

Water & Sewer

Assessment Area

The quality of drinking water in Miami-Dade County meets or exceeds all federal and state drinking water standards. Miami-Dade's per-capita use in calendar year 2009 was 139.6 gallons of water a day, down from 158 gallons four years prior. The per capita use is calculated by dividing the total water produced at the plants (finished water) by the population served. In 2009, the County produced an average of 312.5 million gallons per day (MGD) and served a population of more than 2.2 million customers. The water supply comes from the Biscayne aquifer, the County's primary drinking water source. The Miami-Dade Water and Sewer Department (WASD) is the main public water supplier in Miami-Dade County. In addition to WASD, there are four municipalities in Miami-Dade, which are permitted to withdraw water for public water supply. All water supply sources in the County are managed and regulated by the South Florida Water Management District (SFWMD) through Water Use Permits (WUPs). The WUP provides Miami-Dade County with a framework for providing future generations with adequate supplies of drinking water.

Water availability and sewer capacity for most of Miami-Dade is provided by the Miami-Dade Water and Sewer Department (WASD) through three regional water treatment plants (WTPs), five smaller WTPs and three regional wastewater treatment plants (WWTPs). The principal responsibilities of WASD are water transmission, treatment, and distribution; and wastewater collection, treatment, reuse and disposal. WASD is one of the largest public utilities in the United States, and currently serves about 418,000 retail water customers and 336,000 retail wastewater customers. In addition, wholesale water service is provided to 13 of Miami-Dade County's 35 municipalities; wholesale sewer service is provided to 12 municipalities in the County.

The Biscayne aquifer, the main source of water supplies in Miami-Dade County has been designated as a sole source aquifer by the US Environmental Protection Agency. Because this water supply is located just a few feet below the surface, Miami-Dade County is diligent in the protection and conservation of this most important resource. Developing efficient practices and using water wisely is paramount to lessening the impact of future water shortages and protecting water quality. In addition to efficient water use, Miami-Dade County is ensuring the sustainability of the Biscayne aquifer and making certain that Miami-Dade County has sufficient water to meet future demand by developing Alternative Water Supplies (AWS). AWS projects will ensure that the Biscayne aquifer is sustainable even with future population growth. By improving water use efficiency, Miami-Dade County can meet future water demands without causing harm to our water resources and surrounding natural systems.

With the 2006 adoption of the Miami-Dade Water Use Efficiency Plan by the Miami-Dade County Board of County Commissioners, Miami-Dade County began educating residents on how to use water more efficiently to preserve these natural resources for future generations while reducing future water and wastewater infrastructure costs. The plan summarizes expected water savings from the implementation of a set of water use efficiency best management practices (BMPs) over a period of 20 years, which began in 2007 and extends through 2026.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- Providing adequate water supply while protecting the water resources through compliance with all current and future regulations.
- Meeting future energy demands required to meet water and wastewater production projected by 2030 which is estimated to be three times that used to meet current demands.
- Promoting the designation of quantifiable water use efficiency as an alternative water supply (AWS) source instead of only pursuing major capital investments.
- Reducing the amount of water loss through leaks.
- Developing a funding strategy to address pipe replacement due to age and identification of areas where growth requires expansion, including an adequate water rate structure.
- Addressing state ocean outfall legislation, including the elimination of outfalls and implementing the 60 percent wastewater reuse requirements.
- Identifying and tracking the consumption rates of various sectors of water users in the absence of a comprehensive reporting system.
- Funding strategy to address needed upgrades of meters and submeters to adequately manage electricity use at the plants

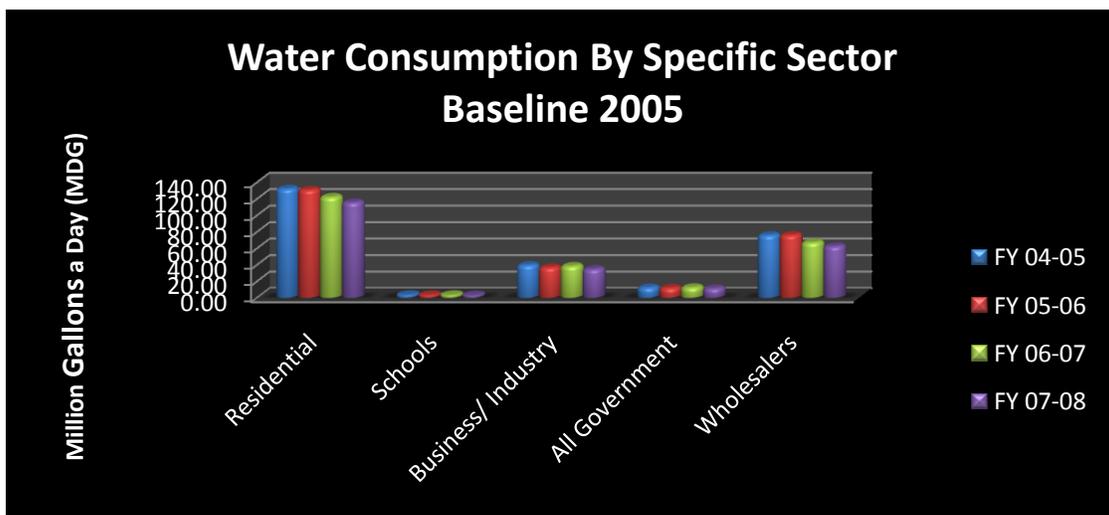
ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

A series of indicators is presented below to provide an understanding of water consumption and future projected demands on a per capita basis as well as by sectors within the community. Also included are indicators on water losses in the system and results of water conservation efforts.

