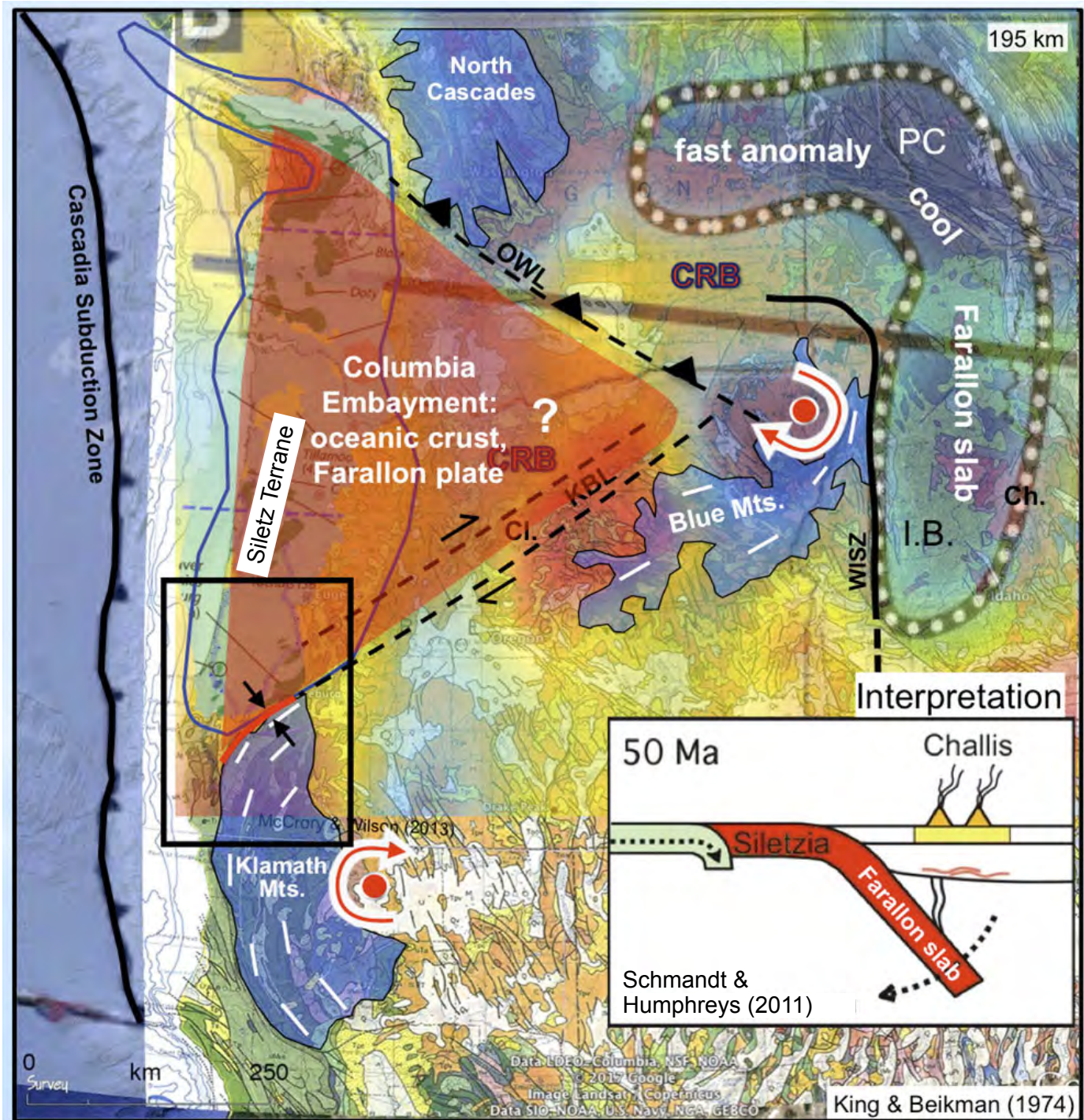


FIELD TRIP

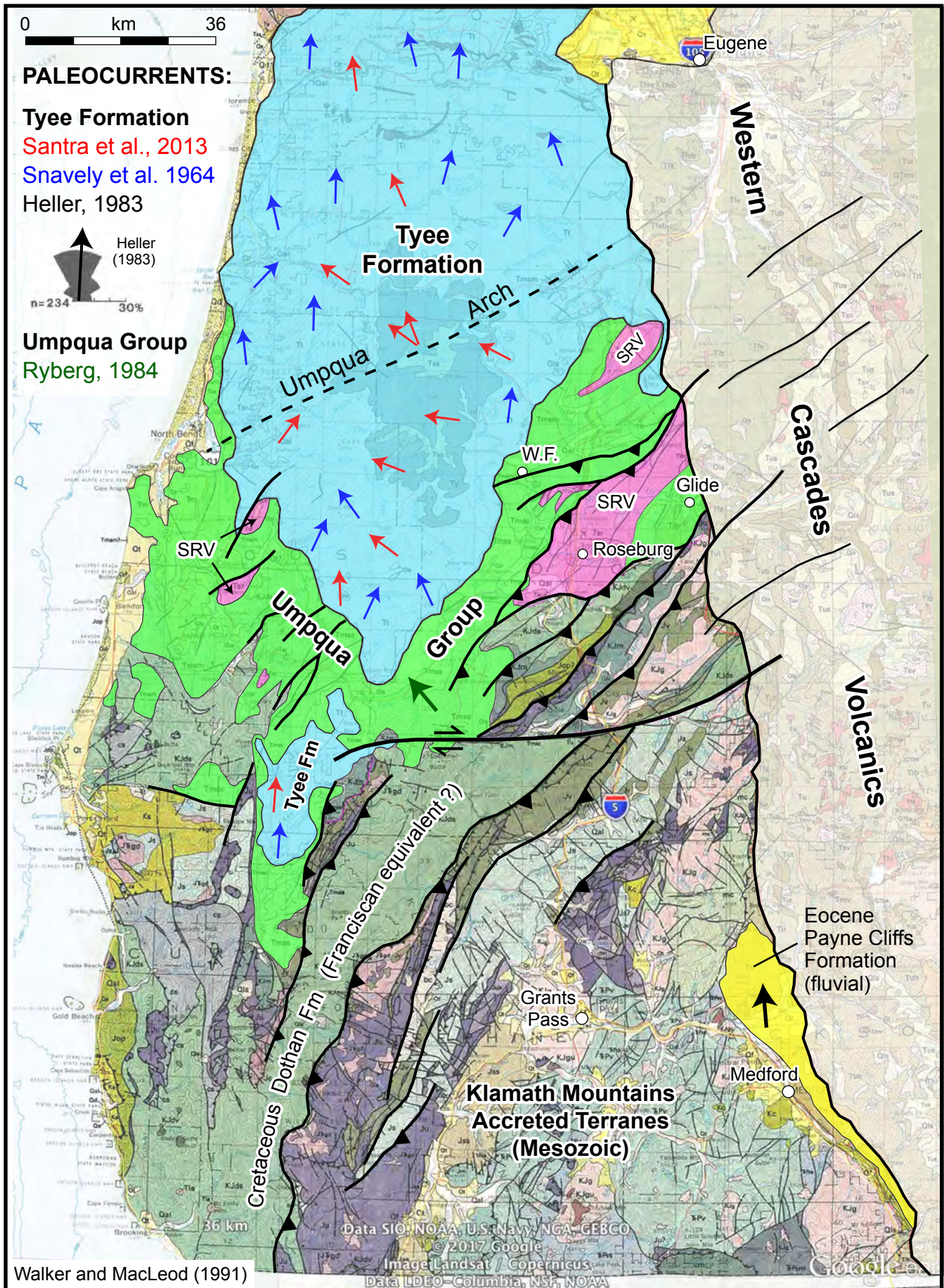
Eocene Accretion of Siletzia, SW Oregon

