

Nevadan Orogeny
Late Jurassic
(162-144 Ma)

Reading:
GNAM G3, CH. 4, pp157-168

Characteristics

- General
 - Turbidite deposition across ophiolites and synchronous deformation define orogeny
- Plate edge
 - Fore arc basins source of ophiolites
- Isolated magmatism as small plutons

Main Events

- Final stage of fringing terrane accretion
- Emplacement of ophiolites and arc sequences
- Turbidites deposited across ophiolite basins
- Synchronous deformation = Nevadan orogeny

Nevadan Orogeny

- Short-lived Late Jurassic deformational event
- Basis for a collided exotic arc model for Sierra Nevada-Klamath belt

Josephine Ophiolite Complex

- Best evidence for Nevadan Orogeny
- Change from pelagic to flysch sedimentation
- Outer margin of basin detached & obducted
- Process took only 10 Ma at 162 Ma ago

Late Jurassic Magmatism

- Clusters of small plutons
- Zones of extension and transtension
- Ignimbrite fields
- Disruption of intrusive patterns due to:
 - Rapid growth of ophiolite basins
 - Reversal of tangential motion patterns along plate edge

Strike-slip Faulting

- Sinistral strike-slip faulting along the plate edge
- Sinistral transpressive deformation
- Contractile deformation in back-arc regions

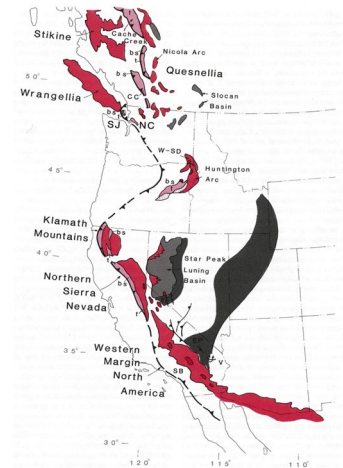
Plate Edge

- Fore arc basin in California
- Great Valley
- Ophiolite formation

Ophiolites

- Late Jurassic ophiolites
- Inter-arc basin crust?
- Or a loosely-coupled fore-arc domain?

Triassic to Middle Jurassic



Ophiolite Origin

- Arc basin crust between N.A. and arc system
- Fore arc accumulation
- Regional extension and regional contraction due to tangential deformation

Fringing Arc System

- Rogue sequence
- Coast Range ophiolite
- Wrangellia

Structural Expression

- Tight folding and slaty cleavage of Mariposa and Galice Formations
- Foothill fault system
- East dipping thrust faults bounding the Josephine ophiolite

Magmatism

- Volcanics of Rogue fringing arc are tholeiitic pillow basalts and submarine volcanics (mafic to felsic)
- Arc magmatic products intruded the actively collapsing Josephine basin
- Isolated Plutons
 - 150-145 Ma ages

Sedimentation and Volcanism

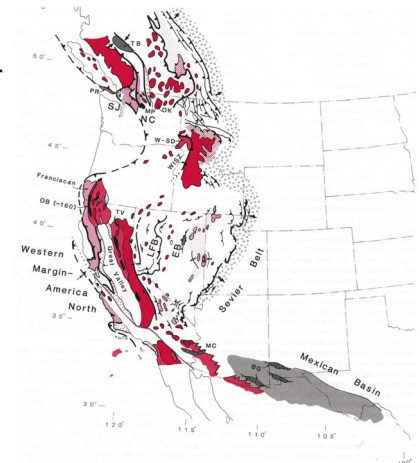
- Overlapped by Galice flysch
- East-dipping subduction outboard of the Rogue fringing arc
- Silicic Submarine Volcanism
 - Sierra Nevada

Insular Suture Belt

Initial Franciscan Deposits

- Local Deposition Began in Late Jurassic
- Washington (Pickett Peak Fm)
 - Basalt, Argillite, Clastics
- South Oregon (Otter Point Complex)
 - Volcaniclastics, Basalts, Submarine Pyroclastics

Middle Jurassic-Late Cretaceous



Transtensional Disruption

- Bisbee Basin
 - Rift Sediments (Glance Conglomerate, 2 Km)
- McCoy Basin
 - Volcaniclastic Rocks (3 Km)
- Sinistral Faults (Sonora)
- Independence Dike Swarm
 - Rift Related

Three Deformation Belts

- Lunning Fencemaker Thrust (Nevada)
- Sevier Belt
- Hinterland Belt (Willow Creek Allochthon)

Plate Interior

- Foreland Deformation
 - Foreland fold and thrust belt and related basin system
- Foreland Basin Deposits
 - Aeolian deposits (Navajo ss.) followed by marine incursion (Morrison Fm.)

Foreland Basin Deposits

- Fluvial Morrison Formation with conglomerate wedges
- Deposited on top of earlier aeolian deposits of Navajo ss.
- Represents erosion from a western orogenic highland onto an extensive eastern foreland basin