Chronology of Water Quality Related Events in Charlotte County

August 13, 2019

Compiled by Coty Keller, David Blewett, and Judy Ott

This chronology provides a summary of some of Charlotte County's relevant water quality related events over the past several years. The events span from the decades-old issue of septic tank/sewers through the June 2019 Budget Workshop for the Board of County Commissioners. These events form the foundation of the ideas and objectivity of a forthcoming discussion paper.

Contents

2000 – 2019: Septic System Impacts Identified throughout the County for Many Years.

Septic system impacts on water quality in Charlotte County have been the topic of multiple studies over the last 18 years, including:

- **2001** Evaluation of effects of seasonal variability and weather on fecal pollution in Charlotte Harbor (Lipp, 2001).
- **2003** Assessment of the density and potential water quality impacts of septic tank systems in the Peace and Myakka River Basins (Charlotte Harbor Environmental Center, 2003).
- **2005** Assessment of water quality of Charlotte Harbor (FDEP, 2005).
- **2009** Use of nitrogen isotopes to quantify sources of nutrients in the Peace River watershed (Hale, 2009).
- **2010** Evaluation of wastewater service alternatives for Area 1 (Charlotte County Utilities Department, 2010).

- **2013** Review of water quality in East and West Spring Lake (Tetra Tech, 2013).
- **2015** Infrastructure workshop presentation to Charlotte County Board of County Commissioners (Charlotte County Utilities Department, 2015).
- **2016** Assessment of Charlotte County water quality, analysis of data and recommendations for long-term monitoring (Lapointe, 2016).
- **2016** Survey of County residents' water quality concerns (Staugler, 2016).
- **2017** Completion of Sewer Master Plan (Charlotte County Utilities Department, 2017).
- **2019** Convening of Charlotte County Water Quality Summit in Punta Gorda (Charlotte County, 2019).
- **2019** Inclusion of water quality improvement goals in 2019 Budget Workshop (Charlotte County, 2019).

It is significant to note that during the September 2018 Beaches and Shores Advisory Committee meeting a lengthy discussion ensued about septic system issues "*haunting*" the county for many years. Reference was made to a previous study that indicated that the County has been aware of the need to replace septic systems with sewers for almost 20 years. The study explains why septic systems are not suitable for Florida's geology, and if septic systems are not replaced with sewage systems in identified areas, overall water quality will continue to degrade throughout the County. Discussions included informing newly elected Commissioners of the study and educating the public about the value of the septic–to–sewer conversions on community wellbeing and economy.

Comparing the number of water quality studies with the rate of septic–to–sewer conversions completed to date highlights several important points:

- **Understanding water quality issues and solutions in the County is not new**; both have been discussed for decades.
- **Critical water quality solutions have not been implemented in a timely manner**. Septic–to–sewer conversion projects are not being implemented as planned; only two of the eight projects on the five-year list will be completed within five years.
- **Effective water quality problem solving needs to be based more science than politics.** More efficient and effective approaches to solving the County's water quality issues can be initiated by relying on technical expertise of staff and paid consultants. For example, the County paid for the 2016 water quality assessment, data analysis and long-term monitoring solutions developed by Dr. Brian Lapointe, Florida Atlantic University (Lapointe et al. 2016). The study identifies limits on nutrient levels for County waterways that will keep them healthy. The study also emphasizes the need for a comprehensive water quality monitoring program that provides data to guide effective water resource management. Without conducting technically sound water quality monitoring, an evaluation of the success or failure of treatment programs isn't possible.

2015: *Inter*-Agency Water Quality Meeting Shows Need for *Intra*-Department Coordination.
Charlotte County staff attended a meeting hosted by the Charlotte Harbor National Estuary Program (CHNEP) in August 2015 to explore establishing a water quality monitoring program in

the Port Charlotte canals. At that time, CHNEP Director Lisa Beever offered to partner with the County to develop a volunteer water monitoring program because: *"Port Charlotte is the largest urbanized areas in the coastal CHNEP area that isn't included in a routine water quality monitoring program. Having additional information about the ambient condition of the water quality in the Port Charlotte canals will help us collectively implement cost effective and efficient resource management activities through our partnerships".*

The meeting topics included:

- Need for Water Quality Monitoring in Port Charlotte
- Volunteer Monitoring Program Successes
- Existing Volunteer Water Quality Monitoring Programs in CHNEP
- Steps for Developing Volunteer Water Quality Monitoring Programs
- Define Purpose and Design of Port Charlotte Volunteer Water Quality Monitoring

The meeting highlighted several County organizational hurdles related to water quality:

- **There is no County entity with the responsibility and/or authority to coordinate the inter-departmental water quality efforts needed to sustain healthy water resources throughout the County over the long-term.** The current County organizational structure separates water quality responsibilities into two departments: Utilities, concerned with sewage, and Public Works, concerned with stormwater – making coordination of water quality programs challenging.
- **The lack of coordination of County water quality programs creates a void in the basic understanding, management and monitoring of our vital estuaries and interior waterways.** This void continues, despite recognition of the need to integrate sewage treatment, stormwater management and water quality monitoring – intensifying our water quality crisis.
- **The current County organizational structure limits coordination of water quality monitoring and restoration efforts, despite staff willingness to do so.** Due to structural design and workload, the County's two water quality departments, Utilities and Public Works, continue to focus on their independent mandates – leaving the County's overall water quality picture unattended to.
- **Charlotte County remains the only urbanized area in the Charlotte Harbor region without a comprehensive water quality monitoring program.**

2016: Charlotte County Funds Water Quality Study by FL Atlantic University.
With support from Charlotte County, Dr. Brian Lapointe and colleagues from Florida Atlantic University analyzed historical water quality data in the Port Charlotte area. The study looked at nutrient and bacterial pollutant data for surface water, ground water, and stormwater available in state and county datasets. The study also included water sampling for nutrients and tracers of human waste pollution to help distinguish nutrient sources from septic tanks vs. other sources, such as fertilizers. The report included data summaries and recommendations for developing a cost-effective, comprehensive monitoring program to measure nutrient loading

changes during the septic-to-sewer conversion processes. The findings were presented to the Board of County Commissioners in December 2016.

Important conclusions of the FAU report (Lapointe, et all. 2016) include:

- **Water quality problems are primarily associated with wastewater and stormwater runoff** throughout the County.
- **The long-term health of the County's economically essential estuaries depends on managing sewage and stormwater systems to meet state water quality standards for nitrogen, phosphorus and chlorophyll** – the state's Numeric Nutrient Criteria (NNC).
- **A comprehensive water quality monitoring and reporting program is essential for effectively managing and improving water quality** throughout the County.
- **The comprehensive water quality monitoring and reporting program should be initiated as soon as possible** – but it has yet to be started three years following presentation of the study to the County.

2017 – 2018: Water Quality Impairments are Reported throughout Charlotte Harbor.
In its 2017 Estuary Report Card, The Conservancy of Southwest Florida (CSWF) gave Charlotte Harbor a grade of C+ for overall water resource health. According to the report, 54% of the Charlotte Harbor watershed, including both fresh and estuarine waters, is impaired for at least one parameter. Dissolved oxygen, nutrients and metals are the most pervasive problems.

In March 2018, the CHNEP's watershed status reports showed many areas of nutrient impairment in the tidal Myakka River, Tippecanoe Bay, Charlotte Harbor and Lemon Bay estuaries and watersheds.

Details of the water quality impairments are found in the reports and links to the reports are included in the References section. These published analyses and interpretations of water quality data are important to the County because:

- **The County contracts for sampling and analysis of much of the water quality data used to prepare the Conservancy and CHNEP status reports.** However, the County currently lacks support for analyzing, reporting, understanding and utilizing the water quality data it pays to collect. As of August 2018, County staff reported that they were not aware of water quality problems within the County, contrary to the published reports.
- **The County's organizational structure does not include a department or person tasked with evaluating and reporting the health of our essential estuaries and waterways.** As of June 2019, the County has not publicly recognized that our estuaries are impaired.

2018 August: Water Quality Crisis and Solutions are Topic of Editorial in Local Newspapers.
The August 27, 2018 edition of the Charlotte Sun Newspapers (Englewood, Port Charlotte and Northport) carried a guest opinion article addressing local water quality concerns and emphasizing local solutions (Keller, 2018). The article focused on local estuaries, why they are important to our economy and lifestyles and what we can do here in Charlotte County to protect the future of our estuaries.

