Estimation of Nitrogen loading from converted Septic Systems (2013-14 and 2014-15) to Surface Waterbodies in Port St. Lucie, FL

Results Completed: August 2015

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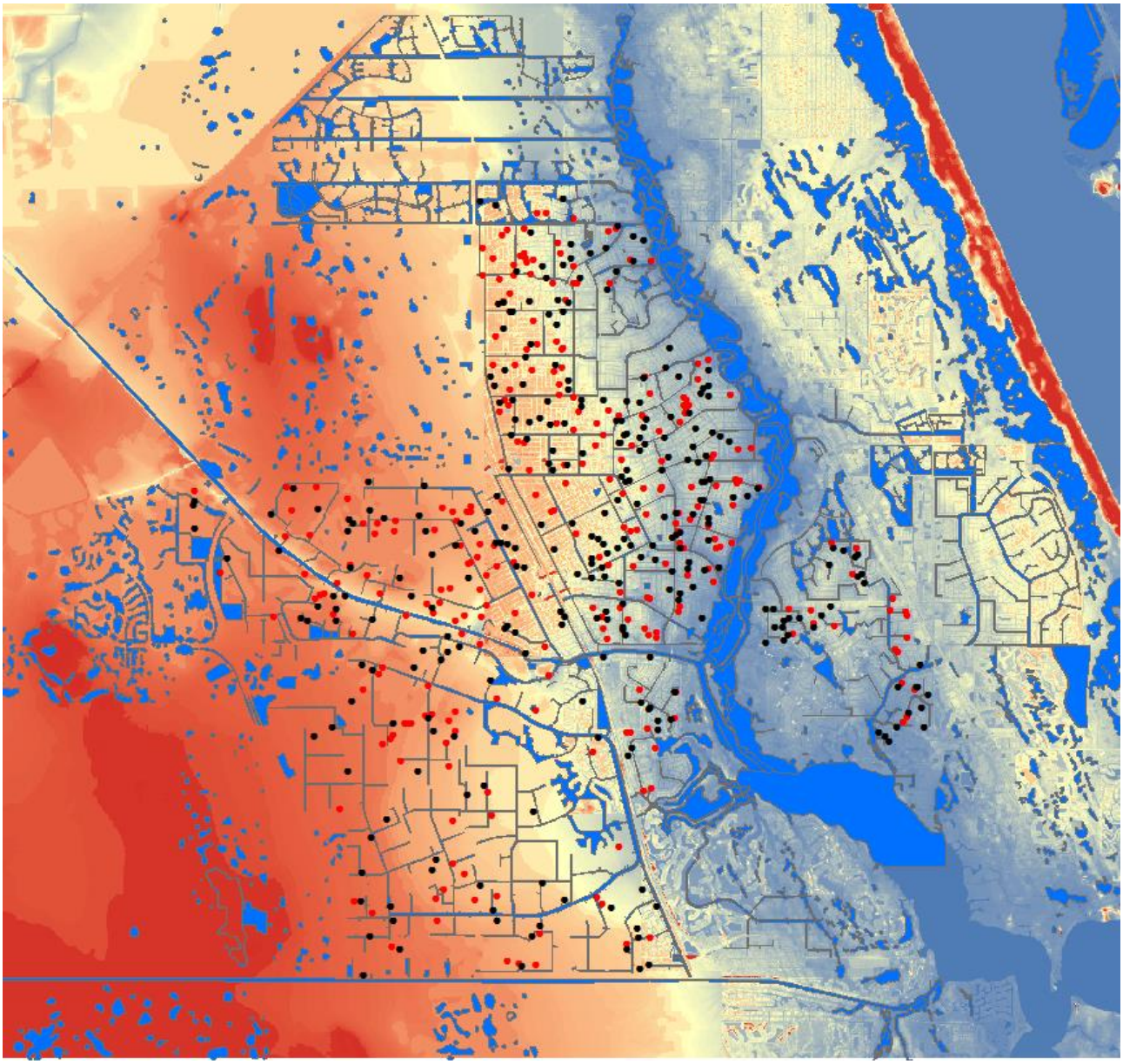


Figure 1. Locations of converted septic systems during 2013-14 (black dots) and 2014-15 (red dots) considered in this study and surface water bodies (blue polygon). The background map (red-yellow) is the DEM with 10m × 10m resolution.

