Florida Department of Environmental Protection

Division of Environmental Assessment and Restoration

Basin Management Action Plan
Weeki Wachee

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June 2015





Springs Coast

BMAPs in development

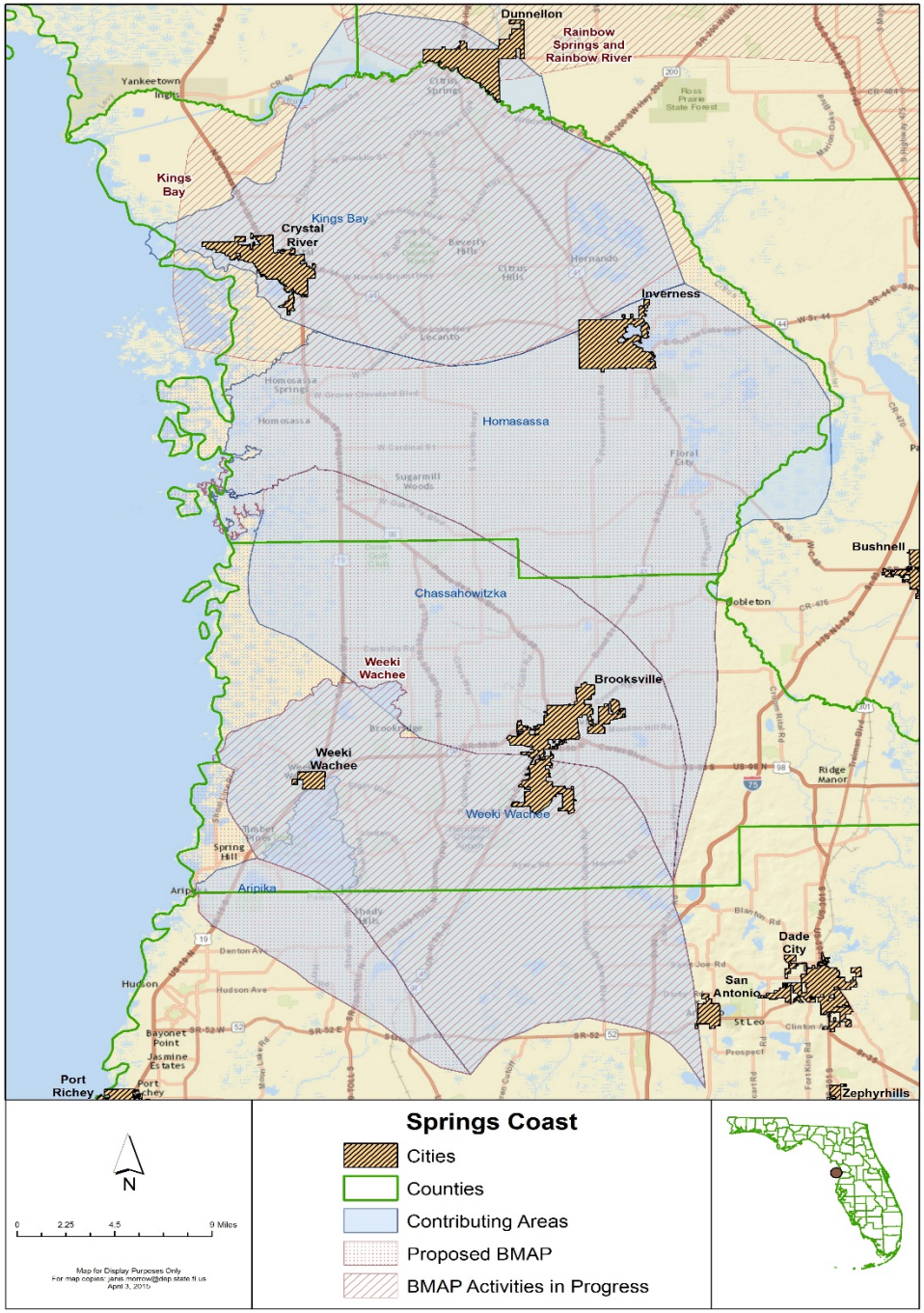
- Crystal River / Kings Bay
- Weeki Wachee

TMDL finalized

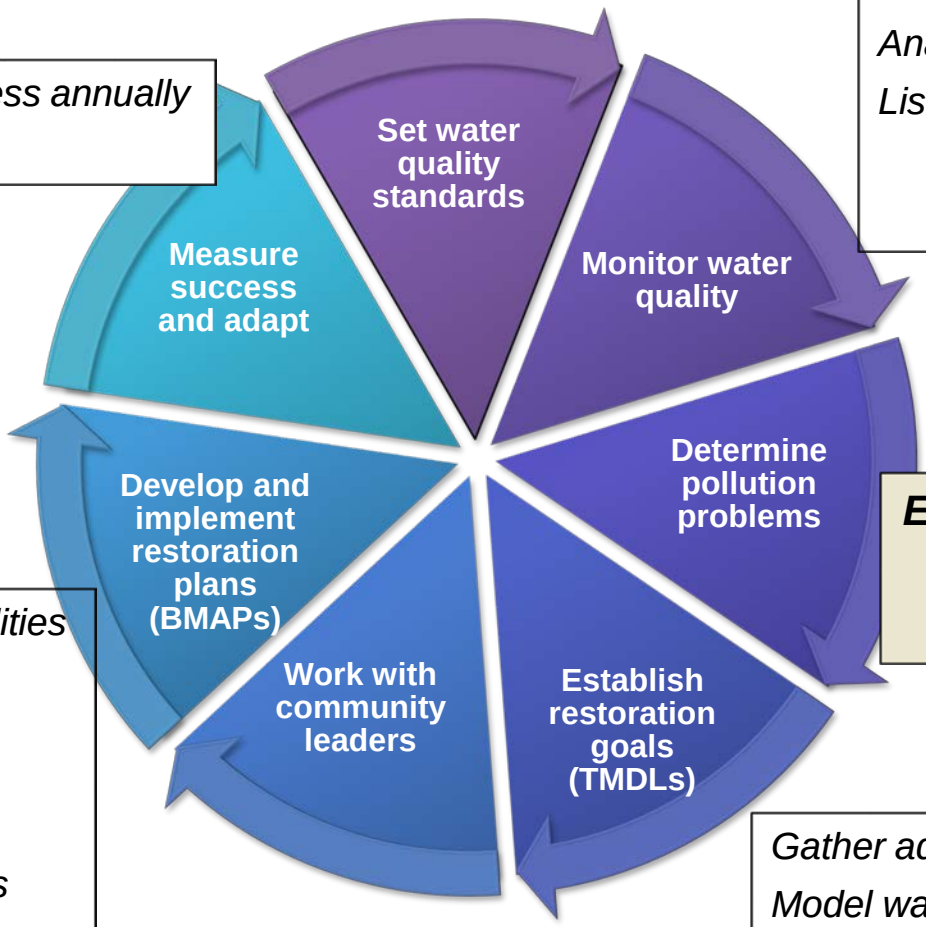
- Homosassa
- Chaz

TMDL in development

- Aripeka



Water Quality Framework



Collect data
Analyze and verify
List "impaired" waters

REPEAT

Excessive nutrients
Bacteria
Mercury

Gather additional data
Model water quality
Adopt pollutant reduction targets

Allocate responsibilities
Identify projects
- *Infrastructure*
- *BMPs*
- *Land acquisition*

