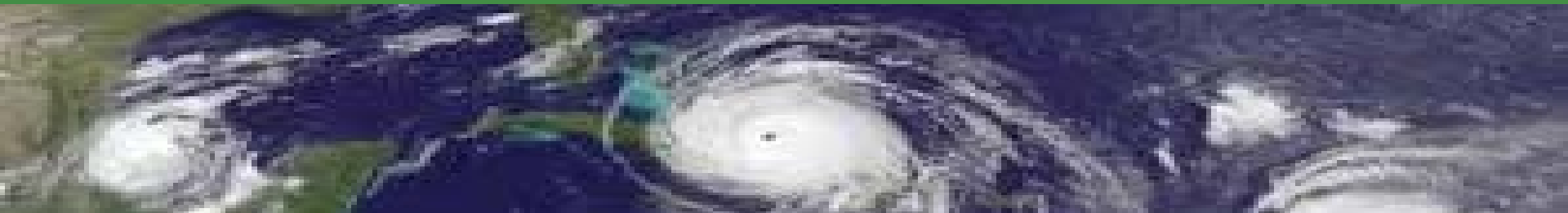
Translating the effects of sea-level rise in urban systems to the coastal ecosystem interface

Todd Z. Osborne[1,2], Nicholas Ward[3], Paul Julian III[2]
Rose Collins[2],Tracey B. Schafer[1,2]

[1]Whitney Laboratory for Marine Bioscience UF
[2]Soil and Water Sciences Department UF
[3]Pacific Northwest National Laboratories



Acknowledgements

Dr. Pamela Fletcher

Dr. Yuncong Li

Dr. Lorae Simpson

Dr. Mark W. Clark

UF IFAS UNIVERSITY of FLORIDA

Climate Change Initiative

Pacific Northwest NATIONAL LABORATORY

Florida Department of Environmental Protection

Soil & Water SCIENCES

Soil & Water SCIENCES

MONEYBOX

Massive October King Tide Gives Miami Another Taste of Climate Change

By Henry Grabar • OCT 05, 2017, 5:45 PM

MIAMI-DADE COUNTY

King tides to peak in South Florida this week

BY JOEY FLECHAS
jflechas@miamiherald.com
OCTOBER 26, 2015 06:12 PM

Journal of Coastal Zone Management

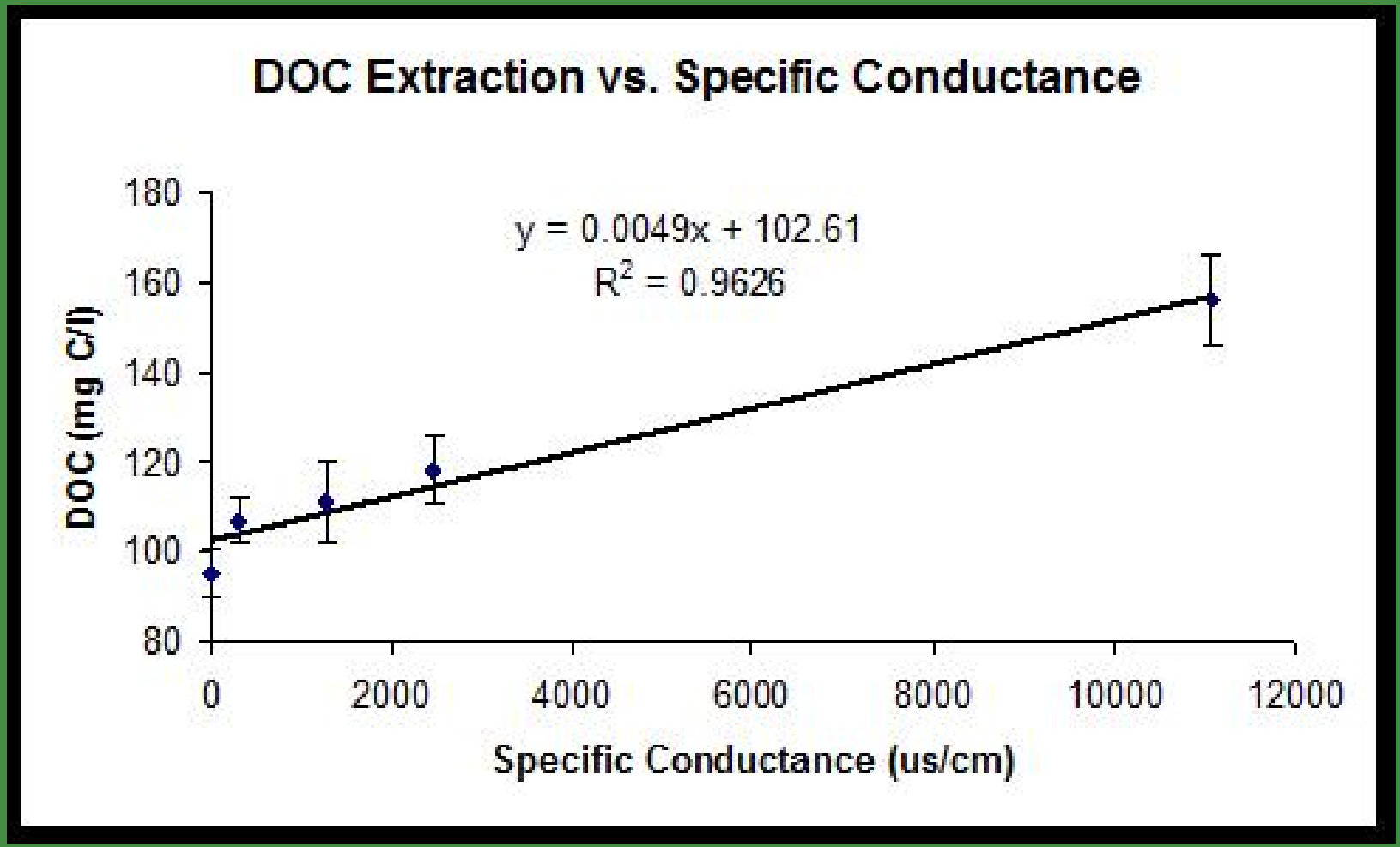
Brien, J Coast Zone Manag 2017, 20:3
DOI: 10.4172/2473-3350.1000447

