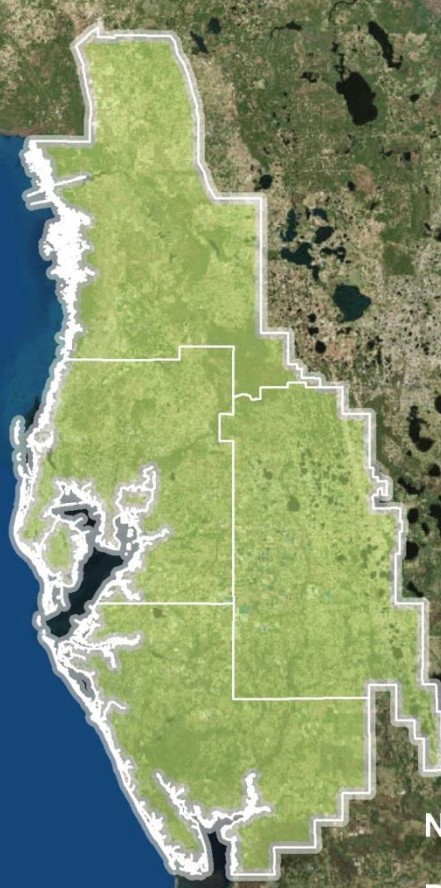
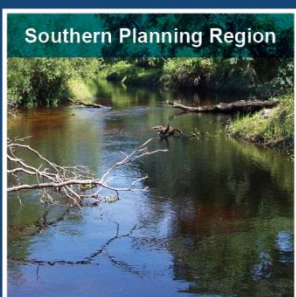
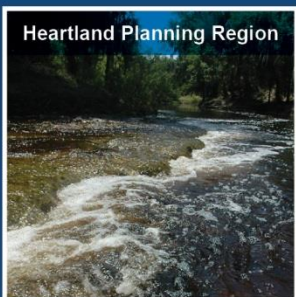
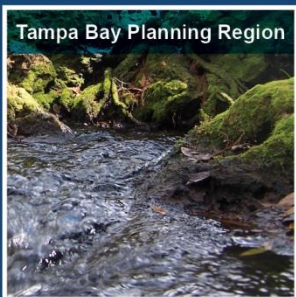
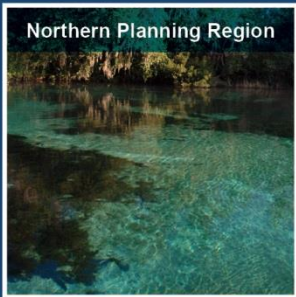


# 2015 Regional Water Supply Plan

## Executive Summary



November 17, 2015

Prepared by:

Southwest Florida  
Water Management District

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With the Assistance of:



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# **2015 Regional Water Supply Plan**

## **Executive Summary**

Board Approved

November 17, 2015

For further information regarding this plan, please  
contact the Water Supply Section at:

2379 Broad Street  
Brooksville, FL 34604-6899  
(352) 796-7211 or  
(800) 423-1476 (Florida Only)

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Southwest Florida Water Management District

# 2015 Regional Water Supply Plan

This report is produced by the Southwest Florida Water Management District

November 17, 2015

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District Project Manager: George A. Schlutermann, P.G.

## District Significant Contributors

Carole Estes, P.G.	Mary Margaret Hull, APR	Lisann Morris, P.E., PMP
John Ferguson, P.G.	Danny Kushmer	Tara Poulton
Jim Golden, AICP	Doug Leeper	Amy Poxson
Yassert Gonzalez	Tamera McBride, P.G.	Jay Yingling
Estella Gray	Jason Mickel	Chris Zajac

## District Contributors

Gene Altman, P.E.	Don Ellison, P.G.	Trisha Neasman, AICP
Anthony Andrade	Randy Emberg	Jason Patterson
Cristina Baldeon	Mark Fulkerson, Ph.D., P.E.	Jessica Patterson
Mark Barcelo, P.E.	Mike Hancock, P.E.	Robert Peterson, P.G.
Ron Basso, P.G.	Kenna Harrison	Michael Phillippi
Terri Behling, APR, CPRC	Darrin Herbst, P.G.	Chris Tanner, J.D.
Jonathan Bilby	Mark Luchte, P.E.	Susanna Martinez Tarokh
Amy Brennan, J.D.	Josh Madden	Colleen Thayer, APR, CPRC
Tom Burke, P.E.	Jerry Mallams, P.G.	Don Weaver
Ed Craig, C.P.S.S.	Cara Martin, APR	Jeff Whealton, P.W.S.
Corey Denninger, GISP	Jeremy McKay	Brent White
Lynn Dicks	Michael Molligan	Kevin Wills
Harry Downing, P.E.	Claire Muirhead, P.G.	Allen Yarbrough

## Other Contributors

<i>Wade Trim, Inc.</i>	<i>Pellucid Corp.</i>	<i>Edgehill Golf Advisors</i>
Brad Cornelius, AICP, CPM	James Koppenhaver	Stuart Lindsay
Amanda Warner, AICP		

This report is available online at: [WaterMatters.org/RWSP](http://WaterMatters.org/RWSP)

You may send a request for a printed copy to [info@watermatters.org](mailto:info@watermatters.org)

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## Chapter 1. Introduction

The 2015 Regional Water Supply Plan (RWSP) is an assessment of projected water demands in the Southwest Florida Water Management District (District) and potential sources of water to meet those demands for the period from 2010 through 2035. The RWSP has been prepared in accordance with the Florida Department of Environmental Protection's (DEP) 2009 Format and Guidelines for Regional Water Supply Planning. The RWSP consists of four geographically based volumes that correspond to the District's four designated water supply planning regions (see Figure 1). The RWSPs for each planning region contain the following chapters: Chapter 1, Introduction; Chapter 2, Resource Protection Criteria; Chapter 3, Demand Estimates and Projections; Chapter 4, Evaluation of Water Sources; Chapter 5, Overview of Water Supply Development Options; Chapter 6, Water Supply Projects Under Development; Chapter 7, Water Resource Development Component; and Chapter 8, Overview of Funding Mechanisms. This Executive Summary also contains a list of Guiding Principles outlining strategies to meet water supply demand throughout the planning period.

The purpose of the RWSP is to provide a framework for future water management decisions in the District. The 2015 RWSP for the four planning regions shows that water supply demands for all use sectors can be met through 2035. It also shows natural systems can be restored using a combination of alternative water sources, fresh groundwater and water conservation measures.



*Springs are a major economic resource for the Northern Planning Region*

The RWSP also identifies hundreds of potential water supply options and associated costs for developing alternative sources. The options are not intended to represent the District's most preferable options for water supply development. However, they are provided as reasonable concepts that water users in the planning region can pursue to meet their water supply needs. Additionally, the RWSP provides information to assist water users in developing funding strategies to construct water supply projects. The District previously completed RWSPs in 2001, 2006 and 2010 that included the Southern, Heartland and Tampa Bay planning regions. The 2010 update included the District's Northern Planning Region for the first time.

### **Statutory Requirements for Water Supply Planning**

The requirement for regional water supply planning originated from legislation passed in 1997 that amended Chapter 373, Florida Statutes (F.S.). Regional water supply planning requirements are codified in Part VII of Chapter 373 (373.709), F.S., and the District's RWSP has been prepared pursuant to these provisions. Regional water supply planning requirements were amended as a result of the passage of Senate Bill 444 during the 2005 Florida legislative session. The bill strengthened requirements for the identification and listing of water supply development projects. In addition, the legislation intended to foster better communications

among water planners, local government planners and local utilities. Local governments are now permitted to develop their own water supply assessments, which the water management districts (WMDs) are required to consider when developing their RWSPs. Finally, a trust fund was created that provides the WMDs with state matching funds to support the development of alternative water supplies by local governments, water supply authorities and other water users.

