

Chapter 28: The Everglades Becomes a Test Case for Ecosystem Restoration: The Road to CERP

As described in chapter 9, researchers in the 1970s and 1980s gained a greater understanding of the Everglades ecosystem and the negative effects caused by the operations of the Central & Southern Florida Flood Control Project (C&SF Project). Scientists increasingly began to view South Florida as one interconnected hydrologic and ecological system that needed to be managed holistically. At the national level, the developing fields of systems ecology and conservation biology gave birth to the concept of ecosystem management. Ecosystem management emphasizes the goal of maintaining viable populations of all species in an ecosystem, with the area encompassed within an ecosystem defined by its natural functioning rather than by political boundaries. The concept requires a systems perspective rather than a narrow focus (for example on one or a handful of species) as well as close cooperation among land managers within the ecosystem. Another key element is adaptive management, that is, adjusting management strategies based on the ongoing monitoring of the results obtained by various actions. Finally, ecosystem management tends to view humans as embedded within nature not set apart from it. As the concept of ecosystem management gained ground, ecosystem restoration was seen as a logical next step. Proponents of ecosystem restoration established the goal of returning an ecosystem to some prior, presumably healthier, condition. Usually this was defined as its condition before “novel” or “outside” forces began to have an effect.¹¹⁶⁰

Ecosystem management emerged as a particularly relevant approach for South Florida, with its mosaic of private, state, local, and federal land ownership. As ecosystem management gained traction as an idea, and many individuals and groups began pushing for restoration of the Everglades ecosystem, getting all the competing interests to the table became key. The Lehtinen lawsuit over water quality and other environmental controversies had engendered a lot of acrimony and distrust. Through Governor Lawton Chiles’s Committee on a Sustainable South Florida, trust among various interests was rebuilt. Working with the Corps and the South Florida Water Management District (SFWMD), the committee was able to produce consensus recommendations for ecosystem restoration. These recommendations, backed strongly

¹¹⁶⁰ R. Edward Grumbine, “What is Ecosystem Management?,” *Conservation Biology* 8/1 (Mar. 1994):27-38; William R. Jordan III and George M. Lubick, *Making Nature Whole: A System of Ecosystem Restoration* (Washington, D.C., Island Press, 2011), 2-3, 170. It is evident that applying the concept of restoration to a natural system raises many questions, such as establishing a “reference state” or baseline condition for the Everglades ecosystem, given that ecosystems continually evolve.

by the Clinton/Gore administration, served as the basis for 2000's Comprehensive Everglades Restoration Plan (CERP). The CERP was projected to cost billions over a period of several decades. From the beginning, knowledgeable observers understood that maintaining political will and focus would be a key to the CERP's success.

Foundation Projects: Modified Water Deliveries and the C-111 Project

The Modified Water Deliveries and C-111 Projects described in chapter 9 laid the groundwork for what emerged in 2000 as the CERP. After the passage of the CERP, these two programs as well as the dechannelization of the Kissimmee River came to be called "foundation projects." CERP stipulated that certain new projects like the decompartmentalization of WCA 3 and water storage in quarries would receive no appropriations until "the completion of the project to improve water deliveries to Everglades National Park" as specified in the 1989 Everglades National Park Protection and Expansion Act. Before turning to a narrative of the events leading to CERP, the history of the progress on Mod Waters and the C-111 Project up to the 2010 CERP Report to Congress will be related.

8.5 Square Mile Area (8.5 SMA), Now Known as the Las Palmas Residential Area

Following the mandate of the 1989 Everglades National Park Protection and Expansion Act and subsequent acts, the iterative testing of experimental water deliveries to the park continued in the 1990s. The Service's goal of getting more water to the Northeast Shark Slough and Taylor Slough conflicted with the mission of the Corps and the SFWMD to provide flood protection for East Everglades residents and agricultural interests. This fundamental conundrum provided a clear demonstration of the lack of coordination between urban development policies and water management policies in the post-World-War-II period. During the 1990s, Everglades National Park managers and many environmentalists came to believe that buying up as much of the land as possible between the park's eastern boundary and the L-31 and C-111 Canals would bring the most environmental benefits for the park. The concept was sometimes described as creating an eastern flow-way. Residents of the 8.5 Square Mile Area (8.5 SMA) and Frog Pond farmers were assertive in resisting acquisition, filing a number of lawsuits. As described in chapter 9, Congress in 1989 had directed the Corps to prepare a general design memorandum (GDM) for both the Modified Waters Project and the C-111 Project. The Corps released its GDM for the Modified Waters Project in 1992. The GDM called for:

1. Flood mitigation in the 8.5 SMA including a pump station, a flood mitigation canal, and a perimeter levee.
2. Raising a portion of the Tamiami Trail to allow more water to flow south into the Northeast Shark Slough (NESS) section of the park, which would entail raising two Miccosukee camps to keep them from flooding.
3. Structural modifications to allow more water to flow from WCA 3A to 3B and from WCA 3B to Canal L-29, along with measures to limit seepage to the east from WCA 3B and the park (known as the conveyance and seepage control component).
4. A new operational plan that would allow 55 percent of total water releases to occur east of L-67, into the NESS.¹¹⁶¹

Not long after the release of the GDM, Hurricane Andrew struck South Florida, causing flooding in the 8.5 SMA. The storm both slowed overall progress on Mod Waters and reinforced a belief that the 8.5 SMA could never entirely escape a threat of flooding. In 1994, Congress amended the Everglades National Park Protection and Expansion Act to allow funds appropriated for construction of flood control works to be used instead to purchase land in the East Everglades, including the 8.5 SMA. A full buyout of the 8.5 SMA emerged as the NPS's preferred solution. That same year, Governor Lawton Chiles appointed a committee that ultimately recommended that only the western portion of the 8.5 SMA be acquired, allowing the bulk of the area's residents to remain, protected by a levee and other flood control works. The board of the SFWMD in November 1998 approved a complete buyout of the 8.5 SMA. Governor Jeb Bush (served 1999-2007) made new appointments to the SFWMD Board, which promptly reversed the buyout decision. In July 2000, the Corps proposed a compromise solution, Alternative 6D, which involved the purchase of the western 40 percent of the 8.5 SMA, with the remaining, more heavily populated, 60 percent protected by a major perimeter levee. In 2003, Congress authorized the Corps to proceed with this alternative. The SFWMD then acquired the properties, some from willing sellers and some by eminent domain. Approximately 80 occupied tracts were purchased. More than 300 occupied tracts remained in the protected area (see figure 8-4). Land acquisition and construction of water control features was completed in 2008. A key feature was the location of pump station S-357 at the southern perimeter

¹¹⁶¹ See U.S. Army Corps of Engineers, *Modified Water Deliveries to Everglades National Park, Central and Southern Florida Project, Part 1, Agricultural and Conservation Areas, Supplement 54, General Design Memorandum and Environmental Impact Statement* (Jacksonville: Corps, 1992).

of the area; this pump discharges to a storm water treatment area (STA) that is part of the C-111 Project.¹¹⁶²

Tamiami Trail Modifications

The 1992 GDM for Mod Waters assumed that if two additional spillway structures (355A and S355B, completed in 1996) were constructed along the L-29 Canal east of the S-333, sufficient water could flow into the NESS portion of the park via culverts under the Tamiami Trail. Subsequent studies showed that forcing water through the culverts would require a higher water stage in Canal L-29. This higher water level threatened to damage the trail, which was not acceptable to the Florida Department of Transportation. Planners began to look at options for elevating all or a portion of the trail on a bridge and strengthening the trail where needed. Constructing a bridge along the entire 10.7-mile section of the trail between the L-67 extension and L-31N seemed the best option to many, but the cost, as much as \$1.6 billion, was prohibitive. Various alternatives were studied and discussed with the Florida Department of Transportation, the park, and other interested parties. The option finally authorized by Congress in 2009 had three components: 1) elevating a one-mile section of the trail, 2) raising and strengthening the remaining 9.7 miles of the trail so as to accommodate an 8.5-foot stage in Canal L-29, and 3) constructing spreader swales at the downstream openings of culverts 43 and 51. The spreader swales were meant to disperse water flows over a wider expanse, more closely imitating sheet flow. Construction of the one-mile bridge began in March 2010 under a contract awarded to Kiewit Construction Company and was completed in March 2013. Two Indian camps along the trail, Tigertail Camp and Osceola Camp, needed to be raised to protect them from the higher water stage. Tigertail Camp has been raised and discussions continue on raising

¹¹⁶² Testimony and prepared statement of William Leary, Sr. Counselor to Asst. Sec. for Fish, Wildlife and Parks, *Issues Regarding Everglades National Park and Surrounding Areas*, 1999, 28-31; Alfred R. Light, "Tales of the Tamiami Trail," 72-75; Godfrey, 388-389; Nathaniel P. Reed to Michael Hayden, Asst. Sec. for Fish, Wildlife, and Parks, Oct. 7, 1992, NPR papers, box 4; "E. Glades Buyout Ordered; Wetland Residents Protest Decision," *Miami Herald*, Nov. 13, 1998; "Demolition Under Way in Miami-Dade," *Florida Sun-Sentinel*, Mar. 3, 2004; SAR, 2004.

