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Delivered via Email to Avril.Wood-McGrath@FloridaDEP.gov

May 19, 2021

Re: *DRAFT Implementation of the Turbidity Criterion for the Protection of Coral Reef Resources*

Dear Ms. Wood-McGrath:

Thank you for the opportunity to comment on this *DRAFT Revised Turbidity Criterion*, as well as to the Florida Department of Environmental Protection (FDEP) for recognizing that the previous standards for turbidity did not adequately protect sensitive environments such as reefs and seagrasses. We applaud this effort to adopt a science-based standard to protect Florida's precious and imperiled coral reef ecosystem and support a more protective standard, such as the one proposed. We incorporate our prior November 2019 comment letter by reference here as well.

South Florida is home to the only nearshore barrier reef system in the continental United States. Reefs bring billions of dollars in sales and tens of thousands of jobs to South Florida. They also provide shelter, food, and breeding sites for commercially and recreationally valuable fish as well as coastal barriers from storms. Unfortunately, the reefs in Florida have declined by over 80 percent since the 1970s. Reefs face natural and anthropogenic threats, including climate change, warming oceans, water pollution, ocean acidification, coastal construction, and disease. The combination of these stressors has left our coral reefs in an urgent crisis.

The Port of Miami has experienced several dredging projects to accommodate Neo-Panamax cargo ships after expanding the Panama Canal. Dredging can be incredibly harmful to coral reef ecosystems due to the increase in sedimentation that occurs in its process. Sedimentation smothers these fragile ecosystems in layers of sand and leads them to their demise. Between 2013-2015, the U.S. Army Corps of Engineers (USACE) led a project to dredge the Port of Miami. It was initially predicted that sediment would not spread more than 150 meters from the



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dredged channel, it was later found that sediment spread several kilometers from the channel (FDEP, 2012; Cunning et al., 2019). These projects at the Port of Miami killed greater than 560,000 corals on the Florida Reef Tract by burying them in sediment over an area the size of 200 football fields (Cunning et al., 2019). Since this incident, the USACE has asked Congress to consider their plans to dredge in Port Everglades without implementing protective measures for coral reefs. While somewhat improved in the recent draft supplemental EIS, the proposal still underestimates the impact that sediment will have on the reef system found near Port Everglades, placing more species of corals at risk (U.S. Army Corps of Engineers, 2020). The new supplemental EIS also heavily relies on turbidity limits to protect coral reefs.

Implementation Guidance

We want to assert our strong support for the revision of the 29 NTU standard, as it is clearly insufficient to protect corals. We applaud the department for moving forward with a new, more protective standard. However, this is a non-numeric criterion. As such, the implementation of this standard is going to be crucial to its value. Yet, it appears that in this version of the standards, that the implementation document has been removed from consideration. It is very difficult to evaluate the standard without knowing the implementation.

For example, this standard could vary widely based on different baseline collection methods or compliance sample collection and associated calculations. If ranges are used to determine the baseline, a large fluctuation in values could be considered acceptable as “baseline”. At Port Everglades, where they monitored for a year without dredging, they found many anomalously high values (e.g., 180 NTU) at certain times. (See Port Everglades supplemental EIS at this link on page 121: <https://usace.contentdm.oclc.org/utis/getfile/collection/p16021coll7/id/16671>)

Several recommendations have been made to ensure the safety of coral reef ecosystems. This includes the need for more assurance that the sites chosen for ‘background’ turbidity measurements during project construction are comparable and representative as a control. There should be some requirement to demonstrate, pre-project, that candidate ‘background’ sites or areas will have the same turbidity at the same time of day as the construction sites.

There should be a protocol to stop construction activity in the event of unusually high background turbidity, such as during a prolonged rain event or after a large storm. Allowing dredging during these high background condition periods could result in turbidity levels far exceeding the ‘normal’ natural maximum values for a given area. Further increases due to construction could be particularly detrimental at these times. In other words, if the during-project background is exceeding the pre-project mean by some amount, dredging should not be allowed to proceed to avoid stressing the corals even more.

