Hellenic National Meteorological Service

Climatology-Applications Division

2015
SIGNIFICANT WEATHER and CLIMATIC EVENTS in GREECE

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SIGNIFICANT WEATHER and CLIMATIC EVENTS in GREECE during 2015

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:

EXTREME PRECIPITATION EVENT

FLOODS (2 episodes)

HIGH TEMPERATURE and Tmax RECORDS

FOREST FIRES

HEAT WAVE

CLIMATOLOGY of DECEMBER 2015

ANNUAL RAINFALL HEIGHT

ANNUAL TEMPERATURE

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Cover Page: Tornado over Athens, 22 OCTOBER 2015.
(source: https://www.youtube.com/watch?v=Gczk-idng_A)

***WMO-ID**: World Meteorological Organization-IDentification Number*
***HNMS**: Hellenic National Meteorological Service*
***NOA**: National Observatory of Athens*

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

***R12**: 12-hours Rainfall Height (in mm)*
***R24**: 24-hours Rainfall Height (in mm)*
***R72**: 72-hours Rainfall Height (in mm)*

***Tmean**: mean Temperature (in ℃)*
***Tmax**: maximum Temperature (in ℃)*
***Tmin**: maximum Temperature (in ℃)*

EXTREME PRECIPITATION EVENT

DESCRIPTION

During **21-22 OCTOBER 2015**, a 2-day severe weather event resulted in extended flash floods mainly over the northwest Peloponnese and Attica.

Moreover, several touched-down tornadoes observed in Attica (see cover image).

SEVERITY

RAINFALL HEIGHT

on 22 OCTOBER 2015, at the area of the northwest Peloponnese:

at the HNMS-WS of **Andravida** (WMO-ID: 16682): **R12=125.6 mm**

historical reference

the R12=125.6 mm of the WS-Andravida (WMO-ID: 16682) is its
new record for the 12-hour precipitation height *(reference period: 1959-2015).*

(OCTOBER monthly average: 97.2 mm, reference period 1971-2000).

at the HNMS-WS of **Araxos** (WMO-ID: 16687): **R12=107.3 mm**

historical reference

the R12=107.3 mm of the WS-Araxos (WMO-ID: 16687) is its
new record for the 12-hour precipitation height *(reference period: 1955-2015).*

(OCTOBER monthly average: 79.4 mm, reference period 1971-2000).

at the NOA-AWS of **Lappa**, Achaia: **R24=185.6 mm**

on 22 OCTOBER 2015, at the area of Attica:

at the HNMS-AWS of **Nea Filadelphia** (WMO-ID: 16791): **R24=114.8 m**m

historical reference

the R24=114.8 mm of the AWS-Nea Filadelphia (WMO-ID: 16791),
compared to the records of WS- Nea Filadelphia (WMO-ID: 16701) which was at the same location with the AWS, is set as its
2nd in rank for the 24-hour precipitation height *(reference period: 1955-2010).*
(the R24 record=115.6 mm, on 6 NOVEMBER 1961).

(OCTOBER monthly average: 45.9 mm, reference period 1971-2000).

at the NOA-AWS of **Ano Liosia**: **R24=130.6 mm**

at the private WS of **Menidi**: **R24=179.8 mm**

CASUALTIES

At the prefecture of Attica, 4 people were swept away in the flash floods.

IMPACTS

Heavy rainfall affected several parts of the country and caused floods and landslides. Large damage to electricity, telecommunication and water supply networks, crops, infrastructure, roads and private property.

Several touched-down tornados occurred over Athens and the prefecture of Attica (see cover image). At Lavrio port, minor damage was reported.

In Athens, the Fire Service received more than 3000 calls to help pump water out of basements.

On 23 OCTOBER 2015, the island of Hydra, Saronic Gulf, was declared state of emergency.

Athens flash floods, 22 OCTOBER 2015.

(source: ttp://www.grreporter.info/en/mediterranean_storm_takes_victims_greece/13453)

FLOOD

DESCRIPTION

During **30 JANUARY—01 FEBRUARY 2015**, a 3-day severe weather event caused extended floods over the west (mainly northwest) part of Greece due to continuous downpours.

