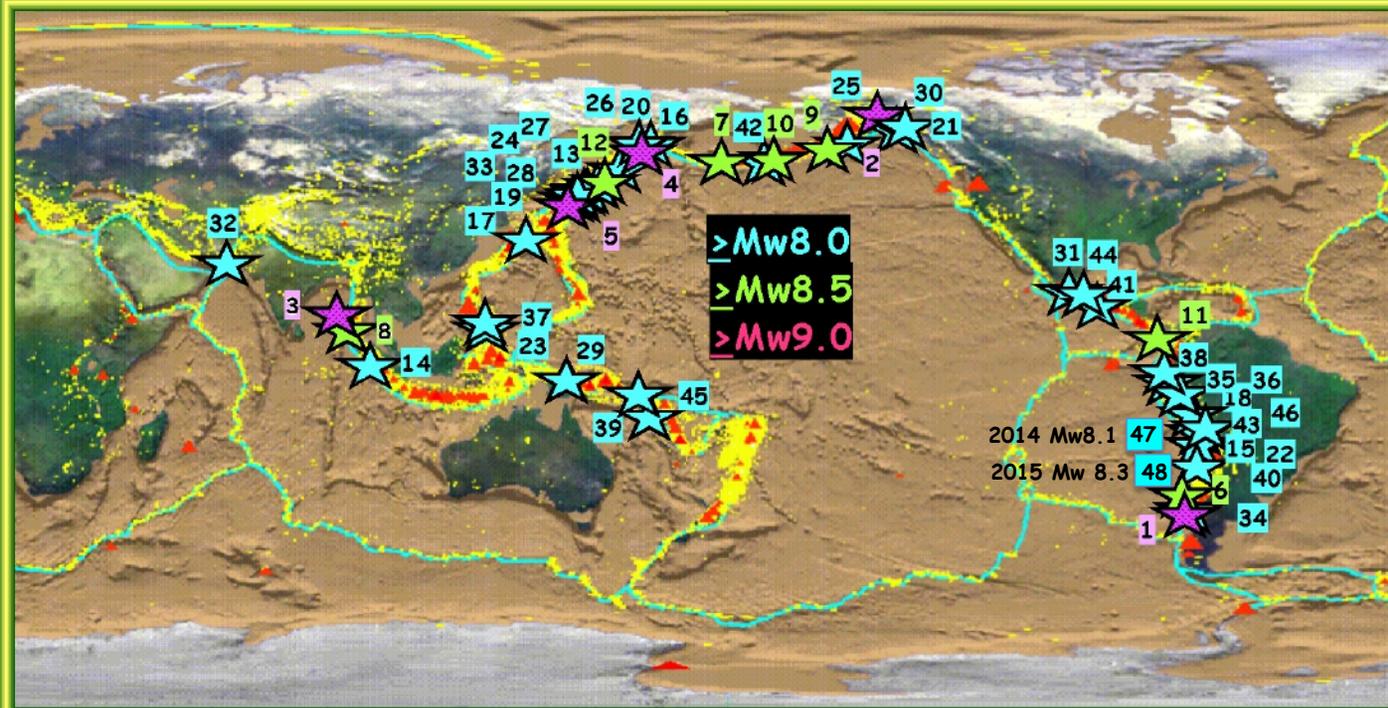


Why do Great Megathrust Earthquakes Commonly Rupture, and Repeatedly so,
at Certain Subduction Zones and Not at Others ?

