Seasonal Bulletin on the Climate in WMO Region VI

- Europe and Middle East -

Summer 2016

Deutscher Wetterdienst

Issued: 21 September 2016

Highlights:

- **Thunderstorms with heavy precipitation in Western Europe and the Balkans in June**
- **Heatwave in Eastern Europe in June**
- **Extreme temperature in northern Europe in July**
- **High precipitation amounts from Balkan to Scandinavia in July and August**
- **Heat wave in southern and eastern Europe in August**

The following maps are first guess products based on meteorological bulletins which have been quality checked roughly. The text is based upon these maps as well as the monthly climate bulletins of the countries of RA VI as far as they are available on the web. More detailed information including updated analyses of more data which have undergone a better quality control and further aspects like clouds and water vapour may be found on the link of the Regional Climate Centre on Climate Monitoring in RAVI:

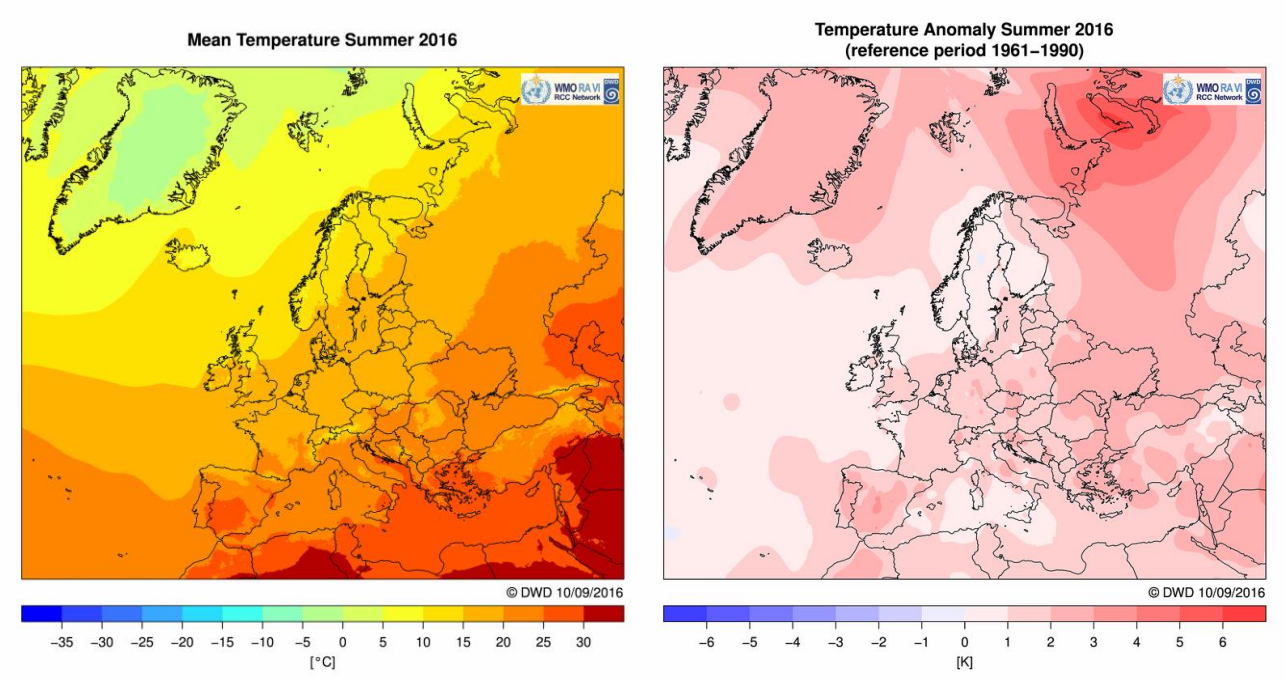
RCC-CM RA VI /

and at the Global Precipitation Climatology Center (GPCC):

The GPCC

The Seasonal Bulletin on the Climate in WMO Region VI will usually be delivered within 2 months after the end of a season.

