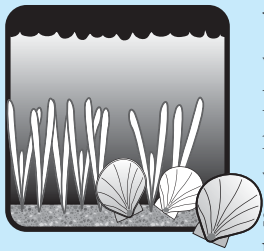


Water Quality Degradation

Quantifiable objectives



WQ-1: Maintain or improve water quality from year 2000 levels. By 2011, bring all impaired water bodies into a watershed management program such as reasonable assurance or basin management action plan.

By 2015, remove at least two water bodies from the impaired list by improving water quality.

WQ-2: By 2015, develop and meet site-specific alternative criteria that are protective of living resources for dissolved oxygen, *chlorophyll a*, turbidity/total suspended solids, salinity and pesticides.

WQ-3: By 2025, reduce severity, extent, duration and frequency of harmful algal blooms (HABs), including macroalgae, phytoplankton and periphyton, through the identification and reduction of anthropogenic influences.

WQ-4: By 2025, meet shellfish harvesting standards year round for the Myakka River conditionally restricted area and the conditionally approved areas of Lemon Bay, Gasparilla Sound, Myakka River, Pine Island Sound Western Section and Pine Island Sound Eastern Section.

Priority actions

WQ-A: Participate in 303(d) total maximum daily load (TMDL), reasonable assurance and basin management action plan (BMAP) development and implementation.

WQ-B: Identify gaps in water quality data needed to calibrate the appropriate models used to assess impairments, determine total maximum daily load (TMDL) limits and develop basin management action plans (BMAPs). Coordinate monitoring programs and implement programs to fill data gaps for impairment assessments, TMDLs and BMAPs.

WQ-C: Develop integrated ground and surface water quality and pollutant loading models.

WQ-D: Reduce nonpoint-source pollutants associated with stormwater runoff. Install or retrofit best management practices (BMPs) to maintain or improve water quality and flows.

WQ-E: Implement projects to restore or protect water quality to offset anthropogenic impacts.

WQ-F: Promote conservation, stormwater and intergovernmental coordination within local comprehensive plans and land development codes to prevent the impacts of increasing levels of impervious surface and fill to achieve either a neutral impact on water quality and loss of groundwater and surface water storage or achieve restoration, based upon the condition of the receiving waters.

WQ-G: Develop site-specific criteria for dissolved oxygen, *chlorophyll a*, turbidity/total suspended solids, salinity and pesticides as applicable.

WQ-H: Assess the bacteria, nutrient load and base flow impacts of septic systems, wastewater treatment plants and reuse water. Recommend effective corrective action.

WQ-I: Determine the relationship between macro- and micronutrients and phytoplankton/algal blooms.

WQ-J: Provide central sanitary sewers to developed areas within 900 feet of waters such as estuarine shorelines, rivers, creeks, canals and lakes.

WQ-K: Implement Florida-friendly plant programs, including the Florida Yards & Neighborhoods Program, throughout the CHNEP study area.

WQ-L: Increase the use of personal and home best management practices by consumers throughout the watershed to reduce nonpoint-source pollution.

WQ-M: Support public involvement programs addressing water quality issues.



WQ-A

Participate in 303(d) total maximum daily load (TMDL), reasonable assurance and basin management action plan (BMAP) development and implementation.

Background

Total maximum daily loads is a federal and state program to identify water bodies impaired by pollutants, to calculate an acceptable load and to regulate polluters so they discharge at levels acceptable for the “health” of the water body and its designated uses. Reasonable assurance and basin management action plans (BMAPs) are watershed management plans that consolidate existing efforts in one document and set a course for restoration to acceptable pollutant loads. Because they are legally binding, TMDLs provide a unique opportunity to focus community efforts on maintaining bays, rivers and lakes in a sustainable condition. The FDEP, in cooperation with the EPA and water management districts, is eager to work with local stakeholders to use the TMDL framework to set water quality targets, monitor and assess status and trends, identify high priority projects and implement projects with quantifiable outcomes. Because the CHNEP is not subject to TMDL regulations, the CHNEP is a natural arbiter among stakeholders.

This priority action helps fulfill WQ-1.

Strategy

- 1) Track and participate in review of EPA and DEP regulations and policy changes, including designated uses, nutrient criteria, pollutant trading and water body identification policies.
- 2) Review draft impaired water list for accuracy.
- 3) Ensure adequate, high-quality data are submitted to state database used for impairment verification.
- 4) Review and correct station location relationship to water body identification boundaries and similar factual errors.
- 5) Review of water body identification (WBID) boundaries to ensure they are accurate and agree with watershed boundaries.
- 6) Evaluate proposed TMDL, including watershed models used to develop load estimates, assimilative capacity determination and pollutant load reductions.
- 7) Provide comments as necessary within the comment period.

- 8) Participate in reasonable assurance (RA) and BMAP development. Incorporate CCMP objectives and actions in RA and BMAPs. Involve stakeholders in RA and BMAP development and implementation.
- 9) Participate in the implementation of the *Shell Creek and Prairie Creek Watersheds Management Plan* reasonable assurance document. A copy is available at http://www.swfwmd.state.fl.us/documents/plans/spjc_wmp.pdf.
- 10) Encourage implementation of capital improvement projects that reduce pollutant loads.
- 11) Encourage low-impact development and pollutant load reduction needs into new development projects.
- 12) Advocate consistency of point-source discharge permits with pollutant load reductions into impaired and potentially impaired water bodies. Permitted loads should not cause impairment.
- 13) Consider role of the CHNEP as facilitator of BMAP development and implementation.
- 14) Adopt and implement TMDL determinations and BMAPs for impaired surface waters, as identified through the *Peace River Resource Management Plan*.
- 15) Monitor *Shell Creek and Prairie Creek Watersheds Management Plan* to ensure protection of Punta Gorda’s water supply; develop similar plans in other Peace River watersheds, as identified through the *Peace River Resource Management Plan*.

