

CITY OF SANTA BARBARA WATERFRONT DEPARTMENT

MEMORANDUM

Date: November 19, 2015
To: Harbor Commissioners
From: Scott Riedman, Waterfront Director
Subject: **Winter Storm Preparations**

RECOMMENDATION:

That Harbor Commission receive a staff report on winter storm preparations throughout the Waterfront.

BACKGROUND:

The El Niño Southern Oscillation (ENSO) is a climatic condition whereby sea surface temperatures (SSTs) in the eastern Pacific Ocean are considerably higher than normal. This condition has been associated with powerful storms hitting southern California bringing heavy rainfall and high surf. Recent ENSO monitoring indicates that SSTs are consistent with those observed in 1997, a winter characterized by some of the heaviest rainfall on record and large waves. Although there is no guarantee this winter will be out of the ordinary, past experience dictates that preparing for winter storms may be more important this year than in the recent past.

The Waterfront is vulnerable to coastal storms in many ways. The most significant is from heavy surf coinciding with high tides. Flooding from local creeks and storm drains can also impact the Waterfront but those drainages are maintained by Public Works with little preparation necessary by the Waterfront Department. Winter storm preparations focus primarily on the potential impact from large waves.

DISCUSSION:

Winter storm preparation can best be described in the context of *existing protection*, *proposed protection*, *clean up*, and *notification*.

Existing Protection

The breakwater is Santa Barbara Harbor's primary protection from winter storms. Completed in 1930, the breakwater has been improved in a variety of ways. An extension was added in the 1970s essentially "anchoring" the sand spit that formed a natural protective barrier from southeast wind and swell. A short addition to the breakwater extension was added in 1983 after one of the worst winters ever, to provide additional protection from southeast wind and waves. The breakwater cap, consisting of a sidewalk

and parapet wall, was added not long after the original construction. The cap was most recently replaced between 2004 and 2010, raising the wall an additional 7". Although the breakwater and its extension provide protection from most storms, extreme storms, when large swells coincide with higher tides, allow some wave energy to wash into the harbor creating very rough conditions on the docks.

The Waterfront has been particularly vulnerable west of the harbor beyond the protection of the breakwater. A wave run up wall was constructed between the 132 building and the Santa Barbara Yacht Club (SBYC) extending to the boatyard. Large waves have historically washed under SBYC (built on piles that allows wave energy to pass underneath the building) and into the harbor commercial area. The wave run up wall has reduced the frequency and severity of this occurrence although the risk of flooding the harbor commercial area still exists.

Stearns Wharf is particularly vulnerable to large waves. After the Moby Dick Restaurant fire in 1998, that section of the wharf was rebuilt 18" higher to help large waves pass under the wharf. Piles under the wharf are inspected regularly and replaced as necessary. Although guidelines to maintain the structural integrity of the wharf focus on its load bearing capacity, staff maintains the wharf at the highest recommended capacity to maximize its resilience to large waves as well.

Emergency generators have been installed at both the harbor and Stearns Wharf. These generators activate automatically during a power outage. The emergency generators power utilities, lights, and other key facilities to allow for emergency operations during storms.

Proposed Protection

Several years ago a study was commissioned to consider ways to protect Waterfront property west of the harbor. The study concluded that annual construction of a sand berm was the most feasible means of protecting that area. A relatively large sand berm is constructed every year extending from in front of SBYC westward wrapping around the maintenance yard. The sand berm has proven very effective over the years but is limited to providing protection for one large swell (coinciding with high tide) at a time. Depending on the size and duration of large swells, the berm can wash away quickly, requiring reconstruction on short notice prior to the next large swell. Although rebuilding the sand berm has not been required the last couple winters, there have been years when it was rebuilt multiple times. This winter's sand berm has been constructed and the contractor and funds are available to have it rebuilt several times this winter as necessary.

Concrete highway barricades known as K-rail are installed in key locations to minimize flooding from large waves that overtop the sand berm. The entrance SBYC is one location where K-rail is located. Other areas have been considered but the effectiveness of K-rail is limited when directly exposed to large waves.

Despite construction of a sand berm and placement of K-rail, the harbor commercial area can still be flooded by large waves, as happened on March 1, 2014. Sand bags are

provided to Waterfront tenants at the 117 and 125 buildings as well as the Shoreline Beach café to prevent water from entering those businesses.

