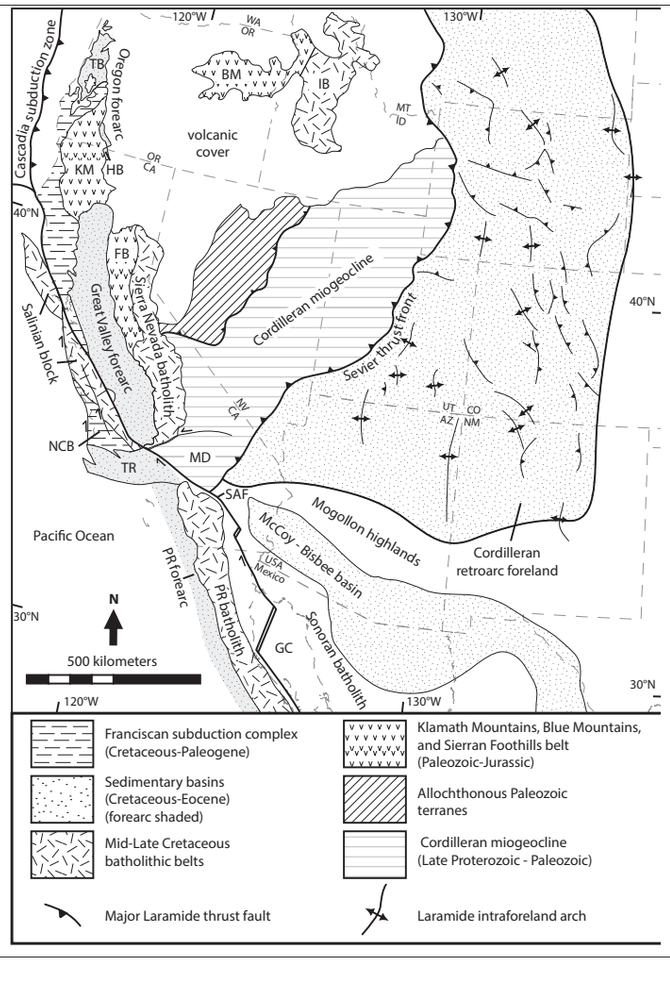
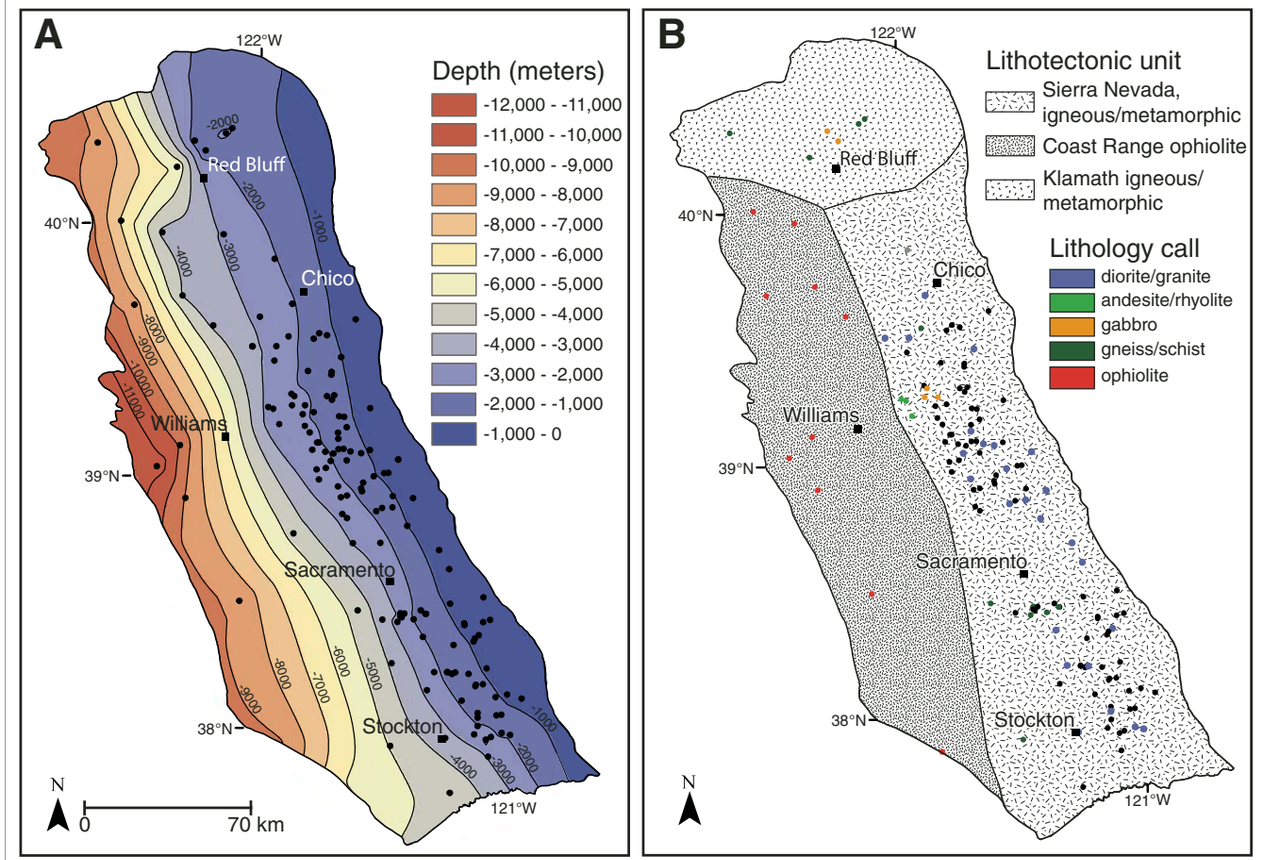
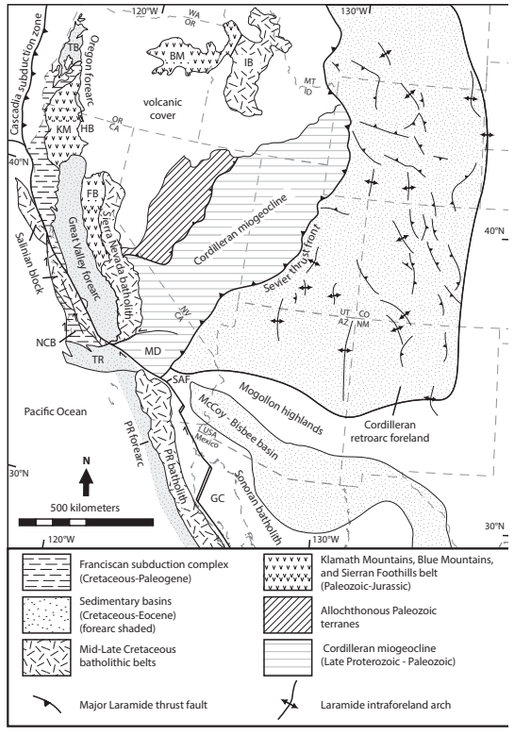


Sharman et al., *GSA Bull.*, 2015

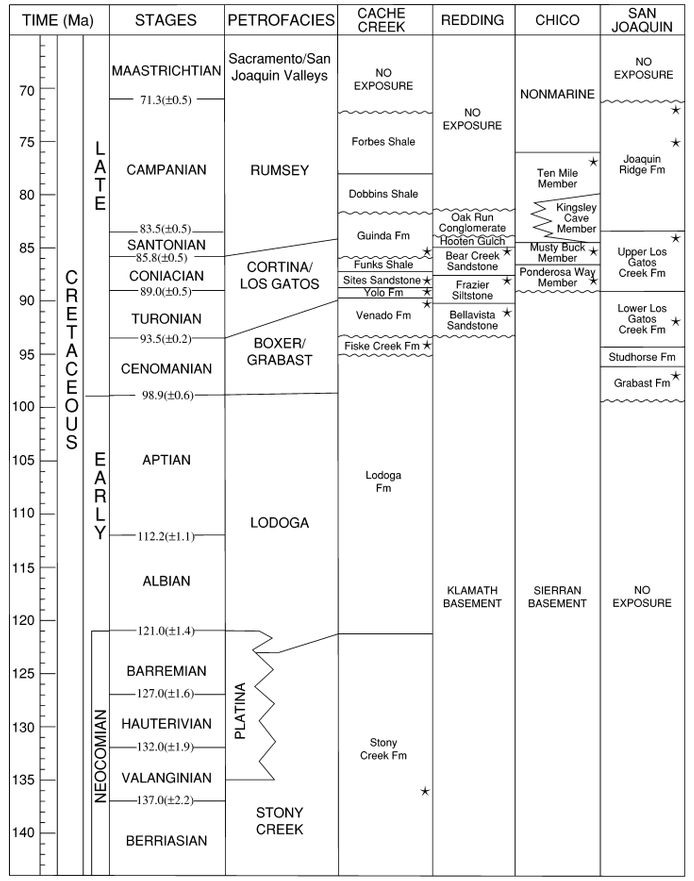


Orme & Graham, *GSA Spec Paper 540.*, 2018

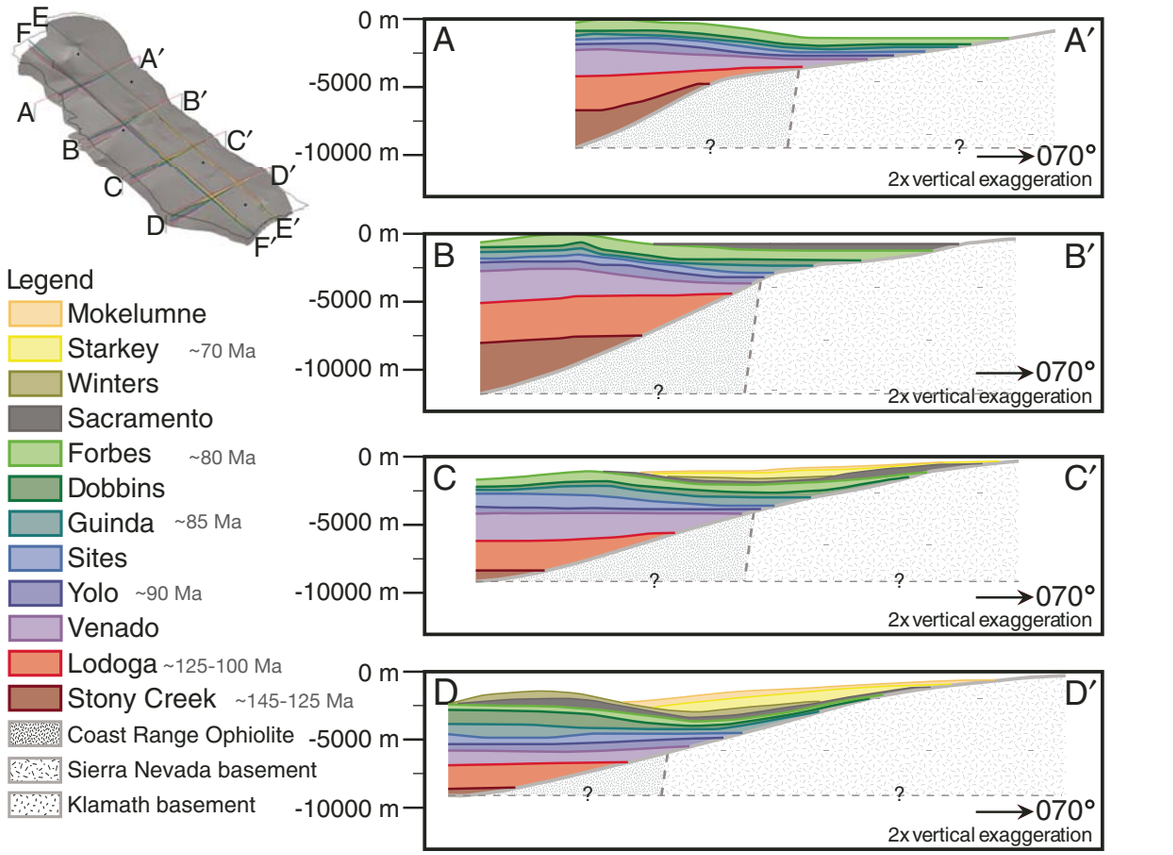
Overview of what the northern part of the basin is currently like. Note that the basement from cores is largely Sierra arc (which a lot of papers get wrong).



