

Jacobsen Pilot Service, Inc.

Tug and Pilot Availability in the Event of a Tsunami



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Operations Manager**



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Topic Overview

- Decisive decision making by USCG and Port Partners
- Limitations of Pilot Staff and supporting Pilot boat crew
- Benefits of small geographical area compromising both LA/LB Harbors
- Use of NOAA Advisories





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Decisive Decision Making by Port Partners

- USCG
 - Issue initial warning broadcasts on VHF 16
 - Guidance for Vessel movement and priority
 - Advise JPS and MX/VTS
- Jacobsen Pilot Service
- Marine Exchange/VTS





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Ship Moves

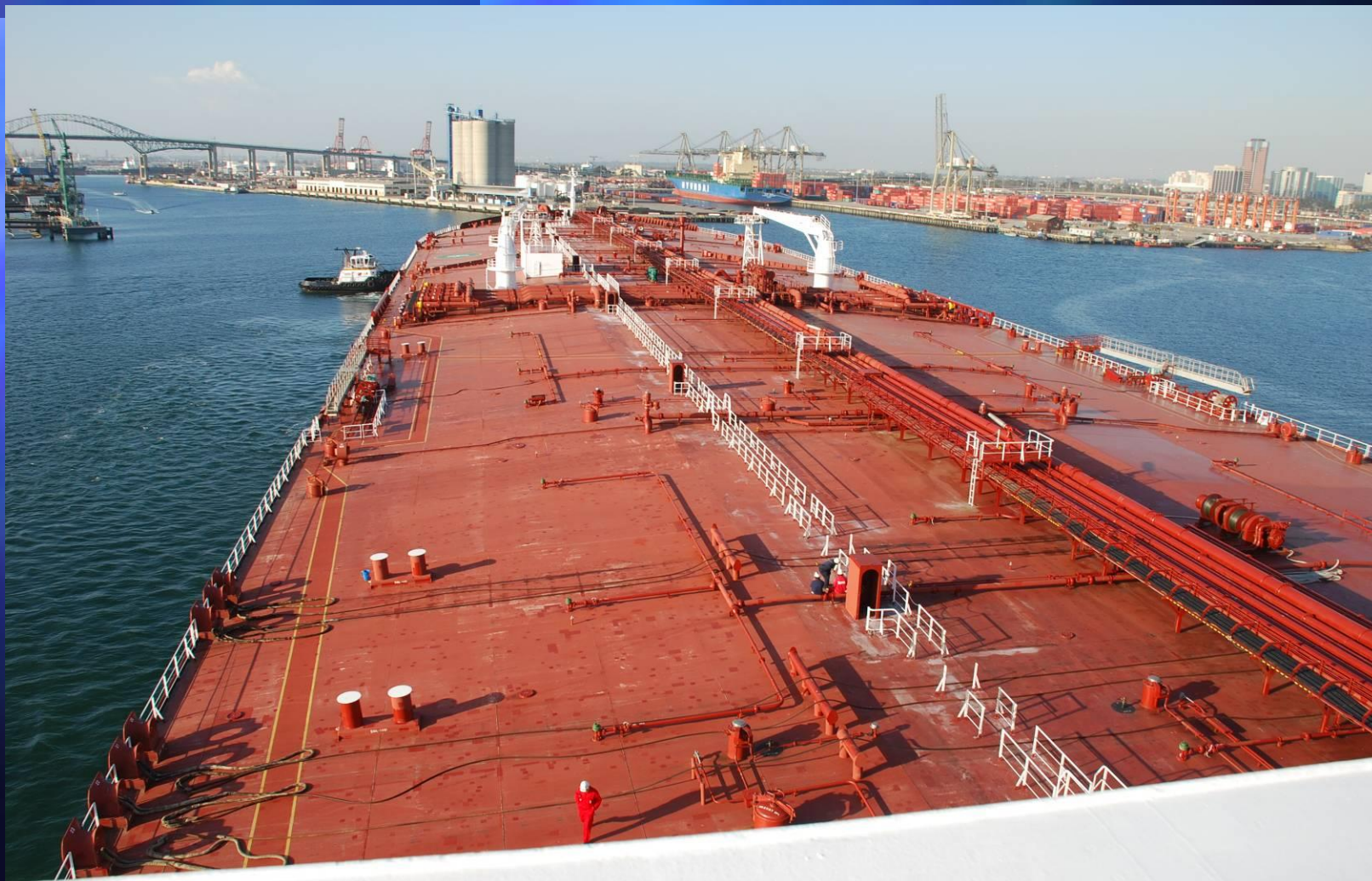
- EARLY AND TIMELY
- JPS coordination of moves with USCG, ship's agents, tug companies, line-handling agencies and terminals





