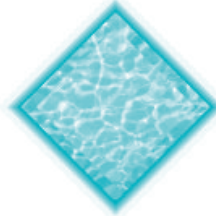


The Human Framework



We see things not as they are, but as we are.

— Henry Major Tomlinson, *Out of Soundings*, 1931

KEY IDEAS

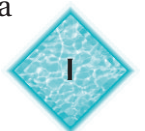
- Water has played a critical role in the settlement of Florida since the first humans arrived around 14,000 years ago.
- Water resources exist within legal, social, economic and political contexts.
- Early in Florida's development as a state, the main themes of water management were drainage, flood control and navigation.
- Today, Floridians are actively seeking ways to preserve, protect and restore water resources.
- Modern water management in Florida is governed by the Water Resources Act of 1972, one of the most innovative laws of its kind in the nation.

VOCABULARY

Drainage
 Ecosystem restoration
 Flood control
 Hammocks
 Land acquisition
 Limestone
 Minimum flows and levels
 Navigation
 Prior appropriation
 Reasonable and beneficial use
 Riparian
 Savanna
 Water allocation
 Water supply

In Florida for at least 14,000 years, human settlement has been shaped by water. Although its official nickname is “The Sunshine State,” Florida could very well be called “The Water State.” Florida is surrounded on three sides by water. Its landmass is underlain by water-filled **limestone**: highly porous rock formed over millennia from shells and bones of sea animals. The Florida Keys, a gentle arc of islands extending 93 kilometers (150 miles) south of the peninsula to Key West, are coral rock covered in most places with a thin layer of sand. Florida's abundance of sinkholes, springs, rivers and lakes is partly the result of the rising and falling of sea level. The sea is also largely responsible for the state's many bays, inlets and islands. On average, more rain falls in Florida (135 centimeters or 53 inches) per year than in any other state in the nation besides Louisiana, which receives an average of 140 centimeters (55 inches) (Henry et al. 1994). In Florida, rain does not always fall when and where it is needed, and sometimes too much rain falls too quickly.

Water management in Florida today has evolved from lessons learned through experience, as well as from changing philosophies about natural resources and the environment. Early in the state's history, Floridians were most concerned about **drainage, flood control and navigation**. Natural resources were to be used, controlled and modified. Wetlands were drained for farms, groves and houses. Canals were cut to facilitate drainage and to improve navigation. Floodwaters were held back with engineering works. Wastes were discharged without treatment into rivers, lakes and coastal waters. Florida was thought to have too much



water. Now, the value and the finite nature of Florida's water resources are clear. Water managers today are concerned with water quality protection, **water supply** planning and water resources development, and

preservation and protection of the natural environment. Conserving, protecting and restoring natural systems, while ensuring an adequate supply of water, remains one of Florida's greatest challenges.

The First Floridians

About 14,000 years ago, people first entered the Florida peninsula. Known as "Paleoindians," these original Floridians survived by hunting mastodons, camels, mammoths, bison and horses. At the time, much of the world's water was frozen in glaciers, sea level was much lower than it is today, and Florida was a dry, large, grassy prairie. Many present-day rivers, springs and lakes had yet to be formed; even groundwater levels were far lower than they are today. Sources of fresh water were limited, and finding them was critical to the survival of the Paleoindians and the animals they hunted for food. The Paleoindians lived and hunted near springs and lakes. Many of these sites are now under water. Archeologists have found bone and stone weapons and tools in many springs and rivers, and even offshore in the Gulf of Mexico.

About 9000 B.C., glaciers melted, sea level rose and Florida's climate became wetter. As forests replaced grasslands, big game animals disappeared. A larger number of rivers and lakes afforded many more suitable places for people to live. By 3000 B.C., when Florida's climate became similar to today's climate, people occupied almost every part of the present state. Numerous settlements developed in coastal regions in southwest, northwest and northeast Florida, as well as along the St. Johns River (Milanich 1995). People took full advantage of the plentiful supply of fish and shellfish. Along the coasts and the banks of rivers and bays, huge mounds of shells from millions of prehistoric meals began to accumulate.

When Spanish explorers arrived in Florida in the 1500s, an estimated 350,000 Native Americans were living throughout the present-day state

(Milanich 1995). The Apalachee and Timucuan in the north were farmers and grew corn, beans and squash. Their large villages were often located near the region's many lakes and rivers. Although they grew food, the Apalachee and Timucuan still obtained part of their diet from hunting, fishing and gathering of wild plants. The Native Americans living in the southern part of the peninsula continued to live exclusively off the natural bounty of the land and the sea.

The Belle Glade people lived on the vast **savanna** around Lake Okeechobee. They built villages on mounds and earthen embankments, and connected them by canoe highways.

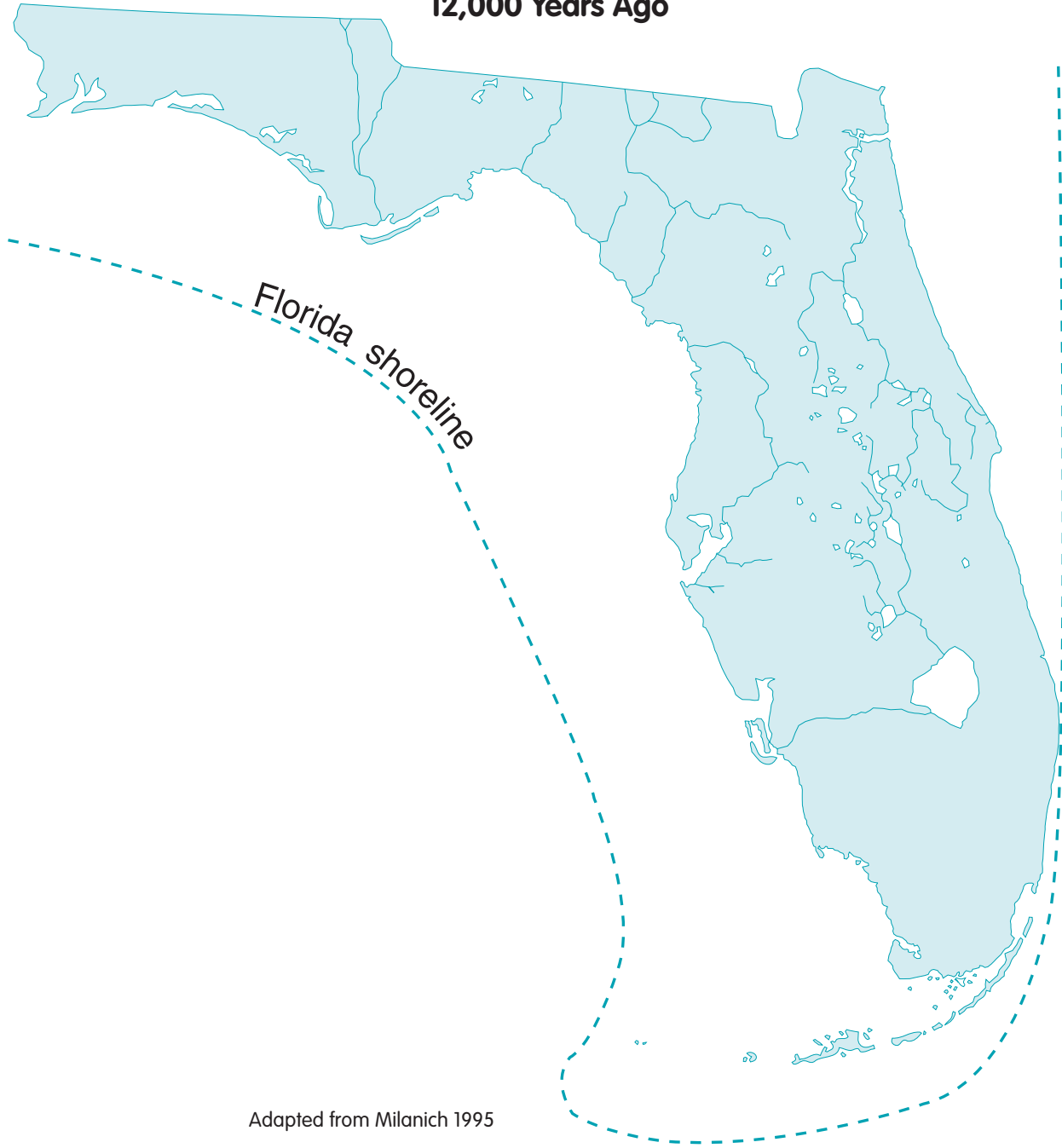
Along the southwest coast, a remarkable people called the Calusa lived by fishing, gathering shellfish, collecting plants and hunting. The Seminole Indians later immortalized the Calusa by naming the major river in the region the Caloosahatchee, "river of the Calusa." A single chief ruled the Calusa's vast domain. They lived in large villages and developed elaborate political, social and trade networks, as well as highly sophisticated art. They traveled into the gulf in canoes lashed together to form catamarans. This level of cultural development is usually only obtained with agriculture. Only by growing crops do people usually have enough food to support villages and to allow some individuals to specialize in pursuits other than obtaining food. However, the Calusa's natural environment was so rich that they were able to grow and thrive without crops.

