

Table 1. Rates and Volumes of Basaltic Volcanism

Location (Volcano Name)	Duration (Ma)	Extrusive Volume (km <sup>3</sup> )	Volume Extrusion Rate Q <sub>e</sub> (km <sup>3</sup> a <sup>-1</sup> )	Mass Extrusion Rate (kg a <sup>-1</sup> )	Bulk SiO <sub>2</sub>	Petrotectonic Setting	Notes	Reference
<i>Area &lt; 10<sup>4</sup> km<sup>2</sup> (Individual Volcanoes / Small Volcanic Fields)</i>								
Ascension	1.500	90	6.00E-05	1.49E+09	48	oceanic hotspot	Rough estimate of volumes from topography; rates constrained by a few K-Ar dates since 1.5 Ma.	[Gerlach, 1990; Nielson and Sibbett, 1996]
Auckland, New Zealand	0.140	2	1.07E-05	2.89E+07	B	Continental volcanic field	Volume calculated from thickness and areal extent based on field mapping and boreholes for 49 volcanic centers and adjusted to DRE volume. Active for last 140 ka based on K-Ar, thermo-luminescence, and <sup>14</sup> C dates.	[Allen and Smith, 1994]
Bouvet	0.700	28	4.00E-05	4.59E+08	48	oceanic hotspot	Very rough estimate of volume from island topography; active for past 0.7 Ma.	[Gerlach, 1990]

Camargo, Mexico	4.64	120	2.6E-05	7.02E+07	B	Continental volcanic field	Constraints from K-Ar dates from 4.73±0.04 Ma to 0.09±0.04 Ma. Volume based on an area of 3000 km <sup>2</sup> and average thickness of 40 m	[Aranda-Gomez et al., 2003]
La Palma, Canary Islands	0.123	125	1.0E-03	2.70E+09	48	oceanic hotspot	Detailed field observations, mapping, and <sup>39</sup> Ar/ <sup>40</sup> Ar dating of uneroded Cumbre Viejo indicate activity since 123±3 ka.	[Carracedo et al., 1999; Guillou et al., 1998]
Santo Antao, Cape Verdes	1.750	68	4.00E-05	1.08E+08	48	oceanic hotspot	Rates from main shield-building stage Cha de Morte volcanics deposited between 2.93±0.03 and 1.18±0.01 Ma ( <sup>39</sup> Ar/ <sup>40</sup> Ar ages) and field mapping.	[Plesner et al., 2002]
Coso, CA	1.500	24.3	1.60E-05	5.40E+12	57	continental volcanic field	Field mapping estimate of 23-25.5 km <sup>3</sup> erupted between 4.02±0.06 and 2.52±0.05 Ma (K-Ar ages).	[Duffield et al., 1980]

Crater Flat, Nevada	3.700	10	3.7E-05	9.99E+07	B	continental volcanic field	Comprehensive study of volcanism in southern Nevada. Volumes from topography and field mapping, ages constrained to last 3.7 Ma mainly by $^{40}\text{Ar}/^{39}\text{Ar}$ .	[ <i>Perry et al.</i> , 1998]
Edgecumbe	0.607	32	5E-05	1.35E+08	53	continental arc	Oldest age is K-Ar $611\pm 74$ ka; youngest is radiocarbon date $4030\pm 90$ a. Volume based on detailed geologic mapping and accounting for DRE volumes for lavas and pyroclastic deposits.	[ <i>Crisp</i> , 1984; <i>Riehle et al.</i> , 1992]
Eifel Volcanic field	0.690	2	2.14E-06	5.79E+06	B	continental volcanic field	Volumes from field mapping. Activity 0.7 to 0.01 Ma based on $^{40}\text{Ar}/^{39}\text{Ar}$ and tephrochronology.	[ <i>Mertes and Schmincke</i> , 1985]
Erebus	0.250	4.00E-03	4.0E-03	1.08E+10	B	Continental arc	Volumes based on topography and assumed erosion, age constraints from $^{39}\text{Ar}/^{40}\text{Ar}$ dates.	[ <i>Esser et al.</i> , 2004]
Erebus	0.950	1.20E-03	1.2E-03	3.24E+09	B	Continental arc	Rough estimate of volume for proto-Erebus from topography and age constraints from $^{40}\text{Ar}/^{39}\text{Ar}$ dates.	[ <i>Esser et al.</i> , 2004]

Fernando de Noronha	12.000	60	5.00E-06	1.35E+07	48	oceanic hotspot	Approximate duration of volcanism 14 to 2 Ma.	[Gerlach, 1990]
		99					K-Ar ages from 2.55±0.51 to 0.13±0.02 Ma. Volume of basaltic shield does not include estimate of eroded volume prior to trachyte phase.	[Chevallier, 1987; Maund et al., 1988]
Gough	2.42		4.09E-05	1.10E+08	48	oceanic hotspot		
Juan Fernandez	1.000	72	7.20E-05	1.94E+08	48	oceanic hotspot	Approximate duration of volcanism 3 to 4 Ma. Ages constrained by K-Ar dates.	[Gerlach, 1990]
Kilauea	0.4	20000	5.00E-02	1.35E+11	48	oceanic hotspot	Volume estimate from drillhole stratigraphy and topography for past 0.4 Ma, based on K-Ar ages.	[Quane et al., 2000], [Dvorak and Dzurisin, 1993]
Kluychevskoy	0.010	275	2.70E-02	7.29E+10	B	continental arc	Volume based on cone is 275±25 km <sup>3</sup> and does not include ejecta beyond cone.	[Crisp, 1984]
Kohala, Hawaii	0.400	14000	3.50E-02	9.45E+10	B	oceanic hotspot	Volume estimate from bathymetry and topographic maps for past 0.4 Ma, based on K-Ar ages.	[Crisp, 1984]

Koolau, Oahu	0.600	20900	3.50E-02	9.45E+10	B	oceanic hotspot	Volume estimate from bathymetry and topographic maps for past 0.6 Ma, based on K-Ar ages.	[Crisp, 1984]
La Gomera, Canary Islands	1.4	350	2.5E-04	6.75E+08	B	oceanic hotspot	Rates obtained for main shield building stage. Volume calculated from DEM and field mapping for period of 9.4-8.0 Ma (K-Ar dates and paleomagnetic stratigraphy).	[Paris et al., 2005]
Lunar Crater, NV	5.700	100	1.70E-05	4.59E+07		Continental Volcanic field	Approximately 100 km <sup>3</sup> erupted over the past 5.7 Ma.	[Crisp, 1984]
Mauna Kea, Hawaii	0.300	24800	8.30E-02	2.24E+11	46	oceanic hotspot	Volume estimate from bathymetry and topographic maps for past 0.3 Ma, based on K-Ar ages.	[Crisp, 1984]
Mauna Loa, Hawaii	0.004	80	2.00E-02	5.40E+10	48	oceanic hotspot	Volume estimate from bathymetry and topographic maps for past 4 ka, based on K-Ar ages.	[Lipman, 1995]
Mauna Loa, Hawaii	0.500	42500	8.50E-02	2.30E+11	51	oceanic hotspot	Volume estimate from bathymetry and topographic maps for past 0.5 Ma, based on K-Ar ages.	[Crisp, 1984]

