

Seasonal Bulletin on the Climate in WMO Region VI



- Europe and Middle East -

Winter 2013

Deutscher Wetterdienst



Last Change: Thu Apr 11 09:10:46
UTC 2013

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.

Highlights:

- 3 phases of cold, snow and ice in the mid-latitudes
 - Warm Christmas in western and central Europe
 - Frequent depressions with heavy rain and storm in the Mediterranean
 - Early snow melting and flooding on Iceland
-

Overview:

Temperature:

Winter 2012/2013 was colder than normal in central, northern, southern and partly western Europe while it was warmer than normal in the northwest, in the Arctic and in the east and southeast. The negative anomalies were largest (-1 to -2 K) in southern Norway and the positive anomalies were largest (more than +4 K) in the Arctic region. Remarkable were for instance the negative anomalies of frost days on Iceland and the Balkan Peninsula.

December 2012 was warmer than normal in the Arctic, the North Atlantic, the western, central and southwestern European continent and the Middle East. It was colder than normal in Scandinavia, Russia, the eastern central European continent, the Balkan Peninsula and Italy. The warm anomalies in the Arctic exceeded + 4 K and the cold anomalies in Russia exceeded - 4 K. In eastern Europe the cold came unexpectedly early and strong. **January 2013** was colder than normal in the North Sea with the adjacent countries western UK, northern France, Belgium, the Netherlands, northwestern Germany and southern Norway and in the Baltic countries with southern Sweden, northeastern Poland and most of Belarus. As well colder than normal were parts of southern France. Elsewhere it was warmer than normal, with anomalies of more than +4 K in the Arctic and northern Norway and northern Russia and more than +3 K on Iceland, in southern Russia and in Austria and parts of Bosnia and Herzegovina and Serbia. **February 2013** was colder than normal in western, central and southern Europe. The largest negative anomalies spread over western and southwestern France with anomalies in the range of -2 to -3 K and locally more than -3 K. Negative anomalies in the range of -2 to -1 K extended remarkably far southward in the Mediterranean Sea. Northern, eastern central, eastern and southeastern Europe and the Middle East were warmer than normal. Positive anomalies of +4 K and more were observed from Finland southward to the Caucasus area. Warmer than normal was as well the Arctic Sea with +4 K for Spitsbergen and +2 to +3 K on Iceland and southeastern Greenland. Iceland reported February 2013 to be preliminarily the 2nd to 4th warmest February since observations started in the 19th century.

Precipitation:

In **winter 2012/2013** especially the Balkan Peninsula and southern Europe as well as Middle East received more precipitation than normal. The Italian Peninsula had locally more very wet days than normal. Generally only Scandinavia, the western Mediterranean with the eastern Iberian Peninsula and southern France as well as the Caucasus area received less precipitation than normal. In combination with the low temperatures there was partly much snow (which is not well reflected in the anomaly maps due to the partly bad station coverage). See the table below for the mean snow-covered areas.

While **December 2012** was drier than normal in northern and western Scandinavia, northern Russia, the Baltic states and the Caucasus, the Iberian Peninsula and western Mediterranean, it was partly remarkably wetter than normal elsewhere. In southern Greenland SYNOP reports of the station Prins Christian Sund give a monthly total of more than 340 mm. In eastern UK, northern France, Belgium and the Netherlands it was about twice of the normal and in eastern Romania and southern Ukraine as well as in parts of the Middle East more than 250 % of the normal were observed. In **January 2013** the countries under the influence of the Atlantic as well as in the central and eastern Mediterranean Sea and in Middle East received partly much more precipitation than normal. More precipitation than normal was as well registered in eastern and southeastern Europe and southern Russia. On the other hand much of UK, southern Scandinavia, the western central Europe, the western Mediterranean region, southern Turkey and northern Russia and Finland had less precipitation than normal. This pattern is widely consistent with the circulation anomalies. **February 2013** was wetter than normal on the northern Iberian Peninsula, the Italian and western Balkan Peninsula and western Turkey. Drier than normal were northern, western and central Europe as well as southern Russia and the Caucasus, the eastern Mediterranean area and the Middle East.

Sunshine Duration:

In **winter 2012/2013** the low sunshine duration was remarkable in central Europe. This is as well reflected in the anomaly map of the number of dull days which are much more frequent than normal.

In **December 2012** the sunshine duration was clearly higher than normal for Poland, the Czech Republic and partly the eastern Alps as well as in Russia. But for winter and northern regions a small difference makes already a large anomaly. **January 2013** was remarkably dull in Europe except in the Mediterranean region and Middle East, central and eastern Europe, the north of Europe and the southern Ukraine had less than 25 percent of the normal while the southeastern Iberian Peninsula, southern France and partly Middle East received 150 percent of the normal. In France January 2013 was one of the dullest January months since 1950, together with January 2004 and January 1970. In Germany January 2013 was the dullest since 1951. **February 2013** was dull in most of the area with few exceptions: more sunshine than normal was recorded on the British Isles, most of the Iberian Peninsula and southwestern France, southern and northern Norway, the Baltic states and Turkey.

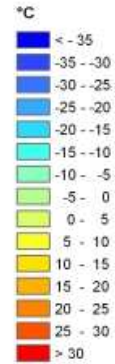
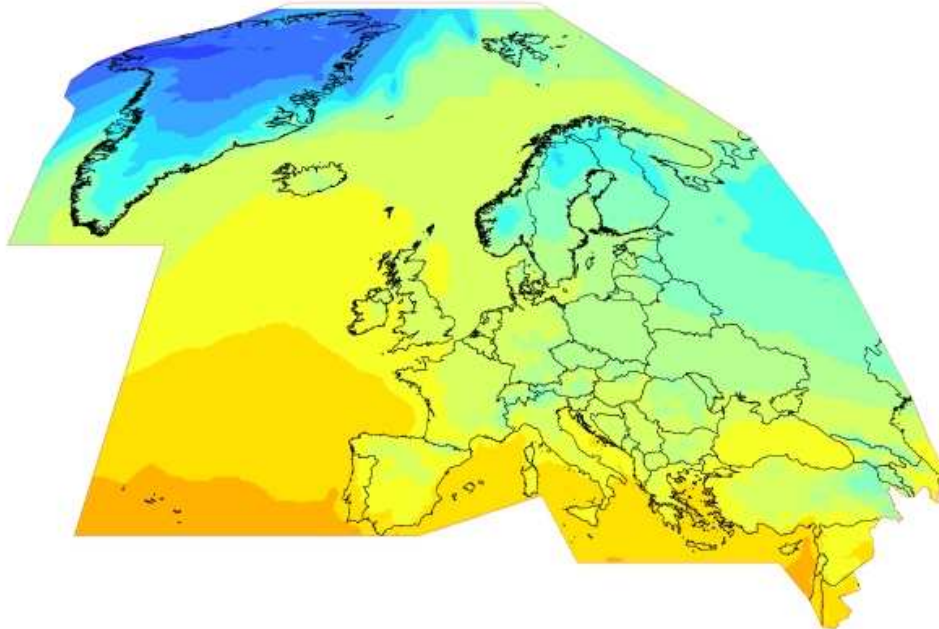
Circulation:

Winter 2012/2013 was characterized by a slightly negative NAO index (-0.22) and a clearly negative AO index (-1.13). For the geopotential height of 500 hPa the mean, the anomalies (reference period 1981-2010) and the anomalies references to the period 1961-1990 are shown (from <http://www.esrl.noaa.gov/psd/cgi-bin/data/composites/printpage.pl>). Both anomaly maps show positive values in the polar region centered east of Greenland and negative values (stronger for the reference 1981 to 2010 than for the reference 1961-1990) centered over Central Europe.

In connection with the long enduring high pressure in the north with the frequent transport of cold air from the northeast to central Europe and the unusual widespread and partly also much snowfall in large parts of Europe and the frequent lows in the Mediterranean area there is a discussion of the role of the warm polar region during the last year and the low Arctic ice extent, based upon recent scientific investigations (see the reference list below).

Temperature:

Mittlere Temperatur Winter 2012/2013
Mean Temperature Winter 2012/2013



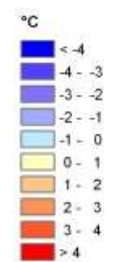
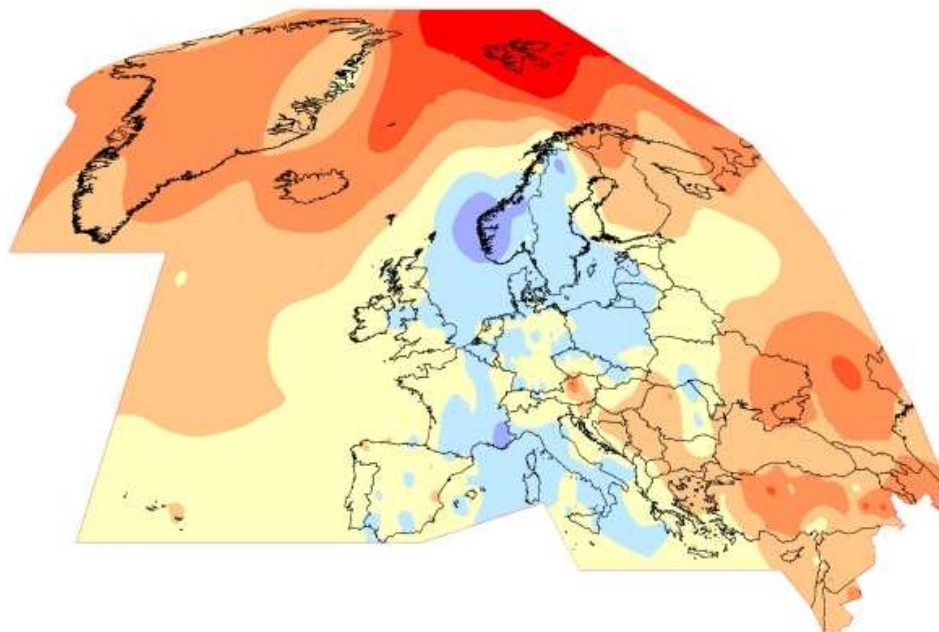
Datenbasis / Data basis:

CLIMAT und Schiffsmeldungen
CLIMAT and ship observations

Stand / last update :

08.03.2013

Temperaturabweichung Winter 2012/2013 vom Normalwert 1961-1990
Temperature deviation Winter 2012/2013 (reference period 1961-1990)

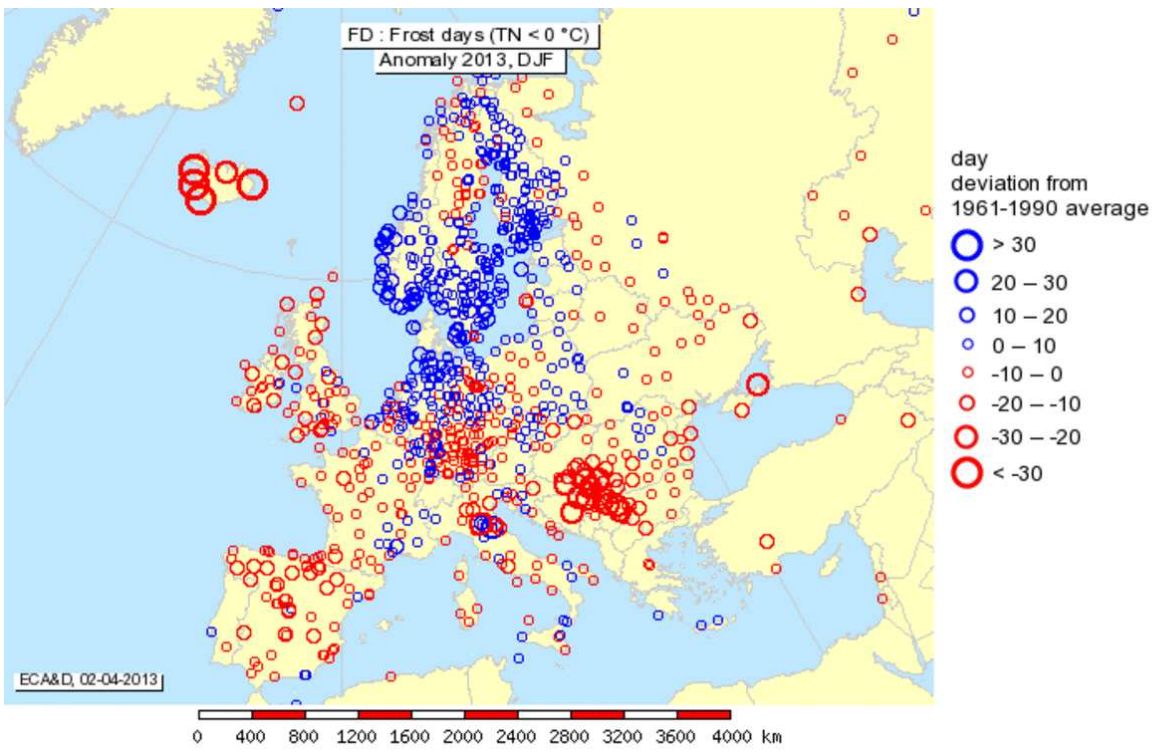


Datenbasis / Data basis:

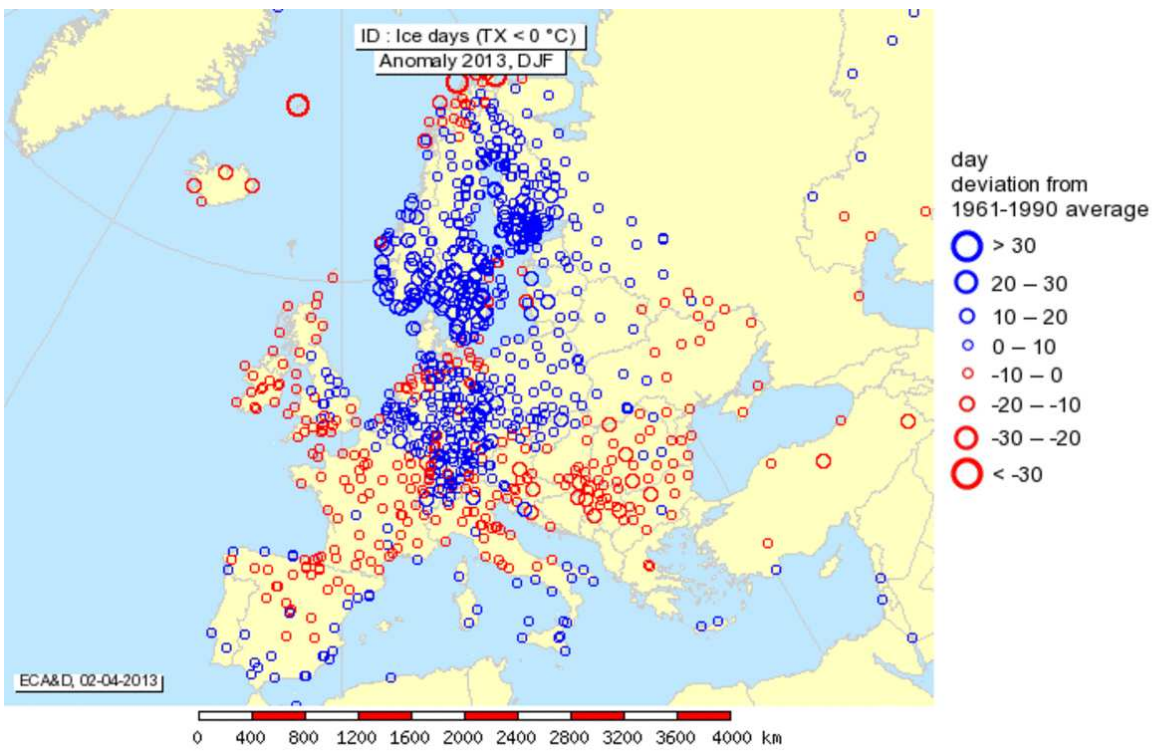
CLIMAT und Schiffsmeldungen
CLIMAT and ship observations

Stand / last update :

08.03.2013



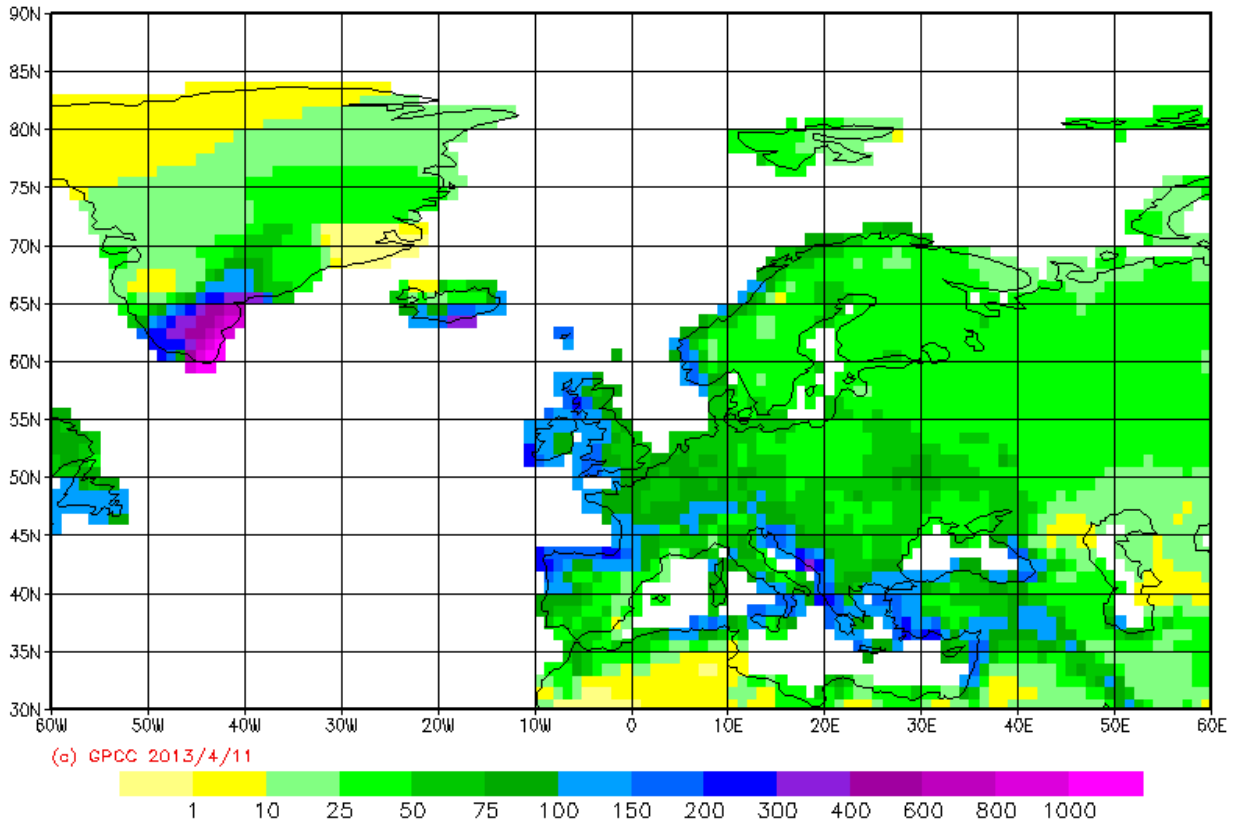
Anomalies of Frost Days for winter 2012/2013 (ECA&D)



