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# APPENDIX 1. METHODS

## Contents

## Overview

Data and methods used to estimate base year 2020 water use and project future water demands for the 2025-2045 planning horizon vary according to water use category. The categories defined in rule include:[1]

1. Public Supply
2. Domestic Self-Supply
3. Agriculture
4. Recreational Irrigation
5. Industrial/Commercial/Institutional Uses
6. Thermoelectric (power generation) Use

For each of the six categories, water use was estimated for existing and projected future reasonable-beneficial uses. Water use projections include both average and drought-year estimates. Sources of uncertainty in the estimates and demand projections are described for each use category. The data and methods used to estimate and project water use are similar to those utilized in the 2018 WSA Update unless otherwise noted.

Projecting future water demands for drought events depends on anticipated future needs and on future climate conditions. Florida Statutes requires the anticipation of and planning for drought events:

> *"The level-of-certainty planning goal associated with identifying the water supply needs of existing and future reasonable-beneficial uses must be based upon meeting those needs for a 1-in-10 year drought event." (Section 373.709(2)(a)1., F. S.).*

A 1-in-10 year drought event has a 10 percent probability of occurring during any given year. The level of certainty planning goal is to ensure that, in any given year, there is a 90 percent probability that all reasonable-beneficial water demand needs will be met.

Annual average streamflow and precipitation data for a 30-year period was analyzed as part of the 2018 WSA to determine which years experienced conditions similar to a 1-in-10 drought event and which years experienced normal or above average rainfall. Year 2011 was selected as a dry year and compared to 2015, which approximated a normal rainfall year, to estimate increases in water demands for public supply uses under drought conditions. Rainfall was generally near average or above average during 2013 through 2020, and Year 2011 continues to represent the most recent drought year condition. Further information on the drought analysis and estimating methods is provided for each water use category.

## Population Estimates

Estimating and projecting populations served are essential for developing water use estimates and projections. Population estimates and projections used for determining future water supply needs must be based upon best available data.[2] Districts shall consider the University of Florida's Bureau of Economic and Business Research (BEBR) data, which includes annual estimates and projections of permanent residents at the county level.

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[1] Chapter 62-40, Water Resource Implementation Rule, section 62-40.531, Regional Water Supply Plans.
[2] Section 373.709, F.S., Regional water supply planning, (2)(a)1.a.

Public supply utilities with Individual Water Use Permits (IWUPs) submit pumping reports of water withdrawals to the District. Water use for public supply is attributable to seasonal, as well as permanent, populations. In addition, many utilities submit population estimates data and number of meters or service connections, differentiating between residential and non-residential water uses. This WSA recognizes these seasonal populations and seasonal water use in data provided by utilities.

In 2014, the District commissioned a population study to estimate permanent, seasonal, and adjusted total populations for Public Supply (PS), Domestic Self-Supply (DSS), and total county populations. This study used 2012 population data from the United States Census Bureau, American Community Survey (ACS) and parcel data from the Florida Department of Revenue (DOR). Seasonal populations include tourists and migrant workers, as defined by the ACS below (ACS, 2012). Group quarters, i.e., correctional facilities, college housing and university dormitories, were excluded from the 2014 District study.

### DEFINITIONS (SEASONAL POPULATIONS)

**For Seasonal, Recreational, or Occasional Use –** These are vacant units used or intended for use only in certain seasons or for weekends or other occasional use throughout the year. Seasonal units include those used for summer or winter sports or recreation, such as beach cottages and hunting cabins. Interval ownership units, sometimes called shared-ownership or time- sharing condominiums, also are included here.

**For Migrant Workers –** These include vacant units intended for occupancy by migratory workers employed in farm work during the crop season. (Work in a cannery, a freezer plant, a food-processing plant, or logging is not farm work.)

The population study estimated seasonal populations in all housing units described above and then halved the estimates to approximate the impacts that transient residents have on populations and water use. The rationale for this approach was to capture both seasonal and migrant workers as well as short-term tourists. For this WSA, this same method was applied: half of estimated seasonal populations were added to permanent populations to arrive at adjusted total population estimates.

All District counties have some seasonal populations, in both public supply (PS) utility service areas and among domestic self-supply (DSS) users. Counties with the greatest estimated percentage of seasonal residents were Walton, Franklin, Gulf, Bay, and Okaloosa; followed by Liberty and Wakulla. The study also produced seasonal population rates for each public supply utility, for the DSS use category in each county, and countywide averages. Seasonal population rates are half of the seasonal population estimate divided by the estimated permanent population.

The resulting seasonal rates from the 2014 study were used to adjust BEBR medium county 2020 population estimates and 2025-2045 future population projections. Seasonal population rates were sometimes refined following review of public supply utility outreach results. The selected seasonal population rates and total adjusted 2020 population estimates are provided in Table A1.1.

Population estimates for the portion of Jefferson County within the NWFWMD were coordinated and compared with the Suwannee River Water Management District (SRWMD) estimated share of Jefferson County. The combined total of both WMDs population estimates and projections is within about two percent of BEBR Jefferson County estimates and projections. Ongoing collaboration and data sharing with SRWMD will provide additional future opportunities to refine population and water use estimate and projection data.

**Table A1.1 BEBR Population Estimates, Seasonal Rates, and Adjusted Population Estimates 2020**

| Planning Region | County / Region | BEBR 2020 County Permanent Populations(1)(2) | Estimated Seasonal Rate % | Estimated Seasonal(3) Populations | TOTAL(4) 2020 Population Estimates | Estimated Populations Served | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Public Supply(5) | | Domestic Self-Supply(6) | |
| | | | | | | Population | % of | Population | % of |
| I | Escambia | 323,714 | 3.2% | 10,359 | 334,073 | 313,170 | 94% | 20,903 | 6% |
| | **Total/Average** | **323,714** | **3.2%** | **10,359** | **334,073** | **313,170** | **94%** | **20,903** | **6%** |
| II | Okaloosa | 203,951 | 9.0% | 18,356 | 222,307 | 212,297 | 95% | 10,010 | 5% |
| | Santa Rosa | 184,653 | 2.0% | 3,693 | 188,346 | 179,857 | 95% | 8,489 | 5% |
| | Walton | 74,724 | 49.0% | 36,615 | 111,339 | 106,546 | 96% | 4,793 | 4% |
| | **Total/Average** | **463,328** | **20.0%** | **58,663** | **521,991** | **498,700** | **96%** | **23,291** | **4%** |
| III | Bay | 174,410 | 12.0% | 20,929 | 195,339 | 168,428 | 86% | 26,911 | 14% |
| | **Total/Average** | **174,410** | **12.0%** | **20,929** | **195,339** | **168,428** | **86%** | **26,911** | **14%** |
| IV | Calhoun | 14,489 | 3.0% | 434.67 | 14,924 | 3,723 | 25% | 11,201 | 75% |
| | Holmes | 20,001 | 1.0% | 200.01 | 20,201 | 6,489 | 32% | 13,712 | 68% |
| | Jackson | 46,587 | 3.0% | 1,398 | 47,985 | 20,836 | 43% | 27,148 | 57% |
| | Liberty | 8,575 | 9.0% | 771.75 | 9,347 | 4,246 | 45% | 5,101 | 55% |
| | Washington | 25,334 | 3.0% | 760.02 | 26,094 | 6,941 | 27% | 19,153 | 73% |
| | **Total/Average** | **114,986** | **3.8%** | **3,564** | **118,550** | **42,235** | **36%** | **76,315** | **64%** |
| V | Franklin | 11,864 | 39.0% | 4,627 | 16,491 | 15,749 | 95% | 743 | 5% |
| | Gulf | 14,724 | 22.0% | 3,239 | 17,964 | 14,533 | 81% | 3,431 | 19% |
| | **Total/Average** | **26,588** | **30.5%** | **7,866** | **34,455** | **30,281** | **88%** | **4,174** | **12%** |
| VI | Gadsden | 46,226 | 2.4% | 1,109 | 47,335 | 31,578 | 67% | 15,758 | 33% |
| | **Total/Average** | **46,226** | **2.4%** | **1,109** | **47,335** | **31,578** | **67%** | **15,758** | **33%** |
| VII | Jefferson(NWF Only) | 10,158 | 3.5% | 355.53 | 10,514 | 5,760 | 55% | 4,754 | 45% |
| | Leon | 299,484 | 0.5% | 1,497 | 300,981 | 262,123 | 87% | 38,858 | 13% |
| | Wakulla | 33,981 | 5.0% | 1,699 | 35,680 | 26,786 | 75% | 8,894 | 25% |
| | **Total/Average** | **343,623** | **3.0%** | **3,552** | **347,175** | **294,669** | **85%** | **52,505** | **15%** |
| **TOTALS / AVERAGES** | | **1,492,875** | **7.1%** | **106,043** | **1,598,919** | **1,379,061** | **86%** | **219,858** | **14%** |

(1) Source: University of Florida (UF), Bureau of Economic and Business Research (BEBR), Population Studies Program, https://www.bebr.ufl.edu/population.

(2) UF BEBR, Population Studies Program, Vol. 54, Bulletin 189, April 2021. Permanent population estimates only, but includes estimated inmate populations.

(3) Estimated seasonal populations based on county average seasonal rates applied to BEBR population estimates.

(4) Total county populations adjusted by adding the estimated seasonal populations to BEBR estimate.

(5) The population served by each public supply utility service area is estimated from review of all available data, including compliance submissions, and include seasonal population estimates where applicable.

(6) Net Domestic Self-Supply (DSS) population estimates are derived by subtracting public supply utility populations served from adjusted county totals. This estimate includes other miscellaneous populations, e.g., small public systems and correctional facility inmates not otherwise accounted for.

Additional information on seasonally-adjusted population estimates is noted in the methods and in regional resource assessments. Unless specifically noted otherwise, e.g. BEBR data, all population data and information in this WSA is seasonally adjusted.

# Water Use Estimates and Projections

## 1. Public Supply

Data and methods for public supply water use estimates and projections are similar to those used for the previous WSA (NWFWMD 2018). In brief, the public supply water use estimates and projections incorporated the following:

1) Base year (2020) water use, and per capita rates, estimated from reported data,
2) Populations served for base year (2020) and future projections (2025-2045) estimated, and
3) Future water demand = gross per capita water use rates multiplied by the population projections.

The methods include drought year projections and a description of sources of uncertainty in demand projections.

### 1) Water Use Estimates, Base Year 2020

The District collects pumping reports submitted by utilities with IWUPs and audits public supply utility water use annually. The majority of compliance submissions are from utility systems that have an annual average daily rate (ADR) of 0.1 mgd or greater. Systems below the 0.1 mgd threshold are included in the base year water use estimates if reported use is submitted to the District, if water use may meet the threshold during the future planning horizon, or if multiple small systems within a county collectively meet the 0.1 mgd threshold. Monthly Operating Reports (MORs) from DEP provide supplemental data and may be used to fill data gaps.

Water withdrawn is not always equivalent to water distributed or consumed. Water may be imported and/or exported to and from other utilities or service areas. Public supply typically includes not only residential uses but also commercial, institutional, industrial, recreation, fire protection and other uses or services that obtain water from the utility. Large industrial or other water uses, if separately reported by the utility, are removed and added to the appropriate water use category. Following adjustments noted above, the total average daily gross water use or average daily rate (ADR) for each utility is determined according to the following formula:

Gross Utility Water Use (mgd) = Withdrawals + Imports – Exports

Water leaks and other unaccounted water losses are a part of total water withdrawals. Per capita water use metrics are determined by dividing gross and residential water use estimates by associated populations served. The per capita water use rates formula is:

$$\text{Gross or Residential per capita water use (gallons per day)} = \frac{\text{Gross or Residential Water Use}}{\text{Utility Population Served}}$$

Utility populations served include seasonal resident adjustments. The per capita rates are used for planning purposes to project future demand.

### 2) Population Estimates and Projections

Adjusting BEBR data with seasonal population estimates is previously described above. This section describes the methods used to determine seasonally-adjusted population estimates in conjunction with population data provided by utilities.

***2020 Utility Population Served Estimates***

Customer Use Survey (CUS) reports submitted by IWUP holders to the District provide estimates of populations served, number of dwelling units, and number of meter or service connections, in addition to residential data disaggregated from commercial and other water uses. Basic Facility Reports (BFRs) submitted to DEP provide similar and supplemental data. Persons per household (PPH) is calculated from BEBR and utility-provided data submitted on Customer Use Reports associated with IWUPs. Seasonal population estimates are reviewed and considered in conjunction with other data sets. This WSA applied review and consideration of all available public supply utility population data.

Data reported by utilities was generally the default selection for 2020 estimates of populations served if reported data was within reason considering estimated seasonal populations where applicable, and after checking PPH metrics and other available estimates from published sources. In the absence of clear and definitive population values, estimates used are based on medium estimated values.

***2025-2045 Population Projections***

Population projections used for determining public water supply needs shall consider the BEBR medium population projections and population projection data and analysis submitted by local governments (section 373.709, F.S.). The method used to project future populations was similar to the approach used in the 2018 WSA. Seasonal adjustments are included in the 2020 estimates, and future population projections. For the 2023 WSA Update, District staff considered a variety of growth factors and population trends to estimate and select BEBR county growth rates as a proxy for growth of populations served. Population projection method in brief:

- Review and analyze geospatial information and determine whether:
    - *PS utility service area more or less coincides with a BEBR incorporated area, and*
    - *PS utility service area is rural or otherwise unrelated to BEBR population estimates.*
- Review and consider additional available data and information,
- Select set of BEBR growth rates that best represents a proxy for probable growth, and
- Multiply the 2020 population estimates by selected growth rate(s).

Projection methods are described in more detail below.

<u>Geospatial Analysis</u>: Review of geospatial information to ascertain the correlation between a utility service area and whether the service area has direct or some correlation with a BEBR incorporated area or is located in an unincorporated area or otherwise unrelated to a BEBR-identified city or town.
Geospatial analysis was reviewed to determine the percent of water used in the NWFWMD for some Jefferson County utilities.

*<u>Service Area in BEBR Incorporated Area</u>* **-** If a service area coincides with or has a significant correlation with a BEBR-identified incorporated area, review of associated population data includes:

- Historical populations and historical change in population trends,
- Historical growth rates, 2000-2020 growth rates, and
- Ratio or share of incorporated area vs. total county population.

*<u>Service Area in Unincorporated Area of a County</u>* **-** If a service area is in an unincorporated area of a county, aerial photography and current land use was reviewed to discern any commercial or residential structures. The ratio or share of municipal populations to total county populations,

referenced above, was also reviewed for evidence of people relocating between incorporated areas and other areas of a county.

Additional Data: The initial analyses described above were considered together with other available data and information, for example:

- Population projection data and analysis submitted by local entities,
- Historical trends in public supply utility population, number of service connections, or water use data, and
- Other local area future projected growth and development information.

Select Growth Rates: All of the above was considered to select one set of assumed best-fit growth rates for the 2025-2045 planning horizon for each public supply utility. Selected growth rates were low, medium, or high projected rates generated from BEBR data, or interpolated intermediate low-medium or medium-high growth rates. BEBR medium was the default selection unless analyses, and/or utility-provided data, supported an alternative growth rate. If a negative growth rate appeared to be most statistically appropriate, a no growth (0.0%) scenario was used for future growth projections.

Project Future Populations: Future populations were projected from 2020 estimates multiplied by selected BEBR growth rates. As seasonal population adjustments were already factored into the 2020 baseline population estimates, future projections are also assumed to include seasonal populations. Estimates, projections, and supporting data were sent in outreach surveys to utilities for review. Utilities returned surveys with comments, which contributed to refinement of the estimates.

**3) 2025-2045 Demand Projections**

Water demand projections are the product of population projections and gross per capita water use rates estimated in base year 2020. For planning purposes, per capita rates are assumed to remain constant over the 2025-2045 planning horizon.

**4) Water Production Estimates and Projections**

A water use estimate is the amount of water used or in demand by populations in public supply service areas. Water production is the amount of water withdrawn or pumped from specified locations, sometimes referred to as wholesale raw water withdrawals.

In some counties demand and production estimates and projections are identical. Counties that have different demand and production data are Santa Rosa, Okaloosa and Walton counties (Region II), Calhoun, Washington and Holmes counties (Region IV), and Leon and Wakulla counties (Region VII).

Base year 2020 water production estimates for each utility were estimated from reported pumpage compliance submissions and regulatory audits. Utility production future projections were estimated from base year 2020 reported pumpage and relevant population growth rates. For wholesale water production and for utilities engaged in water transfers (imports and/or exports), growth rates were approximated across multiple service areas, which at times cross county borders. Also, some utilities have planned changes in water withdrawals, for example, reductions in coastal withdrawals and corresponding increases in inland pumpage over time. As required, production projections were refined according to varying growth rates, water transfers, and changing permit conditions.

Water use estimates and future demand projections were also forwarded to public supply utilities and to other affected and interested parties for review and comment. Responses were received and, following review and analysis, estimates and projections were modified based on outreach responses where appropriate.

**Drought Year Projections**

The 1-in-10 year drought projections indicate the estimated increase in water used during a drought year primarily due to short-term increases in irrigation in public supply service areas. Reported public supply pumpage data from 2011, which is the most recent drought year, was compared to data for year 2015, which approximated average rainfall conditions. This comparison yield a drought year event multiplier of 1.07, or a seven percent increase over an average or normal year. The 1.07 multiplier was used in the 2023 WSA to determine drought year public supply water demand projections.

**Sources of Uncertainty in Demand Projections**

Population estimates and projections used in public supply water use estimates and demand projections are based on best available data, including best estimates of seasonal population adjustments. Future population estimates may differ numerically or spatially from what is projected.

## 2. Domestic Self-Supply

Data and methods used for Domestic Self-Supply (DSS) estimates and projections are outlined below:.

1) Base year 2020 DSS populations and future DSS population projections are derived by subtracting the total public supply utility populations from county totals,
2) The average Districtwide per capita DSS water use rate was obtained from USGS (USGS, 2020), and
3) Per capita water use rate was multiplied by DSS populations to determine the 2020 estimates and the water demand projections (2025-2045).

The detailed description of methods below includes drought year projections and describes sources of uncertainty in the demand projections.

**1) Population Estimates and Projections**

Domestic self-supply is the population not served by public supply utilities, which includes DSS and small public water systems with an annual average water withdrawal of less than 0.1 mgd. DSS populations in each county were estimated by subtracting the sum of the public supply populations served from the total estimated county population for 2020 estimates and for the 2025-2045 planning horizon. Since DSS is calculated from county and public supply utility population data, all DSS population estimates include the same seasonal population adjustments previously noted.

**2) Per Capita Water Use Rate**

County-wide average domestic per capita use rates are estimated by USGS, which exclude commercial and industrial usage to derive residential usage. The Districtwide average DSS per capita rate in 2015 was about 85 gpd (USGS, 2020). This Districtwide rate was used in this WSA. For planning purposes, it was assumed that per capita use rate will remain constant over the 2025-2045 planning horizon.

**3) Water Use Estimates and Projections**

Water use estimates and projections are calculated by multiplying the DSS population estimates aggregated at the county level by the Districtwide average per capita water use rate.

**Drought Year Projections**

The same factors that increase public supply demand in a 1-in-10 year drought event are presumed to also affect domestic self-supply water demands. Therefore, the drought year projections for DSS use the same 1.07 multiplier as that used in public supply drought year projections.

**Sources of Uncertainty in Demand Projections**

DSS estimates and projections depend on the accuracy of aggregate public supply utility and total county population estimates. Future population estimate methods, including seasonal residents, may be further refined as new data become available. Population estimates and projections may also differ spatially.

Public supply service areas often contain pockets of domestic self-supply wells, which may lend uncertainty to both DSS and public supply service area population estimates. Public supply utilities may expand service areas over time, for example into franchise areas, and provide public water connections that make DSS wells suitable for abandonment.

## 3. Agriculture

Per Florida Statutes[3], agricultural demand projections used for determining the needs of agricultural self-suppliers must be based upon the best available data. Districts shall consider the future water supply demands provided by the Florida Department of Agriculture and Consumer Services (DACS), and data and analysis submitted by local governments[4].

The DACS Florida Statewide Agricultural Irrigation Demand (FSAID) initiative began in 2013-2014 to assist in meeting the agricultural water demand objectives set forth in Florida Statutes. The FSAID data, methods, water use estimates and water demand projections have been updated and refined each year. This WSA incorporates the ninth iteration of FSAID data and analyses (DACS 2022) for the 2020 estimates and demand projections for 2025-2045. Data and methods are briefly outlined below:

1) Geospatial datasets were developed and updated to 2020 conditions for:
    - Total Agricultural Lands Geodatabase (ALG),
    - Irrigated Lands Geodatabase (ILG);
2) Projections of ALG and ILG were developed:
    - The share of irrigated versus total agricultural land was calculated for each county.
    - Trends in total agricultural land were determined for 1987-2017 for each county and forecast to 2045.
    - The projected change in share that is irrigated was used to forecast irrigated land through 2045.
3) Spatially-varying climate variables (average rainfall and evapotranspiration for 2005 - 2020, and soil assignments) were incorporated.

[3] Section 373.709(2)(a)1.b., F.S., Regional water supply planning.
[4] Section 373.709(2)(a)1.b., F.S., Regional water supply planning.

4) Review and analysis of district water use metered data and permit information (crop type, irrigation system, acreage).
5) Irrigation application rates were estimated for different crop types.
6) With the above inputs along with projected crop prices and costs, an econometric model was used to estimate:
    - 2020 crop irrigation water use, and
    - Future water demand projections (2025-2045).
7) Additional estimate and projection factors incorporated:
    - Non-crop water use (livestock, aquaculture), and
    - Frost-freeze protection.

The econometric model incorporates agronomic variables (crop choice, soil type, location, climate), engineering or physical factors (irrigation equipment, plot size), economic or behavioral factors (crop prices, share of irrigated land), and actual metered data or reported pumpage. Projected water use is estimated by simulating future conditions including price forecasts and future land area estimates.

**Drought Year Projections**

Dry year estimates were calculated for each district with 1-in-10 ratios by crop. The dry to average year water demand ratio in northwest Florida ranges from a low of 1.17 for greenhouse/nursery crops to a high of 1.72 for hay. The overall statewide average dry to average year ratio is 1.34.

**Sources of Uncertainty in Demand Projections**

The ninth edition of FSAID represents the best available data for this WSA. FSAID IX is available at:

https://www.fdacs.gov/Water/Agricultural-Water-Supply-Planning

Conservation potential has been estimated in the FSAID project, but demand projections have not been modified based upon this analysis.

## 4. Recreational Irrigation

The three primary types of reported recreational self-supplied water use in the District are golf course irrigation, landscape irrigation, and water-based recreation. Additional recreational water uses include aesthetic use (both ponds and irrigation), residential irrigation, and miscellaneous outdoor uses. Data and methods used for recreational Irrigation water use estimates and projections are similar to those used for the previous WSA 2018.

1) Base year 2020 water use was estimated from reported and audited pumpage, and additional base year estimates added from:
    - Individual water use permits (IWUPs) that have no water use reporting requirements, and
    - Water users with a well construction permit and a general water use permit (GWUP) issued by rule.
2) Future water demand = base year water use multiplied by BEBR Medium population growth rates.

The District's Water Resource Caution Areas, Areas of Resource Concern, and more recent water use permitting rule revisions have resulted in lower permitting thresholds for recreational IWUPs and in the Region II WRCA the use of the Floridan aquifer for non-potable uses is prohibited. Estimates in the 2023

WSA were developed from IWUPs without reporting requirements for recreation water use that had a permitted allocation of less than 0.1 mgd and IWUP permittees with reporting requirements of less than 0.1 mgd.

IWUPs with No Reporting Requirements: As part of the 2023 WSA update, it was determined that reported recreational water use averaged roughly 60 percent of the permitted allocation. This percentage was used to estimate water use for IWUPs issued prior to January 1st, 2021, with no reporting requirements. Each IWUP's Average Daily Rate was multiplied by 60 percent.

GWUPs with Well Construction Permits: The GWUP recreational water uses were separated into two categories: (1) golf courses and (2) non-golf course use, i.e., residential and other small-scale recreational water uses.

The methods detailed below include drought year projections and a description of sources of uncertainty in the demand projections.

### 1) Water Use Estimates, Base Year 2020

Base year 2020 reported water use for IWUPs are added to additional estimates described below.

***IWUPs with No Reporting Requirements***

Historical data from 2010-2015 was reviewed and analyzed to determine water use as a percentage of the permitted allocation for IWUPs. Permittees without sufficient historical data and outliers were removed. An overall Districtwide average of 60 percent of the permitted allocation was used to estimate water use for permittees without reporting requirements. This water use was estimated in aggregate at the county level.

***GWUPs with Well Construction Permit***

Nearly all District GWUPs with well construction permits are small wells (primarily 2" to 4", but up to 6" diameter) used for residential outdoor irrigation. Non-residential GWUP wells include a small number used for golf course irrigation, aesthetic use, or water-based recreation purposes. Common examples include wells used to supplement rural ponds or landscape fountains. All permitted wells have an associated GWUP issued by rule, except for domestic self-supply wells which are exempt from water use permitting. The GWUP water use was estimated in aggregate at the county level. Estimating methods are described below.

Golf Course Irrigation. There are currently about twenty golf courses in the District without an IWUP. Some known to use reclaimed water were omitted from estimating analyses. The number of golf course holes multiplied by a golf course industry standard of 5.6 average irrigated acres per hole yielded an estimated irrigated acreage, which was then multiplied by the Agricultural Field Scale Irrigation Requirement Simulation (AFSIRS) average Districtwide irrigation rate for turf grass of 25 inches per year:

Estimated Total Irrigation = Irrigated Acreage multiplied by 25 in/year

Estimated total irrigation was then converted to an average annual daily rate (ADR) of water use.

Residential Irrigation and Other Small-Scale Recreational Water Use. 49,989 non-golf course irrigation GWUP wells were present across the District in 2020. Of the total, 67 percent were located in Region II (Okaloosa, Santa Rosa, and Walton counties) for a total of 33,548 wells and 84 percent in Regions I, II, and III combined. Work completed on the North Florida Southeast Georgia (NFSEG) groundwater model identified a Districtwide weighted average outdoor water use for residential parcels of 76 gallons per day (gpd) (Balmoral, 2017), which was then multiplied by the number of wells to estimate the associated water use:

Estimated Water Use (ADR) = No. of Wells multiplied by 76 gpd

General Water Use Permits categorized as both non-golf and non-residential are few in number and are primarily associated with small well diameters. Geo-spatial review identified these wells as residential in nature or associated with similar small-scale water use operations. These wells were incorporated into the well count above.

**2) 2025-2045 Demand Projections**

Baseline (2020) recreation irrigation water use was multiplied by the BEBR medium population projection growth rate to generate future water demands by county and then summed by water supply planning region.

**Drought Year Projections**

A dry to average year multiplier for sod or perennial grass of 1.34 was used to approximate 1-in-10 year drought conditions for recreation irrigation. This multiplier was developed through the FSAID project (DACS 2022).

**Sources of Uncertainty in Demand Projections**

Estimates. Actual water use for IWUPs with no reporting requirements may vary from the assumed 60 percent of the permitted allocation. For the roughly 50,000 GWUP recreational water users Districtwide with unknown water consumption, the specific locations of many are not known and it is unknown whether wells are still in use. Further, recreational water use, particularly for golf courses, is in many cases a mix of groundwater and surface water sources, which may be co-mingled with stormwater run-off and sometimes also merged with reclaimed water.

Projections. Demand projections depend upon baseline water use estimates that contain some inherent uncertainties. Additionally, reductions in water demand may be realized over time due to increasing use of improved technology, best management practices (BMPs), reuse of reclaimed water, or connection to a public supply system. In addition, some data indicates that recreational water use may not grow at the same pace as population growth rates.

## 5. Industrial/Commercial/Institutional Self-Supply

The data and methods used to estimate water use for Industrial/Commercial/Institutional (ICI) self-supply are similar to those used in past WSA updates. The general approach is outlined below.

1) Base year (2020) water use was reported and estimated.
2) Water demand projections were requested from permittees, and if unavailable, were derived from review of available water use data.

The methods detailed below include drought year projections and a description of sources of uncertainty in the demand projections.

**1) Water Use Estimates, Base Year 2020**

ICI self-supplied water users may include manufacturing plants, chemical processing plants, water bottling plants, correctional facilities, military bases, and other miscellaneous ICI uses. The permitted allocations for ICI water users vary among regions and counties and range from an annual Average Daily Rate (ADR) of less than 0.001 mgd to more than 38 mgd. All reporting permittees are included in this WSA.

In some situations, ICI water withdrawn for heating and cooling systems is returned to the source. This recirculated water is not, for planning purposes, considered consumptive use. Also, ICI can include multiple mixed water uses. Examples include public supply at a military base, agricultural irrigation at a correctional facility, landscape irrigation at a manufacturing facility, and irrigation of a corporate headquarters or military installation golf course. Generally, these incidental water uses are reported within the ICI water use category. Occasionally, a significant secondary use may be moved to another water use category if it can be clearly identified using the available data.

**2) 2025-2045 Demand Projections**

Demand projections for the 2025-2045 planning horizon were requested directly from permittees. Projections provided were generally incorporated unless a projection exceeded the permitted allocation or if there were other anomalies in water use data provided. Historical water use, water use trends, and share of water use to the permitted allocation were also reviewed and considered to determine future demands.

**Drought Year Projections**

Drought-year water demand projections for ICI water users are not anticipated to differ from water demands during an average rainfall year.

**Sources of Uncertainty in Demand Projections**

Demand projections were primarily provided by permittees. Industrial and commercial enterprises are subject to market and economic variables while fluctuations in populations or governing policies may affect institutional facilities. Market forces can affect day-to-day industrial production and commercial operations or lead to facility expansions or closures.

## 6. Thermoelectric Power Generation

Data and methods used to develop thermoelectric power generation self-supply water use estimates and projections are similar to those used in the 2018 WSA.

1) Base year (2020) net water use reported and estimated values were compiled.
2) Water demand projections were requested from permittees and in some cases were obtained from a review of Ten-Year Site Plans.

The methods detailed below include a description of sources of uncertainty in the demand projections.

**1) Water Use Estimates, Base Year 2020**

Thermoelectric power generating facilities in the District by owner are:

FPL: Lansing Smith Plant, Bay County; and Gulf Clean Energy Center, Escambia County.

City of Tallahassee: Arvah B. Hopkins Plant, Leon County; Sam O. Purdom Plant, Wakulla County.

> Others: Bay County Board of County Commissioners Waste to Energy Facility, Bay County; and Telogia Power, Liberty County.

Water use for thermoelectric power generation reflects the net amount of water used annually. Water withdrawn from fresh surface water or brackish water sources is typically used for recirculation and cooling, and then returned to its source, and is not, for planning purposes, considered consumptive use. Net water use for thermoelectric power generation does or may include water lost to evaporation, blowdown, drift, and leakages.[5] Other water uses include potable or other on-site uses.

### 2) 2025-2045 Demand Projections

Demand projections for the 2025-2045 planning horizon were requested directly from permittees. Some additional information was available in electric utility Ten-Year Site Plans submitted to the Florida Public Service Commission and from historical water use. Demand projections in five-year increments 2025-2045 are estimated net amount of water demand, not including recirculated water returned to the source.

#### Drought Year Projections

Drought-year water demand projections for power water users are not anticipated to differ from water demands during an average rainfall year.

#### Sources of Uncertainty in Demand Projections

Demand projections were primarily provided by permittees. In making demand projections, electric utilities may consider national and local economic outlooks, projected economic growth, interest rates and inflation, population and labor force projections, weather and demographics, fuel sources and pricing, and energy and seasonal peak demand forecasts.

## Alternative Water Supply and Conservation

If an area requires a regional water supply plan, alternative sources of water and conservation shall be fully evaluated as part of water resource and water supply development plans to meet regional demands (per section 62-40.531, F.A.C.), as noted below.

> **62-40.531 Regional Water Supply Plans.**
>
> *(2) Each plan shall fully evaluate water resource and water supply development options, including the potential for water conservation, and alternative sources such as desalination, aquifer storage and recovery, use of surface water reservoirs, and reuse of reclaimed water, to meet the regional demands.*
> *(3) Conservation and reuse shall be evaluated to the same degree as other options.*

Water conservation, also known as demand management, promotes water use efficiencies, which increases the available supply of water from existing sources. Water conservation is immediate, relatively low cost, and more energy efficient than developing new alternative sources of water. While not an alternative water source per se, effective water conservation makes more efficient use of existing water supplies and can offset or delay the need to develop new water supply resources.

[5] USGS Thermoelectric Power Water Use, http://water.usgs.gov/watuse/wupt.html.

Reclaimed water is defined in Chapter 373, F.S., as *"… water that has received at least secondary treatment and basic disinfection and is reused after flowing out of a domestic wastewater treatment facility."* Reuse of reclaimed water can be generally divided into that which replaces potable quality water and other beneficial direct or indirect reuse water flows. For the purposes of alternative water supply planning, reclaimed water that offsets or replaces water demands that would otherwise be needed from potable supplies is of greatest interest. Public access reclaimed water may be used in golf course or residential irrigation, public access areas (e.g. parks and schools), irrigation of some edible and other crops, and industrial uses such as toilet flushing or fire protection. Other reuse flows include groundwater recharge through rapid infiltration basins (RIBs), absorption fields, surface water augmentation, wetland recharge, and underground injection wells.

## Regulatory Framework

In addition to incorporating alternative water in water supply planning, alternative water sources and conservation are further defined and governed through statutes and rules. As noted in Chapter 62-40.412, F.A.C., *"The overall water conservation goal of the state shall be to prevent and reduce wasteful, uneconomical, impractical, or unreasonable use of water resources. Conservation of water shall be required unless not economically, environmentally, or technically feasible."*

The District includes alternative water, water conservation and efficiency program conditions in many consumptive water use permits. Conditions for General Water Use Permits (GWUPs) are in the Water Use Permit Applicant's Handbook. This Handbook also assists IWUP applicants in the permitting process by establishing a framework for meeting the conditions for permit issuance in section 40A-2.301, F.A.C.