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Tankers at Berth With Minimum UKC - PRIORITY





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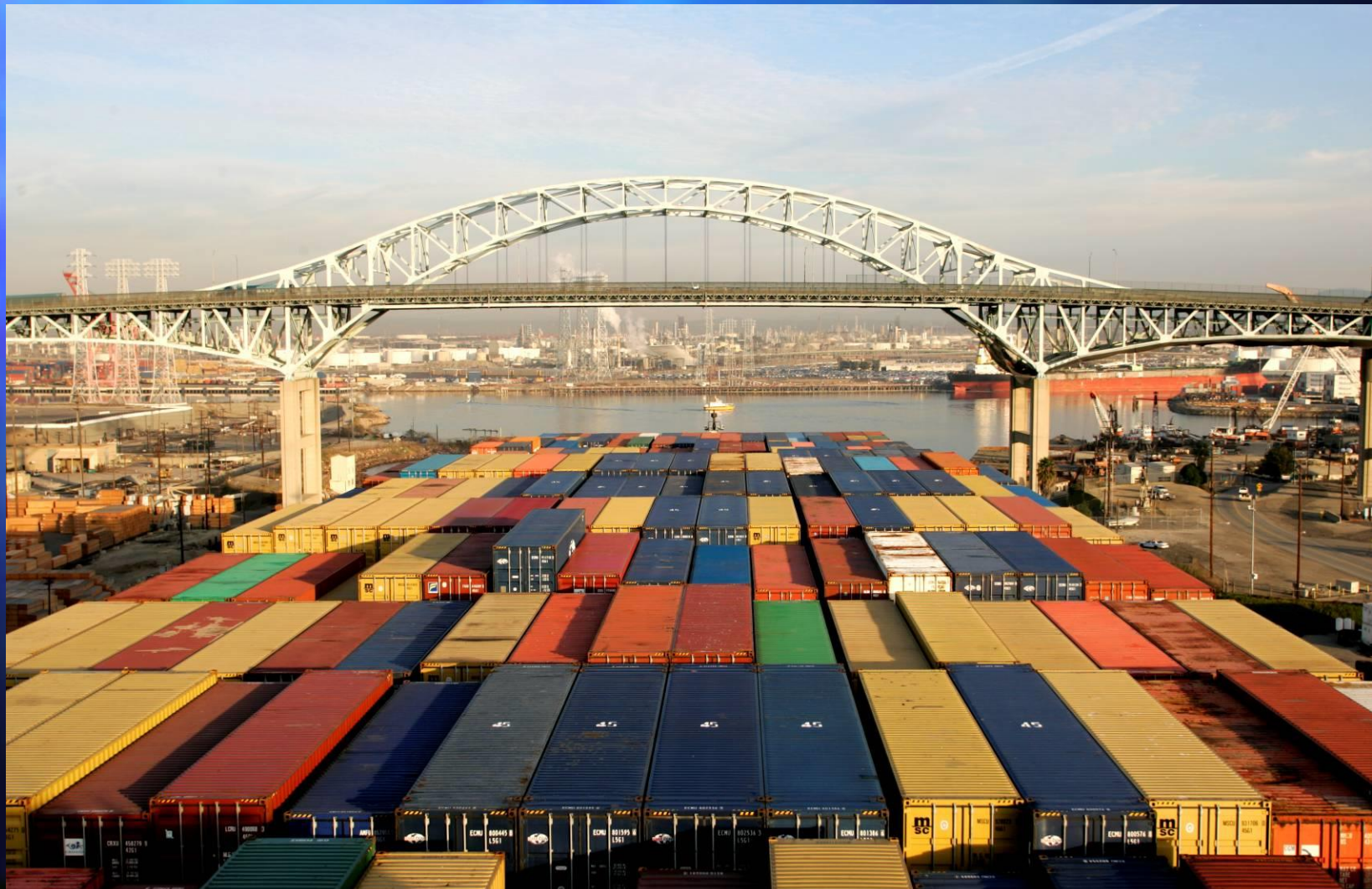
VLCC at Anchor With Minimum UKC - PRIORITY





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Bigger Ships more difficult to move in urgent conditions- Air and Water draft considerations





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Pilot Dispatch/Vessel Traffic Service / Long Beach Sector



