2

Demand Estimates and Projections

This chapter discusses water demand estimates and projections for the LEC Planning Area. The development of water demand estimates and projections is a complex process and is accomplished via coordination with staff from local governments, utilities, other agencies, and stakeholder groups. Data collection and analysis to support the projections included in this update began in 2011.

In the LEC Planning Area, the most recent estimates and projections were published in the 2005–2006 LEC Plan Update (SFWMD 2006). Since its publication, a national economic downturn has occurred and population growth in the LEC Planning Area has slowed significantly, leading to a reduced rate of increase in future urban water demand. Agriculture has been affected as well, and demand is now projected to increase.

WATER USE CATEGORY DESCRIPTIONS AND SUMMARY

The water demand for the six categories established by the FDEP is projected for a 20-year planning horizon starting in 2010 and extending to 2030. A base year of 2010 is used for comparison in trend analyses; the percent usage for each water use category is described in **Figure 1**. In 2010, average annual gross water demand for all categories in the LEC Planning Area totaled 1,670.8 MGD. By 2030, the projected average annual gross water demand is estimated to total 1,941.5 MGD, an increase of 16 percent. The average annual gross water demand projections for 2010 and 2030 for the six water use categories is as follows:

- **Public Water Supply (PWS)** includes water supplied by water treatment facilities for potable use (drinking quality) with projected average withdrawals equal to or greater than 100,000 gallons per day (GPD) or 0.1 MGD. PWS is expected to increase by 19 percent by 2030 (845.3 MGD in 2010 compared to 1,005.9 MGD in 2030).
- **Domestic Self-Supply (DSS)** includes households served by small utilities (less than 0.1 MGD) and private wells. DSS is expected to increase by 11 percent by 2030 (16.6 MGD in 2010 compared to 18.5 MGD in 2030).

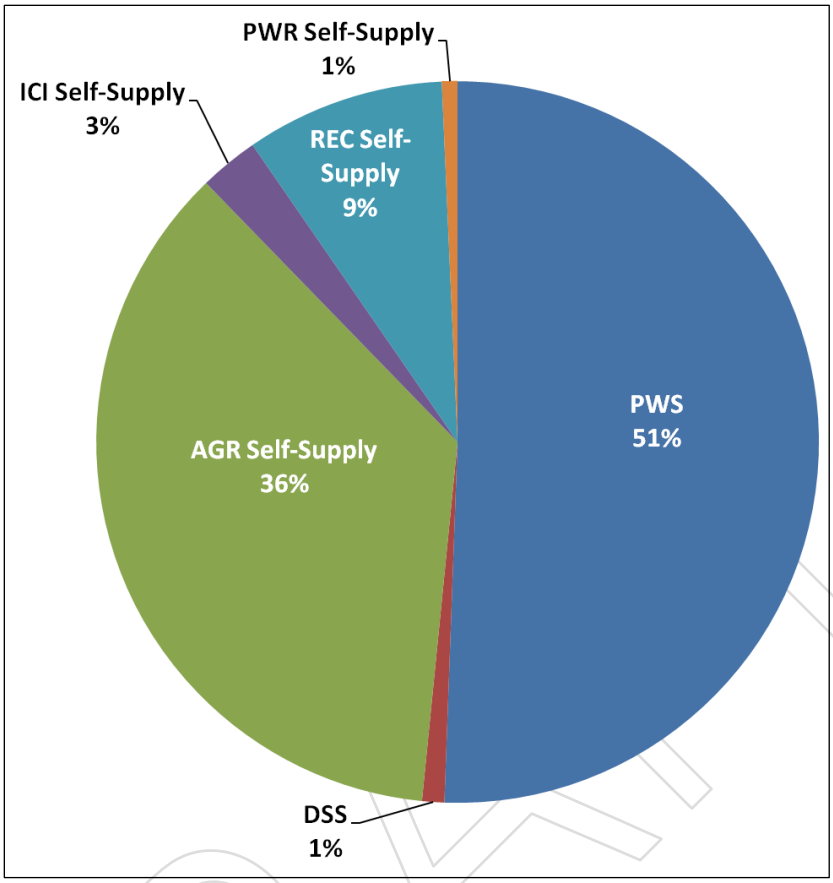

Figure 1. Percentage of projected demand of each major water use category in 2010. Total usage is 1,670.8 MGD.

- **Agricultural (AGR) Self-Supply** is water used for commercial crop irrigation, nurseries, livestock watering, and aquaculture. AGR Self-Supply is expected to increase by 12 percent by 2030 (604.0 MGD for 543,684 acres in 2010 compared to 674.4 MGD to irrigate 605,577 acres in 2030).
- **Industrial/Commercial/Institutional (ICI) Self-Supply** includes self-supplied water consumed by business operations, such as mining and food processing, and institutions, such as schools, hospitals, and prisons, that have demand of 0.1 MGD or greater. ICI Self-Supply is expected to increase by 28 percent by 2030 (44.3 MGD in 2010 compared to 56.6 MGD in 2030).
- **Recreational/Landscape (REC) Self-Supply** is used for irrigation of golf courses, parks, cemeteries, large common areas such as homeowner associations, schools, commercial developments, and other self-supplied irrigation uses with demand of 0.1 MGD or greater. REC Self-Supply is projected to increase by 3 percent (148.9 MGD in 2010 compared to 152.8 MGD in 2030).
- **Power Generation (PWR) Self-Supply** includes water consumed by power plants for use in the production of electricity, excluding use of seawater and reclaimed water sources. PWR Self-Supply is projected to increase by 185 percent by 2030 (11.7 MGD in 2010 compared to 33.3 MGD in 2030).

