DEPARTMENT OF THE INTERIOR
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Purpose of Map

Extensive radiometric age dating of the plutonic rocks of the central Sierra Nevada batholith has been done by K-Ar, Rb/Sr, and Pb-U methods (Evernden and Kistler, 1970; Kistler and Peterman, 1973; Stern and others, 1981; and Chen and Moore, 1982). By contrast, in the southern Sierra Nevada, where geologic studies have lagged behind, there has been much less radiometric age dating. Geologic mapping and sampling in the southern Sierra Nevada have now progressed to the point where the distribution and character of individual plutons have been determined for much of the area north to 36°00' north latitude, and further studies are now under way.

This map shows the generalized distribution of those plutons and locates all known published radiometric age dates as of the end of 1982. The purposes of this map are to show the radiometric age "base" that exists now, and to guide further radiometric age dating. Particularly noticeable is the absence at present of any published Pb-U age data. Much of the sampling for the K-Ar and Rb/Sr data that are presented here predates the geologic mapping of the plutons, and therefore in some localities there is a question of what unit was sampled.

Table 1. Potassium-argon Data

Number	Mineral	K2O (%)	Radiogenic Ar40 (%)	Age (m.y.)	Reference
121	Biotite	6.66	86	84.7	Evernden and Kistler, 1970
122	Biotite	6.58	53	48.8	Evernden and Kistler, 1970
124	Biotite	7.971	95	102	Evernden and Kistler, 1970
	Hornblende	.580	76	108	
	Plagioclase	.774	80	102	
	K-Feldspar	9.253	94	100	
	Quartz	.041	9	58	
125	Biotite	7.829	91	98.0	Evernden and Kistler, 1970
	Hornblende	.493	82	102	
126	Biotite	7.177	92	86.6	Evernden and Kistler, 1970
127	Biotite	7.486	93	89.7	Evernden and Kistler, 1970
128	Biotite	7.527	90	90.2	Evernden and Kistler, 1970
129	Biotite	7.556	90	92.3	Evernden and Kistler, 1970
130	Biotite	7.657	89	90.6	Evernden and Kistler, 1970
131	Biotite	7.273	90	87.7	Evernden and Kistler, 1970
132	Biotite	7.127	85	85.5	Evernden and Kistler, 1970
	Hornblende	1.066	88	87.7	
133	Biotite	7.392	91	87.0	Evernden and Kistler, 1970
134	Biotite	7.042	87	85.1	Evernden and Kistler, 1970
135	Biotite	7.682	90	79.2	Evernden and Kistler, 1970
136	Biotite	7.335	91	78.7	Evernden and Kistler, 1970
137	Biotite	7.393	87	78.2	Evernden and Kistler, 1970
138	Biotite	6.884	80	66.1	Evernden and Kistler, 1970
139	Biotite	7.620	79	74.0	Evernden and Kistler, 1970
	Hornblende	.805	83	86.2	
140	Biotite	7.272	81	81.2	Evernden and Kistler, 1970
141	Biotite	7.207	87	80.4	Evernden and Kistler, 1970
	Hornblende	.936	83	81.4	
142	Biotite	7.349	79	86.1	Evernden and Kistler, 1970
153	Hornblende	.324	57	77.4	
1169	Hornblende	.026	55	11644	Ross and others, 1973
1182	Hornblende	.190	26	16596	Ross and others, 1973
1189	Hornblende	.107	41	207±10	Ross and others, 1973
3596	Biotite	9.16	86	85.9±1	J. L. Morton, written commun., 1979 (Ross, in press)
	Hornblende	.937	68	88.1±1	
SR-6-73	Biotite	8.81	77	67.1±2	Kistler and Peterman, 1978
SR-8-73	Biotite	9.36	94	78.7±2	Kistler and Peterman, 1978
SR-9-73	Biotite	9.16	70	74.8±2	Kistler and Peterman, 1978
4972	Biotite	9.11	90.5	81.1±2	R. M. Tosdal in Bergquist and Nitkiewicz, 1982

