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Compilation of Disruptions to Airports by Volcanic Activity (Version 1.0, 1944–2006)

By Marianne Guffanti, Gari C. Mayberry, Thomas J. Casadevall, and Richard Wunderman

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U.S. Geological Survey, Reston, Virginia: 2007

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Compilation of Disruptions to Airports by Volcanic Activity (Version 1.0, 1944-2006)

By Marianne Guffanti,[1] Gari C. Mayberry,[2] Thomas J. Casadevall,[3] and Rick Wunderman[4]

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Overview

Volcanic activity has caused significant hazards to numerous airports worldwide, with local to far-ranging effects on travelers and commerce (Guffanti and others, 2004; Casadevall, 1993). To more fully characterize the nature and scope of volcanic hazards to airports, we collected data on incidents of airports throughout the world that have been affected by volcanic activity, beginning in 1944 with the first documented instance of damage to modern aircraft and facilities in Naples, Italy, and extending through 2006. Information was gleaned from various sources, including news outlets, volcanological reports (particularly the Smithsonian Institution's Bulletin of the Global Volcanism Network), and previous publications on the topic (see Data References).

This report presents the full compilation of the data collected. For each incident, information about the affected airport and the volcanic source has been compiled as a record in a Microsoft Access database. The database is incomplete in so far as incidents may not have not been reported or documented, but it does present a good sample from diverse parts of the world. Not included are en-route diversions to avoid airborne ash clouds at cruise altitudes. For publication, the database has been converted to a Microsoft Excel spreadsheet (Table 1), a format with which most users are likely to be familiar.

Analysis of the database reveals that, at a minimum, 101 airports in 28 countries were impacted on 171 occasions from 1944 through 2006 by eruptions at 46 volcanoes. The number

of affected airports (101) probably is better constrained than the number of incidents (171) because recurring disruptions at a given airport may have been lumped together or not reported by news agencies, whereas the initial disruption likely is noticed and reported and thus the airport correctly counted.

The types of hazardous volcanic activity that have affected airports are ashfall, ash in airspace around airports, lava flows, pyroclastic flows, and phreatic explosions. The primary hazard to airports is ashfall, which can cause loss of visibility, create slippery runways, infiltrate communication and electrical systems, interrupt ground services, and damage buildings and parked airplanes. Large amounts of ashfall are not necessary to disrupt operations at airports; temporary airport closures have resulted from accumulation of as little as a few millimeters of ash.

The effects of volcanic activity on airports include disruption of operations, damage to aircraft, and damage to facilities. The most common effect is temporary operational disruption, ranging from flight cancellations to airport closures for hours to weeks. Rarely, buildings, runways, and other physical infrastructure are destroyed or airports permanently closed. The risks are not restricted to airports located close to volcanoes, but can affect airports many hundreds of kilometers away. The size of affected airports varies from major international airports handling thousands of passengers and substantial cargo tonnages per day to regional airfields that, while much smaller, nevertheless are critical transportation infrastructure in some countries.

More detailed analysis of the database and discussion of methods to mitigate the adverse effects of volcanic activity on airports are presented in Guffanti and others (2008).

Database Fields

Incident #:	Unique identifier for each incident, assigned in this study
City/Airport:	City, town, or military base in which airport is located/airport name
Country1:	Country in which the airport is located
APLat:	Airport latitude in decimal degrees; negative values indicate location in the southern hemisphere
APLong:	Airport longitude in decimal degrees; negative values indicate location west of Prime Meridian (which runs through Greenwich, England)
Dist, km:	Distance between location of airport and location of source volcano, calculated in this study using APLat, APLong, VLat, and VLong
Erupt Date Y/M/D:	Date, as year/month/day, of eruption that caused the airport incident

VEI:	Volcanic Explosivity Index (VEI) of eruptive activity that affected an airport, generally taken from the Smithsonian Institution's online global volcanism database which can be queried at http://www.volcano.si.edu/
Volcano:	Name of volcano that caused the airport incident (source volcano)
VNum:	Unique identifying number assigned to each of the world's volcanoes by the Smithsonian Institution's Global Volcanism Program.
VLat:	Volcano latitude in decimal degrees; negative values indicate location in the southern hemisphere
VLong:	Volcano longitude in decimal degrees; negative values indicate location west of Prime Meridian (which runs through Greenwich, England)
Country2:	Country in which the source volcano is located
Comment:	Brief summary of the effects on the airport
Hazard:	Type of hazard at airport – AF, ashfall; AA, airborne ash; PF, pyroclastic flow; LF, lava flow; EX, phreatic or magmatic explosion; GD, ground deformation (inflation, subsidence, faulting).
Days closed:	Number of days (if known) an airport may have been closed
References:	Data references

Database Updates

This report, published only as an online document, will be updated in future years. The compilation for the years 1944 through 2006 is identified in the report title as version 1.0. In future updates, the Open-File Report number will remain the same, while the version number will change to indicate the revised time period for which data is compiled. If any reader knows of inaccuracies in the data or has additional data and information to contribute, please contact the first author at guffanti@usgs.gov.

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Prior to 1986, some issues of BGVN were known as the Scientific Event Alert Network (SEAN)

1982 (07:03)
1986 (11:03)
1991 (16:04)
1991 (16:08)
1991 (16:10)
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SEAN 1983 (08:09)
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SEAN 1986 (11:09)

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R. Stewart pers. comm. 2005
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Table 1. Compilation of Disruptions to Airports by Volcanic Activity (Version 1.0, 1944-2006)
By M. Guffanti, G.C. Mayberry, T.J. Casadevall, R. Wunderman. Data fields explained in report text. (AP=Airport)

