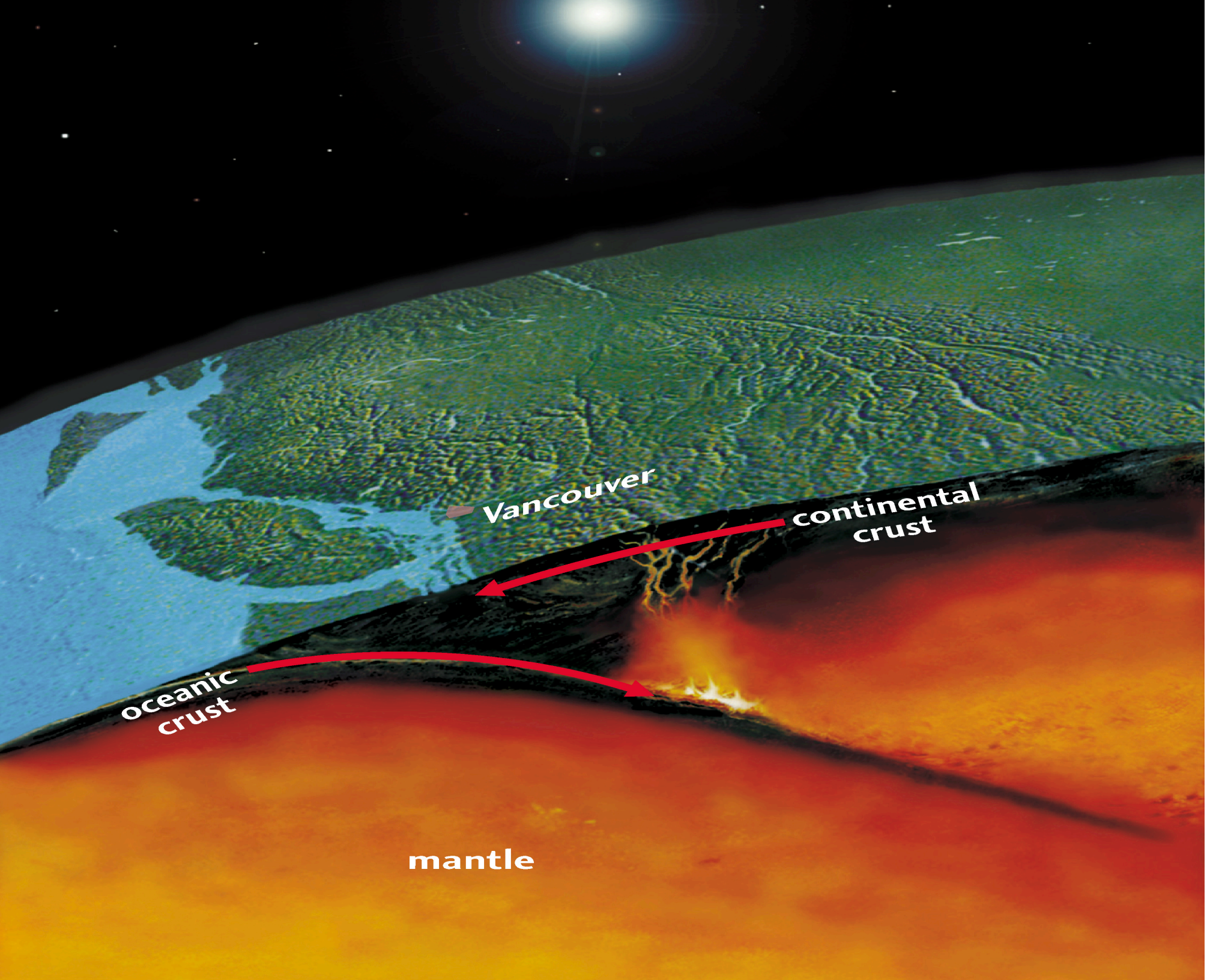
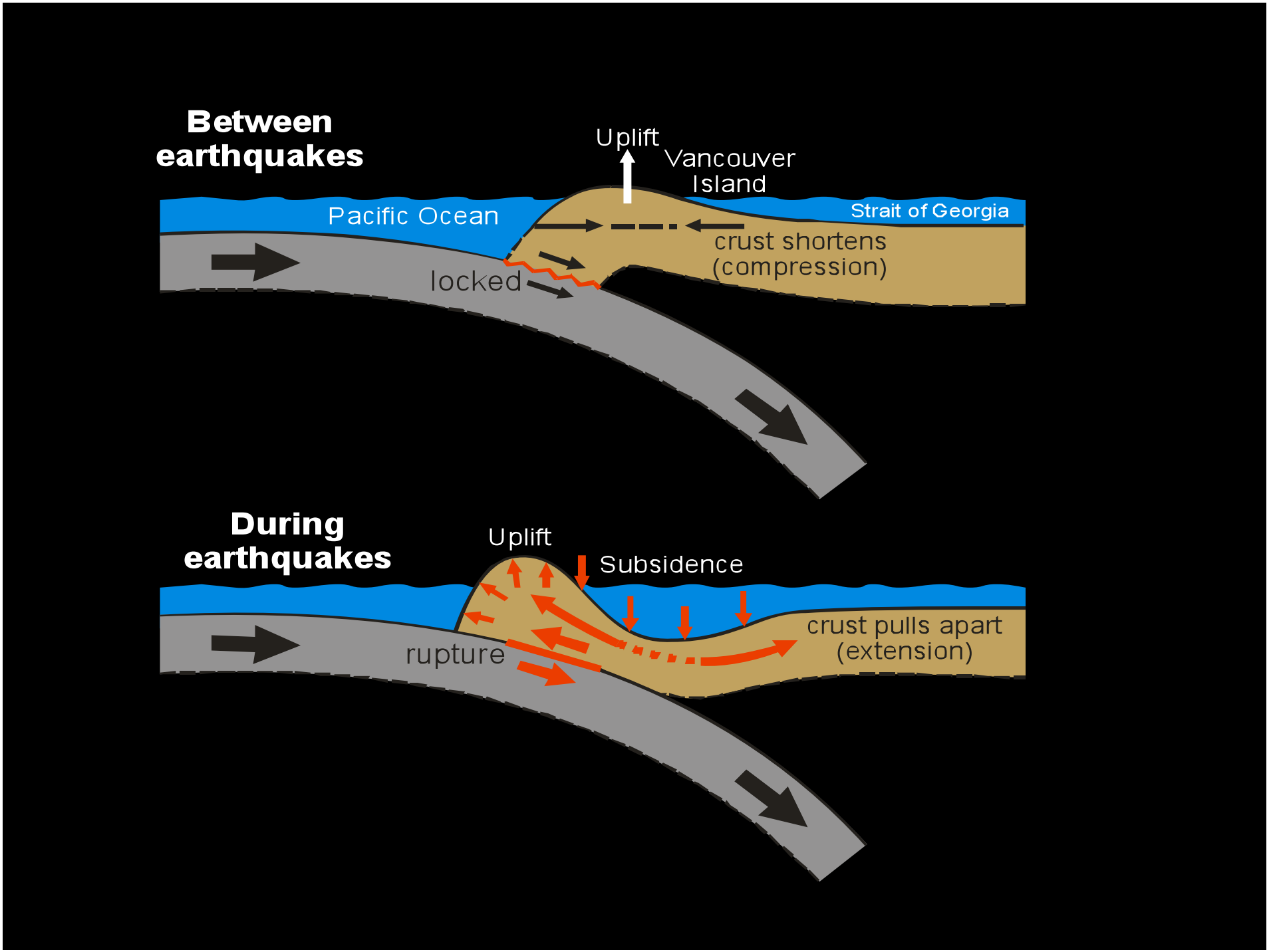
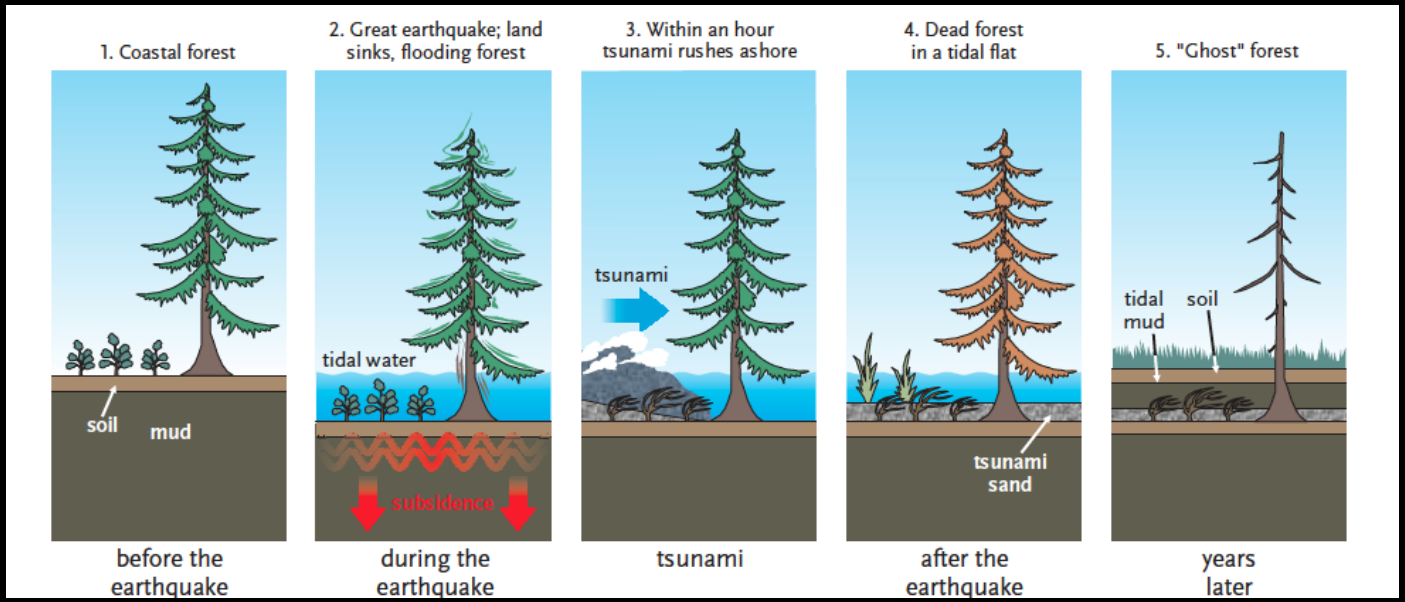
Since Europeans first settled B.C., we have known that earthquakes occur here …