Potential coordinating organizations

County and municipal governments
Florida Dept. of Agriculture and Consumer Affairs
Florida Department of Environmental Protection
Florida Department of Health
Industry
Organizations: Conservation
Stormwater utilities
Utilities: Public and private
Water control districts
Water management districts



WQ-B

Identify gaps in water quality data needed to calibrate the appropriate models used to assess impairments, determine total maximum daily load (TMDL) limits and develop basin management action plans (BMAPs). Coordinate monitoring programs and implement programs to fill data gaps for impairment assessments, TMDLs and BMAPs.

Background

The Florida Department of Environmental Protection assesses impairments, establishes TMDLs for water bodies within the state that have been identified as not meeting current water quality standards, and participates in the development of BMAPs. For many water bodies, there is inadequate data to determine if a water body is impaired.

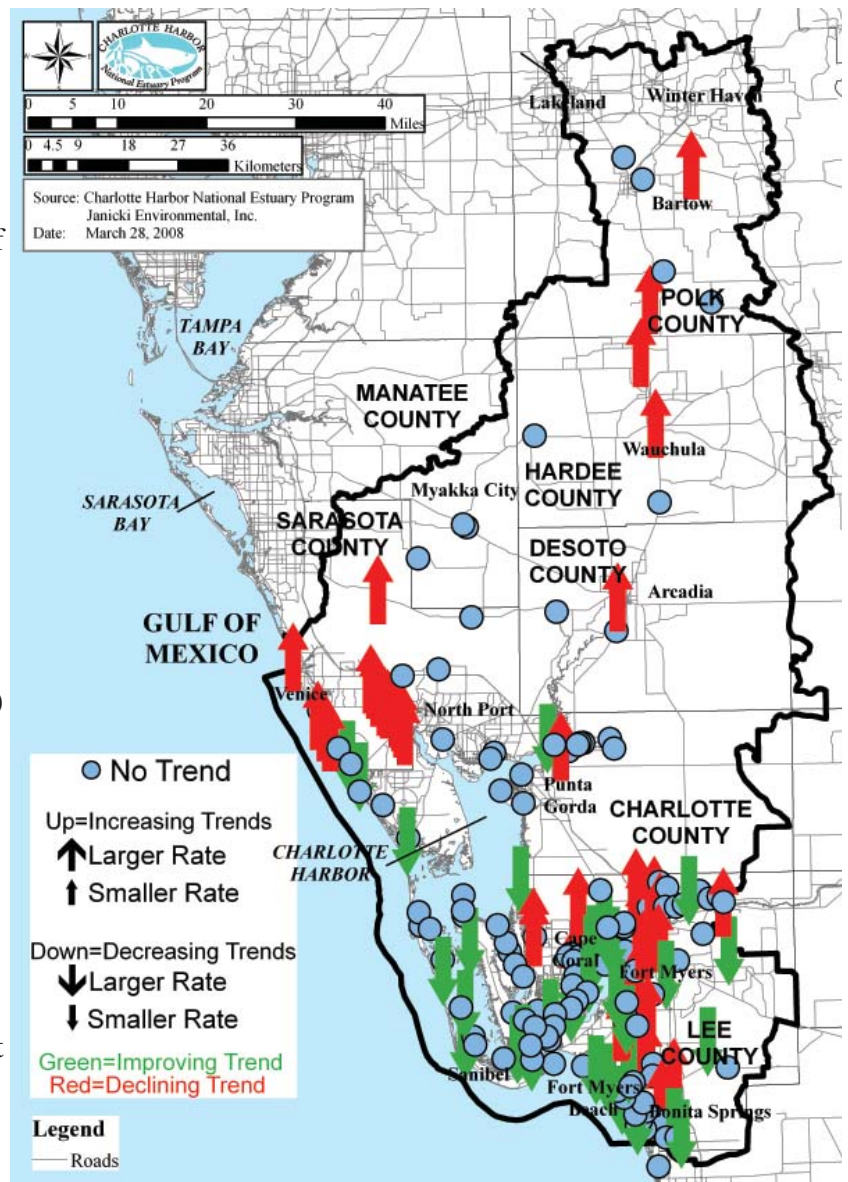
This priority action helps fulfill WQ-1.

Strategy

- 1) Map core analyte data deficiencies.
- 2) Prioritize data needs based on likelihood of impairments.
- 3) Develop monitoring programs to address gaps in data needed to develop accurate TMDLs with the Florida Department of Environmental Protection Watershed Management Program.
- 4) Collect accurate and reliable data appropriate to assess impairments, determine TMDL limits and develop BMAPs through agency water quality monitoring programs.
- 5) Evaluate water body identification (WBID) boundary changes or other assessment changes (e.g., reach-based NHD) in relation to monitoring programs.
- 6) Continue to support adding water quality data to the standard common database (e.g., STORET).
- 7) Identify a suite of pharmaceuticals of concern and potential sources, including reuse water and other wastewater treatment products (WWTP).
- 8) Conduct a triennial water quality analysis to establish status and trends.

