

# Tectonic History of Coos Bay Basin

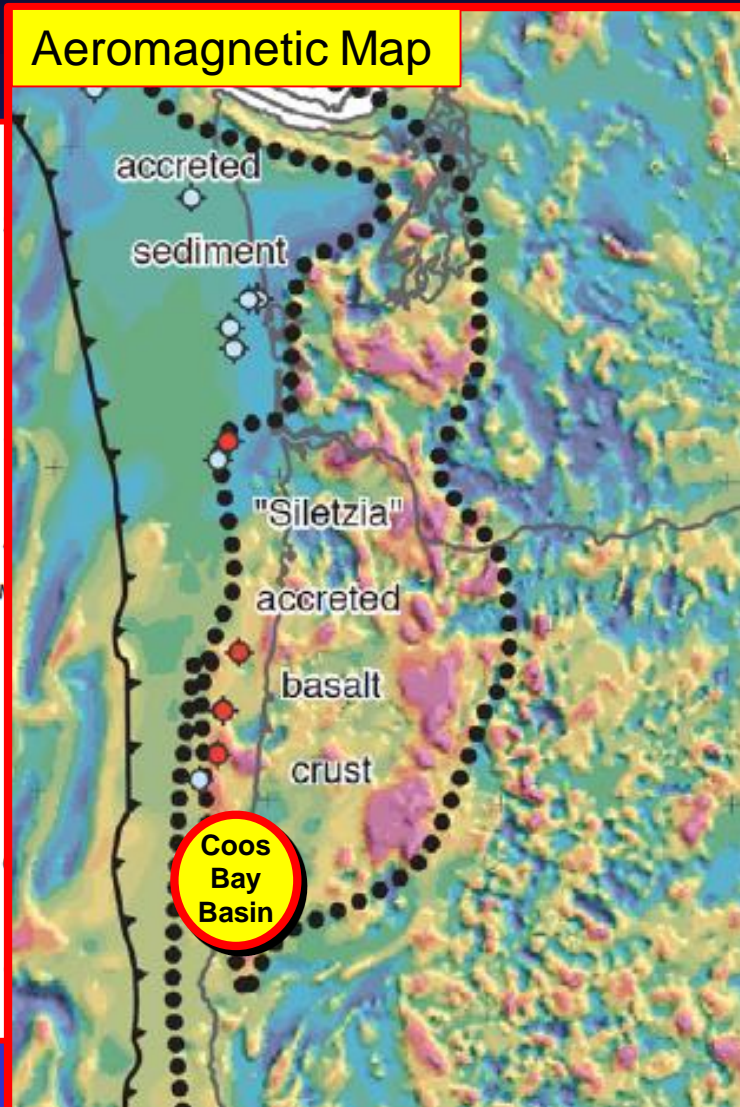
## and its' Relationship to Cenozoic Tectonics in the Pacific Northwest A Preliminary Report of Ongoing Research

Laird Thompson, Utah State University  
John Armentrout, University of Oregon  
Dave Blackwell, University of Oregon

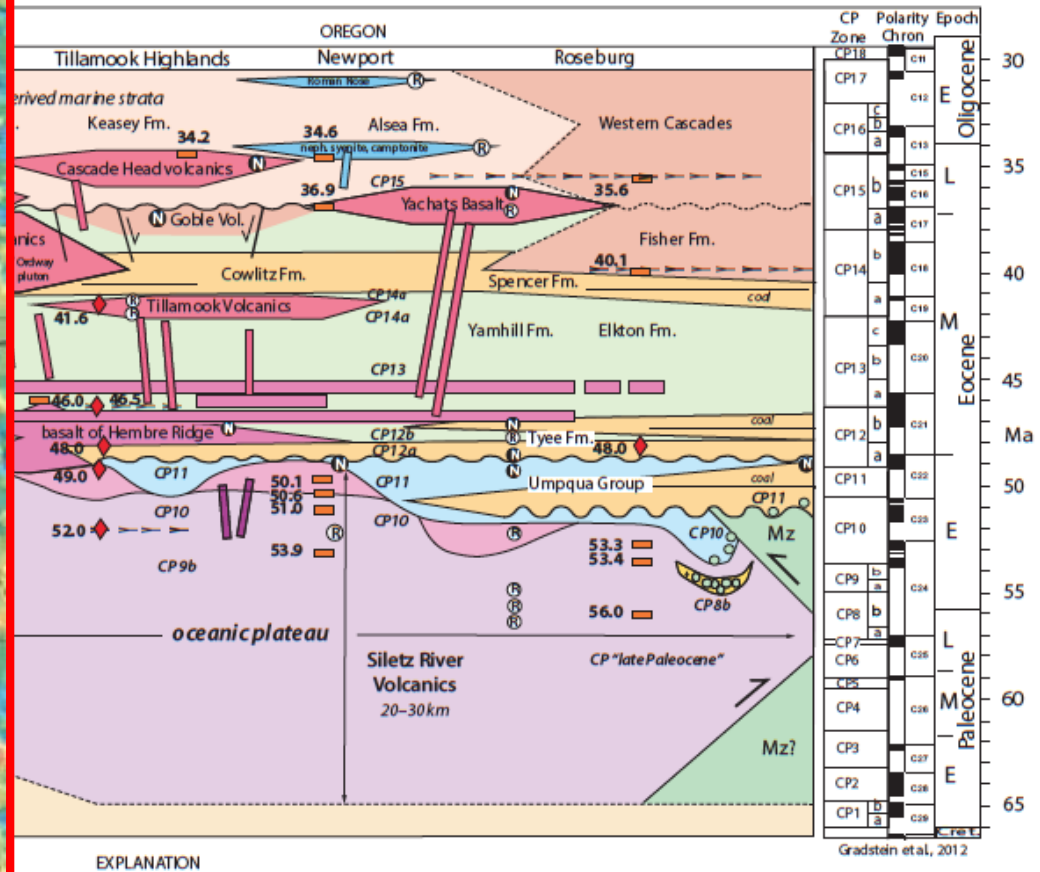


# 'Siletzia' Accreted a "Large Igneous Province"

Aeromagnetic Map



Siletzia Time-Rock Diagram



Wells et al. (2014)