…. but we did not know that giant earthquakes happen just off our coast until 30 years ago


Vancouver
continental crust
oceanic crust
mantle

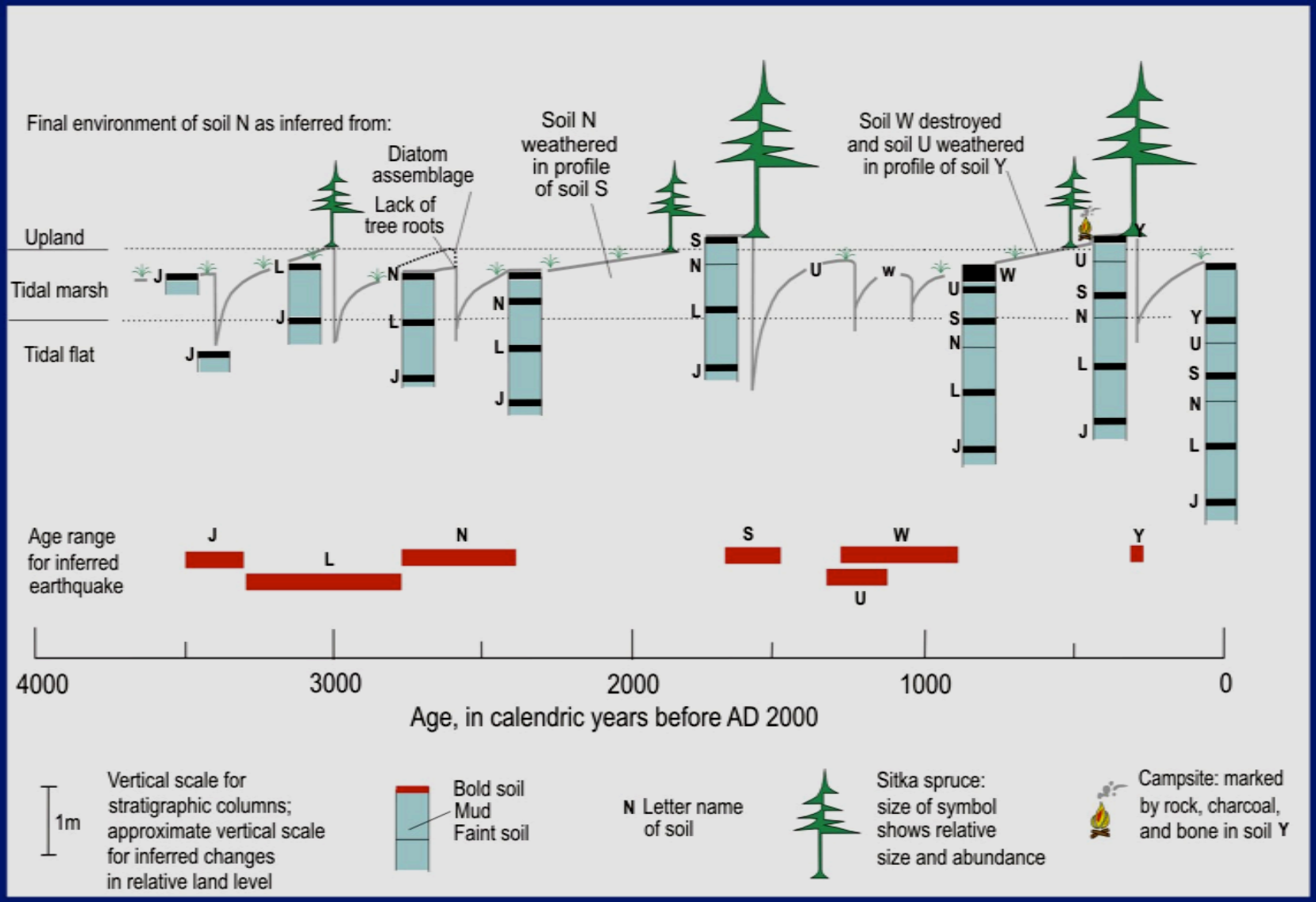

Between earthquakes
Uplift
Vancouver Island
Pacific Ocean
Strait of Georgia
crust shortens (compression)
locked
During earthquakes
Uplift
Subsidence
crust pulls apart (extension)
rupture