Incident #	City/Airport	Country1	APLat	APLong	Dist, km	Erupt Date Y/M/D	VEI	Volcano	VNum	VLat	VLong
2006AP-5.2	Catania/Sigonella Naval Air Station	Italy (USN base)	37.40	14.92	38	2006/11/24-12/16	2?	Etna	0101-06	37.734	15.004
2006AP-5.1	Catania/Fontanarossa Intl AP	Italy	37.467	15.067	30	2006/11/24-12/16	2?	Etna	0101-06	37.734	15.004
2006AP-4.1	Kokopo/Tokua AP	Papua New Guinea	-4.340	152.380	21	2006/10/07-10	3	Rabaul	0502-14	-4.271	152.203
2006AP-3.6	Manta/Manta AP	Ecuador (US base)	-0.95	-80.683	256	2006/08/16-17	4	Tungurahua	1502-08	-1.467	-78.442
2006AP-3.5	Riobamba/Riobamba AP	Ecuador	-1.40	-78.38	10	2006/08/16-17	4	Tungurahua	1502-08	-1.467	-78.442
2006AP-3.4	Latacunga/Cotopaxi Intl AP	Ecuador	0.933	-78.62	268	2006/08/16-17	4	Tungurahua	1502-08	-1.467	-78.442
2006AP-3.3	Ambato/Ambato AP	Ecuador	-1.2	-78.57	33	2006/08/16-17	4	Tungurahua	1502-08	-1.467	-78.442
2006AP-3.2	Quito/Mariscal Sucre Intl AP	Ecuador	-0.133	-78.483	148	2006/08/16-17	4	Tungurahua	1502-08	-1.467	-78.442
2006AP-3.1	Guayaquil/Simon Bolvar AP	Ecuador	-2.167	-79.867	177	2006/08/16-17	4	Tungurahua	1502-08	-1.467	-78.442
2006AP-2.5	Caracas/Ciudad Bolivar AP	Venezuela	8.13	-68.53	1175	2006/05/20-21	4	Soufriere Hills	1600-05	16.72	-62.18
2006AP-2.4	Oranjestad/Queen Beatrix Intl AP	Netherlands (Aruba)	12.5	-70.012	965	2006/05/20-21	4	Soufriere Hills	1600-05	16.72	-62.18
2006AP-2.3	Curacao/Hato AP	Netherlands Antilles	12.2	-68.97	887	2006/05/20-21	4	Soufriere Hills	1600-05	16.72	-62.18
2006AP-2.2	Havana/Jose Marti Intl AP	Cuba	23.02	-82.38	2224	2006/05/20-21	4	Soufriere Hills	1600-05	16.72	-62.18
2006AP-2.1	Santo Domingo/AP de las Americas	Dominican Republic	18.47	-69.9	841	2006/05/20-21	4	Soufriere Hills	1600-05	16.72	-62.18
2006AP-1.1	Anchorage/Anchorage Intl AP	USA	61.167	-149.983	275	2006/01/13-17	1	Augustine	1103-01	59.37	-153.42
2005AP-9.1	Pasto/Pasto Cano AP	Colombia	1.467	-77.25	31	2005/11/24	2	Galeras	1501-08	1.22	-77.37
2005AP-8.1	Saipan/Saipan Intl AP	USA (CNMI)	15.13	145.7	136	2005/08/01-05	1	Anatahan	0804-20	16.35	145.67
2005AP-7.1	Colima/Colima AP	Mexico	19.3	-103.667	24	2005/05/31	3	Colima	1401-04	19.514	-103.62
2005AP-6.1	Kalibo/Kalibo AP	Philippines	11.7	122.37	166	2005/05/03	1	Canlaon	0702-02	10.412	123.132
2005AP-5.1	Moroni/Hahaya-Iconi AP	Comoros	-11.7	43.233	17	2005/04/16-18	3	Karthala	0303-01	-11.75	43.38
2005AP-4.1	Saipan/Saipan Intl AP	USA (CNMI)	15.13	145.7	136	2005/04/06	3	Anatahan	0804-20	16.35	145.67
2005AP-3.1	Kokopo/Tokua AP	Papua New Guinea	-4.340	152.380	21	2005/02/22-24	2	Rabaul	0502-14	-4.271	152.203
2005AP-2.1	Saipan/Saipan Intl AP	USA (CNMI)	15.13	145.7	136	2005/02/14	1	Anatahan	0804-20	16.35	145.67
2005AP-1.1	Kokopo/Tokua AP	Papua New Guinea	-4.340	152.380	33	2005/01/27	4	Manam	0501-02	-4.1	145.061
2004AP-6.1	Reykjavik/Keflavik AP	Iceland	63.983	-22.6	260	2004/11/01-04	4	Grimsvotn	1703-01	64.42	-17.33
2004AP-5.1	Boram/ Wewak AP	Papua New Guinea	-3.598	143.667	950	2004/10/24	4	Manam	0501-02	-4.08	145.037
2004AP-4.1	Yokota Air Base	Japan (US base)	35.75	139.35	103	2004/09/13-16	2	Asama	0803-11	36.4	138.53
2004AP-3.1	Maumere/Waioty AP	Indonesia	-8.633	122.25	22	2004/09/06?	2	Egon	0604-16	-8.67	122.45
2004AP-2.1	Sangihe/Tahuna AP	Indonesia	-1.183	123.817	571	2004/06/08-09	2	Awu	0607-04	3.67	125.50
2004AP-1.1	Ust-Kamchatsk	Russia	unknown	unknown		2004/05/09	4	Sheveluch	1000-27	56.63	161.32
2003AP-5.4	Cuenca/Mariscal La Mar AP	Ecuador	-2.9	-78.967	170	2003/08/27	2	Tungurahua	1502-08	-1.467	-78.442
2003AP-5.3	Quito/Mariscal Sucre Intl AP	Ecuador	-0.133	-78.483	148	2003/08/27	2	Tungurahua	1502-08	-1.467	-78.442
2003AP-5.2	Ambato/Ambato AP	Ecuador	-1.2	-78.57	33	2003/08/27	2	Tungurahua	1502-08	-1.467	-78.442
2003AP-5.1	Guayaquil/Simon Bolivar AP	Ecuador	-2.167	-79.867	177	2003/08/27	2	Tungurahua	1502-08	-1.467	-78.442
2003AP-4.7	St. Kitts/St. Kitts AP	St. Kitts	17.2	-62.7	77	2003/07/12-13	3	Soufriere Hills	1600-05	16.72	-62.18
2003AP-4.6	Unspecified AP on Anguilla	UK (Anguilla)	?	?		2003/07/12-13	3	Soufriere Hills	1600-05	16.72	-62.18
2003AP-4.5	San Juan/Luis Munoz Marin Intl AP	USA (Puerto Rico)	18.45	-66	448	2003/07/12-13	3	Soufriere Hills	1600-05	16.72	-62.18
2003AP-4.4	St. Thomas/Cyril King AP	USA (Virgin Islands)	18.333	-64.967	346	2003/07/12-13	3	Soufriere Hills	1600-05	16.72	-62.18

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Incident #	City/Airport	Country1	APLat	APLong	Dist, km	Erupt Date Y/M/D	VEI	Volcano	VNum	VLat	VLong
2003AP-4.3	Sint Maarten/Princess Juliana Intl AP	Netherlands Antilles	18.05	-63.117	178	2003/07/12-13	3	Soufriere Hills	1600-05	16.72	-62.18
2003AP-4.2	Unspecified AP on Guadeloupe	France (Guadeloupe)	unknown	unknown		2003/07/12-13	3	Soufriere Hills	1600-05	16.72	-62.18
2003AP-4.1	Roseau/Cane Field AP	Dominica	15.5	-61.3	165	2003/07/12-13	3	Soufriere Hills	1600-05	16.72	-62.18
2003AP-3.2	Guam/Guam Intl AP	USA (Guam)	13.4	144.73	343	2003/05/23	3	Anatahan	0804-20	16.35	145.67
2003AP-3.1	Saipan/Saipan Intl AP	USA (CNMI)	15.13	145.7	136	2003/05/23	3	Anatahan	0804-20	16.35	145.67
2003AP-2.1	San Juan/Luis Munoz Marin Intl AP	USA (Puerto Rico)	18.45	-66	448	2003/03/17	3	Soufriere Hills	1600-05	16.72	-62.18
2003AP-1.1	Kokopo/Tokua AP	Papua New Guinea	-4.340	152.380	21	2003/01/01-31	2	Rabaul	0502-14	-4.271	152.203
2002AP-6.1	Quito/Mariscal Sucre Intl AP	Ecuador	-0.133	-78.483	92	2002/11/03	4	Reventador	1502-01	-0.078	-77.656
2002AP-5.3	Catania/Fontanorossa Intl AP	Italy	37.067	15.067	30	2002/10/27-2003/01/28	3	Etna	0101-06	37.734	15.004
2002AP-5.2	Reggio di Calabria/ Reggio di Calabria AP	Italy	38.067	15.65	68	2002/10/27-2003/01/28	3	Etna	0101-06	37.734	15.004
2002AP-5.1	Catania/Sigonella Naval Air Station	Italy (USN base)	37.40	14.92	38	2002/10/27-2003/01/28	3	Etna	0101-06	37.734	15.004
2002AP-4.1	Kokopo/Tokua AP	Papua New Guinea	-4.340	152.380	21	2003/10/20+	2	Rabaul	0502-14	-4.271	152.203
2002AP-3.1	Roosevelt Roads NAS	USA (Puerto Rico)	18.26	-65.64	405	2002/09/30	3	Soufriere Hills	1600-05	16.72	-62.18
2002AP-2.1	Kimbe/Hoskins AP	Papua New Guinea	-5.462	150.405	18	2002/08/05	3	Pago	0502-08	-5.58	150.52
2002AP-1.1	Goma/Goma AP	D.R. Congo	-1.667	29.233	16	2002/01/17-21	1	Nyiragongo	0203-03	-1.52	29.25
2001AP-5.4	St. Thomas/Cyril King AP	USA (Virgin Islands)	18.333	-64.967	346	2001/07/29	3	Soufriere Hills	1600-05	16.72	-62.18
2001AP-5.3	San Juan/Luis Munoz Marin Intl AP	USA (Puerto Rico)	18.45	-66	449	2001/07/29	3	Soufriere Hills	1600-05	16.72	-62.18
2001AP-5.2	St. Croix/Alex. Hamilton AP	USA (Virgin Islands)	17.717	-64.783	298	2001/07/29	3	Soufriere Hills	1600-05	16.72	-62.18
2001AP-5.1	Sint Maarten/Princess Juliana Intl AP	Netherlands Antilles	18.05	-63.117	178	2001/07/29	3	Soufriere Hills	1600-05	16.72	-62.18
2001AP-4.1	Catania/Fontanarossa Intl AP	Italy	37.467	15.067	30	2001/07/21-30	3	Etna	0101-06	37.734	15.004
2001AP-3.1	Mexico City/Benito Juarez Intl AP	Mexico	19.433	-99.083	67	2001/07/03	3	Popcatepetl	1401-09	19.023	-98.622
2001AP-2.1	Legaspi/Legaspi AP	Philippines	13.167	123.733	11	2001/06/23-29	3	Mayon	0703-03	13.257	123.685
2001AP-1.1	Manado/Sam Ratulangi AP	Indonesia	1.533	124.917	24	2001/05/20	2	Lokon	0606-10	1.358	124.792
2000AP-6.1	Miyakejima/Miyakejima AP	Japan	34.067	139.567	4	2000/08/18	3	Miyake-jima	0804-04	34.08	139.53
2000AP-5.1	Tauranga/Tauranga AP	New Zealand	-37.667	176.2	88	2000/07/19	3	White Island	0401-04	-37.52	177.18
2000AP-4.2	Catania/Sigonella Naval Air Station	Italy (USN base)	37.40	14.92	38	2000/06/05	3	Etna	0101-06	37.734	15.004
2000AP-4.1	Catania/Fontanarossa Intl AP	Italy	37.467	15.067	30	2000/06/05	3	Etna	0101-06	37.734	15.004
2000AP-3.1	Legaspi/Legaspi AP	Philippines	13.167	123.733	11	2000/02/23-24	3	Mayon	0703-03	13.257	123.685
2000AP-2.2	Riobamba/Riobamba AP	Ecuador	-1.40	-78.38	10	2000/02/08	2	Tungurahua	1502-08	-1.467	-78.442
2000AP-2.1	Ambato/Ambato AP	Ecuador	-1.2	-78.567	33	2000/02/08	2	Tungurahua	1502-08	-1.467	-78.442
2000AP-1.1	Guatemala City/La Aurora Intl AP	Guatemala	14.567	-90.533	22	2000/01/16	1	Pacaya	1402-11	14.381	-90.601
1999AP-3.1	Quito/Mariscal Sucre Intl AP	Ecuador	-0.133	-78.483	13	1999/11/24	3	Pichincha	1502-02	-0.171	-78.598
1999AP-2.1	Quito/Mariscal Sucre Intl AP	Ecuador	-0.133	-78.483	13	1999/10/05-07	3	Pichincha	1502-02	-0.171	-78.598
1999AP-1.1	Guatemala City/La Aurora Intl AP	Guatemala	14.567	-90.533	39	1999/05/21	2	Fuego	1402-09	14.473	-90.880
1998AP-4.1	Mexico City/Benito Juarez Intl AP	Mexico	19.433	-99.083	67	1998/12/20	3	Popcatepetl	1401-09	19.023	-98.622
1998AP-3.1	Guatemala City/La Aurora Intl AP	Guatemala	14.567	-90.533	22	1998/09/18-19	3	Pacaya	1402-11	14.381	-90.601
1998AP-2.1	Catania/Fontanarossa Intl AP	Italy	37.467	15.067	30	1998/07/22	3	Etna	0101-06	37.734	15.004
1998AP-1.1	Guatemala City/La Aurora Intl AP	Guatemala	14.567	-90.533	22	1998/05/20	3	Pacaya	1402-11	14.381	-90.601

