

# Port and Waterways Safety Assessment Workshop Report New York

## Executive Summary

Risk identification and mitigation are, and have been, ongoing activities within the United States Coast Guard Sector New York area of responsibility. In support of overall safety improvement activities, a formal Port and Waterways Safety Assessment (PAWSA) for New York harbor and adjacent waters was conducted on Staten Island, New York on 9 – 10 September 2008, sponsored by the U.S. Coast Guard. The workshop was attended by 30 participants representing waterway users, regulatory authorities, and stakeholders (i.e., organizations with an interest in the safe and efficient use of New York and New Jersey waterways for commercial and recreational purposes).

A Waterway Risk Model, incorporating 24 risk factors associated with both the causes and the effects of waterway casualties, was used throughout the workshop to guide discussions and numerical assessments. That model originally was conceived by a United States Dialog Group on National Needs for Vessel Traffic Services and subsequently has been refined based on experience gained during the 40+ PAWSA workshops that preceded this New York session.

Waterway Risk Model					
Vessel Conditions	Traffic Conditions	Navigational Conditions	Waterway Conditions	Immediate Consequences	Subsequent Consequences
Deep Draft Vessel Quality	Volume of Commercial Traffic	Winds	Visibility Impediments	Personnel Injuries	Health and Safety
Shallow Draft Vessel Quality	Volume of Small Craft Traffic	Water Movement	Dimensions	Petroleum Discharge	Environmental
Commercial Fishing Vessel Quality	Traffic Mix	Visibility Restrictions	Bottom Type	Hazardous Material Release	Aquatic Resources
Small Craft Quality	Congestion	Obstructions	Configuration	Mobility	Economic

The PAWSA process uses a structured approach for obtaining expert judgments on the level of maritime safety risk for each factor in the Waterway Risk Model. The process also addresses the effectiveness of existing and possible future intervention actions for reducing risk in the specified port and waterways. The first step in the PAWSA process is for the participants to discuss and then numerically evaluate the baseline risk levels in the geographic area being analyzed using pre-defined qualitative risk descriptions. The second step is for the participants

# Report Documentation Page

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to assess the expertise of each other with respect to the risk categories in the model. Those expertise assessments are used to weight inputs obtained during the other steps in the process. In the third step, the participants discuss and then evaluate the risk reducing effectiveness of existing mitigation strategies. Next, the participants offer new ideas for further reducing risk, for those factors where risk is judged to be not well balanced with existing mitigations. Finally, the potential effectiveness of those new intervention ideas is evaluated. The PAWSA process produces a consensus view of risks in the port and waterways and has proven to be an excellent tool for focusing follow-on risk mitigation efforts.

Based on extensive discussions during the workshop, concentrations of risks were noted by the participants in five locations:

- Sandy Hook Bay
- Arthur Kill and Kill Van Kull (Bergen Point and bridges)
- Hudson River (between Hoboken and Weehawken)
- East River (Hell Gate, Roosevelt Island, and Execution Point)
- The confluence of the Hudson and East River in the vicinity of Lower Manhattan (Battery)

The PAWSA New York participants judged that additional risk reduction actions were needed with respect to six of the 24 risk factors in the Waterway Risk Model. The table below summarizes that information and is arranged from highest to lowest possible risk improvement. The specific action(s) listed is (are) the one(s) recommended within the general strategy recommended by the most participant teams; see the detailed information at the end of this report for a full list of alternatives suggested during the workshop.

<b>Risk Factor Name</b>	<b>General Strategy</b>	<b>Specific Action(s)</b>
Congestion	Enforcement	Increase USCG resources for Op Clear Channel
Water Movement	Nav/Hydro Information	Integrate available tide & current data sources
Small Craft Quality	Voluntary Training	Communicate to boaters to stay out of the way of large vessels
Traffic Mix	Other Actions	Establish Port Safety grant program (Enforcement: Increase USCG assets)
Volume of Small Craft Traffic	Enforcement	Increase USCG resources for Op Clear Channel
Shallow Draft Vessel Quality	Voluntary Training	Company training for new deckhands

## **Report Contents**

This PAWSA New York workshop report includes the following information:

- List of attendees
- Geographic bounds of the area included in the PAWSA
- Numerical results from the following activities:
  - Book 1 – Baseline Risk Levels
  - Book 2 – Team Expertise Cross-Assessment
  - Book 3 – Mitigation Effectiveness
  - Book 4 – Additional Interventions
- Summary of risks and mitigations discussion

## **Attendees**

The following waterway users and stakeholders attended this PAWSA workshop:

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## **Geographic Area**

The geographic bounds of the waterway area were defined as:

- The Atlantic Ocean approaches to New York harbor shoreward of the precautionary area.
- Jamaica Bay
- The navigable waters of Lower New York Harbor bounded on the east by a line drawn from Norton Point to Breezy Point; on the south by a line connecting the entrance buoys at the Ambrose Channel, Swash Channel, and Sandy Hook Channel to Sandy Hook Point; and on the southeast including the waters of Sandy Hook Bay south to a line drawn at latitude 40° 25' N.; then west into the waters of Raritan Bay to the Raritan River Railroad Bridge; and then north including the waters of the Arthur Kill and Newark Bay to the turning basin in the vicinity of Penhorn Creek on the Hackensack River; and then east including the waters of the Kill Van Kull.
- The Gowanus Canal
- Upper New York Bay, then north on the Hudson River to the vicinity of Yonkers, NY.
- The East River to Execution Rocks, including the Harlem River and Newtown Creek.

## Numerical Results

### Book 1 – Baseline Risk Levels:

Vessel Conditions	Traffic Conditions	Navigational Conditions	Waterway Conditions	Immediate Consequences	Subsequent Consequences
Deep Draft Vessel Quality	Volume of Commercial Traffic	Winds	Visibility Impediments	Personnel Injuries	Health and Safety
2.9	8.3	1.9	8.0	9.0	9.0
Shallow Draft Vessel Quality	Volume of Small Craft Traffic	Water Movement	Dimensions	Petroleum Discharge	Environmental
4.3	5.6	8.1	6.5	9.0	6.6
Commercial Fishing Vessel Quality	Traffic Mix	Visibility Restrictions	Bottom Type	Hazardous Materials Release	Aquatic Resources
3.6	7.8	3.1	8.8	8.4	4.7
Small Craft Quality	Congestion	Obstructions	Configuration	Mobility	Economic
7.9	8.2	3.8	9.0	8.3	7.9

Risk values highlighted red (values at or above 7.7) denote very high baseline risk levels; risk values highlighted green (values at or below 2.3) denote very low baseline risk levels.

