Last revised 24 June 2013

Preferred Magnitudes of Selected Significant Earthquakes

Date	Time†	Place	Lat.	Long.	Fatalities	M	M_X‡ (M reference)
January 23, 1556		Shaanxi (Shensi), China	34.5	109.7	830,000	~8	
February 5, 1663	22:30	Charlevoix-Kamouraska, Quebec, Canada (5:30 PM local time)	47.6	-70.1	none	~7	M (Lamontagne et al, 2008)
August 17, 1668		Anatolia, Turkey	40.0	36.0	8,000	~8	
January 26, 1700		Cascadia subduction zone from No. CA to Vancouver Is.				~9	M (Satake et al, 1996)
November 1, 1755	10:16	Lisbon, Portugal	36.0	-11.0	70,000	~8.7	M_I (Johnston, 1996)
December 16, 1811	08:15	New Madrid, MO (2:15 AM local time)	36.6	-89.6		~7.7	M_I (Williams et al, 2011; Johnston, 1996; Hough et al, 2000; Bakun and Hopper, 2004)
December 16, 1811	13:15	New Madrid, MO ("dawn aftershock" -7:15 AM)	36.6	-89.6		~6.8-7.0	M_I (Williams et al, 2011)
January 23, 1812	15:15	New Madrid, MO (9:15 AM local time)	36.6	-89.6		~7.5	M_I (Williams et al, 2011; Johnston, 1996; Hough et al, 2000; Bakun and Hopper, 2004)
February 7, 1812	09:45	New Madrid, MO (3:45 AM local time)	36.6	-89.6		~7.7	M_I (Williams et al, 2011; Johnston, 1996; Hough et al, 2000; Bakun and Hopper, 2004)
June 2, 1823	08:00	South flank of Kilauea, HI	19.3	-155		~7	M_I (Klein and Wright, 2000)
June 10, 1836	15:30	S San Francisco Bay region, CA	36.96	-121.37		~6.5	M_I (Bakun, 1999)
June 1838		San Francisco Peninsula, CA	37.27	-122.23		~6.8	M_I (Bakun, 1999)
January 5, 1843	02:45	Marked Tree, AR	35.5	-90.5		~6.3	M_I (Johnston, 1996)
January 9, 1857	16:24	Fort Tejon, CA (San Andreas fault from Parkfield to Wrightwood)			1	~7.9	M (Grant and Sieh, 1993; Stein and Hanks, 1998)
December 16, 1857	21:00	Naples, Italy	40.3	16.0	11,000	~6.9	M_I
October 8, 1865	20:46	San Jose, CA	37.21	-121.86		~6.5	M_I (Bakun, 1999)
April 3, 1868	02:25	Hilea, SE Hawaii, HI	19.2	-155.5	77	~7.9	M_I (Klein and Wright, 2000)
October 21, 1868	15:53	Hayward, CA	37.7	-122.1	30	~6.8	M_I (Bakun, 1999)
February 20, 1871	08:42	Molokai, HI	21.2	-156.9		~6.8	M_I (Klein and Wright, 2000)
March 26, 1872	10:30	Owens Valley, CA	36.5	-118.0	27	~7.4	M (Beanland and Clark, 1994)
December 15, 1872	05:40	N Cascades, WA	47.9	-120.3		~6.8	M_I (Bakun et al, 2002)
November 23, 1873	05:00	CA-OR coast	42.2	-124.2		~7.3	M_I (Bakun, 2000)
September 1, 1886	02:51	Charleston, SC	32.9	-80.0	60	~7.3	M_I (Johnston, 1996)
April 24, 1890	11:36	Corralitos, CA	36.96	-121.78		~6.3	M_I (Bakun, 1999)
October 27, 1891	21:38	Mino-Owari, Japan	35.6	136.6	7,273	~8	M_S
April 19, 1892	10:50	Vacaville, CA	38.50	-121.82	1	~6.4	M_I (Bakun, 1999)
April 21, 1892	17:43	Winters, CA	38.59	-121.96		~6.4	M_I (Bakun, 1999)
October 31, 1895	11:08	Charleston, MO	37.0	-89.4		~6.6	M_I (Johnston, 1996)
June 15, 1896	10:32	Sanriku, Japan	39.5	144.0	27,000	~8.5	M