### ***Connection to Central Florida Water Initiative (CFWI)***

Since 2011, the District has been working with public water supply utilities, the St. Johns River and South Florida WMDs, DEP, Florida Department of Agriculture and Consumer Services (FDACS), and multiple stakeholders on the CFWI, which includes portions of Polk and Lake counties and all or parts of four other counties in central Florida outside of the District (see Figure 2). This is an area where the WMDs have previously determined, through water supply planning efforts and real-time monitoring, that groundwater availability is limited. The CFWI mission is to help protect, develop, conserve and restore central Florida's water resources by collaborating to address central Florida's current and long-term water supply needs. The CFWI is led by a Steering Committee that includes a public water supply utility representative, a Governing Board member from each of the three WMDs, and representatives from DEP and FDACS. The Steering Committee oversees the CFWI process and provides guidance to the technical teams and technical oversight/management committees that are developing and refining information on central Florida's water resources. The Steering Committee has guided the technical and planning teams in the development of the CFWI RWSP, which ensures the protection of water resources and related natural systems and identifies sustainable water supplies for all water users in the CFWI region through 2035. Those efforts, which are reflected in this 2015 RWSP update for the Heartland and Northern planning regions, will lead to adoption of new rules and management strategies. More detailed information concerning the CFWI is available on the CFWI website at <http://cfwiwater.com/planning.html>.

### ***Connection to Growth Management and Local Government Comprehensive Plans***

Consistent with Section 373.709(8)(a), F.S., within six months following approval of a RWSP, the District is to notify each local government covered by the RWSP. Within one year after the notification, each local government is required to provide to the District notification of any alternative water supply projects or options that it has developed or intends to develop; an estimate of the quantity of water to be produced by each project; and the status of project implementation, including development of the financial plan. The information is updated annually in a progress report provided to the District. If an entity does not intend to develop an alternative water supply project option identified in the RWSP, the local government is to propose, within one year after notification, another alternative water supply project option sufficient to address the demands within the local government's jurisdiction; and to provide an estimate of the quantity of water to be produced by the project and the status of project implementation. The local government has the option to request that the District consider a project not included in the RWSP.

Section 163.3177(6)(c)3., F.S., also indicates that within 18 months after Governing Board approval of a RWSP, local governments in the planning region must update their comprehensive plans. These updates must incorporate a work plan detailing alternative and traditional water supply projects, including conservation and reuse, within the local government's jurisdiction, covering at least a 10-year planning period.

### **Agency Coordination/Public Outreach**

The RWSP was developed in an open public process, in coordination and cooperation with staff from other WMDs, water supply authorities, the DEP and FDACS, and representatives from utilities, agriculture, various industries, and environmental organizations.

The District actively involved stakeholders in the RWSP planning process by facilitating public workshops in the Brooksville, Sarasota, and Tampa service offices and at the Cornerstone Baptist Church in Inverness. The District conducted and recorded interactive webcasts at all public workshops, and involved its standing advisory committees (public supply, agricultural, industrial, well drillers, green industry and environmental) and advisory groups (environmental resource permit and water use permit). Additionally, District staff facilitated presentations to numerous professional organizations.

District staff also involved other affected parties in the development of the RWSP by coordinating to develop methods for projecting water demands and assisting with the identification of potential options for water supply development. A District RWSP webpage was developed to provide public drafts of the entire document, advertise public workshops, post the recorded webcasts, and solicit comments from the public and interested parties.

Overall, the District conducted 31 public workshops, presentations, and meetings between January 2014 and September 2015 to explain the draft RWSP, collect input on the major components of the plan, and develop water resource and water supply development project options.

