

## CHAPTER XIII

### THE 1928 HURRICANE AND FEDERAL PARTICIPATION

#### 1. The Hurricane

The high waters of 1926 receded slowly through the fall, and the winter of 1927 proved dry enough to be a good season for farming.<sup>1</sup> By February 11, 1927, 32,000 hampers of beans had been moved out of the Canal Point area at prices ranging from \$7 to \$8.50 for each unit.<sup>2</sup> Three thousand farmers cultivating 9,000 acres of upper 'Glades lands from January to June had produced 3,000 carloads of fresh vegetables which brought approximately \$3,000,000.<sup>3</sup>

The use of various trace elements in the soil studies at the Everglades Experiment Station in 1926 began to produce results in 1927. R. V. Allison, O. C. Bryan, and J. H. Hunter published a paper on the outcome of their experiments on the muck soils near Lake Okeechobee. Tracing the brief history of recorded attempts to produce crops on the raw saw grass muck, the scientists related their observations of plant response in soils to which copper sulphate had been accidentally

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1 John Newhouse, "Memories," IV, 173.

2 Everglades News, February 11, 1927. Three thousand acres were being prepared in October for the fall crop. Ibid., October 7, 1927.

3 Florida Review, II (September 19, 1927), 6.

added when it had been sprayed on as an insecticide.<sup>4</sup> They suspected that copper compounds were valuable, and in the spring of 1927 planted seventy-six plots in which fifteen various elements were used. The results demonstrated that thirty to fifty pounds of copper sulphate gave as good a start to plants as larger quantities. The conclusion was drawn that plant responses to materials of this nature were indicative of definite deficiencies of these elements in an available form in the organic soils.<sup>5</sup> This discovery had far-reaching significance to the Everglades in that normal crops could now be grown on the raw peat soils with the addition of this trace element.

The dry seasons of 1927 and 1928 enabled the farmers in the Everglades to enjoy a degree of prosperity that few had previously known on the organic soils. The cautious words of Nathan Mayo, Commissioner of Agriculture, that the

. . . instances of astonishing results. . . had lent a halo of romance around the magic word "Everglades" and many who failed to investigate and who had no previous experience thought they had a rainbow with its proverbial pot of gold, and of course suffered disillusionment. . .

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<sup>4</sup> R. V. Allison, O. C. Bryan, and J. H. Hunter, "The Stimulation of Plant Responses on the Raw Peat Soils of the Florida Everglades through the Use of Copper Sulphate and Other Chemicals," Bulletin 190, University of Florida Agricultural Experiment Station, 35-42. Hereinafter cited as "Stimulation of Plants by Copper Sulphate."

<sup>5</sup> Ibid., 78 The trace metals are used in sulphate form. See L. R. Ender, "Fertilizing Crops with Metals," Review of Reviews, LXXVIII (October, 1928), 416-417.

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went unheeded.

The rainy season of 1927 had been lighter than usual for the previous half decade and as a consequence saw grass and muck fires became dangerous in the late spring of 1928. In March a number of buildings were burned at the settlement of Geerworth, having been in the path of a roaring fire through the grass.<sup>7</sup> Coincident with the dry seasons of 1927 and early 1928 were the warnings in 1927 by several of the staff of the Everglades Experiment Station on the important problem of the shrinkage and excessive drying of the peat soils. "If the Everglades is to develop into a durable agricultural project more importance should be placed on this than any other consideration."<sup>8</sup> The scientists cautioned that absolute water control was necessary since drought alone

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6 Nathan Mayo, "Possibilities of the Everglades," Florida Quarterly Bulletin of the Department of Agriculture, XXXVII (October, 1926), 22. "Men who are use to hard work on the farm and are not looking for a soft snap, who exercise common sense in selecting their land, and are willing to put the same amount of labor and money into an investment in the Everglades that they do in other lands will do well there. On the other hand, if they expect to find their holdings a honey pond with pan cakes hanging from the trees growing around the edge, they are doomed to disappointment and failure."

7 Everglades News, March 9, 1928. Zane Grey vividly recalled an Everglades grass fire set by hunters for the purpose of driving out deer and other game to shoot. ". . . I considered it a cruel and unsportsmanlike way to hunt. Again I had forced on me the appalling crudeness of the majority of men who seek diversion in remote and wild places." Zane Grey, Tales of Southern Rivers, 72-73.

8 R. V. Allison, O. C. Bryan, and J. H. Hunter, "Stimulation of plants by Copper Sulphates," loc. cit., 80.

accelerated oxidation in the organic soils. The point was made that excessive drying was a problem of agricultural research in coordinating crops and rotating them with the movement of the water table so as to afford protection against losses. Illustrating the question with the example of the tremendous losses in the Fens of England, the Florida experts quickly added that the Everglades were underlaid with limestone rock and not the clay found in the case of their illustration.<sup>9</sup>

The extended dry months were broken on August 8, 1928, by heavy rains and strong winds which raised water levels high enough to handicap field operations.<sup>10</sup> Perhaps the greatest damage was the washing of 50,000 cubic yards of sand and the forming of a sand bar in the St. Lucie Canal at Indiantown, a factor which imperiled the efficiency of the canal for control of Lake Okeechobee.<sup>11</sup>

During August and early September 1928, three feet of rain fell on the lake and on the Glades. The half dozen canals from Okeechobee ran bank-full. The lake waters crept closer and closer to the crest of the muck and sand levees.<sup>12</sup>

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<sup>9</sup> Allison, Bryan, and Hunter, "Stimulation of Plants with Copper Sulphate," loc. cit., 80. "Ultimately a large area of the Everglades will be converted into impounding reservoirs to conserve the water for use during the dry season, and especially during years of minimum rainfall." A. M. Munn, "Drainage of the Everglades," The Miamian, VII (June, 1927), 30-31.

