Annual Assessment of Florida's Water Resources: Supply, Demand, and Quality

2022 Edition
Volume 2

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Executive Summary

The Office of Economic and Demographic Research (EDR) has completed the sixth annual assessment of Florida's water supply, water demand, and water quality pursuant to section 403.928, Florida Statutes. The report presents topics in isolation that, at least in part, overlap. Land conservation, water supply, water quality, and water infrastructure are all interrelated, and investments in one of these areas will almost certainly benefit another.

EDR is currently modeling water supply and demand with two approaches: one based on water management district projections (the principal model used in this edition) and the other using an independent water demand forecast (EDR's pilot model). The principal model projects water demand to increase by over 15 percent between 2020 and 2040, reaching 7,407.8 millions of gallons daily by 2040.[1] EDR's pilot model suggests a lower forecast, primarily because it takes greater account of the historic pace of conservation. The two largest drivers of water demand are and will continue to be population growth and agriculture. According to the districts' regional water supply plans and water supply assessments, the water needs of the state can be met through the 2040 planning horizon through a combination of traditional and alternative water sources; however, this assumes appropriate management, continuing conservation efforts, and necessary investments are made. These investments are related to alternative water supply projects identified in regional water supply plans. Because no district can meet its future demand solely with existing source capacity, these extra efforts (and the funding for them) are critical beginning now and continuing through 2040.

Using water demand projections from the principal model shows that the total costs, excluding operations and maintenance, associated with ensuring that future water supplies are available to meet the increasing water demands are between $1.11 and $1.87 billion over the 2020 through 2040 planning horizon.[2] This is only modestly higher than the previous Edition's estimate. Using EDR's pilot model suggests that the average total cost would be slightly lower and fall within a tighter range. These estimates are based on an analysis of projects identified by water management districts through the water supply planning process and may change significantly in the future as the methodologies, both of EDR and the water management districts, are refined. The future demand not met with existing supply assumes average weather conditions and that the demand which has been met in the past will continue to be met in the future.

The cost estimates described above only capture the cost of developing alternative water supplies. In addition, the estimated cost to complete projects benefitting the natural systems must be taken into account. These are projects needed to meet the minimum flows and minimum water levels for natural systems that are currently in recovery and prevention status, as well as additional projects expected to primarily benefit the natural systems. This cost is estimated to be $842.7 million.[3]

Overall, the state's share of the expenditures necessary to ensure sufficient water is available to meet the growing water demand, as well as the needs of the natural systems, varies based on

[1] This assumes average annual rainfall and does not account for potential new water conservation activities. For more details, see Section 3.3.
[2] *See* Table 3.6.5.
[3] *See* Section 3.9, which provides an explanation of the increased cost estimate since the previous edition.

location and project type, but is expected to be about 9.3 percent. Based on the costs identified to date, this amounts to a state investment of $217.6 million by 2040; however, additional research is planned that is likely to increase this estimate.[4]

While EDR's annual assessment focuses on known water impairments and their solutions, several disasters over the past year, like the Piney Point crisis, have brought attention to the potential for future-altering events. These disasters could suddenly upend the forecast as developed in this Edition. The preliminary estimates of the expenditures necessary to simply comply with key federal and state laws and regulations governing water quality protection and restoration suggest required state expenditures of approximately $280.9 million for the development of total maximum daily loads (TMDLs)[5] and $5.5 billion for the implementation of basin management action plans (BMAPs).[6] The projected state costs for the development of TMDLs are nearly identical to the previous Edition; however, the state's projected costs for BMAPs increase by 70.7 percent in the new forecast.

Future editions will expand the water quality analysis to include expenditure forecasts for other activities required by or implemented pursuant to federal or state law, including alternative plans for impaired waters and water quality monitoring. The degree to which the assumed timeframes and cost shares underlying these expenditure forecasts are legally required is still being assessed.

In the 2020-21 fiscal year, the State of Florida expended approximately $171.2 million on water supply[7] projects and an additional $954.2 million on water quality and other water resource-related programs.[8] Given the size of this funding commitment, substantial policy questions arise. What is the total amount of state funding that should be committed to these initiatives? Should funds be dedicated to proactively mitigate known risks? One of EDR's objectives for this ongoing report is to assist policy makers in developing the answers to these questions.

Subsequent editions of this report will continue to satisfy the requirements of section 403.928, Florida Statutes, and address those subjects that require further research. First, EDR is continuing to refine its integrated water supply and demand model and preparing to submit its pilot model for publication and peer-review before full deployment. Second, EDR will work with the Department of Environmental Protection and the water management districts to incorporate additional expenditures that are necessary to comply with laws governing water quality.

[4] *See* Table 3.9.2.
[5] *See* Table 4.1.4.
[6] *See* Table 4.1.6.
[7] *See* Table 2.1.1.
[8] *See* Table 2.3.7.

2. Florida's Expenditures and Revenues Related to Water Supply and Water Quality

Florida's waters are the state's most basic and valued resource, providing an array of benefits crucial to existence, quality of life, and the economy. These benefits include water storage, flood protection, water purification, habitat for plant and animal species, recreational and educational opportunities, and scenic beauty. The management, protection, and restoration of Florida's surface water and groundwater require a coordinated effort among various state agencies, water management districts, public and private utilities, local governments, and other stakeholders.

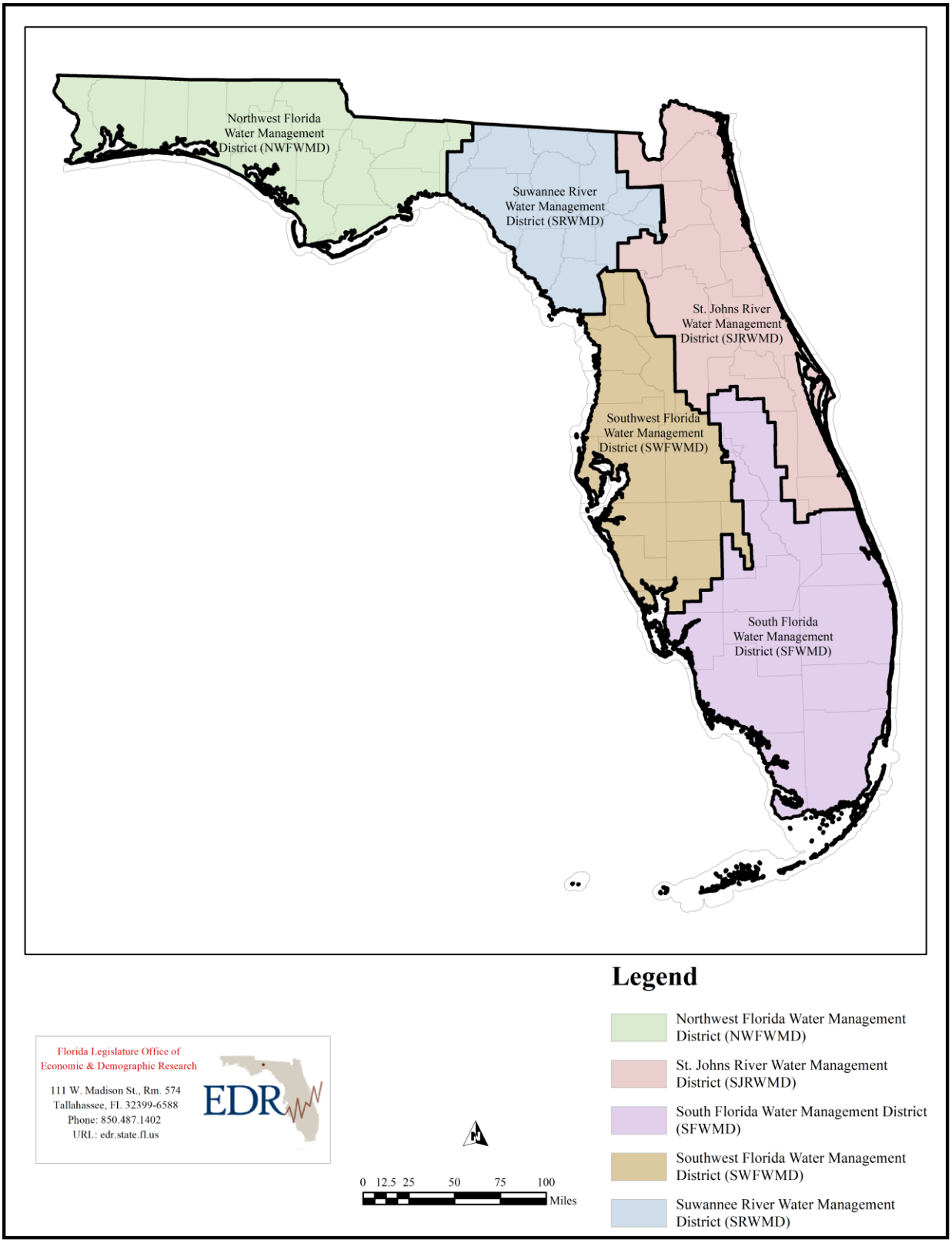
Water resource management in Florida is conducted on a state and regional level.[9] Recognizing that water resource problems vary in magnitude and complexity from region to region across the state, the Legislature vests in the Department of Environmental Protection (DEP) the power and responsibility to accomplish conservation, protection, management, and control of waters of the state, but with enough flexibility to accomplish these ends by delegating powers to the five water management districts (WMDs).[10] Chapter 373, Florida Statutes, provides the WMDs with broad authority to implement a wide range of regulatory and non-regulatory programs that address four areas of responsibility: water supply, water quality, flood protection and floodplain management, and natural systems. The five WMDs are identified in Figure 3.0.1. In addition, state agencies including the Florida Department of Agriculture and Consumer Services and the Florida Fish and Wildlife Conservation Commission implement activities that support water quality protection and restoration.

This section of the report provides an assessment of the various programs and initiatives associated with water supply and water quality. The assessment includes historic and estimated future expenditures on water programs and projects as well as forecasts of revenues used for these purposes. For an identification of gaps between projected revenues and estimated expenditures, see Chapter 8.

[See figure on following page]

[9] § 373.016(4)(a), Fla. Stat.
[10] § 373.016(5), Fla. Stat.

Figure 2.0.1 Water Management Districts



2.1 Historical and Projected Water Supply Expenditures

The Office of Economic and Demographic Research (EDR) defines water supply projects or initiatives as activities that appear to more directly promote the availability of sufficient water for all existing and future reasonable-beneficial uses and the natural systems. This would include activities associated with increasing available water supplies, drinking water infrastructure needed to convey and treat water supplies, and water supply planning activities.[11] For the most part, expenditures for water supply occur on the regional and local level with some programs and activities, such as funding assistance and statewide oversight of the water management districts (WMDs), occurring at the state level.

Expenditures of State and Federal Funds

State-appropriated funding is primarily associated with the Drinking Water State Revolving Fund (DWSRF) administered by DEP's Division of Water Restoration Assistance pursuant to section 403.8532, Florida Statutes, and the federal Safe Drinking Water Act.[12] With funding provided by federal and state sources, the DWSRF provides low interest loans that finance infrastructure improvements related to public water systems for the purpose of achieving and maintaining compliance with federal and state law.[13] In order to receive the federal capitalization grant for the state revolving fund, the state must match at least 20 percent of the total grant amount made available to the state.[14] The Fiscal Year 2021-22 appropriation for the DWSRF is $128.00 million, a drop from the previous year's $215.06 million.

In addition to the DWSRF, beginning in Fiscal Year 2017-18, the Water Storage Facility Revolving Loan program was created with an appropriation of $30.0 million.[15] The first disbursements were made in Fiscal Year 2020-21 for a total of $3.22 million. In the first half of Fiscal Year 2021-22, a further $9.5 million was disbursed. Since Fiscal Year 2011-12, the expenditures for the revolving funds have totaled approximately $837.9 million, with the majority originating from federal funding sources.

In Fiscal Year 2005-06, funding for an alternative water supply grant program was established to provide funds for the WMDs to cost share alternative water supply projects with local applicants.[16] Between Fiscal Year 2005-06 and Fiscal Year 2008-09, $227.70 million was appropriated to this program. The statutory appropriation was repealed in Fiscal Year 2008-09.[17] Of the $227.70 million appropriated, $202.49 has been expended.

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[11] Activities associated with the regulation of public water systems by DEP under the Florida Safe Drinking Water Act, part IV of chapter 403, Florida Statutes, or by the Florida Department of Health under section 381.0062, Florida Statutes, are included when identifiable within EDR's water quality and other water resource-related program component.
[12] 42 U.S.C. §300f et. seq.
[13] § 403.8532(1), Fla. Stat.
[14] 42 U.S.C. § 300j-12(e).
[15] *See* § 12, ch. 2017-10, Laws of Fla.
[16] *See* § 17, ch. 2005-291, Laws of Fla. For more information on alternative water supply projects see Chapter 4 and the project list maintained by DEP available at: https://fdep.maps.arcgis.com/sharing/rest/content/items/c0fb905537c0497a826efdd6a854d5ff/data. (Accessed November 2021.)
[17] *See* § 1, ch. 2009-68, Laws of Fla.

In Fiscal Year 2019-20, funding was established for a water supply and water resource development grant program. In the first year, $39 million was appropriated from General Revenue (GR) and $1 million from the Water Protection and Sustainability Program Trust Fund (WPSPTF). In Fiscal Year 2020-21, an additional $38.2 million was appropriated from GR and $1.8 million from WPSPTF. Of note, in Fiscal Year 2019-20, $22.48 million of the GR and $0.75 million of the WPSPTF appropriations was expended. In Fiscal Year 2020-21, $6.52 of the GR and $0.25 million of the WPSPTF appropriations was expended.

Table 2.1.1 shows the annual cash expenditures since Fiscal Year 2011-12.[18] Due to the inconsistent history of these expenditures, the forecast relies on a 3-year moving average level of expenditures. Because these funds are provided for fixed capital outlay projects, the expenditures occur over multiple fiscal years.

Table 2.1.1 Water Supply Annual Expenditures and Forecast (in $millions)

History	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21
Drinking Water Revolving Fund	$72.23	$34.75	$82.49	$52.95	$27.41	$57.49	$58.58	$138.41	$149.20	$164.39
Aid to WMDs for Alternative Water Supply	$1.63	$0.51	$0.27	$0.17	$1.65	$1.09	$3.42	$1.58	$23.63	$6.77
Total	**$73.86**	**$35.26**	**$82.77**	**$53.13**	**$29.05**	**$58.58**	**$62.00**	**$140.00**	**$172.82**	**$171.16**

Forecast	FY 21-22	FY 22-23	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31
Total	$161.33	$168.44	$166.97	$165.58	$167.00	$166.52	$166.36	$166.62	$166.50	$166.50

Regional Expenditures

Similar to the analyses for the WMDs' conservation land acquisition and management, in order to identify WMD expenditures related to water supply, EDR reviewed the WMDs' preliminary budgets and tentative budgets developed in accordance with sections 373.535 and 373.536, Florida Statutes, respectively. These budget documents include actual audited expenditures allocated to six program areas and across each of the four areas of responsibility, including water supply.[19]

Table 2.1.2 provides a forecast and details a history of expenditures that the WMDs attributed to the water supply area of responsibility. These expenditures include activities related to water supply assessments, regional water supply plans, alternative water supply, minimum flows and

[18] The personnel expenditures associated with the Drinking Water State Revolving Fund are included within the total personnel expenditures for Water Restoration Assistance, Table 2.3.3.

[19] The six program areas are: 1.0 Water Resources Planning and Monitoring; 2.0 Land Acquisition, Restoration and Public Works; 3.0 Operation and Maintenance of Works and Lands; 4.0 Regulation; 5.0 Outreach; and 6.0 District Management and Administration. The WMDs report expenditures in the four areas of responsibility at the program level only. Each program area contains multiple activities or sub-activities. The program allocation by area of responsibility are estimates since projects and initiatives may serve more than one purpose.

levels and associated recovery or prevention strategies, water conservation initiatives, water resource monitoring and data collection, land acquisition and management, and regulatory water use permitting. To avoid double counting WMD expenditures between the conservation land and water sections of this report, the total expenditures assigned to the "2.1 Land Acquisition" and "3.1 Land Management" activities have been removed[20] from the expenditures in Table 2.1.2 and the WMD water quality tables in Section 2.3. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. Forecasts rely on a three-year moving average as it best fits the nature of the data.

Table 2.1.2 Water Management District Water Supply Expenditures (in $millions)

History	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19	LFY 19-20
NWFWMD	$8.20	$7.90	$5.23	$3.90	$3.13
SJRWMD	$42.38	$42.50	$41.33	$25.78	$33.86
SFWMD	$85.53	$93.71	$92.45	$90.57	$90.57
SWFWMD	$34.06	$26.16	$33.25	$37.34	$44.51
SRWMD	$6.19	$3.93	$5.38	$5.58	$5.86
Total	$176.35	$174.20	$177.64	$163.17	$177.93
Forecast	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**	**FY 24-25**
Total	$172.60	$171.21	$172.68	$172.17	$172.02

Source: Annual Budgets of the Water Management Districts.

Table 2.1.3 provides a forecast and details a history of water supply expenditures[21] by special districts[22] that are located in multiple counties. Based on survey results, a portion of the local government expenditures identified in 537 Conservation and Resource Management and 572 Parks and Recreation may be for water supply purposes. Additionally, the Account 533 Water Utility Service Expenditures is included as a water supply expenditure of the respective government type as public utility data cannot be accurately separated from the local government data. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. Forecasts rely on a three-year moving average growth rate as it best fits the nature of the data.

[See table on following page]

[20] While the districts are not required to allocate each activity and sub-activity among the four areas of responsibility, Northwest Florida WMD approximated that 10 percent of land acquisition and management is categorized as Water Supply, and 30 percent to each of Water Quality, Flood Protection, and Natural Systems. These shares are used across all districts and years to address the removal of subcategories 2.1 Land Acquisition and 3.1 Land Management.

[21] For further details on the source and methodology of this data, *see* "Local Expenditures" in Section 1.2 of the Conservation Land Report.

[22] There exists a small number of governmental entities (*e.g.*, utility authorities) that cross counties but are technically not special districts. Their expenditures are included here.

Table 2.1.3 Water Supply Expenditures by Regional Special Districts (in $millions)

History	LFY 14-15	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19
Supply	$277.32	$281.26	$284.53	$295.20	$293.85
Forecast	**FY 19-20**	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**
Supply	$298.99	$304.28	$308.31	$313.16	$318.03

Source: Annual Financial Report data obtained from the Florida Department of Financial Services, Division of Accounting and Auditing, Bureau of Local Government. Account 533 and a portion of accounts 537 and 572 are shared out in accordance with local government survey results.

Local Expenditures

Table 2.1.4 provides a forecast and details a history of water supply expenditures by local governments. Based on survey results, a portion of the local government expenditures[23] identified in accounts 537 Conservation and Resource Management and 572 Parks and Recreation may be attributed to water supply. Additionally, the Account 533 Water Utility Service Expenditures is included as a water supply expenditure of the respective government type as public utility data cannot be accurately separated from the local government data. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. Forecasts rely on a three-year moving average growth rate as it best fits the nature of the data.

Table 2.1.4 Water Supply Expenditures by Local Governments (in $millions)

History	LFY 14-15	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19
Counties	$322.65	$315.98	$304.59	$311.87	$327.44
Municipalities	$663.20	$679.20	$729.16	$754.97	$753.04
Special Districts	$18.45	$17.71	$19.68	$19.88	$19.63
Total	$1,004.29	$1,012.90	$1,053.42	$1,086.72	$1,100.11
Forecast	**FY 19-20**	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**
Total	$1,127.06	$1,156.48	$1,183.75	$1,214.26	$1,244.80

Source: Annual Financial Report data obtained from the Florida Department of Financial Services, Division of Accounting and Auditing, Bureau of Local Government. Account 533 and a portion of accounts 537 and 572 are shared out by local government survey.

Private Utility Expenditures

Table 2.1.5 provides a forecast and details a history of water supply expenditures by private drinking water utilities. The basis for this data was provided to EDR by the Florida Public Service

[23] For further details on the source and methodology of this data, *see* "Local Expenditures" in Section 1.2 of the Conservation Land Report.

Commission (PSC) from the annual financial reports submitted by private drinking water utilities within jurisdictional counties. As of October 2021, only 38 of Florida's 67 counties had resolutions or ordinances adopted to impose PSC jurisdiction over private water and wastewater utilities.[24] Because of this, the expenditures from counties outside its jurisdiction were estimated based on per capita utility expenditures. This methodology should provide suitable estimates due to a similar mix of rural and urban counties both in and out of the PSC's jurisdiction. Note that the historic data is in calendar years. For forecasting purposes, it has been converted to state fiscal years. Population growth drives the forecast as utility expenditures are generally expected to follow population growth.

Table 2.1.5 Water Supply Expenditures by Private Drinking Water Utilities (in $millions)

History	CY 2011	CY 2012	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020
Total	$45.94	$44.78	$37.64	$38.71	$40.77	$40.65	$42.64	$41.78	$46.33	$44.83
Forecast	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**	**FY 24-25**	**FY 25-26**	**FY 26-27**	**FY 27-28**	**FY 28-29**	**FY 29-30**
Total	$46.18	$46.76	$47.37	$47.95	$48.51	$49.05	$49.59	$50.12	$50.65	$51.16

Source: A historical series was created using data provided by the Florida Public Service Commission.

2.2 Historical and Projected Revenues for Water Supply

EDR is required to forecast "federal, state, regional, and local government revenues dedicated in current law for the purposes… [of projects or initiatives associated with water supply and water quality protection and restoration] or that have been historically allocated for these purposes, as well as public and private utility revenues."[25] There are a variety of revenue sources that support water resources, including specific taxes and fees that are dedicated in law. The following discussion identifies and forecasts the relevant water supply revenues.

State-Appropriated Revenue Sources

The primary sources of state-appropriated revenue for water supply initiatives are federal grants and repayment of loans, which are deposited in the Drinking Water Revolving Loan Trust Fund.[26] The trust fund is used to provide low-interest loans for planning, engineering, design, and construction of public drinking water systems and improvements to such systems.

[24] As of the date of this report, there were 38 jurisdictional counties: Alachua, Bradford, Brevard, Broward, Charlotte, Clay, Duval, Escambia, Franklin, Gadsden, Gulf, Hardee, Highlands, Jackson, Lake, Lee, Leon, Levy, Manatee, Marion, Martin, Monroe, Nassau, Okaloosa, Okeechobee, Orange, Osceola, Palm Beach, Pasco, Pinellas, Polk, Putnam, Seminole, St. Johns, St. Lucie, Sumter, Volusia, and Washington. The non-jurisdictional counties were: Baker, Bay, Calhoun, Citrus, Collier, Columbia, DeSoto, Dixie, Flagler, Gilchrist, Glades, Hamilton, Hendry, Hernando, Hillsborough, Holmes, Indian River, Jefferson, Lafayette, Liberty, Madison, Miami-Dade, Santa Rosa, Sarasota, Suwannee, Taylor, Union, Wakulla, and Walton. For an updated list of jurisdiction counties, see http://www.psc.state.fl.us/Files/PDF/Utilities/WaterAndWastewater/wawtextchart.pdf. (Accessed January 2022.)
[25] § 403.921(1)(c), Fla. Stat.
[26] § 403.8533, Fla. Stat.

Based on a review of state accounts for the last ten fiscal years, a historical data series was constructed for the identified revenues. The Long-Term Revenue Analysis adopted by the Revenue Estimating Conference includes a forecast for federal grants, which is used as the basis for that part of the forecast through Fiscal Year 2030-31. For repayments of loans, a three-year moving average is used for the forecast. The historical series and the forecast are shown in Table 2.2.1.

Table 2.2.1 Revenues Available for Water Supply (in $millions)

History	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21
Federal Grants	$38.97	$42.40	$58.39	$21.26	$31.22	$29.69	$26.74	$31.55	$46.34	$39.69
Repayment of Loans	$34.32	$33.09	$41.30	$47.22	$44.83	$90.13	$36.37	$37.98	$43.54	$85.57
Total	**$73.29**	**$75.49**	**$99.69**	**$68.48**	**$76.05**	**$119.82**	**$63.11**	**$69.53**	**$89.88**	**$125.26**

Forecast	FY 21-22	FY 22-23	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31
Federal Grants	$24.96	$24.47	$24.75	$25.09	$25.45	$26.10	$26.56	$27.06	$27.61	$28.12
Repayment of Loans	$55.70	$61.60	$67.62	$61.64	$63.62	$64.30	$63.19	$63.70	$63.73	$63.54
Total	**$80.66**	**$86.08**	**$92.37**	**$86.74**	**$89.07**	**$90.40**	**$89.75**	**$90.76**	**$91.34**	**$91.66**

In addition to the federal grants and repayment of loans, state funds including General Revenue and Land Acquisition Trust Fund (LATF) receipts are also deposited in the Drinking Water Revolving Loan Trust Fund to provide the state match for federal grants. On average, the state matching funds were approximately $9.67 million per year during the past ten fiscal years. These dollars are included in the revenue forecast.

Regional Revenues

Revenues generated by the WMDs are identified in full in Section 2.4. While all of the WMDs' revenues may be dedicated to managing water resources, an attempt to categorize the split between water supply and water quality would be arbitrary. As a result, the revenues for water supply are blended with the revenues for water quality and other water resource-related expenditures.

Table 2.2.2 provides a forecast and details a history of water supply revenues from self-generated sources as well as federal and state sources to special districts that are located in multiple counties.[27] Similar to the expenditures, public utility revenues are contained in their respective government's revenues. Self-generated revenues include the accounts identified as 314.300 Utility Service Tax - Water, 323.300 Franchise Fee – Water, and 343.300 Charges for Services - Water Utility, as well as survey results regarding 343.700 Charges for Services – Conservation and Resource Management. The accounts identified as 334.310 State Grant – Water Supply System

[27] There exists a small number of governmental entities (*e.g.*, utility authorities) that cross counties but are technically not special districts. Their expenditures are included here.

and 335.310 State Revenue Sharing – Water Supply System are categorized as water supply revenue from the state and the account identified as 331.310 Federal Grant – Water Supply System is categorized as a water supply revenue from the federal government. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. As revenues are largely based on population, forecasts rely on population growth rates.

Table 2.2.2 Water Supply Revenues Generated by Regional Special Districts by Government Source (in $millions)

History	LFY 14-15	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19
Self	$309.29	$317.56	$324.65	$333.18	$342.47
State	$-	$0.07	$0.13	$-	$-
Federal	$1.47	$1.33	$0.07	$-	$-
Forecast	**FY 19-20**	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**
Self	$348.15	$353.63	$358.94	$364.09	$369.05
State	$-	$-	$-	$-	$-
Federal	$-	$-	$-	$-	$-

Source: Annual Financial Report data obtained from the Florida Department of Financial Services, Division of Accounting and Auditing, Bureau of Local Government. Accounts 314.300, 323.300, 343.300, and survey results are applied to 343.700 for self; 334.310 and 335.310 for State; and 331.310 for Federal.

Local Revenues

Table 2.2.3 provides a forecast and details a history of water supply revenues that are self-generated by local governments. Based on survey results, a portion of the local government account[28] identified as 343.700 Service Charge – Conservation and Resource Management is self-generated for use on water supply projects and initiatives. Further, the accounts identified as 314.300 Utility Service Tax - Water, 323.300 Franchise Fee – Water, and 343.300 Charges for Services - Water Utility are categorized as water supply self-generated revenue. In addition, local governments may have other revenue sources used to fund water supply initiatives including impact fees and special assessments. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. As revenues are largely based on population, forecasts rely on population growth rates.

[See table on following page]

[28] For further details on the source and methodology of this data, *see* "Local Expenditures" in Section 1.2 of the Conservation Land Report.

Table 2.2.3 Water Supply Revenues Generated by Local Governments (in $millions)

History	LFY 14-15	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19
Counties	$413.26	$432.58	$455.78	$465.79	$481.14
Municipalities	$1,174.09	$1,339.10	$1,440.88	$1,416.89	$1,450.55
Special Districts	$48.44	$48.76	$52.23	$58.50	$56.09
Total	$1,635.80	$1,820.44	$1,948.88	$1,941.18	$1,987.78
Forecast	**FY 19-20**	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**
Total	$2,020.74	$2,052.51	$2,083.36	$2,113.23	$2,142.02

Source: Annual Financial Report data obtained from the Florida Department of Financial Services, Division of Accounting and Auditing, Bureau of Local Government. Accounts 314.300, 323.300, 343.300 and survey results are applied to Account 343.700.

Table 2.2.4 provides a forecast and details a history of water supply revenues generated by the state and provided to local governments. The accounts identified as 334.310 State Grant – Water Supply System and 335.310 State Revenue Sharing – Water Supply System are categorized as water supply revenues from the state. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. As revenues are largely based on population, forecasts rely on population growth rates.

Table 2.2.4 Water Supply Revenues Provided to Local Governments from the State (in $millions)

History	LFY 14-15	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19
Counties	$5.92	$0.85	$2.25	$1.65	$2.07
Municipalities	$15.72	$12.02	$10.47	$8.10	$20.08
Special Districts	$0.37	$0.21	$0.06	$0.21	$0.09
Total	$22.01	$13.08	$12.78	$9.95	$22.24
Forecast	**FY 19-20**	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**
Total	$22.61	$22.97	$23.31	$23.65	$23.97

Source: Annual Financial Report data obtained from the Florida Department of Financial Services, Division of Accounting and Auditing, Bureau of Local Government, Accounts 334.310 and 335.310. Note that the 2021 Edition of this report mislabeled the years for both the LFY history and the FY forecast. The labels have been corrected in this Edition's table.

Table 2.2.5 provides a forecast and details a history of water supply revenues generated by the federal government and provided to local governments. The account identified as 331.310 Federal Grant – Water Supply System is categorized as water supply revenue from the federal government. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. As revenues are largely based on population, forecasts rely on population growth rates.

Table 2.2.5 Water Supply Revenues Provided to Local Governments from the Federal Government (in $millions)

History	LFY 14-15	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19
Counties	$4.63	$2.34	$-	$0.03	$0.61
Municipalities	$8.50	$4.44	$6.70	$5.06	$4.84
Special Districts	$0.79	$-	$-	$-	$0.06
Total	$13.93	$6.78	$6.70	$5.09	$5.51
Forecast	**FY 19-20**	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**
Total	$5.60	$5.69	$5.77	$5.86	$5.94

Source: Annual Financial Report data obtained from the Florida Department of Financial Services, Division of Accounting and Auditing, Bureau of Local Government, Accounts 331.310. Note that the 2021 Edition of this report mislabeled the years for both the LFY history and the FY forecast. The labels have been corrected in this Edition's table.

Private Utility Revenues

Table 2.2.6 provides a forecast and details a history of water supply-related revenues generated by private drinking water utilities. The basis for this data was provided to EDR by the Florida Public Service Commission (PSC) from the annual financial reports submitted by drinking water utilities within jurisdictional counties. As of October 2021, only 38 of Florida's 67 counties had resolutions or ordinances adopted to impose PSC jurisdiction over private water and wastewater utilities.[29] As a result, the remaining revenues from counties outside of its jurisdiction were estimated based on per capita utility revenues. This methodology should provide suitable estimates due to a similar mix of rural and urban counties both in and out of the PSC's jurisdiction. Note that the historic data is in calendar years. For forecasting purposes, it has been converted to state fiscal years. As revenues are largely based on population, forecasts rely on population growth rates.

Table 2.2.6 Revenues Generated by Private Drinking Water Utilities (in $millions)

History	CY 2011	CY 2012	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020
Total	$67.66	$66.17	$53.98	$54.55	$56.71	$59.98	$61.83	$59.73	$68.76	$64.29
Forecast	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**	**FY 24-25**	**FY 25-26**	**FY 26-27**	**FY 27-28**	**FY 28-29**	**FY 29-30**
Total	$67.40	$68.25	$69.14	$69.98	$70.80	$71.59	$72.38	$73.16	$73.93	$74.68

Source: A historical series was created using data provided by the Florida Public Service Commission.

[29] As of the date of this report, there were 38 jurisdictional counties: Alachua, Bradford, Brevard, Broward, Charlotte, Clay, Duval, Escambia, Franklin, Gadsden, Gulf, Hardee, Highlands, Jackson, Lake, Lee, Leon, Levy, Manatee, Marion, Martin, Monroe, Nassau, Okaloosa, Okeechobee, Orange, Osceola, Palm Beach, Pasco, Pinellas, Polk, Putnam, Seminole, St. Johns, St. Lucie, Sumter, Volusia, and Washington. The non-jurisdictional counties were: Baker, Bay, Calhoun, Citrus, Collier, Columbia, DeSoto, Dixie, Flagler, Gilchrist, Glades, Hamilton, Hendry, Hernando, Hillsborough, Holmes, Indian River, Jefferson, Lafayette, Liberty, Madison, Miami-Dade, Santa Rosa, Sarasota, Suwannee, Taylor, Union, Wakulla, and Walton. For an updated list of jurisdiction counties, see http://www.psc.state.fl.us/Files/PDF/Utilities/WaterAndWastewater/wawtextchart.pdf. (Accessed October 2021.)

2.3 Historical and Projected Water Quality and Other Water Resource-Related Expenditures

Article II, Section 7 of the Florida Constitution requires that adequate provision in law be made for the abatement of water pollution. Recognizing the importance of the state's water resources, the Florida Legislature passed the Florida Air and Water Pollution Control Act[30] in 1967 and the Florida Water Resource Act[31] in 1972. In addition, the Florida Safe Drinking Water Act[32] was passed in 1977 to ensure "safe drinking water at all times throughout the state, with due regard for economic factors and efficiency in government."[33] Further, chapter 376, Florida Statutes, addresses surface and groundwater pollution through various programs including state-funded cleanup for petroleum and dry-cleaning solvents, waste cleanup requirements for potentially responsible parties, and restoration of certain potable water systems or private wells impacted by contamination.

Expenditures of State and Federal Funds

To identify the water quality and other water resource-related program expenditures, EDR reviewed the projects and initiatives implemented by DEP and other state agencies related to the protection or restoration of water quality, as well as the activities associated with the regulation of drinking water in Florida. Potentially all existing environmental or natural resource-based programs, projects, and initiatives influence the quality of water. Therefore, EDR attempted to identify those areas that appeared to be more directly related to the protection and restoration of water quality. Future editions may include refinements to these categorizations.

For the water quality and other water resource-related program component, EDR grouped the identified programs, projects, and initiatives into four categories generally following the internal structure of DEP: Environmental Assessment and Restoration; Water Restoration Assistance; Other Programs and Initiatives; and Regulatory/Clean-up Programs.

Environmental Assessment and Restoration
DEP's Division of Environmental Assessment and Restoration (DEAR) implements critical responsibilities under state and federal law relating to protecting and restoring water quality in Florida. These responsibilities include adopting, reviewing, and revising Florida's surface water quality standards; monitoring and reporting on water quality; assessing waterbodies to identify those that are impaired; developing water quality restoration targets for the impaired waterbodies (*i.e.*, total maximum daily loads or TMDLs), developing and implementing water quality restoration plans such as basin management action plans (BMAPs), and providing laboratory services to DEP and other agencies.[34]

[30] Ch. 67-436, Laws of Fla.; § 403.011 et seq.
[31] Ch. 72-299, Laws of Fla.; Ch. 373, Fla. Stat.
[32] Ch. 77-337, Laws of Fla.; § 403.850, Fla. Stat. et seq.
[33] Ch. 77-337, § 2, Laws of Fla.; § 403.851(3), Fla. Stat.
[34] DEP, Division of Environmental Assessment and Restoration, https://floridadep.gov/dear. (Accessed November 2021.)

Expenditures related to DEAR, including personnel and operational costs, monitoring programs, laboratory services and support, and the TMDL program, are included in this category. The expenditures identified for the TMDL program are primarily related to projects and activities adopted in basin management action plans, which are developed with state, regional, and local stakeholders to achieve one or more TMDLs. The TMDL and BMAP programs are discussed in more detail in Chapter 4.

Since Fiscal Year 2011-12, expenditures for environmental assessment and restoration have totaled $309.13 million. Nearly three fourths of expenditures are from state sources with the remaining quarter coming from federal sources. Most of the federal funding is associated with the TMDL program. Table 2.3.1 shows the annual cash expenditures over the past ten years.

Table 2.3.1 DEP's Division of Environmental Assessment and Restoration Expenditures (in $millions)

	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21
Personnel	$10.67	$10.23	$11.30	$13.02	$12.81	$12.08	$12.00	$12.35	$12.50	$12.62
Operations	$2.22	$2.14	$2.56	$2.59	$2.63	$3.56	$3.25	$2.89	$2.58	$2.47
Lab Support	$0.50	$0.62	$0.62	$0.32	$0.19	$0.51	$0.44	$0.38	$0.25	$0.28
Watershed Monitoring	$1.93	$2.00	$3.59	$3.09	$2.30	$2.33	$2.62	$2.34	$2.48	$2.57
TMDL Program*	$7.08	$12.99	$12.72	$11.77	$24.32	$9.50	$9.46	$11.97	$11.65	$9.62
Other Projects	$1.88	$1.57	$1.68	$1.57	$1.75	$0.95	$0.67	$0.86	$0.39	$0.90
Total	**$24.29**	**$29.56**	**$32.46**	**$32.36**	**$43.99**	**$28.93**	**$28.44**	**$30.78**	**$29.86**	**$28.46**

* Note that this table only includes TMDL expenditures by DEAR and does not include grants awarded to eligible entities by the DEP's Division of Water Restoration Assistance for TMDL implementation. The latter is included in the Nonpoint Source Funds category of Table 2.3.3.

In addition to the expenditures for water quality initiatives associated with assessment and restoration at DEP, the Legislature also provides funding to support water-related programs administered by the Department of Agriculture and Consumer Services (DACS). Since Fiscal Year 2011-12, the expenditures for these programs have totaled $322.10 million, primarily from state sources. Table 2.3.2 shows the annual cash expenditures over the past ten years.

[See table on following page]

Table 2.3.2 DACS Water-Related Expenditures (in $millions)

	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21
Personnel	$2.26	$2.32	$2.43	$2.58	$2.77	$3.45	$3.91	$4.01	$3.94	$3.98
Operations	$0.35	$0.38	$0.39	$0.50	$0.56	$0.75	$0.53	$0.50	$0.62	$0.83
Best Management Practices	$10.74	$14.58	$14.94	$21.29	$20.24	$34.53	$33.18	$33.68	$34.94	$31.14
Hybrid Wetlands	$-	$-	$0.03	$4.61	$4.30	$11.55	$-	$-	$-	$-
Nitrate & Nitrite Research and Remediation	$0.33	$0.86	$0.64	$0.42	$0.54	$0.69	$0.60	$0.80	$0.53	$0.44
Other	$-	$-	$-	$-	$-	$-	$-	$-	$-	$-
Total	**$13.68**	**$18.15**	**$18.44**	**$29.41**	**$28.40**	**$50.96**	**$38.22**	**$38.99**	**$40.04**	**$45.80**

Much of this funding is to support projects and initiatives related to the implementation of agricultural best management practices (BMPs). In addition to cost-sharing programs that assist farmers in implementing BMPs, DACS' water-related expenditures include operation of hybrid wetland treatment technology systems and floating aquatic vegetative tilling wetland treatment facilities, as well as ongoing nitrate and nitrite research and remediation.