Potential coordinating organizations

County and municipal governments
Florida Department of Environmental Protection
Industry
Organizations: Conservation
Stormwater utilities
Water management districts



Map 26: Turbidity Trends

This map is a product of the Triennial Water Quality Status and Trends produced by the CHNEP, representing turbidity trends from 1995–2005. Turbidity is cloudiness in the water.



Background

The amount of pollutants entering water bodies has important effects on water quality. Thus it is necessary to understand the relationship between pollutants and land use. Accurate pollutant loading rates from event mean concentration (EMC) and runoff estimates are useful for National Pollutant Discharge Elimination System (NPDES) permits for municipal (and county) stormwater systems and basin management action plans (BMAPs). For NPDES permits, Rule 62-624.5, FAC, requires an estimate for seasonal pollutant load and the EMC of a representative storm for each major outfall or watershed within the MS4, which are included in an annual report. Parameters for all Florida Phase I permits include: biochemical oxygen demand (BOD5), total phosphorus, chemical oxygen demand (COD), dissolved phosphorus, total suspended solids (TSS), total recoverable copper, total dissolved solids (TDS), total recoverable lead, total nitrogen (as N), total recoverable zinc, total ammonia plus organic N and total recoverable cadmium. Highways and future highway projects are critical since they also require drainage facilities that will gather, concentrate and discharge many of the pollutants mentioned above. Common public domain GIS-based models include HSPF (Hydrological Simulation Program - FORTRAN), found at www.epa.gov/ceampubl/swater/hspf/.

This priority action helps fulfill WQ-1.

Strategy

- 1) Review loading/water quality models for Florida and CHNEP study area, including ACOE and DEP pre-/post-construction loading models.
- 2) Through review of models and other literature, identify which land uses are the largest contributors of pollutants per unit area.
- 3) Collect information to determine EMC and runoff estimates for different local crop types within the general agricultural land use. Information collected may include runoff rates and surveys of farmer associations to determine acreage of specific crops grown.

- 4) Rank land uses considering two criteria: loading potential and the potential to ameliorate loading through management. Support mitigation of hydrologic alterations and impacts to water quality as part of future roadway improvement projects.
- 5) Determine the land use of highest priority then characterize the uncertainty in EMC and runoff estimates for that land use.
- 6) If it is determined that existing data does not adequately characterize the priority land use, design and implement a monitoring effort to refine the estimate(s) and reduce the uncertainty to an acceptable level.
- 7) Explore opportunities to more accurately quantify both wet and dryfall atmospheric nitrogen deposition to the estuary, as it may account for almost 20 percent of loads to the CHNEP study area.
- 8) Confirm and update existing point discharge information through NPDES permit reported data review.
- 9) Compile data on or conduct a study of implemented BMP reuse water projects in the CHNEP study area.
- 10) Inventory BMP manuals with monitoring program data.
- 11) Estimate removal efficiency of different BMPS.
- 12) Establish an EMC working group, similar to what was done by Tampa Bay Estuary Program. Charge the working group with determining whether to develop pollutant load models or to rely on a Level 1 spreadsheet that provides bounds or the magnitude of pollution.

Potential coordinating organizations

Associations: Farmers and growers
 Florida Dept. of Agriculture and Consumer Affairs
 Florida Department of Environmental Protection
 U.S. Environmental Protection Agency
 Water management districts



WQ-D

Reduce nonpoint-source pollutants associated with stormwater runoff. Install or retrofit best management practices (BMPs) to maintain or improve water quality and flows.

Background

According to the CHNEP *Synthesis of Existing Information*, the largest source of potential pollutants within each of the identified watersheds comes from nonpoint-source stormwater runoff. The CHNEP 2000 *Water Quality Status and Trends Report* and the 2003 *Southwest Florida Feasibility Study Water Quality Trends Report* both indicate degrading water quality trends. Once the assimilative capacities of water bodies have been established, the point- and nonpoint-source pollutants should be identified. Then, effective programs to reduce and/or maintain loading levels within the assimilative capacity of each surface water system should be identified. Where septic systems pose a significant potential threat of pollution to ground and surface waters and where central sewer systems are impractical, composting toilet systems may present a viable alternative.

This priority action helps fulfill WQ-1.

Strategy

- 1) Inventory existing BMP manuals associated with
 - a. citrus, cattle, vegetable, container-grown plant and aquaculture operations,
 - b. residential, recreational, commercial and industrial areas and
 - c. phosphate mines and sand/rock mines. Include a special focus on stormwater systems.
- 2) Evaluate and rank various practices.
- 3) Identify loads and EMCs from different land uses within the CHNEP study area.
- 4) Install a variety of BMPs to improve water quality.
- 5) Improve development standards to reduce pollutant loads (e.g., SFWMD BMP list).
- 6) Encourage redevelopment of older properties and businesses to improve stormwater treatment whenever possible.
- 7) Reduce impervious paved surface required by various land uses. Monitor using periodic land-use updates and impervious estimates. Correlate with load and EMC estimates.
- 8) Encourage local governments to adopt integrated pest management policies and implement environmentally beneficial landscaping practices on all public property.
- 9) Assure and/or improve agricultural BMPs.
- 10) Evaluate the impacts of sludge and sediments on water quality.
- 11) Identify locations to install stormwater treatment areas (STAs) and pursue installation of top-priority STAs.
- 12) Complete the construction of the Lake Hancock filtration marsh.
- 13) Develop incentives to increase use of agricultural BMPs, as identified through the *Peace River Resource Management Plan*.