Sharman et al., *GSA Bull.*, 2015

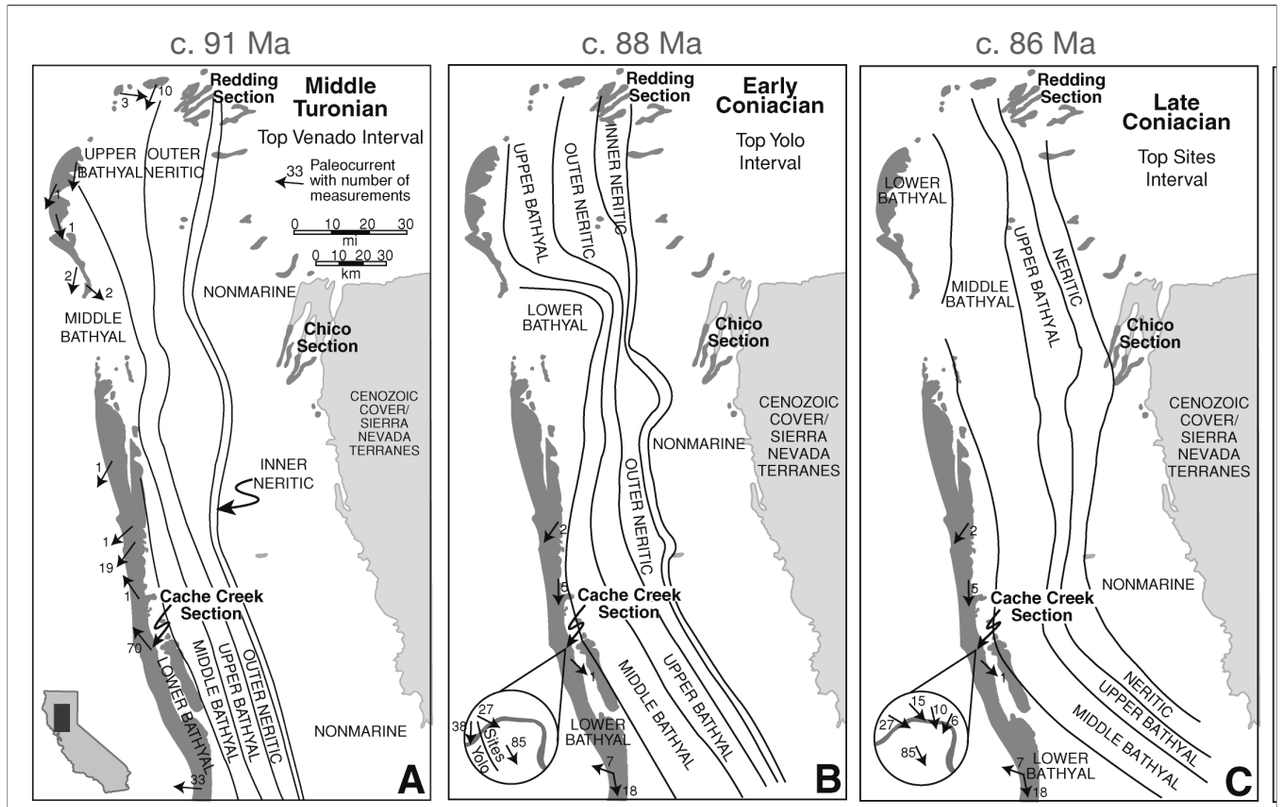


DeGraaff-Surpless et al., *GSA Bull.*, 2002



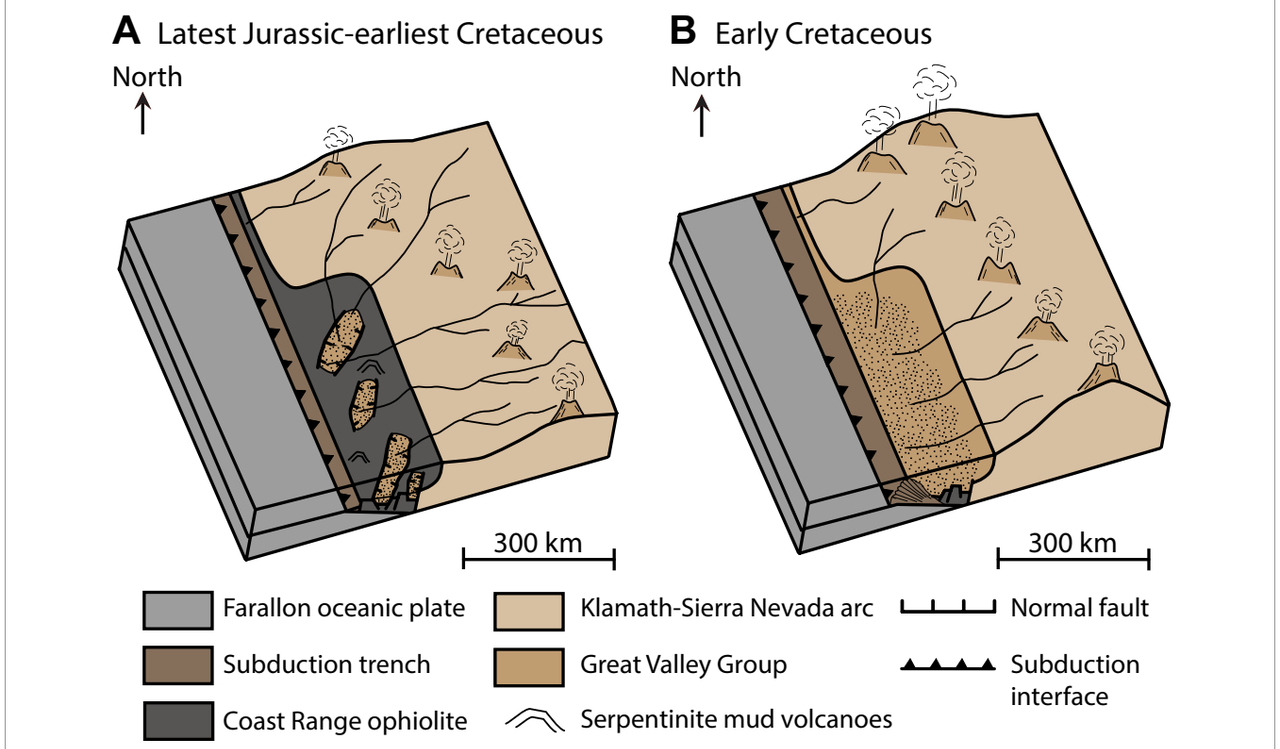
Orme & Graham, *GSA Spec Paper 540.*, 2018