# Topics

---

Basin Setting

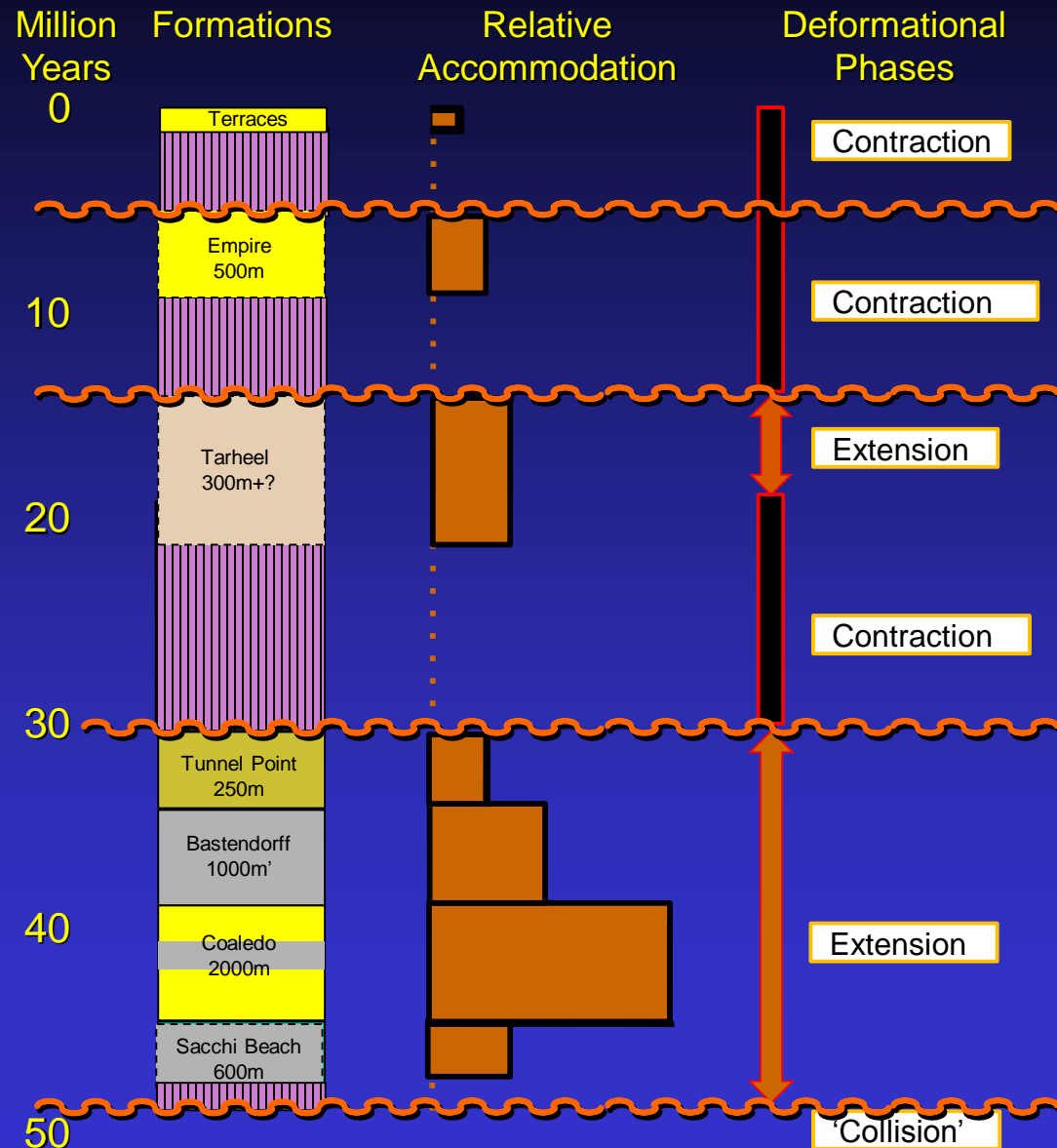
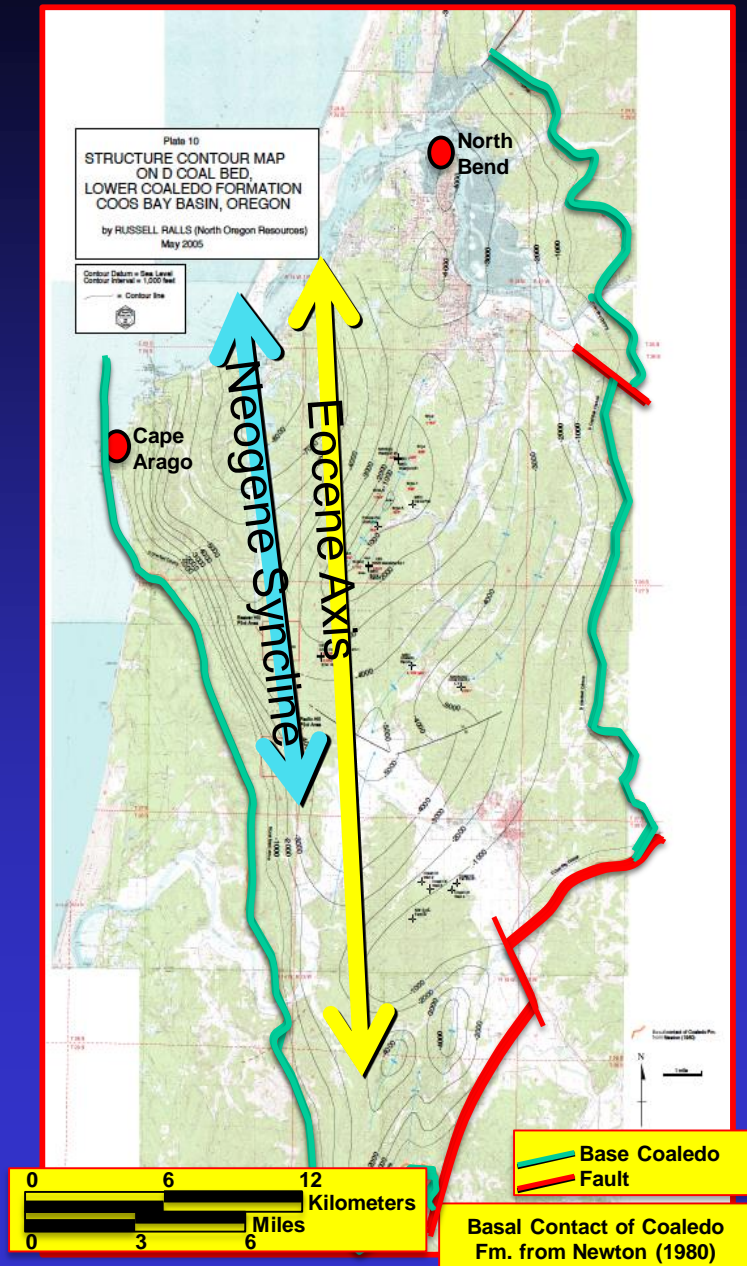
Structural Observations

