

FLORIDA KEYS NATIONAL MARINE SANCTUARY
Water Quality Protection Program Steering Committee Meeting

July 30, 2024

DRAFT MINUTES

Steering Committee Members Present

Wade Lehmann, US Environmental Protection Agency (EPA), Region 4 (Chair)
Kim Shugar, Florida Department of Environmental Protection (DEP) (Co-Chair)
Sarah Fangman, Florida Keys National Marine Sanctuary (FKNMS)
Meagan Schrandt, National Park Service (NPS)
Greg Boling, Florida Keys National Wildlife Refuges Complex (FKNWR)
Gil McRae, Florida Fish and Wildlife Conservation Commission (FWC)
Sue Heim, Key Largo Wastewater Treatment District (KLWTD)
Andrea Leal, Florida Keys Mosquito Control District (FKMCD)
George Garrett, City of Marathon
Kelly Cox, FKNMS Sanctuary Advisory Council (SAC)
Chris Bergh, Florida Keys Program, The Nature Conservancy (TNC)
Sandy Walters, Resource Environmental Solutions
Shelly Krueger, Florida Sea Grant/IFAS Extension Monroe County
Patience Cohn, Marine Industries Association of South Florida (MASTF)

Summary of Resolutions

- **Motion 1 (passed)**: George Garrett made a motion to approve the agenda. Sandy Walters seconded the motion. The motion passed with no objections or changes.
- **Motion 2 (passed)**: George Garrett made a motion to approve the March 7, 2024 meeting minutes. Patience Cohn seconded the motion. The motion passed with no objections.
- **Motion 3 (passed)**: Chris Bergh made a motion to establish the WQPP Communications Subcommittee as described in this meeting. This should be established with a two-year timeframe, then revisited to determine if anything needs to be changed, or if it should be sunsetted or extended. Gil McRae and George Garrett seconded the motion. The motion passed with no objections.

Other Action Items:

- The WQPP co-chairs and staff will follow-up with Brenda Calvante, USACE, regarding the named representative to the U.S. Army Corps of Engineers seat on the WQPP Steering Committee.
- Share the link for Lee Kump's publication on the shallow well investigation in Marathon: *The Efficiency of Phosphate Removal via Shallow Wastewater Injection into a Saline Carbonate Aquifer*, available at: <https://pubs.acs.org/doi/10.1021/acsestwater.4c00407>.

I. Introduction and Opening Remarks

Kim Shugar, Division of Ecosystem Assessment and Restoration (DEAR) Director, FDEP, called the meeting to order and welcomed everyone. Wade Lehmann, Ocean and Estuarine Section Chief, EPA Region 4, and Ms. Shugar are the meeting co-chairs.

Steering committee members in attendance were recognized.

Karen Bohnsack introduced the virtual meeting format and instructions for attendee participation. The presentations and materials associated with the meeting will be available at the steering committee page on the Water Quality Protection Program website http://ocean.floridamarine.org/FKNMS_WQPP/.

Ms. Shugar introduced herself and gave the opening remarks on behalf of FDEP. Thanks for joining this meeting. We also appreciate the presenters for taking the time to provide updates. We have a few new Steering Committee members joining us today, and quite a few TAC and Management Committee members in attendance. Ms. Shugar reviewed the voting procedures on the webinar: generally, when voting in this virtual format, yes is implied unless a “no” or abstention is voiced verbally or in the question box.

Mr. Lehmann gave the opening remarks on behalf of EPA. Thanks for participating in today’s meeting; it is the members who make the WQPP function. Thank you also to those behind the scenes who are instrumental in pulling these meetings together. EPA continues to focus on climate resilience needs, green infrastructure, and environmental justice in addition to water quality. The South Florida Program. Notice of Funding Opportunity closed last night (July 29th) at midnight to about 40 applications. Those will be reviewed in the coming weeks. Any questions, please reach out.

Agenda and Minutes

Ms. Shugar reviewed the agenda and minutes and requested edits or a vote to approve from the Steering Committee. George Garrett made the motion to approve the agenda; Sandy Walters seconded. The agenda was approved with no changes. George Garrett made the motion to approve the minutes from the March 7, 2024 meeting; Patience Cohn seconded. The agenda was approved with no changes. The minutes passed with no objections.

II. WQPP Administrative Updates: Bylaws and Membership

Karen Bohnsack, FKNMS, provided an overview of the WQPP Steering Committee Bylaws. These were last reviewed in November 2021, at which point the committee voted on a series of updates to modernize the bylaws as the previous version of that document was adopted in 1996. Per the amended bylaws, these are due to be reviewed by the Steering Committee every three years to reaffirm participation and continued commitment to the implementation of the WQPP. The full text of the current [WQPP Bylaws](#) are available on the WQPP website. While no edits are currently proposed for this document, the Steering Committee is welcome to suggest updates, which would be provided in writing and brought to a formal vote and a future meeting.

The WQPP steering committee operates under bylaws that dictate the basic rules for how the program is organized and operates. This document includes 13 sections, which were briefly summarized:

Background and Purpose: These two sections cover the general history behind the establishment of the WQPP and its purpose. The WQPP was established in 1990 by the Florida Keys National Marine Sanctuary and Protection Act (FKNMSPA), and in a 1992 amendment Congress provided additional direction on the implementation of WQPP, including establishing a Steering Committee. This section also

acknowledges the TAC and Management Committee as key supporting bodies of the WQPP. The purpose of the WQPP is to set guidance and policy for implementation of the program. This specifically references implementing the 4 central components of the program – corrective actions, monitoring, research/special studies and public education and outreach. The Steering Committee is also directed to help seek funding for the program.

Membership: This section identifies the specific agencies who are to have representatives on the Steering Committee, which includes federal and state agencies, local government and a minimum of three knowledgeable citizens, of which the Steering Committee currently has five. The FKNSMPA and the bylaws name EPA and DEP as the co-chairs for the committee; these representatives alternate between chairing the committee meetings. Ms. Bohnsack clarified terminology: membership represents the actual seat at the table, while the representative is who is actually named to that seat on behalf of the agency/organization. At any meeting, changes in representation can be made by the named SC representative upon written notification to one of the co-chairpersons. That designated representative will have full voting authority on behalf of the absent member. Additional seats/members may be added to the SC by a two-thirds affirmative vote of the Steering Committee.

