MIAMI WATERKEEPER®

DEFENDING, PROTECTING, AND PRESERVING MIAMI AND THE SURROUNDING WATERS THROUGH CITIZENS INVOLVEMENT AND COMMUNITY ACTION. MIAMI WATERKEEPER WORKS TO ENSURE SWIMMABLE, DRINKABLE, FISHABLE WATER FOR ALL.

To Whom It May Concern:

My name is Rachel Silverstein and I am the Executive Director of Miami Waterkeeper, a non-profit organization focused on ecosystem protection, clean water, and sea level rise resiliency. I hold a B.A. in Evolution, Ecology and Environmental Biology from Columbia University, and I received a Ph.D. from the University of Miami's Rosenstiel School for Marine and Atmospheric Science, Department of Marine Biology and Fisheries. My dissertation focused on coral reef ecology. I write in order to share with you some lessons learned from the recent PortMiami expansion project, in which dredging occurred across the Florida reef tract and damaged vast areas of coral reef. During this project, I completed many dives on the impacted reefs, was a plaintiff in Endangered Species Act (ESA) litigation, and published two peer-reviewed scientific papers about the project and its impact. Despite promising only "temporary and significant" indirect impacts to the reef, actual impacts to the reef and corals far surpassed these predictions. It is my hope that in writing to share the lessons learned in the PortMiami project, the repetition of these costly mistakes and loss of vital economic and environmental resources can be prevented in the Cayman Islands.

Coral reefs provide billions of dollars of economic benefit to local communities and nationally, in addition to harboring diverse species and protecting coastlines from storm surge. Coral reef fish also provide key protein sources for coastal communities. However, coral reefs are also experiencing dramatic declines. In Florida, we have lost over 80% of our coral reef since the 1970s. Recent years have seen bleaching, harmful construction projects, and a regional disease outbreak that has killed an estimated tens of millions of corals and is still spreading. Urgent action is now needed to save what is left of our region's corals. This is particularly crucial when considering local factors such as dredging, which are easier to control to prevent damage to the corals that remain. In the past, it was believed that damaged reef would simply regrow. However, this is no longer the case, as today's corals face an onslaught of threats and stressors and are in a downward spiral.

Miami Waterkeeper
2103 Coral Way, 2nd Floor
Miami, FL 33145
305.905.0856
miamiwaterkeeper.org

In order to expand the Port of Miami shipping channel, the U.S. Federal agency tasked with building infrastructure, the United States Army Corps of Engineers (Army Corps), contracted a dredging company, Great Lakes Dredge and Dock, to deepen and widen the channel in the Port of Miami between 2013 and 2015. Initial environmental assessments promised little to no coral or habitat damage, with impacts only "temporary and insignificant" in the immediate 150m area around the construction project in the channel. By contrast, we now know that the dredging in Miami produced fine-grained sediment that stretched for over 20 kilometers from the site of the dredging and killed an estimated 560,000 corals (see Cunning et al. 2019). Coral scientists from the National Marine Fisheries Service (NMFS), another U.S. Federal agency tasked with protecting important habitat and species, determined that approximately 95% of the area that they surveyed post-dredging was no longer suitable habitat to support coral reproduction as a result of the dredging (April 2016 NMFS Sediment Assessment Report). In other words, habitat has been irreparably lost. When reef is buried in dredging sediment, which is often more lethal to corals because it is fine-grained and also is less likely to be naturally dispersed, there is really no practical way to remove the sediment over a large area and to restore the reef. Recovery after dredging projects is therefore severely limited.

Furthermore, in this project, surveys severely underestimated the amount of ESA-listed corals present before the dredging. This led to damage to even these highly protected species of corals, despite the strong legal protections afforded by U.S. laws including the ESA.

Adaptive management was proposed as a means to stop dredge work if environmental impacts exceeded allowable limits. However, adaptive management failed to correct project issues that arose during construction and was rarely, if ever, implemented effectively. The Army Corps also failed to heed warning letters from the Florida Department of Environmental Protection (FDEP), the Environmental Protection Agency (EPA), or the National Oceanic and Atmospheric Administration (NOAA) about environmental impacts and violations or to make the necessary changes or enforcement. Therefore, Great Lakes Dredge and Dock was able to continue dredging unabated, despite clear data showing major, and unpredicted, impacts to area corals.

