

Active bank erosion can be recognized by falling or fallen vegetation along the bank line, cracks along the bank surface, slump blocks, deflected flow patterns adjacent to the bank line, live vegetation in the flow, increased turbidity, fresh vertical faces, newly formed bars immediately downstream of the eroding area, and, in some locations, a deep scour pool adjacent to the toe of the bank. These indications of active bank erosion can be noted in the field and on stereoscopic pairs of aerial photographs. Color infrared photography is particularly useful in detecting most of the indicators listed above, especially differences in turbidity.⁽¹⁶⁾ Figure 2.8 illustrates some of the features which indicate that a bank line is actively eroding.



Figure 2.8. Active bank erosion illustrated by vertical cut banks, slump blocks, and falling vegetation.

Bank Materials. Resistance of a streambank to erosion is closely related to several characteristics of the bank material. Bank material deposited in the stream can be broadly classified as cohesive, noncohesive, and composite. Typical bank failure surfaces of various materials are shown in Figure 2.9 and are described as follows:⁽¹⁷⁾

- Noncohesive bank material tends to be removed grain by grain from the bank. The rate of particle removal, and particle movement, and hence the rate of bank erosion, is affected by factors such as particle size, bank slope, the direction and magnitude of the velocity adjacent to the bank, turbulent velocity fluctuations, the magnitude of and fluctuations in the shear stress exerted on the banks, seepage force, piping, and wave forces. Figure 2.9(a) illustrates failure of banks of noncohesive material from flow slides resulting from a loss of shear strength because of saturation, and failure from sloughing resulting from the removal of materials in the lower portion of the bank.