Required Work Product and Meetings: The only specified required work product in the bylaws is the WQPP Congressional Report. However, the Steering Committee also is expected to attend meetings, which are held as necessary to carry out the WQPP and at least two times per year. While the bylaws only specify two meetings per year, the committee asked for three meetings per year, so we have tried to adhere to that request. Meetings can be called by the co-chairpersons or by a majority of the Steering Committee members, are held in the Florida Keys or remotely, and follow Roberts Rules of Order (which provide guidelines for conducting meetings and making decisions in an organized manner, including calling for a motion and second on any pending action). All meetings must be noticed to the public.

Quorum and Voting: Quorum has to do with attendance. Members are expected to attend all meetings and missing two or more consecutive meetings may result in a request to resign. At least 2/3 of members (determined by eligible, filled seats) must be present to achieve quorum, which is necessary for any vote or consensus decision to take place. The goal is to operate by consensus; however, a simple majority vote is sufficient for a resolution to pass if consensus cannot be reached. If requested by a Steering Committee member, individual votes and abstentions will be recorded in the minutes.

Staff Participation and Public Participation: Steering Committee members can invite staff to meetings to participate in discussions, but staff do not vote. All Steering Committee meetings are open to the public, with a portion of time allocated for public comment.

Agenda and Conflict of Interest: Co-chairpersons are responsible for the meeting agendas. In practice these are developed largely by the Management Committee first, with coordination and approval by the co-chairs. All members are welcome and encouraged to provide suggestions for meeting agenda topics. Agendas must be distributed one week prior to the meeting date, and members can add additional agenda items at the beginning of the meeting if approved by majority vote. Members must state potential conflicts of interest, and no members or staff should participate in discussions or votes on issues that would constitute or have the appearance of a conflict of interest.

Subcommittees can be established to carry out the purpose and responsibilities of the Steering Committee. These are advisory bodies which can include Steering Committee members and outside members. While subcommittee meetings are not subject to public notice or frequency requirements, they may seek public input as requested by the co-chairs or Steering Committee. Unless otherwise directed, subcommittee members are selected by a 2/3 affirmative vote of the Steering Committee members. The bylaws

recognize the TAC and Management Committees as standing subcommittees that are necessary to support WQPP implementation, and provide direction about membership on those bodies.

Adoption/Amendment of Bylaws: Finally, bylaws are adopted by affirmative vote of at least 2/3 of the Steering Committee. Amendments must be proposed in writing, noticed on a meeting agenda, and circulated 14 days in advance of the meeting.

Ms. Bohnsack also provided a brief update on recent membership changes and the importance of reengaging members with vacant or functionally vacant seats. First, Meagan Schrant was introduced as the new NPS representative to the committee. Ms. Schrandt further introduced herself. She recently joined Everglades National Park as a Marine Ecologist after having spent 7.5 years with FWRI's marine fisheries independent monitoring program. In her new role she will be leading and organizing collaborative science initiatives to facilitate restoration and management, primarily focused in Florida Bay, but also within South Florida as a whole. Karen welcomed Meagan and also thanked her predecessor in this seat, Tylan Dean, for his contributions over the past couple of years.

Ms. Bohnsack also recognized Charlie Causey, who stepped down from his Knowledgeable Citizen seat on the Steering Committee. Mr. Causey was one of the original members of the WQPP. He founded the Florida Keys Environmental Fund in the late 80s, and has been an avid champion for a healthy marine environment. His efforts were central to initiating research and restoration of corals, sponges, and seagrasses following the die-offs in Florida Bay.

Finally, Ms. Bohnsack flagged that there are currently a few vacancies on the Steering Committee, as well as seats that are functionally vacant because their named representatives do not participate in WQPP meetings. This is problematic as it has been a challenge to achieve quorum at meetings, which is necessary for the Steering Committee to take action and carry out the purpose of the WQPP. Additionally, the power of the WQPP lies in having the full suite of members at the table to generate a common understanding of water quality challenges and opportunities to address those. While we recognize that it can be difficult to be present at these meetings, the Bylaws provide flexibility in allowing representatives to name a designee to stand in for a specific meeting they cannot attend, or even to identify a standing designee as backup.

Questions & Answers/Comments/Discussion:

- Wade Lehmann added that USACE is one of the functionally vacant seats. He has reached out to the representative but has not heard back.
- George Garrett, City of Marathon, flagged the importance of having USACE participate as we move to the next \$100M authorized in FKWQIP.
- Chris Bergh, TNC, clarified that the Knowledgeable Citizen seats are based on the person, not the agency or organization they work for. His seat is not a specific seat for the Nature Conservancy, rather based on his credentials as a knowledgeable citizen. Charlie Causey was a long-time contributor in his seat; his heart was in this effort and he brought funding to the table. Because we still have five Knowledgeable Citizens on the committee, it is not necessary to actively recruit a replacement for Charlie, however the Steering Committee would be willing to consider a new member if someone was interested.
- Brenda Calvante, USACE, asked to discuss the USACE vacancy, noting her belief that the previous representative was the Project Manager for FKWQIP. Wade Lehmann clarified that the most recent history of this seat is that the Jacksonville district selected Gretchen Ehlinger to serve on this committee. Anyone can be named to represent the agency, as long as USACE agrees. The WQPP co-chairs and staff will follow-up after the meeting to discuss USACE representation on the Steering Committee. Army Corps is presenting later in the agenda, and Brenda will introduce herself and her team at that point.

Following brief discussion on the bylaws, the Steering Committee noted that, as there are no proposed changes, a vote on the bylaws is not necessary and the existing document will stand. This presentation and discussion completes the triennial review of the WQPP Steering Committee Bylaws.

III. Communications Subcommittee

Genevieve Schave, DEP, shared the draft purpose, objectives, membership and operating procedures for a proposed new communications team to potentially be established as a subcommittee of the WQPP.