Deformation Phases

Emerging Regional Pattern

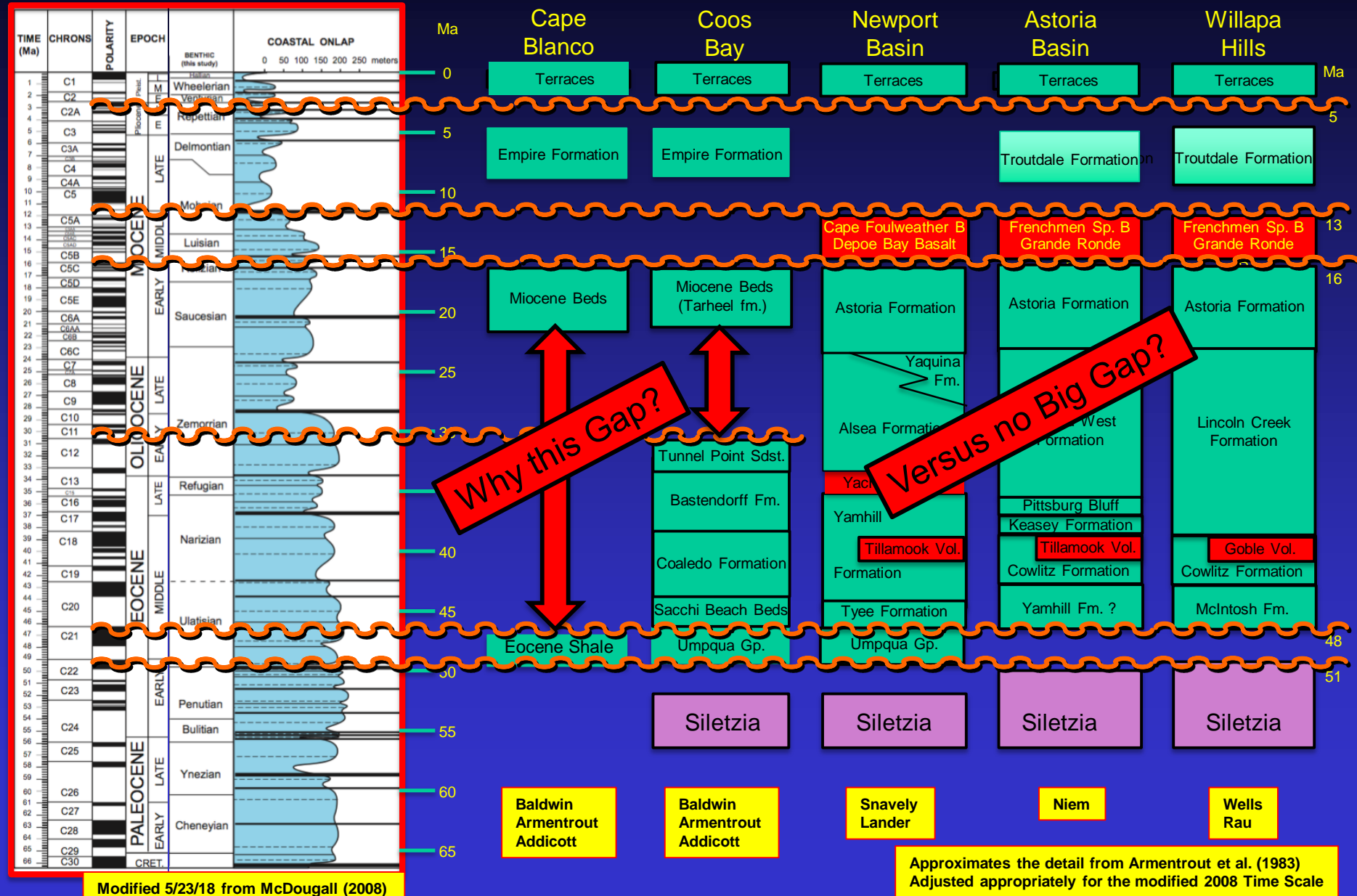
Ongoing Research

# Coos Bay Basin



# Stratigraphic Record

## Cenozoic Time Scale



# Topics

---

Basin Setting

Structural Observations

Deformation Phases

Emerging Regional Pattern

Ongoing Research