### Book 1 Analysis:

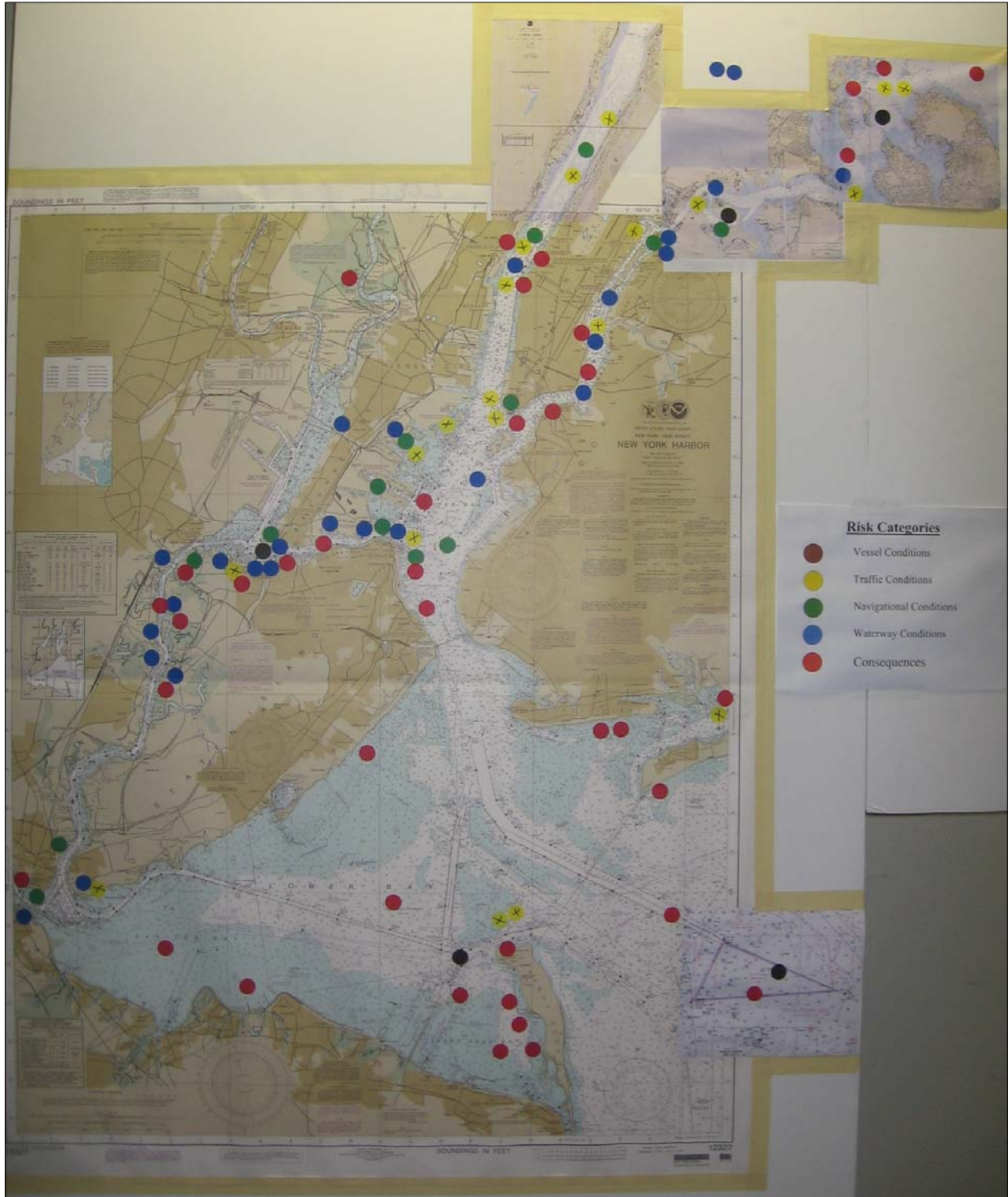
The participants evaluated the baseline risk levels in the waterway by selecting a qualitative description for each risk factor that best described conditions in the New York area. Those qualitative descriptions were converted to discrete values using numerical scales that were developed during ten earlier PAWSAs. On those scales, 1.0 represents low risk (best case) and 9.0 represents high risk (worst case), with 5.0 being the mid-risk value.

In the New York area, 17 of the 24 risk factors were scored at or above the mid-risk value:

- Health and Safety (9.0)
- Personnel Injuries (9.0)
- Petroleum Discharge (9.0)
- Configuration (9.0)
- Bottom Type (8.8)
- Hazardous Materials Release (8.4)
- Mobility (8.3)
- Volume of Commercial Traffic (8.3)
- Congestion (8.2)
- Water Movement (8.1)
- Visibility Impediments (8.0)
- Economic (7.9)
- Small Craft Quality (7.9)
- Traffic Mix (7.8)
- Environmental (6.6)
- Dimensions (6.5)
- Volume of Small Craft Traffic (5.6)



**Photo of Waterway Charts:**



As participants identified specific locations associated with particular risks, nautical charts of the area were annotated with colored dots corresponding to the risk category being discussed. The risk categories were as follows:

Brown	Vessel Conditions
Yellow	Traffic Conditions
Green	Navigational Conditions
Blue	Waterway Conditions
Red	Consequences

Note the concentrations of dots in five locations:

- Hudson River at the ferry crossings between Hoboken and Weehawken
- At the confluence of the Hudson and East Rivers (Battery Point)
- East River specifically in the vicinity of Hell Gate, Execution Rocks, and the southern end of Roosevelt Island
- Arthur Kill and Kill Van Kull, especially at Bergen Point
- Sandy Hook Bay

## **Book 2 – Team Expertise Cross-Assessment**

The workshop participants assessed their own and all the other participant teams' level of expertise for each of the six categories in the Waterway Risk Model. Overall, 37% of the participant teams were placed in the upper third, 35% in the middle third, and 29% in the lower third of all teams. This result was very close to the "ideal" 33% / 33% / 33% distribution. The expertise ranking for each team was used to weight the inputs that each team provided in the other three books used during the PAWSA workshop.

**Book 3 – Mitigation Effectiveness**

Vessel Conditions	Traffic Conditions	Navigational Conditions	Waterway Conditions	Immediate Consequences	Subsequent Consequences
Deep Draft Vessel Quality	Volume of Commercial Traffic	Winds	Visibility Impediments	Personnel Injuries	Health and Safety
2.9 2.5	8.3 5.3	1.9 1.4	8.0 5.2	9.0 4.2	9.0 5.2
Balanced	Balanced	Balanced	Balanced	Balanced	Balanced
Shallow Draft Vessel Quality	Volume of Small Craft Traffic	Water Movement	Dimensions	Petroleum Discharge	Environmental
4.3 4.1	5.6 5.0	8.1 5.9	6.5 4.4	9.0 5.0	6.6 4.4
Maybe	Maybe	Maybe	Balanced	Balanced	Balanced
Commercial Fishing Vessel Quality	Traffic Mix	Visibility Restrictions	Bottom Type	Hazardous Materials Release	Aquatic Resources
3.6 3.3	7.8 6.5	3.1 2.4	8.8 5.1	8.4 5.7	4.7 3.4
Balanced	Maybe	Balanced	Balanced	Balanced	Balanced
Small Craft Quality	Congestion	Obstructions	Configuration	Mobility	Economic
7.9 7.3	8.2 6.5	3.8 2.8	9.0 5.7	8.3 4.4	7.9 5.6
NO	Maybe	Balanced	Balanced	Balanced	Balanced

KEY		EXPLANATION
Risk Factor		Book 3 Baseline level of risk
Risk Factor		Book 4 Level of risk taking into account existing mitigations
Risk Factor		Balanced Consensus that risks are well balanced by existing mitigations
Risk Factor		Maybe No consensus that risks are adequately balanced by existing mitigations
Book 3	Book 4	Rising No consensus that risks are adequately balanced by existing mitigations and the mitigated risk level either is higher than the result from a previous PAWSA or is higher than the baseline risk level from this PAWSA
Consensus		NO Consensus that existing mitigations do NOT adequately balance risk

**Book 3 Analysis:**

The participants examined the effectiveness of existing risk mitigation activities in the New York area with respect to all risk factors in the Waterway Risk Model. For 18 risk factors, there was consensus that risks were well balanced by existing mitigations; for one risk factor, there was consensus that risks were NOT adequately balanced by existing mitigations; and for the other five risk factors, there was no consensus on whether existing mitigations adequately reduced risk. Consensus is defined as 2/3 of the participant expertise being in agreement.

When the Book 3: Mitigation Effectiveness results were discussed during the workshop, the participants underlined that the risk / mitigations balance is being achieved, in most cases, because all members of the maritime community are doing their best to make the port work. This does not mean, however, that the most effective or most efficient risk reducing measures are being employed. Participants stressed that more resources are needed to make this safety improvement work more effectively and/or efficiently. The balance seen in the Book 3 results is being created by working hard to compensate for a lack of resources.

