MINUTES OF THE COLLIER COUNTY
COASTAL ADVISORY COMMITTEE
WATER QUALITY SUBCOMMITTEE MEETING

Naples, Florida, March 15, 2022

LET IT BE REMEMBERED, the Collier County Coastal Advisory Committee Water Quality Subcommittee, in and for the County of Collier, having conducted business herein,met on this date at 1 P.M. in REGULAR SESSION at the GMD Horseshoe Square South Conference Room, 2685 Horseshoe Drive S., Unit 103, Naples, Florida, with the following members present:

CHAIRMAN:	Bob Roth
VICE CHAIRMAN:	Bob Raymond
	Ray Christman

ALSO PRESENT: Andy Miller, County Coastal Zone Manager
Farron Bevard, Operations Analyst, Coastal Zone Management
Denise McLaughlin, Chair, Pelican Bay Services Division Board
Erin Hodel, Program Director, CSA Ocean Sciences Inc. (via Zoom)

I. Call to Order
Chairman Roth called the meeting to order at 1:04 p.m.

II. Pledge of Allegiance
The Pledge of Allegiance was recited.

III. Roll Call
Roll call was taken, and a quorum of three was established.

IV. Changes and Approval of Agenda
No changes were made.

V. Approval of CAC Sub-Committee Minutes
Jan. 10, 2022
Feb. 7, 2022

Mr. Christman made a motion to approve the Jan. 10, 2022, and Feb. 7, 2022, meeting minutes. Second by Vice Chairman Raymond. The motion passed 3-0.

VI. Public Comments
None

VII. Staff Reports
None

VIII. New Business [Erin Hodel, Senior Marine Biologist, CSA Ocean Sciences Inc. - via Zoom]
PowerPoint Presentation: *"Submerged Aquatic Vegetation (SAV) Mitigation through Wind-Wave and Boat-Wake Reductions."*

Ms. Hodel's employer is one of Collier County's approved vendors for marine-based and seagrass monitoring. She spoke with Andy Miller after a presentation she gave at the Florida Shore & Beach Preservation Association 2022 Tech Conference, whose goal is to obtain funding to prevent shoreline erosion. The group, which has about 400-500 members, works with the state Legislature on beach-renourishment issues. She worked on a project that was supervised by Dr. Mark Fonseca, who was with NOAA for many years, and pioneered seagrass restoration.

She detailed a NCDOT project that reduced wave energy to fulfill seagrass restoration goals:

- The water depth was three- to four feet.
- Seagrass systems are very prone to disturbances through winds and waves.
- As wave energy is decreased, the cover of SAV is increased.
- There's a tipping point for seagrasses and they can't settle and grow.
- They noticed that seagrass is higher in the lee of formation, the side away from the wind.
- SAV abundant energy increases in the lee of formations.

The Bonner Bridge Seagrass Mitigation Project concept involved the Bonner Bridge area (now called the Mark Basnight Bridge) and was the first such project undertaken. It was completed in 2019 and covered 1.28 acres, a total that's very attainable. We knew we needed to look for an alternative mitigation strategy. Seagrasses are easy to restore and will just re-colonize. There was no injury to seagrass beds from boating or anthropogenic/environmental pollution sources. The reduction in wave energy encourages coalescence of natural seagrass patches and creates new, persistent seagrass acreage as mitigation for bridge construction

impacts. CSA's extensive past research demonstrated that SAV habitat sheltered from wind-waves developed continuous cover, unlike those that are exposed. The team developed wave-forecasting models to precisely identify the size, location, and orientation of the wave attenuation system needed to aid SAV growth.

The wave break is three miles from the bridge and is visible from Google Earth. The wave-break construction used Reefmaker units structured in a chevron pattern to produce wave reductions. The wave breaker was constructed from a total of 101 Reefmaker units that dissipated wave energy, but allowed water to flow through. Prior to construction, all SAV had to be removed and transplanted into the lee of the structure. Barges were used, it was completed in January 2017 and has been in use for five years. Atlantic Reefmaker was the company selected; others make similar units.

The units/pilings consisted of individual eco-disks layered on top of each other with granite rock; others use oyster shells. This was done in the middle of an estuary. This was an atypical project for Atlantic Reefmaker. The units were mechanically supported so the height could be changed to specified elevations above the seafloor. The design prevents it from settling into the seafloor over time and made it easily adjustable to future sea-level rise without the need for additional environmental permitting or compensatory mitigation.