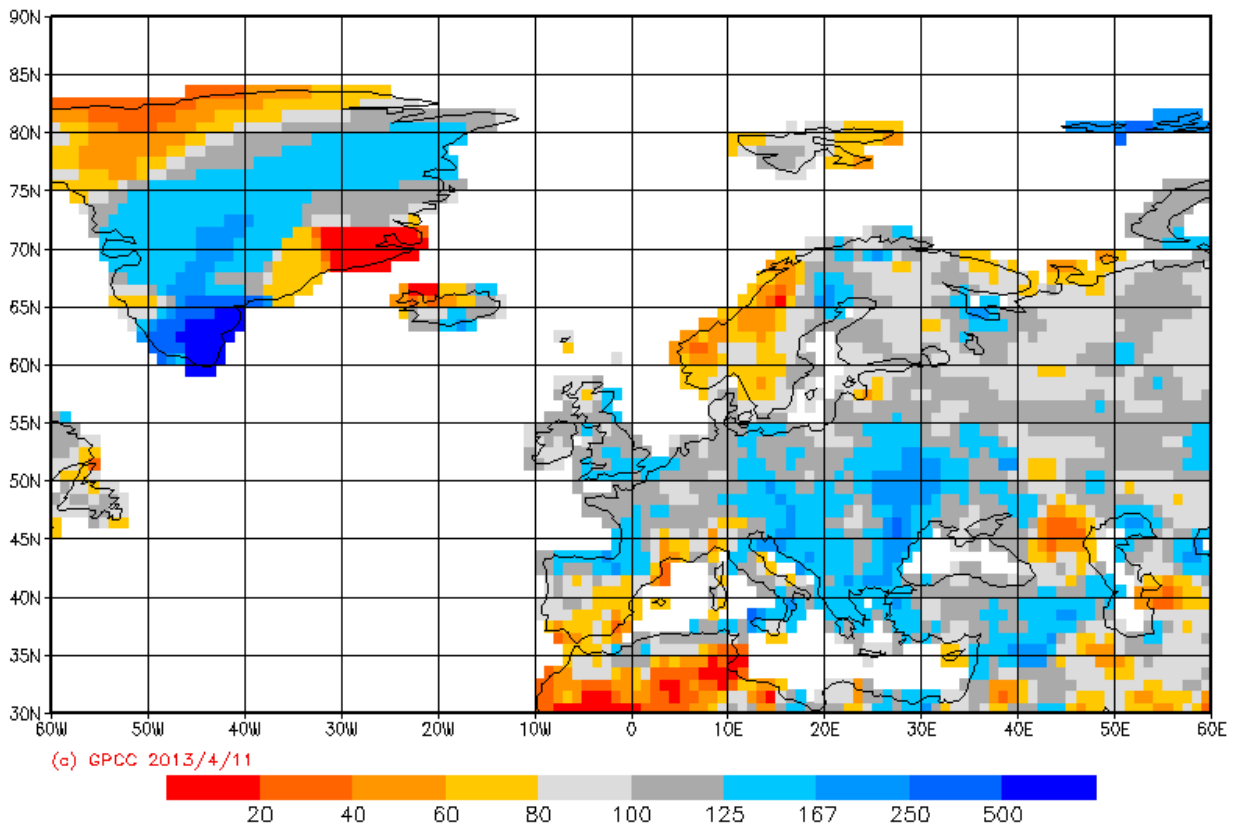
Anomalies of Ice Days for winter 2012/2013 (ECA&D)

Precipitation:

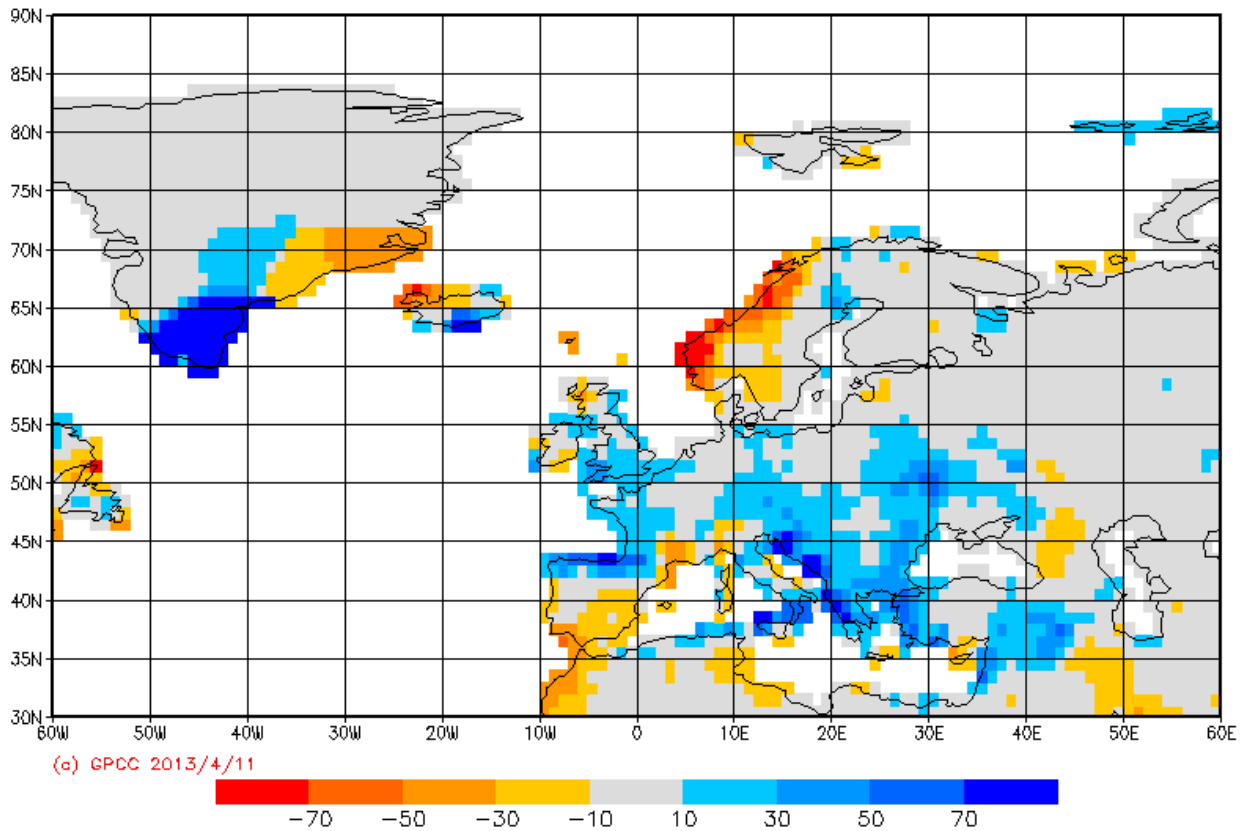
GPCC First Guess 1.0 degree
precipitation for Season (Dec,Jan,Feb) 2012/2013 in mm/month

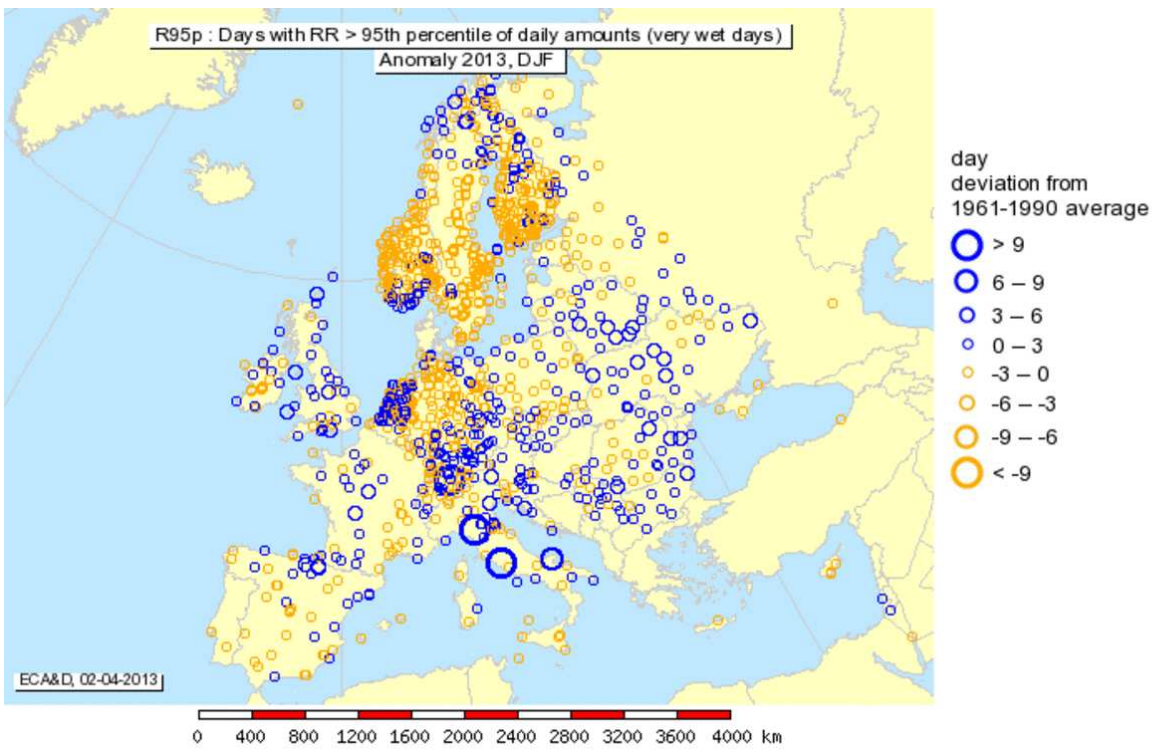


GPCP First Guess 1.0 degree
precipitation percentage of normals 1951/2000 for Season (Dec,Jan,Feb) 2012/2013
(grid based)

