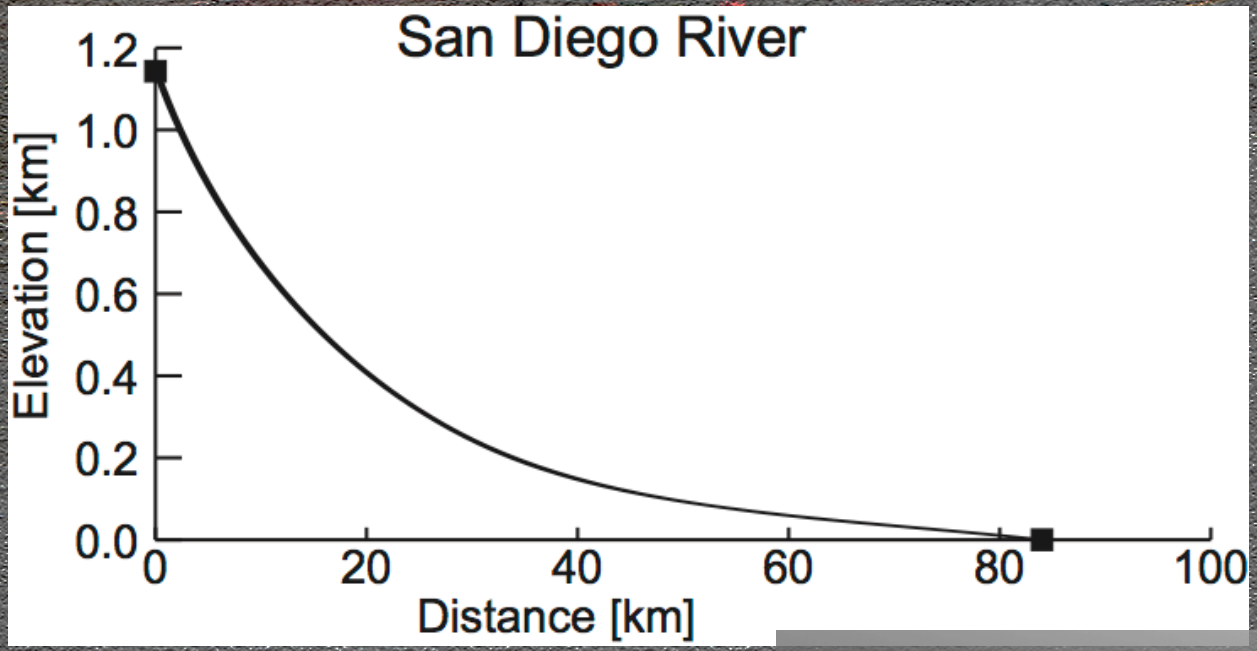
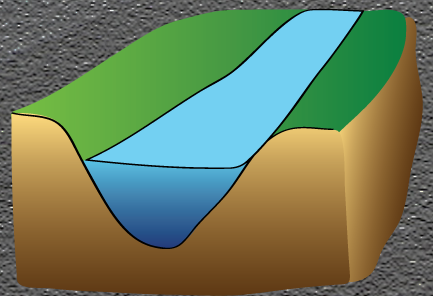
The Longitudinal Profile

