Plate 1: Mafic to Intermediate Dike Swarm Regional Map

Topographic Map: 7.5' Topographic Quadrangle Maps from United States Geological Survey (USGS) 2011. San Bernardino and Los Angeles Counties, CA. Contour Interval is 40 ft.
Faults: Fault traces determined from Nourse 2003, Morton 1973 and Morton and Miller 2007.
Measurement Points: UTM coordinate system is NAD 1927 CONUS. Points collected by D.M. Morton (1973), J.A. Nourse (1992-1998; 2016) , J.W. Marshak (2014-2016).
Stereonet Diagrams: Diagrams prepared in Stereonet 9.8.3 Program by Richard Allmendinger. Grey lines refer to measurement planes, black lines are poles to the planes, contours are 1% area.
Rose Diagrams : Displayed in red in the center of the diagram have 10° bins and are converted to a half circle rose diagram. Stereonet diagram radius represents 50% of total population.

Works Cited:

Morton, D.M. (1973). Geology of parts of the Azusa and Mount Wilson quadrangles, San Gabriel Mountains, Los Angeles County, California. Special Report 105. California Division of Mines and Geology.
Nourse, J.A., Weigand, P.J., and Hazelton, G.B. (1998). Igneous and tectonic response of the San Gabriel Mountains to Neogene extension and rotation of the western Transverse Ranges block, in Behl, R.J., ed., "Field trip guidebook for the 99th Cordilleran Section meeting of the Geological Society of America", pp. 10.1–10.15.
Nourse, J. A. (2002). Middle Miocene reconstruction of the central and eastern San Gabriel Mountains, southern California, with implications of evolution of the San Gabriel fault and Los Angeles basin, in "Crustal Evolution of the Southwestern United States",Spec. Pap. 365, edited by A. Barth, Geol. Soc. of America, Boulder, Colorado.
Morton, D.M. and Miller, F.K. (2006). Geologic Map of the San Bernardino and Santa Ana 30' x 60' Quadrangles. United States Geological Survey, California.