Review Article OMICS International

Miami's Sea Level Rise and How the King Tide is Outing America's Political and Economic Jokers

John O'Brien*
University of Florida, Miami, FL, United States

Soil & Water SCIENCES



Osborne and Newman unpublished data

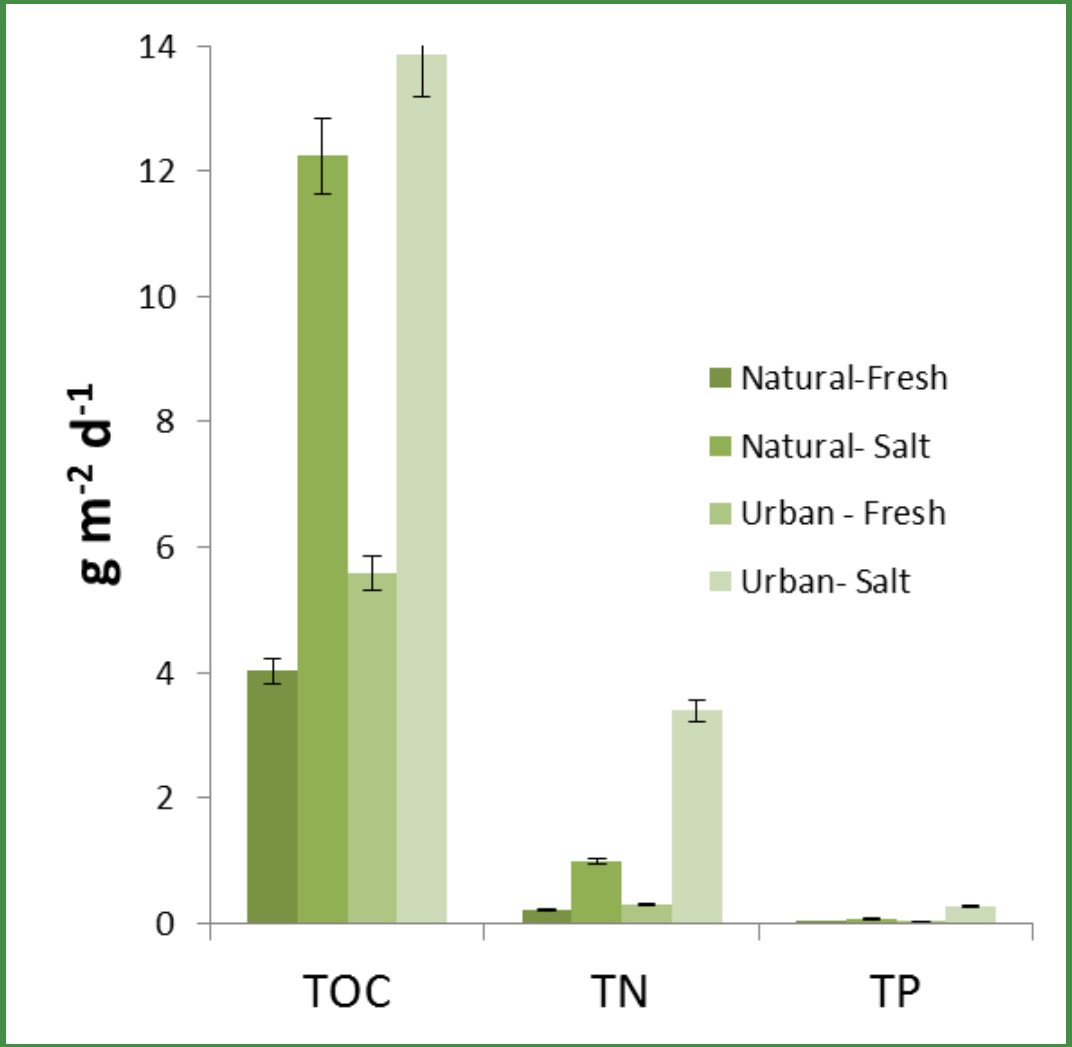
Soil & Water SCIENCES