Mt. Cameroon	3.0	1500	5.00E-04	1.35E+09	45	continental hotspot	Rough estimate of volume for entire volcano, age constraints approximate activity from <3 Ma to present.	[ <i>Fitton and James, 1986; Marzoli et al., 2000</i> ]
Ocate, New Mexico	4.0	86	2.1E-05	5.67E+07	B	Continental Rift	Lavas erupted from 4.8 to 0.8 Ma, based on whole rock K-Ar dates. Approximate volume from field mapping. Older deposits (5.5 to 8.1 Ma) are substantially eroded so these are excluded here.	[ <i>Nielsen and Dungan, 1985</i> ]
Reunion	2.000	4800	2.40E-03	5.67E+11	48	oceanic hotspot	Based on a volcanic rate of $2.4 \pm 0.4 \text{ km}^3/\text{ka}$ and geochronology from early K-Ar dates for bulding the island over the past 2 Ma.	[ <i>Gerlach, 1990</i> ]
Ross	4.000	4800	1.20E-03	6.48E+09	48	oceanic hotspot	Based on a volcanic rate of $1.2 \pm 0.2 \text{ km}^3/\text{ka}$ for bulding the island over an estimated period of 0-4 Ma.	[ <i>Gerlach, 1990</i> ]
San Francisco Volcanic Field, AZ	5.000	525	1.05E-04	2.84E+08	B	Continental Volcanic field	Volume of small basaltic cinder cones and flows and larger silicic cones estimated from field mapping over past 5 Ma based on K-Ar dates.	[ <i>Tanaka et al., 1986</i> ]

Sao Miguel, Azores	0.00455	4.5	9.90E-04	2.67E+09	B	oceanic hotspot	Volume of 4.5 km <sup>3</sup> , DRE, from field mapping erupted over past 4.55 ka based on <sup>14</sup> C ages.	[Crisp, 1984]
Servilleta Basalt	1.0	200	2.0E-04	5.40E+08	B	Continental rift	Estimate of volume based on extent (200 km <sup>2</sup> ) and average thickness of flows (50 m) which range from 10 to 175 m thick. Eruptions in middle-to-late Pliocene is 1.0±0.5 Ma based on K-Ar dates.	[Dungan et al., 1986]
Skye, British Tertiary Igenous Province	1.600	2300	1.44E-03	3.88E+09	B	Continental rift	Estimate of volume based on areal extent (1550 km <sup>2</sup> ) times average thickness (1.5 km) of deposits. Volcanic activity between 60.53±0.08 Ma and 58.91±0.06 Ma based on U-Pb zircon ages.	[Fowler et al., 2004]
Springerville, Arizona	1.8	300	1.67E-04	4.51E+08	48	Continental Volcanic field	Volumes from geologic mapping and borehole data. Eruptive period 0.3-2.1 Ma from K-Ar and magnetic polarity ages.	[Condit et al., 1989]

St. Helena	8.000	192	2.40E-05	7.29E+09	48	oceanic hotspot	Based on a volcanic rate of $0.24 \pm 0.12$ km <sup>3</sup> /Ma for bulding the island over an estimated period of 7-15 Ma.	[ <i>Gerlach, 1990</i> ]
Tatara, Chile	0.071	22	3.1E-04	8.37E+08	BA	continental arc	Estimates from field mapping, K-Ar and <sup>40</sup> Ar/ <sup>39</sup> Ar ages. Eruption time interval from 90 to 19 ka; units older than 90 ka are highly eroded	[ <i>Singer et al., 1997</i> ]
Tolbachik <i>Area &gt; 10<sup>4</sup> km<sup>2</sup> (large volcanic fields / arcs)</i>	0.010	69	6.90E-03	6.48E+08	B	continental arc	From rough estimate of average eruption rates over 2-10 ka and 2 ka to present.	[ <i>Crisp, 1984</i> ]
Baikal (Vitim)	10	5000	5.0E-04	1.35E+09	B	continental rift	Rough estimate of volumes and rates constrained by very limited K-Ar dates. Eruptive period 16.6-6.6 Ma.	[ <i>Johnson et al., 2005</i> ]; [ <i>Crisp, 1984</i> ]
Canary Islands	20.000	150000	7.50E-03	1.08E+08	B	oceanic hotspot	Age of oldest shield-building activity is uncertain. Oldest dated subaerial lava is 20 Ma (K-Ar) but oldest submarine activity could be 3X older.	[ <i>Crisp, 1984</i> ; <i>Hoernle and Schmincke, 1993</i> ]

Caribbean Plateau	3.000	4000000	1.33E+00	1.08E+08	50	ocean plateau	Volume constraints from bathymetry and a drillhole. Eruptions from 91 to 88 Ma based on $^{40}\text{Ar}/^{39}\text{Ar}$ ages.	[ <i>Courtillot and Renne, 2003; Sinton et al., 1998</i> ]
Central Atlantic Basalt Province	4.000	2000000	5.00E-01	5.94E+09	50	continental flood basalt	Rough estimate of volume based on extent including Eastern North America, western Africa and Europe. Eruption between 197-201 Ma from a variety of sources ( $^{40}\text{Ar}/^{39}\text{Ar}$ , U-Pb, biostratigraphy)	[ <i>Courtillot and Renne, 2003</i> ]
Central Oregon p/100 km	1.0	163	1.63E-04	4.40E+08	B	continental arc	330 km <sup>3</sup> from mafic volcanoes and 180 km <sup>3</sup> from composite volcanoes for past 1 Ma. Uncertainties 10%-30% of volume. Adjusted for 300 km length of arc.	[ <i>Sherrod et al., 1990</i> ]
Central Oregon	2.0	750	3.75E-04	1.01E+09	53	continental arc	Volume estimated from field mapping and probable eroded volume at 2150 km <sup>3</sup> and adjusted for 300 km arc. K-Ar age dates cluster in the period from 4 to 6 Ma.	[ <i>Crisp, 1984</i> ]

Columbia River Basalt (Grande Ronde Basalt)	1.4	148600	1.06E-01	2.86E+11	B	continental flood basalt	Volume estimate from field mapping and borehole thickness data. Lavas were erupted 17-15.6 Ma based on $^{40}\text{Ar}/^{39}\text{Ar}$ and K-Ar ages.	[ <i>Reidel et al.</i> , 1989]
Columbia River Basalt	11.5	174300	1.54E-02	4.32E+06	50	continental flood basalt	Volume estimate from field mapping and borehole thickness data for $174,300 \pm 27,900 \text{ km}^3$ . Lavas were erupted 17.5-6 Ma based on $^{40}\text{Ar}/^{39}\text{Ar}$ and K-Ar ages.	[ <i>Tolan et al.</i> , 1989]
Deccan Traps	1.000	2000000	2.00E+00	8.91E+08	50	continental flood basalt	Eruptive period 65-66 Ma. There is a fair amount of controversy over the duration of activity.	[ <i>Courtillot and Renne</i> , 2003]
E. Australia	60.000	20000	3.30E-04	2.59E+10	B	continental flood basal	Volume estimate from geologic mapping. Extrusion rate approximately constant for past 60 Ma. Only slight erosion for deposits less than 37 Ma.	[ <i>Crisp</i> , 1984]

East Pacific Rise (p/100 km)	1.000	9600	9.60E-03	1.89E+10	50	ocean spreading	Volume calculated by multiplying area from spreading rate and given length, by extrusive layer thickness obtained from reflection seismic and stratigraphic mapping. Seismic Layer 2A assumed equal to extrusive layer thickness.	[ <i>Karson, 1998</i> ], [ <i>Harding et al., 1989</i> ], [ <i>Becker et al., 1989</i> ]
Eastern Snake River Plain	3.000	21000	7.00E-03	7.02E+09	B	continental hotspot	Rough estimate for past 3 Ma, with no estimate of uncertainties.	[ <i>Crisp, 1984</i> ]
Eithiopia-Yemen Traps	1.500	1200000	8.00E-01	2.70E+12	50	continental flood basalt	Eithopian traps are 0.7 Mkm <sup>3</sup> and Yemen traps are 1.2 Mkm <sup>3</sup> . Erupted from 29.5 to 31 Ma based on <sup>40</sup> Ar/ <sup>39</sup> Ar and magneto-stratigraphy.	[ <i>Courtillot and Renne, 2003</i> ]
Emeishan	1.000	1000000	1.00E+00	2.21E+10	50	continental flood basalt	Rough estimate of volume from reconstruction of original area (5 Mkm <sup>2</sup> ) and thickness (2 km). Ages from <sup>40</sup> Ar/ <sup>39</sup> Ar and U-Pb are somewhat uncertain. Stratigraphic age is 258 Ma.	[ <i>Courtillot and Renne, 2003</i> ]