Purpose: A communications subcommittee would serve as an advisory body to the Steering Committee with a purpose to coordinate communications and outreach to raise awareness about the WQPP and efforts and opportunities to protect water quality in FKNMS. This is not intended to replace or dictate the programs, products, or authorities of individual entities, but would capitalize on the existing network within the community working in this realm.

The objectives of this group would be to: Coordinate communication and outreach on water quality issues in the Keys; raise awareness of ongoing WQPP efforts and those of other partners in the community; stress the importance of good water quality in FKNMS and efforts to protect it; and summarize the latest science and water quality monitoring data.

Currently, the proposed membership includes the following individuals who have been contacted and/or have reached out with an interest in joining this effort: Kristen Livengood (Monroe County), Sara Matthis (City of Marathon), Steven Blackburn (EPA), Shelly Kruger (Florida Sea Grant), Kristene Parsons (FWC), and Marlies Tumolo/Scott Atwell (FKNMS). More recently, Sue Heim (KLWTD) and Allison Delashmit (LKGA) have also expressed interest.

The proposed roles and responsibilities of this group would include first participating in a water quality-focused interpretive planning workshop that would be facilitated by NOAA staff. Following that effort, the subcommittee would have semi-regular meetings with routine reporting to the Steering Committee. Together, this group would coordinate on communications and outreach opportunities, create shared messaging and products to amplify the work of the WQPP, and contribute to the biennial congressional report. The subcommittee would also be charged with identifying a lead, co-lead and secretary to assist with the group's administration. Deliverables would include recommendations for content and updates for the WQPP website, supporting the development and distribution of the congressional report, coordinating on shared messaging and external-facing products and resources, and providing regular updates to the Steering Committee.

Questions & Answers/Comments/Discussion:

- Wade Lehmann requested that the Sanctuary Advisory Council (SAC) also be looped into this effort, especially if we are trying to communicate technical items. Please consider how the SAC can feed into this subcommittee.
- Chris Bergh supported Wade's recommendation. A lot of water quality challenges originate outside the Florida Keys. There is a joint WQPP/SAC working group that is focused on this regional connectivity and what is happening outside vs. inside FKNMS boundaries. It's important that we maintain this understanding that issues are larger than the geographic boundaries of the Keys. The FCRRP also operates in this space; they have a standing communications committee that meets biweekly at this point. A water quality-focused communications subcommittee is a good idea, but consider how to cross-pollinate with the FCRRP comms committee that is more geographically comprehensive.

- Patience Cohn, MIASTF, agreed that communications are key and this effort is important. Should we prioritize individuals with marketing and comms skills on the committee?
 - Karen Bohnsack clarified the credentials of several group members. For example, Kristin Livingood is the County Public Information Officer; the FKNMS staff are interpretation and marketing professionals, etc. The intent is for this group to be mostly composed of communications professionals.
- George Garrett suggested consideration of Andy Newman. He is TDC-focused, but also does lobster outreach and other water-quality relevant stuff.
- Sandy Walters, RES, would be happy to participate in this group; their company does outreach in the Keys and she has direct experience with communications from a private sector perspective.
- Shelly Krueger, Florida Sea Grant, supported Chris Bergh's suggestions. We will hear from FCRRP later in this meeting, and we should figure out how to incorporate with them or create those connections. Both Shelly and Allison Delashmit are on the SAC, and Shelly also sits on the Connectivity Team. Regular communication with these groups would be beneficial.
- Wade Lehmann: Regarding roles and responsibilities, the WQPP has struggled with the congressional report. In the current draft we did a good job accumulating a lot of information, and now the task is to trim that down to a 20-page report, maximum. This might be worth putting on the list for the subcommittee: to find or create a template into which we can build this report to present that information in a concise format.
 - Kim Shugar agreed with this suggestion.
- Chris Bergh added that this subcommittee should meet before the regular Steering Committee meetings so they have something to present or ask of the Steering Committee. They should also meet as needed when there are crises or other issues that are germane to the water quality communications (e.g., if there were an oil spill).
- Sandy Walters agreed this should be a standing agenda item on the Steering Committee meeting agenda. Communications need to be consistent.
- Karen Bohnsack inquired if the Steering Committee was inclined to bring the creation of a communications subcommittee to a vote today?
- Wade Lehmann supported approval to set this up, even if we don't have the full formal list of participants. Pulling the group together will make it easier to flush out tasks and assign those actions to members. Want to keep this moving, especially given the need to finish the congressional report. Let's ensure Steering Committee members and representatives on the subcommittee are included in the discussion moving forward.

Motion (passed)

Chris Bergh made a motion to establish the WQPP Communications Subcommittee as described here. This should be established with a two-year timeframe, then revisited to determine if anything needs to be changed, or if it should be sunsetted or extended. Both Gil McRae, FWC, and George Garrett seconded the motion. Co-Chair Shugar called the question. The motion passed with no objections.

IV. Update on Abnormal Fish Behavior/Sawfish Mortality Response

FWRI Update

Tom Matthews provided an overview of research and response efforts associated with the sawfish mortality and spinning fish event that was first observed in late 2023 in the Lower Keys.

Mr. Matthews began his presentation showing a video of a mojarra exhibiting the typical behavior associated with the spinning fish phenomenon. In addition to reports of abnormal spinning behavior, small scale mortalities have occurred, although this was not a mass fish mortality like we see with red tide, low oxygen, or cold water events. Paralleling this phenomenon, 54 smalltooth sawfish died. These

are impressive animals, which reach up to 15 feet long. Sawfish migrate from the Gulf to the Florida Keys in the winter, and this incident occurred while they were here, which was incredibly bad timing.

The cause of abnormal behavior/mortality is not known. FWC and response partners have collected a lot of samples. The event is largely over at present, and lab technicians are still processing hundreds of water quality and fish samples, but we still have no definitive case description. We do, however, have lines of inquiry and are making progress.

