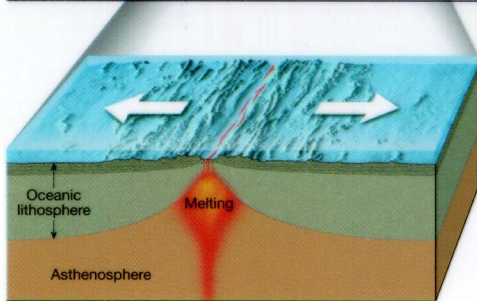
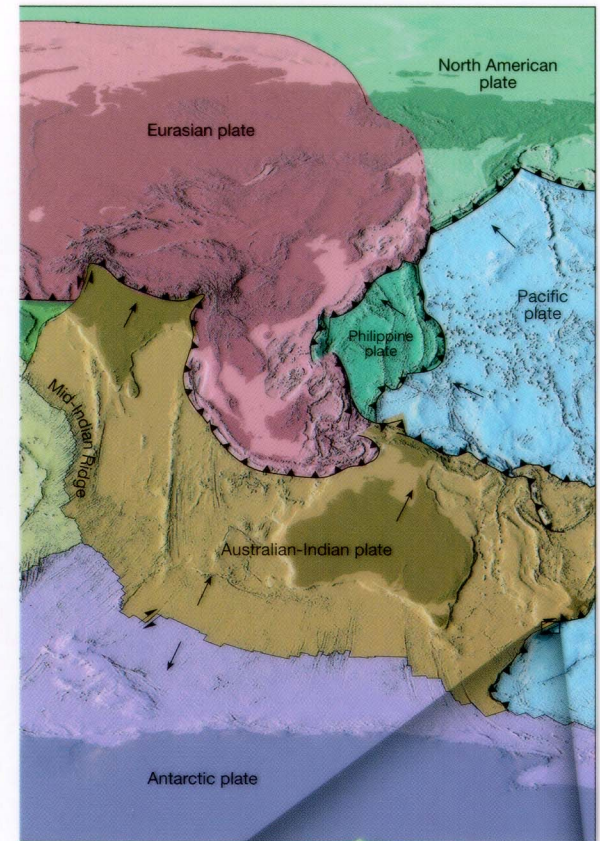
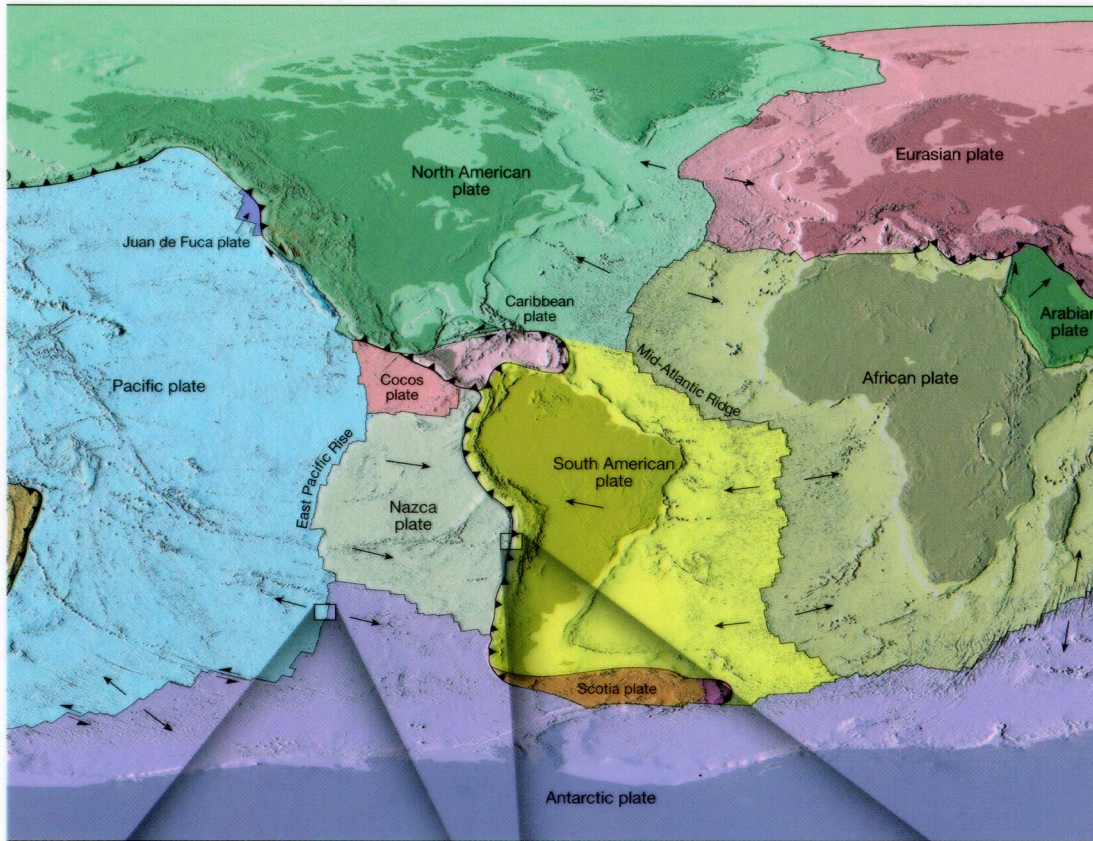


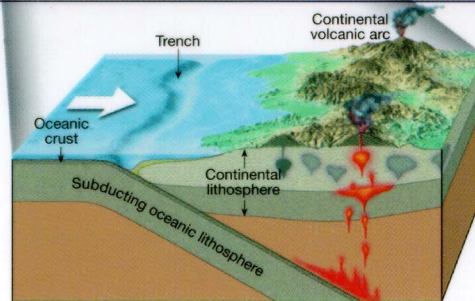
Plate Tectonics and the Environment in S. AK (or, why we should care)

- Plate tectonics produces topography
- Interaction of topography w/ ocean and atmosphere produces climate
 - Glaciers - erosion rates, types of rivers and sediment load
- Tectonics produces mineral wealth - people, and their consequences
- Large earthquakes have local catastrophic effects
 - Erosion rates: Landslides, rockslides, and other disasters
 - Coastal plains: Sudden uplift and subsidence
 - Raises havoc with barnacles as well as people

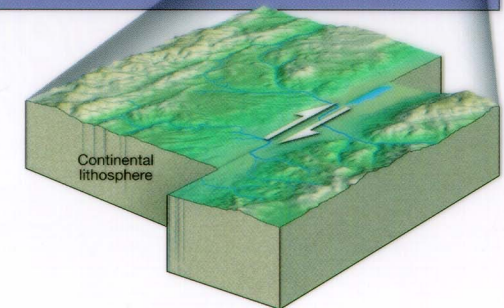
Mosaic of Earth's outer shell (LITHOSPHERIC PLATES)