Projections for each water use category are based on demand under average annual rainfall conditions and anticipated growth in the LEC Planning Area through 2030. As water demand may be significantly impacted by weather, particularly rainfall, gross and net demands for 1-in-10 year drought conditions are estimated and projected in **Appendix A**. **Appendix A** also contains additional information about water demand including a description of the methods applied to derive demand for each water use category. For PWS and DSS, permanent population and, for PWS, demand by utility are provided. For AGR Self-Supply, irrigated acreage and demand by crop type are provided. Although not quantified in this chapter, environmental demand is addressed during the water supply planning process using resource protection criteria (**Chapter 3**).

POPULATION AND WATER USE TRENDS

Population projections form the initial and key step in developing water demand projections; especially for PWS and DSS water use categories. Population estimates for the LEC Planning Area include the resident permanent populations of Palm Beach, Broward, and Miami-Dade counties, most of Monroe County, and the eastern portion of Hendry County (**Table 1**). A portion of Collier County is in the LEC Planning Area, but it is within the Big Cypress National Preserve, which does not have any permanent residents.

Table 1. Comparison of population projections published in the 2005–2006 LEC Plan Update and current projections presented in this plan update.

County	2010	2015	2020	2025	2030
2005–2006 LEC Plan Update Population Projections					
Palm Beach	1,415,809	1,549,635	1,679,326	1,804,188	
Broward	1,941,036	2,095,169	2,241,487	2,340,794	
Miami-Dade	2,600,263	2,769,725	2,921,389	3,066,750	
Monroe	84,100	85,800	87,200	88,600	
Hendry	1,279	1,279	1,279	1,279	
Total LEC Planning Area	**6,042,487**	**6,501,608**	**6,930,681**	**7,301,611**	
Current Projections					
Palm Beach	1,320,134	1,401,987	1,483,994	1,565,996	1,648,000
Broward	1,748,066	1,809,306	1,870,551	1,931,789	1,993,030
Miami-Dade	2,496,435	2,610,526	2,724,617	2,838,710	2,952,800
Monroe	73,090	72,143	71,195	70,248	69,300
Hendry	1,279	1,320	1,360	1,401	1,441
Total LEC Planning Area	**5,639,004**	**5,895,282**	**6,151,717**	**6,408,144**	**6,664,571**

The LEC Planning Area's population is expected to increase by 18 percent from 2010 to 2030 with Palm Beach and Miami-Dade counties attracting the greatest number of new residents. Monroe County is expected to experience a small reduction in permanent residents over the next 20 years. When aggregated, the total population is projected to increase by 1,025,567 people. This is a slower rate of growth than projected previously in the 2005–2006 LEC Plan Update, which was a 31 percent growth rate or an estimated increase of 1,745,488 people.

This trend is consistent with the University of Florida's Bureau of Economic and Business Research (BEBR) medium range 20-year projections completed over each of the last six years (**Figure 2**). Changes in population projections, in combination with reduced per capita water use, has resulted in progressively declining PWS demand projections over the last three plans (**Figure 3**).

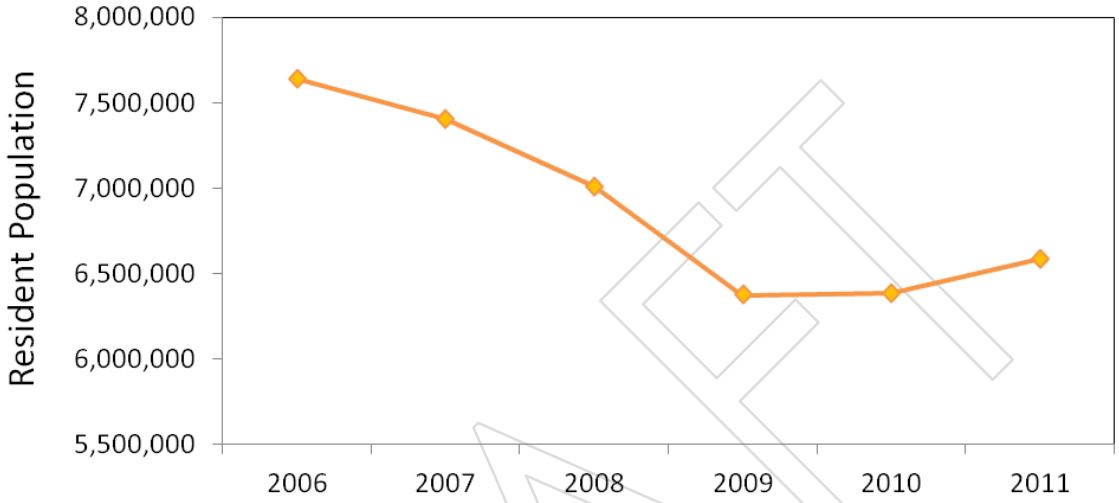

Figure 2. BEBR 20-year population projections over the last six years for the LEC Planning Area.

