

Orange County Environmental Protection Division

**Orange County
Groundwater Vulnerability
Assessment**

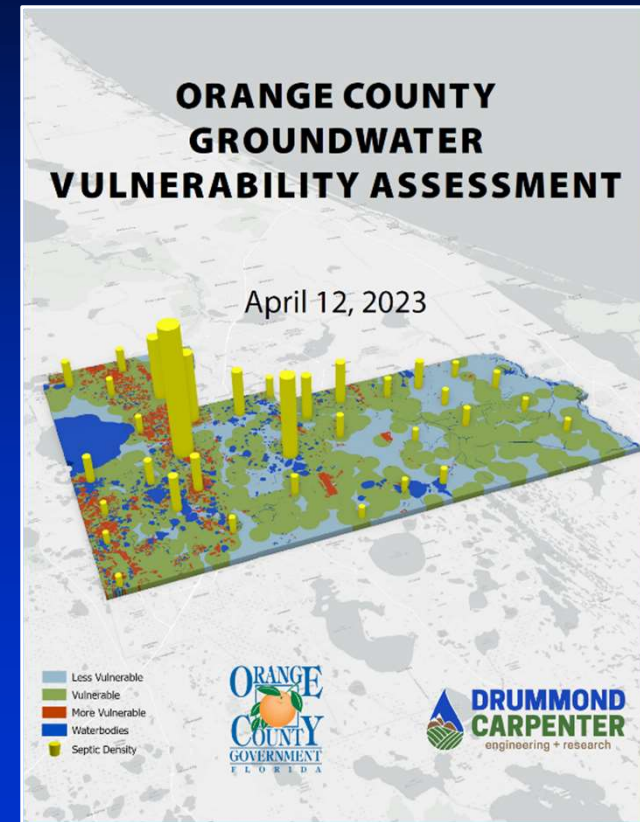
METRA General Meeting

July 12, 2023



Presentation Outline

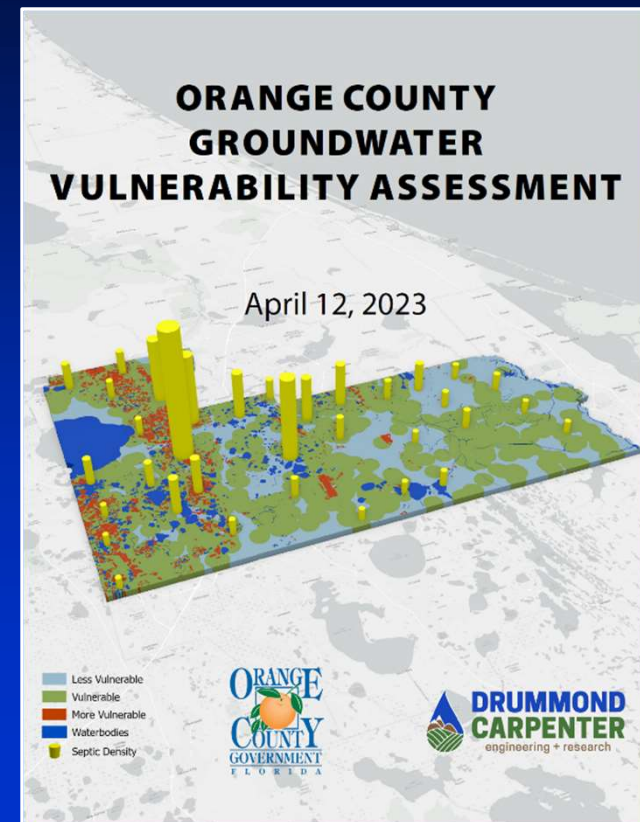
- Background
- Groundwater Vulnerability Assessment
- Recommendations
- Stakeholder Engagement
- Next Steps
- Summary





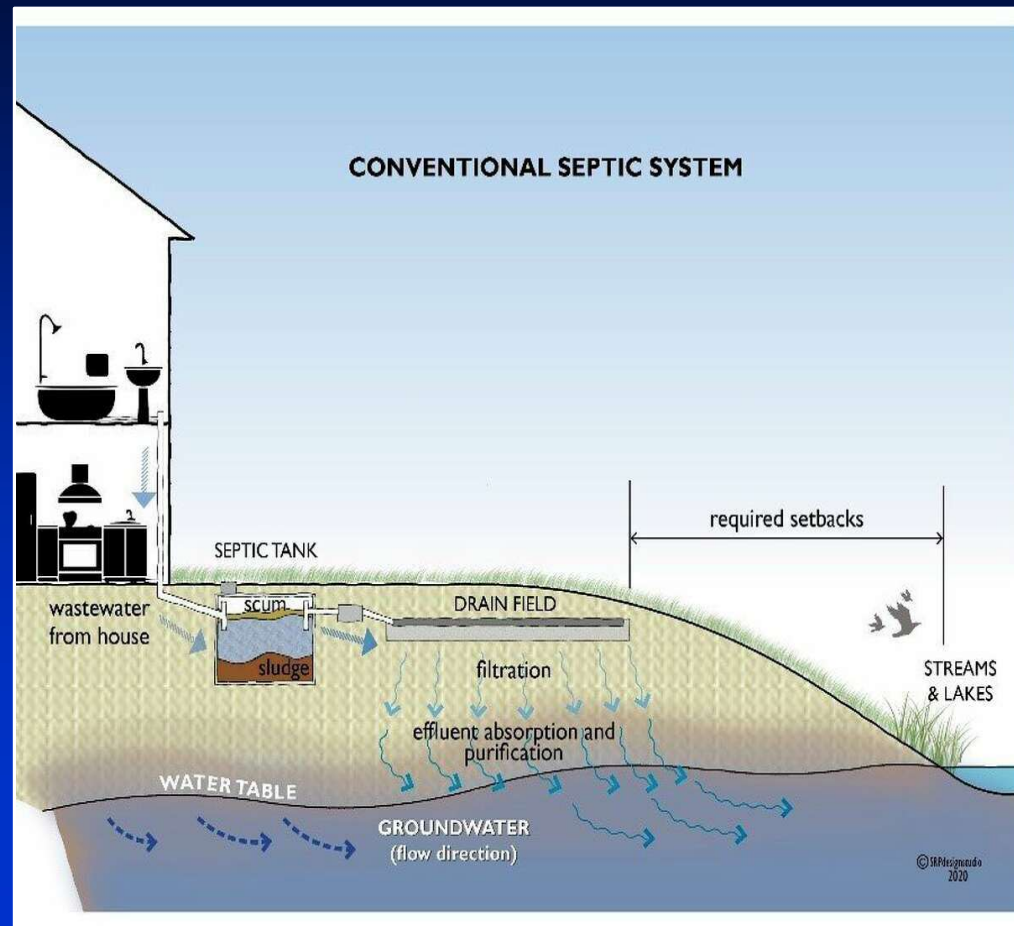
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Background

- Conventional septic systems are effective in the right locations and at the right densities
- Groundwater can transport nutrients to surface water
- Excessive nutrient loading to surface waters can degrade water quality and surrounding biological communities