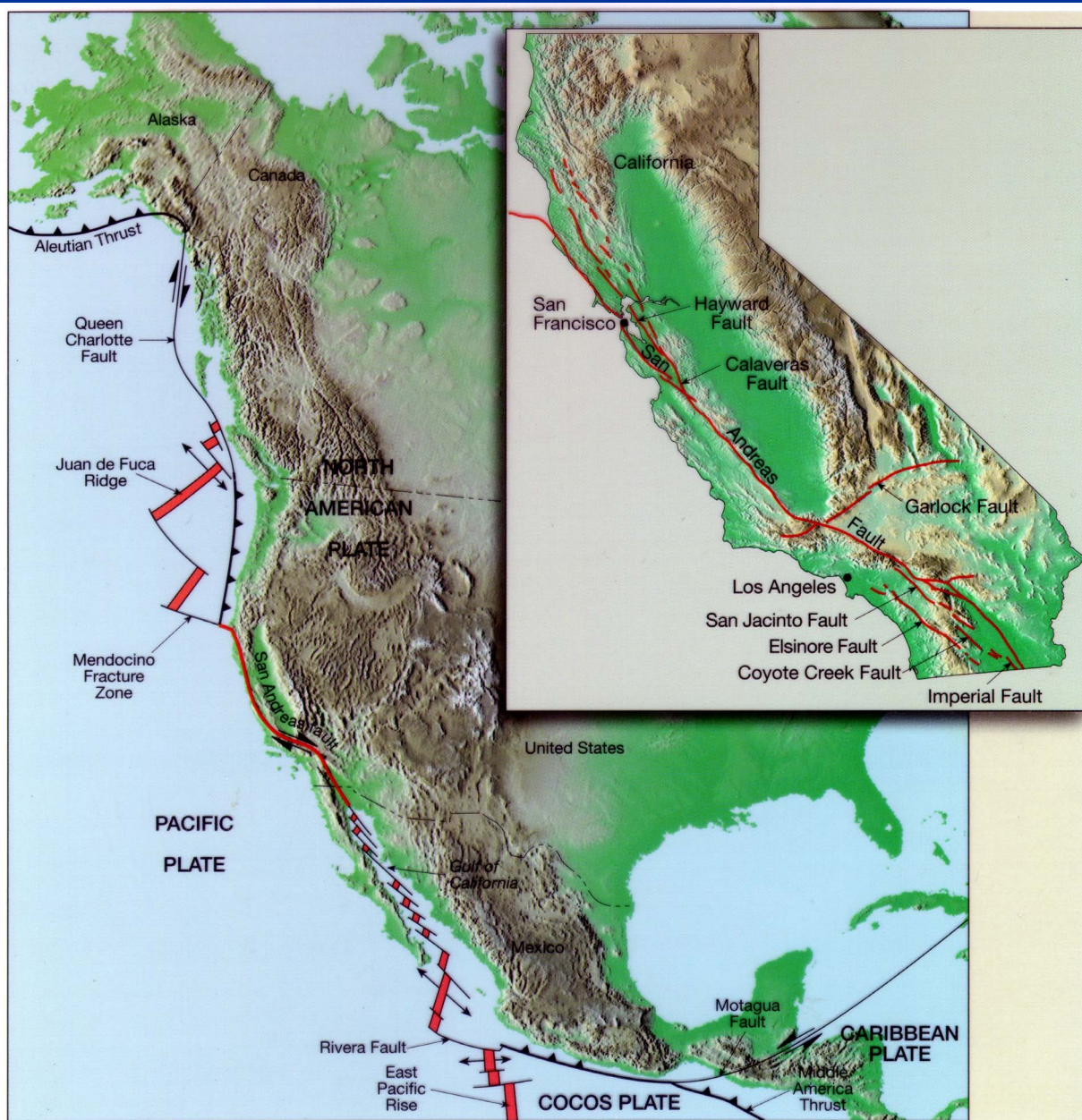
A. Divergent boundary ↗↖

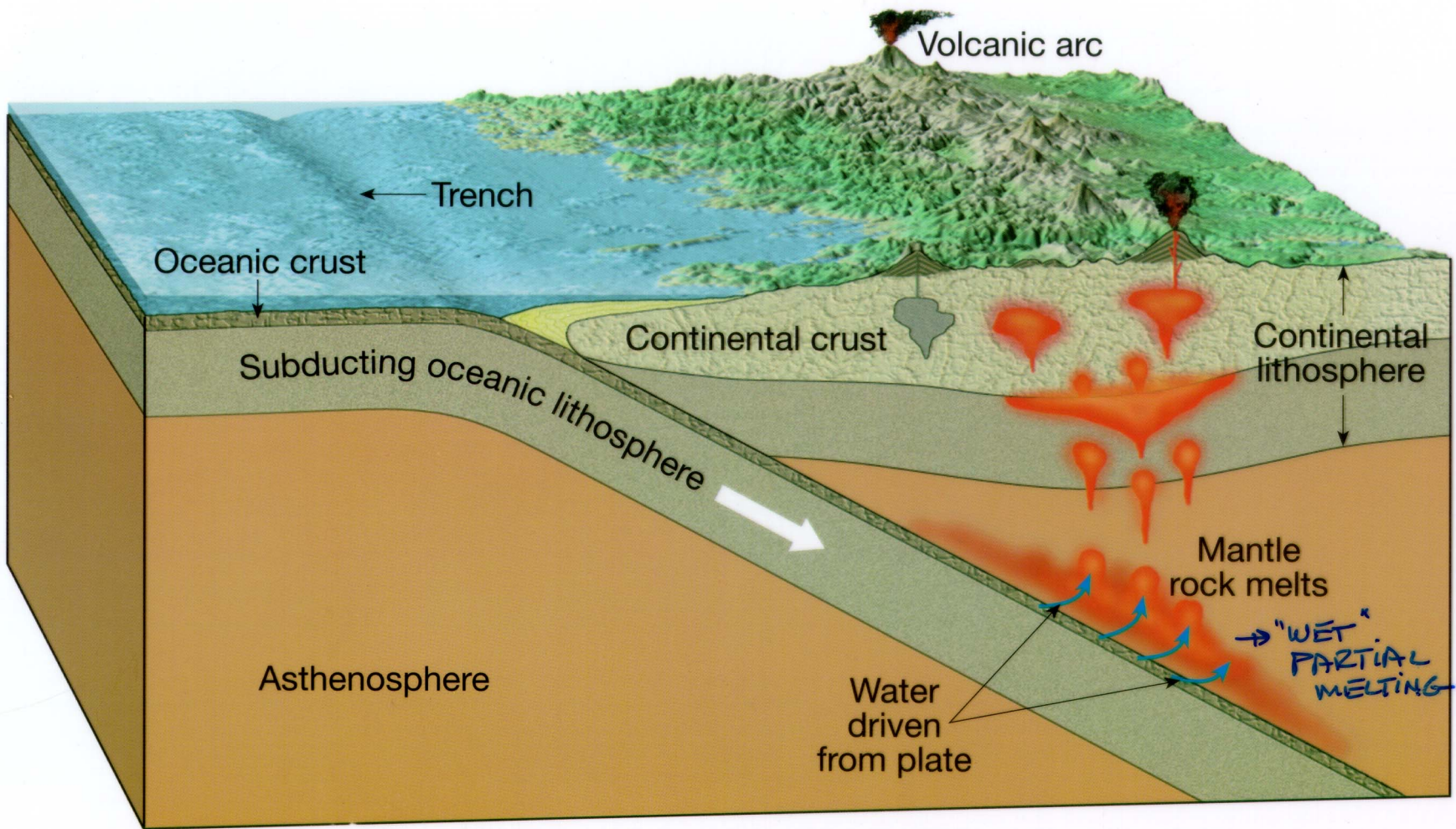


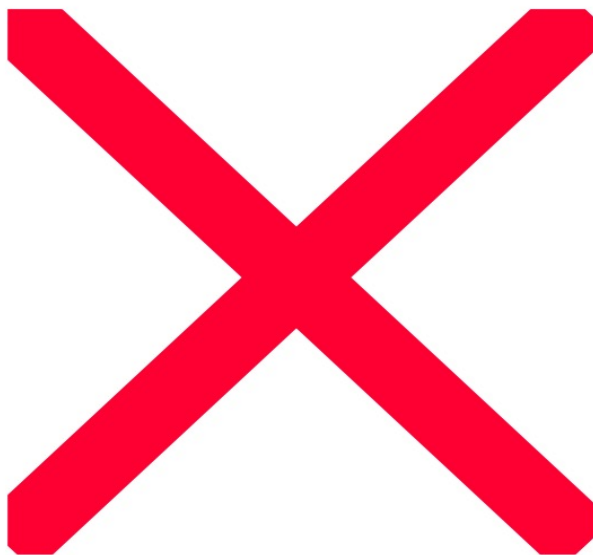
B. Convergent boundary ↘↙



C. Transform fault boundary ↗↖

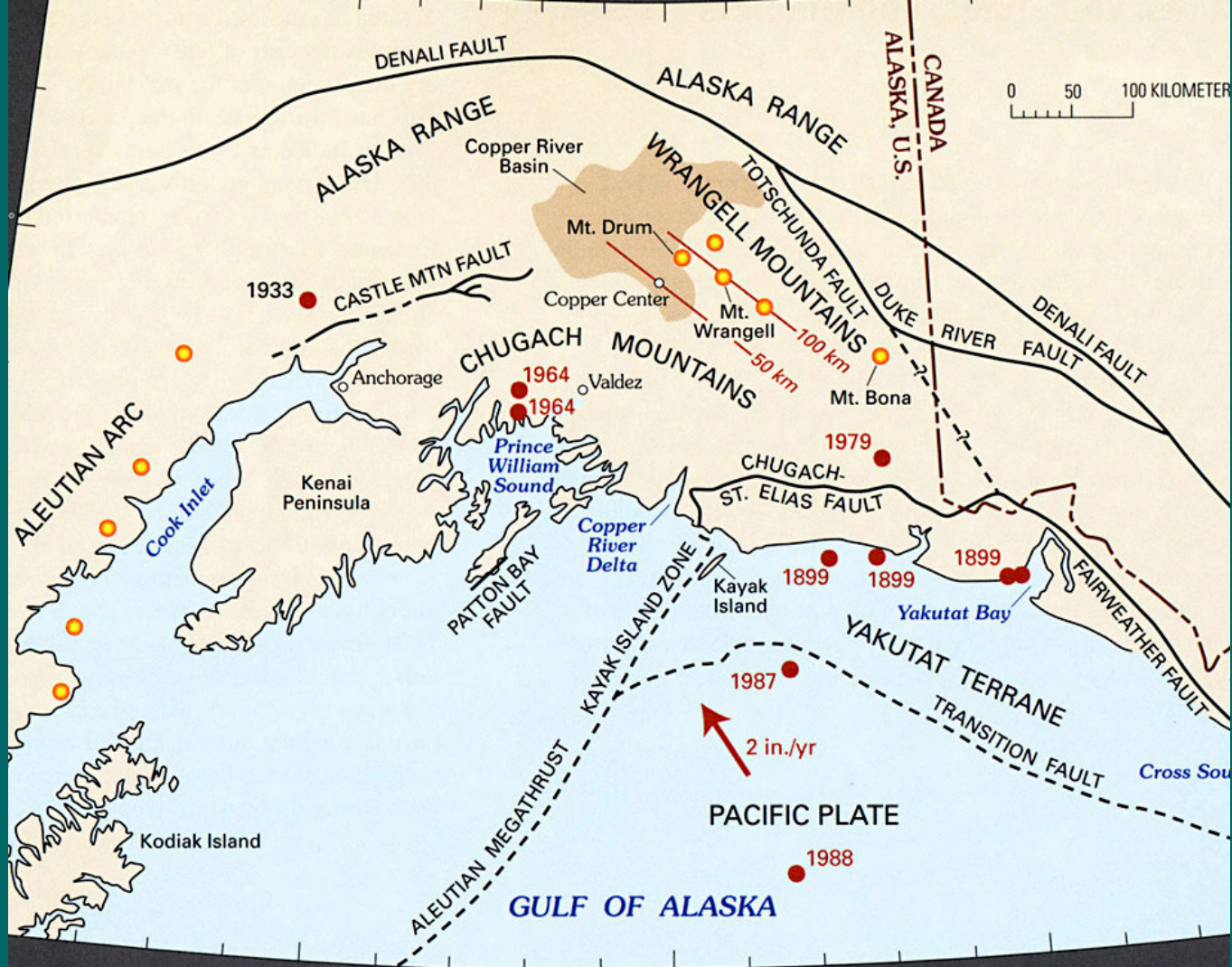




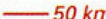





Mountain Belts - Wrangell Mtns. And Chugach Mtns.

- Wrangell Mtns - Age of rocks = age of Mountains - built by volcanic flows - constructive
- Chugach Mtns. - Age of rocks *older* than age of Mountains - built by tectonic uplift
 - Uplift age similar to age of oldest volcanics in Wrangell Mtns.

