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BENEFICIAL REUSE OF WASTEWATER (BREW):
AN UPDATE ON TRENDS IN FLORIDA AND INTERDISCIPLINARY RESEARCH OPPORTUNITIES

FOR THE #GATORGOOD

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About Us

1 Interdisciplinary

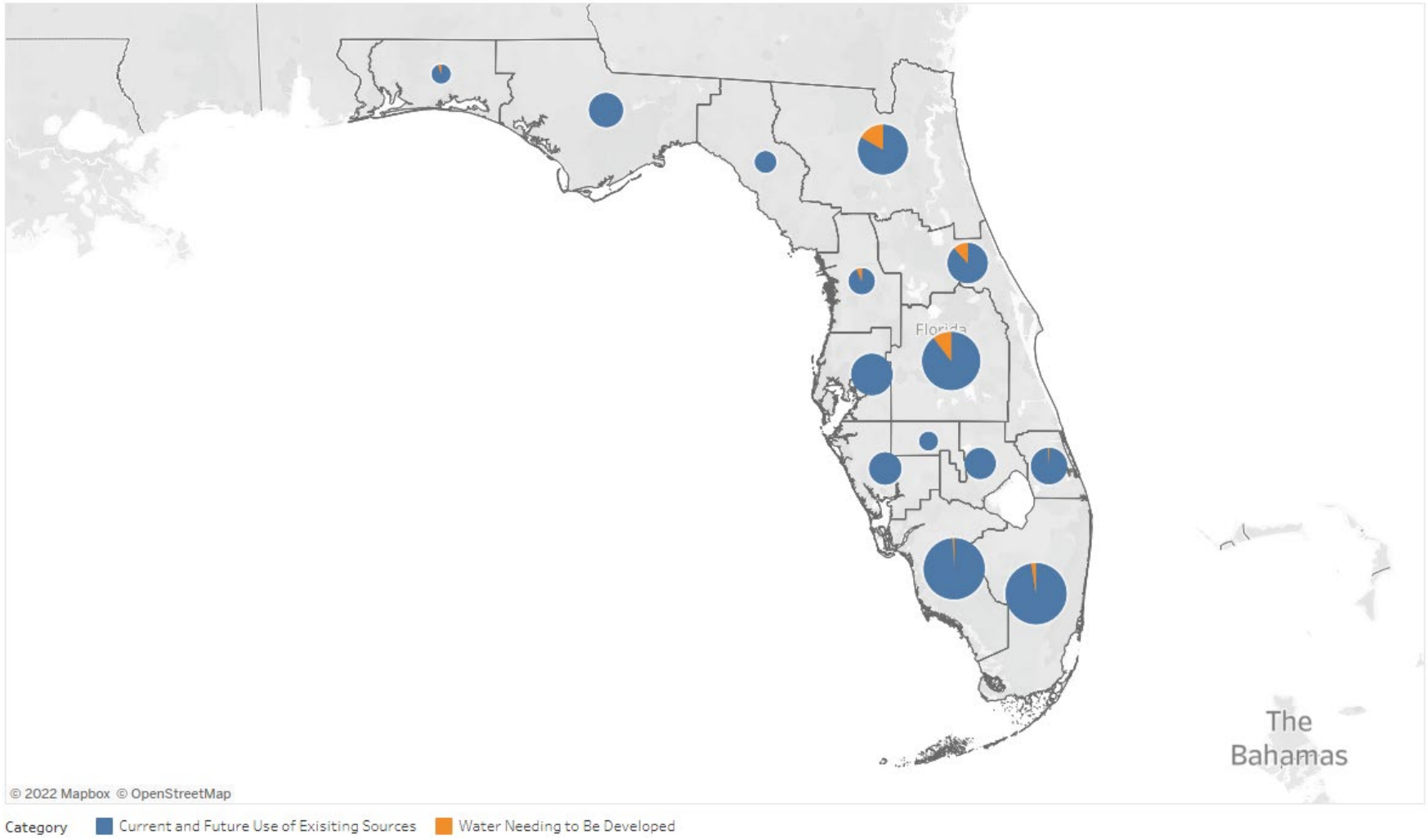
Social sciences, risk assessment, soil & water sciences, geological sciences,
ag & bio engineering

2 Focused on Emerging Research Needs

Public perceptions, contaminant fate and transport, urban & agricultural uses, treatment technologies

Our goal is to provide research-based information for expanding the beneficial reuse of wastewater in Florida and beyond.