June 12, 1897	11:06	Assam, India	26.0	91.0	1,500	~8.3	
June 20, 1897	20:14	Calaveras fault, CA	37.0	-121.6		~6.3	M_I (Bakun, 1999)
March 31, 1898	07:43	Mare Island, CA	38.11	-122.36		~6.3	M_I (Bakun, 1999)
April 15, 1898	07:07	Mendocino County, CA	39.3	-123.9		~6.8	M_I (Bakun, 2000)
September 4, 1899	00:22	Cape Yakataga, AK	60.0	-142.0		7.9	M_S
September 10, 1899	21:41	Yakutat Bay, AK	60.0	-142.0		8.0	M_S
October 9, 1900	12:28	Kodiak Is., AK	57.1	-153.5		7.7	M_S
March 3, 1901	07:45	Parkfield, CA	36.2	-120.7		6.4	M_S (Abe, 1988)
August 27, 1904	21:56	Fairbanks, AK	64.7	-148.1		7.3	M_S
July 9, 1905	09:40	Mongolia	49.0	99.0		8.4	M (Kanamori, 1977)
January 31, 1906	15:36	Colombia-Ecuador	1.0	-81.5	1,000	8.8	M (Kanamori, 1977)

Date	Time†	Place	Lat.	Long.	Fatalities	M	M_X‡ (M reference)
April 18, 1906	13:12	San Francisco, CA (San Andreas fault from Cape Mendocino to San Juan Bautista)			3,000	7.8	M (Bakun, 1999)
August 17, 1906	00:40	Valparaiso, Chile	-33.0	-72.0	3,882	8.2	M (Kanamori, 1977)
December 28, 1908	04:20	Messina, Italy	38.3	15.6	70,000	7.2	M_S
July 1, 1911	22:00	Calaveras fault, CA	37.39	-121.80		6.5	M_S
October 3, 1915	06:52	Pleasant Valley, NV	40.5	-117.5		7.1	M (Stover and Coffman, 1993)
October 11, 1918	14:14	Puerto Rico	18.47	-67.63	116	7.5	M_S (McCann, 1985)
December 6, 1918	08:41	Vancouver Is., B.C., Canada	49.62	-125.92		7.0	M_L (Gutenberg and Richter, 1954: Rogers, 1983)
December 16, 1920	12:05	Ningxia-Gansu, China	36.60	105.32	200,000	7.8	M (Kanamori, 1977)
January 31, 1922	13:17	offshore, Cape Mendocino, CA	40.70	-125.55		7.3	M_{G-R} (Ellsworth, 1990)
March 10, 1922	11:21	Parkfield, CA	35.9	-120.9		6.1	M (Bakun and McEvilly, 1984)
January 22, 1923	09:04	offshore, Cape Mendocino, CA	40.49	-125.32		7.2	M_{G-R} (Ellsworth, 1990)
September 1, 1923	02:58	Kanto, Japan	35.40	139.08	143,000	7.9	M (Kanamori, 1977)
March 1, 1925	02:19	Charlevoix-Kamouraska, Quebec, Canada	47.76	-69.84		6.2	M (Lamontagne et al, 2008; Bent, 1992)
June 28, 1925	01:21	Clarkston Valley, MT	46.32	-111.52		6.6	M (Dosier, 1989)
June 29, 1925	14:42	Santa Barbara, CA	34.3	-119.8	13	6.8	M (Stein and Hanks, 1998)
October 22, 1926	12:35	Monterey Bay, CA	36.62	-122.35		6.1	M_{G-R} (Ellsworth, 1990)
October 22, 1926	13:35	Monterey Bay, CA	36.55	-122.18		6.1	M_{G-R} (Ellsworth, 1990)
March 7, 1927	09:27	Tango, Japan	35.80	134.92	3,020	7.6	M_S
May 22, 1927	22:32	Gansu, China	37.39	102.31	>40,900	7.6	M (Kanamori, 1977)
November 4, 1927	13:51	offshore Lompoc, CA	34.92	-121.03		7.1	M (Stein and Hanks, 1998)
May 26, 1929	22:39	South of Haida Gwaii (Queen Charlotte Is.), B.C., Canada	51.51	-130.74		7.0	Ms (Lamontagne et al, 2008)
November 18, 1929	20:32	Grand Banks, Newfoundland-Nova Scotia, Canada	44.69	-56.01	28	7.2	M (Lamontagne et al, 2008)
