



**Johnson Education Center
HBOI-FAU, Fort Pierce, Florida
February 7-8, 2013**

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Generous sponsorship under the auspices of the Harbor Branch Oceanographic Institute Foundation has helped to underwrite the cost of this symposium and *Love Your Lagoon*, a dinner event on February 8 at HBOI to raise funds to support research on the Indian River Lagoon. We thank all of our donors:

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We also thank Janet Alford, Executive Director of the HBOI Foundation, for all of her support.

Indian River Lagoon Symposium 2013
The Indian River Lagoon – Health of the Lagoon

Program Schedule – Technical Sessions
Thursday, February 7, 2013

(Note: The presenting author of talks is the first author, unless indicated by underlining.)

0715 - 0810 Registration, Set Up Posters, and Coffee & Tea

0810 Welcome
M. Dennis Hanisak, HBOI-FAU

0815 - 0845 Keynote Address
Regime Shift? Shifting Baselines? What is the State of the Lagoon?
Joel Steward, St. Johns River Water Management District, Palatka, FL

0845 - 1000 Oral Session 1 – The Blooms of 2011
Session Chair: Joel Steward, St. Johns River Water Management District, Palatka, FL

0845 - 0900 Monitoring of the 2011 Super Algal Bloom in Indian River Lagoon, FL Using Satellite Data
Andrew W. Kameronosky and Hyun Jung Cho
Bethune-Cookman University, FL

0900 - 0915 Investigating the Causes and Consequences of the IRL 2011 Superbloom – A Water Quality Analysis
Margaret A. Lasi¹, Charles A. Jacoby^{1,2}, Edward J. Philips³, Susan Badylak³, Wendy A. Tweedale¹, and Joel S. Steward¹
¹St. Johns River Water Management District, Palatka, FL; ²Indian River Lagoon National Estuary Program, Palm Bay, FL

0915 - 0930 The Bloomin' Lagoon – Bloom and Bust of Indian River Lagoon Seagrasses
Lori Morris¹, Robert Chamberlain¹, and Lauren Hall²
¹St. Johns River Water Management District, Palatka, FL; ²St. Johns River Water Management District, Palm Bay, FL

0930 - 0945 Changes in Biomass of Submerged Macrophytes in the Northern Indian River Lagoon Related to the 2011 “Superbloom”
Robert Chamberlain¹, Lori Morris¹, Lauren Hall², Whitney Green¹, Jan Miller², Charles Jacoby¹, Joel Steward¹, and Robert Virnstein³
¹St. Johns River Water Management District, Palatka, FL; ²St. Johns River Water Management District, Palm Bay, FL; ³Seagrass Ecosystems Analysts, Palatka, FL

0945 - 1000 Searching for Top-Down Effects Associated with the 2011 Superbloom
Charles Jacoby¹, Ronald Brockmeyer¹, Joel Steward¹, Margaret Lasi¹, Kevin Johnson², Bjorn Tunberg³, Ed Philips⁴, Richard Paperno⁵, and Agustin P. Sebastian⁵
¹St. Johns River Water Management District, Palatka, FL; ²Florida Institute of Technology, Melbourne, FL; ³formerly Smithsonian Marine Station, Fort Pierce, FL; ⁴University of Florida, Gainesville, FL; ⁵Florida Fish and Wildlife Conservation Commission, Melbourne, FL

1000 - 1030 Break

1030 - 1200 Oral Session 2 – Nutrients/Water Quality

Session Chair: Valerie Paul, Smithsonian Marine Station, Fort Pierce, FL

1030 - 1045 TMDLs and Basin Management Action Plans: How They Can Help Restore Seagrasses in the Indian River Lagoon Basin

Jan Mandrup-Poulsen and Mary Paulic

Florida Department of Environmental Protection, Tallahassee, FL

1045 - 1100 Preparing to Update TMDLs for the IRL

Virginia Barker¹, Brett Cunningham², Gordon England³, Harvey Harper⁴, Anthony Janicki⁵, Claudia Listopad⁶, and Steve Peene⁷

¹Brevard County Office of Natural Resource Management, Viera, FL; ²Jones Edmunds, Gainesville, FL; ³Stormwater Solutions, Cocoa Beach, FL; ⁴Environmental Research and Design, Orlando, FL; ⁵Janicki Environmental, St. Petersburg, FL; ⁶Applied Ecology, Indian Harbour Beach, FL; ⁷Applied Technology and Management, Tallahassee, FL