Establish schedules
Identify success criteria

Monitor and report progress annually
Adapt and change

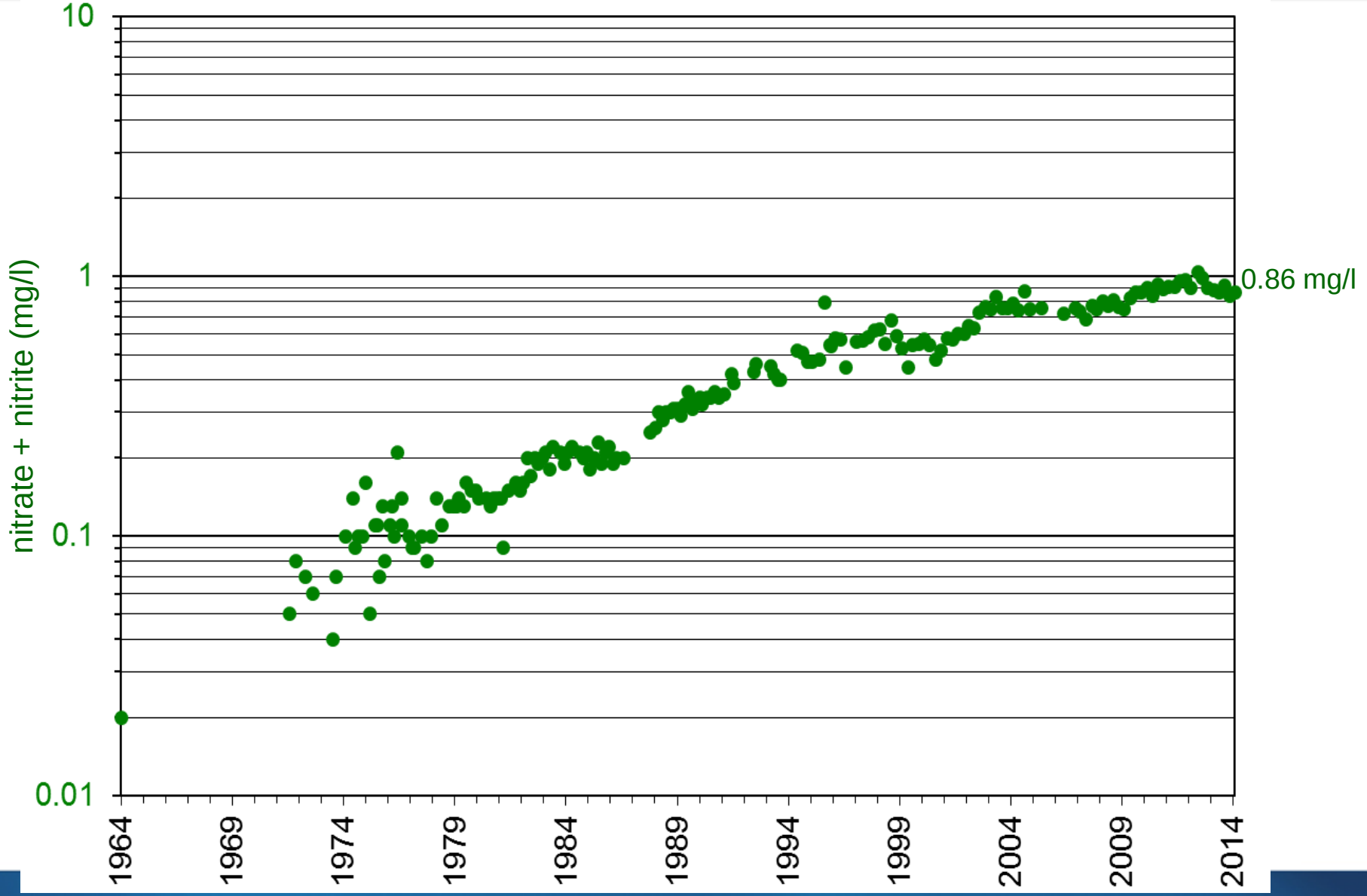
Basin Management Action Plan

- FDEP's method for restoring water quality to an impaired water body.
- BMAPs are adopted by FDEP through a Secretarial Order.
- BMAPs are enforceable.
- BMAPs are reviewed annually and updated every 5 yrs.

Regulatory Framework

- The process for preparing BMAPs is found in:
  - Section 403.067, Florida Statutes (F.S.), known as the Florida Watershed Restoration Act (FWRA).
  - Spells out issues that are addressed within a BMAP.

Nitrate Concentrations at Weeki Wachee Spring, 1964 to 2014 (data sources, USGS, SWFWMD)



Weeki Wachee Nitrate TMDL

Table 6.2. TMDL Components for Weeki Wachee Spring and River

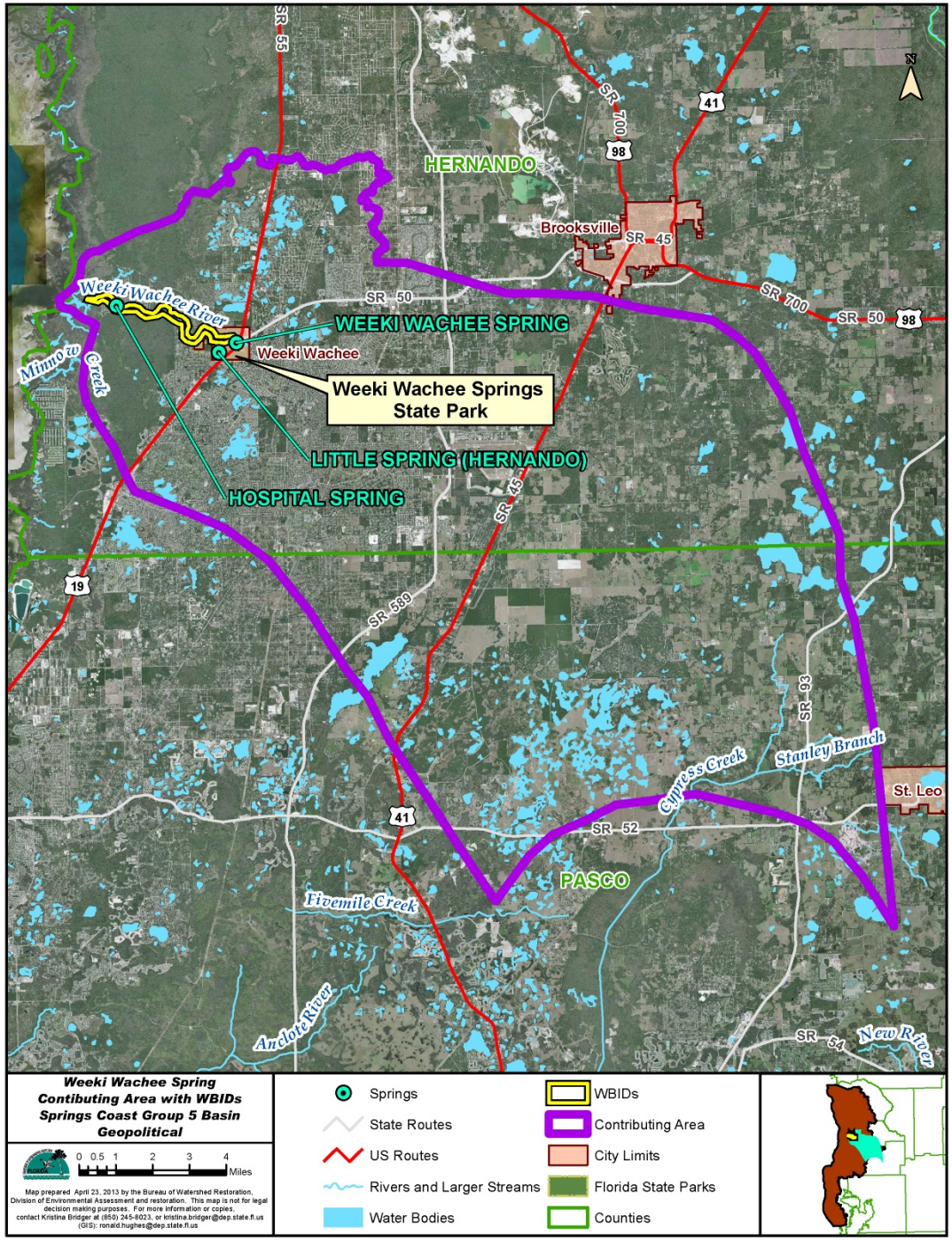
* N/A = Not applicable

Waterbody (WBID)	Parameter	TMDL (mg/L)	TMDL % reduction	Wasteload Allocation for Wastewater*	Wasteload Allocation for NPDES Stormwater % Reduction*	LA % reduction	MOS
Weeki Wachee Spring (WBID 1382B),	Nitrate as annual average	0.28	71.1	N/A	71.1	71.1	Implicit
Weeki Wachee River (WBID 1382F)	Nitrate as annual average	0.20	77.3	N/A	77.3	77.3	Implicit