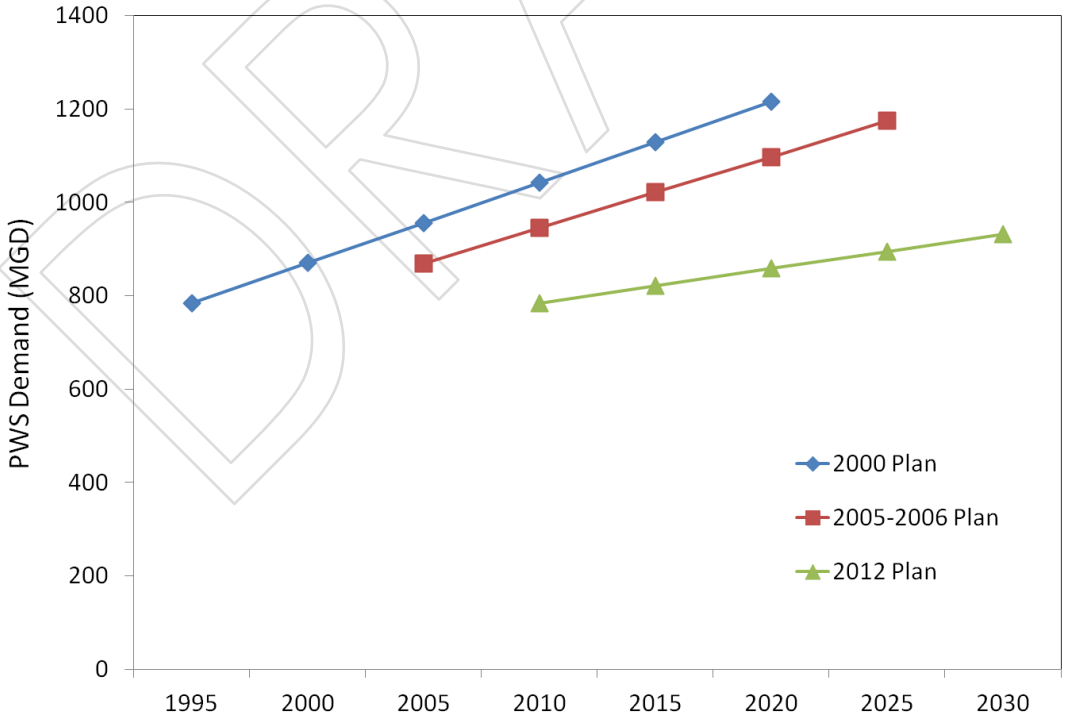

Figure 3. PWS demand projections in 2000 LEC Plan, and the 2005–2006 and current plan update.

PROJECTED DEMAND BY WATER USE CATEGORY

This section reviews the gross, or raw, water demand of all of the six water use categories described above. Water demand is described using two methods, gross and net. Gross water demand, commonly termed raw water demand, is the amount of water withdrawn from the source to meet a water user or customer needs. Gross demand accounts for water lost during conveyance and transmission, and treatment and inherit conveyance system inefficiencies. Gross demand is the volume of water allocated in a Consumptive Use Permit (CUP) and subsequently withdrawn from the source. Net demand is the volume of water that satisfies an end user, customer, or crop need. By definition, gross demand is greater than net demand, as most uses lose water through the treatment or transport of the water, or system inefficiencies. A detailed description of both gross and finished demands, are provided in **Appendix A**.

In 2010, daily gross water demand for an average year for all categories in the LEC Planning Area totaled 1,670.8 MGD. By 2030, the projected average annual gross water demand is estimated to total 1,941.5 MGD, an increase of 16 percent (**Figure 4** and **Table 2**).