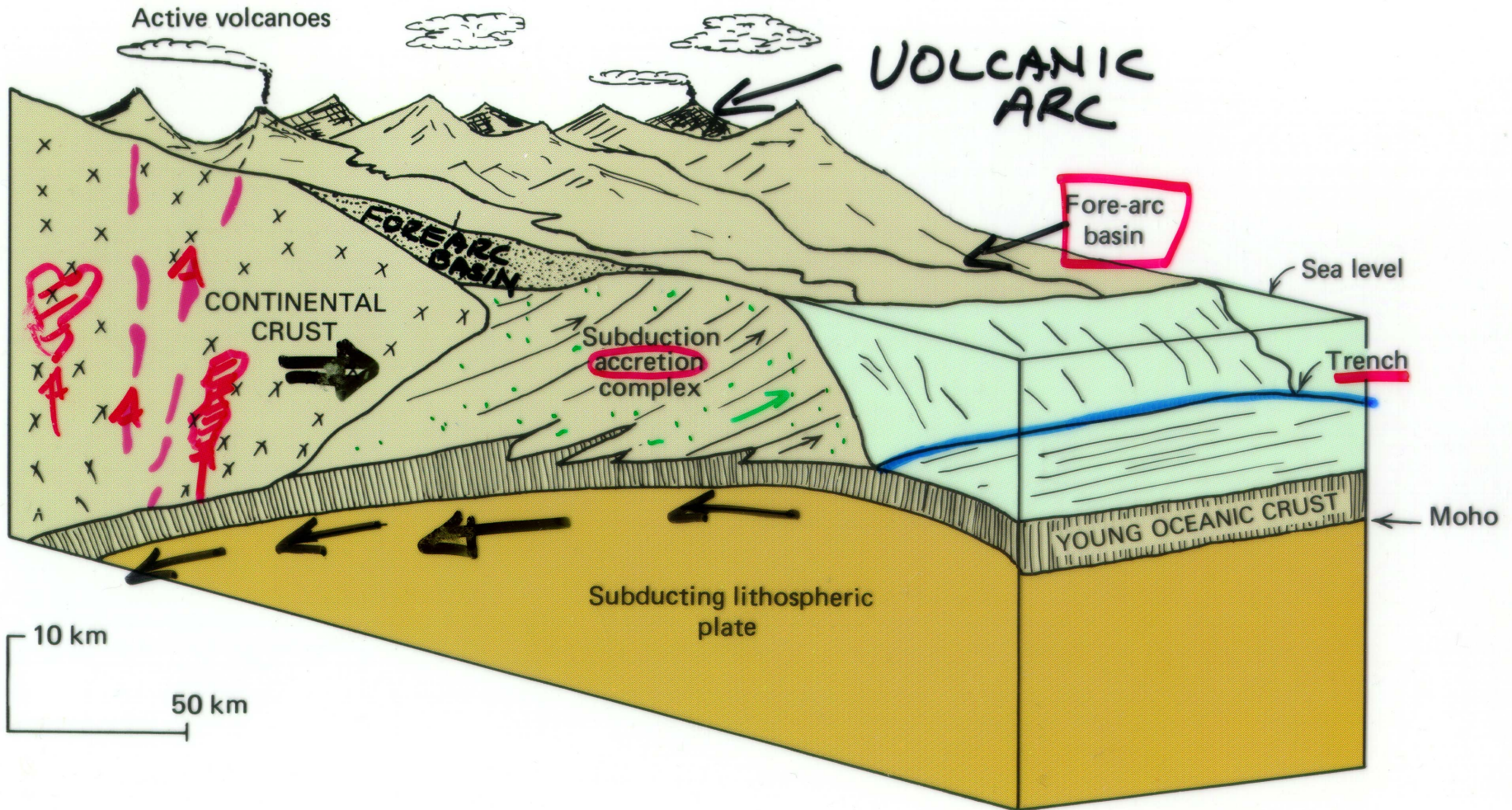


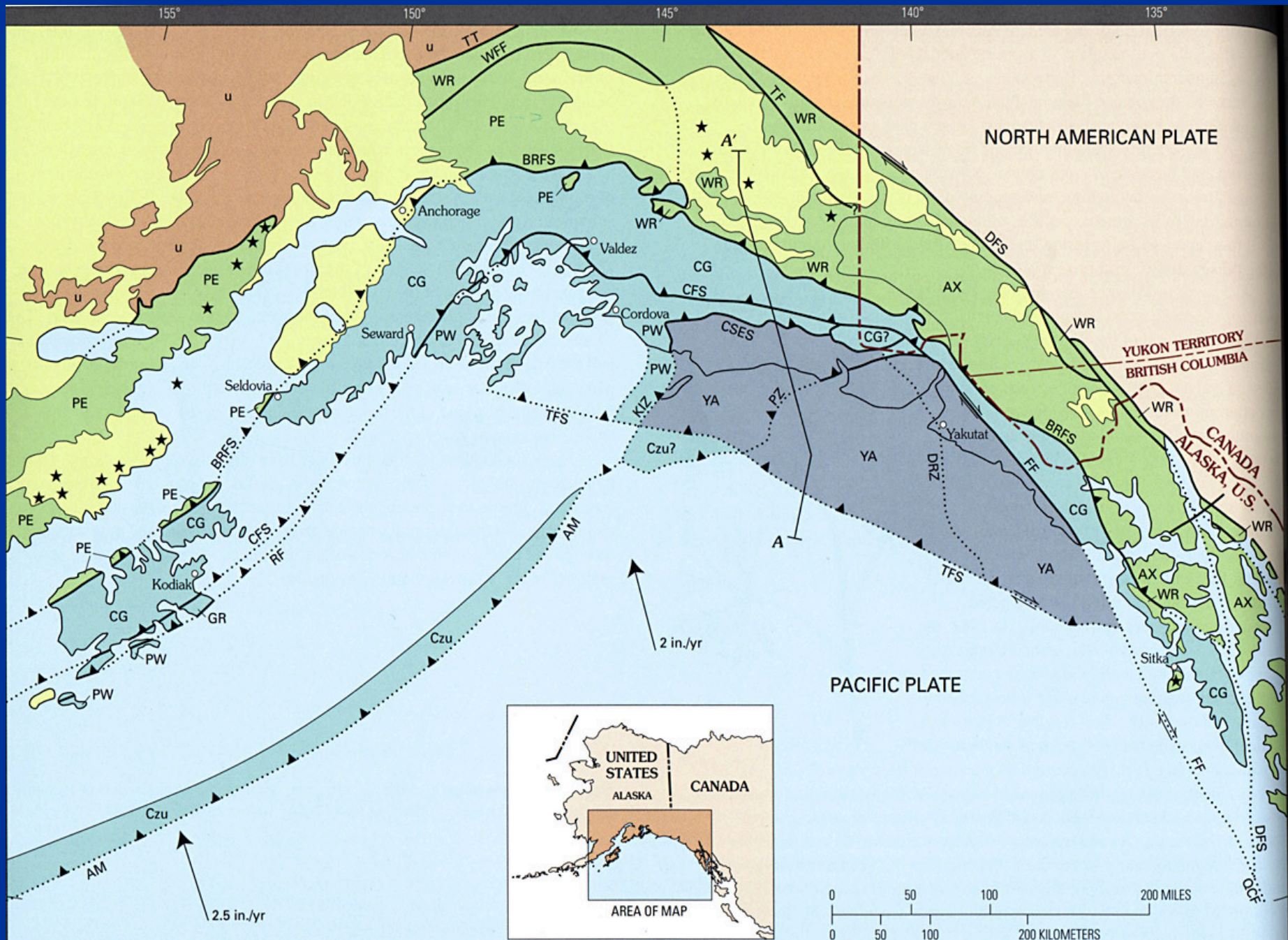
EXPLANATION

-  50 km Average depths of earthquakes in the Wrangell Benioff zone of seismicity—Contours in kilometers
-  1979 Earthquake epicenter with magnitude > 7.0—Showing year
-  Volcano
-  2 in./yr Motion vector of Pacific plate relative to North American plate

What is driving the uplift of the Chugach Range?

SUBDUCTION OF YOUNG, OCEANIC CRUST





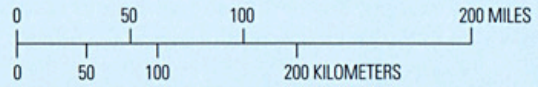
155° 150° 145° 140° 135°

NORTH AMERICAN PLATE

YUKON TERRITORY
BRITISH COLUMBIA

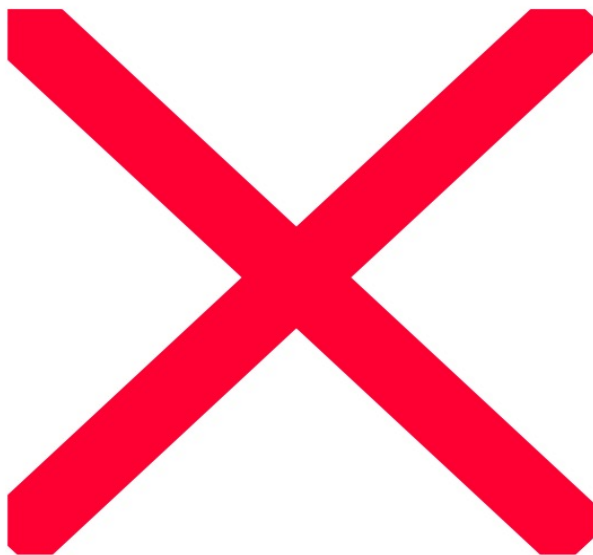
CANADA
ALASKA, U.S.

