

A Portable Wave Flume

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Estimate of Coastal Road Mileage:

There are over 60,000 highway miles in America that are occasionally exposed to coastal tides, waves, and currents*



Every coastal state has some



... that provide access to the coast (and evacuation)

Every coastal state has some roads ...

*... that provide access
along the coast*



Photo by S. Douglass

Most coastal states have some roads

... that cross coastal estuaries



And most coastal states have some roads



... with tidal bridge crossings

... in Ecologically Special Places

- bays
- wetlands
- dunes
- beaches



US 98, Mobile Bay

Mobile Register photo

... Unique Design Environment

- **water levels**
- **waves**
- **sand transport**
- **tidal currents**
- **winds**
- **soils**



Photo by S. Douglass

... and these roads are vulnerable to coastal storms



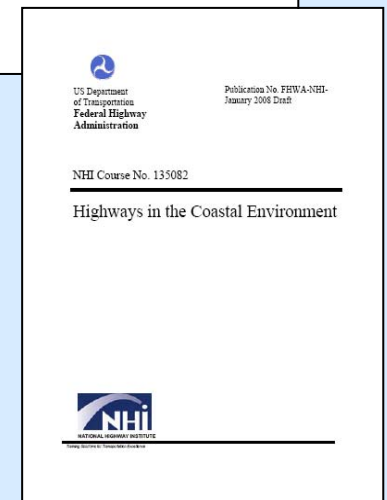
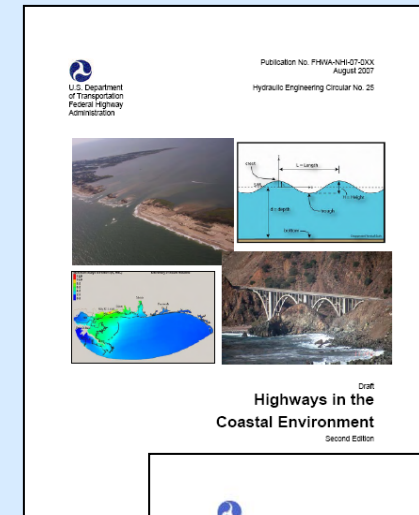
Douglass and Oliver



2008 ASBPA - Chicago

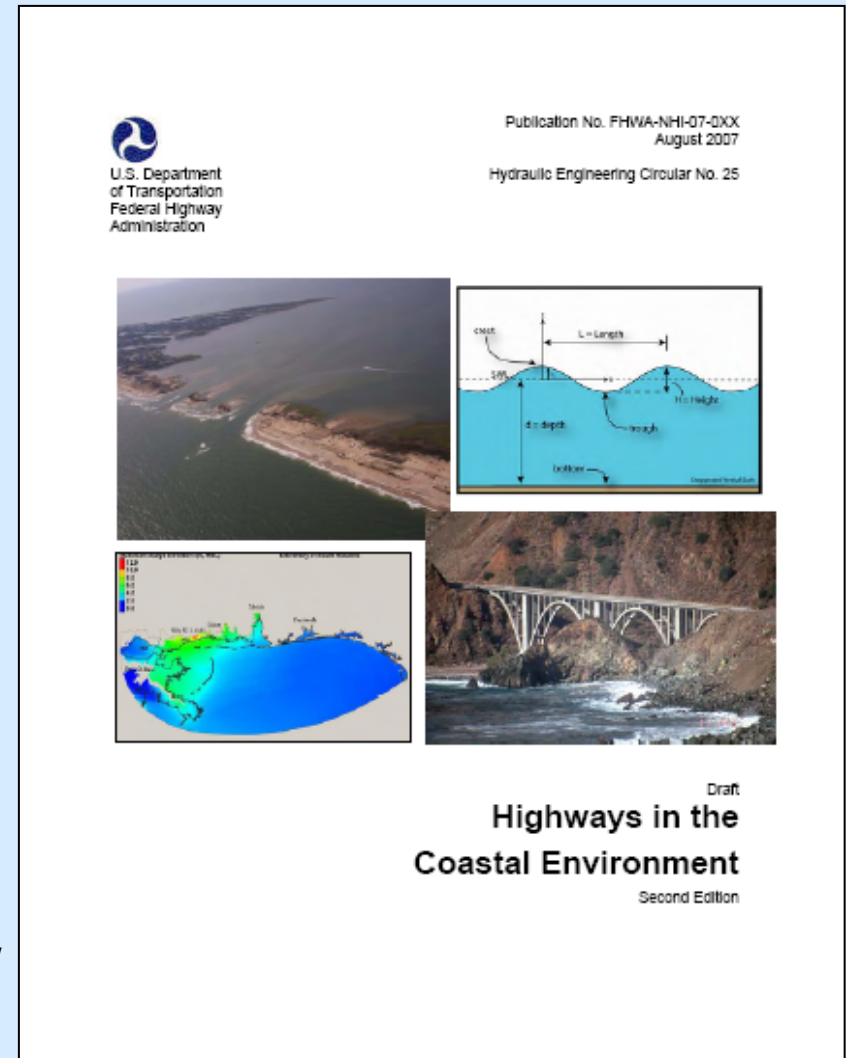
Newly Developed FHWA Guidance and Training on Highways in Coastal Areas:

1. **HEC-25 (2nd edition), *Highways in the Coastal Environment*, FHWA Publication No. FHWA-NHI-07-096.**
2. **National Highway Institute Course #135082, *Highways in the Coastal Environment***



“Highways in the Coastal Environment”

- Provides guidance for the analysis, design and operation of highways in the coastal environment
- Download from FHWA’s “hydraulics” web-page:
<http://www.fhwa.dot.gov/engineering/hydraulics/>



Target audience:

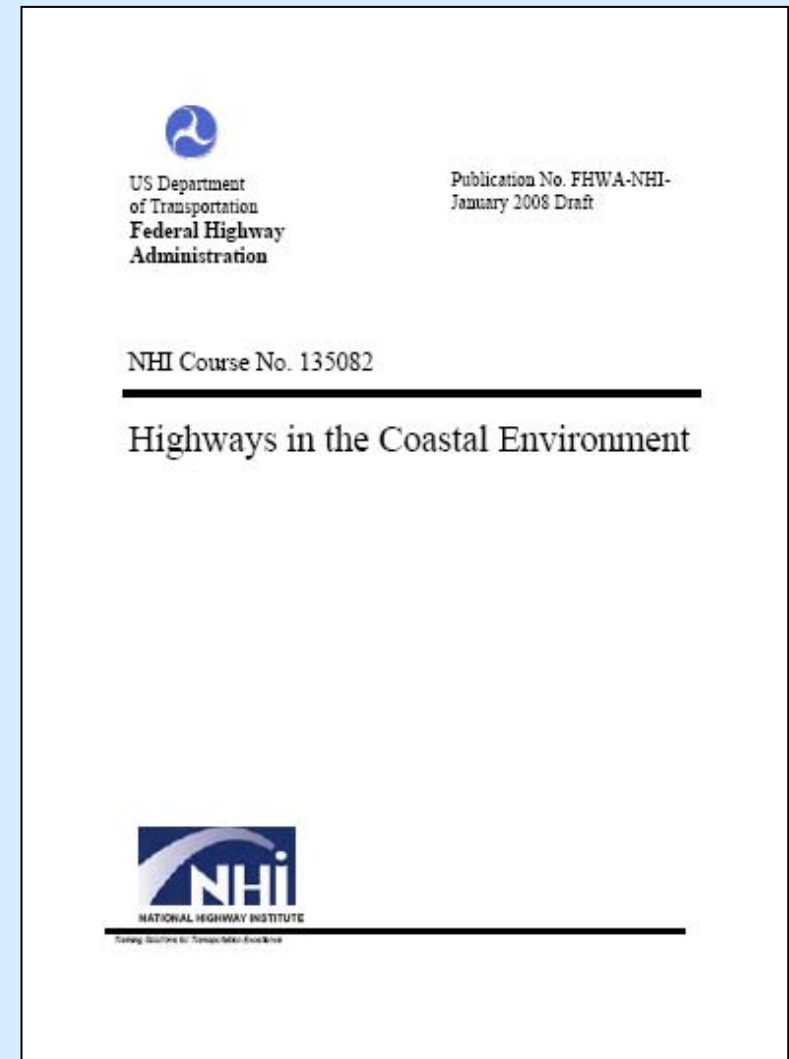
- civil engineers,
- coastal engineers,
- hydraulic engineers,
- roadway designers,
- field inspectors,
- construction supervisors,
- and other technical personnel involved with transportation systems in the coastal environment

Target audience:

- Those with little experience in coastal engineering... facing coastal highway problems,
- and
- experienced coastal engineers... providing highway-oriented assistance to State DOTs

Companion 3-day short course

- Available now from NHI
- Developed with Kilgore Consulting & Management
 - Roger Kilgore
 - Gina Wightman, All About Training Inc
 - NHI staff
 - FHWA staff
- HEC-25 (2nd ed.) is course reference



NHI course #135082

The purpose of this course is to ...

teach important concepts and terminology of coastal science and engineering,

to highway engineers ,

for use in the planning and design of coastal roads.

Schedule



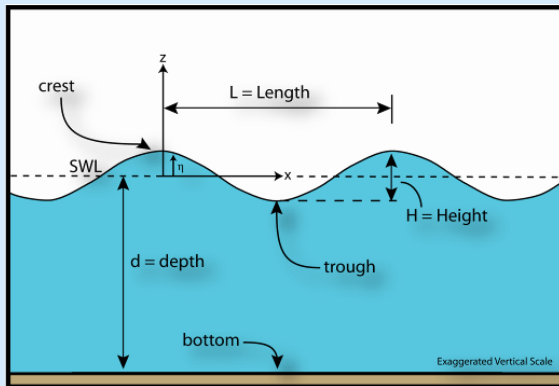
- **Day 1**
 - Waves and wave generation
 - Tides and water levels
- **Day 2**
 - Coastal revetment design
 - Wave loads on rigid structures
 - Coastal geology and sediments
- **Day 3**
 - Shoreline change and stabilization
 - Road overwash
 - Tidal inlets
 - Summary and wrap-up

NHI course #135082

A portable wave flume is part of the course



Florida DOT personnel taking course in Gainesville, FL, February 2008



Course participants measuring wave length in the wave flume

Other hands-on workshops in the flume:

- 1. rubble mound design with Hudson's Equation**
- 2. wave uplift loads on bridge decks**
- 3. combined wave and surge effects on roads**



Wanna go play with the flume now?