**Book 4 – Additional Interventions**

Vessel Conditions	Traffic Conditions	Navigational Conditions	Waterway Conditions	Immediate Consequences	Subsequent Consequences
Deep Draft Vessel Quality	Volume of Commercial Traffic	Winds	Visibility Impediments	Personnel Injuries	Health and Safety
Balanced	Balanced	Balanced	Balanced	Balanced	Balanced
Shallow Draft Vessel Quality	Volume of Small Craft Traffic	Water Movement	Dimensions	Petroleum Discharge	Environmental
Voluntary Training 3.3	Enforcement 4.8	Nav / Hydro Info 4.5	Balanced	Balanced	Balanced
Commercial Fishing Vessel Quality	Traffic Mix	Visibility Restrictions	Bottom Type	Hazardous Materials Release	Aquatic Resources
Balanced	Other Actions 5.1	Balanced	Balanced	Balanced	Balanced
Small Craft Quality	Congestion	Obstructions	Configuration	Mobility	Economic
Voluntary Training 6.8	Enforcement 6.1	Balanced	Balanced	Balanced	Balanced

KEY		EXPLANATION	
Risk Factor		Intervention	Intervention general strategy that most participants selected for further risk mitigating actions
Intervention		Risk Improvement	The amount that present risk levels might be reduced if new mitigation measures were implemented
Risk Improvement	Caution	Caution	No consensus alert

**Legend:**

The intervention general strategy listed is the one that most participant teams selected for further reducing risks. The Risk Improvement is the expected reduction in risk when taking the actions specified by the participants. A green **Balanced** indicates that no intervention is needed because risk in the waterway was judged to be well balanced by existing mitigations. A yellow **Caution** indicates that there was a difference between the most effective general strategy and the general strategy most selected by the participants for additional action(s).

**Intervention Category Definitions:**

<i>Coordination / Planning</i>	Improve long-range and/or contingency planning and better coordinate activities / improve dialogue between waterway stakeholders
<i>Voluntary Training</i>	Establish / use voluntary programs to educate mariners / boaters in topics related to waterway safety (Rules of the Road, ship/boat handling, etc.)
<i>Rules &amp; Procedures</i>	Establish / refine rules, regulations, policies, or procedures (nav rules, pilot rules, standard operating procedures, licensing, <u>required</u> training and education, etc.)
<i>Enforcement</i>	More actively enforce existing rules / policies (navigation rules, vessel inspection regulations, standards of care, etc.)
<i>Nav / Hydro Info</i>	Improve navigation and hydrographic information (NTM, charts, coast pilots, AIS, tides and current tables, etc.)
<i>Radio Communications</i>	Improve the ability to communicate bridge-to-bridge or ship-to-shore (radio reception coverage, signal strength, reduce interference & congestion, monitoring, etc.)
<i>Active Traffic Mgmt</i>	Establish / improve a Vessel Traffic Service: information / navigation / traffic organization
<i>Waterway Changes</i>	Widen / deepen / straighten the channel and/or improve the aids to navigation (buoys, ranges, lights, DGPS, etc.)
<i>Other Actions</i>	Risk mitigation measures needed that do NOT fall under any of the above strategy categories

**Book 4 Analysis:**

The six risk factors needing additional risk reduction action (per the Book 3 results) are shown below along with the general mitigation strategy selected by most participant teams, ordered from highest to lowest possible risk improvement.

- Small Craft Quality – Voluntary Training (6.8)
- Congestion – Enforcement (6.1)
- Traffic Mix – Other Actions (5.1)
- Volume of Small Craft Traffic – Enforcement (4.8)
- Water Movement – Nav/Hydro Info (4.5)
- Shallow Draft Vessel Quality – Voluntary Training (3.3)

### **Recommended Actions**

The catalog of risks and possible mitigation strategies derived from this New York PAWSA workshop are set forth in the next section of this report. This listing provides a solid foundation for maritime organizations to build on to achieve both near-term safety improvements and to guide future risk mitigation planning. This listing should be viewed as a starting point for continuing dialogue within the local maritime community, leading to refined risk identification and more fully developed mitigation measures.

### Vessel Conditions: Deep Draft Vessel Quality

#### Baseline Risks:

- Variety of vessels transiting waterway: tank ships / container ships / bulk carriers / vehicle carriers / break bulk / chemical carriers / passenger vessels / ATBs (Articulated Tug and Barges)
- Quality of the foreign crews declining. Much more difficult for vessel operators to get their best people to come to the United States due to facility security measures. This is affecting quality of life for the crew and overall safety of the vessel.
- Decreased ability of foreign crews to speak in English. There also are more differing nationalities on foreign flagged vessels, reducing communication effectiveness during operations. This language barrier causes problems for pilots and the passing of information on the condition of the vessel.
- Difficult to get crews to comply with regulations, requirements, and inspections
- Material condition of the vessels is increasing because of enforcement under Port State Control; 5% of vessels may have material deficiencies
- Mating of tugboats with deep draft vessels can be challenging with new deep draft designs.
- Reduction in vessel crew size is affecting the safe handling of the vessel and cargo; increasing administration burden and crew fatigue also issues
- Less than 10% of vessels present a problem to the port

#### Trends:

- Language issues are getting worse
- Increasing problem getting the best crews to man vessels coming to the United States

#### Existing Mitigations:

- U.S. is holding crewmembers to a high standard including enforcement of Standards of Training, Certification, and Watchkeeping (STCW) requirements
- Port State Control inspection program
- ISM Code
- ISO Quality Standards – major companies seek ISO certification, but not all companies
- Coast Guard and other government agency enforcement presence, such as for Port State Control and Security boardings, are improving vessel quality
- Surprise inspections are an extremely effective deterrent
- Pilot on board helps to improve communications with foreign crews
- New vessel construction has increased horsepower; more have bow thrusters; and are of better design
- Reputable companies are hiring good crews to make sure operations run smoothly
- More companies are reporting deficiencies
- OCIMF – Oil Company International Marine Forum – tanker vetting program; published guidelines and best practices

#### New Ideas (number of times suggested):

- Risks judged to be well balanced with existing mitigations.



### Vessel Conditions: Shallow Draft Vessel Quality

#### Baseline Risks:

- Quality of crew issues: fatigue / overwork; turnover / inexperience
- Radio comms: not using proper radio frequencies; relying on channel 14, not guarding channel 13
- Commuter passenger vessels – bridge crew and deck hand turnover is making these crews less experienced and not as well trained
- Increase of crews not familiar with waterway
- Moving fleets from one operator to another
- Ability to predict the movement of shallow draft vessels is a safety concern for the human powered vessel community
- Maintenance of vessels suffers from minimal staffed crews and shore support staff
- High Speed Passenger vessels – do not have AIS and often don't respond to VHF radio calls
- One man in the pilot house on passenger vessels and towboats is compounded by administrative over-tasking
- Outside companies visiting the port more likely to have problems due to unfamiliarity with the waterway
- 10% of vessels having these issues

#### Trends:

- Increasing tug/tow barge traffic carrying more cargo
- Since 9/11 at least 100% increase in passenger vessels; 10% increase per year
- Turnover of crew is increasing in the passenger vessel industry

#### Existing Mitigations:

- Local companies are very familiar with the waterway
- Passenger vessels are better at reporting casualties because of additional regulations
- If vessel is capable of carrying 149 passengers or higher then AIS carriage is required
- Coast Guard licensing and training requirements
- Harbor Operations Passenger Vessel Subcommittee is creating safety awareness within the passenger vessel community
- AWO Responsible Carrier Program (RCP) – though not all companies are members
- Proposed 46 CFR Subchapter M will require Coast Guard inspections for towboats; standards within towboat industry being increased voluntarily in anticipation of Subchapter M requirements
- Internal training program with Kings Point – some towing companies have formed a partnership with the school to increase the effectiveness of their training programs; incorporating quality programs to get towboats ready for Subchapter M regulations
- More towing companies are following the 12-hour watchstanding rule
- Coast Guard marine inspection programs for inspected vessels; Coast Guard standards set the minimum level of safety expected by the industry
- Coast Guard minimum safety standards exist for un-inspected vessels

