

# **Ports and Waterways Safety Assessment Workshop Report**

## **Port Canaveral, Florida**



**Providing Navigation Safety Information  
for America's Waterways Users**

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## Executive Summary

The United States Coast Guard (USCG) Sector Jacksonville sponsored a Ports and Waterways Safety Assessment (PAWSA) workshop in Canaveral, FL, on 7-8 September 2022. Thirty participants represented the range of waterway users, stakeholders, commercial space transportation industry, joined together with Federal, State, and local safety authorities to collaboratively assess navigation safety on the waterways adjoining Port Canaveral and proximate offshore regions. Ahead of the formal workshop, the USCG Navigation Center (NAVCEN) facilitated an executive-level stakeholder engagement meeting on 27 June 2022 to enhance community outreach and prepare stakeholders for the formal workshop.

The primary goal of a PAWSA workshop is to improve coordination and cooperation between government agencies and the private sector. Workshop stakeholders participate in a facilitated discussion framed by a USCG developed decision tool that numerically represents the participants understanding of relative risks among a standard set of waterway design and use factors subsequently referred herein as “Waterway Risk Factors”. These outputs focus the collective discussions and consensus towards the identification of potential long-term solutions tailored to local circumstances. PAWSA workshops have been held by the Coast Guard since 1999 but the goals of the program have changed significantly in that time. Commissioned by the PAWSA program office, Waterways Management (CG-WWM-1), in 2020 to evaluate the original decision tool’s results against modern programmatic goals, NAVCEN implemented substantive revisions by 2021. While the fundamentals of the PAWSA construct remain unchanged, the risk scoring system and numerical results from this report are not comparable to pre-2021 PAWSA reports.

On the first day of the workshop, participants discussed and scored sixteen risk factors that form the basis of the PAWSA decision tool. Generally, these risk factors rate the quality of vessels and their crews that operate on the waterway; the volume of commercial, non-commercial and recreational small craft vessel traffic using the waterway; navigational and waterway conditions that mariners encounter when transiting the assessment area. Potential consequences as a result of a casualty or incident on the waterway are evaluated with each factor to develop a baseline risk value for each of the sixteen waterway risk factors. In parallel to this baseline assessment, participants assessed risk trends over time, risk tolerances, and the effectiveness of any existing mitigation measures.

On the second day, participants reviewed the survey results and prioritized the risk factors most in need of more effective mitigation measures. The following Waterway Risk Factors were agreed upon as the highest priorities: all four traffic conditions, recreational vessel quality, obstructions, and deep draft vessel quality. Participants discussed and agreed on risk mitigation strategies that involve education, coordination, policy/regulatory improvements, and physical waterway configuration enhancements. Section 4 contains the complete list of mitigation strategies.

USCG Marine Safety Detachment Port Canaveral’s port partner outreach and coordinative efforts throughout this workshop proved invaluable to this productive assessment. The USCG Marine Transportation Systems Directorate (CG-5PW), NAVCEN, and Sector Jacksonville, extend a sincere appreciation to the workshop participants for their contributions to the Port Canaveral PAWSA workshop. Their expertise was critical to the success of the workshop and recommendations will meaningfully assist the USCG as it continues to work with all Port Canaveral stakeholders to improve safe and efficient navigation in the Port Canaveral area.

## Background and Purpose

The USCG Marine Transportation Systems Directorate (CG-5PW) is responsible for developing and implementing policies and procedures that facilitate commerce, improve safety and efficiency, and inspire dialogue with ports and waterway users with the goal of making waterways as safe, efficient, and commercially viable as possible.

The 1997 Coast Guard Appropriations Act directed the USCG to establish a process to identify minimum user requirements for new Vessel Traffic Service (VTS) systems in consultation with local officials, waterway users and port authorities, and to review private / public partnership opportunities in VTS operations.

The Coast Guard convened a National Dialogue Group (NDG) comprised of maritime and waterway community stakeholders to identify the needs of waterway users with respect to Vessel Traffic Management (VTM) and VTS systems. The NDG was intended to provide the foundation for the development of an approach to VTM that would meet the shared government, industry, and public objectives of ensuring the safety of vessel traffic in U.S. ports and waterways, in a technologically sound and cost-effective way.

The *Ports and Waterways Safety Assessment (PAWSA) Waterway Risk Model* and the *PAWSA workshop process* is a direct output of NDG efforts. PAWSA is a disciplined approach designed to identify major waterway safety hazards, estimate risk levels, evaluate potential mitigation measures, and set the stage for the implementation of selected risk reduction strategies.

The process involves convening a select group of waterway users and stakeholders and facilitating a structured workshop agenda to meet the risk assessment objectives. A successful workshop requires the participation of professional waterway users with local expertise in navigation, waterway conditions, and port safety. Regional stakeholders are also included in the process to ensure that important environmental, public safety, and economic consequences get appropriate attention in the identification and evaluation of risk interventions.

The long-term goals of the PAWSA process are to:

- Provide input during planning for projects that intend to improve the safety of navigation;
- Further the Marine Transportation System (MTS) goals of improved coordination and cooperation between government and the private sector, and involving stakeholders in decisions affecting them;
- Foster development and/or strengthen the roles of Harbor Safety Committees within each port; and,
- Support and reinforce the role of USCG Sector Commanders and Captains of the Port (COTP) in promoting waterway and VTM activities within their geographic areas of responsibility.

## PAWSA Waterway Risk Model

The PAWSA Waterway Risk Model includes variables associated with causes of waterway casualties and their consequences. The Waterway Risk Model measures risk as defined as a function of the probability of a casualty and its consequences. The diagram below shows the four general risk categories and their corresponding risk factors that make up the Waterway Risk Model.

Vessel Quality & Operation	Traffic	Navigation	Waterway
Deep Draft Commercial Vessels	Volume of Commercial Traffic	Winds	Dimensions
Shallow Draft Commercial Vessels	Volume of Recreational Traffic	Currents/Tides	Obstructions
Commercial Fishing Vessels	Traffic Mix	Visibility Restrictions	Visibility Impediments
Recreational Vessels	Congestion	Bottom Type	Configuration

- **Vessel Quality and Operation Conditions** – The quality of vessels and their crews that operate on a waterway.
- **Traffic Conditions** – The number of vessels that use a waterway and how they interact with each other.
- **Navigational Conditions** – The environmental conditions that vessels must deal with in a waterway.
- **Waterway Conditions** – The physical properties of the waterway that affect vessel maneuverability.

In addition to the four general risk categories, the model utilizes two categories of consequences: immediate consequences and subsequent consequences. The table below shows the breakdown of the consequences in the two categories.

Immediate Consequences	Subsequent Consequences
Personnel Injury	Public Health and Safety
Petroleum Discharge	Environmental Damage
Hazardous Materials Release	Aquatic Resources
Port Mobility	Economic

## **Workshop Process**

Workshop activities include a series of discussions about port and waterway attributes and vessels that use the waterway. Following dialogue with each risk factor, the participants are surveyed to establish a relative risk baseline. Using predefined qualitative risk descriptions for predefined risk factors, the baseline survey establishes a relative numerical value. The risk characterization survey segment then evaluates risk tolerance, current risk level trends, effectiveness of existing mitigation efforts, and collects preliminary comments. Additionally, participants were able to add georeferenced comments to a gridded nautical chart (Appendix C). On the second day, participants are briefed on and review the aggregated survey results. This serves as the basis for determining which factors to discuss for additional risk mitigation strategies. Group discussion and consensus then affirms the priority risk factors, which are generally where the assessed risk is high and/or existing mitigations are ineffective. A facilitated dialogue then identifies potential mitigation strategies for these prioritized risks (Section 4).

## **Port Canaveral PAWSA Workshop**

A PAWSA workshop to assess navigation safety within Port Canaveral and adjoining waterways was held in Canaveral, FL on 7-8 September 2022. Thirty participants represented the range of waterway users, stakeholders, commercial space transportation industry, and Federal, State, and local regulatory authorities to collaboratively assess navigational safety in this Port Canaveral assessment area. The USCG Navigation Center (NAVCEN) facilitated the PAWSA workshop.

Participants discussed the quality of vessels and their crews that operate on the waterway; the volume of commercial, non-commercial, and recreational small craft vessel traffic using the waterway, navigational and waterway conditions that mariners encounter when transiting the assessment area, and the potential environmental impacts that could result from a marine casualty or incident on the waterway.

Over the two-day workshop, the participants discussed and then numerically evaluated 16 risk factors in the PAWSA Model.

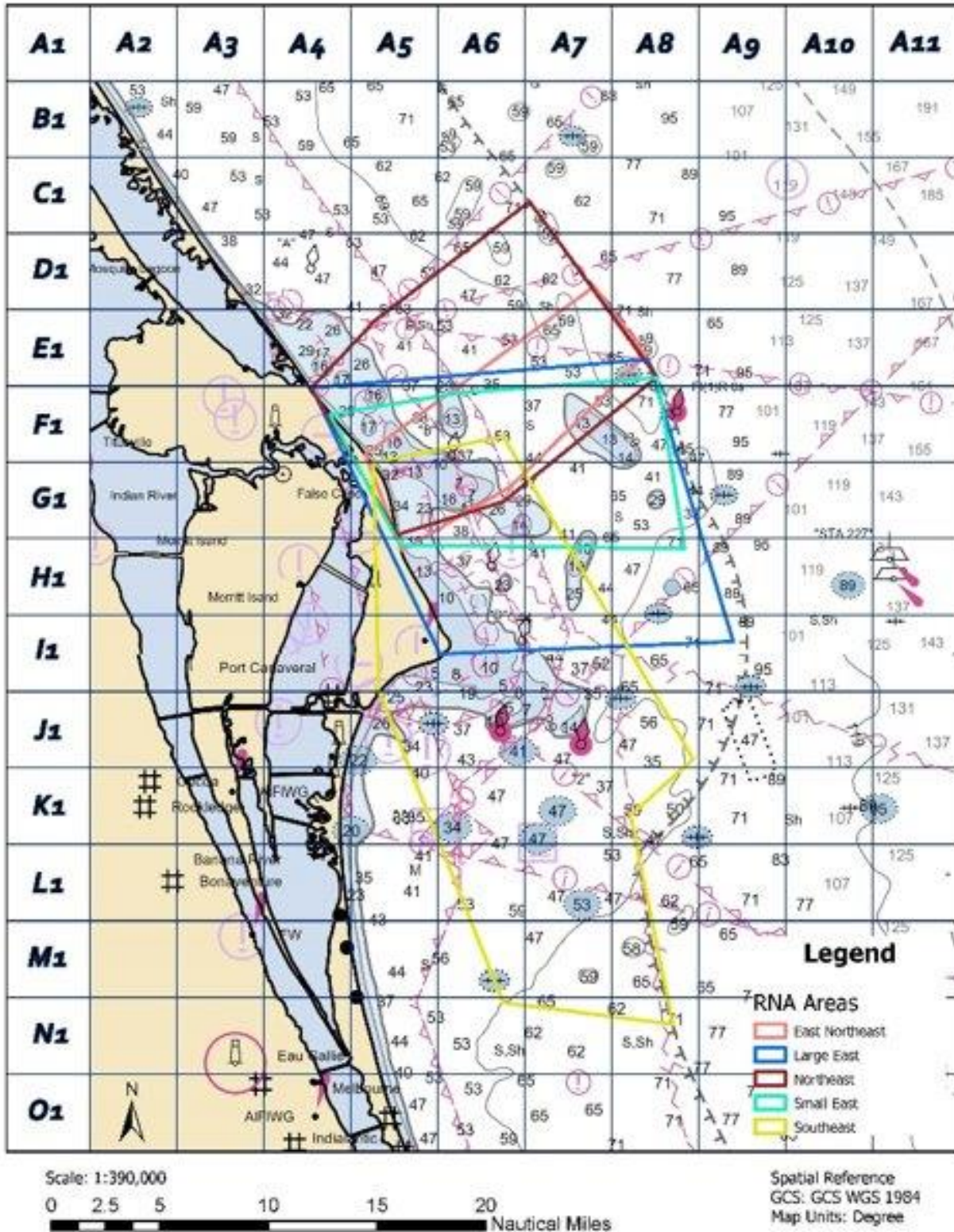
Baseline risk levels were first evaluated using pre-defined qualitative risk descriptions for each risk factor. Participants then characterized risk mitigation strategies by evaluating cost and effectiveness of existing mitigation strategies followed by an assessment of risk trends over time. For the highest rated risk factors, the participants engaged in further discussion to identify additional mitigation strategies to reduce the risk. The results of the baseline-risk-level survey, risk characterization, additional risk intervention strategies, and participant comments and observations are outlined in this report.

