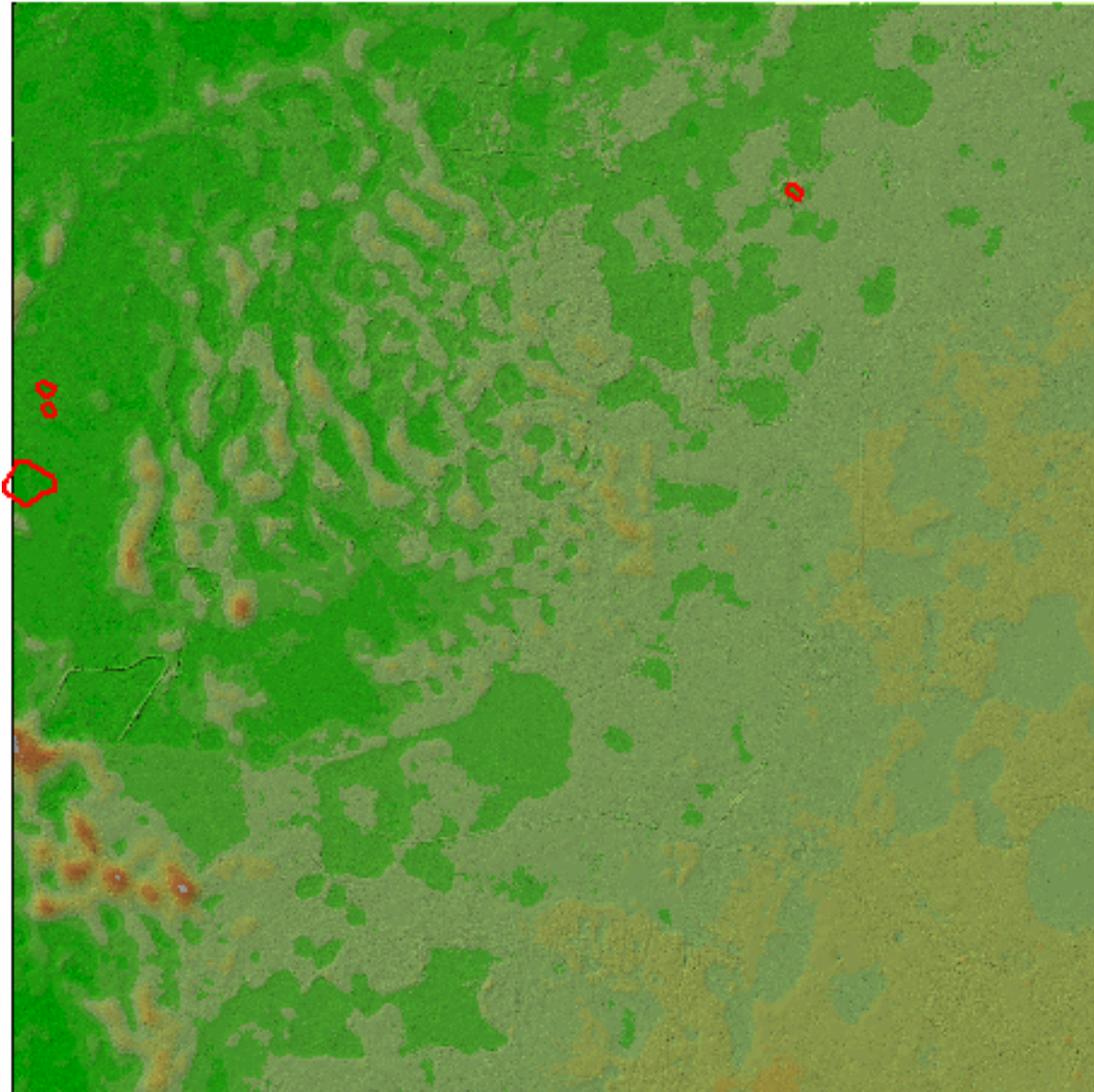
Tile: X_000003- Water points not vaporized



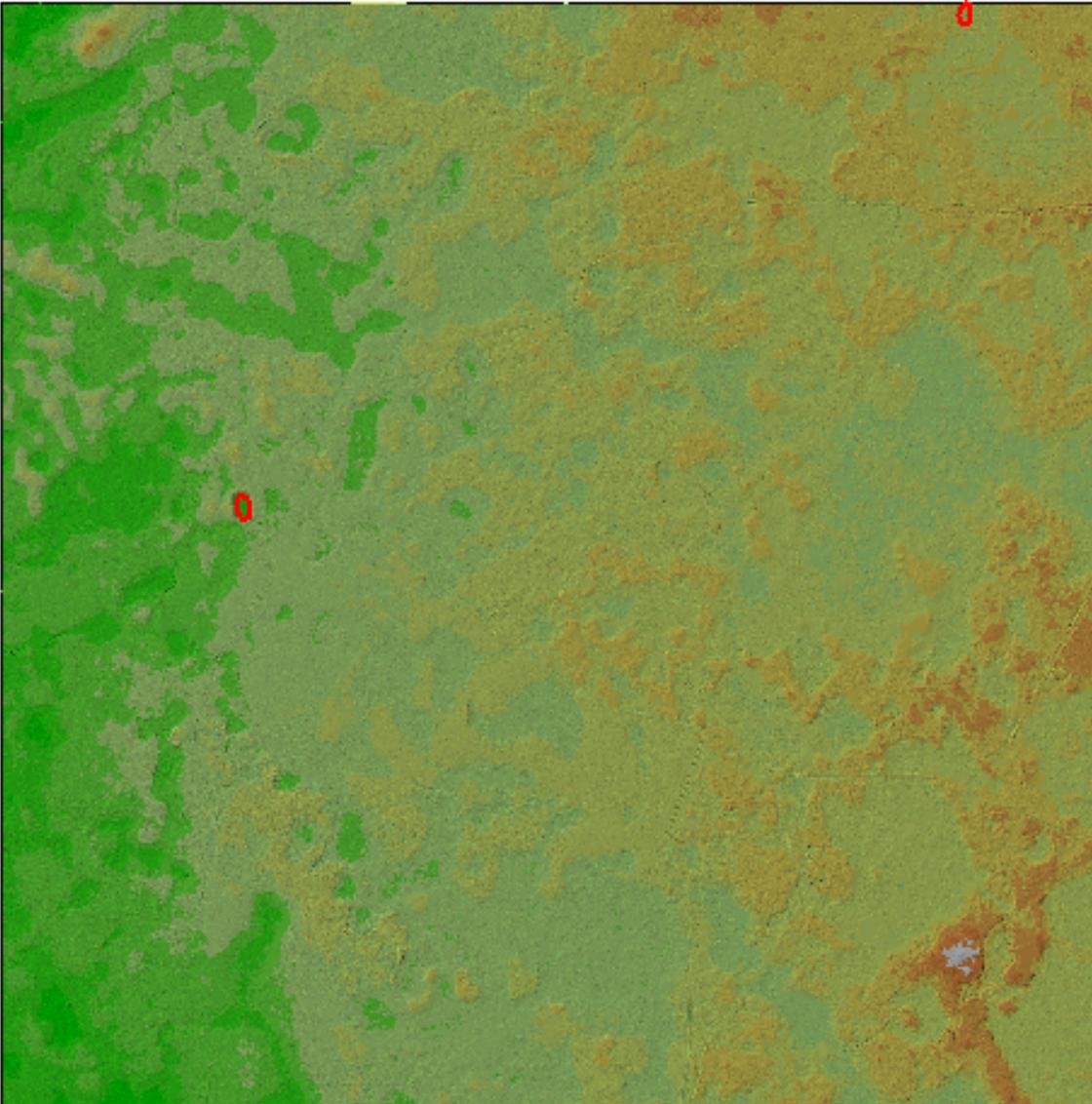
Tile: X_000004- Water points not vaporized