Table 1: Nitrogen load estimates of the converted septic systems of this study (2013-14 and 2014-15), and for the previous study (2012-13) in the Port St. Lucie.

	This Study		**Previous Study**
Septic Conversion year	**2013-14**	**2014-15**	**2012-13**
Number of Septic tank	299	272	5592
Total load (kg/d)	2.55	1.79	42.48
Load per septic system (gm/d)	8.54	6.58	7.6
Reduction Ratio (%)	62	71	67

Table 2. Values of model parameters are used in this study (2013-14, and 2014-15 septic system conversion), was adopted from the previous (2012-13 septic system conversion) Port St. Lucie modeling study.

Parameter	**This and previous Modeling study**
Smoothing factor	40
Source plan concentration, C_0 (mg/L)	40
Longitudinal dispersivity, α_x (m)	60
Horizontal transverse dispersivity, α_y (m)	1.6
First-order denitrification coefficient, *k* (1/d)	0.0011

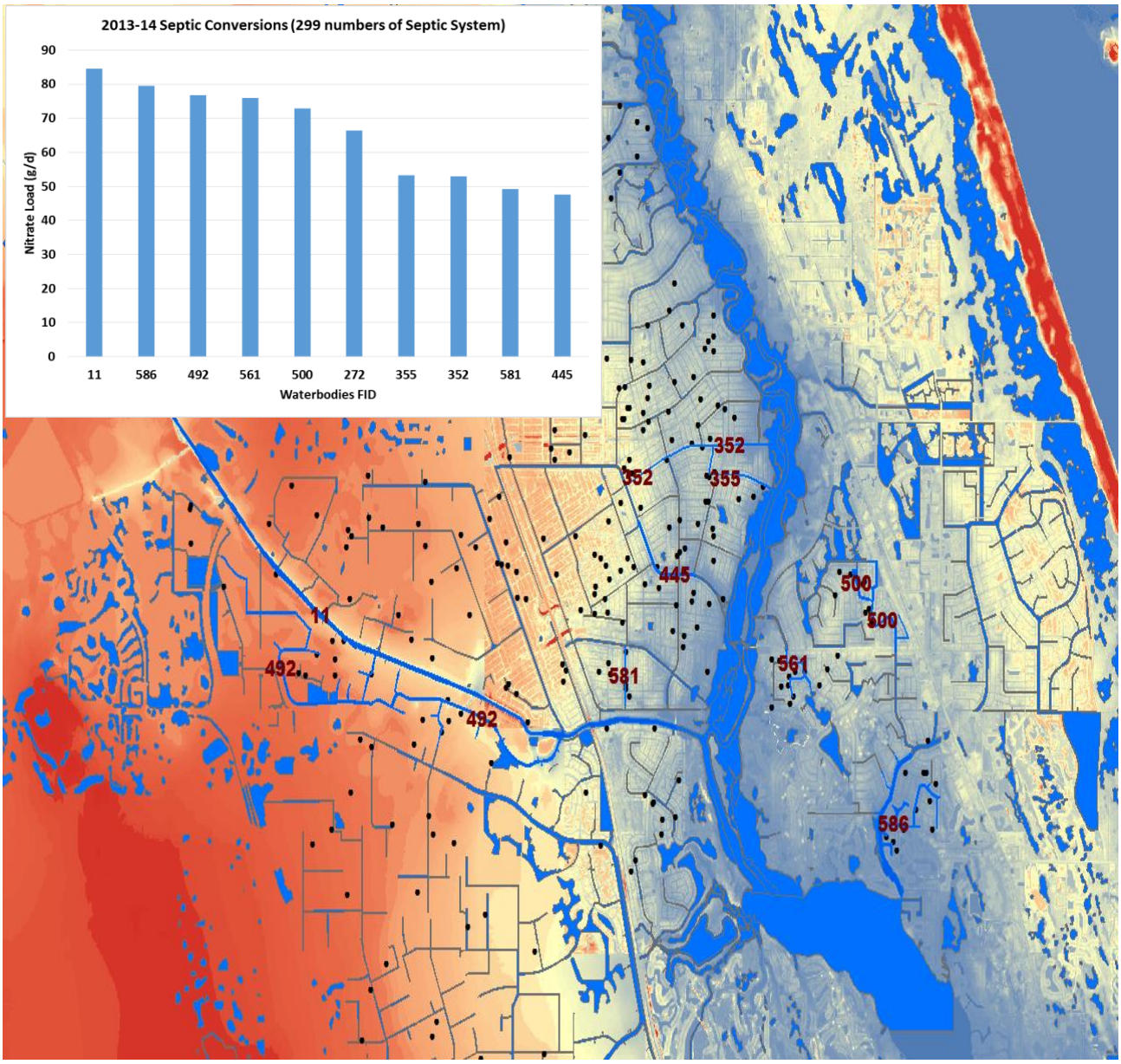


Figure 4. Highest 10 load receiving waterbodies are labeled with its FIDs by brown color in the map and nitrogen load (g/d) values were shown in bar chart.