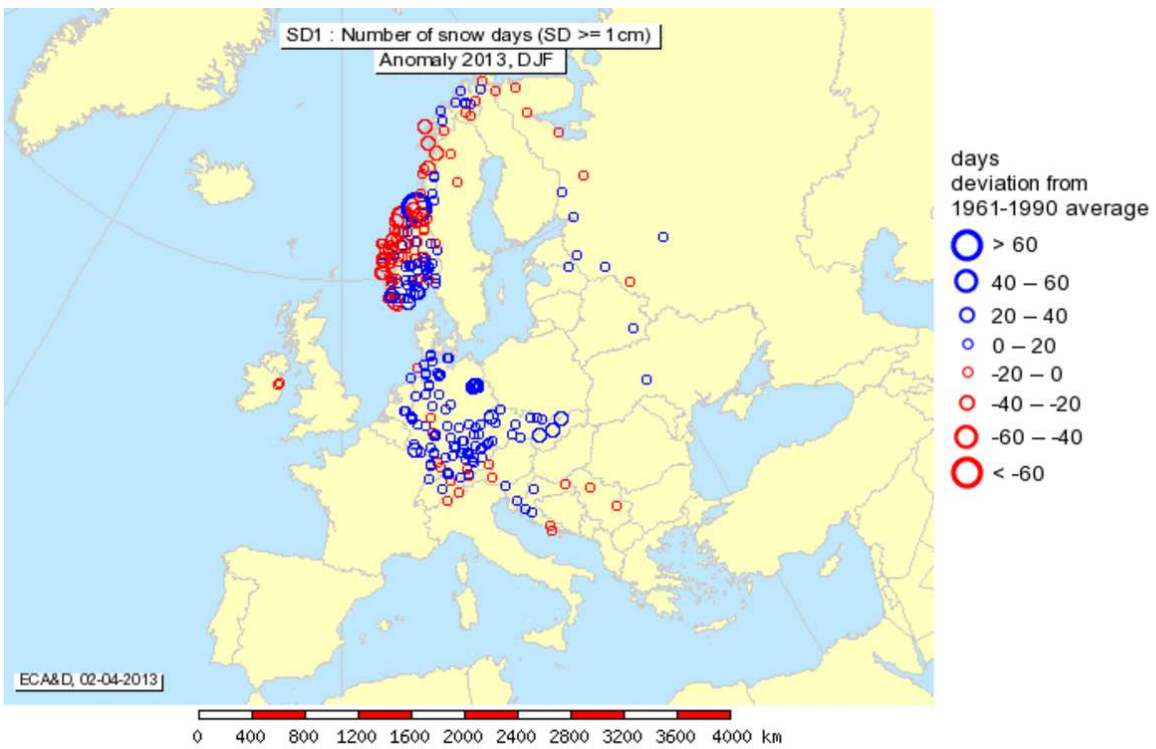


GPCP First Guess 1.0 degree
precipitation anomaly for Season (Dec,Jan,Feb) 2012/2013 in mm/month
(deviation from normals 1951/2000) (grid based)

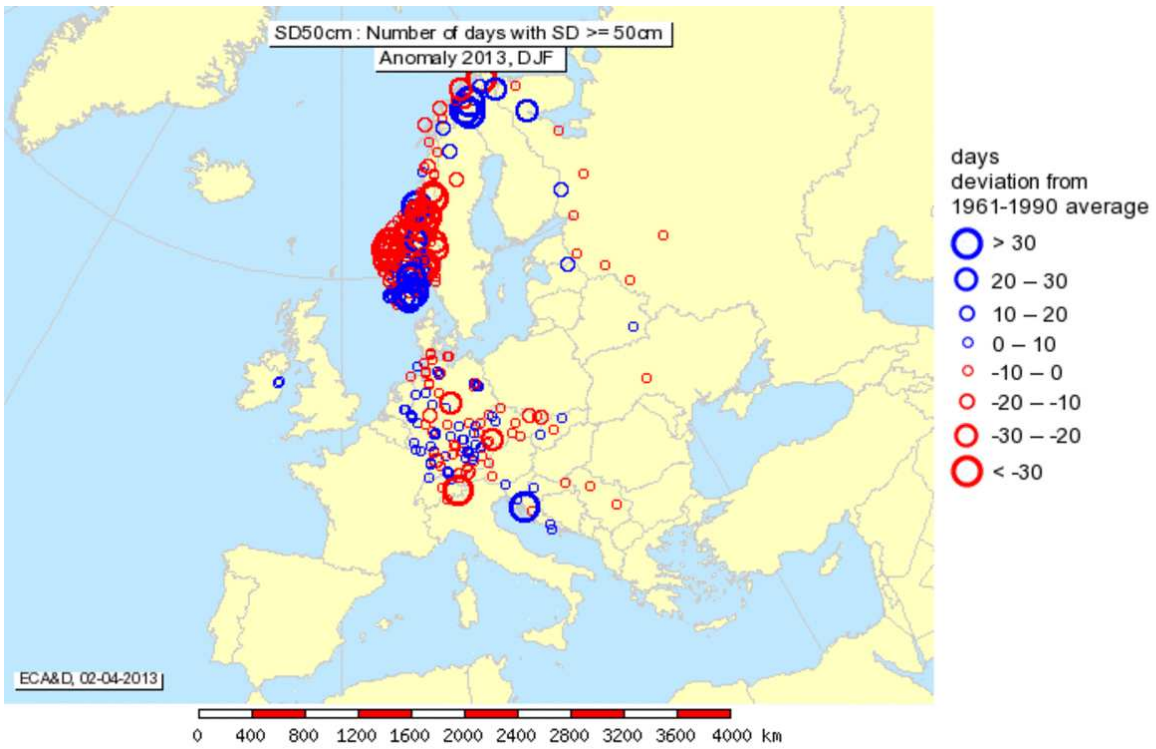




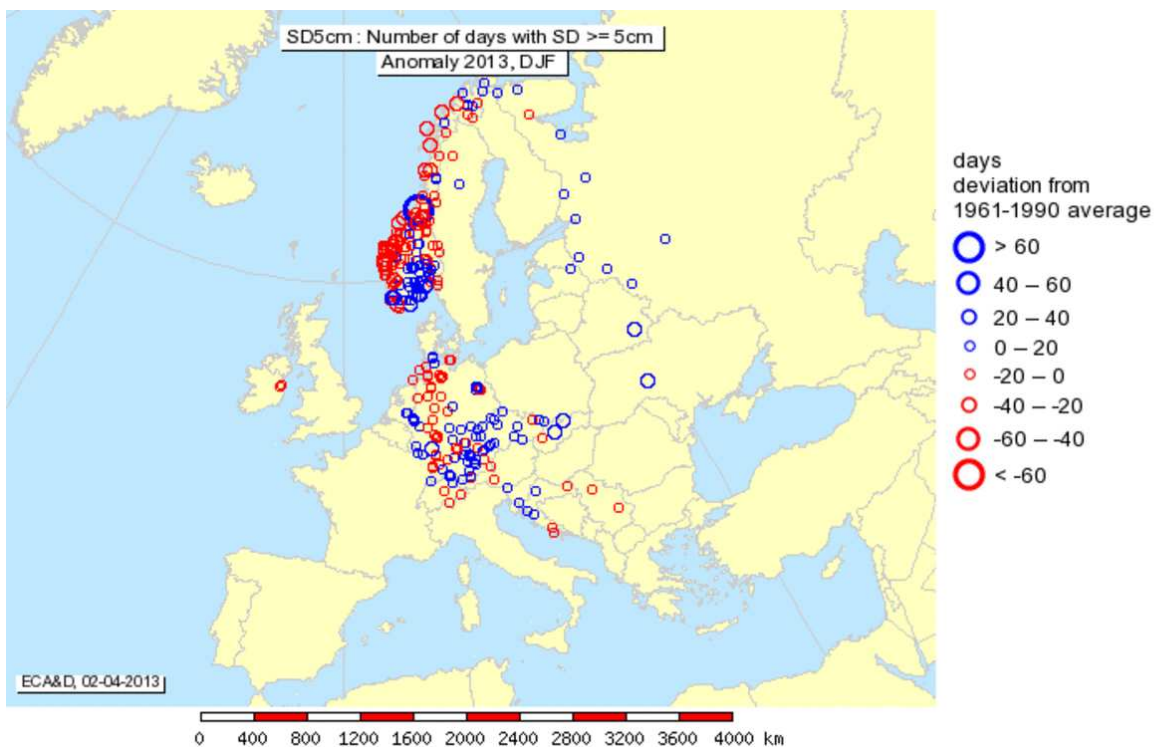
Anomalies of Very Wet Days in Winter 2012/2013 (ECA&D)



