

# Ventura County CCAMP

Technical Review of FEMA California Coastal Analysis and  
Mapping Open Pacific Coast Study  
Ventura County, California



Oxnard Workshop  
August 23, 2017



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# Technical Review Performed

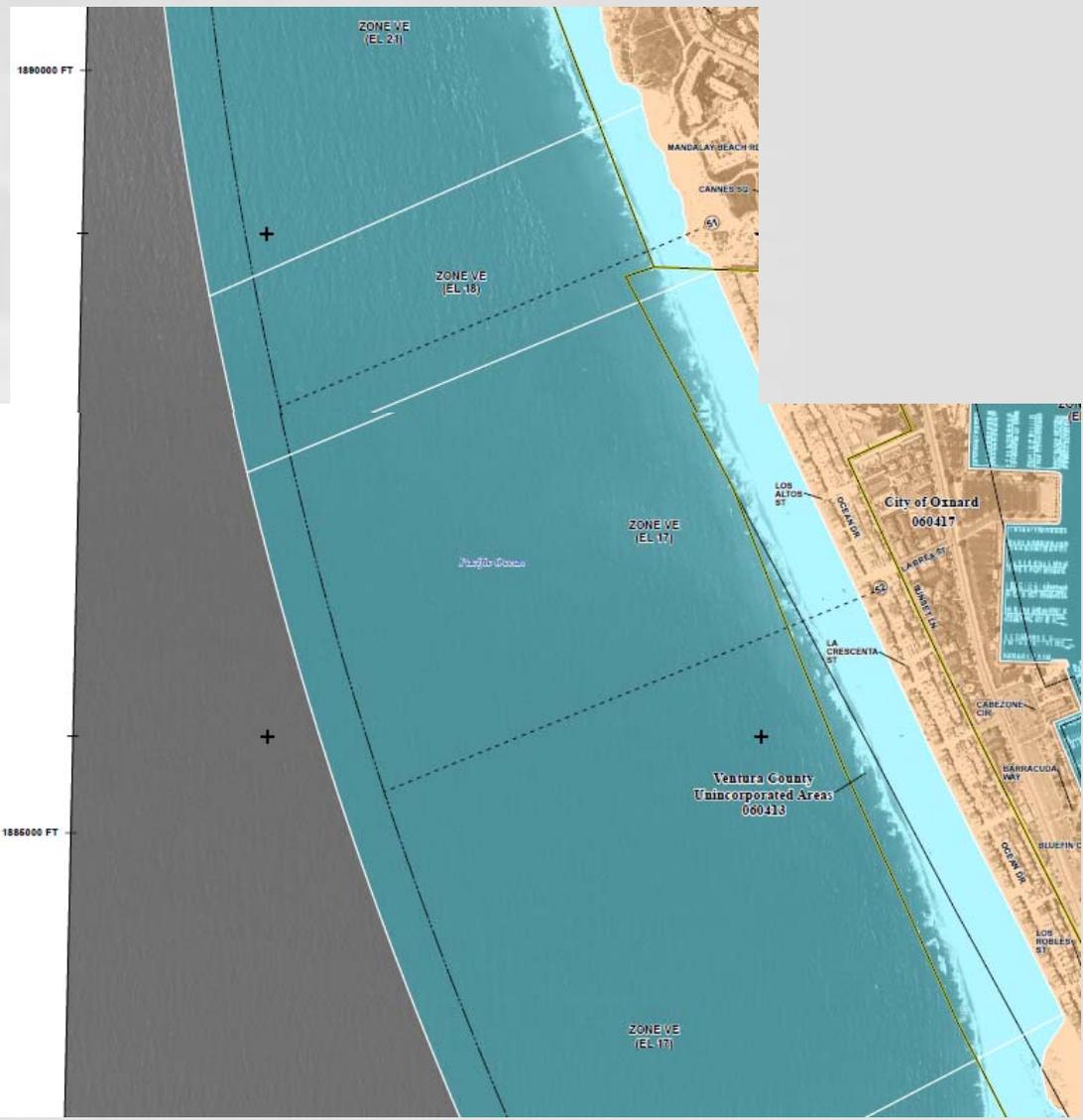
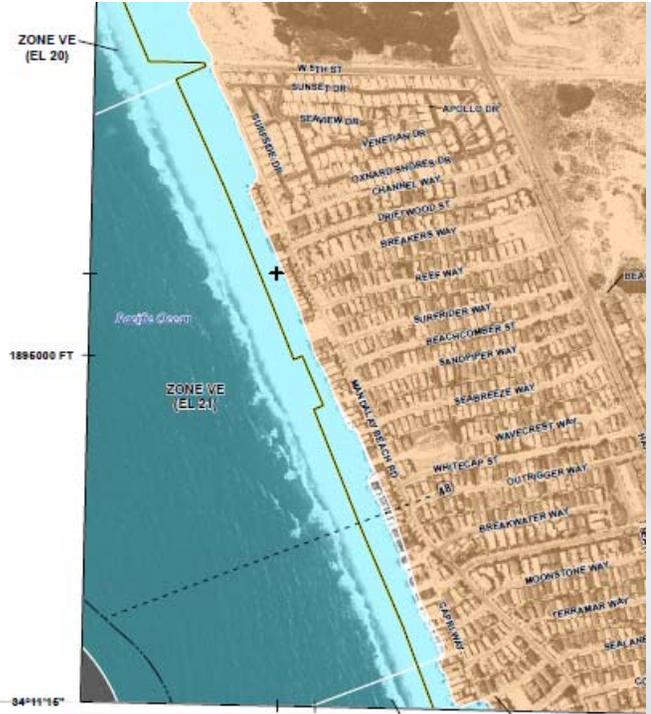
- FEMA methodology
- Applicability of the methodology
- Whether the right and all available data were used
- Whether analyses followed the methodology
- Identify areas of potential issues
- Provide recommendations