For pre-project baseline range establishment, we recommend that at least a year of pre-project samples are collected, one or even a few tidal cycles would be insufficient to serve as a baseline. We suggest that the establishment of baseline levels are undertaken with the same type of sediment as will be/is produced during dredging. For during-project baseline samples, a system must be implemented to ensure that baseline samples are taken in water that is entirely unaffected by the plume. Protocols for locating the appropriate place for a compliance sample should be addressed to ensure that projects remain protective. Further, we propose that alternative monitoring methods be adopted if dredging during nighttime is being undertaken. Therefore, we recommend also including turbidity monitoring at the seafloor in the standards, as that is where the coral resources are located. We recommend that specific qualifications are required for turbidity monitors, both before and during the project. We also recommend that third-party oversight of turbidity monitoring be implemented and/or improved, possibly also through drones or satellite methodology.

Turbidity Ranges as a standard

As far as the proposed non-numeric criteria, it is not clear what the biological rationale is for using the natural tidal range in turbidity as the allowable increase in turbidity, as it does not seem to meet the stated goal to "maintain the pre-project background turbidity magnitude, frequency, and duration." It could also mean that corals are experiencing widely different turbidity ranges even within the allowable range. For example, if pre-project turbidity ranges from 1 to 5 NTU (with a mean of 3 NTU), then allowable turbidity during a project under this criterion could range from 5 to 9 NTU (with a mean of 7 NTU). These levels, on average, are more than double, maybe even triple, the mean pre-project turbidity and could be maintained throughout the project, according to this criterion. Even if the interquartile range of historical data is used to establish the allowable increase, the limits may be slightly lower but could still result in values that greatly exceed pre-project levels. The real outcome for corals could be an allowable doubling, or much more, of background turbidity levels for the project duration.

Considering Coral Disease Risk

A May 5, 2021 presentation by Dr. Michael Studivan and Dr. Ian Enochs (NOAA AOML) given to the Disease Advisory Committee (led by NOAA) demonstrated the serious implications for sedimentation impacts and coral disease. The research does indicate that suspended sediments increase the rate of Stony Coral Tissue Loss Disease (SCTLD) spread significantly (Studivan & Enochs, 2021). The research (in prep) implicate suspended sediments as an STCLD vector. These findings should be incorporated into rulemaking literature reviews and considerations for protective standards.

