



CHNEP Technical Advisory Committee Meeting Minutes
Thursday, August 8th, 2024, 9:30 am – 2:00 pm
Centennial Park, Large Multipurpose Room
1120 Centennial Blvd. Port Charlotte, FL 33953

**Draft Technical Advisory Committee Meeting Minutes
August 8, 2024**

Members Present:

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| Mike Taylor | U.S. Army Corps of Engineers (USACE) |
| Arielle Taylor-Manges | Florida Department of Environmental Protection (FDEP) |
| Eric Weather (alt) | Florida Fish & Wildlife Conservation Commission (FWC) |
| Kate Rose | Florida Sea Grant |
| Jeff Devine | West Coast Inland Navigation District (WCIND) |
| Mark Walton | Southwest Florida Water Management District (SWFWMD) |
| James Douglass | Florida Gulf Coast University (FGCU) |
| Brandon Moody | Charlotte County |
| Rick Armstrong | Lee County |
| Ernesto Lasso de la Vega | Lee County Hyacinth/Mosquito Control District |
| Brooke Langston | Sarasota County |
| Kraig Hankins | City of Cape Coral |
| Ryan Pieper | City of North Port |
| Brittany Metzler | City of Punta Gorda |
| Dana Dettmar | City of Sanibel |
| Steve Suau | Carbon-Life LLC |
| David Ceilley | Aquatic Ecologist |
| Michelle Tickles | Mosaic Company |

Members Present via Teams:

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| Kevin Kalasz | U.S. Fish & Wildlife Service (USFWS) |
| Mark Sramek | NOAA National Marine Fisheries Service (NMFS) |
| Mark Barton | South Florida Water Management District (SFWMD) |
| Greg Knothe | Polk County |
| Devon Moore | City of Winter Haven |

Others Present:

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| Jennifer Hecker | Coastal & Heartland National Estuary Partnership (CHNEP) |
| Nicole Iadevaia | Coastal & Heartland National Estuary Partnership (CHNEP) |
| Sarina Weiss | Coastal & Heartland National Estuary Partnership (CHNEP) |
| Andrea Vale | Coastal & Heartland National Estuary Partnership (CHNEP) |
| Keara Abel | Coastal & Heartland National Estuary Partnership (CHNEP) |
| Vanessa Bauzo (virtual) | Florida Department of Agriculture & Consumer Services (FDACS) |
| Melynda Brown (virtual) | Florida Department of Environmental Protection (FDEP) |
| Kaylee Kwek | Florida Department of Environmental Protection (FDEP) |
| Mary McMurray (virtual) | Florida Department of Environmental Protection (FDEP) |
| Jack Wallace (virtual) | Florida Department of Environmental Protection (FDEP) |
| Jamie Wolanin | Florida Fish & Wildlife Conservation Commission (FWC) |
| Emily Clancy | Florida Fish & Wildlife Research Institute (FWC) |
| Casey Craig (virtual) | Florida Fish & Wildlife Research Institute (FWC) |
| Kara Radabaugh (virtual) | Florida Fish & Wildlife Research Institute (FWC) |



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| Liz Estes | Charlotte County |
| Kelly Colvin | Sarasota County |
| Clinton Cunningham | City of Cape Coral |
| Harry Phillips | City of Cape Coral |
| Roxanna Saadatzaheh | City of Cape Coral |
| Rick Lehmkul | City of Punta Gorda |
| Olivia Husick (virtual) | City of Winter Haven |
| Miles Medina (virtual) | ECCO Scientific |
| David Tomasko | Sarasota Bay Estuary Program |
| Jennifer Shafer | Shafer Consulting |
| Lenny Landau | Public |
| Judy Ott | Public |
| John Ryan | Public |

Agenda Item #1 – Call to Order and Introductions — Ernesto Lasso de la Vega, Co-Chair

Co-Chair Ernesto Lasso de la Vega called the meeting to order at 9:31 am. Introductions were then made.

Agenda Item #2 – Agenda Additions or Deletions — Ernesto Lasso de la Vega, Co-Chair

There were no additions or deletions to the agenda.

MARK WALTON MOVED, SECONDED BY ERIC WEATHER TO APPROVE THE AGENDA AS PRESENTED. THE MOTION WAS CARRIED UNANIMOUSLY WITH NO FURTHER DISCUSSION.

Agenda Item #3 – Public Comments on Agenda Items — Ernesto Lasso de la Vega, Co-Chair

No public comments on agenda items were made.

Agenda Item #4 – Technical Advisory Committee April 11th, 2024 Meeting Minutes — Ernesto Lasso de la Vega, Co-Chair

No edits were made to the April 11, 2024 Technical Advisory Committee Meeting Minutes.

RICK ARMSTRONG MOVED, SECONDED BY ARIELLE TAYLOR-MANGES TO APPROVE THE MINUTES AS PRESENTED. THE MOTION WAS CARRIED UNANIMOUSLY WITH NO FURTHER DISCUSSION.

Agenda Item #5 – CHNEP Update — Jennifer Hecker, CHNEP

CHNEP's Executive Director, Ms. Jennifer Hecker, presented on programmatic activity occurring since the last Technical Advisory Committee meeting. Highlights are as follows:

Planned and executed the Spring Committee meetings; the draft FY25 EPA 320 Master Work Plan and FY25 EPA BIL Work Plan and budget tables were reviewed and approved at the Spring Policy meeting; the CHNEP EPA 320 and EPA BIL FY25 grant applications, with their approved Work Plans and Budgets, were prepared and submitted to U.S. EPA; a revised version of the Memorandum of Understanding (MOU) between Charlotte County and CHNEP was approved at the May board meeting; fully executed interlocal agreements with Highlands County, City of Punta Gorda, and the Lehigh Acres Municipal Services Improvement District (LAMSID); for the CCMP update planning, CHNEP reviewed 2019 CHNEP CCMP and helped facilitate discussions during



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the Spring Management Conference meetings to record and synthesize comments from the Committees (consensus comments were provided to a contractor to begin the CHNEP CCMP update over the spring and summer); CHNEP participated along with staff from Florida's other 3 National Estuary Programs in a day-long workshop focused on sharing updates and opportunities for collaboration and lessons learned; reviewed and provided content for the U.S. EPA NEP FY23 Accomplishments Report, including information on post-Hurricane Ian remediation efforts; and reviewed and sent a technical comment letter on the SFWMD Draft Sea Level Rise and Flood Resiliency Plan.

