Hellenic National Meteorological Service
Climatology-Application Division

2014
SIGNIFICANT WEATHER AND CLIMATIC EVENTS IN GREECE

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SIGNIFICANT WEATHER AND CLIMATIC EVENTS IN GREECE DURING 2014

The definition of the weather categories and the selection of the cases of each category was done according to the instructions and recommendations of the World Meteorological Organization.

For the chosen cases the geographical extent, duration, severity, casualties and impacts of the event were taken into account.

ANALYTICALLY:

This report was conducted by Paraskevi - Vivianna Fragkouli, Head of Climate and Research Section of Hellenic National Meteorological Service.

Cover Page: Image of Lemnos (2014), Photograph by George Papavasileiou.

***WMO-ID**: World Meteorological Organization-IDentification Number*

***HNMS**: Hellenic National*
***NOA**: National Observatory of Athens*

***WS**: Weather Station*
***AWS**: Automatic Weather Station*

***R-12h**: 12-hours Rainfall Height*
***R-24h**: 24-hours Rainfall Height*
***R-48h**: 48-hours Rainfall Height*

***T_{mean}**: mean Temperature*
***T_{max}**: maximum Temperature*

THE MOST SIGNIFICANT WEATHER EVENT in GREECE in 2014

DESCRIPTION

During **23-25 OCTOBER 2014** a synoptic scale disturbance (two successive barometric lows 998 and 1000 hPa respectively) affected the whole country (including Attica-Athens, the capital city of Greece) and caused severe thunderstorms with heavy rainfalls, windstorms, floods, landslides, and locally tornadoes.

SEVERITY

Recorded Rainfall Height:

on 24 OCT. 2014, at the area of Peloponesse:

HNMS-WS of Tripolis (WMO-ID: 16710):	R-12h=35.0 mm
NOA-AWS of Pyrgos:	R-24h=50.0 mm
NOA-AWS of Stemnitsa:	R-24h=50.0 mm

on 24 OCT. 2014: at the area of west Attica:

HNMS-WS of Tatoi (WMO-ID: 16715):	R-12h=63.0 mm
HNMS-WS of Elefsina (WMO-ID: 16718):	R-12h=61.0 mm
NOA-AWS of Ano Liosia:	R-24h=101.8 mm.

on 24-25 OCT. 2014: at the area of Chalkidiki:

NOA-AWS of Vatopedi:	R-48h=143.6 mm
NOA-AWS Stratoni:	R-48h=119. 0 mm

HISTORICAL REFERENCE

average OCTOBER Rainfall Height (1971-2000 climatology):

HNMS-WS of Tripolis (WMO-ID: 16710)	*OCT-average R=64.7 mm*
HNMS-WS of Tatoi (WMO-ID: 16715)	*OCT-average R=50.7 mm*
HNMS-WS of Elefsina (WMO-ID: 16718)	*OCT-average R =40.1 mm*

IMPACTS:

- The heavy rainfall at the area of west Attica resulted in flooded roads and buildings, while a number of people got stranded in their cars. The Fire Service received more than 1,000 calls due to overflowed basements. Also, there were many catastrophes in the infrastructure and the transportation.
- Flooding of the transboundary river of Evros (among Greece, Bulgaria, and Turkey).
- The regional roads of Tripolis (area of central Peloponnese) and Chalkidiki (N-NE Greece) and the path of the national Park of Samaria (Crete Island) were partially damaged and closed due to landslides.
- Tornadoes at Zakynthos Island (Ionian Sea) and Komotini (NE Greece) caused damage to infrastructures, buildings and agriculture.

SUMMER INSTABILITY

DESCRIPTION

The year 2014, especially the period of **MAY-SEPTEMBER 2014** due to favorable weather conditions, was characterized by many cases of large sized hail-falls (upto golf-ball size). The affected regions were mainly located at the northern and central mainland of Greece.

DATES OF THE EVENT OCCURRENCES

The most significant events were on:
18 JUNE, 27 JUNE, 22 JULY and **5-6 AUGUST 2014.**

ECONOMIC LOSSES

The 2014 total amount of the compensations for hail damaged cultivations was over 65 million euros (first assessment of the Hellenic Agricultural Insurance Organization).