Water consumption by all sectors is represented in Figure 1 in millions of gallons per day (MGD). Using the baseline consumption for Calendar Year 2005, the same users were tracked through 2008 to assess water use reduction patterns. The consumption reduction trend is a representation of the overall effectiveness of the County's conservation efforts.

Figure 1

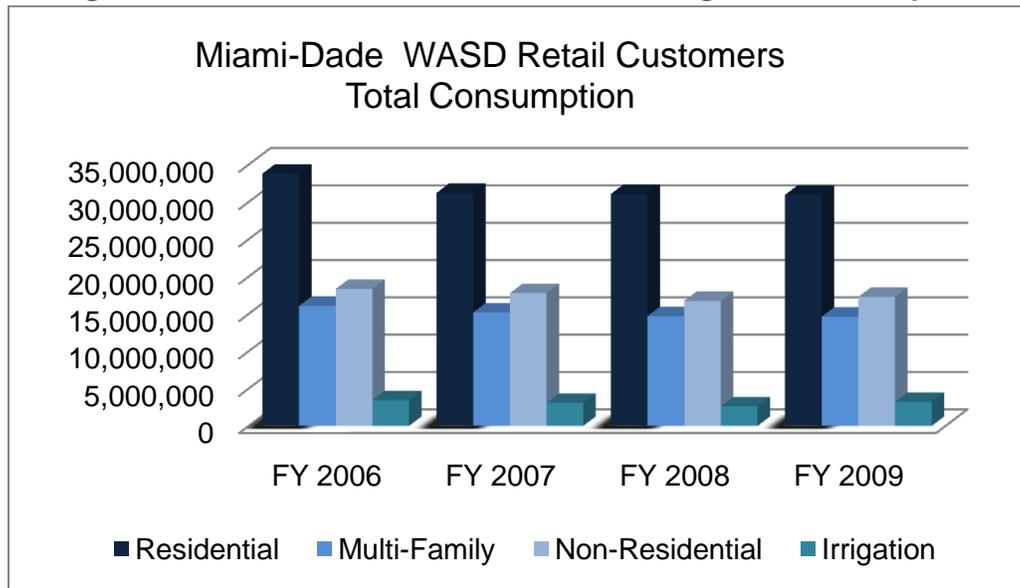


Data for Figure 1

| | FY 04-05 | FY 05-06 | FY 06-07 | FY 07-08 |
|--------------------|----------|----------|----------|----------|
| Residential | 132.13 | 130.84 | 122.23 | 115.60 |
| Schools | 3.71 | 3.48 | 3.62 | 3.13 |
| Business/ Industry | 39.56 | 36.73 | 38.40 | 34.77 |
| All Government | 12 | 12 | 13 | 11 |
| Wholesalers | 76 | 76 | 67 | 62 |

The graph below, Figure 2, summarizes the annual consumption of residents, multi-family residences, non-residential customers, and water used for irrigation, which only includes the demand from those customers that have a separate irrigation meter. Most customers have only one meter, which accounts for all their uses. In addition, a large number of irrigation is done through the use of private wells. The South Florida Water Management District estimates that almost half of the total amount of water consumed by the residential sector is used outside the home for irrigation to maintain landscapes.

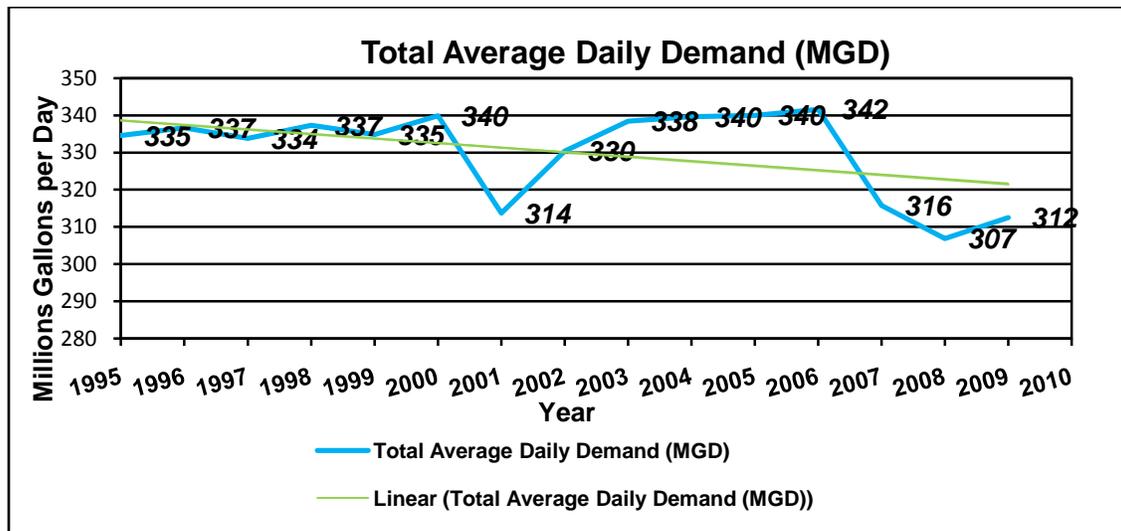
Figure 2: Residential, Non-Residential, and Irrigation Consumption



Per-Capita Daily Demand

Consumption of water in Miami-Dade was 181 gallons per capita per day (gpcd) in 1994, similar to most counties within the SFWMD's jurisdiction. Consumption has steadily fallen since 1994 exhibiting dramatic decreases during the 2001 and 2007 droughts as a result of mandatory water restrictions. Per capita consumption is expected to continue to fall, from the current level of 139.6 gpcd, with the implementation of the revised Building Code water efficiency and sustainable design standards for new construction.