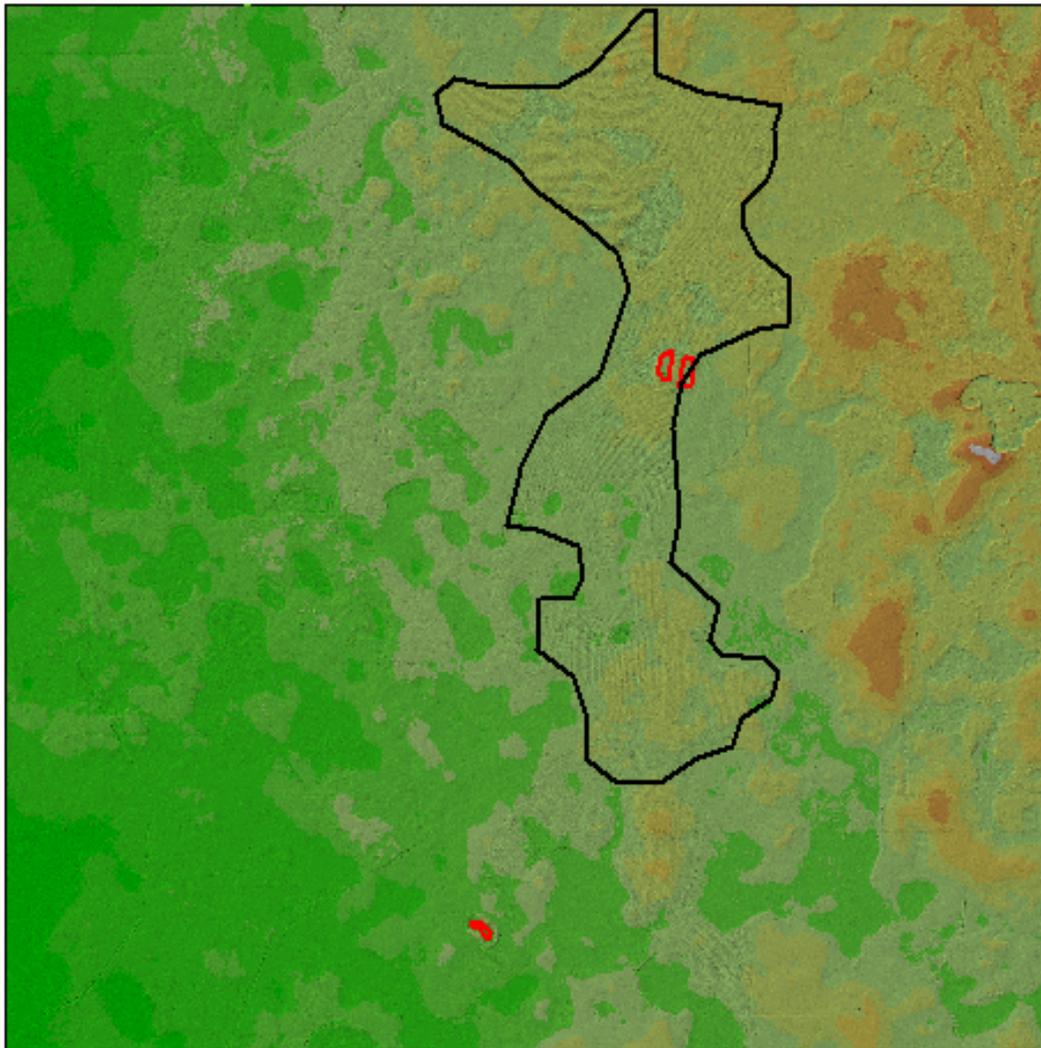
Tile: X_000005- Water points not vaporized