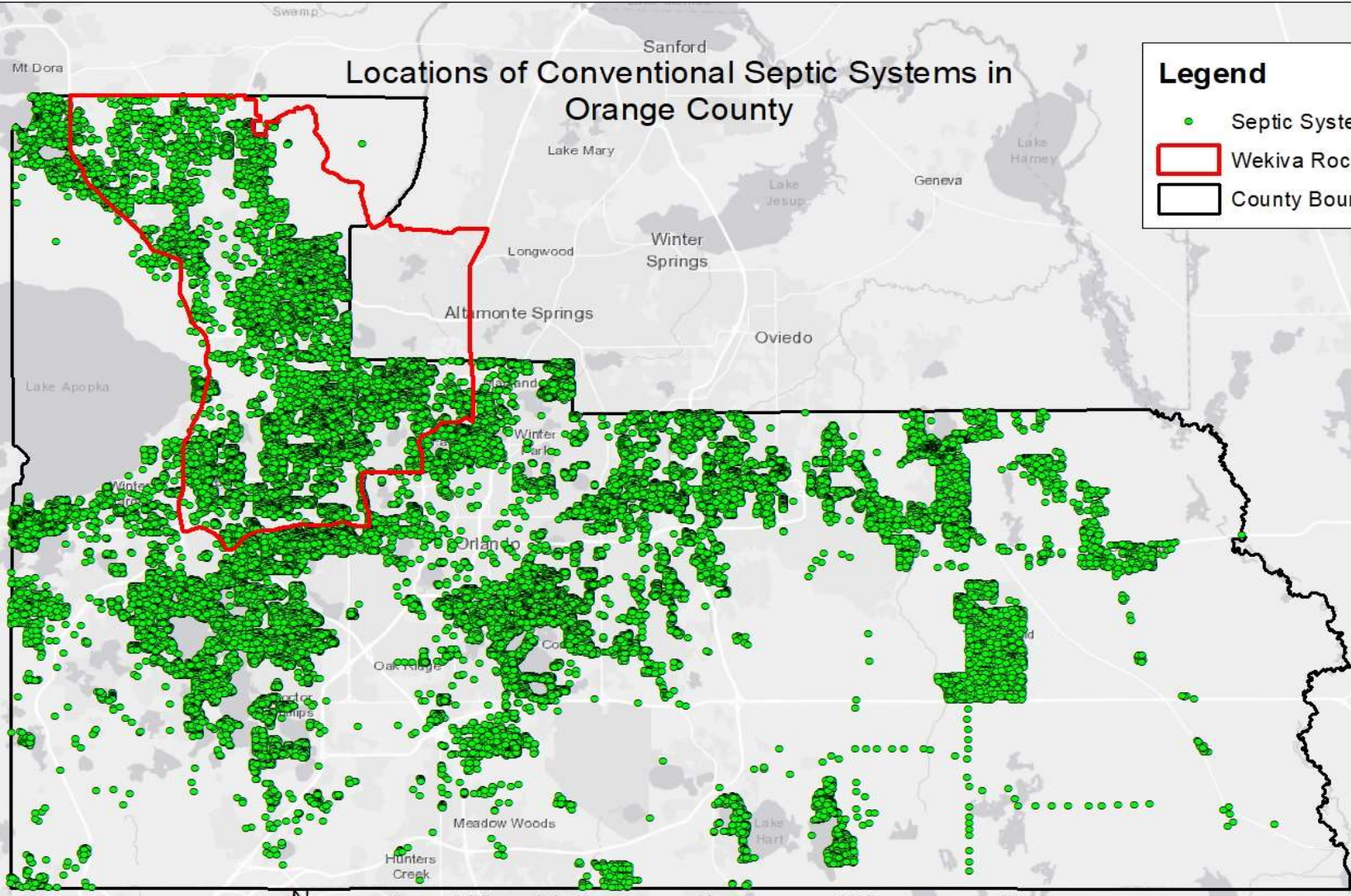
Background

- **State legislation addressing septic system impacts:**
 - **Florida Springs and Aquifer Protection Act (2016)**
 - **State Clean Waterways Act (2020)**
 - **Requires Orange County to incorporate plans addressing Onsite Septic Treatment Disposal Systems (OSTDS) into nutrient BMAPs by July 1, 2025**
 - **House Bill 1379 (2023)**
 - **Prohibits new OSTDS within a BMAP, Reasonable Assurance Plan, or pollution reduction plan where sewer is available. On lots one acre or less where sewer is not available, new OSTDSs must be an enhanced systems or other treatment system that achieves at least 65% nitrogen reduction.**
- **May result in future updates to Chapter 37, Water and Wastewater, Orange County Code.**

Locations of Conventional Septic Systems in Orange County

Legend

- Septic System
- ▭ Wekiva Rock Springs PFA
- ▭ County Boundary





Background

Distribution of Conventional Septic Systems in Orange County

District	Orange County	OCU Service Area Inside Wekiva PFA	OCU Service Area Outside Wekiva PFA
1	13,010	0	12,890
2	27,732	14,000	585
3	14,457	0	11,426
4	2,252	0	2,412
5	18,067	22	8,541
6	10,324	3,740	6,025
Total	85,932	17,762	41,879



Background

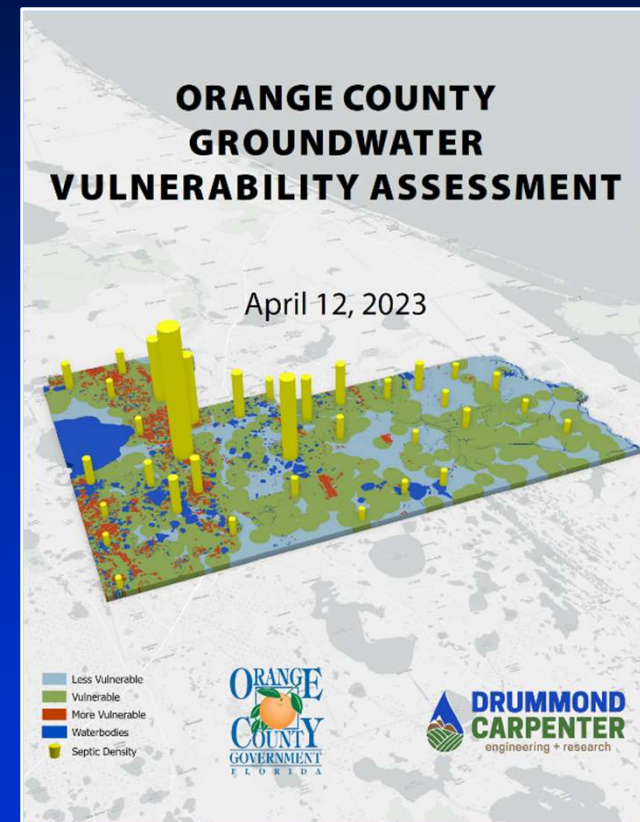
Purpose of the Groundwater Vulnerability Assessment (GVA)

- Which waterbodies are most vulnerable to excessive nutrient loading from existing conventional septic systems?
- Where should use of conventional septic systems be restricted for new development?
- Where should connections to the central sewer or upgrading to advanced septic systems be prioritized for existing conventional septic systems?
- Are current setback requirements from septic systems in code adequate to protect nearby surface waters?