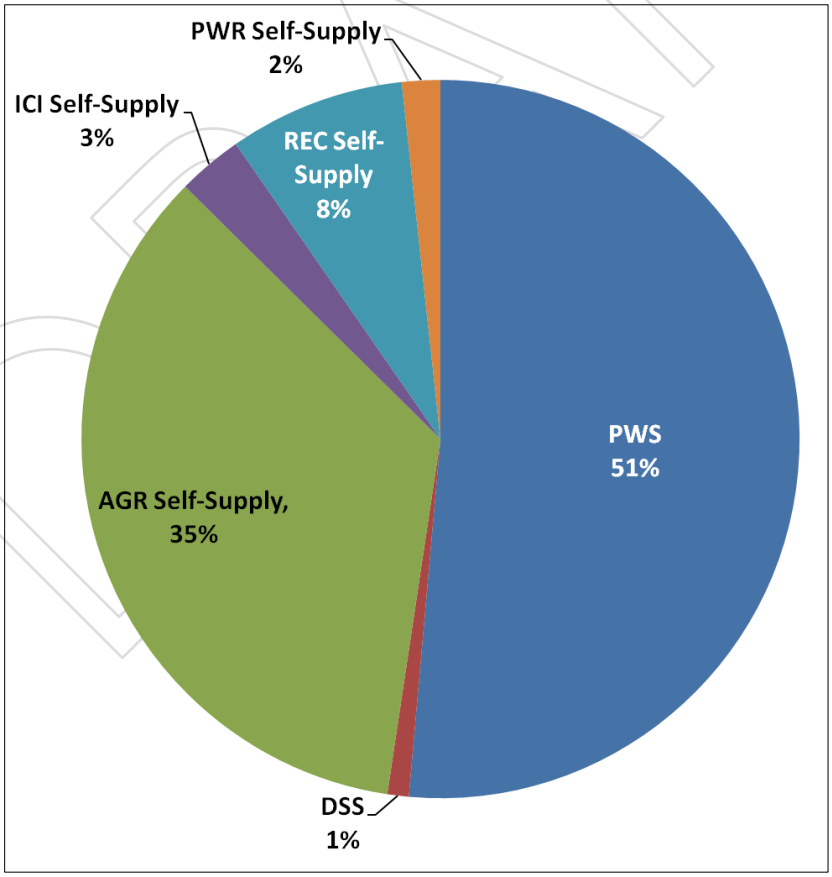

Figure 4. Percentage of projected demand of each water use category in 2030.

Table 2. Estimated gross (raw) water demand for an average rainfall year by water use category for 2010 and 2030.

	Public Water Supply	Domestic Self-Supply	Agricultural Self-Supply	Industrial/ Commercial/ Institutional Self-Supply	Recreational/ Landscape Self-Supply	Power Generation Self-Supply	Total
Estimated 2010 MGD	845.3	16.6	604.0	44.3	148.9	11.7	1,670.8
Projected 2030 MGD	1005.9	18.5	674.4	56.6	152.8	33.3	1,941.5
Percent Change	19%	11%	12%	28%	3%	185%	16%
Percent of Projected 2030 Total	51%	1%	35%	3%	8%	2%	100%

Public Water Supply and Domestic Self-Supply

PWS is the water supplied by water treatment facilities for potable use (drinking quality) to users such as homes, offices, retail facilities, schools, and institutions. Utilities with projected average withdrawals of 0.1 MGD or greater through 2030 comprise the PWS category. Water used by households or facilities served by small utilities (less than 0.1 MGD) or private wells are categorized as DSS.

Development of the water demand projections for the LEC Planning Area was a multi-step process. The process began with development of maps showing the geographic areas currently served by each utility (PWS service areas). The 2010 United States Census data for population estimates for each county (U.S. Census Bureau 2010) was then used to spatially distribute populations for the 2010 PWS utility estimates and projections by overlaying census blocks on PWS service areas.

The 2010 population estimates for each PWS utility are projected at the medium BEBR county growth rate to provide a preliminary estimate for each of the 2030 service area populations (BEBR 2011). It is important to note that the BEBR projections use permanent resident populations and do not include seasonal residents, tourists, and migrant workers. The 2030 service area populations are adjusted if the areas served by PWS are expected to change in the next 20 years. DSS population estimates for 2010 and 2030 are also calculated for each county. They represent the difference between the total county population and the PWS utility service area populations. A linear population growth rate is used to distribute the projected population changes from 2010 to 2030 in five-year intervals for each utility service area and DSS population.

The 2010 population and finished water use data, as reported to the FDEP, were then used to calculate the finished water per capita use per day. This finished water PCUR was then applied to the 2030 population to project future demand for each utility service area.

PCURs, the total water use divided by the permanent resident population, reflect all usage because these rates are based on finished water produced by each utility, including the water used by permanent and seasonal residents, as well as tourists and migrant workers. This approach produces higher PCURs for utilities with large seasonal populations than other approaches that include a factor for seasonal residents. The initial draft of the projected demand for most utility service areas assumed a constant PCUR based on 2010 for the 20-year planning horizon.

Water conservation measures were not factored into the demand projections used in this chapter. Rather, water conservation is considered a water source option (**Chapter 4**). Some utilities are implementing significant conservation projects and planned savings is included as a project to meet their future needs and is shown on their utility summary profile (**Chapter 6**).

The draft PWS service area maps, system descriptions, population, 2010 finished water produced, and projections for the PWS and DSS categories within the LEC Planning Area were provided to each utility and local government planning department. In several cases, the utilities were able to provide input on their respective maps and geographic information system (GIS) coverages, system operational data, demands, and projections that resulted in adjustments to the estimated demand. Many of these data exchanges took place during follow-up meetings, telephone conferences, and email correspondences. Revisions resulting from this coordination comprise the final projections published in this update. DSS projections are based on a countywide average PCUR from the utilities and population census estimates for areas not served by public utilities.

