

## **TODD Z. OSBORNE, Ph.D.**

Associate Professor of Coastal Biogeochemistry



My interest in environmental science was catalyzed by continual exposure to the wonders of the natural world at a young age which, in turn, led to degrees in biology, environmental engineering and biogeochemistry. As a new faculty member at Whitney Laboratory, I seek to meld my scientific interests and training with a lifelong passion for the environment. Arguably, there is no better way to do this than to investigate the intricate ecological processes that define coastal ecosystems.

Estuaries lie at the nexus of freshwaters (rivers, streams, wetlands) and the ocean. These incredibly complex and ecologically important ecosystems are experiencing effects of global climate change in ways that we are only just beginning to understand. Defining the biogeochemical processes and the resulting cascade of ecological effects that climate change brings to our coastal ecosystems is at the center of my research focus. Carbon sequestration, mangrove migration and coastal eutrophication are issues of great importance locally and globally and will thus be the priority areas of my research programs. Funding from my research programs come from a variety of sources, including National Estuaries Program, US Department of Agriculture, US Department of Interior, Florida Department of Environmental Protection, Water Management Districts, and Florida Fish and Wildlife Conservation Commission. I continue to pursue funding from NSF's Environmental Biology (Ecosystem Science) and Geosciences (Marine Geochemistry) programs to investigate carbon and nitrogen sequestration processes in coastal wetlands from the mangrove systems of the Everglades to the cordgrass marshes of the Georgia coast.

### **Education:**

2005	Doctor of Philosophy, Biogeochemistry, Soil and Water Science Department, University of Florida, Gainesville, FL
2000	Master of Science, Environmental Engineering Sciences, University of Florida, Gainesville, FL
1997	Bachelor of Science, Applied Biology and Biotechnology, School of Biology, Georgia Institute of Technology, Atlanta, GA

### **Professional Experience:**

2019-Present	Associate Professor, Estuarine Biogeochemistry, Whitney Laboratory for Marine Bioscience, University of Florida, St. Augustine, FL
2014-2019	Assistant Professor, Estuarine Biogeochemistry, Whitney Laboratory for Marine Bioscience, University of Florida, St. Augustine, FL
2013	Senior Environmental Scientist (ES VI) Physicochemistry- Aquatic Sciences, Bureau of Environmental Sciences, St. Johns River Water Management District, Palatka, FL
2007-2013	Research Assistant Professor, Aquatic Biogeochemistry, Wetland Biogeochemistry Laboratory, Soil and Water Science Department, University of Florida, Gainesville, FL
2005	Post-Doctoral Associate, Soil and Water Science Department, University of Florida, Gainesville, FL
2003-2005	Project Coordinator, Soil and Water Science Department, University of Florida, Gainesville, FL Everglades Soil Mapping Project, soil, water, vegetation sampling and ecological site description 2000+ sites in Everglades basin
1999-2005	Environmental Scientist (On Demand Consultant), Jones Edmunds and Associates (JEA) Gainesville, FL
1998-2005	Graduate Teaching Assistant, Soil and Water Science Department, University of Florida, Gainesville, FL

**Todd Z. Osborne, Ph.D.**

1998-2000 Graduate Research Assistant, Environmental Engineering Sciences  
Department, University of Florida, Gainesville, FL  
1998 Research Intern, Makerere University Biological Field Station, Kanuwara,  
Uganda

### Research Interests:

- Soil biogeochemical processes associated with sea level rise, coastal forest retreat and development of salt marsh ecosystems
- Coastal ecosystem processes with respect to sea grasses, salt marshes, and mangrove productivity and organic matter cycling, sub-aqueous soil pedogenesis
- Biogeochemical cycling of carbon, nitrogen, phosphorus and other nutrients in wetland soils and aquatic ecosystems
- Role of organic matter as driver and modulator of aquatic ecosystem functions
- Role of aquatic vegetation in DOM/POM/nutrient dynamics, soil accretion
- Aquatic organisms i.e. clams/oysters that provide ecosystem services and natural water quality treatment
- Wetland soils as natural water quality treatment systems
- Aquatic ecosystem services evaluation

### Membership in Professional Societies:

American Society of Limnology and Oceanography  
Society of Wetland Scientist  
American Society of Agronomy – Soil Science Society of America  
Ecological Society of America  
Sigma Xi Scientific Honor Society  
Coastal and Estuarine Research Federation  
Southeastern Estuarine Research Society  
Florida Association of Environmental Soil Scientists (lifetime)