Osceola Camp. The spreader swale pilot project was suspended in 2010 because of cost concerns, but may be resumed in the future.¹¹⁶³

Because the one-mile Tamiami Trail bridge was expected to provide less than half of the water that the NESS needed, Congress in 2009 also directed the NPS to evaluate options for elevating additional portions of the trail. The NPS prepared an Final Environmental Impact Statement (FEIS) for what became known as the Tamiami Trail Modification: Next Steps Project, published April 26, 2011. The key finding of the FEIS was that another 5.5 miles of the trail needed to be raised. In the Consolidated Construction Act of 2012 (P.L. 112-74), Congress authorized construction of the Next Steps Project. NPS Director then directed the Service to focus its attention first on raising a 2.6-mile section of the trail approximately five miles west of the one-mile section already raised. In August 2013, Florida Governor Rick Scott committed the state to providing \$90 million, its one-half share of the total estimated construction cost. The project is expected to enter the design phase soon.¹¹⁶⁴

Because Mod Waters funding now has been fully committed, the construction of the Tamiami Trail one-mile bridge and the raising of the Osceola Camp will bring Mod Waters to a conclusion, without all of its original goals being met. The remaining unfinished business of Mod Waters includes: 1) Modification of Levees L-67A and L-67C and their associated borrow canals to restore connectivity between WCAs 3A and 3B, and 2) backfilling the remaining five miles of the L-67 extension. Further work on these unfinished aspects of Mod Waters will fall under the CERP or other authorizations.¹¹⁶⁵

C-111 Project

As described in chapter 9, tests 6 and 7 of the Experimental Water Deliveries Program involved both Northeast Shark Slough and Taylor Slough, the latter falling within the C-111 Project area. As required by the 1989 Everglades Preservation and Expansion Act, the Corps in May 1994 prepared a general reevaluation report (GRR)

¹¹⁶³ Audubon Florida, "Tamiami Trail One-Mile Bridge," Mar. 2013, <http://audubonoffloridanews.org/wp-content/uploads/2013/03/Tamiami-Trail-One-Mile-Bridge-March-2013.pdf>; NPS, *Tamiami Trail Modifications: Next Steps, Draft EIS* (Homestead, Fla.: NPS, April 2010), 2-1—2-3; see Omnibus Appropriations Act of 2009, 443-443. The alternative approved by Congress in 2009 was alternative 3.2.2.a from the Corps' 2008 *Modified Water Deliveries to Everglades National Park Tamiami Trail Modifications Final Limited Reevaluation Report and Environmental Assessment*.

www.saj.usace.army.mil/dp/mwdenp-c111/index.htm. Chapter 3 of the National Research Council's 2008 review has details. SAR, 2007, 2010; Corps and DOI, *Comprehensive Everglades Restoration Plan, 2010 Report to Congress*, D-4, http://www.evergladesplan.org/pm/pm_docs/rte_2010/rte_2010_final.pdf.

¹¹⁶⁴ Acting Supt. Shawn Bengé to File, May 8, 2014, <http://parkplanning.nps.gov/document.cfm?parkID=374&projectID=26159&documentID=59569>.

¹¹⁶⁵ The Corps held public meetings on the L-67A and L-67C work in late 2008 before this aspect was dropped. SAR, 2009; *2010 CERP Report to Congress*, D-4.

for the C-111 Project. The goal of the GRR was to propose system modifications that would maintain the existing flood protection for private lands east of the L-31N and C-111 while providing more natural hydrologic conditions in the Taylor Slough and eastern panhandle areas of Everglades National Park (see figure 8-4). The preferred alternative in the GRR had the following components:

1. Construction or modification of nine canals.
2. Creation of a spreader canal along the lower portion of the C-111.
3. L-31 and S332D tieback levees.
4. Construction of five pump stations.
5. Degradations of the spoil mound along the southern edge of C-111, allowing water to flow into the park's eastern panhandle.
6. Construction of a new bridge over Taylor Slough for the park's main road.
7. Purchase of 11, 866 acres, including Frog Pond and Rocky Glades for use as water detention areas.

The cost of the proposed modifications was set at \$121 million with estimated annual operating costs of \$12 million. Included in the GRR was a recommendation for the preparation of a combined operational plan for Mod Waters (Shark River Slough) and the C-111 Project (Taylor Slough and eastern panhandle).¹¹⁶⁶

As described in chapter 9, the drawdown of canal levels to allow early planting of winter vegetables in the Frog Pond had been a source of bitter controversy (figure 28-1, tomato growing). When the area flooded in 1993 because of the high water stage maintained in canals, the farm operators sued the SFWMD.¹¹⁶⁷ This suit was unsuccessful, but the threat of litigation remained. Following the recommendation of the C-111 GRR, the SFWMD decided to purchase the Frog Pond acreage. The district at first was interested in only the western portion, but ultimately negotiated a purchase of the entire area for \$43 million. The order of taking accomplishing this purchase was filed February 7, 1995, and the deal closed in April 1996. The district, however, allowed the farmers to continue operations for a brief period under leases, before beginning to allow it to return to more natural functions. The acreage now functions as a water retention area.¹¹⁶⁸

Further progress on the C-111 Project was delayed largely because of concerns over the Cape Sable seaside sparrow, an endangered species. Iteration 7 of the Mod Waters ended prematurely in 2000, largely because of these concerns. The U.S. Fish and Wildlife Service (FWS) issued a preliminary biological opinion dated October

¹¹⁶⁶ Corps, *Canal 111 (C-111) Final Integrated General Reevaluation Report and EIS* (Jacksonville: Corps, May 1994), syllabus; "The Experimental Program," undated park fact sheet (~2011). Preferred Alternative 6A was developed with input from Everglades National Park.

¹¹⁶⁷ *South Dade Land Corporation v. Sullivan*, 853 F. Supp. 404.

¹¹⁶⁸ "Growers Buy Agricultural Land Near Everglades," *South Dade News Leader*, June 10, 1988; "\$43 Million Ends Farming in Frog Pond," *Miami Herald*, Apr. 12, 1996; Godfrey, 381.



Figure 28-1. Tomato growing in 2012

the combined operational plan for Mod Waters and the C-111 Project recommended in the 1994 GRR. The combined plan is expected to set guidelines for operations that will enhance ecosystem restoration while maintaining other project objectives. Based on past experience, the park expects that the development of the combined plan to “involve potentially contentious discussions” among affected agencies and the general public. The Corps began the scoping process for the combined operational plan in June 2011.¹¹⁶⁹

A portion of the C-111 Project was accomplished with the construction of two new bridges carrying the main park road over Taylor Slough. This construction project

¹¹⁶⁹ SFNRC, *An Assessment of the Interim Operation Plan* (Homestead, Fla.: SFNRC, 2005), 8-12; SAR, 2010.

27, 1995, stating that the contemplated operations threatened the sparrow’s critical habitat. The opinion directed the Corps to prepare a remedial action plan. Disagreement over the contents of this plan led to further negotiations, which produced two versions of an interim structural and operational plan (ISOP, 2000 and 2001). The ISOP continued to be discussed and adjusted until June 2002, when the Corps issued a final environmental impact statement for the Interim Operational Plan (IOP). The IOP built on the ISOP and made use of structural features from Mod Waters and the C-111 Project. The IOP represented a temporary approach, intended to be replaced by

was completed in October 2000 and dedicated in February 2001 (see chapter 7). The first water retention/detention zone features of the C-111 Project have been completed, and some spoil mounds along the lower reach of the C-111 Canal have been removed. The C-111 spreader canal was included as one of the ten initial CERP projects in 2000, with an estimated cost of \$94 million. Because of the complexities involved, the project later was split into an eastern and western component. Phase 1, the western component, involves creating a nine-mile hydrologic ridge along the eastern boundary of the park. Embraced in this component are two above-ground water detention areas with pumps and related structural modifications of the C-111, C-110, and L31E Canals. Construction on the \$30 million western component began in January 2010 and its completion was celebrated in February 2013. The eastern component is meant to improve water distribution in the Model Lands area east of the park. It likely will involve backfilling portions of the C-111 and a spreader canal.¹¹⁷⁰

The Clinton/Gore Administration Embraces Everglades Repair

William Jefferson Clinton had a mixed record on environmental issues as governor of Arkansas, but the environmental community was pleased with some of his campaign rhetoric and personnel choices. Environmentalists applauded his selection of Al Gore for vice president. Gore, author of *Earth in the Balance* (published June 1992) was among the most environmentally conscious of national politicians. The president also made Floridian Carol Browner administrator of the U.S. Environmental Protection Agency (EPA). She had headed the Florida Department of Environmental Regulation for two years and supported Everglades restoration. Clinton's choice for attorney general was Janet Reno, a South Floridian who knew and loved the Everglades. For the Department of the Interior, Clinton chose Bruce Babbitt, the former two-term governor of Arizona. Environmentalists at first did not know what to make of Babbitt. He had been the chair of the League of Conservation Voters but also a cofounder of the Democratic Leadership Council, which represented the more business-friendly wing of the party.¹¹⁷¹

Secretary Babbitt was the keynote speaker at the January 1993 annual meeting of the Everglades Coalition in Tallahassee. Park Superintendent Richard Ring worked

1170 Corps, C-111 Spreader Canal Phase 1 Project Implementation Briefing Memo, Jan. 2010; Corps, "C-111 Spreader Canal Western Project Fact Sheet," May 2009; Maj. Gen. Meredith W. B. Temple, Acting Chief of Engineers, to SOA, Jan. 2012, http://www.evergladesplan.org/pm/projects/project_docs/pdp_29_c11/013012_c111_chiefs_report.pdf; 2010 CERP Report to Congress, D-6; NPS, "First Restoration Component to Directly Benefit the Park," Feb. 5, 2013, <http://www.nps.gov/ever/parknews/first-restoration-component-to-directly-benefit-the-park.htm>.