# Deformation Observations: Multiple Scales

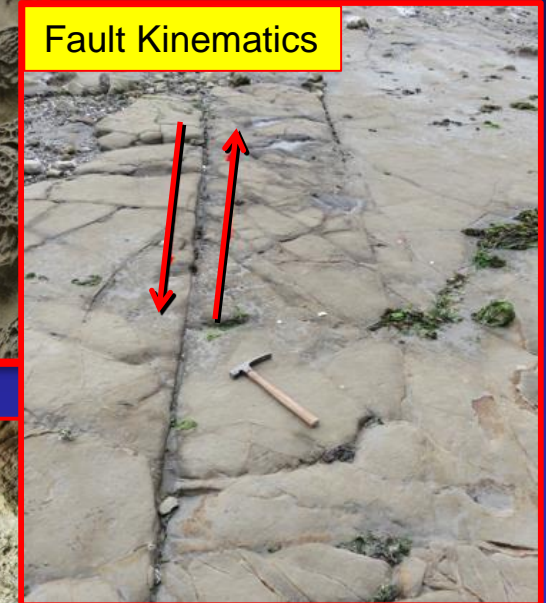
Disequilibrium Compaction



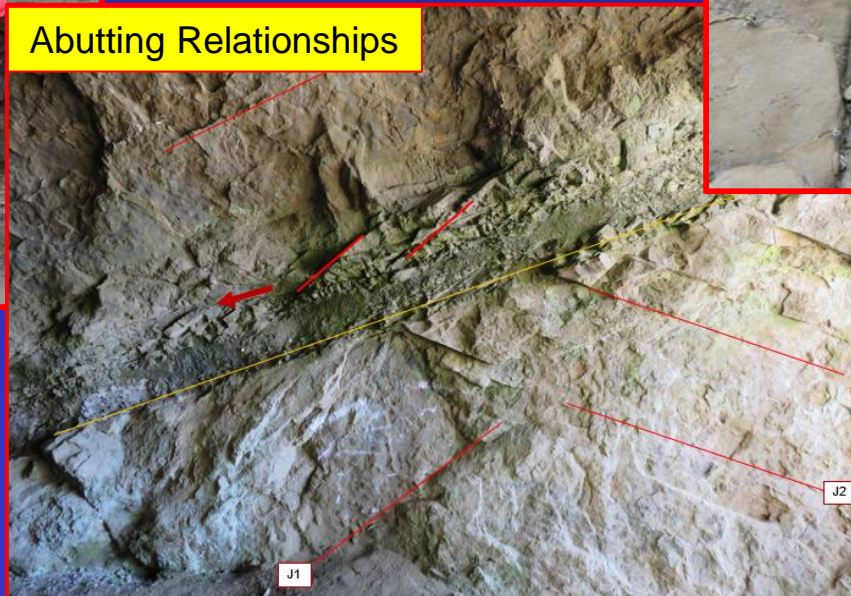
Deformation Bands

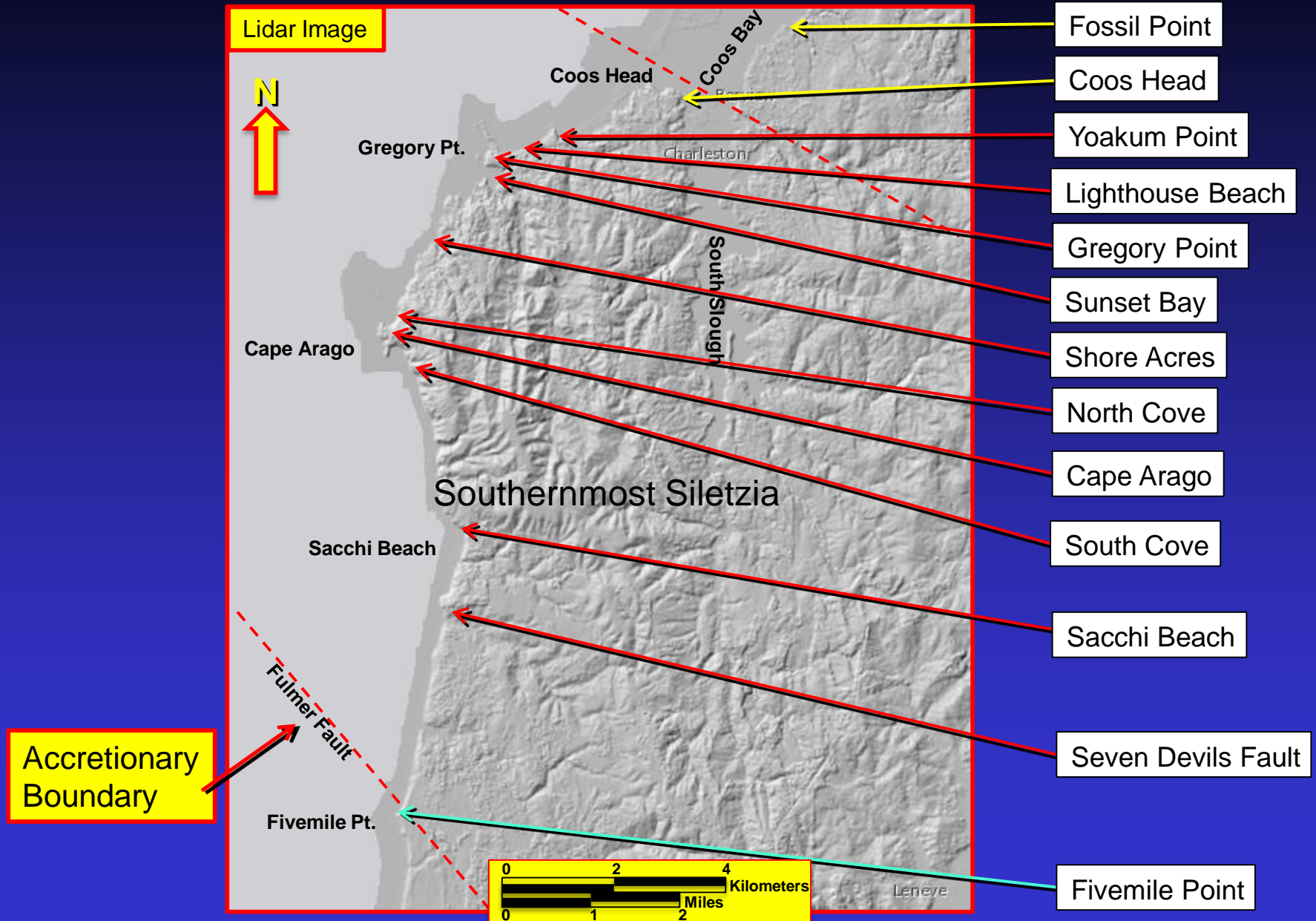


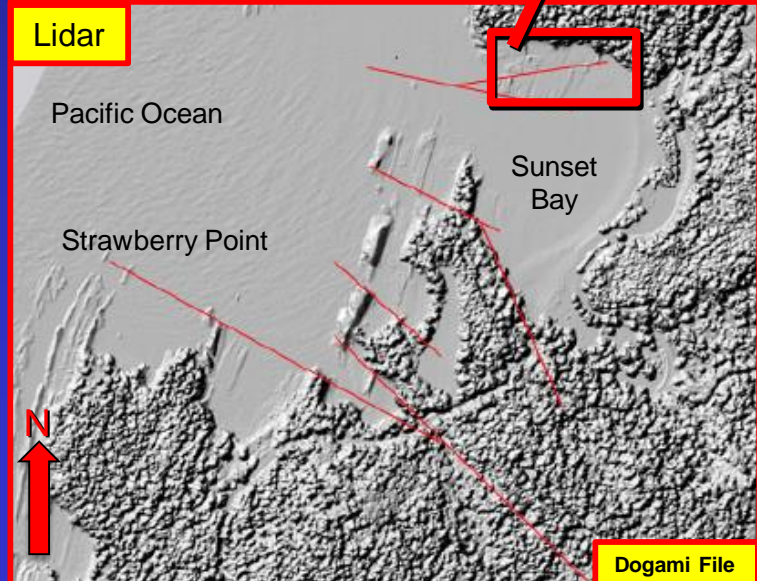
Fault Kinematics



Abutting Relationships







# Topics

---

Basin Setting