Eco-disks were designed to stay above the substrate. These were among the first prototypes and were originally square, but they switched to an octagonal shape because they found they could reduce the weight of the disks by 300 pounds if they cut all corners.

The octagonal shape was more effective for dissipation. They encourage the collision of waves and water is being structured by angled legs and dissipates when the legs open up and force water out. Octagonal units reduced wave energy by 67%-84%. The monitoring project had four main components. There was height monitoring with wave sensors on the north and south sides. It provided a good data set for five years, with near-field and far-field sediment. They also utilized remote vehicles to do detailed monitoring of the entire area. In addition, they looked at aerial imagery collected by a drone.

The result was that wave heights were strongest from the north. Top wave heights occurred five times more frequently on the north side, with more than 4,000 extreme events on the north versus 800 on the south side. This helped confirm wind-energy reduction zones. But it caused a scour pit and a little more sediment accumulated there.

Lessons learned: It mobilized a lot of sand. Unfortunately, they planted seagrasses that were obliterated by the sediment. The newer octagonal units reduce this scouring effect and hopefully, will alleviate it.

Results: epibiota monitoring, granite rocks embedded into concrete. Of primary concern was oysters. Also, among strata, low- to medium-strata sometimes submerged and high-strata rarely submerged.

The rock has exhibited more success. There was a two-year lag before they saw oysters. By five years, it was 12 times higher on rock versus concrete. The oysters prefer to congregate on rock. Atlantic Reefmaker has now roughed up the texture of the concrete to be like rock because the granite rock is far more expensive. They also embedded natural oyster shell on the concrete. They believe that's the solution.

Medium- and high-rock strata really lagged. High rock was the lowest. Was it worth it to put the rocks into that tier? Probably not. The results were collected by drone, which is pretty cheap compared with fixed-wing aircraft, the previous method. The average was selected because that was the peak of SAV growing season. The most grew from 2020-2021.

Until the fall of 2020, all the wave energy zones and reference zone tracked closely. In 2020, things started to take off. If reference areas also increased, it could just be a regular event. This prompted them to perform an SAV-change analysis. There were two acres in August, the peak of growing season. This shows percentage

change in SAV cover, from August 2020 to August 2021. That corresponded well and suggested the predicted effect of SAV-patch coalescence, which was our goal.

What they ended up with as of 2021 was a net increase of 1.17 acres. From 2018-2021, there were 1.15 acres. The goal was 1.28 acres, so they were just a little shy of that. It attracted a lot of different seabirds and pelicans and created a nice structure for them to rest. Essentially, it's a fish habitat. There were a lot of mullet and sheepshead. Fish loved the foraging. There was a net gain, although it took five years.

They're working on ideas to fill the scour pit. After five years, it's still holding up and has survived major hurricanes and storm events with no damage. The principle also lends itself well to reducing energy from boat waves. As opposed to planting seagrass in donor areas and transferring it, here we're encouraging seagrass to grow. It's not a cheap solution, but it's very scalable. The construction, plus five-year monitoring, was about $2.5 million for a little more than an acre. It definitely helped North Carolina DOT fulfill its seagrass criteria.

We considered creating a slightly larger buffer. If we could have enclosed the seagrass within two barriers, we feel it would have worked better.

Mr. Miller asked if there were any issues with public involvement.

Ms. Hodel said there were some shrimp trawlers and fishermen who were not happy, but other anglers were happy because they knew it was a fish-attraction device. There was not much boat traffic there, anyway. The man who takes anglers out on the water, a blue-crab fisherman, said people don't mind it. One main issue is that the lights need to be functioning at night. Lights must be inspected more frequently than just yearly inspections.

Mr. Miller asked what the tidal range was.

Ms. Hodel said it was a maximum of 5 feet. If there was a storm at the time, the structure was fully exposed, while other times it's completely underwater.

Mr. Raymond asked if they had to get U.S. Coast Guard or Army Corps of Engineers approval.

Ms. Hodel said they did. This was a pilot project, very large scale. If it were up to her, she would done a smaller project for the pilot phase. North Carolina DOT had limited options and seagrass restoration was required. For Collier County, water quality and transporting seagrass really makes sense. Our water bodies are imperiled everywhere. We're making a tiny dent with something like this. Dr. Mark Fonseca says to look around and see where seagrass is. Don't expect it to grow if transplanted.