1171 "Bill Clinton, Environmentalist?," *New York Times*, Jan. 5, 1993. Many believe that Browner was the principal author of *Earth in the Balance*.

with Jim Webb of The Wilderness Society to ensure that at luncheon the secretary was flanked by Ring and the Corps' district engineer, Col. Terrence "Rock" Salt. Ring and Salt described the plight of the Everglades and explained that the Restudy of the Central and Southern Florida Project had been authorized but not funded. Not long after the meeting, Babbitt moved to make the Everglades the administration's top environmental priority. He arranged for the Corps to reprogram \$2 million to start on the reconnaissance phase of the Restudy.¹¹⁷² The secretary came to understand that a number of federal agencies had responsibilities in South Florida and were spending billions, often without coordinating their efforts. In response, he formed the South Florida Ecosystem Task Force (Task Force) with high-level representatives from the Departments of Defense, Interior, Agriculture, Commerce, and Justice and the EPA. Under the Task Force at the field level was the South Florida Management and Coordination Working Group (Working Group). The Task Force was envisioned as a policy body, while the Working Group's goal was to build consensus among the agencies on various issues and coordinate the development of restoration alternatives. Babbitt and his assistant secretary for fish, wildlife, and parks, Georg

e Frampton, saw the Working Group as a means of keeping pressure on the Corps to accelerate the Restudy and make sure it seriously addressed environmental goals. The Working Group met monthly and briefed the Task Force at least twice a year to keep the latter up-to-date and involved. Federal legislation was needed in 1995 to allow representatives of nonfederal interests, notably the Seminole and Miccosukee tribes, to become full participants. The Task Force and Working Group have been instrumental in guiding the development and implementation of CERP.¹¹⁷³

A basic issue with the Restudy was that its overarching purpose was declared to be ecosystem restoration while the C&SF Project remained a multiple-use endeavor. The easier part of the challenge was finding ways to store more fresh water, so that more water could flow to Everglades National Park and other protected natural areas while the growing needs of urban water users continued to be met.¹¹⁷⁴ It was well understood that there were limits to surface water storage. Shallow reservoirs like

1172 Under the Corps' planning process, a reconnaissance study was a preliminary step, followed by a feasibility study. The feasibility study would then go to Congress with a recommendation from the Corps's chief of engineers, and Congress would decide what to authorize and fund.

1173 "Babbitt to Form Task Force to Help Save the Everglades," *Palm Beach Post*, Feb. 23, 1993; Grunwald, 292-295; Richard Ring, interview by Brian Gridley, May 17, 2002, Michael Davis, interview by Brian Gridley Mar. 2, 2002, Terry Rice, interview by Brian Gridley, Mar. 8, 2001, George Frampton, interview by Brian Gridley, July 25, 2002, University of Florida Proctor Oral History Center; Godfrey, 306. The Task Force and Working Group formally came into being with the signing of an interagency agreement on September 23, 1993. It defined the Task Force mission as setting federal objectives for ecosystem restoration and "coordinat[ing] the development of consistent policies, strategies plans, programs, and priorities for addressing the environmental concerns of the South Florida Ecosystem."

1174 Because of soil subsidence and other issues, agriculture in the EAA was expected to decline over time and therefore need less water.

the WCAs lost much water to evapotranspiration and seepage. Secondly, maintaining high water levels in Lake Okeechobee and the WCAs degraded those environments. Additionally, purchasing agricultural land in the Everglades Agricultural Area for more water storage and treatment was expensive and carried political risks because it put people out of work. For these reasons, finding alternatives to shallow surface water reservoirs emerged as a key focus of the Restudy. Increasing the “natural” functioning of the ecosystem—providing more sheet flow and connectivity and improving water quality—was far more difficult than “increasing the water pie” via additional storage capacity. The chief way to restore more natural functioning was to remove water control structures—levees and canals—to encourage surface water flow (figure 28-2, North New River Canal). Removing engineering structures, however, increased the risk of flooding to residential areas and could limit the quantity of water in surface storage. To vastly oversimplify, in discussions surrounding the Restudy, engineers tended to focus on fine-tuning the managed water system while biologists and environmentalists focused on removing barriers and letting the water flow.

While Secretary Babbitt viewed the Restudy as the way to address the big picture of Everglades restoration, he also wanted to break the impasse over water quality. As



Figure 28-2. North New River Canal, 2011

described in chapter 9, the 1992 consent decree in the Lehtinen suit had committed the state to creating stormwater treatment areas and establishing regulations requiring

ranchers and sugar growers to adopt best management practices. The agricultural interests who had intervened in the original Lehtinen suit were not signatories to the consent decree and continued with lawsuits against the state.¹¹⁷⁵ In March 1992, the SFWMD adopted a Surface Water Improvement and Management (SWIM) Plan for the Everglades, which largely followed the terms of the consent decree and the 1991 Everglades Protection Act. Growers mounted legal challenges to the plan. The state Department of Environmental Regulation, the Miccosukee Tribe, the U.S. EPA, and several environmental groups were allowed to join that case as interveners. Florida's 1994 Everglades Forever Act put the force of law behind a number of the commitments embodied in the consent decree. It increased Florida's funding of land purchases, but it extended the deadline for establishing numerical phosphorous concentration standards to 2003 and the deadline for meeting the ppb targets until 2006. Several parts of the act were vague, and it included no mechanism for getting phosphorous to 10 ppb in federally protected areas, the level most scientists considered safe for the natural environment. The act had been introduced as the Marjory Stoneman Douglas Act, but when she learned of its final terms, the 103-year-old Everglades defender insisted that her name be removed.¹¹⁷⁶

Fearing that the water quality litigation would prove endless and get in the way of the Restudy effort, Babbitt began closed-door negotiations with the two major sugar growers in the EAA, Flo-Sun, Inc., and U.S. Sugar Corporation (Big Sugar) (figure 28-3, sugar cane in the Everglades Agricultural Area). In July 1993, the secretary held a news conference in the auditorium at Main Interior in Washington to announce a grand bargain. With NPS Director Roger Kennedy, state officials, and representatives of U.S. Sugar and Flo-Sun at his side, Babbitt unveiled a statement of principles meant to bring closure to the water quality disputes. The growers committed to paying from \$240 to \$320 million of the total cleanup costs over 20 years, considerably more than the consent decree had required. The statement called for expanding the STAs to 40,000 acres but provided for a five-year delay in meeting water quality standards. Environmental groups and the Miccosukee Tribe denounced the deal as a sell-out to Big Sugar. Environmentalists believed that the sugar growers had reaped the lion's share of the rewards from the C&SF Project for decades, while the urban taxpayers of Southeast Florida footed the bill and the ecosystem declined. They insisted that sugar interests needed to bear more of the cleanup cost, advocating that large acreages in the EAA be restored to marsh conditions. A few environmentalists believed the best solution was a complete elimination of sugar production in the EAA. By the end of the year, Secretary Babbitt's grand bargain had collapsed. Hoping that it would influence

1175 Ring interview with Gridley.

1176 Godfrey, 232. The state defined "the Everglades" as the three water conservation areas (including the Arthur R. Marshall Loxahatchee Wildlife Reserve) and Everglades National Park.



