Appendix 1: Model output at locations inside San Francisco Bay

ID	Name	Latitude	Longitude
1	BP West Coast Products Richmond	37.9133	237.6342
3	Chevron USA, Inc., Richmond	37.9225	237.5892
5,12	Kinder Morgan and ConocoPhilips, Richmond	37.9167	237.6350
6,11	IMTT and Shore Terminals LLC, Richmond	37.9208	237.6317
7	Shell Oil Products, US, Martinez	38.0325	237.8758
9	Pacific Atlantic Terminals, Martinez	38.0467	237.8983
10	Pacific Atlantic Terminals, Selby	38.0592	237.7592
13	ConocoPhillips, Rodeo Refinery	38.0542	237.7417
14	Tesoro, Inc. - Avon Wharf	38.0492	237.9092
15	Tesoro, Inc. - Amorco Wharf	38.0350	237.8775
16	Valero Refining Berth 1, Benicia	38.0367	237.8817
17	Valero Refining Berth 2, Benicia	38.0417	237.8600
18	Mirant Potrero LLC, San Francisco	37.7517	237.6317
19	Golden Gate, entrance to San Francisco Bay	37.8150	237.5200
20	Presidio (Fort Point)	37.8067	237.4167

Table A1-1: Name and locations of Marine Oil Terminals and other points of interests Inside San Francisco Bay.

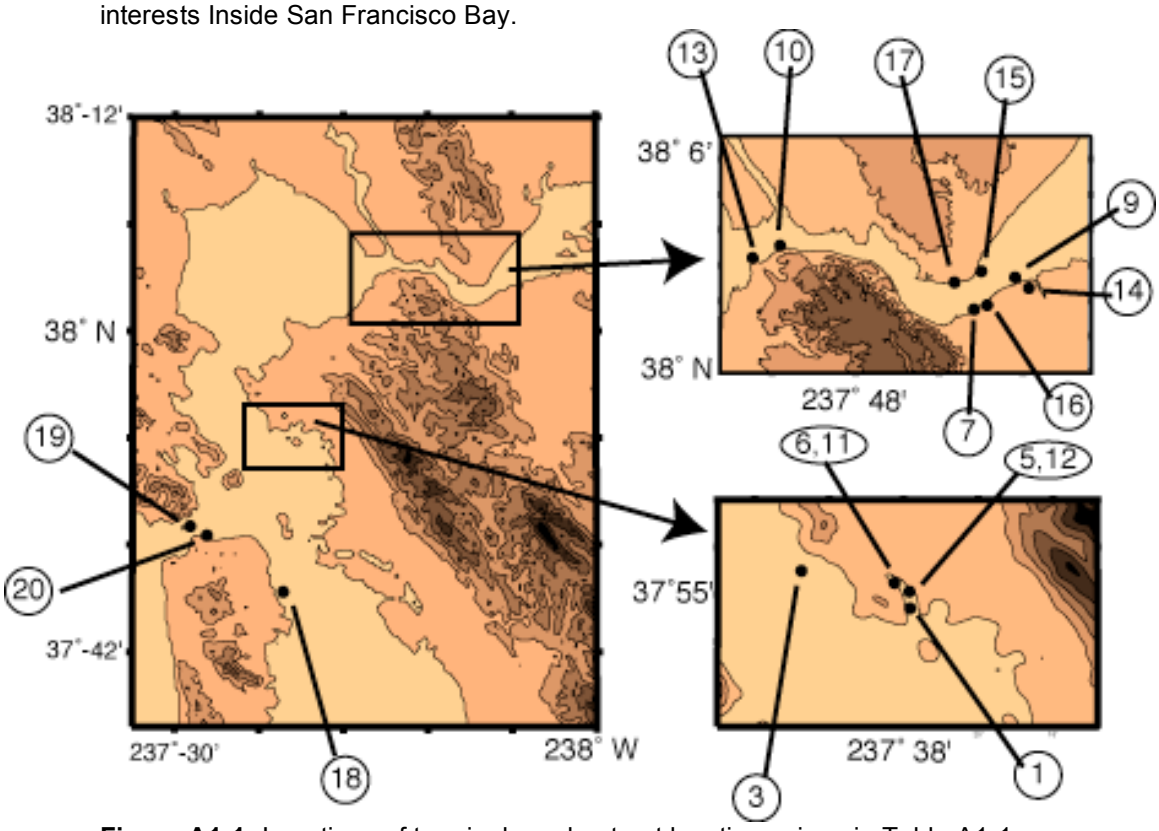


Figure A1-1: Locations of terminals and out put locations given in Table A1-1.

Case Name	L	W	disp	dip	rake	strike	depth	Mo	M_w
	(km)	(km)	(m)	deg	deg	deg	(km)	(Nm)	
Alaska 1964								7.80E+22	9.26
___Segment 1	400	200	10	10	90	218	5		
___Segment 2	300	300	20	9	75	241	15		
Aleutian I	500	100	10	n/a	90	n/a	5	1.50E+22	8.78
Aleutian II	500	100	10	n/a	90	n/a	5	1.50E+22	8.78
Aleutian III	700	100	25	n/a	90	n/a	5	5.25E+22	9.15
Kuril I	1000	100	9	n/a	90	n/a	5	2.70E+22	8.95
Kuril II	400	100	10	n/a	90	n/a	5	1.20E+22	8.72
Kuril III	400	100	10	n/a	90	n/a	5	1.20E+22	8.72
Kuril IV	400	100	10	n/a	90	n/a	5	1.20E+22	8.72
Japan I	900	100	5	n/a	90	n/a	5	1.35E+22	8.75
Japan II	400	100	10	n/a	90	n/a	5	1.20E+22	8.72
Chile 1960	1000	100	20	n/a	90	n/a	5	6.00E+22	9.26
Chile North	1400	100	25	n/a	90	n/a	5	1.05E+23	9.35
Cascadia I	600	100	10	n/a	90	n/a	5	1.80E+22	8.84
Cascadia II	800	100	11.1	n/a	90	n/a	5	2.70E+22	8.95
Cascadia SN	-	-	-	-	-	-	-	4.61E+21	8.4
___Segment 1	150	80	8	10	90	350	5		
___Segment 2	90	80	8	10	90	340	5		
Cascadia SW	-	-	-	-	-	-	-	5.76E+21	8.5
___Segment 1	150	100	8	10	90	350	5		
___Segment 2	90	100	8	10	90	340	5		
Cascadia SP2	-	-	-	-	-	-	-	5.54E+21	8.5
___Segment 1	150	100	8	10	90	350	5		
___Segment 2	90	30	4	10	90	340	5		
___Segment 3	90	70	8	10	90	340	10		
___Segment 4	90	10	4	20	90	310	5		
Hayward-Rodgers Creek	10	18	1.5	70	-90	40	5	8.10E+18	6.61
San Gregorio	50	15	2	60	90	320	5	4.50E+19	7.10

Table A1-2 – Summary of source parameters used for each scenario. Strike values for the far-field sources derived from the FACTS database are listed as 'n/a' since they are dependent on the local curvature of the subduction zone

1964 Alaskan Tsunami

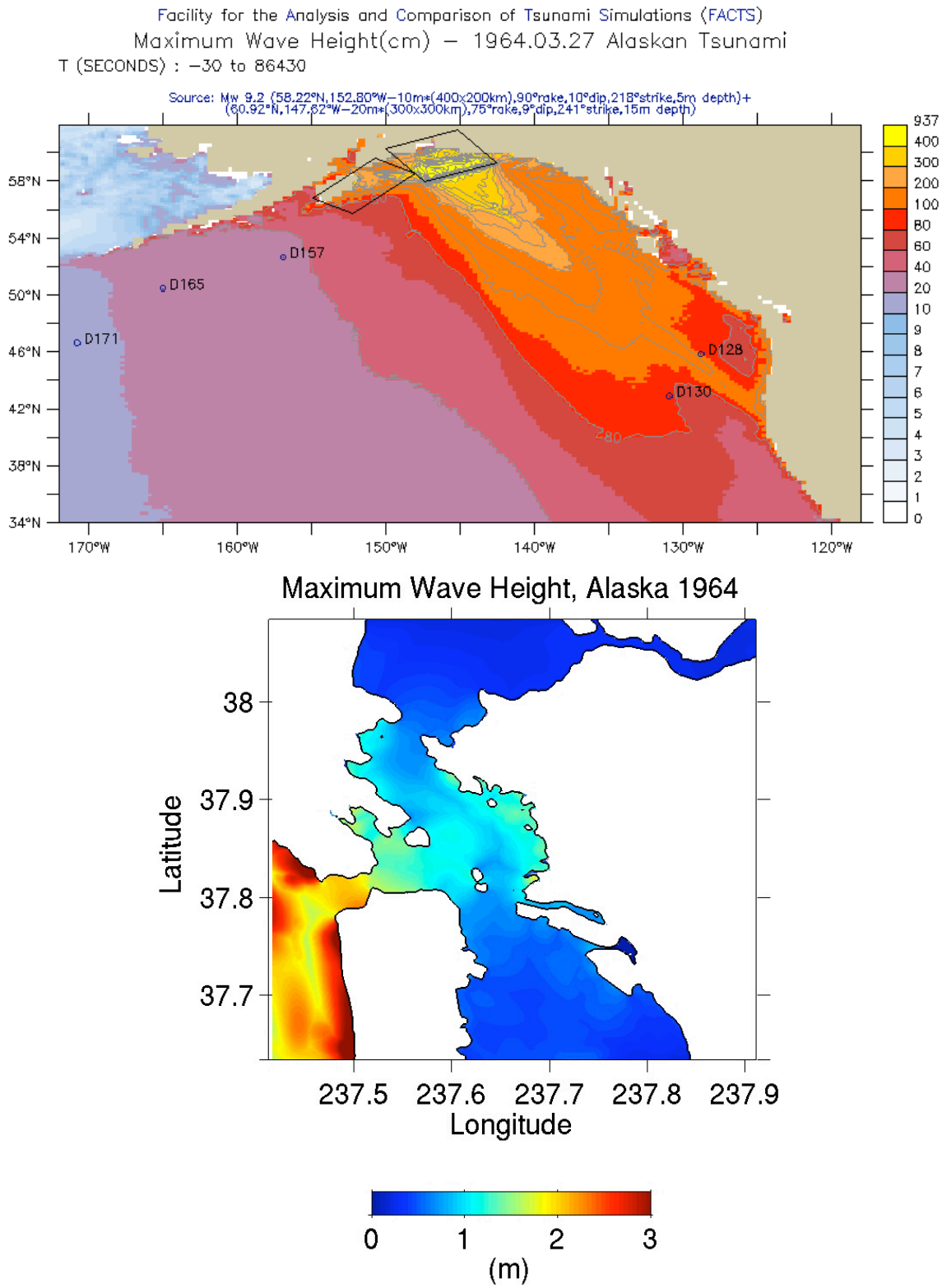
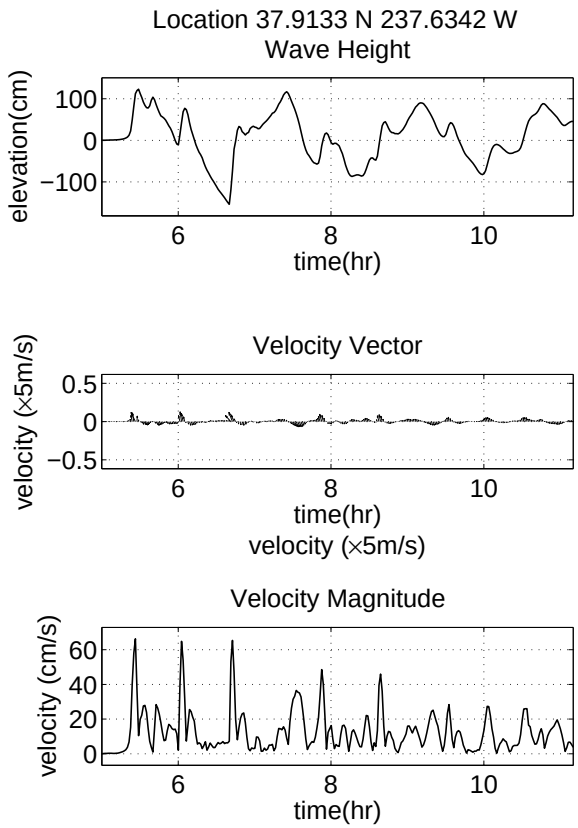
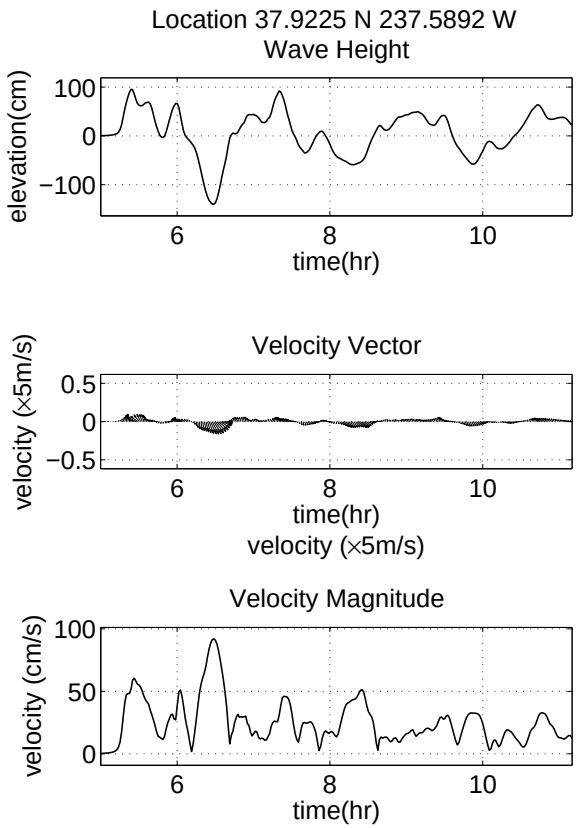


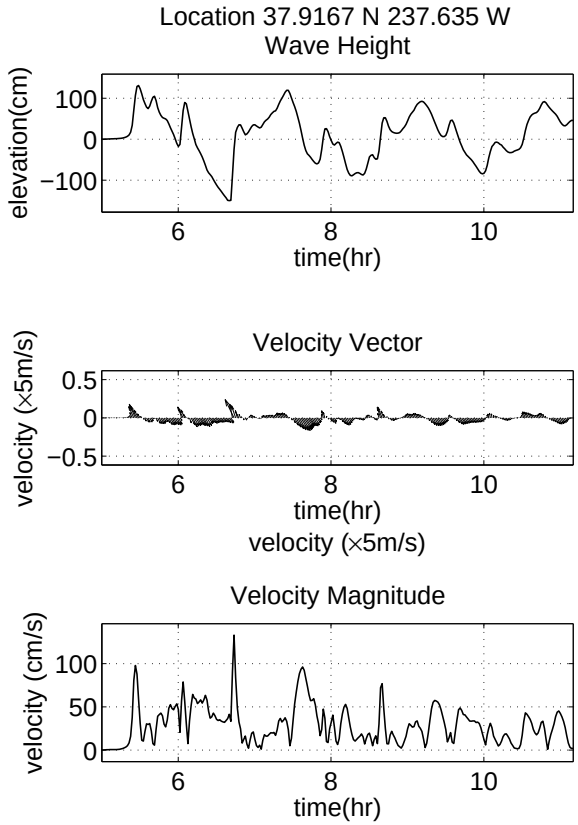
Fig. A1-2 – Maximum wave heights for tsunami simulation, basin wide (upper panel) and in San Francisco Bay (lower panel).



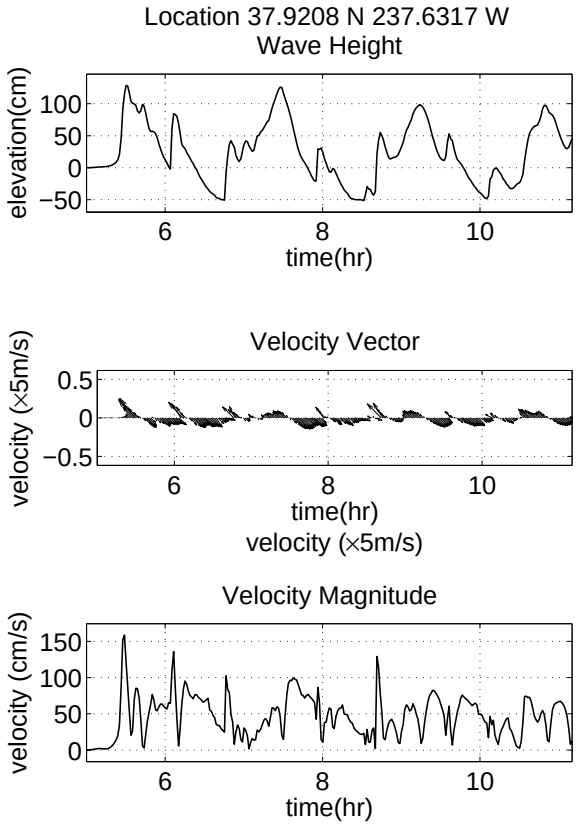
(1) BP West Coast Products, Richmond



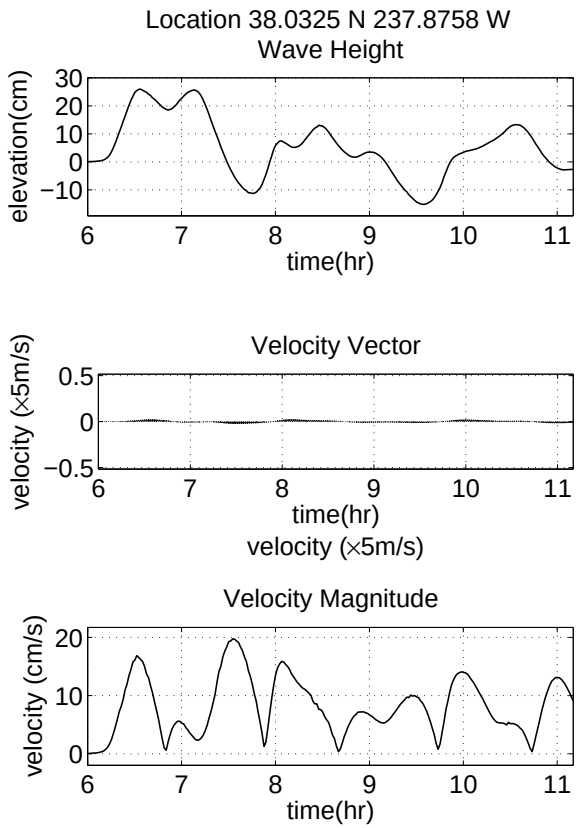
(3) Chevron USA, Inc., Richmond



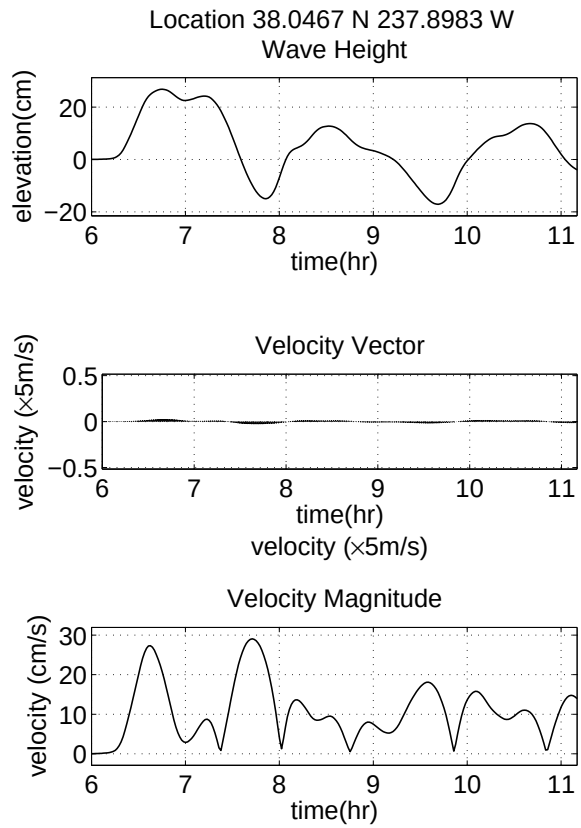
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



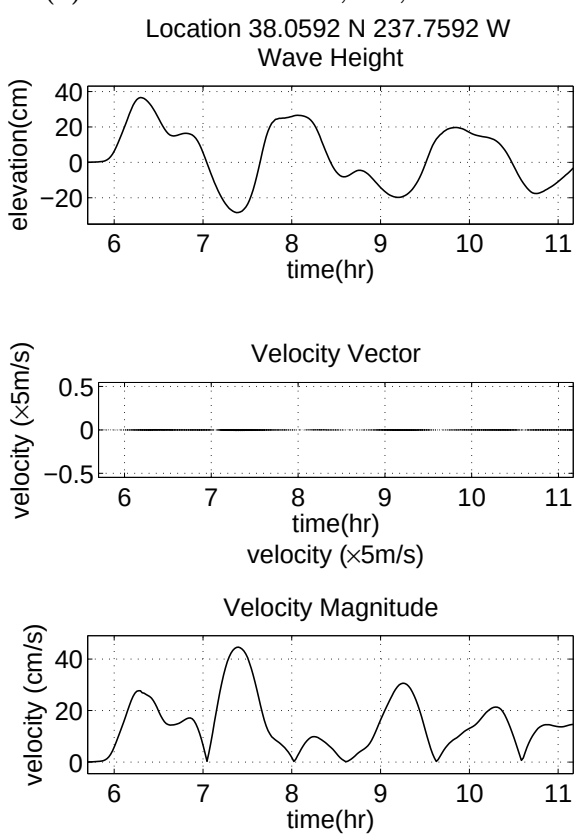
(6, 11) IMTT/Shore Terminals LLC, Richmond



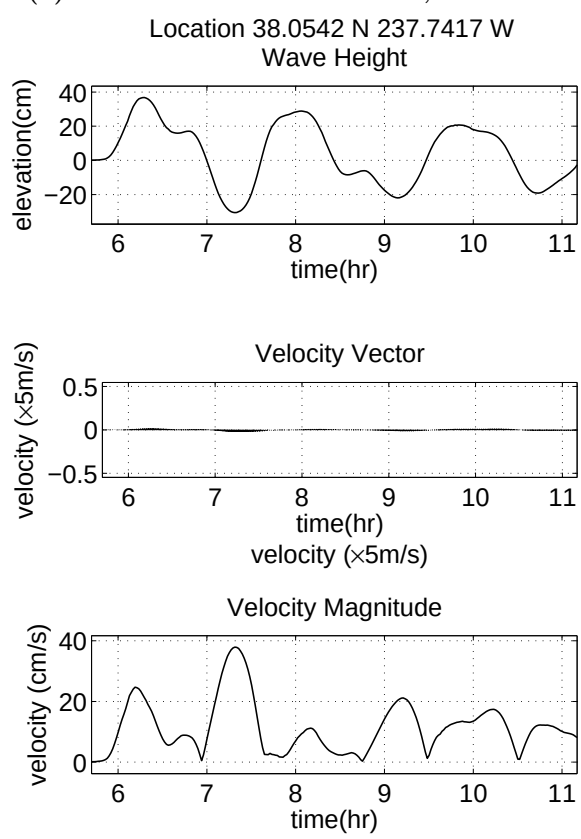
(7) Shell Oil Products, US, Martinez



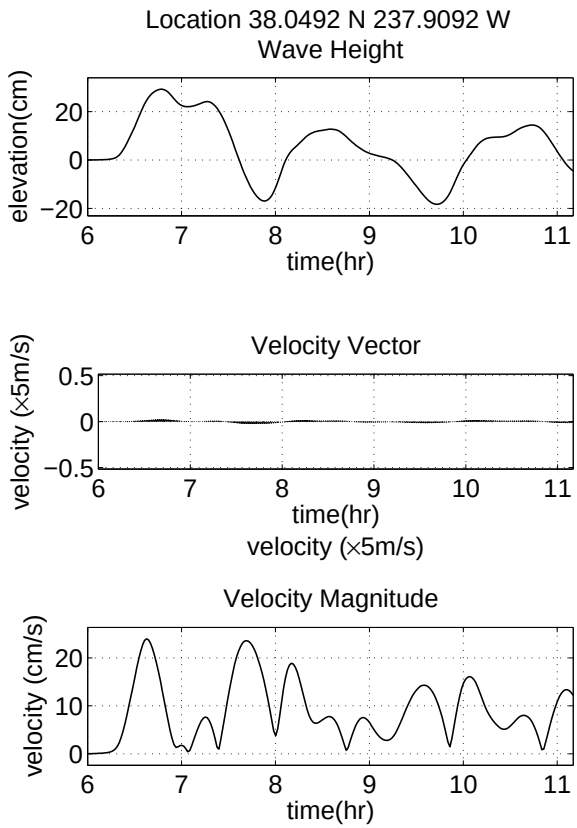
(9) Pacific Atlantic Terminals, Martinez



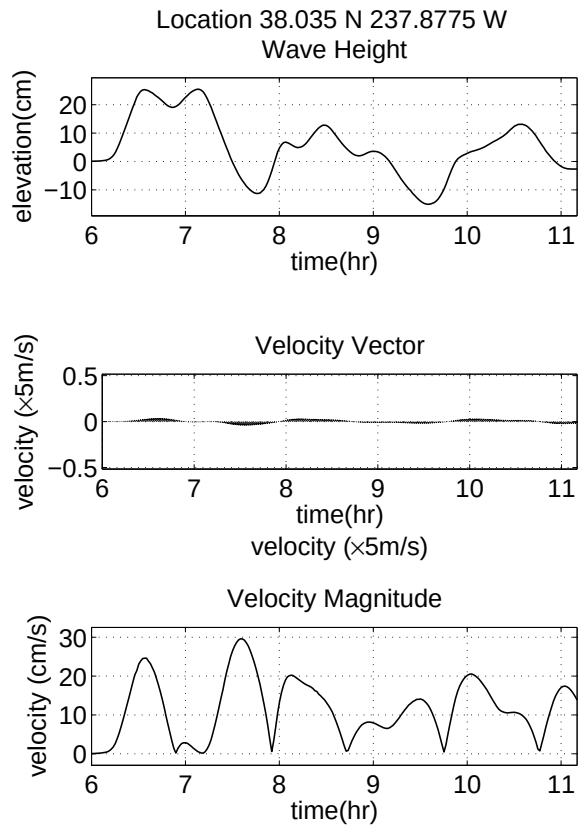
(10) Pacific Atlantic Terminals, Selby



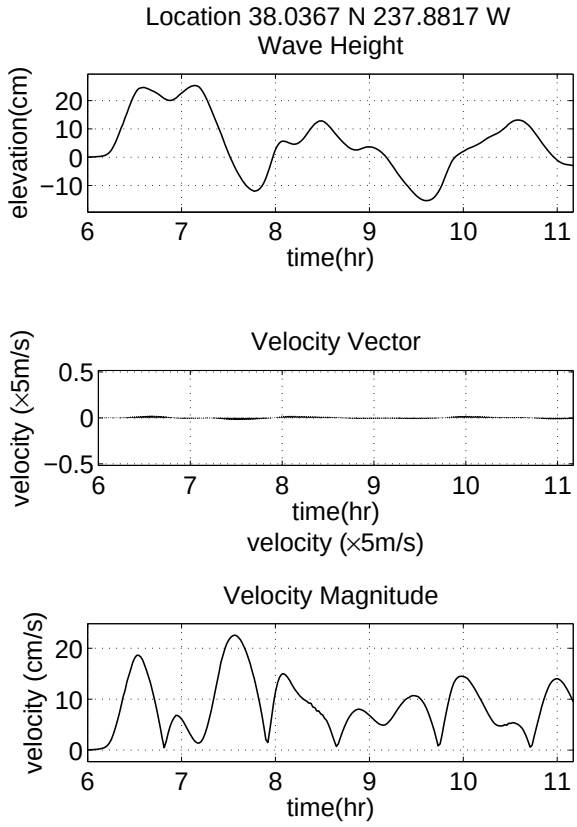
(13) ConocoPhillips, Rodeo



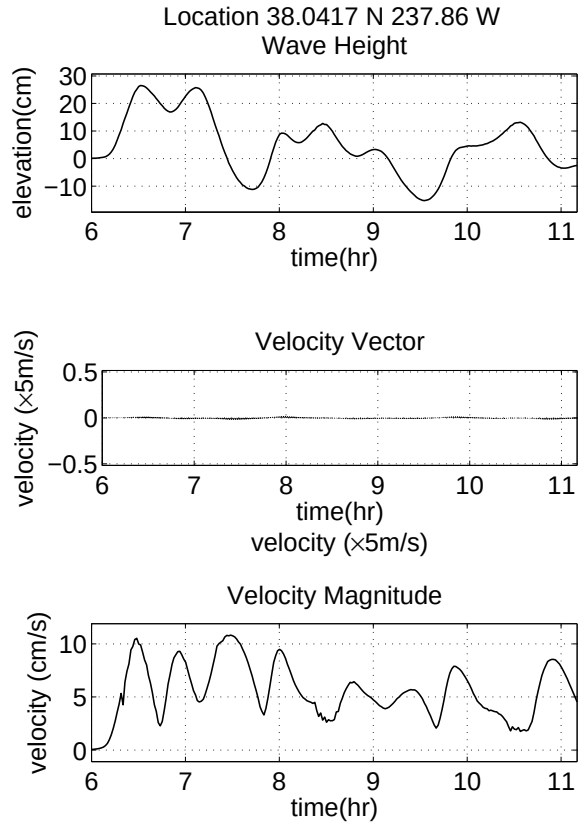
(14) Tesero, Inc. - Avon Wharf



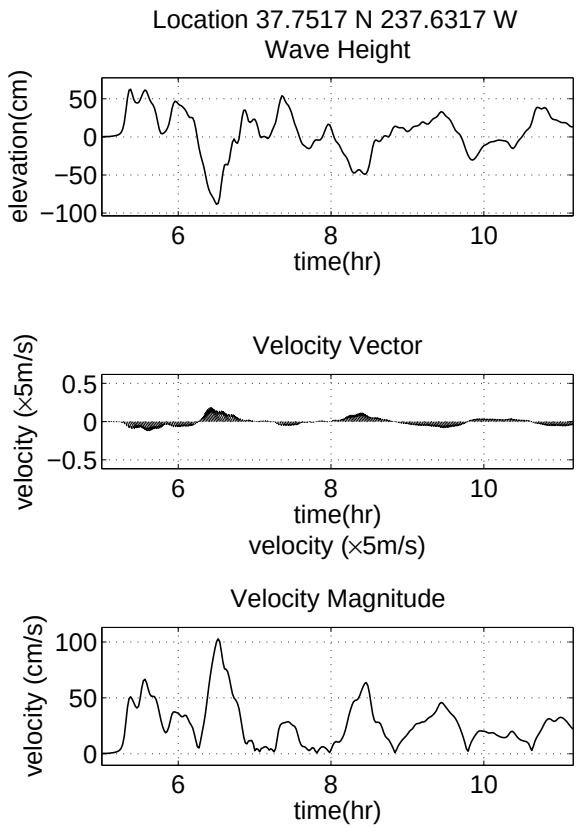
(15) Tesero, Inc. - Amorco Wharf



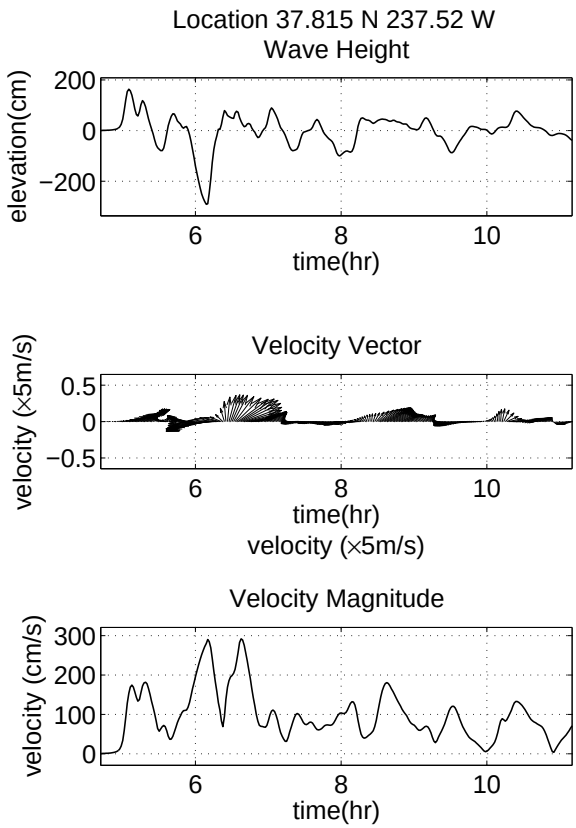
(16) Valero Refining Berth 1, Benicia



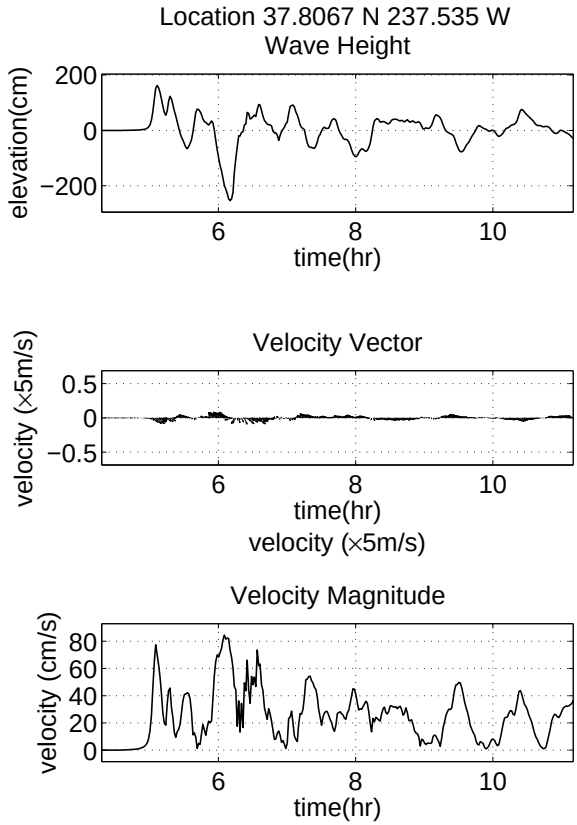
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco



(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Aleutians I

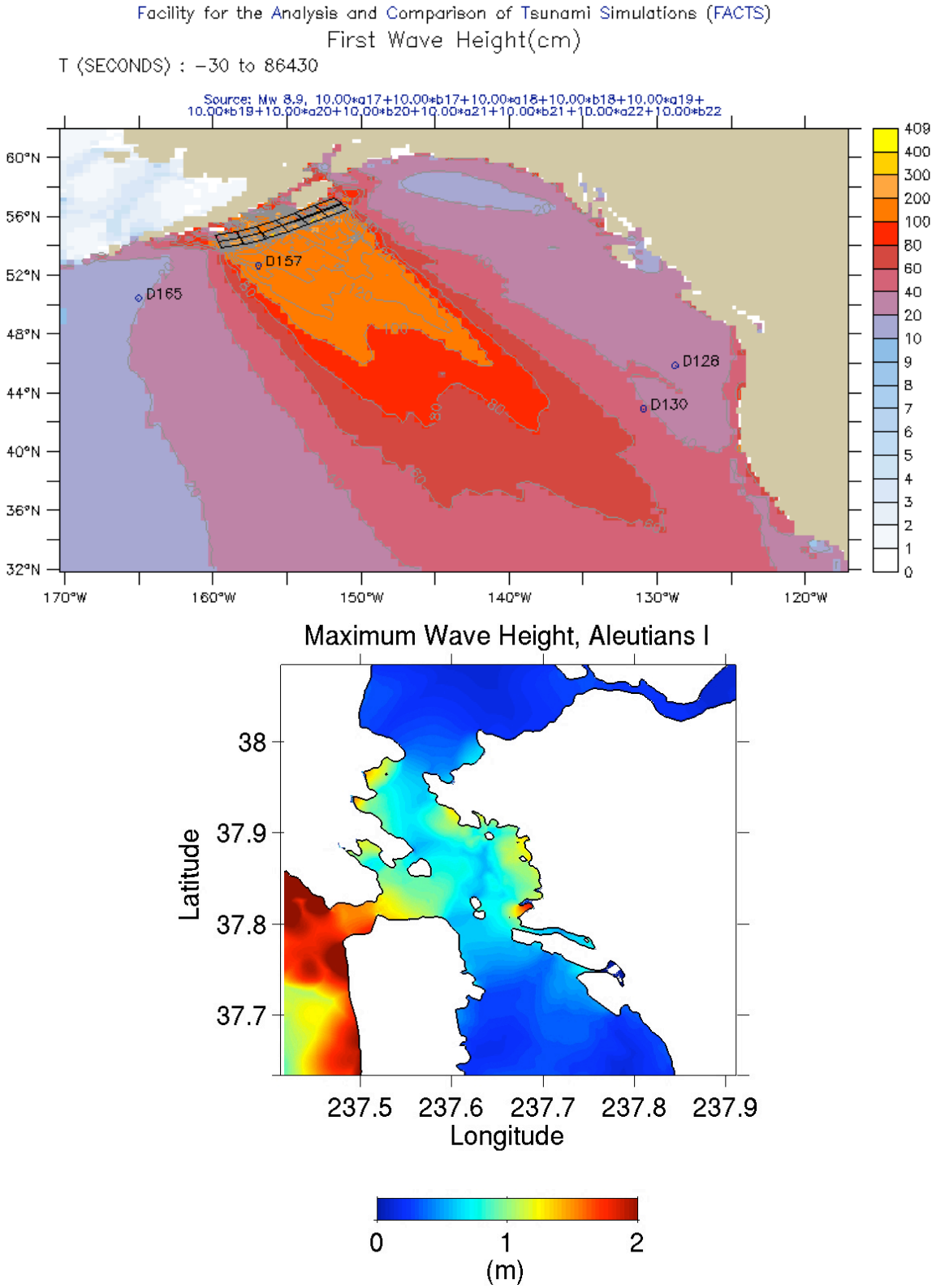
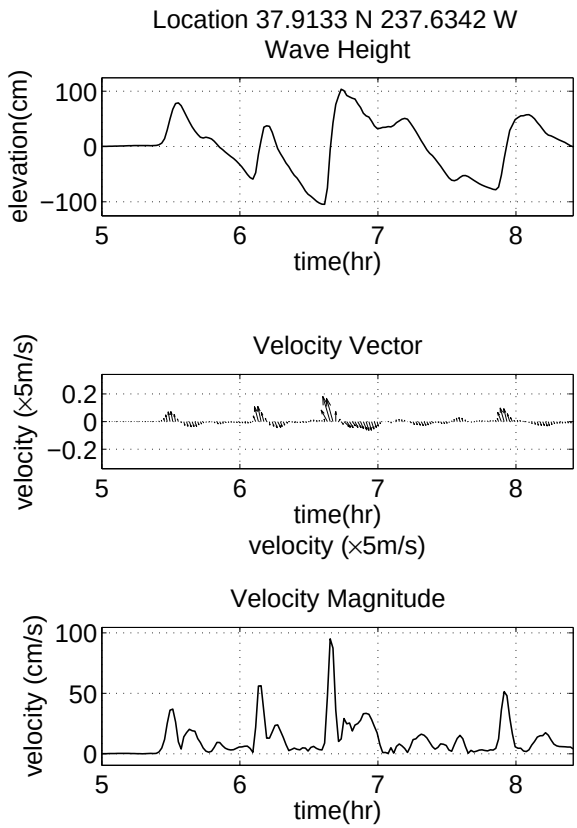
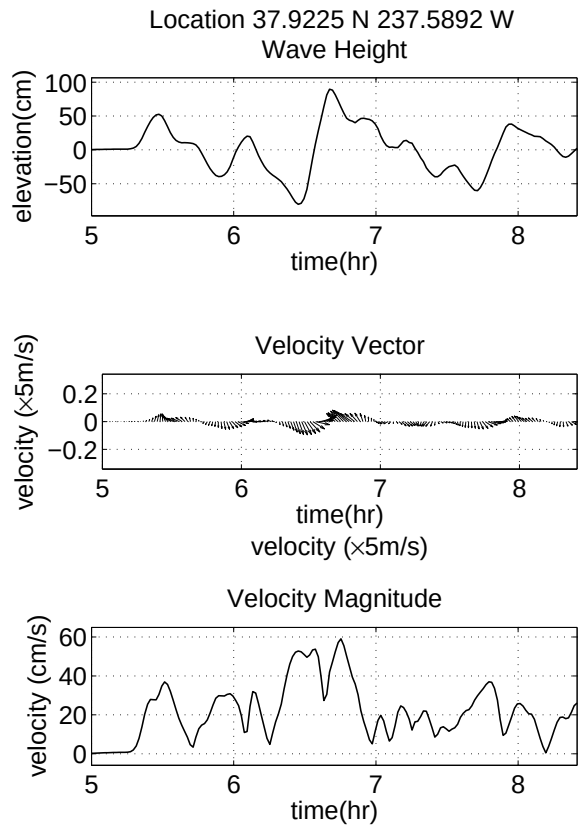


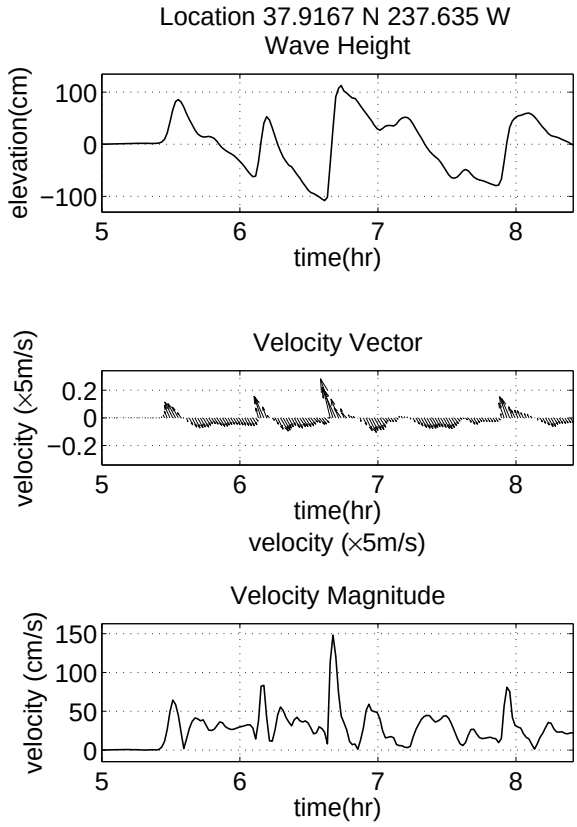
Fig. A1-3 – Maximum wave heights for tsunami simulation, basin wide (upper panel) and in San Francisco Bay (lower panel).



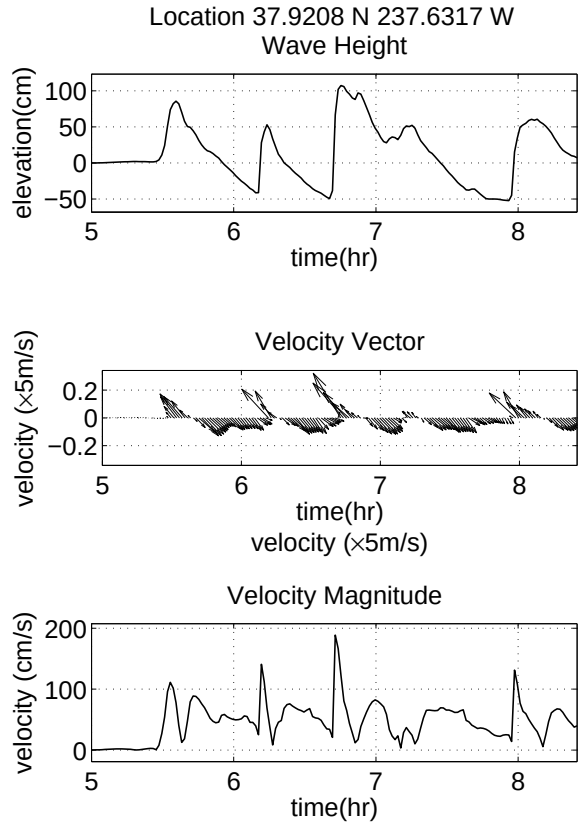
(1) BP West Coast Products, Richmond



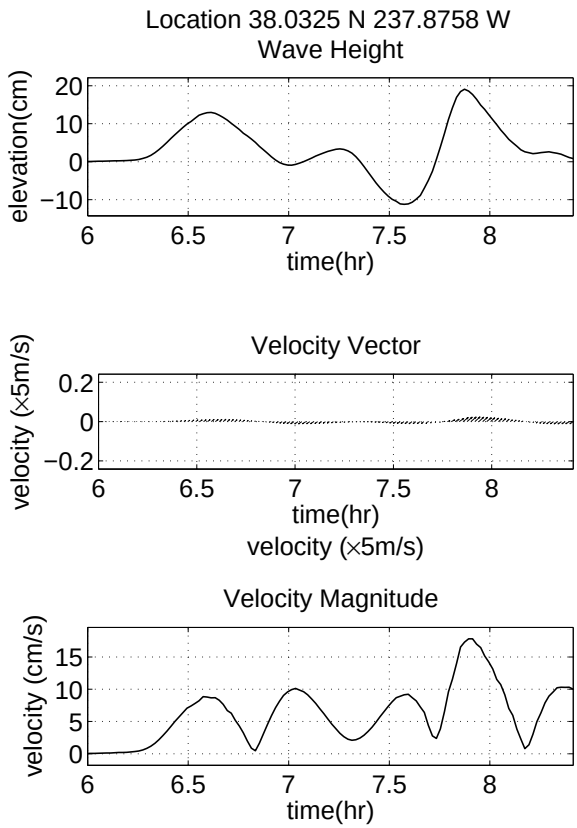
(3) Chevron USA, Inc., Richmond



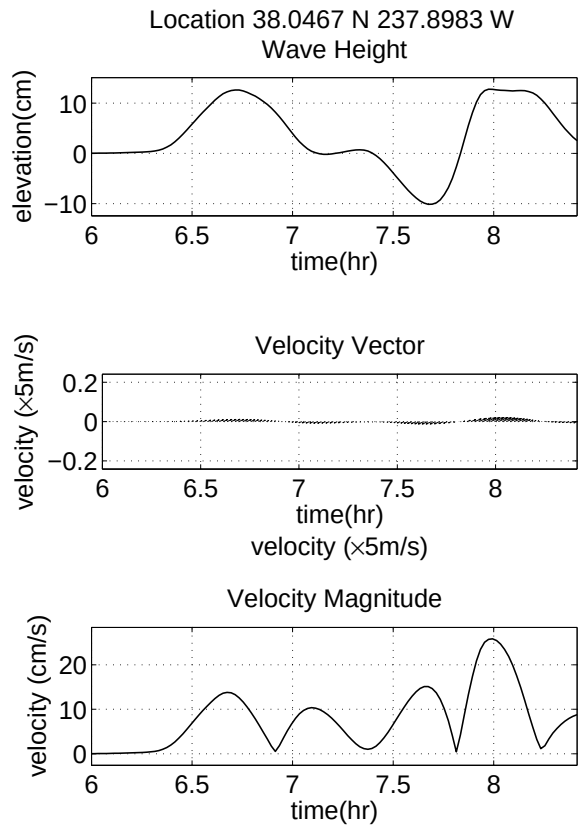
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



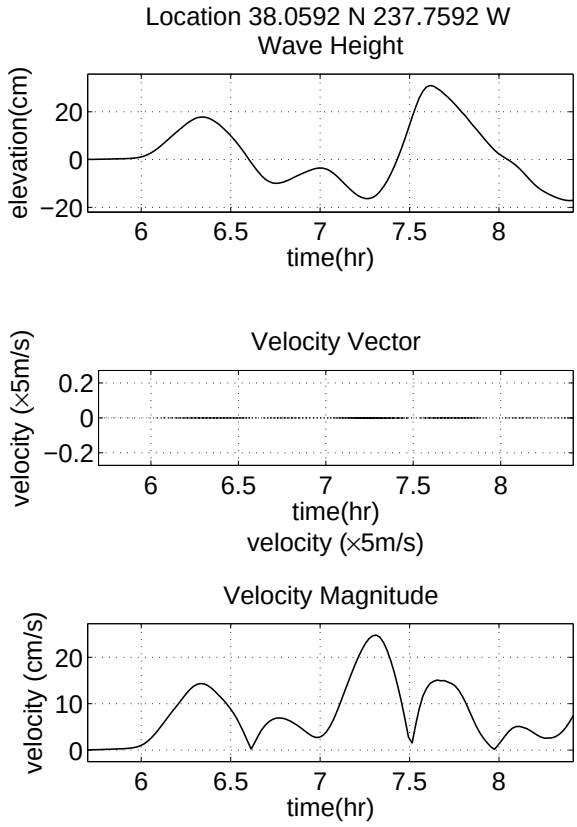
(6, 11) IMTT/Shore Terminals LLC, Richmond



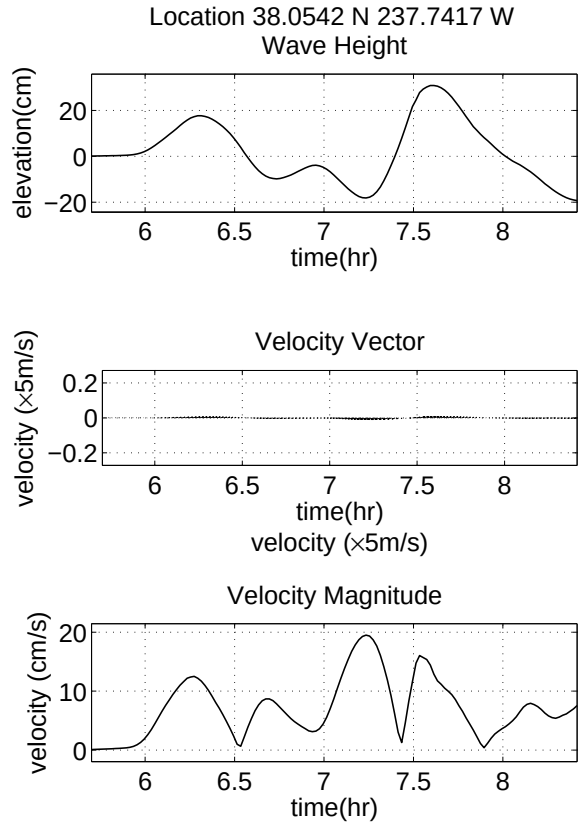
(7) Shell Oil Products, US, Martinez



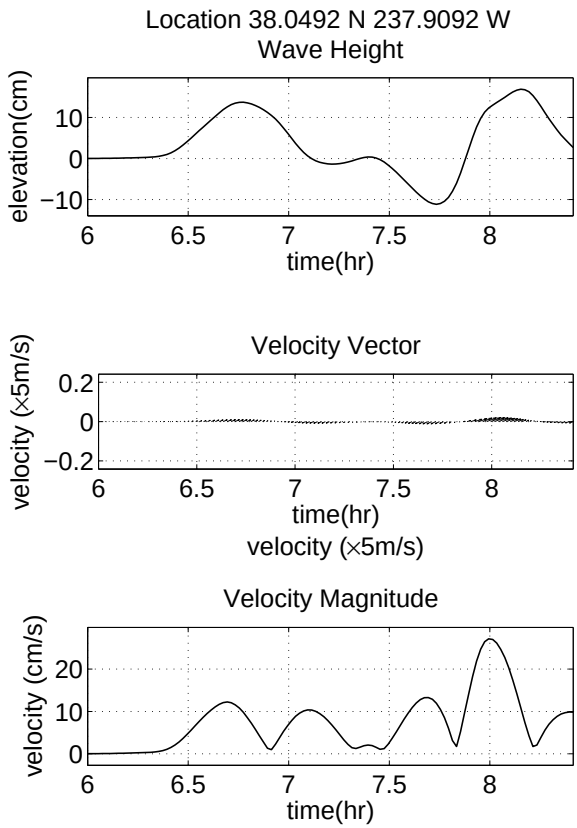
(9) Pacific Atlantic Terminals, Martinez



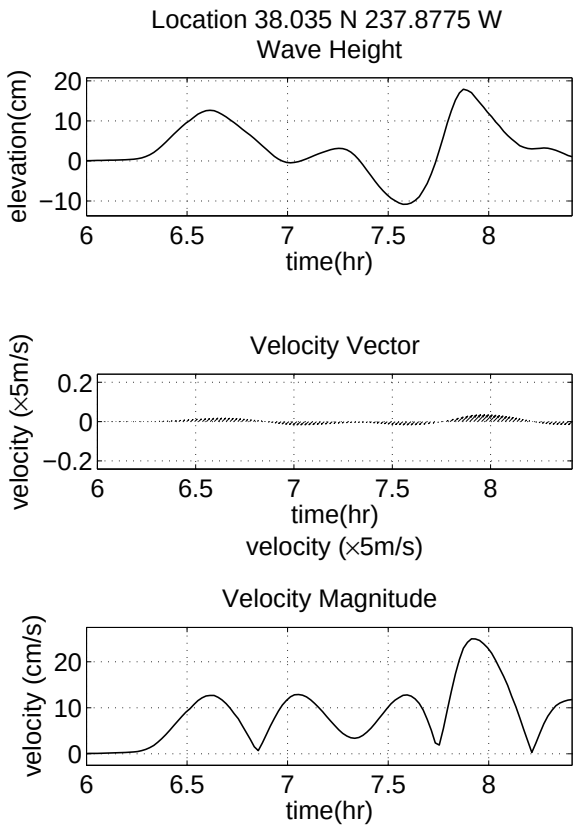
(10) Pacific Atlantic Terminals, Selby



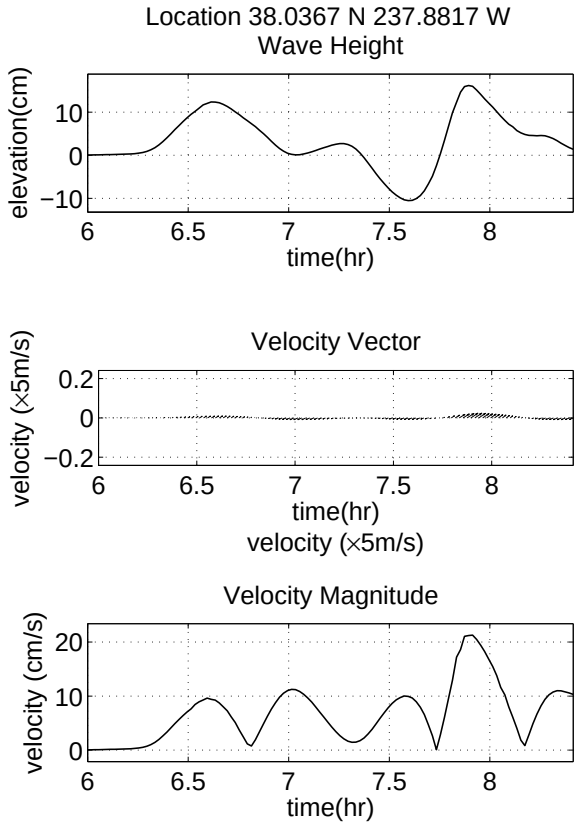
(13) ConocoPhillips, Rodeo



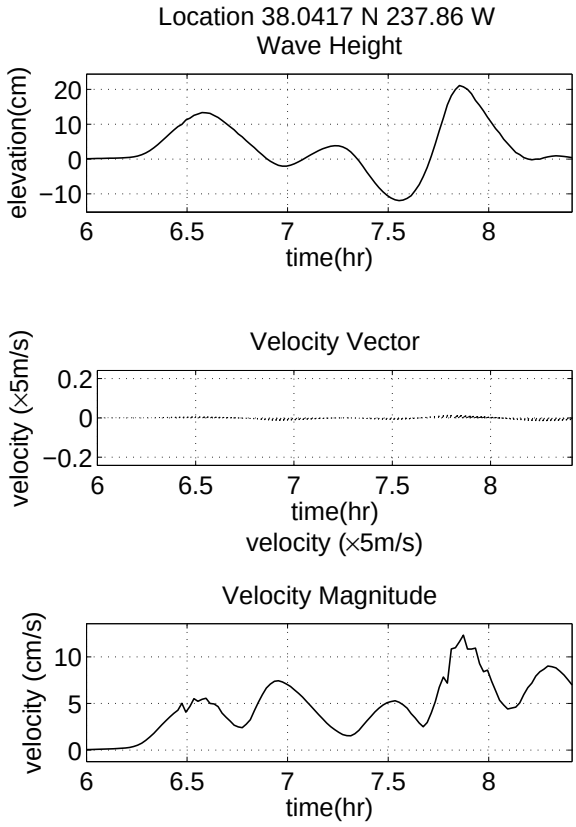
(14) Tesero, Inc. - Avon Wharf



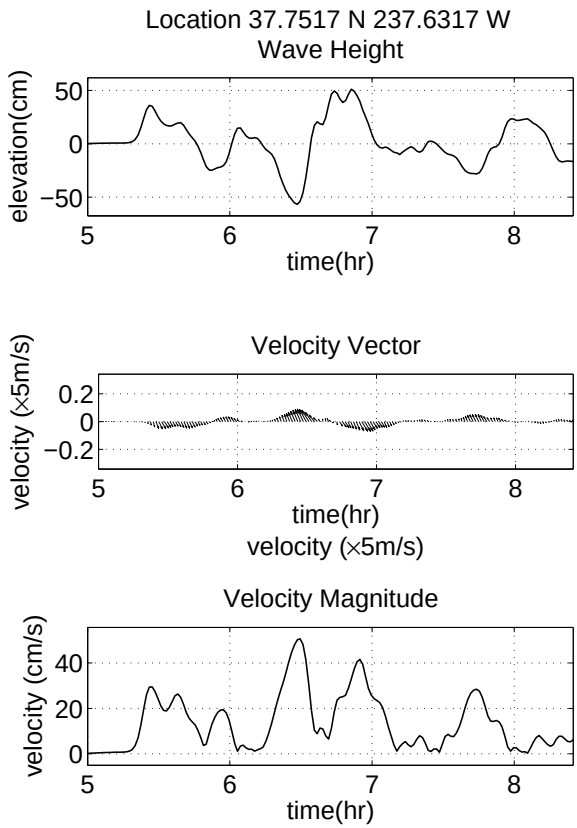
(15) Tesero, Inc. - Amorco Wharf



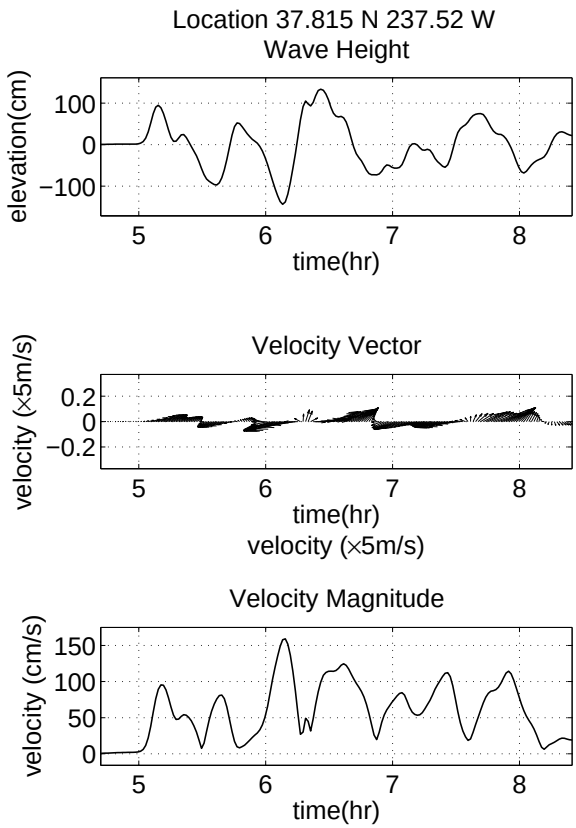
(16) Valero Refining Berth 1, Benicia



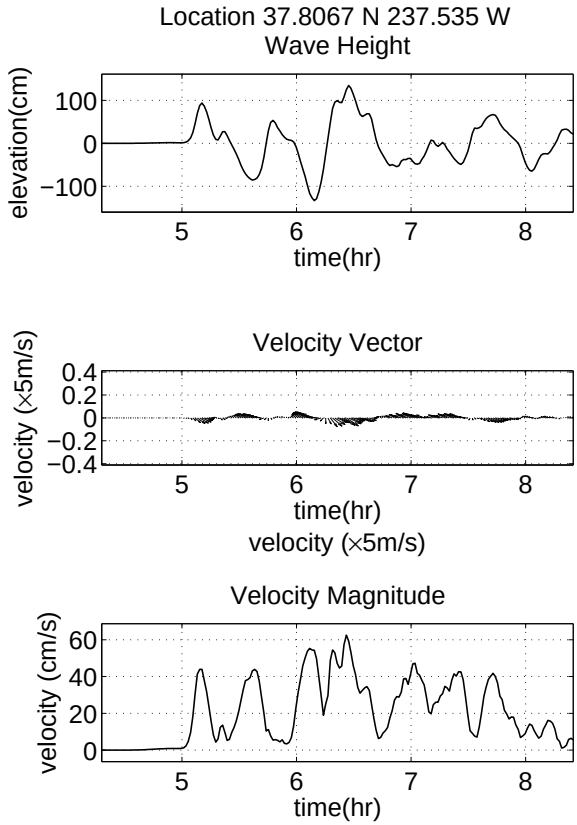
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco



(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Aleutians II

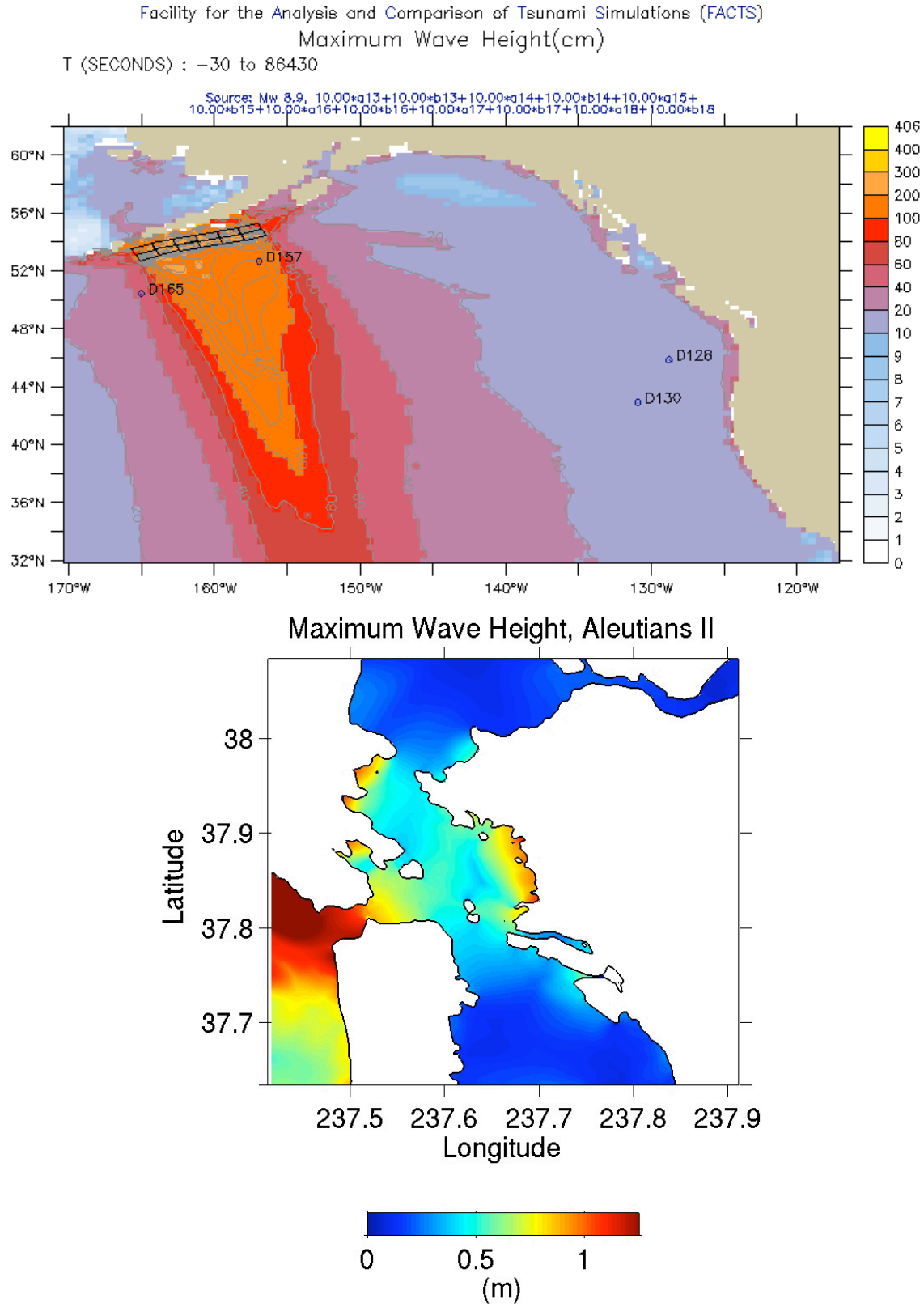
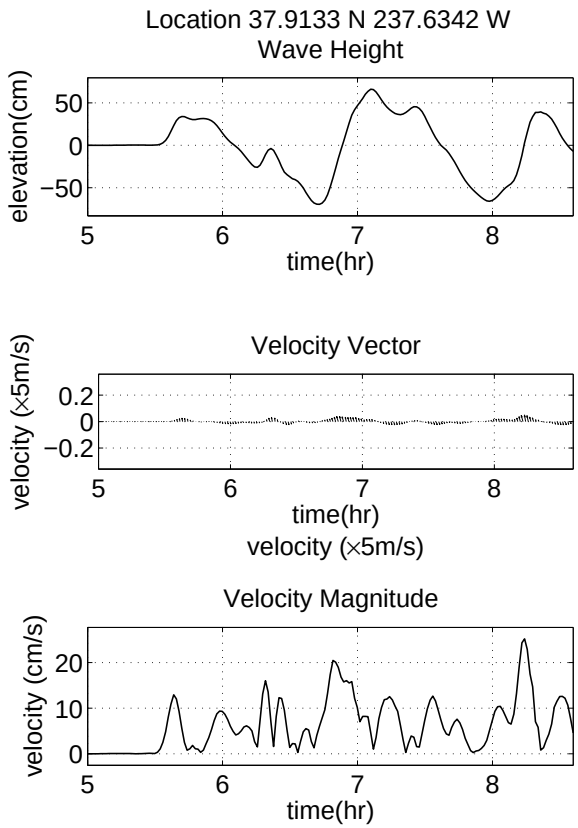
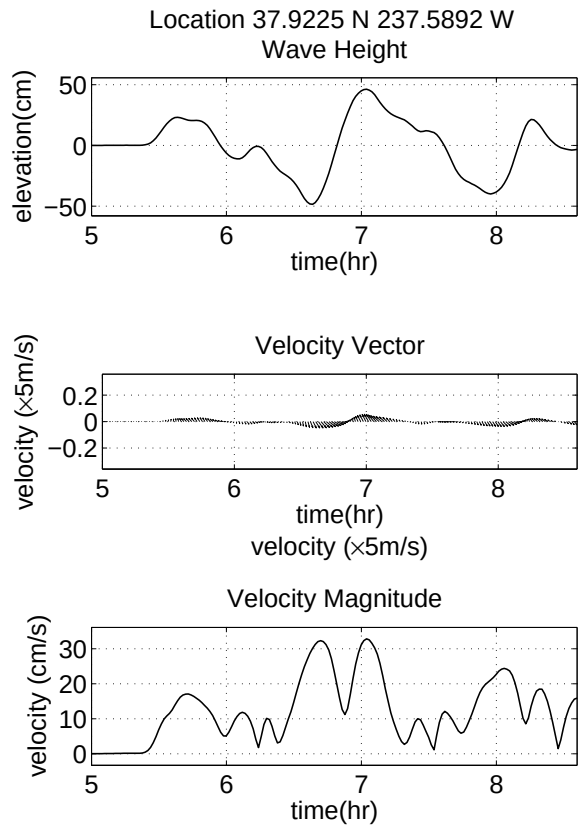


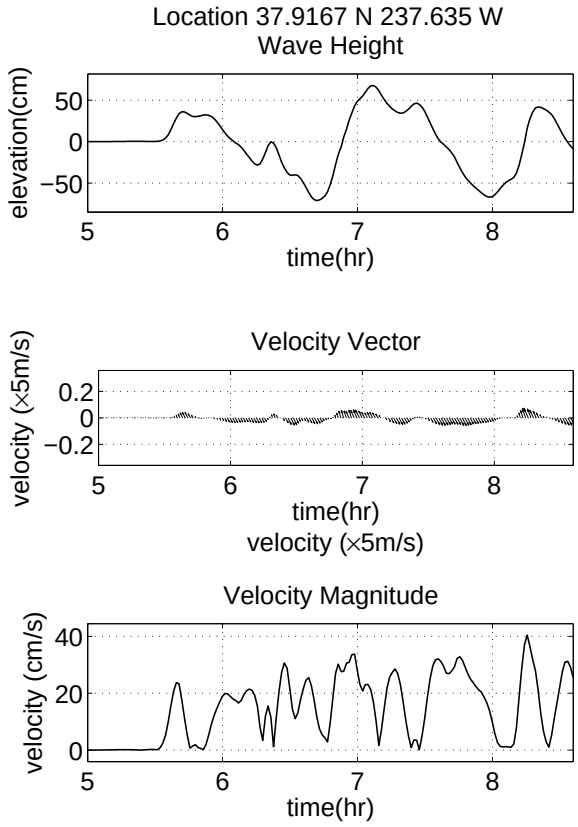
Fig. A1-4 – Maximum wave heights for tsunami simulation, basin wide (upper panel) and in San Francisco Bay (lower panel).