CHNEP provided Letters of Support for partner projects such as Bond Farm Hydrologic Enhancement projects included in the Florida TIG "Draft Restoration Plan 3 & Environmental Assessment: Water Quality" on the project list for upcoming Deepwater Horizon NRDA Funding; Conservation of the Gulf Coast and Wildlands Conservation proposals to FDEP for additions to the Florida Forever list for state purchase; the Florida Water (FloW) Center Proposal from UF and other state universities; and CHNEP partnered on a letter of interest for 3 NOAA RESTORE Proposals, of which 2 were invited to submit full proposals.

For finance and grants, the CHNEP EPA 320 Novated Grant award was received and accepted by CHNEP's host; CHNEP EPA FY24 BIL Grant award was accepted by CHNEP's host on June 11th; sent mid-year report for EPA 320 and EPA BIL FY24 cooperative funding agreements; prepared and finalized EPA FY24 match documentation based on SFWMD for CERP Caloosahatchee (C-43) West Basin Storage Reservoir Project; sent Q2 and Q3 reports for FDEP FY24 cooperative funding agreement (prepared and submitted final invoice for FY24 funding from FDEP and the grant was closed out); began drafting documents for FY25 FDEP funding agreement; reviewed and processed the final reimbursement from SWFWMD for the Myakka Headwaters Project; the fully executed SWFWMD Agreement for FY24 was received by CHNEP and accepted by CHNEP host; sent Q2 report for SWFWMD FY24 cooperative funding agreement; updated the conservation grant application and conducted review of previous grants for CCMP and planning for outreach (sent award email to Conservation Grant applicant for spring 2024 award cycle, this award was accepted and the applicant submitted a W-9 for the County); received Q2 and Q3 quarterly reports for both Upper and Lower CCHMN projects, reviewed deliverables and report, and processed invoices; received Q2 and Q3 reports for the FY24 Water Atlas project and processed the invoice (received revised final report for FY23 Water Atlas project and processed final invoice); and processed private donations via check and PayPal.

CHNEP Staff attended several partnership meetings since last cycle, including:

- CHNEP Water Atlas Monthly Management Meetings
- CHNEP/USGS Stream Stats in Florida Discussion
- Southwest Florida RAMP Meeting
- Charlotte County Board Meeting
- Industries of the Future: Expanding Florida's Aquaculture Insights and Innovations
- Desoto County Vulnerability Assessment Steering Committee Meeting
- Hardee County Vulnerability Assessment Steering Committee Meetings
- CHNEP/Charlotte County Comprehensive Vulnerability Assessment Meetings
- ANEP Communications – Media Relations Meeting
- CHNEP Citizens Advisory Committee (CAC) Meeting
- South Florida Everglades Restoration Task Force (SFERTF) Meeting



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- Science and Environment Council (SEC) Meeting
- NOAA Restore Grant Gulf of Mexico Meeting with UF
- Collaboration Meeting with Calusa Waterkeeper
- Polk County Vulnerability Assessment Steering Committee Meeting
- Resilient Florida, Adaptation Planning Guidebook Stakeholder Workshop
- EPA/ANEP Meetings from April 29-30, including with the offices of Congressman Franklin, Senator Rubio, Congressman Steube, and Congressman Soto.
- FDEP Quarterly Resilience Forum
- CHNEP/Conservation Foundation of the Gulf Coast GIS Data Support Meeting
- Water Quality Playbook Update
- ANEP External Affairs Meeting
- CHNEP Water Atlas Biennial Assessment Master List Set Up Meeting
- CCHMN Electronic Field Form Development
- Naples Conservancy of Southwest Florida Meeting
- GOMA/Waters to the Sea Webinar
- CCHMN Data and FDEP Assessment Database Upload
- Florida Water & Climate Alliance: Statewide Drought Response & Coordination
- CHNEP CCMP Update Kick-Off Meeting
- Resiliency Coordination Forum Meeting
- NOAA RESTORE project meeting Tarpon Coastal Ponds
- Pine Island Flatwoods Preserve Restoration Project Meeting
- FDEP Acquisition and Restoration Council Meeting
- Charlotte Harbor Flatwoods Initiative Quarterly Meeting
- CCHMN Data Upload Meeting
- Florida NEP Meeting
- Highlands County Comprehensive Vulnerability Assessment Meeting
- Heartland Counties Comprehensive Vulnerability Assessment(s) Meeting with CFRPC
- Tiki Point Living Shoreline Project Meeting
- Redfish Annual Review meeting: Charlotte Harbor Region
- Lee County Comprehensive Vulnerability Assessment Meeting
- Macroalgae Working Group Meeting
- Corkscrew Watershed Initiative Public Meeting
- US EPA Virtual Event 2024 “QA: Transforming Challenges into Opportunities”
- NOAA RESTORE Proposal Meeting
- CCHMN Field Form Development Meeting
- 2025 CHNEP Nature Calendar Photo Selection Meeting

In addition, CHNEP attended and presented at numerous events which included as an expert panelist at the Science and Environment Council meeting on case studies and scenarios for environmental communication. CHNEP collaborated with the EPA to share a keynote presentation by the Miccosukee Tribe of Indians of Florida from 2024 Southwest Florida Climate Summit at the National Estuary Program meetings and had an abstract accepted for the upcoming Restore America’s Estuaries 2024 Coastal & Estuarine Summit.