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Incident #	City/Airport	Country1	APLat	APLong	Dist, km	Erupt Date Y/M/D	VEI	Volcano	VNum	VLat	VLong
1997AP-5.1	Saint John's/V.C. Bird Intl AP	Antigua	17.05	-61.8	55	1997/09/07	3	Soufriere Hills	1600-05	16.72	-62.18
1997AP-4.1	Mexico City/Benito Juarez Intl AP	Mexico	19.433	-99.083	67	1997/06/30	3	Popocatepetl	1401-09	19.023	-98.622
1997AP-3.1	Plymouth/W. H. Bramble AP	UK (Montserrat)	16.732	-62.177	1	1997/06/25	3	Soufriere Hills	1600-05	16.72	-62.18
1997AP-2.1	Plymouth/W. H. Bramble AP	UK (Montserrat)	16.732	-62.177	1	1997/06/17	3	Soufriere Hills	1600-05	16.72	-62.18
1997AP-1.1	Kokopo/Tokua AP	Papua New Guinea	-4.340	152.380	21	1997/03/14	2	Rabaul	0502-14	-4.271	152.203
1996AP-3.1	Unspecified AP on Guadeloupe	France (Guadeloupe)	unknown	unknown		1996/09/17	3	Soufriere Hills	1600-05	16.72	-62.18
1996AP-2.1	Plymouth/W. H. Bramble AP	UK (Montserrat)	16.732	-62.177	1	1996/09/02-03	3	Soufriere Hills	1600-05	16.72	-62.18
1996AP-1.11	Palmerston North/Palmerston N AP	New Zealand	-40.317	175.617	115	1996/06-08	3	Ruapehu	0401-10	-39.28	175.57
1996AP-1.10	New Plymouth/New Plymouth AP	New Zealand	-39.033	174.183	123	1996/06-08	3	Ruapehu	0401-10	-39.28	175.57
1996AP-1.09	Wanganui/Wanganui AP	New Zealand	-39.967	175.017	90	1996/06-08	3	Ruapehu	0401-10	-39.28	175.57
1996AP-1.08	Gisborne/Gisborne AP	New Zealand	-38.67	177.98	219	35224	3	Ruapehu	0401-10	-39.28	175.57
1996AP-1.07	Taupo/Taupo AP	New Zealand	-38.667	176.133	87	1996/06-08	3	Ruapehu	0401-10	-39.28	175.57
1996AP-1.06	Napier/Hastings AP	New Zealand	-39.47	176.87	114	1996/06-08	3	Ruapehu	0401-10	-39.28	175.57
1996AP-1.05	Whakatane/Whakatane AP	New Zealand	-37.933	176.933	191	1996/06-08	3	Ruapehu	0401-10	-39.28	175.57
1996AP-1.04	Hamilton/Hamilton AP	New Zealand	-37.867	175.133	159	1996/06-08	3	Ruapehu	0401-10	-39.28	175.57
1996AP-1.03	Tauranga/Tauranga AP	New Zealand	-37.667	176.2	88	1996/06-08	3	Ruapehu	0401-10	-39.28	175.57
1996AP-1.02	Rotorua/Rotorua AP	New Zealand	-38.15	176.27	120	1996/06/17	3	Ruapehu	0401-10	-39.28	175.57
1996AP-1.01	Auckland/Auckland Intl AP	New Zealand	-36.867	174.767	277	1996/06/17	3	Ruapehu	0401-10	-39.28	175.57
1995AP-3.1	Plymouth/W. H. Bramble AP	UK (Montserrat)	16.732	-62.177	1	1995/10/21	3	Soufriere Hills	1600-05	16.72	-62.18
1995AP-2.9	Palmerston North/Palmerston N AP	New Zealand	-40.317	175.617	115	1995/09-10	3	Ruapehu	0401-10	-39.28	175.57
1995AP-2.8	Rotorua/Rotorua AP	New Zealand	-38.15	176.27	120	1995/09-10	3	Ruapehu	0401-10	-39.28	175.57
1995AP-2.7	Taupo/Taupo AP	New Zealand	-38.667	176.133	87	1995/09-10	3	Ruapehu	0401-10	-39.28	175.57
1995AP-2.6	Wanganui/Wanganui AP	New Zealand	-39.967	175.017	90	1995/09-10	3	Ruapehu	0401-10	-39.28	175.57
1995AP-2.5	Hamilton/Hamilton AP	New Zealand	-37.867	176.133	159	1995-09-10	3	Ruapehu	0401-10	-39.28	175.57
1995AP-2.4	Whakatane/Whakatane AP	New Zealand	-37.933	176.933	191	1995/09-10	3	Ruapehu	0401-10	-39.28	175.57
1995AP-2.3	Tauranga/Tauranga AP	New Zealand	-37.667	176.2	88	1995/09-10	3	Ruapehu	0401-10	-39.28	175.57
1995AP-2.2	Napier/Hastings AP	New Zealand	-39.47	176.87	114	1995/10/14	3	Ruapehu	0401-10	-39.28	175.57
1995AP-2.1	Gisborne/Gisborne AP	New Zealand	-38.67	177.98	219	1995/10/11-12	3	Ruapehu	0401-10	-39.28	175.57
1995AP-1.1	Puebla/Puebla-Hermanos Serdan AP	Mexico	19.135	-98.368	29	1995/01/27	2	Popcatepetl	1401-09	19.023	-98.622
1994AP-2.2	Neuquen/Neuquen AP	Argentina	-38.95	-68.133	313	1994/05/17	2	Llaima	1507-11	-38.692	-71.729
1994AP-1.2	Rabaul/Rabaul AP	Papua New Guinea	-4.2I4	152.186	7	1994/09/19	4	Rabaul	0502-14	-4.271	152.203
1994AP-1.1	Kavieng/Kavieng AP	Papua New Guinea	-2.579	150.808	244	1994/09/19	4	Rabaul	0502-14	-4.271	152.203
1993AP-2.1	Pasto/Pasto Cano AP	Colombia	1.467	-77.25	31	1993/06/07	2	Galeras	1501-08	1.22	-77.37
1993AP-1.4	Salta/Salta AP	Argentina	-24.85	-65.483	281	1993/04/18-21	4	Lascar	1505-10	-23.37	-67.73
1993AP-1.3	Cordoba/Cordoba AP	Argentina	-31.317	-64.217	949	1993/04/18-21	4	Lascar	1505-10	-23.37	-67.73
1993AP-1.2	Asuncion/Presidente Gen Stroessner AP	Paraguay	-25.267	-57.667	1041	1993/04/18-21	4	Lascar	1505-10	-23.37	-67.73
1993AP-1.1	Jujuy/El Cadillal AP	Argentina	-24.233	-65.267	268	1993/04/18-21	4	Lascar	1505-10	-23.37	-67.73
1992AP-2.4	Kenai/Kenai Municipal AP	USA	60.583	-152.15	35	1992/08/18	4	Spurr	1103-04	61.3	-152.75