## Conservation Potential

Water conservation can be achieved through regulatory, economic, and incentive-based programs; and through public outreach, education, and technical assistance. Specific permit conditions that address water conservation are in many IWUPs in the public supply, agriculture, recreation, ICI, and thermoelectric power water use categories. Specific conditions vary but generally request permittees to, "… *encourage and provide for the efficient and non-wasteful use of water, and shall implement water conservation measures, including a proactive leak detection program, designed to enhance water use efficiency and reduce water demand and water losses."*

Potential future water savings from conservation initiatives are uncertain, as it depends on future participation in incentive and voluntary programs. Conservation estimates and ongoing initiatives are further noted below.

<u>Public Supply and DSS</u>: Permit conditions for a 'Water Conservation and Efficiency Program' typically include requirements for public education and information campaigns, indoor and outdoor water use conservation programs, water loss reduction, and incentivizing or inclining block rate structures. Conservation goals include achieving and maintaining water system losses at less than 10 percent and maintaining an average residential per capita daily water use of 110 gallons or less.

For each region the ratio of water used per capita was analyzed by comparing the public water use demand to the population served. The data used for this originated from previous WSAs. The WSAs included in the analysis were the 1998, 2003, 2008, 2013, 2018, and the 2023 WSA.

Agriculture and Recreation Irrigation Self-Supply: Agricultural water conservation can be implemented through irrigation efficiency improvements and through changes in agricultural practices. An example is the District's Precision Agricultural Systems and Solutions Cost-Share Program, which provides funding for producers to retrofit irrigation equipment with water-saving and nutrient reducing technologies that can reduce energy and water overuse while also reducing nutrient application. The conservation potential for recreation irrigation self-supply may include using industry-specific best management practices such as mowing heights, aeration, or plant types.

ICI and Power: Many power generation and large industrial facilities are advancing water conservation and efficiency programs. Savings from conservation programs implemented by permittees may be reflected in future demand projections.

## Reuse Potential

Reclaimed water use within each planning region is summarized in the 2023 WSA. Data were obtained from the Florida Department of Environmental Protection. Potable offset reuse flows include public access irrigation, irrigation of edible crops, toilet flushing, fire protection, and industrial uses. Not included in potable offset flows are agriculture irrigation of other crops (sprayfields), absorption fields, rapid infiltration basins (RIBs), wetlands, and industrial reuse at the treatment plant.

Potable quality water offset is defined in section 62-610.200, F.A.C. as, *"… the amount of potable quality water (Class F-I, G-I, or G-II groundwater or water meeting drinking water standards) saved through the use of reclaimed water expressed as a percentage of the total reclaimed water used. The potable quality water offset is calculated by dividing the amount of potable water saved by the amount of reclaimed water used and multiplying the quotient by 100."*

### 1) Water Use Estimates, Base Year 2020

The estimated amount of reclaimed water used in 2020 is primarily from FDEP's 2020 Reuse Inventory (FDEP 2020). Operators of domestic wastewater facilities with a permitted capacity of 0.1 mgd or greater that produce reclaimed water are required to submit an annual report to FDEP. Smaller facilities were included in the estimates where data and information were available. Some wastewater treatment facilities became inactive and diverted the wastewater flow to an active wastewater treatment facility. The 2018 WSA reflected those changes by adding the additional flows from inactive facilities to the respective flow totals of the receiving active wastewater treatment facilities. In the 2023 WSA, only active wastewater treatment plants were included.

### 2) Future Demand Projections, 2025-2045

Future wastewater flows were estimated by multiplying 2020 wastewater flows by the BEBR medium growth rates to represent growing populations and increasing public supply water use. The 2020 potable offset reuse flow was subtracted from future wastewater flows to determine future estimated availability.

Future potable offset reuse flows presented assume that WWTFs have treatment and disinfection levels suitable for the reuse end uses and that transmission infrastructure is available to reuse customers. Many other factors such as storage capacity, water quality treatment standards, distribution systems, demand locations, and costs were not considered as part of this WSA.

# Regional Resource Assessments

The approach and methods to evaluate and assess the adequacy of existing and reasonably anticipated sources of water to meet future needs varies by region and type of water resources.

## Groundwater Resources

For groundwater resources, the assessment criteria generally included an evaluation of long-term changes to the potentiometric surface, trends in aquifer levels, and trends in chloride, sodium, or total dissolved solids that may be indicative saline water intrusion and impacts to groundwater quality. Where appropriate, the potential for groundwater pumpage to reduce groundwater discharge to surface water features was evaluated by assessing trends in stream baseflows. The trend analysis methods are described in detail below.

To further assess the magnitude of groundwater withdrawals, regional scale groundwater budgets were re-evaluated. The water budgets were based on output from calibrated steady-state groundwater flow models and provide an approximation of average groundwater conditions. Although steady-state models do not account for seasonal or annual variation in flow, they do provide a means to estimate the relative magnitude of the various inflows to, and outflows from, an aquifer. Finally, where available, groundwater and solute transport models were used to assess the effects of changes in pumpage over a 20-year planning horizon on aquifer levels, groundwater quality and spring flows.

## Surface Water Resources

For surface water resources, the assessment criteria involved evaluating the sustainability of surface water resources and associated natural systems. The assessments were typically made by comparing the relative magnitudes of surface water withdrawals and surface water flows. As indicated above, trends in stream baseflows were also assessed.

## Trend Analyses

*Introduction*

Evaluating patterns and changes in groundwater levels, streamflow, and water quality is an essential aspect of assessing the impact of groundwater or surface water withdrawals within the District. Natural fluctuations in these variables occur in response to rainfall and natural variations in other meteorological variables. Changes in groundwater levels, streamflow, and water quality can also arise from sea level rise and anthropogenic factors, such as changes in groundwater and surface water withdrawals and land-use. As part of the 2023 WSA Update, statistical analyses were performed to assess the presence and nature of long-term trends for the following variables:

- groundwater levels,
- stream and river baseflows,
- chloride concentrations in groundwater,
- total dissolved solids (TDS) concentrations in groundwater, and
- specific conductance of groundwater.

A comprehensive evaluation of all available stations containing data for one or more of the variables of interest was performed to support the 2023 WSA trend analysis. Field measurements of groundwater levels, chloride and TDS concentrations, and specific conductance were retrieved from the NWFWMD Aquarius database. Daily mean discharge values were retrieved from the USGS National Water

Information System for 37 stations, using the R programming language data Retrieval Package (Hirsch and De Cicco, 2015). Daily mean discharge values were also retrieved from the NWFWMD Aquarius database for two streamflow sites (02329534 Quincy Creek at State Road 267 and 02330053 Telogia Creek at County Road 65D) for which the District had additional discharge data. Trend analyses were performed at groundwater sites with 20 or more years of data where at least one value was available in a given year, resulting in evaluations of trends at 314 groundwater level sites, 93 wells with chloride concentration data, 68 wells with TDS concentration data, and 23 wells with specific conductance data. Trend analyses were also performed at 34 sites with daily streamflow data.

Several trend analysis methods were used in this assessment, and for each method, an attempt was made to remove the effect of rainfall on a given variable (groundwater level, groundwater chloride concentration, groundwater TDS concentration, groundwater specific conductance, and stream baseflow) when the possibility of a meaningful correlation between that variable and prior cumulative rainfall existed. Descriptions of the methods used to account for the effects of rainfall and assess trends are described in the text that follows.

*Assessment of rainfall effects*

The potential for correlation between a variable of interest and rainfall was assessed using monthly median values of the variable of interest and rainfall totals for six accumulation periods: the month coinciding with a given measurement (concurrent month), as well as for 3-, 6-, 12-, 18-, and 24-months (the concurrent month plus the prior 2-, 5-, 11-, 17- or 23-month rainfall amounts, respectively). A monthly time scale was used in the trend analyses because the rainfall data utilized for this analysis was available at a monthly resolution. Time-series of monthly rainfall totals at a 4 km by 4 km grid resolution were retrieved from the PRISM Climate Group, Oregon State University website (https://prism.oregonstate.edu). These gridded monthly values were then aggregated and used to compute time-series of monthly mean values for each county in the District, as well as for the drainage or groundwater contributing area associated with each of the 34 stream gaging stations at which baseflow trends were assessed. These monthly-mean rainfall time series were then used to compute corresponding, rolling-mean time series over 3-, 6-, 12-, 18-, and 24-month averaging (accumulation) periods for each county in the District and for each stream gage drainage or contributing area.

Once the rainfall data were retrieved and processed, an assessment of the correlation between concurrent or prior rainfall and each variable of interest was made. This assessment was made for each site and variable of interest by fitting an ordinary, least squares (OLS) regression model to datasets comprising monthly values of a given variable of interest and concurrent monthly or antecedent 3-, 6-, 12-, 18-, and 24-month rainfall totals. Thus, a set of six OLS regression models were fit for each site and variable (one corresponding to each of the rainfall accumulation periods). For each set of OLS regression models, corresponding values of the root-mean square error (RMSE) of the residual values (fitted value minus observed), and an estimated p-value of the rainfall regression parameter was computed. A significance level ($\alpha$) of 0.05 was used in this assessment, and rainfall accumulation periods with an estimated p-value that was less than 0.05 for a given fit were assumed to be significant unless further assessment indicated otherwise. The rainfall accumulation period resulting in the lowest RMSE value for a given fit was selected as the accumulation period to be used to control for rainfall effects if that fit had a p-value that was less than 0.05.

*Trends in Groundwater Variables*

As noted above, trends were assessed for groundwater levels, groundwater chloride concentrations, groundwater TDS concentrations, and groundwater specific conductance values. For each variable, monthly median values were computed by first computing the median daily value for any day with one or more field measurements, and then computing the median monthly value from these median daily values. The median was chosen as the statistic that best represented the monthly value because medians are less sensitive than means to outlier values when estimating central tendency, especially for smaller sample sizes. Once the monthly median datasets were constructed for each site and groundwater variable, trend analyses were executed as described below.

The default trend analysis method was to fit a linear relation between a given variable and time, using the nonparametric Theil-Sen (also known as Kendall-Theil) line fitting procedure (Helsel and Hirsch, 2020). This method was selected because the Theil-Sen line *"… does not depend on the normality of residuals for validity of significance tests, and is not strongly affected by outliers …"* (Helsel and Hirsch, 2020). For these reasons, the Theil-Sen line should have a greater power to detect significant trends in hydrologic data (which are commonly non-normal and skewed), when compared to a parametric line fitting method, such as OLS regression. If the assessment of rainfall effects indicated that a significant relation between a given variable and one of the antecedent rainfall periods existed, then a non-linear, Local Polynomial Regression ("loess"; Helsel and Hirsh, 2020) curve was fit between the variable of interest (response variable) and the rainfall total (explanatory variable) over the accumulation period that resulted in the lowest RMSE value in the assessment of rainfall effects. This loess fit was then used to estimate values for the variable of interest, and the residuals from this fit (actual monthly median minus estimated value from the fit) were computed.

After the residuals are computed, a Theil-Sen line is then fit to the monthly residuals (which constitute the response variable) and their associated dates (which constitute the explanatory variable). The slope of this line is an estimate of the long-term trend in a variable of interest, exclusive of the effects of rainfall. In cases where the variable of interest was not significantly correlated with any of the antecedent rainfall periods at a given site, then the Theil-Sen line was fit directly to the monthly median values of the variable, rather than the rainfall-corrected residuals. In either case, the slope of the Theil-Sen line represents the average rate of change per year of the variable of interest at a given site.

After the Theil-Sen trend line was fit, its significance was assessed. One issue that must be considered in any significance test based on hydrologic data is serial correlation, which is defined as the correlation between a value of a given hydrologic variable and previous values of the variable. An example of serial correlation is the sequence of increasing groundwater levels or streamflow after a rainfall event, or a long sequence of successively lower groundwater levels or stream flows during drier periods. Serial correlation is generally higher when hydrologic data are more closely spaced in time. This can affect tests of statistical significance because these tests typically assume that errors (estimated as differences between fitted and observed values) are uncorrelated. When errors are serially correlated, the noise (error variance) associated with a statistical test is underestimated and significance is typically overstated. In trend testing, serial correlation can result in a trend test being incorrectly identified as being significant at rate higher than the desired $\alpha$ (in other words, a tendency towards 'false positives').

The issue of serial correlation was addressed in this trend analysis by using a 'bootstrapping' approach to estimate the trend slope and its significance. In this bootstrapping approach, a subset of values from a dataset for a given site and variable of interest is randomly sampled and a Theil-Sen line is fit to this random sample. The slope of this line is saved, and this process of randomly selecting a subset of values and then fitting a trend line to the subset is repeated many times, thereby producing a set of trend line slopes. In the analyses for the 2023 WSA, 1,000 randomly sampled subsets were generated for each site and variable of interest. Each of these random samples was generated by first randomly sampling one value per year, and then randomly selecting 75 percent of these values. A Theil-Sen line was fit to each of the 1,000 randomly sampled subsets, producing a set of 1,000 trend slope estimates. The median of these 1,000 slope values was then selected as the best estimate of the trend slope. The significance of this slope estimate was assessed by computing the 2.5 and 97.5 percentiles from the bootstrap set of 1,000 slope values, defining the lower and upper limits, respectively, of a 95-percent confidence interval for the trend slope. Significant slopes were defined as those with corresponding 95-percent confidence intervals that did not include zero. Therefore, when the lower confidence limit was negative and the upper confidence limit was positive, the trend slope was classified as being insignificant. Conversely, a significant downward trend slope was indicated when the upper and lower confidence limits were both negative, and a significant upward trend slope was indicated when the lower and upper confidence limits were both positive.

An alternative, ‘step-trend’ approach (Helsel and Hirsch, 2020) was used when there was a long period of missing data within the period of record for a given site and variable of interest, or a known event occurred that could produce a change during the period of record. This trend approach tests for the significance of difference between conditions prior to and after a long period of missing data or before and after some event that could plausibly produce a change in a variable of interest. The step trend approach was used for sites in which a period of missing data (‘data gap period’) existed that was more than one third of the length of the period of record, and which had at least 10 years with one or more values before and after the data gap. It was also implemented in cases where there were a few values in the data gap period, but the frequency of data collection in the gap was much lower than before or after the data gap period. The step-trend approach was also used to assess whether there had been a change in a variable of interest following a known ‘structural’ event, such as relocation of a utility’s groundwater withdrawals from coastal areas to an inland wellfield.

For these sites, a non-parametric, two-sample Wilcoxon Rank-sum Test (Wilcoxon, 1947) was used to evaluate whether there is a significant difference between the values of a variable of interest before or after a data gap period or event. This test was used instead of a parametric t-test because it has comparable efficiency to the parametric t-test, but has less restrictive assumptions (Helsel and Hirsh, 2020; Higgins, 2003). For example, the t-test requires that data from each group have equal variances and be normally distributed, but this requirement does not apply to the Rank-sum Test (Conover, 1999; Helsel and Hirsh, 2020).

The effects of rainfall and serial correlation were mitigated against in the step-trend test in a manner similar to that previously described for the linear Theil-Sen trend testing approach. If the assessment of rainfall effects indicated that a significant relation between a given variable and one of the antecedent rainfall periods existed, then a non-linear, Local Polynomial Regression ("loess"; Helsel and Hirsh, 2020) curve was fit between the variable of interest (response variable) and antecedent rainfall (explanatory variable). Residuals from this ‘rainfall-correction’ fit were then used in the step trend analysis. In the absence of a significant correlation between the variable of interest and rainfall, values for the variable of interest, rather than residuals, were used directly in the step trend analysis. A bootstrapping procedure (similar to that used for the linear Theil-Sen trend testing) was used in which the Rank-sum test was performed for each of 1,000 random samples from the available data at a given site, generating a set of 1,000 Rank-sum test p-values. Each of these bootstrap samples was obtained by first randomly sampling one monthly median value for each year in the pre- and post-data gap periods, and then (from this initial set of random values) randomly selecting 75 percent of the values from the pre-data gap period and 75 percent the values from the post-data gap periods. The bootstrapped estimate of the step-trend p-value was then estimated by computing the median p-value from the set of 1,000 p-values obtained by executing the rank sum test on the 1,000 bootstrap samples. An analogous approach was used to implement bootstrapping for step trend tests to assess the significance of the effect of an event, such as the migration of groundwater withdrawals from coastal to inland areas.

Analyses of nonlinear trends were also performed at selected sites that exhibited nonlinear trends. The analyses were conducted in a manner similar to the bootstrapping procedure used for the linear, Theil-Sen trend testing. The primary difference was that a Local Polynomial Regression ("loess"; Helsel and Hirsh, 2020) model (instead of a Theil-Sen model) was fit between the variable of interest (response variable) and the time (explanatory variable), and the that the significance of a trend was assessed by evaluating the significance of the predicted differences between selected points in time (rather than the significance of the slope of the Theil-Sen line). These selected points in time were generally the first and last dates at which data were available for the variable of interest, and the corresponding nonlinear trend test assessed the significance of the change in a variable of interest between these two dates. In selected cases where the effect of a ‘structural’ event was of interest (e.g., such as the movement of withdrawals from coastal to inland areas) and historical patterns in a variable of interest (or its rainfall-corrected residual) exhibited a nonlinear pattern, then this same approach was used and the significance of a change from the date on which the event occurred and to the most recent date was also assessed.

The choice of whether or not to control for antecedent precipitation for nonlinear trend analysis was based on randomly sampling the available data (as previously described) 1,000 times and fitting a univariate loess model (time as the only explanatory variable) and a multivariate loess model (time and antecedent precipitation as explanatory variables) to each of these 1,000 random samples. This process resulted in a set of 1,000 univariate models and a corresponding set of 1,000 multivariate models. The root-mean square errors (RMSE) were then calculated for each model in these two sets of (1,000) models. If less than five percent of the 1,000 RMSE values from the complex models were greater than the corresponding RMSE value in the simple model, then the multivariate loess model that controlled for antecedent precipitation was used for the nonlinear trend analyses, rather than the simpler univariate loess model. Note that the accumulation period chosen for controlling antecedent precipitation was the optimal period identified in the initial OLS regression assessment of antecedent rainfall effects.

The significance of a nonlinear trend was assessed using a method very similar to that used for the linear trend analysis. The chief difference was that significance was based on difference between loess-model predicted values at the start and end of the period of record, or the difference between loess-model predicted values at the time of a known structural event and the end of the period of record. The first step in this assessment was computing the difference between predicted start and end values of a variable of interest (groundwater level for example) for each of the 1,000 randomly generated samples described in the previous paragraph, and then computing the 2.5 and 97.5 percentiles from this set of 1,000 differences, thereby defining the lower and upper limits, respectively, of a 95-percent confidence interval for the predicted difference. Significant trends then were defined as those with corresponding 95-percent confidence intervals that did not include zero.

*Baseflow Trends*

Stream and river baseflow estimates were computed from daily mean discharge time series using a method described by Perry (1995). This method is essentially a low-pass filter, in which a 'rolling minimum' stream flow is calculated for each day in the period of record by selecting the minimum daily mean discharge within a user-specified number days ('time window') centered on that day. A 'rolling mean' value for each day is then calculated in a similar manner by computing (for each day) the mean of the previously calculated rolling minimums within the time window centered on that day. Window widths selected for a given site ranged from 7 to 61 days and were based on the characteristics of this site and a comparison of the baseflow estimates with the streamflow hydrograph at the site. The daily mean baseflow estimates that were produced using this method were then used to calculate monthly mean baseflows for each month in the period of record for a given stream gage. The resulting monthly mean time series were then used to assess trends in baseflow.

Trends in baseflows were assessed using methods that were nearly identical to those described previously to assess trends in the groundwater variables (groundwater levels, chloride and TDS concentrations, and specific conductance), except for two differences. First, monthly mean (rather than median) values were used in the analyses of baseflows. Means rather than medians were used because the monthly baseflow values were computed from generally continuous, daily data and because mean values are more suitable for characterizing variables that can be used in summations (for example monthly mean streamflow rates can readily be used to calculate monthly total streamflow volumes). Second, the baseflow trend bootstrapping analyses did not have a second resampling step when selecting values for each of the 1,000 samples used to compute a given bootstrap estimate (e.g., Theil-Sen slope or Wilcoxon Rank-Sum Test p-value). Recall that for the groundwater variables (groundwater level, chloride, TDS, and specific conductance) each of the 1,000 bootstrap samples were created in a two-step processes: in the first step, an initial set of values were selected from all available values by randomly sampling one value per year was randomly sampled, and in the second step 75 percent of the values in the initial set were randomly selected and retained for input into a given trend analysis. This two-step process was necessary for the groundwater variables because the data were more limited and sometimes only one value was available per year. In contrast, twelve (monthly) values were typically available for a given year in the baseflow trend analyses.

## Minimum Flows and Minimum Water Levels

Minimum flows and minimum water levels (MFLs) are defined as the limit at which further withdrawals would be harmful to the water resources or the ecology of the area. As of 2023, three springs within the District have adopted minimum flows: the St. Marks River Rise, a first magnitude spring located in Leon County, and the Wakulla and Sally Ward Spring System, located in Wakulla County.

Florida Statutes requires that if at any time, the existing flow or water level in a waterbody is below the applicable flow, the District shall expeditiously adopt and implement a recovery strategy. If flows or water levels in a waterbody are projected to fall below the applicable minimum flow or level within 20 years, the District shall, as part of a regional water supply plan, develop and implement a prevention strategy (Section 373.0421, F.S.). A recovery or prevention strategy shall include the development of additional water supplies and other actions to achieve the recovery to the established minimum flow or level or prevent the existing flow or level from falling below the established minimum flow or minimum water level (Section 373.0421, F.S.).

As part of this WSA, evaluations were performed to determine whether waterbodies are currently meeting adopted MFLs and whether waterbodies are anticipated to continue to meet adopted MFLs for a 20-year planning horizon, or alternatively, whether recovery or prevention strategies are needed.

### Sources of Uncertainty

The resources assessments performed for each planning region are based on best available data and results are subject to the uncertainty associated with those data. Data are collected by the District but are also obtained from other sources, such as other governmental agencies, water use permittees, or published literature. The uncertainty associated with these data varies depending on the qualifications and training of those collection the data, the collection methods, and management of the data. There is also uncertainty associated with modeling results used for water budget evaluations and the order-of-magnitude comparison with estimated water use. Regional groundwater models are being developed to support MFL technical assessments, which should improve predictions of future water use impacts on natural systems.

## Determining the Need for a Regional Water Supply Plan

Water demand projections and water resource evaluations are compared to determine the adequacy of existing and anticipated future water sources and conservation efforts to meet projected reasonable-beneficial uses and to sustain water resources and related natural systems through 2045. Where sources of water are not anticipated to be adequate to both supply water for all existing and future reasonable-beneficial uses and sustain water resources and related natural systems through 2045, staff recommend initiating or updating a regional water supply plan to the District’s governing board. The governing board makes the final determination as to the need for a regional water supply plan.

Assessments are made at the regional scale for each of the seven planning regions. The methods used to determine the need for regional water supply plans vary according to regional characteristics and types of water resources. Specific methods and criteria are described in each regional resource assessment section but may include evaluation of surface water flows, baseflows, groundwater levels, changes or drawdown of an aquifer’s potentiometric surface, or changes in water quality parameters that may be indicative of saltwater intrusion or up-coning of poor quality water.

# APPENDIX 2. DISTRICTWIDE SUMMARY ESTIMATES AND FUTURE DEMAND PROJECTIONS

Appendix 2 summarizes the Northwest Florida Water Management District (NWFWMD or District) population estimates and future projections, estimated water use, water use estimates and projections by source, future demand projections, and reuse and conservation potential.

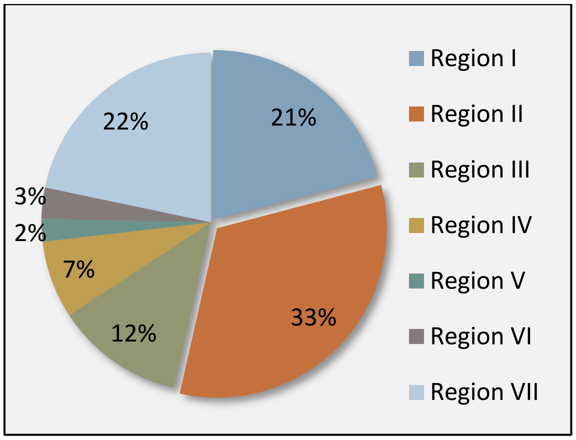


**Figure A2.1. Population 2020 by Region**

**POPULATION**: In 2020, the estimated seasonally adjusted District total population was 1,598,918, about seven percent higher than the BEBR 2020 population estimate. District counties with the highest estimated seasonal rates are within regions II, III and V. About 87 percent of the District population is estimated to be served by public supply utilities. Thirty-three percent of all District population in 2020 is estimated to have resided in Region II (Figure A2.1). In addition, over half (54%) of all districtwide population increases over the planning period are projected to be in Region II. Additional population data is at the end of Appendix 2 in Table A2.2.

In 2020, approximately 66 percent of the District population was in regions I, II and III combined; 22 percent in Region VII; and the remaining 12 percent in regions IV, V and VI combined. This spatial distribution of populations is projected to remain consistent over time and be similar in 2045.

**ESTIMATED 2020 WATER USE**: Estimated NWFWMD 2020 water use totaled close to 341 mgd. Public supply accounts for half, and collectively public supply and domestic self-supply (DSS) comprise 56 percent of all District water use, followed by industrial/commercial/institutional (ICI) at 19 percent (Figure A2.2).

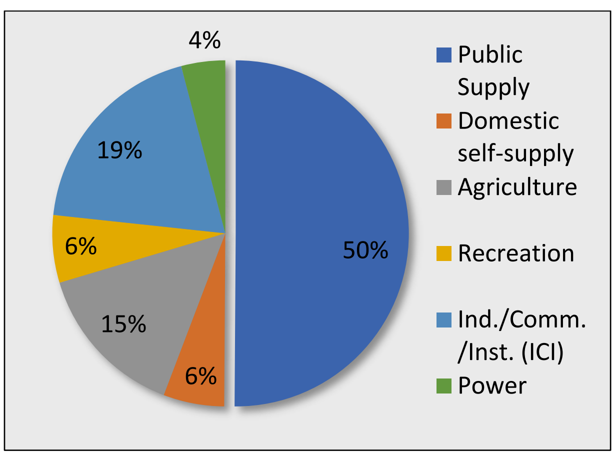


**Figure A2.2. 2020 Water Use by Category**

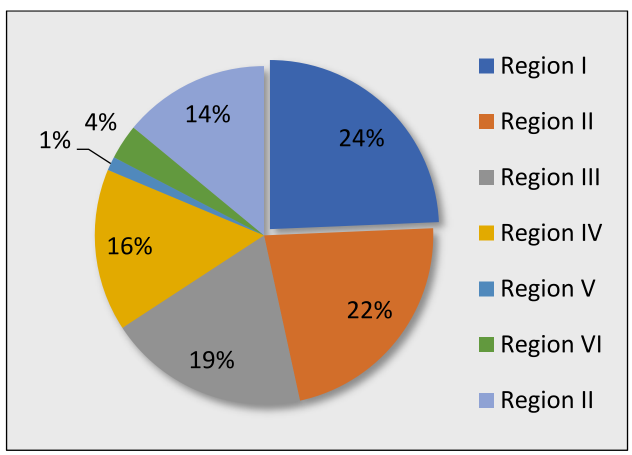


**Figure A2.3. 2020 Water Use by Region**

Jackson County and Region IV continue to be the dominant agricultural water use areas, while small-scale recreational landscape irrigation uses are focused in Region II (Table A2.3). The majority of power generation and ICI self-supply water use is in Escambia County (Region I) and Bay County (Region III). Escambia County is estimated to have used close to one-fourth of all water in 2020 (Figure A2.3).

**Estimated Water Use by Source**: Nearly two-thirds of all District water is provided by groundwater aquifer systems (Figure A2.4). Major aquifer systems are the Floridan and the sand-and-gravel. More than ninety percent of sand-and-gravel water use is in Escambia and Santa Rosa counties. Minor aquifers supplying just one percent of all water are the intermediate, Claiborne, and surficial aquifers. Seventy-nine percent of all surface water use districtwide is in Bay County, primarily supplied by the Deer Point Lake Reservoir. See Appendix 3 for more information on estimates and projections by source.

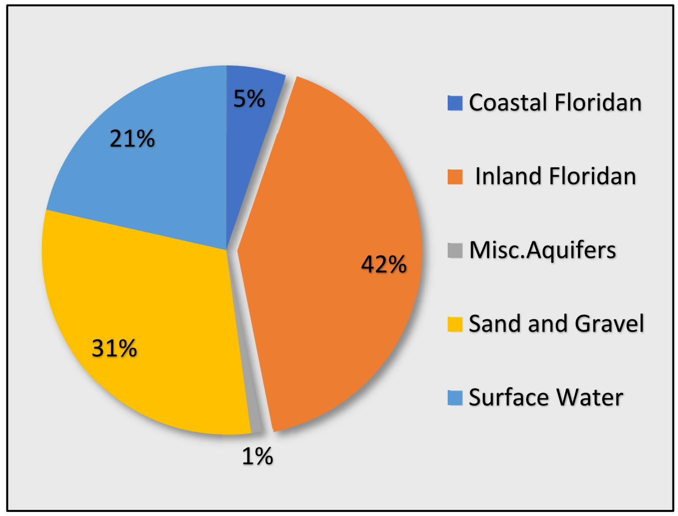


**Figure A2.4. 2020 Estimated Water Use by Source**

**Future Demand Projections 2025-2045**: The two fastest growing counties in the District - Walton and Santa Rosa - are in Region II where there is a projected increase of about 28 mgd or 37 percent in water use by year 2045. Steady increases in water demand are also estimated in regions I, IV, and VII. Franklin and Gulf counties in Region V have seasonal populations but overall water use estimates are not expected to change significantly over the planning horizon (Table A2.4). Drought event future demand projections reach about 429 mgd districtwide by year 2045. Regions II and IV have the highest estimated percentage increase in drought conditions due to significance of the agricultural sector and public supply (Table A2.5).

**Alternative Water Supply and Conservation**: The 2020 reuse flow totaled about 26 mgd and the future reuse availability is estimated to be close to 89 mgd districtwide by year 2045, as noted in Table A2.1, below. There are several ongoing projects to expand potable offset reuse in various stages of planning and implementation. Across the District, there are significant opportunities to increase production of potable offset reuse through the planning horizon. Additionally, the potential for additional water conservation projects will be evaluated as part of the 2024 Regional Water Supply Plan Update for Region II.

**Table A2.1. Reuse Flow 2020 and Future Potential Reuse Availability 2025-2045 (mgd)**

| REGION | Potable Offset Reuse Flow 2020 | Future Beneficial Reuse Estimated Availability | | | | | 2045 Estimated Availability | |
|---|---|---|---|---|---|---|---|---|
| | | 2025 | 2030 | 2035 | 2040 | 2045 | WWTF Flow Mgd | Capacity |
| **Region I** | 10.719 | 11.170 | 11.728 | 12.179 | 12.586 | 12.950 | 22.776 | 67.4% |
| **Region II** | 9.243 | 22.476 | 24.491 | 26.155 | 27.652 | 29.011 | 38.254 | 60.8% |
| **Region III** | 3.736 | 13.812 | 14.581 | 15.140 | 15.586 | 15.956 | 19.692 | 58.3% |
| **Region IV** | 0.689 | 4.573 | 4.647 | 4.697 | 4.732 | 4.769 | 5.458 | 45.8% |
| **Region V** | 0.431 | 1.075 | 1.123 | 1.161 | 1.188 | 1.210 | 1.641 | 26.5% |
| **Region VI** | 0.270 | 1.908 | 1.926 | 1.936 | 1.945 | 1.945 | 2.215 | 52.1% |
| **Region VII** | 1.035 | 20.601 | 21.356 | 21.952 | 22.455 | 22.887 | 23.992 | 78.2% |
| **TOTALS** | **26.123** | **75.614** | **79.851** | **83.220** | **86.143** | **88.727** | **113.958** | **62.1%** |

**Table A2.2 NWFWMD Population 2020 Estimates and Future Population Projections 2025-2045**

| Planning Region | County | BEBR 2020 Population Estimates[1] | TOTAL 2020 Population[2] Estimates | Future Population Projections[2] | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2025 | 2030 | 2035 | 2040 | 2045 | Population[1] | % |
| I | Escambia | 323,714 | 334,073 | 345,823 | 355,008 | 362,438 | 369,146 | 375,132 | 41,059 | 12.3% |
| | **Region I Total** | **323,714** | **334,073** | **345,823** | **355,008** | **362,438** | **369,146** | **375,132** | **41,059** | **12.3%** |
| II | Okaloosa | 203,951 | 222,307 | 233,914 | 243,288 | 250,700 | 257,240 | 262,799 | 40,492 | 18.2% |
| | Santa Rosa | 184,653 | 188,346 | 205,836 | 220,218 | 232,356 | 243,474 | 253,470 | 65,124 | 34.6% |
| | Walton | 74,724 | 111,339 | 127,991 | 142,295 | 154,364 | 165,241 | 175,671 | 64,332 | 57.8% |
| | **Region II Total** | **463,328** | **521,991** | **567,741** | **605,801** | **637,420** | **665,955** | **691,940** | **169,949** | **32.6%** |
| III | Bay | 174,410 | 195,339 | 207,200 | 216,272 | 222,880 | 228,144 | 232,512 | 37,173 | 19.0% |
| | **Region III Total** | **174,410** | **195,339** | **207,200** | **216,272** | **222,880** | **228,144** | **232,512** | **37,173** | **19.0%** |
| IV | Calhoun | 14,489 | 14,924 | 15,553 | 16,068 | 16,480 | 16,686 | 16,995 | 2,071 | 13.9% |
| | Holmes | 20,001 | 20,201 | 20,301 | 20,301 | 20,402 | 20,402 | 20,503 | 302 | 1.5% |
| | Jackson | 46,587 | 47,985 | 48,513 | 48,925 | 49,131 | 49,234 | 49,337 | 1,352 | 2.8% |
| | Liberty | 8,575 | 9,347 | 9,592 | 9,919 | 10,028 | 10,246 | 10,355 | 1,008 | 10.8% |
| | Washington | 25,334 | 26,094 | 26,986 | 27,604 | 28,119 | 28,531 | 28,943 | 2,849 | 10.9% |
| | **Region IV Total** | **114,986** | **118,550** | **120,945** | **122,817** | **124,160** | **125,099** | **126,133** | **7,583** | **6.4%** |
| V | Franklin | 11,864 | 16,491 | 17,236 | 17,792 | 18,209 | 18,487 | 18,765 | 2,274 | 13.8% |
| | Gulf | 14,724 | 17,964 | 18,788 | 19,398 | 19,886 | 20,252 | 20,496 | 2,533 | 14.1% |
| | **Region V Total** | **26,588** | **34,455** | **36,024** | **37,190** | **38,095** | **38,739** | **39,261** | **4,806** | **13.9%** |
| VI | Gadsden | 46,226 | 47,335 | 47,923 | 48,333 | 48,538 | 48,742 | 48,742 | 1,407 | 3.0% |
| | **Region VI Total** | **46,226** | **47,335** | **47,923** | **48,333** | **48,538** | **48,742** | **48,742** | **1,407** | **3.0%** |
| VII | Jefferson[(NWF Only)] | 10,158 | 10,514 | 10,655 | 10,728 | 10,801 | 10,947 | 11,020 | 506 | 4.8% |
| | Leon | 299,484 | 300,981 | 313,862 | 324,615 | 333,057 | 340,193 | 346,323 | 45,342 | 15.1% |
| | Wakulla | 33,981 | 35,680 | 38,220 | 40,320 | 42,105 | 43,470 | 44,730 | 9,050 | 25.4% |
| | **Region VII Total** | **343,623** | **347,175** | **362,736** | **375,663** | **385,963** | **394,609** | **402,073** | **54,898** | **15.8%** |
| | **TOTALS** | **1,492,875** | **1,598,919** | **1,688,393** | **1,761,084** | **1,819,494** | **1,870,435** | **1,915,793** | **316,874** | **19.8%** |

[(1)]UF BEBR, Population Studies Program, Vol. 54, Bulletin 189, April 2021. Permanent population estimates only, but includes estimated inmate populations.
[(2)]Total estimated populations by county and region, including seasonal adjustments.

