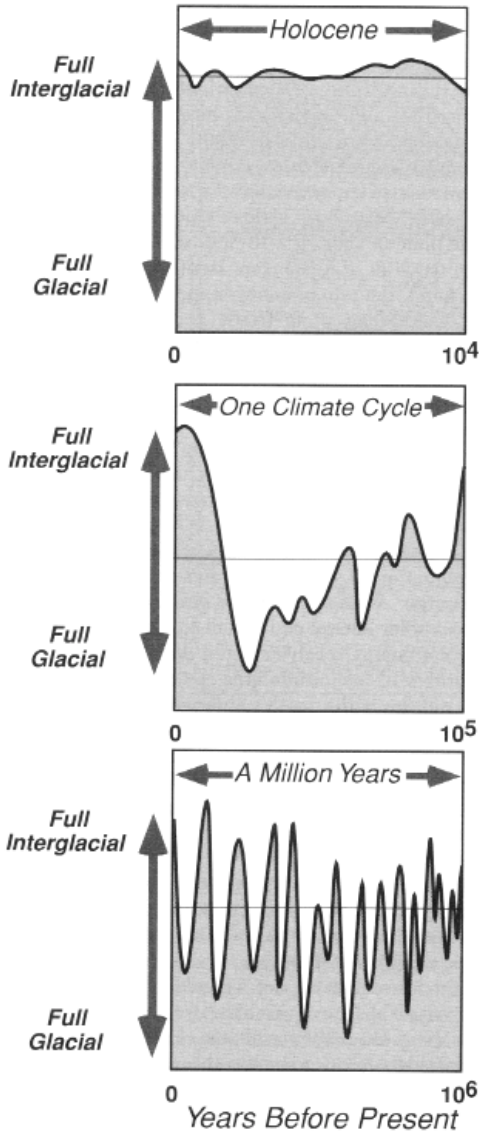
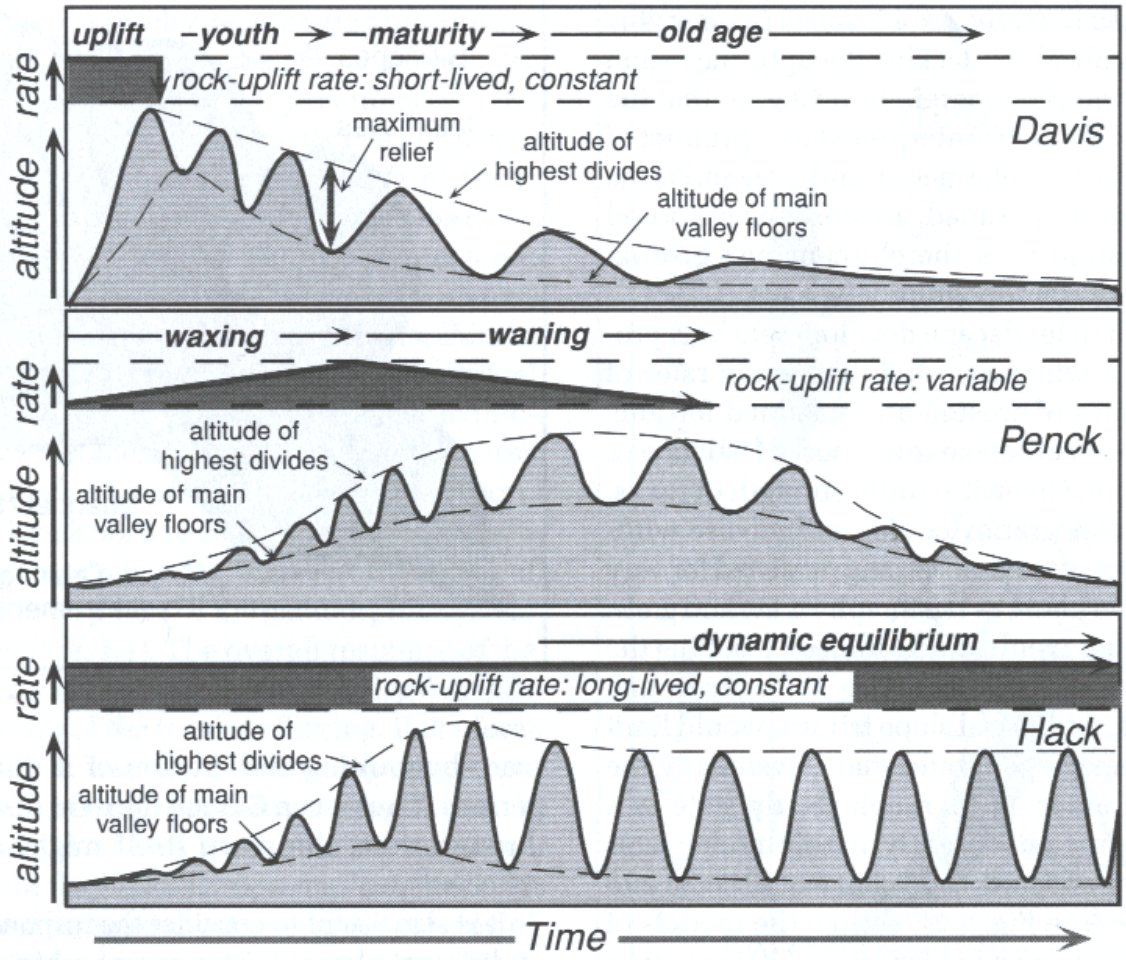
Tectonic Geomorphology