By the early 1700s, virtually all the members of Florida's original Native American groups were gone, many having succumbed to European diseases for

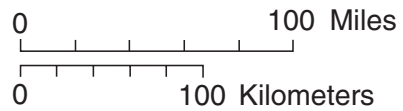
which they had no resistance. Remnants of other southeastern Indian groups, later known as the Seminoles, began to move into the now abandoned fertile farmlands

around the lakes and rivers in northern Florida. The only permanent settlements of any consequence were St. Augustine, Pensacola and Key West.

Paleoindian Period 12,000 Years Ago



Adapted from Milanich 1995





Seminole Indian Village, Royal Palm Hammock, 1920s

Source: Florida State Archives

THE SEMINOLES

ADAPTATION TO A WATERY WILDERNESS

The Seminole Indians — with their dugout canoes, chickees, and loose, colorful patchwork clothing — have long been associated with south Florida. But the Seminoles did not originate in south Florida or any place else in the state. Their ancestors were members of populous tribes and chiefdoms from other parts of the southeastern United States. These groups — the Oconee, Yuchi, Alabama, Yamasee, Hitchiti, Koasati and dozens of others — were called “Creeks” by English settlers.

The Creeks were farmers and hunters. Corn was their principal crop, and each year the Creeks celebrated its ripening with the Green Corn Dance. Some Creeks lived in towns of 5,000 to 15,000 people. These towns were built around a plaza, which included a square ground (a square flat cleared area). In the center of the square ground was the ceremonial fire with four logs pointing in

cardinal directions. At one end was a circular council house where men discussed political affairs. Family compounds consisted of a cooking house, a winter house and a storage house. Other Creeks lived outside of towns along the banks of rivers and streams in family camps (Weisman 1999).

Creeks in towns and in the countryside were linked together by clans. All Creeks belonged to clans, family groups named after animals or natural events. Some Creek clans were the Bear, Deer, Wildcat, Tiger (Panther), Wolf, Alligator, Wind and Turkey. Both male and female children belonged to the clan of their mother and remained a part of this clan for their entire lives. Clans lived together in camps or in the same part of town. When you visited a new town or a new part of Creek country, other members of your clan welcomed you.

By the 18th century, Creek clothing was a blend of European and traditional Indian styles. The men wore cloth turbans, belts, beads, and leggings and jackets of deerskin. Women wore long dresses of manufactured cloth.

The Creeks traveled long distances on the Southeast's numerous rivers and streams in dugout canoes. They were skilled hunters, and the men spent much of their time hunting deer and other animals. Creeks traded the pelts of the animals they hunted for European traders' guns and other manufactured items.

By the early 1700s, small bands of Creeks began migrating into northern Florida, at first to hunt and later to farm lands once occupied by the Timucuan and Apalachee Indians. These groups were now gone, their members having died in conflicts with Europeans or from European diseases for which they had no resistance.

The name "Seminole" was first recorded in field notes accompanying a 1765 map of Florida. Most scholars believe it was derived from the Spanish "cimarrone," meaning "wild" or "runaway." By 1800, many of the Seminoles were prospering, raising cattle and growing crops. Some lived in two-story houses and owned slaves. These newcomers to Florida had built towns from the Apalachicola River to the St. Johns River and from south Georgia to the Caloosahatchee River.

As the American colonists settled more and more of the South, more Indians fled to Florida. Soon, however, Florida lands also became desirable to the colonists. The Treaty of Payne's Landing, signed in 1832, required the Indians to give up their Florida lands and move to Indian Territory in the West. The Seminoles refused and a 7-year war ensued, fought between the Seminoles and the United States in the swamps and hammocks of central Florida. At the end of the war, several hundred Seminoles were forcibly shipped to Indian Territory, while others escaped into the watery wilderness of Big Cypress Swamp and the Everglades.

It was on the **hammocks**, small tree

islands in the midst of marsh and swampland, that the Seminoles made their home. Never a maritime or aquatic culture, like the Calusa Indians who had lived before them in southern Florida, the Seminoles adapted their traditional ways of making a living — farming, raising livestock and hunting — to their new wetter and warmer home.

They settled in clan camps rather than in towns. Although no longer united around towns, clan camps came together each year for the traditional Green Corn Dance. They cleared trees from the center of the hammocks and grew corn, squash, melons and peas on the rich soil. They ran their cattle on lands that were dry enough. Their reliance on wild plants and animals increased. They ate the new shoots of cabbage palm and prepared flour (known as coontie) from the root of the tropical tuber zamia. They continued to hunt deer and hunted the then-abundant manatee, which they called "giant beaver."

They abandoned their traditional four-walled board cabin for chickees, distinctive open-air structures built of cypress poles with palmetto-thatched roofs. The local environment provided all the materials they needed for construction. They traveled between settlements in dugout canoes, and they exchanged their deerskin garments for fewer, more loosely fitting cotton clothes.

After the Civil War, the Seminoles, like their Creek ancestors, began to hunt commercially. They provided traders with skins of otters, deer, raccoons and alligators, as well as with feathers from the thousands of tropical birds found in the Everglades (Kersey 1975). Women in cities in America and Europe fueled the market for plumes with their insatiable desire for exotic feathers used to decorate their hats.

By early in the twentieth century, the Seminoles' world changed again. Plume hunting was outlawed in an effort to save the remaining birds. Illegal trade continued and ended only when women's fashions changed (Weisman 1999). The physical environment

was also rapidly changing. Roads were being built, land was being drained for agriculture, and new communities were springing up overnight. In order to survive, the Seminoles had to adapt. This time they adapted by responding to the growing tourist market (West 1998). They entertained tourists with alligator wrestling and later with airboat rides. Women used hand-cranked sewing machines to more quickly sew the colorful cotton patchwork for which the Seminoles are famous. Seminole dolls and patchwork clothing became popular tourist items.

By the 1960s the Seminoles had separated into two political groups: the Seminole Tribe of Florida and the Miccosukee Tribe. A group of about 100 individuals continued to live in the Everglades and chose not to enroll in either tribe.

Today, tourism is still an important aspect of the Seminole culture and economy. Both the Seminole Tribe and the Miccosukee Tribe operate high-stakes bingo palaces. On its Big Cypress reservation, the Seminole Tribe attracts tourists with its Ah-Tha-Thi-Ki ("to learn") Museum, Big Cypress Hunting Adventures, and Billie Swamp Safari. The Seminoles also run multi-million dollar cattle and citrus operations and maintain a fleet of aircraft. But they still pass their legends on from generation to generation and they still belong to clans (Bear, Panther, Wind, Otter, Snake, Bird, Deer and Big Town). They continue to gather each spring in a secret location far from the hustle and bustle of the modern world to reaffirm their identity and survival through the Green Corn Dance.

Drainage, Flood Control and Navigation

When Florida became a state in 1845, most of its 70,000 inhabitants lived in the north. The state had few assets other than land, much of which was unsuitable for development without drainage and flood control. Water remained the main avenue of travel, and Floridians clamored for canals and river improvements. As early as 1824, the legislative council of the territory had proposed a ship canal across north Florida to spare ships the long and dangerous journey around the peninsula.

At statehood, Congress granted the state 500,000 acres (202,400 hectares) of federal land outright for "internal improvements." Five years later, the state received an additional 20 million acres (8 million hectares) through an act that transferred all "land unfit for cultivation due to its swampy and overflowed condition." In 1881, the state sold 4 million acres (1.6 million hectares) at 25 cents per acre to Philadelphia businessman Hamilton Disston.

The following year, Disston began to dig canals in the upper Kissimmee River basin and the Caloosahatchee-Lake Okeechobee region. These waterways were to drain the land in the interior of the state and to provide corridors to transport crops and commercial products.

As the 1800s drew to a close, Florida remained largely dependent on water transport. Phosphate had been discovered in the Peace River valley, and boats equipped with steam dredges were used to mine the sand bars. Steamboats carried passengers and freight to coastal ports and to hundreds of riverside docks. Florida's leading product, lumber, was transported by water to markets in Europe and the northeastern United States. Construction of railroads in the late 1800s opened virgin forests to the growing lumber and naval stores (turpentine and rosin) industries. Before railroads, water transportation limited lumbering to the banks along major rivers and streams. During times when rivers were low, logs

could not be transported to markets and water-powered saw mills had to be shut down.