Exploring the Role of Interplate Roughness and Smoothness

Dave Scholl, Steve Kirby, and Roland von Huene

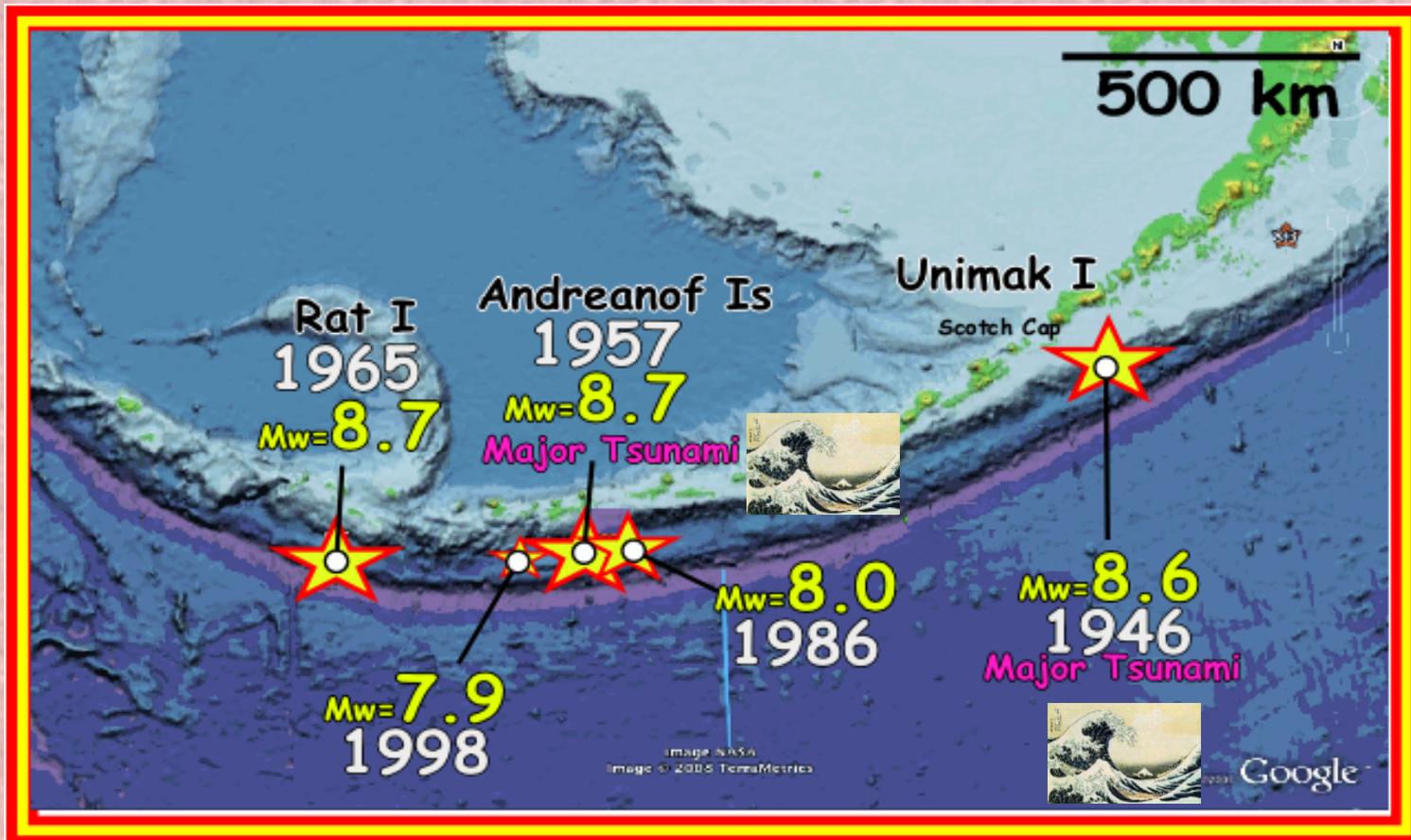


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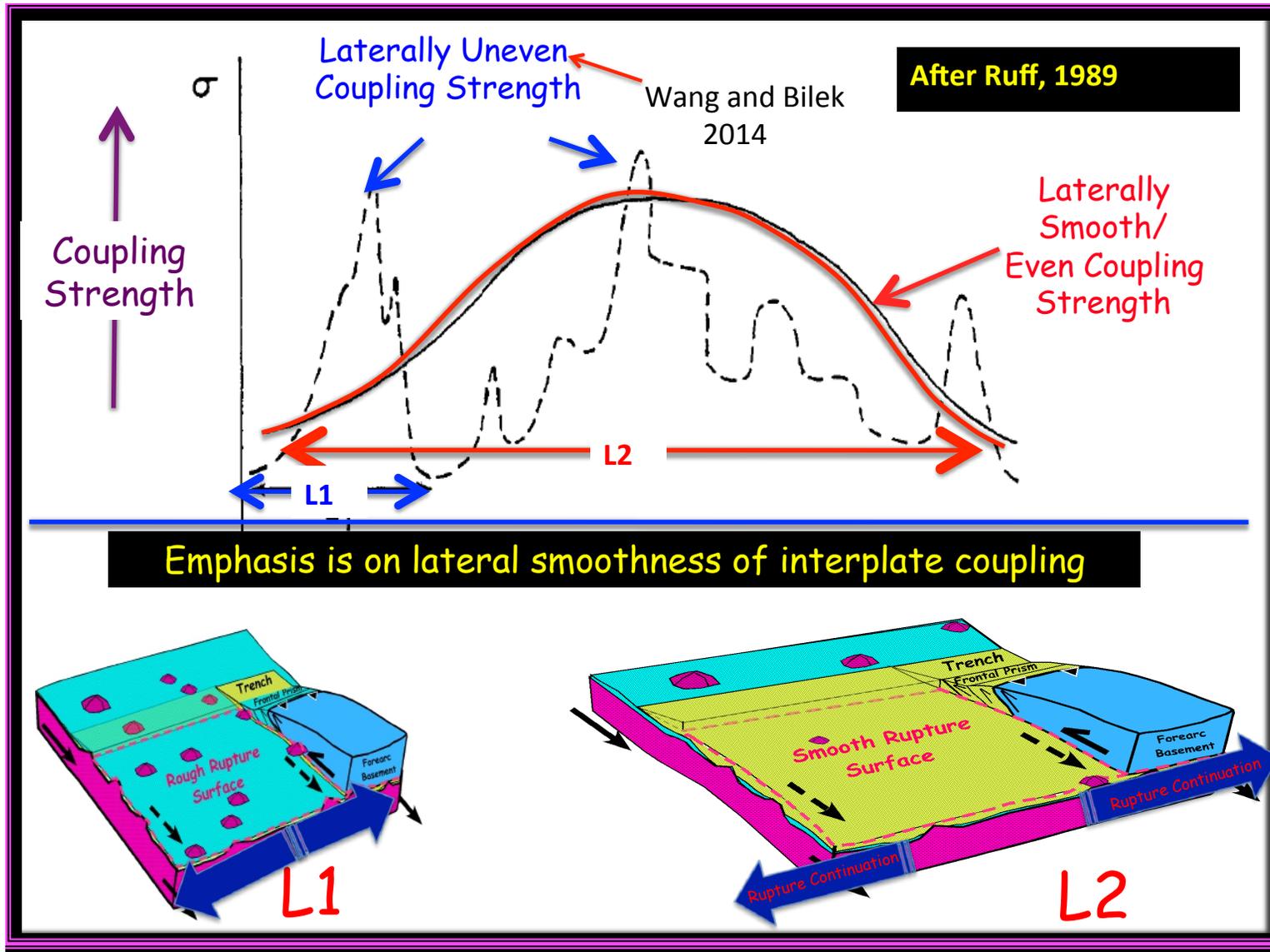
In the Past 58 Years, Three of the Largest Known Earthquakes Ruptured Along the Aleutian Subduction zone, Two of which Launched Trans-Pacific Tsunamis