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Groundwater Vulnerability Assessment

GVA Methodology

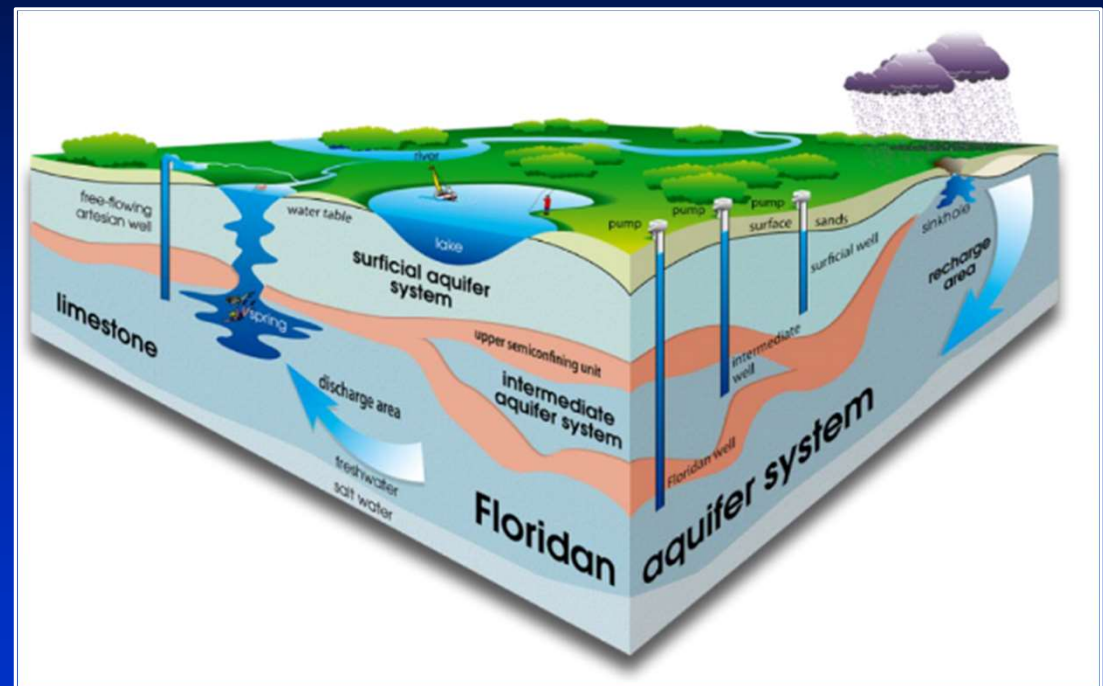
1. Determine categories of groundwater areas that are more vulnerable, vulnerable, or less vulnerable to contamination from septic systems (based on the 2005 FGS FAVA model).
2. Rank subdivisions by their potential to discharge septic system nutrients to groundwater or water bodies
3. Create a list of waterbodies of interest and establish their capture zones and how long it takes nutrients to reach the waterbody
4. Identify Orange County Priority Vulnerability Areas (PVAs) by merging subdivision septic sources and waterbody influence zones



Groundwater Vulnerability Assessment

1. Determine groundwater vulnerabilities

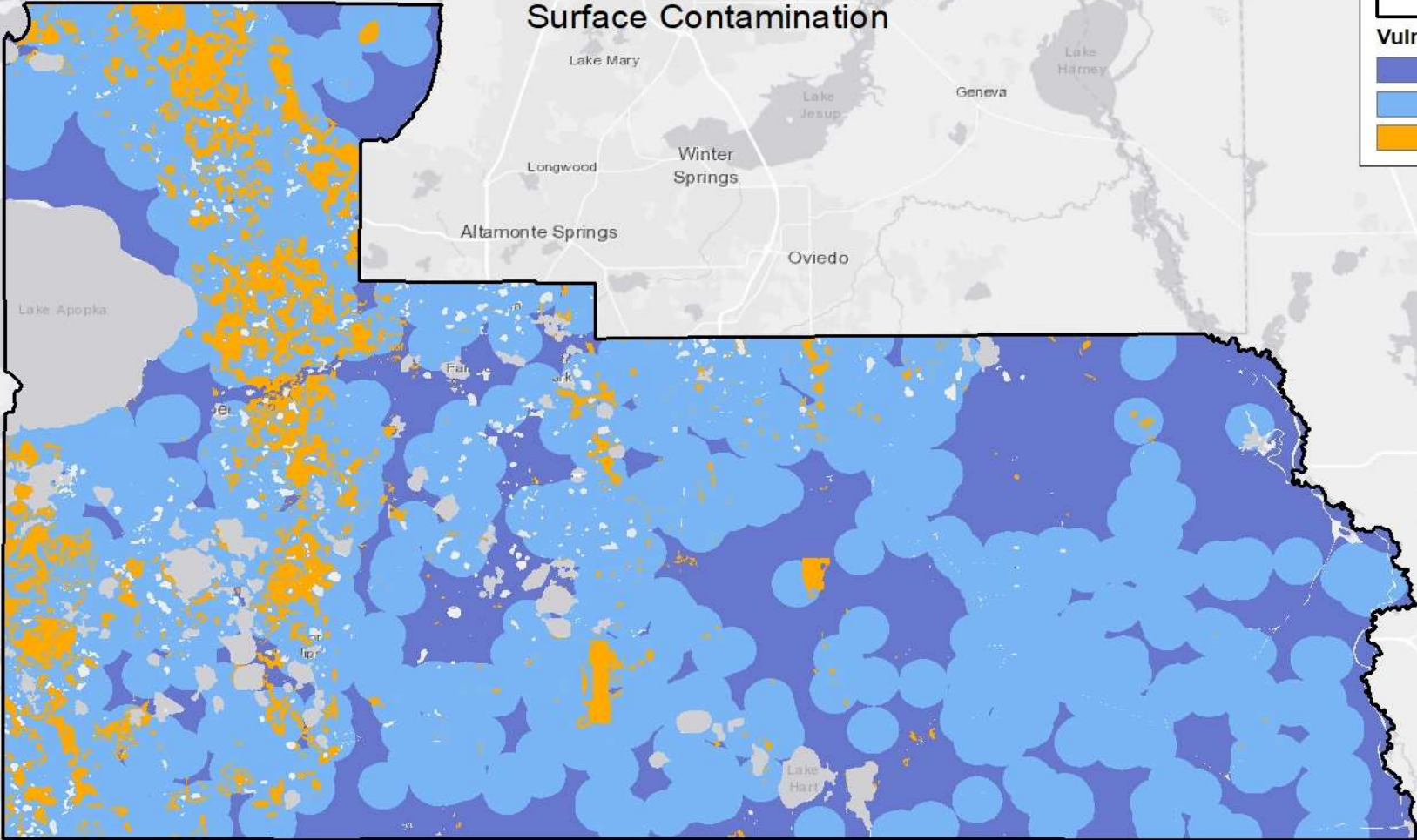
- The vulnerability model uses data to produce a map of areas where groundwater is vulnerable to discharges from conventional septic systems
- Areas where the local data combines to produce vulnerability categories



Groundwater Areas Vulnerable to Surface Contamination

Legend

- County Boundary
- Vulnerability**
 - Less Vulnerable
 - Vulnerable
 - More Vulnerable