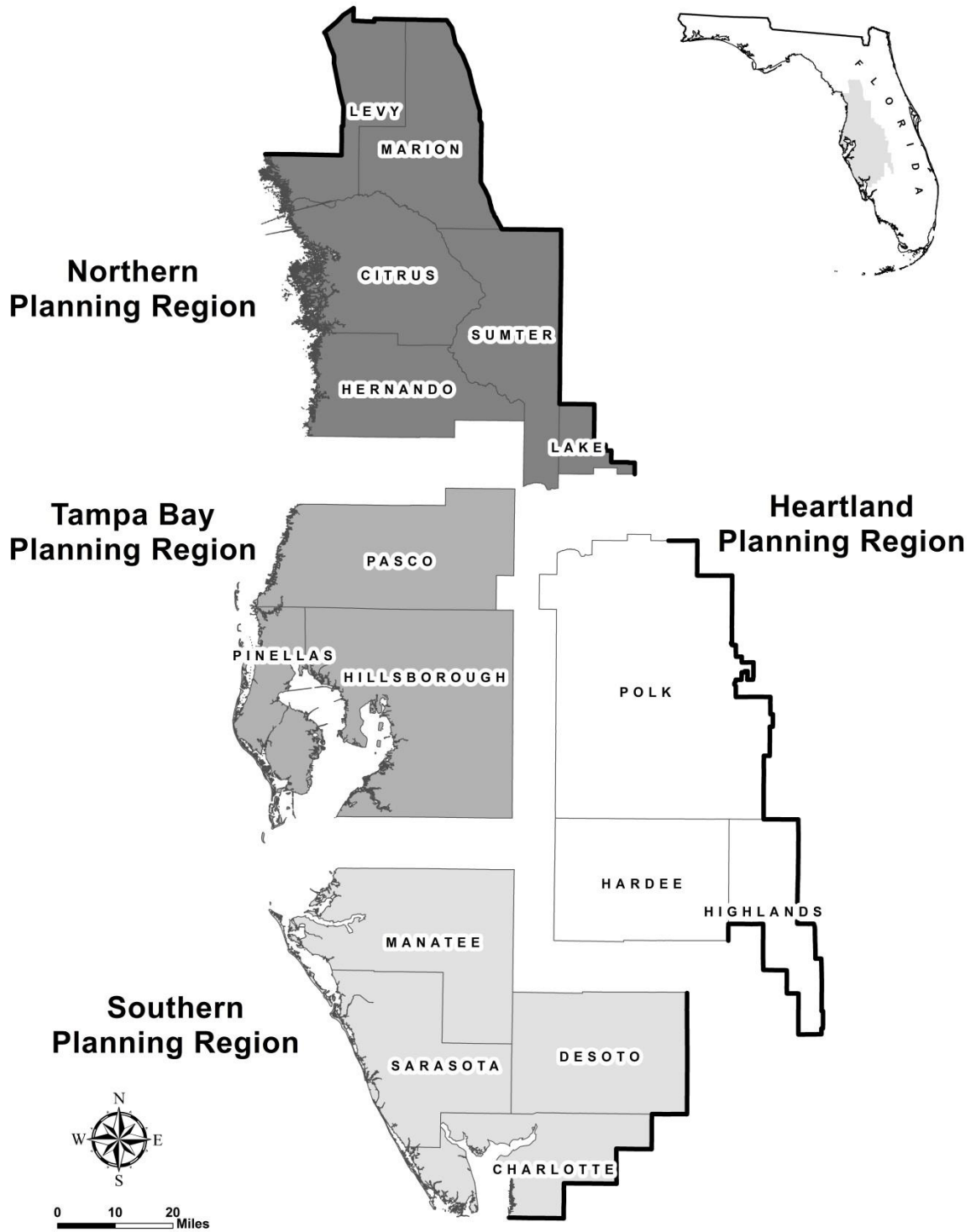


Figure 1. Location of the District's four water supply planning regions

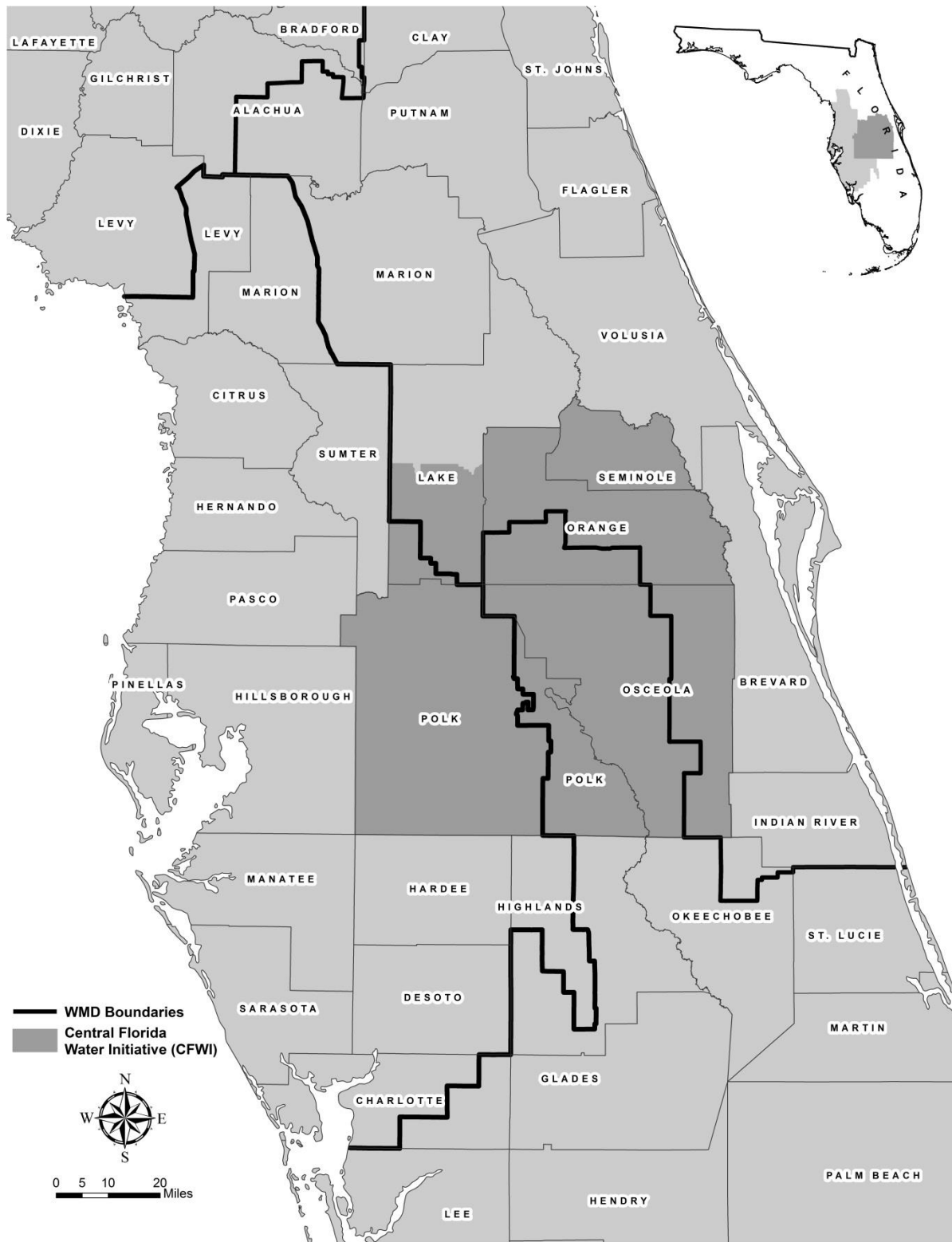


Figure 2. Location of the Central Florida Water Initiative Area

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## Chapter 2. Resource Protection Criteria

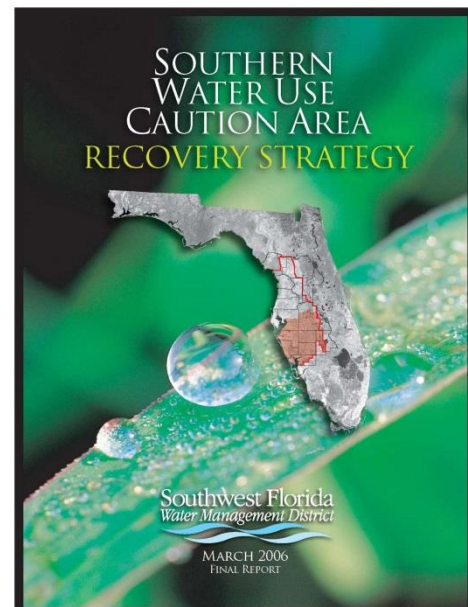
This chapter addresses the primary strategies the District employs to protect water resources, which include minimum flows and levels (MFLs), water use caution areas (WUCAs), prevention and recovery strategies, reservations, and climate change.

### *Minimum Flows and Levels (MFLs)*

A water resource MFL is the limit at which additional withdrawals would be significantly harmful to that water resource or the ecology of the area. The District implements established MFLs primarily through its water supply planning, water use and environmental resource permitting programs, and by funding water resource and water supply development projects that are part of a recovery strategy. The District established and annually updates a list of priority ground and surface waters for which MFLs will be set. Numerous factors are considered in determining which water resources are included, such as the importance of the water resources to the state or region; the existence of, or potential for, significant harm to occur; the required inclusion of all first-magnitude springs and all second-magnitude springs within state or federally owned lands purchased for conservation purposes; the availability of historic hydrologic records; the possibility that the water resource may be developed as a water supply; and the value of developing an MFL for regulatory purposes.

### *Water Use Caution Areas (WUCAs)*

WUCAs are areas requiring regional action to address cumulative water withdrawal concerns that are causing or may cause adverse impacts to the water and related land resources or the public interest (Rule Chapter 40D-2.801, Florida Administrative Code (F.A.C.)). To determine whether an area should be declared a WUCA, the District considers factors that include the quantity and quality of water available for use from groundwater and surface water sources; the health of environmental systems such as wetlands, lakes, streams, estuaries, fish and wildlife or other natural resources; and lake stages or surface water rates of flow. In response to continuing resource concerns, the District established the Northern Tampa Bay Water Use Caution Area (NTBWUCA), the Southern Water Use Caution Area (SWUCA) and its Most Impacted Area (MIA), and the Dover/Plant City Water Use Caution Area (Dover/Plant City WUCA) (see Figure 3).