# City of Oxnard (#45 - #53)



PFIRM Panels  
0882F  
0884F  
0903F  
0911F

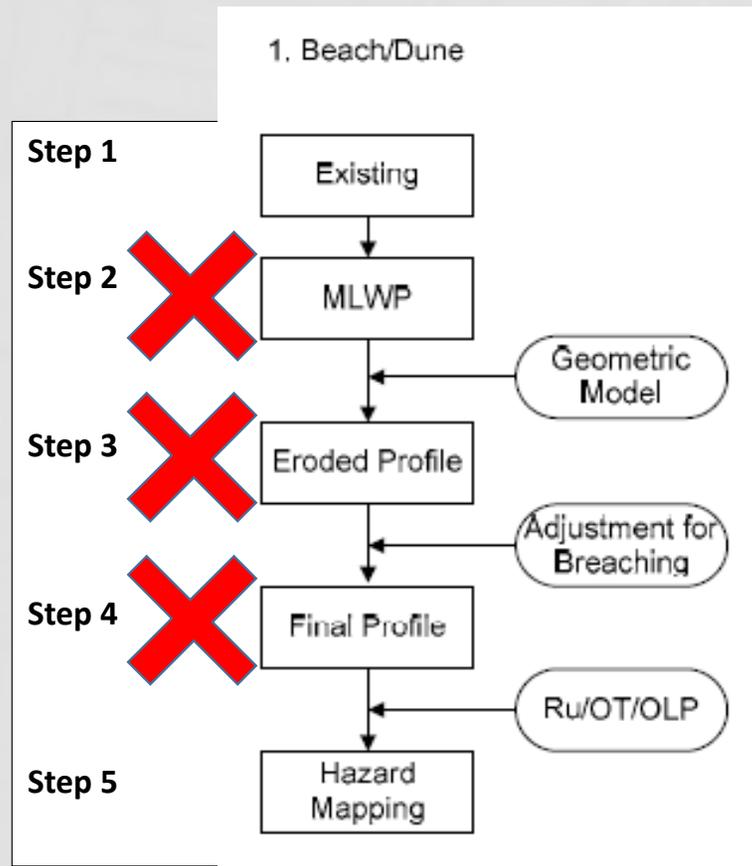




# General Findings Applicable to Oxnard

- FEMA Pacific Guidelines were not followed for Sandy Beaches.
- The following factors would result in underestimate of TWL
  - Most Likely Winter Profile is not calculated
  - Procedures for estimating eroded winter profiles during 1% annual flood conditions were not followed
  - Used wave breaker index for flat slope, underestimating wave height
- The following factor would result in overestimate of TWL:
  - Reduction due to oblique wave approach was not considered
- AE zone mapping errors for the reach between transects 44 and 45, and between 46 and 47
- Minimum mappable distance criterion: A 35-foot minimum distance criterion was applied in the mapping for transects with overtopping.