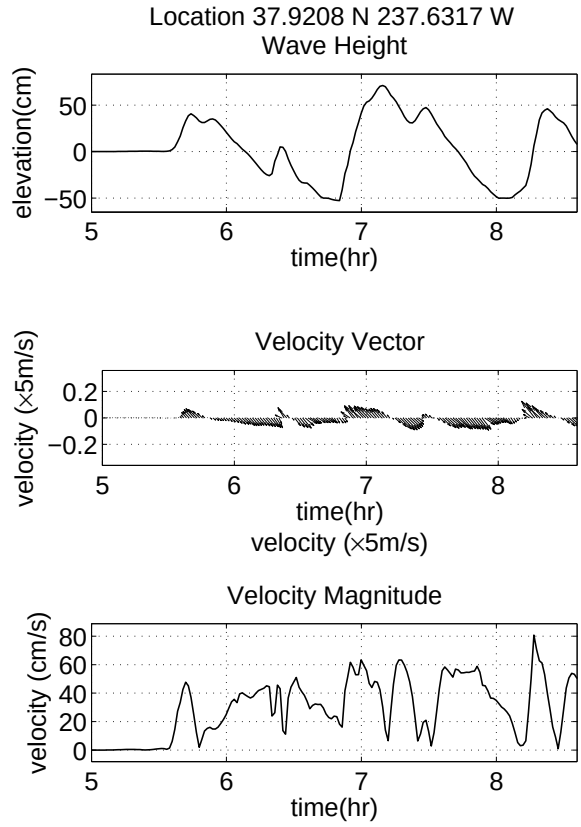
(1) BP West Coast Products, Richmond



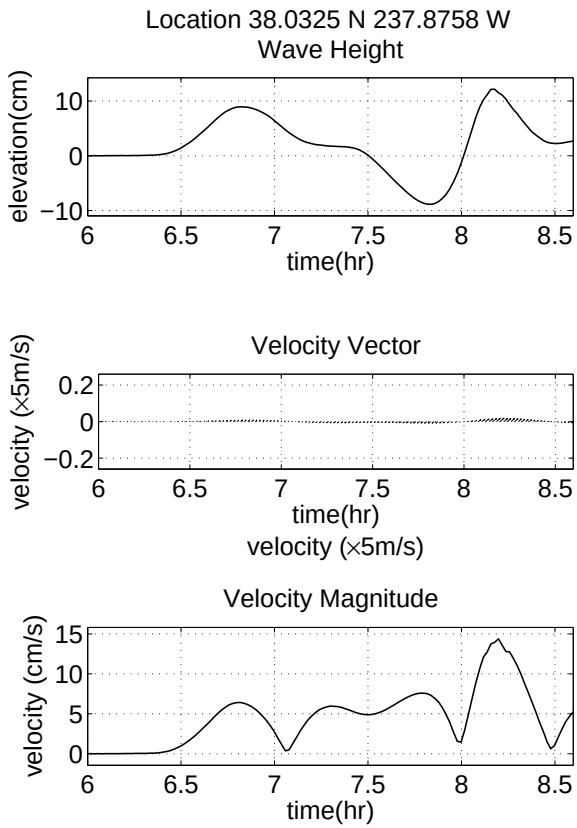
(3) Chevron USA, Inc., Richmond



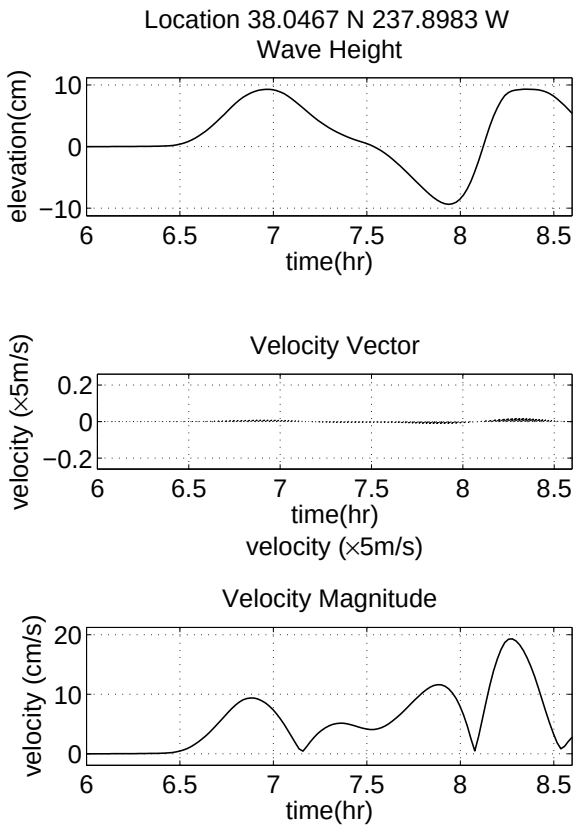
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



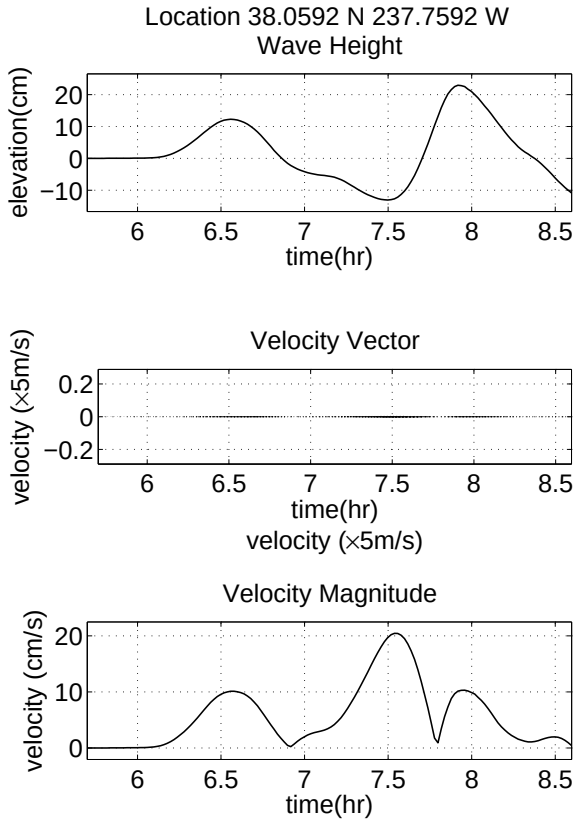
(6, 11) IMTT/Shore Terminals LLC, Richmond



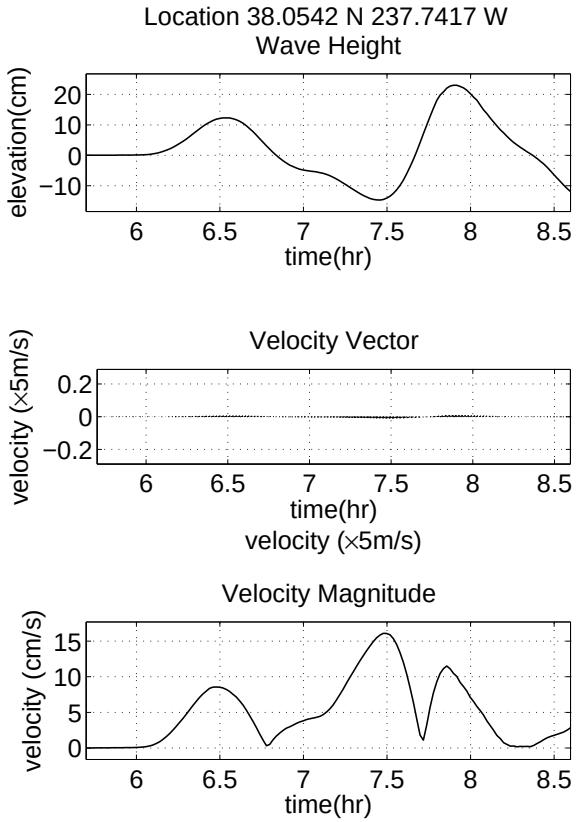
(7) Shell Oil Products, US, Martinez



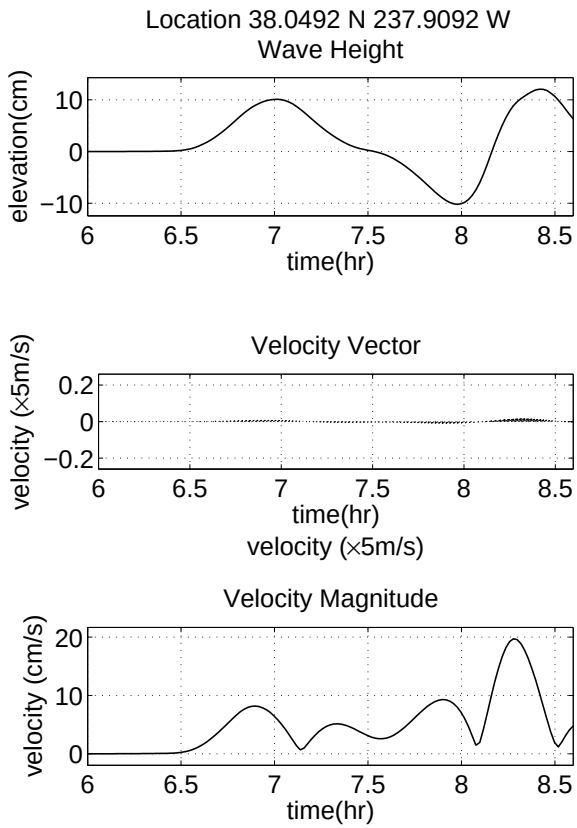
(9) Pacific Atlantic Terminals, Martinez



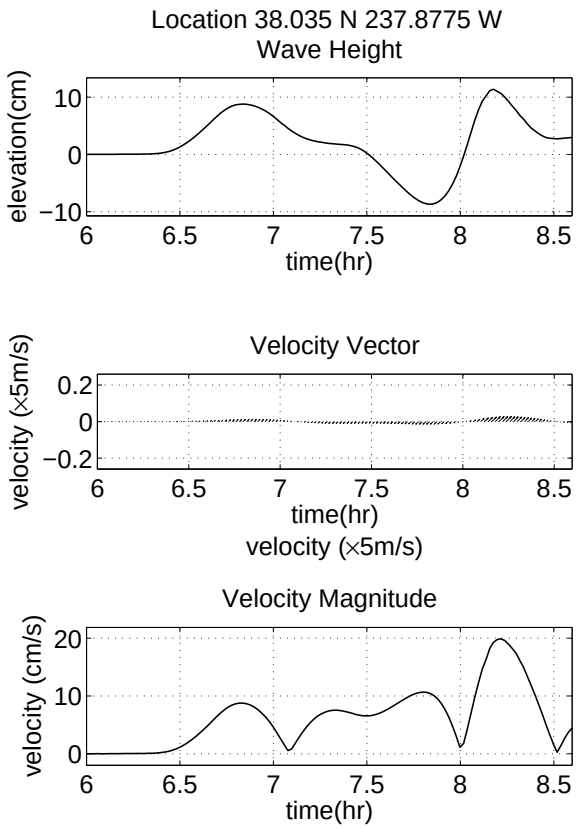
(10) Pacific Atlantic Terminals, Selby



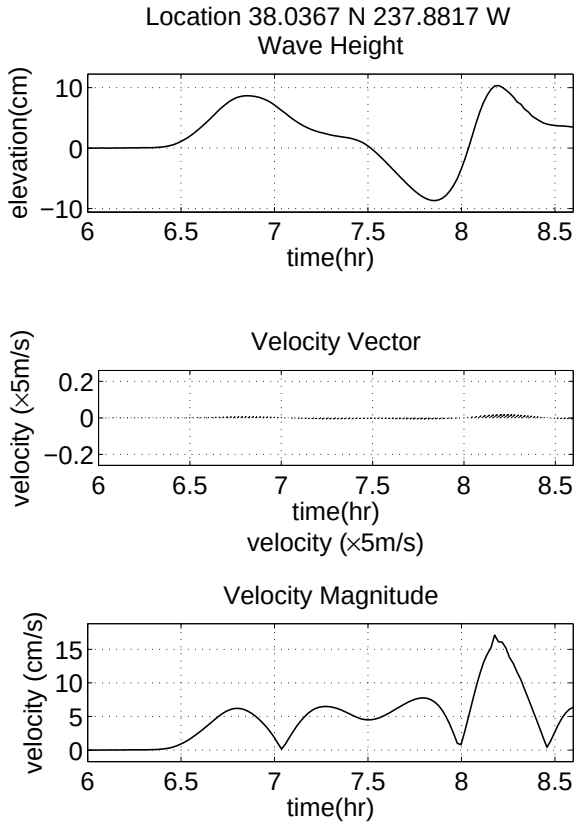
(13) ConocoPhillips, Rodeo



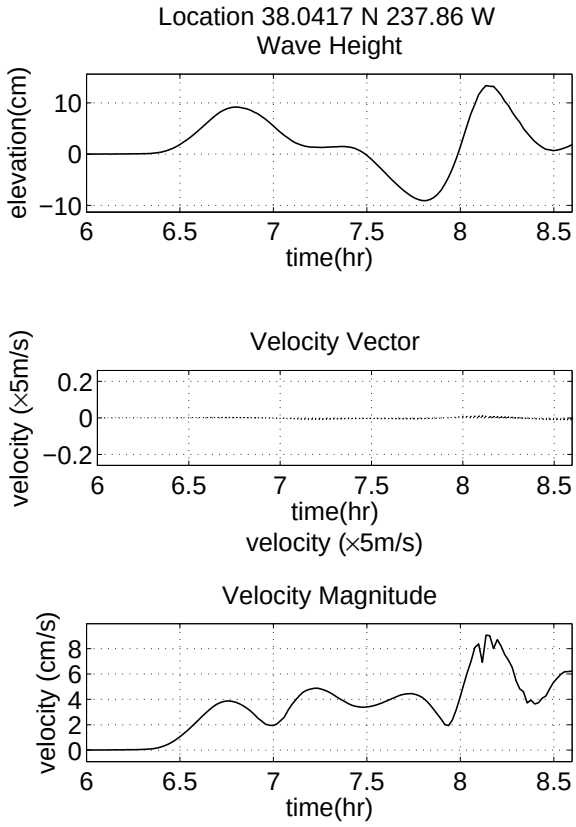
(14) Tesero, Inc. - Avon Wharf



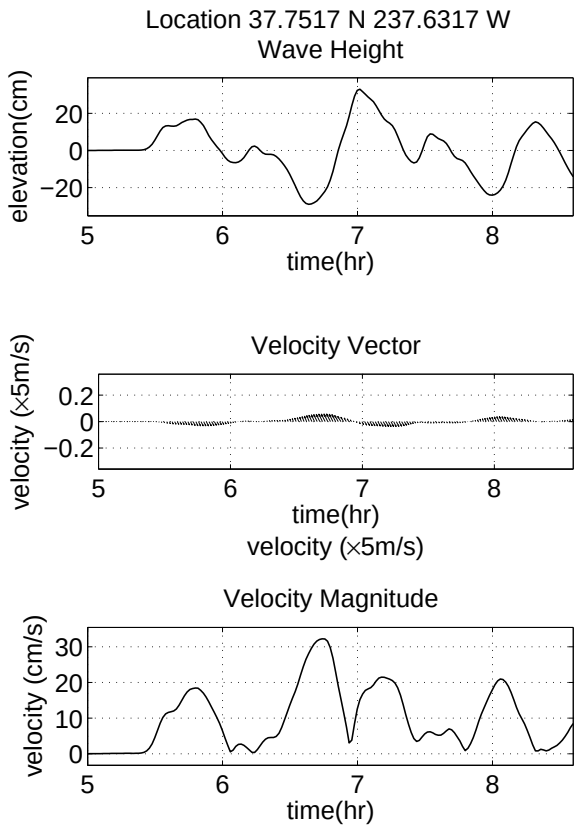
(15) Tesero, Inc. - Amorco Wharf



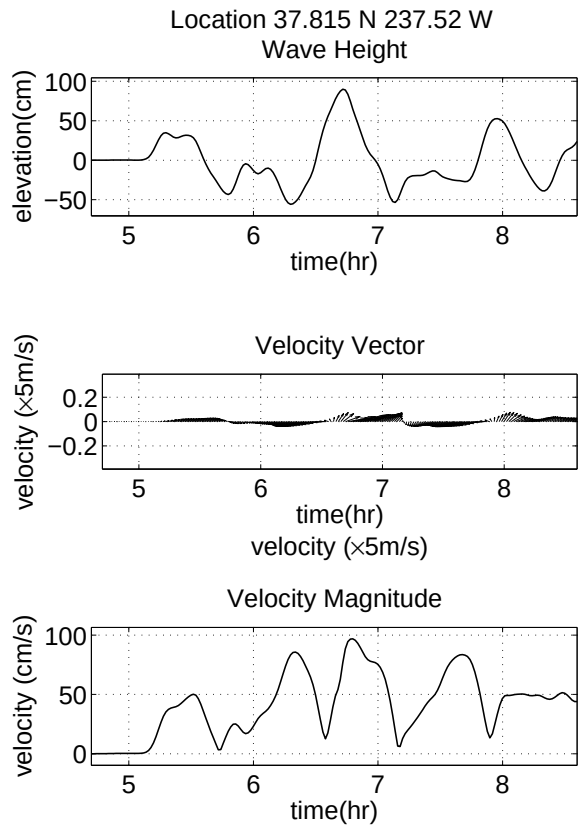
(16) Valero Refining Berth 1, Benicia



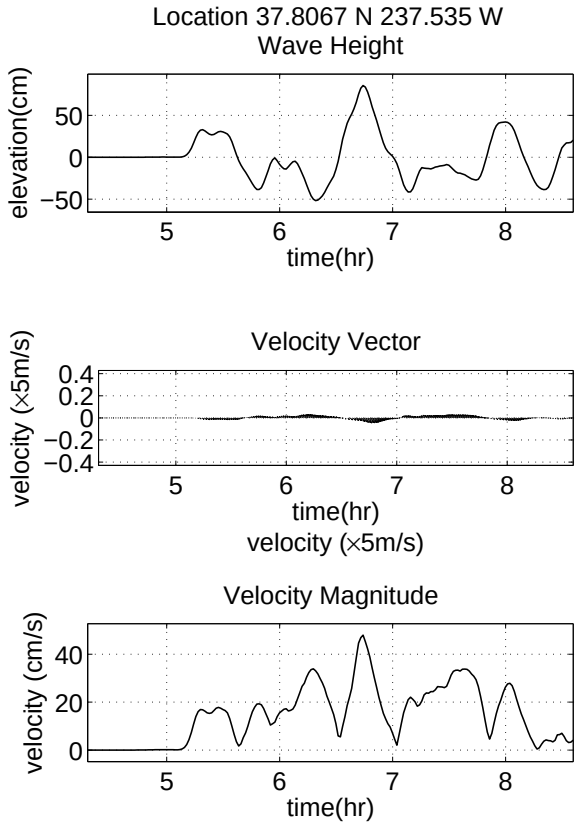
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco



(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Aleutians III

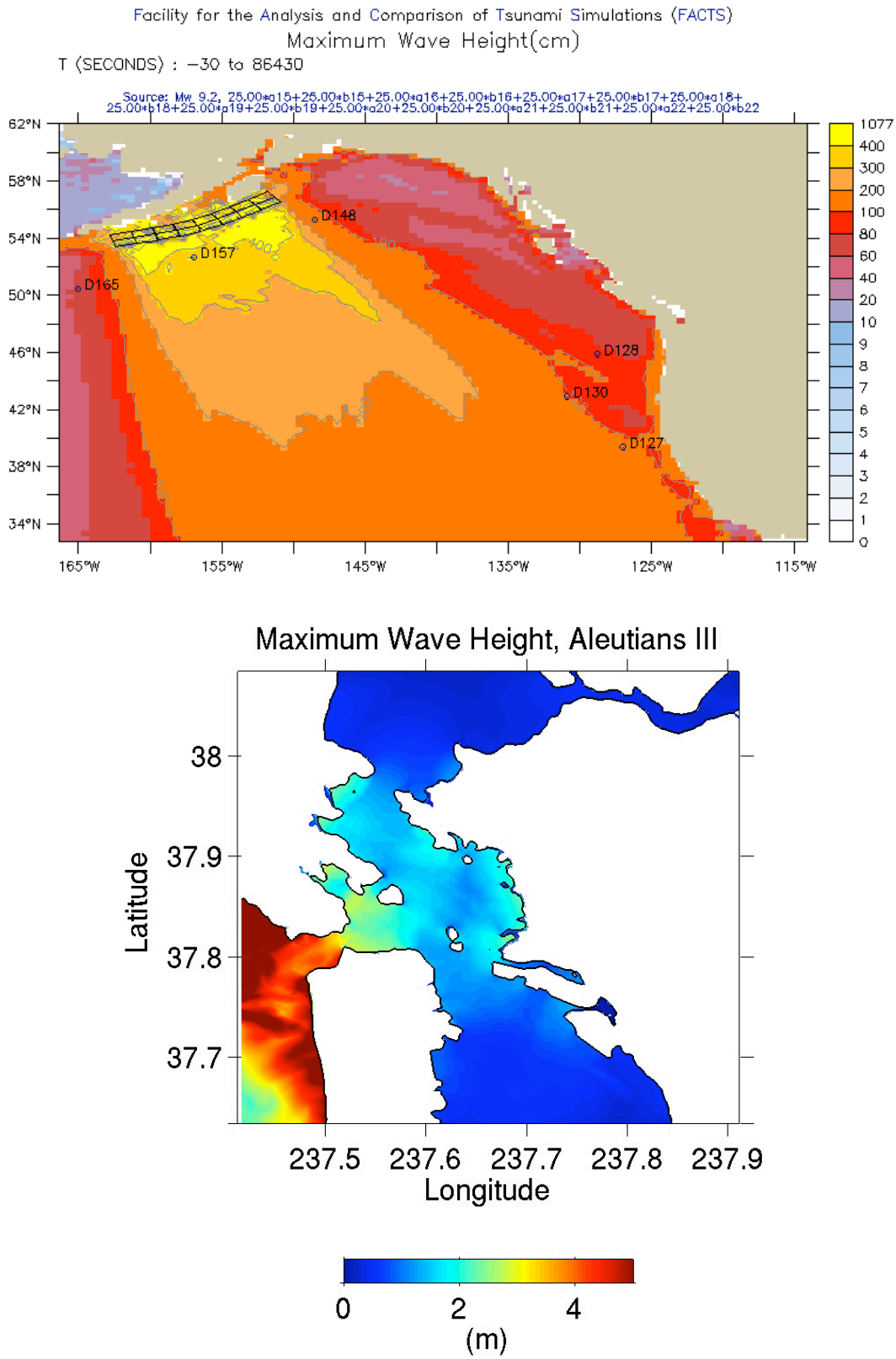
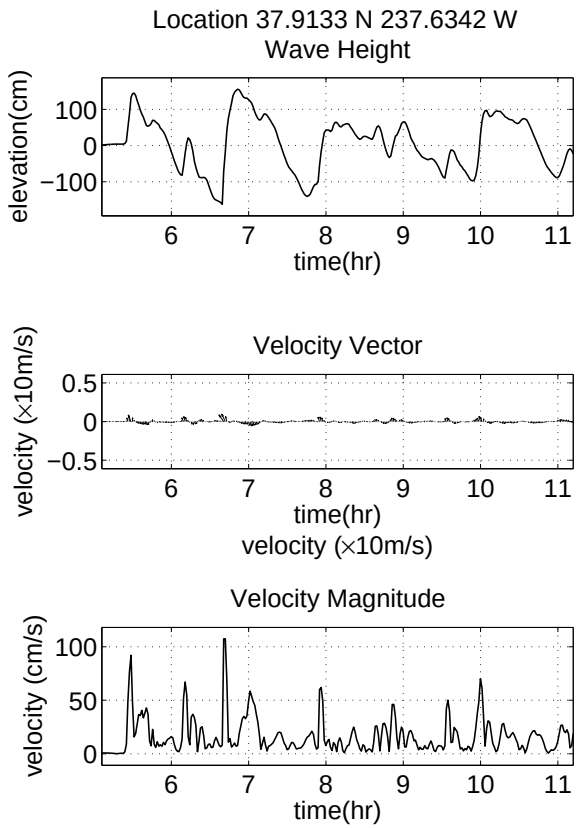
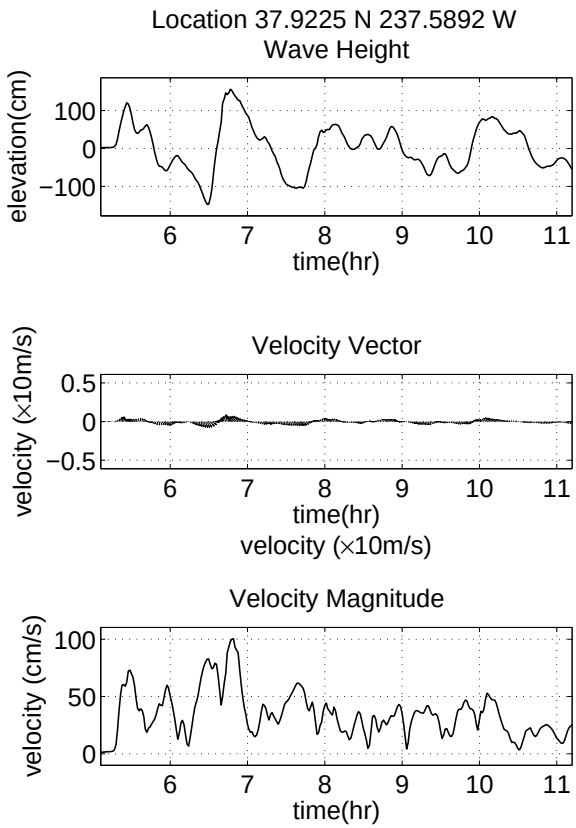


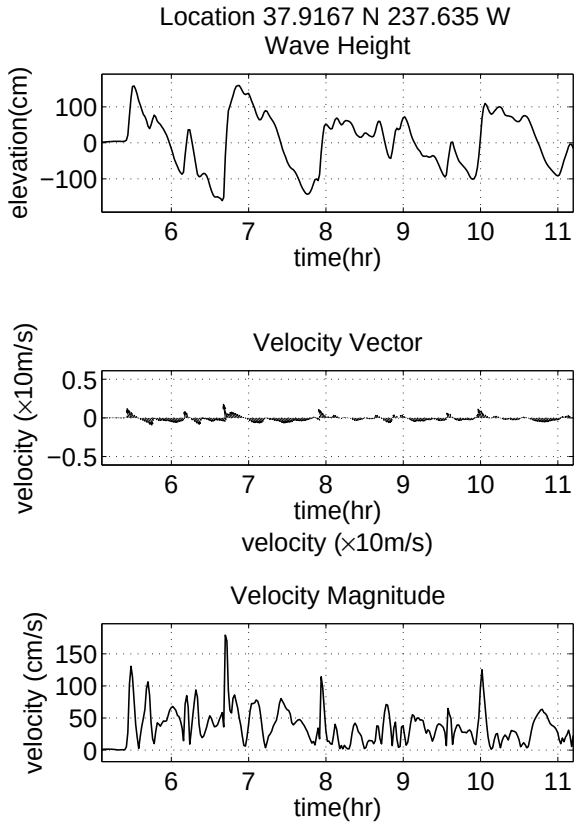
Fig. A1-5 – Maximum wave heights for tsunami simulation, basin wide (upper panel) and in San Francisco Bay (lower panel).



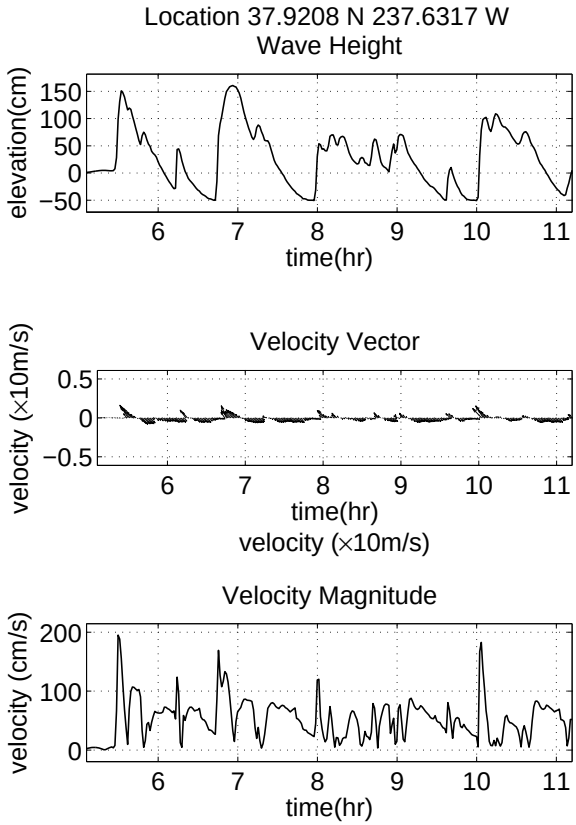
(1) BP West Coast Products, Richmond



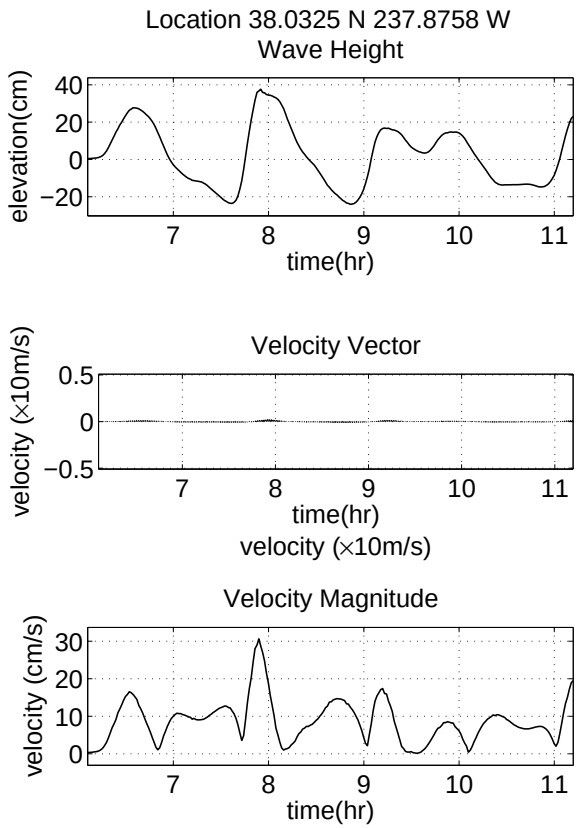
(3) Chevron USA, Inc., Richmond



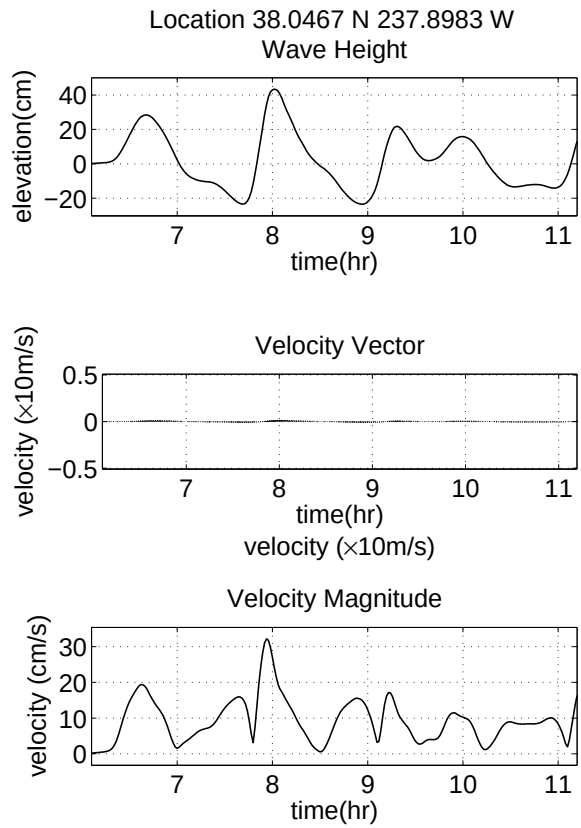
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



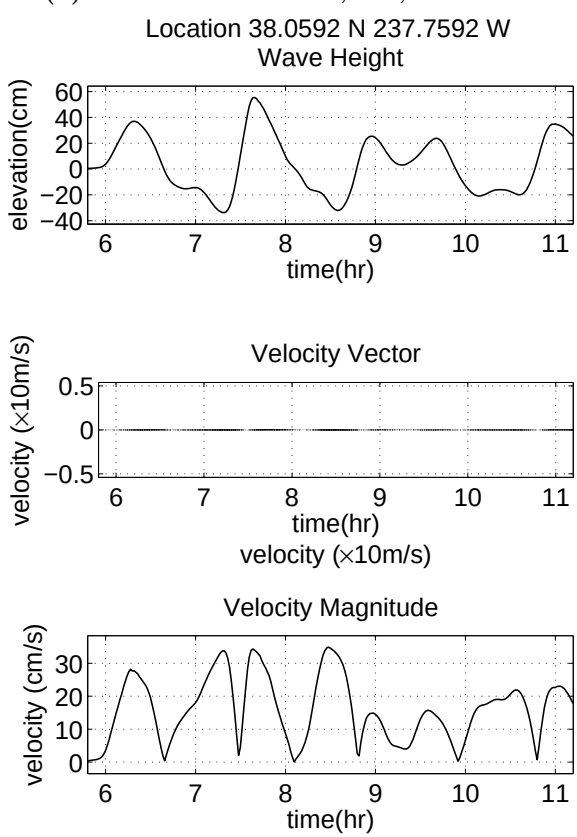
(6, 11) IMTT/Shore Terminals LLC, Richmond



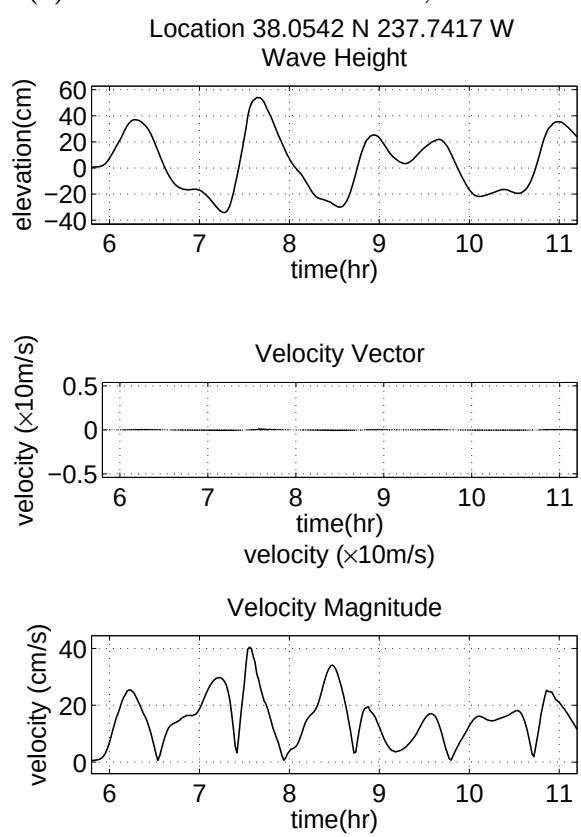
(7) Shell Oil Products, US, Martinez



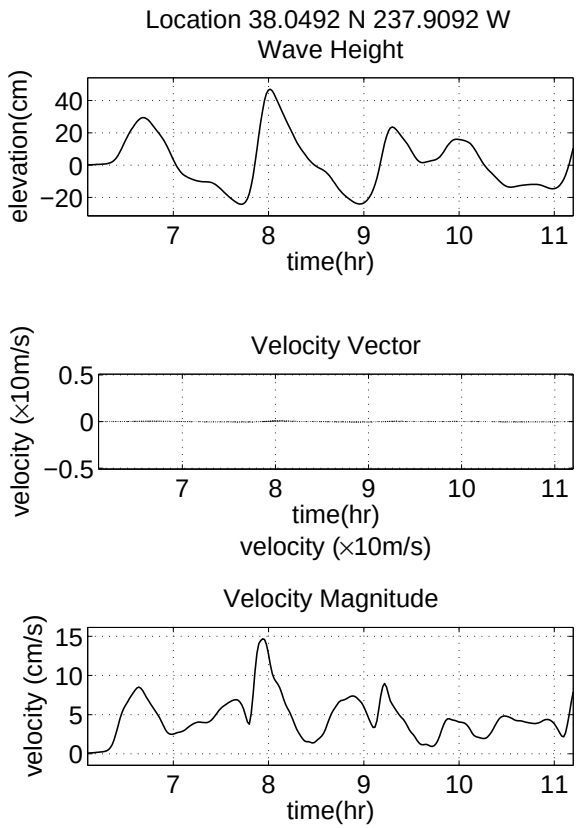
(9) Pacific Atlantic Terminals, Martinez



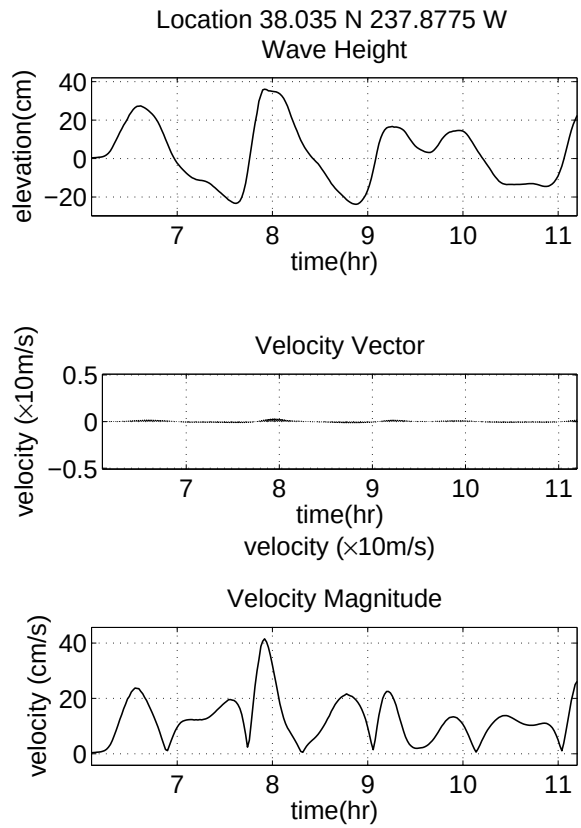
(10) Pacific Atlantic Terminals, Selby



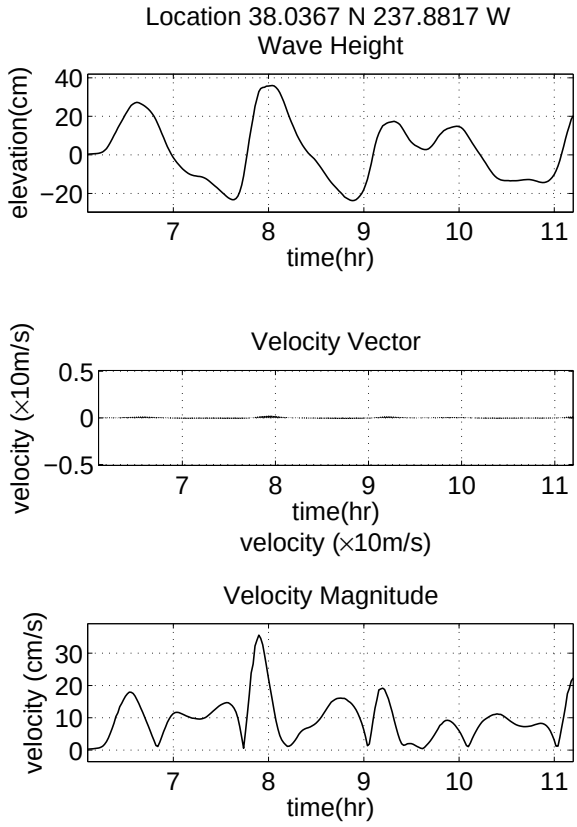
(13) ConocoPhillips, Rodeo



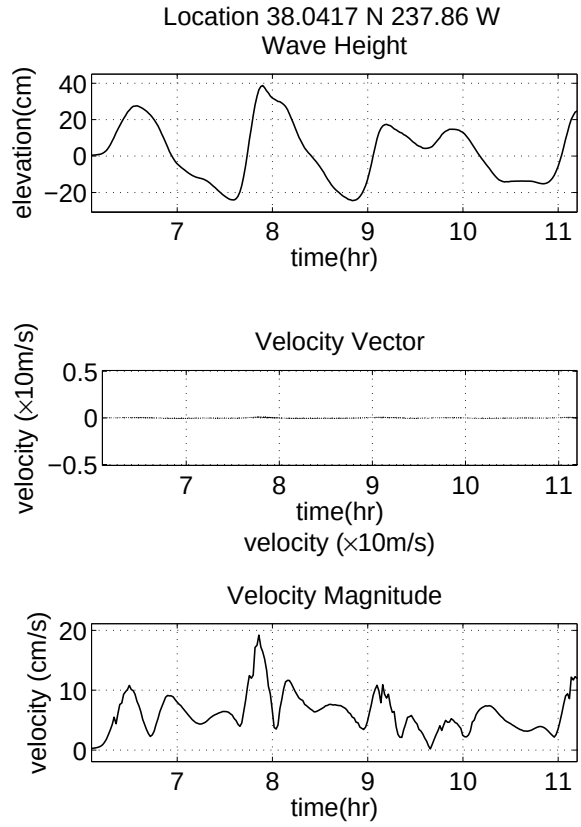
(14) Tesero, Inc. - Avon Wharf



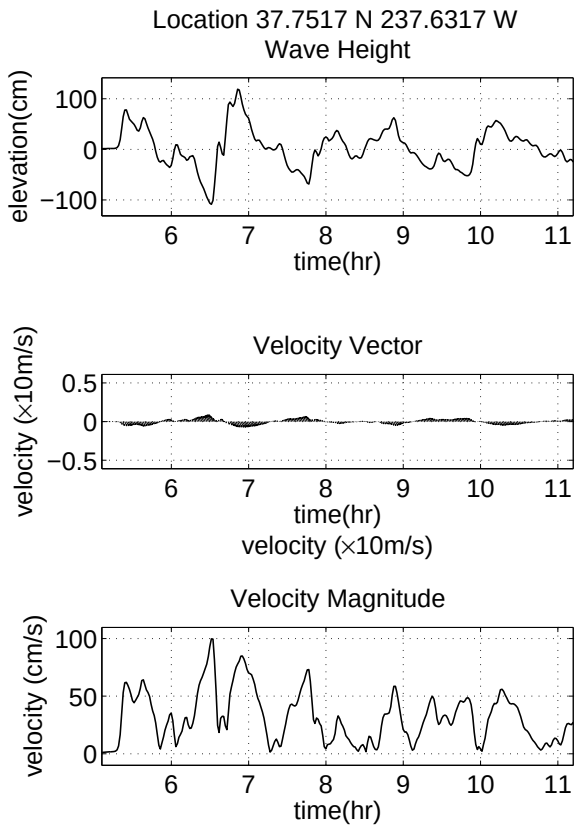
(15) Tesero, Inc. - Amorco Wharf



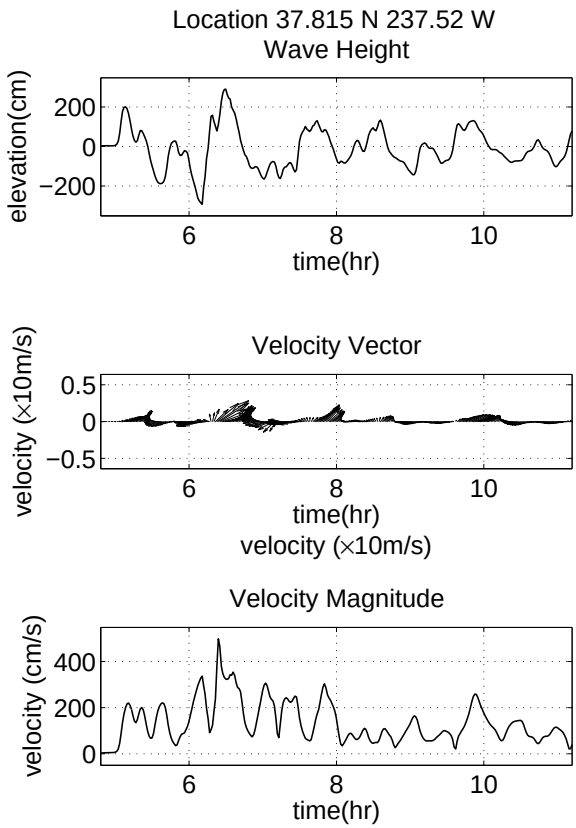
(16) Valero Refining Berth 1, Benicia



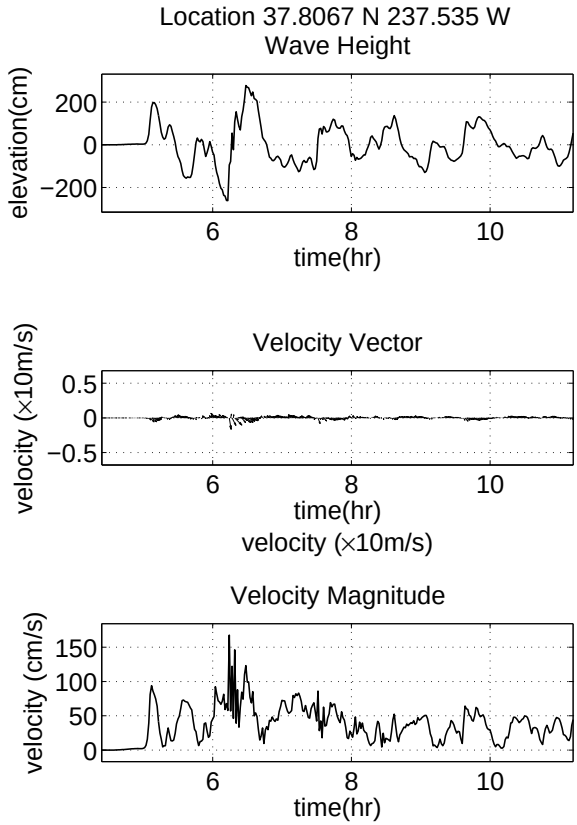
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco



(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Kuril I

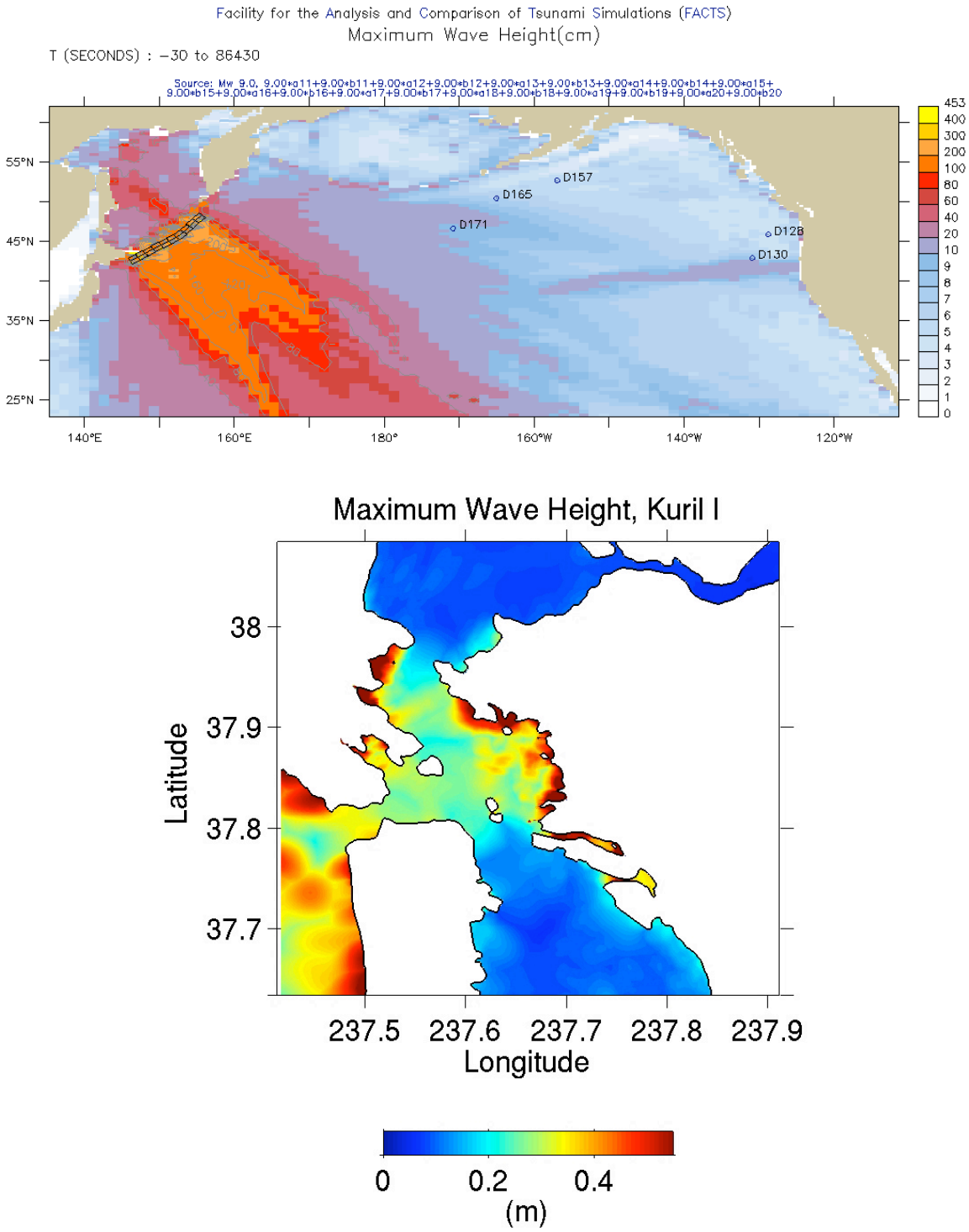
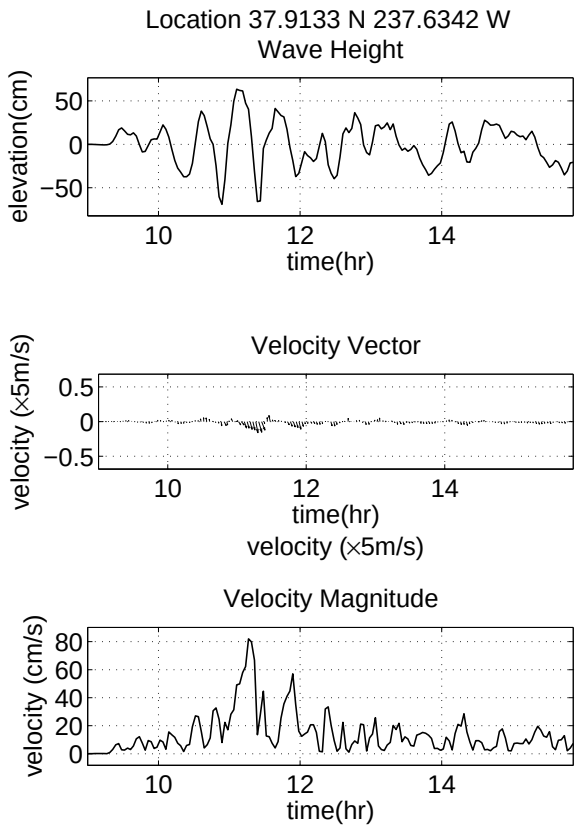
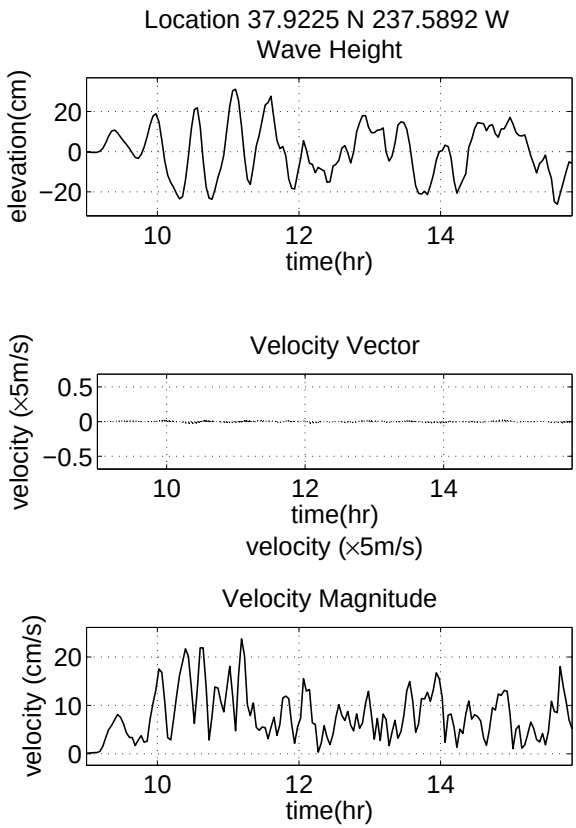


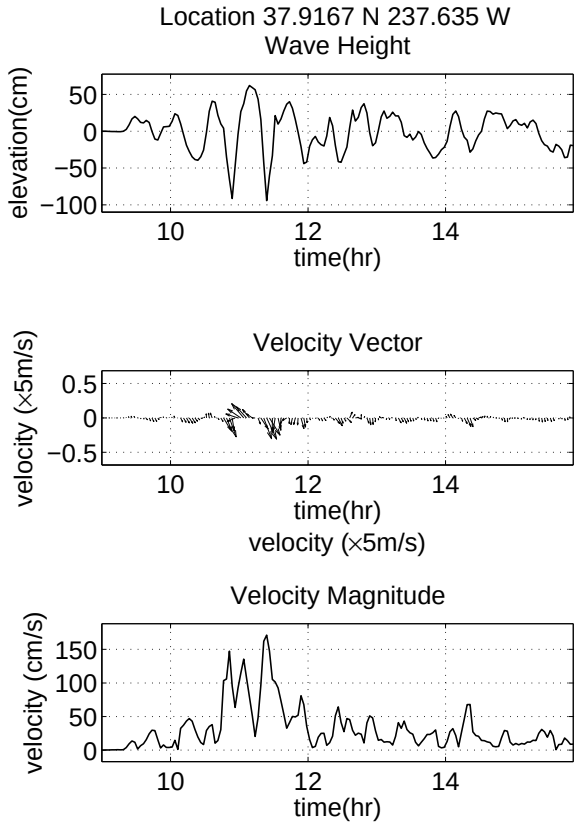
Fig. A1-6 – Maximum wave heights for tsunami simulation, basin wide (upper panel) and in San Francisco Bay (lower panel).



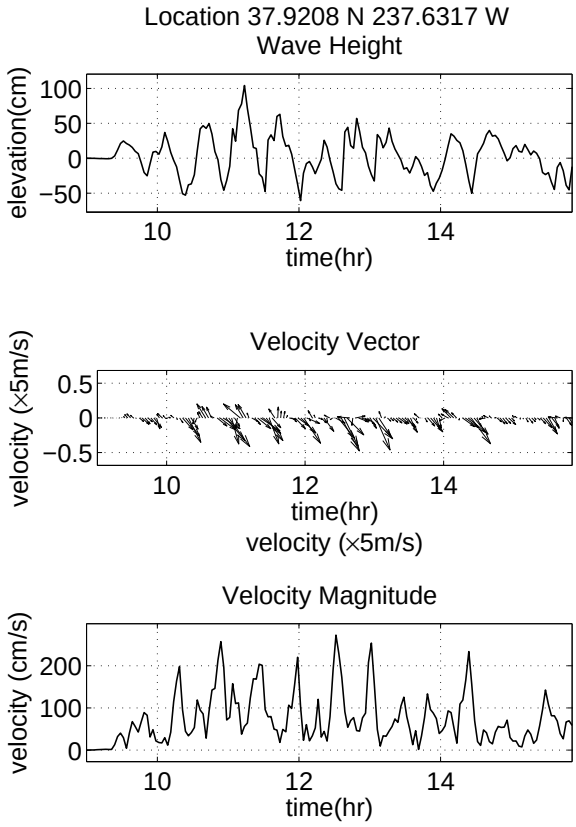
(1) BP West Coast Products, Richmond



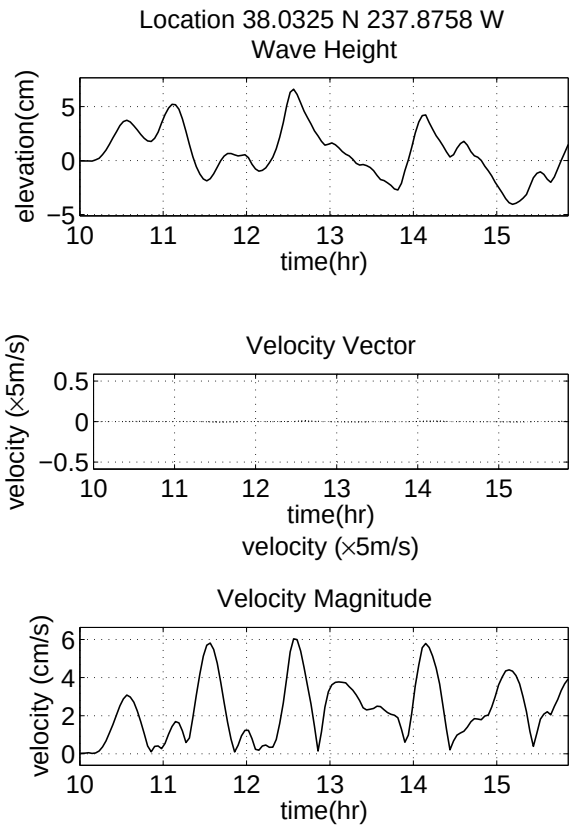
(3) Chevron USA, Inc., Richmond



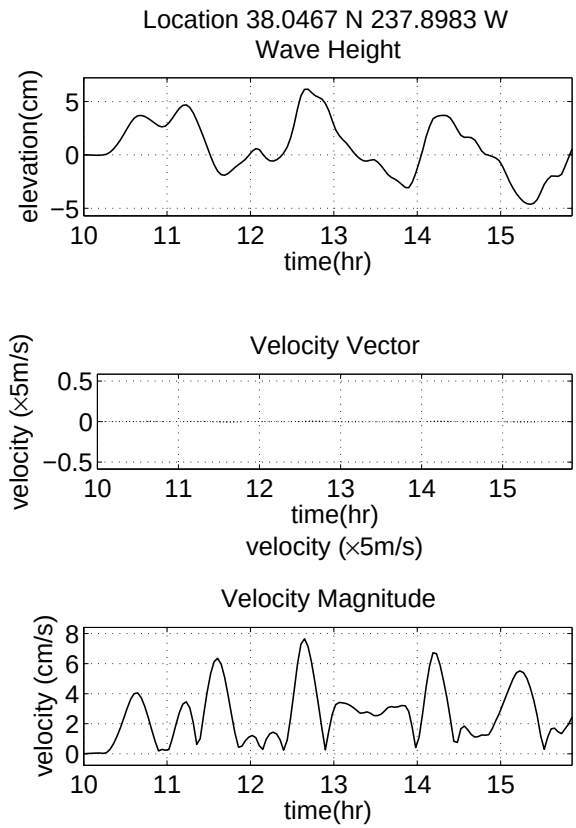
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



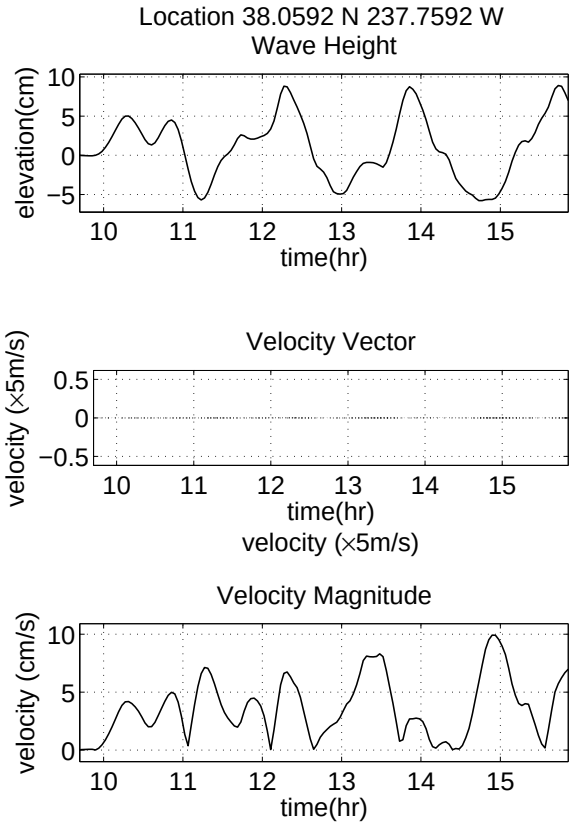
(6, 11) IMTT/Shore Terminals LLC, Richmond



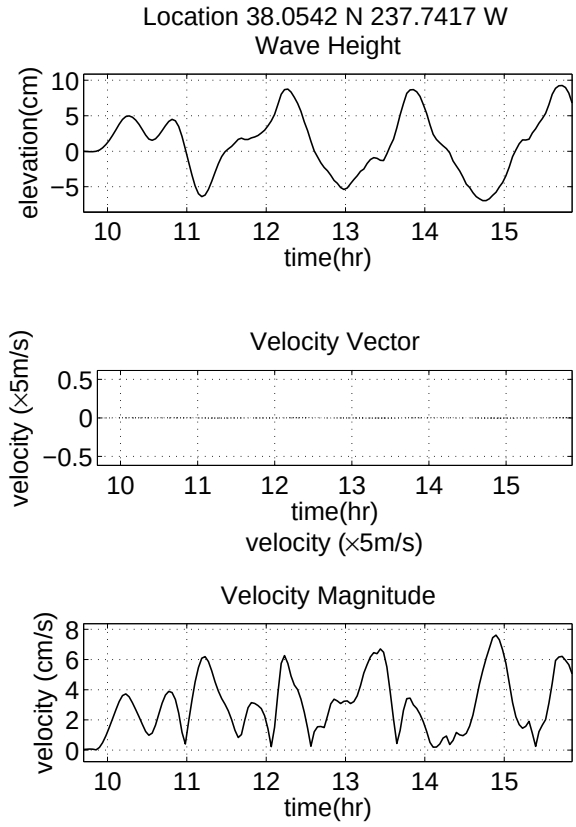
(7) Shell Oil Products, US, Martinez



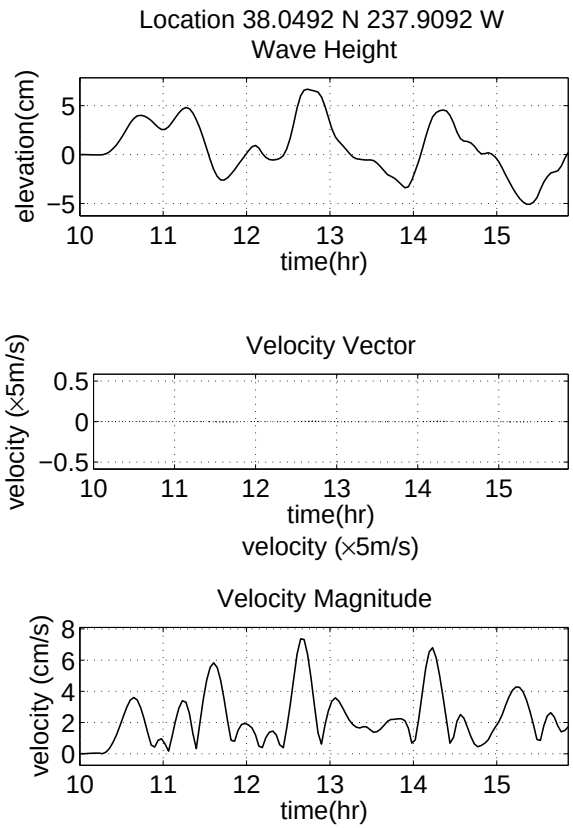
(9) Pacific Atlantic Terminals, Martinez



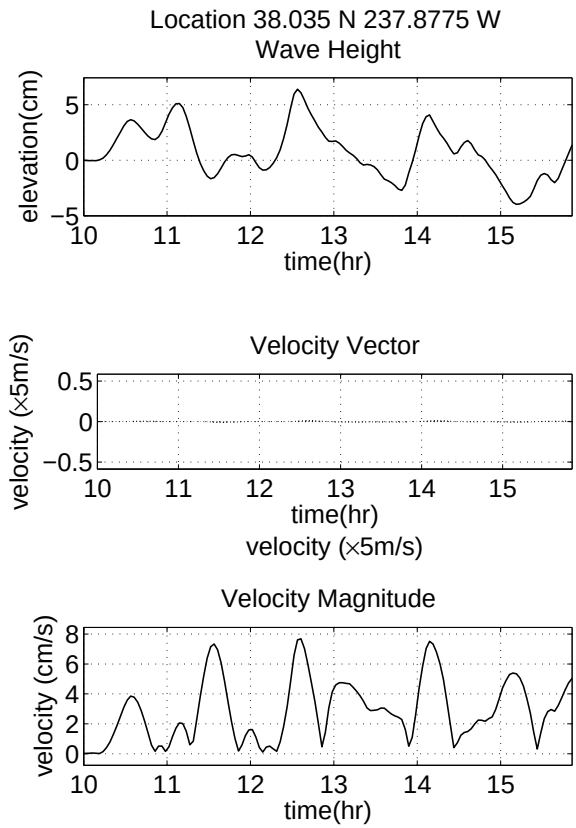
(10) Pacific Atlantic Terminals, Selby



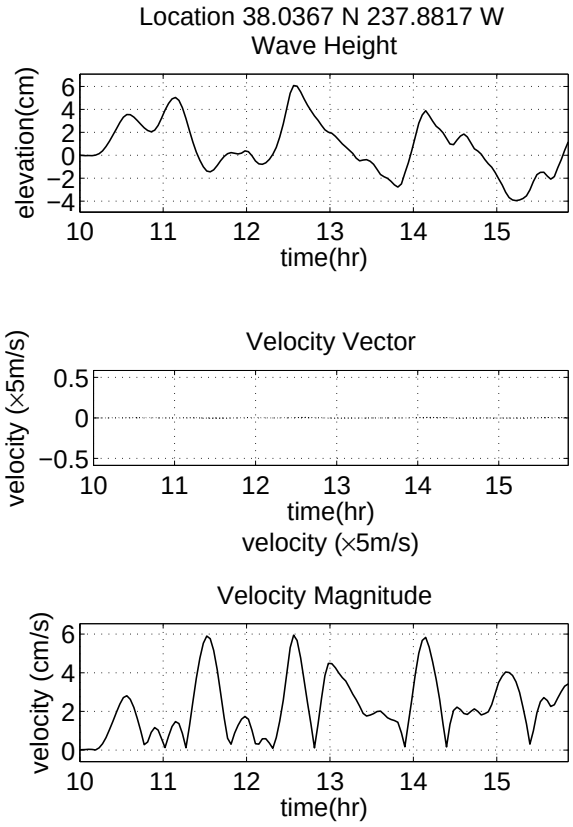
(13) ConocoPhillips, Rodeo



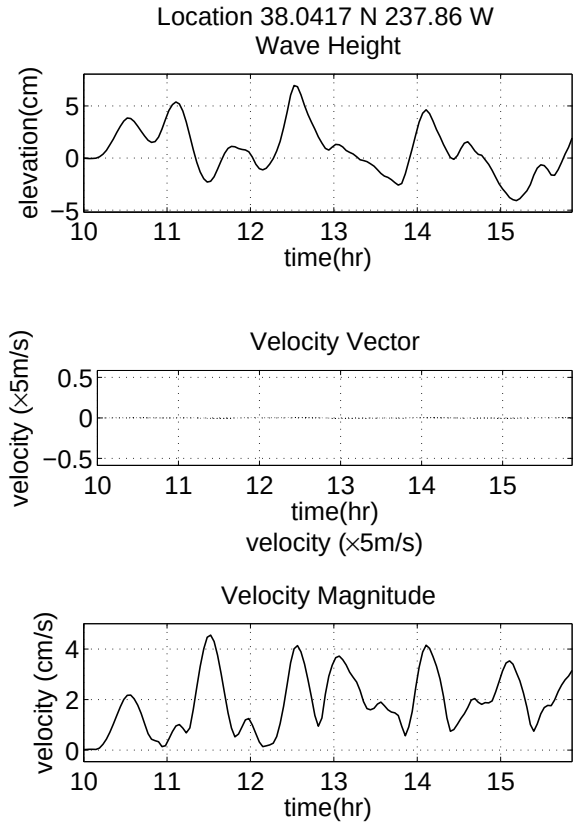
(14) Tesero, Inc. - Avon Wharf



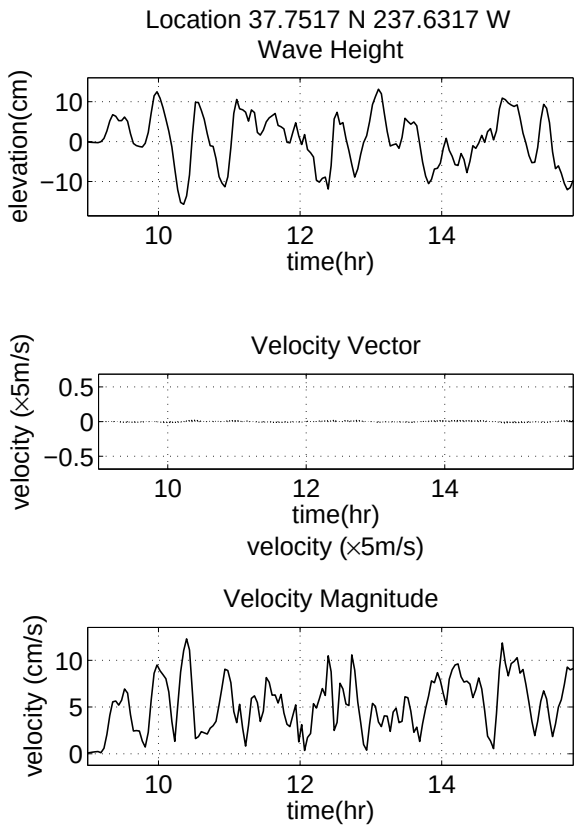
(15) Tesero, Inc. - Amorco Wharf



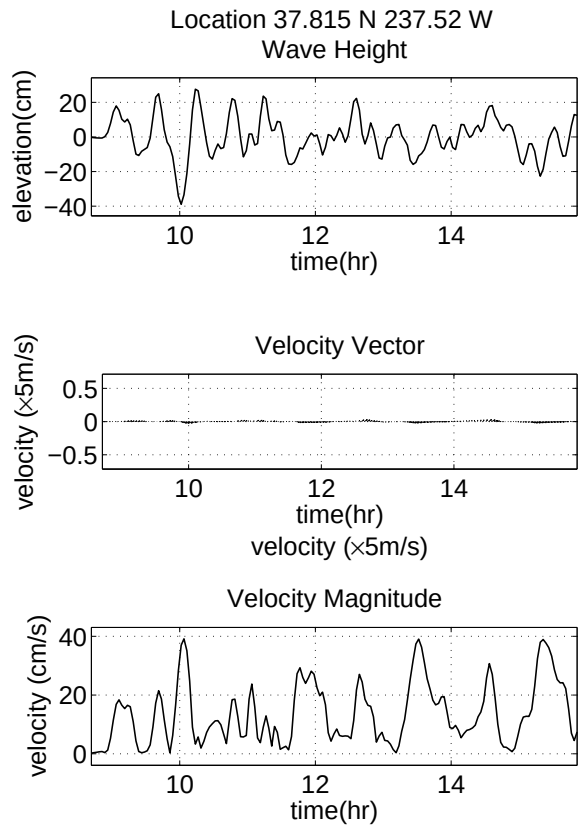
(16) Valero Refining Berth 1, Benicia



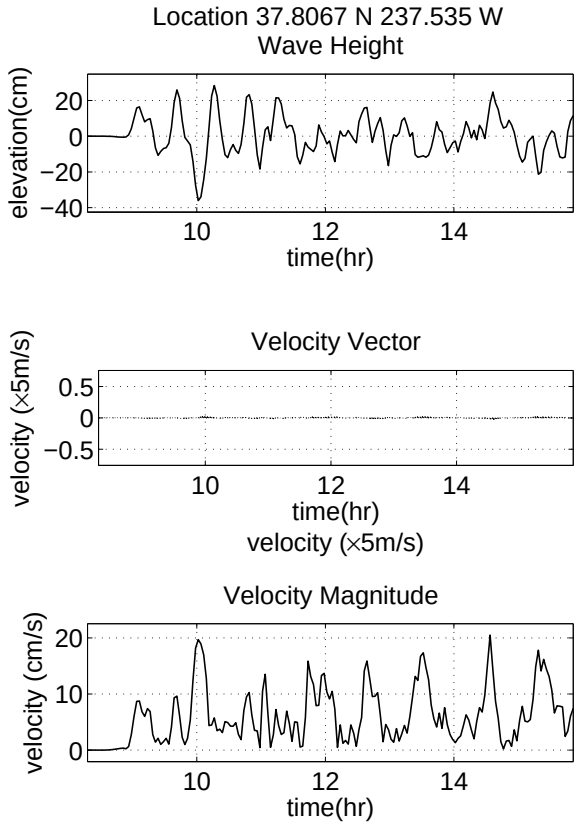
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco

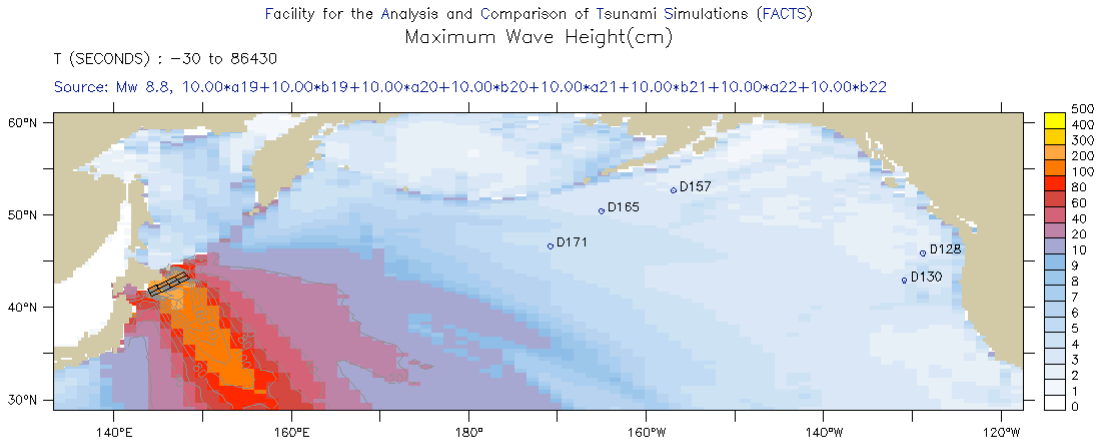


(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Kuril II



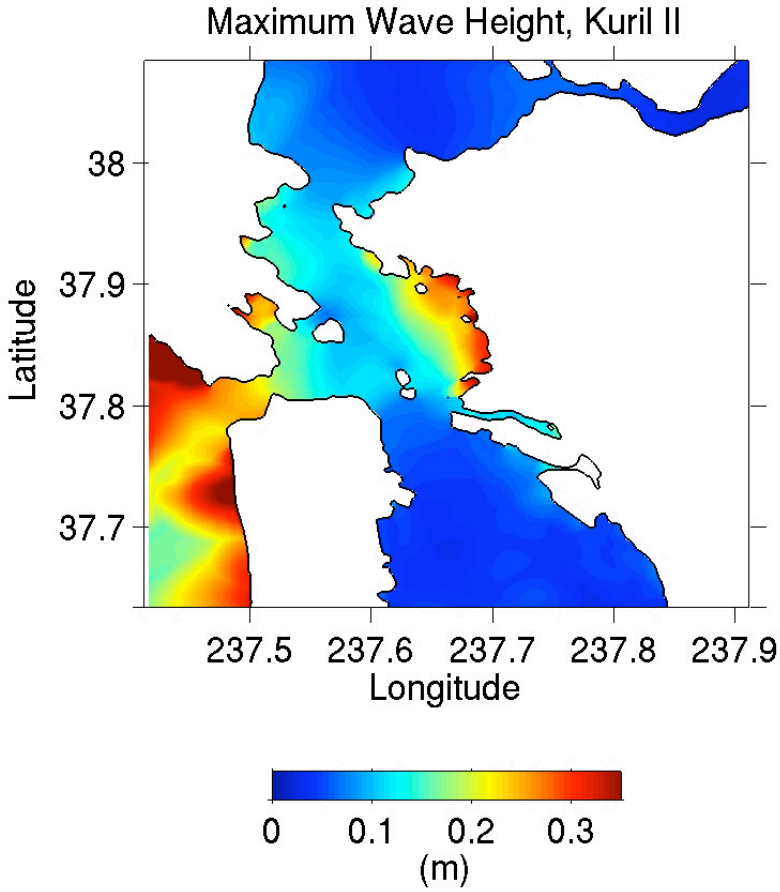
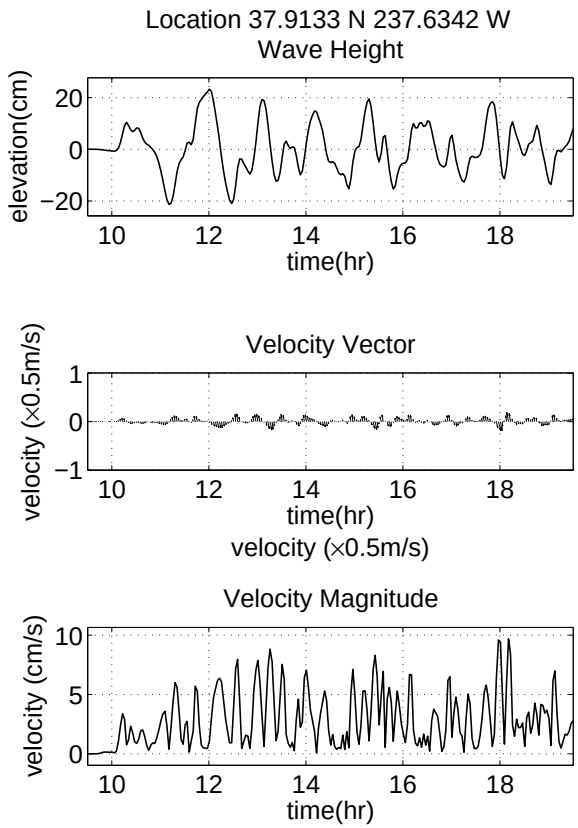
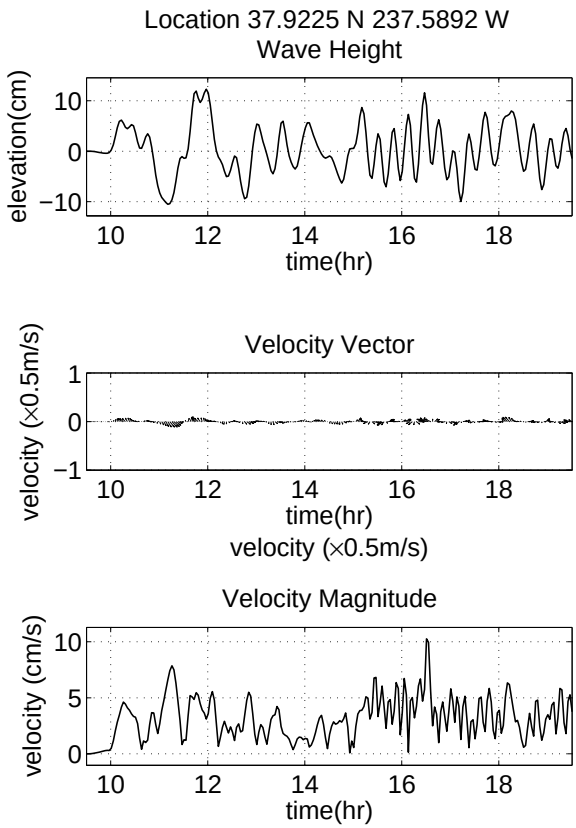


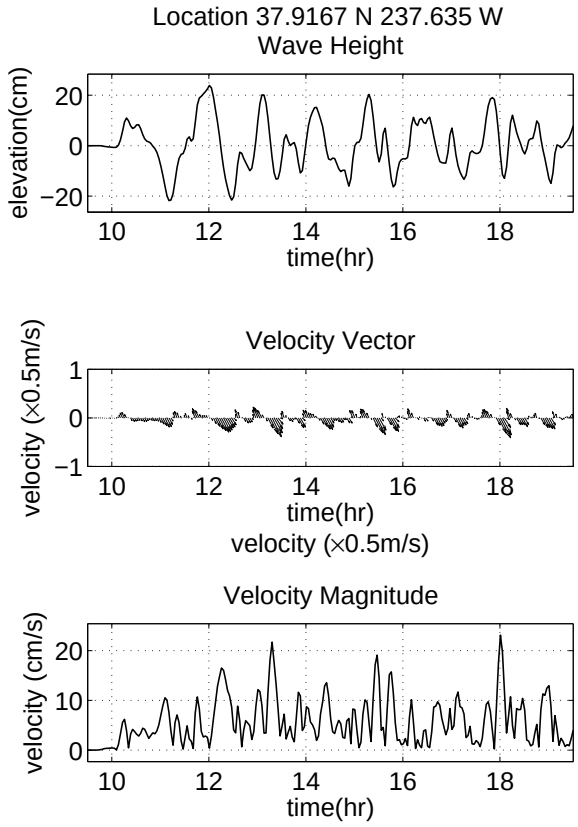
Fig. A1-7 – Maximum wave heights for tsunami simulation, basin wide (upper panel) and in San Francisco Bay (lower panel).