<sup>10</sup> University of Florida Agricultural Experiment Station, Annual Report, 1929; 85.

<sup>11</sup> E. D. D. "Minutes," VII, August 10, 1928.

<sup>12</sup> Ralph Wallace, "Death in the Everglades," Reader's Digest, XLVII (October, 1945), 34-35, condensed from the St. Louis Post-Dispatch, September 23, 1945.

Despite the heavy rains of the late summer, the fall of 1928 found the Everglades enjoying an influx of farmers and laborers surpassing any previous year. The early plantings had attracted an estimated 5,000 migrant farmers and field hands, many of whom lived in tents and tar-paper shacks along the roads and canal banks.<sup>13</sup>

The 1928 storm, the most violent and destructive of the century, probably originated near the Cape Verde Islands in the early days of September and passed over the island of Puerto Rico on September 13. "The center moved over the Florida coast line near Palm Beach early in the night of September 16, crossed the Lake Okeechobee region and turned northward with diminishing force."<sup>14</sup> Ralph Wallace, feature writer for the St. Louis Post-Dispatch, described the "night of unforgettable horror" which occurred on the southern and southeastern shores of Lake Okeechobee when the winds reached a velocity of 125 to 135 miles per hour.<sup>15</sup>

<sup>13</sup> Ralph Wallace, "Death in the Everglades," loc. cit., 34. The impermanency of the new frontier, the character of the muck soils, and the transportation difficulties had brought many houseboats or other vessels on which cafes, drink stands, barber shops, laundries, and so forth were conducting business while tied up along the canal banks of the Everglades waterways. In February, 1926, the Drainage Board had directed that such occupancy of the State canals be prohibited. E. D. D. "Minutes," VI, 24.

<sup>14</sup> Ivan Ray Tannehill, Hurricanes: Their Nature and History, 197.

<sup>15</sup> Ralph Wallace, "Death in the Everglades," loc. cit., 34-37. "No such flood catastrophe had occurred in America since the Johnstown flood of 1889." F. P. Stockbridge and J. H. Perry, So This is Florida, 109. There was a greater loss of life in the Galveston, Texas, storm of 1900. J. H. Reese, Florida's Greatest Hurricane, 83-84.

The strong winds blew the water out of Lake Okeechobee into the pocket at the southeastern end of the lake. The damage and loss of life was greatest in the towns of Pelican Bay, Pahokee, Canal Point, Belle Glade, Chosen, and South Bay. The 450 inhabitants of Pelican Bay all perished during the night of September 16. "Residents <sup>16</sup> [of the Glades] estimated that 2500 had perished."

Reaction to the tragedy throughout the state and nation was an overwhelming urge to aid the suffering and to repair the ravages of the storm. Governor Martin and several members of his staff toured the area from Pahokee to South Bay in a survey of the damage. The Drainage Board made all of the district's equipment available, while the Southern Sugar Company advanced \$50,000 in taxes to aid in repairing the drainage works. <sup>17</sup> By September 21 the recorded death toll had reached 800, by September 28, 1500. Howard Sharp traversed the area and pictured the great damage for his readers, but wrote that out of the tragedy the 'Glades would <sup>18</sup> rise again.

The American Red Cross mobilized its forces and rushed aid and relief to the area. Communications were maintained

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16 Ralph Wallace, "Death in the Everglades," loc. cit., 37.

17 E. D. D. "Minutes," VII, September 19, October 3, 1928. The Arundel Corporation gave up a \$50,000 tax priority to enable the money to be spent on repairs: Ibid., October 9, 1928.

18 Everglades News, September 21, 23, 1928. A hundred residents of South Bay rode out the wild night on a barge anchored to the concrete locks of the Lauderdale Canal by heavy cable.

by the establishment of a radio station at Belle Glade, and railroads transported refugees and freight at no cost. The total family registration in the Everglades area for relief reached 2,126, of whom eighty per cent were given assistance; the Red Cross spent \$2,702,463 in storm relief in Florida.<sup>19</sup> The rehabilitation extended beyond repair and refurnishing of homes as the flood waters prohibited any form of agriculture. The water stood on the muck for several weeks until the dikes had been repaired and pumping could effectively help uncover the land.<sup>20</sup>

Illustrative of the force and fury of the 1928 storm was the damage inflicted at the Everglades Experiment Station, eight miles from Lake Okeechobee and four miles from Belle Glade. The station's anemometer was destroyed when it registered ninety-two miles per hour; the director estimated that the velocity continued to rise as high as 125 miles per hour.<sup>21</sup> A breach in the station dike caused the flooding of the whole area to a depth of three feet, and it was not until December

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<sup>19</sup> American National Red Cross, The West Indies Hurricane Disaster of September 1928, 65-90. Hereinafter cited as 1928 Storm:

<sup>20</sup> Ibid., 73: The emergency relief program furnished the farmers with seed, fertilizer, feed for stock, and fuel for farm machinery. The Ford Motor Company sent two trucks and mechanics with spare parts to repair 150 Fordson tractors. The Palm Beach County Farm Loan Fund lent approximately \$100,000 in sums up to \$300 at 5% to farmers in the Everglades area. Ibid., 73-74.

<sup>21</sup> University of Florida Experiment Station, Annual Report, 1929, 85. The Station measured the rainfall on September 16-17 at 11.35 inches but it was doubtful that this height was accurate since the top rain gauge had been blown away.