As a result of the heavy rainfalls and the river flooding, the **Plaka Bridge** at the prefecture of Arta**, a 19th-century stone one-arch bridge, collapsed on 1 FEBRUARY 2015.**

Moreover, south winds up to strong gale force prevailed over Aegean Sea.

Also, significant Sahara dust transport episode affected the whole country.

SEVERITY

RAINFALL HEIGHT

Many WSs reported large rainfall amount, but here are reported the precipitation heights of those which are located upstream of the Plaka Bridge that collaped on 1 FEBRUARY 2015.

during 30,31 JANUARY and 1 FEBRUARY 2015:

at the NOA-AWS of **Vulgareli**:	**R72=61.0+150.4+41.2=252.6 mm**
at the NOA-AWS of **Derviziana**:	**R72=118.0+ 172.0+68.6=358.6 mm**
at the NOA-AWS of **Katarraktes-Arta**:	**R72=115.2+ 125.2+82.8=323.2 mm**

WIND SPEED

on 31 JANUARY 2015:

at the HNMS-AWS of **Soufli**:	**68 knots** (~ 126 km/h)
at the HNMS-AWS of **Psara**:	**62 knots** (~ 115 km/h)
at the NOA-AWS of **Paximada**:	**166 km/h** (~ 89 knots)
at the NOA-AWS of **KavoNtoro**:	**167 km/h**(~ 90 knots)

IMPACTS

Heavy rainfall caused flash floods, landslides and river overflow in several parts of Greece, mainly in the prefecture of Ipirus, west Macedonia, west Peloponnese, and Sterea Ellada.

Large damage to infrastructure, roads, crops, livestock and private property.

The prefecture of Arta and Evritania were declared states of emergency and the authorities ordered the preventive evacuation of some low-lying villages. Also, the Plaka Bridge, a 19th-century one-stringer stone bridge which was the biggest in the Balkans, collapsed on 1 FEBRUARY 2015 due to floods.

Image of the historical Plaka Bridge, before and after the collapse on 1 FEBRUARY 2015.

(source: http://greece.greekreporter.com)

FLOOD

DESCRIPTION

The period **21-30 SEPTEMBER 2015** was characterized by heavy rainfalls that affected the whole country. Specifically, during the following two sub-periods of extreme episodes, many WSs reported daily precipitation height greater than 100 mm:

- **21-23 SEPTEMBER 2015**: the areas of west Peloponnese, Attica, Evia Island, Sporades Islands and Chalkidiki Peninsula were mainly affected.
- **25-26 SEPTEMBER 2015**: the mainly affected areas were Ionian Islands and Crete.

SEVERITY

RAINFALL HEIGHT

During the above mentioned period many WSs reported R24>100 mm, but here are reported only those where the results were disastrous.

during 21-23 SEPTEMBER 2015:

at the NOA-AWS of **Skopelos** Island: **R72=56.2+209.6+49.2=315.0 mm**

on 25 SEPTEMBER 2015:

at the HNMS-WS of **Kefalonia** Island (WMO-ID: 16685): **R12=99.6 mm**

historical reference

the R12=99.6 mm of the WS Kefalonia (WMO-ID: 16685) is its ***4rd in rank record for the 12-hour precipitation height*** *(reference period: 1970-2015).*

(SEPTEMBER monthly average: 34.6 mm, reference period 1971-2000).

CASUALTIES

On 21 SEPTEMBER 2015, 2 people killed by lightning (in the area of Kinouria, Peloponnese and Salamina Island, close to Attica).

IMPACTS

Severe weather, including heavy rainfall and strong winds, caused large damage to several parts of Greece. Particularly:

- injuries and large damage by tornados at southwest Peloponnese were reported on 21 SEPTEMBER 2015 and the area of Asproxoma Kalamtas was declared state of emergency.
- Skopelos island (Sporades Islands, central Aegean Sea) was declared state of emergency (after the floods, mainly on 22 SEPTEMBER 2015).
- Kefalonia Island (Ionian Islands, west Greece) suffered severe damage on infrastructure and property on 25 SEPTEMBER 2015. Also, power supply outages for 2 days.
- at least 55 tourists were trapped at the national gorge of Samaria, Crete Island, south Greece on 26 SEPTEMBER 2015.