*To achieve adopted MFLs, recovery strategies have been developed for each WUCA*

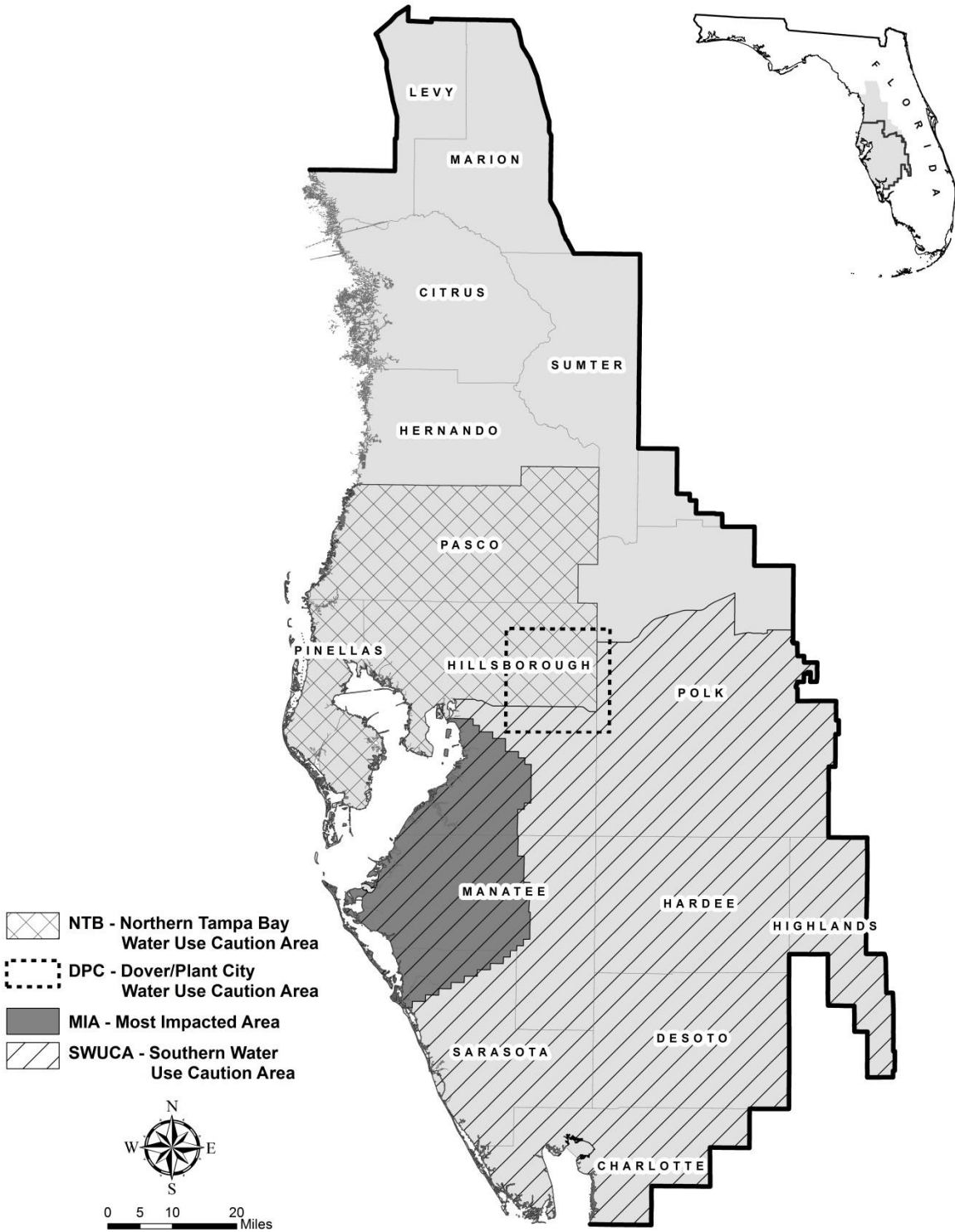


Figure 3. Location of the District's water use caution areas and the MIA of the SWUCA



### ***Prevention and Recovery Strategies***

Section 373.0421(2), F.S., requires that a recovery strategy be developed if the existing flow or level in a water resource is below, or within 20 years is projected to fall below, established MFLs. To date, the District has developed several recovery plans for achieving adopted MFLs. Regional plans were developed for the NTBWUCA and SWUCA; and recovery strategies were developed for the lower Alafia and Hillsborough rivers and the Dover/Plant City WUCA. Regulatory components of the recovery strategies for water resources in these areas are incorporated into District rules (Rule Chapter 40D-80, F.A.C.) and outlined in District reports.

To address the effects of water resource impacts in the NTBWUCA, the District took several important actions, including the establishment of MFLs for cypress wetlands, lakes, rivers and the Upper Floridan aquifer (UFA); entering into an agreement with Tampa Bay Water (TBW) and its member governments to reduce groundwater withdrawals; and working toward recovery in areas where water resources are impacted. The SWUCA recovery strategy, adopted in 2006, provides a plan for reducing the rate of saltwater intrusion in the UFA, restoring low flows to the upper Peace River, and restoring lake levels by 2025 while ensuring sufficient water supplies and protecting the investments of existing water use permittees. The Lower Hillsborough River recovery strategy is a plan to develop a number of projects that will supply quantities of water sufficient to meet the river's established minimum flow by 2017. The Lower Alafia River recovery strategy requires major industrial water users to augment the river with groundwater to prevent their use of surface water from exceeding the established MFL. The recovery strategy for the Dover/Plant City WUCA requires reduction of groundwater withdrawals used for frost/freeze protection.

### ***Reservations***

Section 373.223(4), F.S., authorizes reservations of water from use by permit applicants for the protection of fish and wildlife or public health and safety. The District will consider establishing a reservation of water when a District water resource development project will produce water needed to achieve adopted MFLs. Reservations of water will be established by rule.

### ***Climate Change***

Climate change may affect water supply sources and will be factored into evaluations of supplies to meet future demand. It also has potential to change patterns of demand and could be an important consideration in demand projections. Changes in the nature of supply and demand would necessitate infrastructure adaptation, which can be costly. However, as information is generated, existing and proposed water sources and projects will be evaluated to determine their feasibility and desirability. For these reasons, the District is assuming a "monitor and adapt" approach toward climate change. The District will actively monitor current research projects, both locally and nationally, interpret the results, and initiate appropriate actions deemed necessary to protect our water resources against the effects of climate change. For further information, see the climate change section in the Resource Protection Criteria chapter of each planning region's RWSP.

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## Chapter 3. Demand Estimates and Projections

This chapter presents the analysis of water demand for each water use sector in the District through 2035. The analysis includes the District's methods and assumptions used in projecting water demand for each county, the demand projections in five-year increments and a discussion of important trends in the data. The multiagency-produced demand estimates and projections for the CFWI region are noted.

Water demand has been projected for the following sectors for each county in the District: public supply (PS), agriculture (AG), industrial/commercial (I/C), mining/dewatering (M/D), power generation (PG), landscape/recreation (L/R) and environmental restoration (ER). FDACS prepared Florida Statewide Agricultural Irrigation Demand (FSAID2) projections through 2035. For an explanation of why the District did not use the FSAID2 projections, and a comparison of FSAID2 projections to District projections, see Appendix 3-1. The ER sector comprises quantities of water that need to be retired to meet established MFLs. The ER demand may increase during the planning period based on the recovery requirements of MFLs established in future years.

Table 1 summarizes the projected changes in demand for the average rainfall (5-in-10) condition for each water use sector in the District in five-year increments during the planning period. The table shows that the overall increase in water supply demand for the planning period for all use categories and for restoration of natural systems is 281.88 million gallons per day (mgd); a 23.4 percent increase over the quantity used in the 2010 base year. Approximately 25.54 mgd, or 9 percent of total demand, will be for environmental restoration. Approximately 15 mgd of this quantity will consist of decreases in groundwater withdrawals estimated to be needed to meet the saltwater intrusion minimum aquifer level in the SWUCA in the Southern, Heartland, and Tampa Bay planning regions. The estimated remaining quantities needed to meet minimum flows are 5.54 mgd for the lower Hillsborough and lower Alafia rivers in the Tampa Bay Planning Region, and 5.0 mgd for the upper Peace River in the Heartland Planning Region.

**Table 1. Summary of the projected demand by planning region (5-in-10) (mgd)**

Water Use Category	Planning Period						Change 2010-2035	
	2010	2015	2020	2025	2030	2035	mgd	%
<b>Heartland Planning Region</b>								
Public Supply	96.41	103.51	111.92	120.16	127.94	135.13	38.72	40.2%
Agriculture	183.41	183.73	184.55	185.49	186.61	187.84	4.43	2.4%
I/C & M/D	56.57	51.85	55.10	55.39	56.61	58.20	1.63	2.9%
Power Gen.	15.35	15.95	16.81	17.75	18.80	19.90	4.55	29.6%
Landscape/Rec.	18.14	19.87	21.70	23.50	25.32	27.33	9.18	50.6%
Env. Restoration	-	-	2.7+	10.0+	10.0+	10.0+	10.0+	N/A
<b>Region Total</b>	<b>369.89</b>	<b>374.91</b>	<b>392.78</b>	<b>412.29</b>	<b>425.28</b>	<b>438.40</b>	<b>68.52</b>	<b>18.5%</b>
<b>Northern Planning Region</b>								
Public Supply	87.93	98.78	110.51	120.92	130.44	139.28	51.36	58.4%
Agriculture	26.71	26.89	26.82	27.14	27.72	28.55	1.85	6.9%
I/C & M/D	9.18	9.55	9.83	10.13	10.42	10.72	1.54	16.7%
Power Gen.	2.33	2.36	2.43	2.50	2.56	2.64	0.31	13.2%
Landscape/Rec.	14.93	14.99	16.86	18.78	20.73	22.71	7.78	52.1%
Env. Restoration	-	-	-	-	-	-	-	-
<b>Region Total</b>	<b>141.08</b>	<b>152.57</b>	<b>166.45</b>	<b>179.46</b>	<b>191.87</b>	<b>203.91</b>	<b>62.83</b>	<b>44.5%</b>
<b>Southern Planning Region</b>								
Public Supply	100.56	106.25	112.95	119.06	124.45	129.24	28.68	28.5%
Agriculture	170.00	173.22	178.15	183.72	187.88	192.20	22.20	13.1%
I/C & M/D	4.22	1.89	1.75	1.77	1.78	1.80	-2.42	-57.3%
Power Gen.	0.01	0.01	0.01	0.01	0.01	0.01	0.01	14.3%
Landscape/Rec.	22.02	23.20	25.23	27.30	29.41	31.51	9.49	43.1%
Env. Restoration	-	-	-	5.0+	5.0+	5.0+	5.0+	N/A
<b>Region Total</b>	<b>296.81</b>	<b>304.57</b>	<b>318.08</b>	<b>336.86</b>	<b>348.53</b>	<b>359.77</b>	<b>62.97</b>	<b>21.2%</b>
<b>Tampa Bay Planning Region</b>								
Public Supply	292.29	308.89	327.90	345.62	361.18	375.40	83.11	28.4%
Agriculture	75.97	71.26	67.79	66.48	65.11	64.21	-11.76	-15.5%
I/C & M/D	13.40	14.20	11.61	11.93	12.25	12.57	-0.83	-6.2%
Power Gen.	0.37	0.39	0.40	0.41	0.42	0.44	0.06	16.9%
Landscape/Rec.	15.94	16.50	17.98	19.47	20.94	22.40	6.46	40.5%
Env. Restoration	-	-	5.54+	10.54+	10.54+	10.54+	10.54+	N/A
<b>Region Total</b>	<b>397.97</b>	<b>411.24</b>	<b>431.21</b>	<b>454.45</b>	<b>470.44</b>	<b>485.55</b>	<b>87.57</b>	<b>22.0%</b>
<b>Districtwide Totals</b>								
Public Supply	577.19	617.42	663.28	705.75	744.01	779.05	201.87	35.0%
Agriculture	456.08	455.09	457.30	462.84	467.33	472.80	16.72	3.7%
I/C & M/D	83.37	77.49	78.30	79.21	81.07	83.30	-0.08	-0.1%
Power Gen.	18.06	18.71	19.65	20.67	21.79	22.99	4.93	27.3%
Landscape/Rec.	71.04	74.57	81.76	89.06	96.40	103.95	32.91	46.3%
Env. Restoration	-	-	8.24+	25.54+	25.54+	25.54+	25.54+	N/A
<b>Districtwide Total</b>	<b>1,205.75</b>	<b>1,243.28</b>	<b>1,308.53</b>	<b>1,383.06</b>	<b>1,436.13</b>	<b>1,487.63</b>	<b>281.88</b>	<b>23.4%</b>