Weeki Wachee Area

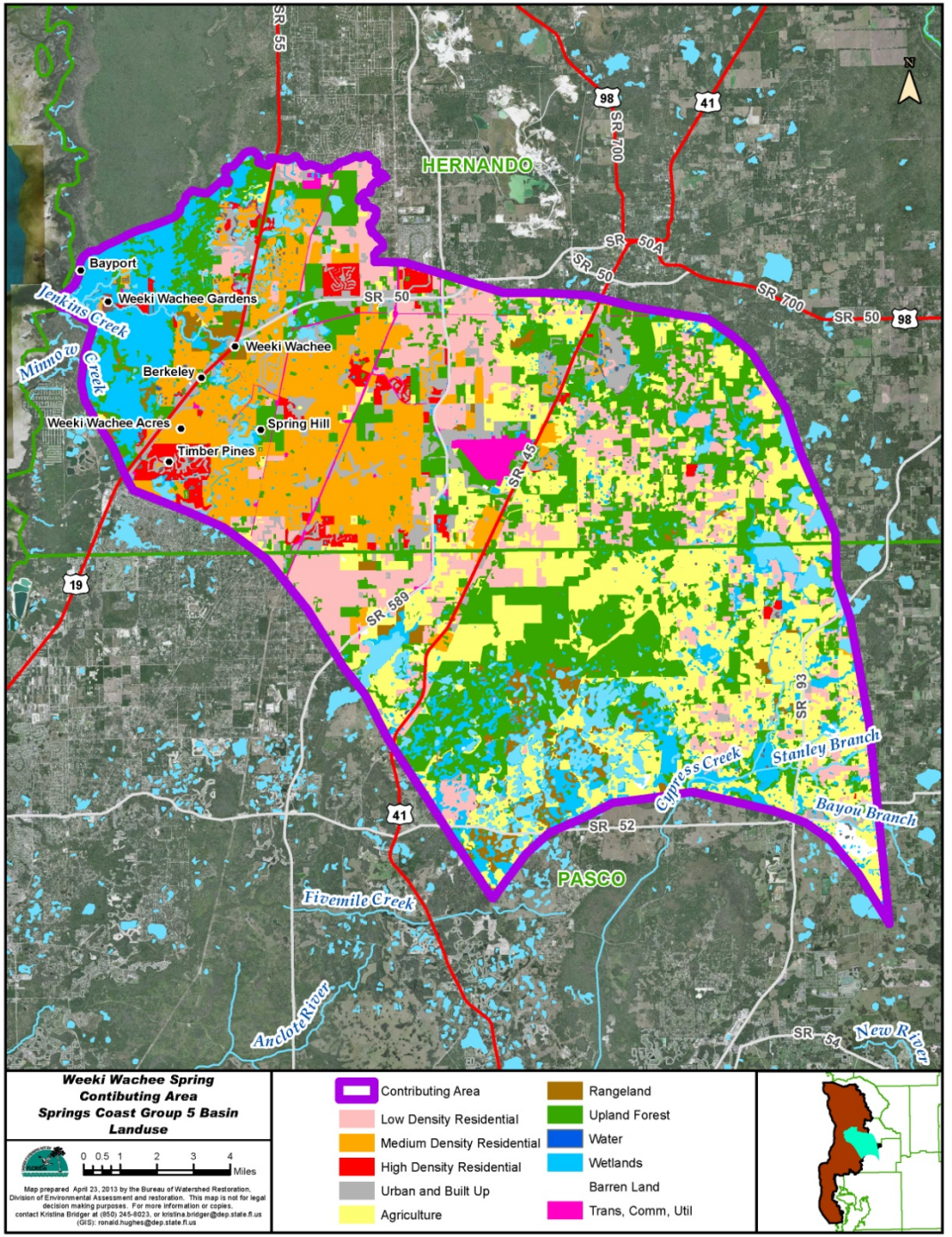
Spring - WBID 1382B
TMDL 71.1% reduction to achieve 0.28mg/l nitrate as annual average.

River – WBID 1382F
TMDL 77.3% reduction to achieve 0.20 mg/l nitrate as annual average.



Land Use

33% residential
24% forest
21% agriculture
16% wetlands
4% waterbodies & other



Sources of Nitrogen in BMAP Area

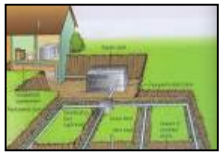
- Atmospheric Deposition

- Fertilizers (cropland, pasture, turfgrass)



- Land application of treated wastewater/ biosolids

- Septic Tanks



- Animal wastes


- Stormwater runoff

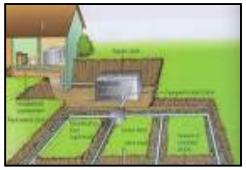
Estimating Nitrogen Loads to Ground Water

A multi-step process:

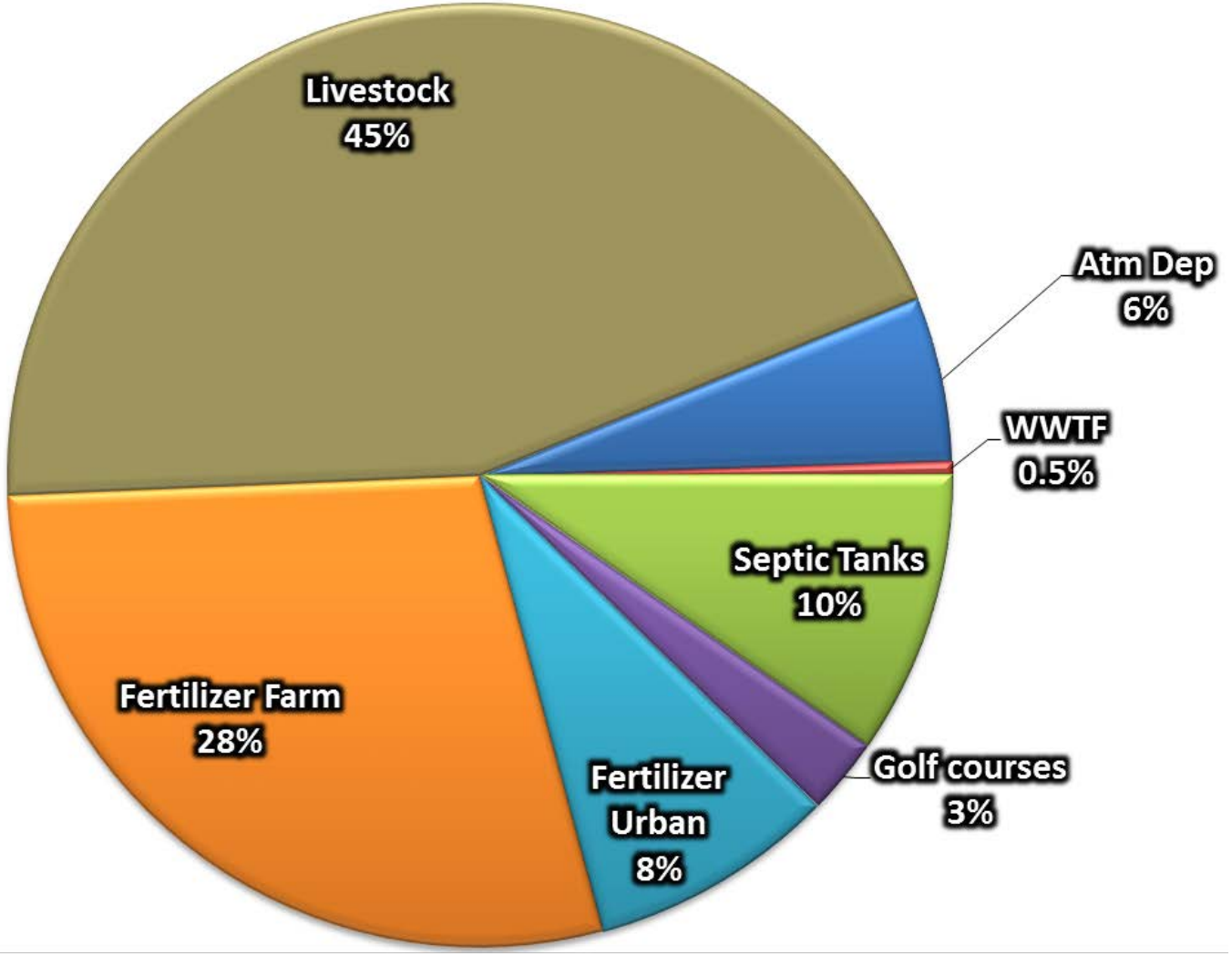
1. Estimate the inputs of nitrogen to the land surface from the source inventory information (a work in progress).
2. Apply attenuation factors based on the various environmental processes that could transform the various forms of nitrogen in the subsurface (such as denitrification, nitrification of ammonia, uptake by vegetation, mineralization of organic nitrogen).
3. Apply an areal weighting factor that is based on the rate of recharge to ground water to get nitrogen loads to ground water.
4. Account for proximity of N source to spring. Fine-tune estimates after getting feedback from stakeholders.