1100 - 1115 A Water Quality Box Model for the St. Lucie Estuary and the Southern Indian River Lagoon

Detong Sun, Yongshan Wan, and Peter Doering

South Florida Water Management District, West Palm Beach, FL

1115 - 1130 Creating Water Pollution Gradient Maps as a Tool for Educating Community Stakeholders about Sources of Pollution in the Indian River Lagoon

Beth Falls, Brandy Nelson, Retta Rohm, Chloe Lloyd, Jerry Corsaut, and Edith Widder
Ocean Research & Conservation Association, Fort Pierce, FL

1130 - 1145 Nitrogen Versus Phosphorus Limitation in the Indian River Lagoon: Spatial and Temporal Trends

Brian E. Lapointe, Laura W. Herren, and David D. Debortoli

Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL

1145 - 1200 Recognition of Novel Cyanobacterial Biodiversity for Monitoring and Predictions of Harmful Cyanobacterial Blooms in the IRL

Niclas Engene¹, Sarath P. Gunasekera¹, Andrea Thor², Mark H. Ellisman², and Valerie J. Paul¹

¹Smithsonian Marine Station, Fort Pierce, FL; ²University of California San Diego, La Jolla, CA

1200 - 1230 Three Minutes, Three Slides

Session Chair: M. Dennis Hanisak, HBOI-FAU

Mapping of Seagrass and Chlorophyll Using the Satellite Hyperspectral HICO Data

Christopher Clarke and Hyun Jung Cho

Bethune-Cookman University, Daytona Beach, FL

A Brown Tide Event in the Indian River Lagoon: Microscopic Description and Bloom Concentrations

Susan Badylak¹, Edward J. Philips¹, Karen Kelley¹, and Margie Lasi²

¹University of Florida, Gainesville, FL; ²St. Johns River Water Management District, Palatka, FL

Identity of the Brown Tide Organism *Aureoumbra lagunensis* Verified with a Polyclonal Antibody

Leanne J. Flewelling and Alina A. Corcoran

Florida Fish and Wildlife Conservation Commission, St. Petersburg, FL

Physiology and Ecology of Bloom-forming Macroalgae in the Indian River Lagoon, FL

Lisa N.A. Vlaming and Brian E. Lapointe

Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL

Environmental Humanities and the IRL

Nathaniel Osborn

Florida Atlantic University, Boca Raton, FL

Hands on Conservation: The Indian River Lagoon Shoreline Restoration Project, a Partnership between Florida Department of Environmental Protection and Brevard Zoo

Amy Reaume

Brevard Zoo, Melbourne, FL

Seagrass and Dolphins: What Can They Tell Us about the Health of the Indian River Lagoon?

Keenan Petersen¹, Daviela Ramirez¹, George Anderson¹, Marilyn Mazzoil², Lori Morris³, Greg O'Corry-Crowe², M. Dennis Hanisak², and R. Grant Gilmore, Jr.⁴

¹Sebastian River High School, Sebastian, FL; ²Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL; ³St. Johns River Water Management District, Palatka, FL; ⁴Estuarine, Coastal and Ocean Science Inc., Vero Beach, FL

IRLscience.com: Bringing Together Scientists, Teachers, Students, Legislators, and the Public to Be Better Informed about Issues Affecting Our Indian River Lagoon

Sarah E. Krejci

Florida Institute of Technology, Melbourne, FL

1230 - 1330 Lunch (provided)

1330 - 1445 Oral Session 3 – Health of Key Species

Session Chair: Patti Gorman, South Florida Water Management District, West Palm Beach, FL

1330 - 1345 Distribution of Lymphosarcoma in Redfin Needlefish, *Strongylura notata*, in the Indian River Lagoon (IRL)

Yasunari Kiryu, Micah D. Bakenhaster, Jan H. Landsberg, Amanda J. Tyler-Jedlund, and Patrick W. Wilson

Florida Fish and Wildlife Conservation Commission, St. Petersburg, FL

1345 - 1400 Trends in Fibropapilloma Rates of Juvenile Green Turtles (*Chelonia mydas*) in South Hutchinson Island and the Indian River Lagoon

David Clark¹, Cody Mott¹, Jeffrey Guertin¹, Steve Weege¹, Ryan Welsh¹, Mike Bresette¹, Jonathan Gorham¹, and Vince Munne²

¹Inwater Research Group Inc., Jensen Beach, FL; ²Florida Power and Light, Jensen Beach, FL

1400 - 1415 Do Trends in Waterbird Nest Effort at Pelican Island National Wildlife Refuge Foretell an Ecosystem in Decline?

