SWM

PLAN Pinellas_SURFACE WATER MANAGEMENT SUPPLEMENTAL

SURFACE WATER MANAGEMENT SUPPLEMENTAL [SWM]

INTRODUCTION

As a peninsula surrounded, transected, and speckled by water bodies, water directly or indirectly influences daily life in Pinellas County and most elements of this Comprehensive Plan. Because water is essential to all aspects of life, many of the statutory requirements related to water are covered in detail by other Elements, including:

Topic	Element
Groundwater and Aquifer Recharge	Natural Resource Conservation and Management
Sinkholes	Natural Resource Conservation and Management
Wetlands Protection and Management	Natural Resource Conservation and Management
Floodplains – Ecological Functions	Natural Resource Conservation and Management
Aquatic Communities Preservation Conservation and Management	Natural Resource Conservation and Management
Potable Water and Wastewater Management	Potable Water Supply, Wastewater and Reuse
Resource-based Parks and Blueways	Recreation, Open Space and Culture
Beach and Shoreline Public Access	Recreation, Open Space and Culture
Sea Level Rise and Peril of Flood	Coastal Management

Traditional suburban development patterns and practices have contributed to the disruption of natural surface water drainage and the degradation of surface water quality. Structural drainage facilities, such as culverts and channels, were historically designed primarily to accommodate increases in surface water runoff volume and did not consider the comprehensive impacts to natural systems and environmental quality. Increased impervious surface areas and surface water runoff, decreased natural infiltration and recharge, diminished wetlands, and altered floodplains have polluted surface waters and adversely impacted Pinellas County's natural systems.
However, regulatory requirements addressing project design for flood control have become increasingly comprehensive, addressing water quality as well as quantity. The protection, restoration and enhancement of water resources is a critical priority. Pinellas County has become a leader in local and regional efforts to restore water resources, introducing innovative policies and programs to address integrated water management.

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COMPREHENSIVE INTEGRATED WATER MANAGEMENT

Pinellas County strives to be a model community for comprehensive integrated water management. In 2011, Pinellas County began developing a comprehensive program to manage stormwater, water quality, floodplain management, and natural resources protection, enhancement and restoration.[1]

The Integrated Water Resources Management Plan Principals include:

1. Pinellas County Comprehensive Surface Water Management Initiative https://www.florida-stormwater.org/assets/MemberServices/AwardsProgram/2016/pinellas%20county.pdf

- Recognize that water resources are finite
- Manage all water resources (drinking, wastewater, stormwater, and solid waste-produced [reclaimed] water) as "one water"
- View urban communities as complete, interconnected systems
- Seek sustainable practices
- Develop multi-use/multi-benefit projects and infrastructure
- Allocate resources efficiently and equitably
- Account for risk and uncertainty
- Involve and engage stakeholders

The Integrated Water Resources Management Plan objectives include:

- Meet utility needs reliably
- Provide cost-effective solutions
- Improve ambient water quality
- Provide resiliency against climate change
- Protect watersheds and natural systems
- Ensure quality of life[2]

Pinellas County has ambitious water resource management goals. (Re)development should improve, not exacerbate, surface water quality and flooding conditions. Beyond mitigating existing water resource issues, the County is implementing plans, policies and programs that will protect, enhance and restore hydrologic and ecological functions, while addressing the inherent need to reduce risk to life and property.

SURFACE WATER REGULATORY FRAMEWORK

FEDERAL

Under the Federal Clean Water Act, counties and municipalities are required to reduce the amount of stormwater pollution entering our waters. Each government agency is issued a stormwater permit, also known as a National Pollutant Discharge Elimination System (NPDES) permit. Pinellas County and 23 of its municipalities operate under NPDES permit requirements which include:

- Identify major outfalls and pollutant loadings (mapping for source tracking)
- Reduce pollutants in runoff from industrial, commercial, and residential areas (enforcement and drainage system maintenance and cleanup)
- Control stormwater discharges from new development and redevelopment areas (inspections and site plan process)
- Implement a monitoring program (monitor water quality)[3]

Any waterbody that is deemed impaired (or unhealthy) based on specific criteria must be improved, using a Total Maximum Daily Load (TMDL) issued by the state or federal government. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet State Water Quality Standards. The Florida Department of Environmental Protection and the US Environmental Protection Agency (EPA) use TMDLs as regulatory tools to ensure waters are returned to a healthy state. Local governments must then implement projects on a strict schedule to reduce pollutants and restore the health of the waters based on the TMDL.

