



(U) IMPACTS TO FLORIDA PORTS FROM HURRICANE IRMA

Prepared By: Office of Cyber and Infrastructure Analysis (OCIA)

(U) KEY FINDINGS

- **(U) The Port of Miami, Port Everglades, Port of Palm Beach, and Port Canaveral will experience significant physical damage due to storm surge. Port facilities will also be impacted by wind damage, loss of power and communications, and roadway blockages.**
- **(U) Cargo receipts and shipments along the east coast of Florida will be significantly disrupted for weeks, including the movement of containers at all ports, the receipt of gasoline at Port Everglades, and exports from the Port of Palm Beach.**
- **(U) The Port of Palm Beach is a major exporter to the Bahamas and other Caribbean islands. Disruptions at this port could have a significant short-term economic impact for Caribbean islands and slow their recovery from Hurricane Irma.**
- **(U) Ports along the east coast of Florida are the busiest cruise ports in the United States and will experience significant physical damage from storm surge, rain, and sustained winds that can disrupt cruise line operations for weeks or months.**
- **(U) Damage assessments of terminal facilities are only possible once the storm has passed and roads to port facilities are accessible. It will take weeks or months to return to full operations at terminals, depending upon the extent of the damage.**

(U) SCOPE NOTE: This Infrastructure Impact Assessment details the potential impacts to ports and port facilities at the Port of Miami, Port Everglades, Port of Palm Beach, and Port Canaveral. Storm surge damage and electric power outages were based on the National Hurricane Center's, 0800 EDT September 7, 2017 update. Changes in the forecast may change the impacts to ports and port facilities.

(U) The Department of Homeland Security (DHS)/Office of Cyber and Infrastructure Analysis (OCIA) coordinated this product with the DHS/National Protection and Programs Directorate/ Office of Infrastructure Protection, the DHS/United States Coast Guard/National Command Center, DHS/United States Coast Guard/Intelligence Coordination Center, and the DHS/Federal Emergency Management Agency/National Response and Coordination Center.

(U) IMPACTS TO CARGO MOVEMENT

(U) Port Everglades and the Port of Miami are the 12th and 13th largest container ports in the United States, respectively, with each moving approximately one million 20-foot equivalent units in 2016.^{1,2} Storm surge and high

¹ (U) Container capacity is measured in 20-foot equivalent units (TEUs), with one TEU equal to one standard 20- by 8-foot container. The measurement used is an approximation; it takes into account only length and width, not height.

² (U) American Association of Port Authorities. (2016). "NAFTA Region Container Traffic, 2016 Port Rankings by TEUs." http://aapa.files.cms-plus.com/Statistics/NAFTA%20REGION%20CONTAINER%20TRAFFIC%20PORT%20RANKING%202016_T3.pdf. Accessed September 7, 2017.

winds can damage cranes, vehicles, storage facilities, and offices at container terminals. Containers on-site can be carried by the storm surge, creating potential hazards within the facility and nearby waterways. Container terminals may shut down for days to weeks depending upon the level of damage. Cargo vessels may move to other ports to unload cargo; however, the potential for Hurricane Irma to temporarily shut down ports further north, including the Ports of Jacksonville, Savannah, and Charleston, may limit the amount of cargo that can be diverted.

(U) Port Everglades stores and distributes 20 percent of gasoline and petroleum products for Florida, with the port receiving over 14 million tons of gasoline and other fuel oils in 2015.^{3,4,5} Disruptions in the receipt, storage, and distribution of fuel will occur as long as Port Everglades remains closed, with physical damage to terminals and storage facilities from storm surge potentially disrupting operations for days to weeks. This will impact the availability of gasoline and other fuels in South Florida until operations are restored at Port Everglades.