**Table A2.3 NWFWMD 2020 Estimated Water Use By Category (mgd)**

| Planning Region | County / Region | 1. Public Supply | 2. Domestic Self-Supply | 3. Agriculture (FSAID) | 4. Recreation | 5. ICI | 6. Power Generation | TOTAL 2020 WATER USE (mgd) |
|---|---|---|---|---|---|---|---|---|
| I | Escambia | 40.091 | 1.853 | 2.998 | 2.138 | 30.530 | 5.453 | 83.063 |
| | **Region I Total** | **40.091** | **1.853** | **2.998** | **2.138** | **30.530** | **5.453** | **83.063** |
| II | Okaloosa | 24.103 | 0.888 | 0.408 | 5.453 | 1.671 | - | 32.523 |
| | Santa Rosa | 18.391 | 0.753 | 1.894 | 2.208 | 2.925 | - | 26.172 |
| | Walton | 11.675 | 0.425 | 0.613 | 4.483 | 0.094 | - | 17.290 |
| | **Region II Total** | **54.169** | **2.065** | **2.915** | **12.145** | **4.690** | **-** | **75.984** |
| III | Bay | 29.359 | 2.386 | 0.884 | 2.151 | 26.480 | 4.271 | 65.531 |
| | **Region III Total** | **29.359** | **2.386** | **0.884** | **2.151** | **26.480** | **4.271** | **65.531** |
| IV | Calhoun | 0.546 | 0.993 | 3.171 | 0.004 | 0.244 | - | 4.958 |
| | Holmes | 1.222 | 1.216 | 1.119 | 0.191 | - | - | 3.748 |
| | Jackson | 2.613 | 2.407 | 30.929 | 0.398 | 0.898 | 1.431 | 38.677 |
| | Liberty | 0.482 | 0.452 | 0.114 | 0.001 | 0.259 | 0.206 | 1.514 |
| | Washington | 1.013 | 1.698 | 0.790 | 0.307 | 0.282 | - | 4.091 |
| | **Region IV Total** | **5.876** | **6.767** | **36.123** | **0.901** | **1.684** | **1.637** | **52.988** |
| V | Franklin | 1.886 | 0.066 | 0.006 | 0.248 | 0.017 | - | 2.223 |
| | Gulf | 1.451 | 0.304 | 0.297 | 0.089 | 0.166 | - | 2.307 |
| | **Region V Total** | **3.337** | **0.370** | **0.303** | **0.337** | **0.183** | **-** | **4.530** |
| VI | Gadsden | 4.395 | 1.397 | 4.938 | 0.220 | 0.472 | - | 11.423 |
| | **Region VI Total** | **4.395** | **1.397** | **4.938** | **0.220** | **0.472** | **-** | **11.423** |
| VII | Jefferson (NWF Only) | 0.556 | 0.422 | 1.091 | 0.791 | - | - | 2.860 |
| | Leon | 30.309 | 3.446 | 0.547 | 2.689 | 0.084 | 2.500 | 39.575 |
| | Wakulla | 2.934 | 0.789 | 0.134 | 0.197 | 1.166 | 0.207 | 5.428 |
| | **Region VII Total** | **33.799** | **4.656** | **1.772** | **3.678** | **1.250** | **2.707** | **47.863** |
| | **TOTALS** | **171.026** | **19.495** | **49.933** | **21.569** | **65.290** | **14.068** | **341.381** |
| **Percent of water use:** | | **50.1%** | **5.7%** | **14.6%** | **6.3%** | **19.1%** | **4.1%** | **100.0%** |

**Table A2.4 NWFWMD Projected Water Demand 2025-2045 (mgd) - Average/Normal Years**

| Planning Region | County / Region | TOTAL 2020 WATER USE (mgd) | Future Demand Projections - Average/Normal Years | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| I | Escambia | 83.063 | 89.017 | 94.174 | 95.633 | 97.036 | 98.412 | 15.349 | 18.5% |
| | **Region I Total** | **83.063** | **89.017** | **94.174** | **95.633** | **97.036** | **98.412** | **15.349** | **18.5%** |
| II | Okaloosa | 32.523 | 34.048 | 35.764 | 36.903 | 37.768 | 38.516 | 5.993 | 18.4% |
| | Santa Rosa | 26.172 | 28.713 | 30.936 | 32.928 | 34.839 | 36.475 | 10.303 | 39.4% |
| | Walton | 17.290 | 20.385 | 22.825 | 25.063 | 27.176 | 29.317 | 12.027 | 69.6% |
| | **Region II Total** | **75.984** | **83.146** | **89.525** | **94.894** | **99.783** | **104.307** | **28.323** | **37.3%** |
| III | Bay | 65.531 | 45.077 | 47.523 | 48.579 | 49.920 | 50.471 | -15.060 | -23.0% |
| | **Region III Total** | **65.531** | **45.077** | **47.523** | **48.579** | **49.920** | **50.471** | **-15.060** | **-23.0%** |
| IV | Calhoun | 4.958 | 5.104 | 5.258 | 5.456 | 5.657 | 5.855 | 0.897 | 18.1% |
| | Holmes | 3.747 | 3.768 | 3.770 | 3.779 | 3.781 | 3.796 | 0.049 | 1.3% |
| | Jackson | 38.677 | 39.633 | 40.143 | 40.693 | 41.187 | 41.626 | 2.949 | 7.6% |
| | Liberty | 1.515 | 1.622 | 1.721 | 1.782 | 1.853 | 1.913 | 0.398 | 26.3% |
| | Washington | 4.091 | 4.360 | 4.689 | 4.912 | 5.143 | 5.386 | 1.295 | 31.7% |
| | **Region IV Total** | **52.988** | **54.486** | **55.581** | **56.623** | **57.621** | **58.576** | **5.588** | **10.5%** |
| V | Franklin | 2.222 | 2.333 | 2.403 | 2.469 | 2.510 | 2.550 | 0.327 | 14.7% |
| | Gulf | 2.307 | 2.534 | 2.684 | 2.819 | 2.889 | 2.950 | 0.642 | 27.8% |
| | **Region V Total** | **4.530** | **4.868** | **5.087** | **5.288** | **5.399** | **5.499** | **0.970** | **21.4%** |
| VI | Gadsden | 11.423 | 11.539 | 11.765 | 11.900 | 12.045 | 12.105 | 0.682 | 6.0% |
| | **Region VI Total** | **11.423** | **11.539** | **11.765** | **11.900** | **12.045** | **12.105** | **0.682** | **6.0%** |
| VII | Jefferson (NWF District Only) | 2.859 | 2.923 | 2.967 | 2.992 | 3.028 | 3.054 | 0.195 | 6.8% |
| | Leon | 39.575 | 42.798 | 43.744 | 44.500 | 45.106 | 45.585 | 6.010 | 15.2% |
| | Wakulla | 5.428 | 5.754 | 6.011 | 6.188 | 6.327 | 6.450 | 1.022 | 18.8% |
| | **Region VII Total** | **47.862** | **51.474** | **52.721** | **53.681** | **54.462** | **55.089** | **7.227** | **15.1%** |
| | **TOTALS** | **341.381** | **339.607** | **356.376** | **366.597** | **376.266** | **384.460** | **43.079** | **12.6%** |

**Table A2.5 NWFWMD Future Projected Water Demand 2025-2045 (mgd) - Dry Years**

| Planning Region | County / Region | TOTAL 2020 WATER USE (mgd) | Future Demand Projections - Dry Years | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| I | Escambia | 83.063 | 93.904 | 99.311 | 100.985 | 102.595 | 104.231 | 21.168 | 25.5% |
| | **Region I Total** | **83.063** | **93.904** | **99.311** | **100.985** | **102.595** | **104.231** | **21.168** | **25.5%** |
| II | Okaloosa | 32.523 | 37.952 | 39.818 | 41.075 | 42.043 | 42.890 | 10.367 | 31.9% |
| | Santa Rosa | 26.172 | 31.491 | 34.119 | 36.511 | 38.800 | 40.764 | 14.593 | 55.8% |
| | Walton | 17.290 | 23.277 | 26.048 | 28.574 | 30.954 | 33.358 | 16.068 | 92.9% |
| | **Region II Total** | **75.984** | **92.721** | **99.985** | **106.159** | **111.797** | **117.012** | **41.028** | **54.0%** |
| III | Bay | 65.530 | 48.391 | 50.963 | 52.109 | 53.520 | 54.128 | -11.403 | -17.4% |
| | **Region III Total** | **65.530** | **48.391** | **50.963** | **52.109** | **53.520** | **54.128** | **-11.403** | **-17.4%** |
| IV | Calhoun | 4.958 | 6.313 | 6.511 | 6.769 | 7.051 | 7.345 | 2.387 | 48.1% |
| | Holmes | 3.747 | 4.226 | 4.228 | 4.237 | 4.240 | 4.257 | 0.510 | 13.6% |
| | Jackson | 38.677 | 51.521 | 52.204 | 52.923 | 53.576 | 54.179 | 15.502 | 40.1% |
| | Liberty | 1.515 | 1.697 | 1.800 | 1.860 | 1.933 | 1.994 | 0.480 | 31.7% |
| | Washington | 4.091 | 4.912 | 5.303 | 5.587 | 5.899 | 6.201 | 2.110 | 51.6% |
| | **Region IV Total** | **52.988** | **68.670** | **70.046** | **71.376** | **72.699** | **73.976** | **20.988** | **39.6%** |
| V | Franklin | 2.222 | 2.565 | 2.643 | 2.715 | 2.759 | 2.803 | 0.581 | 26.1% |
| | Gulf | 2.307 | 2.727 | 2.885 | 3.026 | 3.103 | 3.168 | 0.133 | 5.8% |
| | **Region V Total** | **4.530** | **5.292** | **5.528** | **5.741** | **5.862** | **5.971** | **1.441** | **31.8%** |
| VI | Gadsden | 11.423 | 13.615 | 13.851 | 13.987 | 14.139 | 14.204 | 2.780 | 24.3% |
| | **Region VI Total** | **11.423** | **13.615** | **13.851** | **13.987** | **14.139** | **14.204** | **2.780** | **24.3%** |
| VII | Jefferson (NWF District Only) | 2.859 | 3.524 | 3.583 | 3.613 | 3.655 | 3.684 | 0.824 | 28.8% |
| | Leon | 39.575 | 46.339 | 47.373 | 48.196 | 48.856 | 49.379 | 9.803 | 24.8% |
| | Wakulla | 5.428 | 6.124 | 6.398 | 6.588 | 6.738 | 6.868 | 1.441 | 26.5% |
| | **Region VII Total** | **47.862** | **55.987** | **57.355** | **58.397** | **59.248** | **59.931** | **12.069** | **25.2%** |
| | **TOTALS** | **341.381** | **378.579** | **369.363** | **408.754** | **395.769** | **429.452** | **88.071** | **25.8%** |

# APPENDIX 3. WATER WITHDRAWALS AND PRODUCTION PROJECTIONS BY SOURCE

**Table A3.1. NWFWMD 2020 Water Withdrawals by Source (mgd)**

| Planning Region | County / Region | Groundwater Aquifer Systems | | | | | | TOTAL Groundwater | TOTAL Surface Water | TOTAL ESTIMATED WATER USE (mgd) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Coastal Floridan | Inland Floridan | Inter-mediate | Claiborne | Sand and Gravel | Surficial | | | |
| I | Escambia | - | - | - | - | 77.067 | 0.075 | 77.142 | 5.921 | 83.063 |
| | **Region Totals** | **-** | **-** | **-** | **-** | **77.067** | **0.075** | **77.142** | **5.921** | **83.063** |
| II | Okaloosa | 12.883 | 13.064 | - | - | 1.067 | - | 27.014 | 2.138 | 29.152 |
| | Santa Rosa | 0.948 | 0.870 | - | - | 23.865 | - | 25.683 | 0.489 | 26.172 |
| | Walton | 1.257 | 15.138 | 0.157 | - | 2.639 | 0.158 | 19.349 | 1.311 | 20.660 |
| | **Region Totals** | **15.088** | **29.073** | **0.157** | **-** | **27.571** | **0.158** | **72.046** | **3.938** | **75.984** |
| III | Bay | 0.459 | 6.007 | 0.406 | - | 0.015 | 1.150 | 8.035 | 57.498 | 65.534 |
| | **Region Totals** | **0.459** | **6.007** | **0.406** | **-** | **0.015** | **1.150** | **8.035** | **57.498** | **65.534** |
| IV | Calhoun | - | 4.463 | 0.397 | - | - | - | 4.860 | 0.098 | 4.958 |
| | Holmes | - | 3.459 | - | 0.252 | - | - | 3.711 | - | 3.711 |
| | Jackson | - | 37.112 | - | 0.172 | - | - | 37.284 | 1.392 | 38.677 |
| | Liberty | - | 1.289 | 0.181 | - | - | 0.044 | 1.514 | 0.001 | 1.515 |
| | Washington | - | 3.653 | - | - | - | - | 3.653 | 0.474 | 4.127 |
| | **Region Totals** | **-** | **49.977** | **0.578** | **0.424** | **-** | **0.044** | **51.023** | **1.966** | **52.988** |
| V | Franklin | 1.903 | 0.039 | 0.054 | - | - | - | 1.996 | 0.226 | 2.222 |
| | Gulf | 0.417 | 0.745 | 0.197 | - | - | 0.045 | 1.404 | 0.903 | 2.307 |
| | **Region Totals** | **2.320** | **0.784** | **0.252** | **-** | **-** | **0.045** | **3.400** | **1.130** | **4.530** |
| VI | Gadsden | - | 9.487 | - | - | - | - | 9.487 | 1.936 | 11.423 |
| | **Region Totals** | **-** | **9.487** | **-** | **-** | **-** | **-** | **9.487** | **1.936** | **11.423** |
| VII | Jefferson (NWF Only) | - | 2.859 | - | - | - | - | 2.859 | - | 2.859 |
| | Leon | - | 39.305 | - | - | - | - | 39.305 | 0.771 | 40.076 |
| | Wakulla | - | 4.720 | - | - | - | - | 4.720 | 0.207 | 4.927 |
| | **Region Totals** | **-** | **46.884** | **-** | **-** | **-** | **-** | **46.884** | **0.978** | **47.862** |
| | **DISTRICT TOTALS** | **17.867** | **142.211** | **1.392** | **0.424** | **104.653** | **1.471** | **268.017** | **73.367** | **341.385** |
| | | | | | | | | | | |
| | | | | | **Percentage of Water Source:** | | | **78.5%** | **21.5%** | **100.0%** |

**Table A3.2. NWFWMD 2020 Water Withdrawals and 2045 Production Projections by Source (mgd)**

| Planning Region | County / Region | 2020 Estimated Water Use (mgd) | | | Average / Normal Year 2045 Projected Water Use[1] (mgd) | | | Dry / Drought Year 2045 Projected Water Use[1] (mgd) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Ground Water | Surface Water | TOTAL WITHDRAWALS | GW | SW | Totals | GW | SW | Totals |
| I | Escambia | 77.142 | 5.921 | 83.063 | 90.978 | 7.434 | 98.412 | 96.482 | 7.749 | 104.231 |
| | **Region Totals** | **77.142** | **5.921** | **83.063** | **90.978** | **7.434** | **98.412** | **96.482** | **7.749** | **104.231** |
| II | Okaloosa | 27.014 | 2.138 | 29.152 | 35.988 | 2.528 | 38.516 | 35.169 | 3.387 | 38.556 |
| | Santa Rosa | 25.683 | 0.489 | 26.172 | 35.817 | 0.658 | 36.475 | 39.883 | 0.882 | 40.764 |
| | Walton | 19.349 | 1.311 | 20.660 | 27.248 | 2.068 | 29.317 | 37.173 | 2.772 | 39.945 |
| | **Region Totals** | **72.046** | **3.938** | **75.984** | **99.053** | **5.254** | **104.307** | **112.225** | **7.040** | **119.265** |
| III | Bay | 8.035 | 57.498 | 65.534 | 7.990 | 42.485 | 50.474 | 9.208 | 44.925 | 54.133 |
| | **Region Totals** | **8.035** | **57.498** | **65.534** | **7.990** | **42.485** | **50.474** | **9.208** | **44.925** | **54.133** |
| IV | Calhoun | 4.860 | 0.098 | 4.958 | 5.733 | 0.122 | 5.855 | 7.180 | 0.165 | 7.345 |
| | Holmes | 3.711 | - | 3.711 | 3.796 | - | 3.796 | 4.218 | - | 4.218 |
| | Jackson | 37.284 | 1.392 | 38.677 | 40.164 | 1.462 | 41.626 | 52.681 | 1.498 | 54.179 |
| | Liberty | 1.514 | 0.001 | 1.515 | 1.910 | 0.003 | 1.913 | 1.992 | 0.003 | 1.994 |
| | Washington | 3.653 | 0.474 | 4.127 | 4.527 | 0.859 | 5.386 | 5.092 | 1.151 | 6.243 |
| | **Region Totals** | **51.023** | **1.966** | **52.988** | **56.131** | **2.446** | **58.576** | **71.163** | **2.816** | **73.979** |
| V | Franklin | 1.996 | 0.226 | 2.222 | 2.292 | 0.257 | 2.550 | 2.458 | 0.345 | 2.803 |
| | Gulf | 1.404 | 0.903 | 2.307 | 1.807 | 1.143 | 2.950 | 1.945 | 1.223 | 3.168 |
| | **Region Totals** | **3.400** | **1.130** | **4.530** | **4.099** | **1.400** | **5.499** | **4.403** | **1.568** | **5.971** |
| VI | Gadsden | 9.487 | 1.936 | 11.423 | 10.147 | 1.958 | 12.105 | 11.617 | 2.586 | 14.204 |
| | **Region Totals** | **9.487** | **1.936** | **11.423** | **10.147** | **1.958** | **12.105** | **11.617** | **2.586** | **14.204** |
| VII | Jefferson (NWF Only) | 2.859 | - | 2.859 | 3.054 | - | 3.054 | 3.684 | - | 3.684 |
| | Leon | 39.305 | 0.771 | 40.076 | 44.721 | 0.865 | 45.585 | 48.834 | 1.159 | 49.993 |
| | Wakulla | 4.720 | 0.207 | 4.927 | 6.150 | 0.300 | 6.450 | 5.892 | 0.300 | 6.192 |
| | **Region Totals** | **46.884** | **0.978** | **47.862** | **53.925** | **1.165** | **55.089** | **58.410** | **1.459** | **59.869** |
| | **DISTRICT TOTALS** | **268.017** | **73.367** | **341.385** | **322.322** | **62.142** | **384.464** | **363.507** | **68.144** | **431.651** |
| | | | | **Percentage of Water Source:** | **83.8%** | **16.2%** | | **84.2%** | **15.8%** | |

(1) Production projections vary marginally (<1%) from demand projections.

# APPENDIX 4. PUBLIC SUPPLY UTILITY DATA

**Table A4.1. 2020 Public Supply Water Demand, Populations Served, and Per Capita Water Use**

| Planning Region | County / Region | Reported Water Demand (mgd) | | | | Populations and Per Capita Water Use (gpd) | | |
|---|---|---|---|---|---|---|---|---|
| | | Reported Pumpage | Imports | Exports | Water Demand | Public Supply Total Adjusted[1] 2020 Population Served | Average GROSS Per Capita Water Use | Average RESIDENTIAL Per Capita Water Use |
| I | Escambia | 40.091 | - | - | 40.091 | 313,170 | 127.11 | 76.76 |
| | **Totals/Average Per Capita** | **40.091** | **0.000** | **0.000** | **40.091** | **313,170** | **127.11** | **76.76** |
| II | Okaloosa | 20.733 | 3.371 | - | 24.103 | 269,103 | 102.49 | 65.22 |
| | Santa Rosa | 18.391 | 7.150 | 7.150 | 18.391 | 179,857 | 117.67 | 78.90 |
| | Walton | 15.045 | 2.557 | 5.928 | 11.675 | 106,546 | 99.64 | 68.68 |
| | **Totals/Average Per Capita** | **54.169** | **13.078** | **13.078** | **54.169** | **555,506** | **106.60** | **70.93** |
| III | Bay | 29.788 | 26.584 | 27.013 | 29.359 | 172,428 | 128.09 | 73.04 |
| | **Totals/Average Per Capita** | **29.788** | **26.584** | **27.013** | **29.359** | **172,428** | **128.09** | **73.04** |
| IV | Calhoun | 0.790 | - | 0.244 | 0.546 | 4,470 | 145.01 | 96.44 |
| | Holmes | 1.186 | 0.036 | - | 1.222 | 6,489 | 117.73 | 49.97 |
| | Jackson | 2.613 | - | - | 2.613 | 20,724 | 102.90 | 46.00 |
| | Liberty | 0.482 | - | - | 0.482 | 4,382 | 123.78 | 86.17 |
| | Washington | 1.050 | - | 0.036 | 1.013 | 6,941 | 142.16 | 90.09 |
| | **Totals/Average Per Capita** | **5.876** | **0.036** | **0.036** | **5.876** | **43,005** | **126.32** | **73.73** |
| V | Franklin | 1.886 | 0.092 | 0.092 | 1.886 | 15,749 | 118.79 | 70.76 |
| | Gulf | 1.451 | - | - | 1.451 | 14,533 | 92.69 | 54.30 |
| | **Totals/Average Per Capita** | **3.337** | **0.092** | **0.092** | **3.337** | **30,281** | **105.74** | **62.53** |
| VI | Gadsden | 4.395 | 0.017 | 0.017 | 4.395 | 31,578 | 134.71 | 84.12 |
| | **Totals/Average Per Capita** | **4.395** | **0.017** | **0.017** | **4.395** | **31,578** | **134.71** | **84.12** |
| VII | Jefferson (NWF District Only) | 0.556 | - | - | 0.556 | 5,760 | 99.49 | 87.36 |
| | Leon | 30.810 | - | 0.501 | 30.309 | 261,040 | 103.79 | 206.83 |
| | Wakulla | 2.433 | 0.501 | - | 2.934 | 26,786 | 125.17 | 85.37 |
| | **Totals/Average Per Capita** | **33.799** | **0.501** | **0.501** | **33.799** | **293,586** | **109.48** | **126.52** |
| | **DISTRICT TOTALS/AVERAGE** | **171.700** | **40.199** | **40.873** | **171.026** | **1,439,554** | **119.72** | **81.09** |

(1) Populations served include seasonal resident adjustments.

(2) Million gallons per day (mgd) or gallons per day (gpd).

**Table A4.2. Region I Public Supply Utility Data - Estimates and Projections, Demand and Production**

| REGION I | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **ESCAMBIA COUNTY** | **2020 Baseline Estimates** | | | **DEMAND and PRODUCTION Projections (ADR, gpd)** | | | | |
| **Public Supply Utility or Service Area** | **Gross Water Use (ADR, gpd)** | **Populations Served** | **Gross Per Capita (gpcd)** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Central Water Works, Inc. | 413,195 | 2,480 | 167 | 441,514 | 459,074 | 473,412 | 486,869 | 499,266 |
| Century, Town of | 550,515 | 4,056 | 136 | 550,661 | 557,621 | 561,849 | 564,966 | 566,795 |
| Cottage Hill Water Works, Inc. | 377,143 | 3,562 | 106 | 390,409 | 400,778 | 409,166 | 416,739 | 423,496 |
| Emerald Coast Utilities Authority (ECUA) | 33,834,581 | 257,211 | 132 | 35,024,645 | 35,954,873 | 36,707,417 | 37,386,797 | 37,993,013 |
| Farm Hill Utilities, Inc. | 632,058 | 5,458 | 116 | 696,463 | 733,366 | 763,825 | 793,113 | 820,643 |
| Gonzalez Utilities Association, Inc. | 548,581 | 4,854 | 113 | 586,178 | 609,492 | 628,528 | 646,394 | 662,853 |
| Molino Utilities, Inc. | 915,025 | 5,578 | 164 | 977,737 | 1,016,624 | 1,048,375 | 1,078,176 | 1,105,629 |
| People's Water Service Company | 2,471,732 | 27,074 | 91 | 2,558,670 | 2,626,626 | 2,681,602 | 2,731,233 | 2,775,519 |
| Walnut Hill/Bratt-Davisville (EREC) | 347,885 | 2,897 | 120 | 360,121 | 369,686 | 377,423 | 384,409 | 390,642 |
| **REGION I TOTALS (gpd)** | **40,090,714** | **313,170** | | **41,586,398** | **42,728,139** | **43,651,596** | **44,488,694** | **45,237,857** |
| **REGION I mgd** | **40.091** | | | **41.586** | **42.728** | **43.652** | **44.489** | **45.238** |

## Table A4.3. Region II Public Supply Utility Data - Estimates and Projections, Demand and Production

| **REGION II** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **OKALOOSA COUNTY** | **2020 Baseline Estimates** | | | **Gross Water DEMAND Projections (ADR, gpd)** | | | | |
| **Public Supply Utility or Service Area** | **Gross Water Use (ADR, gpd)** | **Populations Served** | **Gross Per Capita (gpcd)** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Auburn Water System | 2,303,156 | 15,895 | 145 | 2,423,412 | 2,520,529 | 2,597,320 | 2,665,076 | 2,722,668 |
| Baker Water System | 250,329 | 2,494 | 100 | 263,399 | 273,955 | 282,301 | 289,666 | 295,925 |
| Blackman Community Water System, Inc. | 34,719 | 557 | 62 | 34,719 | 35,170 | 35,378 | 35,465 | 35,465 |
| Crestview, City of | 2,553,409 | 29,666 | 86 | 2,773,744 | 2,923,399 | 3,047,006 | 3,160,792 | 3,260,575 |
| Destin Water Users | 4,110,252 | 30,457 | 135 | 4,464,927 | 4,705,828 | 4,904,801 | 5,087,964 | 5,248,585 |
| Fort Walton Beach, City of | 2,604,373 | 21,357 | 122 | 2,740,356 | 2,850,175 | 2,937,008 | 3,013,625 | 3,078,750 |
| Holt Water Works, Inc. | 239,682 | 2,086 | 115 | 252,197 | 262,304 | 270,295 | 277,346 | 283,340 |
| Laurel Hill, City of | 131,709 | 1,505 | 88 | 131,709 | 133,420 | 134,209 | 134,538 | 134,538 |
| Mary Esther, City of | 412,101 | 4,013 | 103 | 412,101 | 417,453 | 419,923 | 420,953 | 420,953 |
| Milligan Water System | 145,017 | 1,680 | 86 | 145,017 | 146,901 | 147,770 | 148,132 | 148,132 |
| Niceville, City of | 2,615,405 | 20,321 | 129 | 2,751,965 | 2,862,249 | 2,949,450 | 3,026,392 | 3,091,793 |
| OCW&S - Bluewater | 1,272,485 | 14,877 | 86 | 1,338,926 | 1,392,583 | 1,435,009 | 1,472,444 | 1,504,264 |
| OCW&S - Main Area | 6,388,882 | 61,810 | 103 | 6,722,468 | 6,991,868 | 7,204,882 | 7,392,836 | 7,552,596 |
| *SWUC (Okaloosa County portion)* | *567,286* | *3,350* | *169* | *596,906* | *620,827* | *639,741* | *656,430* | *670,615* |
| Valparaiso, City of | 474,608 | 4,284 | 111 | 482,634 | 495,439 | 504,452 | 511,650 | 516,302 |
| **Okaloosa County TOTALS (gpd)** | **24,103,414** | **214,351** | **102** | **25,534,481** | **26,632,098** | **27,509,544** | **28,293,308** | **28,964,502** |

**Table A4.3. Region II Public Supply Utility Data - Estimates and Projections, Demand and Production (Continued)**

| Okaloosa County PRODUCTION | | | | Water PRODUCTION Pumpage (ADR, gpd) | | | | |
|---|---|---|---|---|---|---|---|---|
| **Public Supply Utility or Service Area** | **Production (ADR, gpd)** | | | **2025** | **2030** | **2035** | **2040** | **2045** |
| Auburn Water System | 2,303,156 | | | 2,423,412 | 2,520,529 | 2,597,320 | 2,665,076 | 2,722,668 |
| Baker Water System | 250,329 | | | 263,399 | 273,955 | 282,301 | 289,666 | 295,925 |
| Blackman Community Water System, Inc. | 34,719 | | | 34,719 | 35,170 | 35,378 | 35,465 | 35,465 |
| Crestview, City of | 2,553,409 | | | 2,773,744 | 2,923,399 | 3,047,006 | 3,160,792 | 3,260,575 |
| Destin Water Users | 1,306,874 | | | 1,770,000 | 1,770,000 | 1,770,000 | 1,770,000 | 1,770,000 |
| Fort Walton Beach, City of | 2,604,373 | | | 2,740,356 | 2,850,175 | 2,937,008 | 3,013,625 | 3,078,750 |
| Holt Water Works, Inc. | 239,682 | | | 252,197 | 262,304 | 270,295 | 277,346 | 283,340 |
| Laurel Hill, City of | 131,709 | | | 131,709 | 133,420 | 134,209 | 134,538 | 134,538 |
| Mary Esther, City of | 412,101 | | | 412,101 | 417,453 | 419,923 | 420,953 | 420,953 |
| Milligan Water System | 145,017 | | | 145,017 | 146,901 | 147,770 | 148,132 | 148,132 |
| Niceville, City of | 2,615,405 | | | 2,751,965 | 2,862,249 | 2,949,450 | 3,026,392 | 3,091,793 |
| OCW&S - Bluewater | 1,272,485 | | | 1,338,926 | 1,392,583 | 1,435,009 | 1,472,444 | 1,504,264 |
| OCW&S - Main Area | 6,388,882 | | | 6,722,468 | 6,991,868 | 7,204,882 | 7,392,836 | 7,552,596 |
| *SWUC (Okaloosa County portion)* | - | | | - | - | - | - | - |
| Valparaiso, City of | 474,608 | | | 482,634 | 495,439 | 504,452 | 511,650 | 516,302 |
| **Okaloosa County TOTALS (gpd)** | **20,732,750** | | | **22,242,648** | **23,075,443** | **23,735,003** | **24,318,914** | **24,815,302** |

Imports are received by Destin Water Users, and SWUC (Okaloosa County Portion).