Temperature

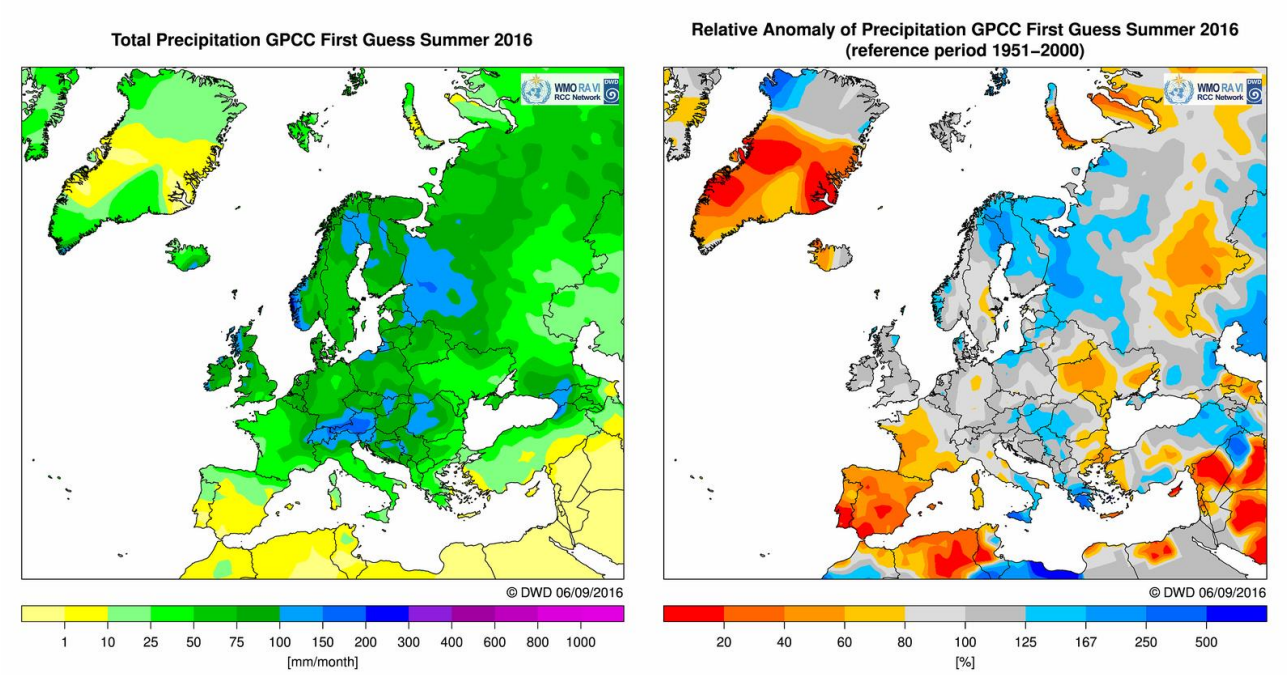


Seasonal temperature (in °C, left) and their anomalies (in °C, right) with respect to the reference period 1961-1990 for Europe JJA 2016

In summer 2016 temperature anomalies for Europe were mostly positive with a maximum of more than +6°C over north-eastern Europe. Due to the pressure and clouds distribution Scandinavia and western Europe showed the lowest temperature anomalies.

The temperature in Portugal in summer 2016 was after 2005 the second highest (since 1931) and climbed up to 44.8°C at station Mora on the 8th August. In Spain this summer reached the third rank (since 1956, after 2003 and 2015) with a maximum temperature of 42.3°C at Sevilla and Morón de la Frontera on 19th July.

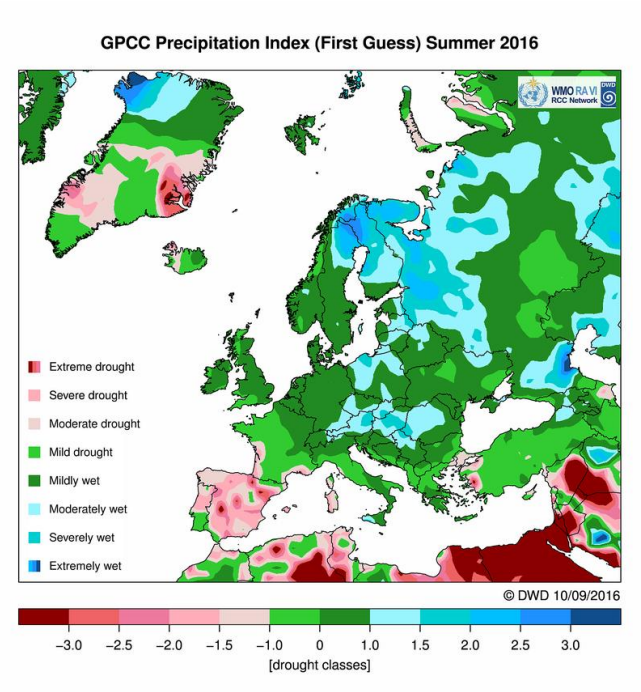
Precipitation



Map of seasonal precipitation totals (mm, left) and their anomalies (in %, right) with respect to the reference period 1961-1990 for Europe JJA 2016