Tidal wetland record

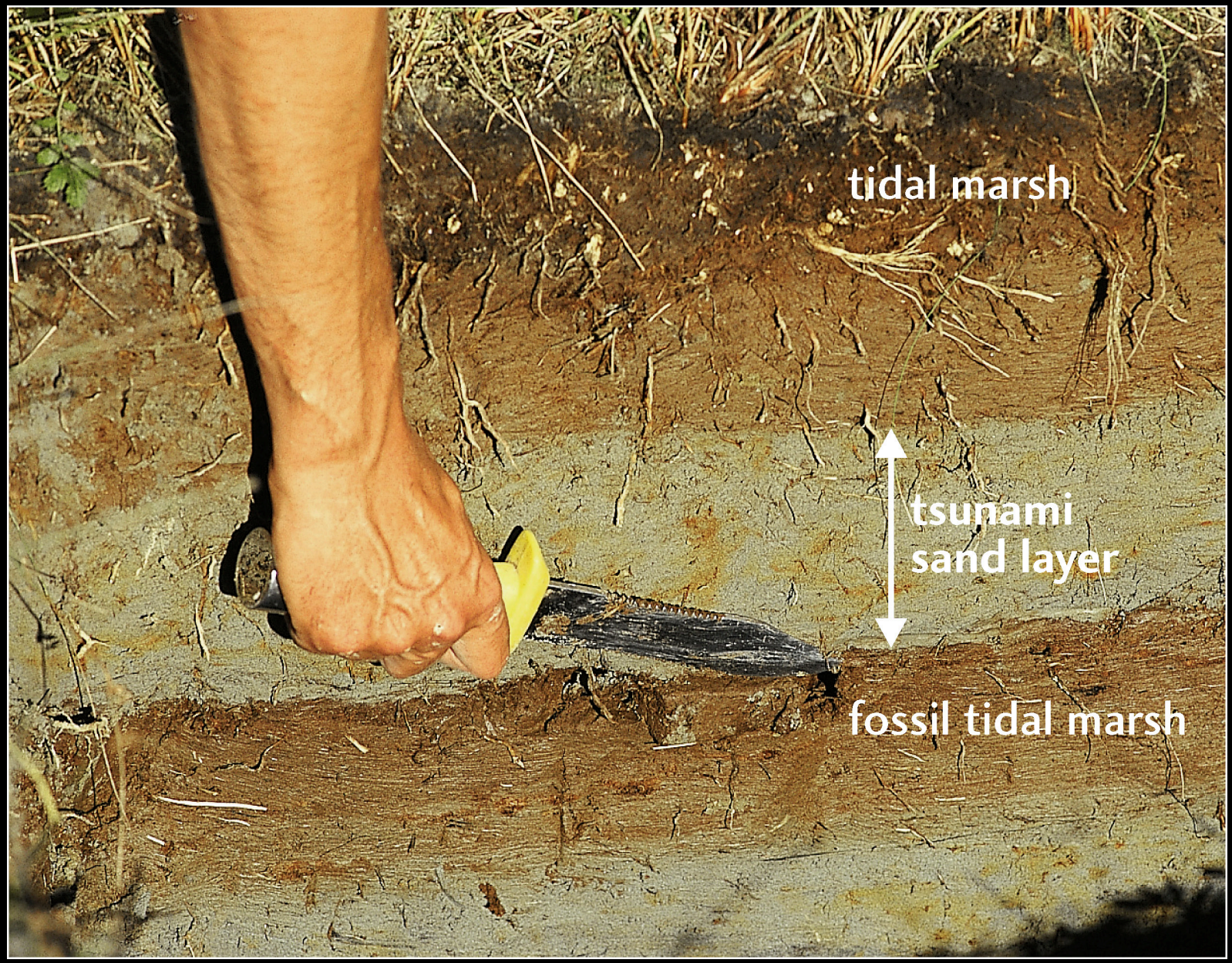


Niawiakum River, WA

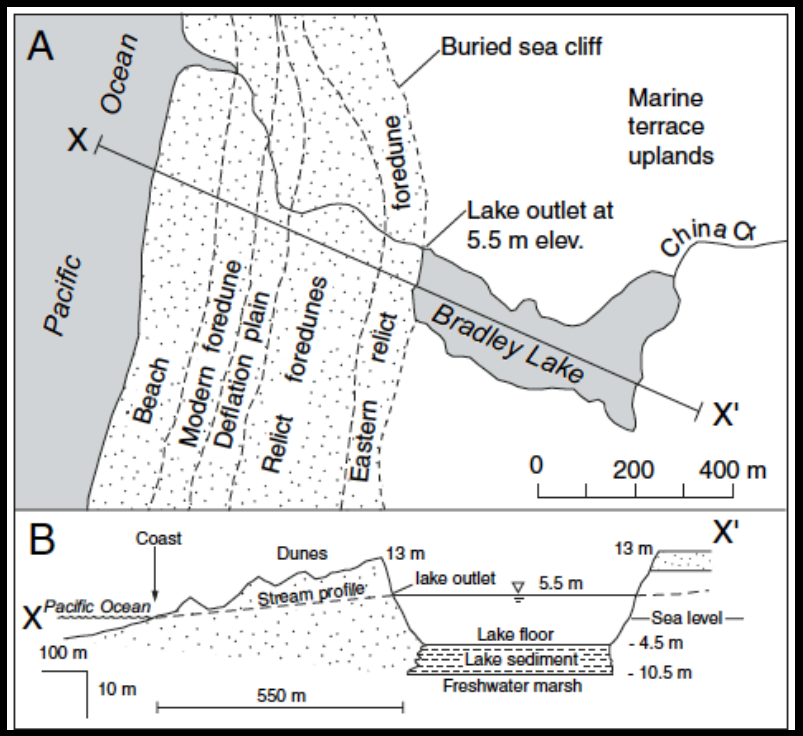
Recurrence – tidal marshes

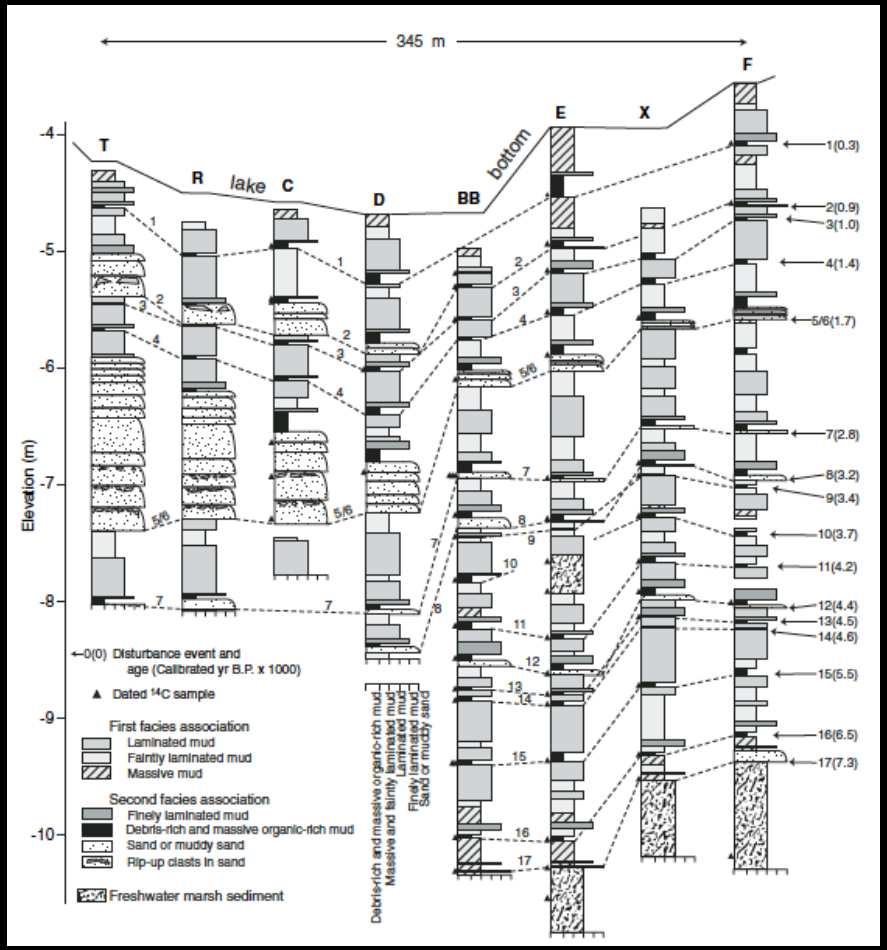


Tsunami research