The main discussion points of the editorial included:

- People are ready to hear about water quality because of red tide and blue-green algae.
- Water quality and algae problems in Lake Okeechobee and the Gulf of Mexico are important, but beyond our local control; we need to focus on what we can do locally.
- Our pristine lifestyle here is threatened and we are contributing to the excess nutrients and global warming that have worsened the crisis.
- Without a viable water monitoring and evaluation program, we cannot tell if our estuary is healthy or if our corrective actions are having positive effects.
- Because of inadequate funding for state, regional and County environmental and water management budgets, we aren't able to effectively manage local water quality.
- One solution is to have the County assume full responsibility for the monitoring, evaluation and public reporting of water quality in our local estuaries and waterways.
- Other local actions needed to preserve our waterways are: reduce stormwater runoff and upgrade urban stormwater treatment as the County develops; continue conversion from septic–to–sewers; upgrade reclaimed water; and mitigate climate change.

This editorial is important because:

- **It helped inform County Commissioner Stephen Deutsch about the importance of local estuaries, waterways and water quality** to County citizens.
- **It helped encourage the Beaches and Shores Advisory Committee to include water quality as a regular topic** on meetings agendas.
- **It outlined the importance of local action** – local Charlotte County citizens and officials have more at stake economically, care more about the resources and are more knowledgeable about issues and solutions than state and federal agencies might be.

2018 September: Beaches and Shores Advisory Committee Calls for Action on Water Quality. Following lengthy discussions, by fall 2018, the Beaches and Shores Advisory Committee understood the critical need for comprehensive water quality monitoring and reporting and was aware that the County lacks such a program. The Advisory Committee concluded that the County should initiate a comprehensive water quality effort. Even though the Committee's role is advisory and they aren't a decision making body, they passed a water quality action resolution for the record. Subsequently, the resolution was brought to the attention of the County Commissioners, specifically Commissioners Stephen Deutsch and Bill Truex.

The water quality action resolution was passed unanimously by the Beaches and Shores Advisory Committee on September 6, 2018. It recommends that the Commission takes specific actions to safeguard the quality of water in local waters by **establishing an effective water quality program that ensures that:**

- Waterways in and adjoining local estuaries are sampled routinely.
- Analysis is performed to state standards and criteria for acceptable levels of nutrients. Standards for key water quality parameters for local waters are provided in Appendix A.
- Someone with authority reviews the results and decides what actions need to be taken.

- Reports are generated and distributed to the public to ensure their interests are served.
- Runoff from homes and businesses is eliminated.
- Septic tanks are replaced by sewers and appropriate waste treatment systems.
- Untreated agricultural runoff is eliminated.
- Improved urban runoff systems are required in future development.
- Reclaimed water systems are upgraded.

2018 November: FDEP Reports Water Quality Impairments in Tidal Peace and Myakka Rivers. Waters in the Tidal Peace and Tidal Myakka watersheds were reported as impaired in the Florida Department of Environmental Protection's (FDEP) draft assessment in November 2018, under the state's impaired waters rule. Continued water quality impairments may cause the FDEP to require the County to take actions to reduce the pollutants causing impairment.

The state's pollutant load reduction program – or Total Minimal Daily Load (TMDL) program – follows steps where FDEP requires the County to initiate water quality improvement actions :

1. Assess the quality of surface waters – are they meeting water quality standards?
2. Determine which waters are impaired – which waters are not meeting standards?
3. Establish a TMDL for each impaired water for each pollutant.
4. Develop Basin Management Action Plan (BMAP) to identify actions to reduce pollutants.
5. Implement the strategies and actions recommended in the BMAP.
6. Measure the effectiveness of the BMAP – locally, plus by state every five years.
7. Adapt – change BMP and actions if things aren't working.
8. Reassess the quality of surface waters continuously.

Details about impaired waters, TMDLs and BMAPs are at: https://floridadep.gov/dear/water-quality-evaluation-tmdl/content/total-maximum-daily-loads-tmdl-program .

Having waters included on the state's impaired waters list is important because:

- If the County does not act collectively, soon, to improve water quality, **control of water quality management will be ceded from the County to the state FDEP.**
- Water quality impairments severe enough to trigger the TMDL program indicate degradation that may not be reversed in a timely or affordable way. **It is more cost-effective and efficient to prevent water quality impairment than to clean up** – and acting sooner than later is critical.