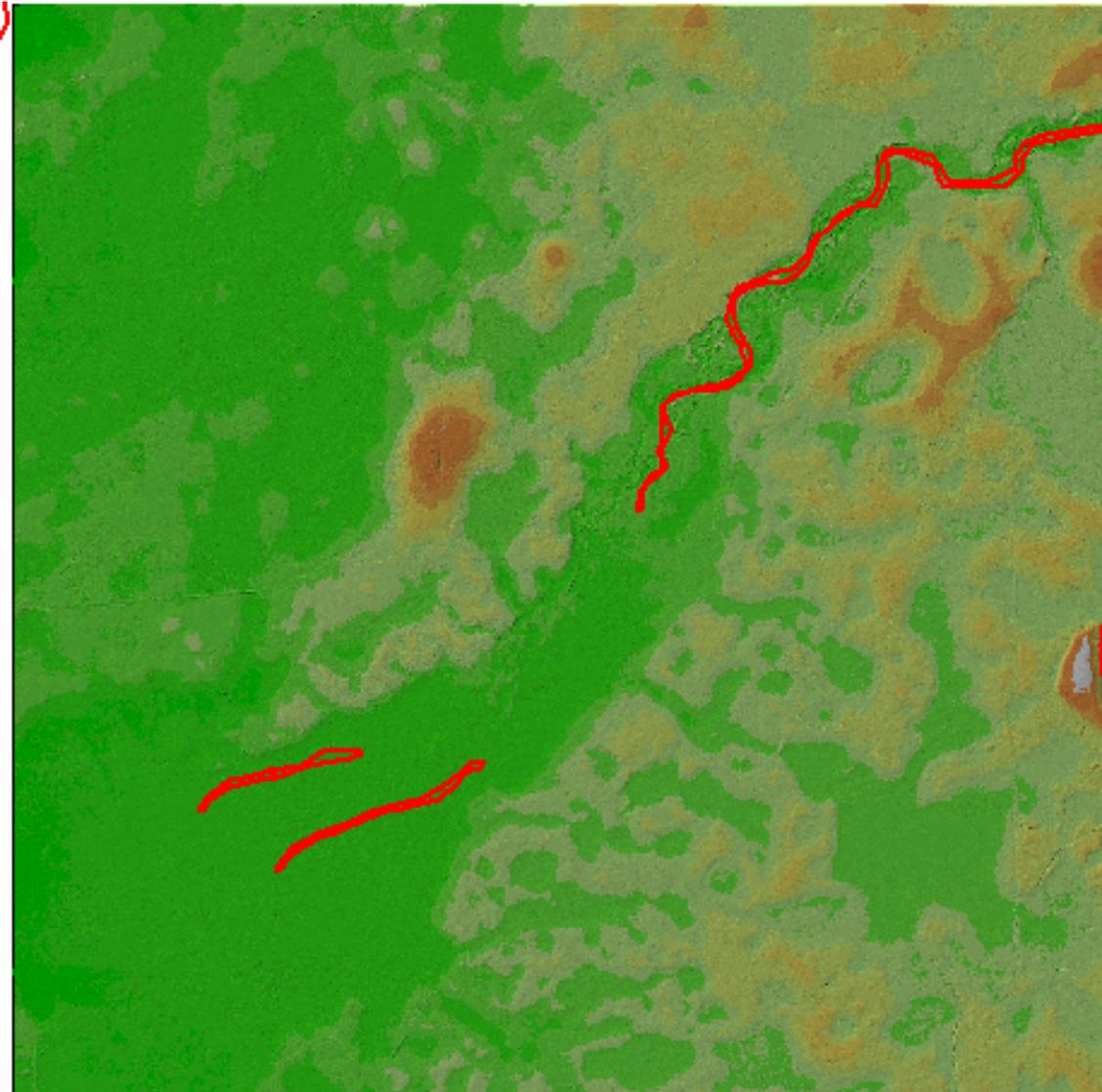
Tile: X_000006- Water points not vaporized



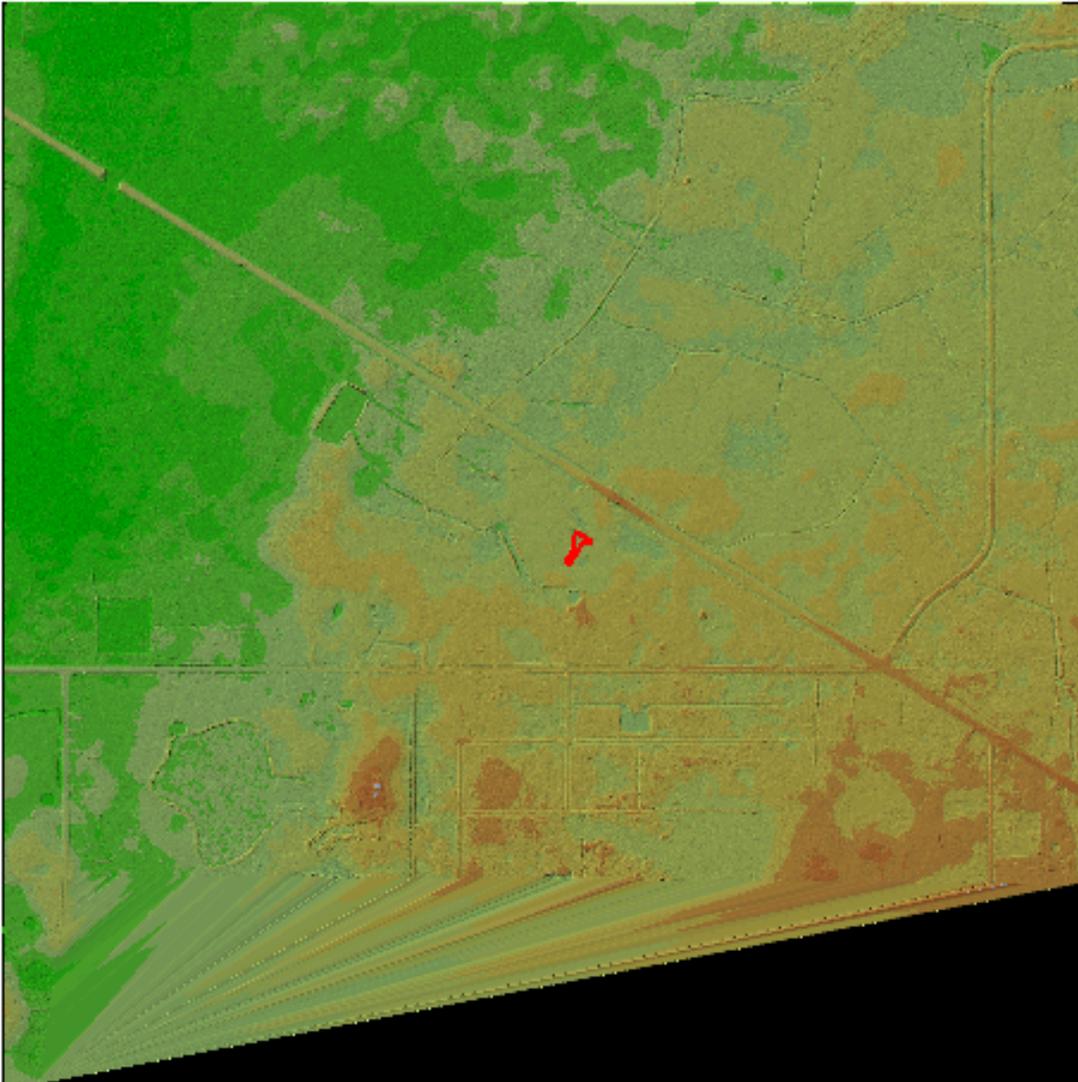
Tile: X_000007- Water points not vaporized unknown lines in terrain.