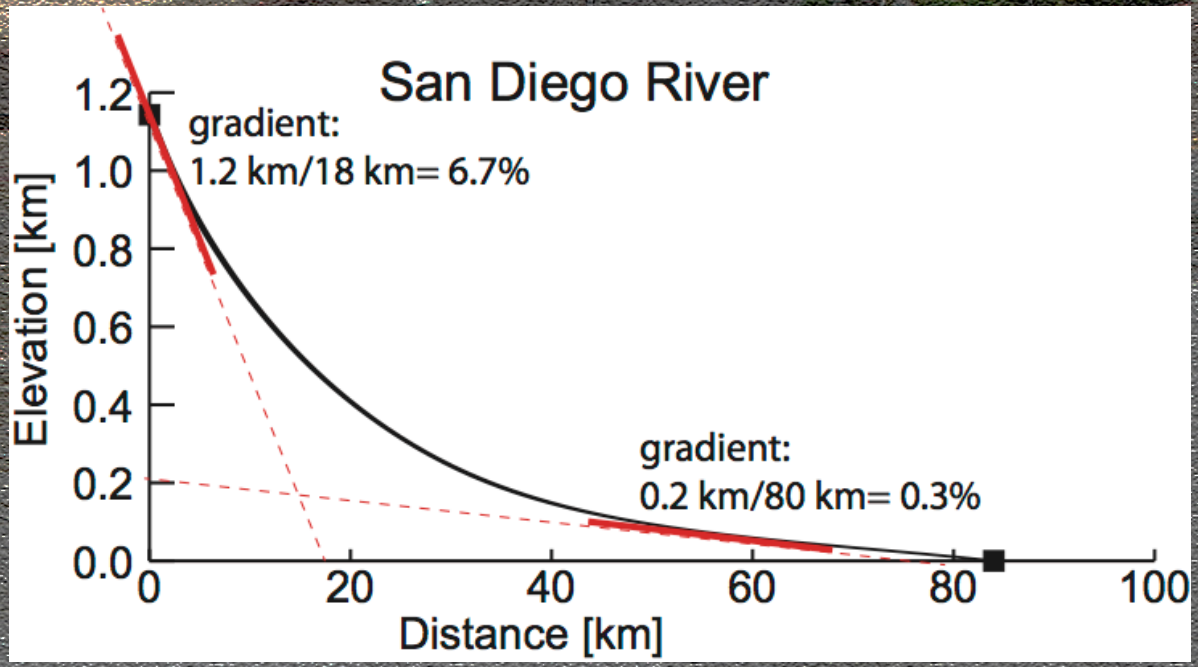
longitudinal profile (stream profile):
elevation vs. distance ALONG the river



