Indian River Lagoon SWIL Model Update Technical Meeting
Webinar Summary
Thursday, March 23, 2023
10:00 am – 11:41 am

Participants

Carolina Alvarez, Brevard County
Cassondra Armstrong, SFWMD
Vanessa Arnal, Brevard County
Jana Ash, RES
Aleah Ataman, Brevard County
Christian Avila, SFWMD
Matthew Berbig, Citizen
Steven Baker, Space Force
Lisa Bally, RES
Peter Barile, Citizen
Virginia Barker, Brevard County
Venetia Barnes, City of Ft. Pierce
Sebastian Barragan, RES
Terri Breeden, Brevard County
Ann Broadwell, FDOT
Stacy Burke, Volusia County
Graham Cox, Citizen
Scott Calleson, FWS
Timothy Carlisle, City of Cape Canaveral
Danessa Chambers, City of Vero Beach
Eric Charest, Indian River County
Mike Conner, Citizen
Kathy Copeland, Indian River County
Steve Crawford, Lake County Water Authority
Andrea Crumpacker, Stantec
Sara Davis, DEP
Tim Denison, Johnson Engineering
Kayleigh Douglass, Applied Ecology, Inc.
Doug Durham, NASA
Christine Eastwick, FWS
Bill Eggers, Evans Properties
James Einloth, Citizen
Yesenia Escribano, FDACS
Aubrey Frye, SFWMD
Chris Fagerstrom, Pond & Company
Jennifer Ferngren, FDOT
Sabrina Fischer, DEP
Gary Franklin, St Lucie County
Cristina Gauthier, SFWMD
Beth Gibson, Planning Solutions Corp
Joe Gilio, Citizen
Avery Gillett, Citizen
Tiffany Grantham, Citizen
Mitchell Griffin, Jacobs
Martha Guyas, American Sport Fishing Association
Samuel Hankinson, DEP
Kenneth Hayman, DEP
Janet Hearn, ATM
Hannah Herrero, Citizen
Charlie Hoey, DEP
Robin Holland, FDACS
Geraldine Hurley, AECOM
Jeff Iudicello, SFWMD
Charles Jacoby, SJRWMD
Megan Jacoby, SFWMD
Paul Julian, Everglades Foundation
Elizabeth Kelly, Martin County
Juli LaRock, SFWMD
Monique Laham-Pass, SFWMD
Jim Lappert, St. Lucie County
Margie Lasi, SJRWMD
Ivette Leiva, FDOT
Ben Lewis, FRWA
Esteban Lopez, RES
Kenneth Ludwa, BSE Consultants, Inc.
Ricky Ly, Jacobs
Jonathan Madden, SFWMD
Amanda McDonald, SFWMD
Michael Mccabe, Melbourne Tillman
Matthew Mitts, City of Vero Beach
Michelle Moore, NASA
Nicole Morgan, DEP
Abigail Morgan, City of Cocoa
Lori Morris, SJRWMD
Anita Nash, DEP
Rick Nipper, Melbourne Tillman
Jarek Nowak, FDACS
Keegan OBrien, MSE Group
Stacey Ollis, SFWMD

Steffany Olson, SFWMD
Judy Orcutt, Citizen
Joshua Papacek, SJRWMD
Melanie Parker, SJRWMD
Roy Pence, Citizen
Jon Perry, Janicki Environmental
Nicolas Pisarello, ATM
Elon Poole, City of Rockledge
Allyson Reinert, DEP
Rhonda Roff, Citizen
Fränk Rohrer, Citizen
John Roller, Citizen
Jennifer Sikes, RES
Jordan Skaggs, DEP
Eric Smith, City of Daytona Beach
Dani Straub, City of Melbourne
Janelle Strong, DEP
Mary Szoka, RES
David Taylor, DEP
Jose Vega, Indian River County
Charlie Venuto, Citizen
Wendy Werner, Citizen
Terry Williamson, Brevard County
Kelly Young, Volusia County
Jessica Fetgatter, DEP

The webinar recording and supporting materials are posted to the Florida Department of Environmental Protection (DEP) file transfer protocol (FTP) site at http://publicfiles.dep.state.fl.us/DEAR/BMAP/Caloosahatchee/Meetings/2023_03_17_Annual_Meeting/

Questions and Answers

Question on the DEP presentation: The natural background run currently optional appears to be essential to differentiate natural from man-made sources of pollutant nutrients into IRL.
Answer from Diana Turner, DEP: We do intend to have Applied Ecology complete the natural background run.