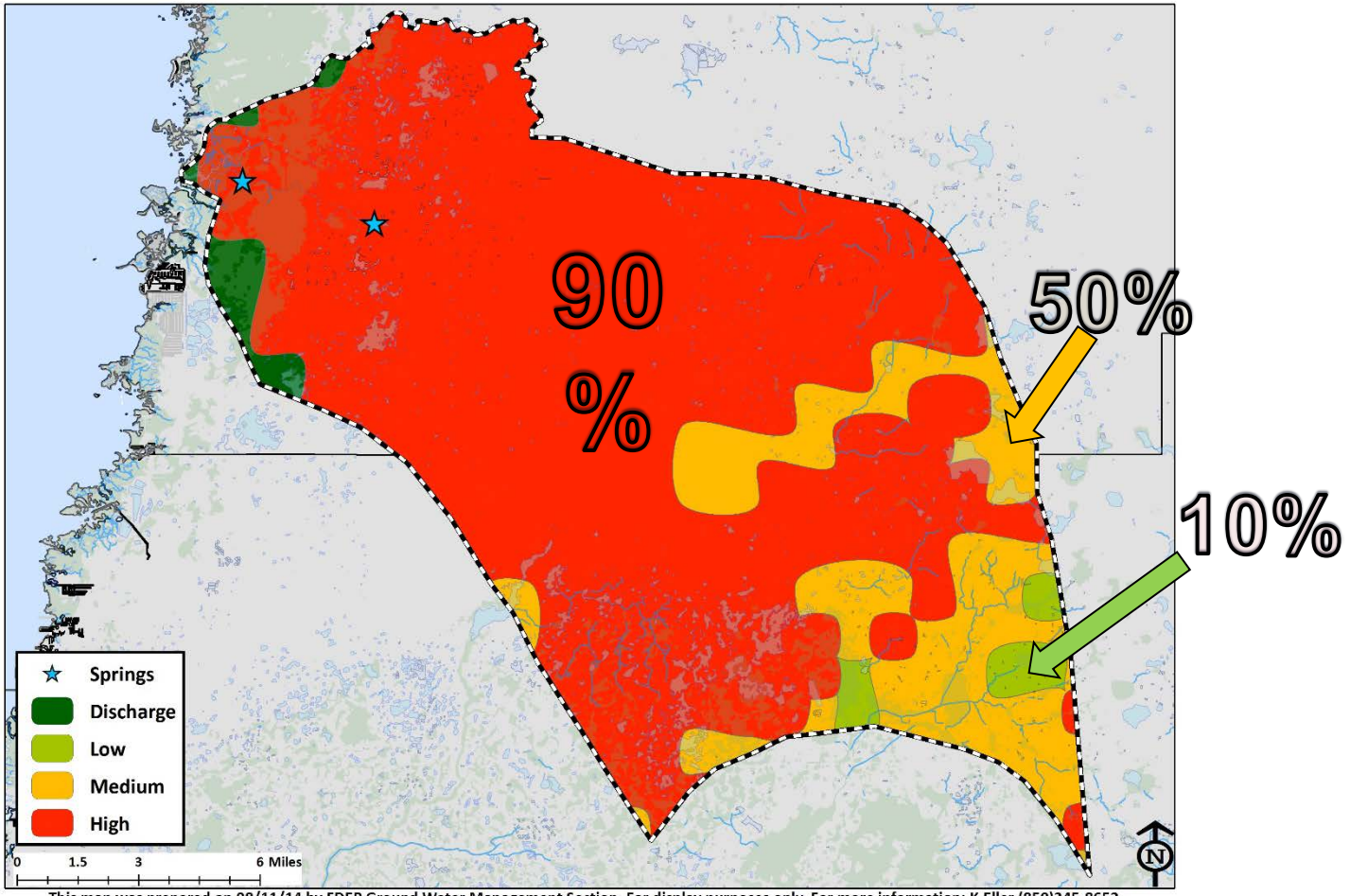



NSILT Input to Land Surface Estimation

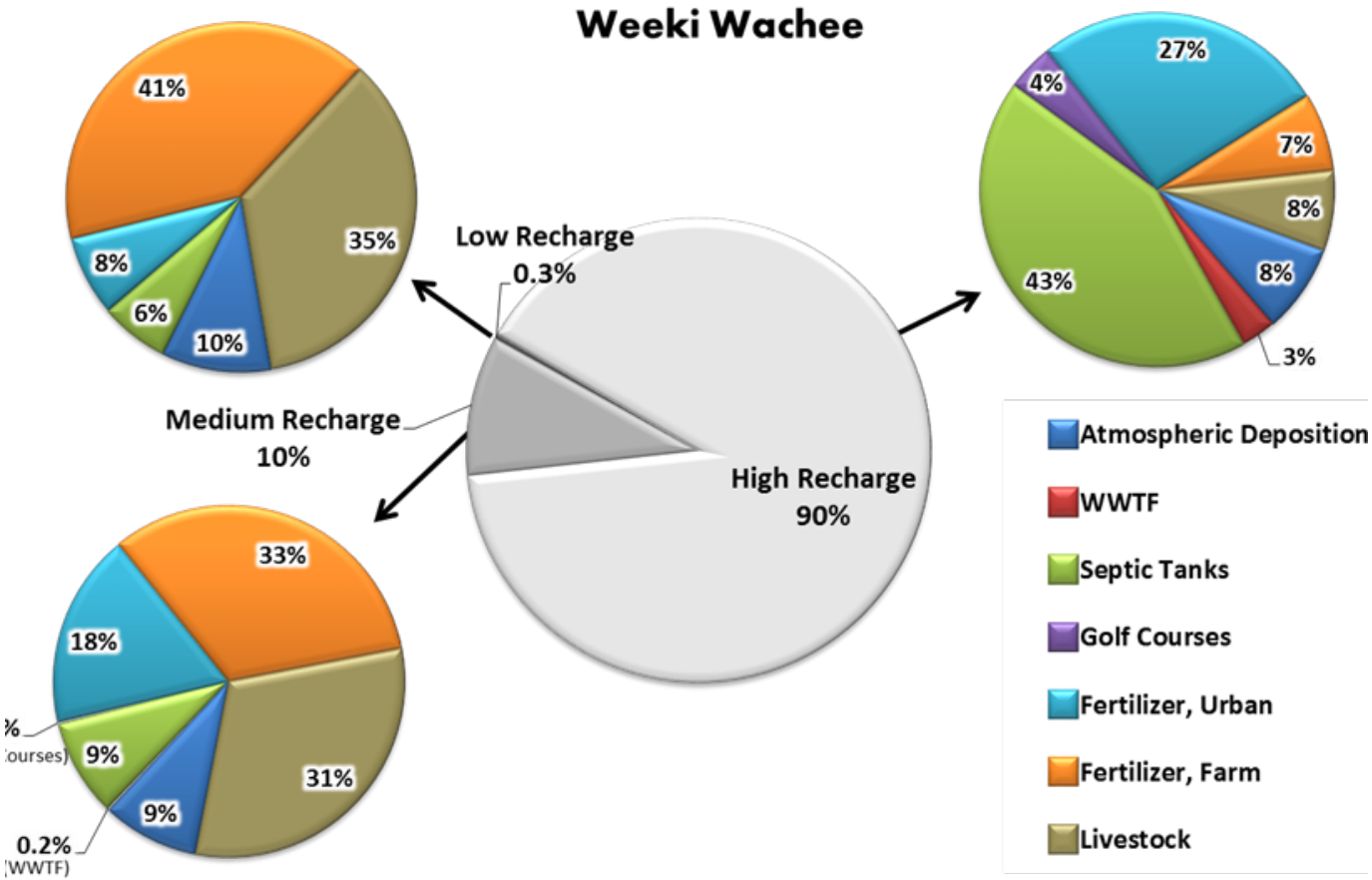


Recharge Factors

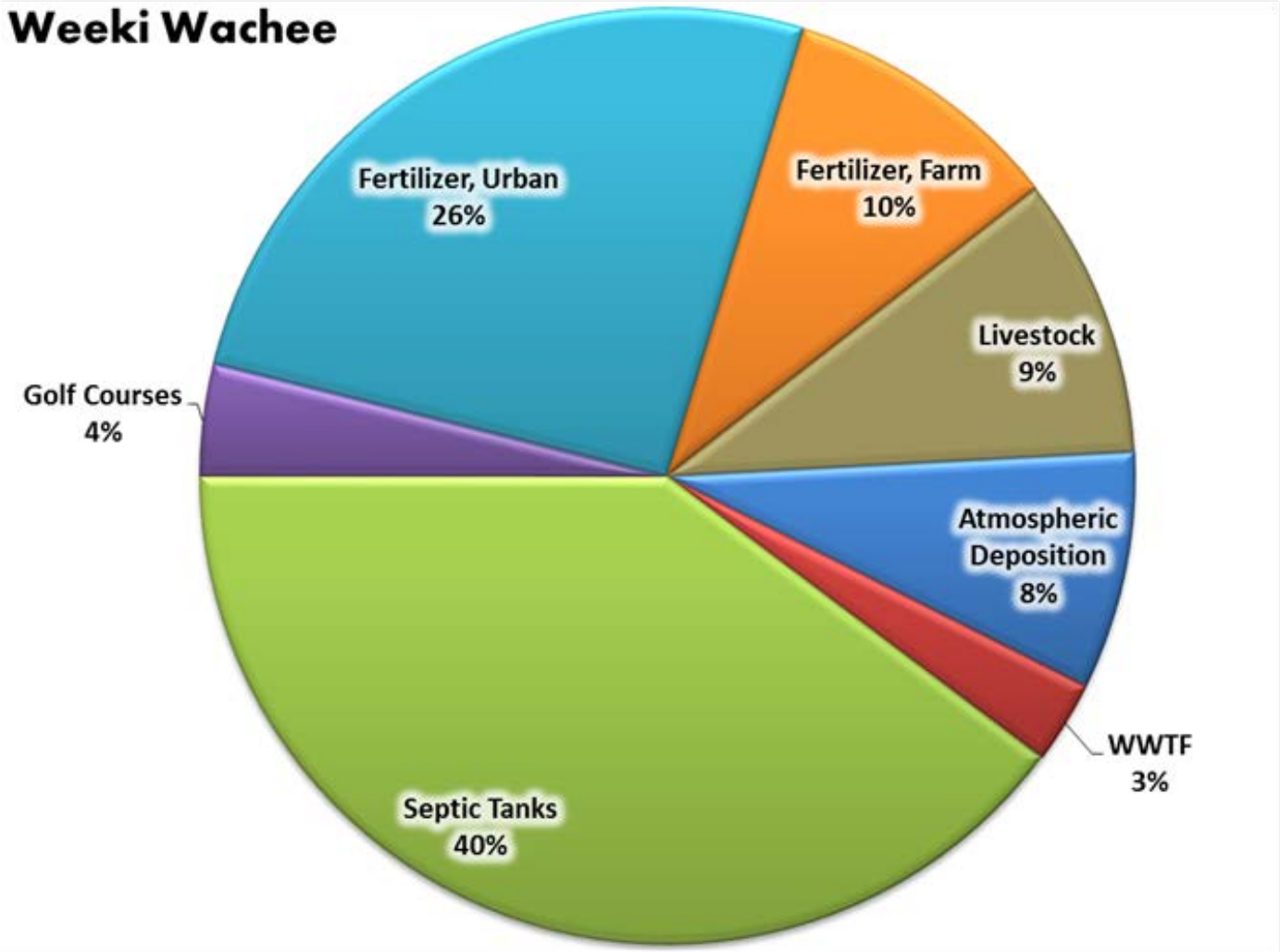
- Recharge factors are used to estimate the percentage of the non-attenuated nitrogen expected to reach the aquifer in a year.