During the next 20 years, the LEC Planning Area population is projected to increase from an estimated 5,639,004 in 2010 to 6,664,571 by 2030 (**Table 3**). PWS gross demand increases through the 2030 projection horizon are due to this anticipated population increase (**Table** 4). However, since completion of the 2005–2006 LEC Plan Update, less water was used in general due to implementation of rules restricting lawn irrigation, water shortage restrictions, and a decline in economic activity. These changes have all suppressed PCUR to varying degrees over the past five years. It is uncertain if the newly learned behaviors or water use ethics that reduced water demand at the tap or effects of the economic downturn are permanent or temporary. The economy is currently in a relatively weak phase of expansion compared to past cycles. DSS demand growth rate is decreasing, as most new potable water demand will be served by PWS systems.

By 2030, these two water use categories are expected to account for 52 percent of the LEC Planning Area's total gross water demand, with PWS representing 51 percent of the LEC Planning Area's total demand by 2030. PWS is projected to remain the LEC Planning Area's single largest use category.

Table 3. Permanent resident population projections in the LEC Planning Area for 2010 and 2030.

County	2010 Estimated Population			2030 Projected Population		
	Total[a]	PWS	DSS	Total[b]	PWS	DSS
Palm Beach	1,320,134	1,251,542	68,592	1,648,000	1,576,268	71,732
Broward	1,748,066	1,740,468	7,598	1,993,030	1,984,701	8,329
Miami-Dade	2,496,435	2,472,741	23,694	2,952,800	2,924,775	28,025
Monroe[c]	73,090	73,090	0	69,300	69,300	0
Hendry[c]	1,279	0	1,279	1,441	0	1,441
LEC Planning Area Total	**5,639,004**	**5,537,841**	**101,163**	**6,664,571**	**6,555,044**	**109,527**

a. Source: BEBR 2011

b. Sources: U.S. Census Bureau 2010 and BEBR 2011

c. Portion of county within the LEC Planning Area

Table 4. Gross water demand in the LEC Planning Area for 2010–2030.

Lower East Coast Finished Water Demand Summary (in MGD)					
Net Water Demand	**2010**	**2015**	**2020**	**2025**	**2030**
Public Water Supply	845.3	885.4	925.6	964.8	1,005.9
Domestic Self-Supply	16.6	17.1	17.5	18.0	18.5
LEC Planning Area Total	**861.9**	**902.5**	**943.1**	**982.8**	**1,024.4**

Agricultural Self-Supply

Agriculture in the LEC Planning Area holds a unique place of importance to the region, the state of Florida, and the United States economy. The LEC Planning Area hosts the region collectively known as the "Winter Bread Basket" and "Salad Bowl" to the nation. In addition, the region's nursery and ornamental industry is the largest in the state and second largest in the United States (DCFB 2012). AGR Self-Supply in the LEC Planning Area includes water used for commercial crop irrigation, livestock watering, and aquaculture. Agricultural acreage and associated water demand are challenging to project because of the various market forces, land use patterns and growth, water management projects, environmental restoration activities, macroeconomic forces, weather, and disease issues that can impact the distribution, acreage, and production/yield over a 20-year planning horizon. To estimate future gross water demand, a range was applied. For conservative water planning purposes, the high range projection was used in this plan.

Based on structural adjustments occurring in the housing market, and a slow pace of economic recovery, the agricultural projections reflect a modest increase in acreage requiring irrigation by 2030. The projections basically assume retention of existing acres with some slight declines in select regions attributable to the persistence of the weak economy. These declines are offset by other areas within the LEC Planning Area where acres under irrigation are expected to increase by 2030.

Acreage projections are calibrated to the data and methods contained in the land use projection analysis completed by the SFWMD to support this update. Agricultural acreage estimates from the United States Department of Agriculture (USDA) and the SFWMD Water Use Regulatory Database also informed and revealed key patterns and confirmed or revised

previous analyses where warranted. Agricultural industry experts also provided review and input on the agricultural acreage estimates, which were considered in the overall analysis.

Projections of acreage by crop type are shown for each county in **Appendix A**. The projection methods used are also discussed in **Appendix A**. Because of the uncertainty associated with the recovery of citrus production, a low and high projection was prepared for this crop. By 2030, the projected high scenario acreage is expected to be 34,705 acres. In the low scenario, citrus acreage continues to decline and, in 2030, accounts for only 12,930 acres. The recovery function and growth trajectories incorporated research from a special symposium on the future of citrus.

Total irrigated agricultural acreage in the LEC Planning Area is expected to increase from 543,684 acres in 2010 to 605,577 acres by 2030. The high range projection assumes that citrus acreage will recover between 2015 and 2020. By 2030, citrus acreage is expected to increase but will still be below 2010 levels. Sugarcane and field crop acres are expected to increase over the planning horizon, while vegetables are expected to retain their existing footprint. Sod and greenhouse/nursery acreage are expected to follow a "U" shaped pattern of economic recovery and will not expand until there is stronger demand associated with residential and urban development. With economic growth persisting at historically low levels, the recovery in sod and greenhouse/nursery is expected to resume between 2015 and 2020.