### Honors:

Professional Wetland Scientist (PWS)  
Sigma Xi Inductee (2002)  
USDA National Needs Fellow (2000-2003)  
Water Institute Early Career Fellow (2015-2018)  
High Impact Journal Article Award (IFAS 2018)  
Best Restoration Project IRL (Marine Resource Council 2019)

### National /International Professional Service:

- Co-Host and Organizer, Restoration Aquaculture in Florida Workshop, Port St. Lucie FL, April 2022
- Host and Organizer, 13<sup>th</sup> International Wetland Biogeochemistry Symposium, Baton Rouge LA, April 2021.
- Host and Organizer, 12<sup>th</sup> International Wetland Biogeochemistry Symposium, Coral Springs FL, April 2018.
- Co-Host and Organizer, 4<sup>th</sup> International Mangrove and Macrobenthos Meeting, St. Augustine FL, August 2016.
- Guest Associate Editor and Organizer: *Fire Ecology Vol 9 Issue 1- Special Issue -Fire in Wetlands*
- Editorial Board: *Trends in Soil Science and Plant Nutrition*
- Editorial Board: *Journal of Geology and Geosciences*
- Session Chair: Fire as an Ecological Driver in Wetland Ecosystems- International Association of Ecology 2012 Orland FL; Management Challenges in Wetland Restoration- Society of

**Todd Z. Osborne, Ph.D.**

Freshwater Scientists, Jacksonville, FL 2013

- Volunteer manuscript reviewer for: *Limnology and Oceanography, Aquatic Botany, Ecological Engineering, Fundamental and Applied Limnology, Environmental Engineering, Catena, Soil Science Society of America Journal, Estuaries and Coasts, Soil and Sediment Contamination, Soil, Water, and Air Pollution, Wetlands Ecology and Management, Wetlands, Biology of Invasive Species, Fire Ecology, Florida Scientist, European Journal of Soil Science, African Journal of Ecology, Biogeochemistry, Hydrobiologia, Oecologia, Water Research, Journal of the North American Benthological Society*
- US Environmental Protection Agency (technical reviews)
- Estonia Science Foundation (proposal review committee)
- Louisiana Sea Grant (proposal review committee)
- USACE DECOMP (professional review committee)
- Monitoring and Assessment Program (MAP) SFWMD Landscape and Nutrients committees
- Restoration, Co-ordination, and Verification (RECOVER) USACE interagency Everglades Restoration Program committee & project reviewer
- Oklahoma Water Resources Research Institute (review committee)

### Recent Publications (2010-Present):

Walker, J. E., Ankersen, T., Barchiesi, S. Meyer, C. K., Altieri, A. H., **Osborne, T. Z.**, Angelini, C.. 2022. Governance and the mangrove commons: advancing a cross-scale, nested framework for the global conservation and wise use of mangroves. *Journal of Environmental Management* 312:114823 doi10.1016/j.jenvman.2022.114823

Schafer, T.B., Dix, N., Dunnigan, S., Reddy, K. R., **Osborne, T.Z.** 2022. Impacts of hurricanes on nutrient export and ecosystem metabolism in a blackwater river-estuary complex. *Journal of Marine Science and Engineering* 10(5): 661 DOI: 10.3390/jmse10050661

Martinez, B., Da Silva, B. F., Aristizabal-Henao, J. J., **Osborne, T. Z.**, Morrison, E. S., Bianchi, T. S., Bowden, J. A. 2022. Increased levels of perfluorooctanesulfonic acid (PFOS) during Hurricane Dorian on the east coast of Florida. *Environmental Research* 208: 112635 DOI: 10.1016/j.envres.2021.112635

MacDonnell, C., Bydalek, F., **Osborne, T. Z.**, Beard, A., Barbour, S., Leonard, D., Makinia, J., Inglett, P. W. 2022. Use of a wastewater recovery product (struvite) to enhance subtropical seagrass restoration. *Science of the Total Environment* 838(1): 155717 DOI: 10.1016/j.scitotenv.2022.155717

