Living with Creeks

Creek Hazards

Mountain creeks move large volumes of debris because they generally react quickly to rain and snow melt, have gulleys and narrow flood plains, and erode rather than deposit material.

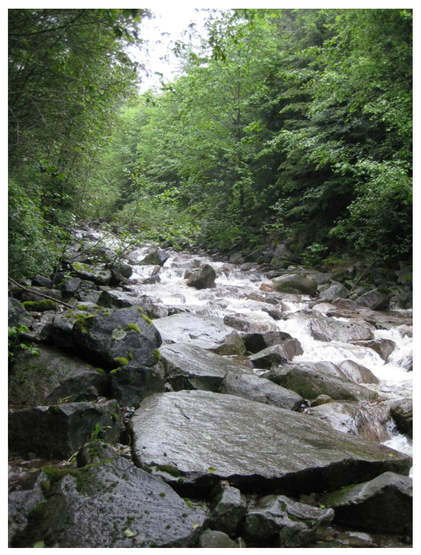
They channel water and debris from their side hills. They can be clogged by debris that makes a dam which holds back water. Small dams like that generally disintegrate quickly and release the water.

Increased storm events due to changing climate cause more frequent flooding. Preventative measures to avoid flood and debris flow damage used in the past may not apply to the near future.

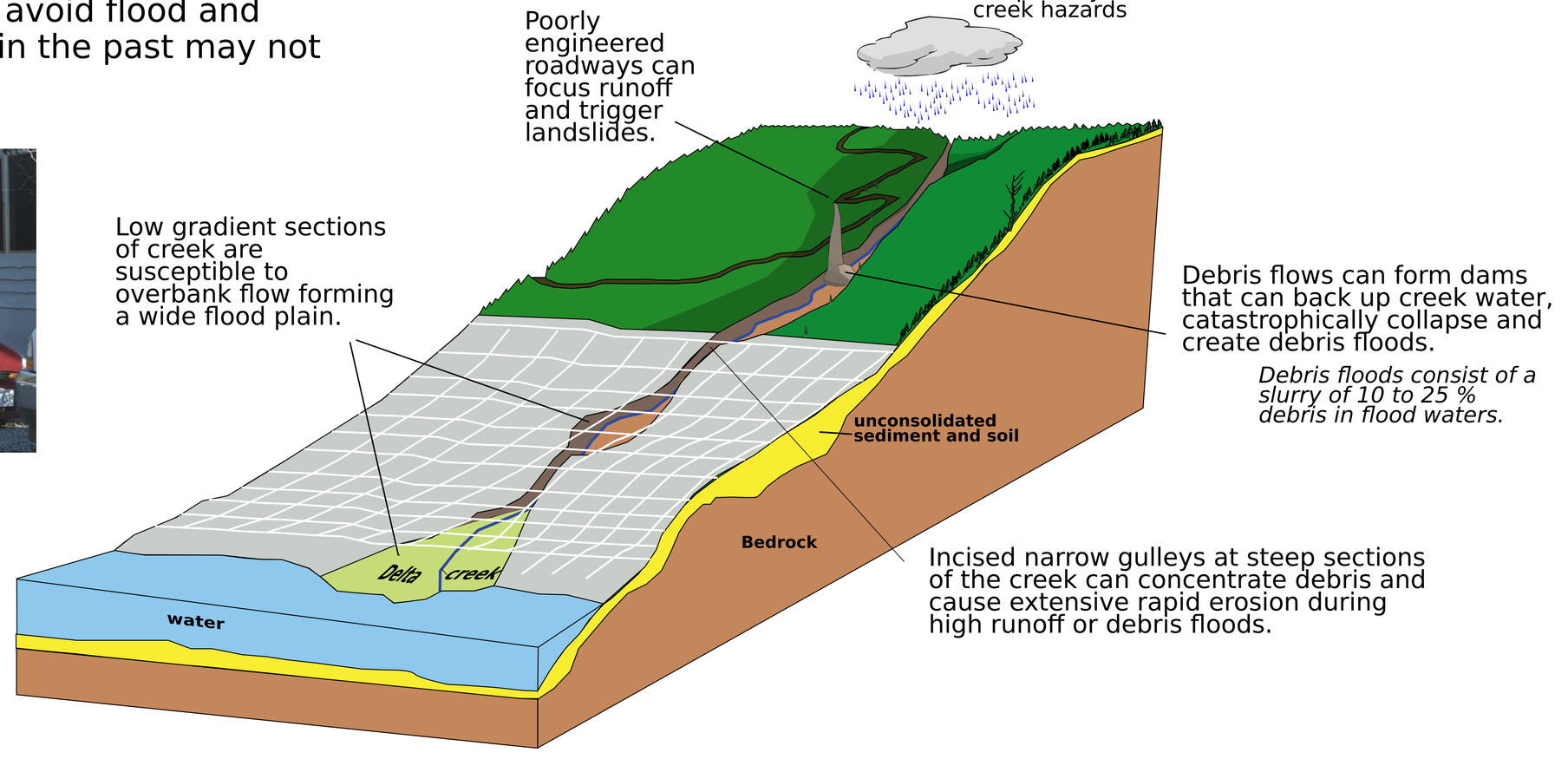
Debris flows triggered where the logging road concentrated runoff.