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Incident #	City/Airport	Country1	APLat	APLong	Dist, km	Erupt Date Y/M/D	VEI	Volcano	VNum	VLat	VLong
1992AP-2.3	Anchorage/Merrill Field	USA	61.2	-149.833	130	1992/08/18	4	Spurr	1103-04	61.30	-152.25
1992AP-2.2	Anchorage/Elmendorf AFB	USA	61.253	-149.792	131	1992/08/18	4	Spurr	1103-04	61.30	-152.25
1992AP-2.1	Anchorage/Anchorage Intl AP	USA	61.167	-149.983	122	1992/08/18	4	Spurr	1103-04	61.30	-152.25
1992AP-1.1	Kagoshima/Kagoshima AP	Japan	31.55	130.567	10	1992/06/06	3	Sakurajima	0802-08	31.58	130.67
1991AP-6.2	Medan/Polonia AP	Indonesia	3.567	98.683	2911	1991/10/24	3	Lokon	0606-10	1.358	124.792
1991AP-6.1	Manado/Sam Ratulangi AP	Indonesia	1.533	124.917	24	1991/10/24	3	Lokon	0606-10	1.358	124.792
1991AP-5.5	Stanley/Mt. Pleasant Airfield	UK (Falkland Islands)	-51.82	-58.45	1247	1991/08/12-15	5	Hudson	1508-057	-45.90	-72.97
1991AP-5.4	Mar del Plata/ Mar del Plata AP	Argentina	-37.933	-57.567	1548	1991/08/12-15	5	Hudson	1508-057	-45.90	-72.97
1991AP-5.3	Puerto Julian/San Julian AP	Argentina	-49 .25	-67.8	537	1991/08/12-15	5	Hudson	1508-057	-45.90	-72.97
1991AP-5.2	Puerto Deseado/Puerto Deseado AP	Argentina	-47.717	-65.917	573	1991/08/12-15	5	Hudson	1508-057	-45.90	-72.97
1991AP-5.1	Comodoro Rivadavia/C. Rivadavia AP	Argentina	-45.783	-67.467	427	1991/08/12-15	5	Hudson	1508-057	-45.90	-72.97
1991AP-4.1	Manila/Ninoy Aquino Intl AP	Philippines	14.517	121.017	99	1991/07/17	6	Pinatubo	0703-083	15.13	120.35
1991AP-3.7	Manila/Ninoy Aquino Intl AP	Philippines	14.517	121.017	99	1991/06/12-15	6	Pinatubo	0703-083	15.13	120.35
1991AP-3.6	Sangley Point Air Base	Philippines	14.5	120.9	92	1991/06/12-15	6	Pinatubo	0703-083	15.13	120.35
1991AP-3.5	Cubi Point Naval Air Station	Philippines (US base)	14.78	120.27	40	1991/06/12-15	6	Pinatubo	0703-083	15.13	120.35
1991AP-3.4	Clark Air Base	Philippines (US base)	15.183	120.533	21	1991/06/12-15	6	Pinatubo	0703-083	15.13	120.35
1991AP-3.3	Basa Air Base	Philippines	15	120.5	22	1991/06/12-15	6	Pinatubo	0703-083	15.13	120.35
1991AP-3.2	Legaspi/Legaspi AP	Philippines	13.167	123.733	425	1991/06/12-15	6	Pinatubo	0703-083	15.13	120.35
1991AP-3.1	Puerto Princesa/Puerto Princesa AP	Philippines	9.733	118.75	625	1991/06/12-15	6	Pinatubo	0703-083	15.13	120.35
1991AP-2.1	Kumamoto/Kumamoto AP	Japan	32.8	130.77	44	1991/06/03	1	Unzen	0802-10	32.75	130.30
1991AP-1.1	Colima/Colima AP	Mexico	19.3	-103.667	24	1991/04/16	2	Colima	1401-04	19.514	-103.62
1990AP-3.1	Kagoshima/Kagoshima AP	Japan	31.55	130.567	10	1990/03/11	3	Sakurajima	0802-08	31.58	130.67
1990AP-2.1	Anchorage/Anchorage Intl AP	USA	61.167	-149.983	168	1990/02/21,28	3	Redoubt	1103-03	60.48	-152.75
1990AP-1.1	Kenai/Kenai Municipal AP	USA	60.583	-152.15	35	1990/01/08	3	Redoubt	1103-03	60.48	-152.75
1989AP-1.1	Anchorage/Anchorage Intl AP	USA	61.167	-149.983	168	1989/12/15	3	Redoubt	1103-03	60.48	-152.75
1986AP-2.1	Catania/Fontanarossa Intl AP	Italy	37.467	15.067	30	1986/09/24	2	Etna	0101-06	37.734	15.004
1986AP-1.1	Anchorage/Anchorage Intl AP	USA	61.167	-149.983	275	1986/03/27-31	4	Augustine	1103-01	59.37	-153.42
1984AP-2.1	Legaspi/Legaspi AP	Philippines	13.167	123.733	11	1984/09/23-24	3	Mayon	0703-03	13.257	123.685
1984AP-1.2	Gorontola/Tolotio AP	Indonesia	0.65	122.917	207	1984/05/24-26	3	Soputan	0606-03	1.108	124.725
1984AP-1.1	Manado/Sam Ratulangi AP	Indonesia	1.533	124.917	52	1984/05/24-26	3	Soputan	0606-03	1.108	124.725
1983AP-2.1	Miyakejima/Miyakejima AP	Japan	34.067	139.567	4	1983/10/03	3	Miyake-jima	0804-04	34.08	139.53
1983AP-1.1	AP west of Gamalama	Indonesia	unknown	unknown		1983/08/09	3	Gamalama	0608-06	0.80	127.325
1982AP-2.4	Bandung/Husein Sastranegara AP	Indonesia	-6.901	107.577	65	1982/04/5-1983/01/08	4	Galunggung	0603-14	-7.25	108.05
1982AP-2.3	Bandung/Husein Sastranegara AP	Indonesia	-6.901	107.577	65	1982/04/5-1983/01/08	4	Galunggung	0603-14	-7.25	108.05
1982AP-2.2	Bandung/Husein Sastranegara AP	Indonesia	-6.901	107.577	65	1982/04/5-1983/01/08	4	Galunggung	0603-14	-7.25	108.05
1982AP-2.1	Bandung/Husein Sastranegara AP	Indonesia	-6.901	107.577	65	1982/04/5-1983/01/08	4	Galunggung	0603-14	-7.25	108.05
1982AP-1.2	Tuxtla Gutierrez/Llano San Juan AP	Mexico	16.75	-93.12	69	1982/04/03	5	El Chichon	1401-12	17.360	-93.228
1982AP-1.1	Villahermosa/C.R.Rovirosa Perez Intl AP	Mexico	17.99	-92.98	75	1982/04/03	5	El Chichon	1401-12	17.360	-93.228