Tile: X_000008- Water points not vaporized



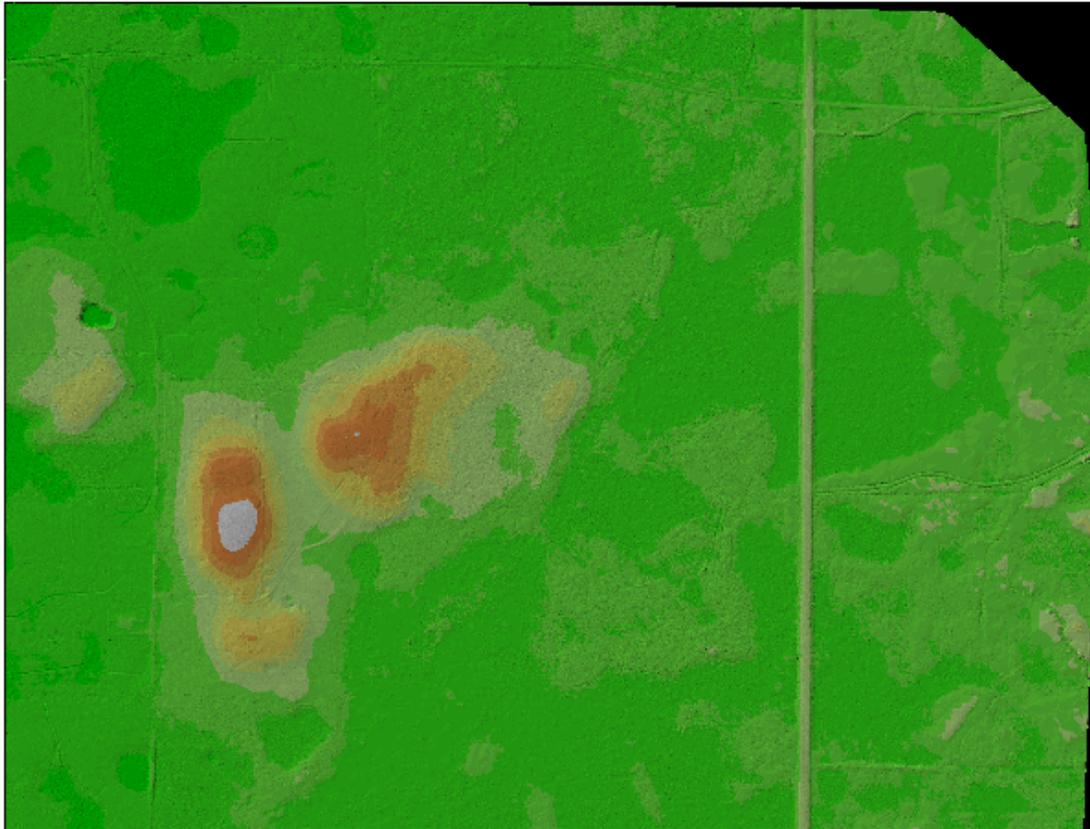
Tile: X_000009- Water points not vaporized and possible structure.



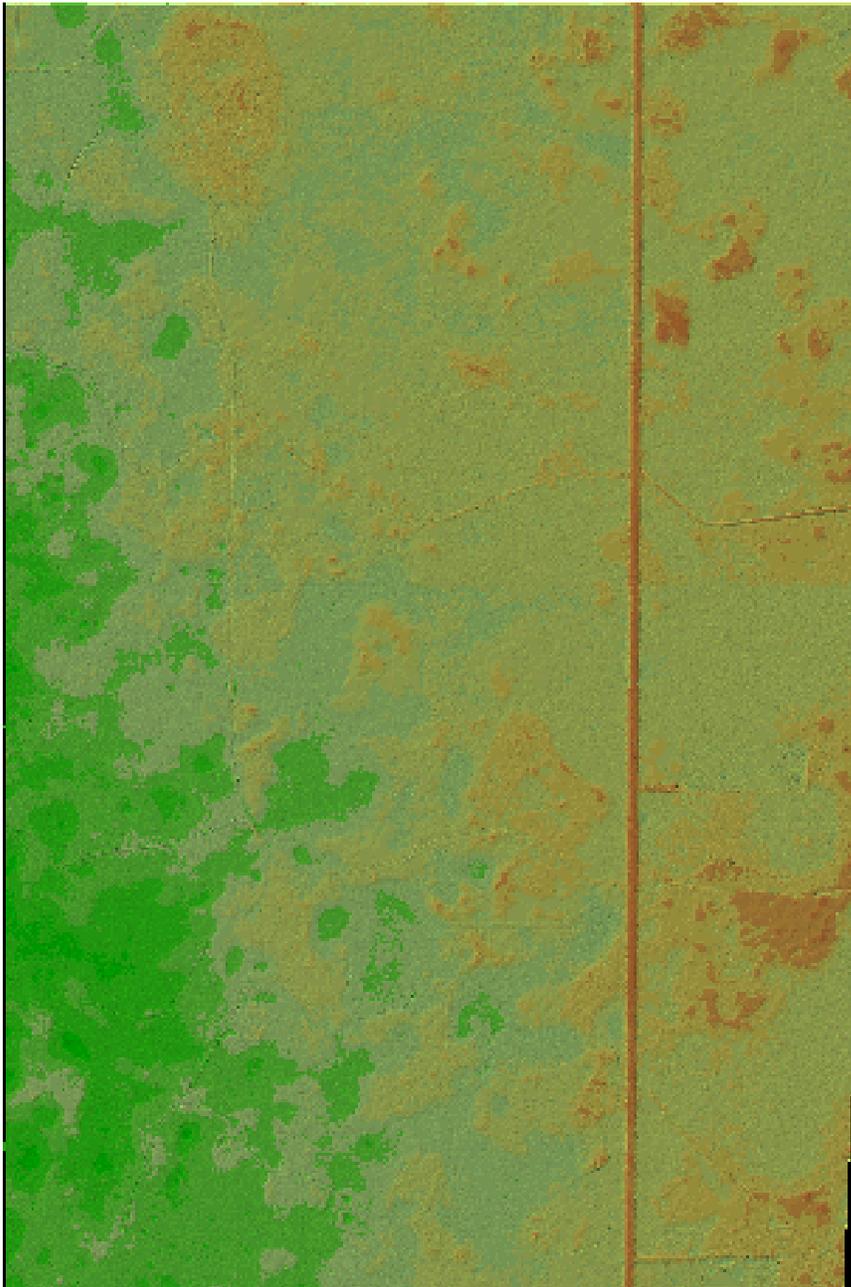
Tile: X_000010- Water points not vaporized