December 21, 1932	06:10	Cedar Mountain, NV	38.51	-118.08		7.2	M
March 2, 1933	17:31	Sanriku, Japan	39.22	144.62	2,990	8.4	M (Kanamori, 1977)
March 11, 1933	01:54	Long Beach, CA	33.6	-118.0	115	6.4	M (Hauksson & Gross, 1991)
November 20, 1933	23:21	Baffin Bay, Canada	73.00	-69.98		7.4	M (Stein et al. 1979)
January 15, 1934	08:43	Bihar, India	27.55	87.09	10,700	8.1	M (Kanamori, 1977)
June 8, 1934	04:47	Parkfield, CA	35.9	-120.9		6.1	M (Bakun and McEvilly, 1984)
November 1, 1935	06:03	Temiskaming, Quebec, Canada	46.78	-79.07		6.1	M (Lamontagne et al, 2008)
July 22, 1937	17:09	Salcha, AK	64.49	-146.85		7.3	M_S
January 23, 1938	08:32	Maui, HI	20.96	-156.18		6.8	M_S (Klein and Wright, 2000)
November 10, 1938	20:18	Shumagin Islands, AK	55.33	-158.37		8.2	M (Kanamori, 1977)
December 26, 1939	23:57	Erzincan, Turkey	39.77	39.53	32,700	7.8	M_S
May 19, 1940	04:36	Imperial Valley, CA	32.73	-115.50	9	7.1	M (Ellsworth, 1990)
December 7, 1944	04:35	Tonankai, Japan	33.75	136.00	1,223	8.1	M (Kanamori, 1977)
April 1, 1946	12:28	Unimak Is., AK	52.75	-163.50	165	8.1	M (Tanioka and Seno, 2001)
June 23, 1946	17:13	Vancouver Island, B.C., Canada	49.76	-125.34	2	7.3	Ms (Rogers, 1983; Lamontagne et al, 2008)
August 4, 1946	17:51	Dominican Republic	19.25	-69.00	100	8.0	M_S (Abe, 1981)
December 20, 1946	19:19	Nankaido, Japan	32.5	134.5	1,330	8.1	M (Kanamori, 1977)
October 16, 1947	02:09	Fairbanks, AK	64.2	-148.3		7.2	M
April 13, 1949	19:55	Olympia, WA	47.1	-122.7	8	7.1	M_L (Baker and Langston, 1987)
August 22, 1949	04:01	Haida Gwaii (Queen Charlotte Is.), B.C, Canada	53.62	-133.27		8.1	M (Kanamori, 1977)
August 15, 1950	14:09	Assam-Tibet	28.5	96.5	1,526	8.6	M (Kanamori, 1977)
August 21, 1951	10:57	Kona, HI	19.50	-155.95		6.9	M_S (Klein and Wright, 2000)
July 21, 1952	11:52	Kern County, CA	34.95	-119.05	12	7.3	M (Stein and Hanks, 1998)
November 4, 1952	16:58	Kamchatka, Russia	52.76	160.06		9.0	M (Kanamori, 1977)

Date	Time†	Place	Lat.	Long.	Fatalities	M	M_X‡ (M reference)
March 29, 1954	06:17	Spain	37.03	-3.51		7.9	M
July 6, 1954	11:13	Rainbow Mtn, NV	39.42	-118.53		6.6	M (Ellsworth, 1990)
August 24, 1954	05:51	Stillwater, NV	39.58	-118.45		6.8	M (Ellsworth, 1990)
December 16, 1954	11:07	Fairview Peak, NV	39.32	-118.20		7.1	M (Ellsworth, 1990)
December 16, 1954	11:11	Dixie Valley, NV	39.5	-118.0		6.8	M (Ellsworth, 1990)
October 24, 1955	04:10	Concord, CA	38.0	-122.1	1	5.4	M_L (Bolt and Miller, 1975)
March 9, 1957	14:22	Andreanof Is., AK	51.56	-175.39		8.6	M (Johnson et al., 1994)
December 4, 1957	03:37	Gobi-Altai, Mongolia	45.15	99.21	30	8.1	M (Kanamori, 1977)
April 7, 1958	15:30	Huslia, AK	65.94	-156.37		7.3	M
July 10, 1958	06:15	Fairweather, AK	58.37	-136.66	5	7.7	M (Abe and Kanamori, 1980)
August 18, 1959	06:37	Hebgen Lake, MT	44.60	-110.64	28	7.3	M (Dosier, 1985)