Feller, I. C., Berger, U. Chapman, S. K., Dangremond, E. M., Dix, N., Langley, J. A., CE Lovelock, C. E., **Osborne, T. Z.**, Shoar, A. C., Simpson, L. T. 2022. Nitrogen addition increases freeze resistance in black mangrove (*Avicennia germinans*) shrubs in a temperate-tropical ecotone. *Ecosystems*. DOI:10.1007/s10021-022-00796-z

Reddy, K.R., Hu, J., Villapando, O., Bhomia, R.K., Vardanyan, L., **Osborne, T.Z.** 2021. Long-term accumulation of macro-and secondary elements in subtropical treatment wetlands. *Ecosphere* 12 (11), e03787

Julian, P., **Osborne, T.Z.**, Bhomia, R.K., Villapando, O. 2021. Knowing your limits: evaluating aquatic metabolism in a subtropical treatment wetland. *Hydrobiologia* 848 (17), 3969-3986

PJ, I.I., **Osborne, T.Z.**, Nair, V.D. 2021. Seal Tightly and Store in a Cool Dry Place: Exploring Soil Phosphorus Storage in a Subtropical Treatment Wetland. *Mapping Intimacies* 10.21203/rs.3.rs-824704/v1

- Vaughn, D.R., Bianchi, T.S., Shields, M.R., Kenney, W.F., **Osborne, T.Z.** 2021. Blue Carbon Soil Stock Development and Estimates Within Northern Florida Wetlands. *Frontiers in Earth Science* 9, 6
- Schafer, T., Powers, L., Gonsior, M., Reddy, K.R., **Osborne, T.Z.** 2021. Contrasting responses of DOM leachates to photodegradation observed in plant species collected along an estuarine salinity gradient. *Biogeochemistry* 152 (2), 291-307
- Craig, H., Antwis, R.E., Cordero, I., Ashworth, D., Robinson, C.H., **Osborne, T.Z.**, Bardgett, R.D., Rowntree, J.K., Simpson, L.T. 2021. Nitrogen addition alters composition, diversity, and functioning of microbial communities in mangrove soils: an incubation experiment. *Soil Biology and Biochemistry* 153, 108076
- Eastman, C.B., Farrell, J.A., Whitmore, L., Rollinson Ramia, D.R., Thomas, R.S., Prine, J., Eastman, S.F., **Osborne, T.Z.**, Martindale, M.Q., Duffy, D.J. 2020. Plastic ingestion and stomach accumulation is near ubiquitous across multiple species of deceased post-hatchling sea turtles in Florida near shore waters. *Frontiers in Marine Biology*. doi.org/10.3389/fmars.2020.00693
- Julian, P., Gerber, S., Bhomia, R. K., King, J., **Osborne, T.Z.**, Wright, A. L. 2020. Understanding stoichiometric mechanisms of nutrient retention in wetland macrophytes: stoichiometric homeostasis along a nutrient gradient in a subtropical wetland. *Oecologia* 193 (4), 969-980
- Schafer, T., Ward, N., Julian, P., Reddy, K. R., **Osborne, T. Z.** 2020. Impacts of Hurricane Disturbance on Water Quality across the Aquatic Continuum of a Blackwater River to Estuary Complex. *Journal of Marine Science and Engineering* 8 (6), 412
- Dangremond, E.M., Simpson, L.T., **Osborne, T. Z.**, Feller, I. C. 2020. Nitrogen Enrichment Accelerates Mangrove Range Expansion in the Temperate–Tropical Ecotone Ecosystems 23 (4), 703-714
- Vaughn, D. R., Bianchi, T. S., Shields, M. R., Kenney, W. F., **Osborne, T. Z.** 2020. Increased Organic Carbon Burial in Northern Florida Mangrove-Salt Marsh Transition Zones. *Global Biogeochemical Cycles* 34 (5), e2019GB006334
- Julian, P., Gerber, S., Bhomia, R. K., King, J., **Osborne, T. Z.**, Wright, A. L. 2020. Stoichiometric homeostasis of wetland vegetation along a nutrient gradient in a subtropical wetland. Understanding stoichiometric mechanisms of nutrient retention in wetland 3 macrophytes. bioRxiv, 221465
- Julian II, P., Gerber, S., Bhomia, R.K., King, J., **Osborne, T.Z.**, Wright, A.L., Powers, M., Dombrowski, J. 2019. Evaluation of nutrient stoichiometric relationships among ecosystem compartments of a subtropical treatment wetland. Do we have “Redfield wetlands”? *Ecological Processes* 8 (1), 20
- Walker, J.E., Angelini, C., Safak, I., Altieri, A.H., **Osborne, T.Z.** 2019. Effects of Changing Vegetation Composition on Community Structure, Ecosystem Functioning, and Predator–Prey Interactions at the Saltmarsh-Mangrove Ecotone. *Diversity* 11 (11), 208
- Flower, H., Rains, M., Fitz, H.C., Orem, W., Newman, S., **Osborne, T.Z.**, Reddy, K.R., Obeysekera, J.. 2019. Shifting Ground: Landscape-Scale Modeling of Biogeochemical Processes under Climate Change in the Florida Everglades. *Environmental management* 64 (4), 416-435
- Smith, R.S., **Osborne, T.Z.**, Feller, I.C., Byers, J.E. 2019. Detrital traits affect substitutability of a range-expanding foundation species across latitude. *Oikos* <https://doi.org/10.1111/oik.06149>
- Silliman, B.R., He, Q., Angelini, C., Smith, C.S., Kirwan, M.L., Daleo, P., Renzi, J.J., Butler, J., **Osborne, T.Z.**, Nifong, J.C., de Koppel, J. 2019. Field Experiments and Meta-analysis Reveal Wetland Vegetation as a Crucial Element in the Coastal Protection Paradigm. *Current Biology* 29 (11), 1800-1806. e3