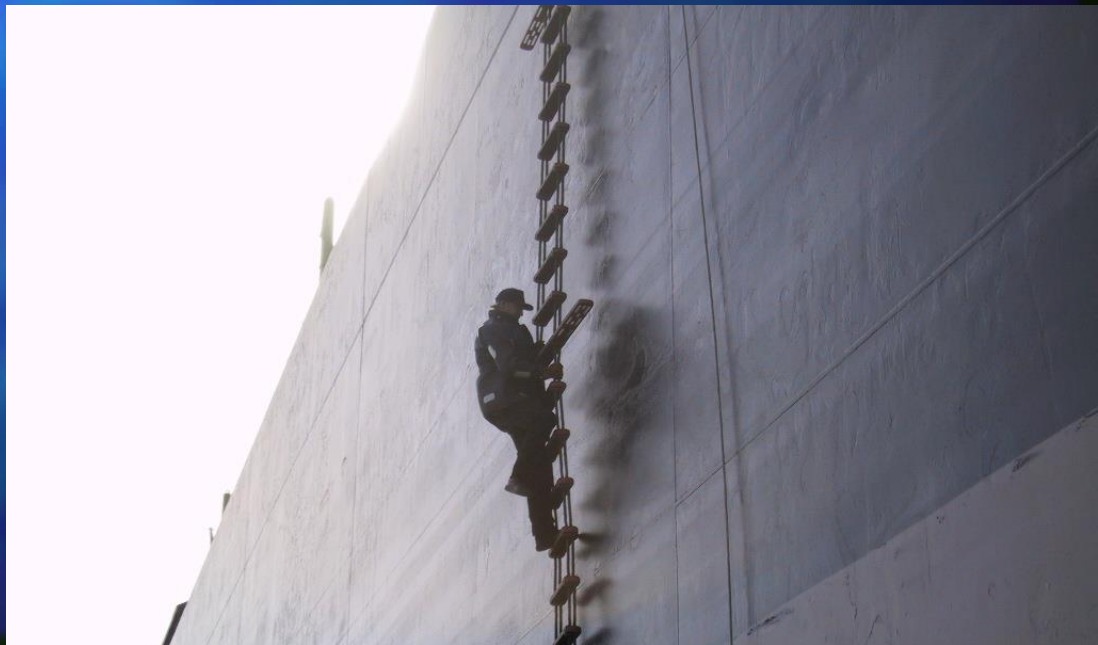
- Dispatcher at JPS coordinates all moves.



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Pilot Availability

- Available Pilot Staff and JPS Team
- 8 Pilots and Management Pilot on duty
- Additional 8 Pilots on time off/Call in available pilots
- 2 Boatman
- 1 Dispatcher
- 3 Pilot Boats
- Boats to Sea





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3 Major Tug Companies in the Port Complex