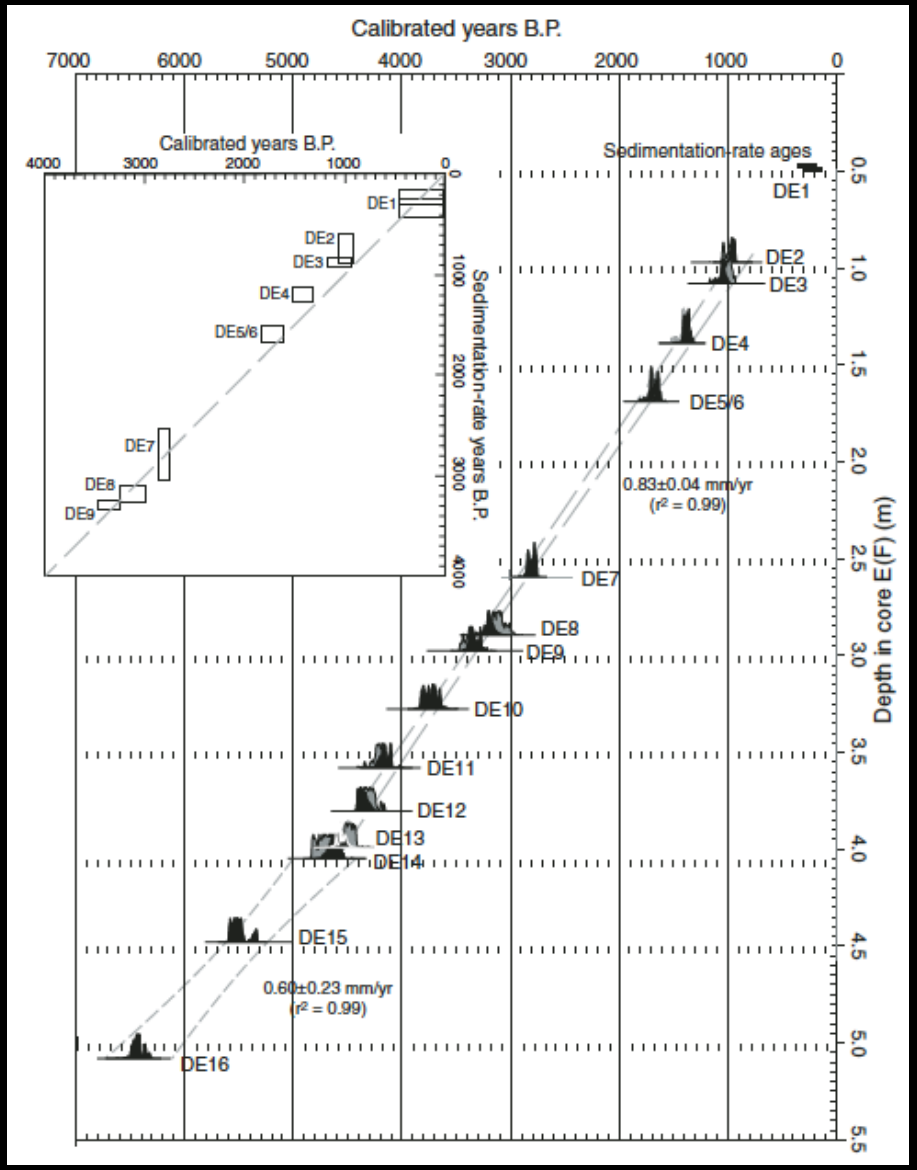
Tofino, BC





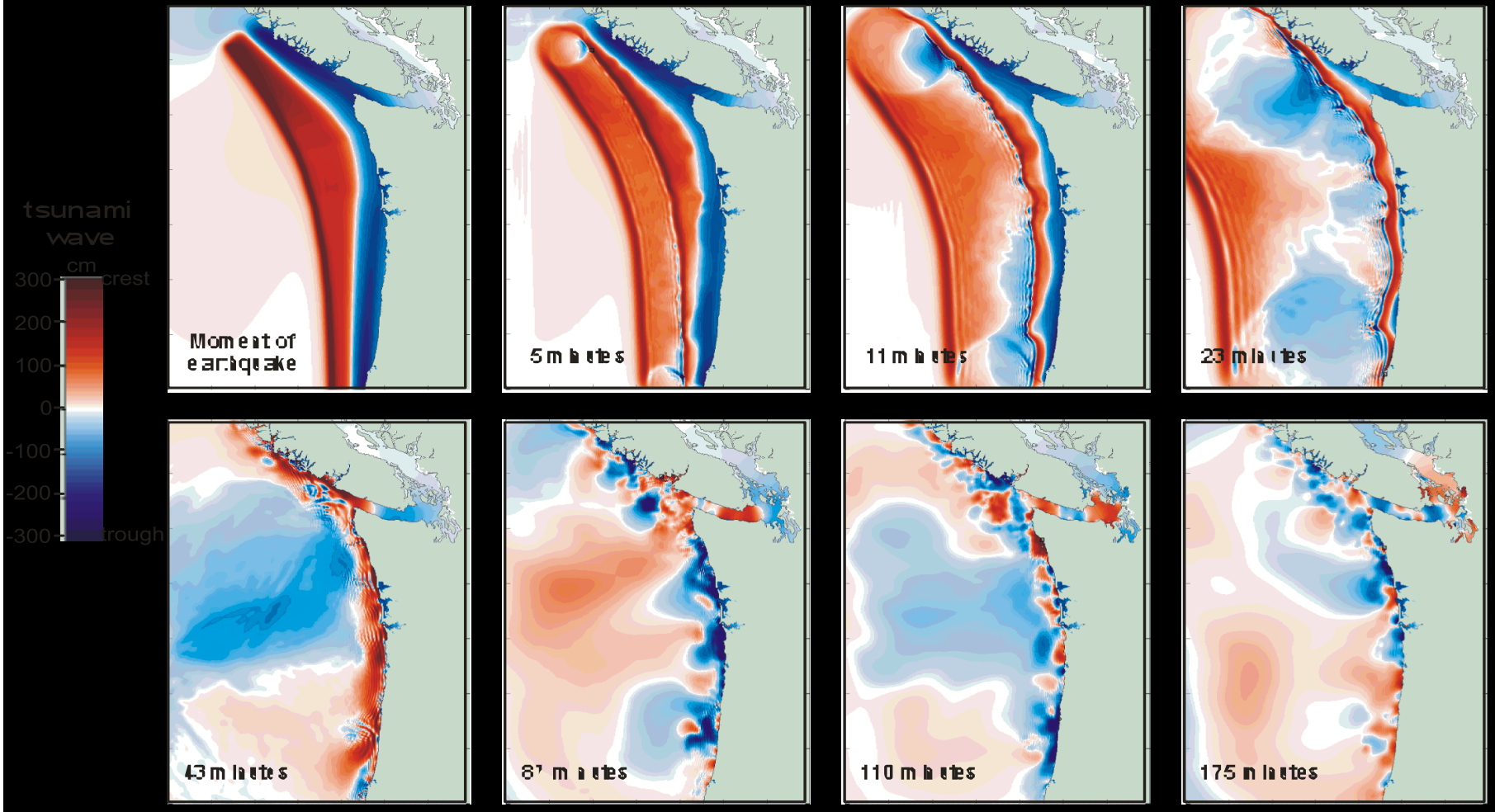
Kelsey et al., 2005

Recurrence – coastal lakes



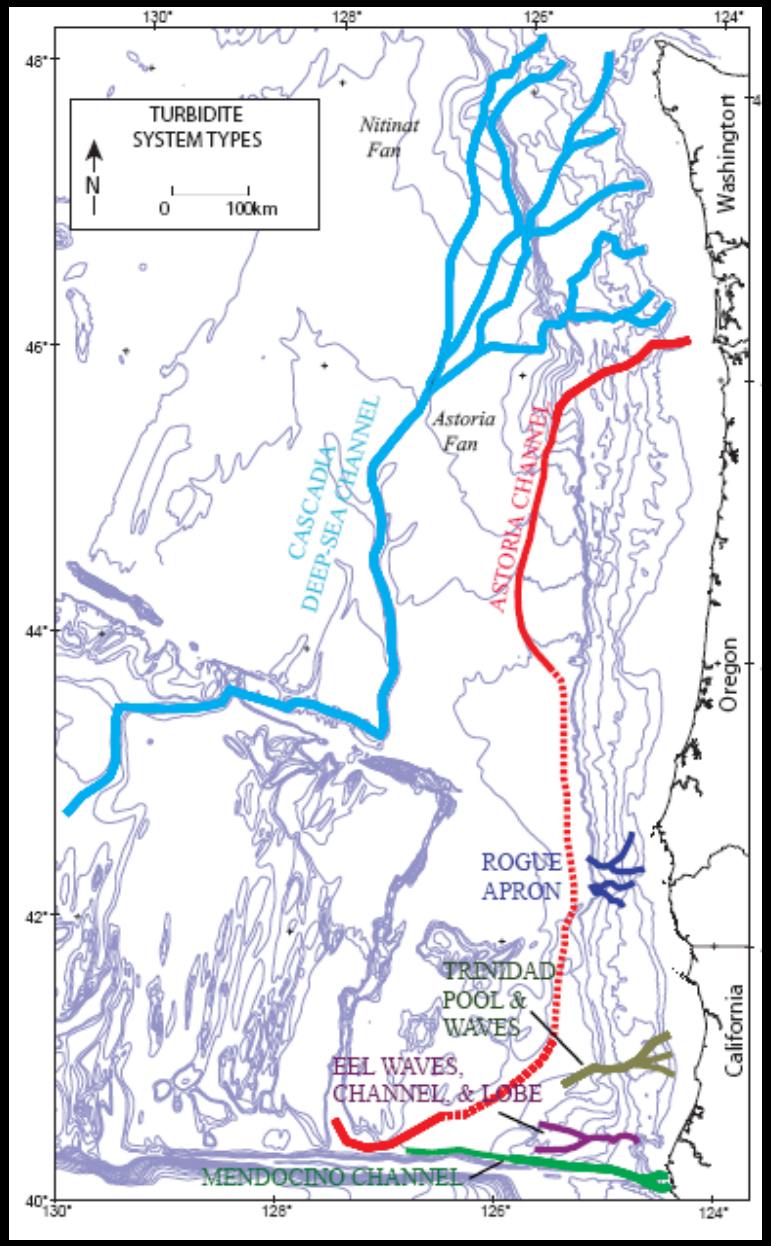
Kelsey et al., 2005