The primary goal of a PAWSA workshop is to improve coordination and cooperation between government agencies and the private sector. A PAWSA workshop engages stakeholders in decisions affecting them and provides the Coast Guard and members of the waterway community with an effective tool to evaluate risk and work towards long-term solutions tailored to local circumstances.

In support of these goals, this report is a starting point for continued dialogue within the Port Canaveral maritime community. The USCG may use this PAWSA report, together with other information, to determine whether, and to what extent, regulatory or other actions are necessary to address navigation safety risk. Any rulemaking efforts will follow Coast Guard public notice and comment rulemaking procedures to allow for public participation in the process.

## Section 1: Port Canaveral PAWSA Assessment Area

The geographic area for the Port Canaveral PAWSA includes the contiguous inland waterways and near coastal region as depicted.





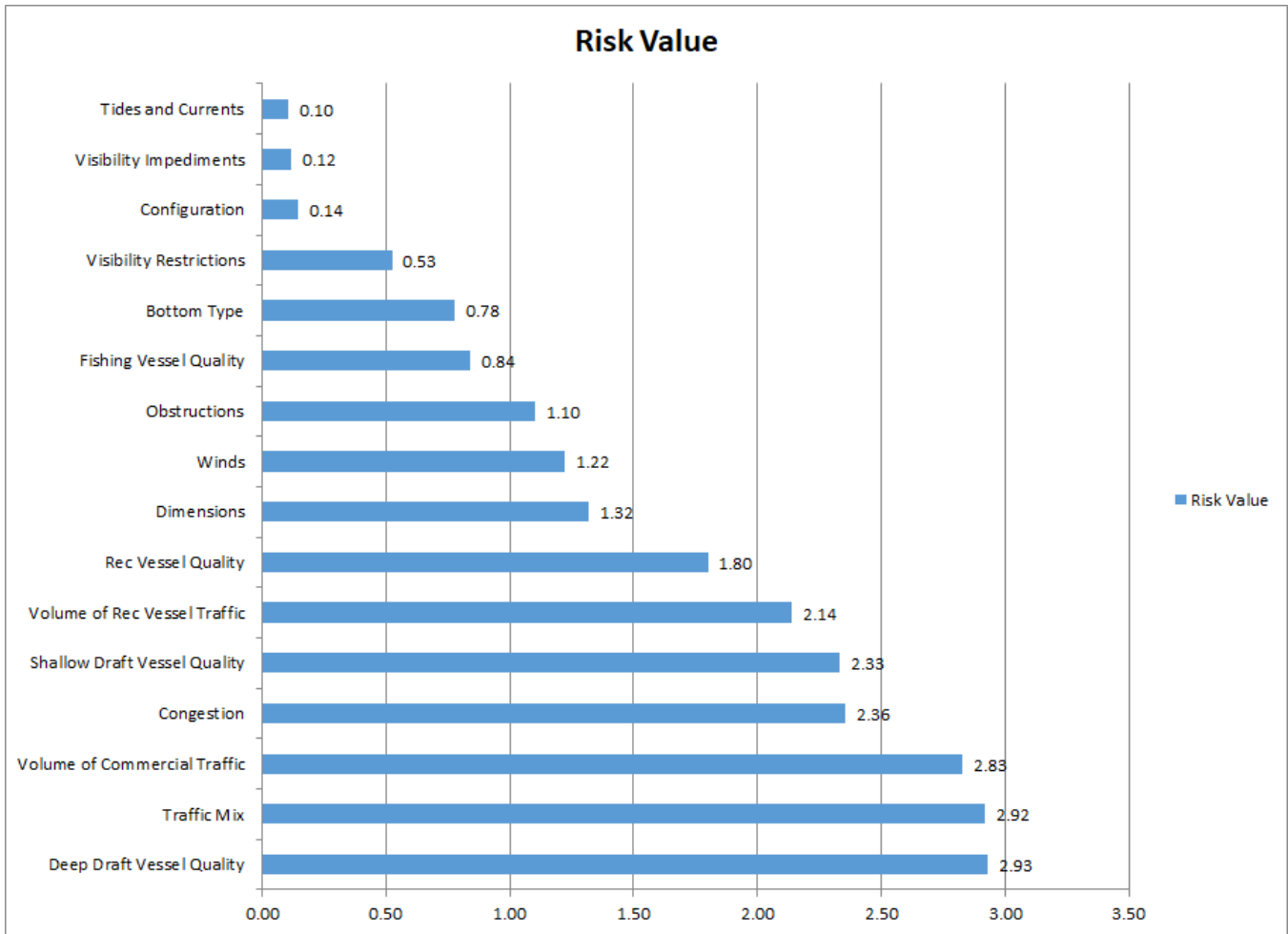
## Section 2: Baseline Risk Levels

The first step in the workshop was the completion of a baseline survey to determine a baseline risk level value and trend characterization for each risk factor in the Waterway Risk Model. To establish the baseline risk levels, participants discussed each of the 16 applicable factors in the Waterway Risk Model and filled out the baseline survey based on quantitative descriptions of the risk level and the severity of consequences associated with those risks. These risk levels are converted to a numerical value between 1 and 4 based on the severity of the risk. The consequences are given a value of 0, 0.5, or 1 based on the level selected by the participant. For each risk factor, the baseline is determined by multiplying the risk (1-4) by the average immediate consequence plus the average subsequent consequence using the below formula.

$$Risk\ Value = (risk\ level) \times \left( \frac{\sum Immediate\ Consequences}{4} + \frac{\sum Subsequent\ Consequences}{4} \right)$$

The results of the risk value are on a scale between 0 and 8. On that scale, 0.0 represents low risk (best case) and 8.0 represents high risk (worst case), with 4.0 being the mid-risk value.

The graph below shows the baseline risk-level values for all risk factors evaluated by the Port Canaveral PAWSA workshop participants.



### Section 3: Risk Characterization

Concurrently within the survey, risk characterization questions determine if the current risk for each category is acceptable, the current trends in the risk level, and if current mitigations were effective. The survey also collects initial comments from the participants on the risk and mitigations for each risk factor (Appendix B). The results are generated based on what a plurality of the participants selected for each risk factor. The baseline risk value and risk characterization results were combined and reviewed with the participants to begin the second day.

The resulting baseline values and risk characterizations from the Port Canaveral PAWSA workshop surveys were assessed on the second day. Facilitators reviewed these results with the participants to determine which risk factors to focus on in developing potential mitigation measures. Based on the risk values and risk characterization trends, participants could discuss, reorder, and/or choose to focus on risk factors that were not necessarily the highest initial risk value from the baseline survey. Mitigation strategies or interventions were developed for the highlighted categories.

Participants generally assessed that the risk factors with an “increasing” trend were the highest priority. Therefore, the collective Traffic conditions (i.e., mix, volumes, and congestion) were grouped at the top. Additionally, the group discussed and re-ordered Obstructions for follow-on mitigation strategies. Participants validated Deep Draft Vessel Quality as the most significant risk, should an incident occur, but ordered it to the bottom of the list as existing mitigations are robust. In totality, the group chose to identify mitigation strategies for: Traffic, Recreational Vessel Quality, Obstructions, and Deep Draft Vessel Quality.

Risk Factor	Risk Value	Current Risk Level	Current Risk Trend	The Current Mitigations are
Traffic Mix	2.92	Acceptable, keep the status quo	Increasing	Acceptable but Tenuous
Volume of Commercial Traffic	2.83	Acceptable, keep the status quo	Increasing	Acceptable but Tenuous
Congestion	2.36	Acceptable, keep the status quo	Increasing	Acceptable but Tenuous
Volume of Rec Vessel Traffic	2.14	Acceptable, keep the status quo	Increasing	Unacceptable, we need more/better mitigations
Shallow Draft Vessel Quality	2.33	Acceptable, keep the status quo	Increasing	Acceptable but Tenuous
Rec Vessel Quality	1.80	Acceptable, keep the status quo	Increasing	Unacceptable, we need more/better mitigations
Obstructions	1.10	Acceptable, keep the status quo	Staying The Same	Acceptable
Dimensions	1.32	Acceptable, keep the status quo	Staying The Same	Acceptable
Winds	1.22	Acceptable, keep the status quo	Staying The Same	Acceptable
Fishing Vessel Quality	0.84	Acceptable, keep the status quo	Staying The Same	Acceptable
Bottom Type	0.78	Acceptable, keep the status quo	Staying The Same	Acceptable
Visibility Restrictions	0.53	Acceptable, keep the status quo	Staying The Same	Acceptable
Configuration	0.14	Acceptable, keep the status quo	Staying The Same	Acceptable
Visibility Impediments	0.12	Acceptable, keep the status quo	Staying The Same	Acceptable
Tides and Currents	0.10	Acceptable, keep the status quo	Staying The Same	Acceptable
Deep Draft Vessel Quality	2.93	Acceptable, keep the status quo	Increasing	Acceptable

## **Section 4: Risk Mitigation Strategies**

The workshop's final step focused participant efforts on specific risk factors, risk level evidence collection, and identifying potential mitigation measures. Using a team facilitated discussion format, participants employed handwritten sticky notes to then group and consolidate ideas. Resulting major themes/ideas were then presented to the participants to further distill action items. From this bank of action items, participants were encouraged to create specific, measurable, actionable, realistic, and timebound (SMART) goals.