Meeting Future Demands



relative size of circle = relative projected future water need

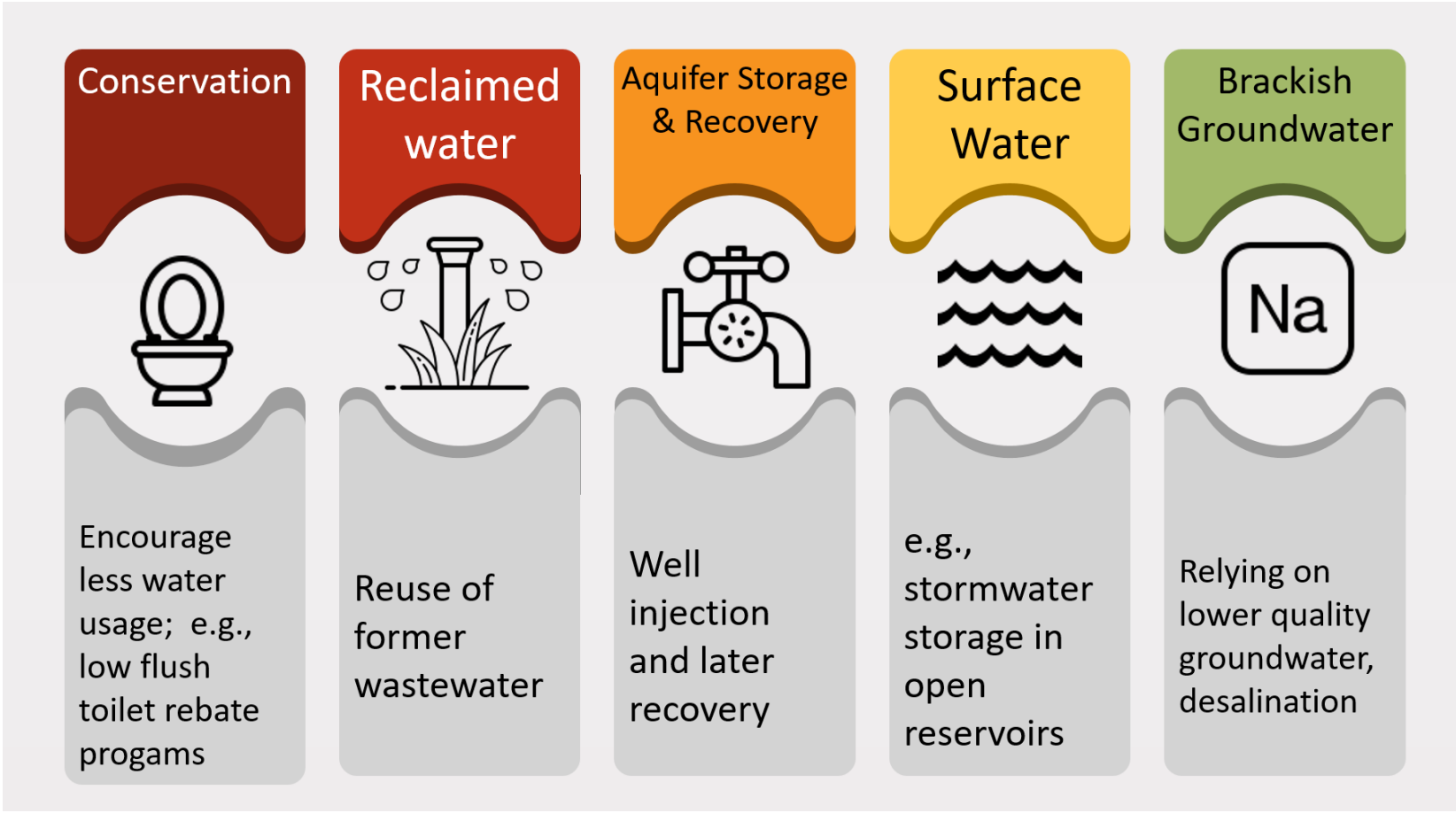
blue = future need that can be met by existing water sources

orange = future need that will need to be developed

Map Source: FDEP, 2021

2040 projected statewide shortfalls: ~337 MGD

So where will this water come from?