Anomalies of Days with Snow Cover of more than 1 cm in Winter 2012/2013 (ECA&D)



Anomalies of Days with Snow Cover of more than 5 cm in Winter 2012/2013 (ECA&D)



Anomalies of Days with Snow Cover of more than 50 cm in Winter 2012/2013 (ECA&D)

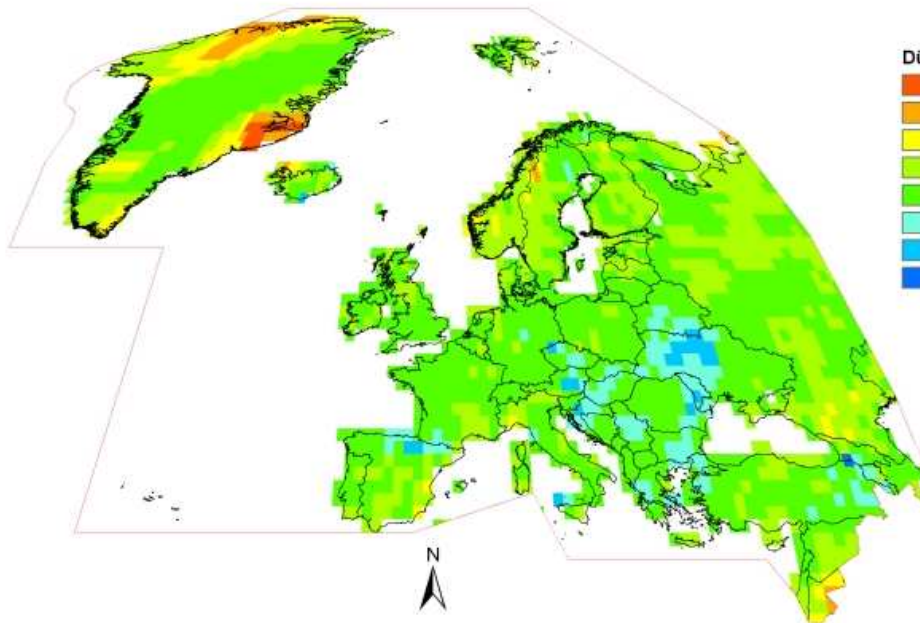
Mean Snow Cover and Depth :

The following table shows the snow covered area for 7 mountainous subregions in km² and in %:

(see <http://www.dwd.de/rcc-cm> for definition of the subregions and more information)

Region	Covered Area (km**2)	Covered Area (%)
Germany	194556	55
Fennoscandia	1354550	87
Caucasus	206753	38
Eastern_Alps	110686	70
Pyrenees	3218	1
Carpathian_Mts_N_Balkan_Peninsula	528208	51
Western_Alps	64175	53

DWD-Standardisierter Niederschlags-Index Winter 2012/2013
DWD Standardized Precipitation Index Winter 2012/2013



Dürreklassen/Drought classes

<-2	extrem trocken/extremely dry
-2 - -1,5	sehr trocken/severely dry
-1,5 - -1	mäßig trocken/moderately dry
-1 - 0	leicht trocken/slightly dry
0 - 1	leicht feucht/slightly wet
1 - 1,5	mäßig feucht/moderately wet
1,5 - 2	sehr feucht/very wet
>2	extrem feucht/extremely wet

Datenbasis / Data basis:

WZN/GPCC
Landsurface First Guess
Product 1.0^o

Projektion / Projection:

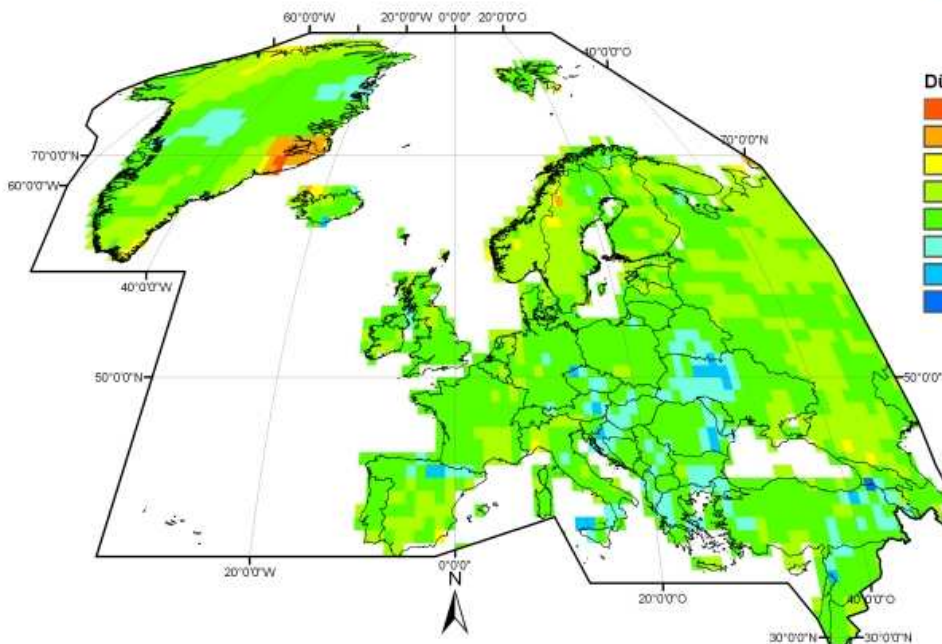
Mollweide

Stand / last update :

05.03.2013

DWD-Standardisierter Niederschlags-Index Winter 2012/2013
(Abweichung vom Normalwert 1961-1990)

DWD Standardized Precipitation Index Winter 2012/2013
(deviation from normals 1961-1990)



Dürreklassen/Drought classes

<-2	extrem trocken/extremely dry
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0 - 1	leicht feucht/slightly wet
1 - 1,5	mäßig feucht/moderately wet
1,5 - 2	sehr feucht/very wet
>2	extrem feucht/extremely wet

Datenbasis / Data basis:

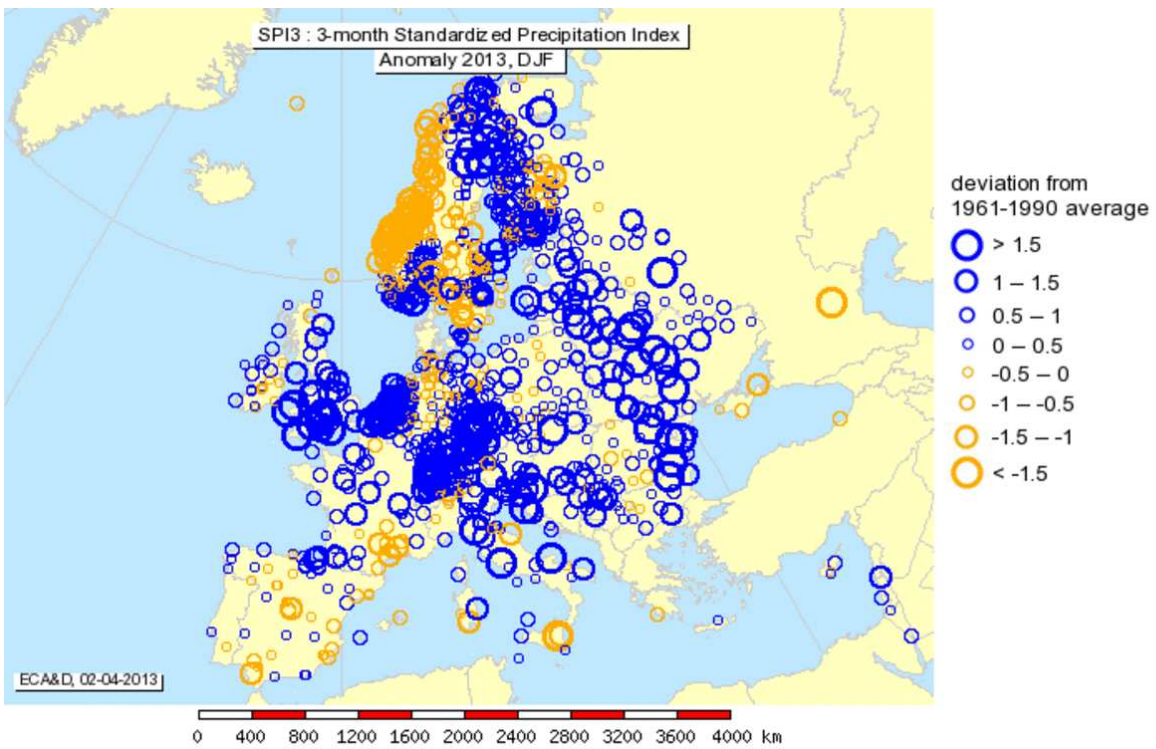
WZN/GPCC
Landsurface First Guess
Product 1.0^o