RAINFALL and WET MONTHS

DESCRIPTION

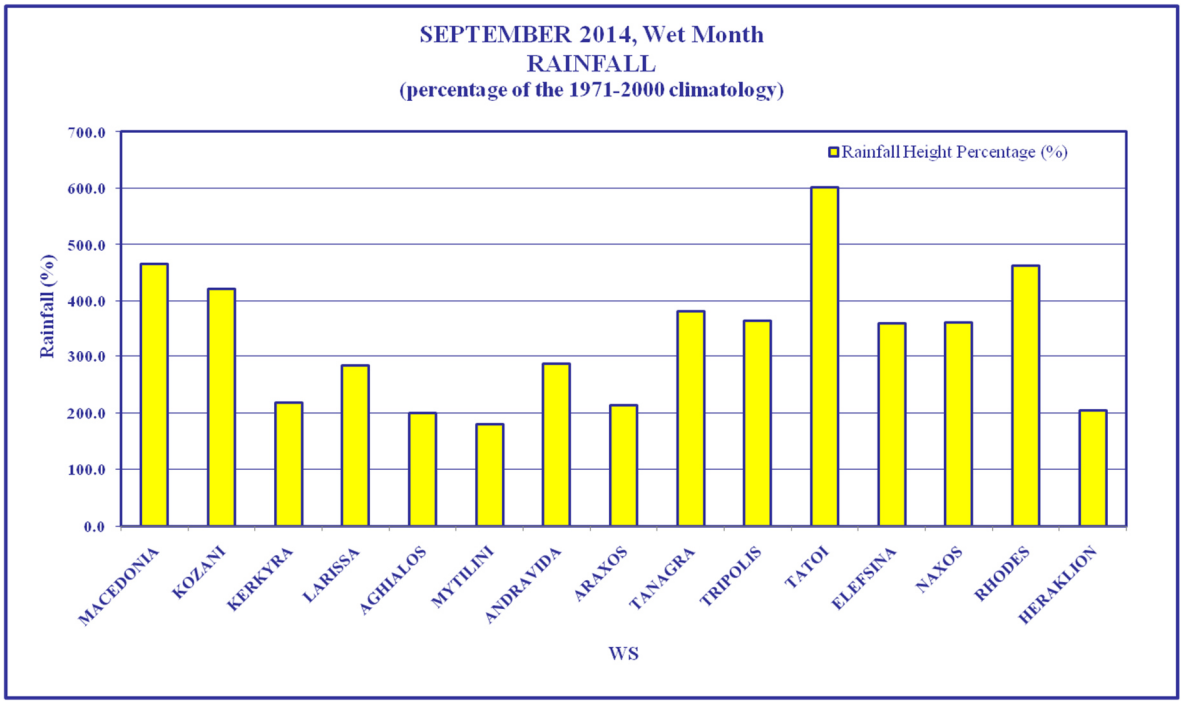
The 2014 annual rainfall height (the average of selected Weather Stations) was about 50% near the normal values, while the corresponding ones of **AUTUMN MONTHS** and **DECEMBER 2014** were above climatology.