(U) The Port of Palm Beach is a major export and shipping facility, providing 60 percent of goods shipped to the Bahamas and an essential lifeline to other Caribbean Islands.⁶ Damage to the port preventing the export of goods could have significant short-term economic impacts for these islands, though essential goods will likely be routed through other ports inside and outside of the United States. The Port of Palm Beach is also important for the movement and export of sugar, molasses, and other food products.⁷ The closure of the port will significantly delay the movement of products through the port, particularly bulk products that cannot be moved by container. The anticipated loss of crops due to the storm, including sugar, will lower the amount of cargo that is delayed by the port closure.

(U) IMPACTS TO CRUISE TRAFFIC

(U) The Ports of Miami, Port Everglades, and Port Canaveral are the three busiest cruise ports in the United States, with the Port of Palm Beach being the 16th busiest cruise port (table 1). Combined, these four ports account for approximately 43 percent of cruise passenger traffic in the United States.⁸ Cruise lines have already begun canceling sailings.⁹ Significant damage to cruise terminals could result in cancellations of cruises for weeks or months. This will result in significant losses of revenue for affected cruise companies and local businesses that benefit from the cruise industry.

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(U) TABLE 1— FLORIDA PORTS CRUISE TRAFFIC¹⁰

PORT	NATIONAL RANKING	2016 PASSENGERS REVENUE ¹¹	CRUISE SHIP CALLS
Miami	1	4,980,490	972
Port Canaveral	2	4,248,296	1,388
Port Everglades	3	3,826,415	876
Palm Beach	16	482,211	180

³ (U) This includes kerosene, diesel fuel, and other distillate and residual fuel oils.

⁴ (U) Port Everglades. (n.d.) "petroleum." www.porteverglades.net/cargo/petroleum/ Accessed September 7, 2017.

⁵ (U) US Army Corps of Engineers. (2016). "Waterborne Commerce of the United States." www.navigationdatacenter.us/data/datawvus.htm. Accessed September 6, 2017.

⁶ (U) Port of Palm Beach. (n.d.) "General Information." www.portofpalmbeach.com/121/General-Information. Accessed September 7, 2017.

⁷ (U) US Army Corps of Engineers. (2016). "Waterborne Commerce of the United States." www.navigationdatacenter.us/data/datawvus.htm. Accessed September 6, 2017.

⁸ (U) American Association of Port Authorities. (2016). "NAFTA Region Port Cruise Traffic 2014-2016." www.aapa-ports.org/unifying/content.aspx?ItemNumber=21048. Accessed September 7, 2017.

⁹ (U) Sloan, G. (2017). "Cruise lines cancel more sailings as Irma approaches Florida." *USA Today*. www.usatoday.com/story/travel/cruises/2017/09/06/cruise-lines-cancel-more-sailings-irma-approaches-florida/636554001/. Accessed September 7, 2017.