This was mostly a nearshore/shallow water event that began in October 2023 and was largely over by June 2024. It was first documented by fishermen, including Bonefish and Tarpon Trust (BTT) and the Lower Keys Guides Association (LKGA) who notified FWC in December 2023. Allison Delashmit with LKGA has helped coordinate sample collection with the fishermen. Lower Keys residents have collected a number of videos. In one video, a juvenile goliath grouper is observed with abnormal behavior; this specific fish survived, as did most. Some fish did die; they attempted to revive some in the lab with clean water, but those animals did succumb. Sawfish did have mortality. They beached or grounded themselves and exhibited frantic struggling in shallow water. This was an unprecedented mortality event for sawfish. There was one recovery to attempt intervention, which will be discussed more later.

There were a number of partners involved in this response. The Florida Keys Event Working Group had regular calls and coordinated on field trips and sample sharing. This included a handful of researchers focused on harmful algae. Mike Parsons, FGCU, and his technician have worked with *Gambierdiscus* spp. in the Florida Keys for years. Dr. Alison Robertson with University of South Alabama/Dauphin Island Sea Lab (USA/DISL) is an expert in the effects of HABs on a range of species (birds, fish, crustaceans, etc.); her findings are reviewed at bimonthly meetings. There is also a sawfish coordination team. Sawfish are a protected species and both NOAA and FWC have a number of people working on that. This event also included a lot of collaboration between the scientific and fishing communities, including those with state agencies, BTT, and the LKGA. The LKGA has developed a Rapid Response Network in which they regularly report good and bad things they see on the water. This was key, as historically we get few reports to the FWC hotlines from the Florida Keys. This event spurred a greater interest in this and we now have a better reporting network. LKGA were the boats in the water; they took FWC on 20 individual sampling events at their own expense. We now have legislative support/funding for research, but this started as a grassroots effort.

Event Timeline: As noted, this was first reported in October. By December, we were actively collecting samples (water and fish), and by January we had a response working group. The first sawfish was reported on January 28th. It is important to note that although the abnormal fish behavior and sawfish mortality occurred at the same time and place, it may not be the same cause. This may be an example/specific species with a very bad response/behavior, or it may have been something else. Researchers are being careful not to make assumptions, and this research is ongoing. The first dead sawfish was collected on February 5th in Key West; over 40 have been collected in total and autopsies continue. Tissue samples are also being examined. On April 5th, a sawfish was rescued and brought to Mote for rejuvenation. Unfortunately, it never ate and the animal was euthanized as it was in great distress. Reports have now slowed down and no sawfish mortalities were seen in July. FWC has a website that posts updates on samples/observations (<https://myfwc.com/research/saltwater/health/spinningevent/>). In total, over 475 reports were received; 93 of 509 reports included mortality (18%). Again, these are not mass mortalities; an average of 3 dead fish were associated with each report.

As far as the response, as of the end of July over 20 sampling trips had been conducted and 340 fish samples, and 358 water samples collected. There are 84 species that were reported as affected; this is a broad spectrum event and not likely to be food chain driven. Many of the 188 sawfish hotline reports were duplicates and some may have swum off. We do not know if all the affected sawfish died. There are

tagged sawfish and a network of receivers that are downloaded approximately every 6 months. If some of the tagged sawfish survived this event, we may not pick them up for another year, even if they are in the area.

Mr. Matthews showed an animated heatmap of reported fish mortalities and abnormal behavior: In November see reports in the Lower Keys, where this was focused through January, February, and March. Reports then expanded to the entire Florida Keys with a handful of observations in Miami. In West Palm Beach there was also one small fish with the same symptoms reported. We return to background levels in June/July. Mullet spinning has been reported for 10 years in the Keys, and samples have never definitively identified a cause. This is a background level event that increased in frequency this winter.

Mr. Matthews showed another video of a southern stingray swimming upside down. This is unusual behavior, but this one did survive. We've seen this as a short-term behavioral response, after which the fish regain normal behavior when flood tide comes in. The sawfish, however, was unprecedented. Early reports of unusual pelican behavior (4 dead recovered) are still being examined. It's not unusual for pelicans to die in the winter as they come down this time of year. No definitive cause of death has yet been identified, but scientists are looking to see if HAB toxins are also in these tissues. Notably, fishing guides continued to report good fishing throughout this event. It was a spotty event, but fishing continued to be good and still is.

At this point, we know a lot about what this isn't: It is not a classic *Karenia brevis*/red tide. DEP tested for 250 chemicals that were all within limits. DO/Salinity, pH and temperature are not suspected (in winter we get cold water, while in summer we see hot water, which can reduce dissolved oxygen and contribute to hypersalinity. Freshwater seeps may affect pH. None of these factors are suspected. No pathogenic viruses have been found via histology or eDNA tests, and fish disease is also not suspected. There are no lesions and fish had good body condition across a large range of species (bony fish, elasmobranchs, even some crustaceans) and all levels of the food chain (things that eat plankton algae, benthic algae, predators that eat small clams or other species, etc.). Thus, this is not likely to be a trophic level event.

One harmful algae frequent in the samples is *Gambierdiscus* spp. Certain species of this genus of algae are best known for ciguatera and fish poisoning. The casual search of the internet regarding this genus is heavily weighted to incidents of food poisoning in humans and appears to be a primary source of misinformation regarding the potential effect on human health of the current event. There has been no indication that the genus of *Gambierdiscus* found in higher abundance with the current event is related to human health. Ciguatoxins include a range of chemicals, not all of which build up in the food chain. Researchers regularly communicate with the Department of Health (DOH), which has not indicated increased reports of ciguatera poisoning that there is no indication this is a food toxin event for humans. Several benthic dinoflagellates have been identified in the water, and *Gambierdiscus* was in 58 of 241 water samples analyzed via light microscopy. Toxins are an algal defense mechanism; these chemicals restrict organisms from eating them.

Preliminary results indicate that exposure to fish is via direct contact with water. USA, BTT and FWRI have taken exposed fish and put them in clean water to watch them recover. USA is isolating potential toxic species and culturing them in the lab (they are slow growing so this is a lot of work and takes a long time). Those toxins can then be extracted, added to water, and exposed to fish to replicate the abnormal behavior. We still do not know if one or a combination of harmful algae is the causative agent. There is also a list of neurotoxins that are potential chemicals - these are waterborne chemicals that fish are exposed to, then go away quickly, so fish recover from it. These are among a list of candidates that may cause this. Again, we've largely been able to identify what this is not. The Florida Keys has had regular cyanobacterial blooms composed of single cell blue-green algae that are toxic since 1992. None of these

were present in the samples, so this is not the cause either. Each tested organism has a mix of benthic algal toxins in their body; this is why it's a struggle to identify the cause. Looking at muscle, gill and liver samples.