2. Pinellas County: Integrated Water Resource Management Planning https://www.florida-stormwater.org/assets/MemberServices/Conference/AC15/01%20-%20mcclelland%20cunningham%20levy.pdf
3. http://pinellascounty.org/environment/watershed/regulatory.htm

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Pinellas County has a large number and variety of surface waters, from lakes and rivers to estuaries, and is very densely populated. This results in significant stormwater pollution to our waters. As of 2021, nearly all waterbodies in Pinellas County are considered impaired.

As of 2021, there are 47 TMDLs in Pinellas County: 24 are for fecal bacteria, and 23 are for dissolved oxygen and/or nutrients.[4] The County and its municipal partners are working towards implementing plans to address these TMDLs. Every five years, TMDL watersheds are ranked and prioritized for plans to improve water quality. Bacteria Pollution Control Plans (BPCPs) are drafted for watersheds with bacteria TMDLs, and TMDL Implementation Plans (TIPs) are written for watersheds with nutrient and/or dissolved oxygen TMDLs. The County's NPDES program has reduced illicit connections and discharges through education and compliance; service-sharing expanded for monitoring, TMDL and watershed planning, and NPDES inspection and compliance activities.

In recognition of the water quality challenges the region faces, the Tampa Bay National Estuary Program (TBNEP) was established in 1991 as a local, state and federal partnership. Partners signed a formal Interlocal Agreement, pledging to achieve the goals of the Comprehensive Conservation and Management Plan (CCMP) for Tampa Bay, and the nitrogen reduction goals established by the Tampa Bay Nitrogen Management Consortium. The CCMP has a 10-year planning horizon and sets goals, objectives, and metrics for the estuary. Every five years, the EPA conducts a Program Evaluation and Implementation Review to ensure that significant progress towards accomplishing CCMP goals has been made.[5]

STATE

The Florida Department of Environmental Protection (DEP) Division of Environmental Assessment and Restoration (DEAR) develops, adopts and reviews Florida's surface water quality standards. DEAR also identifies and prioritizes pollution problems and develops and implements strategies to resolve the problems in partnership with local stakeholders.[6] The annual DEP Florida Water Plan provides water resource implementation goals, objectives and guidance for the development and review of programs, rules and plans relating to water resources.[7] The Water Plan also includes the District Water Management Plan for the Southwest Florida Water Management District (SWFWMD) and all other Water Management Districts in Florida.

REGIONAL

SWFWMD has four core mission areas: Water Supply, Water Quality, Flood Protection and Floodplain Management, and Natural Systems Protection.[8] Watershed management goals are developed for all watersheds within the boundaries of a water management district. The Strategic Plan provides guidance objectives, strategies and metrics for success to meet water resources. As of 2021, the SWFWMD Strategic Plan has identified the following priorities for the Tampa Bay Region:

- Water Supply: Implement Minimum Flows and Levels (MFLs) Recovery Strategies
- Water Quality and Natural Systems Protection: Improve Tampa Bay and Lakes Seminole, Tarpon and Thonotosassa

4. http://pinellascounty.org/environment/watershed/regulatory.htm
5. https://tbep.org/about-tbep/what-guides-us/
6. https://floridadep.gov/dear
7. https://fdep.maps.arcgis.com/apps/Cascade/index.html?appid=473b768b4af049bf91b2879b83ea961c
8. https://www.swfwmd.state.fl.us/about/about-the-district/who-we-are-what-we-do

