Study authorized by House Resolution, 25 June 1998:
"That the Secretary of the Army is requested to review the report...with a view of determining if the authorized project should be modified in any way at this time, with particular reference to widening the existing interior channel through Lake Worth Inlet."
Why we are here

- **USACE Navigation Mission:** is to provide safe, reliable, and efficient waterborne transportation systems, stemming from commerce clause of the constitution.

- **Method:** USACE charged to adhere to 6 step planning process and identify National Economic Development Plan (NED)- the plan that maximizes net benefits while protecting or minimization of impacts to environment.

- **BCR:** Benefit to Cost Ratio also needs to be greater than 1.0.

- **Benefits:** In this case, monetary savings to the government and taxpayer as a result of reductions in transportation cost.
National Economic Development Plan (NED)

- **NED Plan**: Deepen from 33 ft to 39 ft with widening
- **Additional Features**: Advance Maintenance and Settling Basin expansion
- **BCR**: 1.71
- **Cost**: $100 million
- **Construction estimated start**: 2015
Bottom Line Upfront

NED Plan

Existing Channel
Measures
NED Plan
Existing Conditions

North Marginal Wharf (NMW)
Main Marginal Wharf (MMW)
Mid Marginal Wharf (MiDW)
South Marginal Wharf (SMW)

33' DEPTH MAIN TURNING BASIN
NORTH MARGINAL WHARF (NMW)

300' WIDTH INNEN CHANNEL

PEANUT ISLAND
ENTRANCE CHANNEL
400' WIDTH
35' DEPTH

25' DEPTH

35' DEPTH

South Marginal Wharf (SMW)

BEACH &/OR NEARSHORE PLACEMENT

MAIN TURNING BASIN
MID MARGINAL WHARF (MiMW)

LAKE WORTH

WARM WATER OUTFLOW

MANATEES AND SEAGRASS

Gulfstream

Halodule wrightii (Hw)
Halophila decipiens (Hd)
Halophila johnsonii (Hj)

SEAGRASS SPECIES

Hw
Hj
Hj/Hd
Hd
Hj/Hd
Hj/Hd/Hw

EXISTING PROJECT
RAILROAD
HARDBOTTOM (PBSJ 2008)

CRABBING & CORRECTIVE ACTIONS
(white indicates effective beam)
NED Plan – 39 ft deepening plus widening

- **North Jetty** requires sheetpile stabilization.
- **Peanut Island** entrance channel width: ranges from 440’ to 460’.
- **Depth**: 41’
- **Width**: 150’
- **Main Turning Basin** extension 25’
- **Depth**: same
- **Slip 2**
- **Lake Worth**
- **Main Marginal Wharf (MMW)**
- **Mid Marginal Wharf (MID MW)**
- **South Marginal Wharf (SMW)**
- **Nearshore Placement**
- **Warm Water Outflow**

**Notes:**
- **Width:** Ranges from 440’ to 460’
- **Depth:** 41’
Environmental Impact Minimization

- Original Scope (yellow); NED Plan (blue)
- Seagrass Impact Minimization:
  - 59% less from original scope
- Hardbottom Impact Minimization:
  - 25% less from original scope
Mitigation

**Seagrass:**
- Impacts: 4.5 acres; Mitigation: 8.25 to 11.25 acres
- Fill dredged hole to surrounding elevation

**Hardbottom:**
- Impacts: 4.9 acres; Mitigation: 4.9 to 9.8 acres
- Create artificial habitat in artificial reef site using quarry rock, dredged rock, or other pre-fabricated substrate
Dredged Material Placement With Mitigation Sites
(and other beneficial use opportunities)