Contributing Factors

Moderately steep mountain stream over bedrock showing typical large boulders and blocks. Such material can be destructive when moved during intense floods.



In the path of a debris flood overflow channel. The debris is dumped out of the water as it encounters obstacles and slows it flow. (C. Struik)



Controls on Creek Conditions:
Slope, Geology, Weather

Slope

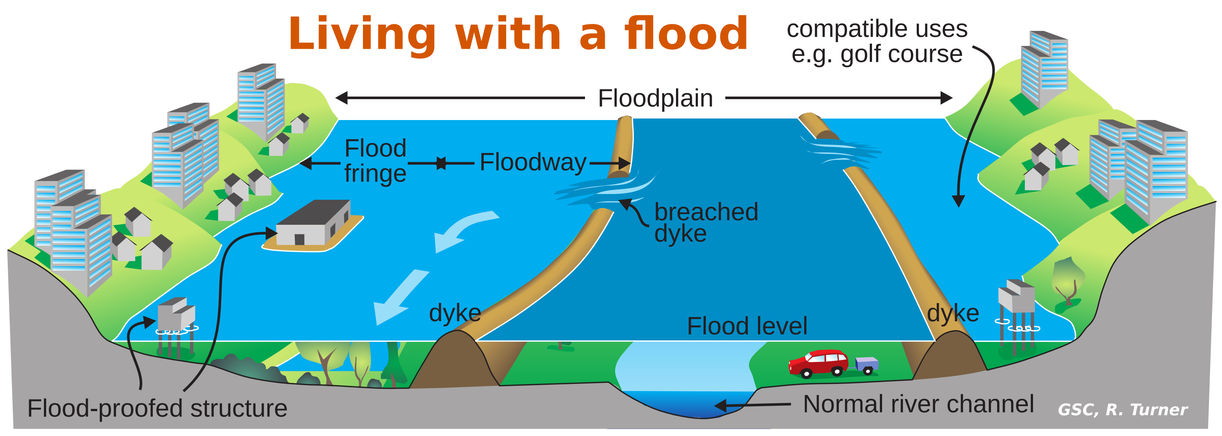
The steeper the slope, the faster the water flows. Large volumes of fast-moving water can move large debris.

The shallower the slope the more the water spreads out, potentially creating wide flood plains.
The instability increases as the slope steepens.

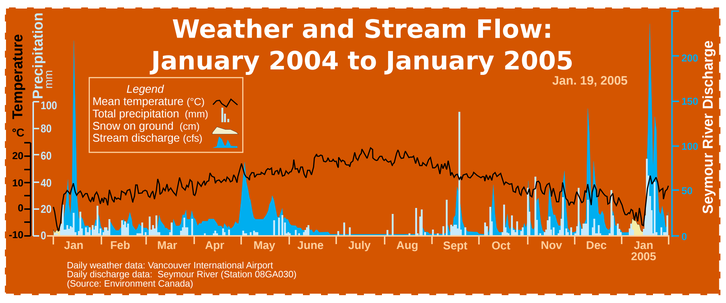
Geology

Loose sediment and soil can be easily eroded by fast creeks. On steep slopes the creek will form steep gulleys through loose material. Erosion is increased during floods.

Bedrock can form steep walled canyons where creeks are steep and fast flowing. Canyons and gulleys channelize the flow.



Weather



Graph shows weather conditions that led up to the January 2005 Berkley landslide in the District of North Vancouver, BC. In coastal BC, heavy rains are typical in fall and winter. Rain on snow can make the situation worse. Intense rainfall on saturated sediment causes increased groundwater flow and surface runoff. Floods are common in the fall (intense rain) and early summer (melting snow).

Britannia Beach flood of September 1991. Example of a typical mountain stream flood at the stream's delta.

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