Reclaimed Water

Former domestic wastewater that has been highly treated and disinfected; may be disposed of or reused; if not reused, it is discharged to the environment

Top 3 RW users in the United States

California

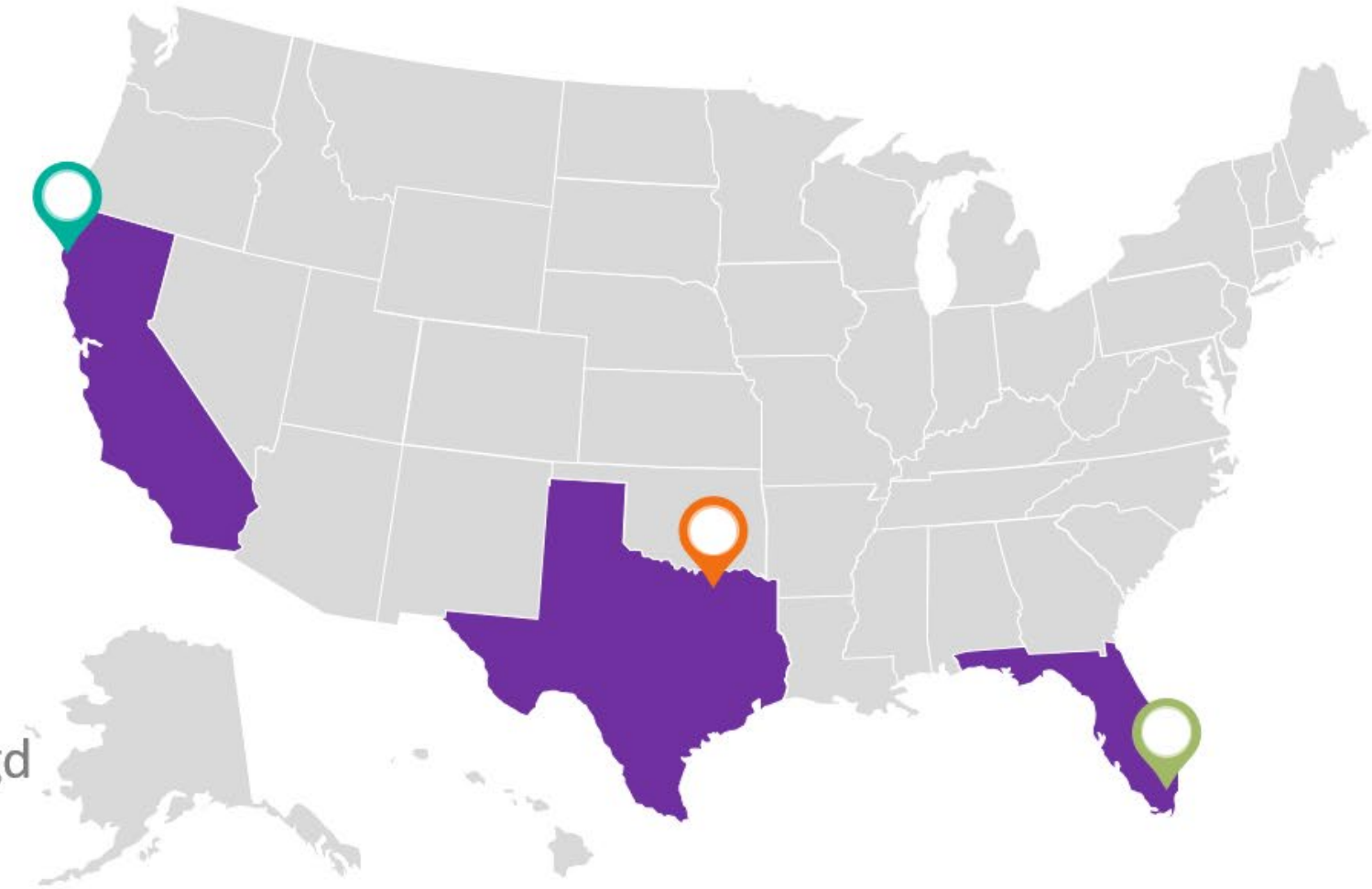
530 mgd

Texas

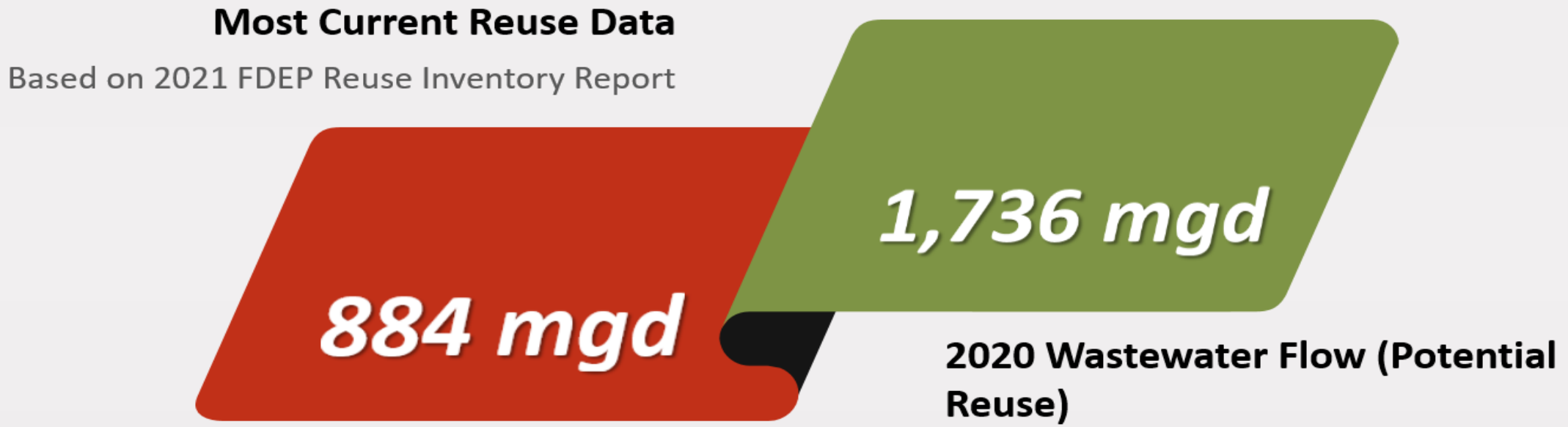
31 mgd

Florida

National leader at 884 mgd



Florida's Current vs Potential RW reuse



This means we are discharging (not reusing) 852 mgd (49%) of treated wastewater in Florida. Remember we're facing a 337 mgd statewide shortfall of water needs.

2021 Senate Bill 64 in Florida (Laws of Florida 2021-168)

Requires utilities to develop plans to eliminate non-beneficial discharges by 2032.
Where will it go instead?

Non-beneficial discharges

Establishes RW as a potential "source water" for drinking water development. Makes potable reuse projects eligible for water supply funding.

