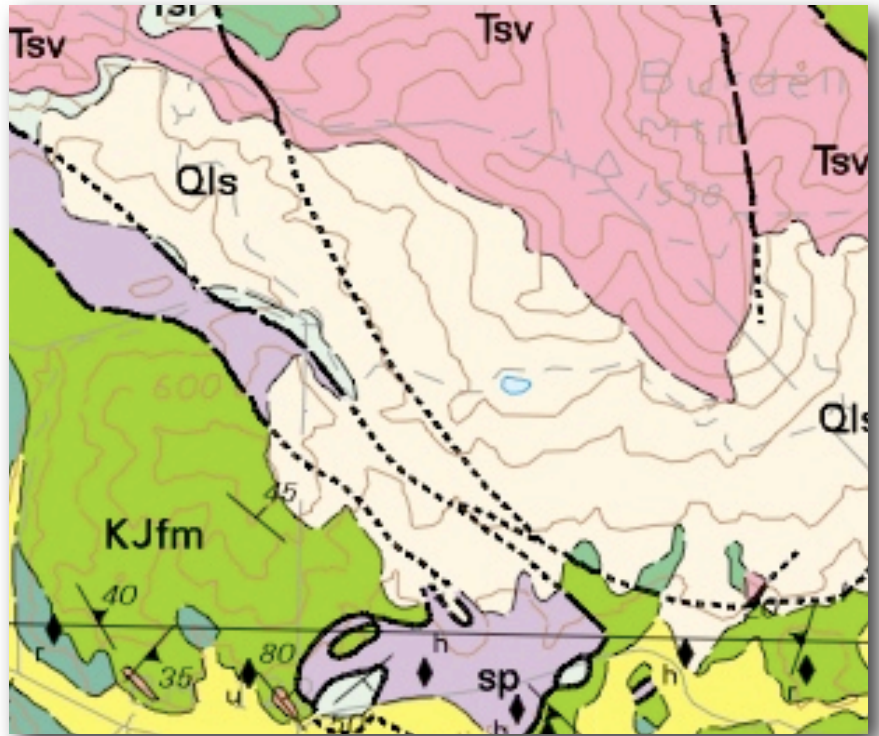


# FIELD TRIP 5 Mt. Burdell

## DIRECTIONS

1. from CoM, Hwy 101 north (13 miles)
2. take **Atherton Ave** exit toward San Marin Dr
3. turn left at exit, toward the west
4. after 2 miles, turn **right** onto **San Andreas Dr.**
5. after 1/2 mile, park on right with other cars and walk to trailhead at the highest point



## Basic Facts

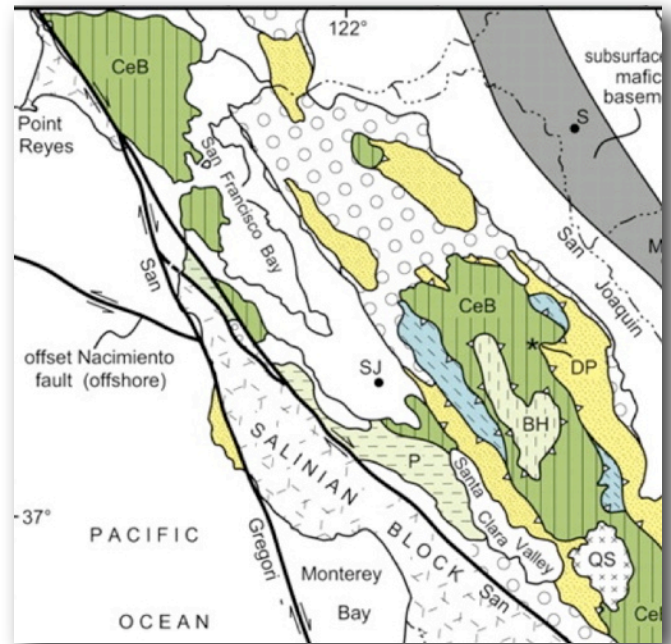
- 1558 feet, highest spot in northern Marin County
- not a volcano
- volcanic rocks: rhyolite, dacite, andesite, basalt
- dated 13.6- 11.1 Ma
- heavily covered in landslides
- sandwiched by Franciscan rocks
- linked to Quien Sabe Volcanics

