

Is Reclaimed Water A Free Lunch Drink?



Or Are There Hidden Costs?

Erich Marzolf, Ph.D.



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The Case for Reuse of Reclaimed Water

- In Central Florida the effects of further withdrawals from the Floridan aquifer is, or will soon be unacceptable (2013)
- There is an ongoing search for alternative water sources (conservation, rivers, estuaries, oceans, reuse)
- Since ~50% of domestic water goes for landscape irrigation, reclaimed water appears to be a good alternative to irrigating with potable water



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Nutrient Impairment In the SJRWMD

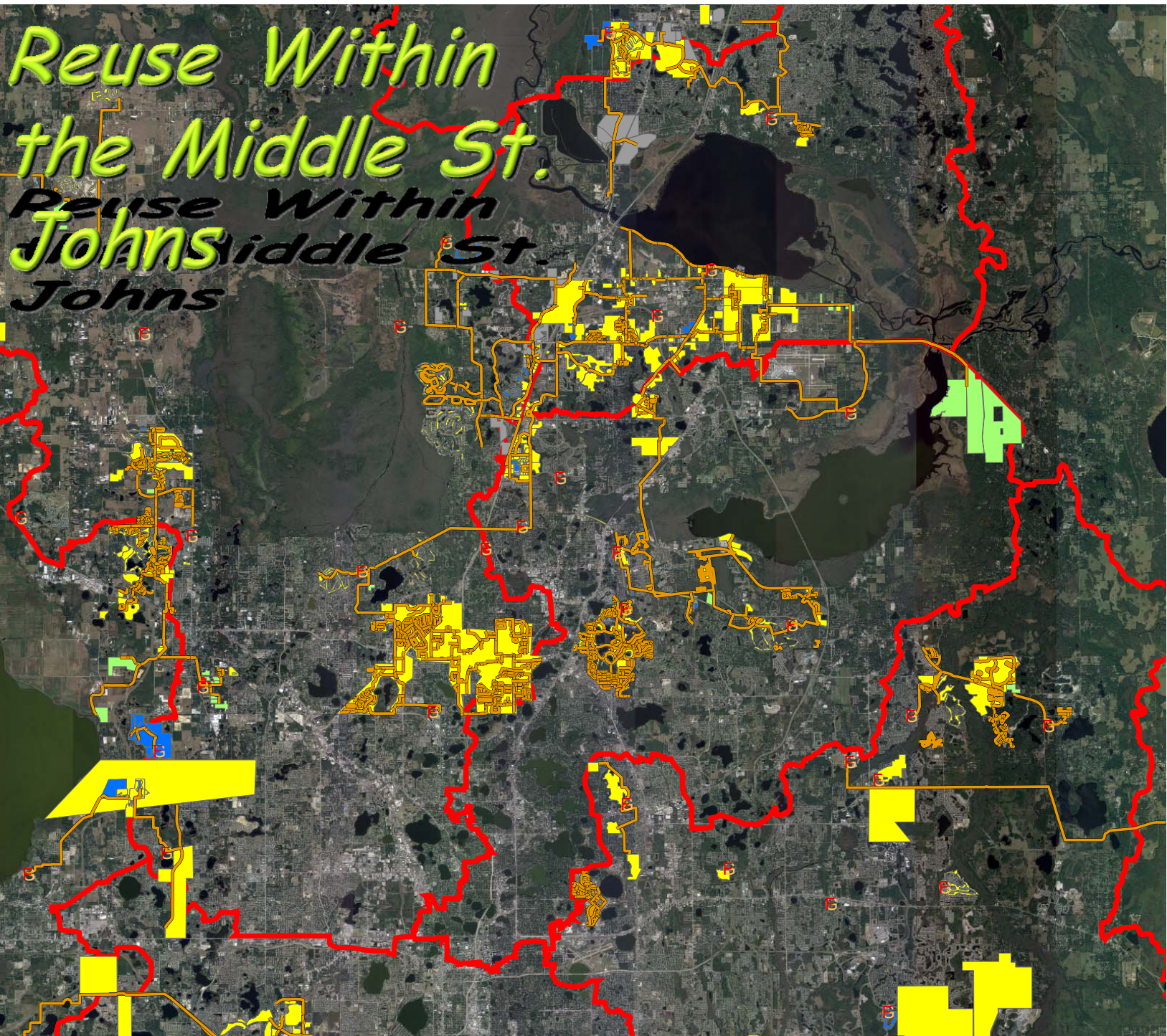
- SJRWMD has many large nutrient-impaired water bodies (Middle St. Johns ~ metro Orlando = Lakes Harney, Monroe & Jesup, St. Johns River, Wekiva River)
- Central FL counties reuse a large fraction of their wastewater
- Is there a potential for nutrients in reclaimed water to exacerbate already excessive nutrient loads?