- Flood Protection: Improve flood protection in Anclote, Hillsborough and Pithlachascotee Rivers, Lake Tarpon, and Pinellas County coastal watersheds.[9]

The Tampa Bay Estuary Program (TBEP) is an intergovernmental partnership of Hillsborough, Manatee, Pasco and Pinellas counties; the cities of Tampa, St. Petersburg and Clearwater; the EPA; the Southwest Florida Water Management District (SWFWMD); and the Florida Department of Environmental Protection (FDEP) that grew out of the TBNEP.[10] Charting the Course: the Comprehensive Conservation and Management Plan (CCMP) for Tampa Bay was updated in 2017, the third revision of the original plan. The CCMP synthesizes years of scientific research into Tampa Bay's challenges and opportunities along with input from citizens, stakeholders, and communities with a mutual interest in a healthy estuary.

The CCMP presents 39 actions to sustain progress in bay restoration through the year 2027. Significant goals and challenges for the 2017-2027 timeframe are identified as:

- Maintaining at least 38,000 acres of seagrass by continuing to manage nitrogen loadings to the bay;
- Improving water quality in Old Tampa Bay through better management of freshwater inflow and removal of physical barriers to tidal circulation;
- Expanding our knowledge of the sources, distribution and ecological effects of new contaminants of concern such as personal care products, pharmaceuticals and microplastics;
- Reducing municipal sewer overflows and the occurrence of harmful algal blooms in the bay;
- Establishing restoration and protection targets for novel habitats – such as hard/live bottoms, coastal uplands and tidal tributaries; and,
- Ensuring that bay habitats can withstand and adapt to climate change.[11]

LOCAL

Stormwater Management

Stormwater runoff is a major cause of water pollution. When rain falls on our roofs, streets, and parking lots in cities and suburbs, the water cannot permeate the ground as it should. Stormwater drains through gutters, storm sewers, and other engineered collection systems and is discharged into nearby water bodies. The stormwater runoff carries trash, bacteria, heavy metals, and other pollutants from the urban landscape. Higher flows resulting from heavy rains also can cause erosion and flooding in urban streams, damaging habitat, property, and infrastructure.

The *Pinellas County Stormwater Manual* catalogues approved stormwater methods for the County, and includes specific design criteria, standards, and details for each method. The Stormwater Manual allows for variation in traditional stormwater methods to provide a comprehensive, yet flexible means to manage stormwater in a redevelopment setting.[12]

Nonstructural BMPs (AKA source controls) are used for pollution prevention to minimize pollutants getting into stormwater or to minimize stormwater volume. They include Site Planning BMPs such as preserving vegetation, clustering development, minimizing total impervious and directly connected impervious area. They also include Source Control BMPs such as minimizing clearing, minimizing soil compaction and using Florida-Friendly Landscaping™ and minimizing fertilizer use. All of these nonstructural BMPs are part of green infrastructure principles and practices.

9. Southwest Florida Water Management District 2021-2025 Strategic Plan https://www.sfwmd.gov/sites/default/files/documents/2021-2026_Strategic_Plan_Main%20Document_Final_2021-2026_STRATEGIC_Review_Version.pdf

10. https://tbep.org/about-tbep/who-we-are/

11. Tampa Bay Estuary Program Charting the Course: The Comprehensive Conservation and Management Plan for Tampa Bay August 2017 Revision https://indd.adobe.com/view/cf7b3c48-d2b2-4713-921c-c2a0d4466632

12. http://www.pinellascounty.org/plan/pdf_files/pc_stormwater_manual.pdf

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Green Infrastructure

Green infrastructure is a water management approach included in the Stormwater Manual that provides many benefits. Conventional piped drainage and water treatment systems are designed to move urban stormwater away from the built environment. Green infrastructure reduces and treats stormwater at its source while delivering environmental, social, and economic benefits.
Green infrastructure uses vegetation, soils, and other elements and practices to restore some of the natural processes required to manage water and create healthier urban environments. At the County scale, green infrastructure is a patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water.