The unrelenting competition between tectonic processes that tend to build topography and surface processes that tend to tear them down represent the core of Tectonic Geomorphology



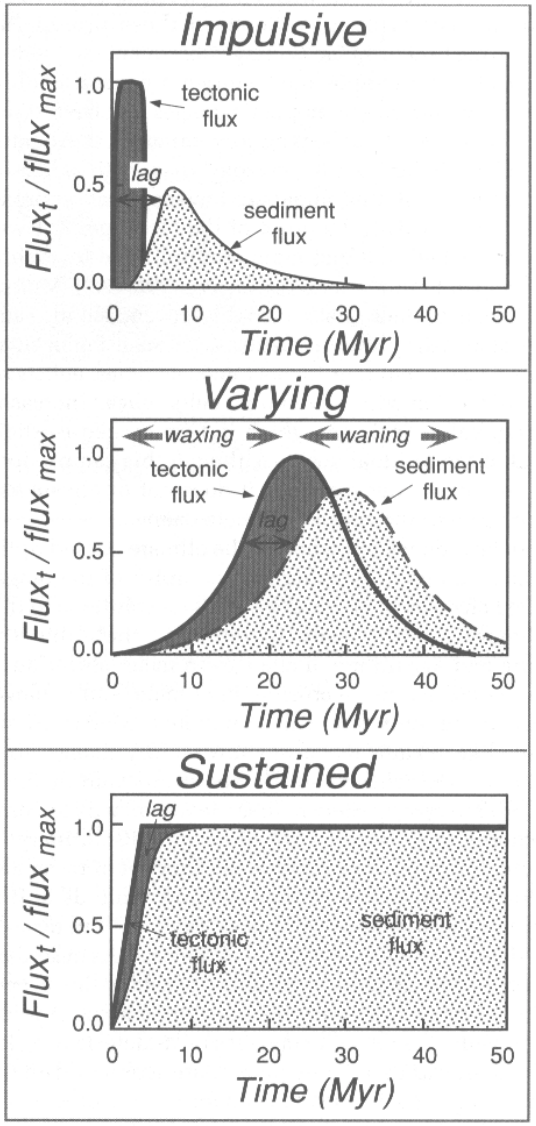
Tectonic Geomorphology

Classical models of tectonic forcing and landscape responses after the theories of Davis (top), Penck, and Hack (bottom).