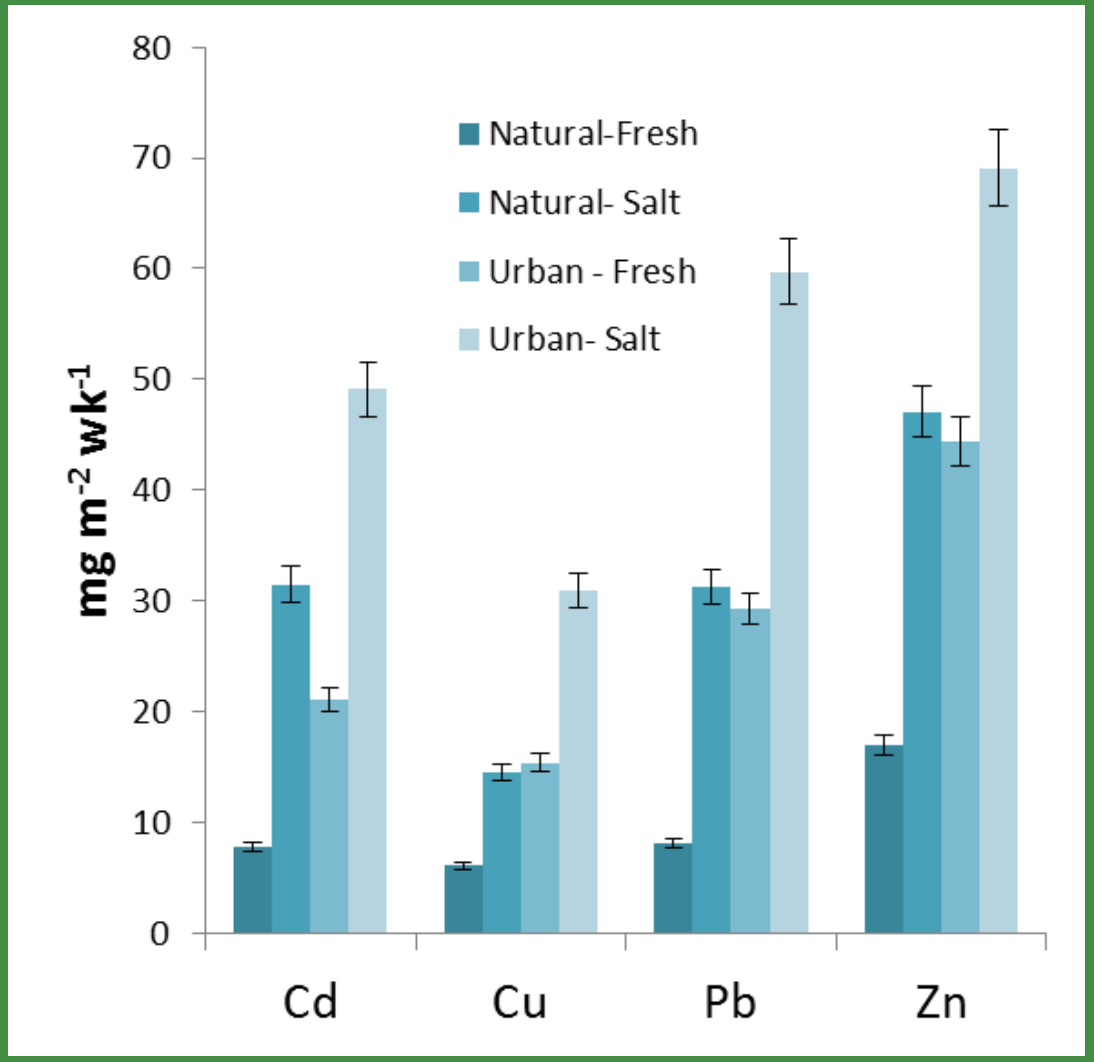
Soil & Water SCIENCES

- urbanized vs natural landscape
- 7.5 cm dia cores (in triplicate)
- Fresh and salt (30ppt) treatments
- Incubations 1 week, sampled 1,3,7 days

Soil & Water SCIENCES

- Rosemary Collins (SWS)
- Significant increases in nutrient fluxes from salt water exposures
- Urban landscape source of C,N,P

