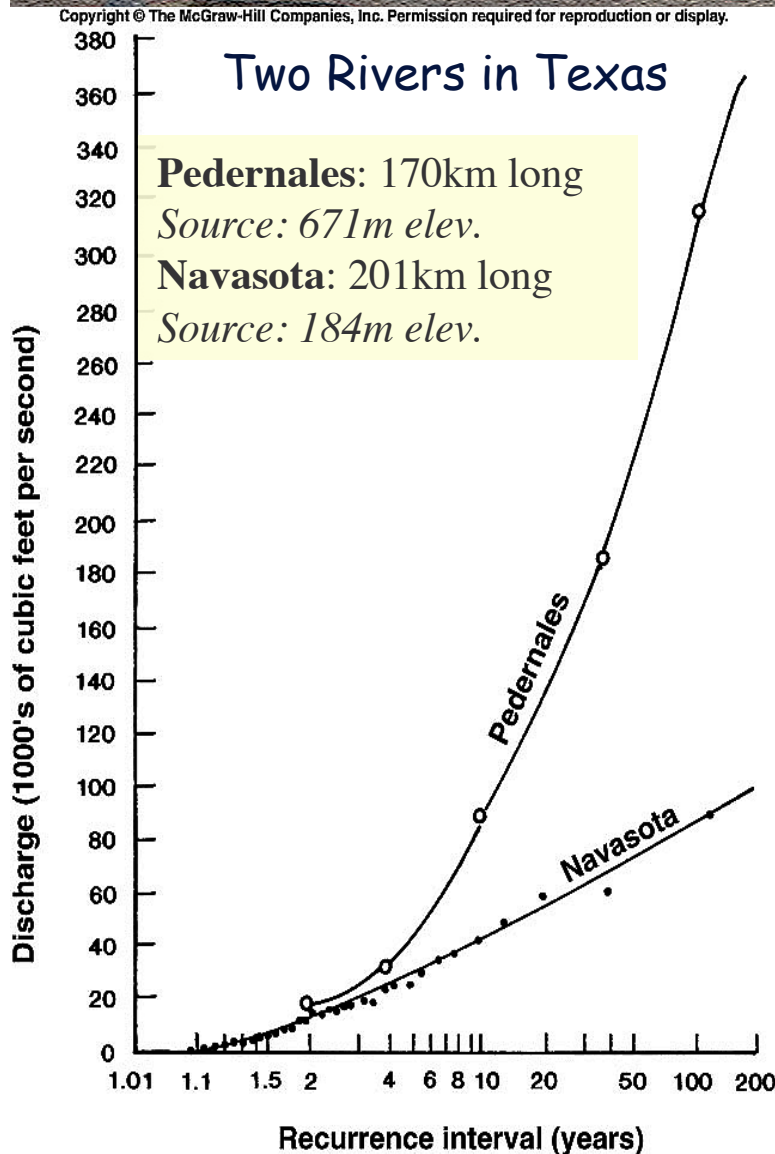


Flood Frequency Curves (FFC)

likelihood for certain flood events from FFCs

FEMA: Federal Emergency Management Agency; uses FFCs for regulations



- ✧ small floods more often than large floods
- ✧ different rivers have different FFC

✧ the likelihood of a certain size flood is increasing with time

a 100-year flood has

- ✧ 1% probability to occur in any year
BUT
- ✧ only 63% to occur in 100 years

Source: P. Abbott "Natural Disasters"

The Role of Levees

supposed to

- ✧ keep river in its bed
- ✧ avoid spill into flood plain
- ✧ protect near-sea level land from ocean
- ✧ flood gates for controlled flooding

