To: Storm, Linda[Storm.Linda@epa.gov]
From: Dean, Heather
Sent: Mon 6/12/2017 8:54:13 PM
Subject: RE: Can you help with technical/scientific definitions for marine "sub-tidal"

Any time!

From: Storm, Linda
Sent: Monday, June 12, 2017 11:32 AM
To: Dean, Heather <Dean.Heather@epa.gov>
Subject: RE: Can you help with technical/scientific definitions for marine "sub-tidal"

Thank you Heather! Good call, "the answer depends on the purpose of the question." My understanding (which I'm realizing needs more clarification on our ultimate purpose) is that we want to be able to have a scientifically based and consistent way for defining "intertidal" v. "subtidal" habitats. In our HCCC ILF Instrument's interim credit-debit tool we have 5 different habitat categories (that lump resources within these "umbrella" categories). These are: Intertidal Non-wetland, non-vegetated; Intertidal Non-wetland Vegetated; Subtidal Vegetated (eelgrass, kelp); Subtidal Non-vegetated; Marine riparian. We have an agreed upon definition for Marine Riparian area. The others we want a scientifically based approach to identifying the break from intertidal to subtidal. The ultimate goal would be to track these losses and to make decisions about compensatory mitigation, as well as more explicitly track the habitat loss trade-offs we are making.

I will let you know if the result of next HCCC ILF meeting they would be interested in pursuing identifying the lowest annual tide. Thanks for offering ☺!

Cheers,

Linda

Linda E. Storm, Aquatic Ecologist

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Email: storm.linda@epa.gov

From: Dean, Heather
Sent: Monday, June 12, 2017 8:20 AM
To: Storm, Linda <Storm.Linda@epa.gov>
Subject: RE: Can you help with technical/scientific definitions for marine "sub-tidal"

Hi, Linda.

Thanks for the vote of confidence. That said, since the focus of the interagency HTL workgroup was at the opposite end of the tide, I would beg to differ that it resulted in any expertise at the low end. I would say, however, that the "answer" depends on the purpose of the question. Cowardin defines "subtidal" as "permanently flooded with tidal water" (https://www.fws.gov/wetlands/documents/classwet/watermod.htm), which NWI goes on to identify as "continuously submerged substrate (i.e., below extreme low water)" (ELW; https://fwsprimary.wim.usgs.gov/decoders/wetlands.aspx). I think those are useful definitions insofar as they are simple and apply consistently wherever you are looking. However, although they are *accurate* (i.e., "permanent" or "continuous" inundation must never be exposed, so it must be below ELW), I personally think ELW is far too infrequent be a good ecological indicator. For example, at the Seattle tide station, ELW, which is -5.04', MLLW, occurred in 1916 (https://tidesandcurrents.noaa.gov/datums.html?id=9447130; note, the datums on this page reference to the station datum, & I converted them to reference to MLLW). Lowest Astronomical Tide (LAT), meanwhile, is -4.34', MLLW, & occurred in 1986. (At Union, on Hood Canal, LAT is -4.62', MLLW, & it also occurred in 1986). Using LAT would also raise the issue of the purpose of asking the question, because it, too, is relatively infrequent. (I don't know the frequency, since we analyzed only high tides, but for HAT, there weren't more than a handful of occurrences within the 19-year tidal epoch at any location.)

The other issue with using either ELW or HAT is that most tide stations don't report them; Union, for example, doesn't report ELW. (Bangor does report both, but something's off, because it has LAT lower than ELW, even though ELW occurred longer ago…?) (b)(5) [redacted]
(b)(5) Deliberative Process Privilege [redacted]

(b)(5) Deliberative Process Privilege
(b)(5) Deliberative [redacted] So, again, it depends on the reason for the question. Based on our work on HTL, I would say it is likely that the "lowest annual tide" would be very close to the LAT, but would occur much more frequently (e.g., up to a handful of times a year). Unless the purpose is to target a particular species or assemblage, that might be the best way to go. The downside of using it is that you would have to calculate it, because NOAA hasn't done so already. The upside is that it's easy to do, from data that's available from even more tide stations than is MLLW, & once it's done, annual updates are even easier (& quick). It's also fairly consistent with Cowardin & NWI (not an absolute match, but pretty close).

That's my two sense. Good luck!

BTW, if there is interest in pursuing lowest annual, I'd be happy to illustrate how to calculate it & updates thereto to whomever was interested.

From: Storm, Linda
Sent: Friday, June 09, 2017 11:05 AM
To: Dean, Heather <Dean.Heather@epa.gov>
Subject: Can you help with technical/scientific definitions for marine "sub-tidal"

Hi there – on the Hood Canal Coordinating Council In-Lieu-Fee program Interagency Review Team meeting today we identified a need to pull together definitions for marine "subtidal" habitat (best available science/technical references, and any state/federal regulatory definitions). (In the recent Navy's ILF Use plan they used -4feet MLLW as the demarcation between interidal and sub-tidal). I imagine there are different definitions depending on species considered or processes, and I'm not specifically aware of specific regulatory definitions

What I would love is if you have any technical references you can share, and if you are interested/will to help me out by compiling any information you may already have? I am thinking you are the most knowledgeable person in our agency on this topic given your work on the "HTL" issue MHHWM/HAT/HPT.

Whatever you can provide would be most helpful. We are wanting to discuss what resources we come up with at our next HCCC ILF meeting to be scheduled toward the end of July. The need is

so that we are classifying impacts consistently and with scientific backing in terms of addressing the compensatory mitigation requiremetns (and then the difficult potential trade-off decisions we will be making in the program).

I am completely swamped the next several weeks with deadlines so don't have time to do my own research on this topic myself.

Thanks,

Linda

Linda E. Storm, Aquatic Ecologist

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