Workshop participants identified, discussed, and evaluated additional risk intervention strategies through education, coordination, policy/regulatory improvements, and/or physical waterway configuration enhancements. These recommended additional risk intervention strategies, recorded below, were agreed upon by consensus of the PAWSA workshop participants and should not be construed to represent the views of the USCG.

### **Traffic (Mix, Volume, Congestion):**

Mitigation Strategy 1: Revitalize and employ a marine traffic focused body through the local Harbor Safety Committee (HSC). Preferred subcommittee participants include Brevard County, commercial fishing operators, commercial space industry, passenger cruise lines, East Coast Fishing Section, FAA, Fisherman's Alliance, Florida Fish and Wildlife Conservation Commission, NASA, Port Canaveral tenants, recreational vessel community leadership (e.g., marinas), USA/SDDC, USACE, USAF, USCG, USN, and USSF.

Mitigation Strategy 2: Through an HSC Sub-Committee, in consultation with regulatory authorities and commercial space transportation industry, a waiver process for individual waterway operators/operations to remain in or transit through USCG Regulated Navigation Areas, Limited Access Areas, etc.

Mitigation Strategy 3: Enhanced distribution and accessibility of Marine Safety Information. Port Canaveral HSC supports a Federal Joint Navigation Information Fusion & Distribution Center concept to enable continual push of platform agnostic forecasted and real-time information to vessel wheelhouses, public stakeholders, and other commercial or private enterprises.

Mitigation Strategy 4: Capitalize on existing platforms to alert mariners and public.

- Use social media/internet, regional/county geo-referenced Short Messaging Service distributors, mobile device QR-codes, e-mail lists, electronic highway roads signs, etc. referring to single authoritative website with forecasted/active limited access areas (e.g., space launch/re-entry zones).
- Employ U.S. Coast Guard Auxiliary and other outreach resources to combat potential informational fatigue.

Mitigation Strategy 5: Affect new platforms and deployment of capabilities to enhance mariner and public awareness of limited access areas.

- Develop a centralized web-app (e.g., similar to NOAA's Whale Alert: "...display(s) active whale management areas, required reporting areas, recommended routes, areas-to-be-avoided and near real-time warnings in shipping lanes along both coasts of the United States...allows vessel operators to avoid collision...")
- Utilize virtual Automatic Identification System (AIS) Aids to Navigation (ATON) to mark limited access areas.

Mitigation Strategy 6: Provide public comment to forthcoming U.S. Coast Guard Port Access Route Study when published in Federal Register.

Mitigation Strategy 7: Address congestion concerns in vicinity of waterborne space vehicle hazardous material transfers with coordination between commercial space support activities and port facilities/harbormaster.

### **Recreational Vessel Quality/Operation:**

Mitigation Strategy 1: Multi-pronged boater training, education, and awareness to address unsafe operations and poor seamanship practices in congested waterways:

- Invest in federal, state, and local enforcement activity capacity to promptly address hazardous boating operations, inspect existing safety equipment requirements, and conduct boater education (e.g., International & Inland U.S. Inland Navigation Rules, monitor VHF CH-16 and CH-12 to understand harbor operations).
- Develop/promote authoritative and easily accessible single-source Maritime Safety Information distribution platform (e.g., see previous Traffic Condition Federal Joint Navigation Information Center mitigation above).
- Enhance physical/visual informational signage in and around Port Canaveral.
- Develop and support Port Canaveral specific waterway user training (i.e., unique traffic mix and local regulated navigation/limited access area) to complement national, state, and/or other existing boater safety courses.

Mitigation Strategy 2: Consider insurance industry incentives and/or private marina led ramp/dock checks for operator completion of recognized safe boating courses. A non-unanimous suggestion includes government-imposed ramp fee incentives.

### **Obstructions:**

Mitigation Strategy 1: Continue discussions through Harbor Safety Committee to mitigate chokepoints and streamline maritime evacuations vessels and barrier island fuel removal truck operations preceding heavy weather.

- Support construction of fixed bridge in place of current SR-401 drawbridge with sufficient vertical and lateral clearance for vessel evacuations.
- Discuss, evaluate, and establish bridge opening windows during evacuations.
- Establish Harbor Safety Committee hurricane evacuation sub-committee inclusive of recreational vessel community representatives.

Mitigation Strategy 2: Prioritize maintenance dredging through the Banana River and Barge Canal to accommodate small craft relief and heavy weather evacuation routes. These are vital port congestion and hurricane evacuation relief routes, particularly given the priority and increase of deep draft vessel dimensions and volume of deep draft activity in Port Canaveral.

- Engage U.S. Army Corps of Engineers and Congressional representation to prioritize dredging of shoaled areas in Banana River and Barge Canal.

- Follow up with U.S. Army Corps of Engineers on lock operation efficiencies to identify potential scheduling to accommodate needs of smaller vessels displaced by expanding industry in port.
- Enforce regulatory and contractual requirements (e.g., lighting, gear positioning, unnecessary navigable area obstruction) on dredging operations to enhance obstruction visibility and minimize impacts to remaining navigable waterway.

**Deep Draft Vessel Quality:**

Mitigation Strategy 1: Evaluate 33 CFR § 164.25(a)(1) & (5), the tests of steering gear and machinery propulsion astern prior to entering navigable waters of the United States, in the context of modern Z-drive propulsion systems. Operators may also consider pursuing modified testing intervals through the cognizant Captain of the Port as outlined in USCG Marine Safety Manual Vol. II: Material Inspection Section D. Port State Control Chapter 7: Procedures Applicable to Foreign Passenger Vessels.

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## **Appendix A**

### **Workshop Participants**

<b>Participant</b>	<b>Organization</b>
Jeff Koch	Blue Origin
Lt. Brett Lockhart	Brevard County Sherrifs Office
Capt. Ben Borgie	Canaveral Pilots Association
Peter Bergeron	Canaveral Port Authority
Asst. Chief Chris Quinn	Cape Canaveral Fire and Rescue
Mark Skrzypek	Cape Canaveral Marine Center
Mike Merrifield	Cape Canaveral Shrimp Co.
Edoardo Morbiducci	Disney Cruise Line
Brian Vahey	The American Waterways Operators
Eva Long	FAA
Luke Richards	GT USA
Ryan Moore	International Towing and Salvage
Hyo "Marino" Hwang	McAllister
Theodore Morrell	Military Surface Deployment and Distribution Command
Steve Chan	NASA
Kyle Ward	NOAA
Thomas Sullivan	Northstar Midstream/Polaris New Energy
Jonathon Gardner	Norwegian Cruise Line
Richard Roten	Port Canaveral Yacht Club
Dain Detellier	QLNG
Matt Pickett	Royal Caribbean
Jim Busse	Seafood Atlantic (CFV/Fish sales)
Eddy Oduber	Seaport Canaveral
Jimmy Moffitt	Space Florida
Frank Messina	SpaceX
Andrew Phillips	The Port Canaveral Fisherman's Alliance
LT Joseph Francisco	US Naval Ordinance Test Unit
Lt Col Colin Mims	US Space Force
LCDR TJ Bigay	USCG
Faron Petteys	USCG Auxiliary

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## Appendix B

### Participant Observations - Trends in the Port and Existing Risk Mitigations

Workshop participants are local subject matter experts, waterway users, and regional stakeholders. These comments capture their observations, opinions, and analyses to provide a general sense of the ideas discussed during the workshop. Participants were asked to identify risks, trends, and any existing or potential mitigation strategies. References to existing regulations and standards may be included for additional context. Participant comments provide various perspectives representative of varying interests and do not reflect the views of or statements by the United States Coast Guard.

The following participant comments are structured by risk condition/factor as follows:

1. Participant observations of risks, issues, and/or trends
  - Existing mitigations
    - Potential mitigation strategies

#### **Risk Condition: Vessel Quality & Operation**

##### **Risk Factor: Deep Draft Vessels**

1. Significant amount of deep draft traffic, to include cargo, passenger, military surface vessels, and Navy submarines.
  - USCG Captain of the Port implements Security Zones for numerous military vessels transits.
2. Contingent of aging vessels.
  - Vessels comply with company safety management system, inspections, and increased maintenance regimes.
3. Increase of exceptionally hazardous cargo carriage through the port (i.e., LNG barges and petrochemical) critical to the regional economy.
  - Risk potential increasing given additional traffic of this type, however, extensive safety program and practices in place reduce probability of high consequence event.
4. Increased passenger and cargo capacity on newer vessels.
5. Port visited by many of the newest construction passenger cruise vessels with LNG propulsion.
  - Increased safety management system requirements and practices.

##### **Risk Factor: Shallow Draft Vessels**

1. Articulated tug-barge (ATB) and novel traffic (e.g., commercial space support vessels) operations were discussed for inclusion between deep draft or shallow draft categories.
  - Risks posed by barges carrying space vehicles mitigated by grappling hardware securing the load under nominal conditions.
2. Recent implementation of 46 CFR Chapter I Subchapter M for towing vessels to obtain Certificate of Inspection (COI) has improved the material quality, maintenance regimens, and overall safety.
3. Small passenger vessels drawn to space operations as waterside spectators in close proximity to established safety zones.

- USCG response assets, regional law enforcement partners, commercial support vessels, and USCG Auxiliary volunteers often provide mitigate with patrol, awareness, and outreach efforts to keep vessels in designated spectator zones.
4. Dredge vessel operations have been prone to unnecessarily restricting available waterway with haphazard placement vessel, gear, and/or improper lighting of marker buoys.
    - Address contract compliance and/or safety issues through USACE representative.

**Risk Factor: Commercial Fishing Vessels**

1. Mix of owner-operator and fleet managed commercial fishing and shrimper type vessels. Operations also consist of offloading catch from homeported and visiting fleets at two commercial docks in Port Canaveral. Range of licensed master and foreign crew experience, some with extensive local knowledge and, potentially, less so with transitory and managed fleets. Vessels rotate seasonally, with between 10 to 60 catch offloads occurring in the Port each day. Significant traffic to Seafood Atlantic and Wild Ocean seafood market docks by commercial operators and charter fishing vessels.
2. Observations of operators getting underway regardless of weather due to quota-based fisheries management.
3. Local fisherman are noticeably more well-rested and prepared to operate than in past years

**Risk Factor: Recreational Vessels**

1. Waterside space operations tourism by recreational vessels poses personal, passenger, and property risks. Waterways users are potentially unaware of or ignore regulated access areas and/or limited access areas in place for space vehicle launch and reentry activity.
  - Regulated navigation areas and limited access areas for these activities are risk mitigations developed by the USCG (Seventh District and Captain of the Port) in coordination with multiple federal partners and the commercial space activities.
    - Mitigation enhancements include local boater safety course supplement with insurance provider incentives, boat operator pamphlet handout events, increased physical signage around the port, georeferenced services/alerts through mobile phone providers, and consolidated marine safety information services and distribution.
2. Port Canaveral is a hub for the spectrum of waterborne recreation (e.g., power & sail cruisers, offshore and nearshore fishing, human powered craft, personal watercraft rentals, yachting, etc.). During the recent pandemic, boater outreach/education metrics anecdotally reduced by more than half while boat sales increased. Concurrently, observations indicate a trend of increasing vessel horsepower and speed capability in this category.
  - USCG Auxiliary hosts boating safety class every third Saturday in Port Canaveral.
  - Insurance companies requiring boat education, competency, and/or experience based on vessel length overall.
3. Observations indicate increasing trend of recreational vessel abandonment outside the main port area, intercoastal, and barge canal.
  - Increased funding for federal and local enforcement efforts is needed to identify responsible parties of derelict vessels and to effect clearing of hazards.