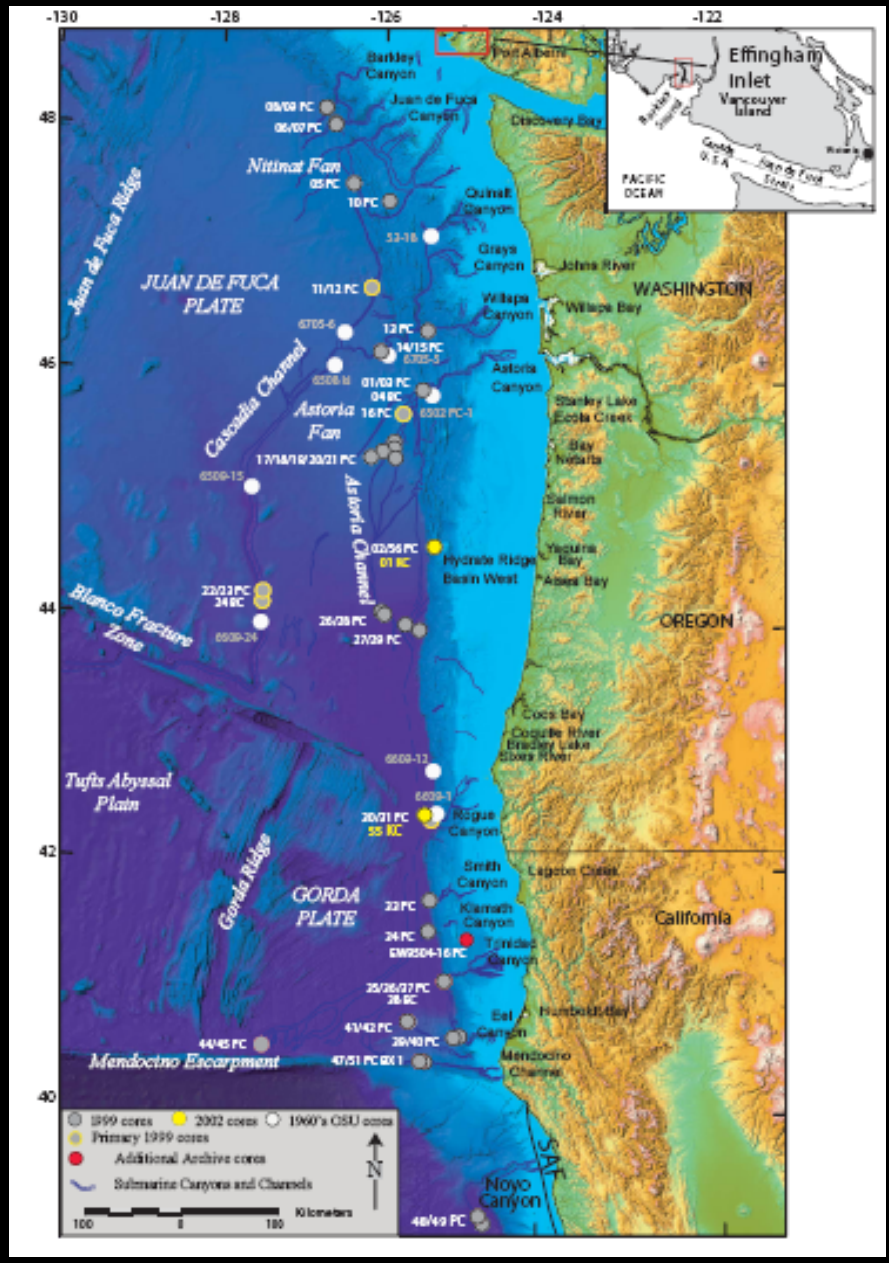
Tsunami modelling

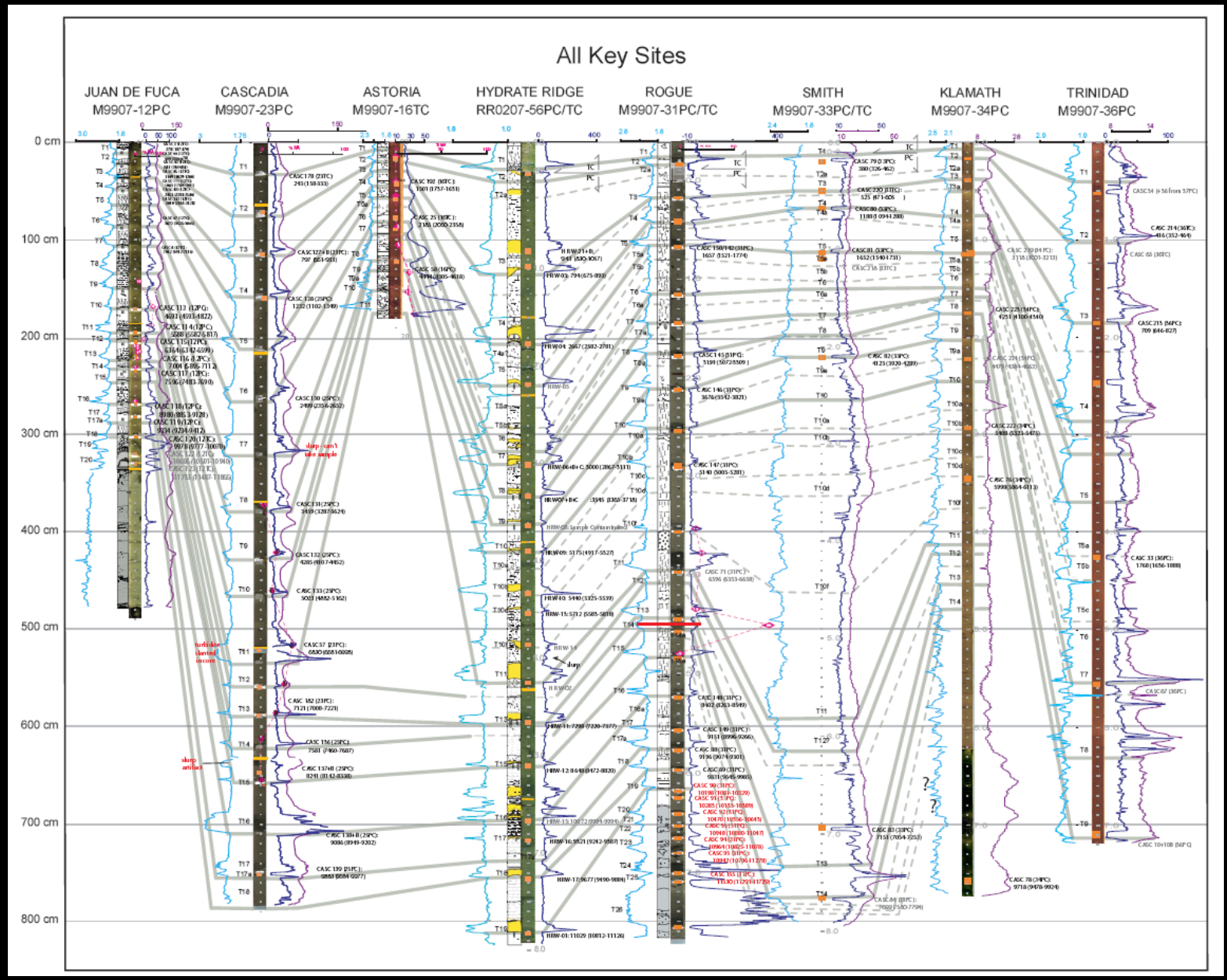


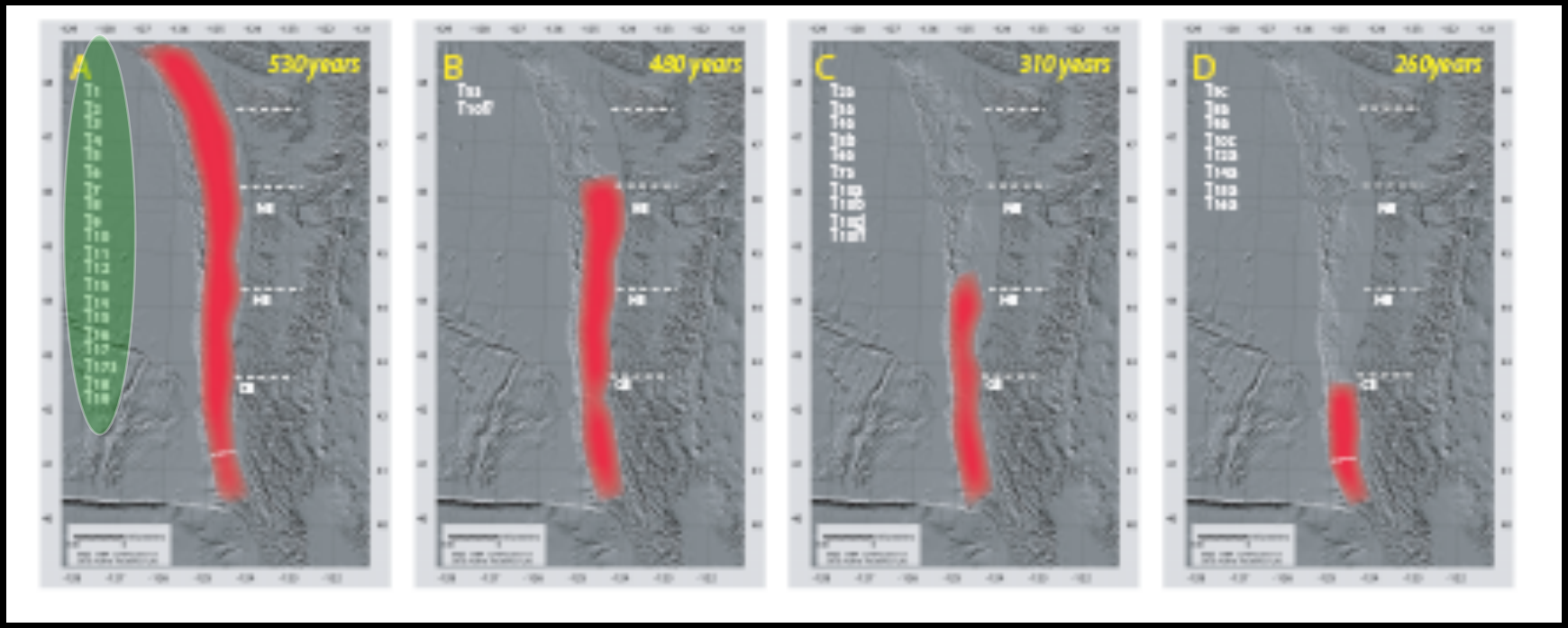
Institute of Ocean Sciences

Offshore turbidite record






All Key Sites
JUAN DE FUCA
M9907-12PC
CASCADIA
M9907-23PC
ASTORIA
M9907-16TC
HYDRATE RIDGE
RR0207-56PC/TC
ROGUE
M9907-31PC/TC
SMITH
M9907-33PC/TC
KLAMATH
M9907-34PC
TRINIDAD
M9907-36PC
0 cm
100 cm
200 cm
300 cm
400 cm
500 cm
600 cm
700 cm
800 cm