Loading by Recharge Area



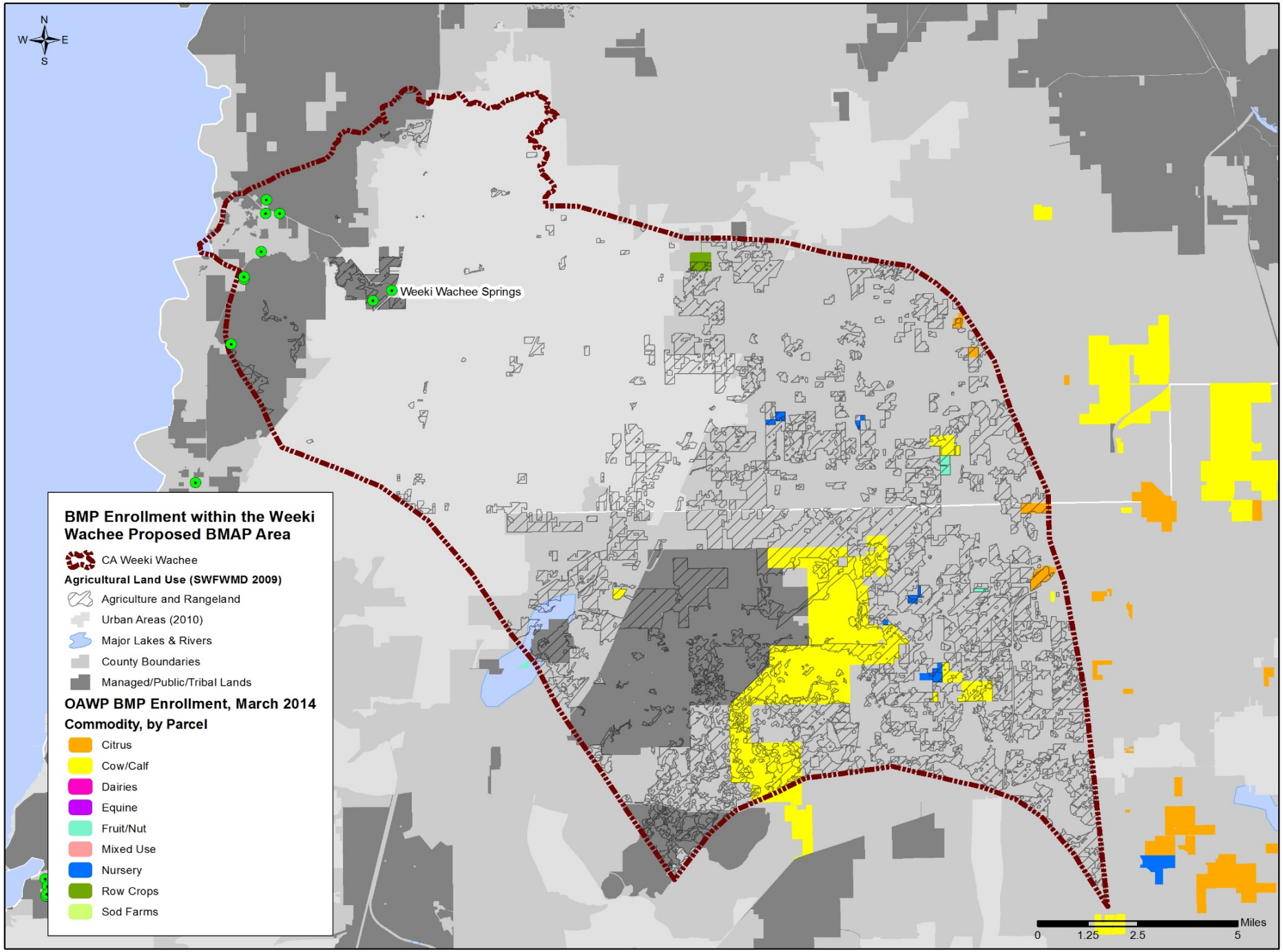
Annual Average Loading to Ground Water



Projects

Major Source Categories

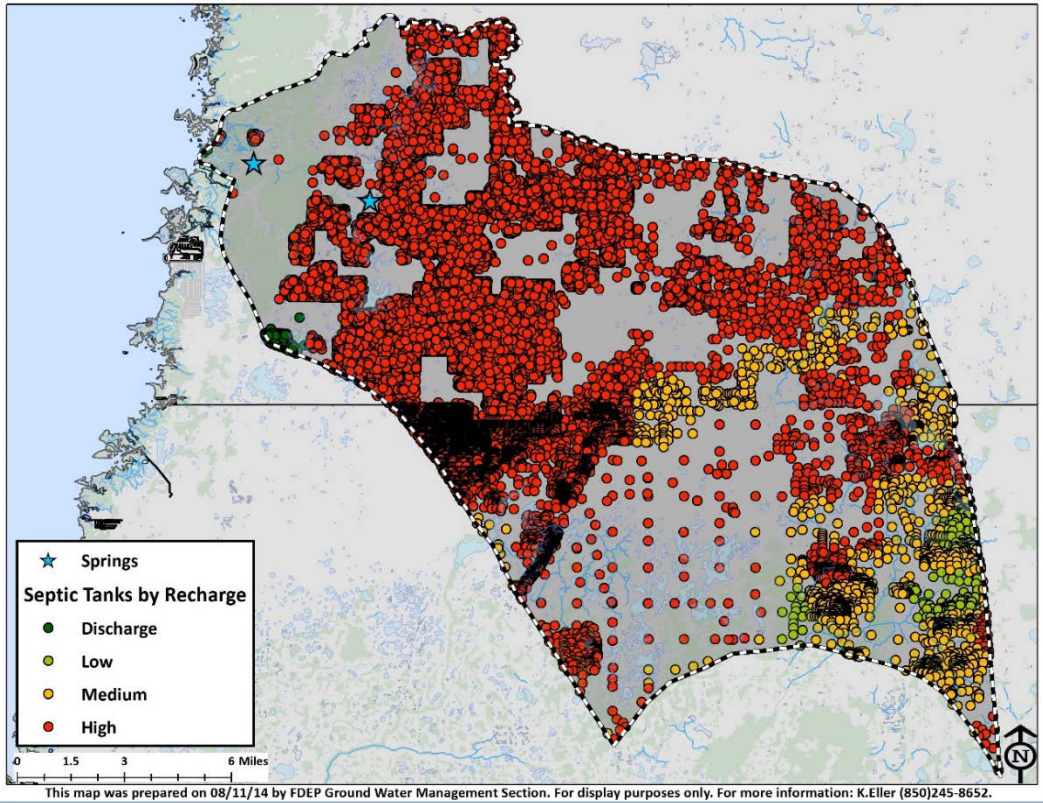
- Agriculture - Implement and document BMPs
  - Fertilizer & Livestock
- Urban Fertilizer - Fertilizer Ordinance
- WWTF - Projects
- Stormwater - Projects
- Golf Courses
- Septic Tanks


N
W
E
S
Weeki Wachee Springs
BMP Enrollment within the Weeki Wachee Proposed BMAP Area
CA Weeki Wachee
Agricultural Land Use (SWFWMD 2009)
Agriculture and Rangeland
Urban Areas (2010)
Major Lakes & Rivers
County Boundaries
Managed/Public/Tribal Lands
OAWP BMP Enrollment, March 2014
Commodity, by Parcel
Citrus
Cow/Calf
Dairies
Equine
Fruit/Nut
Mixed Use
Nursery
Row Crops
Sod Farms
Miles
0
1.25
2.5
5