February 29, 1960	23:40	Agadir, Morocco	30.5	-9.3	10,000	5.7	M
May 22, 1960	19:11	Valdivia, Chile	-38.29	-73.05	1,655	9.5	M (Kanamori, 1977)
March 28, 1964	03:36	Prince William Sound, AK	61.02	-147.65	128	9.2	M (Kanamori, 1977)
June 16, 1964	04:01	Niigata, Japan	38.43	139.23	26	7.5	M
February 4, 1965	05:01	Rat Is., AK	51.21	178.50		8.7	M (Kanamori, 1977)
April 29, 1965	15:28	Seattle-Tacoma, WA	47.32	-122.33	7	6.5	M_L (Algermissen and Harding, 1965)
June 28, 1966	04:26	Parkfield, CA	35.88	-120.49		6.1	M (Tsai and Aki, 1969)
September 12, 1966	16:41	Truckee, CA	39.38	-120.22		5.9	M (Tsai and Aki, 1970)
December 10, 1967	22:51	Koyna, India	17.39	73.77		6.3	M (Langston, 1976)
October 2, 1969	06:19	Santa Rosa, CA	38.30	-122.76	1	5.7	M_L (Bolt and Miller, 1975)
May 31, 1970	20:23	Peru	-9.25	-78.84	66,000	7.9	M (Kanamori, 1977)
July 31, 1970	17:08	Colombia	-1.49	-72.56	1	8.0	M_S
February 9, 1971	14:00	San Fernando, CA	34.40	-118.39	65	6.6	M (Heaton, 1982)
February 4, 1975	11:36	Haicheng, China	40.72	122.73	10,000	7.0	M (Cipar, 1979)
August 1, 1975	20:20	Oroville, CA	39.50	-121.39		5.8	M
November 29, 1975	14:47	South flank of Kilauea, HI	19.45	-155.03	2	7.2	M_S (Klein and Wright, 2000)
February 4, 1976	09:01	Guatemala	15.30	-89.14	23,000	7.5	M
July 27, 1976	19:42	Tangshan, China	39.61	117.89	255,000*	7.5	M (Kanamori, 1977)
August 6, 1979	17:05	Coyote Lake, CA	37.11	-121.52		5.7	M (Ellsworth, 1990)
October 15, 1979	23:17	Imperial Valley, CA	32.82	-115.65		6.5	M (Stein and Hanks, 1998)
January 24, 1980	19:00	Livermore, CA	37.71	-121.73		5.8	M (Bolt et al., 1981)
May 25, 1980	16:33	Mammoth Lakes, CA	37.60	-118.83		6.2	M (Ellsworth, 1990)
May 25, 1980	16:49	Mammoth Lakes, CA	37.65	-118.90		5.9	M_L (Ellsworth, 1990)
May 25, 1980	19:44	Mammoth Lakes, CA	37.55	-118.82		5.9	M (Ellsworth, 1990)
May 27, 1980	14:50	Mammoth Lakes, CA	37.48	-118.80		6.0	M (Ellsworth, 1990)
November 8, 1980	10:27	Gorda Plate, CA	41.12	-124.67		7.2	M (Ellsworth, 1990)
May 2, 1983	23:42	Coalinga, CA	36.23	-120.32		6.4	M (Stein and Hanks, 1998)
October 28, 1983	14:06	Borah Peak, ID	44.09	-113.80	2	6.9	M (PDE Monthly Listing)
November 16, 1983	16:13	Kaoiki, HI	19.44	-155.38		6.7	M (PDE Monthly Listing)
April 24, 1984	21:15	Morgan Hill, CA	37.30	-121.71		6.1	M (PDE Monthly Listing)
November 23, 1984	18:08	Round Valley, CA	37.45	-118.60		5.8	M (Ellsworth, 1990)
September 19, 1985	13:17	Michoacan, Mexico	18.44	-102.36	9,500	8.0	M (PDE Monthly Listing)
December 23, 1985	05:16	Nahanni, NW Terr, Canada	62.16	-124.31		6.8	M (Wetmiller et al., 1988)
May 7, 1986	22:47	Andreanof Is., AK	51.56	-174.81		7.9	M (PDE Monthly Listing)
July 8, 1986	09:20	North Palm Springs, CA	33.97	-116.78		6.1	M (Hartzell, 1989)
July 21, 1986	14:42	Chalfant Valley, CA	37.53	-118.43		6.2	M (Ellsworth, 1990)