Sediments onlap to the Sierra to the east

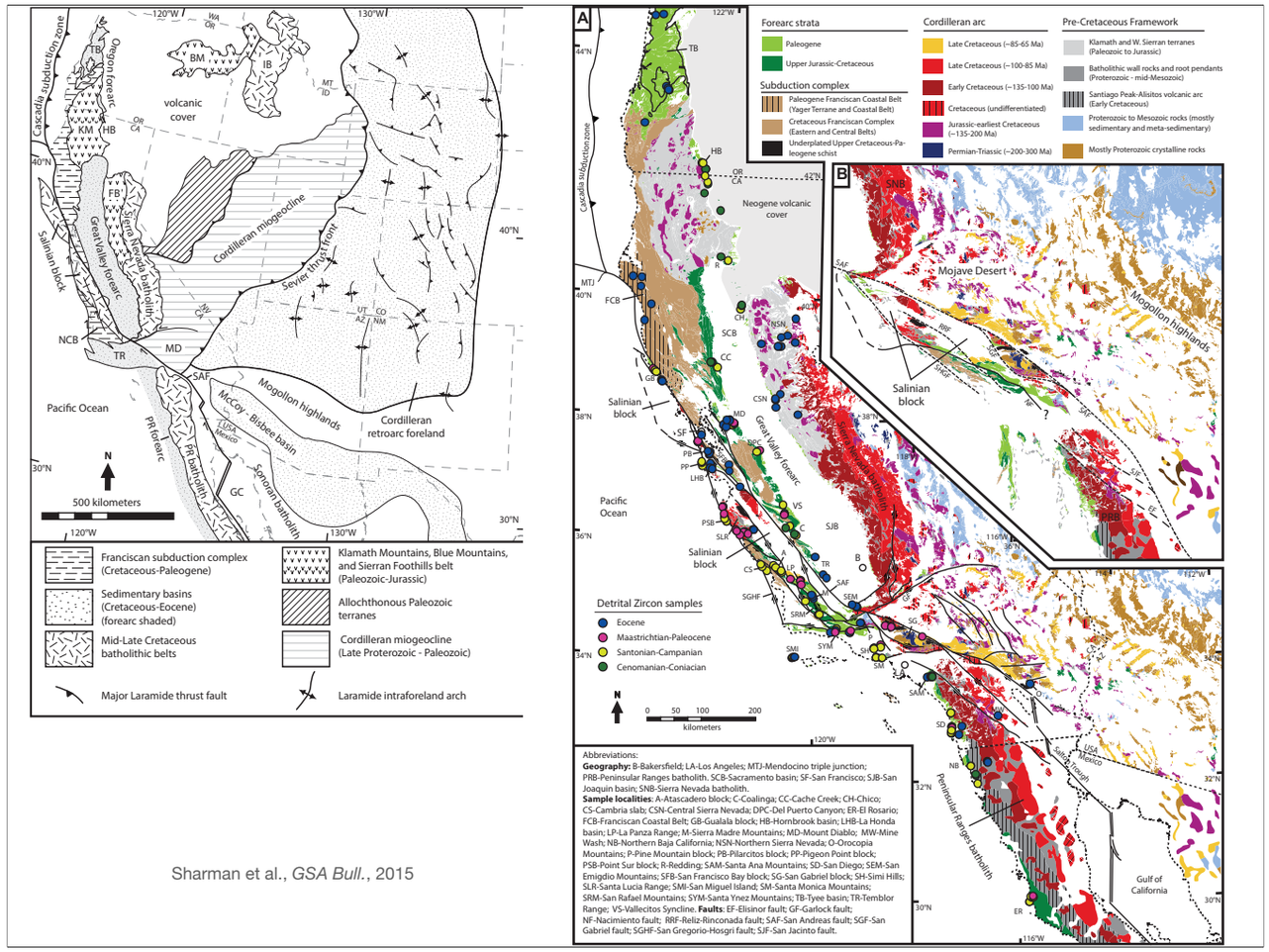


DeGraaff-Surpless et al., *GSA Bull.*, 2002

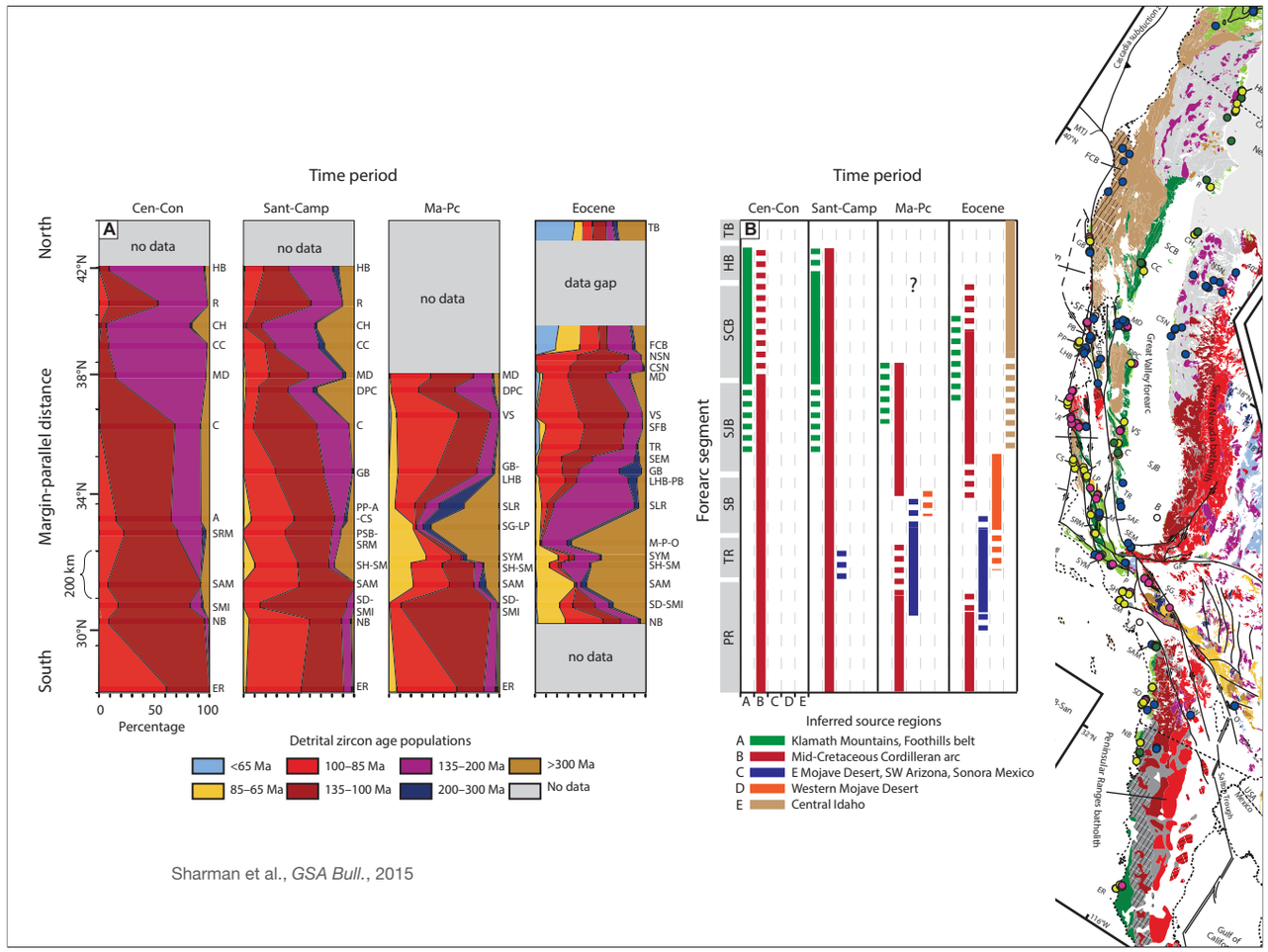
In addition to the onlap, facies deepen rapidly going offshore—and deepen through time as sediments onlap to Sierra