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Incident #	City/Airport	Country1	APLat	APLong	Dist, km	Erupt Date Y/M/D	VEI	Volcano	VNum	VLat	VLong
1980AP-3.1	Portland/Portland Intl AP	USA	45.583	-122.6	76	1980/06/12	5	St. Helens	1201-05	46.20	-122.18
1980AP-2.1	Portland/Portland Intl AP	USA	45.583	-122.6	76	1980/05/25	5	St. Helens	1201-05	46.20	-122.18
1980AP-1.6	Spokane/Fairchild AFB	USA	47.626	-117.644	351	1980/05/18	5	St. Helens	1201-05	46.20	-122.18
1980AP-1.5	Spokane/Spokane Intl AP	USA	47.633	-117.533	387	1980/05/18	5	St. Helens	1201-05	46.20	-122.18
1980AP-1.4	Moses Lake/Grant County AP	USA	47.095	-119.261	244	1980/05/18	5	St. Helens	1201-05	46.20	-122.18
1980AP-1.3	Yakima/Yakima Air Terminal	USA	46.567	-120.533	133	1980/05/18	5	St. Helens	1201-05	46.20	-122.18
1980AP-1.2	Pullman/Pullman Moscow Regional AP	USA	46.75	-117.117	393	1980/05/18	5	St. Helens	1201-05	46.20	-122.18
1980AP-1.1	Missoula/Missoula Intl AP	USA	46.917	-114.083	624	1980/05/18	5	St. Helens	1201-05	46.20	-122.18
1979AP-1.1	Catania/Fontanarossa Intl AP	Italy	37.467	15.067	30	1979/08/03	2	Etna	0101-06	37.734	15.004
1976AP-1.1	Anchorage/Anchorage Intl AP	USA	61.167	-149.983	275	1976/01/23-25	4	Augustine	1103-01	59.37	-153.42
1971AP-1.1	Kagoshima/Kagoshimna AP	Japan	31.55	130.567	10	1971/09/09	3	Sakurajima	0802-08	31.58	130.67
1963AP-2.1	Surabaya/Surabaya-Juanda Intl AP	Indonesia	-7.217	112.717	1758	1963/03/17	5	Agung	0604-02	8.342	115.508
1963AP-1.1	San Jose/Juan Santamaria Intl AP	Costa Rica	9.93	-84.1	28	1963/03/13	3	Irazu	1405-06	9.979	-83.852
1957AP-1.1	Iwo-jima/Iwo-jima Airfield	Japan	24.784	141.323	4	1957/03/28	1	Iwo-jima	0804-12	24.754	141.29
1953AP-1.3	Anchorage/Merrill Field	USA	61.2	-149.833	130	1953/07/09	4	Spurr	1103-04	61.30	-152.25
1953AP-1.2	Anchorage/Elmendorf AFB	USA	61.253	-149.792	131	1953/07/09	4	Spurr	1103-04	61.30	-152.25
1953AP-1.1	Anchorage/Anchorage Intl AP	USA	61.167	-149.983	122	1953/07/09	4	Spurr	1103-04	61.30	-152.25
1951AP-1.1	Port Moresby/Jacksons AP	Papua New Guinea	-9.441	147.220	116	1951/01/21	4	Lamington	0503-01	-8.95	148.15
1944AP-1.1	Naples	Italy	40.883	14.283	14	1944/03/22	3	Vesuvius	0101-02	40.821	14.426

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Incident #	Country2	Hazard	Days closed	References
2006AP-5.2	Italy	AA	14 nights	C. Holliday pers. comm. 2006
2006AP-5.1	Italy	AA	14 nights	Agenzia Giornalistica Italia 6Dec2006
2006AP-4.1	Papua New Guinea	AF	4	Austalian Broadcasting Corp 11Oct2006
2006AP-3.6	Ecuador	AF	2	C. Holliday pers. comm. 2006
2006AP-3.5	Ecuador	AF	?	Diario del Hoy 17July2006
2006AP-3.4	Ecuador	AA?	?	Diario del Hoy 17July2006
2006AP-3.3	Ecuador	AF	?	El Comercio 18July2006
2006AP-3.2	Ecuador	AA	0	Diario del Hoy 17July2006
2006AP-3.1	Ecuador	AF	?	Diario del Hoy 17July2006
2006AP-2.5	UK (Montserrat)	AA	0	Associated Press 22May2006
2006AP-2.4	UK (Montserrat)	AA	0	Associated Press 22May2006
2006AP-2.3	UK (Montserrat)	AA	0	Associated Press 22May2006
2006AP-2.2	UK (Montserrat)	AA	0	Associated Press 22May2006
2006AP-2.1	UK (Montserrat)	AA	0	Associated Press 22May2006
2006AP-1.1	USA	AA	0	C. Neal pers. comm. 2006
2005AP-9.1	Colombia	AF	0	El Tiempo 24Nov2005
2005AP-8.1	USA (CNMI)	AA	4	Saipan Tribune 8Aug2005; Pacific Daily News 2Aug2005
2005AP-7.1	Mexico	AF	?	LATimes Wire Reports 31May2005
2005AP-6.1	Philippines	AA	0	Inquirer News Service 3May2005, BGVN 2005 (30:06)
2005AP-5.1	Comoros	AF	3?	Reuters 17April2005; BGVN 2005 (30:04)
2005AP-4.1	USA (CNMI)	AA	?	Saipan Tribune 8Aug2005; Pacific Daily News 2Aug2005, BGVN 2005 (30:04)
2005AP-3.1	Papua New Guinea	AF,AA	?	BGVN 2005 (30:07); Post Courier 2Mar2005
2005AP-2.1	USA (CNMI)	AA	0	Saipan Tribune 15Feb2005, BGVN 2005 (30:02)
2005AP-1.1	Papua New Guinea	AA	?	BGVN 2005 (30:05)
2004AP-6.1	Iceland	AA?	1?	S. Karlsdottir pers. comm. 2006; Times Online 5Nov2004
2004AP-5.1	Papua New Guinea	AF,AA	0	BGVN 2004 (29:10); D. Innes pers. cmm. 2006
2004AP-4.1	Japan	AF	0	Star&Stripes 21Sept2004; AFWA Alert 16Sept2004
2004AP-3.1	Indonesia	AF	1	Jakarta Post 15Sept2004
2004AP-2.1	Indonesia	AF	>2	Reuters 8June2004; VSI written comm. 2004, BGVN 2004 (29:05)
2004AP-1.1	Russia	AF	1	BGVN 2004 (29:05)
2003AP-5.4	Ecuador	AA	0	El Comercio 29Aug2003
2003AP-5.3	Ecuador	AA	0	El Comercio 29Aug2003
2003AP-5.2	Ecuador	AF	0	BGVN 2003 (28:11)
2003AP-5.1	Ecuador	AA	0	El Comercio 29Aug2003
2003AP-4.7	UK (Montserrat)	AF	0	Associated Press 13July2003
2003AP-4.6	UK (Montserrat)	AF	0	Associated Press 13July2003
2003AP-4.5	UK (Montserrat)	AF	0	Associated Press 13July2003
2003AP-4.4	UK (Montserrat)	AF	0	Associated Press 13July2003

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Incident #	Country2	Hazard	Days closed	References
2003AP-4.3	UK (Montserrat)	AF	0	Associated Press 13July2003
2003AP-4.2	UK (Montserrat)	AF	0	Associated Press 13July2003
2003AP-4.1	UK (Montserrat)	AF	0	Associated Press 13July2003
2003AP-3.2	USA (CNMI)	AF,AA	0	Saipan Tribune 24May03; BGVN 2003 (28:05)
2003AP-3.1	USA (CNMI)	AF,AA	0	Saipan Tribune 24May2003; BGVN 2003 (28:05)
2003AP-2.1	UK (Montserrat)	AA?	0	L. Salinas pers. comm. 2003
2003AP-1.1	Papua New Guinea	AF	?	BGVN 2003 (28:03)
2002AP-6.1	Ecuador	AF	8	Reuters 3Nov2002; BGVN 2002 (27:11)
2002AP-5.3	Italy	AF	many	BGVN 2002 (27:11, 27:12); Coltelli 2006
2002AP-5.2	Italy	AF	many	BGVN 2002 (27:11); Coltelli 2006
2002AP-5.1	Italy	AF	?	S. Eckhert pers. comm. 2002
2002AP-4.1	Papua New Guinea	AA	6	BGVN 2002 (27:11)
2002AP-3.1	UK (Montserrat)	AF,AA	0	C. Holliday pers. comm. 2002
2002AP-2.1	Papua New Guinea	AF	?	Reuters 9Aug2002; David Innes pers. comm. 2003
2002AP-1.1	D.R. Congo	LF	?	BGVN 2001 (26:12), 2002 (27:04)
2001AP-5.4	UK (Montserrat)	AF	0	Reuters 31July2001; BGVN 2001 (26:07)
2001AP-5.3	UK (Montserrat)	AF	0	Reuters 31July2001; BGVN 2001 (26:07)
2001AP-5.2	UK (Montserrat)	AF	0	Reuters 31July2001; BGVN 2001 (26:07)
2001AP-5.1	UK (Montserrat)	AF	0	Reuters 31July2001; BGVN 2001 (26:07)
2001AP-4.1	Italy	AF	?	BGVN 2001 (26:09); BGVN 2002 (27:03)
2001AP-3.1	Mexico	AF	0	BGVN 2001 (26:08)
2001AP-2.1	Philippines	AF	11	Agence France Presse 3July2001
2001AP-1.1	Indonesia	AF	?	BGVN 2001 (26:11)
2000AP-6.1	Japan	AF	0	BGVN 2000 (25:07); Tupper et al. 2004
2000AP-5.1	New Zealand	AF,AA	?	BGVN 2000 (25:07); Johnston et al. 2000
2000AP-4.2	Italy	AF	?	BGVN 2000 (25:06)
2000AP-4.1	Italy	AF	?	BGVN 2000 (25:06)
2000AP-3.1	Philippines	AA	1	Airline Industry Information 25Feb2000
2000AP-2.2	Ecuador	AF	?	BGVN 2000 (25:04)
2000AP-2.1	Ecuador	AF	?	BGVN 2000 (25:04)
2000AP-1.1	Guatemala	AF	0.5	Prensa Libre 17Jan2000
1999AP-3.1	Ecuador	AF	?	BGVN 1999 (24:10)
1999AP-2.1	Ecuador	AF	3	BGVN 1999 (24:09); J. Ewert pers. comm. 2002
1999AP-1.1	Guatemala	AF,AA	?	BGVN 2002 (27:03)
1998AP-4.1	Mexico	AF	<1	BGVN 1998 (23:12)
1998AP-3.1	Guatemala	AF	2	BGVN 1999 (24:02)
1998AP-2.1	Italy	AF	<1	BGVN 1998 (23:11)
1998AP-1.1	Guatemala	AF	3	BGVN 1998 (23:05)

