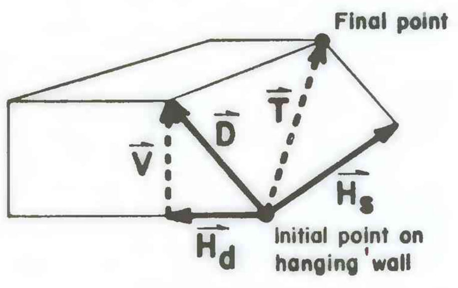
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Map Location #	Fault	Location	Latitude/ Longitude	Fault Strike	Style:[1] Compo- nent	Slip[2] mn - mx	Age of Offset[2,4] (1000 Years) mn - mx	Slip Rate (mm / yr) mn	mx	pf	Feature Offset		Method of Age Estimation	Us	Ua[3]	Reference(s)	Comments	Compiler's Initials
Salton Trough																		
ST CYC01	Coyote Creek	Lower Borrego Valley	33°5.4'/' 116°2.7	152	RR:H_s	10.9-11.1 m	* 4.5-6.5	1.4	2.0	--	subsurface channel	CYC01	^{14}C	A	B	Sharp (1981)	Age range represents maximum and minimum for channel cutting. Minimum slip is sum of horizontal components (parallel to average trend of zone) for at least 13 separate breaks. Maximum slip is sum of horizintal components not corrected for trend.	RS
ST CYC02	Coyote Creek	Lower Borrego Valley	33°5.4'/ 116°2.7'	152	RR:H_s	1.3 m S	* .265-.500	2.7	5.0	--	lake bed, vertical component	CYC02	^{14}C, historic records	D	A	Sharp (1981)	No direct measure of horizontal component of slip. Strike slip (H_s) is fabricated from vertical component for one event (1968). Time elapsed since 1968, and slip of that event were not used in calculating the slip rate.	RS
ST IMP01	Imperial	Bond's Corner Quad	32°41'/ 115°22'	139	RV:H_s	6.0 m S	* .70-U	--	8.6	--	ground surface	IMP01	^{14}C	A	B	Sharp (1979); Sharp (1982); and R.V. Sharp, unpub. data	Slip is maximum recorded for 1940 event, measured on a crop row. Age is minimum for which no pre-1940 slip can be proved, determined at All American Canal.	RS
ST IMP02	Imperial	McCabe Road	32°45'/ 115°25.5'	145	RV?:H_s V T	.78-U m .04-U m .78-U m	* .040 S	20	--	--	canal	IMP02	calendar	B B B	A	Sharp and others (1982)	H_s and V are minima because creep displacements between 1940 and 1979 are not included. Assumes strain released during and after 1979 earthquake accumulated after 1940 earthquake.	RS
ST IMP03	Imperial	Harris Road	32°53'/ 115°32.4'	010	RN:V	.40-U m	.042 S	10	--	--	road surface	IMP03	calendar	A	A	Sharp and Lienkaemper (1982)	Minimum estimate for period 1940 to 1982 based only on vertical component from 1976 to 1982. Dip-slip creep for period 1940 to 1976 must add to this. Horizontal components poorly known here. Assumes release of vertical strain that accumulated after 1940 earthquake.	RS
ST SAN15	San Andreas	Indio Hills	33°44.4'/ 116°11.1'	130	RL?:H_s	1 m P	.53-.67	1.5	1.9	--	lake bed	SAN15	^{14}C	B	A	Sieh (1981)	Source is an abstract. Data presented can be interpreted various ways by reader.	RS
ST SAN20	San Andreas	Indio Hills	33°46.9'/ 116°14.4'	130	RV?:H_s	.7-U km	20-70	10	35	23-35	fan	SAN20	soil development	D	D	Keller and others (1982a)	Authors indicate that correlation of fan segments is questionable--thus the 0.7 km of slip may be invalid. Age based on soil development relies on comparison to Mojave Desert soils; precipitation differences between high and low deserts could mean age used here is too small. Preferred rate is from Keller and others (1982a)	RS
Transverse Ranges																		