**Table A4.3. Region II Public Supply Utility Data - Estimates and Projections, Demand and Production (Continued)**

| SANTA ROSA COUNTY | 2020 Baseline Estimates | | | Gross Water DEMAND Projections (ADR, gpd) | | | | |
|---|---|---|---|---|---|---|---|---|
| **Public Supply Utility or Service Area** | **Gross Water Use (ADR, gpd)** | **Populations Served** | **Gross Per Capita (gpcd)** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Bagdad-Garcon Point Water System | 725,170 | 5,945 | 122 | 753,630 | 791,967 | 821,806 | 847,472 | 867,702 |
| Berrydale Water System | 281,118 | 2,630 | 107 | 292,151 | 307,012 | 318,579 | 328,529 | 336,372 |
| Chumuckla Water System | 369,093 | 4,150 | 89 | 403,367 | 431,551 | 455,337 | 477,125 | 496,714 |
| East Milton Water System | 1,810,463 | 13,020 | 139 | 1,978,584 | 2,116,830 | 2,233,505 | 2,340,376 | 2,436,462 |
| ***Fairpoint Regional Utility System (FRUS)*** | | - | - | | | | | |
| Gulf Breeze Water Department (Service Area) | 1,043,800 | 6,613 | 158 | 1,059,457 | 1,075,348 | 1,091,479 | 1,107,851 | 1,124,469 |
| Holley-Navarre Water System, Inc. | 3,212,440 | 47,404 | 68 | 3,510,750 | 3,756,050 | 3,963,076 | 4,152,705 | 4,323,198 |
| Jay, Town of | 152,770 | 1,115 | 137 | 158,766 | 166,842 | 173,128 | 178,535 | 182,797 |
| Midway Water System | 1,618,843 | 17,485 | 93 | 1,682,377 | 1,767,959 | 1,834,569 | 1,891,865 | 1,937,027 |
| Milton, City of | 1,857,515 | 18,520 | 100 | 2,030,005 | 2,171,844 | 2,291,552 | 2,401,200 | 2,499,783 |
| Moore Creek-Mt. Carmel Utilities, Inc. | 321,375 | 3,096 | 104 | 351,218 | 375,758 | 396,469 | 415,439 | 432,495 |
| Pace Water System, Inc. | 4,633,526 | 40,366 | 115 | 5,179,227 | 5,590,583 | 5,954,008 | 6,295,853 | 6,615,587 |
| Point Baker Water System, Inc. | 892,726 | 9,400 | 95 | 975,625 | 1,043,793 | 1,101,325 | 1,154,022 | 1,201,402 |
| Navarre Beach - Santa Rosa BOCC | 417,126 | 5,904 | 71 | 455,861 | 487,712 | 514,594 | 539,217 | 561,355 |
| South Santa Rosa Utilities (Service Area) | 1,055,530 | 4,209 | 251 | 1,206,137 | 1,313,456 | 1,411,827 | 1,506,391 | 1,597,549 |
| **Santa Rosa County TOTALS (gpd)** | **18,391,495** | **179,857** | | **20,037,154** | **21,396,706** | **22,561,255** | **23,636,581** | **24,612,910** |

**Table A4.3. Region II Public Supply Utility Data - Estimates and Projections, Demand and Production (Continued)**

| Santa Rosa County PRODUCTION | | | | Water PRODUCTION Projections (ADR, gpd) | | | | |
|---|---|---|---|---|---|---|---|---|
| **Public Supply Utility or Service Area** | **Production (ADR, gpd)** | | | **2025** | **2030** | **2035** | **2040** | **2045** |
| Bagdad-Garcon Point Water System | 725,170 | | | 753,630 | 791,967 | 821,806 | 847,472 | 867,702 |
| Berrydale Water System | 281,118 | | | 292,151 | 307,012 | 318,579 | 328,529 | 336,372 |
| Chumuckla Water System | 369,093 | | | 403,367 | 431,551 | 455,337 | 477,125 | 496,714 |
| East Milton Water System | 1,810,463 | | | 1,978,584 | 2,116,830 | 2,233,505 | 2,340,376 | 2,436,462 |
| ***Fairpoint Regional Utility System (FRUS)*** | ***6,094,588*** | | | ***6,656,844*** | ***7,142,788*** | ***7,557,808*** | ***7,940,292*** | ***8,285,860*** |
| Gulf Breeze Water Department (Service Area) | - | | | - | - | - | - | - |
| Holley-Navarre Water System, Inc. | 605,320 | | | 605,320 | 605,320 | 605,320 | 605,320 | 605,320 |
| Jay, Town of | 152,770 | | | 158,766 | 166,842 | 173,128 | 178,535 | 182,797 |
| Midway Water System | 634,896 | | | 634,896 | 634,896 | 634,896 | 634,896 | 634,896 |
| Milton, City of | 1,857,515 | | | 2,030,005 | 2,171,844 | 2,291,552 | 2,401,200 | 2,499,783 |
| Moore Creek-Mt. Carmel Utilities, Inc. | 321,375 | | | 351,218 | 375,758 | 396,469 | 415,439 | 432,495 |
| Pace Water System, Inc. | 4,633,526 | | | 5,179,227 | 5,590,583 | 5,954,008 | 6,295,853 | 6,615,587 |
| Point Baker Water System, Inc. | 892,726 | | | 975,625 | 1,043,793 | 1,101,325 | 1,154,022 | 1,201,402 |
| Navarre Beach - Santa Rosa BOCC | **12,937** | | | 17,521 | 17,521 | 17,521 | 17,521 | 17,521 |
| South Santa Rosa Utilities (Service Area) | - | | | - | - | - | - | - |
| **Santa Rosa County TOTALS (gpd)** | **18,391,497** | | | **20,037,154** | **21,396,706** | **22,561,255** | **23,636,581** | **24,612,910** |

Imports are received by Gulf Breeze Water Department, Holley-Navarre Water Systems, Inc., Midway Water Systems, Navarre Beach, and South Santa Rosa Utilities.

Exports are from Fairpoint Regional Utility System, Gulf Breeze Water Department, and Midway Water System.

## Table A4.3. Region II Public Supply Utility Data - Estimates and Projections, Demand and Production (Continued)

| **WALTON COUNTY** | **2020 Baseline Estimates** | | | **Gross Water DEMAND Projections (ADR, gpd)** | | | | |
|---|---|---|---|---|---|---|---|---|
| **Public Supply Utility or Service Area** | **Gross Water Use (ADR)** | **Populations Served** | **Gross Per Capita (gpcd)** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Argyle Water System | 62,762 | 767 | 82 | 63,703 | 64,659 | 65,628 | 66,613 | 67,612 |
| DeFuniak Springs, City of | 1,223,802 | 12,243 | 100 | 1,406,838 | 1,564,064 | 1,696,722 | 1,816,279 | 1,930,923 |
| ***FCSWC / Regional Utilities*** | ***5,568,821*** | ***56,163*** | ***99*** | ***7,050,083*** | ***8,145,604*** | ***9,226,219*** | ***10,306,834*** | ***11,469,428*** |
| Freeport, City of | 1,003,310 | 9,827 | 102 | 1,153,369 | 1,282,267 | 1,391,025 | 1,489,041 | 1,583,030 |
| Freeport, City of, North Bay Water System | 134,964 | 2,145 | 63 | 155,150 | 172,489 | 187,119 | 200,304 | 212,947 |
| Inlet Beach Water System, Inc. | 245,609 | 2,615 | 94 | 282,344 | 313,898 | 340,522 | 364,516 | 387,524 |
| Mossy Head Water Works, Inc. | 293,745 | 3,682 | 80 | 337,679 | 375,417 | 407,259 | 435,956 | 463,473 |
| Paxton, City of | 163,290 | 1,515 | 108 | 165,739 | 168,225 | 170,748 | 173,310 | 175,909 |
| ***SWUC - Rockhill Inland Well Field*** | - | - | - | | | | | |
| *SWUC - Coastal Wells* | *2,978,251* | 17,589 | *169* | *3,510,377* | *3,940,982* | *4,322,383* | *4,677,374* | *5,030,700* |
| **Walton County TOTALS (gpd)** | **11,674,553** | **106,546** | | **14,125,282** | **16,027,604** | **17,807,625** | **19,530,227** | **21,321,545** |
| | | | | | | | | |
| **Walton County PRODUCTION** | | | | **Water PRODUCTION Projections (ADR, gpd)** | | | | |
| **Public Supply Utility or Service Area** | **Production (ADR, gpd)** | | | **2025** | **2030** | **2035** | **2040** | **2045** |
| Argyle Water System | 62,762 | | | 63,703 | 64,659 | 65,628 | 66,613 | 67,612 |
| DeFuniak Springs, City of | 1,223,802 | | | 1,406,838 | 1,564,064 | 1,696,722 | 1,816,279 | 1,930,923 |
| ***FCSWC / Regional Utilities*** | ***5,578,728*** | | | ***7,052,237*** | ***8,179,312*** | ***9,286,551*** | ***10,391,160*** | ***11,576,762*** |
| Freeport, City of | 1,003,310 | | | 1,153,369 | 1,282,267 | 1,391,025 | 1,489,041 | 1,583,030 |
| Freeport, City of, North Bay Water System | 134,964 | | | 155,150 | 172,489 | 187,119 | 200,304 | 212,947 |
| Inlet Beach Water System, Inc. | 235,702 | | | 280,190 | 280,190 | 280,190 | 280,190 | 280,190 |
| Mossy Head Water Works, Inc. | 293,745 | | | 337,679 | 375,417 | 407,259 | 435,956 | 463,473 |
| Paxton, City of | 163,290 | | | 165,739 | 168,225 | 170,748 | 173,310 | 175,909 |
| ***SWUC - Rockhill Inland Well Field*** | ***5,350,525*** | | | 5,672,210 | 6,367,637 | 6,966,924 | 7,521,767 | 8,049,901 |
| *SWUC - Coastal Wells* | *998,389* | | | *1,130,000* | *1,130,000* | *1,130,000* | *1,130,000* | *1,130,000* |
| **Walton County TOTALS (gpd)** | **15,045,217** | | | **17,417,115** | **19,584,259** | **21,582,167** | **23,504,620** | **25,470,746** |
| **REGION II TOTALS (gpd)** | **54,169,462** | **500,754** | | **59,696,917** | **64,056,407** | **67,878,424** | **71,460,115** | **74,898,958** |
| **REGION II mgd** | **54.169** | | | **59.697** | **64.056** | **67.878** | **71.460** | **74.899** |

Imports are received by Inlet Beach Water System, Inc., and SWUC – Coastal Wells.

Exports are from FCWC / Regional Utilities, SWUC – Rockhill Inland Well Field, and SWUC – Coastal Wells.

## Table A4.4. Region III Public Supply Utility Data - Estimates and Projections, Demand and Production

| REGION III | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **BAY COUNTY** | **2020 Baseline Estimates** | | | **Gross Water DEMAND Projections (ADR, gpd)** | | | | |
| **Public Supply Utility or Service Area** | **Gross Water Use (ADR)** | **Populations Served** | **Gross Per Capita (gpcd)** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Bay County BOCC (Public Supply ONLY) | 28,034,137 | 1,357 | | | | | | |
| *Bay County - Cedar Grove* | *568,087* | *3,401* | 167 | 602,581 | 628,964 | 648,181 | 663,490 | 676,193 |
| *Bay County - North Bay/Lake Merial* | *671,192* | *6,000* | 112 | 711,946 | 743,118 | 765,823 | 783,910 | 798,919 |
| Bay County - Bay Co. (excludes North Bay, Lk Merial, SE) | 1,087,394 | 9,370 | 116 | 1,153,419 | 1,203,921 | 1,240,705 | 1,270,008 | 1,294,324 |
| Bay County BOCC - Total Exports | (26,584,000) | - | - | | | | | |
| Callaway | 1,333,621 | 16,790 | 79 | 1,368,718 | 1,411,736 | 1,438,909 | 1,456,306 | 1,466,971 |
| Lynn Haven, City of | 2,265,975 | 19,586 | 116 | 2,489,311 | 2,640,515 | 2,764,298 | 2,868,758 | 2,962,865 |
| Mexico Beach | 191,016 | 2,488 | 77 | 202,614 | 211,486 | 217,947 | 223,095 | 227,366 |
| Panama City Water System | 6,184,858 | 40,998 | 151 | 6,560,396 | 6,847,635 | 7,056,859 | 7,223,528 | 7,361,829 |
| Panama City Beach | 14,664,273 | 60,951 | 241 | 15,554,673 | 16,235,715 | 16,731,783 | 17,126,956 | 17,454,865 |
| Parker | 327,505 | 3,694 | 89 | **327,505** | **333,752** | **336,403** | **336,592** | **336,592** |
| Springfield | 1,044,121 | 7,793 | 134 | 1,044,121 | 1,064,038 | 1,072,487 | 1,073,091 | 1,073,091 |
| **Bay County TOTALS (gpd)** | **29,358,863** | | | **30,015,285** | **31,320,880** | **32,273,396** | **33,025,734** | **33,653,015** |
| | | | | | | | | |
| **Bay County PRODUCTION** | | | | **Water PRODUCTION Projections (ADR, gpd)** | | | | |
| **Moore Creek-Mt. Carmel Utilities, Inc.** | **Production (ADR, gpd)** | | | **2025** | **2030** | **2035** | **2040** | **2045** |
| *Bay County BOCC (Public Supply ONLY)* | *28,034,137* | | | 27,525,974 | 28,680,365 | 29,509,098 | 30,156,977 | 30,690,149 |
| *Bay County - Cedar Grove* | - | | | - | - | - | - | - |
| *Bay County - North Bay/Lake Merial* | - | | | - | - | - | - | - |
| Bay County - Bay Co. (excludes North Bay, Lk Merial, SE) | - | | | - | - | - | - | - |
| Bay County BOCC - Total Exports | | | | - | - | - | - | - |
| Callaway | - | | | - | - | - | - | - |
| Lynn Haven, City of | 1,753,932 | | | 2,489,311 | 2,640,515 | 2,764,298 | 2,868,758 | 2,962,865 |
| Mexico Beach | - | | | - | - | - | - | - |
| Panama City Water System | - | | | - | - | - | - | - |
| Panama City Beach | - | | | - | - | - | - | - |
| Parker | - | | | - | - | - | - | - |
| Springfield | - | | | - | - | - | - | - |
| **REGION III TOTALS (gpd)** | **29,358,863** | | | **30,015,285** | **31,320,880** | **32,273,396** | **33,025,734** | **33,653,015** |
| **REGION III mgd** | **29.359** | | | **30.015** | **31.321** | **32.273** | **33.026** | **33.653** |

Imports are received by Bay County - Cedar Grove, Bay County - North Bay/Lake Merial, Bay County - Bay Co. (excludes North Bay, Lk Merial, SE), Callaway, Mexico Beach, Panama City Water System, Panama City Beach, Parker, and Springfield.

Exports are from Bay County BOCC.

## Table A4.5. Region IV Public Supply Utility Data – Estimates and Projections, Demand and Production

| REGION IV | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **CALHOUN COUNTY** | **2020 Baseline Estimates** | | | **DEMAND and PRODUCTION Projections (ADR, gpd)** | | | | |
| **Public Supply Utility or Service Area** | **Gross Water Use (ADR, gpd)** | **Populations Served** | **Gross Per Capita (gpcd)** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Altha, Town of | 144,552 | 800 | 181 | 144,662 | 147,057 | 148,413 | 148,413 | 148,696 |
| Blountstown | 401,266 | 3,670 | 109 | 401,571 | 408,219 | 411,984 | 411,984 | 412,770 |
| **Calhoun County TOTALS (gpd)** | **545,818** | **3,722** | | **546,232** | **555,276** | **560,397** | **560,397** | **561,466** |
| | | | | | | | | |
| **Calhoun County PRODUCTION** | | | | **Water PRODUCTION Projections (ADR, gpd)** | | | | |
| **Public Supply Utility or Service Area** | **Production (ADR, gpd)** | | | **2025** | **2030** | **2035** | **2040** | **2045** |
| Altha, Town of | 144,552 | | | 144,662 | 147,057 | 148,413 | 148,413 | 148,696 |
| Blountstown | 645,553 | | | 645,571 | 658,219 | 661,984 | 661,984 | 662,770 |
| **Calhoun County TOTALS (gpd)** | **790,105** | | | **790,232** | **805,276** | **810,397** | **810,397** | **811,466** |

Exports are from Blountstown

## Table A4.5. Region IV Public Supply Utility Data – Estimates and Projections, Demand and Production (Continued)

| **HOLMES COUNTY** | **2020 Baseline Estimates** | | | **DEMAND and PRODUCTION Projections (ADR, gpd)** | | | | |
|---|---|---|---|---|---|---|---|---|
| **Public Supply Utility or Service Area** | **Gross Water Use (ADR)** | **Populations Served** | **Gross Per Capita (gpcd)** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Bonifay, City of | 987,551 | 4,148 | 238 | 992,439 | 992,439 | 997,376 | 997,376 | 1,002,314 |
| *Caryville, Town of (Holmes County portion)* | *36,474* | *271* | 135 | 36,474 | 36,474 | 36,474 | 36,474 | 36,474 |
| Esto Water Works | 52,591 | 395 | 133 | 52,591 | 52,591 | 52,591 | 52,591 | 52,591 |
| Joyce E. Snare Waterworks | 23,404 | 254 | 92 | 23,404 | 23,404 | 23,404 | 23,404 | 23,404 |
| Noma, Town of | 3,531 | 237 | 15 | 3,531 | 3,531 | 3,531 | 3,531 | 3,531 |
| Ponce de Leon, Town of | 79,160 | 850 | 93 | 79,160 | 79,160 | 79,160 | 79,160 | 79,160 |
| Westville, Town of | 39,480 | 334 | 118 | 39,480 | 39,480 | 39,480 | 39,480 | 39,480 |
| **Holmes County TOTALS (gpd)** | **1,222,190** | **6,489** | | **1,227,078** | **1,227,078** | **1,232,016** | **1,232,016** | **1,236,953** |

| **Holmes County PRODUCTION** | | | | **Water PRODUCTION Projections (ADR, gpd)** | | | | |
|---|---|---|---|---|---|---|---|---|
| **REGION I mgd** | **Production (ADR, gpd)** | | | **2025** | **2030** | **2035** | **2040** | **2045** |
| Bonifay, City of | 987,551 | | | 992,439 | 992,439 | 997,376 | 997,376 | 1,002,314 |
| *Caryville, Town of (Holmes County portion)* | - | | | - | - | - | - | - |
| Esto Water Works | 52,591 | | | 52,591 | 52,591 | 52,591 | 52,591 | 52,591 |
| Joyce E. Snare Waterworks | 23,404 | | | 23,404 | 23,404 | 23,404 | 23,404 | 23,404 |
| Noma, Town of | 3,531 | | | 3,531 | 3,531 | 3,531 | 3,531 | 3,531 |
| Ponce de Leon, Town of | 79,160 | | | 79,160 | 79,160 | 79,160 | 79,160 | 79,160 |
| Westville, Town of | 39,480 | | | 39,480 | 39,480 | 39,480 | 39,480 | 39,480 |
| **Holmes County TOTALS (gpd)** | **1,185,716** | | | 1,190,605 | 1,190,605 | 1,195,542 | 1,195,542 | 1,200,480 |

Imports are received by the Town of Caryville

**Table A4.5. Region IV Public Supply Utility Data – Estimates and Projections, Demand and Production (Continued)**

| JACKSON COUNTY | 2020 Baseline Estimates | | | DEMAND and PRODUCTION Projections (ADR, gpd) | | | | |
|---|---|---|---|---|---|---|---|---|
| Public Supply Utility or Service Area | Gross Water Use (ADR, gpd) | Populations Served | Gross Per Capita (gpcd) | 2025 | 2030 | 2035 | 2040 | 2045 |
| Alford, Town of | 59,759 | 588 | 102 | 59,759 | 59,759 | 59,759 | 59,759 | 59,759 |
| Campbellton, Town of | 16,479 | 281 | 59 | 16,479 | 16,479 | 16,479 | 16,479 | 16,479 |
| Cottondale, City of | 149,617 | 1,081 | 138 | 151,265 | 152,549 | 153,191 | 153,513 | 153,834 |
| Graceville, City of | 329,178 | 2,238 | 147 | 329,178 | 329,178 | 329,178 | 329,178 | 329,178 |
| Grand Ridge, Town of | 114,797 | 907 | 127 | 114,797 | 114,797 | 114,797 | 114,797 | 114,797 |
| Greenwood, Town of | 55,638 | 659 | 84 | 55,638 | 55,638 | 55,638 | 55,638 | 55,638 |
| Jackson Utilities, Plant 1, JCBOCC | 281,764 | 3,678 | 77 | 284,867 | 287,286 | 288,496 | 289,100 | 289,705 |
| Jacob, City of | 18,718 | 318 | 59 | 18,718 | 18,718 | 18,718 | 18,718 | 18,718 |
| Malone, Town of | 63,713 | 2,070 | 31 | 64,415 | 64,962 | 65,235 | 65,372 | 65,509 |
| Marianna, City of | 1,294,789 | 7,095 | 183 | 1,354,905 | 1,386,197 | 1,410,319 | 1,427,497 | 1,443,239 |
| Sneads, Town of | 228,630 | 1,810 | 126 | 228,630 | 228,630 | 228,630 | 228,630 | 228,630 |
| **Jackson County TOTALS (gpd)** | **2,613,083** | **20,836** | | **2,678,651** | **2,714,194** | **2,740,441** | **2,758,682** | **2,775,487** |

| LIBERTY COUNTY | 2020 Baseline Estimates | | | DEMAND and PRODUCTION Projections (ADR, gpd) | | | | |
|---|---|---|---|---|---|---|---|---|
| Public Supply Utility or Service Area | Gross Water Use (ADR, gpd) | Populations Served | Gross Per Capita (gpcd) | 2025 | 2030 | 2035 | 2040 | 2045 |
| Bristol, City of | 228,649 | 1,954 | 117 | 234,649 | 242,648 | 245,315 | 250,648 | 253,314 |
| Liberty Co. BOCC, Estiffanulga | 26,455 | 281 | 94 | 26,455 | 26,906 | 26,906 | 26,906 | 26,906 |
| Liberty Co. BOCC, Hosford-Telogia | 123,220 | 1,439 | 86 | 126,453 | 130,764 | 132,201 | 135,075 | 136,512 |
| Liberty Co. BOCC, Lake Mystic | 45,512 | 314 | 145 | 45,512 | 46,288 | 46,288 | 46,288 | 46,288 |
| Liberty Co. BOCC, Rock Bluff | 34,126 | 166 | 206 | 34,126 | 34,126 | 34,126 | 34,126 | 34,126 |
| Liberty Co. BOCC, Sumatra Water System | 15,682 | 163 | 96 | 15,682 | 15,682 | 15,682 | 15,682 | 15,682 |
| Talquin Electric - Sweetwater System | 7,991 | 65 | 123 | 7,991 | 7,991 | 7,991 | 7,991 | 7,991 |
| **Liberty County TOTALS (gpd)** | **481,636** | **4,246** | | **490,869** | **504,406** | **508,509** | **516,716** | **520,820** |

**Table A4.5. Region IV Public Supply Utility Data – Estimates and Projections, Demand and Production (Continued)**

| WASHINGTON COUNTY | 2020 Baseline Estimates | | | DEMAND and PRODUCTION Projections (ADR, gpd) | | | | |
|---|---|---|---|---|---|---|---|---|
| **Public Water Supply Utility or Service Area** | **Gross Water Use (ADR)** | **Populations Served** | **Gross Per Capita (gpcd)** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Sunny Hills (formerly Aqua Utilities) | 110,979 | 1,413 | 79 | 114,773 | 117,401 | 119,592 | 121,344 | 123,096 |
| *Caryville, Town of* | *85,105* | *421* | *202* | *85,105* | *85,726* | *85,988* | *85,988* | *85,988* |
| Chipley, City of | 660,605 | 3,885 | 170 | 683,187 | 698,833 | 711,871 | 722,301 | 732,731 |
| Vernon, City of | 88,622 | 734 | 121 | 88,622 | 89,269 | 89,541 | 89,541 | 89,541 |
| Wausau, Town of | 67,942 | 488 | 139 | 67,942 | 68,439 | 68,647 | 68,647 | 68,647 |
| **Washington County TOTALS (gpd)** | **1,013,254** | **6,941** | | **1,039,629** | **1,059,668** | **1,075,639** | **1,087,821** | **1,100,004** |
| | | | | | | | | |
| **Washington County PRODUCTION** | | | | **Water PRODUCTION Projections (ADR, gpd)** | | | | |
| **Public Water Supply Utility or Service Area** | **Production (ADR, gpd)** | | | **2025** | **2030** | **2035** | **2040** | **2045** |
| Sunny Hills (formerly Aqua Utilities) | 110,979 | | | 114,773 | 117,401 | 119,592 | 121,344 | 123,096 |
| *Caryville, Town of* | *121,578* | | | *121,578* | *122,200* | *122,461* | *122,461* | *122,461* |
| Chipley, City of | 660,605 | | | 683,187 | 698,833 | 711,871 | 722,301 | 732,731 |
| Vernon, City of | 88,622 | | | 88,622 | 89,269 | 89,541 | 89,541 | 89,541 |
| Wausau, Town of | 67,942 | | | 67,942 | 68,439 | 68,647 | 68,647 | 68,647 |
| **Washington County TOTALS (gpd)** | **1,049,727** | | | **1,076,103** | **1,096,141** | **1,112,112** | **1,124,295** | **1,136,478** |
| **REGION IV TOTALS (gpd)** | **5,875,981** | **42,234** | | **5,982,459** | **6,060,621** | **6,117,002** | **6,155,632** | **6,194,729** |
| **REGION IV mgd** | **5.876** | | | **5.982** | **6.061** | **6.117** | **6.156** | **6.195** |

Exports are from the Town of Caryville.

**Table A4.6. Region V Public Supply Utility Data – Estimates and Projections, Demand and Production**

| REGION V | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **FRANKLIN COUNTY** | **2020 Baseline Estimates** | | | **DEMAND and PRODUCTION Projections (ADR, gpd)** | | | | |
| **Public Supply Utility or Service Area** | **Gross Water Use (ADR)** | **Populations Served** | **Gross Per Capita (gpcd)** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Alligator Point Water Resources District | 100,991 | 671 | 151 | 105,554 | 108,959 | 111,513 | 113,215 | 114,918 |
| Apalachicola, City of | 543,479 | 3,754 | 145 | 568,033 | 586,356 | 600,099 | 609,261 | 618,423 |
| Carrabelle, City of | 326,080 | 3,028 | 108 | 326,080 | 329,884 | 330,778 | 330,778 | 330,778 |
| - Carrabelle, City of (Lanark Village) | 91,736 | 1,625 | 56 | 91,736 | 92,806 | 93,058 | 93,058 | 93,058 |
| Eastpoint Water and Sewer District | 250,382 | 2,365 | 106 | 250,382 | 253,303 | 253,989 | 253,989 | 253,989 |
| St. James Island (Summercamp, FRWA) | 7,490 | 56 | 133 | 7,490 | 7,578 | 7,598 | 7,598 | 7,598 |
| Water Management (St. George Island) | 565,403 | 4,250 | 133 | 590,947 | 610,010 | 624,307 | 633,838 | 643,370 |
| **Franklin County TOTALS (gpd)** | **1,902,616** | **15,749** | | **1,940,222** | **1,988,896** | **2,021,341** | **2,041,737** | **2,062,133** |
| | | | | | | | | |
| **GULF COUNTY** | **2020 Baseline Estimates** | | | **DEMAND and PRODUCTION Projections (ADR, gpd)** | | | | |
| **Public Supply Utility or Service Area** | **Gross Water Use (ADR, gpd)** | **Populations Served** | **Gross Per Capita (gpcd)** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Gulf County Water System | 411,877 | 3,804 | 108 | 448,969 | 472,388 | 492,845 | 510,350 | 526,183 |
| Port St. Joe, City of | 903,333 | 8,758 | 103 | 991,242 | 1,042,947 | 1,088,112 | 1,126,760 | 1,161,717 |
| Wewahitchka, City of | 130,008 | 1,971 | 66 | 135,977 | 140,392 | 143,924 | 146,573 | 148,339 |
| **Gulf County TOTALS (gpd)** | **1,980,432** | **14,533** | | **1,576,189** | **1,655,728** | **1,724,881** | **1,783,683** | **1,836,238** |
| **REGION V TOTALS (gpd)** | **3,883,048** | **30,281** | | **3,516,411** | **3,644,623** | **3,746,222** | **3,825,420** | **3,898,371** |
| **REGION V mgd** | **3.883** | | | **3.516** | **3.645** | **3.746** | **3.825** | **3.898** |

City of Carrabelle transfers water to Lanark Village.

**Table A4.7. Region VI Public Supply Utility Data – Estimates and Projections, Demand and Production**

| REGION VI | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **GADSDEN COUNTY** | **2020 Baseline Estimates** | | | **DEMAND and PRODUCTION Projections (ADR, gpd)** | | | | |
| **Public Supply Utility or Service Area** | **Gross Water Use (ADR, gpd)** | **Populations Served** | **Gross Per Capita (gpcd)** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Chattahoochee, City of | 502,570 | 3,090 | 163 | 508,811 | 513,159 | 515,334 | 517,508 | 517,508 |
| - Rosedale Water Association | | - | - | | | | | |
| Greensboro, Town of | 58,214 | 640 | 91 | 58,937 | 59,441 | 59,693 | 59,944 | 59,944 |
| Gretna, City of | 362,087 | 1,489 | 243 | 362,087 | 362,087 | 362,087 | 362,087 | 362,087 |
| Havana, Town of | 462,411 | 3,240 | 143 | 484,658 | 495,920 | 504,600 | 511,313 | 516,911 |
| Quincy, City of | 1,287,939 | 10,005 | 129 | 1,303,932 | 1,315,077 | 1,320,649 | 1,326,221 | 1,326,221 |
| Talquin Electric - Gadsden County Regional | 1,693,387 | 12,792 | 132 | 1,714,414 | 1,729,067 | 1,736,394 | 1,743,720 | 1,743,720 |
| Talquin Electric - Hammock Creek | 5,250 | 40 | 131 | 5,250 | 5,250 | 5,250 | 5,250 | 5,250 |
| Talquin Electric - Jamieson Water | 13,125 | 107 | 123 | 13,288 | 13,402 | 13,458 | 13,515 | 13,515 |
| Talquin Electric - St. James | 10,119 | 175 | 58 | 10,245 | 10,332 | 10,376 | 10,420 | 10,420 |
| **Gadsden County and REGION VI TOTALS (gpd)** | **4,395,103** | **31,578** | | **4,461,622** | **4,503,735** | **4,527,841** | **4,549,979** | **4,555,578** |
| **mgd** | **4.395** | | | **4.462** | **4.504** | **4.528** | **4.550** | **4.556** |

The City of Quincy transfers some water to the City of Gretna.

**Table A4.8. Region VII Public Supply Utility Data – Estimates and Projections, Demand and Production**

| **REGION VII** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **JEFFERSON COUNTY** | **2020 Baseline Estimates** | | | **DEMAND and PRODUCTION Projections (ADR, gpd)** | | | | |
| **Public Supply Utility or Service Area** | **Gross Water Use (ADR)** | **Populations Served** | **Gross Per Capita (gpcd)** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Jefferson Communities Water System, Inc. | 189,967 | 1,770 | 107 | 200,604 | 205,735 | 210,799 | 216,513 | 221,468 |
| Monticello, City of | 365,696 | 3,990 | 92 | 386,173 | 396,050 | 405,798 | 416,798 | 426,337 |
| **Jefferson County TOTALS (gpd)** | **579,820** | **5,760** | | **586,778** | **601,785** | **616,597** | **633,311** | **647,805** |
| | | | | | | | | |
| **LEON COUNTY** | **2020 Baseline Estimates** | | | **Gross Water DEMAND Projections (ADR, gpd)** | | | | |
| **Public Supply Utility or Service Area** | **Gross Water Use (ADR)** | **Populations Served** | **Gross Per Capita (gpcd)** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Seminole Waterworks, Brewster Estates | 22,862 | 403 | 57 | 22,862 | 23,019 | 23,027 | 23,027 | 23,027 |
| Seminole Waterworks, Bucklake Estates | 12,985 | 147 | 88 | 12,985 | 13,074 | 13,079 | 13,079 | 13,079 |
| Seminole Waterworks, Meadow Hills Subdivisio | 30,512 | 246 | 124 | 30,512 | 30,721 | 30,732 | 30,732 | 30,732 |
| Seminole Waterworks, North Lake Meadows | 15,289 | 191 | 80 | 15,289 | 15,394 | 15,399 | 15,399 | 15,399 |
| Seminole Waterworks, Plantation Estates | 22,977 | 366 | 63 | 22,977 | 23,135 | 23,143 | 23,143 | 23,143 |
| Seminole Waterworks, Sedgefield | 21,593 | 248 | 87 | 21,593 | 21,741 | 21,749 | 21,749 | 21,749 |
| **Tallahassee, City of** | 26,798,605 | 227,849 | 115 | 27,423,165 | 28,362,736 | 29,100,343 | 29,723,796 | 30,259,439 |
| Talquin Electric - Bradfordville Regional | 1,530,158 | 11,595 | 132 | 1,595,639 | 1,650,308 | 1,693,226 | 1,729,503 | 1,760,669 |
| Talquin Electric - Lake Jackson Regional | 1,095,031 | 10,496 | 104 | 1,141,891 | 1,181,014 | 1,211,728 | 1,237,688 | 1,259,992 |
| Talquin Electric - Leon County East Regional | 304,662 | 1,990 | 153 | 317,700 | 328,585 | 337,130 | 344,353 | 350,559 |
| Talquin Electric - Leon County West Regional | 291,141 | 2,234 | 130 | 303,600 | 314,002 | 322,168 | 329,070 | 335,000 |
| Talquin Electric - Meadows Regional | 481,897 | 4,053 | 119 | 502,519 | 519,737 | 533,253 | 544,678 | 554,493 |
| Annawood System, TEC | - | 106 | 0 | - | - | - | - | - |
| TEC, Leon County South Regional Water System | 24,089 | 729 | 33 | 24,275 | 24,774 | 25,101 | 25,318 | 25,443 |
| Meridian Hills Water System, TEC | 40,612 | 228 | 178 | 40,612 | 40,891 | 40,905 | 40,905 | 40,905 |
| Stonegate Water System, TEC | 13,407 | 159 | 84 | 13,407 | 13,499 | 13,504 | 13,504 | 13,504 |
| **Leon County TOTALS (gpd)** | **30,810,254** | **262,123** | | **31,489,026** | **32,562,631** | **33,404,485** | **34,115,942** | **34,727,131** |

**Table A4.8. Region VII Public Supply Utility Data – Estimates and Projections, Demand and Production (Continued)**

| **Leon County PRODUCTION** | | | | **Water PRODUCTION Pumpage (ADR, gpd)** | | | | |
|---|---|---|---|---|---|---|---|---|
| **Public Supply Utility or Service Area** | **Production (ADR, gpd)** | | | **2025** | **2030** | **2035** | **2040** | **2045** |
| Seminole Waterworks, Brewster Estates | 22,862 | | | 22,862 | 23,019 | 23,027 | 23,027 | 23,027 |
| *Seminole Waterworks, Bucklake Estates* | *12,985* | | | *12,985* | *13,074* | *13,079* | *13,079* | *13,079* |
| *Seminole Waterworks, Meadow Hills Subdivision* | *30,512* | | | *30,512* | *30,721* | *30,732* | *30,732* | *30,732* |
| *Seminole Waterworks, North Lake Meadows* | *15,289* | | | *15,289* | *15,394* | *15,399* | *15,399* | *15,399* |
| *Seminole Waterworks, Plantation Estates* | *22,977* | | | *22,977* | *23,135* | *23,143* | *23,143* | *23,143* |
| *Seminole Waterworks, Sedgefield* | *21,593* | | | *21,593* | *21,741* | *21,749* | *21,749* | *21,749* |
| ***Tallahassee, City of*** | *26,297,788* | | | *27,968,832* | *28,943,514* | *29,712,656* | *30,361,069* | *30,919,825* |
| *Talquin Electric - Bradfordville Regional* | *1,530,158* | | | *1,595,639* | *1,650,308* | *1,693,226* | *1,729,503* | *1,760,669* |
| *Talquin Electric - Lake Jackson Regional* | *1,095,031* | | | *1,141,891* | *1,181,014* | *1,211,728* | *1,237,688* | *1,259,992* |
| *Talquin Electric - Leon County East Regional* | *304,662* | | | *317,700* | *328,585* | *337,130* | *344,353* | *350,559* |
| *Talquin Electric - Leon County West Regional* | *291,141* | | | *303,600* | *314,002* | *322,168* | *329,070* | *335,000* |
| *Talquin Electric - Meadows Regional* | *481,897* | | | *502,519* | *519,737* | *533,253* | *544,678* | *554,493* |
| *Annawood System, TEC* | - | | | - | - | - | - | - |
| *TEC, Leon County South Regional Water System* | *24,089* | | | *24,275* | *24,774* | *25,101* | *25,318* | *25,443* |
| Meridian Hills Water System, TEC | 40,612 | | | 40,612 | 40,891 | 40,905 | 40,905 | 40,905 |
| Stonegate Water System, TEC | 13,407 | | | 13,407 | 13,499 | 13,504 | 13,504 | 13,504 |
| **Leon County TOTALS (gpd)** | 30,309,437 | | | **32,034,692** | **33,143,409** | **34,016,798** | **34,753,215** | **35,387,517** |

Exports are from the City of Tallahassee.