Investigations into the potential role of harmful algae continue. Exposure experiments show that after exposure, fish showed abnormal whirling behavior within 20 minutes. When removed and placed in water without algal extracts, normal behavior resumed within 28 min. Clinically recovered fish may resume abnormal behavior after the fact if exposed to some other disturbance or stress (e.g., if exposed to light at night or when caught during the day, they may exhibit this behavior again). This may be why sawfish continued to exhibit abnormal behavior. One hypothesis is that fats in the liver were being metabolized and that reintroduced the toxins to its system. Research is underway to determine if this hypothesis was causative. It is not confirmed whether fish recover fully or if they may continue to have symptoms at a later time.

Increased levels of *Gambierdiscus* cells were found compared to historical data. Peak observations were in March, although elevated levels were in both water and benthic samples between January and April. These were focused in the backcountry in January and were more spread out geographically in March. By April, quite a few samples showed that *Gambierdiscus* was undetected, although it was seen in other areas of South Florida. Abundance of *Gambierdiscus* ranged from undetected to over 10,000 cells/L. Surface and bottom samples were collected, but this is a hard group of algae to sample (you scrape seagrass - so it depends on how much you take). The 10,000+ counts are very high for this sampling technique. This was a spotty event, hence why spinning fish were not seen everywhere, and why good fishing areas persisted.

The smalltooth sawfish population in the US is practically limited to the Florida coast, although there have been a handful of sightings outside of Florida in the last couple of years, which was a good sign of recovery. Florida is critical habitat for this species, which was listed via the ESA in 2003. We were in a good place thinking the population was expanding until this event. At this point, we do not know the impact this event had on the population, but it is concerning. A lot of people have worked on sawfish for a long time and any effects of this event continue to be evaluated.

Please report observations to the various FWC hotlines:

- Fish Kill Hotline (FKH): Report abnormal fish behavior, fish disease, fish kills
 - Web form ([MyFWC.com/ReportFishKill](https://myfwc.com/ReportFishKill))
 - Phone (800-636-0511), Monday – Friday, 9:00 am -5:00 pm
- Sawfish Hotline: Report sawfish sightings, especially if any are in distress
 - Call (844-472-9347)
 - Email (Sawfish@MyFWC.com)
- FWC Wildlife Alert Hotline: For injured, sick or dead marine mammals, sea turtles, or other listed species
 - 888-404-FWCC (888-404-3922)
- Avian mortality web form: <https://app.myfwc.com/FWRI/AvianMortality/>

DEP Update

Dr. Nick Parr added additional information about water quality sampling efforts that DEP has led in the Lower Keys to additionally investigate this event. DEP led water quality sampling throughout this event. They tested everything they could, including analytes that are not normally measured. This included all the human-made toxins that have a test available, pharmaceuticals, pesticides, and herbicides, including things like DDT that are no longer in production. Sediments were also sampled. From this testing, we have learned that the abnormal behavior is not directly caused by a human made chemical. Everything tested was in background concentrations, other than a few things that we see regularly in the environment

(such as sucralose which is an indicator of treated/untreated wastewater or just peeing in the water). Most of the samples were below mean detection limits. Thus, chemicals of human origin were unlikely to be responsible for this event. DEP sampled immediately adjacent to affected fish and everywhere in the highest reported areas between Stock Island to Big Pine Key and out to the Marquesas. One or two low dissolved oxygen readings were taken in canals, but that is not unusual; otherwise, dissolved oxygen was normal. Higher sucralose measurements in the nearshore are being addressed by the Florida Keys Reasonable Assurance Plan.

The lab tests that DEP has conducted are for nutrients and human derived chemicals. They could not test for marine toxins which is the work that Dr. Robertson at USA is doing. Of what DEP tested, nothing came up at a biologically relevant concentration. The lab also took some water samples and exposed juvenile fish in a bioassay.* This did not result in a change of behavior, but not a significant increase in mortality, which provides additional evidence that this is a waterborne issue. *The DEP lab is not a behavioral/fish certified lab; these are qualitative results.

Questions & Answers/Comments/Discussion:

- Chris Bergh: This event seems seasonal. Are there any plans in place to be ready if this happens again? What does the future look like?
 - This is the big question. Did something happen last year that allowed harmful benthic algae to be more present? We have not been able to link this to the 2023 marine heatwave. However, due to that event, a lot of hardbottom organisms died - sea fans, sponges, etc. There are some indications that these algae species may take over newly opened habitat, but we don't know for sure. Thus far, this year's heatwave does not seem as bad as last year; early high temperatures were knocked back and the current temperatures are lower than this time last year. Experts have mixed opinions about whether this may happen again. The reporting network is standing by if it does.

Break

V. Water Quality Improvement Program

Several staff from USACE provided an update on the Florida Keys Water Quality Improvement Program (FKWQIP), including the additional funding authorized in the Water Resources Development Act (WRDA) 2022.

Dimael Lopez is the new project manager for Section 109, where FKWQIP sits. This role was formerly held by Manny Vianzon, who presented to the WQPP in March. USACE is currently reorganizing so there will be a whole branch - the Programs and Project Delivery Support (PPDS) Branch - dedicated to this program. Mr. Lopez introduced Brenda Calvente, the PPDS Branch Chief. Ms. Calvente introduced the rest of the support team, including Hector Cruz, Section Chief, and Richard Butler, Program Manager. The PPDS branch was created to manage workload across many programs that require execution in the Jacksonville district.

Richard Butler provided an update on the current status and next steps for FKWQIP. He is the Small Projects Program Manager who will work with Mr. Lopez to administer this program. We are very close to finishing spending on the first \$100M allocation. To date, reimbursements are completed for Key Colony Beach, Key West and Layton; reimbursements are still due for Key Largo Islamorada, and Marathon. Approximately \$80M of the \$100M have been reimbursed back to the municipalities.