TR APD01	Arroyo Parida	Ventura River	34°26.0'/ 119°17.5'	085	R?:V R?:V R?:V R?:V	10.7-11.3 m 13.7-14.3 m 17-23 m 31-37 m	28.5-30.9 36.5-39.5 -- -- -- --	.35 .35 .35 .35	.40 .39 .39 .39	-- -- -- --	river terrace surface river terrace surface river terrace surface river terrace surface	APD01	soil development, ^{14}C soil development, ^{14}C inferred inferred	B B B B	B B B B	Keller and others, in press; Rockwell (1983)	Fault progressively offsets 4 terraces of the Ventura River. Dip of fault unknown. Assumes that vertical separation approximates V; H_s may by present. Constant slip rate extended by Rockwell to older 2 terraces.	JZ
TR CBT01	Culbertson	Timber Canyon	34°24.0'/ 119°00.7'	080	N:V T N:V T N:V T	0-5 m 0-6 m 1.5-7.5 m 1.6-9.1 m 34-40 m 37-49 m	4.5-5 25-30 160-200	0 .05 .19	1.3 .36 .31	-- -- --	alluvial fan surface alluvial fan surface alluvial fan surface	CBT01	soil development, dendrochronology, and ^{14}C soil development, ^{14}C soil development	B C A B A B	A B C	Rockwell (1983)	Assumes that vertical separation approximates V. Fault parallels bedding and may represent flexural-slip along overturned limb of fold. Offset of youngest surface is inferred from uphill-facing break in fan slope. Fault dip of 55°-65° used to compute T.	JZ
TR CLG01	Cleghorn	Cleghorn Road	34°17.3'/ 117°22.5'	090	LL:Hs	200 m P	50-100	2.0	4.0	2.0	streams cut into terrace approx. 100,000 yrs old	CLG01	correlation	B	C	Meisling and Weldon (1982a, 1982b)	Rate consistent with that obtained from offsets of older terraces and from offset fold axes in the Upper Pliocene Crowder Formation.	JZ
TR CLG02	Cleghorn	Cleghorn Road/ Miller Canyon	34°17.3'/ 117°22.5'	090	LL:Hs	1.1 km P	>250-730	1.5	<4.4	2.2	alluvial gravels from source	CLG02	correlation	B	C	Meisling and Weldon (1982a, 1982b)	Rate consistent with that obtained from offsets of incised stream channels and from offset fold exes in the Upper Pliocene Crowder Formation.	JZ
TR CUC01	Cucamonga	Day Canyon	34°10.0'/ 117°32.0'	090	R:V T	35-37 m 37-64 m	10-13	2.9	6.4	--	allurial fan surface	CUC01	soil development, ^{14}C	A	B	Weldon and Sieh (1980), Morton and others (1982), Matti and others (1982), Weldon (1983); J. C. Matti and J. C. Tinsley, unpub. data	Vertical component of slip (36m) is cumulative separation of alluvial-fan surface on three strands. Uncertainties: (1) No direct age control; based on 13,000 yr maximum for climatic changes, and ^{14}C-dated fills elsewhere in Transverse Ranges; (2) The calculated dip-slip rate assumes fault dips 35-70° in subsurface (35° observed in trenches).	JM JT
TR DGL01	Devil's Gulch	Ventura River	34°24.9'/ 119°17.7'	055	R:V T R:V T	17.7-18.3 m 24.3-26.9 m 34-59 m 47-59 m	36.5-39.5 44-64	.62 .73	.74 1.34	-- --	river terrace surface river terrace surface	DGL01	soil development, ^{14}C inferred from slip rate	A A B B	B C	Keller and others, in press; Rockwell (1983)	Fault generally parallels bedding and may represent flexural-slip displacement. Older terrace age estimate is inferred from offset rate for Arroyo Parida fault Fault dip of 43°-47° used to compute T.	JZ
TR HLD01	Hollywood	Atwater School	34°06.9'/ 118°15.0'	090	R?:V	2-3 m	4-6	.33	.75	--	river terrace surface	HLD01	correlation of alluvial soils	D	B	Weber (1980); J. C. Tinsley, unpub. data	Assumes that degraded scarps on terrace are fault-produced; overlies subsurface fault. Assumes that vertical separation approximates V. Rate calculated by compilers.	JZ JT