Groundwater Vulnerability Assessment

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2. Subdivision Ranking

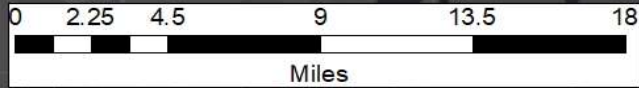
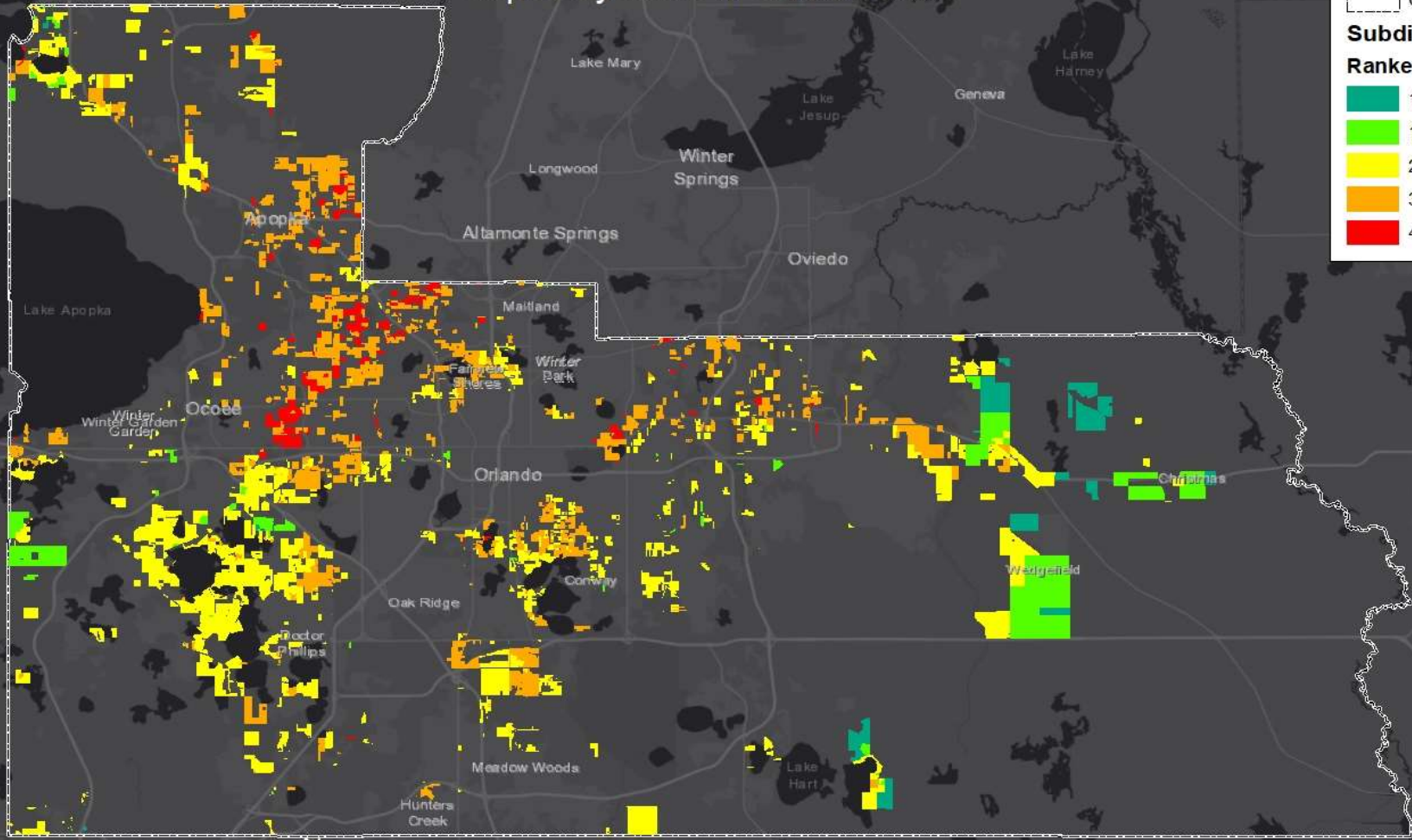
- Rank subdivisions by the potential for their conventional septic systems to discharge nutrients to groundwater
- Ranked by density of conventional septic systems, distance to a water body, percent of the subdivision in an impaired watershed, etc.
- Produce a heat map of subdivision rankings

Potential for Groundwater Pollution from Septic Systems in Subdivisions

Legend

- County Boundary
- Subdivision**
- Ranked Vulnerability**

1.4 - 1.7
1.7 - 2.0
2.0 - 3.0
3.0 - 4.0
4.0 - 5.0

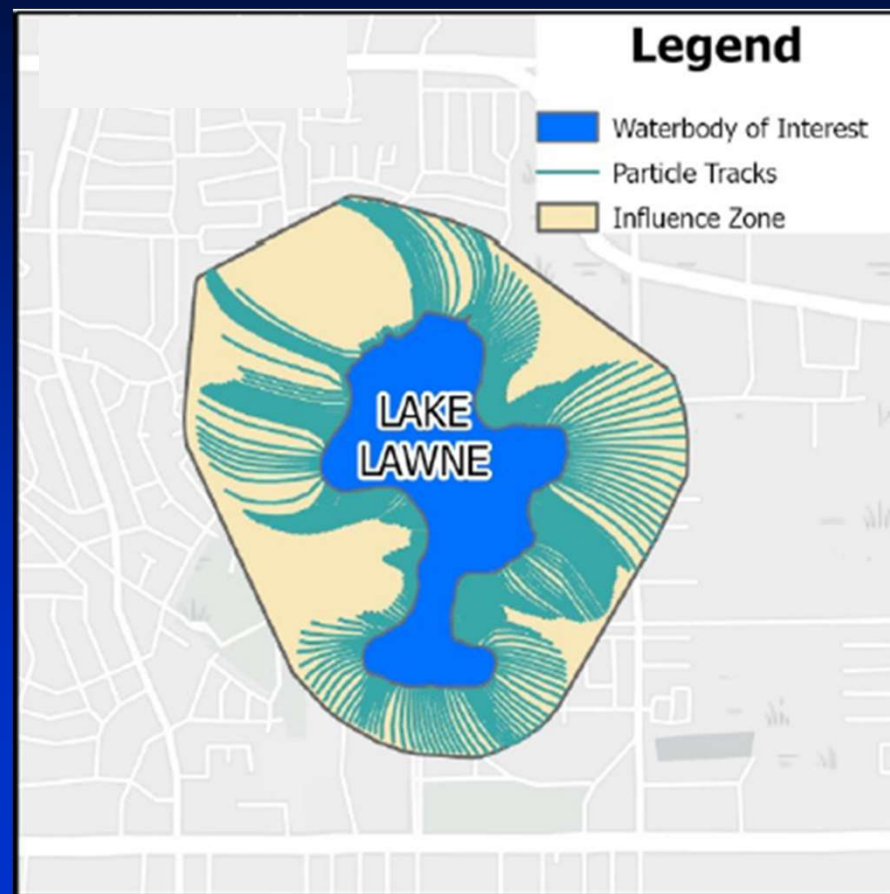




Groundwater Vulnerability Assessment

3. Determine waterbodies of interest and their capture zones

- A water body of interest:
 - Has one or more impairments, has a TMDL, is located within a BMAP, is an OFW , is within a closed basin or known karst area
 - Is adjacent to areas with a high density of conventional OSTDSs
- Use a regulatory groundwater model to establish capture zone and travel times to the water bodies of interest