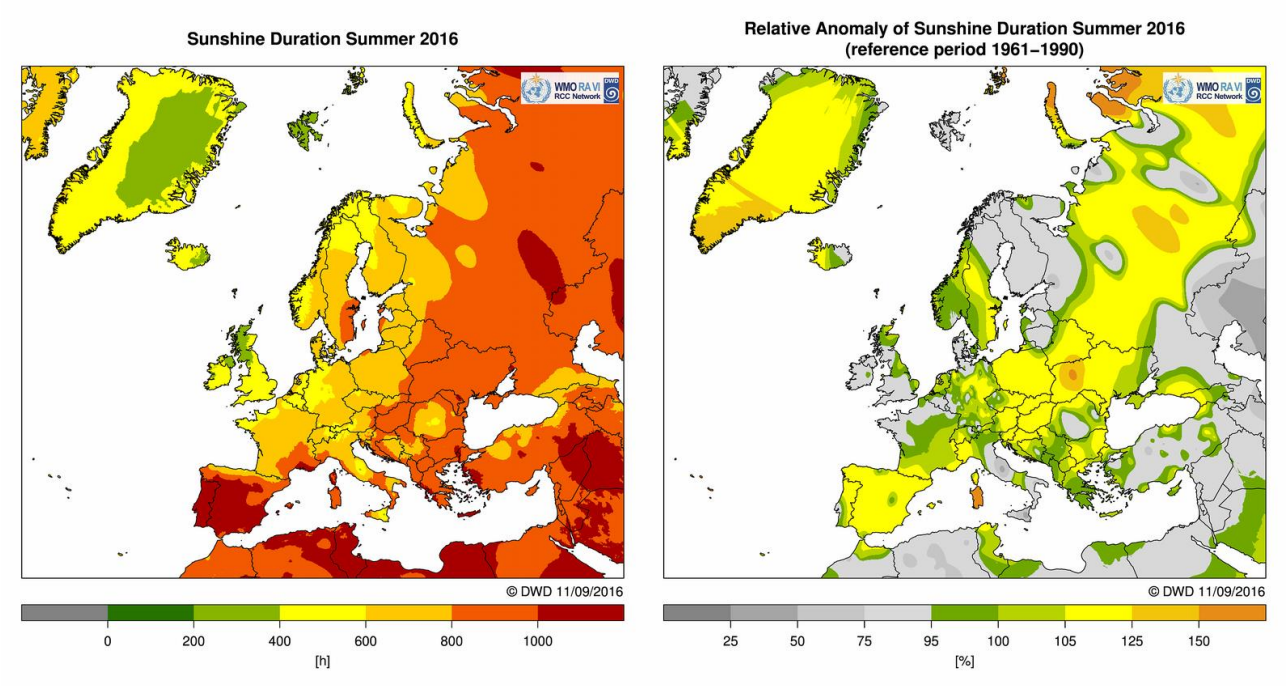
Precipitation anomalies in Summer were highest in northern Scandinavia and northern European Russia with more than 150%. Southern Italy and Greece as well as eastern Turkey were wetter than normal due to convection. Iberia, France, Germany, Ukraine, Bulgaria and western Turkey showed a precipitation deficit.

The relative anomaly for whole of Spain was 51%. In Germany violent thunderstorms brought catastrophic quantities of rain to some areas at the start of June. In 48 hours from 1 to 2 June, Simbach am Inn reported more than 180 mm and a flash flood cost seven people their lives. The highest daily amount of 150.7 mm was recorded on 23 June in Groß Berßen.