TR JVC01	Javon Canyon	Javon Canyon	34°20.1'/ 119°23.3'	090	R:V T	42-49 m 45-53 m	45-60	.8	1.2	--	marine platform	JVC01	amino-acid and U-series dating on mollusks; U/Pa on vertebrate bone	A	A	Sarna-Wojcicki and others (1979); Yeats (1982)	Inferred to be a flexural slip fault by Yeats (1982) and consequently not seismogenic; but fault shows stratigraphic evidence of repeated rapid offsets in Holocene time. Slip is measured in plane of fault.	AS
TR JVC02	Javon Canyon	Javon Canyon	34°20.2'/ 119°23.9'	098	R:T	4.0-4.5 m	1.8-5.8	.7	2.5	--	stream terrace graded to Holocene marine terrace	JVC02	^{14}C, range of several samples	A	A	Sarna-Wojcicki and others (1979); Yeats (1982)	Inferred to be a flexural slip fault by Yeats (1982) and consequently not seismogenic; but fault shows stratigraphic evidence of repeated rapid offsets in Holocene time. Slip is measured in plane of fault.	AS
TR LAV01	La Vista	Ventura River	34°25.2'/ 119°17.6	045	R:V R:V R:V R:V	10.7-11.3 m 14.7-15.3 m 38-44 m 95-100 m	28.5-30.9 36.5-39.5 44-64 79-105	.35 .37 .59 .90	.40 .42 1.0 1.3	-- -- -- --	river terrace surface river terrace surface river terrace surface river terrace surface	LAV01	soil development, ^{14}C soil development, inferred inferred	B B B B B	B B C C C	Keller and others, in press; Rockwell (1983)	Fault progressively offsets four terraces of the Ventura River. Fault generally parallels bedding and may represent flexural-slip displacement. Older terrace ages estimated by Rockwell using assumed constant slip rate for Arroyo Parida fault.	JZ
TR MCO01	Malibu Coast	Corral Canyon	34°02.1'/ 118°43.7'	095	R?:V	5 m P	185-200	.03	.03	--	marine wave-cut platform	MCO01	paleontology, amino acids, geomorphology, sea-level curve	B	B	Yerkes and Wentworth (1965); K. R. Lajoie, unpub. data	Assumes that vertical separation approximates V. Rate calculated by compiler.	JZ
TR MCO02	Malibu Coast	Marie Canyon	34°02.1'/ 118°42.4'	130	R:V T	4.9-6.1 m 8.5-16.3 m	185-200	.04	.09	--	marine wave-cut platform	MCO02	correlation	A B	B	R. L. Yerkes, R. H. Campbell, K. L. Lajoie, unpub. data	Marine deposits on platform. Fault dips 22-35° NE. Slickensides show dominant dip slip. Middle of 3 marine terraces at this location.	KL
TR MRR01	More Ranch	Goleta	34°25.0'/ 119°52.5'	090	R?:V	10-U m	40-60	.2	>.3	>.3	marine wave-cut platform	MRR01	paleontology, amino acids	C	B	K. R. Lajoie, unpub. data	Platform north of fault (down) not exposed, so maximum V not known. H_s may be present. Assumes vertical separation approximates V.	KL
TR OKV01	Oak View	Ventura River	34°24.4'/ 119°17.0'	055	R:V T	16-22 m 23-33 m	44-64	.36	.75	--	river terrace surface	OKV01	inferred	B B	C	Keller and others, in press; Rockwell (1983)	Fault generally parallels bedding and may represent flexural-slip displacement Terrace age estimated by Rockwell using assumed constant slip rate for Arroyo Parida fault. Fault dip of 41°-45° used to compute T.	JZ
TR OMT01	Ord Mountains	northwest flank	34°24.5'/ 117°11.8'	040	R?:V	70 m P	500-1000	.07	.14	--	alluvial fan surface	OMT01	correlation	C	C	Allen and Meisling (1982)	Assumes that vertical separation approximates V.	JZ