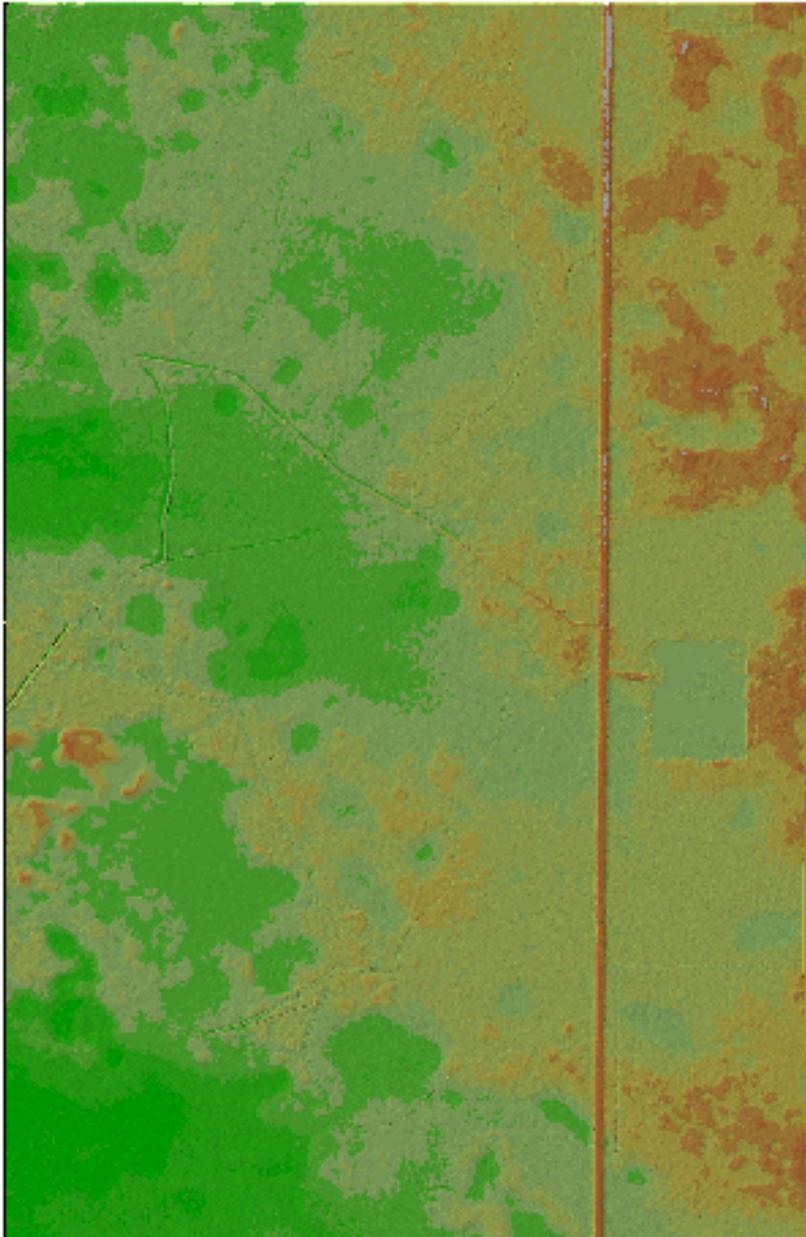
Tile: Y_000001- Water points not vaporized



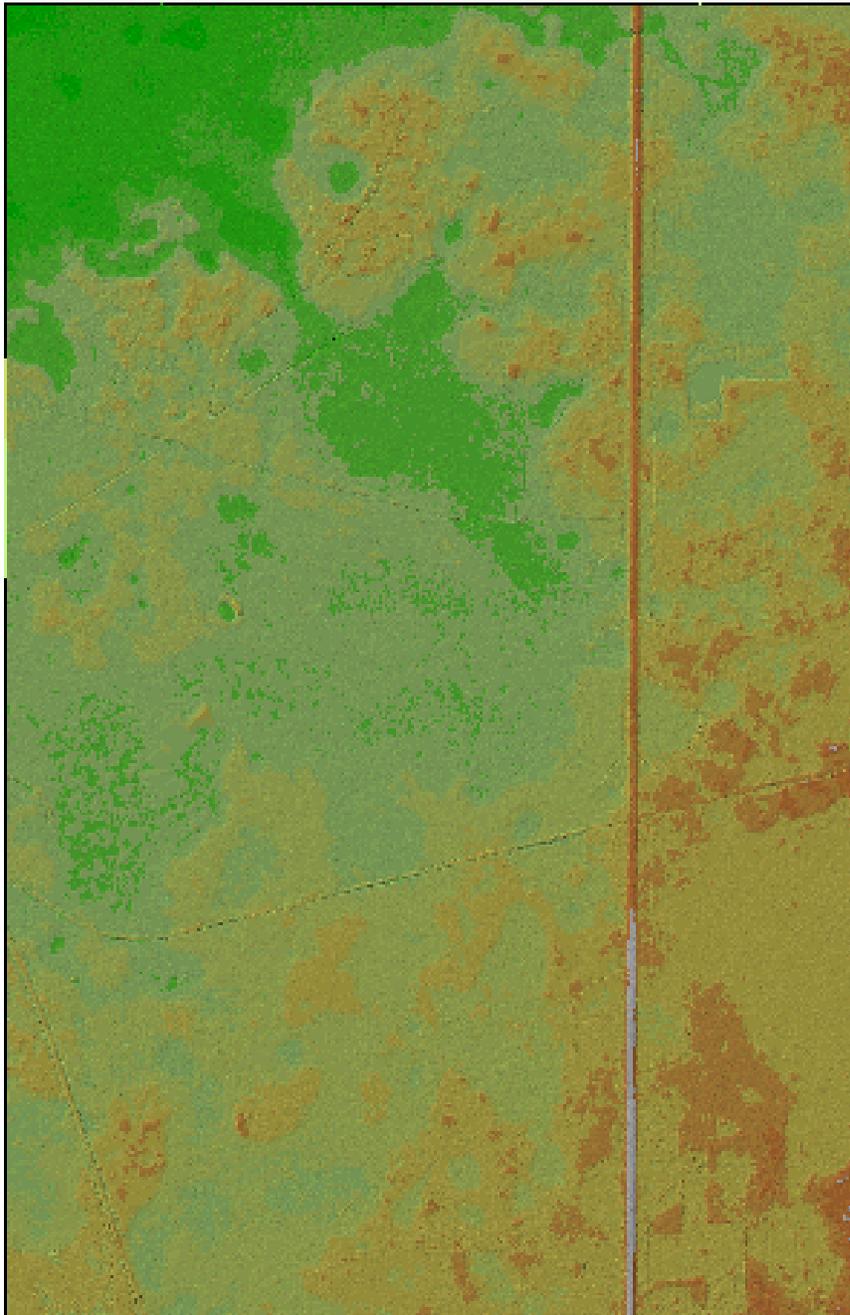
Tile: Y_000002- Water points not vaporized