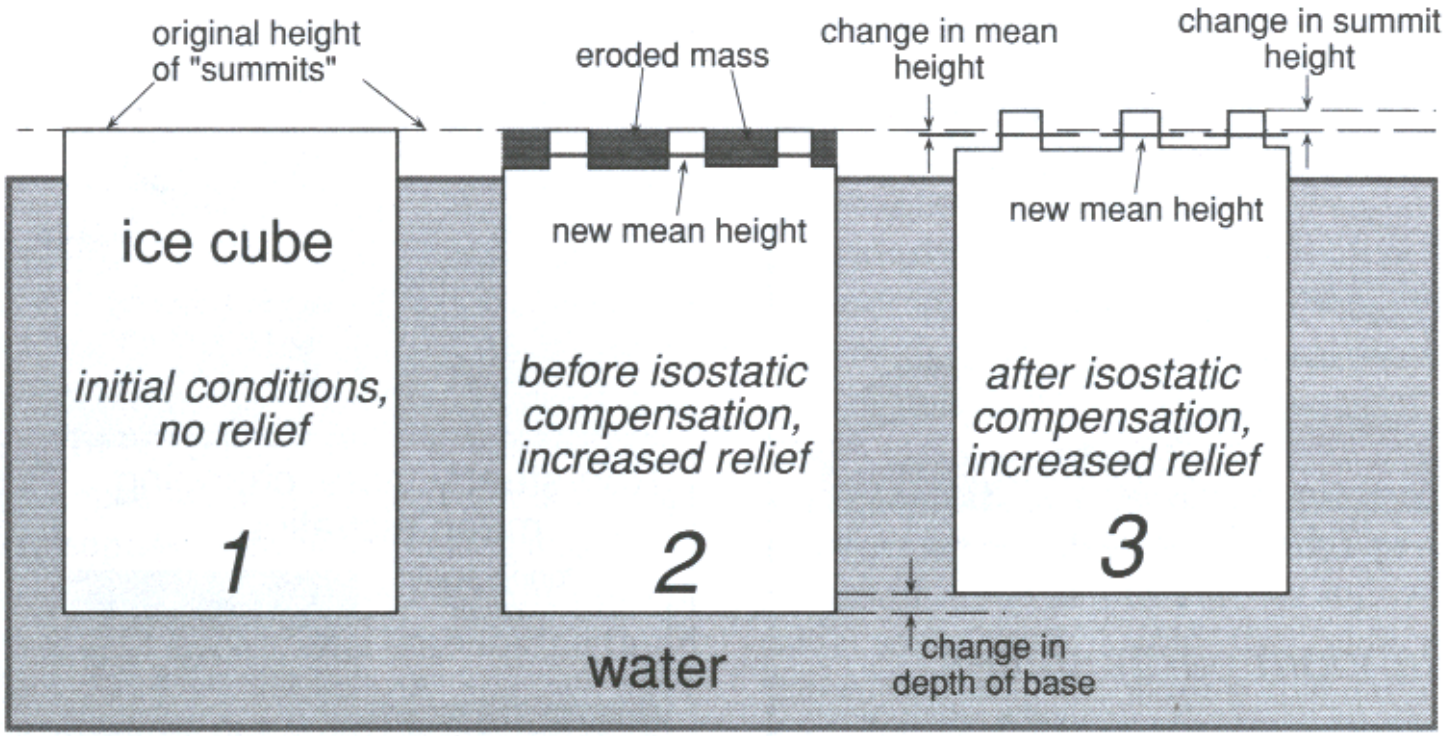
Tectonic Geomorphology

Output of a process-response model in which the duration and magnitude of rock uplift (vertical tectonic flux) is compared with the erosional sediment flux



