

# Hillsboro Inlet District Operations - June 2016

## Jack Holland, Chairman

### Background

In 1957 the Florida Legislature created the Hillsboro Inlet District. This is a special independent district that can levy taxes to finance the maintenance and improvements to the Inlet. The taxing District runs from Dixie highway to the Ocean and from the Broward/Palm Beach county line to Lauderdale by the Sea. The District has eight commissioners from: Pompano Beach, Lighthouse Point, Deerfield Beach, Hillsboro Beach, Lauderdale-by-the-Sea, Sea Ranch Lakes, Ft. Lauderdale and Broward County.

Based on a physical model in 1964 at the University of Florida, the current configuration of the inlet was created by cutting the rock reef between the channel markers to 10 feet deep, adding the 400 foot South jetty and a 200 foot north jetty. In heavy northeast storms the spillway between the north jetty and the lighthouse allows waves to carry sand from the littoral drift into a sand trap inside the inlet. With the outside channel rock at 10 feet, the sand dredging could only maintain a depth of 8 to 9 feet.

### Financials

The District's source of revenue is predominately ad valorem taxes levied on real property within the District. The District's budget consists of two major components the recurring expenses and funding for special projects.

Recurring expenses are the day to day expenses to operate and maintain the dredging equipment to dredge the channel and bypass sand to the South. These expenses are labor cost for crew of five, fuel, supplies, insurance, legal, accounting, etc. The day by day operation of the crew is supervised by the Dredge Captain and the Assistant Captain. The overall management strategy of the operation is provided by the District's eight commissioners that are volunteers with no direct compensation.

Special projects are mainly capital equipment purchases, major maintenance for equipment and improvements to the inlet. Channel improvements were cost shared with FDEP and FIND.

For these special projects a reserve is set up and funds are accrued (mostly over several years) before committing to the project. The District's special project outlay occurs in the year of the construction, major maintenance and/or the purchase of the capital equipment. The District does not carry any debt.

The District's dredging equipment consists of a hydraulic sand pumping dredge, two support workboats, an elbow barge and a yard crane. A reserve to replace the dredging equipment had been established in the early 1980's.

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### Inlet Improvement Project

As part of a State required Inlet Management Plan, the District created a design to deepen and widen the outer channel. The plan was to remove the rock down to 20 feet and widen the channel by removing a small portion of the submerged reef on the south side of the channel. This reduces the danger of boats going onto the reef and gives the ever increasing number of boats more room to maneuver safely. A fan shaped channel design for these improvements was completed in 1995.

When the District was getting ready to implement the plan, the Army Corps of Engineers wanted to help the District using Federal funds. If they were to supply funding, they had to redesign the project. They spent several years studying and redesigning the project but no Federal Funds were available.

In 2002, an opportunity to economically have a rock cutting dredge complete the project for far less than the ACOE estimates occurred. It was decided to use the dredging equipment reserve to implement the channel improvement project. This project was completed with financial support from FDEP and FIND with permitting from ACOE, FDEP and Broward County.

### Project Costs:

Rock dredging:	\$3,250,000
Engineering, Misc. Expenses*:	\$250,000
Artificial Reef mitigation:	\$500,000
Total Cost:	\$4,000,000

### Project Funding:

Florida DEP:	\$1,600,000
FIND:	\$927,000
Hillsboro Inlet District**:	\$1,473,000
Total Funds:	\$4,000,000

\*Includes removal of navigation aids, project monitoring, etc.

\*\* Mostly from reserve funds built up over the last 10 years for possible dredge replacement.

Construction of an artificial Reef was required as mitigation for removing a small portion of the hardbottom/reef south of the channel during the inlet improvement construction. The artificial reef was permitted by ACOE, FDEP and Broward County and was completed in April 2009 at a total cost of \$1.3M with FDEP providing \$550K and Hillsboro Inlet District providing \$750K.

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**Taxes**

In 2003 to 2005 the Special Project portion of the budget was increased temporarily to replenish the dredging equipment reserve.

Year	Millage	Taxes on \$500,000	% Increase Since 2000	Revenue
2000	0.1036	51.80	0%	714,852
2001	0.0951	47.55	-8%	714,519
2002	0.1170	58.50	13%	994,390
2003	0.2490	124.50	140%	2,389,878
2004	0.1845	92.25	78%	2,016,626
2005	0.1845	92.25	78%	2,344,637
2006	0.1170	58.50	13%	1,802,521
2007	0.0860	43.00	-17%	1,432,315
2008	0.0860	43.00	-17%	1,338,686
2009	0.0860	43.00	-17%	1,201,233
2010	0.0860	43.00	-17%	1,047,195
2011	0.0860	43.00	-17%	1,021,118
2012	0.0860	43.00	-17%	1,031,819
2013	0.0860	43.00	-17%	1,068,167
2014	0.0860	43.00	-17%	1,134,761
2015	0.0860	43.00	-17%	1,213,982

**Dredge Replacement**

The District's equipment operates in very harsh environmental conditions with constant salt spray and wave action

The District's dredge was an Ellicott Dredge built in 1971. The District purchased it from Hanson Dredging in 1982.

For several years it required extensive repairs with excessive down time. Many of repair parts had to be custom fabricated by the crew and/or the original manufacturer.

In 2008, the District replaced the dredge with a new dredge built to better withstand the harsh salt environment.