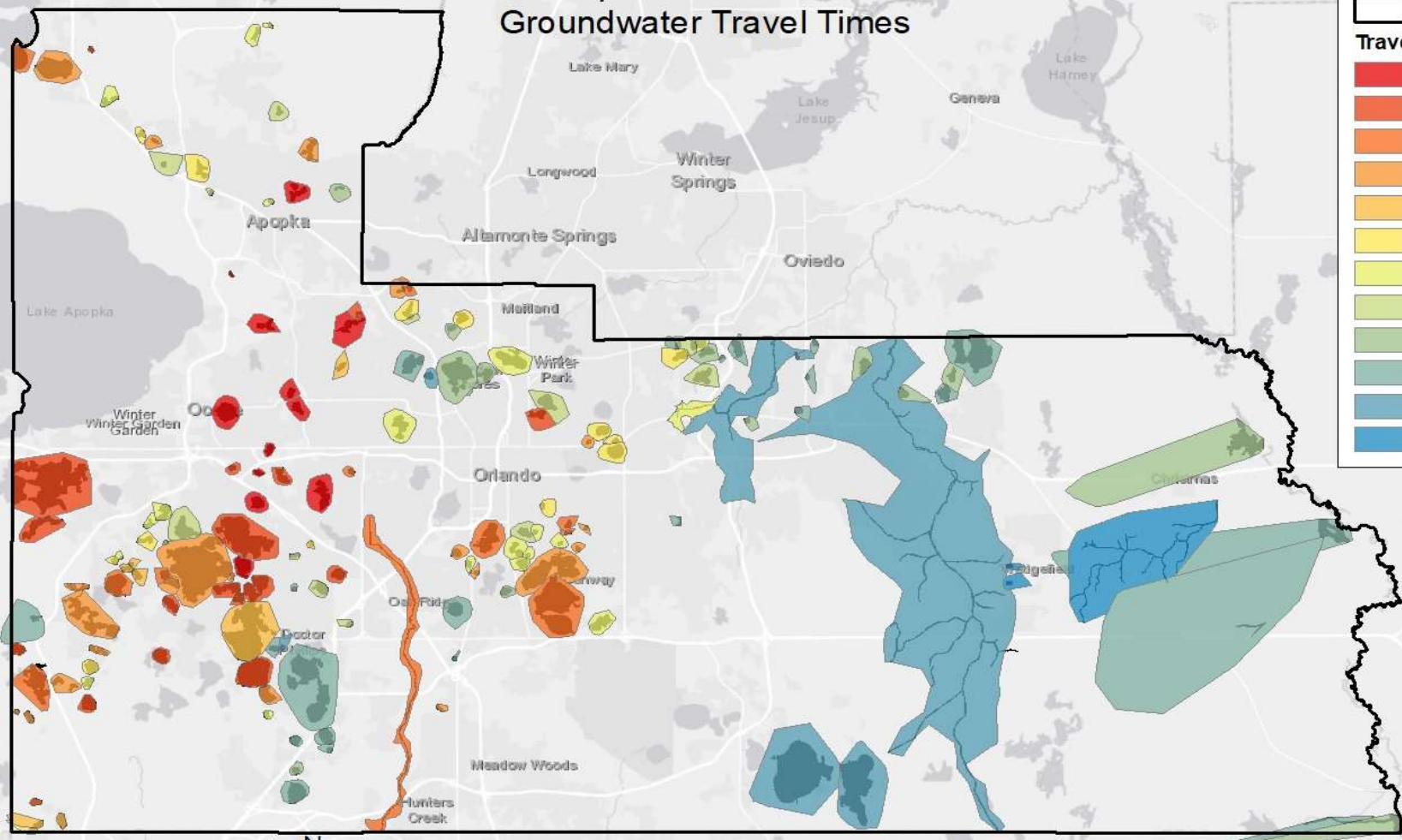
Capture Zones and Groundwater Travel Times

Legend

County Boundary

Travel Time (Years)

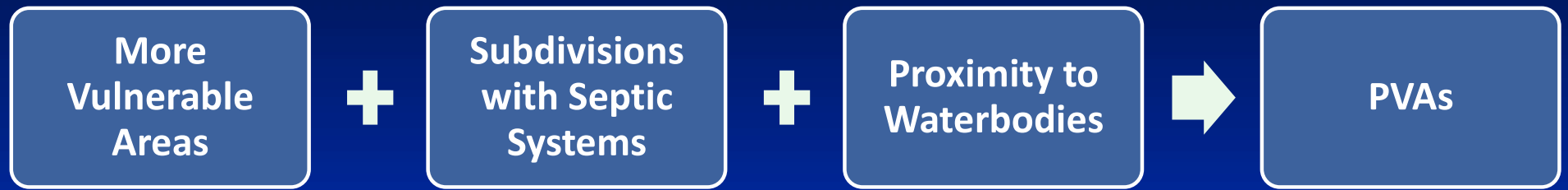
- 0.4 - 0.8
- 0.8 - 1.1
- 1.1 - 1.3
- 1.3 - 1.5
- 1.5 - 1.7
- 1.7 - 2.0
- 2.0 - 2.3
- 2.3 - 2.6
- 2.6 - 3.5
- 3.5 - 5.2
- 5.2 - 7.7
- 7.7 - 15.3