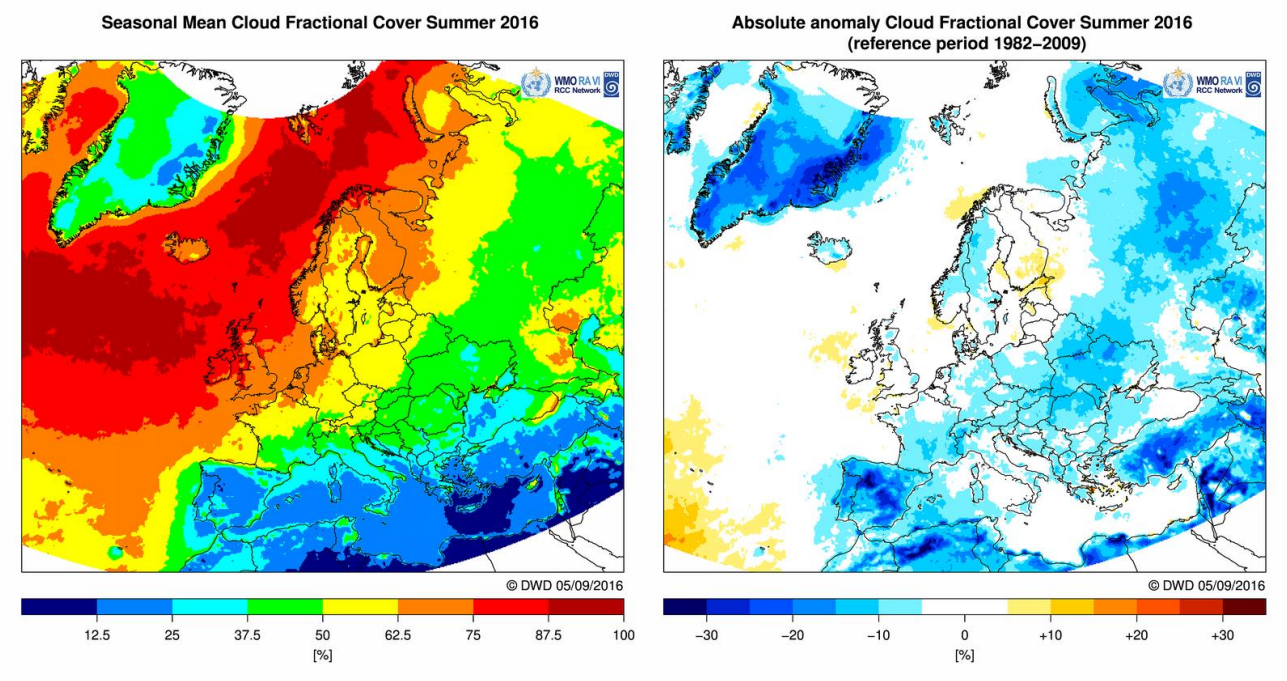


Map of mean seasonal drought index (SPI, modified by DWD) Europe JJA 2016

Sunshine Duration and Cloud Cover



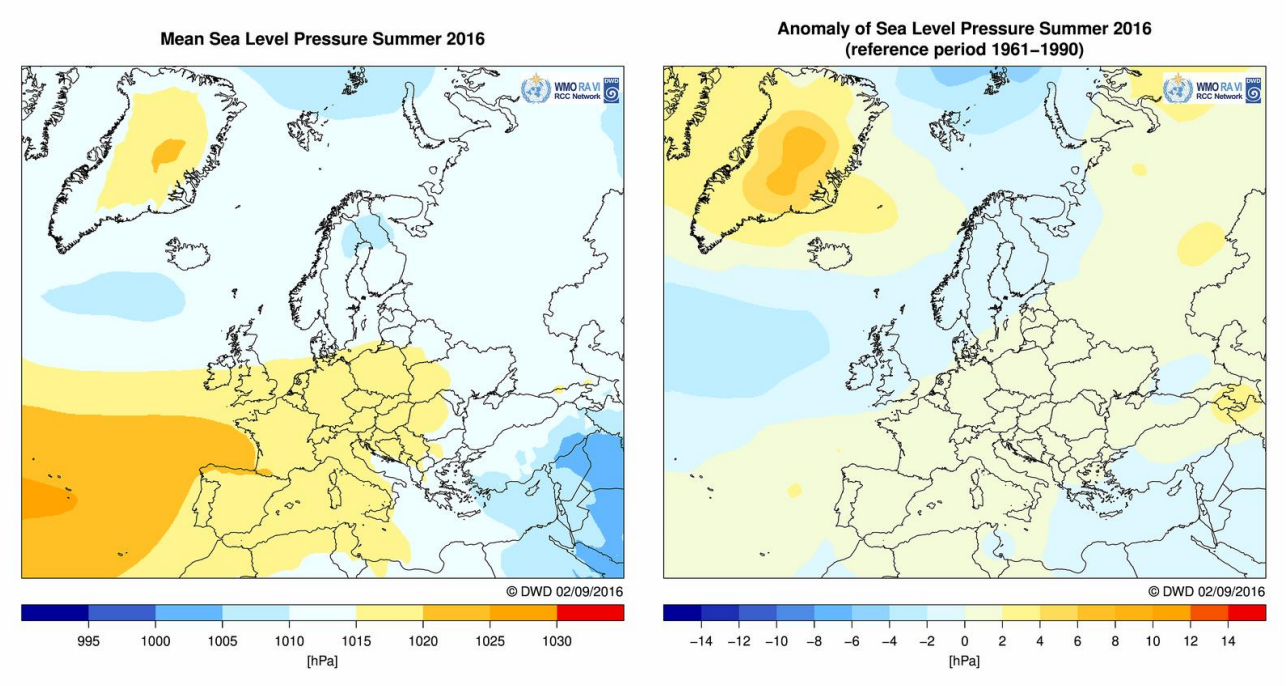
Seasonal Sunshine Duration (hours left) and their anomalies (in %, right) with respect to the reference period 1961-1990 for Europe JJA 2016



