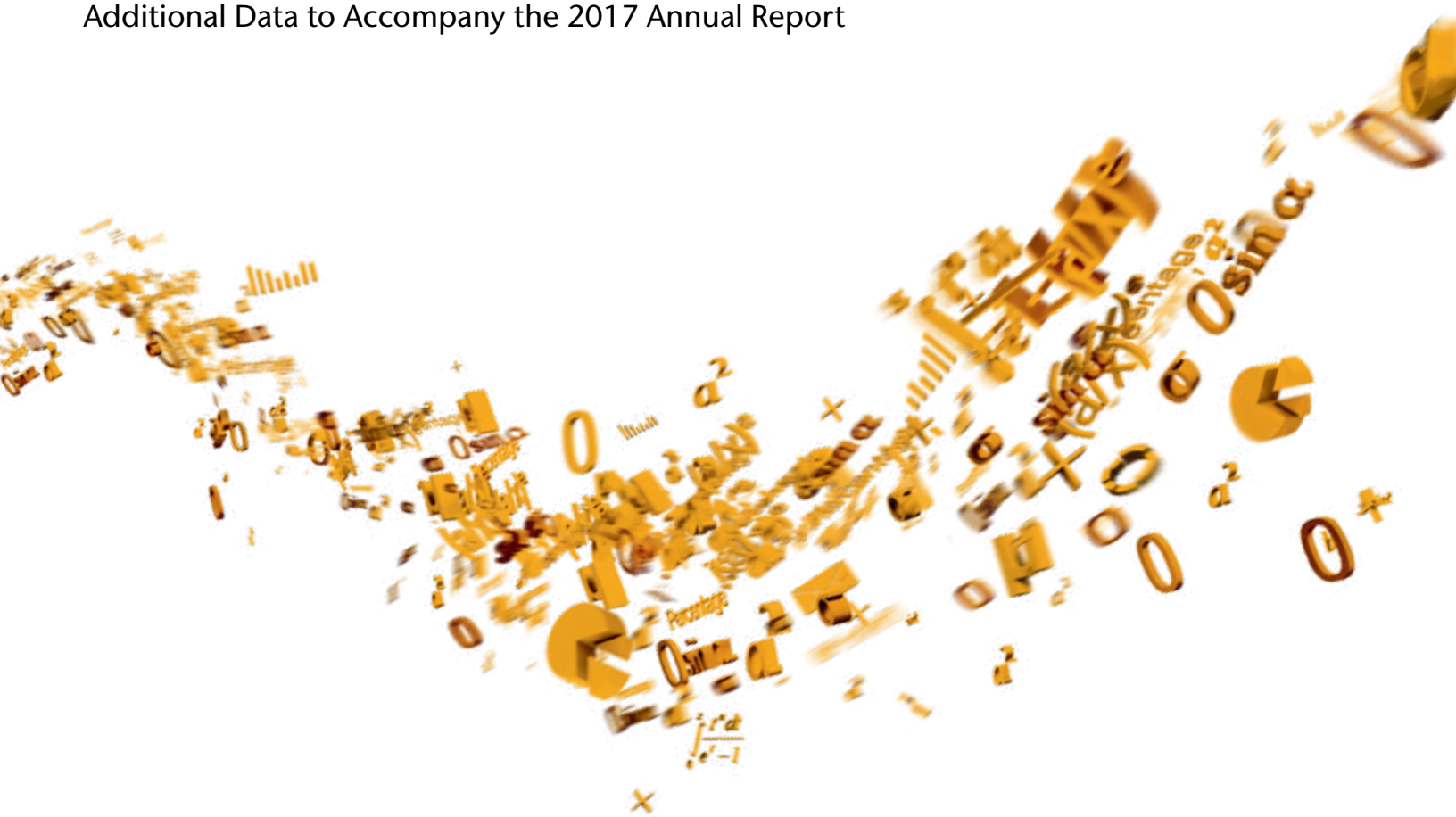
Aon Benfield

Companion Volume to Weather, Climate & Catastrophe Insight

Additional Data to Accompany the 2017 Annual Report



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About the Companion Volume

The following document provides supplementary data and information to the Weather, Climate & Catastrophe Insight: 2017 Annual Report. 2017 was one of the costliest and most significant years for natural disasters on record following major hurricane, wildfire, earthquake, and severe weather events. Direct economic damage topped USD353 billion dollars with public and private insurance groups covering USD134 billion of the bill. Each of these totals was second only to the historic year in 2011.

When focused on weather events alone, the economic cost was USD344 billion dollars as insurers covered USD132 billion of that total. Both of those tallies set a new record.

The majority of the disaster losses resulted from three hurricane events: Harvey, Irma, and Maria. Each of those storms made landfall in either the United States or the Caribbean Islands. All three occurred within a matter of weeks after first developing and tracking across the Atlantic Ocean. The storms caused a combined USD220 billion dollars in damage, with insurers covering an estimated USD80 billion. 2017 slightly trailed 2005 as the most expensive year for tropical cyclones on record.

So what lies ahead for 2018? 2017 taught us that we continue to live in an increasingly risky world with more people and exposures located in vulnerable spots. Identifying ways to increase awareness, improve communication, and lower the insurance protection gap will help better prepare for the next major event.

For an in-depth view of the natural disaster events in 2017, please access Impact Forecasting's *Weather, Climate & Catastrophe Insight: 2017 Annual Report* at **http://aon.io/ab-if-annual-report-2017**

Appendix A: 2017 Global Disasters

Exhibit 1: United States

Date(s)	Event	Location	Deaths	Structures/Claims	Economic Loss (USD)
01/01-01/03	Severe Weather	Southeast, Plains	6	20,000+	250+ million
01/06-01/13	Winter Weather	Pacific Northwest, Southwest, Rockies	5	40,000+	700+ million
01/06-01/08	Winter Weather	Southeast, East Coast	5	Thousands	Millions
01/13-01/18	Winter Weather	Plains, Midwest	7	10,000+	50+ million
01/17-01/19	Winter Weather	West, Rockies	4	Thousands	10s of millions
01/18-01/23	Severe Weather	Southeast, Plains, West, Northeast	21	100,000+	1.3+ billion
01/19-01/25	Winter Weather	West, Rockies, Plains, Midwest	5	Thousands	10s of millions
02/03-02/06	Winter Weather	Pacific Northwest	0	5,000+	10s of millions
02/07-02/08	Severe Weather	Southeast	1	10,000+	175+ million
02/08-02/09	Winter Weather	Mid-Atlantic, Northeast	0	20,000+	200+ millions
02/10-02/14	Flooding	California	0	N/A	200+ million
02/12-02/14	Winter Weather	Upper Mid-Atlantic, Northeast	1	Thousands	10s of millions
02/14	Severe Weather	Texas	0	20,000+	225+ million
02/16-02/18	Flooding	California	7	25,000+	800+ million
02/19-02/20	Severe Weather	Texas	0	20,000+	225+ million
02/19-02/21	Flooding	California	1	10,000+	500+ million
02/24-02/25	Severe Weather	Northeast, Mid-Atlantic	0	20,000+	200+ million
02/27-03/02	Severe Weather	Midwest, Southeast, Mid-Atlantic	4	175,000+	1.9+ billion
03/01-09/30	Drought	Rockies, Plains	N/A	N/A	2.5+ billion
03/06-03/10	Severe Weather	Midwest, Plains, Southeast	0	250,000+	2.2+ billion
03/06-03/12	Wildfires	Plains, Rockies, Florida	7	Hundreds	125+ million
03/12-03/14	Winter Weather	Plains, Midwest, Southeast, Northeast	11	Thousands	1.1+ billion
03/20-03/22	Severe Weather	Southeast, Midwest	1	80,000+	975+ million
03/26-03/28	Severe Weather	Plains, Southeast, Midwest	0	200,000+	2.6+ billion
03/28-03/31	Severe Weather	Plains, Southeast, Midwest, Mid-Atlantic	1	30,000+	325+ million
04/01-04/03	Severe Weather	Plains, Southeast	5	30,000+	350+ million
04/04-04/06	Severe Weather	Plains, Mississippi Valley, Southeast	0	90,000+	900+ million
04/07-04/08	Severe Weather	West	1	10,000+	125+ million
04/09-04/11	Severe Weather	Plains, Midwest	1	30,000+	325+ million
04/14-04/20	Severe Weather	Plains, Midwest	0	Thousands	175+ million
04/21-04/26	Severe Weather	Plains, Midwest, Southeast, Mid-Atlantic	1	70,000+	950+ million
04/25-04/27	Severe Weather	Plains, Midwest, Southeast	0	15,000+	125+ million
04/28-05/01	Severe Weather	Midwest, Plains, Southeast, MS Valley	20	100,000+	2.0+ billion
05/02-05/05	Severe Weather	Plains, Mississippi Valley, Southeast	0	20,000+	175+ million
05/08-05/11	Severe Weather	Rockies, Plains	0	250,000+	3.4+ billion
05/15-05/19	Severe Weather	Plains, Midwest, Rockies	2	70,000+	975+ million
05/20-05/25	Severe Weather	Plains, Midwest, MS Valley, Southeast	0	Thousands	100+ million

Date(s)	Event	Location	Deaths	Structures/Claims	Economic Loss (USD)
05/25-05/29	Severe Weather	Plains, Midwest, Mid-Atlantic, Rockies	0	45,000+	600+ million
06/01-09/30	Wildfires	West	0	1,000+	2.0+ billion
06/02-06/04	Severe Weather	Plains	0	15,000+	175+ million
06/02-06/07	Flooding	Florida	0	Thousands	10s of millions
06/11	Severe Weather	Midwest	0	110,000+	2.1+ billion
06/12-06/14	Severe Weather	Plains, Rockies	0	70,000+	1.0+ billion
06/15-06/19	Severe Weather	Plains, Midwest, Northeast	0	55,000+	550+ million
06/21-06/23	Tropical Storm Cindy	Southwest	1	Thousands	10s of millions
06/25-06/26	Severe Weather	Southwest, Plains	0	Thousands	10s of millions
06/27-06/30	Severe Weather	Plains, Midwest, Northeast	0	125,000+	1.6+ billion
07/02-07/04	Severe Weather	Plains, Midwest, Southeast	0	Thousands	10s of millions
07/05-07/06	Severe Weather	Plains, Midwest, Southeast	0	Thousands	10s of millions
07/06-07/15	Wildfire	California	0	Hundreds	10s of millions
07/09-07/16	Severe Weather	Plains, Midwest, Ohio Valley	1	Thousands	250+ million
07/12-07/24	Flooding	Illinois	0	2,100+	Millions
07/15	Flooding	Arizona	10	N/A	N/A
07/19-07/20	Severe Weather	Midwest	0	Hundreds	Millions
07/21-07/23	Severe Weather	Plains, Midwest, Mid-Atlantic	4	45,000+	600+ million
07/31	Tropical Storm Emily	Florida	0	Hundreds	≤10 million
08/01	Flooding	Southeast	0	1,000+	10s of millions
08/05-08/08	Severe Weather	Plains, Midwest, Southeast	0	15,000+	325+ million
08/10-08/11	Severe Weather	Plains, Midwest	0	Thousands	200+ million
08/16	Severe Weather	Plains, Midwest	0	Thousands	10s of millions
08/21-08/22	Severe Weather	Midwest, Ohio Valley, Northeast	1	Thousands	10s of millions
08/25-09/02	Hurricane Harvey	Plains, Southeast	90	850,000+	100+ billion
09/10-09/12	Hurricane Irma	Southeast	90	1.1 million	25+ billion
9/26-9/28	Hurricane Maria	North Carolina	0	Unknown	Millions
10/07-10/09	Hurricane Nate	Southeast, Mid-Atlantic	0	20,000+	250+ million
10/08-10/31	Wildfires	California	44	45,000+	13+ billion
10/14-10/15	Severe Weather	Plains, Midwest, Northeast	0	17,500+	250+ million
10/21-10/24	Severe Weather	Midwest, Southeast, Mid-Atlantic	0	10,000+	200+ million
10/29-10/31	TS Philippe (remnants)	Mid-Atlantic, Northeast	0	25,000+	800+ million
11/05-11/06	Severe Weather	Midwest, Northeast	0	10,000+	275+ million
11/18	Severe Weather	Midwest, MS Valley, Mid-Atlantic	0	Thousands	10s of millions
12/03-12/17	Wildfires	California	0	2,500+	3.2+ billion
12/06-12/12	Winter Weather	Plains, Southeast, Midwest, Northeast	3	Thousands	10s of millions
12/23-12/31	Winter Weather	Plains, Southeast, Midwest, Northeast	4	Thousands	100+ million

Exhibit 2: Remainder of North America (Canada, Mexico, Central America, Caribbean Islands)