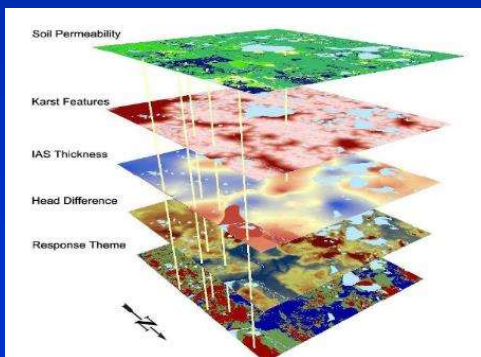


Groundwater Vulnerability Assessment

4. Identify Orange County Priority Vulnerability Areas (PVAs)



Easy Flow to Groundwater



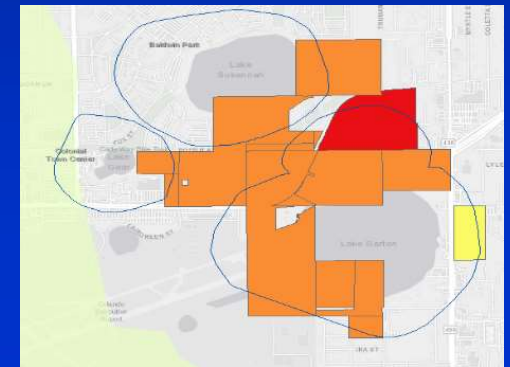
Source of Nutrients



Target of Nutrients



Priority Vulnerability Areas

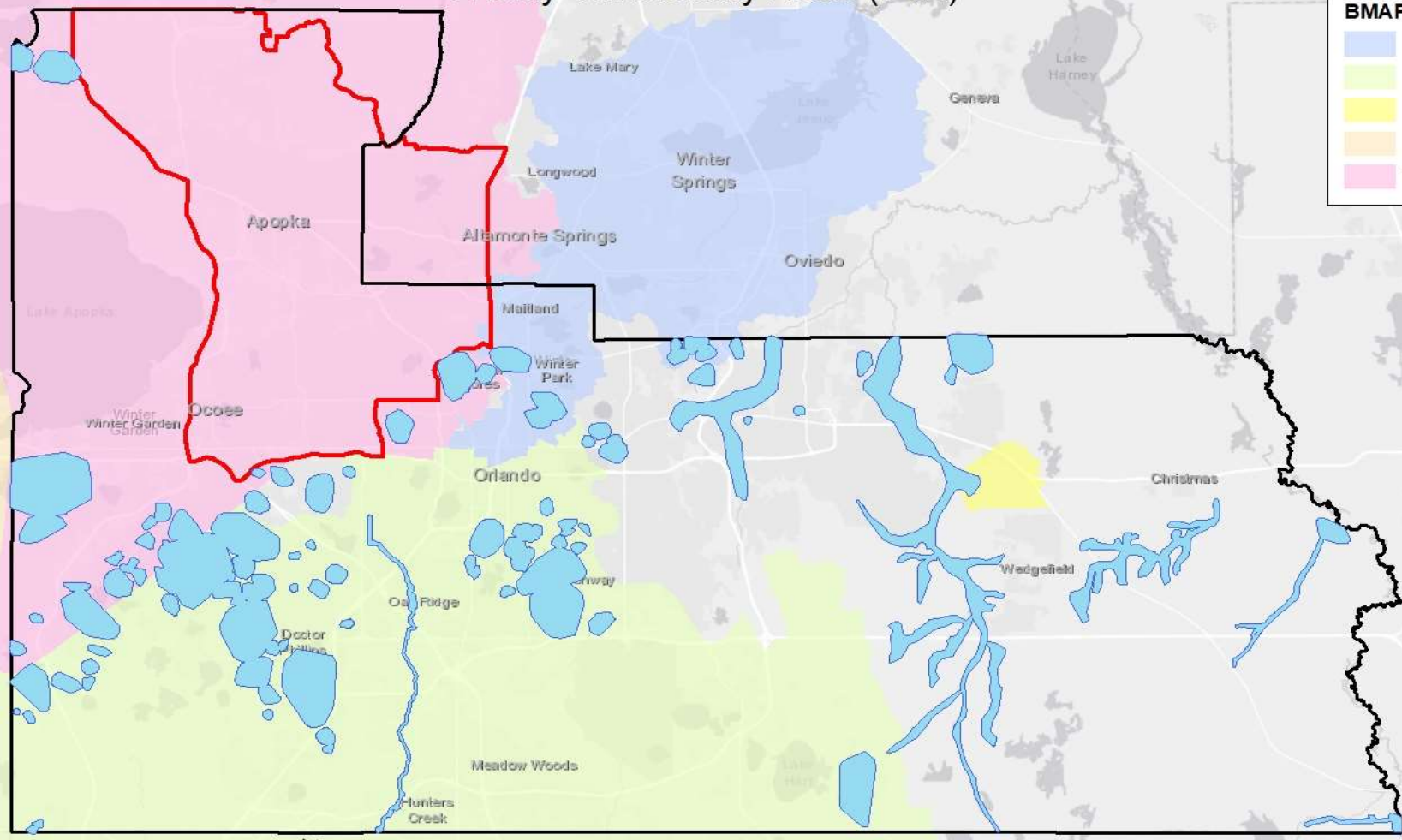


Priority Vulnerability Areas (PVA)

Legend

BMAP Name

- Lake Jesup
- Lake Okeechobee
- Long Branch
- Upper Ocklawaha
- Wekiva





Background

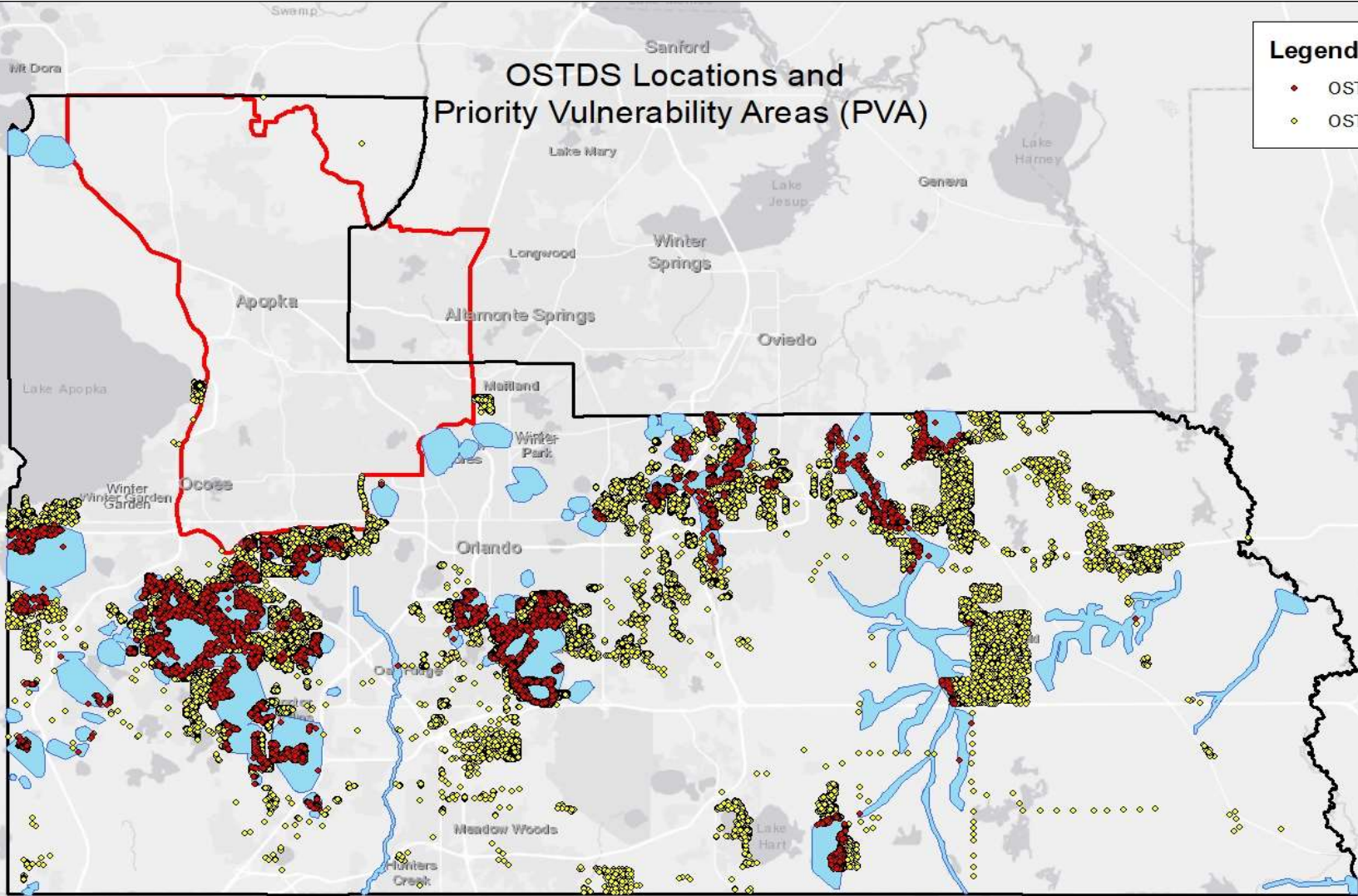
- **Distribution of Conventional Septic Systems in Orange County**

District	OCU Outside the Wekiva PFA	Inside PVAs	Outside PVAs
1	12,936	4,994	7,942
2	584	0	584
3	11,396	3,875	7,521
4	2,394	453	1,941
5	8,551	1,614	6,937
6	6,018	905	5,113
Total	41,879	11,841	30,038

OSTDS Locations and Priority Vulnerability Areas (PVA)

