

Presentation 1: FDOT District 1, Hurricane Ian – Flooding, Lessons Learned and Resiliency

Description: On September 28, 2022 Hurricane Ian slammed into southwest Florida and brought damaging storm surge, Category 4 winds and record rainfall. Both roadway accesses to Sanibel Island and Pine Island were severed requiring immediate repairs to restore emergency access. Additionally, several other roads and bridges were damaged or flooded during Hurricane Ian. This presentation will review the impacts of Hurricane Ian on southwest Florida roadways, engineering lessons learned, emergency repair efforts and resiliency improvements.

Requested CEU: 1.0

Length of Presentation: 50 minutes

Speaker: Brent Setchell

Speaker Bio: Brent Setchell, P.E. graduated Cum Laude from the University of Central Florida with a BS in Civil Engineering. Brent served as the Florida Department of Transportation (FDOT) District 1 Environmental Permitting Engineer for 7 years and has been the FDOT District 1 Drainage Design Engineer for the last 6 years. Brent received the 2011 Excellence in Innovation in Creativity Award, and was awarded the 2013, 2014 and 2016 Highway Engineer of the Year Award for FDOT District 1.

Speaker Engineering Licensure: PE

Speaker Degree: BSCE

Presentation 2: FDOT District 5 Drainage Updates

Description: Within District 5 of the Florida Department of Transportation, several severe storm events have resulted in catastrophic pond failure that will result in a District policy change. This presentation will educate engineers as to the resiliency considerations associated with pond design. Also, some clarification will be provided for FDOT's wall zone pipe requirements.

Requested CEU: 0.5

Length of Presentation: 30 minutes

Speaker: Ferrell Hickson

Speaker Bio: Ferrell Hickson currently serves as the District Drainage Design Engineer for the Florida Department of Transportation, District 5. Mr. Hickson is a registered Professional Engineer in the State of Florida and has been with the Department for 30 years, including 27 in stormwater engineering. He leads a group of 9 professional engineers, designers, biologists, and scientists in the areas of stormwater design, permitting, and NPDES to deliver a variety of transportation projects for a billion dollar annual district work program. Mr. Hickson graduated Summa Cum Laude with a Bachelor's Degree in Civil Engineering from the University of Central Florida in 1992.

Speaker Engineering Licensure: PE

Speaker Degree: BSCE

Presentation 3: 2022 Indian River Lagoon Harmful Algal Blooms Review: A View from 700 km Up

Description: Chlorophyll A (ChlA) in the Indian River Lagoon (IRL) can vary day to day and from meter to meter. That's why early detection is key. The use of satellite remote sensing has been identified as cost-effective and can rapidly identify Harmful Algal Blooms (HABs). As part of an ongoing HAB surveillance program for Brevard County, Applied Ecology, Inc., utilized the European Space Agency Sentinel-2 and Sentinel-3 satellites to create 56 weekly reports of estimated ChlA across the IRL. This presentation will summarize the initial findings from these reports.

In 2022, southern Mosquito Lagoon, Central-North IRL, and North-Central IRL were hotspots of elevated estimated ChlA across the entire year. There appeared to have been minimal impacts on HABs from two major hurricanes and their subsequent flooding. Additionally, the high spatial and temporal resolution of the satellites identified several unique HAB patterns resulting from the lagoon's unique hydrology and weather.

Requested CEU: 0.5

Length of Presentation: 30 minutes

Speaker: Claudia Listopad

Speaker Bio: Dr. Claudia Listopad is the President of Applied Ecology, Inc., a woman- and minority-owned business providing high-quality and cost-effective scientific, technical, and engineering services to solve environmental issues. She is a cross-disciplinary project manager specialized in the application of GIS, remote sensing, modelling, and statistical analyses to complex datasets, particularly those related to natural resources, water resources, and restoration. Dr. Listopad has been involved with several critical state and locally funded projects to restore Florida's impaired waters, from developing custom watershed loading models to understanding groundwater pollution sources for guiding restoration strategies. Additionally, she is actively involved in both the research and public consulting world for water resources and remote sensing.

She has 23 years of applicable experience, with her role of Project Manager dating back to 2007. Dr. Listopad has worked in the academic sector as a Researcher and Adjunct Professor at the Department of Ocean Engineering and Sciences at Florida Institute of Technology, as well as an environmental project manager in a mid-size engineering firm, prior to founding Applied Ecology in 2009. She currently leads the strategic development of AEI, all staffing and financial decisions, and ensures high quality products are delivered consistently and safely to a rapidly growing public sector client base.

Speaker Engineering Licensure: N/A

Speaker Degree: Ph.D.

Presentation 4: Development of A Science-Based Update to the Orange County Fertilizer Ordinance

Description: Orange County is experiencing explosive population growth and the commensurate change in land use, which have contributed to impaired surface waters and subsequent adoptions of TMDLs by the State of Florida. The financial burden of attaining a TMDL falls primarily upon local governments and frequently exceeds the resources available to satisfy the competing needs demanded by growth. Water quality best management practices (BMPs) to restore water resources can range in cost from hundreds to tens of thousands of dollars per pound of nutrient pollutant removed. BMPs can take the form of engineering solutions or institutional controls. This presentation will describe the data-driven adoption of an institutional control, a revision to the Orange County Fertilizer Ordinance, that is intended to decrease nutrient pollutant loading to groundwater and freshwater resources of the County.