cross section:
cut across the river



The Gradient

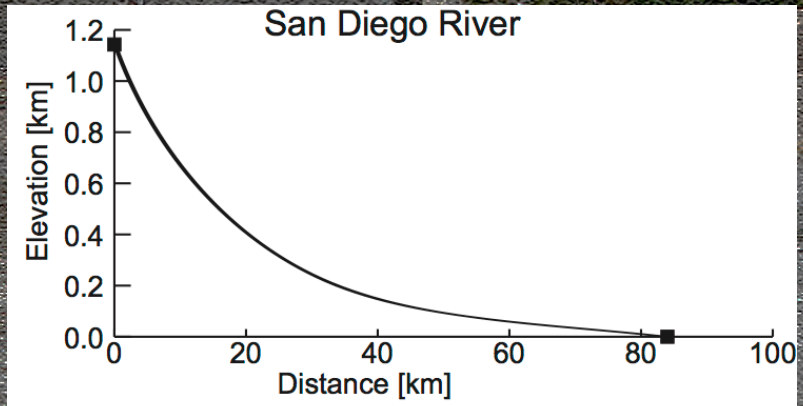


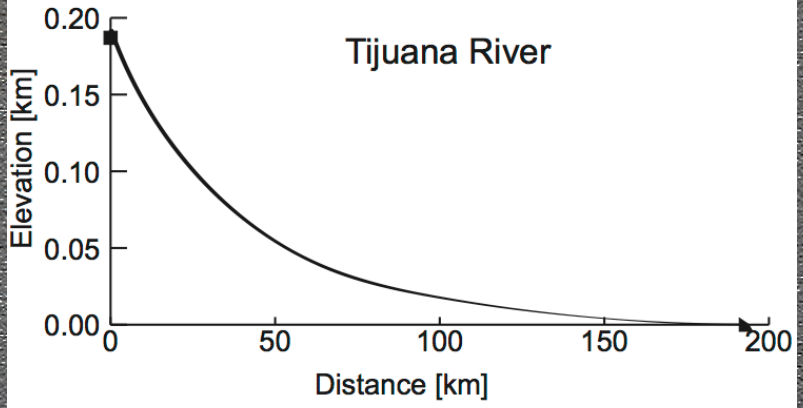
gradient:
height vs distance traveled

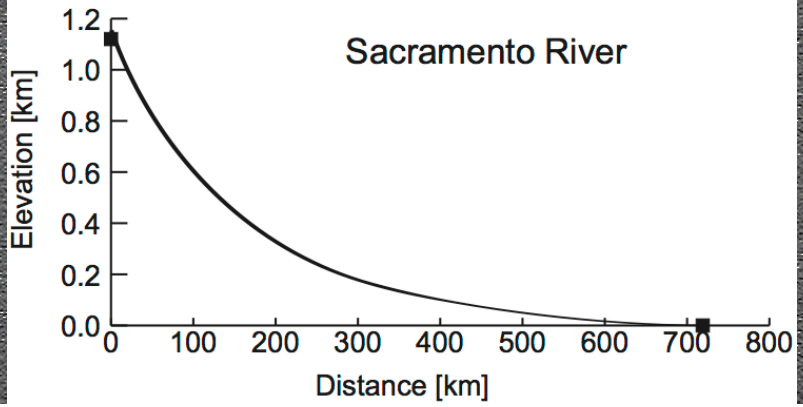
near top: large
near bottom: low

Some Cali River Profiles

every river has the same basic CONCAVE stream profile

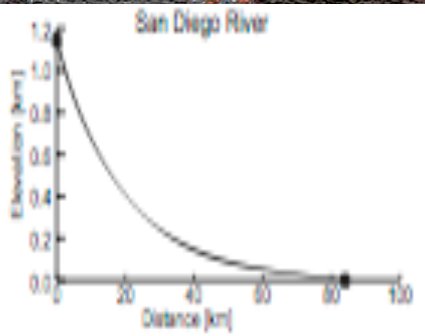






Local River Profiles – Same Scale

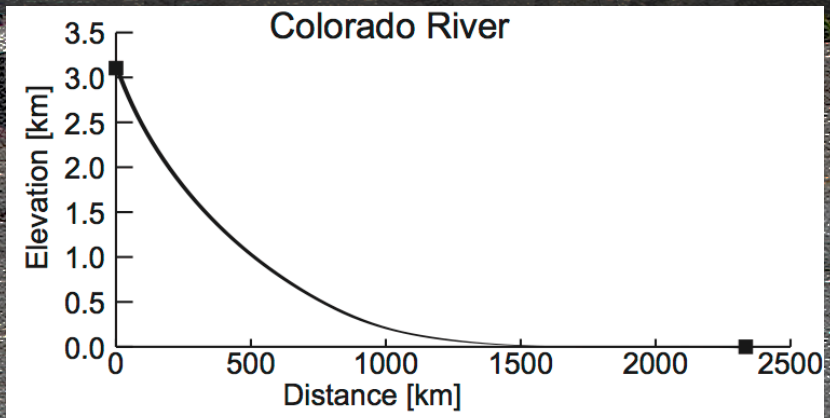
every river has the same basic CONCAVE stream profile