ACE: Army Corpse of Engineers;
responsible for
flood control channels and
levees

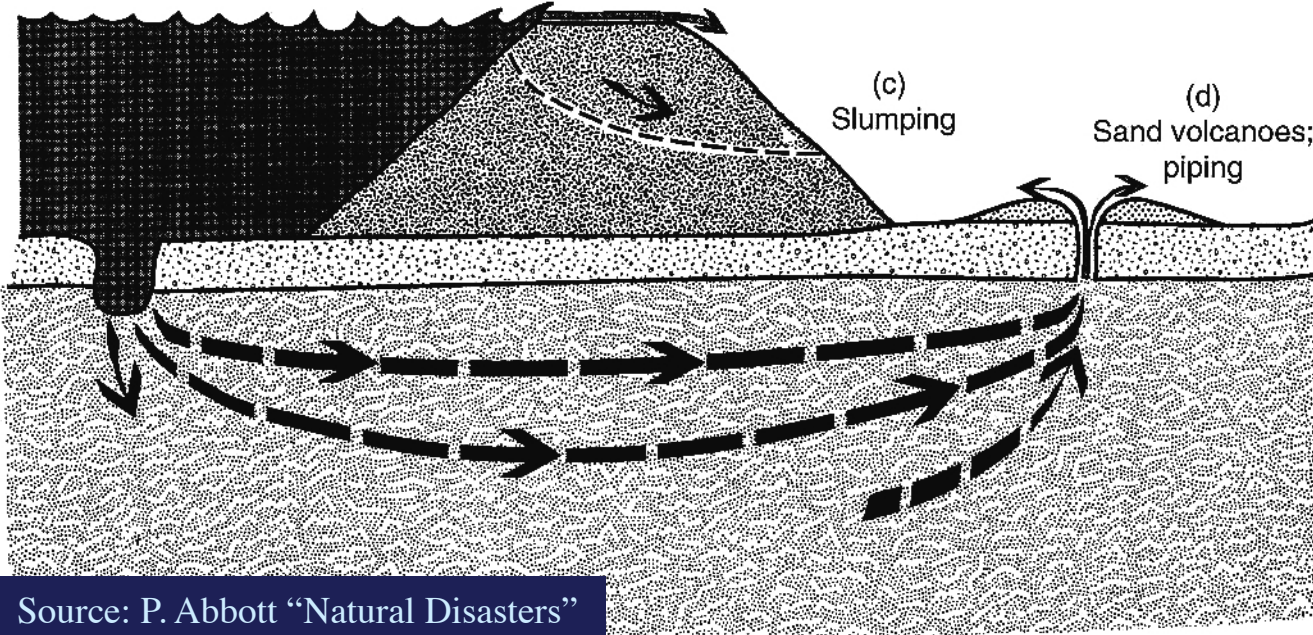
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(a) Wave attack