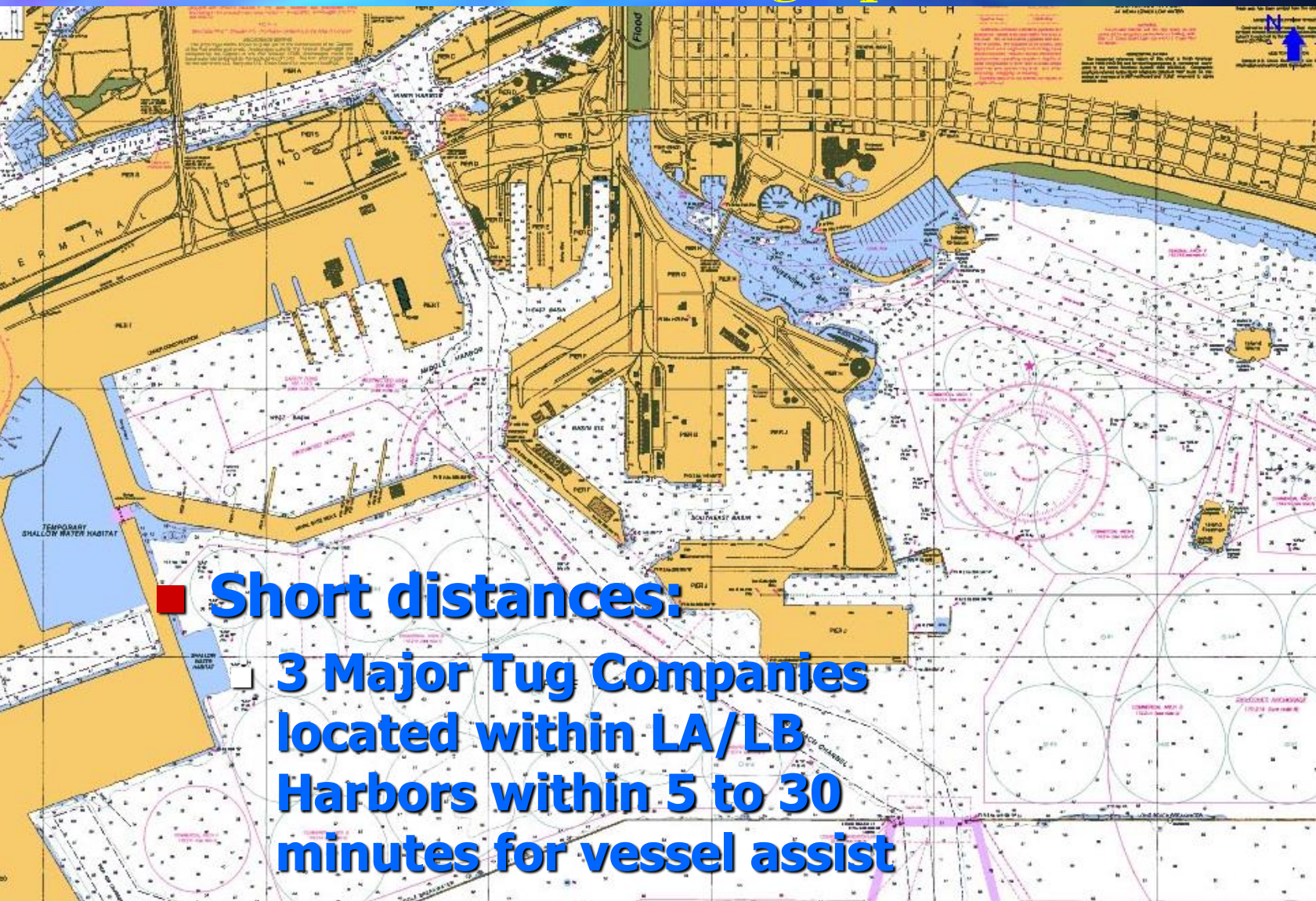
- *Foss, Millennium and Crowley – with approximately 16 tugs available*
- *Tug Co.'s will have evacuation plan for their own equipment*





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Benefit of Geographical Size



Short distances:

**3 Major Tug Companies
located within LA/LB
Harbors within 5 to 30
minutes for vessel assist**



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Geographical Benefits

- Short transit time outbound from anchorages and most berths in the harbor complex
- “Doubling back” of Pilots and Tugs





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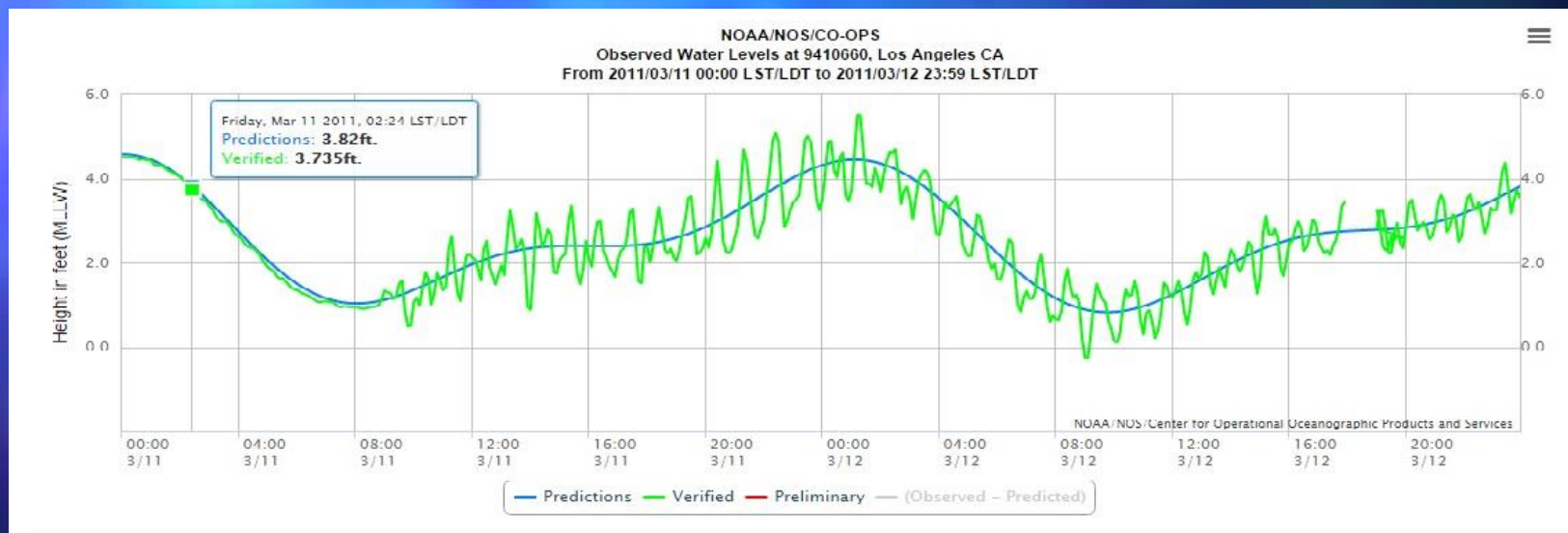
Use of NOAA Tsunami Advisories and forecasts to determine time frame of safe vessel movement