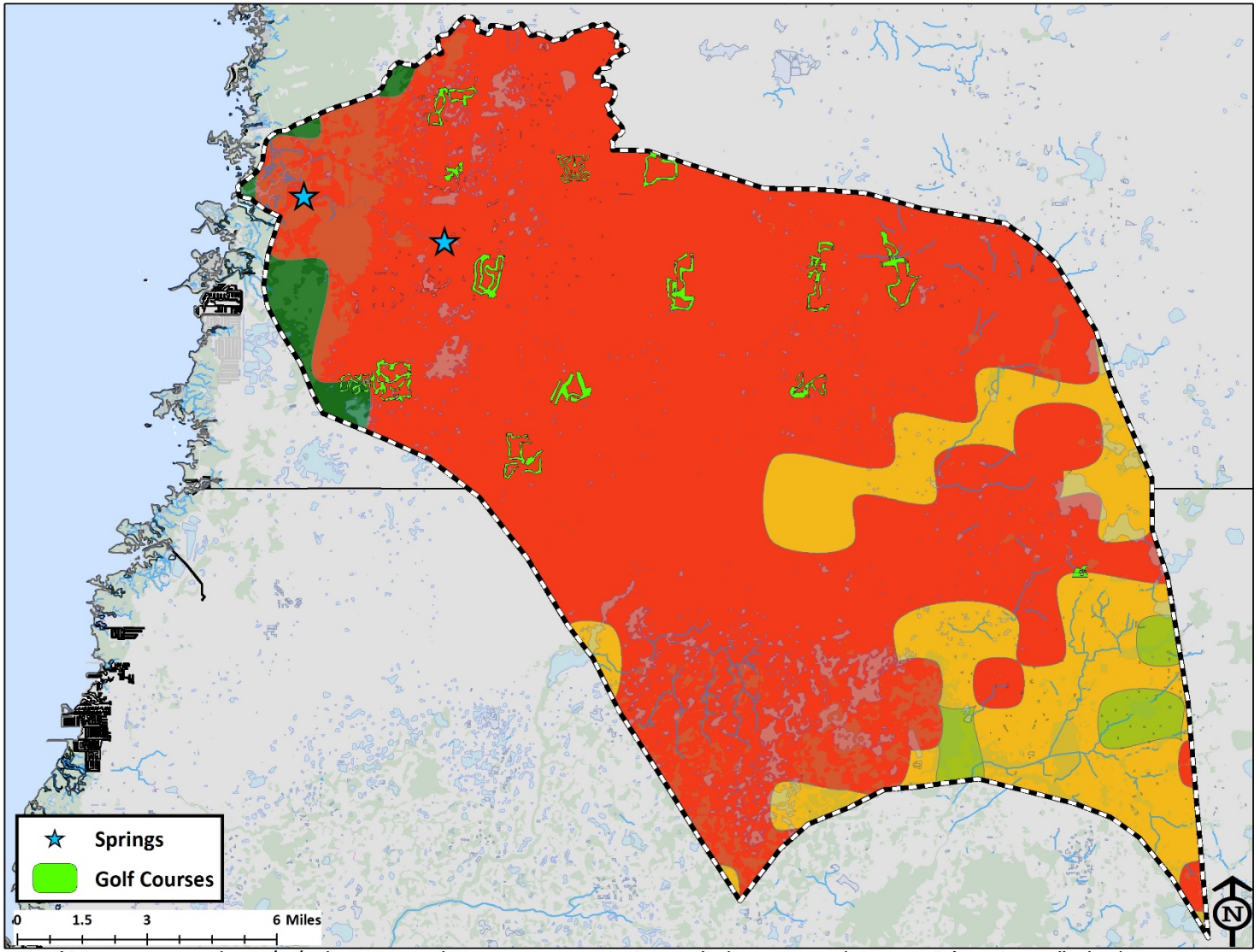
Septic Tanks

- DOH model relies on tax parcel data and sewer service areas
- Calculate # of people relying on septic tanks from 2010 Census
  - People per household in Hernando (2.41) and Pasco (2.45) counties
  - 36,051 tanks in BMAP boundary
- Average annual input to septic tank = 9.92 lb-N/person (FDOH)

Recharge Area	Input to Land Surface (lb-N)
Low	3,525
Medium	32,857
High	817,664



Golf Courses



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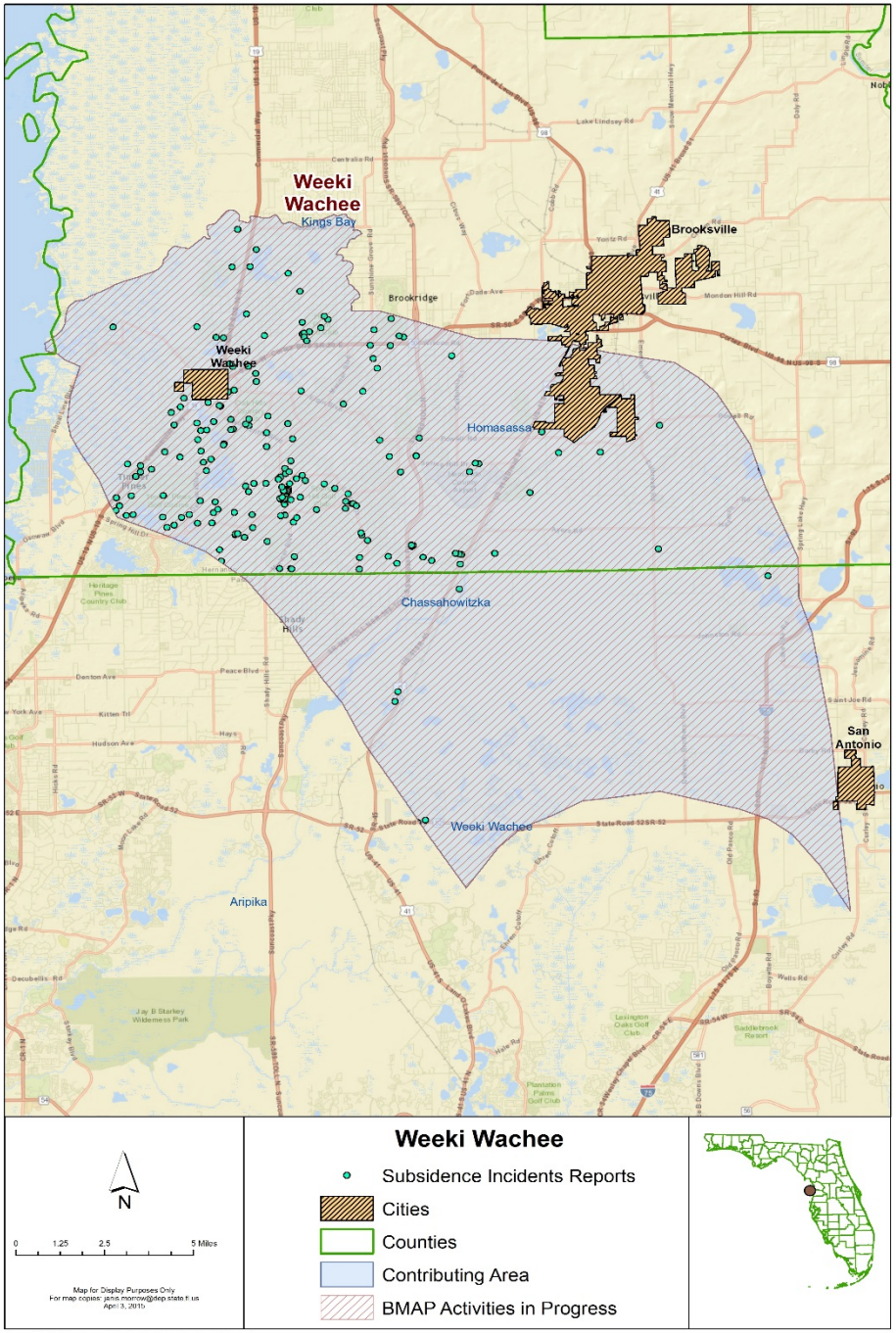
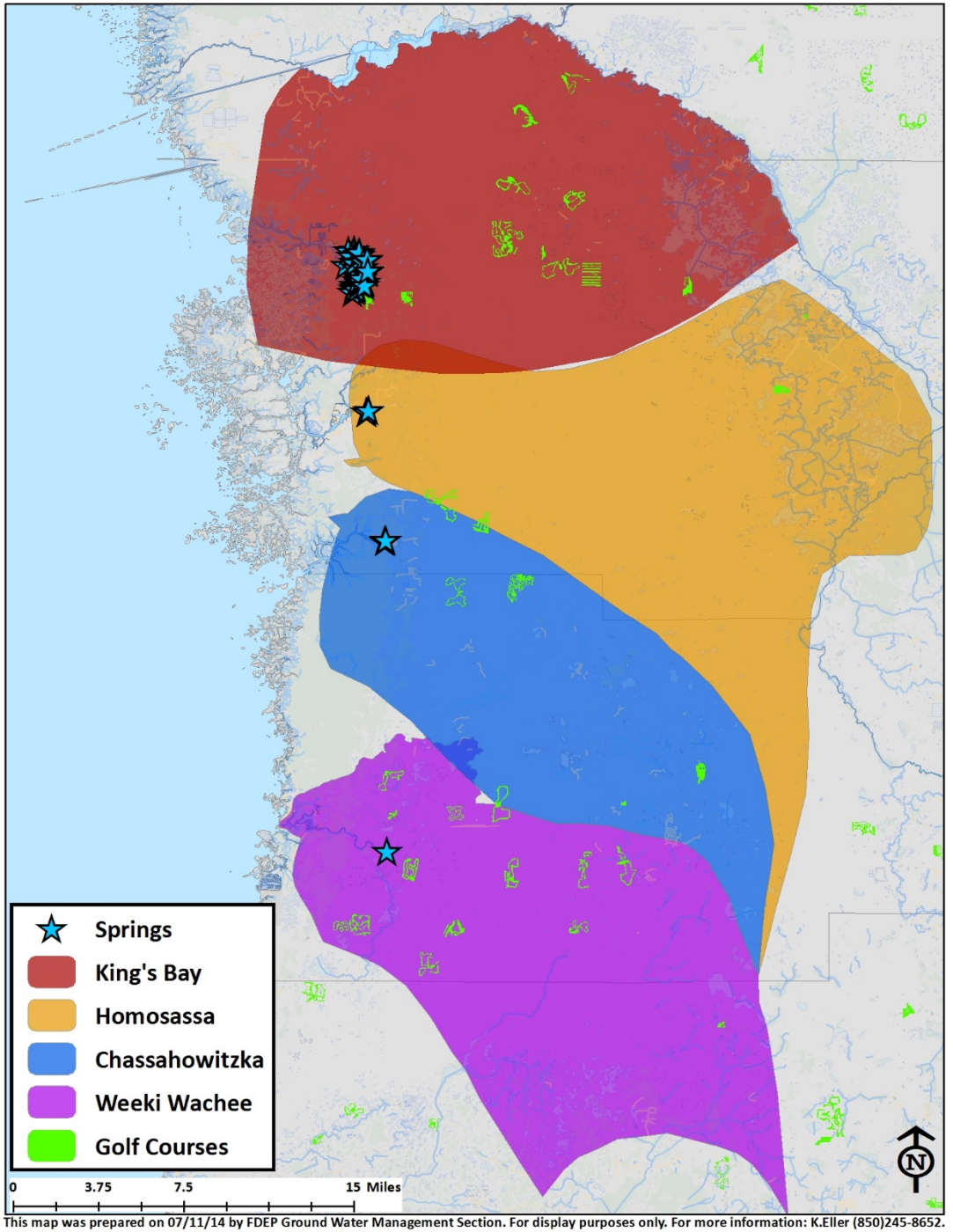
Subsidence Incidents