## Vessel Conditions: Shallow Draft Vessel Quality

### **New Ideas** (number of times suggested):

- Establish minimum standards for towboats – voluntary adoption of 46 CFR Subchapter M (8)
- Encourage more commuter ferry participation in the Harbor Ops Committee (6)
- Improve voluntary company training for passenger vessel deckhands (6)
- Implement ways to reduce turnover of commuter ferry crews (5)
- Encourage owners to follow existing work hours rules for manning (5)
- Emphasize entry level training for new deck hands (1)
- Develop best practices/industry standards concerning training and qualifications for deckhands on commuter passenger ferries (4)
- Improve passenger vessel deck hand proficiency by hosting a competition similar to “Working Harbor Day” (1)
- Increase Coast Guard VTS resources (1)
- Increase Coast Guard enforcement (1)
- Discourage poaching of tugboat crew from other companies (1)
- Improve barge quality (1)
- Include a segment on shared use of the waterway in small passenger vessel licensing courses (1)

<b>Vessel Conditions: Commercial Fishing Vessel Quality</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Fishing boats operate mainly in deep water – which is usually the main shipping channel</li> <li>• Overall vessel material condition is getting better because the economy is squeezing out the smaller companies; cost of fuel has reduced the number of vessels in the fleet</li> <li>• Crew quality has decreased</li> <li>• Minimal safety regulations / standards</li> <li>• Commercial fishing is mainly out of sight and out of mind</li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• Commercial fishing increasing for oysters and clams</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• Coast Guard Commercial Fishing Vessel Safety Examinations – voluntary program</li> <li>• Enforcement – state and federal (life rafts, emergency radios, general safety equipment)</li> <li>• No prevention program except for enforcement</li> <li>• Coast Guard has tried hard to educate, especially in areas where there are lots of commercial fishing vessels</li> <li>• New Jersey marine police enforce state rules/policies – though state regulations are very minimal</li> <li>• Presence of marine officers out on the water; commercial fishing vessels are unaware of jurisdiction constraints, but just the enforcement presence helps</li> </ul>
<p><b>New Ideas (number of times suggested):</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations.</li> </ul>	

<b>Vessel Conditions: Small Craft Quality</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Many recreational boaters do not seem to be aware of Rule 9 or the danger posed by large commercial vessels constrained by draft</li> <li>• General lack of knowledge / awareness of commercial traffic; operator inattention most common cause of conflicts</li> <li>• Lighting on small craft is poor / hard to see, especially against background lights</li> <li>• Human powered craft very constrained in their ability to get out of the way of commercial traffic</li> <li>• Insufficient resources to enforce rules and regulations with recreational boats</li> <li>• Most recreational boaters don't know proper VHF protocol and tie up the frequencies</li> <li>• Availability of cheap recreational boats has increased and may not always be suitable for the locations / sea conditions they are used in</li> <li>• Operating recreational boats under the influence causes poor judgment and unpredictability</li> <li>• Material condition of small craft generally good</li> <li>• Large percentage of small craft operators have questionable skills</li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None identified.</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• Education programs – State of New Jersey, CG Auxiliary, Power Squadron</li> <li>• New Jersey law – mandatory education requirement for recreation boaters <ul style="list-style-type: none"> <li>○ Experienced boaters clause, but have to take State test; if failed then must take 8-hour training course</li> <li>○ Dealing with online education issue now</li> </ul> </li> <li>• Marine Service Bureau does random safety inspections</li> <li>• Harbor Ops Committee has a public access workgroup which is trying education-oriented outreach with marinas, sailing schools, rowing clubs, fishing clubs; and smaller programs by other organizations</li> <li>• CG produced informational flyer which is circulated at marinas</li> <li>• Operation Clear Channel video</li> </ul>
<p><b>New Ideas (number of times suggested):</b></p> <ul style="list-style-type: none"> <li>• Provide more USCG resources to enforce boating safety regulations (11)</li> <li>• Encourage New York State to require same boater education certification that the State of New Jersey requires in order to operate a recreational boat (6)</li> <li>• Better communicate to boaters that they should stay out of the way of large vessels (5)</li> <li>• Coast Guard, Power Squadron, and other boater education courses should include a segment on shared waterway awareness / mixed use (4)</li> <li>• Provide more and better radio procedures training for small craft operators (3)</li> <li>• Encourage more boaters to attend USCG classes (2)</li> <li>• Mandatory license or certification for recreational boaters (1)</li> <li>• Provide more Coast Guard VTS resources (1)</li> </ul>	

### Traffic Conditions: Volume of Commercial Traffic

#### Baseline Risks:

- 25 arrivals per day; 120,000 – 145,000 vessel transits per year (~ 400/day) in the New York / New Jersey port area
- Radio congestion issues are increasing due to an increase in the number of commercial and recreational vessel traffic
- Not enough anchorage space for lightering, waiting for berths, and other logistic needs
- Berthing backups; vessels having to wait at the anchorage; vessels must slow down to time arrival at berthing causing volume issues on the approaches
- Choke points for barges while waiting on tide changes; fleeting areas are limited
- No anchorages for 50' drafts; turning basins are not well suited for these large vessels; very difficult for vessels to turn around and go back out to sea
- Facility security measures are causing difficulties coordinating logistics in port (stores and bunkers); there now must be many more ship movements to obtain logistic support
- Replenishment underway while in channel further adds to traffic volumes; this is especially true in Arthur Kill and Kill Van Kull

#### Trends:

- General trend is an increase in overall volume of cargo, though the number of vessels has decreased slightly because the vessels and cargo holds are getting larger
- Ships movements are increasing due to ops that can't be done dock side; crew change; stores; bunkers; security efforts are driving these issues
- Increasing tug/tow barge traffic carrying more cargo
- Since 9/11 at least 100% increase in passenger vessels; 10% increase per year
- Panama Canal widening project will impact the size of vessels calling on the port by 2014

#### Existing Mitigations:

- Good vessel traffic management currently is in place; VTS helps to manage the traffic
- Good VHF-FM radio communications system; good comms between pilots, towboats, VTS, and other vessels
- Excellent pilotage
- Harbor Ops Committee coordinates the port stakeholders concerns and helps organize the port community when developing and implementing solutions
- AIS
- Coast Guard Sector is an excellent partner in the port
- Industry is developing more berths within the harbor
- Dredging has allowed larger vessels to take up the increase in cargo

### **Traffic Conditions: Volume of Commercial Traffic**

#### **New Ideas:**

- Risks judged to be well balanced with existing mitigations.
- The PAWSA workshop participants emphasized that though the risk is balanced by existing mitigations, this results only from extraordinary efforts on the part of commercial operators. To sustain this effort requires an increase in the amount of resources. Also noted was that the port has a tremendous need for more anchorages, additional ATON, traffic schemes, and properly trained / experienced mariners.

### Traffic Conditions: Volume of Small Craft Traffic

#### Baseline Risks:

- 600 marine events per year; 75% are in the Upper Bay
- 5 - 10 firework events per week during the summer (Lower Bay, Jamaica Bay, the Battery, Ellis and Liberty Islands); shore side firework events (minor league baseball stadium on Staten Island, weddings, funerals) attract small boats
- Recreational boating is seasonal but volume is increasing; Lincoln Harbor reported their best season ever; revenues from fuel sales are up
- Registrations are down from 2001 for New Jersey
- Access improvements have increased water use by recreation boaters
- Number of marinas has increased on the Hudson
- Manhattan marina slip space is limited, but slips are abundant outside of Manhattan
- Hudson River and New York City Water Trail is providing more launching and landing points, which has increased the use of human powered boats
- Limited fueling places for recreational boats outside the port area

#### Trends:

- Human powered boating increasing but is predicted to level out
- Recreational boating increasing at:
  - Sandy Hook
  - The Battery
  - Statue of Liberty
  - Morris Channel
  - Execution Rock
  - Crossing the East River at Hell Gate
  - Jamaica Bay