**Risk Condition: Traffic**

### **Risk Factor: Volume of Commercial Traffic**

1. No significant observations or trends noted through discussion.

### **Risk Factor: Volume of Small Craft Traffic**

1. No significant observations or trends noted through discussion.

### **Risk Factor: Traffic Mix**

1. Complex waterway usage given passenger cruise, commercial space, cargo, fishing community, recreational vessels and human powered craft, and other activities.
2. Commercial space operations continue to evolve autonomous and remote safety systems (e.g., autonomous flight termination system) for launch and recovery activities occurring above and within the Marine Transportation System.
  - Updating the large space shuttle “Challenger” era safety zones, the USCG established Regulated Navigation Areas as a flexible means of imposing safety areas or exclusionary zones based on the dynamic aggregate risk profiles of space operations in the vicinity of the MTS.
    - Several participants, particularly fishing vessel and recreational boating community representatives, voiced interest in a dialogue and process to consider vessel/operational waivers for transits of restricted areas and waivers of liability.
    - Not currently supported by Coast Guard regulations, cross-walking space activity aggregate risk profiles to maritime safety zones (e.g., only vessels of a certain passenger capacity must keep out versus case-by-case exceptions).
    - Space operators open to industry and community input to then modify space launch/reentry profiles to afford maritime transit zones in safe areas.
    - Ensure all impacted or adjacent stakeholders are engaged in public rulemaking dialogue; improve notice of proposed rulemaking outreach methods and engagement.
  - Maritime Safety Information and supplemental guidance distributed through Port Canaveral social media, .Gov email delivery services, multiple internet sites ([Space Launch Delta 45 > Home \(spaceforce.mil\)](#)), [Broadcast Notice to Mariners | Navigation Center \(uscg.gov\)](#), [Port Directory Content \(uscg.mil\)](#), traditional VHF marine radio, and other means.
    - A joint federal navigation information center for collection and dissemination of real-time MSI is a proposed mitigation
    - Developing a regional mobile device application (e.g., Safe Launch or Safe Zone) with forecast and current regulated navigation area and limited access area restrictions would improve commercial and recreational mariner awareness of potential voyage conflicts.
    - Representatives from multiple stakeholder groups expressed interest in convening dialogue groups to discuss, understand, and mitigate traffic conflicts between space operations and other waterways users.
  - Space vehicle hazardous materials (i.e., remaining booster propellant) are removed from the rocket boosters while and secured to their receiving vessel. This occurs under nominal conditions at-sea and limits explosion risks while the vessel and secured space vehicle transit through the port. Should other than nominal conditions inhibit this transfer at sea, COTP orders and existing regulations for explosives handling mitigate port risks.

### **Risk Factor: Congestion**

1. Authorities and coordinating bodies exert significant effort to manage multi-use waterway around the clock with limited road access to infrastructure and facilities on barrier islands (e.g., tens of thousands of cruise passengers, onshore and offshore space operations tourists, fisheries, etc.).
2. Space launch and reentry activity is increasing compared to previous decades with corresponding risk mitigation measures implemented on waterways underlying modeled risk contours.
  - Current mitigation efforts potentially result in congestion and vessels meeting within adjacent waterways as users look to transit immediately prior, following, or around a waterway restriction.
  - Advanced notice of waterway restrictions is circulated locally at fish docks, however, more lead time would aid awareness, compliance, and use of any potential alternative fishing grounds.

### **Risk Condition: Navigation**

#### **Risk Factor: Winds**

1. Wind velocity is the dominant environmental factor that effects the safe transits of vessels in Port Canaveral. to observation data, generally from port adjacent land-based stations, is not reflective of and undervalues conditions experienced at-sea, and particularly, at the mast height or exposed surfaces of larger vessels (e.g., 10-15 knots higher offshore for cruise ships). Causes deep draft vessels to crab through narrow channels with the effect of a greater “virtual beam” (e.g., increase from 150ft to 220ft).
  - Available navigable waterways, given physical dimensions and cumulative environmental effects, restrict large vessels to one-way traffic within Port Canaveral.

#### **Risk Factor: Tides/Currents**

1. When locks retaining the Banana River are opened the associated currents can increase upwards of three or four knots. However, the lock is generally kept in the closed position.

#### **Risk Factor: Visibility Restrictions**

1. Fog and/or rain induced visibility limitations were identified as having a manageable effect (e.g., 10-15 times per year) on vessel traffic.

#### **Risk Factor: Bottom Type**

1. No significant observations or trends noted through discussion.

### **Risk Condition: Waterway**

#### **Risk Factor: Dimensions**

1. Regional hurricane evacuation plans call for the movement of vessels through the Barge Canal and the “crossroads”, which is not adequately maintained to project depth. This is a potentially significant chokepoint due to groundings of those vessels as transit windows become increasingly limited to tidal windows and “bumping bottom”. A Florida statute directs, “Upon the issuance of a hurricane watch affecting the waters of marinas located in a deep water seaport, vessels under 500 gross tons may not remain in the waters of such marinas that have been deemed not suitable for refuge during a hurricane...” Though not a designated “safe haven”, commercial vessels use the barge canal for this purpose. Boat lift/ramp capacity within the port is also inadequate to support the removal of vessels in advance of a hurricane.

- Previous dredging projects of the Barge Canal and adjacent waterways have been inadequate to ensure routine or emergency use of this waterway.
  - Scope and fund adequate maintenance dredging projects to assure access to Indian River, Banana River, and Port Canaveral through the Barge Canal.
- 2. Passenger cruise vessels are a core component of Port Canaveral marine traffic and continually increasing in size (length, beam, and height).
  - Port facilities and infrastructure (e.g., berths, channel width, jetties) projects aim to meet demands. The narrow channel into the port restricts large vessels to one-way traffic and with speed restrictions through the jetties.
- 3. Hydrodynamic surge is amplified considerably by Port Canaveral's narrow deep draft channel and close proximity of vessel moorings. The movement of large (e.g., 80,000 ton) vessels has resulted in damage to mooring lines, ships, and gangways.

#### **Risk Factor: Obstructions**

1. Amplifying hurricane evacuation requirements and challenges, opening of the SR-401 bascule bridge (25ft vertical clearance in closed position) is critical to the movement of small vessels (e.g., private vessels and commercial fishing). During evacuation periods the opening/closing needs of fuel trucks and waterborne vessels are in direct conflict.
  - There is informal coordination, inclusive of FL DOT, that tries to enable adequate movement windows for both waterside and landside traffic.
  - Florida Department of Transportation proposed bridge replacement project (ID#: 4447871) is open for comment.
    - Identify appropriate alternatives for some vessels to remain in port during elevated hurricane conditions.
    - A study to quantify the evacuation requirements across transportation modes is needed to better inform future plans, spatial planning, and/or identify alternative bridge operations.
    - Support an alternative construction plan in lieu of the existing bridge to enable the unrestricted transit of these shallow draft vessels to/from the Barge Canal and Port Canaveral.
2. Participants broadly expressed concerns with respect to blanket vessel speed restrictions imposed by offshore marine mammal protection measures. 10 knot speed restrictions can affect the maneuverability of deep draft vessels, particularly in narrow channels during high wind conditions as they "crab" through a waterway. This effectively limits available channel width increases risk of collision and/or hard grounding. Common industry propulsion engine order telegraph input of 'dead slow ahead' can yield insufficient steerageway, especially in high wind conditions and sea states. Whereas 'slow ahead' can often exceed a given speed restriction. Further, speed restrictions reduce available maneuvering techniques (i.e., stern-sweep) to safely transfer pilots at-sea.

#### **Risk Factor: Visibility Impediments**

1. Vegetation overgrowth and obstruction of ATON occurs rapidly.
  - Waterway user engagement with responsible USCG WWM office and/or ATON unit is effective for any necessary clearance of impediments.

#### **Risk Factor: Configuration**

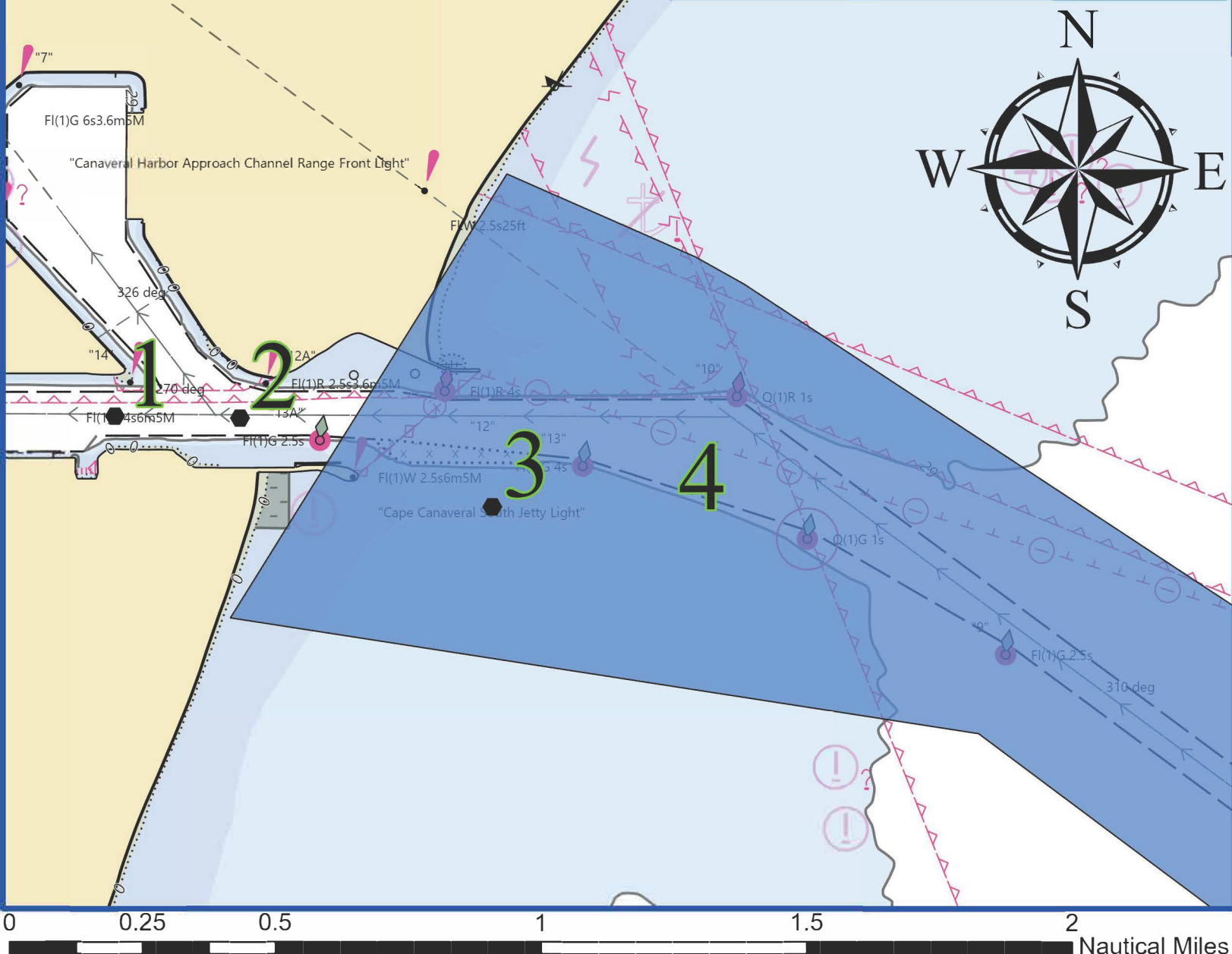
1. Physical aids to navigation are critical to pilotage and the maneuvering of large vessels.
  - The temporary lighted buoy in place of the missing Canaveral Harbor Approach Lighted Buoy 5 for over two years is inadequate.