Springs Coast Golf Courses

Possible Solution (still in development)

- Supervisor certification
- BMP Manual implementation



OSTDS Initiative

Advisory Committee

- FDEP organized
- Representatives
  - FDOH, utilities, government, businesses, homeowners

GOAL - develop & implement management strategies necessary to reduce nutrient loading from OSTDS within realistic timeframe

OSTDS Initiative

Objectives:

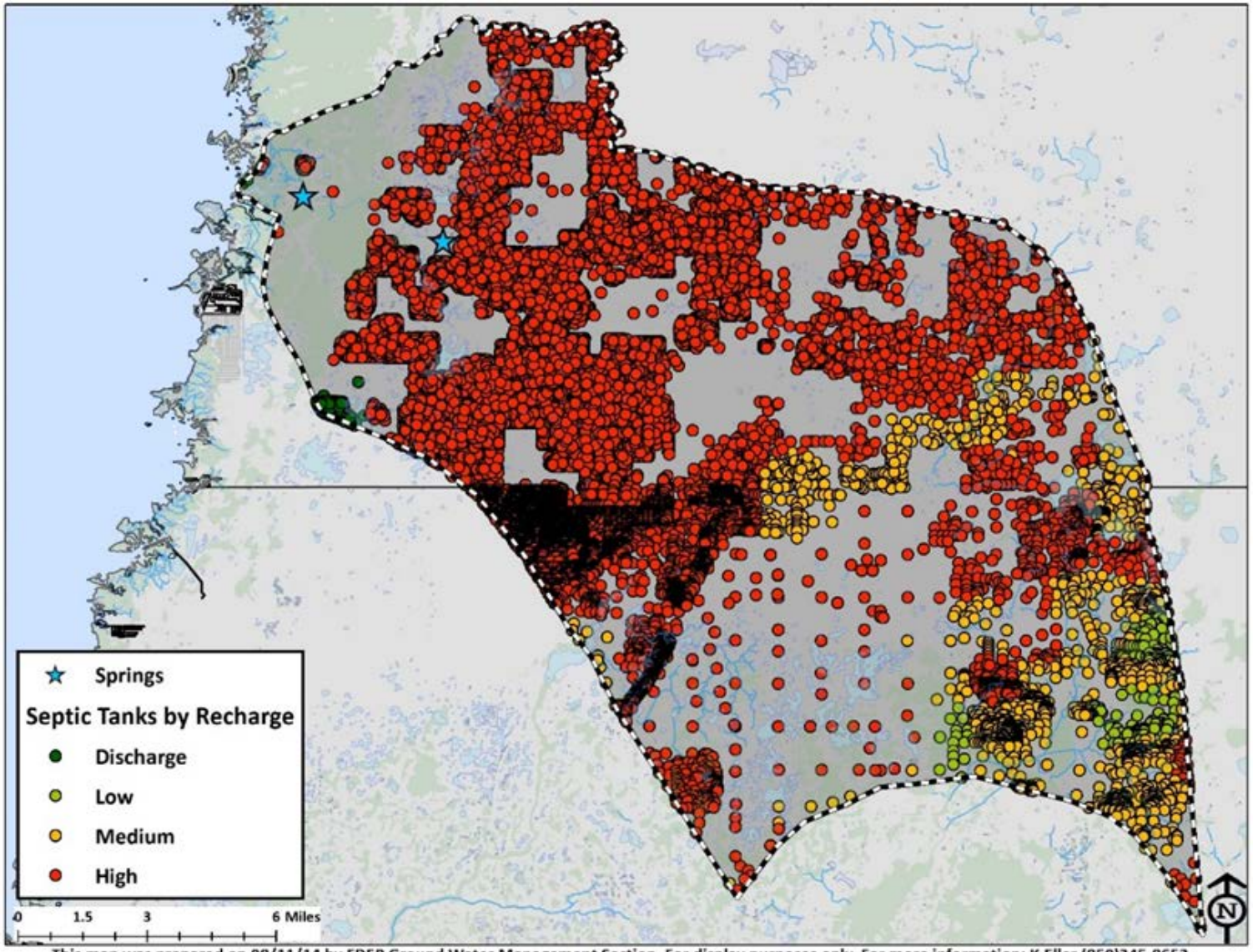
- Scientific Information Collection
- Develop Education Plan
- Identify and develop nutrient reduction projects for OSTDS

Plan:

- Prioritize areas where greatest risk exists
- Determine areas of opportunity (cost/benefit ratio)

Funding Dependent

Weeki Wachee Septic Tanks



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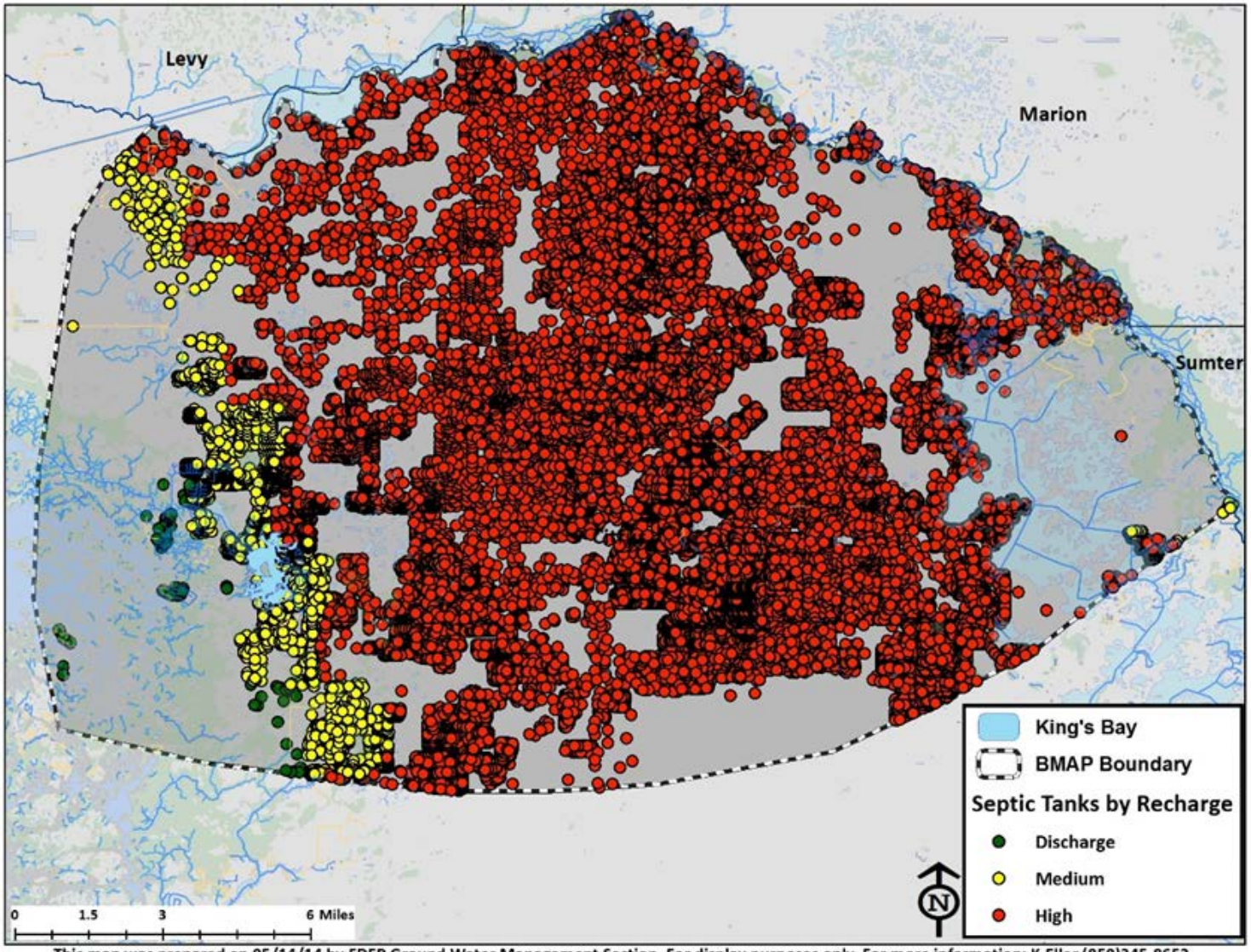
Crystal River Septic Tanks