2019 January: Authors Request Meeting with County Administrator about Water Quality. The authors requested a meeting with the County Administrator Sandrock to discuss the County taking a more proactive role in evaluating local water quality. While the meeting was not granted, an invitation was extended to attend the Charlotte County Water Quality Summit to be held January 29, 2019. The purpose of the Summit was to educate the public and elected officials about harmful algal blooms, such as red tide and blue-green algae. While the meeting did not occur, the contact was important. It became clear that the County was focusing on the latest red tide and blue-green algae crisis, but was not aware of the longer term water quality

crises and nutrient impairments in Lemon Bay, Charlotte Harbor, and the Peace and Myakka rivers.

2019 January: Charlotte County Water Quality Summit Convened.
The January 29, 2019 Charlotte County Water Quality Summit confirmed the County's focus on the latest red tide and blue-green algae crisis. It is important to note that during the Summit local water quality impairments were not mentioned, nor was the importance of water quality monitoring and reporting.

Following the Water Quality Summit, the authors requested a meeting with County Administrator Sandrock to discuss the value and need for water quality monitoring, including:

- The economic and lifestyle value of the estuaries.
- The benefits of water quality monitoring in canals and tributaries.
- Criteria for an effective water quality monitoring program.

2019 March: Authors Present Water Quality Concerns and Ideas to County Staff.
The authors met with Charlotte County Utilities Director Craig Rudy, Community Development Director Claire Jubb, and Public Works Project Manager Sherri Ouimet, and staff on March 11, 2019. At that time, Director Jubb was organizing a working group to develop a water quality strategy. At the meeting the authors provided a PowerPoint presentation highlighting water quality concerns and ideas for specific steps the County might take to begin addressing the water quality problems (Keller, et al, 2019).

The **Take Home Message** from the presentation is the **urgent need for adequate water quality monitoring needed to guide the Charlotte County community in efforts to protect and restore our estuaries.** Supporting information in the presentation includes:

- **Importance of Our Estuaries** – The economic and lifestyle importance of our estuaries.
- **Threats to Our Estuaries –** The scientific evidence – fisheries, seagrass and water quality – that indicates Charlotte County waters may be at the tipping point of losing recreational and sport fisheries, as well as moving towards the kind of irreversible water resource crises occurring in the Indian River Lagoon and Caloosahatchee River.
- **Comprehensive Water Quality Monitoring is the Critical First Step** – Creation of an effective water quality monitoring program must not be delayed in order to prevent irreparable damage to our economically and ecological essential estuaries.
- **Design and Components of an Effective Water Quality Monitoring Program –** Existing expertise and programs are available to build a Charlotte County program on.
- **Importance of Acting Locally** – While the pollution coming down the Caloosahatchee River and the red tide in the Gulf are important, given limited County resources, the most cost-effective and efficient approach is to focus on local solutions and actions.

More detailed discussions during the presentation included:

- **Fisheries Resiliency Concerns** – Analysis of local and state fisheries data shows that fish populations are able to recover from red tide and cold spells, over time. But populations

are not able to recover from chronic water quality issues within an estuary. For example, the algae blooms fueled by excess nutrients in the Indian River Lagoon have drastically changed fisheries dynamics in that estuary. Locally, documented increasing nutrient levels correlate with increasing frequency, size and duration of filamentous algae blooms in Upper Charlotte Harbor, Coral Creek and the Tidal Peace and Myakka Rivers. Relationships between filamentous algae blooms and fisheries populations are currently being studied by FWC Charlotte Harbor Field Laboratory fisheries scientists.

- **Local Actions Needed to Protect and Restore Estuaries** – Water quality protection and restoration is a large undertaking and must include a comprehensive set of solutions to be accomplished. The first step – implementing a water monitoring program – is needed to be able to gauge the success of the other actions. And, progress towards each of these actions must occur concurrently. Local actions must include, as a minimum:

Local Actions Needed to Protect and Restore Our Estuaries:

1. Implement Comprehensive Water Quality Monitoring and Reporting Program. **Note: This is 1st step is essential to gauge the success of other actions.**
2. Improve wastewater treatment and reduce problem septic systems.
3. Improve stormwater management and reduce nutrient runoff.
4. Increase native vegetation and reduce fertilizer use.
5. Monitor reclaimed water and only use for irrigation away from surface and groundwater.
6. Participate in habitat restoration projects, including wetlands and bivalves.
7. Reduce climate change and plan for higher storms, temperatures and sea level.