Projected total agricultural acreage and water use is expected to rise slightly in the LEC Planning Area between 2010 and 2030. Little change in agricultural acreage and water use is expected in Palm Beach, Broward, and Miami-Dade counties. The only area where water use is expected to increase is in Hendry County. Supplemental irrigation in Hendry County's portion of the EAA is expected to increase significantly due to an expansion of acres under cultivation.

Agricultural water demand reflects projected irrigated acreage, crop and soil types, growing seasons, and irrigation system types and strategies. AGR Self-Supply demand calculations for this update were made using the Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) Model. The model calculates water demand for average rainfall and 1-in-10 year drought conditions using 30 years of daily rainfall and evaporation records (Smajstrla 1990).

Gross irrigation requirements are the amount of water that must be withdrawn from the source in order to be delivered to the plant root zone and includes the effect of losses due to inefficiencies in water application. The volumes provided account for soil type and irrigation system efficiency. Net demand reflects an estimate of the amount of water farmers need to place into the root zones of crops to sustain yields. **Appendix A** presents both net and gross irrigation demands by crop type under average rainfall year and 1-in-10 year drought conditions through the 2030 planning horizon.

Estimated agricultural irrigated acreages and gross demand for an average year by crop type for 2010 and 2030 are presented in **Table 5**. In terms of gross demand, water use is expected to increase from 604.0 in 2010 to 674.4 MGD by 2030. Current agricultural water

use accounts for 36 percent of the region's total gross demand. By 2030, the LEC Planning Area's total gross AGR demand is projected to increase by 12 percent compared to the 2010 level of 604.0 MGD.

Table 5. Estimated irrigated acreages and gross demand for an average water year by crop type for 2010 and 2030

Crop Category	2010 Acres	2010 Demand (MGD)	2030 Acres	2030 Demand (MGD)
Citrus	31,628	47.5	34,705	45.1
Field crops – sugarcane	384,100	368.8	435,000	423.0
Field crops – other	15,079	28.2	19,309	36.5
Vegetables, melons, and berries	82,530	98.5	81,918	99.7
Sod	7,775	12.6	10,781	17.1
Greenhouse/nursery	14,270	38.4	15,670	43.1
Other fruits and nuts	8,302	10.0	8,194	9.9
LEC Planning Area Total	**543,684**	**604.0**	**605,577**	**674.4**

Note: Perceived discrepancies in totals between this chapter and **Appendix A** are due to rounding.

Industrial/Commercial/Institutional Self-Supply

The water demand projections for the ICI Self-Supply sector are expected to rise to 56.6 MGD by 2030 from 44.3 MGD in 2010. These projections are slightly lower than the 2025 61.3 MGD projected in the 2005–2006 LEC Plan Update and reflect the different economic environment and sustainable resource use applications. In the LEC Planning Area, a large component of the water use projections for ICI Self-Supply assume that growth in self-supply for this region is proportional to the underlying economic activity that generates water demand in the area. This assumption was developed based on observed historic correlations with industrial output and water inputs in key sectors.

The ICI Self-Supply use category comprises large facilities for production processing, with the largest uses consisting of mining (i.e., aggregates industry) and food processing (dominated by the sugar industry). Because of the importance of these large users, the projection methodology was based on isolating and assessing the relationship between water consumption and expected future growth for these sectors (see **Appendix A**).

The projections also reflect trends in process efficiencies (less water input demanded per unit of output) over the past ten years observed in large ICI Self-Supply users. ICI Self-Supply projections assume demand for average rainfall and 1-in-10 year drought conditions are the same, and that withdrawal demand is equal to user demand so that no distinction is made between net (finished) and gross (raw) water amounts. It should be noted, with some use types within the ICI Self-Supply group, a large share of water demand is quickly returned to the system for reuse/recycling purposes (i.e., rock washing in the aggregates industry).

Many other ICI Self-Supply facilities receive their water from PWS and their needs are included in PWS use. Time series data of pumpage reports obtained from the SFWMD Water

Use Regulatory Database were used to evaluate and calculate ICI Self-Supply water use demand in addition to other data described in **Appendix A**.

Recreational/Landscape Self-Supply

Gross demand for REC Self-Supply is projected to increase by 3 percent from the estimated 148.9 MGD in 2010 to 152.8 MGD in 2030 (**Table 2**). REC demand supplied by PWS utilities is included in the PWS net demand. REC Self-Supply water use projections include landscape and golf course irrigation demand, as well as water needs for parks, communities, and homeowner associations with large common areas and consolidated irrigation systems; and areas with large green spaces such as ball fields, stadiums, and cemeteries.