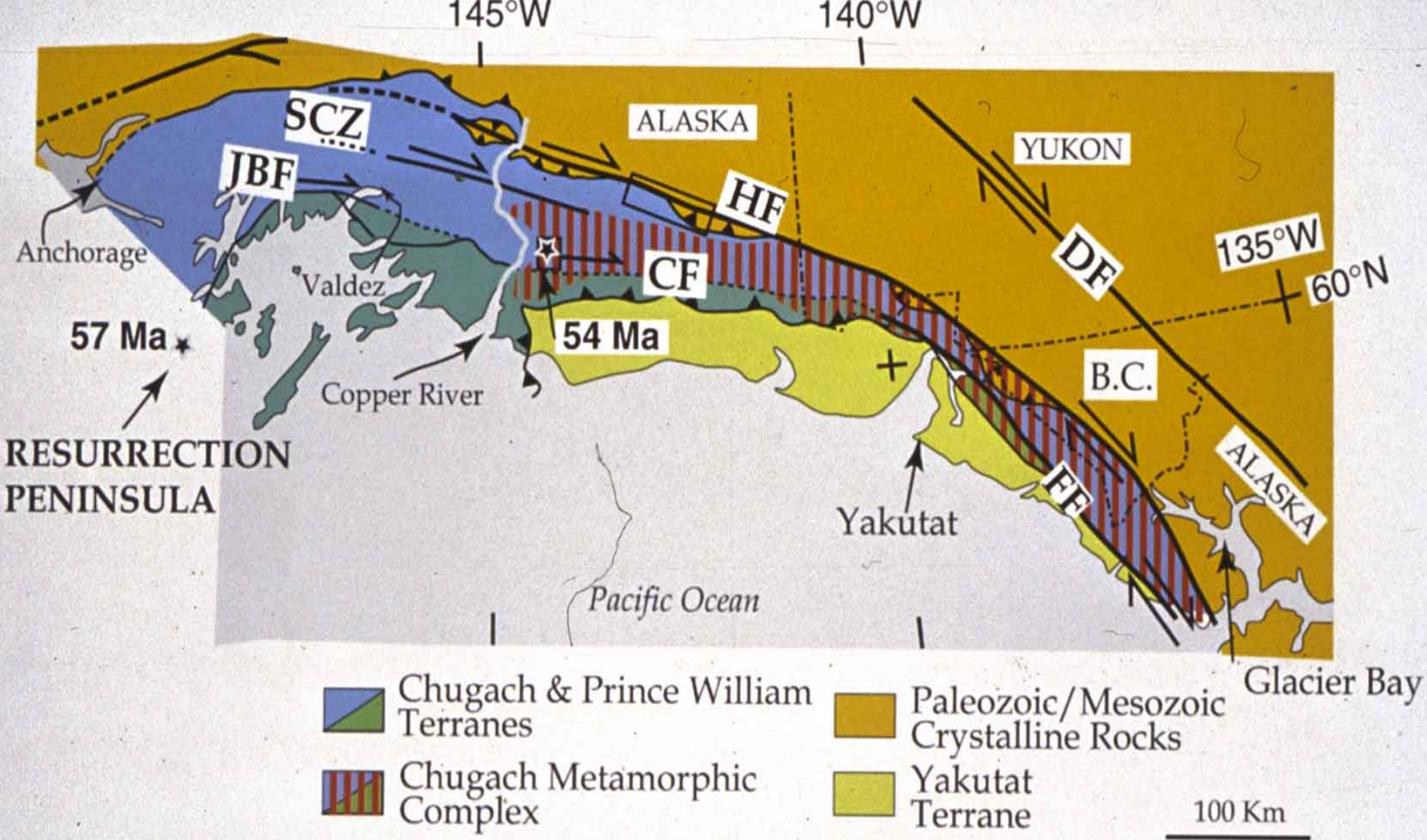
PACIFIC PLATE



2.5 in./yr

2 in./yr





Generalized Tectonic Setting of the Southern Alaska Accretionary Complex

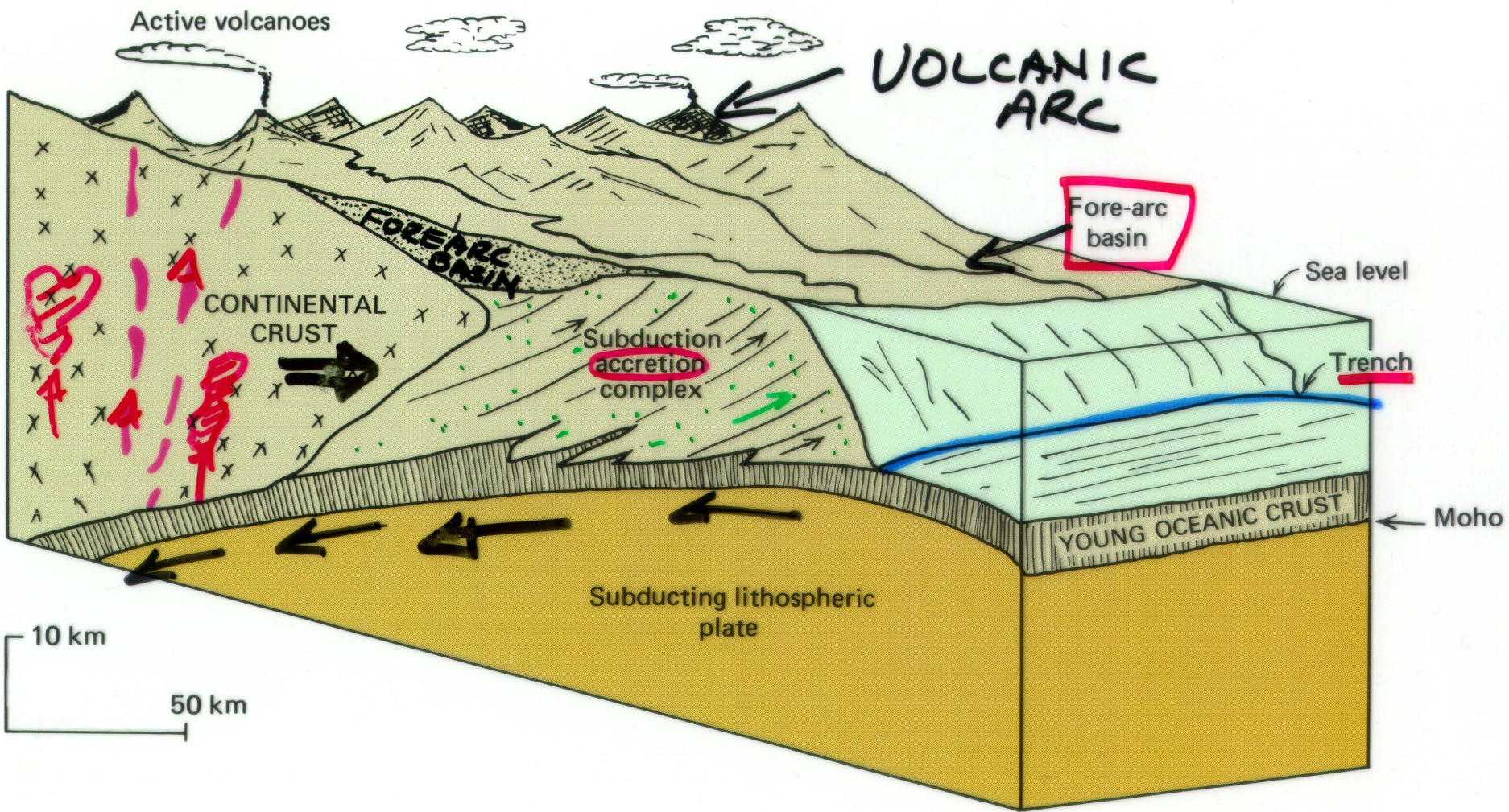
(adapted from Plafker, 1994; unpub. mapping of Sisson, Pavlis, Roeske, Cooper, Marty and Poole).

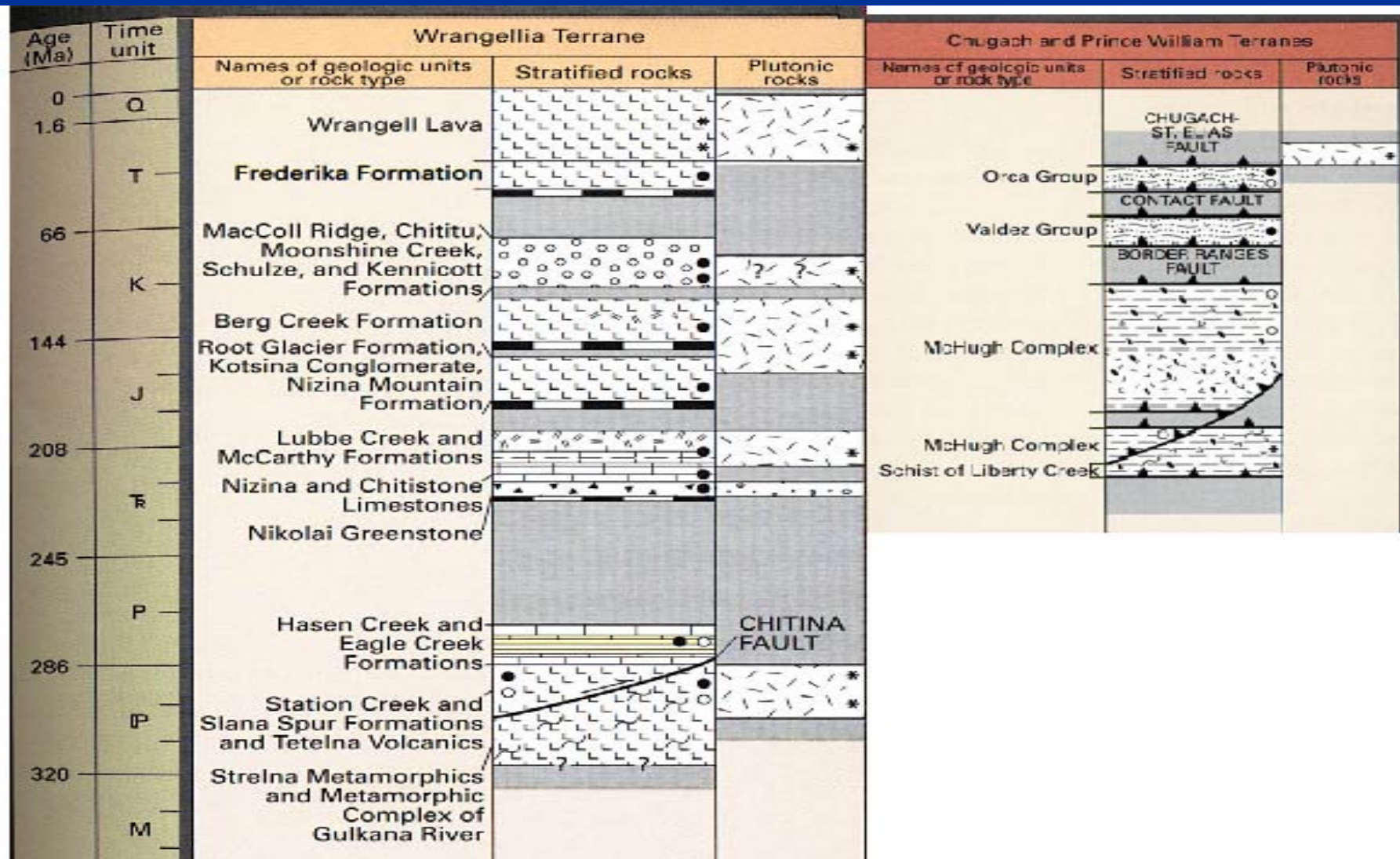
CF=Contact Fault, HF=Hanagita Fault, SCZ=Stuart Creek zone,
 JBF=Jack Bay Fault, DF=Denali Fault, FF=Fairweather Fault.