Potential coordinating organizations

Associations: Homeowners

County and municipal governments

Education: Colleges and universities

Florida Department of Environmental Protection

Florida Department of Health

Industry

Organizations: Conservation

Regional planning councils

U.S. Environmental Protection Agency

U.S.D.A. Natural Resources Conservation Service

Water management districts



WQ-E Implement projects to restore or protect water quality to offset anthropogenic impacts.

Background

Southwest Florida is one of the fastest-growing areas in the country. Adverse water quality impacts usually accompany increases in population. Some water bodies within the Charlotte Harbor region may suffer from adverse anthropogenic (man-made) impacts without triggering FDEP or EPA total maximum daily load (TMDL) programs. For instance, increasing conductivity from groundwater contributions has impacted the upper Myakka River watershed and a number of watersheds in the Peace and Caloosahatchee rivers. However, despite documentation of increasing levels of sulfates, chlorides or other minerals, these watersheds are not considered impaired under the Florida Impaired Waters Rule. Also, trend analyses have documented increases in total suspended solids throughout coastal Charlotte Harbor and turbidity in southern Charlotte Harbor. Suspended matter within the water column has been shown to be a major contributor to light attenuation in Charlotte Harbor and can at times reduce seagrass coverage. Identification of this trend has not triggered formal action. Implementation of appropriate improvement projects will help protect water quality in the region.

The SFWMD watershed management model and report has identified the main sources of nitrogen, phosphorus and other analyte loading in the Estero Bay and Caloosahatchee River watershed. The study recommends general, but not specific, actions to address the nutrient pollution and assumes that existing basis of review stormwater treatments are sufficient to address nutrient pollution. It is documented that the existing basis of review standards do not adequately address nutrient pollution and even if older facilities are retrofitted to current basis of review or Harper standards, the nutrient pollution for the watershed will continue to increase and expand damage to estuarine and freshwater water bodies. Specific planning for improvements in permitted design and in retrofit standards is needed to reduce identified nutrient pollution in many subwatersheds. Retrofit plans for the major subwatersheds identified as having the highest nutrient loading are needed to

begin to address existing and future nutrient pollution in the watershed. In order to reverse current pollution and avoid cumulative impacts, specific works projects will be needed — including regional stormwater treatment facilities, regional stormwater conveyance reconstruction to retain rather than drain water, expanded on-site detention, and designs that utilize BMPs in series.

This priority action helps fulfill WQ-1.

Strategy

- 1) Determine if a water body is degraded or projected to degrade and will be targeted for restoration.
- 2) Identify appropriate numeric pollutant load reduction goal(s) for maintenance or restoration activities to offset anthropogenic water quality impacts.
- 3) Establish partners and funding sources to implement projects.
- 4) Review the SFWMD report *Nutrient Load Assessment Estero Bay and Caloosahatchee River Watershed* and identify which subwatersheds are the largest contributors of pollutants to the area.
- 5) Collect information to determine source land uses that are contributing the major part of the current nutrient loading, using projected build-out scenarios.
- 6) Identify the land uses within the subwatersheds considering two criteria: loading potential and the potential to ameliorate loading through management.
- 7) Determine the nutrient source of highest priority in each subwatersheds and identify available actions that could be undertaken to reduce/eliminate that source.

Potential coordinating organizations

County and municipal governments
Florida Department of Environmental Protection
Industry
U.S. Environmental Protection Agency
Utilities: Public and private
Water management districts



WQ-F

Promote conservation, stormwater and intergovernmental coordination within local comprehensive plans and land development codes to prevent the impacts of increasing levels of impervious surface and fill to achieve either a neutral impact on water quality and loss of groundwater and surface water storage or achieve restoration, based upon the condition of the receiving waters.

Background

Research has shown that watersheds with increasing percentages of impervious surface had higher levels of total organic carbon, total phosphate and fecal coliforms. The National Oceanic and Atmospheric Administration links impervious service to altered hydrology, increased flooding, impaired ecosystems and contamination of seafood and beaches. Thresholds of 10 to 20 percent impervious cover show chemical contamination and pathogens. When the threshold of 20 to 30 percent impervious cover is exceeded, there is an ecological response including reduced abundance, fewer sensitive taxa, altered food webs and shellfish bed closures. Models indicate that the watersheds within the CHNEP study area currently have impervious surface coverage of 10 to 20 percent, but growth projections indicate impervious coverage of 20 to 40 percent by 2050. Moreover, percentage coverage within various land-use categories shows an increasing trend.

Local comprehensive plans should be consistent with and help to implement the CCMP.

This priority action helps fulfill WQ-1.