Orme & Surpless, *Geology*, 2019

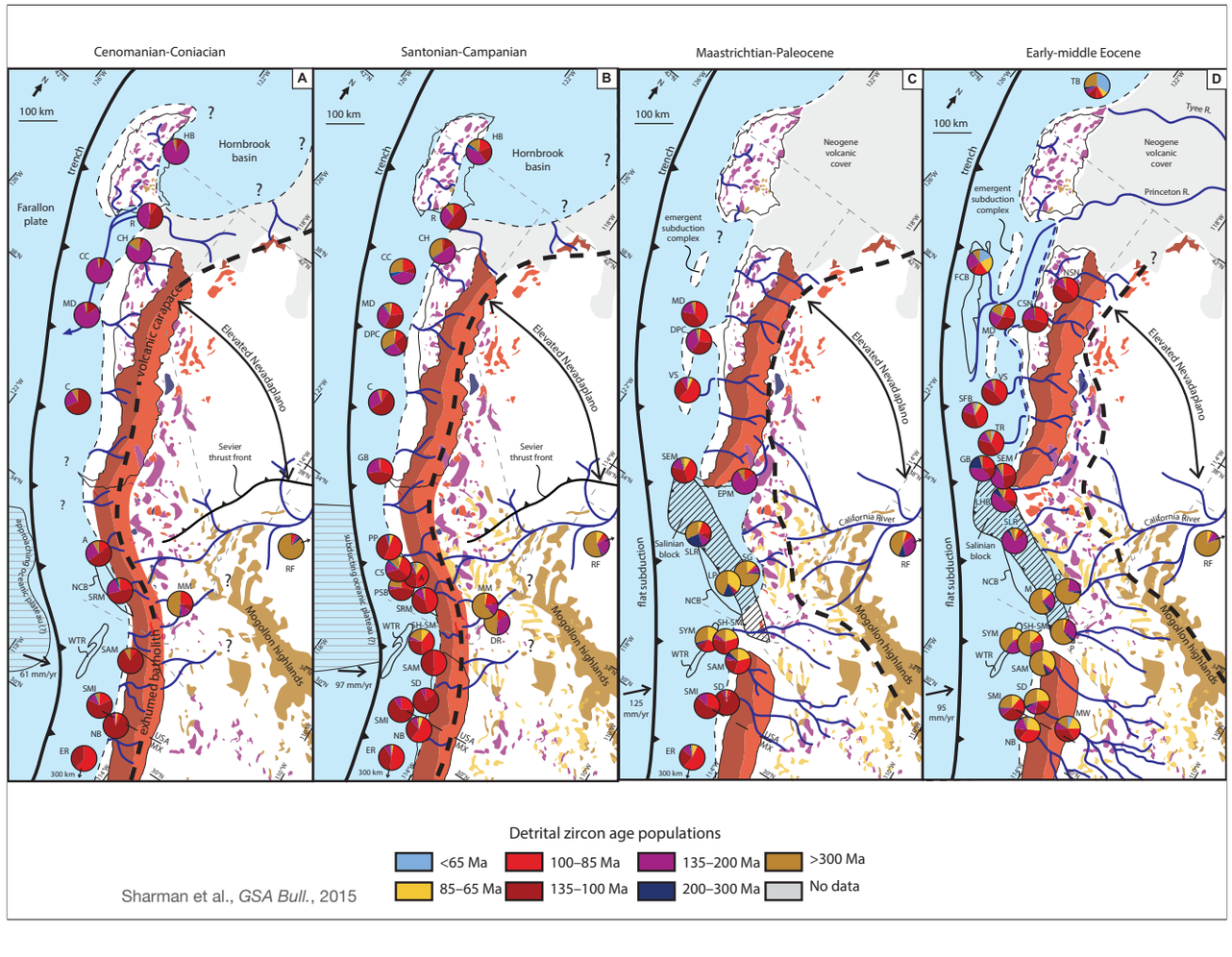


Sharman et al., *GSA Bull.*, 2015



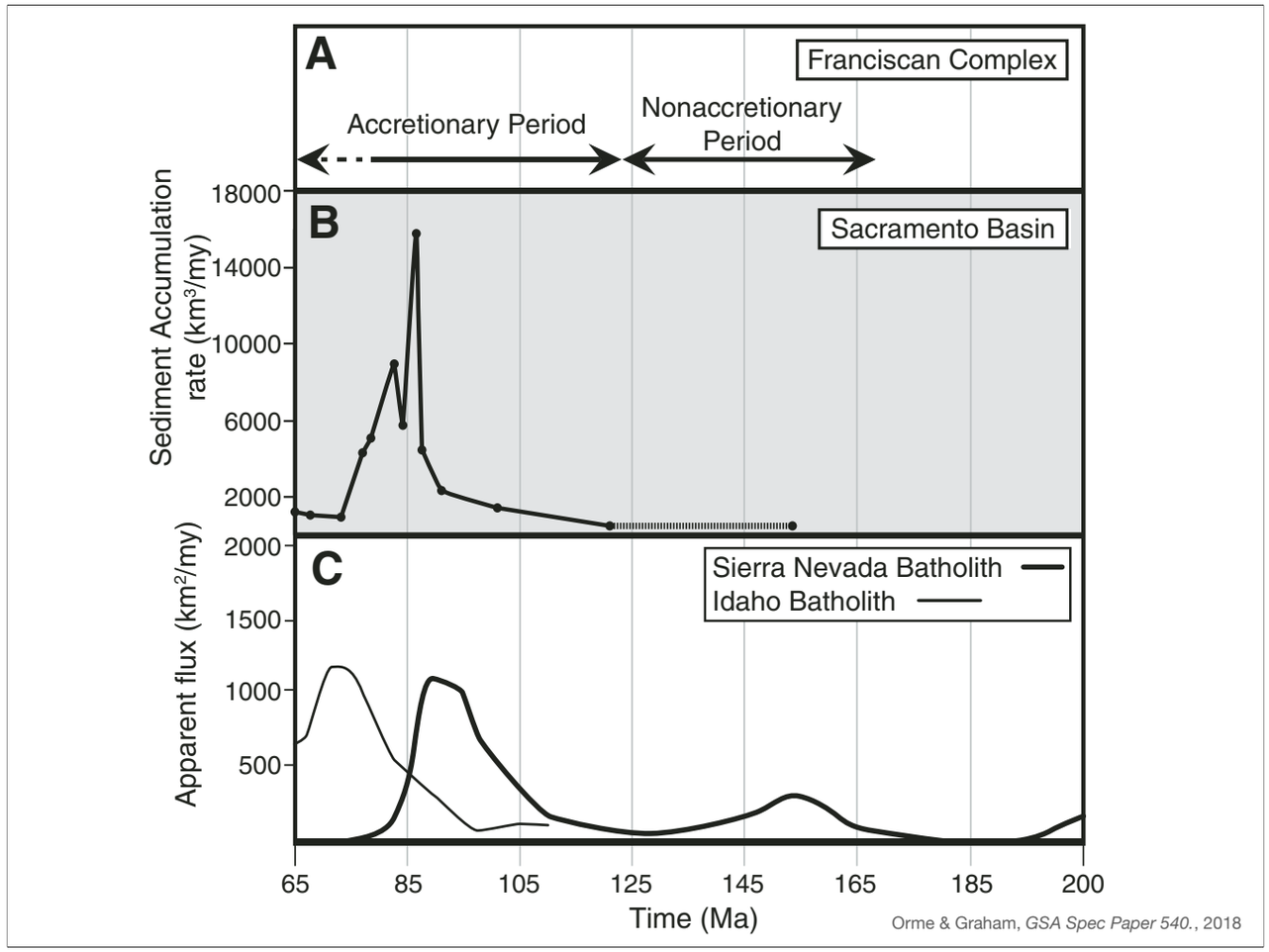
Sharman et al., *GSA Bull.*, 2015

Compilation of a lot of detrital zircons

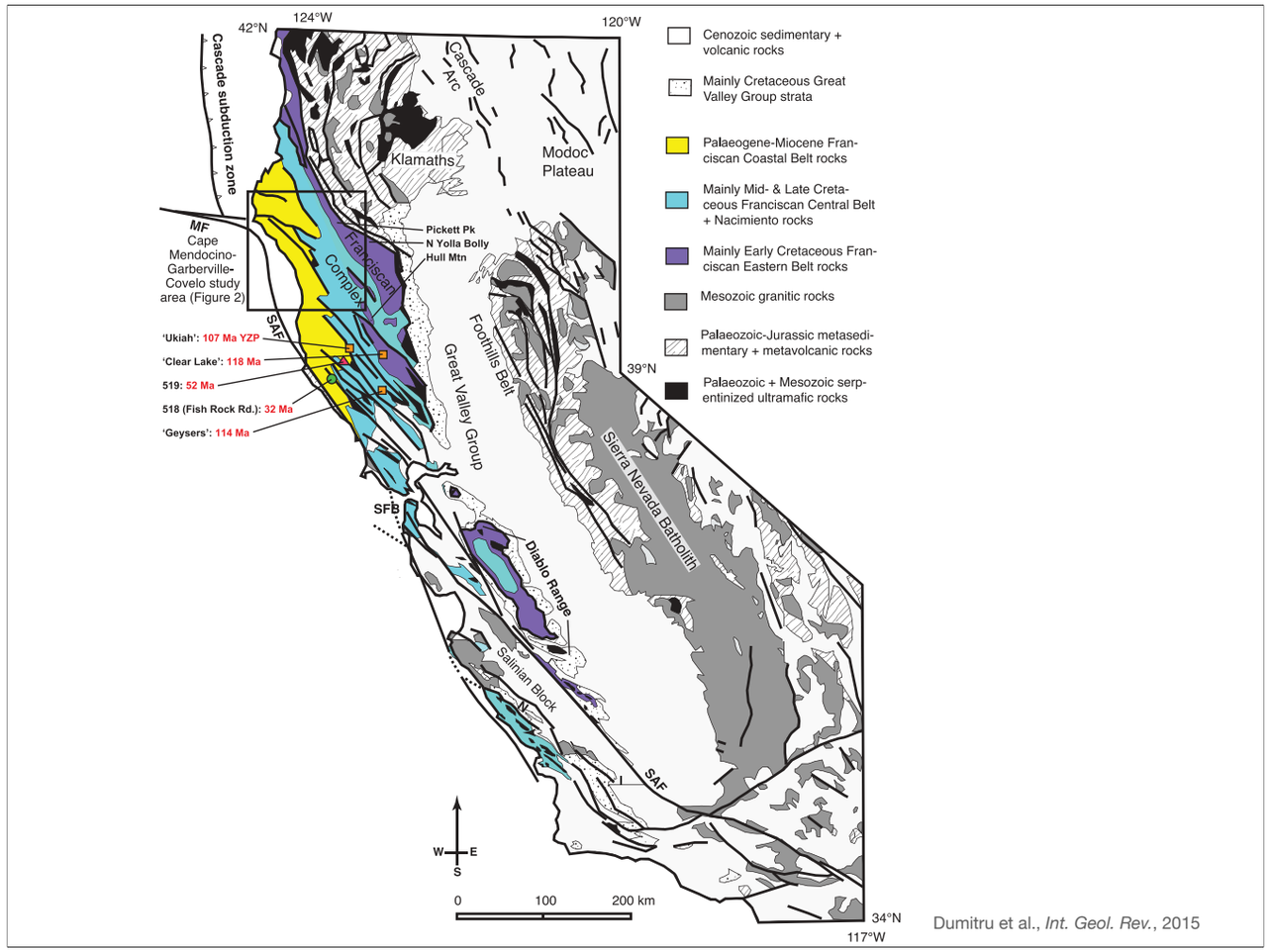


Sharman et al., *GSA Bull.*, 2015

…leads to ability to infer some paleogeography



Most sedimentation in the Sacramento Valley from Sierra eroding—generally overlaps with time when Franciscan was accumulating…



Dumitru et al., *Int. Geol. Rev.*, 2015

Reference map of Franciscan.

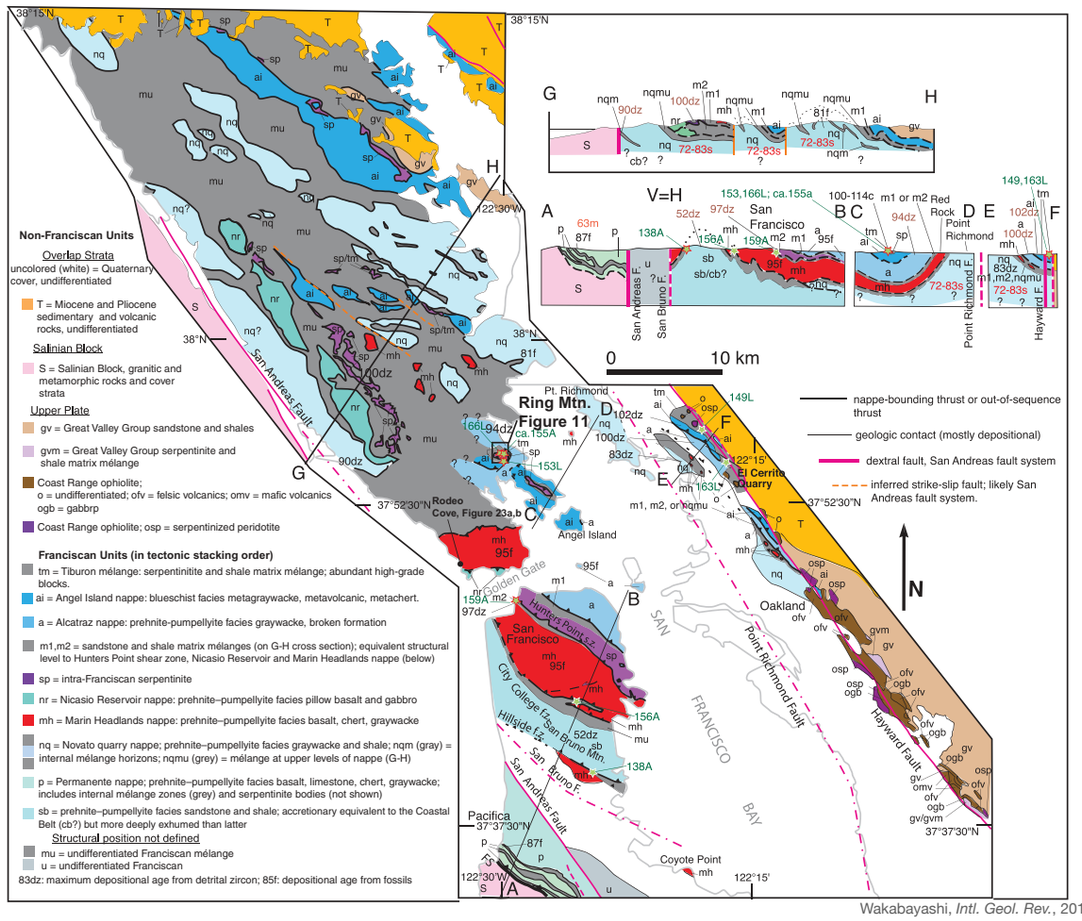
A typical view of the Franciscan

Here can see the serpentinite framework with a high-grade (blueschist?) boulder above