DACS has primary authority to develop and adopt BMP manuals, by rule, that address agricultural nonpoint sources of pollution, as well as to verify the implementation of BMPs. BMPs are designed to improve water quality while maintaining agricultural production through practices and measures that reduce the amount of fertilizers, pesticides, animal waste, and other pollutants that enter the state's waters. Typical practices include nutrient management, irrigation management, and water resource protection.[35]

Agricultural BMPs serve as the primary tool to prevent and reduce water pollution. DEP, WMDs, and DACS are required to assist agricultural entities with their implementation. To that end, DACS implements cost-share programs to provide financial assistance for BMP implementation. DACS' Office of Agricultural Water Policy reported on July 1, 2021, that 4.7 million of the state's 7.6 million agricultural acres are enrolled in BMPs (not including silviculture).[36] This represents nearly a 62% enrollment rate, which shows a six percentage-point improvement from the 2020 report.

[35] DACS, *What are Agricultural Best Management Practices?*, available at: https://www.fdacs.gov/content/download/30796/file/What-Are-FDACS-best-management-practices.pdf. (Accessed November 2021.)
[36] *See* Florida Department of Agriculture and Consumer Services, Status of Implementation of Agricultural Nonpoint Sources Best Management Practices, July 1, 2021, available at: https://www.freshfromflorida.com/Divisions-Offices/Agricultural-Water-Policy. (Accessed October 2021.)

Water Restoration Assistance

DEP's Division of Water Restoration Assistance (DWRA) is responsible for providing financial assistance in the form of low-interest loans or grants to fund water quality and water quantity projects throughout the state.[37] This includes the federal and state-funded State Revolving Fund; nonpoint source grants under both the federal Clean Water Act Section 319(h) grants and the state's State Water-quality Assistance Grants (formerly known as the TMDL Water Quality Restoration Grants); and the Deepwater Horizon program.[38] DWRA also manages legislatively appropriated water projects and springs restoration funding.[39]

Expenditures related to DEP's DWRA, including personnel and the various loan and grant programs, are included in this category. Since Fiscal Year 2011-12, the expenditures for the identified programs total more than $2.77 billion. Of the total appropriations, approximately 62 percent has been funded from federal sources and 38 percent from state sources. Most of the federal funding is associated with the State Revolving Fund, including grants for Wastewater Treatment Facilities Construction and grants for Small Community Wastewater Treatment. Table 2.3.3 shows the annual cash expenditures over the past 10 years.

[See table on following page]

[37] DEP, *Division of Water Restoration Assistance*, https://floridadep.gov/wra. (Accessed November 2021.)
[38] For the 2023 Edition and beyond, expenditures for beach management projects and non-mandatory land reclamation may be excluded as not being directly related to water quality restoration or improvement. In addition, these programs are currently being administered by DEP's Division of Water Resource Management.
[39] DEP, *Division of Water Restoration Assistance*, https://floridadep.gov/wra. (Accessed November 2021.)

Table 2.3.3 Water Restoration Assistance Expenditures (in $millions)

	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21
Personnel	$4.19	$3.84	$3.75	$3.38	$3.28	$6.58	$3.88	$4.42	$4.08	$4.29
Operations	$0.66	$0.64	$0.38	$0.48	$0.42	$0.50	$0.35	$0.38	$0.37	$0.43
Revolving Fund - Wastewater Facilities	$154.88	$101.75	$80.60	$162.99	$119.05	$161.73	$169.88	$244.56	$231.12	$158.36
Revolving Fund - Wastewater Small Community	$12.88	$22.21	$37.47	$22.03	$16.49	$7.28	$0.89	$0.90	$1.85	$14.86
Water Projects	$16.58	$16.44	$9.26	$20.07	$43.43	$49.96	$47.79	$33.28	$48.39	$31.07
Nonpoint Source Funds	$12.17	$7.68	$3.08	$2.80	$3.86	$12.72	$17.91	$10.74	$11.16	$12.56
Springs Restoration	$-	$-	$10.00	$0.06	$5.19	$9.36	$17.00	$15.47	$33.85	$46.06
Beach Projects/Restoration*	$15.97	$15.52	$15.69	$24.92	$37.42	$37.24	$38.74	$29.04	$27.02	$31.63
Non-Mandatory Land Reclamation	$4.92	$1.44	$0.86	$1.53	$2.18	$1.02	$0.17	$0.60	$1.34	$0.83
Deepwater Horizon Projects**	$1.18	$1.88	$3.29	$32.87	$12.92	$19.01	$20.00	$29.96	$17.14	$15.43
Other Projects	$0.50	$-	$0.12	$0.01	$0.16	$0.37	$1.82	$4.47	$0.50	$2.04
Total	**$223.94**	**$171.38**	**$164.50**	**$271.13**	**$244.41**	**$305.78**	**$318.45**	**$373.82**	**$376.82**	**$317.55**

***** Beach restoration and inlet management projects may not be considered traditional water quality restoration or improvement projects. However, because of the significance of funding assistance for beaches in Florida, as well as their potential value as a defense against storm surge, EDR continues to include these expenditures within this section for reference among the other water funding assistance programs. In future editions, EDR may reevaluate including these expenditures.

****** The amounts shown are those expenditures identified as being related to water resources and are not inclusive of all expenditures funded through Deepwater Horizon-related settlements.

During this time, approximately 67 percent of water restoration assistance expenditures were for water quality projects funded through the Clean Water State Revolving Fund (CWSRF),[40] Section 319 Clean Water Acts grants,[41] and the State Water-quality Assistance Grants. Eligible projects under the CWSRF include the construction or upgrade of wastewater and stormwater infrastructure. A more extensive discussion of CWSRF eligibility and federal funding allocation to states can be found in Chapter 6. Projects funded through Section 319 and TMDL grants (nonpoint source funds) are intended to reduce nonpoint source pollution and may include demonstration and evaluation of urban and agricultural best management practices, stormwater retrofits, and public education projects.[42]

[40] *See* 33 U.S.C. § 1383; § 403.1835, Fla. Stat.
[41] 33 U.S.C. § 1329(h).
[42] DEP, Nonpoint Source Funds, https://floridadep.gov/WRA/319-TMDL-Fund. (Accessed November 2021.)

A more recent funding initiative is the annual statutory distribution from the Land Acquisition Trust Fund for spring restoration, protection, and management projects. Of the funds remaining after payment of debt service for Florida Forever bonds and Everglades restoration bonds, the lesser of 7.6 percent or $50 million is to be appropriated for springs projects.[43] In the five most recent General Appropriations Acts, the Legislature appropriated funds for land acquisition to protect springs and for projects that protect water quality and water quantity that flow from springs. Through the end of Fiscal Year 2020-21, $121.74 million of the funds appropriated for springs restoration had been spent.

The final major category of funding assistance is provided through specific legislative appropriations for water projects identified each year in the General Appropriations Act. These water projects vary from year to year, although some projects have received funding in multiple years. The projects address water quality improvement (including septic-to-sewer projects), stormwater management, wastewater management, waterbody restoration, water supply,[44] flooding, and other water resource-related concerns. Expenditures on water projects have ranged from as high as $49.96 million in Fiscal Year 2016-17 to as little as $9.3 million in Fiscal Year 2013-14. In Fiscal Year 2020-21, spending on water projects was $31.07 million.

Other Programs and Initiatives

In addition to Environmental Assessment and Restoration and Water Restoration Assistance, the Legislature has funded a variety of other water quality restoration projects and initiatives over the past ten years. Since Fiscal Year 2011-12, expenditures for these programs have reached nearly $1.63 billion. More than 98 percent of expenditures were from state sources with less than two percent from federal sources. The largest initiative in this category is Everglades restoration, with total expenditures of $1.41 billion or 86 percent of the total over this time period. See Chapter 7 for a dedicated discussion of Everglades expenditures. The annual cash expenditures since Fiscal Year 2011-12 are shown in Table 2.3.4.

Table 2.3.4 Other Programs and Initiatives Expenditures (in $millions)

	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21
Everglades Restoration	$27.54	$26.60	$93.92	$54.56	$115.77	$140.37	$184.53	$276.28	$232.16	$267.88
Office of Water Policy	$-	$1.79	$2.27	$2.29	$2.36	$2.32	$2.43	$2.48	$2.40	$2.49
Other Projects	$6.91	$8.06	$7.61	$15.46	$14.88	$17.76	$19.59	$24.08	$30.51	$28.29
Red Tide Research	$0.64	$0.64	$1.28	$1.26	$0.62	$0.68	$0.43	$3.67	$7.23	$5.58
Total	**$35.09**	**$37.09**	**$105.09**	**$73.57**	**$133.63**	**$161.12**	**$206.98**	**$306.51**	**$272.31**	**$304.23**

[43] § 375.041(3)(b)2., Fla. Stat.

[44] Water supply projects such as drinking water infrastructure projects and alternative water supply projects have also received legislatively-appropriated funding under this category. Although expenditures for drinking water infrastructure projects and alternative water supply projects would relate to water supply, these expenditures are included in this category because insufficient project level data currently exists to allocate the expenditures between water supply and water quality.

Over the past ten fiscal years, the state has spent an average of $2.20 million per year for ongoing red tide research. The Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute partners with Mote Marine Laboratory to monitor the organism that causes most red tides along the southwest coast. Through this partnership, scientists conduct water sampling and monitoring and update the public on the status of red tide.[45]

Regulatory and Clean-Up Programs

EDR included DEP's regulatory section in its analysis of expenditures for water quality and other water resource-related programs because program areas within this section implement or enforce laws related to water quality, provide research that supports water-related programs, and implement programs that are associated with the assessment or remediation of surface and groundwater pollution.

Since Fiscal Year 2011-12, the State of Florida has spent approximately $2.31 billion for regulatory and clean-up programs administered by DEP. Nearly all of this funding, over 90 percent, has been funded from state sources. Most of the expenditures are associated with clean-up programs for hazardous waste sites, petroleum tanks, underground tanks, and water wells. The personnel included in this grouping are employed by DEP's district offices, water resource management, waste management, and the Florida Geological Survey. DEP's district offices are responsible for implementing programs relating to air and waste regulation, as well as water resource protection and restoration. EDR was unable to identify the personnel who exclusively work on water within the available data; therefore, all personnel costs have been included. Table 2.3.5 shows the annual cash expenditures since Fiscal Year 2011-12.

Table 2.3.5 Regulatory and Clean-up Program Expenditures (in $millions)

	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21
Personnel	$61.48	$58.87	$59.07	$58.15	$56.24	$52.74	$65.04	$66.20	$66.11	$66.23
Operations	$8.04	$6.88	$7.13	$7.65	$8.42	$8.63	$10.04	$9.56	$9.23	$8.76
Petroleum Restoration	$120.29	$132.11	$81.85	$59.73	$80.97	$119.44	$122.40	$119.08	$127.91	$120.70
Waste Clean-Up	$41.45	$36.68	$26.38	$28.68	$37.40	$36.11	$36.61	$38.06	$38.18	$39.02
Other Projects	$21.47	$16.83	$14.63	$15.02	$15.29	$16.74	$18.87	$17.31	$17.00	$16.45
Total	**$252.73**	**$251.38**	**$189.06**	**$169.24**	**$198.32**	**$233.66**	**$252.96**	**$250.20**	**$258.43**	**$251.18**

The expenditures shown for Waste Clean-Up include the activities associated with the following major types of clean-up efforts: dry-cleaning solvent contamination; hazardous waste; underground storage tanks; water wells; and contracts with local governments. In addition, the expenditures shown for Other Projects include various programs and projects including waste

[45] *See* Florida Fish and Wildlife Conservation Commission, FWC/FWRI-Mote Cooperative Red Tide Program, https://myfwc.com/research/redtide/monitoring/current/coop/. (Accessed November 2021.)

planning grants, underground storage tank compliance verification, solid waste management activities, and transfers to other agencies for specified activities (*e.g.*, to the Department of Health for Biomedical Waste Regulation).

State Aid to Water Management Districts

Each year in the state budget, the Legislature provides funding to support the WMDs. Since Fiscal Year 2011-12, direct expenditures to support the districts' water quality and other water resource-related programs have totaled $160.17 million. Most of the funding is provided through DEP; however, the expenditures related to Everglades restoration are provided through the Florida Department of Transportation. In this regard, a portion of the toll revenue deposited into the State Transportation Trust Fund from the Alligator Alley Toll Road has been provided, when available, to the South Florida Water Management District for Everglades restoration projects.[46] Table 2.3.6 shows the annual cash expenditures since Fiscal Year 2011-12.

Table 2.3.6 State Aid to Water Management Districts (in $millions)

	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21
Operations and Permitting Assistance	$0.19	$1.71	$2.26	$8.08	$7.95	$7.95	$7.95	$7.95	$7.95	$7.95
Minimum Flows and Levels	$-	$-	$-	$-	$1.50	$1.50	$3.45	$3.45	$3.45	$3.45
Wetland Protection	$0.36	$0.73	$2.44	$0.88	$1.31	$0.00	$-	$-	$-	$-
Dispersed Water Storage	$-	$-	$-	$10.00	$5.00	$5.00	$5.00	$5.00	$5.00	$5.00
Everglades Restoration	$-	$4.40	$4.40	$8.60	$7.06	$-	$8.01	$5.24	$-	$-
Total	**$0.55**	**$6.84**	**$9.10**	**$27.56**	**$22.83**	**$14.45**	**$24.41**	**$21.63**	**$16.40**	**$16.40**

Note: "$-" indicates a zero, whereas "$0.00" indicates an amount less than $5,000.

Forecast of Expenditures on Water Quality and Other Water Resource-Related Programs

Table 2.3.7 provides a forecast for total state expenditures on water quality and other water resource-related programs. The average annual growth rate of the past ten recorded fiscal years is nearly 7% which was used in the forecast.

[46] § 338.26, Fla. Stat. (Each year, tolls are generated from the use of Alligator Alley. The Department of Transportation is authorized to transfer any funds in excess of those used to conduct certain activities prescribed in paragraph (3)(a) to SFWMD for Everglades restoration.)

Table 2.3.7 History and Forecast of State Expenditures on Water Quality and Other Water Resource-Related Programs (in $millions)

History	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21
Total	$550.28	$514.39	$518.65	$603.27	$671.59	$794.91	$869.46	$1,021.94	$993.86	$954.21

Forecast	FY 21-22	FY 22-23	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31
Total	$1,062.80	$1,062.28	$1,120.83	$1,182.60	$1,247.77	$1,316.54	$1,389.09	$1,465.65	$1,546.42	$1,631.64

Regional Expenditures

Similar to the analyses for the WMDs' conservation land acquisition, land management, and water supply projects, in order to identify WMD expenditures related to water quality, EDR reviewed the WMDs' preliminary budgets and tentative budgets developed in accordance with sections 373.535 and 373.536, Florida Statutes, respectively. These budget documents include actual audited expenditures allocated to six program areas and across each of the four areas of responsibility, including water quality.[47] Note that due to the SFWMD's unique responsibilities related to Everglades restoration, a large component of its water quality expenditures is related to the implementation of the Restoration Strategies Regional Water Quality Plan, water quality features of the Comprehensive Everglades Restoration Plan (CERP), and other ecosystem restoration projects supporting water quality goals within the Everglades ecosystem.

Table 2.3.8 provides a forecast and details a history of expenditures across all program areas that the WMDs attribute to the water quality area of responsibility. These expenditures include activities related to water quality improvement and restoration, environmental monitoring and data collection, land acquisition and management, and regulatory permitting (*e.g.*, environmental resource permitting program and water well construction permitting). To avoid double counting WMD expenditures between the conservation land and water sections of this report, the total expenditures assigned to "Land Acquisition" and "Land Management" activities have been removed from the expenditures in Table 2.3.8, 2.3.9, and 2.3.10. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. Rather than using the simple three-year moving average, the forecast also takes into account the three-year moving average growth rate, averaging the two.

[See table on following page]

[47] The six program areas are: 1.0 Water Resources Planning and Monitoring; 2.0 Land Acquisition, Restoration and Public Works; 3.0 Operation and Maintenance of Works and Lands; 4.0 Regulation; 5.0 Outreach; and 6.0 District Management and Administration. The WMDs report expenditures in the four areas of responsibility at the program level only. Each program area contains multiple activities or sub-activities. The program allocation by area of responsibility are estimates since projects and initiatives may serve more than one purpose.

Table 2.3.8 Water Management District Water Quality Expenditures (in $millions)

History	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19	LFY 19-20
NWFWMD	$4.92	$5.35	$6.25	$5.83	$4.61
SJRWMD	$25.05	$27.34	$51.88	$36.99	$41.22
SFWMD	$89.18	$113.99	$121.59	$123.33	$123.33
SWFWMD	$25.12	$22.23	$23.74	$24.30	$20.74
SRWMD	$4.09	$2.29	$2.73	$3.58	$3.62
Total	$148.36	$171.21	$206.19	$194.03	$193.52
Forecast	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**	**FY 24-25**
Total	$200.46	$201.55	$203.15	$206.52	$208.62

Source: Annual Budgets of the Water Management Districts.

Table 2.3.9 provides a forecast and details a history of expenditures across all program areas that the WMDs attribute to the flood protection area of responsibility. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. Forecasts rely on a three-year moving average as it best fits the nature of the data.

Table 2.3.9 Water Management District Flood Protection Expenditures (in $millions)

History	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19	LFY 19-20
NWFWMD	$2.70	$2.36	$2.62	$2.72	$2.82
SJRWMD	$8.42	$11.47	$15.30	$18.61	$15.01
SFWMD	$90.42	$98.50	$109.50	$101.54	$101.54
SWFWMD	$17.47	$17.94	$26.12	$31.31	$34.98
SRWMD	$4.47	$2.62	$3.00	$3.83	$3.92
Total	$123.48	$132.89	$156.55	$158.01	$158.27
Forecast	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**	**FY 24-25**
Total	$155.49	$157.11	$156.94	$156.51	$156.85

Source: Annual Budgets of the Water Management Districts.

Table 2.3.10 provides a forecast and details a history of expenditures across all program areas that the WMDs attribute to the natural systems area of responsibility. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. Forecasts rely on a three-year moving average as it best fits the nature of the data.

[See table on following page]

Table 2.3.10 Water Management District Natural Systems Expenditures (in $millions)

History	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19	LFY 19-20
NWFWMD	$3.60	$4.26	$4.32	$4.39	$4.11
SJRWMD	$31.10	$34.03	$7.53	$18.36	$6.38
SFWMD	$121.42	$147.16	$136.48	$138.13	$138.13
SWFWMD	$32.77	$32.58	$25.61	$29.38	$27.33
SRWMD	$5.86	$3.55	$4.29	$5.09	$5.26
Total	$194.75	$221.57	$178.23	$195.34	$181.22
Forecast	FY 20-21	FY 21-22	FY 22-23	FY 23-24	FY 24-25
Total	$188.29	$188.04	$187.03	$187.79	$187.62

Source: Annual Budgets of the Water Management Districts.

Table 2.3.11 provides a forecast and details a history of water quality protection and restoration expenditures[48] by special districts[49] that are located in multiple counties. The expenditures in accounts 535 Sewer/Wastewater Services, 536 Water-Sewer Combination Services, and 538 Flood Control/Stormwater Management have been classified as water quality protection and restoration expenditures. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. Forecasts rely on a three-year moving average as it best fits the nature of the data.

Table 2.3.11 Water Quality Protection and Restoration Expenditures by Regional Special Districts (in $millions)

History	LFY 14-15	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19
Quality Protection & Restoration	$101.93	$105.35	$119.28	$118.55	$135.09
Forecast	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24
Quality Protection & Restoration	$121.83	$123.84	$125.54	$123.74	$124.37

Source: Annual Financial Report data obtained from the Florida Department of Financial Services, Division of Accounting and Auditing, Bureau of Local Government. Accounts 535, 536, 538, and a portion of accounts 537 and 572 are shared out in accordance with local government survey results.

Local Expenditures

Table 2.3.12 provides a forecast and details a history of water quality protection and restoration expenditures by local governments. Based on survey results, a portion of the local government expenditures in accounts 537 Conservation and Resource Management and 572 Parks and Recreation may be attributed to water quality protection and restoration. Further, expenditures in

[48] For further details on the source and methodology of this data, *see* "Local Expenditures" in Section 2.2.

[49] There exists a small number of governmental entities (*e.g.*, utility authorities) that cross counties but are technically not special districts. Their expenditures are included here.

accounts 535 Sewer/Wastewater Services, 536 Water-Sewer Combination Services, and 538 Flood Control/Stormwater Management have been classified as water quality protection and restoration expenditures. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. Forecasts rely on a three-year moving average growth rate as it best fits the nature of the data.

Table 2.3.12 Water Quality Protection & Restoration Expenditures by Local Governments (in $millions)

History	LFY 14-15	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19
Counties	$2,204.88	$2,371.30	$2,446.70	$2,522.53	$2,821.62
Municipalities	$3,263.44	$3,395.27	$3,521.30	$3,746.98	$4,091.18
Special Districts	$497.16	$535.21	$589.46	$883.27	$1,027.56
Total	$5,965.48	$6,301.77	$6,557.46	$7,152.79	$7,940.36
Forecast	**FY 19-20**	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**
Total	$8,333.39	$9,056.66	$9,867.41	$10,697.90	$11,626.74

Source: Annual Financial Report data obtained from the Florida Department of Financial Services, Division of Accounting and Auditing, Bureau of Local Government. Accounts 535, 536, 538, and a portion of 537 and 572 are shared out by local government survey.

Private Utility Expenditures

Table 2.3.13 provides a forecast and details a history of water quality expenditures by private wastewater utilities. The basis for this data was provided to EDR by the Florida Public Service Commission (PSC) from the annual financial reports submitted by wastewater utilities within jurisdictional counties. As of October 2021, only 38 of Florida's 67 counties had resolutions or ordinances adopted to impose PSC jurisdiction over private water and wastewater utilities.[50] Similar to the private drinking water utilities detailed in Section 2.1, the remaining expenditures from counties outside its jurisdiction were estimated based on per capita utility expenditures. This methodology should provide suitable estimates due to a similar mix of rural and urban counties both in and out of the PSC's jurisdiction. Note that the historic data is in calendar years. For forecasting purposes, it has been converted to state fiscal years. Population growth drives the forecast as utility expenditures are generally expected to follow population growth.

[50]As of the date of this report, there were 38 jurisdictional counties: Alachua, Bradford, Brevard, Broward, Charlotte, Clay, Duval, Escambia, Franklin, Gadsden, Gulf, Hardee, Highlands, Jackson, Lake, Lee, Leon, Levy, Manatee, Marion, Martin, Monroe, Nassau, Okaloosa, Okeechobee, Orange, Osceola, Palm Beach, Pasco, Pinellas, Polk, Putnam, Seminole, St. Johns, St. Lucie, Sumter, Volusia, and Washington. The non-jurisdictional counties were: Baker, Bay, Calhoun, Citrus, Collier, Columbia, DeSoto, Dixie, Flagler, Gilchrist, Glades, Hamilton, Hendry, Hernando, Hillsborough, Holmes, Indian River, Jefferson, Lafayette, Liberty, Madison, Miami-Dade, Santa Rosa, Sarasota, Suwannee, Taylor, Union, Wakulla, and Walton. For an updated list of jurisdiction counties, see http://www.psc.state.fl.us/Files/PDF/Utilities/WaterAndWastewater/wawtextchart.pdf. (Accessed September 2020.)

Table 2.3.13 Water Quality Expenditures by Private Wastewater Utilities (in $millions)

History	CY 2011	CY 2012	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020
Total	$38.14	$37.01	$32.99	$32.72	$33.50	$35.42	$37.08	$39.40	$38.47	$43.28
Forecast	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**	**FY 24-25**	**FY 25-26**	**FY 26-27**	**FY 27-28**	**FY 28-29**	**FY 29-30**
Total	$41.41	$41.93	$42.48	$42.99	$43.49	$43.98	$44.46	$44.94	$45.42	$45.88

Source: A historical series was created using data provided by the Florida Public Service Commission.

2.4 Historical and Projected Revenues for Water Quality and Other Water Resource-Related Programs

EDR is required to forecast "federal, state, regional, and local government revenues dedicated in current law for the purposes… [of projects or initiatives associated with water supply and water quality protection and restoration] or that have been historically allocated for these purposes, as well as public and private utility revenues." There are a variety of revenue sources that support water resources, including specific taxes and fees that are dedicated in law. The following discussion identifies and forecasts the relevant water quality and other water resource-related revenues.

State-Appropriated Revenue Sources

There are a number of state and federal revenue sources that have been used historically to support appropriations related to water quality. For this analysis, these revenues are categorized as either Documentary Stamp Tax revenue or Non-Documentary Stamp Tax revenue.

Documentary Stamp Tax Revenue

The primary source of revenue currently dedicated to land conservation and water resource-related initiatives is the Documentary Stamp Tax,[51] which is largely dependent on the health of Florida's housing market. Until recently, Florida's housing market was still recovering from the extraordinary upheaval of the housing boom and its subsequent collapse. The housing boom was underway by late Fiscal Year 2002-03 and clearly in place by Fiscal Year 2003-04, with the peak occurring during Fiscal Year 2005-06. After steadily increasing for ten years from a low point in Fiscal Year 2009-10, documentary Stamp Tax collections surged to surpass the previous Fiscal Year 2005-06 peak in Fiscal Year 2020-21, posting total collections of $4.08 billion. As explained in the previous Edition, this level of collections was not expected by the Revenue Estimating Conference to occur until Fiscal Year 2030-31. Currently, the Revenue Estimating Conference expects a short-term correction before growth resumes.

The availability of funding for water resources is closely linked to the trajectory of this revenue source. Table 2.4.1 shows the historical and forecasted total collections from the Documentary

[51] Ch. 201, Fla. Stat.

Stamp Tax, as well as the constitutionally required distribution to the Land Acquisition Trust Fund (LATF).[52] These estimates were adopted by the Revenue Estimating Conference in August 2021.

Table 2.4.1 Documentary Stamp Tax History and Forecast (in $millions)

History	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21
Doc Stamp Collections	$1,261.60	$1,643.40	$1,812.50	$2,120.80	$2,276.87	$2,417.76	$2,510.02	$2,651.07	$2,874.90	$4,082.82
Percent Change	9.09%	30.26%	10.29%	17.01%	7.36%	6.19%	3.82%	5.62%	8.44%	42.02%
Committed to Water Resources	$-	$-	$-	$-	$-	$-	$254.22	$294.77	$316.10	$319.00

Forecast	FY 21-22	FY 22-23	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31
Doc Stamp Collections	$3,817.40	$3,657.10	$3,593.60	$3,575.70	$3,611.40	$3,665.60	$3,757.20	$3,870.00	$3,986.00	$4,105.60
Percent Change	-6.50%	-4.20%	-1.74%	-0.50%	1.00%	1.50%	2.50%	3.00%	3.00%	3.00%
Total to LATF	$1,256.51	$1,203.61	$1,182.65	$1,176.75	$1,188.53	$1,206.41	$1,236.64	$1,273.87	$1,312.15	$1,351.61
Debt Service	$135.62	$125.02	$104.83	$104.83	$81.32	$60.90	$44.37	$24.82	$6.93	$6.93
Remaining for LATF	$1,120.89	$1,078.59	$1,077.82	$1,071.92	$1,107.21	$1,145.51	$1,192.27	$1,249.05	$1,305.22	$1,344.68
Committed to Water Resources	**$319.00**	**$319.00**	**$319.00**	**$319.00**	**$319.00**	**$314.00**	**$314.00**	**$314.00**	**$314.00**	**$314.00**
Lake Okeechobee Watershed Restoration	**$50.00**	**$50.00**	**$50.00**	**$50.00**	**$50.00**	**$50.00**	**$50.00**	**$50.00**	**$50.00**	**$50.00**
Uncommitted LATF Based on Statute	**$751.90**	**$709.60**	**$708.80**	**$702.90**	**$738.20**	**$781.50**	**$828.30**	**$885.10**	**$941.20**	**$980.70**

Section 201.15, Florida Statutes, directs the distribution of Documentary Stamp Tax revenues.[53] The Documentary Stamp Tax collections forecast for Fiscal Year 2021-22 is $3.8 billion, with an estimated $2.78 billion (72.84 percent) expected to be distributed to the General Revenue Fund and the LATF. The distribution to the LATF is split into two component parts (debt service and all other uses) that together reach the required 33 percent after the deduction for the Department of Revenue's administrative costs.

In Fiscal Year 2021-22, the LATF is expected to receive approximately $1.256 billion in total, including $135.62 million for debt service payments and $1.12 billion for other uses. Pursuant to the Florida Constitution, the funds in the LATF must be expended only for the following purposes:

[52] In 2014, Florida voters approved the Water and Land Conservation constitutional amendment (Amendment 1) to provide a dedicated funding source for water and land conservation and restoration. The amendment created article X, section 28 of the Florida Constitution, which requires that starting on July 1, 2015, for 20 years, 33 percent of the net revenues derived for the existing excise tax on documents must be deposited into the Land Acquisition Trust Fund.

[53] A forecast showing the distributions is available on EDR's website: http://edr.state.fl.us/content/conferences/docstamp/docstampresults.pdf.

1) As provided by law, to finance or refinance: the acquisition and improvement of land, water areas, and related property interests, including conservation easements, and resources for conservation lands including wetlands, forests, and fish and wildlife habitat; wildlife management areas; lands that protect water resources and drinking water sources, including lands protecting the water quality and quantity of rivers, lakes, streams, springsheds, and lands providing recharge for groundwater and aquifer systems; lands in the Everglades Agricultural Area and the Everglades Protection Area, as defined in Article II, Section 7(b); beaches and shores; outdoor recreation lands, including recreational trails, parks, and urban open space; rural landscapes; working farms and ranches; historic or geologic sites; together with management, restoration of natural systems, and the enhancement of public access or recreational enjoyment of conservation lands.

2) To pay the debt service on bonds issued pursuant to Article VII, Section 11(e).

Of the LATF revenues available in Fiscal Year 2021-22, approximately $319 million has been dedicated in law to the Everglades, spring restoration, and Lake Apopka projects as provided in section 375.041, Florida Statutes. During the 2021 Session, the Legislature passed Senate Bill 2516 (ch. 2021-40, Laws of Florida) to provide funding to the South Florida Water Management District for the design, engineering, and construction of the Lake Okeechobee Watershed Restoration project in accordance with s. 373.4599, F.S. The annual distribution is $50 million from the LATF, beginning in Fiscal Year 2021-22. The remaining $751.9 million is available for other qualifying purposes authorized and appropriated by the Legislature.

The outcome of pending civil litigation pertaining to specific appropriations from the LATF and the spending of appropriated money by the executive agencies may affect future editions of this report.[54] With respect to the ongoing litigation, on January 3, 2022, the second judicial court granted the State's motion for summary judgment because the contested 2015-16 appropriations had expired and no actual controversy remained. Subsequent to that ruling, the Legislative parties to the case requested the court to enter a final judgment (February 7, 2022).

Total State Revenues for Water Quality and Other Water Resource-Related Programs

In addition to the Documentary Stamp Tax discussed above, there are a variety of other revenue sources available for water quality. In order to determine the types of revenue historically allocated for water quality and other water resource-related programs, the various state and federal trust funds from which funds have been appropriated in the most recent five-year period were identified and described in the 2018 Edition of this report.[55] They include the following: Internal Improvement Trust Fund, Inland Protection Trust Fund, General Inspection Trust Fund, Florida Coastal Protection Trust Fund, Minerals Trust Fund, Florida Permit Fee Trust Fund, Save Our Everglades Trust Fund, Solid Waste Management Trust Fund, Wastewater Treatment and Stormwater Management Revolving Loan Trust Fund, Water Quality Assurance Trust Fund,

[54] For a detailed history of litigation, see the 2020 Edition of this report at page 86, available at: http://edr.state.fl.us/Content/natural-resources/LandandWaterAnnualAssessment_2020Edition.pdf.
[55] http://edr.state.fl.us/Content/natural-resources/LandandWaterAnnualAssessment_2018Edition.pdf at page 186.

Nonmandatory Land Reclamation Trust Fund, Grants and Donations Trust Fund, and Federal Grants Trust Fund. Within the identified trust funds, the types of revenue were also identified and described.[56] These revenues include: Fees and Licenses; Fines, Penalties, and Judgments; Grants and Donations; Pollutant Taxes and Fees; Repayment of Loans; Sales and Leases; Severance Taxes, and Sale of Bonds.

Based on a review of state accounts for the last ten fiscal years, a historical data series was constructed for the identified revenues. With the exception of repayment of loans and sale of bonds, each of the revenue sources is forecasted by the Revenue Estimating Conference, meeting specifically on Transportation Revenues, General Revenue, and the Long-Term Revenue Analysis. The assumptions used within these conferences provide the basis for the overall forecast through Fiscal Year 2030-31. For the repayment of loans, a three-year moving average is used for the forecast. The historical series and the forecast for the total revenues available for water quality and other water resource-related programs, comprised of the non-Documentary Stamp Tax revenues and the Documentary Stamp Tax revenues committed to water resources from Table 2.4.1, are shown in Table 2.4.2. In this table, the new $50 million distribution for the Lake Okeechobee Watershed Restoration Project has been included as part of the Documentary Stamp Tax Revenues committed to water resources.

[See table on following page]

[56] *Id.* at 188.

Table 2.4.2 Revenues Available for Water Quality and Other Water Resource-Related Programs (in $millions)

History	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21
Fees and Licenses	$33.44	$28.54	$25.64	$28.23	$24.22	$24.23	$23.39	$25.04	$24.76	$27.56
Fines, Penalties, Judgments	$0.07	$16.38	$0.87	$78.62	$9.56	$3.74	$5.39	$47.15	$2.45	$3.47
Grants and Donations	$113.49	$86.93	$81.18	$93.08	$96.89	$82.62	$73.19	$106.87	$107.34	$106.47
Pollutant Taxes and Fees	$246.36	$246.85	$252.04	$260.33	$267.19	$273.15	$286.48	$301.35	$282.40	$265.56
Repayment of Loans	$75.52	$86.76	$102.86	$99.78	$83.38	$95.98	$68.24	$81.72	$119.71	$123.20
Sales of Lands, Goods, and Services	$2.37	$1.67	$4.96	$1.38	$1.33	$1.33	$1.58	$1.06	$1.56	$1.17
Severance Taxes	$5.00	$5.55	$5.24	$4.93	$6.85	$6.61	$6.83	$6.70	$5.94	$9.76
Sale of Bonds	$-	$49.90	$-	$-	$49.87	$-	$-	$-	$-	$-
Non-Doc Stamp Subtotal	**$471.24**	**$467.12**	**$467.55**	**$561.43**	**$482.57**	**$481.04**	**$458.28**	**$563.18**	**$538.23**	**$527.42**
Doc Stamp Committed to Water Resources	$-	$-	$-	$-	$-	$-	$254.22	$294.77	$316.10	$319.00
Total Water Quality Revenues	**$471.24**	**$467.12**	**$467.55**	**$561.43**	**$482.57**	**$481.04**	**$712.50**	**$857.95**	**$854.33**	**$846.42**

Forecast	FY 21-22	FY 22-23	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31
Fees and Licenses	$27.90	$28.27	$28.61	$28.94	$29.27	$29.59	$29.91	$30.22	$30.53	$30.83
Fines, Penalties, Judgements	$3.52	$3.56	$3.61	$3.65	$3.69	$3.73	$3.77	$3.81	$3.85	$3.88
Grants and Donations	$66.97	$65.65	$66.38	$67.31	$68.26	$70.01	$71.24	$72.58	$74.06	$75.44
Pollutant Taxes and Fees	$291.69	$295.90	$299.55	$302.43	$303.98	$304.86	$305.53	$305.97	$306.30	$306.63
Repayment of Loans	$108.21	$117.04	$116.15	$113.80	$115.66	$115.20	$114.89	$115.25	$115.11	$115.08
Sales and Leases	$1.18	$1.20	$1.21	$1.22	$1.24	$1.25	$1.27	$1.28	$1.29	$1.30
Severance Taxes	$5.95	$4.41	$3.19	$3.18	$3.21	$3.45	$3.53	$3.53	$3.65	$3.71
Sale of Bonds	$-	$-	$-	$-	$-	$-	$-	$-	$-	$-
Non-Doc Stamp Subtotal	**$499.47**	**$511.60**	**$515.51**	**$517.36**	**$522.09**	**$524.65**	**$526.60**	**$529.11**	**$531.15**	**$533.18**
Doc Stamp Committed to Water Resources	$369.00	$369.00	$369.00	$369.00	$369.00	$364.00	$364.00	$364.00	$364.00	$364.00
Total Water Quality Revenues	**$868.47**	**$880.60**	**$884.51**	**$886.36**	**$891.09**	**$888.65**	**$890.60**	**$893.11**	**$895.15**	**$897.18**

Regional Revenues

The WMDs are required to report their annual revenues in their Comprehensive Annual Financial Reports. While each district must report its total revenues, the allocation to discrete categories is largely at the discretion of the district. As a result, intergovernmental sources cannot be identified at a granular level. Further, the amount of these revenues used for water supply purposes versus water quality is not identifiable, and projects or initiatives may benefit both purposes. Table 2.4.3 provides a forecast and details a history of WMD revenues from their own sources. Ad valorem collections[57] comprise approximately 50 to 95 percent of this revenue, with the remainder a mix of investment earnings, timber harvesting and sales, apiary use, billboard and cell tower leases, sales of excavated materials, cattle grazing, alligator egg harvests, feral hog hunts, and other miscellaneous revenues. The ad valorem portion of the first two years of the forecast come from the adopted and tentative budgets of the WMDs while the final three years rely on a three-year moving average growth rate by district.[58] The forecast for the remaining share of this revenue relies on population growth adopted by the July Demographic Estimating Conference. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years.

Table 2.4.3 Water Management District Revenues from Own Sources (in $millions)

History	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19	LFY 19-20
NWFWMD	$5.08	$6.31	$7.05	$5.69	$5.50
SJRWMD	$90.89	$90.24	$91.81	$98.35	$97.14
SFWMD	$312.66	$310.64	$317.29	$340.40	$328.44
SWFWMD	$114.46	$112.72	$117.29	$130.25	$130.87
SRWMD	$7.69	$7.60	$6.91	$9.86	$9.43
Total	$530.78	$527.51	$540.35	$584.54	$571.39
Forecast	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**	**FY 24-25**
Total	$586.77	$611.88	$627.90	$645.76	$666.74

Source: Comprehensive Annual Financial Reports of the Water Management Districts.

Table 2.4.4 provides a forecast and details a history of WMD revenues sourced from other governments. This can be federal, state, or local cities and counties. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. As revenues are largely based on population, forecasts rely on population growth rates.

[57] Within the WMDs, there can exist basin boards for various purposes detailed in section 373.0695, Florida Statutes. The WMD's governing board can levy ad valorem taxes within the designated basin of the basin boards. Currently, only three such basin boards exist and all of them are within the SFWMD.