- Safe Vessel movement can be determined by use of the advisories and warnings
 - Time and amplitude of wave/surge predicted
 - Air gap for Desmond Bridge in Long Beach Real and predicted
 - Water level gauge in Los Angeles



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NOAA Advisories



**JPS monitored Real-Time Water
Level in March 11, 2011 Event**



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| | Maximum Tsunami Amplitudes | | | First Arrival Times | | Estimated Maximum Current Speeds (knots) | Reported Damage or Other Effects from Tsunami (NDR = no damage reported) |
|----------------------|----------------------------|-------------------------------|------------------------------|---------------------|----------------------------|--|--|
| | Forecasted (meters) | Observed Tide Gauges (meters) | Estimated By Others (meters) | Forecasted (PDT) | Observed Tide Gauges (PDT) | | |
| Crescent City | 0.61 | 0.64 | | 1340 | 1346 | | NDR |
| Eureka | 0.2 | 0.23 | | 1336 | 1333 | | NDR |
| Arena Cove | 0.49 | 0.39 | | 1248 | 1304 | | NDR |
| Point Reyes | 0.46 | | | 1259 | 1259 | | NDR |
| Alameda | 0.18 | 0.12 | | 1344 | 1345 | | NDR |
| San Francisco | 0.22 | 0.32 | | 1320 | 1326 | | NDR |
| Half Moon Bay | 0.96 | | 0.6 | | | | NDR |
| Santa Cruz | 0.51 | | 0.9 | | | 8-10 | minor damage to boats and marine infrastructure |
| Monterey | 0.45 | 0.36 | | 1231 | 1243 | | NDR |
| Morro Bay | 0.82 | | 0.5 | | | 4-6 | NDR |
| Port San Luis | 0.84 | | 0.8 | | | | NDR |
| Pismo Beach | 1.43 | | 0.9-1.2 | | | | NDR |
| Santa Barbara | 0.75 | 0.91 | | 1230 | 1231 | 8-10 | minor damage to dredging equipment |
| Ventura | | | 0.6-0.9 | | | 12-15 | over 20 docks damaged; buoys moved |
| Santa Monica | 1.18 | 0.64 | | 1225 | 1225 | | NDR |
| Two Harbors/Catalina | | | 0.6-0.9 | | | | minor damage to several docks |
| Los Angeles | 0.77 | 0.42 | | 1215 | 1215 | 4-6 | minor damage to docks and marine infrastructure |
| Seal Beach | | | | | | | minor flooding from storm and tsunami surges 24 hours later |
| Dana Point | | | 0.5-0.7 | | | 10-12 | bait barge severed |
| Oceanside | | | 0.4 | | | 5-8 | several buoys carried out to sea; boat trailer swamped |
| La Jolla | 0.84 | 0.60 | | 1202 | 1202 | | NDR |
| Mission Bay | | | | | | 8-10 | small sailboat swamped trying to leave harbor; buoys moved |
| San Diego | 0.27 | 0.40 | 0.6 | 1204 | 1208 | 12-15 | damage to docks, concrete piers, and boats |



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US Navy Contract for Piloting / NWS Seal Beach

- JPS Pilots
 - Assist Navy in Piloting Warships in Seal Beach
 - Movements not under USCG authority
 - Naval Vessels would be part of the evacuation process





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Tsunami Surge February 27, 2010





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Hurricane Marie Swell Condition Long Beach

August 27, 2014





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Hurricane Marie Swell Condition Long Beach

August 27, 2014





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