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# PAWSA Participant Comments: Vessel Quality & Operations Conditions. Page 1 of 1.

Launch Complex 6

Spatial Reference  
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Datum: WGS 1984  
Map Units: Degree  
Scale: 1:20,000



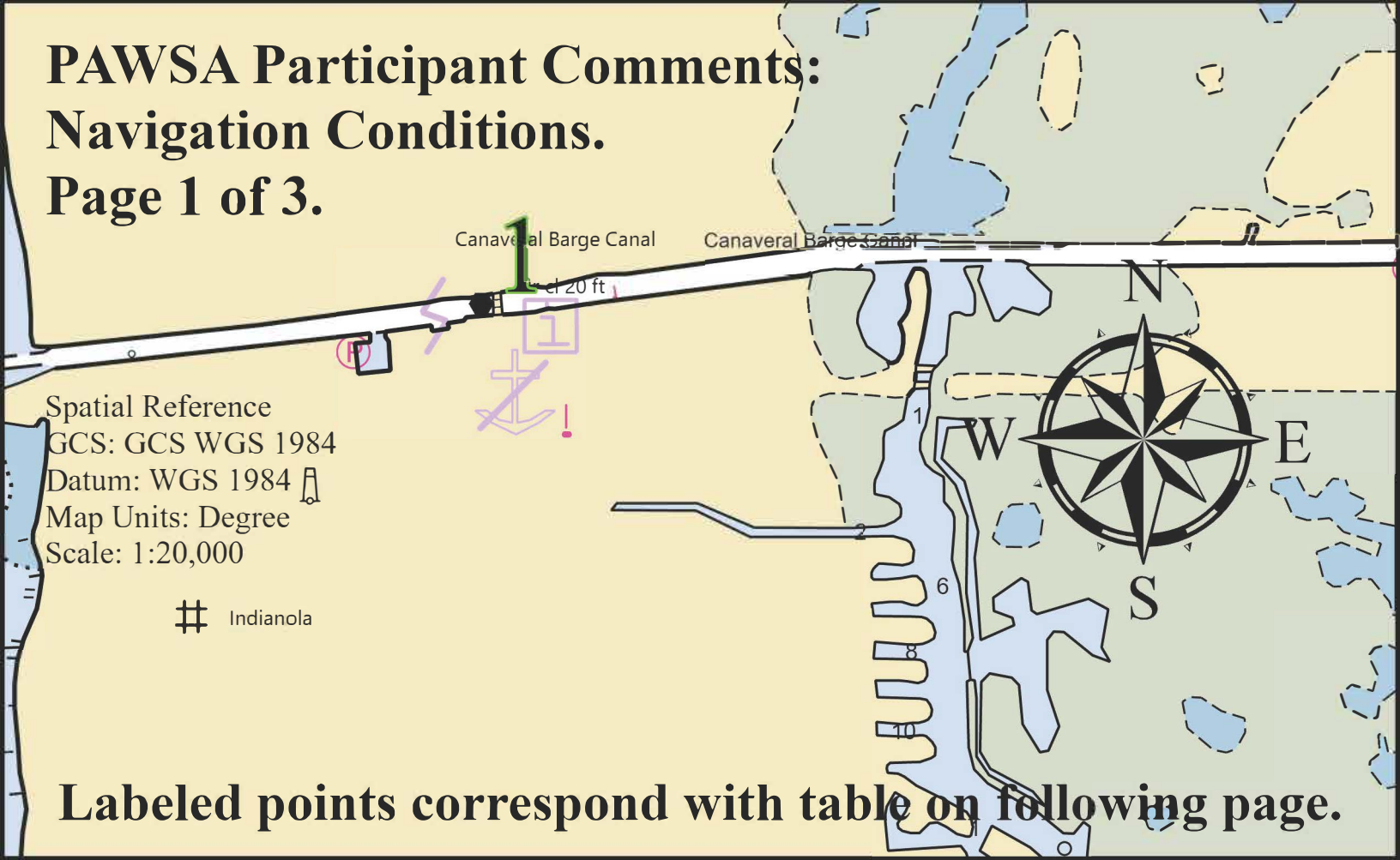
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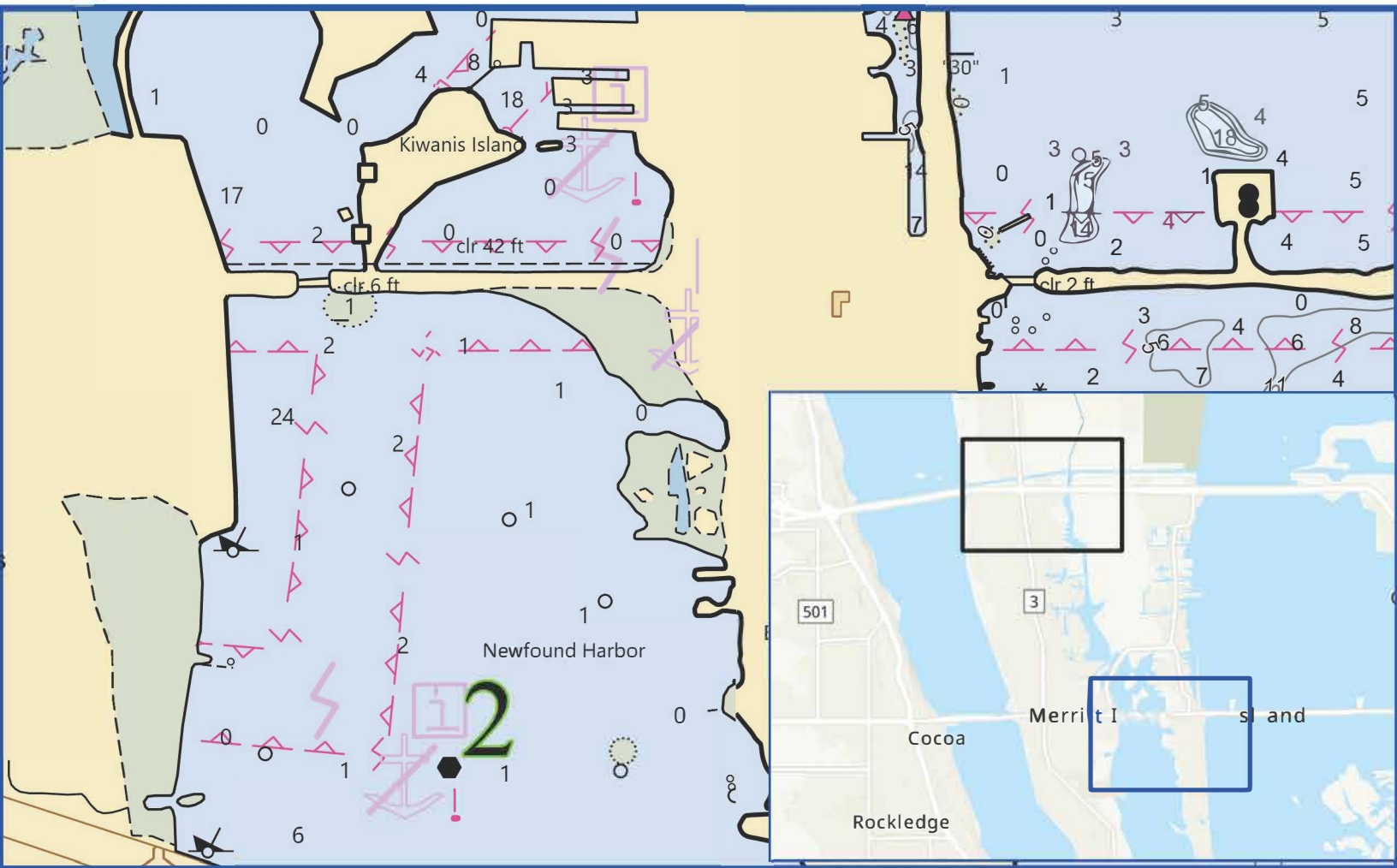
## Vessel Quality & Operations Condition Comments

Point	Comment
1	Poorly lit buoys/no lit buoys associated with dredge operations and a lack of enforcement by the contract owner.
2	Dredge operations leaving buoys and lines in the waterway.
3	Revision of CFR pre-arrival astern test with azipods.
4	We need a launch deconfliction for marine assets. "Fairway Assessment."