Faeroe Islands	3.5	4200	1.20E-03	3.24E+09	49	oceanic hotspot	Volume is rough estimate based on area of the islands, with 3 km thickness of lava pile. Unknown amount of original volume removed by glaciers, so volume is an underestimate. Ages based on $^{40}\text{Ar}/^{39}\text{Ar}$ and paleomagnetic dating.	[Crisp, 1984; Riisager et al., 2002]
		31					Uniform rate of $1.5\text{E-}03 \text{ km}^3/\text{a}$ from 15 to 7 ka, then an increase to $2.8\text{E-}03 \text{ km}^3/\text{a}$ from 7 to 2 ka. Lava flow area mapped and multiplied by average flow thickness to derive volumes for each of 38 individual flows. Age constraints from radiocarbon and paleomagnetic dating.	
Great Rift, Snake River Plain, Idaho	0.013		2.40E-03	6.48E+09	54	continental hotspot	Comprehensive assessment of volcano volumes using bathymetry. K-Ar ages.	[Kuntz et al., 1986]
Hawaii-Emperor Seamounts	73.600	1080000	1.50E-02	4.05E+10	48	oceanic hotspot	Volumes of postglacial eruptions over the past 10-12 ka, constrained by radiocarbon and tephrochronology.	[Crisp, 1984]
Iceland	0.011	484	4.4E-02	1.19E+11	50	oceanic hotspot		[Crisp, 1984]

Iceland	1.000	20000	2.00E-02	5.40E+10	B	oceanic hotspot	Based on total volume of Iceland divided by age of volcanism.	[Crisp, 1984]
Ireland	5.500	2000	3.60E-04	9.72E+08	B	Continental rift	Eruptive period from 66 Ma to 60.5±0.5 Ma estimated from K-Ar and <sup>40</sup> Ar/ <sup>39</sup> Ar ages. Volume estimated from the total area of 4000 km <sup>2</sup> and average thickness of 0.5 km.	[Crisp, 1984]
Juan de Fuca Ridge (p/ 100 km)	1.000	9000	9.00E-03	2.43E+10	50	ocean spreading	Based on stratigraphic mapping of the extrusive layer thickness where exposed by faults, and the average spreading rate.	[Karson, 1998]
Kamchatka	0.250	8700	3.50E-02	6.48E+10	B	continental arc	Estimate of erupted volume between 0.85-0.6 Ma corrected for DRE.	[Crisp, 1984]
Kamchatka (basalts)	0.850	20660	2.40E-02	9.45E+10	B	continental arc	20660±300 km <sup>3</sup> erupted over past 0.08 Ma (from mainly radiocarbon ages). Overall rate calculated from a detailed assessment of rates as a function of time and type of volcanism.	[Crisp, 1984]

Kamchatka (basalts)	0.080	6140	7.70E-02	2.08E+11	B	continental arc	Rate calculated for just the basaltic volume erupted over the past 0.08 Ma	[Crisp, 1984]
Karoo-Farrar	6.000	2500000	4.16E-01	1.12E+12	50	continental flood basalt	The volume is highly uncertain due to erosion, and the duration from 184 Ma to 178 Ma is based on $^{40}\text{Ar}/^{39}\text{Ar}$ ages.	[Courtillot and Renne, 2003; Jourdan et al., 2005]
Kenya (basalts)	2.500	15580	6.20E-03	9.45E+09	B	continental rift	Volume from geologic mapping and pre-erosional estimates for past 2.5 Ma, based on K-Ar and $^{40}\text{Ar}/^{39}\text{Ar}$ ages.	[Crisp, 1984]
Kenya (basalts)	4.500	23000	5.10E-03	1.38E+10	B	continental rift	Volume from geologic mapping and pre-erosional estimates for 7-2.5 Ma, based on K-Ar and $^{40}\text{Ar}/^{39}\text{Ar}$ ages. Uncertainties larger for older deposits.	[Crisp, 1984]
Kenya (basalts)	11.000	39000	3.50E-03	1.67E+10	B	continental rift	Volume from geologic mapping and pre-erosional estimates for 23-12 Ma, based on K-Ar and $^{40}\text{Ar}/^{39}\text{Ar}$ ages. Uncertainties larger for older deposits.	[Crisp, 1984]

Kenya and Tanzania	2.500	40470	1.60E-02	4.32E+10	B	continental rift	Volume (40,470±7680 km <sup>3</sup> ) from geologic mapping and pre-erosional estimates for past 2.5 Ma, based on K-Ar and <sup>40</sup> Ar/ <sup>39</sup> Ar ages.	[Crisp, 1984]
Kenya and Uganda	11.000	108375	9.80E-03	2.65E+10	B	continental rift	Volume (108,375±23,125 km <sup>3</sup> ) from geologic mapping and pre-erosional estimates for 23 to 12 Ma, based on K-Ar and <sup>40</sup> Ar/ <sup>39</sup> Ar ages.	[Crisp, 1984]
Kerguelen Archipelago	11.000	99000	9.00E-03	5.94E+08	50	oceanic hotspot	Rough estimate of volume for island based on topography and bathymetry for 29.26±0.87 to 24.53±0.29 Ma, based on <sup>40</sup> Ar/ <sup>39</sup> Ar ages.	[Nicolaysen et al., 2000]
Kerguelen Island	26.000	5720	2.20E-04	2.43E+10	48	oceanic hotspot	Based on a volcanic rate of 0.22±0.01 km <sup>3</sup> /ka for bulding the island over an estimated period from 27 Ma to 1 Ma.	[Gerlach, 1990]
Kerguelen-Rajmahal-Bunbury	10.000	6000000	6.00E-01	1.62E+12	50	continental flood basalt	Grouped based on geochemical similarity. Erupted at 119-109 Ma.	[Courtillot and Renne, 2003]

Madagascar	4.000	4400000	1.10E+00	2.97E+12	50	continental flood basalt	Rough estimate of volume from area and thickness; erupted from 86-90 Ma based on $^{40}\text{Ar}/^{39}\text{Ar}$ dating.	[ <i>Courtillot and Renne, 2003</i> ]
Mid-Atlantic (p/ 100 km)	1.000	1500	1.50E-03	4.05E+09	50	Ocean spreading	Volume calculated by multiplying area from spreading rate and given length, by extrusive layer thickness obtained from reflection seismic. Seismic Layer 2A assumed equal to extrusive layer thickness.	[ <i>Tolstoy et al., 1993</i> ] [ <i>Tucholke et al., 1997</i> ], [ <i>Hooft et al., 2000</i> ]
Midland Valley, Scotland	27.500	6400	2.3E-04	6.21E+08	B	continental rift	Highly uncertain estimate of volume (4800 to 8000 km <sup>3</sup> ) erupted over 25-30 Ma during Carboniferous Period. Volume and age range estimates from <i>Crisp</i> [ <i>Crisp, 1984</i> ] corrected here.	[ <i>Crisp, 1984</i> ]
Modoc Basalt	5.000	2550	5.10E-04	7.59E+08	B	continental arc	Volume estimate from 1950 to 3150 km <sup>3</sup> based on field mapping. K-Ar ages from 5 to 10 Ma.	[ <i>Crisp, 1984</i> ]