[58] In the 2019 Edition and prior, the forecast for the ad valorem share of this revenue relied on the growth rate of county taxable value as adopted by the Ad Valorem Revenue Estimating Conference. The conference growth rate for the county taxable value was significantly outperforming the growth rate for actual collections.

Table 2.4.4 Water Management District Revenues from Intergovernmental Sources (in $millions)

History	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19	LFY 19-20
NWFWMD	$14.00	$14.86	$17.88	$17.73	$16.82
SJRWMD	$23.45	$28.57	$38.31	$23.80	$18.99
SFWMD	$137.45	$176.79	$170.20	$208.09	$297.87
SWFWMD	$6.24	$13.62	$6.92	$10.14	$14.64
SRWMD	$15.75	$8.41	$14.03	$14.64	$15.00
Total	$196.89	242.25	247.34	274.40	363.32
Forecast	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**	**FY 24-25**
Total	$346.80	$352.32	$357.34	$362.18	$366.83

Source: Comprehensive Annual Financial Reports of the Water Management Districts.

Table 2.4.5 provides a forecast and details a history of revenues used for water quality purposes by special districts that are located in multiple counties. Based on survey results, a portion of the account identified as 343.700 Service Charge – Conservation and Resource Management is self-generated for use on water quality protection and restoration projects and initiatives. Further, accounts 323.600 Franchise Fee – Sewer, 343.500 Charges for Services - Sewer-Wastewater Utility, and 343.600 Charges for Services - Water-Sewer Combination Utility are categorized as water quality protection and restoration self-generated revenue. Accounts 334.350 State Grant – Sewer/Wastewater, 334.360 State Grant – Stormwater Management, and 335.350 State Shared Revenues – Sewer/Wastewater are categorized as water quality protection and restoration revenues from the state. Finally, account 331.350 Federal Grant – Sewer/Wastewater is categorized as water quality protection and restoration revenue from the federal government. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. As revenues are largely based on population, forecasts rely on population growth rates.

Table 2.4.5 Water Quality Protection & Restoration Revenues Generated to Regional Special Districts by Government Source (in $millions)

History	LFY 14-15	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19
Self	$94.65	$97.83	$102.40	$104.30	$109.68
State	$0.74	$0.43	$0.15	$1.49	$0.07
Federal	$0.03	$-	$-	$0.01	$-
Forecast	**FY 19-20**	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**
Self	$111.50	$113.25	$114.95	$116.60	$118.19
State	$0.07	$0.07	$0.07	$0.07	$0.07
Federal	$-	$-	$-	$-	$-

Source: Annual Financial Report data obtained from the Florida Department of Financial Services, Division of Accounting and Auditing, Bureau of Local Government. Accounts 323.600, 343.500, 343.600, and survey results are applied to 343.700 for self; 334.350, 334.360, and 335.350 for State; and 331.350 for Federal.

Local Revenues

Table 2.4.6 provides a forecast and details a history of self-generated revenues by local governments used for water quality purposes. Based on survey results, a portion of the local government account 343.700 Service Charge – Conservation and Resource Management is self-generated for use on water quality protection and restoration projects and initiatives. Further, accounts 323.600 Franchise Fee – Sewer, 343.500 Charges for Services - Sewer-Wastewater Utility, and 343.600 Charges for Services - Water-Sewer Combination Utility are categorized as water quality protection and restoration self-generated revenue. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. As revenues are largely based on population, forecasts rely on population growth rates.

Table 2.4.6 Water Quality Protection & Restoration Revenues Generated by Local Governments (in $millions)

History	LFY 14-15	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19
Counties	$2,091.74	$2,239.62	$2,378.51	$2,439.50	$2,558.35
Municipalities	$3,211.27	$3,222.00	$3,372.43	$3,465.77	$3,617.41
Special Districts	$222.21	$235.45	$241.99	$242.46	$266.78
Total	$5,525.21	$5,697.07	$5,992.93	$6,147.73	$6,442.55
Forecast	**FY 19-20**	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**
Total	$6,549.36	$6,652.35	$6,752.30	$6,849.14	$6,942.44

Source: Annual Financial Report data obtained from the Florida Department of Financial Services, Division of Accounting and Auditing, Bureau of Local Government. Accounts 323.600 and survey results are applied to Account 343.700.

Table 2.4.7 provides a forecast and details a history of revenues generated by the state and provided to local governments for water quality purposes. Accounts 334.350 State Grant – Sewer/Wastewater, 334.360 State Grant – Stormwater Management, and 335.350 State Shared Revenues – Sewer/Wastewater are categorized as water quality protection and restoration revenues from the state. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. As revenues are largely based on population, forecasts rely on population growth rates.

[See table on following page]

Table 2.4.7 Water Quality Protection & Restoration Revenues Provided to Local Governments from the State (in $millions)

History	LFY 14-15	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19
Counties	$21.53	$8.00	$9.79	$11.95	$11.28
Municipalities	$21.99	$30.23	$34.69	$32.35	$28.69
Special Districts	$0.80	$2.56	$0.26	$0.95	$2.53
Total	$44.31	$40.78	$44.74	$45.25	$42.50
Forecast	**FY 19-20**	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**
Total	$43.20	$43.88	$44.54	$45.18	$45.79

Source: Annual Financial Report data obtained from the Florida Department of Financial Services, Division of Accounting and Auditing, Bureau of Local Government, Accounts 334.350, 334.360, and 335.350.

Table 2.4.8 provides a forecast and details a history of revenues generated by the federal government and provided to local governments for water quality purposes. Account 331.350 Federal Grant – Sewer/Wastewater is categorized as water quality protection and restoration revenue from the federal government. Note that the historic data is in local fiscal years, which begin October 1 and end September 30. For forecasting purposes, it has been converted to state fiscal years. As revenues are largely based on population, forecasts rely on population growth rates.

Table 2.4.8 Water Quality Protection & Restoration Revenues Provided to Local Governments from the Federal Government (in $millions)

History	LFY 14-15	LFY 15-16	LFY 16-17	LFY 17-18	LFY 18-19
Counties	$0.97	$0.08	$0.51	$0.57	$2.28
Municipalities	$10.83	$12.07	$6.40	$6.18	$8.58
Special Districts	$1.77	$0.75	$0.54	$1.00	$1.00
Total	$13.57	$12.89	$7.46	$7.76	$11.85
Forecast	**FY 19-20**	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**
Total	$12.05	$12.24	$12.42	$12.60	$12.77

Source: Annual Financial Report data obtained from the Florida Department of Financial Services, Division of Accounting and Auditing, Bureau of Local Government, Accounts 331.350. Data in this table has been significantly revised and supersedes that reported in previous editions.

Private Utility Revenues

Table 2.4.9 provides a forecast and details a history of revenues generated by private wastewater utilities for water quality-related purposes. The basis for this data was provided to EDR by the Florida Public Service Commission (PSC) from the annual financial reports submitted by private wastewater utilities within jurisdictional counties. As of October 2021, only 38 of Florida's 67 counties had resolutions or ordinances adopted to impose PSC jurisdiction over private water and

wastewater utilities.[59] As a result, the remaining revenues from counties outside of its jurisdiction were estimated based on per capita utility revenues. This methodology should provide suitable estimates due to a similar mix of rural and urban counties both in and out of the PSC's jurisdiction. Note that the historic data is in calendar years. For forecasting purposes, it has been converted to state fiscal years. As revenues are largely based on population, forecasts rely on population growth rates.

Table 2.4.9 Revenues Generated by Private Wastewater Utilities (in $millions)

History	CY 2011	CY 2012	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020
Total	$55.79	$53.07	$45.65	$47.81	$50.12	$54.64	$56.71	$58.12	$60.94	$53.34
Forecast	**FY 20-21**	**FY 21-22**	**FY 22-23**	**FY 23-24**	**FY 24-25**	**FY 25-26**	**FY 26-27**	**FY 27-28**	**FY 28-29**	**FY 29-30**
Total	$57.89	$58.62	$59.38	$60.11	$60.80	$61.49	$62.16	$62.83	$63.49	$64.14

Source: A historical series was created using data provided by the Florida Public Service Commission.

[59] As of the date of this report, there were 38 jurisdictional counties: Alachua, Bradford, Brevard, Broward, Charlotte, Clay, Duval, Escambia, Franklin, Gadsden, Gulf, Hardee, Highlands, Jackson, Lake, Lee, Leon, Levy, Manatee, Marion, Martin, Monroe, Nassau, Okaloosa, Okeechobee, Orange, Osceola, Palm Beach, Pasco, Pinellas, Polk, Putnam, Seminole, St. Johns, St. Lucie, Sumter, Volusia, and Washington. The non-jurisdictional counties were: Baker, Bay, Calhoun, Citrus, Collier, Columbia, DeSoto, Dixie, Flagler, Gilchrist, Glades, Hamilton, Hendry, Hernando, Hillsborough, Holmes, Indian River, Jefferson, Lafayette, Liberty, Madison, Miami-Dade, Santa Rosa, Sarasota, Suwannee, Taylor, Union, Wakulla, and Walton. For an updated list of jurisdiction counties, see http://www.psc.state.fl.us/Files/PDF/Utilities/WaterAndWastewater/wawtextchart.pdf. (Accessed January 2022.)

3. Modeling Future Water Demand and Supply

Abstract

The expenditures associated with ensuring that future water supplies are available to meet the increase in water demands are projected to be $1.49 billion over the 2020 through 2040 planning horizon, with a projected state expenditure of $128.54 million over that period. These expenditures are based on each water management district's water demand projections and existing supply estimates as further developed by the Office of Economic and Demographic Research (EDR). If the separate water demand forecast produced by EDR's pilot model is considered, it points to modestly lower future expenditures needed to meet the increase in the future water demand, partially because it assumes greater conservation efforts. The future demand not met with existing supply assumes average weather conditions and that the demand which has been met in the past will continue to be met in the future. An overview of the expenditures needed to maintain and replace existing infrastructure required for current demand is discussed in Chapter 5. In addition, regarding the expenditures necessary to ensure that sufficient water is available for the natural systems, EDR examined projects implementing the recovery and prevention strategies for minimum flows and minimum water levels of water courses, water bodies, and aquifers, as well as additional projects expected to primarily benefit the natural systems. Excluding Everglades expenditures, the estimated cost of these projects has been significantly revised to $842.66 million, of which the state's share is projected to be $89.03 million. These estimates will continue to evolve as methodologies and the accompanying data sources are further refined. Additional research will be undertaken to provide more complete and more precise cost estimates for future editions of this annual report.

In Chapter 2, the historical expenditures related to water supply and demand management, and spending for the protection and restoration of natural systems, are discussed. The objective of Chapter 3 is to determine whether the expenditure level is sufficient to meet the Legislature's intent. Specifically, section 403.928(1)(b), Florida Statutes, requires the Office of Economic and Demographic Research (EDR) to estimate future expenditures necessary to achieve the Legislature's intent that sufficient water is available for all existing and future reasonable-beneficial uses and the natural systems, and that the adverse effects of competition for water supplies be avoided.[60] The historical level of expenditures discussed in Chapter 2 differ from the expenditures necessary to achieve this intent because they have yet to be cleanly linked.

This chapter starts with a review of the existing water supply planning framework in Florida. It continues with the analysis of water demand and supply, inferred supply shortage, and expenditure estimates. The final section of this chapter discusses future steps to further improve the expenditure forecast.

3.1 Water Supply Planning in Florida

Florida law provides a comprehensive framework for water supply planning. Water supply assessments (WSAs) and regional water supply plans (RWSPs) developed by the water

[60] This section also requires EDR to compile water supply and demand projections developed by each water management district (WMD), documenting any significant differences between the methods used by WMDs.

management districts (WMDs) are the primary tools for long-term water demand and supply planning in Florida.[61] Under section 373.036, Florida Statutes, the governing board of each WMD must develop a district water management plan.[62] Every district water management plan must be prepared for at least a 20-year planning period and is required to address water supply, water quality, flood protection and floodplain management, and natural systems. For water supply specifically, all district water management plans include WSAs. The assessments determine whether existing and reasonably anticipated sources of water and conservation efforts are adequate to supply water for all existing legal uses and reasonably anticipated future needs and to sustain water resources and related natural systems over the next 20 years.

Furthermore, in cases where it is determined that existing water sources are inadequate to meet the needs over the next 20 years, RWSPs must be developed. Each RWSP contains water supply development project options and water resource development projects and programs.[63] The total capacity of the projects included in the regional water supply plans must exceed the water supply needs for all existing and future reasonable-beneficial uses within the 20-year planning horizon. An RWSP should also take into account water conservation and other demand management measures, as well as water resource constraints, including adopted minimum flow and minimum water levels and water reservations. Both RWSPs and districtwide WSAs are required to be updated at least once every five years.[64]

Florida Statutes require "[t]he planning must be conducted in an open public process, in coordination and cooperation with local governments, regional water supply authorities, government-owned and privately owned water and wastewater utilities, multijurisdictional water supply entities, self-suppliers, reuse utilities, the Department of Environmental Protection, the Department of Agriculture and Consumer Services, and other affected and interested parties" (§ 373.709(1), Fla. Stat.). While developing RWSPs, the WMDs share information about planning results and solicit comments from interested stakeholders via meetings, public workshops, webpage updates, and other means.

The Department of Environmental Protection (DEP) is in charge of providing the Governor and Florida Legislature an annual status summary of regional water supply planning activities in each WMD.[65] The most recent status summary (for calendar year 2020) published in December 2021 is

[61] For a map of the five WMDs, see Figure 3.0.1.

[62] According to § 373.036, Florida Statutes, a governing board may substitute an annual strategic plan for the requirement to develop a district water management plan and the district water management plan annual report. The strategic plan should meet "the following minimum requirements:

1. The strategic plan establishes the water management district's strategic priorities for at least a future 5-year period.
2. The strategic plan identifies the goals, strategies, success indicators, funding sources, deliverables, and milestones to accomplish strategic priorities.
3. The strategic plan development process includes at least one publicly noticed meeting to allow public participation in its development.
4. The strategic plan includes separately, as an addendum, an annual work plan report on the implementation of the strategic plan for the previous fiscal year, addressing success indicators, deliverables, and milestones."

[63] Based on § 373.709, Fla. Stat.

[64] § 373.036, Fla. Stat. For more details on the water supply planning process in Florida, see pages 66-70 of the 2018 Edition of this report, available online at: http://edr.state.fl.us/Content/natural-resources/index.cfm (accessed January 2021).

[65] § 373.709, Fla. Stat.

referred to in this chapter as "DEP (2021a)."[66] Florida is divided into 19 mutually exclusive water supply planning regions (Table 3.1.1; Figure 3.1.1). For presentation purposes, the DEP (2021a) report combines six of the seven water supply planning regions in the Northwest Florida Water Management District (NWFWMD), reducing the number of regions statewide from 19 to 14. Water supply is projected to meet the demand throughout the planning period in all six of those NWFWMD regions, so they do not require RWSPs. For all 14 regions, DEP includes data for "Base Year Total Water Use," "Net Demand Change," and "Water Needed," from which EDR infers available supply data. The WMDs use different schedules for their 5-year updates of the water supply assessments and plans. Specifically, 12 of the areas currently use the 2020-2040 planning horizon, while two areas still have a 2015-2035 planning horizon. Table 3.1.1 summarizes the RWSPs/WSAs used in the "Annual Status Report on Regional Water Supply Planning" in DEP (2021a).

[See table on following page]

[66] DEP. 2021a. Regional Water Supply Planning 2020 Annual Report, available online at: https://floridadep.gov/water-policy/water-policy/content/water-supply. (Accessed December 2021.)

Table 3.1.1 Water Supply Planning Regions

Water Management District	Water Supply Planning Region	Counties	Abbreviation	Water Supply Planning Document Referenced in DEP (2021a)	Base Year for Water Use Estimates	Planning Horizon	
						2015-2035	2020-2040
Northwest Florida Water Management District (NWFWMD)	I	Escambia	**NW – Oth**	2018 Water Supply Assessment Update (2018)	2015		√
	III[a]	Bay[a]					
	IV	Calhoun, Jackson, Holmes, Liberty, Washington					
	V[b]	Franklin and Gulf[b]					
	VI	Gadsden					
	VII	Jefferson (part), Leon, Wakulla					
	II	Okaloosa, Santa Rosa, and Walton	**NW – II**	2019 Region II Regional Water Supply Plan (2020)[c]	2015		√
Suwannee River Water Management District (SRWMD)	Area outside NFRWSP	Dixie, Jefferson (part), Lafayette, Levy (part), Madison, and Taylor	**SR – West**	Water Supply Assessment 2015-2035 (2018)	2010	√	
St. Johns River Water Management District (SJRWMD)	Central Springs and East Coast (Region 2, formerly Regions 2, 4, and 5)	Brevard, Indian River Marion (part), Lake (part), Okeechobee (part), and Volusia	**SJR – CSEC**	Under Development[d]	2015		√
Southwest Florida Water Management District (SWFWMD)	Northern Planning Region (partially in Central Florida Water Initiative)[e]	Citrus, Hernando, Lake (part), Levy (part), Marion (part), and Sumter[e]	**SW – N**[e]	2020 Regional Water Supply Plan (Draft); partially in CFWI Regional Water Supply Plan 2020 (Draft)	2015		√
	Tampa Bay Planning Region	Hillsborough, Pasco, and Pinellas	**SW – TB**	2020 Regional Water Supply Plan (Draft)	2015		√
	Heartland Planning Region (partially in Central Florida Water Initiative)[e]	Hardee, Highlands (part), Polk (part)[e]	**SW – H**[e]	2020 Regional Water Supply Plan (Draft); partially in CFWI Regional Water Supply Plan 2020 (Draft)	2015		√
	Southern Planning Region	Charlotte (part), DeSoto, Manatee, and Sarasota	**SW – S**	2020 Regional Water Supply Plan (Draft)	2015		√
South Florida Water Management District (SFWMD)	Lower Kissimmee Basin	Glades (part), Highlands (part), and Okeechobee (part)	**SF – LKB**	Regional Water Supply Plan Update (2019)	2017[f]		√
	Upper East Coast	Martin, Okeechobee (part), and St. Lucie	**SF – UEC**	Regional Water Supply Plan Update (2016)	2013[f]		√
	Lower East Coast	Broward, Collier (part), Hendry (part), Miami-Dade, Monroe (part), and Palm Beach	**SF – LEC**	Regional Water Supply Plan Update (2018)	2016[f]		√
	Lower West Coast	Charlotte (part), Collier (part), Glades (part), Hendry (part), Monroe (part), and Lee	**SF – LWC**	Regional Water Supply Plan Update (2017)	2014[f]		√
SRWMD and SJRWMD	North Florida Regional Water Supply Partnership	Alachua, Baker, Bradford, Clay, Columbia, Duval, Flagler, Gilchrist, Hamilton, Nassau, Putnam, St. Johns, Suwannee, and Union	**NFRWSP**	NFRWSP Regional Water Supply Plan (2017)	2010[g]	√[h]	
SJRWMD, SWFWMD, and SFWMD	Central Florida Water Initiative	Lake (part), Orange, Osceola, Seminole, and Polk	**CFWI**	CFWI Regional Water Supply Plan 2020 (Draft)	2015		√

[a] The RWSP for Region III was first approved in 2008 and updated in 2014. This plan was discontinued in December 2018.
[b] The Region V RWSP was approved in 2007 and discontinued in 2014.
[c] The 2018 WSA is incorporated by reference, with the 2018 WSA containing the technical data, modeling tools, and methods used to develop the 2019 RWSP.
[d] The demand estimates and projections are available in DEP (2021a). The draft RWSP (revised 10/15/2021) is available on the SJRWMD's website at https://www.sjrwmd.com/water-supply/planning/csec-rwsp/ (accessed January 2022).
[e] In this report, the portion of the region outside Central Florida Water Initiative is mentioned, with the abbreviations SW – N (for the Northern Region) and SW – H (for the Heartland Region).
[f] Water demand estimates for 2015 are available in DEP (2021a). Most recent RWSP for SF – UEC was updated in November 2021, but has not been included in DEP (2021a) yet (see https://www.sfwmd.gov/our-work/water-supply/upper-east-coast, accessed January, 2022).
[g] SR – West planning region was created following the recommendations in SRWMD WSA (2018). SRWMD is developing the first regional WSA and RWSP for SR – West and is currently in the stakeholder review process (see https://www.srwmd.org/1605/Water-Supply-Assessment-Plan, accessed January, 2022).
[h] RWSP for the 2020-2045 planning horizon is expected to be approved in Winter 2022 (see https://www.northfloridawater.com/watersupplyplan/index.html, accessed January, 2022).

Figure 3.1.1 Florida's WMDs and Water Supply Planning Regions

Note: WMD coloring applies only to regions that have a regional water supply plan. The hatching identifies the planning regions that cross the borders between the WMDs and where regional water supply plans were developed through collaboration by two or three WMDs.
Source: Provided by DEP, Office of Water Policy & Ecosystems Restoration.

3.2 The Expenditure Forecast: Role of EDR

Section 403.928, Florida Statutes, directs EDR to estimate future expenditures necessary to provide sufficient water for all existing and future reasonable-beneficial uses and the natural systems. EDR is also directed to include, in this report, "a compilation of projected water supply and demand data developed by each water management district pursuant to ss. 373.036 and 373.709, with notations regarding any significant differences between the methods used by the districts to calculate the data" (§ 403.928, Fla. Stat.).

To meet these requirements, EDR's expenditure analysis focuses on synthesizing a single statewide forecast using data from other state agencies, the plans developed by the WMDs, and the most recent economic and demographic projections adopted by the Consensus Estimating Conferences. Note that the Economic Estimating Conferences develop official projections related to the state economy while the Demographic Estimating Conference develops official information concerning the population (§ 216.136, Fla. Stat.). In developing its official estimates, the Demographic Estimating Conference uses additional materials provided by EDR (§§ 216.136 and 186.901, Fla. Stat.).[67] As part of this process, EDR contracts with the University of Florida's Bureau of Economic and Business Research (BEBR) to produce the longer-term and more granular population projections. The goal for future editions of this report is to link the water expenditure forecast with the official economic and demographic forecasts for purposes of the state planning and budgeting system.

The information in DEP's annual status report (DEP 2021a[68]) provides an important basis for the EDR expenditure forecast presented in this edition. Demand estimates and projections for at least a 20-year planning horizon are developed by the WMDs using mostly standardized techniques with region-specific information. The WMDs' estimates and projections are developed with input from water utilities, local governments, and other water users and stakeholder groups. The WMDs analyze water supply availability by simulating future demands through the use of hydrogeological models. The WMDs' projections fulfill the statutory requirements of water supply planning and provide the districts with sufficient information for planning purposes within their sub-regions. DEP exercises general supervisory authority over the WMDs throughout this process (§ 373.036(7), Fla. Stat.).

For estimating and projecting populations in water supply plans, the WMDs must consider the BEBR medium population projections and population projection data and analysis submitted by a local government if the data and analysis support the local government's comprehensive plan (§ 373.709, Fla. Stat.). Any adjustment of or deviation from the BEBR projections must be fully described, and the original BEBR data must be presented along with the adjusted data. Due to the

[67] General provisions for the Consensus Estimating Conferences are defined in § 216.134, Fla. Stat. Specifically, the Consensus Estimating Conferences are within the legislative branch. The membership of each consensus estimating conference consists of principals and participants. The principals of each conference shall be the professional staff of the Executive Office of the Governor designated by the Governor, the coordinator of EDR, professional staff of the Senate designated by the President of the Senate, and professional staff of the House of Representatives designated by the Speaker of the House of Representatives.

[68] DEP. 2021a. Regional Water Supply Planning 2020 Annual Report, available online at: https://floridadep.gov/water-policy/water-policy/content/water-supply (Accessed December 2021).

adjustments, the WMDs' projections do not aggregate well to the annual statewide forecast needed by EDR to produce its required expenditure forecast. Specifically:

- The schedules to develop the WMDs' projections are not required to be synchronized. As a result, the 20-year planning horizons can differ among the regions.[69] Currently, all but two planning regions use the 2020-2040 planning horizon.

- The asynchronous 5-year updates for the RWSPs/WSAs result in different vintages of population and economic projections being used across regions. For example, the SF – UEC projections utilize the 2014 BEBR population publication (with the BEBR's base year estimates for 2013). The SF – LKB uses the 2018 BEBR publication (with the BEBR's base year estimates for 2017). By 2040, the difference between the 2014 and 2018 BEBR statewide population projections is almost one million people. In other words, even though the regions consider the BEBR medium projection for the 2040 population, the statewide population projection for 2040 is not equal to the sum of the population projections from the WMDs' planning regions.[70]

- The WMDs' water demand projections are generally updated every five years,[71] while EDR annually provides population estimates and projections to the Executive Office of the Governor (§ 186.901, Fla. Stat.). Furthermore, an updated statewide population forecast is adopted several times per year (through the Consensus Estimating Conferences). These incremental changes can be considerable given recent events and incoming data.

- According to WMD staff, economic conditions are considered in developing their water demand projections. Still, results combined from the regions are unlikely to be consistent with the official Florida Economic forecast or share the same overarching economic outlook. Regardless, the official Florida Economic forecast is updated more frequently than the WMDs' projections. Projected increases in water demand should be closely tied to the most recent long-term forecast adopted by the Florida Consensus Estimating Conferences. The annually updated long-term population forecast adopted by the Demographic Estimating Conference, along with the most recent economic forecasts used by EDR, should serve as the basis for EDR's water demand projections intended for statewide expenditure modeling.[72]

[69] Following the terminology defined in the 2019 guidelines established by DEP and the five WMDs, "planning period" or "planning horizon" refers to "the period of time starting with the first projected year (…). This period must not be less than 20 years. This planning period may begin before the final approval of the plan, so long as the plan is approved within five years of the start of the planning period. The planning period must end on a year ending in 5 or 0 (*e.g.*, 2020, 2025, 2030, etc.) for statewide reporting consistency." In turn, the "base year" is "typically between one and five years prior to the first year of the planning period" and "water use in the base year is not a projection, but rather actual or estimated use." For more information, refer to: DEP, NWFWMD, SFWMD, SWFWMD, SJRWMD, and SRWMD. 2019. Format and Guidelines for Regional Water Supply Planning.
[70] For selected WMDs, the county population considered in WSAs/RWSPs may differ from the BEBR medium population projections due to the WMDs' analysis of permanent and non-permanent populations (the BEBR focuses on the permanent population only).
[71] Updated as part of the WMD water supply planning requirements (§ 373.036, Fla. Stat.)
[72] EDR focuses on statewide water demand and expenditure modeling. In contrast, the WMDs focus on region-specific water demand projections, which is more appropriate for the WMDs' mission.

- Asynchronous schedules of WSAs/RWSPs updates also lead to the application of different versions of agricultural acreage and water use projections by the WMDs. The Florida Department of Agriculture and Consumer Services (DACS) now releases annual updates of its Florida Statewide Agricultural Irrigation Demand (FSAID) Geodatabase. During the initial years of the FSAID, data sources and methods were continually refined. Currently, the eighth update of the agricultural acreage and irrigation demand is available, although it is likely the regions use earlier versions. For example, existing forecasts from the NFRWSP use the second update, while the predictions for the SWFWMD and SF – LKB rely on the fifth update.

- Significant differences in the demand estimation and projection methodologies exist among the WMDs (as discussed in the following section). These methodologies reflect local and regional data availability, since underlying data sources vary across the state. Note that the WMDs and the DEP collaborate on developing consistent methodologies for water demand and supply planning for the CFWI, NFRWSP, and SR – West, as well as updating the guidelines for regional water supply planning (DEP et al. 2019[73]).

- The WMDs' projections are not required to be annual.[74] In contrast, as Florida's legislative budgeting process is completed annually, EDR must develop annual estimates of future expenditures in support of the budgeting process. Specifically, while yearly forecasts can be generated by interpolating 5-year forecasts, such interpolation requires an assumption of a trend (*e.g.*, an equal increase in the water demand each year in a 5-year interval).

It is worth reiterating that the WMDs' information is sufficient for the planning purposes of the WMDs' planning regions and is consistent with statutory direction. Further, based on discussions with WMD staff, the WMDs and DEP have made considerable effort to update their guidelines and methodologies to standardize their planning data formats. Nevertheless, due to the importance of updated economic and demographic data for a statewide water demand forecast, and considering the office's forecasting capacity, EDR is confident that it can produce an independent demand projection to facilitate the expenditure forecast while ameliorating the difficulties bulleted above. Further, for the EDR forecast, adjustments can be made each year. Alternative scenarios can be explored, such as drought, fluctuations in tourism (if the seasonal population is incorporated in the demand projections), and economic cycles. Eventually, a water demand forecast produced by EDR could also extend beyond the 20-year planning horizon used by the WMDs in the attempt to account for long-term trends, such as weather and climate patterns.[75]

Note that EDR's forecast should only be considered at the statewide level for the purposes identified in section 403.928, Florida Statutes, and is not appropriate for any regional regulatory

[73] DEP, NWFWMD, SFWMD, SWFWMD, SJRWMD, and SRWMD. 2019. Format and Guidelines for Regional Water Supply Planning. 42pp.
[74] Water demand projections are required to be developed for 5-year intervals during the planning period, see subparagraph 62-40.531(1)(a), F.A.C.
[75] For example, the Texas 2022 State Water Plan focuses on the 2020-2070 planning period (available online at: https://www.twdb.texas.gov/waterplanning/swp/index.asp; accessed January 2022.) California also considers a 50-year planning horizon, with projected state funding needs for their State Water Plan Goal 2 "Strengthen Resiliency and Operational Flexibility of Existing and Future Infrastructure" estimated at $59.0 billion by 2068 (available online at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/California-Water-Plan/Docs/Update2018/Final/California-Water-Plan-Update-2018.pdf; accessed January 2022.)

or permitting use. This difference between the WMD's projections and EDR's forecast is partly because EDR is more focused on developing a reliable statewide expenditure forecast. Further, EDR currently does not intend to tailor its predictions to reflect specific regional-level drivers unless they later prove to be important to the statewide forecast.

3.3 Water Use Projections Based on WMD Data

While the most recent WSAs and RWSPs were developed or updated in different years, estimated or projected water uses are available for most regions for 2020 to 2040, based on 5-year intervals. The exceptions are two regions — SR – West and NFRWSP — where demand estimates and projections are available for 2015-2035 only.[76] For these regions, EDR estimates the 2040 use with a linear trend (see Appendix A.1 in the report's 2021 Edition).[77]

Based on the WMDs' data, between 2020 and 2040, the total statewide water use is projected to increase by about 980 million gallons per day (mgd), or approximately 15% (Table 3.3.1). Roughly two-thirds of the statewide water use increase (656.78 mgd) can be attributed to four regions: NFRWSP, CFWI, SF – LEC, and SF – LWC.

Overall, all but one planning region expect an increase in water use at the end of the planning period. The exception is the SW – H (outside the CFWI), where a slight reduction in total water use is projected by 2040 largely due to a projected decrease in agricultural irrigation.

[See table on following page]

[76] Throughout this chapter, we use the terms "water use" and "water demand" interchangeably. However, in economic literature, the word "demand" refers to the quantity of water used given a specific price level, and "demand function" refers to the relationship between the quantity of water used and the price of water.

[77] This projection is being used to create a single 20-year timeframe. For the two regions, extending the WMDs' projections in a linear trend is a simple forecasting approach. It does not account for the myriad factors the WMDs must incorporate into their predictions.

Table 3.3.1 Water Use Projections by WMDs

Region	Estimates or Projections (mgd)	Projections (mgd)					Difference between 2020 and 2040 water use projections	
	2015	2020	2025	2030	2035	2040	mgd	%
NW – II	69.74	76.88	82.25	87.03	91.19	94.88	18.00	23.4%
NW – Oth	254.16	273.72	287.12	296.92	304.58	311.90	38.18	14.0%
SR – West*	100.55	106.53	110.92	116.69	122.35	127.54*	21.01*	19.7%*
SJR – CSEC	353.17	383.47	395.62	406.11	416.72	427.87	44.40	11.6%
SW – N**	131.08	142.49	153.55	163.54	173.09	181.73	39.24	27.5%
SW – TB	385.71	413.34	432.77	436.96	450.56	461.85	48.51	11.7%
SW – H**	94.91	91.52	89.45	96.17	94.96	89.15	-2.38	-2.6%
SW – S	234.95	245.02	254.22	265.77	272.99	279.33	34.31	14.0%
SF – LKB	245.29	249.90	251.83	253.68	253.83	257.49	7.59	3.0%
SF – UEC	272.95	279.15	288.89	298.46	325.38	354.68	75.53	27.1%
SF – LEC	1,739.61	1,813.99	1,863.91	1,923.28	1,963.65	2,006.54	192.55	10.6%
SF – LWC	980.33	1,030.31	1,073.57	1,113.64	1,170.36	1,210.68	180.37	17.5%
NFRWSP*	555.29	585.06	612.70	641.36	667.47	696.57*	111.51*	19.1%*
CFWI	667.12	735.24	789.49	836.65	873.94	907.59	172.35	23.4%
State	**6,084.85**	**6,426.62**	**6,686.29**	**6,936.25**	**7,181.07**	**7,407.80**	**981.18**	**15.3%**

* For the SR – West and NFRWSP, 2040 projections are developed by EDR using a linear trend and 2015-2035 estimates and projections available from the WMDs.
** Portion of the region outside the CFWI.

In each water supply planning region, the demand projections are developed for six use-type categories defined in part through water supply means (*i.e.*, public supply or self-supply). The names of the categories vary slightly among the WMDs, and therefore, EDR adopts the names suggested in the 2019 regional water supply planning guidelines:[78]

a) *Public Supply (PS)* — such as water utilities supplying water for various uses, including household and community purposes, as well as commercial, industrial, institutional, mining, power generation, and recreational landscaping uses. According to the Format and Guidelines for the RWSP (DEP et al. 2019[79]), public supply uses with a current allocation greater than or equal to 0.1 mgd should be listed individually. Small public supply systems (*i.e.*, public supply systems with an allocation of less than 0.1 mgd) and individual residential irrigation wells may also be included in the PS category (DEP et al. 2019). Note that in their RWSPs, the SWFWMD combines public supply and domestic self-supply into one group, together with the estimated water use for residential irrigation wells. This group is then split into PS and Domestic Self-Supply (DSS) in DEP's report (DEP 2021a[80]) to make the categories more consistent with those used by the other WMDs.

[78] Note that these names are slightly different from that used in § 62-40.531(1)(b), Florida Administrative Code. These names also differ from those used in the 2018 and 2019 Editions of this EDR report and from those used in some of the WSAs/RWSPs. The names are consistent with the 2019 Format and Guidelines document (DEP et al. 2019).
Reference: DEP, NWFWMD, SFWMD, SWFWMD, SJRWMD, and SRWMD. 2019. Format and Guidelines for Regional Water Supply Planning. 42pp.
[79] DEP, NWFWMD, SFWMD, SWFWMD, SJRWMD, and SRWMD. 2019. Format and Guidelines for Regional Water Supply Planning. 42pp.
[80] DEP. 2021a. Regional Water Supply Planning 2020 Annual Report, available online at: https://floridadep.gov/water-policy/water-policy/content/water-supply. (Accessed December 2021.)

b) *Domestic Self-Supply (DSS)* — such as domestic wells providing for both indoor and outdoor household uses.[81] Note that a WMD may consider individual residential irrigation wells, including those both within and outside a public supply service area, in either the DSS or the landscape / recreational use categories (DEP et al. 2019). Also, the WMDs may choose to include small public supply systems in the DSS category (DEP et al. 2019).

c) *Agriculture (AG)* — includes self-supplied agricultural irrigation, livestock watering, aquaculture, and frost-freeze protection. DEP et al. (2019) suggest that all known self-supplied agriculture irrigation should be included based on the best available data. In determining the best available data, the WMDs are required to consider the DACS's future agricultural water supply demands data (§§ 373.709 and 570.93, Fla. Stat.).

d) *Landscape/Recreational (L/R)* — includes, but is not limited to, self-supplied golf courses, parks (including water parks), and commercial center irrigation (DEP et al. 2019). Note that a WMD may consider individual residential irrigation wells, including those both within and outside a public supply service area, in either the DSS or the L/R use categories (DEP et al. 2019).

e) *Commercial/Industrial/Institutional (CII)* — includes various self-supplied commercial, industrial, and institutional activities that are not supplied with water through PS. Self-supplied commercial, industrial, and institutional uses equal to or greater than 0.1 mgd may be listed individually or in the aggregate. The WMDs may exclude appropriate quantities of recirculated water from demand projections for planning purposes (DEP et al. 2019).

f) *Power Generation (PG)* — includes power generation facilities that rely on self-supplied groundwater or fresh surface water. According to DEP et al. (2019), self-supplied power generation uses with an individual water use permit or Site Certification issued by the DEP should be listed individually. Other known self-supplied power generation uses may be listed individually or in the aggregate. The WMDs should exclude recirculated water from demand projections for planning purposes.

According to DEP et al. (2019), the WMDs must account for reclaimed water[82] when analyzing and projecting demand for all water use categories except for DSS. Therefore, although category names may include the reference to "self-supply," a share of water use in these categories can be met by reclaimed water from domestic wastewater treatment plants.

As mentioned above, the WMDs' projections for the water use categories depend on local and regional data availability. While the general approach to estimating and projecting the water demand is consistent among the regions, differences were identified in the specifics. A detailed

[81] As stated above, the SWFWMD combines public supply and domestic self-supply into one group, together with the estimated water use for residential irrigation wells. This group is then split into the PS and DSS categories in the DEP (2021a) to make the categories more consistent with that used by the other WMDs.

[82] "Reclaimed water" is defined in Chapter 62-610.200, Florida Administrative Code, as "water that has received at least secondary treatment and basic disinfection and is reused after flowing out of a domestic wastewater treatment facility."

analysis of the differences among the WMDs' methods can be found in Appendix A.2 in the 2021 Edition of this report. Significant differences include:

- *The definition of the population used to forecast PS water use*. For each water utility included in PS, all WMDs project water demand as a product of the per capita water use rate (based on the last year or last several years) and the projected population. The definitions of the population, however, differ between the WMDs. Some WMDs explicitly base their projections on the permanent and non-permanent populations, combined.