- **Comprehensive Water Quality Monitoring and Reporting Program Details** – Before an effective and efficient water quality monitoring program can be implemented in a technically sound manner, the purpose, criteria and sampling locations and frequency must be defined. Components of a comprehensive water monitoring program include:

Comprehensive Water Quality Monitoring Program Purpose and Criteria:

Purpose: To collect, analyze, evaluate and provide water quality data to decisions makers and the public to direct actions to ensure the health of our estuaries.

Criteria:

1. Adequate sampling frequency, locations and parameters of estuaries and waterways to describe current and changing water quality conditions.
2. Routine reporting of field and laboratory analysis results to agencies responsible for interpreting, evaluating and presenting results.
3. Routine review of water quality reports by staff with adequate authority, knowledge and understanding to be able to direct actions based on results.
4. Readily available access to understandable reports are provided to the public and elected officials in a timely manner, such as the USF Water Atlas.

- **Conclusions and Discussions from the Presentation** – are summarized below:

Water Quality Presentation Conclusions and Discussion:

1. We have a water quality crisis – many of our waters are already impaired.
2. If we delay action, our valuable estuaries will be at greater risk.

3. Water quality prevention is more effective and less expensive than restoration.
4. The first step is to establish a comprehensive local water quality monitoring and reporting program.
5. The water quality program needs to include adequate sampling, understandable interpretation and routine reporting of results to people with authority to implement corrective actions.
6. Water quality results also need to be made readily available in an understandable way to the public and elected officials.
7. We encourage the County to invest in the staff and partnerships needed to accomplish this critical step towards protecting our invaluable estuaries as soon as possible before irreversible damage occurs.
8. Community Affairs Director Jubb explained that the County has made water quality monitoring a priority and these ideas presented will be useful to the task force as it moves forward.
9. The authors are available to assist the County with creating the capacity to effectively manage our local estuary and waterways water quality.
10. It is important to keep the momentum going for the County to address water quality issues through budget, organizational and staffing processes.

2019 April: Authors, Commissioner Deutsch and Administrator Sandrock Discuss Water.
Commissioner Deutsch scheduled a meeting April 26, 2019 with County Administrator Sandrock and the authors to discuss water quality concerns, including a budget estimate for creating a new water quality office. Commissioner Deutsch opened the meeting by sharing his increased understanding of the importance of our estuaries – especially to the fisheries – and increased priority for protecting and improving water quality. The authors re-emphasized the value of our estuaries to our economy and lifestyle, making their conservation worth any cost.

During the meeting, Administrator Sandrock stated that many Commissioners, Administrators and staff are in agreement with four of the authors' conclusions:

- We have a water quality crisis in the making – many of our waters are already impaired.
- If we delay action, our valuable estuaries will be at greater risk.
- Prevention is more effective and less expensive than restoration.
- The first step is to establish a comprehensive local water quality monitoring and reporting program.

The County has formed a task force to develop a strategy to address water quality problems. The authors restated the need to further educate elected officials, decision-makers and the general public about the values, threats and impairments to our local estuaries and waterways.

The authors suggested that the gravity of the local water quality crisis might be better addressed by the County investing in additional staff and partnerships, rather than adding tasks to existing staff workloads, under existing organizational structures. This could be accomplished by creating a County Office of Water Quality that oversees and coordinates water quality monitoring and reporting. The Office could benefit from strategic partnerships with the FDEP Charlotte Harbor Aquatic Preserves, and Coastal and Heartland National Estuary Partnership

(CHNEP). These organizations share interests and access to scientific information which could be utilized by the County Office of Water Quality.

The authors also provided budget estimates for an Office of Water Quality, based on information from Sarasota County, including a manager's salary, staff and operations funding.

Additional discussions at the meeting include:

- The authors suggested it may take action by County leadership to initiate the organizational changes needed to create local capability for managing our water quality effectively. Creating a much needed Office of Water Quality to augment existing Public Works and Utilities programs will take dedicated and skillful leadership, backed by significant resources. Changing organizational structures, paradigms and budgets is challenging, but the water quality crisis calls for the most effective approaches available.
- The authors asked how they could support the County's efforts to create an effective water quality program. Administrator Sandrock's suggestion to join the County water quality task force was enthusiastically received by the authors – who look forward to being included in follow-up meetings.
- The authors concluded from the meeting that:
    1. Water quality is a stated "*top down*" priority for the County.
    2. Understanding and addressing organizational impediments to creating an effective County water quality monitoring and management program need to be improved.
    3. Sufficient financial support for enhancing the County's water quality monitoring and management capabilities needs to be budgeted.
    4. Additional expertise, including from the authors, needs to be actively included in the County's water quality task force.