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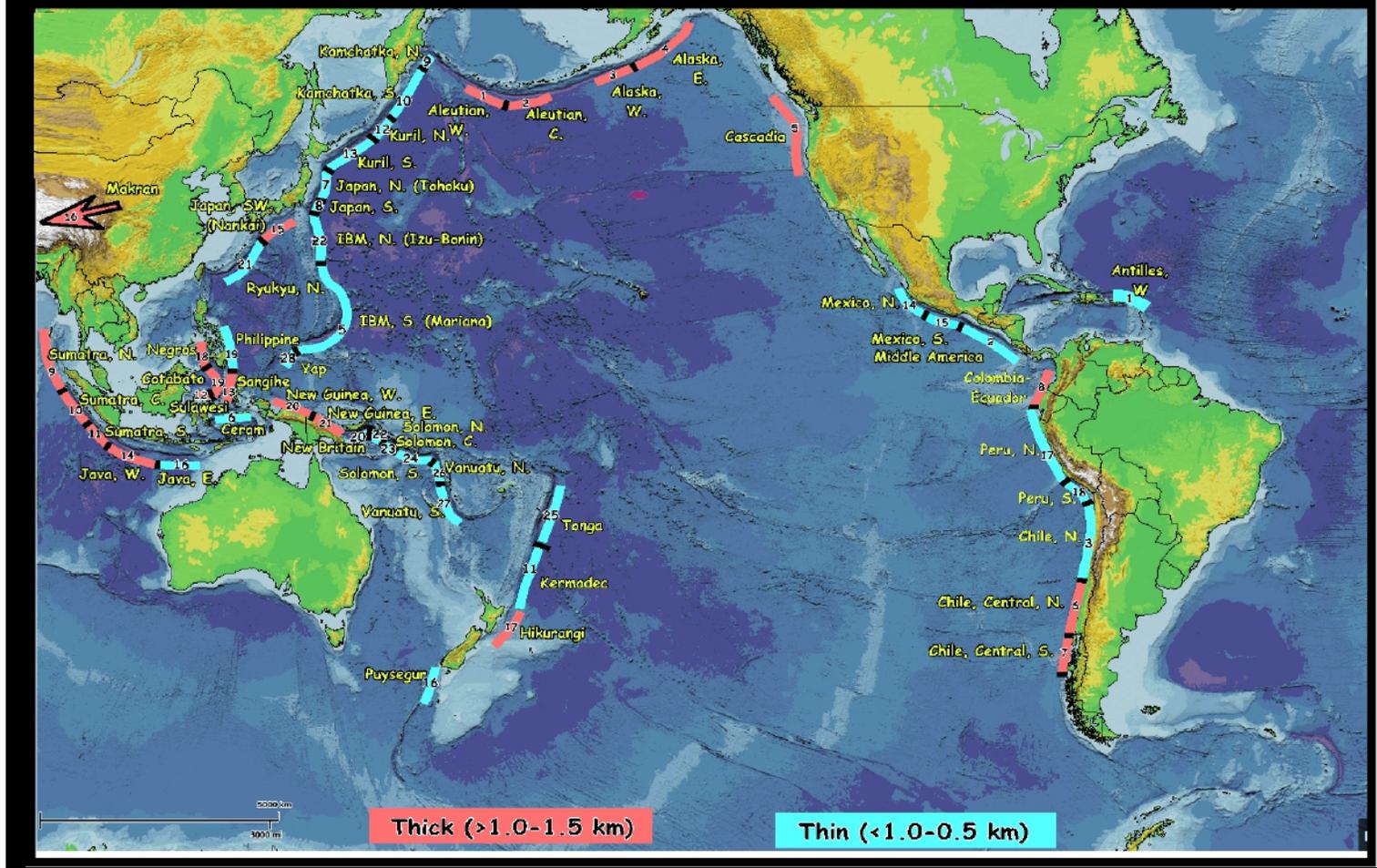


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Testing the Ruff Conjecture Using a Simple, Thick or Thin, Classification of Sediment Thickness Along Sectors of Trench Where Megathrusts of $\geq Wm7.5$ Have Occurred



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≥Mw7.5 that Occurred at Thin Sediment Sectors (n=115)