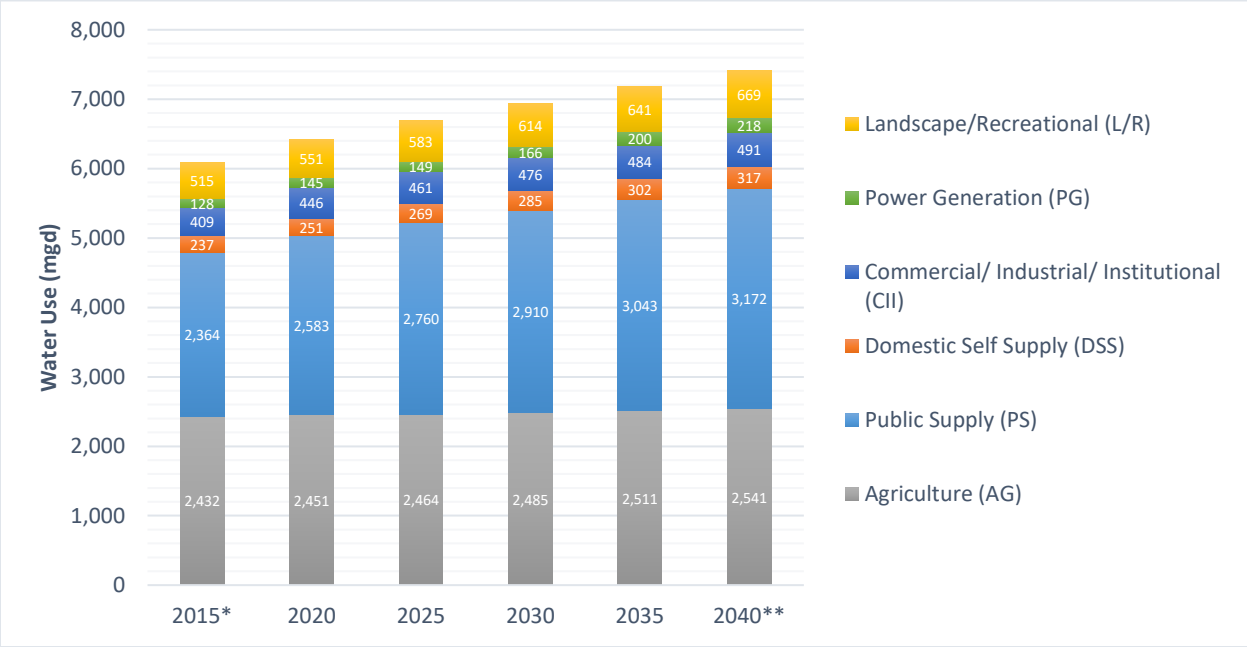
- *County population projections utilized in PS and DSS projections.* All WMDs reconcile their county population projections (*i.e.*, the total of PS and DSS populations) to that of BEBR.[83] However, the publication years for the annual BEBR projections used by the WMDs range from 2014 to 2018. Therefore, the population considered in all the WSAs/RWSPs does not add up to the most recent statewide population projections adopted by the Demographic Estimating Conference. Note that the BEBR's population projections are prepared under a contractual agreement with the Florida Legislature to support the Conference and EDR.

- *Agricultural water use projection.* Districts are required to consider irrigated agricultural acreage and demand data published in the most recent FSAID Geodatabase released by DACS (§ 373.709, Fla. Stat.). While some WMDs apply agricultural water use projections developed by DACS, others develop their projections independently (*e.g.*, using FSAID acreage data), based on suitability within specific planning regions.

Water use is projected to grow in all categories, but public supply accounts for most of the total growth (*i.e.*, 589.13 mgd out of the total increase of 981.18 mgd). While the finalized statewide water use data for 2020 are not yet fully incorporated into regional plans, the WMDs have estimated that public supply finally surpassed agriculture to become the largest water use category. The rate of water use expansion in public supply (22.81%), domestic self-supply (26.36%), and landscape / recreational (21.33%) generally match the rate of population growth (22.61% in 2020-2040, based on the EDR population forecast). While water use in agriculture is also forecasted to increase, the combined use across districts only grows 3.65% over the 20-year period. A graph summarizing this data is provided in Figure 3.3.1.

[83] Overall, according to Section 373.709(2)(a)1.a, Florida Statutes, "Population projections used for determining public water supply needs must be based upon the best available data. In determining the best available data, the district shall consider the University of Florida Bureau of Economic and Business Research (BEBR) medium population projections and population projection data and analysis submitted by a local government pursuant to the public workshop described in subsection (1) if the data and analysis support the local government's comprehensive plan. Any adjustment of or deviation from the BEBR projections must be fully described, and the original BEBR data must be presented along with the adjusted data."

Figure 3.3.1 WMDs' Water Use Projections (mgd)



Source: DEP, with adjustments for 2040 demand in NFRWSP and SR-West

* For most regions, water use in 2015 is estimated based on available data; for selected regions with older RWSPs, the use was projected using 2010 data.

** For two regions–NFRWSP and SR-West–2040 projections were not available in DEP 2021; as with the 2021 Edition of this report, EDR estimated the water use based on a linear trend. Note that for all water use categories in both regions, linear trend represented 2015-2035 data extremely well (R-squared for Ordinary Least Squares regression above 0.99, estimated in Microsoft Excel).

Alternative Water Use Scenarios: Impacts of Water Conservation and Droughts

The projected 2020-2040 increase in statewide water use is significant – 15.27%. EDR refers to the scenario discussed above as "Scenario 1" or "baseline scenario." The EDR expenditure forecast is based on this "baseline scenario." However, it is important to realize that part of the water use increase projected for Scenario 1 can be offset by improving water use efficiency and water conservation, which is not explicitly accounted for in the water demand projection. Conversely, the demand can exceed the projections, especially given drought conditions.

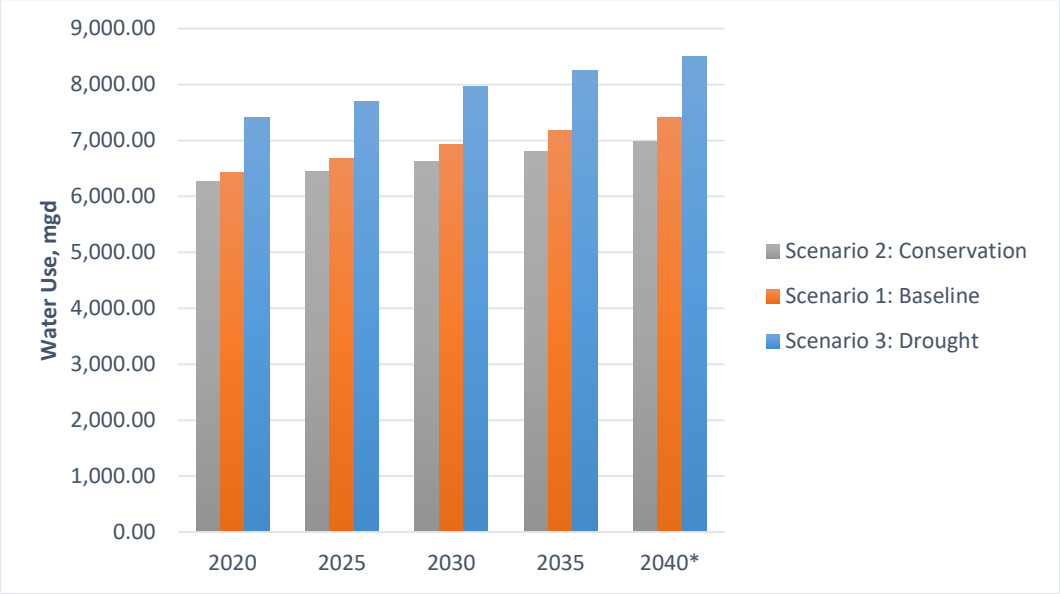
The conservation projections are intended to represent "reasonably expected demand reduction at the end of the planning period due to conservation activities" (DEP et al. 2019, p. 30).[84] According to district projections compiled by DEP, conservation could offset 418.14 mgd by 2040 statewide.[85] This would reduce the projected statewide 2040 water demand by 5.64%, from

[84] An alternative water use scenario accounts for conservation potential. This scenario is referred to as Scenario 2, conservation. For planning purposes, water conservation is defined as "the prevention and reduction of wasteful, or unreasonable uses of water to improve the efficiency of use" (p. 30, DEP et al. [2019]).
Reference: DEP, NWFWMD, SFWMD, SWFWMD, SJRWMD, and SRWMD. 2019. Format and Guidelines for Regional Water Supply Planning. 42pp.

[85] In DEP (2021a), the value is 399.29; however, the projection stops at 2035 for two regions.

7,407.80 mgd to 6,989.66 mgd (Figure 3.3.2). In terms of the projected 2020-2040 demand increase, the conservation scenario could, with appropriate investments, reduce this increase by 26.90% compared to the baseline scenario (from 981.18 mgd to 717.20 mgd).[86] This alternative scenario is referred to as Scenario 2, conservation. Note that the WMDs emphasize that any potential conservation should not be directly removed from water demand estimates since actual savings are based on endorsement and implementation of conservation measures by public supply utilities and other users, as well as being highly contingent on specific user participation rates. Substantial investments may be needed to realize these savings. As a result, conservation projections are developed by the WMDs separately from the baseline water demand projections.

Figure 3.3.2 Statewide Water Use Projections Based on WMDs Data



* For two regions–NFRWSP and SR-West–2040 projections were not available in DEP 2021; EDR estimated the water use based on a linear trend. Note that for all water use categories in both regions, linear trend represented 2015-2035 data extremely well (R-squared for Ordinary Least Squares regression above 0.99, estimated in Microsoft Excel).

The WMDs are required to incorporate a level-of-certainty planning goal associated with demand for a 1-in-10-year drought event.[87] The 1-in-10-year drought event is defined as "a year in which below normal rainfall occurs with a 10% probability of occurring in any given year" (DEP et al. 2019).[88] For the final year of their current planning horizons (*i.e.*, 2035 or 2040), all WMDs calculate the drought year water demand. These estimates are summarized in DEP (2021a). Some WMDs also provide drought demand projections for the 5-year intervals. EDR relied on these

[86] The calculations of the conservation potential for 2020-2040 are discussed in Section 3.7 of this report and Appendix A.4 in the report's 2021 Edition. This report generally includes the estimates presented in DEP (2021a), accounting for both "Conservation Projection" and "Additional Conservation Projection" from DEP (2021a).
Reference: DEP. 2021a. Regional Water Supply Planning 2020 Annual Report, available online at: https://floridadep.gov/water-policy/water-policy/content/water-supply . (Accessed December 2021.)

[87] Specifically, the Florida Statutes require the level-of-certainty planning goal associated with identifying the water supply needs of existing and future reasonable-beneficial uses to be based upon meeting those needs for a 1-in-10-year drought event (§ 373.709(2)(a)1, Fla. Stat.).

[88] Reference: DEP, NWFWMD, SFWMD, SWFWMD, SJRWMD, and SRWMD. 2019. Format and Guidelines for Regional Water Supply Planning.

projections to develop 5-year drought demand estimates, along with a review of individual WSAs and RWSPs[89]. Statewide, the drought demand is expected to be approximately 15% higher than the demand in the baseline scenario. The scenario that accounts for the 1-in-10-year drought but does not explicitly consider the conservation potential is referred to as Scenario 3 (see Figure 3.3.2).

3.4 WMDs' Sufficiency Analysis and EDR's Inferred Water Supply and Inferred Water Shortage Values

The EDR expenditure forecasts must rely on the estimates of the difference between the projected demand and the existing water supply. If the difference is negative or zero, no investments in increasing the water supply are needed. In this case, only expenditures for maintaining or replacing existing infrastructure and investments for natural system restoration are needed (see Chapter 5 in this report). In contrast, if the projected demand is greater than the existing supply, additional water supplies should be identified, and invested in, to meet water demand growth.

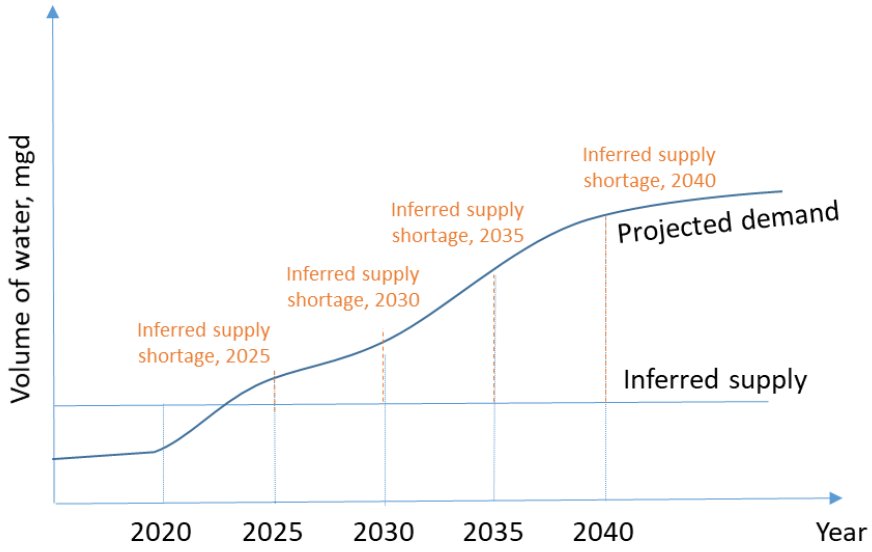
As required by Section 373.709(2), Florida Statutes, water management districts include "sufficiency analysis" in their WSAs/RWSPs. The analyses must identify "sufficient water resource and water supply development project options to meet projected water demands while preventing the loss of natural resources (…)" (SJRWMD 2021[90]). Districts' sufficiency analyses rely on models of potential effects on groundwater resources and natural systems from increased groundwater withdrawals. The Districts' studies focus on sub-regions (e.g., counties or their portions) and incorporate population and withdrawal projections and hydrologic analysis for those relatively small geographical areas. WMDs then examine the potential effects of increased withdrawals and identify the needs for alternative water supply and conservation to offset the withdrawals and ensure future water demands can be met without losing natural systems. DEP summarizes the WMD's estimates of alternative water supply and conservation needs in the "Water Needed" column of the Annual Status Report on Regional Water Supply Planning. EDR utilizes the data from DEP's "Water Needed" column in calculating the "inferred water supply" and "inferred water supply shortage" values.

EDR defines the "inferred water supply shortage" as the projected water demand's exceedance over the existing inferred supply. This "inferred water supply shortage" should not be considered an actual water shortage emergency as defined in the Florida Administrative Code.[91] An "inferred water supply shortage" should instead be seen as a potential future imbalance between the projected demand and the currently existing inferred supply. For the purposes of this assessment, EDR's conceptual supply shortage is more related to a condition of water scarcity and should be first addressed by proactively investing in additional water supplies. For each planning region listed in DEP (2021a) and for each period, the inferred water supply shortage is calculated as the

[89] See Appendix A.5 of the 2021 edition for a summary of EDR drought demand calculations, by region.
[90] Quoted from page 47 of the following document:
SJRWMD. 2021. Central Springs/East Coast Regional Water Supply Plan (2020–2040). Draft. July 12, 2021. Available at: https://www.sjrwmd.com/water-supply/planning/csec-rwsp/#documents (Accessed August 7, 2021.)
[91] The "inferred water supply shortage" is developed for EDR's expenditure forecasts only and it is not the same as "water shortage" as defined in Chapter 40A-21.051, Florida Administrative Code, which describes water shortage as a situation that "usually occurs as a result of a drought." (A similar description is presented in 40A-21, 40B-21, 40C-21, 40D-21 and 40E-21, Florida Administrative Code.)

difference between projected demand in that period and the 2020 inferred water supply (see Figure 3.4.1).

Figure 3.4.1 Schematic Illustration of Inferred Water Supply Shortage Calculations



Any shortage calculation is, of course, dependent on supply. To infer the existing water supply, EDR subtracts "water needed" as reported in DEP (2021a) from the demand projected for the last year of the WMDs' planning horizon (*i.e.*, 2035 or 2040, depending on the region).[92] Note that this inferred supply does not necessarily represent the total water volume available for withdrawals or a precise measurement of the supply of water.[93] The dynamic nature of hydrogeology and water quality do not easily lend themselves to calculating a specific static water supply. The inferred supply described, however, is the best proxy for the total water supply that EDR can use to calculate the expenditure forecasts.

[92] Based on DEP et al. (2019), water needed can be interpreted as the amount of water a WMD identifies as needed to meet future demands.
Reference: DEP, NWFWMD, SFWMD, SWFWMD, SJRWMD, and SRWMD. 2019. Format and Guidelines for Regional Water Supply Planning. 42pp.

[93] For example, in the NWFWMD, water resources are examined using methods such as potentiometric surface mapping, long-term hydrograph trend analysis, generalized groundwater budget evaluation, and groundwater quality analysis. Determining the total water supply is not the goal of such analysis; instead, the focus is on whether the projected demand can impact and potentially harm water resources. In addition to this general determination, the NWFWMD uses the currently permitted volumes of water for public supply to estimate the total demand that can be met, as well as related "water needed." Therefore, as long as projected demand can be met with the permitted water volumes, no other determinations of the total water supply are made by the NWFWMD. The approach is different in selected other regions, where the WMDs identify the total water availability. For example, in the CFWI, it was determined that "the CFWI Planning Area could potentially sustain up to 760 mgd of fresh groundwater withdrawals, but local management strategies will be needed (...) to address unacceptable impacts" (CFWI 2020, p. iv). For the description of the methods used by the WMDs to identify supplies, see Appendix A.6 of the 2021 Edition.
Reference: CFWI. 2020. 2020 Central Florida Water Initiative (CFWI) Regional Water Supply Plan (RWSP), Volume I. Public Review draft.

Table 3.4.1 summarizes the water demand at the end of each WMD's planning period and related water needed information provided by the WMDs and reported in DEP (2021a). Note that these water demand projections focus on demand Scenario 1 (baseline); that is, they do not account for the potential drought nor do they explicitly consider the conservation potential. The projected water demand in the last year of the region's planning horizon minus "water needed" is equal to the inferred water supply, as shown in Figure 3.4.2 below.

Figure 3.4.2 Inferred Water Supply Equation

Table 3.4.1 Inferring Water Supply

Planning Region	Data from DEP (2021a)			Calculations by EDR
	2035 Water Use Projection	**2040 Water Use Projection**	**Water Needed (mgd)**	**Inferred Water Supply***
NW – II	91.19	94.88	5.00	89.88
NW – Oth	304.58	311.90	0.00	311.90
SF – LKB	253.83	257.49	0.01	257.48
SF – UEC	325.38	354.68	3.75	350.93
SF – LEC	1,963.65	2,006.54	49.55	1,956.99
SF – LWC	1,170.36	1,210.68	9.27	1,201.41
SJR – CSEC	416.72	427.87	51.10	376.77
SR – West	122.35	N/A	0.00	122.35
SW – N (excluding CFWI)	173.09	181.73	11.55	170.18
SW – TB	450.56	461.85	0.00	461.85
SW – H (excluding CFWI)	94.96	89.15	0.00	89.15
SW – S	272.99	279.33	0.00	279.33
CFWI	873.94	907.59	95.00	812.59
NFRWSP	667.47	N/A	112.20	555.27

* Estimated as 2040 water use minus water needed. If 2040 water use is not available in DEP (2021a), 2035 water use is applied. This inferred supply does not necessarily represent the total water volume available for withdrawals and/or existing water supply. However, this is the best proxy for the total water supply that EDR can use to develop the expenditure forecasts.

To calculate the inferred supply shortage, water demand information reported in DEP (2021a) is compared with the inferred supply. The inferred supply shortage is the difference between the WMD-projected water demand and the inferred water supply reported in Table 3.4.1. For all regions, except NFRWSP and SR−West, inferred supply shortage is equal to the "water needed" values summarized in DEP (2021a). Note that no water availability determinations, groundwater

or otherwise, are performed by EDR. Further, the analysis of regional inferred supply shortages is not an indicator of water availability on an individual permit basis.

The inferred supply and inferred supply shortage calculations contain four assumptions:

- It is assumed that the estimated demand in the base year was met with the inferred supply and that this base year quantity will continue to be met decades into the future. It does not account for the investments needed to maintain aging infrastructure, relocate wellfields due to saltwater intrusion in coastal areas, or address other impacts on the existing supply.

- It is assumed that the inferred supply in a region does not change over time without investments in alternative water supplies. In the future, EDR plans to refine this assumption. It is recognized that "Water Needed" reported above is based on the specific approaches to estimating the existing supplies used by WMDs, and in some cases, part of the "Water Needed" can still be met by the traditional groundwater sources. For example, based on feedback from SWFWMD, traditional groundwater resources are anticipated to be the primary sources to meet a majority of the projected additional water demands in SW – N through 2040.[94] Groundwater can be a less expensive water supply source as compared with the alternative water supplies, and therefore, the expenditure forecast for SW – N presented in this report may exceed the actual expenditure needs. Another issue to be addressed in the future is the potential change in the inferred existing supply due to the saltwater intrusion, drought, or other issues that could potentially require additional future investments not accounted in this report.

- Regions reported as having zero "water needed" in DEP (2021a) are assumed by EDR to have an inferred supply equal to their highest projected water use. Realistically, it is highly unlikely that the existing sources[95] are precisely the same as the future demand in all of these regions; however, this assumption is still reasonable given the limited data available.

- Although somewhat implausible, natural system restoration needs are assumed to be accounted for in the "water needed" field in DEP (2021a). Taking account of the water necessary to restore or protect natural systems is integral to EDR's statutorily required expenditure calculations. However, water for natural systems is not explicitly identified as a water demand, and it is unclear to what degree natural system restoration is accounted for in the "water needed" field in DEP (2021a). The differences in methodologies used by the WMDs exacerbate this uncertainty (see Appendix A.6 in the report's 2021 Edition for further explanation).

Regardless of these assumptions and due to the complex nature of quantifying water supply across the state, EDR relies on the WMDs' water demand and water needed data to infer supply. The demand, inferred supply, and inferred supply shortage data are shown in Tables 3.4.2 and 3.4.3. Approaches used by the WMDs to evaluate existing supplies are discussed in Appendix A.6 in the report's 2021 Edition.

[94] SWFWMD also continues to support the development of reclaimed water and conservation projects within the Region.
[95] Existing sources include both traditional and alternative sources already built or proposed to be built during the 20-year planning horizon.

Table 3.4.2 Water Demand and Inferred Supply Based on WMD Data

Demand	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Inferred Supply[i]
NW – II	69.74					76.88					82.25					87.03					91.19					94.88	89.88
NW – Oth	254.16					273.72					287.12					296.92					304.58					311.90	311.90
SR - West[ii]	100.55					106.53					110.92					116.69					122.35					127.54**	122.35
SJR – CSEC[iii]	353.17					383.47					395.62					406.11					416.72					427.87	376.77
SW – N (excluding CFWI)	131.08					142.49					153.55					163.54					173.09					181.73	170.18
SW – TB	385.71					413.34					432.77					436.96					450.56					461.85	461.85
SW – H (excluding CFWI)	94.91					91.52					89.45					96.17					94.96					89.15	96.17
SW – S	234.95					245.02					254.22					265.77					272.99					279.33	279.33
SF – LKB	245.29					249.90					251.83					253.68					253.83					257.49	257.48
SF – UEC	272.95					279.15					288.89					298.46					325.38					354.68	350.93
SF – LEC	1,739.61					1,813.99					1,863.91					1,923.28					1,963.65					2,006.54	1,956.99
SF – LWC	980.33					1,030.31					1,073.57					1,113.64					1,170.36					1,210.68	1,201.41
NFRWSP[ii]	555.29					585.06					612.70					641.36					667.47					696.57**	555.27
CFWI	667.12					735.24					789.49					836.65					873.94					907.59	812.59
Statewide	6,084.85					6,426.62					6,686.29					6,936.25					7,181.07					7,407.80	7,043.10

[i]The supply data are inferred by subtracting the region's "water needed" from the highest water demand projected by WMDs for their current planning period, based on DEP (2021a). Green highlighted cells indicate the year of the RWSP/WSA publication for that region which is identified in DEP (2021a). In reality, the availability of sufficient water for all existing and future reasonable-beneficial uses and natural systems while avoiding the adverse effects of competition for water supplies is location-specific.

[ii] The 2040 water demand is projected by EDR using the WMDs' data for 2010-2035, as discussed in Appendix A.1 in the report's 2021 Edition.

[iii] Draft RWSP was published online in July 2021.

Table 3.4.3 Cumulative Inferred Supply Shortages to Be Met through Investments

Planning Regions	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
NWF – II	-					-					-					-					1.31					5.00
NWF – Oth	-					-					-					-					-					-
SR – West	-					-					-					-					-					5.19
SJR – CSEC	-					6.70					18.85					29.34					39.95					51.10
SW – N (excluding CFWI)	-					-					-					-					2.92					11.55
SW – TB	-					-					-					-					-					-
SW – H (excluding CFWI)	-					-					-					-					-					-
SW – S	-					-					-					-					-					-
SF – LKB	-					-					-					-					-					-
SF – UEC	-					-					-					-					-					3.75
SF – LEC	-					-					-					-					6.66					49.55
SF – LWC	-					-					-					-					-					9.27
NFRWSP	0.02					29.79					57.43					86.09					112.20					141.30
CFWI	-					-					-					24.06					61.35					95.00
Statewide (sum of regions)	**0.02**					**36.49**					**76.28**					**139.49**					**224.38**					**371.72**

Note: These values are calculated by subtracting the inferred supply from Table 3.4.2 from the demand in each year of the same table and only display a value when the demand is higher than the inferred supply.

3.5 Water Supply and Water Resource Development Projects: Dataset Used in the EDR Expenditure Analysis

For the expenditure analysis, EDR utilizes the information about project capacity and funding available in Appendix C of DEP (2021a), referred to below as "the project appendix." Overall, the DEP project appendix includes the projects identified in the RWSPs and RPSs (recovery or prevention strategies), the projects implemented and funded by the WMDs or state agencies in the past, and the projects currently being designed or constructed (and funded or co-funded by agencies) in order to meet the RWSP and MFL (Minimum Flows and Minimum Water Levels) RPS goals.[96] Noteworthy differences exist between DEP (2021a) and the previous year's project appendix.

As part of the RWSPs developed pursuant to section 373.709, Florida Statutes, the WMDs are required to compile a list of project options for water supply development and water resource development. For the water supply development component, the project options include traditional and alternative water supply projects. The water that can be made available from these project options (*i.e.*, the total capacity) must exceed the water supply needs for all existing and future reasonable-beneficial uses within the 20-year planning horizon and take into account water conservation. Local governments, public and private utilities, regional water supply authorities, multi-jurisdictional water supply entities, self-suppliers, *etc*., can either choose among the options or develop their own projects when additional supplies are needed. Because the identified projects are statutorily required to be "technically and financially feasible," EDR relies on the appendix for part of its expenditure forecasting.

The water resource development component must support the water supply development component and the natural systems under certain circumstances. While the recovery or prevention strategies (RPSs) for adopted Minimum Flows and Minimum Water Levels (MFLs) are specifically required as part of the water resource development component, section 373.0421, Florida Statutes, requires the WMDs to include in each RWSP any water supply development or water resource development project that is identified in an RPS. Further, the RPS must include a phased-in approach for the development of additional water supplies, implementation of conservation measures, and other actions to achieve recovery to an established minimum flow (for rivers, streams, estuaries, and springs) or minimum water level (for lakes, wetlands, and aquifers), or to prevent the existing flow or water level of such water resources from falling below the established minimum levels.

The project appendix is the most comprehensive statewide dataset of the Florida water supply and water resource development projects currently available. Nevertheless, EDR recognizes that this dataset has two limitations that could influence the expenditure estimates. First, the project appendix primarily includes projects that are eligible for district or state cost-share funding. Such projects can differ from those carried out solely by local entities. Second, the project appendix can include projects implemented or planned for multiple benefits, with water supply or MFL RPS goals being only a secondary benefit. For example, reclaimed water projects can be primarily constructed to dispose of treated wastewater, rather than offset potable water use. Some projects

[96] See the complete list of the columns and project characteristics in Appendix A.7 of the 2021 Edition.

can also be intended to ensure water supply reliability (*e.g.*, at the time of peak demand), diversify water supply sources, and reduce demands on traditional sources rather than to meet new water demand. In addition, projects can be constructed to replace aging infrastructure, providing limited water conservation benefits. EDR assumes, however, that since the project appendix is part of DEP's RWSP Annual Status Update, most of the projects are intended to meet water demand or MFL RPS goals.

The DEP project appendix currently includes 1,694 project items. For each project item, the "Project Status" column indicates whether the item is canceled, completed, in construction or underway, in design, on hold, or an "RWSP or RPS option only." When canceled project items are removed, 1,629 project items remain for further analysis.

The "Project Total" column in the DEP project appendix provides information about the total project funding (if any) by the state, district, and cooperating entity. Cooperative entities in the appendix include counties, municipalities, water utilities, or private entities such as farms, homeowner associations, or golf clubs. The funding information is not always reflective of the project's total implementation cost since it generally does not include information about land purchases[97] or the costs of project components ineligible for funding. This information also excludes funding provided by federal agencies, if any. EDR assumes, however, that the funding from the state, district, and cooperating entity accounts for most of the implementation cost.[98]

Further, for the projects that are listed as RWSP or RPS option only, the "Projected Total Funding (for RWSP/RPS Options Only)" column summarizes information about potential funding requirements (*i.e.*, planning-level cost estimates). This "Projected Total Funding" is an estimate only and is not verified until the project is submitted for cost-share funding to begin design or implementation. Still, this projected funding level represents the best available information regarding the future funding needs and, therefore, EDR includes it in the analysis. Below, the combined "Project Total" and "Projected Total Funding (for RWSP/RPS Options Only)" is referred to as the "project total ($)." EDR indexes "project total ($)" to state fiscal year 2020-2021 (referred to as $2021 throughout this chapter).[99]

EDR also examines whether a project item on the list is a phase of a larger project. For example, the project appendix may list the construction of a water treatment facility and the construction of wells providing water to that facility as separate project items. Further, to evaluate the water or reuse flow made available by the projects (*i.e.*, the project capacity), the columns "Quantity of Water Made Available on Completion (mgd)" and "Reuse Flow Made Available on Project Completion (mgd)" are generally used.[100] For the purposes of this Edition, EDR groups the appendix's projects into more general categories in Table 3.5.1. Of particular note, after this year's

[97] For most projects, "No" is reported for the "Land Acquisition Component" spreadsheet column.
[98] See additional discussion of infrastructure cost and funding in Chapter 5.
[99] See Table A.1.2 in Appendix A for details.
[100] "Quantity of Water Made Available to Date (mgd)" and "Reuse Flow Made Available to Date (mgd)" were also reviewed. This information was used to evaluate project capacity for projects from SWFWMD that had more than one phase. Quantities available today (as opposed to "upon project completion") were also applied to estimate capacity for the following projects: SRWS00003A, SRWS00007A, SJWS00340A, and SFWS00208A. This decision was made due to discrepancies between quantities reported "today" vs. "upon completion," based on the other project details.

review, a significantly higher number of projects were apportioned among the categories, with all categories other than water for the natural systems coming in for a greater array.

Table 3.5.2 General Project Categories Defined by EDR

EDR Project Category	Project Description	Number of Projects in DEP Project Appendix*
Additional water supply to meet growing demand	Projects in the regions with positive 2040 inferred supply shortages, given that the projects are not associated with any MFL RPS. Specifically, the following project types are considered: • Reclaimed Water (for potable offset) • Brackish Groundwater • Surface Water • Surface Water Storage • Groundwater Recharge • Aquifer Storage and Recovery (ASR) • Stormwater • Other Project Type • Other Non-Traditional Source • Desalination • Distribution / Transmission Capacity	960
Water demand management and conservation	• PS and CII Conservation • Agricultural Conservation	570
Water for natural systems	• All projects that are not yet completed and that are associated with specific MFL RPS • Reclaimed water projects for groundwater recharge or natural system restoration, if the project status is listed as in design, in construction / underway, or on hold • All project types if the projects are in the regions with no inferred shortage, if the project status is in design, in construction/underway, or on hold	165
Other	• Flood Control Works • Data Collection and Evaluation	78

* The total is greater than the total number of the projects in the dataset since some projects fall into more than one category.

3.6 Expenditure Projections to Meet the Future Demand

To forecast the expenditures needed to increase existing supply and meet the future demand, EDR considered (a) capacity for the projects completed since relevant WSA/RWSPs were finalized; (b) capacity and expenditures for the projects currently in design, in construction/underway, or on hold, and (c) potential additional projects currently in RWSP/RPS Options Only status.

Upon completion, projects that are in design, in construction/underway, or on hold are expected to reduce the 2040 inferred water shortage from 371.72 to 184.96 mgd (see Table 3.6.1). The total expenditures forecasted for these projects is $647.18 million $2021 (see Table 3.6.1). These expenditures are significantly higher than the expenditures identified in the previous edition of this EDR report ($340.25 million $2020). The difference is attributable to: (1) updates to previously recorded projects in the DEP project appendix, (2) additional projects added to the project list, and (3) methodological changes to how EDR estimates the timing of expenditures for projects. Previously, EDR assumed 50% of a project's total funding had yet to be spent if the project status was in design, in construction/underway, or on hold. That is still true of in construction/underway

projects, but EDR now assumes that 100% of the expenditures for projects with an on hold or in design status should be part of the expenditure forecast (*i.e.*, none of the recorded funding for on hold or in design projects has been spent yet).

The projects in design, construction/underway, or on hold are estimated to completely eliminate the inferred water supply shortage in the NWF – II, SF – UEC, SF – LEC, and SF – LWC. In the remaining regions that still have water supply shortages, EDR assumes that additional investments in water supply or water conservation projects will be made.

[See table on following page]

Table 3.6.1 Analysis of the Projects in Construction, in Design, and On Hold, by Region Where Water is Needed*

Planning Regions	Inferred Supply Shortage by 2040, mgd (end of planning period)	Water by the Projects in Design, Construction, and On Hold, mgd	Remaining Inferred Supply Shortage by 2040, mgd**	Project Expenditures in EDR Forecast (million, $2021)***
(1)	(2)	(3)	(4) = (2) – (3)	(5)
NWF – II	5.00	5.01	-	$21.16
SR – West	5.19	1.99	3.20	$5.01
SJR – CSEC	51.10	25.83	25.27	$156.07
SW – N****	11.55	0.45	11.10	$30.46
SF – UEC	3.75	36.63	-	$11.64
SF – LEC	49.55	88.03	-	$32.62
SF – LWC	9.27	29.97	-	$22.13
NFRWSP	141.30	10.26	131.04	$28.48
CFWI	95.00	80.65	14.35	$339.61
Statewide (sum of regions)	**371.72**	**274.78**	**184.96**	**$647.18**

* The table focuses on the regions with "Water Needed" identified in DEP (2021a). Five regions are not listed because they have no inferred supply shortage: NWF-other, SW-H (excluding CFWI), SW-TB, SW-S, and SF-LKB. Projects considered to be for the natural system restoration are excluded. These are the projects associated with MFL RPS, reclaimed water (for groundwater recharge or natural system restoration), and most of the projects described as restoration (in the "Project Description" field).
** Negative values of the inferred shortage are not reported.
*** Total expenditure forecast for the regions with no inferred shortage are estimated to be $220.02 million, bringing the statewide total to $901.37 million ($2021).
**** Excluding CFWI.

To develop scenarios for supplying the remaining inferred supply shortage of 184.96 mgd, for each planning region, EDR identified suitable project types from the "RWSP/RPS Options Only" alternatives.[101] From those project types, EDR retained only those ranked as "highly" or "moderately likely" to be viable in an undated DEP report on alternative water supplies.[102] EDR used this selection as a basis for estimating the cost of closing the remaining inferred water supply shortage. These project types are summarized in Table 3.6.2.[103]

[See table on following page]

[101] The only exception is NW – II, where all projects are considered, since no "RWSP/RPS Options Only" projects are identified.
[102] DEP. Undated. An Assessment of Viable Alternative Water Supply Resources and Critical Funding Needs. Presented by the FDEP pursuant to Executive Order 19-12 and Chapter 2019-115, Laws of Florida.
[103] See Appendix A.10 for additional details.

Table 3.6.2 Project Types Identified for Each Region to Meet the Inferred Water Supply Shortage

Water Supply Planning Regions where Additional Investments are Needed beyond Completion of the Projects currently in Design, Construction, or on Hold	Brackish Groundwater	Groundwater Recharge	Reclaimed water
SR–West			✓
SJR–CSEC	✓		✓
SW – N (excluding CFWI) *			✓
NFRWSP		✓	✓
CFWI	✓		✓

* The portion of the region excluding CFWI. For the 2023 Edition of the report, EDR plans to refine the assumption of the future water supply sources for the region. Discussions with SWFWMD staff indicated that the future water demand is expected to be met with groundwater, though the District will continue implementing reclaimed water projects as well.

Reclaimed water is expected to play an essential role in meeting the increase in water demand in all regions. In addition, brackish groundwater is likely to be crucial in south and central Florida, while groundwater recharge can be a vital project type in the NFRWSP.

Further, expenditures per-mgd can vary widely on project capacity, prompting EDR to select the median capacity for each project type (see Table 3.6.3). For reclaimed water projects, the median project capacity varied among regions to reflect the differences in project sizes identified by EDR in the DEP project appendix.[104]

Table 3.6.3 Project Capacity, mgd of water or beneficial offset

Project Type	Median Project Capacity, mgd of water or beneficial offset
Aquifer Storage and Recovery	3.00
Brackish Groundwater	4.00
Groundwater Recharge	2.10
Reclaimed Water (for potable offset):	
NW – II	0.36
SR– West	0.28
SJR – CSEC	0.27
NFRWSP	0.22
SW – N*	0.28
SF – UEC	2.06
CFWI	0.55
SF – LWC	2.64
SF – LEC	1.10
Stormwater	1.70
Surface water storage	3.00

* The portion of the region excluding CFWI.

[104] Appendix A.10 of the 2021 Edition discusses alternative project capacity assumptions. These assumptions are unchanged since that Edition of this report.

Project expenditures depend on project capacity, type, and location. EDR developed a multivariate regression model to examine this relationship. The dependent variable in the model is the natural logarithm of "project total ($)" (million dollars). Various combinations of the independent variables were tested, and the final model used in the analysis is described in Appendix A.1. The model includes project capacity (i.e., the natural logarithm of water or beneficial offset for the projects), the region of project implementation, project type, and project status. The model is estimated in the "R" software environment using Fitting Generalized Linear Models (*glm)*, and it explains approximately 74% of the variability in the dependent variable. EDR will continue testing alternative model specifications to improve the model predictive capacity for the 2023 Edition of this report.

The regression model is then used to estimate the project expenditures (per mgd of water or beneficial offset).[105] Note that the estimated expenditures for reclaimed water projects account for the beneficial offset being only 0.55[106] of the actual project capacity. This assumption makes this project type especially expensive (Table 3.6.4). In contrast, brackish groundwater and groundwater recharge projects are relatively inexpensive, but they are only relevant to selected regions.

Table 3.6.4 Estimated Project Expenditures per Unit of Capacity (million $2021 per mgd)

	Brackish Groundwater	Groundwater Recharge	Reclaimed water
SR–West			$12.27
SJR–CSEC	$5.60		$9.28
SW – N***			$14.69
NFRWSP		$0.77	$5.48
CFWI	$1.23		$4.84

Note: Values in this table assume the median project capacity. For reclaimed water projects, the beneficial offset is assumed to be 55 percent of each project's capacity, based on the average of the beneficial offset values reported in DEP (2020).
* Excluding CFWI.

These estimated per-mgd expenditures are then used to forecast the investments needed to meet the remaining inferred supply shortage in each region summarized in Table 3.6.1. EDR uses the most and least expensive project types in these calculations (see columns 6 and 7 in Table 3.6.5). These expenditures are then combined with the costs of the projects currently in construction, in design, and on-hold. As shown in columns 8 and 9 in Table 3.6.5, the total projected expenditures to meet the inferred supply shortage by 2040 are between $1.110 and $1.872 billion (with $1.491 billion being the average). Note that "less expensive" and "more expensive" scenarios show the same costs for several regions since the inferred shortage is expected to be met with the projects already in construction, in design, or on hold. These expenditures are considerably higher than the expenditures identified in the 2021 Edition of this EDR report − $852.00 million $2020. The difference is caused by updates to the DEP project appendix and methodological changes governing how EDR estimates the timing of project expenditures.