Figure 28-3. Sugar cane in the Everglades Agricultural Area, 2011

the other growers, the federal government concluded a separate agreement in January 1994 with Flo-Sun. The Everglades Coalition responded by beginning a campaign to place a new penny-a-pound tax on sugar. That effort ultimately failed. The acrimony created by the prolonged battle over water quality and the sugar tax complicated the effort to reach consensus on Everglades restoration goals.¹¹⁷⁷

The Governor's Commission for a Sustainable South Florida

A key step in creating a consensus on ecosystem restoration was the formation by Governor Lawton Chiles in March 1994 of the Governor's Commission for a Sustainable South Florida (GC). Chiles in large part hoped to get beyond the bitter atmosphere surrounding the water quality dispute and pursue larger goals. The 40-member GC had representatives from state and local government, agriculture and business, environmental groups, the SFWMD, and the Seminole and Miccosukee Tribes. Additionally there were nonvoting members from Interior, the Corps, EPA, and the National Oceanic and Atmospheric Administration. Everglades Superintendent Richard Ring was the ex-officio NPS member. Chiles chose Richard Pettigrew, former speaker of the Florida House of Representatives, to chair the GC. Participants in the process were unanimous in praising Pettigrew's painstaking efforts to foster trust among members through informal get-togethers and other means.¹¹⁷⁸

¹¹⁷⁷ Grunwald, 296-300; Hollander, 251-254; "A Compromise with Risks and Praterfalls?," *Miami Herald*, Aug. 15, 1993; Kathy Westra to Paul C. Pritchard, Pres., NPCA, July 13, 1993, Everglades Coalition to SOI Babbitt, July 30, 1993, NPCA papers, box 75.

¹¹⁷⁸ Grunwald, 300-301; Rice interview.

Between summer 1993 and fall 1994, the Corps worked on the reconnaissance phase of the Restudy of the C&SF Project. The main task during this phase was identifying the ecosystem's problems and laying out conceptual solutions. In Florida, District Engineer Salt chose Stuart Appelbaum to lead the Restudy team. Appelbaum was a civilian employee of the Corps, an expert in water resource planning. He decided early on to do everything he could to break down barriers between professional disciplines and agencies.¹¹⁷⁹ He wanted to put the engineers and the ecologists in the same room. With support from the Task Force, the Corps worked closely with the SFWMD and encouraged public participation in the planning process, something of a novelty for the Corps. The Corps had the benefit of a 1992 proposal for Everglades ecosystem restoration put together by the Everglades Coalition. The Science Sub-Group of the Working Group also produced a report on restoration goals in November 1993. Some saw the Sub-Group's report as unrealistic because it advocated a return to predrainage ecological conditions and said almost nothing about the flood control and water supply goals that the Corps was required to meet. The Corps released its Restudy reconnaissance report in November 1994. The report confidently stated that the "hydrologic function of the historic south Florida ecosystem can be recovered." The report recommended that a feasibility study be prepared and outlined the goals for that portion of the Restudy. Most of the report zeroed in on environmental restoration goals, calling in general terms for expanded surface water storage areas and the acquisition of from 80,000 to 260,000 acres to meet project goals. The authors believed that with those acquisitions, new engineering structures, and operational changes, the ecosystem could recover a substantial degree of its "natural" functioning. From the beginning an adaptive management approach was considered essential for a project that had so many uncertainties.¹¹⁸⁰

The Governor's Commission (GC) had been formed after the reconnaissance study was under way. In spring 1995, Col. Terry Rice (who had succeeded Salt as district commander in August 1994) urged the GC to come up with a more nuanced and detailed conceptual plan for Everglades restoration. Rice's career with the Corps had involved him in a number of foreign projects, and he had developed considerable political sensitivities. He realized that strong backing from all the interests represented on the GC was critical in getting any restoration plan approved by Congress. The GC got most of its technical advice from the staff of the SFWMD and the Corps. The Corps' Stuart Appelbaum and his team members spent the better part of a year facilitating the

1179 John Ogden, who was a biologist with ENP when the reconnaissance study began, moved to a position with the SFWMD in 1996. Ogden and Appelbaum interviews, University of Florida Proctor Oral History Center.

1180 Cathleen C. Vogel, "Central & Southern Florida Project Comprehensive Review Study: Road Map or Road Block for the Future?," *Water Resources Update* 11 (Spring 1998), 86-87; Appelbaum interview.

GC's work, essentially giving them a course in "Planning 101." On October 1, 1995, the GC presented a consensus statement on the direction that the Restudy should take. Then in August 1996, the GC released a more detailed Conceptual Plan for the Central & Southern Florida Project Restudy. The plan contained 40 options for restoration grouped under 13 thematic concepts. The GC's conceptual plan included almost all of the features that eventually were included in the CERP, such as aquifer storage and recovery and conversion of stone quarries to reservoirs.¹¹⁸¹

The Feasibility Study Phase

The Water Resources Development Act of 1996 (P.L. 104-303) authorized the Corps to proceed with the development of a Comprehensive Everglades Restoration Plan (CERP) via a feasibility study.¹¹⁸² The WRDA established goals for the CERP, reiterating the concept that the primary goal was ecosystem restoration and that no cost/benefit analysis was required. The act established the principle that project construction and operating costs would be shared 50/50 between the federal and state governments. It also mandated that nonfederal interests—the state of Florida and the two Florida tribes—be included in the process. The Corps wanted five or six years for the CERP feasibility study, but the administration mandated that the plan be presented to Congress by July 1, 1999. Clinton and Gore were determined to get the CERP passed as the crowning environmental achievement of their second term. In developing the CERP, Stuart Appelbaum's Restudy team identified alternatives, prioritized them, evaluated them, and established measures by which their success could be judged. Appelbaum created two subgroups: an alternative development group and an alternative evaluation group. To speed up the process, the results of modeling were placed on the web as PDF files to facilitate rapid review and comment. The Restudy team, with about 150 members at its peak, worked intensively to meet the July 1999 deadline. The Corps initially asked that park scientists be detailed to the team. Superintendent Ring thought this inappropriate, because the team's decisions had such important policy implications. Park scientists offered input and raised concerns throughout the development of the feasibility study. In January 1998, for example, SFNRC Chief Robert Johnson told the *Miami Herald* that the Corps was relying too heavily on adding additional water control structures and was refusing to do modeling on some of the park's preferred alternatives.¹¹⁸³

1181 Appelbaum interview; Rice interview.

1182 As described above in chapter 13, section 528 of the legislation also authorized additional studies, including the Florida Bay and Florida Keys Feasibility Study.

1183 Godfrey, 330-331, 395; Ring interview with author; "Conflict in the Glades: Scientists, Engineers at Odds over Restoration," *Miami Herald*, Jan. 4, 1998.

Finding that the two groups created to develop and evaluate alternatives had worked well, the Restudy team looked for a way to ensure that scientists would continue to have input, both while the CERP was developed and, crucially, as it was implemented. (Congress of course had not yet approved implementation, but the team was looking ahead). The desire for ongoing scientific input led to the formation of RECOVER, the REStoration, COordination, and VERification scientific advisory group. Stuart Appelbaum of the Corps and Biologist John Odgen of the SFWMD were the first co-leaders of RECOVER. RECOVER had members from a variety of agencies. Its role was and continues to be that of providing technical input on modeling and other issues, with the aim of helping to ensure that steps taken to implement CERP achieve the greatest environmental benefits. Further elaboration of the functions and membership of RECOVER was included in the CERP Programmatic Regulations (see below).¹¹⁸⁴

The development of the CERP depended heavily on the use of computer models. The models were used to predict the probable effects of the many variations of the CERP that were proposed and to come up with performance measures. The SFWMD had developed the first computer model for Everglades hydrology, known as the Natural System Model, in the late 1980s. This model replicated the conditions of the predrainage Everglades. A second model, the South Florida Water Management Model, replicated the system as modified by C&SF Project. These models focused on hydrology; both continued to be refined throughout the 1990s and were subjected to peer review. Another model, Across Trophic Landscape System Simulation (ATLSS) was developed to evaluate effects of various proposed modification of the system on multiple species. Members of the Restudy team understood that models are by their nature simplifications of reality and needed to be carefully evaluated. The results obtained from modeling depended on the validity of the assumptions and data that produced the models.¹¹⁸⁵

While the Restudy effort continued, the Clinton/Gore administration was eager to show some visible progress on the Everglades. Vice President Gore was scheduled to be the major speaker at Everglades National Park's 50th anniversary celebration and rededication in early December 1997 (see chapter 26). The Talisman Sugar Corporation, a subsidiary of the St. Joe Paper Company, had indicated a willingness to sell 52,000 acres of sugar property in the EAA. Conversion of EAA lands to reservoirs and filter marshes was emerging as a key feature in the Restudy, and the 1996 Farm Bill

¹¹⁸⁴ The late John Odgen told an interviewer that Appelbaum suggested that the group be called SWEAT, for System-wide Ecological Assessment Team. Finding SWEAT a less than compelling acronym, Odgen suggested RECOVER. Ogden interview.