INSTRUMENTAL ERA INTERPLATE THRUSTS (IPTs) AT THIN-SEDIMENT TRENCHES (>1.0-1.5 km)										
ID	Year	Magnitude	Depth (km)	Latitude	Longitude	Depth (km)	Depth (km)	Depth (km)	Description	Depth (km)
1	1966	8	4	17°11'N	107°25'	-69	70	70	Antilles, western Puerto Rico Trench (F11-058)	1
1	1943	7	30	6°07'N	107°25'	-67	68	70	Antilles, western Puerto Rico Trench (F11-058)	1
2	1962	8	4	24°16'N	107°05'	-61	61	70	Central America Tehuantepec Ridge to Cocos Seamounts & Ridge (F11-061) Guatemala	1
4	1960	10	6	14°09'N	107°15'	-66	66	70	Central America Tehuantepec Ridge to Cocos Seamounts & Ridge (F11-061) Costa Rica	2
5	1961	4	3	0°16'N	111°20'	-87	81	70	Central America Tehuantepec Ridge to Cocos Seamounts & Ridge (F11-061) Nicaragua	1
6	1961	4	3	2°50'N	111°20'	-85	75	70	Central America Tehuantepec Ridge to Cocos Seamounts & Ridge (F11-061) Costa Rica	1
6	1929	11	11	4°37'N	-74 55'	-70	76	85	Chile northern Anticline to Juan Fernandez Ridge (F18-033)	1
7	1965	7	30	5°11'N	-71 34'	-70	76	80	Chile northern Anticline to Juan Fernandez Ridge (F18-033)	1
8	1961	6	6	16°07'N	-70 58'	-71	77	70	Chile northern Anticline to Juan Fernandez Ridge (F18-033)	1
9	1966	17	76	9°08'N	-75 50'	-70	76	70	Chile northern Anticline to Juan Fernandez Ridge (F18-033)	1
10	1981	10	4	18°52'N	-76 01'	-70	76	70	Chile northern Anticline to Juan Fernandez Ridge (F18-033)	1
11	2007	11	14	15°41'N	-79 44'	-70	73	70	Chile northern Anticline to Juan Fernandez Ridge (F18-033)	1
12	1987	3	6	19°17'N	-74 38'	-70	73	70	Chile northern Anticline to Juan Fernandez Ridge (F18-033)	1
13	1993	8	8	8°24'N	-17 06'	-145	111	70	ISM north, Oostvaarders Blauw in Tapan Trench (F26-34-03)	4
14	1927	13	4	10°16'N	135 30'	-140	80	70	ISM north, Oostvaarders Blauw in Tapan Trench (F26-34-03)	4
15	1945	7	24	11°01'N	-2 40'	-176	101	70	Indonesia, Java Sea	6
16	2011	3	11	5°36'N	144 13'	-144	147	0	Tapan north, Frijoles Seamounts at Kuril-Tapan Ridge to Taiichi Koshima Seamounts (F41-036)	7
18	1968	13	16	17°48'N	143 00'	-143	143	80	Tapan north, Frijoles Seamounts at Kuril-Tapan Ridge to Taiichi Koshima Seamounts (F41-036)	8
19	1968	13	28	17°19'N	143 03'	-143	147	70	Tapan north, Frijoles Seamounts at Kuril-Tapan Ridge to Taiichi Koshima Seamounts (F41-036)	8
20	1960	3	30	17°07'N	143 00'	-143	140	70	Tapan north, Frijoles Seamounts at Kuril-Tapan Ridge to Taiichi Koshima Seamounts (F41-036)	8
20	1978	4	17	8°14'N	143 07'	-143	147	70	Tapan north, Frijoles Seamounts at Kuril-Tapan Ridge to Taiichi Koshima Seamounts (F41-036)	8
21	1981	3	0	10°08'N	143 00'	-143	140	70	Tapan north, Frijoles Seamounts at Kuril-Tapan Ridge to Taiichi Koshima Seamounts (F41-036)	8
22	1988	11	6	8°43'N	143 01'	-143	140	70	Tapan north, Frijoles Seamounts at Kuril-Tapan Ridge to Taiichi Koshima Seamounts (F41-036)	8
23	1938	11	5	10°40'N	137 11'	-143	148	70	Tapan north, Frijoles Seamounts at Kuril-Tapan Ridge to Taiichi Koshima Seamounts (F41-036)	8
24	2011	3	6	7°48'N	143 03'	-143	140	70	Tapan north, Frijoles Seamounts at Kuril-Tapan Ridge to Taiichi Koshima Seamounts (F41-036)	8
25	1973	9	7	0°05'N	141 13'	-141	140	70	Japan, south, Daiichi Koshima Seamounts to Japan-Izu trench junct. (F36-34-5N)	8
26	1979	13	10	10°08'N	142 30'	-142	140	70	Kamoharaka south, south of Emperor Seamounts (F41-036)	8
27	1957	11	4	16°58'N	160 56'	-160	60	0	Kamoharaka south, south of Emperor Seamounts (F41-036) Basin (F43-040N)	10
27	1957	11	4	16°58'N	160 56'	-160	60	0	Kamoharaka south, south of Emperor Seamounts (F41-036) Basin (F43-040N)	10
28	1959	6	4	7°15'N	160 60'	-160	60	0	Kamoharaka south, south of Emperor Seamounts (F41-036) Basin (F43-040N)	10
29	1961	17	8	11°27'N	161 01'	-161	61	0	Kamoharaka south, south of Emperor Seamounts (F41-036) Basin (F43-040N)	10
30	1961	6	3	13°03'N	158 75'	-158	75	0	Kamoharaka south, south of Emperor Seamounts (F41-036) Basin (F43-040N)	10
31	1976	1	14	16°47'N	-177 43'	-177	66	70	Kermadec, Louisville	11
33	1976	1	14	15°56'N	-177 60'	-177	60	70	Kermadec, Louisville	11
34	1917	5	1	18°26'N	-177 00'	-177	00	70	Kermadec, Louisville	11
35	1955	7	20	20°43'N	-175 50'	-175	50	70	Kermadec, Louisville	11
36	1959	9	14	14°00'N	-177 80'	-177	80	70	Kermadec, Louisville	11
37	1986	3	6	6°46'N	-176 00'	-176	00	70	Kermadec, Louisville	11
38	2006	11	15	11°14'N	153 77'	-153	77	80	Kiritimati K. (F41-036)	12
39	1916	4	14	15°17'N	148 40'	-148	40	70	Kiritimati K. (F41-036)	12
40	1978	3	24	10°47'N	148 78'	-148	78	70	Kiritimati K. (F41-036)	12
41	1966	11	11	10°17'N	148 78'	-148	78	70	Kiritimati K. (F41-036)	12
42	1958	11	4	22°04'N	148 67'	-148	67	80	Kiritimati K. (F41-036)	12
43	2003	9	26	10°08'N	143 31'	-143	31	80	Kiritimati K. (F41-036)	12
44	1918	4	14	17°16'N	140 25'	-140	25	80	Kiritimati K. (F41-036)	12