Strategy

- 1) Identify the drainage watersheds for water courses.
- 2) Evaluate the degree of impervious surfaces or unrestricted drained lands within the watershed.
- 3) Forecast the degree of change of these conditions to the end of the planning period.
- 4) Evaluate the current capacity of stormwater systems of the watershed to store and treat storm water of the designed storm and its frequency, under current conditions and future conditions.
- 5) Pursue coordinated approaches with neighboring jurisdictions.
- 6) Subsequent to local comprehensive plan amendments, implement land development regulations (LDR) that restore, mitigate or prevent the impacts of increasing levels of impervious

surface and fill from having a negative effect and achieve either a neutral impact on water quality and loss of groundwater and surface water storage or achieve restoration, based upon the condition of the receiving waters.

- 7) Develop accurate analytical tools.
- 8) Work with the Southwest Florida Water Management District and area local governments to improve the use of zoning, land-use and comprehensive planning tools to protect water resources in the watershed. Provide technical assistance to evaluate, plan and initiate financing for environmental infrastructure necessary to assure sustainable water supplies and improved water quality, as identified through the *Peace River Resource Management Plan*.

Potential coordinating organizations

County and municipal governments
Water management districts



WQ-G

Develop site-specific criteria for dissolved oxygen, *chlorophyll a*, turbidity/total suspended solids, salinity and pesticides as applicable.

Background

State water quality rules allow local water quality standards called site-specific alternative criteria (SSAC). SSACs provide meaningful water quality standards where (1) the natural background conditions of the water body exceeds one or more state water quality standards or (2) current state water quality standards are not sufficiently protective of the resource. SSACs are particularly valuable for parameters that show strong diurnal or spatial variation where a water quality standard must be more complex than a simple numeric target. In the case where the natural background conditions of a water body exceed state water quality standards, an SSAC developed prior to the verification of a water body impairment may prevent the development of a total maximum daily load (TMDL). An SSAC may also be an important part of the basin management action plan, which implements a TMDL. In this case, the SSAC is developed to help manage the parameter responsible for the impairment.

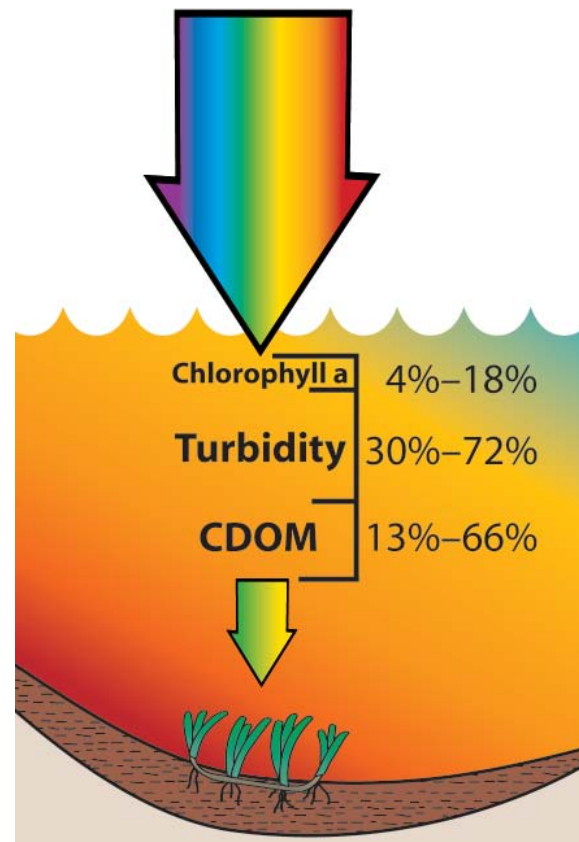
This priority action helps fulfill WQ-2.

Strategy

- 1) Identify water bodies where an SSAC may be appropriate.
- 2) Evaluate and expand monitoring programs in target water bodies to collect additional data needed to develop an SSAC.
- 3) Develop optical models to help establish local standards or numeric water quality targets for *chlorophyll a*, turbidity and total suspended solids that incorporate dissolved matter.
- 4) Investigate the relationship between conductivity variations caused by groundwater pumping and aquatic life use support in predominantly freshwater areas.
- 5) Determine the structure and data requirements of ambient SSACs for dissolved oxygen, hypoxia, *chlorophyll a*, turbidity/total suspended solids, salinity, fish tissue contaminants and pesticides in fresh and estuarine waters.
- 6) Establish or expand monitoring programs for pesticides in sediment.

Potential coordinating organizations

Charlotte Harbor National Estuary Program
County and municipal governments
Florida Department of Environmental Protection
Organizations: Conservation
Stormwater utilities
Water management districts



In Charlotte Harbor, seagrasses receive less light because of a combination of chlorophyll a, turbidity and colored dissolved organic matter (CDOM) absorbing and dispersing light. The CHNEP and its partners are developing numeric water quality targets based on this principle.



WQ-H

Assess the bacteria, nutrient load and base flow impacts of septic systems, wastewater treatment plants and reuse water. Recommend effective corrective action.

Background

There are potential pollutant impacts from high and moderately dense urban areas relying on septic systems to both ground and receiving surface waters.

This priority action helps fulfill WQ-2 and WQ-4.

Strategy

- 1) Identify sources of bacteria, nutrients and other indicators in water bodies.
- 2) Conduct appropriate groundwater and surface water studies necessary to determine the cumulative impacts of high densities of septic systems.
- 3) Promote recommendations of the *Southwest Florida Regional Planning Council Resolution 07-02* regarding wastewater discharge.
- 4) Identify appropriate indicators to identify septic system discharges.