Table 2. Rubidium-strontium data

Number	Rb (ppm)	Sr (ppm)	Rb/Sr	$^{87}Sr/^{86}Sr$	I_i	Age (m.y.)	Reference
SR-1-73	77.2	360	0.215	0.7048	0.7038	120	Kistler and Peterman, 1978 (same as 124, Table 1).
SR-2-73	57.7	399	0.145	0.7050	0.7043	120	Kistler and Peterman, 1978 (same as 125, Table 1).
SR-3-73	44.0	514	0.086	0.7036	0.7032	120	Kistler and Peterman, 1978
SR-4-73	146.0	249	0.586	0.7089	0.7061	120	Kistler and Peterman, 1978 (same as 129, Table 1).
SR-5-73	154.0	238	0.646	0.7084	0.7053	120	Kistler and Peterman, 1978 (same as 130, Table 1).
SR-6-73	140.0	349	0.401	0.7073	0.7058	90	Kistler and Peterman, 1978
SR-8-73	98.0	737	0.133	0.7080	0.7075	90	Kistler and Peterman, 1978
SR-9-73	81.8	695	0.118	0.7084	0.7080	90	Kistler and Peterman, 1978
SR-10-73	89.6	634	0.141	0.7076	0.7070	90	Kistler and Peterman, 1978
SR-12-73	80.1	612	0.131	0.7062	0.7058	81	Kistler and Peterman, 1978 (same as 141, Table 1).
SR-14-73	55.0	347	0.159	0.7055	0.7050	80	Kistler and Peterman, 1978
SR-15-73	53.8	341	0.158	0.7060	0.7055	81	Kistler and Peterman, 1978 (same as 140, Table 1).
671	<2	147	--	0.7031	0.7031	200	Kistler and others, 1973
698	127	376	0.338	0.7093	0.7078	110	Kistler and others, 1973
1182	8.8	228	0.016	0.7042	0.7038	200	Kistler and others, 1973
3023	<5	603	--	0.70337±10			R. W. Kistler, written commun., 1981 (Ross, in press).
3097	2.4	261	0.009	0.70364±12			R. W. Kistler, written commun., 1981 (Ross, in press).
3098	16.6	289	0.057	0.70446±3			R. W. Kistler, written commun., 1981 (Ross, in press).
3356	80.4	632	0.127	0.70833±4		~85	R. W. Kistler, written commun., 1981 (Ross, in press).
3534	129	416	0.310	0.70895±3	0.7079	~85	R. W. Kistler, written commun., 1981 (Ross, in press).
3733	82.7	618	0.134	0.70840±5	to	~85	R. W. Kistler, written commun., 1981 (Ross, in press).
3756	132	370	0.357	0.70991±5	0.7085	~85	R. W. Kistler, written commun., 1981 (Ross, in press).
4093	81.3	652	0.125	0.70864±3		~85	R. W. Kistler, written commun., 1981 (Ross, in press).
4472	91.3	665	0.140	0.70904±7		~85	R. W. Kistler, written commun., 1981 (Ross, in press).