Date(s)	Event	Location	Deaths	Structures/Claims	Economic Loss (USD)
01/24-01/27	Winter Weather	Canada	2	Thousands	50+ million
03/08	Severe Weather	Canada	1	14,500+	145+ million
03/11	Winter Weather	Canada	0	5,000+	130+ million
04/05-04/07	Flooding	Canada	0	7,500+	190+ million
04/15-05/10	Flooding	Canada	0	Thousands	Millions
04/20-04/25	Flooding	Jamaica, Haiti, Dominican Republic	2	Thousands	150+ illion
05/01-05/15	Flooding	Canada	2	10,000+	300+ million
05/05-05/20	Flooding	Canada	2	5,200+	250+ million
05/23-05/24	Severe Weather	Canada	0	8,000+	83+ million
06/01-06/03	Tropical Storm Beatriz	Mexico	6	Thousands	10s of millions
06/02	Severe Weather	Canada	0	10,000+	50+ million
06/10-06/20	Flooding	Honduras, Guatemala, El Salvador	17	Hundreds	10s of millions
06/20	Severe Weather	Canada	0	5,000+	10s of millions
07/07-09/27	Wildfire	Canada	0	1,800+	120+ million
07/12-07/13	Severe Weather	Canada	0	5,500+	42+ million
07/15-07/27	Wildfire	Canada	0	6,000+	120+ million
07/23	Severe Weather	Canada	0	10,000+	86+ million
07/27-07/29	Severe Weather	Canada	0	7,000+	70+ million
08/08-08/11	Hurricane Franklin	Mexico	0	5,000+	15+ million
08/28-08/29	Flooding	Canada	0	6,700+	365+ million
09/01-09/02	Tropical Storm Lidia	Mexico	20	Thousands	10s of millions
09/05-09/09	Hurricane Irma	Caribbean, Bahamas	44	50,000+	~30+ billion
09/07 & 09/23	Earthquake	Mexico, Guatemala	98	50,000+	1.3+ billion
09/18-09/21	Hurricane Maria	Caribbean	Hundreds	550,000+	~65+ billion
09/19	Earthquake	Mexico	370	50,000+	4.5+ billion
10/04-10/06	Hurricane Nate	Central America	44	10,000+	250+ million
10/16-10/18	Severe Weather	Canada	0	12,600+	126+ million
10/29-10/30	Philippe (remnants)	Canada	0	5,000+	125+ million
11/14-11/18	Flooding	Haiti	5	10,000+	Millions

Exhibit 3: South America

Date(s)	Event	Location	Deaths	Structures/Claims	Economic Loss (USD)
01/08-01/13	Flooding	Bolivia	8	1,700+	Millions
01/14-03/31	Flooding	Peru	124	260,000+	3.2+ billion
01/15-02/10	Wildfire	Chile	11	2,500+	870+ million
02/24-02/26	Flooding	Chile	6	Thousands	10s of millions
03/17-03/27	Flooding	Colombia	12	Hundreds	Millions+
03/31-04/01	Flooding	Colombia	420	2,500+	10s of millions
04/19	Landslide	Colombia	24	100+	Millions
05/25-06/16	Flooding	Uruguay, Argentina	0	10,000+	10s of millions
05/27-05/28	Flooding	Brazil	12	50,000+	200+ million
06/16-06/17	Flooding	Chile	4	Thousands	50+ million
11/07	Flooding	Colombia	22	5,000+	50+ million

Exhibit 4: Europe

Date(s)	Event	Location	Deaths	Structures/Claims	Economic Loss (USD)
01/02-01/13	Winter Weather	Central, Eastern, Southeastern Europe	76	Thousands	100+ million
01/12-01/13	Windstorm Egon	France, Germany	0	25,000+	450+ million
01/18	Earthquake	Italy	31	Hundreds	425+ million
01/19-01/23	Severe Weather	Spain, France, Italy	3	Thousands	29+ million
02/03-02/06	WS Kurt, Leiv, Marcel	Spain, France	2	Thousands	235+ million
02/19	Flooding	Spain	0	3,500+	18+ million
02/23-02/24	Windstorm Thomas	Western & Central Europe	3	Thousands	475+ million
02/26-02/28	Windstorm Udo	United Kingdom, Ireland	0	Thousands	10s of millions
03/06-03/07	Windstorm Zeus	France	2	25,000+	550+ million
03/18	Windstorm Eckhart	Central Europe	1	Thousands	100+ million
04/19-04/25	Winter Weather	Central & Western Europe	0	Thousands	3.0+ billion
05/01-08/31	Drought	Central Europe	N/A	N/A	729+ million
05/12-05/17	Severe Weather	Central Europe	0	10,000+	10s of millions
05/19	Severe Weather	Germany	0	Hundreds	Millions
05/29	Severe Weather	Russia	16	Thousands	10s of millions
05/30	Severe Weather	Germany	0	Hundreds	Millions
05/31-06/01	Severe Weather	Switzerland	0	7,000+	10s of millions
06/01-09/30	Drought	Italy, Spain, Portugal	N/A	N/A	6.6+ billion
06/12	Earthquake	Greece, Turkey	1	5,000+	10s of millions
06/17-06/24	Wildfire	Portugal	66	1,000+	565+ million
06/22-06/25	Severe Weather	Central & Southern Europe	4	Thousands	706+ million
06/29-06/30	Severe Weather	Germany	0	Thousands	92+ million
07/06-07/07	Flooding	Spain	0	2,700+	18+ million
07/08-07/08	Flooding	Switzerland	0	10,000+	200+ million

Exhibit 4: Europe (continued)

Date(s)	Event	Location	Deaths	Structures/Claims	Economic Loss (USD)
07/10	Severe Weather	Austria	0	5,000+	117+ million
07/17-07/18	Wildfires	Balkans, Portugal, France, Italy	0	Hundreds	Millions
07/21	Earthquake	Greece, Turkey	2	Thousands	147+ million
07/25-07/27	Severe Weather	Central & Southern Europe	0	Thousands	59+ million
07/30	Severe Weather	France, Switzerland, Germany	0	20,000+	40+ million
08/01	Severe Weather	Switzerland	0	3,500+	10s of millions
08/05-08/06	Flooding	Austria, Italy, Balkans	7	10,000+	120+ million
08/10-08/11	Severe Weather	Central Europe	6	Thousands	772+ million
08/18-08/19	Severe Weather	Central Europe	5	10,000+	250+ million
08/21	Earthquake	Italy	2	2,300+	59+ million
08/22	Flooding	United Kingdom, Ireland	0	Hundreds	530+ million
09/10-09/13	Flooding	Italy	8	10,000+	250+ million
09/11	Flooding	Croatia	0	Hundreds	160+ million
09/12-09/13	Windstorm Sebastian	UK, Netherlands, Germany	2	10,000+	100+ million
09/17	Severe Weather	Romania	8	7,000+	10s of millions
09/26	Flooding	Greece	0	Hundreds	30+ million
09/30-10/02	Flooding	Norway	0	3,000+	110+ million
10/04-10/06	Windstorm Xavier	Germany, Poland	9	20,000+	415+ million
10/15-10/20	Wildfire	Portugal, Spain	49	2,000+	885+ million
10/16-10/17	Ex-Hurricane Ophelia	Ireland, United Kingdom	3	10,000+	300+ million
10/20-10/21	Windstorm Dietrich	United Kingdom, Ireland	0	5,000+	200+ million
10/29-10/30	Windstorm Herwart	Central Europe	10	10,000+	595+ million
11/12-11/19	Severe Weather	Greece, Italy, Turkey	20	1,500+	100+ million
11/23	Windstorm Reinhard	United Kingdom, Norway	0	10,000+	100+ million
11/30-12/03	Flooding	Albania, Greece	1	10,000+	10s of millions
12/10-12/12	Windstorm Ana	Western & Central Europe	1	10,000+	120+ million
12/12	Flooding	Italy	0	Thousands	125+ million
12/26-12/28	Windstorm Bruno	Western Europe	3	Thousands	90+ million

Exhibit 5: Middle East

Date(s)	Event	Location	Deaths	Structures/Claims	Economic Loss (USD)
04/05	Earthquake	Iran	1	2,000+	10s of millions
04/14-04/15	Flooding	Iran	48	Thousands	353+ million
05/13	Earthquake	Iran	3	5,000+	10s of millions
07/17-07/18	Flooding	Turkey	0	20,000+	200+ million
07/27	Severe Weather	Turkey	0	50,000+	500+ million
08/11	Flooding	Iran	51	Thousands	35+ million
08/30	Flooding	Yemen	18	10,000+	10s of millions
11/12	Earthquake	Iran, Iraq	630	40,000+	740+ million
12/16	Flooding	Oman, United Arab Emirates	3	5,000+	10s of millions

Exhibit 6: Africa

Date(s)	Event	Location	Deaths	Structures/Claims	Economic Loss (USD)
01/01-03/31	Flooding	Zimbabwe	271	Thousands	200+ million
01/01-06/01	Drought	South Africa	N/A	N/A	100+ million
01/01-12/31	Drought	Somalia, Ethiopia, Kenya	100s	N/A	1.9+ billion
01/05-01/12	Flooding	South Africa, Angola	7	5,000+	Millions
02/14-02/16	Cyclone Dineo	Mozambique	7	107,000+	17+ million
03/07-03/09	Cyclone Enawo	Madagascar	96	85,000+	50+ million
03/19	Severe Weather	Ghana	19	0	N/A
03/21-03/24	Flooding	Angola	11	5,300+	Millions
05/08-05/15	Flooding	Kenya, Tanzania	33	15,000	194+ million
06/07-06/09	Wildfires	South Africa	12	10,000+	400+ million
06/10-06/16	Flooding	Niger, Ivory Coast	27	Thousands	10s of millions
07/08-07/09	Flooding	Nigeria	20	Hundreds	5.0+ million
07/10	Flooding	Niger	23	2,405	Millions
08/14	Landslide	Sierra Leone	1,141	1,545+	10s of millions
08/16	Landslide	Democratic Republic of Congo	200	50+	Negligible
09/19	Flooding	Democratic Republic of Congo	104	Hundreds	1.0+ million
09/26	Flooding	Uganda	23	Hundreds	1.0+ million
10/09-10/10	Severe Weather	South Africa	8	10,000+	200+ million

Exhibit 7: Asia

Date(s)	Event	Location	Deaths	Structures/Claims	Economic Loss (USD)
01/01-01/23	Flooding	Malaysia	0	25,000+	132+ million
01/01-01/31	Flooding	Thailand	85	585,000+	860+ million
01/01-05/01	Drought	Sri Lanka	N/A	N/A	10s of millions
01/01-06/30	Drought	North Korea, South Korea	N/A	N/A	90+ million
01/12-01/16	Flooding	Philippines	11	Hundreds	Millions
01/16-01/31	Flooding	Philippines	11	2,000+	8.1+ million
01/20	Landslide	China	12	N/A	Negligible
01/22-01/24	Flooding	Pakistan	5	Hundreds	Unknown
01/24-01/25	Winter Weather	Afghanistan	31	N/A	Unknown
01/25-01/26	Winter Weather	India	11	N/A	Unknown
01/25-01/30	Flooding	Indonesia	1	2,500+	Millions
01/28	Earthquake	China	0	14,000+	55+ million
02/01-02/05	Winter Weather	Afghanistan, Pakistan	159	Hundreds	Millions
02/09-02/12	Flooding	Indonesia	12	18,000+	10s of millions
02/10	Earthquake	Philippines	8	7,200+	40+ million
02/17-02/19	Winter Weather	Afghanistan, Pakistan	58	N/A	N/A
03/01	Severe Weather	China	7	5,400+	28+ million
03/03	Flooding	Indonesia	8	3,500+	19+ million
03/14-03/29	Severe Weather	Thailand	3	6,000+	Millions
03/27	Earthquake	China	0	50,000+	50+ million
03/28-04/15	Flooding	Bangladesh	0	Thousands	352+ million
04/01	Landslide	Indonesia	28	Hundreds	11+ million
04/04-04/09	Earthquakes	Philippines	0	3,500+	Millions
04/08-04/10	Severe Weather	China	2	2,300+	36+ million
04/15	Tropical Depression 02W	Philippines	10	Hundreds	Millions
04/15-04/17	Severe Weather	China	0	3,800+	41+ million
04/20-04/22	Heatwave	India	10	N/A	N/A
04/22	Severe Weather	Pakistan	11	Hundreds	Unknown
04/29	Landslide	Kyrgyzstan	24	11+	Negligible
04/29	Flooding	Indonesia	10	71+	Unknown
05/01-08/31	Drought	China	N/A	N/A	2.5+ billion
05/01	Severe Weather	Bangladesh	12	Unknown	Unknown
05/04-05/06	Severe Weather	China	3	13,000+	11+ million
05/07-05/20	Flooding	China	17	15,000+	225+ million
05/11	Earthquake	China	8	59,300+	294+ million
05/12-05/15	Flooding	Indonesia	7	5,000+	Millions
05/13-05/15	Severe Weather	China	1	5,000+	147+ million
05/20-05/24	Severe Weather	China	9	20,000+	294+ million

Exhibit 7: Asia (continued)