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Reuse Within the Middle St. Johns

Reuse Within the Middle St. Johns



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Reuse Nutrient Content Vs. Turf Requirements

- Reclaimed water is largely used for irrigation of lawns, golf courses and public lands
- Turf and associated soils can assimilate some nutrients, reducing concentrations prior to recharge or surface runoff
- Turf nutrient needs can be assessed against nutrient availability in reclaimed water
- Do turf areas irrigated with reclaimed water require additional fertilizer?



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Turf Irrigation

What Reclaimed Water Concentration Meets Turf's Phosphorus Demand?

Assume a 1,000 ft² yard for 1 year

MASS

IFAS (2007) recommends
0.5 lb P₂O₅ = 99,024 mg P

VOLUME District Irrigation Rule – no more than 2 X
per week with ³/₄ inch applied each time
= 184,060 L

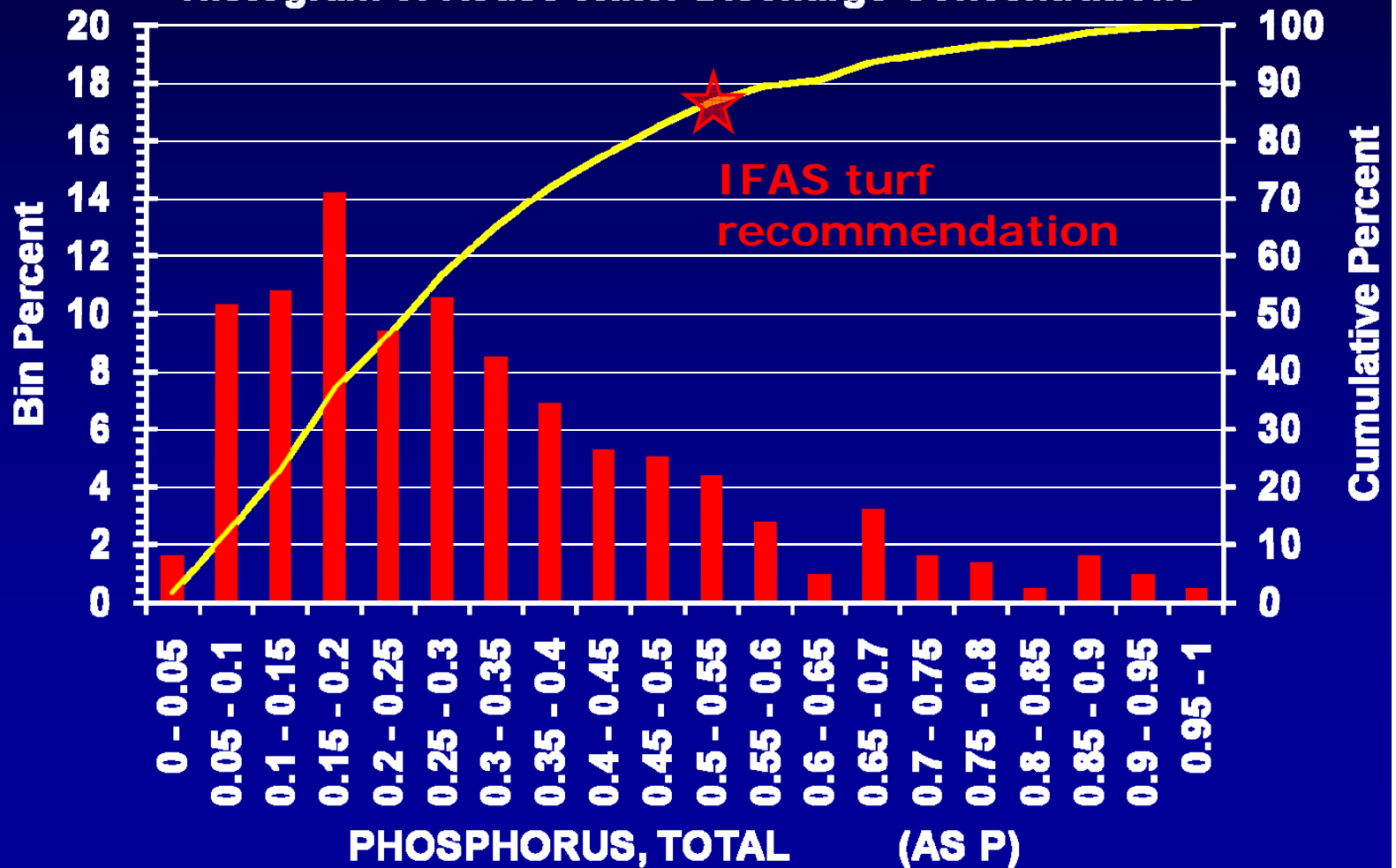
CONCENTRATION

0.54 mg P/L
will meet St. Augustine turf
needs given the above
assumptions



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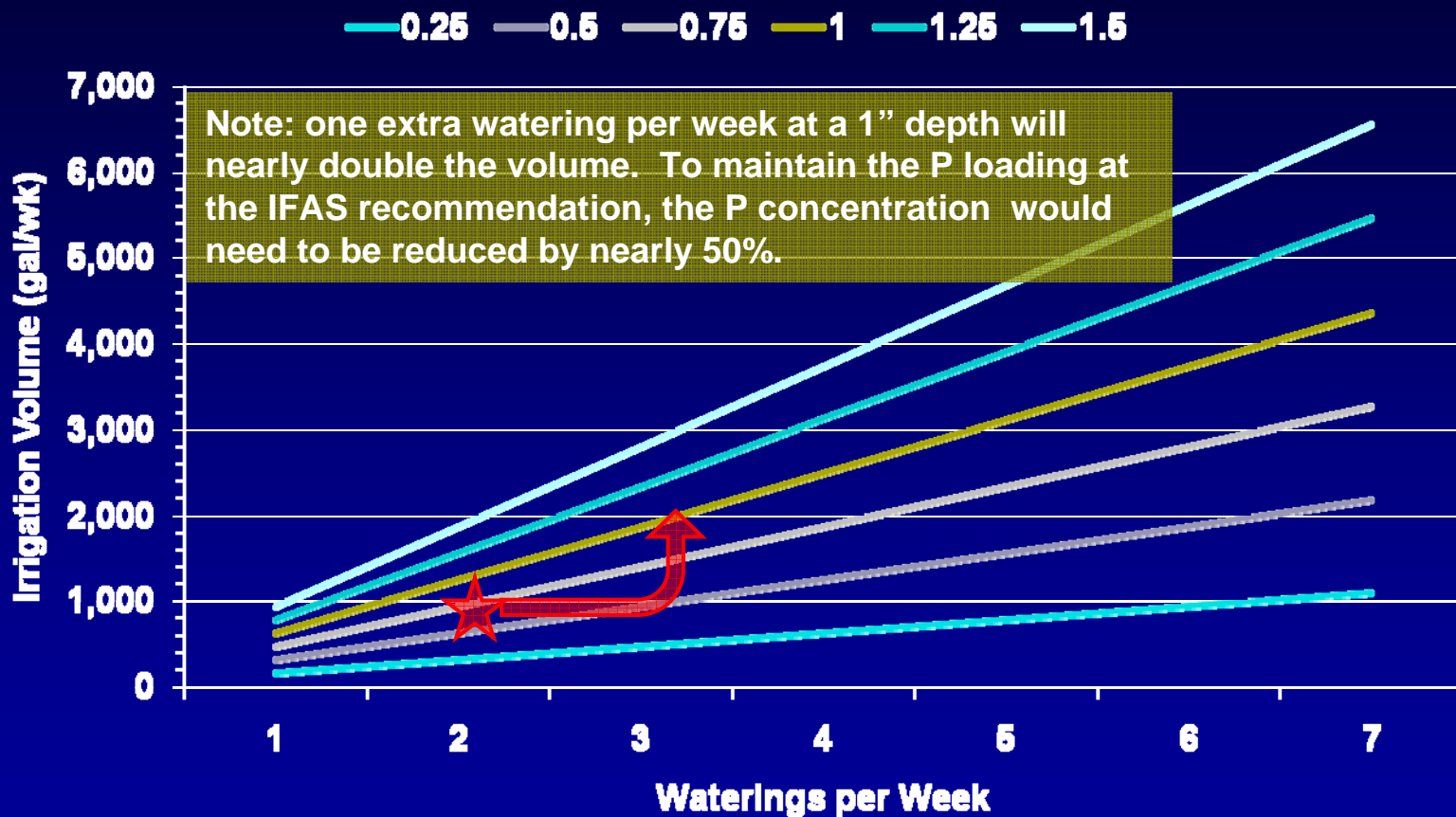
Monthly Mean TP Data
 WAFR database for WWTPs within
 SJRWMD (n=511)
 WAFR database for WWTPs within
 49 of 141 (35%) WWTPs reporting
 Histogram of Reuse Water Discharge Concentrations



