

# Harbor Safety Committee

of the San Francisco Bay Region

*Mandated by the California Oil Spill  
Prevention and Response Act of 1990*

## Harbor Safety Committee of the San Francisco Bay Region

Thursday, June 8, 2017

Port of Oakland

2<sup>nd</sup> Floor Board Room

530 Water Street

Oakland, CA

Capt. Lynn Korwatch (M), Marine Exchange of the San Francisco Bay Region (Marine Exchange), Chair of the Harbor Safety Committee (HSC); called the meeting to order at 10:00.

Alan Steinbrugge, Marine Exchange, confirmed the presence of a quorum of the HSC.

Committee members (M) and alternates (A) in attendance with a vote: **Jim Anderson** (M), CA Dungeness Crab Task Force; **John Berge** (M), Pacific Merchant Shipping Association; **Capt. Chad Culbertson** (M), Chevron Shipping Company; **Brian Garcia** (A), NOAA; **Bob Gregory** (M), Foss Maritime Company; **Scott Grindy** (A), San Francisco Marine Small Craft Harbor; **Benjamin Huber** (M), Westar Marine Services; **Phil Kipper** (A), San Francisco Bay Keeper; **Capt. Tom Kirsch** (M), Blue and Gold Fleet; **Andrew Marshall** (M), Port of Benicia; **MJR Kevin McCormick** (A), US Army Corps of Engineers; **Jim McGrath** (M), Bay Conservation and Development Commission; **Capt. Pat Nelson** (A), United States Coast Guard; **Chris Peterson** (M), Port of Oakland; **Jeff Robbins** (M), General Steamship Corp; **Capt. Paul Ruff** (A), San Francisco Bar Pilots; **Capt. Ray Shipway** (M), International Organization of Masters, Mates, and Pilots; **Jeff Vine** (A), Port of Stockton.

The meetings are always open to the public.

### Approval of the Minutes-

A motion to accept the minutes of May 11, 2017 meeting was made and seconded. The minutes were approved without dissent.

### Comments by Chair- Capt. Lynn Korwatch

Welcomed the committee members and audience.

### Coast Guard Report- Capt. Patrick Nelson

- Advised of recent Sector San Francisco personnel changes and introduced Cmdr. Rebecca Deakin, Waterways Management.

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- Cmdr. Deakin read from the May- 2017 Prevention/Response Report (attached).
- Advised that the salvage of the crane barge Vengeance is progressing under Unified Command.
- Advised that an e-ATON has been added to Light 12 in San Pablo Bay.

## **Army Corps of Engineers Report- MJR Kevin McCormick**

- Advised of upcoming command change. Lt.Col. John Morrow will be transferring at the end of the month.
- Read from the US Army Corps of Engineers, San Francisco District Report (attached). Debris removal totals are still above average.
- Advised that emergency dredging is planned for Stockton next week. Emergency dredging for Sacramento is scheduled for July.
- Advised that the USACE has a new Work Plan website: [www.usace.army.mil/Missions/Civil-Works/Budget/](http://www.usace.army.mil/Missions/Civil-Works/Budget/)
- In response to a question from Jeff Robbins, it was advised that the target depth for the Stockton and Sacramento emergency dredging is 30-35 feet.
- Jim Mazza advised of dredge Essayons disposal off of Ocean Beach.
- Jim Haussener, CMANC, expressed concerns regarding the possibility of delays impacting Suisun Bay dredging considering the project was deferred last season. MRJ McCormick advised that dredging is estimated to start in mid-September with the contract awarded in August.
- Capt. Korwatch asked about the increased numbers of abandoned vessels recovered. MJR McCormick advised that many of the vessels are small craft.

## **Clearing House Report- Alan Steinbrugge (report attached)**

## **OSPR Report- David Mighetto**

- Announced new membership appointments. Daniel Morrison is Alternate member representing Tug & Tank Barge Operators. Andrew Marshall is Member representing the Port of Benicia. Terms end on July 7, 2020. The positions of Alternate representing Commercial Fishing and Alternate representing Port of San Francisco are currently open.

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## **NOAA Report- Brian Garcia**

- Advised that public feedback is welcome regarding the National Charting Plan and emphasis on electronic vs. paper charts. The comment period is now open until July 1<sup>st</sup>.
- Advised that the NWS will continue to assist in the Vengeance recovery by providing spot forecasts and other services if requested.
- Advised that signs indicate the possibility of an El Niño developing.
- Capt. Korwatch advised of recently presented cybersecurity concerns relating to electronic charts and indicated that paper charts are an important backup.
- Jim Hausener advised that the NOAA plan would affect the way Army Corps data is presented on charts and urged reconsideration. A webinar on National Charting Plan issues is being held.

## **State Lands Commission Report- Richard Hernandez (report attached)**

- Advised that detailed information regarding product sources and types transferred is now available. John Berge welcomed the data and advised that non-floating oil is of particular concern. Capt. Korwatch asked if any trends have been detected that can be presented to the HSC. Richard Hernandez advised he will present at the next meeting.

## **Work Group Reports-**

**Plan Update Work Group- Linda Scourtis** advised that the HSC Plan Update with 2016/2017 Executive Summary is complete (attached). A motion was made and seconded to approve the Plan Update. Capt. Korwatch advised that concerns with language describing chart boundaries will be addressed by the Navigation Work Group. A vote was held and the motion to approve passed without dissent.

**Tug Work Group-** Nothing to Report.

**Navigation Work Group- Capt.** Nothing to Report.

**Ferry Operations Work Group-** Nothing to Report.

**Dredge Issues Work Group-** Nothing to Report.

**PORTS Work Group-** Nothing to Report.

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**Prevention through People Work Group-** Nothing to Report

**Presentation on FASTER: A Maritime Approach to Tsunami Safety- Rick Wilson, CA Geological Survey  
and Kevin Miller, Cal OES**

- Brian Garcia introduced Rick Wilson and Kevin Miller who gave a presentation to the committee regarding a new tsunami preparedness and mitigation program called FASTER (presentation slides attached).
- The program includes tsunami inundation modeling and formulation of evacuation plans. Preparedness and training are emphasized as well as post-tsunami response and recovery. The NOAA Tsunami Warning Center issues tsunami alerts based on hazard level. Six tsunami alerts of varying degrees have been issued in recent years for the San Francisco Bay region. Several tsunamis have caused damage to harbors.
- Individual Response Playbooks have been created for local regions including San Francisco, Oakland/Alameda, Richmond and Richardson's Bay. Safe zones with deep water and low current have been identified within the bay. Plans help direct vessels to safe zones and provide other response information tailored to the specific tsunami event. Harbor Improvement Reports are also being developed for mitigation. Feedback on the program is welcome.

**PORTS Report- Alan Steinbrugge**

- Advised of continuing communications issues affecting the South Hampton Shoal buoy mounted current sensor. A new antenna will be installed at the shore station. Plans are being made to move the shore station to a new location.
- Advised that planning continues with the Port of San Francisco to install a weather station and current sensor at Pier 27.

**Public Comment-**

- Jim Haussener advised that California has received 45 percent more dredge funding than initially requested and encouraged a continued push for more funding in 2018.
- Capt. Korwatch advised that a maritime report by Congressman John Garamendi's office has been published.
- Sean Kelley, USCG, advised that VTS will be upgrading their phone system today. Phones will be down briefly and temporary numbers provided.

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**Old Business- None**

**New Business- None**

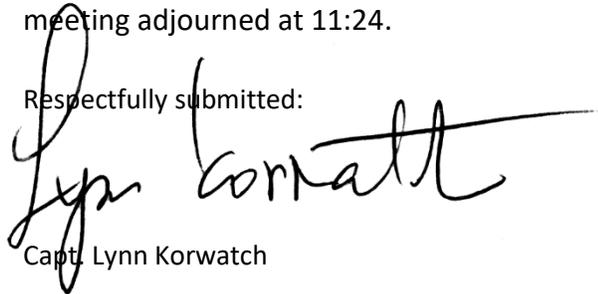
**Next Meeting-**

1000-1200  
July 13, 2017  
California Maritime Academy  
Richmond Safety & Security Center  
756 West Gertrude Street  
Richmond, CA

**Adjournment-**

A motion to adjourn was made and seconded. The motion passed without dissent and the meeting adjourned at 11:24.