HIGH TEMPERATURE and Tmax RECORDS

DESCRIPTION

During **6-7 MAY 2015**, a 2-day period of daily maximum Temperature (Tmax) above average **set some records** over northwest Greece.

SEVERITY

Tmax TEMPERARURE

on 6 MAY 2015:

at the HNMS-WS of **Kastoria** (WMO-ID: 16614): **Tmax=34.8 °C**

historical reference

the Tmax=34.8 °C of WS-Kastoria (WMO-ID: 16614) is its
MAY's Tmax new record *(2nd in rank 33.4 °C, on 28 MAY 2008, reference period: 1981-2015).*

(MAY monthly average Tmax: 21.8 °C, reference period 1981-2000).

at the HNMS-WS of **Konitsa** (WMO-ID: 16628): **Tmax=34.6 °C**

historical reference

the Tmax=34.6 °C of WS-Konitsa (WMO-ID: 16628) is its
MAY's Tmax new record *(2nd in rank 33.2 °C, on 23 MAY 1994, reference period: 1990-2015).*

(MAY monthly average Tmax: 23.5 °C, reference period 1990-2000).

FOREST FIRES

DESCRIPTION

During **17-20 JULY 2015,** extended Forest Fires occurred in many places of Greece.

The most affected regions were the prefectures of Lakonia (Peloponnese) and Attica including the suburban forest of mount Hymettus in Athens city.

CASUALTIES

One man found dead in the vicinity of Kareas (mount Hymettus, Attica).

IMPACTS

For protective and safety purposes, people removed from their places and some campus were evacuated.

(source: http://www.zerohedge.com/news/2015-07-17/greece-burning-literally)

(source: http://www.ibtimes.co.uk/greece-fire-rages-hills-around-athens-causing-residents-flee-1511369)

HEAT WAVE

DESCRIPTION

During **5-6 SEPTEMBER 2015,** a 2-day **Heat Wave event (**Tmax>=40 °C) affected the central part of the Greek mainland

SEVERITY

Tmax TEMPERARURE

on 5 SEPTEMBER 2015:

at the HNMS-WS of **Larissa** (WMO-ID: 16648): **Tmax=40.4 °C**

historical reference

the Tmax=40.4 °C of WS-Larissa (WMO-ID: 16648) is its ***SEPTEMBER's Tmax new record*** *(2nd in rank 39.4 °C, on 21 SEPTEMBER 2000, reference period: 1955-2015).*

(SEPTEMBER monthly average Tmax: 28.6 °C, reference period 1971-2000).

on 6 SEPTEMBER 2015:

at the HNMS-WS of **Elefsina** (WMO-ID: 16718): **Tmax=41.6 °C**

historical reference

the Tmax=41.6 °C of WS-Elefsina (WMO-ID: 16718) is its ***SEPTEMBER's Tmax new record*** *(2nd in rank 39.8 °C, on 2 SEPTEMBER 1962, reference period: 1958-2015).*

(SEPTEMBER monthly average Tmax: 28.9 °C, reference period 1971-2000).

at the HNMS-WS of **Nea Agxialos** (WMO-ID: 16665): **Tmax=40.7 °C**

historical reference

the Tmax=40.7 °C of WS-Nea Agxialos (WMO-ID: 16665) is its ***SEPTEMBER's Tmax new record*** *(2nd in rank 37.8 °C, on 3 SEPTEMBER 1988, reference period: 1956-2015).*

(SEPTEMBER monthly average Tmax: 27.3 °C, reference period 1971-2000).

at the HNMS-WS of **Tanagra** (WMO-ID: 16699): **Tmax=40.2 °C**

historical reference

the Tmax=40.2 °C of WS-Tanagra (WMO-ID: 166995) is its ***SEPTEMBER's Tmax new record*** *(2nd in rank 39.0 °C, on 14 SEPTEMBER 1979, reference period: 1958-2015).*

(SEPTEMBER monthly average Tmax: 28.0 °C, reference period 1971-2000).