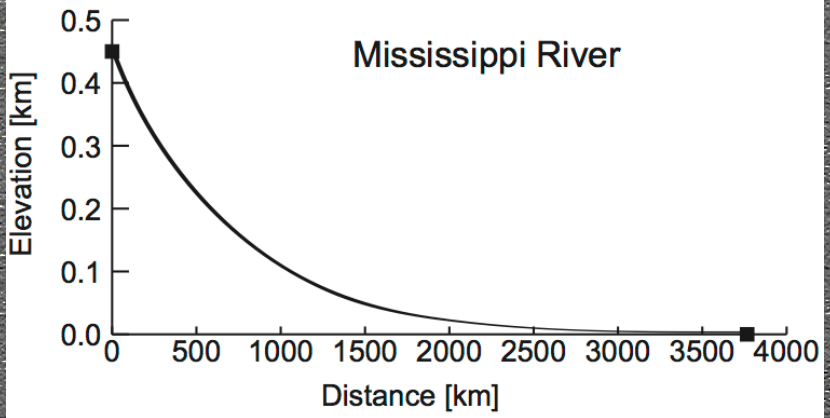


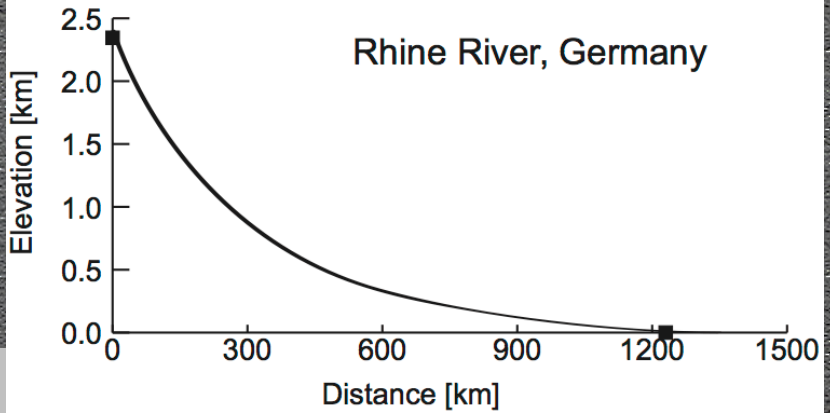
.. but the scales are different

Bigger River Profiles

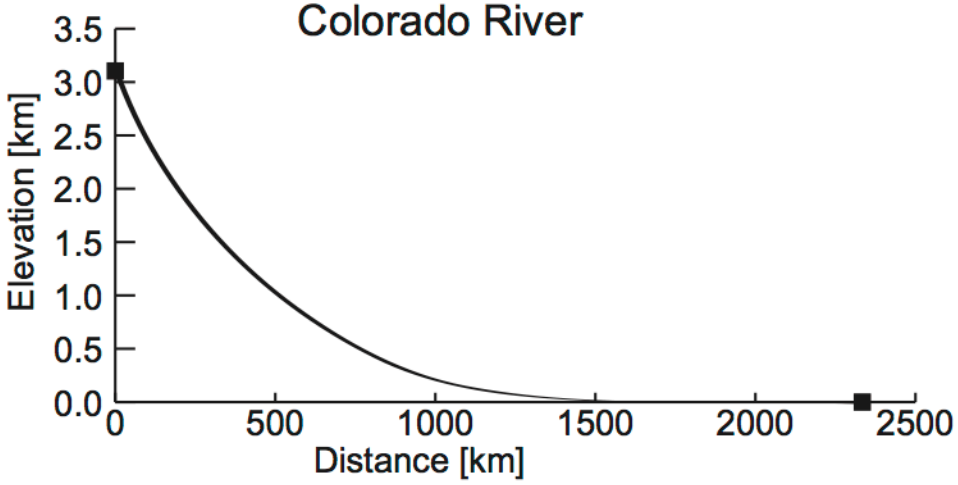
every river has the same Basic CONCAVE stream profile