Date(s)	Event	Location	Deaths	Structures/Claims	Economic Loss (USD)
05/25-05/31	Flooding	Sri Lanka	291	21,000+	197+ million
05/29-05/31	Cyclone Mora	Bangladesh, Myanmar	9	50,000+	100+ million
06/01-06/03	Flooding	Indonesia	4	60,000+	10s of millions
06/02-06/07	Flooding	China, Taiwan	4	15,000+	370+ million
06/05-06/07	Heatwave	India	28	N/A	Unknown
06/09-06/13	Flooding	China	12	11,500+	166+ million
06/10	Severe Weather	Pakistan	10	Hundreds	Millions
06/12-06/13	Flooding	China	1	1,500+	51+ million
06/12-06/13	Flooding	Bangladesh, India	169	20,000+	10s of millions
06/15-06/21	Flooding	China	10	2,000+	93+ million
06/21-06/22	Severe Weather	China	2	2,000+	50+ million
06/22-07/05	Flooding	China	141	412,600	7.5+ billion
06/23	Landslide	China	83	Hundreds	Millions
06/27-08/31	Flooding	Pakistan	105	Thousands	10s of millions
07/03-07/07	Tropical Storm Nanmadol	Japan	37	5,000+	1.2+ billion
07/04-07/07	Flooding	China	7	6,800+	75+ million
07/06	Earthquake	Philippines	3	3,800+	6.9+ million
07/06-07/11	Severe Weather	China	1	2,100+	67+ million
07/07-07/10	Flooding	Vietnam, Laos	19	Hundreds	1.3+ million
07/07-07/12	Flooding	China	23	20,000+	272+ million
07/08-07/15	Flooding	India, Pakistan, Bangladesh	80	165,000+	100s of millions
07/13-07/17	Flooding	China	37	58,100+	4.5+ billion
07/14-07/18	Flooding	China	0	3,200+	33+ million
07/14-07/18	Flooding	India	27	15,000+	450+ million
07/17	Flooding	Afghanistan	36	260+	Millions
07/17-07/18	Tropical Storm Talas	China, Vietnam, Laos, Thailand	9	4,200+	90+ million
07/17-07/20	Flooding	China	12	3,200+	37+ million
07/18-07/25	Flooding	Thailand, Myanmar	23	12,500+	300+ million
07/19-07/21	Severe Weather	China	12	3,700+	48+ million
07/21-07/26	Flooding	India	53	Thousands	423+ million
07/22-07/23	Flooding	South Korea	2	2,345+	51+ million
07/23	Earthquake	China	0	8,700+	8.0+ million
07/24-07/28	Severe Weather	China	13	6,500+	171+ million
07/25-07/28	Tropical Storm Sonca	Vietnam, Laos, Cambodia, Thailand	12	4,200+	Millions
07/29-07/31	TY Nesat & TS Haitang	China, Taiwan, Philippines	1	9,500+	132+ million
08/02-08/03	Flooding	China	4	2,000+	60+ million
08/02-08/03	Flooding	Vietnam	40	5,000+	90+ million
08/02-08/05	Flooding	China	3	15,000+	327+ million

Exhibit 7: Asia (continued)

Date(s)	Event	Location	Deaths	Structures/Claims	Economic Loss (USD)
08/06-08/07	Flooding	Russia	0	2,200+	10s of millions
08/06-08/09	Flooding	China	37	15,000+	315+ million
08/07-08/09	Typhoon Noru	Japan	2	9,500+	100s of Millions
08/08	Earthquake	China	25	72,500+	500+ million
08/08-08/09	Severe Weather	China	1	4,400+	20+ million
08/10-08/31	Flooding	Bangladesh	144	717,600+	10s of millions
08/11-08/16	Flooding	China	18	12,600+	429+ million
08/11-08/31	Flooding	Nepal	159	235,400+	125+ million
08/11-08/31	Flooding	India	950	50,000+	225+ million
08/12-08/13	Severe Weather	China	0	300+	54+ million
08/13	Landslide	India	46	20+	Negligible
08/17-08/20	Severe Weather	China	2	2,500+	46+ million
08/23-08/24	Typhoon Hato	Macau, Hong Kong, China	22	25,000+	3.5+ billion
08/25-08/28	Typhoon Pakhar	China	13	Thousands	56+ million
08/25-09/01	Flooding	China	0	4,700+	90+ million
08/28	Flooding	China	35	Hundreds	25+ million
08/29-08/30	Flooding	India	12	Thousands	500+ million
08/31	Flooding	Pakistan	25	Hundreds	Millions
08/31-09/03	Severe Weather	China	2	Hundreds	93+ million
09/08-09/11	Flooding	China	19	5,800+	94+ million
09/12-09/19	Typhoon Doksuri	Philippines, China, Indochina	40	230,500+	500+ million
09/14-09/18	Typhoon Talim	Japan	5	70,000+	750+ million
09/16-09/17	Severe Weather	China	0	2,400+	1.0+ million
09/18-09/19	Flooding	China	1	2,400+	26+ million
09/24-09/30	Flooding	China	16	20,500+	361+ million
10/01-10/10	Flooding	China	23	28,800+	494+ million
10/09-10/12	Flooding	China	0	400+	77+ million
10/10-10/14	Flooding	Vietnam	98	18,000+	300+ million
10/14-10/17	Typhoon Khanun	Philippines, China, Vietnam	1	Thousands	250+ million
10/14-10/19	Flooding	Thailand	3	50,000+	30+ million
10/21-10/23	Typhoon Lan	Japan, Philippines	17	170,000+	2.0+ billion
10/22	Avalanche	Mongolia	17	N/A	N/A
10/29-10/30	Typhoon Saola	Japan	0	Thousands	250+ million
10/31-11/06	Flooding	India	14	Thousands	10s of millions
11/02-11/05	Typhoon Damrey	Vietnam, Philippines	114	300,000+	1.0+ billion
11/04	Flooding	Malaysia	7	Thousands	10s of millions
11/04-11/07	Flooding	Indonesia	0	3,400+	Millions
11/15	Earthquake	South Korea	0	1,000+	10s of millions

Exhibit 7: Asia (continued)

Date(s)	Event	Location	Deaths	Structures/Claims	Economic Loss (USD)
11/18	Earthquake	China	0	7,800+	25+ million
11/20-11/23	Flooding	Vietnam	8	8,300+	10s of millions
11/21-12/02	Volcano	Indonesia	0	N/A	Millions
11/23	Earthquake	China	0	3,800+	6.1+ million
11/28-11/29	Cyclone Cempaka	Indonesia	11	4,000+	Millions
11/29-12/02	Flooding	Sri Lanka	16	32,100+	Millions
11/29-12/03	Flooding	Thailand	5	161,300+	10s of millions
11/29-12/05	Cyclone Ockhi	India, Sri Lanka	40	50,000+	920+ million
12/15	Earthquake	Indonesia	4	Thousands	Millions
12/16-12/22	Tropical Storm Kai-Tak	Philippines	83	31,000+	10s of millions
12/21-12/26	Typhoon Tembin	Philippines, Vietnam	323	10,000+	10s of millions

Exhibit 8: Oceania (Australia, New Zealand, and the South Pacific Islands)

Date(s)	Event	Location	Deaths	Structures/Claims	Economic Loss (USD)
01/20-01/23	Flooding	French Polynesia	0	1,000+	15 million
02/09-02/13	Wildfires	Australia	0	1,200+	85 million
02/09-02/16	Flooding	Australia	2	5,000+	153 million
02/15-02/18	Wildfires	New Zealand	1	100+	25 million
02/17-02/19	Severe Weather	Australia	1	53,700+	525+ million
03/07-03/12	Flooding	New Zealand	0	7,800+	90+ million
03/13-03/15	Severe Weather	Australia	0	10,000+	50+ million
03/28-04/05	Cyclone Debbie	Australia	14	72,767+	2.4+ billion
04/04-04/06	Debbie (remnants)	New Zealand	1	5,000+	100+ million
04/09-04/14	Cyclone Cook	Vanuatu, New Caledonia, New Zealand	1	5,000+	33+ million
05/04-05/10	Cyclone Donna	South Pacific Islands, New Zealand	2	Thousands	10+ million
07/21-07/23	Winter Weather	New Zealand	0	Thousands	10s of millions
10/15-10/19	Flooding	Australia	7	Hundreds	10s of millions
12/01-12/02	Flooding	Australia	0	2,700+	20+ million
12/19-12/20	Severe Weather	Australia	0	50,000+	300+ million

Appendix B: Historical Natural Disaster Events

The following tables provide a look at specific global natural disaster events since 1950. Please note that the adjusted for inflation (2017 USD) totals were converted using the U.S. Consumer Price Index (CPI). Insured losses include those sustained by private industry and government entities, such as the U.S. National Flood Insurance Program (NFIP).

For additional top 10 lists, please visit **www.aonbenfield.com/catastropheinsight**

Exhibit 9: Top 10 Costliest Global Economic Loss Events (1950-2017)

Date(s)	Event	Location	Economic Loss[1] Actual (USD)	Economic Loss[1,2] (2017 USD)
March 11, 2011	Tohoku Earthquake/Tsunami	Japan	210 billion	230 billion
January 17, 1995	Kobe Earthquake	Japan	103 billion	167 billion
August 2005	Hurricane Katrina	United States	125 billion	156 billion
August–September 2017	Hurricane Harvey	United States	100 billion	100 billion
May 12, 2008	Sichuan Earthquake	China	85 billion	96 billion
October 2012	Hurricane Sandy	U.S., Caribbean, Bahamas, Canada	72 billion	76 billion
January 17, 1994	Northridge Earthquake	United States	44 billion	74 billion
September 2017	Hurricane Maria	United States, Caribbean	65 billion	65 billion
September 2017	Hurricane Irma	United States, Caribbean	55 billion	55 billion
November 23, 1980	Irpinia Earthquake	Italy	19 billion	53 billion

Exhibit 10: Top 10 Costliest Global Insured Loss Events (1950-2017)

Date(s)	Event	Location	Insured Loss[3] Actual (USD)	Insured Loss[2,3] (2017 USD)
August 2005	Hurricane Katrina	United States	67 billion	83 billion
March 11, 2011	Tohoku Earthquake/Tsunami	Japan	35 billion	38 billion
October 2012	Hurricane Sandy	U.S., Caribbean, Bahamas, Canada	30 billion	32 billion
August-September 2017	Hurricane Harvey	United States	30 billion	30 billion
August 1992	Hurricane Andrew	U.S., Bahamas	16 billion	27 billion
September 2017	Hurricane Maria	United States, Caribbean	27 billion	27 billion
January 17, 1994	Northridge Earthquake	United States	15 billion	26 billion
September 2017	Hurricane Irma	United States, Caribbean	23 billion	23 billion
September 2008	Hurricane Ike	United States	15 billion	17 billion
June–December 2011	Flooding	Thailand	16 billion	17 billion

[1] Economic loss include those sustained from direct damages, plus additional directly attributable event costs
[2] Adjusted using US Consumer Price Index (CPI)
[3] Losses sustained by private insurers and government-sponsored programs)w

Exhibit 11: Top 10 Costliest Tropical Cyclones: Economic Loss (1950-2017)

Date(s)	Event	Location	Economic Loss[4] Actual (USD)	Economic Loss[4,5] (2017 USD)
August 2005	Hurricane Katrina	Southeast	125 billion	156 billion
August 2017	Hurricane Harvey	Texas, Louisiana	100 billion	100 billion
October 2012	Hurricane Sandy	U.S., Caribbean, Bahamas, Canada	72 billion	76 billion
September 2017	Hurricane Maria	U.S., Caribbean	65 billion	65 billion
September 2017	Hurricane Irma	U.S., Caribbean	55 billion	55 billion
August 1992	Hurricane Andrew	U.S., Bahamas	27 billion	47 billion
September 2008	Hurricane Ike	U.S., Caribbean	38 billion	42 billion
October 2005	Hurricane Wilma	U.S., Caribbean	27 billion	34 billion
September 2004	Hurricane Ivan	U.S., Caribbean	24 billion	30 billion
September 2005	Hurricane Rita	U.S., Caribbean	19 billion	23 billion

Exhibit 12: Top 10 Costliest Tropical Cyclones: Insured Loss (1950-2017)

Date(s)	Event	Location	Insured Loss[6] Actual (USD)	Insured Loss[5,6] (2017 USD)
August 2005	Hurricane Katrina	Southeast	67 billion	83 billion
October 2012	Hurricane Sandy	U.S., Caribbean, Bahamas, Canada	30 billion	32 billion
August 2017	Hurricane Harvey	Texas, Louisiana	30 billion	30 billion
August 1992	Hurricane Andrew	U.S., Bahamas	16 billion	27 billion
September 2017	Hurricane Maria	U.S., Caribbean	27 billion	27 billion
September 1992	Hurricane Irma	U.S., Caribbean	23 billion	23 billion
September 2008	Hurricane Ike	U.S., Caribbean	15 billion	17 billion
October 2005	Hurricane Wilma	U.S., Caribbean	12 billion	15 billion
September 2004	Hurricane Ivan	U.S., Caribbean	10 billion	13 billion
September 1991	Typhoon Mireille	Japan	7.0 billion	12 billion