Estimated landscape and golf course acreage were projected separately. Projected golf course acreage was based on the total number of golf course acres identified through golf course inventories and by reference to the SFWMD water use permits registered in the SFWMD Water Use Regulatory Database. Time series trends of irrigated golf course acreage within the LEC Planning Area by county were reviewed from 1985 through the present and were compared to development history, depicted by a time series of annual new privately owned residential building permits within each LEC Planning Area county. Given the recession and housing crisis, followed by a weak economic recovery that has been restrained by a structurally troubled and weak housing market, the demand for new golf courses, and existing course expansion has been and will remain stagnant. In light of the slowdown in community development that could sustain new courses (or course expansions), and the pace of economic recovery over the near to medium term of the 20-year planning horizon, the golf course acreage projection is based on a U-shaped economic recovery pattern that anticipates continued weakness (or lack of development) and is not capable of supporting new or expanded golf patronage. In 2010, total irrigated golf course acreage in the LEC Planning Area was estimated to be 25,253 acres . Approximately 30 percent of this total acreage was irrigated in part using reclaimed water (pers. comm. Richard Nevulis, Reuse Specialist, SFWMD).

Historic patterns of growth in acreage for nongolf course landscaping and recreational water use were also evaluated since the 2005–2006 LEC Plan Update. Between 2006 and 2011, these intervening years witnessed a rapid community development expansion that increased the landscape acreage requiring irrigation. This trend was visible in homeowners' association permit applications to irrigate common areas supporting developments rising considerably since the last plan update. The last ten years also witnessed a development phase characterized by unprecedented urban development, with community expansion moving westward in the LEC Planning Area prior to the housing price bubble bursting in 2007. With the housing correction and bubble burst, the projections assume some marginal declines in the landscape irrigated acreage category followed by a slight recovery to a plateau over the remainder of the planning horizon.

The estimated 2010 acreage and projected gross demand were calculated using the 2010 estimated acreage and the 2030 projected acreage and the AFSIRS. The AFSIRS calculates the net irrigation requirements of a crop type given and its irrigation system. Details

regarding the future acreage projections for permitted landscape irrigation for each county are contained within **Appendix A**.

Power Generation Self-Supply

The need for additional power supplies is expected to grow as the population in the LEC Planning Area and other portions of south Florida grow. The PWR Self-Supply water demand projections were developed with input from Florida Power & Light (FPL), and consider expected load growth and power pool grid contributions within the LEC Planning Area. FPL utilizes an assessment method incorporating environmental, economical, and technical feasibility when selecting power generation and cooling technologies most appropriate for site-specific conditions, including water supply and wastewater disposal. Different technologies may require and utilize traditional and alternative water supply sources.

Currently, three power generation plants in the LEC Planning Area are permitted to withdraw fresh or brackish water: the FPL West County Energy Center, which is currently the largest combined-cycle plant in the country, located in northwestern Palm Beach County; the FPL Turkey Point Plant located near Florida City in Miami-Dade County; and the Homestead Municipal Power Plant in Miami-Dade County. The FPL West County Plant has utilized reclaimed water from Palm Beach County since 2010 and is no longer making withdrawals from surface and brackish water sources. Water from the closed cycle recirculation canal system and brackish Floridan aquifer water are being used by the FPL Turkey Point Plant. The Homestead Municipal Power Plant withdraws water from the Biscayne aquifer. Potential new power generation and the proposed Turkey Points Units 6 and 7 expansions are expected to be added to FPL's south Florida grid system within the next 20 years. Its planned source of cooling water is reclaimed water provided by the Miami-Dade Water and Sewer Department. PWR Self-Supply demand is projected to increase from 11.7 MGD in 2010 to 33.3 MGD by 2030 (**Table 2**). These projections represent the water needed to support all power generating capacity increases in the LEC Planning Area.

The projections do not include the Lake Worth Power Plant or some FPL facilities. The Lake Worth Power Plant uses fresh water from the City of Lake Worth Utilities, but this water demand is accounted for under PWS. FPL has power generation plants in the LEC Planning Area that use seawater (Cutler, Riviera Beach, Lauderdale, and Port Everglades). The use of seawater does not require a CUP, and therefore, is not addressed in this update. FPL has demolished the 1960s era Riviera plant and will replace it with a new, state-of-the-art high efficiency facility. The new plant will begin serving customers in 2014 when it returns to service as a "next generation clean energy center." The Riviera plant will continue to use water from the Intracoastal Waterway for once-through cooling purposes. FPL has submitted an application with plans to modernize the existing Port Everglades Plant, which will then become the Port Everglades Energy Center, in the future. The plant may continue to use water from the Intracoastal Waterway for once-through cooling purposes or switch to reclaimed water.

The projections also reflect process efficiencies associated with natural gas combined cycle generation units. These projections are based on current usage and are assumed to remain the same between average and 1-in-10 year drought conditions demands. Because no distinction is needed between net (finished) and gross (raw) water in this use category, withdrawal demand is considered the same as user demand. In the 2005–2006 LEC Plan Update, the estimated thermoelectric self-supply freshwater demand for 2005 was only 4.5 MGD, but was expected to grow to 102.9 MGD by 2025 to support proposed new power generating facilities. However, FPL's continued use of seawater, the modernization of plants, and use of reclaimed water when available has contributed to the decrease in SFWMD permitted water demand for PWR Self-Supply.