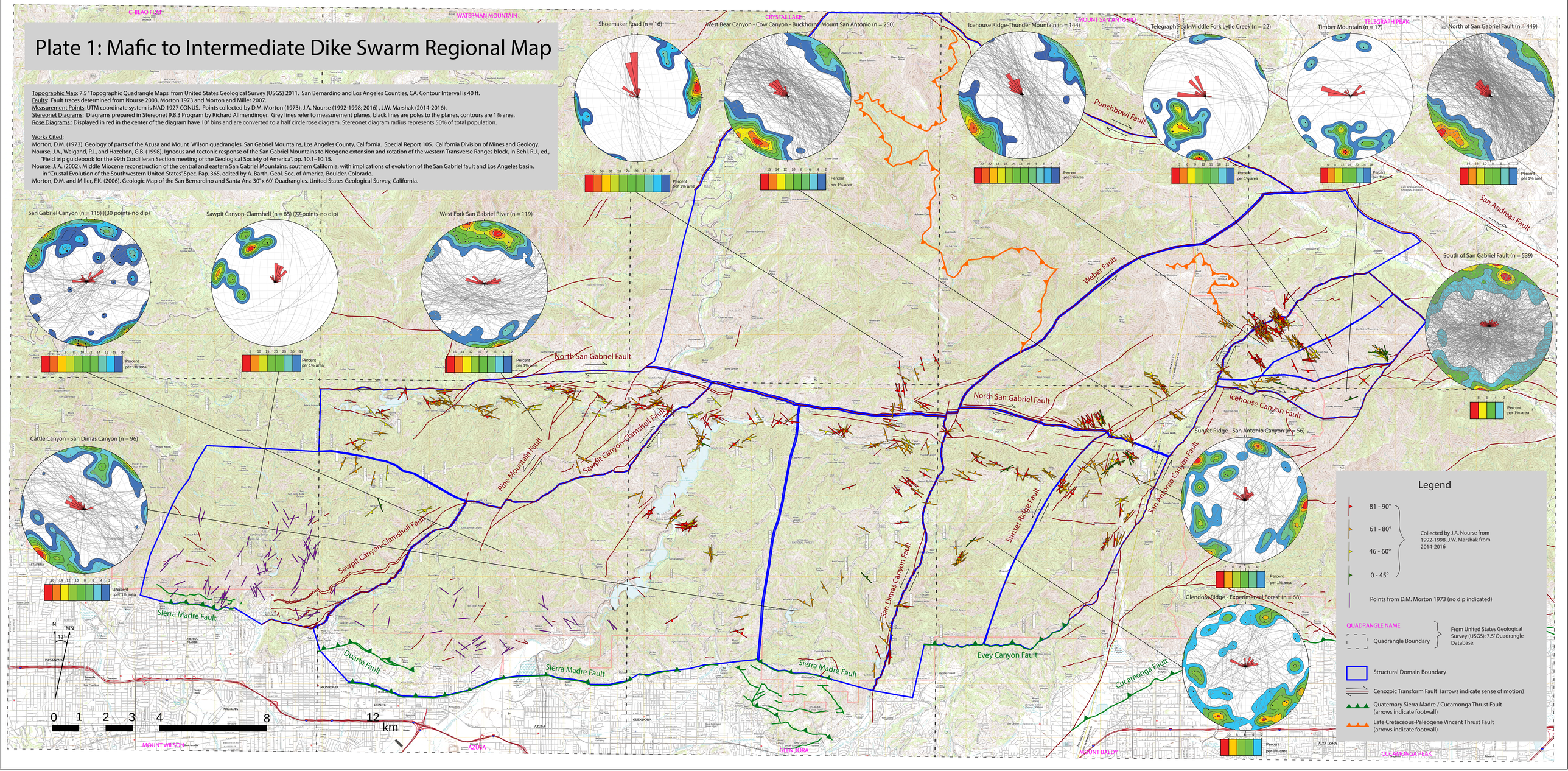
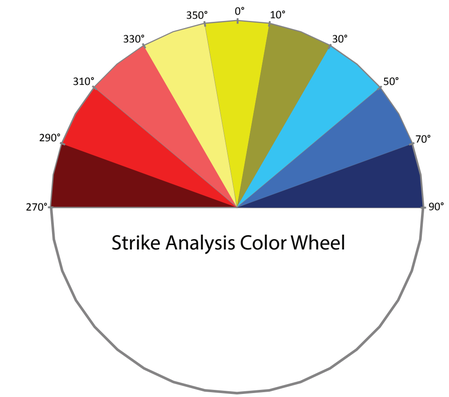
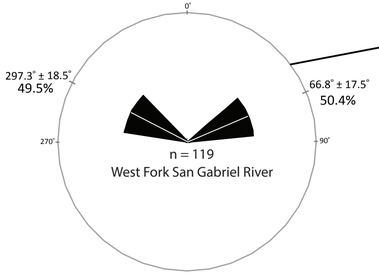
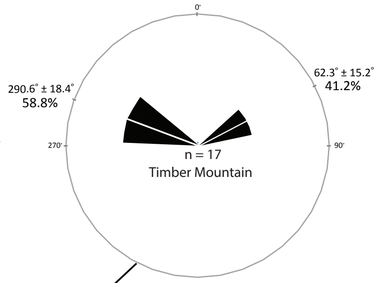
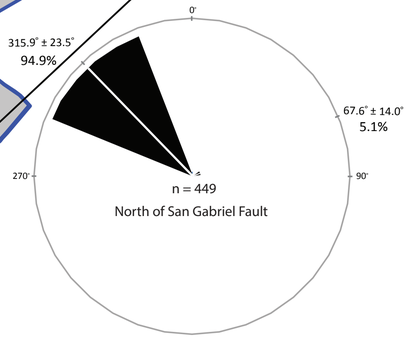


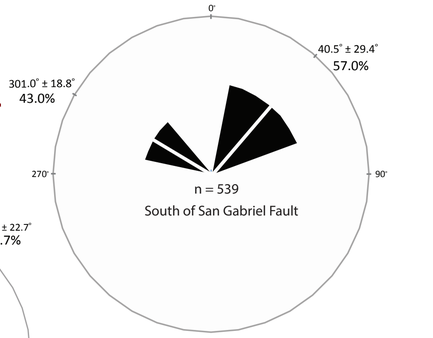
Plate 2: Statistical Data Compilation Map