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Incident #	Country2	Hazard	Days closed	References
1997AP-5.1	UK (Montserrat)	AF?	?	BGVN 1997 (22:09)
1997AP-4.1	Mexico	AP	0.5	BGVN 1997 (22:07)
1997AP-3.1	UK (Montserrat)	PF	permanent	BGVN 1997 (22:06)
1997AP-2.1	UK (Montserrat)	PF	1	W. Aspinall pers. comm. 2003
1997AP-1.1	Papua New Guinea	AF	1	BGVN 1997 (22:03)
1996AP-3.1	UK (Montserrat)	AA?	<1	BGVN 1996 (21:09)
1996AP-2.1	UK (Montserrat)	PF	?	BGVN 1996 (21:09)
1996AP-1.11	New Zealand	AA	0	Johnston et al. 2000; P. Lechner written comm. 2004
1996AP-1.10	New Zealand	AA	0	Johnston et al. 2000; P. Lechner written comm. 2004
1996AP-1.09	New Zealand	AA	0	Johnston et al. 2000; P. Lechner written comm. 2004
1996AP-1.08	New Zealand	AA	0	Johnston et al. 2000; P. Lechner written comm. 2004
1996AP-1.07	New Zealand	AF	?	Johnston et al. 2000; P. Lechner written comm. 2004
1996AP-1.06	New Zealand	AF	?	Johnston et al. 2000; P. Lechner written comm. 2004
1996AP-1.05	New Zealand	AF	?	Johnston et al. 2000; P. Lechner written comm. 2004
1996AP-1.04	New Zealand	AF	?	Johnston et al. 2000; P. Lechner written comm. 2004
1996AP-1.03	New Zealand	AF	?	Johnston et al. 2000; P. Lechner written comm. 2004
1996AP-1.02	New Zealand	AF	1	T. Hurst pers. comm. 2007; Johnston et al. 2004
1996AP-1.01	New Zealand	AF,AA	?	BGVN 1996 (21:05); Johnston et al. 2000
1995AP-3.1	UK (Montserrat)	AF	<1	BGVN 1995 (20:10)
1995AP-2.9	New Zealand	AA	0	Johnston et al. 2000; P. Lechner written comm. 2004
1995AP-2.8	New Zealand	AA	0	Johnston et al. 2000; P. Lechner written comm. 2004
1995AP-2.7	New Zealand	AA	0	Johnston et al. 2000; P. Lechner written comm. 2004
1995AP-2.6	New Zealand	AA	0	Johnston et al. 2000; P. Lechner written comm. 2004
1995AP-2.5	New Zealand	AA	0	Johnston et al. 2000; P. Lechner written comm. 2004
1995AP-2.4	New Zealand	AA	0	Johnston et al. 2000; P. Lechner written comm. 2004
1995AP-2.3	New Zealand	AA	0	Johnston et al. 2000; P. Lechner written comm. 2004
1995AP-2.2	New Zealand	AF	?	Johnston et al. 2000; P. Lechner written comm. 2004
1995AP-2.1	New Zealand	AF	?	Johnston et al. 2000; P. Lechner written comm. 2004
1995AP-1.1	Mexico	AF	?	BGVN 1995 (20:03)
1994AP-2.2	Chile	AF	?	BGVN 1994 (19:04)
1994AP-1.2	Papua New Guinea	AF, AA	permanent	BGVN 1994 (19:08); R. Stewart pers. comm. 2005
1994AP-1.1	Papua New Guinea	AF	?	BGVN 1994 (19:08)
1993AP-2.1	Colombia	AF	<1	BGVN 1993 (18:05)
1993AP-1.4	Chile	AF	?	Casadevall 1993
1993AP-1.3	Chile	AF	?	Casadeval, 1993
1993AP-1.2	Chile	AF	?	Casadevall 1993
1993AP-1.1	Chile	AF	?	Casadevall 1993
1992AP-2.4	USA	AF	?	BGVN 1992 (17:07)

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Incident #	Country2	Hazard	Days closed	References
1992AP-2.3	USA	AF	<1	Casadevall 1993
1992AP-2.2	USA	AF	?	Casadevall 1993
1992AP-2.1	USA	AF	3	Casadevall 1993
1992AP-1.1	Japan	AF	1	Casadevall 1993
1991AP-6.2	Indonesia	AA	"several"	Casadevall 1993
1991AP-6.1	Indonesia	AF	5	Casadevall 1993; BGVN 1991 (16:10)
1991AP-5.5	Chile	AF,AA	?	Casadevall 1993; BGVN 1991 (16:08)
1991AP-5.4	Chile	AF,AA	?	Casadevall 1993; BGVN 1991 (16:08)
1991AP-5.3	Chile	AF,AA	?	Casadevall 1993; BGVN 1991 (16:08)
1991AP-5.2	Chile	AF,AA	?	Casadevall 1993; BGVN 1991 (16:08)
1991AP-5.1	Chile	AF,AA	?	Casadevall 1993; BGVN 1991 (16:08)
1991AP-4.1	Philippines	AF,AA	2	Casadevall et al. 1996
1991AP-3.7	Philippines	AF	5	Casadevall 1993; Casadevall et al. 1996
1991AP-3.6	Philippines	AF	?	Casadevall 1993; Casadevall et al. 1996
1991AP-3.5	Philippines	AF	13	Casadevall 1993; Casadevall et al. 1996
1991AP-3.4	Philippines	AF	permanent	Casadevall 1993; Casadevall et al. 1996
1991AP-3.3	Philippines	AF	?	Casadevall 1993; Casadevall et al. 1996
1991AP-3.2	Philippines	AF	?	Casadevall 1993; Casadevall et al. 1996
1991AP-3.1	Philippines	AF	?	Casadevall 1993; Casadevall et al. 1996
1991AP-2.1	Japan	AF,AA	0	Casadevall 1993
1991AP-1.1	Mexico	AF	"several"	BGVN 1991 (16:04)
1990AP-3.1	Japan	AF	<1	Casadevall 1993
1990AP-2.1	USA	AF, AA	0	Casadevall 1993
1990AP-1.1	USA	AF	"several"	Casadevall 1993
1989AP-1.1	USA	AF, AA	0	Casadevall 1993
1986AP-2.1	Italy	AF	2	SEAN 1986 (11:09)
1986AP-1.1	USA	AF	0	BGVN 1986 (11:03); C. Neal pers. comm. 2006
1984AP-2.1	Philippines	AA	?	C. Newhall pers. comm. 2007
1984AP-1.2	Indonesia	AF	2	SEAN 1984 (09:05)
1984AP-1.1	Indonesia	AF	2	SEAN 1984 (09:05)
1983AP-2.1	Japan	AF	4	Blong 1984; SEAN 1983 (08:09, 08:10)
1983AP-1.1	Indonesia	AF	?	SEAN 1983 (08:07)
1982AP-2.4	Indonesia	AF,AA	1	Casadevall 1993
1982AP-2.3	Indonesia	AF,AA	1	Casadevall 1993
1982AP-2.2	Indonesia	AF,AA	1	Casadevall 1993
1982AP-2.1	Indonesia	AF,AA	18	Casadevall 1993
1982AP-1.2	Mexico	AF	?	BGVN 1982 (07:03)
1982AP-1.1	Mexico	AF	?	BGVN 1982 (07:03)