¹¹⁸⁵ Corps and SFWMD, *Final Integrated Feasibility Report and Programmatic EIS, C&SF Project Comprehensive Review Study* (Jacksonville: Corps, Apr. 1999), xv-xvi; Michael Zimmerman, interview by Colleen Benoit and Mike Folkerts, Apr. 9, 2012.

had provided \$200 million for conservation-related land purchases. Urged on by the environmental community, the federal government worked out a deal with St. Joe and other EAA growers in time for Gore to triumphantly announce the Talisman deal at the rededication on December 6, 1997.¹¹⁸⁶

The Corps released its draft CERP feasibility study for agency technical review in October 1998. The study included a mammoth 10-volume, 4,000-page technical plan. Everglades National Park's science team prepared 44 pages of comments on the draft that were highly critical of the preferred CERP alternative. At bottom, they believed that the plan focused primarily on water storage and supply for urban and agricultural users and that ecosystem benefits came largely at the tail end of the project and were highly uncertain. They concluded that the plan "does not represent a restoration scenario for the southern, central and northern Everglades." The park had a December 31 deadline for forwarding its comments to the Corps. SFNRC Director Robert Johnson had deputy superintendent Larry Belli sign the cover letter for the comments on December 30, while Superintendent Ring was away from park headquarters. Park scientists had been raising these same concerns all along and Ring was familiar with their general tenor. Nevertheless, the superintendent felt the tone of the comments was overly negative. He attempted to soften the blow in a letter to the Corps emphasizing that the comments "are not the final position of Everglades National Park on the Restudy" and stressing that the NPS remained committed to the Restudy process and stood ready to cooperate to arrive at a plan acceptable to all.¹¹⁸⁷

Park staff shared their bluntly worded critique with representatives of conservation groups, and environmental consultant Joe Browder provided a copy to a *Miami Herald* reporter. A January 16 story in that paper caused quite a stir, alleging that the park officials had "ripped" the draft plan. Top officials in Interior and the Army were not happy that the NPS and FWS were so critical of the plan and that the controversy had gone public. At the January 1999 Everglades Coalition meeting, EPA Administrator Browner urged environmentalists to unite behind the restoration plan. The Corps and Interior attempted to assure the environmental community that the concerns would be addressed. Within the environmental community, the National Audubon Society (NAS) and its Florida affiliate had emerged as the strongest supporters of the administration's restoration efforts. Other groups like the Sierra Club and the Friends of the Everglades were far less sanguine. With the help of Joe Browder, the Sierra Club got six natural scientists with international reputations to do a quick review of

¹¹⁸⁶ Nathaniel P. Reed to Paul Tudor Jones, Nov. 17, 1997, NPR papers, box 6; "Gore, Other Dignitaries Help to Rededicate Park," *Miami Herald*, Dec. 7, 1997. See Godfrey, 410-412, for details of the Talisman deal.

¹¹⁸⁷ Acting Supt., ENP, to Col. Joe Miller, District Commander, Jacksonville District, Corps, Dec. 30, 1998, transmitting Comments of ENP on the Programmatic EIS and Alternative D13R, EVER 42242; Robert Johnson, interview by author, Oct. 11, 2012.

the feasibility study. Led by Stuart Pimm of the University of Tennessee, a biologist who specialized in endangered species, the team prepared a statement that blasted the plan and insisted it needed major revision.¹¹⁸⁸ Chief among its objections were that the plan lacked any real ecological restoration, that it relied too much on engineering fixes, and that the computer modeling underlying the plan was flawed. Pimm's group recommended that the National Research Council review the plan. Here, the administration's desire to get a consensus-based restoration plan through Congress before Clinton left office in January 2001 ran up against some scientists' and environmentalists' wish to proceed carefully toward a plan with maximum environmental benefits. Assistant Secretary Frampton believed that Pimm's group was very high-powered but lacked in-depth knowledge of South Florida. Fearing that no plan would satisfy the most strident environmentalists, Frampton continued to promote the consensus-based plan. Some environmental groups, notably the NAS and World Wildlife Fund, opposed further reviews that would delay action, but still pressed the administration to revise the plan.¹¹⁸⁹

Stuart Appelbaum's team and administration officials worked in early 1999 to address criticism of the plan and hold together the fragile coalition of interests backing it. The team did some more modeling based on input from park scientists, which indicated that an additional 245,000 acre-feet of water per year might be available for the park. It was too late in the process to change the 10-volume technical plan, but Michael Davis, deputy assistant secretary of the army for civil works made sure the chief of engineer's report that accompanied the technical plan make concessions to the park's point of view.¹¹⁹⁰ It was clear to everyone that Congress was unlikely to back a restoration plan if the park had strong objections. Superintendent Ring used this to maximum advantage, threatening to oppose the plan if it he believed it did not do enough for the park.¹¹⁹¹ The chief's report included language that promised an additional 245,000 acre-feet of water per year to the park. The perception that the park was getting special treatment after a consensus had been reached was upsetting to many, the Miccosukee in particular. Nonetheless, on July 1, 1999, Vice President Gore personally delivered the feasibility study and chief's report to Congress with a strong plea

1188 The other members of the team were Edward O. Wilson of Harvard, Paul Erlich of Stanford, Peter Raven, director of the Missouri Botanical Gardens, Gary Meffe of the University of Florida and editor of *Conservation Biology*, and Gordon Orians of the University of Washington.

1189 Joe Browder, interview by Nancy Russell, Dec. 7, 1999; "Park Attacks Plan to Restore Glades," *Miami Herald*, Jan. 16, 1999; "Sierra Club: Glades Restoration Plan Needs Review," *Miami Herald*, Jan. 23, 1999; "Big Ecological Guns Fault Plan for Everglades," *Miami Herald*, Jan. 30, 1999; The Everglades Foundation, National and Florida Audubon Societies, World Wildlife Fund, The Conservancy of Southwest Florida, and the National and Florida Wildlife Federations to Vice President Albert Gore, Feb. 2, 1999, NPR papers, box 8; Frampton interview.

1190 Typically the chief's report was a two- to three-page document that formally transmitted a report to Congress, but in the case of CERP it was 27 pages and more substantive. Rice interview.

1191 Grunwald, 326-327.

for its enactment into law. Restoration advocates got the jitters when a conservative, Bob Smith (R-N.H.), replaced conservation-minded moderate John Chafee (R-R.I.) as chair of the Senate Environment and Public Works Committee in October. Smith held committee hearings in Naples in conjunction with the January 2000 meeting of Everglades Coalition and committed himself to CERP. He announced “you will not find daylight” between him and Chafee on Everglades issues.¹¹⁹²

Final Passage of the CERP

In April, the administration sent the 2000 Water Resources Development Act, with CERP as its centerpiece, to Congress.¹¹⁹³ The state of Florida maintained its strong commitment to the plan. In May 2000, Governor Jeb Bush traveled to Everglades National Park and signed the state’s Everglades Restoration and Investment Act at Royal Palm. The act committed the state to spending \$2 billion over ten years to restore the Everglades ecosystem. This was clearly meant to show that the state was serious about the project. As *Miami Herald* columnist Carl Hiassen wrote, “the governor’s stance is important because it puts pressure on Congress” to do its part and pass the CERP.¹¹⁹⁴

Controversy continued to swirl around the CERP as it made its way through Congress. Chairman Smith asked for an opinion on water quality issues from the Government Accounting Office (GAO). The GAO noted that the CERP was far more conceptual than the typical Corps plan and might require additional projects not included in the feasibility study. Senators Smith, Graham, and Connie Mack (R-Fla.) worked hard to keep agricultural, urban, and environmental interests behind the plan. To prevent business interests from bolting, the law specified that nothing in the Chief’s Report (notably the 245,000 acre-feet of water for the park) would go forward without further study by the Corps. To appease environmentalists, the law specified that ecosystem restoration was the primary purpose of the act. The Senate report accompanying the bill contained language suggesting that 80 percent of the added water generated by the plan would go “for the benefit of natural systems.” The House threatened to derail the process by adding half a billion dollars of additional projects to the WRDA. This forced the bill to go to a conference committee, which removed the House additions. The final version of the bill passed Senate on a voice vote and the House by 312 to 2. President Clinton signed the bill on December 11, 2000, the same

¹¹⁹² Corps and SFWMD, *Central and South Florida Project, Comprehensive Review Study, Final Integrated Feasibility Report and Programmatic EIS* (Jacksonville: Corps, Apr. 1999); Appelbaum interview; Godfrey, 414.

¹¹⁹³ The committee hearings were held in Naples on Jan. 7, 2000.