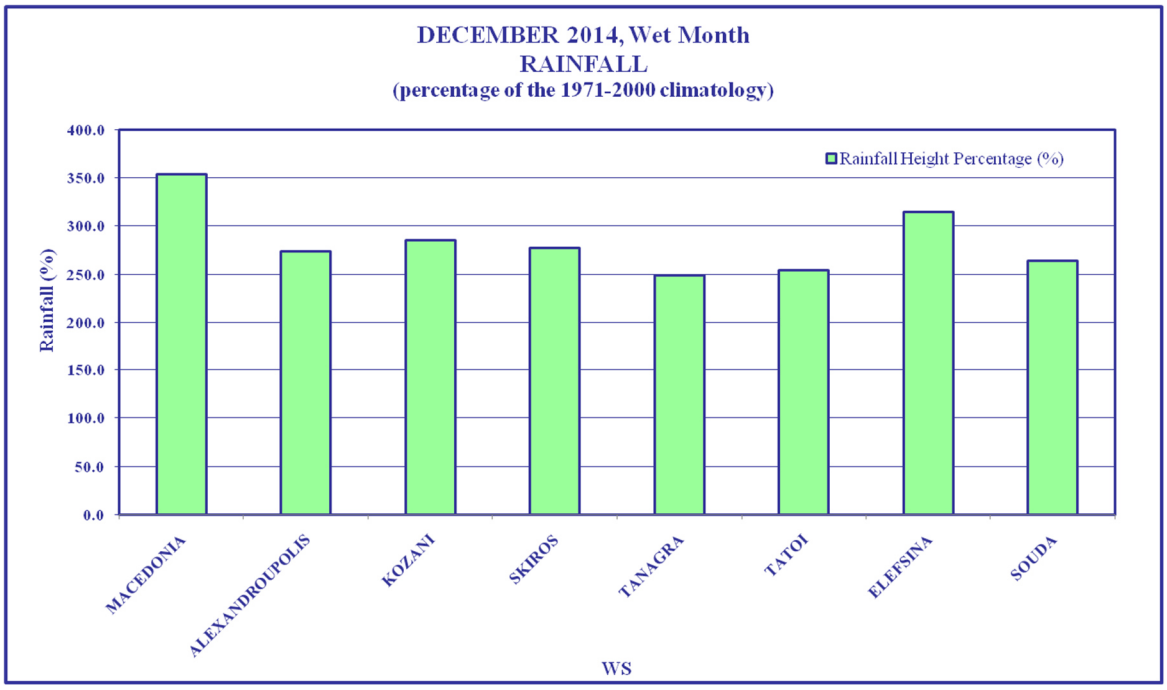
In particular, the monthly rainfall amount of **SEPTEMBER 2014** and **DECEMBER 2014** was 80% above the 1971-2000 climatology.

Some representative rainfall heights are presented in the following Table and the corresponding Figures.

RAINFALL HEIGHT

		RAINFALL HEIGHT (mm)			
WEATHER STATION (WMO-ID)	**LOCATION**	**2014**		***MONTHLY 1971-2000 normals***	**Percentage (%)**
MACEDONIA (16622)	Macedonia, northern Greece	SEP 2014	118.4	*25.4*	465.8
KOZANI (16632)	Macedonia, northern Greece	SEP 2014	118.2	*28.1*	421.0
KERKYRA (16641)	Ionion Sea Islands, northwestern Greece	SEP 2014	156.7	*71.8*	218.3
LARISSA (16648)	Thessaly, central Greece	SEP 2014	69.8	*24.6*	283.7
AGHIALOS (16665)	Thessaly, central Greece	SEP 2014	48.9	*24.5*	199.7
MYTILINI (16667)	east Aegean Islands, eastern Greece	SEP 2014	16.9	*9.4*	179.8
ANDRAVIDA (16682	Peloponnese, west Greece	SEP 2014	82.4	*28.7*	286.9
ARAXOS (16687)	Peloponnese, west Greece	SEP 2014	62.9	*29.5*	213.2
TANAGRA (16699)	Sterea Ellada, central Greece	SEP 2014	45.0	*11.8*	380.7
TRIPOLIS (16710)	Peloponnese mainland, southern Greece	SEP 2014	85.0	*23.3*	364.7
TATOI (16715)	Attica, central Greece	SEP 2014	61.0	*10.2*	600.6
ELEFSINA (16718)	Attica, central Greece	SEP 2014	31.1	*8.6*	359.7
NAXOS (16732)	Cyclades Islands, south Aegean Sea	SEP 2014	23.1	*6.4*	361.7
RHODES (16749)	Dodecanese Islands, southeastern Aegean Sea	SEP 2014	13.0	*2.8*	462.1
HERAKLION (16754)	Crete Island, southern Greece	SEP 2014	24.0	*11.7*	204.5
MACEDONIA (16622)	Macedonia, northern Greece	DEC 2014	164.4	*46.5*	353.8
ALEXANDROUPOLIS (16627)	Thrace, northeastern Greece	DEC 2014	215.3	*78.6*	274.0
KOZANI (16632)	Macedonia, northern Greece	DEC 2014	112.0	*39.3*	285.2
SKYROS (16684)	Sporades Islands, central Aegean Sea	DEC 2014	164.2	*59.2*	277.4
TANAGRA (16699)	Sterea Ellada, central Greece	DEC 2014	175.0	*70.2*	249.1
TATOI (16715)	Attica, central Greece	DEC 2014	202.9	*79.9*	253.8
ELEFSINA (16718)	Attica, central Greece	DEC 2014	190.9	*60.6*	315.1
SOUDA (16746)	Crete Island, southern Greece	DEC 2014	261.0	*98.9*	263.9