Regional Stormwater Treatment Facilities

Regional stormwater treatment facilities are a potential alternative solution to site-specific challenges for stormwater treatment and attenuation, particularly for small sites. Small sites simply may not be large enough to use conventional methods of stormwater management. In addition to other BMPs described in the *Stormwater Manual* (as of 2021), regional stormwater facilities may offer a solution in some instances. Mitigation banking could be utilized to fund County construction and maintenance of regional stormwater facilities, achieving a net environmental benefit and flexibility for (re)development on constrained sites. Such systems collect and treat stormwater from a larger area and individual sites pay into the mitigation bank to fund a stormwater treatment facility that benefits an entire neighborhood.

Stormwater Planning and Infrastructure

Pinellas County has an ongoing program to identify and correct stormwater management deficiencies. In addition to programming for major drainage/stormwater improvements, Pinellas County monitors system deficiencies causing minor flooding within residential developments and County roadways. The County's Public Works Department oversees the project management, design and implementation of major and minor flood control and stormwater system projects, and is provided support by the County's Department of Environmental Management for projects related primarily to water quality improvement. In many cases, flooding problems are being eliminated or prevented by early detection and preventive maintenance. Public Works also keeps detailed records of residential and business complaints and includes their own deficiency findings in order to prioritize, schedule and implement corrective measures.

Wastewater / Stormwater Partnership

The Wastewater / Stormwater Partnership is a joint initiative of the Pinellas County Board of County Commissioners, Pinellas County municipalities, and other agencies to identify wastewater and stormwater solutions for the County. As of 2021, the Partnership is comprised of state and county officials, 17 municipal leaders, seven local agency leaders, and three private utility systems, as well as staff representatives who serve on a Technical Working Group.[13]

The Technical Working Group was tasked with identifying comprehensive solutions for stormwater inflow, groundwater infiltration, and the potential need for increased treatment and/or storage capacity; developing short-term and long-term solutions; and actions to mitigate emergency situations.

The Technical Working Group developed an Action Plan, which provided specific recommendations to improve countywide management of stormwater and wastewater, especially during heavy rain events. The action plan items fall into seven main categories which include:

13. http://www.pinellascounty.org/partnership/

- Inflow and Infiltration Initiatives
- Address System Hydraulic Bottlenecks
- Rehabilitation/Replacement Programs for Aging Infrastructure
- Stormwater Drainage Improvements to Benefit Wastewater System
- Resource Sharing/Maximization,
- Develop Public Dialogue Program, and
- Legislation, Regulations, and Local Ordinances.[14]

WATERSHED MANAGEMENT

A watershed is an area of land that water flows across as it moves toward a common body of water. Every part of Pinellas County is in a watershed. Watershed management protects and improves the environmental and aesthetic quality of the County surface waters such as creeks, streams, lakes, bays, and coastal waters.

Watershed management plans are developed in order to guide Pinellas County in protecting and managing environmental resources, achieving improvements in water quality, and providing flood protection when needed. Watershed management plans incorporate all aspects of the environmental condition and are not limited to simply addressing drainage issues. The diagnostic phase of watershed planning includes field surveys, flooding information, water quality and flow data, land use information and other data to facilitate creation of a comprehensive plan for the management of a watershed, including the identification of required capital projects. These plans include structural and nonstructural management strategies, developed to meet goals dealing with flooding and environmental management, recreational and social opportunities, and educational components to inform citizens about the watershed, how they impact it and how they can help to protect it.

Watersheds are prioritized for management plans during the annual capital improvements planning meetings. The prioritization is based on the greatest needs, including flooding problems, impaired water quality levels and other resource management issues that may arise. Those waterbodies that do not qualify for a watershed management plan, but experience significant flooding issues, may still be prioritized for a basin study.
As a Watershed Management Plan is completed and adopted by the BCC, it becomes the source of information concerning the individual watersheds. The goal is to create Watershed Management Plans for each of the 52 drainage basins in the County. The most current versions of these Watershed Management Plans are incorporated by reference into this Comprehensive Plan.