Legend

- OSTDS Inside PVA
- ◊ OSTDS Outside a PVA

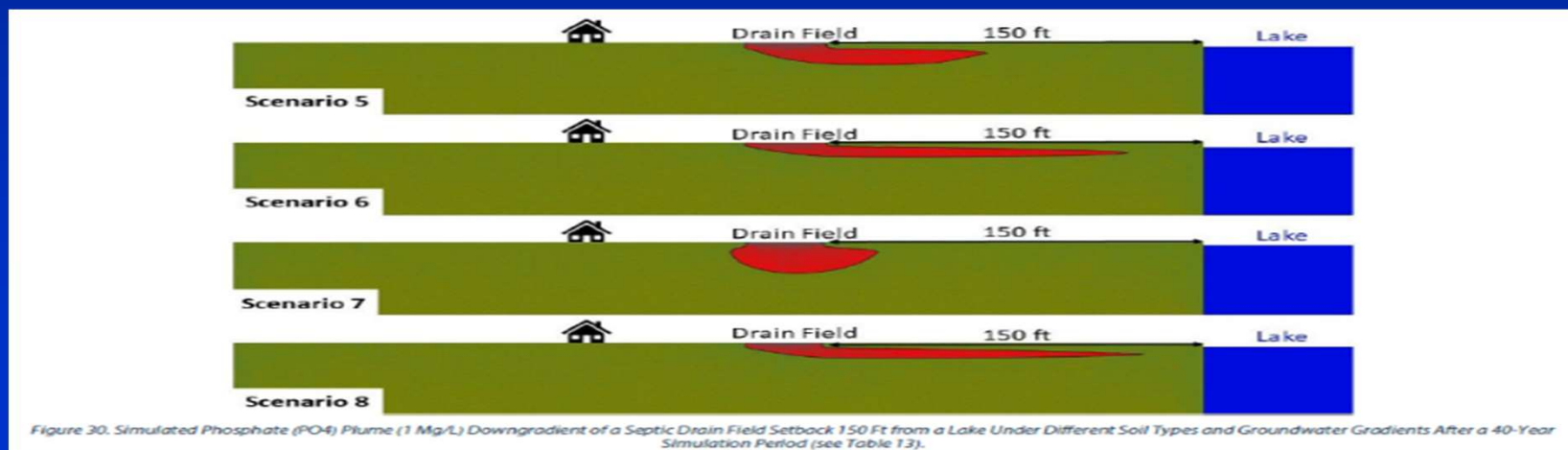




Groundwater Vulnerability Assessment

Evaluating septic system setbacks

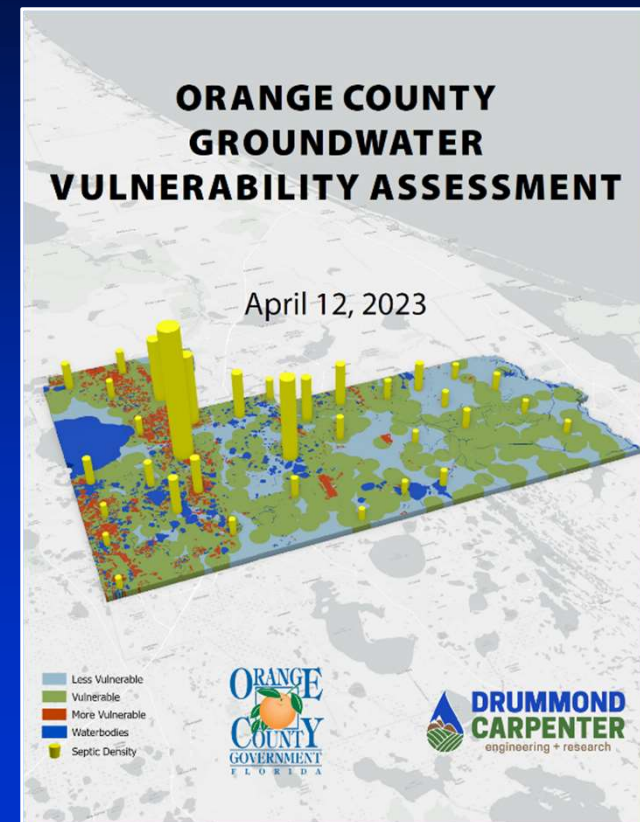
- Eight different modeling scenarios evaluating septic system impacts
- Install advanced treatment systems in areas with high water tables
- Connect conventional systems to central sewer or require advanced systems
- Require larger setbacks from water bodies





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GVA Recommendations for Consideration

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- **Orange County created a Workgroup to identify actionable OSTDS interventions to mitigate and prevent impairments to water bodies**
 - **Septic Working Group Overview presented to the BCC (02/22/2022)**
- **Subgroups presented before the Board in 2022 to discuss various issues related to septic tanks**
 - **Subgroup A - new development connections to central sewer (07/12/2022)**
 - **Subgroup B - existing septic-to-sewer connections (06/21/2022)**
 - **Subgroup C - existing septic tank upgrades (08/30/2022)**
 - **Subgroup D - new septic tank standards and permitting (09/13/2022)**



GVA Recommendations for Consideration

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Subgroup A (new development connecting to central sewer)

- Consider increasing the distance for which connection to central sewer is required for new developments in vulnerable areas

Subgroup B (existing septic-to-sewer connections)

- Conduct septic-to-sewer feasibility studies
- Develop potential funding strategies
- Evaluate how new policies may be used to address nutrient BMAP requirements



GVA Recommendations for Consideration

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Subgroup C (existing septic tank upgrades)

- Consider requiring failing septic systems to upgrade to advanced treatment systems
- Require existing septic systems within a setback to be upgraded to advanced treatment systems
- Develop funding strategies
- Develop an interagency agreement between Orange County and FDOH/FDEP



GVA Recommendations for Consideration

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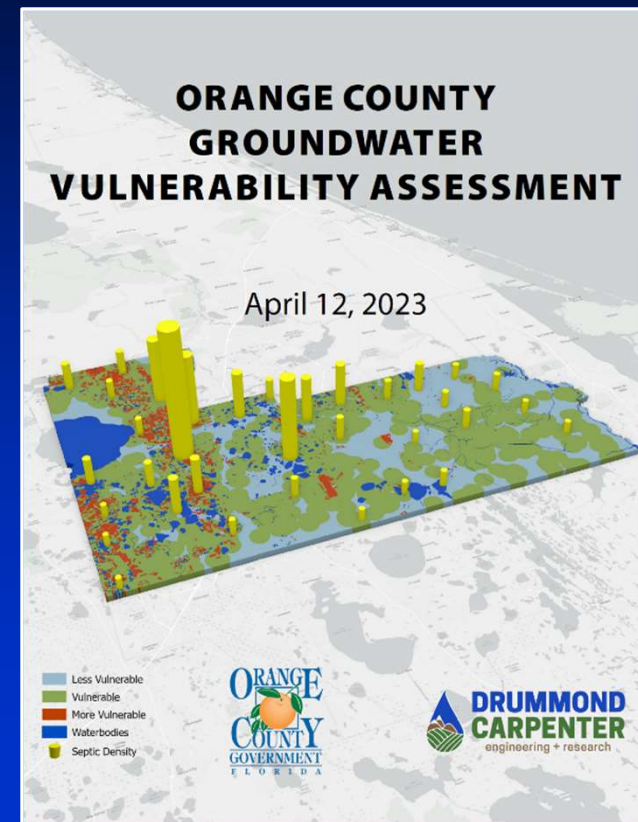
Subgroup D (new septic tank standards and permitting)

- **Consider prohibiting new conventional septic tanks**
- **Develop setbacks from a waterbody for new conventional systems and where advanced treatment systems would be required**
- **Develop variance criteria that account for lots that are too small to meet setback requirements.**
- **Develop an interagency agreement between Orange County and FDOH/FDEP**



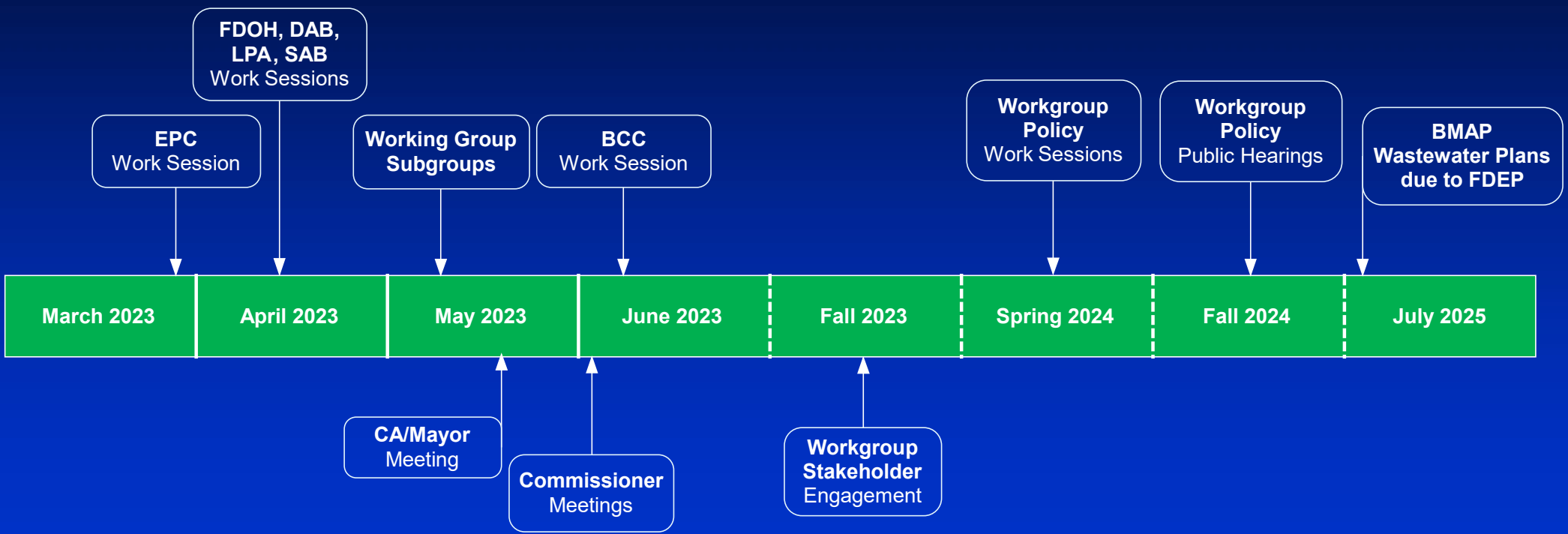
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Stakeholder Engagement