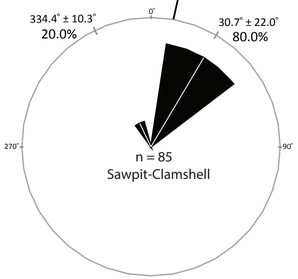


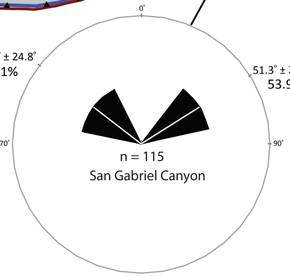


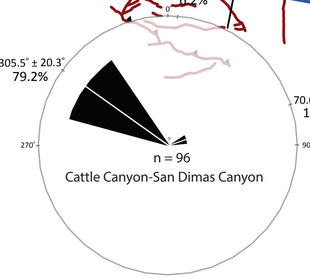


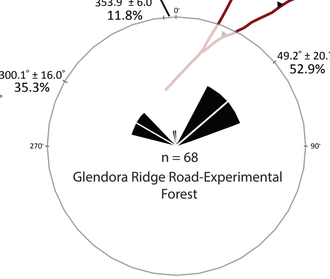


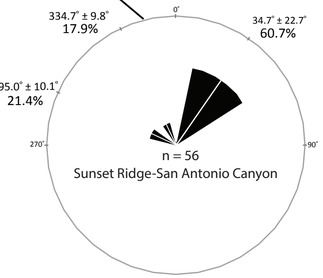












Key

- Structural block boundary
- Cenozoic strike-slip fault
- Thrust fault
- Fault sense of motion
- Measurement point : refer to Color Wheel for fill color