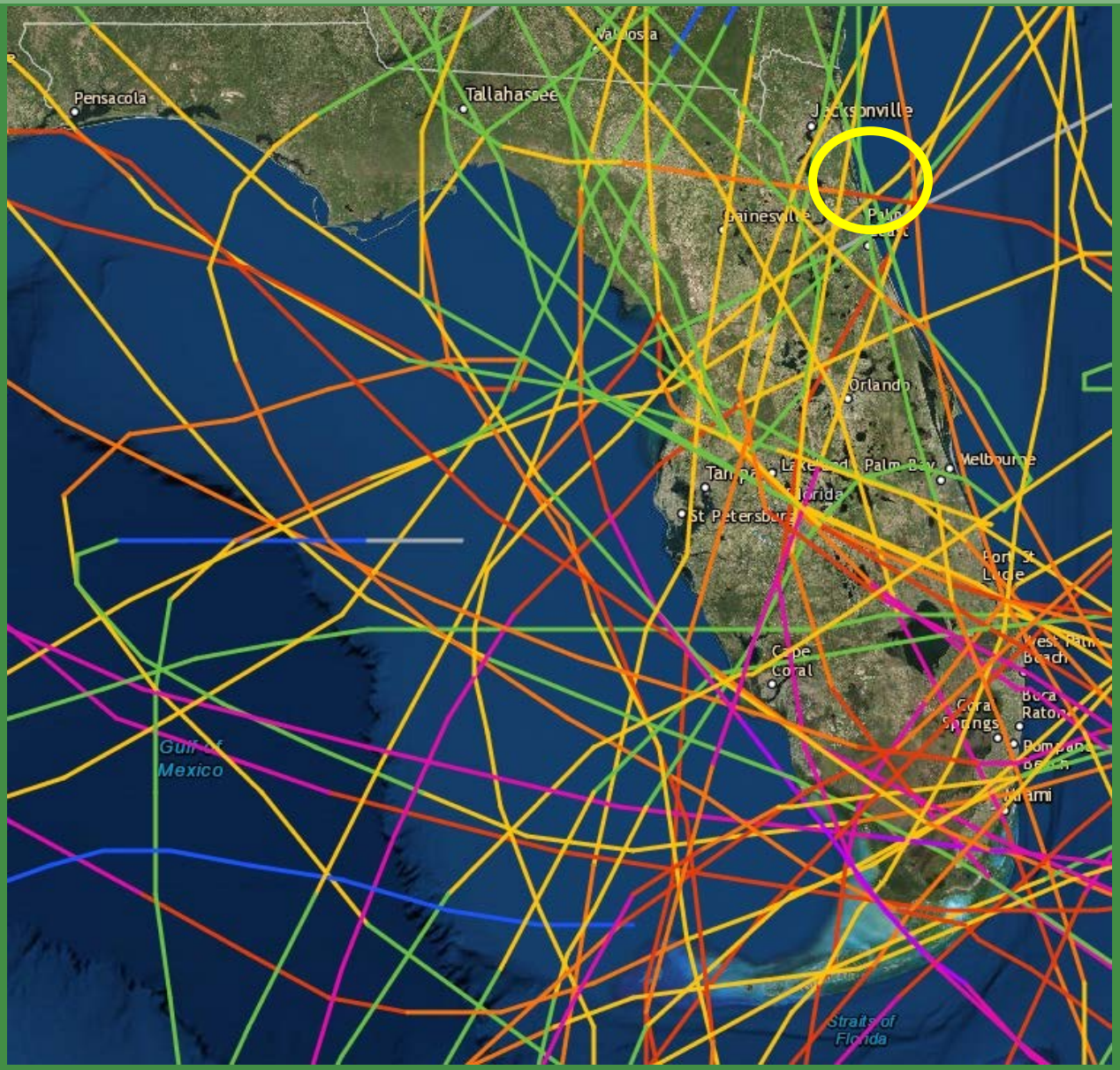



80
70
60
50
40
30
20
10
0
mg m-2 wk-1
Natural-Fresh
Natural- Salt
Urban - Fresh
Urban- Salt
Cd
Cu
Pb
Zn


Fe
IRON
82
Pb
LEAD
30
Zn
ZINC
Heavy Metals

Compound	Natural Soil Increase in saltwater (%)	Urban Soil Increase in saltwater (%)
Naphthalene	29	312
Acenaphthene	140	224
Fluorene	78	386
Phenanthrene	<10	189
Anthracene	88	206
Fluoranthene	154	122
Pyrene	74	145
Benzo(a)anthracene	82	170
Chrysene	19	285
Benzo(b)fluoranthene	45	159
Benzo(k)fluoranthene	<10	175
Benzo(a)perylene	36	89
Dibenzo(a,h)anthracene	120	282
Benzo(g,h,i)perylene	22	175
Indeno(1,2,3-cd)pyrene	77	210