45	1969	8	11	21°37'N	147 83'	-147	83	80	Kiritimati K. (F41-036)	12
46	1967	1	1	1°39'N	143 17'	-143	17	70	Kiritimati K. (F41-036)	12
47	1967	17	3	18°11'N	147 30'	-147	30	70	Kiritimati K. (F41-036)	12
48	1971	6	1	11°05'N	147 30'	-147	30	70	Kiritimati K. (F41-036)	12
49	2001	12	22	8°43'N	145 58'	-145	58	70	Kiritimati K. (F41-036)	12
50	1972	6	10	10°16'N	145 58'	-145	58	70	Kiritimati K. (F41-036)	12
51	1985	9	19	13°18'N	17 41'	-101	59	80	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
52	1985	7	6	15°42'N	17 41'	-101	59	80	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
53	1911	6	7	11°07'N	17 50'	-102	50	80	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
54	1987	6	18	10°17'N	17 41'	-101	49	80	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
55	1988	6	21	1°37'N	17 42'	-101	49	80	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
57	2003	4	3	7°36'N	18 37'	-104	1	80	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
58	1978	11	29	10°43'N	17 41'	-101	49	80	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
59	1979	9	29	20°18'N	18 00'	-101	49	80	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
60	1973	1	14	14°07'N	18 00'	-101	49	80	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
61	1977	10	15	17°08'N	18 00'	-101	49	80	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
62	1978	6	17	3°19'N	18 00'	-101	49	80	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
63	1985	8	23	10°46'N	18 00'	-101	49	80	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
64	1911	7	16	19°40'N	18 00'	-101	49	80	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
65	1987	7	28	3°17'N	18 00'	-101	49	80	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
66	1979	3	14	11°17'N	17 78'	-101	37	70	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
67	2009	7	15	4°41'N	166 26'	-70	26	70	Mexico north, Nautico to abundant Frijoles Plate (F21-17-0N)	14
70	2003	11	16	4°41'	-148	162	17	80	Papua New Guinea, New Britain Trench, eastern (F51-53)	17
68	1966	10	17	-1°41'	-178 80'	-81	81	80	Beniu north, Nauru Basin to Fijian Basin (F11-053)	18
69	1974	8	1	0°00'N	-177 42'	-81	81	80	Beniu north, Nauru Basin to Fijian Basin (F11-053)	18
71	2007	8	1	0°00'N	-178 60'	-81	81	80	Beniu north, Nauru Basin to Fijian Basin (F11-053)	18
72	1949	7	1	0°00'N	-177 76'	-77	76	70	Beniu north, Nauru Basin to Fijian Basin (F11-053)	18
73	1936	7	3	1°11'N	-79 50'	-79	50	70	Beniu north, Nauru Basin to Fijian Basin (F11-053)	18
74	1949	7	3	1°11'N	-77 64'	-77	64	70	Beniu north, Nauru Basin to Fijian Basin (F11-053)	18
75	1941	7	3	1°11'N	-79 50'	-79	50	70	Beniu north, Nauru Basin to Fijian Basin (F11-053)	18
76	1913	10	31	2°14'N	-77 64'	-77	64	70	Beniu north, Nauru Basin to Fijian Basin (F11-053)	18
77	1966	10	31	2°14'N	-77 64'	-77	64	70	Beniu north, Nauru Basin to Fijian Basin (F11-053)	18
78	1966	10	31	2°14'N	-77 64'	-77	64	70	Beniu north, Nauru Basin to Fijian Basin (F11-053)	18
79	1924	18	18	4°03'	-156 00'	-81	81	80	Philippine, Philippine Trench (F11-021)	18
80	1969	13	19	-2°02'N	8 00'	-179 24'	74	80	Philippine, Philippine Trench (F11-021)	18
81	1989	13	15	14°44'N	7 88'	-176 96'	76	80	Philippine, Philippine Trench (F11-021)	18
82	2001	1	1	6°57'N	6 73'	-177 07'	76	80	Philippine, Philippine Trench (F11-021)	18
83	1938	6	1	23°03'N	78 50'	-128	00	70	Solomon Trench, Bougainville (F23-136-5E)	19
84	1971	7	14	13°01'N	-6 50'	-153 00'	70	80	Solomon Trench, Bougainville (F23-136-5E)	19
85	1919	6	1	10°41'N	-6 50'	-153 00'	70	80	Solomon Trench, Bougainville (F23-136-5E)	19
86	1971	7	26	17°03'N	-6 80'	-153 20'	70	80	Solomon Trench, Bougainville (F23-136-5E)	19
87	1985	6	29	10°28'N	-11 50'	-153 64'	70	80	Solomon Trench, Bougainville (F23-136-5E)	19
88	1913	6	30	11°46'N	-8 00'	-154 50'	70	80	Solomon Trench, Bougainville (F23-136-5E)	19
89	1916	1	1	13°00'N	-8 00'	-154 00'	70	80	Solomon Trench, Bougainville (F23-136-5E)	19
90	1939	1	30	21°08'N	-6 50'	-155 00'	70	80	Solomon Trench, Bougainville (F23-136-5E)	19
91	1976	4	1	14°13'N	-6 50'	-155 00'	70	80	Solomon Trench, Bougainville (F23-136-5E)	19
92	1953	4	23	16°24'N	-6 80'	-154 00'	70	80	Solomon Trench, Bougainville (F23-136-5E)	19
93	1977	4	23	18°44'N	-7 00'	-155 21'	70	80	Solomon Trench, Bougainville (F23-136-5E)	19
94	2007	4	30	20°46'N	-6 47'	-147 64'	41	80	Solomon Trench, Bougainville (F23-136-5E)	19
95	1939	4	30	3°00'N	-6 26'	-160 24'	41	80	Solomon Trench, Bougainville (F23-136-5E)	19
96	1931	10	3	10°13'N	-11 25'	-161 25'	70	80	Solomon Trench, Bougainville (F23-136-5E)	19
97	1965	6	15	11°00'N	-10 40'	-160 00'	70	80	Solomon Trench, Bougainville (F23-136-5E)	19
98	1969	7	19	17°08'N	-11 50'	-163 64'	70	80	Solomon Trench, Bougainville (F23-136-5E)	19
99	1931	10	10	19°00'N	-9 808'	-161 044'				