Fabric in a Blueschist

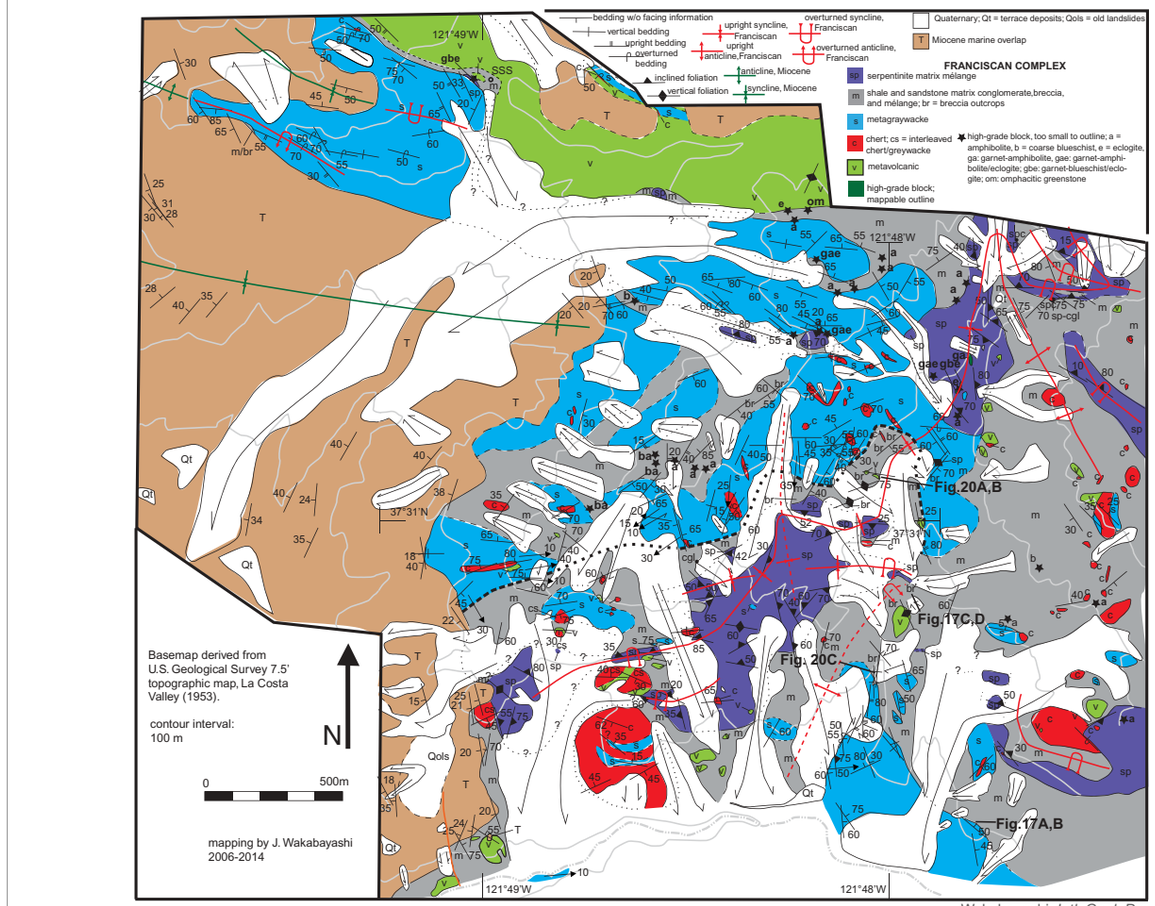
Detail of the blueschist

Pillow lavas in Franciscan



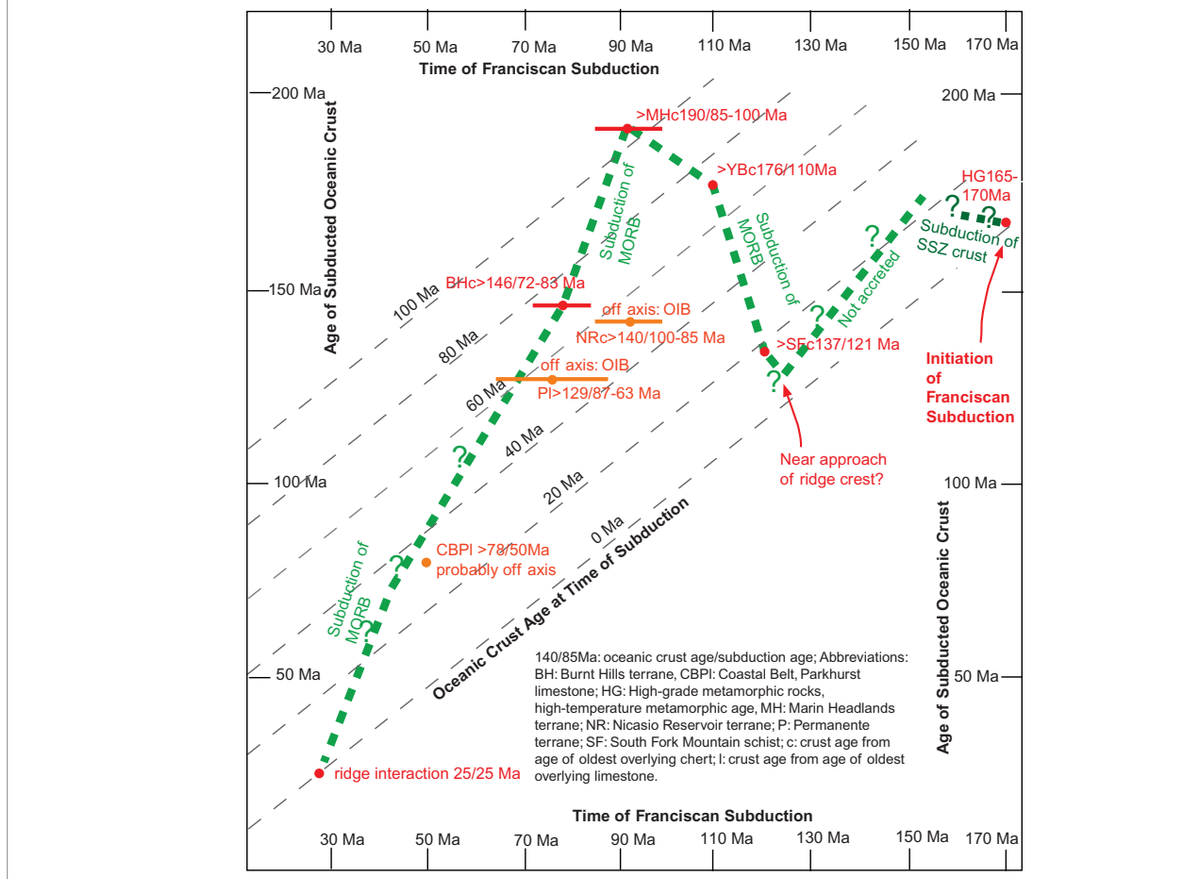
Wakabayashi, *Intl. Geol. Rev.*, 2015

Why it is a “complex”: coherent chunks are lost in melange (grays here)



Wakabayashi, *Intl. Geol. Rev.*, 2015

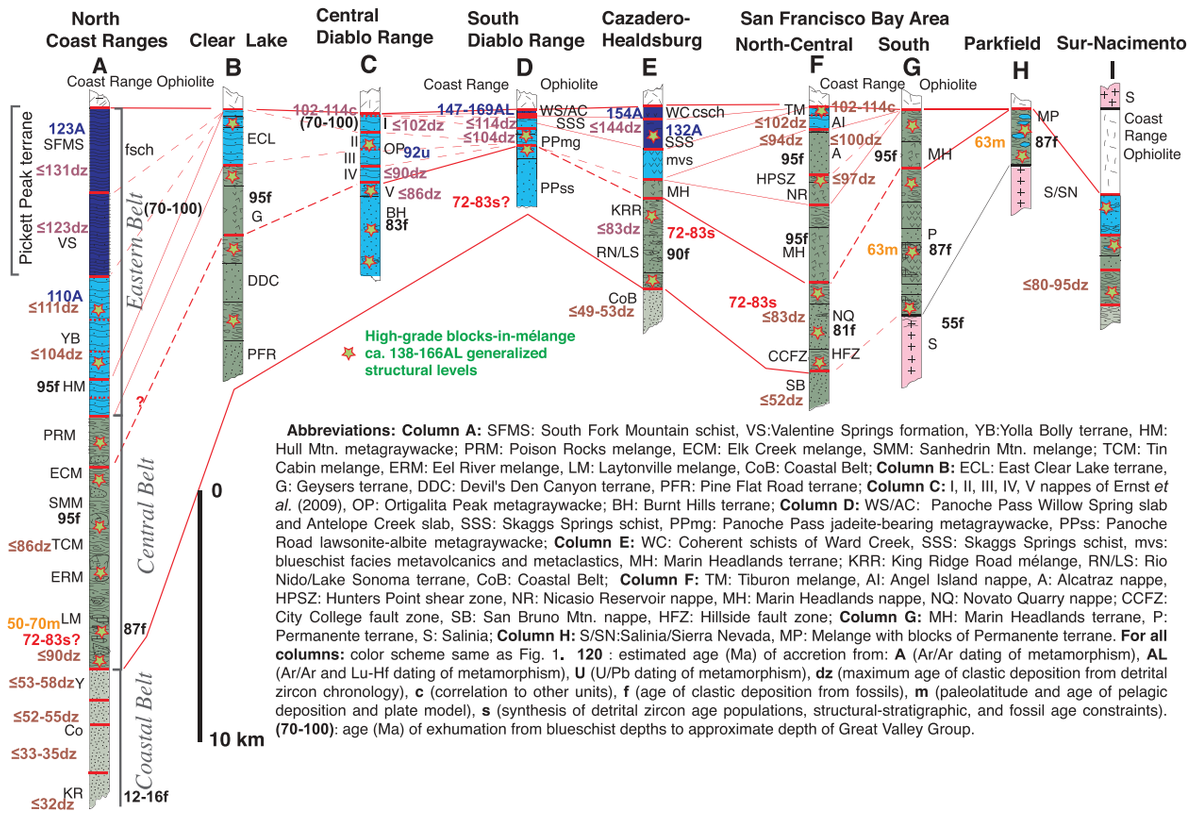
Note the scale here—illustrates just how crazy this is. Note the coherent blocks of graywacke. Also note all the landslides…