(b) Overtopping water

(c)
Slumping

(d)
Sand volcanoes;
piping

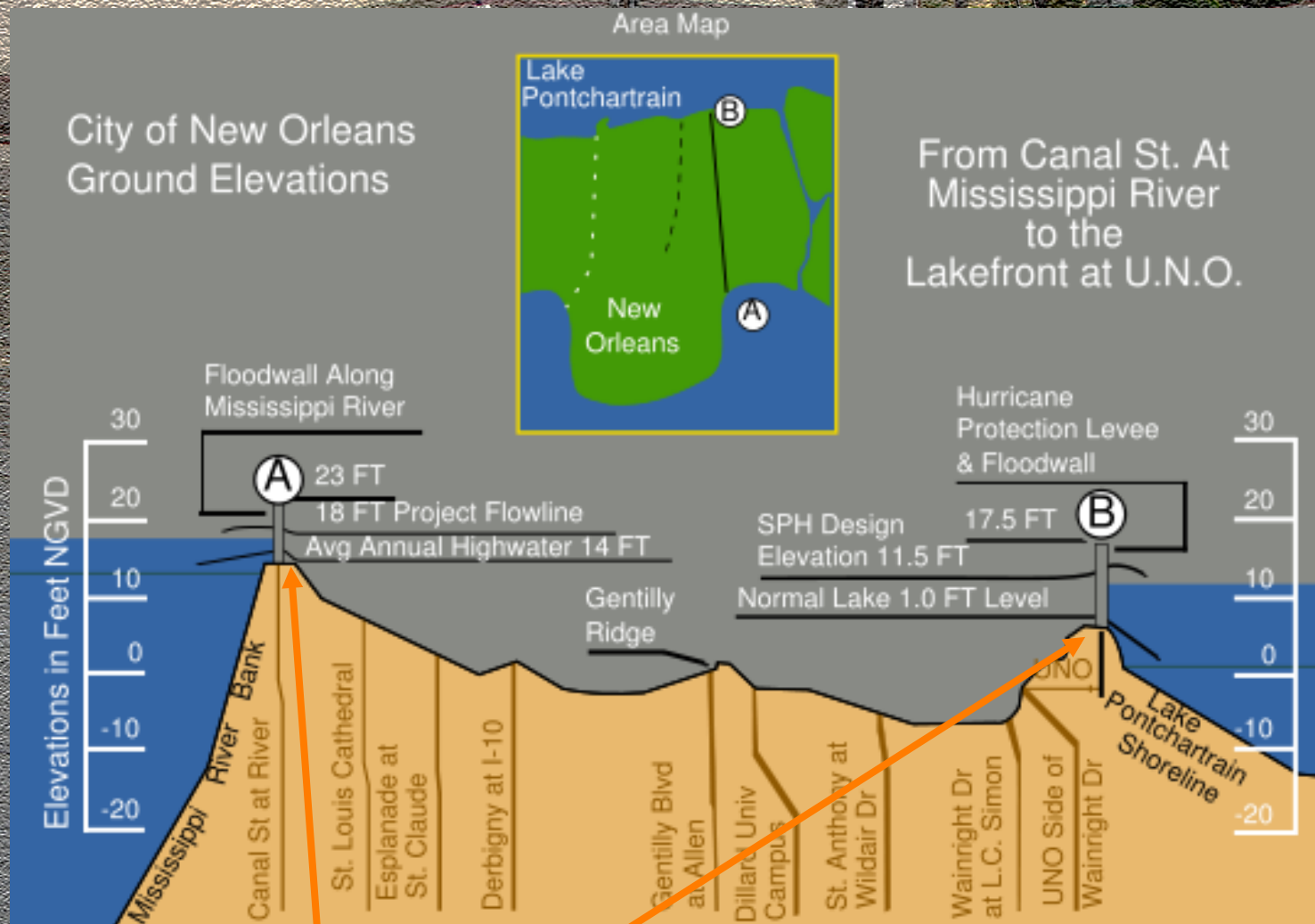


Source: P. Abbott "Natural Disasters"

fail due to

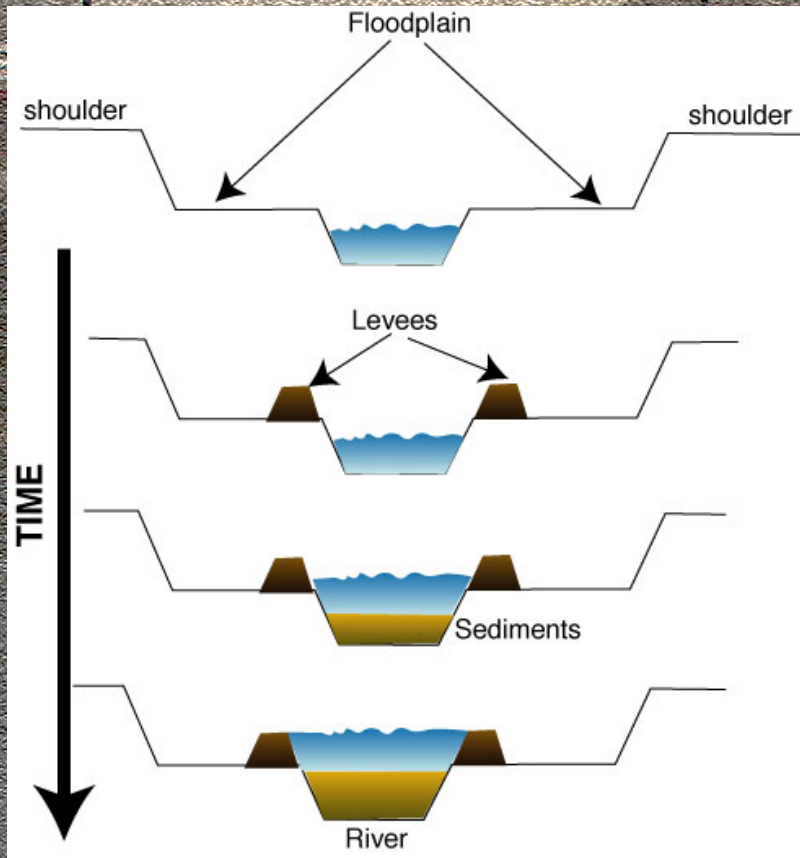
- wave attack
- overtopping
- slumping
- piping

2005 Katrina: The Impact of Levees – New Orleans



NGVD: national geodetic vertical datum (1929)
SPH: Louisiana Standard Project Hurricane

The Impact of Levees



CONS:

- ✧ higher levees ... time ... -> river ABOVE floodplain
- ✧ **MISSISSIPPI:** floodwater height increased 2-4 m in engineered upper basin
- ✧ no change in not-engineered sections

this also happens to local flood control channels!



PERHAPS:

- remove some levees to restore wetland habitat and ease flood risk
- move towns
- Louisiana: restore wetlands (\$18 billion)