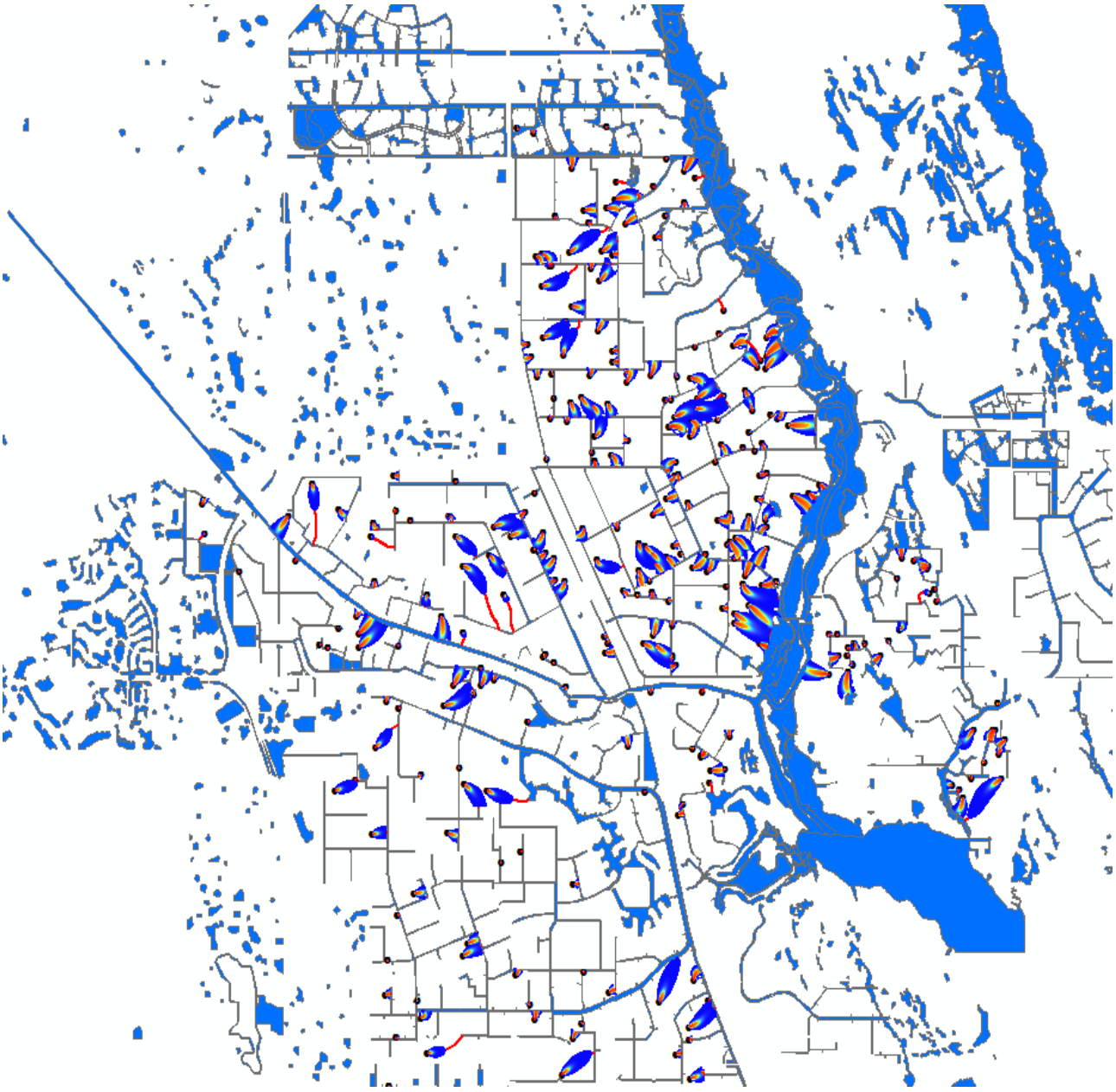
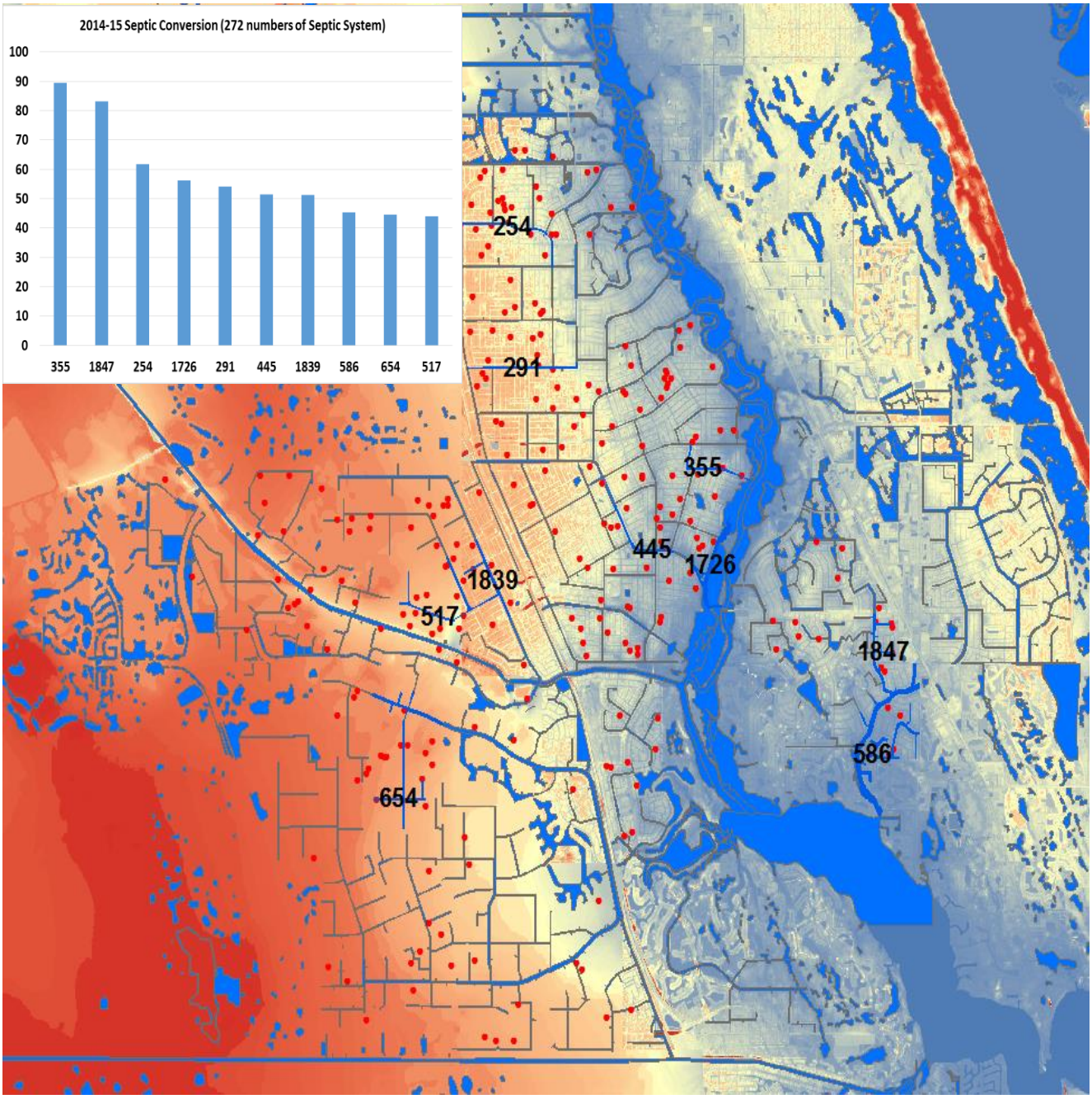


Figure 3. Simulated nitrogen plumes from removed septic systems (2013-14) in the City of Port St. Lucie.