¹¹⁹⁴ “Florida Commits to Everglades,” *Miami Herald*, May 17, 2000; Carl Hiassen, “A Contentious, Expensive Plumbing Job,” *Miami Herald*, May 21, 2000.

day that the U.S. Supreme Court stopped the recount in Florida, assuring that George W. Bush, rather than Al Gore, would be the next president.¹¹⁹⁵

The WRDA of 2000 proclaimed “the overarching objective of the Plan [CERP] is the restoration, preservation, and protection of the South Florida Ecosystem while providing for other water-related needs of the region.” (Figure 28-4, Metro Miami, a large consumer of water.) Significantly, the South Florida Ecosystem was defined by the act as all the land and water within the SFWMD. The plan contained 68 separate projects with a total estimated price tag of \$7.8 billion. Annual operating costs were placed at \$172 million. As mentioned above, both construction and operating costs were to be split 50/50 between the state and the federal governments. Completion of all the projects was expected to require 35 years. The act identified 10 initial construction projects expected to “provide the most immediate system-wide improvements in water quantity, quality and flow distribution.” Among the major elements of CERP were:

- 180,000 acres of surface water storage reservoirs.
- More than 300 aquifer storage and recovery (ASR) wells that could accept and store up to 1.6 billion gallons per day.
- 35,000 additional acres of stormwater treatment areas.
- Removal of 240 miles of internal levees and canals, including most of the Miami Canal within WCA 3.
- Rebuilding of 20 miles of the Tamiami Trail with bridges and culverts allowing more natural flow into Everglades National Park.
- Conversion of limestone quarries to water storage reservoirs.
- Two wastewater treatment plants in Miami-Dade County with the ability to cleanse water for discharge into wetlands.
- Seepage barriers along eastern edge of park.¹¹⁹⁶

Congress made sure that it would continue to be involved in CERP implementation, stipulating that each project would have to be congressionally approved via a project implementation report, before any funds were appropriated.¹¹⁹⁷

As was clear to the members of the Restudy team, a great deal of uncertainty was involved in the attempt to restore a complex ecosystem like the Everglades. The CERP’s approach to managing uncertainty had three major components: pilot projects, adaptive management strategies, and peer review. Many questions remained about the application of a number of the technologies employed in CERP projects. Aquifer

1195 “House Approves Plan to Restore Everglades,” *New York Times*, Nov. 4, 2000; “Glades Get New Life, Congress Approves \$7.8 Billion Renewal Plan,” *Miami Herald*, Nov. 4, 2000; Godfrey, 415.

1196 Title VI—Comprehensive Everglades Restoration, Water Resources Development Act of 2000, P. L. 106-541, Dec. 11, 2000. Hereafter WRDA 2000.

1197 Section 601(f)(1) of WRDA 2000.



Figure 28-4. Metro Miami, a large consumer of water

storage and recovery (ASR) wells, for example, had never been attempted at the scale called for in CERP. In recognition of the technological uncertainties, the CERP authorized pilot projects meant to test the technology in four key areas: ASR, in-ground reservoirs, seepage management, and wastewater reuse.¹¹⁹⁸

The CERP contained “an aggressive adaptive assessment strategy that includes independent peer review and a process for identifying and resolving uncertainties.” Congress wanted to be sure that, as conditions changed and experience was gained, managers would have the ability to change aspects of projects, cancel projects, and add new ones. The CERP and the regulations that implemented it were meant to ensure that the success of projects would be measured against performance criteria and adjustments made as the plan moved forward.¹¹⁹⁹

Part of the adaptive management framework outlined in the 2000 WRDA was an independent scientific review panel to review CERP progress. The panel was to be established by the Corps, Interior, and the state of Florida, in consultation with the Task Force. The act suggested that the National Academy of Sciences (NAS) or a similarly

¹¹⁹⁸ Title VI—Comprehensive Everglades Restoration, WRDA 2000.

¹¹⁹⁹ Title VI—Comprehensive Everglades Restoration, WRDA 2000; *Final Integrated Feasibility Report and Programmatic Environmental Impact Statement, C&SF Project Comprehensive Review Study*, Apr. 1999.

prestigious body coordinate the formation and work of the panel.¹²⁰⁰ The sole mission of the panel was to “review progress in meeting natural system restoration goals,” including the “assessment of ecological indicators and other measures of progress in restoring the ecology of the natural system.”

Prior to the passage of CERP, the DOI already had asked the NAS “to provide advice on scientific aspects of the design and implementation of CERP.” This led to the formation of the National Research Council Committee on the Restoration of the Greater Everglades Ecosystem (CROGEE). CROGEE’s mandate included reviewing CERP’s goals, the computer models used in its preparation, research requirements, and adaptive management strategies. CROGEE produced several reports including *Aquifer Storage and Recovery in the Comprehensive Everglades Restoration Plan* (2001) and *Adaptive Monitoring and Assessment for the Comprehensive Everglades Restoration Plan* (2003).¹²⁰¹

The 2000 WRDA specifically required that the independent review panel for CERP produce a biennial report that would go to Congress, the Department of the Army, DOI, and the governor of Florida. In June 2004, the Secretary of the Army concluded a cooperative agreement with the NASc to implement the review panel, the Committee on Independent Scientific Review of Everglades Restoration Progress (CISRERP). The NASc had the authority, with input from the Army, Interior, and the state of Florida, to appoint members to this “expert and objective” panel. The agreement had a term of five years and could be renewed. A number of well-respected scientists have served on the CISRERP. Wayne C. Huber, PhD, Civil Engineering, of Oregon State University, was the committee’s first chair. CISRERP produced reports in 2006, 2008, and 2010, and 2012. The 2014 report was not released in time to be included in this history.¹²⁰²

Implementation of the CERP

Several individuals who helped develop the CERP clearly understood that maintaining momentum for it over the required three to four decades would be a challenge. The coalition of environmental groups, governmental agencies, and agricultural and urban interests that had secured the plan’s passage was a tenuous one. Many environmentalists had serious qualms about putting the Corps, which was largely responsible

¹²⁰⁰ The National Academy of Sciences along with the National Research Council, the National Academy of Engineering, and the Institute of Medicine make up the National Academies. All four are nonprofit corporations that provide independent expertise.

¹²⁰¹ See National Academies Press, <http://search.nap.edu/napsearch.php?term=crogee&x=15&y=13>.

¹²⁰² Cooperative Agreement W912EP-04-2-0001 between the National Academy of Science/ National Research Council and the U.S. Army Corps of Engineers, June 17, 2004, http://www.evergladesplan.org/pm/pm_docs/ind_rev_panel/doc_b_cano_W912EP-04-2-0001.pdf.

for the damage to the ecosystem, in charge of the restoration. They wanted the Department of the Interior to have that role.¹²⁰³ Some environmentalists also believed that water quality issues had been neglected in the CERP. Although Congress intended that the Department of Interior be intimately involved in the implementation of CERP, much would depend on the attitude of future administrations and Congresses. CERP passed at the tail end of the Clinton/Gore administration, and the commitment of the incoming George W. Bush administration to CERP was uncertain. Environmentalists were not encouraged by Bush's appointment of Gale Norton as secretary of the interior.¹²⁰⁴ Perhaps the most encouraging aspect of the politics of Everglades restoration was that the 2000 election had shown that many Florida voters cared about environmental issues.¹²⁰⁵

Once the CERP became law, several years were required to put in place an administrative process that would allow the huge, complex plan, involving multiple players, to move forward. In June 2001, President Bush joined his brother, Governor Jeb Bush, at Royal Palm in Everglades National Park to pledge his commitment to Everglades restoration and burnish his credentials as an environmentalist. He stated "I am here to join with your governor in the cause of preserving and protecting the Everglades." The president reaffirmed the commitment of the federal government to supply one-half of the restoration cost.¹²⁰⁶ In January 2002, as required by the 2000 WRDA, the president and his brother signed a legally binding agreement assuring that additional water provided by the CERP would not go to other users unless sufficient benefits had accrued first to the ecosystem.¹²⁰⁷ The 2000 act had also directed the Corps to prepare programmatic regulations that would serve to ensure the accomplishment of CERP's goals. Congress mandated that the governor of Florida and the SOI concur in the regulations. The Corps circulated an initial draft of the regulations dated December 2001 for comments. The DOI accomplished several changes to the initial version that

1203 See A. Clark and G. Dalrymple. "\$7.8 Billion for Everglades Restoration: Why Do Environmentalists Look So Worried?," *Population and Environment* 24/6 (2003):541-569.

1204 Norton had been an attorney with James Watt's Mountain States Legal Foundation and had served under him in the DOI in the Reagan administration. "Gale Norton is No James Watt: She's Even Worse," *Los Angeles Times*, Jan. 9, 2001.

1205 Some have argued that his refusal to take a stand on the proposal for a redeveloping Home-stead Air Force Base as a commercial airport cost Gore Florida's electoral votes in the 2000 election. See Mayr's book.

1206 The president also used the occasion to announce his nomination of Fran Maniella, director of Florida's state park system, as director of the NPS. White House Office of the Press Secretary, "Remarks by the President at Royal Palm Visitors [sic] Center, June 4, 2001"; "Mixed Reaction to Bush Visit," *Miami Herald*, June 5, 2001.