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Irrigation Volume

Irrigation Volumes as a Function of Watering Frequency & Depth (1,000 ft² yard)

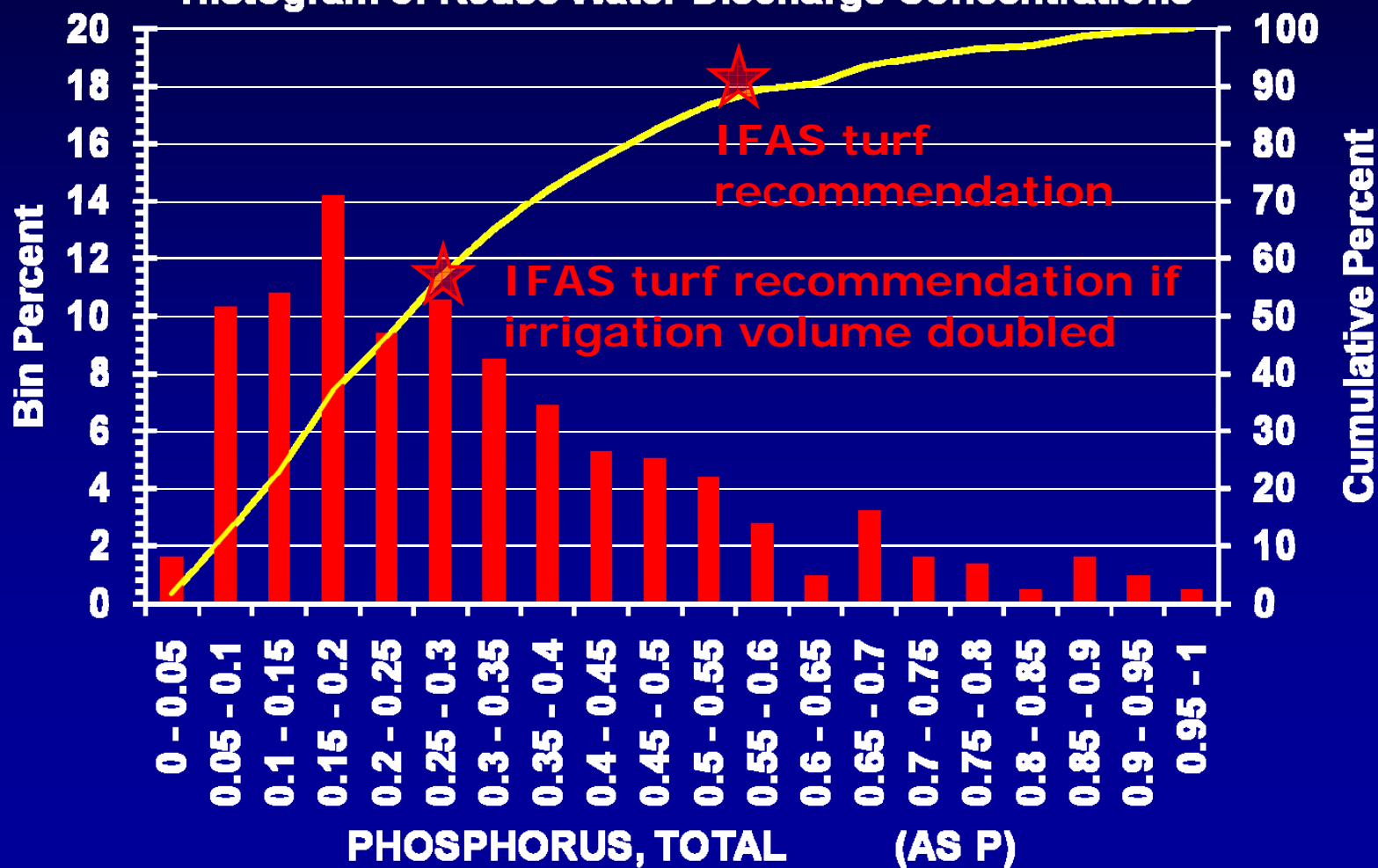


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District survey data show that from 2004 – 2007, 9 – 31% of households watered 3 or more times per week, with a declining trend.

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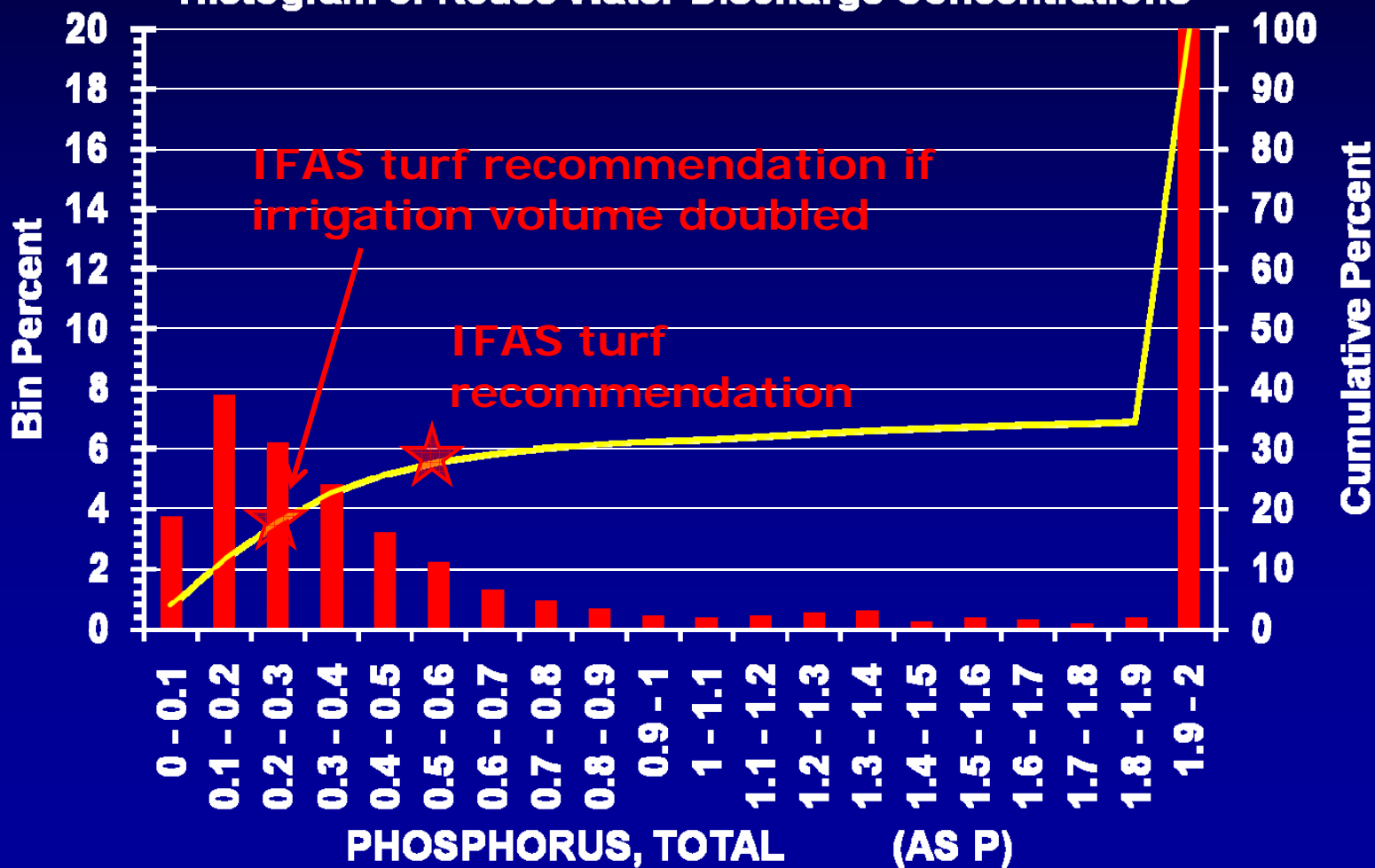
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Histogram of Reuse Water Discharge Concentrations