Potable Reuse

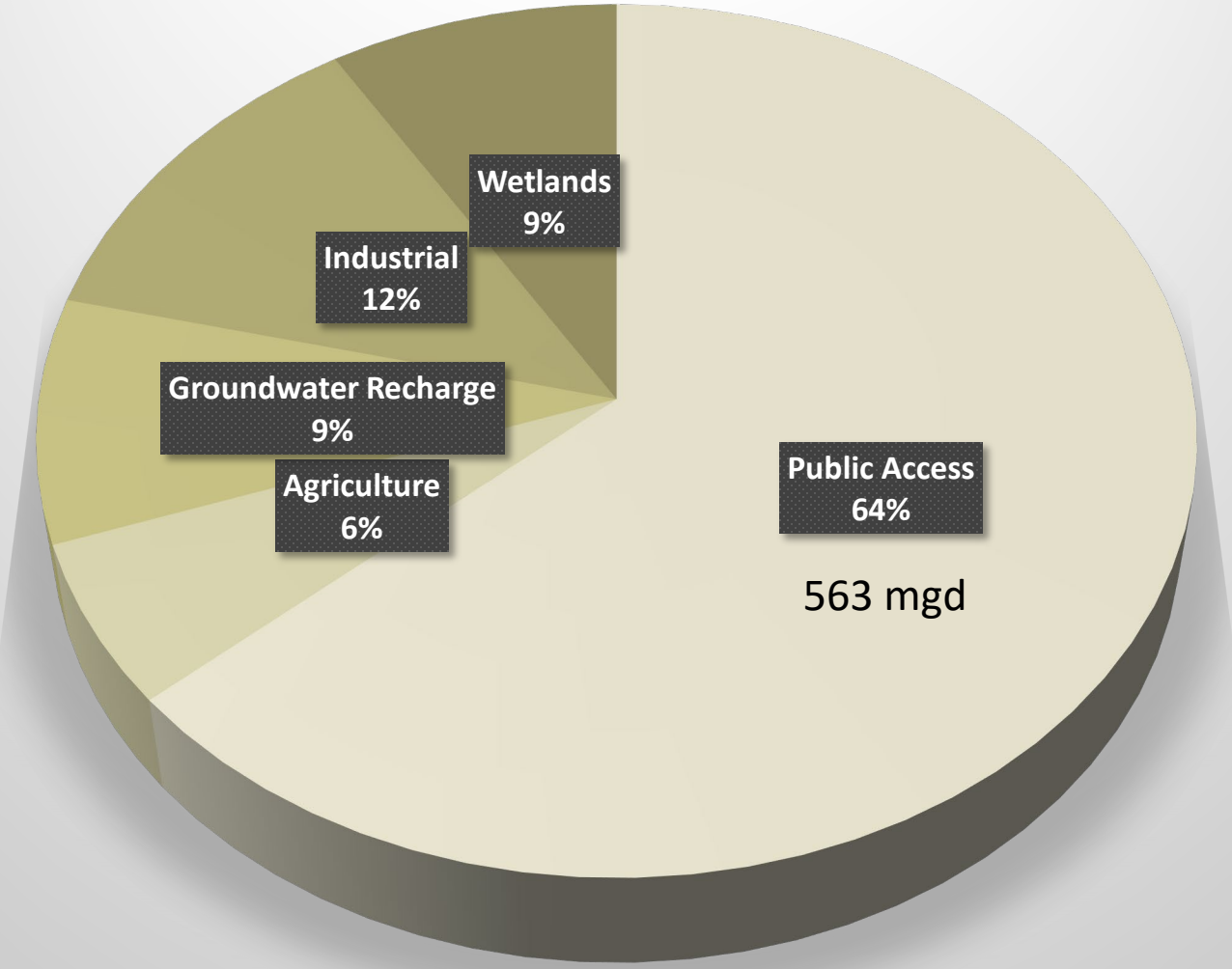
Incentivizes potable reuse projects by providing expedited permitting and funding.

Permitting

Other beneficial reuses include agricultural and urban irrigation, groundwater recharge, wetland hydration, surface water augmentation.