[4] Economic loss include those sustained from direct damages, plus additional directly attributable event costs
[5] Adjusted using US Consumer Price Index (CPI)
[6] Losses sustained by private insurers and government-sponsored programs

Exhibit 13: Top 10 Costliest Wildfire Outbreaks: Insured Loss (1950-2017)

Date(s)	Event	Location	Insured Loss[7] Actual (USD)	Insured Loss[7,8] (2017 USD)
October 2017	Tubbs, Atlas, Mendocino Fires	U.S. (California)	11 billion	11 billion
October 1991	Tunnel Fire	U.S. (California)	1.7 billion	3.0 billion
May 2016	Horse Creek Fire	Canada (Alberta)	2.8 billion	2.9 billion
October 2003	Cedar, Old Fires	U.S. (California)	2.1 billion	2.7 billion
December 2017	Thomas, Lilac, Creek Fires	U.S. (California)	2.2 billion	2.2 billion
October 2007	Witch Fire	U.S. (California)	1.6 billion	1.9 billion
February 2009	Black Saturday Bushfires	Australia (Victoria)	1.1 billion	1.3 billion
September 2015	Valley Fire	U.S. (California)	950 million	980 million
December 2016	Chimney Tops 2 Fire	U.S. (Tennessee)	915 million	930 million
May 2011	Slave Lake Fire	Canada (Alberta)	700 million	760 million

Exhibit 14: Top 10 Global Human Fatality Events (1950-2017)

Date(s)	Event	Location	Economic Loss[9] Actual (USD)	Insured Loss[7] Actual (USD)	Fatalities
November 1970	Tropical Cyclone	Bangladesh	90 million	N/A	300,000
July 27, 1976	Tangshan Earthquake	China	5.6 billion	N/A	242,769
December 26, 2004	Indian Ocean Earthquake/Tsunami	Indonesia	14 billion	3 billion	227,898
January 12, 2010	Haiti Earthquake	Haiti	8 billion	100 million	222,570
April 1991	Cyclone Gorky	Bangladesh	2 billion	100 million	138,866
May 2008	Cyclone Nargis	Myanmar	10 billion	N/A	138,366
August 1971	Flooding	Vietnam	N/A	N/A	100,000
May 12, 2008	Sichuan Earthquake	China	85 billion	366 million	88,000
October 8, 2005	Kashmir Earthquake	Pakistan	5.2 billion	50 million	88,000
Summer 2003	Drought/Heatwave	Europe	13.5 billion	1.1 billion	70,000

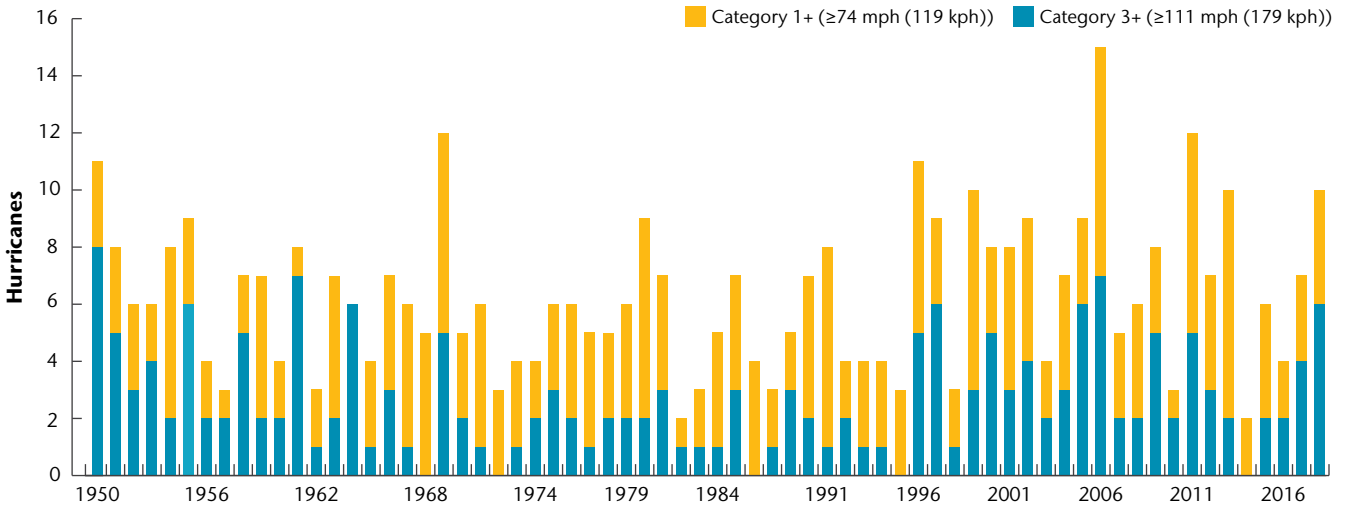
[7] *Losses sustained by private insurers and government-sponsored programs*
[8] *Adjusted using US Consumer Price Index (CPI)*
[9] *Economic loss include those sustained from direct damages, plus additional directly attributable event costs*

Appendix C: Tropical Cyclone Activity & Landfalls

The following shows tropical cyclone activity and landfalls by basin. Note that data for the Atlantic and Western Pacific Basins in this section extend to 1950 given the level of quality data as provided by NOAA's IBTrACS historical tropical cyclone database. All other basins include data to 1980.