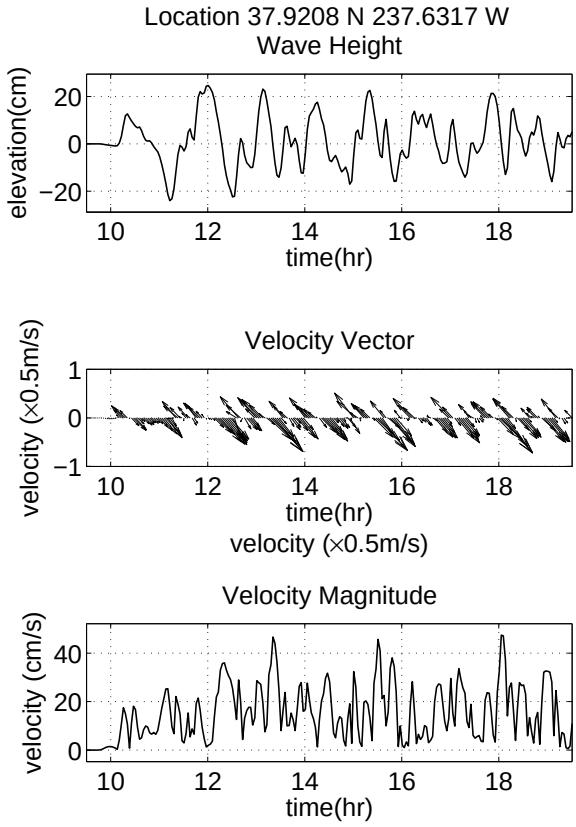
(1) BP West Coast Products, Richmond



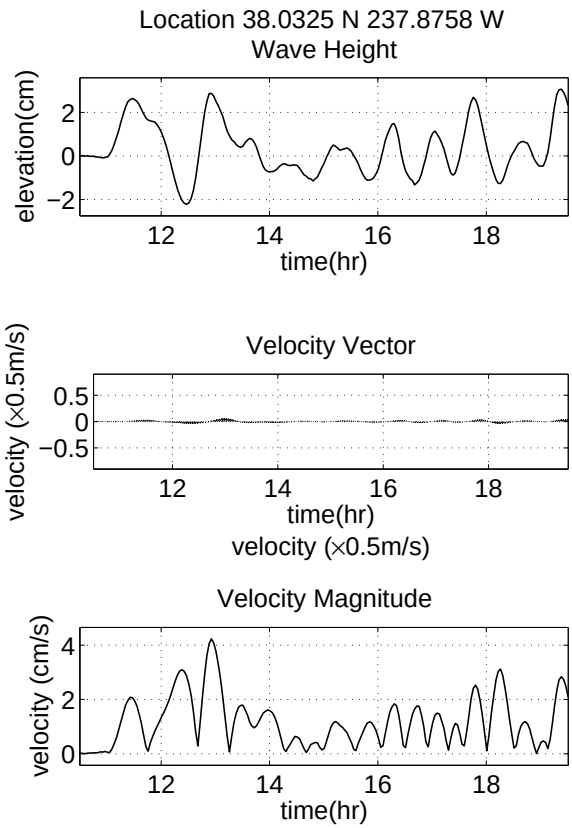
(3) Chevron USA, Inc., Richmond



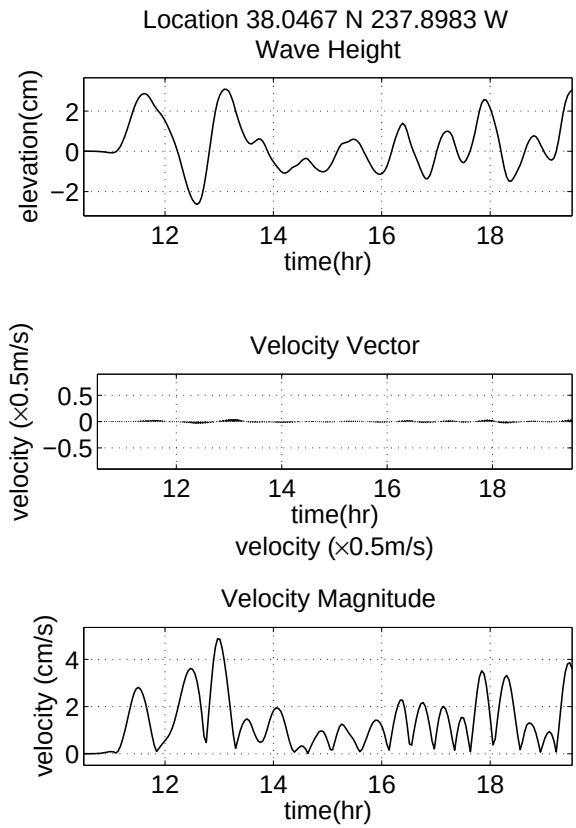
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



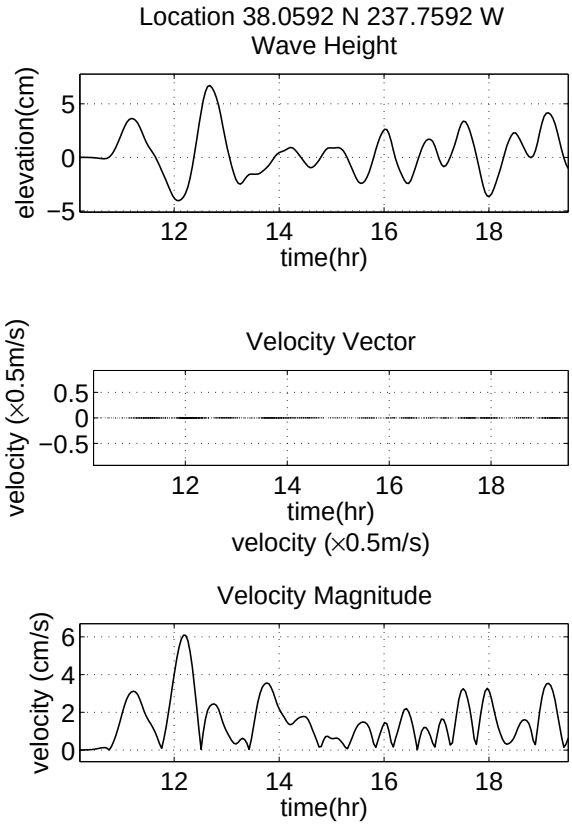
(6, 11) IMTT/Shore Terminals LLC, Richmond



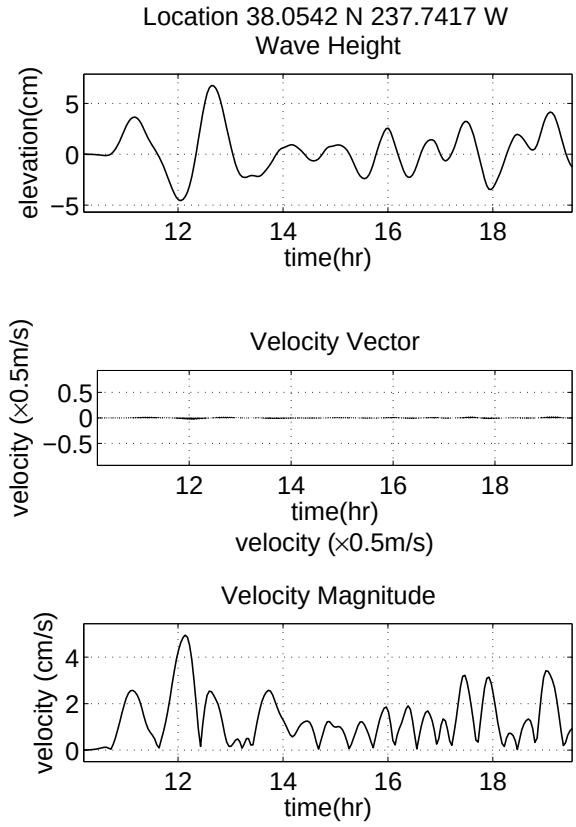
(7) Shell Oil Products, US, Martinez



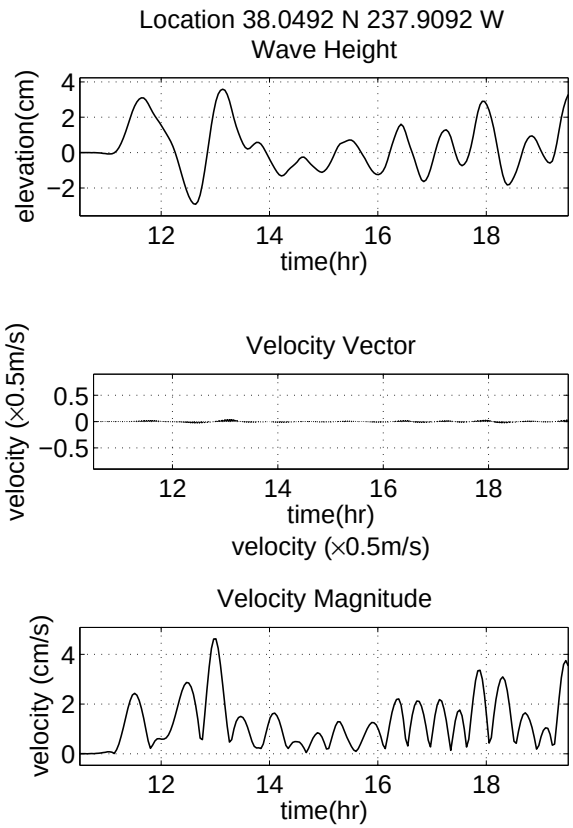
(9) Pacific Atlantic Terminals, Martinez



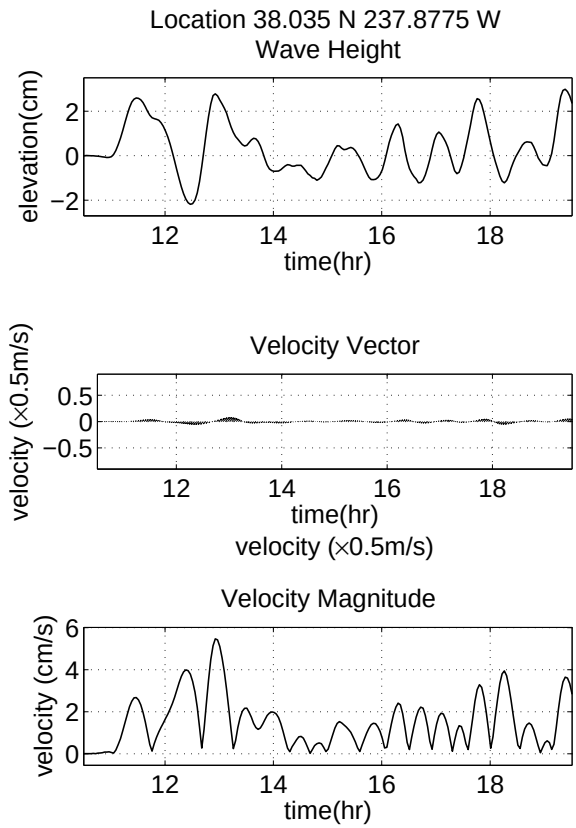
(10) Pacific Atlantic Terminals, Selby



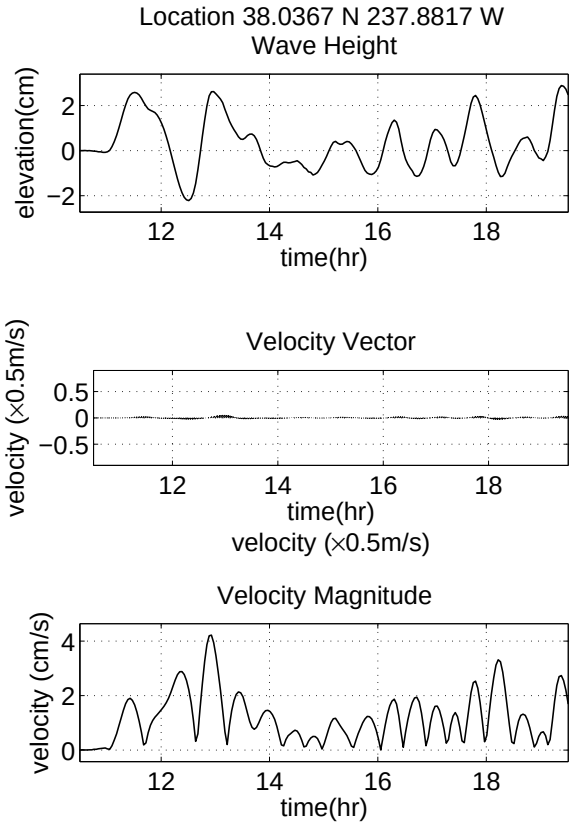
(13) ConocoPhillips, Rodeo



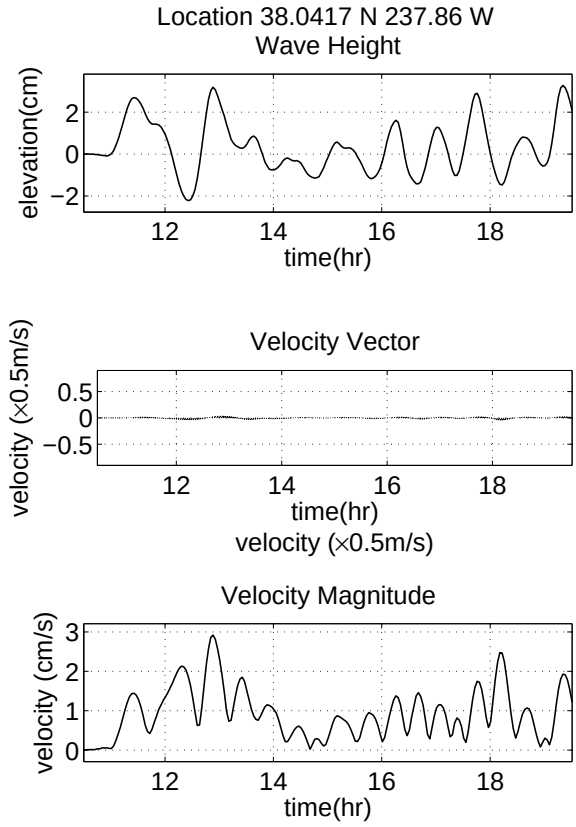
(14) Tesero, Inc. - Avon Wharf



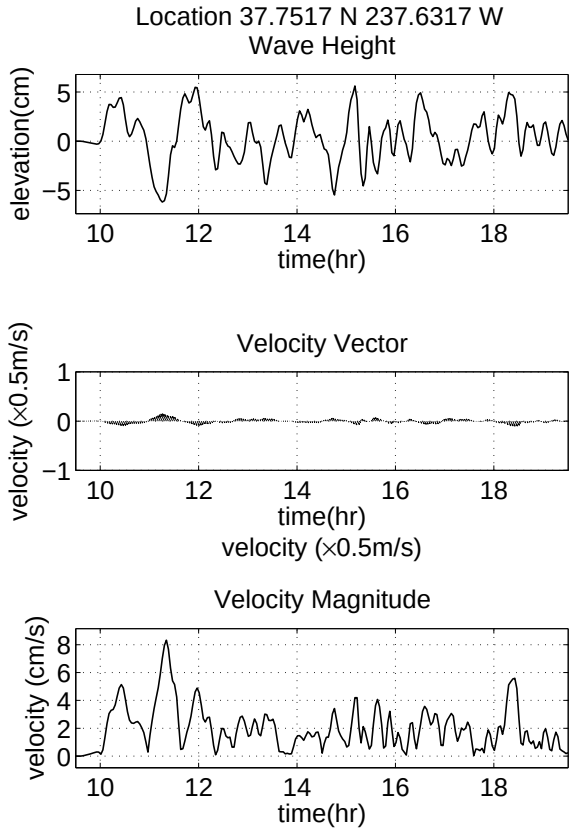
(15) Tesero, Inc. - Amorco Wharf



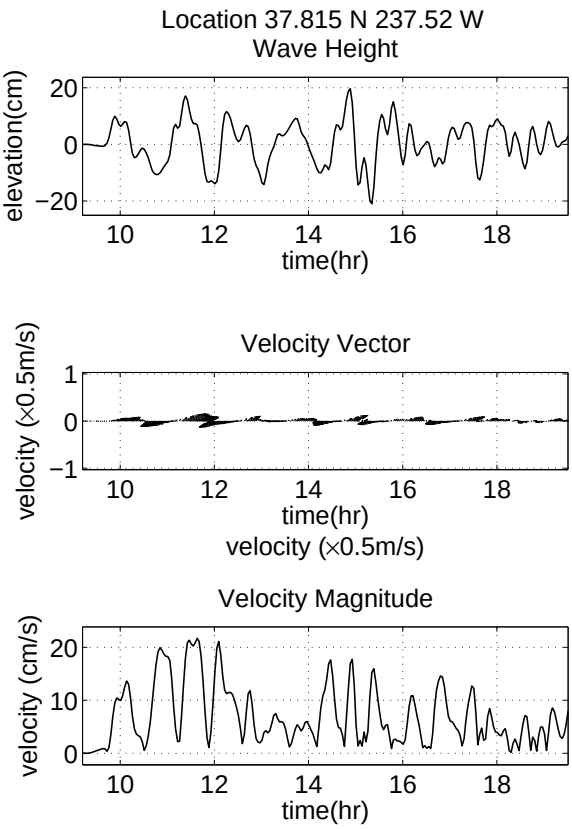
(16) Valero Refining Berth 1, Benicia



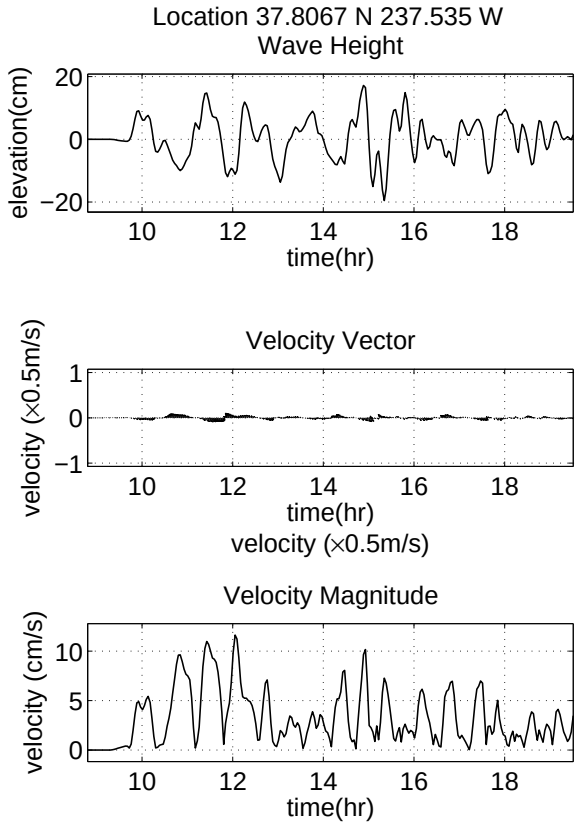
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco



(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Kuril Islands – III

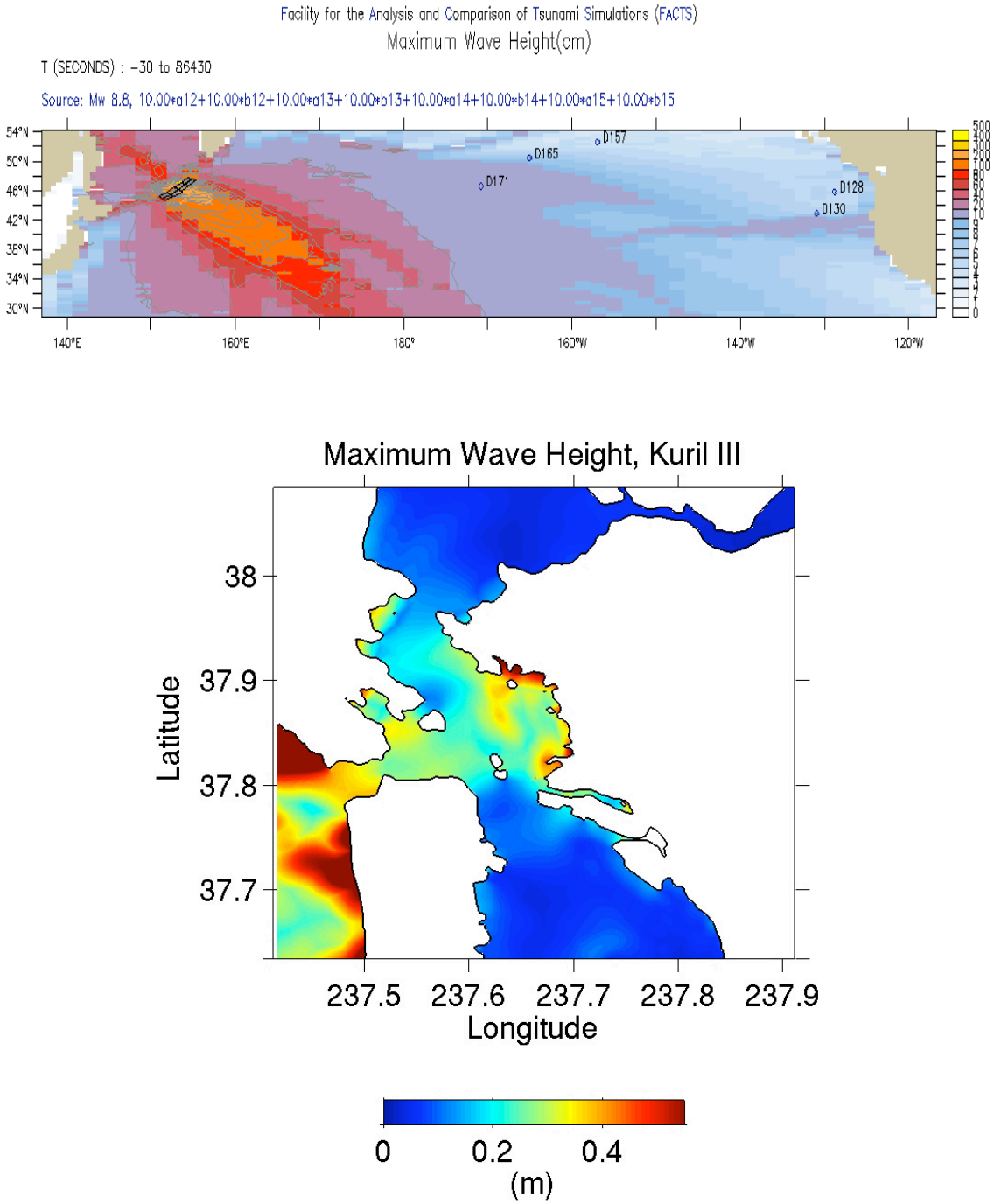
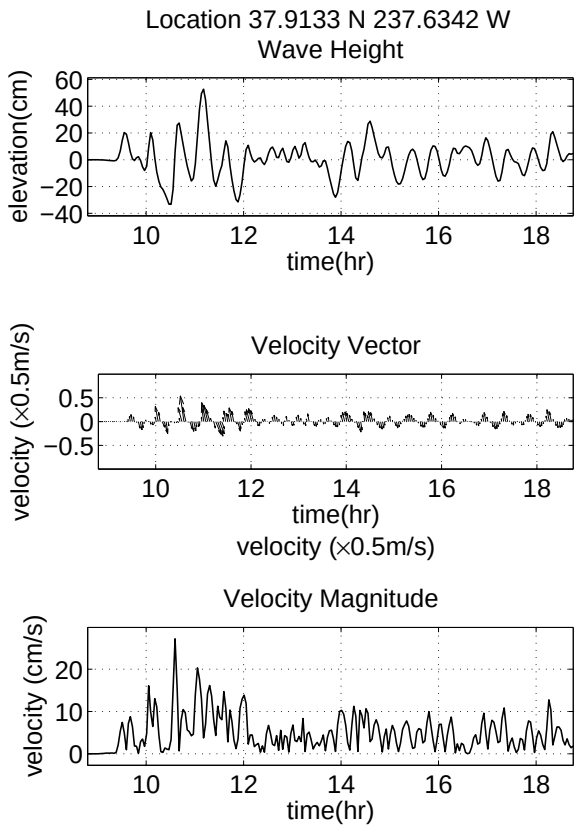
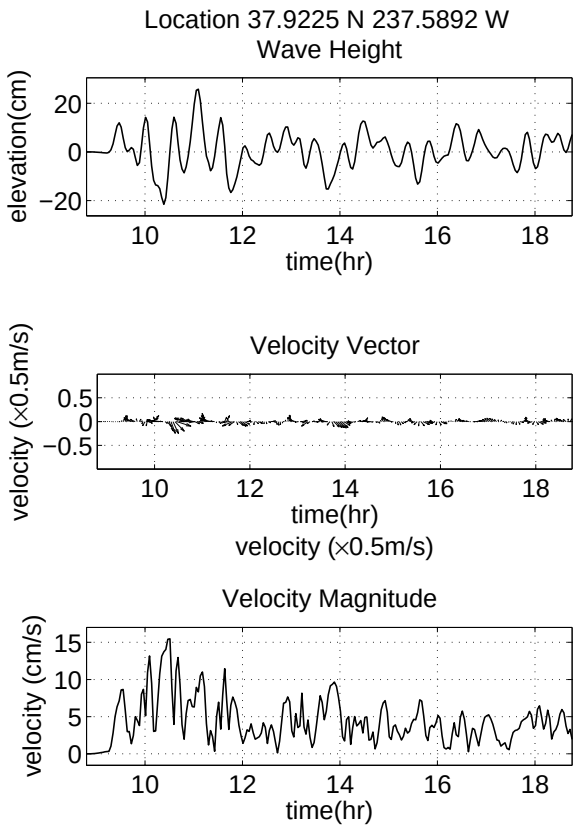


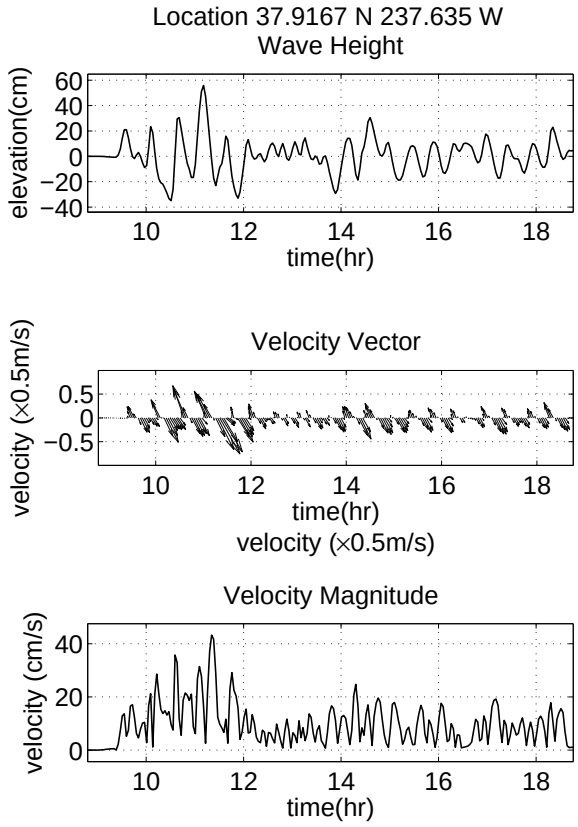
Fig. A1-8 – Maximum wave heights for tsunami simulation, basin wide (upper panel) and in San Francisco Bay (lower panel).



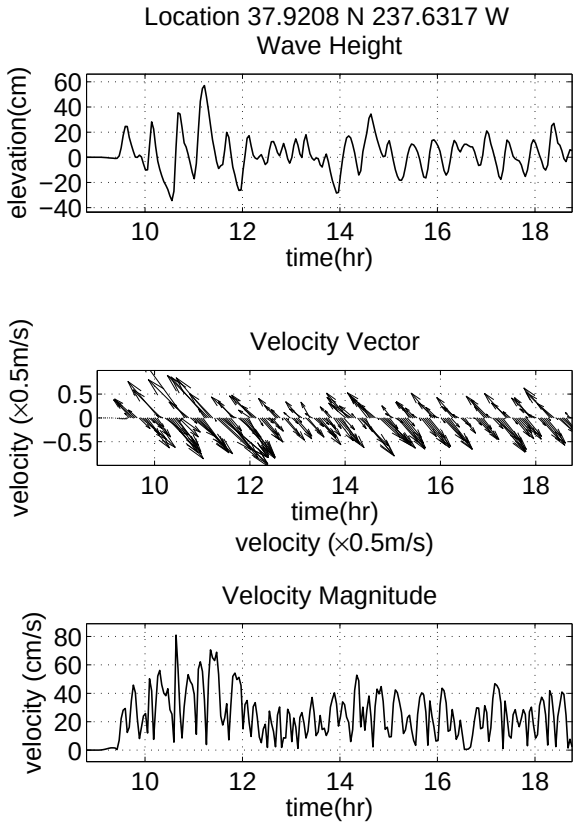
(1) BP West Coast Products, Richmond



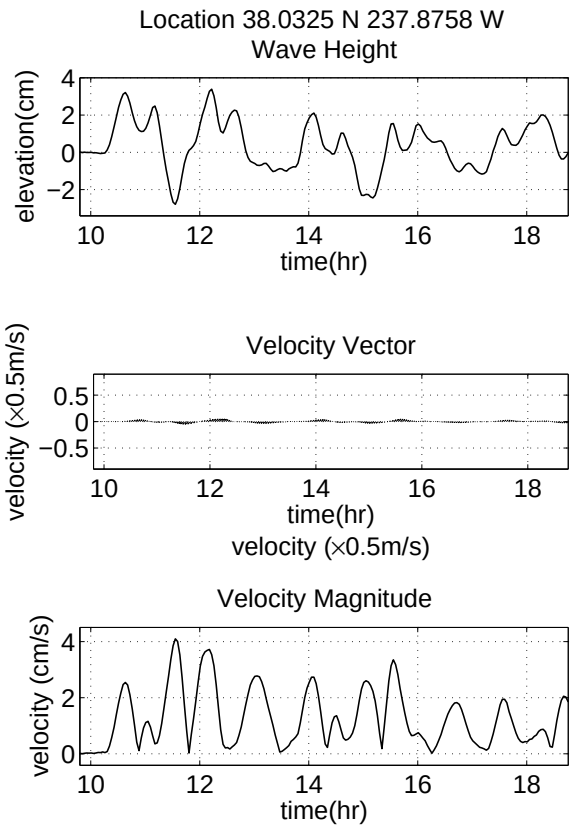
(3) Chevron USA, Inc., Richmond



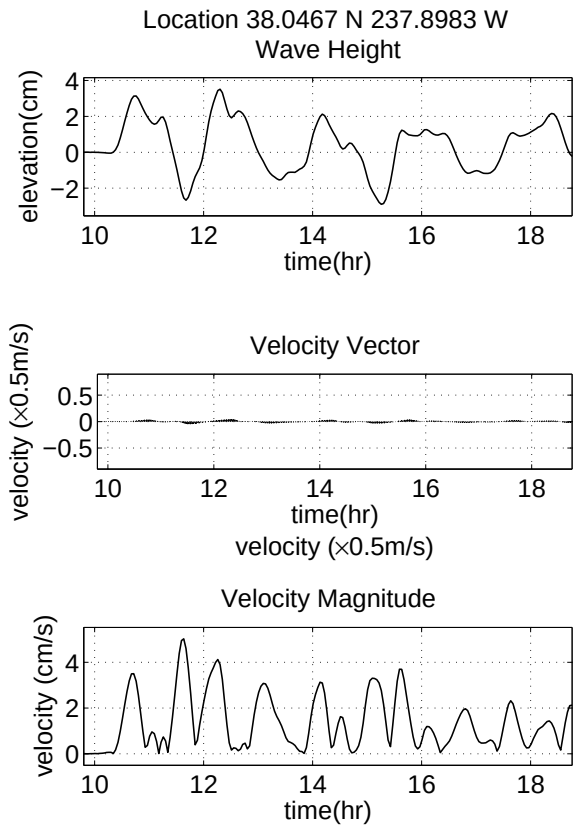
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



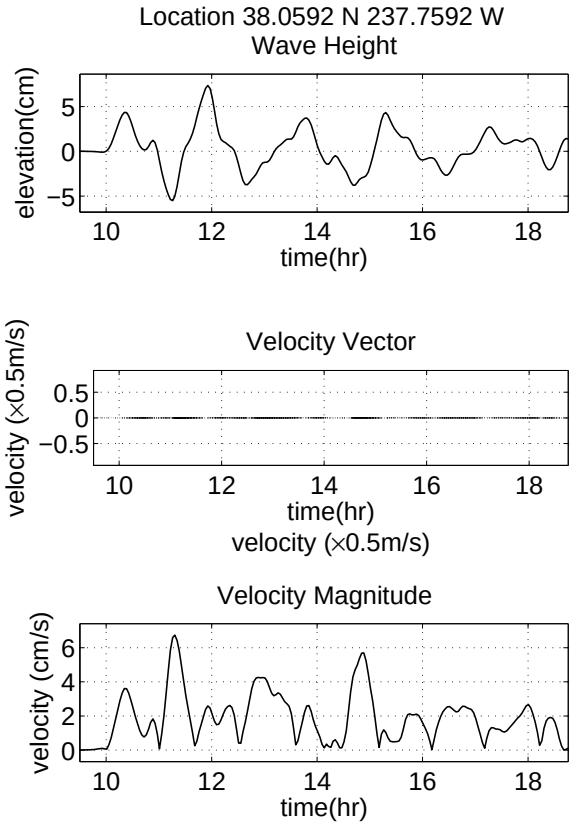
(6, 11) IMTT/Shore Terminals LLC, Richmond



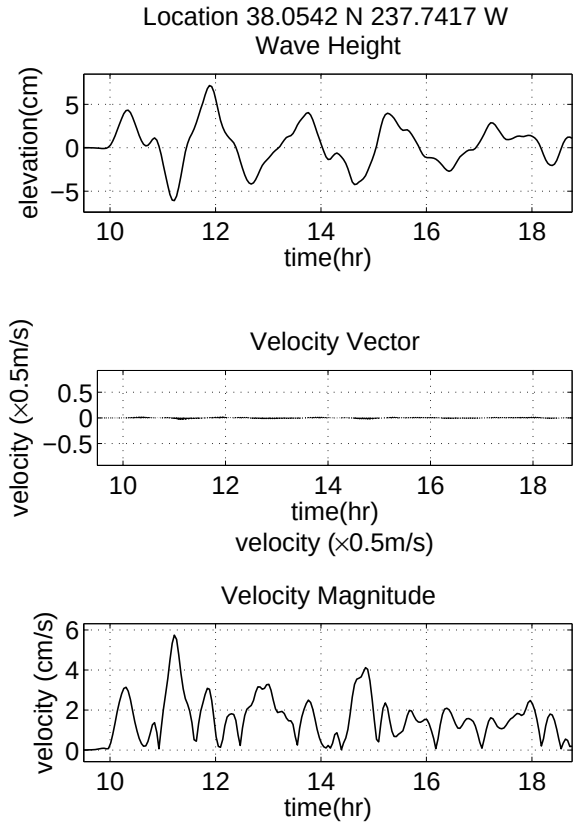
(7) Shell Oil Products, US, Martinez



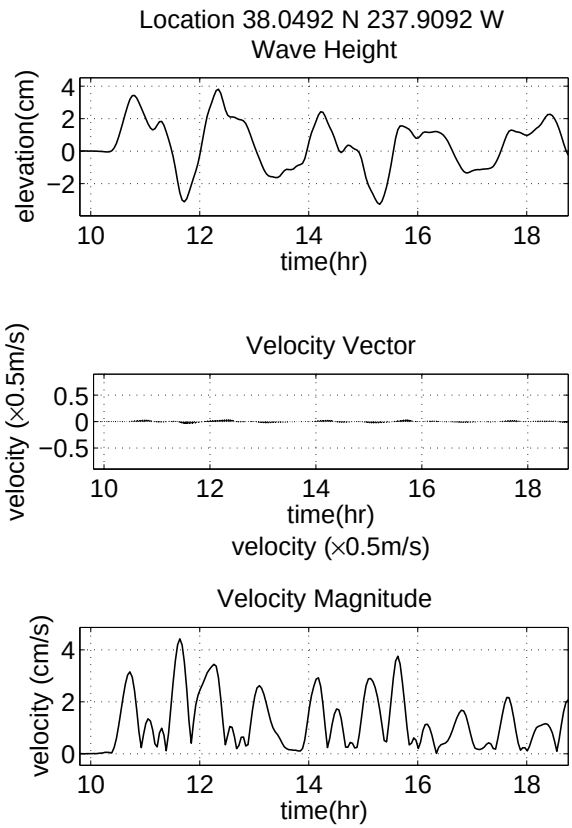
(9) Pacific Atlantic Terminals, Martinez



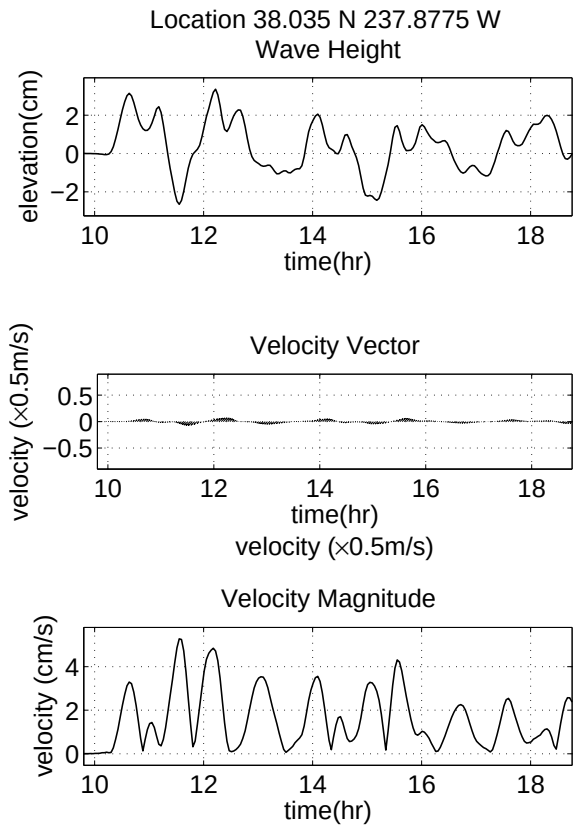
(10) Pacific Atlantic Terminals, Selby



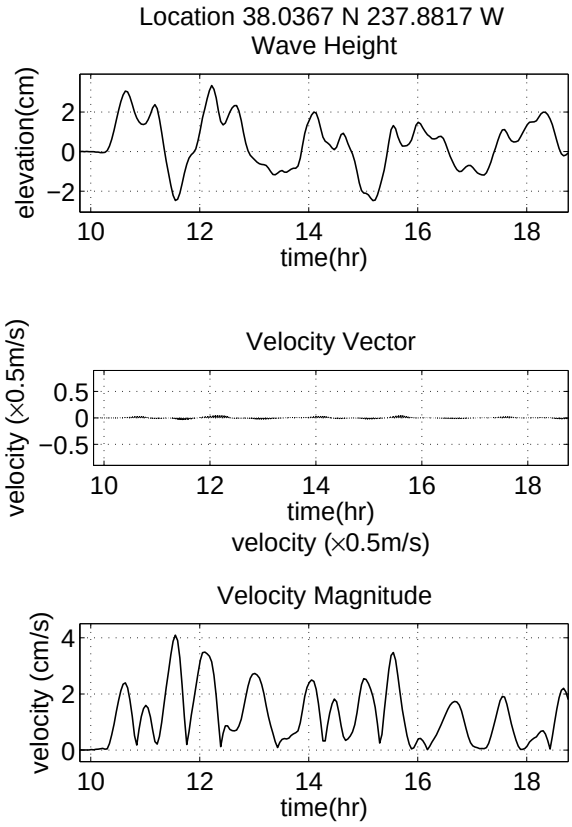
(13) ConocoPhillips, Rodeo



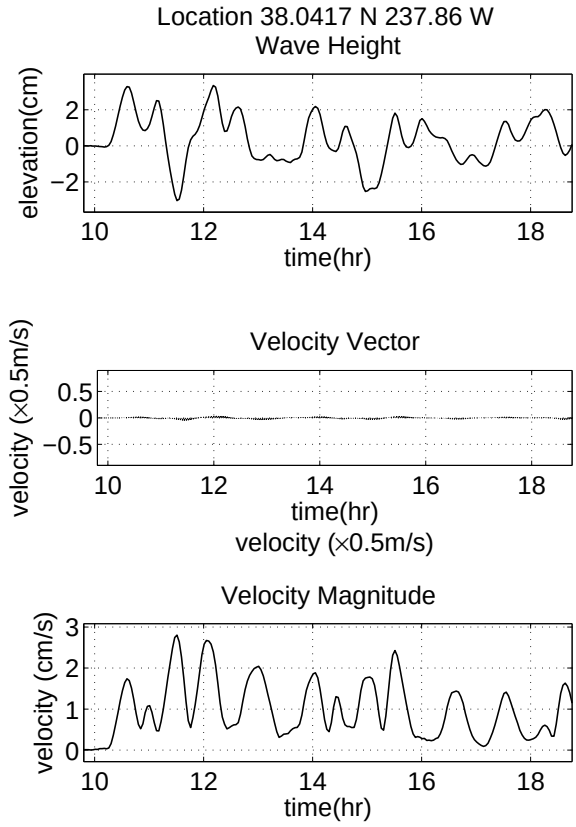
(14) Tesero, Inc. - Avon Wharf



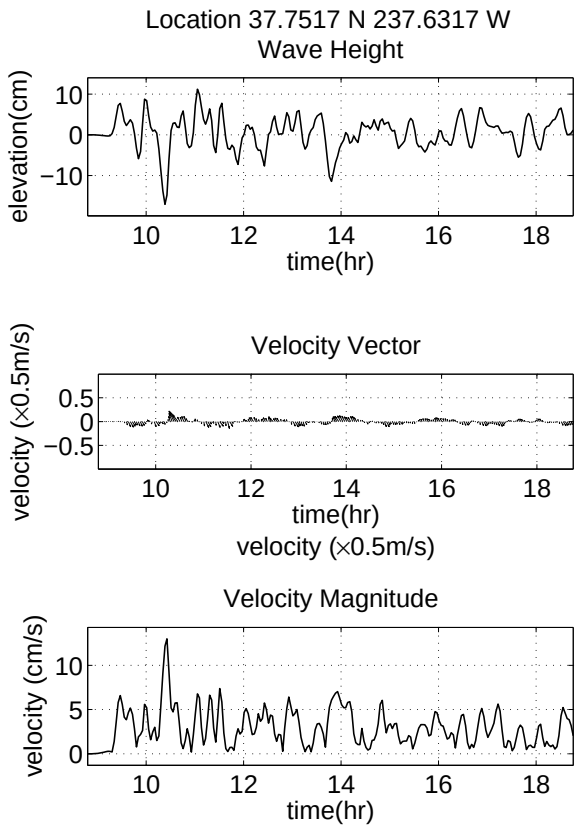
(15) Tesero, Inc. - Amorco Wharf



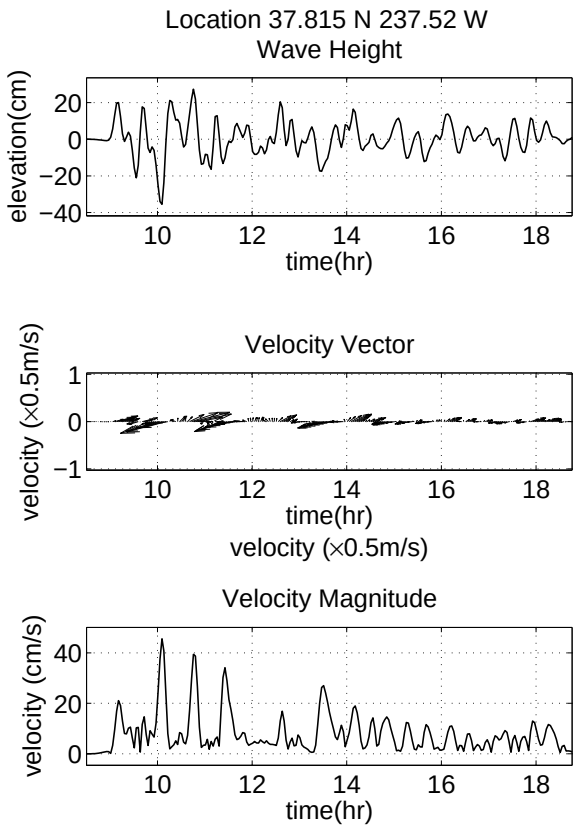
(16) Valero Refining Berth 1, Benicia



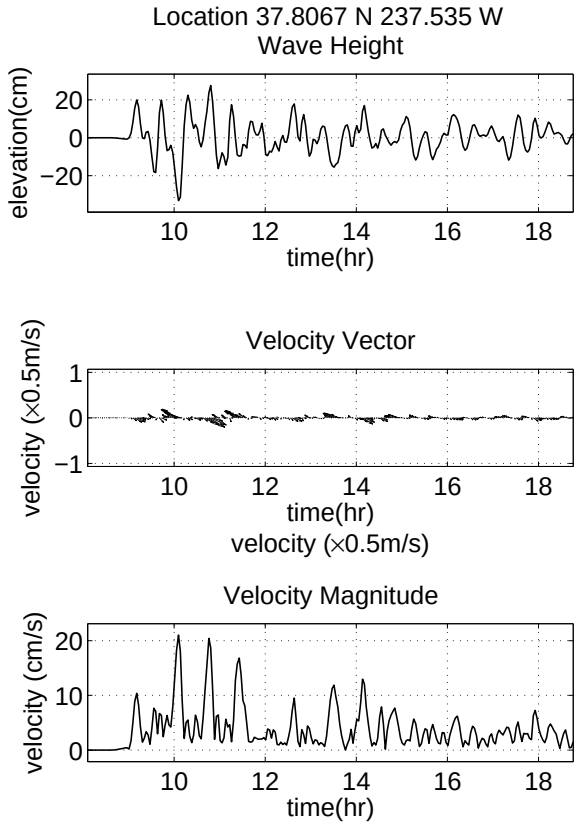
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco

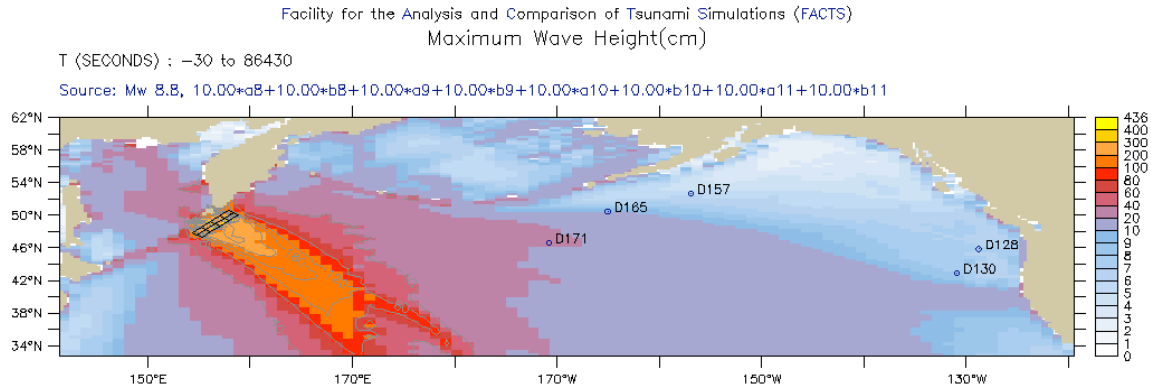


(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Kuril Islands – IV



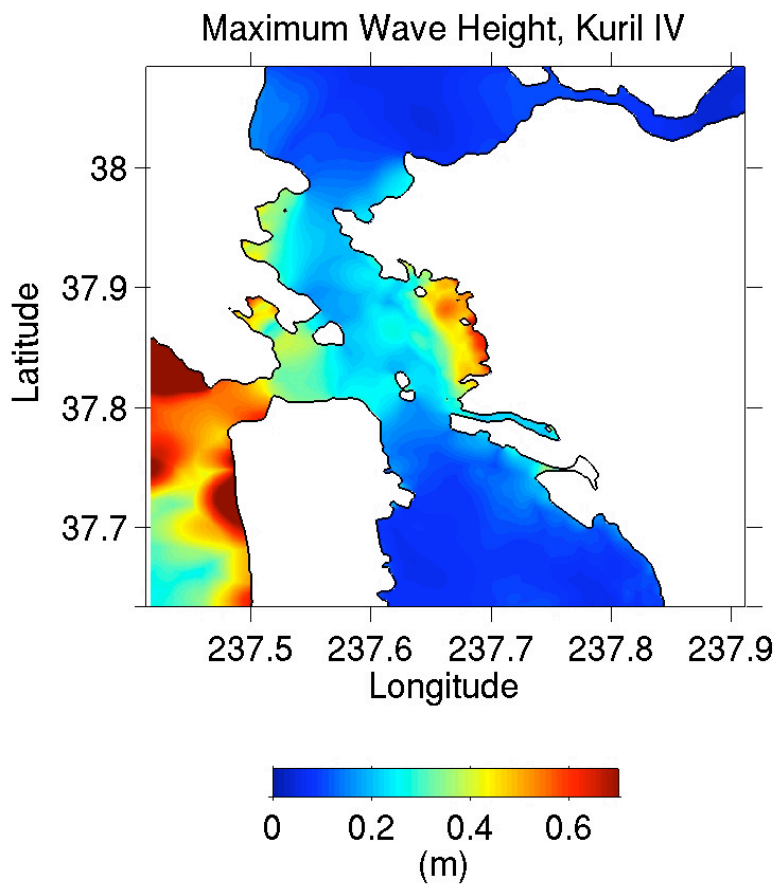
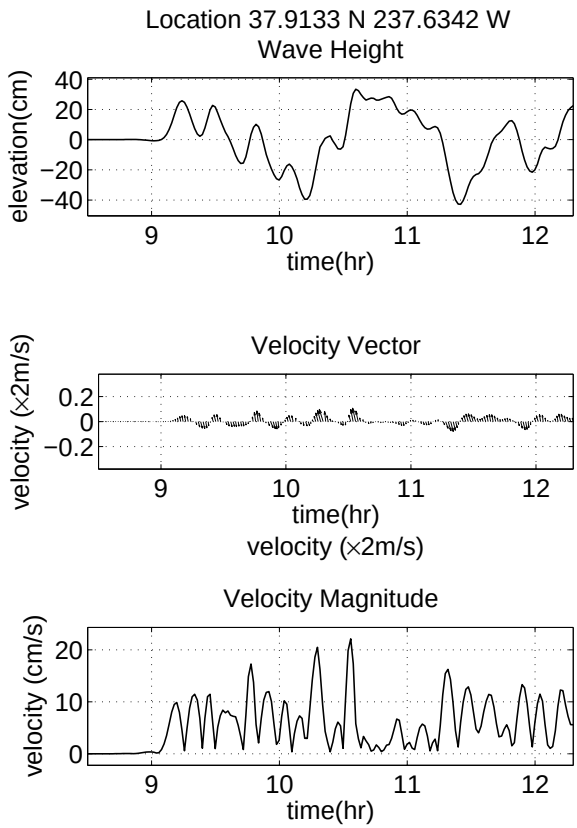
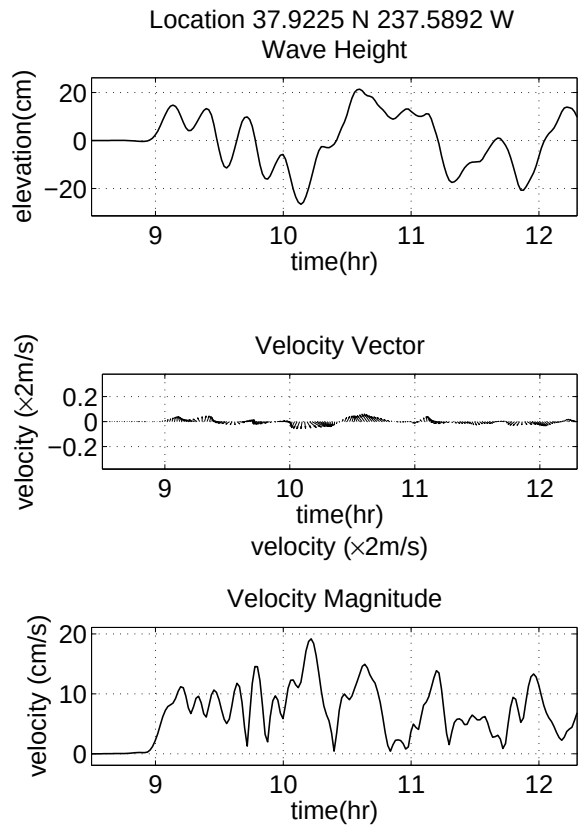


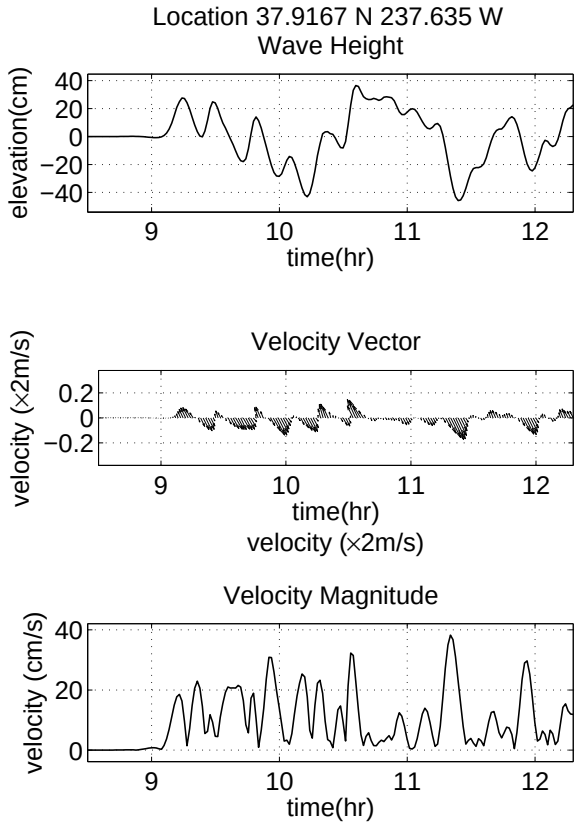
Fig. A1-9 – Maximum wave heights for tsunami simulation, basin wide (upper panel) and in San Francisco Bay (lower panel).



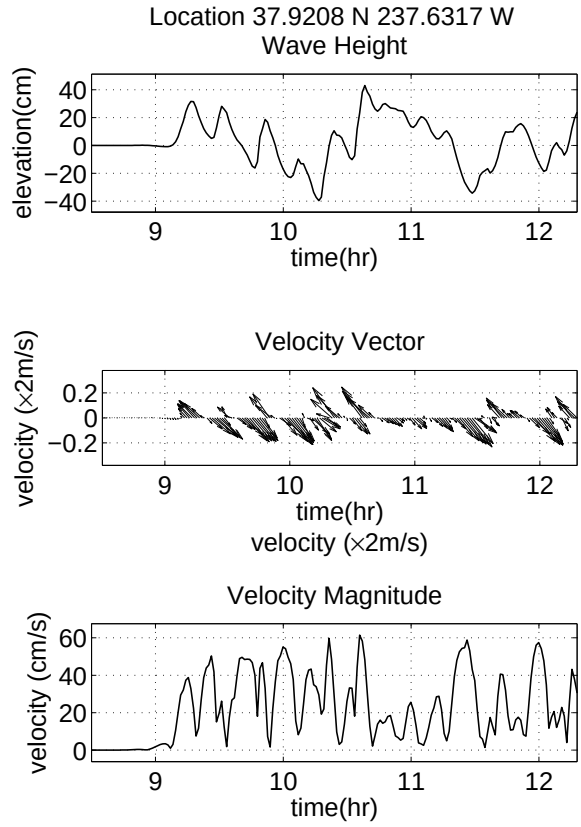
(1) BP West Coast Products, Richmond



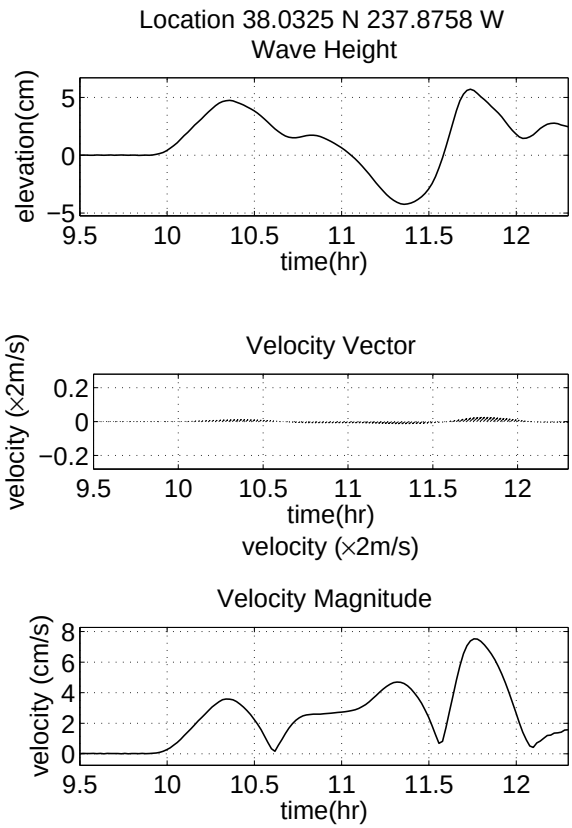
(3) Chevron USA, Inc., Richmond



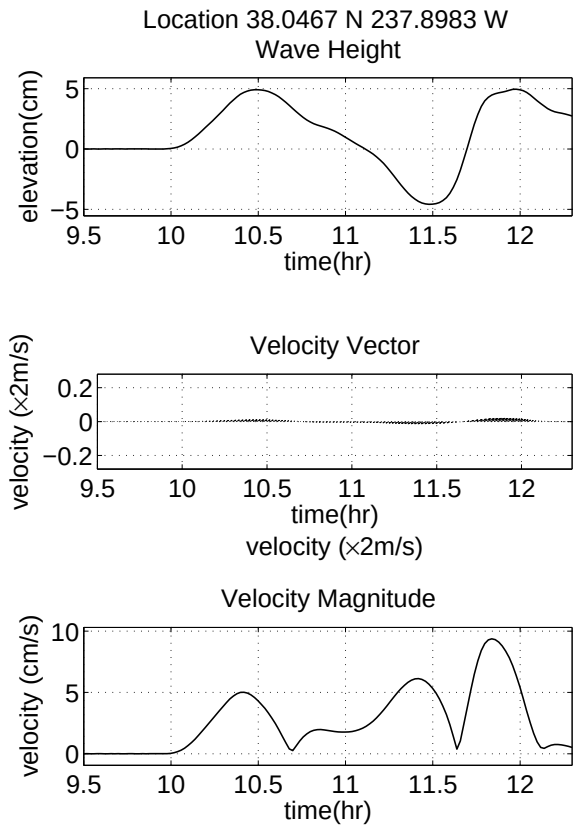
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



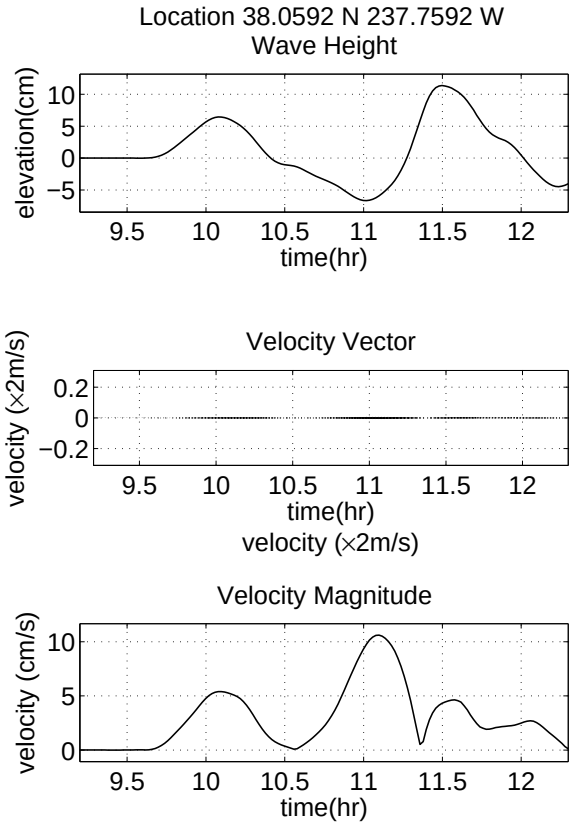
(6, 11) IMTT/Shore Terminals LLC, Richmond



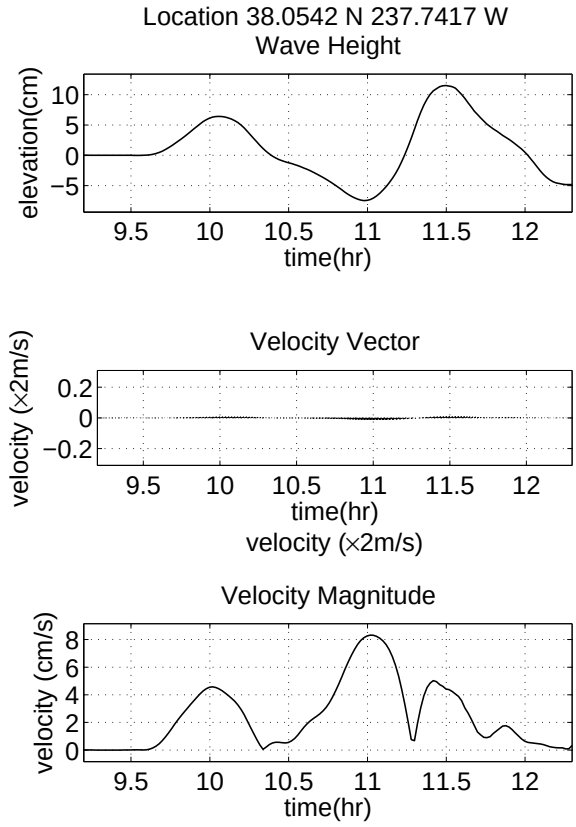
(7) Shell Oil Products, US, Martinez



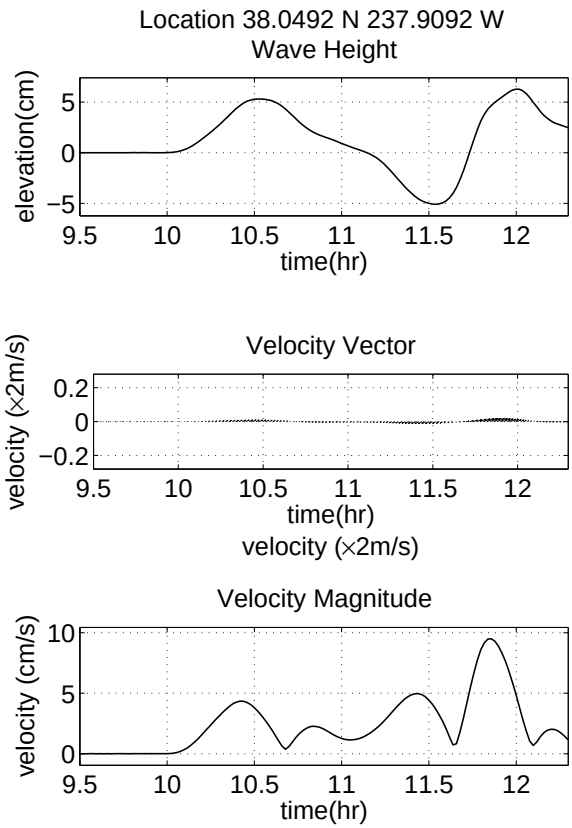
(9) Pacific Atlantic Terminals, Martinez



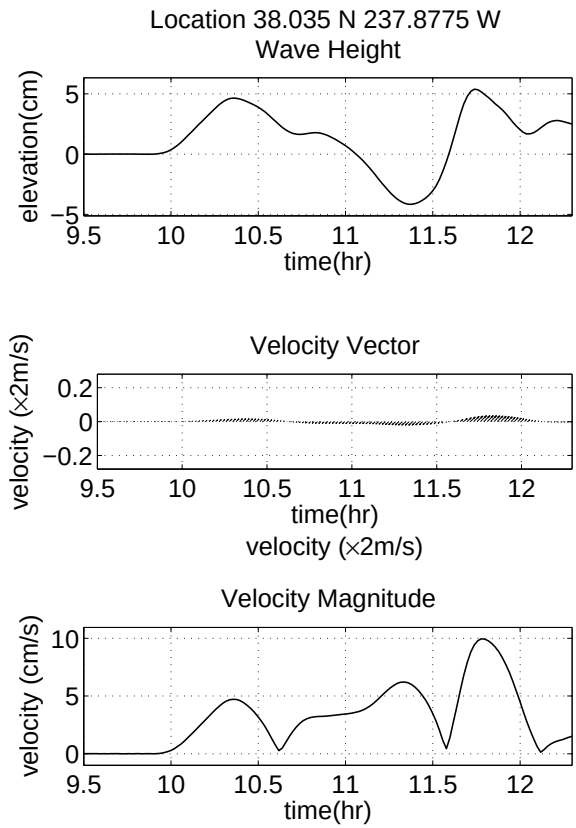
(10) Pacific Atlantic Terminals, Selby



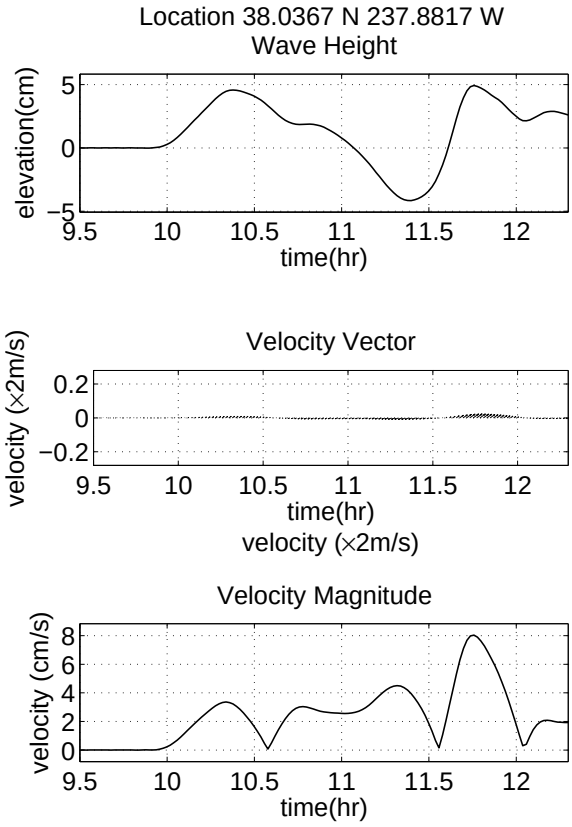
(13) ConocoPhillips, Rodeo



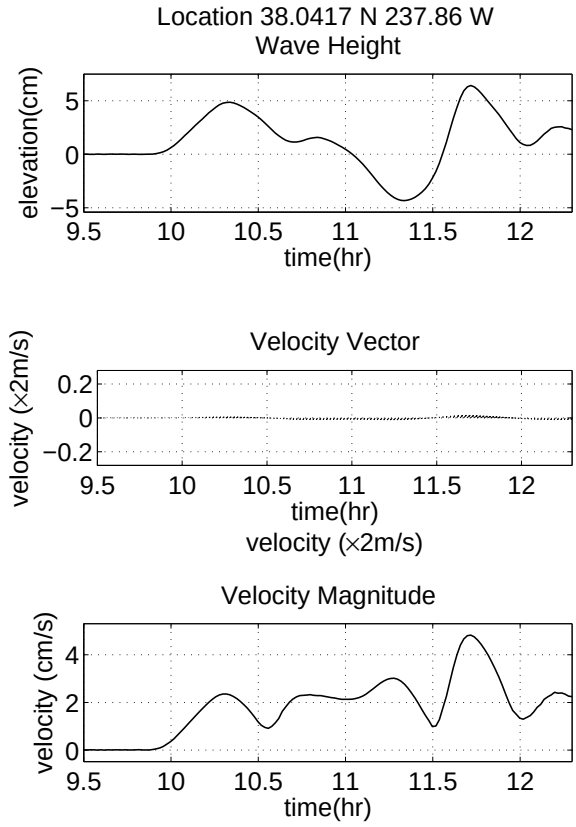
(14) Tesero, Inc. - Avon Wharf



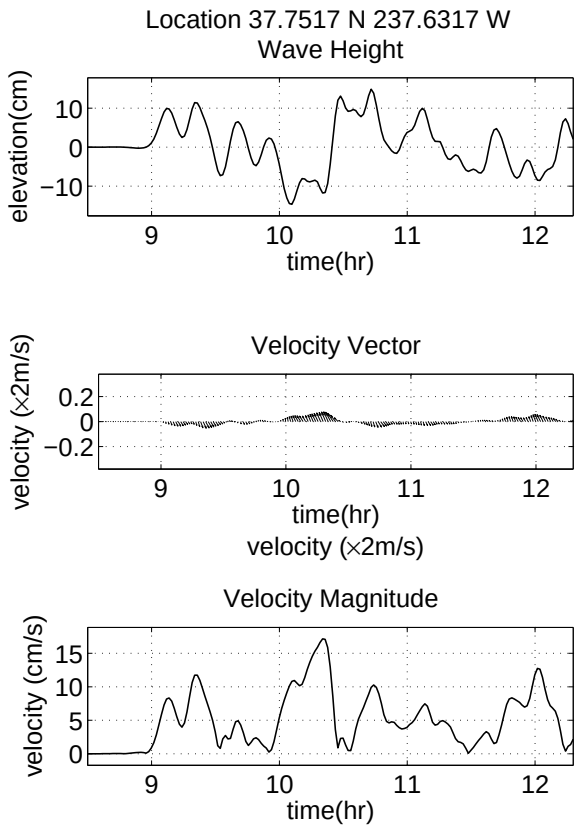
(15) Tesero, Inc. - Amorco Wharf



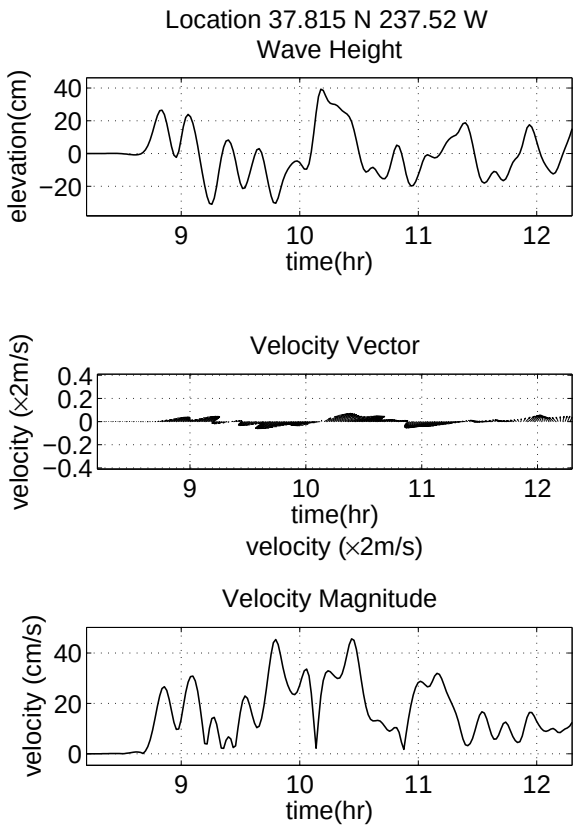
(16) Valero Refining Berth 1, Benicia



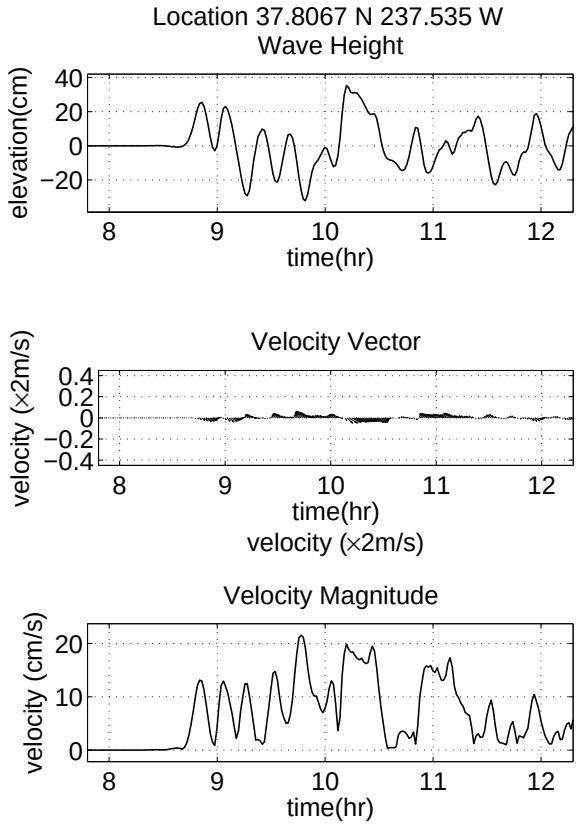
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco



(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Japan - I

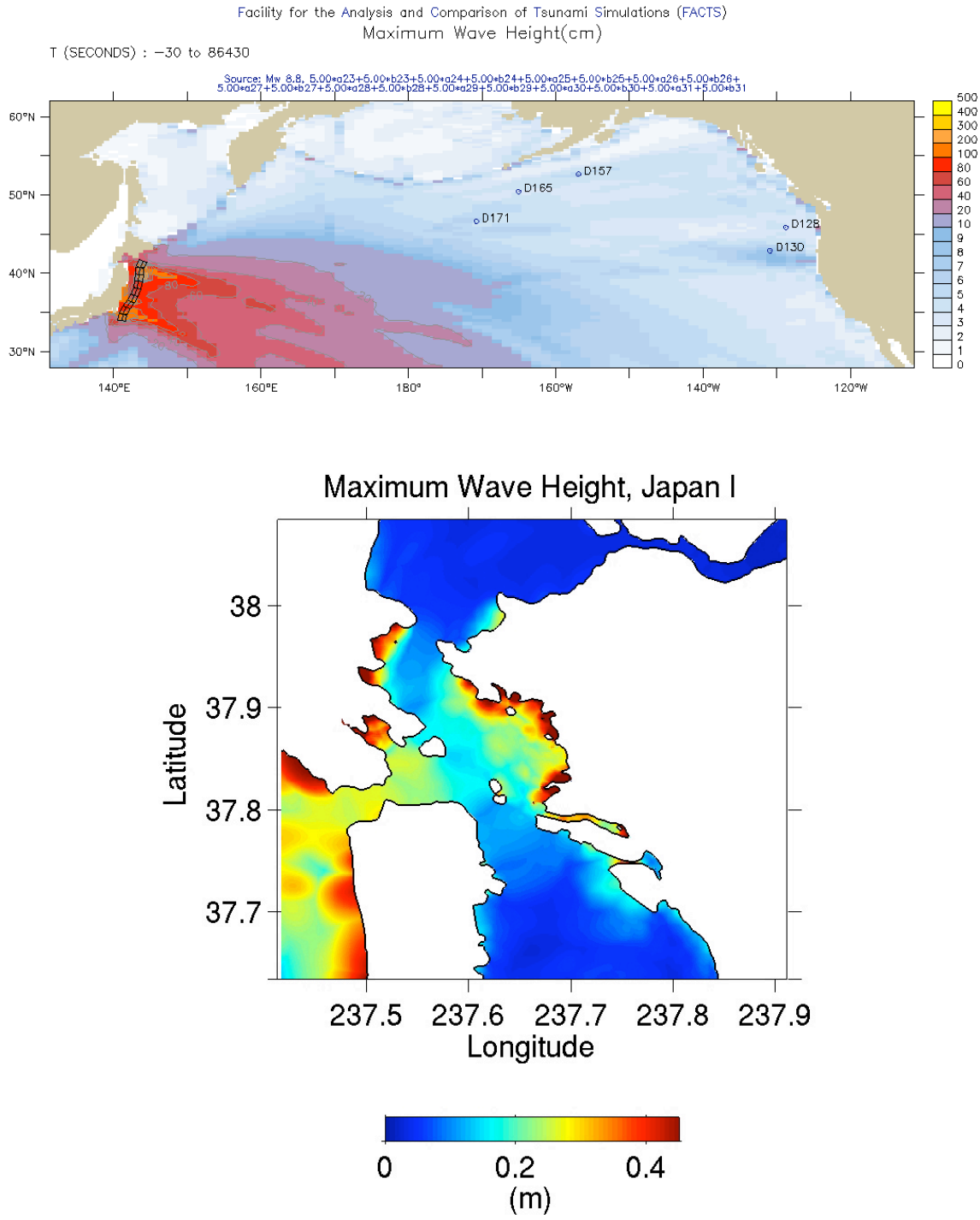
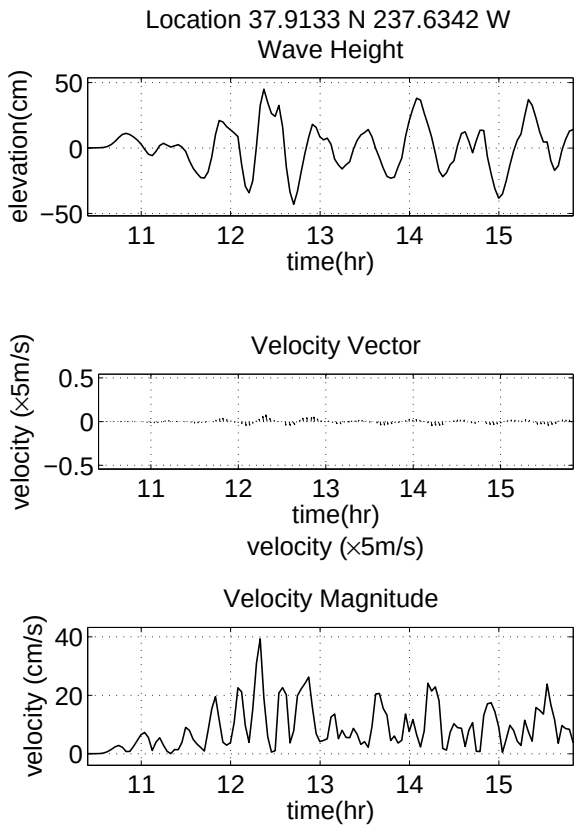
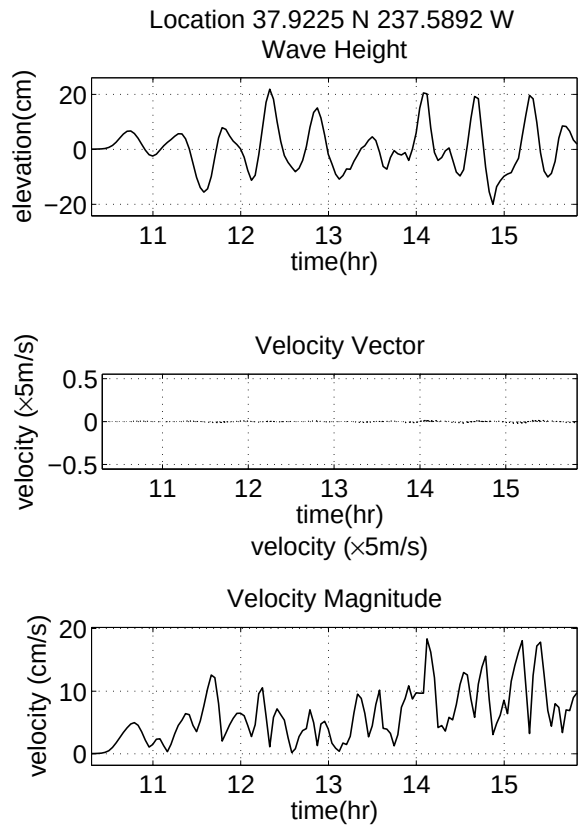


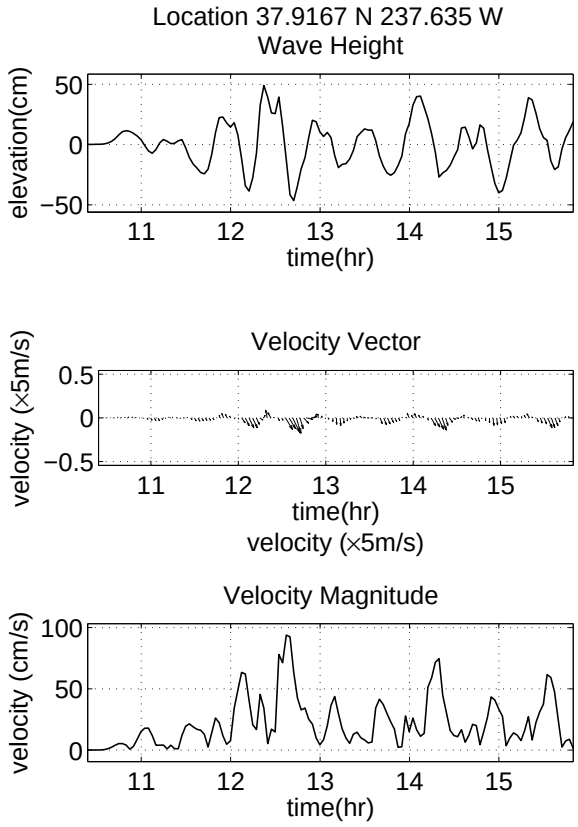
Fig. A1-10 – Maximum wave heights for tsunami simulation, basin wide (upper panel) and in San Francisco Bay (lower panel).