Respectfully submitted:



Capt. Lynn Korwatch

**PREVENTION / RESPONSE - SAN FRANCISCO HARBOR SAFETY STATISTICS**

**May 2017**

<b>PORT SAFETY CATEGORIES*</b>	<b>May-2017</b>	<b>May-2016</b>	<b>**3yr Avg</b>
<b>Total Number of Port State Control Detentions:</b>	0	0	0.78
SOLAS (0), STCW (0), MARPOL (0), ISM (0), ISPS (0)			
<b>Total Number of COTP Orders:</b>	3	3	3.47
Navigation Safety (3), Port Safety & Security (0), ANOA (0)			
<b>Marine Casualties (reportable CG 2692) within SF Bay:</b>	12	9	9.67
Allision (1), Collision (0), Fire (0), Capsize (0), Grounding (1), Sinking (0)			
Steering (1), Propulsion (3), Personnel (3), Other (3), Power (0)			
<b>Total Number of (routine) Navigation Safety issues/Letters of Deviation:</b>	3	4	3.50
Radar (2), Gyro (0), Steering (0), Echo Sounder (0), AIS (1)			
ARPA (0), Speed Log (0), R.C. (0), Other (0)			
<b>Reported or Verified "Rule 9" or other Navigational Rule Violations:</b>	0	1	0.42
<b>Significant Waterway events/Navigation related Cases:</b>	1	2	0.39
<b>Total Port Safety (PS) Cases opened</b>	<b>19</b>	<b>19</b>	<b>18.22</b>
<b>MARINE POLLUTION RESPONSE</b>			
<b>Pollution Discharge Sources (Vessels)</b>	<b>May-2017</b>	<b>May-2016</b>	<b>**3yr Avg</b>
U.S. Commercial Vessels	0	2	0.89
Foreign Freight Vessels	0	0	0.11
Public Vessels	0	2	0.50
Commercial Fishing Vessels	0	1	0.39
Recreational Vessels	2	1	3.61
<b>Pollution Discharge Sources (Facilities)</b>			
Regulated Waterfront Facilities	0	0	0.28
Regulated Waterfront Facilities - Fuel Transfer	0	0	0.00
Other Land Sources	0	0	1.11
Mystery Spills - Unknown Sources	6	3	4.69
<b>Number of Pollution Incidents within San Francisco Bay</b>			
Spills < 10 gallons	2	5	4.47
Spills 10 - 100 gallons	0	2	1.19
Spills 100 - 1000 gallons	0	0	0.17
Spills > 1000 gallons	0	0	0.06
Spills - Unknown Size	6	2	5.81
<b>Total Pollution Incidents</b>	<b>8</b>	<b>9</b>	<b>11.69</b>
<b>Oil Discharge/Hazardous Materials Release Volumes by Spill Size</b>			
Estimated spill amount from U.S. Commercial Vessels	0.00	21.00	15.08
Estimated spill amount from Foreign Freight Vessels	0.00	0.00	8.42
Estimated spill amount from Public Vessels	0.00	3.00	1.68
Estimated spill amount from Commercial Fishing Vessels	0.00	15.00	9.90
Estimated spill amount from Recreational Vessels	11.00	1.00	39.73
Estimated spill amount from Regulated Waterfront Facilities	0.00	0.00	3.03
Estimated spill amount from Regulated Waterfront Facilities - Fuel Transfer	0.00	0.00	0.00
Estimated spill amount from Other Land Sources	0.00	0.00	1.73
Estimated spill amount from Unknown Sources (Mystery Sheens)	unk	unk	0.56
<b>Total Oil Discharge and/or Hazardous Materials Release (Gallons)</b>	<b>11.00</b>	<b>40.00</b>	<b>80.11</b>
<b>Penalty Actions</b>			
Civil Penalty Cases	0	0	0.06
Notice of Violations	0	0	0.67
Letters of Warning	2	3	3.14
<b>Total Penalty Actions</b>	<b>2</b>	<b>3</b>	<b>3.86</b>
* NOTE: Values represent all cases within the HSC jurisdiction during the period. Significant cases are detailed in the narrative.			
** NOTE: Values represent an average month over a 36 month period for the specified category of information.			

## SIGNIFICANT PORT SAFETY AND SECURITY CASES (May 2017)

### MARINE CASUALTIES

**Allision (04MAY17):** A foreign flag container vessel allided with a pier side crane guide wire. The crane guide wire broke and a section of the bridge canopy tore off. Case Closed.

**Equipment Failure (12MAY17):** A US flag passenger vessel experienced a loss of bridge control. A COTP Order was issued requiring the Class Surveyor to attend the vessel. A Class Surveyor observed the repairs and proper operations of associated systems. The COTP Order was lifted. Case Closed.

**Loss of Propulsion (15MAY17):** A foreign flag container vessel experienced a loss of while inbound San Francisco Bay. The vessel was able to regain propulsion but was placed under a COTP Order requiring the vessel to take on a two tug escort and proceed to Anchorage 9 to identify causative factors. A Class Surveyor attended the vessel and witnessed satisfactory operation of the propulsion system. The COTP was lifted. This case was not attributed to fuel switching. Case Closed.

**Equipment Failure (25MAY17):** A foreign flag bulk carrier experienced a reduction in propulsion while transiting inbound to Anchorage 9. The vessel transited to Anchorage 9 with a two tug escort. A COTP Order was issued requiring class to attend the vessel. A Class Surveyor attended the vessel and witnessed satisfactory operation of the propulsion system. The COTP Order was lifted. This case was not attributed to fuel switching. Case Closed.

### VESSEL SAFETY CONDITIONS

**Operational Control (08MAY17):** A US flag passenger vessel experienced a loss of propulsion and a loss of steering. The vessel was able to safely moor and disembark all passengers. The vessel has been taken out of service and a CG-835 No Sail. The Coast Guard witnessed satisfactory sea trials on the hydraulic systems. The CG-835 No Sail was lifted. Case Closed.

### NAVIGATIONAL SAFETY

**Letter of Deviation (LOD), Inop S-Band Radar onboard a foreign vessel (01MAY17):** Vsl issued an inbound LOD.

**Letter of Deviation (LOD), Inop S-Band Radar onboard a foreign vessel (04MAY17):** Vsl issued an outbound LOD.

**Letter of Deviation (LOD), Inop AIS onboard a foreign tankship (07MAY17):** Vsl issued inbound LOD.

### SIGNIFICANT INCIDENT MANAGEMENT DIVISION CASES

**23MAY17 (LOW):** A 21-ft recreational vessel discharged 5 gal engine oil into harbor near Stockton. Case Closed.

**24MAY17(LOW):** A 30-ft recreational vessel sunk at its berth in Sandmound Slough and discharged 10 gal gasoline. Case Closed.

**Harbor Safety Committee  
Of the San Francisco Bay Region**

**Report of the  
U.S. Army Corps of Engineers, San Francisco District  
June 8, 2017**

**1. CORPS O&M DREDGING PROGRAM**

The following report covers the upcoming FY 2017 dredging program for San Francisco Bay. This program is subject to change based on a number of variables including final FY 2017 appropriations and Corps Work Plan. Please refer to the Local Notice to Mariner for details of dredge operations.

**FY 2017 DREDGING**

- a. **SF Main Ship Channel** – Estimated start mid-May 2017, estimated completion early June 2017, by government hopper.
- b. **Richmond Inner Harbor** – Estimated start early September 2017, estimated completion end of October 2017, by contracted clamshell.
- c. **Richmond Outer Harbor (and Richmond Long Wharf)** – Deferred due to special conditions contained in the Water Quality Certification.
- d. **Oakland Harbor** – Estimated start mid-August 2017, estimated completion end of November 2017, by contracted clamshell.
- e. **Redwood City Harbor** – Estimated start early September 2017, estimated completion end of October 2017, by contracted clamshell.
- f. **San Pablo Bay (Pinole Shoal)** – Estimated start mid-June 2017, estimated completion late-June 2017, by Government hopper.
- g. **Suisun Bay Channel (and New York Slough)** – Estimated start mid-September 2017, estimated completion mid-November 2017, by contracted clamshell.

**2. DEBRIS REMOVAL** – Debris removal for May 2017 was 112.5 tons. Dillard: 84.5 tons, including 3 abandoned vessels; Raccoon: 16 tons; other boats: 12 tons, including 6 abandoned vessels. Average for May from 2007 to 2016 is 39.9 tons. (Range: 13-112.5 tons).