Note: Summation and/or percentage calculation differences occur due to rounding. Values match the 5-in-10 scenarios provided in Table 3-6 of the HPR, SPR, and TBPR volumes and Table 3-5 in the NPR volume.

## Chapter 4. Evaluation of Water Sources

This chapter outlines the District's investigations to quantify the amount of water that is potentially available from all sources of water within each planning region to meet demands through 2035. Sources of water that were evaluated include surface water, stormwater, reclaimed water, seawater, brackish groundwater, fresh groundwater and conservation. Aquifer storage and recovery (ASR) is also discussed as a storage option with great potential to maximize the utilization of surface water, stormwater, and reclaimed water.

Table 2 summarizes the potential availability of water from each source and the potential for water conservation measures to reduce demand through 2035 in each of the planning regions. The table shows that approximately 127 mgd is available from fresh groundwater and approximately 210 mgd is available from other permitted sources or alternative water supply options. The table also shows that water conservation measures have the potential to reduce demand by approximately 108 mgd. The total water supply availability and potential for water conservation to reduce demand in the District through 2035 is approximately 838 mgd. When compared to the projected 2035 additional demand of 281.88 mgd (see Table 1), it can be concluded that the available water supplies and conservation measures are sufficient to meet the 2035 projected demands.

Water demand will be met differently in each planning region. The following is a general overview of how the projected water demands in each planning region are likely to be met with the identified sources.

### *Heartland Planning Region*

The 2010–2035 increase in water demand in the Heartland Planning Region is projected to be 68.52 mgd. As of 2015, it is estimated that at least 76 percent of that demand (52.2 mgd) has either been met or will be met by existing permitted quantities. The remaining 16.32 mgd will be supplied by 15.29 mgd of reclaimed water combined with agricultural and non-agricultural conservation projects that are under development (see Table 3). However, it is expected that the cumulative demand will be larger due to the limited accessibility of permitted supplies for all demand centers and use types. The development of regional transmission systems is anticipated to help improve supply reliability and assist with environmental restoration. Potential project options for additional water supply include up to 28.56 mgd of reclaimed water, 6.96 mgd of non-agricultural water conservation, and 6.90 mgd of agricultural water conservation that could be developed by 2035 (see Table 2). In addition, the District is conducting exploratory drilling investigations of the Lower Floridan aquifer to evaluate whether this resource can be utilized without negatively affecting the recovery of aquifer levels and MFL water bodies in the SWUCA.

### *Northern Planning Region*

The 2010–2035 increase in demand in the Northern Planning Region is projected to be 62.83 mgd. As of 2015, it is estimated that at least 38 percent of that demand (23.94 mgd) has either been met or will be met by existing permitted quantities. The remaining 38.89 mgd will be supplied in part by 4.31 mgd of reclaimed water combined with agricultural and non-agricultural conservation projects that are under development (see Table 3), leaving approximately 34.58

mgd of demand unmet. Computer groundwater flow modeling using the Northern District model has demonstrated that groundwater may be available to meet demand to 2035, if conservation and reuse initiatives are also utilized to reduce demands (Cardno-Entrix, 2014). Additional demand reductions can be achieved through identified project options including a total of 10.64 mgd from reclaimed water options, 18.25 mgd of non-agricultural water conservation, and 5.30 mgd of agricultural water conservation (see Table 2). While the availability of fresh groundwater from the UFA can be prolonged by maximizing conservation and reclaimed water benefits, future groundwater availability will be dependent on achieving MFLs for the Withlacoochee River and springs systems.

### ***Southern Planning Region***

The 2010–2035 increase in water demand in the Southern Planning Region is projected to be 62.97 mgd. As of 2015, it is estimated that at least 52 percent of that demand (32.76 mgd) has either been met or will be met by existing permitted quantities. The remaining 30.21 mgd will be supplied in part by 20.38 mgd of reclaimed water combined with agricultural and non-agricultural conservation projects that are under development (see Table 3). By this metric, approximately 9.83 mgd of demand remains to be met. The continued development of regional transmission systems will enable utilities to meet public supply needs from multiple sources. Reductions in agricultural water use through Facilitating Agricultural Resource Management Systems (FARMS) projects will be very significant to the planning region for meeting the demands for agriculture and environmental restoration for the SWUCA Recovery Strategy. A combination of alternative water supply project options are available to develop new supplies, when necessary, including surface water and brackish groundwater sources, reclaimed water, and through additional non-agricultural water conservation. Potential project options for additional water supply include up to 25.68 mgd of reclaimed water, 12.27 mgd of non-agricultural water conservation, and 6.53 mgd of agricultural water conservation that could be developed by 2035 (see Table 2).

### ***Tampa Bay Planning Region***

The 2010–2035 increase in water demand in the Tampa Bay Planning Region is projected to be 87.57 mgd. As of 2015, it is estimated that at least 92 percent of that demand (80.60 mgd) has either been met or will be met by existing permitted quantities currently available or by brackish groundwater projects in progress. Reclaimed water and conservation projects under development could reduce demand by 20.34 mgd (see Table 3). Additional demand reductions can be achieved through identified project options, including a total of 65.70 mgd from reclaimed water options, 45.69 mgd of non-agricultural water conservation, and 6.35 mgd of agricultural conservation (see Table 2). A projected reduction in agricultural demand by 11.76 mgd in the planning region could be permanently retired to help achieve the saltwater intrusion minimum aquifer level and/or used to allow development of a limited amount of fresh groundwater by mitigation. A combination of alternative water supply project options are available to develop new supplies, when necessary, including the implementation of TBW's System Configuration III project to create additional public supply while maintaining the recovery goals of the NTBWUCA.