Multiple lines of evidence were explored in assessing fertilizer's contribution to waterbodies, primarily through the groundwater pathway, including statistical water quality data analysis and fate and transport modeling. Isotopic signatures of groundwater nitrate found that fertilizer represents a dominant nitrogen load at several monitored groundwater locations, while groundwater fate and transport modeling corroborated the nitrogen concentrations found at monitored wells and downgradient impaired waters.

These data-driven approaches were reviewed in context with fertilization practices within Orange County, and the need to maintain healthy turf grass, to formulate a practical fertilizer ordinance revision for the County.

Requested CEU: 0.5

Length of Presentation: 30 minutes

Speaker: Lee Mullon

Speaker Bio: Lee is a professional engineer with decades of experience practicing water resources engineering in Central Florida. Lee received a bachelor's and master's degree in Civil Engineering from the University of Central Florida, has performed research into best management practices at UCF's Stormwater Management Academy, and has taught the Water Resources Senior Design class at UCF. Lee's current work focuses on addressing complicated water issues primarily for Florida municipalities looking to balance the competing needs of a rapidly growing Florida population while protecting vital environmental systems.

Speaker Engineering Licensure: PE

Speaker Degree: BSCE, MSCE

Presentation 5: Hurricane Ian – A local government’s perspective

Description: This presentation will provide an overview of how Hurricane Ian and the severe flooding impacted the City of Oviedo. The presentation will highlight some of the most heavily impacted areas, the City’s emergency response, working with FEMA, and some of the ongoing design improvements for the interim repairs and long-term solutions.

Requested CEU: 0.5

Length of Presentation: 30 minutes

Speaker1: Paul Yeargain

Speaker 1 Bio: Mr. Paul Yeargain is the Assistant City Engineer and Engineering Manager with the City of Oviedo. Most of his 29-year professional career has focused on studying and designing complex stormwater solutions for roadway and site development-related projects. He has extensive engineering experience with the stormwater permitting process and working with the SJRWMD and SFWMD. Mr. Yeargain served as an adjunct instructor at the University of Central Florida for nine years, teaching the Water Resources Design Course for the Civil Engineering Department. Mr. Yeargain is committed to promoting the use of LID practices in Florida and has also conducted LID educational sessions for local agencies as well as the American Society of Civil Engineers.

Speaker 1 Engineering Licensure: PE

Speaker 1 Degree: BSCE

Speaker 2: Joshua Spence

Speaker 2 Bio: Joshua Spence is a Project Manager and Associate with Inwood Consulting Engineers, Inc., where he provides stormwater and water resources services for municipal government clients throughout Florida. Josh received his Bachelor and Master of Science in Civil Engineering from the University of Central Florida. He is a registered PE and certified floodplain manager. Josh’s key areas of expertise include stormwater analysis, watershed management planning, floodplain analysis, and stormwater retrofit design. He has extensive experience in hydrologic and hydraulic modeling in support of stormwater retrofit and watershed analysis.

Speaker 2 Engineering Licensure: PE

Speaker 2 Degree: BSCE, MSCE

Presentation 6: Don't be Baffled by Your Baffle Box, Understanding Baffle Box and Upflow Filter Performance

Description: A 2nd Generation Nutrient Separating Baffle Box (NSBB) with a Bold & Gold upflow filter was installed on a drainage system in Orange County that collects runoff from a mostly residential area. To support the improvement of surface waters in their district, the Orange County Environmental Protection Division (EPD) frequently performs water quality and hydrologic/hydraulic assessments of systems they installed. This is done to better understand the performance of systems installed, how their performance compares to design assumptions / can inform future designs, and to provide guidance on maintenance intervals and how frequency impacts system performance. The EPD commissioned Geosyntec to monitor the aforementioned system for an approximate 1-year period. The system was evaluated for TN and TP reduction, hydraulic performance, and debris collection rates. Autosamplers were used to characterize the inflow to the NSBB, the inflow to the upflow filter, and outflow from the system. Additionally, debris removed from the NSBB during maintenance events were also sampled and the TN and TP removed due to these activities quantified. This talk will present some design and construction issues encountered as well as the results of the performance assessment. Additionally, some lessons learned as a result of this assessment and recommendations for future designs will be presented.

Requested CEU: 1.0

Length of Presentation: 50 minutes

Speaker1: Mike Hardin

Speaker 1 Bio: Dr. Hardin is a graduate from the University of Central Florida (UCF) and is a licensed professional engineer (PE). To support projects at Geosyntec, Mike performs watershed assessments, develops water-quality master plans, conducts hydrologic and hydraulic modeling and water quality monitoring, and provides stormwater quality enhancement designs. He samples stormwater (with grab and flow-weighted sampling), assesses surface water sediment, evaluates the water quality performance of BMP practices, and optimizes nonstructural BMPs for water quality improvement. In addition, he provides GIS data analysis, conducts microbial source tracking, and conducts surface water hydrologic studies and nutrient budget studies.