TR PDJ01	Padre Juan	Javon Canyon	34°20.4'/ 119°23.1'	110	R?:V	61.0-U m	45-60	1.0	>1.4	--	marine platform	PDJ01	amino-acid and U-series on mollusks; U/Pa on vertebrate bone	B	A	Sarna-Wojcicki and others (1979); Yeats (1982)	Vertical component is used because fault plane is not exposed. Fault displacement is probably high-angle reverse with possible small RL component.	AS
TR PDJ02	Padre Juan	Javon Canyon	34°20.6'/ 119°23.8'	129	R?:V	24.2 m P	45-60	.4	.5	--	marine platform	PDJ02	Same as for PDJ01	B	A	Same as for PDJ01	Same as for PDJ01	AS
TR RMD01	Raymond	Sunnyslope Reservoir	34°07.8'/ 118°05.1'	075	LR?:V	N/A	N/A	.10	.22	.13	bases of sag pond deposits	RMD01	^{14}C	C	B	Crook and others, in press	Assumes sedimentation rates based on ^{14}C dates in sequence of sag pond deposits are equal to rates of vertical separation during past 36,000 yr. Rates of sedimentation based on mean values from 9 samples from different depths. H_s may be present.	JZ JT
TR RMT01	Red Mountain, main strand	Javon Canyon	34°20.8'/ 119°23.7'	127	R?:V D	27.4 m E 27.4-31.6 m	45-60	.5	>.7	--	marine platform	RMT01	amino-acid and U-series on mollusks; U/Pa on vertebrate bone	B B	A	Lajoie and others (1982); Sarna-Wojcicki and others (1979); Lee and others (1979); Yeats and others, in press; Yerkes and Lee (1979); Yeats (1982)	Fault plane is not exposed. Fault in subsurface is high-angle reverse, as inferred from oil-well data and first-motion studies. Possible small component of LL inferred from first-motion data several km. east. D derived from assumed fault dip of 60°-90°.	AS
TR RMT02	Red Mountain, S. strand	Punta Gorda	34°21.7'/ 119°26.2'	115	R?:V D	22.8 m E 22.8-26.3 m	45-60	.4	.6	--	marine platform	RMT02	Same as for RMT01	B B	A	Same as for RMT01	Same as for RMT01	AS
TR RMT03	Red Mountain, S. strand	Punta Gorda	34°22.0'/ 119°26.7'	120	R?:V D	60 m E 60-69 m	45-60	1.1	1.5	--	marine platform	RMT03	Same as for RMT01	B B	A	Same as for RMT01	Same as for RMT01	AS
TR RMT04	Red Mountain, N. strand	Punta Gorda	34°22.4'/ 119°26.9'	105	R?:V D	29.5 m E 29.5-34.1 m	45-60	.5	.8	--	marine platform	RMT04	Same as for RMT01	B B	A	Same as for RMT01	Same as for RMT01	AS
TR RUD01	Rudolf	Orcutt Canyon	34°23.3'/ 119°02.3'	070	R:V T R:V T R:V T	3-9 m 3-9 m 23-28 m 23-29 m 60-62 m 60-64 m	4.5-5 25-30 80-100	.6 .77 .6	2 1.2 .8	-- -- --	alluvial fan surface alluvial fan surface alluvial fan surface	RUD01	soil development, dendrochronology, and ^{14}C soil development, ^{14}C soil development	B C A B A B	A B C	Rockwell (1983)	Assumes that vertical separation approximates V. Fault parallels bedding and may represent flexural-slip along upright limb of fold. Offset of youngest surface is inferred from uphill-facing break in fan slope. Fault dip of 75°-85° used to compute T.	JZ
TR SAN30	San Andreas	Elder Gulch near Highland	34°07.5'/ 117°10.0'	115	RL:H_s	30-50 m	U-U	--	25	--	stream channels	SAN30	soil-profile characteristics	C	D	Rasmussen (1982); G.S. Rasmussen, unpubd. data	The 25 mm slip-rate estimate compares well with the 20-25 mm/yr rate of Weldon and Sieh (1980). However, the geologic, stratigraphic, and soil age data are not documented in the published study, and Rasmussen (1982, p. 112) indicates that the actual slip rates could be considerably less than 25 mm/yr.	JM