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity (cubic yards)</th>
<th>Placement</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dredging Volumes</strong> (Federal)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entrance Channel</td>
<td>285,404</td>
<td>nearshore</td>
<td>Sand and Silty Sands</td>
</tr>
<tr>
<td>Entrance Channel</td>
<td>145,767</td>
<td>ODMDS</td>
<td>Rock, Interfingering Layers</td>
</tr>
<tr>
<td>Inner Harbor</td>
<td>910,129</td>
<td>ODMDS</td>
<td>Rock, Interfingering Layers</td>
</tr>
<tr>
<td>Inner Harbor</td>
<td>112,950</td>
<td>Seagrass Mitigation (dredged Hole)</td>
<td>Sand and Silty Sands</td>
</tr>
<tr>
<td>Advance Maintenance</td>
<td>172,700</td>
<td>nearshore</td>
<td>Sand and Silty Sands</td>
</tr>
<tr>
<td>Advance Maintenance</td>
<td>12,000</td>
<td>ODMDS</td>
<td>Rock, Interfingering Layers</td>
</tr>
<tr>
<td>Settling Basin</td>
<td>258,000</td>
<td>ODMDS</td>
<td>Rock, Interfingering Layers</td>
</tr>
<tr>
<td><strong>(Non-Federal)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port of Palm Beach Slip 3</td>
<td>71,415</td>
<td>ODMDS</td>
<td>Rock, Interfingering Layers</td>
</tr>
</tbody>
</table>

**TOTAL DREDGING QUANTITIES** 1,968,365
Recommended Advance Maintenance

- **Historical Condition**: O&M occurred up to 2 times/year
- **Existing Condition**: Advance Maintenance package (approved Dec. 2011, constructed March 2013) reduces frequency of dredging to 1 time/year
- **Future with Project**: This feasibility study will recommend further advance maintenance improvements to the existing project to reduce frequency of dredging to 1 time/2 years
## Main Commodity Trade Routes

### Vessel Type
- **Tanker (Petroleum & Molasses)**
- **Bulker (Cement)**
- **Cruise**

<table>
<thead>
<tr>
<th>Vessel Type</th>
<th>EXISTING TYPICAL SAILING DRAFT</th>
<th>POTENTIAL DESIGN DRAFT</th>
<th>EXISTING TYPICAL LOA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanker</td>
<td>30 ft</td>
<td>41 ft</td>
<td>574 ft</td>
</tr>
<tr>
<td>Bulker</td>
<td>30 ft</td>
<td>37.7 ft</td>
<td>612 ft</td>
</tr>
<tr>
<td>Cruise</td>
<td>20 ft</td>
<td>21 ft</td>
<td>673 ft</td>
</tr>
</tbody>
</table>

**EXISTING**

**VESSEL TYPE**

- **TANKER**
- **BULKER**
- **CRUISE**

**TYPICAL SAILING DRAFT**

- **30 ft**
- **37.7 ft**
- **20 ft**

**TYPICAL LOA**

- **574 ft**
- **612 ft**
- **673 ft**

**TANKER**

- LOA: 30 ft
- Draft: 41 ft
- LOA: 574 ft

**BULKER**

- LOA: 30 ft
- Draft: 37.7 ft
- LOA: 612 ft

**CRUISE**

- LOA: 20 ft
- Draft: 21 ft
- LOA: 673 ft

**SUGAR**

- Exports: Cuba, Trinidad, Curaçao, Brazil
- Imports: United States

**MOLASSES**

- Exports: Brazil, Mexico, Caribbean
- Imports: United States

**CEMENT**

- Exports: United States, Mexico, Caribbean
- Imports: United States

**PETROLEUM**

- Exports: United States, Mexico, Caribbean
- Imports: United States

**Diagram:**

- **Tanker (Petroleum & Molasses)**
- **Bulker (Cement)**
- **Cruise**

**Map:**

- Routes from different countries and regions
- Color-coding for different commodities