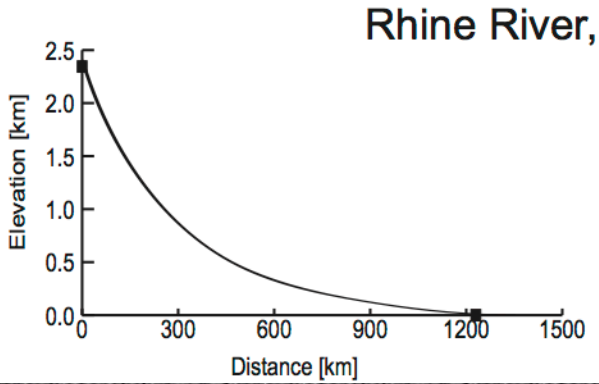






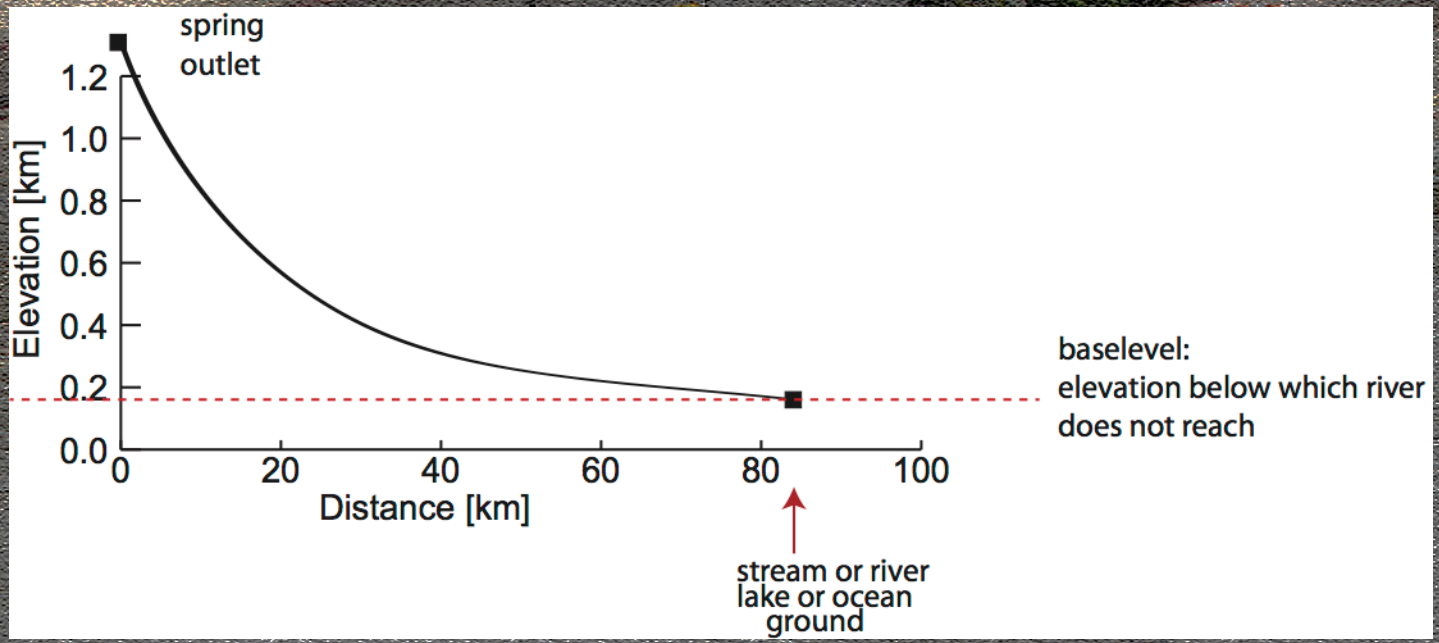
Bigger River Profiles - Scaled





.. but the scales are different

The Spring, the Mouth and the Baselevel

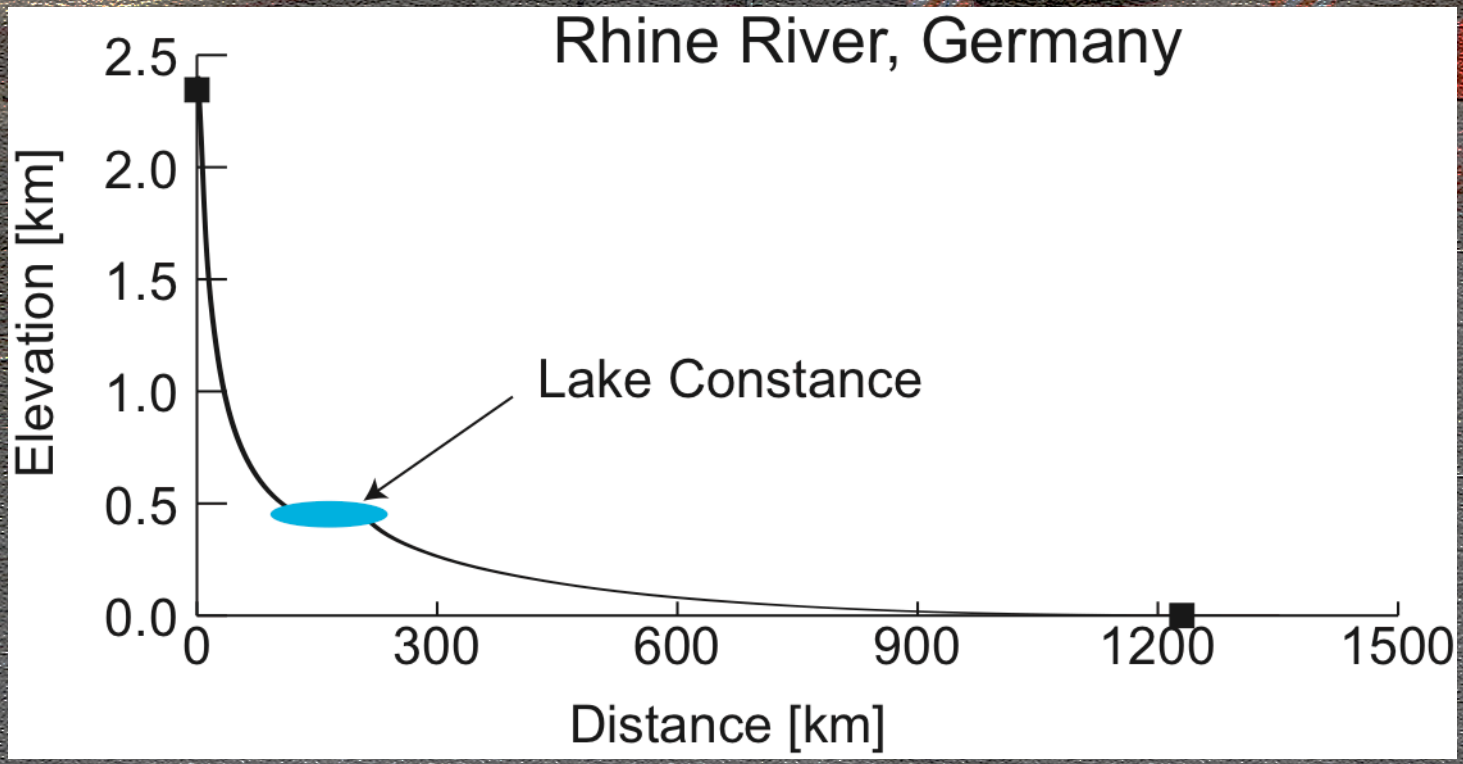