Tile: Y_000003- Water points not vaporized

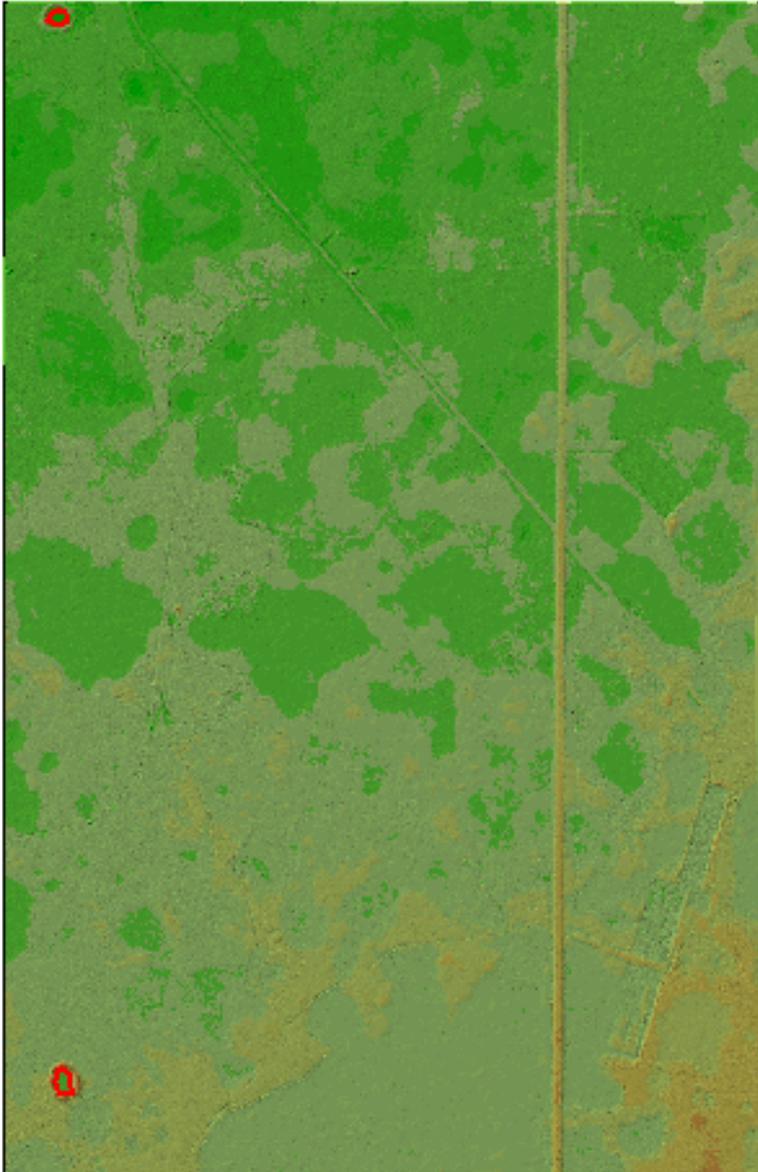


Tile: Y_000004- Water points not vaporized



5

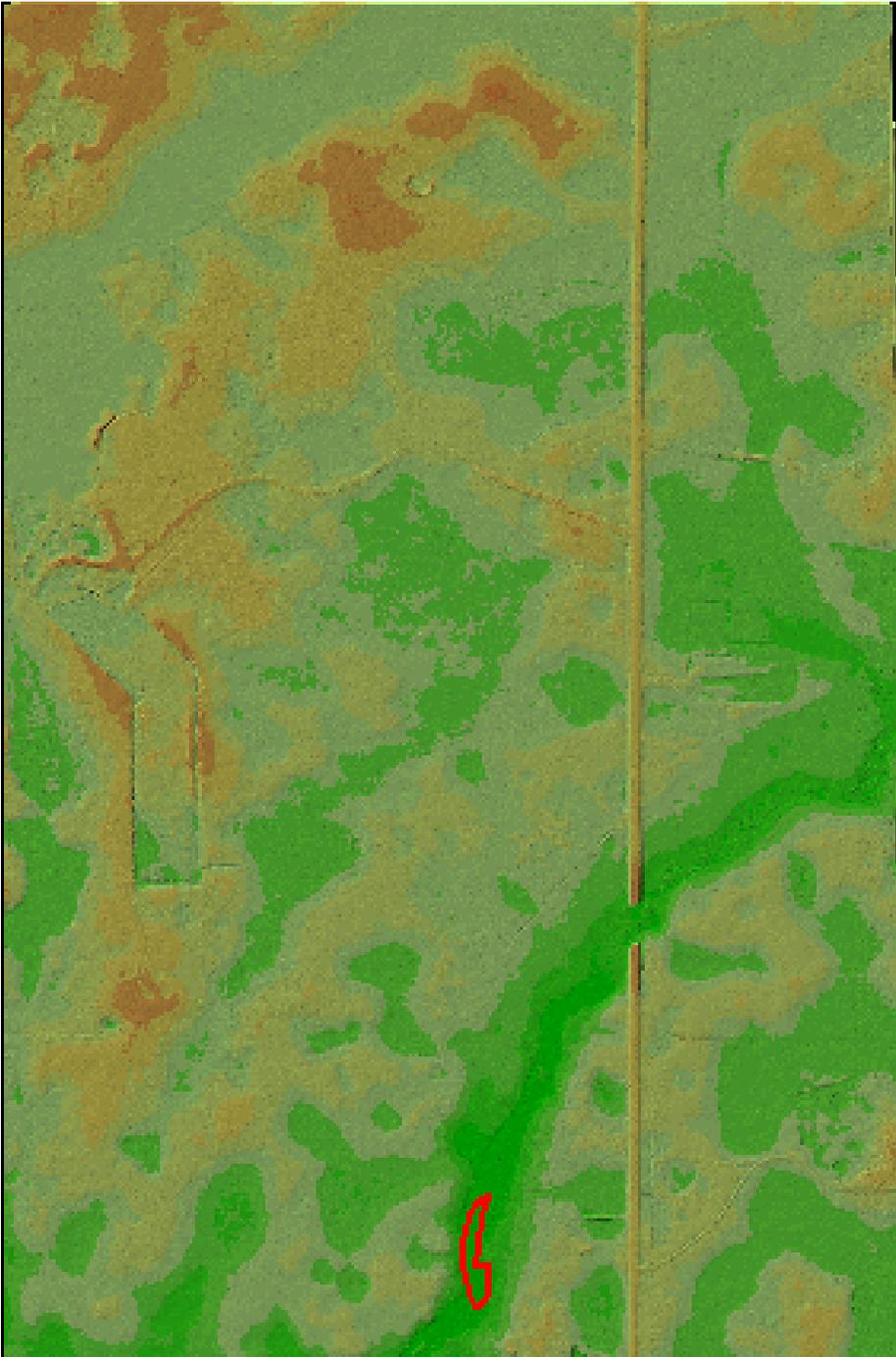
Tile: Y_000005- Water points not vaporized