The purpose of FKWQIP is to improve water quality in the Florida Keys by implementing projects within the wastewater and stormwater master plans prepared by Monroe County and the municipalities. Public

Law 106-554 authorizes USACE to provide technical and financial assistance to carry out such wastewater and stormwater projects to improve water quality in FKNMS. This is a 65% federal and 35% local cost share. WRDA 2022 increased the FKWQIP authorization from \$100M to \$200M. This is subject to the following 2006 implementation amendments: a) Removing or remediating contamination related to any hazardous substances are not eligible; b) the non-federal sponsor will determine the costs of non-federal work (including pre-arrangement work); c) the non-federal sponsor will be responsible for providing all Lands, Easements, Rights-of-Way, Relocations, and Disposal Facilities (LERRD); and d) the non-federal sponsor will be responsible for operations, maintenance, repair, replacement, and rehabilitation (OMRR&R).

Next Steps: At this point we are closing out the first \$100M with the three remaining municipalities. For the next \$100M, we first need to identify a program delivery team (PDT) which will consist of one representative from each municipal governmental agency in Monroe County, as well as state and federal agency representatives. USACE will work with Monroe County to understand which municipalities will be included and to identify the appropriate points of contact. Once the PDT is developed from that contact list, they will have a meeting or series of meetings to develop the course of action. A program management plan (PMP) needs to be developed, which will outline the specific projects to be initially funded, identify resource needs, and establish preliminary budgets and construction schedules. Then a letter report/project partnership agreement (PPA) will be developed for each municipality, followed by an implementation plan and NEPA review.

We've done this before, so we have a foundation that we can revisit and modify. We have a previous PMP and implementation plan. Lessons learned from those will be incorporated into this next phase of implementation. To reiterate, the process from here will include the following steps: develop the team, understand who will be involved, determine what each local government wants to address and what that entails, and ensure we do the necessary administrative components (NEPA, etc.). USACE's request is for assistance identifying who the POCs are for each municipality, and that each entity start thinking about what they want to address with the next \$100M (having this in mind before the PDT is developed will be very helpful). Ms. Calvante added that these steps are based on conversations with the team that participated in the initial \$100M effort. USACE is happy to help serve this team as much as possible and wants to ensure this process works for the WQPP as well.

Questions & Answers/Comments/Discussion:

- Shelly Krueger: Will Monroe County be formally included as an eligible entity for funding this time?
 - Yes, both the county and cities can be included in this authorization. If the county wants to have their own efforts and PPA it will be part of the initiative.
- George Garrett agreed we would like to include Monroe County in this additional \$100M. Key Largo is part of Monroe County (it is not a municipality, but was singled out originally). It is relevant to include the county, but it is also important to include the municipalities as separate entities (not just run everything through the county).
- Sarah Fangman, FKNMS: Regarding the new \$100M - is this authorized or appropriated?
 - This is a \$100M authorization from WRDA 2022. This will require coordination with the county and cities before that amount can be allocated then distributed. USACE needs to be ready to proceed with work for allocation. USACE does not separate between the first and second \$100M; this is more money to support the efforts. We still need to determine how those will be distributed. Once agreements are in place, we will proceed with the allocation process.
 - George Garrett clarified that this money is authorized, but not appropriated. The money comes in chunks and it has taken nearly 25 years for the first \$100M to be appropriated.

The new \$100M is an additional authorization and we will have to work with Congress to get the appropriations.

- Wade Lehmann: How does this group maintain connections with the PDT? The WQPP will be interested in the work as this process is developed and implemented.
 - USACE needs some guidance on this. Who needs to be part of the team? They will reach out to Monroe County first; but will also need to identify the rest of the PDT participants. The group will also need to determine a meeting schedule (monthly, quarterly?). Each individual local government entity will need to make their own efforts to develop SOWs and budgets, and ensure those are communicated.

VI. Florida Keys Tidal Connection Project

Dr. Nick Parr, DEP, provided an overview of the objectives and planning for an EPA-funded tidal restoration project at Curry Hammock State Park and the City of Marathon.

This is a large project that has been of interest for some time; this was identified by Gus Rios before he retired. Florida Keys tidal connection was originally proposed as an element of the Comprehensive Everglades Restoration Plan (CERP). This was intended to restore the tidal connection between the Atlantic Ocean and Gulf of Mexico that was eliminated with the construction of Flagler's railroad, for the purpose of restoring water quality and hydrology in Florida Bay. That project was suspended from CERP, however. While the original CERP project included a series of 4 connections, this project is focusing on connections #2 (near Long Point Key) and #3 (Little Crawl Key). Long Point Key is a hydrological split. Water coming from the southeast moves to #3, water from the west goes to #2.

These two locations hug Curry Hammock state park. An EPA grant was issued to get this project shovel ready and initiate the environmental monitoring. Approximately 60% of the design is completed. This is very technical, but the basic idea is that the eastern connection will be a double box culvert, with each culvert being 10' wide x 8' tall. This will require riprap and shoreline stabilization (so some mangrove removal), but this will restore flow across 180' of fill that was put in by Flagler's railroad. The western site, due to hydrology and location, will require 3 box culverts. Mean high tide will fall about midway through the culvert. Culverts will go under US1, The Overseas Heritage Trail and the FKAA pipe will need to move a bit. The wastewater line is only an issue at the western site, which will cover a distance of 200 feet.

Part of the design process is boring to see what geology we're dealing with. Those revealed a light brown sandy silt to a depth of about 7 feet below the mean high with limestone underneath. The silt is what Flagler filled in to construct the railroad and below that is what we believe the natural grade actually is. Most likely this will be excavated to original limestone grade and will use gravel wrapped in filter fabric to provide a more stable base.