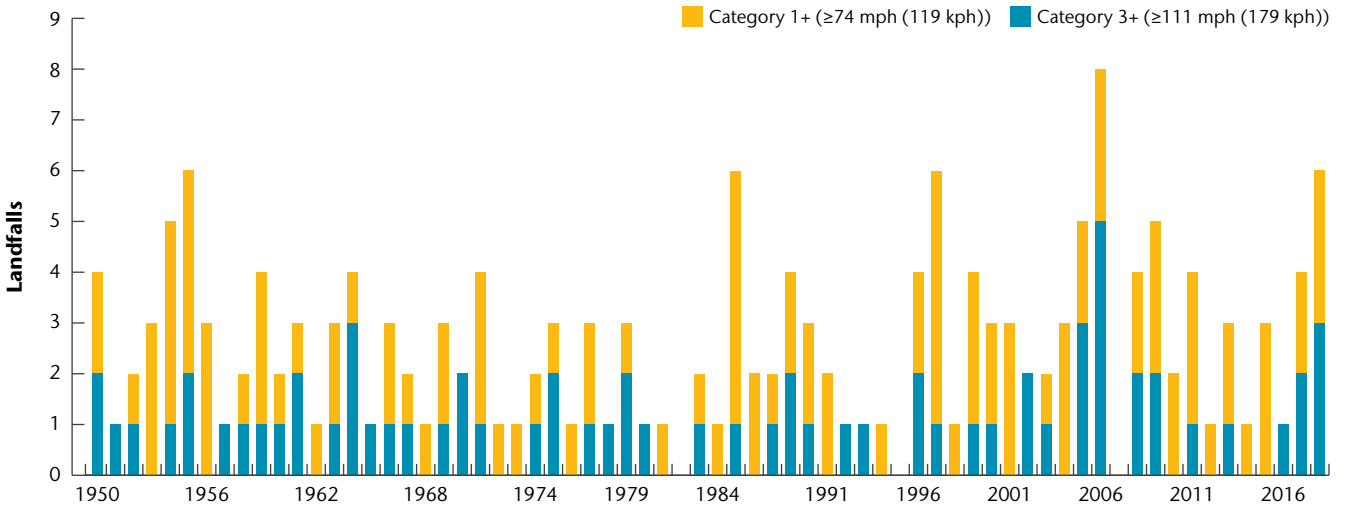
Atlantic Ocean Basin

Exhibit 15: Atlantic Basin Hurricane Activity



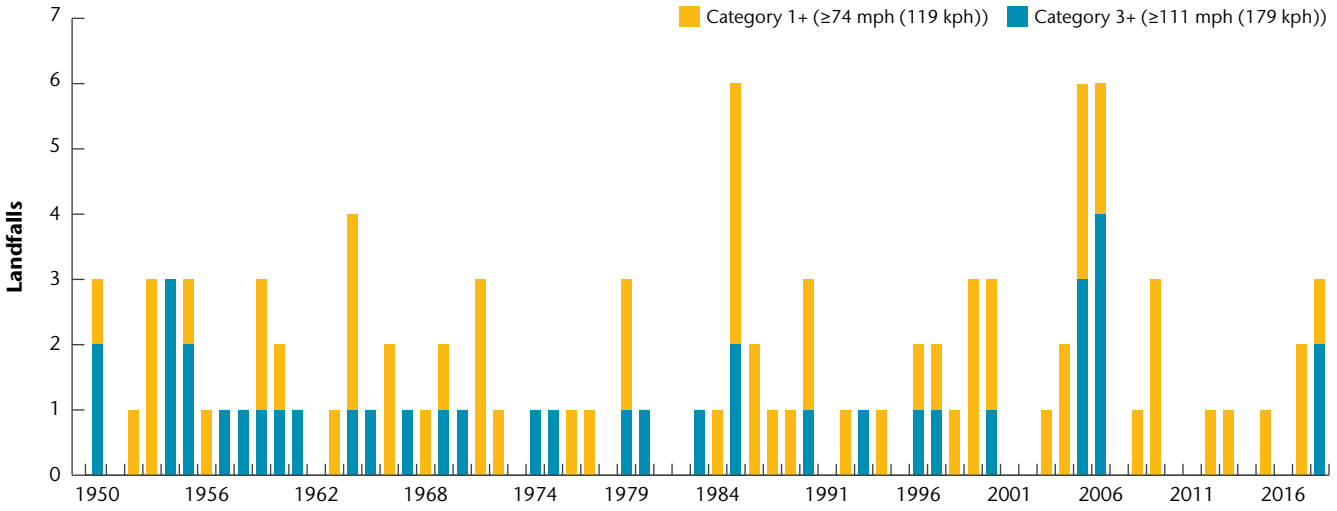
Source: Aon Benfield & NHC

Exhibit 16: Atlantic Basin Hurricane & Major Hurricane Landfalls



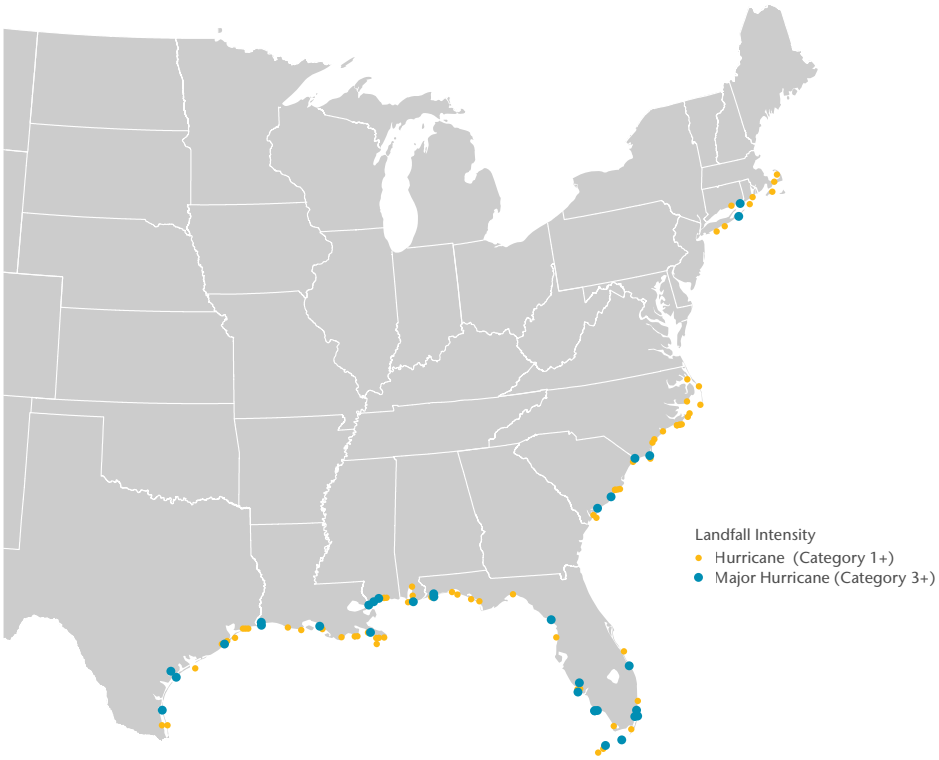
Source: Aon Benfield & NHC

Exhibit 17: United States Hurricane & Major Hurricane Landfalls



Source: Aon Benfield & NHC

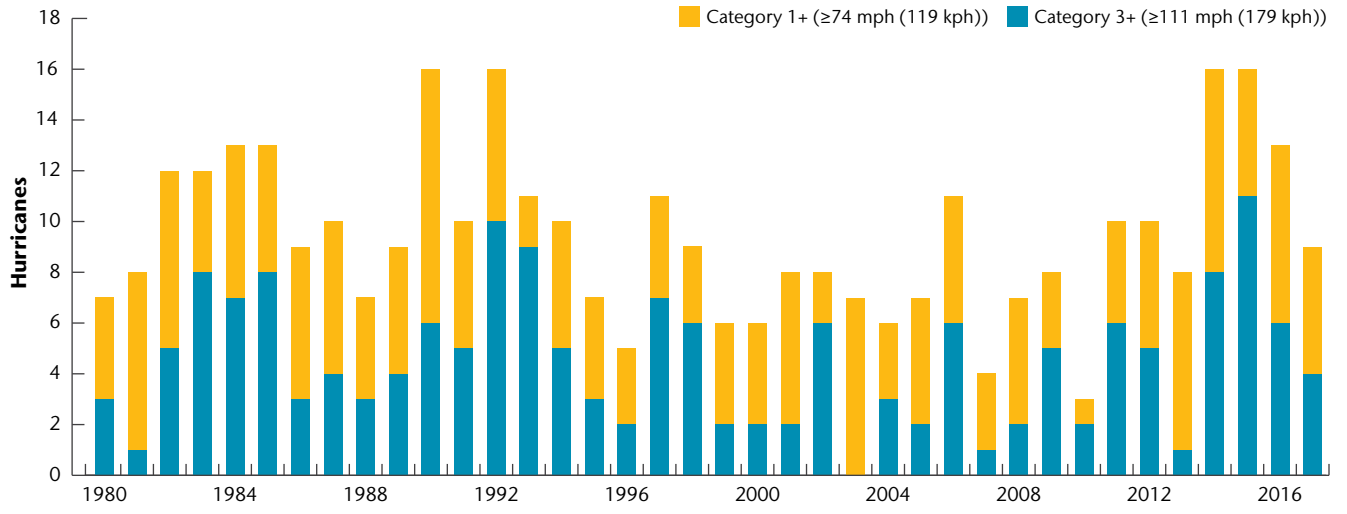
Exhibit 18: United States Hurricane & Major Hurricane Landfall Map (1950-2017)



Source: Aon Benfield & NOAA

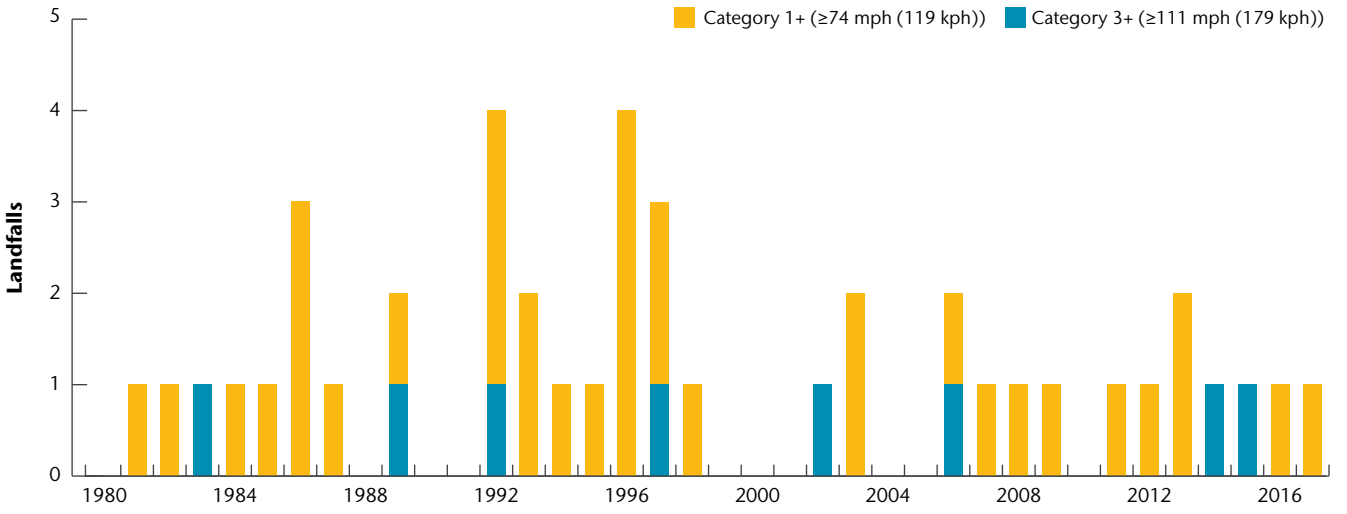
Eastern Pacific Ocean Basin

Exhibit 19: Eastern & Central Pacific Basin Hurricane Activity



Source: Aon Benfield & NHC

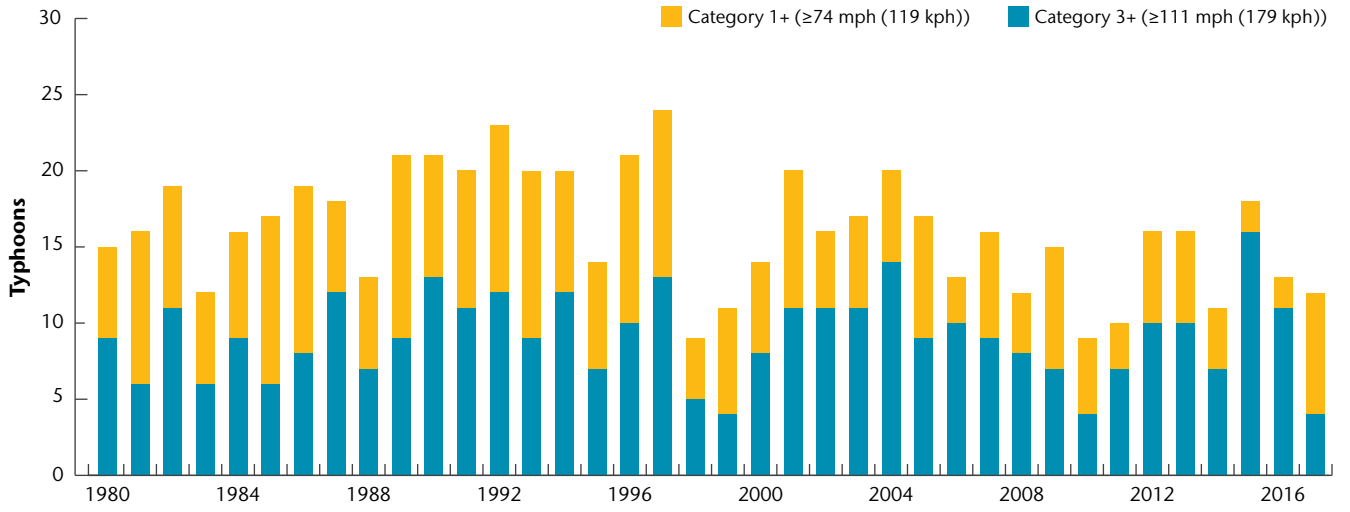
Exhibit 20: Eastern & Central Pacific Basin Hurricane & Major Hurricane Landfalls



Source: Aon Benfield & NHC

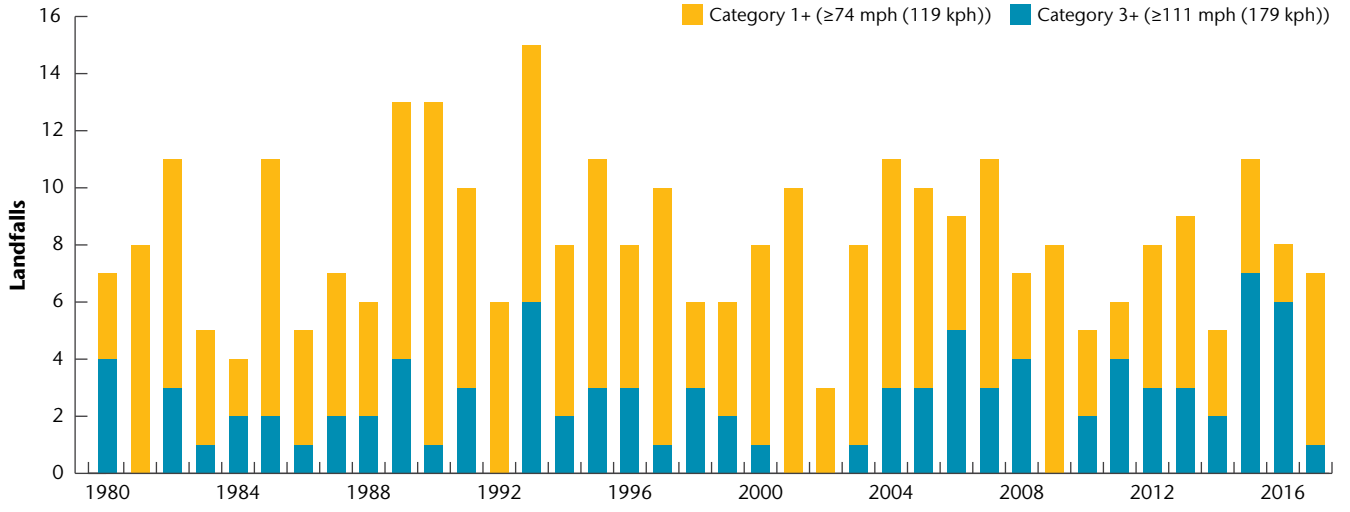
Western Pacific Ocean Basin

Exhibit 21: Western Pacific Basin Typhoon Activity



Source: Aon Benfield & JTWC

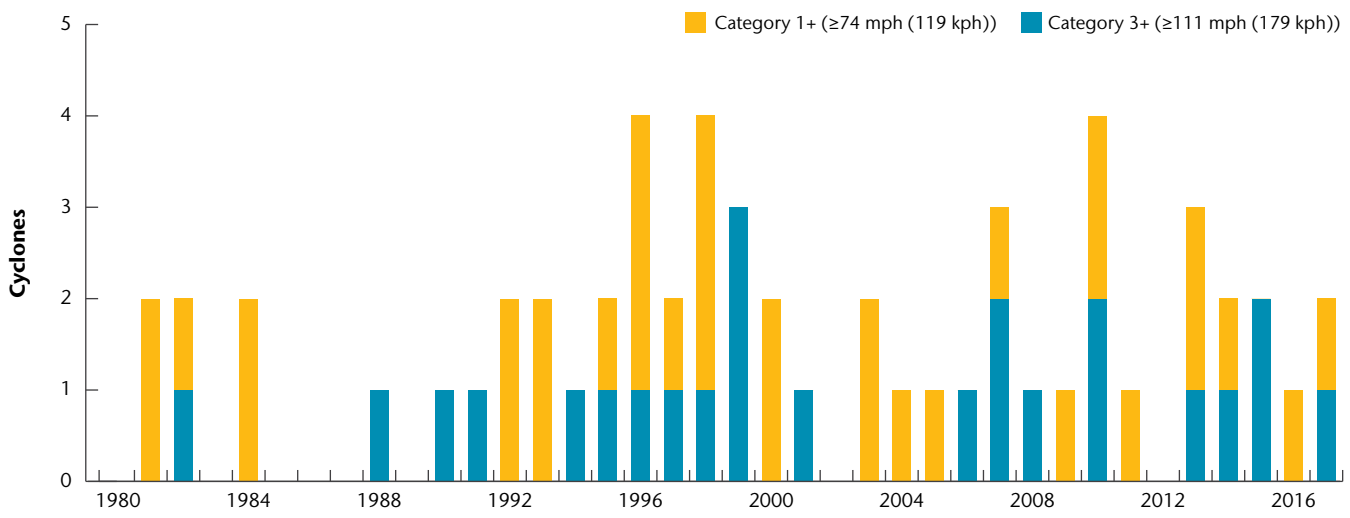
Exhibit 22: Western Pacific Basin Typhoon Landfalls