Regarding outreach, CHNEP sent invites to new CAC applicants; hosted a booth at Wild About Nature Fest hosted by the Conservation Foundation of the Gulf Coast where over 200 visitors made 120-plus wildflower seed bombs; and attended Ding Darling Conservation Carnival at Lakes



Park where over 240 guests stopped by to play a game, compete in trivia, and receive educational prizes. CHNEP shared information with its network to highlight upcoming partner events, such as by Conservation Grants recipients UF IFAS Extension Polk County, Future Forestry, and the Environmental Conservancy of North Port and Surrounding Areas; provided Conservation Grant recipient (Estero Community Park Shoreline Improvement) with materials for volunteer folders at planting event; continued to post on social media including for sea turtle nesting season and World Bee Day; mailed CHNEP 2025 nature calendar photo contest flyers to libraries and art alliances to increase engagement and entries; completed edits for the Spanish kids' activity book with support from Dr. Ernesto Lasso de la Vega (this file has been prepared for printing); added new features to the CHNEP website including an accessibility toolbar and a refreshed news page. In addition, CHNEP staff provided 100 kids' activity books to the North Port Summer camp; presented a 1-hour K-8 Summer camp program for 20-plus kids at the Summer Success Institute at Wellen Park as well as provided kids' activity books; drafted a purchase request and scope of services for the printing and distribution of the 2025 nature calendar; held the CAC calendar photo contest selection meeting which guided the development of a draft calendar layout for the designer; and sent out a call for abstracts for the 2025 Southwest Florida Climate Summit.

CHNEP staff were interviewed and featured in the "*The language of science*" – WaterLine by Your Sun Newspaper. CHNEP has 50 new Facebook followers for a total of 1,952 with 7 new "likes" (1,700 total likes), 5,897 subscribers for the educational mailings, 4,298 unique visitors and 6,604 page visits to the CHNEP website, 9,660 YouTube views with 64 subscribers and 297 videos, and 63 new Instagram followers for a total of 596 total followers.

One member asked for the dates of the 2025 Climate Summit and Ms. Hecker said that flyers would be sent to all Management Conference Committee members and that there is a landing page on the CHNEP website for more information (<https://www.chnep.org/climate-summit>).

Agenda Item #6 – Overview of the Draft 2024 CHNEP Comprehensive Conservation Management Plan (CCMP) Update — Jennifer Shafer, PhD, Shafer Consulting

Shafer Consulting was tasked with making major revisions to the CCMP based on the input from Management Conference committee members from the last meeting cycle as well as with additional input from CHNEP staff. Dr. Shafer provided the TAC with an overview of the updates made to the CCMP on behalf of their respective organizations. Highlights are as follows:

The CCMP consists of 4 action plans: water quality improvement; hydrologic restoration; fish and wildlife habitat protection; and public engagement. These 4 action plans have 15 actions and 32 activities. Updates made to the CCMP include data updates, new science and policy, projects and programs, accomplishments, and 5 new activities. The CHNEP Milestones infographic was updated with highlights and moments that marked environmental milestones, and a design was created that is both informational and eye-catching. The Major Accomplishments infographic was also updated with new statistics that illustrate CHNEP's major accomplishments over the last 5 years. Figures and tables were updated throughout to reflect current numbers and data.

The breakdown for the specific TAC member' s/staff contributions is as follows:

To address comments made by TAC members and CHNEP staff on the Water Quality Action Plan, Shafer Consulting revised and expanded the language on contaminants of emerging concern to include PCBs and PFAS; added a section on bioindicators as a compliment to chemical/physical parameters; expanded the section on the new state stormwater rule; revised



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the septic system section to include new FDEP oversight and advice on new advanced technologies; updated Activity 4.1 text to reflect using caution with non-AWT reuse water; expanded language to reflect new understandings of nutrients, climate, macroalgae, and seagrass health; and quantified the link between polluted runoff and red tide based on the Tomasko et al. 2024 publication. TAC members had requested that the wastewater treatment facility map be updated to show which facilities are considered Advanced Wastewater Treatment (AWT), however, there is no comprehensive list of AWT facilities available from FDEP. Other updates made to the Water Quality Action Plan include new text on Hurricane Ian and CHNEP contributions to disaster response; new CHNEP Water Atlas 2.0 pages and tools; updated SWFWMD SWIM plan; improved farm inspections and reporting by FDACS OAWP; updates to some counties in statewide OSTDS inventory (total 300-plus k); and 2040 projections for 90+ % reuse and 99% reduction surface water discharge. Finally, a new activity WQ-5.2 was added for exploring best practices and technologies to reduce or mitigate HAB impacts.

To address comments made by TAC members and CHNEP staff on the Hydrologic Restoration Action Plan, Shafer Consulting added City of Winter Haven's examples of integrated modeling; added hydrologic modeling completed for Charlotte Harbor Flatwoods Initiative and South Lee County Watershed Initiative; added the new Lake Okechobee System Operating Manual (LOSOM); updated Activity 2.2 to support community adoption of Low Impact Design (LID); updated progress on the C-43 reservoir project; added language on the co-benefits of designing hydrologic engineering projects with water quality goals in mind; emphasized the importance of climate extremes when planning; added text on the Warm Mineral Springs Creek restoration project to benefit manatee refuge habitat; updated Activity 3.1 to support floodplain connectivity, reduced stream channelization, and fish passage barriers; and updated Activity 3.2 to support limited estuary connections to coastal ponds. Other updates made to the Hydrologic Restoration Action Plan include added text about the 2021 SWUCA update that all 13 MFLs were met for rivers, estuaries, and springs, as well as added text on the new Caloosahatchee River MFL. Finally, a new Activity HR-3.3 was added for implementation of the vulnerability assessment recommendations to protect water quality and hydrology.

To address comments made by TAC members and CHNEP staff on the Fish, Wildlife & Habitat Protection Action Plan, Shafer Consulting added a new section on bioindicators and revised the section on seagrass monitoring, trends, and indicators; revised and expanded the section on clam restoration; updated text to recommend living shorelines as a seawall alternative; added text on the new tidal creek assessment framework by Wessel; added new coastal ponds and tidal creek fisheries work by Blewett and Wilson; updated language to encourage urban and suburban restoration opportunities with LID; revised recommendations for restoration with the results from HRN II; and updated Activity FW-3.1 performance measure to technical support to advance HRN implementation. Other updates were made to the Fish, Wildlife & Habitat Protection Action Plan including to reflect that the Homosassa shrew was state-delisted and the Atlantic sturgeon is federally endangered; the loss of 10,000 acres of seagrass since 2014; expanded tape-grass restoration in Caloosahatchee up to 100 acres; large-scale coordinated land conservation initiatives such as the Florida Wildlife Corridor and the Everglades to Gulf Conservation Area; addition of 87,000 conservation acres since 2019; and \$13.6 billion annually in regional economic benefits from natural resources equal to projected losses from another serious HAB. Two new activities were added, including: Activity FW-1.3 to protect, monitor, and restore shoreline habitats, including mangroves and salt marshes, to establish status and



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trends as a biological indicator of ecosystem health and fisheries, and to track changes that are due to sea level rise and shoreline hardening; and Activity FW-2.3 to implement the Habitat Restoration Needs Plan in facilitating habitat restoration and migration in current and future scenarios.