GEOL 440/540 - Sedimentary Basin Analysis

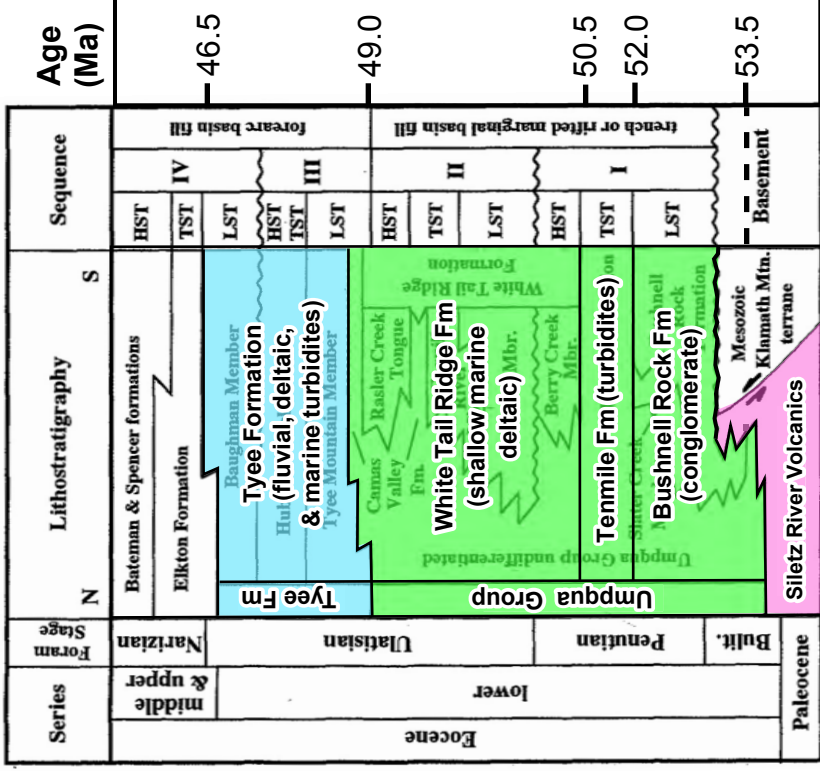
October 6-7, 2018



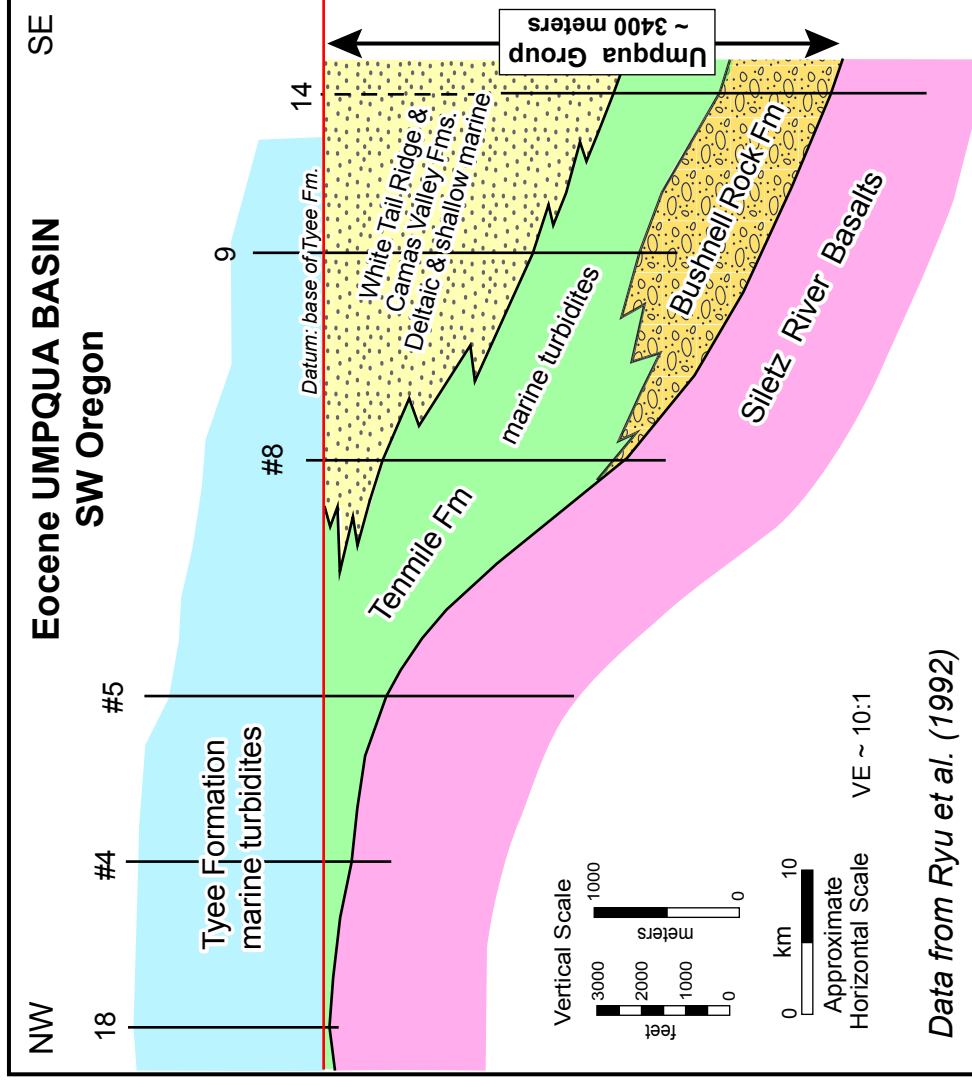