Tile: Y_000006- Water points not vaporized.



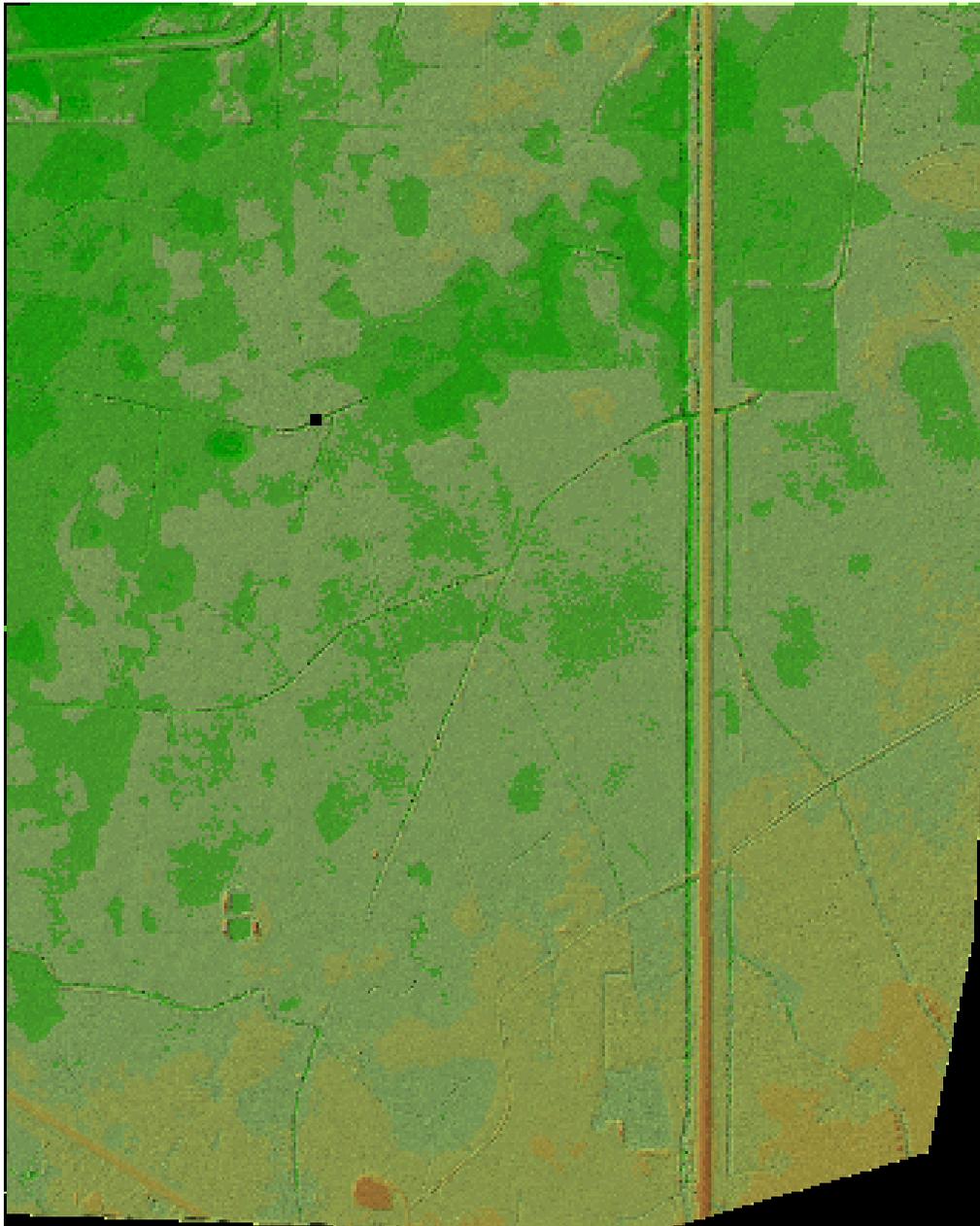
Tile: Y_000007- Water points not vaporized.



Tile: Y_000008- Water points not vaporized.



Tile: Y_000009- Possible bridge.