Ancient Accretionary Complex - 200 Mya to Present

SUBDUCTION OF YOUNG, OCEANIC CRUST



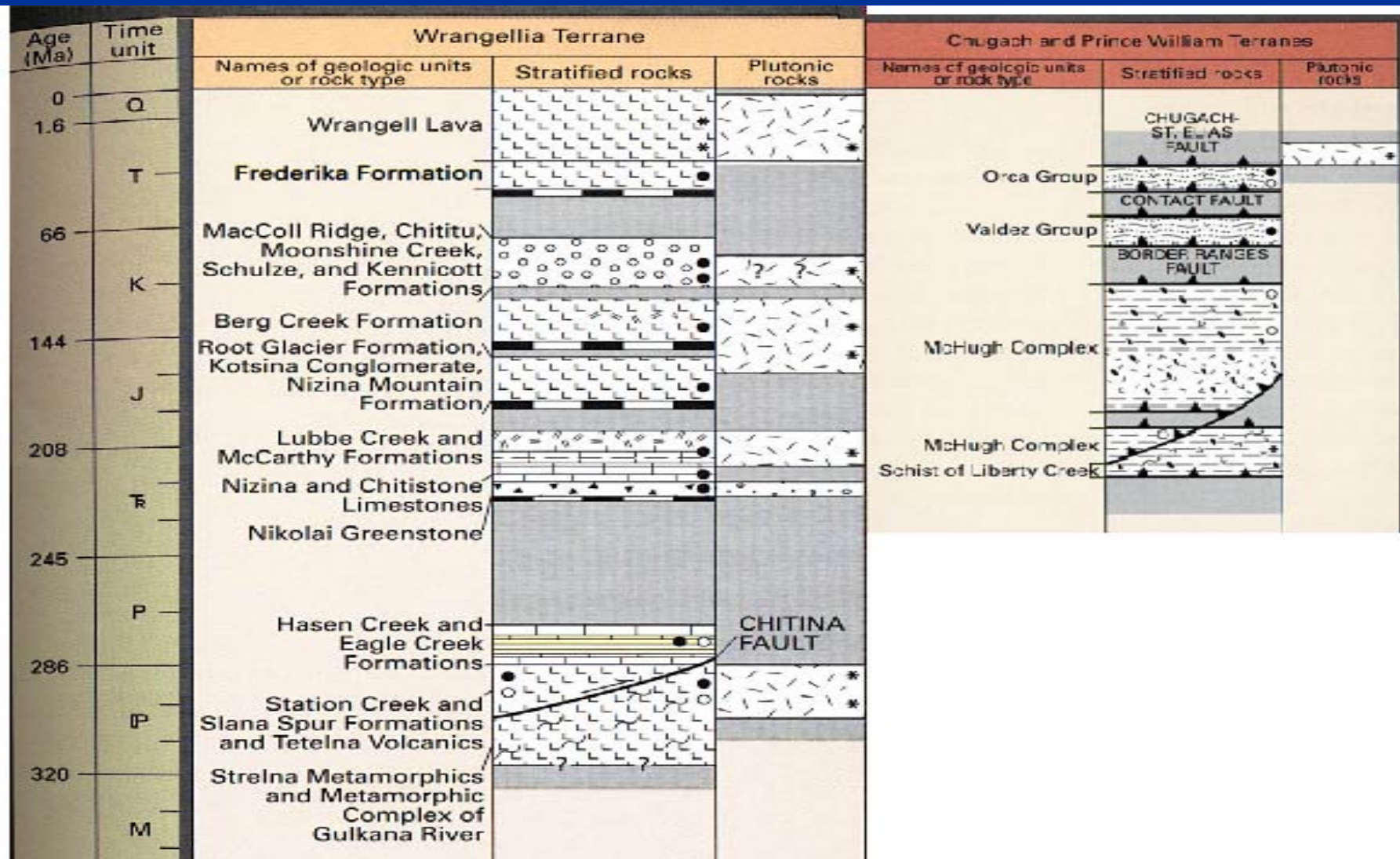




I ALASKA

Pentel EnerGel 60000 series

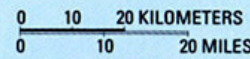




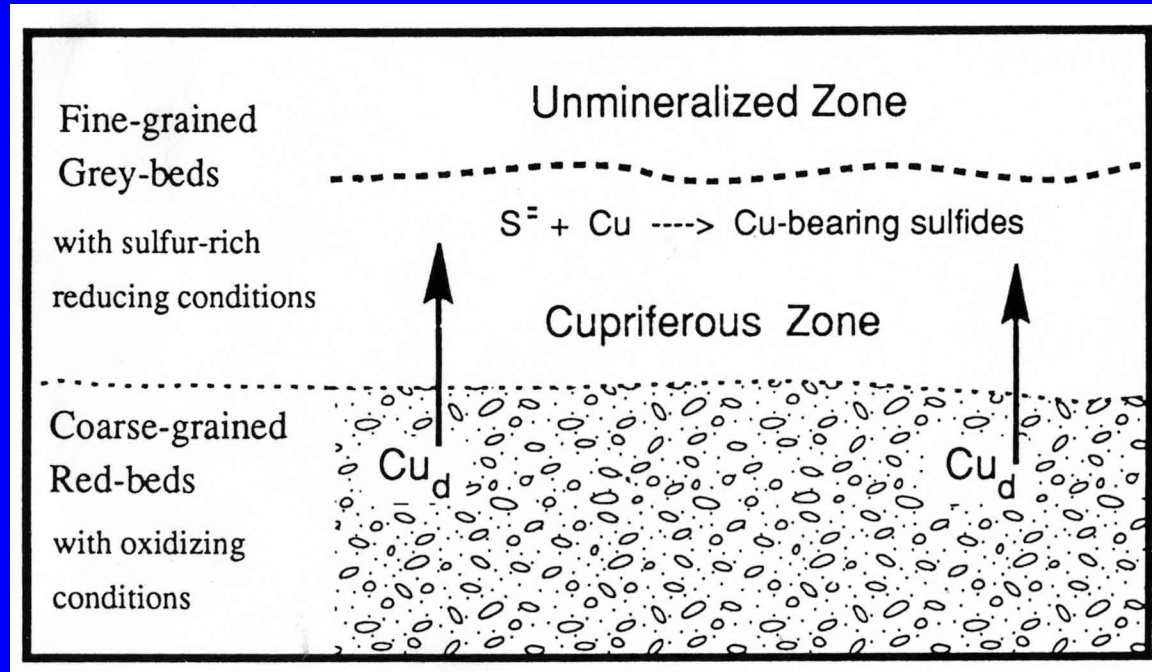


EXPLANATION

- Wrangell-St. Elias National Park
- Wrangell-St. Elias National Preserve
- Native corporation lands
- Unpaved road
- Extent of mining districts