Other uses

Florida's beneficial uses of reclaimed water, 2020



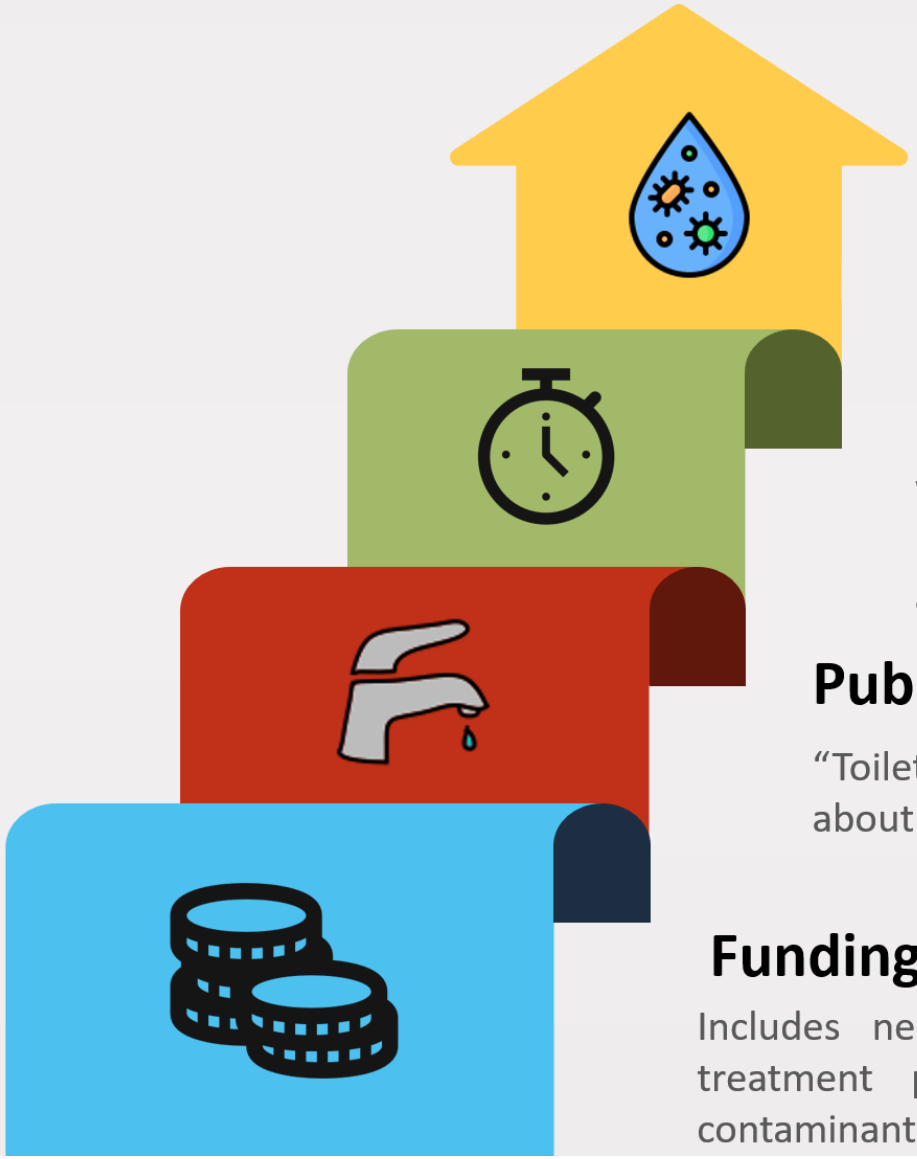
Data source: FDEP, 2021

Barriers to Expanded RW Reuse

Reusing treated wastewater

Environmental/human health considerations as well as a strong social dimension to consider

Interactions between social, technological, and environmental implications necessitate an interdisciplinary approach.



Water Quality

RW may contain elevated nutrients, pathogens, emerging contaminants, microplastics, etc.

Matching Supply with Demand

When and where treated wastewater is produced may not always match when and where it is needed.

Public Perception

"Toilet to tap" anyone? What about food irrigated with RW?

Funding & Regulatory Framework

Includes needs for conveyance infrastructure, treatment plant upgrades, public education, contaminant treatment, research, rulemaking.

BREW Team Research Areas

Agricultural

How can we use more RW in agriculture while maintaining crop productivity, soil health, and human health?

Led by D. Kadyampakeni

01

Environmental and Urban

What contaminants are potentially transported to surface and groundwater by RW use?

How may those contaminants affect ecosystems?

Led by A. Reisinger

02

Drinking Water Treatment

What treatment levels are needed for increased potable reuse?

Led by M. Lusk

03

BREW Team Research Areas

Engineering

What biological or geological materials can be found or created to mitigate potential contaminants?

Led by A. Zimmerman

04

Public Perception

What does the public know and believe about RW?

What socio/cultural barriers exist to RW use?

Led by K. Ash

05

Summary

Reclaimed Water

Former domestic wastewater that has been highly treated and may be reused instead of discharged into the environment

01

Florida faces a 337 mgd shortfall of future water needs

02

Despite leading the nation in reclaimed water reuse (51% of wastewater flows), we still discharge over 800 mgd.

03

Numerous barriers to increasing RW reuse call for interdisclipinary approaches.