**Table A4.8. Region VII Public Supply Utility Data – Estimates and Projections, Demand and Production (Continued)**

| WAKULLA COUNTY | 2020 Baseline Estimates | | | DEMAND and PRODUCTION Projections (ADR, gpd) | | | | |
|---|---|---|---|---|---|---|---|---|
| **Public Supply Utility or Service Area** | **Gross Water Use (ADR)** | **Populations Served** | **Gross Per Capita (gpcd)** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Panacea Area Water System, Inc. | 221,764 | 2,556 | 87 | 237,551 | 250,603 | 261,697 | 270,181 | 278,013 |
| Sopchoppy, Town of | 1,013,855 | 10,738 | 94 | 1,086,029 | 1,145,700 | 1,196,422 | 1,235,208 | 1,271,011 |
| St. Marks, City of, Water Sys. | 140,221 | 722 | 194 | 144,013 | 149,694 | 154,102 | 156,822 | 158,870 |
| ***Tallahassee, City of (Wakulla portion)*** | *360,596* | *3,019* | 119 | 401,653 | 431,084 | 458,211 | 480,451 | 501,516 |
| Talquin Electric Coop/Wakulla Regional | 1,160,785 | 9,475 | 123 | 1,243,417 | 1,311,737 | 1,369,809 | 1,414,216 | 1,455,208 |
| Wakulla County, River Sink Subdivision | 36,919 | 276 | 134 | 36,919 | 37,803 | 38,356 | 38,467 | 38,467 |
| **Wakulla County TOTALS (gpd)** | **2,934,140** | **26,786** | | **3,149,582** | **3,326,622** | **3,478,597** | **3,595,346** | **3,703,085** |
| | | | | | | | | |
| **Wakulla County PRODUCTION** | | | | **Water PRODUCTION Pumpage (ADR, gpd)** | | | | |
| **Public Supply Utility or Service Area** | **Production (ADR, gpd)** | | | **2025** | **2030** | **2035** | **2040** | **2045** |
| Panacea Area Water System, Inc. | 221,764 | | | 237,551 | 250,603 | 261,697 | 270,181 | 278,013 |
| Sopchoppy, Town of | 1,013,855 | | | 1,086,029 | 1,145,700 | 1,196,422 | 1,235,208 | 1,271,011 |
| St. Marks, City of, Water Sys. | - | | | - | - | - | - | - |
| ***Tallahassee, City of (Wakulla portion)*** | - | | | - | - | - | - | - |
| Talquin Electric Coop/Wakulla Regional | 1,160,785 | | | 1,243,417 | 1,311,737 | 1,369,809 | 1,414,216 | 1,455,208 |
| Wakulla County, River Sink Subdivision | 36,919 | | | 36,919 | 37,803 | 38,356 | 38,467 | 38,467 |
| **Wakulla County TOTALS (gpd)** | **2,433,323** | | | 2,603,916 | 2,745,844 | 2,866,284 | 2,958,073 | 3,042,699 |
| **REGION VII TOTALS (gpd)** | **34,324,214** | **294,669** | | **35,225,386** | **36,491,038** | **37,499,679** | **38,344,598** | **39,078,021** |
| **REVION VII mgd** | **34.324** | | | **35.225** | **36.491** | **37.500** | **38.345** | **39.078** |

Imports are received by the City of Saint Marks Water System, and the City of Tallahassee (Wakulla County portion).

## Table A4.9. Public Supply Utilities – Estimated Growth Rates

| REGION and County<br>Public Water Supply Utility or Water System | BEBR Growth Projection Rate | Growth Characteristics of Population, Water Use, Meter Connection (MC), City/County Share |
|---|---|---|
| **REGION I: ESCAMBIA COUNTY** | | |
| **ESCAMBIA grew rapidly 1950-2005 but 2005-10 saw a decline and recent growth was just over 3% 2010-15; with Walton, Santa Rosa and many others expected to grow much faster. Leon is expected to surpass Escambia to be the largest county around 2030. Escambia had the highest population density in the District and was ranked 15th in the state in 2015. Escambia is estimated to have a seasonal population rate of 3.2%.** | | |
| Central Water Works, Inc. | **Medium-High** | Utility reports unusually high growth since 2020. LM to Medium after outreach survey returned. |
| Century, Town of | **Low-Medium** | Town population and MCs in decline. |
| Cottage Hill Water Works, Inc. | **Medium** | Utility water use in decline since 2005 while pop increased from 2015-2020. |
| Emerald Coast Utilities Authority (ECUA) | **Medium** | Utility in general concurrence with medium projections. Seasonal populations on Pensacola Beach and Perdido Key barrier islands. |
| Farm Hill Utilities, Inc. | **High** | Rapid growth until 2010 then remained constant; number of MCs up through 2020. |
| Gonzalez Utilities Association, Inc. | **Medium-High** | Utility water use declined since 2010 while number of MCs increased 2.2% from 2010-15. |
| Molino Utilities, Inc. | **Medium-High** | Utility water use and MCs increased through 2020. |
| People's Water Service Company | **Medium** | Utility water use and MCs increased through 2020. |
| Walnut Hill/Bratt-Davisville (EREC) | **Medium** | Utility water use and MCs declined through 2020. |
| **REGION II: SANTA ROSA, OKALOOKA AND WALTON COUNTIES** | | |
| **SANTA ROSA has been on a steady growth trajectory, grew by 7.63% 2010-15, and growth is projected to continue through 2045 at an average growth rate of over 6% - second in the District only to Walton County. In 2015 three-fourths of Santa Rosa's growth was attributed to net migration versus natural occurances, and population density was about one-third of Escambia's. Santa Rosa is estimated to have a seasonal population rate of 2%.** | | |
| Bagdad-Garcon Point Water System | **Low-Medium** | Utility water use and MCs increased through 2020. |
| Berrydale Water System | **Low-Medium** | Utility water use increasing trend 1990-2015, and increase of 0.2% in MCs from 2010-15. |
| Chumuckla Water System | **Medium** | Utility water use increasing while number of MCs decreased through 2020. |
| East Milton Water System | **Medium** | Utility water use and MCs increased through 2020. |
| Fairpoint Regional Utility System (FRUS) | **NA** | *WHOLESALE PRODUCTION - Gulf Breeze, So. Santa Rosa, Holley-Navarre, Midway, Navarre Beach.* |
| Gulf Breeze Water Department (Service Area) | **Very Low (1.5%)** | Utility water use increased but number of MCs declined through 2020, survey reports nearing buildout. |
| Holley-Navarre Water System, Inc. | **Medium** | Utility water use and MCs increased through 2020. |
| Jay, Town of | **Low-Medium** | Utility water use and MCs slight increase through 2020. |
| Midway Water System | **Low-Medium** | Utility water use and MCs increased through 2020. |
| Milton, City of | **Medium** | Utility water use increasing while number of MCs decreased through 2020. |
| Moore Creek-Mt. Carmel Utilities, Inc. | **Medium** | Utility water use has been in decline since 2005, with 2015 water use less than 1990. |
| Pace Water System, Inc. | **Medium-High** | Utility water use grew 81% from 1990-2005, tapered off, then rose again in 2015 to 2005 level. Large increases in water use and MCs through 2020. |
| Point Baker Water System, Inc. | **Medium** | Utility water use and MCs increased through 2020. |
| Navarre Beach - Santa Rosa BOCC | **Medium** | Utility water use and MCs slight increase through 2020. |
| South Santa Rosa Utilities (Service Area) | **Medium-High** | Utility water use and MCs slight increase through 2020. |
| **OKALOOSA grew rapidly from 1950-2005, experienced a dip, and since then has continued to grow albeit at a slower rate which was just over 6% from 2010-15. Population density of Okaloosa was greater than Santa Rosa but less than half that of Escambia in 2015. The City of Crestview has been one of the most rapidly growing urban areas in the District. Okaloosa is estimated to have a seasonal population rate of 11%.** | | |
| Auburn Water System | **Medium** | Increasing trends in utility water use and number of MCs. |
| Baker Water System | **Medium** | Utility water use and MCs increased through 2020. |
| Blackman Community Water System, Inc. | **Low** | Utility water use increasing 2012-14 then dropped in 2015 to near 2012 levels. |
| Crestview, City of | **Medium-High** | Utility water use increased 1990-2010 and number of MCs increased 24.5% from 2010-15. City has had double-digit growth and increasing city-county share since 1990. |
| Destin Water Users | **Medium-High** | Utility water use increased through 2020. Survey results similar to that projected by District. |
| Fort Walton Beach, City of | **Medium** | Number of MCs through 2020. City population increased 7% 2010-15 and city-county shrare increased 2010-15. |
| Holt Water Works, Inc. | **Medium** | Utility water use increased thhrough 2020. |
| Laurel Hill, City of | **Low** | Utility water use and MCs declined through 2020. |
| Mary Esther, City of | **Low** | Utility water use and town-county share in decline since 1995. |
| Milligan Water System | **Low** | Utility water use more or less steady through 2020. |
| Niceville, City of | **Medium** | Utility water use and MCs increased through 2020. |
| OCW&S - Bluewater (Raintree) | **Medium** | Utility water use and MCs increased through 2020. No suggestions from survey outreach. |
| OCW&S - Main (Garniers) Office Well Plant | **Medium** | Utility water use and MCs increased through 2020. No suggestions from survey outreach. |
| **SWUC (Okaloosa County portion)** | **Medium** | Utility water use and MCs increased through 2020. |
| Valparaiso, City of | **Low-Medium** | Utility water use steadily declining since 2000. City-county share has steadily declined 1995-2015. |

(1) Negative rates adjusted to zero



MC = Meter Connection

## Table A4.9. Public Supply Utilities – Estimated Growth Rates (Continued)

| REGION and County<br>Public Water Supply Utility or Water System | BEBR Growth Projection Rate | Growth Characteristics of Population, Water Use, Meter Connection (MC), City/County Share |
|---|---|---|
| **<u>WALTON</u> is expected to be the fastest growing county in the District through 2045. The growth rate 2010-15 was 10.25% and projected 5-year rates 2010-2045 are an average of 9.26%. In 2015 population density was about one-fourth that of Okaloosa and one-eighth Escambia's, and only about 12% of population increases were due to natural occurrences. Walton is estimated to have a seasonal population rate of 49%.** | | |
| Argyle Water System | **Very Low (1.5%)** | Utility water use in steady decline 2000-20. |
| DeFuniak Springs, City of | **Medium** | Utility water use has held more or less steady 2000-20. |
| FCSWC / Regional Utilities | **High** | Utility water use nearly doubled 1995-2000, more than tripled 1995-2005, and in 2015 was 5.5 times higher than 1995. Large increases in water use and MCs through 2020. |
| Freeport, City of | **Medium** | Utility water use and MCs slight increase through 2020. |
| Freeport, City of, North Bay Water System | **Medium** | Utility water use and MCs slight increase through 2020. |
| Inlet Beach Water System, Inc. | **Medium** | Utility water use and MCs large increase through 2020. |
| Mossy Head Water Works, Inc. | **Medium** | Utility water use and MCs slight increase through 2020. |
| Paxton, City of | **Very Low (1.5%)** | Utility water use in steady decline 2000-20. |
| **SWUC - Rockhill Inland Well Field** | **NA** | *Regional wholesale inland well field serving coastal communities.* |
| **SWUC - Coastal Wells** | **Medium-High** | Utility water use and MCs large increase through 2020. |
| **REGION III: BAY COUNTY** | | |
| **<u>BAY</u>. With multiple urbanized areas, Bay County has grown at an overall steady rate since 1950. The increase in population 2010-15 was 2.64% but higher rates are expected from 2015-25. In 2015 61% of population increases were from natural occurrences. Also in 2015 Bay had the third highest population density, but still less than half that of Escambia. Bay is estimated to have a seasonal population rate of 12%.** | | |
| Bay County BOCC (Public Supply ONLY) | | |
| - *Cedar Grove (separate BOCC service area)* | **Medium** | *Utility water use and MCs slight increase through 2020. County in agreement.* |
| - *GCEC (North Bay, Lake Merial)* | **Medium** | *Utility water use and MCs slight increase through 2020. County in agreement.* |
| - Bay Co. (excludes North Bay, Lk Merial, SE) | **Medium** | Utility water use and MCs slight increase through 2020. County in agreement. |
| Callaway | **Low-Medium** | Slight to negative growth in water use/MCs through 2020. |
| Lynn Haven, City of | **Medium-High** | Utility water use and MCs large increase through 2020. |
| Mexico Beach | **Medium** | Utility water use and MCs slight increase through 2020. |
| Panama City Water System | **Medium** | Utility water use and MCs slight increase through 2020. |
| Panama City Beach | **Medium** | Utility water use and MCs large increase through 2020. High city growth and increase in city-county share. |
| Parker | **Low** | Slight to negative growth in water use/MCs through 2020. |
| Springfield | **Low** | Slight to negative growth in water use/MCs through 2020. |
| **REGION IV: WASHINGTON, HOLMES, JACKSON, CALHOUN AND LIBERTY COUNTIES** | | |
| **<u>WASHINGTON.</u> The population of Washington increased by only 0.32% from 2010-15 but higher rates are expected over the planning horizon. All of the population change from 2010-15 is attributed to net migration. All municipal city-county shares have been in decline from 1990-2015. Washington is estimated to have a seasonal population rate of 3%.** | | |
| Sunny Hills (formerly Aqua Utilities) | **Medium** | Little change or decline through 2020. |
| Caryville, Town of | **Low-Medium** | Little change or decline through 2020. |
| Chipley, City of | **Medium** | Utility water use and MCs slight increase through 2020. |
| Vernon, City of | **Low-Medium** | Little change or decline through 2020. |
| Wausau, Town of | **Low-Medium** | Little change or decline through 2020. |
| **<u>HOLMES</u>. In 2015 80% of the Holmes County population resided in unincorporated areas. Holmes lost population 2010-15 and has the lowest projected growth rates District-wide through 2045. Holmes Low and Low-Medium growth rate scenarios are all negative. Holmes is estimated to have a seasonal population rate of 1%.** | | |
| Bonifay, City of | **Medium** | Utility water use and MCs slight increase through 2020. |
| Caryville, Town of (Holmes County portion) | **Low-Medium** | Utility water use generally declined 1990-2010, then increased through 2020. |
| Esto Water Works | **Low-Medium** | Utility water use and MCs slight increase through 2020. |
| Joyce E. Snare Waterworks | **Low-Medium** | Utility water use declined through 2020. |
| Noma, Town of | **Low-Medium** | Utility water use has fluctuated and reached a high in 2010, and declined through 2020. |
| Ponce de Leon, Town of | **Low-Medium** | Little change through 2020. |
| Westville, Town of | **Low-Medium** | Little change through 2020. |

[1]Negative rates adjusted to zero



MC = Meter Connection

## Table A4.9. Public Supply Utilities – Estimated Growth Rates (Continued)

| REGION and County<br>Public Water Supply Utility or Water System | BEBR Growth Projection Rate | Growth Characteristics of Population, Water Use, Meter Connection (MC), City/County Share |
|---|---|---|
| **JACKSON grew by 1.43% from 2010-15 and projected growth rates 2015-45 are more modest. At 55 people per square mile in 2015, population density was in line with Walton's (58) and Wakulla's (52), but less than one-fourth that of Bay County. Jackson is estimated to have a seasonal population rate of 3%.** | | |
| Alford, Town of | **Low-Medium** | Utility water use and MCs slight increase through 2020. |
| Campbellton, Town of | **Low-Medium** | Utility water use and MCs slight decrease through 2020. |
| Cottondale, City of | **Medium** | Little change through 2020. |
| Graceville, City of | **Low-Medium** | Little change through 2020. |
| Grand Ridge, Town of | **Low-Medium** | Utility water use and MCs slight increase through 2020. |
| Greenwood, Town of | **Low-Medium** | Little change through 2020. |
| Jackson Utilities, Plant 1, JCBOCC | **Medium** | Utility water use and MCs slight increase through 2020. |
| Jacob, City of | **Low-Medium** | Little change through 2020. |
| Malone, Town of | **Medium** | Utility water use and MCs slight decrease through 2020. |
| Marianna, City of | **Medium-High** | Utility water use and MCs increased through 2020. |
| Sneads, Town of | **Low-Medium** | Little change through 2020. |
| **CALHOUN lost population in the 2010-15 period and has a modest 5-year average growth rate of 1.57% through 2045. At 26 people per square mile, the population density is low and Calhoun was ranked 60th in the state in 2015. Calhoun is estimated to have a seasonal population rate of 3%.** | | |
| Altha, Town of | **Low-Medium** | Utility water use and MCs slight increase through 2020. |
| Blountstown | **Low-Medium** | Utility water use and MCs slight increase through 2020. |
| **LIBERTY. In 2015 89% of the Liberty County population resided in unincorporated areas, and Liberty also in 2015 had, at 10 persons per square mile, the lowest population density in not only the District but also the entire State of Florida. A large part of the county is in the Apalachicola National Forest. Liberty grew at nearly 4% from 2010-15 and 5-year growth rates are expected to average 4.52% from 2010-45. Liberty is estimated to have a seasonal population rate of 9%.** | | |
| Bristol, City of | **Medium** | Utility water use increased through 2020. |
| Liberty Co. BOCC, Estiffanulga | **Low-Medium** | Utility water use and MCs slight increase through 2020. |
| Liberty Co. BOCC, Hosford-Telogia | **Medium** | Utility water use and MCs slight increase through 2020. |
| Liberty Co. BOCC, Lake Mystic | **Low-Medium** | Utility water use and MCs slight increase through 2020. |
| Liberty Co. BOCC, Rock Bluff | **Zero-no growth** | Little change or decline through 2020. |
| Liberty Co. BOCC, Sumatra Water System | **Zero-no growth** | Little change or decline through 2020. |
| Talquin Electric - Sweetwater System | **Zero-no growth** | Little change or decline through 2020. |
| **REGION V: GULF AND FRANKLIN COUNTIES** | | |
| **GULF. In 2015 65% of the Gulf County population resided in unincorporated areas. The county grew 3.04% from 2010-15. The population density has increased from 26 persons per square mile in 2000, to 28 in 2010, and 29 in 2015. Gulf Low and Low-Medium growth rate projections are all negative. Gulf is estimated to have a seasonal population rate of 22%.** | | |
| Gulf County Water System | **Medium-High** | Slight change in water use though higher in MCs through 2020. |
| Port St. Joe, City of | **Medium-High** | Slight change in water use though higher in MCs through 2020. |
| Wewahitchka, City of | **Medium** | Little change or decline through 2020. |
| **FRANKLIN County grew by 2.52% from 2010-15. Population is concentrated in coastal communities. All of the population change from 2010-15 is attributed to net migration. Franklin is estimated to have a seasonal population rate of 39%.** | | |
| Alligator Point Water Resources District | **Medium** | Utility water use and MCs slight increase through 2020. |
| Apalachicola, City of | **Medium** | Little change through 2020. Slight increase based on returned survey. |
| Carrabelle, City of | **Low-Medium** | Little change for both systems. |
| - Carrabelle, City of (Lanark Village) | **Low-Medium** | Little change for both systems. |
| Eastpoint Water and Sewer District | **Low-Medium** | Water use and MCs in decline through 2020. |
| St. James Island (Summercamp, FRWA) | **Low-Medium** | Water use and MCs in decline through 2020. |
| Water Management (St. George Island) | **Medium** | Utility water use and MCs slight increase through 2020. |
| **REGION VI: GADSDEN COUNTY** | | |
| **GADSDEN grew by over 4% from 2010-15 but projected future 5-year growth rates are more modest, averaging 1.71% from 2015-45. At 94 people per square mile in 2015, Gadsden was ranked No. 39 in the state for population density, but was still less than half the density of Santa Rosa and one-fifth that of Escambia. Gadsden is estimated to have a seasonal population rate of 2.4%.** | | |
| Chattahoochee, City of | **Medium** | Slight change in water use through 2020. |
| - Rosedale Water Association | | |
| Greensboro, Town of | **Medium** | Water use slight increase through 2020. Number of MCs down through 2020. |
| Gretna, City of | **Low-Medium** | Utility water use decreased with slight increase in MCs through 2020. |
| Havana, Town of | **Medium-High** | Utility water use and MCs slight increase through 2020. |
| Quincy, City of | **Medium** | Utility water use and MCs slight increase through 2020. |
| Talquin Electric - Gadsden County Regional | **Medium** | Utility water use and MCs slight increase through 2020. |
| Talquin Electric - Hammock Creek | **Low-Medium** | Similar to TEC County Regional. |
| Talquin Electric - Jamieson Water | **Medium** | Similar to TEC County Regional. |
| Talquin Electric - St. James | **Medium** | Similar to TEC County Regional. |

(1)Negative rates adjusted to zero



MC = Meter Connection

## Table A4.9. Public Supply Utilities – Estimated Growth Rates (Continued)

| REGION and County<br>Public Water Supply Utility or Water System | BEBR Growth Projection Rate | Growth Characteristics of Population, Water Use, Meter Connection (MC), City/County Share |
|---|---|---|
| **REGION VII: LEON, WAKULLA AND JEFFERSON COUNTIES** | | |
| **LEON has grown rapidly since 1950, experienced a slowing trend 2005-10, and grew at 3.25% from 2010-15. Leon is expected to surpass Escambia and become the most populous county in the District around 2030. In 2015 Leon had the second-highest (after Escambia) population density and was ranked No. 17 in the state. About three-fourths of the population increases in 2015 were by natural occurrences. Leon is estimated to have a seasonal population rate of 0.5%.** | | |
| Seminole Waterworks, Brewster Estates | **Low** | Little change through 2020. Likely at full build-out of system area. |
| Seminole Waterworks, Bucklake Estates | **Low** | Little change through 2020. Likely at full build-out of system area. |
| Seminole Waterworks, Meadow Hills Subdivision | **Low** | Little change through 2020. Likely at full build-out of system area. |
| Seminole Waterworks, North Lake Meadows | **Low** | Little change through 2020. Likely at full build-out of system area. |
| Seminole Waterworks, Plantation Estates | **Low** | Little change through 2020. Likely at full build-out of system area. |
| Seminole Waterworks, Sedgefield | **Low** | Little change through 2020. Likely at full build-out of system area. |
| Tallahassee, City of | **Medium** | Increasing trends in utility water use and number of MCs. |
| Talquin Electric - Bradfordville Regional | **Medium** | Increasing trends in utility water use and number of MCs. |
| Talquin Electric - Lake Jackson Regional | **Medium** | Increasing trends in utility water use and number of MCs. |
| Talquin Electric - Leon County East Regional | **Medium** | Increasing trends in utility water use and number of MCs. |
| Talquin Electric - Leon County West Regional | **Medium** | Increasing trends in utility water use and number of MCs. |
| Talquin Electric - Meadows Regional | **Medium** | Increasing trends in utility water use and number of MCs. |
| Talquin Electric - Annawood System | **Low** | Little to no change through 2020. |
| Talquin Electric - Leon County South Regional Water System | **Low-Medium** | Little to no change through 2020. |
| Talquin Electric - Meridian Hills Water System | **Low** | Little to no change through 2020. |
| Talquin Electric - Stonegate Water System | **Low** | Little change through 2020. Likely at full build-out of system area. |
| **WAKULLA is projected to be the District's third fastest growing county over the planning horizon after Walton and Santa Rosa counties. Wakulla experienced more rapid population growth from 1995-2010, which then slowed from 2010-2015. The five-year growth from 2015-2020 is expected to be over 7 percent. A large part of the county is in the Apalachicola National Forest. Wakulla is estimated to have a seasonal population rate of 5%.** | | |
| Panacea Area Water System, Inc. | **Medium** | Utility water use and MCs slight increase through 2020. |
| Sopchoppy, City of | **Medium** | Increasing trends in utility water use and number of MCs. |
| St. Marks, City of, Water Sys. (COT Booster Plant) | **Low-Medium** | Utility water use and MCs slight increase through 2020. |
| Tallahassee, City of (Wakulla County portion) | **Medium-High** | Increasing trends in utility water use and number of MCs. |
| Talquin Electric - Wakulla Regional | **Medium** | Increasing trends in utility water use and number of MCs. |
| Wakulla County, River Sink Subdivision | **Low** | Little to no change through 2020. |
| **JEFFERSON lost population from 2010-15, and after Holmes, is projected to be the second-slowest growing county in the District from 2015-40. Jefferson Low and Low-Medium growth rate scenarios are all negative. Jefferson is estimated to have a seasonal population rate of 3.5%.** | | |
| Jefferson Communities Water System, Inc. | **Medium-High** | Little change through 2020. |
| Monticello, City of | **Medium-High** | Little change through 2020. |

(1)Negative rates adjusted to zero



MC = Meter Connection

**Table A4.10. Projected Five-Year Growth Rates by County**

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| **BAY** | | | | | |
| Low | -0.81% | 1.91% | 0.79% | 0.06% | -0.45% |
| *Low-Medium* | *2.63%* | *3.14%* | *1.92%* | *1.21%* | *0.73%* |
| Medium | 6.07% | 4.38% | 3.06% | 2.36% | 1.91% |
| *Medium-High* | *9.86%* | *6.07%* | *4.69%* | *3.78%* | *3.28%* |
| High | 13.64% | 7.77% | 6.32% | 5.20% | 4.65% |
| **CALHOUN** | | | | | |
| Low | -4.07% | 0.00% | -0.72% | -1.45% | -1.47% |
| *Low-Medium* | *0.08%* | *1.66%* | *0.92%* | *-0.10%* | *0.19%* |
| Medium | 4.22% | 3.31% | 2.56% | 1.25% | 1.85% |
| *Medium-High* | *8.70%* | *5.01%* | *4.42%* | *3.31%* | *3.22%* |
| High | 13.19% | 6.71% | 6.29% | 5.38% | 4.59% |
| **ESCAMBIA** | | | | | |
| Low | -3.46% | -0.13% | -0.58% | -0.74% | -0.97% |
| *Low-Medium* | *0.03%* | *1.26%* | *0.76%* | *0.55%* | *0.32%* |
| Medium | 3.52% | 2.66% | 2.09% | 1.85% | 1.62% |
| *Medium-High* | *6.85%* | *3.98%* | *3.12%* | *2.84%* | *2.55%* |
| High | 10.19% | 5.30% | 4.15% | 3.83% | 3.47% |
| **FRANKLIN** | | | | | |
| Low | -5.60% | -0.89% | -1.80% | -2.75% | -2.83% |
| *Low-Medium* | *-0.54%* | *1.17%* | *0.27%* | *-0.61%* | *-0.66%* |
| Medium | 4.52% | 3.23% | 2.34% | 1.53% | 1.50% |
| *Medium-High* | *9.58%* | *4.92%* | *4.28%* | *3.36%* | *3.22%* |
| High | 14.63% | 6.62% | 6.21% | 5.19% | 4.94% |
| **GADSDEN** | | | | | |
| Low | -5.46% | -1.83% | -2.33% | -2.63% | -2.70% |
| *Low-Medium* | *-2.11%* | *-0.49%* | *-0.95%* | *-1.10%* | *-1.35%* |
| Medium | 1.24% | 0.85% | 0.42% | 0.42% | 0.00% |
| *Medium-High* | *4.81%* | *2.32%* | *1.75%* | *1.33%* | *1.09%* |
| High | 8.38% | 3.79% | 3.08% | 2.24% | 2.19% |
| **GULF** | | | | | |
| Low | -3.56% | 0.00% | -0.70% | -1.42% | -1.44% |
| *Low-Medium* | *0.52%* | *1.62%* | *0.91%* | *0.21%* | *-0.12%* |
| Medium | 4.59% | 3.25% | 2.52% | 1.84% | 1.20% |
| *Medium-High* | *9.01%* | *5.22%* | *4.33%* | *3.55%* | *3.10%* |
| High | 13.42% | 7.19% | 6.15% | 5.26% | 5.00% |
| **HOLMES** | | | | | |
| Low | -8.00% | -2.72% | -3.35% | -3.47% | -2.99% |
| *Low-Medium* | *-3.75%* | *-1.36%* | *-1.43%* | *-1.73%* | *-1.25%* |
| Medium | 0.49% | 0.00% | 0.50% | 0.00% | 0.50% |
| *Medium-High* | *4.74%* | *1.83%* | *1.80%* | *1.72%* | *1.70%* |
| High | 8.99% | 3.67% | 3.10% | 3.43% | 2.90% |
| **JACKSON** | | | | | |
| Low | -5.55% | -1.82% | -2.31% | -2.84% | -2.93% |
| *Low-Medium* | *-2.23%* | *-0.48%* | *-0.95%* | *-1.32%* | *-1.36%* |
| Medium | 1.10% | 0.85% | 0.42% | 0.21% | 0.21% |
| *Medium-High* | *4.64%* | *2.31%* | *1.74%* | *1.22%* | *1.10%* |
| High | 8.18% | 3.77% | 3.06% | 2.23% | 2.00% |

Source: Projections of Florida Population by County, 2025-2045, with Estimates for 2020 BEBR Florida Population Studies, Volume 54, Bulletin 189, April 2021

Notes: Negative growth rates (shown in gray) were not used; for utilities with declining or no growth, 2020 values were held constant through the planning period. Projected growth rates "Low-Medium" and Medium-High" interpolated by District staff.