Geologic Map of SW Oregon



Eocene Stratigraphy of SW Oregon



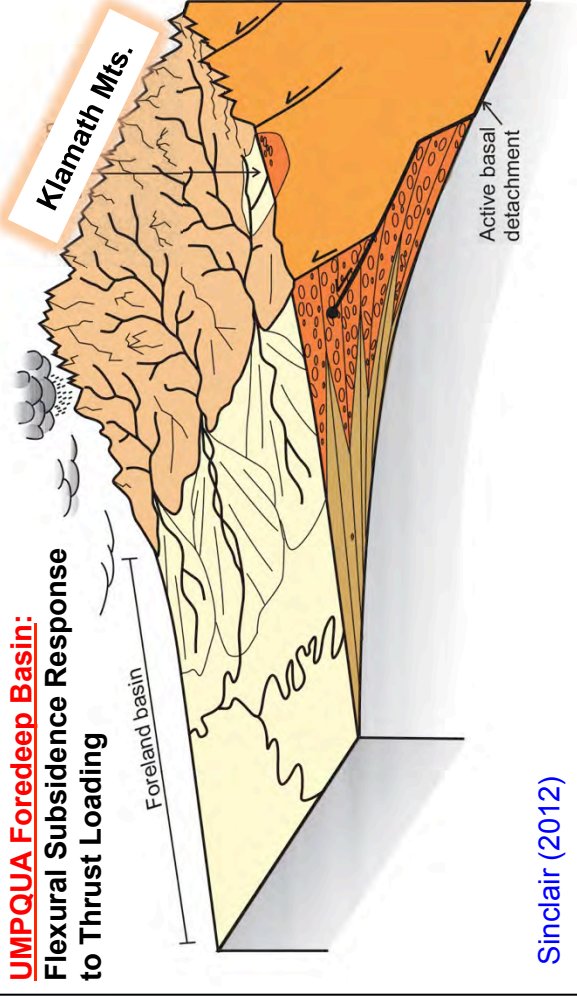
Ryu & Niem 1999 (ages from Wells et al., 2014)