Wakabayashi, *Intl. Geol. Rev.*, 2015

Note pretty continuous accretion from 120 Ma to 70 Ma

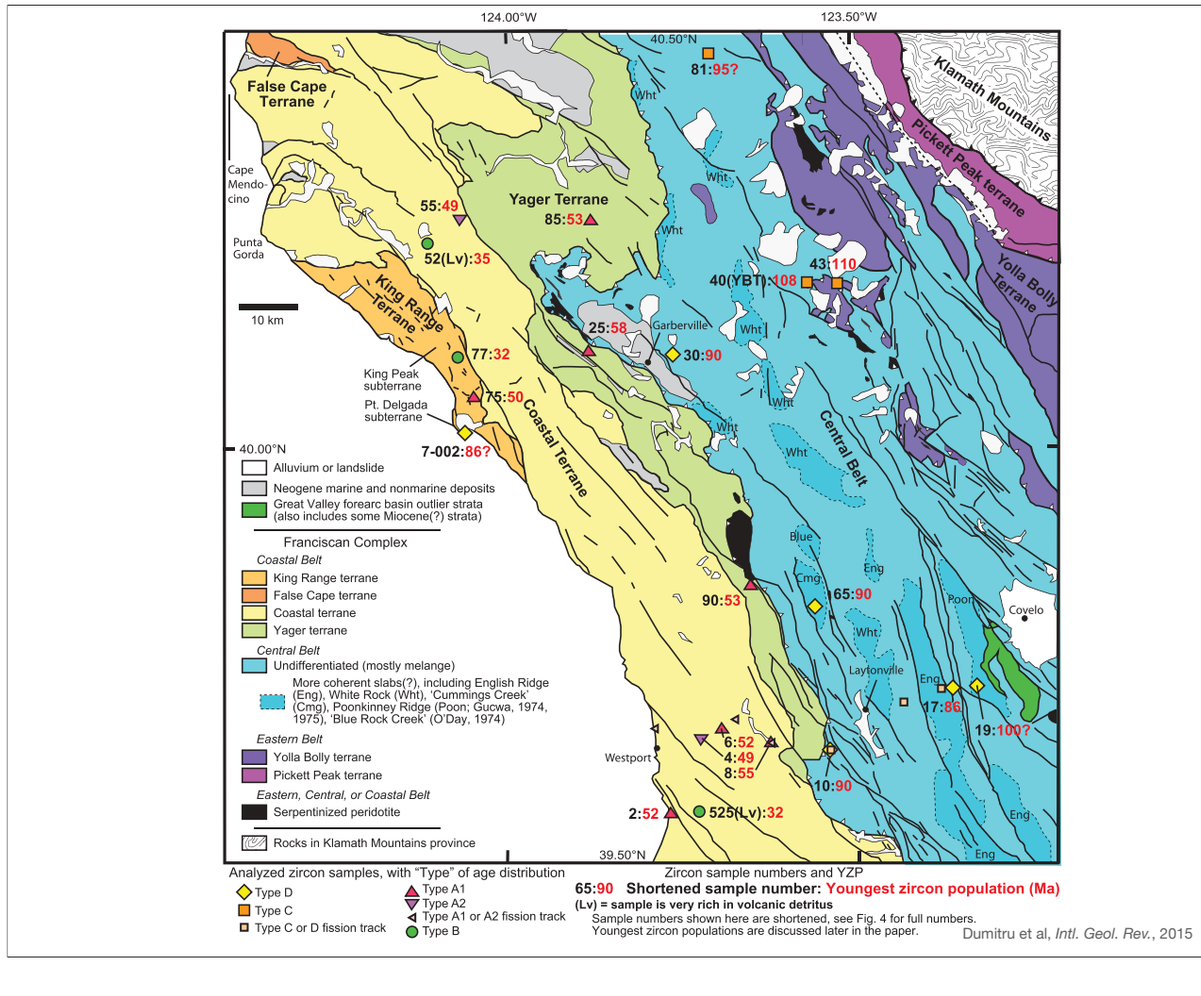
Figure 9. Plot showing accretionary versus ocean crust age of various oceanic units in the Franciscan. Updated and revised from Wakabayashi et al. (2010). Accretionary age estimated from metamorphic ages or depositional age of clastic rocks associated with an oceanic crustal fragment. Oceanic crust age estimated by age of oldest pelagic sedimentary rocks overlying oceanic basalt from Murchey and Blake (1993) for YB, MH, BH, P, and CBP, and Murchey and Jones (1984) for NR. Subduction initiation age in young arc crust from Wakabayashi et al. (2010). SF ocean crust age estimated from young detrital zircon populations in chert overlying metabasite and SF subduction age from Ar–Ar metamorphic age (Dumitru et al. 2010). YB subduction age from analysis of previously published metamorphic ages and young detrital zircon populations (Dumitru et al. 2010). MH and NR subduction age upper limit from fossil age of clastic sedimentary rocks (Blake et al. 1984) and lower limit by regional analysis of geochronologic data (Dumitru et al. 2015). BH subduction age estimate from estimate of depositional age of clastic sedimentary rocks from this study (Section 4.5). Subduction age of P upper limit from youngest pelagic sediments (Sliter 1984; Sliter and McGann 1992) and lower limit from plate model of Tarduno et al. (1985). Subduction age for CBP estimated from age of clastic sedimentary rocks from Dumitru et al. (2013, 2015). Determination of OIB geochemistry of NR and P from Ghatak et al. (2012), whereas CBP inferred by general relationship of limestone section overlying basaltic rocks. MORB geochemistry of SF and MH from Wakabayashi et al. (2010) and Ghatak et al. (2012). MORB is inferred for YB and BH on the basis of chert (and no associated limestone) overlying basaltic rocks. The subducted ocean plate age after BH is poorly constrained and has been adjusted to be older than CBP at the time of CBP subduction on the basis of the off-axis interpretation of CBP.



Abbreviations: Column A: SFMS: South Fork Mountain schist, VS:Valentine Springs formation, YB:Yolla Bolly terrane, HM: Hull Mtn. metagraywacke; PRM: Poison Rocks melange, ECM: Elk Creek melange, SMM: Sanhedrin Mtn. melange; TCM: Tin Cabin melange, ERM: Eel River melange, LM: Laytonville melange, CoB: Coastal Belt; **Column B:** ECL: East Clear Lake terrane, G: Geysers terrane, DDC: Devil's Den Canyon terrane, PFR: Pine Flat Road terrane; **Column C:** I, II, III, IV, V nappes of Ernst *et al.* (2009), OP: Ortigalita Peak metagraywacke; BH: Burnt Hills terrane; **Column D:** WS/AC: Panoche Pass Willow Spring slab and Antelope Creek slab, SSS: Skaggs Springs schist, PPmg: Panoche Pass jadeite-bearing metagraywacke, PPss: Panoche Road lawsonite-albite metagraywacke; **Column E:** WC: Coherent schists of Ward Creek, SSS: Skaggs Springs schist, mvs: blueschist facies metavolcanics and metaclastics, MH: Marin Headlands terrane; KRR: King Ridge Road mélange, RN/LS: Rio Nido/Lake Sonoma terrane, CoB: Coastal Belt; **Column F:** TM: Tiburon melange, AI: Angel Island nappe, A: Alcatraz nappe, HPSZ: Hunters Point shear zone, NR: Nicasio Reservoir nappe, MH: Marin Headlands nappe, NQ: Novato Quarry nappe; CCFZ: City College fault zone, SB: San Bruno Mtn. nappe, HFZ: Hillside fault zone; **Column G:** MH: Marin Headlands terrane, P: Permanente terrane, S: Salinia; **Column H:** S/SN:Salinia/Sierra Nevada, MP: Melange with blocks of Permanente terrane. **For all columns:** color scheme same as Fig. 1**. 120** : estimated age (Ma) of accretion from: **A** (Ar/Ar dating of metamorphism), **AL** (Ar/Ar and Lu-Hf dating of metamorphism), **U** (U/Pb dating of metamorphism), **dz** (maximum age of clastic deposition from detrital zircon chronology), **c** (correlation to other units), **f** (age of clastic deposition from fossils), **m** (paleolatitude and age of pelagic deposition and plate model), **s** (synthesis of detrital zircon age populations, structural-stratigraphic, and fossil age constraints). **(70-100)**: age (Ma) of exhumation from blueschist depths to approximate depth of Great Valley Group.

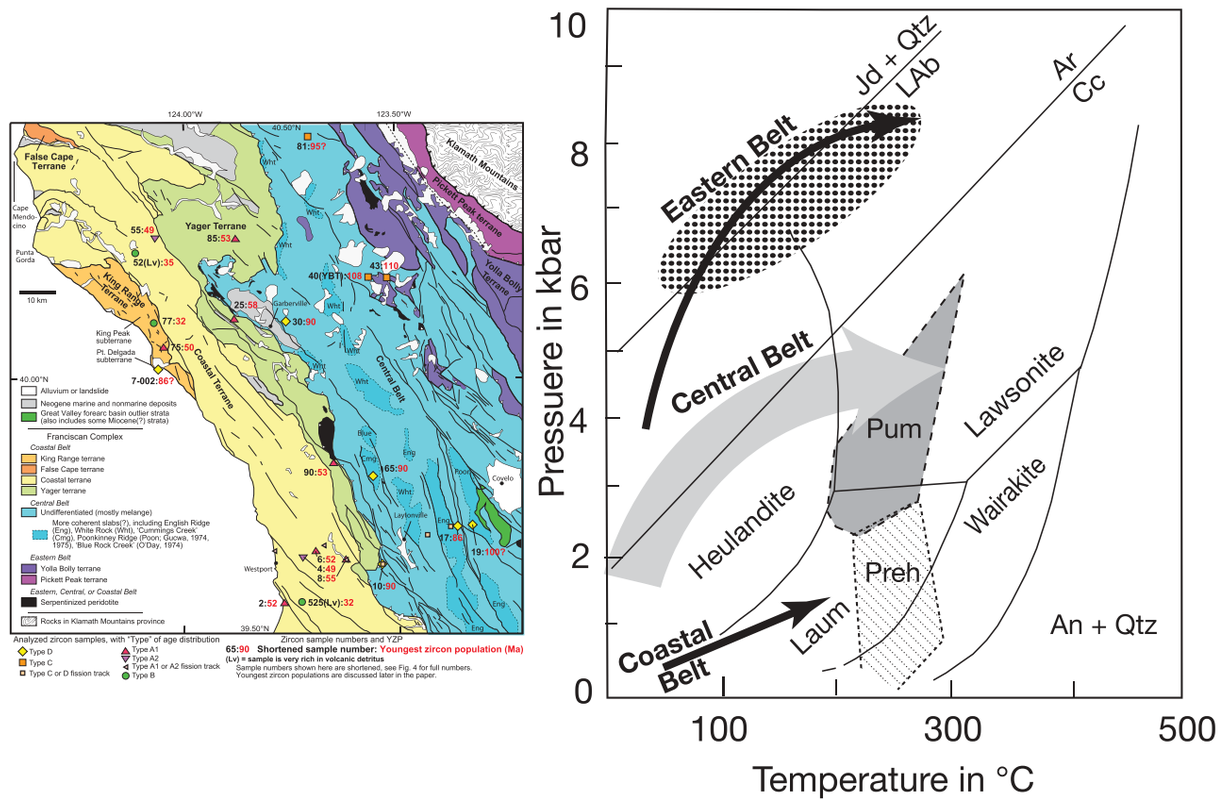
Wakabayashi, *Intl. Geol. Rev.*, 2015

Structure columns: Note that highest structural level is pretty consistently the oldest.