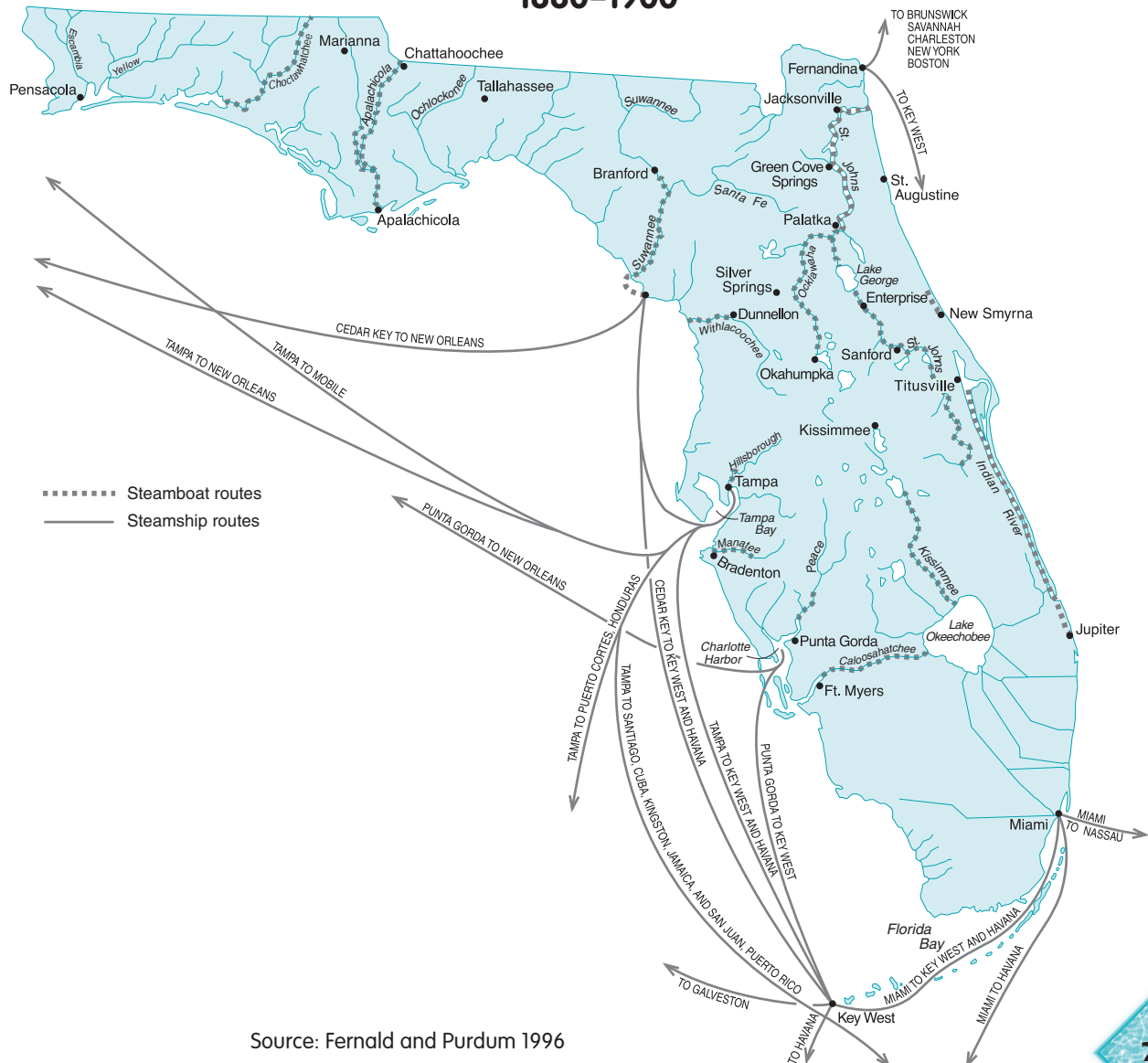
Meanwhile, Florida's mineral springs, spas, rest homes and warm climate began to attract northern visitors seeking relief from rheumatism and from asthma and other lung ailments. Steamboat tours along the major rivers of north and central Florida became very popular, especially with hunters. In fact, by the late 1800s, game animals along the middle St. Johns River had become scarce.

As the twentieth century dawned, south Florida was still largely in its natural state.

In 1904, Napoleon Bonaparte Broward was elected governor by promising to drain the Everglades. Established in 1913, the Everglades District became the first of several districts that carried out drainage projects in south Florida.

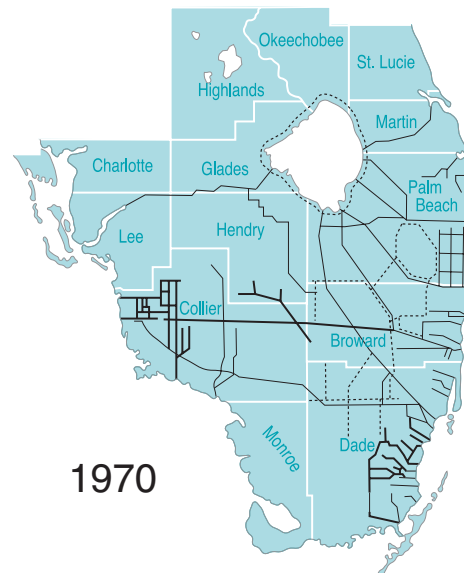
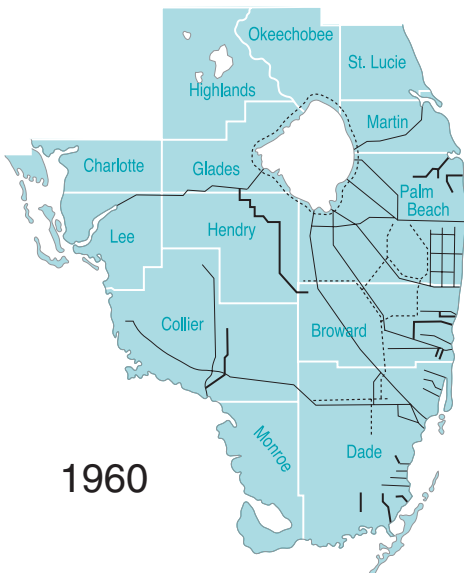
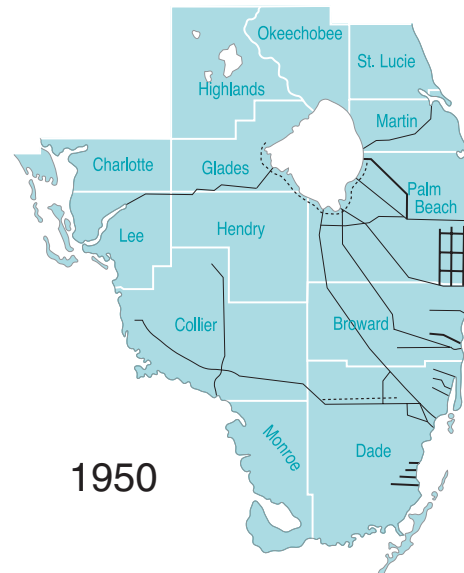
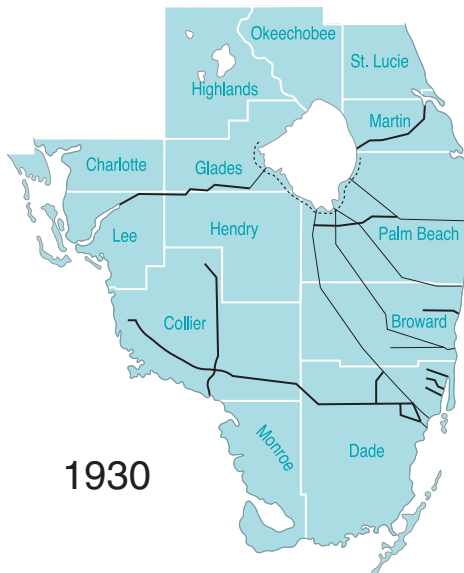
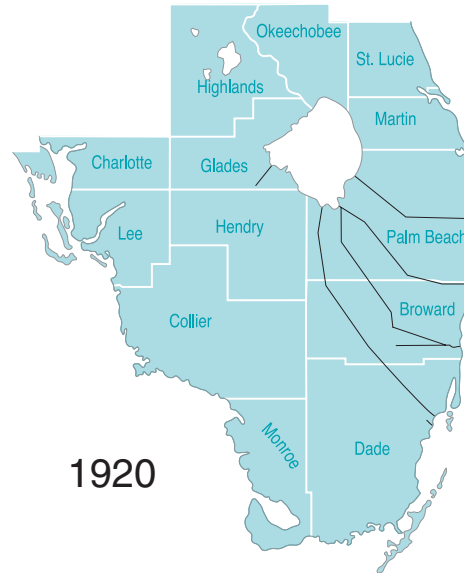
Drainage projects around Lake Okeechobee encouraged settlement and development of agriculture, but the region was still vulnerable to the catastrophic effects of extremely strong hurricanes that swept across south Florida in the 1920s. During the 1926 hurricane, the dike along the southern perimeter of the lake broke, killing more than 400 people in the Moore

Navigation 1880-1900



Growth of Water Control System South Florida

- Major canal existing at given date
- New canal since last date
- Major levee



Haven area. During the 1928 hurricane, wind-blown water overflowed the lake, drowning more than 2,000 people. As a consequence, the Okeechobee Flood Control District was established in 1929. The U.S. Army Corps of Engineers began a major program of flood control in Florida, including construction of the 53-kilometer-long (85-mile-long) Herbert Hoover Dike flanking Lake Okeechobee.

In 1947, two more hurricanes and floods hit south Florida. Again, the existing network of canals and levees failed to protect farms and newly populous coastal communities. In response, Congress passed the Flood Control Act of 1948, calling for a huge multistage flood control project designed and constructed by the U.S. Army Corps of Engineers. The Central and Southern Florida Flood Control District was created by the Florida Legislature in 1949 to operate and maintain the massive project.

Streams and lakes were also modified in other parts of Florida. In the late 1800s and early 1900s, land was drained in the Ocklawaha and Peace river basins for farms, and canals were dug to create navigation routes for shipping vegetables, citrus, timber and other products. Coastal navigation waterways were also under construction, and the Intracoastal Waterway from Jacksonville to Miami was completed in 1912. The waterway provided a safer means of travel along the often hazardous east coast, and it linked river channels and the Okeechobee Waterway to Florida's deep-water coastal ports.