A
530years
B
480years
C
310years
D
260years

Recurrence – turbidite record

Oldest turbidite, ca. 9800 yrs old

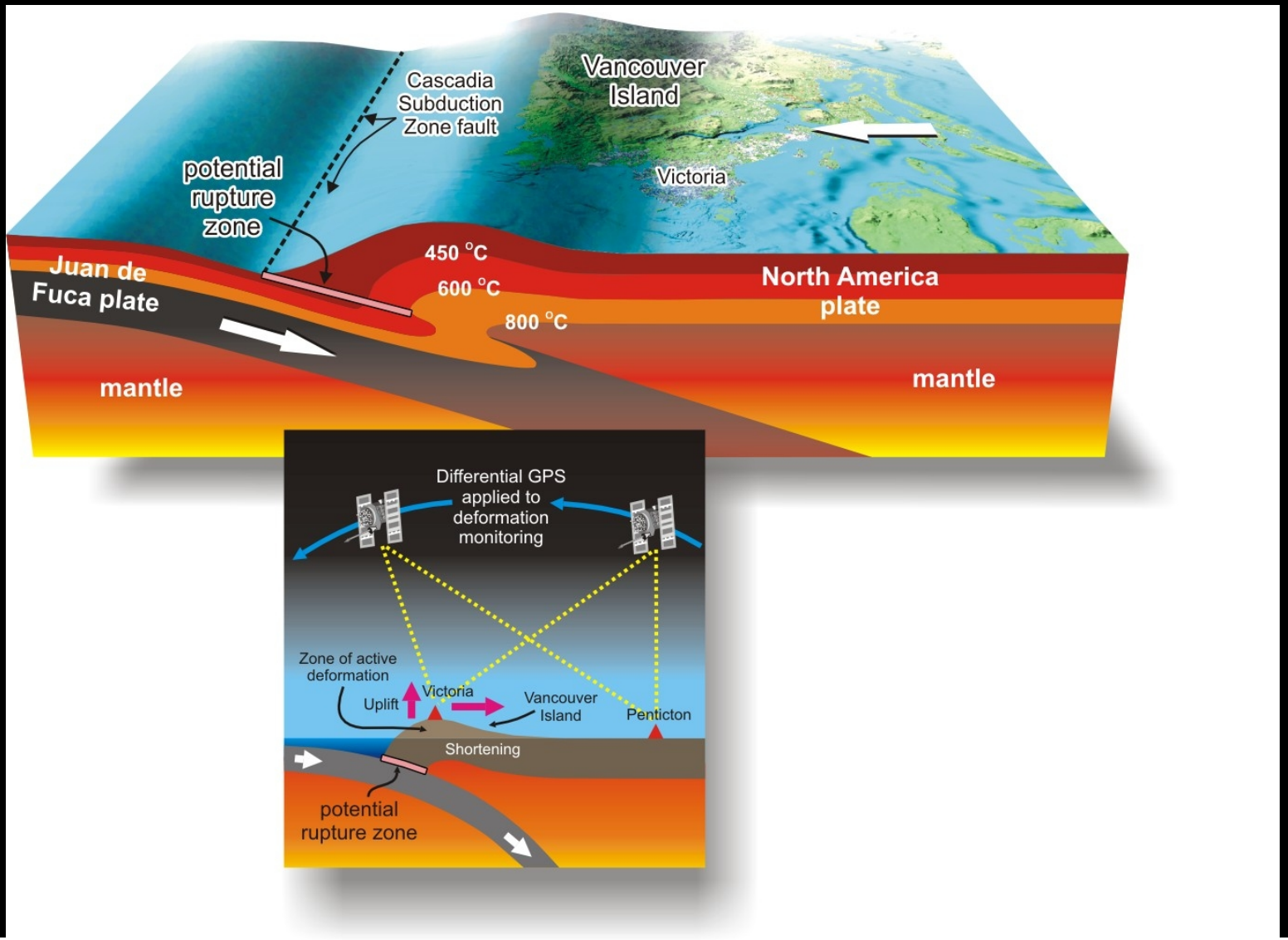
Youngest turbidite, AD 1700

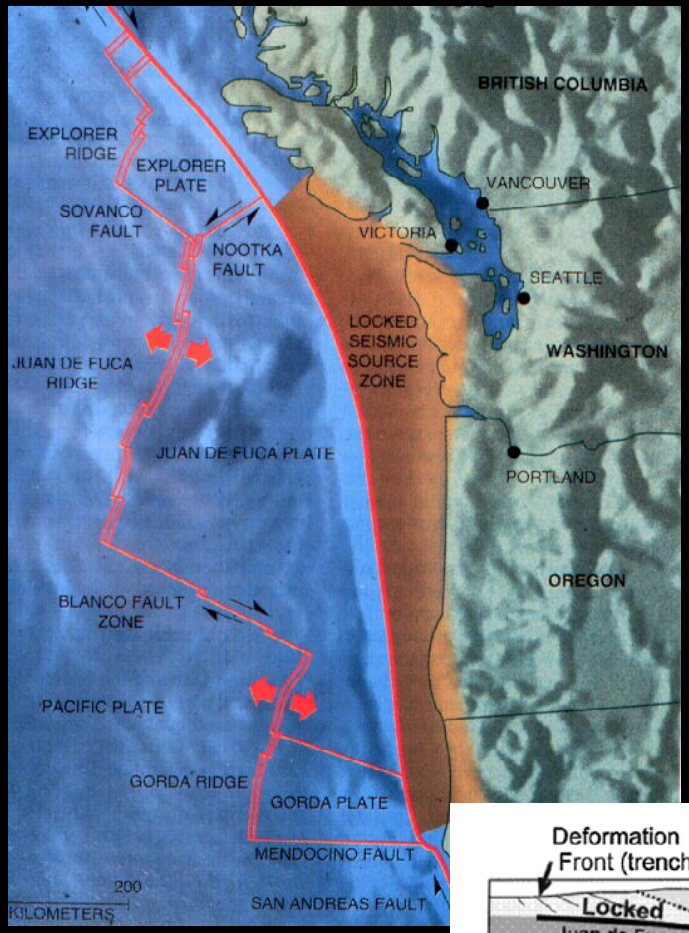
19 full length ruptures – average recurrence 530 yrs