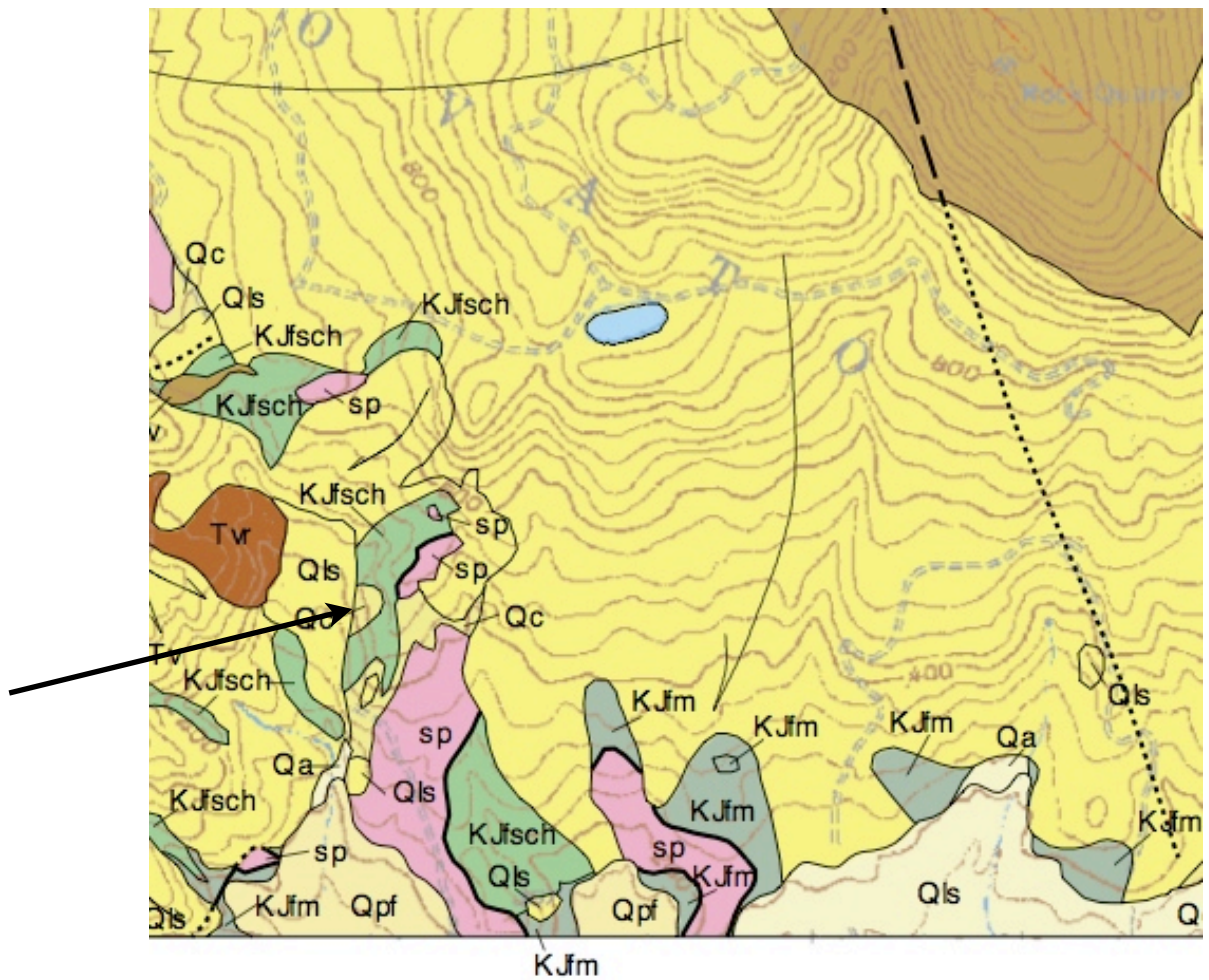
## Quien Sabe Volcanics

- near Hollister
- erupted as SAF came into region
- 11.6 - 7.4 Ma
- 175 km displacement
- Wagner, 2005: “complex, heterogeneous, bimodal volcanic suites inferred to be the result of mantle upwelling behind a slab window trailing the Mendocino triple junction”

