

**STATUS OF THE SWAMP AND OVERFLOWED LANDS PATENTED
TO THE STATE TO AUGUST 6, 1904.**

	Acres.
Total number of acres of swamp and overflowed lands patented to the State to Aug. 6, 1904.....	20,133,837.42
Deeded to railroad companies.....	8,242,317.69
Deeded to canal companies.....	2,252,816.96
Deeded to Hamilton Disston.....	4,000,000.00
Deeded to Dickerson.....	248,802.98
Deeded to Jackson.....	113,064.80
Deeded to individuals not under legislative grants.....	2,200,130.31
 Total disposed of prior to Aug. 6, 1904.....	 17,056,932.74
Leaving a balance on hand Aug. 6, 1904.....	3,076,904.68

(Annual Report, General Counsel, of the Internal Improvement Fund, Florida, 1908-9, p. 14.)

AREA OF FLORIDA AND OF WET LANDS UNPATENTED, 1904.

The Government's statement shows the total area of the land surface of Florida to be 35,072,640 acres; that 33,895,534 acres have been heretofore patented, leaving remaining after deducting homestead lands, reservations, and water surface an estimated area of only 200,000 acres of swamp and overflowed lands.

(Annual Report, General Counsel, of the Internal Improvement Fund, Florida, 1908-9, p. 15.)

**DRAINAGE INVESTIGATIONS, 1904, BY C. G. ELLIOTT, ENGINEER,
U. S. DEPARTMENT OF AGRICULTURE, IN CHARGE.**

United States Department of Agriculture, Office of Experiment Stations, Irrigation and Drainage Investigations, Elwood Meade, chief. Extract from Separate No. 9, Office of Experiment Stations, Bulletin No. 158, Annual Report of Irrigation and Drainage Investigations, 1904, by C. G. Elliott, engineer in charge of drainage investigations, pp. 714-717.]

The Everglades of southern Florida are attracting attention by reason of their ability, under proper drainage and management, to produce vegetables for the northern winter market and subtropical fruits of acknowledged excellence. A reconnoissance of lands in the vicinity of Miami was made for the purpose of determining upon the feasibility of draining a small tract of Everglade land for experimental use.

The part examined comprises a belt of land extending about 60 miles north and 25 miles south of the city of Miami and for various distances from the coast line toward the Everglades. The topography of the land near the coast and its relation to the Everglades which occupy the interior are interesting and important. The rise of the general surface from the coast line westward for a distance of 3 or 4 miles is 9 to 16 feet. From this, westward across the Everglades, the rate is about 0.3 foot per mile, as ascertained by two separate surveys made under the direction of the Florida East Coast Railway Co. The dividing line between the slopes toward the Gulf and the Atlantic is about 22 feet above tide and extends south from near the center line of Lake Okeechobee. The belt of land 3 or 4 miles wide first mentioned may be regarded as a rim which prevents the ready flow of water from the Everglades southeasterly to the ocean. Numerous small streams extend from the edge of the

Glades proper through this rim and are the only natural facilities for draining the Glades.

The rock found in this part of the State is the coral breccia, which crops out at the surface over the entire width of the rim and is covered with pine timber and palmetto, with the exception of small areas termed "hammocks," which are covered with hardwood trees. Arms of the Glade land 0.5 to 2 miles wide extend from the head end of these small streams back into the Everglades proper for a distance of 2 or 3 miles, bordered by pine woods, beyond which is the open expanse known as the Everglades. These lands are called "prairies" and are covered with saw grass. Two types are best known, the marl and the sand prairies. The soil varies in depth from 1 inch to several feet and in all cases rests upon a base of coral rock. In some instances the rock is known as "plate rock," which is apparently smooth and solid. In other cases the rock is filled with potholes, making an irregular base upon which the soil rests. In some portions of the northern part of the tract examined muck and peat lands are found in quite extended beds, but they usually thin out and pass into the prevailing marl formation.

A great deal of money has been expended in drainage works by the Florida East Coast Railway Co. The operations of this company so far have been directed toward opening and enlarging the natural streams for the purpose of lowering the water of the arms of the Glades during the winter season, in order to facilitate the growing of winter vegetables. This drainage has also permitted some fruit growers owning small detached tracts of Glade land to so drain them that trees are now successfully grown.

The average annual rainfall of that portion of the State is about 63 inches. The so-called dry season or portion of the year in which there is the least rainfall occurs between the months of November and March, during which time the normal precipitation is about 11.5 inches, ranging from 1.5 to 2.5 inches per month. During this season portions of the prairie lands are planted to vegetables, principally tomatoes, which are more profitable for shipping to the northern market than others and when properly fertilized produce large crops. The remainder of the year these lands are frequently covered with water and are largely abandoned until the opening of the winter season, when they are again plowed and planted.

None of the Glade land proper, as far as examined, has been so drained as to be suitable for the growing of trees or of vegetables requiring the entire season, except openings which are sufficiently high to be protected from the volume of water of the interior, and which, by reason of their more elevated situation, have been artificially drained.

There are some features of climate, soil, and geological structure peculiar to this section which have an important bearing upon the success of any reclamation project that may be considered. The soil, both the marl and the sand, lacks those natural elements of fertility commonly found in other low-lying lands, and requires the liberal use of artificial fertilizers to produce either fruits or vegetables. The soil-water table may be 8 to 20 inches from the surface without injuring the growth of fruit trees, and it is observed that plants usually are not as sensitive to a saturated condition of the soil as they are in colder latitudes, where clay is a leading element in the composition of the soil.