Tectonic Geomorphology

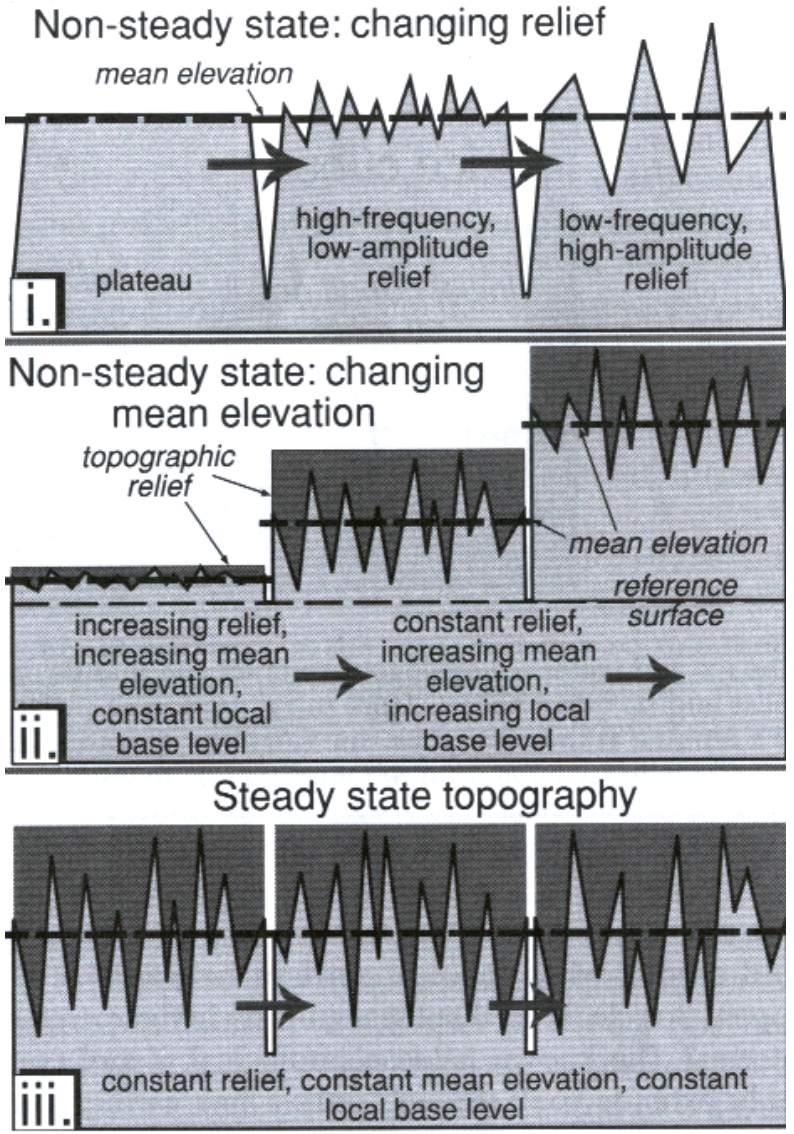
Isostatic uplift of mountain summits due to enhanced erosion as exemplified by an ice cube.



Tectonic Geomorphology

Non-steady-state topography can have constant mean topography, or constant relief but changing mean elevation.

In **steady-state** condition, relief, mean elevation and base level remain constant, although the elevation of an individual peak can vary through time



Tectonic Geomorphology

In order to measure the amount of deformation that has occurred due to tectonic processes, it is necessary to have an identifiable marker (**geomorphic marker**) that has been displaced.

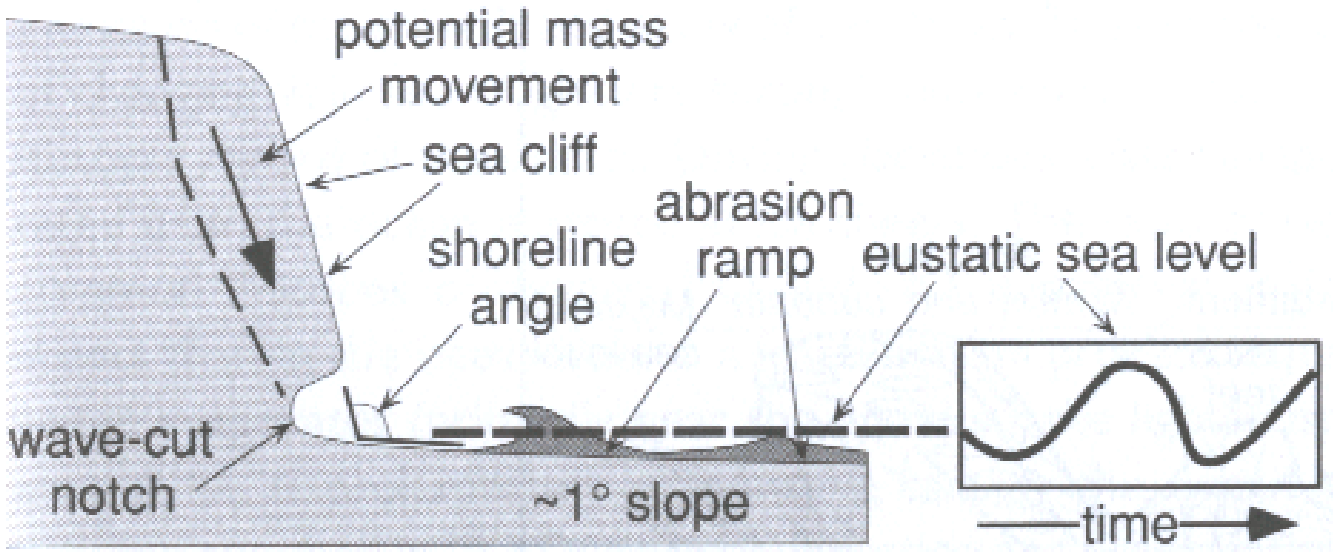
The best geomorphic markers are readily recognizable landforms, surfaces or linear trends that have these characteristics:

1. Known initial undeformed geometry,
2. Known age, and
3. High preservation potential with respect to the time scale of the tectonic process being studied.

Tectonic Geomorphology

Geomorphic Markers

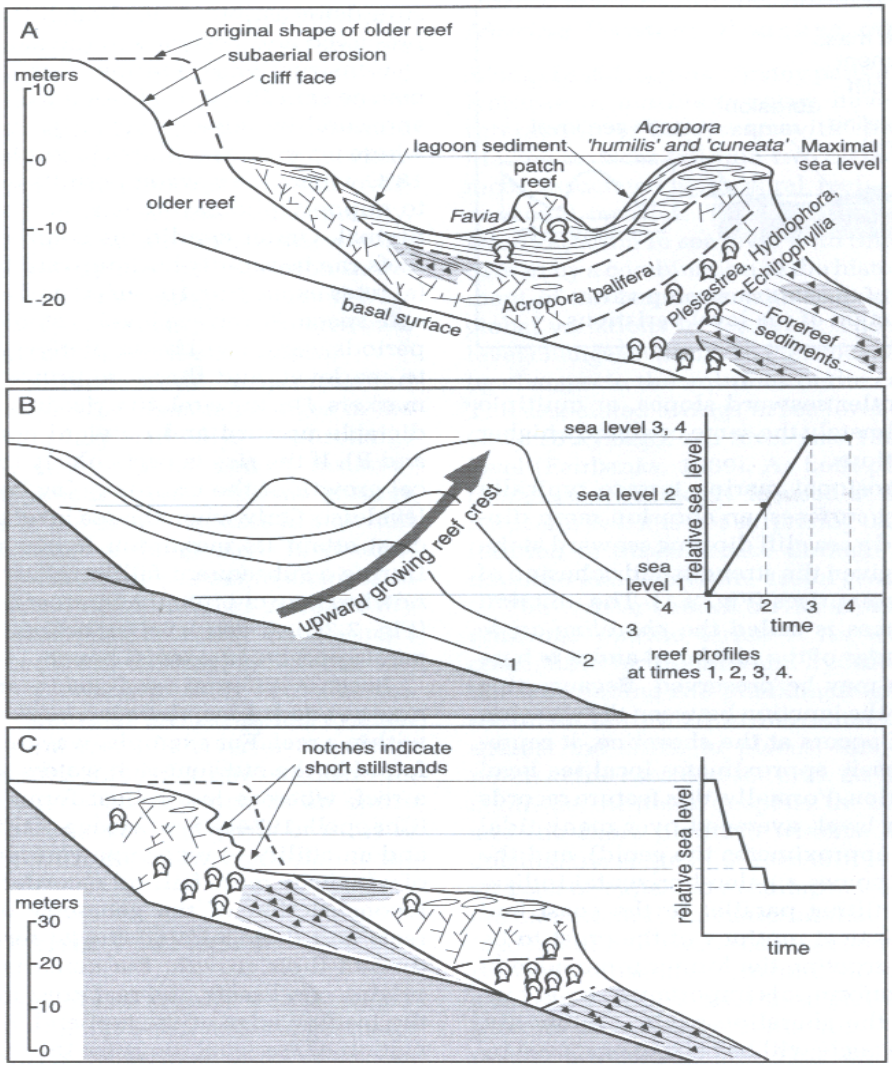