Construction of major water control works continued into the 1960s. In 1961, Congress authorized the Four River Basins, Florida Project for flood control in the Tampa Bay area. Construction of the Kissimmee Canal began in 1962. Work on the Cross Florida Barge Canal, first begun in 1935, resumed in the 1960s with the installation of major locks and dams on the Withlacoochee and Ocklawaha rivers. Opposition to this canal grew steadily during the late 1960s until President Nixon halted construction in 1971. Controversy

about the Rodman Dam and Reservoir portion of the Cross Florida Barge Canal project persists to this day. Various environmental groups have called for removal of the dam and the restoration of the Ocklawaha River. Portions of the Kissimmee River, channelized barely 30 years ago, are now being restored.

1972 YEAR OF THE ENVIRONMENT

- Florida Water Resources Act creates regional water management districts and establishes a permit system for allocating water use.
- Land Conservation Act authorizes the sale of state bonds to purchase environmentally endangered lands.
- Environmental Land and Water Management Act creates Development of Regional Impact and Area of Critical State Concern programs.
- The Comprehensive Planning Act requires development of a state comprehensive plan.
- First public hearing on the restoration of the Kissimmee River.
- Federal Clean Water Act sets "swimmable and fishable" as goal for all U.S. waters.
- Florida citizens approve a constitutional amendment authorizing \$240 million in state bonds for the Department of Natural Resources to purchase environmentally endangered lands.

Modern Water Management

1970s

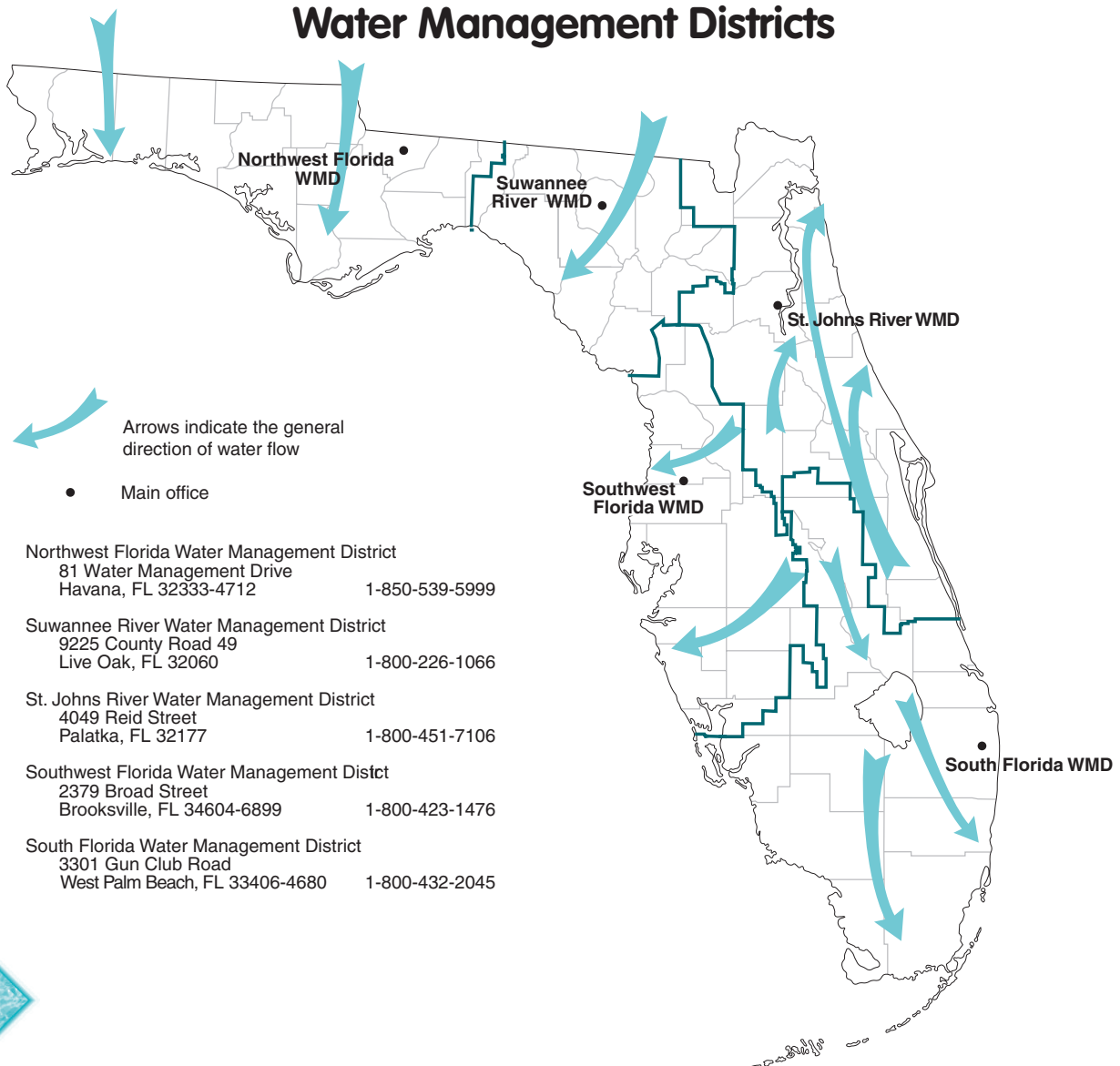
Attitudes toward water and the environment began to change as the consequences of uncontrolled growth and damage to the natural environment became more and more evident. During 1970–71, Florida experienced its worst drought to date, spurring state leaders to action. Four major pieces of legislation were enacted by the 1972 Legislature: the Environmental Land and Water Management Act, the Comprehensive Planning Act, the Land Conservation Act, and the Water Resources Act. These laws are based on the philosophy that land use, growth policy and water management cannot be separated, a theme

that continues to this day.

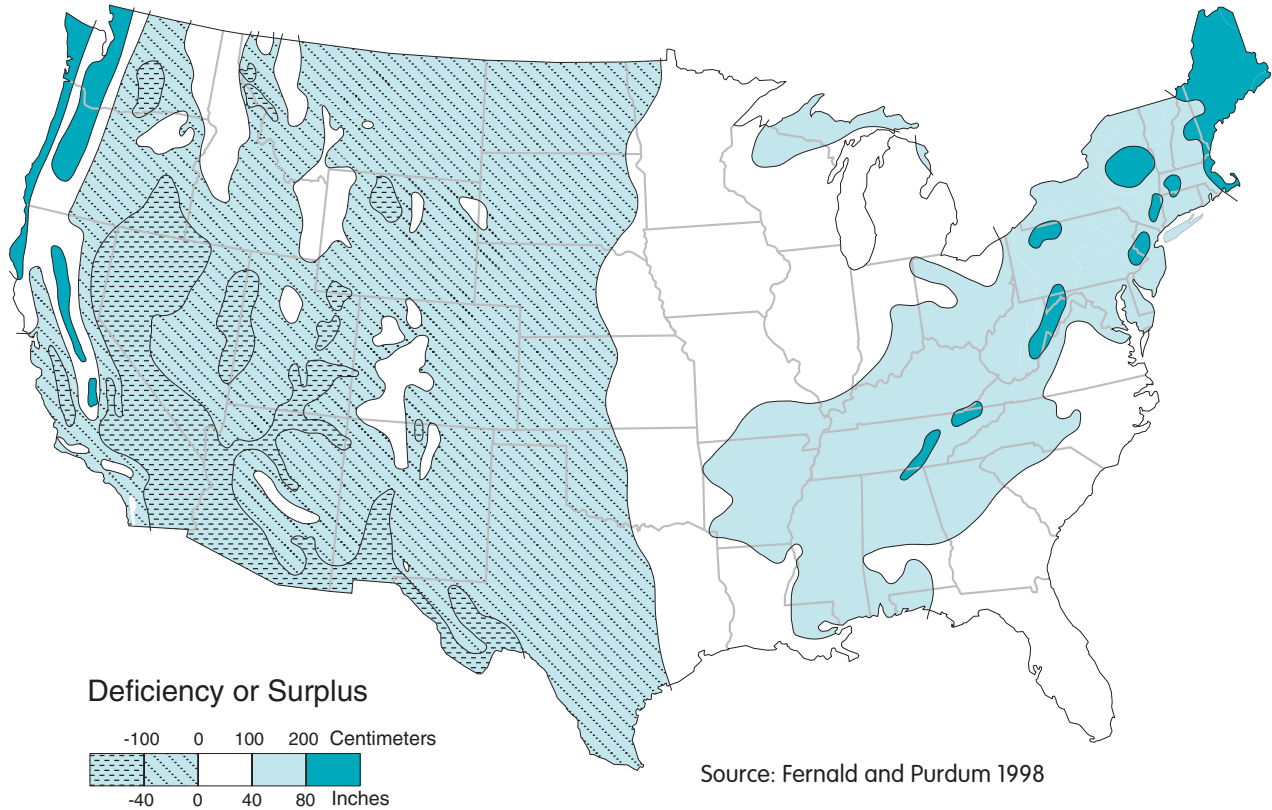
Florida's institution of water management is unique — regional agencies, established by the Legislature and recognized in the state constitution, based on hydrologic boundaries and funded by a tax usually reserved for local government.

The 1972 Water Resources Act established five water management districts with broad authority and responsibilities. Responsibilities encompass the four broad categories of water supply (including conservation and allocation), water quality, flood protection and natural systems management.

Water Management Districts



Water Deficiency and Surplus



WATER LAW

Study this map. What differences do you notice between the eastern and western United States?