Dale E. Gawlik and Jennifer E. Chastant

Florida Atlantic University, Boca Raton, FL

1415 - 1425 Genetic Variation and Immune Response in Dolphins; Part 1: Population Structure of IRL and Atlantic Dolphins

Sarah Rodgers, Tatiana Ferrer, Heidi Pagán, and Greg O’Corry-Crowe

Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL

1425 - 1435 Genetic Variation and Immune Response in Dolphins; Part 2: Variation in MHC Coding Regions

Tatiana Ferrer, Heidi Pagán, Sarah Rodgers, and Greg O’Corry-Crowe

Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL

1435 - 1445 Genetic Variation and Immune Response in Dolphins; Part 3: Variation in MHC Promoter Regions

Heidi Pagán, Tatiana Ferrer, Sarah Rodgers, and Greg O’Corry-Crowe

Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL

1445 - 1515 Break

1515 - 1630 Oral Session 4

Session Chair: Linda Walters

University of Central Florida, Orlando, FL

1515 - 1530 “The Most Diverse Estuary in North America” – Really??

Paul E. Hargraves

Harbor Branch Oceanographic Institute at Florida Atlantic University and Smithsonian Marine Station, Fort Pierce, FL

1530 - 1545 Slime & Aliens: Exploring Links between Biofilms and Invasive Species

L. Holly Sweat¹ and Kevin B. Johnson¹

¹Florida Institute of Technology, Melbourne, FL

- 1545 - 1600 **Laying a Baseline: Retrospective Multivariate Analyses of Native/Non-Native Species Associations**
Jesse R. Blanchard¹, Ralph G. Turingan¹, and Richard Paperno²
¹Florida Institute of Technology, Melbourne, FL; ²Florida Fish and Wildlife Conservation Commission, Melbourne, FL
- 1600 - 1615 **Investigation of Lionfish (*Pterois volitans*) Amongst Florida's Critical Estuarine Mangroves: A Case Study of the Indian River Lagoon, Florida, USA**
Emily Dark
Antioch University New England, Keene, NH & Florida Fish and Wildlife Conservation Commission, Fort Pierce, FL
- 1615 - 1630 **Integrated Remote and *In Situ* Sensing System for Monitoring Manatee Abundance and Behavior in Relation to Changing Environmental Conditions**
Anni Vuorenkoski, Marilyn Mazzoil, Greg O'Corry-Crowe, Fraser Dalgleish, and Bing Ouyang
Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL
- 1630 - 1645 **Restoration Initiative Utilizing Laboratory-reared *Ruppia maritima* Seedlings**
Joseph A. White and Hyun Jung Cho
Bethune-Cookman University, FL
- 1645 - 1710 Three Minutes, Three Slides**
Session Chair: Chris Wilson, University of Florida/IFAS Indian River Research and Education Center, Fort Pierce, FL
- A 3-Minute Tour of Microzooplankton in the Indian River Lagoon**
Nikki Dix
Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL
- Which Seagrass Species Provides Better Foraging Habitat for Wading Birds?**
Lauri R. Green¹, Dale E. Gawlik², and Brian E. Lapointe¹
¹Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL;
²Florida Atlantic University, Boca Raton, FL
- Here Today, Gone Tomorrow: Patterns in Bottlenose Dolphin Calf Mortality May Explain Bimodal Birthing Peaks**
Elisabeth Howells, Marilyn Mazzoil, Greg O'Corry-Crowe, and Sarah Rodgers
Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL
- Community and Spatiotemporal Dynamics of the Dolphin Social Network in the Indian River Lagoon**
Elizabeth Murdoch Titcomb, Greg O'Corry-Crowe, Elizabeth Hartel, and Marilyn Mazzoil
Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL
- Don't Cough on Me, Bro! Spatial Analysis of the Dolphin Social Network in the IRL**
Elizabeth Hartel, Elizabeth Murdoch Titcomb, Greg O'Corry-Crowe, and Marilyn Mazzoil
Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL

Satellite Telemetry of Bottlenose Dolphins, *Tursiops truncatus*, in the Indian River Lagoon

Greg O'Corry-Crowe¹, Wendy Noke-Durden², and Marilyn Mazzoil¹

¹Harbor Branch Oceanographic Institute, Florida Atlantic University, Fort Pierce, FL;

²Hubbs-SeaWorld Research Institute, Melbourne Beach, FL

Indian River Lagoon Observatory: Real-time Water Quality Data Network for Research, Education, and Outreach

M. Dennis Hanisak, Brian E. Lapointe, Megan Davis, and Geoff Beiser

Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL

1710 Closing Comments and Transition to Poster Session & Reception

1730 - 1900 Poster Session & Reception (Open to the Public, too!)

Posters will be displayed all day in the Education Annex.

Presenters of odd-numbered posters will be at their posters between 1730 and 1815;
presenters of even-numbered posters will be at their posters between 1815 and 1900.

- 1. Age and Growth of the Bull Shark in the Indian River Lagoon, FL**
Douglas H. Adams¹ and Lisa J. Natanson²
¹Florida Fish and Wildlife Conservation Commission, Melbourne, FL; ²NOAA-National Marine Fisheries Service, Narragansett, RI
- 2. Linking Mercury to Health Effects with Laser Ablation: Will It Work for Marine Fishes?**
Douglas H. Adams¹, Aaron P. Roberts², James D. Smith², and Guido F. Verbeck²
¹Florida Fish and Wildlife Conservation Commission, Melbourne, FL; ²University of North Texas, Denton, TX
- 3. Simulation and Forecasting Potential Responses of *Syringodium filiforme* with Freshwater Inflow to the Southern Indian River Lagoon over a Range of Time Scales**
Christopher Buzzelli, Peter Doering, Yongshan Wan, Zhiqiang Chen, Patti Gorman, and Becky Robbins
South Florida Water Management District, West Palm Beach, FL
- 4. Phylogenetic Diversity of *Pyrodinium bahamense* (Dinophyceae) from the Indian River Lagoon (Florida) Based on Single-Cell PCR and Sequencing of the 18S rRNA and Luciferase Genes**
Kathleen D. Cusick¹, Steven W. Wilhelm¹, and Gary S. Saylor^{1,2}
¹University of Tennessee, Knoxville, TN; ²Oak Ridge National Lab, Oak Ridge, TN
- 5. Living Shoreline Successes and Pitfalls in Mosquito Lagoon**
Melinda Donnelly¹, Jennifer Manis¹, Paul Sacks¹, John Stiner², and Linda Walters¹
¹University of Central Florida, Orlando, FL; ²Canaveral National Seashore, Titusville, FL
- 6. Comparison of Estimated, External, Nutrient Loading to Chlorophyll *a* Preceding and during the 2011 Super Bloom**
Whit Green and Joel Steward
St. Johns River Water Management District, Palatka, FL
- 7. Changes in the Fish Assemblage of the Indian River Lagoon, FL Concurrent with Extended Algal Blooms and a Resultant Loss of Seagrass Habitat**
Charles Jacoby^{1,2}, Ronald Brockmeyer², Joel Steward², Robert Chamberlain², Margaret Lasi², Lauren Hall², Agustin P. Sebastian³, and Richard Paperno³
¹Indian River Lagoon National Estuary Program, Palm Bay, FL; ²St. Johns River Water Management District, Palatka, FL; ³Florida Fish and Wildlife Conservation Commission, Melbourne, FL
- 8. Seasonal Variation in Bacterial Load in Waters of the Indian River Lagoon**
Kathleen E. Janda and Peter J. McCarthy
Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL
- 9. Effect of Seagrass Density on Population Demographics and Feeding Ecology of the Gulf Pipefish, *Syngnathus scovelli*, in the Indian River Lagoon**
Sarah E. Krejci
Florida Institute of Technology, Melbourne, FL