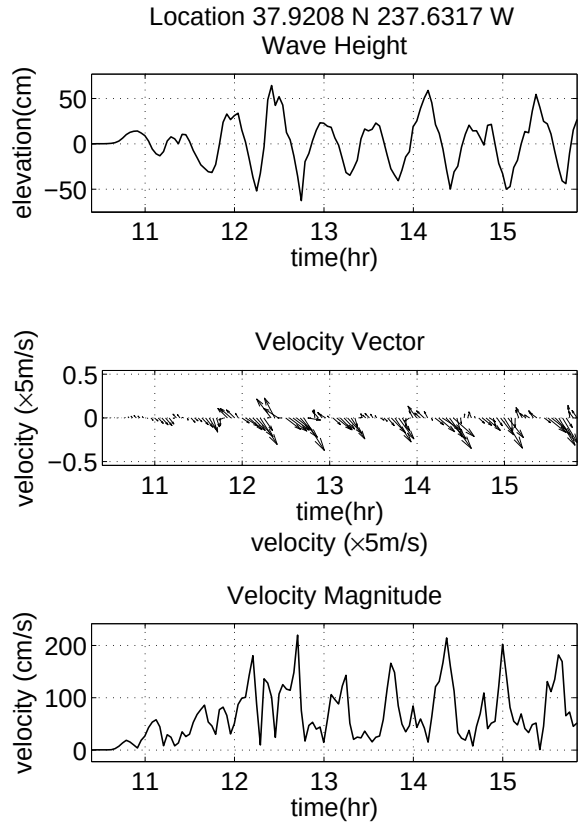
(1) BP West Coast Products, Richmond



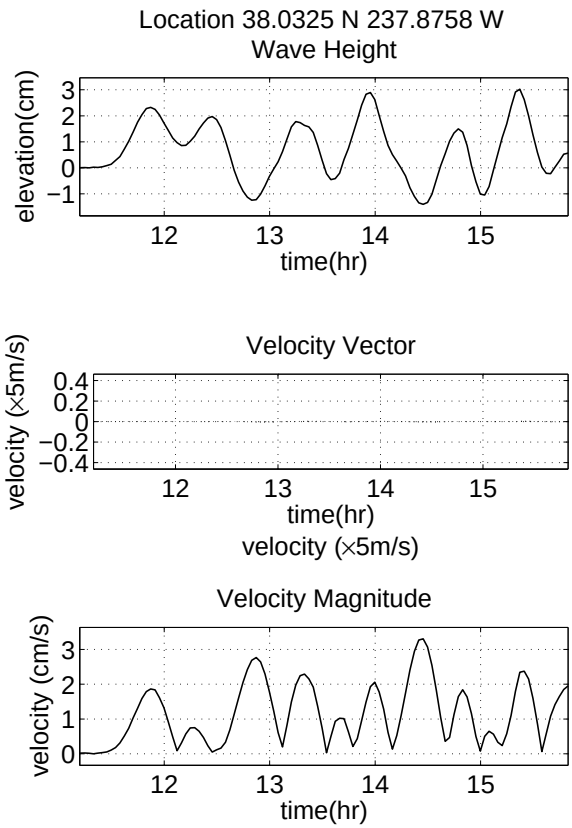
(3) Chevron USA, Inc., Richmond



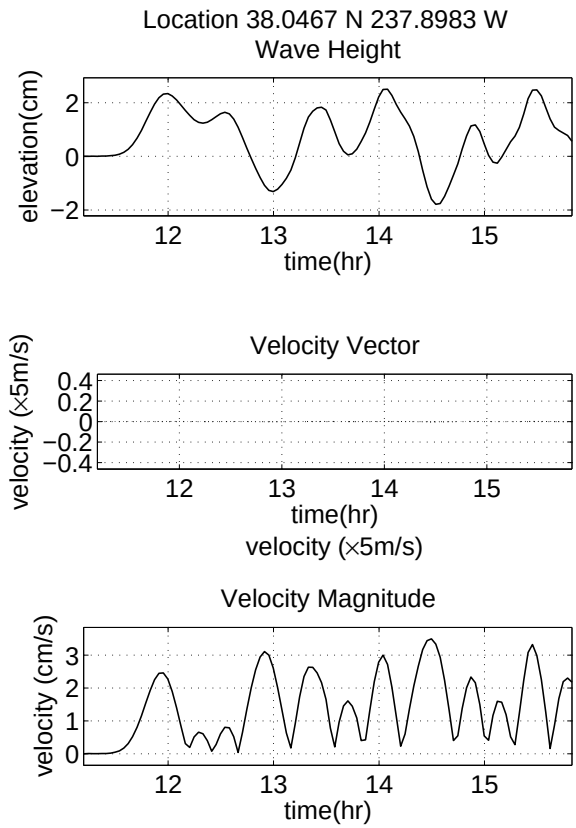
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



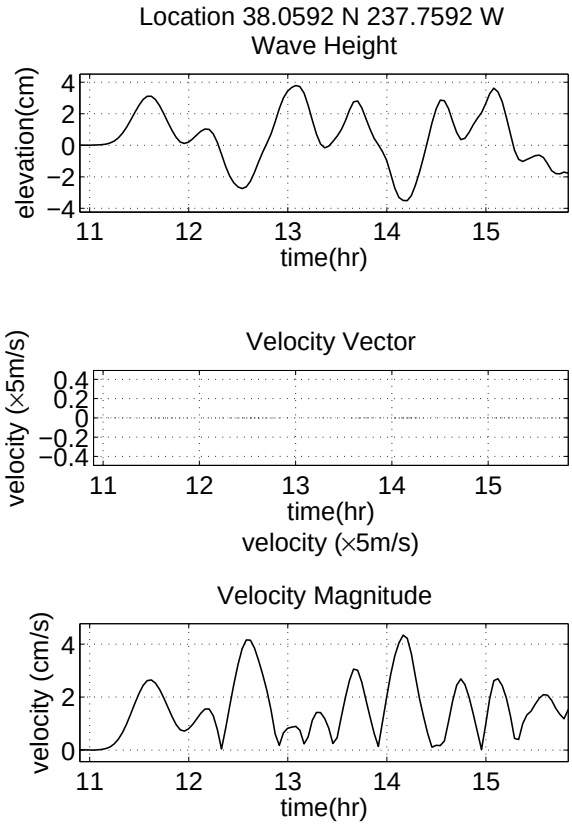
(6, 11) IMTT/Shore Terminals LLC, Richmond



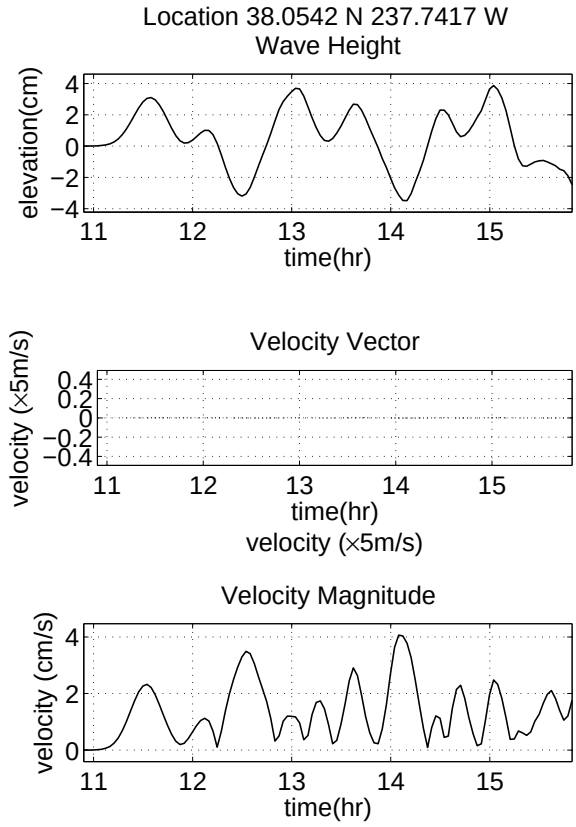
(7) Shell Oil Products, US, Martinez



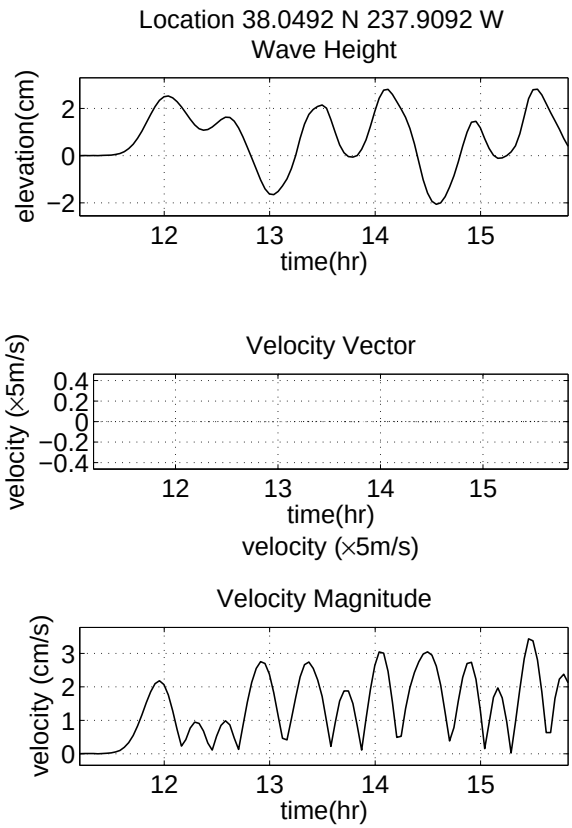
(9) Pacific Atlantic Terminals, Martinez



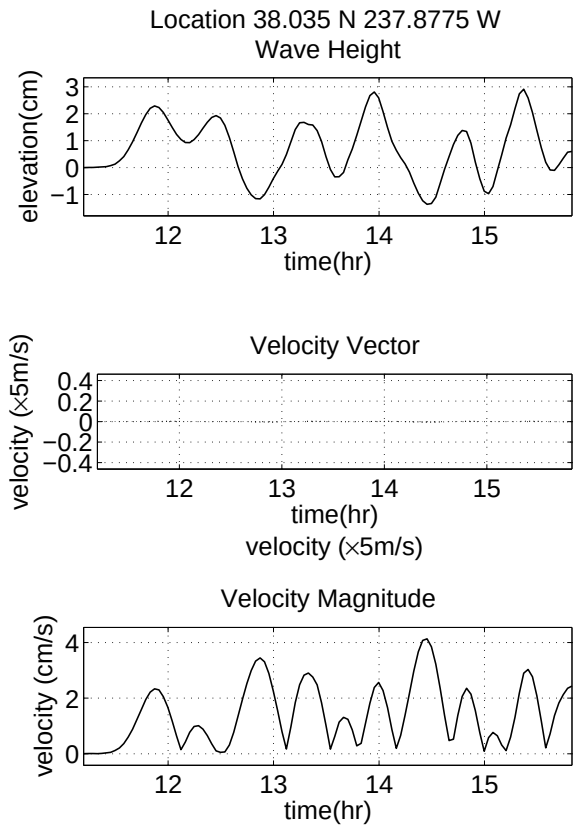
(10) Pacific Atlantic Terminals, Selby



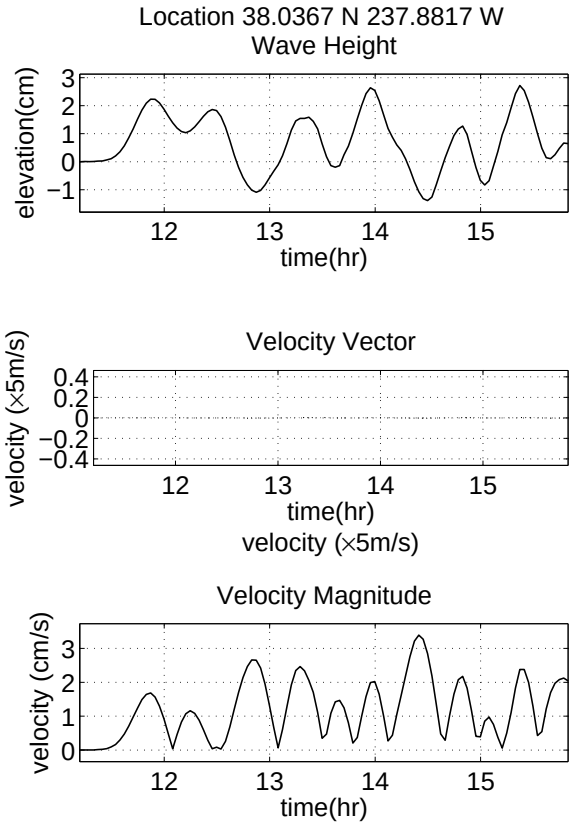
(13) ConocoPhillips, Rodeo



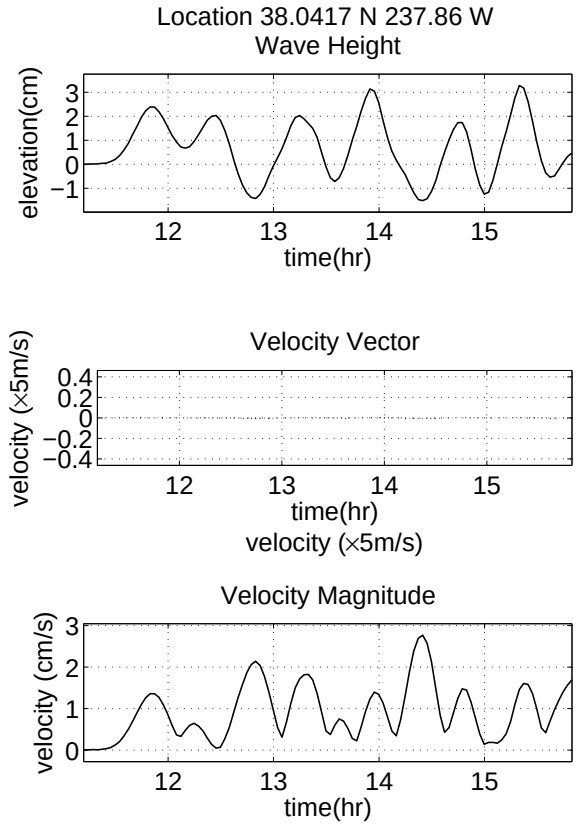
(14) Tesero, Inc. - Avon Wharf



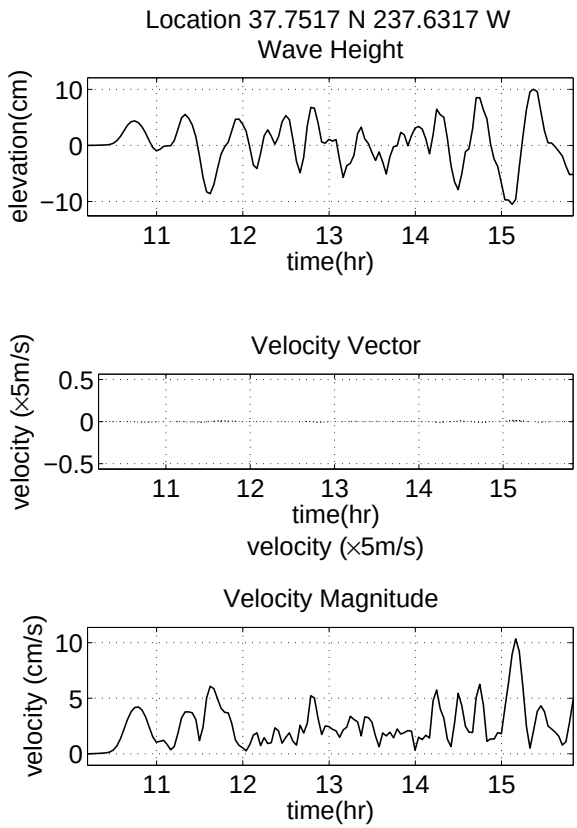
(15) Tesero, Inc. - Amorco Wharf



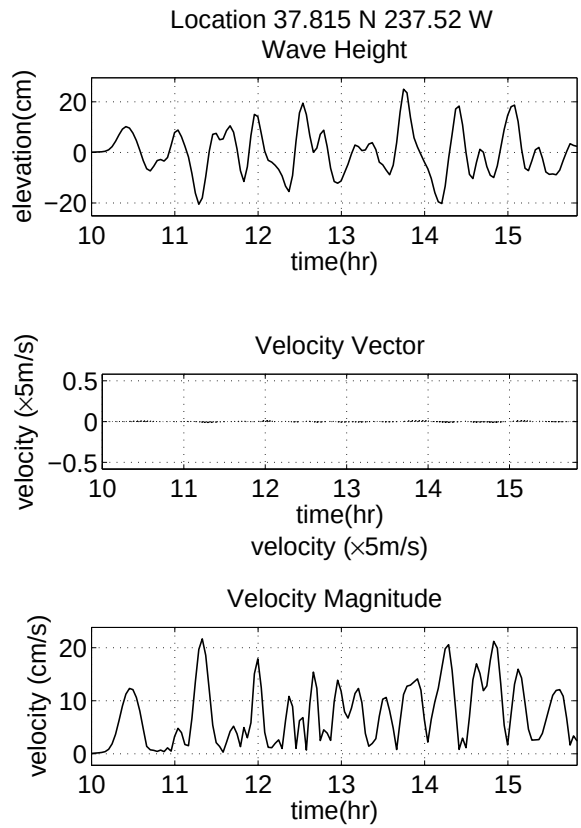
(16) Valero Refining Berth 1, Benicia



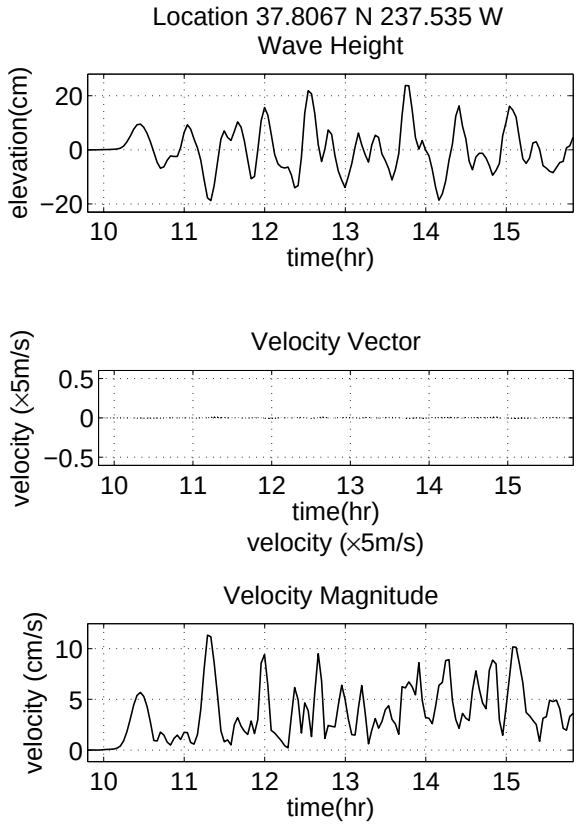
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco



(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Japan - II

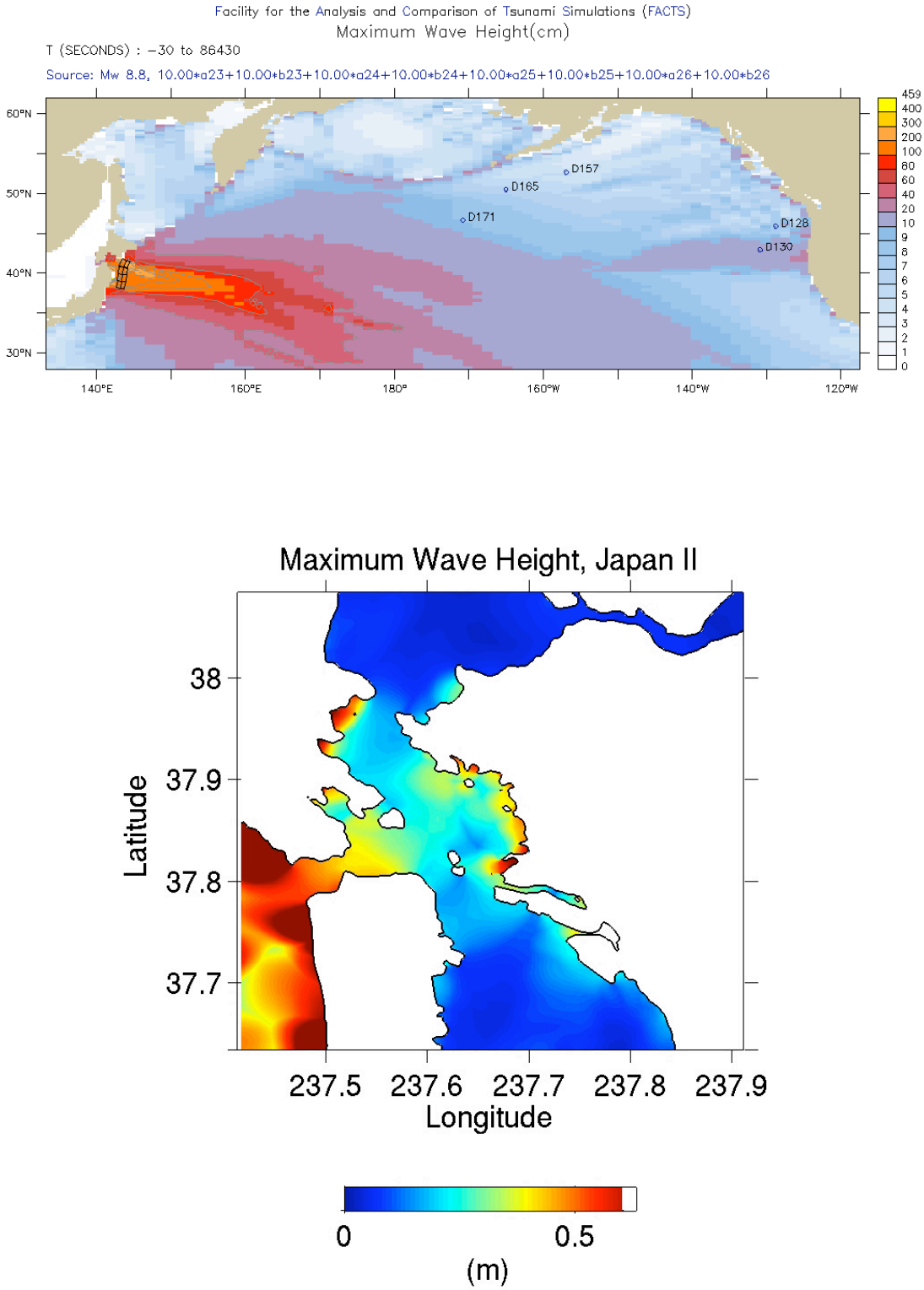
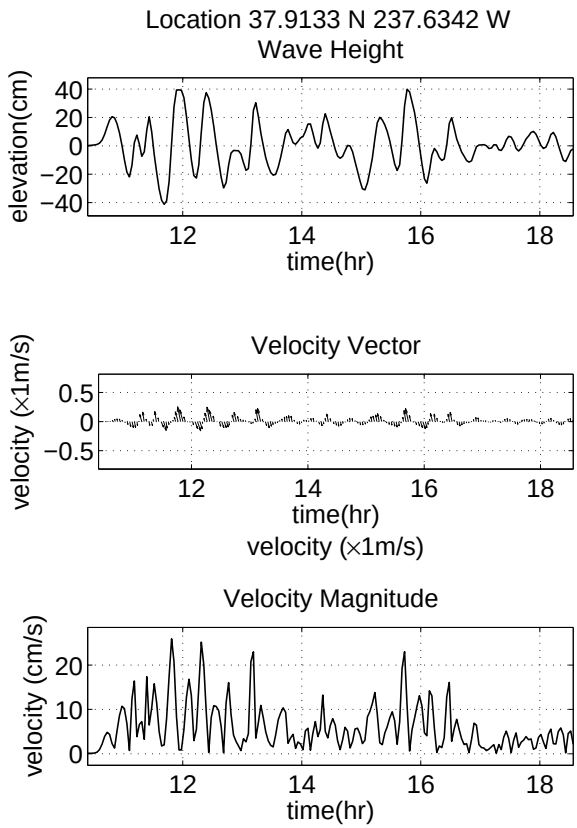
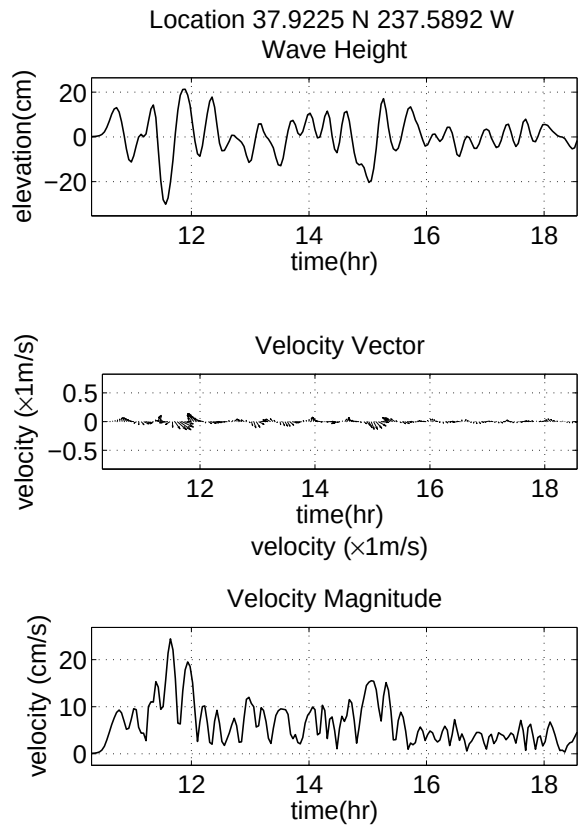


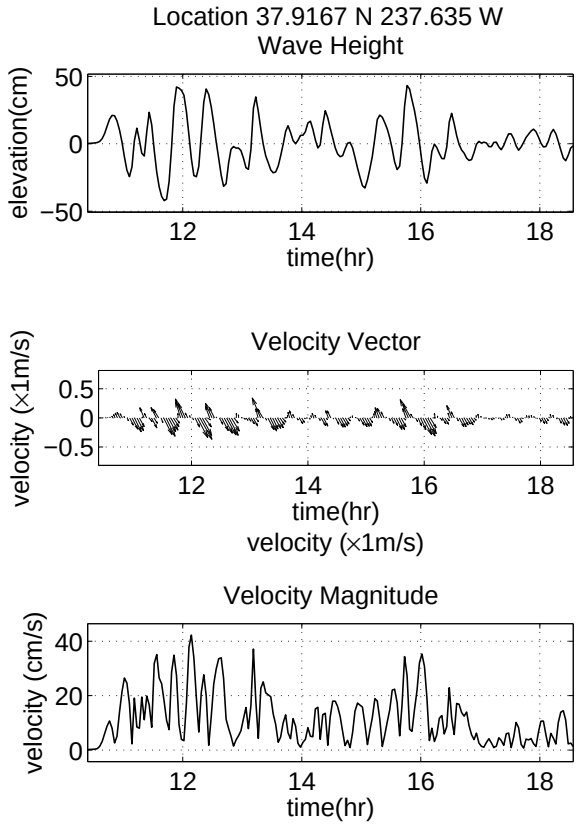
Fig. A1-11 – Maximum wave heights for tsunami simulation, basin wide (upper panel) and in San Francisco Bay (lower panel).



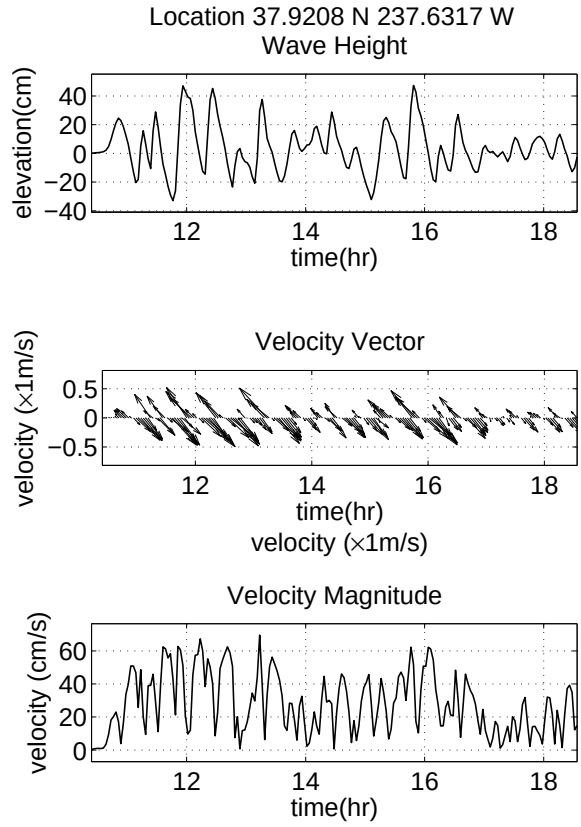
(1) BP West Coast Products, Richmond



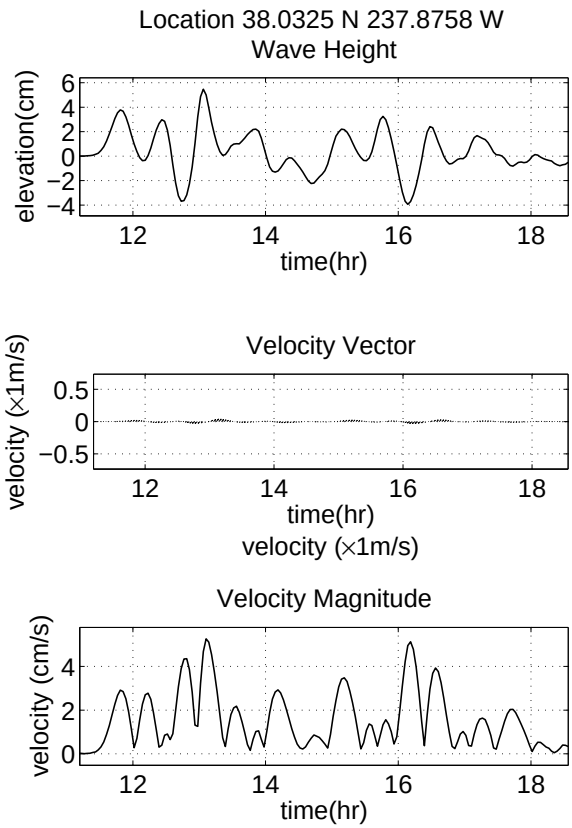
(3) Chevron USA, Inc., Richmond



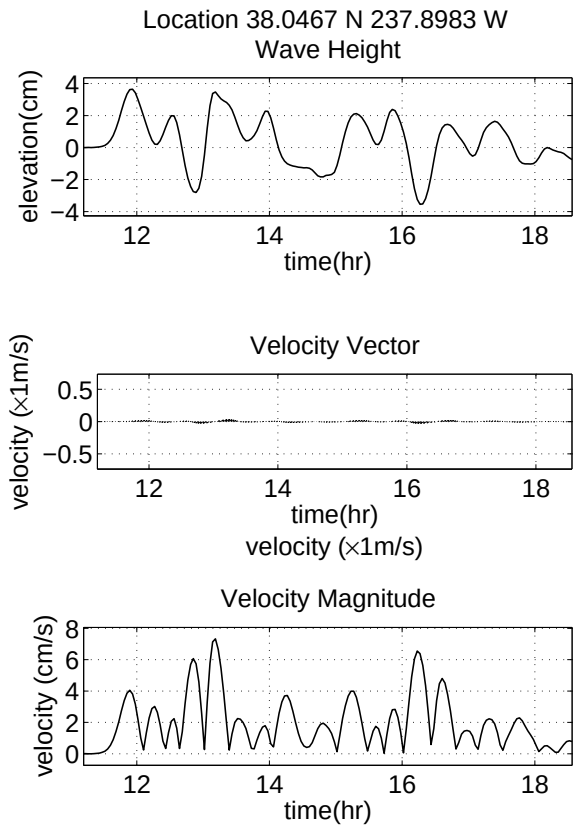
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



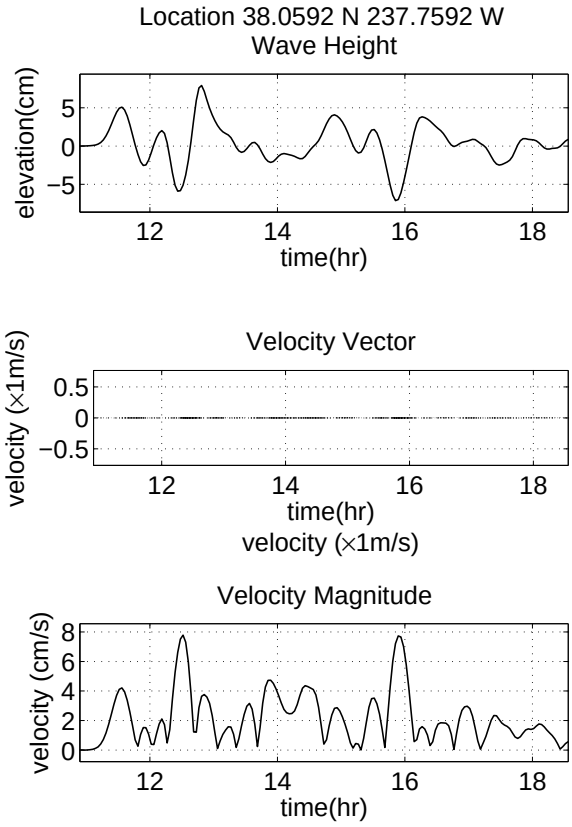
(6, 11) IMTT/Shore Terminals LLC, Richmond



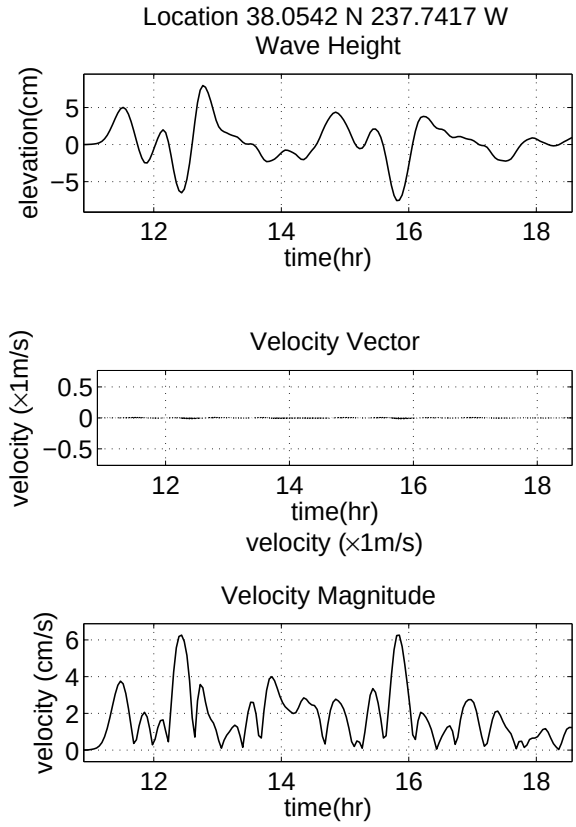
(7) Shell Oil Products, US, Martinez



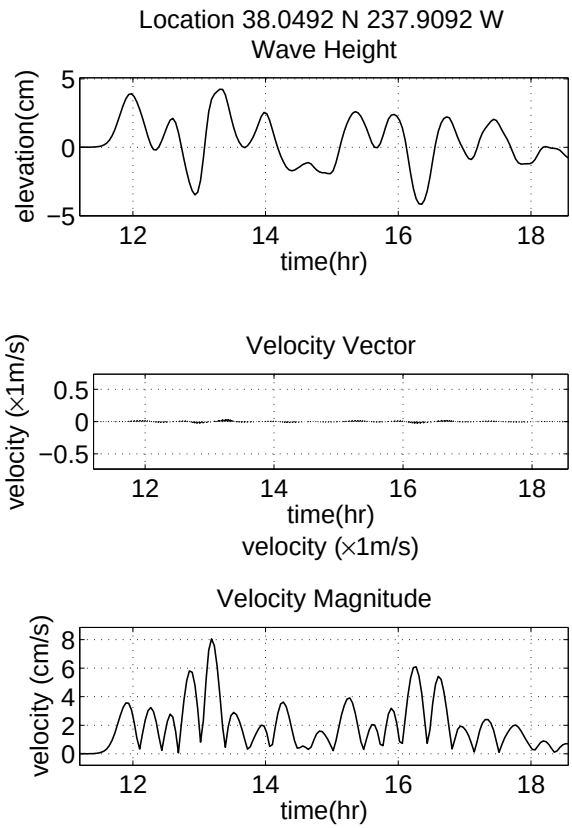
(9) Pacific Atlantic Terminals, Martinez



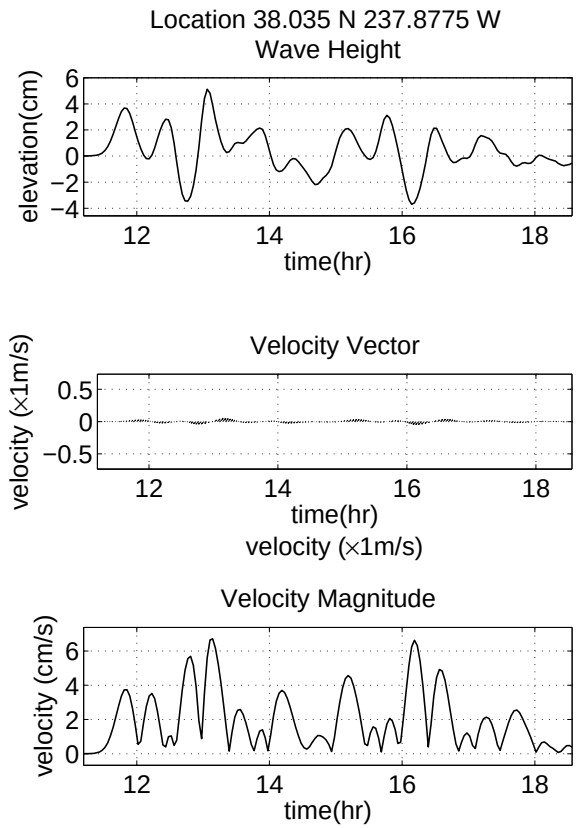
(10) Pacific Atlantic Terminals, Selby



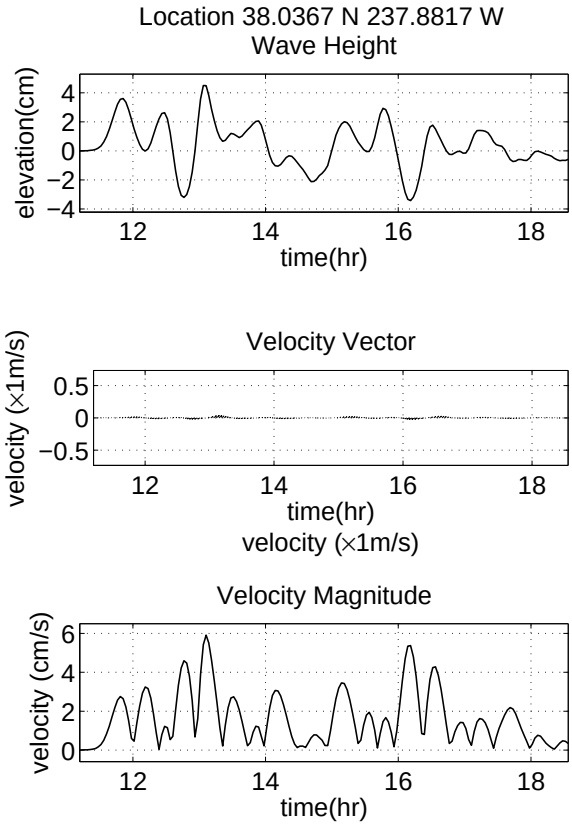
(13) ConocoPhillips, Rodeo



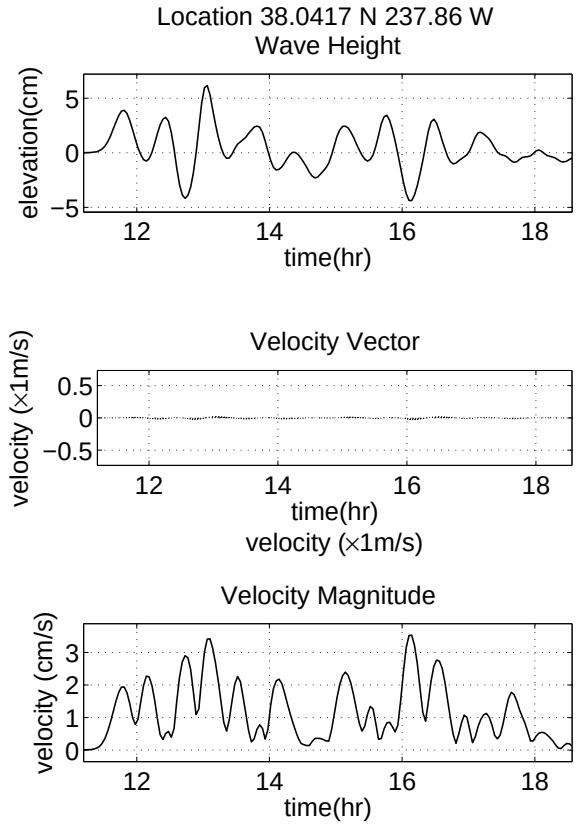
(14) Tesero, Inc. - Avon Wharf



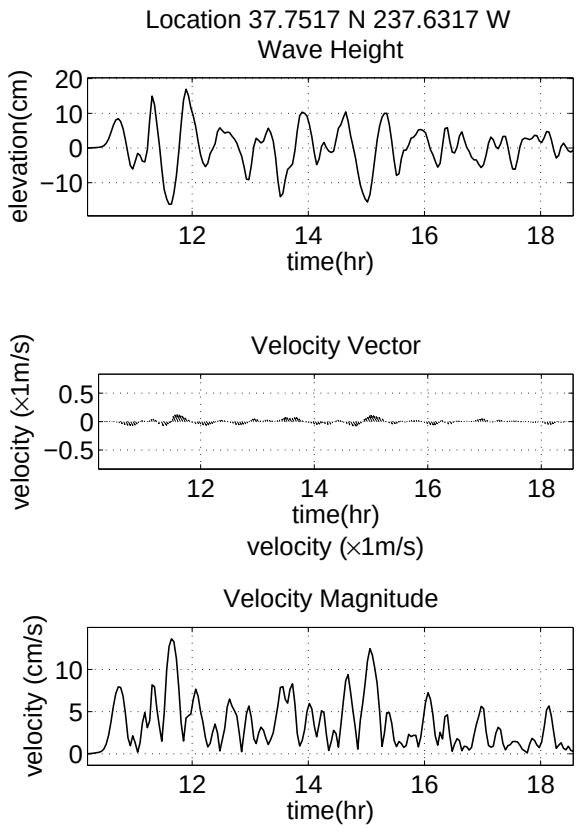
(15) Tesero, Inc. - Amorco Wharf



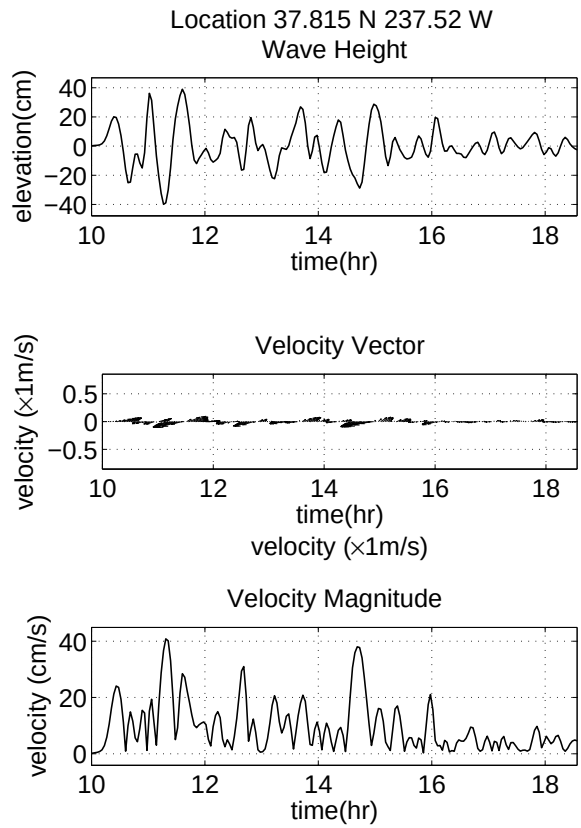
(16) Valero Refining Berth 1, Benicia



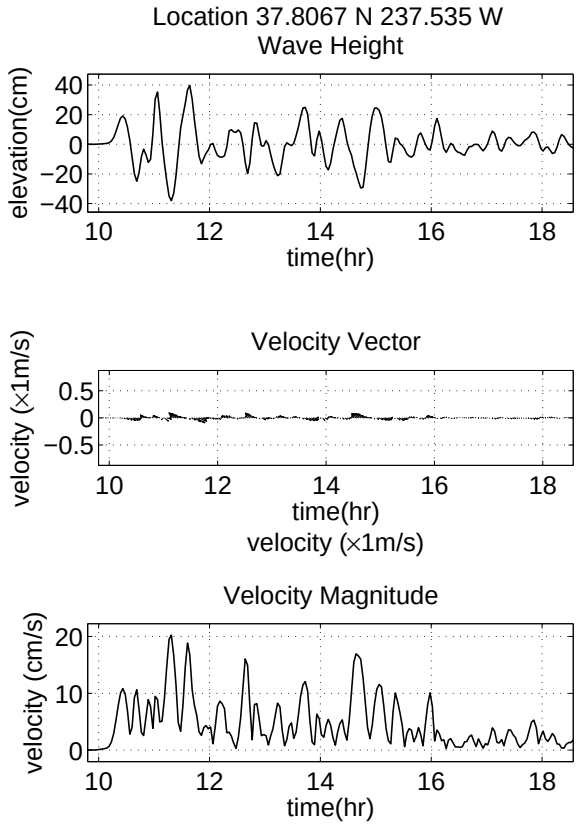
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco



(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

1960 Chilean Tsunami

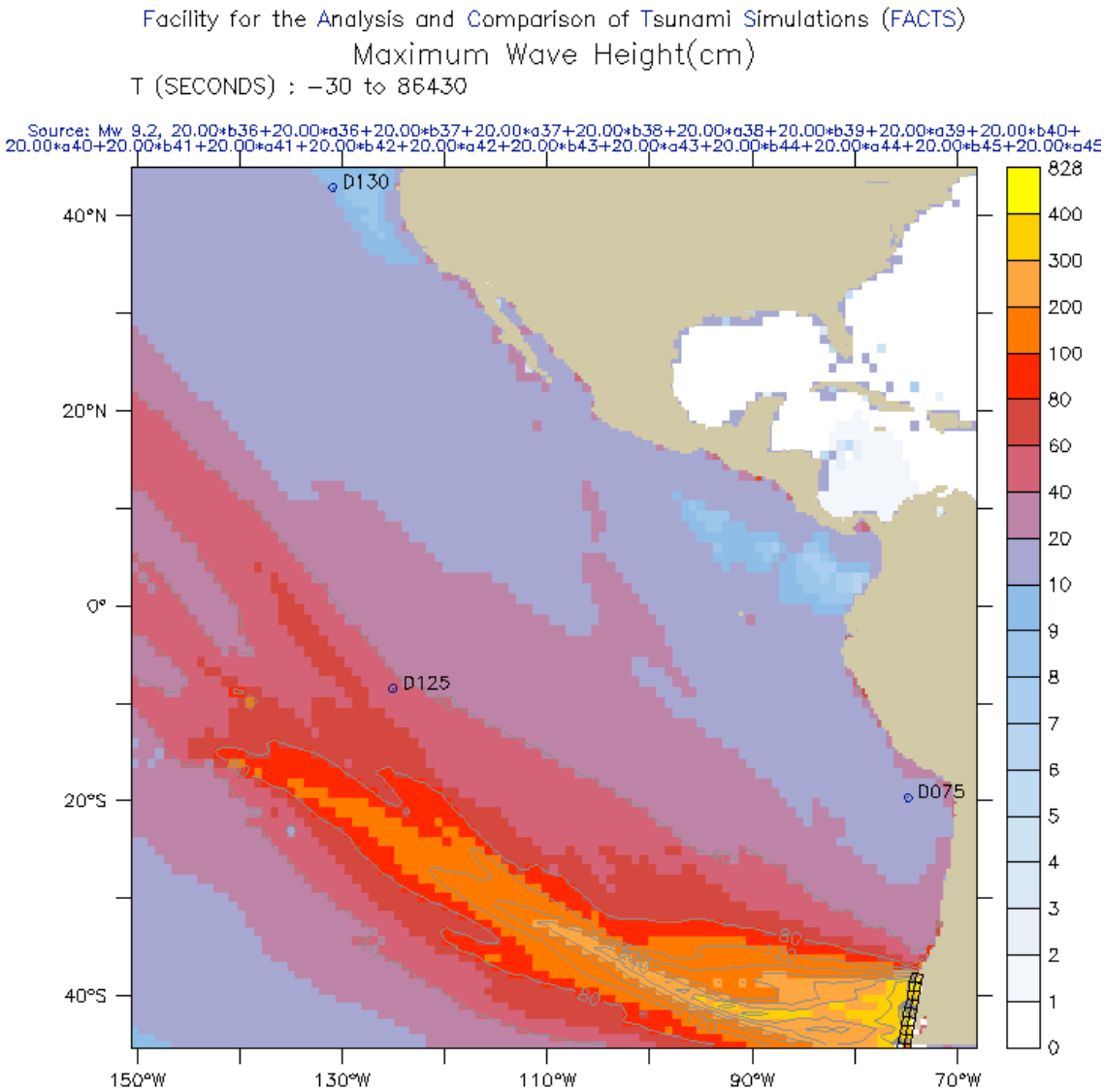


Fig. A1-12 – Maximum wave heights for tsunami simulation, basin wide.

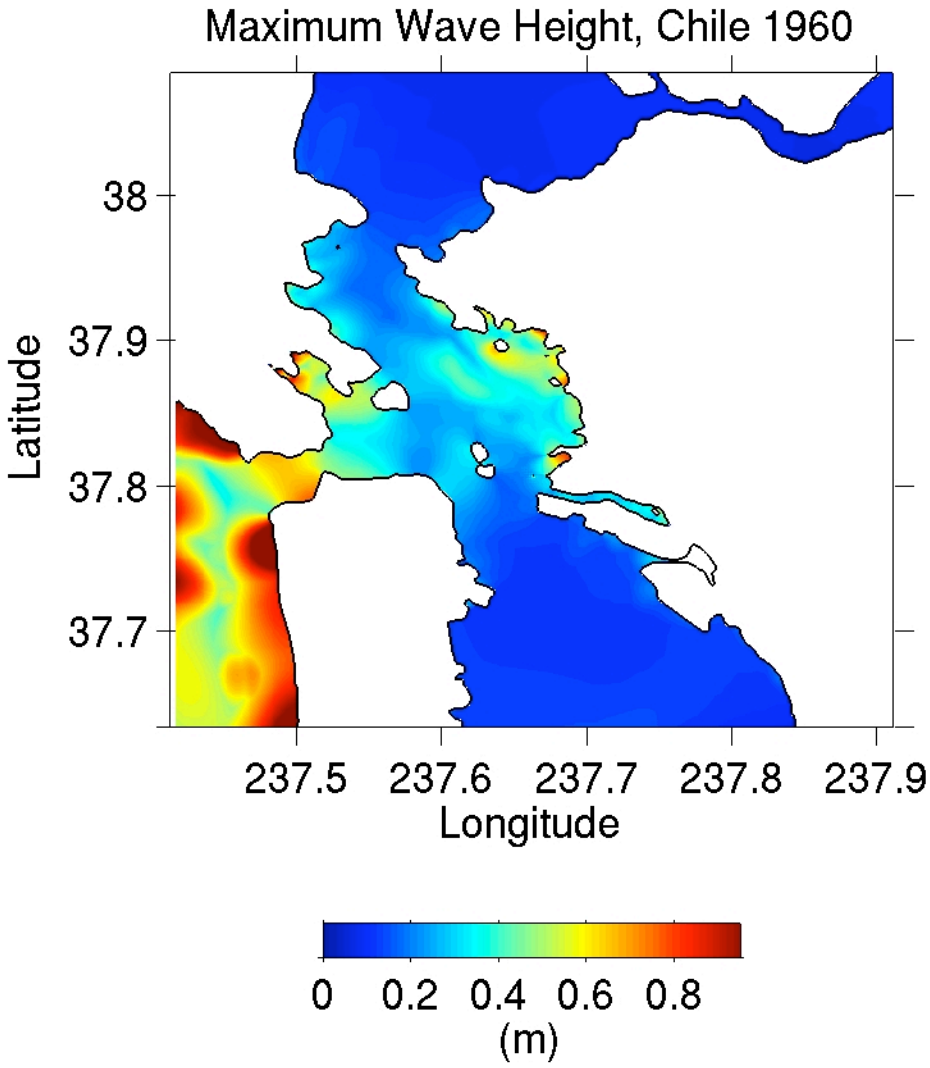
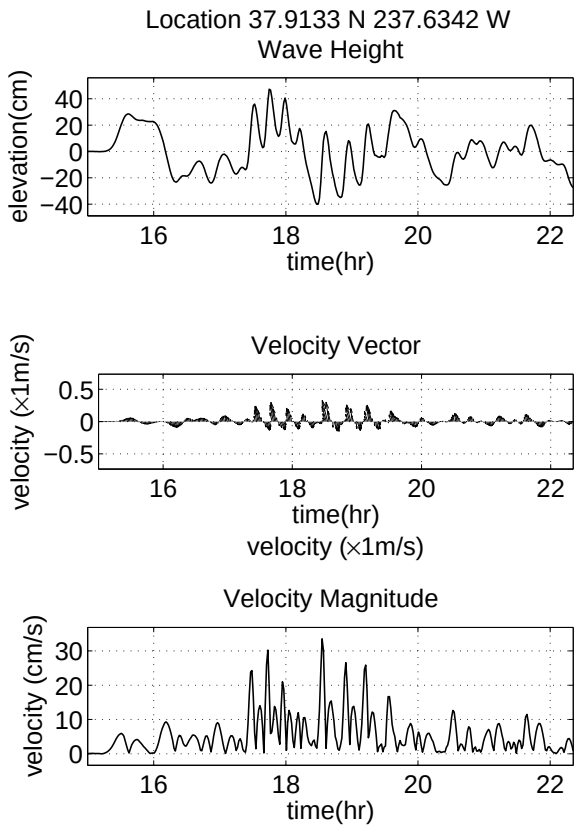
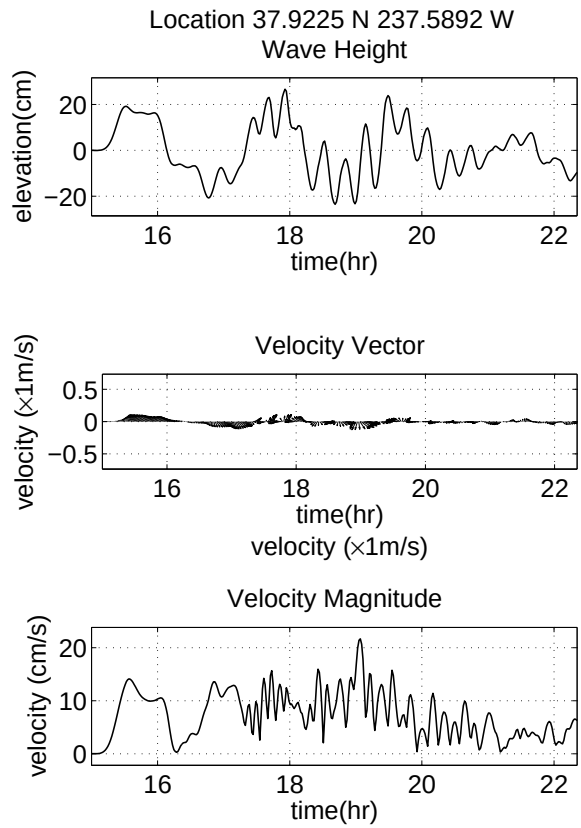


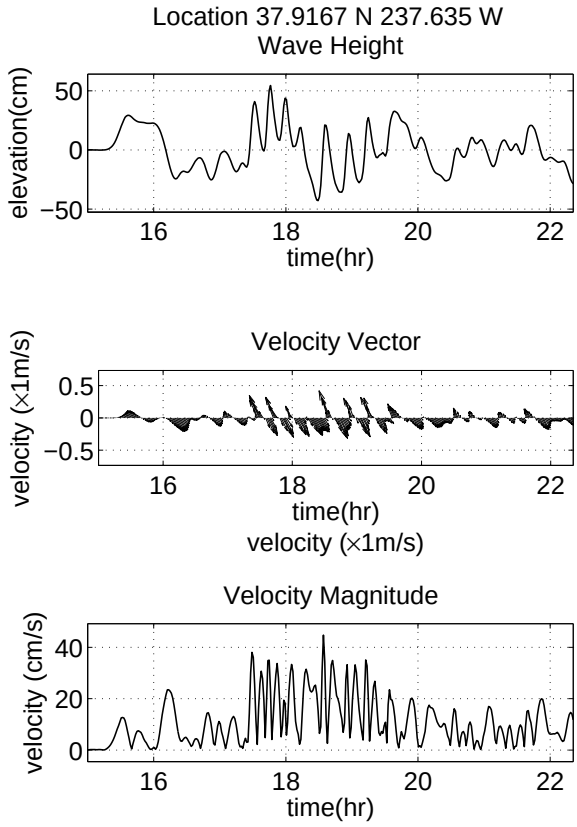
Fig. A1-13 – Maximum wave heights for tsunami simulation in San Francisco Bay.



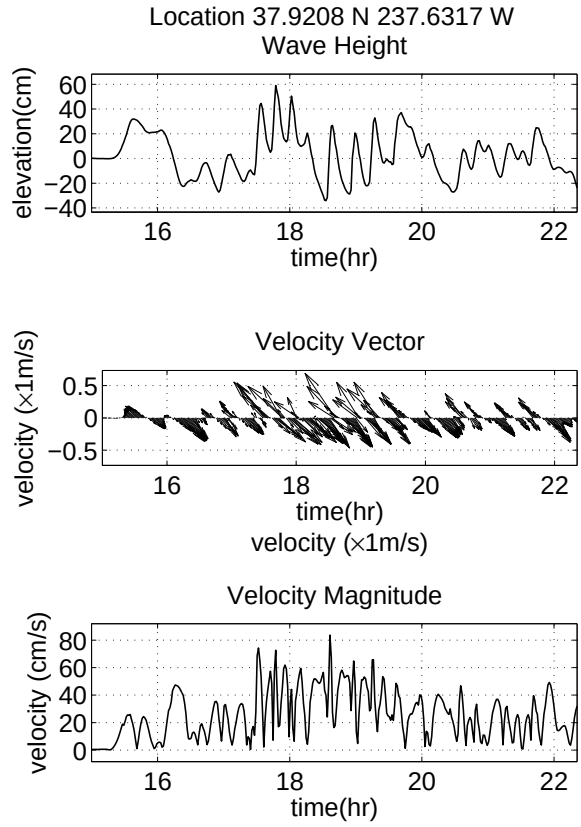
(1) BP West Coast Products, Richmond



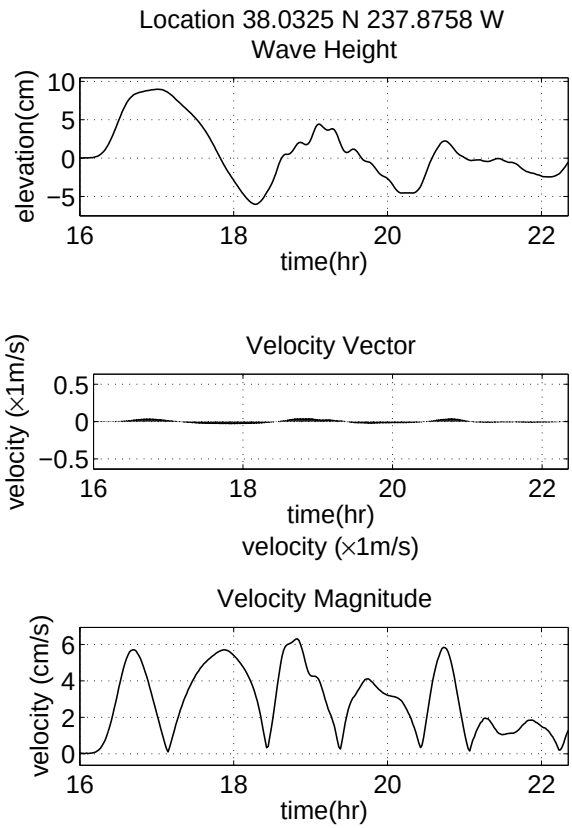
(3) Chevron USA, Inc., Richmond



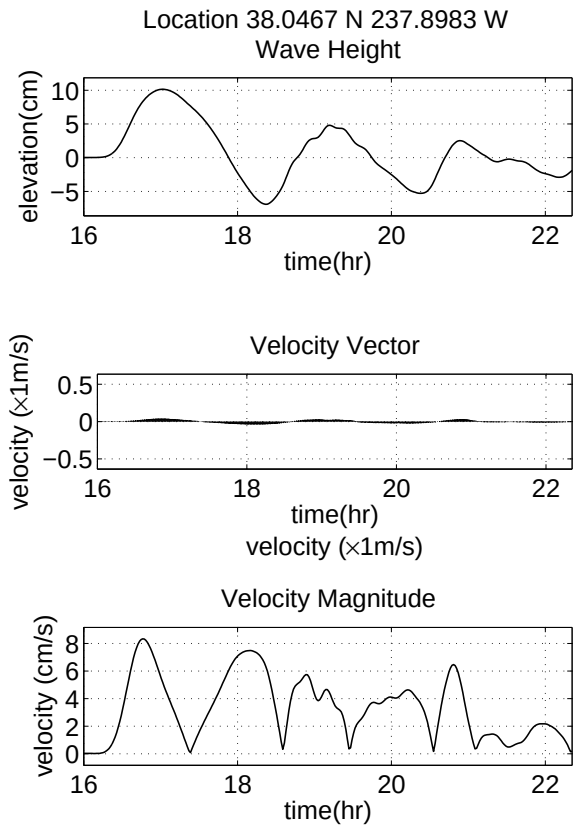
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



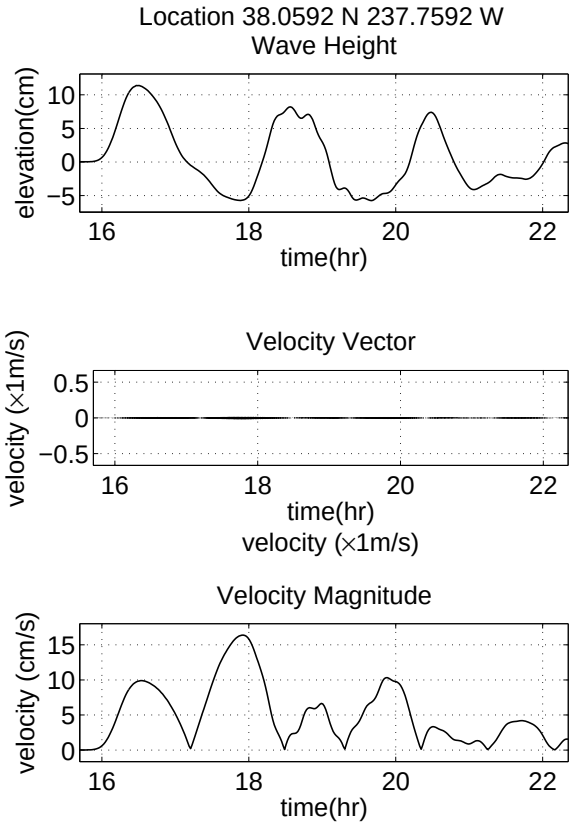
(6, 11) IMTT/Shore Terminals LLC, Richmond



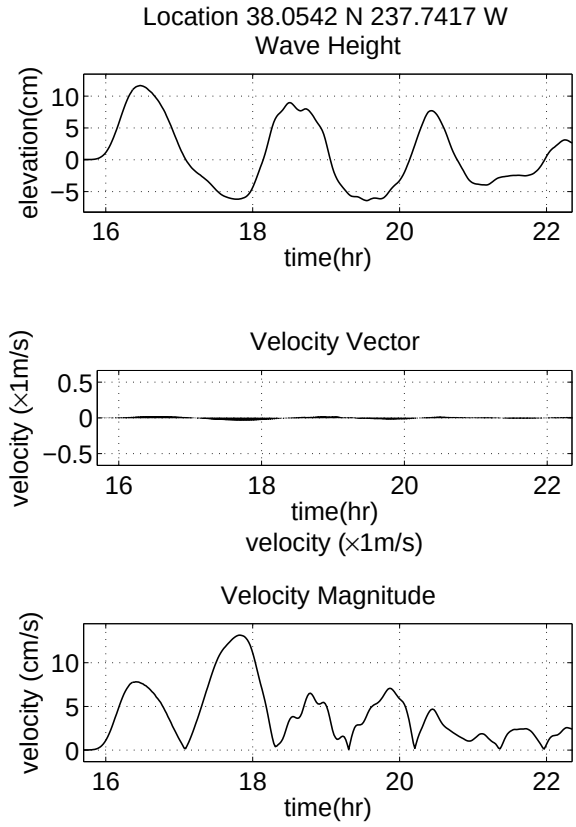
(7) Shell Oil Products, US, Martinez



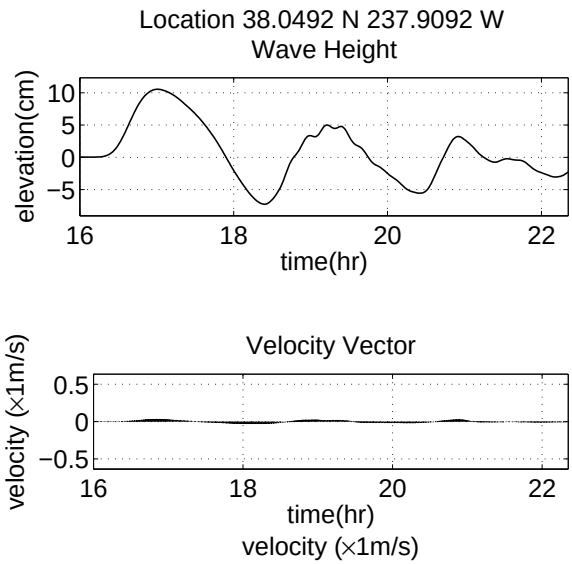
(9) Pacific Atlantic Terminals, Martinez



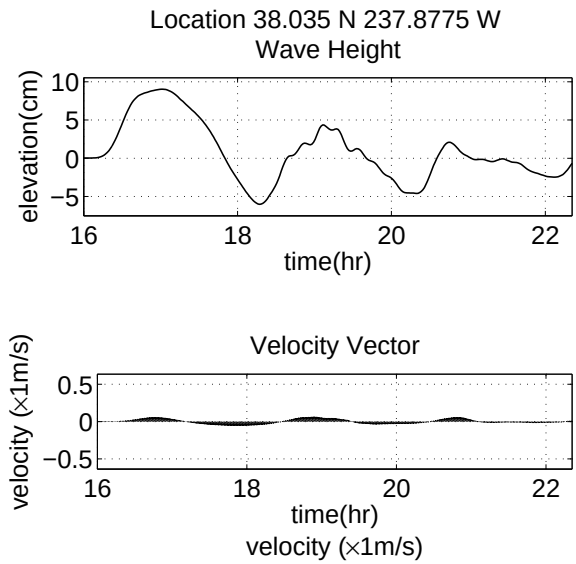
(10) Pacific Atlantic Terminals, Selby



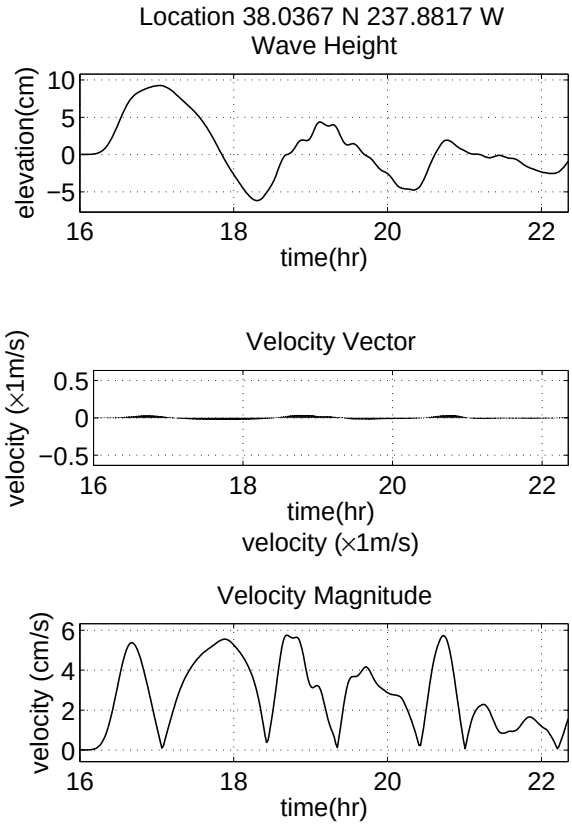
(13) ConocoPhillips, Rodeo



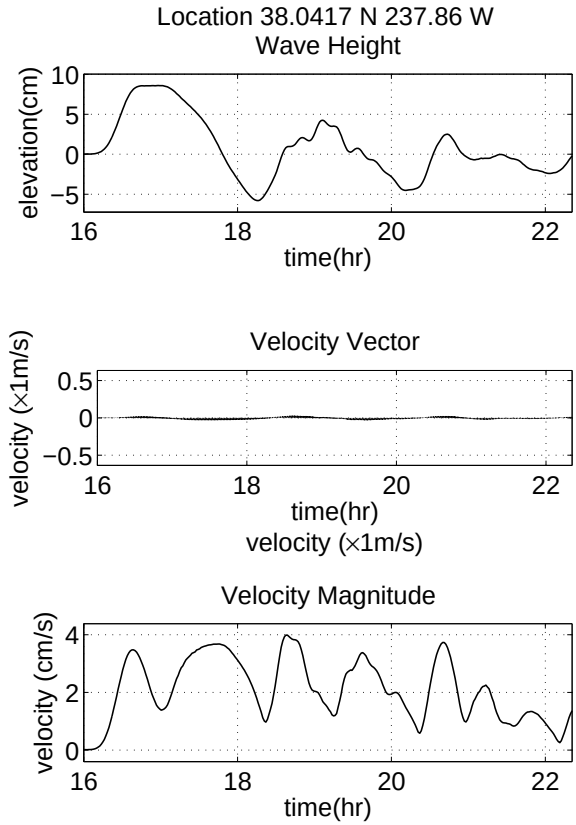
(14) Tesero, Inc. - Avon Wharf



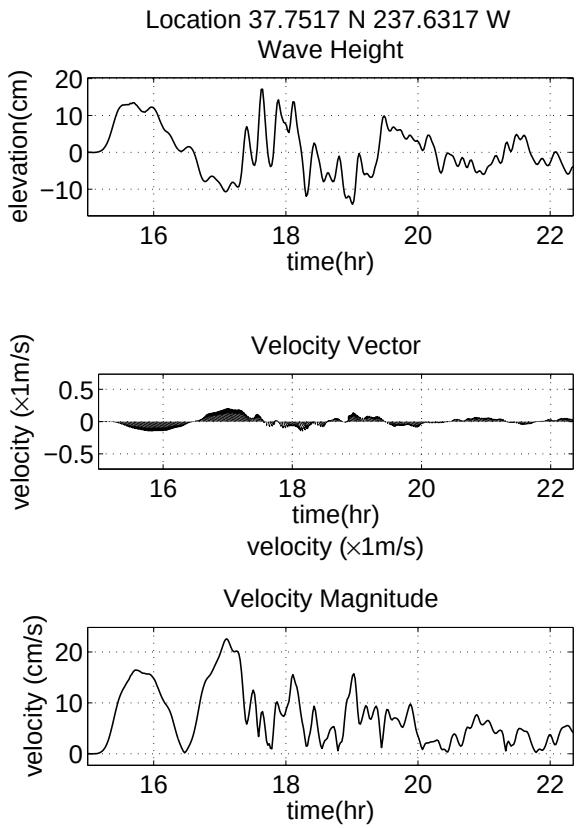
(15) Tesero, Inc. - Amorco Wharf



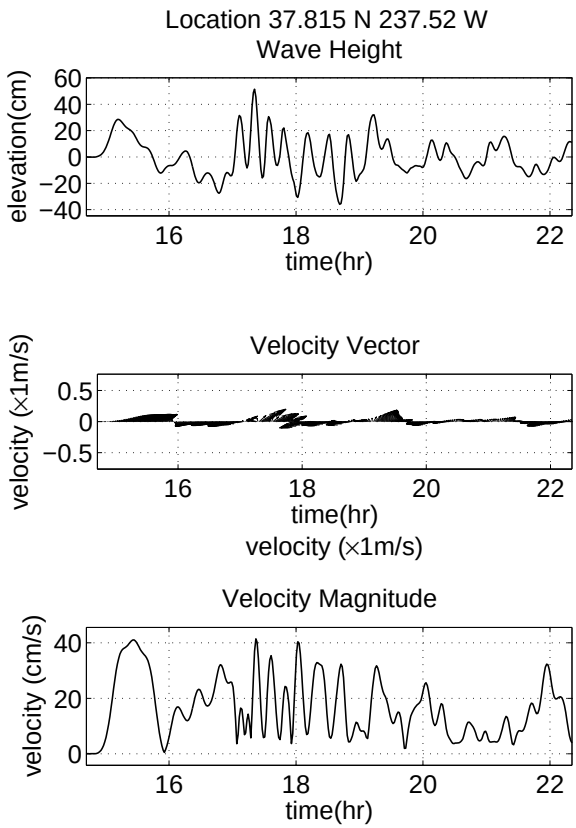
(16) Valero Refining Berth 1, Benicia



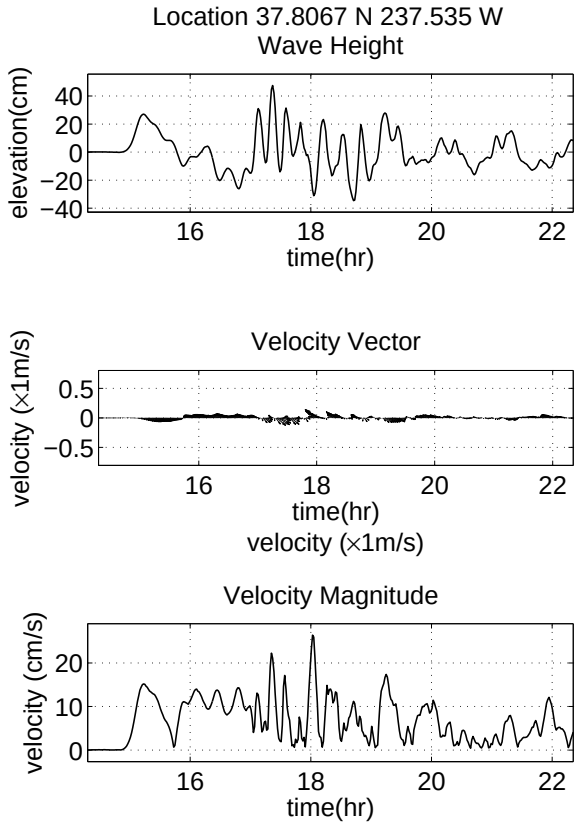
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco

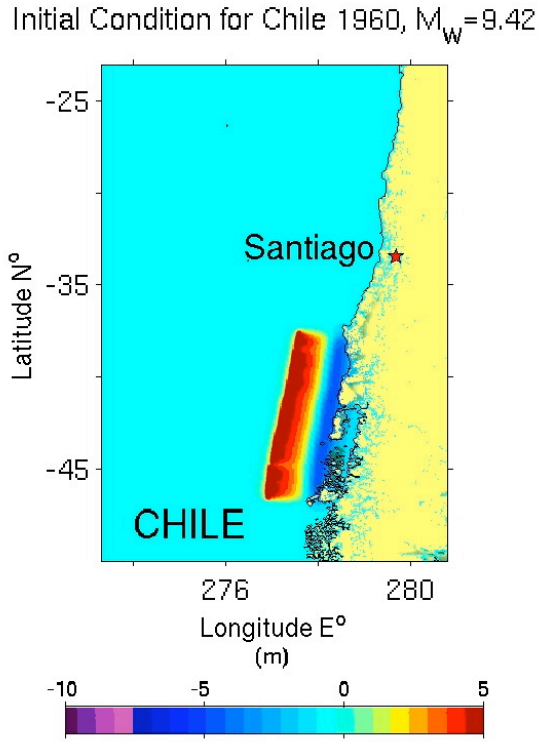


(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

1960 Wider Chilean Tsunami



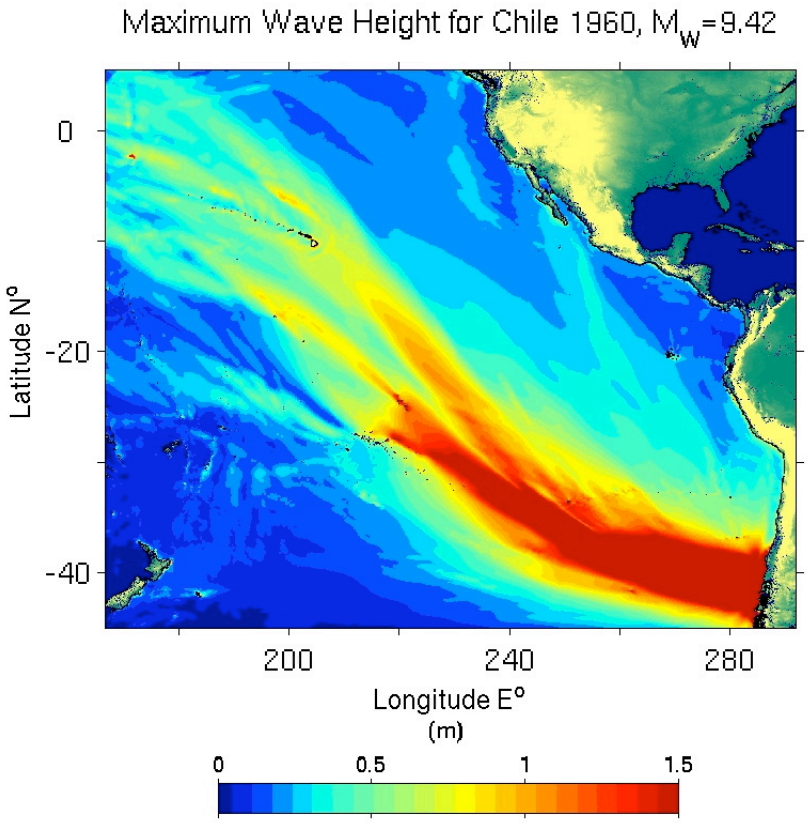


Fig. A1-14 – Initial condition for Chile 1960W (upper panel) and maximum wave heights for tsunami simulation, basin wide (lower panel).