Collisional Orogen & Foredeep Basin

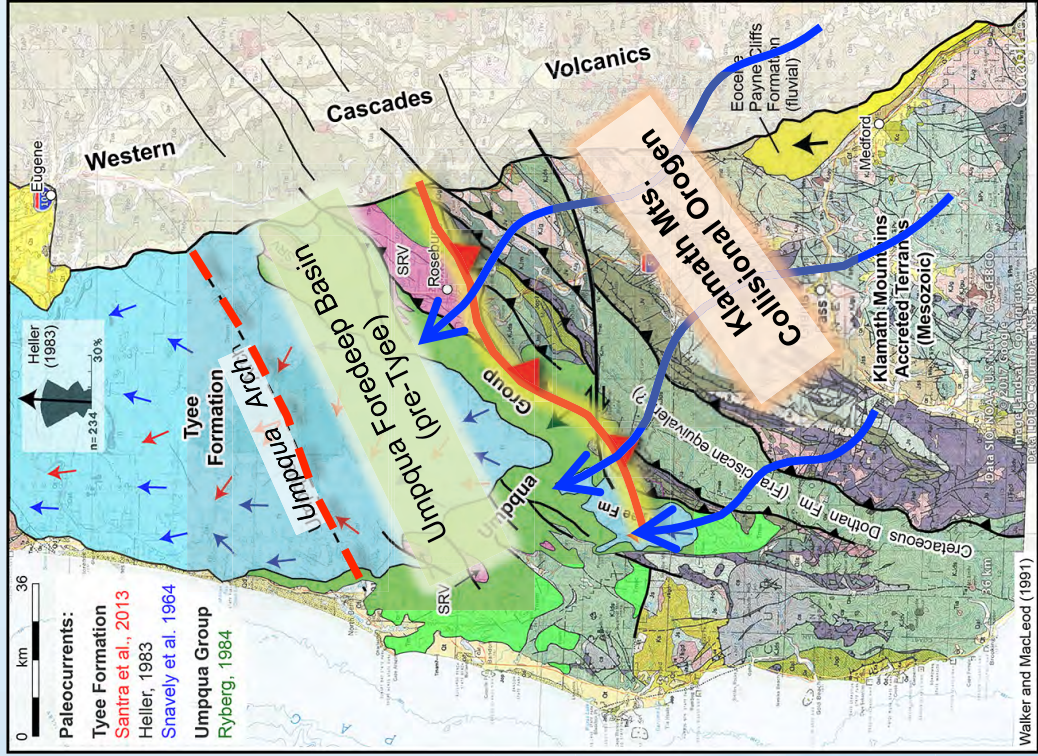
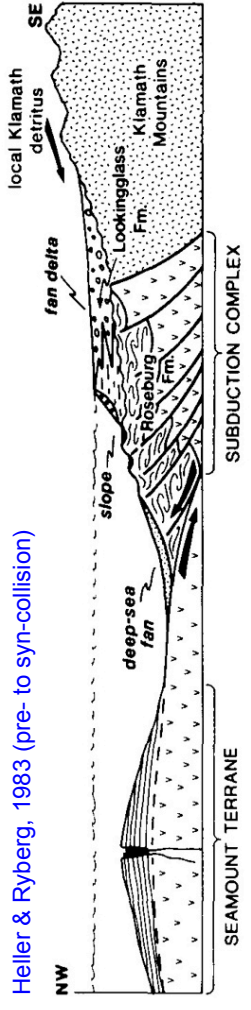
UMPQUA Foredeep Basin:

Flexural Subsidence Response to Thrust Loading



Sinclair (2012)

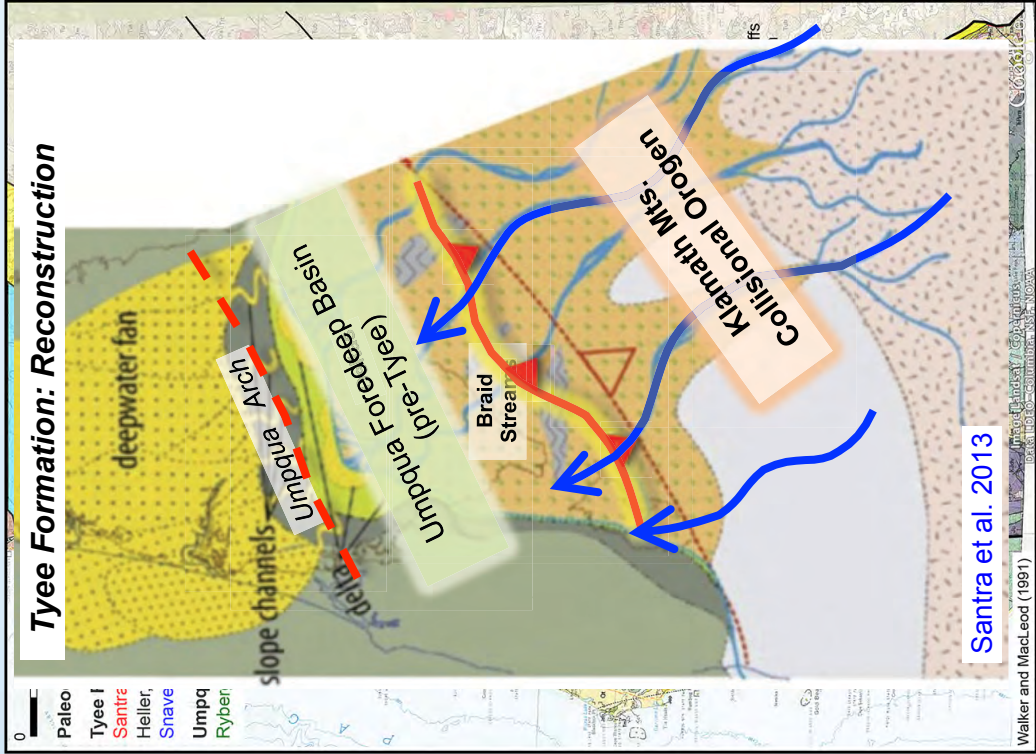
Heller & Ryberg, 1983 (pre- to syn-collision)