≥Mw7.5 that Occurred at Thick Sediment Sectors (n=61)

EQ NO.	YYYY	MM	DD	Time	Latitude° N	Longitude° E	Mw	TRENCH SECTOR	SECTOR NO.	AVERAGE THICKNESS km	SECTOR LENGTH km
1	1899	9	10	21:30:00	59.39	-139.50	8.2	Alaska, eastern, Kodiak to Middleton Is (154-145E)	1	2.0	800
2	1899	9	4	0:22:00	59.43	-143.05	8.1	Alaska, eastern, Kodiak to Middleton Is (154-145E)	1	2.0	800
3	1964	3	28	3:36:00	61.02	-147.65	9.2	Alaska, eastern, Kodiak to Middleton Is (154-145E)	1	2.0	800
4	1979	2	28	21:27:38	60.50	-141.39	7.5	Alaska, eastern, Kodiak to Middleton Is (154-145E)	1	2.0	800
5	1917	5	31	12:07:00	54.79	-159.12	7.9	Alaska, western, Unimak Pass to Shumagin Is (~165-157E)	2	1.5	500
6	1938	11	10	20:18:00	55.33	-158.37	8.2	Alaska, western, Unimak Pass to Shumagin Is (~165-157E)	2	1.5	500
7	1946	4	1	12:29:00	53.31	-162.88	8.6	Alaska, western, Unimak Pass to Shumagin Is (~165-157E)	2	1.5	500
8	1957	3	9	14:22:00	51.56	-175.39	8.6	Aleutian, central, Amchitka Pass to Amliia FZ (~180-173W)	3	2.0	500
9	1986	5	7	22:47:44	51.33	-175.43	8.0	Aleutian, central, Amchitka Pass to Amliia FZ (~180-173W)	3	2.0	500
10	1996	6	10	4:03:35	51.56	-177.63	7.9	Aleutian, central, Amchitka Pass to Amliia FZ (~180-173W)	3	2.0	500
11	1965	2	4	5:01:00	51.21	178.50	8.7	Aleutian, western, Stalemate Pass to Amchitka Pass (~170E-180)	4	1.5	600
12	2003	11	17	6:43:31	51.14	177.86	7.8	Aleutian, western, Stalemate Pass to Amchitka Pass (~170E-180)	4	1.5	600
13	1906	8	17	0:40:00	32.99	-72.00	8.2	Chile, central, northern, Juan Fernandez Ridge to Mocha Valdivia FZs (~33-40 S)	5	2.5	750
14	1928	12	1	16:06:00	-35.00	-72.00	7.8	Chile, central, northern, Juan Fernandez Ridge to Mocha Valdivia FZs (~33-40 S)	5	2.5	750
15	1985	3	3	22:47:07	-33.14	-71.87	8.0	Chile, central, northern, Juan Fernandez Ridge to Mocha Valdivia FZs (~33-40 S)	5	2.5	750
16	2010	2	27	6:34:14	-35.85	-72.72	8.8	Chile, central, northern, Juan Fernandez Ridge to Mocha Valdivia FZs (~33-40 S)	5	2.5	750
17	1960	5	21	10:02:00	-37.17	72.96	8.1	Chile, central, southern, Mocha Valdivia FZs to South Chile Rise (~40-46.5S)	6	2.5	700
18	1960	5	22	19:11:00	-38.29	-73.05	9.5	Chile, central, southern, Mocha Valdivia FZs to South Chile Rise (~40-46.5S)	6	2.5	700
19	1975	5	10	14:27:00	-38.18	-73.78	7.6	Chile, central, southern, Mocha Valdivia FZs to South Chile Rise (~40-46.5S)	6	2.5	700
20	1906	1	31	15:36:00	1.00	-81.50	8.5	Colombia-Ecuador (~7N-0)	7	2.5	800
21	1942	5	14	21:03:00	0.01	-80.12	7.7	Colombia-Ecuador (~7N-0)	7	2.5	800
22	1979	12	12	7:59:00	1.60	-79.36	8.1	Colombia-Ecuador (~7N-0)	7	2.5	800
23	1994	6	2	18:17:34	-10.48	112.84	7.7	Indonesia, Java, west, Roo Rise to Sunda Strait (6-11S)	8	1.6	1000
24	1910	12	16	14:45:00	4.50	126.50	7.5	Indonesia, Molucca-Halmahera (~1S-4N)	9	4.0	500
25	1913	3	14	12:05:00	4.50	126.50	7.8	Indonesia, Molucca-Halmahera (~1S-4N)	9	4.0	500
26	1932	5	14	13:11:00	0.50	126.00	7.7	Indonesia, Molucca-Halmahera (~1S-4N)	9	4.0	500
27	1936	4	1	20:09:00	4.50	126.50	7.7	Indonesia, Molucca-Halmahera (~1S-4N)	9	4.0	500
28	1957	9	24	10:01:00	5.50	127.00	7.7	Indonesia, Molucca-Halmahera (~1S-4N)	9	4.0	500
29	1968	8	10	20:07:00	1.40	126.20	7.7	Indonesia, Molucca-Halmahera (~1S-4N)	9	4.0	500
30	2007	1	21	11:28:01	1.10	126.21	7.5	Indonesia, Molucca-Halmahera (~1S-4N)	9	4.0	500
31	1941	6	26	11:52:00	12.16	97.77	7.5	Indonesia, Nicobar-Andaman Is to Myanmar (~11-18N)	10	5.0	800
32	1990	4	18	15:39:35	1.31	-4.35	7.6	Indonesia, Sulawesi (120-125E)	11	2.0	500
33	1991	6	20	5:19:00	1.30	-4.23	7.5	Indonesia, Sulawesi (120-125E)	11	2.0	500
34	1996	1	1	8:05:23	1.30	-4.93	7.9	Indonesia, Sulawesi (120-125E)	11	2.0	500
35	2005	3	28	16:09:36	2.40	97.11	8.7	Indonesia, Sumatra, central, Nias I to Explorer Ridge (~2N-3S)	12	2.0	650
36	2007	9	12	21:09:35	4.40	100.13	7.9	Indonesia, Sumatra, central, Nias I to Explorer Ridge (~2N-3S)	12	2.0	650
37	1907	1	4	1:00:00	1.18	96.11	7.8	Indonesia, Sumatra, north, 90E Ridge to Simeulue I (~11-2N)	13	2.0	950
38	2004	12	25	11:00:00	1.09	94.26	9.2	Indonesia, Sumatra, north, 90E Ridge to Simeulue I (~11-2N)	13	3.0	950
39	2010	4	6	11:00:00	2.05	96.71	7.8	Indonesia, Sumatra, north, 90E Ridge to Simeulue I (~11-2N)	13	2.0	950
40	1914	6	25	9:00:00	-4.50	102.50	7.5	Indonesia, Sumatra, south, Explorer Ridge to Sunda Strait at 6S (~3-8S)	14	2.0	900
41	2000	6	4	12:28:46	-4.73	101.94	7.9	Indonesia, Sumatra, south, Explorer Ridge to Sunda Strait at 6S (~3-8S)	14	2.0	900
42	2007	9	12	11:11:15	-3.78	100.99	8.4	Indonesia, Sumatra, south, Explorer Ridge to Sunda Strait at 6S (~3-8S)	14	2.0	900
43	2010	10	25	14:42:22	-3.48	100.11	7.8	Indonesia, Sumatra, south, Explorer Ridge to Sunda Strait at 6S (~3-8S)	14	2.0	900
44	1923	9	1	2:59:00	35.10	139.50	7.9	Japan, south, Nankai (31-35 N)	15	1.5	700
45	1941	11	18	15:46:00	32.00	132.00	7.6	Japan, south, Nankai (31-35 N)	15	1.5	700
46	1944	12	7	4:35:00	33.75	136.00	7.8	Japan, south, Nankai (31-35 N)	15	1.5	700
47	1946	12	20	19:19:00	33.03	135.61	8.3	Japan, south, Nankai (31-35 N)	15	1.5	700
48	1961	2	26	18:10:00	31.80	131.60	7.6	Japan, south, Nankai (31-35 N)	15	1.5	700
49	1968	4	1	18:00:00	32.50	132.30	7.6	Japan, south, Nankai (31-35 N)	15	1.5	700
50	1945	11	27	21:56:00	25.15	63.48	8.1	Makran (~57-66E)	16	7.0	900
51	1931	2	2	22:46:00	-39.50	177.00	7.6	New Zealand, Hikurangi (~38-42S)	17	3.0	400
52	1918	8	15	12:18:00	5.77	123.64	8.2	Philippines, Mindinao Cotabato (~2-7N)	18	2.5	350
53	1955	3	31	18:17:00	8.00	124.00	7.6	Philippines, Mindinao Cotabato (~2-7N)	18	2.5	350
54	1976	8	16	16:11:00	6.29	124.09	8.1	Philippines, Mindinao Cotabato (~2-7N)	18	2.5	350
55	2002	3	5	21:16:23	5.92	124.25	7.5	Philippines, Mindinao Cotabato (~2-7N)	18	2.5	350
56	1948	1	24	17:46:00	10.50	122.00	7.8	Philippines, Negros Trench (~9-12N)	19	2.5	350
57	2002	9	8	18:44:38	-3.27	143.38	7.6	PNG--Papua New Guinea, eastern (~141-145 E)	20	1.5	700
58	1914	5	26	14:22:00	0.01	133.31	7.9	PNG--Papua New Guinea, western (~134-142E)	21	1.5	700
59	1935	9	20	14:06:00	-3.50	141.75	7.7	PNG--Papua New Guinea, western (~134-142E)	21	1.5	700
60	1996	2	17	5:59:30	-0.89	136.95	8.2	PNG--Papua New Guinea, western (~134-142E)	21	1.5	700
61	2009	1	3	19:43:51	-0.38	132.88	7.7	PNG--Papua New Guinea, western (~134-142E)	21	1.5	700
										TOTAL LENGTH,	14050
										km	