- 5) Make appropriate changes in state laws and local septic system ordinances to mitigate impacts to the greatest practical extent.
- 6) Require periodic inspection of all septic systems where impacts to groundwater/surface waters have been shown. Counties should be encouraged to include such language within their updated comprehensive plans.
- 7) Enhance enforcement to ensure appropriate repairs are made when necessary.
- 8) Establish homeowner education programs.

Potential coordinating organizations

Charlotte Harbor National Estuary Program
County and municipal governments
Florida Department of Environmental Protection
Florida Department of Health
IFAS Cooperative Extension Service
Organizations: Conservation
Regional planning councils
U.S. Environmental Protection Agency



Photo by Lisa Beever, 5/19/03

View at the Cape Coral Wastewater Treatment Plant. This plant meets state water quality standards for wastewater discharge. In order to reduce nutrient pollution, the Southwest Florida Regional Planning Council Resolution 07-02 recommends higher standards.



WQ-I

Determine the relationship between macro- and micronutrients and phytoplankton/algal blooms.

Background

Land development and population rise is often linked to increased nutrient loading and eutrophication of surrounding water bodies. Locally, within the CHNEP watershed, there has been quick growth and increased development over the past several decades, leading to concerns of water quality degradation, including increased occurrence and duration of phytoplankton and algal blooms. Phytoplankton blooms occur when conditions are adequate for rapid growth and cell division. This requires sufficient light for photosynthesis and sufficient concentrations of macro- and micronutrients to fuel carbon fixation during photosynthesis. A suite of macronutrients (e.g., NH₄, NO₃, PO₄, SiO₂) and micronutrients (e.g., Fe, Cu, Zn, B, Mo, Mn) are used during the photosynthetic process at varying ratios. The general ratios of the nutrient requirements are known; however, specialized phytoplanktonic groups (e.g., nitrogen fixers) will thrive under conditions outside of the defined ratios. Any one of the nutrients can be limiting phytoplankton production at any one time; if the limiting nutrient is supplied, phytoplankton will bloom until something becomes limited. In the open ocean, micronutrients are often the limiting factor; whereas in estuaries, macronutrients (e.g., nitrogen and phosphorus) are typically limiting. Identifying the limiting nutrient and the source of nutrients within the system allows for better management.

This priority action helps fulfill WQ-3.

Strategy

- 1) Identify programs currently in place to monitor nutrient concentrations within the watershed (spatial extent, frequency, duration, nutrients).
- 2) Determine programs that systematically collect phytoplankton/algal species and location information.
- 3) Identify areas lacking adequate sampling programs and implement collection of nutrient and phytoplankton/algal data.
- 4) Install continuous nutrient monitoring devices in critical locations (e.g., areas commonly experiencing phytoplankton blooms).

- 5) Analyze data, calculate ratios and compare the general nutrient ratio requirements to those present in the systems to identify limiting factors. Determine natural phytoplankton/algal bloom occurrences and those caused by anthropogenic impacts.
- 6) If there is a relationship between phytoplankton/algal blooms and nutrients, identify sources of the nutrients.
- 7) Perform bioassays using water collected from water bodies/areas of concern to identify the limiting nutrient for the phytoplankton composition present in the water column.
- 8) During bloom events, identify to the lowest biologically significant taxonomic level the phytoplankton composition.
- 9) Monitor zooplankton concentrations that may exhibit top-down, grazing influence on phytoplankton and therefore mask the effect of increased nutrients.
- 10) Determine if and to what extent the practice of removing drift algae affects natural systems.

Potential coordinating organizations

Charlotte Harbor National Estuary Program
County and municipal governments
Florida Department of Environmental Protection
Florida Fish and Wildlife Conservation Commission
National Atmospheric and Oceanic Administration
Organizations: Nonprofit research
Water management districts



WQ-J

Provide central sanitary sewers to developed areas within 900 feet of waters such as estuarine shorelines, rivers, creeks, canals and lakes.

Background

Emphasis on the protection of ground waters from pollutant loadings from septic systems should be given to areas nearest to any surface waters.

This priority action helps fulfill WQ-4.

Strategy

- 1) Develop and implement plans to provide central sewer to higher-density developed areas.
- 2) In such areas where densities are low, require advanced on-site septic systems.
- 3) Improve quality and availability of central sanitary sewage package plants to service more developed areas.
- 4) Incorporate action into local government comprehensive plans.