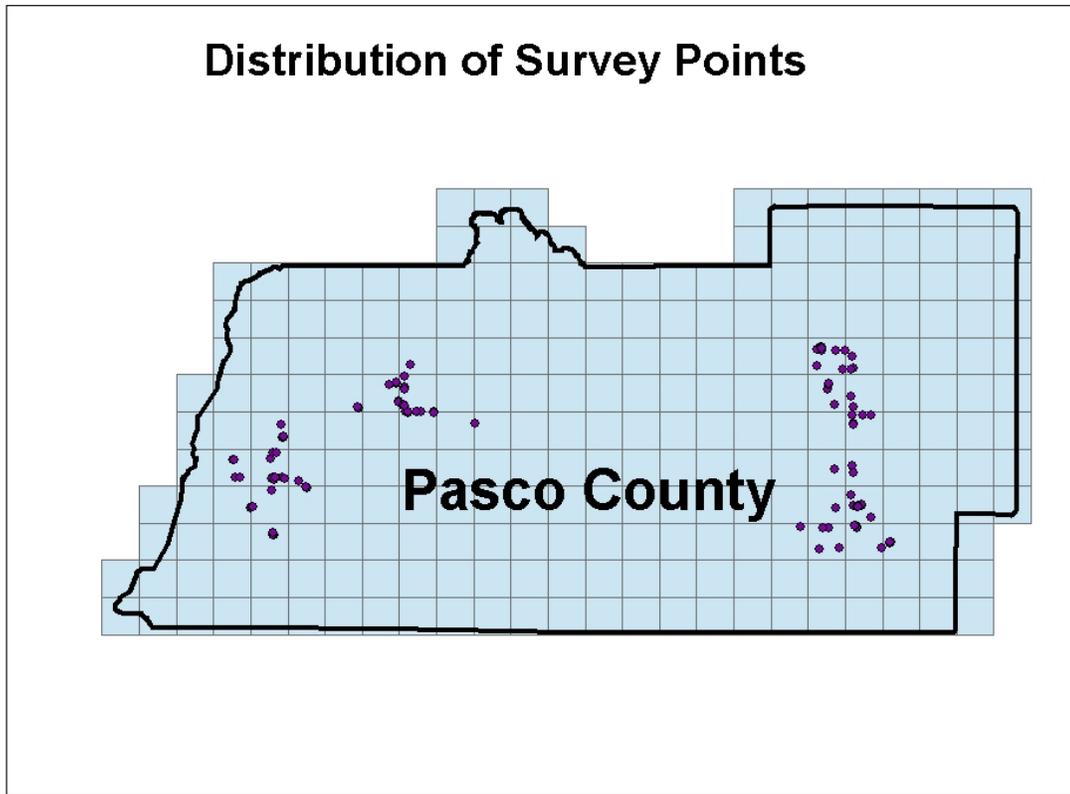


Figure 2- Distribution of survey points used for RMSE Calculations

Pasco County LIDAR Project RMSE Calculations

Based on the Earth Data International LIDAR data set

Pasco County

		With Outliers		
All Points 120 points	Average=	0.132	120 points	
	RMSE=	0.363	feet	
		11.064	centimeters	

Conclusions

Hillshade Review- Of the 251 tiles of LIDAR data that Watershed Concepts reviewed, 61 polygons were created where concerns exist in the data. These concerns mainly consisted of aggressive removal of vegetation. For this preliminary study, water bodies were marked with polygons as an indication that the water has not been vaporized from the LIDAR. These should not be viewed as problem areas but instead should be used for informational purposes only. Few other areas of concern were identified. The following figure shows the extent of the areas of concern in this review.

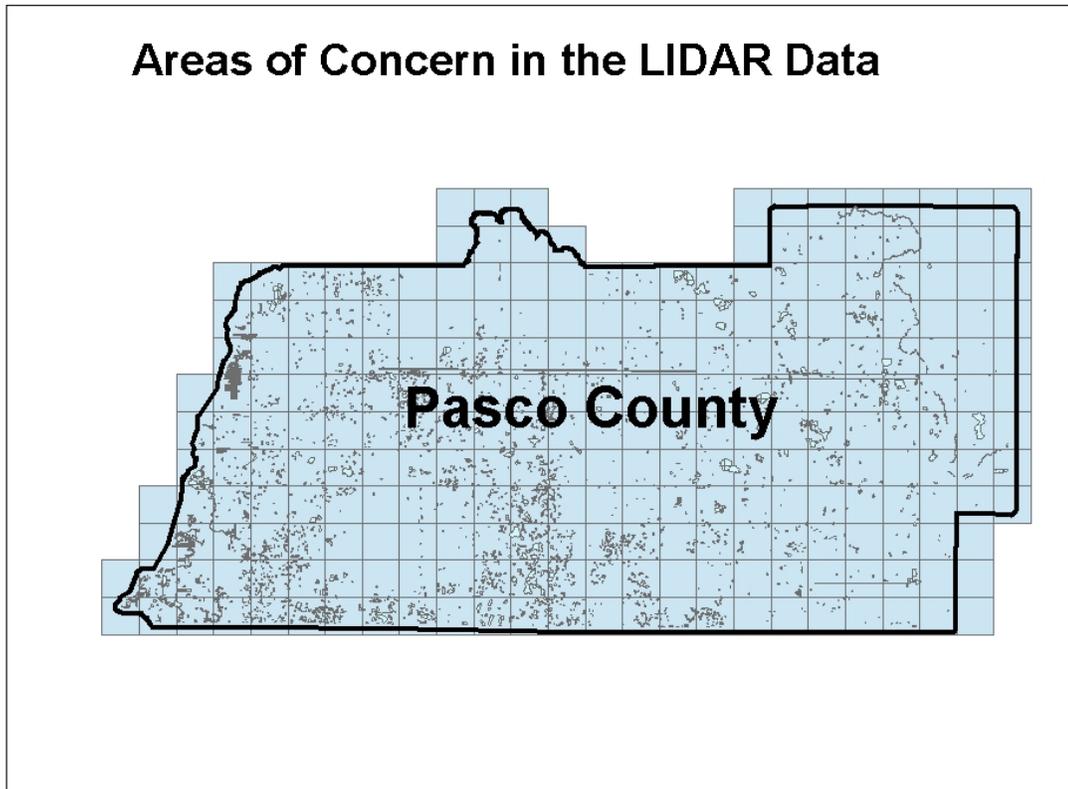


Figure 4- Areas of Concerns found in Lidar Data.

RMSE Calculations- The RMSE with all points (120 points) included is 11.064, which is within the projects specifications (See Attached Appendix 1).

Conclusions- Overall the data sets were very detailed and of excellent quality. The RMSE is well with in the project scope. Watershed Concepts does recommend that Earth Data International investigate the areas of concern identified in the hillshade review.