#### Existing Mitigations:

- Marine event permitting process is allowing more control (i.e., USCG knows where events are taking place)
- VTS communicates locations of small boats / marine events to commercial traffic
- Increase in price of gasoline is causing shift away from power boats
- Harbor Ops Committee includes small craft and recreational boat stakeholders
- More organizations are in place to train and educate human powered operators about boating safety issues; those organizations also doing more outreach to individuals
- Human powered boat organizations are reaching out to the deep draft community to improve relations

### Traffic Conditions: Volume of Small Craft Traffic

#### **New Ideas:**

- Provide more funding / resources for the Coast Guard to effectively conduct Operation Clear Channel (14)
- Increase the number of small craft fueling stations outside the port area (2)
- Expand VTS AOR to include the Hudson River up to Yonkers and the East River to Execution Rocks (1)



### Traffic Conditions: Traffic Mix

#### Baseline Risks:

- Mix of commercial and recreational vessels throughout the waterway has increased
- Large volume and mix of vessels are concentrated at these locations:
  - In all marked channels
  - Execution Rocks
  - Lower Bay
  - Sandy Hook Point
  - The Battery
  - Statue of Liberty
  - Morris Channel
  - Crossing the East River at Hell Gate
  - Jamaica Bay
- Friday nights and weekends bring out the sailboats
- Operators are not aware nor do not take care / responsibility for their wake
- Passenger ferries and recreational boats are mixing on the Hudson River in the vicinity of Hoboken causing a lot of chop ('washing machine' effect)
- Congestion at the Battery with the fast commuter ferries; these ferries aren't following designated routes and are manned with minimal crews (single bridge manning)
- The Beast / cigarette boats are a concern because of their high rate of speed
- Two deaths in the last 18 months – at Execution Rocks and in the Narrows
- Most small craft have VHF-FM but many operators do not know how to properly use the radio

#### Trends:

- Increasing traffic mix as more marinas a put in areas previously dominated by commercial users

#### Existing Mitigations:

- Operation Clear Channel – escorts
- Voluntary rules for fast commuter ferries
- Marine event permitting and vetting
- Coast Guard Auxiliary patrols – but strictly a volunteer effort
- AIS – but not carried by all vessels, nor should it be to prevent even more clutter on shipboard display systems
- Designated restricted areas
- Some VHF-FM radios on kayaks
- Good communications during marine events between commercial vessels and event organizers, coordinated by the VTS

## Traffic Conditions: Traffic Mix

### New Ideas:

- Increase USCG enforcement assets to patrol security / safety zones and other high traffic mix areas (10)
- Establish a Port Safety Grant Program / increase funding for boater safety education (9)
- Increase VTS staff and training resources to levels needed to expand the VTS AOR (8)

Note: The inexperience and rapid turnover among military VTS watchstanders, especially coupled with insufficient training resources within the VTS staff, and the proper balance between military and civilian employees, were the subject of considerable discussion during the PAWSA, with a clear sense that the VTS, as currently staffed, does not have the bench depth to provide the level of service expected by waterway users, never mind providing an adequate level of service for a larger area of responsibility (AOR).

- Assign active duty Coast Guard personnel to the Harbor Operations Committee (7)
- Increase voluntary boater education about the hazards of commercial vessels through a mix of media (e.g., signage, videos, boater education courses) (6)
- Minimize security zone sizes and increase safety zone sizes around commercial facilities (5)
- Include a segment on mixed use waterway issues in boater education courses (5)
- Establish additional ATON to clearly mark the FA-19 anchorage on the Hudson River (5)
- Develop waterway zoning for specific watercraft (i.e., “bike lanes” and “crosswalks” for recreational craft) (4)
- Expand VTS AOR to Yonkers and extend coverage out to Execution Rocks (3)
- Post signs at recreational boat launch and landing sites to provide awareness of the shared waterway with commercial vessels (3)
- Conduct more paddlers and captains meetings to improve human power operator and ferry boat operator education (2)
- Encourage boaters to do “ride-along” training on commercial vessels (2)
- Require marinas / boat launches on public land to provide boater awareness on operating on a shared waterway with commercial vessels (1)
- Develop an offshore lightering platform to reduce the number of transit by lightering vessels (1)
- Prohibit the towing of loaded mud barges (scows – not oil or container barges) on a short hawser astern (1)
- Harbor Operations Committee coordinate more closely with community planners / developers, industry, and harbor stakeholders concerning land use decisions / locations of marinas (1)
- Harbor Operations Committee consider need for speed limits based on vessel type (1)
- Increase the lighting required on recreational craft operating at night (1)
- Include night time operations in boater education classes (1)

## Traffic Conditions: Congestion

### Baseline Risks:

- Summer fishing season notable congestion –
  - Sandy Hook Point
  - Vicinity of Execution Rock
- Marine events – 600 per year; 5 – 10 fireworks events per week during the summer draw large crowds of recreational boats
- Congestion / narrow waterways in the Arthur Kill and Kill Van Kull
- Arthur Kill Railroad bridge causes problems for tugs and barges trying to make a slack water transit through Hell Gate
- Areas where tugs and barges lay up waiting on the Hell Gate tide: Execution Rocks, Roosevelt Island, and Upper Bay
- Lower East River during commuter rush hours
- Concentrations of kayaks at piers 84 and 97
- Harlem River construction on 3<sup>rd</sup> Avenue Bridge
- Improvements to water access have increased congestion by recreation boaters; development pressure – more / proposed condos with marinas or ferry launches
- West end of Raritan Bay
- Constable Hook Range
- Off limits waters push recreational boats into channels, e.g., Ellis Island due to security zone
- Claremont Channel – barge fleeting /mooring area
- PST cruise ship terminal area
- Anchorage FA 19 in Hudson used for fleeting barges; designated channel is on the New Jersey side, but deeper water is on the Manhattan side – which is where the anchorage is

### Trends:

- None identified

### Existing Mitigations:

- The FTRP – a voluntary protocol that sets forth ferry-specific routes (not lanes) allowing for others to predict high-speed ferry movements
- Harbor Ops Committee reduced the amount of time for staying at anchorages; VTS responsible for managing the anchorages
- Harbor Ops Committee vets permit requests that could create congestion issues
- Coast Guard compiles / issues list of construction projects, marine events, and other activities that will be affecting the waterway; events posted on Coast Guard Home Port web-site
- Advance Notice of Arrival reporting requirements help VTS to anticipate / manage commercial traffic flow
- Coast Guard communication between VTS, pilots, and shipping companies is very good
- Aids to navigation system – regularly improved based on inputs from users
- Marine events are well marked with yellow and red flashing lights; there is good communication at the start, during, and end of these events; required radios for the event
- National Oceanographic and Atmospheric Administration (NOAA) charts

## Traffic Conditions: Congestion

### **New Ideas** (number of times suggested):

- Increase the number of anchorages (12)
- Increase Coast Guard assets for enforcing Op Clear Channel throughout the harbor (11)
- Provide incentives / encourage terminals to allow husbanding alongside (7)
- Install remote VTS sensors (radar/camera) on Hart Island (6)
- Increase the number of fueling stations outside of the port area (5)
- Encourage less aggressive timetables for commuter ferries (5)
- Establish visibility measuring equipments in Arthur Kill and Kill Van Kull (3)
- Educate small craft/shallow draft operators by encouraging deep draft ride along program (1)
- Expand VTS coverage (area of responsibility) (1)
- Establish an additional VTS VHF-FM radio frequency to reduce the saturation on Channel 14 (1)