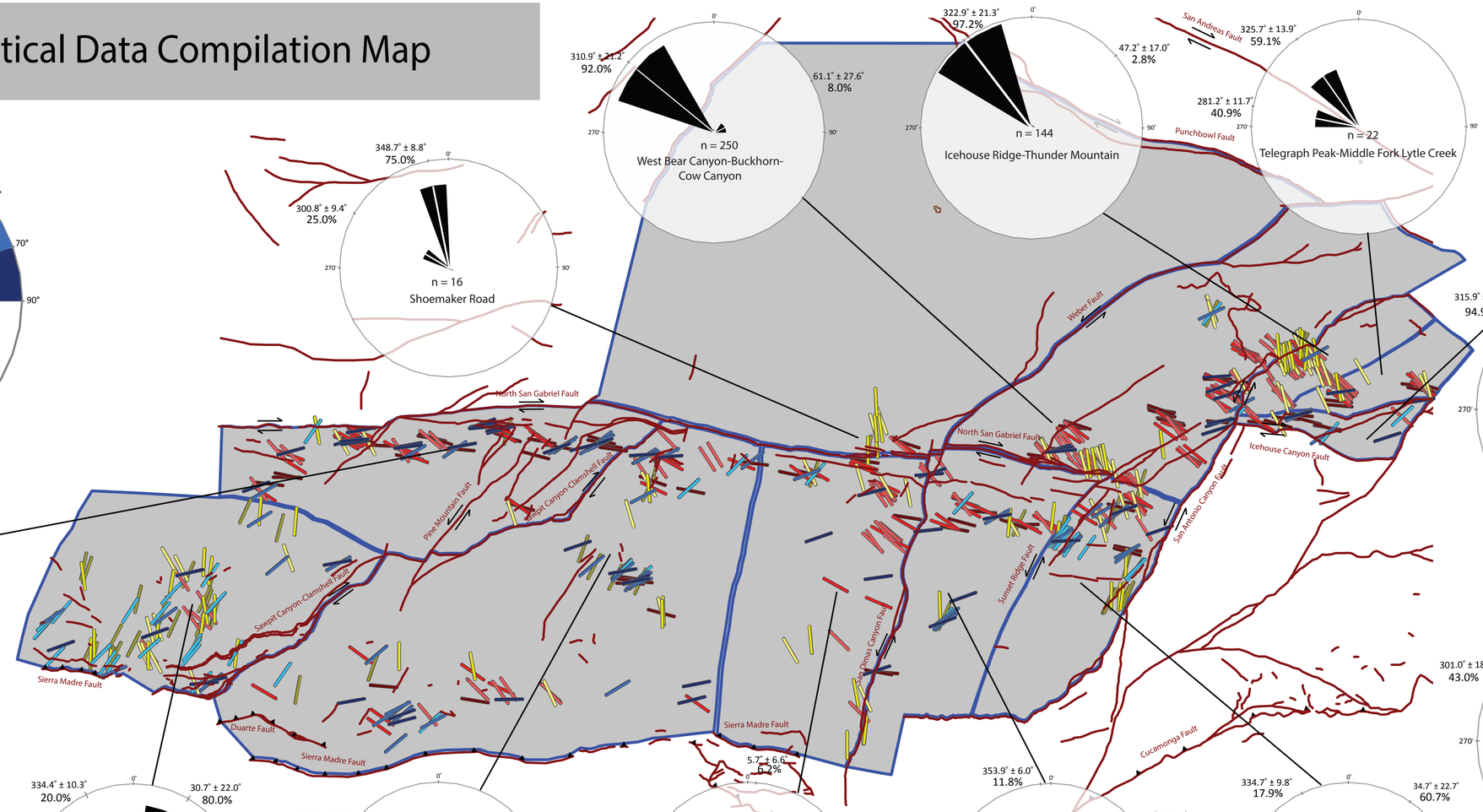


Plate 3: 18 Ma San Gabriel Mountains Tectonic Reconstruction Model

Middle Miocene tectonic reconstruction model of the eastern San Gabriel Mountains prior to dike emplacement. Block translations are inferred from Nourse 2002a, Figure 9. Fracture patterns from dike orientation data are superimposed onto each of my defined structural domains. An additional 15º of counterclockwise rotation that occurred for the San Gabriel Block is restored, MC and VC represent Mint Canyon and Vasquez Formations paleomagnetic measurement locations from Terres (1984). Below the reconstruction map are map-view stress diagrams which suggest how the fractures were generated. Primary, secondary and tertiary stress directions are indicated on the diagram (σ1, σ2 and σ3 respectively).

