

be calculated, as the pre-project baseline range is described with an unspecified number of measurements during tidal cycles and two different confidence intervals (upper 90% confidence interval of the mean difference between minimum and maximum turbidity for 3-4 pre-project tidal cycle measurements at surface and bottom; upper 95% confidence interval of the mean difference between minimum and maximum turbidity for 5 or more pre-project tidal cycle measurements at surface and bottom). With these two ranges, pre-project studies may not be conducted with an accurate number of samples to determine the natural variability of a site.

For pre-project baseline range establishment, we recommend that at least a year of pre-project samples are collected. This is particularly important to capture natural variability ranges through seasons, storms, tides, current flow changes, and other factors that might influence pre-project background levels, especially for long term construction projects that stretch across multiple seasons. At an absolute minimum, the pre-project conditions should reflect the proposed length of time of the construction project.

We support the inclusion of compliance samples taken during the project. For these samples, protocols for locating the appropriate sites should be addressed to ensure that projects remain protective of coral reef habitat. We recommend considering the use of drones or remote sensing to achieve this, as well as more third-party oversight of monitoring. For example, we published a [remote sensing paper](#) in 2015 about the Port Miami project's turbidity plumes. The lead author, Brian Barnes, has the capacity to translate remote sensing information into NTU levels given the proper calibrations based on location, sediment type, and in situ monitoring data. This is just one possible solution, and we are confident that more options exist to solve the issue of compliance samples.

We support the addition of the narrative that applies this standard to all waters, as well as the narrative for areas with corals, worm rock, and hardbottom communities. Assessment of natural levels of sedimentation and light levels so as not to impair normal growth, function, reproduction, or recruitment of aquatic life in all waters, as well as the limitation of turbidity beyond the natural range of background conditions in Florida Reef Tract areas is critical to the health of these ecosystems.

## **II. Consideration of Sediment Type and Other Factors in Dredging Sediment**

From the presentation at the Public Workshop, along with the Turbidity Implementation Document and the Turbidity Technical Support Document, it is unclear whether the sediment type and grain size will be required as part of the establishment of pre-construction background for permits. Section 1.4, Outstanding Florida Waters Considerations of the September 2019 version of the Turbidity Implementation Document mentions that the establishment of "natural background" may be based on paleolimnological examination of sediment cores or examination of geology and soils, but this does not seem to be required. We recommend that baseline levels are collected with the same type of sediment as will be/is produced during dredging. Sediment released by dredging activities can be different from naturally occurring sediment (Jones et al., 2016). Dredging sediment is often more fine-grained than natural coarse sediment, and these