4 that the land was all out of the water. One five room house, two cabins, a garage, and half of the greenhouse were destroyed, and a two story building was so weakened that it had to be torn down. All field work in progress was destroyed and a number of experiments had to be abandoned. Surprisingly enough, not all the sugar cane was lost, the Coimbatore plantings withstanding the flood conditions. <sup>22</sup>

Following the precedent established in 1927, the Board of Drainage Commissioners of the Everglades Drainage District published the biennial report of the Chief Drainage Engineer on the work of the two year period with recommendations for the guidance of the Board in preparation for the April meeting of the legislature. <sup>23</sup> Governor Doyle Carlton had been elected in 1928 on a platform which, in part, promised home rule to the Everglades as well as the adoption of a policy of putting the large South Florida drainage district on a "pay as you go basis." It became increasingly obvious that

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<sup>22</sup> University of Florida Experiment Station, Annual Report, 1929, 92.

<sup>23</sup> F. C. Elliot, Chief Drainage Engineer, Biennial Report, 1927-1928 to Board of Commissioners of Everglades Drainage District, 3-4. A resolution of the Board adopted in June, 1927, had instructed the engineer to prepare a brief historical sketch for the Commissioners on the subject of operations, work, general conditions, taxes and finances, advancement of the district, its condition, status, and future development. Elliot brought his report of 1927 to the Commissioners up to date since the time of the previous report. Ibid., 4. Cited hereinafter as 1927-1928 Report.



the old order which had prevailed in the Everglades drainage operations, particularly under the administration of John W. Martin, would change when Carlton won the Democratic nomination in the 1928 spring primaries. For this reason the Chief Drainage Engineer summarized the work of the district since its inception and accentuated the work of the previous governor's term.

To January, 1929, Elliot noted that \$14,871,185 had been spent for canal excavation, \$2,005,157 for canal control works, \$691,434 for levees, and \$358,325 for other expenses, a total of \$17,926,103.<sup>24</sup> The 1927-1928 report called attention to the one of two years previous, issued by the same officers, which had placed emphasis on the need for lakeshore levees. In the report under scrutiny the Chief Engineer again demanded levee construction as imperative to the protection of human life in the lakeshore areas, pointing to the estimated damage of \$3,800,000 and the loss of approximately 2,000 lives from the storm of the preceding September.<sup>25</sup>

Other suggestions in the 1927-1928 report included increased discharge outflow capacity, for Okeechobee's control, in the St. Lucie or Caloosahatchee Canals. Elliot cited the

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24 F. C. Elliot, 1927-1928 Report, 19. Distribution of these costs as made by Elliot were for drainage \$9,775,390; for flood control \$6,066,748; for navigation \$2,083,964.

25 Ibid., 24. "It is here emphasized that the levees proposed are for flood protection under hurricane conditions, and not for holding water in the lake at high levels under non-hurricane conditions."

fact that the inflow into Okeechobee in the ninety day period before and after the 1928 storm was greater than for any other year of record, and that had an outlet discharge of 7,500 cubic feet per second existed, the damage on September 16 and 17 would have been minimized.<sup>26</sup> The engineer recommended that 2,500 cubic feet per second discharge capacity be added in the Caloosahatchee Canal rather than in the St. Lucie Canal so that ". . . if one of these waterways received damage which reduced its discharge capacity from the lake, the other will escape and will be intact for its full capacity."<sup>27</sup>

The Chief Engineer recommended that a sum of \$4,000,000 be raised by the State to be spent at a rate of \$1,000,000 a year for the drainage of limited areas, partly as evidence that the state government was sufficiently interested in the Everglades to invite participation and aid from the federal government in flood control assistance.<sup>28</sup> Elliot drew the attention of his readers to the value of the outstanding bonds of the district, totaling \$10,141,000, as against the Board's assessment of the property and improvements in the district, set at \$106,000,000 in 1928.<sup>29</sup> In the period covered by the report the prices paid for state lands averaged from \$68 to \$92 per acre, and on the basis of acreage sold in 1927 Elliot

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26 F. C. Elliot, 1927-1928 Report, 45-46

27 Ibid.; 47

28 Ibid.; 55-58

29 Ibid., 76.

valued state lands in the district at \$350,500,000. The estimated population of the district was set at 48,000; paved roads at 586 miles; railroads at 210 miles; and acres under cultivation at 92,000.<sup>30</sup>

Comparing values of lands in the Everglades Drainage District in 1905 with those in 1927, the state official found the former figure to be \$5,591,000 and the latter \$350,500,000. With the total cost of drainage to 1929 figured at \$18,000,000, it was possible to see that for each million dollars spent for operations in the district, the land and other property values had increased over sixteen times. The Chief Drainage Engineer stressed the fact that other than paying taxes on its lands and contributing some of the proceeds from the sale of lands granted to the state in 1850, Florida had never given any money to the Everglades reclamation proposition.<sup>31</sup>

Elliot sought to draw the local, state, and national interests in the Everglades proposition to a head and to show how, by a common participation, the three could jointly complete the job begun with the cession of the lands to Florida in 1850. Local interests were concerned in local drainage

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30 F. C. Elliot; 1927-1928 Report, 76  
31 Ibid., 79-81, 85.

to make the lands fit for settlement and cultivation and the consequent improvement of property and benefits therefrom. State interests involved the carrying out of the obligations assumed with the 1850 grant, the enhancement of state lands, the development of a natural resource for tax benefits, securing new citizens, and insuring the safety of the territory for habitation. Federal interests extended to protection of life, national promotion of navigable waterways, and "the obligation on the part of the United States to permit the said State to carry out that condition."<sup>32</sup>

## 2. Federal Participation

There were no records of any hurricanes passing through the lake section prior to 1926, but on the basis of the subsidence of the muck soils on Okeechobee's shore F. C. Elliot, chief drainage engineer, had recognized the need for levees on the lakeshore to guard against flooding as early as 1920.<sup>33</sup> Beginning in that year the Everglades Drainage District started the construction of combination muck, sand, and rock levees around the south shore between Bacom Point and Fisheating Creek. And "Following the storm of 1926 an attempt was made to interest the Federal government in the reclamation of the [Everglades] area and particularly in providing protection against such storms as had occurred."<sup>34</sup>

<sup>32</sup> F. C. Elliot, 1927-1928 Report, 84.