Source: Aon Benfield & JTWC

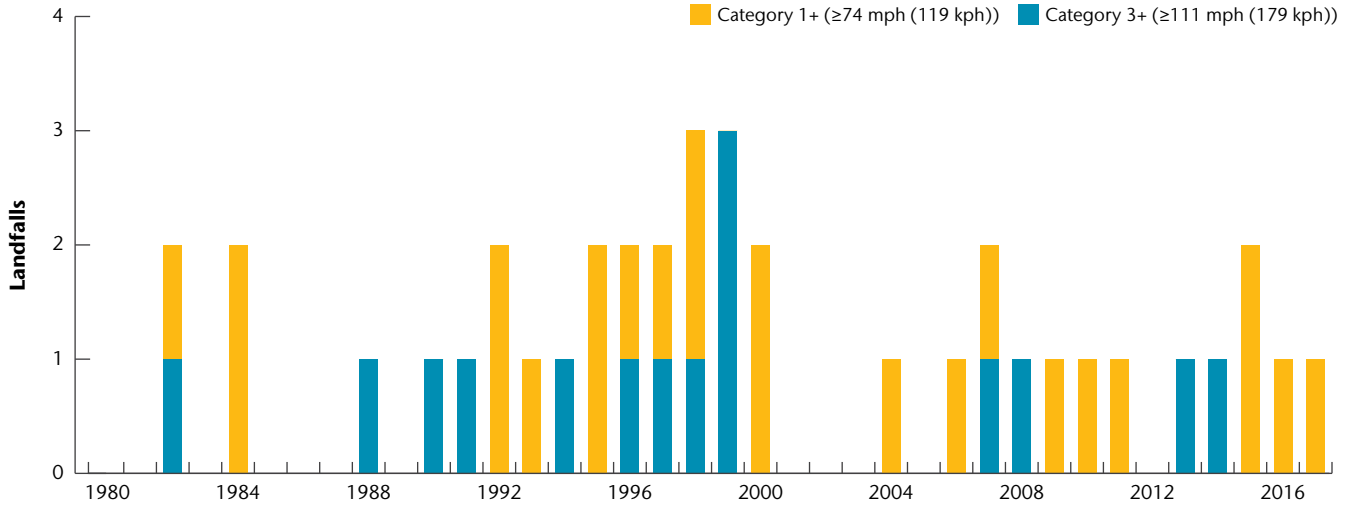
North Indian Ocean Basin

Exhibit 23: North Indian Basin Tropical Cyclone Activity



Source: Aon Benfield & JTWC

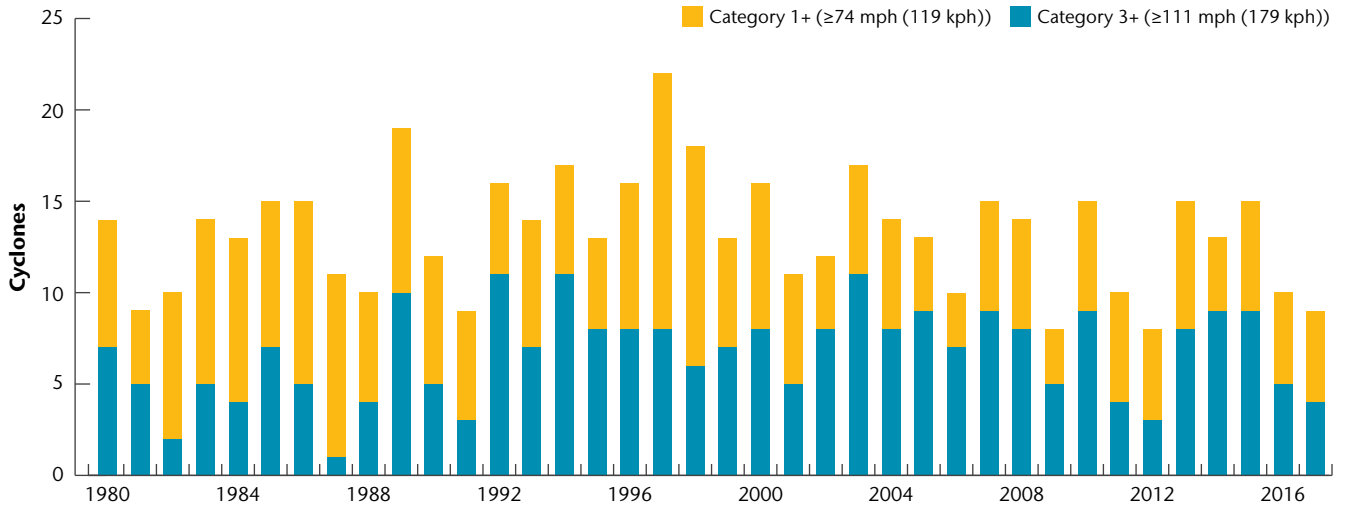
Exhibit 24: North Indian Basin Tropical Cyclone Landfalls



Source: Aon Benfield & JTWC

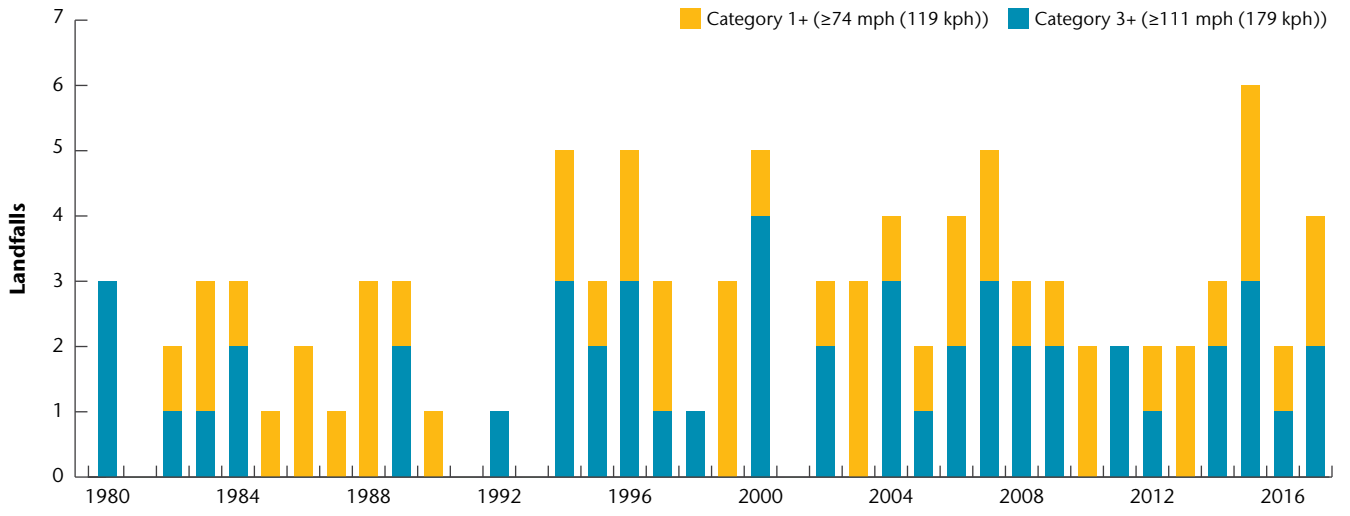
Southern Hemisphere

Exhibit 25: Southern Hemisphere Tropical Cyclone Activity



Source: Aon Benfield & JTWC

Exhibit 26: Southern Hemisphere Tropical Cyclone Landfalls

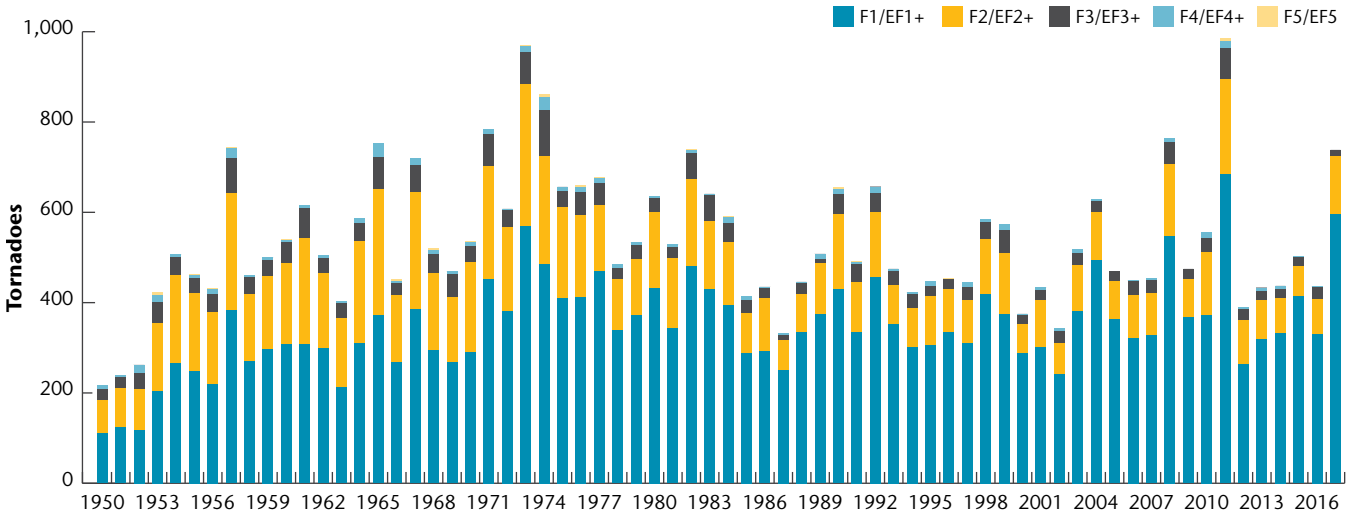


Source: Aon Benfield & JTWC

Appendix D: United States Severe Weather Data

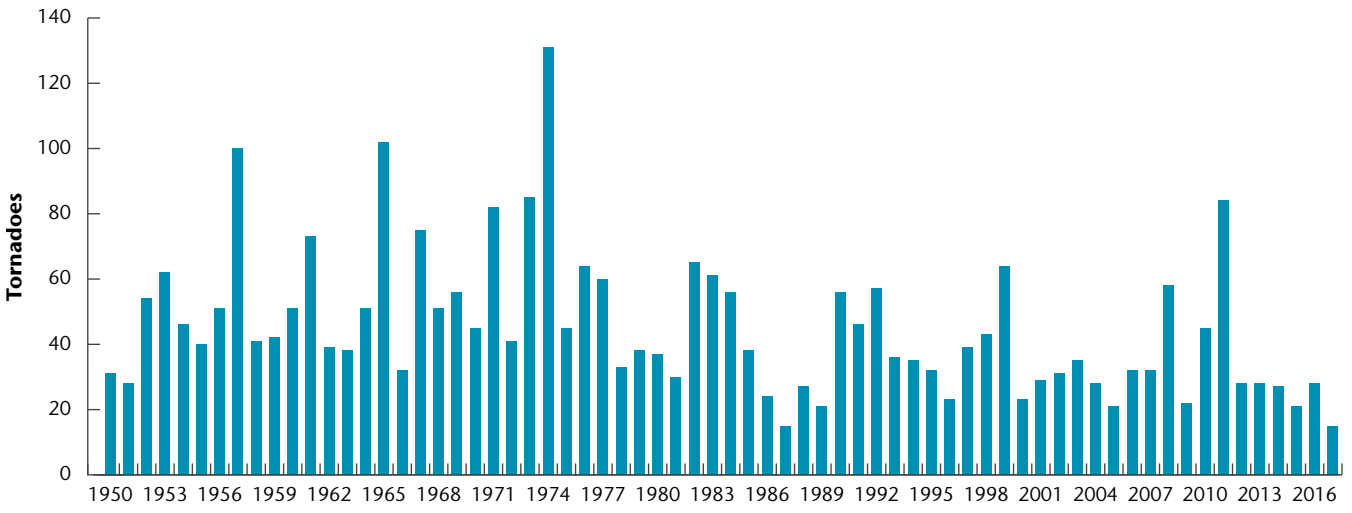
Given the increased cost of severe weather related damage in the United States during the past decade for insurers, the following is a breakout of tornadoes, tornado fatalities, large hail (2.0" or larger), and damaging straight-line winds (75 mph or greater). The data comes via NOAA's Storm Prediction Center. Please note that data prior to 1990 are often considered incomplete given a lack of reporting. The implementation of Doppler radar, greater social awareness and increased reporting has led to more accurate datasets in the last 30 years. Tornado data from 2017 is considered preliminary.