SEPTEMBER 2014, Wet Month
RAINFALL
(percentage of the 1971-2000 climatology)
Rainfall Height Percentage (%)
Rainfall (%)
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
MACEDONIA
KOZANI
KERKYRA
LARISSA
AGHIALOS
MYTILINI
ANDRAVIDA
ARAXOS
TANAGRA
TRIPOLIS
TATOI
ELEFSINA
NAXOS
RHODES
HERAKLION
WS


DECEMBER 2014, Wet Month
RAINFALL
(percentage of the 1971-2000 climatology)
Rainfall Height Percentage (%)
Rainfall (%)
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
MACEDONIA
ALEXANDROUPOLIS
KOZANI
SKIROS
TANAGRA
TATOI
ELEFSINA
SOUDA
WS

CASUALTIES due to FLOODS and SUMMER INSTABILITY

DESCRIPTION

The prolonged summer instability period and the resulting flash-floods of the wet last months of the year 2014 led to a number of casualties.

CASUALTIES

Totally, 9 people lost their lives being hit by thunder, or swept away by the water torrents or landslides.

EXTREME RAINFALL HEIGHTS

DESCRIPTION

During the year 2014, the **monthly rainfall height** of some Weather Stations was set as an absolute record or second in rank.

		RAINFALL HEIGHT (mm)			
WEATHER STATION (WMO-ID)	**LOCATION**	**2014**		**RANK and *Monthly Record***	***MONTHLY 1971-2000 normals***
KERKYRA (16641)	Ionion Sea Islands, northwestern Greece	JUL 2014	68.6	1rst in rank ,new JUL-record *(previous record: 58.6 mm in JUL 1991)*	*10.74*
ALEXANDROUPOLIS (16627)	Thrace, northeastern Greece	AUG 2014	108.9	2nd in rank *(AUG record: 114.3 mm in AUG 1951)*	*12.78*
KOZANI (16632)	Macedonia, northern Greece	AUG 2014	101.3	2nd in rank *(AUG record: 158.8 mm in AUG 1982)*	*28.21*
MACEDONIA (16622)	Macedonia, northern Greece	SEP 2014	118.4	2nd in rank *(SEP record: 135.0 mm in SEPT 1973)*	*25.42*
ELEFSINA (16718)	Attica, central Greece	DEC 2014	190.9	1rst in rank, new DEC-record *(previous record: 171.7 mm in DEC 1969)*	*60.59*
TATOI (16715)	Attica, central Greece	DEC 2014	202.1	2nd in rank *(DEC-record: 242.2 mm in DEC 1977)*	*79.93*

EXTREME HIGH TEMPERATURE and T_{max} RECORDS

DESCRIPTION

During the months **JANUARY** and **FEBRUARY 2014** the Temperature was above the average all over the country.

Especially**,**

- the **18-19 FEBRYARY 2014** were the warmest days;
- on **19 FEB 2014,** a **maximum Temperature record was set** at the WS of **Florina**.

SEVERITY

on 19 FEBRUARY 2014:

HNMS-WS of Florina (WMO-ID: 16613): T_{max}=23.3 °C

(record of FEB maximum Temperature, previous record: T_{max}=23.0 °C on 23 FEB 1977).