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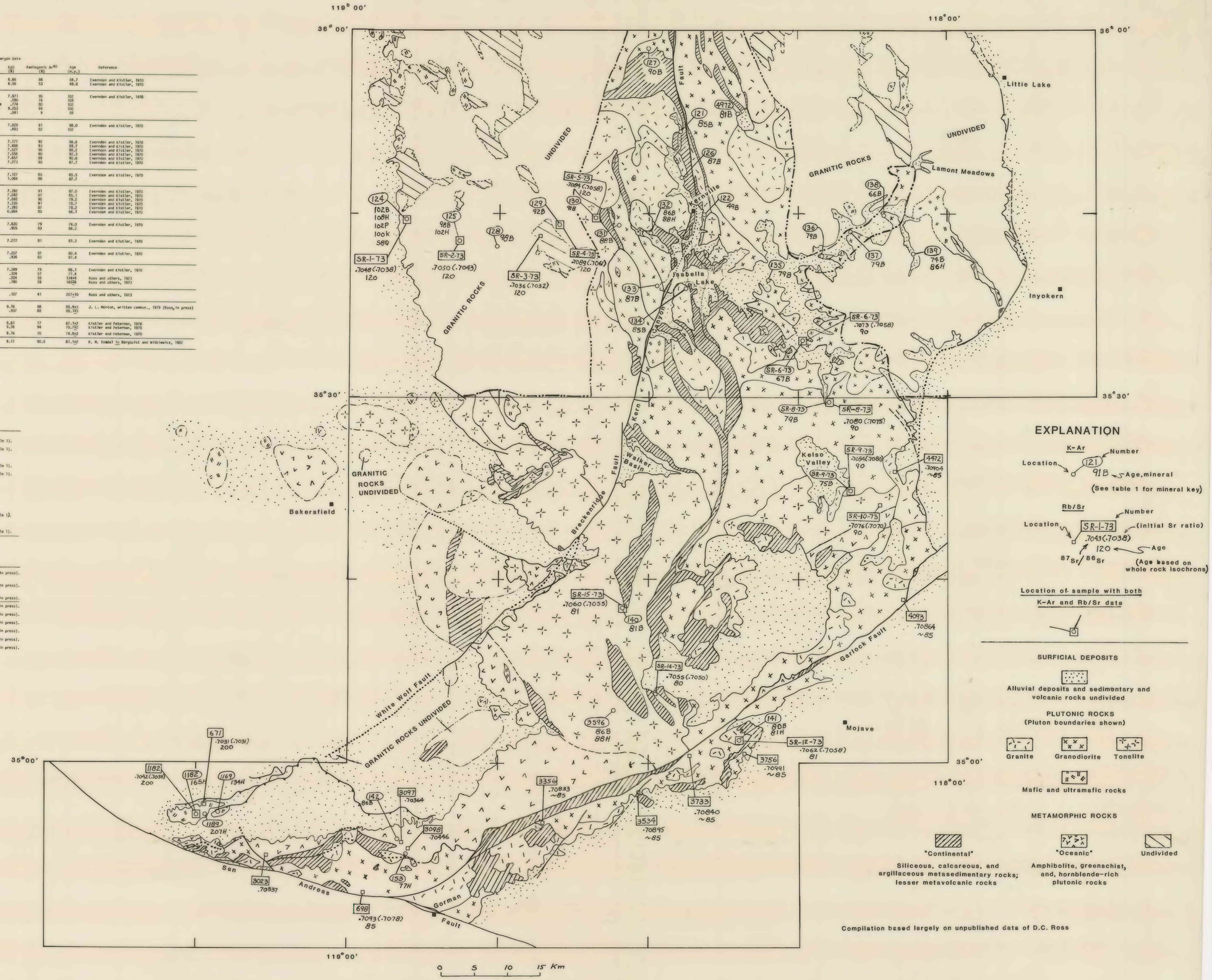

EXPLANATION

K-Ar: Location — Number — Age, mineral (See table 1 for mineral key)

Rb/Sr: Location — Number — (initial Sr ratio) — Age — $^{87}Sr/^{86}Sr$ (Age based on whole rock isochrons)

Location of sample with both K-Ar and Rb/Sr date

SURFICIAL DEPOSITS

Alluvial deposits and sedimentary and volcanic rocks undivided

PLUTONIC ROCKS (Pluton boundaries shown)

Granite | Granodiorite | Tonalite

Mafic and ultramafic rocks

METAMORPHIC ROCKS

"Continental": Siliceous, calcareous, and argillaceous metasedimentary rocks; lesser metavolcanic rocks

"Oceanic": Amphibolite, greenschist, and, hornblende-rich plutonic rocks

Undivided

Compilation based largely on unpublished data of D.C. Ross

GENERALIZED GEOLOGIC MAP OF THE SOUTHERN SIERRA NEVADA, CALIFORNIA, SHOWING THE LOCATION OF SAMPLES FOR WHICH K-Ar RADIOMETRIC AGE DATA AND Rb/Sr DATA HAVE BEEN DETERMINED

Compiled by
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