Figure 3

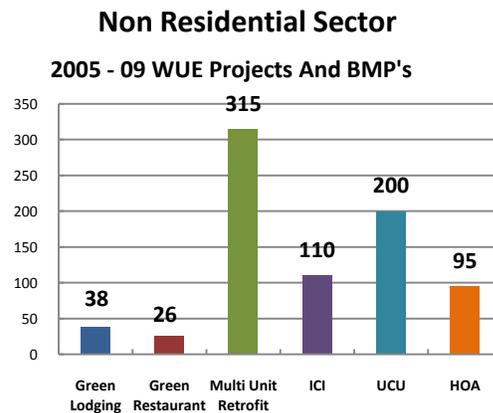
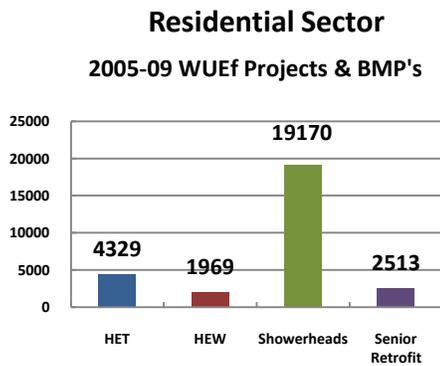


The Water Use Efficiency (WUE) Plan is a requirement of the 20-Year Water Use Permit (WUP) issued by the SFWMD to Miami-Dade County, in November 2007. The WUE Plan was developed for the area served by WASD, as well as the thirteen (13) municipalities that receive wholesale water from WASD. The Plan summarizes expected water savings from the implementation of a set of water use efficiency best management practices (BMPs) over a period of 20 years, which began in 2007 and extends through 2026.

Water Savings from Implementation of Water-Use Efficiency Programs

WASD has expended considerable effort over the years implementing numerous water conservation measures and best management practices (BMP). The total water savings target of 19.6 MGD through 2026 has been consistently exceeded to-date. In 2009, the actual water demand was about 34 MGD lower than what had been projected in the WUP. This demand reduction is the result of a very successful WUE Program, mandatory restrictions in place since March 2007, slight decrease in population growth, and economic conditions. The charts below, Figures 4 and 5, show the savings directly attributed to the implemented best management practices and measures which include extensive public education campaigns, water irrigation restrictions and a number of projects and incentives such as:

- High Efficiency Toilets (HET) Rebate Program \$100 rebate
- High Efficiency Showerhead (1.5 gpm) Rebate Program- \$10 rebate
- Seniors HET Retrofit – free toilet replacement for Seniors that qualify for Senior Homestead exemption
- High-Efficiency Washer Rebate Program
- Green Lodging Hotel and Restaurant Project (evaluation/free water efficiency items)