- Paleocurrents:**
- Tye Formation
Santra et al., 2013
 - Heller, 1983
 - Snaveley et al. 1964
 - Umpqua Group
Ryberg, 1984

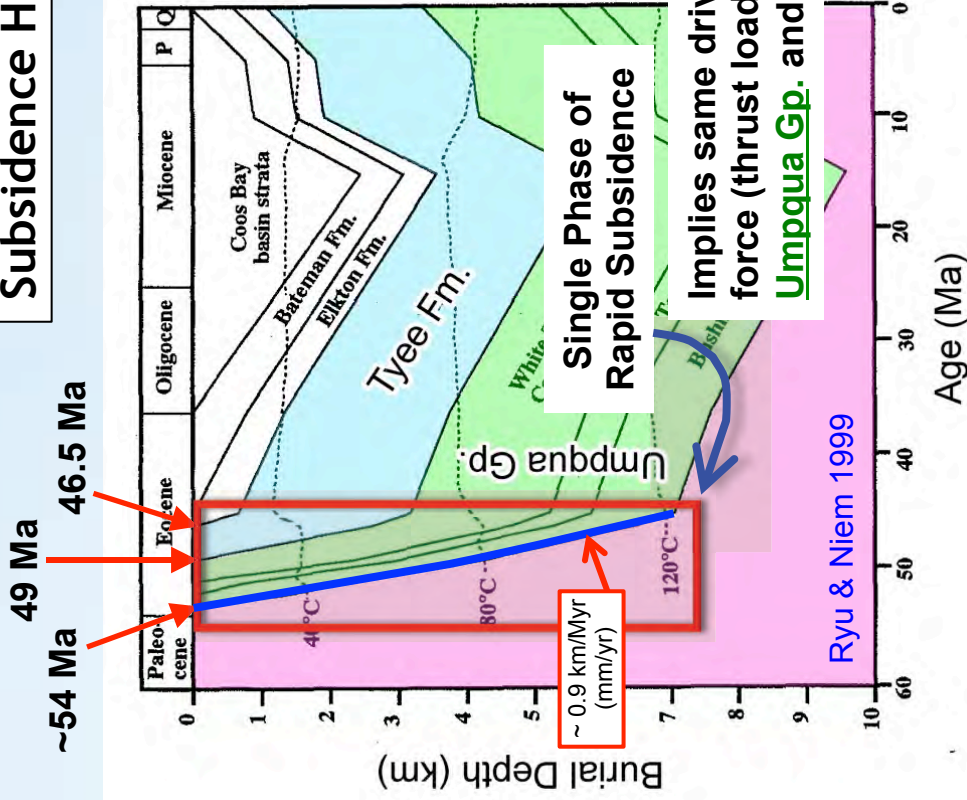
Walker and MacLeod (1991)