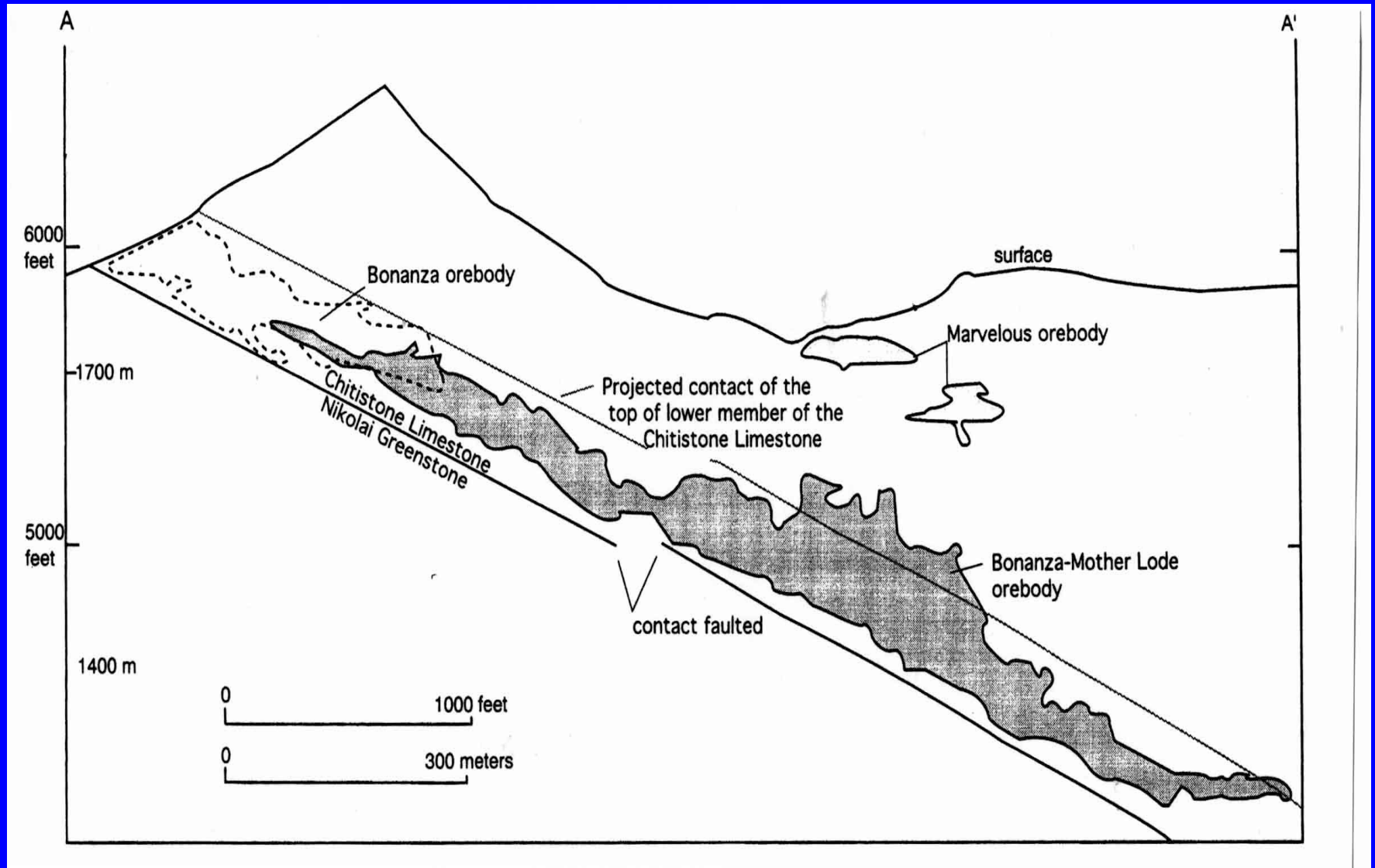


General Model for Sediment-hosted Cu deposit

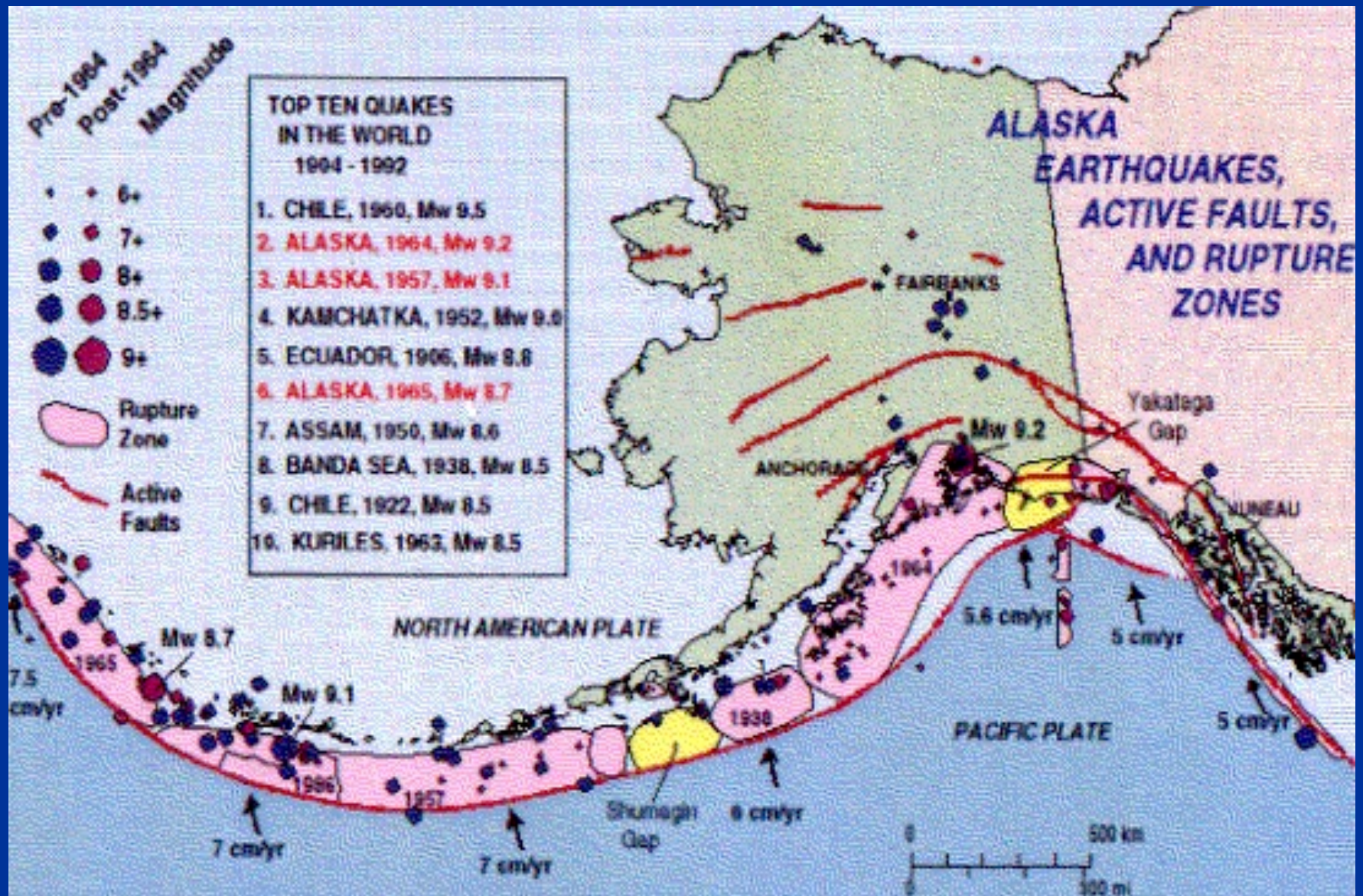




A different type of Cu-deposit

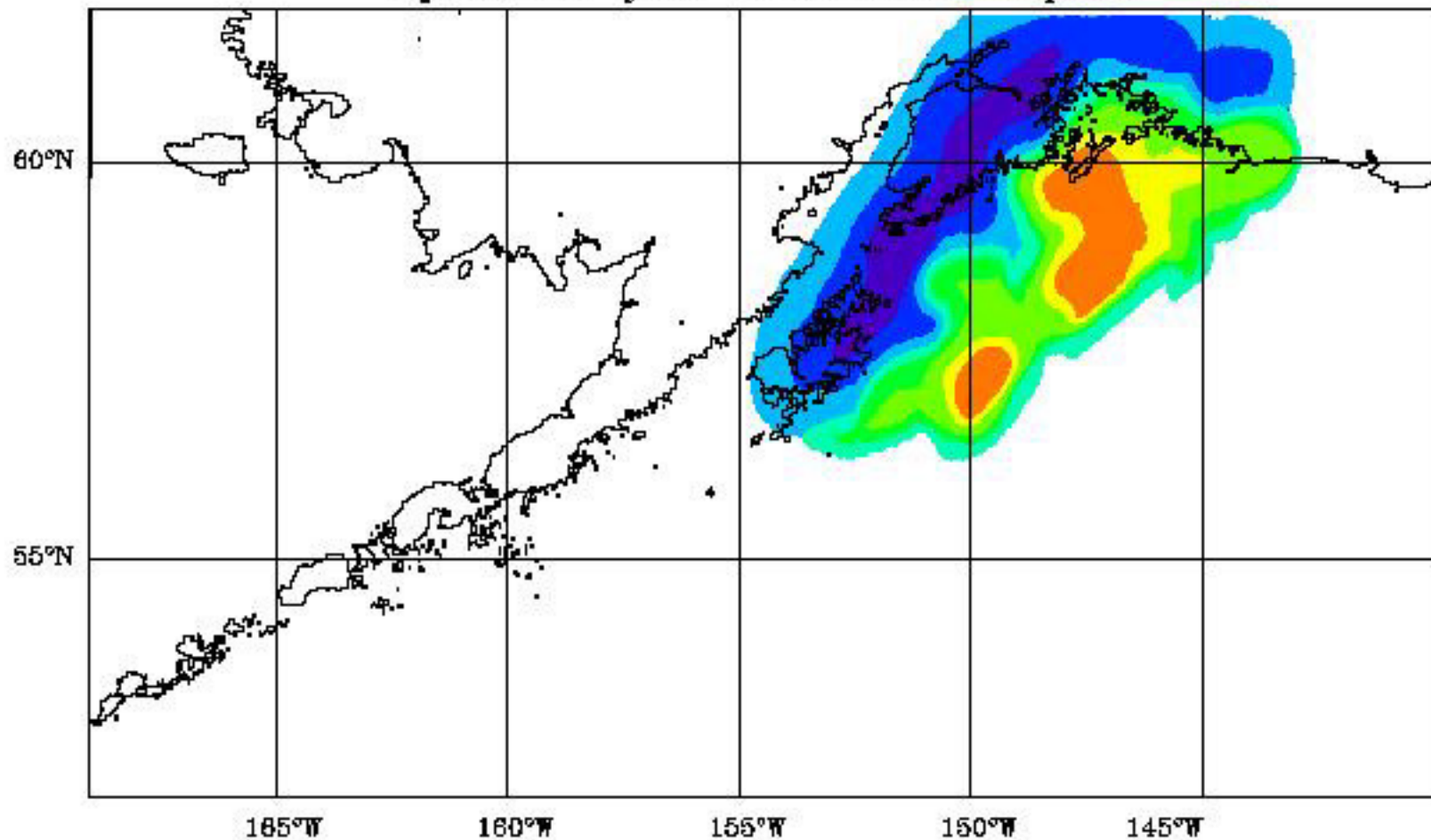


Living on the Edge

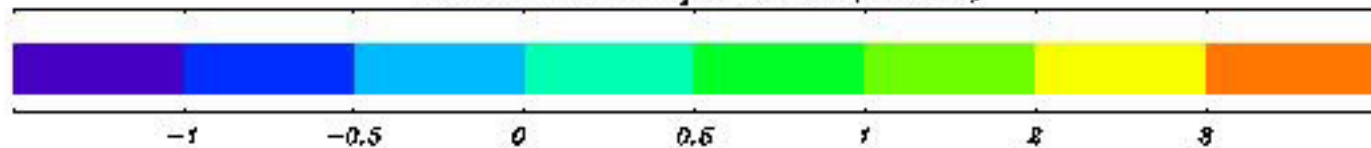


Effects of Large Earthquakes

Deformation of the 1964 Alaska earthquake



Vertical static displacement (meters)



EXPLANATION

-----s-----
Isobase contour, showing uplift (+) or subsidence (-) in feet
Dashed where approximately located; dotted where inferred