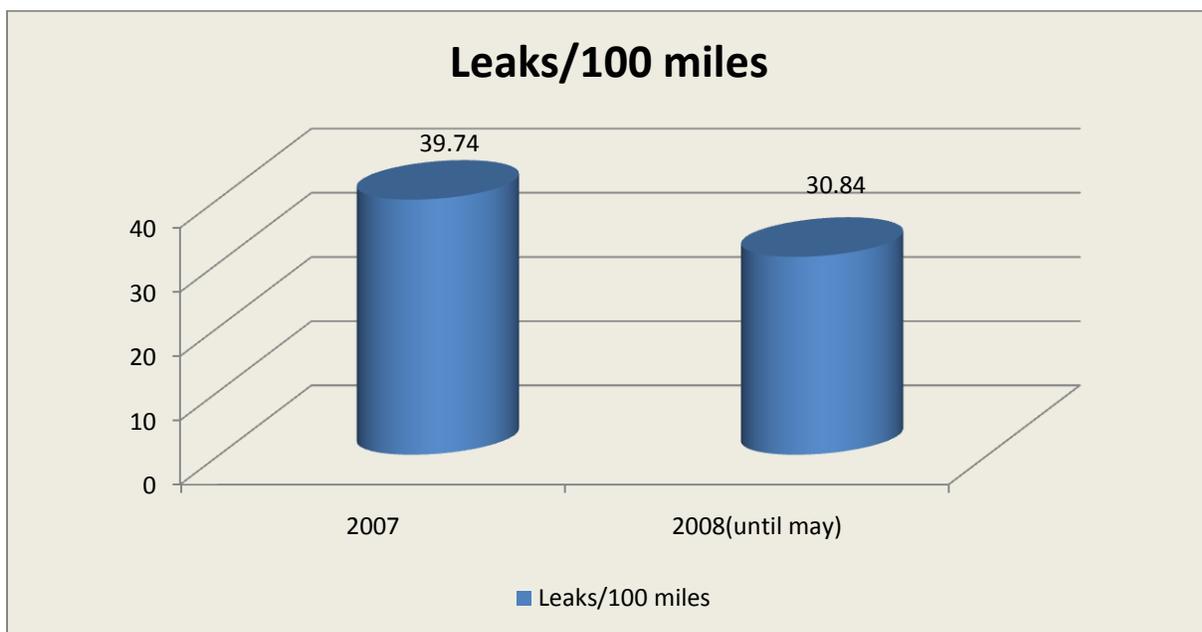


Key
 HET – High Efficiency Toilets
 HEW – High Efficiency Washers
 ICI- Industrial-Commercial-Institutional
 UCU- Urban Conservation Unit
 HOA - landscape irrigation evaluations (soil moisture sensors)

Non-Revenue Water Loss

Non-Revenue Water Loss is an indicator of the difference between the water produced by the water treatment plants and water sold. WASD is implementing a Non-Revenue Water Loss Reduction Plan (NRWLR), which is a requirement of the WUP. The NRWLR Plan includes a proposed target for acceptable losses and specific actions that will be taken to achieve the goal. A Plan, to achieve the goal, including specific milestone dates extending through 2026, has been developed.

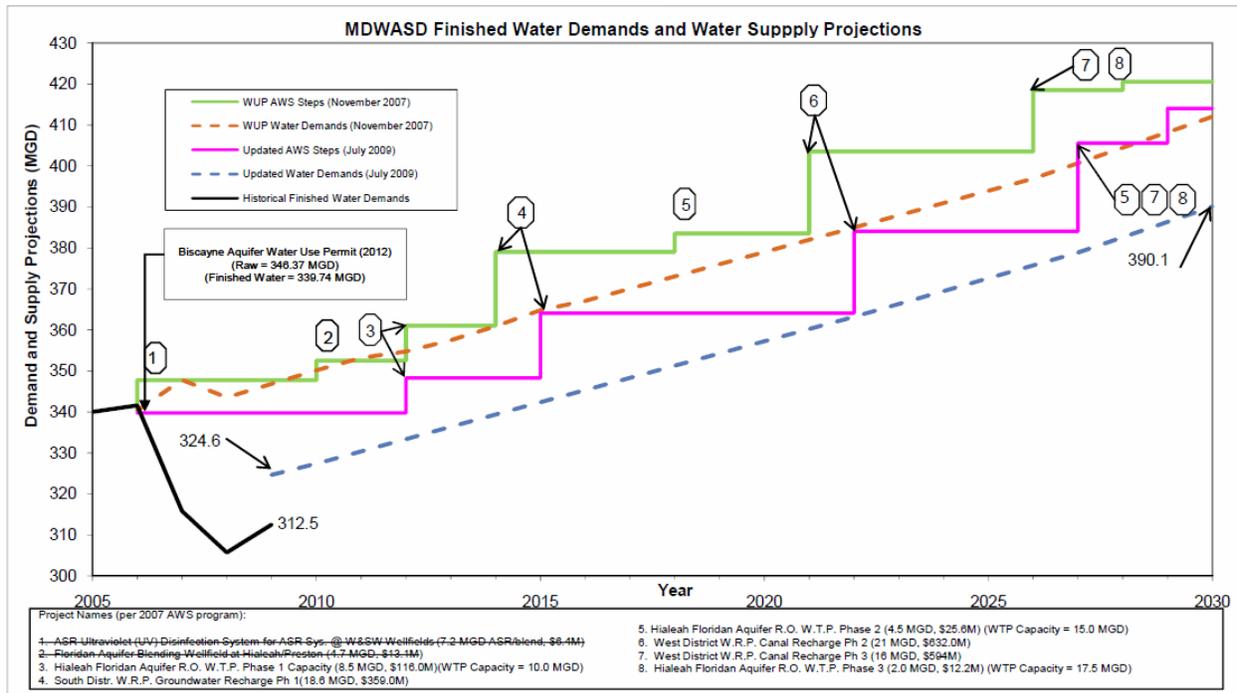
Figure 6



Water Saved

WASD compares the actual water demands (black solid line) with the allocation allowed by the WUP (green solid line). The dashed lines, in Figure 7, represent the projections as they were in the permit (light gray) and the revised projections (blue lines):

Figure 7



10/23/10
Comparison of WUP Projections and updated Per Capita Projections 01/21/10, as Revised (Step Chart 111209)

Water and Wastewater Treatment Plant Capacities

In Miami-Dade County Water Treatment Plant capacity is rated by both the Florida Department of Health and the Miami-Dade County Department of Environmental Resources Management (DERM), in terms of the capacity to treat maximum day flows. The wastewater treatment plant capacity is rated by the Florida Department of Environmental Protection and DERM, in terms of annual average daily flow (AADF). The actual flow treated by the plants is compared to the rated capacity.

The High Level Disinfection (HLD) plant at the South District Wastewater Treatment Plant (SDWWTP) which is currently under construction and expected to be completed by 2014, will serve to expand the SDWWTP's maximum (peak) treatment capacity by 60 MGD, to 285 MGD, from the current 225 MGD. The HLD is a precursor to the water reclamation plant that is currently being designed. HLD addressed regulatory requirements but at the same time represent a challenge due to the high level of energy required for its operations. An additional HLD plant is in the planning stages for the Central District Wastewater Treatment Plant.