Environmental monitoring will consist of both benthic and water quality monitoring. Benthic monitoring will occur at 12 sites that will include the mouth adjacent to the connection areas and at the edge of the halo zone. Sites could not be located closer to the connection points because of the poor visibility and unsafe diving conditions. Control sites will be located adjacent to one of the other locations originally proposed by CERP that we are not restoring with this effort. This initial monitoring is funded by an EPA grant; follow-up monitoring will be funded by DEP (after installation). For water quality, DO, pH, temperature, salinity, conductivity and trend analysis of chlorophyll a will be monitored continuously via datasondes in the project area and at an adjacent reference site where flow will not be restored. Devices will also track water movement/speed at the bottom, midwater and surface to understand tidal flushing now and post restoration.

Questions & Answers/Comments/Discussion:

- Chris Bergh flagged that near the reference site sonde location, there is an active USACE permit application for Valhalla Resort to dredge an east-west waterway. That may affect the relevance of the reference site. Unknown if that proposal is permissible, but it is a current application in the project area.
 - This is on DEP's radar. Sonde locations won't move, so this will give baseline data. If they do this project, it may be interesting to compare those data/monitor that as well.
- George Garrett stated that he is happy to see this tidal connection project happening; this is something for which he has also applied for funding in the past. Of the original four sites, these were the two most relevant. Another site was near the Holiday Inn Express as well. If anyone wants to see what this looks like when completed, there is an area called Pull 'N Be Damned Creek (west of the causeway going to Key Colony Beach) that is an identical project to this.
- Chris Bergh: Once constructed, will these culverts be passable by manatees, turtles, paddle craft, etc?
 - Yes, via manatees, turtles. This is the reason for the large box culverts. Paddling through is not recommended because the amount of flow we expect could create hazardous conditions. There will likely be signage advising that the culverts not be used that way. For comparison, look at conditions in Vaca Cut when the tide flows. The other project at Pull N' Be Damned Creek is actually blocked for this reason. This is otherwise a 15 mile dam, so we expect a lot of water to be moving through these passes.
- DEP is looking for \$20M to do this project. The design should be complete by December.

VII. Florida Coral Reef Coordination Team

Dr. Wesley Brooks, Chief Resilience Officer for the State of Florida, introduced the WQPP to Florida's Coral Reef Coordination Team (FCRCT), which was authorized on September 1, 2022 under the umbrella of the South Florida Ecosystem Restoration Task Force (SFERTF).

Over the two-year partnership, this team has accomplished a lot already and has a vision for the future too. There are a lot of teams set up for coordination. This is one, and others have been mentioned too. This shows the importance and interest in the resources we have here. The FCRCT is an advisory body to the SFERTF Working Group (WG). This is important because Everglades restoration is the largest anthropogenic perturbation to the ecosystem and billions of dollars are being spent on it. This team is trying to get ahead of the impending changes and the massive increments of new water that are set to be delivered downstream from the mainland. This team's charge is to understand the changes that will take place, and ensure we are properly monitoring changes in adjacent coral reefs and marine waters so we can potentially link that to changes upstream. Because this group is directly tied into Everglades restoration, it has access to the high level leadership of the SFERTF, which includes assistant secretaries of federal agencies, the Secretary of DEP, the Executive Director of FWC, etc. In contrast to grassroots groups, this is a leadership-oriented team that is poised to move information straight to the top.

FCRCT representation includes 10 voting and 10 non-voting members. Voting members are the agencies who have management responsibility along Florida's Coral Reef. Non-voting members are important partners from the counties and other agencies, such as USGS, USACE, SFWMD, etc. The membership list and other information is available online at: <https://www.evergladesrestoration.gov/fcrct>.

The deliverables to be produced by the FCRCT include: a collaborative framework for water quality monitoring along Florida's Coral Reef and recommendations for ecological indicators and performance measure that can be used to guide management decisions (this team will provide recommendations to the SFERTF's Science Coordination Group [SCG] to tie into existing mechanisms such as RECOVER, which is charged with assessing Everglades restoration progress). The FCRCT will also support other needs of the WG/SCG as deemed necessary.

To date, the FCRCT has developed and adopted a unified monitoring framework for Florida's Coral Reef. This document is innovative in that it is not a static plan but an iterative document that the team can come back to and can refresh as needed (e.g., as new information emerges, funding becomes available, policies, change, etc.). Thus far this is an initial framework for developing a larger monitoring schema that includes four priority focus areas and 10 actions to structure data collection and evaluation of evidence to answer a couple of key questions: Can we detect changes in nearshore water quality from Everglades restoration? How do those changes affect Florida's Coral Reef? Do those changes manifest in measurable benefits for neighboring human communities? The team is currently working on developing coordinated action plans (CAPs) for each of the 10 actions; these CAPs can be revisited and updated at any point within this framework.

The four priority focus areas are as follows:

- Inventory existing monitoring programs
- Define effective monitoring to measure Everglades restoration impacts
- Identify monitoring gaps
- Develop, track, and support implementation of consensus recommendations

Dr. Brooks briefly reviewed the 10 actions:

- Action 1: Inventory existing water quality monitoring programs along Florida's Coral Reef and nearshore coastal waters in South Florida.
- Action 2: Inventory existing ecological or biological monitoring programs related to Florida's Coral Reef and associated resources within the South Florida ecosystem.
- Action 3: Develop the appropriate parameters to monitor Florida's Coral Reef. With support from the Florida Coral Reef Resilience Program's Water Quality team, a workshop was held just last week to focus on this action. This is in progress.
- Action 4: Identify Everglades restoration projects and other water management activities that may influence nearshore water quality and Florida's Coral Reef. It is important to understand what projects are in design that may affect the reef, so that monitoring can be structured to capture those changes. The tidal connection project presented by Nick Parr is another project to add to this list.
- Action 5: Propose Conceptual Ecological Models (CEMs) and Hypothesis Clusters (HCs). This work was done for Florida's Coral Reef ~20 years ago, and similar tools exist for Everglades restoration, so we are looking to better incorporate the coral models into the Everglades framework.
- Action 6: Propose Ecological Indicators (EIs) for Florida's Coral Reef.
- Action 7: Define changes to existing monitoring programs to implement data solutions while preserving the original program aims.
- Action 8: Assess where data gaps exist that cannot be captured by existing monitoring programs.
- Action 9: Issue consensus recommendations to unify and enhance monitoring efforts.
- Action 10: Facilitate implementation. This includes working with Congress to obtain the resources to move projects forward. This action is still a ways away.