The County's watershed planning initiatives are coordinated with ongoing initiatives such as the SWFWMDs Surface Water Improvement and Management Program (SWIM), the Comprehensive Watershed Management Plan (CWM) for the Pinellas-Anclote Watershed, and the Tampa Bay Estuary Program (TBEP).

FLOODPLAIN PROTECTION AND MANAGEMENT

The natural functions of floodplains are primarily covered in the Natural Resources Conservation Element of PLANPinellas. The Surface Water Element primarily focuses on floodplains in Pinellas County in terms of current federal, state, and local regulations designed to ensure the health, safety, and welfare of County residents; promote sustainable development; and protect floodplains as natural conveyance systems, wildlife and vegetative habitat and groundwater recharge areas.

Pinellas County receives approximately 52 inches of rainfall in a year, with the heaviest rainfall occurring in the summertime.[15] Rainfall, topography, and drainage characteristics determine the floodplain areas in the County. Flooding and drainage are critical factors constraining development, based on high water table, flooding from rainfall events and tidal surge.

14. http://www.pinellascounty.org/partnership/pdf/documents/05-16-18-Task_Force_Action_Plan_Progress_Update.pdf
15. https://www.swfwmd.state.fl.us/resources/data-maps/rainfall-summary-data-region

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Historic practices resulted in development of flood-prone areas that would not be permitted under current regulations. Control structures were built to block, divert, speed up, slow down, or otherwise change natural drainage patterns to protect developed areas from flooding. Areas of previous periodic flooding were eliminated, flood waters were contained and diverted, and flow was altered to be more efficient in their drainage to retention ponds, detention ponds or open water bodies. The result of these practices has not only altered natural systems and ecological functions, but can often increase risks for people and property during severe floods. The preservation and restoration of the natural resources of floodplains reduces risk to human resources because many of the normal hydrologic and biologic functions of natural floodplains act to mitigate the intensity, extent, and damaging aspects of flooding. Pinellas County recognizes the importance of floodplains to the natural and human environments, and incorporates this understanding into policy, land development regulation and floodplain protection.

Prudent land development planning and floodplain management are essential to developing a sustainable, resilient, and equitable Pinellas County for future generations. The location of (re)development and flood risk reduction methods directly influence the magnitude of damage produced by these natural, inevitable, and more frequently occurring events.[16] The recurring risk of flood damage has significant adverse impacts on the physical[17] , mental[18] and economic[19] health, security, and welfare of the community, including:

- Residents, visitors and future generations are at risk of personal injury, loss of income and property damage;
- Public investments, such as roads and utilities, are subject to damage from flooding and repair at public expense;
- Loss of natural water storage capacity leads to reduction in available water supply;
- Socio-economic conditions impact individual's ability to prepare, respond, and recover from a flooding event, resulting in disproportionately adverse impacts;[20]
- Water quality is degraded, freshwater inflows to estuaries are disrupted and habitats are lost;
- Economic activity disrupted by damaging floods results in inequitable negative outcomes for vulnerable populations;
- Recurring flooding influences the housing market and property values, with attendant disproportionate negative impacts to vulnerable communities; and[21]
- Dangerous disaster response and relief operations are conducted at considerable public expense.

FEDERAL FLOOD REGULATION AND MANAGEMENT

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP), which was established by Congress in 1968, and allows property owners to purchase federally-backed flood insurance within communities that participate in the NFIP. All municipalities in Pinellas County participate in the NFIP.

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16. Brody, Samuel D., et al. "The rising costs of floods: Examining the impact of planning and development decisions on property damage in Florida." Journal of the American Planning Association 73.3 (2007): 330-345. https://www.tandfonline.com/doi/abs/10.1080/01944360708977981

17. Lowe, Dianne, Kristie L. Ebi, and Bertil Forsberg. "Factors increasing vulnerability to health effects before, during and after floods." International journal of environmental research and public health 10.12 (2013): 7015-7067.