**Table A4.10. Projected Five-Year Growth Rates by County (Continued)**

| | | | | | |
|---|---|---|---|---|---|
| **JEFFERSON** (NOTE: growth rates based on total county population, not disaggregated by WMD) | | | | | |
| Low | -6.91% | -2.24% | -2.29% | -3.13% | -2.42% |
| *Low-Medium* | *-2.74%* | *-0.78%* | *-0.80%* | *-0.89%* | *-0.88%* |
| Medium | 1.43% | 0.68% | 0.68% | 1.35% | 0.67% |
| *Medium-High* | *5.60%* | *2.56%* | *2.46%* | *2.71%* | *2.29%* |
| High | 9.77% | 4.43% | 4.24% | 4.07% | 3.91% |
| **LEON** | | | | | |
| Low | -2.73% | 0.69% | 0.03% | -0.41% | -0.82% |
| *Low-Medium* | *0.77%* | *2.06%* | *1.32%* | *0.87%* | *0.49%* |
| Medium | 4.28% | 3.43% | 2.60% | 2.14% | 1.80% |
| *Medium-High* | *7.65%* | *4.80%* | *3.69%* | *3.17%* | *2.70%* |
| High | 11.02% | 6.17% | 4.79% | 4.19% | 3.61% |
| **LIBERTY** | | | | | |
| Low | -5.54% | 0.00% | -1.23% | -2.50% | -2.56% |
| *Low-Medium* | *-1.46%* | *1.70%* | *-0.07%* | *-0.16%* | *-0.75%* |
| Medium | 2.62% | 3.41% | 1.10% | 2.17% | 1.06% |
| *Medium-High* | *7.29%* | *4.83%* | *3.00%* | *3.42%* | *2.76%* |
| High | 11.95% | 6.25% | 4.90% | 4.67% | 4.46% |
| **OKALOOSA** | | | | | |
| Low | -1.84% | 1.30% | 0.59% | 0.25% | -0.34% |
| *Low-Medium* | *1.69%* | *2.65%* | *1.82%* | *1.43%* | *0.91%* |
| Medium | 5.22% | 4.01% | 3.05% | 2.61% | 2.16% |
| *Medium-High* | *8.63%* | *5.40%* | *4.23%* | *3.73%* | *3.16%* |
| High | 12.04% | 6.78% | 5.41% | 4.86% | 4.15% |
| **SANTA ROSA** | | | | | |
| Low | -1.44% | 3.19% | 2.02% | 1.46% | 0.67% |
| *Low-Medium* | *3.92%* | *5.09%* | *3.77%* | *3.12%* | *2.39%* |
| Medium | 9.29% | 6.99% | 5.51% | 4.78% | 4.11% |
| *Medium-High* | *14.27%* | *8.90%* | *7.49%* | *6.70%* | *6.05%* |
| High | 19.25% | 10.81% | 9.47% | 8.61% | 8.00% |
| **WAKULLA** | | | | | |
| Low | -1.71% | 2.40% | 1.46% | 0.29% | -0.29% |
| *Low-Medium* | *2.70%* | *3.94%* | *2.94%* | *1.77%* | *1.31%* |
| Medium | 7.12% | 5.49% | 4.43% | 3.24% | 2.90% |
| *Medium-High* | *11.39%* | *7.33%* | *6.29%* | *4.85%* | *4.38%* |
| High | 15.65% | 9.16% | 8.16% | 6.47% | 5.87% |
| **WALTON** | | | | | |
| Low | 1.84% | 6.83% | 4.55% | 3.41% | 2.62% |
| *Low-Medium* | *8.40%* | *9.00%* | *6.52%* | *5.23%* | *4.46%* |
| Medium | 14.96% | 11.18% | 8.48% | 7.05% | 6.31% |
| *Medium-High* | *20.78%* | *13.36%* | *10.87%* | *9.38%* | *8.80%* |
| High | 26.60% | 15.54% | 13.27% | 11.71% | 11.28% |
| **WASHINGTON** | | | | | |
| Low | -4.87% | -0.83% | -1.26% | -1.69% | -2.16% |
| *Low-Medium* | *-0.73%* | *0.73%* | *0.31%* | *-0.11%* | *-0.36%* |
| Medium | 3.42% | 2.29% | 1.87% | 1.47% | 1.44% |
| *Medium-High* | *7.76%* | *4.31%* | *3.58%* | *3.09%* | *2.97%* |
| High | 12.10% | 6.34% | 5.30% | 4.72% | 4.50% |

Source: Projections of Florida Population by County, 2025-2045, with Estimates for 2020 BEBR Florida Population Studies, Volume 54, Bulletin 189, April 2021

Notes: Negative growth rates (shown in gray) were not used; for utilities with declining or no growth, 2020 values were held constant through the planning period. Projected growth rates "Low-Medium" and Medium-High" interpolated by District staff.

# APPENDIX 5. ESTIMATES AND PROJECTIONS BY COUNTY

## Region I

**Table A5.1. Escambia County**

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 40.091 | 41.586 | 42.728 | 43.652 | 44.489 | 45.238 | 5.147 | 12.8% |
| DSS | 1.853 | 1.844 | 1.861 | 1.875 | 1.885 | 1.892 | 0.039 | 2.1% |
| Agriculture | 2.998 | 3.318 | 3.635 | 3.964 | 4.332 | 4.768 | 1.770 | 59.0% |
| Recreation | 2.138 | 2.213 | 2.272 | 2.319 | 2.362 | 2.400 | 0.263 | 12.3% |
| ICI | 30.530 | 33.055 | 36.678 | 36.823 | 36.968 | 37.113 | 6.583 | 21.6% |
| Power | 5.453 | 7.000 | 7.000 | 7.000 | 7.000 | 7.000 | 1.547 | 28.4% |
| **TOTALS** | **83.063** | **89.017** | **94.174** | **95.633** | **97.036** | **98.412** | **15.349** | **18.5%** |

## Region II

**Table A5.2. Okaloosa County**

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 24.103 | 25.534 | 26.632 | 27.510 | 28.293 | 28.965 | 4.861 | 20.2% |
| DSS | 0.888 | 0.692 | 0.615 | 0.540 | 0.461 | 0.386 | (0.502) | -56.6% |
| Agriculture | 0.408 | 0.413 | 0.413 | 0.414 | 0.414 | 0.429 | 0.021 | 5.1% |
| Recreation | 5.453 | 5.738 | 5.968 | 6.150 | 6.310 | 6.446 | 0.993 | 18.2% |
| ICI | 1.671 | 1.671 | 2.136 | 2.290 | 2.290 | 2.290 | 0.619 | 37.1% |
| Power | - | - | - | - | - | - | n/a | n/a |
| **TOTALS** | **32.523** | **34.048** | **35.764** | **36.903** | **37.768** | **38.516** | **5.993** | **18.4%** |

**Table A5.3. Santa Rosa County**

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 18.391 | 20.037 | 21.397 | 22.561 | 23.637 | 24.613 | 6.221 | 33.8% |
| DSS | 0.753 | 0.711 | 0.724 | 0.708 | 0.680 | 0.635 | (0.118) | -15.7% |
| Agriculture | 1.894 | 2.324 | 2.866 | 3.407 | 3.941 | 4.528 | 2.634 | 139.1% |
| Recreation | 2.208 | 2.413 | 2.582 | 2.724 | 2.854 | 2.972 | 0.764 | 34.6% |
| ICI | 2.925 | 3.228 | 3.367 | 3.527 | 3.727 | 3.727 | 0.802 | 27.4% |
| Power | - | - | - | - | - | - | n/a | n/a |
| **TOTALS** | **26.172** | **28.713** | **30.936** | **32.928** | **34.839** | **36.475** | **10.303** | **39.4%** |

**Table A5.4. Walton County**

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 11.675 | 14.125 | 16.028 | 17.808 | 19.530 | 21.322 | 9.647 | 82.6% |
| DSS | 0.425 | 0.395 | 0.400 | 0.370 | 0.321 | 0.250 | (0.175) | -41.2% |
| Agriculture | 0.613 | 0.617 | 0.618 | 0.620 | 0.621 | 0.622 | 0.009 | 1.5% |
| Recreation | 4.483 | 5.154 | 5.730 | 6.216 | 6.654 | 7.074 | 2.590 | 57.8% |
| ICI | 0.094 | 0.094 | 0.050 | 0.050 | 0.050 | 0.050 | (0.044) | -46.8% |
| Power | - | - | - | - | - | - | n/a | n/a |
| **TOTALS** | **17.290** | **20.385** | **22.825** | **25.063** | **27.176** | **29.317** | **12.027** | **69.6%** |

# Region III

**Table A5.5. Bay County**

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 29.359 | 30.015 | 31.321 | 32.273 | 33.026 | 33.653 | 4.294 | 14.6% |
| DSS | 2.386 | 2.125 | 2.129 | 2.100 | 2.069 | 2.024 | (0.362) | -15.2% |
| Agriculture | 0.884 | 0.889 | 0.889 | 0.891 | 0.892 | 0.893 | 0.009 | 1.0% |
| Recreation | 2.151 | 2.282 | 2.381 | 2.454 | 2.512 | 2.560 | 0.410 | 19.0% |
| ICI | 26.480 | 5.116 | 6.103 | 6.111 | 6.619 | 6.538 | (19.943) | -75.3% |
| Power | 4.271 | 4.650 | 4.700 | 4.750 | 4.803 | 4.803 | 0.532 | 12.5% |
| **TOTALS** | **65.531** | **45.077** | **47.523** | **48.579** | **49.920** | **50.471** | **(15.060)** | **-23.0%** |

# Region IV

**Table A5.6. Calhoun County**

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 0.546 | 0.546 | 0.555 | 0.560 | 0.560 | 0.561 | 0.016 | 2.9% |
| DSS | 0.993 | 0.982 | 1.022 | 1.054 | 1.073 | 1.099 | 0.106 | 10.7% |
| Agriculture | 3.171 | 3.326 | 3.427 | 3.587 | 3.770 | 3.940 | 0.769 | 24.3% |
| Recreation | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.001 | 13.9% |
| ICI | 0.244 | 0.245 | 0.250 | 0.250 | 0.250 | 0.250 | 0.006 | 2.3% |
| Power | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | n/a | n/a |
| **TOTALS** | **4.958** | **5.104** | **5.258** | **5.456** | **5.657** | **5.855** | **0.897** | **18.1%** |

**Table A5.7. Holmes County**

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 1.222 | 1.227 | 1.227 | 1.232 | 1.232 | 1.237 | 0.015 | 1.2% |
| DSS | 1.216 | 1.223 | 1.223 | 1.230 | 1.230 | 1.237 | 0.021 | 1.7% |
| Agriculture | 1.119 | 1.126 | 1.128 | 1.125 | 1.127 | 1.129 | 0.010 | 0.9% |
| Recreation | 0.191 | 0.192 | 0.192 | 0.193 | 0.193 | 0.194 | 0.003 | 1.5% |
| ICI | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | n/a |
| Power | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | n/a | n/a |
| **TOTALS** | **3.747** | **3.768** | **3.770** | **3.779** | **3.781** | **3.796** | **0.049** | **1.3%** |

**Table A5.8. Jackson County**

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 2.613 | 2.679 | 2.714 | 2.740 | 2.759 | 2.775 | 0.162 | 6.2% |
| DSS | 2.407 | 2.453 | 2.480 | 2.494 | 2.501 | 2.508 | 0.100 | 4.2% |
| Agriculture | 30.929 | 31.632 | 32.003 | 32.430 | 32.880 | 33.270 | 2.341 | 7.6% |
| Recreation | 0.398 | 0.402 | 0.405 | 0.407 | 0.408 | 0.409 | 0.011 | 2.8% |
| ICI | 0.898 | 0.968 | 1.040 | 1.122 | 1.140 | 1.164 | 0.266 | 29.6% |
| Power | 1.431 | 1.500 | 1.500 | 1.500 | 1.500 | 1.500 | 0.069 | 4.8% |
| **TOTALS** | **38.677** | **39.633** | **40.143** | **40.693** | **41.187** | **41.626** | **2.949** | **7.6%** |

**Table A5.9. Liberty County**

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 0.482 | 0.491 | 0.504 | 0.509 | 0.517 | 0.521 | 0.039 | 8.1% |
| DSS | 0.452 | 0.457 | 0.477 | 0.485 | 0.500 | 0.508 | 0.056 | 12.3% |
| Agriculture | 0.114 | 0.115 | 0.115 | 0.116 | 0.116 | 0.117 | 0.003 | 2.6% |
| Recreation | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.000 | 10.8% |
| ICI | 0.259 | 0.351 | 0.418 | 0.465 | 0.512 | 0.560 | 0.301 | 116.1% |
| Power | 0.206 | 0.206 | 0.206 | 0.206 | 0.206 | 0.206 | 0.000 | -0.1% |
| **TOTALS** | **1.515** | **1.622** | **1.721** | **1.782** | **1.853** | **1.913** | **0.398** | **26.3%** |

**Table A5.10. Washington County**

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 1.013 | 1.040 | 1.060 | 1.076 | 1.088 | 1.100 | 0.087 | 8.6% |
| DSS | 1.698 | 1.772 | 1.820 | 1.859 | 1.890 | 1.921 | 0.223 | 13.1% |
| Agriculture | 0.790 | 0.887 | 0.985 | 1.109 | 1.264 | 1.432 | 0.642 | 81.3% |
| Recreation | 0.307 | 0.318 | 0.325 | 0.331 | 0.336 | 0.341 | 0.034 | 10.9% |
| ICI | 0.282 | 0.343 | 0.500 | 0.537 | 0.564 | 0.592 | 0.310 | 109.9% |
| Power | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | n/a | n/a |
| **TOTALS** | **4.091** | **4.360** | **4.689** | **4.912** | **5.143** | **5.386** | **1.295** | **31.7%** |

# Region V

**Table A5.11. Franklin County**

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 1.886 | 1.940 | 1.989 | 2.021 | 2.042 | 2.062 | 0.177 | 9.4% |
| DSS | 0.066 | 0.111 | 0.136 | 0.159 | 0.174 | 0.190 | 0.124 | 188.4% |
| Agriculture | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | - | 0.0% |
| Recreation | 0.248 | 0.259 | 0.267 | 0.273 | 0.278 | 0.282 | 0.034 | 13.8% |
| ICI | 0.017 | 0.017 | 0.005 | 0.010 | 0.010 | 0.010 | (0.007) | -42.8% |
| Power | - | - | - | - | - | - | n/a | n/a |
| **TOTALS** | **2.222** | **2.333** | **2.403** | **2.469** | **2.510** | **2.550** | **0.327** | **14.7%** |

**Table A5.12. Gulf County**

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 1.451 | 1.576 | 1.656 | 1.725 | 1.784 | 1.836 | 0.385 | 26.5% |
| DSS | 0.304 | 0.326 | 0.342 | 0.355 | 0.365 | 0.372 | 0.068 | 22.2% |
| Agriculture | 0.297 | 0.297 | 0.298 | 0.298 | 0.298 | 0.298 | 0.001 | 0.3% |
| Recreation | 0.089 | 0.093 | 0.096 | 0.099 | 0.100 | 0.102 | 0.013 | 14.1% |
| ICI | 0.166 | 0.242 | 0.292 | 0.342 | 0.342 | 0.342 | 0.176 | 106.3% |
| Power | - | - | - | - | - | - | n/a | n/a |
| **TOTALS** | **2.307** | **2.534** | **2.684** | **2.819** | **2.889** | **2.950** | **0.642** | **27.8%** |

# Region VI

**Table A5.13. Gadsden County**

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 4.395 | 4.462 | 4.504 | 4.528 | 4.550 | 4.556 | 0.160 | 3.7% |
| DSS | 1.397 | 1.417 | 1.431 | 1.438 | 1.444 | 1.444 | 0.047 | 3.4% |
| Agriculture | 4.938 | 4.952 | 4.966 | 4.964 | 4.979 | 4.992 | 0.054 | 1.1% |
| Recreation | 0.220 | 0.223 | 0.225 | 0.226 | 0.227 | 0.227 | 0.007 | 3.0% |
| ICI | 0.472 | 0.486 | 0.639 | 0.744 | 0.844 | 0.886 | 0.414 | 87.7% |
| Power | - | - | - | - | - | - | n/a | n/a |
| **TOTALS** | **11.423** | **11.539** | **11.765** | **11.900** | **12.045** | **12.105** | **0.682** | **6.0%** |

# Region VII

**Table A5.14. Jefferson County***

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 0.556 | 0.587 | 0.602 | 0.617 | 0.633 | 0.648 | 0.092 | 16.6% |
| DSS | 0.422 | 0.427 | 0.430 | 0.433 | 0.438 | 0.441 | 0.020 | 4.7% |
| Agriculture | 1.091 | 1.107 | 1.127 | 1.129 | 1.132 | 1.135 | 0.044 | 4.0% |
| Recreation | 0.791 | 0.803 | 0.808 | 0.814 | 0.825 | 0.830 | 0.039 | 4.9% |
| ICI | - | - | - | - | - | - | n/a | n/a |
| Power | - | - | - | - | - | - | n/a | n/a |
| **TOTALS** | **2.859** | **2.923** | **2.967** | **2.992** | **3.028** | **3.054** | **0.195** | **6.8%** |

*NWFWMD portion of county only.

**Table A5.15. Leon County**

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 30.309 | 31.489 | 32.563 | 33.404 | 34.116 | 34.727 | 4.418 | 14.6% |
| DSS | 3.446 | 2.950 | 2.728 | 2.529 | 2.320 | 2.123 | (1.323) | -38.4% |
| Agriculture | 0.547 | 0.553 | 0.555 | 0.558 | 0.560 | 0.563 | 0.016 | 2.9% |
| Recreation | 2.689 | 2.782 | 2.859 | 2.919 | 2.970 | 3.014 | 0.325 | 12.1% |
| ICI | 0.084 | 0.084 | 0.100 | 0.150 | 0.200 | 0.218 | 0.134 | 159.1% |
| Power | 2.500 | 4.940 | 4.940 | 4.940 | 4.940 | 4.940 | 2.440 | 97.6% |
| **TOTALS** | **39.575** | **42.798** | **43.744** | **44.500** | **45.106** | **45.585** | **6.010** | **15.2%** |

**Table A5.16. Wakulla County**

| Use Category | Estimates | Future Demand Projections | | | | | 2020-2045 Change | |
|---|---|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | mgd | % |
| Public Supply | 2.934 | 3.150 | 3.327 | 3.479 | 3.595 | 3.703 | 0.769 | 26.2% |
| DSS | 0.789 | 0.771 | 0.777 | 0.771 | 0.759 | 0.746 | (0.042) | -5.4% |
| Agriculture | 0.134 | 0.133 | 0.134 | 0.136 | 0.137 | 0.133 | (0.001) | -0.7% |
| Recreation | 0.197 | 0.211 | 0.223 | 0.233 | 0.240 | 0.247 | 0.050 | 25.4% |
| ICI | 1.166 | 1.188 | 1.250 | 1.270 | 1.295 | 1.320 | 0.154 | 13.2% |
| Power | 0.207 | 0.300 | 0.300 | 0.300 | 0.300 | 0.300 | 0.093 | 44.9% |
| **TOTALS** | **5.428** | **5.754** | **6.011** | **6.188** | **6.327** | **6.450** | **1.022** | **18.84%** |

# APPENDIX 6. GROUNDWATER LEVEL TREND ANALYSES RESULTS

Appendix 6 contains tables that summarize the results of trend analyses of groundwater levels. This appendix also includes maps showing geographic patterns in the results. Unique symbol shapes are used in each map to represent which aquifer a given trend analysis result pertains to and are as follows:

- Surficial aquifer system (SAS) wells are represented with ***triangular*** symbols.
- Sand and gravel (S&G) aquifer wells are represented with ***square*** symbols.
- Wells in the upper confining unit (UCU; also known as the intermediate system) of the Floridan aquifer system are represented with ***diamond***-shaped symbols.
- Upper Floridan aquifer (UFA) wells are represented with ***circular*** symbols.
- Lower Floridan aquifer (LFA) wells are represented with ***cross***-shaped symbols.
- Claiborne aquifer (CLR) wells are represented with ***pentagon***-shaped symbols.

Unique colors are also used in the maps to indicated trend analyses results for each well and are as follows:

- Insignificant trends are indicated by circular symbols with a ***black*** outline and ***white*** fill color.
- Increasing trends are indicated by ***blue*** circular symbols.
- Decreasing trends are indicated by ***red*** circular symbols.
- Significant trends from step trend tests for wells that had long periods of missing data ('data gaps') in their period of record and for which there was no a priori assumption that groundwater levels should increase or decrease after the data gap are indicated by shapes with a ***purple*** outline.

**Table A6.1 Groundwater Level Linear Trend Results**

| Region | County | Number of Sites Evaluated | Number of Significant Trends | |
|---|---|---|---|---|
| | | | Upward | Downward |
| I | Escambia | 43 | 2 | 8 |
| II | Okaloosa | 15 | 11 | 1 |
| | Santa Rosa | 20 | 5 | 2 |
| | Walton | 23 | 4 | 18 |
| III | Bay | 6 | 0 | 2 |
| IV | Calhoun | 6 | 0 | 2 |
| | Holmes | 8 | 0 | 3 |
| | Jackson | 11 | 1 | 3 |
| | Liberty | 3 | 0 | 2 |
| | Washington | 6 | 0 | 3 |
| V | Franklin | 3 | 0 | 0 |
| | Gulf | 7 | 2 | 1 |
| VI | Gadsden | 9 | 0 | 2 |
| VII | Jefferson | 1 | 0 | 0 |
| | Leon | 18 | 0 | 6 |
| | Wakulla | 6 | 0 | 1 |

**Table A6.2 Groundwater Level Nonlinear Trend Results**

| Region | County | Number of Sites Evaluated | Number of Significant Trends | |
|---|---|---|---|---|
| | | | Upward | Downward |
| I | Escambia | 2 | 0 | 1 |
| II | Santa Rosa | 8 | 0 | 4 |
| | Okaloosa | 60 | 6 | 34 |
| | Walton | 20 | 0 | 16 |
| III | Bay | 2 | 1 | 0 |
| IV | Washington | 0 | -- | -- |
| | Holmes | 0 | -- | -- |
| | Jackson | 0 | -- | -- |
| | Calhoun | 0 | -- | -- |
| | Liberty | 0 | -- | -- |
| V | Gulf | 0 | -- | -- |
| | Franklin | 4 | 1 | 0 |
| VI | Gadsden | 4 | 1 | 2 |
| VII | Leon | 0 | -- | -- |
| | Wakulla | 1 | -- | -- |
| | Jefferson | 2 | -- | -- |

**Table A6.3 Groundwater Level Step Trend Results**

| Region | County | Step Trend Analyses of Change Following a Specific Event | | | Step Trend Analyses Comparing Periods Before and After a Data Gap | |
|---|---|---|---|---|---|---|
| | | Number of Upward Trends | Number of Downward Trends | Number of Insignificant Trends | Number of Significant Trends | Number of Insignificant Trends |
| I | Escambia | -- | -- | -- | 3 | 1 |
| II | Santa Rosa | -- | -- | -- | -- | -- |
| | Okaloosa | -- | -- | -- | -- | -- |
| | Walton | -- | -- | -- | -- | -- |
| III | Bay | 1 | -- | 0 | -- | -- |
| IV | Washington | -- | -- | -- | -- | -- |
| | Holmes | -- | -- | -- | -- | -- |
| | Jackson | -- | -- | -- | 1 | 0 |
| | Calhoun | -- | -- | -- | -- | -- |
| | Liberty | -- | -- | -- | -- | -- |
| V | Gulf | -- | -- | -- | -- | -- |
| | Franklin | -- | -- | -- | 1 | 0 |
| VI | Gadsden | -- | -- | -- | -- | -- |
| VII | Leon | -- | -- | -- | -- | -- |
| | Wakulla | -- | -- | -- | -- | -- |
| | Jefferson | -- | -- | -- | -- | -- |