Marine Terraces, Beaches and Shorelines



Tectonic Geomorphology

Geomorphic Markers

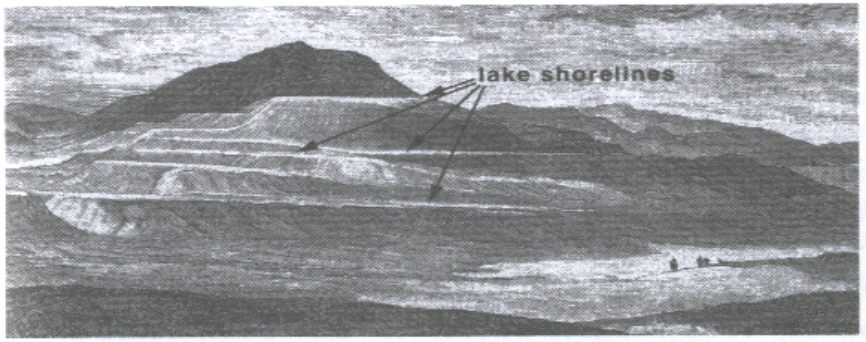
Marine Terraces, Beaches and Shorelines

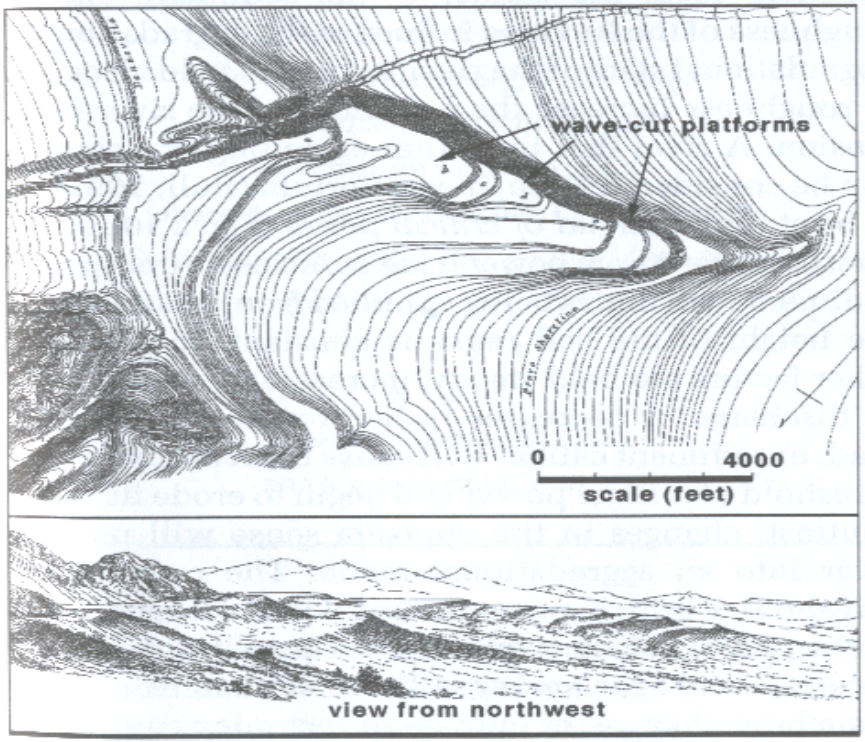


Tectonic Geomorphology

Geomorphic Markers