18. Stanke, Carla, et al. "The effects of flooding on mental health: Outcomes and recommendations from a review of the literature." PLoS currents 4 (2012).

19. Leah Platt Boustan, Matthew E. Kahn, Paul W. Rhode, Maria Lucia Yanguas, The effect of natural disasters on economic activity in US counties: A century of data, Journal of Urban Economics, Volume 118, 2020

20. Masozera, Michel, Melissa Bailey, and Charles Kerchner. "Distribution of impacts of natural disasters across income groups: A case study of New Orleans." Ecological economics 63.2-3 (2007): 299-306.

21. Anguelovski, Isabelle, et al. "Opinion: Why green "climate gentrification" threatens poor and vulnerable populations." Proceedings of the National Academy of Sciences 116.52 (2019): 26139-26143.

In return for this insurance protection, participating communities implement floodplain management measures to reduce flood risks to new development. New or substantially improved residential structures are required to have the lowest floor, elevated to or above the 100-year flood elevation for a community's participation in the NFIP. Non-residential structures have to meet anchoring, tie-down, and elevation requirements.

Some flood-prone areas of the County include a V, or velocity, zone along the edge of coastal areas. These areas are subject to flood surge. In the AV zone, no variances are permitted to the requirements of residential structure elevation and no fill is allowed as a method to raise structures.

The NFIP requires communities prohibit the humanmade alteration of sand dunes and mangrove stands that would increase the potential for flood damage in the velocity zone. Since mangroves, beach vegetation, trees, and many other plants provide a rough and resilient surface which reduces the flow and velocity of floodwater, the removal of this vegetation is greatly limited by this provision. As of 2021, each local government is responsible for developing and adopting its own floodplain ordinances.

Under the NFIP, FEMA is required to develop flood risk data for use in both insurance rating and floodplain management. Floodplain delineation is based on topography, depth to water table, history of flooding, flow obstructors (natural and human-made), and flow accelerators (e.g. vegetation versus parking lots and streets). FEMA develops this data through flood insurance studies (FISs). In FISs, both detailed and approximate analyses are employed.

Using the results of a flood insurance study, FEMA prepares a flood insurance rate map (FIRM) that depicts the special flood hazard areas (SFHAs) within the studied community. SFHAs are areas subject to inundation by a flood having a one percent or greater probability of being equaled or exceeded during any given year. This flood event, which is referred to as the 100-year flood (or base flood), is the national standard on which the floodplain management and insurance requirements of the NFIP are based. The results of studies that had determined the most conservative 100-year estimate for flood elevations were used to establish a Coastal Construction Control Line. The Purpose of the Coastal Construction Control Line is to protect lives and property.

Within the SFHAs identified by detailed analyses, the FIRM shows base flood elevations (BFEs) and flood insurance risk zones. In addition to special flood hazard areas, the rate map shows areas subject to inundation during the 100-year flood and may show areas designated as a regulatory floodway. The regulatory floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood discharge can be conveyed without increasing the base flood elevations.

As of early 2021, FEMA has advised Pinellas County that the multi-year project to re-examine Pinellas County coastal flood zones and develop detailed, digital flood hazard maps (FIRMs) have been completed. These new maps are based on revised coastal flood modeling and may affect owners of properties susceptible to flooding from the Gulf, Tampa Bay, and inland areas near waterways connected to the Gulf or Bay.

Pinellas County participates in the NIP's Community Rating System (CRS) program. The CRS program is designed to encourage and award communities that undertake public awareness and other floodplain activities beyond the minimum requirements of NIP. The County's present rating enables residents of unincorporated county to receive a discount on flood insurance premiums. Credit was granted to the County for its floodplain determination efforts, adoption of restrictive development regulations, and public education efforts to increase awareness and encourage residents to protect their properties from damage.