<sup>33</sup> Ben Herr; "Origin of Lake Flood Control," Belle Glade (Florida) Herald; November 1, 1940.

<sup>34</sup> Ben Herr, "Caloosahatchee and Lake Okeechobee Drainage Areas, Florida," The Soil Science Society of Florida, Proceedings, V-A (1943), 136. Hereinafter cited as "Caloosahatchee Drainage Areas."

The second session of the Sixty-eighth Congress passed an act providing for a preliminary examination of the Caloosahatchee River in Florida with a view to the control of flooding from high waters.<sup>35</sup> In making a report on the examination the United States District Engineer wrote that he believed flood control, navigation, and drainage in the Caloosahatchee River drainage area and in connection with Lake Okeechobee were correlative problems,

. . . and that, since the United States functions in regard to navigation in the Caloosahatchee River and Lake Okeechobee, it should cooperate at least to the extent of making a survey for flood control and drainage. 36

The district engineer recommended a survey of the Caloosahatchee and Okeechobee drainage areas toward the end of flood control at a cost of \$20,000 and \$25,000 respectively. His recommendation was approved by both the Board of Engineers for Rivers and Harbors and the Chief of Engineers of the United States Army, and later was transmitted to the Speaker of the House of Representatives on February 5, 1927, by the Secretary of War.<sup>37</sup>

Acting on the suggestion of the army engineers, Congress

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<sup>35</sup> House of Representatives Documents, Number 690, 69 Congress, 2 Session, 1, 3, 6.

<sup>36</sup> Ibid., 6.

<sup>37</sup> Ibid., 1-3, 3-6. An act of the Florida legislature of the 1925 session set up the "Caloosahatchee Improvement District, comprising 353,900 acres of the 697,000 acres in the drainage area." The Commissioners of this district had sold a \$500,000 bond issue and employed George B. Hills, of Jacksonville, "to make a survey, plans, and recommendations for the improvement of the district, the improvement to consist almost entirely of flood control and drainage." Ibid., 10-11.

authorized the Caloosahatchee-Okeechobee flood survey within ten days of the receipt of Secretary of War Davis' transmittal of the servicemen's report. <sup>38</sup> Congress also authorized the engineering corps to survey the two South Florida drainage areas and determine what control works were necessary for navigation and flood control from the Atlantic Ocean to the Gulf of Mexico and along Okeechobee's shores; the engineers were to consider such factors as outlets, diking, and dredging. <sup>39</sup>

In their report the army engineers noted that the federal government maintained a channel in the Caloosahatchee River one hundred feet wide and four feet deep from Ft. Myers to Ft. Thompson under previous authorization; that the Everglades Drainage District maintained a channel forty feet wide and four feet deep to Okeechobee, and one eighty feet wide and six feet deep from the big lake to the south branch of the St. Lucie River. <sup>40</sup> The Intracoastal Waterway along the Florida east coast was planned for a seventy-five foot width and an eight feet depth, while the federal project in the Kissimmee River provided a channel thirty feet wide and three

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<sup>38</sup> House of Representatives Documents, Number 215, 70 Congress, 1 Session, 1.

<sup>39</sup> Ibid., 1-2. This survey was completed under the provisions of section 3 of a Rivers and Harbors Act of March 1, 1917, authorized by the Rivers and Harbors Act of January 21, 1927, and approved February 14, 1927. Ibid., 5.

<sup>40</sup> Ibid., 2.

feet deep from Lake Tohopekaliga to Ft. Bassenger.

On April 9, 1928, the Secretary of War sent the report of the survey of the Caloosahatchee-Okeechobee area to the House of Representatives Committee on Rivers and Harbors, together with the recommendation of the Chief of Army Engineers that,

In view of the benefits to navigation and interstate commerce, it appears proper that the United States assume the cost of providing a channel 80 feet wide in the Caloosahatchee River if a channel of similar dimensions is provided by local interests within the boundaries of the Everglades drainage district. 42

No action was taken on the recommendations for an improved and deepened channel in the Caloosahatchee River, which would have provided a 2,500 cubic feet per second discharge from Lake Okeechobee, before the 1928 hurricane swept the waters of the big lake out of its southeastern pocket with the consequent loss of life and property. In December following the storm Senator Duncan U. Fletcher introduced a

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41 House of Representatives Documents, Number 215, 70 Congress, 1 Session, 2. The report added that the controlling depth in the improved section of the Kissimmee River was two feet, but that the lower stretches of the river were choked with hyacinths and not navigable.