Faults

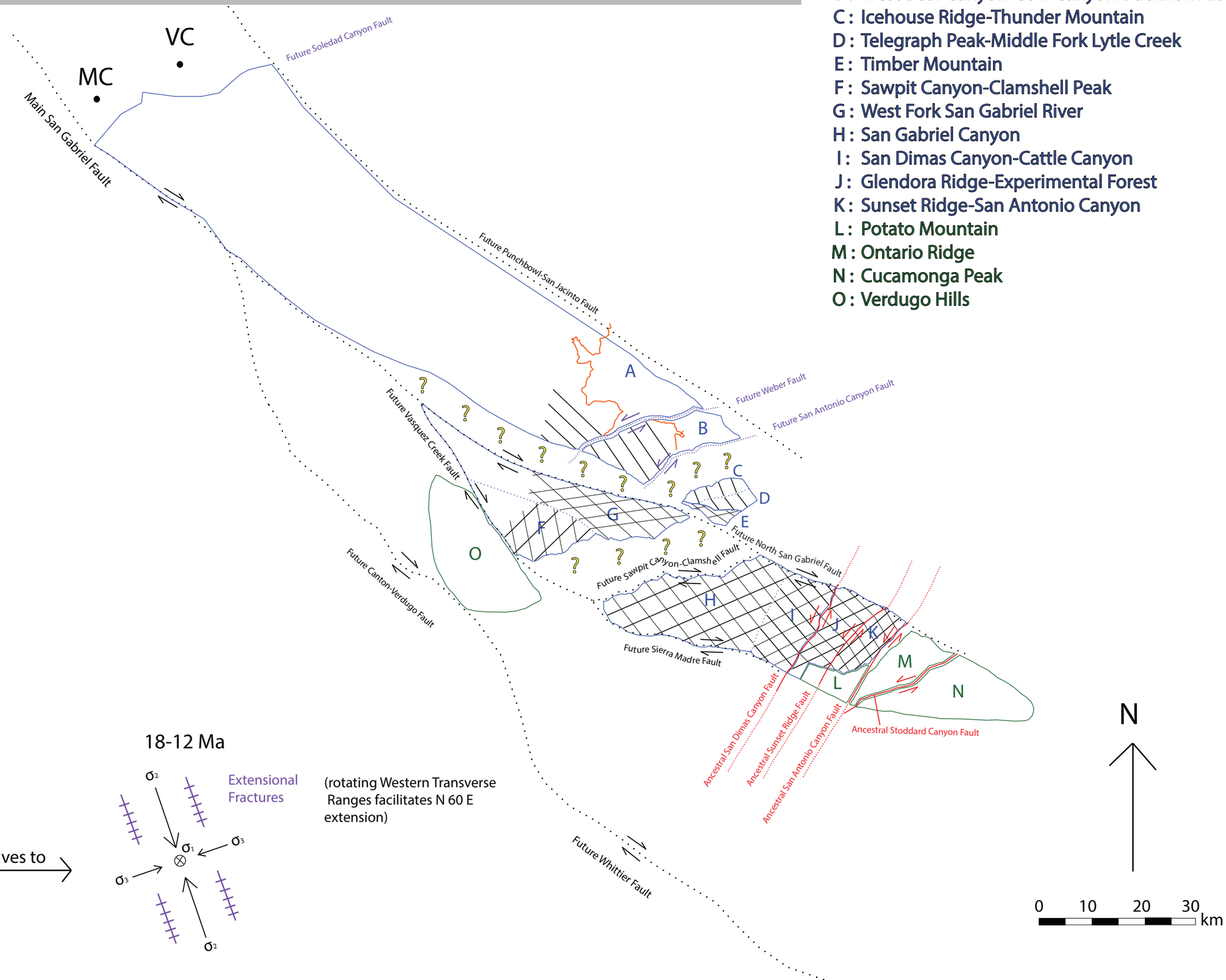
- Late Miocene "Future" Right-Lateral Fault
- Pre-Miocene "Ancestral" Left-Lateral Fault
- Pliocene-Quaternary "Future" Left-Lateral Fault
- Cretaceous-Paleocene Vincent Thrust Fault

Structural Boundaries

- Andesite Dike Structural Block Boundary (dashed lines indicate non-fault boundaries)
- Structural Block Boundary without Andesite Dikes

Miscellaneous

- Fracture Orientations (bold is the primary trend)
- ? Unresolved, empty regions of the reconstruction; artifacts of later compression and rotation
- 15˚ of late Miocene to present counter-clockwise rotation restored

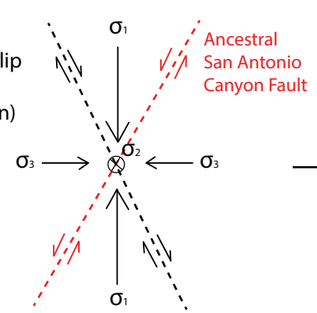


Structural Block Names

- A : Shoemaker Road
- B : West Bear Canyon-Cow Canyon-Buckhorn Lodge
- C : Icehouse Ridge-Thunder Mountain
- D : Telegraph Peak-Middle Fork Lytle Creek
- E : Timber Mountain
- F : Sawpit Canyon-Clamshell Peak
- G : West Fork San Gabriel River
- H : San Gabriel Canyon
- I : San Dimas Canyon-Cattle Canyon
- J : Glendora Ridge-Experimental Forest
- K : Sunset Ridge-San Antonio Canyon
- L : Potato Mountain
- M : Ontario Ridge
- N : Cucamonga Peak
- O : Verdugo Hills

23-18 Ma

(conjugate strike-slip faults open due to oblique subduction)



Evolves to

18-12 Ma

(rotating Western Transverse Ranges facilitates N 60 E extension)