**BASEYARD DEBRIS COLLECTION TOTALS:**

<b>MONTH</b>	<b>RACCOON</b>	<b>DILLARD</b>	<b>MISC</b>	<b>TOTAL</b>
2017	TONS	TONS	TONS	TONS
JAN	30	212	170	417
FEB	75	88	35	198
MAR	65	35	12	112
APR	14	104.5	23	142.5
MAY	16	84.5	12	112.5
JUN	0	0	0	0
JUL	0	0	0	0
AUG	0	0	0	0
SEP	0	0	0	0
OCT	0	0	0	0
NOV	0	0	0	0
DEC	0	0	0	0

YR TOTAL
982

**3. UNDERWAY OR UPCOMING HARBOR IMPROVEMENTS**

None to report.

**4. EMERGENCY (URGENT & COMPELLING) DREDGING**

Stockton DWSC: A joint Task Order was awarded 25 May to the contractor, Ross Island Sand & Gravel, Inc. (RI). RI was issued Notice To Proceed on 2 Jun to begin preparation for emergency dredging operations starting at the sediment trap (Light 48). SPN anticipates that the emergency pumping operations for the Stockton DWSC to commence by early next week.

Sacramento River DWSC: A joint Task Order was awarded 25 May to RI. Once the dredging operations on the Stockton channel are complete, the contractor will mobilize to the Sacramento channel and commence dredging. The regular maintenance dredging will most likely be deferred until FY18. The team anticipates the emergency dredging activities for the Sacramento DWSC to commence in July; directly after the completion of the Stockton DWSC emergency dredging episode.

## 5. OTHER WORK

**San Francisco Bay to Stockton** – The study is now being conducted by the Wilmington District to more efficiently match the study with available resources. Funding was allocated in the work plan and the Wilmington District is revising the Scope and Schedule to match work plan funds and available NFS funds. The Tentatively Selected Plan (TSP) milestone for Phase I (Western Reach) of the project was held on 29 June 2016 utilizing FY14 carryover funds. The recommended plan is to deepen the Phase I reach of the project from a depth of -35 feet to -38 feet MLLW. The final report is scheduled to be approved in February 2019.

## HYDROGRAPHIC SURVEY UPDATE

Address of Corps' web site for completed hydrographic surveys:

<http://www.spn.usace.army.mil/Missions/Surveys,StudiesStrategy/HydroSurvey.aspx>

The following surveys are posted:

**Alameda Point Navigation Channel:** Condition survey of November 2, 2016.  
**Berkeley Marina (Entrance Channel):** Condition survey of September 23, 2014.  
**Islais Creek Channel:** Condition survey of May 12, 2016.  
**Larkspur Ferry Channel:** Condition survey of November 18, 2014.  
**Main Ship Channel:** Condition survey of March 9 & 20, 2017.  
**Mare Island Strait:** Condition survey of September 24, 2014.  
**Marinship Channel (Richardson Bay):** Condition survey of December 6, 2016.  
**Napa River:** Condition survey of May 4-9, 2017.  
**Northship Channel:** Condition survey of late July 29-31, 2015.  
**Oakland Entrance Channel:** Condition survey of May 16-22, 2017.  
**Oakland Inner Harbor (Reach 2):** Condition survey of May 16-22, 2017.  
**Oakland Inner Harbor (Reach 3-6):** Condition survey of May 16-22, 2017.  
**Oakland Outer Harbor (Reach 7-8):** Condition survey of May 16-22, 2017.  
**Oakland Outer Harbor (Reach 9-10):** Condition survey of May 16-22, 2017.  
**Petaluma River (Across-the-Flats):** Condition survey of September 12-14, 2014.  
**Petaluma River (Main Channel):** Condition survey of September 13-14, 2014.  
**Pinole Shoal Channel:** Condition survey of February 6, 2017.  
**Redwood City Harbor:** Pre-solicitation survey of April 21-24, 2017.  
**Richmond Inner Harbor:** Condition survey of March 14, 2017.  
**Richmond Inner Harbor (Santa Fe Channel):** Condition survey of December 20, 2016.  
**Richmond Outer Harbor (Longwharf):** Condition survey of April 4, 2017.  
**Richmond Outer Harbor (Southampton Shoal):** Condition survey of April 10, 2017.  
**Sacramento River Deep Water Ship Channel:** Condition survey of March 11-16, 2017.  
**San Bruno Shoal:** Condition survey of March 27, 2017.  
**San Leandro Marina (and Channel):** Condition survey of March 30 and April 1, 2015.  
**San Rafael (Across-the-Flats):** Condition survey of May 10, 2013.

**San Rafael (Creek):** Condition survey of May 9, 2013.  
**Stockton Ship Channel:** Condition survey of March 28-31 and April 1-2, 2017.  
**Suisun Bay Channel:** Condition survey of February 16-20, 2017.  
**Suisun Bay Channel (Bullshead Reach):** Condition survey of April 19, 2017.  
**Suisun Bay Channel (New York Slough):** Condition survey of February 14-15, 2017.

Disposal Site Condition Surveys:

**SF-08 (Main Ship Channel Disposal Site):** Condition survey of May 11, 2017.  
**SF-09 (Carquinez):** Condition survey of April 19, 2017.  
**SF-10 (San Pablo Bay):** Condition survey of April 19, 2017.  
**SF-11 (Alcatraz Island):** Condition survey of April 11 and May 2, 2017.  
**SF-16 (Suisun Bay Disposal Site):** Condition survey of September 1, 2016.  
**SF-17 (Ocean Beach Disposal Site):** Condition survey of May 11, 2017.

**Requested Surveys:**

**Before (Pre) dredge surveys are scheduled to occur thru the end of August for all of San Francisco District's in-bay projects which are planned to be dredged in FY17.**

NEW WEB ADDRESS – USACE WORK PLAN:

<http://www.usace.army.mil/Missions/Civil-Works/Budget/>

**O&M DREDGING PLAN FOR FY17\***  
**HARBOR SAFETY COMMITTEE MEETING**  
**8-Jun-17**

Project	2016			2017												Volume	Placement Site	Notes	
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC				
	FY 2017																		FY 2018
SF Main Ship Channel								Essayons	█								350kcy	OBDS/ SF-8	Gov't Hopper
Richmond Inner Harbor				**													350kcy	SF-DODS	Clamshell
Richmond Outer Harbor																	250kcy	SF-11	Gov't Hopper Deferred to FY18
Oakland Harbor				**													600kcy	SF-DODS	Clamshell, Option to existing Contract
Redwood City Harbor				**													350kcy	SF-11	Clamshell
Pinole Shoal								ESSAYONS	█								150kcy	SF-10	Gov't Hopper
Suisun Bay Channel																	175kcy	SF-16	Clamshell
Napa River				**													90kcy	Upland	Dredging Completed in Dec 2017
Sacramento River (30 Ft)																	100kcy	Various Upland	Emergency action has been awarded
San Joaquin, Port of Stockton				**													450kcy	Various Upland	Emergency action has been awarded. Follow on contract will be Sole Source 8A

 Ongoing Contracts  
 New SPN Contract  
 West Coast Hopper Contract  
 Government Dredge

 Environmental Window

\* Program execution is based on the FY17 President's Budget, Workplan and Federal Standard plan for each project.

\*\* Window Extension.

Date of Update:

6/5/2017



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Harbor Safety Committee of the  
San Francisco Bay Region Clearing House  
c/o Marine Exchange of the San Francisco Bay Region  
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San Francisco, California 94133-1131  
415-441-6600 fax 415-441-3080 hsc@sfmtx.org

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## San Francisco Clearinghouse Report

June 8, 2017

- ✎ In May the clearinghouse did not need to contact OSPR regarding any possible escort violations.
- ✎ In May the clearinghouse did not receive any notifications of vessels arriving at the Pilot Station without escort paperwork.
- ✎ The Clearinghouse contacted OSPR 1 time in 2016 about a possible escort violations. The Clearinghouse contacted OSPR 3 time in 2015 about possible escort violations. The Clearinghouse contacted OSPR 5 times regarding possible escort violations in 2014. The Clearinghouse contacted OSPR 1 time in 2013. The Clearinghouse contacted OSPR 3 times in 2012 regarding any possible escort violations, 3 times in 2011, 6 times in 2010, 8 time 2009; 4 times 2008; 9 times in 2007; 9 times in 2006; 16 times in 2005; 24 times in 2004; twice in 2003; twice in 2002; 6 times in 2001; 5 times in 2000.
- ✎ In May there were 101 tank vessel arrivals; 15 ATB's, 7 Chemical Tankers, 12 Chemical/Oil Tankers, 30 Crude Oil Tankers, 2 LPG, 1 Non-Specific Tanker, 20 Product Tankers, and 14 Tugs with Barges.
- ✎ In May there were 311 total arrivals.