Simpson, L.T., Stein, C.M., **Osborne, T.Z.**, Feller, I.C. 2019. Mangroves dramatically increase carbon storage after 3 years of encroachment. *Hydrobiologia* 834 (1), 13-26

Morrison, E.S., Liu, Y., Rivas-Ubach, A., **Osborne, T.Z.**, Ogram, A.V., Bianchi, T.S. 2019. Marine microbial community responses related to wetland carbon mobilization in the coastal zone. *Limnology and Oceanography Letters* 4 (1), 25-33

Simpson, L.T., **Osborne, T.Z.**, Feller, I.C. 2019. Wetland Soil Co<sub>2</sub> Efflux Along a Latitudinal Gradient of Spatial and Temporal Complexity. *Estuaries and Coasts* 42 (1), 45-54

Phelps, S.A., **Osborne, T.Z.** (2019) Phosphorus in the Everglades and Its Effects on Oxidation-Reduction Dynamics. Mercury and the Everglades. A Synthesis and Model for Complex Ecosystem Restoration pp 109-130

Kimberli J. Ponzio, K.J., **Osborne, T.Z.**, Davies, G.T., LePage, B., Sundareshwar, P.V., Miller, S.J., Bochnak, A.M.K., Phelps, S.A., Guyette, M.Q., Chowanski, K.M., Kunza, L.A., Pellechia, P.J., Gleason, R.A., Sandvik, C.. 2019. Building Resiliency to Climate Change Through Wetland Management and Restoration. *Wetlands: Ecosystem Services, Restoration and Wise Use* pp 255-309

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Shields, M.R., Bianchi, T.S., Kolker, A.S., Kenney, W.F., Mohrig, D., **Osborne, T.Z.**, Curtis, J.H. 2019. Factors Controlling Storage, Sources, and Diagenetic State of Organic Carbon in a Prograding Subaerial Delta: Wax Lake Delta, Louisiana. *Journal of Geophysical Research: Biogeosciences* <https://doi.org/10.1029/2018JG004683>

Julian, P., **Osborne, T.Z.** (2018). From lake to estuary, the tale of two waters: a study of aquatic continuum biogeochemistry. *Environmental monitoring and assessment*, 190: 96

Dhaliwal, S.S., Toor, G.S., Rodriguez-Jorquera, I.A., **Osborne, T.Z.**, Newman, S. (2018). Trace metals in the soils of Water Conservation Area of Florida Everglades: Considerations for ecosystem restoration. *Journal of Soils and Sediments*, 18: 342

Simpson, L.T., **Osborne, T.Z.**, Feller, I.C. Wetland Soil Co<sub>2</sub> Efflux Along a Latitudinal Gradient of Spatial and Temporal Complexity. (2018). *Estuaries and Coasts*, 1-10

Smith, R.S., Blaze, J.A., **Osborne, T.Z.**, Byers, J.E. (2018). Facilitating your replacement? Ecosystem engineer legacy affects establishment success of an expanding competitor. *Oecologia*, 188: 251