To address comments made by TAC members and CHNEP staff on the Public Engagement Action Plan, Shafer Consulting updated the intro to reflect population growth and opportunities to interact with new audiences; updated Activity 1.2 performance measure to monthly mass communications about volunteer opportunities; updated Activity 2.1 performance measure to annual public event with diverse perspectives and presenters; added text to encourage CHNEP coordination with partner Public Information Officers; updated Activity 3.1 responsible parties to clarify Sanibel Sea School is part of SCCF; and updated Activity 4.1 Performance measure to reflect annual meetings with interested officials. Other highlights added to the Public Engagement Action Plan include that the population tripled in last 50 years and Polk County expected to be most populous by 2035; the CHNEP web presence doubled in the last 4 years; the annual Southwest Florida Climate Summit began in 2021 and is ongoing; and CHNEP leverages \$1 in federal funding to \$55 in restoration thanks to partnerships. Finally, a new Activity PE-3.2 was added to convene and coordinate partners for post-disaster response.

Ms. Hecker noted that input was gathered last cycle and that this cycle is to ensure that the comments from last cycle were appropriately addressed. One member offered that under the Fish, Wildlife, & Habitat Protection Action Plan's 5- year performance measures, when it calls for an "increased understanding" it also means that resources and monitoring must also be increased, and the "restoration" must be monitored and the "increase" must be achieved. The member stated that there seems to be an emphasis on the research but not as much as the restoration. Dr. Shafer responded that after trends and status are established, perhaps the emphasis could be on restoration beginning in 2026. Ms. Hecker reminded members that this is just a 5-year plan and while there are some restoration plans that are advancing in the interim, the emphasis is on the understanding and strategic planning that gets us to that implementation stage. These are living performance measures that will be adapted over time. Another member asked if oysters should have been specifically mentioned as part of living shorelines, to which Ms. Hecker explained that oysters are mentioned in some sections and there is a separate activity for submerged resources. The member responded that there is synergy in the land-sea interface as oysters are a substrate of the mangrove colonizing oysters and it can be tough to draw the line.

Another member suggested adding a citation to the Sarasota County NEST program publication for stormwater pond management. Regarding the OSTDS hotspot map (Figure 14), a member commented that the Charlotte County map reflects existing as well as potential locations for OSTDS to be developed and suggested adding language to clarify that. Ms. Shafer responded that a note could be added to the caption to indicate that the map includes potential areas, and this could help with conversations about planning. Regarding the Managed conservation lands table (Table 13), a member asked if the table distinguishes between acquisitions and conservation easements, to which Dr. Shafer responded that the table does not make that distinction.

Another member pointed to a slide that referenced seagrass losses between 10,000 to 14,000 acres in the lower estuary as well as mention of 100 acres of *Vallisneria* planted. The member explained that they have been monitoring these phases of restoration and expressed that it is crucial to monitor the success of these restoration projects. There was failure in the beginning stages and then Hurricane Ian wreaked havoc as well. Dr. Shafer responded that the stages of the restoration



projects and the progress along the way will be reflected in the actual text in the CCMP, and all partners that are involved in the monitoring and the maintenance are listed there as well. Another member asked why FWC wasn't included in the list of responsible parties for the Water Quality Activities 5.1 and 5.2 as they are heavily involved with the water quality and HAB work. Ms. Hecker responded that it was likely an oversight and that the reason the draft is being presented at the Committee meetings is to ensure that no one is overlooked or left out.

One member mentioned that there is text about improving resiliency and recovery from post-natural disasters and inquired whether there was a section that deals with resiliency planning barriers and policy on a federal and/or state level. The member specifically referenced Florida Senate Bill 250 that prevents local governments from making changes to their land development code that would make anything more restrictive or stringent, which is in place since after Hurricane Ian until 2027. The member explained that there are some things that would make local municipalities more resilient after a natural disaster that this bill would prevent, such as Low Impact Design. Ms. Hecker responded that she didn't think it was necessary to reference specific bills because the Public Engagement section already includes text about reaching out to policymakers to help them get a better understanding of local needs (and implementation of the CCMP). Ms. Hecker further explained that the CHNEP Policy Committee has instituted procedures that the CHNEP must follow when dealing with policymakers and it does have specific limitations regarding engagement. Another member commented that CHNEP does a great job of supporting counties in identifying and implementing other mechanisms to reach these goals of water quality improvement which cannot be done through regulatory mechanisms. CHNEP has a huge pool of expertise and experience from which to pull from to help counties and local entities market and 'beef up' incentivization-based programs.

INCLUDING THE VOTES BY THE VIRTUAL MEMBER ATTENDEES, THERE WAS A CONSENSUS TO MOVE FORWARD WITH THE CCMP DRAFT AS PRESENTED.

Agenda Item #7 – Water Quality Trends in Southwest Florida — Miles Medina, PhD, ECCO Scientific LLC

Dr. Miles Medina from ECCO Scientific LLC briefed the TAC on a recent compilation of twenty years of water quality data to investigate trends in CHNEP estuaries from 2000-2021, based on monthly sampling through the Coastal Charlotte Harbor Monitoring Network (CCHMN) spatially stratified monitoring program. Highlights are as follows:

Researchers partnered to compile twenty years of water quality data to investigate trends in nitrogen, phosphorus, chlorophyll-a, oxygen, and organic carbon concentrations and apparent color in the upper water column samples from southwest Florida of estuaries between 2000 and 2021, based on monthly sampling through the CCHMN stratified monitoring program. CCHMN was established in the early 2000s; it's coordinated by CHNEP, and its partners include Sarasota County, Lee County, SWFWMD, and others. It uses an intentional, stratified random sampling design with monthly water quality sampling across 13 segments (strata) for the curation of data. The monitoring program collects data on a couple dozen water quality parameters, however, this study only focused on nutrients, including nitrogen, phosphorus, and chlorophyll.