<b>Navigational Conditions: Winds</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Winter winds over 20 knots for about a week – very rare; experience 25+ knot winds 3 – 4 times per year</li> <li>• Robins Reef is where the winds are measured</li> <li>• Cross Channel Winds: <ul style="list-style-type: none"> <li>○ Bergen Point</li> <li>○ South Amboy</li> <li>○ Claremont Terminal</li> <li>○ Anchorages in the Upper Bay</li> <li>○ Rikers Island Channel</li> </ul> </li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None identified</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• Wind direction and speed is very predictable throughout the year</li> <li>• Expected wind conditions well communicated via NWS forecast and VTS broadcast</li> <li>• Tugs required to be alongside ships in the Upper Bay anchorages when winds exceed 15 knots on the ebb tide</li> <li>• Channels typically in the direction of the prevailing winds (e.g., Kill Van Kull) or are in a good lee (e.g., Arthur Kill)</li> <li>• Transits around Bergen Point are halted when the wind is 34 knots (gale strength) or more</li> <li>• PORTS system installed – maintained by New Jersey and New York</li> <li>• PORTS-like data available through Stevens Institute of Technology, sponsored by the State of New York</li> <li>• Ambrose Light being replaced with a NOAA weather buoy</li> </ul>
<p><b>New Ideas:</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations</li> <li>• Establish more PORTS sites for wind measurements (1)</li> <li>• Move the wind sensor on the Bayonne Bridge (1)</li> </ul>	

<b>Navigational Conditions: Water Movement</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Locations where currents run at 4 - 5 knots:               <ul style="list-style-type: none"> <li>○ Arthur Kill and Kill Van Kull</li> <li>○ East River Hell Gate – worst current in the area</li> <li>○ Roosevelt Island</li> <li>○ Global Terminal approach through the S-curve</li> </ul> </li> <li>• Hudson River current affected by upstate rain fall and spring snowmelt</li> <li>• East River predictability during rainfall – shortens slack water to sometimes only 5 - 6 minutes</li> <li>• The East River is more like a tidal strait than like a river; increasingly popular for recreational boaters who might not recognize the difference</li> <li>• Human powered boats time their excursions based on predicted currents; generally use the Tide &amp; Current Tables vice PORTs information</li> <li>• Battery area currents vary greatly; many currents come together creating a spider/whirlpool effect</li> <li>• ‘Washing Machine’ (water confusion / chop) a problem for small craft in the Hudson River</li> <li>• Cross current in Constable Hook Channel</li> <li>• The current is cross channel at the Raritan Railroad Bridge</li> <li>• Reliability of hydrographic information in the Arthur Kill and Kill Van Kull is suspect due to the 50’ dredging project</li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None identified</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• NOAA published water movement predictions are fairly good</li> <li>• PORTS provides real-time tide and current information</li> <li>• Voluntary routing for passenger ferries should help reduce washing machine effect from wakes</li> <li>• High quality of docking and harbor pilots</li> <li>• Location of tricky water is well known by local waterway users</li> </ul>

## Navigational Conditions: Water Movement

### New Ideas:

- Integrate available tide and current data from all sources (e.g., PORTS, Stevens Institute of Technology, and others) to create a one-stop-shopping location for water movement information (11)
- Establish an RNA to require commuter ferries to follow previously recommended routing and operating guidelines (6)
- Establish an RNA that sets horsepower/minimum speed restrictions for high current areas (4)
- Publish horsepower/minimum speed standards of care for high current areas (3)
- Publish standards of care for commuter ferry routing and operating guidelines (2)
- Correct the tidal current tables to account for the effects of the dredging project (2)
- Establish commuter ferry routing and operating requirements through the regulatory (CFR) process (1)
- Establish horsepower/minimum speed restrictions for high current areas through the regulatory (CFR) process (1)
- Have VTS watchstanders gain experience with water conditions through a ship-ride program (1)

<b>Navigational Conditions: Visibility Restrictions</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Winter fog; also get fog in late spring / early summer 10 – 12 days for a half-day at a time; Coast Pilot only warns about the winter fog and not the spring / summer conditions</li> <li>• Morning fog the norm</li> <li>• Fog changes with the tide</li> <li>• Fog movements and development are well predicted</li> <li>• Fog can migrate quickly</li> <li>• Localized – St. George and The Battery especially prone to reduced visibility</li> <li>• Thunderstorms in August of short duration</li> <li>• Some visibility restrictions due to snow in February</li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• Appears to be less fog than in the past, possibly due to increased city dwelling / buildings creating microclimates</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• VTS</li> <li>• RADAR</li> <li>• DGPS – pilots carry man-portable units</li> <li>• Bridge to bridge radio communications between vessels</li> <li>• AIS</li> <li>• Electronic charting systems</li> <li>• Aids to navigation system – RACONs on some buoys</li> <li>• Prudent seamanship and Rules of the Road require reduced speed in restricted visibility</li> </ul>
<p><b>New Ideas:</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations</li> </ul>	



<b>Navigational Conditions: Obstructions</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Debris prone areas: Hudson River, Kill Van Kull, Arthur Kill</li> <li>• Debris affects shallow draft more than deep draft vessels</li> <li>• Ice floes on the Hudson River in winter / spring; Jamaica Bay can ice over in a severe winter</li> <li>• Fishing gear not much of an issue, but                             <ul style="list-style-type: none"> <li>○ Shad fishing in the upper Hudson River</li> <li>○ Experimental oyster farming in Hudson River</li> <li>○ Lobster pots around Execution Rock</li> </ul> </li> <li>• Hackensack River Bridges are not aligned with the channel</li> <li>• Harlem River 3<sup>rd</sup> Avenue Bridge construction activities</li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None identified</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• Local ship drivers know where the rocks are</li> <li>• ACOE and NY City have active debris removal programs– patrol everyday</li> <li>• A NOAA navigation response team with side scan sonar is based in New York</li> <li>• Good coordination between Coast Guard and construction projects</li> <li>• Booming around construction sites to control debris</li> <li>• Responsible parties are good about reporting obstructions and/or loss of equipment that creates an obstruction</li> <li>• Good ice preparation with the port community; Coast Guard has several icebreakers assigned to this area</li> </ul>
<p><b>New Ideas:</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations.</li> </ul>	

<b>Waterway Conditions: Visibility Impediments</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Harlem River – 3<sup>rd</sup> Avenue Bridge</li> <li>• South Shooters Reach</li> <li>• Rolls Island Reach – the vertical span is too narrow</li> <li>• Hell Gate – can't see around high bluff and bridge</li> <li>• Tremley Point – paper recycling plant blocks the view</li> <li>• Piers 13 -16 – can't see vessels coming out</li> <li>• Piers 79 and 76 – blind spots approaching from the south</li> <li>• Throgs Neck Point – can't see around 90 degree bend</li> <li>• Perth Amboy</li> <li>• Ward Point</li> <li>• Significant background lighting problems: <ul style="list-style-type: none"> <li>○ Tremley Point</li> <li>○ Manhattan</li> <li>○ Flagg container terminals</li> <li>○ Fire work displays at the St. George ball field</li> <li>○ Bayonne baseball field</li> <li>○ Small boats not lit well enough and masked by background lights</li> </ul> </li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None identified</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• Harbor Ops Committee facilitates the adjustment of lighting on facilities to reduce background lighting problems</li> <li>• Harbor Ops Committee provides comments on proposed new construction projects and ensures lighting impacts on vessel navigation are minimized</li> <li>• CG permitting process on bridge construction ensures mid-span lighting and signage is visible</li> <li>• Regulations and standards for lighting on vessels and structures</li> <li>• Bridge outage form is online</li> <li>• Good comms between construction contractors and vessel operators</li> </ul>
<p><b>New Ideas:</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations</li> </ul>	