Structural Observations

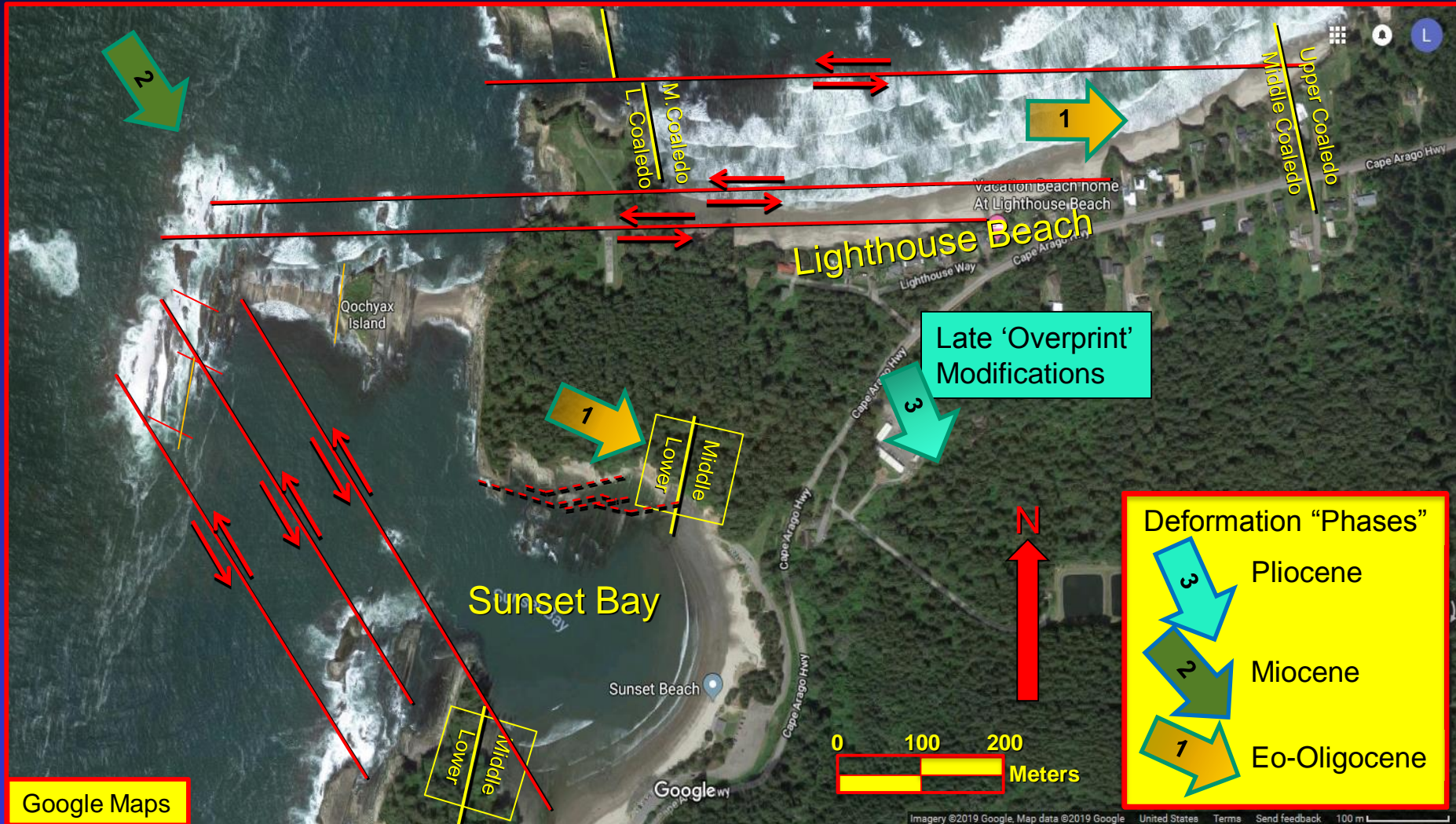
Deformation Phases

Emerging Regional Pattern

Ongoing Research

# Timing of Deformational “Phases” and Orientations

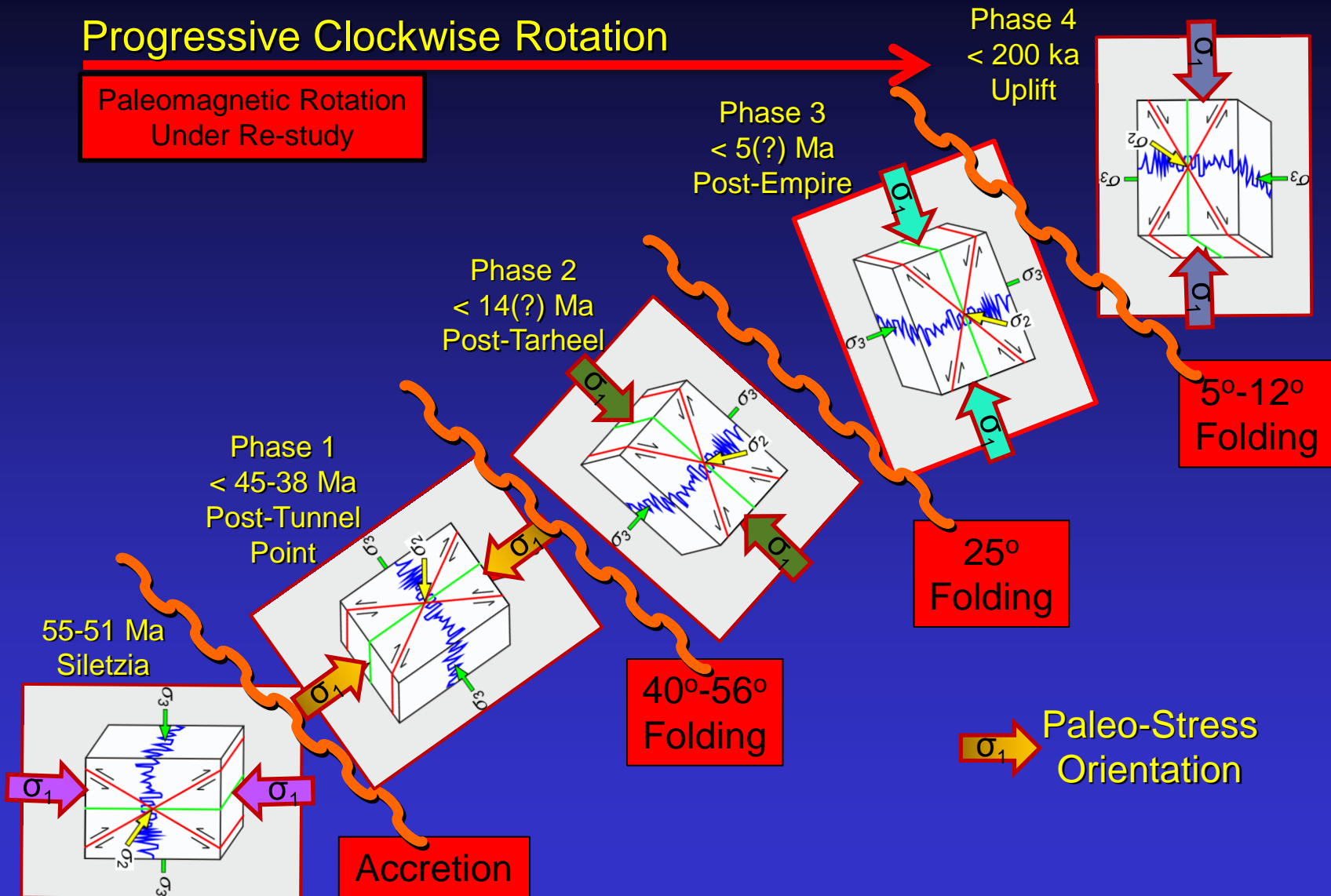
The Coaledo records three phases of deformation:  
Each subsequent phase modifies the previous.