# PAWSA Participant Comments: Navigation Conditions. Page 1 of 3.



0 0.19 0.38 0.75 1.13 1.5 Nautical Miles

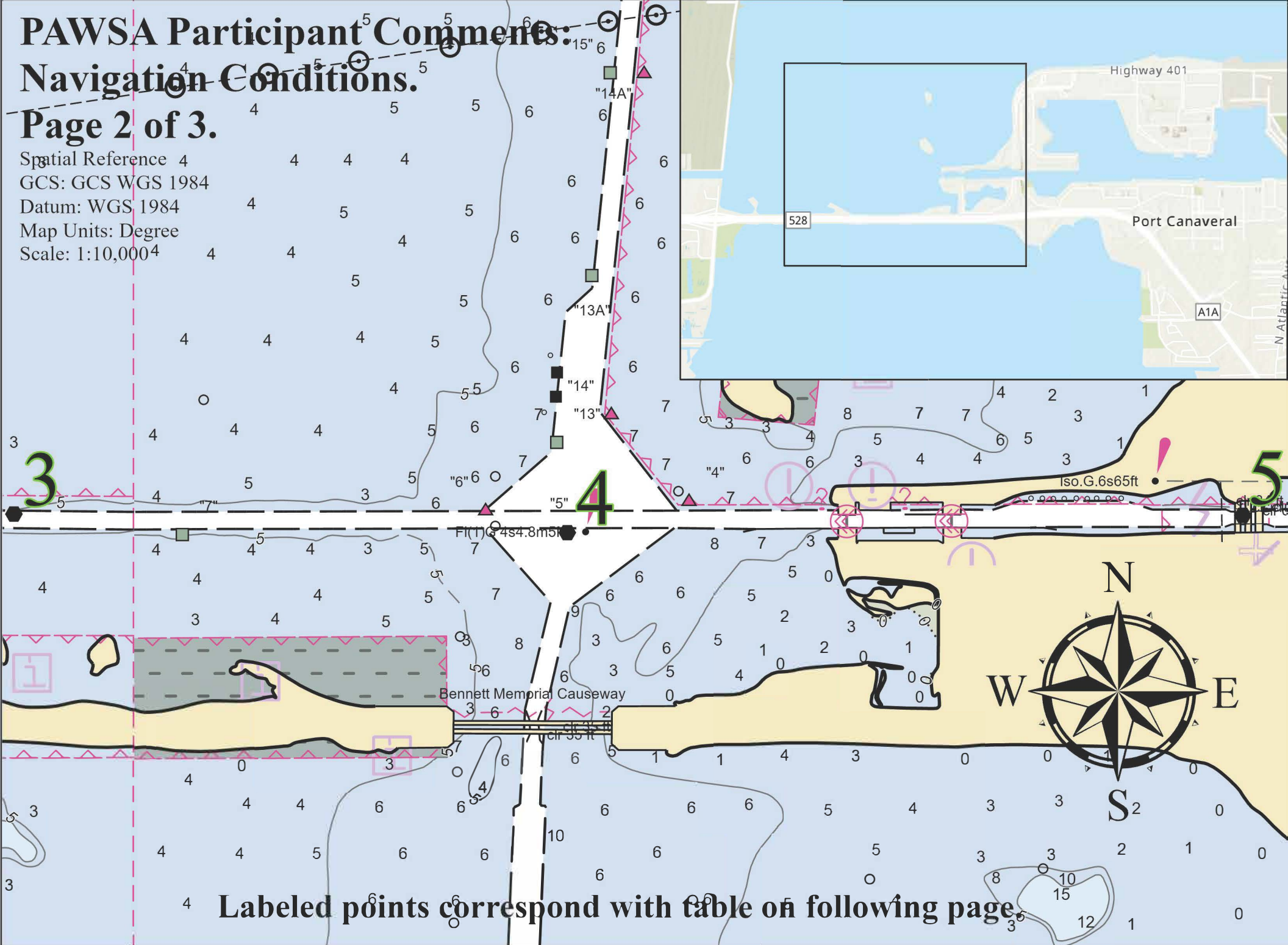


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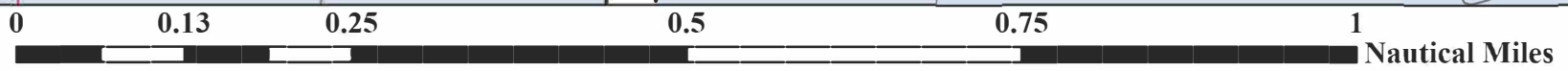
## Navigation Conditions.

Page 2 of 3.

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Scale: 1:10,000



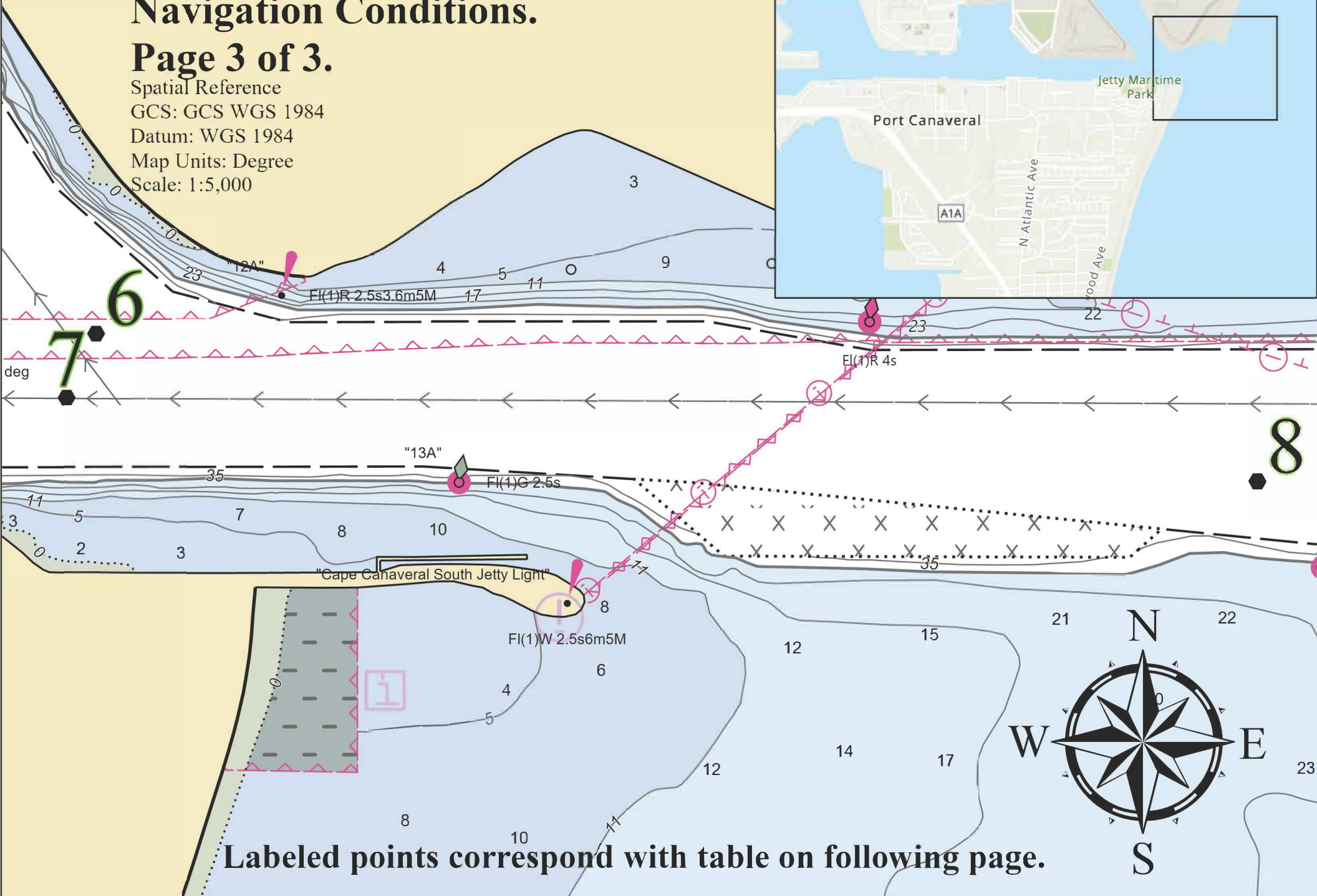
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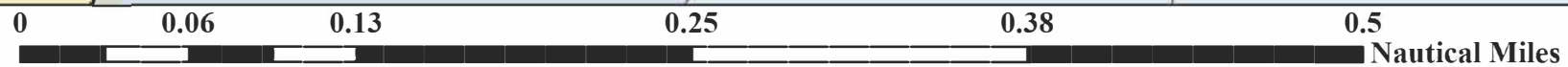
# PAWSA Participant Comments: Navigation Conditions.

Page 3 of 3.

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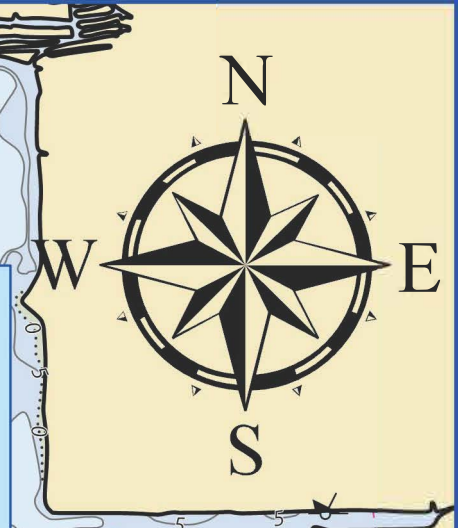
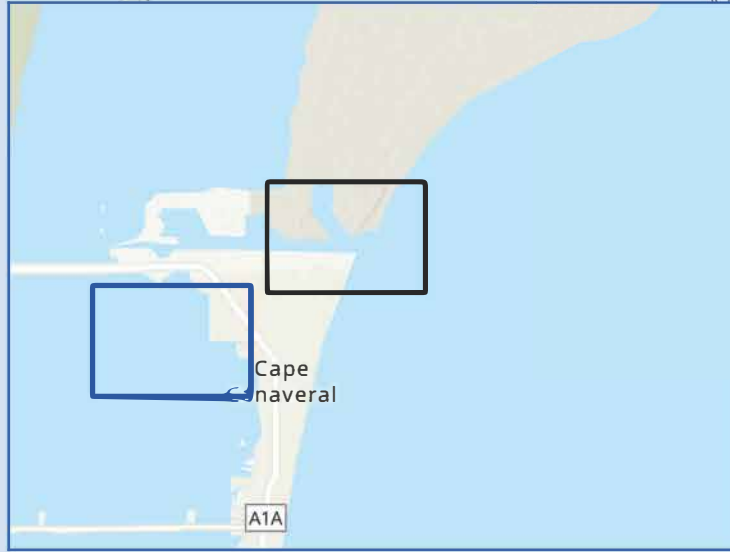
## Navigation Condition Comments

Point	Comment
1	The Banana River cross roads is shallow and a lot of the vessels going through are bumping bottom. It is a concern since it is an evacuation route for the hurricane. Not an official 'safe haven' for hurricanes but it is used as one. Mostly for commercial vessels.
2	Banana River passage to barge canal needs to be dredged. Hurricane evacuation to barge canal requires use of this passage. Vessels bumped bottom crossing into the barge canal. One has a palm tree trunk lodged in the wheel.
3	The Barge Canal has not been taken care of and has been losing depth over the years.
4	Dredge the Banana River Barge Canal. Not enough depth for larger boats evacuating west during hurricanes.
5	The locks keep the current in the main channel low. The winds are the larger concern when navigating larger ships.
6	Multi-model planning.
7	The lighting restrictions for sea turtles is not much of an issue in the port since they are mostly on the beach. The USACE will not allow hopper dredges in the port except in emergencies due to the turtles.
8	Remove rocket launch activity during peak seasonal fishing activities. Allow commercial harvesters access to closed areas during a launch window providing they are cleared and regulated with the Coast Guard and Homeland security or other regulating agency.