# San Francisco Bay Clearinghouse Report For May 2017

## San Francisco Bay Region Totals

	<u>2017</u>		<u>2016</u>		
Tanker arrivals to San Francisco Bay	72		67		
ATB arrivals	15		8		
Barge arrivals to San Francisco Bay	14		24		
Total Tanker and Barge Arrivals	101		99		
Tank ship movements & escorted barge movements	350		339		
Tank ship movements	213	60.86%	160	47.20%	
Escorted tank ship movements	163	46.57%	103	30.38%	
Unescorted tank ship movements	50	14.29%	57	16.81%	
Tank barge movements	137	39.14%	179	52.80%	
Escorted tank barge movements	15	4.29%	54	15.93%	
Unescorted tank barge movements	122	34.86%	125	36.87%	

Percentages above are percent of total tank ship movements & escorted barge movements for each item.

Escorts reported to OSPR 0 0

<b>Movements by Zone</b>	<b>Zone 1</b>	<b>%</b>	<b>Zone 2</b>	<b>%</b>	<b>Zone 4</b>	<b>%</b>	<b>Zone 6</b>	<b>%</b>	<b>Total</b>	<b>%</b>
Total movements	200		336		0		154		690	
Unescorted movements	85	42.50%	164	48.81%	0	0.00%	69	44.81%	318	46.09%
Tank ships	60	30.00%	117	34.82%	0	0.00%	56	36.36%	233	33.77%
Tank barges	25	12.50%	47	13.99%	0	0.00%	13	8.44%	85	12.32%
Escorted movements	115	57.50%	172	51.19%	0	0.00%	85	55.19%	372	53.91%
Tank ships	113	56.50%	158	47.02%	0	0.00%	76	49.35%	347	50.29%
Tank barges	2	1.00%	14	4.17%	0	0.00%	9	5.84%	25	3.62%

Notes:

1. Information is only noted for zones where escorts are required.
2. All percentages are percent of total movements for the zone.
3. Every movement is counted in each zone transited during the movement.
4. Total movements is the total of all unescorted movements and all escorted movements.

# San Francisco Bay Clearinghouse Report For 2017

## San Francisco Bay Region Totals

	<u>2017</u>		<u>2016</u>	
Tanker arrivals to San Francisco Bay	343		703	
ATB arrivals	68		114	
Barge arrivals to San Francisco Bay	65		242	
Total Tanker and Barge Arrivals	408		1,059	
Tank ship movements & escorted barge movements	1,559		3,616	
Tank ship movements	903	57.92%	2,081	57.55%
Escorted tank ship movements	689	44.19%	1,331	36.81%
Unescorted tank ship movements	214	13.73%	686	18.97%
Tank barge movements	656	42.08%	1,535	42.45%
Escorted tank barge movements	101	6.48%	554	15.32%
Unescorted tank barge movements	555	35.60%	1,129	31.22%

Percentages above are percent of total tank ship movements & escorted barge movements for each item.

Escorts reported to OSPR 0 0

<b>Movements by Zone</b>	<b>Zone 1</b>	<b>%</b>	<b>Zone 2</b>	<b>%</b>	<b>Zone 4</b>	<b>%</b>	<b>Zone 6</b>	<b>%</b>	<b>Total</b>	<b>%</b>
Total movements	952		1,516		0		655		3,123	
Unescorted movements	419	44.01%	745	49.14%	0	0.00%	295	45.04%	1,459	46.72%
Tank ships	322	33.82%	538	35.49%	0	0.00%	250	38.17%	1,110	35.54%
Tank barges	97	10.19%	207	13.65%	0	0.00%	45	6.87%	349	11.18%
Escorted movements	533	55.99%	771	50.86%	0	0.00%	360	54.96%	1,664	53.28%
Tank ships	500	52.52%	673	44.39%	0	0.00%	320	48.85%	1,493	47.81%
Tank barges	33	3.47%	98	6.46%	0	0.00%	40	6.11%	171	5.48%

Notes:

1. Information is only noted for zones where escorts are required.
2. All percentages are percent of total movements for the zone.
3. Every movement is counted in each zone transited during the movement.
4. Total movements is the total of all unescorted movements and all escorted movements.



## CALIFORNIA STATE LANDS COMMISSION

### HARBOR SAFETY COMMITTEE MONTHLY REPORT - MAY COMPARISON

#### VESSEL TRANSFERS

	Total Transfers	Total Vessels Monitored	Total Transfers Percentage
MAY 1 - 31, 2016	221	113	51.13
MAY 1 - 31, 2017	240	82	34.17

#### CRUDE OIL / PRODUCT TOTALS

	Crude Oil ( D )	Crude Oil ( L )	Overall Product ( D )	Overall Product ( L )	GRAND TOTAL
MAY 1 - 31, 2016	14,069,070	330,000	20,385,829	9,184,102	29,569,931
MAY 1 - 31, 2017	16,588,400	0	22,943,723	6,441,208	29,384,931

#### OIL SPILL TOTAL

	TERMINAL	VESSEL	Total	Gallons Spilled
MAY 1 - 31, 2016	0	0	0	0
MAY 1 - 31, 2017	0	0	0	0

**Disclaimer:**

*Please understand that the data is provided to the California State Lands Commission from a variety of sources; the Commission cannot guarantee the validity of the data provided to it.*

To: Harbor Safety Committee of the San Francisco Bay Region  
Date: 8 June 2017  
Subject: **Annual Update of Harbor Safety Plan**  
From: Linda Scourtis

The State's Harbor Safety Committees are required to annually update their plans for submittal to the OSPR Administrator. The Administrator subsequently determines whether to accept the individual updated Harbor Safety Plans.

The Committee will vote today whether to adopt an updated Executive Summary (enclosed with this memo), which highlights Committee activities since June 2016.

Plan Maps 1, 2 and 3 have been modified to include the NOAA chartlet for the HSC offshore AOR.

SB 414 requires the Tug Work Group report previously approved by the HSC in April, *Assessment of Offshore Emergency Towing Capabilities in the San Francisco Area of Responsibility*, be included in the Safety Plan. We have added the report as a new appendix N.

Finally, the following appendices were updated by their responsible agencies and will be included in the plan upon its acceptance by the Administrator:

2. Appendix C: Annual Work Group Reports
3. Appendix D: Tug Escort Violations Summary for 2015
4. Appendices E, F and G: Clearing House reports for 2015
5. Appendix J: Vehicular Bridge Inventory
6. Appendix K and L: USCG Bay Port Safety (with LOP data) and Pollution Statistics for 2015
7. Appendix M: SLC Waterborne Petroleum Statistics for 2015

## **Executive Summary 2016/2017**

The Harbor Safety Committee continued its collaborative process to engage the maritime community in working to increase navigation safety in the Bay. The Tug Work Group culminated nearly a year's worth of investigation and submitted to the OSPR Administrator an assessment of emergency towing capabilities in the areas offshore, as required by Senate Bill 414.

Also during 2016-2017:

- The Dredging Issues Work Group authored a letter to the House Appropriations Committee requesting support for FY 2018 funding for dredging operations.
- The Ferry Operations Work Group worked with maritime partners as the Bay Area's ferry system grew in a robust economy.
- The Navigation Work Group met to discuss requirements for laying buried cables and pipelines in the Bay, specifically where these cross or infringe on a navigational channel. The workgroup developed and forwarded a set of proposed amendments to the USACE national permit process; however, these were ultimately not accepted by USACE.

See Appendix C, Annual Work Group reports, for additional activities over the past year.