- 10. Effect of Submerged Aquatic Vegetation (SAV) Type and Density on Habitat Preference of Two Pipefish Species**
Sarah E. Krejci
Florida Institute of Technology, Melbourne, FL
- 11. Effects of Hurricanes, Land Use, and Water Management on Nutrient and Microbial Pollution in the St. Lucie Estuary, Southeast Florida**
Brian E. Lapointe, Laura W. Herren, and David D. Debortoli
Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL
- 12. Shoreline Restoration along the Indian River Lagoon: Past, Present, and Future of the Shoreline Restoration Project**
Dana Maira
Florida Department of Environmental Protection, Fort Pierce, FL
- 13. Threats and Anthropogenic Stressors Facing Bottlenose Dolphins in the Indian River Lagoon, FL**
Stephen McCulloch, Christie Gonzalez, Emily Langille, Steve Burton, and Juli Goldstein
Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL
- 14. Community Outreach, Restoration and Monitoring of Intertidal Oyster Reefs in Mosquito Lagoon, Florida**
Jody B. Palmer¹, Linda Walters², and Paul Sacks³
¹Brevard Zoo, Melbourne, FL; ²University of Central Florida, Orlando, FL; ³Winter Springs High School, Sanford, FL
- 15. Climate Change Issues for Clam Aquaculture in the Indian River Lagoon**
John Scarpa¹, Shirley M. Baker², and Leslie N. Sturmer³
¹Harbor Branch Oceanographic Institute at Florida Atlantic University, Fort Pierce, FL; ²University of Florida, Gainesville, FL; ³University of Florida, Cedar Key, FL
- 16. The Comparison of Tumor Severity and Numbers to the Straight Standard Carapace Length of Juvenile *Chelonia mydas* Infected with Fibropapillomatosis**
Carson Smith¹, Heidi Hammel¹, and Steve Traxler²
¹Oviedo High School, Oviedo, FL; ²US Fish and Wildlife Service, Vero Beach, FL
- 17. Ecological Disturbances in the St. Lucie Estuary and the Southern Indian River Lagoon, Elucidated through Macrobenthic Monitoring**
Michelle Stephens and Erin Fryauff
Smithsonian Marine Station, Fort Pierce, FL
- 18. The Smithsonian's Indian River Lagoon Species Inventory: Using Education to Promote Lagoon Health**
L. Holly Sweat, Joseph Dineen, and Valerie J. Paul
Smithsonian Marine Station, Fort Pierce, FL
- 19. Oyster Reef Restoration in Mosquito Lagoon: Long-Term Data and the Impact of the 2012 Brown Tide**
Linda Walters¹, Jody Palmer², Wei Yuan¹, Jennifer Manis¹, and Paul Sacks¹
¹University of Central Florida, Orlando, FL; ²Brevard Zoo, Melbourne, FL

20. Improving Community-Based Shoreline Stabilization: Impact of Nurse Plants on Red Mangrove Biomass Production and Survival

Paula Yespelkis, Melinda Donnelly, Travis Wolfenberger, and Linda Walters
University of Central Florida, Orlando FL

21. Popcorn Science: A Seminar Series in the Town of Melbourne Beach

Kelli A. Zargiel
Florida Institute of Technology, Melbourne FL

Friday, February 8 – A Forum on Lagoon Health

Three speakers will provide brief and differing perspectives on working to establish and sustain a healthy Indian River Lagoon, followed by an open discussion of what all of us – scientists, resource managers, decision makers, and the public – can do to improve the lagoon’s health.

0815 - 0855 Registration and Coffee & Tea

0900 - 1200 A Forum on Lagoon Health

Session Chair: Chuck Jacoby, St. Johns River Water Management District, Palatka, FL
& Indian River Lagoon National Estuary Program, Palm Bay, FL

0900 - 0910 Opening Remarks

Chuck Jacoby

0910 - 0925 So What? Translating Science into Management

Robert Virnstein
Seagrass Ecosystems Analysts, Palatka, FL

0925 - 0940 An Overview of Education, Outreach and Public Involvement Programs Ongoing throughout the Indian River Lagoon Region

Kathy Hill
Indian River Lagoon National Estuary Program, Palm Bay, FL

0940 - 0955 “Political Will” for Lagoon Remediation?

John Orcutt
Citizen, Vero Beach, FL

0955 - 1200 Discussion

Facilitators: Chuck Jacoby & Dennis Hanisak