Speaker 1 Engineering Licensure: PE , Speaker 1 Degree: Ph.D.

Speaker 2: Kevin Tyre

Speaker 2 Bio: Mr. Tyre is a water resources scientist with Geosyntec Consultants with expertise in water quality and harmful algal bloom research. He specializes in surface water and microbial source tracking studies to address water quality challenges related to excess nutrient loading and bacterial contamination. His work involves source identification of nutrients, bacteria, and other surface water contaminants using stable isotopes and chemical/molecular tracers. He also has expertise in field sampling and monitoring to assess BMP performance. He has a Master's of Science in Environmental Science and a Bachelor's of Science in Marine Science from Florida Gulf Coast University.

Speaker 2 Engineering Licensure: N/A, Speaker 2 Degree: MS

Presentation 7: Get the Most BAM for Your Buck! A New Treatment Train Design for Achieving Additional Phosphorus & Nitrogen Removal Beyond A Traditional Biosorption Activated Media System

Description: Phosphorus and nitrogen are the typical limiting nutrients regulating algal growth in aquatic systems and their removal is a common goal for stormwater best management practices (BMPs). Biosorption activated media (BAM) filters are designed to remove nitrogen, phosphorus, and other pollutants commonly found in stormwater via physical filtration, sorption, and biological processes. Traditionally, BAM filters are the last step in a treatment train. However, recent studies have demonstrated that upflow BAM filters intermittently discharge significant amounts of organic phosphorus associated with biofilm sloughing off the media. Inclusion of sloughed biomass capture via sedimentation treatment downstream of the upflow BAM filter could significantly increase the overall phosphorus and nitrogen removal efficiencies of the system compared to just a BAM filter. This is similar to wastewater treatment trickling filters, which are typically followed by a secondary clarifier to capture sloughed biomass. The intermittent discharge of sloughed biofilm is difficult to monitor, and its influence may not be considered in the accepted removal efficiencies of currently implemented BAM varieties, potentially resulting in overestimated removal performances. A novel treatment train design that includes a BAM filter followed by biomass capture via sedimentation, analogous to a wastewater plant secondary clarifier, is proposed. The proposed treatment train is ideal for the retrofit of existing wet detention ponds, as it accomplishes sloughed biomass sedimentation in the same footprint as the existing pond with negligible impact on the average annual hydraulic detention time of the existing wet detention pond.

Requested CEU: 0.5

Length of Presentation: 30 minutes

Speaker: Andrew Hood

Speaker Bio: Dr. Andrew Hood, PhD, EI, is with WSP's Altamonte Springs office. He has over 8 years of consulting experience and specializes in stormwater nutrient BMPs, especially those utilizing biosorption activated media, also known as BAM filters. In addition to consulting experience, his Dissertation focused on Up-flow BAM filters and his Thesis focused on Downflow BAM filters. He obtained his doctorate in Civil Engineering from UCF.

Speaker Engineering Licensure: EI

Speaker Degree: Ph.D.

Presentation 8: Flood Protection in the St. Johns River Water Management District

Description: While Hurricane Ian made landfall on the southwest coast of Florida, it also had significant impacts for Central Florida. This presentation will focus on the record amounts of rainfall in Central Florida and the impacts of that rainfall on both the St. Johns River and its tributaries. District staff used data gathered from a variety of resources to conduct their analysis, including District-owned gauges, NOAA and the National Weather Service. Additionally, the presentation will describe the St. Johns River Water Management District's flood protection strategies, including both structural and non-structural elements, like wetlands.

Requested CEU: 0.5

Length of Presentation: 30 minutes

Speaker: Mary Ellen Winkler

Speaker Bio: Mary Ellen Winkler is the Assistant Executive Director with the St. Johns River Water Management District. In this role, she oversees the work of the District's Division of Water and Land Resources, Division of Projects and Real Estate Services.

Ms. Winkler has been with the District since 1999 and most recently served as General Counsel. Prior to that, she served as an Assistant, Senior Assistant and Deputy General Counsel. During her time with the District, she has received several awards for her service to the agency. While with the Office of General Counsel, her primary areas of practice have included consumptive use and environmental resource permitting, minimum flows and levels and water supply planning. Ms. Winkler has also represented the District in numerous cases before the State of Florida Division of Administrative Hearings.

A native of Brevard County in Florida's Space Coast, Ms. Winkler graduated with high honors from the University of Florida College of Law where she was awarded the Order of the Coif and Order of the Barrister. She previously graduated summa cum laude with a Bachelor of Science in Engineering from the University of Central Florida and also earned a Master of Engineering in Environmental Engineering from the University of Florida where she was a U.S. Department of Energy Applied Health Physics Fellow.

Speaker Engineering Licensure: N/A

Speaker Degree: BSE, MEEE