TR SAN35	San Andreas	Cajon Canyon	34°16.4'/ 117°27.9'	125	RL:Hs	250 m P	8.5 P	20	30	25	latest Pleistocene terrace riser	SAN35	^{14}C	B	B	Weldon and Sieh (1980,1981) Sieh (1983)	Mn and mx rates from Weldon and Sieh (1981). Welden and Sieh (in Sieh, 1983, p. 160) indicate that 25 mm/yr now is their best estimate for slip rate at Cajon Pass. Assumes that inferred age of oldest adjacent sag pond deposits records initial offset of terrace riser.	JZ JM
TR SAN40	San Andreas	Pallett Creek	34°27.4'/ 117°53.5'	110	RL:H_s	10 m P	* 1.12 P	--	--	9	stream & marsh deposits	SAN40	historic rupture and ^{14}C	B	B	Sieh (1978a, 1978b); Sieh, in press	Offset accumulated across fault breaks at the Pallett Creek site from 735 AD to 1857 AD. Rate is minimal because of considerable folding adjacent to principal breaks	JS
TR SAN44	San Andreas	Three Points	34°42.9'/ 118°33.6'	112	RL:H_s	14-123 m	* 1.84-2.4	5.8	67	48	crest and margins of landslide	SAN44	^{14}C, tree ring corrected	B	B	Rust (1982 a, b);	Age is from basal sediments deposited in an earthquake-caused depression on landslide. Maximum slip is total offset of landslide minus slip (7m) of depression-causing earthquake. Minimum slip assumes only one event between formation of depression and 1857. (7 m each). Time period for slip rate ends at 1857. Preferred value of slip rate from Rust.	KH JS
TR SAN45	San Andreas	Three Points	34°43.5'/ 118°35.9'	112	RL:H_s	33.5-47.0 m	* .747-1.032	33	63	50	gullies on landslide	SAN45	^{14}C, tree ring corrected	B	B	Rust (1982 a, b)	Horizontal offset of 44 ± 3 m reported by Rust for gullies in a landslide. Rust's estimated 1857 offset of 7.5 m subtracted for mn slip. Age is for landslide. Rust thinks mn age is contaminated. Mn and mx slip rate based on period between formation of slide and 1857. Preferred slip rate from Rust.	JS KH
TR SCI01	Santa Cruz Island	Christi Beach	34°02.0'/ 119°52.5'	105	LR?:V	25-U m	45-126	0.2	0.56	--	marine wave-cut platform	SCI01	correlation	C	B	Patterson (1979)	Rate calculated by compiler assuming undated terrace deposits correlate with those on adjacent mainland. Significant left-lateral component indecated by offset stream channels. Assumes that vertical separation is minimum V; apparent vertical separation possible if terrace deposited on west-sloping platform.	JZ
TR SCI02	Santa Cruz Island	Central Valley	34°00.2'/ 119°44.6'	105	LR?:H_s	600 m P	U-700	0.86	--	--	abandoned stream channel	SCI02	correlation	C	C	Patterson (1979)	Rate calculated by compiler assuming that channel no older than late Quaternary. Presumed source of channel was Cascada canyon.	JZ
TR SCY01	San Cayetano	Sisar Creek	34°26.7'/ 119°08.0'	100	R:V T	12.5-13.5 m 17.6-19.0 m	15-20	.88	1.27	--	alluvial fan surface	SCY01	soil development	A B	C	Rockwell (1983)	Assumes that fault dips 45° (constrained by well data).	JZ
TR SCY02	San Cayetano	Bear Creek	34°26.4'/ 119°07.3'	100	R:V T R:V T	8-10 m 11.3-14.0 m 135-145 m 190-204 m	8-12 80-200	.94 .95	1.75 2.55	-- --	alluvial fan surface alluvial fanhead	SCY02	soil development soil development	A B C D	B C	Rockwell (1983)	Assumes that fault dips 45° (constrained by well data)	JZ
TR SCY03	San Cayetano N. strand	Mud Creek	34°25.3'/ 119°02.5'	090	R:V T	29-35 m 36-44 m	15-20	1.8	2.9	--	alluvial fanhead	SCY03	soil development	B C	C	Rockwell (1983)	Assumes correlation of fan remnants across fault. Assumes that fault dips 53°.	JZ