04

The UF BREW Team uses social, technological, agricultural, and environmental research to overcome those barriers.

05

Looking for research and public education collaborators and opportunities.

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We thank the UF Water Institute for their support and assistance in developing the BREW Team

Thank you!

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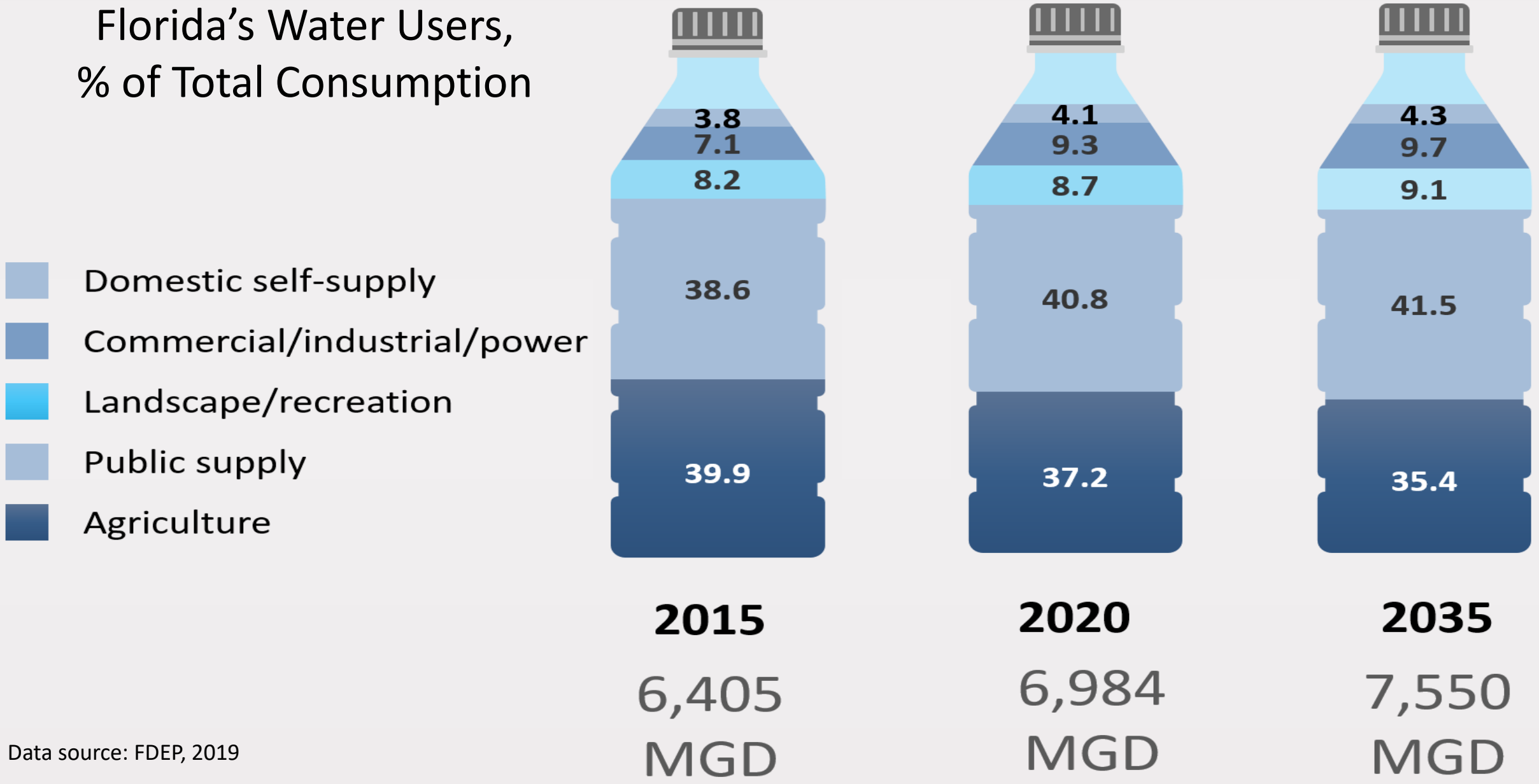