The porous and absorbent nature of the coral rock has an important effect upon the water problems of the country. It is known that cavities exist in the rock at various depths, as shown by drilled wells, which occasionally penetrate reservoirs of water 4 to 6 feet in depth. It is also noted by truck farmers occupying cleared land near the coast that water comes upon their fields in some cases from the underlying rock when the water of the Glades is at high stages. It is quite probable that this open and irregular structure is more strongly characteristic of the rim or coast belt than of land nearer the Glades since, as we approach the latter, the plate or solid rock seems to predominate. This point, however, has not been demonstrated and is one of the undetermined factors entering into the drainage of this portion of the Everglades.

The channels of the streams which now form the overflow outlets of the interior prairies disappear at the outer border of this vast expanse at an elevation of 9 to 13 feet above tide. As a result of surveys made across the Glades, as before stated, it is reported that they have a slope of 0.3 foot per mile in a southeasterly direction. Should these streams be deepened, enlarged, and extended through the prairies, a grade of 0.4 foot per mile might possibly be obtained for the channels, part of which would necessarily be excavated through the rock.

In case only one channel should be made, it would tap the waters of the entire area at flood time, but would afford no more than flood relief, even if the canal were fully ample to carry the water of the entire area, for the reason that this expanse is practically level, and the water will not flow to this channel rapidly enough to give good drainage. This makes it necessary to dredge all of the natural streams into or through the Glades as far as the divide between the eastern and western slopes, which is reported to be 22 feet above tide and to lie in a line extending south from the center of Lake Okeechobee. For the reasons above mentioned, all of this work must be done before this area of approximately 3,500 square miles can be drained sufficiently for summer culture.

The practicability of draining small tracts about the border of the Glades has been demonstrated only for the production of winter vegetables. While these areas may be somewhat increased and the risk of winter flooding diminished by the improvement of natural channels, it will be impossible to extend the area of these lands for fruit growing or make the Glades more than temporary winter fields until more effective drainage is provided. The problem which confronts the investor and cultivator is not so much the possibility of draining the tract as a whole as what may be done in this direction within the limit of individual means to fit portions of this land for the production of crops.

Investigation of this portion of the Glades was made with the view of ascertaining whether some plan might not be devised for reclaiming small areas. An experimental plan for determining whether portions of the marl land could not be inclosed by dikes to protect them from outside water and the interior be kept dry by pumping was proposed and a tract selected for the experiment, but it has not yet been put in operation.

The success of this method of drainage will depend upon whether a good dike can be made of the marl soil and also whether the head of

water back of the dike may not force water through the underlying porous tracts into the inclosed area in greater quantities than can be profitably removed. The plan merits a trial. Such a method of improvement would admit of gradually pushing the drainage of the Glades away from the higher rock lands, leaving an overflowed space of sufficient width to allow for the passage of the interior water. The dikes would be 4 feet high, and the total lift of water about 6 feet.

The economic advisability of such work will depend upon the value of the product. The prestige of Florida fruit in the market is encouraging and indicates that the State may easily lead in the quality of many of her fruits. The value of fruit products during the last two years, as reliably reported, has been \$200 to \$1,000 per acre, which amount would justify considerable expenditure for reclamation improvements. The expense of preparing the rock land for trees is not less than \$100 per acre, while the reclamation by levees, if such were found practicable, will not be more than \$50 per acre, though there would be a continuous expense for maintenance. Shallow drainage channels should accompany the levee system to provide relief from flood water from the Glades and to carry off the water pumped from the land inclosed by levees.

A combination of the two plans will admit of the gradual development of the Glade lands as the demand for their products increases.

OFFICIAL STATE MAP OF THE EVERGLADES, ADOPTED IN 1905.

[Adopted at a meeting of the Trustees of the Internal Improvement Fund of Florida, held in Tallahassee on Jan. 2, 1905.]

The following proceedings were had:

Governor Jennings presented the following letter, together with a map of the Everglades:

TALLAHASSEE, FLA., January 2, 1905.

Hon. W. S. JENNINGS,

Chairman Trustees Internal Improvement Fund, Tallahassee, Fla.

SIR: In compliance with your request I here hand you a map which has been prepared in the land office, showing the area of the Everglade patent, known as No. 137.

We have extended the lines by rule from the surveyed lines on the east and the west side of the Everglades, which is as near a location of the sections, townships, and ranges as we can furnish without an actual survey of the same.

I trust the same will be satisfactory.

Yours, very truly,

B. E. McLIN,

Commissioner of Agriculture.

After consideration, the following resolution was adopted:

"Resolved, That the letter of Hon. B. E. McLin, commissioner of agriculture, be spread on the minutes of the Trustees and that the map of the Everglades, as prepared under his direction, be, and the same is hereby, adopted as the official map of the Everglades land, embracing the lands in United States Patent No. 137, containing 2,862,280 acres, and that said map be identified by the secretary indorsing thereon the following words and figures, viz:

"Official map of the Everglades, covering the lands embraced in U. S. Patent No. 137, prepared under direction of Hon. B. E. McLin, commissioner of agriculture, and adopted as official by the Trustees of the Internal Improvement Fund of the State of Florida, January 2nd, 1905."

"Be it further resolved, That the map be entered on record on a separate page of the minute book of the Trustees of the Internal Improvement Fund of the State of Florida, and that a copy of said map, duly certified as aforesaid, be filed in the office of the Hon. B. E. McLin, commissioner of agriculture * * *." (Minutes of the Trustees of the Internal Improvement Fund, vol. 6, pp. 5-7.)