# Procedures for Sandy Beach Based on FEMA Guidelines



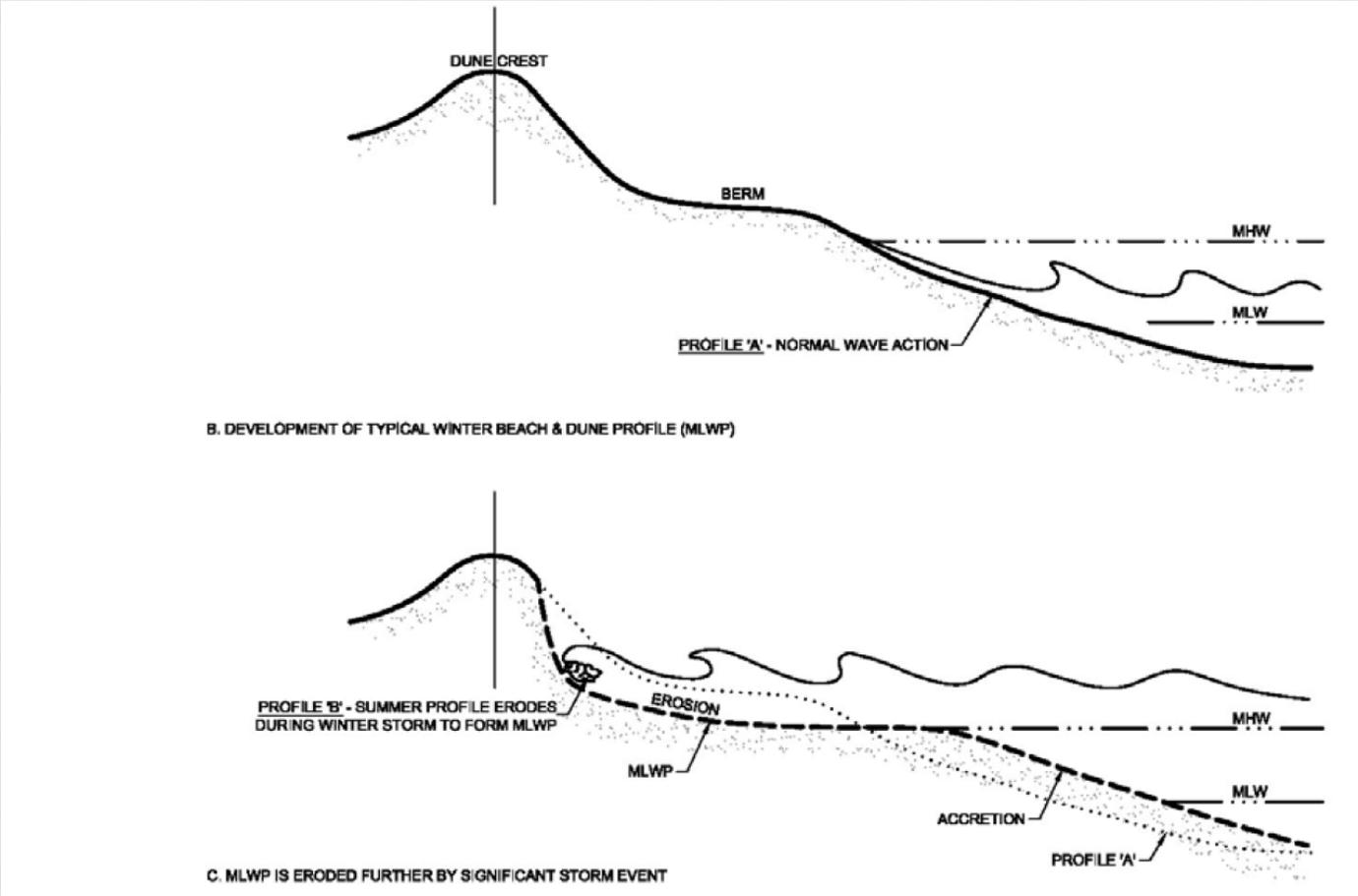
MLWP = Most Likely Winter Profile

Ru = the wave runup

OT = overtopping

OLP = overland wave propagation

# Most Likely Winter Profile Analysis – Not Performed

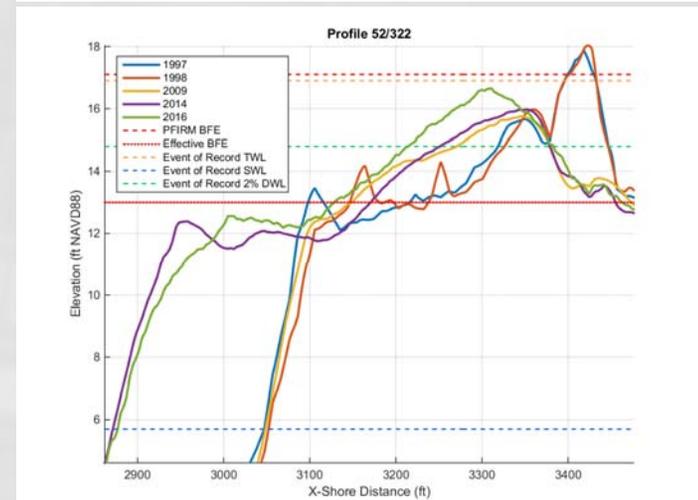
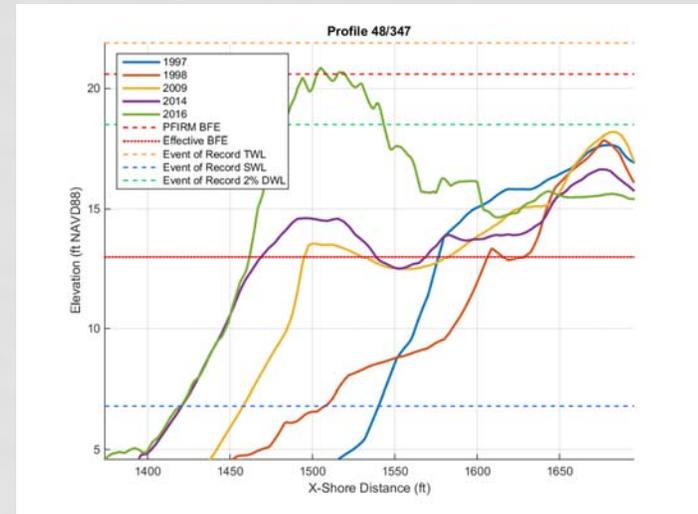


# Site 5: Oxnard Shores (Transects 47–52)

- BFE Changes:
  - Overall: 13 ft (effective) → 17.1–21.3 ft (PFIRM)
- Identified Issues:
  - Adjacent transects show substantial variability
  - Differences in the wave period and still water level used from the same storm event
  - Geomorphic variability in beach slopes affect wave runup elevations.
  - Site has larger waves in the north near Santa Clara River that decrease to the south: pattern was not reflected in the FEMA TWL data
  - The transect based analysis does not consider the widening of the beach due to the changes in dredging
  - Did not use a MLWP to adjust the slope followed by application of the dune erosion before the wave runup analyses
  - Limitation of the method likely under predicts potential flood elevations and extents

# Site 5: Oxnard Shores (Transects 47–52)

- Recommendations:
- Argument 1:
  - At Mandalay Generating station (#47), FEMA did not follow Pacific Guidelines.
  - Could be Primary Frontal Dune, most likely winter profile was not calculated
  - Storm conditions appeared to have lower wave period than surrounding transects
- Argument 2:
  - At residential sites, used different storms of record with varying periods between transects with no consideration of MLWP or dune erosion
  - Full and correct application of Pacific Guidelines could increase the BFE at these locations