For each water quality parameter at each of 13 monitoring strata, a generalized additive model (GAM) was fit to the monthly data to identify trends over a sliding 5-year window. Results were interpreted in the context of nearby nutrient region concentration thresholds and recently observed changes in seagrass coverage and macroalgal abundance. The results showed that nitrogen is



elevated throughout the system, but the northern and southern segments show distinct characteristic behavior. The phosphorus trends showed that phosphorus was low relative to the nutrient thresholds, except for in the Caloosahatchee River and Matlacha Pass. Chlorophyll trends showed that chlorophyll concentrations have been low throughout the system. From 2017 to 2021, nitrogen was elevated (primarily organic nitrogen), while inorganic nitrogen and chlorophyll levels were low. These trends correspond with the massive seagrass loss and macroalgal proliferation observed since 2016 (coinciding with Hurricane Irma in September 2017 and massive red tide bloom in late 2017 to early 2019).

The key takeaway is that trend results are consistent with the hypothesis that nitrogen enrichment has resulted in macroalgal proliferation and seagrass losses. Nitrogen was already trending upward before Hurricane Irma and elevated nitrogen appears to be making the system vulnerable to profound ecosystem changes. Northern and southern segments exhibited interesting differences: Lake Okeechobee discharges and nitrogen loads remain a major concern, however, the Peace River and coastal urban areas also contribute substantial loads. Additionally, the GAM-based trend analysis offers a range of beneficial features such as it captures nuances in inter- and intra- annual dynamics, it propagates uncertainty throughout the analysis, and it is easily scalable to analyze many parameters across many locations. A manuscript detailing the outcomes of the study has recently been submitted for publication. The data set is now available in a public repository.

One member asked if there was a way to gauge if there is a relationship between nutrients and chlorophyll in the Gulf and if that is something that is currently being looked at. Dr. Medina responded that this sort of analysis tells how water quality has changed over time, and the next question would be what is driving the change and then discovering if there is a link between loading from the watershed and what is going on out on the coast. Another member asked if there is an opportunity for Dr. Medina to connect with those at FGCU that are doing an analysis on nutrient hotspots in the Peace River basin for the state so that there could even more coordination in the efforts. The member from FGCU said that he would connect Dr. Medina with the relevant FGCU members to facilitate that coordination.

Ms. Hecker asked how this information will be incorporated into CHNEP Water Atlas, to which Ms. Iadevaia responded that there is an existing water quality trend analysis on the Water Atlas. Ms. Iadevaia explained that the project Dr. Medina presented on was started to look at expanding what trend analysis information was available, and there is another project in the upcoming months to create a dashboard or something similar to display the results, which will then be shared through the Water Atlas water quality trend analysis page.

Another member asked if there was a trend observed in nitrate or ammonia over the 5-year period prior to the proliferation of macroalgae and seagrass losses. Dr. Medina explained that inorganic forms of nitrogen get consumed so quickly that they're often not detected in the grab samples (too low to detect), so he concluded that nitrate and ammonia are so often undetected that it's not appropriate to do a trend analysis based on that limitation. Another member commented that there was a study commissioned about 15 years ago by the City of Sanibel and Lee County to look at the bioavailability of sources of nutrients and their linkages to macroalgal blooms and asked Dr. Medina if he looked at that study. Dr. Medina responded that he's not sure if he's aware of that study or not, but the paper does cite a recent paper by Eric Milbrandt from SCCF on macroalgal connections to storms and nitrogen loads. Dr. Medina asked that the committee member share the



paper with him, to which they responded that it should be available through Lee County, City of Sanibel, or FGCU.

Agenda Item #8 – Mangrove Mortality after Hurricane Ian in Charlotte Harbor — Casey Craig, Fish & Wildlife Research Institute, FWC

Ms. Casey Craig from the FWC Fish & Wildlife Research Institute briefed the TAC on mangrove recovery and monitoring efforts across Charlotte Harbor after extensive damage from Hurricane Ian. Highlights are as follows:

Hurricane Ian made landfall as a high-end category 4 storm in Charlotte Harbor, Florida on September 28, 2022. There was 10-15 feet storm surge, up to 27 inches of rain, and sustained winds of 150 miles per hour. This storm brought stress on the mangroves, including short-term stressors such as branch/trunk snapping, tree uprooting, defoliation of canopy, and sediment erosion, as well as long-term stressors such as storm surge deposit (carbonate mud or sand which can smother lenticels thus impeding gas exchange), sulfide toxicity, and altered hydrology.

Natural mangrove forests should be inundated less than 30% of the time. The hydrology in mangrove forests is often already altered by roads or berms cutting off tidal flow and resulting in impounded stagnant water, causing mangrove stress or mortality. Hurricanes can compound stress in already impounded mangrove forests. Signs of stress in mangroves include discolored water, epicormic growth, adventitious roots, and fungus galls. After Hurricane Ian, there was the opportunity to examine how short-term damage in the presence of long-term stressors impact the rate of recovery in mangrove forests. The study monitored mangrove forests in 4 locations—Gasparilla Island, Catfish Creek, Matlacha, and Pine Island. Vegetation monitoring in 10 m × 10 m plots included quantification of environmental metrics (water level, porewater sulfide concentration, storm surge deposit thickness, and soil shear strength, which measures soil resistance to deformation) and vegetation metrics (tree mortality, canopy cover, and understory development). While several plots showed signs of recovery nearly a year after the hurricane, other mangroves that initially survived the hurricane died several months later. Such delayed mortality was particularly evident in basin forests with standing water or thick storm surge deposits. Matlacha was the only forest in Charlotte Harbor with storm surge deposit from Hurricane Ian. The study concluded that the magnitude of mangrove mortality is influenced by existing stressors coupled with storm impacts (mangroves with more long-term stressors experienced higher delayed mortality after the hurricane). Charlotte Harbor mangrove forests are still experiencing delayed mortality from Hurricane Ian after 16 months, and monitoring will continue through 2024 (long-term stress = long-term monitoring).