Ninetyeast Ridge	40.000	7200000	1.80E-01	1.08E+10	48	oceanic hotspot	Rough estimate of volume for whole ridge based on topography and bathymetry for 38 to 83 Ma, based on $^{40}\text{Ar}/^{39}\text{Ar}$ ages.	[ <i>Duncan, 1991; Nicolaysen et al., 2000</i> ]
Ninetyeast Ridge	40.000	24000000	6.00E-01	4.86E+11	48	oceanic hotspot	Estimate for whole ridge based area and thickness of volcanic extrusive layer interpreted from seismic profiles.	[ <i>Grevemeyer et al., 2001</i> ]
North Atlantic Tertiary Volcanics 1	3.000	2000000	6.67E-01	1.62E+12	50	continental flood basalt	Rough volume estimate for the period of 62-59 Ma based on an extensive suite of dates including $^{40}\text{Ar}/^{39}\text{Ar}$ and U-Pb ages.	[ <i>Courtillot and Renne, 2003</i> ]
North Atlantic Tertiary Volcanics 2	3.000	2000000	6.67E-01	1.62E+12	50	continental flood basalt	Conservative estimate of extrusive volume for the period of 57-54 Ma based on $^{40}\text{Ar}/^{39}\text{Ar}$ and U-Pb ages. Some estimates include ~9.9 Mkm <sup>3</sup> of total igneous material.	[ <i>Courtillot and Renne, 2003</i> ]
Ontong-Java Plateau	2.000	6000000	3.00E+00	1.80E+12	50	ocean plateau	Total, corrected volume of extruded lavas at 122±1 Ma. Total volume of plateau is 44.4 Mkm <sup>3</sup>	[ <i>Courtillot and Renne, 2003</i> ], [ <i>Neal et al., 1997</i> ]

Parana-Etendeka	0.600	2300000	3.83E+00	2.16E+08	50	continental flood basalt	Volume calculated from surface area (1.5 Mkm <sup>2</sup> ) and average thickness of flows (36 km). Total duration of trap volcanism is constrained to 0.6±1 Ma at 133±1 Ma ago by <sup>40</sup> Ar/ <sup>39</sup> Ar dates.	[ <i>Courtillot and Renne, 2003</i> ], [ <i>Renne and Basu, 1991</i> ]
Parana 1	3.000	90000	3.00E-02	1.04E+13	50	continental flood basalt	First phase of basaltic volcanism. Rough volume estimate from average flow thickness and extent. Ages constrained by numerous <sup>40</sup> Ar/ <sup>39</sup> Ar dates	[ <i>Stewart et al., 1996</i> ]
Parana 2	2.000	260000	1.30E-01	2.16E+11	50	continental flood basalt	Second phase of basaltic volcanism. Rough volume estimate from average flow thickness and extent. Ages constrained by numerous <sup>40</sup> Ar/ <sup>39</sup> Ar dates	[ <i>Stewart et al., 1996</i> ]
Parana 3	2.000	420000	2.10E-01	8.10E+10	50	continental flood basalt	Third phase of basaltic volcanism. Rough volume estimate from average flow thickness and extent. Ages constrained by numerous <sup>40</sup> Ar/ <sup>39</sup> Ar dates	[ <i>Stewart et al., 1996</i> ]

Parana 4	3.000	30000	1.00E-02	3.51E+11	50	continental flood basalt	Fourth phase of basaltic volcanism. Rough volume estimate from average flow thickness and extent. Ages constrained by numerous $^{40}\text{Ar}/^{39}\text{Ar}$ dates	[Stewart et al., 1996]
Rio Grande Rise	37.000	11100000	3.00E-01	2.70E+10	48	oceanic hotspot	Volume estimated from bathymetry and subsidence.	[Gallagher and Hawkesworth, 1994]
San Juan Mountains (basalts)	19.800	1020	5.10E-05	3.24E+09	B	Continental Volcanic field	Volume estimated from field mapping, includes estimate of eroded volume. K-Ar ages range from 23.4 to 3.6 Ma.	[Crisp, 1984]
Siberia	32.000	750000	2.70E-03	1.73E+10	B	continental flood basalt	Volume highly uncertain: 575,000 to 1,150,000 km <sup>3</sup> erupted from 248 to 216 Ma.	[Crisp, 1984]
Siberian Traps	1.000	3000000	3.00E+00	2.43E+09	50	continental flood basalt	Volume from reconstruction of original total area of 4 Mkm <sup>2</sup> and preserved average flow thickness. Erupted during 1 Ma at about 250 Ma based on magnetic stratigraphy, U-Pb, and $^{40}\text{Ar}/^{39}\text{Ar}$ ages.	[Courtilot and Renne, 2003], [Renne and Basu, 1991]

Tasmania	44.500	400	9.40E-06	8.10E+12	B	continental rift	Duration from 47.5±7.5 to 2.55±2.45 Ma.	[Crisp, 1984]
Tibesti Massif	64.000	2680	4.20E-05	2.54E+07	55	continental hotspot	Rough estimate of total volume from 65 to 0.95±0.85 Ma.	[Crisp, 1984]
Zitacuaro-Valle de Bravo	1.000	24	2.40E-05	1.13E+08	50	continental arc	Volume estimated from detailed field mapping of uneroded young volcanics broken out by lava type and corrected to DRE. A total of 25 km <sup>3</sup> of basalts were erupted in shields, cones, and tephra along 50 km of arc length. Extensive suite of dates from <sup>40</sup> Ar/ <sup>39</sup> Ar, K-Ar, and radiocarbon. Rates only for volcanics of past 1.0 Ma.	[Blatter et al., 2001]

Table 2. Rates and Volumes of Silicic Volcanism

Location	Duration (Ma)	Extrusive Volume (km <sup>3</sup> )	Volume Extrusion Rate Q <sub>e</sub> (km <sup>3</sup> a <sup>-1</sup> )	Mass Extrusion Rate (kg a <sup>-1</sup> )	SiO <sub>2</sub> Wt%	Petrotectonic Setting	Notes	Refs
<i>Area &lt; 10<sup>4</sup> km<sup>2</sup> (Individual Volcanoes / Small Volcanic Fields)</i>								
Alban Hills, Italy	0.561	290	5.2E-04	1.33E+09	A	Continental arc	Geologic map. Some ages from thermoluminescence. Period of eruptions 580 ka to 19 ka. Not corrected for DRE. Unknown amount of erosion.	[Chiarabba et al., 1997]
Asama	0.030	37	1.20E-03	8.61E+08	A	oceanic arc	37±7 km <sup>3</sup> erupted over past 0.03 Ma	[Crisp, 1984]
Avachinsky, USSR	0.060	100	1.70E-05	1.62E+08	BA	continental arc	Rough estimate excluding ejecta beyond cone.	[Crisp, 1984]
Ceboruco-San Pedro	0.8	80.5	8.05E-5	2.05E+08	A	continental arc	Volume determinations 80.5±3.5 km <sup>3</sup> from field mapping, digital topography, and orthophotos. Only minor erosion. Age from numerous <sup>40</sup> Ar/ <sup>39</sup> Ar dates.	[Frey et al., 2004]

Ceboruco-San Pedro	0.1	60.4	6.04E-4	1.54E+09	A	continental arc	Volume determinations from field mapping, digital topography, and orthophotos. Only minor erosion. Age from numerous $^{40}\text{Ar}/^{39}\text{Ar}$ dates.	[Frey et al., 2004]
Clear Lake, California	2.050	73	3.50E-05	2.81E+09	64	Continental Volcanic Field	For period from 2.06-0.01 Ma. Volume includes estimate of eroded material.	[Crisp, 1984]
Coso, California	0.4	2.4	5.7E-06	1.34E+07	R	Continental Volcanic Field	Geologic mapping estimate of 0.9 km <sup>3</sup> of basalt and 1.5 km <sup>3</sup> of rhyolite erupted over past 0.4 Ma based on K-Ar ages.	[Bacon, 1982]
Davis Mountains, Texas	1.5	1525	1.0E-03	2.35E+09	R	Continental Volcanic Field	Detailed field mapping and $^{40}\text{Ar}/^{39}\text{Ar}$ ages from 36.8 to 35.3 Ma. No DRE correction applied, as deposits have low porosity. The actual total volume may be as high as 2135 km <sup>3</sup> , if buried lava flows over full extent of area suggested.	[Henry et al., 1994]
Fuji	0.011	88	8.00E-03	4.59E+08	BA	oceanic arc	Volume estimated from detailed field mapping for eruptions over past 11 ka (tephrachronology)	[Togashi et al., 1991]