# California Tsunami Program

## A Maritime Approach to Tsunami Safety



**KEVIN MILLER**, CA Governor's Office of Emergency Services

**RICK WILSON**, California Geological Survey

**BRIAN GARCIA**, National Weather Service

**EDIE SCHAFFER**, San Francisco Dept. of Emergency Management



# Tsunami Alert & Response



# State of California

## Tsunami Preparedness & Mitigation Program



### Hazard Assessment & Understanding

- Inundation modeling & maps
- Evacuation modeling & maps
- Probabilistic modeling & maps

### Preparedness

- Evacuation/Maritime Planning & Playbooks
- Training and Exercise Support
- System and Comms Testing
- TsunamiReady® Program Support
- Tsunami Preparedness Week
- Public Education

### Response

- 24/7 Duty Officer Program
- Real-Time / Post-Tsunami Field Teams

### Mitigation & Recovery

- Policy Analysis and Development
- Resiliency and Improvement Reports



# Official NOAA Alert Bulletins



## **Tsunami WARNING** (>3 feet)

Widespread inundation is imminent or occurring  
Full Evacuation Suggested, Move to Higher Ground

## **Tsunami ADVISORY** (1 foot to 3 feet)

Strong currents are imminent or occurring  
Move Away From Shore, Harbors, Marinas

## **Tsunami WATCH**

There is potential tsunami which may later impact your area  
Stay Alert For More Info, May be upgraded to  
Warning/Advisory

## **Tsunami INFORMATION**

Minor Waves at Most  
No Action Suggested

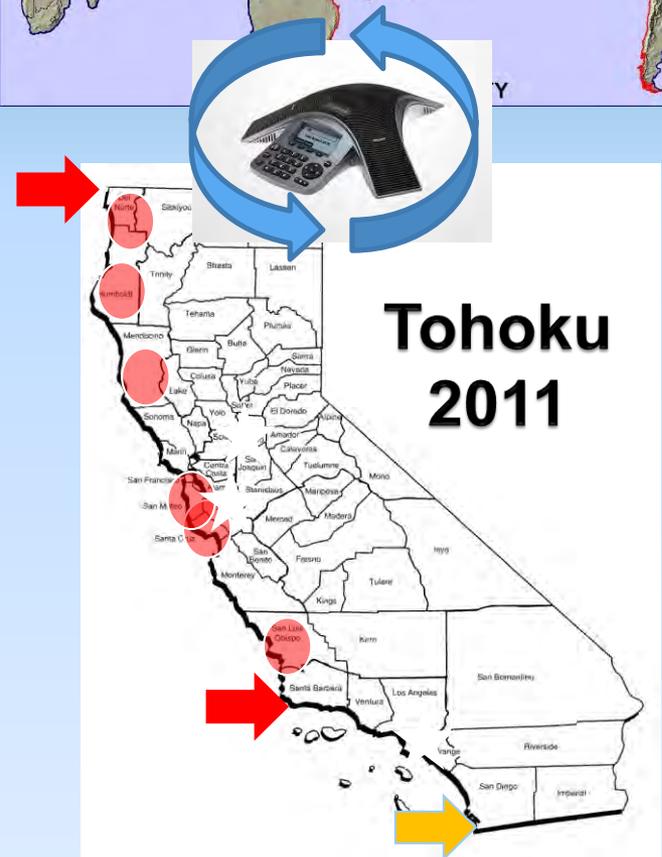
# State Response to: WARNING and/or ADVISORY

## ACTIONS:

- PARTICIPATE in CALLS WITH NOAA TSUNAMI WARNING CENTER
- ACTIVATE STATE EOC's (SOC/REOC's)
- CONDUCT CALLS WITH EMERGENCY MANAGERS IN 20 COASTAL COUNTIES

Focus on specific areas or locations of heightened concern based on:

**Start of Tsunami**  
**Wave Heights**  
**Tide Conditions**

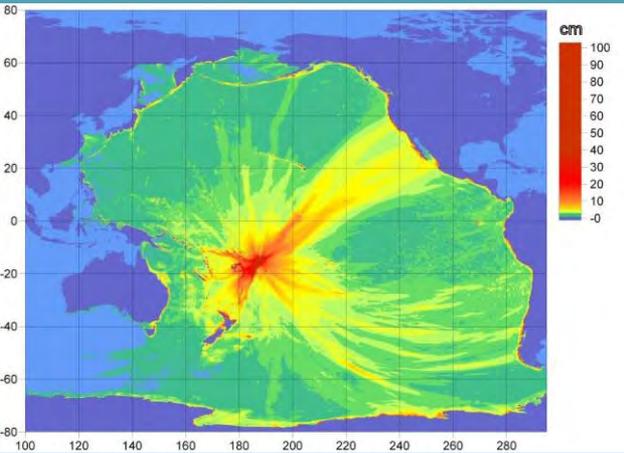


# Tsunami Hazard in California

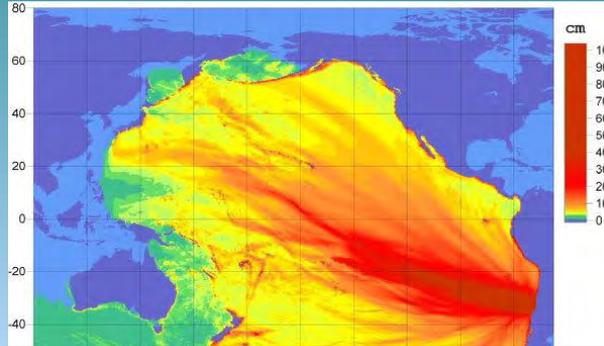


# Recent Tsunamis Activating California Emergency Response

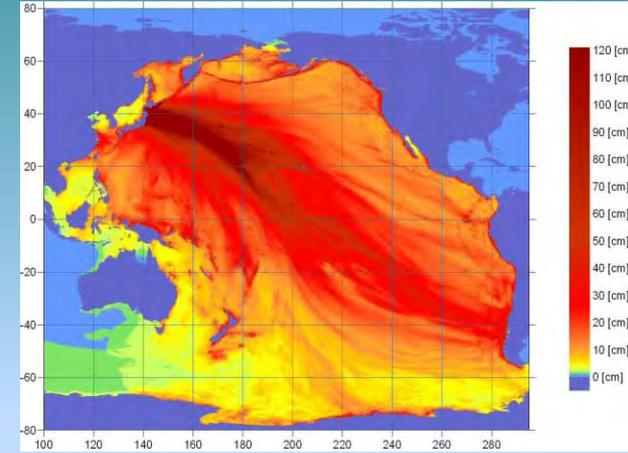
Samoa Sept 2009



Chile Feb 2010

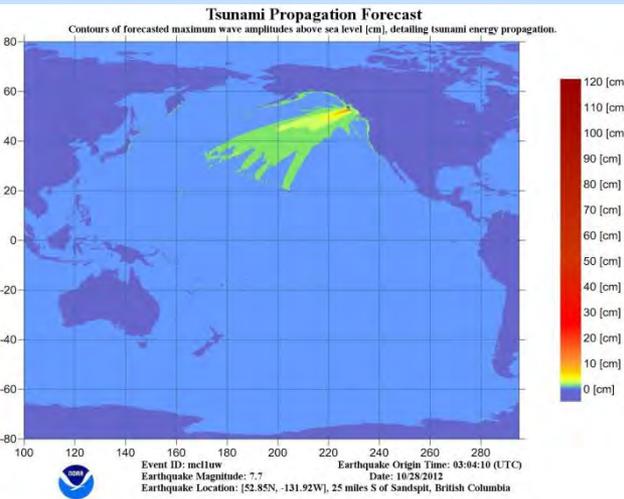


Japan March 2011

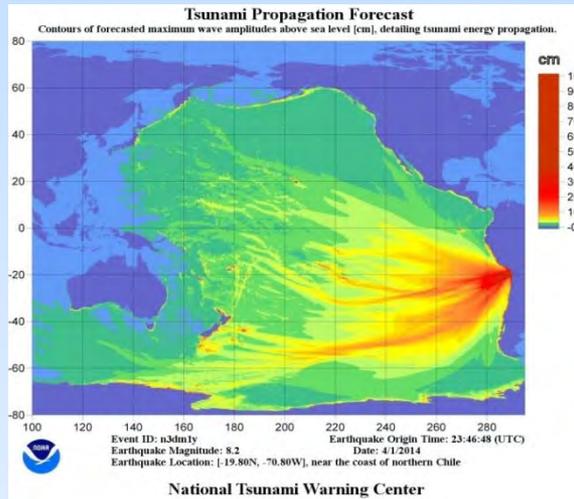


**Six Events in Eight Years**

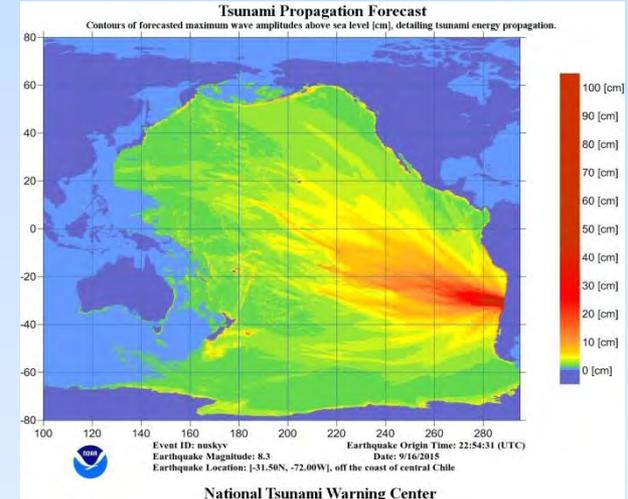
Haida Gwaii Oct 2012



Chile April 2014



Chile Sept 2015



# Notable Historical Tsunamis in the San Francisco Bay Area

Run-up amplitude, in feet, above normal tide conditions

OBS = observed tsunami activity

NR = No damage or severe conditions reported

- Distant Source -  
Tsunamis without felt earthquakes

- Local Source -  
Earthquake and tsunami together

Date	Magnitude-Source area	Tsunami location	Run-Up/Amp	Remarks
2/15/1856	M5.5 - SF Bay (possible submarine landslide)	San Francisco	3 ft	"...water in the bay is exceedingly thick...by throwing up of mud and sand at bottom of bay..."
8/13/1868	M8.5 - Chile	SF-Fort Point	1 ft	NR
10/21/1868	M6.8 - Hayward Fault (possible submarine/subaerial landslide)	SF-Cliff House	OBS	"...decided commotion in the ocean...wave sent inland..."
3/31/1898	M6.2 - Haward-Rodgers Creek Fault crossing Suisun Bay	Oakland	1 ft	"churned" water may be from storm activity, not tsunami
4/1/1946	M8.8 - Aleutian Islands	SF-Presido	1 ft	NR
11/4/1952	M9.0 - Kamchatka	San Francisco	2 ft	NR
		Alameda	1 ft	NR
3/9/1957	M8.6 - Aleutian Islands	San Francisco	1 ft	NR
5/22/1960	M9.5 - Chile	San Francisco	2 ft	San Francisco ferry service disrupted by a current "running like the Mississippi River"
		Alameda	1 ft	NR
3/28/1964	M9.2 - Alaska	San Francisco	4 ft	NR
		Alameda	2 ft	NR
		Oakland	4 ft	NR
		San Rafael	4 ft	Multiple docks damaged; boats sunk and damaged
		Sausalito	6 ft	Docks/boats damaged; minor inundation on dry land
2/27/2010	M8.8 - Chile	San Francisco	1 ft	NR
3/11/2011	M9.0 - Japan	San Francisco	2 ft	Two piles broken; boats heeled over
		Alameda	2 ft	4-6 knot currents but no damage reported
		Berkeley	2 ft	\$80K in damages to docks and piles
		Richmond	1 ft	5-6 knot currents with buoys displaced
		Sausalito	4 ft	Minor damage to house boats and marinas



# Tsunami Source Scenario Model Results for the San Francisco Bay Area

Near shore tsunami heights (flow depths) for both local and distant source scenarios, in FEET above Mean Sea Level. NOTE: The projections do not include any adjustments for ambient conditions, such as storm surge and tidal fluctuations, and model error (it is very important to note this difference, as those numbers can increase the projected water height during an event).

	TSUNAMI SOURCES	Approximate Travel Time	Pacifica	Ocean Beach	Black Point Aquatic Park	Candlestick Park	Alcatraz Island	Treasure Island	Yerba Buena Island	Redwood City	Alameda	Richmond	Mare Island	Saucilito	Bollinas
Local Sources	M7.3 Point Reyes Thrust Fault	10-15min	7	6	4	3	4	3	3	4	4	4	3	6	8
	M6.6 Rodgers Creek-Hayward Fault	10-15min	2	2	2	2	2	2	2		3	3	3	3	
	M7.1 San Gregorio Fault	10-15min	4	4	3	3	3	3	3		4	3	3	3	
Distant Sources	M9 Cascadia-full rupture	1hr	4	5	3	3	3	4	3		4	3	3	4	4
	M9.2 Alaska 1964 EQ	5hr	13	12	7	4	6	5	6		9	7	3	8	10
	M8.9 Central Aleutians I	5hr	9	11	6	4	6	5	4	4	9	7	3	7	7
	M8.9 Central Aleutians II	5hr	5	6	5	3	5	4	4		5	4	3	5	7
	M9.2 Central Aleutians III	5hr	18	22	11	6	10	8	7	5	16	10	4	10	19
	M8.8 Kuril Islands II	9hr	3	3	3	3	3	3	2		5	3	3	4	3
	M8.8 Kuril Islands III	9hr	4	4	3	3	3	3	3		4	3	3	4	5
	M8.8 Kuril Islands IV	9hr	5	5	3	3	3	3	3		4	3	3	4	5
	M8.8 Japan II	10hr	5	5	4	3	3	3	3		6	3	3	3	4
	M8.6 Marianas Trench	11hr	3	3	3	3	3	3	3	4	3	3	3	6	3
	M9.5 Chile 1960 EQ	13hr	5	6	3	3	3	3	3		5	4	3	5	5
M9.4 Chile North	13hr	4	5	4	3	4	4	4		6	3	3	4	5	
<b>Maximum Runup - Local Source</b>			8	6	3	3	4	4	4	4	5	4	3	7	9
<b>Maximum Runup - Distant Source</b>			20	24	12	6	12	10	9	6	18	10	4	11	22



# 2011 Tohoku Tsunami in California

- Large tidal fluctuations = 16 feet in Crescent City (largest surges at low tide)
- Strong currents/debris in harbors
- Potential dangerous tsunami conditions lasted for more than 24 hours.
- Impacts: one fatality; two dozen harbors damaged; Official = \$50M; Total ~\$100M



*March 11, 2011 Tohoku Tsunami in California; video at 11AM (about 3 hours after first arrival of tsunami) within Santa Cruz Harbor*

Lessons Learned/Needs: 1) Consistent response statewide; 2) Response plans for minor to moderate event (not just “worst case”); 3) Harbor specific planning tools; and 4) Recommended minimum actions ahead of event

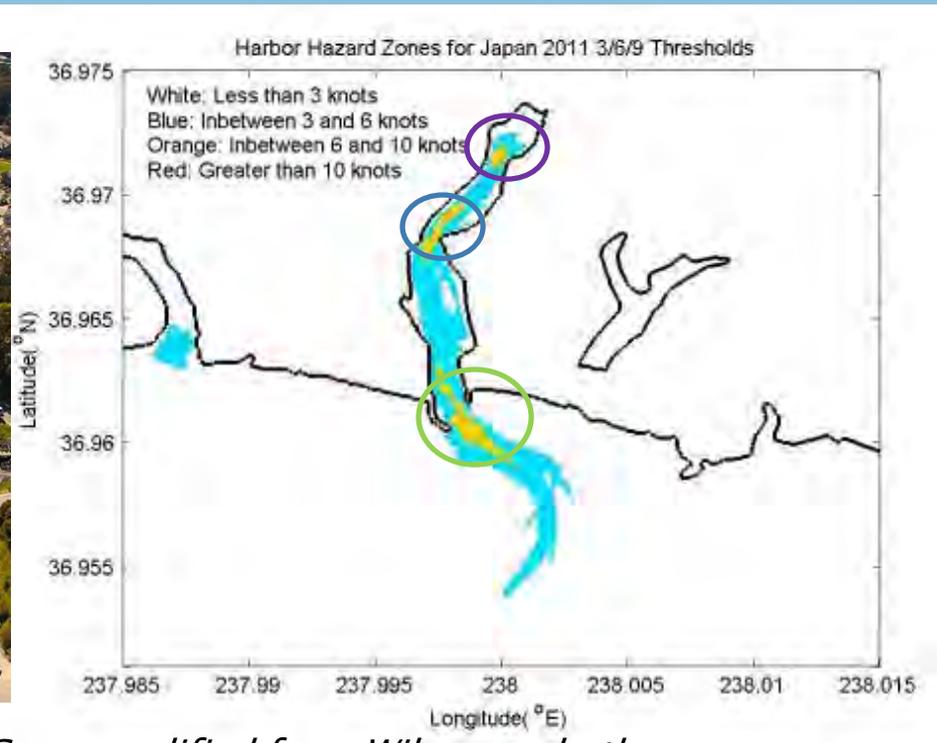
# Maritime Response Playbooks



# Maritime Safety Products – Playbook Approach

1. Create in-harbor hazard maps, based on current vs. damage
2. Create minimum offshore safety line/zone (30 fathoms=180 feet)
3. Provide statewide planning and response guidance (Playbooks)

For work in California, it started with analysis of video and other observations of currents used to validate currents from numerical models



*March 11, 2011 tsunami in Santa Cruz; modified from Wilson and others, 2012, and Lynett and others, 2013*

# Maritime Tsunami Response Playbooks

1. Identifies areas within harbor where strong currents and damage occurs, as well as where safe areas exist
2. Provides multiple response options based on tsunamis of different sizes
3. Real-time MINIMUM response recommendation for events from a distant source
4. Helps with consistent response activities