Chairman Roth said that was the question they had. If it's not there now, don't expect it to come back. We've been pondering the feasibility of a seagrass restoration program. He noted that Marco Island, where he lives, once had tons of seagrass, but has none now. Maybe we can't even think about addressing the loss of seagrass until we address water quality. They've heard about the Indian River program and he asked if there were other success stories.

Ms. Hodel said they did some very large seagrass transplantation projections. In Miami, they transplanted 16 acres that were planted in a checkerboard pattern, one meter bare and one meter planted. The intent was so that the SAV could fill it in. There were manatees munching on the seagrass there. However, long-term monitoring didn't work out due to the collapse of the seagrass in Biscayne Bay. This was an old dredge hole, 4-feet deep, spanning a large area. Transplantation works and can definitely be successful. With SAV and transplantation, there's a better chance of long-term survival. Water quality is the issue. Ultimately, the water quality must be addressed.

Fertilization ordinances might have to be addressed. She didn't think they were enforced much. If they don't get better at enforcement, it won't work. There are many pieces of the puzzle.

Chairman Roth asked if anyone was developing more hardy forms of seagrass. We want to restore it without watching it die.

Ms. Hodel said she wasn't familiar with any new strains, but knew they were looking at new coral strains, so she assumed the same is going on with seagrass. She said Sea & Shoreline LLC has had success growing seagrass. They're feeding manatees with their nursery stock.

Chairman Roth asked about Crystal River.

Ms. Hodel believe that's a Sea & Shoreline LLC project. Sea & Shoreline also has done work with Collier County in the past. They also have wave-attenuating devices, WADs, and are heavily involved in the nursery program for seagrasses.

Mr. Miller asked if CSA Ocean Sciences Inc. was going to be involved in Collier County's hard-bottom monitoring.

Ms. Hodel said they will be. They were involved last summer and enjoyed working on Collier County's vessel. The staff of her company has spoken very highly of County staff and the public marina.

[Ms. Hodel signed off the virtual connection.]

IX. Old Business

Chairman Roth noted that in the CAC Water Quality Subcommittee's first report, they mentioned fertilizer ordinances. He suggested groups such as Pelican Bay Services Division could exert pressure on the County, which definitely doesn't enforce its fertilizer ordinances. He knows that because his landscaper didn't put a sticker on his truck just to check if the County is monitoring that and he's never been stopped by anyone.

Mr. Miller said they could take the issue to the BCC for everyone to make public comments.

Chairman Roth said they need to restate the AWT and fertilizer issues that are outlined in their Subcommittee report. The technology is there, but Florida has its head in the sand. He noted they don't have an updated Subcommittee report to give to anyone, so they should select three points at the next meeting and turn that into a memo.

The Collier County Waterkeeper is an important person to work with. The Waterkeeper will be at Cambier Park for Earth Day, but primarily will be talking about global warming. Collier County should start a VOG program in Naples Bay. The Subcommittee needs to determine how to facilitate the program and should contact someone at the Sarasota program so they can learn how to teach it here.

Ms. McLaughlin said there was a program in Maryland 15 years ago for private docks, plug-and-play oyster starters.

Chairman Roth said that's what the VOG program would be. It would get residents interested in the environment and it would be like watching an aquarium. That's the kind of vibe we need to get going in Collier County. He'd like more of a blue vibe, especially with all the beaches, which are the best in the world.

He asked if Pelican Bay irrigates and fertilizes.

Ms. McLaughlin said it does, but they conduct testing and only use fertilizer in certain areas. She feels strongly that Collier County should be cleaning up its water. We are paying attention to it. We are trying. The back of her building looks very different since they stopped fertilizing.

X. Announcements

None

XI. Committee Member Discussion

XII. Next Meeting Date/Location

April 14, 1 p.m.
GMD Horseshoe Square South Conference Room

There being no further business for the good of the County, the meeting was adjourned by order of the chair at 2:30 p.m.

Collier County Coastal Advisory Committee
Water QualitySubcommittee

_____
Chairman, Bob Roth

These minutes were approved by the Subcommittee/Chairman on _____, as presented (choose one) _____, or as amended _____.