## Mendocino Triple Junction

- northern boundary of San Andreas Fault (SAF)
- currently off coast Mendocino

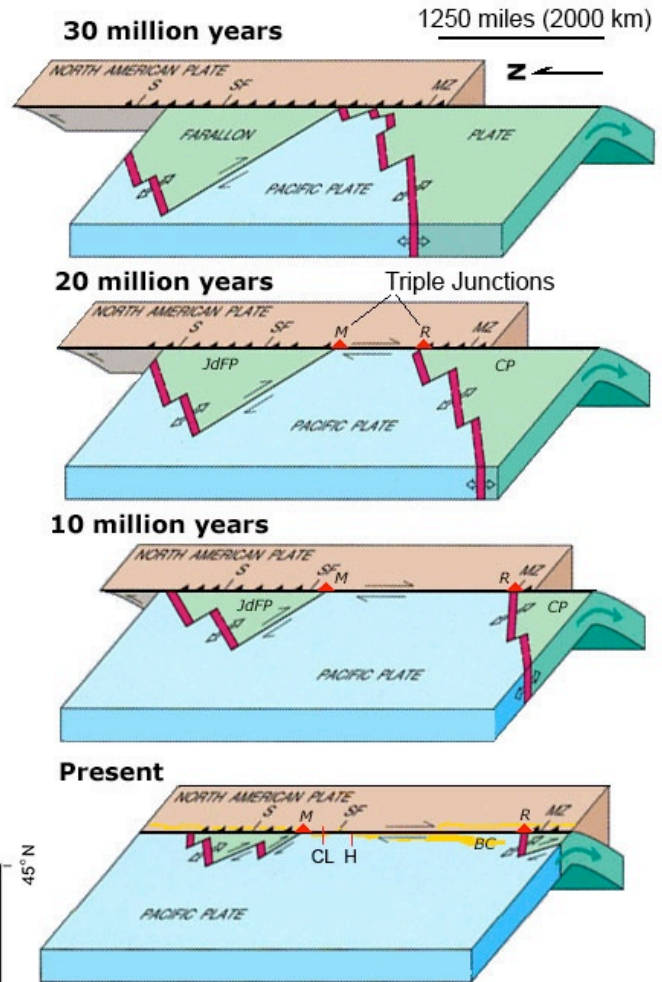




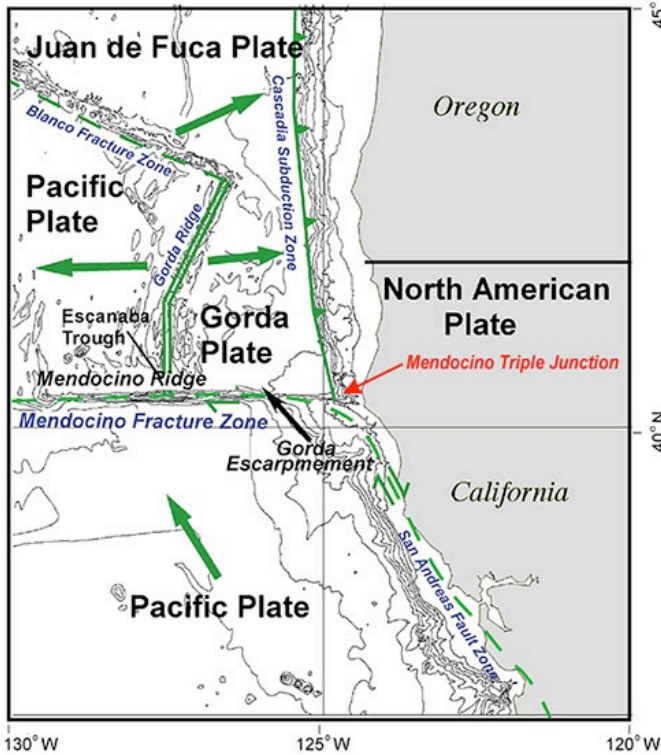
- Tv Tertiary volcanic rocks - Mafic volcanic rocks, mostly basaltic andesite, similar to and probably part of Burdell Mt. Volcanics. Whole rock K/Ar dates of 12.26 +/- 0.38 and 12.47 +/- 0.74 were reported by Fox and others (1985) at quarry near Mc Nears in the northeast part of the quadrangle.
- Tvbm Volcanic rocks of Burdell Mountain. Andesite, basalt, rhyolite, and dacite.
- Tvr Rhyolite on the south slope of Burdell Mountain.
- Ts Tuffaceous, fossiliferous sandstone underlying the volcanics of Burdell Mountain.
- KJfm Franciscan complex melange. Tectonic mixture of masses of resistant rock including sandstone, altered mafic volcanics (greenstone), chert, gabbro, exotic metamorphic rocks imbedded in a sheared shaley matrix. Blocks with melange large enough to be shown at this scale are denoted as:
  - ss - sandstone
  - mw - metavolcanic rock
  - ch - chert
  - gs - greenstone (altered mafic volcanic rocks).
  - ◆ - Blueschist block
- KJsch Franciscan Complex schist, phyllite, and semischist.
- sp Serpentinized ultramafic rocks.

Other Volcanics:

- Burdell, 13.6 - 11.1 Ma
- Quien Sabe, 11.6 - 7.4 Ma (near Hollister)
- Donnell Ranch Volcanics, 10.64 - 9.28 Ma east of Petaluma Valley
- Berkeley volcanics ~10 Ma
- Sonoma Volcanics 8.17 - 1.96 Ma near Rodgers Creek fault zone
- Clear Lake Volcanics, 2.2 - 0.007 Ma
- volcanic young towards north (if reconstructed to position when erupted)
- volcanics are oldest at southern end



- **Spreading center**—Arrows indicate direction of movement