Sanitary Sewer Capacity Allocation

A sewer capacity certification letter issued by DERM is required prior to the approval of any building permit. The sanitary sewer allocation process ensures that development does not exceed the capacity of WASD's sanitary sewer system and the certification letter specifically identifies the allocation issued to the permit applicant. Any construction or change of use that

will cause an increase in wastewater discharge to a sanitary sewer also requires a certification letter.

Water Allocation

A water allocation certification letter issued by WASD will be required prior to the issuance of any building permit. The water allocation process ensures that development does not exceed the available water supply approved in Miami-Dade County's WUP and the certification letter specifically identifies the allocation issued to the permit applicant. Any construction or change of use that will cause an increase in water usage will require a certification letter.

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Comprehensive Development Master Plan

The County's Comprehensive Development Master Plan (CDMP) has a water and sewer element which include various indicators of sustainability and concurrency. Some of those indicators are:

- Water Capacity - treatment plant capacity for the system (water and sewer). (WS-2, CDMP).
- Water Capacity - Reserve capacity of raw and treated water (water). (WS-2, CDMP).
- Water Capacity & Watershed Health - Reserve capacity of raw water and capacity of the aquifer storage and recovery system. (WS-6, CDMP).
- Water Conservation Results - Average water use per capita (WS-5, CDMP).
- Water Conservation Results - Amount of water or wastewater that is reused or reclaimed within Miami-Dade County on an annual basis (WS-5, CDMP).

Water Supply Facilities Work Plan

Population changes directly impact water usage and in turn affect infrastructure and capacity. For that reason, WASD develops and maintains a Water Supply Facilities Work Plan. Consistency is maintained between the water supply projects identified in the Water Supply Facilities Work Plan and those listed in Miami-Dade County's WUP, the SFWMD's Lower East Coast Regional Water Supply Plan, and the Capital Improvements Element of the Miami-Dade County CDMP. Comparison of the projected 20-year water demands with the projected water supply projects is identified in the Work Plan. The Work Plan water demand projections are consistent with the 20-Year water use permit. WASD is in the process of revising the projections as a result of the successful water use efficiency plan.

Water and Sewer Facilities Master Plan

WASD updates its water and sewer master plans approximately every five years, for a planning horizon of 20 years. The Water Facilities Master Plan Update is to be completed in February 2010. The Wastewater Facilities Master Plan was completed in 2007. An Integrated Water, Wastewater and Reclaimed Water Master Plan is currently underway.

Existing Legislation

Legislative initiatives at the federal, state, and local level have changed the way water and sewer providers plan and manage public water and wastewater systems. Federal legislation requires a series of water quality regulations be implemented and permits acquired. At the state level, the Regional Water Availability Rule has provided strict limitations on water withdrawals, and the Ocean Outfall Legislation requires that Miami-Dade County's two outfalls that are being

used for treated wastewater disposal, be eliminated as a primary means of domestic wastewater discharge by 2025 and that 60% of the flows be reused. . Additionally, local ordinances adopted by the Board have enhanced indoor and outdoor water use efficiency.

Federal - Water Quality Requirements

- The Clean Water (CWA) Act, enacted in 1972, provided the statutory basis for the National Pollutant Discharge Elimination System (NPDES) permit program and the basic structure for regulating the discharge of pollutants from point sources, such as the County's ocean outfalls, to waters of the United States. Section 402 of the CWA specifically required the Environmental Protection Agency (EPA) to develop and implement the NPDES program. The CWA gives EPA the authority to set effluent limits on an industry-wide (technology-based) basis and on a water-quality basis for the protection receiving waters. The CWA requires anyone who wants to discharge pollutants to first obtain an NPDES permit, or else that discharge will be considered illegal. In Florida, the NPDES program has been delegated to the Florida Department of Environmental Protection, which issues permits to the County.
- The Safe Drinking Water Act (SDWA) was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells. SDWA authorizes the EPA to set national health-based standards for drinking water to protect against both naturally-occurring and man-made contaminants that may be found in drinking water.

State - Water Resources

- Senate Bills 444 and 360 addressed alternative water supplies (AWS) and growth management, respectively. AWS include salt water, brackish surface and groundwater; surface water captured predominately during wet-weather flows; sources made available through the addition of new storage capacity for surface or groundwater; reclaimed water; stormwater; and any other water supply source that is designated as nontraditional.
- Senate Bill 444 provides for AWS funding to encourage the development of sources other than the Biscayne aquifer for future demand projections.
- Chapter 373, F.S., authorized the SFWMD to revise to the "Basis of Review for Water Use Permit Applications" (Chapter 40E) in 2007 to limit the use of water from the Regional System in the Lower East Coast for new and existing uses.
- Senate Bill 1302, passed in 2008, requires that the six ocean outfalls along the southeast coast of Florida, that are being used for treated wastewater disposal, be eliminated as a primary means of domestic wastewater discharge by 2025. Three of these outfalls are located in Miami-Dade. The bill requires all facilities discharging domestic wastewater through ocean outfalls to achieve, at a minimum, 60 percent reuse by December 31, 2025. This requirement results in WASD having to implement 117 MGD of reuse by 2025. The bill also requires that ocean discharges after December 31, 2018, meet the requirements of advanced wastewater treatment or equivalent. The WASD intends to meet this requirement by diverting flows from the outfalls into existing and proposed injection wells, and is required to submit a detailed plan of how to meet these requirements by July 2013.