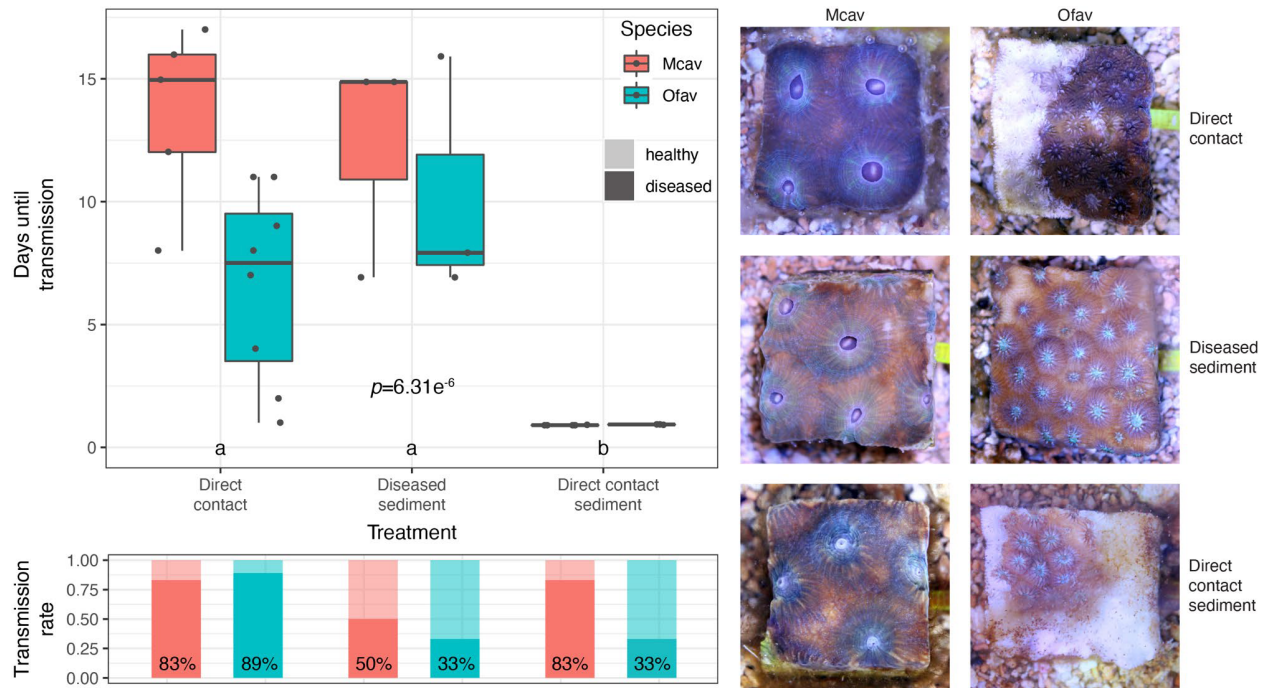


Figure 1. Slide 20 from Studivan and Enochs presentation (5 May 2021) to the Disease Advisory Committee) showing the increase in transmission times when corals were in direct contact with sediment.

Additional Literature Review

Finally, we recommend including additional literature in consideration of the impact of sediment on corals, including Cuning et al. 2019 and many others that have been submitted in previous comment letters. This was in our last comment on this rule as well, and we strongly encourage that these studies be incorporated into the review of protective standards for coral reefs.

Ricardo, G.F., Jones, R.J., Negri, A.P., Stocker, R., 2016. That sinking feeling: suspended sediments can prevent the ascent of coral egg bundles. *Sci. Rep.* 6, 21567.

Ricardo, G.F., Jones, R.J., Nordborg, M., Negri, A.P., 2017. Settlement patterns of the coral *Acropora millepora* on sediment-laden surfaces. *Sci. Total Environ.* 609, 277–288.

Philipp, E., Fabricius, K.E., 2003. Photophysiological stress in scleractinian corals in response to short-term sedimentation. *J. Exp. Mar. Biol. Ecol.* 287, 57–78.

Piniak, G.A., 2007. Effects of two sediment types on the fluorescence yield of two Hawaiian scleractinian corals. *Mar. Environ. Res.* 64, 456–468.

Babcock, R., Smith, L., et al., 2002. Effects of sedimentation on coral settlement and survivorship. In: *Proceedings of the Ninth International Coral Reef Symposium, Bali, 23–27 October 2000*, Citeseer, pp. 245–248.

Storlazzi, C.D., Norris, B.K., Rosenberger, K.J., 2015. The influence of grain size, grain color, and suspended-sediment concentration on light attenuation: why fine grained terrestrial sediment is bad for coral reef ecosystems. *Coral Reefs* 34, 967–975.

Weber, M., Lott, C., Fabricius, K.E., 2006. Sedimentation stress in a scleractinian coral exposed to terrestrial and marine sediments with contrasting physical, organic and geochemical properties. *J. Exp. Mar. Biol. Ecol.* 336, 18–32.

Junjie, R.K., Browne, N.K., Erftemeijer, P.L.A., Todd, P.A., 2014. Impacts of sediments on coral energetics: partitioning the effects of turbidity and settling particles. *PLoS One* 9, e107195.

Edmunds, P.J., Davies, P.S., 1989. An energy budget for *Porites porites* (Scleractinia), growing in a stressed environment. *Coral Reefs* 8, 37–43.

Thank you again for this opportunity to comment on this *DRAFT Revised Turbidity Criterion*. We greatly appreciate the effort to adopt standards that use science to protect our natural ecosystems, such as our imperiled coral reefs.

Sincerely,



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Literature Cited

Cunning, R., Silverstein, R. N., Barnes, B. B., & Baker, A. C. (2019). Extensive coral mortality and critical habitat loss following dredging and their association with remotely-sensed sediment plumes. *Marine pollution bulletin*, 145, 185-199.

Florida Department of Environmental Protection. (2012). Permit #0305721-001-BI. Retrieved from ftp://ftp.dep.state.fl.us/pub/ENV-PRMT/dade/issued/0305721_Miami_Harbor_Phase_III_Federal_Dredging/001-BI/Final%20Order/Miami%20Harbor%20Final%20Order%20052212.pdf.

Studivan, M., & Enochs, I. (2021, May 5). Can reef sediments act as a SCTLD vector? [Slides].

United States Army Corps of Engineers. (2020). Biological Assessment - Port Everglades Navigation Improvement Project.