The team has completed CAPs 1, 2 and 4. CAP 3 is in progress in parallel with the FCRRP Water Quality Team. There are other sponsored workshops that may also be conducted via this collaboration (e.g., related to CEM/EI development), which will result in progress on CAPs 5 and 6. The team plans to make progress on CAPs 7, 8 and 9 by 2025 with a goal to begin implementation (CAP 10) by 2026. The FCRCT meets quarterly, and the next meeting will be in late September.

Dr. Erik Stabenau, NPS, is the Vice Chair of the FCRCT. He provided some additional perspective that the FCRCT is trying to look holistically at the system and be aware when upstream conditions are

potentially influencing downstream conditions on the reef. In this, the team has the potential to inform and influence the larger upstream Everglades restoration effort.

Questions & Answers/Comments/Discussion:

- N/A

VIII. Florida Coral Reef Resilience Program and Water Quality Subteam

Kylie Morgan, DEP, provided an introduction to the newly rebranded Florida Coral Reef Resilience Program (FCRRP), including its efforts related to water quality. FCRRP is a merger between the Stony Coral Tissue Loss Disease (SCTLD) response effort and the former Florida Reef Resilience Program (FRRP). SCTLD was a well-organized successful initiative to respond to the disease outbreak on Florida's Coral Reef. As that threat waned, this was identified as an opportunity to blend this structure with border coral reef conservation and management efforts. In other words, this would allow us to merge the rapid resource mobilization that came with SCTLD with the recovery and resilience efforts of the FRRP.

The goal of the FCRRP is to facilitate the recovery of Florida's Coral Reef into a resilient, self-sustaining ecosystem through action in four focal areas:

- Disturbance Response: Maintain a network of working groups for fast mobilization in response to emerging or existing disturbances.
- Ecosystem Restoration: Undertake actions for ecosystem recovery.
- Water Quality: Support statewide efforts to better understand and improve water quality along Florida's Coral Reef.
- Climate Adaptation: Support innovative research and intervention strategies to address the long-term resilience of Florida's Coral Reef.

To accomplish these 4 focal areas, FCRRP builds on the SCTLD response structure: which includes two leadership bodies and 10 teams. The two leadership bodies are the Executive Coordination Team and Steering Committee, which are both composed of members from the four lead agencies: DEP, FWC, NOAA, NPS. The role of these leadership bodies is to ensure capacity, consistency, and coordination across this work. Each of the 10 teams focus on different topic areas. These teams operate independently but are also collaborative as the problems the reef faces are interdisciplinary. This is where most of the work of the FCRRP happens. The FCRRP also has a Disturbance Advisory Committee (DAC) that is a venue for rapid information sharing, providing updates on the status of the coral reef, disseminating research findings, sharing funding opportunities, etc.

The water quality subteam is one of the 10 FCRRP teams and is the newest (established in Jan 2024). This team is responsible for generating action toward annually identified regional water quality priorities through technical discussion and process development. They work closely with the FCRCT and are currently supporting their efforts to better understand the connections between Everglades restoration and downstream/offshore coral reef health.

The water quality team priorities include: Generating recommendations to the FCRCT on actions in their framework (Actions 1-3; conducted a workshop in July); collating and providing feedback on water quality workshop content (which will help isolate specific recommendations for the FCRCT); prioritizing research and programmatic priorities based off the FCRRP Action Plan (e.g., connect to other programs, have a shared understanding of issues now vs. in the future); and sharing water quality information and updates between team members.

The water quality team is co-led by Dr. Elizabeth Kelly from Martin County and Kylie Morgan from DEP and includes members from across the region and various agencies. Kylie is the point of contact for this water quality team. Maurizio Martinelli with Florida Sea Grant coordinates the FCRRP and DAC, and can be contacted for broader questions about the program.

Questions & Answers/Comments/Discussion:

- N/A

IX. Public Comment

Dottie Moses, Key Largo

Does the sanctuary allow dredging to open up new navigational access within FKNMS waters?

In response, Kim Shugar indicated that we would follow-up with Ms. Moses on this. Wade Lehmann added that this is not just an FKNMS issue; the state and EPA would be involved in these matters as well. George Garrett noted that all of the local comprehensive plans also prohibit new dredging. Chris Bergh added that FKNMS's prohibition on new dredging followed those comprehensive plans. There is a layered reluctance to not permit such activities, and for good reason.

X. Steering Committee Member Updates

Kim Shugar, DEP

The report to congress is still in progress. This has been compiled and sent to a technical editor and some more recent changes are being reconciled. The next step is to reduce the report down and create final summaries.

George Garrett, City of Marathon

The City of Marathon is moving forward with engineering design and permitting for deep injection wells.

- Chris Berth noted that he is happy this is happening; the science supports it. There is one remaining shallow injection well at the Key West Resort Utilities in Stock Island. We don't know if there is an application to do a study at this site similar to that that was completed in Marathon, but he hopes this committee will help support the science to determine if shallow injection is also an issue at that site.
- George Garret added that Lee Kump's first paper from the EPA funded project at Area 3 in Marathon has been published. This can be accessed at: <https://pubs.acs.org/doi/10.1021/acsestwater.4c00407>.
- The committee requested the link be circulated following the meeting.

Chris Bergh, TNC

After last summer's heatwave and coral bleaching event, we learned a lot of lessons. Effort has been spent to prepare for this summer, which fortunately has not been as impactful on coral populations so far. The FCRRP and collaborators are actively watching NOAA Coral Reef Watch predictions and are more prepared this year to take action if needed. This speaks to the benefit of these coordination efforts. There are a lot of them and a lot of moving parts but it is well worth it.

XI. Meeting Wrap-Up and Adjourn

Kim Shugar thanked everyone for participating in the meeting and reviewed accomplishments and next steps. The next Steering Committee meeting will be held in person, in Marathon on Wednesday, November 13th. The meeting was adjourned at 12:30 pm.