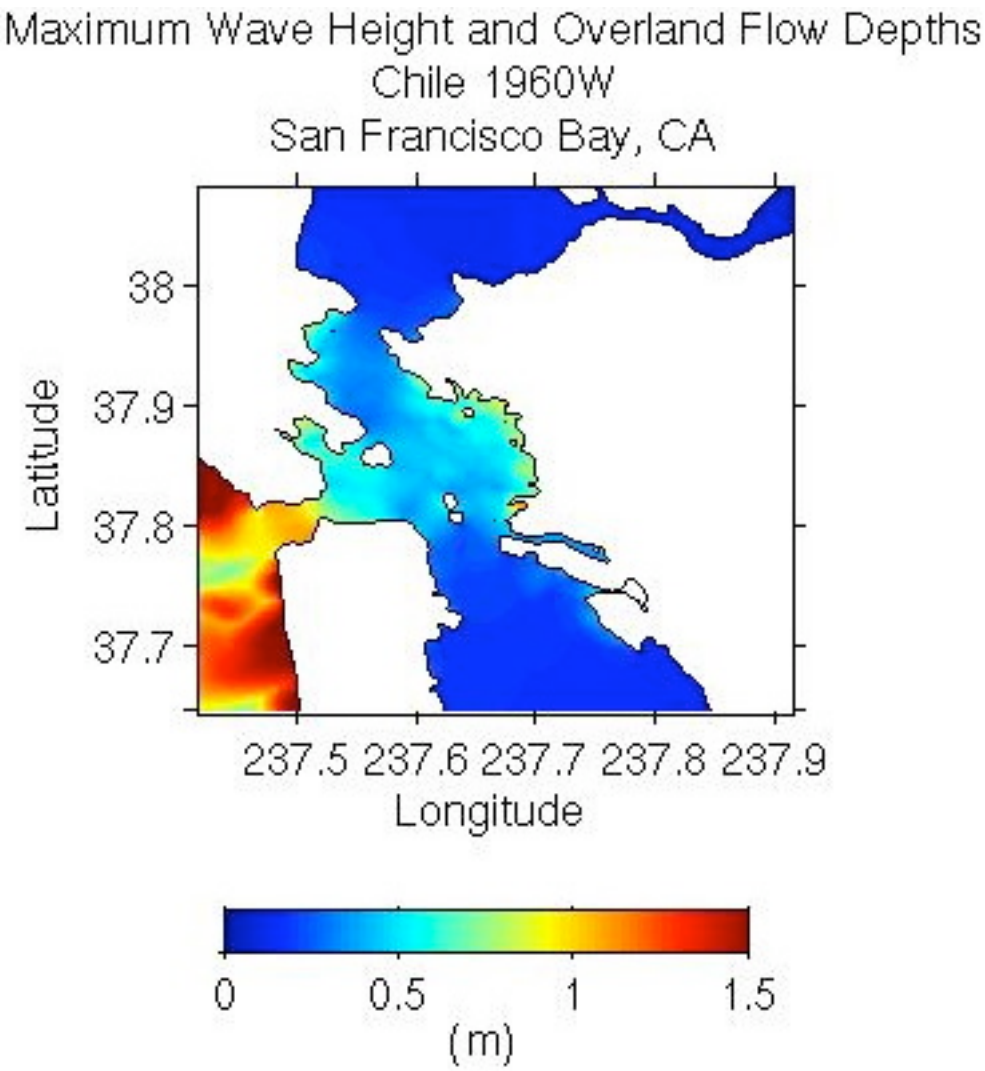
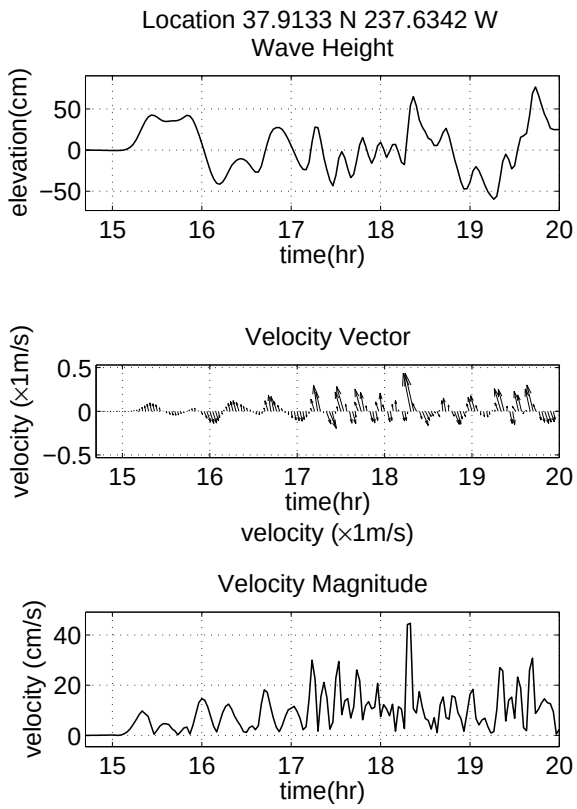
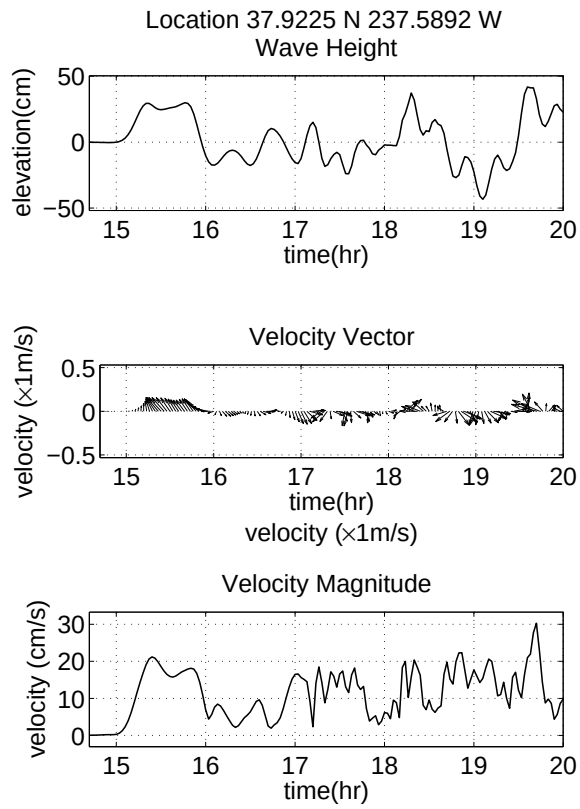


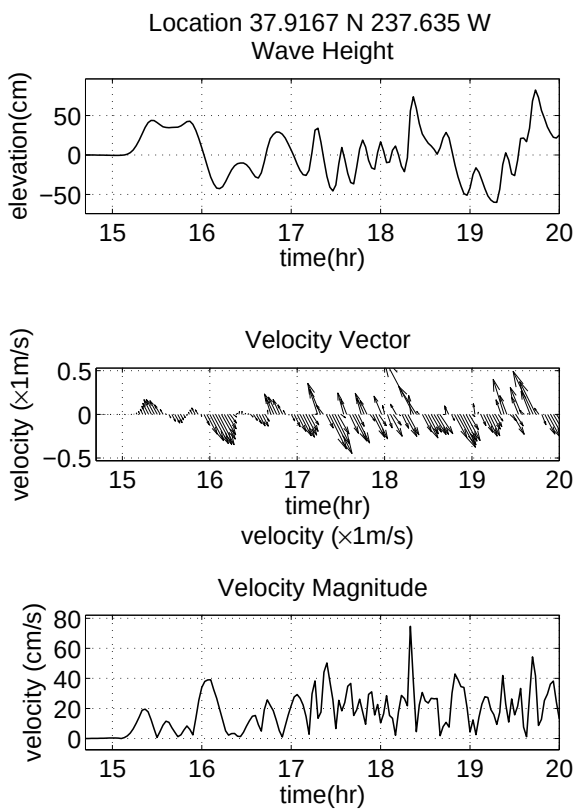
Fig. A1-15 – Maximum wave heights for tsunami simulation, in San Francisco Bay.



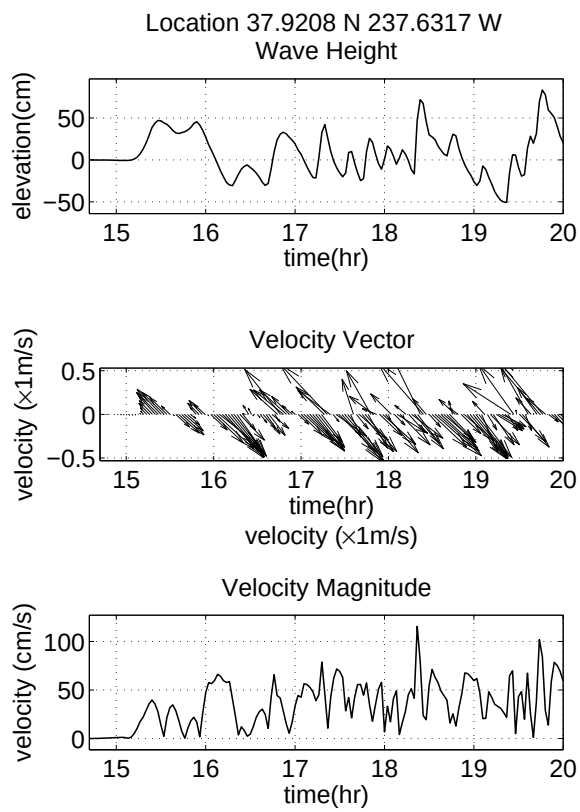
(1) BP West Coast Products, Richmond



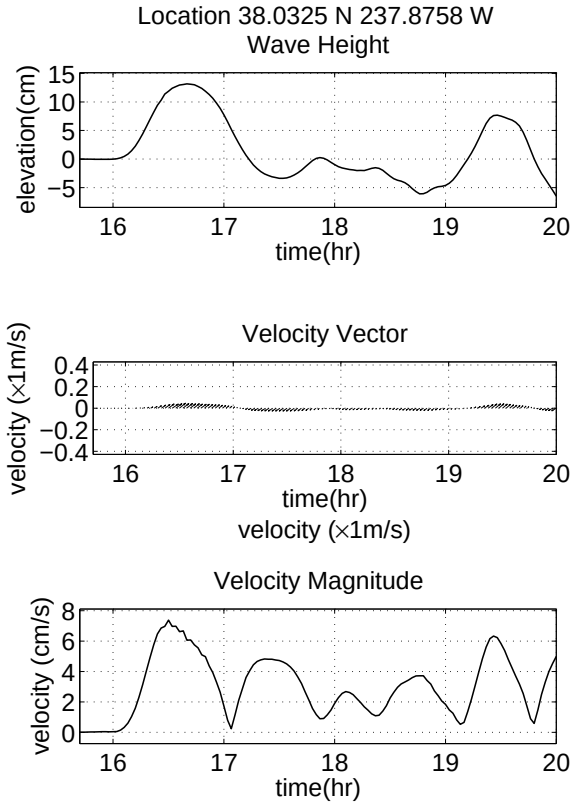
(3) Chevron USA, Inc., Richmond



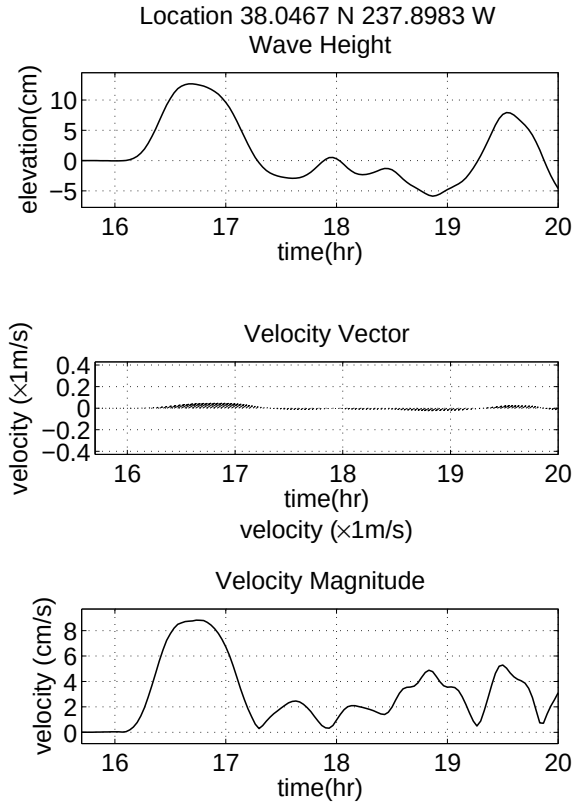
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



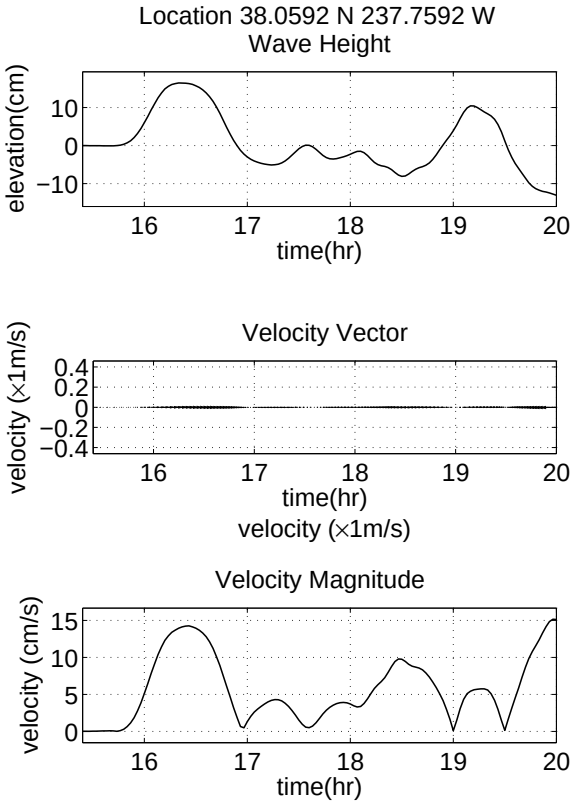
(6, 11) IMTT/Shore Terminals LLC, Richmond



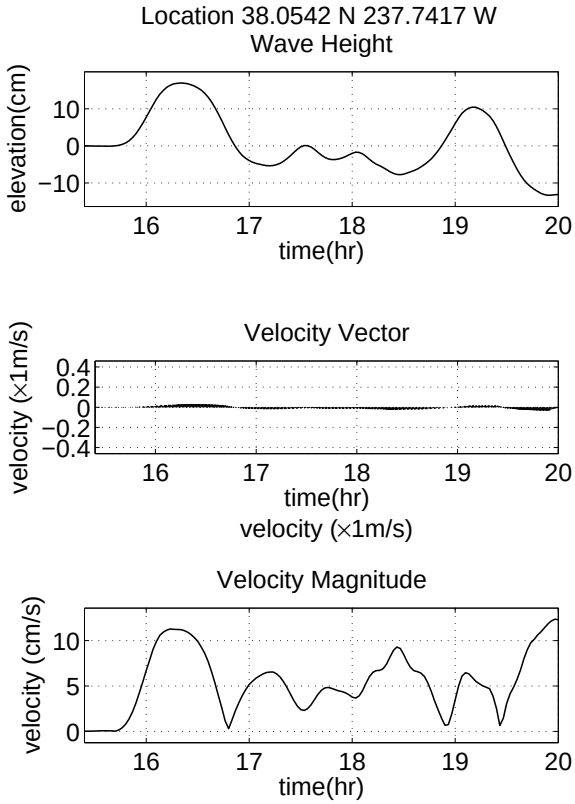
(7) Shell Oil Products, US, Martinez



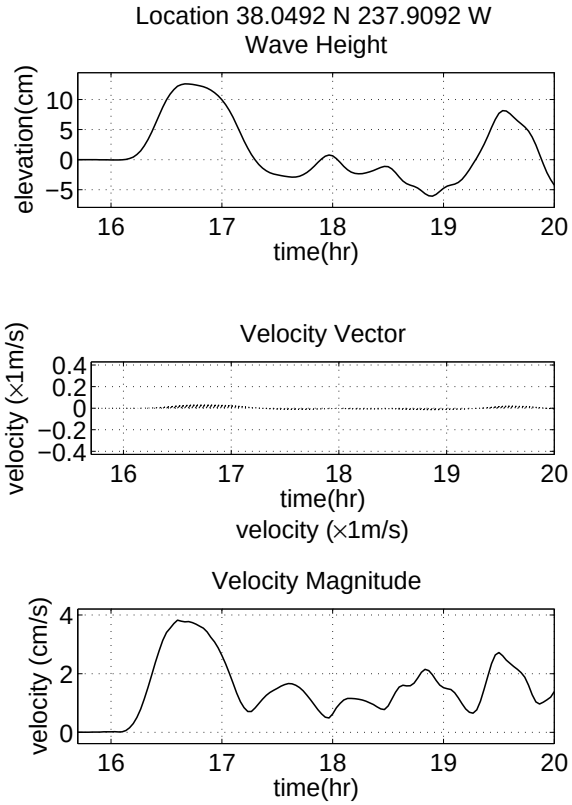
(9) Pacific Atlantic Terminals, Martinez



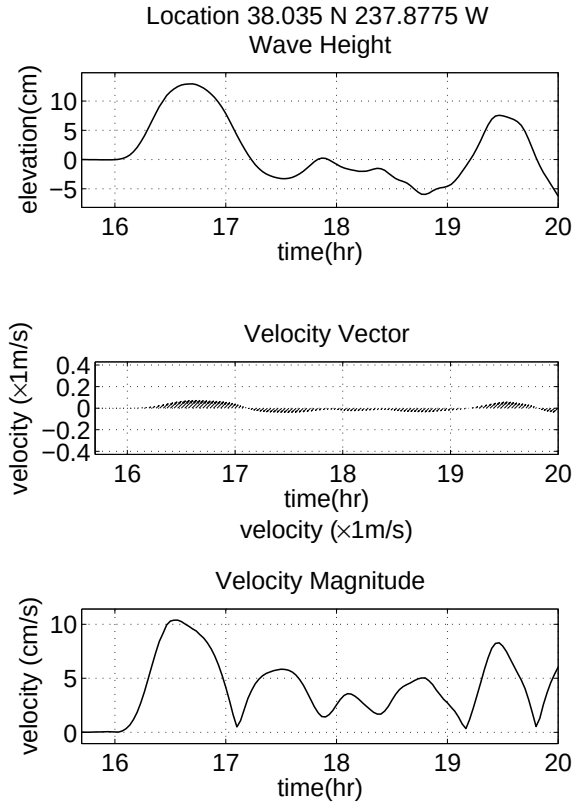
(10) Pacific Atlantic Terminals, Selby



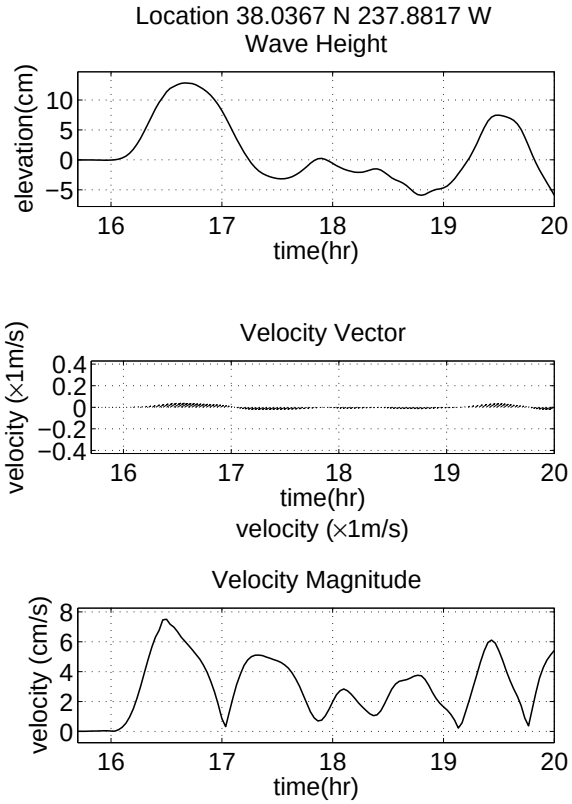
(13) ConocoPhillips, Rodeo



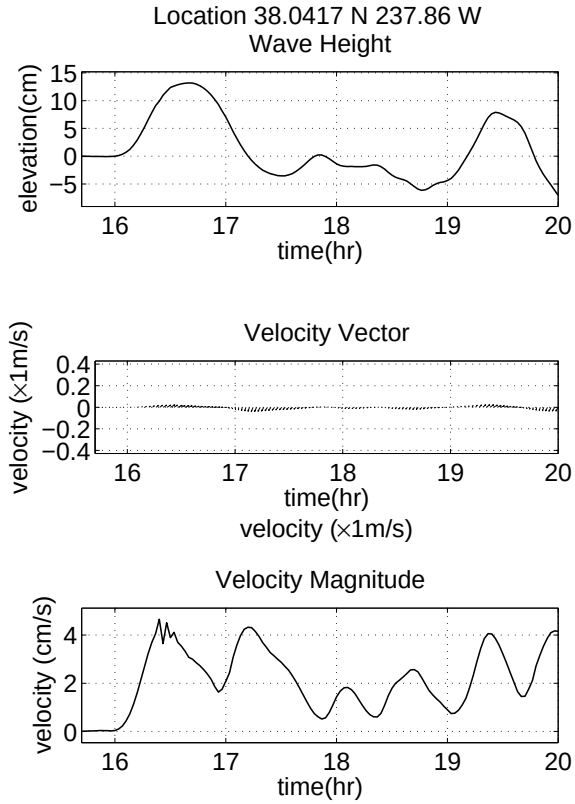
(14) Tesero, Inc. - Avon Wharf



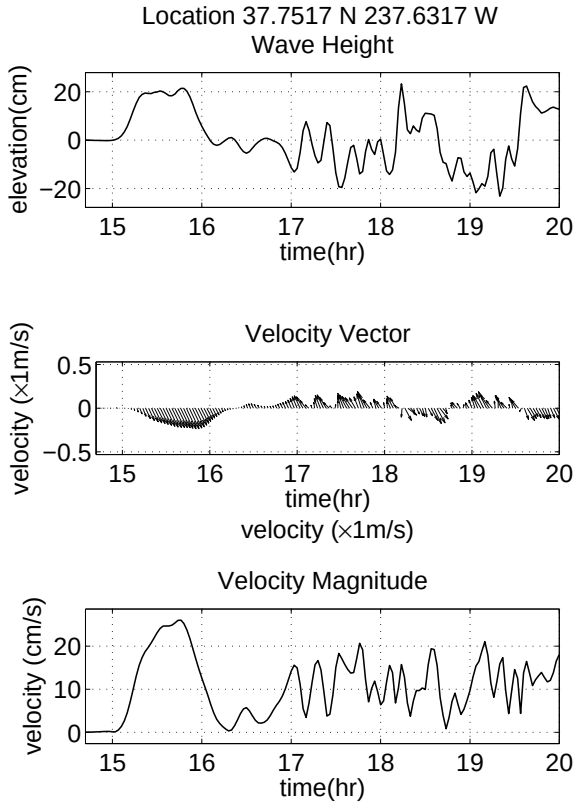
(15) Tesero, Inc. - Amorco Wharf



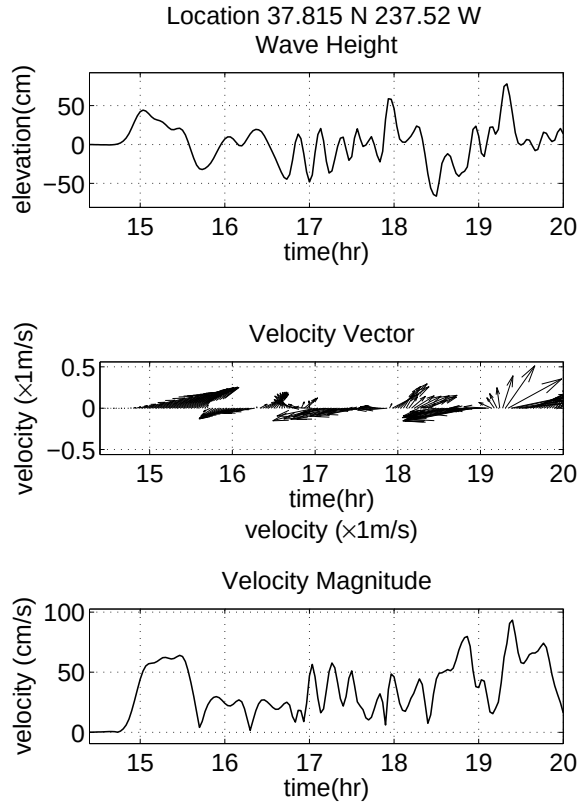
(16) Valero Refining Berth 1, Benicia



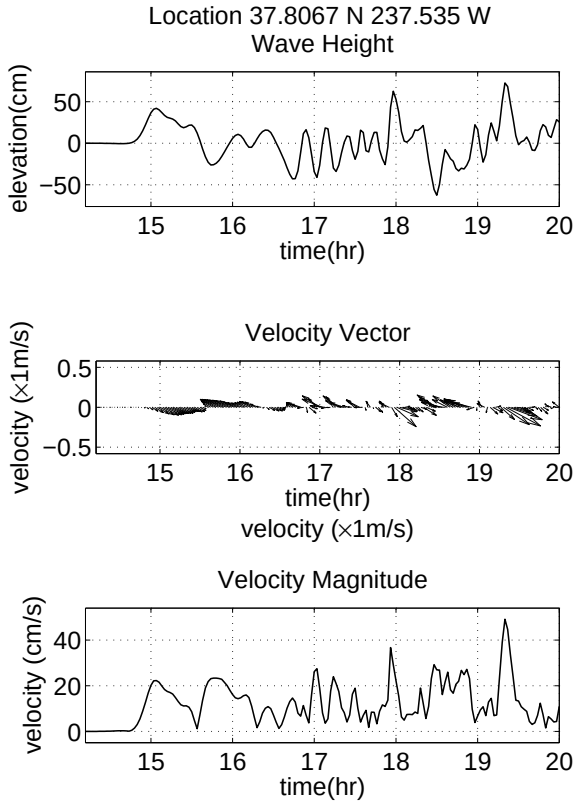
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco



(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Northern Chile Tsunami

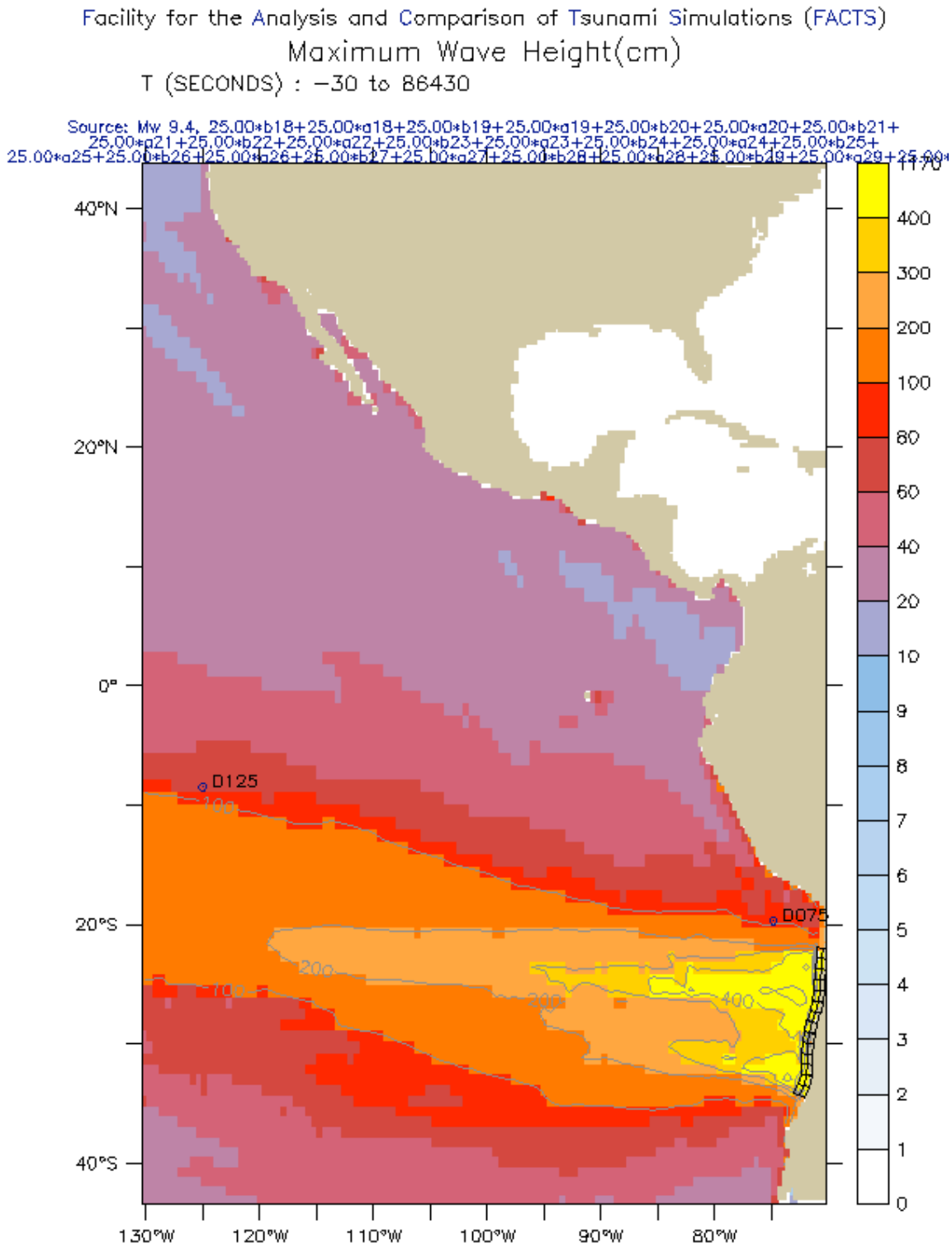


Fig. A1-16 – Maximum wave heights for tsunami simulation, basin wide.

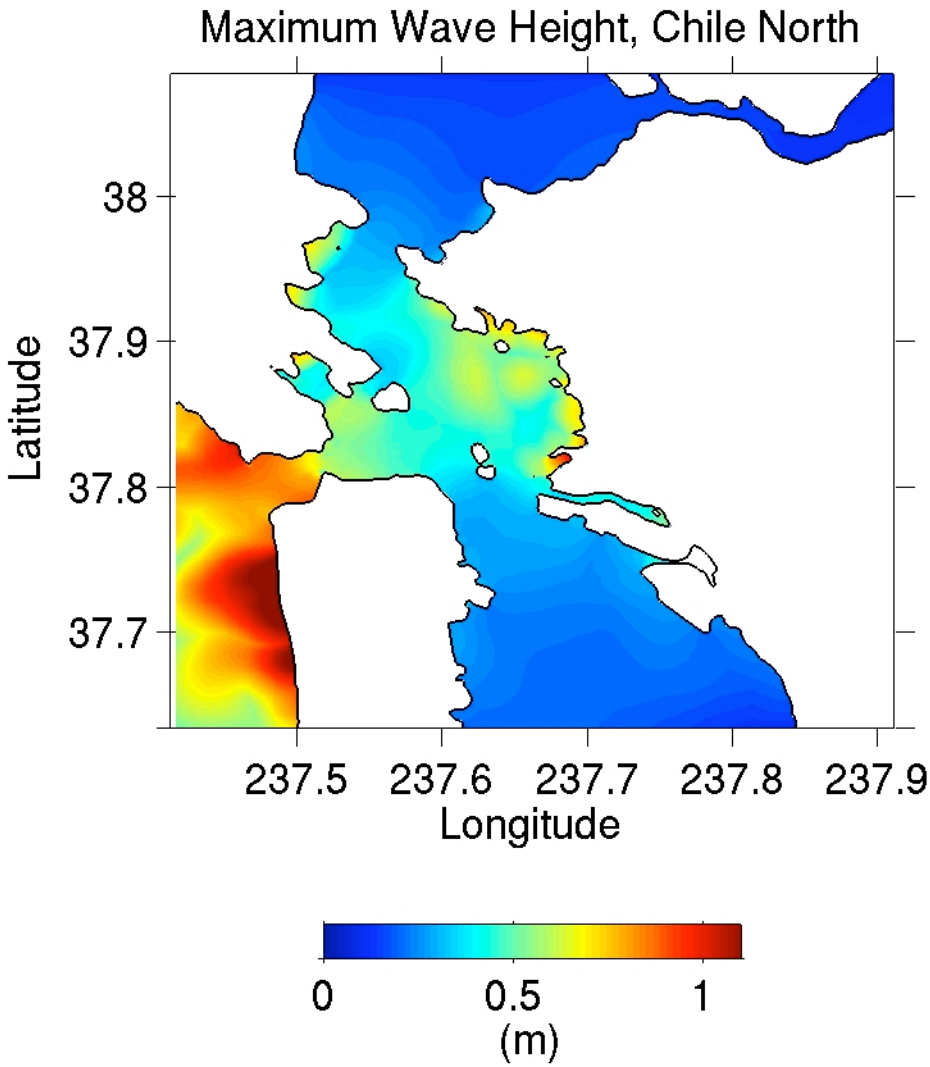
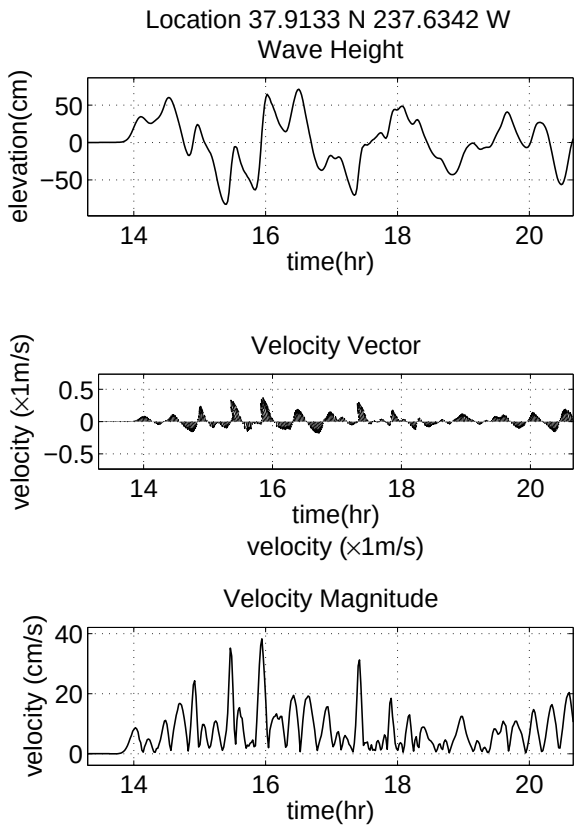
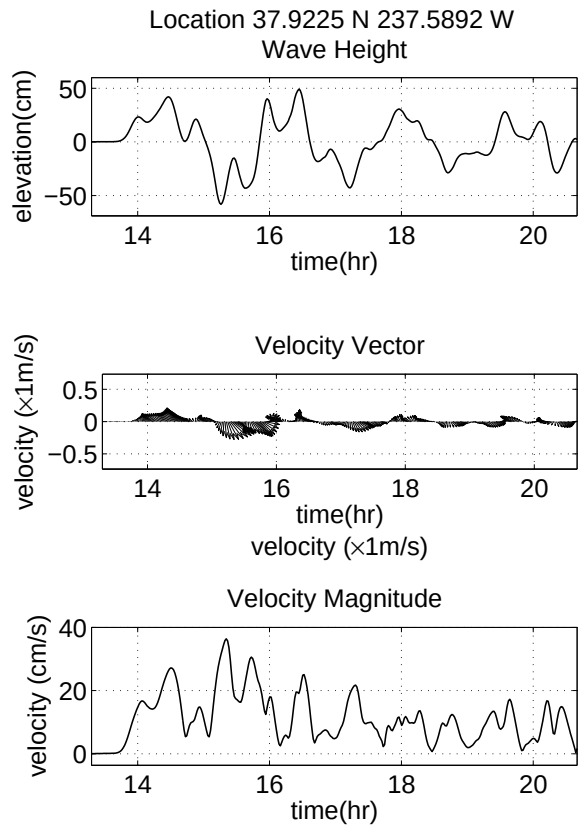


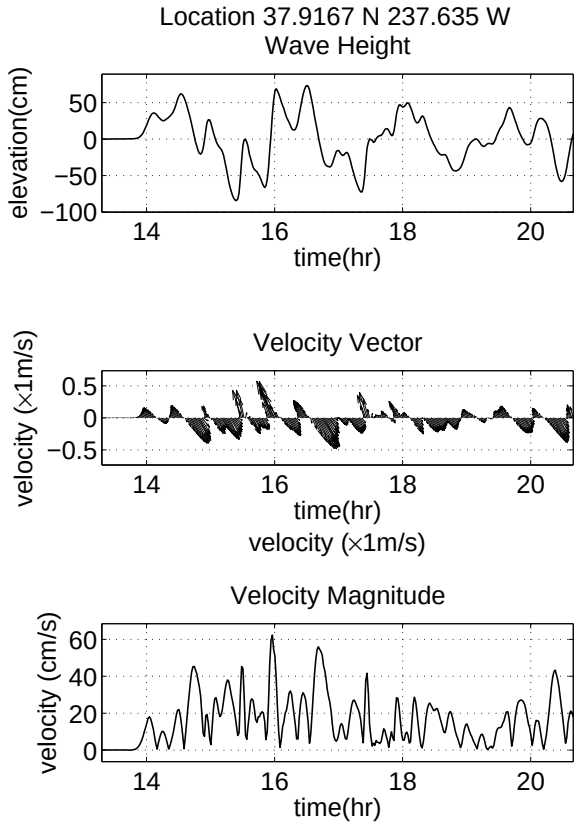
Fig. A1-17 – Maximum wave heights for tsunami simulation in San Francisco Bay.



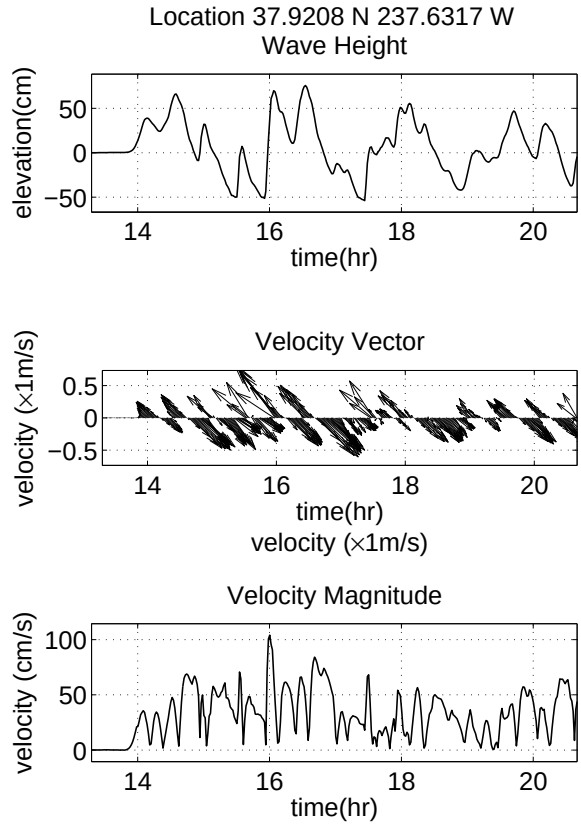
(1) BP West Coast Products, Richmond



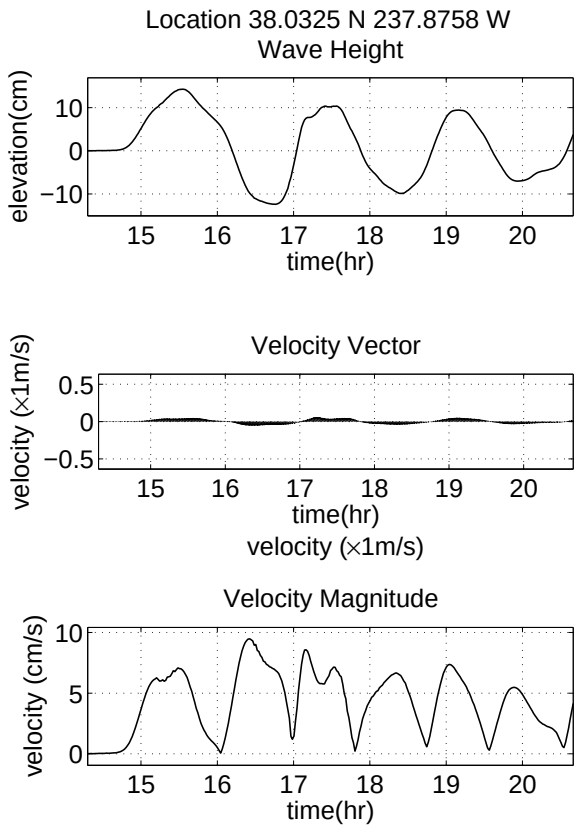
(3) Chevron USA, Inc., Richmond



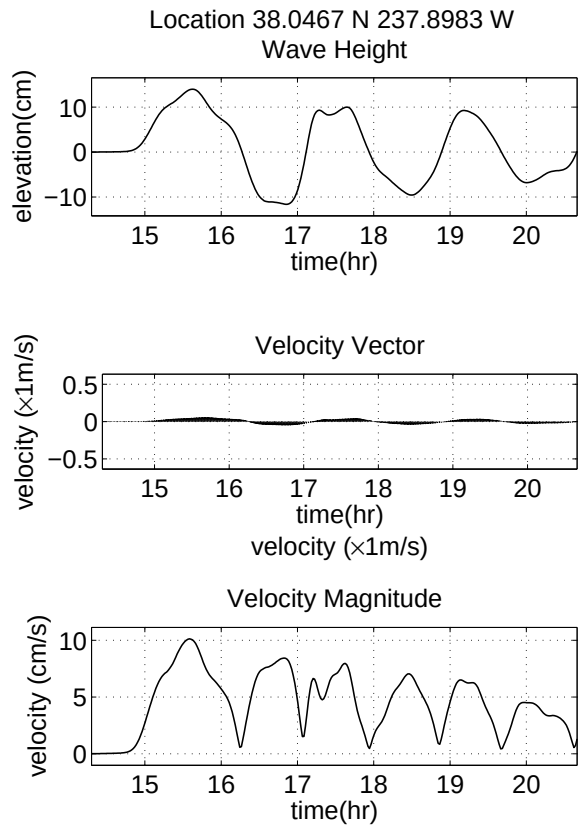
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



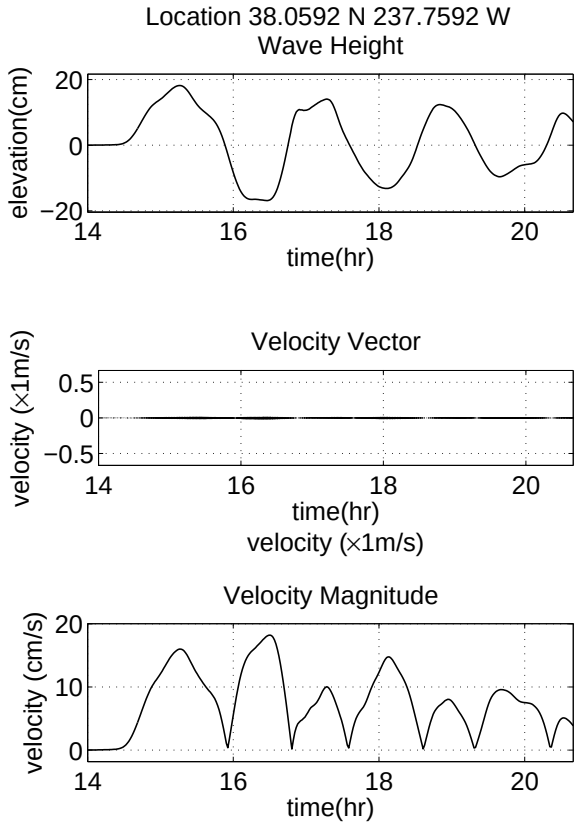
(6, 11) IMTT/Shore Terminals LLC, Richmond



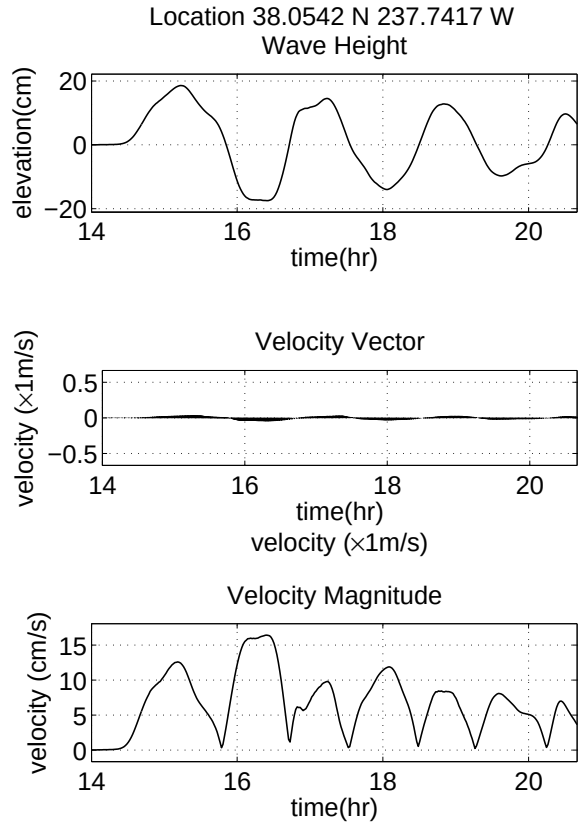
(7) Shell Oil Products, US, Martinez



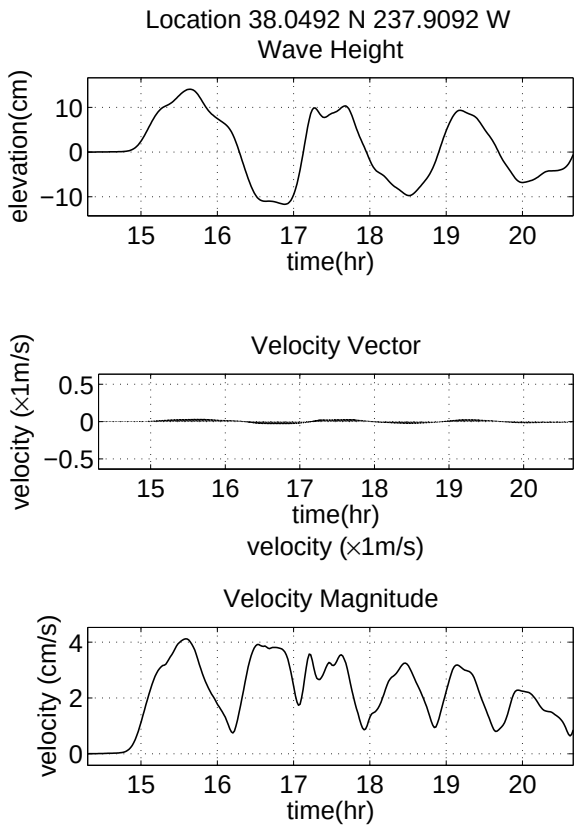
(9) Pacific Atlantic Terminals, Martinez



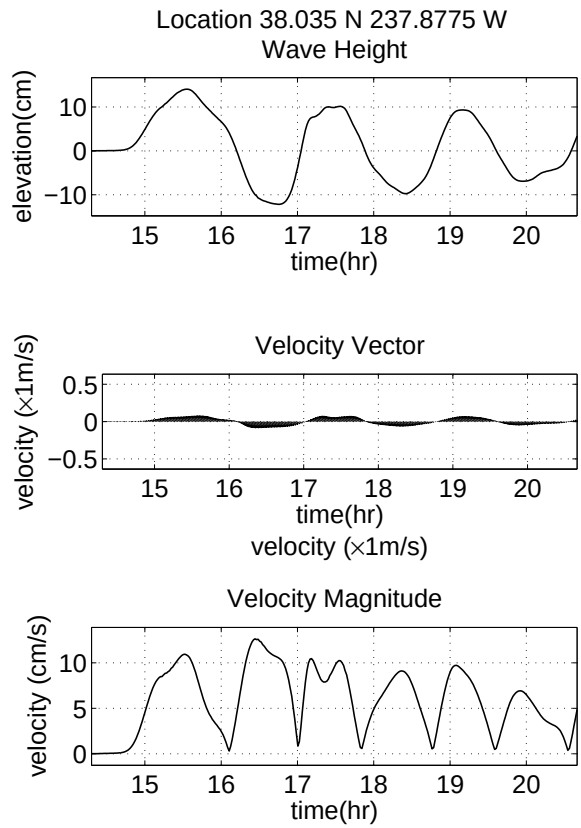
(10) Pacific Atlantic Terminals, Selby



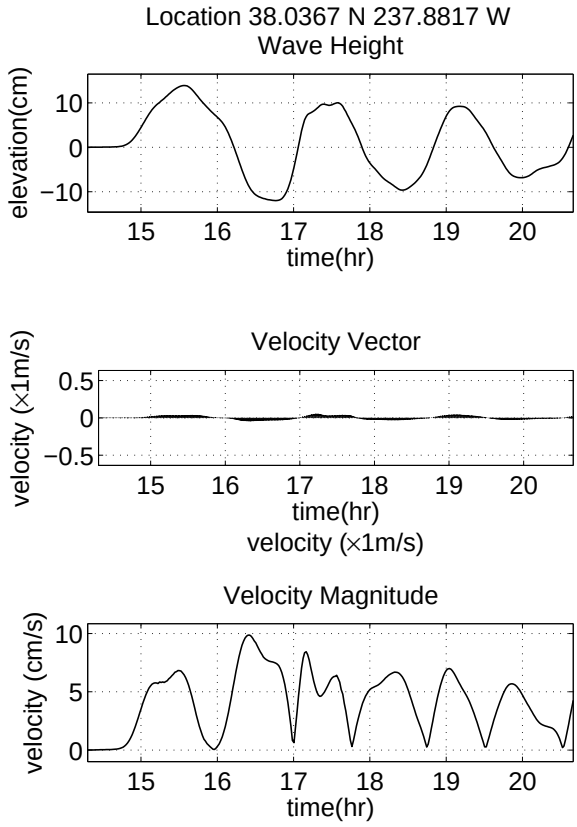
(13) ConocoPhillips, Rodeo



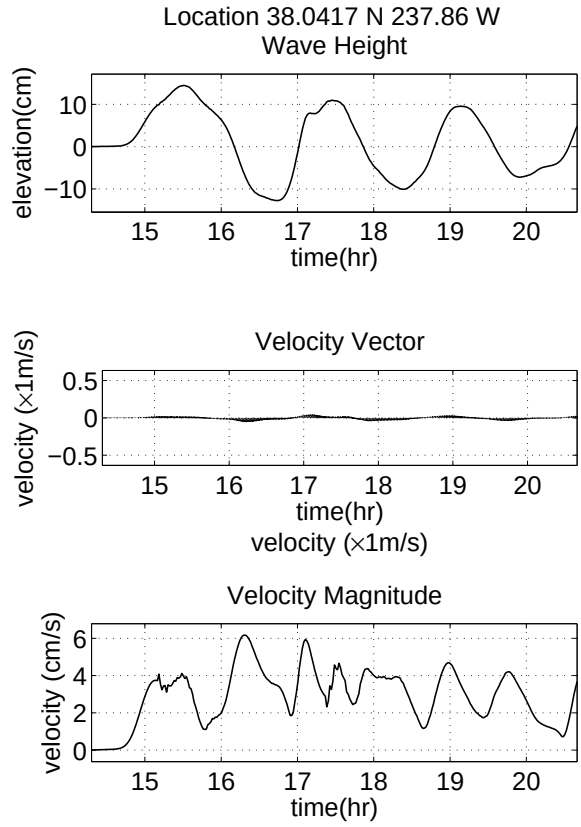
(14) Tesero, Inc. - Avon Wharf



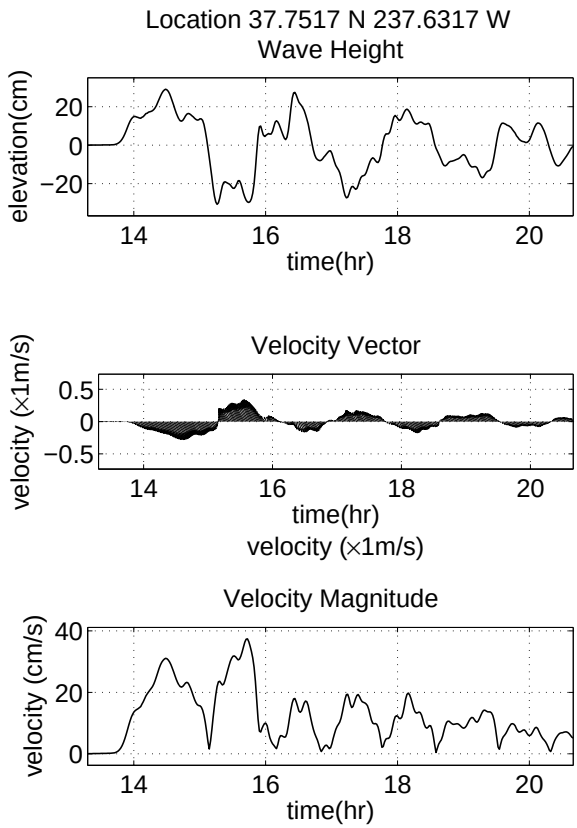
(15) Tesero, Inc. - Amorco Wharf



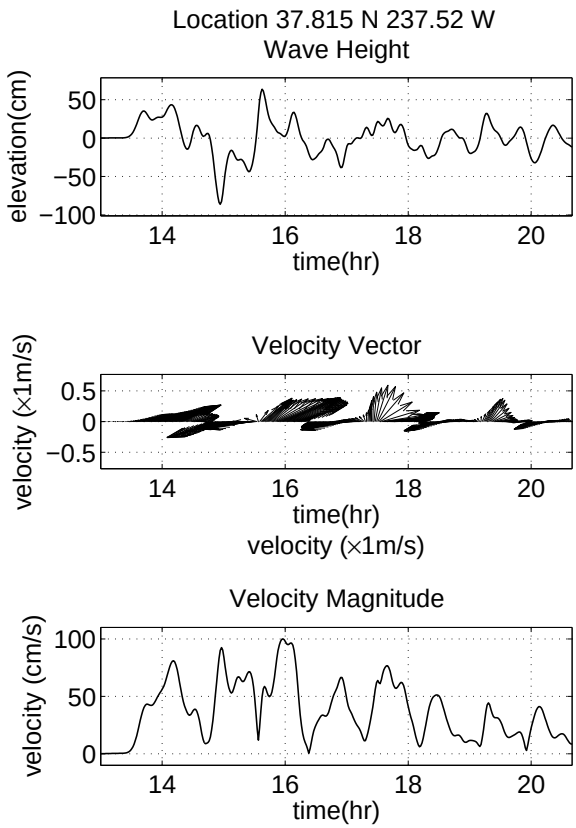
(16) Valero Refining Berth 1, Benicia



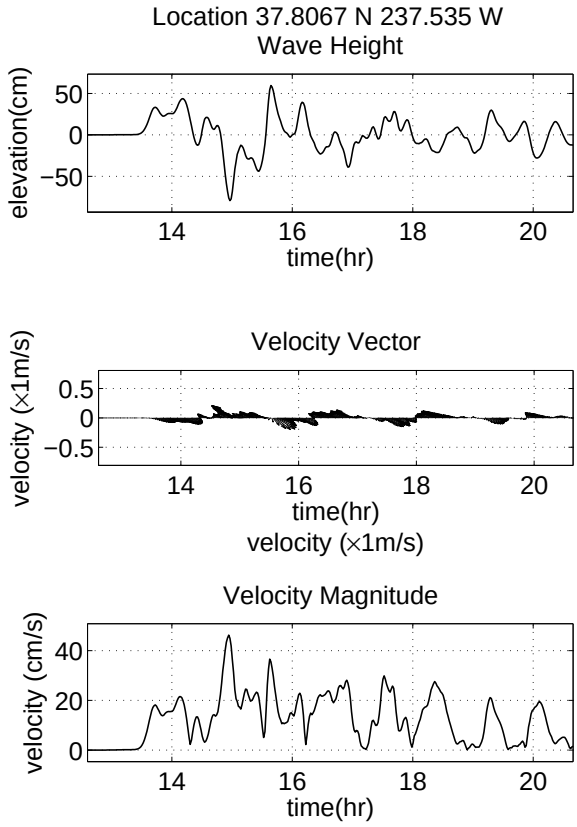
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco

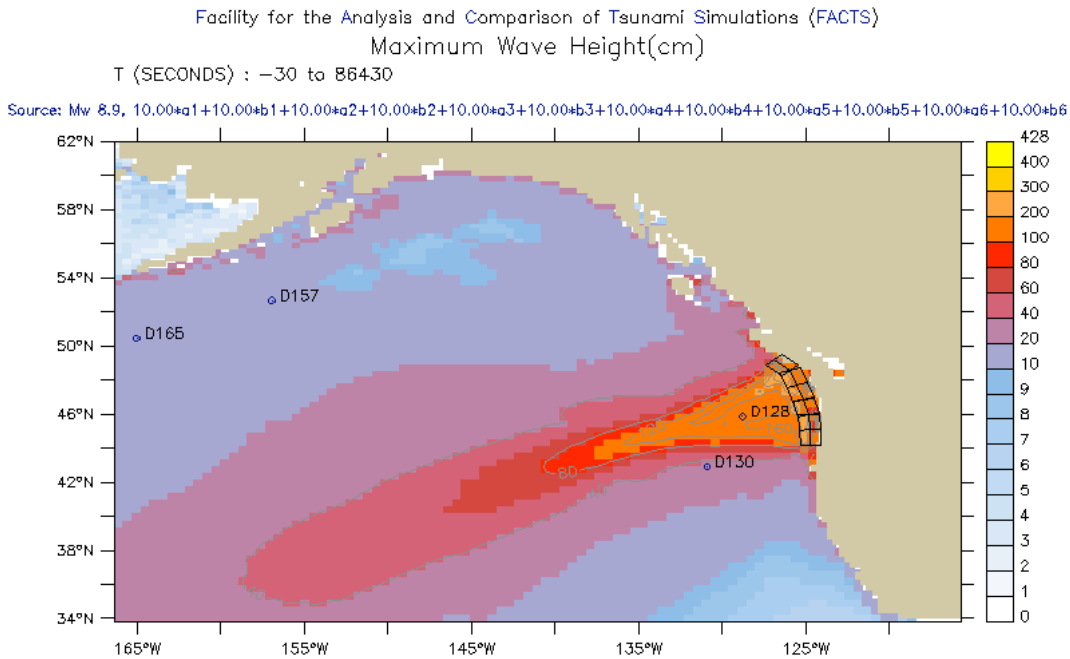


(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Cascadia Subduction Zone – Case I



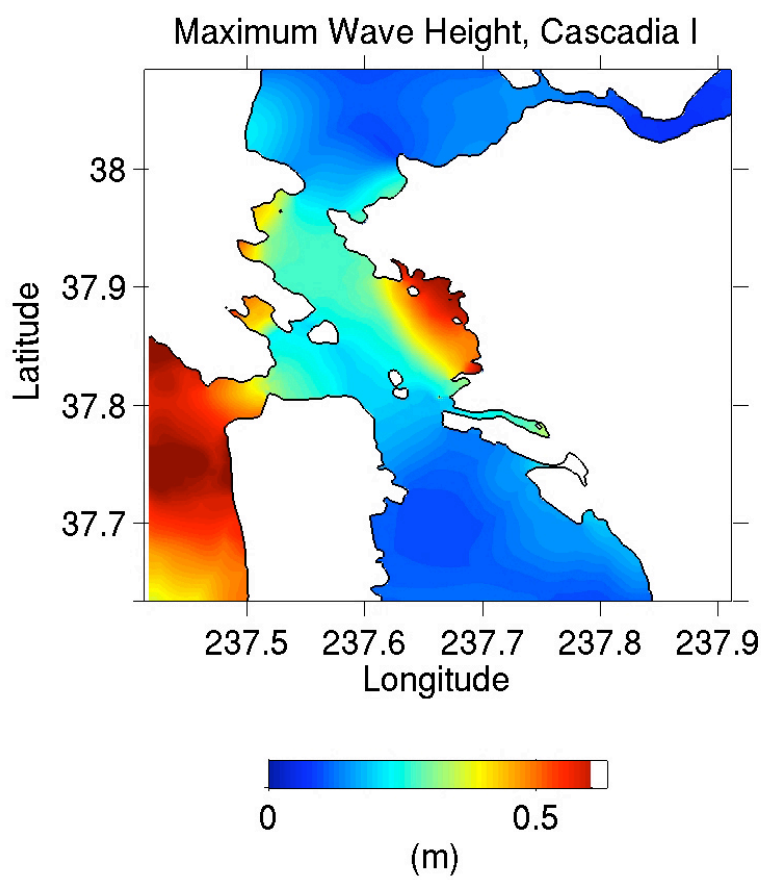
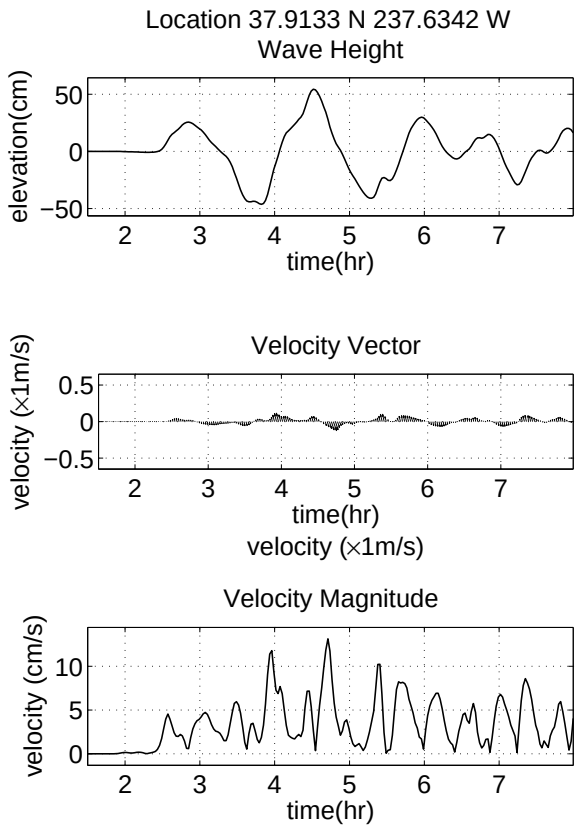
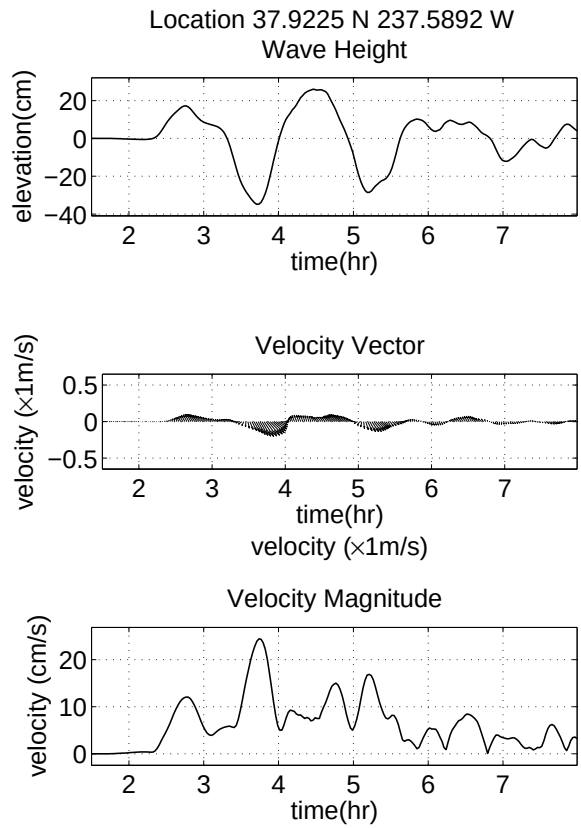


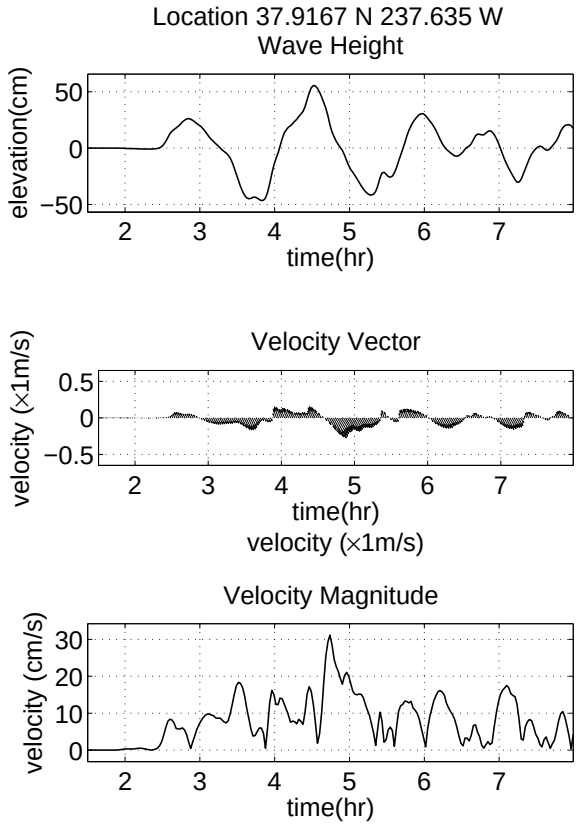
Fig. A1-18 – Maximum wave heights for tsunami simulation, basin wide (upper panel) and in San Francisco Bay (lower panel).