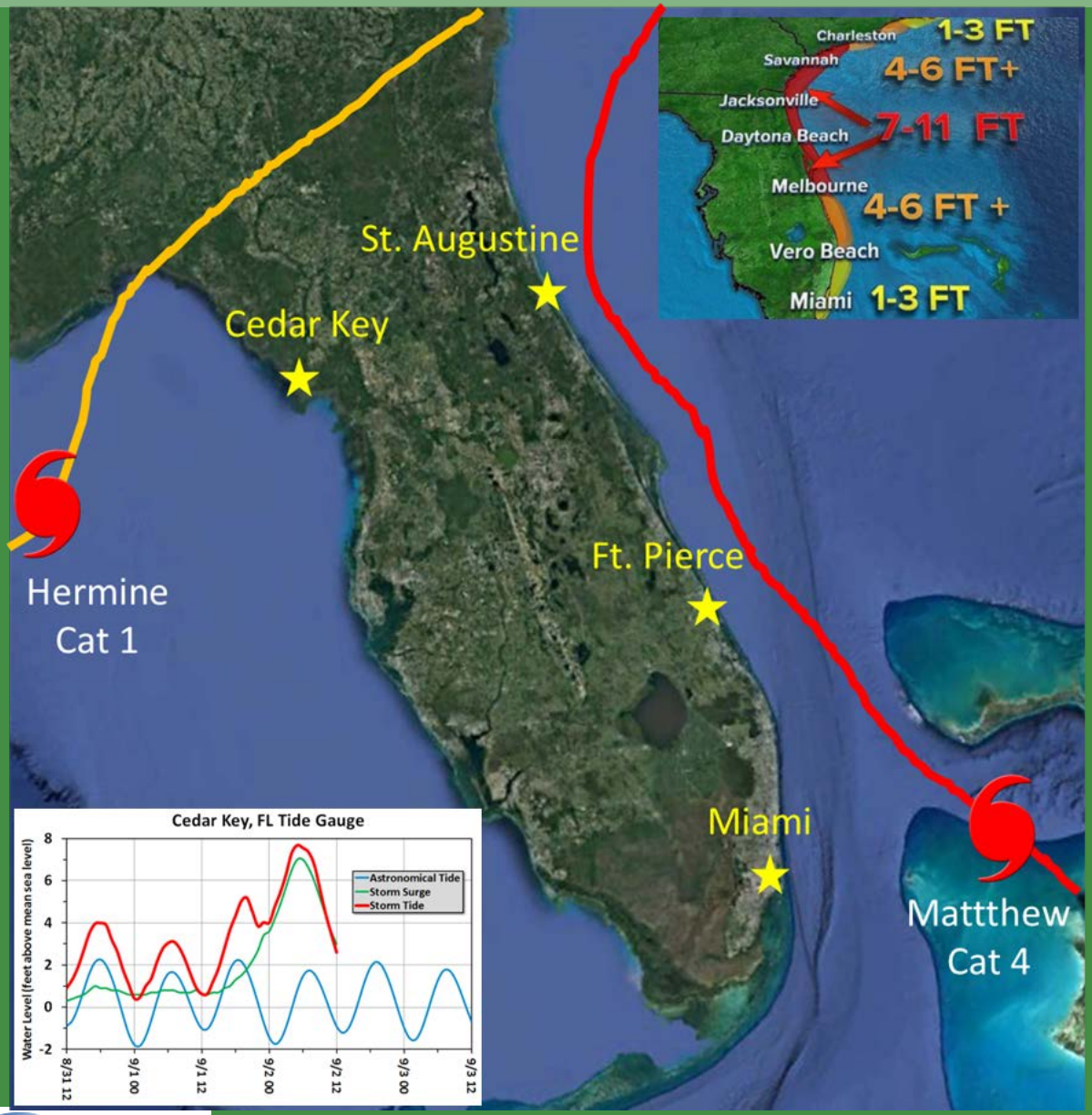
Soil & Water SCIENCES



67 Hurricanes FL Landfall in 100yrs

Opportunity knocks….err kicks down the door!

Soil & Water SCIENCES



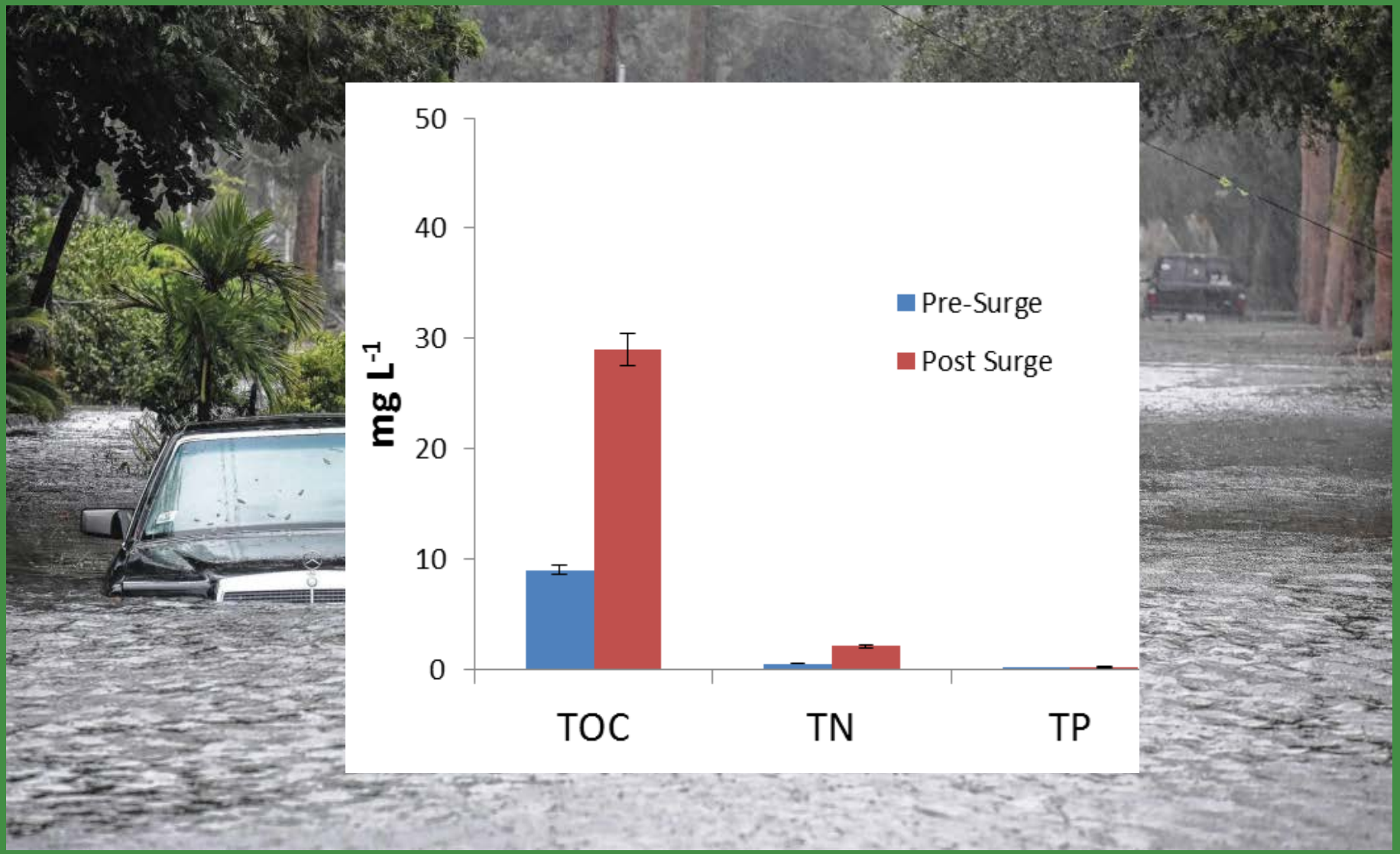
Hurricane Matthew
Category 4
October 4, 2016