CLIMATOLOGY of DECEMBER 2015

DESCRIPTION

The month **DECEMBER 2015** presents some interesting statistics. Specifically:

- the monthly **precipitation height** was much **below** climatology, while some locations recorded zero precipitation.
- the **sunshine duration** was **above** the long-term statistics.
- at the northwest part of Greece, some WSs recorded negative Tmin almost the whole month.
- the country experienced anticyclonic weather conditions during the whole month.

(The average values are from representative HNMS-WSs).

SEVERITY

RAINFALL HEIGHT

The monthly Precipitation Height (averaged value) was approximately 10-times below the 1971-2000 normal value (12.51%).

SUNSHINE DURATION

The Sunshine Duration was above long-term statistics.

Some examples, compared to the 1977-2000 long-term statistics:

at the HNMS-WS of Alexandroupolis (WMO-ID: 16627):	209.65 %
at the HNMS-WS of Thessaloniki (WMO-ID: 16622):	197.94 %
at the HNMS-WS of Kerkira (WMO-ID: 16641):	158.66 %
at the HNMS-WS of Larissa (WMO-ID: 16648):	148.45 %

ANNUAL RAINFALL HEIGHT

DESCRIPTION

The **annual 2015 average Precipitation height** was close to the 1971-2000 normal values.

However, the wet months JUNE and SEPTEMBER and the dry month DECEMBER were characterized by some extremes.

(The average values are from representative HNMS-WSs).

SEVERITY

the **average RAINFALL HEIGHT**

of JUNE 2015 was approximately 3-times above the 1971-2000 climatology:

R anomaly=[(averageR_{2015}=36.30 mm)/(averageR_{ref}=11.44 mm)]=317.42 %

of SEPTEMBER 2015 was approximately 3-times above the 1971-2000 climatology:

R anomaly=[(averageR_{2015}=68.15 mm)/(averageR_{ref}=20.10 mm)]=342.53 %

It is worth mentioning that the SEPTEMBER 2015 precipitation height occurred **only** during the last 10-days of the month.

of DECEMBER 2015 was approximately 10-times below the 1971-2000 climatology:

R anomaly=[(averageR_{2015}=10.90 mm)/(averageR_{ref}=87.19 mm)]=12.51 %

ANNUAL TEMPERATURE

DESCRIPTION

The **year 2015** was characterized by **positive Temperature anomalies**, with the most pronounced during the months SEPTEMBER and NOVEMBER 2015.

The following diagram shows the deviation of the annual average mean, maximum and minimum Temperature from the 1971-2000 climatology.

(The average values are from representative HNMS-WSs).

SEVERITY

TEMPERAURE

the deviation of the average TEMPERAURE (compared to 1971-2000 climatology):

of the YEAR 2015:

Tmean deviation = 0.82 °C

Tmax deviation = 0.86 °C

Tmin deviation = 0.99 °C

of SEPTEMBER 2015:

Tmean deviation = 2.03 °C

Tmax deviation = 1.89 °C

Tmin deviation = 2.61 °C

historical reference

*the **average Tmean=24.6 °C** of **SEPTEMBER 2015** is **set as 3rd in rank,** while the **average Tmax=29.1 °C** is **the 4th** (reference period: 1960-2015).*

of NOVEMBER 2015:

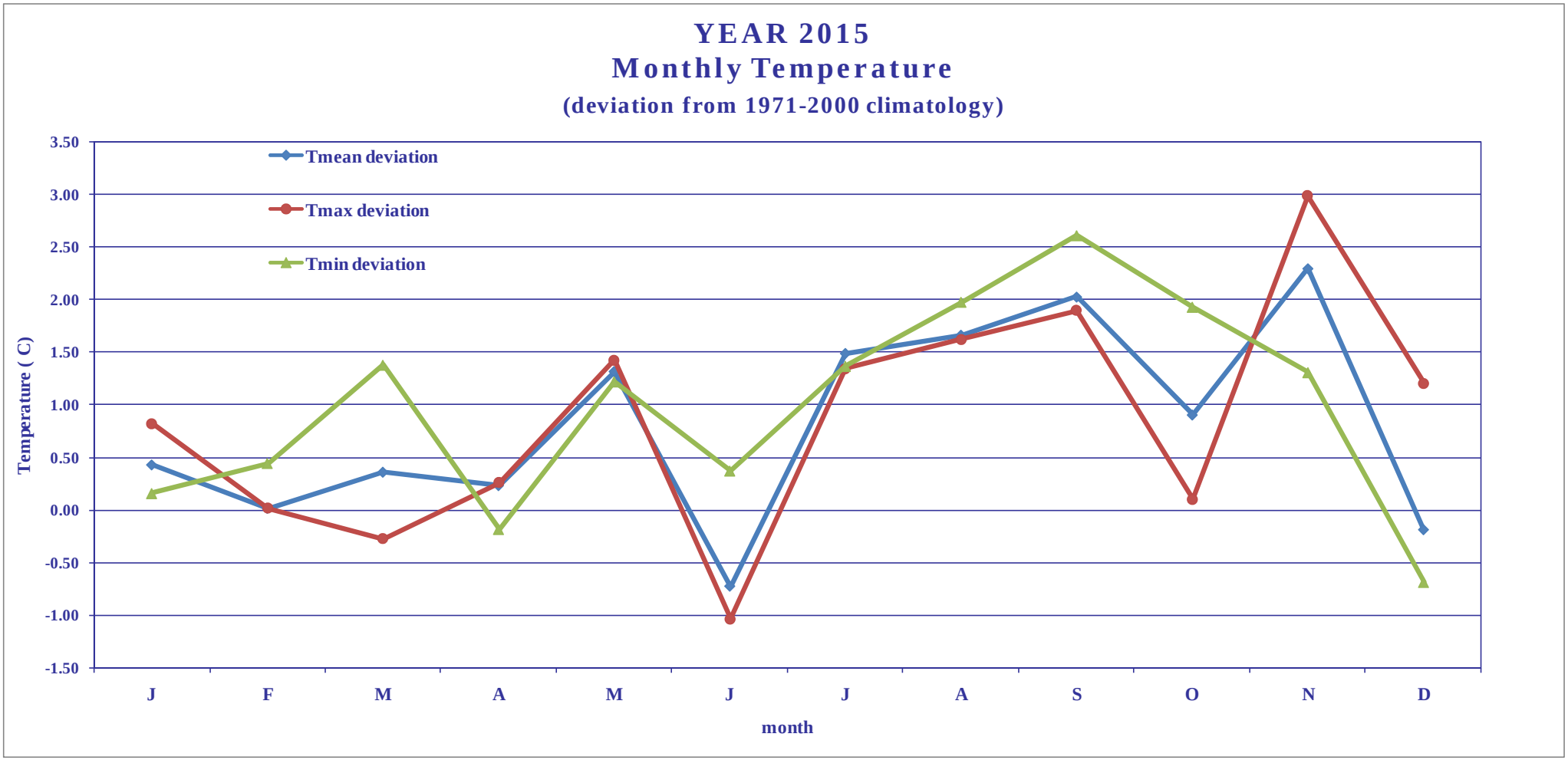
Tmean deviation = 2.30 °C

Tmax deviation = 2.99 °C

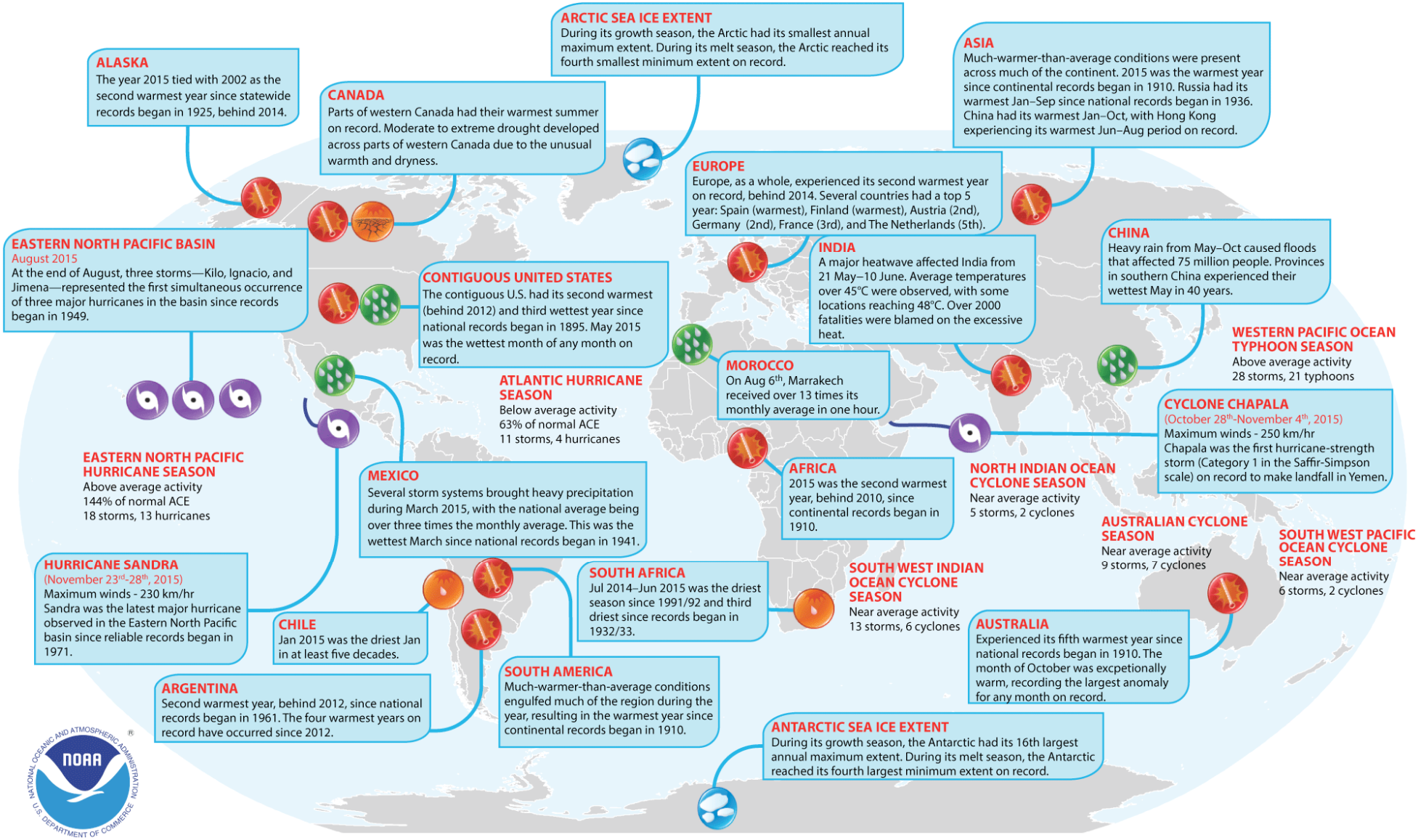
Tmin deviation = 1.31 °C

historical reference

*the **average Tmean=15.4 °C** of **NOVEMBER 2015** is **set as 6th in rank,** while the **average Tmax=20.1 °C** is **the 5th** (reference period: 1960-2015).*


YEAR 2015
Monthly Temperature
(deviation from 1971-2000 climatology)
Tmean deviation
Tmax deviation
Tmin deviation
Temperature (C)
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
-0.50
-1.00
-1.50
J
F
M
A
M
J
J
A
S
O
N
D
month

Selected Significant Climate Anomalies and Events in 2015



Please Note: Material provided in this map was compiled from NOAA's NCEI State of the Climate Reports and the WMO Provisional Status of the Climate in 2015.
For more information please visit: http://www.ncdc.noaa.gov/sotc