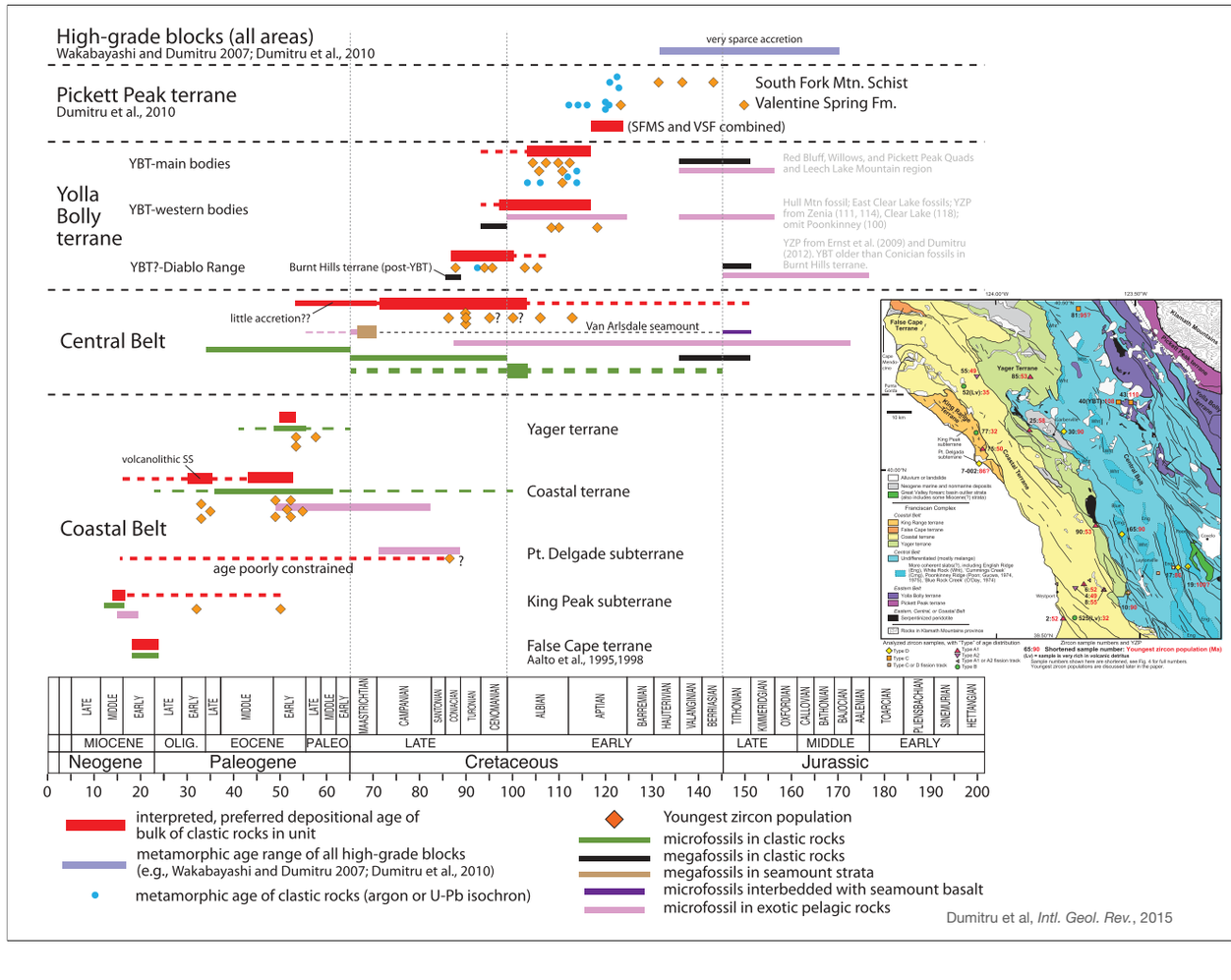
Dumitru et al, *Intl. Geol. Rev.*, 2015

NW California shows in map view the progression from east to west with younger deposits.



Dumitru et al, *Intl. Geol. Rev.*, 2015

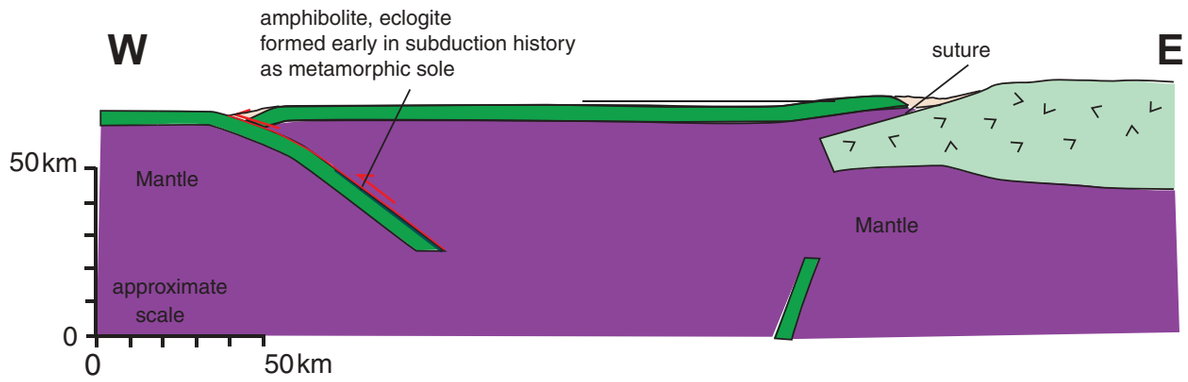
In addition to age progression, older stuff generally had a higher pressure history.



Dumitru et al, *Intl. Geol. Rev.*, 2015

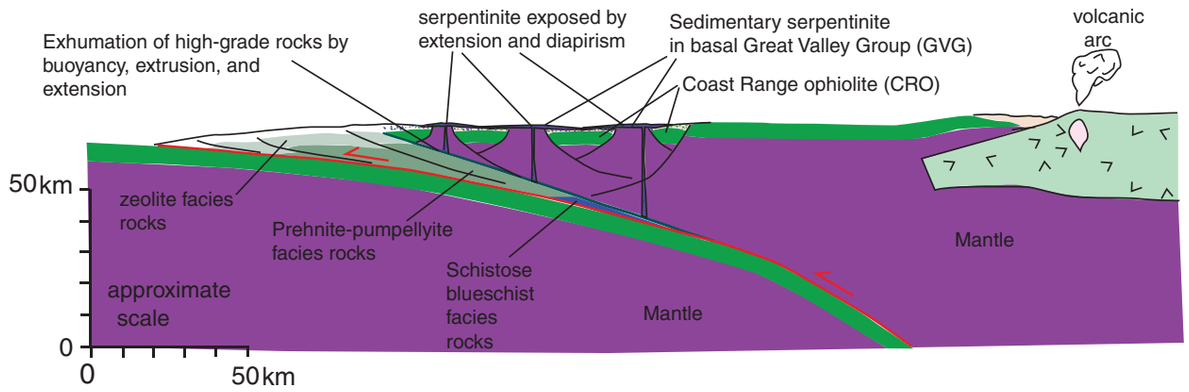
NW California shows in map view the progression from east to west with younger deposits.

