Progress Report Surfrider Foundation Rincón

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Performance Period: June 1, 2019 – November 30, 2019

LONG-TERM GOALS

To continue weekly monitoring and testing of various recreational beach sites in northwestern PR for water quality (WQ) assessment by detection of levels of fecal bacteria contamination using quantified EPA-approved technology under our Blue Water Task Force (BWTF) program. To expand BWTF coverage into southwestern PR coastline, as volunteer time and finances permit. To continue to acquire the most sensitive WQ parameter detection equipment to augment and assist in WQ assessment, and research capacity. To continue to explore additional internet or social media platforms for the dissemination of this data, and provide CariCOOS with a larger audience / user base, including installing physical infrastructure (signage) at BWTF sites to inform beach users of the WQ testing and direct them to the latest testing results of that site via posting of Surfrider Rincón and CariCOOOS websites adresses and the use of QR code to track traffic to those sites in collaboration with Princeton University.

NOTE: At the time of submitting this report, (Dec 12) the last public notification provided by the beach monitoring program now under the Department of Natural and Environmental Resources of PR was on Oct 31, and the last full monitoring effort was Oct 21-23. Since that date, the only beach water quality information being provided to the public has been generated by the BWTF Rincón / CariCOOS program. It is anticipated that similar significant lapses of the DNER program will continue for the foreseeable future, making the BWTF increasingly valuable as a resource and reference to residents and tourists regarding beach water quality issues.
Should this occur, it may well be of benefit for CariCOOS to assign student teams to conduct sampling of popular beach sites in southwestern PR, under supervision of the Rincón BWTF?

MILESTONES / OBJECTIVES

Successful weekly sampling and testing of the 13 sites within the core BWTF Rincón program (Aguada and Rincón), and subsequent publication of that data, for 100% of scheduled sampling dates (n=25). Sampling and testing of the two Añasco sites (Parque Vacacional and Balneario Tres Hermanos) accomplished 75% of testing dates. Sampling and testing of the Rescate Playas Isabela / Ramey School satellite program sites accomplished 90% of available testing dates (n= 12, determined by Ramey School lab facilities being available during academic calendar)

Additional to the standard BWTF monitoring, the 'abandoned' beach site at Corcega (due to the fact that the beach is completely gone, eroded down to bedrock during Hurricane Maria, and thus sees no public use any more) continues to be monitored once a month to keep that site active on the national BWTF database and for general research comparison purposes. A minor

transect was also conducted there on Aug 11 to determine if an adjacent overflowing sewer gravity line access port was affecting marine water quality (only minimal bacteria levels were detected).

WORK COMPLETED

In addition to the BWTF performance, 2 outreach and education activities were conducted by Surfrider Foundation Rincón, and three general meetings (open to the public) were held – a significant focus of these activities was explanation and discussion of the BWTF and CariCOOS services in regards to public health advisories, recreational water use, commercial and private boat navigational aids, and protection of valuable marine resources and coral reef health and environmental protection of the general marine environment. These informational resources were also outlined as a publicly available research tool and reference resource.

In September a pilot project was initiated to install permanent signage at sites within the BWTF / CariCOOS Special Study Area (coastal reaches of the Reserva Marina Tres Palmas southwards past the Rincón Balneario to Playa Lala) in collaboration with a student group from Princeton University. The purpose of the signs is to inform the beach going public of the BWTF Rincón program, and includes the internet link addresses of both the BWTF database for that site, as well as the CariCOOS main web page. QR codes have been generated for each site for scanning by mobile devices and the Princeton team is using those codes to track traffic per sign. To date 2 such signs have been located at Playa Lala, 4 at the Balneario, 2 at Steps Beach, and one each at Marias and Domes Beach, with costs paid out of general chapter funds.

MAJOR OUTCOMES

A unique phenomenon was documented during this report period, the detection of a persistent pseudo point-source contamination event at Steps Beach in the Reserva Marina Tres Palmas at the end of June, of approximately 8 days duration. During that time the BWTF was able to conduct two additional sampling transects within the SSA attempting to pin point the source of the bacteria, and the result of those tests indicated the source or cause was extremely restricted, within an approximately 10 meter extent of beach at the Steps Beach sampling station – thus behaving as a classic point source of contamination (eg. Broken sewage line). However no such source could be located, rainfall was negligible during this period, and no other possible factors could be documented despite an intensive field survey of the surrounding area. By elimination it was hypothesized that the marine water table was saturating the subsurface sand level, allowing transport of terrestrial bacteria dwelling in the moist swale of the adjacent mangroves through the saturated layer into the ocean. However, the contamination source dissipated before that theory could be tested by digging transect holes in the sand down to the water table. But this event was unique in the twelve year history of the BWTF both for the duration of high bacterial levels at the Steps site in isolation (with no other adjacent or nearby sites demonstrating similarly high bacterial counts), and the ability to document an extremely localized water quality problem.

Lesson Learned: Should a similar contamination event reoccur within the RMTP, the BWTF should conduct transects in the opposite manner to the traditional design of an initial large scale area narrowing to a focus, and instead begin with small scale sampling expanding to a larger area. Also, sand hole transects should be considered as an initial response, instead of as a final alternative, depending on the location of the detected problem.

RELATED PROJECTS

None

WORK PLAN FOR UPCOMING PERFORMANCE PERIOD (June 1, 2019 – November 30, 2019)

To maintain the standard weekly BWTF sampling and continue to support the Rescate Playas Isabela / Ramey School satellite program, using the IDEXX equipment and methodology.

To continue to conduct additional testing of the Rincón Balnerio site as frequently as practicable, to provide additional data for the continued refining and comparison purposes of the experimental CariCOOS nowcasting modeling of that site.

To continue investigate and test alternative bacterial detection techniques, especially those that require minimal equipment, microbiological lab experience, and/or electric power (as part of our resiliency and disaster preparedness effort) that is more suitable for use by the general public.

To continue installing permanent signage at BWTF sampling sites, to make the beach going public aware of the water quality program and provide them with the website links and other digital addresses so that they can verify the latest WQ results at that particular site in as user-friendly manner as possible. Of course this is also a method of outreach and education for both Surfrider Rincón and CariCOOS, and possibly traffic analysis tools will provide a future basis for an 'effectiveness' or outreach rating, or perhaps as a way to document public beach use patterns.

A collaborative field trial and testing of a rapid fecal indicator bacteria detection technique is currently scheduled for February 2020 with Dr. David Arnold and students of the University of Florida, funded by PR Sea Grant under the Biennial Marine and Coastal Applied Research Competition 2020-2022. Chapter members will accompany the UFL team to a variety of natural water bodies (marine, freshwater, and potable) to learn how this portable equipment is deployed and operated, and will conduct parallel sampling to verify subsequent bacterial counts using our IDEXX equipment and lab resources. Preliminary plans are being made to arrange presentations of this new technique both to academic groups and the general public, and perhaps other water quality awareness events.

Preliminary discussions have been made with Dr. Ruth Randall of the University of Michigan concerning a similar collaborative field trial and testing of another form of rapid FIB detection, using a completely different technique from the UFL collaboration. At this time, the UM collaboration is scheduled to be conducted late April or early May 2020 and would be designed and conducted in a similar manner as the UFL collaboration, with a specific community outreach component.