**Legend:**

- SUGAR
- MOLASSES
- CEMENT
- PETROLEUM
## Commodity Forecast

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2027</th>
<th>2037</th>
<th>2047</th>
<th>2057</th>
<th>2067</th>
<th>CAGR (2017-2067)</th>
<th>Benefitting Commodity?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar (Shipments)</td>
<td>790</td>
<td>790</td>
<td>790</td>
<td>790</td>
<td>790</td>
<td>790</td>
<td>0.00%</td>
<td>No</td>
</tr>
<tr>
<td>Molasses (Shipments)</td>
<td>265</td>
<td>265</td>
<td>265</td>
<td>265</td>
<td>265</td>
<td>265</td>
<td>0.00%</td>
<td>Yes</td>
</tr>
<tr>
<td>Liquid Petroleum Products (Receipts)</td>
<td>232</td>
<td>251</td>
<td>272</td>
<td>295</td>
<td>320</td>
<td>347</td>
<td>0.80%</td>
<td>Yes (only diesel)</td>
</tr>
<tr>
<td>Asphalt (Receipts)</td>
<td>76</td>
<td>95</td>
<td>119</td>
<td>149</td>
<td>186</td>
<td>186</td>
<td>1.81%</td>
<td>Yes</td>
</tr>
<tr>
<td>Cement &amp; Concrete (Receipts)</td>
<td>97</td>
<td>122</td>
<td>154</td>
<td>194</td>
<td>244</td>
<td>308</td>
<td>2.35%</td>
<td>Yes</td>
</tr>
<tr>
<td>Containerized Cargo (Both Directions)</td>
<td>999</td>
<td>1,343</td>
<td>1,805</td>
<td>1,805</td>
<td>1,805</td>
<td>1,805</td>
<td>1.19%</td>
<td>No</td>
</tr>
<tr>
<td>Non-Containerized General Cargo (Both Directions)</td>
<td>122</td>
<td>135</td>
<td>148</td>
<td>163</td>
<td>179</td>
<td>197</td>
<td>0.96%</td>
<td>Yes (only for largest vessels)</td>
</tr>
<tr>
<td>Total</td>
<td>2,581</td>
<td>3,000</td>
<td>3,552</td>
<td>3,660</td>
<td>3,789</td>
<td>3,897</td>
<td>0.83%</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Values shown in thousands of metric tons. Liquid Petroleum includes residual fuel oil and distillate fuel oil (diesel). Non-containerized general cargo includes break-bulk, project cargo, and Ro-Ro. The “Benefitting Commodity?” column displays whether or not the commodity movements will benefit from channel deepening.
Economics - NED PLAN

Without-Project Calls and With Project calls for Vessel Types that Benefit from Deepening

<table>
<thead>
<tr>
<th>Vessel Type</th>
<th>Calls by Study Year</th>
<th>2017</th>
<th>2037</th>
<th>2067</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vessel calls without project</td>
<td></td>
<td>60</td>
<td>73</td>
<td>107</td>
</tr>
<tr>
<td>Vessel calls with project</td>
<td></td>
<td>35</td>
<td>42</td>
<td>64</td>
</tr>
</tbody>
</table>

### Total Transportation Costs & Benefiting Vessel Calls

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Cost WOP</th>
<th>Cost 39 ft</th>
<th>Calls WOP</th>
<th>Calls 39 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2027</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2037</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2047</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2057</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2067</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Vessel Types

<table>
<thead>
<tr>
<th>VESSEL TYPE</th>
<th>EXISTING TYPICAL LOA</th>
<th>POTENTIAL TYPICAL LOA</th>
</tr>
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<tbody>
<tr>
<td>TANKER</td>
<td>574 ft</td>
<td>656 ft</td>
</tr>
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<td>612 ft</td>
<td>656 ft</td>
</tr>
<tr>
<td>CRUISE</td>
<td>673 ft</td>
<td>673 ft</td>
</tr>
</tbody>
</table>
NED Plan: Deepen 33 to 39 ft with widening (in blue); advance maintenance and settling basin expansion

The plan allows vessels to load to full capacity, thus reducing the amount of vessel calls; transportation cost savings; more efficient navigation from safer maneuvering

Reduced frequency of O&M intervals and more opportunity for beach placement

Seagrass and hardbottom mitigation will be done
Public COMMENT Opportunities

- Comments Due: June 3, 2013
- Public comment cards can be submitted at this meeting, or you can submit comments by the following methods:
  - Email: Angela.E.Dunn@usace.army.mil
  - Mail: Ms. Angela Dunn
    U.S. Army Corps of Engineers
    P.O. Box 4970
    Jacksonville, FL 32232-0019
Thank you for your participation!