Question the Applied Ecology presentation: Is the SWIL model overestimating or underestimating nutrient loading based on observed nutrient concentrations in the water?
Answer from Claudia Listopad, Applied Ecology: In some basins the model overestimates and in other basins it underestimates, however there is not a consistent pattern across the basins. The model is a very good fit for some basins and poorer fit for others. The outcomes are very calibration basin dependent. The model would be easier to calibrate if the pattern were consistent. Some of the fits did not result in EMCs that appear reasonable, such as natural and urban areas. We would expect urban EMCs to have higher load outputs in most cases than natural once optimized to the measured data, when this is flipflopped or values are close to one another, it gives us an idea that something in the model inputs may be impacting the outcome.

Question the Applied Ecology presentation: If water quality data from extreme events like tropical systems are removed for calibration, will the model still be able to accurately predict those loading events which may represent a large portion of the annual external surface loads in those basins?
Answer from Claudia Listopad, Applied Ecology: We were selective in looking at these events. Only hurricane events attributed to high flow were removed from the calibration to provide better optimization. The model still predicts loads for these events. Optimization generally provides some assurance that the aggregated values are not being overestimated because of these uncommon and large volume events.

Question the Applied Ecology presentation: How different are the concentrations of nutrients in septic areas compared to sewer areas? What is the risk of using one EMC for baseflow from developed areas?

Answer from Claudia Listopad, Applied Ecology: They are very different and likely a source of the challenges to calibrate the subsurface flow water quality module. Use of two EMCs compared to one in the subsurface flow module gives a higher resolution to the model and with that additional complexity may make it more challenging to calibrate.

Question the Applied Ecology presentation: Is loading from reclaimed water application going to be factored into the SWIL model at any point?
Answer from Stacy Cecil, DEP: The intent is to acquire that data and see if it is able to be included in the model in a future iteration. At this time this is not included implicitly in the model. It is possible that while we have not received measured data directly from stakeholders about their reclaim projects, that the projects are captured in the sampling data in general.

Question the Applied Ecology presentation: I noticed the annual NSE did not change in the updated model, can you speak to why that may be? Are there plans to adjust the model to capture more of those higher peaks?
Answer from Claudia Listopad, Applied Ecology: The annual NSE value in the presentation does not show as an aggregate. This will be available in the final report for the hydrological calibration. The model resolution is not fine enough to show the impact of every static structure, like a wire or gate, in the lagoon, but this may have an impact on those metrics.

Question the Applied Ecology presentation: Are the different literature values that are being considered for changing the DRO EMCs based on studies in FL or are they from elsewhere? Is the sample size more or less robust?
Answer from Stacy Cecil, DEP: Yes, majority of the literature values used in the review come directly from Florida. You can review the tables we collected here: http://publicfiles.dep.state.fl.us/DEAR/BMAP/IndianRiverLagoon/Models/SWIL/SWIL_Updates_2021-23/2021%20Data%20Requests%20&%20Submissions/PrimaryDataRequestSubmittals/FDACS.zip
Answer from Claudia Listopad, Applied Ecology: Some of this review was performed by the St. Johns Water Management District (SJRWMD). Multi-year studies are the best, studies with only one data point were typically thrown out of the analysis. Most studies still do focus on natural land EMCs, wither wetland or upland, instead primary focus is on urban conditions.

Question the Applied Ecology presentation: Why is the WHAT separation based on 75-85%?
Answer from Claudia Listopad, Applied Ecology: This is a typical range in baseflow models. The range describes the mixing of subsurface flow and flow from direct runoff. While 75% is a general value used, the model could be tightened to 85%, however you begin to lose the number of samples when you narrow the mixing layer by that amount. We looked at both options for optimization to determine model fit which was consistent with the hydrological optimization for the SWIL version 4.