Exhibit 27: U.S. Tornadoes (F1/EF1+)



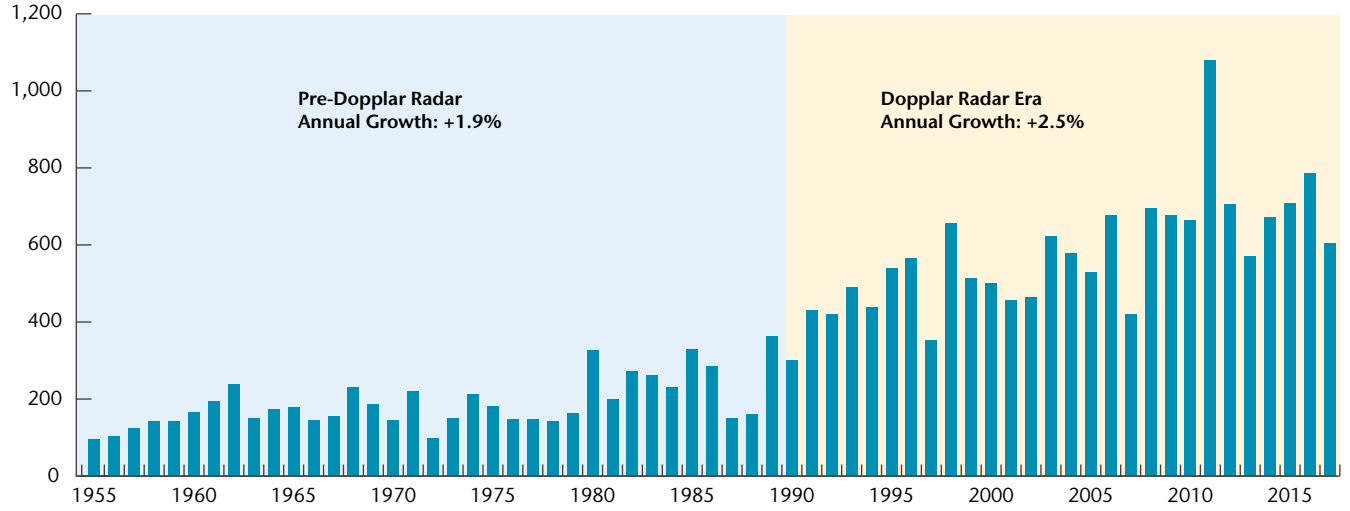
Source: Aon Benfield & NOAA

Exhibit 28: U.S. Tornadoes (F3/EF3+)



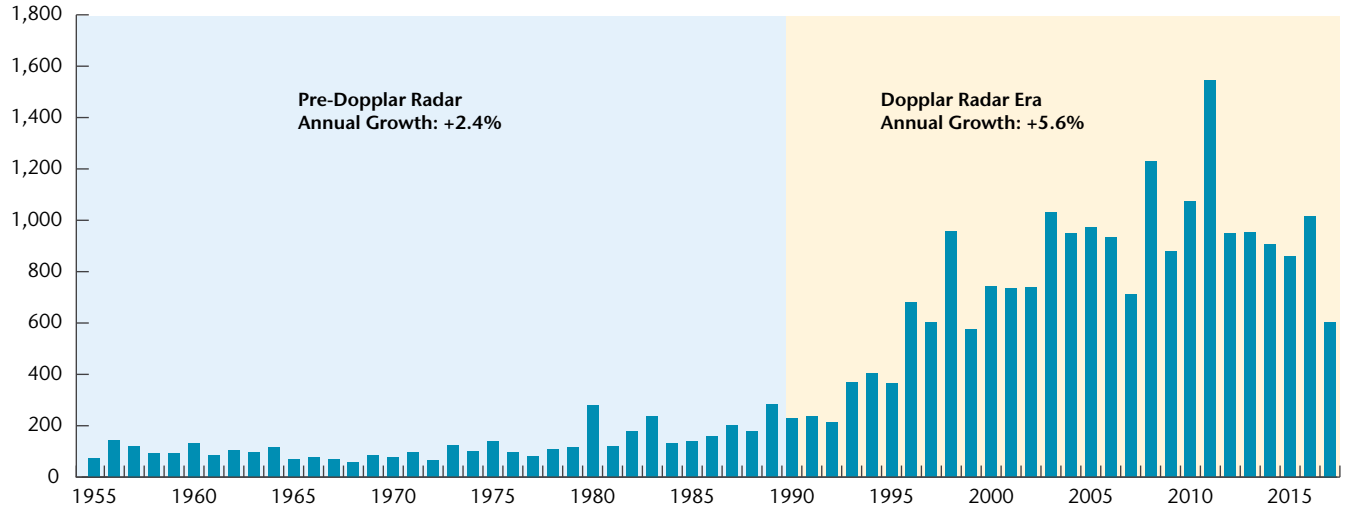
Source: Aon Benfield & NOAA

Exhibit 29: U.S. Large Hail Reports (2.0" or Larger)



Source: Aon Benfield & NOAA

Exhibit 30: U.S. Damaging Wind Reports (75 mph or Greater)

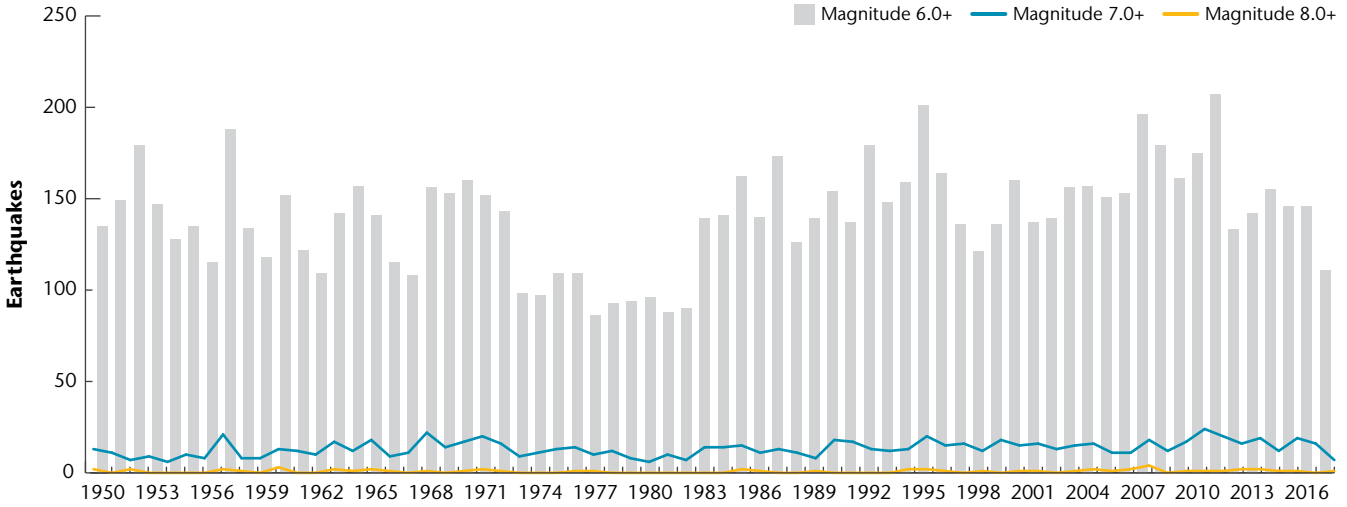


Source: Aon Benfield & NOAA

Appendix E: Global Earthquakes

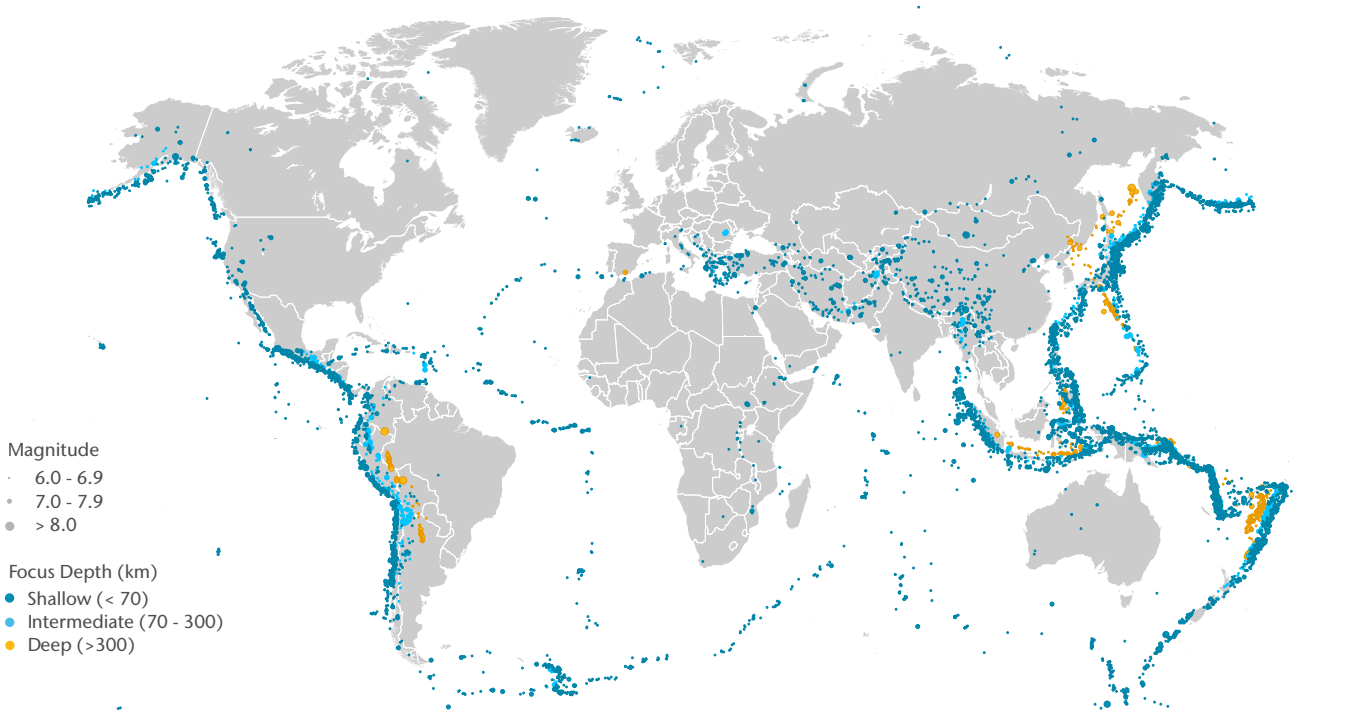
Based on historical data from the United States Geological Survey, the number of earthquakes in 2017 with magnitudes of 6.0 or greater was the fewest (111) since 1982 (90). It was also the first year since 1989 to have fewer than 10 tremors of at least magnitude-7.0 intensity. Despite the reduction in 2017, overall earthquake activity does not often show large fluctuations on an annual basis. This is especially true given the extensive network of global seismograph stations that has led to a robust and thorough dataset over the past several decades.

Exhibit 31: Global Earthquakes (M6.0+)



Source: Aon Benfield & USGS

Exhibit 32: Global Earthquake Map; M6.0+ (1950-2017)

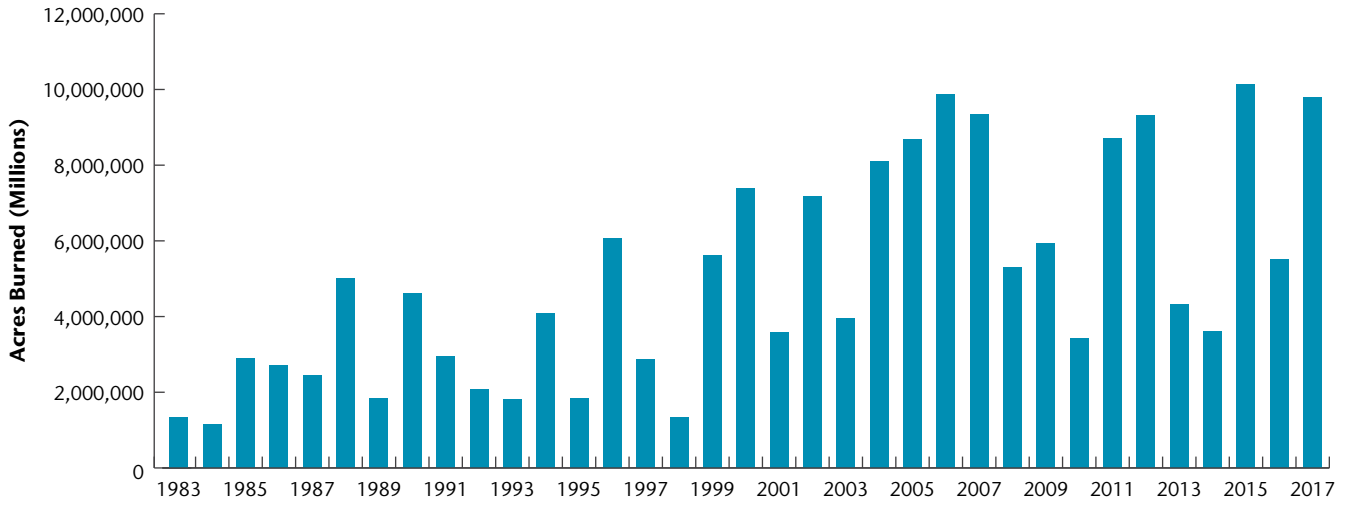


Source: Aon Benfield & USGS

Appendix F: United States & Europe Wildfire Data

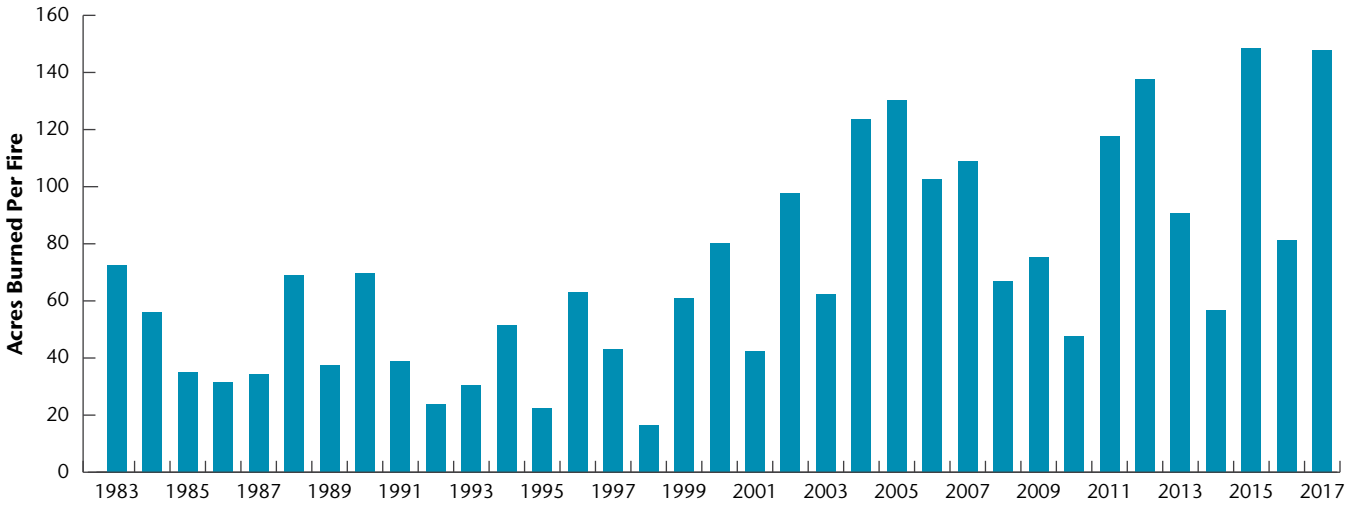
The following wildfire data in the United States is provided from the National Interagency Fire Center (NIFC), which began compiling statistics under their current methodology in 1983. Previous data was collected by the National Interagency Coordination Center (NICC) from 1960 to 1982, but used a different methodology. The European data comes via the European Forest Fire Information System (EFFIS), which is maintained by the European Union's Copernicus programme.