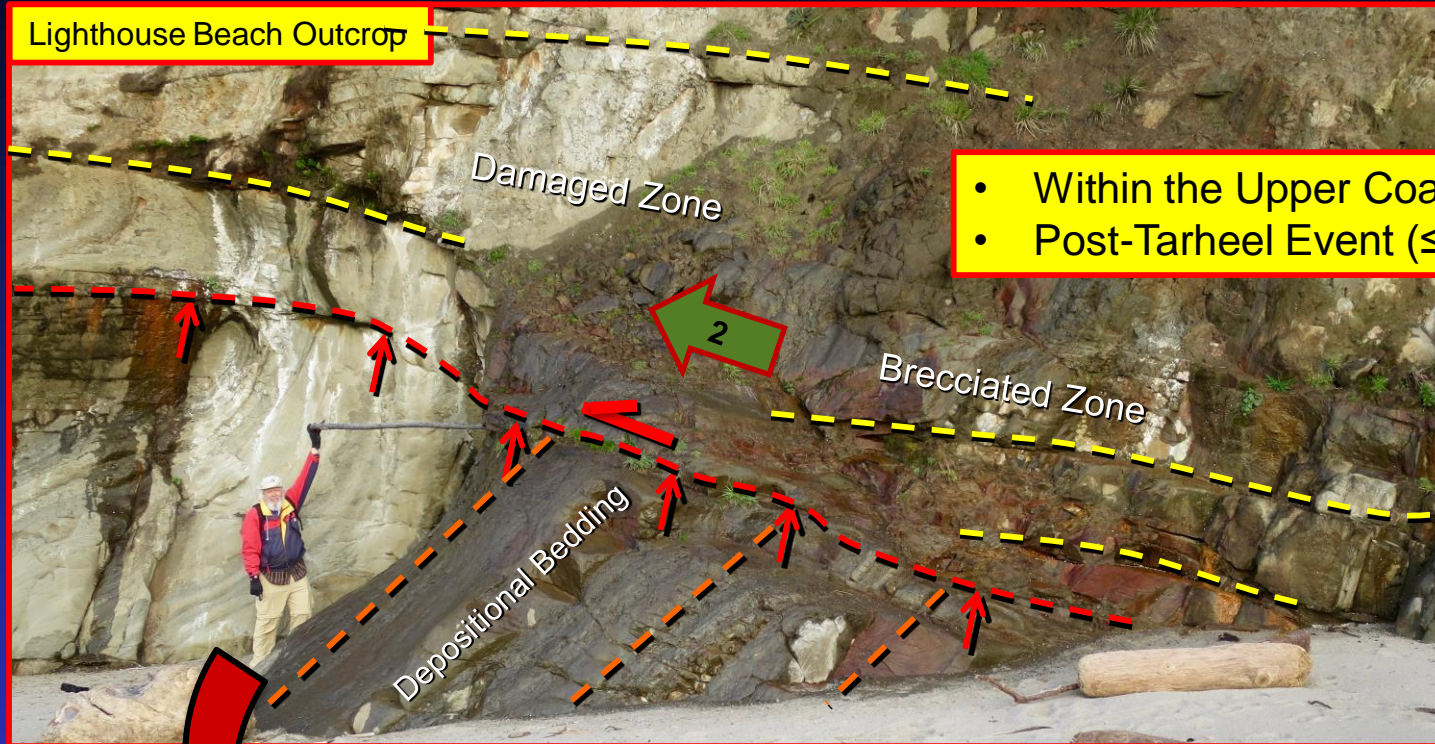
# Upper Plate Deformation

## Progressive Clockwise Rotation

Paleomagnetic Rotation  
Under Re-study

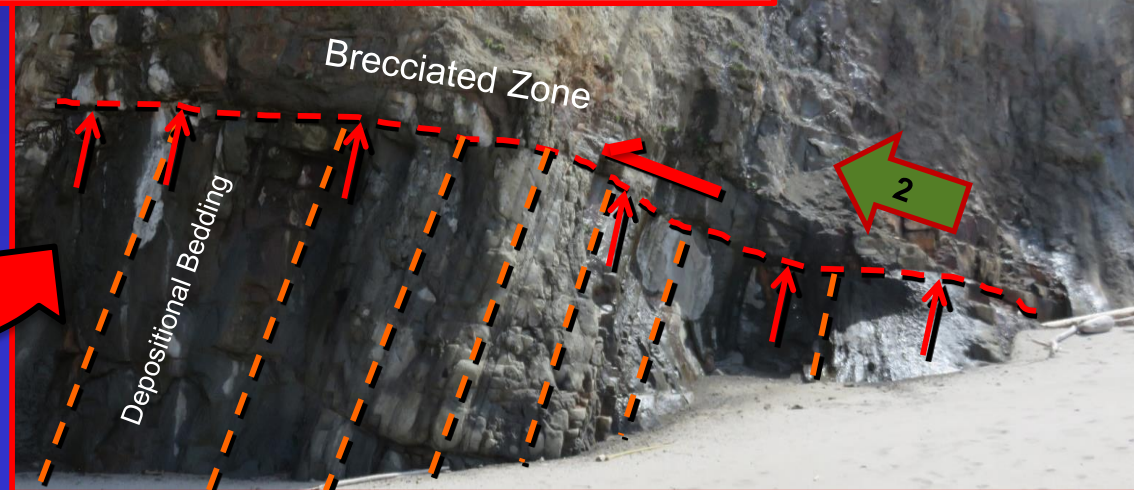


# Lighthouse Beach Thrust



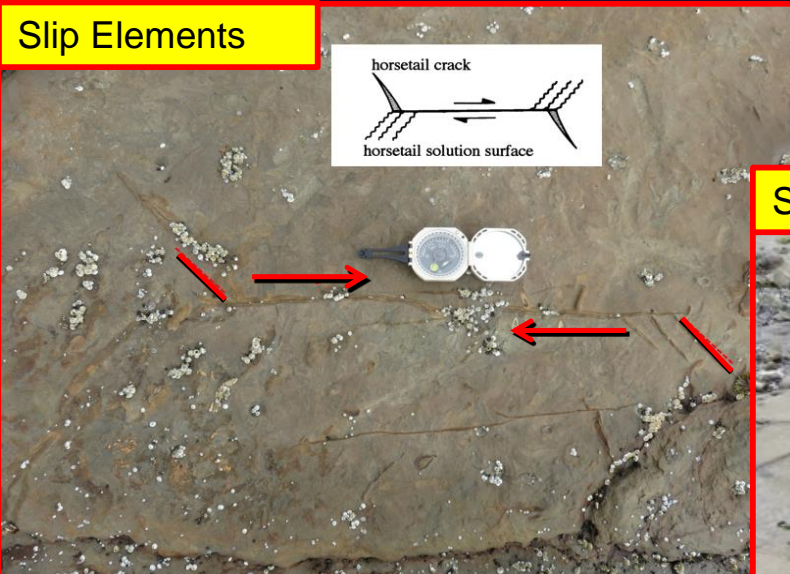
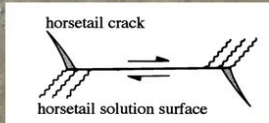
Oblique  
View