[105] Median capacity is assumed for each project type, see Table 3.6.3.
[106] This assumption is based on the average of the beneficial offset values reported in DEP (2020), available online at https://floridadep.gov/water/domestic-wastewater/documents/2020-reuse-inventory-all-appendices-excel. In future editions of this report, EDR plans to explore alternative methods of modeling the beneficial offset provided by reclaimed water projects.

Table 3.6.5 Expenditures Forecast for the Additional Water Supply

Planning Regions	Inferred Supply Shortage by 2040, mgd	Water and Beneficial Offset* for the Projects in Design, Construction, and On Hold, (mgd)	"Project Total" for the Projects in Design, Construction, and On Hold (million, $2021)	Remaining Inferred Supply Shortage By 2040, Mpg***	"Project Total" to Meet Remaining Inferred Shortage (million, $2021)		Total Forecasted Expenditure to meet 2040 Inferred Supply Shortage (million $2021)		
					Less expensive	More expensive	Less expensive	More expensive	Average
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	((8) + (9)) / 2
NWF – II	5.00	5.01	$21.16	-	-	-	$21.16	$21.16	$21.16
SR – West	5.19	1.99	$5.01	3.20	$39.26	$39.26	$44.27	$44.27	$44.27
SJR – CSEC	51.10	25.83	$156.07	25.27	$141.51	$234.51	$297.58	$390.58	$344.08
SW – N**	11.55	0.45	$30.46	11.10	$163.06	$163.06	$193.52	$193.52	$193.52
SF – UEC	3.75	36.63	$11.64	-	-	-	$11.64	$11.64	$11.64
SF – LEC	49.55	88.03	$32.62	-	-	-	$32.62	$32.62	$32.62
SF – LWC	9.27	29.97	$22.13	-	-	-	$22.13	$22.13	$22.13
NFRWSP	141.3	10.26	$28.48	131.04	$100.90	$718.10	$129.38	$746.58	$437.98
CFWI	95.00	80.65	$339.61	14.35	$17.65	$69.45	$357.26	$409.06	$383.16
Statewide (sum of regions)	**371.72**	**274.78**	**$647.18**	**184.96**	**$462.39**	**$1,224.38**	**$1,109.57**	**$1,871.56**	**$1,490.56**

* Accounting for 0.55 beneficial offset coefficient for reclaimed water projects.
** Excluding CFWI.
***Negative values of the inferred shortage are not reported.

To calculate the state's funding contributions toward the total expenditures, EDR considers 272 projects from the DEP project appendix that were completed in the past. These projects are selected because the total of their state, district, and cooperating entity(ies) funding is exactly equal to "project total ($)." The state's funding share differed among the planning regions, with the average share being the highest in the NW – II and the lowest in the SW – N (excluding CFWI) as shown in Table 3.6.6. Statewide, the state funding share is nine percent and the district funding share is 26.6 percent, demonstrating that the cooperative entity or entities cover(s) most of the project expenditures.

Table 3.6.6 Share of State's Funding in the "Project Total ($2021)"

	N	Mean	Median
NW – II	5	0.229	0.307
NFRWSP and SR – West	47	0.130	0.000
SJR – CSEC	48	0.057	0.000
CFWI	51	0.066	0.060
SW – N (excluding CFWI)	5	0.041	0.000
SF – UEC	4	0.106	0.095
SF – LEC	30	0.144	0.091
SF – LWC	18	0.101	0.051

Note: the number of completed projects with a "project total ($)" equal to the total of their state, district, and cooperating entity(ies) funding is unchanged since the 2021 Edition of this report.

The mean estimated funding contributions of the state's expenditures in each region are used to forecast the total state expenditures needed to address the inferred water supply shortage (Table 3.6.7). By 2040, the total is forecasted to range between $84.06 million and $173.02 million, with an average of $128.54 million. The highest investments by 2040 are projected in the NFRWSP

and CFWI. Note that this forecast does not explicitly account for the increased state funding share for the projects in the Rural Economic Development Initiative (REDI) areas.[107]

Table 3.6.7 Estimated State Expenditures (million $2021)

Region	Less expensive	More expensive	Average
NWF – II	$4.85	$4.85	$4.85
SR – West	$5.76	$5.76	$5.76
SJR – CSEC	$16.96	$22.26	$19.61
SW – N (excluding CFWI)	$7.93	$7.93	$7.93
SF – UEC	$1.23	$1.23	$1.23
SF – LEC	$4.70	$4.70	$4.70
SF – LWC	$2.24	$2.24	$2.24
NFRWSP	$16.82	$97.06	$56.94
CFWI	$23.58	$27.00	$25.29
Statewide (sum of regions)	**$84.06**	**$173.02**	**$128.54**

3.7 Expenditure Forecast, Water Conservation, and Drought

The expenditures discussed above focus on the baseline scenario for water use and related inferred shortage calculations. These expenditures do not account for the water use efficiency improvements and water conservation. The overall statewide inferred water supply shortage can be reduced by 70% if the water use efficiency improvements and conservation are accounted for (see Table 3.7.1). Given this water use scenario, the inferred water supply shortage would continue only in CFWI and NFRWSP.

[See table on following page]

[107] As stated in DEO (2020), "Section 288.0656, Florida Statutes, establishes the Rural Economic Development Initiative (REDI) to better serve Florida's economically distressed rural communities by providing a more focused and coordinated effort among state and regional agencies that provide programs and services for rural areas. An 'economically distressed' county/community is eligible to request a 'Waiver or Reduction of Match' of jobs or wage requirements, eligible company criterion, inducement requirement and grants. Each state agency determines which grant programs will allow for a waiver of match based on their annual budget and federal and state guidelines" (quoted from the webpage available at: https://floridajobs.org/community-planning-and-development/community-partnerships/rural-economic-development-initiative; accessed December 2021.)

Table 3.7.1 The 2040 Inferred Water Supply Shortage Given Three Water Demand Scenarios

Regions	Inferred Water Supply, mgd	Baseline Water Demand (Scenario 1)		Water Demand with Conservation (Scenario 2)		Drought Demand (Scenario 3)	
		2040 Water Demand, mgd	Inferred shortage, mgd	2040 Water Demand, mgd	Inferred shortage, mgd	2040 Water Demand, mgd	Inferred shortage, mgd
NW – II	89.88	94.88	5.00	88.88	-	105.89	16.01
NW – Oth	311.90	311.90	-	308.10	-	345.07	33.17
SR – West	122.35	127.54	5.19	116.64	-	137.15	14.80
NFRWSP	555.27	696.57	141.30	643.57	71.94	753.87	198.60
SJR – CSEC	376.77	427.87	51.10	389.65	-	508.56	131.79
CFWI	812.59	907.59	95.00	851.59	39.00	1011.00	198.41
SW – N*	170.18	181.73	11.55	167.65	-	201.40	31.22
SW – TB	461.85	461.85	-	416.88	-	501.24	39.39
SW – H*	96.17	89.15	-	80.85	-	119.74	23.57
SW – S	279.33	279.33	-	258.11	-	335.32	55.99
SF – LKB	257.48	257.49	0.01	257.49	-	303.36	45.88
SF – UEC	350.93	354.68	3.75	340.58	-	481.59	130.66
SF – LEC	1,956.99	2006.54	49.55	1904.14	-	2329.11	372.12
SF – LWC	1,201.41	1210.68	9.27	1184.38	-	1356.84	155.43
Statewide (sum of the region)			**371.72**		**110.94**		**1,447.05**

* Excluding CFWI.

Despite the inferred shortage decrease in Scenario 2, EDR expects limited reductions in the projected expenditures unless most of the water use reduction is achieved through passive conservation. Specifically, for active conservation, the DEP project appendix includes 99 agricultural water conservation projects and 386 PS and CII conservation projects for which both "project total ($)" and project capacity (mgd) are provided. Median costs for these projects are $5.12 and $4.93 million per mgd, respectively. These expenditures are relatively high and comparable with that for the alternative water supply projects. Therefore, the implementation of water conservation strategies is not expected to reduce projected expenditures. The only strategy to reduce the costs is to rely on inexpensive passive water conservation (such as households purchasing more efficient appliances or new urban developments implementing more stringent construction standards).

Table 3.7.2 Expenditure for Water Conservation Projects, million $2021 per mgd of Project Capacity

Project Type	Number of Observations	Mean	Median
Agricultural Conservation	99	17.06	5.12
PS and CII Conservation	386	18.05	4.93

While the water conservation scenario reduces the inferred shortage, the drought scenario can expand the inferred shortage. For example, if a 1-in-10 year drought occurs in 2040, the inferred supply shortage can increase approximately four times, from 371.12 mgd to 1,447.05 mgd (Table

3.7.1). Today, much of the increase in water demand under drought conditions is addressed by available surplus or managed by government-imposed, short-term restrictions on demand. Changing climate conditions may lead to more frequent, prolonged, or severe droughts, requiring significantly higher expenditures to meet water demand in such conditions.

3.8 Expenditures to Ensure That Sufficient Water Is Available for Natural Systems

Part of section 403.928, Florida Statutes, requires EDR to estimate the expenditures necessary to achieve the legislature's intent that sufficient water be available for the natural systems. While the WMDs may use a variety of tools to protect the natural systems, EDR primarily focuses on projects included in recovery or prevention strategies for the implementation of minimum flows and minimum water levels (MFLs); however, there are a few additional conditions under which projects are assumed to benefit the natural systems.

Projects Associated with MFL Recovery or Prevention Strategies

Sections 373.042 and 373.0421, Florida Statutes, provide requirements for the WMDs with regard to the establishment and implementation of MFLs for water courses, water bodies, and aquifers. The MFLs are intended to define "the limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area."[108] These limits are relevant to water supply planning, permitting decisions, and the declaration of water shortages.[109]

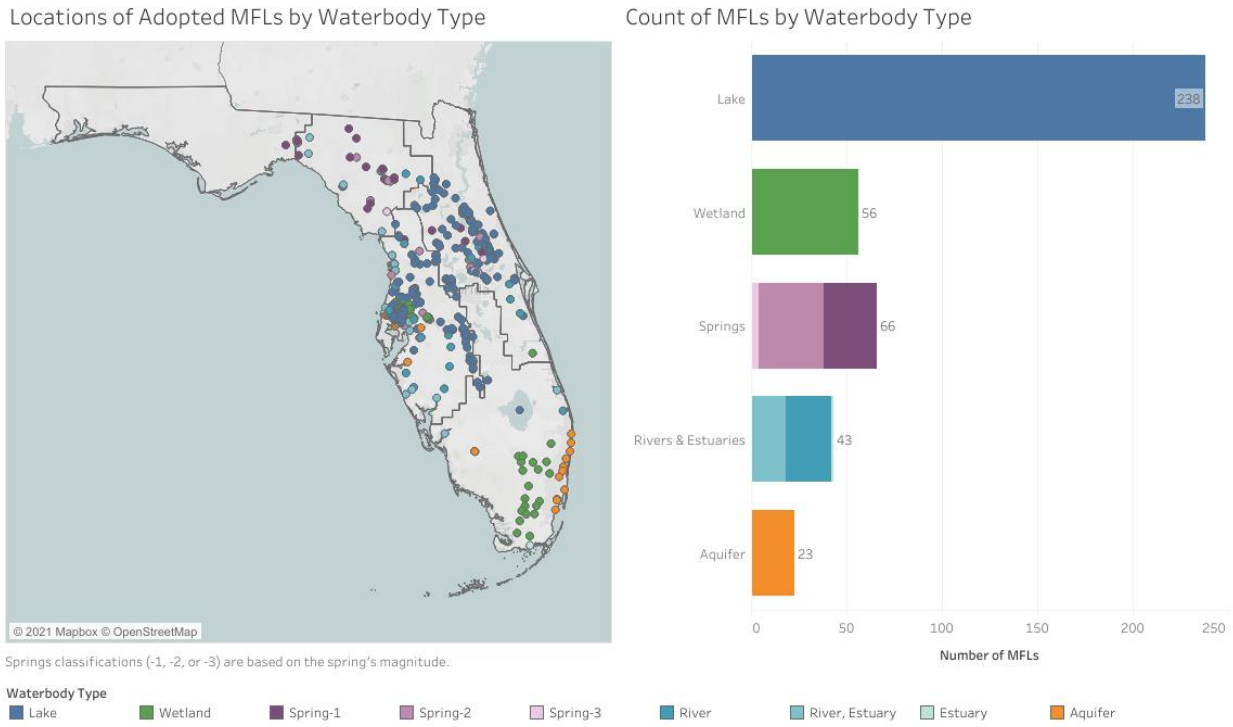
The WMDs are required to adopt (or revise) and implement recovery or prevention strategies to achieve recovery to an MFL as soon as practicable or prevent a future violation of an MFL if it is expected to occur within 20 years.[110] When developing the recovery or prevention strategy, the WMDs must include a phased-in approach or timetable to allow for the provision of water supplies for all existing and projected reasonable-beneficial uses.[111] Once the recovery or prevention strategy is adopted by the appropriate WMD, the applicable RWSP must be amended to include any water supply or water resource development projects.[112] For a visual of all currently adopted MFLs and RPSs by type and status, see Figures 3.8.1 and 3.8.2.

In 2016, the Florida Legislature strengthened the implementation of MFLs for Outstanding Florida Springs (OFSs).[113] The WMDs, excluding NWFWMD, were required to adopt MFLs for all OFSs within their jurisdictions by July 1, 2017.[114] A recovery or prevention strategy for an OFS must identify a prioritized list of projects to implement the plan and include the estimated cost and date of completion for each project, the estimated benefit from each project, and the source and amount of financial assistance available by the applicable WMD.[115] Unlike recovery or prevention

[108] § 373.042, Fla. Stat.
[109] §§ 373.705 and 373.709, Fla. Stat.; Fla. Admin. Code R. 62-40.473(3)-(4);
[110] § 373.0421(2), Fla. Stat.
[111] *Ibid.*
[112] *Ibid*.
[113] *See* 2016-1, §§ 5 and 25, Laws of Fla. (amending section 373.042, Florida Statutes, and creating section 373.805, Florida Statutes, to establish additional MFL requirements for Outstanding Florida Springs).
[114] The deadline for NWFWMD is July 1, 2026.
[115] § 373.805(4), Fla. Stat.

strategies for other water resources, those for OFSs must be designed to achieve the MFLs no later than 20 years after adoption of the strategy and must contain a schedule establishing 5-year, 10-year, and 15-year targets to inform future planning and funding decisions.[116]

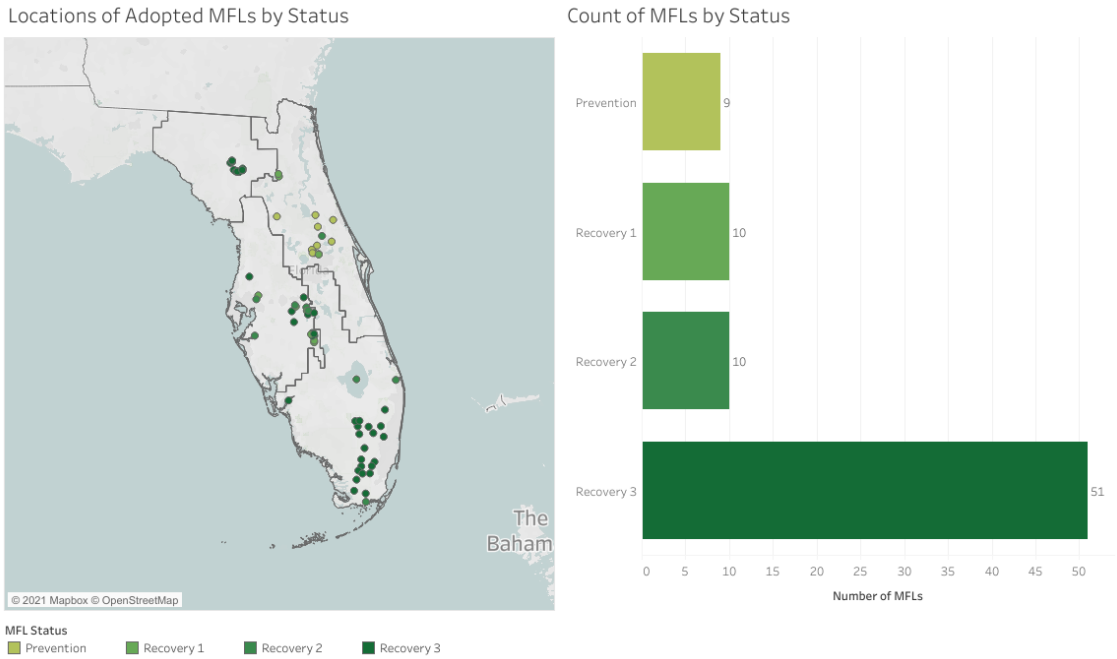
Figure 3.8.1 Locations of Adopted MFLs by Waterbody Type



Source: DEP. 2021b. 2020 Statewide Annual Report (STAR Report). Available online at: https://floridadep.gov/dear/water-quality-restoration/content/statewide-annual-report (Accessed December 2021).

[116] § 373.805(4), Fla. Stat.

Figure 3.8.2 Locations of Adopted MFLs with RPSs by Status



Source: DEP. 2021b. 2020 Statewide Annual Report (STAR Report). Available online at: https://floridadep.gov/dear/water-quality-restoration/content/statewide-annual-report (Accessed December 2021).

EDR analyzed "project total ($)" information for the 89 projects directly associated with the natural system restoration for which all information was available. These projects were assumed to include those related to specific MFL RPSs, reclaimed water (for groundwater recharge or natural system restoration), and most of those described as restoration (in the "Project Description" field). EDR assumed that 50% of the expenditures for the projects in construction/underway statuses would be incurred in the future and, therefore, should be included in the EDR expenditure forecast. EDR also accounted for the total expenditures for the projects identified as "RWSP or RPS Option Only" and associated with specific MFL RPS. In total, it is expected that the natural system restoration projects would cost $626.14 million (see Table 3.8.1).

For comparison, the last edition of this EDR report projected the needed expenditure of $448.76 million. The difference in the forecast is caused by updates to the DEP project database, more granular identification of natural system restoration projects, and methodological changes governing how EDR estimates the timing of project expenditures. Previously, EDR assumed 50% of a project's total funding had yet to be spent if the project status was in design, in construction/underway, or on hold. That is still true of in construction/underway projects, but EDR now assumes that 100% of the expenditures for projects with an on hold or in design status should be part of the expenditure forecast (*i.e.*, none of the recorded funding for on hold or in design projects has been spent yet).

For the projects associated with MFL RPSs and implemented in the past, the average percentage of the state funding is 11.1%, and the average percentage of district funding is 39.6% (based on a sample of 48 projects). Therefore, the forecasted state expenditure for the MFL RPS projects is $69.50 million (or 0.111 x $626.14 million).

Note that these estimates may be too low since it is unclear whether the projects in the appendix are sufficient to meet the MFL target for the related natural systems. Further, it does not account for Everglades restoration which is discussed in Chapter 6, as these projects are largely part of the Comprehensive Everglades Restoration Plan (CERP). Conversely, some of the projects considered by EDR as natural system restoration projects may in fact address the needs of the growing water demand in the region, leading to an overlap between the estimated expenditures for water supply and the natural systems.

While the DEP's Water Resource Implementation Rule states that the WMDs must expeditiously implement all adopted recovery or prevention strategies,[117] there is no generally applicable target date mandated by law to achieve the adopted MFL. Only recovery or prevention strategies for Outstanding Florida Springs (OFSs)[118] are required to contain 5-year, 10-year, and 15-year targets, with achievement of the adopted MFL to occur no later than 20 years after adoption of the strategy.[119] Without a required timeframe to achieve MFLs, the timing of the nearly $70 million in state expenditures is a decision for policy makers.

[See table on following page]

[117] Fla. Admin. Code R. 62-40.473(7).
[118] An "Outstanding Florida Spring" is defined as "all historic first magnitude springs, including their associated spring runs, as determined by the department using the most recent Florida Geological Survey springs bulletin, and the following additional springs, including their associated spring runs: (a) De Leon Springs; (b) Peacock Springs; (c) Poe Springs; (d) Rock Springs; (e) Wekiwa Springs; and (f) Gemini Springs. § 373.802(4), Fla. Stat.
[119] § 373.805(4), Fla. Stat.

Table 3.8.1 Projects Associated with Natural System Restoration

Regions	MFL RPS Supported, if applicable	Project Status	Number of projects	Project total (million $2021)	Project total in EDR Expenditure Forecast (million $2021)
SJR-CSEC	Restoration outside MFL RPS	Construction/Underway	1	128.40	64.2
		Design	1	10.60	10.6
		Total	**2**	**139.00**	**74.8**
	Silver Springs Prevention Strategy	Construction/Underway	5	25.22	12.61
		Design	1	1.61	1.61
		RWSP or RPS Option Only	2	45.79	45.79
		Total	**8**	**72.62**	**60.01**
	Volusia Recovery and Prevention Strategy	Construction/Underway	2	7.35	3.67
		Design	2	18.83	18.83
		RWSP or RPS Option Only	6	118.86	118.86
		Total	**10**	**145.04**	**141.36**
		Total for the region	***20***	***356.65***	***276.17***
SR-West	Restoration outside MFL RPS	Design	2	6.59	6.59
		Total for the region	***2***	***6.59***	***6.59***
SW-TB	Lower Hillsborough River Recovery Strategy	Construction/Underway	1	38.57	19.28
		Total	**1**	**38.57**	**19.28**
	Restoration outside MFL RPS	Construction/Underway	4	20.65	10.33
		Total	**4**	**20.65**	**10.33**
		Total for the region	***5***	***59.22***	***29.61***
SW-S	Restoration outside MFL RPS	Construction/Underway	1	31.0	15.5
		Total for the region	***1***	***31.0***	***15.5***
CFWI	Restoration outside MFL RPS	Construction/Underway	2	1.61	0.8
		Total	**2**	**1.61**	**0.8**
	Southern WUCA Recovery Strategy	Construction/Underway	1	67.50	33.75
		Total	**1**	**67.50**	**33.75**
		Total for the region	***3***	***69.11***	***34.55***
NFRWSP	LSFIR Recovery Strategy	Construction/Underway	6	20.71	10.36
		Design	10	83.20	83.2
		On Hold	3	5.74	5.74
		RWSP or RPS Option Only	36	157.26	157.26
		Total	**55**	**266.91**	**256.56**
	Restoration outside MFL RPS	Design	3	7.16	7.16
		Total	**3**	**7.16**	7.16
		Total for the region	***58***	***274.08***	***263.72***
Total for the state			**89**	**796.65**	**626.14**

Note: This Table does not include Everglades Restoration projects since the Comprehensive Everglades Restoration Plan (CERP) is discussed in Chapter 7.

Other Projects Potentially Intended for Natural System Protection and Restoration

In addition to the projects linked to the MFL RPS, EDR assumed that the natural system protection and restoration goals can be met with the following projects that are currently in design, construction / underway, or on hold: (a) projects classified as "Reclaimed Water (for groundwater recharge or natural system restoration)", and (b) projects where existing supplies are already sufficient for meeting projected future demands (*i.e.*, projects in the regions with no inferred water supply shortage identified in Table 3.4.3).

Five "Reclaimed Water (for groundwater recharge or natural system restoration)" projects are currently being implemented in three planning regions, with the total project expenditures of

$41.22 million (Table 3.8.2). Based on the completed groundwater recharge or natural system restoration projects, the state funds, on average, account for 30.0% of the project expenditures (with WMDs covering 35.0%). Therefore, for the projects currently in design, construction/underway, and on hold, the state funding can be estimated at $12.34 million (or $41.22 x 0.30).

Table 3.8.2 Expenditures for "Reclaimed Water (for groundwater recharge or natural system restoration)" Projects Currently in Design, in Construction / Underway, or on Hold

Regions	Number of Observations	Project Total, million $2021
CFWI	2	$1.62
NFRWSP	4	$18.45
SW – TB	2	$21.15
Statewide (sum of the regions)	**8**	**$41.22**

Next, the projects currently being implemented in the regions that have sufficient existing supply are considered. The total implementation expenditure for these projects is $175.30 million. Based on past projects, the average share of state funding for such projects is small – just 0.041 (i.e., approximately 4.1%). Therefore, EDR expects that the future state funding for the projects in the regions with no inferred water supply shortage is $7.19 million.

3.9 Total Projected Expenditure

Overall, ensuring that sufficient water is available for natural systems is projected to require an investment of $842.66 million, with $89.03 million (approximately 10.5 percent) being covered by the state funds (Table 3.9.1). In addition, the expenditure to address the 2040 inferred water supply shortage is projected at $1.491 billion, with the estimated state share being $128.54 million. Overall, by 2040, $2.333 billion is needed,[120] with the state covering $217.57 million (Table 3.9.2). In the 2021 Edition, the total for natural systems was reported as $448.76 million with a state share of $49.81 million. The difference does not reflect a change in conditions, but rather is largely attributable to SJRWMD, SWFWMD, and SFWMD's recent review of projects that benefit MFL RPSs in their updated RWSPs. The review included a reassessment of which projects were still needed.

[See table on following page]

[120] Assuming that the MFL RPS projects are implemented by 2040.

Table 3.9.1 Projected Expenditures to Ensure that Sufficient Water Is Available for Natural Systems (million $2021)

Expenditure	MFL RPS projects	Reclaimed water for groundwater recharge or natural system restoration	Projects in the regions with no inferred water supply shortage	Total
Total expenditures	$626.14	$41.22	$175.30	**$842.66**
State share	$69.50	$12.34	$7.19	**$89.03**

Table 3.9.2 Total Projected Expenditures by 2040, million $2021

Expenditures	Addressing Inferred Water Supply Shortage*	Providing Water for Natural Systems	Overall Total
Total expenditures	$1,490.56	$842.66	**$2,333.22**
State share of expenditures	$128.54	$89.03	**$217.57**

* Considering the average between the less and more expensive scenarios.

3.10 Development of EDR's Pilot Model

To facilitate the expenditure forecast, EDR is in the process of producing an independent statewide water use forecasting model that reflects the official consensus estimating conference results[121] as well as continually updated EDR outlooks on Florida's demographics and economic conditions. This will enable on-demand fiscal simulations of various economic, demographic, and climate scenarios using the latest data. With relatively modest updates to the demand model since the previous Edition of this report, EDR's results are similar to the previous Edition. These results are compared to the WMDs' projections to identify significant differences that may prompt additional research prior to submitting EDR's pilot model for peer-review. Submission of peer-review is now expected in the 2023-24 fiscal year, with more robust results first being reported in the 2023 Edition. At this time, the pilot model's results should not be interpreted to be more robust than those presented in Section 3.6.

For a thorough and detailed explanation of EDR's pilot model, see the 2021 Edition. In section 3.10 of this Edition, EDR only discusses additional changes and improvements to that model.

EDR's Pilot Model Future Supply Shortage

EDR's pilot model uses inferred existing supply to estimate potential future supply shortages that should be addressed through new investments. The results confirm the conclusion made from the WMDs' water demand projections that additional water supply will need to be developed,

[121] The Economic Estimating Conference develops official projections related to the state economy, while the Demographic Estimating Conference develops official information concerning the population (§ 216.136, Fla. Stat.). General provisions for the Consensus Estimating Conferences are defined in § 216.134, Fla. Stat. Specifically, the Consensus Estimating Conferences are within the legislative branch. The membership of each estimating conference consists of principals and participants. The principals of each conference shall be the professional staff of the Executive Office of the Governor designated by the Governor, the coordinator of EDR, the professional staff of the Senate designated by the President of the Senate, and the professional staff of the House of Representatives designated by the Speaker of the House of Representatives.

although, the pilot model projects a smaller difference of 124.16 mgd between the forecasted demand and estimated water supply by 2040. In contrast, the results based on the WMDs' 2040 water use projections suggest a larger shortage of 371.72 mgd. The difference is due to the lower water use forecasted by EDR's pilot model, as compared to the WMDs' projections. EDR's pilot model indicates that water supply investments are needed in North Florida (NFRWSP) and SWFWMD (the Heartland, Southern and Tampa Bay regions). The potential 2040 supply shortages using both methodologies can be found in Table 3.10.1.

Table 3.10.1 2040 Supply Shortage Estimates – EDR's Pilot Model and EDR Results based on WMD Data (mgd)

Regions	Using WMD	EDR Pilot
NW – II	5.00	-
NW – Oth	-	-
SR – West	5.19	-
NFRWSP	141.30	43.21
SJR – CSEC	51.10	-
SW – N (excluding CFWI)	11.55	-
SW – TB	-	12.97
SW – H (excluding CFWI)	-	15.42
SW – S	-	52.56
CFWI	95.00	-
SF – LKB	-	-
SF – UEC	3.75	-
SF – LEC	49.55	-
SF – LWC	9.27	-
Statewide	**371.72**	**124.16**

EDR's Pilot Model Expenditure Forecast

In order to develop an expenditure forecast that addresses the supply shortage, certain assumptions regarding the projects must be made. These assumptions include the choice of project types and sizes for each region where water use is projected to exceed existing supplies. Similar to the approach discussed in Appendix A.10 in the report's 2021 Edition, water supply development scenarios can be derived from the past projects and future project options included in the DEP project appendix and a recent DEP assessment[122] of this issue. In that assessment, reclaimed water is ranked as a "high confidence" water source for all of the relevant regions. A similarly high rating is assigned to surface water and brackish groundwater in the SW – S and SW – TB, and to groundwater recharge in the NFRWSP.

[122] DEP. Undated. An Assessment of Viable Alternative Water Supply Resources and Critical Funding Needs. Presented by the FDEP pursuant to Executive Order 19-12 and Chapter 2019-115, Laws of Florida.

Implementation Costs per Unit of Project Capacity

The EDR model presented in Appendix A.1 can predict the project costs, given specific project types, sizes, implementation region, and status. Assessment of the unit project costs for the NW – II and NFRWSP are discussed in the previous sections. Following a similar approach, reclaimed water project costs for SW – H (outside CFWI) are estimated at $25.49 million per mgd. Projects in the SWFWMD (outside CFWI) tend to be more expensive; moreover, the average size of the reclaimed water projects in the SW – H is small, which increases the cost per unit of the project capacity. In turn, in the SW – S, brackish groundwater projects are large (on the median), and their average costs are estimated at $10.50 million per mgd. Reclaimed water projects are generally less expensive (estimated at $8.11 million per mgd, on average), and groundwater recharge projects are even more so (estimated at $3.88 million per mgd, on average).

Statewide Expenditure Forecast to Ensure Sufficient Water is Available

The unit cost for various project types and regions can be combined with the estimates of the potential future supply expansion needs (from the pilot model) and the cost of projects already in design, construction/underway, and on hold to generate low − and high − cost expenditure scenarios. On the statewide level, the project expenditures estimated using EDR's pilot model (*i.e.*, $1,195.34 million by 2040) are modestly lower than those estimated using the WMD's water demand projections ($1,490.56 million by 2040). Greater differences appear in the expenditure projections at the regional level, with EDR's pilot model forecasting the bulk of the expenditures occurring in the SW – H (outside CFWI) and SW – S, with some expenditures also needed in the NFRWSP and SW – TB. In contrast, the WMDs' demand estimates point to potential supply expansion needs in the NFRWSP, SW – N (excluding CFWI), CFWI, and SF – LEC. Since EDR focuses on the statewide expenditure forecast, the pilot model's accuracy regarding specific regional expenditure predictions needs further discussion with the WMDs and DEP. These results are shown in Table 3.10.1 below.

As a placeholder, the expenditure forecast for the natural systems from Section 3.8 is included in Table 3.10.2 below. While EDR's pilot water use model is not expected to affect the general approach to the natural system expenditure estimates (which is based on the sum of the expenditures for the projects identified by the WMDs), several issues still need to be addressed. Most importantly, how do supply estimates relate to the needs of the natural system restoration? EDR's pilot model seems to project water demand exceedance in regions considered by the WMD as having sufficient water supply. Does this mean that the projects currently in design, construction/underway, or on hold in these regions are intended for natural system restoration? In many regions, MFLs have already been developed. In the absence of corresponding RPSs, it is not clear if MFLs should be used by EDR to indicate that the existing demand in the region already exceeds (or will likely exceed) the existing supply. Overall, the link between the demand projections, existing supply estimates, and the water needs for the natural systems must be further discussed and clarified.

Table 3.10.2 Statewide Expenditures forecast, Total for 2020-2040, Pilot Model (million $2021)

Planning Regions	Projects in Design, Construction, and On Hold (million, $2021)	Project Meet Remaining Inferred Shortage (million, $2021)		All Projects (million $2021)		
		Less expensive	More expensive	Less expensive	More expensive	Average
(1)	(2)	(3)	(4)	(5)	(6)	((5) + (6)) / 2
SW – TB	$63.31	$4.54	$139.82	$67.85	$203.13	$135.49
NFRWSP	$28.48	$33.27	$236.79	$61.75	$265.27	$163.51
SW – H*	$1.73	$393.06	$393.06	$394.79	$394.79	$394.79
SW – S	$123.65	$203.93	$551.88	$327.58	$675.53	$501.56
Statewide (sum of regions)	$217.17	$634.80	$1,321.54	$851.97	$1,538.71	$1,195.34
Natural Systems				$842.66	$842.66	$842.66
Total Expenditure				**$1,694.63**	**$2,381.37**	**$2,038.00**

* excluding CFWI.

3.11 Next Steps and Recommendations

In the future, EDR plans to continue enhancing the water use forecasting model. Yet, even the current pilot model allows for the following insights:

- EDR's pilot model results in a total expenditure forecast that is, on the whole, lower than the forecast reported in Table 3.9.2 (*i.e.*, the forecast based on the WMDs' demand projections). The key difference is which regions are predicted to have inferred future supply shortages because the project costs vary significantly between regions (see Table 3.6.5). While EDR is required to produce a statewide expenditure forecast, differences at the regional level determine the magnitude of the statewide expenditures.

- The EDR pilot model calls for making investments in alternative water supplies sooner than the forecast based on the WMD data. In fact, for the regions with potential future supply shortages, the bulk of the water supply expenditures are needed in the 2020s.

- Significant improvements in water use efficiency and conservation are forecasted by EDR's pilot model. While some of these improvements can be costless (*i.e.*, passive conservation), others will require significant investments. In the future, the expenditures needed to maintain or accelerate water use efficiency improvements and water conservation should be further explored.

- A critical area for improvement is a better understanding of "beneficial use volume for the total reclaimed water flow" as used in DEP's reclaimed water use inventory and database. Furthermore, EDR's pilot model forecast is based on the assumption that the existing reclaimed water use is precisely equal the available reclaimed water supply. Additional analysis is needed to verify the assumption and strengthen the evaluation of existing reclaimed water supply.

- Expenditures for natural system protection and restoration should be better integrated into EDR's pilot model in the future. An initial step in this process is a discussion of the projects

currently in design, construction/underway, or on hold in the regions with no "Water Needed" identified in DEP (2021a).

- The 2022 Edition includes a limited discussion of drought preparedness expenditures. The discussion of drought impacts on future water demand, existing supplies, and natural systems should be expanded in future editions.

Overall, EDR will continue enhancing the water use and expenditure forecasting model in preparation for submission for peer-review.

4. Estimating Future Expenditures Necessary to Comply with Laws and Regulations Governing Water Quality Protection and Restoration

The Office of Economic and Demographic Research (EDR) is required to forecast expenditures necessary to comply with laws and regulations associated with water quality protection and restoration. This edition further estimates future expenditures relating to state programmatic costs to implement the total maximum daily loads program and basin management action plans. Future editions will continue to refine the existing analyses as better data becomes available and will begin to analyze relevant compliance costs of local governments and public and private utilities to meet requirements related to water quality protection and restoration. While this chapter largely focuses on the primary water quality improvement initiatives required by the federal Clean Water Act and the Florida Watershed Restoration Act, future editions will incorporate other important state and regional water quality protection and restoration initiatives.

4.1 State and Federal Laws and Regulations Governing Surface Water Quality

Florida has an abundance of surface water resources. The protection of these resources is vitally important. Water pollution not only affects Florida's inland and coastal waters, it can also impact the public health of residents and visitors who use and enjoy Florida's waters. According to the United States Environmental Protection Agency (EPA), nonpoint sources of pollution are reported as the leading cause of surface waterbody impairment nationwide[123] and are the largest contributor of pollutants to surface and groundwater in Florida.[124] Unlike point sources of pollution that are conveyed to waterbodies by discrete means, nonpoint pollution comes from many diffuse sources that are generally transported to waterbodies through stormwater runoff.[125] Potential sources of nonpoint source pollution include runoff from agricultural and urban landscapes, septic tanks, and atmospheric deposition. The most significant surface water quality issue identified statewide is excessive nutrients (nitrogen and phosphorus) from both point and nonpoint sources. The Florida Department of Environmental Protection (DEP) is responsible for implementing various surface water quality-related directives under federal and state law. Much of this effort is undertaken in coordination with other state agencies, the water management districts (WMDs), local governments, universities, and other public and private stakeholders.

In 1972, Congress passed the Clean Water Act (CWA) with a purpose to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[126] Two national goals were also declared: (1) the elimination of pollutant discharges into navigable waters by 1985; and (2) fishable and swimmable waters by 1983.[127] Although water pollution still remains an issue nationwide, the intent behind these ambitious goals still embody the implementation of the CWA.

[123] U.S. Environmental Protection Agency, Basic Information about Nonpoint Source (NPS) Pollution, Overview, available at: https://www.epa.gov/nps/basic-information-about-nonpoint-source-nps-pollution (Accessed November 2021.)
[124] Florida Department of Environmental Protection, Nonpoint Source Program Update, April 2015 at 9, available at: https://floridadep.gov/sites/default/files/NPS-ManagementPlan2015.pdf (Accessed November 2021.)
[125] Hydromodification activities can also cause nonpoint source pollution.
[126] 33 U.S.C. § 1251(a).
[127] 33 U.S.C. § 1251(a).

While the CWA establishes the federal framework governing water quality protection and restoration, it is structured in a manner that recognizes the primary responsibilities and rights of states to control water pollution.[128] To this end, the CWA imposes various wide-scale requirements on states with regard to water quality management. These initiatives include establishing and periodically reviewing surface water quality standards, assessing the condition of waterbodies, and establishing water quality goals through the adoption of total maximum daily loads (TMDLs) for waterbody segments which do not meet water quality standards, and implementing controls for permitted sources of pollution. This federal and state partnership is further demonstrated by the availability of federal grants to assist states with the implementation of various water quality programs and initiatives.