# PAWSA Participant Comments: Traffic Conditions.

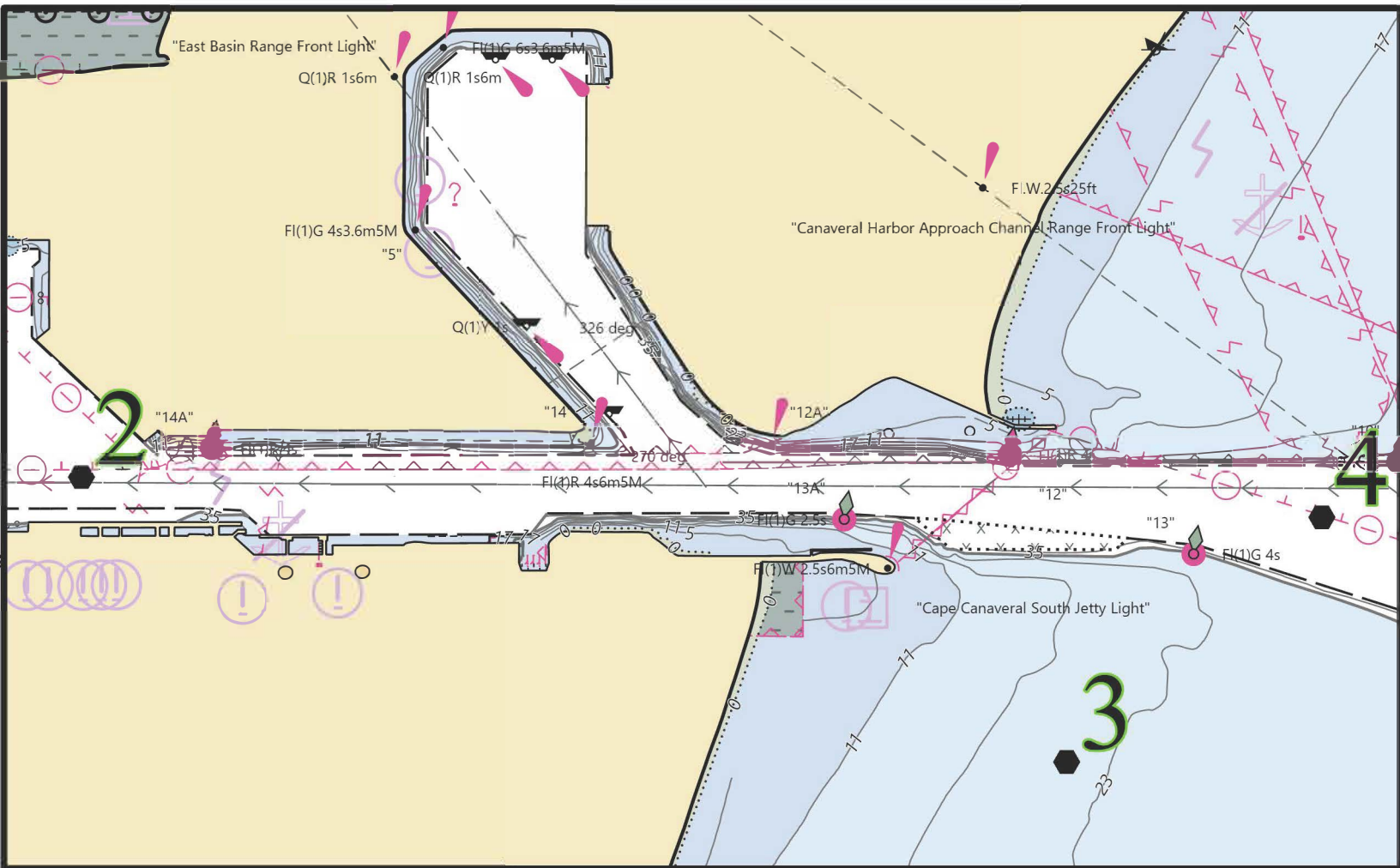
Page 1 of 1.

Spatial Reference  
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0 0.13 0.25 0.5 0.75 1 Nautical Miles



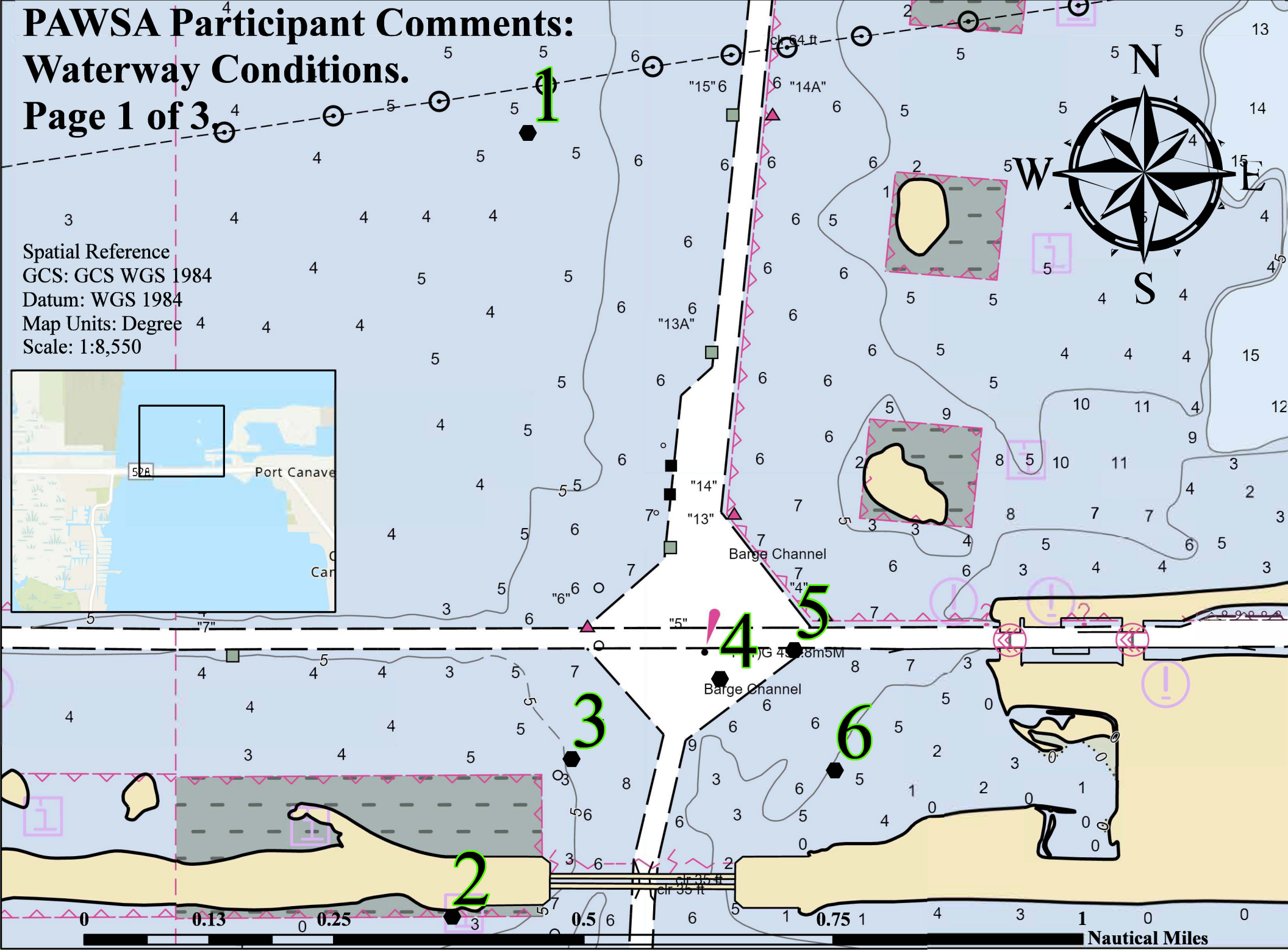
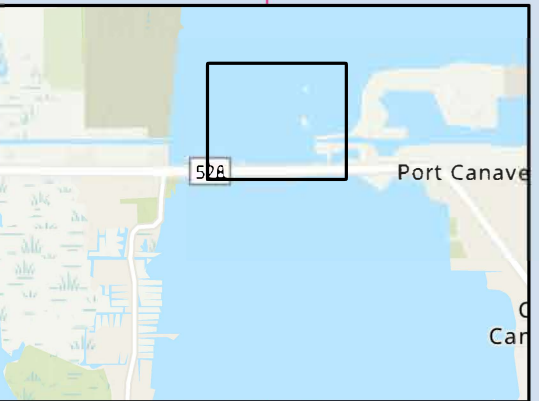
## Traffic Condition Comments

Point	Comment
1	Establish a waiver allowance for vessels traversing closure zones.
2	There are barges in the middle of the channel (dredging barge and construction barges).
3	Port needs designated fairways for the arrival and departure of vessels from Port Canaveral that are out of the normal security zones. CG will notify vessels in fairway zones if security impacts their transit. Fairways should follow historical SE transit.
4	Port needs designated fairway for safe entrance/exit to port harbor at all times, all year.

# PAWSA Participant Comments: Waterway Conditions.

Page 1 of 3

Spatial Reference  
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Datum: WGS 1984  
Map Units: Degree  
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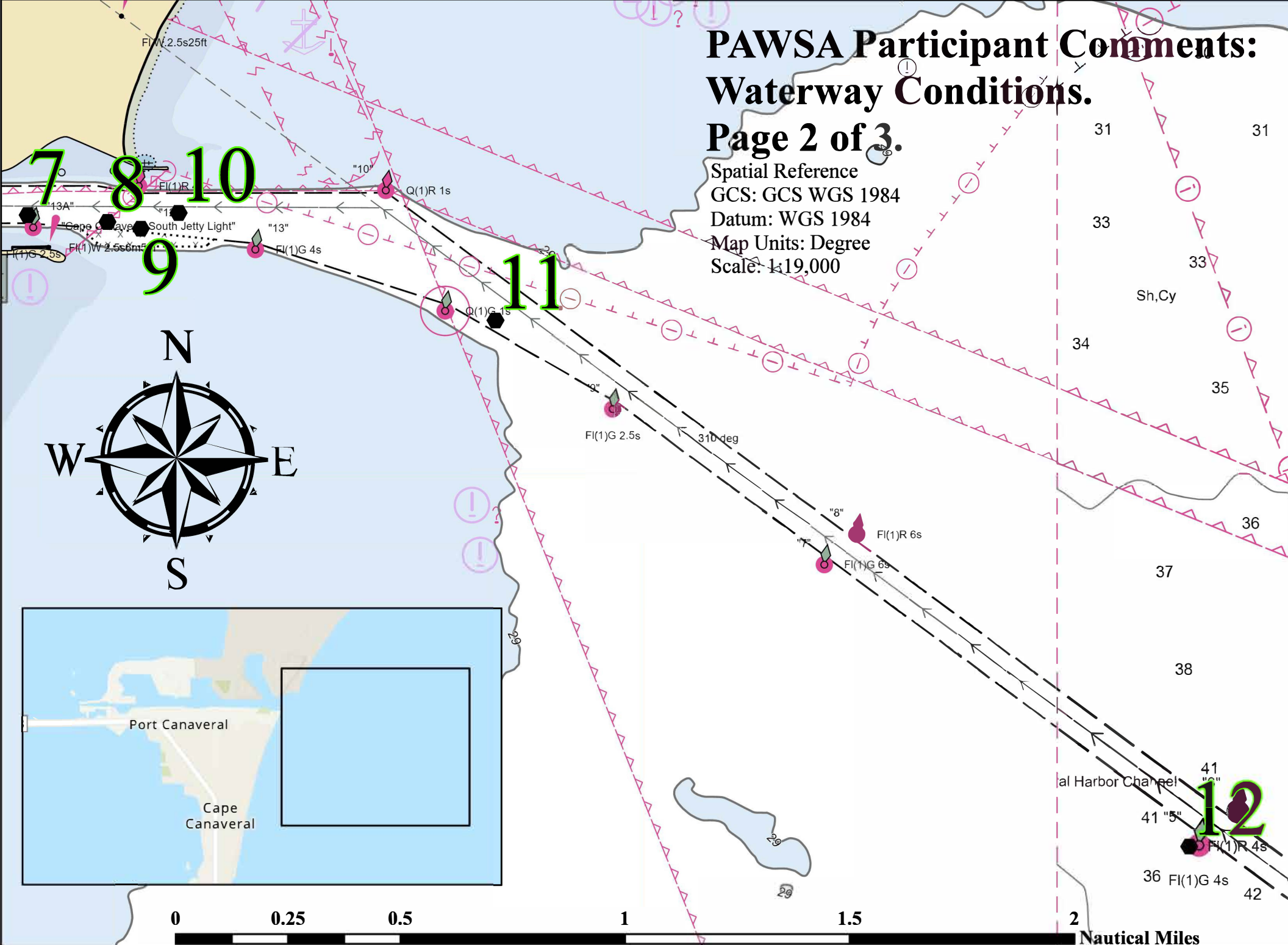
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# PAWSA Participant Comments: Waterway Conditions.