**California Maritime Tsunami Response Playbook And Mitigation Guidance**

**Oakland/Alameda – Alameda County**

Maritime Tsunami Response Playbook (MTRP) No. 2015-Alam-01

**DURING AN EMERGENCY, USE THE "QUICK REFERENCE" SHEET ON THE BACK PAGE (PAGE 22).**

(For the expanded Playbook format, use directions on page 7)

California Maritime Tsunami Response Playbook No. 2015-Alam-01

California Geological Survey  
California Governor's Office of Emergency Services  
University of Southern California  
Humboldt State University  
National Oceanic and Atmospheric Administration

Funded by the Federal Emergency Management Agency and the National Tsunami Hazard Mitigation Program

**Playbook Plan A**  
(based on 2012 Mw 8.8 Chile Event at 10m resolution)  
Current Threshold Map

**Current Thresholds for Potential Damage**

- Minor to moderate damage (1.4-4m)
- Moderate (4-8m)
- Major & complete destruction (8-16m)
- Areas of potential damaging EDDY movement

**Playbook Plan B**  
(based on 2011 Mw 9.0 Japan Event at 10m resolution)  
Current Threshold Map

**Current Thresholds for Potential Damage**

- Minor to moderate damage (1.4-4m)
- Moderate to major damage (4-8m)
- Major damage/complete destruction (8-16m)
- Areas of potential damaging EDDY movement

**Playbook Plan C**  
(based on 1872 Cascadia event at 10m resolution)  
Current Threshold Map

**Current Thresholds for Potential Damage**

- Minor to moderate damage (1.4-4m)
- Moderate to major damage (4-8m)
- Major damage/complete destruction (8-16m)
- Areas of potential damaging EDDY movement

**Playbook Plan D**  
(based on Mw 9.0 Chile scenario at 10m resolution)  
Current Threshold Map

**Current Thresholds for Potential Damage**

- Minor to moderate damage (1.4-4m)
- Moderate to major damage (4-8m)
- Major damage/complete destruction (8-16m)
- Areas of potential damaging EDDY movement

# Individual Maritime Response Playbook Documents

Completed - Covering 70+ Harbors/Ports in California

DRAFT 06/16/2015

## California Maritime Tsunami Response Playbook And Mitigation Guidance

### Richardson Bay – Marin County

Maritime Tsunami Response Playbook (MTRP) No. 2015-Mar-01

**DURING AN EMERGENCY, USE THE "QUICK REFERENCE" SHEET  
ON THE BACK PAGE (PAGE 22).**

(For the expanded Playbook format, use directions on page 7)



California Maritime Tsunami Response Playbook No. 2015-Mar-01

California Geological Survey  
California Governor's Office of Emergency Services  
University of Southern California  
Humboldt State University  
National Oceanic and Atmospheric Administration



Funded by the Federal Emergency Management Agency  
and the National Tsunami Hazard Mitigation Program



FEMA



**Page 2: Purpose and Use of Maritime Response Tsunami Playbook and Mitigation Guidance**

**Page 3: Mitigation Planning**

**Page 4-5: Tsunami Hazards, Tsunami Alert Levels, and General Response Recommendations**

**Page 6: Forecast Amplitude and FASTER Reference Information; Current-Damage Relationship**

**Page 7: Expanded Response Reference Page**

**Pages 8-17: Maritime Tsunami Response Playbook Scenario Plans and Maps**

**Page 18-19: Notable historical tsunamis and state tsunami program modeling results**

**Page 20-21: Offshore and On-shore Evacuation Plans**

**Page 22: APPENDIX – Quick Reference Page for real-time response activities**

# Maritime Tsunami Response Playbooks

## Maps are FEMA RiskMAP Products



California Maritime Tsunami Response Playbook And Mitigation Guidance

### Oakland/Alameda – Alameda County

Maritime Tsunami Response Playbook (MTRP) No. 2015-Alam-01

#### APPENDIX Quick Reference Page for Determining Real-Time Maritime Tsunami Response Activities

**Step 1:** Obtain basic information about the earthquake and tsunami from National Tsunami Warning Center in Alaska, regional National Weather Service office, and/or county emergency manager. **NOTE: Tsunami Alert Level may change in first couple hours after the earthquake.** <https://www.nwac.gov>

## Playbook Plan E

(based on M9.2 Eastern Aleutian-Alaska Scenario)

### Background Information:

Alert level = Warning

Peak Amplitude = 2.2+ meters

Peak Velocity = 9 knots

Projected duration of strong currents (see location maps below):

3-6 knots = 20 hrs; 6-9 knots = 10 hrs; >9 knots = 3 hrs

### Specific Instructions:

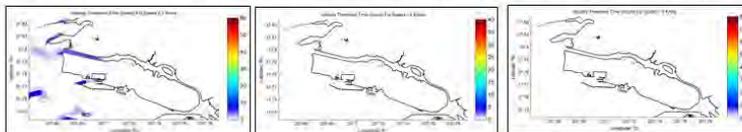
- Follow general guidance for Warning-level tsunamis (Page 5)
- Inundation of dry land could occur in this scenario**
- Strong currents and potential scour are expected in areas identified in blue – yellow-red on the map to the right. Consider relocating vessels located within 100 meters (300 feet) of these areas.
- Specific areas where vessels should be relocated from and docks secured: **(completed with maritime community input)**

Safe areas for repositioning vessels within the Oakland/Alameda maritime communities:

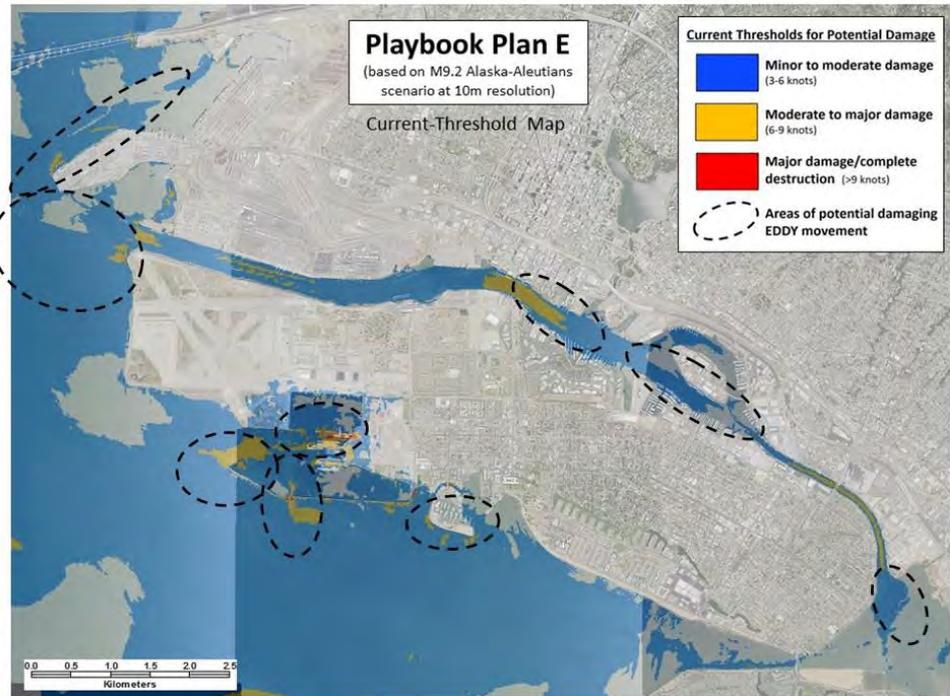
**(completed with maritime community input)**

Time thresholds for currents >3 knots.....>6 knots.....>9 knots

(Colors below represent HOURS of potential activity for blue, yellow, and red zones on opposite page)