42 Ibid., 6. "With some additional dredging in the St. Lucie River and the Caloosahatchee River the proposed work would provide a 6 foot waterway across the state. Such a waterway . . . would, in the opinion of the district engineer, result in annual savings in transportation costs which might eventually reach about \$2,000,000." Ibid., 4. Public hearings in connection with the survey were held at Pahokee and Moore Haven in October, 1927, ibid., 21. F. C. Elliot had notified Howard Sharp in late November that the army engineers had completed their surveys and that federal aid might be forthcoming for flood control and navigation in the areas surveyed. Everglades News, November 25, 1927.

flood control bill in the Senate calling for the improvement of navigation and the control of floods of the Caloosahatchee River and Lake Okeechobee and its drainage area.<sup>43</sup> Fletcher called attention to the reports of the 1927 Everglades Engineering Board of Review and of the army engineers in House of Representatives Document Number 215, 70 Congress, 1 Session. He asked that the joint recommendations of these two groups be carried out on the basis of half the cost being paid by the State of Florida and half by the federal government.<sup>44</sup>

This land, to which the people are flocking back as fast as the waters can be taken off and it can be made habitable, is as rich and fine and fertile as can be found anywhere in the world. The evidence of that is that people had to be restrained from going upon the land too quickly after this flood came. All kinds of vegetables, citrus fruits and other fruits . . . grow there with such rapidity and such perfection that the people are willing to risk their lives by hastening back to begin the work on their farms in this area, and they ought to be protected. They are being taxed for drainage purposes more than they can stand, really, unless some protection is given them.<sup>45</sup>

The Fletcher bill proposed that the State of Florida

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<sup>43</sup> Congressional Record, LXX (December 5, 1928), 60-62.

<sup>44</sup> Ibid., 60.

<sup>45</sup> Ibid. Senator Fletcher urged federal participation on the basis of navigation and flood control, "as it has done in the Sacramento Valley, as it has done in the Mississippi Valley, as the precedents now show, in the construction of . . . levees and canals, for the purpose of developing waterways and at the same time giving flood control." Ibid. The Senator asked inclusion of resolutions and letters from the commissioners of the Everglades Drainage District, President T. E. Will of the South Florida Development League, and Mayor E. G. Sewell of Miami. Ibid., 60-62.



provide \$5,000,000 as its share of the cost of executing the recommendations of the 1927 Board of Review and the 1928 survey of the army engineers. Senator Wesley L. Jones, chairman of the Senate Committee, addressed the chief of the army engineers on the following day requesting the Board of Engineers for Rivers and Harbors to review the report contained in House Document 215, "with a view to determining whether any modification is advisable in that report, particularly in the light of the flood of September 1928. . . ." <sup>46</sup>

The subsequent report of the engineers found in Senate Documents Number 213, 70 Congress, 2 Session, February 1, 1929, endorsed the following suggestions for flood control and navigation in the localities concerned: an eighty by six foot channel in the Caloosahatchee Canal and River; a sixty by six foot channel in Taylor's Creek at the northern end of Lake Okeechobee; and north and south shore levees thirty-one feet high to be constructed of earth capped with stone. The army engineers proposed that the State of Florida or other local interests furnish \$6,740,000 and the United States \$4,000,000, the maintenance of all works except the Caloosahatchee channel to be provided by Florida interests. <sup>47</sup>

- <sup>46</sup> Senate Documents, Number 213, 70 Congress, 2 Session, 1.
- <sup>47</sup> Ibid., 7. The army engineers recommended a 31 foot levee as against the 27 foot levee advocated by the 1927 Board of Review to secure the lakeshore against a repetition of the probable wind tide of 29.6 feet of September, 1928. Protection must be designed for the extraordinary and the unexpected. . . as the area becomes more thickly settled greater loss of life and larger property damage might result from failure of the levees." Ibid., 6.

Commercial and agricultural activity in the Everglades and on the east coast motivated various interests in South Florida to secure a hearing in the Munitions Building Offices of the Board of Engineers for Rivers and Harbors on May 1-2, 1928, regarding the development of Port Everglades. This port, a deep water harbor in Lake Mable below Ft. Lauderdale, was sponsored by the Broward County Port Authority.<sup>48</sup> The meeting, presided over by Wallace S. Dempsey, Chairman of the House Committee on Rivers and Harbors, emphasized the need for a federal appropriation for the east coast port. The Broward port authority had sought aid on the basis of the need for a deep water harbor for the commerce of the Everglades back country, but their plea on this point was negated by the presentation of the 1927 Board of Review's plan for east-west canals and the damming of the long diagonals such as the North New River. A discussion between Chairman Dempsey and George B. Hills, one of the port authority's engineers, led to a telegram from F. C. Elliot, Florida's chief drainage engineer, that the 1927 report "had not been adopted as official plan for the development of the Everglades and I have no idea it will be."<sup>49</sup> T. E. Will, who owned acreage at Okeelanta on

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<sup>48</sup> "Munitions Building Hearing on Port Everglades, May 1-2, 1928," 1, typed manuscript copy in Will Collection, Senator Fletcher, Commander C. S. Root of the U. S. Coast Guard, W. F. Lineberger as engineer for the port authority, T. E. Will, and a number of Florida citizens were present.

<sup>49</sup> Ibid., 2.

the Lauderdale Canal and had sought to improve the waterway for boat and barge traffic, wrote that Elliot's wire to Hills came "when needed" because of the feeling at Port Everglades and in Ft. Lauderdale, but

. . . when the storm blew over, the N. Canal was left as dead as ever; and the government is led to believe that the St. Lucie is the Be-all and End-all of the Everglades; on which delusion they are right now working. 50

Beginning on January 10, and lasting through February 1, 1929, hearings on flood control in Florida and elsewhere were held by the United States House of Representatives Committee on Flood Control. 51 The first witness to make a statement to the flood control group was Senator Fletcher of Florida, who reviewed the history of the Everglades from the swamp land grant act of 1850 through the disaster of the 1928 storm. 52 Senator Park Trammell, Congressman William J. Sears, and

50 "Munitions Building Hearing on Port Everglades, May 1-2, 1928," 3. Preliminary examination of waterways from Port Everglades to the Caloosahatchee River and North New River Canal and Lake Okeechobee drainage area reported on by the army engineers on March 3, 1932, and July 18, 1933, were both unfavorably recommended. House of Representatives Documents, Number 896, 76 Congress, 3 Session, 15. See also Hearings before the Committee on Rivers and Harbors, House of Representatives, 70 Congress, 1 Session of the Subject of the Improvement of the Caloosahatchee River, North New River Canal, St. Lucie River and Canal and Lake Okeechobee, Florida, May 19, 1928.