Mean seasonal cloud cover (in %, left) and their absolute anomaly (in %, right) with respect to the reference period 1961-1990 for Europe JJA 2016

Due to the higher pressure over most of Europe sunshine duration anomalies were also positive with up to 125% in Iberia and eastern Europe. Only the Baltic States, Finland, northern Scandinavia and western Europe showed less sunshine and more cloud cover.

Surface Air Pressure



Mean of sea level pressure (in hPa, left) and its absolute anomaly (in hPa, right) with respect to the reference period 1961-1990 for Europe JJA 2016

Sea level pressure in summer 2016 was marked by several systems. The Azores high was shifted to the south with a core pressure of more than 1025 hPa. Due to the high pressure over Greenland with a core pressure of more than 1020 hPa the Icelandic low was also shifted to the south with a core pressure below 1010 hPa. A second low was located over Scandinavia.

Above normal pressure anomalies ranged from the Azores high to northern Russia. The anomalous high pressure over Greenland extended to Iceland and northwestern Scandinavia with anomalies of more than 8 hPa. The negative anomalies in the central North Atlantic showed values below -2 hPa.

Extremes Values

Data source: The RCC-CD-node: http://www.ecad.eu

RX1d: highest 24 hours total (in mm),
RX5d: highest 120 hours total (in mm),
RR10: highest number of days with heavy precipitation (>10 mm/d),
RR20: highest number of days with very heavy precipitation (>20 mm/d),

TN: lowest mean minimum temperature (° C),
TNN: lowest absolute minimum temperature (° C),
TX: highest mean maximum temperature (° C),
TXX: highest absolute maximum temperature (° C)

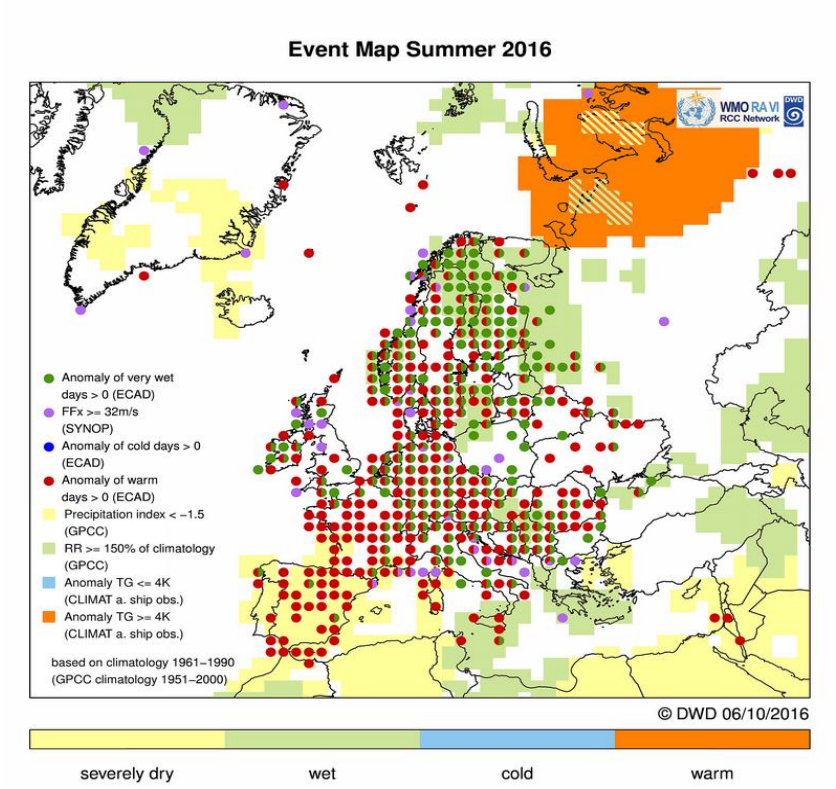
*: value corrected according to NMHSs report, may still be preliminary