a Ca. 165 Ma subduction initiation

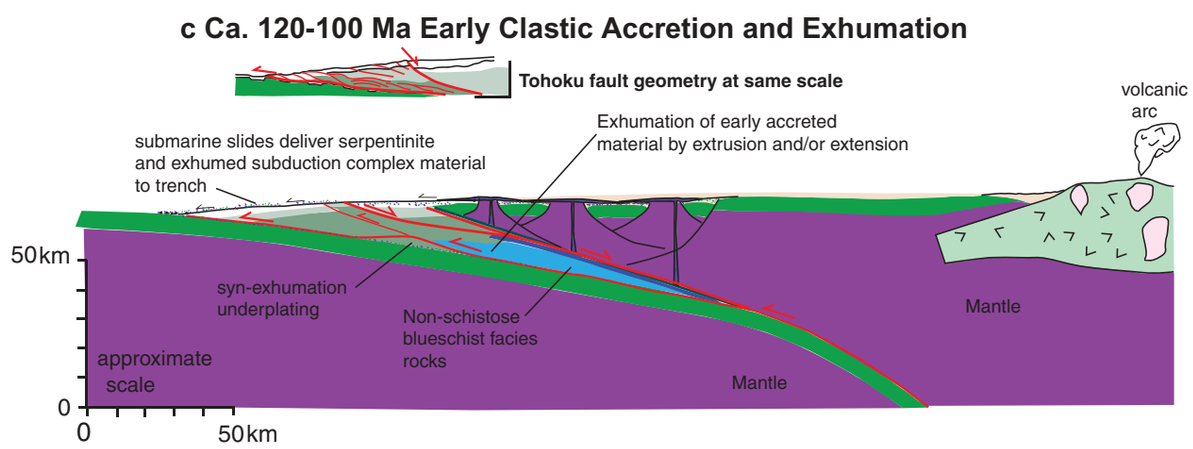


Wakabayashi, *Intl. Geol. Rev.*, 2015

b Ca. 150-135 Ma early serpentinite sedimentation

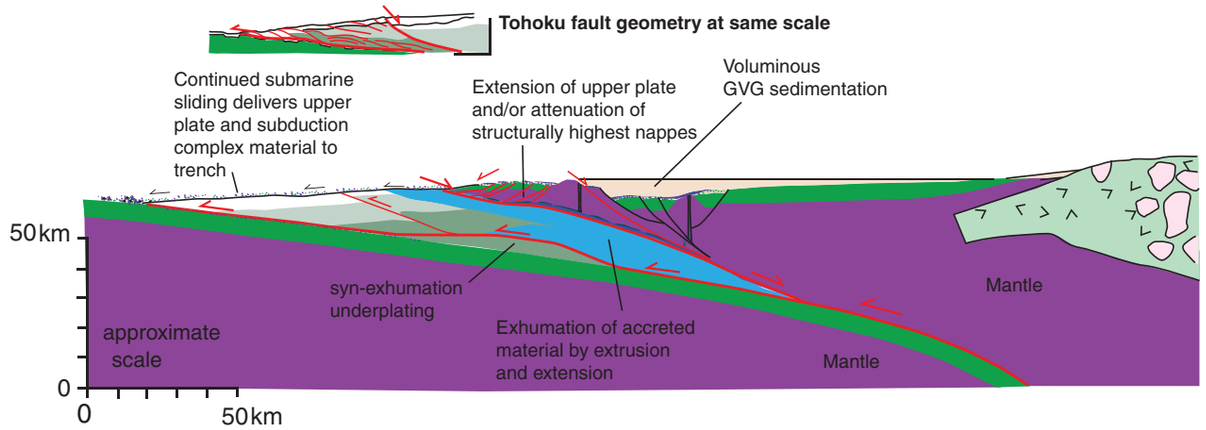


Wakabayashi, *Intl. Geol. Rev.*, 2015



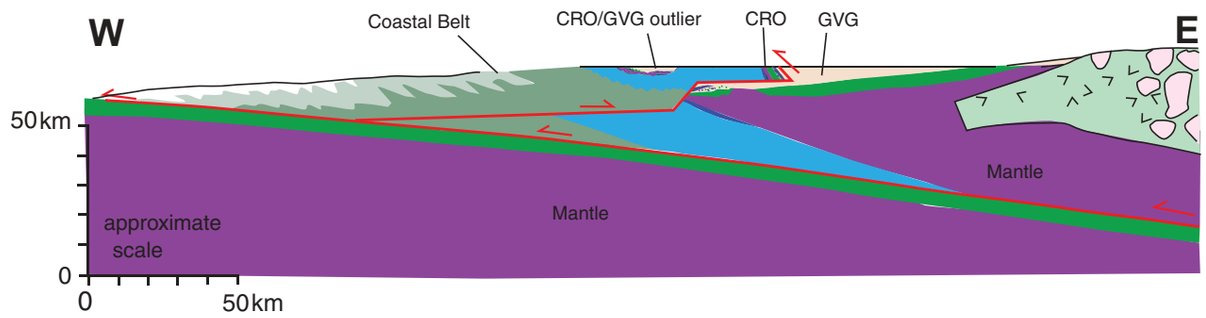
Wakabayashi, *Intl. Geol. Rev.*, 2015

d Ca. 100-70 Ma Clastic Accretion and Exhumation



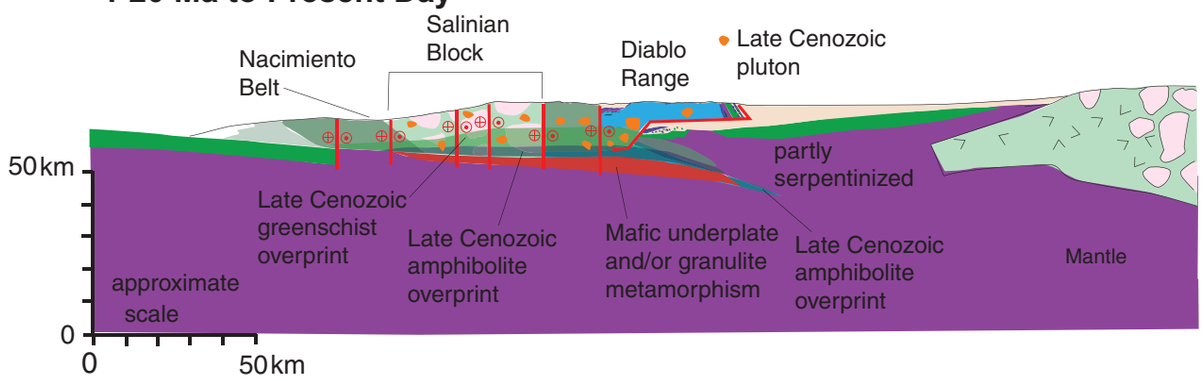
Wakabayashi, *Intl. Geol. Rev.*, 2015

e Ca. 70-20 Ma Tectonic wedging/frontal accretion

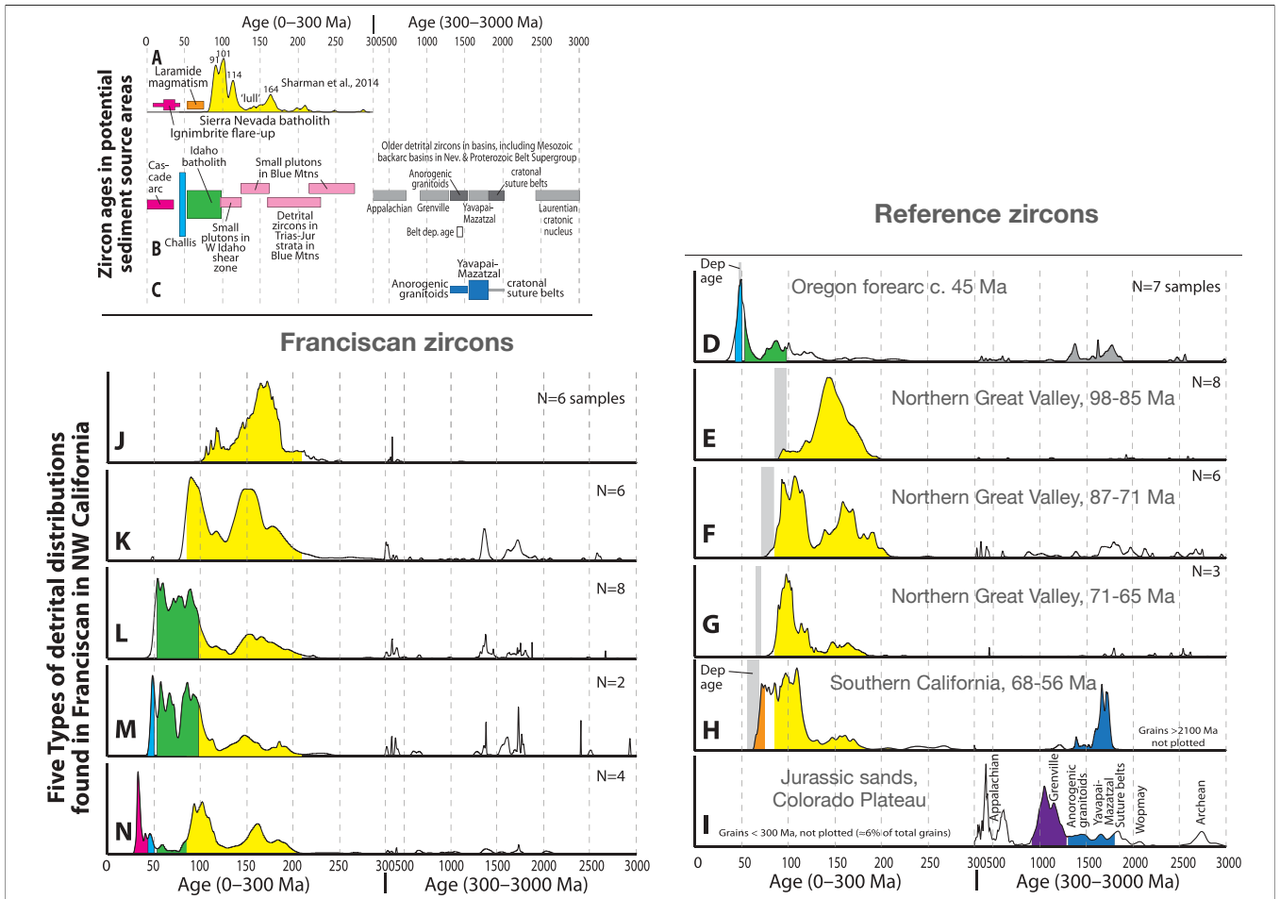


Wakabayashi, *Intl. Geol. Rev.*, 2015

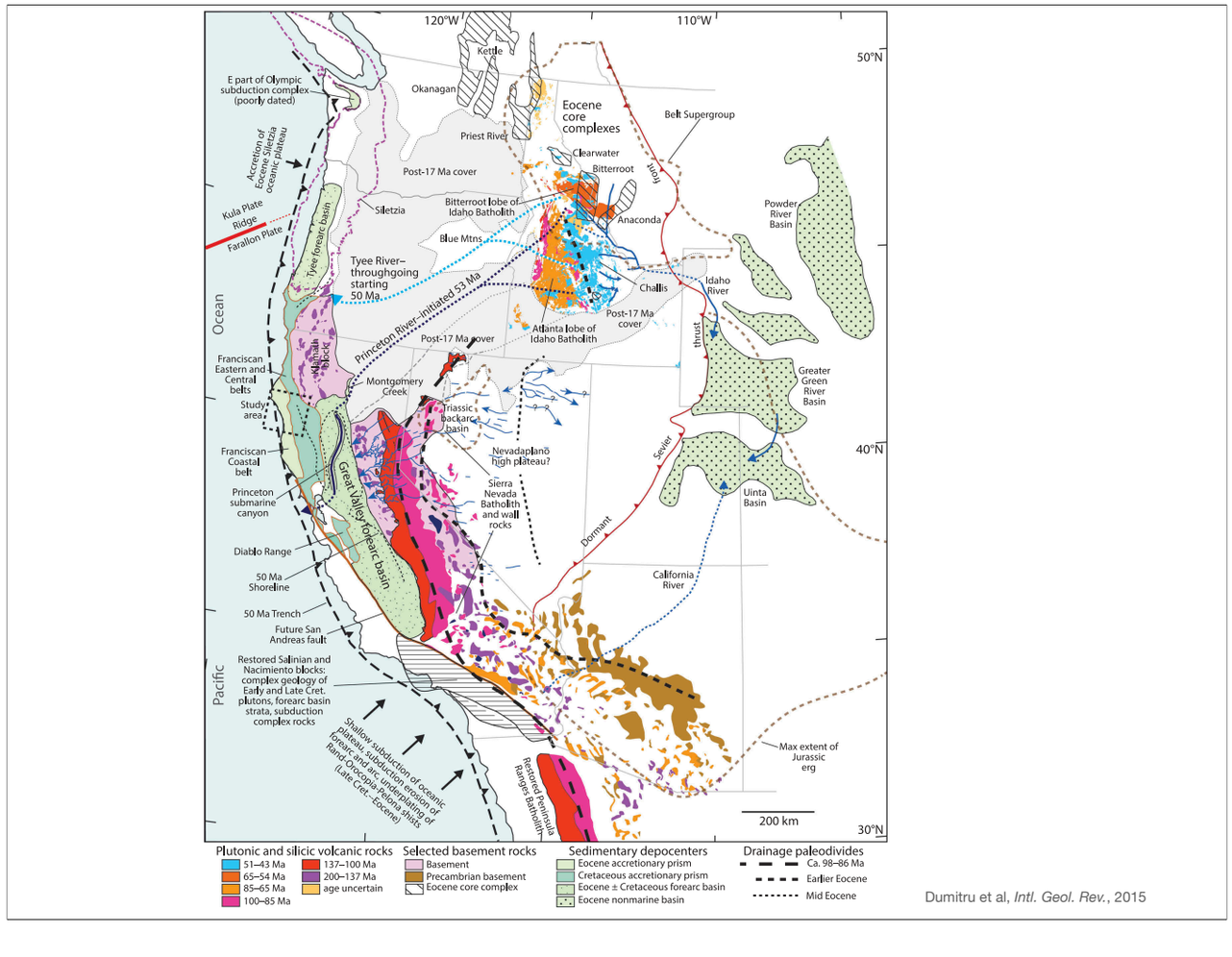
f 20 Ma to Present Day



Wakabayashi, *Intl. Geol. Rev.*, 2015



Dumitru et al, *Intl. Geol. Rev.*, 2015



Dumitru et al, *Intl. Geol. Rev.*, 2015

Result suggests Franciscan is local and not far-travelled, but that major river breached the immediate basin c 50 Ma to bring in debris from Idaho (this showed up on the earlier forearc DZ plots). Note other divides shown here