51 Everglades News, January 11, 1929; House of Representatives Committee on Flood Control, Hearings before the Committee on Flood Control, House of Representatives, 70 Congress, 1 Session, Florida Control in Florida and Elsewhere, January 10, to February 1, 1929, 1-3. Cited hereinafter as 1929 Flood Control Hearings.

52 Ibid., 42-53. Fletcher set the loss of life at 1,800, injured, 1,800; homes and buildings destroyed, 31,615; families affected, 18,000; and property damage at \$100,000. The loss of life was almost entirely in the upper Everglades area.

Herbert J. Drane, with Senator Fletcher headed a long list of Floridians who went before the committee seeking federal aid for Florida's flood control. H. T. Frierson and John S. Cottrell of Moore Haven described the horrors of both storms for the committee, particularly the force of the wall of wind-driven water which killed and drowned some 2,500 people in 1926 and 1938.<sup>53</sup> Bror G. Dahlberg, Walter F. Linberger, F. C. Elliot, and Attorney-General Fred Davis each testified to the need for flood control, and the latter two dwelt on the inability of the region to pay out the money needed for such large-scale improvements. Major General Edward Jadwin, Chief of the Army Engineers, repeated his recommendations made in Senate Documents, Number 213, 70 Congress, 2 Session.

The testimony of Congressman Herbert J. Drane, in whose district the Caloosahatchee River rose and emptied into the Gulf, brought out the story that the Florida representative had been working since 1924 for flood control in the area, but that it took two major catastrophes to get the army engineers to make one move.<sup>54</sup> Drane declared that Florida could not meet the \$6,740,000 share, not even on a proportional basis because of the state's great diversity of

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<sup>53</sup> 1929 Flood Control Hearings, 77-78, 83-87, 87-95.

<sup>54</sup> Ibid., 245-254. Drane said: "I would rather have my name attached to this piece of legislation than to the tallest monument that could be builded by the hand of man." Ibid., 249.

sectional interests. Two members of the committee were in agreement that Jadwin's plan called for too large a contribution by the state or local interests.<sup>55</sup>

Early in 1929, the Florida Flood Control Association was organized to promote local, state, and national aid for the lands of the southern end of the peninsula. F. L. Williamson, an executive of the Southern Sugar Company of Clewiston, became president of the association which sought private and public funds in its program of importuning the state and national legislatures to undertake a program of protection for the Everglades in case of future wind and water disturbances.<sup>56</sup>

In line with the work of Senator Fletcher and other members of the Florida congressional delegation, the state legislature passed a law at the 1929 session, Chapter 13,711, Laws of Florida, creating the Okeechobee Flood Control District. This district covered the entire southern end of the state, less the offshore islands, south of the northern boundaries of Martin and Lee counties.<sup>57</sup> The Board of Commissioners for the district was to be composed of the governor

<sup>55</sup> 1929 Flood Control Hearings, 251.

<sup>56</sup> Benn Herr, "Origin of Lake Flood Control," loc. cit.

<sup>57</sup> Laws of Florida, 1929, 386-406. The Okeechobee Flood Control District "has no responsibilities, duties or authority over matters of drainage problems, all of which remain with the Everglades Drainage District." Ben Herr, "Caloosa-Lake Okeechobee Drainage Areas," loc. cit., 137.

and the same members of his cabinet as served on the Internal Improvement Fund and Everglades Drainage District Boards, and five landowners of the district no two of whom were to reside in the same county. The officials of the district were charged with the responsibility of water control and navigation in all of the Okeechobee, Caloosahatchee, and Everglades region and were given power to levy taxes, borrow money, issue bonds, exercise eminent domain, and other powers of a corporate body.<sup>58</sup> Section five of Chapter 13,711 authorized the Flood Control Board to contract with and to seek the cooperation of the United States government.

"Immediately upon its creation and organization the district took over the work of the Florida Flood Control Association and other agencies that had been engaged in attempting to secure federal assistance."<sup>59</sup> George B. Hills, of the Jacksonville engineering firm of Hills, Youngberg, and Luce, was employed to correlate all pertinent information on the South Florida problem of water control, and he prepared a comprehensive report for submission to the federal government. In order to place the authoritative data in an accessible and convenient form Hill's report was presented to the

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<sup>58</sup> Laws of Florida, 1929, 386-389. The Florida Constitution of 1885 prohibits the issuance of state bonds, hence, it has been the practice of the legislature to create quasi-public corporations for this purpose.

<sup>59</sup> Ben Herr, "Origin of Lake Flood Control," loc. cit.

Joint Committee on Printing and published as Senate Documents, Number 225, 71 Congress, 3 Session in 1930.

The Okeechobee Flood Control Board was organized in September, 1929, under the leadership of Governor Doyle E. Carlton with resident members from Palm Beach, Glades, Broward, Dade, and Okeechobee counties. The first meeting was held in West Palm Beach, in conjunction with the Commissioners of the Everglades Drainage District, on September 4,<sup>60</sup> 1929. A second joint meeting was held in Miami on October 23 to investigate flood conditions in Dade County, and \$50,000<sup>61</sup> was voted for flood relief in the Everglades. A third meeting of the Okeechobee District Commissioners was held at La Belle, on the headwaters of the Caloosahatchee River, on October 31, 1929, again relative to flood control, and ended in<sup>62</sup> a general discussion of the problem.