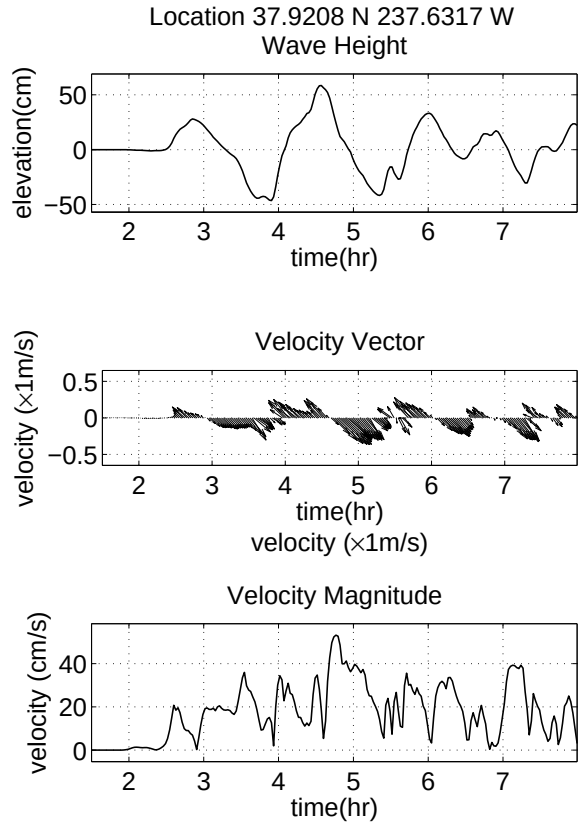
(1) BP West Coast Products, Richmond



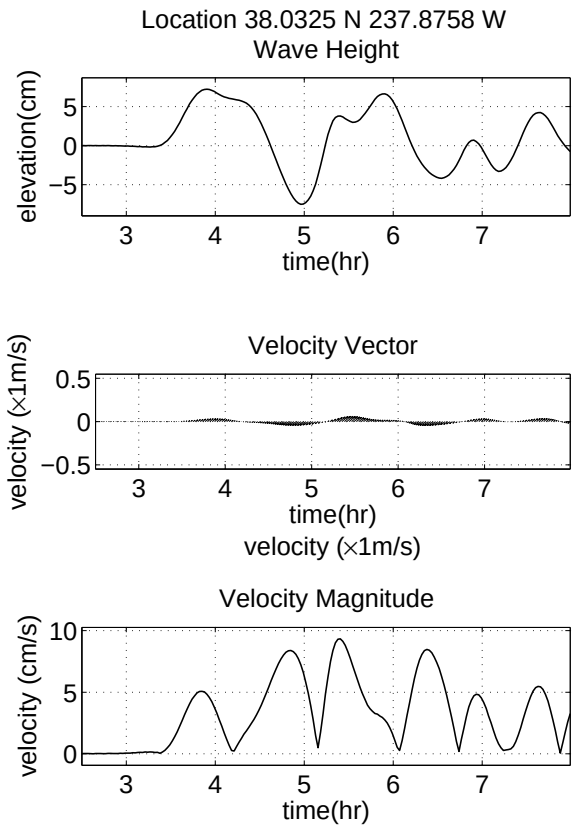
(3) Chevron USA, Inc., Richmond



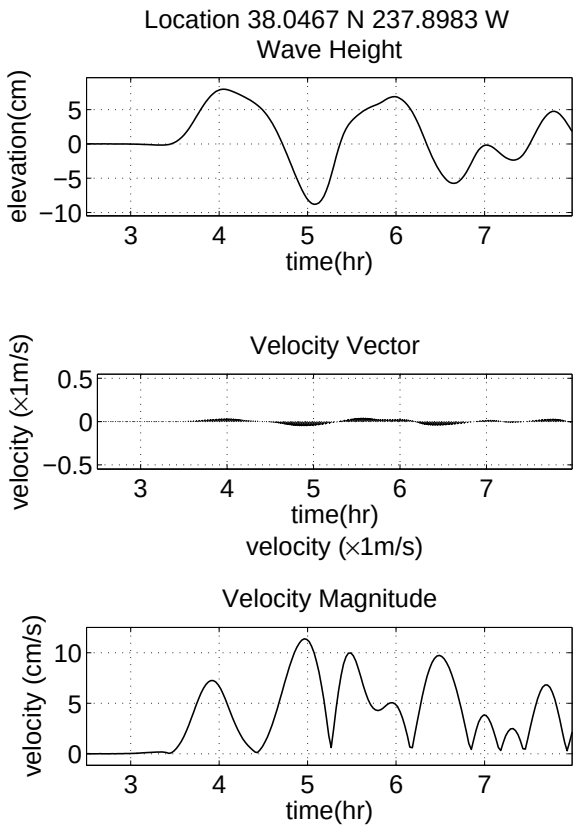
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



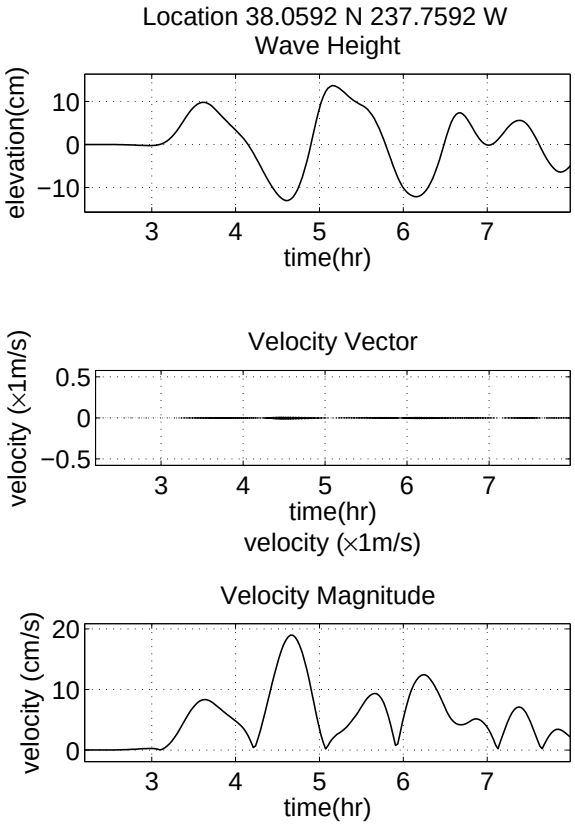
(6, 11) IMTT/Shore Terminals LLC, Richmond



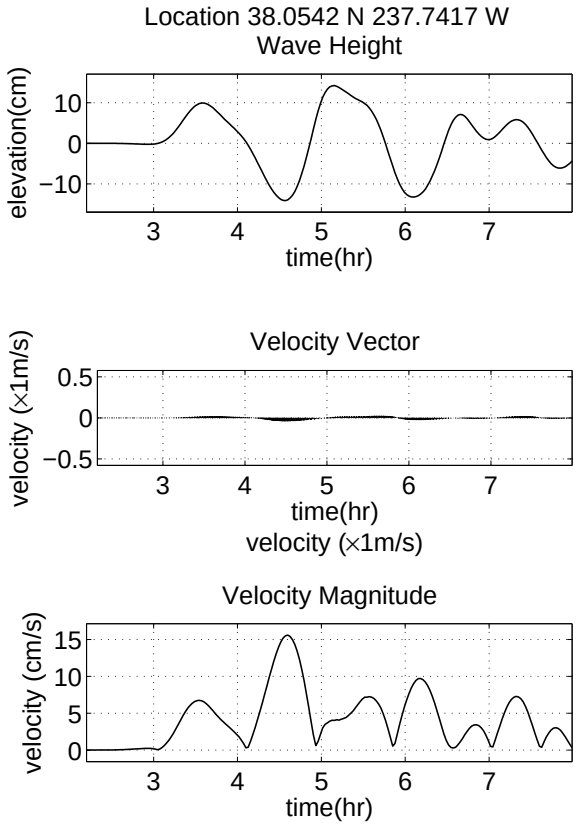
(7) Shell Oil Products, US, Martinez



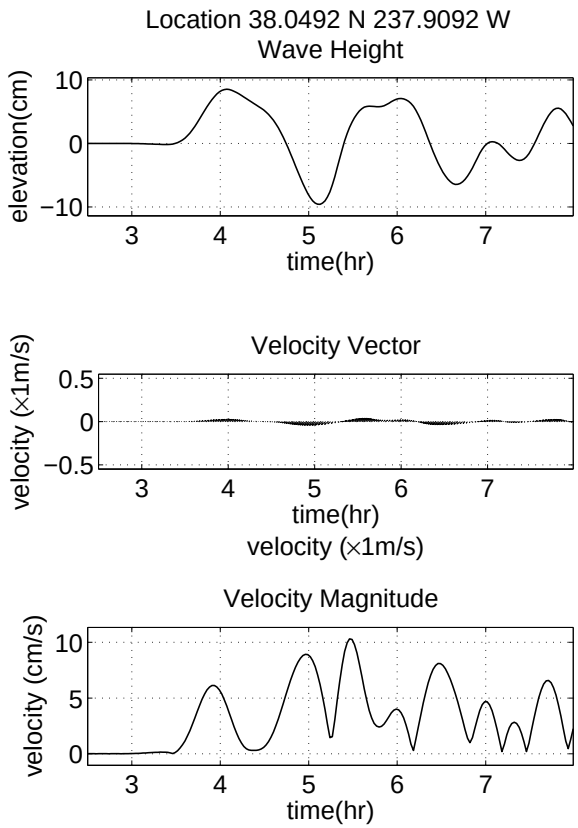
(9) Pacific Atlantic Terminals, Martinez



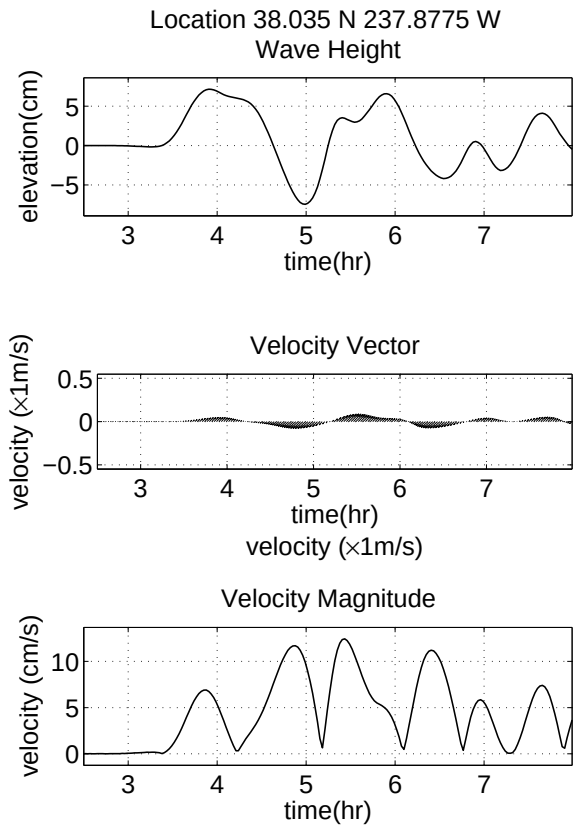
(10) Pacific Atlantic Terminals, Selby



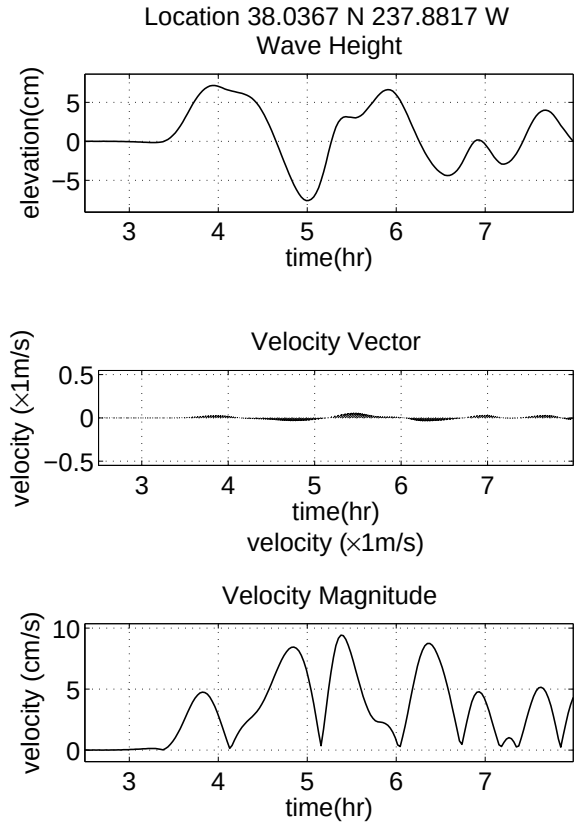
(13) ConocoPhillips, Rodeo



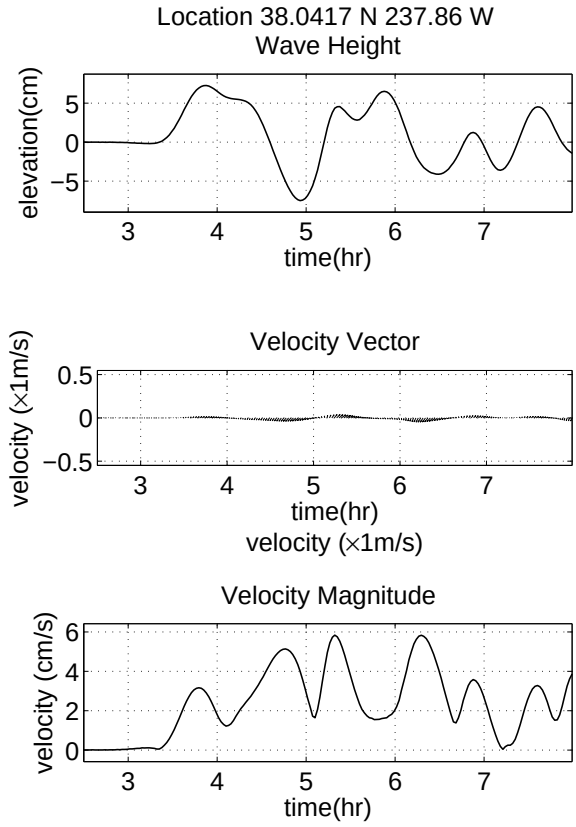
(14) Tesero, Inc. - Avon Wharf



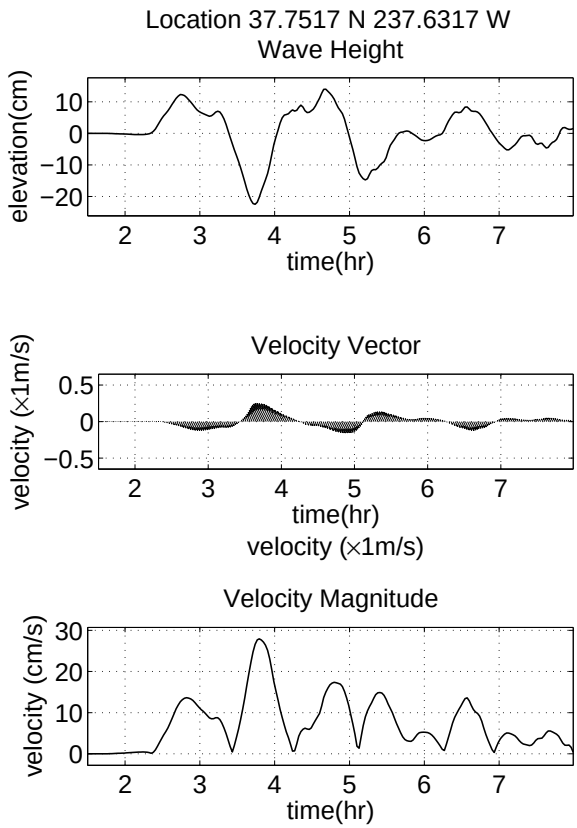
(15) Tesero, Inc. - Amorco Wharf



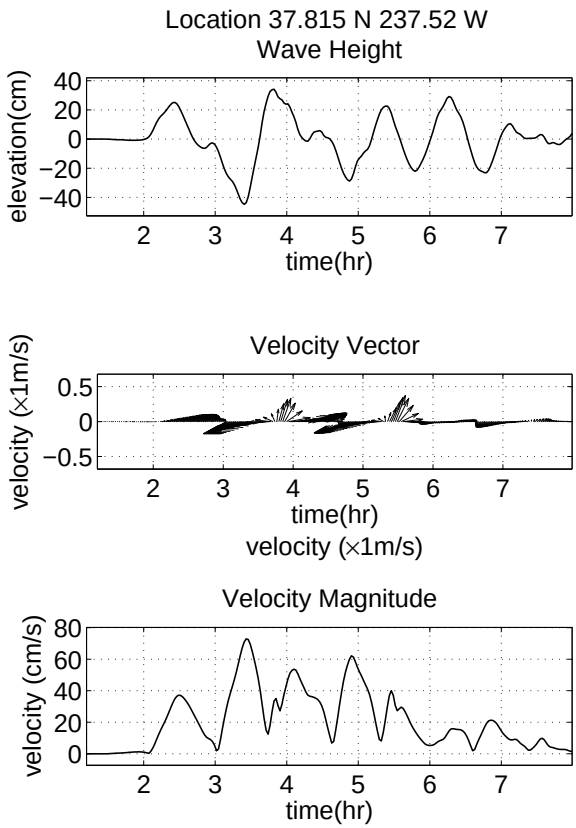
(16) Valero Refining Berth 1, Benicia



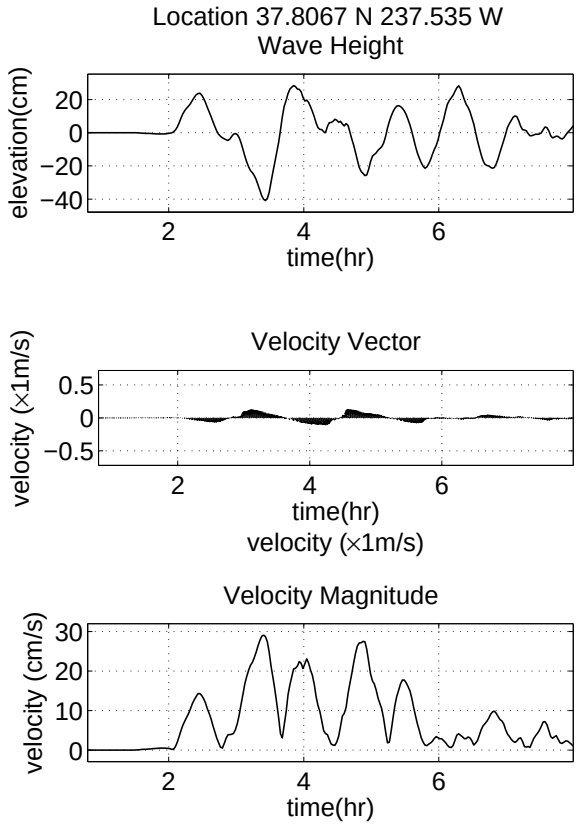
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco



(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Cascadia Subduction Zone – Case II

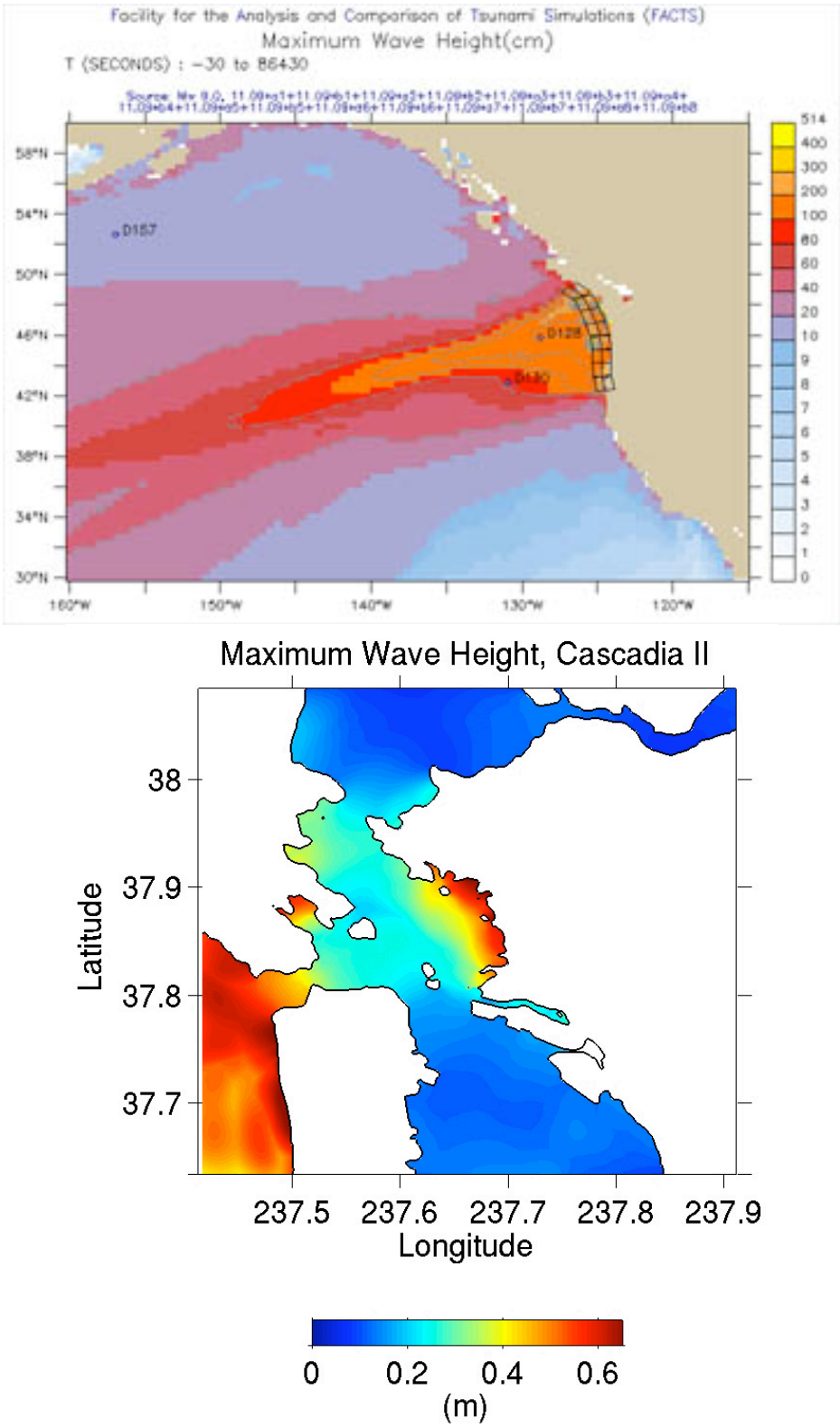
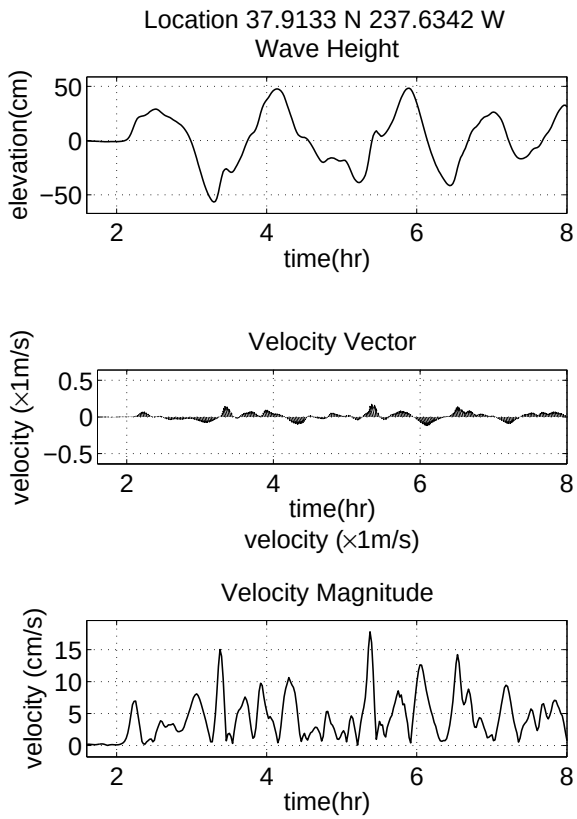
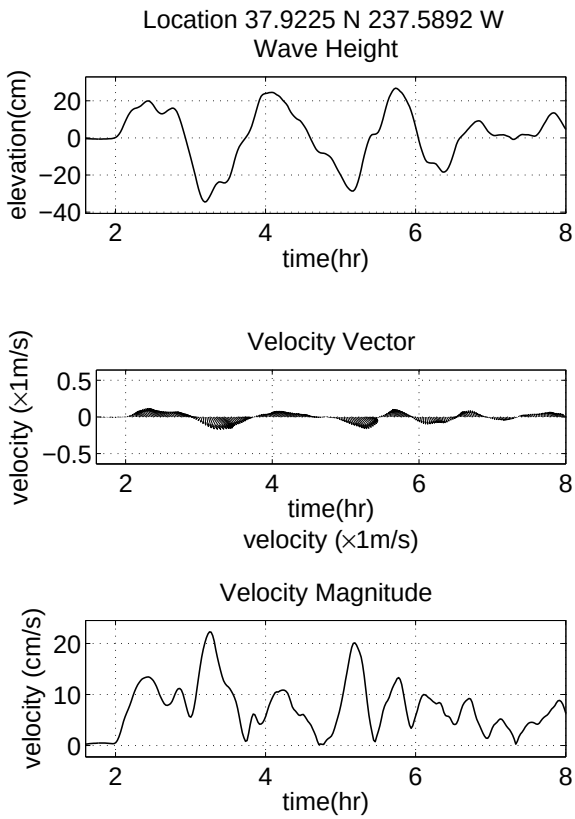


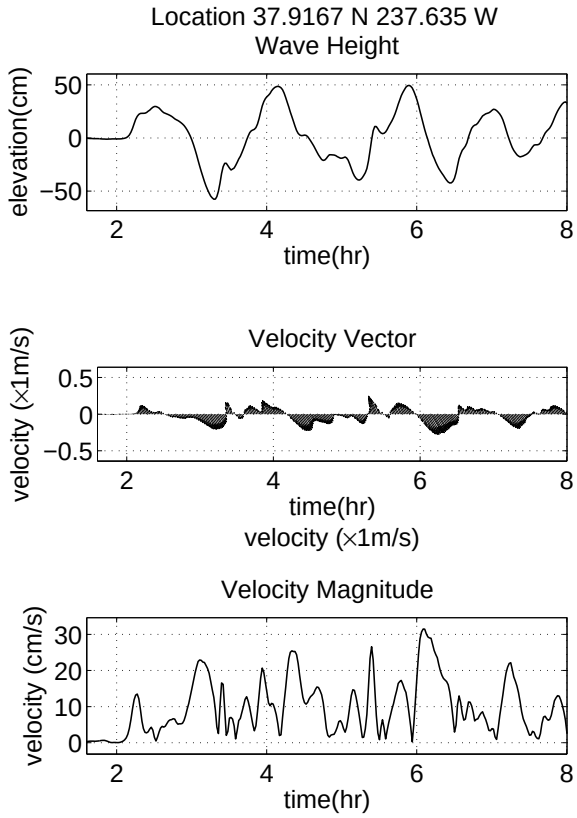
Fig. A1-19 – Maximum wave heights for tsunami simulation, basin wide (upper panel) and in San Francisco Bay (lower panel).



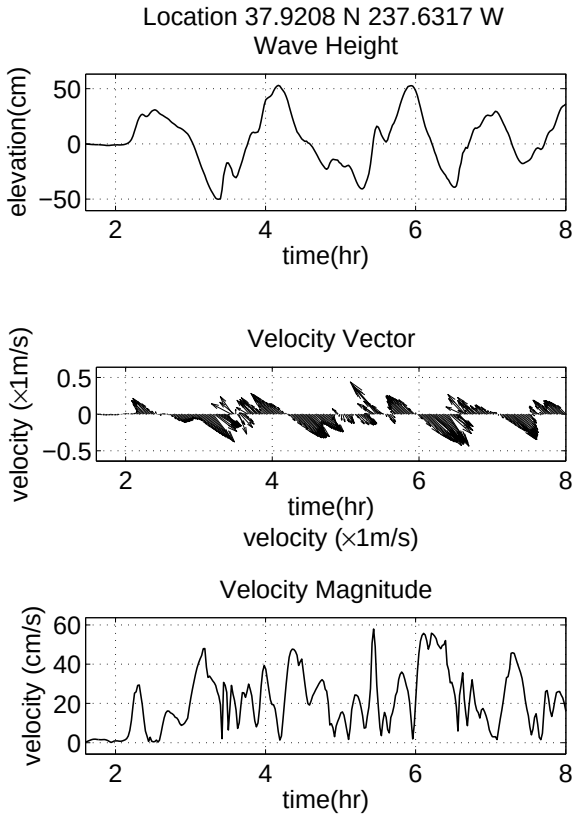
(1) BP West Coast Products, Richmond



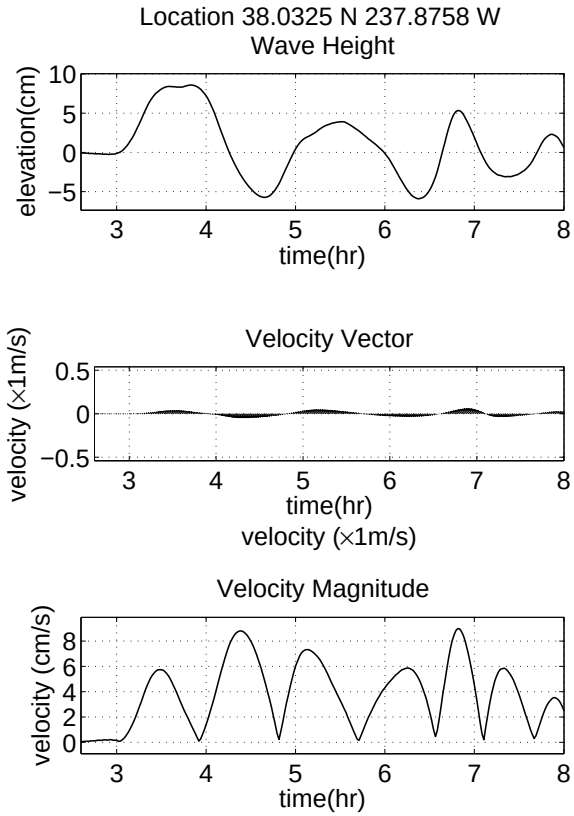
(3) Chevron USA, Inc., Richmond



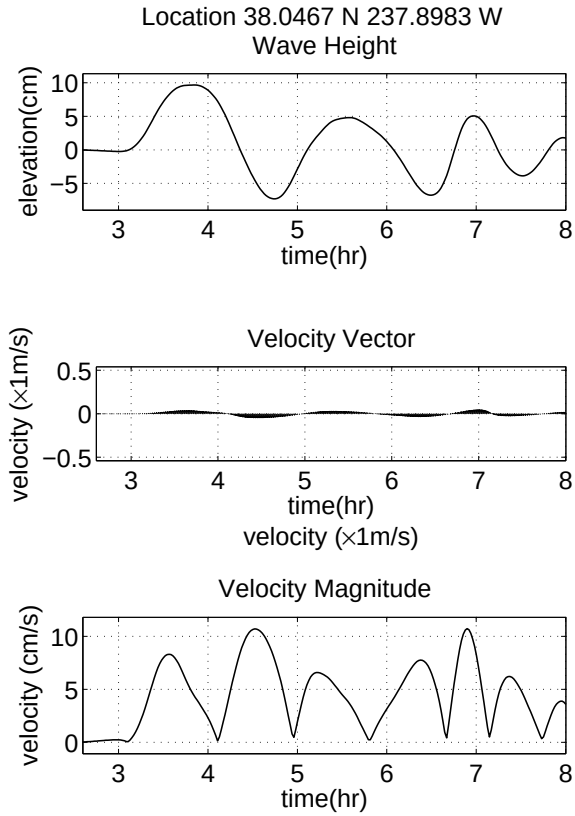
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



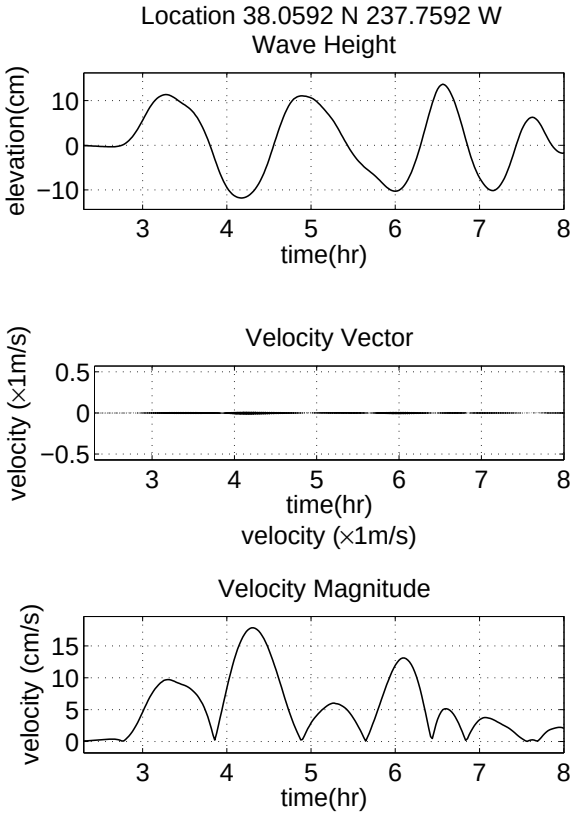
(6, 11) IMTT/Shore Terminals LLC, Richmond



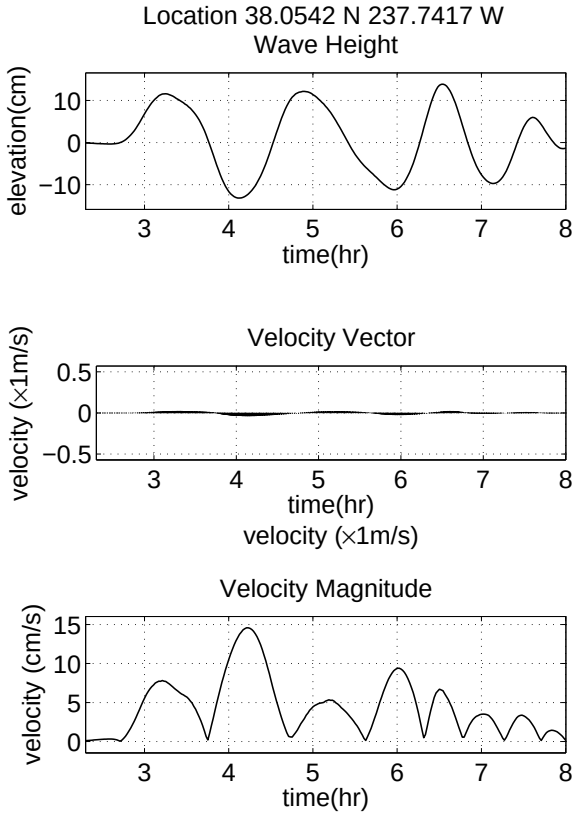
(7) Shell Oil Products, US, Martinez



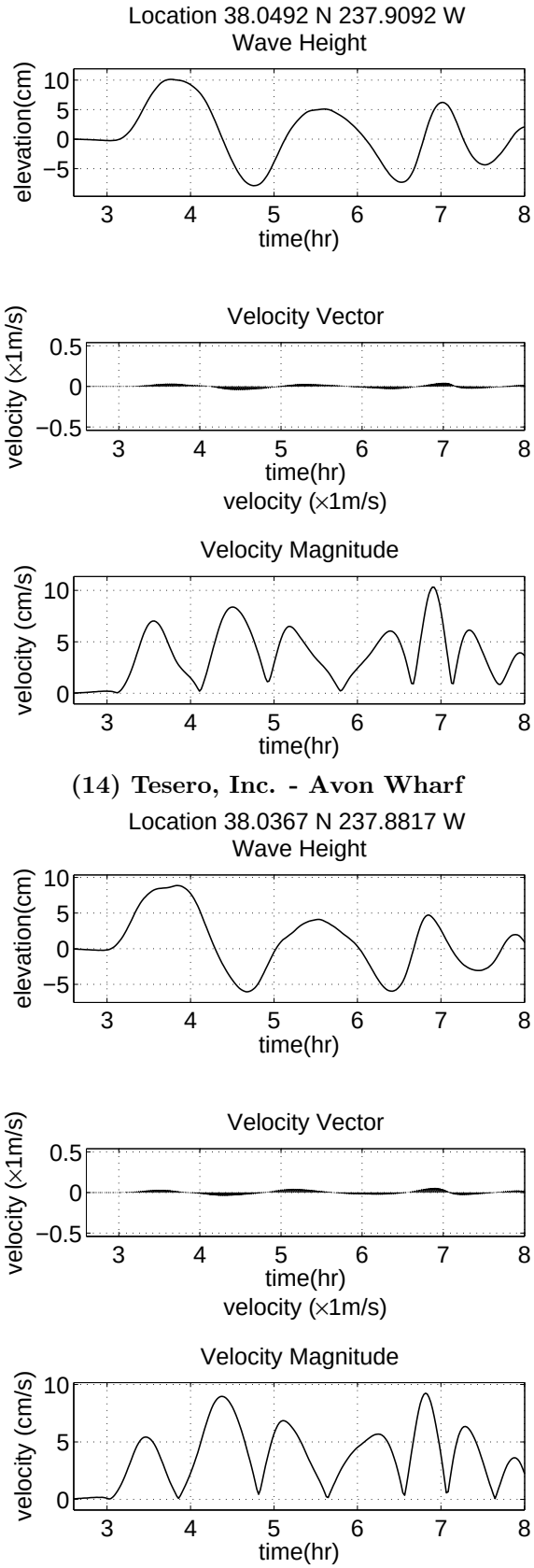
(9) Pacific Atlantic Terminals, Martinez



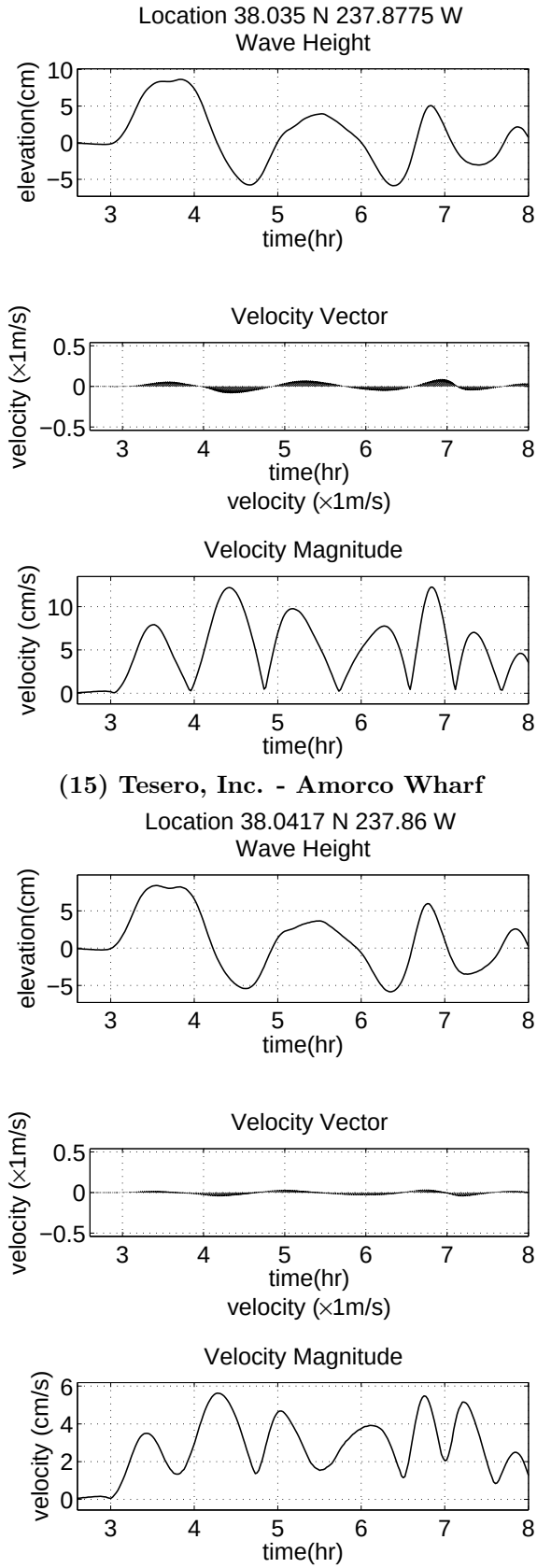
(10) Pacific Atlantic Terminals, Selby



(13) ConocoPhillips, Rodeo



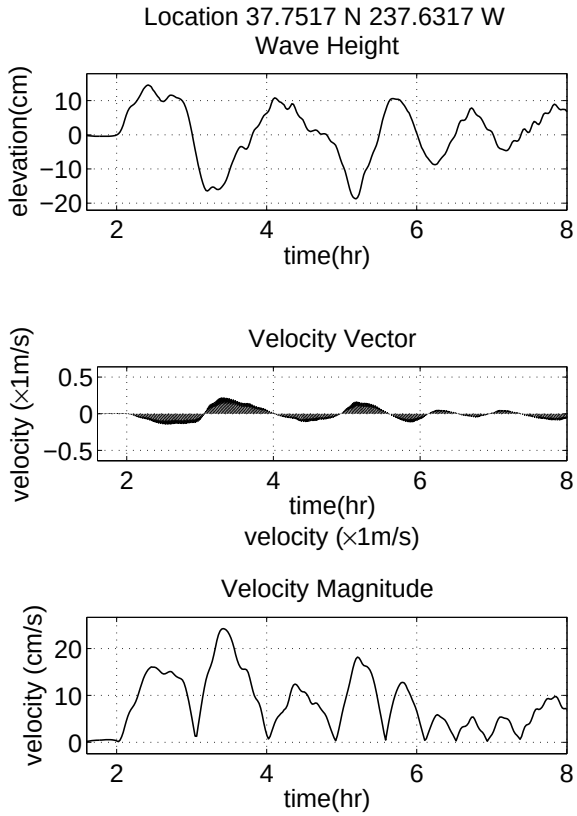
(14) Tesero, Inc. - Avon Wharf



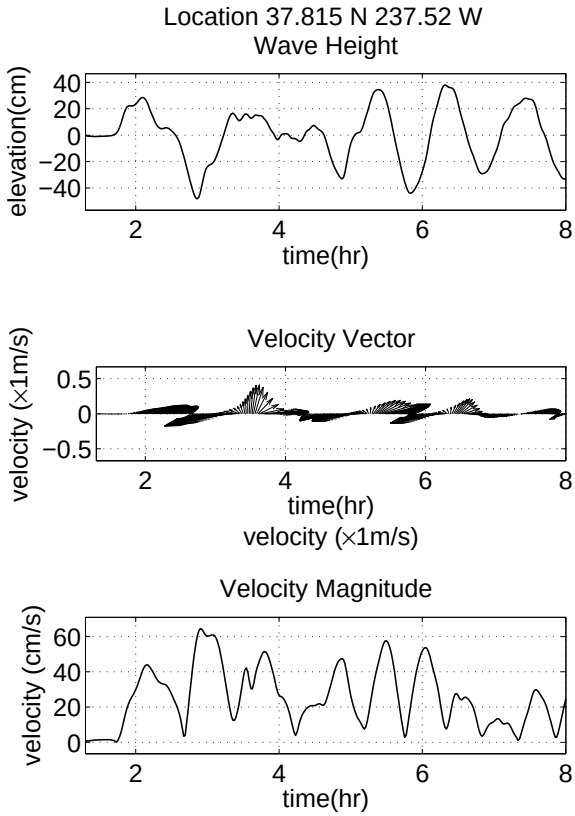
(15) Tesero, Inc. - Amorco Wharf

(16) Valero Refining Berth 1, Benicia

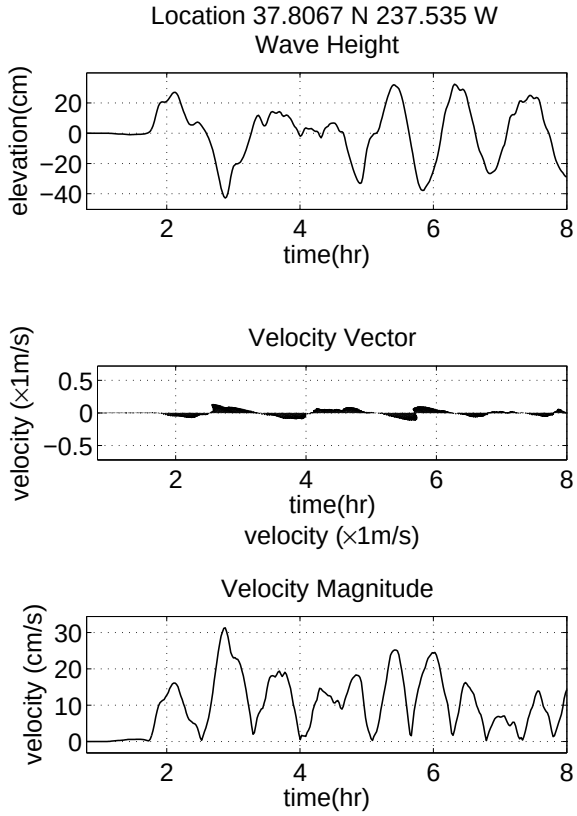
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco

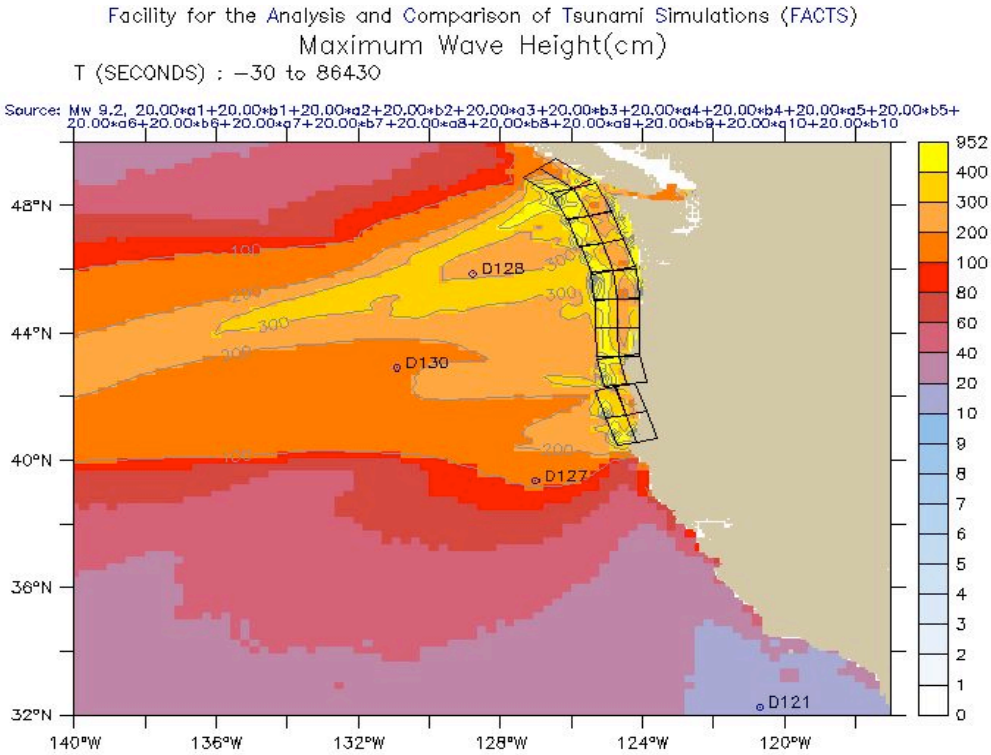


(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Cascadia Subduction Zone – Case III



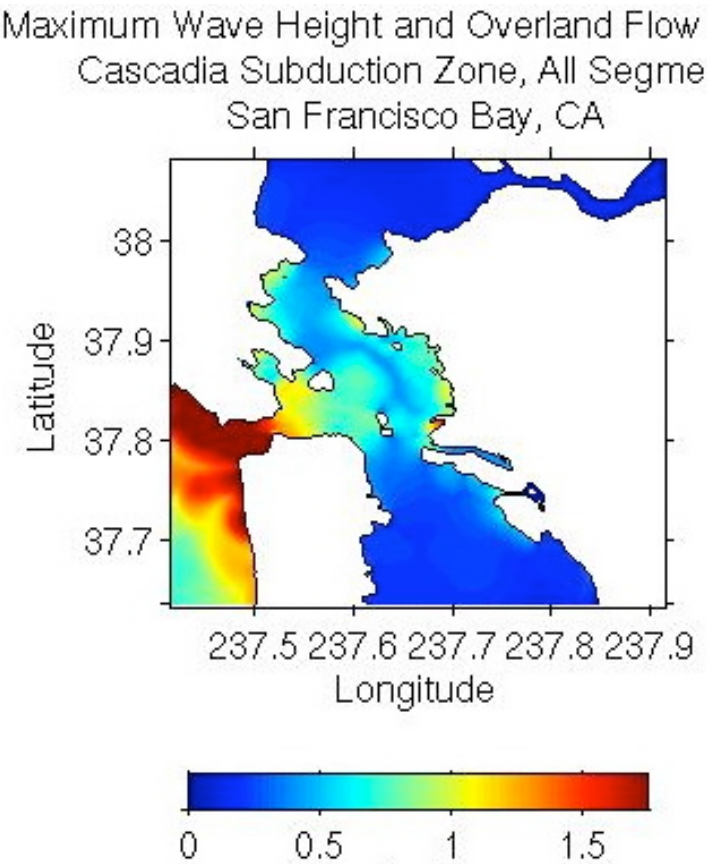
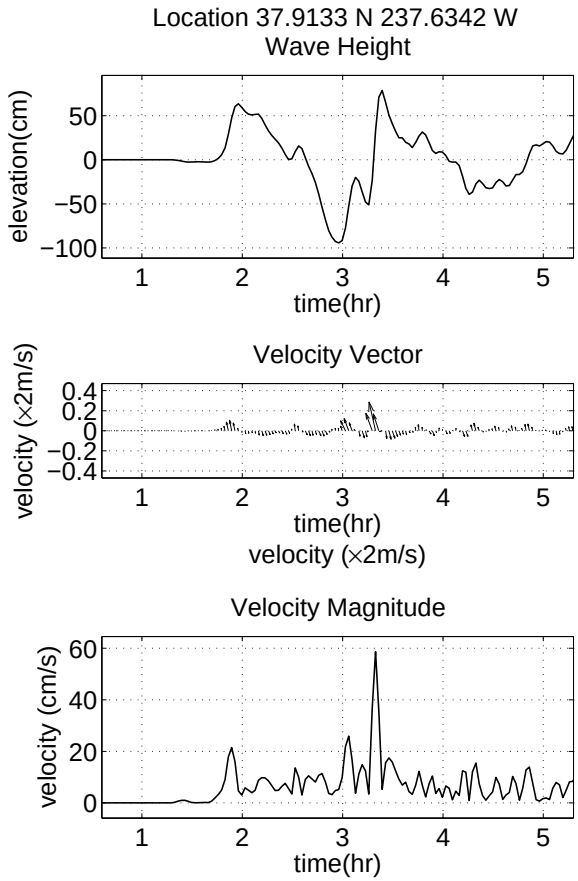
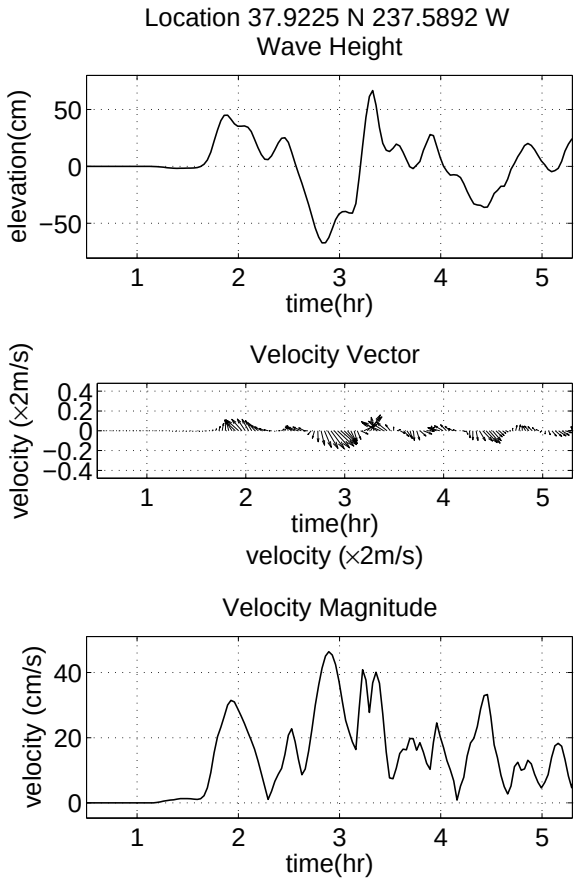


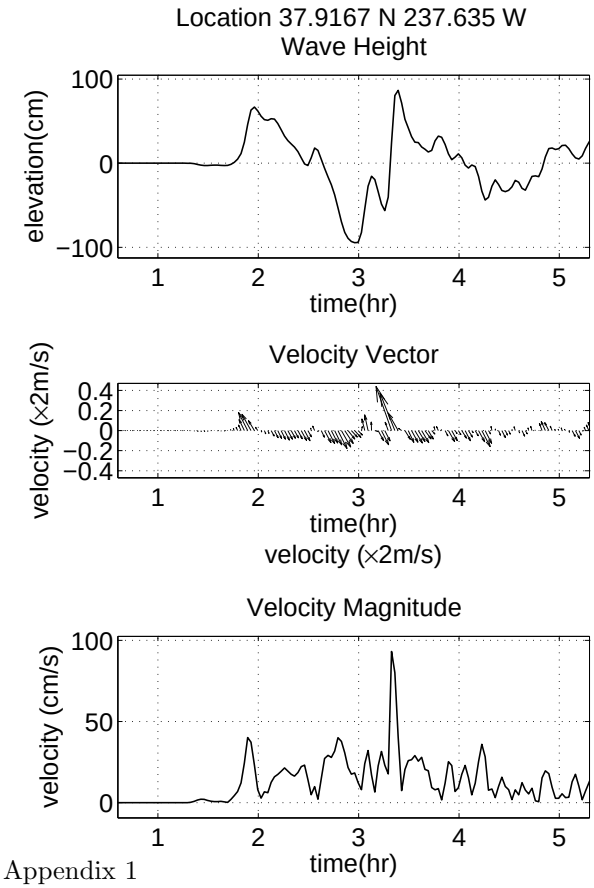
Fig. A1-20 – Maximum wave heights for tsunami simulation, basin wide (upper panel) and in San Francisco Bay (lower panel).



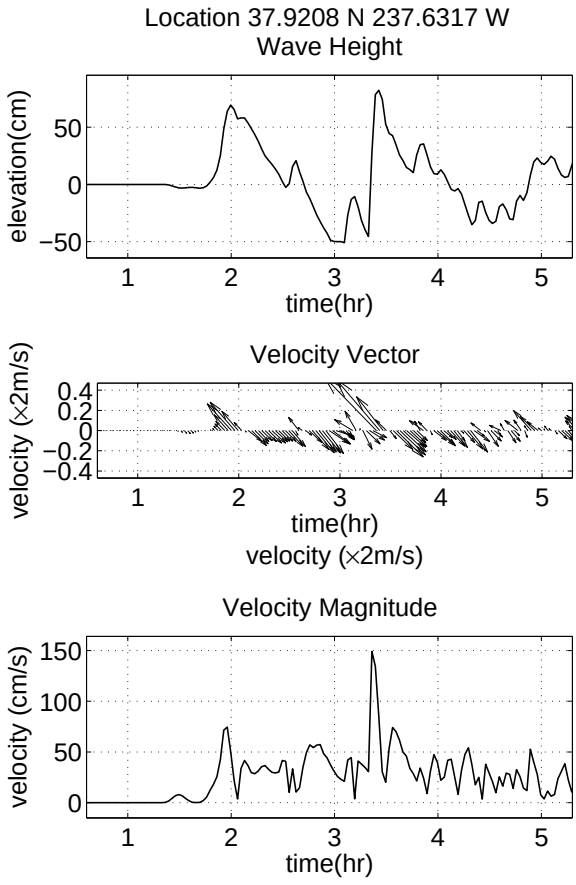
(1) BP West Coast Products, Richmond



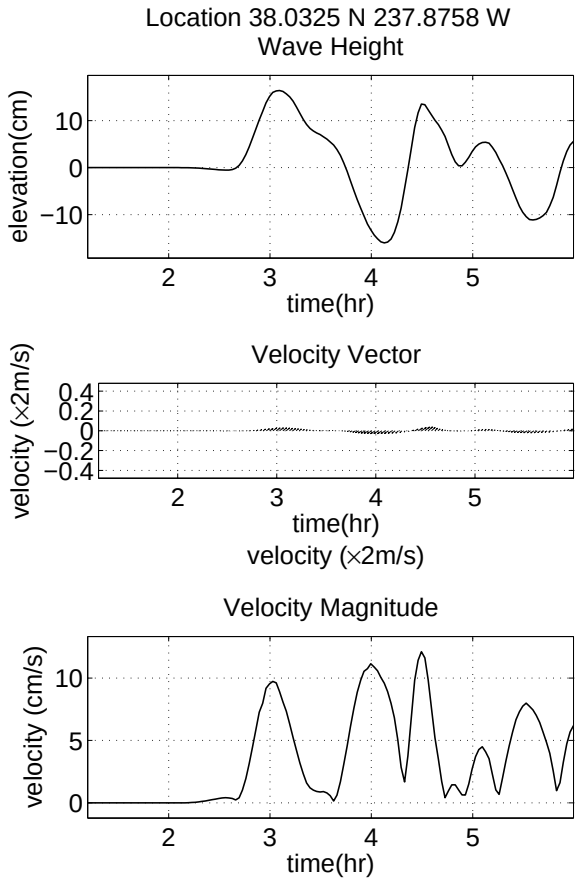
(3) Chevron USA, Inc., Richmond



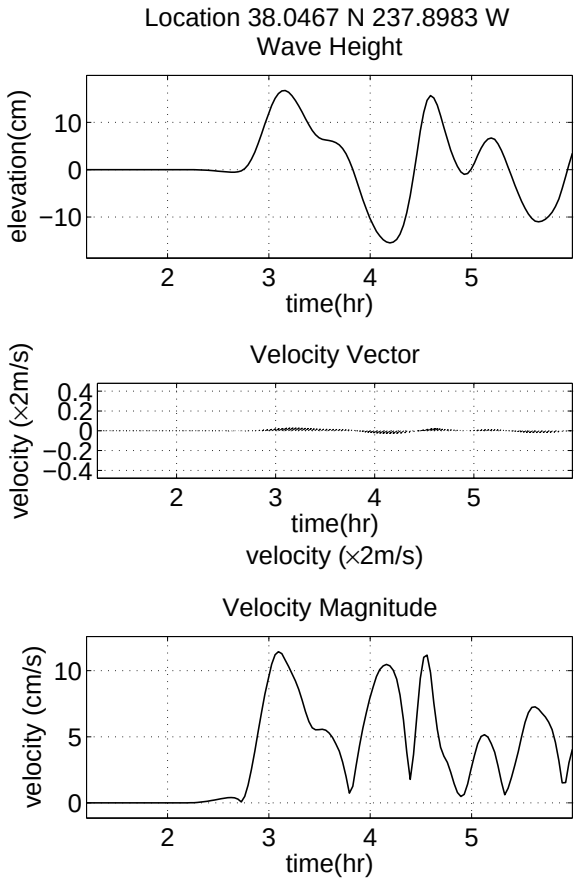
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



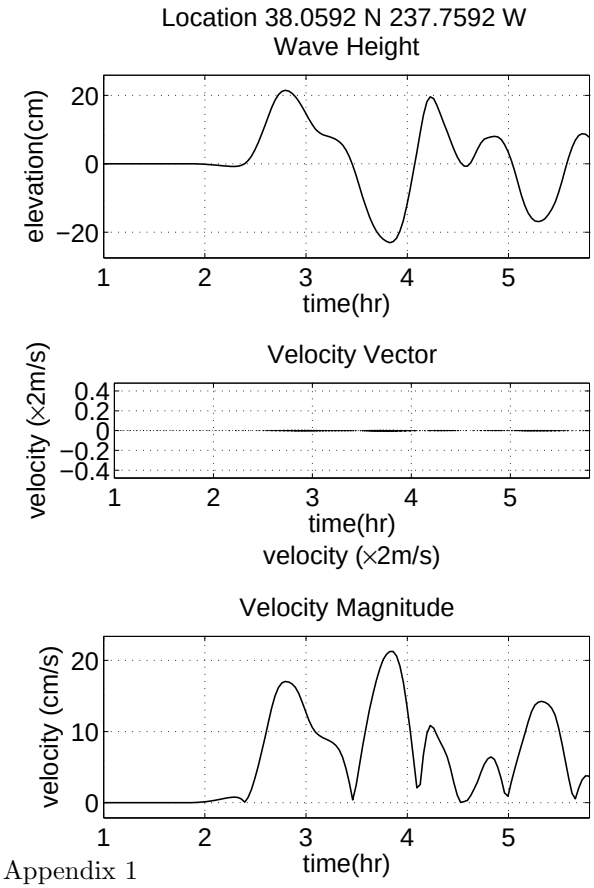
(6, 11) IMTT/Shore Terminals LLC, Richmond



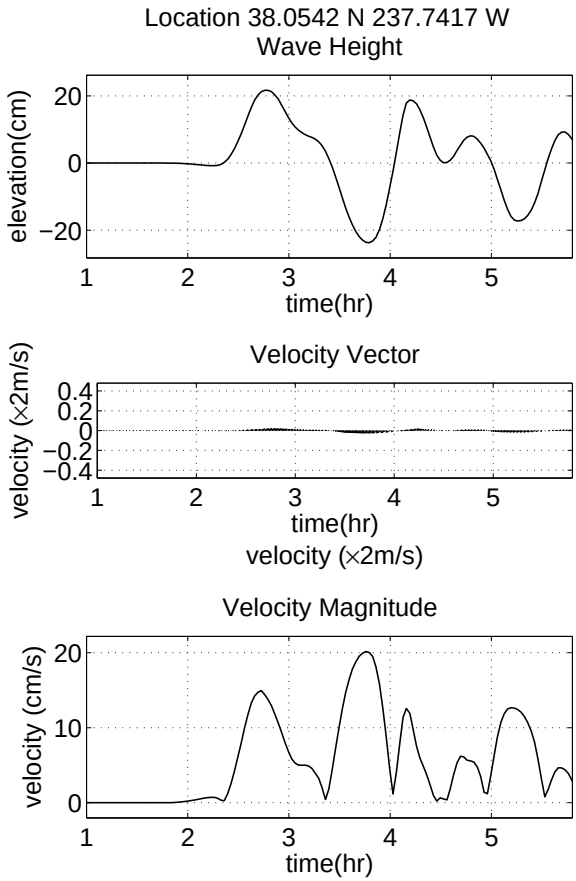
(7) Shell Oil Products, US, Martinez



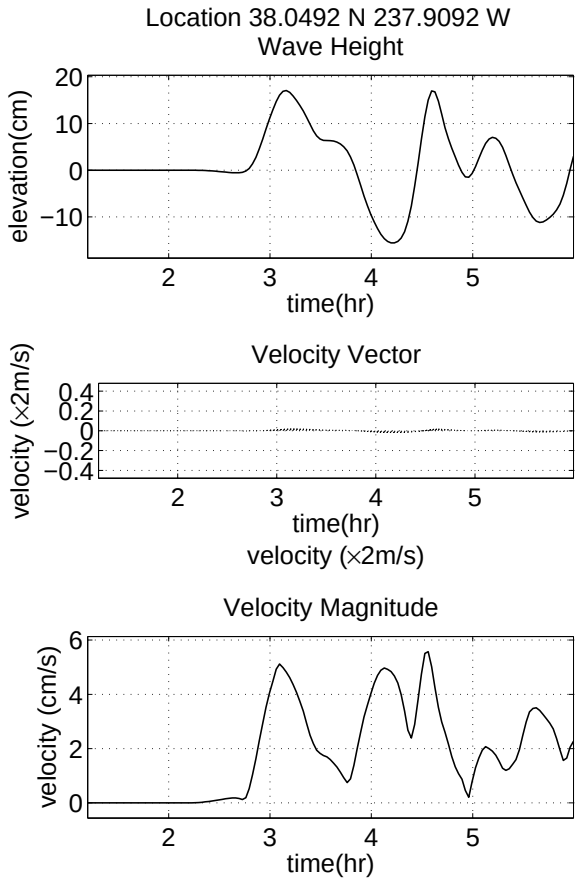
(9) Pacific Atlantic Terminals, Martinez



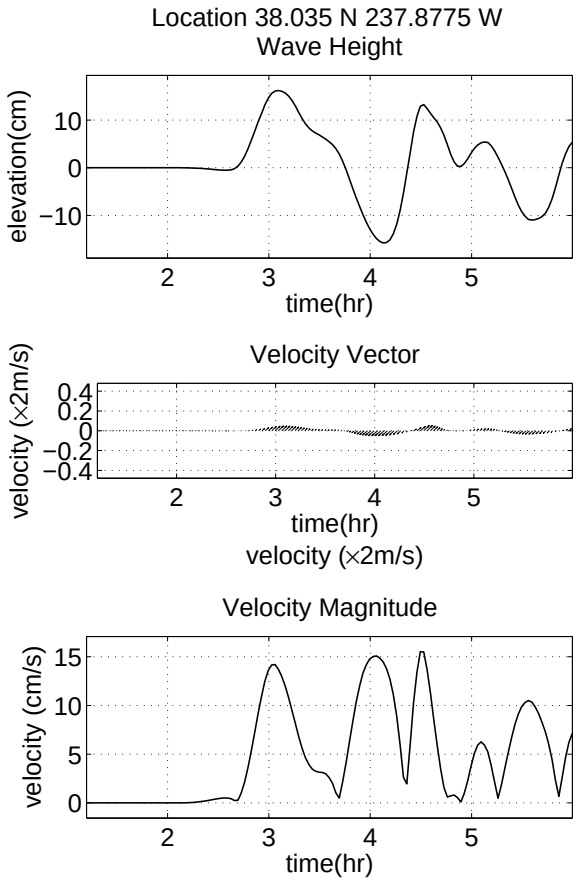
(10) Pacific Atlantic Terminals, Selby



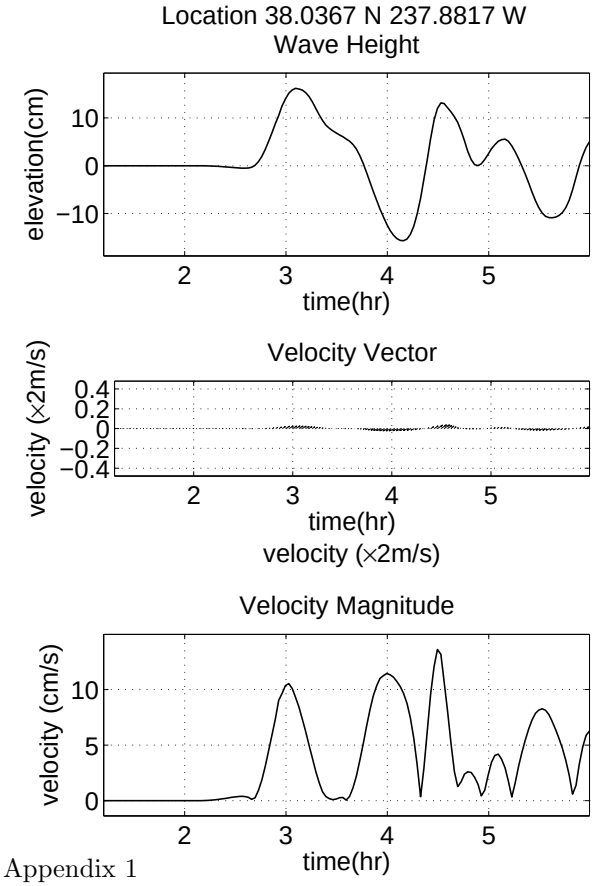
(13) ConocoPhillips, Rodeo



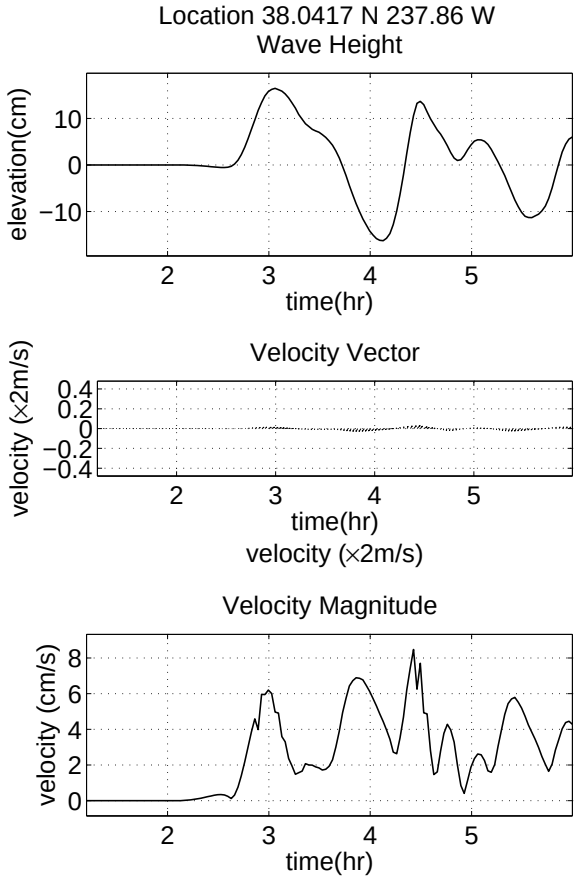
(14) Tesero, Inc. - Avon Wharf



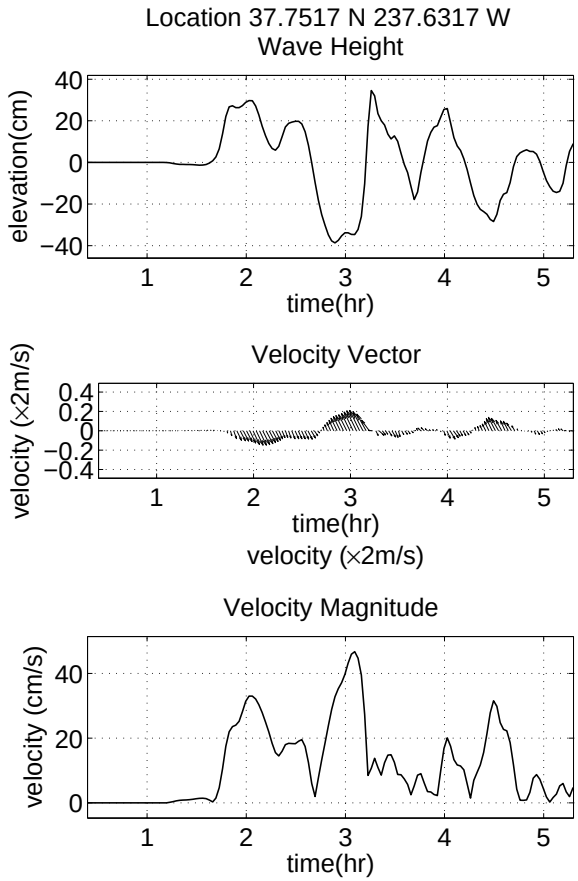
(15) Tesero, Inc. - Amorco Wharf



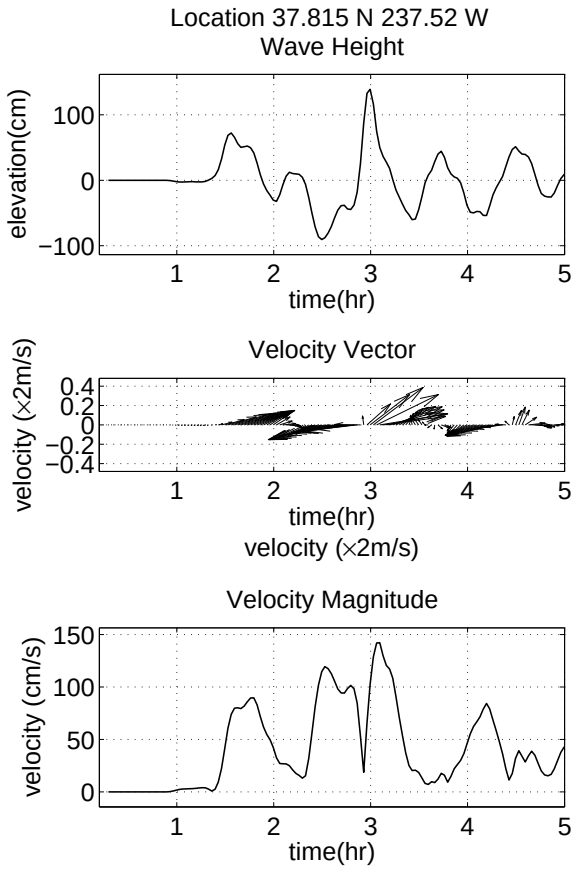
(16) Valero Refining Berth 1, Benicia



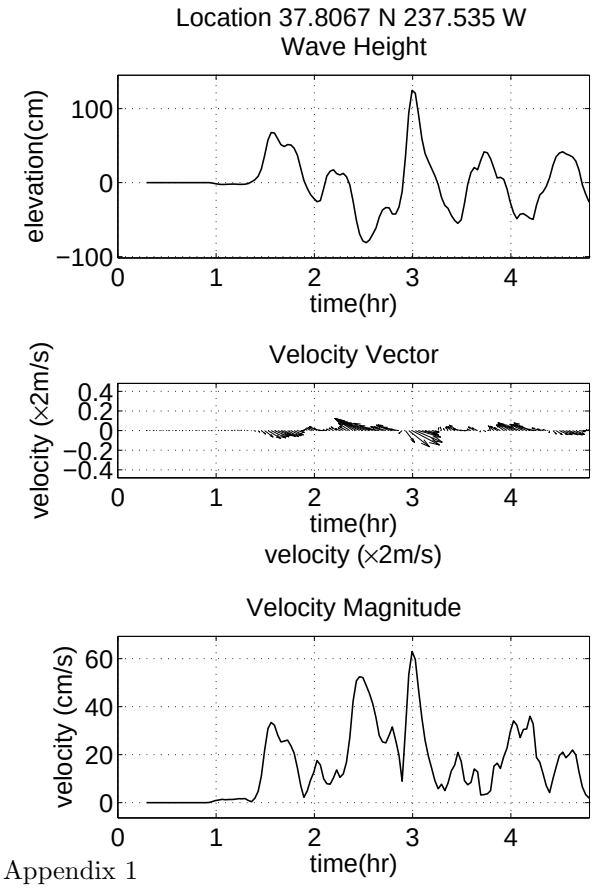
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco

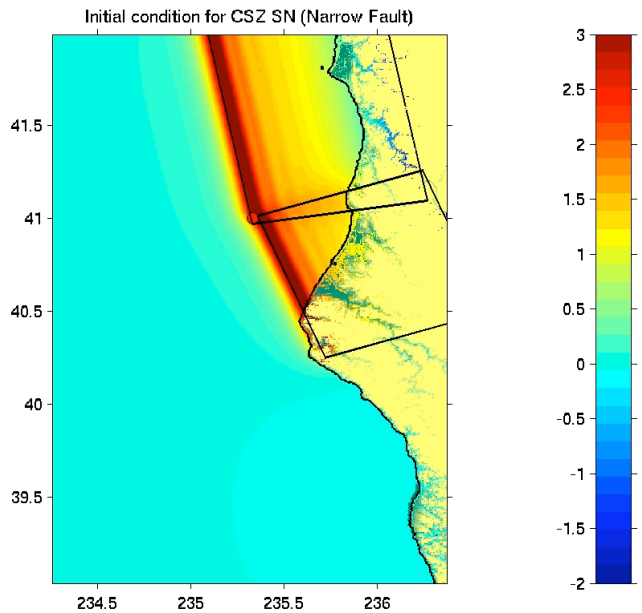


(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Cascadia Subduction Zone - Case SN



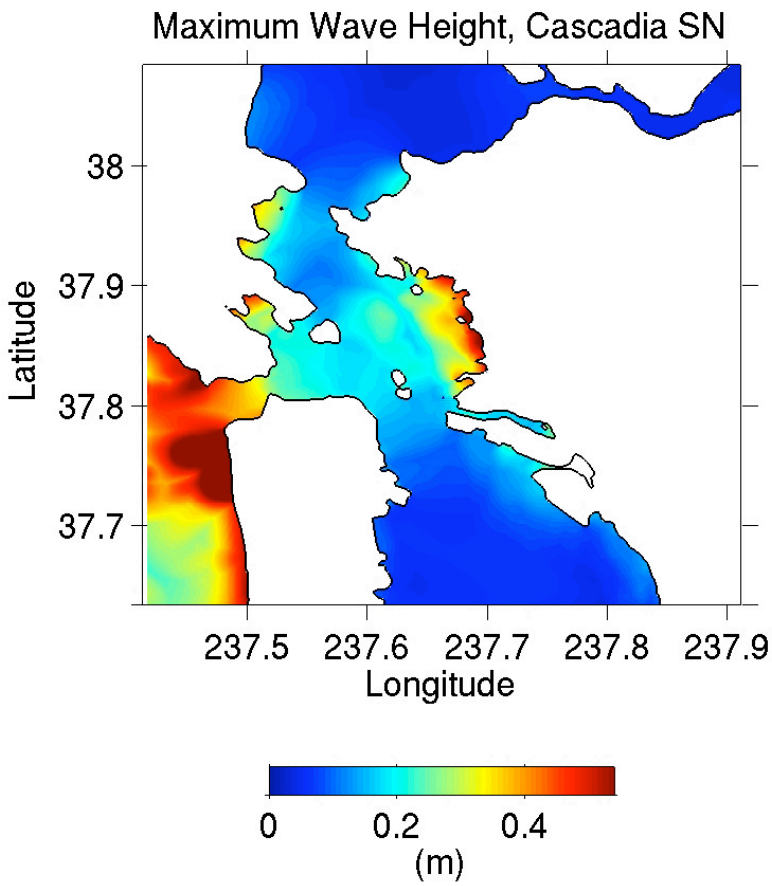
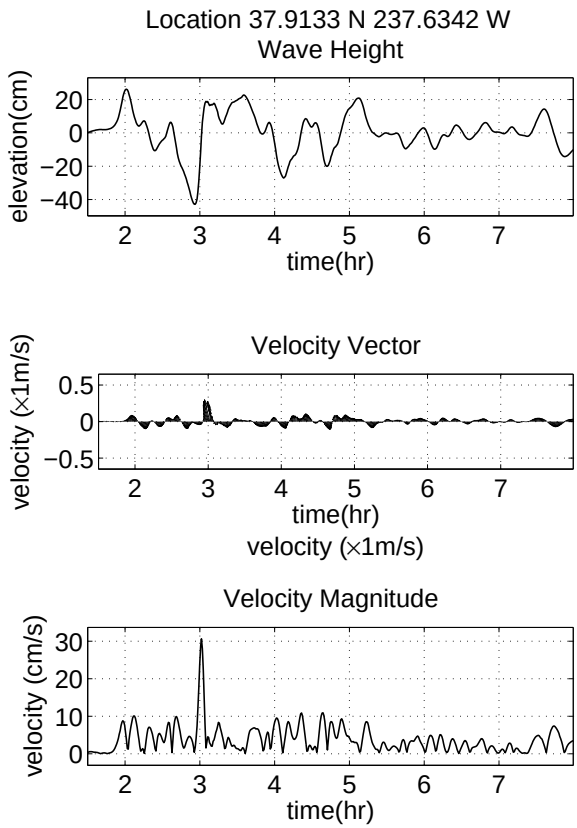
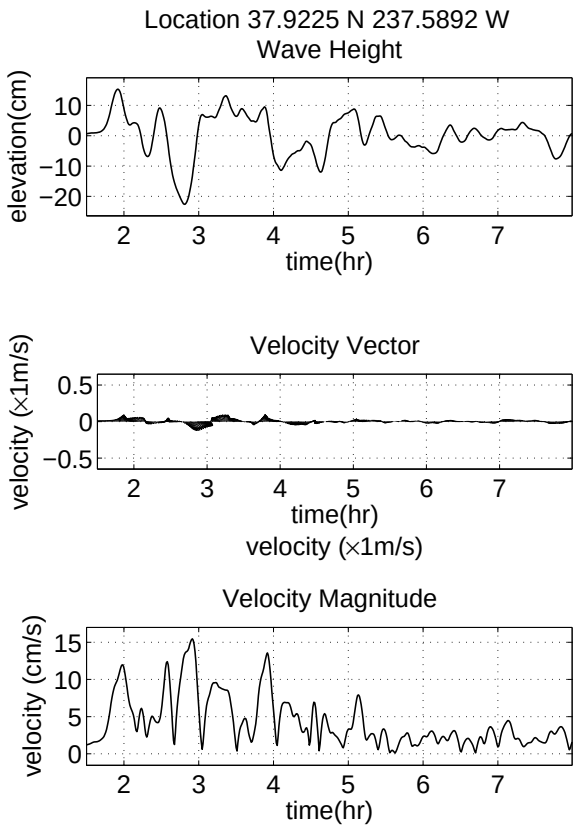


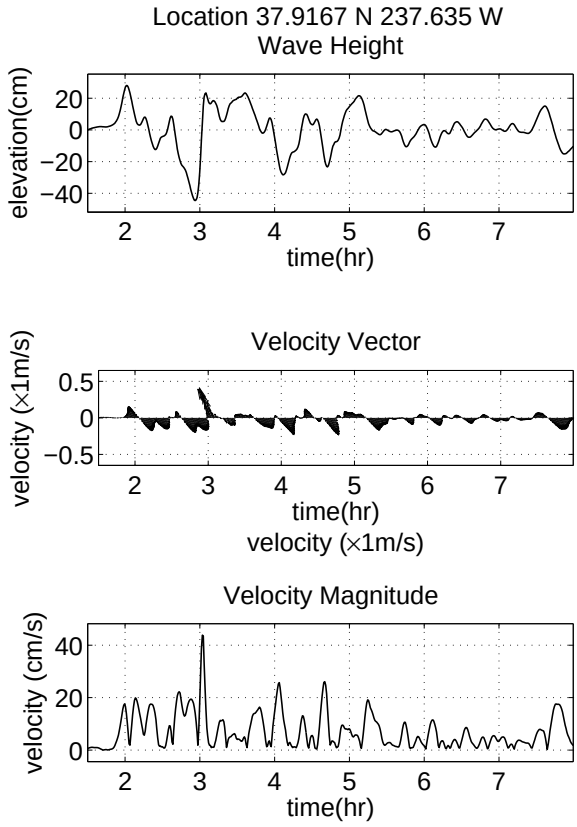
Fig. A1-21 – Initial condition for Cascadia SN (upper panel) and maximum wave heights for tsunami simulation in San Francisco Bay (lower panel).