Tyee Formation: Reconstruction



Santra et al. 2013

Subsidence History



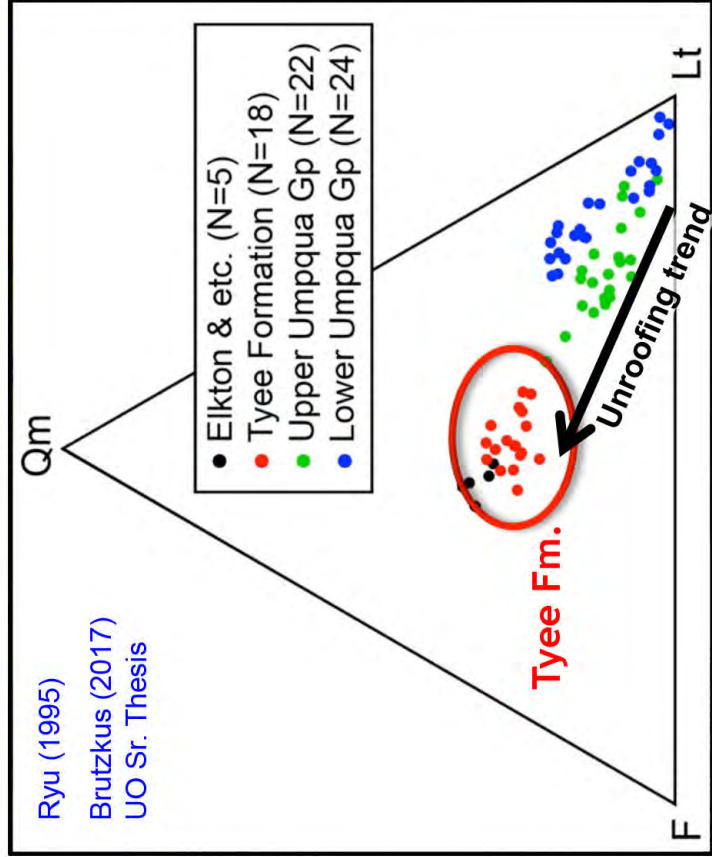
Detrital Zircon Ages



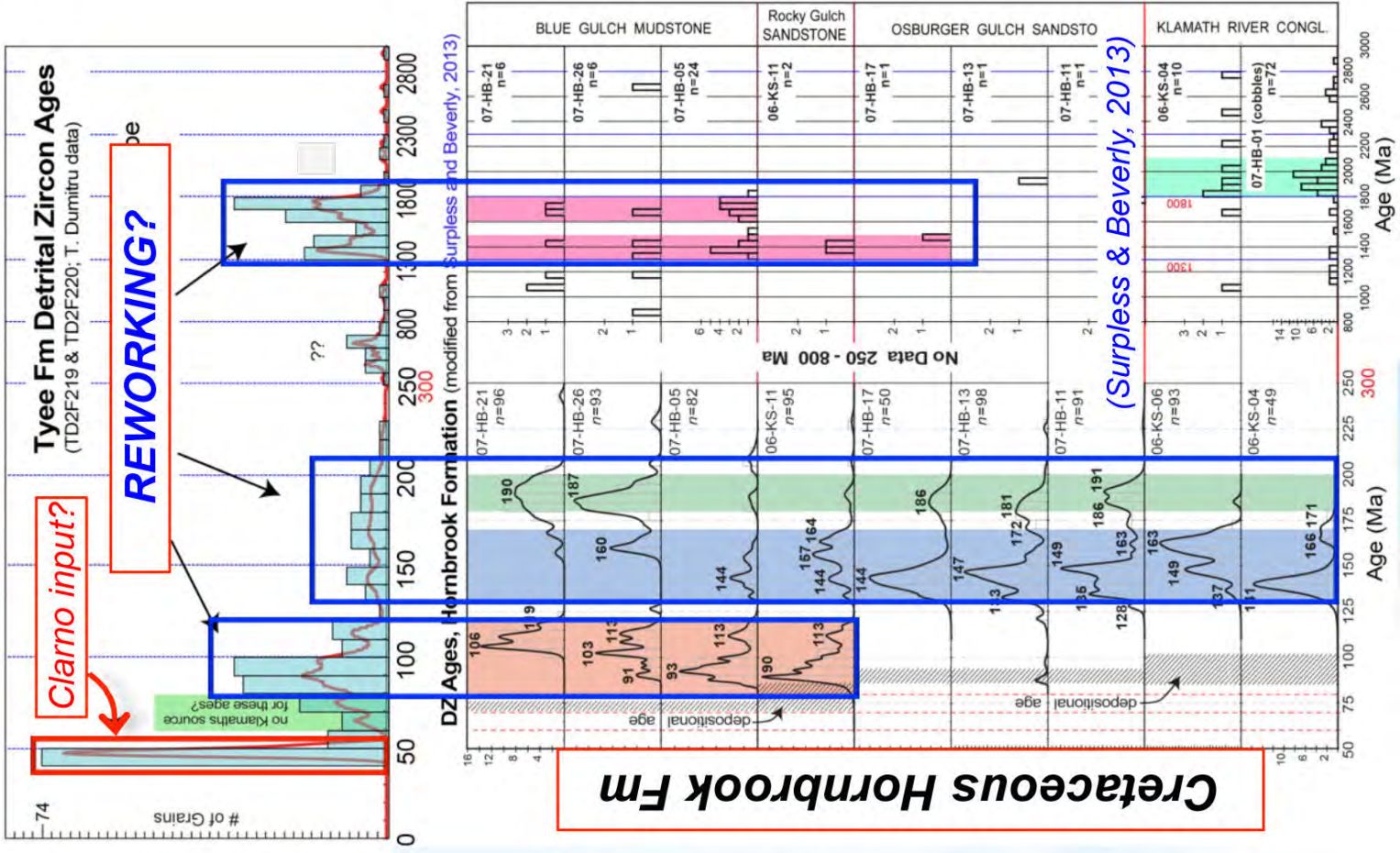
Umpqua Group and Tye Formation display **indistinguishable**:

- Subsidence rate/history
- Implied driver of subsidence
- Sediment dispersal pattern

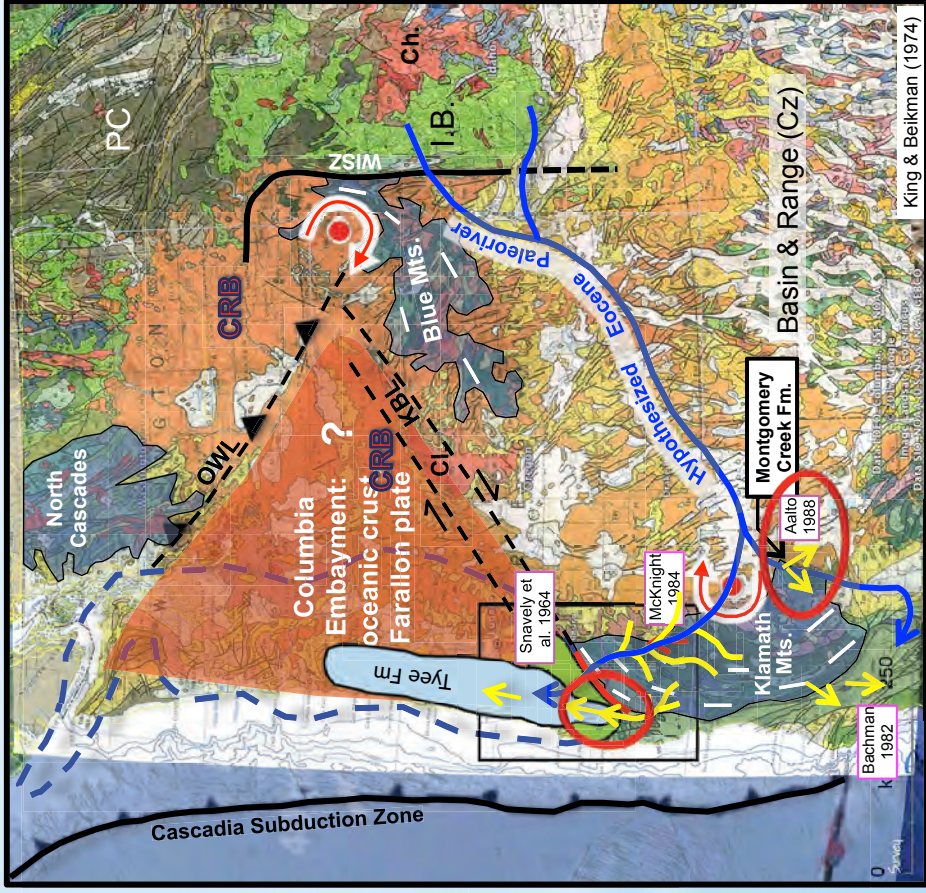
And: Progressive change in sandstone composition (unroofing trend)