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Reclaimed Conservation?

- District irrigation rule doesn't apply to reuse
- No limit on number of watering days per week
- No limit on time of day watering
- Reclaimed water is cheaper than potable water
- Many utilities need to get rid of the water and might have a disposal problem if potable water conservation rules applied to reclaimed water
- Some users are under contract to take a set volume of reclaimed water, rain or shine



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What About Nitrogen?

- Similar potential for excessive nitrogen loading to turf from reuse
- Leaching/export potentially more rapid due to NO_x mobility
- Need to consider spring recharge areas



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Education Opportunity?

...enough nutrients remain in the water to **possibly** enable you to reduce the amount of commercial fertilizer needed.

NOT be connected to the potable (drinking) water system.

FDEP rules and regulations outlined in Chapter 62-610, Part III, Florida Administrative Code, require that: JEA inform reclaimed water customers about the nature and origin of reclaimed water; minimize the risk of possible contamination of the potable water supply as a result of

JEA's reclaimed water when used to irrigate your lawn following the "It Takes Two" watering schedule will supply 100% of your lawn's nitrogen and phosphorus needs. Your lawn **does not** need additional fertilizer. Save your money and help reduce nutrient pollution to St. Johns River by **not** applying additional fertilizer to your yard.



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Inappropriate Uses?

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

- Irrigation
- Power generation
- Street-sweeping operations
- Fire protection
- Dust control
- Natural system restoration
- Aquifer recharge
- Dessert topping (low fat!)
- Grows hair
- It slices, it dices
- but wait there's more if you act now

• Irrigating vegetable and herb gardens (unless a drip or bubbler system is



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Summary



Reuse is increasing throughout the District & Florida (Orlando ~90% & Jacksonville ~9% where District is investing ~\$150M)



Water bodies benefit when point-source effluent discharges are diverted away to reuse



Need to recognize the potential nutrient loading associated with reclaimed water



Nutrient loading from reclaimed water is a function of both concentration & volume



Impervious surfaces have low nutrient uptake abilities



Changing the name “effluent” to “reclaimed” doesn’t reduce the nutrient content



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Questions? Comments? Discussion?