Hurricane Hermine
Category 1
August 18, 2916

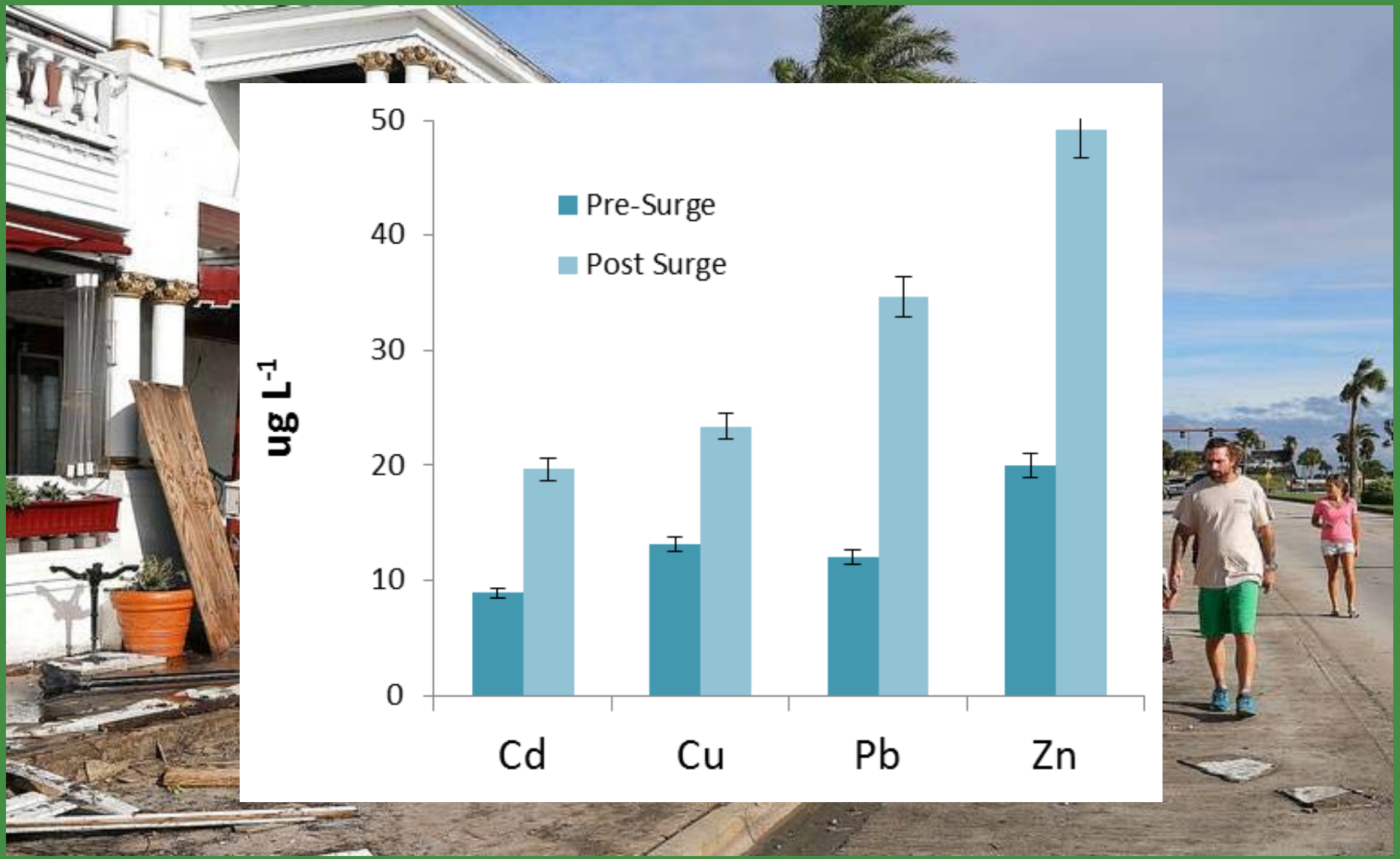
Opportunistic pre and post water samples