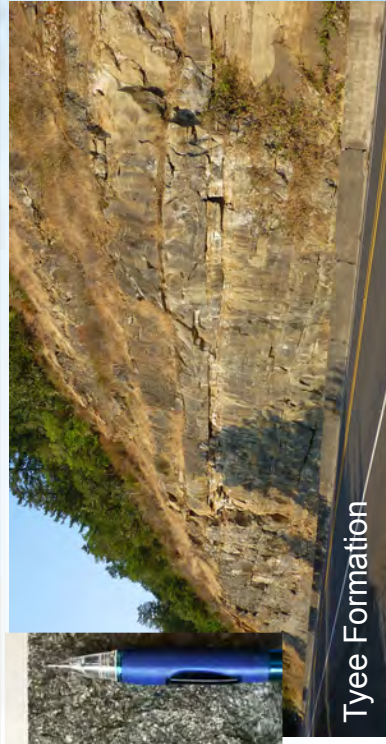
Sandstone Petrography

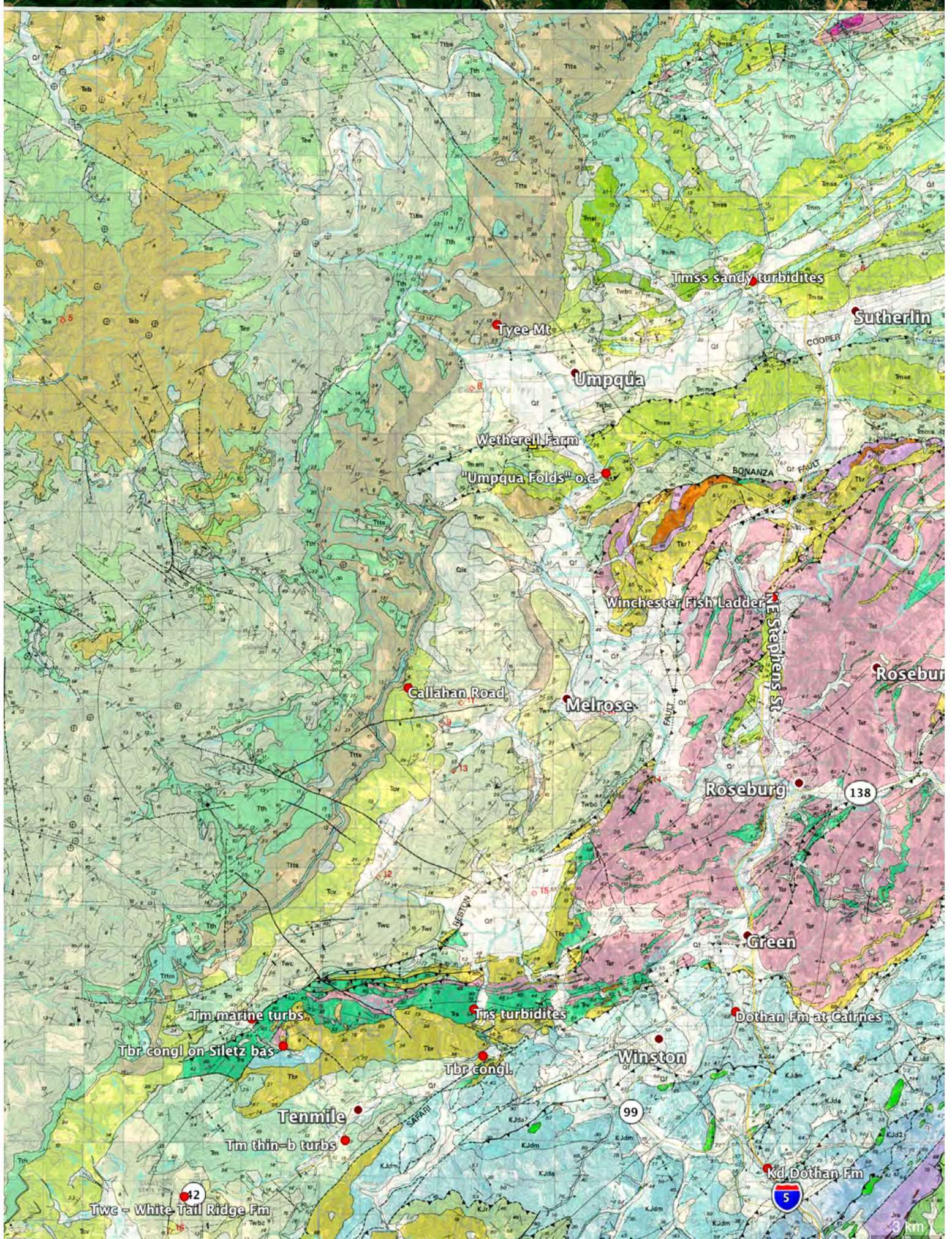


Source of the **TYEE FORMATION**: Klamath Mts. or Idaho Batholith ?



Provenance Hypothesis	Main Data Types	References
Klamath Mts. (original)	Sst. petrography Clast compositions Paleocurrent data	Snavelly et al., 1964; Bachman, 1982; McKnight, 1984; Aalto, 1988
Idaho Batholith	Sst. petrography Isotope geochemistry Detrital mica ages Detrital zircon ages	Heller & Ryberg, 1983; Heller et al., 1985, 1992; Renne et al. 1990; Dumitru et al., 2013
Klamath Mts. (reconsidered)	Sst. petrography Paleocurrents & Facies Subsidence analysis Sedim. mass balance	Ryu et al, 1992; Ryu 1995; Ryu and Niemi, 1999; Santra et al. 2013; This Study







WSW

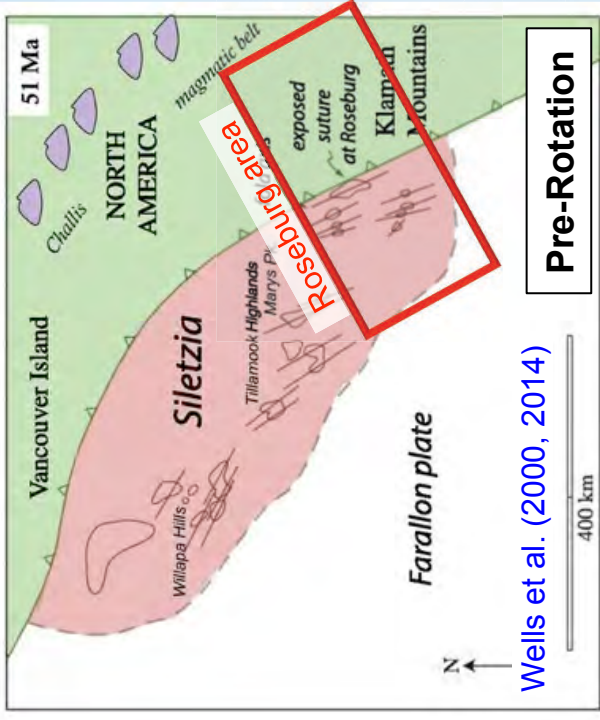