One member asked if there was a survey of how much acreage was lost due to Hurricane Ian, to which Ms. Craig responded that while she is not sure of any quantitative study of how much acreage was lost, there was vegetative index (NVDI) imagery taken after Hurricane Ian that may be used for comparison. Another member asked if the mangrove impact was similar across red, white, and black mangroves. Ms. Craig responded that the impact across the 3 different mangroves was not the same. She explained that red mangroves are positioned lower and are accustomed to the tidal impacts, while white mangroves are found more upland and are not used to those impacts, and thus white and black mangroves have a harder time recovering. Another member asked if Ms. Craig was aware of similar monitoring efforts in Rookery Bay and/or Pine Island Sound, to which Ms. Craig responded that she is not familiar with any monitoring study there.



A member asked if the recovery is taking so long due to the sulfides in the sediment, to which Ms. Craig responded that it is a combination of things. She explained that while sulfides do stress and impact the mangroves, there is also significant impacts from the timing of larger hurricanes which are coming later in the season, specifically impacting white and black mangroves which likely already dropped their propagules and must wait for the next round of propagules to drop (as compared to Red mangroves which drop propagules year-round), so there is a lack of seed source to recover naturally. Another member asked if the data would be impacted by the recent Tropical Storm Debby and the subsequent debris removal efforts. Ms. Craig responded that they haven't been back to survey yet and it is unknown as to what the impact may be, though debris removal does not impact mangroves in comparison with other factors.

Agenda Item #9 – Red Tide Duration and Nitrogen Loads from the Caloosahatchee River – Inclusive of Lake Okeechobee Discharges — David Tomasko, PhD, Sarasota Bay Estuary Program, and Stephen Suau, Carbon-Life LLC

Dr. Dave Tomasko, Sarasota Bay Estuary Program, and Mr. Stephen Suau, Carbon-Life LLC, shared findings from a joint research effort and recent publication looking at intensification factors of harmful algal blooms. The project examined relationships between land-based nitrogen loads and red tide events in Southwest Florida. Highlights are as follows:

Red tides are a regional phenomenon. Red tide blooms often originate in offshore waters, however, once these blooms are transported to nearshore waters by currents and winds it is believed that their abundance and duration can increase due to man-made nutrient pollution. The basis for believing there is an anthropogenic link is that it is known that *Karenia brevis* can utilize nutrients from human as well as “natural” sources, nutrient loads to Southwest Florida’s coastal waters are 2 to 4 times higher than in pre-development times, and recent studies show links between the intensification of events and nitrogen loads from the Caloosahatchee River. The study used nitrogen data collected in the Peace, Myakka, and Caloosahatchee Rivers and red tide data collected in Charlotte Harbor and the Gulf of Mexico.

The study found that, if red tide events are initiated offshore and then the water mass is transported towards Southwest Florida, anthropogenic nitrogen loads can increase their longevity. The overall pattern appears to be driven by the Caloosahatchee River, and perhaps a finer scale is needed to understand the role of the Peace and Myakka Rivers. Total hydraulic loads had almost identical explanatory power in that excessive total nitrogen loads reflect excessive hydraulic loads. Thus, the duration of red tide in Southwest Florida is dependent upon the management of Lake Okeechobee and the restoration of the Everglades system as the Caloosahatchee River contributes the majority of the hydraulic load to Charlotte Harbor and ultimately the Gulf of Mexico. The study supports using existing objects to reduce total nitrogen loads from the Caloosahatchee River, inclusive of Lake Okeechobee discharges to the west coast of Florida. Finally, policies that are more protective of Southwest Florida coastal waters and ecosystems from Lake Okeechobee discharges will help mitigate red tide. A copy of the article published in in the journal “Florida Scientist” can be found here: [An evaluation of the relationships between the duration of red tide \(*Karenia brevis*\) blooms and watershed nitrogen loads in southwest Florida \(USA\)](#).

Ms. Hecker commented that CHNEP has always held a seat on the Science Coordination Group of the South Florida Ecosystem Restoration Task Force, which is essentially the Everglades Restoration Interagency Team. She explained that this information can inform restoration efforts that have management implications. Although the Caloosahatchee River TMDL is being met, there



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is still a Basin Management Action Plan (BMAP) that has not been met and fulfilled its purpose to recover the river. The TMDLs for the Caloosahatchee River are just a segment and there is a Lake Okeechobee TMDL that is not being met. Ms. Hecker explained that it would take all of the TMDLs being met to control nitrogen at a level that would meet seagrass light targets in the Caloosahatchee Estuary. In the C-43 Reservoir, which is the largest on-going CERP project to address high flows from the Caloosahatchee, storing them, and pulsing them back during the dry season, there was a lot of concern about water quality as it was primarily designed around flow management, but it could also become a problem if this very nutrient-heavy water is put into storage for months on end and begins growing algae before it is re-released. A study was conducted and found that the most cost-effective plan was an alum injection (preferred over such things as a stormwater treatment area). Ms. Hecker concluded that the “hold the line” strategy of just creating solutions that don’t worsen things is not ideal for the management of this system. This work can be used to re-open discussion on management strategies throughout watersheds. The C-43 Reservoir was designed to meet minimum flow during the dry season, not to address high flow, and is actually not sized large enough to meet minimum flow.

One member commented that although he thinks this is great information, as someone who sits on the management side, there is always concern that someone is going to use this for their own agenda. The member said that it would be great to extend this project to take the revised management strategy that’s being proposed through LOSOM (the models that they’ve built and run) and re-run those storm events through the new LOSOM models and compare those loads to the actual loads that were recorded. Another member commented that it will be important to look at when the estuary needs the water and when the discharges are causing the most damage to the estuaries. The member also asked about the best way to create messaging for when people to take this information back to their city managers and county officials. Dr. Tomasko responded that this is a flow issue, not just south of the lake or in the lake, but also north of the lake and the entire Lake Okeechobee watershed. The average lake in Florida is 4.5 feet lower than it used to be because watersheds have been ditched and drained. Dr. Tomasko emphasized the need for more wet season storage above the lake. Dr. Tomasko also commented that red tides generate more public interest than seagrass losses, and if you can get people interested in what a TMDL could do for red tide, it could go a long way towards mitigation.