<b>Waterway Conditions: Dimensions</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Narrow channel width:                             <ul style="list-style-type: none"> <li>○ Harlem River</li> <li>○ Arthur Kill</li> <li>○ Hell Gate</li> <li>○ Bergen Point – don’t like to meet there</li> <li>○ North Brother’s Island</li> </ul> </li> <li>• Depth issues:                             <ul style="list-style-type: none"> <li>○ Claremont Channel</li> <li>○ Flushing River</li> <li>○ Newtown Creek</li> </ul> </li> <li>• Air draft issues:                             <ul style="list-style-type: none"> <li>○ Bayonne Bridge</li> <li>○ Leigh High Valley River Bridge</li> <li>○ Arthur Kill Bridge – 135 feet vertical clearance</li> </ul> </li> <li>• Surge effect by passing vessels on the Arthur Kill and Kill Van Kull                             <ul style="list-style-type: none"> <li>○ Hess Bayonne terminal</li> <li>○ New cruise ship terminal in Bayonne when taking on bunkers</li> </ul> </li> <li>• Container terminal soundings are not well communicated to the pilot</li> <li>• Security zones impinging on sail boat racing courses forcing them into the navigational channel</li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None identified</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• U.S. Army Corps of Engineers (USACE) getting data out to operators / companies sooner after depth changes occur</li> <li>• Waterways surveys are up to date and are released in a timely fashion; NOAA charts generally accurate and reasonably up to date</li> <li>• VTS announcements about surge potential due to large vessels</li> <li>• Air draft sensors located on Bayonne and Verrazano Narrows bridges</li> <li>• PORTS provides real-time tide height</li> <li>• No shoaling - waterways don’t change much because of predominantly hard bottom</li> <li>• Harbor Ops Committee provides comments on proposed channel changes and structure development</li> <li>• Harbor Ops Committee is a great facilitator of port and waterway improvement proposals</li> <li>• Aids to navigations indicate where the bad water is located</li> </ul>
<p><b>New Ideas (number of times suggested):</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations.</li> <li>• PAWSA workshop participants emphasized that the effort to adequately mitigate waterway dimensions risks requires a tremendous amount of effort and resources. The suggestion was made that additional aids to navigation would be a more efficient way to achieve these same results.</li> <li>• The need to realign the Sandy Hook and Constable Hook Ranges was discussed. This issue was not resolved due to strong divergent opinions expressed by the four pilotage organizations represented at the PAWSA, plus differences between USCG and USACE definitions of what constitutes the “center” of each channel, plus USCG ATON improvement funding constraints.</li> </ul>	

<b>Waterway Conditions: Bottom Type</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Bottom ranges from silt to granite</li> <li>• The bottom consists of granite in the most challenging navigational areas                             <ul style="list-style-type: none"> <li>○ Kill Van Kull – very hard granite</li> <li>○ Constable Hook Range and Bergen Point – monolithic granite</li> </ul> </li> <li>• Anchorage areas (especially FA 21) in the Upper Bay have an ‘oozy’ bottom and don’t hold well</li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None identified</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• VTS regulations require 2 feet under keel clearance</li> <li>• OCIMF – under keel clearance addressed for channel types and at the pier</li> <li>• Aids to navigation</li> <li>• Electronic charting technology available for navigation</li> </ul>
<p><b>New Ideas:</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations</li> </ul>	

<b>Waterway Conditions: Configuration</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Bends greater than 45 degrees:               <ul style="list-style-type: none"> <li>○ Throgs Neck</li> <li>○ Hell Gate</li> <li>○ Bergen Point</li> <li>○ Sandy Hook Point</li> <li>○ East Harlem River</li> <li>○ Numerous terminal channels</li> </ul> </li> <li>• Intersections and convergences:               <ul style="list-style-type: none"> <li>○ Upper Bay</li> <li>○ Lower Bay</li> <li>○ Bergen Point</li> <li>○ Sandy Hook Point</li> <li>○ Constable Hook Point</li> <li>○ Hell Gate</li> <li>○ The Battery</li> </ul> </li> <li>• Crossing traffic areas:               <ul style="list-style-type: none"> <li>○ Hudson River / Upper Bay</li> <li>○ East River</li> <li>○ Lower Bay</li> <li>○ Bergen Point</li> <li>○ Sandy Hook Point</li> <li>○ Constable Hook Point</li> </ul> </li> <li>• All three waterway configuration issues occur at the eastern entrance to the offshore deep water traffic lanes</li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None identified</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• Pilots</li> <li>• VTS</li> <li>• AIS</li> <li>• Bridge to bridge radio communications</li> <li>• NOAA charts</li> <li>• Professional mariners – mainly local users who are familiar with the area</li> <li>• Amble tugboats available for vessel maneuvering assistance; guidelines for tugboat assistance at Bergen Point have been established as a VTS measure</li> </ul>
<p><b>New Ideas:</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations</li> <li>• PAWSA workshop participants emphasized that the effort to adequately mitigate waterway configuration risks requires a tremendous amount of effort and resources. The suggestion was made that additional aids to navigation would be a more efficient way to achieve these same results.</li> </ul>	

<b>Immediate Consequences: Personnel Injuries</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Large passenger carrying vessels frequently present</li> <li>• Cruise ships <ul style="list-style-type: none"> <li>○ 3,000 – 4,000 people per ship</li> <li>○ Operate once a week</li> </ul> </li> <li>• Ferry traffic: <ul style="list-style-type: none"> <li>○ Largest ferry carries 4,000 – 6,000 passengers</li> <li>○ Operate on a regular basis (every 20 minutes during parts of the day)</li> <li>○ Crossing channel</li> </ul> </li> <li>• Dinner cruises: <ul style="list-style-type: none"> <li>○ Carry up to 700 passengers – 60 transits / year</li> <li>○ Other dinner cruise vessels have from a few hundred down to only 30 passengers on board, depending on the vessel</li> </ul> </li> <li>• Military vessels: <ul style="list-style-type: none"> <li>○ Occasional amphibious carrier (approximately 2,500 crew), especially during Fleet Week</li> <li>○ USCG 378s (approximately 200 crew)</li> </ul> </li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None identified</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• Better communications systems (e.g., VTS can coordinate response efforts)</li> <li>• Cooperative plans in place between ferry companies to execute ferry evacuations; ferry companies drill frequently on mass evacuations</li> <li>• Coast Guard planning and exercises</li> <li>• Coast Guard Stations New York and Sandy Hook have readily available search and rescue (SAR) response assets</li> <li>• 56 NYC Police Department patrol boats (Harbor Charlie); also NJ police department boats</li> <li>• NYC Fire Department has fire/rescue boats</li> <li>• AMSC – fire and evacuation drills for ferry</li> <li>• Congested waterway means immediate assistance due to the number of light tows / other vessels</li> <li>• Many helicopter resources in the NYC area</li> <li>• Good hospital infrastructure</li> <li>• Cruise ships well prepared due to design</li> <li>• Surface current modeling for SAR</li> </ul>
<p><b>New Ideas:</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations.</li> </ul>	

<b>Immediate Consequences: Petroleum Discharge</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Eagle Class tank ships have 600,000 barrels (27.3 million gallons) capacity / vessel – 12 cargo tanks equals 2 million gallons per tank</li> <li>• Significant quantities of bunker oil on large container ships – which may not be double hulled</li> <li>• ATB units carry up to 100,000 barrels</li> <li>• Lightering operations ongoing at anchorages</li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None identified</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• 2010 – single-hulled tank vessels will not be permitted</li> <li>• Trajectory models for oil spills exist; would use PORTS data</li> <li>• Area Contingency Plan</li> <li>• PREP exercises conducted regularly</li> <li>• Industry lead exercises also conducted</li> <li>• Dozens of oil spill response organizations OSROs) in the area; would respond within an</li> <li>• Clean-up Cooperative also exists</li> <li>• NJ Responder (oil skimmer vessel) present in the port but very expensive to use</li> <li>• Coast Guard vessel of opportunity skimming system equipment</li> <li>• Great cooperation between government and industry in the oil spill response arena; good partnerships within the industry</li> <li>• New Jersey requires mandatory booming for oil transfer operations</li> <li>• Vessel Response Plans required for both tank and non-tank vessels; vessels have to show that they have contracts with one or more OSROs</li> <li>• Certified fueling staff</li> <li>• Fire Department regulations for shore side fueling</li> <li>• Greater awareness of requirements</li> <li>• Clean Marina Program – outreach program in New Jersey</li> </ul>
<p><b>New Ideas:</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations</li> </ul>	