Soil & Water SCIENCES

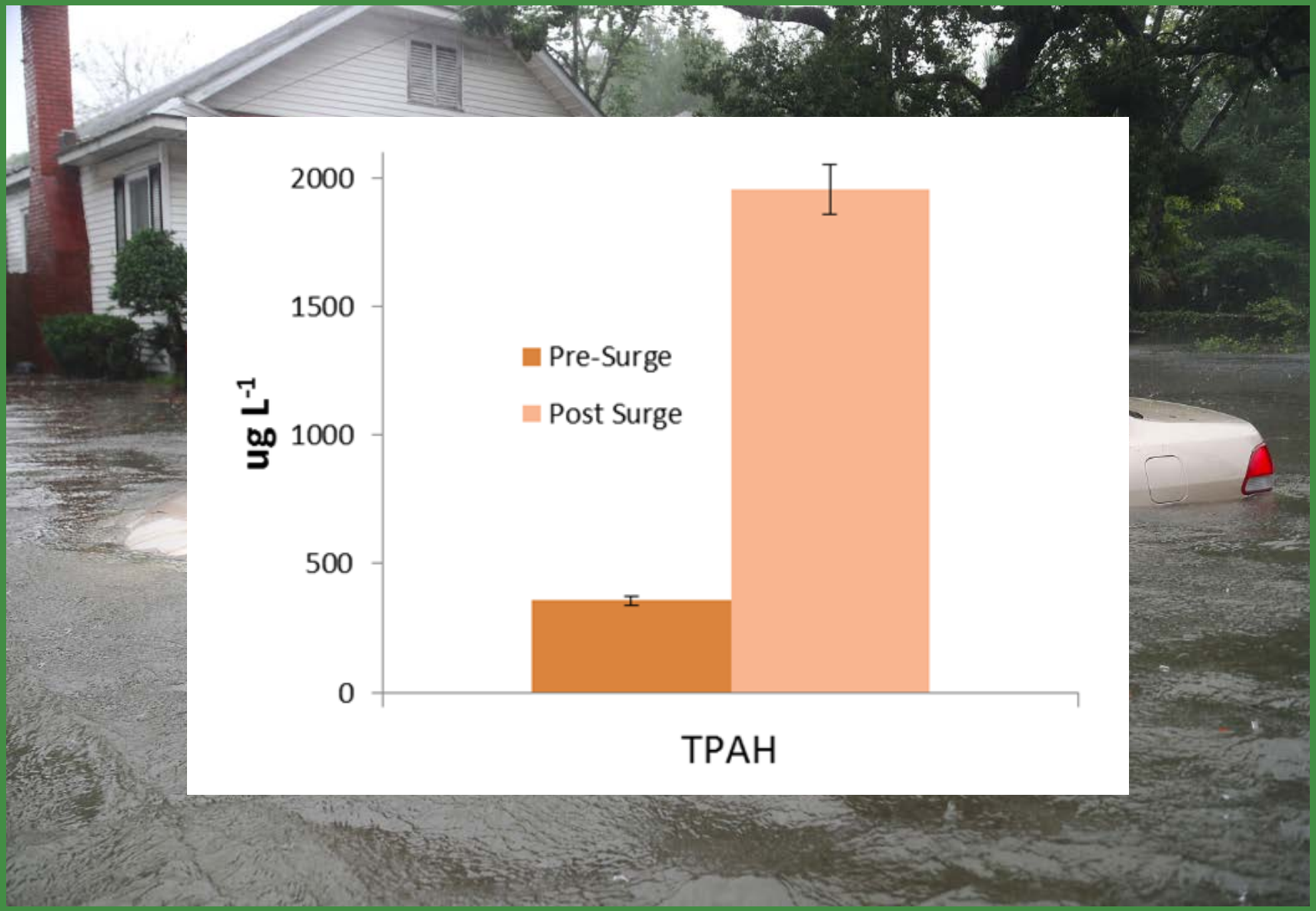
Soil & Water SCIENCES



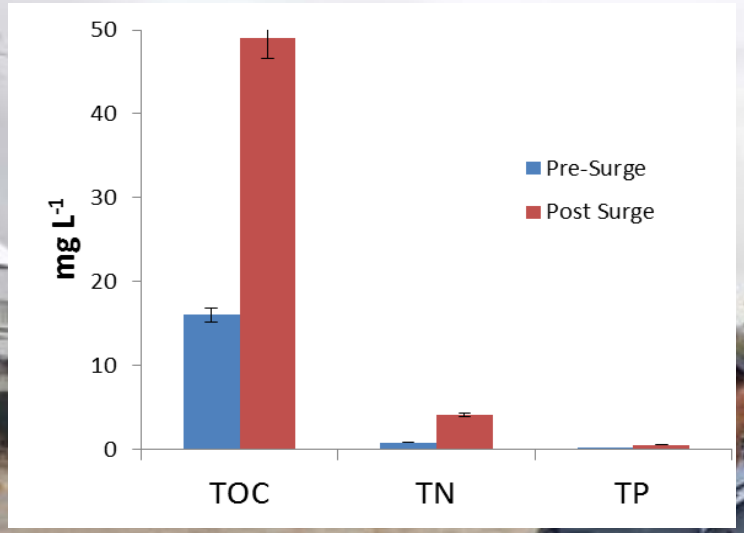
Soil & Water SCIENCES

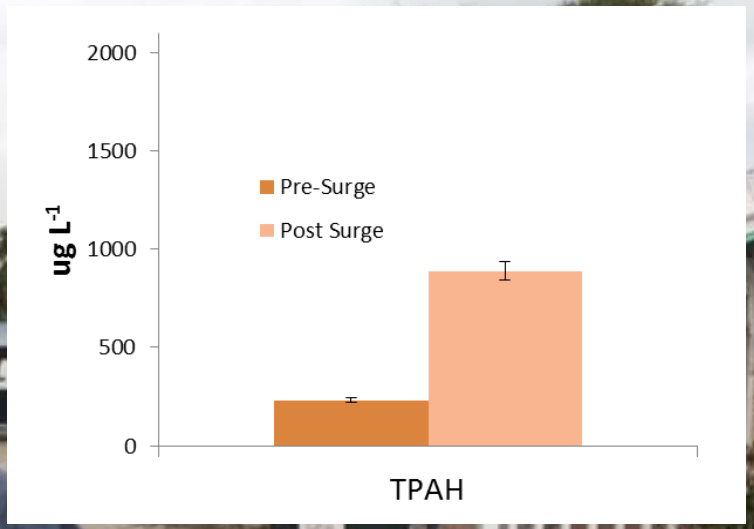


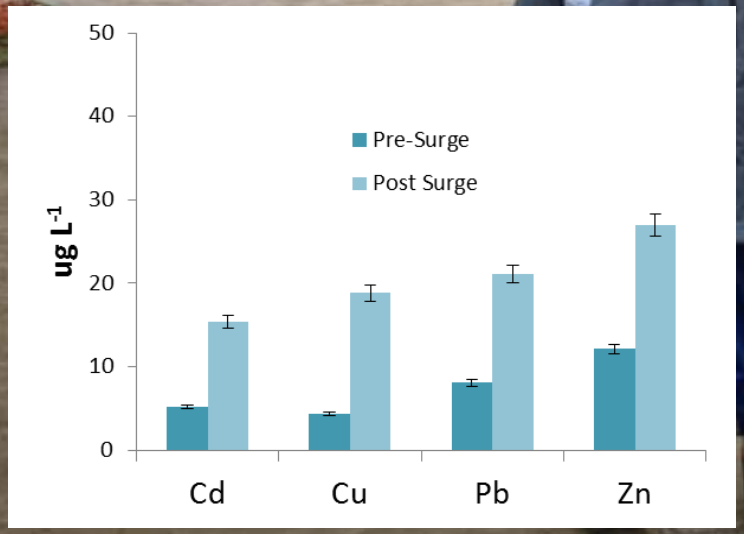
Soil & Water SCIENCES



Soil & Water SCIENCES







Dr. Mike Allen
NCBS Cedar Key

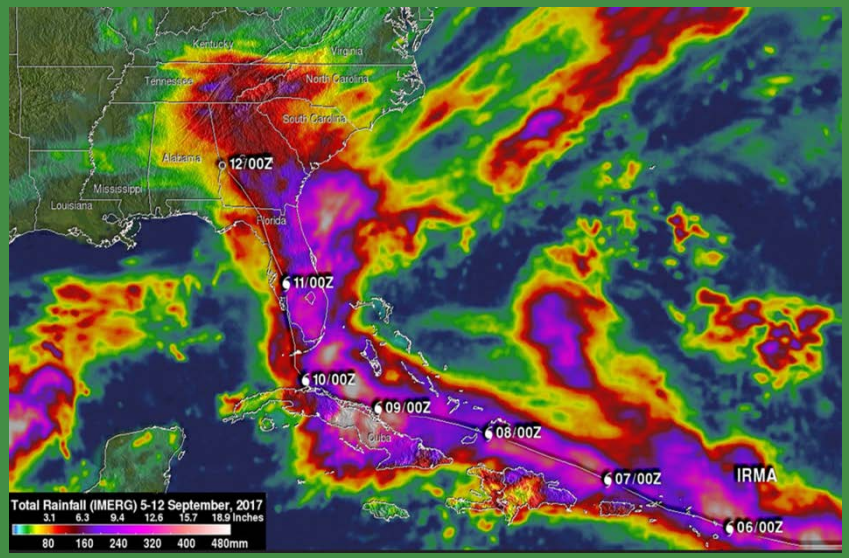
Soil & Water SCIENCES

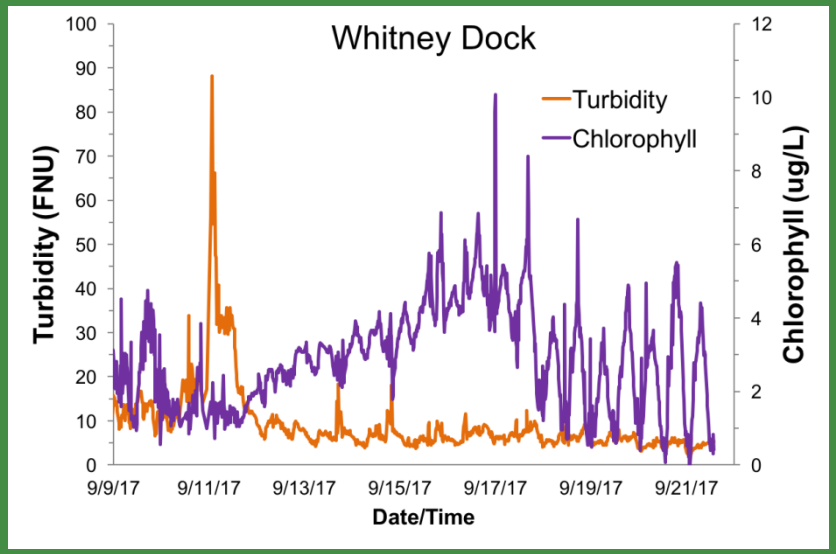
- Urban soils will leach contaminants when exposed to salt water
- anthropogenic materials can be a significant source to surface waters
- In all study sites, TOC, TN, and TP increased with salt water transgression events
- Metals and PAH concentrations increased in ALL study sites post storm surge
- SLR will likely be a slow process punctuated with large scale transgression events – result in episodic loading events

Soil & Water SCIENCES

Effects of Hurricane Irma on dissolved organic carbon fluxes along a salinity gradient

Schafer et al. Poster # 4





Soil & Water SCIENCES

Thank You!

"Scenic" A1A post-Matthew

Soil & Water SCIENCES