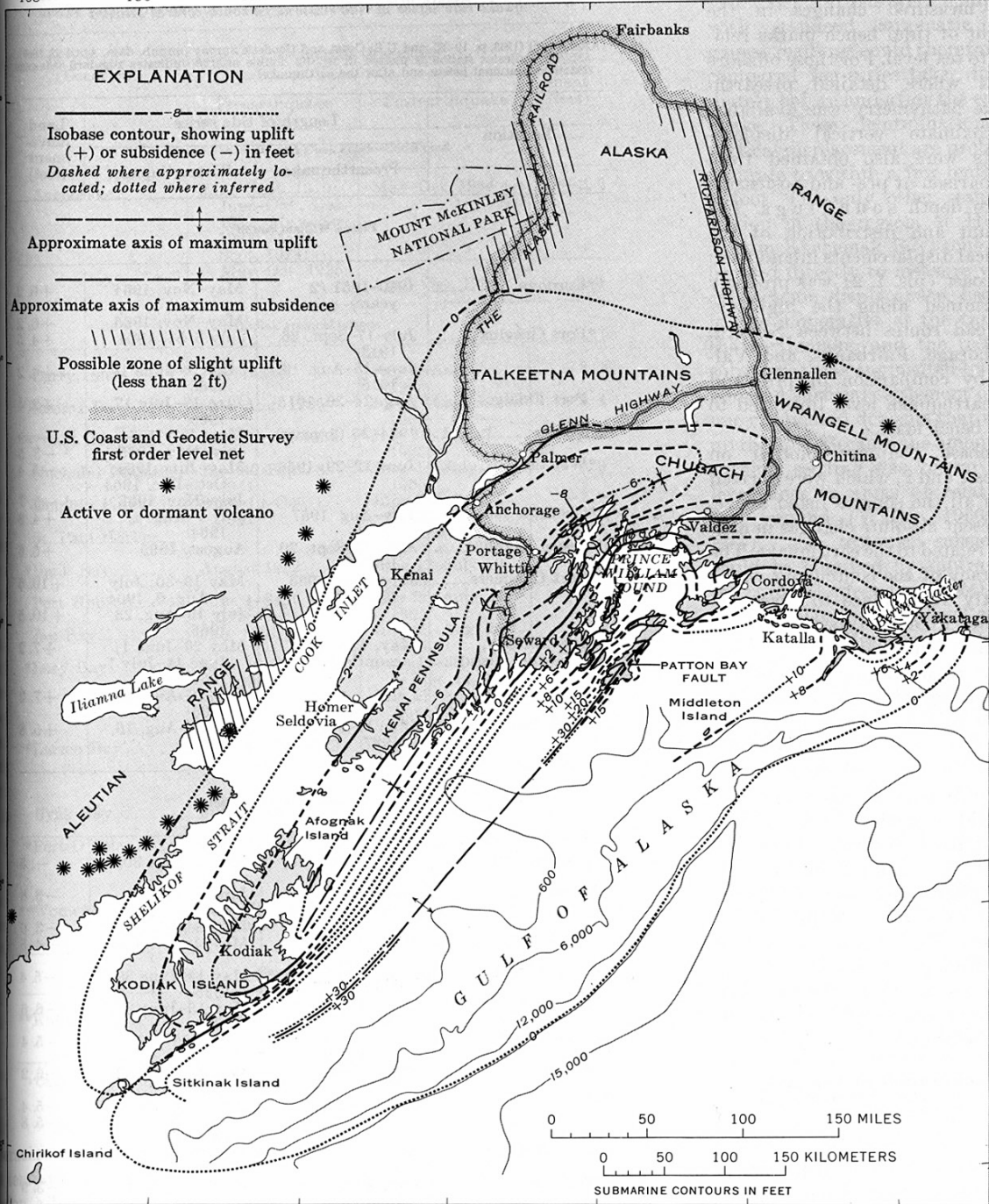
-----↑-----
Approximate axis of maximum uplift

-----↓-----
Approximate axis of maximum subsidence

|||||
Possible zone of slight uplift (less than 2 ft)