Julian, P., Gerber, S., Bhomia, R., King, J., **Osborne, T.Z.**, Wright, A.L., Power, M. (2018). Evaluation of nutrient stoichiometric relationships amongst ecosystem compartments of a subtropical treatment wetland. Fine-scale analysis of wetland nutrient stoichiometry. *bioRxiv*, 220186

Julian, P.J.(g), S. Gerber, A.L. Wright, B. Gu, **T.Z. Osborne**. (2017). Carbon pool trends and dynamics within a subtropical peatland during long-term restoration. *Ecological Processes* 6:43 DOI 10.1186/s13717-017-0110-8

Newman, S. **T.Z. Osborne**, S.E. Hagarthy, C. Saunders, K. Rutchey, K. Shall, K.R.Reddy. (2017). Drivers of landscape evolution: multiple regimes and their influence on carbon sequestration in a subtropical peatland. *Ecological Monographs* 87(4): 578-599

Simpson, L.T. (g), **T.Z. Osborne**, L.J. Duckett, I.C. Feller. (2017). Carbon storages along a climate induced coastal wetland gradient. *Wetlands* 37(6): 1023-1035

**Osborne, T.Z.**, M.F. Coveney, R.A. Mattson. (2017). Potential for direct nitrate-nitrite inhibition of submerged aquatic vegetation (SAV) in Florida Springs: A review and synthesis of current literature. *Water* 8: 30-46

**Osborne, T.Z.**, Fitz H.C., Davis S. (2017). Restoring the foundation of the Everglades: assessment of edaphic responses to hydrologic restoration scenarios. *Restoration Ecology* 25(S1): S59-S70

Simpson, L.T.(g), **Osborne, T.Z.**, Feller, I.C. (2017). Establishment and biomass allocation of black and red mangroves: Response to propagule flotation duration and seedling light availability. *Journal of Coastal Research* 33(5): 1126-1134

Vogel, W.J., **Osborne, T.Z.**, James, R.T. Cohen M.J. (2016). Spectral prediction of sediment chemistry in Lake Okeechobee Florida. *Environmental Monitoring Assessment* 188: 594-607

Julian, P., A.L. Wright, **T.Z. Osborne**. (2016). Iron and sulfur Porewater and surface water biogeochemical interactions in a subtropical peatland. *Soil Science Society of America* 80:794-802

Dhaliwal,S., G.S. Toor, I. Rodriguez-Jorquera, **T.Z. Osborne**, S. Newman. (2016). Trace metals in soils of Water Conservation Area of Florida Everglades: considerations for ecosystem restoration. *Journal of Soils and Sediments* 10.1007/s11368-016-1459-5.

**Osborne, T.Z.**, S. Newman, K. R. Reddy, L. R. Ellis, and M. S. Ross. (2015). Spatial Distribution of Soil Nutrients in the Everglades Protection Area. In: *Microbiology of the Everglades Ecosystem*. J. entry, A. Ogram (Eds.) CRC Press- Taylor Francis Group. Boca Raton FL USA. 38-67.

Bukata, B.J. **T.Z. Osborne**, and M.L. Szafraniec. (2015). Soil nutrient assessment and characterization in a degraded central Florida Swamp. *Water, Air and Soil Pollution* 226(9) 1-11

Orem, W., S. Newman, **T.Z. Osborne**, K.R. Reddy. (2015). Projecting changes in Everglades soil biogeochemistry for carbon and other key elements to possible 2060 climate and hydrologic scenarios. *Environmental Management* 55: 776-798

Gabriel, MC, D. Axelrad, W. Orem, N. Howard, **T.Z. Osborne**. (2015). Response to "Comment on and Reinterpretation of Gabriel et al., (2014) "Fish Mercury and Surface Water Sulfate Relationships in the Everglades Protection Area" *Environmental Management* 55:1227-1231

**Osborne, T.Z.** (2015). Potential for Nitrate-Nitrite Inhibition of Submerged Aquatic Vegetation (SAV) in Florida Springs. St. Johns River Water Management District Special Publication Series SP2015-2

**Osborne T.Z.**, R. Mattson, and M. Coveney. (2015). Macroinvertebrate Grazers, Dissolved Oxygen Stress, and the Loss of Top-Down Control of Algae in Florida Spring Ecosystems. St. Johns River Water Management District Special Publication Series SP2015-1