Exhibit 33: United States Wildfire Acres Burned



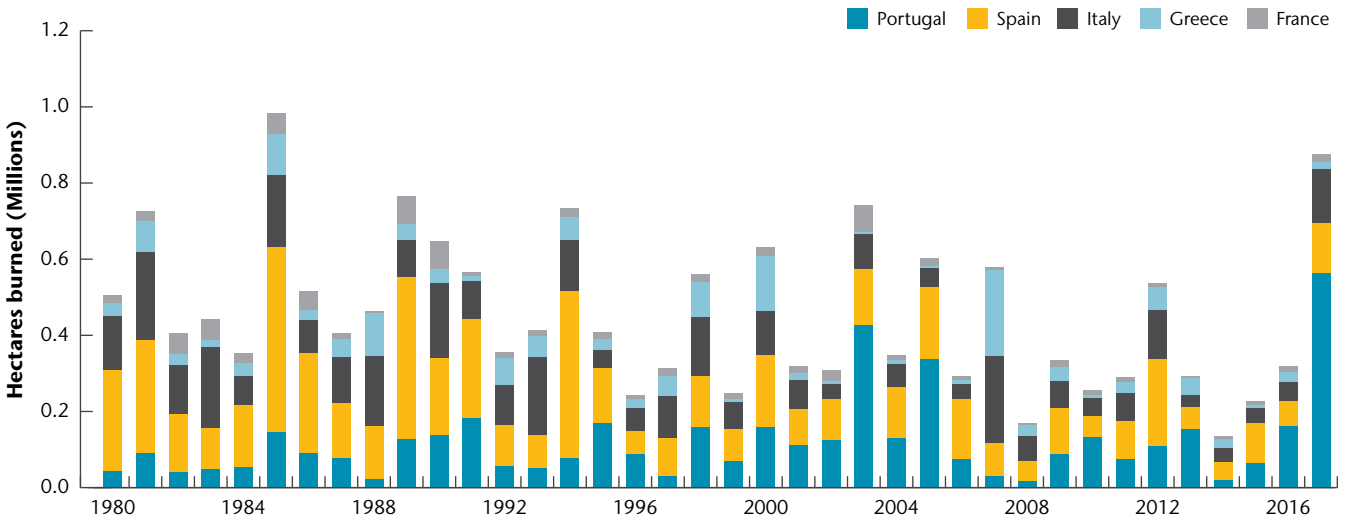
Source: Aon Benfield & NIFC

Exhibit 34: United States Acres Burned Per Fire



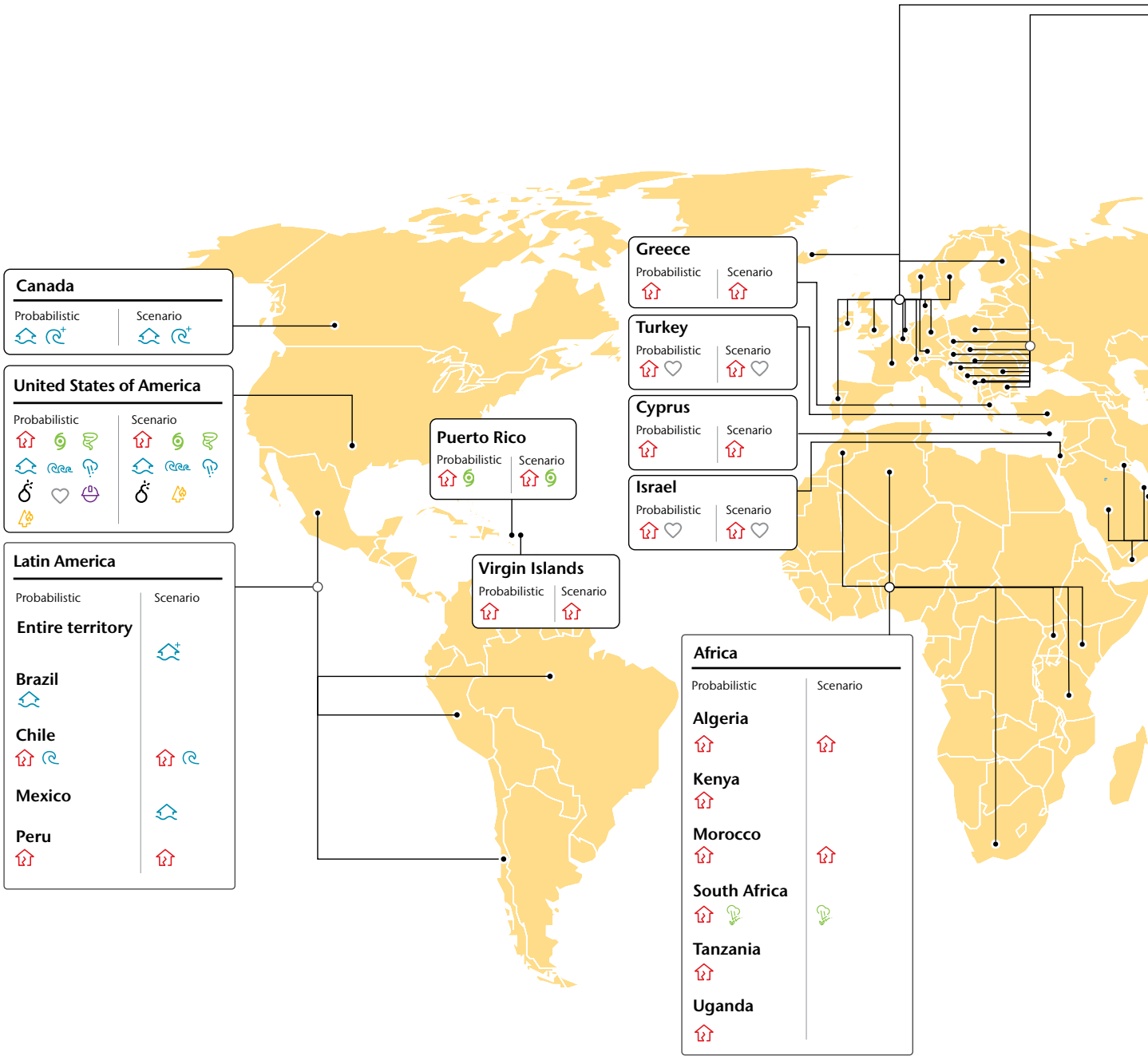
Source: Aon Benfield & NIFC

Exhibit 35: Southern Europe Wildfire Hectares Burned



Source: Aon Benfield & EFFIS

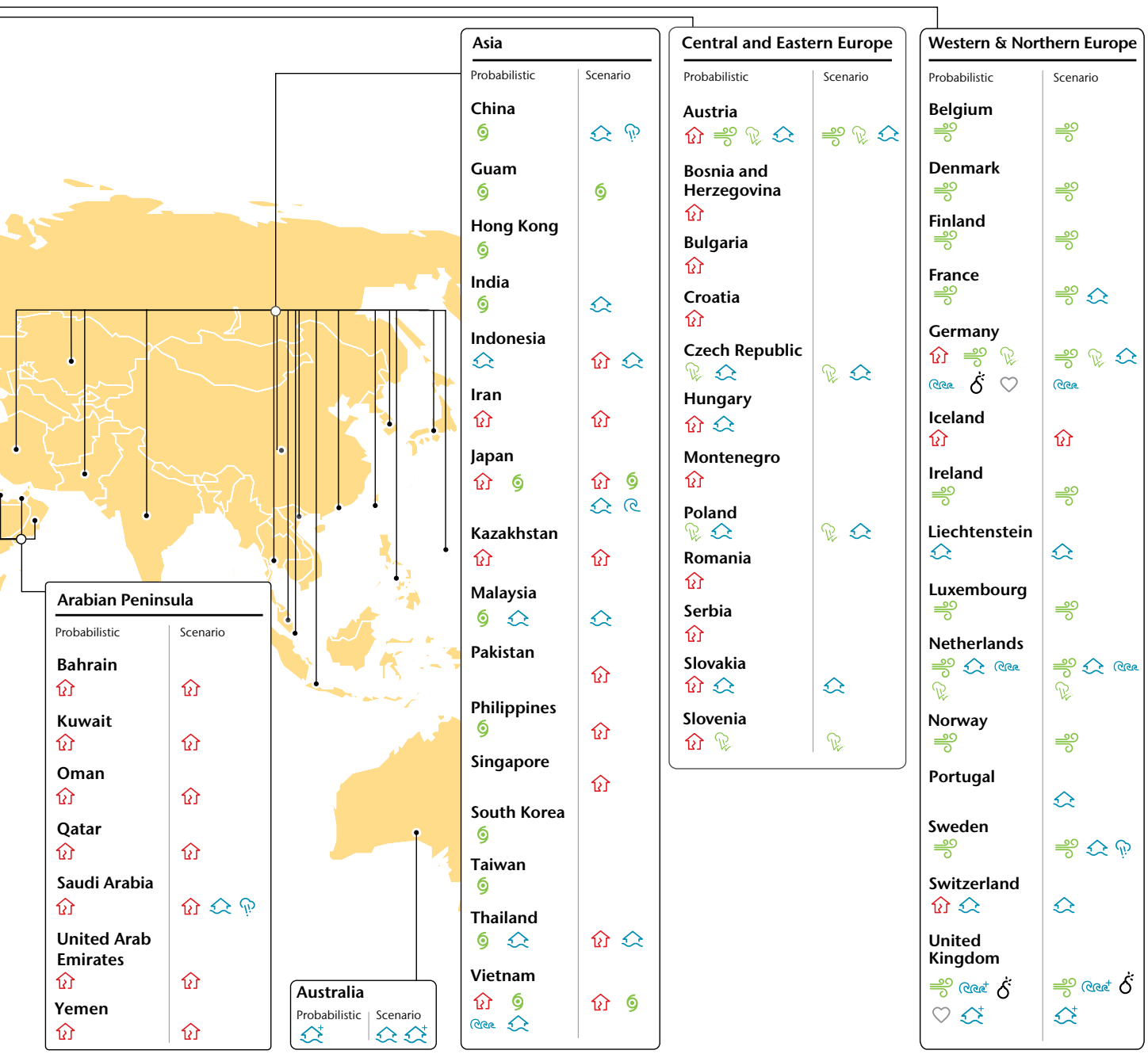
Impact Forecasting Model Coverage Map



Map Icons

earthquake | tropical cyclone | tornado* | windstorm | hail | hail crop | fluvial flood

*tornado / hail / severe winds / thunderstorm



storm surge

tsunami

pluvial flood / cloudburst

brushfire

terrorism

life

workers' compensation

third party models

About Impact Forecasting

Impact Forecasting is a catastrophe model development center of excellence within Aon Benfield whose seismologists, meteorologists, hydrologists, engineers, mathematicians, GIS experts, finance, risk management and insurance professionals analyze the financial implications of natural and man-made catastrophes around the world. Impact Forecasting's experts develop software tools and models that help clients understand underlying risks from hurricanes, tornadoes, earthquakes, floods, wildfires and terrorist attacks on property, casualty and crop insurers and reinsurers. Impact Forecasting is the only catastrophe model development firm integrated into a reinsurance intermediary. To find out more about Impact Forecasting®, visit **www.impactforecasting.com**.

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