Lacustrine Shorelines

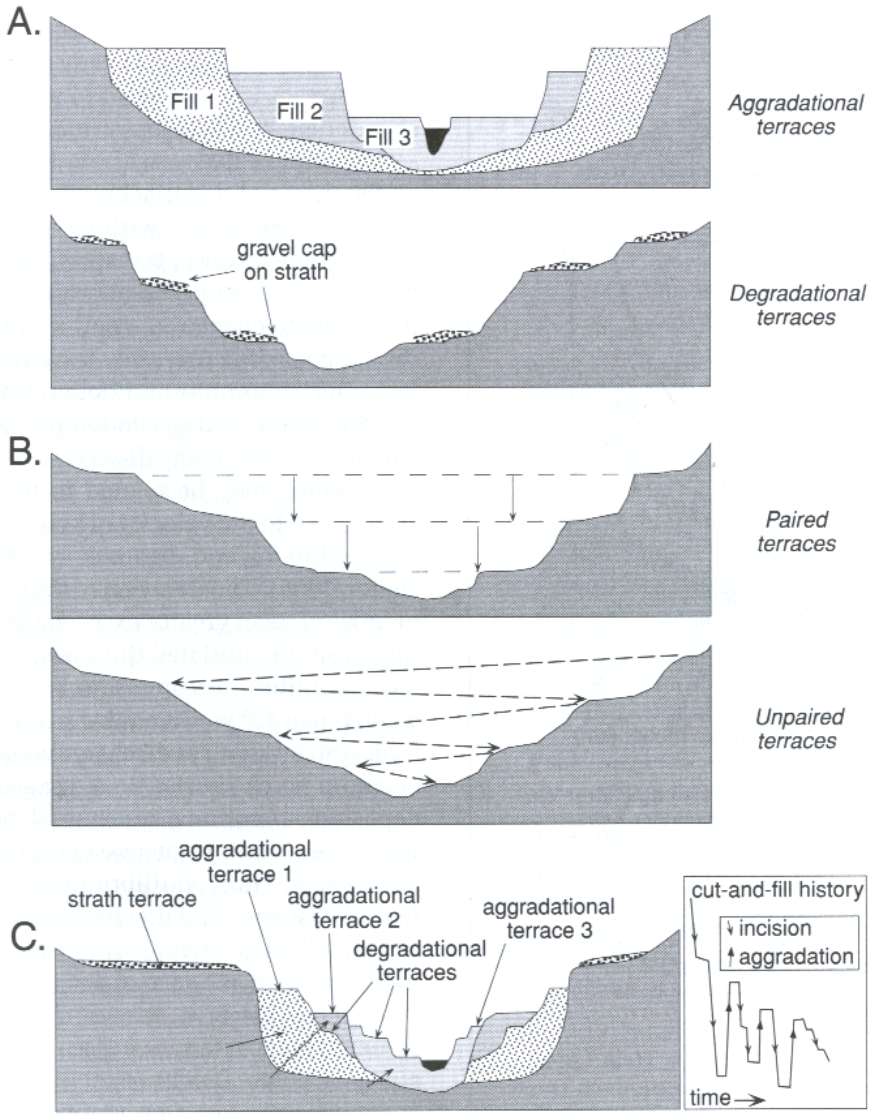




Tectonic Geomorphology

Geomorphic Markers

River Terraces



Tectonic Geomorphology

Geomorphic Markers

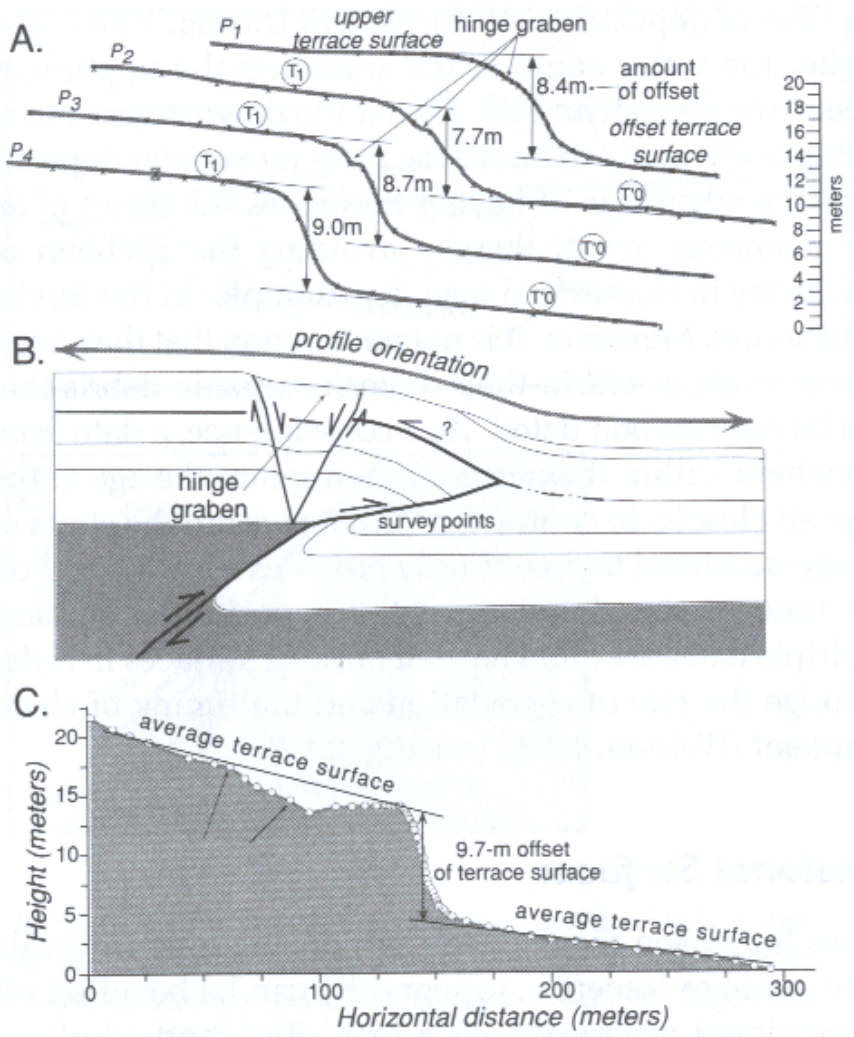
Alluvial fans

Lava Flows