HISTORICAL REFERENCE

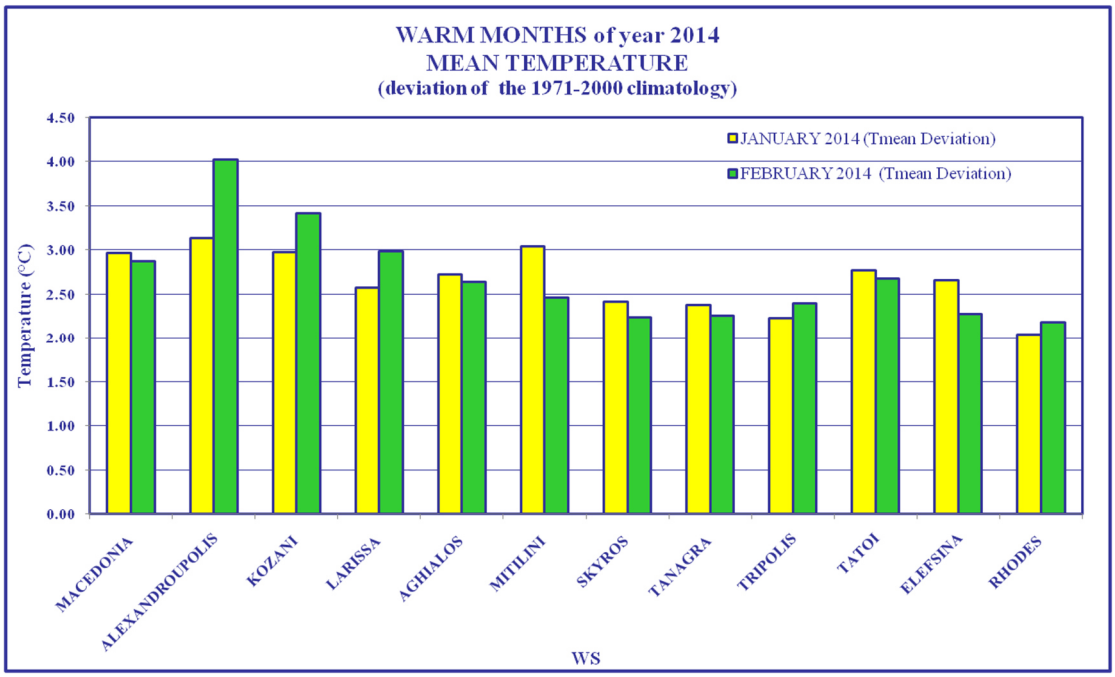
average FEBRUARY maximum Temperature (1971-2000 climatology):

HNMS-WS of Florina (WMO-ID: 16613): FEB-average T_{max}=7.5 °C

Some representative mean Temperature values and their anomalies are presented in the following Table and corresponding Figure respectively.

MEAN TEMPERATURE

		Tmean (°C) JANUARY		Tmean (°C) FEBRUARY	
WEATHER STATION (WMO-ID)	**LOCATION**	**2014**	***1971-2000 normals***	**2014**	***1971-2000 normals***
MACEDONIA (16622)	Macedonia, northern Greece	8.4	*5.43*	9.7	*6.82*
ALEXANDROUPOLIS (16627)	Thrace, northeastern Greece	8.0	*4.86*	9.7	*5.68*
KOZANI (16632)	Macedonia, northern Greece	5.3	*2.33*	7.0	*3.58*
LARISSA (16648)	Thessaly, central Greece	7.8	*5.23*	9.6	*6.62*
AGHIALOS (16665)	Thessaly, central Greece	9.5	*6.78*	10.3	*7.66*
MITILINI (16667)	east Aegean Islands, eastern Greece	12.3	*9.26*	12.0	*9.54*
SKYROS (16684)	Sporades Islands, central Aegean sea	12.1	*9.68*	12.0	*9.76*
TANAGRA (16699)	Sterea Ellada, central Greece	9.8	*7.42*	10.2	*7.94*
TRIPOLIS (16710)	Peloponnese mainland, southern Greece	7.2	*4.97*	7.9	*5.51*
TATOI (16715)	Attica, central Greece	10.0	*7.23*	10.3	*7.62*
ELEFSINA (16718)	Attica, central Greece	11.8	*9.14*	11.8	*9.53*
RHODES (16749)	Dodecanese Islands, south eastern Aegean Sea	14.2	*12.16*	14.4	*12.22*