U.S. Coast and Geodetic Survey first order level net

*
Active or dormant volcano

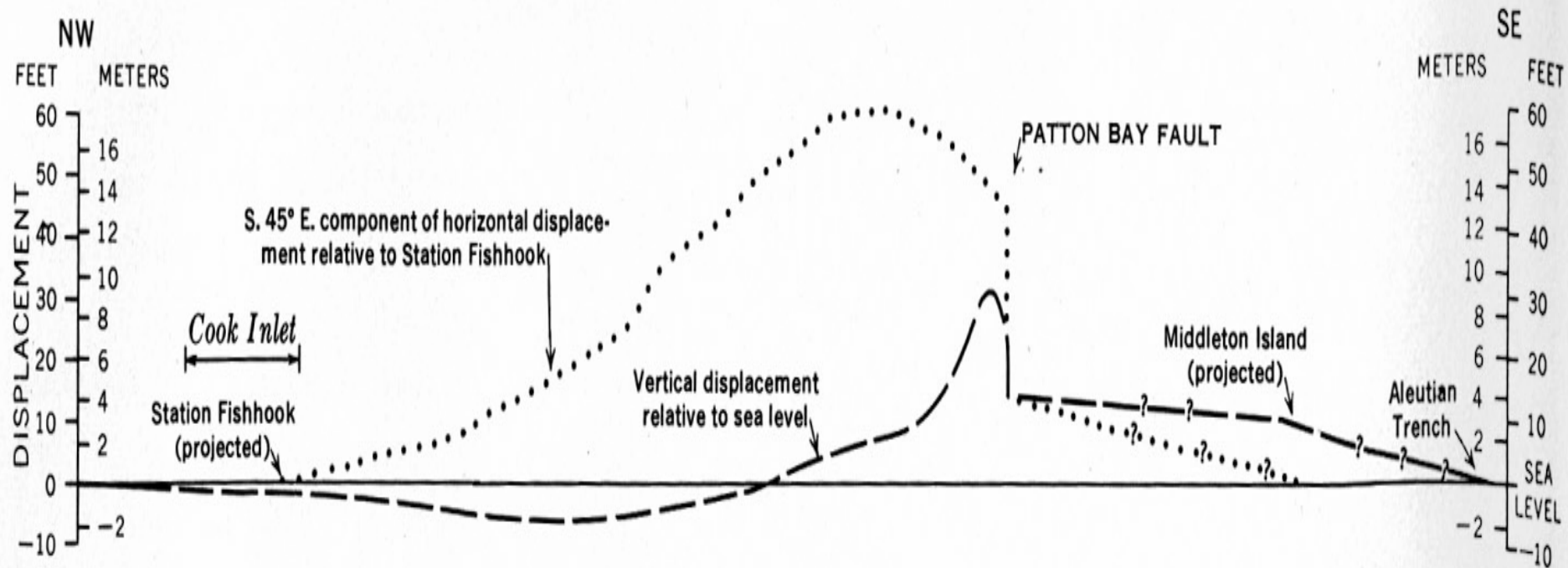


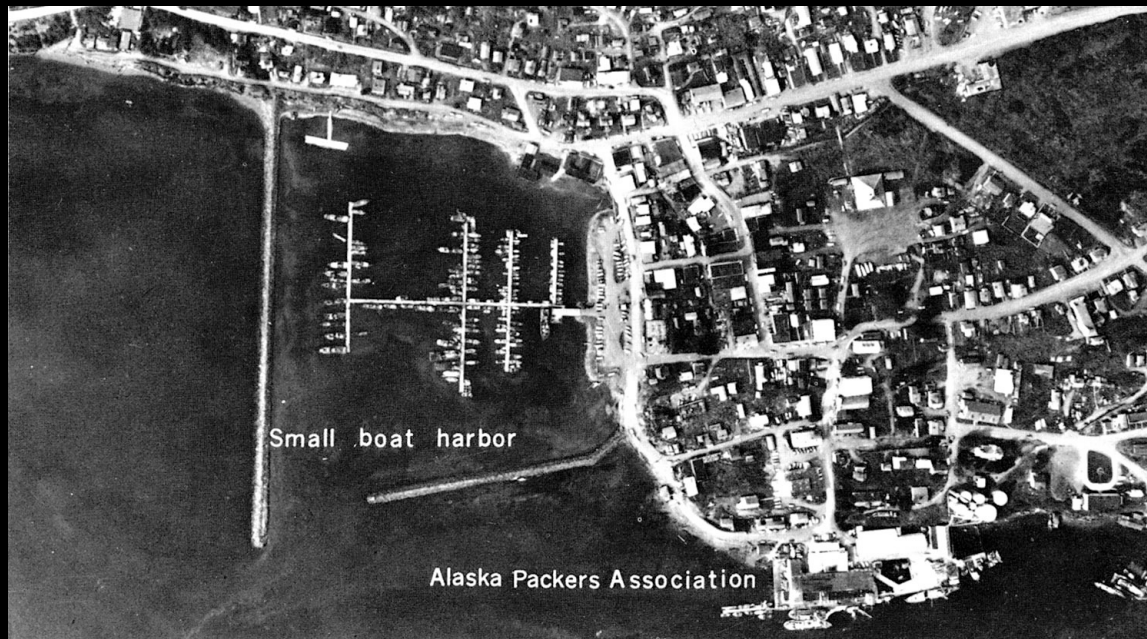
0 50 100 150 MILES

0 50 100 150 KILOMETERS

SUBMARINE CONTOURS IN FEET

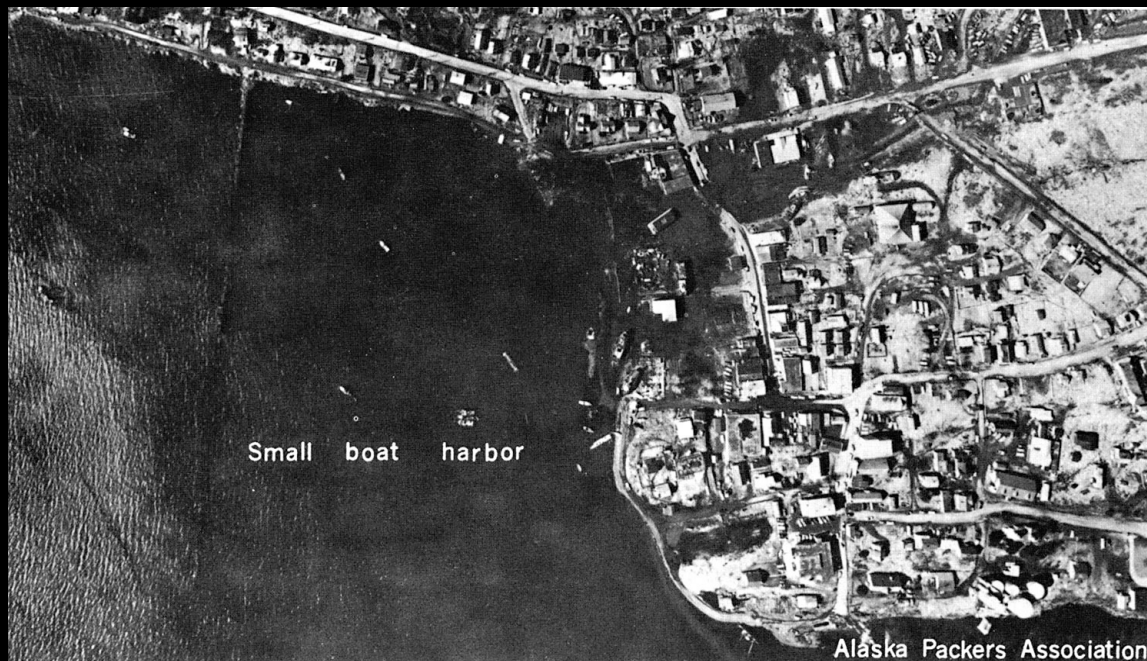
ALASKA EARTHQUAKE, MARCH 27, 1964





Small boat harbor

Alaska Packers Association



Small boat harbor

Alaska Packers Association











R. 5 E.

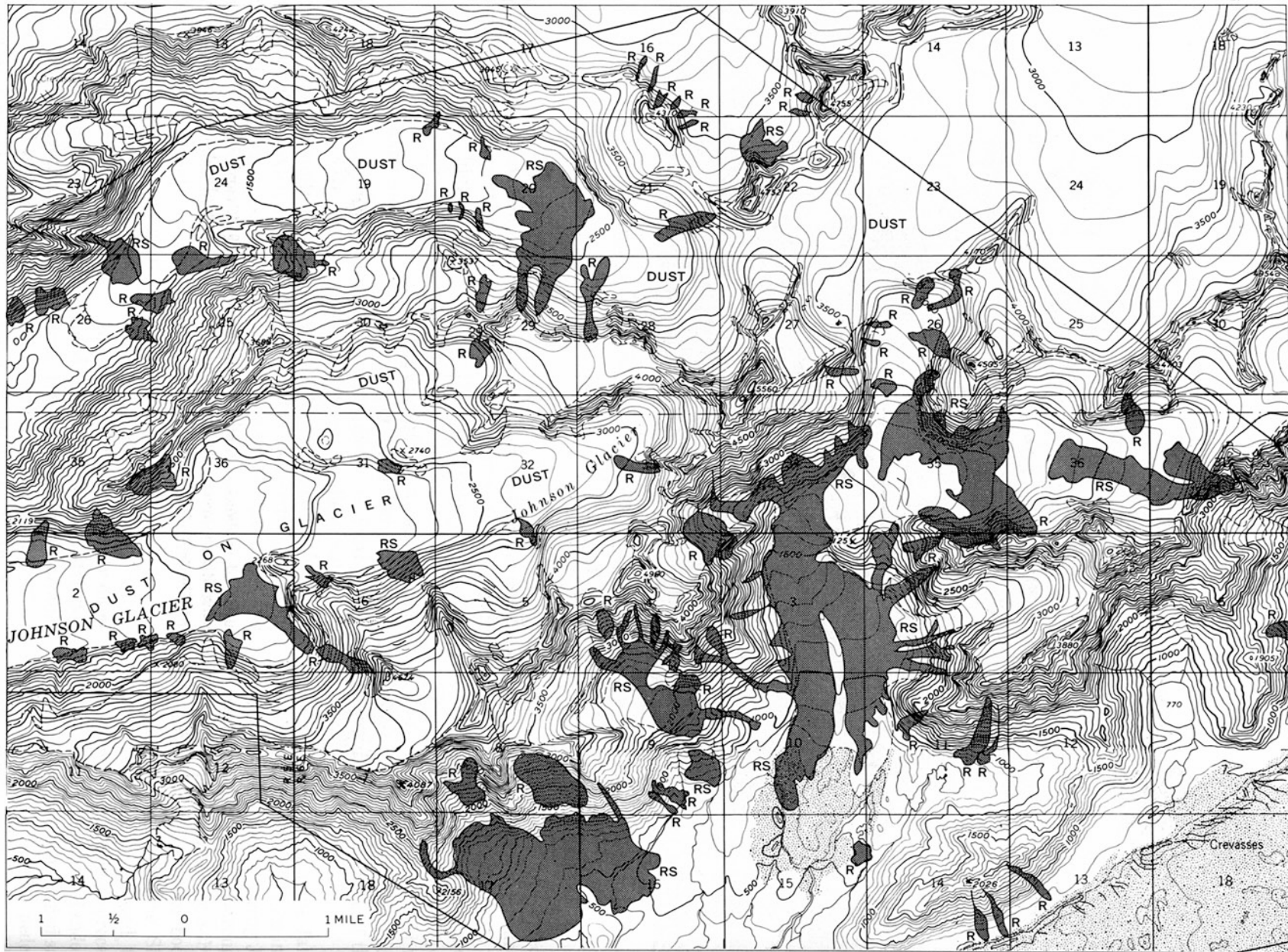
144°22'30"

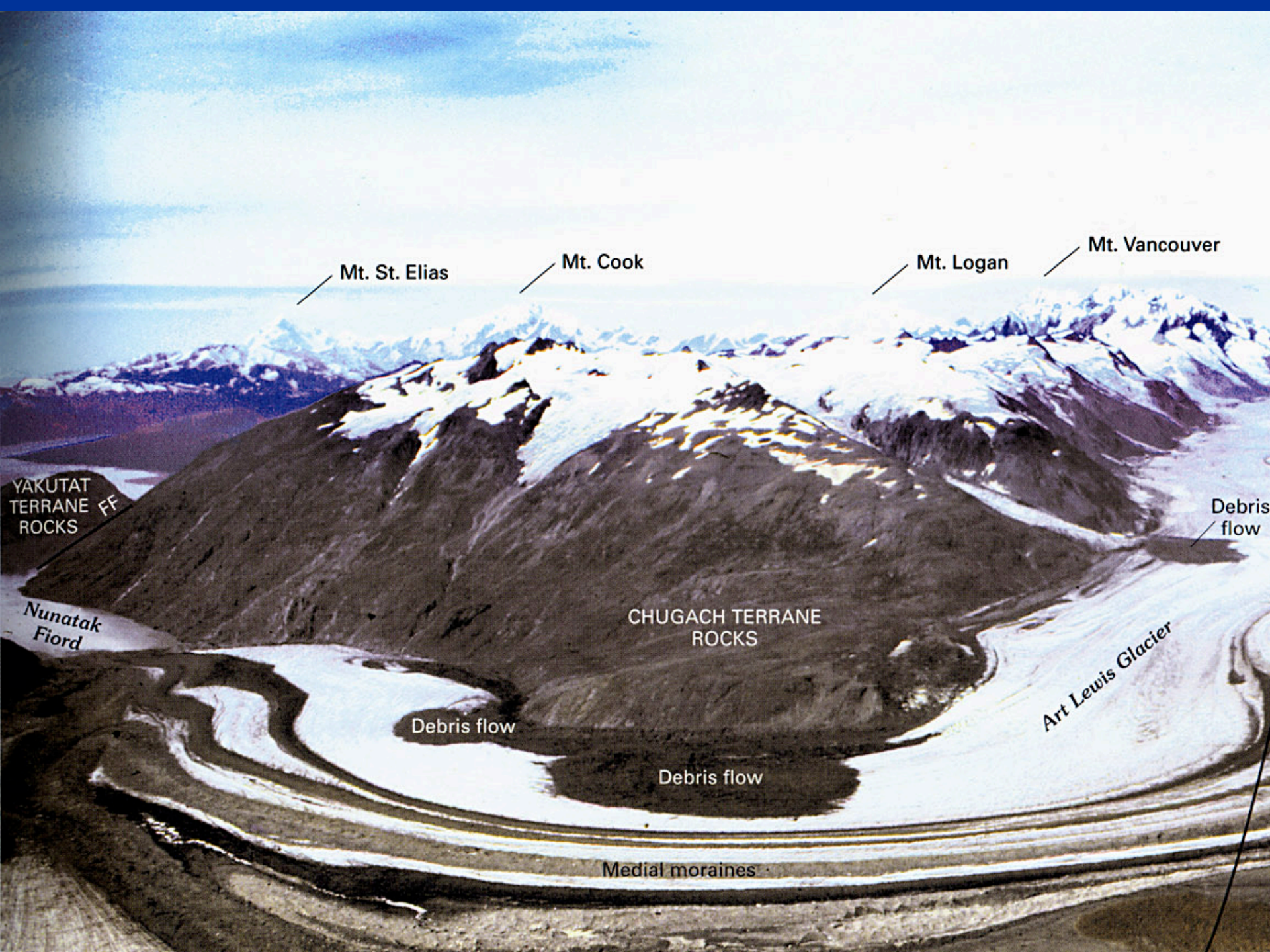
R. 6 E.

R. 7 E.

T. 15 S.

60°30'
T. 16 S.





Mt. St. Elias

Mt. Cook

Mt. Logan

Mt. Vancouver

YAKUTAT
TERRANE
ROCKS

Nunatak
Fiord

CHUGACH TERRANE
ROCKS

Debris
flow

Debris flow

Debris flow

Art Lewis Glacier

Medial moraines