The report submitted by Hills to the Florida flood control district, later published by Congress, explained why the state sought the aid of the national government to promote a cross-state canal and secure the additional benefits to be derived from added lake discharge with adequate depth in

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<sup>60</sup> "Minutes of the Board of Commissioners of the Okeechobee Flood Control District," I, 11-18. Filed in the office of the secretary, West Palm Beach, Florida. Cited herein after as O.F.C.D. "Minutes;" E. D. D. "Minutes," VII, September 4, 1929. F. L. Williamson, T. E. Will, Glen B. Skipper, and others addressed the two boards on flood control and related matters at this meeting.

<sup>61</sup> O.F.C.D. "Minutes," I, 25.

<sup>62</sup> Ibid., 29.

a waterway.<sup>63</sup> The Jacksonville engineer, who had been a member of the 1913 Randolph Commission and the 1927 Engineering Board of Review, was on familiar ground and built an excellent case for the state. Hills noted that the expenditures of the Everglades Drainage District, as agent of the State of Florida, to December 1, 1929, were \$18,017,333.79 while special tax districts in the area had spent another \$11,584,777 for local drainage.<sup>64</sup> Hills showed that for thirteen years, from 1913 to 1925, Everglades tax collections had averaged ninety-seven percent of the levy but that the percentage fell to eighty-nine in 1926-1927. These figures, said he, "are significant in relation to projects for flood control, for the session is attributable to lack of flood control, and the incidental uncertainties as to the future of the Everglades."<sup>65</sup>

After a series of hearings and reviews in late 1929 and early 1930, the Army Chief of Engineers recommended on March 15, 1930, the expenditure of \$9,692,000 in the Okeechobee-Calcoosahatchee drainage areas for channels, levees, and other works of navigation and flood control.<sup>66</sup> The recommendation was conditioned on the provision that Florida or other local

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<sup>63</sup> Senate Documents, Number 225, 71 Congress, 3 Session, 1-86.

<sup>64</sup> Ibid.; 88-89.

<sup>65</sup> Ibid.; 87.

<sup>66</sup> Senate Documents, Number 115, 71 Congress, 2 Session, 5.



interests give \$3,812,000 and construct a north shore levee on Lake Okeechobee as well as furnish all lands needed for operations and provide maintenance after the projects were finished. The proposal included: (1) a 2,500 cubic feet per second discharge channel in the Caloosahatchee from Okeechobee to the Gulf--6 by 80 feet; (2) a 6 by 60 foot channel in Taylor's Creek to Okeechobee City; (3) a 31 foot levee and 6 by 80 foot navigation channel along the south shore of Okeechobee; (4) a 31 foot levee on north shore of Okeechobee; (5) a 6 by 80 foot channel in the St. Lucie Canal; (6) protective works in St. Lucie Canal.

During the first two weeks of May, 1930, hearings were held on rivers and harbors matters before the Senate Committee on Commerce. At several of the hearings members of the Florida congressional delegation, engineers of the Okeechobee Flood Control District, and other Florida citizens testified to the need of federal assistance on flood control and financial aid to the drainage and flood control districts.

<sup>67</sup> Senate Documents, Number 115, 71 Congress, 2 Session, 5. On November 15, 1929, A. W. Young was employed as joint secretary of the Okeechobee Flood Control and Everglades Drainage Districts. O.F.C.D. "Minutes," I, 31-32. On January 2, 1930, the Jacksonville engineering firm of Hills, Youngberg, and Luce were engaged by the Commissioners of the Okeechobee Flood Control District to represent the Board in matters of flood control legislation. Young and Hills made several trips to the national capital regarding proposed federal activity in the district. Ibid., 39.

<sup>68</sup> Rivers and Harbors Hearings before the Committee on Commerce, United States Senate, Seventy-First Congress, Second

The Floridians sought a modification of the share of the state's cost in the proposed project on the ground that

. . . about \$80,000,000 is in bonded indebtedness through the Everglades drainage district and other similar drainage bodies, while another \$80,000,000 has already been expended [for works of reclamation, navigation, and flood control]. 69

The Rivers and Harbors Act, passed by Congress and approved on July 3, 1930, authorized the Secretary of War to begin the work in the Calcosahatchee-Everglades drainage areas, but required the United States to build the Lake Okechobee levees

. . . to an elevation of thirty-one feet above sea level instead of thirty-four feet above sea level and shall be built so as to be capable of being raised an additional three feet. . . . Provided, that the State of Florida or other local interests shall contribute \$2,000,000 toward the cost of the above improvements: . . . And provided further, That no

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Session on H. R. 11781, 179-209. Senator Trammell requested the committee to include a proviso in the bill to allow the Florida flood control district to present its bonds in lieu of cash for the State's share because South Florida had suffered so many disasters the bonds could not be sold. Ibid., 182. George B. Hills stressed the fact that local interests had borne all the financial burden of the reclamation project. Ibid., 184.

69 Ibid., 192. Howard Selby, West Palm Beach banker and vice-chairman of the Board of Commissioners of the Florida flood control district, stated that the people of the Everglades were afraid to go ahead with improvements, but that the proposals of the bill would restore confidence in the area. Ibid., 192-193.

expense shall be incurred for the acquirement of any lands necessary for the purpose of this improvement. <sup>70</sup>

On October 22, 1930, the Commissioners of the Okeechobee Flood Control District made a contract with the United States whereby the former assumed the obligations of the State or local interests under the 1930 act; <sup>71</sup> and the War Department began construction work on the flood control project in November, 1930. <sup>72</sup>

In 1935, Senator Fletcher and other members of the Florida Congressional delegation secured the passage of a Rivers and Harbors Act that declared:

The existing project is hereby modified to provide that the United States shall maintain all project works when completed and shall bear the cost of all drainage structures heretofore or hereafter constructed in connection with said project: Provided, that the total cash contribution required of local interests toward the

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<sup>70</sup> Public Number 520 (H. R. 11781), 71 Congress, 9. The same law provided for inland waterway surveys from Stuart to Ft. Myers via the St. Lucie River and Canal, Lake Okeechobee, and the Caloosahatchee River; from Miami to the Gulf of Mexico via the Miami River and the Tamiami Canal; and from Port Everglades to Lake Okeechobee via the New River and the North New River Canal. *Ibid.*, 23-24.