Gran Canaria, Canary Islands	0.600	200	3.30E-04	7.76E+08	69	oceanic hotspot	Duration is an estimate for the age range 14.1-13.4 Ma, based on K-Ar and $^{40}\text{Ar}/^{39}\text{Ar}$ for the Mogan Formation.	[Crisp, 1984; Freundt and Schmincke, 1995; Hoernle and Schmincke, 1993]
Hakone	0.400	150	3.70E-04	4.34E+09	A	oceanic arc	Volume 150±50 km <sup>3</sup> erupted over past 0.4 Ma	[Crisp, 1984]
Kaimondake	0.003	4	1.30E-03	2.04E+10	A	oceanic arc	Volume 3.7±1.2 km <sup>3</sup> , eruptions from 4-1 ka.	[Crisp, 1984]
Kaiser Spring, Arizona	3.2	7.5	2.34E-06	5.50E+06	R	Continental Volcanic Field	Rough estimate of volumes for rhyolite domes and flows based on field mapping. No estimate for basalt flows. Eruptive activity from 8.8 to 12 Ma based on K-Ar dates.	[Moyer and Esperanca, 1989]
Kuju	0.015	9	6.00E-04	1.53E+09	A	oceanic arc	Volumes from field mapping and average thickness of flows, and isopach maps of tephras corrected for DRE. Age constraints from $^{14}\text{C}$ and tephrachronology. Rates estimated at 0.4-0.7 km <sup>3</sup> /ka.	[Kamata and Kobayashi, 1997]

Long Valley, CA	0.76	700	9.21E-04	2.16E+9	R	Continental Volcanic Field	DRE-corrected volume from geological mapping. Activity since 0.76 Ma based on $^{40}\text{Ar}/^{39}\text{Ar}$ dates.	[ <i>Hildreth, 2004; McConnell et al., 1995</i> ]
Mazama (Crater Lake), Oregon	0.340	101	2.97E-04	6.98E+08	R	Continental arc	Age constraints from $^{14}\text{C}$ and K-Ar dates. Volume estimates from field mapping and estimates for erosion are 40-52 km <sup>3</sup> for pre-caldera Mt. Mazama and 51-59 km <sup>3</sup> erupted during caldera formation. A detailed chronology of eruptive events.	[ <i>Bacon, 1983; Bacon and Lanphere, 1990</i> ]
Misti	0.112	76.5	6.8E-04	1.73E+09	A	Continental arc	Extensive geologic field mapping and ages from $^{40}\text{Ar}/^{39}\text{Ar}$ , plagioclase thermoluminescence, and $^{14}\text{C}$ chronology. Volume of stratocones estimated at 70-83 km <sup>3</sup> . Not enough information to calculate DRE volume.	[ <i>Thouret et al., 2001</i> ]

Mt. Adams	0.520	303	5.8E-04	1.48E+09	A	continental arc	Very detailed assessment of rates as a function of time and type of eruption. Extensive set of whole rock K-Ar ages. Comprehensive geologic mapping with estimates of areas and potential range of pre-erosional thickness for 124 map units. Earliest ages are 940 ka, but most volume was erupted since 520 ka.	[Hildreth and Lanphere, 1994]
Mt Baker	1.290	161	1.25E-04	7.14E+09	60	continental arc	Very detailed assessment of rates as a function of time from 80 K-Ar and <sup>40</sup> Ar/ <sup>39</sup> Ar dates for past 1.29 Ma. Estimate for pre-erosional volume is 161 ± 56 km <sup>3</sup> from detailed field mapping.	[Hildreth et al., 2003a]
Mt Griggs	0.292	35	1.21E-04	5.87E+11	54	oceanic arc	Total erupted volume estimated from detailed field mapping as 35±5 km <sup>3</sup> since 292±11 ka.	[Hildreth et al., 2003b]
Mt Katmai	0.890	70	7.0E-04	6.38E+10	61	oceanic arc	Total erupted volume estimated at 70±18 km <sup>3</sup> since 89±13 ka, although most volume has erupted since 47 ka.	[Hildreth et al., 2003b]

Mt Mageik	0.093	30	3.3E-04	7.05E+09	62	oceanic arc	Total erupted volume estimated from detailed mapping and pre-erosional estimates for the past 93 ka.	[Hildreth et al., 2003b]
Mt. St. Helens	0.040	79	1.98E-03	5.04E+09	A	Continental arc	Volumes include estimates of main cone, flank flows, pyroclastic flows, and rough estimate of pre-1980 tephra volumes corrected for DRE.	[Sherrod et al., 1990]
Oshima	0.025	33	1.50E-03	1.82E+08	A	oceanic arc	Total volume from cone 33±11 km <sup>3</sup> over the past 25±15 ka.	[Crisp, 1984]
Ruapehu, New Zealand	0.25	300	1.20E-03	3.06E+09	A	Continental arc	Volume estimate includes cone (146 km <sup>3</sup> ) plus reworked deposits on ring-plain. Age constraints from <sup>40</sup> Ar/ <sup>39</sup> Ar for eruptions since 250 ka.	[Gamble et al., 2003]
Sakurajima	0.014	25	1.80E-03	2.55E+12	A	oceanic arc	Total volume from cone 25±5 km <sup>3</sup> over the past 14±1 ka.	[Crisp, 1984]

Santorini	0.067	45	6.72E-04	1.58E+09	R	Oceanic arc	Rough estimates of volumes from detailed field mapping and reconstruction Minoan eruption and Skaros shield. Detailed chronology from radiocarbon, K-Ar, and $^{40}\text{Ar}/^{39}\text{Ar}$ dates indicates activity since 360 ka, and building Skaros shield began at $67\pm 9$ ka.	[Druitt <i>et al.</i> , 1999]
Shiveluch	0.200	1000	5.00E-03	1.12E+09	A	continental arc	Rough estimate, does not include ejecta beyond cone.	[Crisp, 1984]
Sierra la Primavera	0.068	34	5.00E+04	1.48E+08	R	continental arc	Magma volume based on field mapping of 320 km <sup>2</sup> study area, erupted over the period $0.095\pm 0.005$ Ma to $0.0275\pm 0.0025$ Ma from K-Ar ages.	[Crisp, 1984]
Soufriere Hills – South Soufriere	0.174	26	1.5E-04	3.83E+08	A	continental arc	Rate given includes DRE correction and assumed submarine deposits. Only minor erosion. Age from numerous $^{40}\text{Ar}/^{39}\text{Ar}$ dates indicate eruptions since $174\pm 3$ ka.	[Harford <i>et al.</i> , 2002]

Taupo	0.027	73	2.76E-03	6.35E+09	74	continental arc	Eruptive volume calculated from detailed stratigraphic record and tephra isopach maps since the volcano's 26.5 ka caldera-forming eruption. Rates constrained by <sup>14</sup> C dates.	[Sutton et al., 2000]
Taupo	0.610	7044	1.10E-02	4.59E+09	R	continental arc	Includes area of pyroclastic sheets (20,000 km <sup>2</sup> ) from Taupo vents. Careful assessment of volumes from geologic mapping, erupted over the period 1.13 to 0.51 Ma. Ages are K-Ar, <sup>14</sup> C, and fission track.	[Crisp, 1984]
Taupo (recent)	0.050	350	7.00E-03	1.18E+10	R	continental arc	Includes Taupo and Okatina volcanic centers. Volume determined from geologic maps and tephra isopach maps, corrected for DRE, over past 50 ka ( <sup>14</sup> C ages).	[Crisp, 1984]
Terceira, Azores	0.023	5.46	2.40E-04	6.48E+07	60	oceanic hotspot	Minimum volume estimated from geological maps and corrected for DRE. Eruptions over past 23 ka constrained by <sup>14</sup> C dates.	[Crisp, 1984]