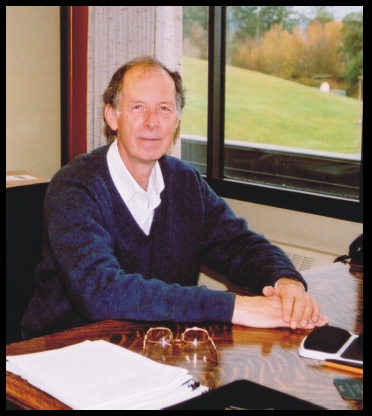
2 ruptures of southern 50-70% of margin

18 smaller ruptures along southern margin

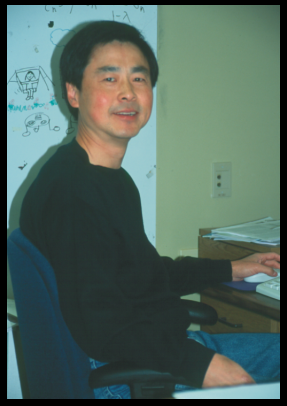
Contributions from geophysicists



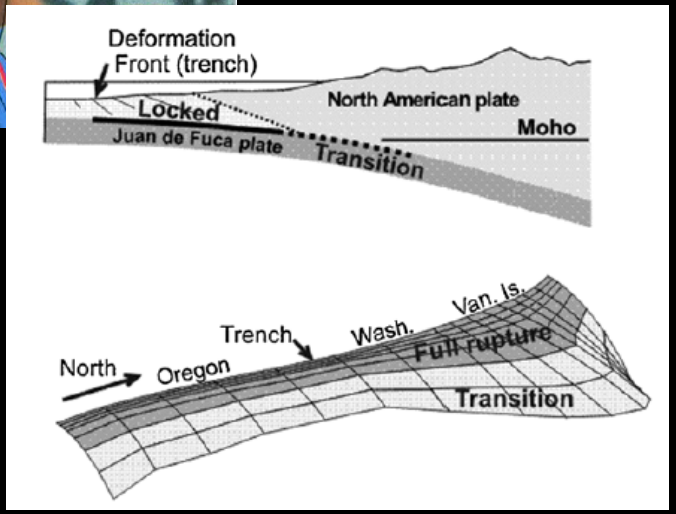




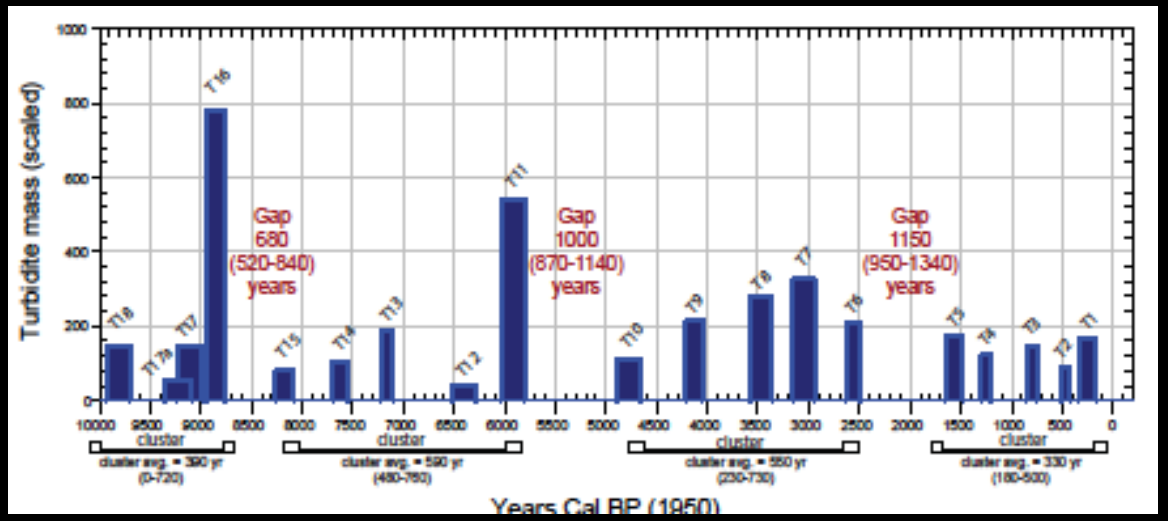
Roy Hyndman

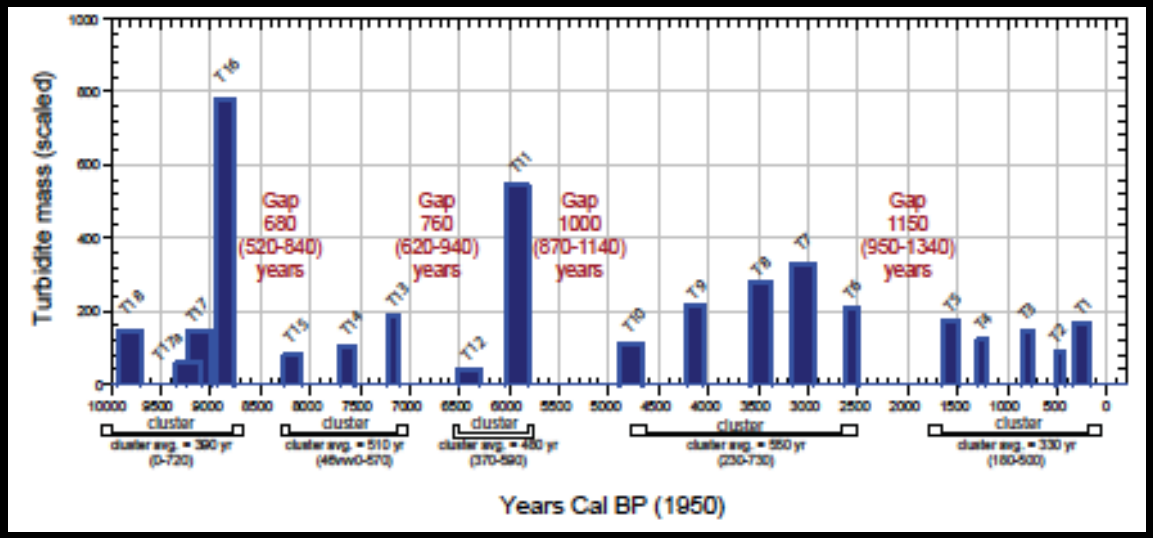


Kelin Wang



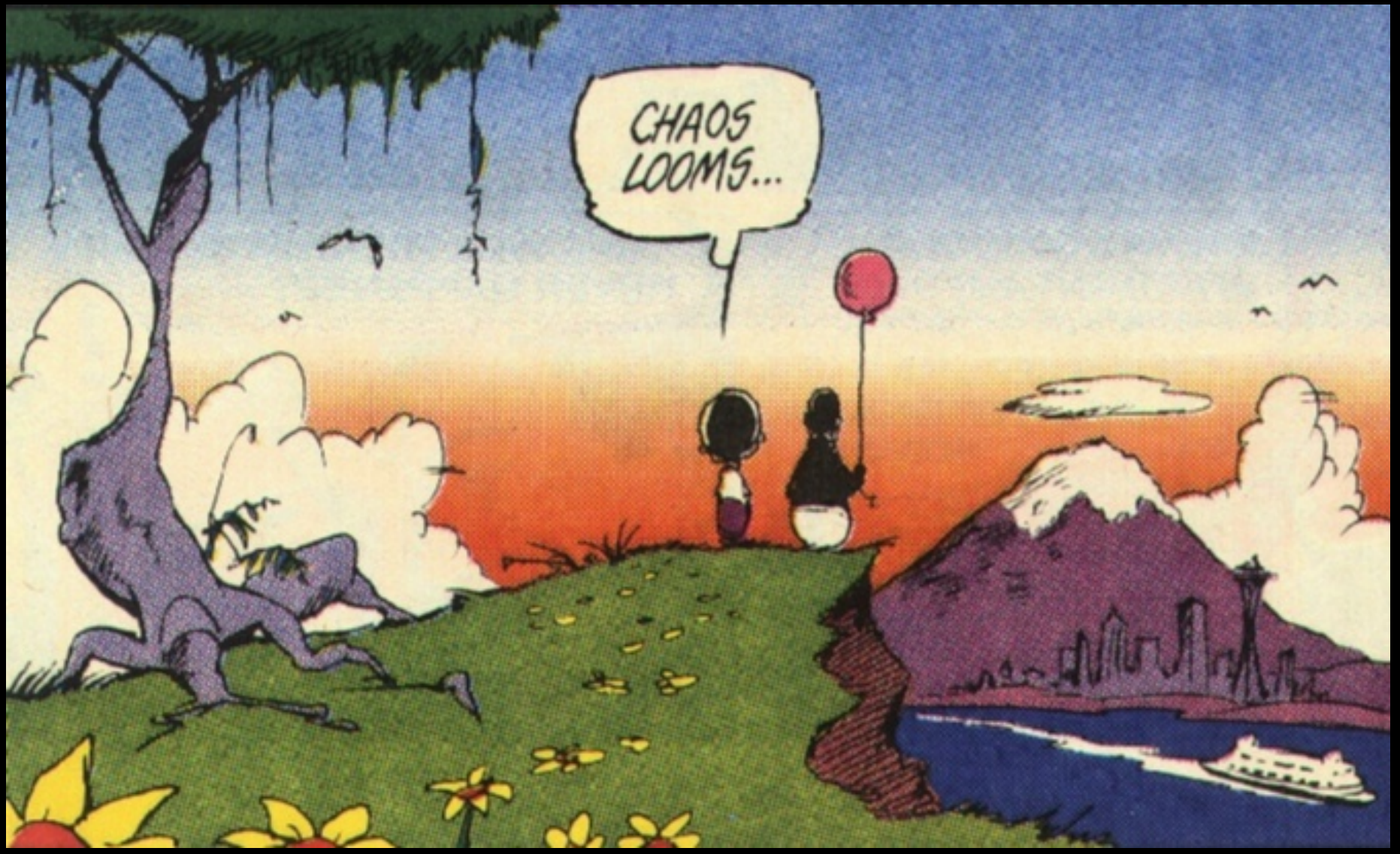
Recognition that great earthquakes occur in clusters





The future

- *Refined map of the locked zone*
- *Further refinements in the earthquake chronology*
- *Tackling the issue of segmentation*
- *Linkages between interface and crustal earthquakes*
- *Better understanding of earthquake effects on our infrastructure*



The End