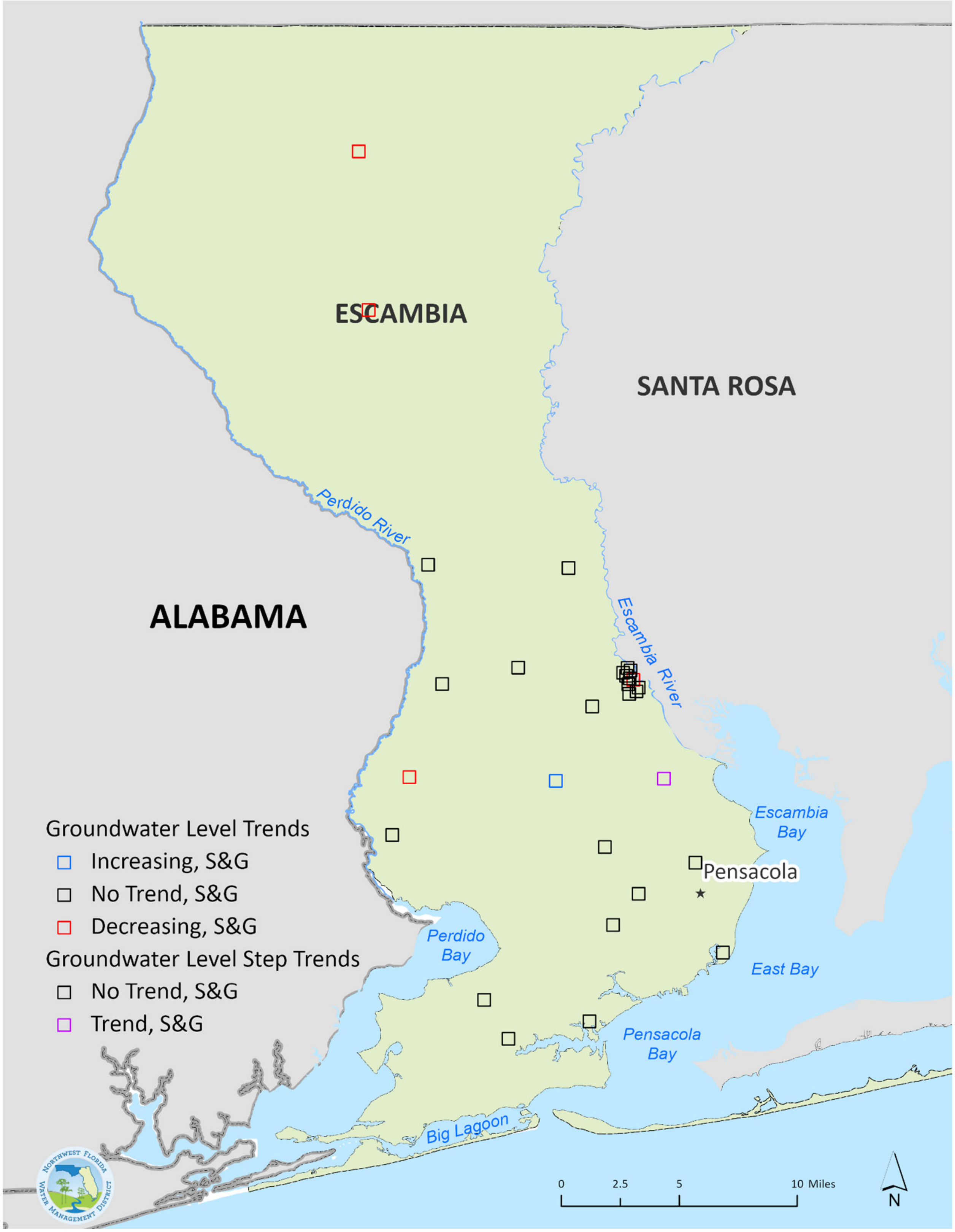


**Figure A6.1 Map of Groundwater Level trend results for Region I**

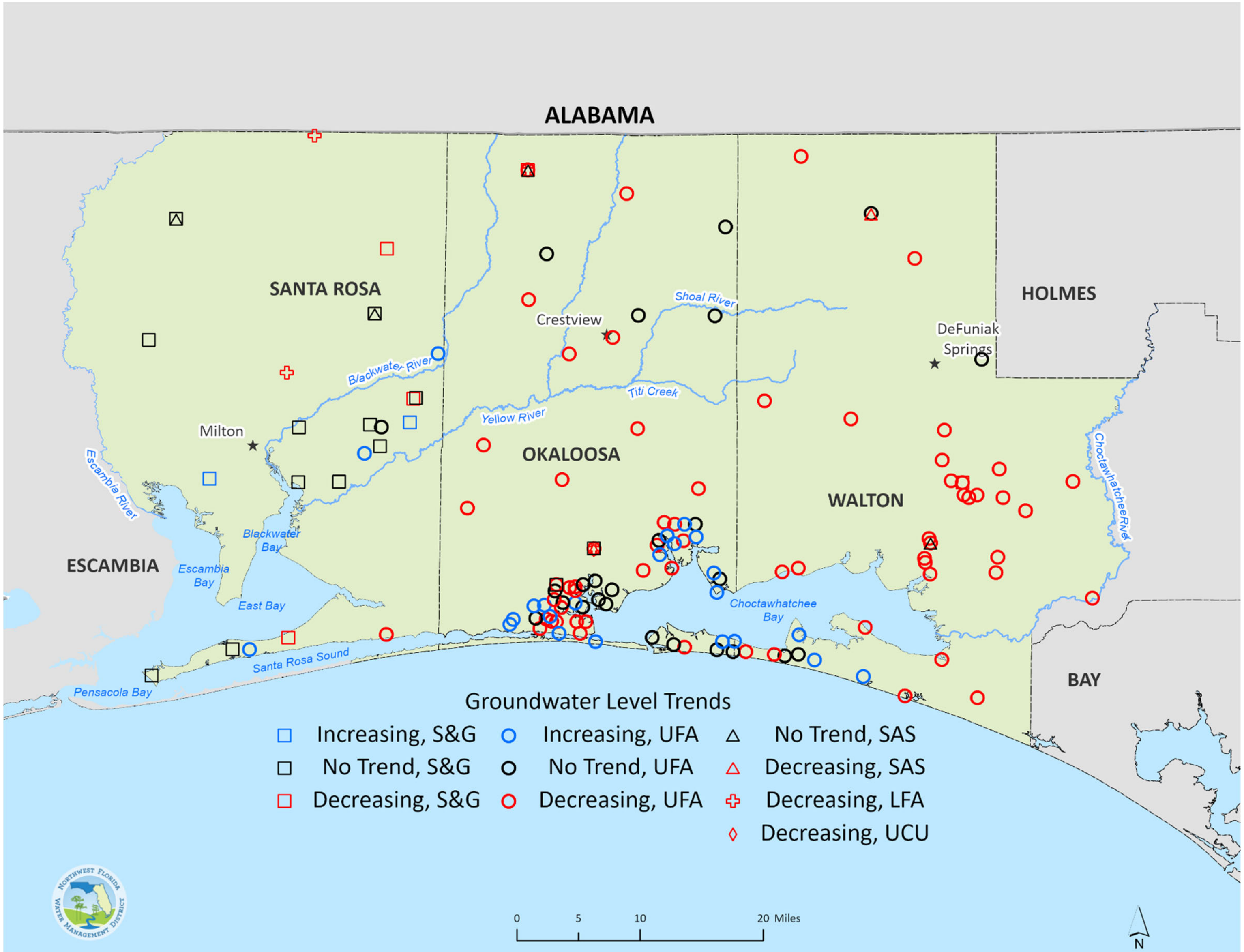


**Figure A6.2 Map of Groundwater Level trend results for Region II**

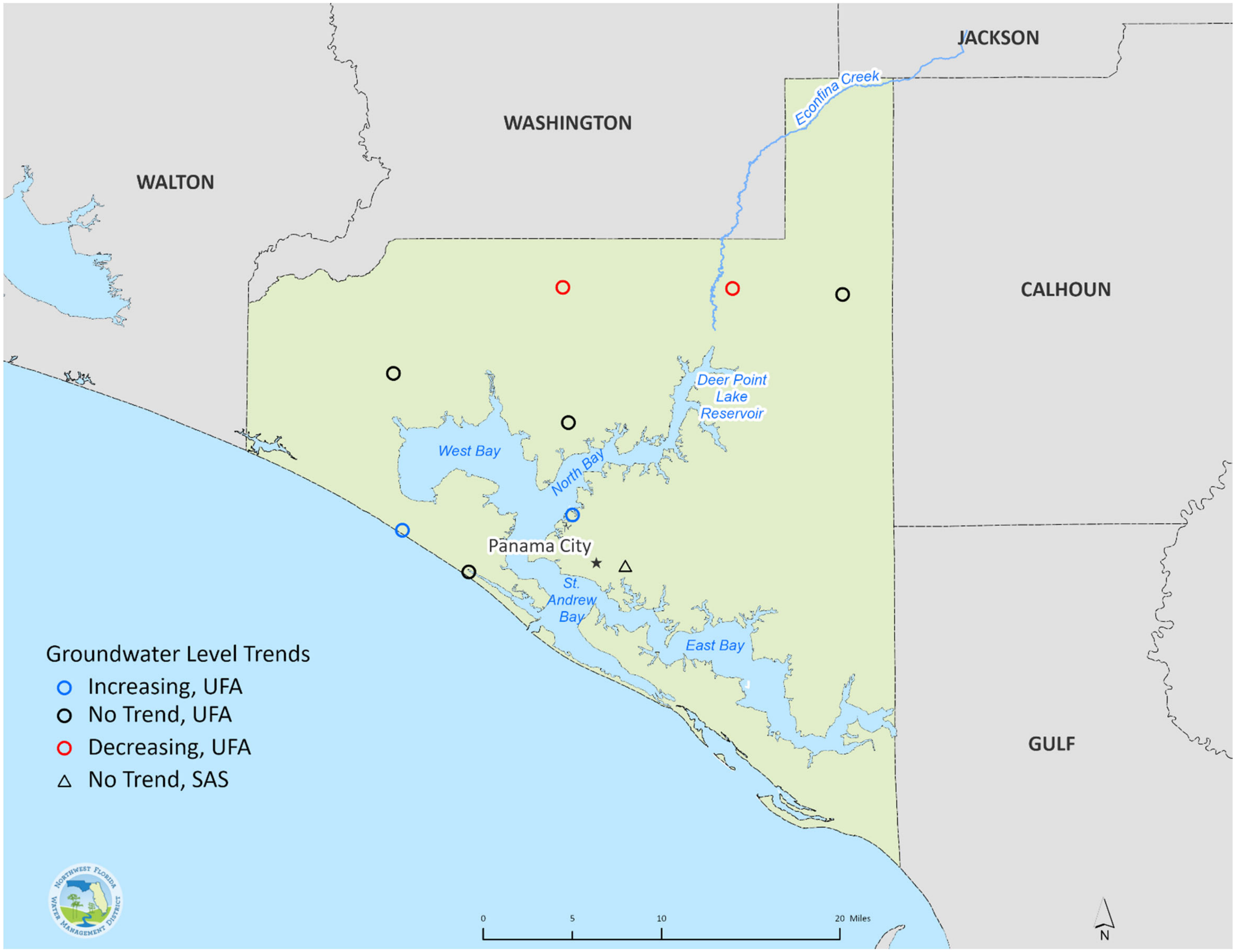


**Figure A6.3 Map of Groundwater Level trend results for Region III**

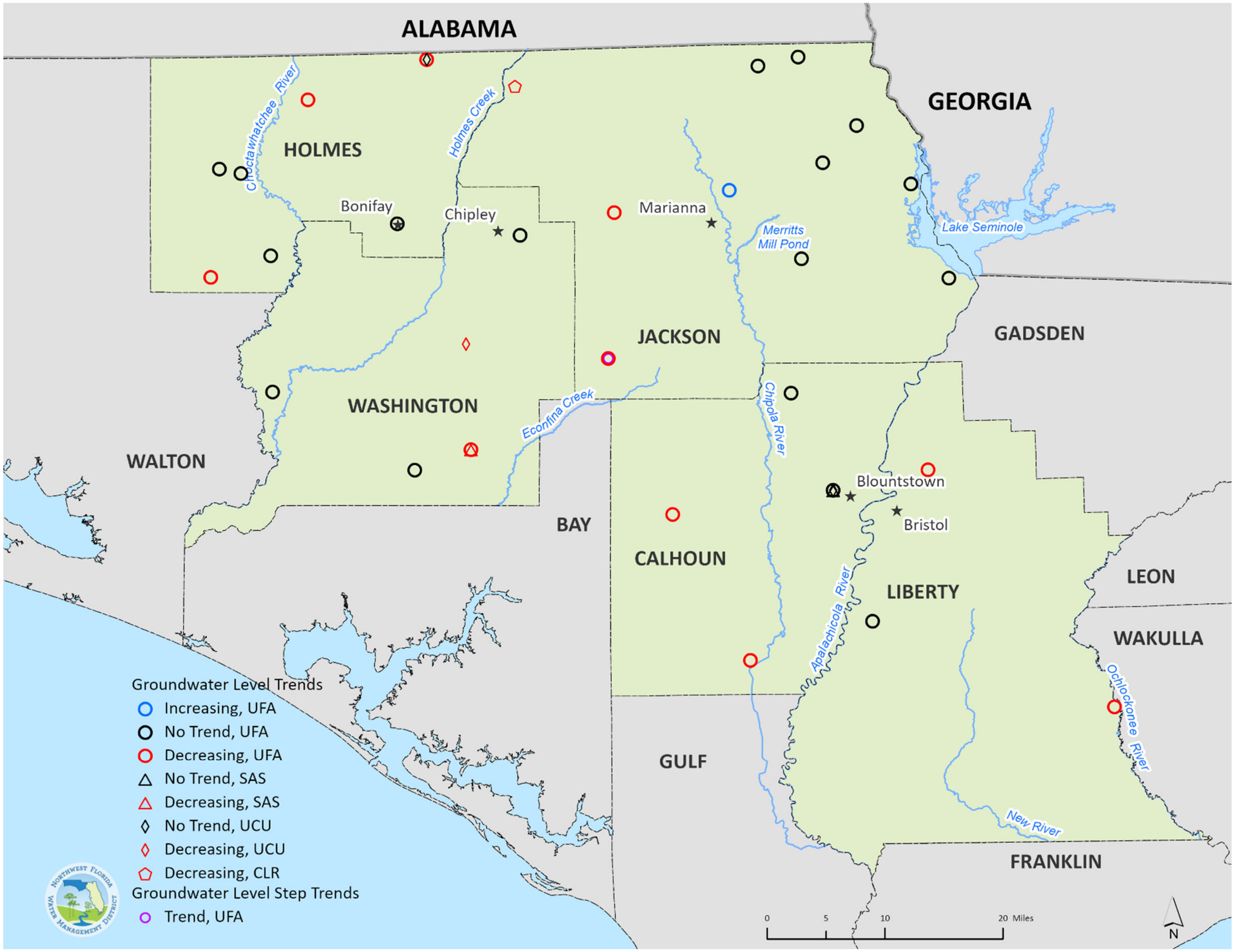


**Figure A6.4 Map of Groundwater Level trend results for Region IV**

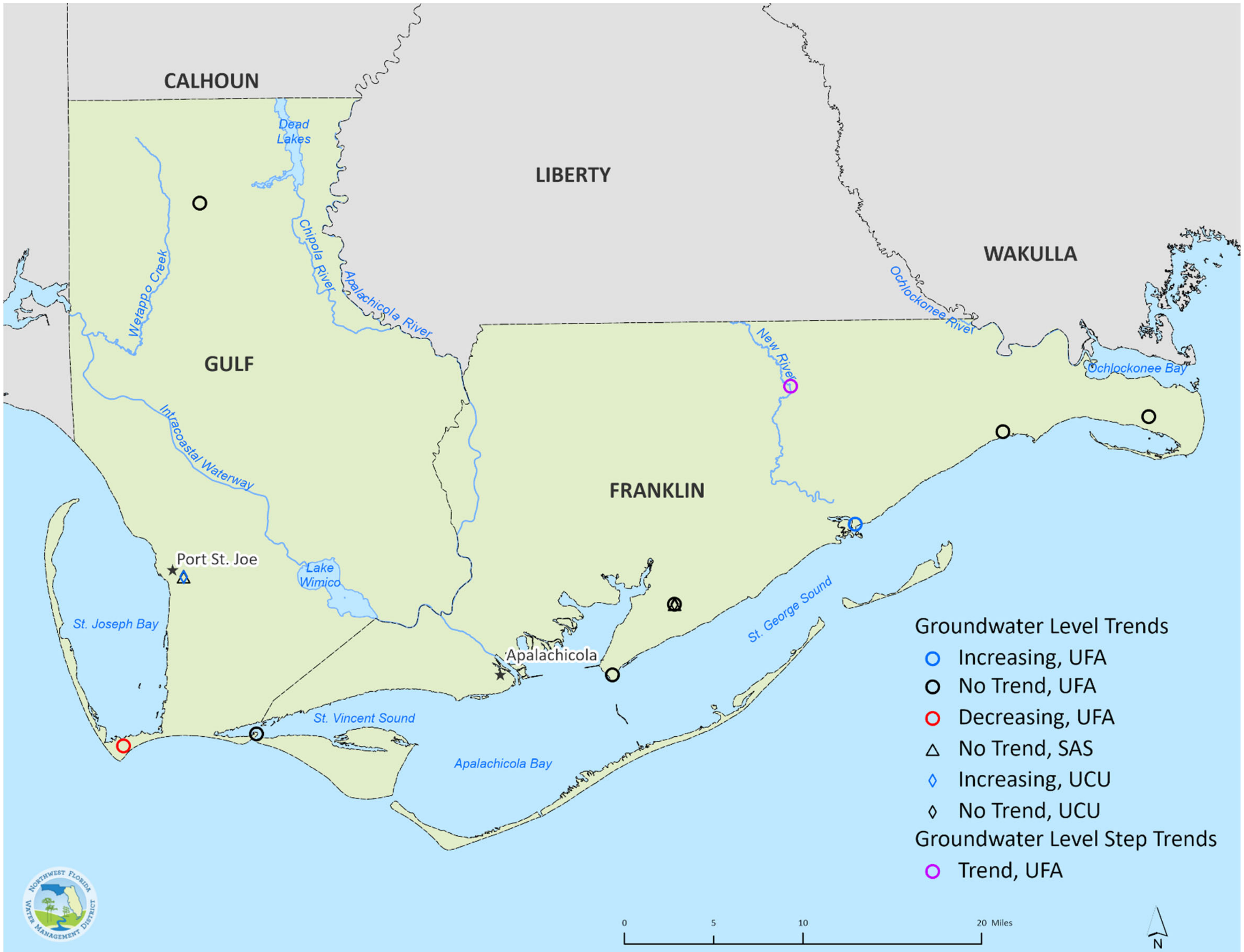


**Figure A6.5 Map of Groundwater Level trend results for Region V**

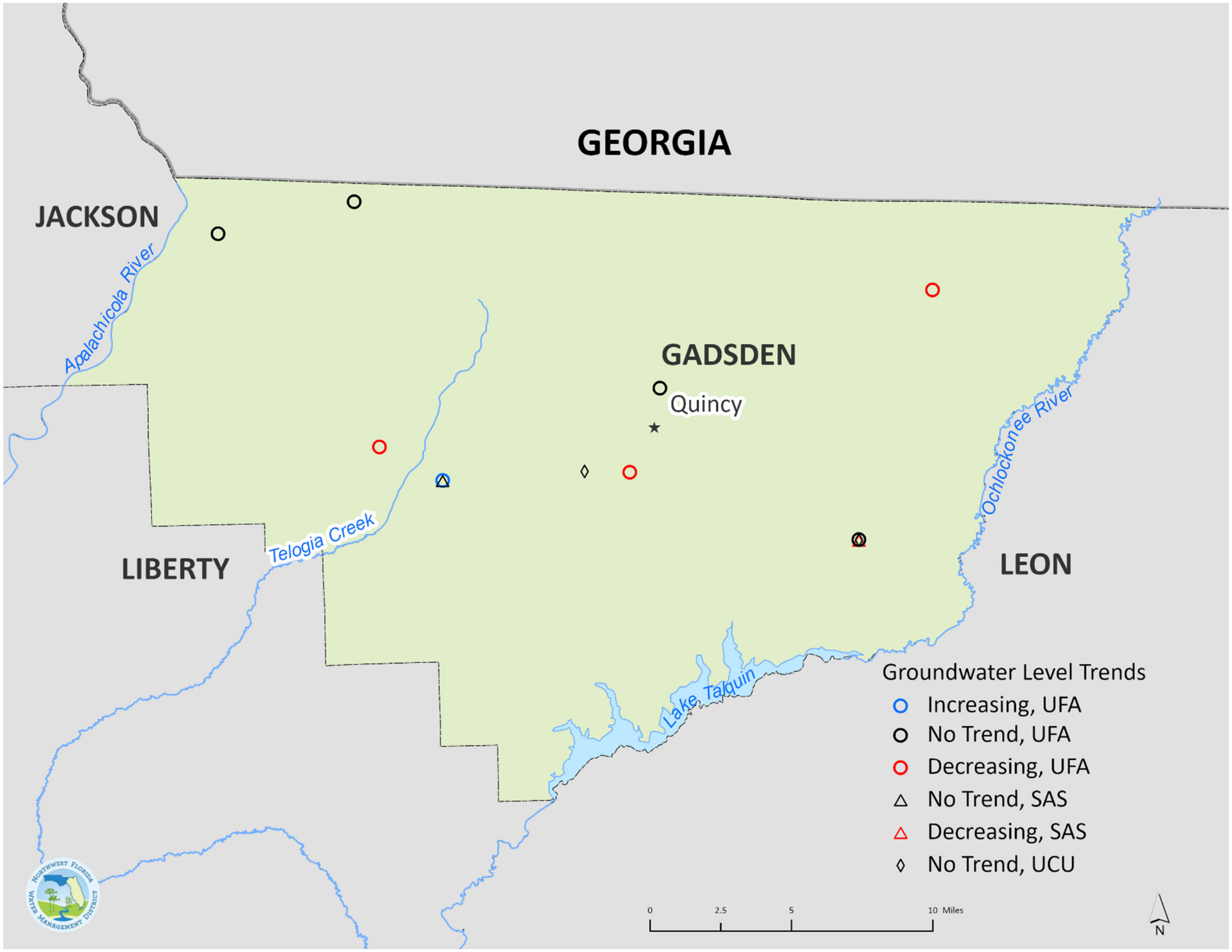


**Figure A6.6 Map of Groundwater Level trend results for Region VI**

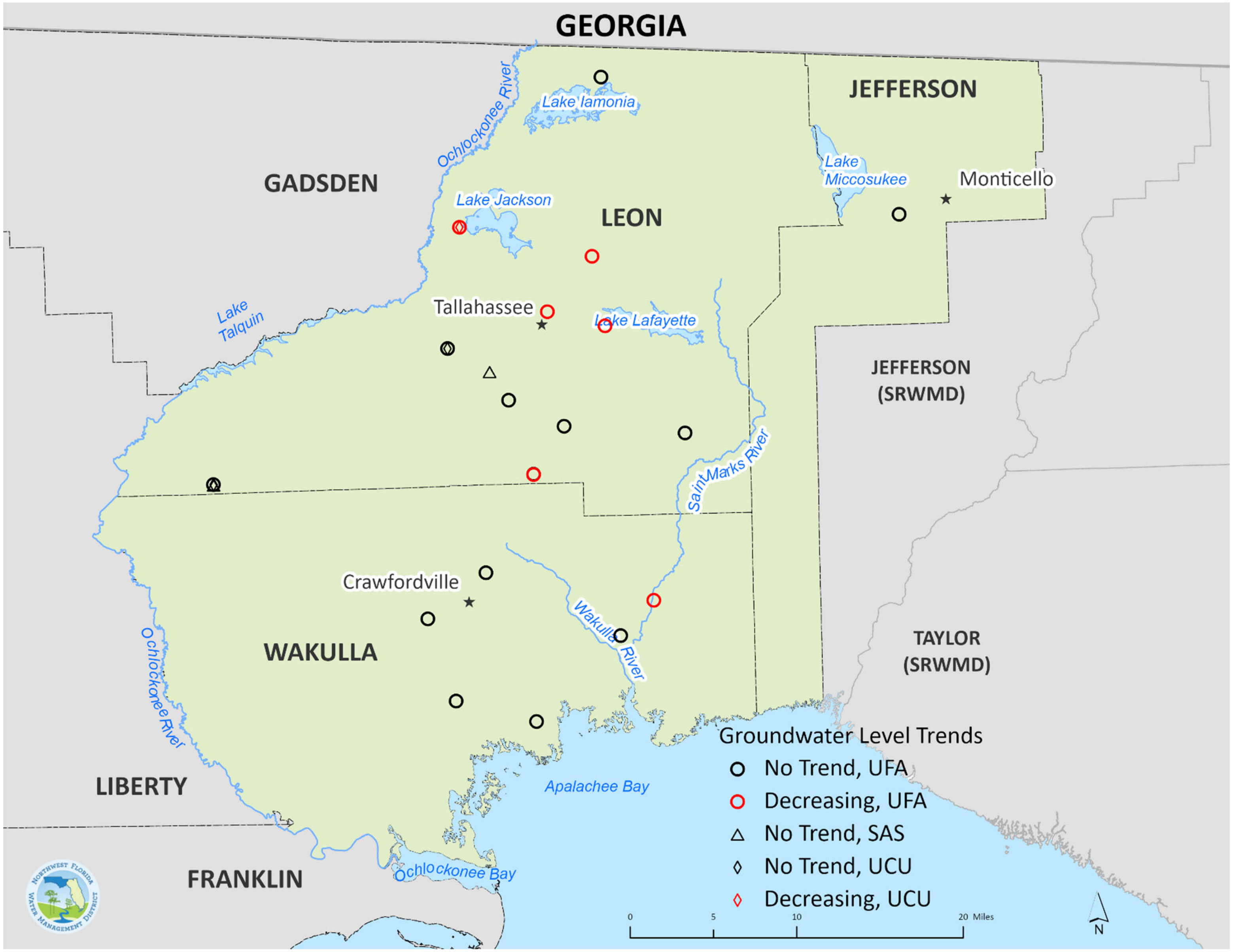


**Figure A6.7 Map of Groundwater Level trend results for Region VII**

# APPENDIX 7. BASEFLOW TREND ANALYSES RESULTS

Appendix 7 contains tables that summarize the results of trend analyses of base flows of rivers. This appendix also includes maps showing geographic patterns in the results. Unique colors are used in the maps to indicated trend analyses results for each well and are as follows:

- Insignificant trends are indicated by shapes with a ***black*** outline.
- Increasing trends are indicated by shapes with a ***blue*** outline.
- Decreasing trends are indicated by shapes with a ***red*** outline.
- Significant trends from step trend tests for stream gages that had long periods of missing data ('data gaps') in their period of record and for which there was no a priori assumption that base flows should increase or decrease after the data gap are indicated by ***purple*** circular symbols.

*Remainder of page left intentionally blank.*

## Table A7.1 Baseflow Linear Trend Results

| Station Number | Station Name | Trend Explanatory Variable | Trend Intercept, in $ft^3/(s*yr)$ | Trend Slope, in $ft^3/(s*yr)$ | Upper Limit of 95% Confidence Limit | Lowerer Limit of 95% Confidence Limit | Signficant Slope? | Trend Direction | Date of First Measurement | Date of Last Measurement |
|---|---|---|---|---|---|---|---|---|---|---|
| 2327022 | WAKULLA RIVER NEAR CRAWFORDVILLE, FL | Residual Baseflow | -16342.4 | 8.127 | 17.291 | -2.011 | FALSE | -- | 2004-Dec | 2021-Mar |
| 2327033 | LOST CREEK AT ARRAN FLA | Residual Baseflow | 140.8 | -0.073 | 2.221 | -2.546 | FALSE | -- | 1998-Nov | 2021-Sep |
| 2327100 | SOPCHOPPY RIVER NR SOPCHOPPY, FLA. | Residual Baseflow | 663.4 | -0.337 | 0.603 | -1.296 | FALSE | -- | 1964-Jul | 2021-Sep |
| 2328522 | OCHLOCKONEE RIVER NR CONCORD, FLA. | Residual Baseflow | 3031.2 | -1.546 | 11.101 | -16.144 | FALSE | -- | 1998-Nov | 2021-Sep |
| 2329000 | OCHLOCKONEE RIVER NR HAVANA, FLA. | Residual Baseflow | 7.4 | -0.045 | 1.693 | -1.655 | FALSE | -- | 1926-Nov | 2021-Aug |
| 2329534 | QUINCY CREEK AT STATE HWY 267 AT QUINCY, FLA. | Residual Baseflow | -20.6 | 0.010 | 0.090 | -0.082 | FALSE | -- | 1974-Nov | 2021-Dec |
| 2329600 | LITTLE RIVER NR MIDWAY, FLA. | Residual Baseflow | 3262.7 | -1.640 | 0.921 | -4.490 | FALSE | -- | 1985-Nov | 2021-Dec |
| 2330000 | OCHLOCKONEE RIVER NR BLOXHAM, FLA. | Residual Baseflow | -1350.8 | 0.621 | 3.111 | -2.062 | FALSE | -- | 1926-Aug | 2021-Aug |
| 2330100 | TELOGIA CREEK NR BRISTOL, FLA. | Residual Baseflow | 1124.6 | -0.569 | -0.156 | -0.993 | TRUE | DOWN | 1950-May | 2021-Sep |
| 2330150 | OCHLOCKONEE RIVER NR SMITH CREEK, FLA. | Residual Baseflow | 9220.0 | -4.635 | 13.752 | -27.830 | FALSE | -- | 1996-Oct | 2021-Oct |
| 2330400 | NEW RIVER NEAR SUMATRA, FLA | Residual Baseflow | 1892.2 | -0.946 | 5.018 | -7.064 | FALSE | -- | 1997-May | 2021-Dec |
| 2359000 | CHIPOLA RIVER NR ALTHA, FLA. | Residual Baseflow | 2388.1 | -1.236 | 1.360 | -4.089 | FALSE | -- | 1913-Jan | 2021-Dec |
| 2365470 | WRIGHTS CREEK AT SH 177-A NR BONIFAY,FL | Residual Baseflow | -586.9 | 0.291 | 4.526 | -3.258 | FALSE | -- | 1998-Nov | 2021-Dec |
| 2365500 | CHOCTAWHATCHEE RIVER AT CARYVILLE, FLA. | Residual Baseflow | 10679.5 | -5.542 | 2.606 | -13.793 | FALSE | -- | 1929-Nov | 2021-Aug |
| 2365769 | BRUCE CREEK AT SH 81 NR REDBAY, FL | Residual Baseflow | -131.0 | 0.062 | 2.543 | -2.495 | FALSE | -- | 1998-Nov | 2021-Dec |
| 2366500 | CHOCTAWHATCHEE RIVER NR BRUCE, FLA. | Residual Baseflow | 10277.4 | -5.373 | 5.884 | -17.172 | FALSE | -- | 1930-Nov | 2021-Dec |
| 2366996 | ALAQUA CREEK NEAR PLEASANT RIDGE, FL | Residual Baseflow | 998.7 | -0.497 | 0.426 | -1.465 | FALSE | -- | 1998-Nov | 2021-Sep |
| 2367900 | YELLOW RIVER NR OAK GROVE, FLA. | Residual Baseflow | -611.0 | 0.286 | 11.062 | -9.740 | FALSE | -- | 1998-Nov | 2021-Sep |
| 2368000 | YELLOW RIVER AT MILLIGAN, FLA. | Residual Baseflow | 2391.2 | -1.242 | 0.906 | -3.496 | FALSE | -- | 1938-Sep | 2021-Sep |
| 2368500 | SHOAL RIVER NR MOSSY HEAD, FLA. | Residual Baseflow | 830.9 | -0.425 | 0.106 | -0.982 | FALSE | -- | 1951-Apr | 2021-Dec |
| 2369000 | SHOAL RIVER NR CRESTVIEW, FLA. | Residual Baseflow | 3527.1 | -1.796 | -0.421 | -3.342 | TRUE | DOWN | 1938-Sep | 2021-Sep |
| 2369600 | YELLOW RIVER NR MILTON, FLA. | Residual Baseflow | -11385.6 | 5.618 | 35.820 | -33.612 | FALSE | -- | 2001-Nov | 2019-Dec |
| 2370000 | BLACKWATER RIVER NR BAKER, FLA. | Residual Baseflow | 303.6 | -0.161 | 0.371 | -0.743 | FALSE | -- | 1950-May | 2021-Sep |
| 2370500 | BIG COLDWATER CREEK NR MILTON, FLA. | Residual Baseflow | 1071.2 | -0.545 | -0.014 | -1.055 | TRUE | DOWN | 1939-Jan | 2021-Sep |
| 2375500 | ESCAMBIA RIVER NEAR CENTURY, FL | Residual Baseflow | 9118.4 | -4.764 | 4.559 | -15.749 | FALSE | -- | 1934-Nov | 2021-Dec |
| 2376033 | ESCAMBIA RIVER NR MOLINO, FLA. | Residual Baseflow | 82636.2 | -41.550 | 70.220 | -171.901 | FALSE | -- | 1984-Jan | 2000-Mar |
| 2376293 | BRUSHY CREEK NEAR BRATT, FL | Residual Baseflow | 93.0 | -0.046 | 0.222 | -0.294 | FALSE | -- | 1998-Nov | 2021-Sep |
| 2376500 | PERDIDO RIVER AT BARRINEAU PARK, FL | Residual Baseflow | 1004.0 | -0.514 | 0.329 | -1.346 | FALSE | -- | 1941-Jul | 2021-Dec |
| 2330053 | TELOGIA CRK @ CR65D | Residual Baseflow | 336.4 | -0.169 | 0.140 | -0.565 | FALSE | -- | 1990-Jun | 2015-Sep |

## Table A7.2 Baseflow Nonlinear Trend Results

| Station Number | Station Name | Trend Explanatory Variable(s) | Model Root Mean Square Error, in $ft^3/s$ | Period of Record | | Predicted Values, in ft3/s | | | Confidence Interval for Predicted Start Date Baseflow Minus End Date Predicted Baseflow, in ft3/s | | Significant Difference? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Start Date (Year-Month) | End Date (Year-Month) | Start Date | End Date | Start Date Minus End Date | Lower Limit of 95% Confidence Interval | Upper Limit of 95% Confidence Interval | |
| 2326900 | ST. MARKS RIVER NEAR NEWPORT, FLA. | Time and Rainfall | 110.9 | 1956-Dec | 2021-Jul | 448.8 | 336.8 | 110.6 | 8.3 | 194.5 | TRUE |
| 2359500 | ECONFINA CREEK NEAR BENNETT, FLA. | Time and Rainfall | 47.4 | 1935-Nov | 2021-Dec | 440.0 | 399.1 | 42.0 | -3.1 | 98.0 | FALSE |

## Table A7.3 Baseflow Step Trend Results

| Station Number | Station Name | Trend Explanatory Variable | Step Trend p-value | Significant Step Trend? | Period of Record Start Year | Period of Record End Year | Gap Period Start Year | Gap Period End Year |
|---|---|---|---|---|---|---|---|---|
| 2365200 | CHOCTAWHATCHEE RIVER NR PITTMAN, FL | Residual Baseflow | 0.290 | NO | 1977 | 2021 | 1981 | 1999 |
| 2366000 | HOLMES CREEK AT VERNON, FL | Residual Baseflow | 0.148 | NO | 1951 | 2022 | 1978 | 2006 |
| 2367310 | JUNIPER CREEK AT STATE HWY 85 NR NICEVILLE, FL | Residual Baseflow | 0.034 | YES | 1967 | 2022 | 1993 | 2013 |

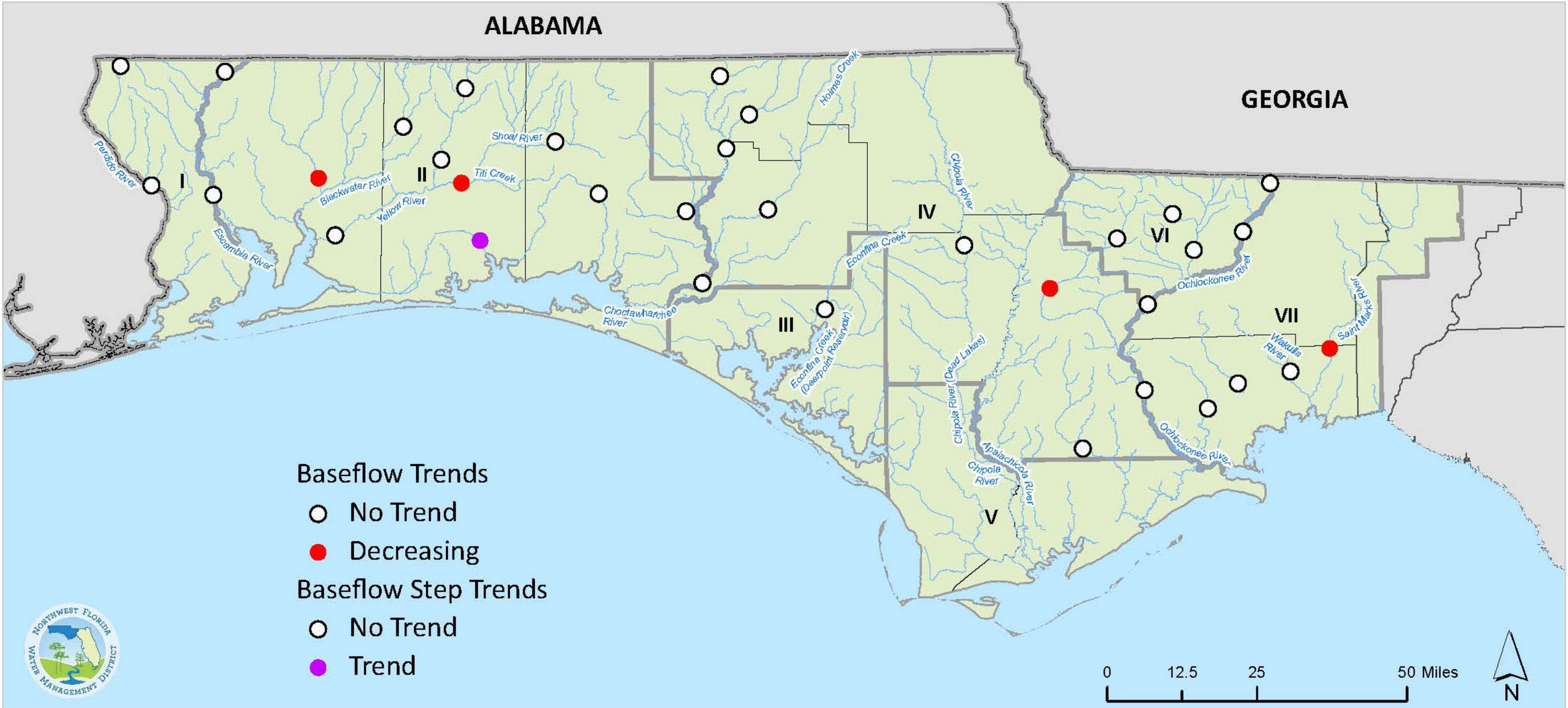


**Figure A7.1 Map of Baseflow Level Trend Results**

# APPENDIX 8: WATER QUALITY TREND ANALYSES RESULTS

Appendix 8 contains tables that summarize the results of trend analyses of chloride concentrations, total dissolved solids concentrations, and specific conductance values in groundwater. This appendix also includes maps showing geographic patterns in the results.
Unique symbol shapes are used in the maps to represent which aquifer a given trend analysis result pertains to and are as follows:

- Surficial aquifer system (SAS) wells are represented with ***triangular*** symbols.
- Sand and gravel (S&G) aquifer wells are represented with ***square*** symbols.
- Wells in the upper confining unit (UCU; also known as the intermediate system) of the Floridan aquifer system are represented with ***diamond***-shaped symbols.
- Upper Floridan aquifer (UFA) wells are represented with ***circular*** symbols.
- Lower Floridan aquifer (LFA) wells are represented with ***cross***-shaped symbols.
- Claiborne aquifer (CLR) wells are represented with ***pentagon***-shaped symbols.

Unique colors are also used in the maps to indicated trend analyses results for each well and are as follows:

- Insignificant trends are indicated by circular symbols with a ***black*** outline.
- Decreasing trends are indicated by ***blue*** circular symbols.
- Increasing trends are indicated by ***red*** circular symbols.
- Significant trends from step trend tests for wells that had long periods of missing data ('data gaps') in their period of record and for which there was no a priori assumption that groundwater levels should increase or decrease after the data gap are indicated by shapes with a ***purple*** outline.