Tequila, Mexico	1.0	128	1.28E-04	3.26E+08	A	Continental arc	K-Ar dating, detailed geologic mapping, and digital elevation models provide minimum-maximum estimates for 49 eruptive units. Overall volume uncertainty is $128 \pm 22$ km <sup>3</sup> .	[Lewis-Kenedi et al., 2005]
Timber Mountain, Nevada	2.8	4000	1.43E-03	3.36E+09	R	Continental Volcanic Field	Volume from large tuff deposits corrected to DRE. Duration from 12.8 Ma to ~10 Ma from <sup>40</sup> Ar/ <sup>39</sup> Ar sanidine and K-Ar. Volume for other minor volcanism in area not reported.	[Farmer et al., 1991; Bindeman and Valley, 2003]
Tongariro	0.275	60	2.2E-04	5.61E+08	A	continental arc	Based on a rough estimate of volume of the volcanic cone and K-Ar ages.	[Hobden et al., 1999; Hobden et al., 1996]
Trident Volcano	0.142	22	1.54E-04	1.18E+17	62	oceanic arc	Total eruptive volume of $22 \pm 3$ km <sup>3</sup> since $142 \pm 15$ ka based on K-Ar dates.	[Hildreth et al., 2003b]

Tungurahua	0.002	3	1.50E-03	9.18E+10	55-65	continental arc	Volumes from most recent edifice in volcanic complex based on estimates from field mapping and topography, erupting since 2215±90 years ago based on detailed tephrochronology and <sup>14</sup> C dates. Volumes include distal tephra and are adjusted to DRE	[Hall et al., 1999]
Twin Peaks, UT	0.39	12	3.1E-05	7.29E+07	76	Continental Volcanic Field	Minimum volume of 12 km <sup>3</sup> of silicic magma erupted from 2.74±0.10 Ma to 2.35±0.08 Ma, based on K-Ar ages.	[Crecraft et al., 1981; Evans et al., 1980]
Valles	1.33	265	2.00E-04	2.59E+10	R	continental hotspot	Volume constraints from mapping. Age constraints from K-Ar dates from 1.43±0.09 to 0.1 Ma	[Crisp, 1984]
Volcan San Juan	0.034	60	1.78E-03	1.65E+10	R	continental arc	Combined volumes of main cone and adjacent satellite cone, from topographic since 33.75±1.8 ka. Volume estimates include very detailed isopach maps of tephra and DRE corrections.	[Luhr, 2000]

Yatsugatake	0.171	513	3.00E-03	3.92E+08	A	oceanic arc	Estimate of volumes from tephra and rough estimate of volcano volumes. Age constraints from tephrochronology for Younger Yatsugatake, past 171 ka.	[Oishi and Suzuki, 2004]
<i>Area &gt; 10<sup>4</sup> km<sup>2</sup> (large volcanic fields / arcs)</i>								
Aleutians p/100 km extrusive only	3.500	350	1.00E-04	5.61E+09	A	oceanic arc	Detailed study of volumes in past 3-4 Ma indicate a total of 4700-10000 km <sup>3</sup> over an arc length of 2100 km	[Crisp, 1984]
Aleutians p/100km int+ext	80.000	272000	3.50E-03	8.93E+09	A	oceanic arc	Estimated from 80 Ma age of arc and approximate 34 km <sup>3</sup> /Ma/km volume excess of the arc over oceanic crust	[Crisp, 1984]
Altiplano-Puna Volcanic Complex	10	6120	6.12E-04	1.56E+09	A	Continental arc	No uncertainties given. Duration for the past 10 Ma.	[Francis and Hawkesworth, 1994]
Cascade Range p/100 km	2.0	1900	9.5E-04	2.42E+09	A	continental arc	Estimated for 0-2 Ma Quaternary volcanics in Northern California to southern British Columbia and 8 to 11 km <sup>3</sup> /km/Ma extrusion rate.	[Sherrod et al., 1990]

Central Andes Volcanic Zone p/100 km	10.000	3740	3.74E-04	9.54E+08	60	continental arc	Volume estimated from volcano edifice volumes (1113 total) for past 10 Ma. No correction for erosion or distal tephtras.	[Francis and Hawkesworth, 1994]
Central Andes Volcanic Zone p/100 km	1.000	159	1.59E-04	4.05E+08	60	continental arc	Volume from edifices active during past 1 Ma (246 total). Somewhat uncertain; ages based partly on geomorphological evidence.	[Francis and Hawkesworth, 1994]
Central Oregon p/100 km	4.000	12425	3.10E-03	3.09E+06	57	continental arc	Volume estimated from field mapping. K-Ar ages cluster in periods from 16 to 14 Ma and 11 to 9 Ma. Adjusted for length of arc of 200 km.	[Crisp, 1984]
Central Oregon p/100 km	14.000	5000	3.60E-02	3.0E+07	62	continental arc	Constrained as minimum volume from field mapping of Oligocene-Early Miocene deposits with K-Ar ages from 34 to 20 Ma. This estimate has more uncertainty than other entries for Central Oregon. Adjusted for length of arc of 200 km.	[Crisp, 1984]

Chon Aike, South America	35.000	23000	6.57E-04	1.51E+09	R	Continental rift	Geologic mapping and detailed stratigraphy of 9 provinces to derive an volume estimated from areal coverage and thickness of representative units. Eruptive activity between 188±1 Ma and 142±4 Ma constraints from K-Ar	[Pankhurst et al., 1998]
East Nicaragua p/100 km	0.135	187	1.38E-03		60	continental arc	Total arc length is 130 km. Volume is an estimate of volcano volumes, and is not corrected for erosion or distal tephtras. Age constraints from tephrachronology.	[Patino et al., 2000]
El Salvador p/100 km	0.2	292	1.5E-03	3.52E+09	60	continental arc	Volume estimate of 736 km <sup>3</sup> for 252 km arc length for past 0.2 Ma. Volume is an estimate of volcano volumes, with no correction for erosion or distal tephtras.	[Patino et al., 2000]
Ethiopia	4.000	28125	7.00E-03	8.93E+07	R	continental rift	Volume of 28,125±5625 km <sup>3</sup> erupted from 5.5 to 1.5 Ma.	[Crisp, 1984]

Guatemala p/100 km	0.084	140	1.7E-03	4.34E+09	60	continental arc	Volume estimate of 163 km <sup>3</sup> for 116 km arc length. Volume is an estimate of volcano volumes, and is fairly uncertain with no correction for erosion or distal tephra. Age constraints from tephrochronology.	[Patino et al., 2000]
Japan	0.250	2020	8.10E-03	1.02E+10	R	oceanic arc	Minimum volume estimate for the past 0.25 Ma	[Crisp, 1984]
Japan	23.000	109400	4.76E-03	9.52E+09	R	oceanic arc	Volume estimated at 109,400±21,900 km <sup>3</sup> based on cones of recent volcanoes, flow thickness maps, and average thickness of older volcanic deposits. Duration updated from Crisp [1984] to conform to Neogene timescale.	[Crisp, 1984]
Kamchatka (silicic)	0.080	840	1.10E-02	1.02E+09	64	continental arc	840±165 km <sup>3</sup> erupted over past 0.08 Ma. Detailed assessment of rates as a function of time and type of volcanism.	[Crisp, 1984; Erlich and Volynets, 1979]

Kenya (phonolites)	2.500	28125	1.20E-02	4.95E+08	R	continental rift	Volume (28,125±9375 km <sup>3</sup> ) from geologic mapping and pre-erosional estimates for past 2.5 Ma, based on K-Ar and <sup>40</sup> Ar/ <sup>39</sup> Ar ages.	[Crisp, 1984]
Kenya (silicic)	2.500	4640	1.90E-03	9.44E+08	R	continental rift	Volume (4640±930 km <sup>3</sup> ) from geologic mapping and pre-erosional estimates for 13.4 to 11 Ma, based on K-Ar and <sup>40</sup> Ar/ <sup>39</sup> Ar ages.	[Crisp, 1984]
Kenya (silicic)	4.500	20600	4.60E-03	9.64E+09	R	continental rift	Volume (20,600±4100 km <sup>3</sup> ) from geologic mapping and pre-erosional estimates for 7 to 2.5 Ma, based on K-Ar and <sup>40</sup> Ar/ <sup>39</sup> Ar ages.	[Crisp, 1984]
Kurile Islands	0.070	300	4.30E-03	1.90E+10	58	oceanic arc	Not corrected for porosity. No details on uncertainty.	[Crisp, 1984]
Kurile Islands p/100km int+ext	83.000	392500	4.75E-03	3.32E+09	58	oceanic arc	Very rough estimate for past 83 Ma.	[Crisp, 1984]
Lesser Antilles p/100 km	0.010	3	3.0E-04	7.65E+08	55	oceanic arc	Detailed volume estimates for individual islands with age constraints from tephrochronology. Volumes adjusted for 100 km of arc length	[Wadge, 1984]