WARM MONTHS of year 2014
MEAN TEMPERATURE
(deviation of the 1971-2000 climatology)
JANUARY 2014 (Tmean Deviation)
FEBRUARY 2014 (Tmean Deviation)
Temperature (°C)
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
MACEDONIA
ALEXANDROUPOLIS
KOZANI
LARISSA
AGHIALOS
MITILINI
SKYROS
TANAGRA
TRIPOLIS
TATOI
ELEFSINA
RHODES
WS

HEAT WAVES

(A) DESCRIPTION

During **26-27 JUNE 2014**, a **2-day warm event** affected the eastern part of the Greek mainland (enhanced by Foehn wind effect) and was accompanied by transport of African dust.

SEVERITY: daily maximum Temperature T_{max}≥40 °C

on 26 JUNE 2014:

HNMS-AWS of Tithorea (WMO-ID: 16649): T_{max}=42.7 °C

(record of maximum Temperature since its operational use from 2011).

HNMS-AWS of Argos (WMO-ID: 16724): T_{max}=42.3 °C

NOA-AWS of Theologos: T_{max}=41.9 °C

NOA-AWS of Avlida: T_{max}=41.9 °C

NOA-AWS of Volos: T_{max}=41.6 °C

NOA-AWS of Monemvassia: T_{max}=41.6 °C

HISTORICAL REFERENCE

average JUNE maximum Temperature (1971-2000 climatology):

HNMS-WS of Argos (WMO-ID: 16724) *JUN-average T_{max}=33.5 °C*

(B) DESCRIPTION

During **22-24 AUGUST 2014**, a **3-day warm event** affected mainly Crete and Peloponnese.

SEVERITY: daily maximum Temperature T_{max}≥40 °C

on 22 AUGUST 2014

HNMS-AWS of Tithorea (WMO-ID: 16649) T_{max}=40.1 °C

on 23 AUGUST 2014

HNMS-AWS of Paliochora (WMO-ID: 16769) T_{max}=42.3 °C

NOA-AWS of Palaiochora: T_{max}=43.1 °C

on 24 AUGUST 2014

HNMS-WS of Elefsina (WMO-ID: 16718) T_{max}=40.0 °C

on 22-23-24 AUGUST 2014:

NOA-AWS of Sparti: average T_{max}=40.8 °C

HISTORICAL REFERENCE

average AUGUST maximum Temperature (1971-2000 climatology):

HNMS-WS of Elefsina (WMO-ID: 16718) *AUG-average T_{max}=32.5 °C*

AFRICAN DUST TRANSPORT

DESCRIPTION

The year 2014 was characterized by many episodes of **Sahara dust transport** over Greece.

The most significant one that affected the whole country was a **3-day event** during **22-24 APRIL 2014,** where the recorded daily maximum value of the PM-10 dust concentration was 63 mg/m^3 (allowable limit: 50 mg/m^3).
(PM-10 measurements *from NOA's station).*

IMPACTS

The transport of Sahara dust combined with the weather conditions (gale force south winds, high values of both maximum Temperature and Relative Humidity) produced a bad air quality that influenced the human health adversely.

ADVECTION FOG

DESCRIPTION

During **18-19 FEBRUARY 2014** the rare phenomenon of advection fog observed at the center of Athens, the capital of the country**.**

HISTORICAL REFERENCE

at the center of Athens:

- *an average of 0.3 days per year (1955-today climatology);*
- *also, 3 recorded cases during the period 1980-2013.*

TORNADOES

DESCRIPTION

The year 2014 was characterized by a maximum number of tornado occurrences all over the country.