Debris Flows

Landslides

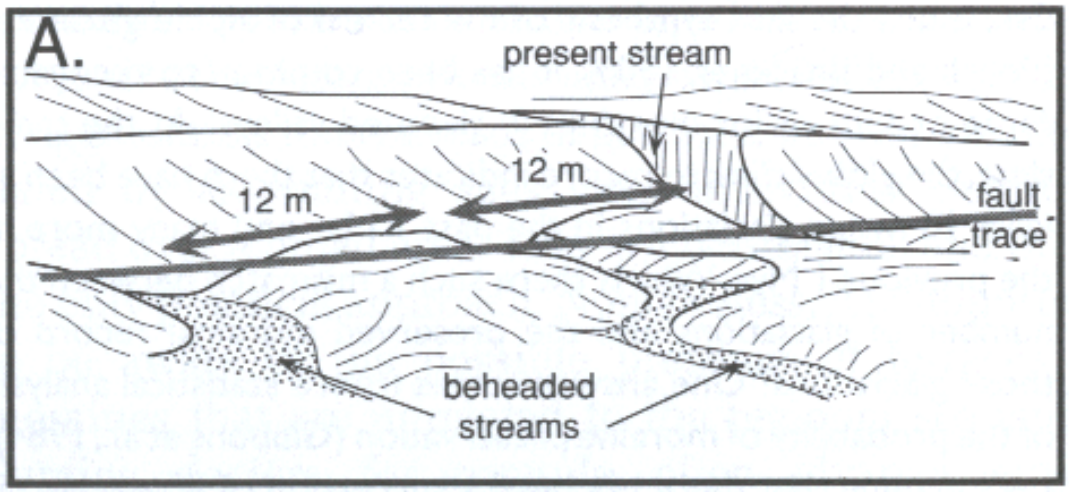
Erosional Surfaces

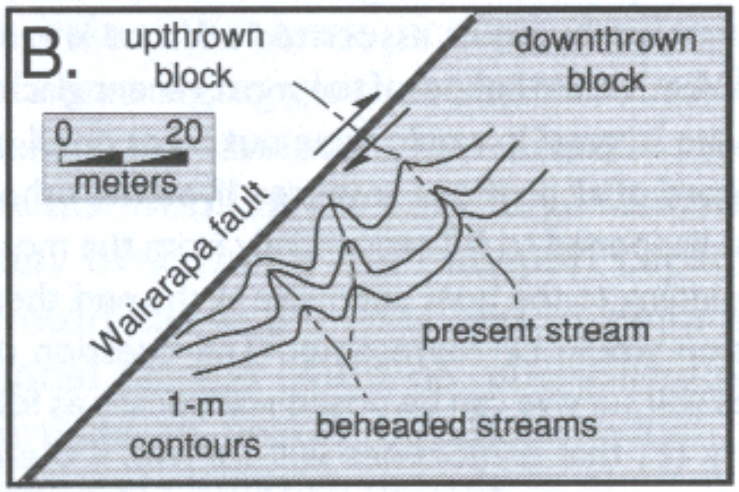


Tectonic Geomorphology

Geomorphic Markers

Beheaded Streams





Tectonic Geomorphology

Geomorphic Markers

Beheaded Streams