October 1, 1987	14:42	Whittier Narrows, CA	34.06	-118.13	8	5.9	M (Hartzell and Iida, 1990)
November 30, 1987	19:23	Gulf of Alaska	58.84	-142.60		7.8	M (PDE Monthly Listing)
January 22, 1988	00:35	Tennant Creek, Australia	-19.87	133.78		6.3	M (Choy and Bowman, 1990)
January 22, 1988	03:57	Tennant Creek, Australia	-19.88	133.83		6.4	M (Choy and Bowman, 1990)
January 22, 1988	12:04	Tennant Creek, Australia	-19.90	133.83		6.6	M (Choy and Bowman,

Date	Time†	Place	Lat.	Long.	Fatalities	M	M_X‡ (M reference)
							1990)
March 6, 1988	22:35	Gulf of Alaska	57.26	-142.75		7.7	M (PDE Monthly Listing)
November 25, 1988	23:46	Saguenay, Quebec, Canada	48.06	-71.27		5.9	M (Boatwright and Choy, 1992)
December 7, 1988	07:41	Spitak, Armenia	40.93	44.11	25,000	6.8	M (PDE Monthly Listing)
October 18, 1989	00:04	Loma Prieta, CA	37.14	-121.76	63	6.9	M (Wald et al., 1991)
December 25, 1989	14:24	Ungava, Quebec, Canada	60.07	-73.54		6.0	M (Bent, 1994)
June 28, 1991	14:43	Sierra Madre, CA	34.25	-117.95	2	5.6	M (Wald et al., 1991)
August 17, 1991	22:17	Honeydew, CA	41.79	-125.58		7.0	M (PDE Monthly Listing)
April 23, 1992	04:50	Joshua Tree, CA	33.87	-116.55		6.2	M (Stein and Hanks, 1998)
April 25, 1992	18:06	Cape Mendocino, CA	40.38	-124.05		7.2	M (PDE Monthly Listing)
April 26, 1992	07:41	Offshore, Cape Mendocino, CA	40.55	-124.29		6.5	M (Oppenheimer et al., 1993)
April 26, 1992	11:18	Offshore, Cape Mendocino, CA	40.44	-124.43		6.7	M (Oppenheimer et al., 1993)
June 28, 1992	11:57	Landers, CA	34.20	-116.52	3	7.3	M (Sieh et al. 1993)
June 29 1992	10:14	Little Skull Mtn, NV	36.77	-116.32		5.7	M (Walter, 1993)
September 2, 1992	00:16	Nicaragua	11.77	-87.35	116	7.6	M (PDE Monthly Listing)
September 29, 1993	22:25	Latur-Killari, India	18.08	76.52	9,748	6.2	M (PDE Monthly Listing)
January 17, 1994	12:30	Northridge, CA	34.18	-118.56	60	6.7	M (PDE Monthly Listing)
June 9, 1994	00:33	Bolivia	-13.86	-67.49	5	8.2	M (PDE Monthly Listing)
September 1, 1994	15:15	Cape Mendocino, CA	40.38	-125.78		7.0	M (PDE Monthly Listing)
January 16, 1995	20:46	Kobe, Japan	34.57	135.03	5,502	6.9	M (PDE Monthly Listing)
May 21, 1997	22:51	Jabalpur, India	23.07	80.12	38	5.8	M (Singh et al., 1999)
July 17, 1998	08:49	New Guinea	-2.94	142.58	2,183	7.0	M (PDE Monthly Listing)
January 25, 1999	18:19	Colombia	4.45	-75.65	1,185	6.1	M (PDE Monthly Listing)
August 17, 1999	00:01	Izmit, Turkey	40.77	30.00	17,118	7.6	M (PDE Monthly Listing)
September 20, 1999	17:47	Chi-Chi, Taiwan	23.82	120.86	2,400	7.6	M (PDE Monthly Listing)
October 16, 1999	09:46	Hector Mine, CA	34.56	-116.44		7.1	M (PDE Monthly Listing)
November 12, 1999	16:57	Duzce, Turkey	40.82	31.23	894	7.2	M (PDE Monthly Listing)
September 3, 2000	08:36	Napa, CA	38.38	-122.41		5.0	M (BRK)