TR SCY04	San Cayetano	Timber Canyon	34°25.5'/ 119°0.7'	090	R:T R:T	16-20 m 1375-1675 m	≤ 5 160-200	3.2 6.9	-- 10.5	-- --	alluvial fan surface alluvial fanhead	SCY04	dendrochronology, soil development, ^{14}C soil development	B D	A	Rockwell (1983)	Assumes that segmentation of alluvial fan reflects 18m of uplift across fault trace. Assumes that fault dips 48° (constrained by well data).	JZ
TR SMD01	Sierra Madre	Dunsmore Canyon	34°14.9'/ 118°15.2'	110	R?:V	4 m P	1-11	.36	4.0	--	alluvial fan surface	SMD01	soil development	B	A	Crook and others, in press	Assumes that vertical separation approximates V; H_s may be present. Rate calculated by compilers.	JZ JT
TR SMD02	Sierra Madre (entire zone)	Gould Mesa	34°12.8'/ 118°11.2'	110	R?:V	600 m P	200-500	1.2	3.0	--	base of oldest late Quaternary alluvial deposits	SMD02	soil development	C	C	Crook and others, in press	Assumes that vertical separation approximates V; H_s may be present. Rate, calculated by compilers, is across entire fault zone.	JZ JT
TR SMD03	Sierra Madre (Bridge strand)	Jet Propulsion Laboratory	34°12.2'/ 118°10.2'	105	R?:V	244-U m	200-500	.5	>1.2	--	base of oldest late Quaternary alluvial deposits	SMD03	soil development	C	C	Crook and others, in press	Assumes that vertical separation approximates V; H_s may be present. Rate, calculated by compilers, is for Bridge strand only.	JZ
TR SMN01	Santa Monica	Potrero Canyon	34°01.9'/ 118°31.6'	075	R?:V	34-47 m	122-126	.27	.39	--	marine wave-cut platform	SMN01	paleontology, amino acids, geomorphology, dated sea-level curve	A	A	McGill (1981); McGill (1982); K. R. Lajoie, unpub. age data	Assumes that vertical separation approximates V.	JZ
TR SSY01	South Santa Ynez	Alegria Canyon	34°29.2'/ 120°16.3'	062	LV:V	3-U m	5-15	.2	>.6	.4	fluvial gravels	SSY01	geomorphology, Holocene sea-level	B	D	K. R. Lajoie, unpub. data	Vertical separation of sediment equals that of a 124,000 yr old marine terrace nearby. Horizontal displacement of shoreline angle is small (< 50 m?) but lateral separation of late Tertiary bedrock units is large (> 1 km).	KL

1. Style: strike-slip RL right lateral
LL left lateral
dip-slip R reverse or thrust, compressional
N normal, extensional
oblique-slip RR right-reverse LR left-reverse
RN right-normal LN left-normal
RV right-vertical LV left-vertical

Components: refer to block diagram

$$T = H_s + D = H_s + H_d + V$$
$$T = (H_s^2 + H_d^2 + V^2)^{1/2}$$



2. mn-minimum mx-maximum pf-preferred
* Slip, age, and slip rate apply to a definite period in the past.
E - best estimate or measured value, neither mn nor mx.
P - published value, neither mn nor mx.
S - accurate to value shown, mn and mx are the same value.
U - mn or mx value is unknown.

3. U_s - qualitative uncertainty associated with slip estimate.
U_a - qualitative uncertainty both in the analytical method used to reckon ages and in the assuptions made linking them to the age of the offset feature.
A - small uncertainty C - distinct uncertainty
B - significant uncertainty D - major uncertainty

4. For all but starred (*) entries "age" is age of offset feature, in years before present.

PRELIMINARY SLIP-RATE TABLE AND MAP OF LATE-QUATERNARY FAULTS OF CALIFORNIA

by

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