Lesser Antilles p/100 km	0.100	40	4.0E-04	1.02E+09	55	oceanic arc	Detailed volume estimates for individual islands with age constraints from tephrochronology. Volumes adjusted for 100 km of arc length	[Wadge, 1984]
Marianas p/100km	5.000	6370	1.25E-03	1.10E+10	BA	oceanic arc	Very rough estimate for an arc length of 620 km, where an estimated 39,500 km <sup>3</sup> DRE magma was erupted since 5 Ma. Volumes derived from topography, volcanic deposits, and volcanoclastic sediments.	[Crisp, 1984]
Michoacan-Guanajuato	4.000	1090	2.73E-04	6.95E+08	53	continental arc	Volume of cinder cones and shields for past 4 Ma, based on K-Ar dates. calculated assuming symmetrical truncated cones and average flow thickness times mapped area of flow, all corrected to DRE based on vesicularity assumptions. Airfall ash volume was assumed 7.73 times the volume of the associated cone. No corrections made for erosion or burial.	[Hasenaka, 1994]

Michoacan-Guanajuato	0.04	30.5	7.6E-04	1.94E+09	53	continental arc	Same as above except volume of young cinder cones only. Volcanism since 40 ka based on constraints from K-Ar and <sup>14</sup> C.	[Hasenaka, 1994; Hasenaka and Carmichael, 1985]
Mongollon-Datil, New Mexico	17.0	40000	2.35E-03	5.53E+09	R	Continental volcanic field	Volume estimates based on area (20,000 km <sup>2</sup> ) times average thickness of deposits (2-3 km). No correction for DRE or erosion. Period of activity estimated as 37-20 Ma, with some minor activity later. Over 50% of volume estimated as rhyolite, with a range of compositions for the remainder.	[Davis and Hawkesworth, 1995]
North Costa Rica p/100 km	0.1	441	4.41E-03	3.19E+10	60	continental arc	Total arc length is 100 km. Volume estimated from volcano cone volumes, with no correction for erosion or distal tephra. Age constraints from radiometric dates.	[Patino et al., 2000]
North Queensland, Australia	105.000	6550	6.30E-05	1.12E+09	R	continental flood basalt	Period of eruptions was 345 to 240 Ma.	[Crisp, 1984]

San Juan Mountains	4.700	40000	8.51E-03	2.17E+10	60	Continental Volcanic field	Volume estimated from field mapping and includes estimate of eroded volume. K-Ar ages span 34.7 Ma to 30 Ma.	[Lipman, 1984]
Sierra Madre Occidental p/100 km	15.000	48900	3.26E-03	3.8E+08	R	continental rift	Rough estimates of volumes, from reconstructed areal coverage and thickness from detailed stratigraphy, of main field (393 km <sup>3</sup> ) and surrounding smaller fields over a total arc length of 1200 km. Ages constrained loosely to 38-23 Ma with some smaller eruptions as late as 16 Ma.	[Aguirre-Diaz and Labarthe-Hernandez, 2003]
Twin Peaks-Cove Fort-Black Rock- Mineral Mtn	2.320	77	3.30E-05	6.50E+09	R	Continental Volcanic Field	Volume 77±4 km <sup>3</sup> erupted from 2.74±0.1 to 0.42±0.07 Ma based on K-Ar ages	[Crisp, 1984]
Whitsunday, Australia	37	100000	2.7E-03	6.19E+09	R	continental rift	Volume is order-of-magnitude estimate based on outcrop and calculated volume of volcaniclastic sediment. Volcanic and intrusive activity occurred from 132 to 95 Ma, but the main phase of activity was 120 and 105 Ma.	[Bryan et al., 1997]

Yellowstone	2.100	4980	2.37E-03	5.25E+09	74	continental hotspot	Detailed study of 71,000 km <sup>2</sup> region from many years of fieldwork, geologic mapping, volcanic stratigraphy breaking out 3 large volcanic cycles. The estimated volume of all known rhyolites is estimated at 4730 km <sup>3</sup> and basalts 250 km <sup>3</sup> . No formal errors are given. Age constraints from an extensive suite of K-Ar and <sup>40</sup> Ar/ <sup>39</sup> Ar dates from 2.16±0.04 to 0.070±0.002 Ma.	[Christiansen, 2001]
Zitacuaro-Valle de Bravo p/100 km	1.000	115.6	1.16E-04	2.04E+09	60-65	continental arc	Volume estimated from detailed field mapping of uneroded young volcanics broken out by lava type and corrected to DRE. Total of 57.8 km <sup>3</sup> of andesite and dacite was erupted in cones, flows, and tephra. Arc length is 50 km. Extensive suite of dates from <sup>40</sup> Ar/ <sup>39</sup> Ar, K-Ar, and radiocarbon. Rates only for volcanics of past 1.0 Ma.	[Blatter et al., 2001]

Zitacuaro-Valle de Bravo p/100 km	1.000	11.4	1.14E-05	7.76E+07	BA	continental arc	<p>Volume estimated from detailed field mapping of uneroded young volcanics broken out by lava type and corrected to DRE. Total of 5.7 km<sup>3</sup> of basaltic andesite was erupted in cones, flows, and tephra. Arc length is 50 km.</p> <p>Extensive suite of dates from <sup>40</sup>Ar/<sup>39</sup>Ar, K-Ar, and radiocarbon. Rates only for volcanics of past 1.0 Ma.</p>	[Blatter et al., 2001]
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Table 3. Intrusive:Extrusive Ratios

Volcano	Intrusive	Extrusive	Ratio	Method	Reference
Aleutians	1073-1738 km <sup>3</sup> /km	627-985 km <sup>3</sup> /km	1:1-3:1*	Seismic and crystallization of Hidden Bay Pluton and related extrusives	[ <i>Kay and Kay, 1985</i> ]
Bushveld-Rooiberg, South Africa	1x10 <sup>6</sup> km <sup>3</sup>	3x10 <sup>5</sup> km <sup>3</sup>	3:1	Stratigraphic mapping. Cr and incompatible trace element analyses indicate that the total magma volume intruded was approximately 1x10 <sup>6</sup> km <sup>3</sup> .	[ <i>Cawthorn and Walraven, 1998; Schweitzer et al., 1997; Twist and French, 1983</i> ]
Central Andes, Peru	9-29x10 <sup>4</sup> km <sup>3</sup>	2.25x10 <sup>4</sup> km <sup>3</sup>	3:1-12:1	Extrusive from geologic mapping. Intrusive from mapping and gravity.	[ <i>Francis and Hawkesworth, 1994; Haederle and Atherton, 2002</i> ]
Challis Volcanic Field, Idaho	3.5x10 <sup>3</sup> km <sup>3</sup>	4x10 <sup>3</sup> - 2.8x10 <sup>4</sup> km <sup>3</sup>	>1:1-8:1	Very uncertain; Field and stratigraphic mapping; extrusive converted to DRE using 75% porosity; total plutonic thickness unk.	[ <i>Criss et al., 1984</i> ]
Coso Volcanic field, California	2.8 km <sup>3</sup> /Ma (basalt) 5.4 km <sup>3</sup> /Ma (rhyolite)	570 km <sup>3</sup> /Ma	1:200*  1:100*	Extrusive from geologic mapping for past 0.4 Ma; intrusive rate based on current heat flow and estimates of local tectonic extension.	[ <i>Bacon, 1983</i> ]
East Pacific Rise	7 km	0.5-0.8 km	5:1-8:1	Seismic; Stratigraphic Mapping	[ <i>Detrick et al., 1993; Harding et al., 1993; Karson, 2002</i> ]
Etna, Italy (1 Ma)	3x10 <sup>2</sup> km <sup>3</sup>	1x10 <sup>2</sup> km <sup>3</sup>	3:1	Seismic (estimate for ~0.1 Ma)	[ <i>Allard, 1997; Hirn et al., 1991</i> ]
Etna, Italy (since 1975)	0.6 km <sup>3</sup>	5.9 km <sup>3</sup>	10:1	SO <sub>2</sub> flux 1975-1995 AD	

