28 May 2009

SUBJECT: Winter 2009-2010 Extreme Tide Analysis

The attached tables are a basic comparison of the predicted winter high tides (November 2009 thru March 2010) for eight coastal locations around Whidbey and Camano Islands. As with previous years, the comparison is made between the high tide predictions from "www. Saltwatertides.com" and the predicted tides on 4 February 2006 (Super Bowl Windstorm) referred to as the "Reference Tides." This year there were no predicted tides in September or October that met the comparison criteria.

TABLE 1 lists the eight locations and all the dates on which the predicted tides will equal or exceed the reference tides. **TABLE 2** lists those dates on which predicted tides will exceed the reference tides. It also shows the maximum predicted tide level measured in feet for that series of days. The TABLE 2 dates will have a higher likelihood of producing floods and beach erosion.

It should be remembered that none of these tides by themselves will produce flooding or other damage unless combined with a strong on-shore wind. The February 2006 storm produced such a situation with an extreme high tide and 30-45 MPH sustained winds - peaking at almost the same time.

While this near perfect occurrence is rare, strong winds and a moderate high tide on 20 December 2007 produced enough of a storm surge to push water across roads on the west coast of Whidbey Island. Data from the National Weather Service indicates that a sustained wind across water may raise water levels. The following chart is provided for illustration. The wind speed is in knots.

HOURS	3	6	9	12	18+
Speed					
15kt	2 Ft	2	3	3	3 Ft
20 kt	3	4	4	4	4
25 kt	4	5	6	6	6
30 kt	5	7	7	7	7
35 kt	7	9	9	9	9
40 kt	9 Ft	10	10	10	10 Ft

Based on wind over water for 35 nautical miles

The information presented is intended only to be a guide to recognizing dates and locations of increased risk for tidal flooding and shoreline damage. Other risk factors may also increase the potential for tidal flooding and those should be included in any storm preparation decisions.

Questions and comments related to this information should be addressed to Island County DEM at dem@co.island.wa.us or Mike Simmons at: msimmons@camanofire.com

TABLE 1 Dates with winter high tides that "Equal or Exceed" the 2006 flood reference levels.

Location	Admiralty Head	Bush Point	Coupeville Penn Cove	Crescent Harbor	Hansville*	Glendale	Sandy Point	Stanwood-Stilliguamish
Reference Tide in Feet	9.7	10.6	12.5	12.8	11.8	11.9	12.2	7.6
Month	**Days of Month**							
November 2009	18-19	17-19	18-19			17-19	17-19	16-21
December 2009	3-9 15-19 31	3-10 15-19 31	2-10 15-21 31	2-10 15-21 31	4-8	2-11 15-23 31	2-11 15-22 30-31	2-12 15-24 30-31
January 2010	1-8 30-31	1-8 14	1-8 17-20 29-31	1-8 17-20 29-31	1-7	1-8 13-21 29-31	1-8 15-21 30-31	1-9 12-21 28-31
February 2010	1-4	1-5 28	1-5	1-4	1-5 28	1-5	1-5	1-5 15-18 27-28
March 2010		2-3	1-4	1-4 30-31	1-3	1-4 29-31	1-4 29-31	1-5 28-31

NOTE: To account for variance in measurement and wind conditions, the predicted tides included in the "equals" criteria are allowed to be within 3 inches of the reference tide. Example: If the reference tide is 9.7 ft., then the "equals:" criteria will also include days with tides from 9-3 ft thru to and greater than 9.7 ft.

***Hansville**: Hansville is the nearest tide reporting location to Double Bluff and Useless Bay on Whidbey Island. Hansville is on the tip of the Kitsap Peninsula, due south of Double Bluff.

TABLE 1 lists the locations where extreme high tide levels were measured and where tidal flooding damage occurred in February of 2006. The "Reference Tide" levels are the predicted high tides on 4 Feb 2006. The high tides that day combined with the wind induced " storm surge" produced tidal flooding and beach erosion. The sustained high wind probably added 2-3 feet of height to the predicted tide level.

TABLE 2 Dates with winter high tides that "Exceed" the 2006 flood reference levels.

Location	Admiralty Head	Bush Point	Coupeville Penn Cove	Crescent Harbor	Hansville*	Glendale	Sandy Point	Stanwood-Stilliguamish
Reference Tide in Feet	9.7	10.6	12.5	12.8	11.8	11.9	12.2	7.6
Month	**Day of Month**							
November 09								
December 09		4-5, 10.7 16-17, 10.7	4-8, 12.7	3-9, 13.0		2-11, 12.2	3-9, 12.3 15-18, 12.2	3-10, 7.8
January 10	3-5, 9.8	2-7, 10.9	1-7, 13.3 30-31, 13.3	1-7, 12.1	1-7, 12.8 30-31, 12.5	1-7, 12.8 30-31, 12.5	1-7, 13.1 30-31, 12.8	1-7, 8.1 30-31, 8.0
February 10		2-3, 10.8	1-4, 13.3	1-4, 13.3	1-4, 12.1	1-4, 12.8	1-4, 13.1	1-4, 8.2
March 10			1-3, 12.8	1-4, 13.1		1-4, 12.2	1-4, 12.6	1-3, 7.4

NOTE: The days indicated on this table are days when the predicted tide exceeds the reference tide level. The tide heights in feet (in red) reflects the highest predicted tide in that series of days, but remember, all tides in the series exceed the reference tide level.

TABLE 2 indicates those locations and dates when the high tide is predicted to exceed the "Reference Tide" levels. The result is a greater risk of tidal flooding if there is a coinciding strong on-shore wind. Again, these high tide levels alone will not cause tidal flooding.