Watts, A. C., D. L. Watts, M. J. Cohen, J. B. Heffernan, D. L. McLaughlin, J. B. Martin, D. A. Kaplan, A. B. Murray, **T.Z. Osborne**, and L. N. Kobziar. (2014). Evidence of biogeomorphic patterning in a lowrelief karst landscape. *Earth Surface Process and Landforms* 39 (15): 2027-2037

Gabriel, M.C., N. Howard, **T.Z. Osborne**. (2014). Fish mercury and surface water sulfate relationships in the Everglades Protection Area. *Environmental Management* 53: 583-593

Chambers, L.G, **T.Z. Osborne**, and K.R. Reddy. (2013). Effect of salinity pulsing events on soil organic carbon loss along an intertidal wetland gradient: A laboratory experiment. *Biogeochemistry* 115:363-383

\***Osborne, T.Z.**, K.R. Reddy, L.R. Ellis, N.G. Aumen, D.D. Surratt, M.S. Zimmerman, and J. Sadle. (2013). Evidence of recent phosphorus enrichment in surface soils of Taylor Slough and northeast Everglades National Park. *Wetlands* 34(1) 37-45

**Osborne, T.Z.**, L.N. Kobziar, & P.W. Inglett. (2013). Investigating the role of fire in shaping and maintaining wetland ecosystems. *Fire Ecology* 9(1): 1-5

Inglett, K.S., P.W. Inglett, K.R. Reddy, and **T.Z. Osborne**. (2012). Temperature sensitivity of greenhouse gas production in wetland soils of different vegetation. *Biogeochemistry* 108: 77-90

White, W.R., L.R. Ellis, L.N. Sturmer, **T.Z. Osborne**, S. Baker. (2012). Applying a soils-based approach to clam aquaculture in Florida. *J. Shellfish Res.* 31(1): 360-360

Chambers, L.G., **T.Z. Osborne**, and K.R. Reddy. (2011). Short-term response of carbon cycling to salinity pulses in a freshwater wetland. *Soil Sci. Soc. Am. J.* 75(5) 1-8

Marchant, B.P., S. Newman, **T.Z. Osborne**, K. Rutchey, K.R. Reddy, and R.M. Lark. (2011). Spatio-Temporal Monitoring of Soil Phosphorus in the Everglades Water Conservation Area 2A: 1998—2008. *European J. Soil Sci.*

**Osborne, T.Z.**, G.L. Bruland, S. Newman, K.R. Reddy, & S. Grunwald. (2011). Spatial distributions and eco-partitioning of soil biogeochemical properties in Everglades National Park. *Env. Monit. Assess.* 183:395-408

Han, Lu, S. Huang, C.D. Stanley, and **T.Z. Osborne**. (2011). Phosphorus fractionation in core sediments from the Haihe River, China. *Soil Sed. Cont. Int. J.* 20(1): 30-53

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\*Reddy, K.R., S. Newman, **T.Z. Osborne**, J.R. White, and C. Fitz. Legacy phosphorus in the Everglades ecosystem: implications for management and restoration. (2011). *Crit Rev Env. Sci Technol.* 41:6 149-186

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Watts, D., M.J. Cohen, J. Heffernan, **T.Z. Osborne**, & M.W. Clark. (2010). Hydrologic modification and the loss of self-organized patterning in the ridge slough mosaic of the Everglades. *Ecosystems* 13: 813-827

### **Current Research Support:**

(PI) St. Johns River Water Mgmt. District. Biosolids (\$605,000 -3yrs)

(Co-PI) St. Johns River Water Mgmt. District. Paired restoration of seagrass and hard clams in the Indian River Lagoon. (\$1,115,000-2yrs)

**Todd Z. Osborne, Ph.D.**

(PI) Indian River Lagoon Council. Restoration of Clam Populations in the Indian River Lagoon for Water Quality Improvement (\$199,994-1yr)

(PI) Brevard Tourism Grant- Brevard County office of Tourism. (\$49,999- 1yr)

(PI) USDA NRCS- Assessing Effects of WRP/E Restoration. (\$179,810- 2yrs)

(PI) South Florida Water Mgmt. District. Sediment Mapping of Lake Okeechobee. (\$175,882-1yr)

(PI) US Department of Interior Natl. Park Service. Taylor Slough- (\$79,951-1yr)