Stakeholders Engagement

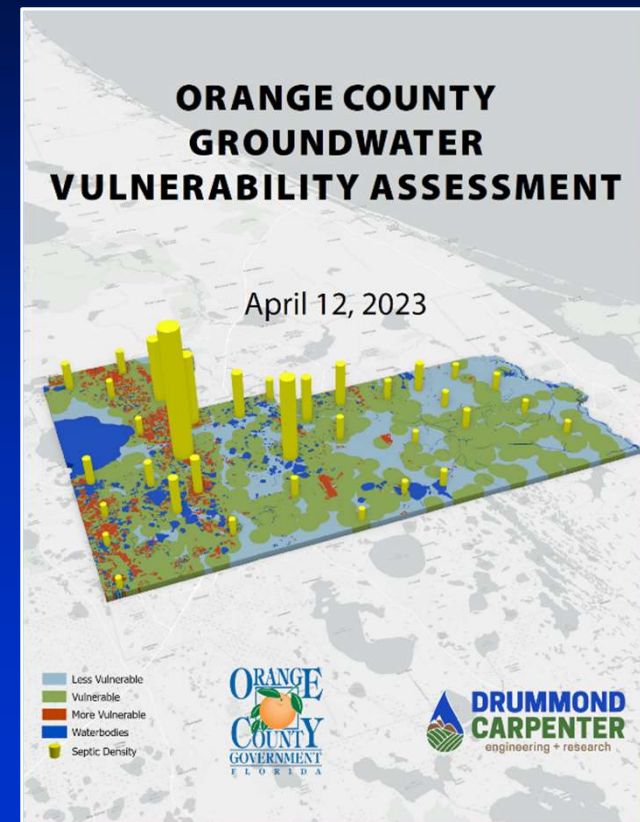
Future Engagement

- Policy Makers (Orange County BCC)
- State Agencies (FDEP, FDOH, SJRWMD, SFWMD)
- Municipalities
- Septic Tank Industry (equipment vendors, installers, maintenance entities, Florida Onsite Wastewater Association)
- Development Industry (residential, commercial, contractors, builders, engineers, attorneys)
- Environmental Groups
- Orange County Residents, Homeowners, and Visitors



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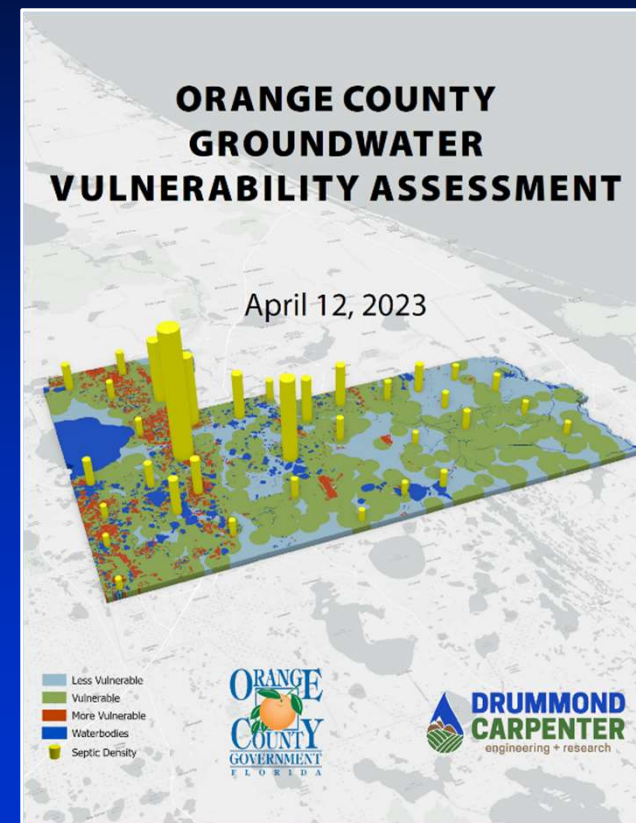
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Next Steps

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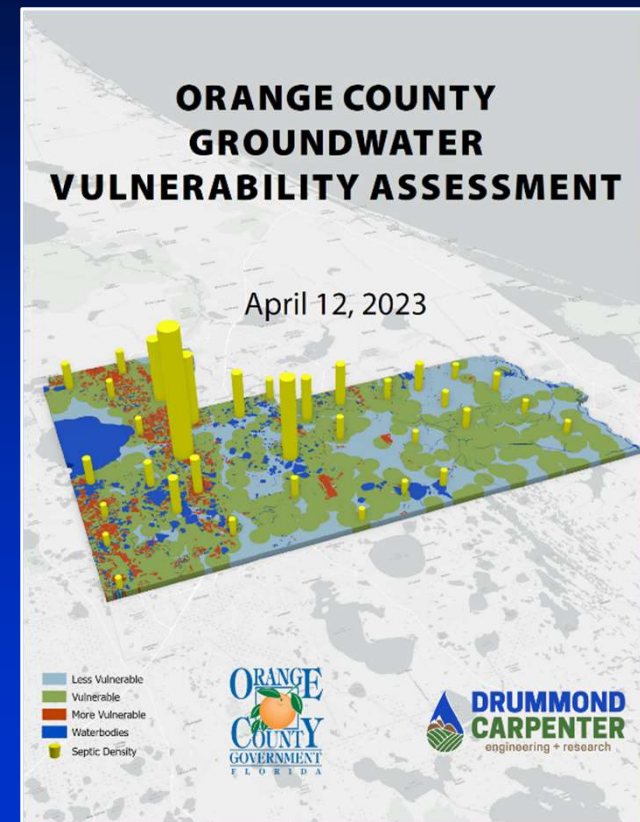
- Subgroups evaluate recommendations to support policy discussions (Summer 2023)
- Stakeholder engagement (Fall 2023)
- Advisory Board and BCC Work Session on policy options (Spring 2024)
- Draft code revisions
- Formulate plans for addressing septic tanks in BMAP areas





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Summary

- **The GVA is a county-wide assessment performed using peer-reviewed models and using local data**
- **The study identified PVAs where there should be restrictions on new conventional septic systems**
- **PVAs help prioritize where septic-to-sewer conversions or upgrades need to occur**
- **GVA will help Orange County with FDEP regulatory requirements**
- **Additional discussions with stakeholders are planned during septic tank policy development**
- **GVA will help Subgroups evaluate potential policy options**



Many Thanks

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- **Orange County Board of County Commissioners**
 - For supporting this work
- **Drummond Carpenter**
 - For meeting deadlines, making last minute changes, ...
- **The METRA Audience**
 - For your time and attentions
- **Questions???**