near top: spring or outlet

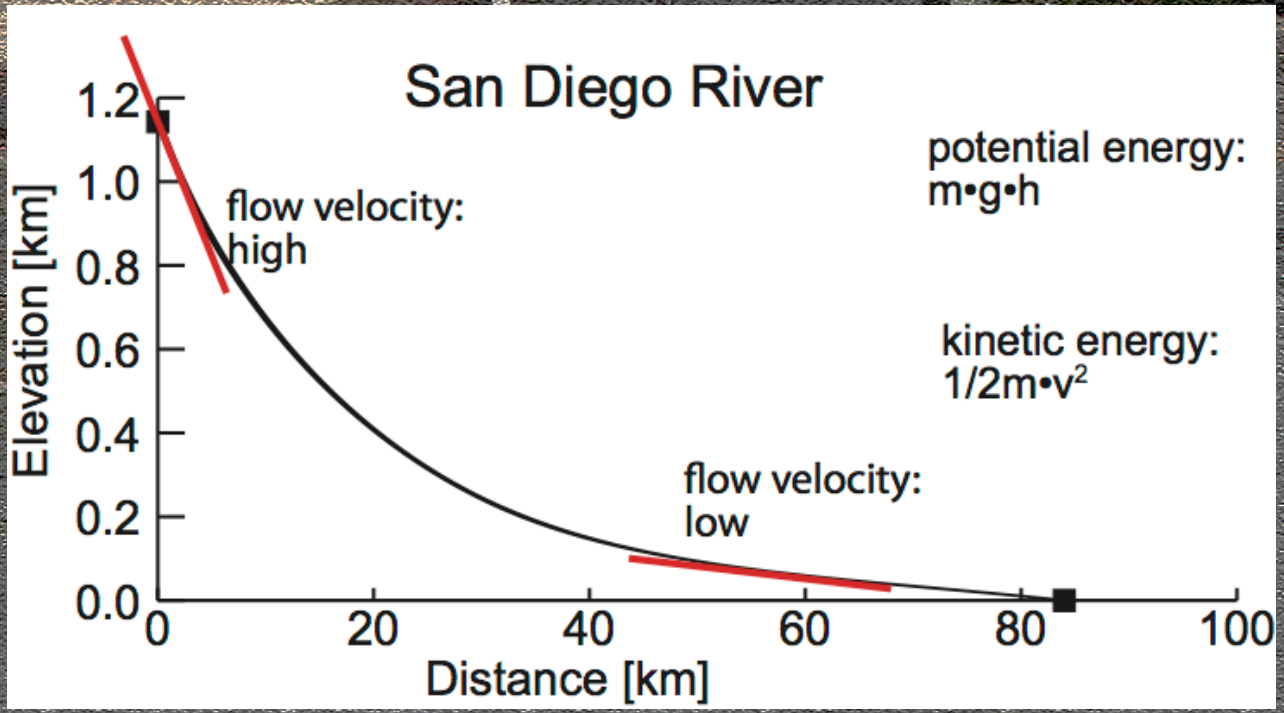
near bottom: mouth

baselevel:
elevation below which river does not reach
may be higher than 0 m

The Profile of the River Rhine