16



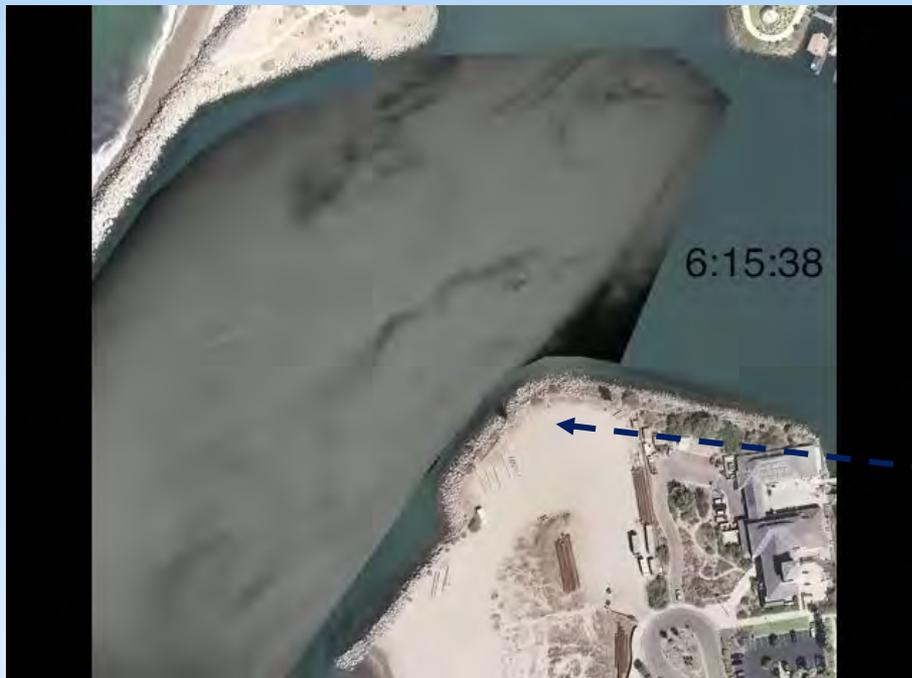
17



# REAL-TIME USE OF PLAYBOOKS

September 16-17, 2015 Tsunami from Chilean M8.3 EQ

- 15 ports and harbors within 5 county Tsunami Advisory
- All harbors in Advisory zone below lowest Playbook Plan (Plan A) because highest forecast wave height was 0.3m
- Harbormasters indicated using Maritime Response Playbooks during event and found them useful
- Harbors monitored and controlled activity around projected areas of moderate-to-high currents

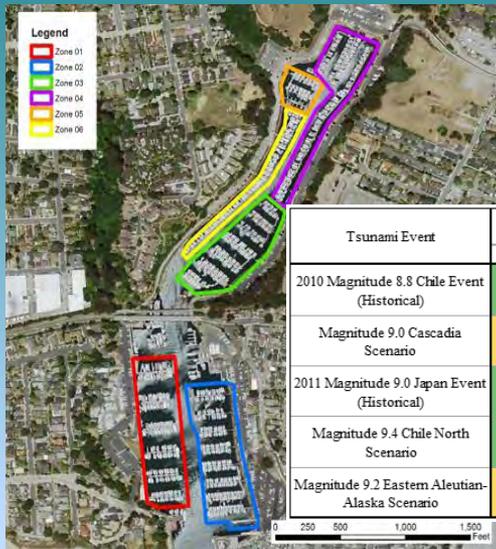


Tsunami currents and eddies from post-processed video by Dr. Pat Lynett.



Current-Threshold Map

# Maritime Tsunami Mitigation and Recovery Planning Work in CA with FEMA support



*Harbor Improvement Report for Santa Cruz – Key locations where damage may occur within harbors*

Tsunami Event	Zone					
	1	2	3	4	5	6
2010 Magnitude 8.8 Chile Event (Historical)	Low	Low	Low	Low	Low	Moderate
Magnitude 9.0 Cascadia Scenario	Moderate	Moderate	Low	Moderate	Low	High
2011 Magnitude 9.0 Japan Event (Historical)	Low	Low	Moderate	Moderate	Low	Moderate
Magnitude 9.4 Chile North Scenario	Low	Moderate	Moderate	Moderate	Low	Moderate
Magnitude 9.2 Eastern Aleutian-Alaska Scenario	Moderate	Moderate	Moderate	Moderate	Moderate	High

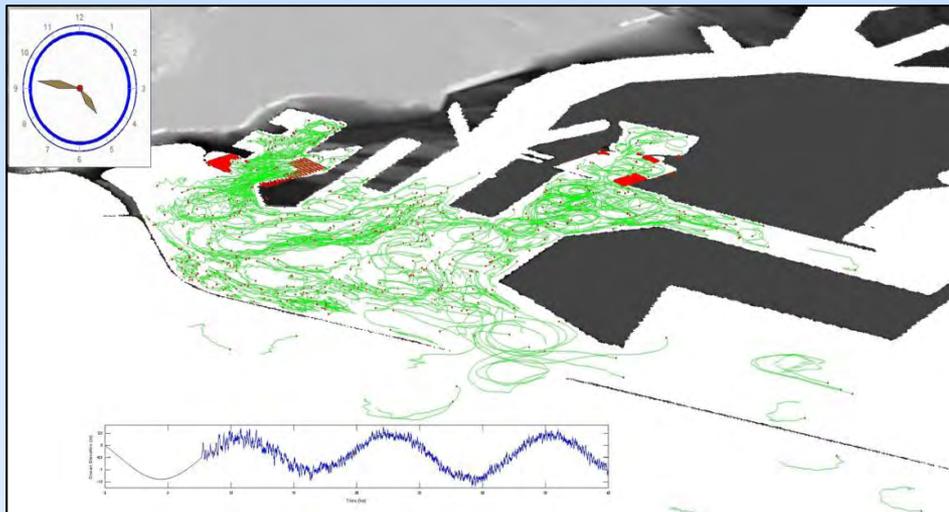
## Mitigation Planning

Assess and recommend risk reduction methods for coastal hazards (tsunami, Sea Level Rise, storm, etc.) to integrate into Local Hazard Mitigation Plans and receive Fed/State funds.

### Harbor Improvement Reports:

- Floating docks (cleats & pile guides)
- Floating debris potential
- Sediment/scour and contaminant transport

*Model of potential debris movement in Port of Los Angeles during large Alaska tsunami*



## Recovery Planning

Guidance for harbors, communities, and state to produce recovery plans for large local- (Cascadia) and distant-source events. Direct impacts are from immediate damages and other issues.

### Indirect Impacts (Time):

- Commercial fishing and shipping disruption
- Waterfront business disruption
- Regulatory redundancy and delays
- Limited resources and funding for recovery
- Loss of business and workforce over time



# San Francisco's Maritime Playbook

DRAFT 3/22/2017

## California Maritime Tsunami Response Playbook [Combined, Excerpted version]

### City and County of San Francisco North and East

2015-SF-01  
2015-SF-02

**DURING AN EMERGENCY, USE THE "QUICK REFERENCE" SHEET  
ON PAGES 32-33.**

For the expanded Playbook format, use directions on pages 7-8.



Source: California Maritime Tsunami Response Playbook No. 2015-SF-01  
California Maritime Tsunami Response Playbook No. 2015-SF-02

California Geological Survey  
California Governor's Office of Emergency Services  
University of Southern California  
Humboldt State University  
National Oceanic and Atmospheric Administration



Funded by the Federal Emergency Management Agency  
and the National Tsunami Hazard Mitigation Program



#### CITY AND COUNTY OF SAN FRANCISCO SMALL CRAFT HARBOR TSUNAMI ADVISORY OR WARNING CHECKLIST

In addition to the General Warning and Advisory recommendations provided on page 4, Harbormasters in San Francisco Small Craft Harbors should take the following additional Notification and Response steps:

##### NOTIFICATION

INTERNAL STAFF	EXTERNAL STAKEHOLDERS
<ul style="list-style-type: none"> <li>Notify Harbor staff and appropriate departmental personnel of Tsunami alert or warning.</li> <li>Monitor VHF Channel 16 for information from USCG.</li> </ul>	<ul style="list-style-type: none"> <li>Notify berth holders, tenants, and other affected stakeholders of Tsunami Advisory or Warning. Provide any available information or instructions.</li> <li>Notification Methods:               <ul style="list-style-type: none"> <li>Phone List</li> <li>Mass Notification System</li> <li>Email</li> </ul> </li> </ul>

##### INITIAL RESPONSE

- Activate Incident Command structure.
- Identify evacuation sites.
- Stage Emergency Response equipment outside of the affected area:
  - Oil Spill Response trailers and containers
  - Department owned vessels and trailers
- Secure public access to facilities.
- Secure or remove any HAZMAT or oil in affected area.
- Secure infrastructure and utilities to small craft harbor facilities:
  - Electric
  - Sewage
  - Potable Water
- Secure fuel supply lines at fuel docks:
  - Hyde Street Harbor
  - Gas House Cove
- Instruct personnel to don personal floatation devices.
- Identify and assign post Tsunami response personnel and resources.
- Provide information and progress updates to Departmental Operations Center or Emergency Operations Center.



富嶽三十六景 神奈川沖  
波裏

**Thank You!**

**TsunamiZone.ca.gov**

**tsunami.ca.gov**

**myHazards.CalOES.ca.gov**

**tsunami.gov**