Dr. Medina offered that one of the first projects his organization was involved with along with the Everglades Foundation was to develop a machine learning model that takes in live data (data in real time) on everything from temperature, discharge, the loop current, etc., and forecasts what the maximum red tide category is going to be next week, next month, etc. The intention of this project was to give a very straight forward prediction of what to expect in terms of red tide in the short-term which can be used to inform discharge decisions. A little more work needs to be done to make it user-friendly, but the model is operational. Ms. Hecker said that CHNEP has a fact sheet on its [Publications page](#) which can be distributed to policymakers. On the CHNEP Water Atlas, there is also a [Lake Okeechobee and Caloosahatchee Release Levels Tracker](#), which simultaneously tracks lake levels and discharge flows. Next year there will also be a Lake Okeechobee waterbody page on the CHNEP Water Atlas.

Another member commented that it was interesting to note the correlation between the hydraulic load and the nitrogen load, and wondered if it would be tricky to message as in which one to focus on, and whether there is a way to eliminate alternative hypotheses and make sure that the hydraulic load is not attributed to something else. Dr. Tomasko responded that there was early work done



by a USF chemistry professor that looked at the potential of the Iron load as a contributing factor. Dr. Tomasko also stated that the Caloosahatchee River's water chemistry is not out of whack compared to other river systems but the percentage of the nitrogen that's in an inorganic form is about 10 times higher than other river systems. Another member asked whether deep well injections could help with the volume of water, to which Ms. Hecker responded that this option has been deeply explored and it is not feasible to help in this circumstance due to the geology and porosity of the limestone and vast amount of storage needed. Dr. Tomasko commented that there are some opportunities, for example Cypress Lake. He explained that Cypress Lake is 2 ft lower than it used to be and there's not a lot of people that live around there. He suggested to look at SWFWMD's Lake Hancock Lake Level Modification project, which successfully raised the lake level in order to hold water back during the wet season and contributes to the Peace River meeting its MFL 90% of the time.

Agenda Item #10 — CHNEP Technical Projects Updates — Nicole Iadevaia, CHNEP

Ms. Nicole Iadevaia, CHNEP Director of Research & Restoration, provided the committee with a brief overview on project progress since the previous TAC meeting. Highlights are as follows:

The CHNEP Water Atlas is a publicly accessible online tool providing regional water resource data and information about the historical and current conditions of our watersheds and ecosystems. The objective is to translate water quality and other data collected by partners into one place to give a holistic management picture to create live "reports" of status and trends. Data is compiled by water quality, hydrology, wildlife/habitat, and climate stressors. The new waterbody, basin, and watershed pages are now live and include over 600 waterbodies. Waterbody pages are presented with associated FDEP WBIDs and appropriate impairment criteria. The CCMP maps were updated to include new layers. The Water Quality Dashboard was also updated based on the new WBID-based waterbodies. The Water Quality Trends page has been updated with data and trends through 2023. Pages were added or modified to reflect non-assessed waterbodies or waterbodies that are not assessed for impairments.

The Coastal Charlotte Harbor Monitoring Network (CCHMN) is a regional partnership of agencies that collects monthly surface water quality data. CHNEP funds sampling, coordinates the Network, conducts field sampling audits, and uploads data on to CHNEP's Water Atlas. Q1 to Q3 data has been collected. The Upper Charlotte Harbor Partners are working on data management and optimization to create an electronic field entry form to streamline field data entry. There has been field and laboratory partner participation in the Southwest Florida RAMP quarterly meetings and field/lab method comparison to support data validation. Annual audits are underway with a CCHMN partner meeting scheduled for the end of August. CHNEP staff contributed comments to the manuscript on the water quality trend analysis using CCHMN data.

Other upcoming projects include the Comprehensive Vulnerability Assessments (CVAs). Charlotte County will soon have a contractor agreement executed with the project to begin in late summer. CHNEP is working with Charlotte County to manage that assessment. A CHNEP-funded project addition to the Lee County CVA is to start this fall and CHNEP is working with Lee County to manage that. Regarding the Heartland Counties, they are working with Central Florida Regional Planning Council to complete CHNEP-funded project additions tailored to each County.

The Yucca Pens Hydrological Restoration Planning Project has been added to the work plan. CHNEP is working with FWC (as well as WMDs and USFWS) to manage this project and contractor procurement is to begin later this fall. CHNEP has been working with the City of Punta



Gorda to manage the Tiki Point Harborwalk Living Shoreline Project and contractor procurement is to begin later in the fall. CHNEP is also working with Lee County to manage the Pine Island Flatwoods Habitat Restoration project and contractor procurement can begin once Lee County has additional funds budgeted.

As for 2023-2024 congressional reporting, there is a last call to provide data for the 2024 National Estuary Program Online Reporting Tool (NEPORT) on annual conservation, management, and restoration accomplishments. Finally, regarding science communication resources, CHNEP produces and updates fact sheets on basin water quality, basin seagrass health, and state and federal research and restoration funding opportunities, which can be found at CHNEP.org.

Agenda Item #11 – TAC Membership Updates and Cyano/Algae Bloom Discussion — Facilitated by Ernesto Lasso de la Vega, Co-Chair

Emily Clancy (FWC): Fisheries and seagrass long-term monitoring programs both document the arrival, expanse, and persistence of green filamentous algal (GFA) blooms in the Charlotte Harbor estuary. The Charlotte Harbor Estuary has been seen as a relatively pristine estuary with preserved shorelines and consistent seagrass coverage from 1982-2018. FWC and FDEP field staff were alerted to GFA blooms starting in 2012. It was collected as bycatch in fisheries gear (FWC-FIM) and observed in seagrass monitoring transects (DEP-CHAP). In Charlotte Harbor, an increased presence of GFA was also discovered on the West Wall between 2012-2014 and on the East Wall between 2016-2021. There have been recent collaborative strategies to gather additional baseline information on GFA in Charlotte Harbor. There is the fine scale “Eyes on Seagrass” biannual survey, which is a small survey, and, within each site, coverage is estimated, and biomass is recorded. The Eyes on Seagrass program identifies all macroalgae present and is conducted by UF Sea Grant during late spring/summer since 2019 to the present. There is also a broad-scale winter algae survey which is a 2-day annual event conducted by FDEP, FWC, SWFWMD and UF Sea Grant since 2020 to the present. Within each site, coverage is estimated and there is an estimate of the percentage of composition of red/brown versus GFA. Substantial losses in seagrass coverage were documented during the 2020 and 2022 surveys. There was a 50% seagrass loss along the eastern shoreline of Charlotte Harbor (East Wall) from 2018 to 2020.

