

Geologic Map of northern Sierra Santa Isabel, Baja California, Mexico

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Mapping completed from 1993-1996 with assistance from
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SYMBOLS	
CONTACTS (DEPOSITIONAL AND INTRUSIVE)	
definite;	approximate
FAULTS	concealed; arrow indicates rise of slickensides striations; bar and ball on downthrow side
ATTITUDES	bedding; inclined, horizontal
	31/32 eutaxitic foliation in tuff - inclined, vertical, with lineations
	69 metamorphic foliation - inclined, vertical
	82 joints - inclined, vertical
	87 flow foliation - inclined, vertical
OTHER SYMBOLS	
connector of two outcrops of the same lithology, when one outcrop is too small to be labelled individually on the map	

Tm1b _(?)	New Year's Mountain basalt (Tmb _(new)). Glomerophytic olivine (?)-pyroxene-plagioclase basalt. Dark, tabular lava flow up to 120 m thick. Contains 12-18% plag. > pyroxene, augite + ol. (?) = limburg.
Tm1w _(?)	Tuffs of Santa Isabel Wash (Tm1w _(old)). Crystal-rich, pumice- and lithic-lapilli tuffs comprised of 5 distinct cooling units (yellow base to red top). Contains 10-20% plag. and smooth, >> olivine = cpx + Fe oxides. $^{40}\text{Ar}/^{39}\text{Ar}$ ages (plag) = 6.5-6.7 ($\pm 0.2-0.3$) Ma (also one anomalous 5.7 ± 0.2 Ma age).
Tm1c _(?)	Pleach Canyon hypabyssal (Tm1c _(old)). Series of flow-like, fine-grained, glomerophytic flows (juvenile (?) and vesicular) 2-3% of unit and as usually surrounded by foliated bands indicating flow direction. Basal breccia includes several m of perlitized obsidian boulders. $^{40}\text{Ar}/^{39}\text{Ar}$ ages (plag) = 5.9-6.0 ($\pm 0.2-0.4$) Ma.
Tm1a _(?)	Pico del Leon andesite (Tm1a _(old)). Trachytic, hornblende-phryre andesite showing 3-5% hibid. phenocrysts (exclusively) in groundmass of 30-45% equant plg. lathes. $^{40}\text{Ar}/^{39}\text{Ar}$ Age (plag) = 9.3 (± 0.4) Ma.
Tm1g _(?)	Tuff of San Felipe (Tm1g _(old)). Crystal-rich, lithic-lapilli. Distinct tan-mottled, brown (base) to black (higher) basal vitrophyre. Contains <15% anorth. >> trace opx, emph., qtz, and Fe oxides. $^{40}\text{Ar}/^{39}\text{Ar}$ age (anorth.) of 12.7 (± 0.3) Ma.
Tm1d _(?)	Tombstone dacite (Tm1d _(old)). Bronze-hornblende-plagioclase-phryre dacite w/ minor qtz. Forms sheer lava plugs and extensive brecciated flows. Contains granitic and gneissic xenoliths. $^{40}\text{Ar}/^{39}\text{Ar}$ ages (plag) = 15.5-16.7 ($\pm 0.3-0.7$) Ma.
Tm1h _(?)	Land of the Lost basalt (Tm1h _(old)). Olivine-pyroxene-plagioclase basalt with minor hibid. Unit is steel-grey with poorly-exposed basal breccia. $^{40}\text{Ar}/^{39}\text{Ar}$ age (plag) = 16.3 (± 0.5) Ma.
Tm1k _(?)	Kiondike Canyon basalt (Tm1k _(old)). Clinopyroxene-olivine-plagioclase basalt w/ up to 4% dis-equilibrium quartz (up to 1 cm in diameter). Grey, red, or black in color w/ poorly-exposed basal breccia. $^{40}\text{Ar}/^{39}\text{Ar}$ ages (plag) = 17.1 (± 1.1) Ma.
Tm1g _(?)	Biotite Tuff (Tm1g _(old)). Crystal-rich, pumice- and lithic-lapilli tuff deposited with Tm1s "paleochannels". Contains 15-25% plag. and/or amphib. > qtz > biot. w/ trace pyx. and Fe oxides. $^{40}\text{Ar}/^{39}\text{Ar}$ ages (plag) = 17.1 (± 1.2) Ma.
Tm1s _(?)	Volcaniclastic sedimentary rocks (Tm1s). Stratified, poorly-sorted, breccia to conglomerate intercalated with thin layers of Tm1s. Hornblende-olivine clast are more common. Small, local tuffs mapped within Tm1s. Can contain up to 10% pumice and 20-35% felds., emph., cpx, opx, biol., ol., qtz, and/or Fe oxides.
Tm1a _(?)	Arroyo Ocillo Tuff (Tm1a _(old)). Crystal-poor, lithic-lapilli, moderately welded tuff. Thickens dramatically in NE where rheomorphic flow features are common. Interbedded concretionary zones. Contains plag. and anorth. >> opx > Fe oxides. $^{40}\text{Ar}/^{39}\text{Ar}$ ages (plag) = 6.4 (± 0.1) Ma.
Tm1d _(?)	Rhyolite (ash-flow tuff) #4 (Tm1d _(old) , includes underlying Tm1d _(old)). Crystal-poor, porcelanous tuff commonly pink, blue, purple, or orange w/ colorful spherulitic lithophysae and a brown, glassy basal vitrophyre. Thickens dramatically in Arroyo Ocillo. Contains < 1% felds. and cpx.
Tm1i _(?)	Rhyolite (ash-flow tuff) #3 (Tm1i _(old)). Crystal-rich, moderately welded pumice- and lithic-lapilli tuff. Includes at least 4 cooling units. Contains 5-15% anorth. >> qtz > opx. Fe oxide < ol. + held. $^{40}\text{Ar}/^{39}\text{Ar}$ Ages (anorth.) of 6.2-6.4 ($\pm 0.1-0.2$) Ma.
P2 _(?)	Metasedimentary rocks (P2). Foliated garnet-epidote paragneisses intersected w/ thin layers of diopside marble. Isoclinal folds are common. Contains qtz > plag. > epidote > garnet > calcite and dolomite. Outcrops only in NW corner of mapped area.