Potential coordinating organizations

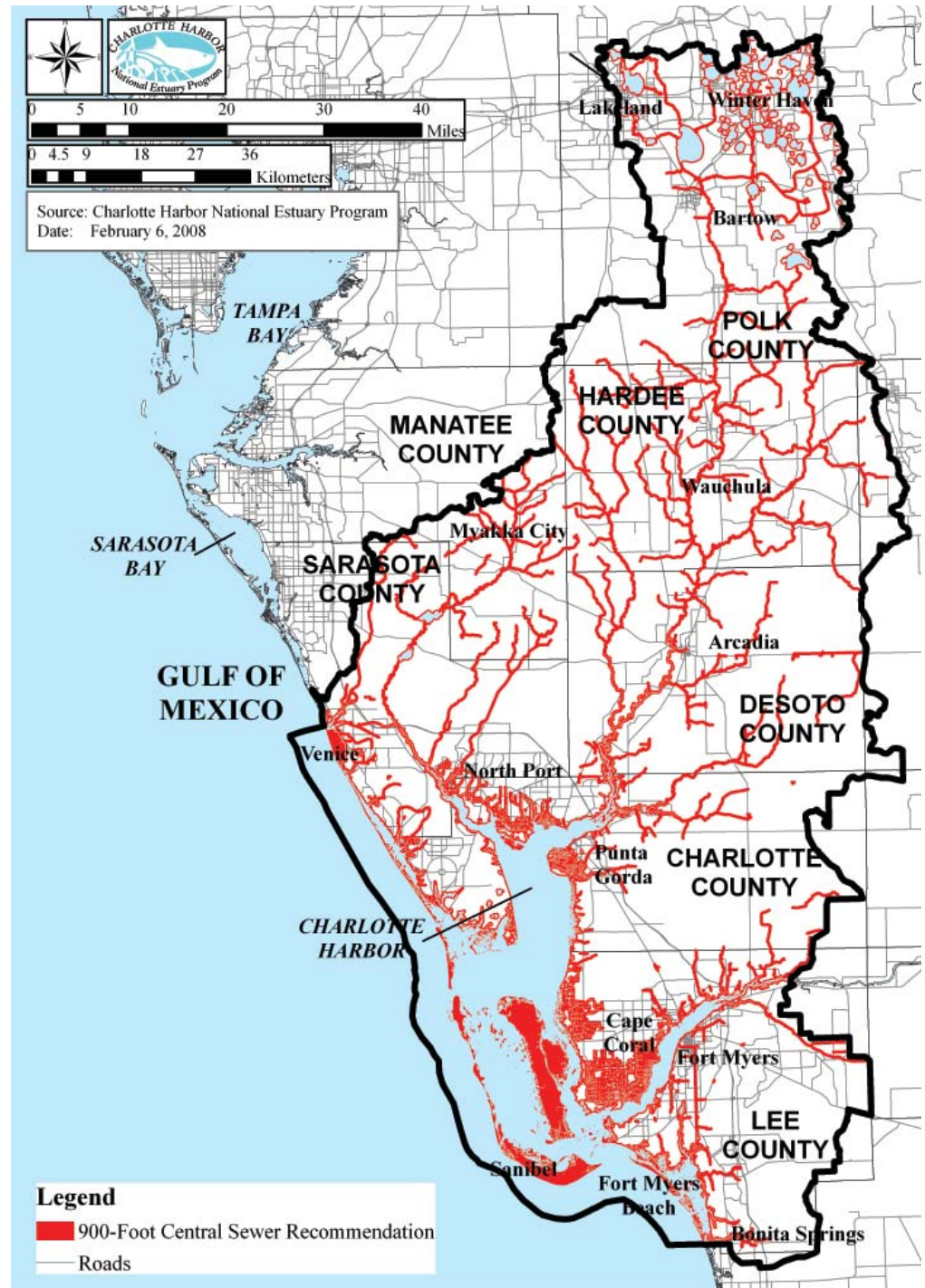
Associations: Homeowners County and municipal governments

Florida Dept. of Agriculture and Consumer Affairs

Florida Department of Environmental Protection

Florida Department of Health

U.S. Environmental Protection Agency



Map 27: 900-Footer Buffer From Shorelines
The red areas represent a 900-foot buffer from estuarine shorelines, rivers, creeks, major canals and lakes. Map developed by the CHNEP in 2007 based on 2000 census information.



WQ-K

Implement Florida-friendly plant programs, including the Florida Yards & Neighborhoods Program, throughout the CHNEP study area.

Background

Several programs now exist to help homeowners become more environmentally friendly with their landscape practices. One such program is the IFAS Florida Yards & Neighborhoods (FYN) program. Objectives of the FYN program are to reduce stormwater runoff, decrease nonpoint-source pollution, conserve water, enhance wildlife habitat and create beautiful landscapes. This program has developed nine principles for homeowners to follow: right plant, right place; water efficiently; fertilize appropriately; mulch; attract wildlife; manage yard pests responsibly; recycle; reduce stormwater runoff; and protect the waterfront.

The CHNEP encourages the use of species native to the CHNEP study area because they typically require far less water, fertilizers and pesticides than commonly used nonnative landscaping species, thus reducing both water consumption as well as nonpoint-source pollutants in stormwater runoff.

This priority action helps fulfill WQ-1 and SG-1.

Strategy

- 1) Double the number of yards following FYN and similar principles.
- 2) Evaluate water quality impacts of FYN principles.
- 3) Improve education of homeowners about methods they can easily implement to reduce sources of pollution.
- 4) Make the business community aware of the kinds of activities and programs they can undertake to reduce nonpoint-stormwater sources from their property.
- 5) Develop programs for providing training and certification for landscaping contractors.
- 6) Use mobile irrigation labs to reduce water use.
- 7) Incorporate FYN in land development codes and land-use regulations.
- 8) Encourage public properties to use FYN principles and other water conservation practices in their planted areas.
- 9) Create a portfolio of FYN demonstration areas.
- 10) Partner with big box stores (such as Lowe's, Home Depot, Wal-Mart), asking that they feature native plants, eliminate the sale of cypress mulch and reduce the sale of exotic species that are known to have negative environmental impacts.