1207 This pact is officially known as Comprehensive Everglades Restoration Plan Assurance of Project Benefits Agreement, dated Jan. 9, 2002.

enhanced its role in the restoration process.¹²⁰⁸ The draft, for example, provided that the Corps and SFWMD would consult with Interior and others on CERP implementation only “as appropriate,” a qualifier that was dropped in the final version. The final version also stipulated that the SOI and the governor of Florida would have to concur in the “pre-CERP baseline,” defined as the South Florida hydrological conditions prevailing as of the 2000 enactment of CERP. The initial version had left this important decision to the Corps and SFWMD. Surprisingly, the initial draft lacked a definition of “restoration.” The final regulations defined restoration as:

The recovery and protection of the South Florida ecosystem so that it once again achieves and sustains those essential hydrological and biological characteristics that defined the undisturbed Florida ecosystem. As authorized by Congress, the restored Florida ecosystem will be significantly healthier than the current system; however it will not completely replicate the undisturbed South Florida ecosystem.¹²⁰⁹

The Corps published a revised version of the programmatic regulations as a proposed rule in the Federal Register in August 2002. Interior had only a few technical changes to suggest, and the final regulations, running to 46 pages in the Code of Federal Regulations, were published in November 2003.¹²¹⁰

The stated purpose of the programmatic regulations was to “establish the processes necessary for implementing” the CERP and achieving its goals. Certain procedures and plan-related documents had been required by the 2000 WRDA. The act stated that no individual project could go forward until Congress had approved a project implementation report (PIR). The act further stated that each project would require a project cooperation agreement and an operating manual agreed to by the Corps and the SFWMD. The project process was further elaborated by the programmatic regulations, which defined the need for and role of guidance memoranda, program management plans, and project management plans. To address issues common to multiple CERP projects, the Corps and the SFWMD opted to prepare a master cooperation agreement to establish a framework of uniform terms and conditions for all projects. Because of the complexities involved, the discussions concerning this agreement were prolonged, and it was not signed until 2009. With the master agreement in place, the

¹²⁰⁸ Corps, *CERP Programmatic Regulations, Initial Draft*, December 2001. http://www.evergladesplan.org/pm/pm_docs/prog_regulations/initial_draft_reg.pdf. Compare draft 385.15 with final, 385.10(b)(2) and draft 385.30 with final, 385.35. Michael Davis came up with the idea of programmatic regulations. Davis interview.

¹²⁰⁹ 33 C.F.R. 385.3. In the realm of ecosystem restoration, “undisturbed” is a tricky concept and it remained undefined in the regulations.

¹²¹⁰ Comprehensive Everglades Restoration Plan Assurance of Project Benefits Agreement, Jan. 9, 2002; “Bush Brothers Agree to Plan for Everglades,” *Los Angeles Times*, Jan. 10, 2002; Godfrey, 293-294; 33 C.F.R. 385; Terrence Salt, Senior Everglades Policy Advisor, DOI, to Col. Greg May, District Engineer, Oct. 1, 2002.

Corps and the District were able to proceed to the preparation of project partnership agreements for individual projects. The programmatic regulations stipulated that the Corps and the SFWMD “shall consult with and seek advice from the Department of the Interior [and other agencies] throughout the implementation process to ensure meaningful and timely input.” Finally, the programmatic regulations were to be reviewed at least every five years and revised as needed.¹²¹¹

The National Science Foundation’s Long-Term Ecological Research Program

Research sponsored by the National Science Foundation (NSF) has and will in the future be of major importance to the CERP. In 1980, the NSF created the Long-Term Ecological Research (LTER) network to support ecological research requiring long time spans and large spatial extents. The program involves a coordinated network of more than 25 field sites. One of these sites is the Florida Coastal Everglades LTER (FCE LTER), established in May 2000 and hosted by Florida International University. FCE LTER includes 140 people—scientists, students, and staff—working to better understand the ecosystem processes in the park’s two major drainage basins, Shark River Slough and Taylor Slough. The project’s research program includes an emphasis on the human dimensions of ecological systems. In particular, this involves investigating the social and economic processes that drive land use change and how these changes affect human communities. Some scholars associated with the FCE LTER see their research as a counterweight to the natural-systems-only bias that seems to have characterized Everglades restoration efforts.¹²¹²

Recession Impacts

While these procedural issues were being resolved, the economic and political environment of the United States changed dramatically. The Al Qaeda-sponsored attacks of September 11, 2001, were followed by U.S. wars in Afghanistan and Iraq. In 2001 and 2003, the George W. Bush administration passed major tax-cutting legislation. The combination of increased spending and reduced tax revenues turned federal budget surpluses into deficits. Through a combination of changed spending priorities and lack of a strong push from President Bush, Congress from 2001 through 2006

¹²¹¹ 33 C.F.R. 385.1, 385.10(b)(2); Master Agreement between the Department of the Army and SFWMD for Cooperation in Constructing and Operating, Maintaining, Repairing, Replacing, and Rehabilitating Projects Authorized to be Undertaken Pursuant to the CERP, Aug. 13, 2009.

¹²¹² National Science Foundation website, http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13449; Florida Coastal Everglades Long-Term Ecological Research website, <http://fcelter.fiu.edu/research/>; Melissa Memory, personal communication, June 26, 2013.

appropriated little for the implementation of CERP. In addition, the Florida senators who did so much to get CERP enacted both retired, Connie Mack in January 2001 and Bob Graham in January 2005. Then in fall 2008, the international financial system came within a hair's breadth of collapsing. The worst U.S. economic recession since the 1930s ensued, further reducing tax revenues at the state and federal levels. The recession and funding decisions by Florida Governor Rick Scott (inaugurated January 2011) limited the financial resources available to the SFWMD for moving forward with CERP.

From 1999 through 2006, federal appropriations for all Everglades projects (both CERP and non-CERP) came to \$2.3 billion, while the state of Florida spent \$4.8 billion. Frustrated with the slow progress on Everglades restoration, Governor Jeb Bush and SFWMD Executive Director Henry Dean in 2004 came up with a measure known as Acceler8. Under this program, the state allocated \$1.5 billion to give a boost to eight lagging CERP projects. Most of these projects focused on improving water storage in the upper Everglades and thus reducing the amount of fresh water flushed to the St. Lucie and Caloosahatchee estuaries. Three of the projects, however, had more tangible benefits for NPS areas: the C-111 spreader canal, the Picayune Strand (Southern Golden Gates) Restoration, and the Biscayne Bay Coastal Wetlands Project. The C-111 spreader canal is discussed above. The Picayune Strand Restoration involved removing the canal and road infrastructure from a large abandoned subdivision west of the Big Cypress National Preserve. The Biscayne Bay project involved restoring more natural water flows to Biscayne Bay and Biscayne National Park. Completion of the project was expected to improve salinity distribution near the shoreline, providing better habitat for marine species. The state had grown impatient with delays at the federal level and sought through Acceler8 to achieve considerable progress on CERP within six years. As former assistant secretary for fish and wildlife George Frampton pointed out at the time, the eight projects had been authorized by the 2000 WRDA but not federally funded.¹²¹³

Charlie Crist, who succeeded Jeb Bush as governor in January 2007, took Everglades restoration in a new direction. In June 2008, the governor unveiled a tentative agreement under which the state would buy out U.S. Sugar Corporation and wind up its operations in the EAA. The aim was to devote former agricultural land to water storage and treatment areas, enhancing north to south flow within the Everglades ecosystem. The initial deal called for the state to pay the company \$1.75 billion for 187,000 acres in the EAA and all of its buildings and equipment. Environmentalists

1213 Tom Swihart, *Florida's Water: A Fragile Resource in a Vulnerable State* (New York: RFF Press, 2011), 133; SFWMD, "Acceler8—An Overview, Oct. 2010, EVER 22965; "Two Bushes and the Everglades," *New York Times*, Nov. 10, 2004; Godfrey, 297-298; Environmental News Service, October 15, 2004, <http://www.ens-newswire.com/ens/oct2004/2004-10-15-10.html>.

were split on this move, with some seeing it as bailing out U.S. Sugar before soils in the EAA were depleted and could no longer support agriculture. Others saw the deal as diverting attention and funds from more important CERP projects. Florida's contracting economy soon forced the deal to be scaled back. In November 2008, the company's infrastructure assets were removed from the deal, which was restated as \$1.34 billion for 181,000 acres. In April 2009, the state announced that the deal had shrunk to 72,800 acres for \$536 million. When the deal closed in October 2010, the state could afford to acquire just 26,800 acres for \$197 million. Two large tracts were involved: 17,900 acres of citrus land in Hendry County and 8,900 acres of sugar cane land in Palm Beach County. The state also retained a 10-year option to purchase an additional 153,000 acres. The ultimate use of the lands acquired as either water reservoirs or stormwater treatment areas has not yet been decided.¹²¹⁴

Following the enactment of the CERP in 2000, Congress passed just two water resources development acts, in 2007 and 2014. This delay deprived the CERP of authorization and funding to proceed with needed projects. The 2007 act was passed over President Bush's veto and included a \$1.8 billion authorization for three CERP projects:

1. Picayune Strand, for environmental restoration, total cost \$375,330,000, with estimated federal share of \$187,420,000.
2. Indian River Lagoon, South, for ecosystem restoration, water supply, flood damage reduction, and protection of water, total cost \$1.365 billion, with estimated federal share of \$682.5 million.
3. Site 1 Impoundment, for environmental restoration, total cost \$80,840,000, with estimated federal share of \$40,420,000.