Significantly less water is available in the western United States than in the eastern United States. This fact has resulted in two very different systems of law governing the use of water.

Western Water Law

In the West, water is often scarce. Cities and farms may be long distances from sources of water. Western water law, also called the **prior appropriation** doctrine, is based upon the premise that water is a property right derived from a historic claim to water — “first in time, first in right.” The first person or entity, such as an agricultural business, a mining company or a city, to withdraw the water from a stream or an aquifer had rights to continue to do so. These rights would be upheld in court. This system

originated during the Gold Rush. Mining required diversion of water, and miners wanted certainty that they would have enough water to continue their operations. Later the doctrine of prior appropriation was modified to include the requirement that the water must be used for beneficial purposes.

Water rights in the West are separate from land rights. A water right is a very valuable commodity that can be bought and sold and passed from one generation to the next.

Advantages: Certainty. Users know they will continue to have water indefinitely.

Disadvantages: May lead to waste by discouraging conservation since reduction in water use may lead to reduction in water rights. Relatively uneconomic or socially unimportant water uses may be continued,

although some people think that free market forces will transfer water rights to the most economical uses. Water needs of natural systems may not be met because all of the water in a stream may have been appropriated for human uses.

Eastern Water Law

Water is considerably more abundant in the eastern United States than it is in the western United States. Eastern water law, also called the **riparian** system, is based on the premise that the riparian, the landowner along the shore, had the right to use the water for boating, fishing, swimming or viewing. Riparians also have a right to take as much water as they want to use on their land as long as they do not interfere with the reasonable use of water by other riparians. Landowners have a similar right to withdraw ground water for use on overlying land.

Advantages: Generally more protective of the water resources than Western law.

Disadvantages: Restricted commercial and other uses of water on nonriparian lands. Ongoing riparians constantly had to adjust to new riparians. Courts had to resolve disputes on a case-by-case basis.

Florida Water Law

Florida water law, found in Chapter 373 of the *Florida Statutes* (available on the Web at www.leg.state.fl.us), is considered by many to combine the best aspects of Western (prior appropriation) and Eastern (riparian) law. In Florida, water is a resource of the state. It is not owned by anyone.

Consumptive use permits: Water is allocated by a permit system administered by the five water management districts. The allocation system is designed to (1) prevent waste, (2) provide certainty to existing users, (3) provide equal rights irrespective of economic power, (4) protect natural resources and (5) provide for

future users by requiring water managers to address comprehensive planning and resource development. Permits to use water are issued by the water management districts and may be issued for up to 50 years. The quantity of water available for use under a permit may be reduced during droughts.

To obtain a permit, the applicant must establish three things: the use is **reasonable and beneficial**, the use will not interfere with any presently existing legal use of the water, and the use is consistent with the public interest. If there is not enough water for all proposed uses, the water management districts are to make decisions based on which use best serves the public interest. If all the competing applicants equally serve the public interest, preference is given to the existing permit holder.

Unlike the Western system of prior appropriation, Florida law discourages the long-distance transfer of water across hydrologic boundaries. A transfer must not diminish the availability of water for present and future needs of the sending area, and the receiving area must have exhausted all reasonable local sources and options. In addition, the transfer of water across county boundaries is discouraged.

Minimum flows and levels: Florida water law requires the water management districts to establish minimum flows for all rivers, streams and canals. This means the districts must identify an amount of water flow below which further withdrawals would cause significant harm to the water resource or to the ecology of the area. The law also requires the water management districts to establish minimum levels for ground water and surface waters (rivers, streams, canals, lakes and wetlands) below which further withdrawals would cause harm to the water resource. Surface waters less than 25 acres (10 hectares) generally are exempt from this requirement.

Determining minimum flows and levels requires complex scientific and technical analyses. The water management districts are

now making progress in establishing minimum flows and levels, which will play a much greater role in water resources planning and permitting in the future.

Advantages: Consumptive use permits help ensure that the use of water in Florida is reasonable and beneficial. Some degree of certainty is given by permits that give the right to withdraw a certain amount of water for a

given time period. The minimum flow provision and the restrictions on the long-distance transport of water help protect the water resources and the environment.

Disadvantages: Terms such as “public interest,” “reasonable and beneficial” and “significant harm” are open to interpretation and may result in conflicts that have to be resolved through the courts.

The districts are drawn on watershed boundaries. These are natural drainage basins, not political boundaries. Water management districts are overseen at the state level by the Department of Environmental Protection. They are governed by a board appointed by the Governor and approved by the Senate. They are funded to do the job of water management by a tax granted to them by the people of Florida in 1976. However, the budgets of the districts are closely monitored by the Governor’s Office and by the Legislature.

1980s

In the late 1970s and early 1980s, protection of Florida’s ground water, the primary source of drinking water in the state, became a major issue. The 1983 Task Force on Water Issues reported that the threat of contamination of ground water and related surface waters from hazardous wastes, sewage, industrial wastes and pesticides had become a major problem. The Legislature passed the Water Quality Assurance Act, granting the Department of Environmental Regulation more authority to protect ground water and to clean up contaminated resources.

In 1985, the Florida Legislature passed the Surface Water Improvement and Management Act (SWIM), the first statewide program for protecting or restoring waters of regional or statewide significance. The initial legislation named the first six water bodies to be restored and

protected under SWIM: Lake Apopka, Tampa Bay, Lake Okeechobee, Biscayne Bay, the Indian River Lagoon and lower St. Johns River.

1990s

Throughout the 1990s, Florida continued to protect environmentally sensitive lands, critical water resources and vital habitats through **land acquisition** efforts. With programs such as Preservation 2000 and Save Our Rivers, Florida has carried out the largest land acquisition effort in the nation. In the last quarter of the twentieth century, Florida purchased 2.1 million acres (850,000 hectares) of conservation and resource-based recreation land. In combination with land protected by local and federal programs or under private conservation management, these purchases protect and preserve 7.6 million acres (3.1 million hectares) of land (about 22 percent of the land in Florida).

In the 1990s, major **ecosystem restoration** projects and land acquisition programs were undertaken throughout the state. The Everglades Forever Act, passed by the Legislature in 1994, outlines a comprehensive program for restoring water quality and improving the amount, timing and distribution of water flows for the entire south Florida ecosystem (Kissimmee River-Lake Okeechobee-Everglades-Florida Bay). In the St. Johns River Water Management District, restoration projects began in the Lower St. Johns River Basin,

WATER KNOWS NO POLITICAL BOUNDARIES

The Apalachicola-Chattahoochee-Flint River Basin (ACF) is located within three states — Georgia, Alabama and Florida. The headwaters are in Georgia above Lake Lanier near Atlanta. The basin terminates in northwest Florida where the Apalachicola River flows into Apalachicola Bay on the Gulf of Mexico. In 1990, Florida joined with Alabama in a federal lawsuit over the Army Corps of Engineers' and Georgia's plan to reallocate water in Lake Lanier for the Atlanta urban area's water supply. In 1997, after years of negotiations, the three states entered into the ACF River Basin Compact, ratified by the three state legislatures and Congress. The Compact directed the three states to develop a water allocation formula to

apportion the water in this river system.

The Suwannee River Basin begins in Georgia in the Okefenokee Swamp and ends in the Gulf of Mexico. Two of the Suwannee's major tributaries, the Withlacoochee (distinct from the southern Withlacoochee) and the Alapaha, also originate in Georgia. In the 1990s, the Suwannee River Water Management District and the Florida Department of Environmental Protection and their counterpart agencies in Georgia formed the Suwannee Basin Interagency Alliance. This group is working to develop a basinwide management planning and river protection program that, for the first time, will address the entire watershed.

Lake Apopka, the Indian River Lagoon, and the upper Ocklawaha River Basin. In the Northwest Florida Water Management District, restoration began in portions of Tates Hell Swamp, formerly ditched and drained for pine plantations. In the Suwannee River Water Management District, large parcels within the 100-year floodplain of the Suwannee River are being acquired, protected, and restored where necessary. In the Southwest Florida Water Management District, over 30 ecosystem restoration projects are under various stages of development for the Tampa Bay

estuarine ecosystem.

In 1999, the Florida Legislature passed the Florida Forever Act, the successor to Preservation 2000. The act provides \$300 million per year for 10 years for land acquisition, water resources protection, ecosystem restoration, and urban parks and open space. Half of the water management districts' allocation (35 percent) may be used for water resources development, including restoring aquifer recharge, capturing and storing of excess flows of surface water, surface water reservoirs, and implementing aquifer storage and recovery.