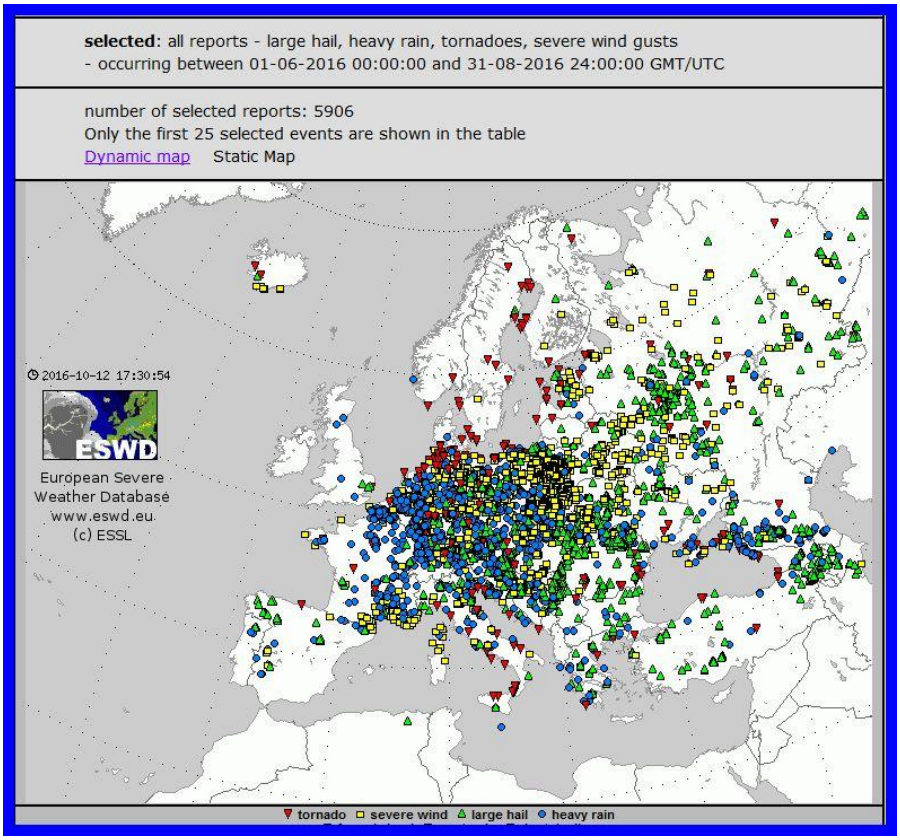
Country	RX1d [mm]	RX5d [mm]	RR10 [days]	RR20 [days]	TN [°C]	TNN [°C]	TX [°C]	TXX [°C]
Algeria	-	-	-	-	-	8	41.1	47.1
Belarus	58	131	10	4	-	3	26.6	34.7
Belgium	61	123.1	12	4	-	3.7	23.9	36.1
Bulgaria	51	87.6	6	3	-	-0.5	-	39.0
Canary Island	4.9	8.9	0	0	-	1.2	29.2	36.5
Croatia	63	118.1	11	7	9.6	1.9	30.1	36.1
Cyprus	0.2	0.4	0	0	-	15.1	-	42.2
Czech Republic	73.2	121.6	16	9	-	2	-	35.6
Denmark	118	-	-	-	-	7.6	21.4	28.9
Estonia	64	-	-	-	-	2.5	23.3	32.5
Finland	51.7	99.1	14	5	7.7	-1.9	21	29.1
France	57	136	12	7	-	0.1	31.2	41.5
Germany	97.4	139	27	11	0.6	-8.1	26.4	37.9
Greece	4	4	0	0	-	-	29	33.9
Greenland	-	-	-	-	1.6	-8.1	12.6	23.9
Hungary	54	94	14	4	-	6.1	28.1	35.7
Iceland	62	-	-	-	8.2	4.5	14.3	20.1
Ireland	45	67.6	9	3	-	2.5	20.1	29.0
Israel	0	0	0	0	-	-	41.1	46.1
Italy	73	158.4	18	13	7.8	0.5	34	41.1
Kazakhstan	-	-	-	-	-	-0.5	34.3	43.4
Kyrgyzstan	-	-	-	-	-	-	30.7	37.9