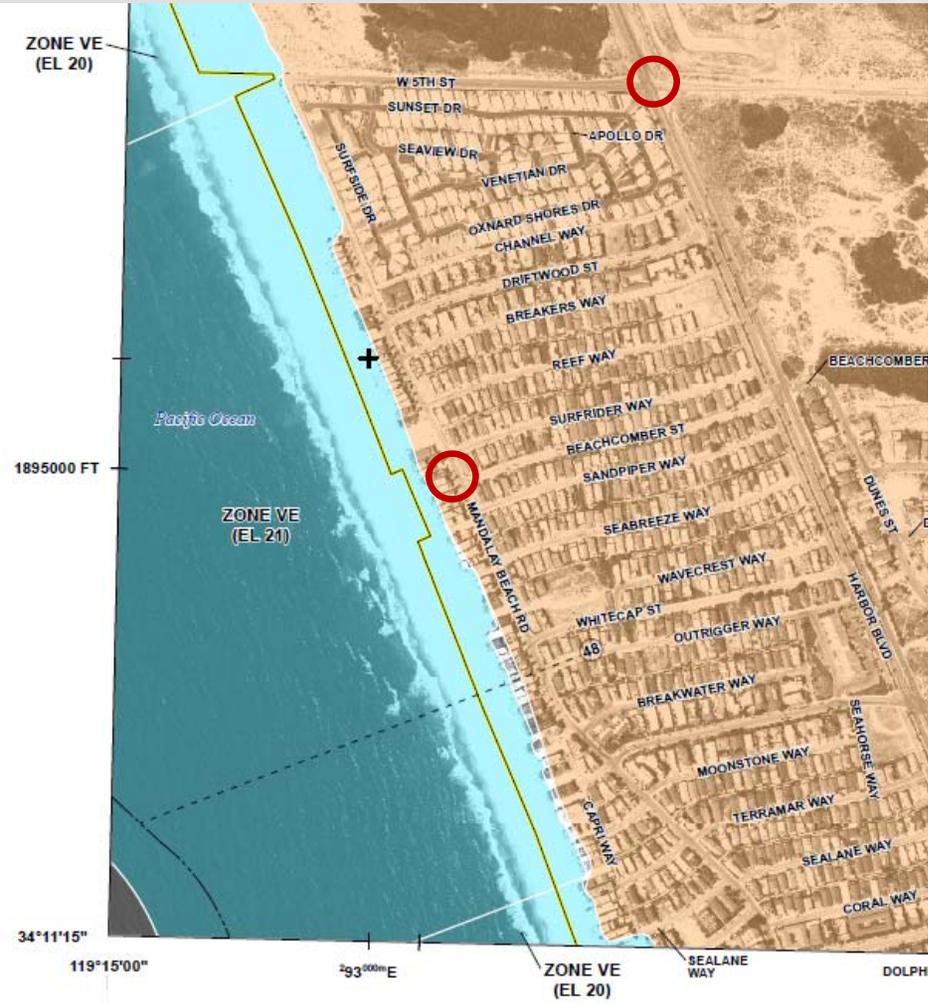


# General Review Results

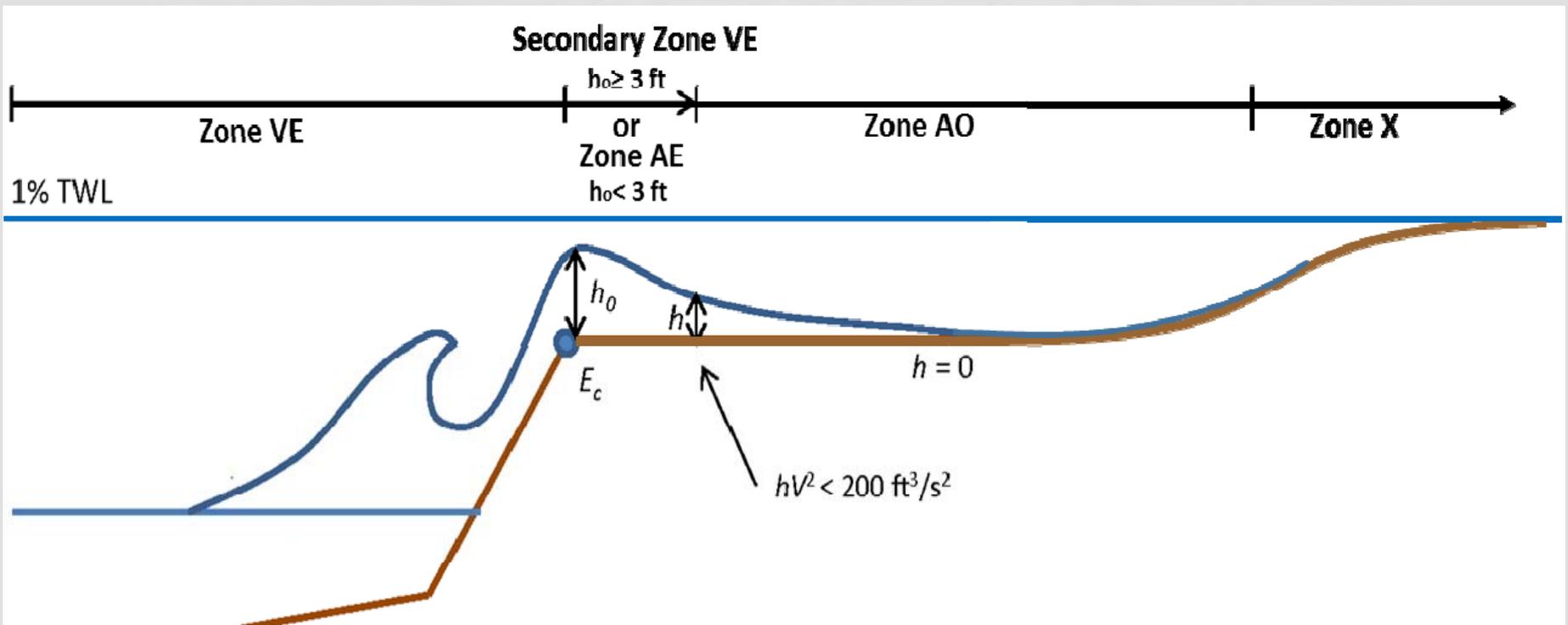
PFIRM Transect No.	Analysis Transect No.	Effective BFE (FT, NAVD88)	PFIRM BFE (FT,NAVD88)	Extreme TWL(Over-/Under-estimate/ Acceptable)	Overtopping/ Overland Flow	Record event (Date/Time)	Peak Period (second)
45	383	13	19.4	U - slope and waves seem low	N	1/18/88 7:00	15.9
46	375	13	19.3	U - slope and waves seem low	N	1/18/88 8:00	14.4
47	359	13	20.1	U - waves seem low	N	1/18/88 8:00	14.4
48	347	13	20.6	U - waves seem low	Y	1/18/88 8:00	15.9
49	342	13	20.1	U - waves seem low	Y	1/18/88 8:00	15.9
50	338	13	21.3	A	N	1/18/88 7:00	15.9
51	330	13	18.3	U - waves seem low	N	3/2/83 0:00 1/18/88 10:00	17.5 14.4
52	322	13	17.1	U - waves seem low	Y	3/2/83 0:00 1/18/88 8:00	17.5 11.9
53	308	16	10.8	O - wave should be more sheltered	Y (only 0.2%)	1/27/83 8:00 1/18/88 8:00	15.9 11.9

Note: U - Underestimate  
A – Acceptable  
O - Overestimate

# Oxnard Shores



# Flood Zones



# Flood Zones

## Zone VE

Coastal Hazard areas where waves and fast moving water can cause damage during the 1-percent-annual-chance flood, this includes:

- The breaking wave height zone – where 3 feet or greater wave heights could occur.
- The wave runup zone – where the ground profile is 3 feet or more below the 2% wave runup elevation and where the runup height above the Stillwater elevation (SWEL) is greater than 3 feet.