2019 June: Board of County Commissioners Budget Workshop Includes Water Quality Goals. The County's 2019-2021 Budget Workshop was held June 18, 2019 (Charlotte County, 2019). The three Economic and Community Development Bold Goals are to:

- Add affordable housing.
- Improve water quality.
- Increase secondary education enrollment.

Betsy Calvert from the Charlotte Sun Newspaper reported on the meeting June 22, 2019 in the article titled "*How oysters can help our economy: Charlotte leaders discuss ways to make community stronger*." (Calvert, 2019).

Positive outcomes from the Budget Workshop include:

- **Water quality is now a County budget priority** – It is important to see water quality as an equal economic goal with affordable housing and higher education.
- **Educating community leaders is recognized as a step towards improving water quality** – The public and County decision-makers need a better understanding of the urgency, severity, causes and solutions to our water quality problems. Awareness is the key to action.

Challenges remaining following the Budget Workshop include:

- **The County must acknowledge that our estuaries and waterways are in crisis** – During the presentation, the concept of the "*estuary*" was not a focal point, nor was their impaired status. Without recognition of the severity of the water quality problems, or the County's responsibility for resolving them, our economy, lifestyle and waterways remain at serious risk.
- **Though the County pays for some water sampling and analyses, it does not have a comprehensive water quality monitoring and reporting system** – Given its limited water quality monitoring, reporting and interpretation capabilities, the County cannot evaluate the extent or sources of water quality pollutants within its estuaries and waterways**.** This makes implementing effective solutions very challenging and costly.
- **Existing water quality monitoring programs could augment additional County monitoring efforts** – Before implementing additional water quality monitoring, the County must consider other existing County, regional and state monitoring efforts to avoid duplication and fill gaps. These include: Public Works, Utilities, FDEP Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network (CHEVWQMN), CHNEP Coastal Charlotte Harbor Monitoring Network (CCHMN) and others. Data from these programs is used to determine which waters are impaired for what parameters.
- **Preventing water quality problems is cheaper than clean up** – For example, oyster (and other shellfish) restoration can be used to reduce turbidity in the water column, on a small scale, short term basis. While shellfish restoration serves as 1 restoration tool, reducing sediment and nutrient runoff from the land before it reaches waterways is much more cost-effective over a larger geographic and time scale. But first the problems must be identified so prevention can be implemented.
- **Reducing as many nutrient sources as possible, as soon as possible, using a variety of methods and programs is paramount** – Because of increasing urbanization, impervious surface area, wastewater sources, stormwater runoff, rainfall flashiness, storms and water temperatures, our estuaries and waterways are receiving nutrient loads that are increasing faster than our attempts to curtail them. To avoid further, irreversible loads to our waters, we must identify all sources, through well designed monitoring, and use all available voluntary and regulatory tools to stop the pollutants at their source.
- **State water quality standards could serve as effective County water quality goals** – The Budget Workshop goal of improving water quality by 5% is a commendable goal. However, it is difficult to measure success towards the goal because it doesn't include specific waterways, parameters or time periods. The state standards that exist for the most important water quality parameters (Appendix A), as well as supporting state assessments of local water bodies, could serve as quantifiable water quality goals. Meeting state standards benefits our local economy and lifestyle, avoids FDEP intervention through the TMDL process – and supports healthy fishery populations.
- **Rigorous efforts are needed to include key partners in County water quality working groups** – Sharing existing data, knowledge and expertise would allow the County to move toward comprehensive water management in the most cost-effective and

efficient way, while avoiding duplication of efforts. Important partners that were not at the Budget Workshop include the FDEP Charlotte Harbor Aquatic Preserves (CHAPs), CHNEP and the SWFWMD. The FDEP CHAPs program manages the estuaries throughout Charlotte County for the public benefit of future generations and routinely collects extensive water quality and seagrass data. The CHNEP is tasked with protecting the estuaries and watersheds throughout Charlotte County. The CHNEP coordinates the monthly Coastal Charlotte Harbor Monitoring Network and supports public access to a variety of data through the CHNEP Water Atlas (http://chnep.wateratlas.usf.edu/). The Water Atlas is a valuable tool for evaluating water quality. SWFWMD is responsible for implementing the Charlotte Harbor SWIM plan and habitat restoration.