Projektion / Projection:

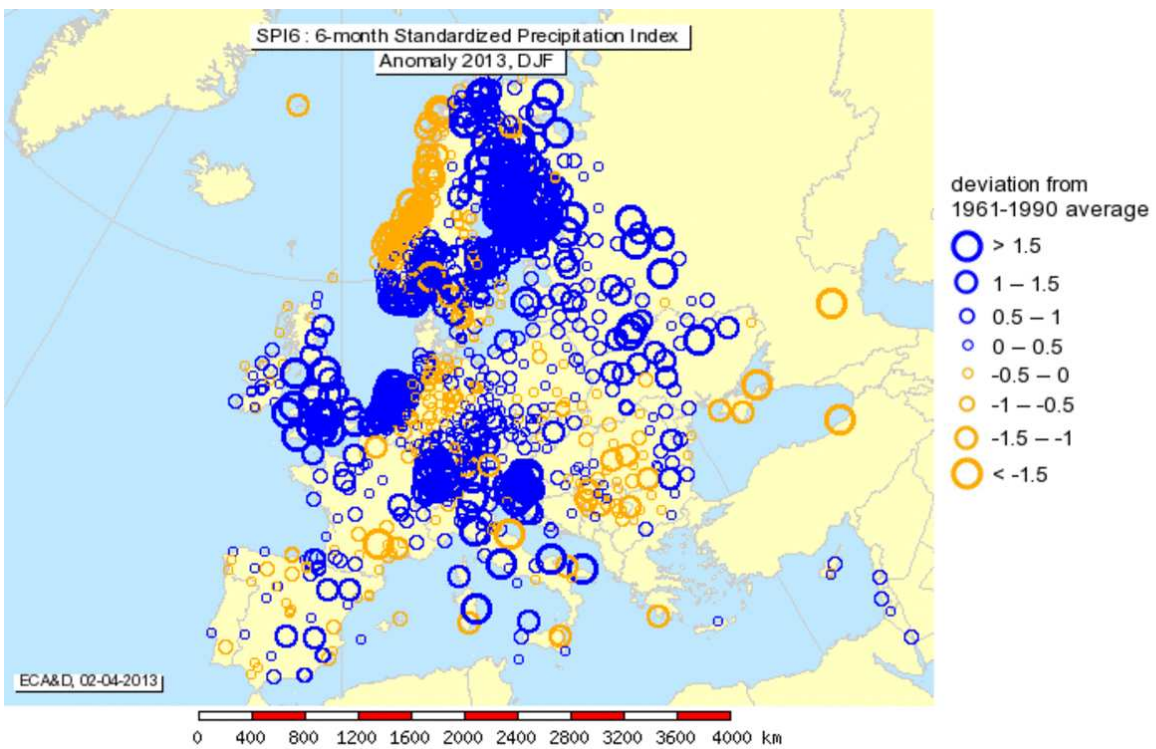
Mollweide

Stand / last update :

05.03.2013



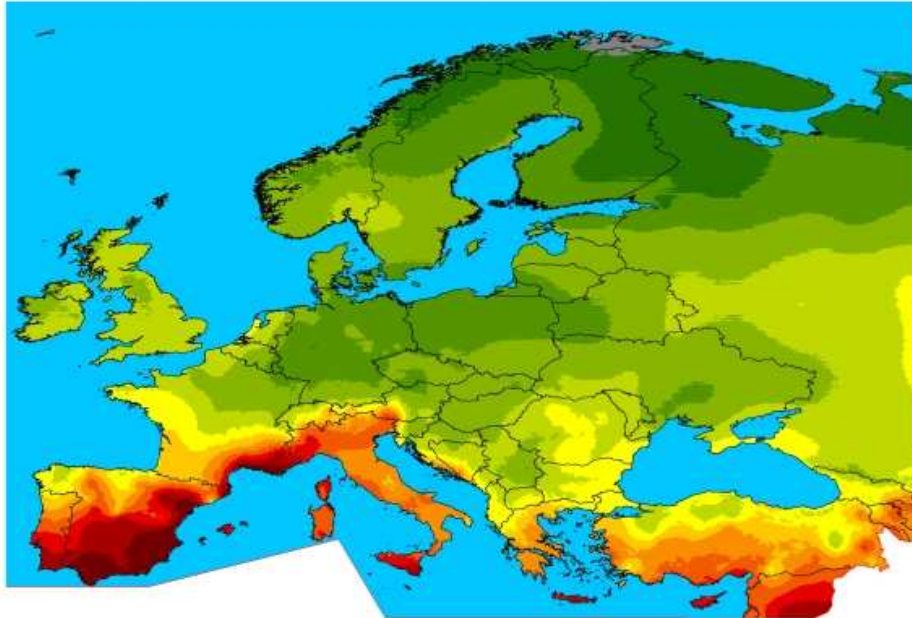
Anomalies of the 3-month Standardized Precipitation Index in Winter 2012/2013 (ECA&D)



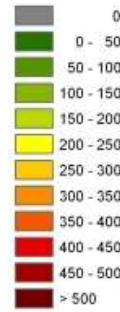
Anomalies of the 6-month Standardized Precipitation Index in Winter 2012/2013 (ECA&D)

Sunshine Duration and Cloud Cover:

Sonnenscheindauer Winter 2012/2013
Sunshine duration Winter 2012/2013



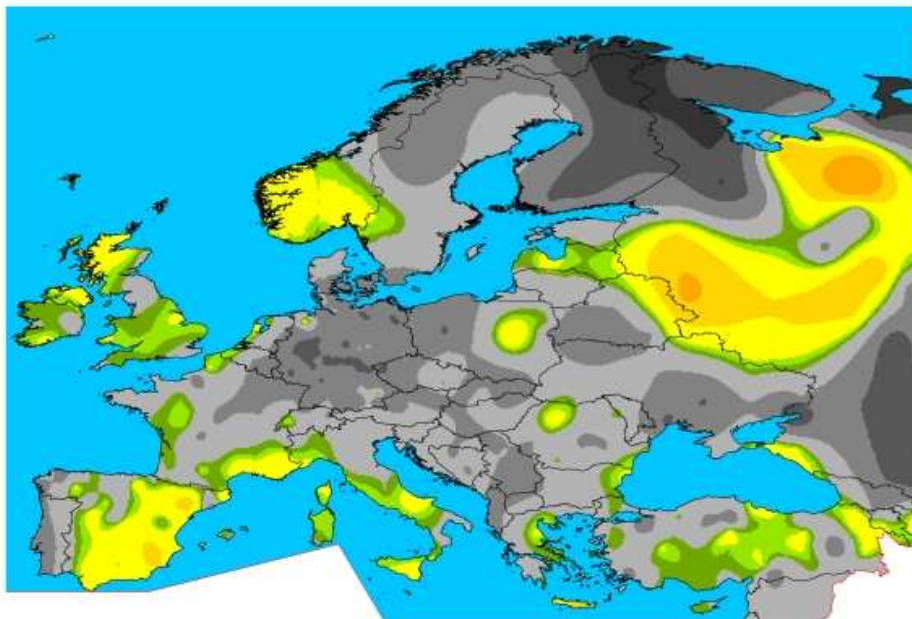
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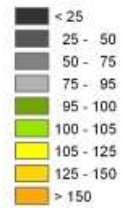
Datenbasis/Data basis:
CLIMAT

Stand / last update :
28.03.2013

Sonnenscheindauer Winter 2012/2013 in % vom Normalwert 1961-1990
Sunshine duration Winter 2012/2013 in % of the 1961-1990 normal