**Table 2.** Potential additional water availability in the District from sources in each planning region through 2035 (mgd)

Planning Region	Surface Water		Reclaimed Water	Desalination		Fresh Groundwater		Water Conservation		Total
	Permitted Unused	Available Unpermitted	Post-2010 Benefits <sup>4</sup>	Seawater	Brackish Groundwater <sup>1</sup>	Surficial and Intermediate	Upper Floridan Permitted Unused	Non-Agricultural	Agricultural	
Heartland	0.84	3.73	28.56	0	0	8	51.36	6.96	6.90	106.35
Northern <sup>2,3</sup>	0.54	88.00	10.64	15	0	0	23.40	18.25	5.30	161.13
Southern	29.90	151.90	25.68	40	14.09	20.4	2.86	12.27	6.53	303.63
Tampa Bay	65.60	19.00	65.70	35	9.40	5.50	15.00	45.69	6.35	267.24
<b>Total</b>	<b>96.88</b>	<b>262.63</b>	<b>130.58</b>	<b>90</b>	<b>23.49</b>	<b>33.9</b>	<b>92.62</b>	<b>83.17</b>	<b>25.08</b>	<b>838.35</b>

<sup>1</sup> The Brackish Groundwater quantities shown include permitted but currently unused capacity. Additional quantities from identified project options will require evaluation similar to fresh groundwater.

<sup>2</sup> Groundwater quantities shown only include permitted but unused groundwater from the UFA. The Northern Planning Region is the only region where groundwater from the UFA will be available in quantities sufficient to meet the 2035 demand, provided existing and anticipated local impacts are mitigated or avoided. Those quantities are not shown in this table. It is anticipated that the District's efforts to aggressively promote and develop reclaimed water and conservation will significantly reduce the amount of groundwater needed to meet the projected demand.

<sup>3</sup> Fresh Groundwater does not include quantities potentially available from the LFA in portions of the planning region. These quantities will be further evaluated in future updates of this RWSP for the Northern Planning Region.

<sup>4</sup> Post-2010 reclaimed water benefits estimated at 70% utilization and 70% efficiency. Water resource benefit is the amount of potable-quality groundwater or surface water that is replaced by reclaimed water usage or the amount of reclaimed water used for environmental enhancement.



**C.W. Bill Young Regional Reservoir,  
Tampa Bay Planning Region**

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## Chapter 5. Overview of Water Supply Development Options

The water supply development component of the RWSP requires the District to identify water supply options from which water users in each planning region can choose to meet their individual needs. In addition, the District is required to determine the associated costs of developing these options. As discussed in Chapter 4, the sources of water that are potentially available to meet projected water demand in the District include surface water, stormwater, reclaimed water, seawater desalination, brackish groundwater desalination, fresh groundwater and conservation. Investigations were conducted to identify reasonable options for developing each of the sources, to provide planning level technical and environmental feasibility analyses, and to determine costs to develop the options.

Where applicable, water supply options developed through regional planning efforts conducted by Polk County, TBW, the Withlacoochee Regional Water Supply Authority, and the Peace River Manasota Regional Water Supply Authority (PRMRWSA) are incorporated into the RWSP for each planning region. These options are not necessarily the District's preferred options, but are provided as reasonable concepts that water users in the region may pursue in their water supply planning efforts. A number of the options are of such a scale that they would likely be implemented by either a regional water supply authority or a group of users. Other options, such as those involving reclaimed water and conservation, could be implemented by individual utilities, farmers or other permittees. It is anticipated that users will choose an option or combine elements of different options that best fit their needs for water supply development, provided they are consistent with the RWSP. Following a decision to pursue an option identified in the RWSP, it will be necessary for the parties involved to conduct more detailed technical assessments to provide the necessary support for developing the option. See Chapter 5 in each planning region's respective RWSP for a complete listing of water supply development options in the District.



*A brackish groundwater treatment facility constructed in Clearwater with cooperative funding by the District*

The CFWI is identifying both traditional source water availability and additional alternative water supply development options for the collaborative planning region, including those portions of Polk and Lake counties within the District. These options include use of brackish groundwater, surface water, reclaimed water, and water management strategies such as conservation. The CFWI RWSP may contain additional information regarding the water supply options available to those counties.

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## Chapter 6. Water Supply Projects Under Development

This chapter is an overview of water supply projects that are under development in the planning regions. Projects under development are those the District is co-funding and either (1) were completed since the year 2010, the base year for the 2015 RWSP; (2) are in the planning, design or construction phase; or (3) are not yet in the planning phase, but are at least partially funded through the 2015 fiscal year (FY). Below are brief summaries of the planning regions' water supply projects under development. The anticipated benefits from the numerous reclaimed water and conservation projects are provided in Table 3. See Chapter 6 in each planning region's respective RWSP for a complete listing of water supply projects under development in the District.

### *Heartland Planning Region*

There are 11 reclaimed water projects under development that include transmission pipelines, pump stations, storage tanks and ponds, and feasibility studies. The projects will supply 12 mgd of reclaimed water that will result in 11.46 mgd of potable-quality water benefits at a total cost of more than \$121 million.

There is one reclaimed water ASR project under development by Polk County in the planning region. This project, which consists of a Lower Floridan ASR well, is in the testing phase. The project cost is approximately \$5.2 million.

The City of Winter Haven completed a desktop feasibility investigation for an indirect aquifer recharge project using wet weather reclaimed water. The City is conducting design and permitting on two sites identified in the feasibility study with a combined capacity of up to 1.7 mgd of recharge to achieve improvements in SWUCA aquifer levels.

There are seven non-agricultural water conservation projects under development in the planning region that include toilet and rain sensor rebates and irrigation evaluations. These seven projects will save more than 126,511 gallons per day (gpd) at a cost of approximately \$262,915.

There are 12 ongoing agricultural research and education projects under development that will result in water savings in the region. These projects involve best management practices to increase the efficiency of agricultural operations. The total cost of these projects is approximately \$2.8 million.

### *Northern Planning Region*

There are nine reclaimed water projects under development that include transmission pipelines, pump stations, storage tanks and ponds, and feasibility studies. The projects will supply 4.6 mgd of reclaimed water that will result in 3.6 mgd of potable-quality water benefits at a total cost of approximately \$34.2 million.

There are nine non-agricultural water conservation projects under development in the planning region that include toilet and rain sensor rebates and irrigation evaluations. The projects will save more than 258,057 gpd at a cost of approximately \$526,548.

There are 12 ongoing agricultural research and education projects under development that will result in water savings in the region. These projects involve best management practices to

increase the efficiency of agricultural operations. The total cost of these projects is approximately \$2.8 million.

### ***Southern Planning Region***

The PRMRWSA is continuing to develop its Regional Integrated Loop System; a series of transmission pipelines that will regionally transfer and deliver water from existing and future alternative supplies to demand centers within its four-county service area. Three of the loop system phases are complete (Phases 1A, 2, 3A). As part of the PRMRWSA's Integrated Water Supply Master Plan Update (2015), the project phasing was revised to improve sharing of capacity and utilize existing infrastructure.



***Reclaimed water storage tank completed as part of a project in the Southern Planning Region***

There are 21 reclaimed water projects under development that include transmission pipelines, pump stations, storage tanks and ponds, ASR systems, and feasibility studies. The projects will supply 12.5 mgd of reclaimed water that will result in 10.9 mgd of potable-quality water benefits at a total cost of approximately \$75 million.

The District is partnering with the City of Punta Gorda to determine the feasibility, permissibility, and long-term reliability of a brackish wellfield. The cost of this project is approximately \$3 million.

There is one reclaimed water ASR project being developed in the planning region by the City of Palmetto. When completed, this project will produce 1.2 mgd of supply at a cost of approximately \$4.1 million.

The City of Bradenton's potable water ASR system became operational in 2013. The City of Bradenton is currently conducting design and permitting on a second potable water ASR facility to meet their future demands. The City of North Port's potable water ASR investigational study is undergoing design modifications and permitting to run a cycle test with partially treated surface water.

There are currently 11 non-agricultural water conservation projects under development that include low-flow toilet rebates and line looping. These projects will save in excess of 512,000 gpd at a cost of approximately \$2 million.

There are 12 agricultural research and education projects under development that involve best management practices to increase the efficiency of agricultural operations. The total cost of these projects is approximately \$2.8 million.