<sup>71</sup> Ben Herr, "Caloosa-Okeechobee Drainage Areas," *loc. cit.*, 139. On the same date the Commissioners of the Everglades Drainage District transferred the St. Lucie Canal, Caloosahatchee Canal, and all the canal channels in Lake Okeechobee as well as lakeshore locks and dams to the Okeechobee Flood Control District. E. D. D. "Minutes," VIII, October 22, 1930.

<sup>72</sup> *Ibid.*, 139. The residents of the Everglades were well pleased with the federal assumption of the control work and felt that if the "government" were doing the job it would be done right. Everglades News, June 5, 1931.

cost of the project shall be \$500,000. <sup>73</sup>

The flood control and navigation improvements from 1930 through 1942 cost approximately \$20,000,000, including construction and maintenance. <sup>74</sup> Included in the project were eighty-five miles of levee, thirty-four to thirty-eight feet above sea level along the north and south shores of the big lake, modern storm gates at canal entrances, culvert drainage structures through the levee, locks and spillways on the St. Lucie and Caloosahatchee Canals, a six by eighty foot channel from Stuart to Ft. Myers, and sundry other similar works. <sup>75</sup>

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<sup>73</sup> Section of 1935 Rivers and Harbors Act quoted in Ben Herr, "Caloosa-Okeechobee Drainage Areas," loc. cit., 139. A resolution of thanks from the Commissioners of the Okeechobee Flood Control District was sent to Senator Fletcher and other members of the Congressional delegation for reducing the maintenance of the flood control works. August 30, 1935. O.F.C.D. "Minutes," II, 159.

<sup>74</sup> Ibid., 143-144.

<sup>75</sup> Senate Documents, Number 115, 71 Congress, 2 Session; House of Representatives Documents; Number 28, 75 Congress, 1 Session; Number 489, 76 Congress, 1 Session; and Number 696, 76 Congress, 3 session.

The cross-state waterway from Stuart to Ft. Myers was opened on March 25, 1937, with the arrival of seventy-five yachts at the latter place. Secretary of Commerce Daniel Roper, Senator Claude Pepper, and other public figures joined in the celebration marking the official opening of the Okeechobee-Caloo-Sahatchee flood control project.<sup>76</sup> In April, 1941, the Navy Department recommended to the War Department the improvement of the Stuart to Ft. Myers waterway to a controlling depth of eight feet in order to allow the operation of small naval vessels through the canal.<sup>77</sup>

Writing in 1943 on the need for responsible agencies with definite plans of operation, the Engineer and Secretary of the Okeechobee Flood Control District said:

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<sup>76</sup> Everglades News, March 26, 1937. For an excellent verbal and pictorial survey of the whole system of federal works in the project, see: Corps of Engineers, U. S. Army, Jacksonville, Florida District, "The Lake Okeechobee Florida Project," (unpublished document, located in Army Engineers office, Jacksonville, Florida), 1-22. A depth of eight feet and a width of eighty feet throughout were recommended by the Chief of Engineers, U. S. Army, in 1940. House of Representatives Document, Number 696, 76 Congress, 3<sup>rd</sup> Session, 3-4.

<sup>77</sup> Orlando Morning Sentinel, April 25, 1941

If some one authority could be provided to assemble all of the information now available on the various features of reclamation in the Everglades and to prepare a comprehensive plan or program of reclamation, there is every reason to believe that it would be of great assistance to the War Department in its present activities and would be of even greater assistance in bringing about further interest and cooperation on the part of the United States. 78

The value of the lake levees and control structures of the Caloosahatchee-Okeechobee areas in the drainage of the Everglades cannot be underestimated in the over-all picture of the reclamation project. The principle established by the Isham Randolph Commission in 1913 of handling the two problems of lake control as a reservoir and land drainage by ditching has been proven to be accurate through the intervening years. <sup>79</sup> The works of the army engineers has supplemented the work of the drainage district to a point where the first problem has been mastered. This fact has become increasingly noticeable

. . . since the year 1931 when the U. S. Engineers assumed responsibility for the rehabilitation of the Lake Control in the interest of navigation and flood control. . . . Federal administration has increased the stability of levees and has planned for control of lake stages between fourteen and seventeen feet above mean sea level and, since 1913, has rather consistently controlled lake stages at about sixteen feet above sea level.

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78 Ben Herr, "Caloosa-Okeechobee Drainage Areas," loc. cit., 143.

79 H. A. Bestor, "Reclamation Problems of Sub-Drainage Districts Adjacent to Lake Okeechobee," The Soil Science Society of Florida, Proceedings, V-A (1943), 158. "Although this is commonly referred to as the Randolph Plan of Everglades Reclamation, it is actually only an Engineer's Report." Ibid., 159.

Prior to 1931, arterial canals were usually overburdened by high lake stages and their contiguous land waters. Since 1931, these arterial canals have had more opportunity to remove water from the lands adjacent to them because of consistently maintained low lake stages combined with distribution of rains and absence of severe storms. 80

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80 H. A. Bestor, "Reclamation Problems of Sub-Drainage Districts Adjacent to Lake Okeechobee," loc. cit., 159.