In even numbered years, states are required to meet reporting requirements under CWA sections 303(d), 305(b), and 314, which identify impaired waters, provide a description of the water quality of all waters in the state, and provide an assessment of the status and trends of significant publicly owned lakes, respectively.[129] DEP prepares the Integrated Water Quality Assessments for Florida, which are available on its website.[130]

The main regulatory components of the CWA prohibit discharges of pollutants into waters of the United States except in compliance with the provisions of the CWA. This includes the regulation of pollutants discharged from point sources under the National Pollutant Discharge Elimination System (NPDES) permit program[131] and discharges of dredged or fill material.[132] The CWA also regulates the use and disposal of biosolids from wastewater treatment processes.[133] Although most nonpoint sources of pollution are not controlled through regulatory measures, the CWA incentivizes nonpoint source management through federal grants to address nonpoint source pollution.[134]

Recent Legislation

In 2020, the Florida Legislature passed the Clean Waterways Act[135] addressing many environmental issues related to water quality improvement in the state. The act requires the Department of Agriculture and Consumer Services (DACS) to inspect agricultural producers enrolled in best management practices at least once every two years, prioritizing operations in certain Basin Management Action Plan (BMAP) areas. Further, it transfers the Onsite Sewage Program from the Department of Health to DEP and allows DEP to provide grants for certain wastewater treatment projects in BMAP areas. The act additionally addresses water quality improvements related to stormwater, biosolids, and golf courses, including setting new expectations for water quality monitoring.[136] A number of the act's provisions are forward looking,

[128] 33 U.S.C. § 1251(b).
[129] 33 U.S.C. §§ 1313, 1315, and 1324.
[130] https://floridadep.gov/dear/dear/content/integrated-water-quality-assessment-florida. (Accessed November 2021.)
[131] 33 U.S.C. § 1342
[132] 33 U.S.C. § 1344.
[133] 33 U.S.C. § 1345.
[134] 33 U.S.C. § 1329.
[135] *See* Ch. 2020-150, Laws of Florida, available at: http://laws.flrules.org/2020/150.
[136] For a concise summary of the bill see:
https://www.flsenate.gov/PublishedContent/Session/2020/BillSummary/Community_CA0712ca_00712.pdf. (Accessed November 2021.) For a more thorough analysis, see:

the full impact of which will follow rule development, appropriations, and study results. Much of the rulemaking process is still underway.[137]

In 2021, the Legislature passed Committee Substitute for Senate Bill 64,[138] relating to reclaimed water. It requires local wastewater utilities to submit a plan to the DEP to eliminate harmful surface water discharge. The plans should include timeframes to meet requirements outlined in this and other related legislation. Depending on how the local wastewater utility plans proceed, they will be eligible to receive funding from existing programs including the Water Protection and Sustainability Program and the Drinking Water State Revolving Fund. The bill also incentivizes the implementation of authorized graywater technology under certain circumstances.

Water Quality Assessment and Total Maximum Daily Loads for Impaired Waters

Water quality assessment begins with water quality standards. The Clean Water Act directs states to establish surface water quality standards, or if the state fails to act, requires the EPA to do so.[139] Florida's surface water quality standards are adopted by rule in chapter 62-302 of the Florida Administrative Code, and consist of designated uses,[140] numeric and narrative criteria necessary to safely support such uses, the state's anti-degradation policy, and moderating provisions (such as variances, mixing zone rules, or exemptions).[141] See Table 4.1.1 which identifies the seven classes of designated uses in Florida, beginning with the classification having the highest degree of protection (*i.e.*, Class I – Potable Water Supplies).

Table 4.1.1 Classification of Surface Waters

CLASS I	Potable Water Supplies
CLASS I-Treated	Treated Potable Water Supplies
CLASS II	Shellfish Propagation or Harvesting
CLASS III	Fish Consumption; Recreation, Propagation, and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife
CLASS III-Limited	Fish Consumption; Recreation or Limited Recreation; and/or Propagation and Maintenance of a Limited Population of Fish and Wildlife
CLASS IV	Agricultural Water Supplies
CLASS V	Navigation, Utility, and Industrial Use

Source: Fla. Admin. Code R. 62-302.400(1).

The cornerstone of water quality restoration under the CWA is the development and implementation of total maximum daily loads for waterbodies or waterbody segments that are not

https://www.myfloridahouse.gov/Sections/Documents/loaddoc.aspx?FileName=h1343z1.ANRS.DOCX&DocumentType=Analysis&BillNumber=1343&Session=2020 . (Accessed November 2021.)

[137] For the current status of DEP's rulemaking activities, see https://floridadep.gov/water/domestic-wastewater/content/water-reuse-news-rulemaking-information.

[138] Chapter 2021-168, Laws of Florida. See http://laws.flrules.org/2021/168. (Accessed February 2022.)

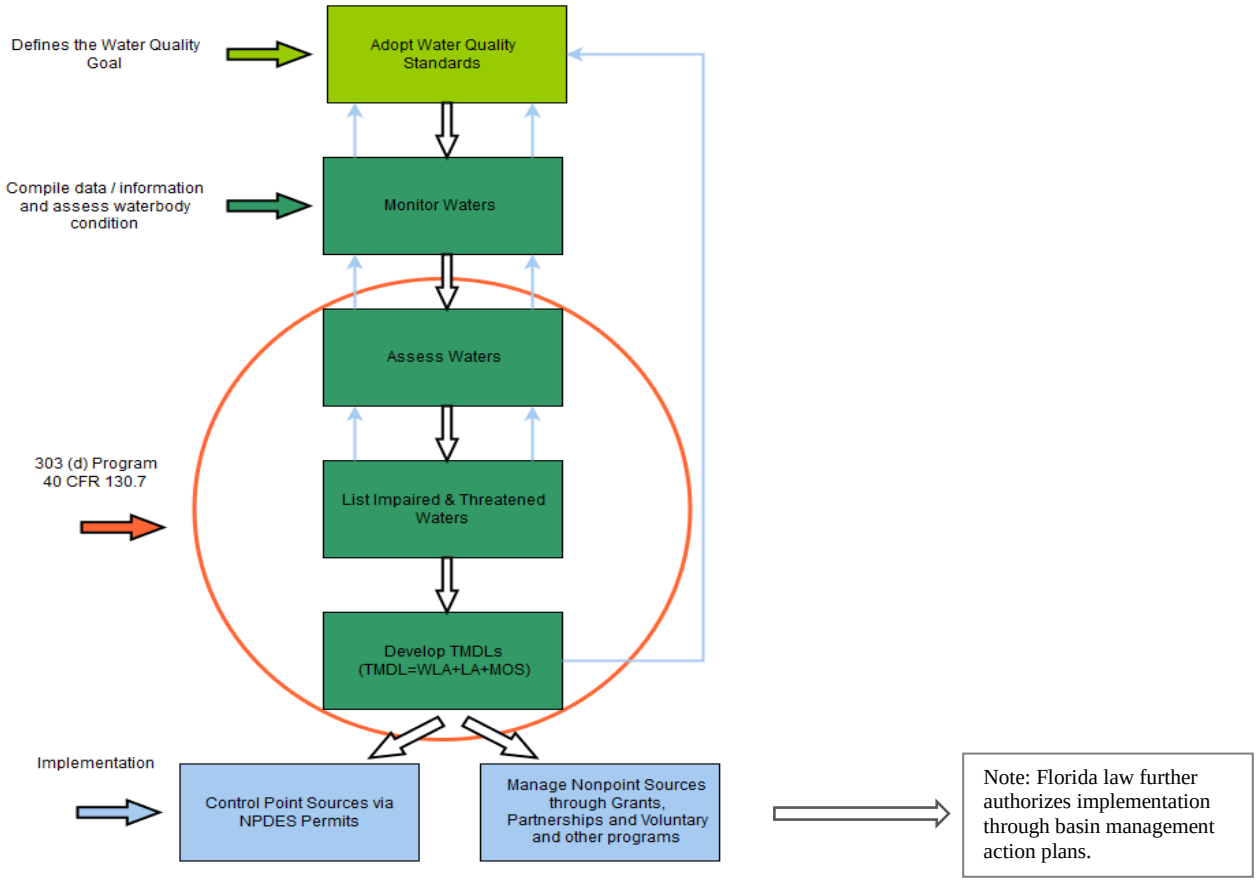
[139] 33 U.S.C. § 1313(a)-(c).

[140] The term "designated use" is defined as "the present and future most beneficial use of a body of water as designated by the Environmental Regulation Commission by means of the Classification system contained in [rule chapter 62-302]." Fla. Admin. Code R. 62-302.200(9).

[141] Fla. Admin. Code R. 62-302.200(42).

fully meeting their designated uses. In 1999, the Florida Legislature passed the Florida Watershed Restoration Act, section 403.067, Florida Statutes, which established the state's TMDL program to implement the requirements in section 303(d) of the federal Clean Water Act.[142] Under this program, waters identified as impaired are placed on DEP's Verified List of impaired waterbodies for which TMDLs must be developed.[143] The list is adopted by DEP secretarial order and is submitted to the EPA biennially pursuant to 303(d) of the Clean Water Act.[144] The EPA must approve or disapprove the 303(d) list and may independently add additional waterbodies not identified by the state. Figure 4.1.1 illustrates the general approach for water quality restoration under the CWA.

Figure 4.1.1 Water Quality-Based Approach of the Federal Clean Water Act



Note: WLA refers to wasteload allocation for point sources, LA refers to load allocations for nonpoint sources, and MOS refers to the margin of safety to account for uncertainty.
Source: U.S. Environmental Protection Agency, Overview of Identifying and Restoring Impaired Waters under Section 303(d) of the CWA, https://www.epa.gov/tmdl/overview-identifying-and-restoring-impaired-waters-under-section-303d-cwa. (Accessed November 2021.)

[142] 33 U.S.C. § 1313(d).
[143] *See generally* Fla. Admin. Code Ch. 62-303 (establishing the methodology for identifying impaired waters to be included on the state's Verified List of impaired waters, as well as the Planning List and Study List identifying potentially impaired waters and waters where additional information is needed, respectively).
[144] *See* Fla. Admin. Code R. 62-303.100(1); *see also* Fla. Admin. Code R. 62-303.150(1). The current Statewide Comprehensive Verified List of Impaired Waters is available at: https://floridadep.gov/dear/watershed-assessment-section/content/assessment-lists. (Accessed November 2021.)

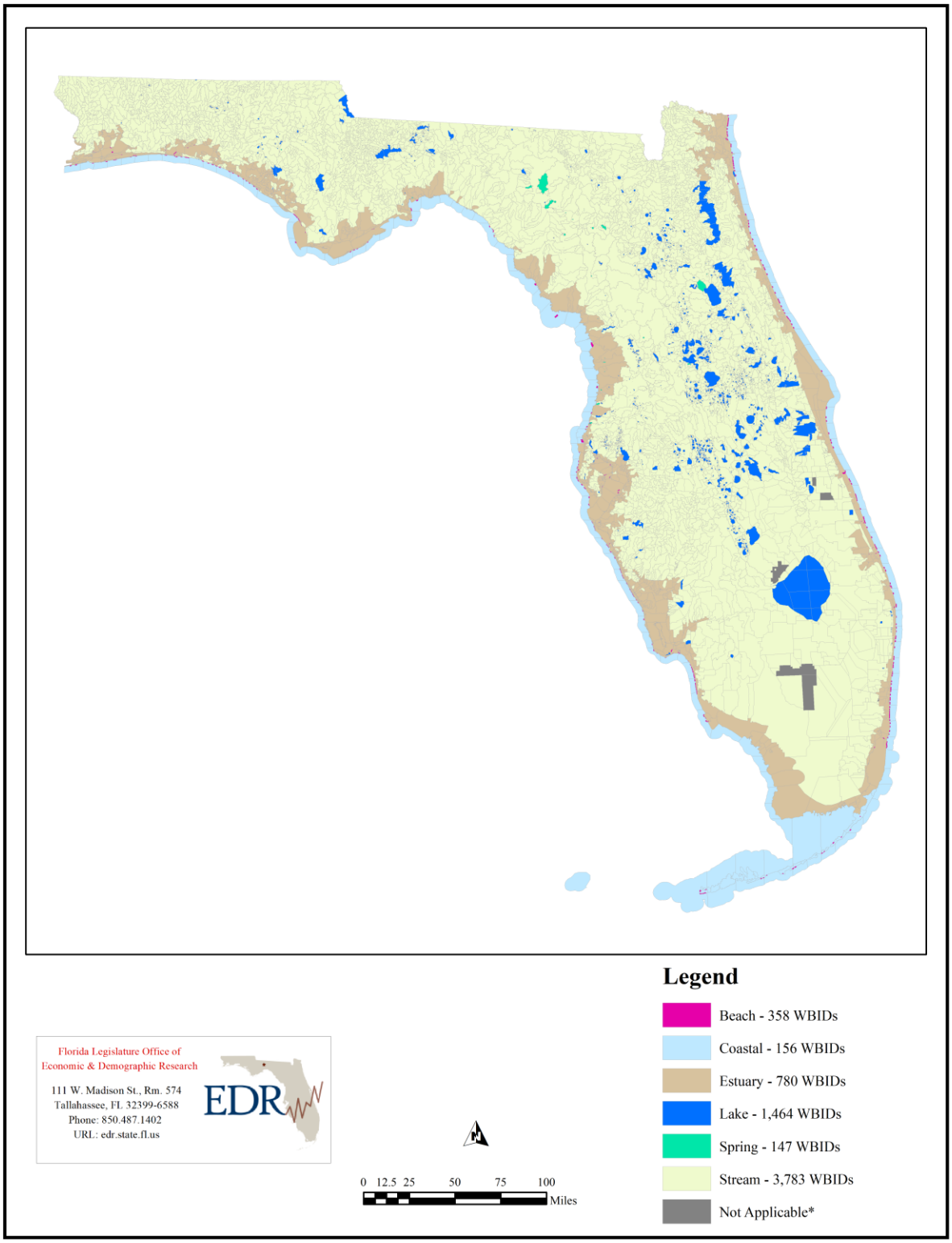
The DEP utilizes a statewide watershed management approach for water resource management in Florida. First, DEP has delineated the state into assessment units with unique water body identification numbers (WBIDs) that represent waterbodies at the watersheds or sub-watershed scale.[145] These WBIDs include "drainage basins, lakes, lake drainage areas, springs, rivers and streams, segments of rivers and streams, coastal, bay and estuarine waters in Florida."[146] The WBIDs are used by DEP in implementation of a number of responsibilities including impaired waters assessment and the total maximum daily loads and basin management action plan programs.[147]

Second, as part of the watershed management approach, Florida's 52 basins are divided into five basin groups that continuously move through a five-year, five-phase cycle of restoration activities that begins with the first phase of preliminary basin evaluation.[148] This approach allows DEP to focus its resources on specific basins throughout the state during each phase and ideally ensures that the WBIDs in each basin group will be assessed every five years. Assessed WBIDs are then placed in assessment categories or subcategories from one through five. See Figure 4.1.2 for a map of WBIDs statewide. See Figure 4.1.3 for a map of the five basin groups. See Figure 4.1.4 for an illustration of the rotating watershed management approach. See Table 4.1.2 for the assessment categories.

[See figures and tables on following pages]

[145] Florida Department of Environmental Protection, Basin 411, What is a WBID?, https://floridadep.gov/dear/watershed-assessment-section/content/basin-411-0. (Accessed November 2021.)
[146] *Id.*
[147] *Id.*
[148] *See* Florida Department of Environmental Protection, Final Integrated Water Quality Assessment for Florida: 2016 Sections 303(d), 305(b), and 314 Report and Listing Update, Table 6.2. Phases of the basin management cycle at 168, available at: https://floridadep.gov/sites/default/files/2016-Integrated-Report.pdf. (Accessed November 2021.) *See also* Florida Department of Environmental Protection, Final Integrated Water Quality Assessment for Florida: 2018 Sections 303(d), 305(b), and 314 Report and Listing Update, at 136-39 (describing the watershed management approach), available at: https://floridadep.gov/sites/default/files/2018_integrated_report.pdf. (Accessed November 2021.)

Figure 4.1.2 Water Body IDs (WBIDs)



*The six areas shown as not applicable are identified in DEP's GIS data as Hollywood Indian Reservation, Miccosukee Indian Reservation, Big Cypress Indian Reservation, Brighton Indian Reservation, Fellsmere Stick Marsh, and C-52 (Blue Cypress Watershed Management Area).

Figure 4.1.3 Basin Groups

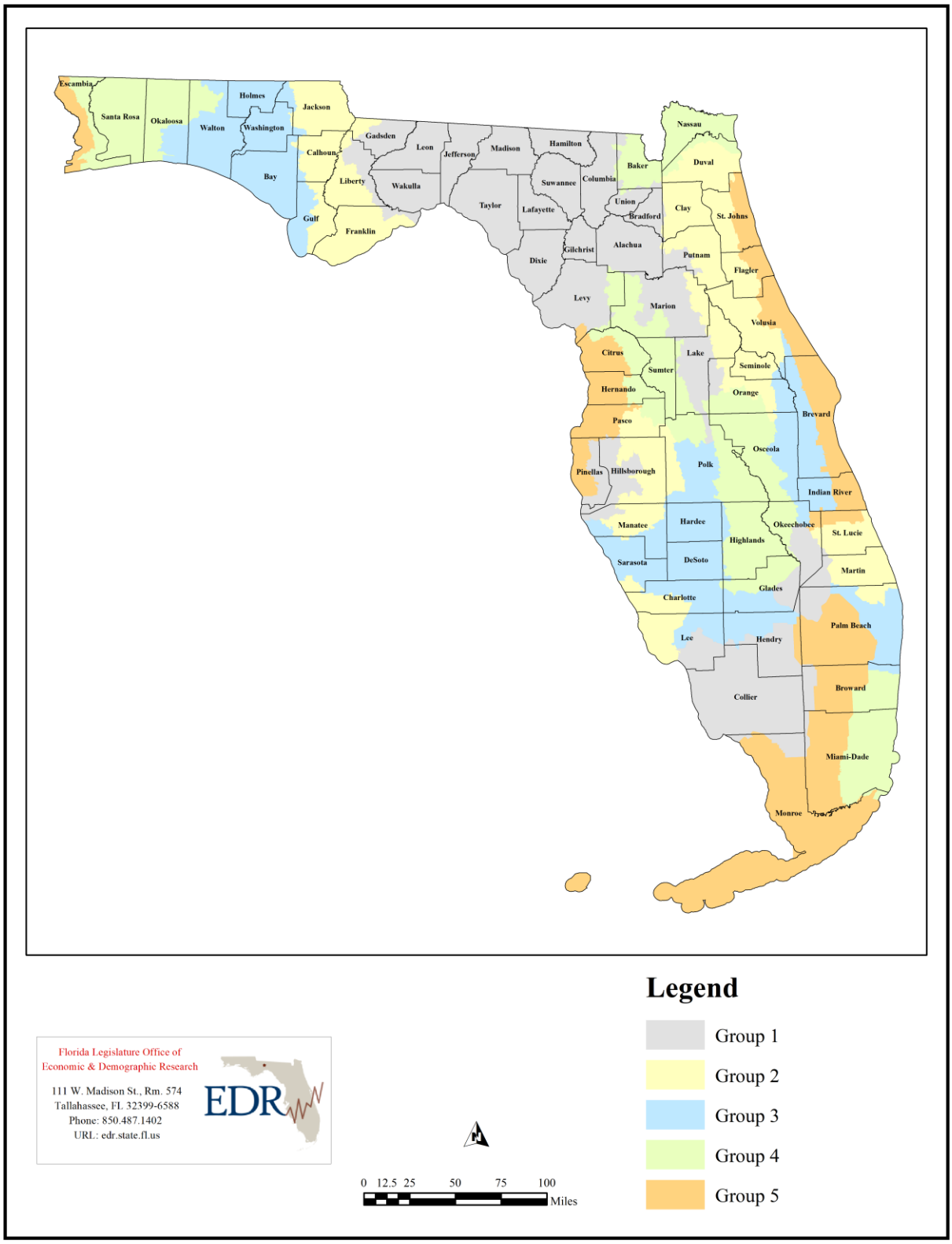


Table 4.1.2 Assessment Categories

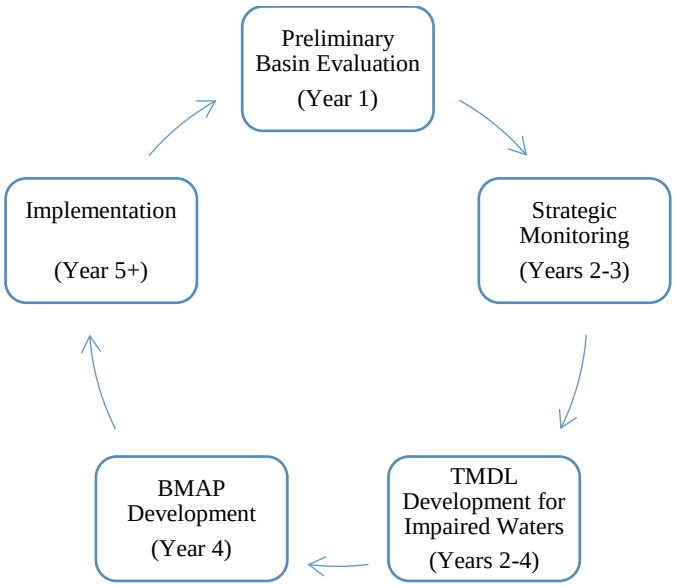
Assessment Category	Assessment Category Definitions
1	Attains all designated uses
2	Attains some designated uses and insufficient or no information or data are present to determine if remaining uses are attained
3a	No data and information are present to determine if any designated use is attained
3b	Some data and information are present but not enough to determine if any designated use is attained
3c	Enough data and information are present to determine that one or more designated uses may not be attained according to the Planning List methodology in Chapter 62-303 of the Florida Administrative Code
4a	Impaired for one or more designated uses but does not require TMDL development because a TMDL has already been completed
4b*	Impaired for one or more designated uses but does not require TMDL development because the water will attain water quality standards due to existing or proposed measures
4c	Impaired for one or more criteria or designated uses but does not require TMDL development because impairment is not caused by a pollutant
4d	Waterbody indicates non-attainment of water quality standards, but the Department does not have enough information to determine a causative pollutant; or current data show a potentially adverse trend in nutrients or nutrient response variables; or there are exceedances of stream nutrient thresholds, but the Department does not have enough information to fully assess non-attainment of the stream nutrient standard.
4e**	Waterbody indicates non-attainment of water quality standards and pollution control mechanisms or restoration activities are in progress or planned to address non-attainment of water quality standards, but the Department does not have enough information to fully evaluate whether proposed pollution mechanisms will result in attainment of water quality standards.
5	Water quality standards are not attained and a TMDL is required.

Source: Florida Department of Environmental Protection, Watershed Assessment Section, available at: https://floridadep.gov/dear/watershed-assessment-section. (Accessed November 2021.) *See also* Memorandum from Robert H. Wayland III, Director, Office of Wetlands, Oceans and Watersheds to EPA Regional Directors et al. dated November 19, 2001, 2002 Integrated Water Quality Monitoring and Assessment Report Guidance, available at: https://www.epa.gov/sites/production/files/2015-10/documents/2002_02_13_tmdl_2002wqma.pdf. (Accessed November 2021.)

*Water segments in the 4b assessment category have Reasonable Assurance Plans in place and are not included in the state's 303(d) list.

** Water segments categorized in the 4e assessment category have Alternative Restoration Plans (also referred to as Pollutant Reduction Plans) in place and are included in the state's 303(d) list. Note that Florida's 4e category is comparable to EPA's 5-alternative (or 5-alt) category as they both recognize ongoing restoration activities for otherwise impaired waterbody segments.

Figure 4.1.4 Watershed Management Approach



Assessed water segments that are identified as impaired and placed in assessment category 5 require TMDL development. Establishing TMDLs for impaired waters represents a major first step towards restoring water quality. A TMDL is a water quality restoration goal that represents the maximum amount of a specific pollutant that a waterbody or waterbody segment can assimilate from all sources while still maintaining applicable water quality standards.[149] Using the TMDL as the maximum value, DEP then assigns individual wasteload allocations for point sources, load allocations for nonpoint sources, and a margin of safety to account for uncertainty in the scientific analysis.[150] Existing point sources may include wastewater treatment facilities, industrial facilities, and municipal separate storm sewer systems (known as MS4s). Existing nonpoint sources may include agricultural runoff and atmospheric deposition. These allocations along with other management and restoration strategies are intended to achieve the pollutant reductions necessary to meet the TMDL.[151]

Expressed mathematically, the TMDL is the summation of the wasteload for existing NPDES wastewater facilities and NPDES stormwater systems, the load allocation for existing nonpoint sources and natural background, and a margin of safety:

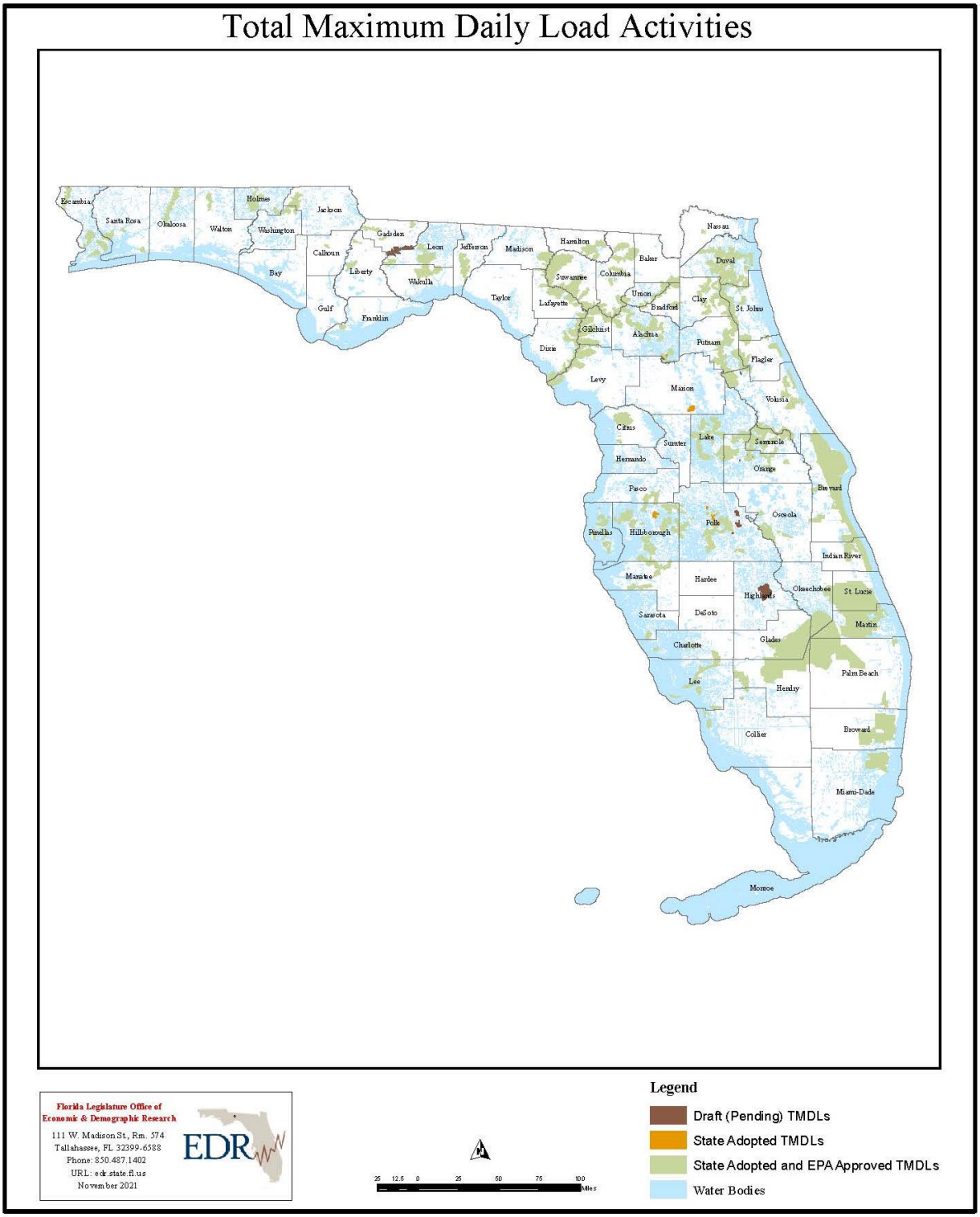
$$\mathbf{TMDL} = \sum \mathbf{WLA_{NPDES}} + \sum \mathbf{WLA_{NPDES\ Stormwater}} + \sum \mathbf{LA_{Nonpoint\ Sources}} + \mathbf{MOS}$$

As of December 31, 2020, DEP has adopted a total of 447 TMDLs for impaired WBIDs (446 site-specific TMDLs and one statewide TMDL).[152] Specifically, there are 262 TMDLs for dissolved oxygen (DO), nutrients, and/or un-ionized ammonia; 179 TMDLs for bacteria; and five for other parameters (iron, lead, and turbidity).[153] In addition to these site-specific TMDLs, in 2013, DEP adopted a single statewide TMDL for mercury that affects over 1,100 waterbody segments in fresh and marine waters previously listed for mercury impairment.[154] For a map of TMDL activities in the state, see Figure 4.1.5.

[See figure on following page]

[149] *See* Fla. Admin. Code R. 62-303.200(31).
[150] All TMDLs include either an explicit margin of safety (*i.e.*, a specified amount of loading held in reserve) or implicit margin of safety (*i.e.*, conservative assumptions made and documented during TMDL development).
[151] § 403.067(6), Fla. Stat.
[152] Florida Department of Environmental Protection, 2020 Statewide Annual Report on Total Maximum Daily Loads, Basin Management Action Plans, Minimum Flows or Minimum Levels, and Recovery or Prevention Strategies, available at: https://floridadep.gov/dear/water-quality-restoration/content/statewide-annual-report. (Accessed December 2021.)
[153] *Id*.
[154] *Id*. Note that mercury impairment is based upon potential risks to human health through consumption of fish with elevated levels of mercury in their tissues and not on an exceedance of the state's water quality criterion for mercury. *See* Final Report, Mercury TMDL for the State of Florida, October 24, 2013, available at: https://floridadep.gov/sites/default/files/Mercury-TMDL.pdf (Accessed September 2020.)

Figure 4.1.5 TMDLs in Florida



Based on DEP's statewide Comprehensive Verified List of impaired waters, which includes the most recent updates published on June 21, 2021, there are approximately 1,717 waterbody-parameter combinations in Florida that are listed as impaired and require a TMDL.[155] Overall, the most frequently identified pollutants causing water impairment relate to excessive nutrients.

In 2015, DEP set forth a priority framework document addressing how Florida's TMDL program will implement the new long term vision that EPA announced for section 303(d) of the Clean Water Act.[156] For the 2015 through 2022 time period, DEP expects to develop site-specific TMDLs for 80 priority waterbodies or waterbody segments.[157] The TMDL priority setting focuses on impaired waters where site-specific TMDLs are the best available option for water quality restoration.[158] Where appropriate, alternatives to the TMDL approach will be implemented.

Forecast of Future Expenditures Necessary to Comply with Laws Governing TMDLs

The DEP's statewide Comprehensive Verified List of impaired waters provides a list of WBIDs over which TMDLs will need to be established.[159] Further, they are prioritized into high, medium, or low priority.[160] While these priorities are not associated with a legally required time to completion, the list indicates that high priority are to be addressed within 5 years, medium within 5 to 10 years, and low within 10 years. As of the June 2021 update, there were 294 WBIDs with high priority for TMDL development, 1,014 with medium priority, and 409 with low priority.[161] The methodology for TMDL establishment provided by DEP suggests that for each WBID, impairments for dissolved oxygen, total nitrogen, total phosphorus, chlorophyll-a, macrophytes, biology, algal mats, nitrates-nitrites, total ammonia, and un-ionized ammonia could be combined into a single TMDL and that all other impairments would require individual TMDLs. Applying this methodology and assuming the highest priority among combined impairments, there are expected to be 276 TMDLs with high priority, 702 with medium, and 395 with low priority.

DEP further provided a history of the 447 existing TMDLs, identifying the year they were established and the pollutant parameter. This history can be found in Table 4.1.3. Moreover, DEP has indicated seven additional TMDLs were established in the 2021 calendar year prior to November 2021.

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[155] Florida Department of Environmental Protection, Statewide Comprehensive Verified List of Impaired Waters, available at: https://floridadep.gov/dear/watershed-assessment-section/content/assessment-lists. (Accessed November 2021.) Note that a waterbody or waterbody segment not meeting more than one water quality standard would be identified more than once on the State's Verified List as separate waterbody-parameter combinations.

[156] Letter from Gregory P. DeAngelo, P.E.., Florida Department of Environmental Protection, to Gracy Danois, Chief, U.S. Environmental Protection Agency (September 1, 2015), available at: https://floridadep.gov/sites/default/files/PriorityFrameworkDocument.pdf. (Accessed November 2021.)

[157] *See* Appendix A of Letter from Gregory P. DeAngelo, P.E.., Florida Department of Environmental Protection, to Gracy Danois, Chief, U.S. Environmental Protection Agency (September 1, 2015), available at: https://floridadep.gov/sites/default/files/PriorityFrameworkDocument.pdf. (Accessed November 2021.)

[158] Letter from Gregory P. DeAngelo, P.E.., Florida Department of Environmental Protection, to Gracy Danois, Chief, U.S. Environmental Protection Agency (September 1, 2015) at 2, available at: https://floridadep.gov/sites/default/files/PriorityFrameworkDocument.pdf. (Accessed November 2021.)

[159] Available at: https://floridadep.gov/dear/watershed-assessment-section/documents/comprehensive-verified-list. (Accessed November 2021.)

[160] Less than 1 percent of the WBIDs on the verified list are not assigned a priority. EDR categorizes them as low priority.

[161] According to DEP staff, the state's bacteria water quality criteria for fresh waters in Florida Administrative Code Rule 62-302.530 were updated from fecal coliform to E. coli to be consistent with EPA recommendations. As DEP begins assessing waters under the new E. coli criteria, waterbody segments currently identified as impaired for fecal coliform and requiring a TMDL may be updated accordingly to reflect E. coli impairment or delisted for fecal coliform.

Table 4.1.3 TMDLs Established by Parameter and Year

	CY 2001	CY 2002	CY 2003	CY 2004	CY 2005	CY 2006	CY 2007	CY 2008	CY 2009	CY 2010	CY 2011
DO, Nutrients, Unionized Ammonia	9	-	-	1	1	28	8	53	46	2	-
Fecal Coliform	-	-	-	6	1	18	5	21	40	31	-
Iron	-	-	-	-	-	1	-	-	-	-	-
Lead	-	-	-	-	-	-	-	-	3	-	-
Mercury in Fish Tissue (statewide)	-	-	-	-	-	-	-	-	-	-	-
Turbidity	-	-	-	-	-	-	-	-	-	-	-
Total	**9**	**-**	**-**	**7**	**2**	**47**	**13**	**74**	**89**	**33**	**-**

	CY 2012	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	CY 2021	All Years
DO, Nutrients, Unionized Ammonia	2	37	10	10	4	13	17	12	9	7	269
Fecal Coliform	39	1	17	-	-	-	-	-	-	-	179
Iron	-	-	-	-	-	-	-	-	-	-	1
Lead	-	-	-	-	-	-	-	-	-	-	3
Mercury in Fish Tissue (statewide)	-	1	-	-	-	-	-	-	-	-	1
Turbidity	-	1	-	-	-	-	-	-	-	-	1
Total	**41**	**40**	**27**	**10**	**4**	**13**	**17**	**12**	**9**	**7**	**454**

*The one TMDL for Mercury covers 1,131 WBIDs.
**This only reflects January 1 through November 1 of 2021.

Finally, DEP provided internal expenditure data that allowed a breakdown between TMDL development expenditures and other TMDL-related expenditures (*e.g.*, funding for restoration efforts). This was able to be produced with confidence going back to Fiscal Year 2012-13. Between that time and Fiscal Year 2020-21, the state of Florida has expended $26.17 million on TMDL development. Using the consumer price index to adjust each year, this represents $28.44 million in Fiscal Year 2020-21 dollars.[162] Over that same time period, 139 TMDLs were established. Assuming similar costs going forward, this suggests an average cost per TMDL of $204,590.37. Applying this cost to the anticipated 1,373 TMDLs from the verified list as adjusted by EDR, and considering the timing differences between priority groups, produces the expenditure forecast shown in Table 4.1.4.

[162] CPI-All Urban Consumers (Current Series) was used. Series Id: CUUR0000AA0; Not Seasonally Adjusted (Series Title: All items - old base in U.S. city average, all urban consumers, not seasonally adjusted; Area: U.S. city average).

Table 4.1.4 Forecast of TMDL Development Expenditures Necessary to Comply with the Law (in $millions)

	FY 21-22	FY 22-23	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31
Total	$33.74	$33.74	$33.74	$33.74	$33.74	$22.44	$22.44	$22.44	$22.44	$22.44

Underlying this forecast is an assumption of approximately 165 TMDLs established per year for the first five years of the forecast and approximately 110 TMDLs established per year for the last five years of the forecast, given appropriate funding. This assumption is becoming increasingly implausible. DEP staff indicates that under their current staffing and funding they are capable of developing TMDLs for approximately 20 WBIDs per year. At that rate, the state would need to expend approximately $4.09 million annually through Fiscal Year 2089-90 to establish TMDLs over WBIDs on the current verified list. Even DEP's assumption of 20 WBIDs per year appears questionable based on recent history; an annual average of 12 TMDLs were established over the past five years. Establishing a TMDL, however, is not the only method through which waterbodies can be removed from the verified list. The Comprehensive Delist List is also maintained by DEP[163] and indicates a wide variety of reasons for a WBID being removed from the Verified List, including becoming part of an alternative restoration approach, identifying analysis flaws, meeting a TMDL, and no longer being impaired.

Basin Management Action Plans

In 2005, the Florida Watershed Restoration Act was amended to authorize DEP to adopt basin management action plans (BMAPs), which are water quality restoration plans that are unique to Florida. The BMAPs provide the state's primary mechanism and blueprint for restoring impaired waters by meeting TMDLs. Addressing surface waters and groundwater-fed springs, they provide an opportunity to manage nonpoint sources of pollution. The plans are intended to integrate all of the management strategies committed to by state, regional, local, and private stakeholders to reduce pollutant sources, and thereby achieve water quality standards for the pollutants causing impairment. BMAPs are adopted by DEP secretarial order and are enforceable by law.[164]

A BMAP includes an equitable allocation of pollutant reductions to individual basins, as a whole to all basins, or to each identified point source or category of nonpoint sources.[165] Through participation from governmental and private stakeholders, DEP identifies appropriate management strategies, schedules for implementation, feasible funding strategies, plans for evaluating the effectiveness of the management strategies, and strategies to address potential future increases in pollutant loadings.[166] A BMAP must include milestones for implementation and water quality

[163] Available at: https://floridadep.gov/dear/watershed-assessment-section/documents/comprehensive-delist-list. (Accessed November 2021.)
[164] § 403.067(7)(d)1., Fla. Stat. (providing that BMAPs are enforceable pursuant to sections 403.067, 403.121, 403.141, and 403.161, Florida Statutes).
[165] § 403.067(7)(a)2., Fla. Stat.
[166] *See* § 403.067(7)(a), Fla. Stat.

improvement, as well as an associated water quality monitoring component to evaluate the progress of pollutant reductions. Except as discussed below, while the implementation of a BMAP is not required to achieve the appropriate TMDLs within a particular time frame, an assessment of the progress toward meeting the milestones is conducted every five years and revisions to BMAPs are made when deemed necessary or appropriate. Special treatment has been established in law for the Outstanding Florida Springs BMAPs[167] and the BMAPs adopted for Lake Okeechobee, the Caloosahatchee Estuary Basin, and the St. Lucie Estuary Basin under the Northern Everglades and Estuaries Protection Program.[168] To ensure expeditious implementation of those BMAPs, a 20-year target to achieve the TMDLs is identified, with 5-year, 10-year, and 15-year intermediate milestones.[169]

In June 2021, DEP submitted its fourth statewide annual report (STAR Report) to the Governor and Florida Legislature, which, in part, provides the status of each TMDL and BMAP as of December 31, 2020.[170] In the STAR Report, DEP must include the status of projects within adopted BMAPs, and, if applicable, an explanation of possible causes and potential solutions for any unmet 5-year, 10-year, or 15-year milestone, or 20-year target.[171] The report must also include project descriptions, estimated costs, proposed priority project ranking, and funding needs to achieve the TMDLs.[172]

The latest STAR Report provides a progress report on 30 adopted BMAPs, the majority of which address nutrient impairments.[173] Note that EDR has not included in its analysis any BMAPs or revisions to BMAPs that were not included in DEP's STAR Report.[174] For a list of adopted BMAPs included in the STAR Report see Table 4.1.5. For a map of all adopted BMAPs as of November 1, 2021, see Figure 4.1.6.