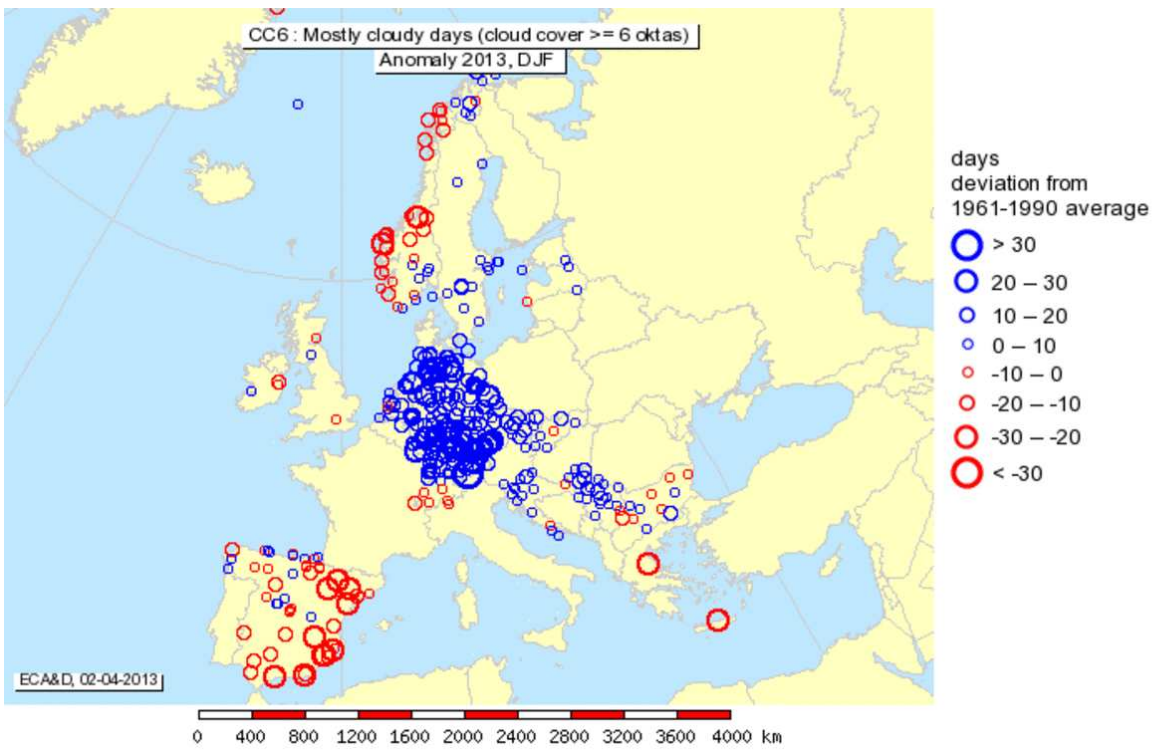


%



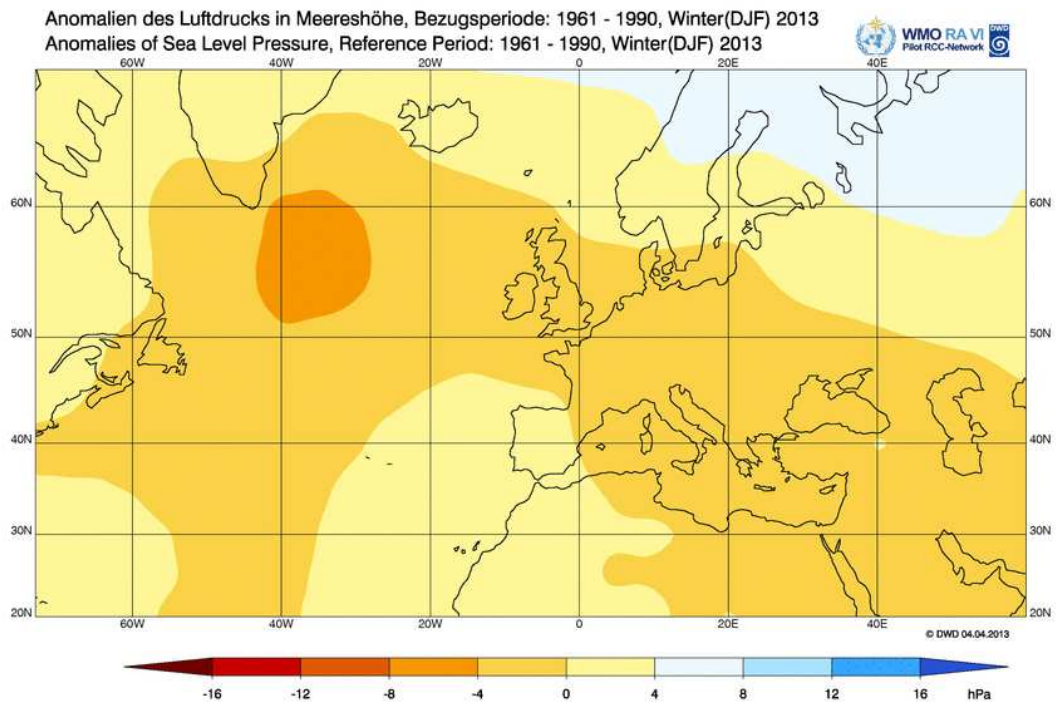
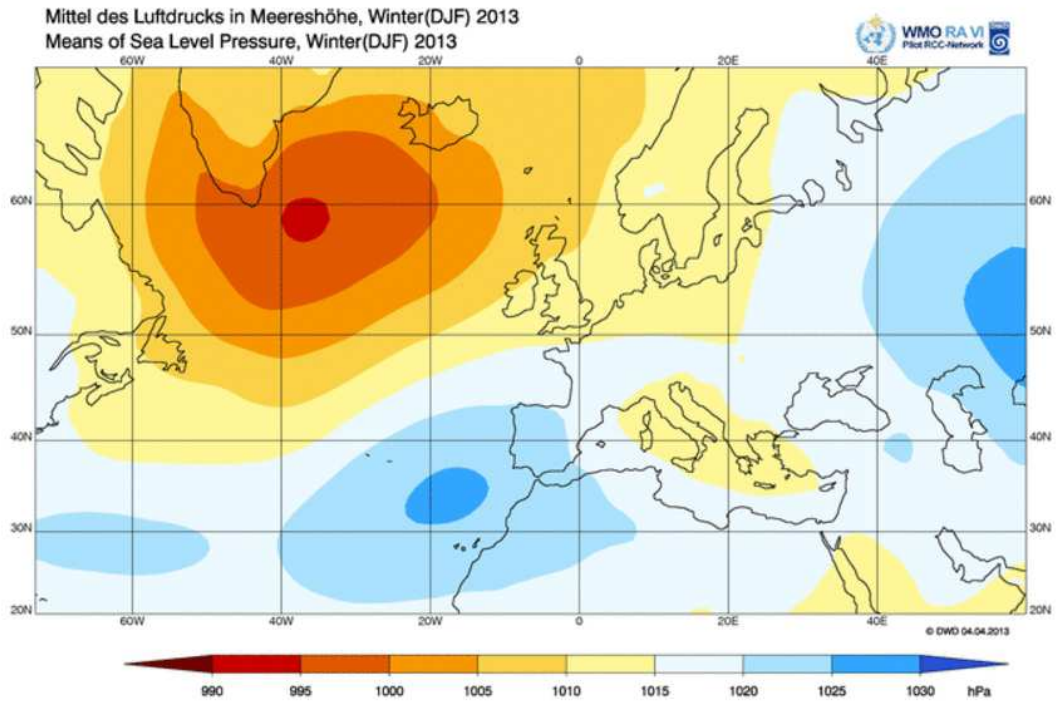
Datenbasis/Data basis:
CLIMAT

Stand / last update :
28.03.2013



Anomalies of Dull Days in Winter 2012/2013 (ECA&D)

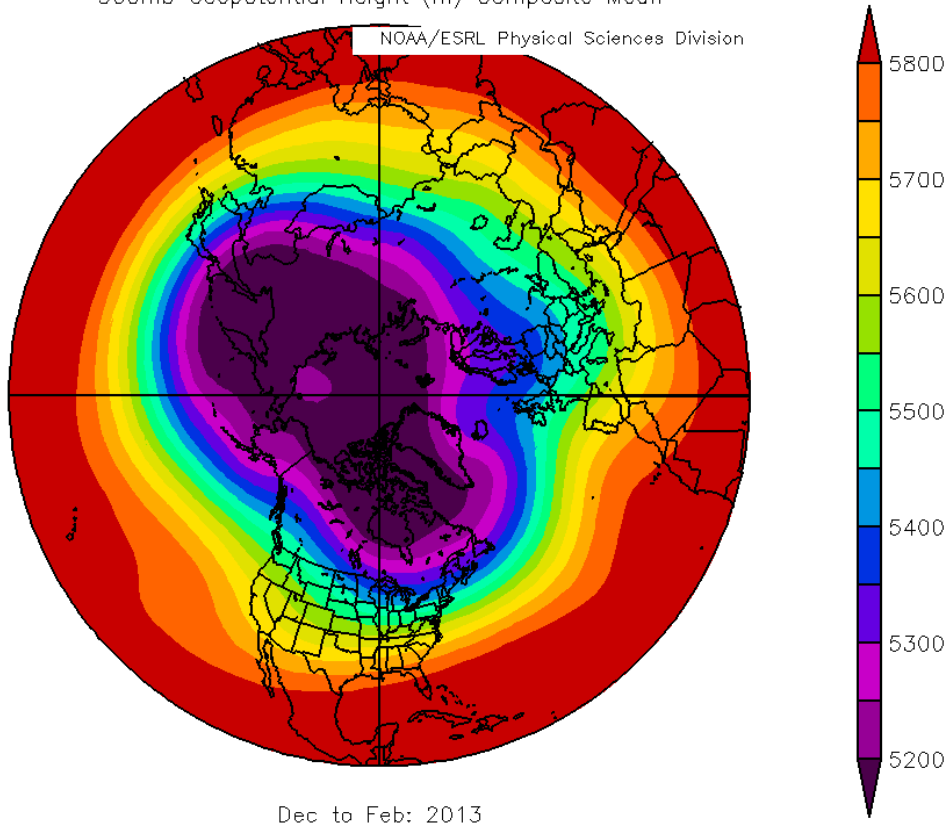
Air Pressure (surface):