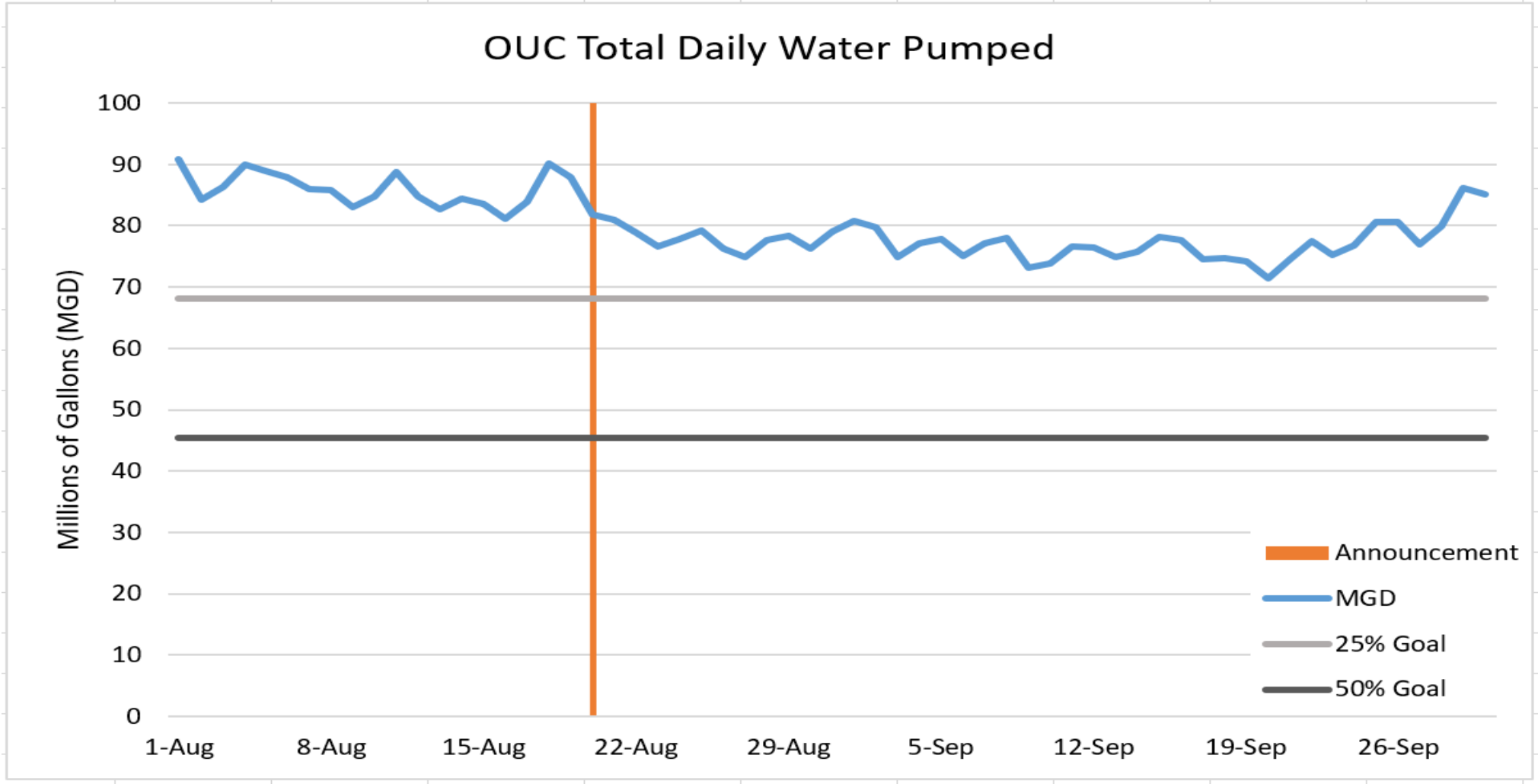
Florida's Water Users, % of Total Consumption



Data source: FDEP, 2019



Conservation

2021: Orange County Florida needed liquid oxygen for COVID patients in local hospitals; led to shortage of liquid oxygen needed for water treatment; calls by the mayor for citizens to reduce water use were not effective

(Lusk, Krimsky, and Taylor, 2021, Urban Science 5(4):90.