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Incident #	Country2	Hazard	Days closed	References
1980AP-3.1	USA	AF	"several"	Schuster 1983; Casadevall 1993
1980AP-2.1	USA	AF	0	Schuster 1983; Casadevall 1993
1980AP-1.6	USA	AF	?	Fairchild AFB Fact Sheet "Fairchild Air Force Base History"
1980AP-1.5	USA	AF	3	Schuster 1981, 1983; Casadevall 1993
1980AP-1.4	USA	AF	15	Warrick et al. 1981; Casadevall 1993
1980AP-1.3	USA	AF	7	Casadevall 1993; Blong 1984
1980AP-1.2	USA	AF	7	Casadevall 1993
1980AP-1.1	USA	AF	"several"	Casadevall 1993; Blong 1984
1979AP-1.1	Italy	AF	1?	Guest et al. 1980; Casadevall 1993
1976AP-1.1	USA	AF	0	Kienle & Swanson 1985; Casadevall 1993; Jennings 1969
1971AP-1.1	Japan	AF	<1	Casadevall 1993
1963AP-2.1	Indonesia	AF	1	Jennings 1969; Suryo 1981; Casadevall 1993
1963AP-1.1	Costa Rica	AF	0	E. Duarte pers. comm. 2006
1957AP-1.1	USA (post WWII)	EX,GD	?	Corwin & Foster 1959
1953AP-1.3	USA	AF	4-7	Juhle & Coulter 1955; Wilcox 1959; Casadevall 1993; Blong 1984
1953AP-1.2	USA	AF	4-7	Juhle & Coulter 1955; Wilcox 1959; Casadevall 1993; Blong 1984
1953AP-1.1	USA	AF	4-7	Juhle & Coulter 1955; Wilcox 1959; Casadevall 1993; Blong 1984
1951AP-1.1	Papua New Guinea	AF	?	Taylor 1958; Casadevall 1993; Blong 1984
1944AP-1.1	Italy	AF	?	Lloyd 1990; New York Times 25Apr1944; Casadevall 1993

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2006AP-5.2	night time flights restricted 29 November to 8 December & 13-16 December
2006AP-5.1	AP closed 6 PM-7AM for ~2 weeks from 24 November as precaution, daytime flights OK; some flights cancelled or diverted
2006AP-4.1	ash covered airstrip; AP closed 7-10 October
2006AP-3.6	fine dusting of ash; AP closed 17-18 July 2006
2006AP-3.5	>3 cm ashfall; AP closed
2006AP-3.4	AP closed
2006AP-3.3	AP closed
2006AP-3.2	flights to/from Guayaquil cancelled; alternate routes used for other destinations
2006AP-3.1	AP closed
2006AP-2.5	Aeropostal flights to/from Caracas/Miami grounded 21 May to/from Aruba, Curacao, Cuba, Dom. Rep; American Airlines suspended flights to/from Miami/Caracas
2006AP-2.4	all fights canceled on 21st, including to Caracas, Miami, NY, San Juan, Puerto Rico, Toronto
2006AP-2.3	Aeropostal flights grounded on 21st to/from Caracas, Aruba, Curacao, Cuba, & Dominican Republic
2006AP-2.2	Aeropostal flights grounded on 21st to/from Caracas, Aruba, Curacao, Cuba, & Dominican Republic
2006AP-2.1	Aeropostal flights grounded on 21st to/from Caracas, Aruba, Curacao, Cuba, & Dominican Republic
2006AP-1.1	Alaska Airlines cancelled 36 flights to/from AP on 13 Jan, FedEx routed 5 inbound planes to Fairbanks, local flights to Homer cancelled/delayed; on 17th
2005AP-9.1	300 people stranded at airport
2005AP-8.1	flights suspended 2-5 Aug; poor of visibility owing to volcanic haze; hundreds unable to depart Saipan
2005AP-7.1	"A shower of ash closed the airport"
2005AP-6.1	2-km visibility; flights to/from Kalibo suspended on 3 May, affecting Boracay resort; 100's of passengers stranded; smaller carriers also grounded
2005AP-5.1	ashfall on western & northern parts of island; flights to island cancelled, resumed on 19 April
2005AP-4.1	light ashfall beginning around 10 AM; AP closed
2005AP-3.1	Fine ash reached AP; many flights cancelled to/from AP during Feb
2005AP-2.1	zero visibility hindered approach and landing of aircraft from Manila
2005AP-1.1	5 commercial flights cancelled from Rabaul, delaying ~ 100 passengers
2004AP-6.1	AP closed at beginning of eruption; KLM cancelled 59 flights from Amsterdam/Schiphol AP; "dozens of domestic flights N & E of Iceland grounded by ash"
2004AP-5.1	AP had only light dusting of ash, but ash haze below 10,000 ft reduced visibility & prevented landings
2004AP-4.1	trace accumulation
2004AP-3.1	AP closed on 14 September; equipment & facilities covered by up to 1 cm of ash & all flights cancelled
2004AP-2.1	AP closed beginning on 8 June at 0800 (for at least 2 days)
2004AP-1.1	1-2 mm of ash deposited; AP closed on 10 May
2003AP-5.4	delays in schedules to/from Quito/Cuenca (Ambato also may have been affected)
2003AP-5.3	delays in schedules to/from Quito/Guayaquil
2003AP-5.2	ash deposition; flight restrictions to/from airport
2003AP-5.1	delays in schedules to/from Quito/Guayaquil
2003AP-4.7	American Airlines cancelled ~50 flights from Puerto Rico to various islands; other airlines also suspended ops
2003AP-4.6	American Airlines cancelled ~50 flights from Puerto Rico to various islands; other airlines also suspended ops
2003AP-4.5	American Airlines cancelled ~50 flights from Puerto Rico to various islands; other airlines also suspended ops
2003AP-4.4	American Airlines cancelled ~50 flights from Puerto Rico to various islands; other airlines also suspended ops

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Incident #	Comment
2003AP-4.3	American Airlines cancelled ~50 flights from Puerto Rico to various islands; other airlines also suspended ops
2003AP-4.2	American Airlines cancelled ~50 flights from Puerto Rico to various islands; other airlines also suspended ops
2003AP-4.1	American Airlines cancelled ~50 flights from Puerto Rico to various islands; other airlines also suspended ops
2003AP-3.2	Continental Airlines cancelled 3 flights, Guam to Saipan, 23 May
2003AP-3.1	Continental Airlines cancelled 3 flights, Saipan to Guam, 23 May; one of these on to Japan
2003AP-2.1	landings cancelled
2003AP-1.1	AP closed several times due to "ash drift " from Tavurvur
2002AP-6.1	AP closed 8 days
2002AP-5.3	repeated AP closures over 3 months, beginning on 27 October; inter-agency ash plan developed for future events
2002AP-5.2	first of repeated AP closures beginning 31 October
2002AP-5.1	Volcanic Ash Operations Plan for US Navy base written as result of 3-month-long explosive activity
2002AP-4.1	Tokua AP closed 22-27 October; reopened when ash plume changed direction; 2 flights per day after reopening
2002AP-3.1	only scheduled flight (C-12) cancelled
2002AP-2.1	AP closed due to ashfall
2002AP-1.1	lava covered N end of runway, Russian plane (possibly 2) damaged when landing (ran into solidified flow)
2001AP-5.4	ash on runways; flight cancellations
2001AP-5.3	ash on runways; flight cancellations
2001AP-5.2	ash on runways; flight cancellations
2001AP-5.1	ash on runways; flight cancellations
2001AP-4.1	AP "paralyzed"
2001AP-3.1	very light ashfall on runways; some takeoffs briefly suspended
2001AP-2.1	light ashfall; AP closed 23 June-3 July
2001AP-1.1	Sam Ratulangi & Cengkareng APs contacted by Volc. Survey of Indonesia; actual impacts unknown
2000AP-6.1	~4 mm ash at AP; at least 2 damaging aircraft encounters with ash cloud enroute to Tokyo's Narita AP
2000AP-5.1	ashfall at AP; landings & departs restricted; Bay of Plenty traffic disrupted
2000AP-4.2	sky darkened by ash; difficulties for air traffic to/from Fontanarossa AP and Sigonella NAS
2000AP-4.1	sky darkened by ash; difficulties for air traffic to/from Fontanarossa AP and Sigonella NAS
2000AP-3.1	all flights to AP cancelled on 24 Feb.
2000AP-2.2	ashfall closed AP; also in Ambato
2000AP-2.1	ashfall closed AP; also in Riobamba
2000AP-1.1	AP closed from 1915 on 16th until 0600 on 17th (~11 hours)
1999AP-3.1	trace amt tephra; AP closure. Tourist sector lost $1.5 M/day due to Oct-Nov closures
1999AP-2.1	<3 mm ashfall; AP closed 3 days; international flights diverted to Guayaquil for few weeks
1999AP-1.1	ash on runway (perhaps from Pacaya); 2 in-flight encounters with Fuego plume near airport
1998AP-4.1	AP closed 2330-0115
1998AP-3.1	AP closed for 35 hours due to fine ashfall
1998AP-2.1	AP closed 15 h due to ~1 mm sand-sized tephra, 1st closure since 1986
1998AP-1.1	~2 mm tephra at AP 23 N of volcano; AP closed 3 days; tephra damaged aircraft on final approach