Country	RX1d [mm]	RX5d [mm]	RR10 [days]	RR20 [days]	TN [°C]	TNN [°C]	TX [°C]	TXX [°C]
Latvia	43	70.6	13	5	-	1	22.8	32.1
Liechtenstein	-	-	-	-	15.1	7.7	24	31.6
Lithuania	39	62.1	13	3	-	2.5	22.7	33.1
Luxembourg	60.4	118	9	3	-	-	-	-
Moldova	26	120.7	5	2	-	9	27.9	35.4
Netherlands	105.8	125.6	13	6	-	5.6	23.8	35.2
Norway	144	266.3	31	16	2.6	-3.2	22.7	30.7
Poland	105	126.5	12	5	-	2.1	24.6	32.6
Portugal	8	9	0	0	-	3.8	30.5	44.8
Romania	114	122	20	8	4.6	-1.6	31.1	37.9
Russian Federation	77	108.6	14	6	9.1	-1.3	27.8	38.9
Serbia	137	138.2	12	7	-	3	29.6	38.1
Slovakia	48	91.2	12	5	-	1.6	27.1	34.5
Slovenia	121.5	199.4	25	13	4.3	-2.5	27.9	34.0
Spain	35.4	61.1	7	3	-	-0.1	37.5	44.5
Sweden	62	97.3	15	8	5.1	-3.6	23	32.7
Switzerland	116.2	173.1	25	14	3.6	-3	26.5	34.6
Tajikistan	-	-	-	-	-	-	35.8	42.1
Turkey	-	-	-	-	-	5.6	31.4	37.0
Turkmenistan	-	-	-	-	-	-	38.3	47.4
Ukraine	90	92	9	5	-	0.7	29.5	37.7
United Kingdom	39	86	14	3	9.4	0.1	23.1	34.0
Uzbekistan	-	-	-	-	-	-	38.8	45.9

Climate Extremes and Severe Weather Events

Map of Climate Extremes and Events of the Season





References:

Seasonal summaries in RA VI at national web-sites:

Austria: HISTALP - Österreich Sommerbericht 2016 http://www.zamg.ac.at/cms/de/klima/news/histalp/histalp-oesterreich-sommerbericht-2016
Belgium: Eté 2016 http://www.meteo.be/meteo/view/fr/1124472-Bilan+climatologique+saisonnier.html
Croatia: http://klima.hr/klima_e.php?id=ocjsez_e
Denmark: http://www.dmi.dk/vejr/arkiver/maanedsaesonaar/
Estonia: http://www.ilmateenistus.ee/kliima/aastakokkuvotted/ulevaated/
France: http://www.meteofrance.fr/climat-passe-et-futur/bilans-climatiques/bilan-2016/bilan-climatique-de-l-ete%20
Germany: http://www.dwd.de/EN/press/press_release/EN/2016/20160830_the_weather_in_germany_in_summer_2016.html?nn=597858
Ireland: http://www.met.ie/climate/monthly-weather-reports.asp
Montenegro: http://195.66.163.23/klimatologija.php?tip=sezonski
Netherlands: http://www.knmi.nl/nederland-nu/klimatologie/maand-en-seizoensoverzichten/
Norway: http://met.no/Klima/Varet_i_Norge/
Poland: http://www.imgw.pl/extcont/biuletyn_monitoringu/
Serbia: http://www.hidmet.gov.rs/podaci/meteorologija/eng/l2016.pdf
Spain: http://www.aemet.es/en/serviciosclimaticos/vigilancia_clima/resumenes?w=0&datos=1
Switzerland: http://www.meteoschweiz.admin.ch/home/klima/gegenwart/klima-berichte.html

Main URLs

(URLs of used data and further information)
RCC-CM http://www.dwd.de/rcc-cm
RCC-CD (ECA&D): http://www.ecad.eu
GPCC: http://gpcc.dwd.de
ESWD: http://essl-org/cgi-bin/eswd/eswd.cgi