<b>Immediate Consequences: Hazardous Materials Release</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Bulk chemical and hazardous materials (hazmat) shipments throughout the port area</li> <li>• Cargoes of particular hazard                             <ul style="list-style-type: none"> <li>○ LNG – 8 shipments per year</li> <li>○ Numerous other shipments of hazardous materials – cargo types / quantities / frequencies not known</li> </ul> </li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None identified</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• Could use local assets through programs like Safeport – using inactive ships to take radiological devices off vessels</li> <li>• Companies who handle hazmat all have response plans; industry is well equipped for hazmat release</li> <li>• Large response community</li> <li>• Coast Guard Strike Team stationed in New Jersey</li> <li>• New Jersey has trained hazmat teams</li> <li>• Good cooperation between terminals / industry and local fire departments</li> <li>• Good federal funding over last few years for improving EMS / hazmat teams</li> <li>• Good ship construction; very high standards for vessels carrying bulk hazmat</li> <li>• Good ship crews – well trained – higher caliber than the norm</li> <li>• Well established federal and state regulations controlling the transportation of hazmat; require detailed manifests and segregation of cargos</li> <li>• Safety Zones established for movement of certain cargos</li> </ul>
<p><b>New Ideas (number of times suggested):</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations.</li> </ul>	



<b>Immediate Consequences: Mobility</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Waterway closures possible due to grounding / spill / hazmat release:                             <ul style="list-style-type: none"> <li>○ Arthur Kill</li> <li>○ Kill Van Kull</li> <li>○ East River – but a spill / release would not last long due to washing out by tidal currents</li> </ul> </li> <li>• Critical maritime transportation system shore side infrastructure that could be impacted by a vessel accident:                             <ul style="list-style-type: none"> <li>○ Bridges – Brooklyn, Bayonne, Goethals, and numerous railroad bridges</li> <li>○ Container cranes alongside Arthur Kill and Kill Van Kull</li> <li>○ Ventilator for the Holland tunnel</li> </ul> </li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None identified</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• Alternate transportation modes / waterways are abundant</li> <li>• Large quantities of heavy lift salvage equipment in the immediate area</li> <li>• USACE salvage contractor is based out of New York</li> <li>• I-95 Coalition</li> <li>• Maritime Response Recovery Plan – has been published and exercised</li> </ul>
<p><b>New Ideas (number of times suggested):</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations.</li> </ul>	

<b>Subsequent Consequences: Health and Safety</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• 800,000 people live / work close to waterways in New York and surrounding areas</li> <li>• Water supplies for cooling only (all drinking water comes from inland reservoirs)</li> <li>• Intakes at Coney Island and Sandy Hook for aquariums</li> <li>• Ravenswood, 14<sup>th</sup> Street, 59<sup>th</sup> Street, Arthur Kill, PGE Hackensack River water intakes for industrial uses</li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None identified.</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• Refineries have a warning system (siren and automated phone system); tested, but with mixed results</li> <li>• 911 system to deal with health and safety notifications</li> <li>• Reverse 911 system employed by some jurisdictions</li> <li>• Post-9/11 planning / funding have improved an already robust health and safety infrastructure</li> <li>• Great comms between boroughs and other municipalities</li> <li>• Air release modeling by Stevens Institute; numerous other air monitoring sites</li> <li>• DOT and NY OEM evacuation route planning for landside</li> <li>• New York and New Jersey have planned and exercised worst case scenario for mass evacuations</li> <li>• MARSEC levels</li> <li>• Constant monitoring at high value industrial water intakes</li> <li>• New York and New Jersey manage notifications for water intake issues</li> </ul>
<p><b>New Ideas (number of times suggested):</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations</li> </ul>	

<b>Subsequent Consequences: Environmental</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Wetlands:                             <ul style="list-style-type: none"> <li>○ Jamaica Bay</li> <li>○ Meadowlands</li> <li>○ Gateway National Park</li> <li>○ Shooters Island</li> <li>○ West side of Long Island</li> <li>○ Arthur Kill</li> <li>○ Riker’s Island</li> <li>○ Sandy Hook</li> <li>○ Hudson River Estuary designation</li> </ul> </li> <li>• Endangered species:                             <ul style="list-style-type: none"> <li>○ Peregrine falcons</li> <li>○ Ospreys</li> <li>○ Right whales</li> <li>○ Sturgeon</li> </ul> </li> <li>• Environmentally sensitive areas:                             <ul style="list-style-type: none"> <li>○ Statue of Liberty</li> <li>○ Private beach clubs</li> <li>○ Public beaches on Coney Island, north shore of Queens, City Island</li> <li>○ 2007 sampling showed New York harbor now has the cleanest water on record; increasing recreational use as a result</li> <li>○ Media capital of the world – if something happens in the port it will be reported all over the world</li> </ul> </li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None identified.</li> </ul>	<p><b>Existing Mitigations:</b></p> <p>Same as listed under the Immediate Consequences: Petroleum Discharge risk factor. In addition:</p> <ul style="list-style-type: none"> <li>• Good partnerships established before an incident with resource stakeholders</li> <li>• ICS Joint Information Center</li> <li>• Strong environmental community</li> <li>• EPA has an environmental issues hotline</li> </ul>
<p><b>New Ideas:</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations.</li> </ul>	

<b>Subsequent Consequences: Aquatic Resources</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Recreational fishing year round</li> <li>• Limited commercial fishing</li> <li>• More than three species targeted                             <ul style="list-style-type: none"> <li>○ Stripper</li> <li>○ Shad</li> <li>○ Black Fish</li> <li>○ Blues</li> </ul> </li> <li>• Fishing tournaments in the Lower Bay</li> <li>• Sandy Hook Entrance Channel and Ambrose Channel are popular recreational fishing areas</li> <li>• Permitted experimental shellfish harvesting</li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None identified</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• Area Contingency Plans have identified sensitive areas; agencies are required to respond within a particular timeframe in these areas</li> <li>• State Environmental Team would be proactive with information concerning impacts of an event to aquatic resources</li> <li>• NOAA Environmentally Sensitive Information (ESI) Maps</li> <li>• Sensors monitored by academia</li> <li>• National Park Service and Fish and Wildlife Service have expertise</li> <li>• New York City has a 311 number that the public can call to obtain information concerning aquatic resources</li> <li>• Transiting fish populations</li> <li>• Right Whale sighting system</li> </ul>
<p><b>New Ideas:</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations.</li> </ul>	

<b>Subsequent Consequences: Economic</b>	
<p><b>Baseline Risks:</b></p> <ul style="list-style-type: none"> <li>• Affected by waterway closure: <ul style="list-style-type: none"> <li>○ Arthur Kill and Kill Van Kull – \$450 million a day</li> <li>○ Cargo is distributed within 200 miles of the port; waterway closure would affect that region</li> <li>○ Water intake shutdown would have local effects</li> <li>○ Region generally has three days of fuel and five days of food</li> </ul> </li> <li>• Shut down for more than a week would have major impacts</li> <li>• Heating and fuel oil more important than food or general cargos</li> <li>• 80% home heating oil for New England transported by barge from New York</li> <li>• City sludge is transferred by ship from New York</li> </ul> <p><b>Trends:</b></p> <ul style="list-style-type: none"> <li>• None</li> </ul>	<p><b>Existing Mitigations:</b></p> <ul style="list-style-type: none"> <li>• Numerous pipelines available to transport petroleum products</li> <li>• Maritime Transportation System Recovery Plan</li> <li>• Alternate routes to move products</li> <li>• Large scale lightering capabilities could be utilized</li> <li>• New Jersey / New York Port Authority</li> <li>• Significant redundancy within the petroleum industry</li> <li>• Other ports (Norfolk, Baltimore, Philadelphia, Providence, Boston) would be pleased to take diverted cargos</li> <li>• Alternate clean product storage exists</li> <li>• Supply chain of containers is quite fluid</li> <li>• Companies that depend on just in time inventory management have established alternate inventory supply chains</li> </ul>
<p><b>New Ideas (number of times suggested):</b></p> <ul style="list-style-type: none"> <li>• Risks judged to be well balanced with existing mitigations.</li> </ul>	