- Slip-surface traced through 3 coves and at points 1.2 km apart



# Post Empire (<5 Ma) Deformation

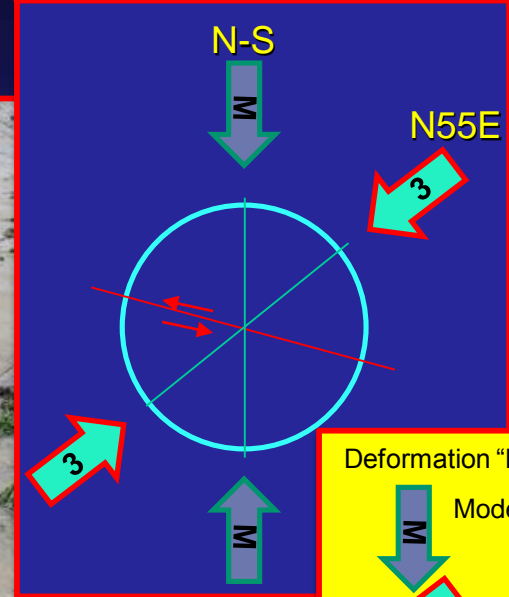
## Slip Elements



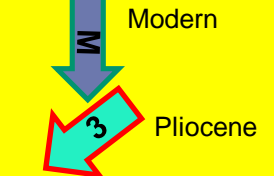
## Shear Patterns



## Apparent Coeval SHmax



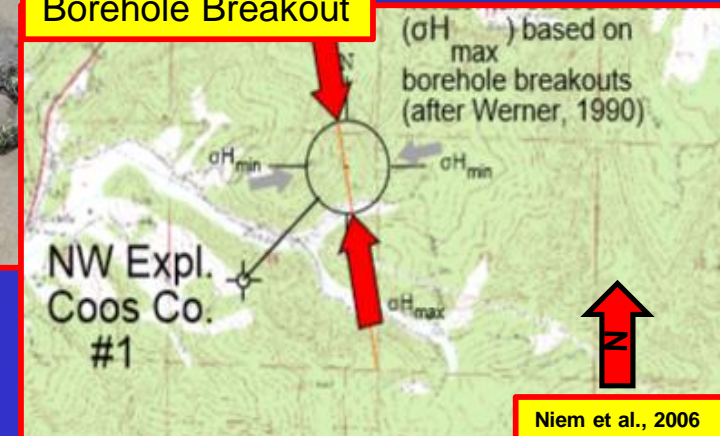
## Deformation "Phases"