- **Subduction zone**—Sawtooth on upper plate
- **Fault**—Arrows indicate direction of relative movement
- **Triple Junction**



### 1. Ignimbrite in river wash

*we'll move left from the trailhead and duck under the fence to go up*

how did this rock form?

Ignimbrite = poorly sorted, pyroclastic rock; deposition from a pumiceous pyroclastic flow; deposition at high temperature and consolidation of a nuée ardente or other type of ash flow, being

Phenocrysts = large crystals in a finer-grained volcanic matrix

Andesite = volcanic rock, fine grained, intermediate silica content; often greyish

### 2. Trailhead

what kind of rocks do we see here?

Dacite = volcanic rock, fine grained, high-medium silica content; light color

how did these rocks get here?

Rhyolite = volcanic rock, fine grained, high silica content; doesn't flow easily as lava; light color

what kind of exposures do we have?

### 3. Tree detour to right

### 4. Little Tank Fireroad

What kind of rock is exposed here?

## 5. Van Note Meadow

Sketch the fault:

What kind of rock do we see exposed here?



Look at the shape of the land and consider the rock type. Where have we seen this pattern before?

## 6. Option 1: Up Cobblestone Rd.

## 7. Option 2: East past Hidden Lake

### **Writeup:**

as always, give me a brief write-up of what we saw at each major stop and email it to me ([geology.prof@yahoo.com](mailto:geology.prof@yahoo.com)) before next Saturday.

### **Resources:**

1. USGS Map of Area: [ftp://ftp.consrv.ca.gov/pub/dmg/rgmp/Prelim\\_geo\\_pdf/petaluma\\_river\\_layout\\_highres.pdf](ftp://ftp.consrv.ca.gov/pub/dmg/rgmp/Prelim_geo_pdf/petaluma_river_layout_highres.pdf)