Potential coordinating organizations

Chambers of commerce
Civic associations
County and municipal governments
Florida Exotic Pest Plant Council
Florida Natural Areas Inventory
Gardeners
IFAS Cooperative Extension Service
Organizations: Nonprofit research
Water management districts



Photo by Maran Hilgendorf, 2/6/07

Florida-friendly workshops in the rural communities in DeSoto and Hardee counties have been well attended.



WQ-L

Increase the use of personal and home best management practices by consumers throughout the watershed to reduce nonpoint-source pollution.

Background

Many significant nonpoint-source pollution reduction decisions are made in the home by the actions of individual consumers. Consumers in southwest Florida lack regionally appropriate guidance to help them make environmentally sound decisions. In other areas, environmental programs have attempted to address this issue by preparing, publishing and distributing residential best management practice (BMP) guides. A similar strategy is proposed here, customized for local needs and accompanied by a marketing and incentive program to encourage consumers to use the BMPs. Given the difficulty of effecting large-scale changes in personal behaviors, the overall effectiveness of the program should also be evaluated.

This priority action helps fulfill WQ-1 and SG-1.

Strategy

- 1) Search compilations of residential or consumer BMPs prepared by others and compile a list of regionally appropriate BMPs. Include such items as septic and drain field care, proper pharmaceutical disposal and yard practices. Include EPA programs at sites such as www.epa.gov/WaterSense/.
- 2) Examine the BMP compilation for coverage or subject-area gaps and develop BMPs to fill these gaps.
- 3) Determine the best ways to distribute BMPs to area consumers. The form and cost of the final product will depend upon the distribution channel(s) selected. Consider multiple distribution channels such as newspaper inserts, utility bill inserts, Internet delivery, direct mail or local government TV.
- 4) Identify market segments, possibly using the Stormwater Academy of the University of Central Florida.
- 5) Develop a companion marketing program to encourage use of the BMPs and help effect the desired behavior changes. Develop an interstitial (public service announcement) on home BMPs; investigate the use of the Ad Council.

- 6) Offer consumers appropriate incentives to use the BMPs.
- 7) Establish partnerships with area agencies or businesses so that significant incentives can be offered, such as meaningful discounts on products or services.
- 8) Evaluate consumer behavior changes and assess the overall effectiveness of the program in terms of per-capita pollutant load reductions.
- 9) Reduce harmful pesticides and fertilizers sold throughout the watershed, using the Babcock settlement as a model.
- 10) Show how “begin at home” programs geared to individuals, homes, businesses and at play have a cumulative impact through the group, community and region.

Potential coordinating organizations

Chambers of commerce
County and municipal governments
IFAS Cooperative Extension Service
Organizations: Conservation
Outreach: Public and private environmental outreach programs
Water management districts



EPA is building WaterSense as a national brand for water efficiency. Manufacturers, retailers, distributors, utilities, governments and certified professionals are asked to use the program to encourage water-efficient behavior and the purchase of quality products that use less water.



WQ-M Support public involvement programs addressing water quality issues.

Background

Public exposure to water quality issues most commonly occurs through the media, especially when a red tide outbreak washes dead fish on the beaches, rivers experience neon-green algal blooms, beaches are closed with health warnings or shellfish are contaminated. Newsworthy water quality issues certainly affect the public. Likewise, the public can affect water quality but may not understand their link to large-scale degradation. It becomes important to deepen and broaden the public awareness and knowledge of water quality issues and to promote how individual actions can improve or degrade water. Reaching and enlisting public participation in water quality issues is a start in effecting positive behavioral change.

This priority action helps fulfill WQ-1, WQ-2, WQ-3, WQ-4 and SG-1.

Strategy

- 1) Compile water quality success stories from businesses and industrial parks and homeowners.
- 2) Create and establish a public involvement program for Lake Hancock and other local areas of interest.
- 3) Place and maintain stencils at stormwater drains. Consider developing “Do not dump” signs to include the name of the receiving water body.
- 4) Place and maintain signs at road/water body crossings to establish sense of place. Consider customizing signs to include receiving water body names.
- 5) Implement household hazardous waste disposal and recycling programs.
- 6) Expand training and resources for coordinators of volunteer water quality sampling programs.
- 7) Work with media in getting accurate water quality information to the public.

- 8) Increase public awareness of potential sources of pollution, agencies responsible for enforcement and public reporting processes.
- 9) Utilize existing videos and PSAs for public education.
- 10) Develop a companion marketing program to inform the public about water quality issues and help effect the desired behavior changes. Develop an interstitial (public service announcement) on water quality issues.
- 11) Hold public education workshops on specific water quality topics, such as those already held featuring the Myakka River watershed, Cape Coral canals and clay settling areas.
- 12) Investigate the idea of water filtration parks/ marshes, complete with an educational nature center, especially in Cape Coral.
- 13) Construct water quality demonstration projects.

Potential coordinating organizations

Chambers of commerce
County and municipal governments
Florida Department of Education
Florida Department of Environmental Protection
IFAS Cooperative Extension Service
Organizations: Conservation
Water management districts



Interpretive signage at Lake Hollingsworth in Lakeland provide citizens with information on watersheds and stormwater quality.

Photo by Maran Hilgendorf, 5/1/06