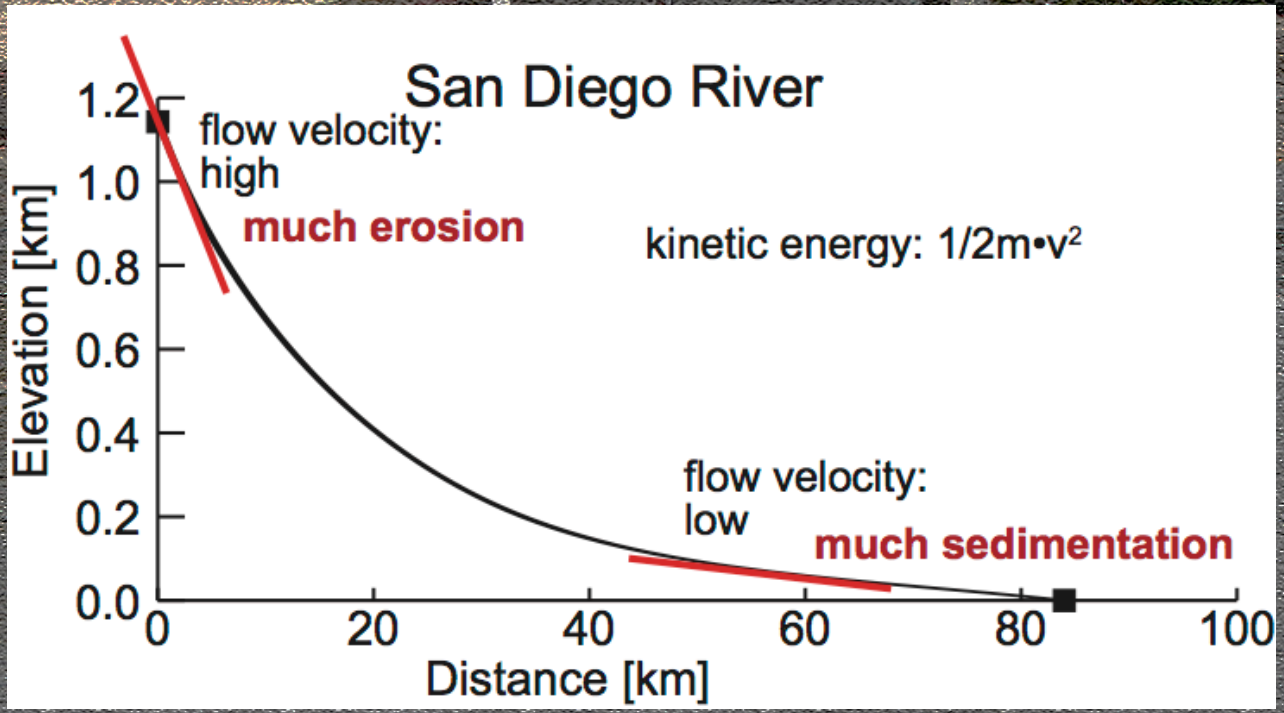
The Gradient and the Energy Budget



initially:
lots of potential energy
-> transferred to kinetic energy

near bottom:
✧all potential energy spent
✧kinetic energy left

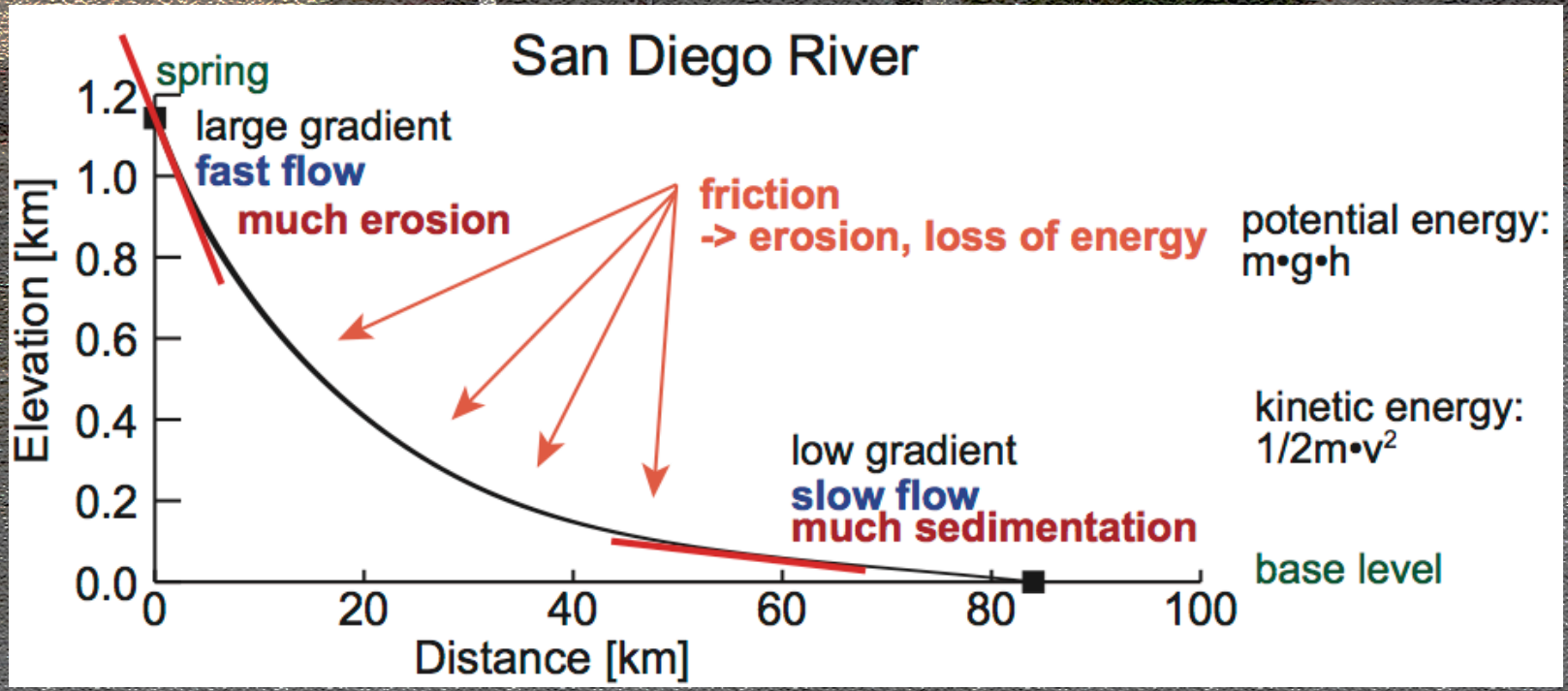
Erosion and Sedimentation



near top:
much erosion

near bottom:
much sedimentation

Energy and Erosion



some of kinetic energy lost to
- ✧friction
- ✧erosion
- ✧near bottom: dump sediments to keep going