Local - Water Use Efficiency Code & Plan

In 2006, the Board adopted Resolution R-468-06 which directed the development of a Water-Use Efficiency Plan to improve the County's water use efficiency. The plan's reduction targets were established by the SFWMD at 1.5 million MGD for a total of 19.6 MGD by 2026.

The objectives of the plan are as follow:

Objective 1 - Improve Water-Use Efficiency

- Raise public awareness of water conservation and encourage responsible public behavior by implementing a public education and information program.
- Assist wholesale customers in continuing efforts towards water use efficiency.
- Implement plumbing retrofit incentive programs and water audit projects.
- "Lead by example" by assuring efficient use of water in County facilities through water use audits, and retrofit projects and Xeriscaping.
- Continue to include public and private stakeholder groups in new program development and the implementation processes.

Objective 2 - Reduce the Loss and Waste of Water

- 2.1 Limit unaccounted-for water from the County's system to no more than 10 percent of the volume of water delivered based on a moving five-year average.
- 2.2 Maintain a program of universal metering (metering of all uses) and meter replacement and repair.
- 2.3 Maintain Infiltration and Inflow (I&I) Reduction Program.
- 2.4 Enhance tampering monitoring program to reduce unauthorized use which contributes to better water accounting.
- 2.5 Upgrade water system data analysis capabilities so that data can be more easily obtained and evaluated for water conservation purposes.

Objective 3 - Comply with Statewide Legislative Criteria and New Initiatives

- 3.1 Guide the development of legislation, policies, guidelines and standards to improve water use efficiency.
- 3.2 Identify, acknowledge and learn from past and current water use efficiency initiatives in Miami-Dade.
- 3.3 Engage community leaders, governmental agencies, water utilities and the public in addressing water supply issues through creative partnerships.

The overall goal of the plan is to prevent and reduce wasteful, uneconomical, impractical, or unreasonable use of water resources. Miami-Dade's program has exceeded the cumulative water saving of 3.53 MGD established by the WUP. In 2009, the actual water demand was about 34 MGD lower than what had been projected in the WUP. This demand reduction is the result of a very successful WUE Program, mandatory restrictions in place since March 2007, slight decrease in population growth, and economic conditions. The WUE Program savings have been accomplished through a combination of extensive public education campaigns and a number of projects and incentives such as:

- High Efficiency Toilets (HET) - \$100 rebate
- High Efficiency Showerhead (1.5 gpm) - \$10 rebate
- Seniors HET Retrofit – free toilet replacement for Seniors that qualify for Senior Homestead exemption
- High-Efficiency Showerhead Exchange
- High-Efficiency Washers (Tier 3) (suspended)
- Residential landscape irrigation evaluations (Soil Moisture Sensor)
- HOA landscape irrigation evaluations (\$2,800 rebate + sensor)
- Green Lodging Hotel and Restaurant Project (evaluation/free items)

- ICI Water use evaluations (County facilities and privately owned)
- A comprehensive public outreach campaign that targets each individual sector or the community
 - Empower the community by increasing communication and coordination with local, state, and federal entities. (NU2)
 - Promote responsible stewardship of natural resources and unique community environments. (NU3)
 - Provide timely and reliable public infrastructure services including road maintenance, storm water, solid waste and wastewater management, and a safe and clean water delivery system consistent with the Comprehensive Development Master Plan (CDMP). (NU6)
 - Ensure the timely acquisition of “best value” goods and services while maintaining integrity and inclusion. (ES3)
 - Attract, develop and retain an effective, diverse and dedicated team of employees (ES5)
 - Ensure the financial viability of the County through sound financial management practices. (ES8)
 - Deliver on promises and be accountable for performance. (ES9)

Most recently, the Board has further strengthened the Code through the following amendments:

- Chapter 32-84, establishes stricter water use efficiency standards for new residential and commercial development. Requires evaluation of AWS projects for new developments of regional impact.
- Chapter 32-8, establishes permanent two days a week irrigation restrictions and mandatory year-round landscape irrigation conservation measures.