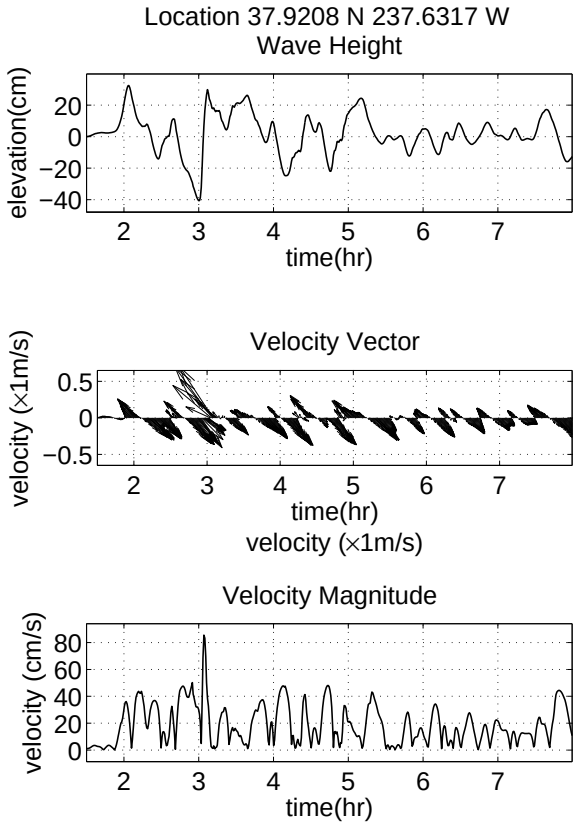
(1) BP West Coast Products, Richmond



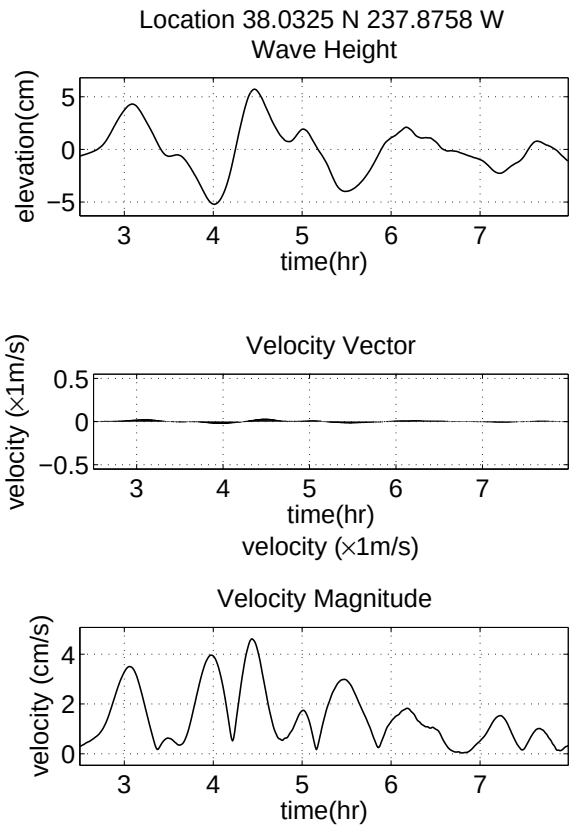
(3) Chevron USA, Inc., Richmond



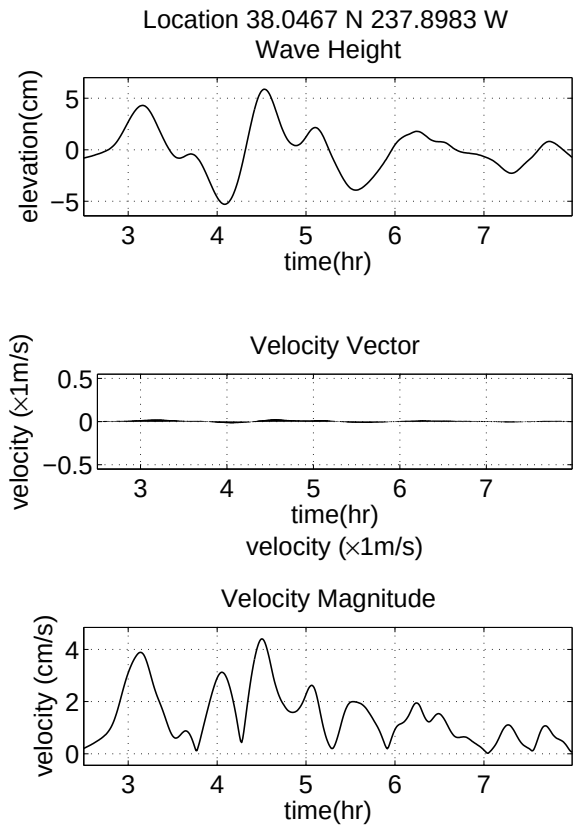
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



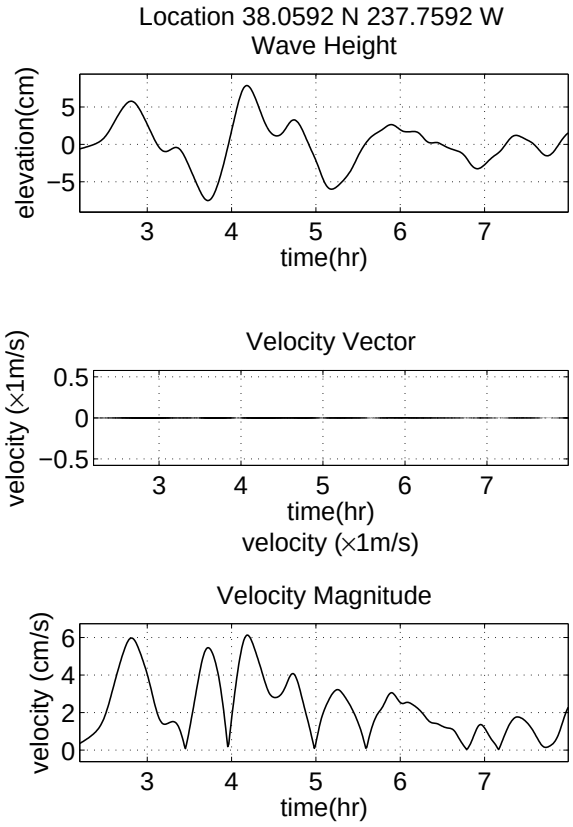
(6, 11) IMTT/Shore Terminals LLC, Richmond



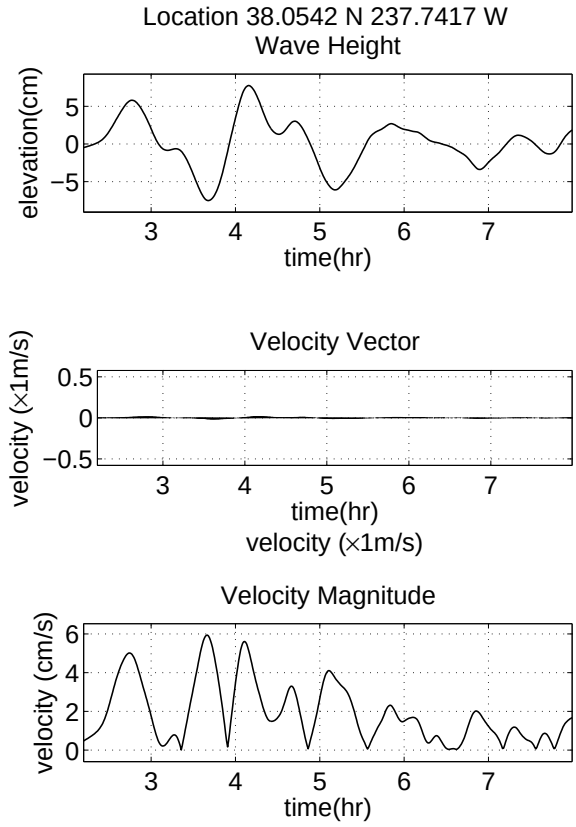
(7) Shell Oil Products, US, Martinez



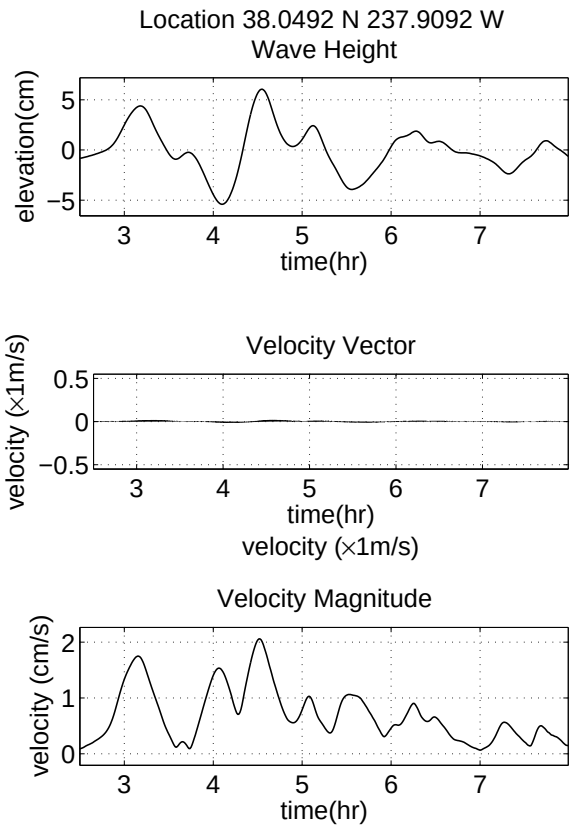
(9) Pacific Atlantic Terminals, Martinez



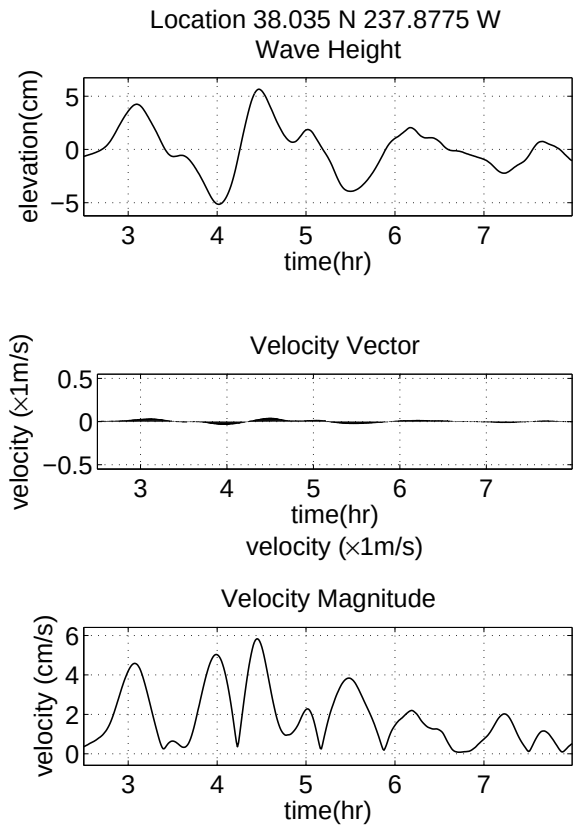
(10) Pacific Atlantic Terminals, Selby



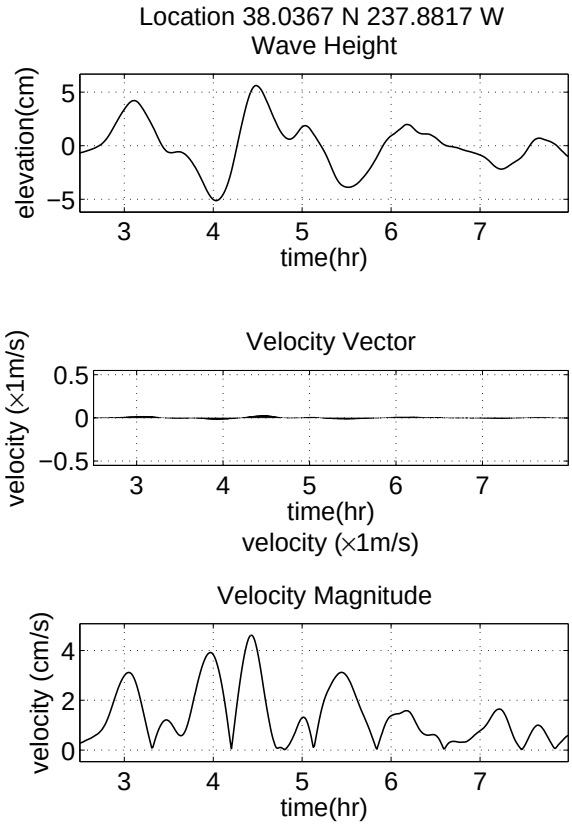
(13) ConocoPhillips, Rodeo



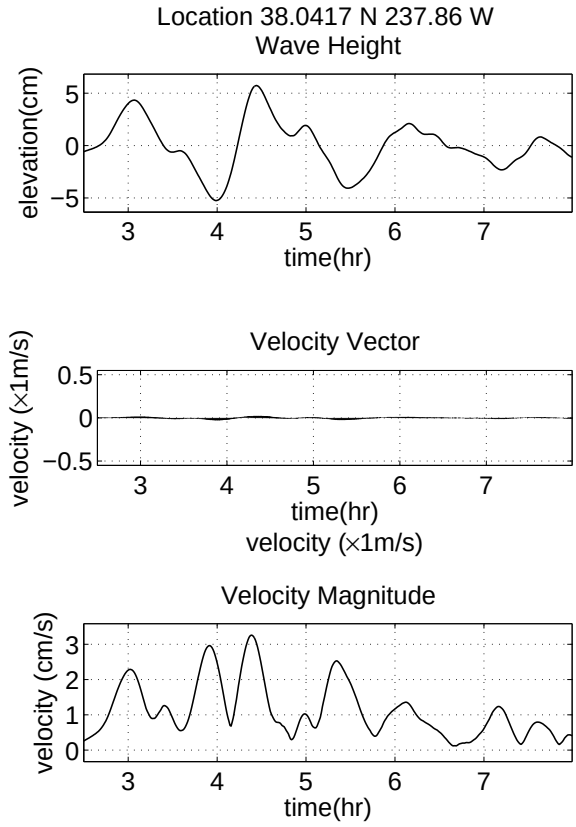
(14) Tesero, Inc. - Avon Wharf



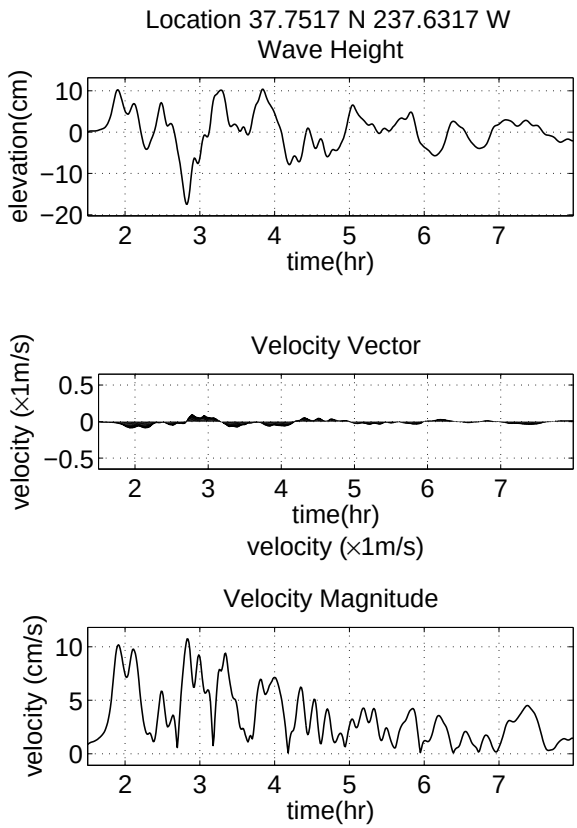
(15) Tesero, Inc. - Amorco Wharf



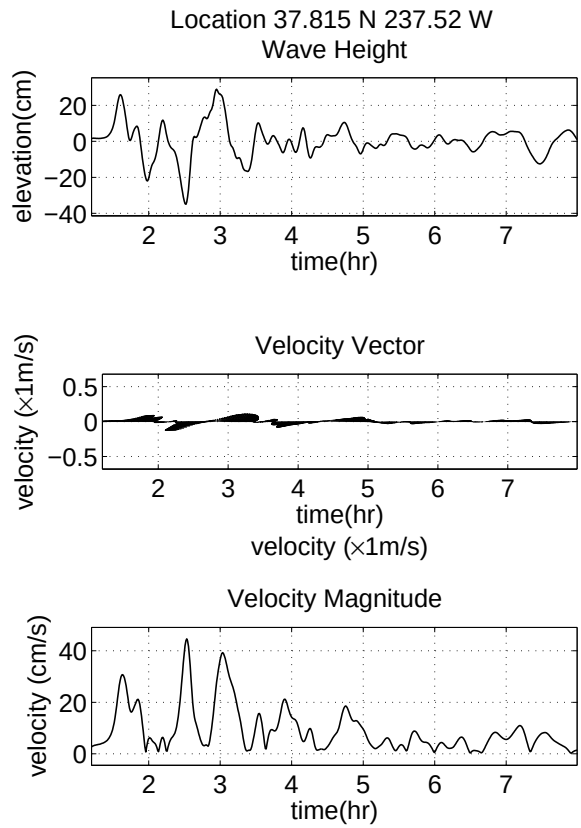
(16) Valero Refining Berth 1, Benicia



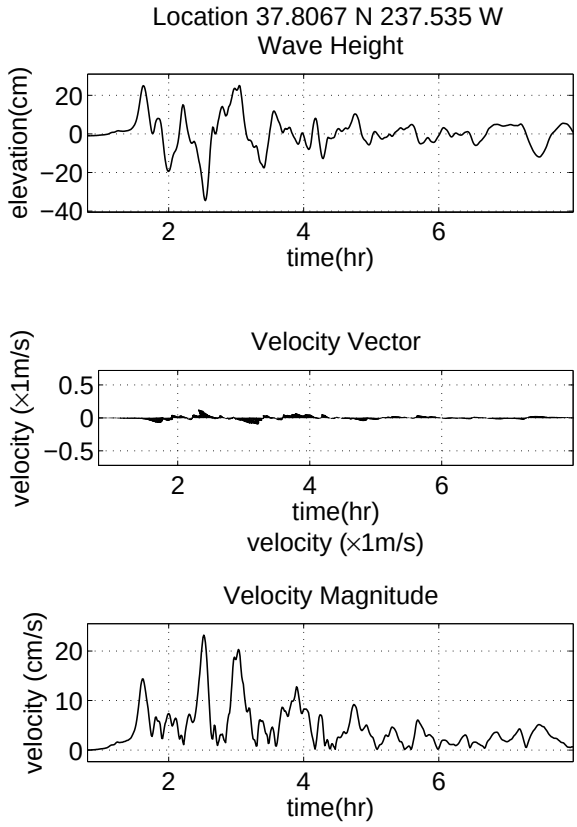
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco

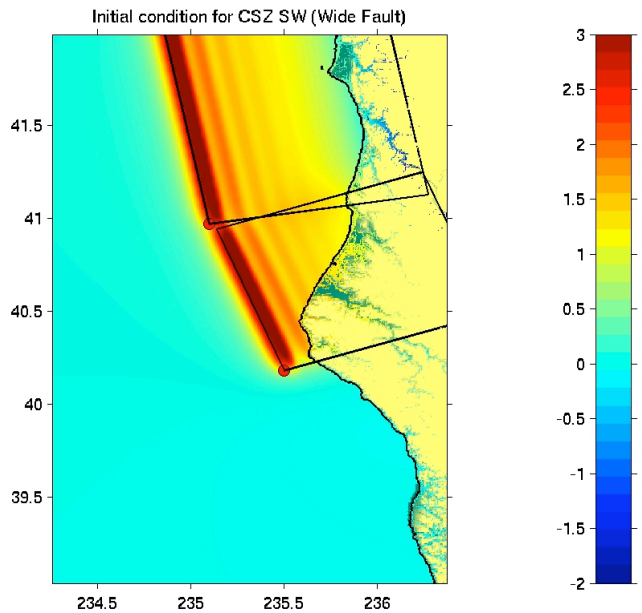


(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Cascadia Subduction Zone – Case 2 - SW



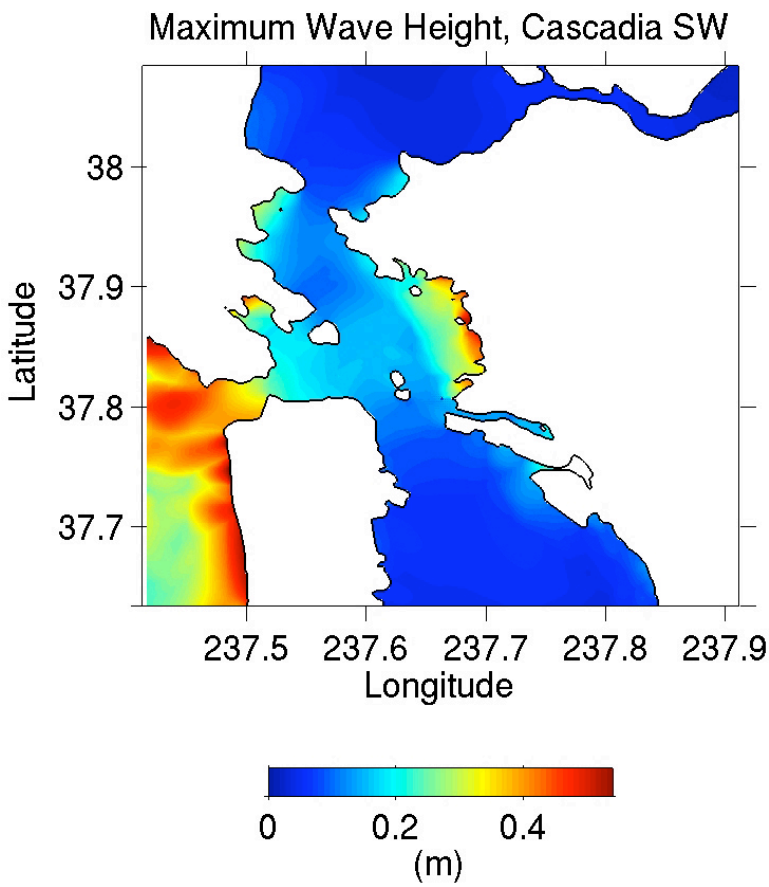
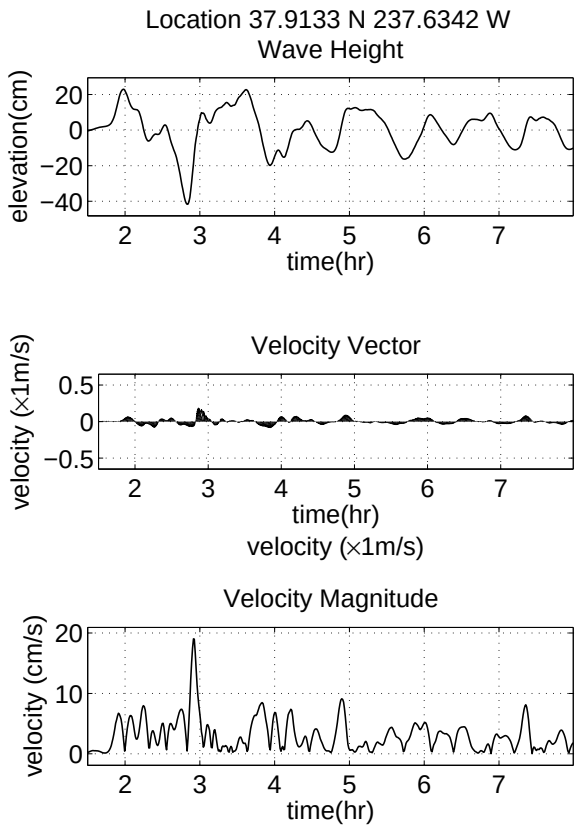
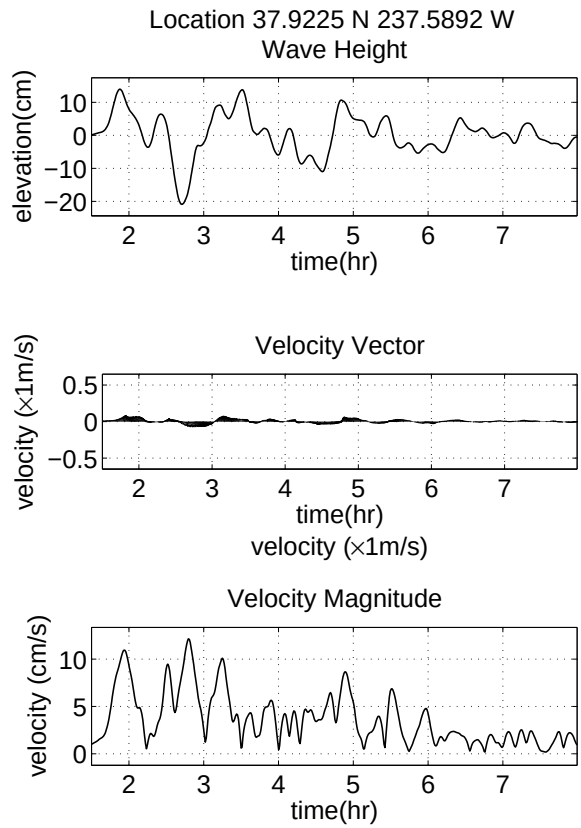


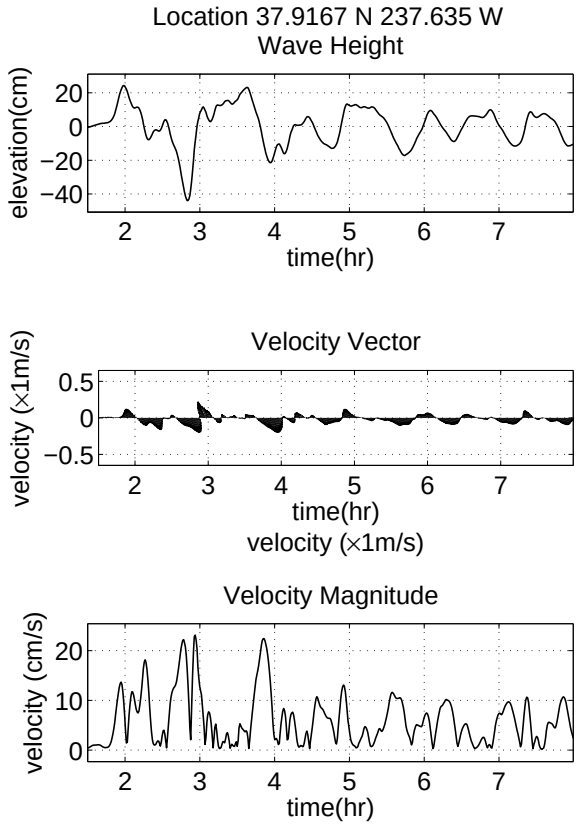
Fig. A1-22 – Initial condition for Cascadia SW (upper panel) and maximum wave heights for tsunami simulation in San Francisco Bay (lower panel).



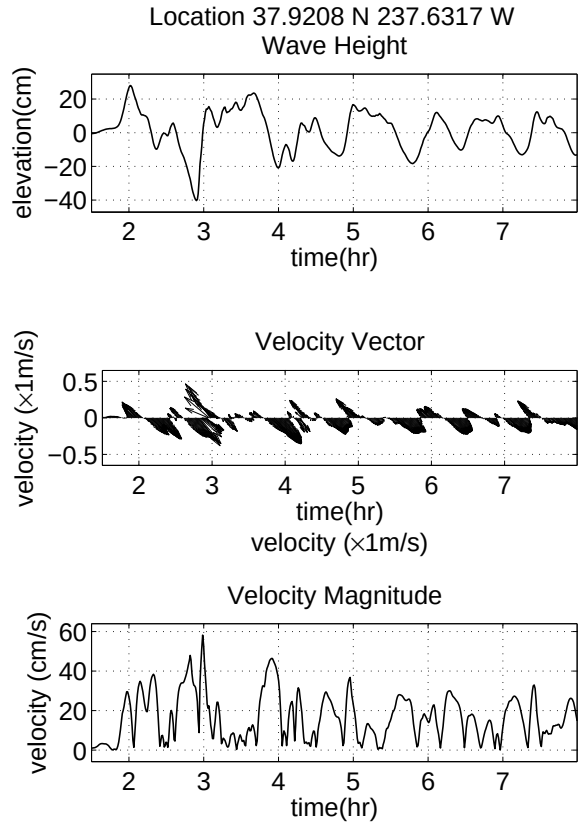
(1) BP West Coast Products, Richmond



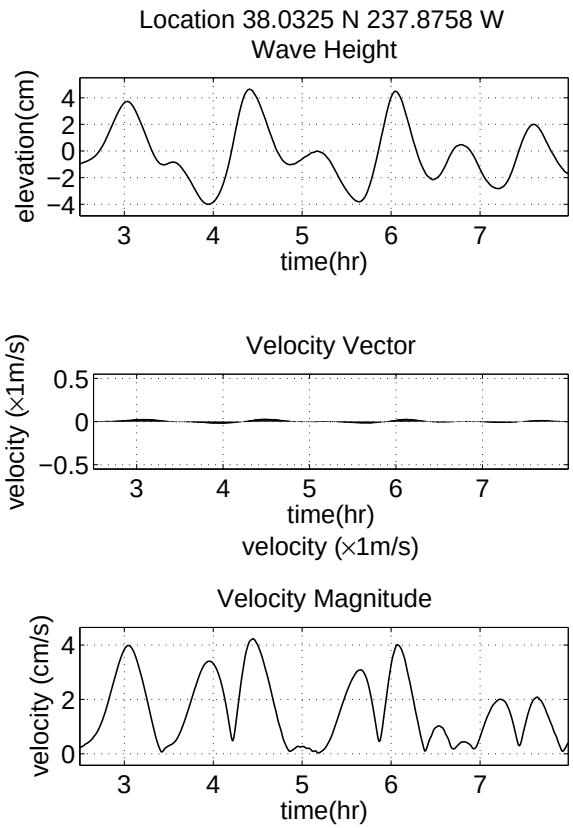
(3) Chevron USA, Inc., Richmond



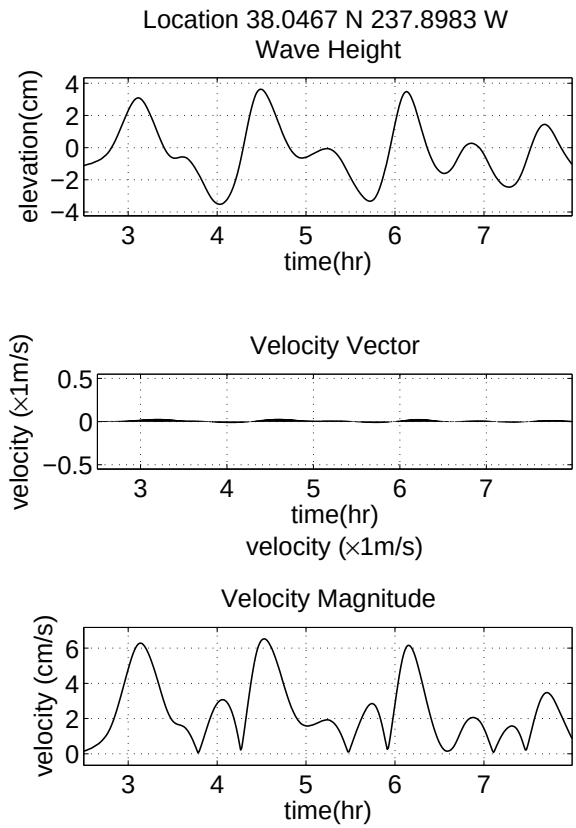
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



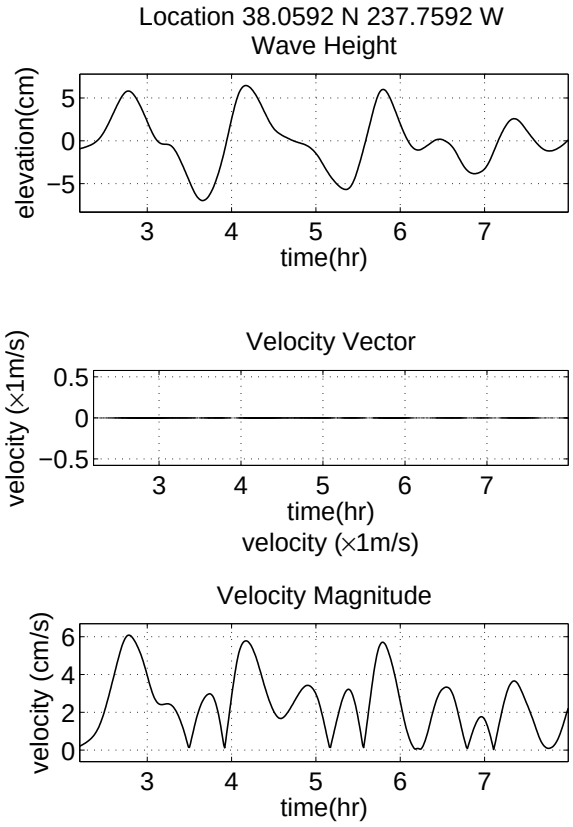
(6, 11) IMTT/Shore Terminals LLC, Richmond



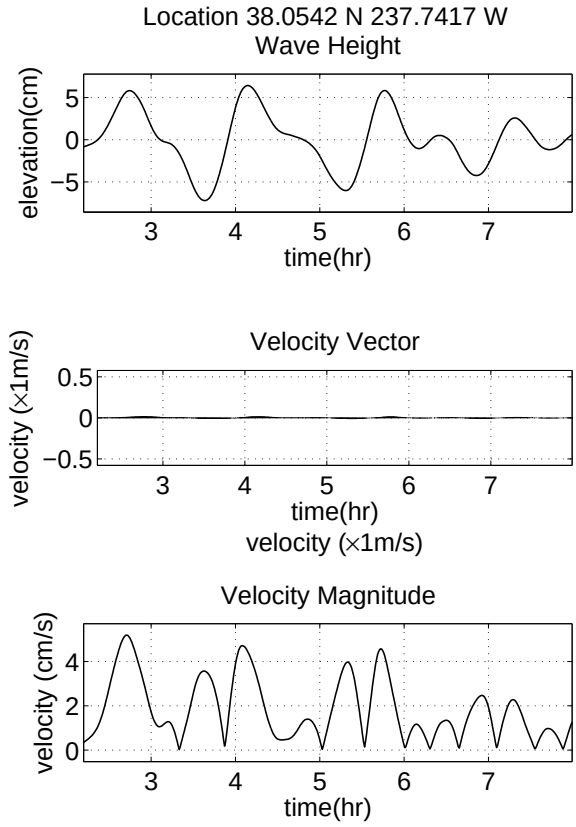
(7) Shell Oil Products, US, Martinez



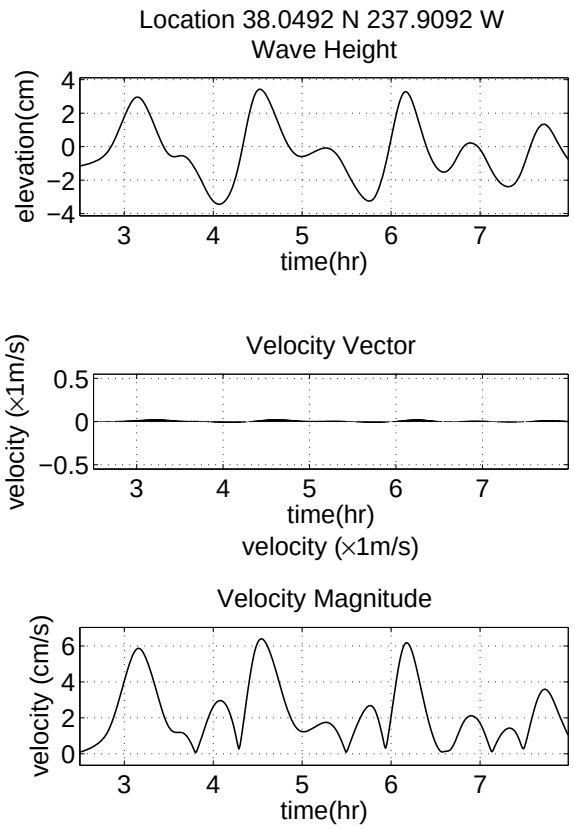
(9) Pacific Atlantic Terminals, Martinez



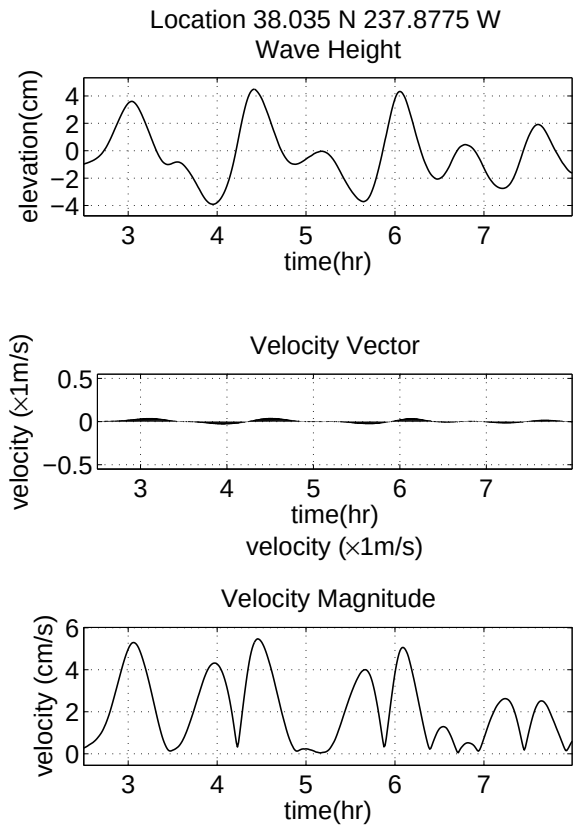
(10) Pacific Atlantic Terminals, Selby



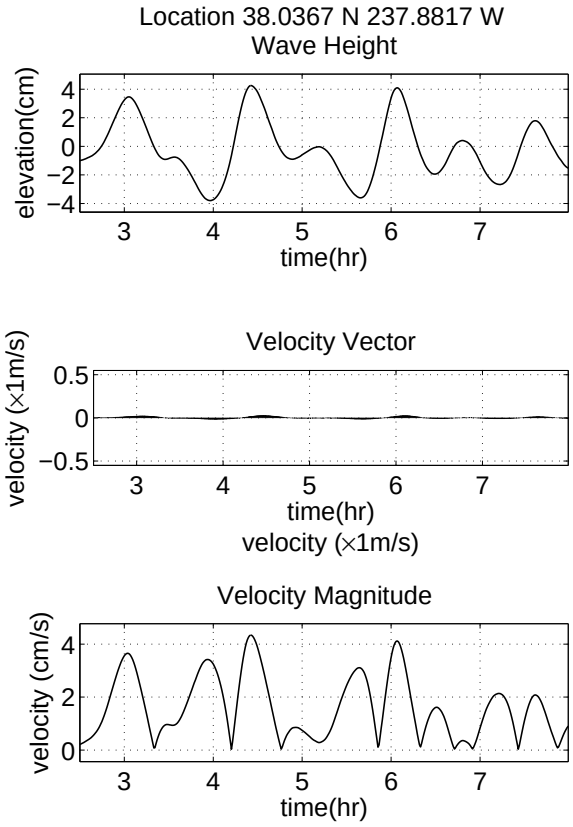
(13) ConocoPhillips, Rodeo



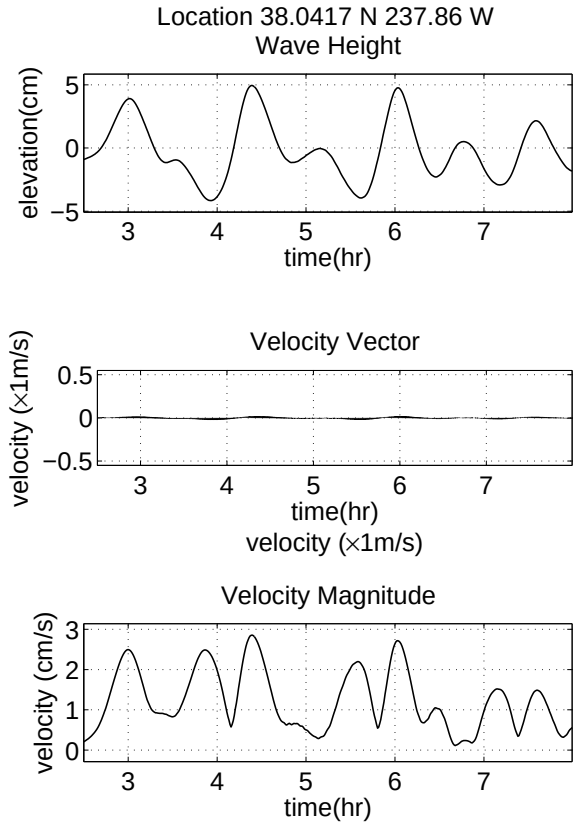
(14) Tesero, Inc. - Avon Wharf



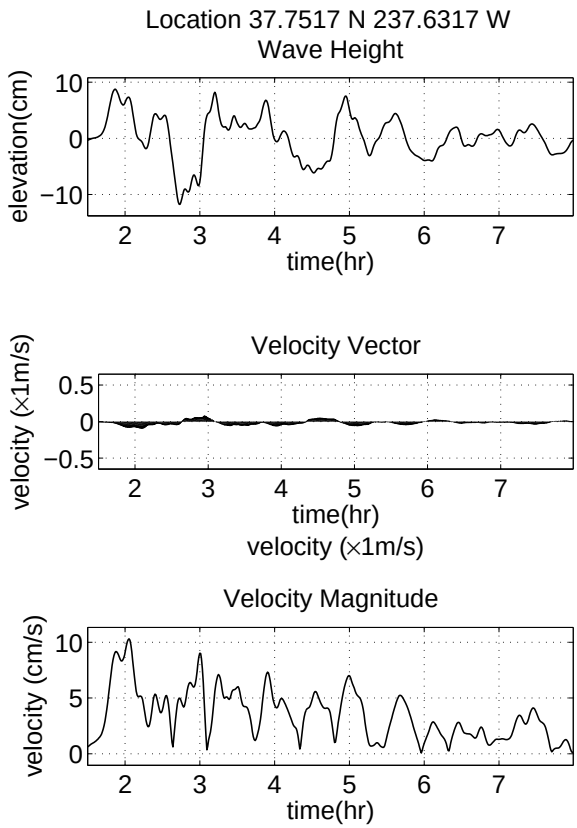
(15) Tesero, Inc. - Amorco Wharf



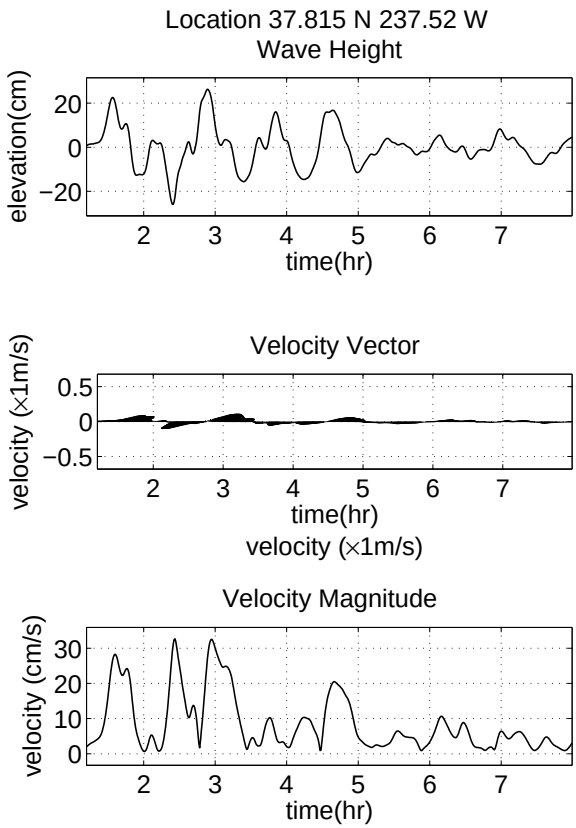
(16) Valero Refining Berth 1, Benicia



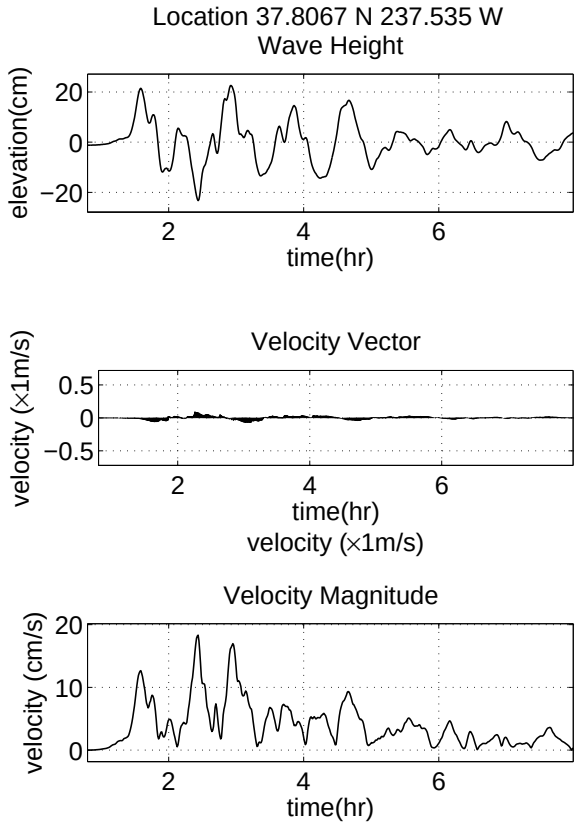
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco

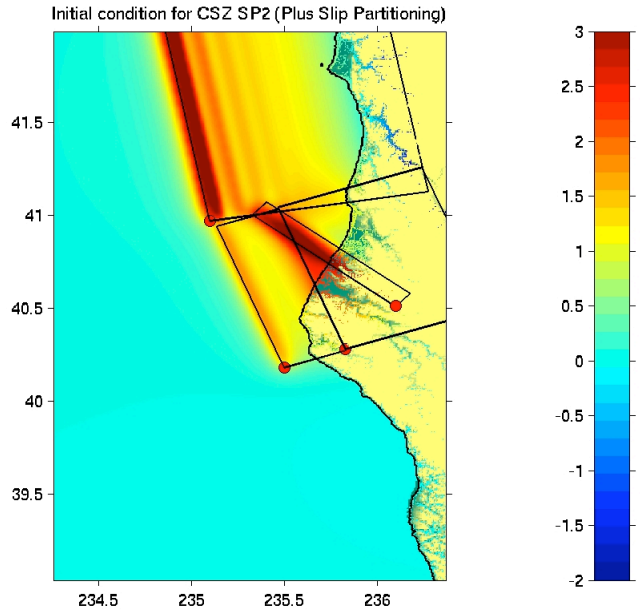


(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Cascadia Subduction Zone – Case 3 – SP2



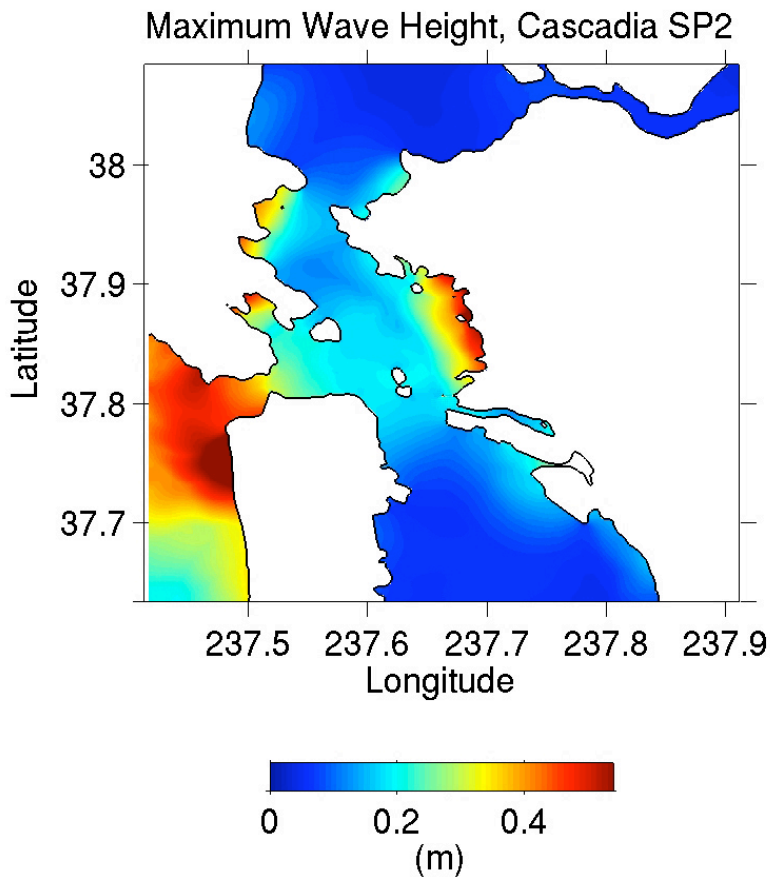
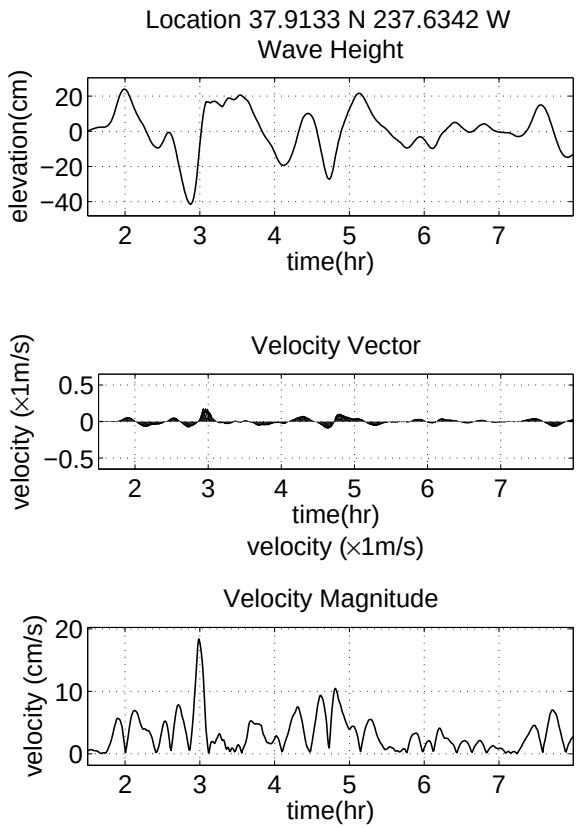
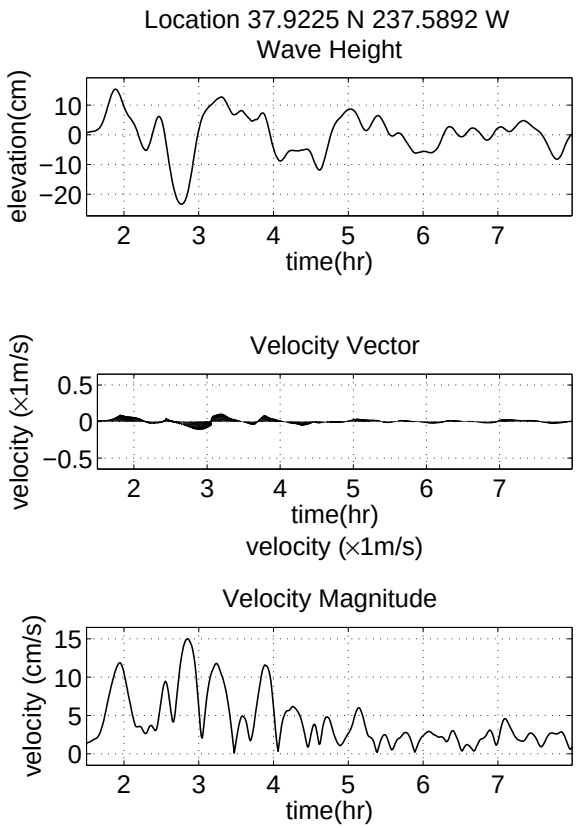


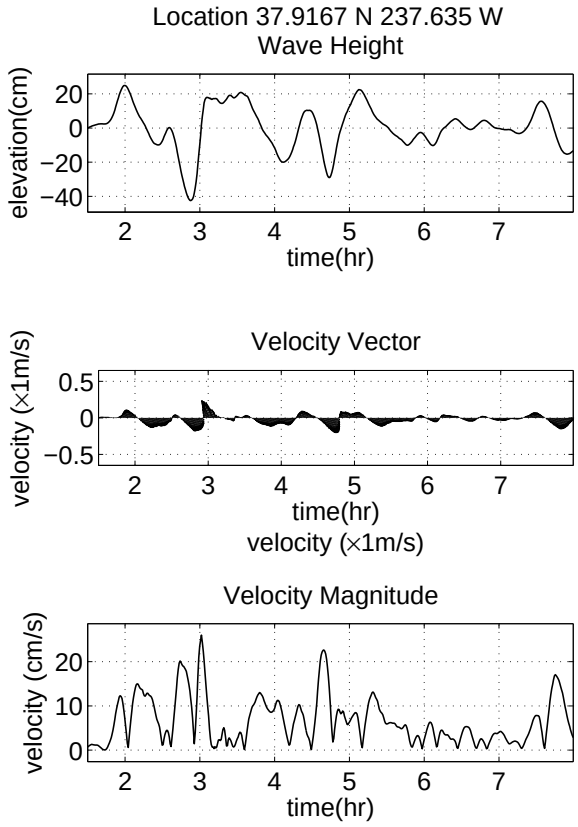
Fig. A1-23 – Initial condition for Cascadia SP2 (upper panel) and maximum wave heights for tsunami simulation in San Francisco Bay (lower panel).



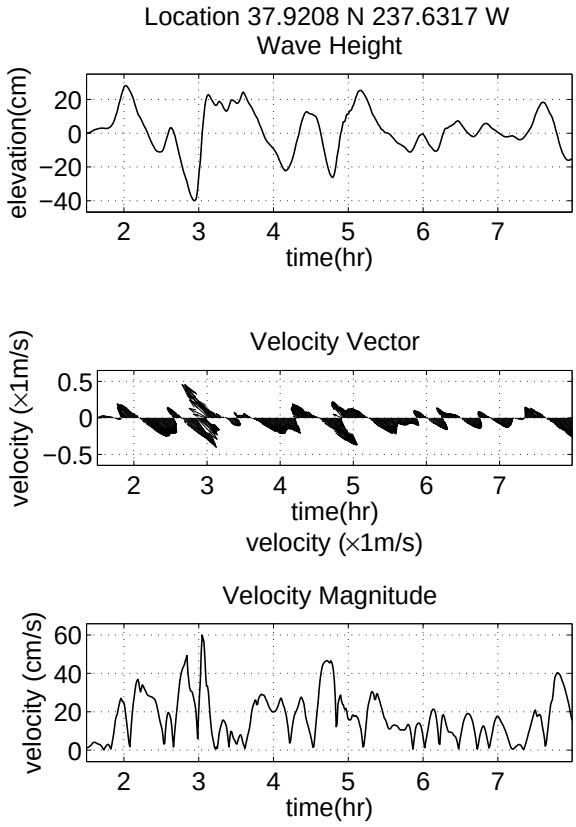
(1) BP West Coast Products, Richmond



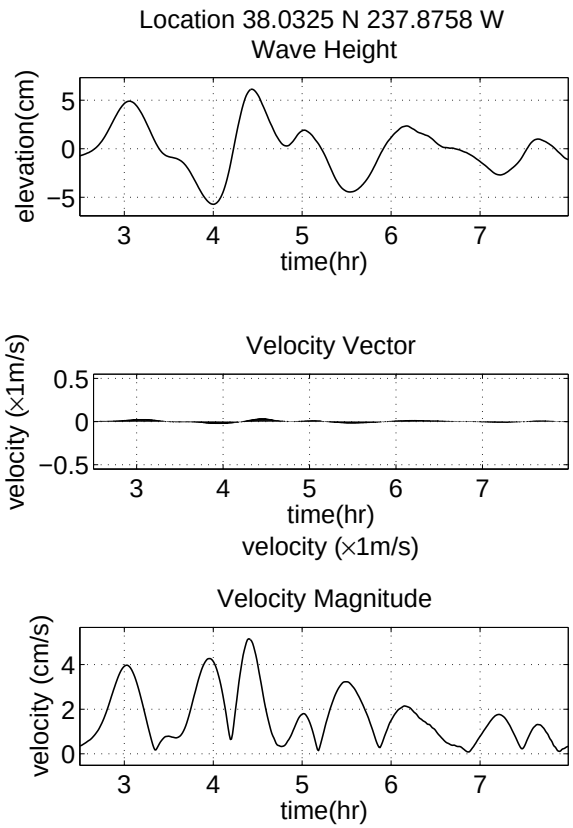
(3) Chevron USA, Inc., Richmond



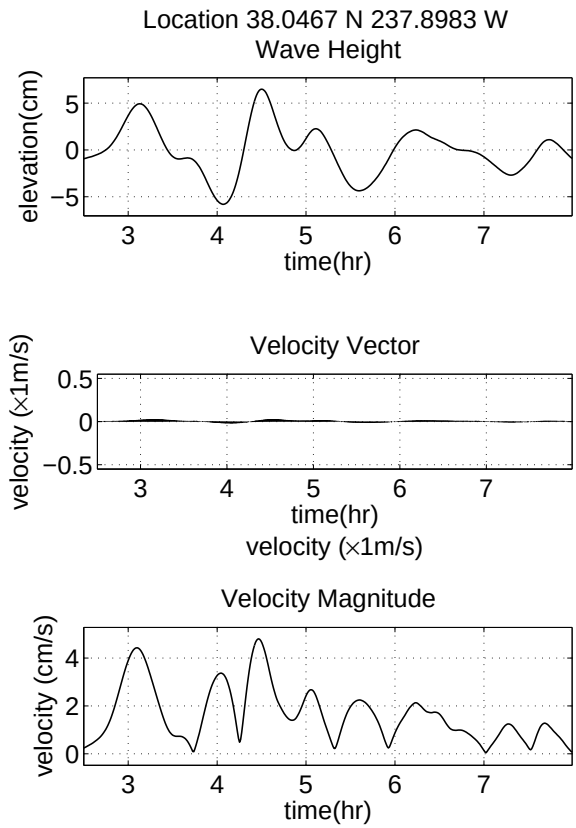
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



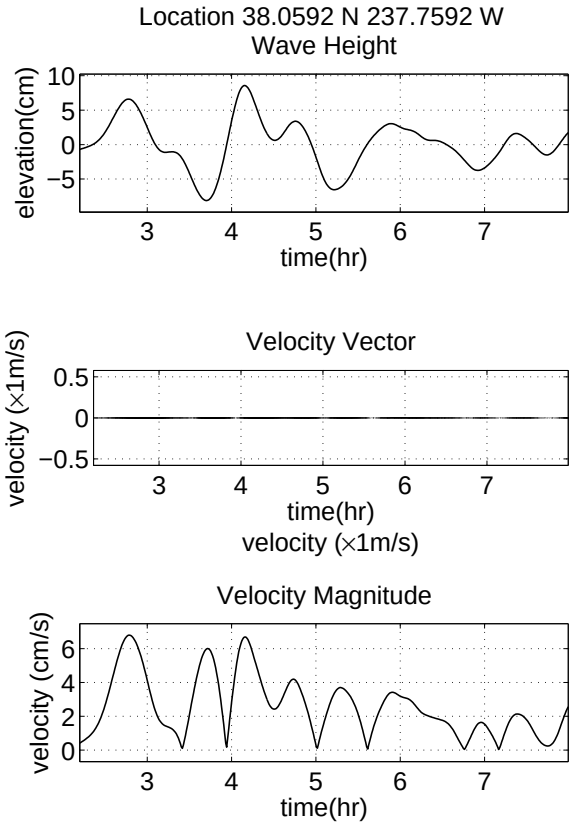
(6, 11) IMTT/Shore Terminals LLC, Richmond



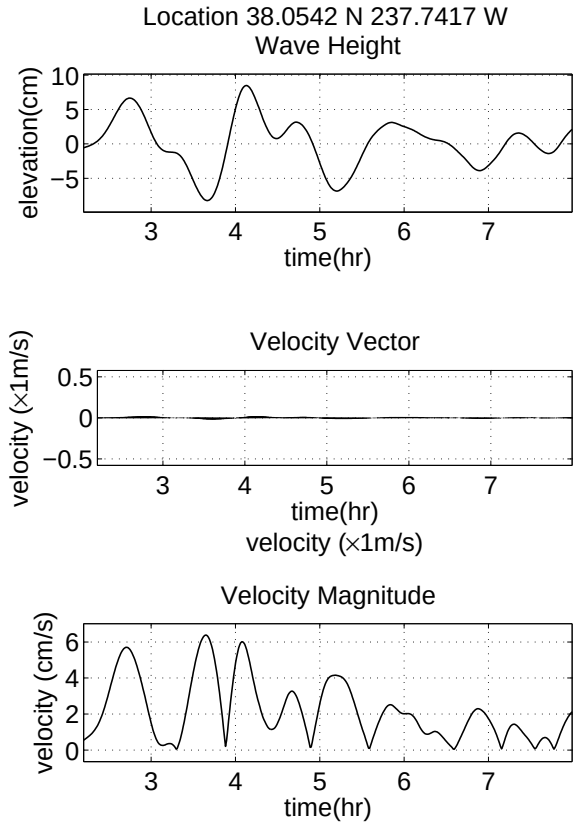
(7) Shell Oil Products, US, Martinez



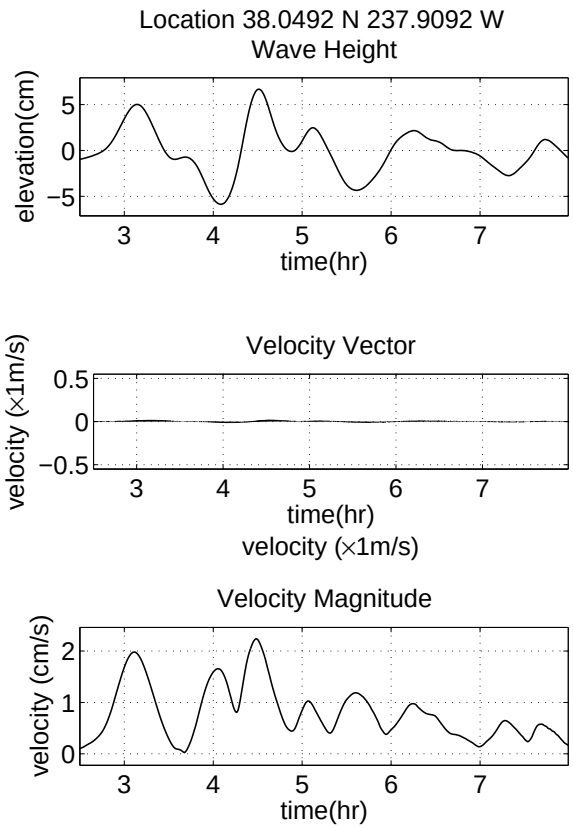
(9) Pacific Atlantic Terminals, Martinez



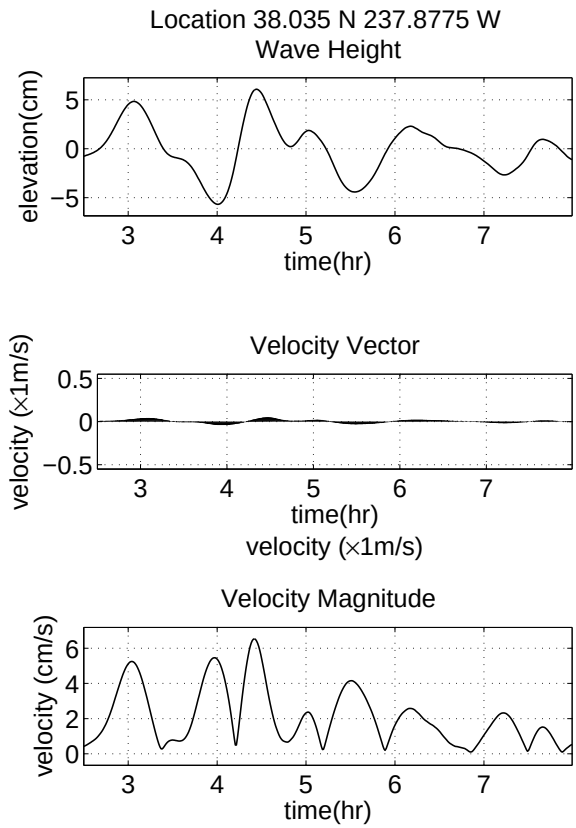
(10) Pacific Atlantic Terminals, Selby



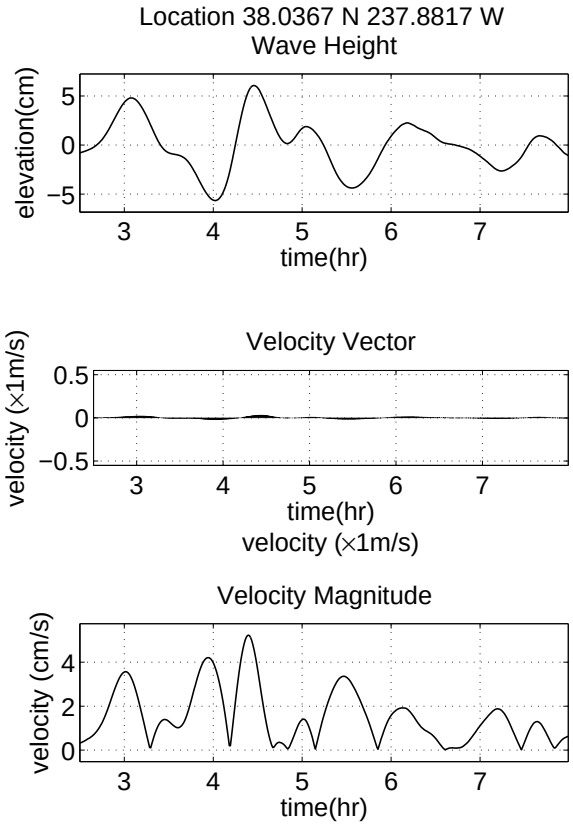
(13) ConocoPhillips, Rodeo



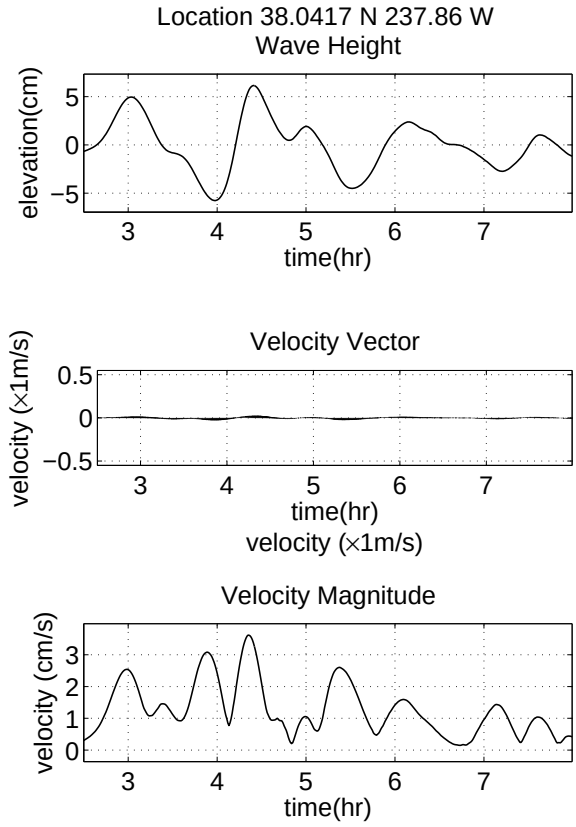
(14) Tesero, Inc. - Avon Wharf



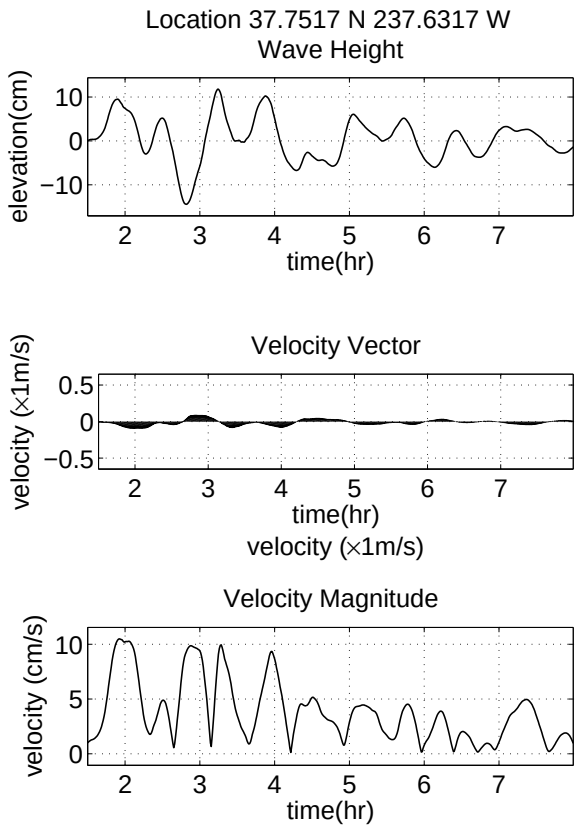
(15) Tesero, Inc. - Amorco Wharf



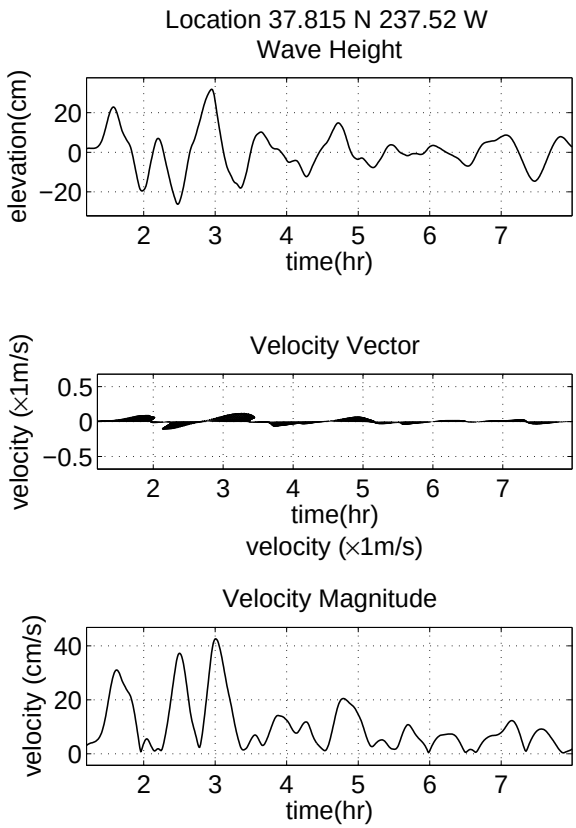
(16) Valero Refining Berth 1, Benicia



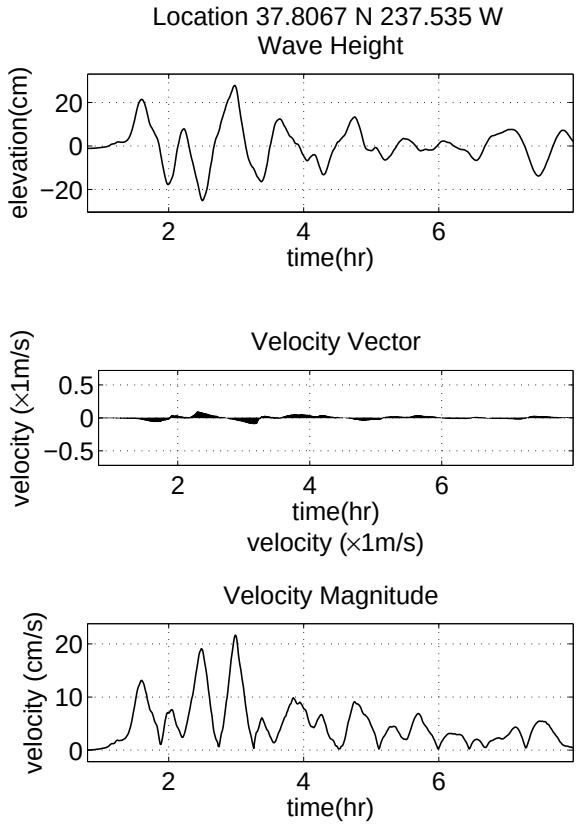
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco



(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Hayward – Rodgers Creek Fault Stepover

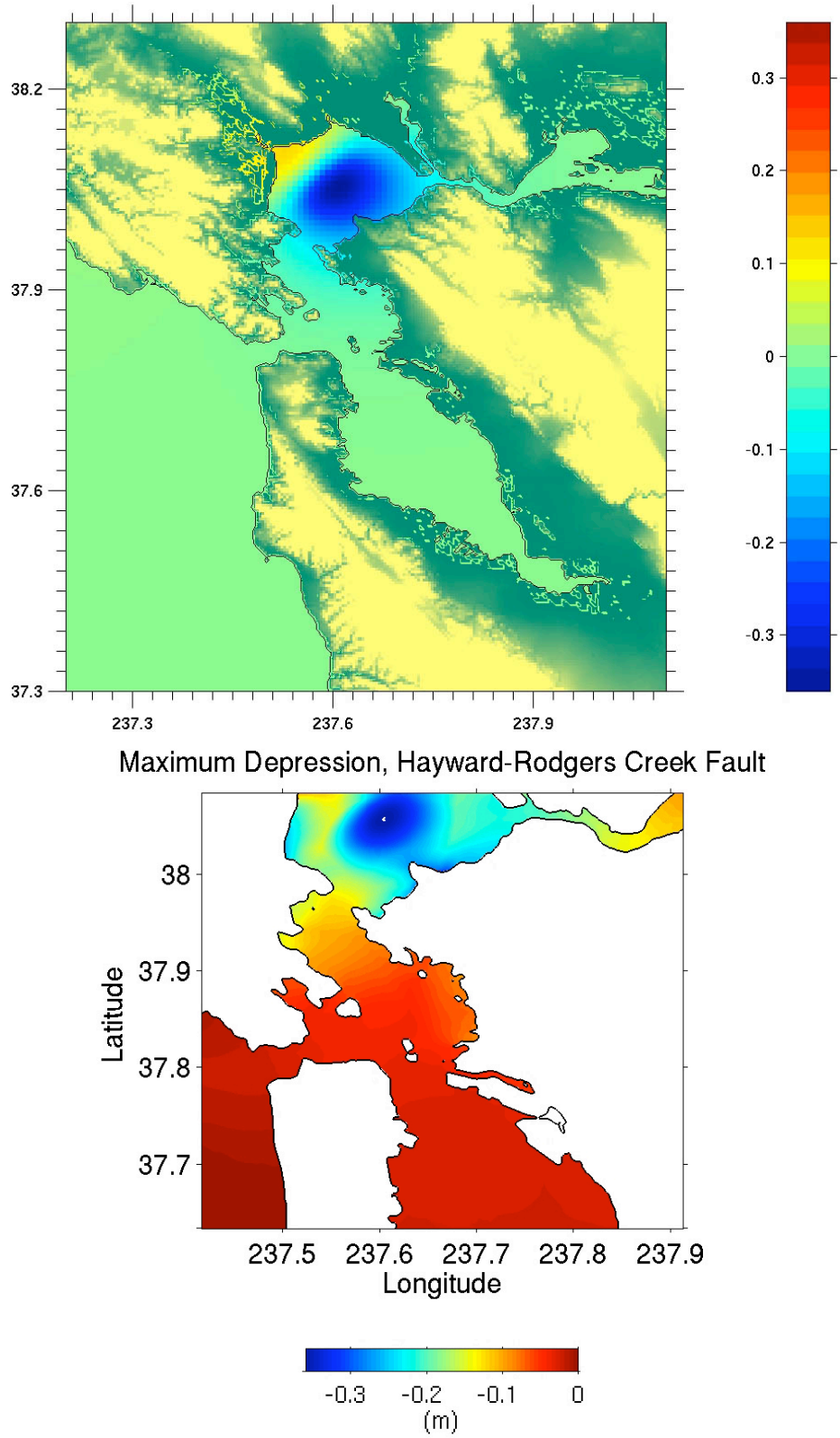
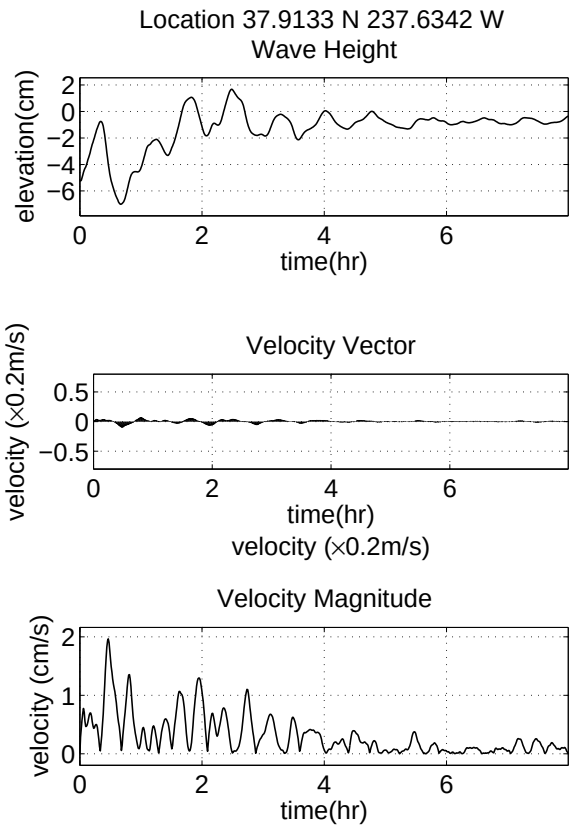
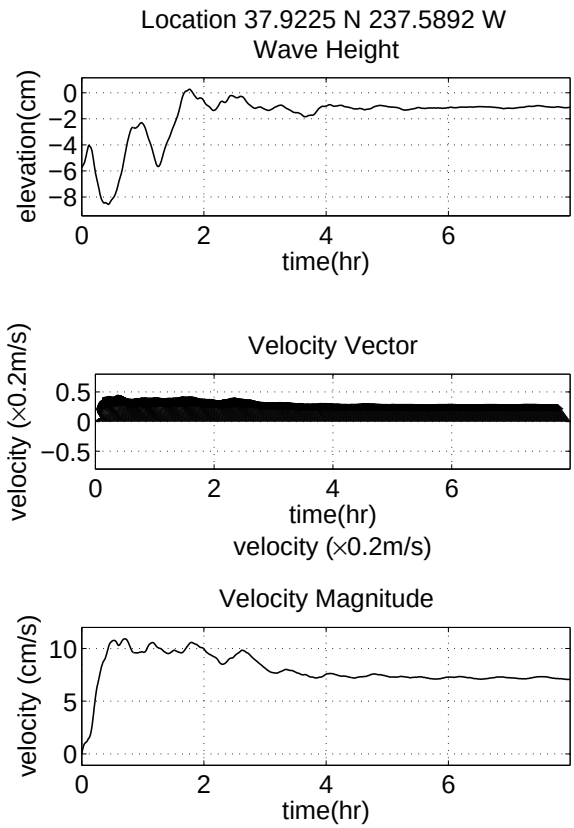


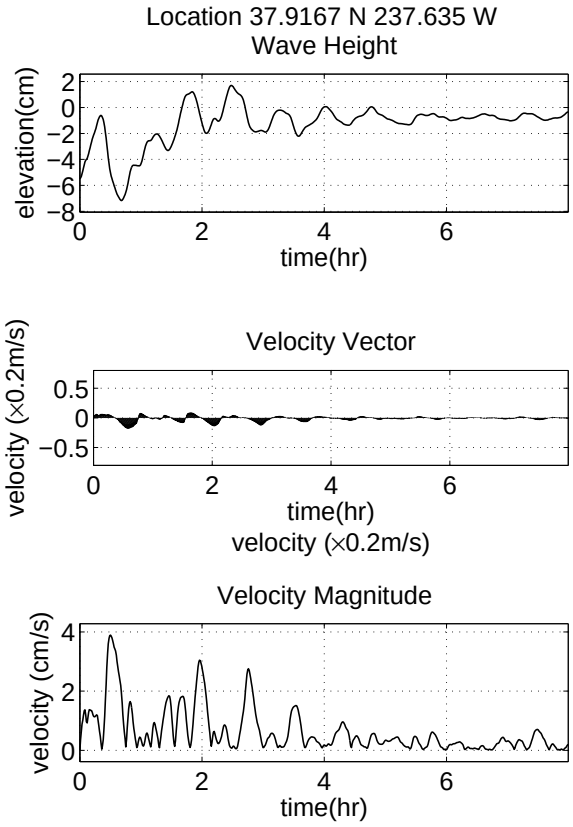
Fig. A1-24 – Initial condition for Hayward-Rodgers Creek Fault (upper panel) and maximum depression wave heights for tsunami simulation in San Francisco Bay (lower panel).