In the Miami project, there were also major issues regarding how the coral condition and other impacts were monitored. The environmental monitoring contractors, Dial Cordy and Associates, were subcontractors of Great Lakes, and the reports that they produced were heavily skewed to try to minimize the apparent impact to area reefs. The environmental contractors' final report said that only 6 corals were killed at the end of the dredging project. It took over a year for my two co-authors and I to untangle the mess of raw data (much of which was provided in PDF format, in different versions, or with single datapoints that had to be extracted from 1000+ individual folders) and to reanalyze it in statistically valid ways to determine the actual extent of the dredging-related impacts. We discovered that over 560,000 corals were lost due to dredging. This work was published in the journal *Marine Pollution Bulletin* (Cunning et al. 2019).

Coral relocation is being presented in the Cayman Islands project as mitigation. In Miami, corals protected under the ESA were relocated outside of what was considered to be the area of impact. Since the actual impact was so much larger than anticipated, however, the relocated corals were still within the area of impact and were therefore also damaged.

While coral restoration science has made many wonderful advances and is providing hope for a disappearing ecosystem, it is still a long way from working effectively at a large scale. Mitigation may appear to be an alluring solution to an inconvenient problem, in practice, this remains a quixotic fantasy. It is still almost impossible to achieve a fully diverse, robust reef restoration that could be considered even a 1:1 replacement for a natural reef. It is in no way a "net benefit" for a destroyed natural reef. Considering the sheer number and size of corals in the predicted area of impact, relocating all of the corals in the area is an undertaking unparalleled.

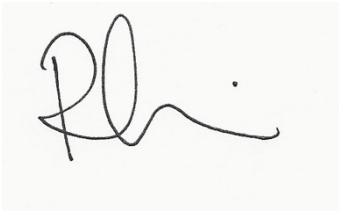
Furthermore, even if total coral relocation or mitigation was attempted, considerations must be made for catastrophic events such as bleaching, disease (such as the devastating outbreak occurring presently), hurricanes, and more. How will success of the proposed mitigation be measured? Who will be held accountable for the relative success/failure of the project? For how long will the coral be monitored? Are cost estimates being realistically considered? Mitigation for unpermitted impacts was also promised in the Miami project, but it has now been 4 years since the project in Miami ended, and no formal impact assessment or mitigation plan have yet been produced. Instead, the agencies are now moving on to permitting new dredging projects around coral reefs, and Miami's reef has been left in rubble.

In order for the Cayman Islands to learn from what went wrong during Miami's dredging project, we encourage decision-makers, the public, and scientists to ask the following questions long before any project plans are executed:

- Who is accountable if there is more damage than anticipated? Or if the mitigation fails? For example, Miami-Dade County was responsible for any unanticipated damage, not the dredging contractors. This created a moral hazard problem and a lack of accountability on the part of the contractors.
- Are there clear ways to measure the impact as the project is underway, with clear shut-down requirements if certain thresholds are being passed? Also, how will these be enforced? Are government agencies sufficiently empowered to stop impacts should they be detected? Will the data about the project be made public in a timely and transparent way? In Miami, civil society and federal and state agencies often didn't get the reports on the impacts were heavily biased or only provided weeks or months later, and by then it was too late to prevent the impacts.

Considering with the rapid decline of coral reefs worldwide, and the deadly coral disease currently ravaging the region, it is crucial to save every coral possible and to preserve still-healthy reefs from certain destruction. This ecosystem is too precious economically and environmentally to contemplate damage of this scale. Coral reefs, as living ecosystems, have an intrinsic value to nations and communities, and we urge the Cayman Islands to properly incorporate the true cost of lost reefs into their planning decisions. We hope that the Cayman Islands can learn from the tragedy that we experienced in Miami and that we can, collectively, work to protect our irreplaceable coral reef ecosystems.

Sincerely,



Rachel Silverstein, Ph.D.
Executive Director and Waterkeeper
Miami Waterkeeper
Rachel@miamiwaterkeeper.org

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(December 2018), 185–199. https://doi.org/10.1016/j.marpolbul.2019.05.027

National Marine Fisheries Service, 12 April 2016. "Examination of Sedimentation Impacts to Coral Reef along the Port of Miami Entrance Channel, December 2015".