## Non-Orthogonal Joints



## Borehole Breakout



Niem et al., 2006

# Topics

---

Basin Setting

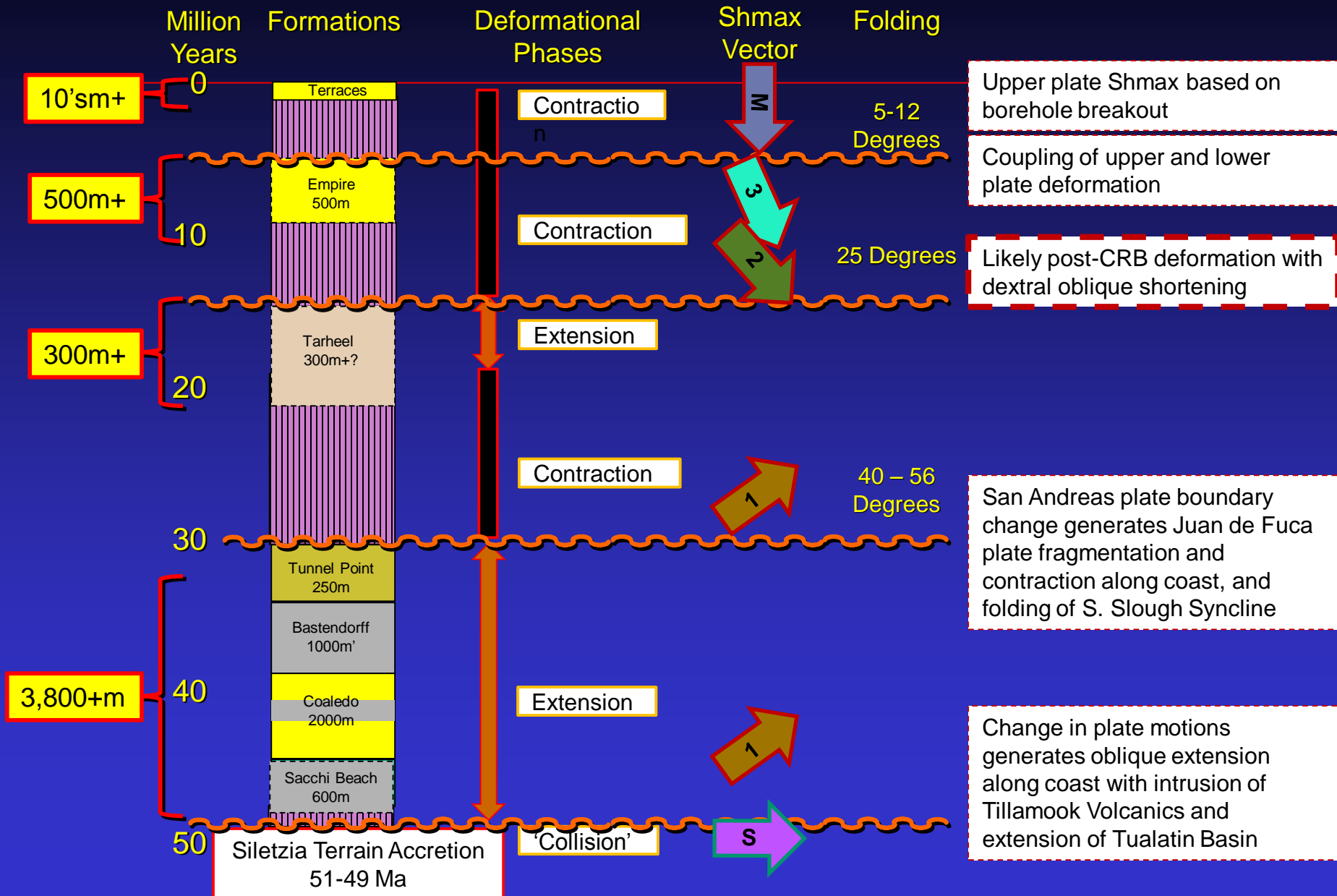
Deformation Phases

Tectonic “Phases”

Emerging Regional Pattern

Ongoing Research

# Stratigraphic and Structural Interpretations



# Topics

---

Basin Setting

Deformation Phases

Tectonic “Phases”

Emerging Regional Pattern

Ongoing Research

# Ongoing Research

## Tectonics:

- Basin Scale Structure, including subsurface
- Balanced Cross Sections
- Paleomagnetic Rotation History – Refined and Expanded

## Stratigraphy:

- Lateral Facies Correlation – Drone-Image Refinement
- Depositional Environments, including integrated biofacies:  
(Forams, Mollusks, Elasmobranchs, Palynomorphs)

## Geochronology:

- Ar/Ar on Tuffs and Pb/U on Zircons
- Paleomagnetic Reversals – Expanded Section
- Micropaleontology - Updated

## Paleogeography:

- Paleoclimate (Palynomorphs, Marine Biofacies)
- Sandstone Mineralogy
- Zircon Age Clusters

# Coaledo Team: Cross Discipline Integration



L.Thompson



J.Armentrout

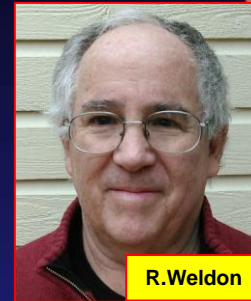


D.Blackwell



J.Jackson

## Structure/Stratigraphy



R.Weldon



N.Blackwell



S.Bogue

## Magnetostratigraphy



A.Niem



S.Pappajohn

## Coal Subbasin



R.Johnson

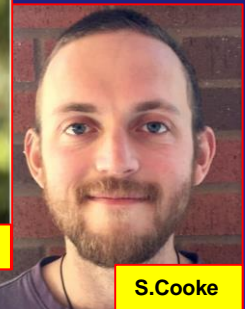
## Drone Pilot



B.Dorsey



M.Darin



S.Cooke

## Sedimentology/Paleogeography



T.Armentrout

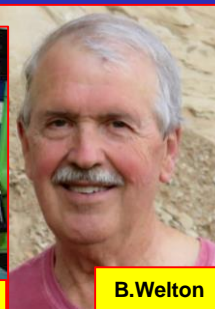
## Field Safety



K.McDougall



C.Hickman



B.Welton

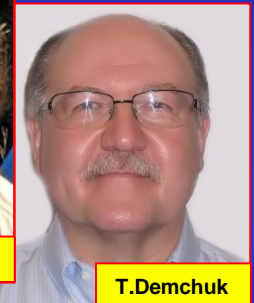


S.Warny

## Paleontology



A.Barbato



T.Demchuk

# Thank You



Shore Acres State Park, Coos Bay, Oregon

Photo from S. Taylor, Western Oregon