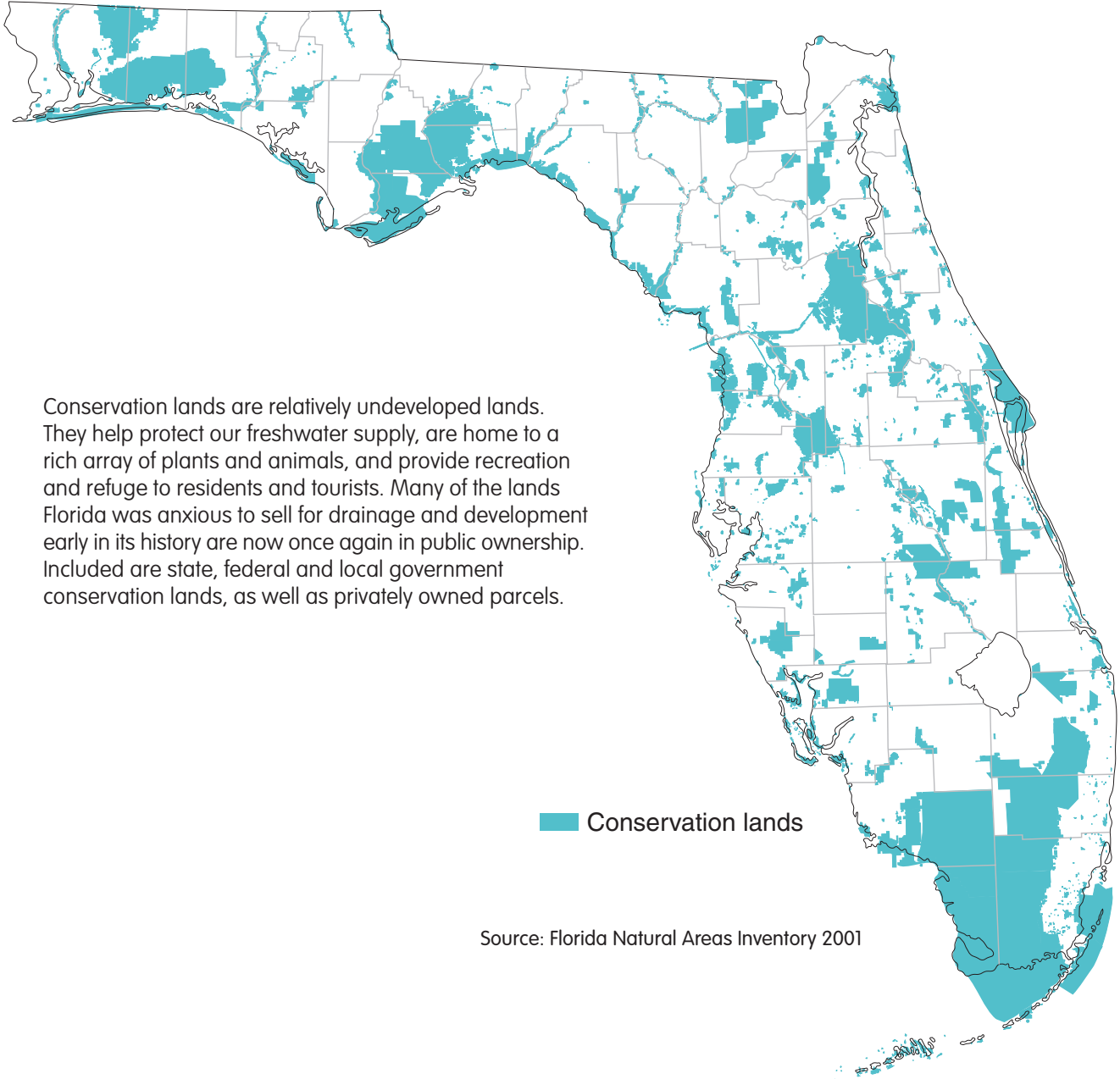
Conclusion

The basic water management framework established by the 1972 Water Resources Act has remained intact. The Department of Environmental Protection and the water management districts jointly implement a broad range of programs related to water supply, flood protection, water quality and natural systems protection.

Water supply and **water allocation** have emerged as paramount issues for the next century. In some areas of the state, demands for water are

beginning to exceed the capacity of aquifers and surface waters to meet these demands. Competition for water is increasing. The effects of withdrawing more ground water than rainfall can replenish are evidenced by saltwater intrusion, diminished spring flow, dried-out marshes and disappearing lakes. In some areas, new, easily developed, clean sources of water no longer exist. Alternative sources can be developed, but at higher costs than traditional sources. Although Florida is in many ways "The Water State," its supplies are not boundless.

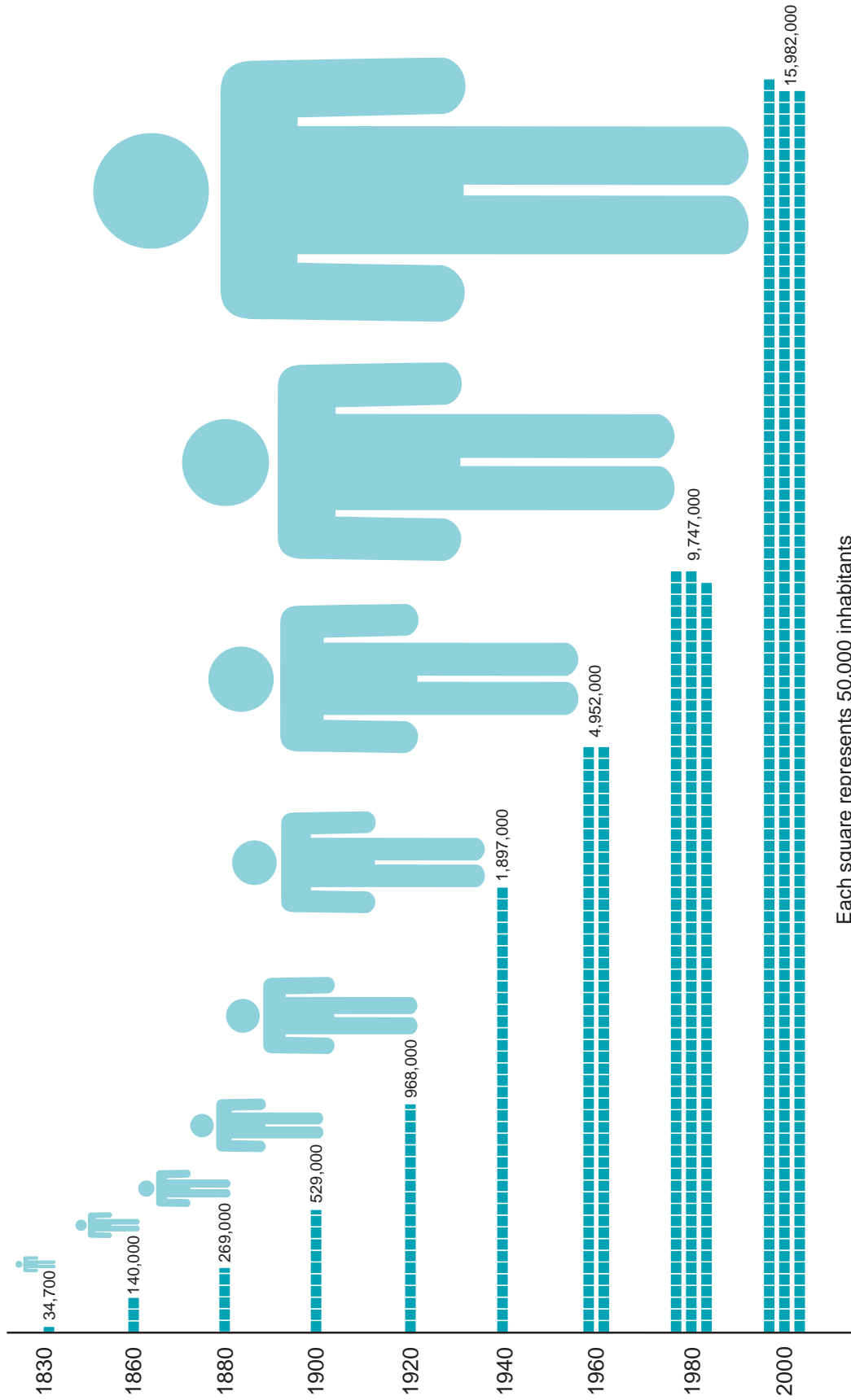
Conservation Lands 2001



Conservation lands are relatively undeveloped lands. They help protect our freshwater supply, are home to a rich array of plants and animals, and provide recreation and refuge to residents and tourists. Many of the lands Florida was anxious to sell for drainage and development early in its history are now once again in public ownership. Included are state, federal and local government conservation lands, as well as privately owned parcels.

