50% of the world’s population lives in a coastal zone, with a majority of this coastal population residing in and around urbanized estuaries, due primarily to the proximity to maritime transportation and port facilities.

90% of global commerce and 95% of US international trade relies on maritime transportation and its supporting distribution and industry infrastructure.

This concentration of population and particularly of maritime transportation infrastructure leads to pressures on coastal ecosystems and vulnerability to coastal hazards. Hurricane Sandy was an extreme example.
Maritime Transportation is increasing

- Worldwide ship traffic has increased by 300 percent since 1992 according to analysis of satellite data.


- Traffic has increased in every ocean. As the global economy has expanded, international trade and the sizes of merchant fleets have both enlarged rapidly over the past two decades, explaining the steep rise in ship traffic.

- Size of vessels has increased almost exponentially in recent decades.
On May 9, 1980, the inbound freighter Summit Venture is blinded and blown out of the ship channel, colliding with a main bridge support, collapsing the southbound span.
New Sunshine Skyway Bridge
Concrete dolphins and rock islands protect center span supports
Tampa Bay PORTS®
Physical Oceanographic Real-Time System

- Measures Winds, Waves, Currents, Tides and Visibility at critical locations for Maritime Transportation
- Operational since 1992
- Operated in collaboration with NOAA/National Ocean Service Center for Operational Ocean Products and Services (CO-OPS) and local maritime interests
- Real-time QA/QC via the Continuous Operational Real-Time Monitoring System (CORMS)
- Voice response: 1-866-TB-PORTS
- See http://tbports.org for links to data portals
PORTS® are presently operational in 29 locations:

- Narragansett Bay
- Los Angeles/Long Beach
- New Haven, CT
- San Francisco Bay
- New York/New Jersey Harbor
- Lower Columbia River
- Delaware Bay and River
- Tacoma, WA
- Anchorage
- Tampa Bay
- Soo Locks, MI
- Houston/Galveston
- Gulfport
- Savannah
- Morgan City
- Charleston Harbor
- Northern Chesapeake Bay
- Southern Chesapeake Bay
- Humboldt Bay
- Jacksonville
- New London
- Lake Charles
- Lower Mississippi River
- Mobile Bay
- Cherry Point
- Sabine Neches
- Pascagoula
- Cuyahoga
- Cape Cod

Tampa Bay was the first and still is the most extensive
PORTS®: t01010 Sunshine Skyway Bridge
PORTS®: wv42098 Egmont Channel Wave Buoy

**Significant Wave Height at Egmont Channel Entrance**

**Peak Direction at Egmont Channel Entrance**

**Wave Period at Egmont Channel Entrance**

**Water Temperature at Egmont Channel Entrance**
PORTS®: 8726412 Middle Tampa Bay, FL

Water Levels at Port Manatee

Winds at Middle Tampa Bay

Air Pressure at Middle Tampa Bay

Air Temperature at Middle Tampa Bay

Visibility at Middle Tampa Bay

Relative Humidity at Middle Tampa Bay

[Images of various environmental monitoring equipment and data graphs]
Landing Page: http://tbports.org/

Photos of buoy deployment:
http://tbports.org/gallery.html

Video:
https://youtu.be/SbXhmIfeHj4
TB-PORTS Data are integrated into the Tampa Bay Cooperative Vessel Traffic Service (CVTS) and the USCG AIS broadcast as an overlay on the Tampa Bay Pilots’ carry-on units.

Since TB-PORTS became operational in 1992, ship groundings have decreased by 60%.

Conservative estimates of annual benefits exceed operating costs by at least 25 to 50 times.
August 1993 Vessel Collision and Oil Spill in Tampa Bay

Could a Vessel Traffic System have prevented this?

Coast Guard battles flames and smoke from collision of barges near mouth of Tampa Bay.
Maritime Security

Maritime Domain Awareness (MDA) – A comprehensive knowledge of all activities, environmental factors, and potential threats in the local maritime domain

A port must be protected from and resilient to all threats – environmental as well as human (terrorist attack, criminal activity, or simple human error)

TB-PORTS data play a critical role in port security, from storm recovery to incident response to prevention of accidents that could close the channels

http://www.dhs.gov/
Real-time observations are combined with a model of currents and water level to provide a predictive capability for storm surge prediction and mitigation, search and rescue, environmental management/permitting, and hazardous material spills.
The USF Center for Maritime and Port Studies

Objectives:
To promote workforce development for the maritime transportation system industry,
To conduct research to foster sustainable, secure, and resilient maritime and port infrastructure, and
To provide independent test and evaluation of maritime sensor technologies

USF College of Marine Science is located on the former campus of the U.S. Maritime Service Training Station on Bayboro Harbor in downtown St. Petersburg – See http://www.usmm.org/stpetersburg.html
Formerly the Pier Aquarium, the Marine Discovery Center will be the public face of the St. Petersburg Ocean Team, located in the Port Terminal Building on Bayboro Harbor in downtown St. Petersburg.