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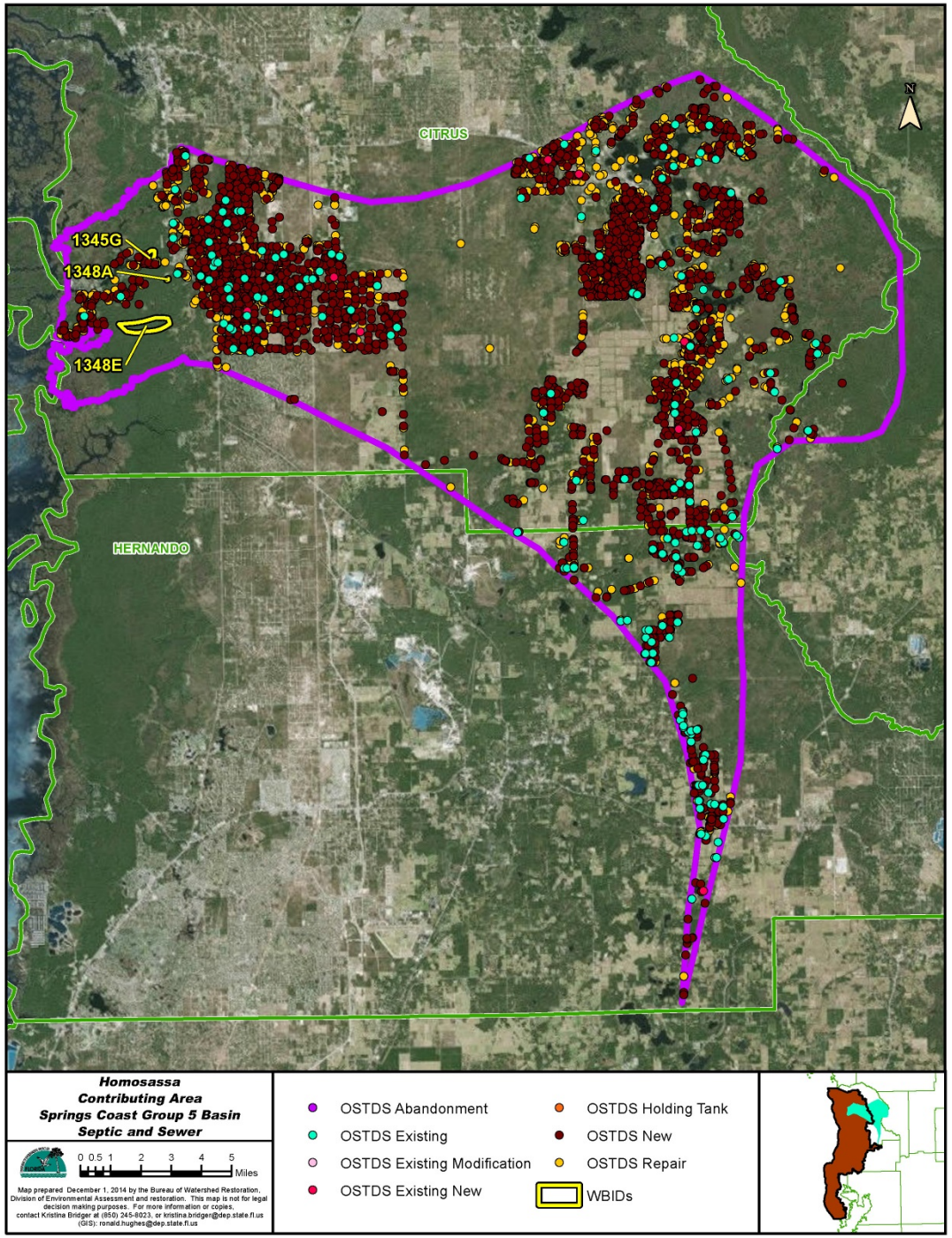
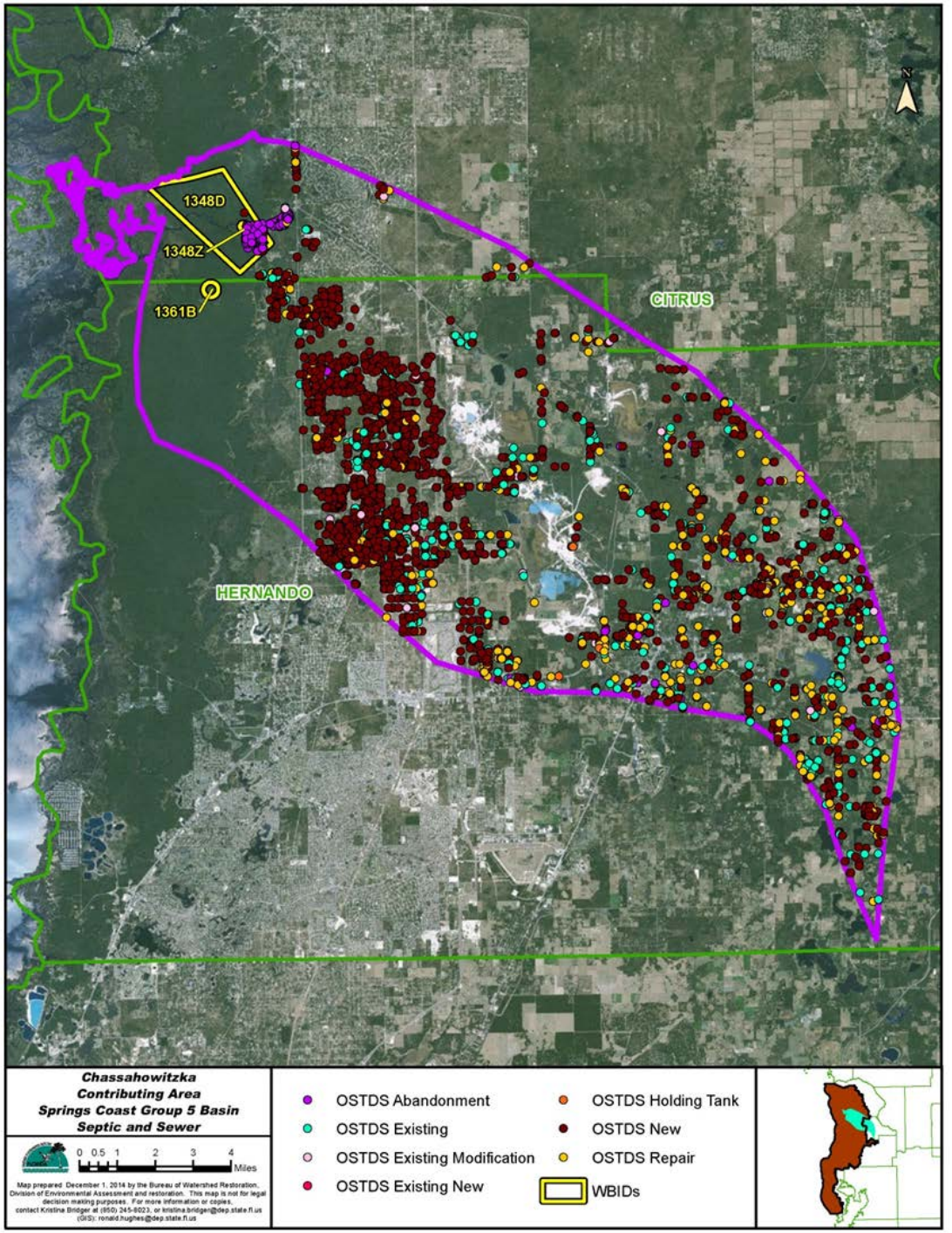
Homosassa Septic Tanks



Chaz Septic Tanks



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BMAP

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http://www.dep.state.fl.us/water/