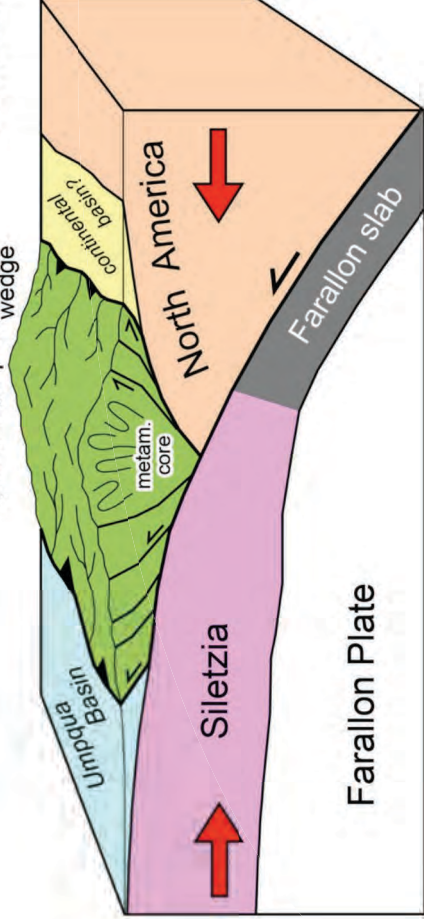
Regional Context

ENE

54 – 49 Ma

elevations to 3-4 km likely

Klamath Mts. collisional orogen
pro-wedge | retro-wedge



Wells et al. (2000, 2014)

Pre-Rotation

- Northern Klamaths rotated at least $67^\circ \pm 14.5^\circ$, post-53 Ma.
- Up to ~ 50% of total rotation may be **syn-collisional**.
- Restored margin NNW strike (pre-Columbia embayment?)

Unit	Age (Ma)	Clockwise Rotation	Syn-Collision (mid-value)	Syn-Collision (max.)
W. Cascades	post-40	$\sim 30^\circ$		
Tyee Fm.	49-46	$67^\circ \pm 14.5^\circ$		
Umpqua Gp.	54-49	(intermed.)	$\sim 12^\circ$	$\sim 39^\circ$
Siletz R. Volcanics	56-53	$79^\circ \pm 12.5^\circ$		

Wells et al. (2000, 2014)

Paleomagnetic Data

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