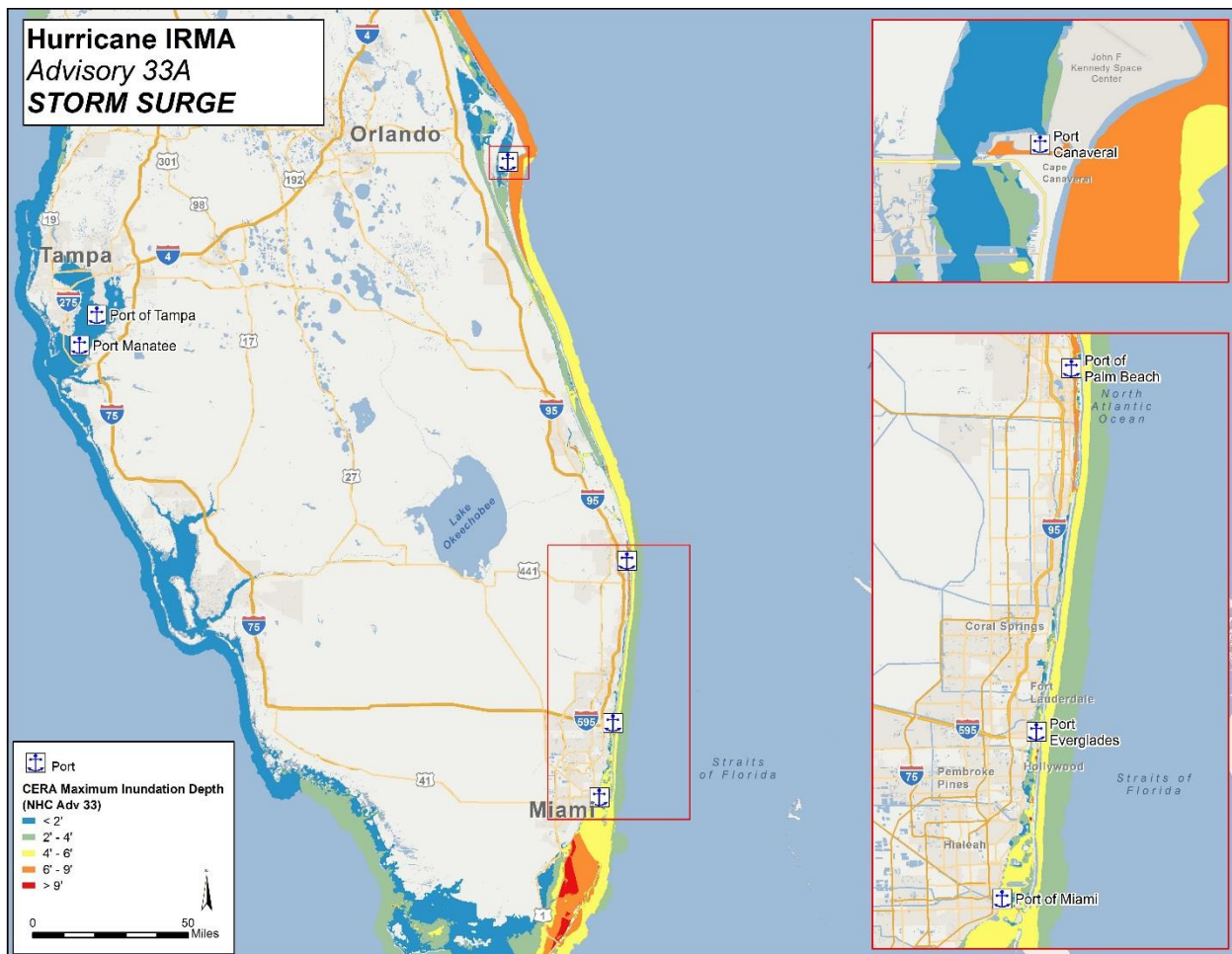
¹⁰ (U) American Association of Port Authorities. (2016). "NAFTA Region Port Cruise Traffic 2014-2016." www.aapa-ports.org/unifying/content.aspx?ItemNumber=21048. Accessed September 7, 2017.

¹¹ (U) Revenue Passengers = embarkations, disembarkations and transits, except where noted.

(U) IMPACTS TO SHIPPING CHANNELS

(U) Shipping channels that connect the South Florida ports to the Atlantic, also known as port entrance channels, will be closed during the storm, with the storm likely causing significant damage to aids to navigation (ATONs). Shoaling¹² can cause changes in the water depth within shipping channels. Dredging may be required before vessels are able to navigate the channels. Following the storm, the channels must be inspected by the U.S. Coast Guard and surveyed by the Army Corps of Engineers. A return to operations depends on critical ATONs being operational, the channels being clear of debris, and water depth being low enough to move vessels in and out of the port entrance channels. The opening of port entrance channels could take days to weeks, depending upon the damage to waterways.

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(U//FOUO) FIGURE I—FORECASTED STORM SURGE AT PORTS

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PDM177223

¹² (U) Shoaling is the build-up of dirt and sediment, in this case within the shipping channels.

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