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Incident #	Comment
1997AP-5.1	ash drifted unusual direction (NE) affecting Antigua AP
1997AP-4.1	AP closed ~12 hr while runways cleared of ash
1997AP-3.1	AP closed when pyroclastic flows reached edge of airport
1997AP-2.1	AP evacuated & closed for day of 17 June
1997AP-1.1	AP closed most of day due to ashfall threat
1996AP-3.1	ash column to 12 km; AP closed AM of 18th
1996AP-2.1	ash from pyroclastic flows fell around island, including at AP
1996AP-1.11	airspace closure
1996AP-1.10	airspace closure
1996AP-1.09	airspace closure
1996AP-1.08	airspace closure
1996AP-1.07	ashfall at AP
1996AP-1.06	ashfall at AP
1996AP-1.05	ashfall at AP
1996AP-1.04	ashfall at AP
1996AP-1.03	ashfall at AP
1996AP-1.02	1 mm ashfall; AP closed 17 June
1996AP-1.01	closures of airspace around Auckland AP & all of North Island
1995AP-3.1	ashfall closed AP for first time, briefly
1995AP-2.9	airspace closure
1995AP-2.8	airspace closure
1995AP-2.7	airspace closure
1995AP-2.6	airspace closure
1995AP-2.5	airspace closure
1995AP-2.4	airspace closure
1995AP-2.3	airspace closure
1995AP-2.2	ashfall at AP
1995AP-2.1	ashfall at AP
1995AP-1.1	planes dusted by ashfall
1994AP-2.2	light ashfall
1994AP-1.2	AP buried under 50 cm tephral; airspace within 110 km radius of AP closed; flights to/from New Britain suspended; AP permanently closed and relocated to Tokua
1994AP-1.1	flights to/from New Ireland suspended; relief flights routed to Tokua AP
1993AP-2.1	trace amount ashfall; closed <1 day
1993AP-1.4	ashfall on airport, flights temporarily suspended
1993AP-1.3	ashfall on airport, flights temporarily suspended
1993AP-1.2	ashfall on airport, flights temporarily suspended
1993AP-1.1	ashfall on airport, flights temporarily suspended
1992AP-2.4	flights to/from AP halted

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Incident #	Comment
1992AP-2.3	by mid-morning on 19th field became operational; cleanup costs ~$53,000
1992AP-2.2	forewarning call from AVO; 28 aircraft evacuated, 70 aircraft shletered in hangars, 6 aircraft sealed; cleanup costs ~$150,000
1992AP-2.1	<5 mm ashfall; AP closed 3 days; cleanup hampered by wind redistribution of ash; cleanup costs ~$250,000
1992AP-1.1	trace amount ashfall; AP closed 1 day
1991AP-6.2	no ashfall but airspace of Medan air traffic region heavily contaminated with ash; AP closed several days
1991AP-6.1	AP closed till 29 October due to poor visibility and minor ashfall
1991AP-5.5	light ashfall
1991AP-5.4	resuspended ash for months after eruption caused reduced visibility and flight cancellations
1991AP-5.3	resuspended ash for months after eruption caused reduced visibility and flight cancellations
1991AP-5.2	resuspended ash for months after eruption caused reduced visibility and flight cancellations
1991AP-5.1	resuspended ash for months after eruption caused reduced visibility and flight cancellations
1991AP-4.1	AP closed 17-18 July; slippery runway
1991AP-3.7	0.5-1 cm ashfall; AP closed 15-19 June, resumed fully normal operations on 4 July
1991AP-3.6	0.5-1 cm ashfall
1991AP-3.5	15-20 cm sand-sized ash; AP closed on 14th, back in partial operation by 26th; parked airplanes damaged by wet ash accumulation
1991AP-3.4	15-20 cm sand-sized ash; aircraft moved in advance of eruption as result of volcanologists' forewarning
1991AP-3.3	15-20 cm sand-sized ash
1991AP-3.2	trace amount ashfall
1991AP-3.1	trace amount ashfall
1991AP-2.1	departing airplane damaged taking off into ash cloud
1991AP-1.1	<5 mm ashfall; AP closed several days
1990AP-3.1	2 mm ashfall; AP closed<1 day
1990AP-2.1	trace amount ashfall; no AP closure, many cancellations; in-flight encounters
1990AP-1.1	~5 mm ashfall; AP closed several days
1989AP-1.1	trace amount ashfall; no closure, many cancellations; damaged aircraft near Anchorage AP
1986AP-2.1	lapilli & light ash; AP closed night of 24th to morning of 25th
1986AP-1.1	"dusting" in Anchorage area; USAF moved planes from Anch to Fbx; most carriers diverted/cancelled flights to/from Anch on 27-29 Mar but AP not closed
1984AP-2.1	more than 73,000 people evacuated from around volcano; alert level 5
1984AP-1.2	AP closed on 26-27 May
1984AP-1.1	AP closed on 26-27 May
1983AP-2.1	10 cm ash & fist-sized tephra on runway; rescue planes unable to land; AP closed for 4 days
1983AP-1.1	ashfall closed unnamed airport W of Gamalama
1982AP-2.4	AP closed 2 September owing to reduced visibility associated with ashfall
1982AP-2.3	AP closed 3 August owing to reduced visibility associated with ashfall
1982AP-2.2	AP closed 14 July owing to reduced visibility associated with ashfall
1982AP-2.1	AP closed 4-21 June owing to reduced visibility associated with ashfall
1982AP-1.2	heavy ashfall; AP closed, roads impassable
1982AP-1.1	heavy ashfall; AP closed, roads impassable

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Incident #	Comment
1980AP-3.1	2-3 mm ashfall; AP closed several days, some carriers continued operations
1980AP-2.1	<1 mm ashfall; no closure; flight cancellations
1980AP-1.6	eruption occurred during Open House celebration, 92nd Bombardment Wing "paralyzed for 1 month"
1980AP-1.5	0.5-1 cm ashfall; AP closed 3 days
1980AP-1.4	7-9 cm ashfall; AP closed 15 days
1980AP-1.3	0.5-1 cm ashfall; AP closed 7 days
1980AP-1.2	1 cm ashfall; AP closed 7 days
1980AP-1.1	1-2 cm ashfall; AP closed several days
1979AP-1.1	trace amount ashfall; AP closed 1 day?
1976AP-1.1	trace amount ashfall; no closure, some cancellations
1971AP-1.1	3 mm ash; reduced visibility; AP closed <1 day
1963AP-2.1	<10 mm ashfall; AP closed 1 day
1963AP-1.1	few mm ashfall; flights re-routed to Panama or Limon
1957AP-1.1	phreatic explosion blew crater in tarmac; runways repeatedly cut by faults before and since 1957
1953AP-1.3	3-6 mm ashfall; military airfield closed 4-7 days
1953AP-1.2	3-6 mm ashfall; military airfield closed 4-7 days
1953AP-1.1	3-6 mm ashfall; AP closed closed 4-7 days
1951AP-1.1	1-2 mm ashfall; airfield closed
1944AP-1.1	first instance of damage from an eruption to modern aircraft and facilities; 88 US military planes damaged