- The wave overtopping splash zone – the landward distance that water from waves could splash over the top of the beach/dune or top of a coastal structure.
- The high-velocity flow zone – the landward distance that water from waves that splash over the top of the beach/dune or top of a coastal structure could be moving fast ( $\geq 200 \text{ ft}^3/\text{sec}^2$ ).
- The primary frontal dune – the landward limit of a beach dune (heel) where the slope changes from steep to mild.

# Flood Zones

## Zone AE

Areas that could be inundated by the 1-percent-annual-chance flood. Many of these zones that were calculated are too small to be shown on the maps (width less than 35 feet) and are combined with zone VE). The criteria include:

- Wave heights less than 3 feet.
- Runup heights less than 3 feet above the still water level.
- TWL is less than 3 feet above ground elevation.

- **Zone AO**

Areas of shallow and slow moving floodwaters below the criteria for zone AE. Due to map scale limitations, many of these zones that were calculated are too small to be shown on the maps and are combined with zone AE or zone VE.

# Flood Zones

## Zone X

Flood hazard areas that could be inundated by the 0.2-percent-annual-chance flood or inundated by the 1-percent-annual-chance flood hazard with average depths of 1 foot or less. Area determined to be outside the 0.2-percent-annual-chance floodplain is unshaded.



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THANK YOU!

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