### **Tampa Bay Planning Region**

In 2011, TBW completed its System Configuration II project. This project increased the capacity of the Regional Surface Water Treatment Plant from 72 mgd to 99 mgd. The additional capacity was achieved by adding pumping and distribution capacity to existing infrastructure, enabling the capture of higher surface water flows on the Hillsborough River, and additional flows from the Tampa Bypass Canal. An added benefit of the project is that it increased the ability to use the existing storage capacity of the C.W. Bill Young Regional Reservoir.

There are 46 reclaimed water projects under development that include transmission pipelines, pump stations, storage tanks and ponds, aquifer storage and recovery systems, and feasibility studies. When complete, these projects will supply 20.6 mgd of reclaimed water that will result in 17.56 mgd of potable-quality water benefits at a total cost of approximately \$231 million.

There are three brackish groundwater projects under development by the cities of Clearwater, Oldsmar and Tarpon Springs that would produce a total of 12 mgd of additional water supply at a cost of approximately \$103 million. There is one reclaimed water ASR project under development by the City of Oldsmar that could potentially provide up to 1 mgd of recharge/recovery. The cost for this project is approximately \$1.7 million.

Indirect aquifer recharge projects under development in the planning region include those for Pasco County and the City of Zephyrhills. Pasco County is conducting ongoing feasibility studies and is moving forward with plans for design and construction of a project in the central region of the county that involves recharge within constructed wetlands. The project could potentially provide between 2 mgd and 5 mgd of potential recharge. As part of the Springs Initiative, the City of Zephyrhills is planning to upgrade its wastewater treatment plant to Advanced Wastewater Treatment standards and use this water for recharge.

Direct recharge projects under development include those for the City of Clearwater and Hillsborough County. The Clearwater project would use state-of-the-art treatment technology and injections systems to recharge a brackish water interval of the UFA. Benefits include an increase in local aquifer levels, reduced saltwater intrusion, and the potential for additional water supply production at City facilities.

There are 21 non-agricultural water conservation projects under development that include low-flow toilet rebates and landscape irrigation evaluations. The projects will save nearly 318,919 gpd at a cost of more than \$1,464,364.

There are 12 agricultural research and education projects under development that involve the implementation of best management practices to increase the efficiency of agricultural operations. The total cost of these projects is approximately \$2.8 million.

**Table 3.** Reclaimed water and water conservation benefits from projects that meet the District's definition of being under development

Planning Region	Reclaimed Water (mgd)	Water Conservation (mgd)			Total (mgd)
	Post-2010 Benefits	Agriculture <sup>1</sup>	Outdoor	Indoor	
Heartland	11.46	3.701	0.095	0.032	15.288
Northern	3.60	0.452	0.229	0.029	4.310
Southern	10.90	8.968	0.327	0.185	20.380
Tampa Bay	17.56	2.457	0.142	0.177	20.336
<b>Total</b>	<b>43.52</b>	<b>15.030</b>	<b>0.793</b>	<b>0.423</b>	<b>60.314</b>

<sup>1</sup> The FARMS projects calculated were specific projects of the FARMS water resource development program that were budgeted from 2011 through 2015. Benefits were calculated from anticipated savings, but may include observed savings for exceptionally performing projects. Frost/freeze reductions were calculated as a one day per year event.

## Chapter 7. Water Resource Development Component

The intent of water resource development components described in this chapter is to enhance the amount of water available for water supply development. The District classifies water resource development projects into two broad categories. The first category encompasses data collection and analysis activities that support water supply development by local governments, utilities, regional water supply authorities and others. The second category includes projects that meet the more narrow statutory definition of water resource development, i.e., “regional projects designed to create from traditional or alternative sources an identifiable, quantifiable supply of water for existing and/or future reasonable-beneficial uses.”

The data collection and analysis activities conducted by the District support the health of natural systems and the development of water supplies. The activities include a comprehensive hydrologic conditions monitoring program to assemble information on key indicators as rainfall, surface and groundwater levels and water quality, and stream flows. Data collected allows the District to gage changes in the health of water resources, monitor trends, identify and analyze existing or potential resource problems, develop programs to correct existing problems, and prevent future problems from occurring. The data collection also supports District flood control structure operations, water use and environmental resource permitting and compliance, MFL status evaluation, recovery strategies, modeling of surface water and groundwater systems, and numerous resource evaluations and reports.

The District has 14 projects that meet the definition of water resource development. These projects include (1) alternative water supply research, restoration and pilot projects that further the development of innovative technologies to produce water from alternative sources and achieve hydrologic restoration; (2) agricultural water supply/environmental restoration projects including the FARMS Program that employ agricultural water conservation strategies to increase the water use efficiency of agricultural operations; and (3) projects to restore minimum flows to impacted water resources. Districtwide, these 14 projects will produce or conserve a minimum of 54 mgd at a total cost of approximately \$203 million.



*Agricultural water supply projects use conservation strategies to increase efficiency and restore water resources*

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## Chapter 8. Overview of Funding Mechanisms

This chapter provides an overview of mechanisms available to generate the necessary funds to implement the water supply and water resource development projects proposed by the District and its cooperators to meet the water supply demand projected through 2035 and to restore MFLs to impacted natural systems.

To estimate capital costs to meet the portion of the 2035 demand that is not yet under development, the District compiled a list of large-scale water supply development projects. The water supply produced from these large-scale water supply development projects, combined with the water supply to be produced from numerous reclaimed water and conservation projects currently under development, will meet approximately 20 percent of the projected demand.

The District anticipates that a large portion of the remaining demand will be met through projects that users will select from the water supply options listed in Chapter 5 of the RWSP for each planning region. Finally, a significant portion of this remaining demand is in the Northern Planning Region. Most of this demand will be met with fresh groundwater from the UFA. To determine the availability of funding to cover the costs of developing alternative water projects, the capital cost of the potential large-scale projects discussed above is compared to the amount of funding that will be generated through 2035 by the various District, state, and federal funding mechanisms.

### *Projection of Utility Revenues from New Customers in the District (2015 to 2035)*

Water supply development funding has primarily been, and will remain, the responsibility of water utilities and water authorities. Demand increases generally result from new customers that help to finance source development through impact fees and utility bills. Water utilities draw from a number of revenue sources such as connection fees, tap fees, development impact fees, base and minimum charges, and volume charges. Impact fees are generally devoted to the construction of source development, treatment and transmission facilities. Base charges generally contribute to fixed customer costs such as billing and meter replacement, but they may also contribute to source development, treatment, and transmission construction cost debt service. Volume charges contribute to source development, treatment, transmission debt service, and operation and maintenance. Financing through volume-related charges is the most economically efficient means to finance new water supply development. Volume charge financing provides consumers and businesses the greatest degree of direct control over water-related costs and a direct incentive to conserve.

Community development districts and special water supply and/or sewer districts may also develop non-ad valorem assessments for system improvements to be paid at the same time as property taxes. Regional water supply authorities are also special water supply districts, and are typically funded through fixed and variable charges to the utilities they supply, although they have the ability to levy taxes with county/municipal approval. All of the above have the ability to issue secure construction bonds backed by revenues from fees, rates, and charges.

In 2014, the District updated a survey of water and sewer utility fees and charges to estimate revenues that contribute to source development, treatment, and transmission capital projects. Between 2015 and 2035 new public water supply demand in the District will generate approximately \$5.8 billion in impact fees, recurring base charges, and volumetric charges. Table

4 illustrates the revenues from water and wastewater charges. The wastewater revenues may contribute to capital expenditures on reclaimed water system development. While some of these revenues will go to pay existing facility debt service, most of that service will be retired in various stages over the next 20 years and debt service for new projects will be added.

