

Beck, Marcus

From: Hagy, Jim
Sent: Thursday, September 25, 2014 11:09 AM
To: Wellendorf, Nijole
Cc: Beck, Marcus
Subject: RE: The Holy Grail of Depth Targets

Hi Nia –

My post-doc Marcus Beck and I are working on an analysis that I think you will find extremely interesting and, once fully developed, possibly transformative with respect to defining water quality criteria based on seagrass distributions. I would say that the central feature of the analysis is that it dispenses with the idea that depth of colonization is constant within WBIDs and replaces it with the idea that it's more likely that while light requirements are relatively constant, (1) water quality may be more variable and (2) not all locations in a WBID necessarily have a "deep water edge." We can likely even resolve spatial patterns in light requirements if we have sufficient secchi depth or other light attenuation data.

If we can resolve WHERE seagrasses are actually growing at light-limited edges, and recognize what water quality needs to be AT THOSE LOCATIONS, we can come up with much better approaches to managing water quality in some challenging areas. In the case of the segment in question, it's likely that the depth of colonization (3.6 m as I recall) largely applies at the fringes of the segment. If so, water clarity should be assessed to that depth target in those areas, not everywhere. At other locations closer to land, seagrasses are growing in shallower water and water clarity requirements could be less stringent. A "compliance points" approach similar to what was developed for the Fenholloway SSAC might be the best way to approach this. Marcus is developing a tool that makes it possible to visualize these patterns in ways we've never seen.

Perhaps you need to make an immediate decision for the rule, but even after you've done so, I think continuing to evolve our approach makes sense. If we could indulge you for a few minutes, Marcus and I would like to show you what we're cooking up once we get it far enough along. We might be there sometime next week.

- Jim

From: Wellendorf, Nijole [mailto:Nijole.Wellendorf@dep.state.fl.us]
Sent: Monday, September 22, 2014 2:00 PM
To: Hagy, Jim
Subject: RE: The Holy Grail of Depth Targets

Hi Jim,

Segment 0820 is interesting. On the north and south ends of the segment, there is seagrass to the deep edge of segment, but not in the middle where the river is. The chlorophylls are low, and human impact in the watershed is very low, so I think river color and freshwater are limiting growth there. Thanks for looking at this, and let me know what you find.

Best regards,

Nia Wellendorf
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From: Hagy, Jim [<mailto:Hagy.Jim@epa.gov>]
Sent: Thursday, September 18, 2014 11:59 AM
To: Wellendorf, Nijole
Subject: RE: The Holy Grail of Depth Targets

Hi Nia. I will get back to you today on this. Looking at the segments in question 0820 and 0821, it seems like 0821 would not have any target adjustment due to CDOM because %PAR due to CDOM attenuation is 25% which is greater than 20%. The slightly more complex question relates to 0820. Short answer is that I don't know for sure. I am suspecting that in the locations of the segment where depths approach Zc(Max), the CDOM is lower than the segment average (i.e., further offshore). The offshore segments likely have this issue more than estuarine segments. - Jim

From: Wellendorf, Nijole [<mailto:Nijole.Wellendorf@dep.state.fl.us>]
Sent: Wednesday, September 17, 2014 9:57 AM
To: Hagy, Jim
Subject: RE: The Holy Grail of Depth Targets

Hi Jim!

I hope all is well with you, and that you're working on fun and exciting new topics. Please allow me to pull you back into Florida Estuary NNC for a brief moment to help with one small detail in our current rulemaking...

We are working on the last of our estuary criteria, and I'm specifically working on the Big Bend segments. When you developed the seagrass colonization targets for the Big Bend segments, you didn't have enough color data to check to see if the CDOM correction was needed. For the Steinhatchee Offshore, we have quite a lot of color data that you didn't have access to when you did your analyses, and I'd like to see if you would have adjusted the depth target based on attenuation by color for that system. I found the spreadsheet you send me last year attached to the email below, and filled in some Steinhatchee information. Attached is your spreadsheet, with modified cells for Steinhatchee highlighted. I wasn't sure how you calculated the salinity, color, and secchi in columns C, D, and E, so I just inserted the long term average we had based on all of our data (including monthly data from 1997-2014). Then I copied your calculations in N, O, and P. Could you please review the results and let me know if we should go with the adjusted target? For Segment 820, the %lo due to CDOM is similar to the numbers for the Charlotte Harbor segments you adjusted, so I suspect we should use a revised depth target of 1.9 for that segment.

Please advise me as soon as possible, since we're on a rulemaking timeclock. Thank you for your guidance!!!

Nia

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From: Hagy, Jim [<mailto:Hagy.Jim@epa.gov>]
Sent: Friday, May 10, 2013 11:22 AM
To: Wellendorf, Nijole; Crawford, Tiffany
Subject: The Holy Grail of Depth Targets

Nia and Tiffany – This is the spreadsheet we’ve been wishing we had. I sent it to Tiffany on 1/18/2012. Some highlights are below.

- (1) There are only 3 segments listed where CDOM limited depth of colonization to less than the historical depth of colonization. They are all in the Charlotte Harbor system: the segments are 1104, 1106, and 1108.
- (2) Everywhere else, FDEP could use the depth targets from my manuscript, which uses either the same data, or better data than the numbers in the proposal. The manuscript is also more concisely documented.
- (3) My suggestion would be for FDEP to look at CDOM in the segments in Charlotte and make their own determination regarding the appropriate target considering the situation with CDOM. The Charlotte Harbor NEP could probably provide guidance.
- (4) The spreadsheet provides average CDOM by segment based on data from IWR40. $K_d(\text{CDOM}) = \text{CDOM} * 0.025$. Units are /m for $K_d(\text{CDOM})$ and PCU for CDOM. In some places there is not that much CDOM data, so the best estimate of CDOM in a segment is based on the relationship between salinity and CDOM in that estuary. That’s what column M is.

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