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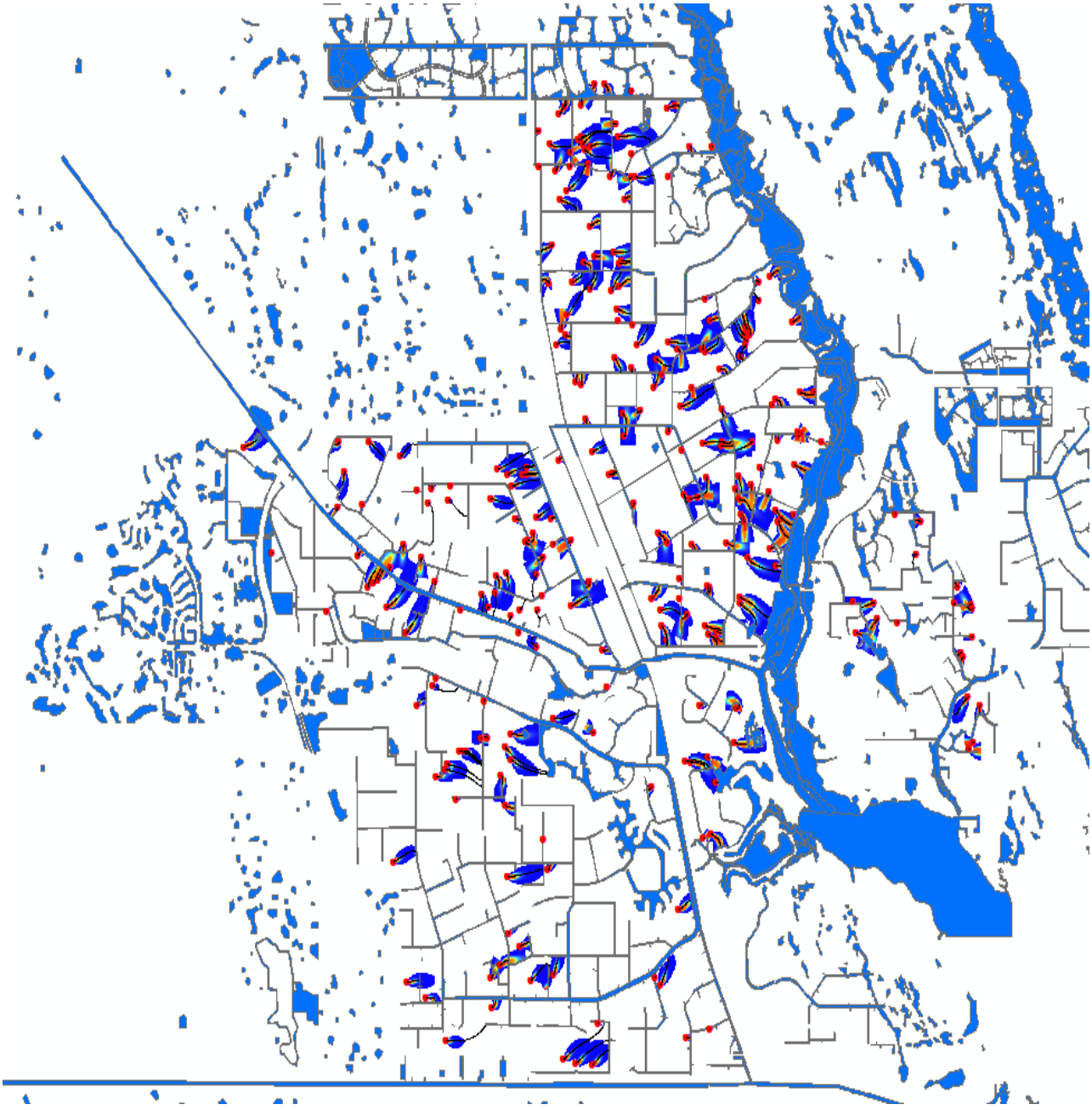

Figure 5. Simulated nitrogen plumes from removed septic systems (2014-15) in the City of Port St. Lucie.