The new dredge was an Ellicott Dragon Series 1070 14/12 Dredge purchased at a cost of \$1.8 M. With an expected life of at least 30 years, the amortized cost of the dredge is about \$60K a year which is 6% of our annual operating budget.

Some key dredge features include:

Large pontoons to give more freeboard to handle waves from ocean and wakes from boat traffic rushing for the bridge and/or ignoring no wake signs

Heavier spuds for better penetration and stability.

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Stainless steel fittings on all hydraulic lines

All raw water piping is of stainless steel.

Fresh water tanks on dredge to facilitate fresh water wash down at the end of work day

New low pollution turbo-charged diesel engines-800HP for Pump and 350 HP for Auxiliary-using low sulfur fuel for reduced emissions.

Oil separator for bilge pump to guarantee no oil discharge

Coast guard approved biodegradable hydraulic fluids which were used on the old dredge for several years.

Gantry lift for ladder to not bang ladder into bottom as with the old dredge hydraulic ladder control

New dredge started pumping sand in May 2008.

### **Workboats Replacement**

The inlet operates two work boats to support the dredging operation. The dredge has no means of moving on its own other than using winches to control its position. The work boats set anchors on steel cables that facilitate the winching operations. We commonly called the old boats the Steel workboat and the Aluminum workboat.

The steel work boat was purchased in Oct 1994. At that time the purchasing process that we have in place today had not yet been implemented and the quality of the boat was very poor. The company that supplied the boat was having financial problems and even though we were buying a new boat they resorted to using used parts in several key areas. Over the years this boat has required extensive repairs and has been unreliable when needed to perform its tasks.

The aluminum work boat purchased Nov 1995 had jet drive propulsion. Again this was purchased without the purchase process that we have in place today.

This boat has proven very unreliable because of sea grass, seaweed and other flotsam in the inlet clogging the jet drive intake. Bottom-line, a jet boat is not a practical application at the inlet. When setting anchors if it loses propulsion the whole dredging operation is impacted. In addition, the crew is put in jeopardy with the boat essentially adrift in the strong currents of the inlet.

An additional concern is that The District's new maintenance dredging permit is very specific about not disturbing any sea grass in The District's permitted operation area. Although unlikely that we would suck any growing grass into the boat, the possibility still exists.

In 2010 the District replaced the older work boats with two new identical custom steel workboats. All spare parts and maintenance techniques will be the same for both boats.

### **Yard Crane**

A used yard crane was purchased in September 1999.

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Again this was purchased without the purchase process that we have in place today. This crane was too large for The District's operation and could not be stored at The District's property at the inlet. It was stored at the Hillsboro Beach City water works on Sample road. This crane has been a problem ever since we've had it with leaking hydraulic fluid, engine problems and safety issues with the outriggers failing endangering the crew. When we had a warrantee problem with the gearbox on the new dredge, the removal of the box was delayed over a week repairing the crane to remove the gearbox and facilitate loading in a crate for shipping.

A new yard crane small enough to be stored at the inlet yet with lifting capacity consistent with the District's operational requirements has been purchased and is now in service at the Inlet.

#### **Distict Location at the Inlet.**

The District has leased land from the US Coast Guard at the Inlet. The lease is a no-cost agreement with the Coast Guard. A portable office building and work shed is at the location. The district has done two major improvements: seawall replacement and workboat dock replacement. Both of these projects were funded by the District and gifted to the coast guard because it is not our property. The District is the main user of these improvements.

#### **Sea Wall Replacement**

The original seawall in our work area was made from piled bags of concrete. With the wave action at the inlet, the wall became undermined and unstable. This presented an unsafe environment to operate heavy equipment to remove equipment and/or service the dredging equipment. A new concrete piling-and-panel seawall with solid concrete cap was built in October 2004.

#### **Workboat Dock Replacement**

The dock for our workboats has been deteriorating for many years and had become unsafe even though being repaired several times. The district built a new dock in August 2008. It was built to withstand the constant wave action and current at the inlet. The dock is also used by the Hillsboro Inlet Lighthouse Preservation Society to bring visitors for lighthouse tours.

#### **Dredging Volumes**

See attached chart showing monthly volumes from 1991 to the present.

On Nov 19, 2008 a blockage developed in the submerged line under the inlet. The submerged line is made up of many sections of 12" rubber hose covered with sand. While removing the sand over the line, the dredge had a failure in the lubrication of the main reduction gear on December 8th.

Working with engineers and technicians from the gear box manufacturer, it was determined that the gear box would be repaired under warrantee but could not be

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repaired on site and would have to be shipped back to the factory in New York. The gear box was removed from the dredge (delayed by old yard crane problems) and shipped it to their factory on December 23rd. The repaired gear box was returned and installed with the dredge being operational February 23, 2009. To prevent future problems, a special alarm was added to the dredge operator's control room to monitor lubrication of the gear box.

The blockage was two steel belted tires from the old tire artificial reef off of Deerfield Beach. The tires with the steel wires were so tightly impaled into our rubber hose that the section of hose had to be replaced. To prevent any future blockages, we have added hardware to the input of the dredge cutter head to prevent large objects from being sucked up with the sand

Amount of sand by-passed is solely dependent on sand arriving at the inlet from Hillsboro Beach to the north by the littoral drift. With the District's deeper channel providing an expanded sand trap no sand is bypassing naturally around the inlet. **All sand arriving at Hillsboro is placed on the North end of Pompano Beach with no loss to near shore bars. With continued bypassing of sand to northern Pompano Beach, no renourishment project has been necessary since 1983.**