DEMAND PROJECTIONS IN PERSPECTIVE

The demand projections presented in this update are based on the best information available. However, these projections reflect trends, circumstances, and industry intentions that change over time. For example, this update expects slower population growth than was anticipated in the 2005–2006 LEC Plan Update. The timing and strength of economic recovery will play a role in future land use patterns and the relative water demand uses across sectors. During past economic recoveries, housing has led the expansion by stimulating demand. In contrast, under the current expansion, a moderate economic growth trajectory is deferred until much later in the planning horizon. This expectation is based on housing conditions that have restrained development and urban growth. Industries important to the LEC Planning Area, such as construction and the supporting materials industries, have been sidelined. With housing and construction remaining depressed, other sectors such as tourism and agriculture become relatively more important in lifting the economy closer to its long-term trend growth potential. **Table 6** shows the 2025 gross demand projected in the 2005–2006 LEC Plan Update compared to the 2030 demand projected in this plan update. The tables contrast the different planning environments (and expectations for future growth) existing at the time of the projections and plan development.

Table 6. Gross demand projected in the 2005–2006 LEC Plan Update versus this plan update.

Water Use Category	Projected 2025 Demand from 2005–2006 Plan Update (MGD)	Projected 2030 Demand from this plan update (MGD)
Public Water Supply	1,286.5	1,005.9
Domestic Self-Supply	48.9	18.5
Agricultural Self-Supply	689.1	674.4
Industrial/Commercial/Institutional Self-Supply	61.3	56.6
Recreation/Landscape Self-Supply	84.8	152.8
Power Generation Self-Supply	102.6	33.3
LEC Planning Area Gross Demand Total	**2,273.2**	**1,941.5**

The LEC Planning Area's projected population growth of about 1,025,567 residents for the 20-year planning horizon from 2010 to 2030 is 719,921 fewer residents than the growth projection of 1,745,488 residents from 2005 to 2025 in the 2005–2006 LEC Plan Update.

With urbanization pressure diminished, the projections assume an opportunity for agricultural land use retention and expansion over the 20-year planning horizon. The agricultural projections are uncertain for a number of reasons including industry-specific factors such as weather and disease that may continue to affect agricultural production within the LEC Planning Area. However, following conservative water supply planning principles, the projections use a high growth scenario based on a future recovery of citrus acreage. In addition, agriculture is highly dependent on global market conditions and, as the economy eventually recovers at a faster rate further out in the planning horizon, pressure from urban development and competition for land to support ecosystem restoration projects is likely.

REC Self-Supply gross demand is expected to increase by 3.9 MGD in the course of the 2010–2030 planning horizon. The majority of future landscaped areas will be associated with the continued support and maintenance of residential developments (constructed under the past housing boom) and corresponding irrigation needs will also be met using reclaimed water.

For the PWR Self-Supply use category, future load growth requiring capacity expansions of the FPL plants will increase the demand for cooling process water to more than 33.3 MGD by 2030, which gives a total still lower than the 2005–2006 LEC Plan Update estimate for 2025 of 102.6 MGD. FPL's use of seawater, modernization of plants, and the use of reclaimed water when available has contributed to the decrease in projected water demand for this use.

In summary, both the population growth driving the LEC Planning Area's urban needs and retention or expansion within the agricultural industry will be the major forces behind the growth in water demand reflected in this update. Most of the population growth is expected to take place in Palm Beach and Miami-Dade counties, which will mask the small decline expected in Monroe County's population.

Analyses, strategies, options, and development projects to meet these water demand estimates and projections are described in following chapters. For the 20-year planning horizon in this update, PWS demand is to be met by existing water sources and the proposed water supply development projects identified in **Chapter 6**.

REFERENCES

DCFB. 2012. *Agriculture: The Lifeblood of South Dade*. Dade County Farm Bureau, http://www.dade-agriculture.org/.

BEBR. 2011. Projections of Florida Population by County, 2010 – 2040. Bureau of Economic and Business Research, University of Florida, *Florida Population Studies* Volume 44, Bulletin 159. (Authors: S.K. Smith and S. Rayer)

SFWMD. 2006. *2005–2006 Lower East Coast Water Supply Plan Update*. South Florida Water Management District, West Palm Beach, FL.

Smajstrla, A.G. 1990. *Technical Manual, Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) Model, Version 5.5*. Prepared by Agricultural Engineering Department, University of Florida, Gainesville, FL, for the St. Johns River Water Management District, Palatka, FL. Special Publication SJ2008-SP17.

U.S. Census Bureau. 2010. *2010 Census*. United States Census Bureau, United States Department of Commerce, Economics and Statistics Administration, Washington, DC. Available online at http://2010.census.gov/2010census/