**Table 4.** *Cumulative projected water and wastewater revenues from new customers in the District (2015 to 2035)<sup>1</sup>*

Revenue Source	Water (Millions)	Wastewater (Millions)
New Base Charges	\$466	\$808
New Volume Charges	\$1,313	\$1,642
New Impact Fees	\$635	\$972
<b>Total</b>	<b>\$2,414</b>	<b>\$3,422</b>

<sup>1</sup> Estimated in 2013 dollars

### **Projection of the Amount of Funding Anticipated to be Generated or Made Available through District and State Funding Programs**

Table 5 is a projection of the amount of funding that could be generated by District and state funding programs. Many potential funding sources, such as the District's Cooperative Funding Initiative and District Initiatives, the state's Water Protection and Sustainability Trust Fund, and the state's Springs Initiative were evaluated to create the projection. The table illustrates that a minimum of \$1.65 billion could potentially be generated or made available to fund the water supply and water resource development projects necessary to meet the water supply demand through 2035 and to restore MFLs for impacted natural systems. This figure may be conservative, since it is not possible to determine the amount of funding that may be available in the future from the federal government and state of Florida legislative appropriations.

### **Evaluation of Project Costs to Meet Projected Demand**

Of the 281.88 mgd of projected demand increases during the 2010–2035 planning period necessary to meet the demand for all users and to restore MFLs for impacted natural systems, it is estimated that 60 mgd, or 21 percent of the demand, either has been met or will be met by reclaimed water and conservation projects that are under development by December 30, 2015. The total District share of cost for the projects currently under development including regional transmission, ASR, and brackish groundwater treatment systems is \$571 million. Of this amount, \$327 million has been funded through FY2015, leaving \$244 million to be funded beginning in FY2016.

To develop an estimate of the capital cost of projects that need to be developed to meet the additional demand, the District compiled a list of large-scale water supply development projects that have been proposed by the PRMRWSA, Tampa Electric Company (TECO), TBW, and Polk County that will produce an additional 34 to 49 mgd of new water supply and provide regional transmission capacity. These projects, as well as their estimated costs and quantities of water they will produce, are listed in Table 6. The table shows that the estimated total cost of the 34 to 49 mgd of water supply that will be produced by these projects ranges from \$1.126 to \$1.574 billion.

The remaining demand in the Northern Planning Region will potentially be met by fresh groundwater, reclaimed water, and conservation projects. Because the District does not fund fresh groundwater projects, matching financial resources may only need to be generated by the District for reclaimed water and conservation projects in the Northern Planning Region. This demand will be met through the development of alternative water source and conservation projects chosen by users from the list of potential options in Chapter 5.

***Evaluation of Potential Available Funding to Assist with the Cost of Meeting Projected Demand***

The conservative estimate of \$1.65 billion in cooperator and District financial resources that will be generated through 2035 (see Table 5) for funding is sufficient to meet the projected \$1.1 to \$1.5 billion total cost of the large-scale projects listed in Table 6. In addition, the \$244 million portion of the cost of projects currently under development will require funding in the near-term. The state and federal funding sources yet to be determined (see Table 5) may assist with the remaining and high-end costs for future alternative water supply projects and water conservation measures where fresh groundwater resources are limited. It may also serve as a reserve for the development of projects to replace water supplies that may be reduced as the result of the establishment or revision of MFLs. These financial projections are subject to economic conditions that may affect the level of District ad-valorem tax revenue and the availability of state and federal funding; however, such conditions may similarly affect future water demand increases.

For a complete discussion of funding options, see Chapter 8 in each planning region.

**Table 5.** Projection of amount of funding that could be generated or made available through District funding programs (District and cooperators) from 2016 through 2035 (millions of \$)

Funding Projection	
Source	Amount (millions)
Cooperative Funding Initiative (CFI)	\$600
Funding provided assuming all CFI water supply funds are used for projects that would be matched by a partner on an equal cost-share basis	\$600
District Initiatives funding	\$300
Funding provided assuming one-half of the District Initiative funds are used for projects that would be matched by a partner on an equal cost-share basis	\$150
State of Florida, Water Protection & Sustainability Trust Fund (WPSTF)	TBD
State of Florida, Springs Initiative	TBD
State of Florida, Florida Forever Trust Fund	TBD
State of Florida Legislative Appropriations	TBD
State of Florida Legislative Appropriations for FARMS	TBD
West-Central Florida Water Restoration Action Plan (WRAP)	TBD
Federal Funds	TBD
<b>Total</b>	<b>\$1,650</b>

**Table 6.** Proposed large-scale water supply and water resource development projects to be completed by 2035 (millions of \$)

Project	Entity to Implement	Quantities (mgd)	Capital Costs	Land Costs	Total Costs (Capital + Land)
Regional Resource Development	PRMRWSA	8	\$340	\$10	\$350
Regional Loop System	PRMRWSA	N/A	\$221	\$12	\$233
Polk County Regional Water Grid System	Polk County and Municipalities	N/A	\$219	\$7	\$226
Flatford Swamp Hydrologic Restoration	TBD	10	\$44-96	\$4	\$48-100
TECO Polk Reclaimed Water Interconnects (Phase 2)	Tampa Electric Co.	6	\$53	-	\$53
TBW System Configuration III	TBW	10-25	\$216-612	TBD	\$216-612
<b>Total – Districtwide</b>		<b>34-49</b>	<b>\$1,093 -1,541</b>	<b>\$33</b>	<b>\$1,126 - 1,574</b>

## Guiding Principles

The analysis provided in the RWSP is based on a number of important principles that will guide the District's strategies to meet water supply demand through 2035. The principles that follow take into account statutory directives, the hydrologic conditions in the planning regions, existing and potential impacts to natural systems, the characteristics of water user groups, and other factors.

### *An emphasis on water conservation*

Conservation is considered to be a potential source of water for all major use types. Future water demand is projected based on current water use efficiencies. If efficiency is increased through conservation, future demand will be offset and reduced. Conservation is strongly recommended for all users; however, special emphasis is placed on public supply use in the Northern Planning Region, which has tremendous potential for water savings. Regarding agricultural demand, the District, in cooperation with the FDACS, has developed the FARMS Program to promote agricultural water conservation. The FARMS Program is a cost-share reimbursement program aimed at the implementation of best management practices that conserve water and improve water quality.

### *An emphasis on reclaimed water*

Reclaimed water is an important resource that can help meet future demands in all use sectors. The District's goals are to utilize 75 percent of all reuse flows and to achieve a 75 percent offset of potable sources. To meet these goals, the District will emphasize water-conserving rate structures, wet-weather storage, and system augmentation where appropriate.

### *Regional cooperation in water supply planning*

The District promotes regional approaches to water supply planning and development. The benefits of regional systems include economies of scale, better ability to manage environmental impacts, improved system reliability, operational flexibility and emergency backup capability. Larger regional systems are also able to take advantage of conjunctive use, wherein both groundwater and alternative sources are available and can be managed to mimic natural hydrologic cycles. The primary vehicles for regional cooperation in the District are the CFWI and the three regional water supply authorities whose jurisdictions correspond closely to three of the four planning regions. The RWSP was developed in close coordination with these entities. The District also coordinated with Polk County and its municipalities, which worked together in 2009 to develop a countywide water supply plan.

### *Focus on alternative sources*

Because three of the four planning regions are subject to MFL recovery strategies due to the effects of groundwater withdrawals, the RWSP focuses on alternative water sources, including surface water, brackish groundwater, seawater desalination, reclaimed water and water conservation. Fresh groundwater supplies are available in the Northern Planning Region and could continue to meet demand beyond the 20-year planning period if the region's considerable potential for reuse and conservation is realized.

### ***Meeting future demand through land-use transitions***

In the SWUCA, land uses such as agriculture and mining are being displaced by residential and commercial land uses. It is anticipated that the water needs of these new land uses will be met in many areas by alternative supplies, such as harvesting and storing the wet-season flow of rivers, reclaimed water and conservation. Because the land uses being replaced rely almost entirely on groundwater, there will be a net reduction in groundwater use. While a portion of this groundwater will be retired to help meet MFLs, the remainder can be used to meet the demands of development in areas where access to alternative supplies is limited.

### ***The role of constraints such as MFLs***

In three of the four planning regions, some water resources are not meeting their established minimums. In these areas, it will be necessary to continue implementation of MFL recovery strategies while also identifying potential water supply options to meet future demands. In the Northern Planning Region, where fewer MFLs have been established to date, it is anticipated that water resources will generally meet their MFLs as they are set. Thus, in the Northern Planning Region, the District's focus is on preventing resource impacts as water demand increases and as additional supplies are developed through 2035.



***Weeki Wachee River***

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