[See table and figure on following pages]

[167] *See* Florida Springs and Aquifer Protection Act, §§ 373.801 – 373.813, Fla. Stat.
[168] § 373.4595, Fla. Stat.
[169] *See* § 373.4595, Fla. Stat. (requiring DEP to develop a schedule establishing 5-year, 10-year, and 15-year milestones and targets to achieve the TMDL within 20 years after adoption of the Lake Okeechobee BMAP, Caloosahatchee Estuary BMAP, and the St. Lucie River and Estuary BMAP; or else provide an explanation of the constraints that prevent achievement within 20 years, an estimate of the time needed, and additional 5-year measurable milestones); *see also* § 373.807, Fla. Stat. (requiring DEP to develop a schedule establishing 5-year, 10-year, and 15-year milestones and targets to achieve the nutrient TMDLs within 20 years of adopting a BMAP for an Outstanding Florida Spring).
[170] Florida Department of Environmental Protection, 2020 Statewide Annual Report on Total Maximum Daily Loads, Basin Management Action Plans, Minimum Flows or Minimum Water Levels, and Recovery or Prevention Strategies, June 30, 2021, available at: https://floridadep.gov/dear/water-quality-restoration/content/statewide-annual-report. (Accessed November 2021.)
[171] § 403.0675(1), Fla. Stat.
[172] *Id*.
[173] The number of BMAPs is sometimes reported as 33, but three were undergoing legal challenges when the December 2020, STAR Report data was released: Suwannee River, Volusia Blue Springshed, and Wekiva Spring and Rock Springs.
[174] A current list of adopted BMAPs is available at: https://floridadep.gov/dear/water-quality-restoration/content/basin-management-action-plans-bmaps. (Accessed November 2021.)

Table 4.1.5 BMAPs Included in Analysis

BMAP Type	BMAP Name	FY* Original Document	FY* Document Updated	Starting FY* for DEP's Milestones
Fecal Indicator Bacteria	Alafia River Basin	2014		N/A**
	Bayou Chico	2012		N/A**
	Hillsborough River Basin	2010		N/A**
	Long Branch***	2008		N/A**
	Lower St. Johns River Tributaries I and II	2009 and 2011	2016 (both)	N/A**
	Manatee River Basin	2014		N/A**
Northern Everglades and Estuaries Protection Program	Caloosahatchee Estuary Basin	2013	2020	2013
	St. Lucie River and Estuary	2013	2020	2013
	Lake Okeechobee	2015	2020	2015
Outstanding Florida Springs	Crystal River/Kings Bay	2018		2018
	DeLeon Springs	2018		2018
	Gemini Springs	2018		2018
	Homosassa and Chassahowitzka Springs Groups	2018		2018
	Jackson Blue Spring and Merritts Mill Pond Basin	2016	2018	2018
	Rainbow Springs Basin	2016		2018
	Santa Fe River	2012		2018
	Silver Springs, Silver Springs Group, and Upper Silver River	2016		2018
	Upper Wakulla River and Wakulla Springs	2016	2018	2018
	Wacissa River and Wacissa Spring Group	2018		2018
	Weeki Wachee	2018		2018
	Wekiva River, Rock Springs Run, and Little Wekiva Canal	2016		2018
Surface Water: Nutrients	Everglades West Coast Basin	2013		N/A**
	Indian River Lagoon Basin: Banana River Lagoon	2013		N/A**
	Indian River Lagoon Basin: Central Indian River Lagoon	2013		N/A**
	Indian River Lagoon Basin: North Indian River Lagoon	2013		N/A**
	Lake Jesup	2010	2020	N/A**
	Lakes Harney, Monroe, Middle St. Johns River, and Smith Canal	2013		N/A**
	Lower St. Johns River Mainstem	2009		N/A**
	Orange Creek	2008	2020	N/A**
	Upper Ocklawaha River Basin	2008	2020	N/A**

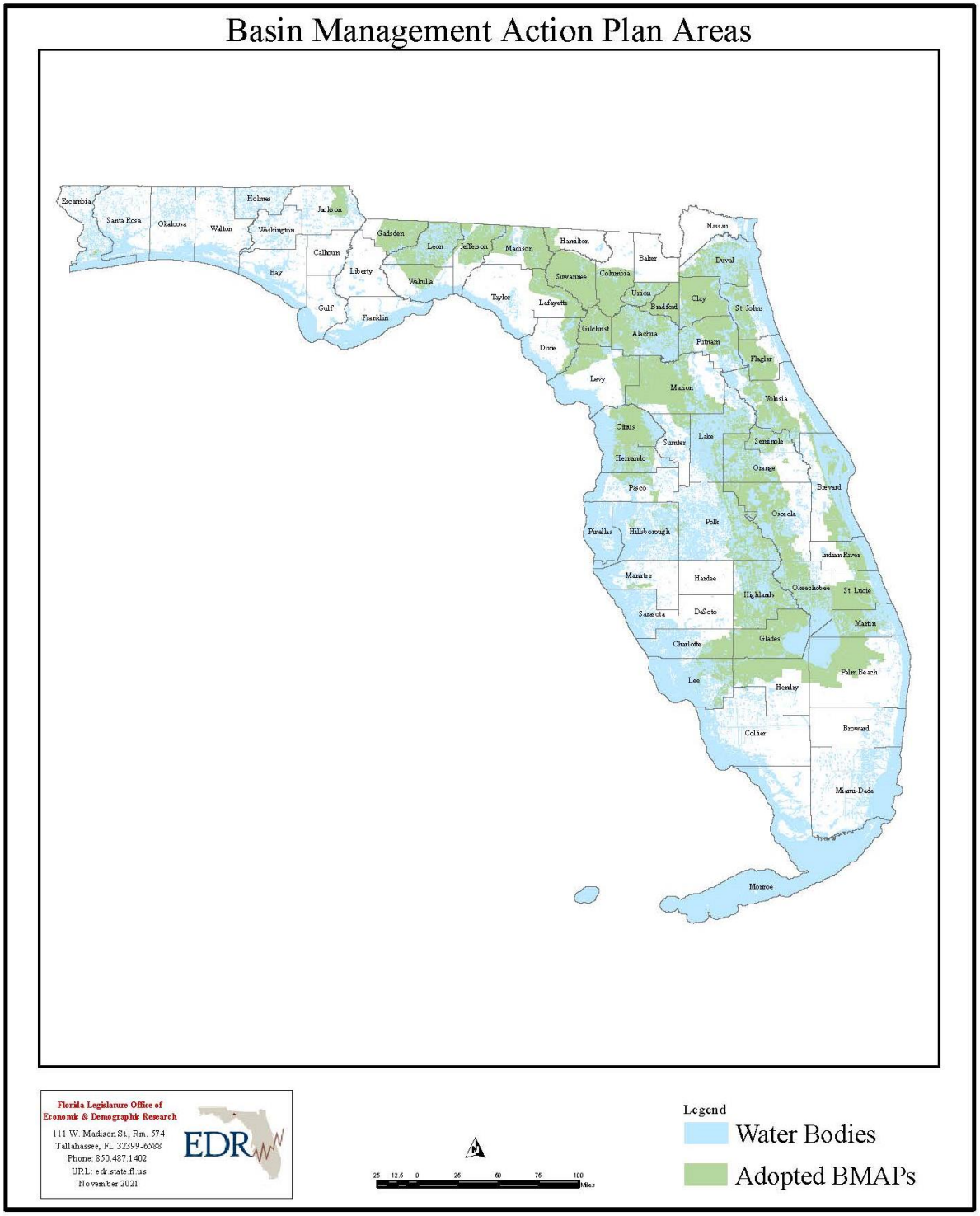
* The Fiscal Year ends in the listed year. For example, 2014 represents Fiscal Year 2013-14.

** The 5, 10, 15, and 20-year milestones are only applicable to BMAPs for the Northern Everglades and Estuaries Protection Program and Outstanding Florida Springs. For timing of expenditures for the other BMAPs in EDR's analysis, the fiscal year of the original document is used. In the case of the Lower St Johns River Tributaries I and II, the average of 2010 is used.

*** See DEP's interactive BMAP map at https://floridadep.gov/dear/water-quality-restoration/content/impaired-waters-tmdls-and-basin-management-action-plans. In the Long Branch BMAP Story Map, the assessment status indicates "[t]here are no longer standards for fecal coliform assessment, so this parameter is now listed Not Applicable (NA). The new bacteria parameter, E. coli, was placed into Category 4e (Ongoing Restoration Activities) for this waterbody and will be placed on the Statewide Comprehensive Study List. DO, Chlorophyll-a, Total Nitrogen (TN), and Total Phosphorus (TP) are not impaired." See https://fdep.maps.arcgis.com/apps/MapSeries/index.html?appid=f8adf3667af645bcaf4d65384d5154c0. (Accessed March, 2022.)

[See figure on following page]

Figure 4.1.6 Basin Management Action Plans



While TMDLs are implemented through timely changes in NPDES permit conditions (such as new discharge limits) for point sources of pollution, the reduction of nonpoint sources of pollution is primarily achieved through the implementation of best management practices (BMPs). Nonpoint source dischargers included in BMAPs are required to implement BMPs or conduct water quality monitoring approved by DEP or the applicable WMD to demonstrate compliance with pollutant load reductions.[175]

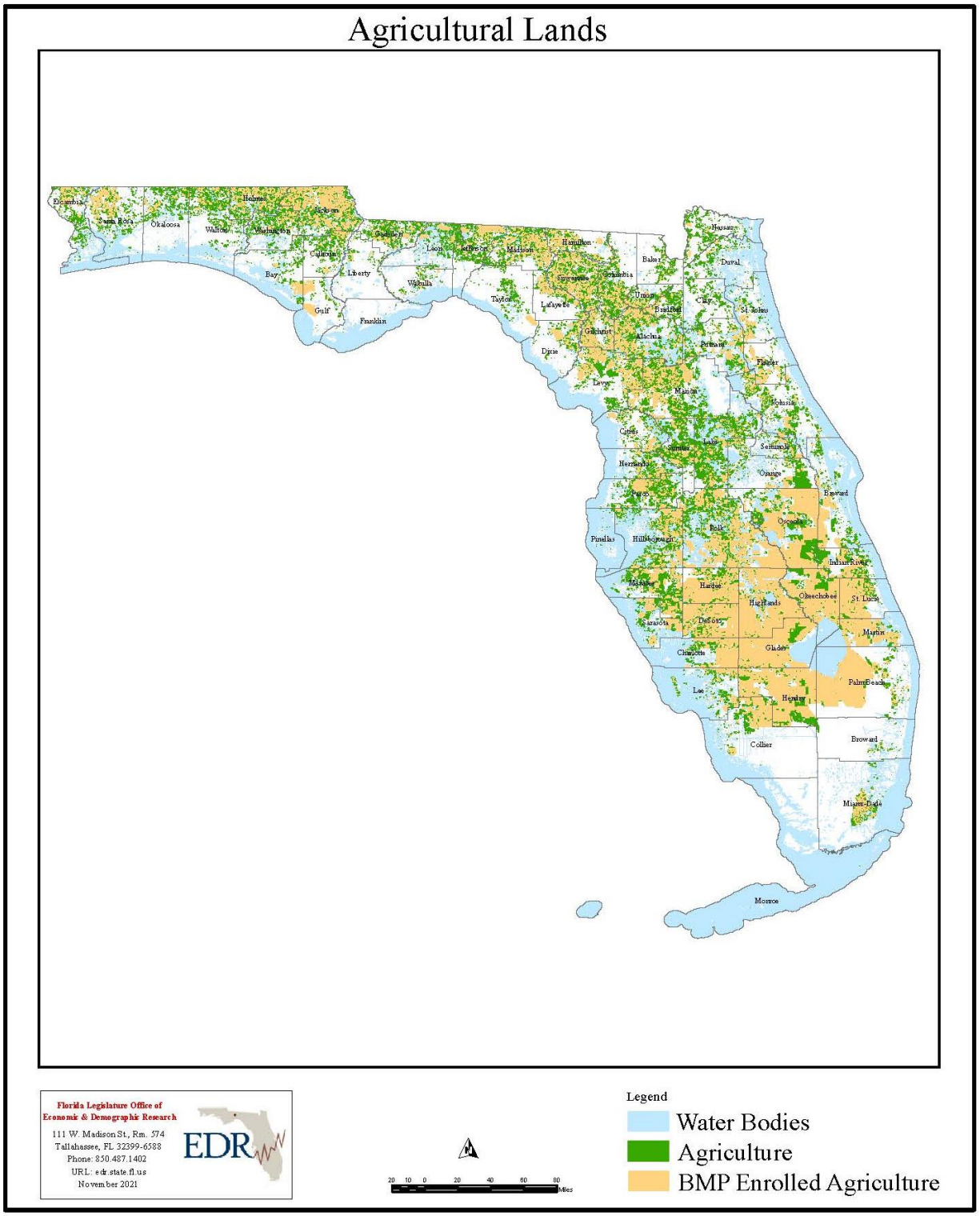
To address nonpoint source pollution from urban and suburban areas (*i.e.*, non-agricultural areas) within BMAPs, responsible stakeholders have identified structural and non-structural BMPs to address stormwater runoff and discharges to receiving waterbodies. Structural BMPs involve constructed systems that are generally intended to reduce the volume of stormwater discharge or reduce concentrations of pollutants. This includes wet or dry detention ponds. Non-structural BMPs focus on preventing, controlling, and treating pollutants at their source before they enter the environment. This includes land conservation, local ordinances (such as fertilizer ordinances), land use planning, watershed planning, and low impact development strategies. According to the BMAP project list provided with the STAR Report, wet detention ponds comprise the most widely identified structural BMP, while education efforts are the most common non-structural practice.[176] Combining structural and non-structural projects, the most common project type is stormwater practices related to fecal indicator bacteria ("FIB-Stormwater").

Agricultural BMPs are intended to be practical, cost-effective measures that agricultural producers can undertake to conserve water and reduce the amount of pollutants that enter water resources.[177] An agricultural producer who implements and maintains verified, DACS-adopted BMPs receives a presumption of compliance with state water quality standards for the pollutants addressed by the BMPs.[178] According to the DACS Office of Agricultural Water Policy, approximately 62 percent of the agricultural acreage in Florida is enrolled in the BMP program.[179] Moreover, 82 percent of the state's irrigated agricultural acreage are enrolled in the BMP program. The latter acres contain the agricultural acres that have the greatest impact to the state's water resources. See Figure 4.1.7 for a map of BMP-enrolled agricultural lands statewide, excluding silviculture and aquaculture.

[See figure on following page]

[175] *See* § 403.067(7)(b)2.g., Fla. Stat.
[176] Available at: https://floridadep.gov/dear/water-quality-restoration/content/statewide-annual-report. (Accessed November 2021.)
[177] *See* DACS, Agricultural Best Management Practices, What Are Agricultural Best Management Practices?, https://www.fdacs.gov/Agriculture-Industry/Water/Agricultural-Best-Management-Practices. (Accessed November 2021.)
[178] § 403.067(7)(c), Fla. Stat.
[179] DACS, Status of Implementation of Agricultural Nonpoint Source Best Management Practices, July 1, 2021, available at: https://www.fdacs.gov/Divisions-Offices/Agricultural-Water-Policy. (Accessed November 2021.)

Figure 4.1.7 Map of BMP-enrolled Agricultural Lands (Excluding Silviculture & Aquaculture)



Forecast of Future Expenditures Necessary to Implement Adopted BMAPs

The STAR Report contains a full list of completed, underway, and planned projects within each BMAP. Project costs and nutrient load reductions are included when available. For some projects, a cost estimate or load reduction may not be applicable. For the instances where costs were unavailable but applicable, EDR estimates them based on average costs of projects of the same type that included cost information.[180]

The duration and timing of the expenditure forecast is unique to each BMAP. Nutrient reduction achieved through completed projects is compared to the initial load reduction requirement in the BMAP to calculate how much progress has been made. Then, the reductions that are still needed are spread across the remaining years expected for that BMAP. EDR caps each BMAP at 20 years from its adoption, assuming projects identified as planned will be completed within five years and that the funding for costs associated with underway projects has already been spent.[181]

For BMAPs whose reduction goal(s) are not met by the planned projects, expenditure projections are continued into the subsequent years using that BMAP's most cost-efficient strategy as a basis for the calculations.[182] Once the reduction goal is met in its entirety, the expenditures end. Fecal Indicator Bacteria BMAPs are assumed to be achieved once the existing underway and planned projects are completed.

The final challenge in forecasting BMAP expenditures was estimating the cost sharing between different funding sources (*i.e.*, local, regional, state, and federal government as well as private stakeholders). The shares are based on project information provided in the STAR Report. Some projects identify a dollar "Funding Amount" value and a single funding entity (approximately 850 projects). For these projects, matching funding amounts to funding sources is straight forward.[183]

The forecast of expenditures necessary to comply with laws governing the BMAP program is provided in Table 4.1.6. This forecast has changed significantly since the previous Edition. It will change further in future years–perhaps substantially–as more project data becomes available and more BMAPs are adopted. In compiling the list of projects, DEP is likely more informed regarding projects involving state funds than those that do not, and as such the state share may be overestimated. Further, it is likely that the cheaper or more cost effective projects would be completed first, meaning that future projects would be more expensive. As such, EDR's methodology based on historical and existing projects may underestimate future project costs.

[180] Project types used are those identified in the project list and consist of 88 different types.

[181] Alternatively, assuming the underway projects have not been funded results in a total expenditure increase of $4,760.20 million, or an increase of 45 percent

[182] For additional information regarding TN and TP projects and cost efficiency, see the 2021 Edition.

[183] The remaining projects present a greater challenge. Additional projects, including those identifying multiple funding sources and funding amounts, were included to nearly double the size of the final dataset in the 2021 Edition. This expanded dataset was then used to calculate the cost shares for the forecast of BMAP expenditures. This same approach was used in the 2022 Edition.

Table 4.1.6 Forecast of BMAP Expenditures Necessary to Comply with the Law (in $millions)

	FY 21-22	FY 22-23	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31
Local	$285.15	$278.49	$274.07	$241.22	$241.22	$139.28	$139.28	$127.83	$127.77	$123.96
Regional	$148.65	$145.19	$142.88	$125.76	$125.76	$72.61	$72.61	$66.64	$66.61	$64.63
State	$653.63	$638.38	$628.25	$552.95	$552.95	$319.27	$319.27	$293.01	$292.88	$284.16
Federal	$166.48	$162.60	$160.02	$140.84	$140.84	$81.32	$81.32	$74.63	$74.60	$72.38
Private	$2.82	$2.76	$2.71	$2.39	$2.39	$1.38	$1.38	$1.27	$1.26	$1.23
Total	$1,256.74	$1,227.42	$1,207.93	$1,063.15	$1,063.15	$613.85	$613.85	$563.37	$563.13	$546.35

	FY 31-32	FY 32-33	FY 33-34	FY 34-35	FY 35-36	FY 36-37	FY 37-38	FY 38-39	Total
Local	$119.31	$113.57	$59.15	$59.15	$18.11	$17.57	$17.57	$13.89	**$2,396.60**
Regional	$62.20	$59.21	$30.84	$30.84	$9.44	$9.16	$9.16	$7.24	**$1,249.41**
State	$273.50	$260.34	$135.58	$135.58	$41.51	$40.27	$40.27	$31.84	**$5,493.64**
Federal	$69.66	$66.31	$34.53	$34.53	$10.57	$10.26	$10.26	$8.11	**$1,399.24**
Private	$1.18	$1.12	$0.59	$0.59	$0.18	$0.17	$0.17	$0.14	**$23.72**
Total	$525.86	$500.56	$260.68	$260.68	$79.81	$77.43	$77.43	$61.22	**$10,562.61**

There was a $461.4 million increase in the needed BMAP expenditures for the current fiscal year relative to the previous Edition. Additionally, the overall total for the forecast horizon contained in the table increased by over $4.4 billion. There are two key forces that drove the significant increase in the forecast. First, cumulative nutrient reduction goals were materially raised by 11.9% for TN and 28.3% for TP.[184] Second, this Edition now includes four TN and two TP reduction goals for BMAPs that previously lacked them. It is also worth noting that the average estimated cost of projects in the planning stage increased by 11.3%.

The updated information regarding nutrient reduction is, at least in part, explained by the consistent progress of the available data in each subsequent release of the STAR report. It is likely that next year's STAR report will identify a net increase in costs again, affecting the BMAP expenditure forecast.

[184] Of these changes, the Lake Okeechobee BMAP stands out. According to DEP's Lake Okeechobee BMAP Story Map, the "Lake Okeechobee BMAP was first adopted in December 2014 to implement the total phosphorus (TP) TMDL in the watershed, and Executive Order 19-12 required an update to this BMAP in 2020. The updated BMAP, adopted in February 2020, replaced the original BMAP and also included the statutorily required 5-Year Review." The total phosphorus reduction goal nearly doubled in this Edition. See: https://fdep.maps.arcgis.com/apps/MapSeries/index.html?appid=ac355a2b17224f7baae353bfa234cbac. (Accessed March 2022.)

Alternative Restoration Plans

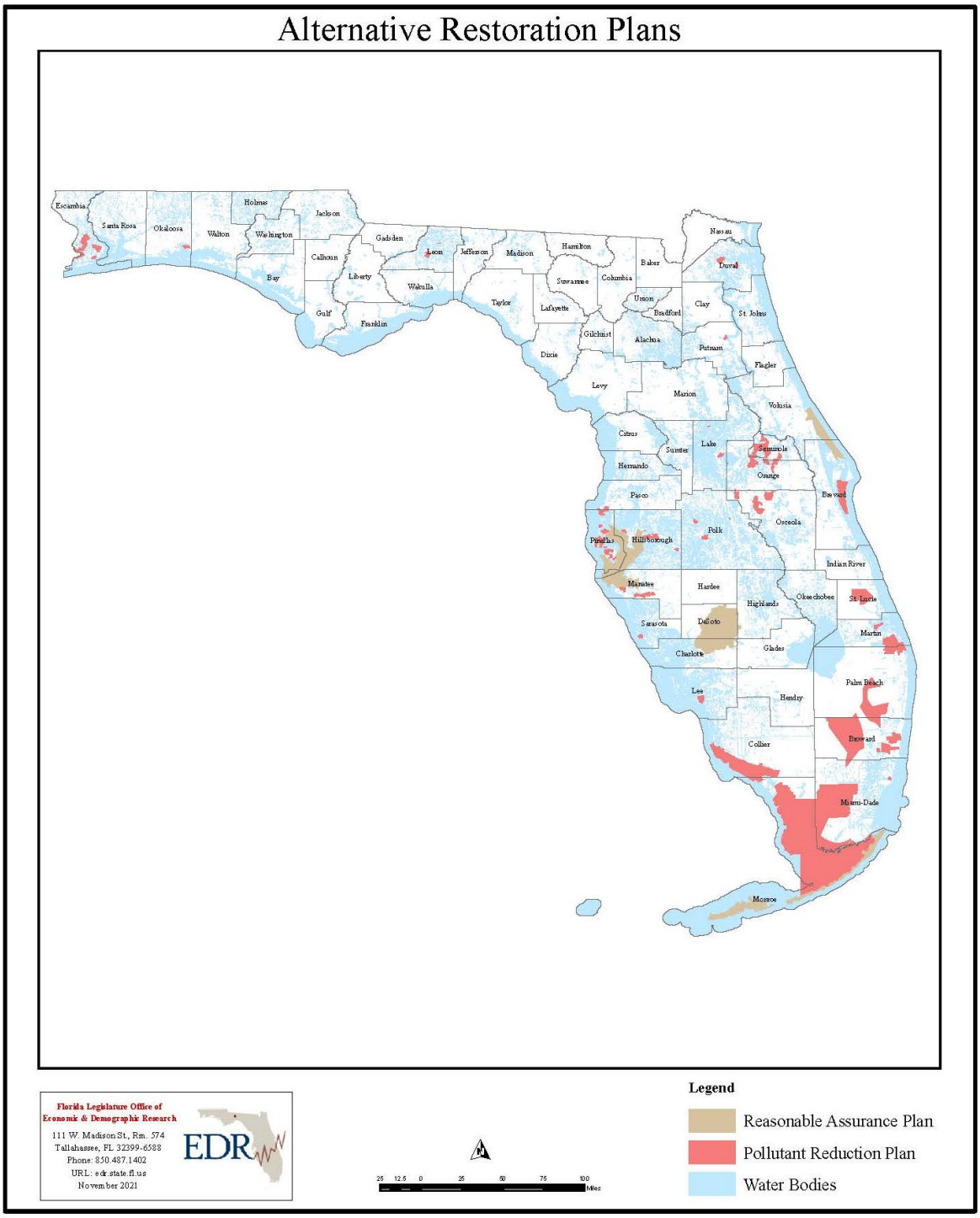
The EPA recognizes that under certain circumstances, the TMDL development approach required under the CWA may not be the most efficient and effective strategy to attain water quality standards.[185] In some limited cases, water quality standards may be attained through (1) technology-based effluent limitations for permitted point sources, (2) more stringent effluent limitations required by the local, state, or federal authority, or (3) other pollution requirements such as best management practices.[186] As a result, the EPA created assessment category 4b for CWA reporting purposes,[187] which recognizes that other pollution control mechanisms in lieu of TMDL development may result in the attainment of applicable water quality standards in the near-term. The 4b waters are not included in a state's 303(d) impaired waters list, and therefore, are not prioritized for TMDL development. The EPA also recognizes a 5-alternative category of waters that are included in a state's 303(d) list and prioritized for TMDL development but are being addressed in the near-term through alternative restoration efforts.

In Florida, DEP encourages local stakeholders to develop and implement water quality restoration activities as soon as practicable, which may obviate the need to use limited state resources to develop TMDLs and implement BMAPs.[188] At a minimum, effectively addressing water quality concerns ahead of these regulatory steps may reduce the state and local expenditures necessary restore water quality.[189] In Florida, there are two types of restoration plans that are intended to promote water quality improvements prior to development of a TMDL: 4b reasonable assurance plans (4b plans or RAPs) and 4e water quality restoration plans (4e plans). Both types of alternative approaches are initiated and driven by stakeholder involvement. The main difference between the 4b and 4e plans concerns the level of certainty regarding when applicable water quality standards will be attained, with 4b plans having greater certainty that reasonable progress will be made by the next assessment cycle for that basin.[190] For a full list of the state's assessment categories, see Table 4.1.2. See Figure 4.1.8 for a map of the 4b and 4e plans currently being implemented in Florida.

[See figure on following page]

[185] *See* Integrated Reporting Guidance under CWA Sections 303(d), 305(b) and 314 for the years 2004, 2008 (providing, in part, guidance on the use of assessment category 4b) available at: https://www.epa.gov/tmdl/integrated-reporting-guidance-under-cwa-sections-303d-305b-and-314. (Accessed November 2021.)
[186] *See* 40 C.F.R § 130.7(b)(1).
[187] As discussed previously, the state water quality reporting requirements are under sections 303(d), 305(b), and 314 of the CWA. These reports are often referred to as integrated reports since a single report meeting all of the requirements are submitted to EPA.
[188] *See* Florida Department of Environmental Protection, *Guidance on Developing Plans as Alternatives to TMDLs – Assessment Category 4b and 4e Plans*, June 2015, at 1, available at: https://floridadep.gov/sites/default/files/4b4ePlansGuidance.pdf. (Accessed November 2021.)
[189] Florida Department of Environmental Protection, *Category 4e Assessments and Documentation*, https://floridadep.gov/dear/alternative-restoration-plans/content/category-4e-assessments-and-documentation. (Accessed November 2021.)
[190] Florida Department of Environmental Protection, *Category 4e Assessments and Documentation*, https://floridadep.gov/dear/alternative-restoration-plans/content/category-4e-assessments-and-documentation. (Accessed November 2021.)

Figure 4.1.8 Alternative Restoration and Reasonable Assurance Plans



For 4b plans, there is reasonable assurance that, due to pollution control mechanisms, the waterbody is "expected to attain water quality standards in the future and is expected to make reasonable progress towards attainment of water quality standards by the time the next section 303(d) list for the basin is scheduled to be submitted to EPA."[191] The 4b plans are developed by local stakeholders, approved by DEP, and adopted by DEP secretarial order. As of November 2021, there are five 4b plans that are being implemented in Florida.[192] See Table 4.1.7 for project implementation costs identified in 4b plans. According to DEP staff, while not required, DEP may try to track 4b project implementation data in a similar format as basin management action plan projects, which may include cost estimates and timeframes for completion. As this data becomes available, EDR will refine the expenditure analysis to include 4b plans.

Table 4.1.7 Reasonable Assurance Plans (4b Plans)

Reasonable Assurance Plans	Lead Entity	Year of Plan and Updates	Total Identified Expenditures*
Lake Seminole	Pinellas County	2007, 2011, 2015, 2019	$47.78
Florida Keys	DEP	2008, 2011, 2018	$721.99
Shell, Prairie, and Joshua Creeks	Southwest Florida WMD	2004, 2006, 2008, 2010, 2012, 2014	$47.22
Tampa Bay Estuary	Tampa Bay Estuary Program	2002, 2007, 2009, 2012, 2014	$-
Mosquito Lagoon	City of Edgewater, City of New Smyrna Beach, City of Oak Hill, THE Department of Transportation, and Volusia County	2019	$20.92

*These expenditures are in millions of dollars and may be historical or planned.

DEP's 4e category is comparable to EPA assessment category 5-alternative (or 5-alt). This category recognizes that there are recently completed or ongoing water quality restoration activities being implemented to address impairment.[193] The 4e waters are included in the state's 303(d) list and the state's study list (for additional data gathering),[194] but the decision to develop a TMDL is deferred until the next assessment cycle. As explained above, 4e plans involve less certainty of when water quality standards will be attained than the 4b plans.[195] The goal of an approved 4e plan "is to implement appropriate restoration activities and, if necessary, additional study so that by the next assessment cycle either a 4b plan can be approved [by DEP] or the

[191] Fla. Admin. Code R. 62-303.600.
[192] *See* Florida Department of Environmental Protection, *Reasonable Assurance Plans (RAPs): Category 4b Assessments and Documentation*, https://floridadep.gov/dear/alternative-restoration-plans/content/reasonable-assurance-plans-raps-category-4b-assessments. (Accessed December 2020.)
[193] Florida Department of Environmental Protection, *Category 4e Assessments and Documentation*, https://floridadep.gov/dear/alternative-restoration-plans/content/category-4e-assessments-and-documentation. (Accessed December 2020.)
[194] Fla. Admin. Code R. 62-303.390(2)(d).
[195] *Ibid*.

waterbody attains water quality standards for the parameter causing impairment."[196] As of November 2021, local stakeholders were implementing restoration projects for 117 waterbody segments as a near-term alternative to TMDL development. This is a large increase since the 2021 Edition, where local stakeholders were implementing projects for only 51 waterbodies. Table 4.1.8 shows the current water quality restoration activities under 4e plans.

In future editions, EDR will work with DEP staff to identify the likely path of the 1,373 waterbody segments needing TMDLs for the purpose of estimating future expenditures. At this point, it is unknown how many of these impaired waters will proceed to the BMAP stage or move under a 4e plan. For those that are ultimately under a 4e plan, project data will be needed to forecast expenditures. In this Edition, that data is still not available.

Table 4.1.8 Water Quality Restoration Plans (Category 4e)

Group Name	WBID	Water Segment Name	Waterbody Type	Parameters Assessed Using the Impaired Surface Waters Rule
Charlotte Harbor	2030	Alligator Creek (Tidal Segment)	Estuary	Dissolved Oxygen, Nutrients (Chlorophyll-a)
Choctawhatchee - St. Andrew	722	Rocky Bayou	Estuary	Nutrients (TN)
Everglades	3289	Shark Slough (Everglades National Park)	Stream	Dissolved Oxygen
Everglades	3252B	Water Conservation Area (WCA) 1 (North Sector)	Stream	Dissolved Oxygen, Nutrients (TP)
Everglades	3252D	WCA 1 (West Sector)	Stream	Dissolved Oxygen, Nutrients (TP)
Everglades	3252E	WCA 1 (South Sector)	Stream	Nutrients (TP)
Everglades	3265F	WCA 2A (West Sector)	Stream	Nutrients (TP)
Everglades	3265G	WCA 2A (Central Sector)	Stream	Dissolved Oxygen, Nutrients (TP)
Everglades	3268H	WCA 3A (East Sector)	Stream	Nutrients (TP)
Everglades	3268I	WCA 3A (Central Sector)	Stream	Dissolved Oxygen, Nutrients (TP)
Everglades	3289E	Chevelier Bay	Estuary	Nutrients (TN)
Everglades	3289G	Cannon Bay	Estuary	Nutrients (Chlorophyll-a), Nutrients (TN), Nutrients (TP)
Everglades	3289H	Lostmans Bay (Everglades National Park)	Estuary	Nutrients (TN)
Everglades	3289I	Bays Near Flamingo (Everglades National Park)	Estuary	Nutrients (TN)
Everglades	3289L	Alligator Bay	Estuary	Nutrients (TN)
Everglades	3289M	Dads Bay	Estuary	Nutrients (TN)
Everglades	3289R	Shark Slough A (Everglades National Park)	Estuary	Nutrients (TN), Nutrients (TP)
Everglades	3289X	Everglades Lakes	Estuary	Nutrients (Chlorophyll-a), Nutrients (TN), Nutrients (TP)
Everglades	3303G	Joe Bay (East Segment)	Estuary	Nutrients (TN)
Everglades West Coast	3258B2	Hendry Creek	Estuary	Enterococci
Everglades West Coast	3259M	Ten Thousand Islands	Estuary	Dissolved Oxygen, Nutrients (Chlorophyll-a), Nutrients (TN)
Everglades West Coast	3278U	Rookery Bay (Coastal Segment)	Estuary	Nutrients (TN)
Florida Keys	6002	Manatee Bay	Estuary	Nutrients (TN)
Florida Keys	6003	Barnes Sound	Estuary	Nutrients (Chlorophyll-a)
Florida Keys	6005	Long Sound	Estuary	Nutrients (TN)
Florida Keys	6016	Duck Key	Coastal	Dissolved Oxygen
Florida Keys	8077	Florida Bay (Middle Keys)	Coastal	Nutrients (TN)
Florida Keys	8078	Florida Bay (Upper Keys)	Coastal	Nutrients (TN)
Florida Keys	6005A	Little Blackwater Sound	Estuary	Nutrients (TN)
Florida Keys	6005B	Blackwater Sound	Estuary	Nutrients (TN)
Indian River Lagoon	3057A	Banana River below 520 Causeway	Estuary	pH

[196] Florida Department of Environmental Protection, *Guidance on Developing Plans as Alternatives to TMDLs – Assessment Category 4b and 4e Plans*, June 2015, at 10, available at: https://floridadep.gov/sites/default/files/4b4ePlansGuidance.pdf. (Accessed December 2020.)