November 16, 2000	04:54	New Ireland, Papua New Guinea	-4.00	152.33		8.0	M (PDE Monthly Listing)
January 13, 2001	17:33	El Salvador	13.04	-88.66	844	7.7	M (PDE Monthly Listing)
January 26,2001	03:16	Gujarat, India	23.39	70.23	20,085	7.6	M (PDE Monthly Listing)
February 28, 2001	18:54	Olympia, WA	47.11	-122.60		6.8	M (PDE Monthly Listing)
June 23, 2001	20:33	Coastal Peru	-16.30	-73.55	75	8.4	M (PDE Monthly Listing)
March 25, 2002	14:56	Hindu Kush Region, Afghanistan	36.06	69.32	1,000	6.1	M (PDE Monthly Listing)
April 20, 2002	10:50	Au Sable Forks, NY	44.51	-73.70		5.1	M (PDE Monthly Listing)
November 3, 2002	22:12	Denali Park, AK	63.52	-147.44		7.9	M (PDE Monthly Listing)
May 21, 2003	18:44	Boumerdes, Algeria	36.96	3.63	2,266	6.8	M (PDE Monthly Listing)
September 25, 2003	19:50	Hokkaido, Japan	41.82	143.91		8.3	M (PDE Monthly Listing)
November 17, 2003	06:43	Rat Is., AK	51.15	178.65		7.8	M (PDE Monthly Listing)
December 22, 2003	19:15	San Simeon, CA	35.71	-121.10	2	6.6	M (PDE Monthly Listing)
December 26, 2003	01:56	Southeastern Iran	28.99	58.31	31,000	6.6	M (PDE Monthly Listing)
September 28, 2004	17:15	Parkfield, CA	35.81	-120.37		6.0	M (PDE Monthly Listing)
December 26, 2004	00:58	Off west coast northern Sumatra	3.30	95.87	227,898	9.1	M (Park et al., 2005)
March 28, 2005	16:09	Northern Sumatra, Indonesia	2.07	97.01	1,313	8.6	M (PDE Monthly Listing)
June 15, 2005	02:50	Off coast of No. California	41.29	-125.95		7.2	M (PDE Monthly Listing)
October 8, 2005	03:50	Pakistan	34.53	73.58	86,000	7.6	M (PDE Monthly Listing)
May 26, 2006	22:53	Java, Indonesia	-7.96	110.45	5,749	6.3	M (PDE Monthly Listing)
October 15, 2006	17:07	Island of Hawaii, HI	19.88	-155.94		6.7	M (PDE Monthly Listing)
November 15, 2006	11:14	Kuril Islands	46.59	153.27		8.3	M (PDE Monthly Listing)
September 12, 2007	11:10	Southern Sumatra, Indonesia	-4.44	101.37	25	8.5	M (PDE Monthly Listing)
October 31, 2007	03:04	San Francisco Bay Area, CA	37.43	-121.77		5.6	M (PDE Monthly Listing)
December 19, 2007	09:30	Andreanof Islands, AK	51.36	-179.51		7.2	M (PDE Monthly Listing)
February 21, 2008	14:16	Wells, NV	41.15	-114.87		6.0	M (PDE Monthly Listing)
May 12, 2008	06:28	Eastern Sichuan, China	31.00	103.32	87,587	7.9	M (PDE Monthly Listing)
September 29, 2009	17:48	Samoa Islands region	-15.49	-172.10	192	8.1	M (PDE Weekly Listing)
September 30, 2009	10:16	So. Sumatra, Indonesia	-0.72	99.87	1,117	7.5	M (PDE Weekly Listing)

† UTC/GMT

Date	Time†	Place	Lat.	Long.	Fatalities	M	M_X‡ (M reference)
‡ M_{G-R} = Gutenberg and Richter's (1954) magnitude, M_S = 20-sec surface-wave magnitude, M = moment magnitude (Hanks and Kanamori, 1979), and M_I is an intensity magnitude, M_L is local magnitude (Richter, 1935)							
* Fatalities estimated as high as 655,000							

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