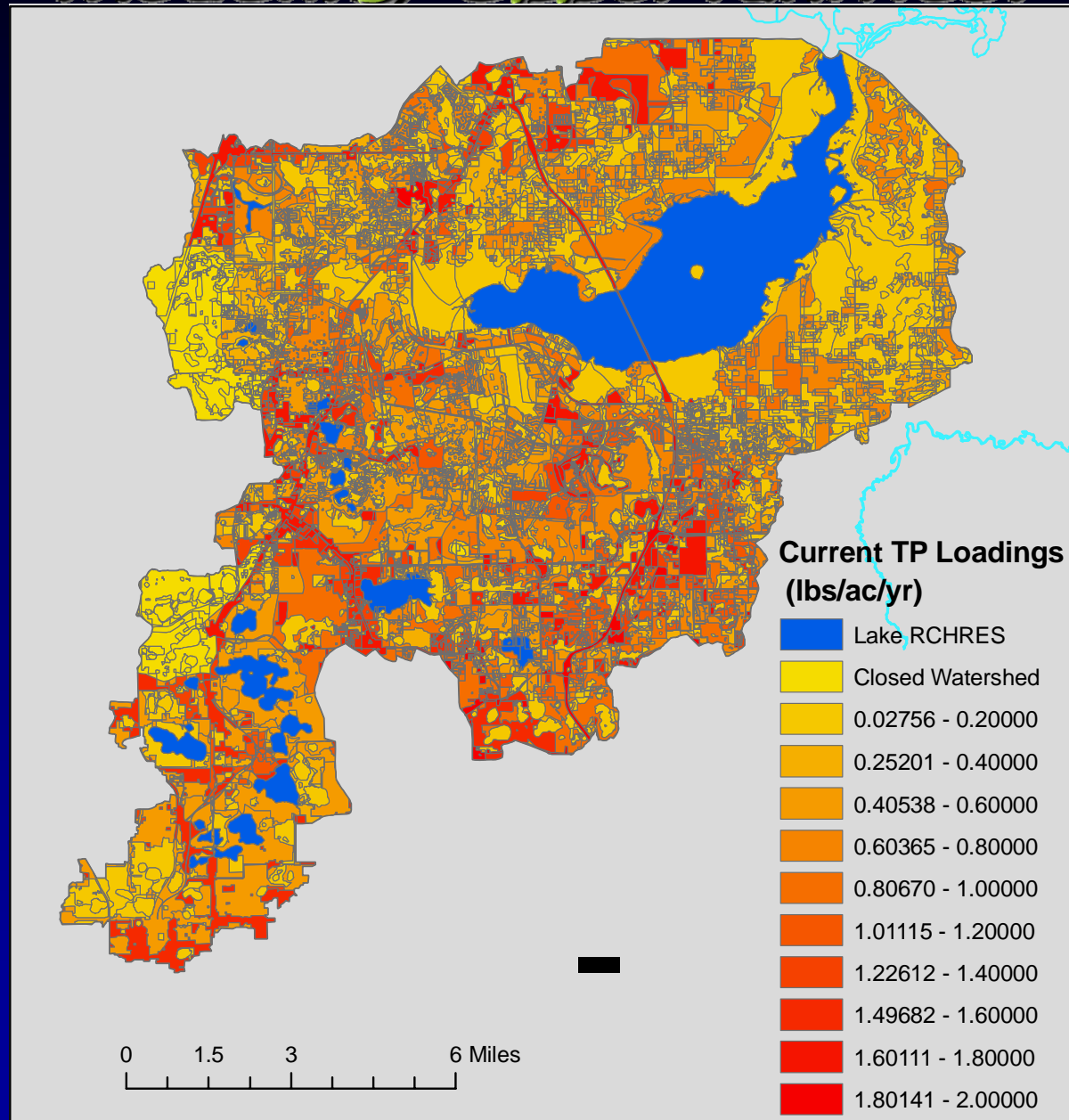


Reuse  Restoration



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Modeling Opportunities?