Group Name	WBID	Water Segment Name	Waterbody Type	Parameters Assessed Using the Impaired Surface Waters Rule
Indian River Lagoon	3057B	Banana River above 520 Causeway	Estuary	pH
Kissimmee River	3172	East Lake Tohopekaliga	Lake	Biology, Nutrients (Chlorophyll-a), Nutrients (TN), Nutrients (TP)
Kissimmee River	3168Z3	Lake Arnold	Lake	Nutrients (Chlorophyll-a), Nutrients (TN), Nutrients (TP)
Kissimmee River	3170F7	Reedy Creek In RCID (Lower)	Stream	E. Coli
Kissimmee River	3173A	Lake Tohopekaliga	Lake	Biology
Lower St. Johns	2239	Strawberry Creek	Stream	E. Coli
Lower St. Johns	2224A	Ribault River (Marine Segment)	Estuary	Enterococci
Lower St. Johns	2224B	Ribault River (Tidal Segment)	Estuary	Enterococci
Lower St. Johns	2224C	Palmdale Tributary	Stream	E. Coli
Lower St. Johns	2567A	Rice Creek	Stream	Dioxin (in fish tissue)
Middle St. Johns	2962	Smith Canal	Stream	E. Coli
Middle St. Johns	2986	Soldier's Creek	Stream	E. Coli
Middle St. Johns	2987	Little Wekiva River	Stream	E. Coli
Middle St. Johns	3001	Little Econlockhatchee River	Stream	E. Coli
Middle St. Johns	3004	Little Wekiva Canal	Stream	E. Coli
Middle St. Johns	3014	Crane Strand Drain	Stream	E. Coli
Middle St. Johns	2994A	Gee Creek	Stream	E. Coli
Middle St. Johns	2997B	Lake Howell	Lake	Biology, Nutrients (Chlorophyll-a)
Middle St. Johns	3001B	Little Econlockhatchee River Above Michael's Reservoir	Stream	E. Coli
Middle St. Johns	3001C	Little Econlockhatchee River Below Michael's Reservoir	Stream	E. Coli
Middle St. Johns	3002E	Lake Prima Vista	Lake	Biology, Nutrients (Chlorophyll-a), Nutrients (TN)
Middle St. Johns	3004K	Lake Orlando	Lake	Biology, Nutrients (Chlorophyll-a), Nutrients (TN), Nutrients (TP)
Ochlockonee - St. Marks	857	Central Drainage Ditch	Stream	Nutrients (Chlorophyll-a)
Ochlockonee - St. Marks	647F	Lake Kanturk	Lake	Nutrients (Chlorophyll-a), Nutrients (TN), Nutrients (TP)
Ochlockonee - St. Marks	647J	Lake Killarney	Lake	Nutrients (Chlorophyll-a), Nutrients (TP)
Ochlockonee - St. Marks	647K	Lake Kinsale	Lake	Nutrients (Chlorophyll-a), Nutrients (TN), Nutrients (TP)
Ochlockonee - St. Marks	756F	Lake Lafayette (Upper Segment)	Lake	Dissolved Oxygen, E. Coli, Nutrients (Chlorophyll-a), Nutrients (TN), Nutrients (TP)
Ocklawaha	2811	West Emeralda Marsh Conservation Area	Lake	Dissolved Oxygen, Nutrients (Chlorophyll-a), Nutrients (TN), Nutrients (TP)
Ocklawaha	2856	Apopka Marsh	Stream	Dissolved Oxygen
Pensacola	676	Carpenter Creek	Stream	E. Coli
Perdido	489	Elevenmile Creek	Stream	E. Coli
Perdido	797	Perdido Bay (Upper Segment)	Estuary	Nutrients (Chlorophyll-a)
Perdido	462A	Perdido River (South Marine)	Estuary	Nutrients (Chlorophyll-a)
Perdido	489A	Tenmile Creek	Stream	E. Coli
Sarasota Bay - Peace - Myakka	15101	Lake Eva	Lake	Nutrients (Chlorophyll-a), Nutrients (TN)
Sarasota Bay - Peace - Myakka	1497A	Crystal Lake	Lake	Nutrients (Chlorophyll-a), Nutrients (TN), Nutrients (TP)
Sarasota Bay - Peace - Myakka	1497B	Lake Parker	Lake	Biology, Nutrients (Chlorophyll-a), Nutrients (TN), Nutrients (TP)
Sarasota Bay - Peace - Myakka	1623K	Saddle Creek	Stream	Dissolved Oxygen, Nutrients (Chlorophyll-a), Nutrients (TN)
Southeast Coast - Biscayne Bay	3274	C-13 East (Middle River Canal)	Estuary	Enterococci
Southeast Coast - Biscayne Bay	3276	C-12	Stream	E. Coli
Southeast Coast - Biscayne Bay	3281	C-11 (East)	Stream	E. Coli
Southeast Coast - Biscayne Bay	3276A	New River (North Fork)	Estuary	Enterococci
Southeast Coast - Biscayne Bay	3277E	Dania Cutoff Canal	Estuary	Enterococci
Southeast Coast - Biscayne Bay	3279A	North Fork Snake Creek Canal	Stream	E. Coli
Southeast Coast - Biscayne Bay	3288A	Wagner Creek/Seybold Canal	Estuary	Enterococci
Springs Coast	1440	Anclote River Tidal	Estuary	Enterococci, Nutrients (Chlorophyll-a), Nutrients (TN)
Springs Coast	1556	Cedar Creek Tidal	Estuary	Enterococci
Springs Coast	1633	McKay Creek (Tidal)	Estuary	Enterococci

Group Name	WBID	Water Segment Name	Waterbody Type	Parameters Assessed Using the Impaired Surface Waters Rule
Springs Coast	1440A	Anclote River Bayou Complex (Spring Bayou)	Estuary	Nutrients (Chlorophyll-a), Nutrients (TN)
Springs Coast	1556A	Cedar Creek	Stream	E. Coli
Springs Coast	1633B	McKay Creek	Stream	E. Coli
Springs Coast	1668A	Joe's Creek	Stream	E. Coli, Nutrients (Macrophytes)
Springs Coast	1668B	Pinellas Park Ditch No. 5 (Bonn Creek)	Stream	E. Coli
Springs Coast	1716A	34th Street Basin	Stream	E. Coli
Springs Coast	1716D	Clam Bayou Drain Tidal	Estuary	Dissolved Oxygen, Enterococci, Nutrients (Chlorophyll-a)
St. Lucie - Loxahatchee	3215	Danforth Creek	Stream	Dissolved Oxygen, Nutrients (TP)
St. Lucie - Loxahatchee	3224	Loxahatchee River (Jonathan Dickinson State Park)	Estuary	Dissolved Oxygen, Enterococci, Fecal Coliform (3)
St. Lucie - Loxahatchee	3226	Jupiter Inlet	Estuary	Nutrients (Chlorophyll-a)
St. Lucie - Loxahatchee	3230	Loxahatchee River above Cypress Creek	Stream	Nutrients (Algal Mats)
St. Lucie - Loxahatchee	3232	Unnamed Drain to Loxahatchee River	Stream	Dissolved Oxygen
St. Lucie - Loxahatchee	3194A	Ten Mile Creek	Stream	Dissolved Oxygen, Nutrients (TP)
St. Lucie - Loxahatchee	3194A	Tenmile Creek	Stream	Biology, Nutrients (Chlorophyll-a), Nutrients (Macrophytes)
St. Lucie - Loxahatchee	3224A1	Loxahatchee River (North Fork Lower)	Estuary	Enterococci, Fecal Coliform (3)
St. Lucie - Loxahatchee	3224B	Kitchings Creek	Stream	E. Coli
St. Lucie - Loxahatchee	3224C1	Cypress Creek	Stream	Dissolved Oxygen
St. Lucie - Loxahatchee	3224C2	Moonshine Creek	Stream	Dissolved Oxygen
St. Lucie - Loxahatchee	3226A	Loxahatchee River (Northwest Fork)	Estuary	Enterococci, Fecal Coliform, Fecal Coliform (3), Nutrients (Chlorophyll-a), Nutrients (TP)
St. Lucie - Loxahatchee	3226C	Loxahatchee River (Southwest Fork)	Estuary	Dissolved Oxygen, Enterococci, Nutrients (Chlorophyll-a)
St. Lucie - Loxahatchee	3226D	North Fork Loxahatchee River (Marine Segment)	Estuary	Enterococci
St. Lucie - Loxahatchee	3230A1	Loxahatchee River (Northwest Fork)	Stream	Dissolved Oxygen
St. Lucie - Loxahatchee	3232A	Tidal Creek to Loxahatchee River	Estuary	Enterococci
Tampa Bay	1574	Alligator Creek	Stream	E. Coli
Tampa Bay	1605	Delaney Creek	Stream	E. Coli
Tampa Bay	1627	Long Branch	Stream	Biology, Dissolved Oxygen, E. Coli, Nutrients (Macrophytes), Nutrients (TP)
Tampa Bay	1570A	Sweetwater Creek (Tidal Segment)	Estuary	Dissolved Oxygen
Tampa Bay	1577A	Pepper Mound Creek	Estuary	Dissolved Oxygen, Nutrients (Chlorophyll-a)
Tampa Bay	1579A	Bellows Lake (East Lake)	Lake	Nutrients (Chlorophyll-a), Nutrients (TN), Nutrients (TP)
Tampa Bay	1587A	Woods Creek	Estuary	Dissolved Oxygen
Tampa Bay	1601A	Tampa Bay Channel	Estuary	Nutrients (Chlorophyll-a)
Tampa Bay	1627B	Long Branch (Tidal)	Estuary	Enterococci
Tampa Bay	1731A	Lake Maggiore	Lake	Nutrients (Chlorophyll-a), Nutrients (TN), Nutrients (TP), Specific Conductance
Tampa Bay	1731B	Salt Creek	Estuary	Nutrients (Chlorophyll-a)
Tampa Bay Tributaries	1675	Owens Branch	Stream	Dissolved Oxygen, Nutrients (Chlorophyll-a)
Tampa Bay Tributaries	1914	Braden River Above Ward Lake	Stream	Dissolved Oxygen, Nutrients (Chlorophyll-a)
Tampa Bay Tributaries	1848D1	Wares Creek (Estuarine Segment)	Estuary	Enterococci
Tampa Bay Tributaries	1848D2	Wares Creek (Freshwater Segment)	Stream	E. Coli

Source: DEP website at https://floridadep.gov/dear/alternative-restoration-plans/content/category-4e-assessments-and-documentation. (Accessed November 2021.)

4.2 Next Steps and Recommendations

Future editions of this report will continue to improve upon the TMDL development and BMAP implementation forecasts. This will include development costs for TMDLs over any water segments added to the Comprehensive Verified List and BMAP implementation costs for any

newly adopted BMAPs identified in DEP's STAR Report. In addition, discussion with DEP staff indicates that project lists, similar to those used to develop the cost estimates for BMAP implementation, will be developed for the Alternative Restoration Plans. Once that data is available, EDR will produce a forecast of the expenditures necessary to comply with laws regarding those plans. EDR will also begin working with DEP staff to better understand the slow adoption rate of TMDLs and the potential impact on EDR's expenditure forecast.

Regarding the BMAP expenditure forecast, DEP added a new project status in the most recent STAR Report. The "ongoing" status is defined as "[p]roject or activity which requires action each year to continue providing water quality benefits. These projects are typically non-structural and continuous."[197] There were just over one thousand projects that were considered completed in the prior STAR Report that are now classified as ongoing. Over the next year, EDR will work with DEP staff to better understand the use of this designation and how those annual costs should be incorporated into future expenditure forecasts. In this Edition, EDR treats nutrient reductions for ongoing projects in the same manner as reductions from completed projects, consistent with DEP's current treatment of these statuses.

Lastly, EDR will work toward identifying the water quality monitoring costs to be presented as a separate expenditure forecast or as a component of other applicable programs.[198] This includes water quality monitoring programs such as the state's Status and Trend monitoring networks for surface waters and the groundwater monitoring network.

At this time, EDR has no formal recommendations for legislative consideration regarding water quality protection and restoration.

[197] Available at: https://floridadep.gov/dear/water-quality-restoration/content/statewide-annual-report. (Accessed November 2021.)
[198] Note that EDR has identified DEP's watershed monitoring expenditures from Fiscal Years 2010-11 to 2019-20 in Table 2.3.1 of Chapter 2.

Appendix A: Additional Resources Regarding Water Supply and Demand Modelling and Expenditures Forecasts

The following are the appendices related to Chapter 3. In this appendix, EDR only presents the revisions applicable to this Edition. For a complete description of EDR's methodology and how it compares with the model based on WMD projections, see Chapter 4 and Appendix A in the 2021 Edition.

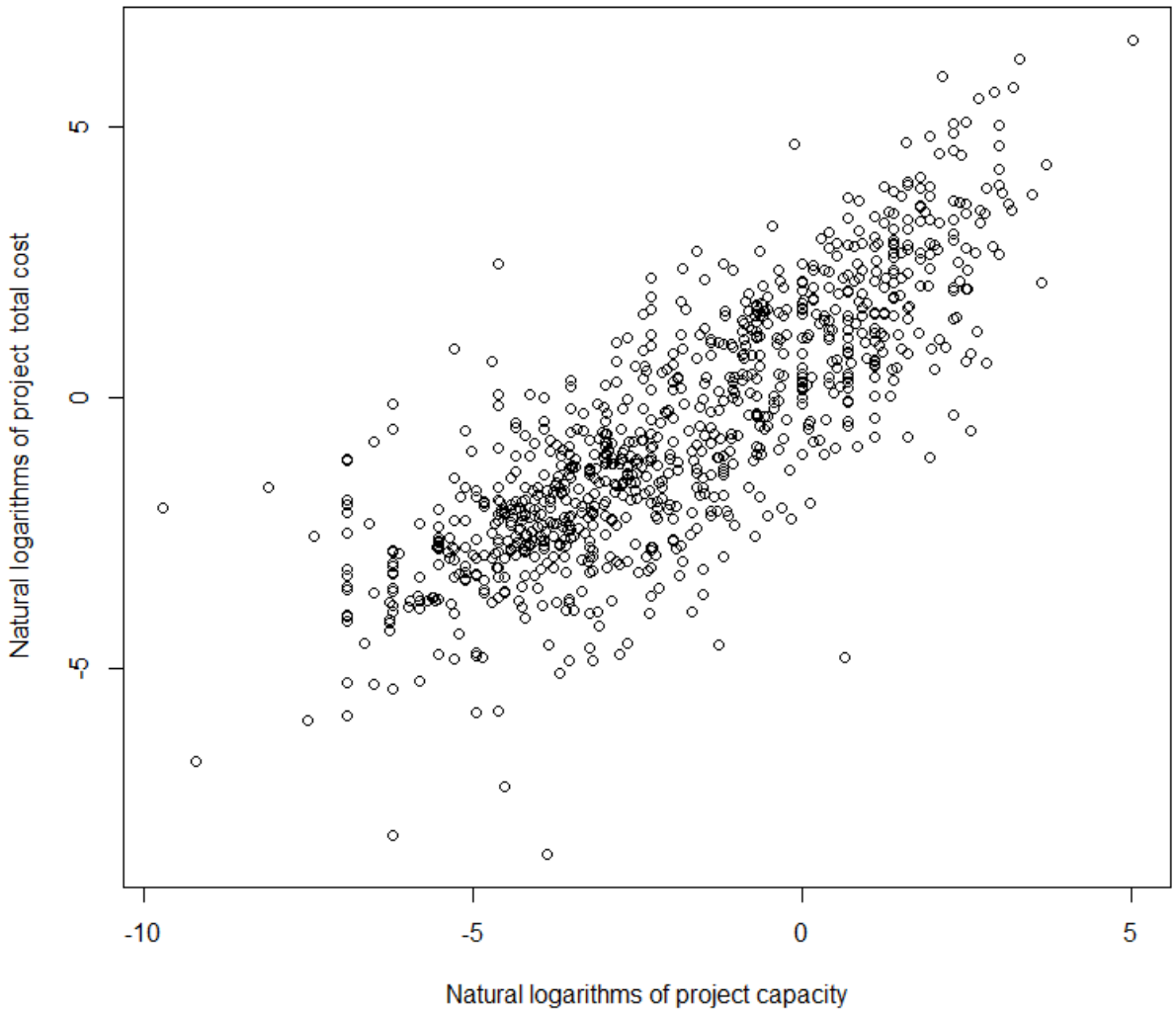
A.1 Regression Analysis of Project Expenditures

Regression analysis was used to explore the relationship between project expenditures and project types, capacities, the regions of implementation, and project status. To develop a regression model, 941 projects from the project appendix were selected. These were projects identified as "Additional water supply" and "Water for natural systems" projects.[199] The natural logarithm of "project total ($)" was strongly correlated with the natural logarithm of the project capacity. As shown in the scatter plot in Figure A.1.1, the relationship between these two variables is linear. Since log-transformation is applied to both variables, the results can be interpreted as each one percent change in project capacity leading to a one percent change in the "project total ($)."

[See figure on following page]

[199] Note project type "Reclaimed Water (for groundwater recharge or natural system restoration)" was excluded.

Figure A.1.1 Scatter Plot, Natural Logarithms of "Project total ($)" and Project Capacity (mgd)



The DEP project appendix provides information about project capacity, type, status, and the region of implementation. The regression model includes all these characteristics. However, EDR revised how it modeled the effects of project capacity, type, status, and the region of implementation on the expenditures for this year's analysis. The model now explains approximately 74% of the variability in the dependent variable (as opposed to 51% in the report's 2021 Edition). EDR will continue testing alternative model specifications to improve the predictive model capacity for this report's 2023 Edition.

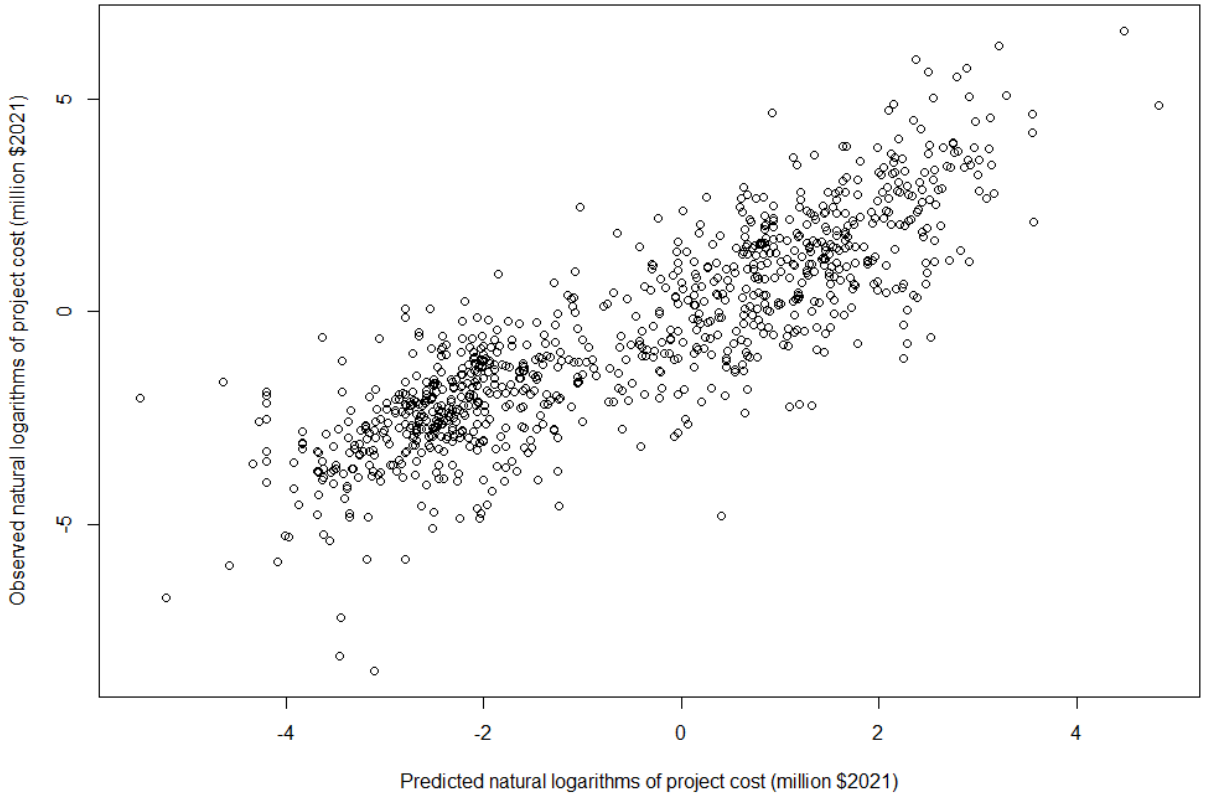
[See table on following page]

Table A.1.1 Regression Analysis Results (dependent variable is the natural logarithm of "project total", in million $2021)

Variable description	Estimate	Std. Error	t value	Pr(>|t|)
Intercept	0.017	0.590	0.028	0.977
Natural Logarithms of project capacity	0.525	0.026	20.253	< 2e-16
Project Type				
Aquifer Storage and Recovery	1.054	0.339	3.106	0.002
Brackish Groundwater	1.719	0.255	6.735	0.000
Data Collection and Evaluation	1.532	0.889	1.723	0.085
Distribution/Transmission Capacity	3.443	1.248	2.758	0.006
Flood Control Works	-0.086	0.879	-0.098	0.922
Groundwater Recharge	0.197	0.335	0.588	0.557
Other Non-Traditional Source	-0.046	0.579	-0.080	0.937
Other Project Type	0.331	0.396	0.837	0.403
PS and CII Conservation	-0.561	0.175	-3.197	0.001
Reclaimed Water (for groundwater recharge or natural system restoration)	0.893	0.340	2.625	0.009
Reclaimed Water (for potable offset)	0.992	0.174	5.685	0.000
Stormwater	-0.122	0.348	-0.350	0.726
Surface Water	1.012	0.329	3.077	0.002
Surface Water Storage	1.278	0.648	1.971	0.049
Wastewater Collection and Treatment	-0.908	1.360	-0.668	0.504
Agricultural Conservation	Baseline, captured in the intercept			
Project Status				
Complete	-0.074	0.560	-0.133	0.894
Construction/Underway	0.222	0.565	0.394	0.694
Design	0.187	0.593	0.316	0.752
Cancelled	Baseline, captured in the intercept			
Project Region				
NFRWSP	0.246	0.151	1.628	0.104
NW−II	*0.707*	*0.484*	*1.460*	*0.145*
NW−Other	0.239	0.147	1.620	0.106
SF−LEC	0.044	0.142	0.307	0.759
SF−LWC	0.325	0.190	1.711	0.087
SF−UEC	-0.458	0.256	-1.785	0.075
SJR−CSEC	0.160	0.168	0.952	0.341
SR−West	1.313	0.566	2.322	0.020
SW−H	-0.053	0.715	-0.075	0.941
SW−N	0.063	0.224	0.280	0.780
SW−S	0.428	0.185	2.313	0.021
CFWI	Baseline, captured in the intercept			

Table A.1.1 presents the regression results showing that expenditures increase with the project capacity. Note that since natural logarithm transformations are used for both expenditure and capacity, the model coefficient reflects one percent change in the expenditure for a one percent change in capacity. The model results also show that reclaimed water projects are statistically less expensive than both aquifer storage and recovery projects and brackish groundwater recharge projects among project types ranked as "highly" or "moderately likely" (Table 3.6.2). Finally, among the regions with potential inferred water supply shortages, the SR−West, NW−II, NFEWSP, SJR−CSEC and SW−N regions tend to be more costly (when compared with projects in the CFWI).

Figure A.1.2 Scatter Plot, Natural Logarithms of predicted project total ($2021) and observed project total ($2021)



This regression equation is used to estimate the expenditures for various project types, capacities, and regions. A comparison of estimated and observed project expenditures is presented in Figure A.1.2. Overall, the model seems to predict the project expenditures well. EDR will continue testing alternative model specifications to improve the predictive model capacity for this report's 2023 Edition.

Table A.1.2 Year and Inflation Multipliers for "Project Total ($)"

State FY Assumed by EDR for "Project Total ($)" Estimates	Inflation Index used to index "Project Total ($)" to State FY$2021
2005	1.600
2006	1.533
2007	1.487
2008	1.445
2009	1.370
2010	1.350
2011	1.305
2012	1.271
2013	1.239
2014	1.208
2015	1.176
2016	1.149
2017	1.109
2018	1.072
2019	1.043
2020	1.027
2021	1.000

Table A.1.3 Agricultural Water Use Projections

	2020	2025	2030	2035	2040
FSAID-8 Projection					
NW – I	2.62	2.93	3.2	3.59	4
NW – II	2.97	3.54	3.94	4.49	5.04
NW – III	0.89	0.9	0.89	0.9	0.9
NW – IV	35.07	35.55	36.22	37.16	38.48
NW – V	0.31	0.31	0.31	0.31	0.31
NW – VI	5.81	5.82	5.83	5.87	5.89
NW – VII	1.5	1.51	1.51	1.5	1.52
SR – West	55.56	58.88	61.98	66.44	70.84
NFRWSP	155.81	160.51	164.67	170.25	175.73
SJR – CSEC	106.22	106.8	106.31	104.99	104.06
SW – N (excluding CFWI)	27.76	30.04	32.23	34.22	37.09
SW – TB	51.45	49.29	47.99	46.61	45.21
SW – H (excluding CFWI)	99.07	99.35	99.3	97.23	95.37
SW – S	169.19	171.75	174.56	175.85	177.16
CFWI	137.83	137.42	137.15	134.98	132.18
SF – LKB	118.67	119.9	121.69	123.61	125.48
SF – UEC	123.48	119.12	114.41	109.17	103.83
SF – LEC	655.0524	633.8644	632.1464	631.0984	629.8404
SF – LWC	334.5	338.82	343.14	348.57	352.92
Statewide	***2,083.76***	***2,076.30***	***2,087.48***	***2,096.84***	***2,105.85***
Water Management Districts' Projections					
NW – I	3.78	4.31	4.96	5.57	6.16
NW – II	3	3.24	3.52	3.77	3.97
NW – III	0.9	0.91	0.93	0.95	0.97
NW – IV	30.64	32.91	34.51	36.54	38.45
NW – V	0.25	0.25	0.25	0.25	0.25
NW – VI	5.39	5.56	5.71	5.88	6.03
NW – VII	1.39	1.39	1.48	1.55	1.67
SR – West	49.3	52.31	56.65	61.07	64.79*
NFRWSP	139.41	142.95	148.8	153.58	156.82*
SJR – CSEC	119.12	119.46	120.71	121.6	122.91
SW – N (excluding CFWI)	19.58	21.14	22.87	24.64	26.43
SW – TB	46.12	44.18	42.35	40.45	38.16
SW – H (excluding CFWI)	71.53	68.99	66.26	65.2	62.18
SW – S	105.58	106.48	107.52	108.55	109.65
CFWI	157.19	157.89	159.66	161.72	163.49
SF – LKB	241.31	243.01	244.66	244.63	248.14
SF – UEC	168.67	170.86	173.31	178.57	186.65
SF – LEC	653.25	643.51	637.51	631.06	625.27
SF – LWC	634.93	644.66	653.01	665.92	678.83
Statewide	***2,451.33***	***2,464.00***	***2,484.66***	***2,511.50***	***2,540.82***
Difference between WMDs' and FSAID8 projections**					
NW – I	1.16	1.38	1.76	1.98	2.16
NW – II	0.03	-0.30	-0.42	-0.72	-1.07
NW – III	0.01	0.01	0.04	0.05	0.07
NW – IV	-4.43	-2.64	-1.71	-0.62	-0.03
NW – V	-0.06	-0.06	-0.06	-0.06	-0.06
NW – VI	-0.42	-0.26	-0.12	0.01	0.14
NW – VII	-0.11	-0.12	-0.03	0.05	0.15
SR – West	-6.26	-6.57	-5.33	-5.37	-6.05
NFRWSP	-16.40	-17.56	-15.87	-16.67	-18.91
SJR – CSEC	12.90	12.66	14.40	16.61	18.85
SW – N (excluding CFWI)	-8.18	-8.90	-9.36	-9.58	-10.66
SW – TB	-5.33	-5.11	-5.64	-6.16	-7.05
SW – H (excluding CFWI)	-27.54	-30.36	-33.04	-32.03	-33.19
SW – S	-63.61	-65.27	-67.04	-67.30	-67.51
CFWI	19.36	20.47	22.51	26.74	31.31
SF – LKB	122.64	123.11	122.97	121.02	122.66
SF – UEC	45.19	51.74	58.90	69.40	82.82
SF – LEC	-1.80	9.65	5.36	-0.04	-4.57
SF – LWC	300.43	305.84	309.87	317.35	325.91
Statewide	**367.57**	**387.70**	**397.18**	**414.66**	**434.97**

* This value was projected by EDR using a trend from the WMDs' 2015-2035 estimates and projections.
** Font colors are used to indicate positive and negative differences between the WMDs' and the FSAID's projections.

Table A.1.4 PSS, DSS, L/R, and CII Water Use Projections and Forecasts

	2020	2025	2030	2035	2040
EDR Forecast					
NW – I	56.40	55.06	53.77	52.15	50.10
NW – II	77.51	79.16	79.41	78.55	76.28
NW – III	27.60	27.33	26.55	25.44	23.92
NW – IV	17.09	16.42	15.60	14.67	13.67
NW – V	4.69	4.54	4.34	4.09	3.80
NW – VI	6.74	6.50	6.14	5.77	5.34
NW – VII	51.17	51.54	50.49	49.09	47.26
SR – West	35.39	33.29	32.31	31.62	31.02
NFRWSP	409.34	413.17	408.88	404.42	397.39
SJR – CSEC	261.16	266.30	261.64	253.81	242.12
SW – N (excluding CFWI)	95.91	98.64	98.51	96.82	93.44
SW – TB	462.39	470.04	462.12	448.70	429.46
SW – H (excluding CFWI)	18.32	18.45	17.83	17.10	16.20
SW – S	155.27	161.63	159.99	156.28	150.07
CFWI	507.07	527.30	533.19	534.62	530.71
SF – LKB	12.16	12.53	12.78	13.01	13.26
SF – UEC	76.67	81.44	81.62	80.57	78.30
SF – LEC	1092.28	1142.59	1144.89	1139.61	1127.07
SF – LWC	361.93	392.70	418.08	439.31	457.86
Statewide	***3,729.07***	***3,858.62***	***3,868.15***	***3,845.62***	***3,787.27***
Water Management Districts' Projections					
NW – I	77.68	82.17	83.50	84.24	84.83
NW – II	73.87	79.01	83.50	87.42	90.91
NW – III	55.92	58.00	59.91	61.71	63.55
NW – IV	16.81	17.30	17.65	17.87	18.09
NW – V	5.16	5.22	5.30	5.35	5.38
NW – VI	6.40	6.62	6.83	7.03	7.15
NW – VII	44.25	46.14	48.18	49.92	51.61
SR – West	57.23	58.61	60.04	61.28	62.75*
NFRWSP	416.09	439.37	460.48	480.01	503.70*
SJR – CSEC	252.21	263.90	272.98	282.53	292.34
SW – N (excluding CFWI)	121.11	130.56	138.71	146.37	153.09
SW – TB	366.88	388.24	394.25	409.74	423.31
SW – H (excluding CFWI)	19.99	20.46	29.91	29.76	26.97
SW – S	135.75	143.82	154.08	160.04	165.04
CFWI	567.05	620.54	665.86	701.03	732.83
SF – LKB	8.59	8.82	9.02	9.20	9.35
SF – UEC	89.28	95.83	101.95	107.61	112.83
SF – LEC	1120.99	1180.65	1233.02	1279.84	1328.52
SF – LWC	394.98	428.51	460.23	489.04	516.45
Statewide	***3,830.25***	***4,073.79***	***4,285.39***	***4,469.98***	***4,648.70***
Difference between WMDs' and EDR projections**					
NW – I	21.28	27.11	29.73	32.09	34.73
NW – II	-3.64	-0.15	4.09	8.87	14.63
NW – III	28.32	30.67	33.36	36.27	39.63
NW – IV	-0.28	0.88	2.05	3.20	4.42
NW – V	0.47	0.68	0.96	1.26	1.58
NW – VI	-0.34	0.12	0.69	1.26	1.81
NW – VII	-6.92	-5.40	-2.31	0.83	4.35
SR – West	21.84	25.32	27.73	29.66	31.73
NFRWSP	6.75	26.20	51.60	75.59	106.31
SJR – CSEC	-8.95	-2.40	11.34	28.72	50.22
SW – N (excluding CFWI)	25.20	31.92	40.20	49.55	59.65
SW – TB	-95.51	-81.80	-67.87	-38.96	-6.15
SW – H (excluding CFWI)	1.67	2.01	12.08	12.66	10.77
SW – S	-19.52	-17.81	-5.91	3.76	14.97
CFWI	59.98	93.24	132.67	166.41	202.12
SF – LKB	-3.57	-3.71	-3.76	-3.81	-3.91
SF – UEC	12.61	14.39	20.33	27.04	34.53
SF – LEC	28.71	38.06	88.13	140.23	201.45
SF – LWC	33.05	35.81	42.15	49.73	58.59
Statewide	**101.17**	**215.15**	**417.25**	**624.37**	**861.43**

* This value was projected by EDR using a trend from the WMDs' 2015-2035 estimates and projections.

** Font colors are used to indicate positive and negative differences between the WMDs' and the EDR's projections.

Table A.1.5 PG: WMDs' Water Use Projections and EDR Forecasts

	2020	2025	2030	2035	2040
EDR Forecast					
NW – I	0.14	0.14	0.14	0.14	0.14
NW – II	4.60	4.60	4.60	4.60	4.60
NW – III	1.89	1.89	1.89	1.89	1.89
NW – IV	0.00	0.00	0.00	0.00	0.00
NW – V	0.00	0.00	0.00	0.00	0.00
NW – VI	2.79	2.79	2.79	2.79	2.79
NW – VII	0.00	0.00	0.00	0.00	0.00
SR – West	25.36	25.36	25.36	25.36	25.36
NFRWSP	4.15	4.15	4.15	4.15	4.15
SJR – CSEC	7.14	7.91	8.70	9.45	10.21
SW – N (excluding CFWI)	0.27	0.22	0.19	0.16	0.15
SW – TB	0.00	0.02	0.02	0.02	0.02
SW – H (excluding CFWI)	4.65	4.65	4.65	4.65	4.65
SW – S	7.06	7.16	7.26	7.36	7.45
CFWI	0.00	0.00	0.00	0.00	0.00
SF – LKB	8.85	8.85	8.85	8.85	8.85
SF – UEC	9.10	9.10	9.10	9.10	9.10
SF – LEC	0.36	0.36	0.36	0.36	0.36
SF – LWC	0.14	0.14	0.14	0.14	0.14
Statewide	***4.60***	***4.60***	***4.60***	***4.60***	***4.60***
Water Management Districts' Projections					
NW – I	12.09	12.09	12.09	12.09	12.09
NW – II	0	0	0	0	0
NW – III	5.82	6.99	8.39	8.39	8.42
NW – IV	2.32	2.32	2.32	2.32	2.32
NW – V	0	0	0	0	0
NW – VI	0	0	0	0	0
NW – VII	4.93	4.93	4.93	4.93	4.93
SR – West	0	0	0	0	0
NFRWSP	29.56	30.38	32.08	33.88	36.05
SJR – CSEC	12.14	12.26	12.42	12.59	12.62
SW – N (excluding CFWI)	1.8	1.85	1.96	2.08	2.21
SW – TB	0.34	0.35	0.36	0.37	0.38
SW – H (excluding CFWI)	0	0	0	0	0
SW – S	3.69	3.92	4.17	4.4	4.64
CFWI	11	11.06	11.13	11.19	11.27
SF – LKB	0	0	0	0	0
SF – UEC	21.2	22.2	23.2	39.2	55.2
SF – LEC	39.75	39.75	52.75	52.75	52.75
SF – LWC	0.4	0.4	0.4	15.4	15.4
Statewide	***145.04***	***148.5***	***166.2***	***199.59***	***218.28***
Difference between WMDs' and EDR projections*					
NW – I	2.38	2.38	2.38	2.38	2.38
NW – II	-0.14	-0.14	-0.14	-0.14	-0.14
NW – III	1.22	2.39	3.79	3.79	3.82
NW – IV	0.43	0.43	0.43	0.43	0.43
NW – V	0.00	0.00	0.00	0.00	0.00
NW – VI	0.00	0.00	0.00	0.00	0.00
NW – VII	2.14	2.14	2.14	2.14	2.14
SR – West	0.00	0.00	0.00	0.00	0.00
NFRWSP	4.20	5.02	6.72	8.52	10.69
SJR – CSEC	7.99	8.11	8.27	8.44	8.47
SW – N (excluding CFWI)	-5.34	-6.06	-6.74	-7.37	-8.00
SW – TB	0.07	0.13	0.17	0.21	0.23
SW – H (excluding CFWI)	0.00	-0.02	-0.02	-0.02	-0.02
SW – S	-0.96	-0.73	-0.48	-0.25	-0.01
CFWI	3.94	3.90	3.87	3.83	3.82
SF – LKB	0.00	0.00	0.00	0.00	0.00
SF – UEC	12.35	13.35	14.35	30.35	46.35
SF – LEC	30.65	30.65	43.65	43.65	43.65
SF – LWC	0.04	0.04	0.04	15.04	15.04
Statewide	***58.96***	***61.60***	***78.43***	***111.00***	***128.85***

* Font colors are used to indicate positive and negative differences between the WMDs' and the EDR's projections.

Table A.1.6 Total Water Use Projections and Forecasts

	2020	2025	2030	2035	2040
EDR Forecast					
NW – I	68.73	67.70	66.68	65.45	63.81
NW – II	80.62	82.84	83.49	83.18	81.46
NW – III	33.09	32.83	32.04	30.94	29.42
NW – IV	54.05	53.86	53.71	53.72	54.04
NW – V	5.00	4.85	4.65	4.40	4.11
NW – VI	12.55	12.32	11.97	11.64	11.23
NW – VII	55.46	55.84	54.79	53.38	51.57
SR – West	90.95	92.17	94.29	98.06	101.86
NFRWSP	590.51	599.04	598.91	600.03	598.48
SJR – CSEC	371.52	377.24	372.10	362.95	350.32
SW – N (excluding CFWI)	130.81	136.59	139.45	140.49	140.74
SW – TB	514.11	519.55	510.29	495.47	474.82
SW – H (excluding CFWI)	117.39	117.82	117.15	114.35	111.59
SW – S	329.11	338.03	339.20	336.79	331.89
CFWI	651.96	671.88	677.61	676.96	670.34
SF – LKB	130.83	132.43	134.47	136.62	138.74
SF – UEC	209.00	209.41	204.88	198.59	190.98
SF – LEC	1,756.44	1,785.56	1,786.14	1,779.81	1,766.01
SF – LWC	696.79	731.88	761.58	788.24	811.14
Statewide	***5,898.91***	***6,021.83***	***6,043.39***	***6,031.05***	***5,982.56***
Water Management Districts' Projections					
NW – I	93.55	98.57	100.55	101.9	103.08
NW – II	76.87	82.25	87.02	91.19	94.88
NW – III	62.64	65.9	69.23	71.05	72.94
NW – IV	49.77	52.53	54.48	56.73	58.86
NW – V	5.41	5.47	5.55	5.6	5.63
NW – VI	11.79	12.18	12.54	12.91	13.18
NW – VII	50.57	52.46	54.59	56.4	58.21
SR – West	106.53	110.92	116.69	122.35	127.54
NFRWSP	585.06	612.7	641.36	667.47	696.57
SJR – CSEC	383.47	395.62	406.11	416.72	427.87
SW – N (excluding CFWI)	142.49	153.55	163.54	173.09	181.73
SW – TB	413.34	432.77	436.96	450.56	461.85
SW – H (excluding CFWI)	91.52	89.45	96.17	94.96	89.15
SW – S	245.02	254.22	265.77	272.99	279.33
CFWI	735.24	789.49	836.65	873.94	907.59
SF – LKB	249.9	251.83	253.68	253.83	257.49
SF – UEC	279.15	288.89	298.46	325.38	354.68
SF – LEC	1,813.99	1,863.91	1,923.28	1,963.65	2,006.54
SF – LWC	1,030.31	1,073.57	1,113.64	1,170.36	1,210.68
Statewide	***6,426.62***	***6,686.28***	***6,936.27***	***7,181.08***	***7,407.80***
Difference between WMDs' and EDR projections*					
NW – I	24.82	30.87	33.87	36.45	39.27
NW – II	-3.75	-0.59	3.53	8.01	13.42
NW – III	29.55	33.07	37.19	40.11	43.52
NW – IV	-4.28	-1.33	0.77	3.01	4.82
NW – V	0.41	0.62	0.90	1.20	1.52
NW – VI	-0.76	-0.14	0.57	1.27	1.95
NW – VII	-4.89	-3.38	-0.20	3.02	6.64
SR – West	15.58	18.75	22.40	24.29	25.68
NFRWSP	-5.45	13.66	42.45	67.44	98.09
SJR – CSEC	11.95	18.38	34.01	53.77	77.55
SW – N (excluding CFWI)	11.68	16.96	24.09	32.60	40.99
SW – TB	-100.77	-86.78	-73.33	-44.91	-12.97
SW – H (excluding CFWI)	-25.87	-28.37	-20.98	-19.39	-22.44
SW – S	-84.09	-83.81	-73.43	-63.80	-52.56
CFWI	83.28	117.61	159.04	196.98	237.25
SF – LKB	119.07	119.40	119.21	117.21	118.75
SF – UEC	70.15	79.48	93.58	126.79	163.70
SF – LEC	57.55	78.35	137.14	183.84	240.53
SF – LWC	333.52	341.69	352.06	382.12	399.54
Statewide	**527.71**	**664.45**	**892.88**	**1,150.03**	**1,425.24**

* Font colors are used to indicate positive and negative differences between the WMDs' and the EDR's projections.