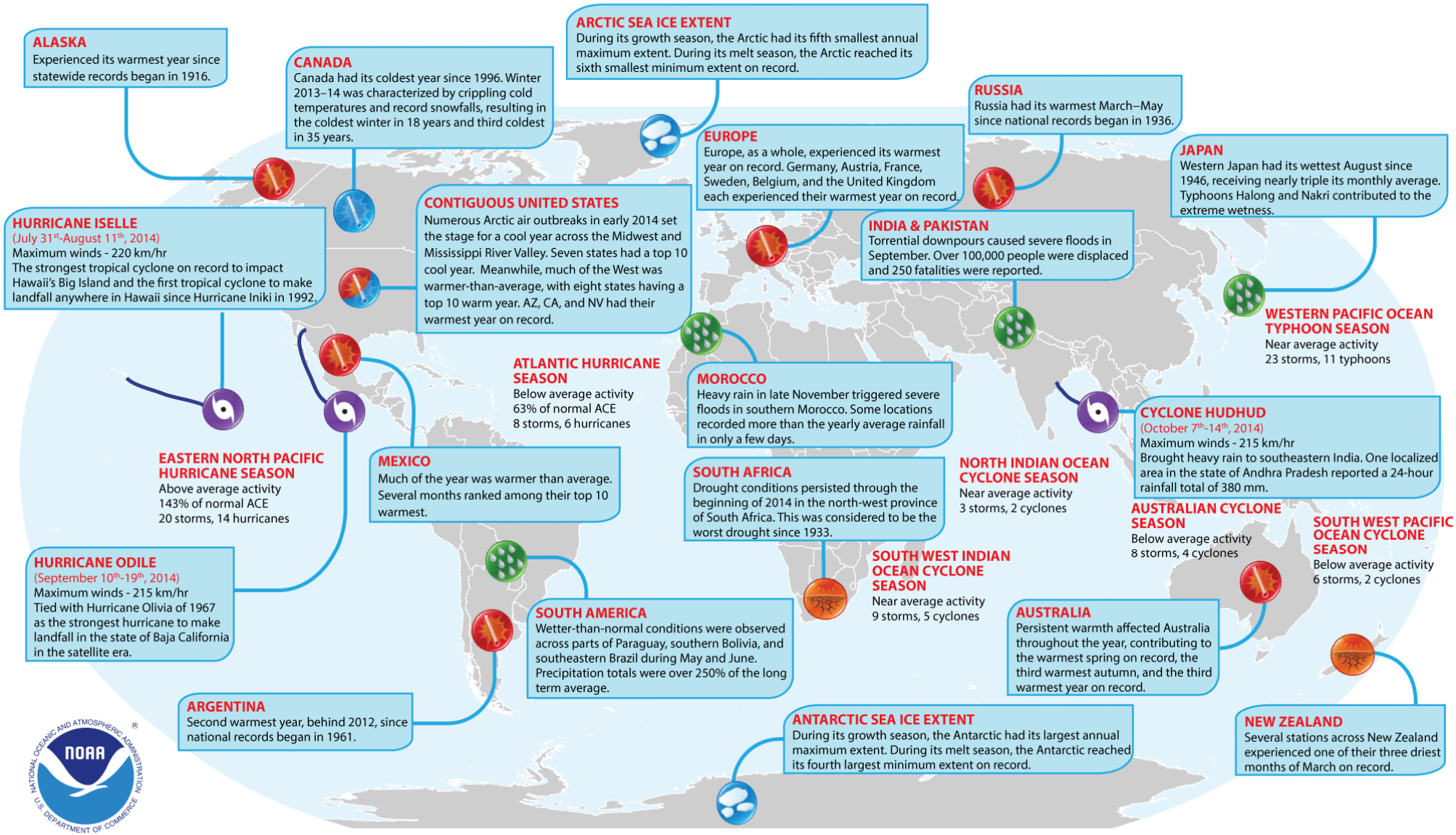
SEVERITY

Approximately 80 cases.

HISTORICAL REFERENCE

This value is considered a maximum one since the year 2000, when amateur meteorologists started recording them.

Selected Significant Climate Anomalies and Events in 2014



Please Note: Material provided in this map was compiled from NOAA's NCDC State of the Climate Reports and the WMO Provisional Status of the Climate in 2014.
For more information please visit: http://www.ncdc.noaa.gov/sotc