

cent swamp and overflowed lands, including the Kissimmee Valley and the right to establish other drainage districts, authorizing a drainage commission to levy an acreage tax for a reasonable amount, to be levied and collected annually, to be used in the drainage and reclamation of said territory; and in the aid of the great purposes and the trusts accepted by the State of Florida in its acceptance of the magnificent domain patented to her by the United States Government.

As a difference of opinion exists as to the necessity for such a constitutional amendment, and as it is the purpose of the Trustees to proceed with the drainage and reclamation of the 3,000,000 acres now under their control as speedily as possible, I also recommend, in addition thereto, that a statute authorizing the creation of drainage districts by the Trustees and the assessment of benefits and damages be enacted.

Respectfully submitted.

N. B. BROWARD, *Governor.*

REPORT OF THE JOINT COMMITTEE OF THE FLORIDA LEGISLATURE FOR THE YEAR 1907, ON THE DRAINAGE OF THE EVERGLADES.

HON. EUGENE S. MATTHEWS,
Speaker of the House of Representatives.

DEAR SIR: Your committee appointed under house concurrent resolution No. 7, same being as follows:

Whereas, The governor of Florida, in a special message to the legislature transmitting the report of the Trustees of the Internal Improvement Fund, recommended the appointment of a committee from both houses to inspect the work that had been done by the Trustees in the matter of building dredges and digging canals in the neighborhood of New River, and to visit Caloosahatchee River, and consider all the facts and data relating to such operation: Therefore

Be it resolved by the senate, the house of representatives concurring, That a committee of four from the house and three from the senate be appointed to visit the scene of the work now being carried on by the Trustees of the Internal Improvement Fund in the vicinity of New River and to inspect the same; to inspect the building of dredges and the work of digging canals, which is now being carried on by the Trustees; also to visit the Caloosahatchee River and consider all the facts and data bearing upon the drainage and reclamation of the swamp and overflowed lands and make report thereof to the legislature,

Have the honor to make the following report, to wit: We left Tallahassee and proceeded to Fort Lauderdale, situated on New River, where we observed and investigated the method of construction of the dredges, the character of the dredges constructed, and the work so far done by them, its value, its effect upon adjacent territory, and its relative cost as compared with the increased value of the territory through which they are digging.

We found two dredges built by the Trustees of the Internal Improvement Fund during the last two years, each of them 105 feet long by 38 feet breadth of hull by 8 feet in depth of hold, and each with two

parallel bulkheads, built staunch and strong throughout of wood and iron, and three decks, with commodious living apartments, all well kept, clean, and manned by crews energetic and industrious.

Each of the dredges is equipped with main engines of the dimensions of 14 inches diameter of cylinder by 20 inches stroke, well geared with steel gearing, and apparently strong and durable, with swinging engines, 8 inches in diameter of bore of cylinder by 10 inches stroke, steel geared wheels. One of the dredges has a steam boiler of Scotch pattern. Two corrugated furnaces allowed a steam pressure of 130 pounds. The other dredge contains a locomotive pattern of boiler, with one furnace and the usual number and sizes of tubes, and allowed same steam pressure. Both of the boilers are covered with asbestos and appear to be in good condition. Both dredges are equipped throughout with a complete system of electric lights, permitting work to be done day and night. The engines also on each of the dredges look clean and run as smoothly as any dredge machinery is expected to run. The dippers used on each of the dredges in the present work (that of excavating rock and earth) are of the rock-dipper type, of 2½ cubic yards capacity, water measurement.

We found quite a large supply of extra parts of those parts of the machinery most likely to break down or wear out rapidly, and two clay dippers of the capacity of 4½ cubic yards, water measurement, one for each of the dredges, which will increase the output of excavation each day very materially as soon as the dredges have cut through the rock rim to the Everglades, which rim is about 3 miles in width from the river, into the soft muck of the broad Everglades beyond. The dredge *Everglades* has passed through her hardest and deepest rock cutting.

As further information, we submit herewith the report of the civil engineer in charge, Mr. John W. Newman:

ANSWERS TO WRITTEN QUESTIONS OF THE COMMITTEE FOR INVESTIGATING DRAINAGE.

1. Estimated cost of two dredges, \$100,000.
2. Character and quantity of material excavated: Of rock, 107,870 cubic yards; of dirt, 42,213 cubic yards; total, 150,183 cubic yards excavated by dredge *Everglades*. Estimated cost of entire work of dredge *Everglades*, including repairs, \$12,907.65.
3. Monthly expenses: Costs of six months from October 1, 1906, \$7,948.69; average cost per month, \$1,324.80. Moved in six months, 78,000 cubic yards of rock and 30,000 cubic yards of dirt; total, 108,000 cubic yards. Cost per cubic yard in six months, rock 8 cents, dirt 6½ cents.
4. Length of canal April 1, 5,886 feet; average width, 60 feet; average depth, 11 feet 10 inches.
5. Value of land before drained, nothing. Value of land after draining, \$30 per acre.
6. Depth of dirt on rock rim in first mile, which is dug before reaching the unsurveyed land, is 0 to 1 foot. Depth of dirt in second and third mile, 5 to 10 feet; fourth and fifth mile, no rock found; sounding, 12 feet.
7. Nature of land west of rock: At 3 miles from mouth of canal in New River no rock is found, sounding every hundred feet with a 12-foot rod, but good muck 3 to 6 feet deep; under this a stratum of hard sand, 3 to 5 feet deep, then soft material, supposed to be muck.
8. Quantity of land drained per mile of canal: Estimated from evident effects of present work, complete drainage will result at average of 906 acres per mile, or 6 miles will drain 5,440 acres, worth when drained, \$163,200.