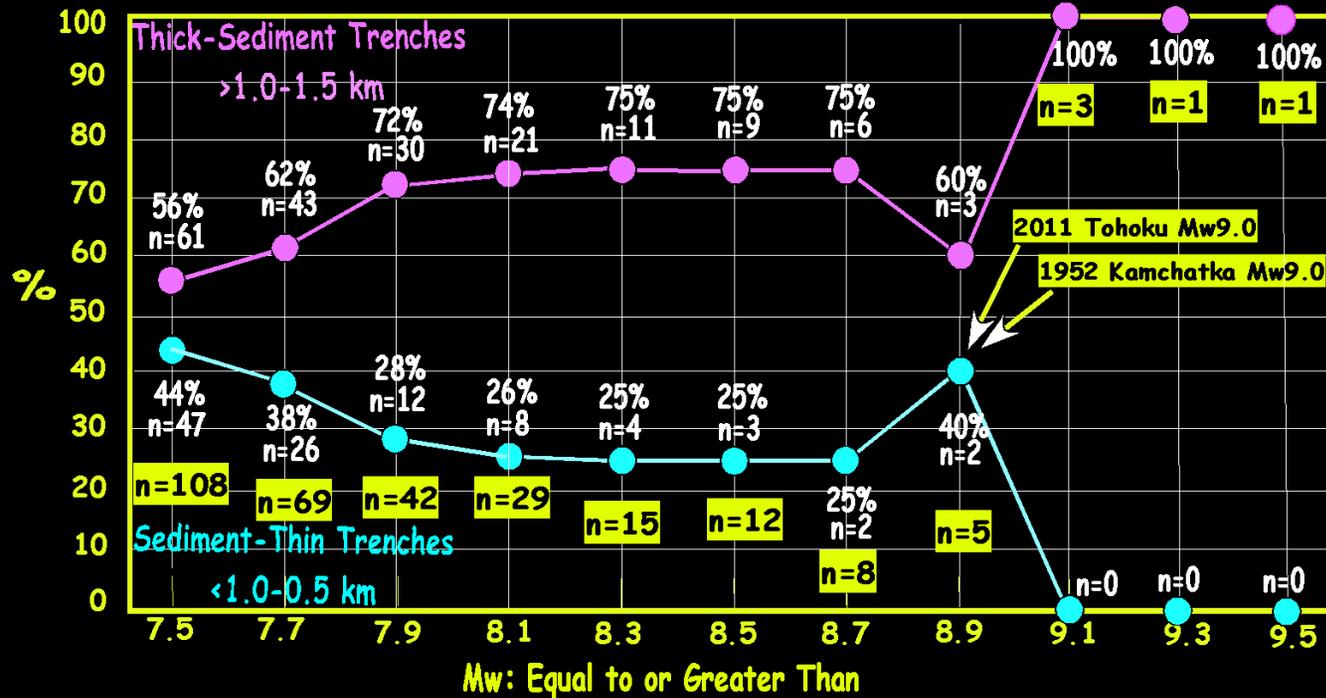
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Relative Percent of Instrumentally Recorded Mw >7.5 Events with Normalizing Reduction of 41% Applied to Thin-trench Mw7.5 Through 8.4 Events to Compensate in this Mw Range for the Significantly Greater Occurrence Length of Thin (19200 km) vs Thick (7800 km) Trench Sectors.