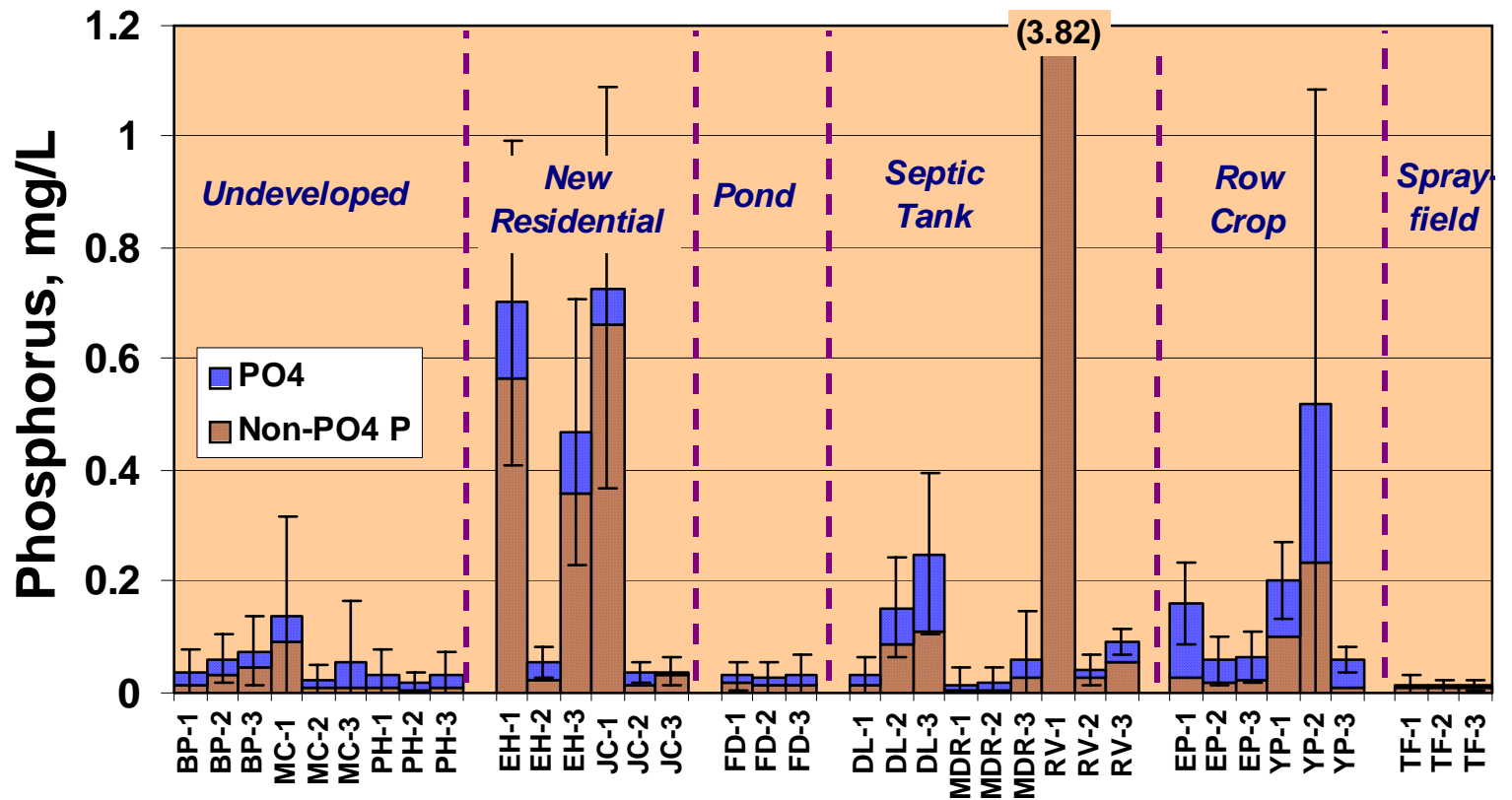


Jia 2007



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Surficial Groundwater Phosphorus



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