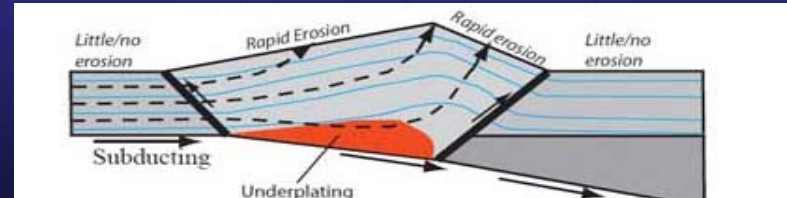
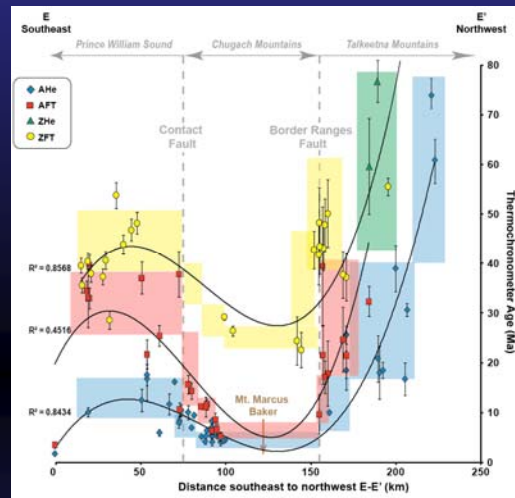


Exhumation and deformation due to shallow subduction above the Yakutat microplate in southern Alaska



Phillip A. Armstrong

California State University, Fullerton



Subduction of the Yakutat microplate in southern Alaska has had a more profound effect on deformation in southern and central Alaska than any other late Cenozoic geologic event. Yakutat microplate subduction (1) has caused intense deformation in the near field of south and southeast Alaska; (2) may be responsible for Neogene deformation in the far field of central and northern Alaska 400 km or more from the present subduction zone; and (3) is probably responsible for deformation leading to hydrocarbon traps in the Cook Inlet and perhaps in the North Slope area. Yet, very little is known about how much of the overall strain imparted by Yakutat subduction is actually accommodated by the accretionary wedge above the subducting plate. Our new apatite (U-Th)/He and fission-track ages, as well as new and published zircon fission-track ages, display a younging towards the syntaxial core in the western part of the Chugach mountains between the Contact fault and Border Ranges fault system. These results are starting to bear out our initial hypothesis that exhumation is focused in the syntaxial region and are probably caused by underplating above the subduction megathrust. Additionally, some unexpected results are that ages on Montague Island (along Hanning Bay fault on map to left) indicate very rapid rock uplift probably associated with collisional processes rather than underplating. These deformation patterns and mechanisms must be accounted for in future models of structural reconstruction for hydrocarbon generating basins in southern Alaska.