Hawaiian-Emperor Seamount Chain	$5.9 \times 10^6 \text{ km}^3$	$1.1 \times 10^6 \text{ km}^3$	6:1*	Extrusive from topographic maps; intrusive from flexural models and seismic, averaged over the past 74 Ma	[Bargar and Jackson, 1974; Vidal and Bonneville, 2004]
Iceland	5 km	20-40 km	4:1-8:1	Seismic	[Bjarnason et al., 1993; Darbyshire et al., 1998; Menke et al., 1998; Staples et al., 1997]
Kerguelen Archipelago	$9.9 \times 10^4 \text{ km}^3$	$2.75 \times 10^6 \text{ km}^3$	28:1*	Seismic	[Nicolaysen et al., 2000]
Kilauea, Hawaii	$9 \times 10^{-2} \text{ km}^3/\text{a}$	$5 \times 10^{-2} \text{ km}^3/\text{a}$	2:1	Drillhole Stratigraphy; Ground Deformation; Geologic Mapping	[Dvorak and Dzurisin, 1993; Quane et al., 2000]
Long Valley, California	$7.6 \times 10^3 \text{ km}^3$	$7.5 \times 10^2 \text{ km}^3$	10:1	Rough estimate from seismic tomography, stratigraphic mapping, drillholes, and gravity	[Hildreth, 2004; McConnell et al., 1995; Weiland et al., 1995]
Marquesas Islands	$6.2 \times 10^5 \text{ km}^3$	$3.3 \times 10^5 \text{ km}^3$	2:1*	Seismic	[Caress et al., 1995]
Mauna Loa, Hawaii	$8 \times 10^1 \text{ km}^3$	$1.1-2.4 \times 10^2 \text{ km}^3$	>1:1-3:1	Stratigraphic mapping, for the 1877-1950 time period	[Klein, 1982; Lipman, 1995]
Mid-Atlantic Ridge	5.5-7 km	0.5-1.5 km	5:1-10:1	Seismic	[Hooft et al., 2000]
Miyake, Japan	$4 \text{ km}^3$	$1.5 \times 10^{-1} \text{ km}^3$	3:1	Geodetic Modeling; SO <sub>2</sub> emissions	[Kumagai et al., 2001]
Mull Volcano, Scotland	$1.3 \times 10^4 \text{ km}^3$	$7.6 \times 10^3 \text{ km}^3$	2:1	Stratigraphic mapping	[Walker, 1993]
Ninetyeast Ridge	7-8 km	3-4 km	2:1	Seismic	[Grevemeyer et al., 2001; Nicolaysen et al., 2000]

Pinatubo, Philippines	60-125 km <sup>3</sup>	3.7-5.3 km <sup>3</sup>	11:1-34:1	Seismic, Stratigraphic Mapping	[Mori et al., 1996; Wolfe and Hoblitt, 1996]
San Francisco Mountain, Arizona	94 km <sup>3</sup>	500 km <sup>3</sup>	6:1	Geologic mapping, estimated amount of eroded material included, and seismic low-velocity body with a volume of 300-700 km <sup>3</sup> .	[Tanaka et al., 1986]
Twin Peaks, Utah	290-430 km <sup>3</sup>	40-43 km <sup>3</sup>	5:1-9:1	Geologic mapping, gravity and thermal modeling.	[Carrier and Chapman, 1981; Crecraft et al., 1981; Evans et al., 1980]
Yellowstone	6.5x10 <sup>3</sup> km <sup>3</sup>	1.89x10 <sup>4</sup> km <sup>3</sup>	3:1	Seismic; Stratigraphic Mapping	[Christiansen and Blank, 1972; Clawson et al., 1989; Miller and Smith, 1999]

\*values that include crustal underplating

Table 4: Repose Times at Selected Volcanic Centers

Volcano	Repose Time Avg (a)	Repose Min (a)	Repose Max (a)	Number of Reposes in Record	wt % SiO <sub>2</sub> min	wt % SiO <sub>2</sub> max	Refs	Notes
Colima	80	48	138	3	56	61	[ <i>Luhr and Carmichael, 1980</i> ]	four cycles of activity ending with ashflow eruptions since 1576 AD
Etna	4	0.1	100	70	47	50	[ <i>Tanguy, 1979; Wadge, 1977</i> ]	Constrained by historical records from 1536 to 2001 AD
Fogo, Cape Verde	20	1	94	27	40	42	[ <i>Doucelance et al., 2003; Trusdell et al., 1995</i> ]	Constrained by historical records from 1500 to 1995 AD
Fuego	100	10	150	60	49	55	[ <i>Martin and Rose, 1981</i> ]	Constrained by historical records since 1500 AD; eruptions occur in clusters of activity
Izu-Oshima	68	13	190	23	53	57	[ <i>Koyama and Hayakawa, 1996</i> ]	Detailed syn- and post-caldera eruptive history from tephra and loess stratigraphy; repose since caldera formation.
Katla	46	13	80	20	46	50	[ <i>Larsen, 2000</i> ]	Last 11 centuries; constrained by historical records
Kilauea	0.8	0.1	10	46	48	50	[ <i>Klein, 1982</i> ]	Constrained by historical records from 1918 to 1979 AD
Mauna Loa	5	0.1	20	34	48	50	[ <i>Klein, 1982</i> ]	Constrained by historical records from 1843 to 1984 AD

Mt Adams	150000	50000	320000	3	57	64	[ <i>Hildreth and Fierstein, 1997; Hildreth and Lanphere, 1994</i> ]	Major cone building episodes since 500 ka.
Mt St Helens	8600	5000	15000	6	63	67	[ <i>Doukas, 1990; Mullineaux, 1996</i> ]	From 40 ka to present, major eruptive cycles only
Ruapehu	30000	10000	60000	5	55	65	[ <i>Gamble et al., 2003</i> ]	Constrained by $^{40}\text{Ar}/^{39}\text{Ar}$ ages
Santorini	30000	17000	40000	12	58	71	[ <i>Druitt et al., 1999</i> ]	For major explosive volcanism since 360 ka. Both $^{40}\text{Ar}/^{39}\text{Ar}$ and K-Ar ages 2or older units, radiocarbon ages 2or younger
Taupo	2000	20	6000	28	72	76	[ <i>Sutton et al., 2000</i> ]	Post-Oruanui eruptions from 26.5 ka to present
Toba	375000	340000	430000	3	68	77	[ <i>Chesner and Rose, 1991</i> ]	Reposes between tuff-forming eruptions since 0.8 Ma
Valles	335000	320000	350000	3	69	75	[ <i>Doell et al., 1968; Heiken et al., 1990</i> ]	Reposes based on eruption of Bandelier and pre-Bandelier tuff, and collapse of Toledo and Valles calderas.
Yatsugatake	32000	10000	85000	5	53	63	[ <i>Kaneoka et al., 1980; Oishi and Suzuki, 2004</i> ]	Plinian eruptions since 0.2 Ma. Tephrochronology and radiocarbon ages.
Yellowstone	700000	600000	800000	3	75	79	[ <i>Christiansen, 2001</i> ]	Considers major tuff-forming eruptions.