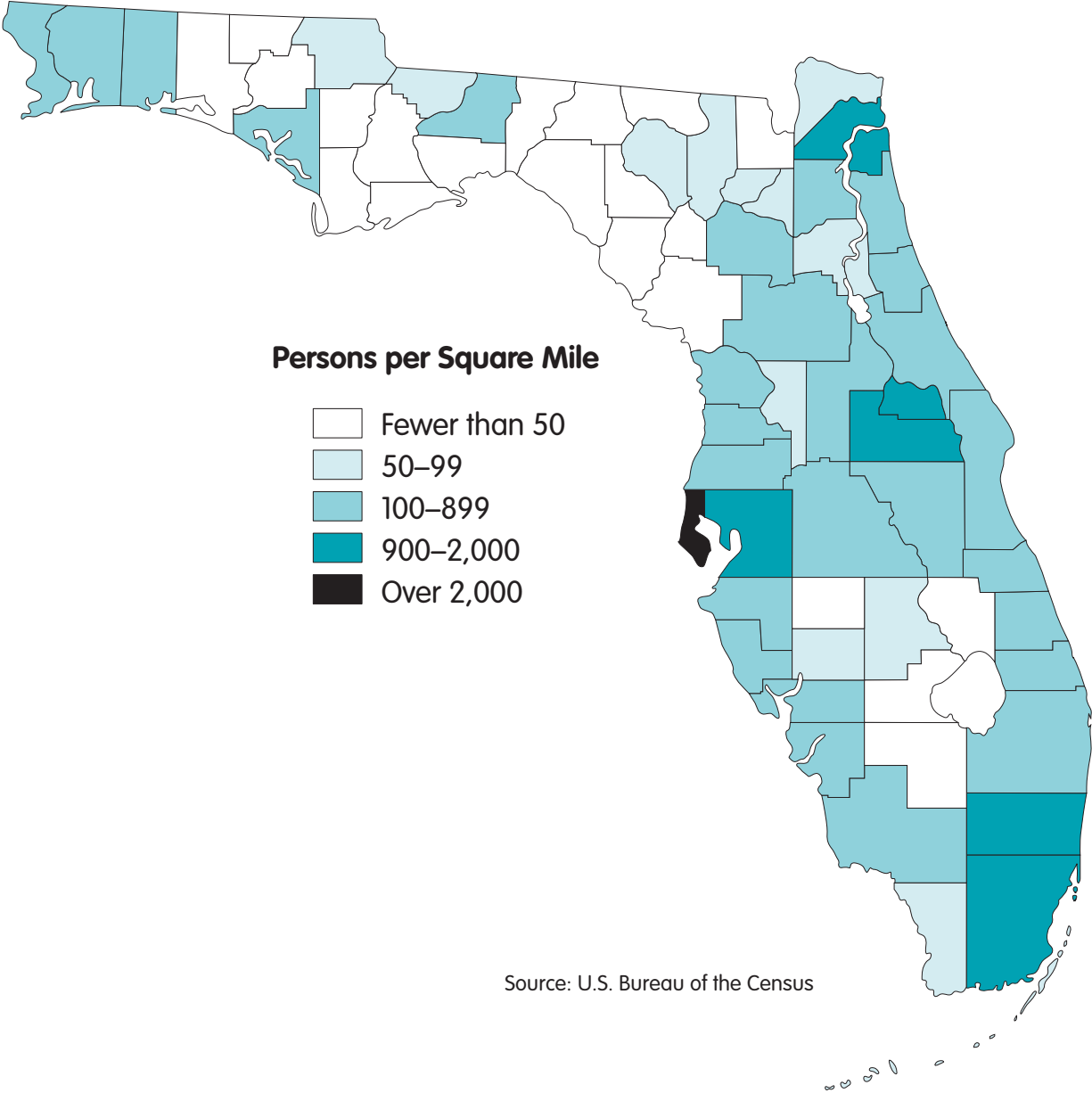
Source: Florida Natural Areas Inventory 2001

Florida's Population Growth

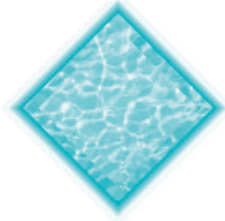


Source: U.S. Bureau of the Census

Population Density 2000



The Human Framework Time Line



12,000 B.C.
First Floridians
enter the Florida
peninsula.

1774
The Suwannee River is
“The cleanest and purest
of any river. . . almost as
transparent as the air we
breathe.”
— Naturalist William Bartram

1821
Spain cedes East and West
Florida to the United States

12,000 BC

1500

1770

1820

1830

1500
Beginning of Spanish
exploration of Florida.

350,000 Native Americans living
throughout the present-day state.

1827
“In appearance it [northern Florida] is
entirely unlike any part of the United
States. The lakes abound in fish, trout,
brim, perch and soft-shelled turtle; and
in the winter with wild fowl.”
— Judge Henry M. Brackenridge

Source: Florida State Archives



Timucuan Indians depositing grain in public granary

1835
Steamboats
begin arriving
in Florida.

1848
Secretary of the
Treasury Buckingham
Smith declares the
Everglades can be
reclaimed by digging
canals. Stephen R.
Mallory, collector of
customs at Key West,
warns “it will be found
wholly out of the
question to drain all
the Everglades.”

1851
Board of Internal Improvement
established to transfer wetlands to
private companies for drainage. Dr. John
Gorrie of Apalachicola patents a process
for making ice; he used the process to
cool the rooms of his patients.

1840

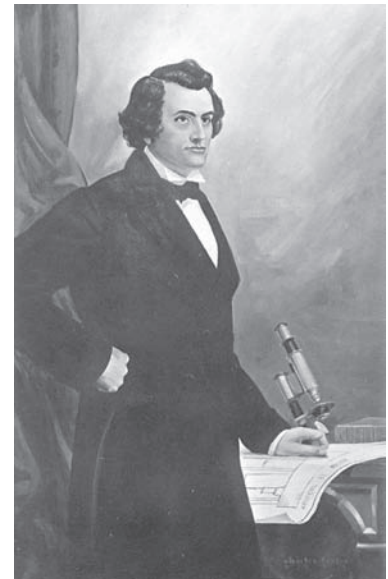
1850

1860

1845
Florida statehood. Federal
government grants 500,000 acres
of land to the state for “internal
improvements.”

1850
U.S. Congress
conveys all swamp
and overflowed
lands to the state.

Source: Florida State Archives



Dr. John Gorrie



John Muir ca. 1870

Source: Florida State Archives

1867

Florida is “so watery and vine tied that pathless wanderings are not easily possible in any direction.”

— John Muir

1875

The Ocklawaha River is “the sweetest waterlane in the world” and Silver Springs Run is a “journey over transparency.”

— Sidney Lanier, Florida:
Its Scenery, Climate, and History

1865

1870

1875

1866

Governor Davis Walker grants William Gleason over 6 million acres based on his proposal to drain swamplands east and south of the Everglades.

1870

Jacksonville becomes a major port for lumber production and export.

Source: Florida State Archives



Lumber wharf, Jacksonville, 1870s

1868

State’s first water pollution law establishes a penalty for defiling or corrupting springs and water supplies.



Water hyacinths, Lake Monroe, between 1903 and 1906

1879
Santa Fe Canal
Company constructs
two canals from Waldo
to Melrose via Lake Alto
and Lake Santa Fe.

1881
State of Florida sells 4 million acres
of land near Lake Okeechobee and
in the Kissimmee River basin to
Hamilton Disston of Philadelphia
for 25 cents per acre.

1884
Mrs. W. F. Fuller plants
water hyacinths along
the shore of her home
on the St. Johns River.

1875

1880

1885



Steamboat on the Ocklawaha River, 1877

1882
Disston links Lake Okeechobee
outlet to the Gulf coast via the
Caloosahatchee River. “. . . by
their insane shooting at
everything, the tourists were
driving all birds, alligators, and
animals from this portion of the
[Ocklawaha] river.”

— George Barbour, *Florida for Tourists,
Invalids, and Settlers*

Source: Florida State Archives



Frost damage to citrus crop

1886

Freeze and hurricane destroy north-central Florida's citrus industry.

1894-95

Great Freeze ends commercial agriculture industry in north Florida.

1885

1890

1895

1889

Phosphate is discovered near Dunnellon.

Source: Florida State Archives



Early phosphate mine

1900

“The existing practices of lumbermen in cutting timber land so close . . . [left] no young trees unscathed to form new forests, and when the pine disappears, it is replaced by utterly worthless scrub.”

— *Pensacola Daily News*, March 27

1900

“[I]n our very midst, we have a tract of land one hundred and thirty miles long and seventy miles wide that is as much unknown to the white man as the heart of Africa.”

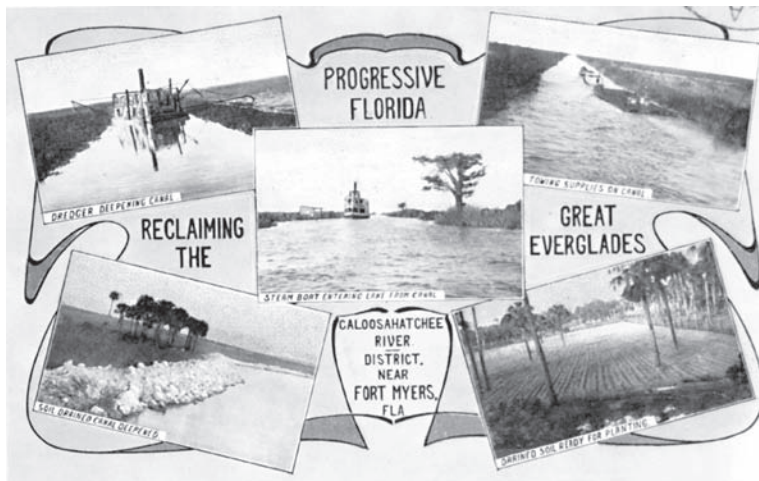
— Hugh L. Willoughby, *Across the Everglades*

1895

1900

1905

Source: Florida State Archives

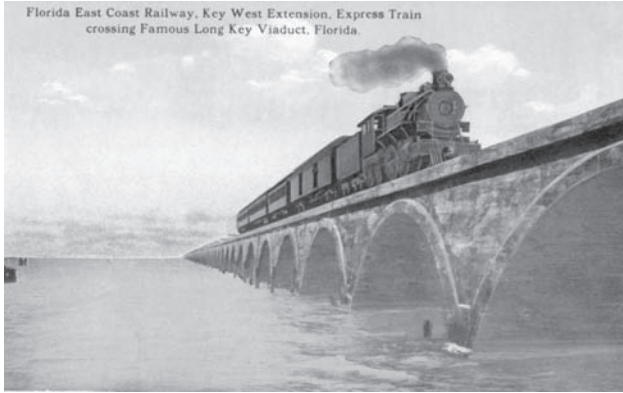


Reclaiming the great Everglades, 1912

1904

Napoleon Broward elected governor on a promise to drain the Everglades for gardens and farms.