Occurrences

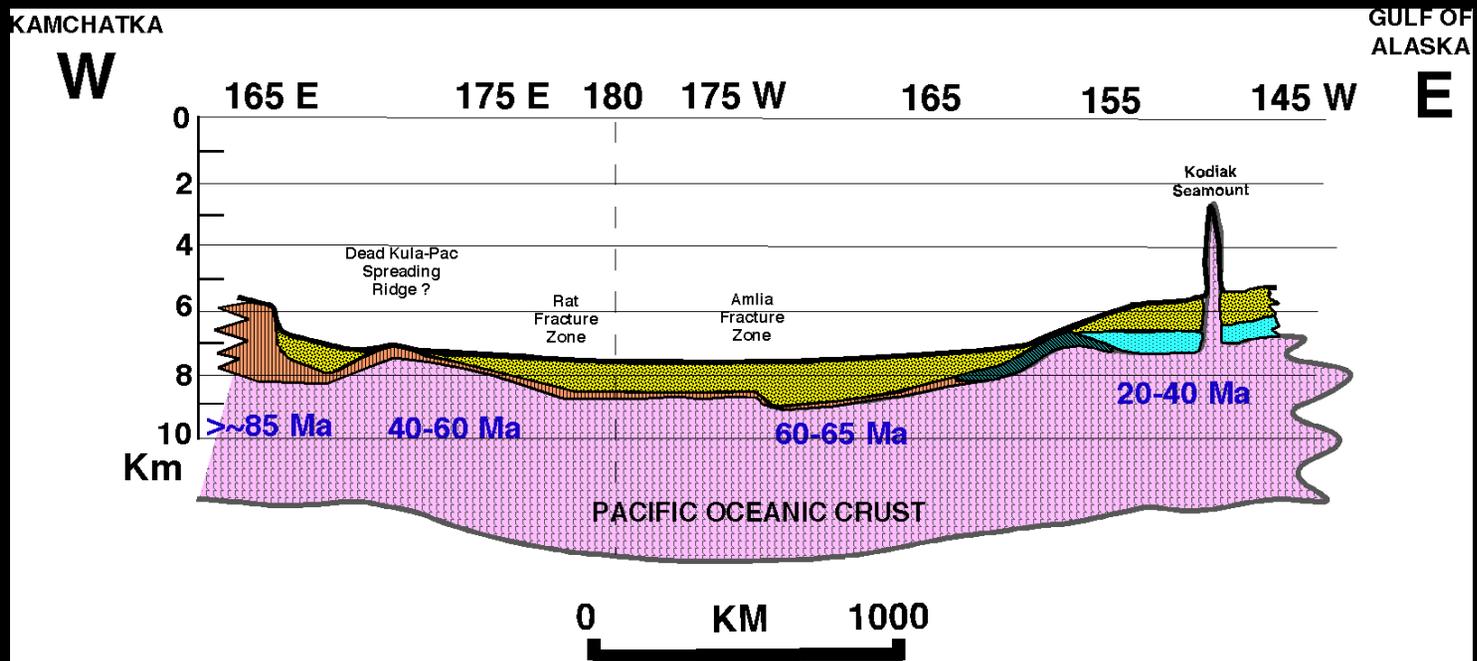


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LATERALLY SMOOTH BASEMENT AND THICK SEDIMENT

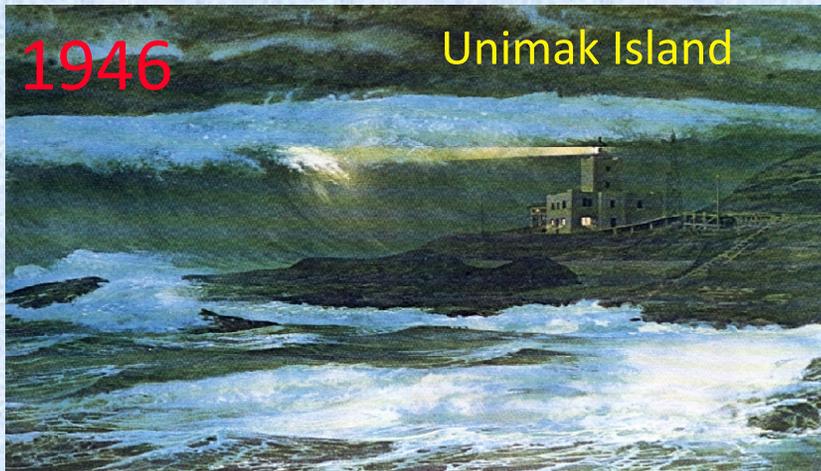


Longitudinal section of Aleutian axial trench deposits

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Scotch Cap tsunami, Unimak Island, April 1, 1946. Painting by Darrel Millsap, *Alaska Geographic Society*, vol. 7, n. 3, p. 25.



The Message

The Aleutian
subduction Zone
has and
will continue
to launch giant
megathrust
earthquakes and
destructive
local and
trans-Pacific
tsunamis

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