

## 33.930 Measurements

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### Sections:

33.930.010-140 No change

33.930.150 Measuring Top of Bank

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## Commentary

### **33.930.150 Measuring Top of Bank:**

This more specific description of how to measure top of bank supplements the definition. See section 33.910.030 for the definition of top of bank.

This staff proposed measurement language responds to several common points of confusion identified by the Bureau of Development Services. The section provides prescriptive standards that must be followed in order to locate the top of bank and determine compliance with development standards that refer to the location of top of bank. Examples and graphics are used in describing how to measure top of bank. Staff notes that not all possible scenarios can be anticipated. In situations where the measurement does not provide a clear determination, the purpose and intent of the development standard in question and its relationship to other regulations and situations must be consulted. Common surveying practices may be taken into consideration when applying this measurement standard as well.

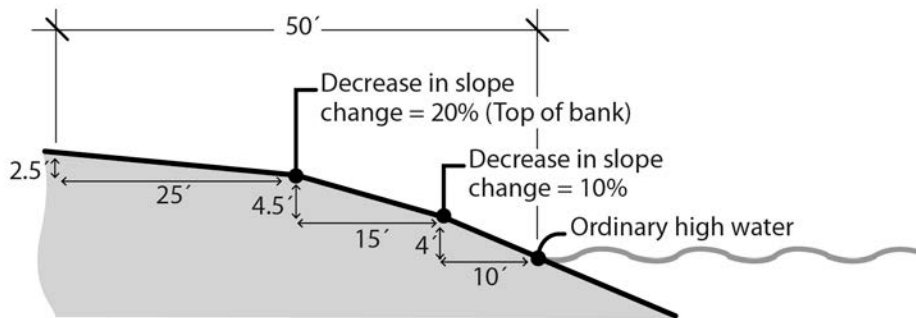
The Bureau of Planning and Sustainability has used Light Detection and Ranging (LIDAR) mapping technology to establish a top of bank map for the Central Reach area regulated in 33.475.

**33.930.150 Measuring Top of Bank**

See Section 33.910.030, Environmental-Related Definitions, Top of Bank.

- A. Using Percent Slope.** Percent slope is determined by dividing the vertical rise by the horizontal run, and converting that decimal to a percentage. For example, a slope section that rises 1 foot over a distance of 4 feet is a 25 percent slope.
- B. Identifying a Decrease in Slope.** A decrease in slope is a change in percent slope from a steeper to a less steep grade. For example, a change from 40 percent slope to 30 percent slope is a decrease in slope of 10 percent. A change from 35 percent slope to 15 percent slope is a decrease in slope of 20 percent. To identify the decrease in slope, the slope must be sampled every 3 feet between the ordinary high water mark and a point 50 feet from the ordinary high water mark. See Figure 930-20.

**Figure 930-20a**  
**Example 1: Identifying a Decrease in Slope**



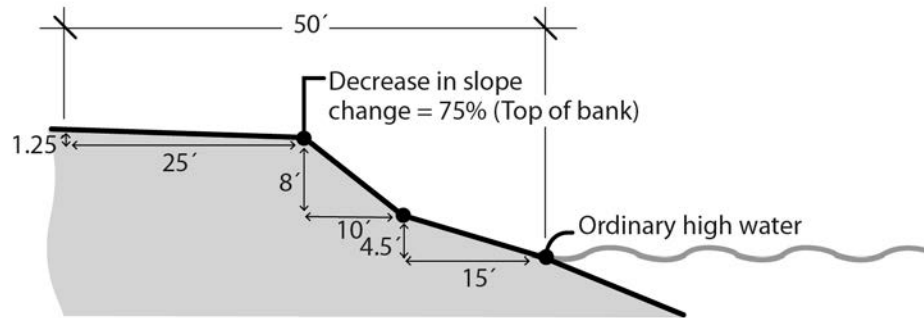
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## Commentary

### **33.930.150.C Default Top of Bank**

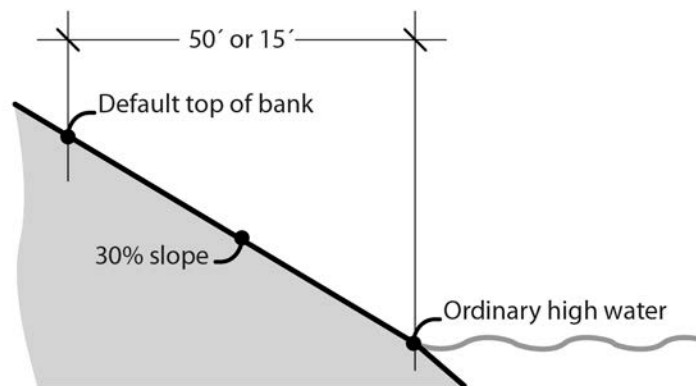
For smaller streams, the existing definition has been difficult to apply consistently, especially in areas where a stream is in a deep ravine, or where the stream is within a relatively level plain. The recommended 50 foot and 15 foot default locations would create greater certainty, and reduce the number of instances where a survey is necessary to determine the top of bank.



**C. Default Top of Bank.** If no slope decrease of 10 percent or more is found within 50 feet (measured horizontally) of the ordinary high water mark, then the top of bank will be one of the following default locations, see Figure 930-21:

1. For the Willamette and Columbia Rivers, the default top of bank is 50 feet (measured horizontally) from the ordinary high water mark. See Figure 930-21.
2. For perennial streams, seeps and wetlands the default top of bank is 15 feet (measured horizontally) from the ordinary high water mark.
3. For intermittent and ephemeral streams, the default top of bank is 15 feet (measured horizontally) from the centerline of the stream.

**Figure 930-21**  
Measuring Default Top of Bank



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## Commentary

### **33.930.150.D Relationship to Other Structures**

The graphic below provides some examples of how the measurement of top of bank is influenced by structures located on or near the river bank. As mentioned previously, not all situations can be anticipated. In situations where the measurement standard does not provide a clear determination, the purpose and intent of the development standard in question and its relationship to other regulations and situations must be consulted. Common surveying practices may be taken into consideration when applying this measurement standard as well.

#### **D. Relationship to Other Structures.**

1. Where a structure straddles the top of bank, the top of bank line is drawn as a straight line through the structure, connecting the top of bank line on either side.
2. Where there is a vertical bulkhead or seawall, the top of bank is the point at the top of the bulkhead that is closest to the river.
3. Docks, pilings, slips, wharves and other similar structures built over the water are not factored into the determination of top of bank. Where there is a dock, wharf or other structure on the bank, measurements of slope are taken on the underlying dry land.
4. Where the bank itself is a structure, such as a rip-rap slope at the edge of reclaimed land, the top of bank line is based on the predominant slope of that structure, rather than the slope of individual boulders or structural elements.

**Figure 930-22**