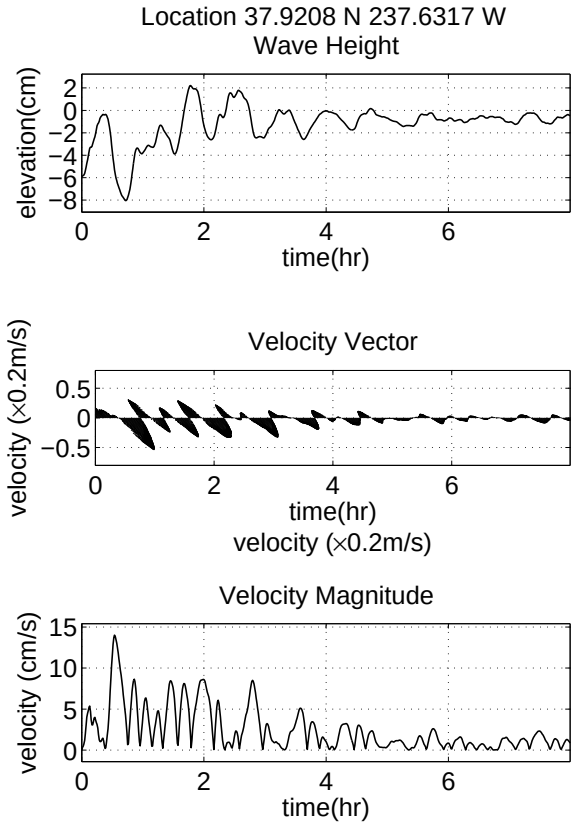
(1) BP West Coast Products, Richmond



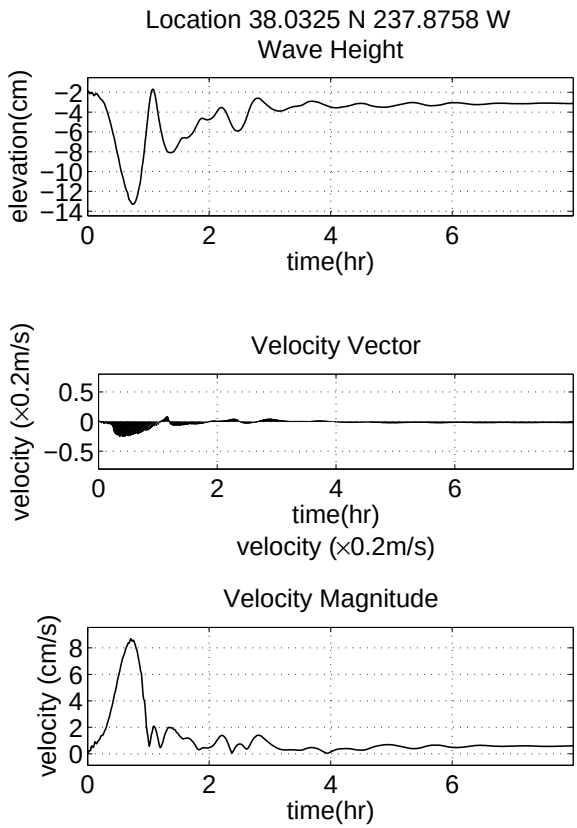
(3) Chevron USA, Inc., Richmond



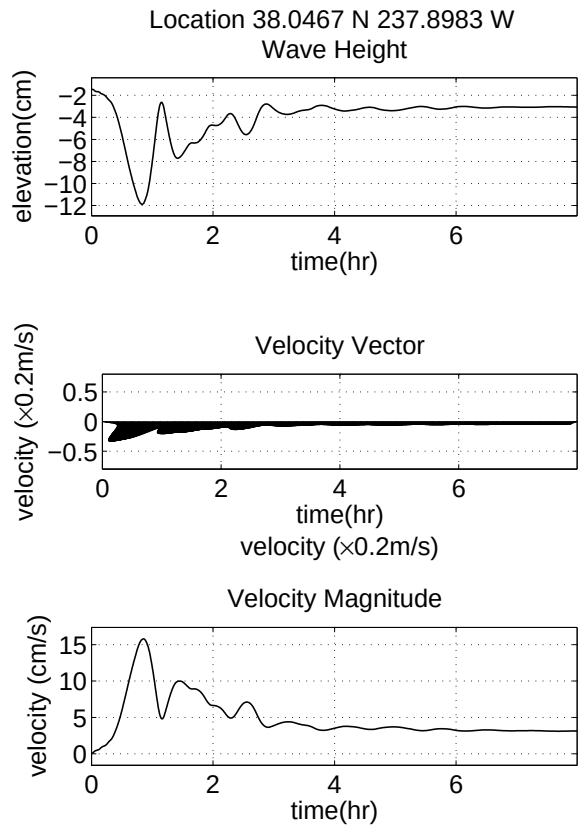
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



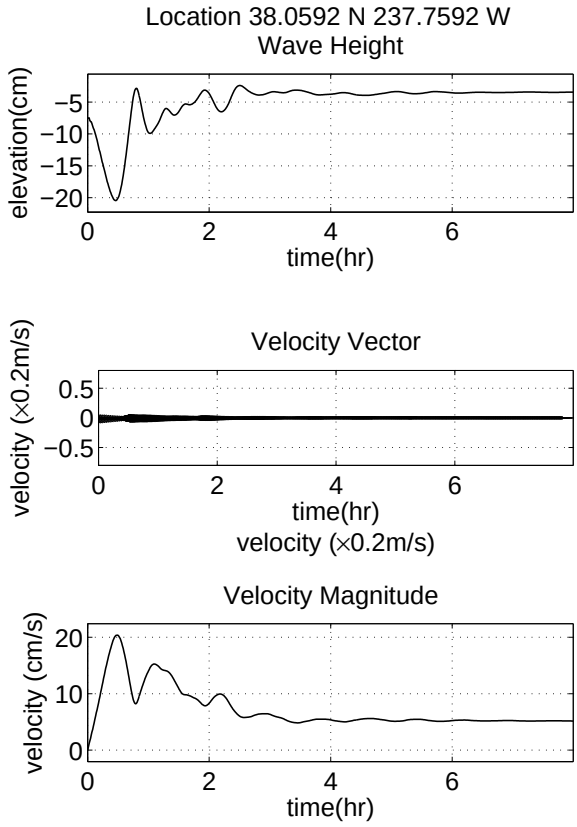
(6, 11) IMTT/Shore Terminals LLC, Richmond



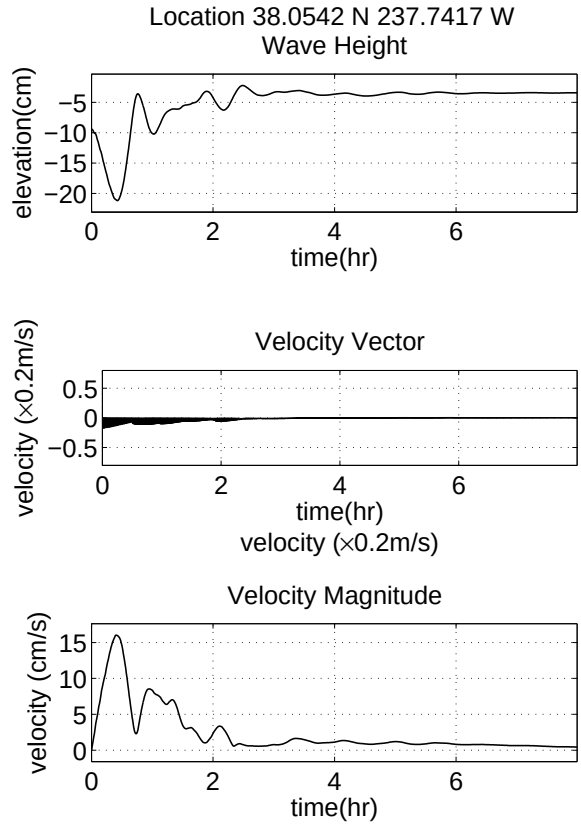
(7) Shell Oil Products, US, Martinez



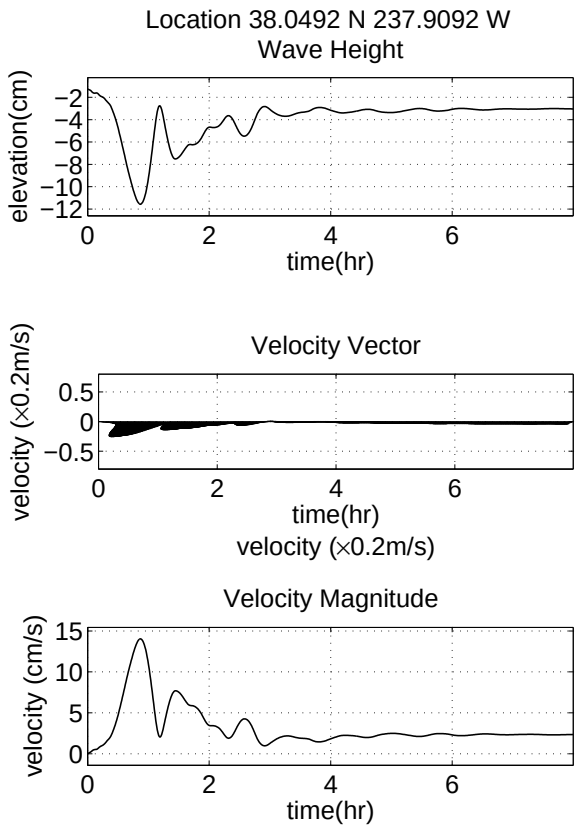
(9) Pacific Atlantic Terminals, Martinez



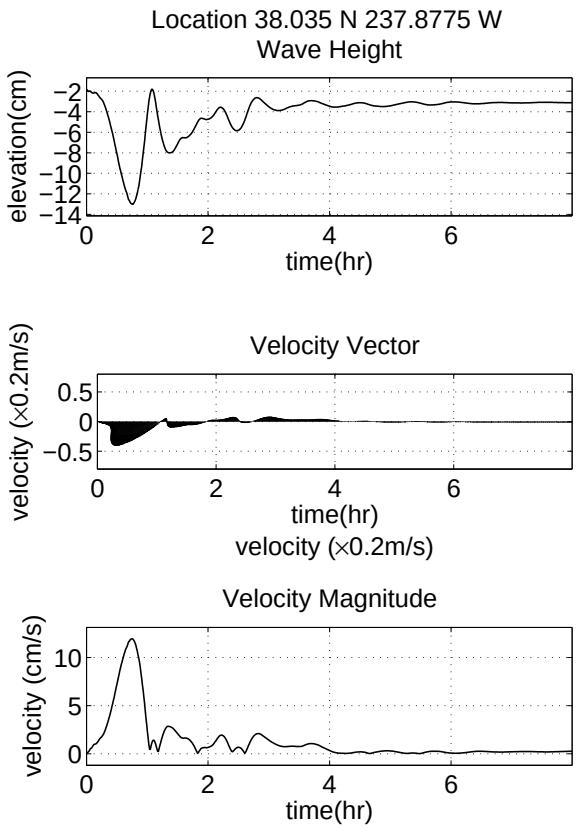
(10) Pacific Atlantic Terminals, Selby



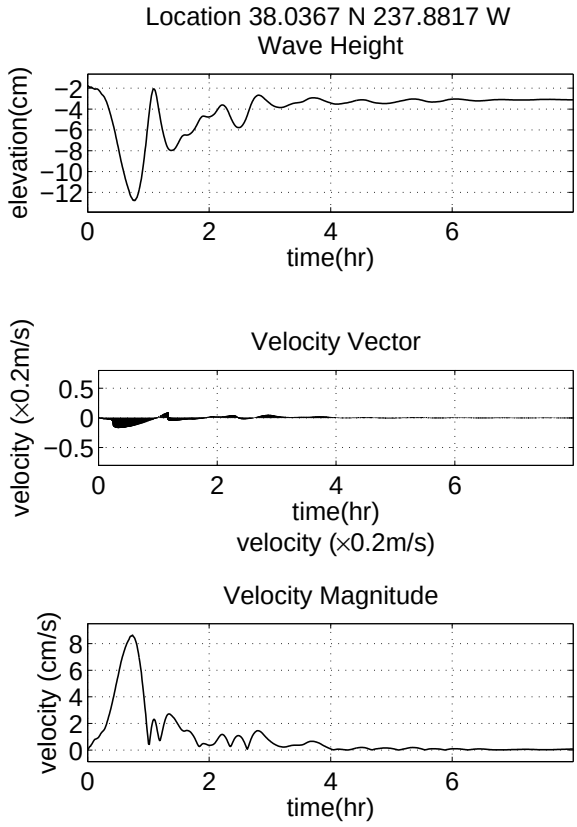
(13) ConocoPhillips, Rodeo



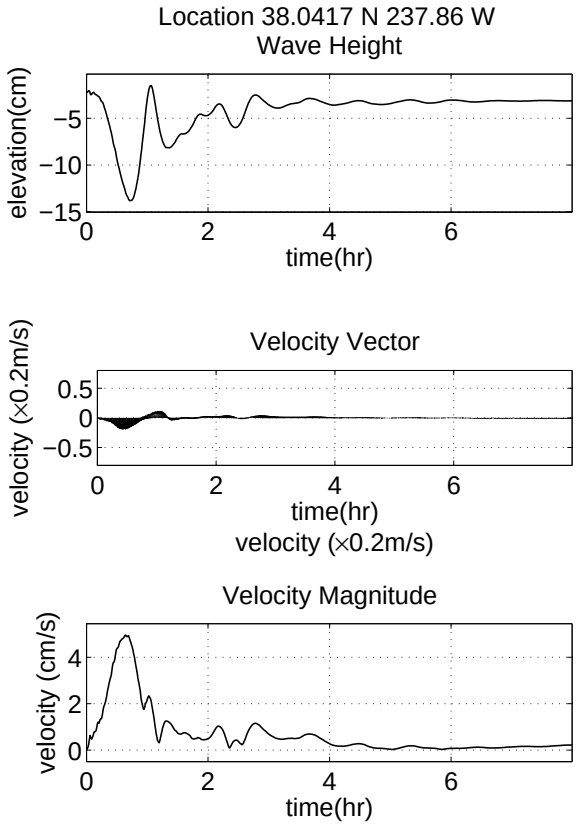
(14) Tesero, Inc. - Avon Wharf



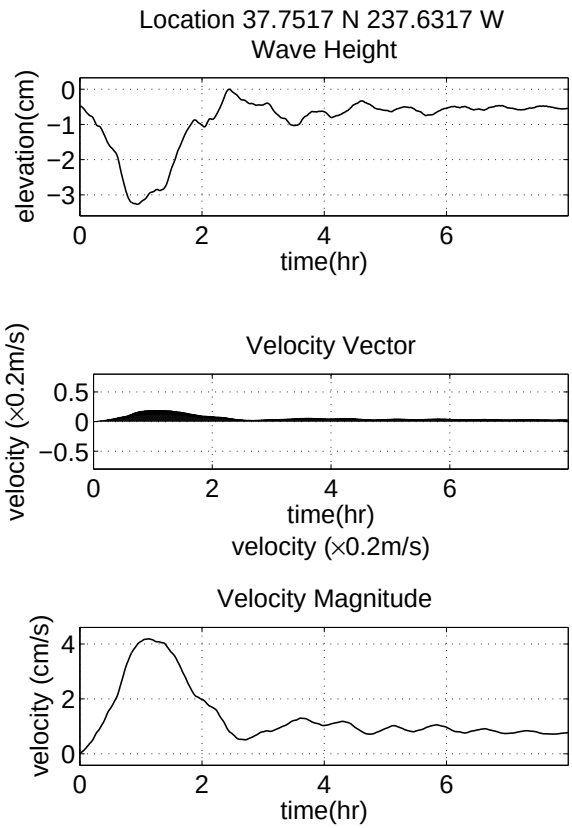
(15) Tesero, Inc. - Amorco Wharf



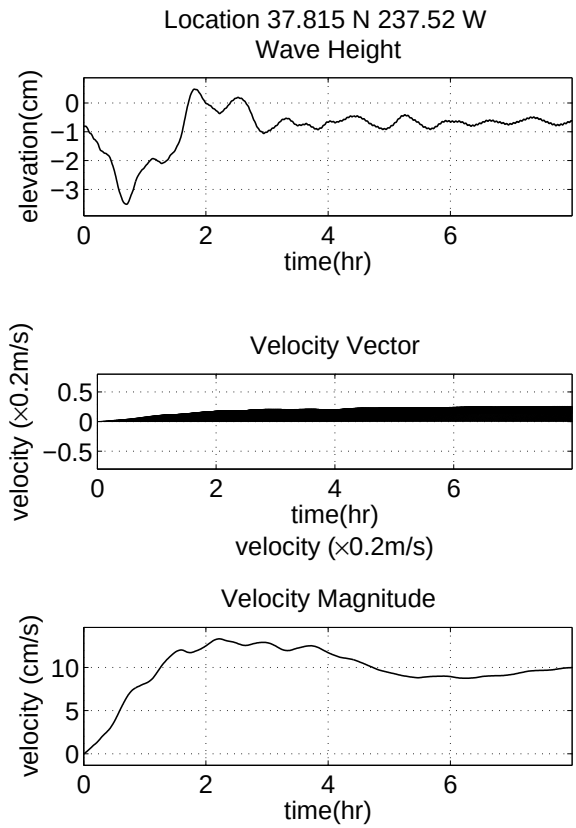
(16) Valero Refining Berth 1, Benicia



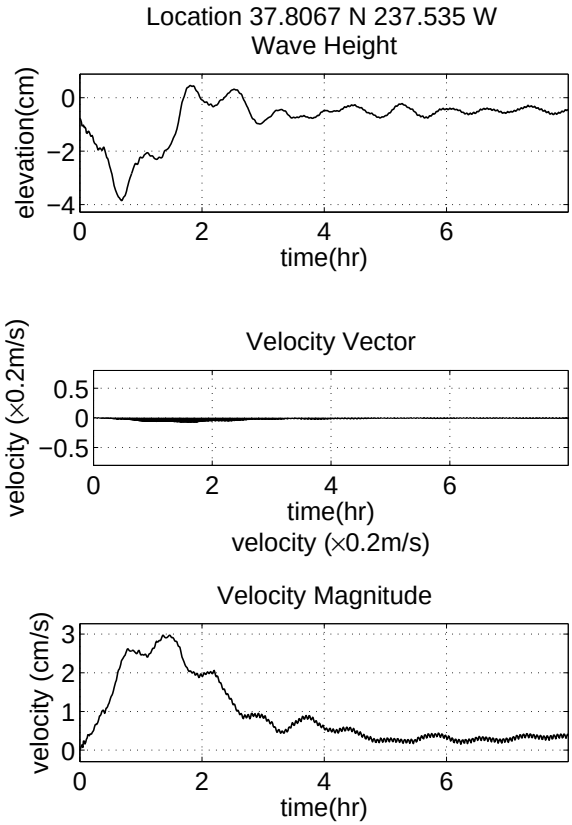
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco



(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

San Gregorio Fault

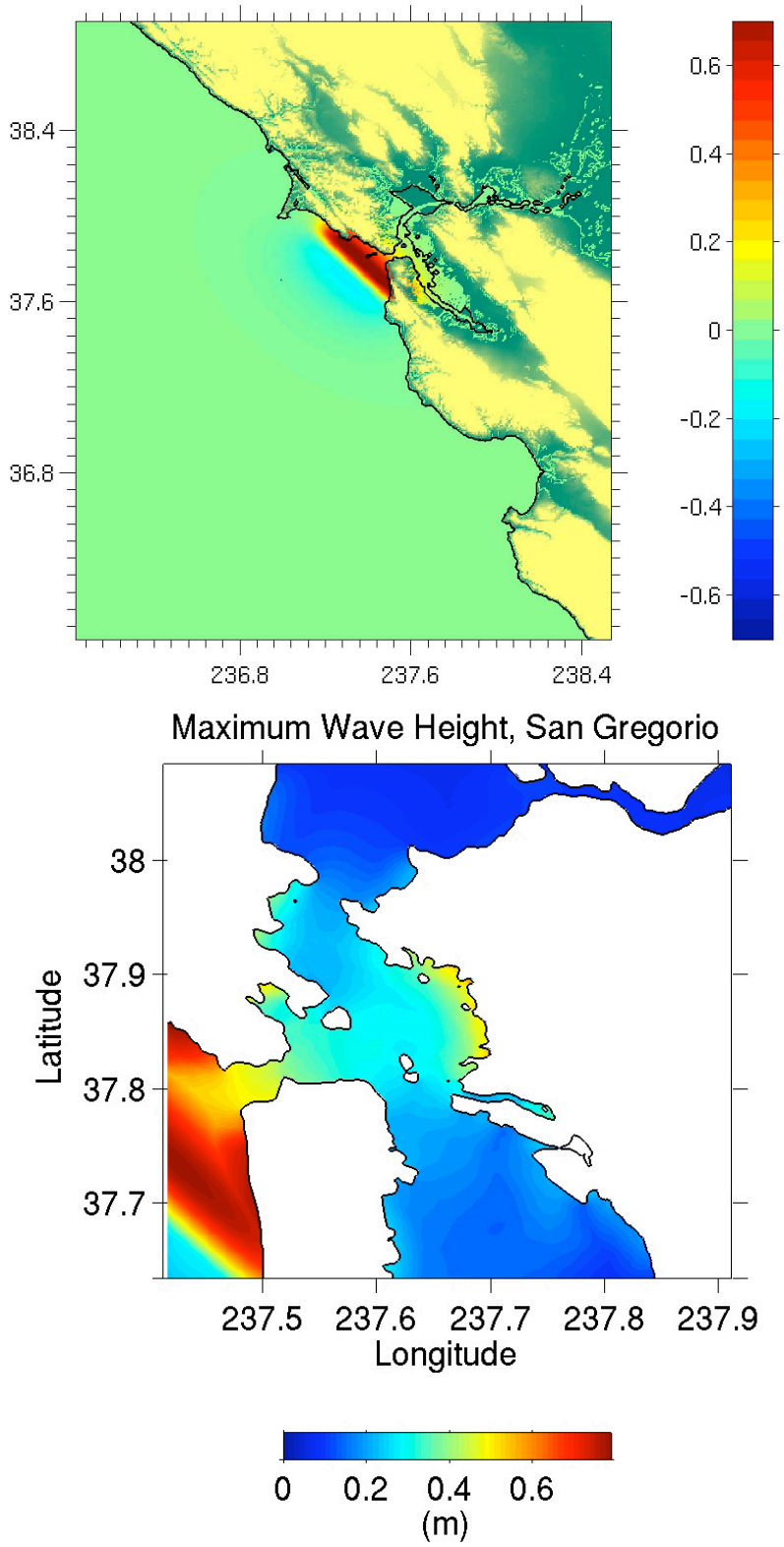
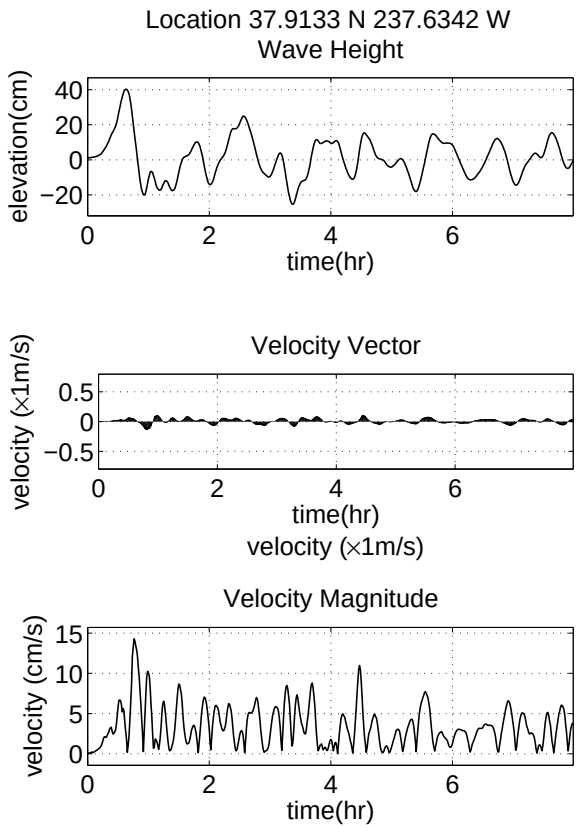
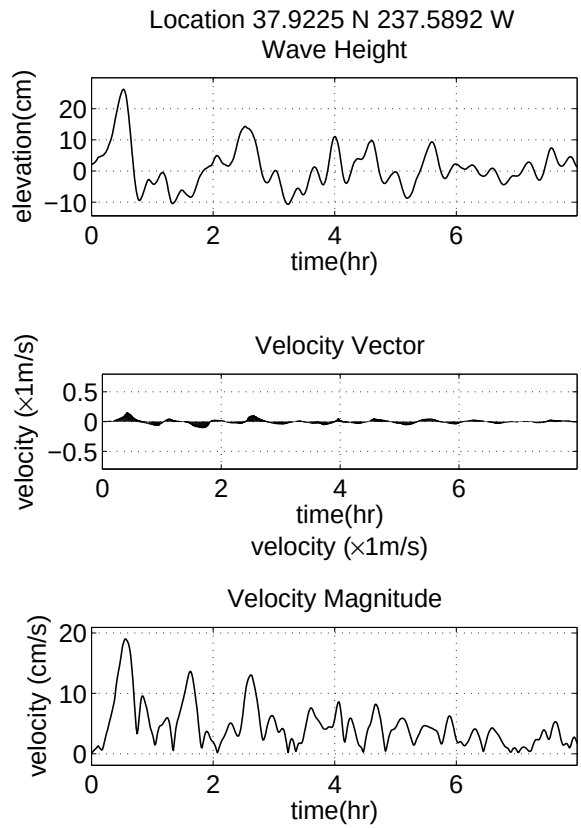


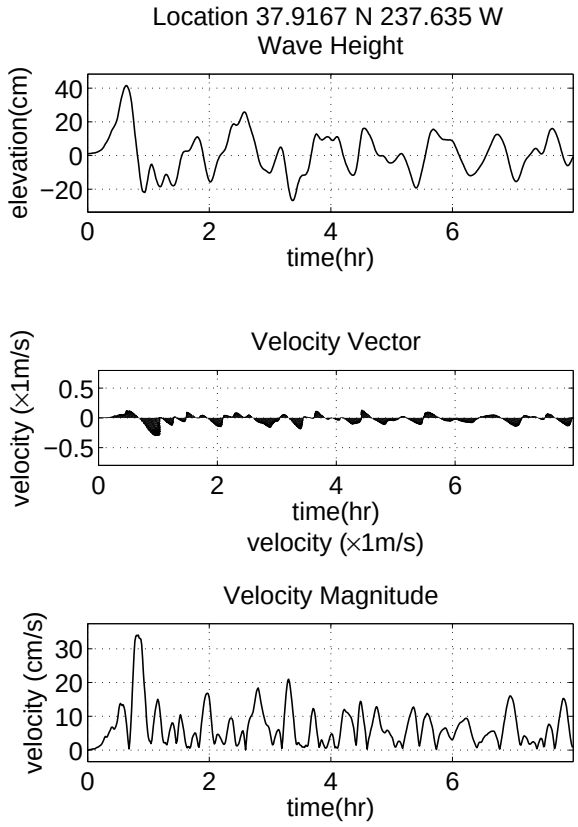
Fig. A1-25 – Initial condition for San Gregorio Fault (upper panel) and maximum wave heights for tsunami simulation in San Francisco Bay (lower panel).



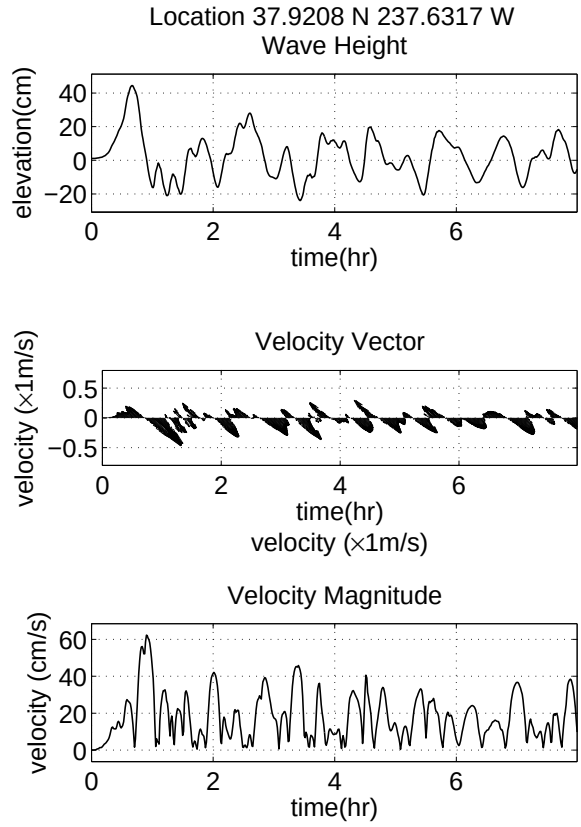
(1) BP West Coast Products, Richmond



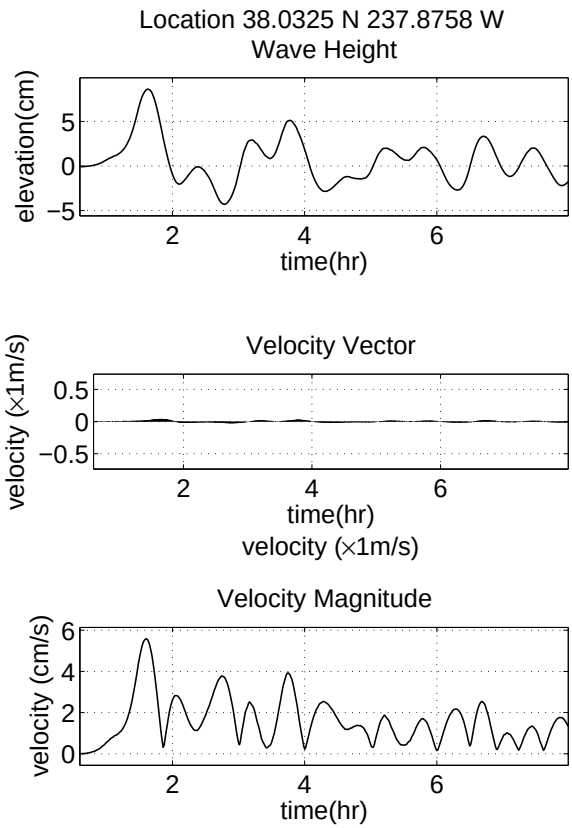
(3) Chevron USA, Inc., Richmond



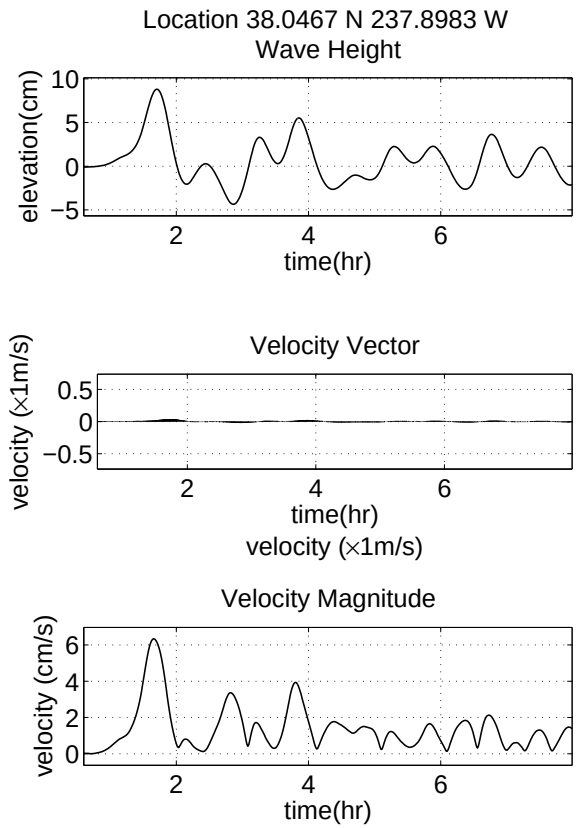
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



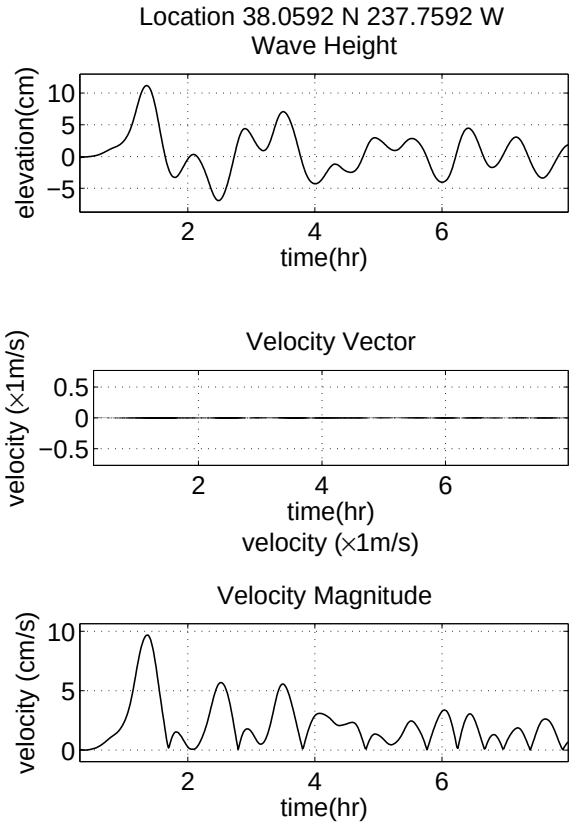
(6, 11) IMTT/Shore Terminals LLC, Richmond



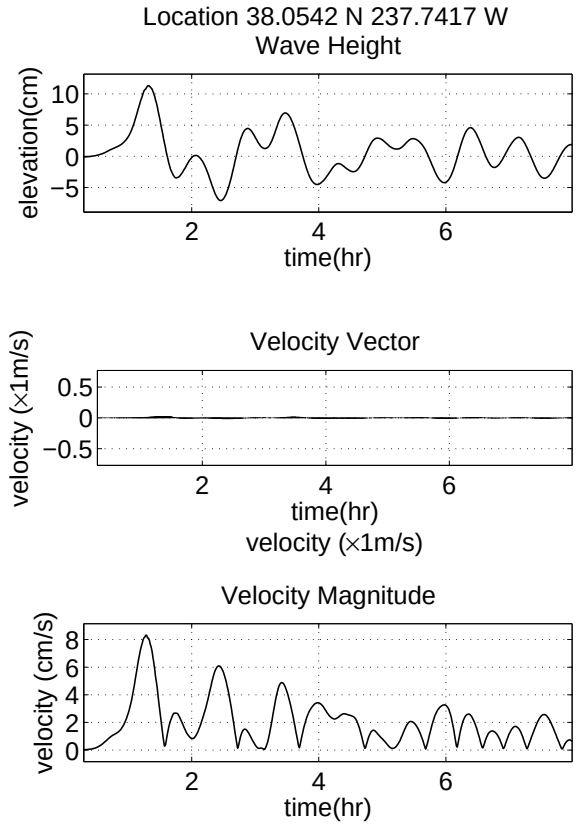
(7) Shell Oil Products, US, Martinez



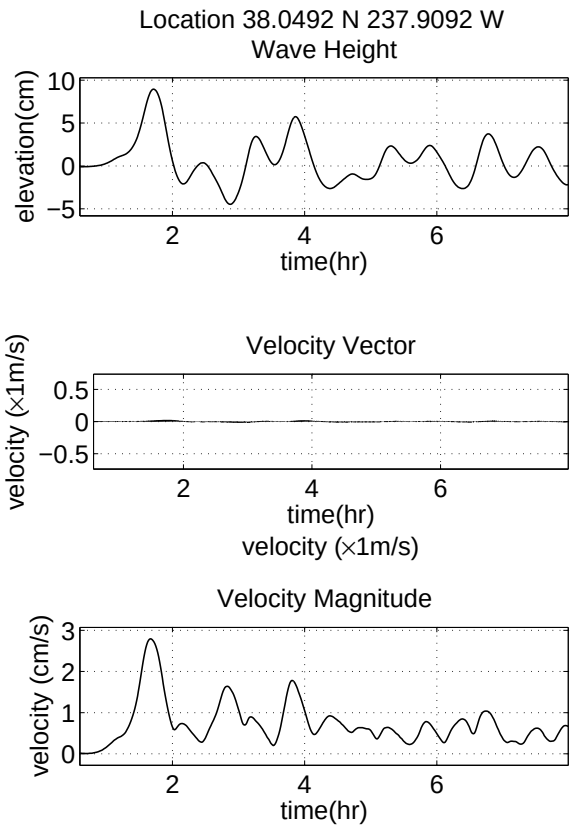
(9) Pacific Atlantic Terminals, Martinez



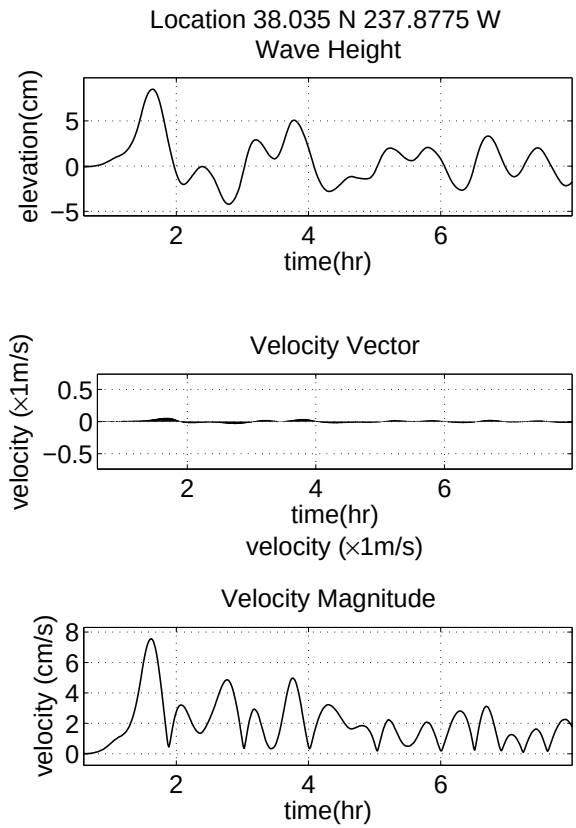
(10) Pacific Atlantic Terminals, Selby



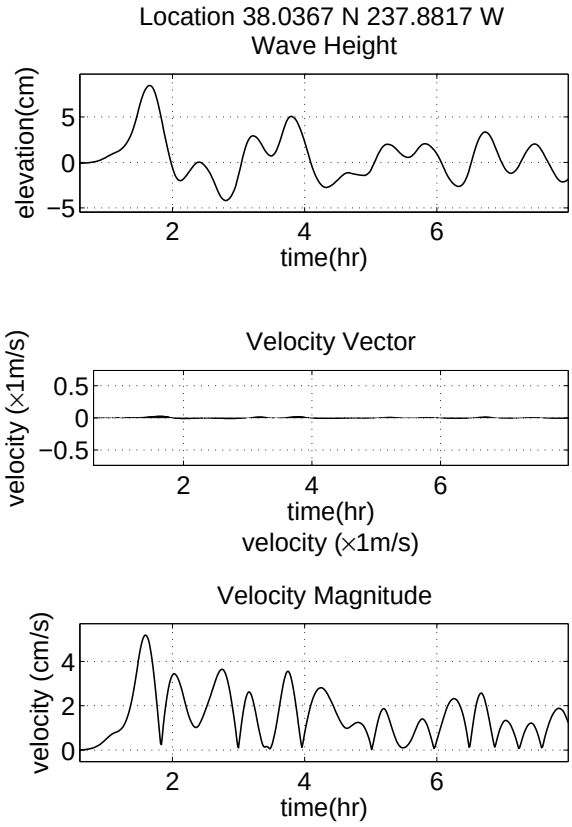
(13) ConocoPhillips, Rodeo



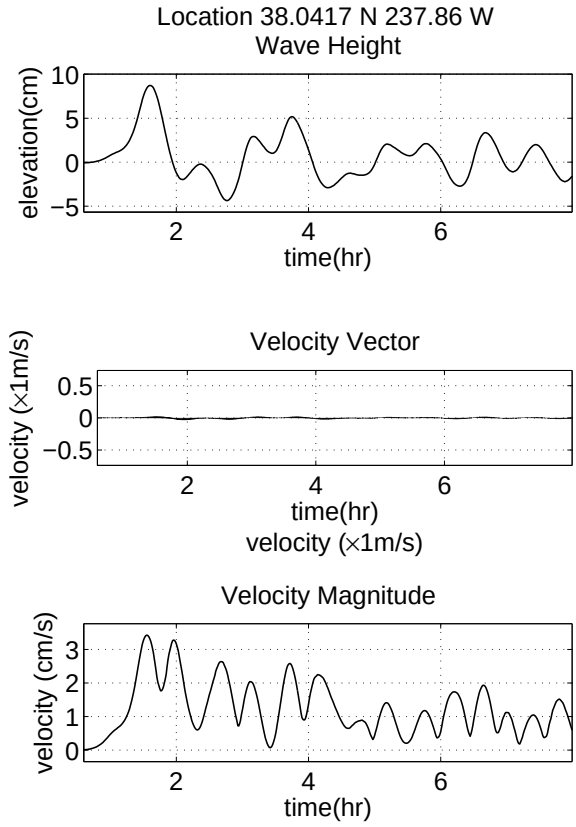
(14) Tesero, Inc. - Avon Wharf



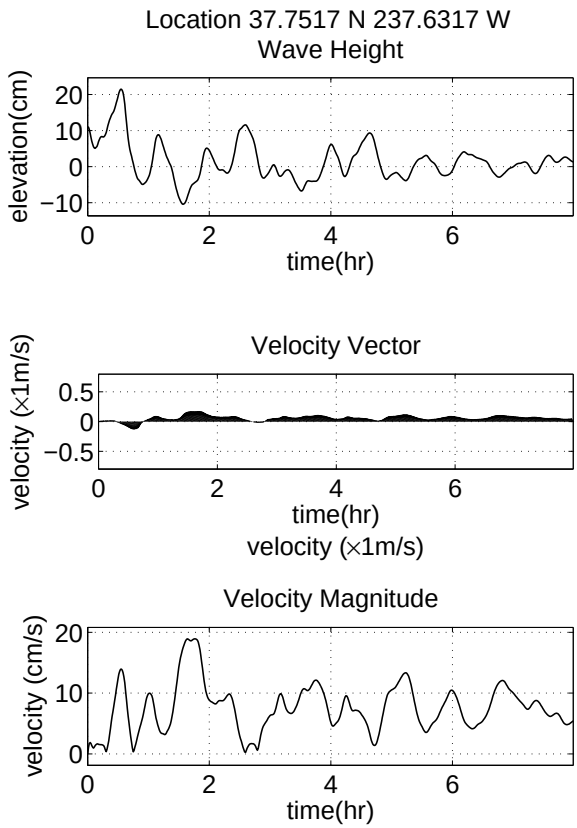
(15) Tesero, Inc. - Amorco Wharf



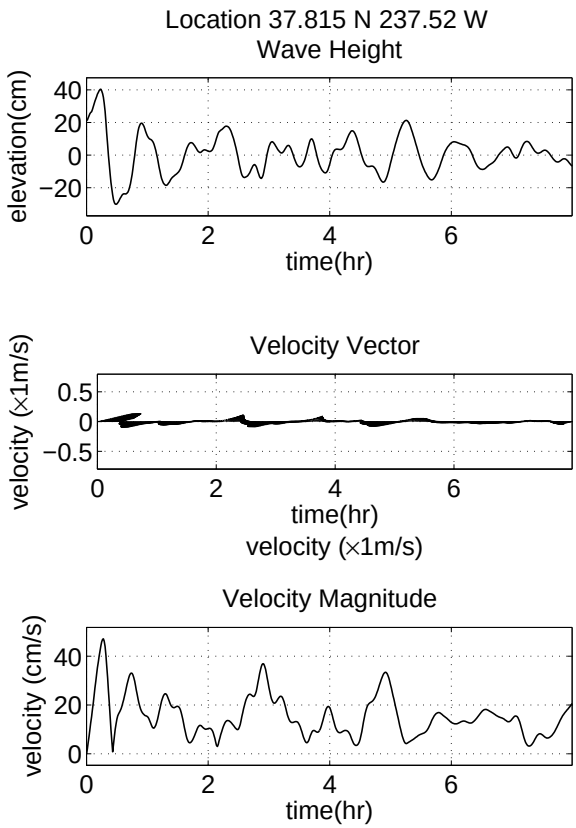
(16) Valero Refining Berth 1, Benicia



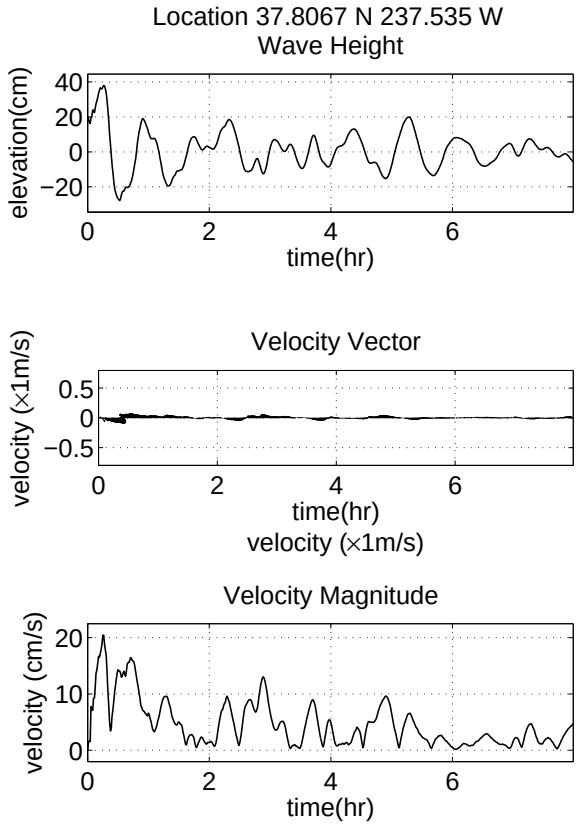
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco

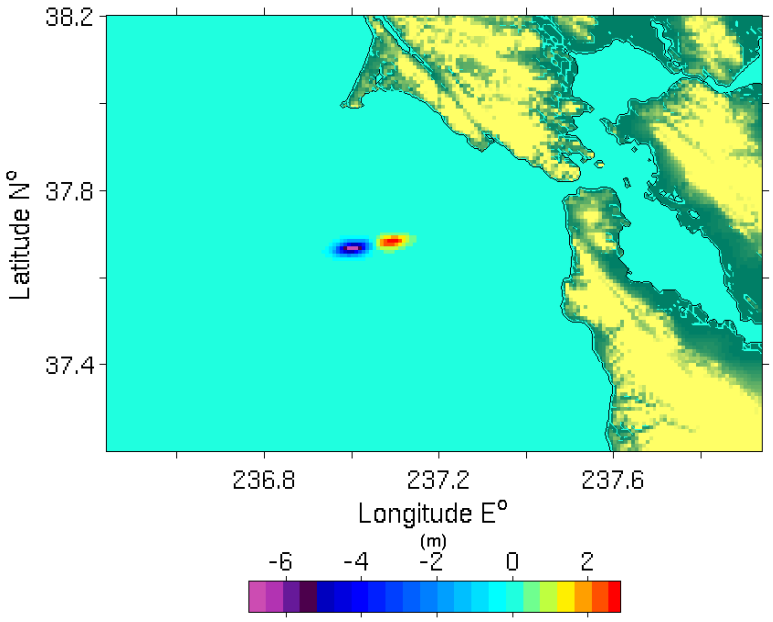


(19) Golden Gate, San Francisco



(20) Presidio, San Francisco

Farallon Islands Landslide



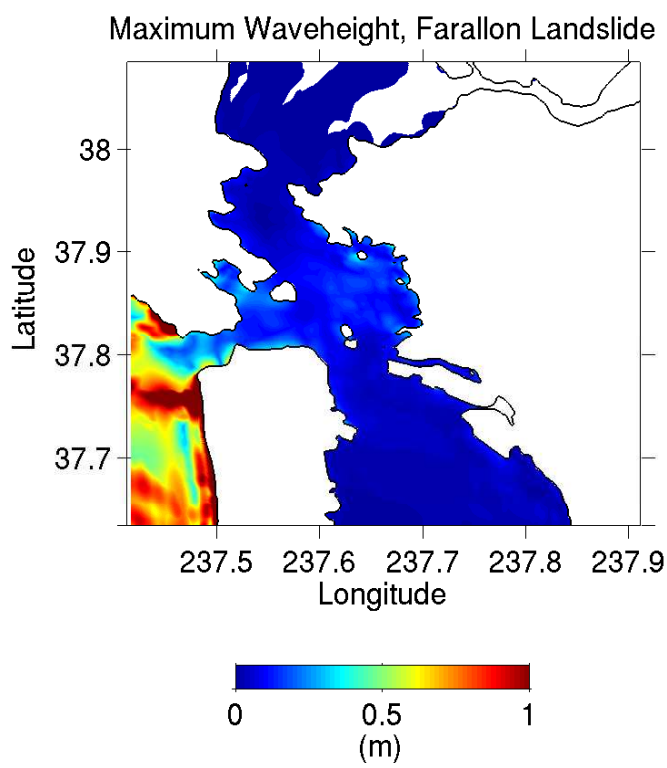
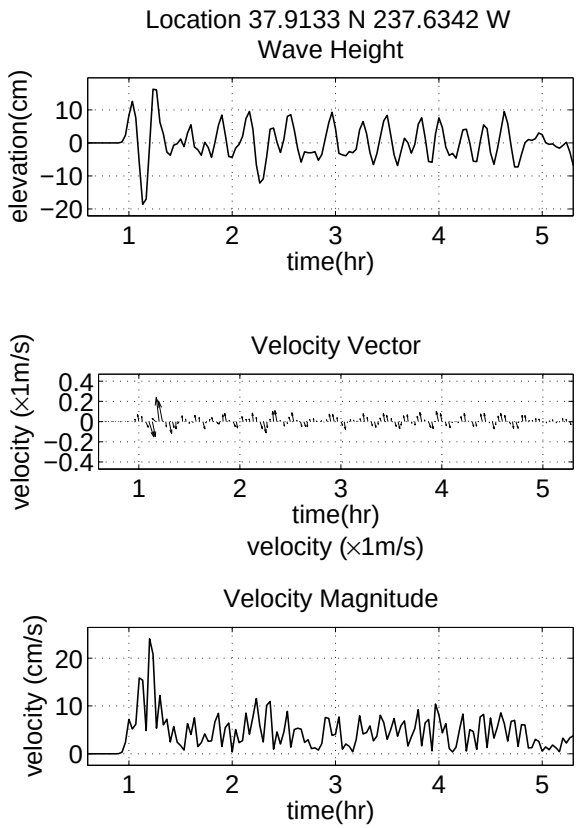
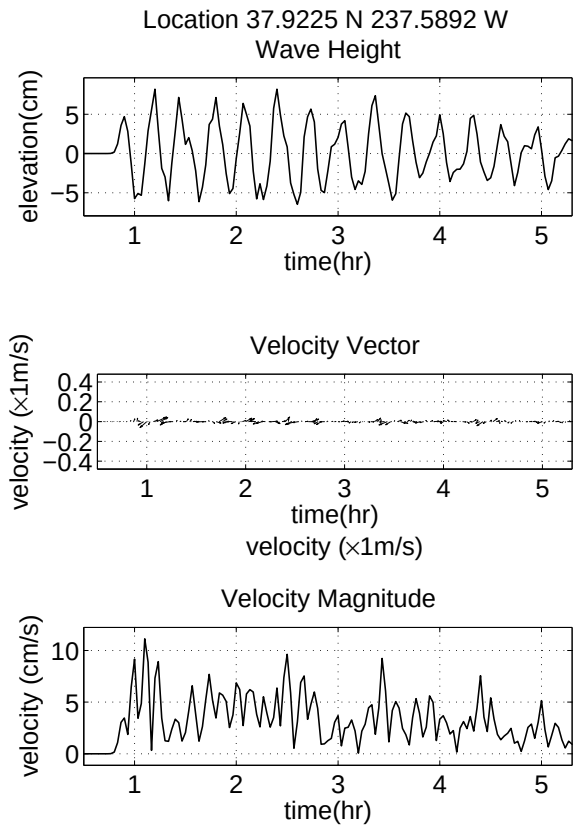


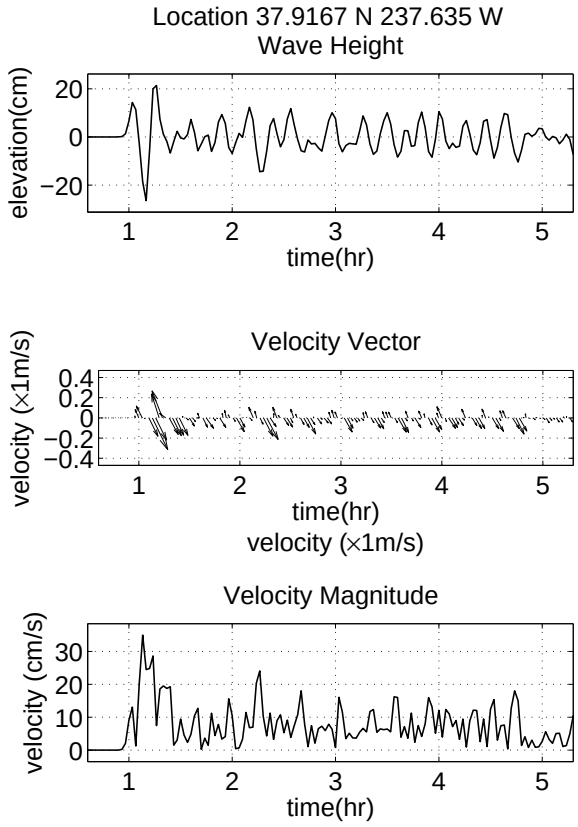
Fig A1-25 – Initial condition for Farallon Landslide (upper panel) and maximum wave heights for tsunami simulation in San Francisco Bay (lower panel).



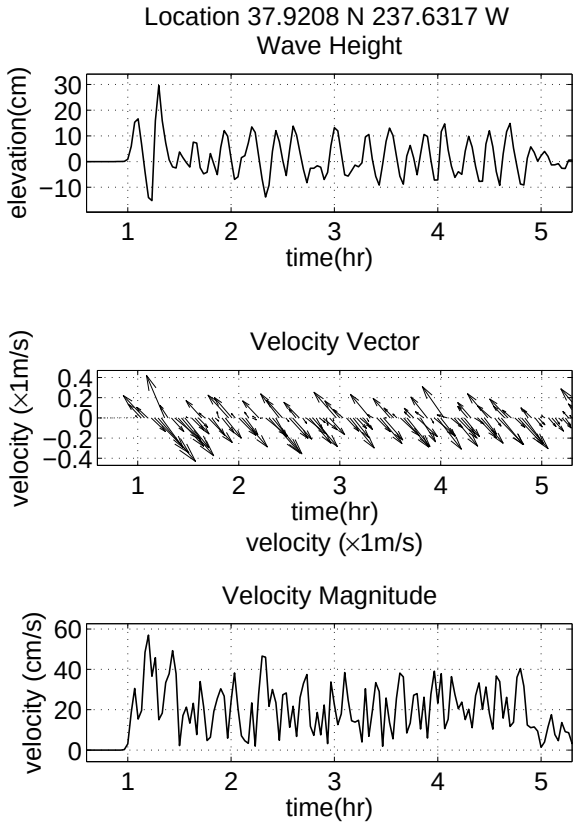
(1) BP West Coast Products, Richmond



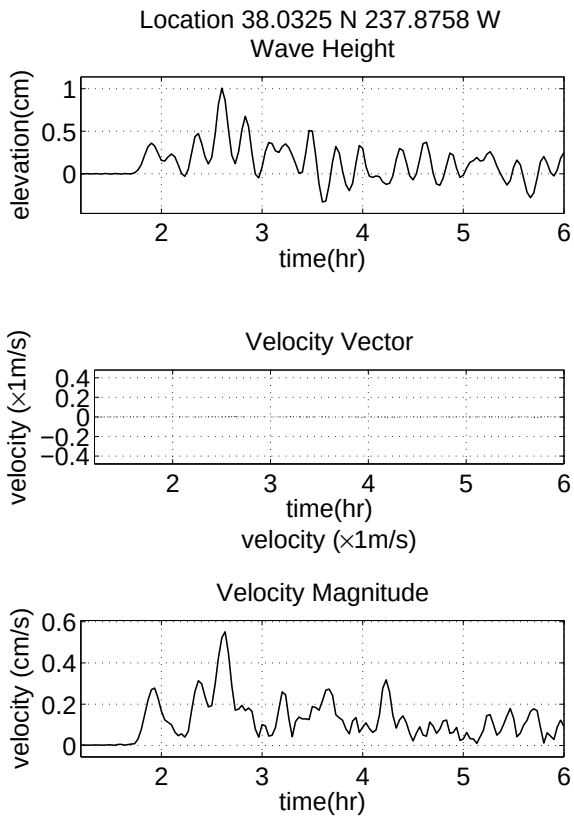
(3) Chevron USA, Inc., Richmond



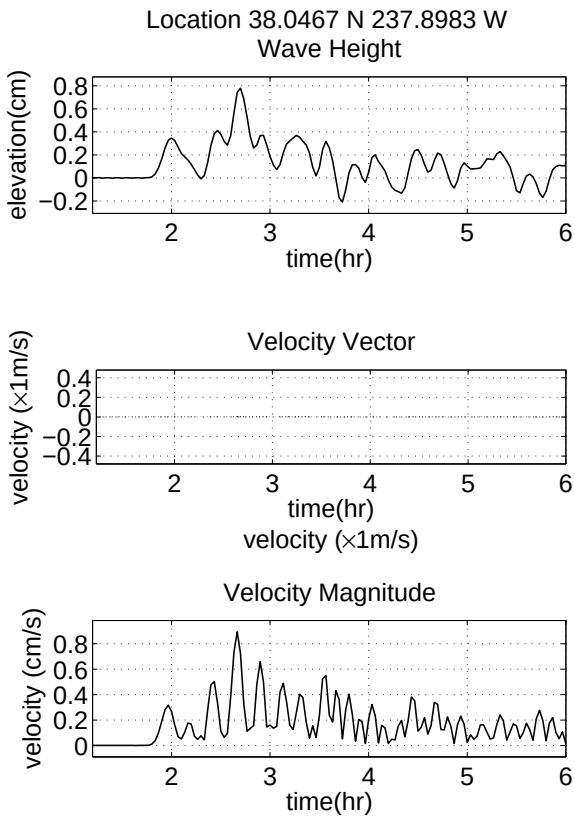
(5, 12) Kinder Morgan/ ConocoPhillips, Richmond



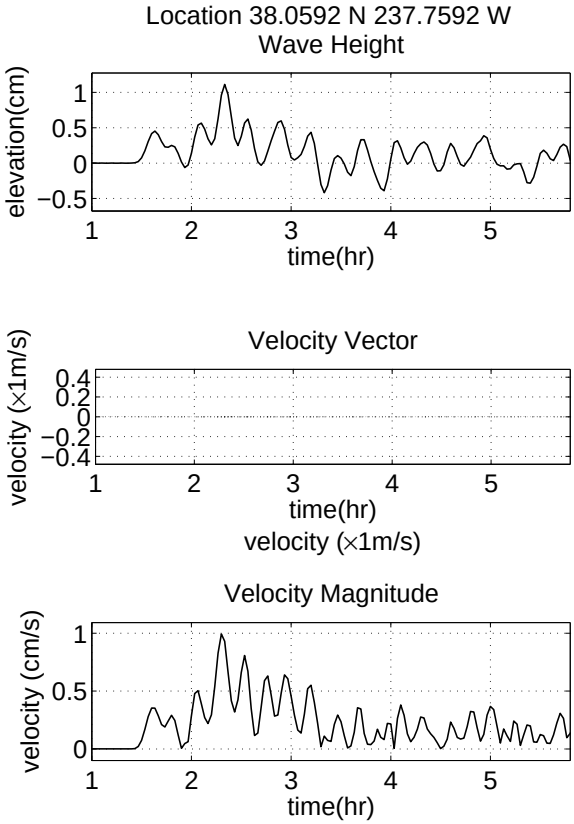
(6, 11) IMTT/Shore Terminals LLC, Richmond



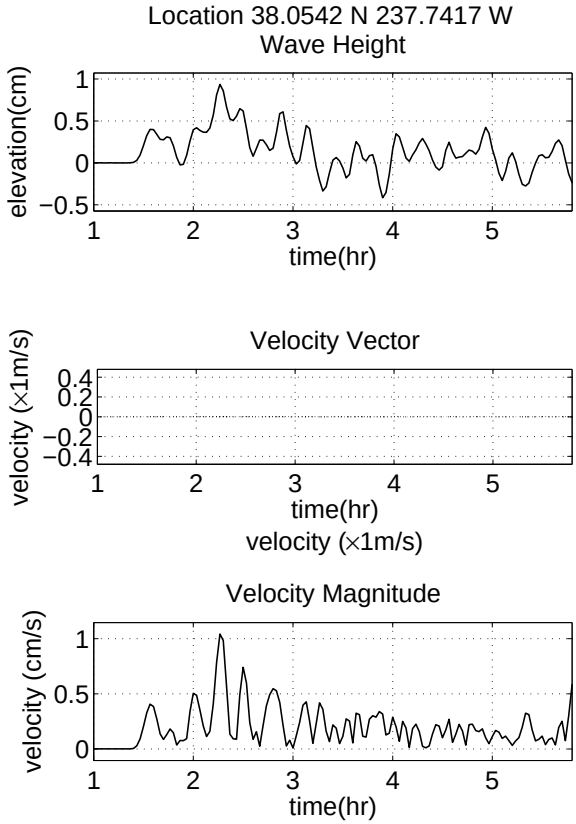
(7) Shell Oil Products, US, Martinez



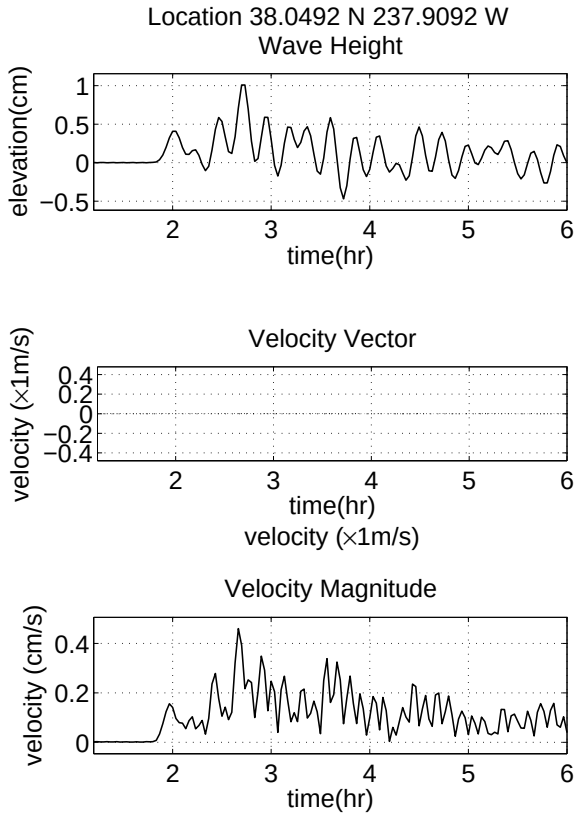
(9) Pacific Atlantic Terminals, Martinez



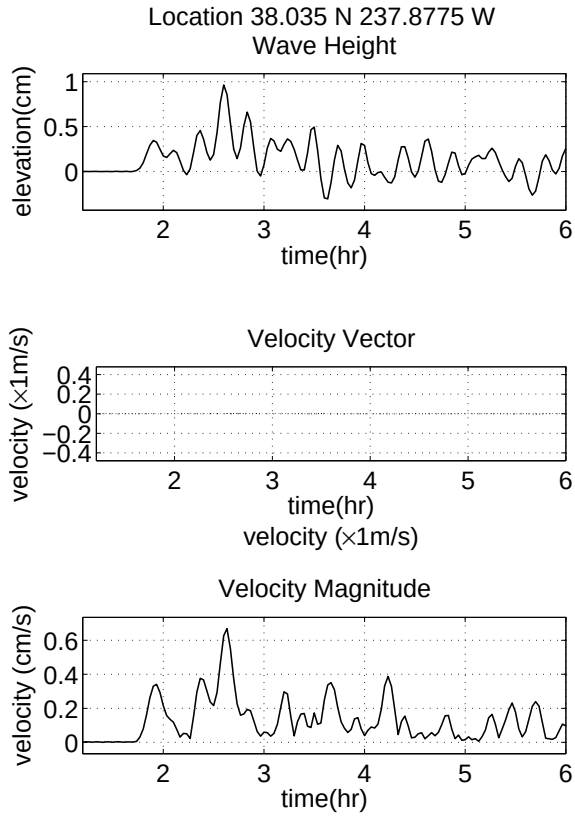
(10) Pacific Atlantic Terminals, Selby



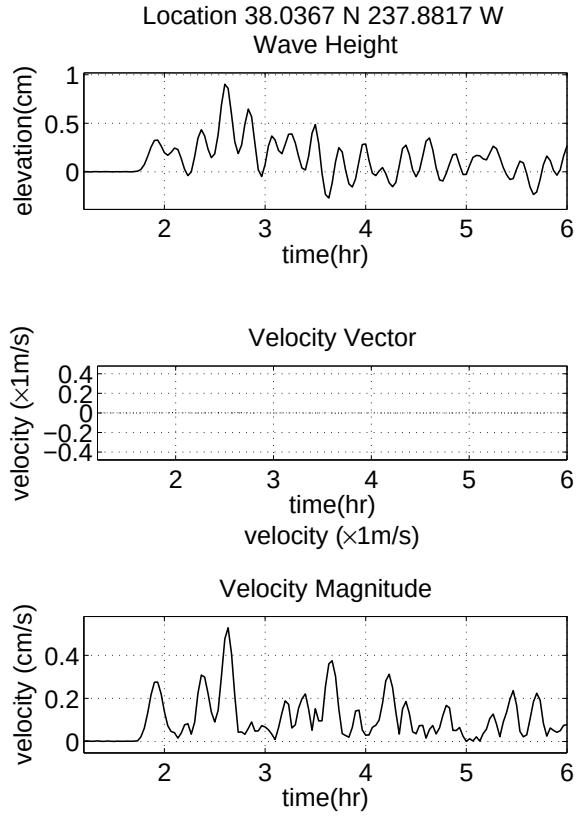
(13) ConocoPhillips, Rodeo



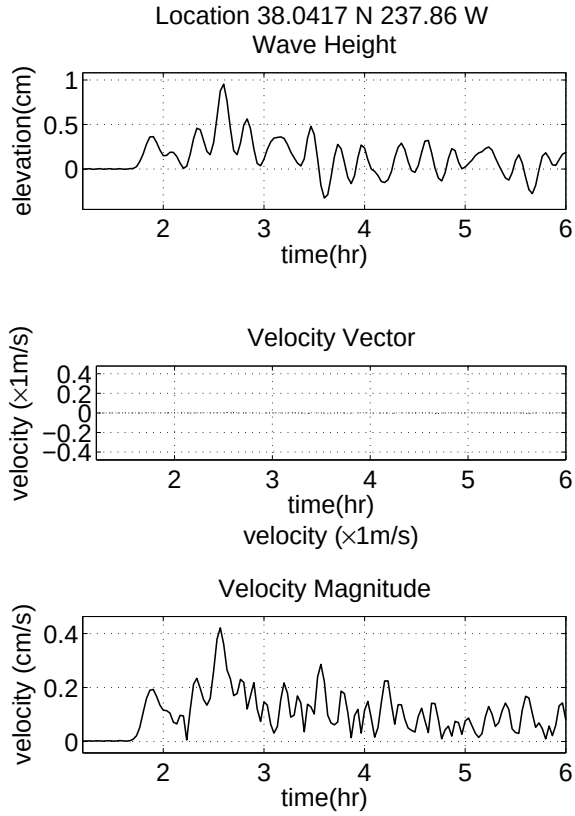
(14) Tesero, Inc. - Avon Wharf



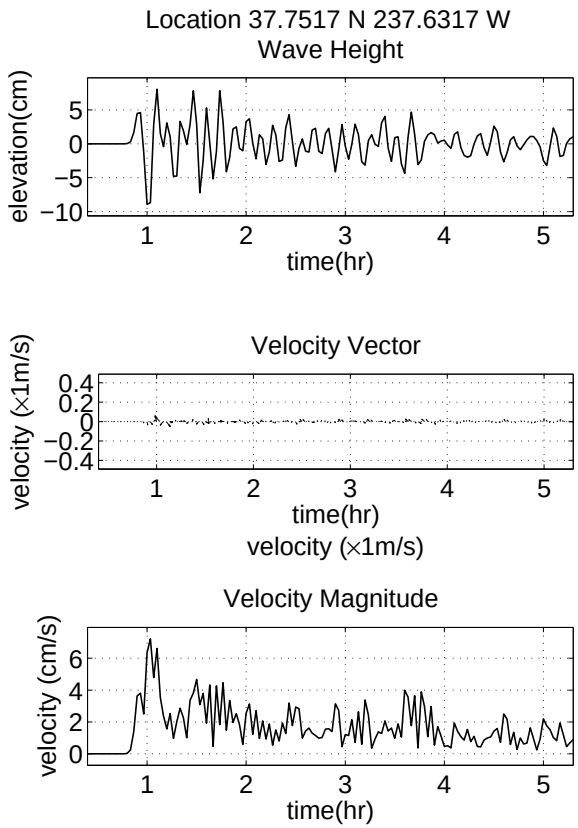
(15) Tesero, Inc. - Amorco Wharf



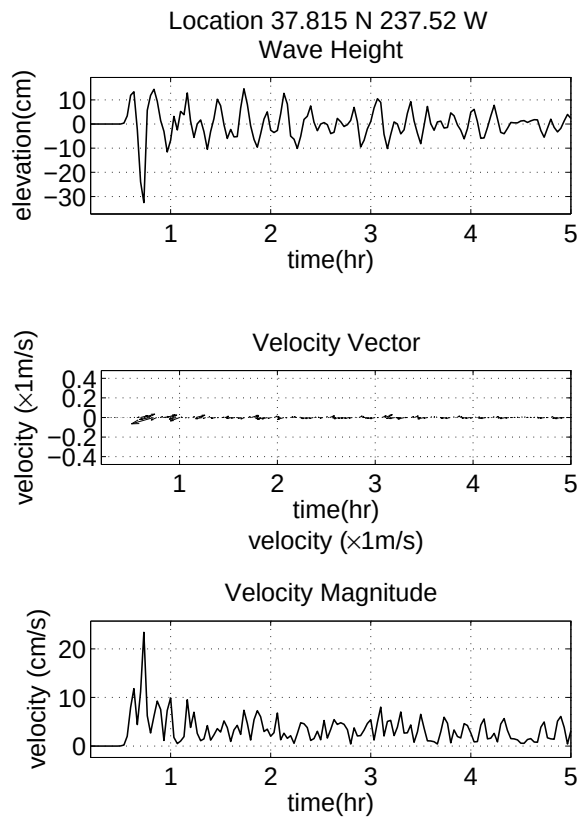
(16) Valero Refining Berth 1, Benicia



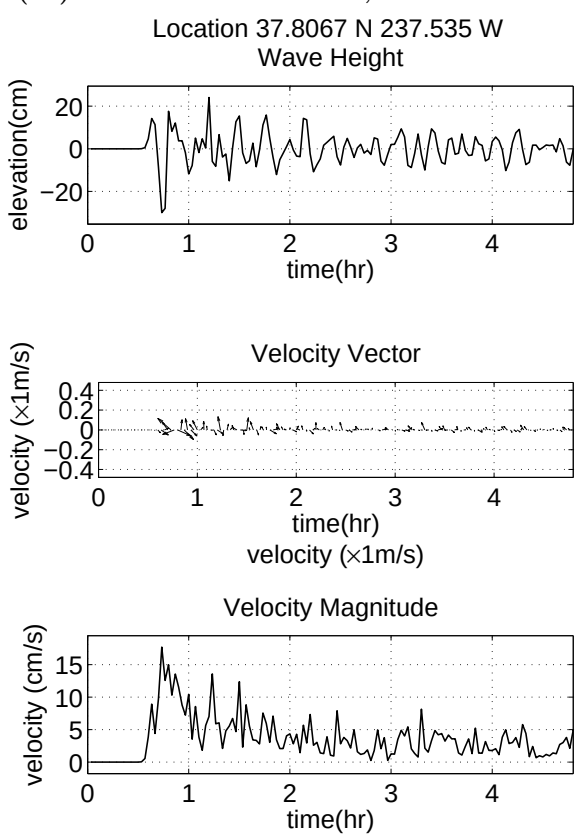
(17) Valero Refining Berth 2, Benicia



(18) Mirant Potrero LLC., San Francisco



(19) Golden Gate, San Francisco



(20) Presidio, San Francisco