COMMUNITY FEEDBACK

Feedback & results gathered through the planning process or surveys

2006 WASD Customer Satisfaction Survey

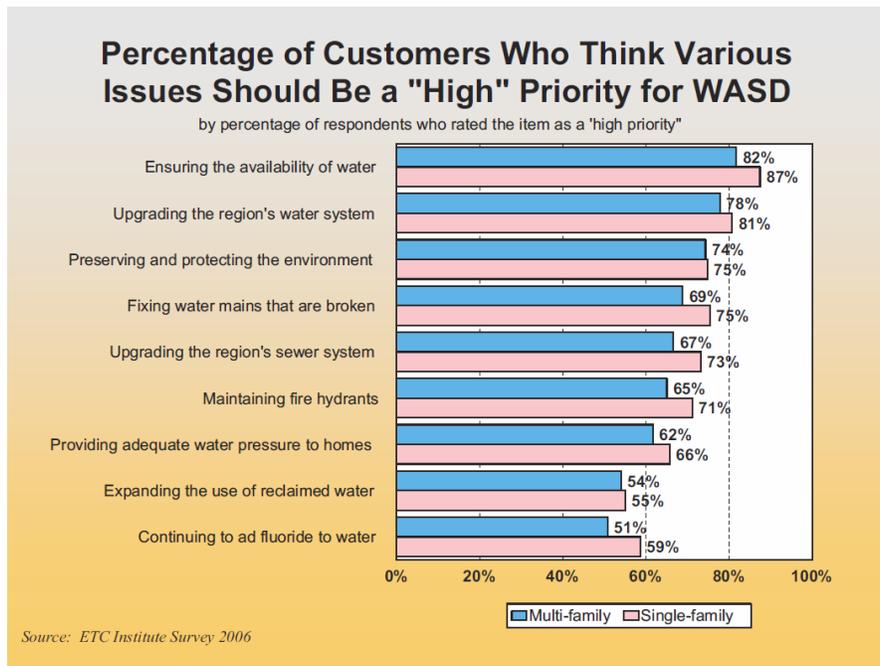
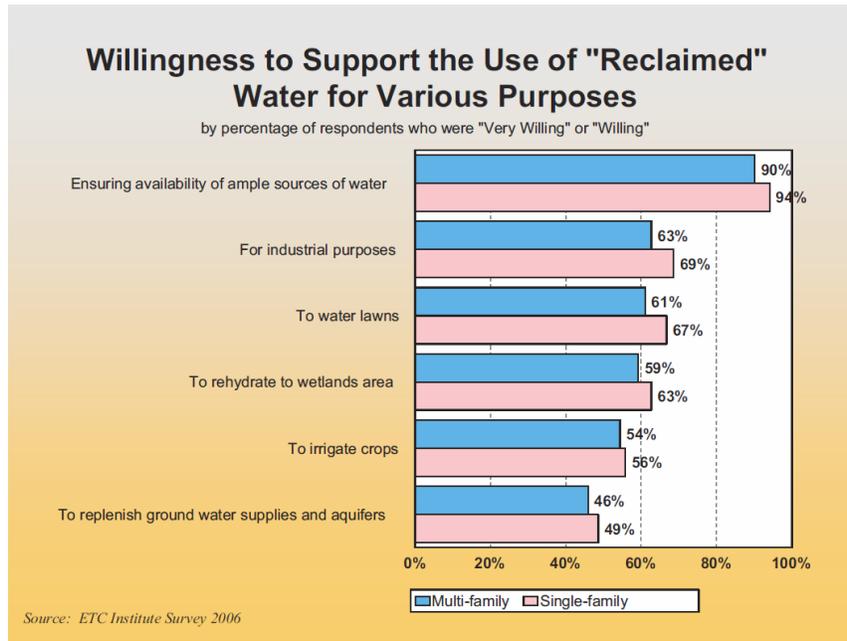
WASD conducted a Customer Satisfaction Survey of 1,207 residential customers during September and October 2006. The survey highlighted the excellent service provided by the department. The following is a summary of some of the responses:

- 92 percent of single family and 85 percent of multi-family customers are either very satisfied or satisfied with the reliability of water service.
- 87 percent of single family and 81 percent of multi-family customers are either very satisfied or satisfied with the quality of water service.
- 82 percent of single family and 69 percent of multi-family customers are either very satisfied or satisfied with the quality of wastewater service.
- 89 percent of single family and 83 percent of multi-family customers rated WASD as always or usually reliable and the most reliable utility as compared to the local phone company, natural gas, cellular phone, electric company, internet service provider or cable/satellite companies.

Of those residents who had used the various programs and services, almost all were satisfied. Some examples are:

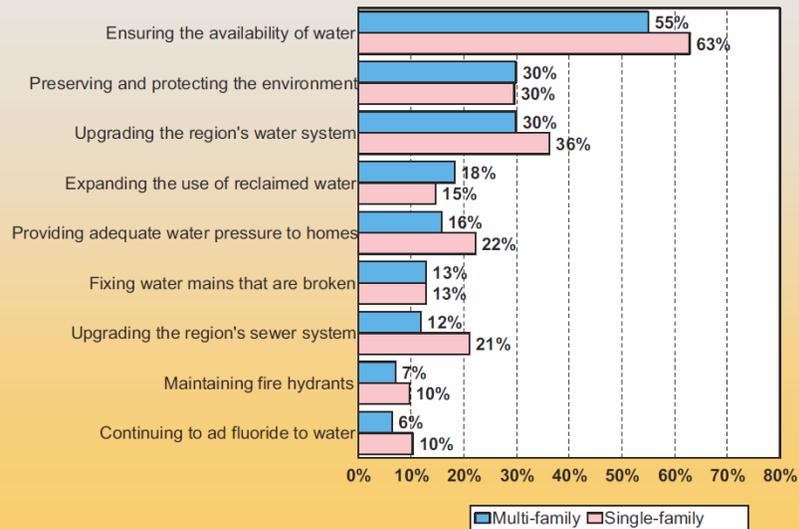
- 80 percent satisfied with WASD’s 24-hour Communications Center
- 90 percent satisfied with public education on Showerhead Exchange Program. This information correlates with the number of showerheads exchanged at events and the department’s customer service offices

The survey included some questions related to sustainability and the environment. The questions and the results are shown below:



Top Priority for WASD

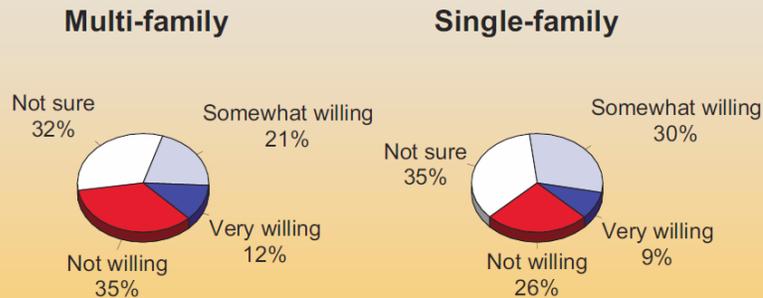
by percentage of respondents who selected the item as one of their top three choices



Source: ETC Institute Survey 2006

Willingness to Pay an Increase in Water Utility Fees to Ensure that Adequate Supplies of Drinking Water are Available to Residents of Miami-Dade County

by percentage of respondents



Source: ETC Institute Survey 2006

Water Use Efficiency Survey

The WASD's Water Use Efficiency Section conducted a residential customer survey from March 26 to May 10, 2009. A total of 801 telephone interviews were conducted, drawn from random samples of households with at least one registered voter. In a pretest wave, 501 respondents were surveyed prior to the widespread implementation of the "Use Less" water conservation campaign. In a post-test wave, respondents were surveyed from May 1 to May 10, 2009 after

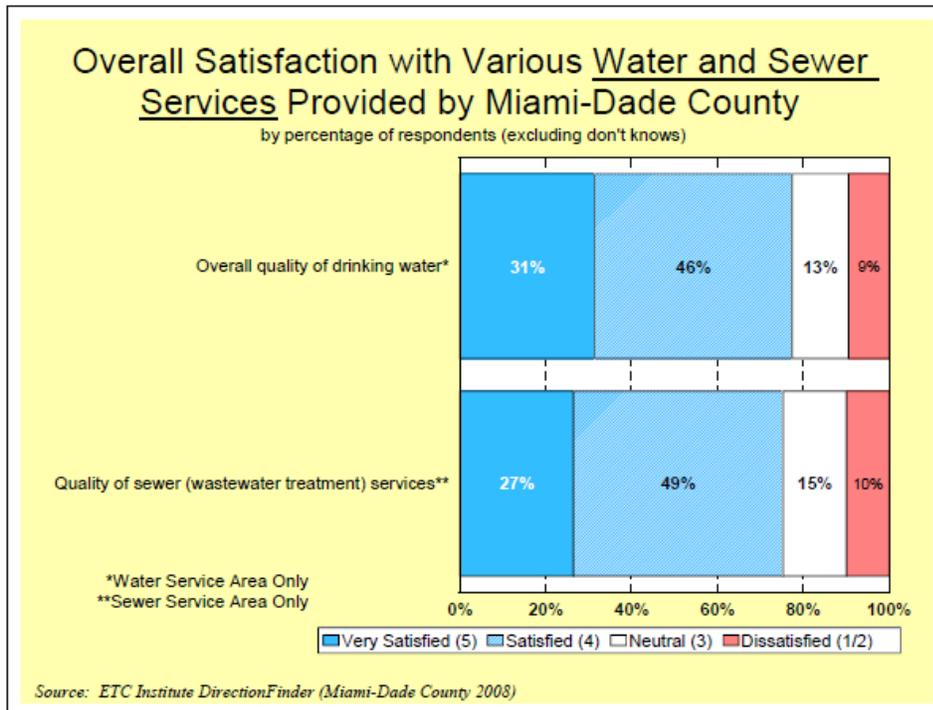
the campaign had peaked. The purpose of the research was to assess the baseline levels of awareness of the need for water conservation, to gauge the level of cooperation with restrictions on lawn and landscape watering, and to measure the impact of the “Use Less” campaign on public opinions.

The survey results clearly indicated that the “Use Less” campaign built on a solid foundation of community awareness about the need for residential water conservation. The campaign was recognized by a significant number of Miami-Dade residents. In fact, 52 percent recalled seeing some water conservation related advertisement but major pro-conservation attitudes and behaviors were already in place at the time of the campaign was launched. This was made evident by the fact that 73 percent of the respondents were aware of and expressed compliance with the two-day watering restrictions.

Miami-Dade County Resident Satisfaction Survey

During the fall of 2008, ETC Institute administered a Resident Satisfaction Survey for Miami-Dade County to assess resident satisfaction with the delivery of major county services and to help determine priorities for the community as part of the County’s ongoing planning process. Of the 20,000 households that received surveys, 5,522 were completed (a 27 percent response rate). The survey was administered in English, Spanish and Creole.

The level of satisfaction with water and sewer services was relatively high in all areas that were rated. Based upon the combined percentage of “very satisfied” and “satisfied” responses among residents *who had an opinion* 77 percent of those surveyed were satisfied with the overall quality of drinking water and 75 percent were satisfied with the quality of sewer (wastewater treatment) services.



Overall Satisfaction with Water and Sewer Services in Miami-Dade County

by percentage of respondents who were "Very Satisfied" or "Satisfied" (excluding don't knows)