**Table A8.1 Chloride Linear Trend Analysis Results**

| Region | County | Number of Sites Evaluated | Number of Significant Trends | |
|---|---|---|---|---|
| | | | Upward | Downward |
| I | Escambia | 8 | 2 | 1 |
| II | Santa Rosa | 4 | 0 | 1 |
| | Okaloosa | 30 | 10 | 1 |
| | Walton | 10 | 2 | 4 |
| III | Bay | 3 | 2 | 1 |
| IV | Washington | 2 | 1 | 0 |
| | Holmes | -- | -- | -- |
| | Jackson | -- | -- | -- |
| | Calhoun | -- | -- | -- |
| | Liberty | -- | -- | -- |
| V | Gulf | 1 | 0 | 0 |
| | Franklin | 7 | 4 | 0 |
| VI | Gadsden | 1 | 0 | 1 |
| VII | Leon | 1 | 0 | 0 |
| | Wakulla | 3 | 0 | 1 |
| | Jefferson | -- | -- | -- |

**Table A8.2 Chloride Nonlinear Trend Analysis Results**

| Region | County | Number of Sites Evaluated | Number of Significant Trends | |
|---|---|---|---|---|
| | | | Upward | Downward |
| I | Escambia | 1 | 1 | 0 |
| II | Santa Rosa | 5 | 1 | 2 |
| | Okaloosa | 12 | 2 | 6 |
| | Walton | 2 | 0 | 1 |
| III | Bay | -- | -- | -- |
| IV | Washington | -- | -- | -- |
| | Holmes | -- | -- | -- |
| | Jackson | -- | -- | -- |
| | Calhoun | -- | -- | -- |
| | Liberty | -- | -- | -- |
| V | Gulf | -- | -- | -- |
| | Franklin | -- | -- | -- |
| VI | Gadsden | -- | -- | -- |
| VII | Leon | -- | -- | -- |
| | Wakulla | -- | -- | -- |
| | Jefferson | -- | -- | -- |

**Table A8.3 Chloride Step Trend Analysis Results**

| Region | County | Step Trend Analyses of Change Following a Specific Event | | | Step Trend Analyses Comparing Periods Before and After a Data Gap | |
|---|---|---|---|---|---|---|
| | | Number of Upward Trends | Number of Downward Trends | Number of Insignificant Trends | Number of Significant Trends | Number of Insignificant Trends |
| I | Escambia | -- | -- | -- | 0 | 1 |
| II | Santa Rosa | -- | -- | -- | -- | -- |
| | Okaloosa | -- | -- | -- | 1 | 3 |
| | Walton | -- | -- | -- | 1 | 0 |
| III | Bay | -- | -- | -- | -- | -- |
| IV | Washington | -- | -- | -- | -- | -- |
| | Holmes | -- | -- | -- | -- | -- |
| | Jackson | -- | -- | -- | -- | -- |
| | Calhoun | -- | -- | -- | -- | -- |
| | Liberty | -- | -- | -- | -- | -- |
| V | Gulf | -- | -- | -- | -- | -- |
| | Franklin | -- | -- | -- | 1 | 0 |
| VI | Gadsden | -- | -- | -- | -- | -- |
| VII | Leon | -- | -- | -- | -- | -- |
| | Wakulla | -- | -- | -- | -- | -- |
| | Jefferson | -- | -- | -- | -- | -- |

**Table A8.4 Total Dissolved Solids Linear Trend Analysis Results**

| Region | County | Number of Sites Evaluated | Number of Significant Trends | |
|---|---|---|---|---|
| | | | Upward | Downward |
| I | Escambia | 4 | 0 | 0 |
| II | Santa Rosa | 7 | 1 | 1 |
| | Okaloosa | 29 | 3 | 2 |
| | Walton | 5 | 0 | 0 |
| III | Bay | 3 | 2 | 1 |
| IV | Washington | 1 | 0 | 0 |
| | Holmes | -- | -- | -- |
| | Jackson | -- | -- | -- |
| | Calhoun | -- | -- | -- |
| | Liberty | -- | -- | -- |
| V | Gulf | 1 | 0 | 0 |
| | Franklin | 6 | 4 | 0 |
| VI | Gadsden | 1 | 0 | 1 |
| VII | Leon | 1 | 0 | 0 |
| | Wakulla | 2 | 0 | 0 |
| | Jefferson | -- | -- | -- |

**Table A8.5 Total Dissolved Solids Nonlinear Trend Analysis Results**

| Region | County | Number of Sites Evaluated | Number of Significant Trends | |
|---|---|---|---|---|
| | | | Upward | Downward |
| I | Escambia | 2 | 0 | 0 |
| II | Santa Rosa | -- | -- | -- |
| | Okaloosa | 2 | 0 | 1 |
| | Walton | 1 | 0 | 0 |
| III | Bay | -- | -- | -- |
| IV | Washington | -- | -- | -- |
| | Holmes | -- | -- | -- |
| | Jackson | -- | -- | -- |
| | Calhoun | -- | -- | -- |
| | Liberty | -- | -- | -- |
| V | Gulf | -- | -- | -- |
| | Franklin | -- | -- | -- |
| VI | Gadsden | -- | -- | -- |
| VII | Leon | -- | -- | -- |
| | Wakulla | -- | -- | -- |
| | Jefferson | -- | -- | -- |

### Table A8.6 Specific Conductance Linear Trend Analysis Results

| Region | County | Number of Sites Evaluated | Number of Significant Trends | |
|---|---|---|---|---|
| | | | Upward | Downward |
| I | Escambia | 3 | 2 | 0 |
| II | Santa Rosa | -- | -- | -- |
| | Okaloosa | 5 | 2 | 2 |
| | Walton | 2 | 1 | 0 |
| III | Bay | 2 | 1 | 1 |
| IV | Washington | 2 | 1 | 0 |
| | Holmes | -- | -- | -- |
| | Jackson | -- | -- | -- |
| | Calhoun | 2 | 2 | 0 |
| | Liberty | -- | -- | -- |
| V | Gulf | -- | -- | -- |
| | Franklin | 3 | 3 | 0 |
| VI | Gadsden | -- | -- | -- |
| VII | Leon | 1 | 1 | 0 |
| | Wakulla | -- | -- | -- |
| | Jefferson | -- | -- | -- |

### Table A8.7 Specific Conductance Step Trend Analysis Results

| Region | County | Step Trend Analyses of Change Following a Specific Event | | | Step Trend Analyses Comparing Periods Before and After a Data Gap | |
|---|---|---|---|---|---|---|
| | | Number of Upward Trends | Number of Downward Trends | Number of Insignificant Trends | Number of Significant Trends | Number of Insignificant Trends |
| I | Escambia | -- | -- | -- | -- | -- |
| II | Santa Rosa | -- | -- | -- | -- | -- |
| | Okaloosa | -- | -- | -- | 0 | 1 |
| | Walton | -- | -- | -- | 1 | 0 |
| III | Bay | -- | -- | -- | -- | -- |
| IV | Washington | -- | -- | -- | -- | -- |
| | Holmes | -- | -- | -- | -- | -- |
| | Jackson | -- | -- | -- | -- | -- |
| | Calhoun | -- | -- | -- | -- | -- |
| | Liberty | -- | -- | -- | -- | -- |
| V | Gulf | -- | -- | -- | -- | -- |
| | Franklin | -- | -- | -- | -- | -- |
| VI | Gadsden | -- | -- | -- | -- | -- |
| VII | Leon | -- | -- | -- | -- | -- |
| | Wakulla | -- | -- | -- | -- | -- |
| | Jefferson | -- | -- | -- | -- | -- |


**Figure A8.1. Map of Chloride Trend Results for Region I**

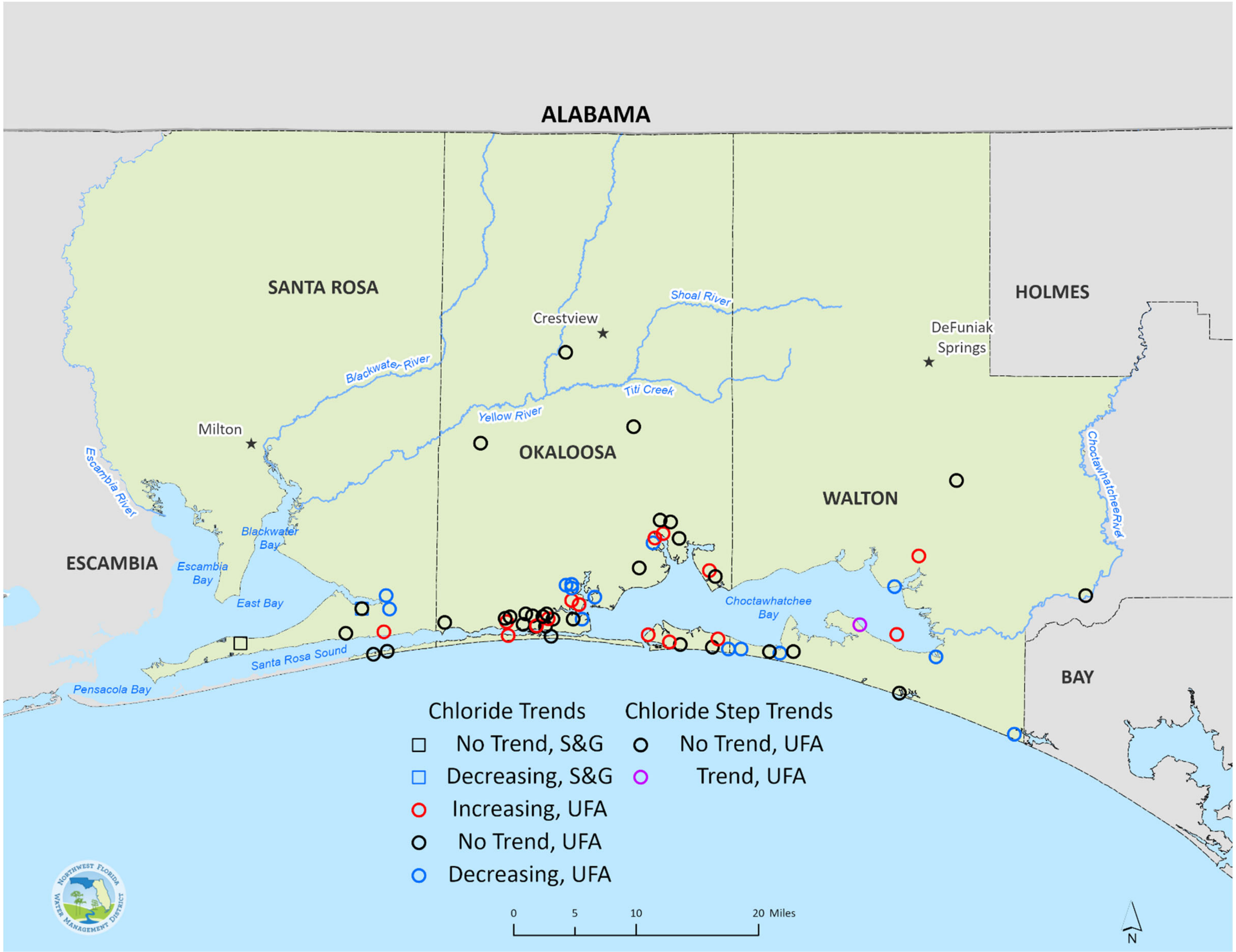


**Figure A8.2. Map of Chloride Trend Results for Region II**

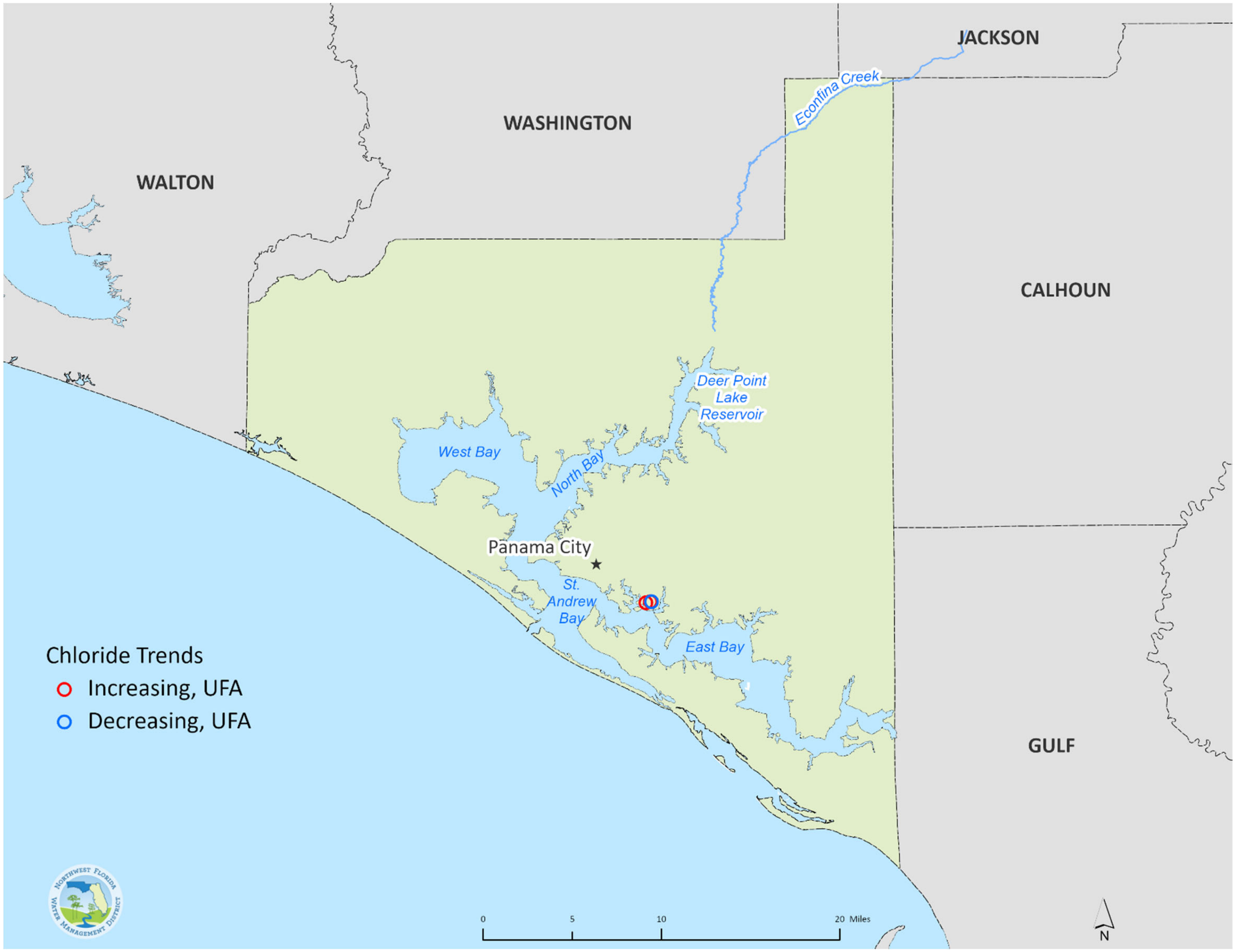


**Figure A8.3. Map of Chloride Trend Results for Region III**


**Figure A8.4. Map of Chloride Trend Results for Region IV**

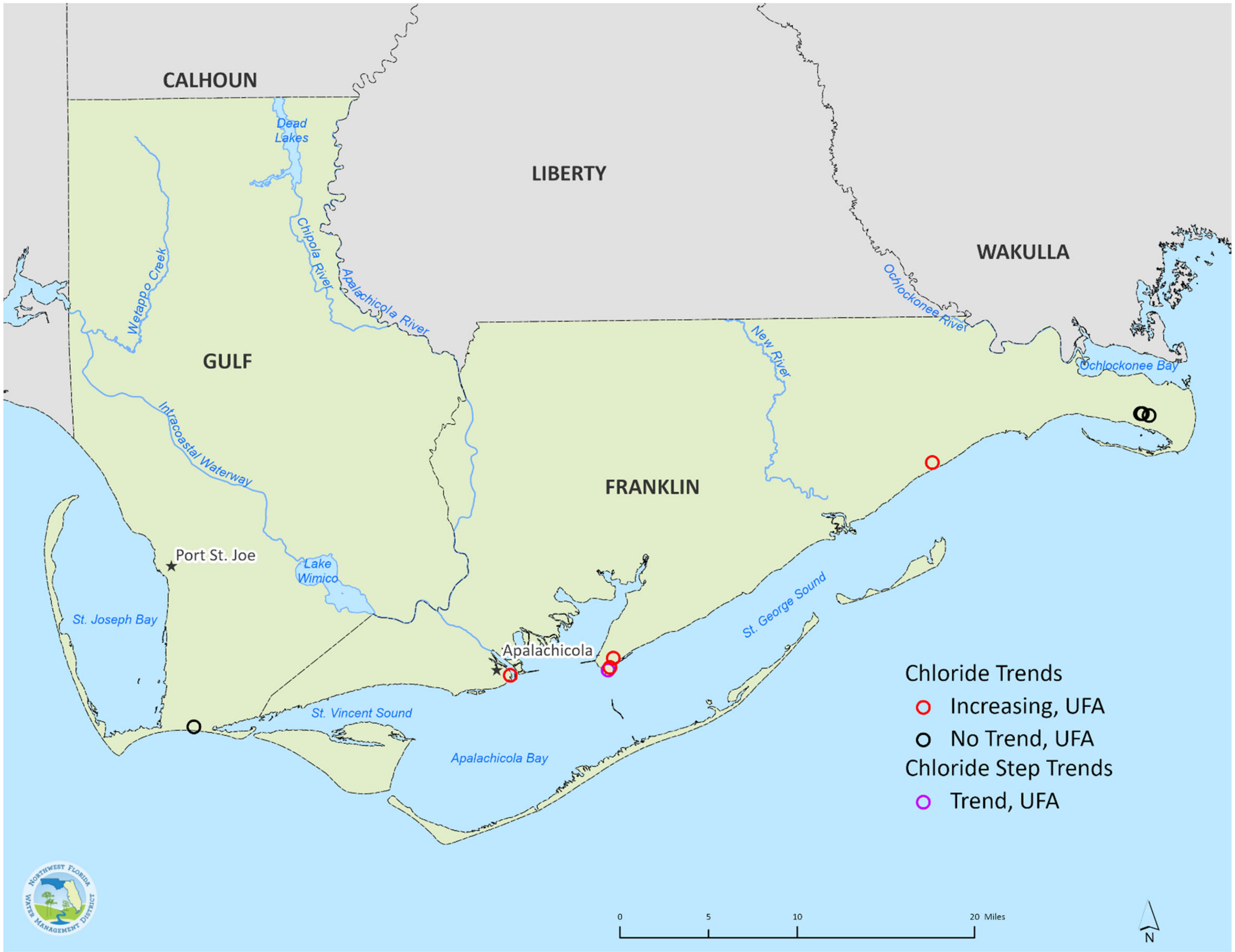


**Figure A8.5. Map of Chloride Trend Results for Region V**

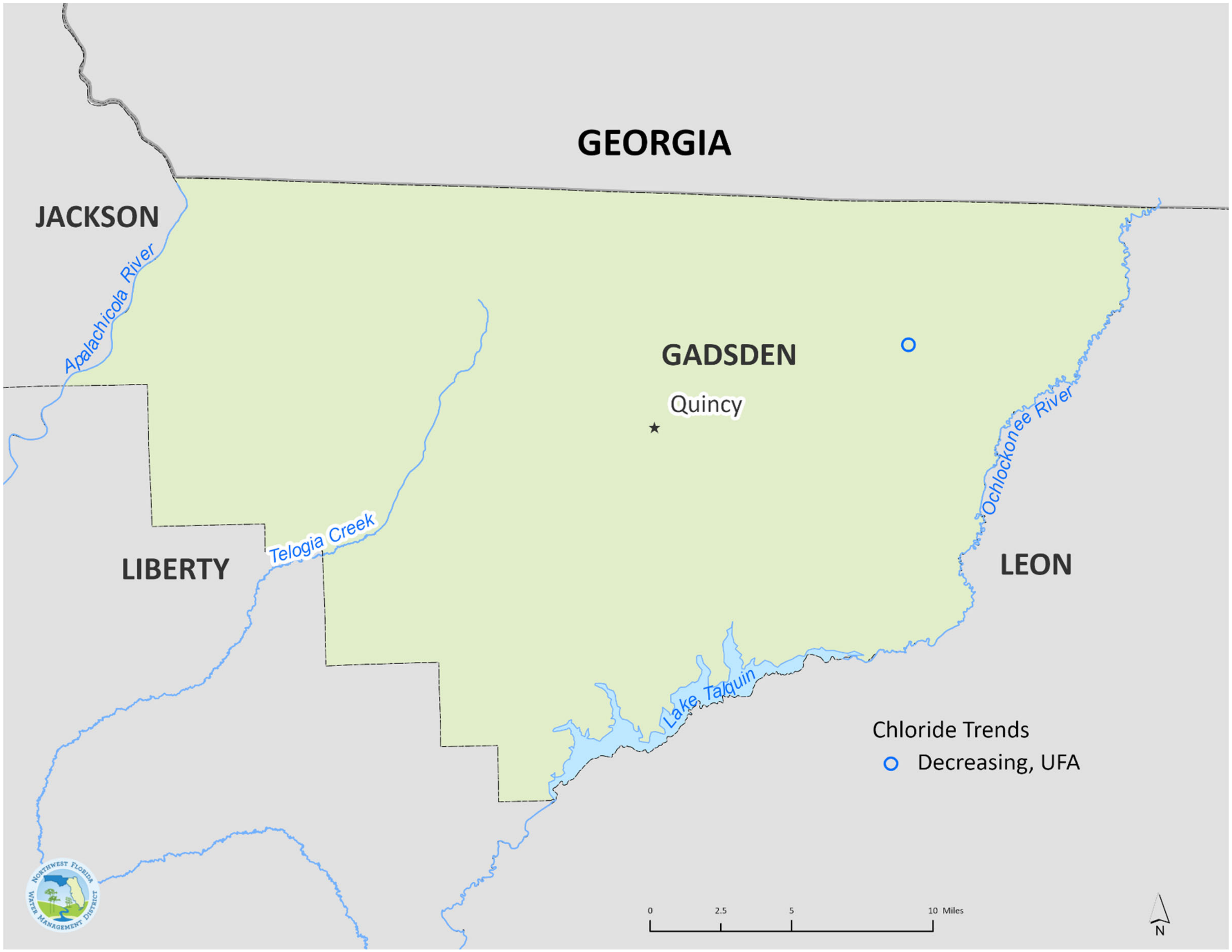


**Figure A8.6. Map of Chloride Trend Results for Region VI**


**Figure A8.7. Map of Chloride Trend Results for Region VII**


**Figure A8.8. Map of Total Dissolved Solids Trend Results for Region I**

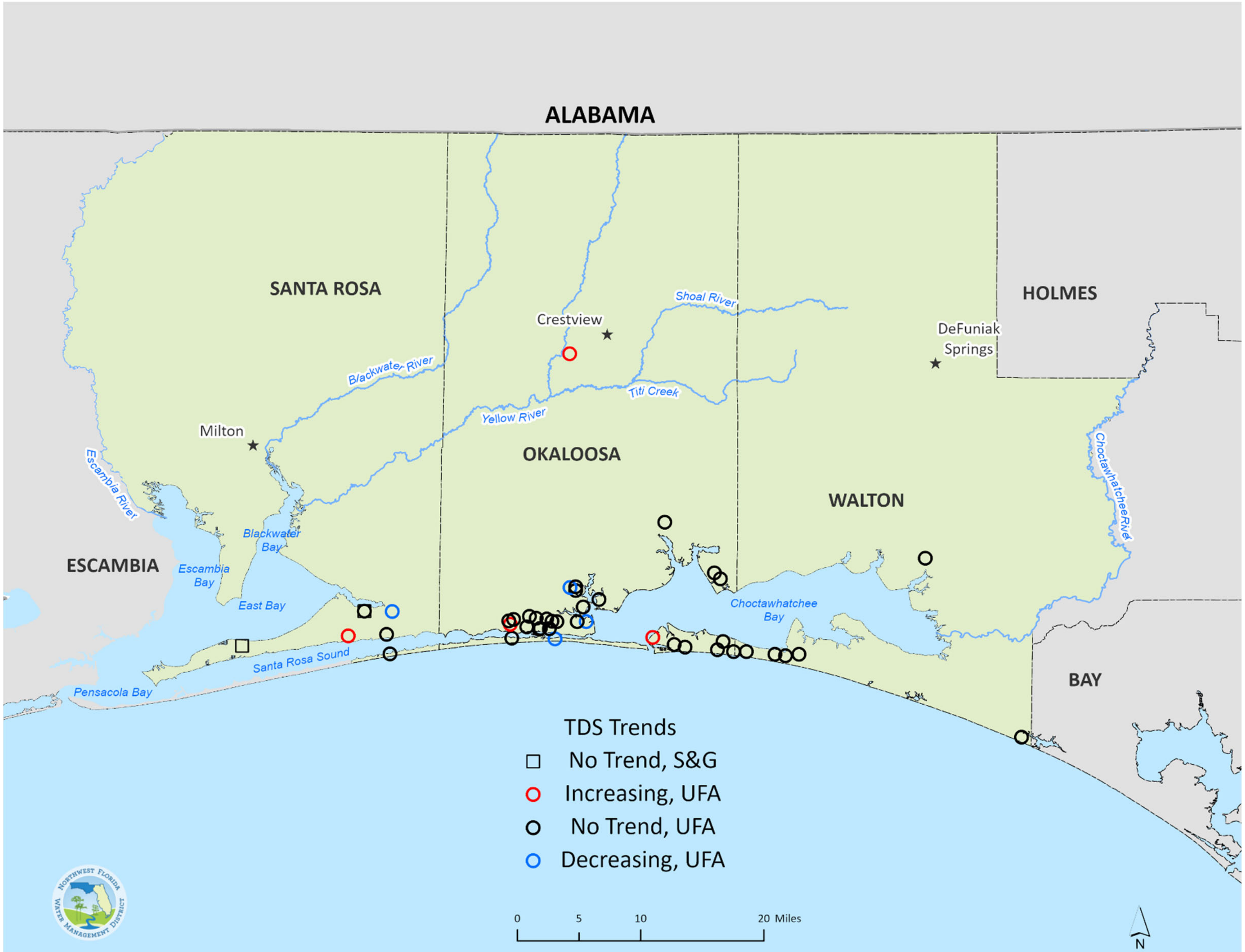


**Figure A8.9. Map of Total Dissolved Solids Trend Results for Region II**

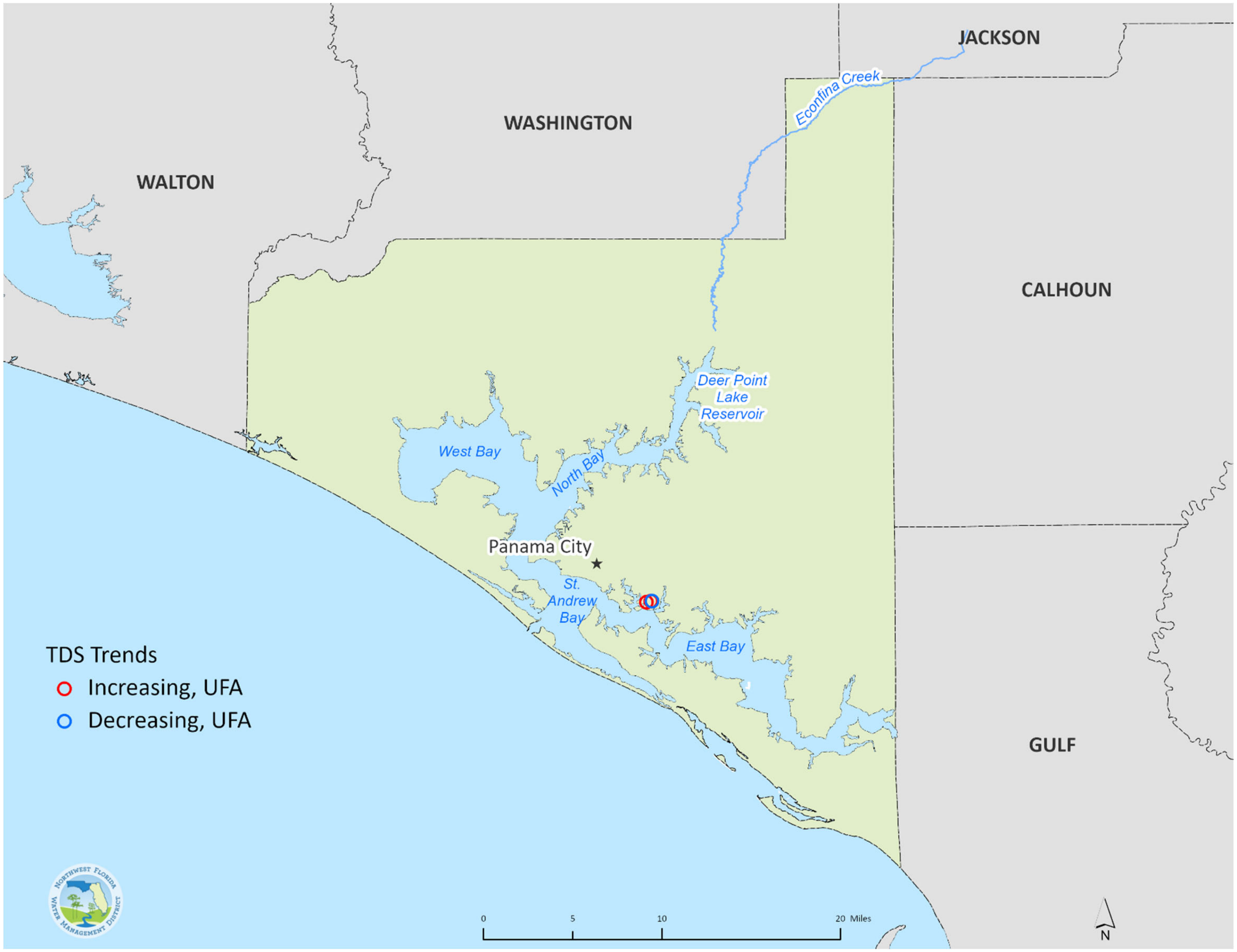


**Figure A8.10. Map of Total Dissolved Solids Trend Results for Region III**


**Figure A8.11. Map of Total Dissolved Solids Trend Results for Region IV**

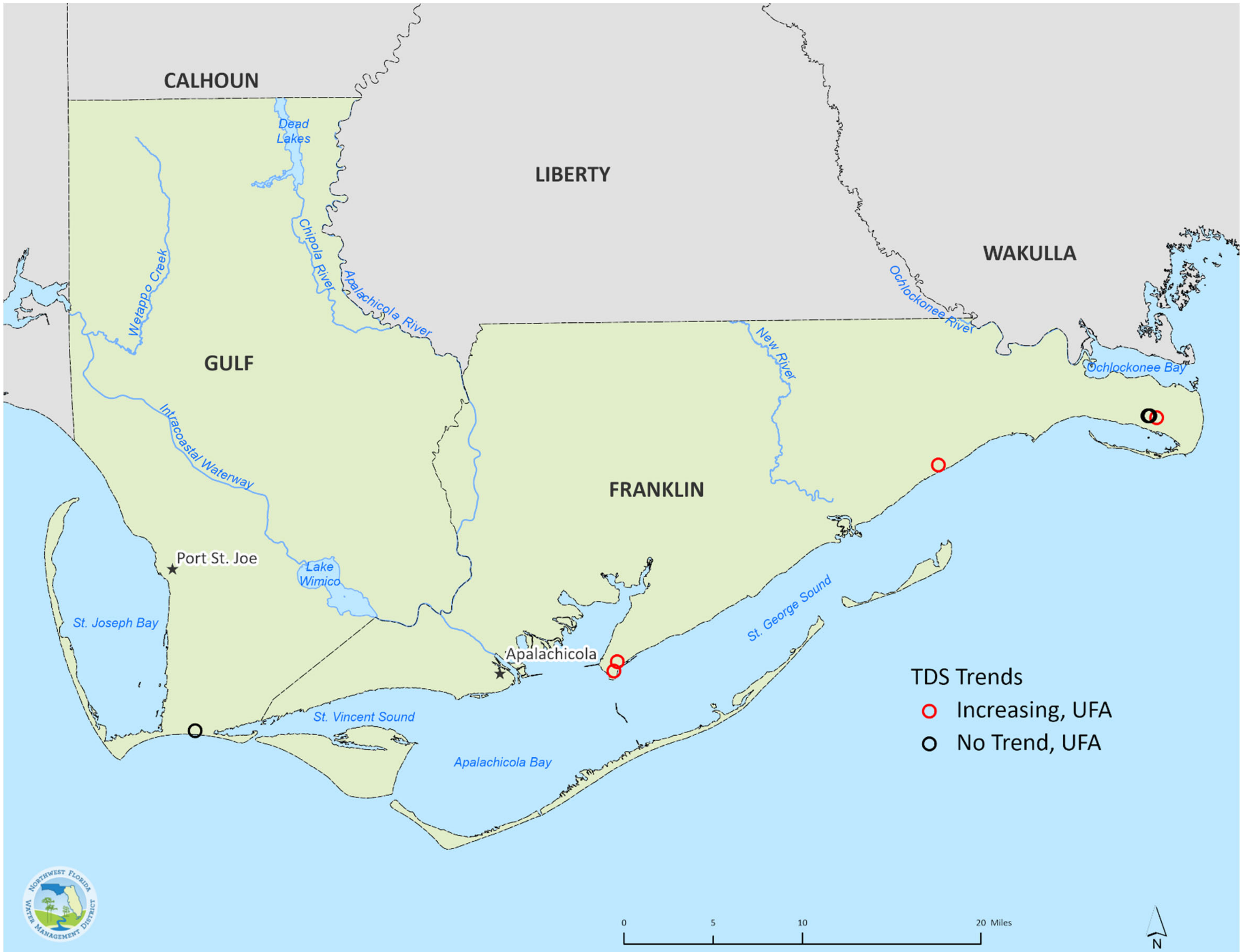


**Figure A8.12. Map of Total Dissolved Solids Trend Results for Region V**

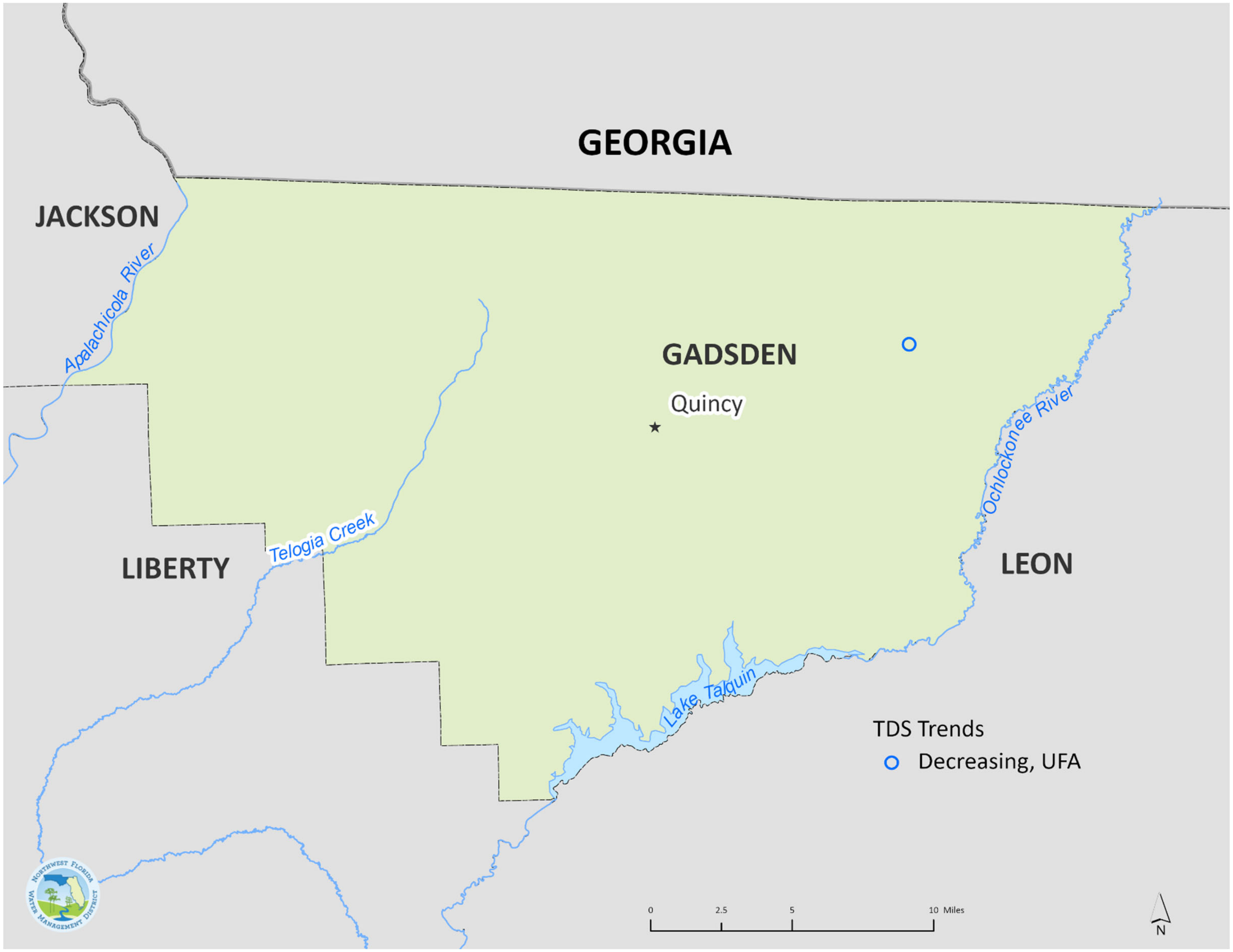


**Figure A8.13. Map of Total Dissolved Solids Trend Results for Region VI**


**Figure A8.14. Map of Total Dissolved Solids Trend Results for Region VII**


**Figure A8.15. Map of Specific Conductance Trend Results for Region I**


**Figure A8.16. Map of Specific Conductance Trend Results for Region II**


**Figure A8.17. Map of Specific Conductance Trend Results for Region III**


**Figure A8.18. Map of Specific Conductance Trend Results for Region IV**


**Figure A8.19. Map of Specific Conductance Trend Results for Region V**


**Figure A8.20. Map of Specific Conductance Trend Results for Region VII**