JOHN W. NEWMAN.

Engineer for Trustees of Internal Improvement Fund.

Question No. 3 is answered as to the dredge *Everglades*, giving you the average monthly expenses for six months beginning October 1, 1906.

Answer No. 2 embraces all work done by *Everglades* to April 1, 1907.

JOHN W. NEWMAN.

Engineer for Trustees of Internal Improvement Fund.

We found by inquiry that no one had been sick on either of the dredges and that the public in that vicinity enjoys good health. We also found the country comparatively free of mosquitoes, and we were informed that no malaria prevails in that country.

The dredge *Okeechobee* is cutting in a southerly and westerly direction, following the narrow stream which constitutes the headwaters of the New River, widening and deepening it to a point near section 25, township 50 south, range 41 east, from which point she will proceed west three-fourths of a mile to the deep muck of the Everglades. From the dredge we were shown the flag marking the western boundary of the rock rim at the intersection of the deep muck.

The estimated area of the territory already drained by the cutting of the first canal is about 750 acres, the character of which land is, in the opinion of this committee, rich in quality and very valuable. In the opinion of those living in the vicinity, the land, after being reclaimed, will be worth about \$30 an acre. Along the banks of this canal your committee observed several truck farms. They stopped and examined a crop of tomatoes growing on land which they were informed was from 12 to 18 inches under water before this drainage canal was cut. This piece of land was about 1 acre in area, and the character of the crop was finer than anything of the kind ever seen by any member of this committee. The estimated value of the crop on this land was about \$700. The soil of this reclaimed land is apparently a very rich alluvial deposit, and is not peaty in character. Although it had not rained for months in that section, moisture was near the surface, and although it rained during the visit of the committee, the committee visited the same land the following day and found it firm and not sloppy and boggy.

The canals being made have a depth of about 10 feet by about 60 feet in width, and are now and will be of great value as highways for commerce.

We found the depth of water in New River to be on an average of about 20 feet. We passed up the river from its mouth, to where the dredges are in the Everglades. We find that it is a waterway of considerable importance even now. Many launches and lighters are used in the transportation of the products of that section and for other purposes. Your committee could clearly see that the effect of the canal has been to drain the land for, say, one-half mile or more on either side of the canal and for a considerable distance in front of it.

Of course, in estimating the ultimate value of the work done by the canal we must take into consideration that its object is not only the drainage of the land along its banks, but also the lowering of Lake Okeechobee, thus lowering the water level throughout this whole territory, and providing an open waterway from the Atlantic Ocean through Lake Okeechobee and down a system of canals already cut into the Caloosahatchee River on into the Gulf of Mexico.

We proceeded from New River to Miami, for the purpose of observing the depth of the Miami River, and to note the fall from the Everglades land into the waters of the Miami River, and the practicability of draining the lands in that vicinity, and to estimate the value of canals and the effect of drainage to the Everglades at the head of the Miami River.

The members of your committee were taken in charge by officers of the board of trade of Miami and shown every courtesy possible. We were first taken in an automobile to a very valuable place in the edge of the Everglades, where we found a tract of 20 acres of land on which had been planted a splendid young orange grove, and on which we found a vegetable farm comprising most of the vegetables grown in Florida. The lands of the Everglades visible from this point were of the same character as those observed at New River. We were also taken in a launch up the Miami River to its head, where there is an observatory tower from which the land of the Everglades can be seen for miles ahead. The incline from the surface of the water in the Miami River and to the Glades was very perceptible to the naked eye, and we are informed that the actual fall in 1,500 feet is about 7 feet. We are informed that the current in the upper portion of the river, near the water in the Glades, during the rainy season, is so swift that it is difficult for a powerful launch to ply upstream.

For the information of the legislature, and as a means of enlightening ourselves as to the actual cost of excavating and dredging through material such as is being cut by the dredges *Everglades* and *Okeechobee*, we obtained from Maj. Francis R. Shunk, United States Corps of Engineers, located at Jacksonville, Fla., the cost of excavating by the United States under the competitive-bid system and as done by the United States Government itself, and we were kindly furnished the following information from the records in his office:

COMPETITIVE CONTRACT WORK BY UNITED STATES GOVERNMENT BIDS.

	Soft material.	Rock.
St. Johns River, Orange Mills Flats.....	\$0.107
St. Johns River, Jacksonville to ocean.....	{ .0823	\$4.33
Biscayne Bay.....	{ .24	1.78
Tampa.....	{ .15
Withlacoochee.....	{ .1190
Hillsborough.....	{ .16	3.50
	{ .14	4.90
	{ .119½	4.89

10 per cent should be added to the above.

GOVERNMENT WORK DONE BY UNITED STATES GOVERNMENT ITSELF.

Key West.....	\$0.1494
Anclote River.....	.116
Kissimmee River.....	.24	\$2.60
Sarasota Bay.....	.181	1.33
Manatee River.....	.177

It will be seen that the United States Government is paying, and has been paying, for excavating soft material, from 8.23 cents per cubic yard minimum price, in the St. Johns River, Jacksonville to the ocean, up to 24 cents per cubic yard in Biscayne Bay and Kissimmee River, and that for excavating rock the United States Government is paying and has paid from \$1.33 per cubic yard minimum in Sarasota Bay up to \$4.90 per cubic yard in Hillsborough Bay at Tampa, while in the Kissimmee River, which flows into Lake Okeechobee, the Government has paid 24 cents per cubic yard for soft material and