Source: Florida State Archives



Florida East Coast Railway, Key West Extension, crossing Long Key Viaduct

1906

John Gifford introduces melaleuca as the ideal plant for drying the Everglades.

1912

The Flagler Railroad to Key West is completed.

Intracoastal Waterway from Jacksonville to Miami is completed.

1905

1910

1915

1907

Everglades Drainage District established.

1913

“Drainage of the Florida Everglades is entirely practicable and can be accomplished at a cost which the value of the reclaimed land will justify, the cost being very small.”

— Florida Everglades Engineering Commission

Source: Florida State Archives



Former Governor Jennings and family with press tour of Everglades Drainage Project, 1907

Source: Florida State Archives



Tamiami Trail blazers

1916

Construction of the Tamiami Trail begins.

1915

1920

1925

1920s

South Florida real estate boom; Carl Fisher transforms wet, mangrove-fringed island to resort of Miami Beach; saltwater intrusion in St. Petersburg's municipal well fields.

Source: Florida State Archives



Bathing beauties at the beach

1926
Hurricane kills 400 in Lake Okeechobee area.

1929
Okeechobee Drainage District formed. In *From Eden to Sahara: Florida's Tragedy*, John Kunkel Small predicts that, once drained, Florida will become a desert.

1931
Gulf Intracoastal Waterway extended from Pensacola to Carrabelle.

1935
Construction begins on the Cross Florida Barge Canal; "Labor Day Hurricane" hits the Keys, killing 400.

1925

1930

1935

1928
Hurricane kills 2,000 south of Lake Okeechobee when earthen dike fails to contain Lake Okeechobee: "The monstropolous beast had left his bed. The two hundred miles an hour wind had loosed his chains. He seized hold of his dikes and ran forward until he met the quarters; uprooted them like grass and rushed on after his supposed-to-be-conquerors, rolling the dikes, rolling the houses, rolling the people in the houses along with other timbers. The sea was walking the earth with a heavy heel."

— Zora Neale Hurston,
Their Eyes Were Watching God

Source: Florida State Archives



Funeral service for hurricane victims, 1928

Source: Florida State Archives



Drought, Everglades

1931–45

Florida experiences drought, saltwater contamination in wells along the coast, and fires in dry muck soils in the former Everglades.

1937

Work suspended on the Cross Florida Barge Canal.

1935

1940

1945

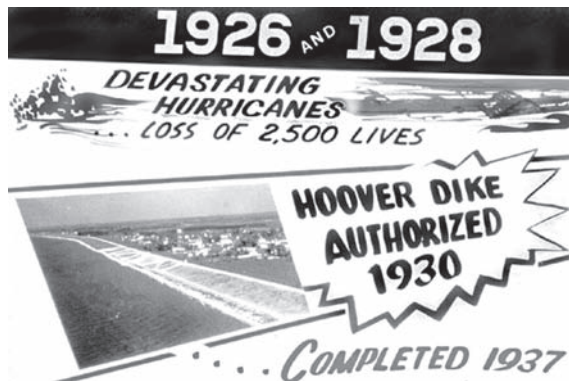
1937

U.S. Army Corps of Engineers completes 85-mile-long Herbert Hoover Dike flanking three-quarters of Lake Okeechobee.

1941–45

In World War II, Florida became a training ground for tens of thousands of soldiers. Many later returned as tourists or to become residents.

Source: Florida State Archives





President Harry Truman with John Pennkamp at dedication of Everglades National Park, 1947

1947

Two hurricanes flood Miami. First algal blooms reported in Lake Apopka. Everglades National Park opens — “There are no other Everglades in the world.”

— Marjory Stoneman Douglas,
The Everglades: River of Grass

1949

Florida Legislature creates the Central and Southern Florida Flood Control District to act as local sponsor for the federally authorized project.

1945

1950

1955

1948

Congress authorizes the Central and Southern Florida Flood Control Project; U.S. Army Corps of Engineers proposes three water conservation areas.

1955

State Board of Health declares Peace River “is now suffering severely from excessive organic and chemical pollution.”

Source: Florida State Archives



Kissimmee River, Canal 38

1964

U.S. Army Corps of Engineers recommends construction of a \$12.5 million hurricane levee across Hillsborough Bay at Tampa. “God was good to this country . . . But in His wisdom the Creator left something for men to do for themselves.”

— President Lyndon B. Johnson, *Groundbreaking for the Florida Cross State Barge Canal*

1962

Construction of the Kissimmee Canal begins.

1957

Jim Woodruff Lock and Dam on the Apalachicola River becomes fully operational.

1960

Hurricane Donna floods Tampa Bay Area.

1955

1959

Suwannee River Authority and Peace River Valley Water Conservation and Drainage District created.

1960

1961

Congress authorizes the Four River Basins, Florida Project for flood control in Tampa area; the Southwest Florida Water Management District is created; south Florida receives only 30 inches of rain.

1965

1965

Congress enacts the Federal Water Quality Act.

1966

Central and Southern Florida Flood Control District pumps excess water from farmlands into water conservation areas, drowning hundreds of deer.

1971

Congress orders U.S. Army Corps of Engineers to deliver more water to Everglades National Park; construction of the Florida Cross State Barge Canal halted; canalization of the Kissimmee completed.

1972

Year of the Environment (see page 9)

1970

Four River Basins, Florida project is halted for restudy; first Earth Day.

1974

Big Cypress National Preserve, located in Ochopee, Florida, next to the Everglades National Park, was established.

1965

1970

1975

1966–67

Fifteen new sinkholes appear in central Florida, indicating a serious drop in the water table.

1969

United States Geological Survey map shows area in southwestern Polk County as a “caution area” for further water withdrawals.

1970–71

State experiences worst drought to date.

1973

Record flood occurs in the upper reaches of the Suwannee River basin.

1970s

Escambia Bay experiences repeated massive fish kills.

Source: Suwannee River Water Management District



Suwannee River at Dowling Park, April 1973 flood

1976

Summary Report on the Special Project to Prevent Eutrophication of Lake Okeechobee finds “water delivered to Lake Okeechobee from the Kissimmee River by Canal-38 contributes significantly to the eutrophication of the Lake.”

1985

Elevated levels of nitrogen detected in the upper reaches of the Suwannee River.

1980

Florida Hazardous Waste Management Act enacted. Floridan aquifer levels in Ft. Walton Beach area had declined as much as 100 feet below sea level.

1984

The Warren S. Henderson Wetlands Protection Act is enacted.

1982–83

Over 400 drinking water wells in northeastern Jackson County found to be contaminated by the pesticide ethylene dibromide.

1975

1977

Upper St. Johns River Basin Restoration Project begins.

1980

1979

Conservation and Recreation Lands (CARL) Trust Fund established.

1981

Florida Legislature creates Water Management Lands Trust Fund, provides funding for Save Our Rivers land-buying program.

1985

1983

Florida Water Quality Assurance Act establishes statewide groundwater monitoring network; Governor Bob Graham announces the Save Our Everglades program.

1986
Florida Legislature establishes the nation's first program to clean up contamination from leaking underground petroleum storage tanks.

1988
St. Johns River Water Management District begins restoration of Lake Apopka.

1990
Preservation 2000 provides \$300 million per year over 10 years to purchase ecologically valuable lands.

1993
The State Department of Natural Resources and Department of Environmental Regulation are merged into the Department of Environmental Protection. The Department of Community Affairs estimates 1.3 million Floridians live in areas subject to flooding.

1994
Everglades Forever Act outlines major elements of Everglades restoration; Tropical Storms Alberto and Beryl and Hurricane Opal flood Panhandle.

1985

1990

1995

1987
Florida Surface Water Improvement and Management (SWIM) Act enacted.

1989
Southwest Florida Water Management District declares northern Tampa Bay, eastern Tampa Bay, and Highlands Ridge as water use caution areas.

1995
Florida Water Plan adopted by the Department of Environmental Protection declares "water must be managed to meet the water needs of the people while maintaining, protecting, and improving the state's natural systems."

Source:
South Florida Water Management District



Hurricane Andrew, 1992

1992
Hurricane Andrew strikes southern Dade County, causing \$16 billion in damages; Congress directs the U.S. Army Corps of Engineers to undertake restoration of the Kissimmee River; Southwest Florida Water Management District combines its three water use caution areas to establish the Southern Water Use Caution Area.

1996

Water management districts required to submit priority lists and schedules for establishment of minimum flows and levels.

1999

Florida Forever Act provides \$300 million dollars per year for 10 years for land acquisition, water resources protection and supply, ecosystem restoration, and urban parks and open space.

Photo credit:
St. Johns River Water Management District



Upper St. Johns River Basin, 1995

1995

2000

2005

1997

Florida Legislature defines regional water supply planning responsibilities of the five water management districts, local governments, and utilities; Legislature approves an agreement with Alabama and Georgia establishing the basis for an interstate compact on the Apalachicola/Chattahoochee/Flint River system; 38 percent of flow from Florida's domestic wastewater treatment plants is reused.

Photo credit: Diane Sterling



Pitcher plants, Apalachicola National Forest