Thousands of properties flood repeatedly nationwide. Often built before floodplain management regulations took effect, these properties continue to place a severe strain on the National Flood Insurance fund. FEMA has several financial assistance programs available to communities and property owners to acquire, retrofit, or fund other flood mitigation projects. These programs are managed through the State Division of Emergency Management's Mitigation Program and require the local government to sponsor the applicant from the application stage through the completion of the project.

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STATE FLOODPLAIN REGULATION AND PROGRAMS

Primary surface water management regulatory authority resides with the State Department of Environmental Protection, although authority is delegated to the water management districts to the extent practicable. As of 2021, Florida Statutes require consideration of future flood risks, including storm surge, sea level rise, and (re)development principles, strategies and engineering solutions to reduce risk in coastal areas. The requirements of the "Peril of Flood" statutes are addressed in the Coastal Management Chapter of PLANPinellas and supported by the Surface Water Management Chapter.
SWFWMD requires strict adherence to applicable state laws and countywide ordinances for building within a flood-prone area. Pinellas County works in cooperation with SWFWMD in these efforts.

Originally created as a flood control agency, SWFWMD implements a flood management program that includes these four components:

1. Land Acquisition: SWFWMD purchases lands to preserve natural flood storage and conveyance functions;
2. Technical Assistance: SWFWMD offers technical assistance in preparing surface water management master plans;
3. Regulation: SWFWMD Rules require most new developments to manage surface waters so as not to increase peak flows from the site; and
4. Structures/Facilities: SWFWMD maintains a small network of flood management structures, such as the Lake Tarpon outfall canal and control structure and the Sawgrass control structure in Pinellas County.

COUNTY FLOODPLAIN REGULATIONS AND PROGRAMS

As of 2021, Pinellas County Floodplain Management Ordinance prohibits development, redevelopment or fill material within a designated 25-year floodway. Restrictions are imposed on development within the 25-year to 100-year floodplain. The purpose of the ordinance is to establish minimum requirements to safeguard the public health, safety, and general welfare and to minimize public and private losses due to flooding through regulation of development in flood hazard areas to:

1. Minimize unnecessary disruption of commerce, access and public service during times of flooding
2. Require the use of appropriate construction practices in order to prevent or minimize future flood damage;
3. Manage filling, grading, dredging, mining, paving, excavation, drilling operations, storage of equipment or materials, and other development which may increase flood damage or erosion potential;
4. Manage the alteration of flood hazard areas, watercourses, and shorelines to minimize the impact of development on the natural and beneficial functions of the floodplain;
5. Minimize damage to public and private facilities and utilities;
6. Help maintain a stable tax base by providing for the sound use and development of flood hazard areas;
7. Minimize the need for future expenditure of public funds for flood control projects and response to and recovery from flood events; and
8. Meet the requirements of the National Flood Insurance Program for community participation as set forth in the 44 CFR 59.22.

One of the primary methods utilized in Pinellas County to protect wetlands and environmentally sensitive areas, including floodplains, is through the establishment of the Preservation category on the Future Land Use Map (FLUM) in the Future Land Use and Quality Communities Element of the Pinellas County Comprehensive Plan. Development is prohibited in Preservation areas. Based on the 25-year and 100-year flood plains for Brooker Creek, the Brooker Creek

floodway in Northeastern Pinellas County was protected in this manner. The 25-year floodplains along several other urban creeks in the unincorporated areas have also been designated as Preservation.

Other methods utilized by Pinellas County to protect the natural functions of floodplains and eliminate or reduce the potential for flood damage include land acquisition, transfers of development rights, regulations requiring upland buffers and a coastal construction code. The passage of a referendum to extend the Penny for Pinellas infrastructure sales tax will provide additional funds for the acquisition of environmentally sensitive lands, which may include lands within floodplains. Transfers of development rights are often utilized to direct incompatible land uses away from environmentally sensitive lands, wetlands and floodplains. In addition, Pinellas County regulations require that developers include an upland buffer adjacent to wetlands, which often also serves to buffer floodplains.