Page 2 of 3.

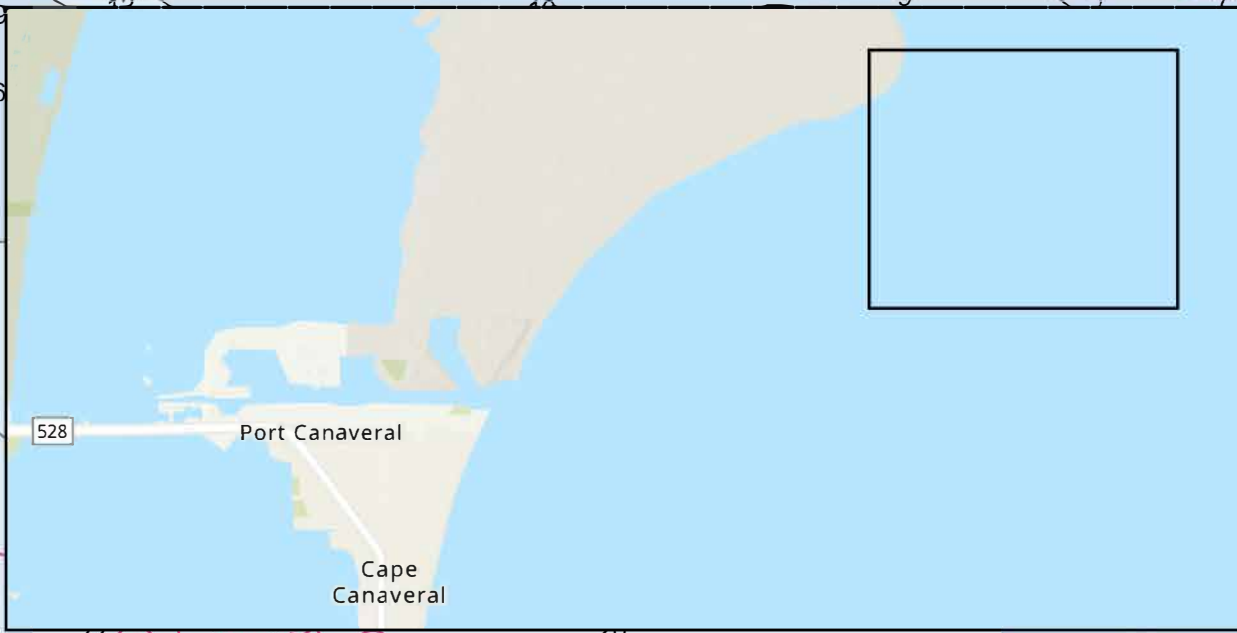
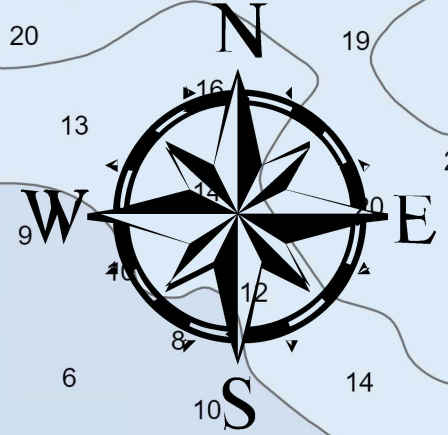
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# PAWSA Participant Comments: Waterway Conditions. Page 3 of 3.

Spatial Reference  
GCS: GCS WGS 1984  
Datum: WGS 1984  
Map Units: Degree  
Scale: 1:19,000



Labeled points correspond with table on following page.

## Waterway Condition Comments

Point	Comment
1	Better/visible signage (ex. "No Motor Zone," "No Drone Zone," "No Wake Zone"). Need more enforcement of existing signage, especially during launches.
2	Fixed Bridges height/width. Will commercial fishing vessels be able to transit through barge canal for hurricane evacuation with the proposed new fixed bridges.
3	Water depth is inadequate to allow larger commercial fishing vessels to enter barge canal from the locks east/west passage must be dredged before evacuations.
4	Depth at seawall. Need to dredge to deeper depth.
5	Prior to launches and offshore events take into consideration the interests of commercial fishing fleets and their daily activities outside of port canaveral. Launch zone restrictions need to be addressed to accomodate access to commercial harvesters as essential business.
6	Project to replace derelict piers requires construction crane/barges very close to the navigation channel. Clearance concern, especially on windy days.
7	Disney cruise ships need to test engines astern once they reach the sea buoy. This isn't what azipods are meant to do and they have to slow down to a nonmaneuverable speed in order to do it.
8	NOAA is proposing an expansion of the right whale zone so it would include port canaveral. The proposal imposes a speed restriction of 10 knots and reduces the length of vessels to 35 ft. Violations of the proposal could be severe. The proposal would effect multiple industries and have a large maritime impact.
9	The idea of an outbound range has been discussed for over 15 years. These are critical aids that are needed but we don't have. Studies have been done, all we need is funding.
10	Port Canaveral is number 2 in cruise ships, number 1 in LNG, and number 1 in space. The current command structure does not reflect this reality. This port needs local authority from the USCG Sector JAX to make decisions. We need to elevate the local rate to an O5 to enable decision making reality.
11	One way traffic when larger ships come in due to ships being large and the channel being smaller.
12	Green channel buoy 5 has been replaced by a temp buoy for over a year! We need that buoy replaced with a proper buoy.
13	The RNA encompasses many major fisheries that currently and historically occur at various times throughout the year.

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## Appendix D

### References

Environmental Protection Agency

<https://www.epa.gov/regulations-emissions-vehicles-and-engines/domestic-regulations-emissions-marine-compression>

International Convention of Standards of Training, Certification and Watchkeeping (STCW)

[http://www.imo.org/en/About/conventions/listofconventions/pages/international-convention-on-standards-of-training,-certification-and-watchkeeping-for-seafarers-\(stcw\).aspx](http://www.imo.org/en/About/conventions/listofconventions/pages/international-convention-on-standards-of-training,-certification-and-watchkeeping-for-seafarers-(stcw).aspx)

International Marine Contracting Association (IMCA) Standards

<https://www.imca-int.com/>

International Tanker Owners Pollution Federation (ITOP)

<http://www.itopf.com/>

Life Lines Brochure - Safety Tips That Could Save Your Life

[http://www.americanwaterways.com/commitment\\_safety/lifelines.pdf](http://www.americanwaterways.com/commitment_safety/lifelines.pdf)

National Oceanic and Atmospheric Administration, National Ocean Service

<https://oceanservice.noaa.gov/>

Offshore Vessel Inspection Database (OVID)

<https://www.ocimf-ovid.org/>

#### PORTS

<https://tidesandcurrents.noaa.gov/ports.html>

Recreational Boating Safety - Accident Statistics

[http://www.uscgboating.org/statistics/accident\\_statistics.php](http://www.uscgboating.org/statistics/accident_statistics.php)

Ship Inspection Report Program (SIRE)

<https://www.ocimf.org/sire/>

#### SIRE

<https://www.ocimf.org/media/84968/SIRE-Factsheet-May-2018.pdf>

State Specific Boating Safety Requirements

<http://www.americasboatingcourse.com/lawsbystate.cfm>

U.S. Army Corps of Engineers - Regulatory Policies

<http://www.usace.army.mil/Missions/>

U.S. Army Corps of Engineers - Vessel Transit Statics

<http://www.navigationdatacenter.us/>

U.S. Coast Guard - Navigation Rules and Regulations

<http://www.navcen.uscg.gov/?pageName=navRuleChanges>

USCG Port State Control Regulations

<https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Inspections-Compliance-CG-5PC-/Commercial-Vessel-Compliance/Foreign-Offshore-Compliance-Division>

U.S. Coast Guard - Vessel Inspection Regulations

<http://www.ecfr.gov/cgi-bin/ECFR?page=browse>

U.S. Coast Guard - Vessel Traffic Services

<https://www.navcen.uscg.gov/?pageName=vtsLocations>

U.S. Coast Guard Auxiliary Requirements for Recreational Boats

<http://www.cgaux.org/boatinged/classes/2011/bss.php>

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## **Appendix E**

### **Abbreviations and Acronyms**

ACP	Area Contingency Plan
AIS	Automated Identification System
ANPRM	Advance Notice of Proposed Rulemaking
ATON	Aids to Navigation
BWI	Boating While Intoxicated
BNM	Broadcast Notice to Mariners
COTP	Captain of the Port
EPA	Environmental Protection Agency
MARAD	Maritime Administration
MTS	Marine Transportation System
MTSRU	Marine Transportation System Recovery Unit
NDG	National Dialogue Group
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic Atmospheric Administration
OSRO	Oil Spill Response Organization
PAWSA	Ports and Waterways Safety Assessment
PFD	Personal Flotation Device
PSC	Port State Control
PORTS	Physical Oceanographic Real-Time System
RNA	Regulated Navigation Areas
STCW	Standards of Training Certification of Watchkeeping
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
VHF	Very High Frequency
VMRS	Vessel Movement Reporting System
VTM	Vessel Traffic Management
VTS	Vessel Traffic Service



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