These projects, known as Generation 1 projects, are all on the periphery of the Everglades ecosystem, and it would be hard to find a scientist who believed they were high-priority endeavors in the bigger picture of Everglades restoration. Picayune Strand authorization allowed further progress on the project previously funded by the state under Acceler8. The Indian River Lagoon, South, project is a major effort to restore salinity conditions and water quality in the Indian River Lagoon and St. Lucie Estuary. The Site 1 Impoundment Project in Palm Beach County is designed to reduce water losses through seepage from the adjacent Arthur R. Marshall Loxahatchee National Wildlife Refuge, thus increasing the amount of water in the natural system. President Obama's economic stimulus program, enacted in early 2009 as the American Recovery and Reinvestment Act (ARRA) provided \$200 million for Everglades

1214 "Florida Buying Big Sugar Tract for Everglades," *New York Times*, June 25, 2008; "Everglades Deal Now Only Land, Not Assets," *New York Times*, Nov. 11, 2008; "Deal to Save Everglades May Help Sugar Firm," *New York Times*, Mar. 8, 2010; "Everglades Land is Finally Sold to State," *Jacksonville Times-Union*, Oct. 13, 2010; Godfrey, 302; *Progress*, 2014, 26.

projects. Projects funded by ARRA (both CERP and foundation) included Kissimmee River restoration, Picayune Strand, Site 1 Impoundment, and adaptive assessment and monitoring. Also funded was a Melaleuca and Other Exotic Plants Eradication Project.¹²¹⁵

Litigation over Everglades water quality, begun in 1988, was ongoing in the first decades of the twenty-first century. With strong support from sugar interests, the Florida legislature in 2003 amended the 1994 Everglades Forever Act. This act renamed the Everglades SWIM Plan the “Everglades Long-Term Plan.” It once again extended, to 2016, the deadline for meeting numerical phosphorous concentrations and stated that the Everglades Long-Term Plan “shall, to the maximum extent practicable, achieve water quality standards.” The extension of the deadline and use of the term “maximum extent practicable” were seen by many as weakening the state’s commitment to cleaning up Everglades water. Under the pressure of a lawsuit by the Miccosukee Tribe, the U.S. EPA in September 2010 ordered the state of Florida to take actions that would reduce the phosphorous concentration to 10 parts per billion in water discharged to the Everglades Protection Area. The Everglades Protection Area is defined as Everglades National Park, the Arthur R. Marshall Loxahatchee Wildlife Refuge, and the WCAs. In June 2012, the state came up with a Restoration Strategies Regional Water Quality Plan that the EPA and the federal court accepted. The plan calls for the state to create 6,500 acres of additional stormwater treatment areas. Implementing the plan requires substantial expenditures by the SFWMD, limiting its ability to fund CERP projects.¹²¹⁶

General frustration with the slow pace of Everglades restoration led the Corps and the SFWMD, in consultation with the state of Florida and DOI, in October 2011 to launch a new initiative: the Central Everglades Planning Project (CEPP). A growing concern that the core of the Everglades was continuing to deteriorate to the CEPP. The CEPP is meant to provide a more expedited path to a more natural sheetflow pattern in the central Everglades and to increase the amount of freshwater flow. Components of the CEPP include projects that have been talked about for decades. These include controlling seepage from the EAA into the water conservation areas, degrading levees including those separating WCA 3A and 3B, and removing the L-67 Extension Canal and Levee that extends into the park. The estimated CEPP price tag is \$1.8 billion. Recognizing that environmental conditions in the central Everglades continued to deteriorate, the Corps expedited its planning process for the CEPP. The

1215 Section 6004, Water Resources Development Act of 2007, Nov. 8, 2007, P. L. 110-114; American Recovery and Reinvestment Act, Feb. 17, 2009, P. L. 111-5; Corps and DOI, *2010 CERP Report to Congress* (Washington, D.C., Corps, Apr. 2011), 26, http://www.evergladesplan.org/pm/pm_docs/rtc_2010/rtc_2010_final.pdf; *Progress*, 2014, 59.

1216 Florida Statutes 2003, Everglades Forever Act, Ch. 2003-12; Godfrey, 297, 304; *Progress*, 2014, 26.

Corps released a draft Integrated Project Implementation Report and Environmental Impact Statement with a tentatively selected alternative for CEPP in 2013. As of this writing, the Corps has received approval to forward the report for review by the state of Florida and other federal agencies.¹²¹⁷

On June 10, 2014, President Obama signed the Water Resources Reform and Development Act (WRRDA). This act authorized four CERP projects. It had been hoped that some CEPP projects would be included, but the project report was not approved in time. Four new projects in WRRDA were:

1. The C-43 West Basin Storage Reservoir, meant to hold water in the Caloosahatchee River basin.
2. C-111 Spreader Canal, adding federal support to the existing state project.
3. Biscayne Bay Coastal Wetlands, partially funded by Acceler8.
4. Broward County Water Preserve Area, meant to capture and store surface water run-off.¹²¹⁸

Restoration Status and Prospects

The National Research Council released its fifth biennial report to Congress on Everglades restoration progress on June 27, 2014. It noted some impressive achievements, while acknowledging “increasingly frustrating financial, procedural, and policy constraints” that retarded progress. To begin with, the ultimate cost of the CERP is now projected at more than \$14 billion, and government coffers are still feeling the effects of the recession. The NRC team complimented the Corps and its partners on the rapid development of the CEPP report, but cautioned that project implementation needed to be equally rapid. It also remarked upon the notable success of a nonCERP restoration project, Kissimmee River dechannelization, where more than 15,000 acres of riverine habitat have been restored. The adoption of best management practices and the construction of stormwater treatment areas have accomplished a substantial reduction in nutrient loads in water entering the Everglades Protection Area. Much remains to be done, however, to meet the EPA-mandated target of 10 parts per billion. The bridging of the Tamiami Trail, mentioned previously, is another positive,

¹²¹⁷ USACE, Jacksonville District, *Central Everglades Planning Project Draft Integrated Project Implementation Report and Environmental Impact Statement* (Jacksonville, Fla.: USACE, August 2013), ES-2-ES-6; USACE, Jacksonville District, “Corps Approves Release of Final Report for Central Everglades Project,” May 23, 2014, http://www.evergladesplan.org/docs/2014/05/20140523_CEPPE-Notice.pdf.

¹²¹⁸ Water Resources Reform and Development Act of 2014, P.L. 113-449, June 10, 2014; *Progress*, 2014, 60; USACE, Caloosahatchee River (C-43) West Basin Storage Reservoir Fact Sheet, July 2013, http://www.evergladesplan.org/docs/fs_c43_july_2013_508.pdf; USACE website, <http://www.saj.usace.army.mil/Media/FactSheets/tabid/6073/Article/479986/broward-county-water-preserve-areas.aspx>.

but its ultimate success depends on ensuring that the water delivered to the park is clean. Some four miles of the nine-mile L-67 extension levee in the park have been eliminated. Aquifer Storage and Recovery pilot projects, involving cycle testing and monitoring, had been started at the Kissimmee River and Hillsboro Canal. It remains to be seen whether this innovative technology will deliver the hoped-for results.¹²¹⁹

Successful restoration has been defined as re-establishing the “defining characteristics of the original Everglades,” albeit in a natural Everglades system that is considerably smaller than the predrainage Everglades. The cited defining characteristics are sheetflow, low nutrient levels in freshwater wetlands, healthy productive estuaries, resilient plant communities, and abundant populations of native wetland animals. Substantial obstacles to re-establishing these characteristics remain. As scientists learn more about the historical Everglades ecosystem, it is apparent that plant communities in particular locations have changed over time. This raises questions about just what the target characteristics of a restored system should be. Adaptive management is a key component of the CERP, designed to give managers flexibility to alter projects as needed. Considerable uncertainties arise in applying adaptive management concepts



Figure 28-5. Sunset over Florida Bay

to civil engineering works that cost hundreds of millions of dollars and require many years to build. As nimble and flexible as engineers and scientists try to be, there are limits to the kind of midcourse corrections to CERP projects that can be accomplished. Curtis J. Richardson, professor of resource ecology at Duke University, has proclaimed that “the Everglades is the sentinel wetland for the world. If we cannot get this restoration right with all our money, engineering technology, environmental laws, and ecological knowledge, then the future of wetlands worldwide is endangered.”

¹²¹⁹ *Progress*, 2014, 57-58, 93, 101-102; *2010 CERP Report to Congress*, v, viii; “Dramatic Spread of Cattails Chewing Up River of Grass,” *Miami Herald*, Feb. 7, 2000.

Much is riding on the success of the CERP. If it is widely viewed as a failure, it seems unlikely that U.S. politicians will again support a major ecosystem restoration project anywhere else.¹²²⁰ The future health of Everglades National Park is in the balance (figure 28-5, Sunset over Florida Bay).

¹²²⁰ 2010 CERP Report to Congress, 3; Curtis J. Richardson, *The Everglades Experiments: Lessons for Ecosystem Restoration* (New York: Springer, 2008), 641; Michael Grunwald, "A Rescue Plan, Bold and Uncertain," *Washington Post*, June 22, 2002.