Brandon Moody (Charlotte County): This is not a new issue for Charlotte Harbor. It has been going on for several years and made a significant impression last year on the East Wall. Last year was bad and this year might be worse in terms of the coverage. The turbidity that is created by decaying algae in the water is prolific. This led to the creation of a formal working group that can parse through what needs to be done and can start putting together action items. There will be 3 main perspectives including research, management, and education/outreach, because part of this is not about trying to figure out what causes this, where it’s coming from, or what we need to do about it, but also about how we communicate to the residents around it as well as the managers and county officials. It is about thinking about what we need to do about stormwater management, wastewater management, etc. There was an initial meeting of a small cluster of individuals from invested agencies to begin talking about this process. The next meeting will follow this TAC meeting and it will get the conversation going to talk about some on-the-ground ideas that might be worth pursuing. The idea is getting things going and funded through my job as a county administrator. One idea is to get a much more comprehensive circulation monitoring assessment of the area. This is a dynamic system, the hydrology’s different, what impacts the East Wall, and the West Wall is different, etc. Also looking at the organic matter accumulation in the system. The



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ultimate end goal is to emulate what happened with Tampa Bay with this consortium working towards this common goal. The [Charlotte County Water Quality dashboard](#) is up online. Our 2-year-old monitoring program is showing initial trends and hotspots that need to be addressed. There has been a coordinated effort to get the CCHMN data easily available.

Steve Suau: We're moving into the 2nd phase of the Stolen Saddle project. I will get the information to you.

Ernesto Lasso de la Vega (Lee County Hyacinth/Mosquito Control District): The Florida Lake Management Society is having its annual meeting in Coconut Point in Estero on August 27th. The CHNEP is sponsoring a one workshop event for all HOAs, all homeowners, etc. who are monitoring water/stormwater ponds.

Mark Walton (SWFWMD): We are currently in the interpretation phase of the seagrass mapping. There is useful macroalgae data included which may address harmful algal blooms. There are over 1,000 field validation points. It is about providing a story as well as the insights for that story as a resource. The maps will be available in January/February of next year.

Eric Weather (FWC): Fisheries independent monitoring continues as usual. We had one study from the Caloosahatchee and San Carlos Bay from 2004 to 2007 and there is interest in redoing that study. We have a proposal ready to go and we're seeking opportunities to do some fisheries independent monitoring in that area. There is also interest in partnering with fisherman to do some fish tagging to look at fish movement in relation to Caloosahatchee releases. We will then be seeking out funding sources.

Kate Rose (Sea Grant): The upcoming Florida HAB working group meeting will be an interactive and good use of everyone's time.

Michelle Tickle (Mosaic): There are 2 different mitigation projects that will be finalized by the end of the year. It will be about 2,600 acres in the Peace River basin of creation and enhancement. At the December meeting, I may be able to speak about our conservation easement.

James Douglass (FGCU): FGCU has gotten permits for propellor scar protection areas in Estero Bay, and we are now looking for funding to implement seagrass propellor scar protection in 2 large areas of Estero Bay. Propellor scars are a significant problem along with pollution. Propellor scar protection should help, and we will scientifically evaluate whether it does. We are working on assessing some pond restoration projects using data from the pond watch program and we are trying to demonstrate better littoral plant management using FGCU ponds as the example as well as some HOA ponds. We completed an assessment of the continental shelf environment around the Caloosahatchee discharge area, and we submitted a paper that talks about Hurricane Ian impacts on that area. A student completed a thesis on the overall variation of sea bottom life on the continental shelf of the Caloosahatchee discharge area.

Mark Sramek (NOAA): We are continuing our influence on the federal regulatory arena. There will probably be a large influx of emergency consultation projects and marine construction and restoration projects as a result of Hurricane/Tropical Storm Debby.

Agenda Item #12 – Public Comment — Ernesto Lasso de la Vega, Co-Chair

Dave Tomasko (Sarasota Bay Estuary Program): We are in the public phase of getting a permit from FDEP for what is being called the "magic jet ski study." It is regarding a jet ski that can



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generate ozonated seawater at 1000 to 2000 gallons per minute and the permit will allow us to determine if it works if we get 100,000 cells per liter, in Sarasota County.

Judy Ott: For the Water Quality trends, it would be interesting and beneficial to look at the relationship between water quality and turbidity and to see some turbidity analyses and graphics. It is hard to capture whether turbidity is from suspension in the water or decaying particles. But if you look at the chlorophyll and the turbidity together, that might be helpful. We had an original water quality report card based on that, which led to the development of numeric nutrient criteria. As for the mangrove mapping, CHNEP has done qualitative mapping studies in the past in 2007, 2010, 2017 with volunteers mapping along the entire CHNEP shoreline. It would be interesting to see how that's been updated since the 2 hurricanes. There was also aerial imagery interpretation to see when the mangroves were stressed. It would be helpful to compare those to the mangrove mortality information. As for the red tides and nutrient information, it was very interesting and useful using the images and graphics to convey the changes in the total load. It would also be helpful to look at how the C-43 affects total loads.

Agenda Item #13 – Future Meeting's Topics, Location and Date — Ernesto Lasso de la Vega, Co-Chair

The remaining CHNEP 2024 TAC Meeting date is 12/05/24. If you have ideas of new research and restoration topics and/or presenters (including those outside the CHNEP area if applicable to CHNEP CCMP efforts), please email CHNEP Director of Research & Restoration Nicole Iadevaia at niadevaia@chnep.org.

Agenda Item #14 — Adjourn — Ernesto Lasso de la Vega, Co-Chair

Meeting was adjourned at 1:50 pm.