Boats and other equipment located in SBYC's dry storage area and the maintenance yard can be exposed to large waves. The launch ramp is made available for relocation of these boats and equipment when large swells are forecast.

The City Pier is the most protected facility in the harbor. Large local commercial fishing vessels, large transient vessels, and the bait barge are relocated to the City Pier when high winds and/or large waves are forecast. The dredge typically moors just inside the breakwater extension and provides a secure platform for other dredge equipment such as the floating pipe, cable barge, and dredge tender. This equipment is monitored by the dredge contractor and Harbor Patrol during storms to make any necessary adjustments to mooring tackle.

A large inventory of chains, binders, ropes, and piles are kept at the maintenance yards. Securing floating assets such as boats, docks, dredge equipment, and the bait barge is a top priority for staff during storms. Enough heavy timber is on hand to rebuild several bents of the Stearns Wharf roadway if damage to the wharf is extreme. Furthermore, staff has good relationships with several local contractors to assist before, during and after storms.

Cleanup

Damage from winter storms can never be entirely prevented. Cleaning up after a storm is as important as limiting damage before and during a storm.

The City's Parks and Recreation Department has been instrumental in the rapid cleanup of parking lots after storms, especially the Harbor West lot. Waterfront staff will also rent a loader and keep it on hand during the winter to assist cleanup efforts during and after storms.

Storm debris consisting of kelp and organic debris that washes down creeks has been known to deposit throughout the harbor and "lock" vessels in their slips. The Waterfront contracts with Cushman Contracting Corporation to pick up debris on the water throughout the year to maintain good water quality. Cushman is available throughout the year to increase their efforts as necessary to remove floating debris after storms.

The waters off East Beach offer year-round free anchoring. There are very few free anchorages in southern California and Santa Barbara's year-round anchorage is very popular. Anyone anchoring off East Beach is encouraged to berth inside the harbor during storms but not everyone does. Boats running aground during storms is a frequent occurrence with the responsibility for removing them often falling on the Waterfront. The Division of Boating and Waterways provides grant funds to clean up boats off the beach at little or no cost to the Waterfront. This program has grown over the years and is instrumental in keeping the beach clean of grounded boats as well as minimizing the financial impact on the Waterfront's budget.

Notification

The Waterfront Department operates two separate alert/messaging systems.

First, in cooperation with the Santa Barbara County Sheriff's Office, it manages a local Reverse 9-1-1 phone alert system that covers slip permittees, mooring permittees, Waterfront tenants and staff at the El Estero Wastewater facility. Reverse 9-1-1 is used when imminent, life-threatening danger is present and immediate action, such as evacuation, is recommended. To date, the system has only been used once: during the 2011 tsunami. Staff would not hesitate to use Reverse 9-1-1 in the face of a storm event that threatened people, boats, businesses or structures in the Harbor.

The other outreach method is a web-based messaging system, known as Blackboard Connect. It is used to send recorded voice messages to slip permittees, mooring permittees and tenants, typically for non-emergency situations like event announcements. It can, however, be used as backup to Reverse 9-1-1. During El Nino storms, Blackboard Connect would likely be used for updates related to facilities damage and repairs, harbor debris cleanup and general information related to storm preparedness and response.

CONCLUSION:

Waterfront Department staff has plans and equipment to prepare for, respond to, and clean up after winter storms. In addition, staff recommends that all boaters prepare for El Nino themselves, by tending to their vessels in the following ways:

- Early Warning: Monitor weather reports. Visit your boat before the next storm. If you can't check your boat, find a responsible person who can.
- Dock lines: Visually inspect for chafe, wear and trip hazards (please don't run mooring lines across fingers). Tie lines securely to cleats or pilings; consider chafing gear and doubling-up lines.
- Dock obstructions: Don't store skiffs or other items on the dock.
- Bilge check: Test your bilge pump to ensure that 1) it's working, 2) float switches properly activate the pumps; and 3) float switches aren't hindered by debris. Be sure limber holes aren't blocked. Close seacocks and check propeller and rudder shafts.
- Fenders: Have an adequate number of appropriate-sized fenders.
- Sails, rigging, tarps, loose gear on deck: Store or tightly secure.
- Hatches, ports and windows: Close and secure.

- Consider: Removing valuables and electronics, installing a dehumidifier or moisture absorber, propping up cushions and opening the boat during periods of fair weather to circulate air.

For assistance or to report problems contact Harbor Patrol at 564-5530 or on VHF channels 12 or 16.

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