- **These challenges could most effectively be addressed by creating a County Office of Water Quality** – A unified program with dedicated expertise, staff, funding and authority could cross Departmental lines, coordinate water monitoring and management efforts, work with partners and educate the public and community leaders to achieve the greatest improvement in water resources conditions over the shortest time period for the least cost, ensuring the long term sustainability of our essential estuaries, economy and lifestyle.

Appendix A: Charlotte County Estuary Water Quality Standards

Nutrient Data will be analyzed as annual geometric means and are ***not to be exceeded more than once in a three-year period.***				
	Tidal Myakka (includes Tippecanoe Bay)	Tidal Peace River	Charlotte Harbor Proper	Lower Lemon Bay
Total phosphorus	0.31 mg/L	0.50 mg/L	0.19 mg/L	0.17 mg/L
Total nitrogen	1.02 mg/L	1.08 mg/L	0.67 mg/L	0.62 mg/L
chlorophyll a	11.7 µg/L	12.6 ug/L	6.1 µg/L	6.1 µg/L

Total phosphorus (TP): milligrams per liter (mg/L); equivalent to parts per million (ppm). Although TP is used for plant growth, excess phosphorus is often an indicator of pollution. Sources of TP include wastewater, watershed and agriculture runoff, and/or leaching and resuspension of phosphorus rich sediments.

Total nitrogen (TN): milligrams per liter (mg/L); is calculated as the sum of total Kjeldahl nitrogen (TKN) plus nitrate and nitrite (NOX). Nitrogen is an element necessary for plant growth; low levels of nitrogen or phosphorus may limit plant growth in surface waters; high levels may cause excess plant & phytoplankton growth; common inorganic forms needed for plants: ammonia (NH_3), nitrate (NO_3) and nitrite (NO_2). High levels of nitrogen are often an indicator of pollution. Sources of nitrogen include wastewater, watershed runoff, agriculture and fertilizer runoff, and atmospheric deposition.

Chlorophyll *a* (Chl a): micrograms per liter (µg/L). Chlorophyll *a* is a green pigment used by plants for photosynthesis and is a useful indicator of algae levels in the water; important because algae form the base of the food chain and help in oxygenating the water, but too much algae can cause oxygen levels to collapse. Measures the amount of photosynthetic (phytoplankton/plant) productivity in the water. Excess chlorophyll can be used as an indicator of nutrient enrichment or degraded water quality.

For **fecal coliform, in all waterbodies:**
Monthly average must not exceed 200 cfu/100ml.
10% of samples must not exceed 400 cfu/100ml
Must not exceed 800 cfu/100ml on any given day

Fecal coliform bacteria (FC): number of colonies per 100 milliliters (CFU/100ml). Fecal coliform bacteria are rod-shaped bacteria that can grow in elevated temperatures and are usually associated with the fecal material of warm blooded animals; includes *E. coli* and can serve as an indicator of other pathogens that can cause serious human health risks.

The daily average percent of **Dissolved Oxygen in all waterbodies:** saturation shall not be below 42 percent saturation in more than 10 percent of the values.

Dissolved oxygen (DO): milligrams per liter (mg/L) or saturation (%). Measures the concentration of oxygen contained in the water; it is influenced by water temperature and salinity (the higher the temperature or salinity, the lower the amount of oxygen that can dissolve in the water); it is necessary for organisms to breathe; at low levels, fish and other animals can become stressed or even die. In terms of DO saturation, this measures the percent of dissolved gas molecules. High photosynthetic activity or rapid temperature change can cause DO saturation readings above 100%

Turbidity in all waterbodies must not exceed 29 NTU or above natural background conditions.

Turbidity: Nephelometric Turbidity Units (NTU). Turbidity measures how cloudy water is; influenced by plankton, sediment, water color; may limit plant growth if sunlight cannot penetrate. Sources of turbidity include resuspension of organic material and solids, watershed runoff, and erosion.

Source: https://www.flrules.org/gateway/ruleNo.asp?id=62-302.300

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