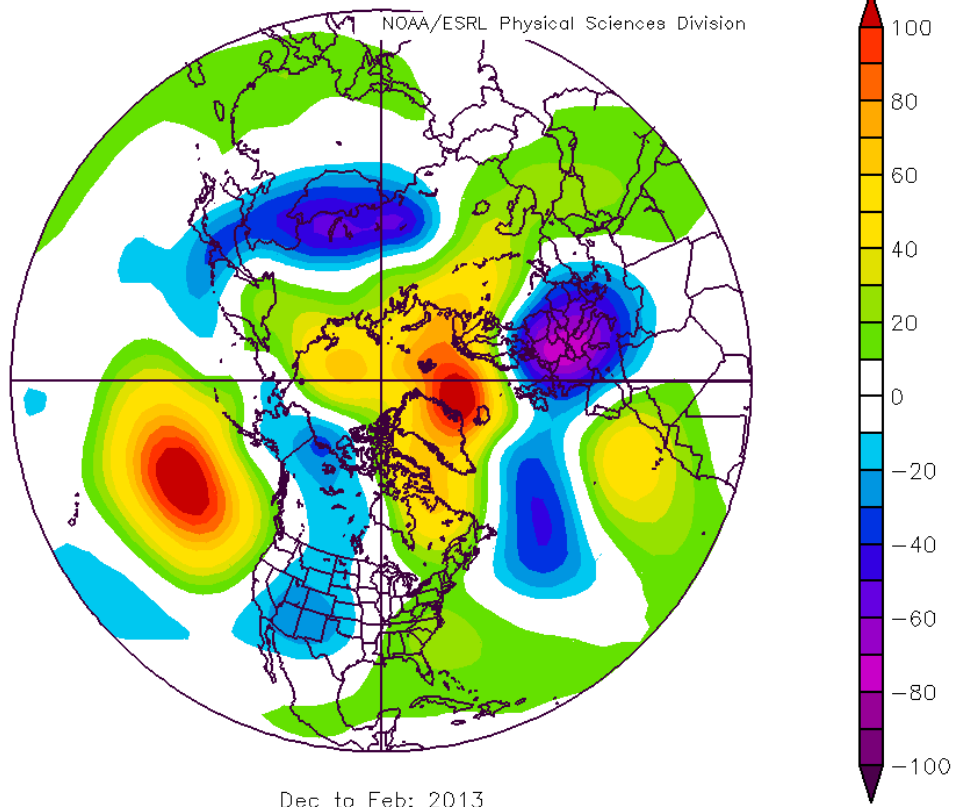
Geopotential Height (500 hPa):

NCEP/NCAR Reanalysis
500mb Geopotential Height (m) Composite Mean

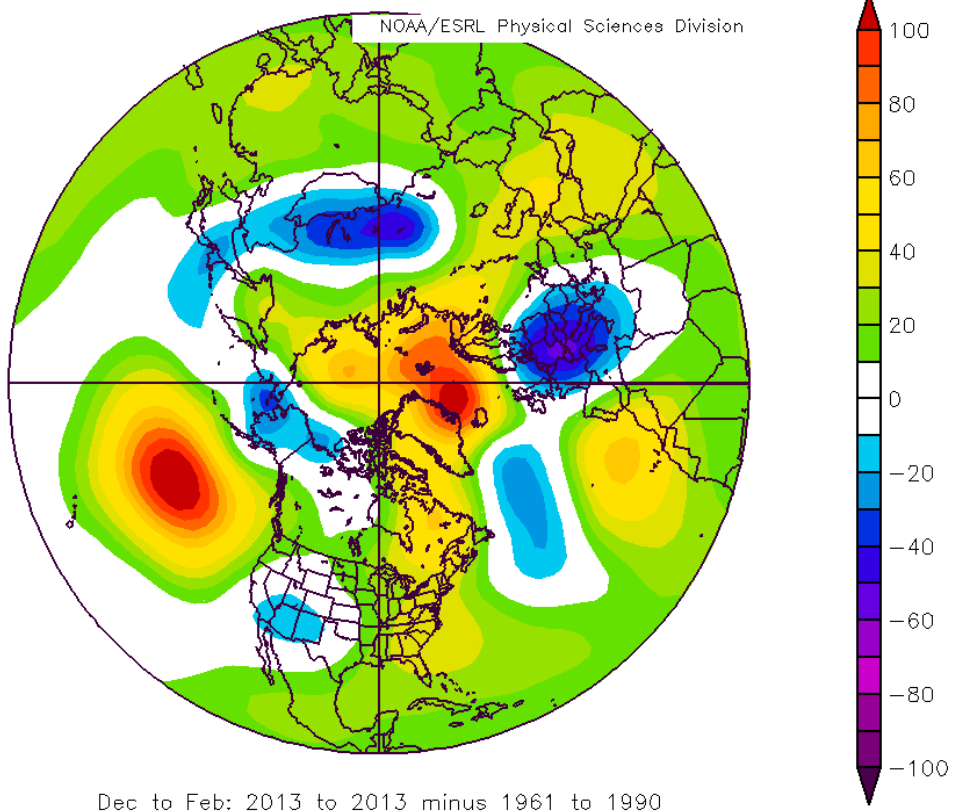
NOAA/ESRL Physical Sciences Division



NCEP/NCAR Reanalysis
500mb Geopotential Height (m) Composite Anomaly 1981–2010 climo



NCEP/NCAR Reanalysis
500mb Geopotential Height (m) Composite Anomaly 1981–2010 climo



Extremes Values:

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

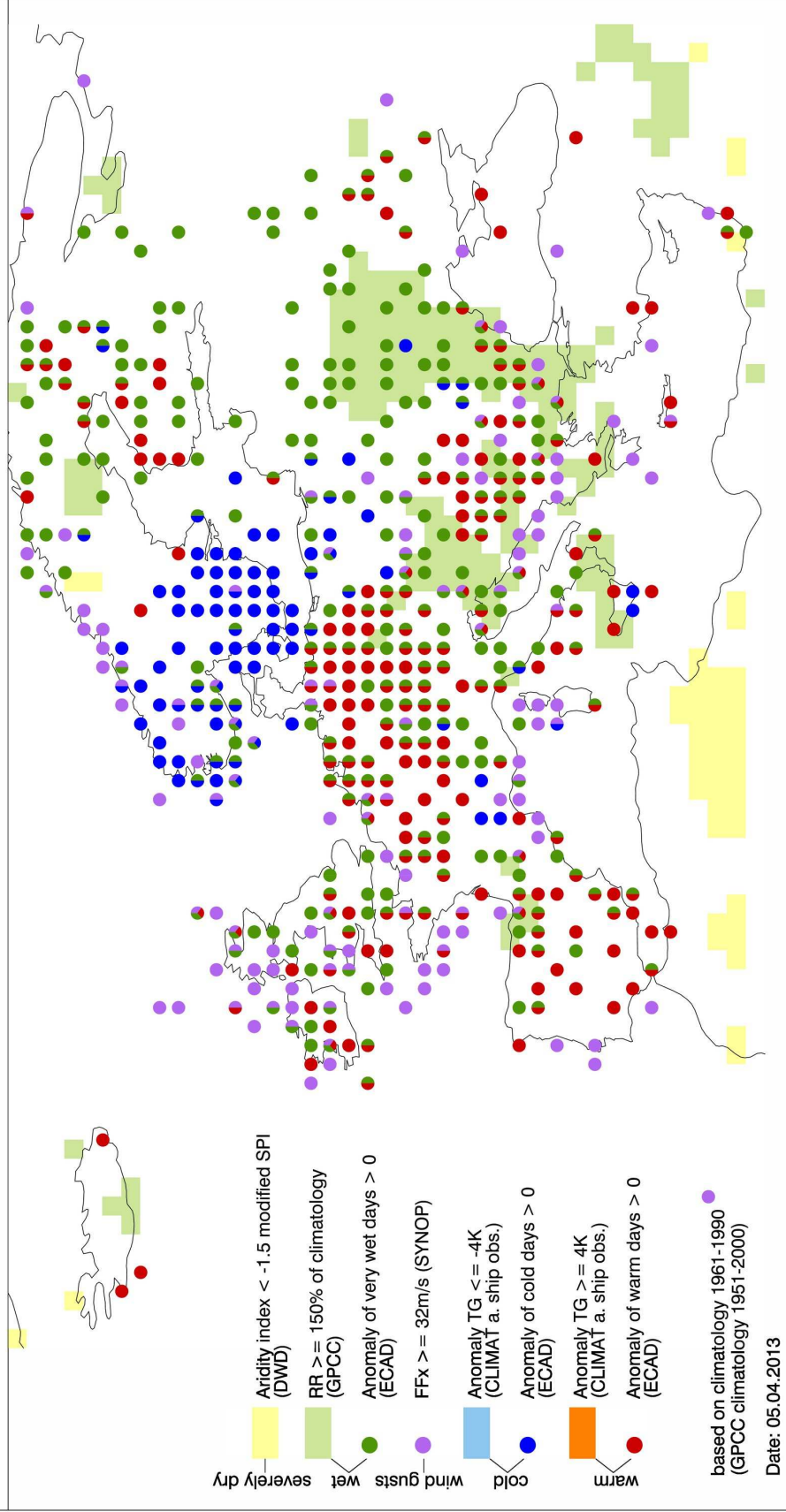
RX1d: highest 24 hours total (in mm), RX5d: highest 120 hours total (in mm), RR10: highest number of days with heavy precipitation (>10 mm/d), RR20: highest number of days with very heavy precipitation (>20 mm/d), TN: lowest mean minimum temperature (° C), TNN: lowest absolute minimum temperature (° C), TX: highest mean maximum temperature (° C), TXX: highest absolute maximum temperature (° C)

Country	RX1d [mm]	RX5d [mm]	RR10 [days]	RR20 [days]	TN [°C]	TNN [°C]	TX [°C]	TXX [°C]
Austria	51.0	94.0	20	7	-14.7	-21.5	3.2	25.6
Bosnia and Herzegovina	-	-	-	-	-0.8	-8.1	-	-
Belgium	41.0	89.2	12	2	-1.6	-11.4	5.9	24.6
Bulgaria	55.0	86.9	14	7	-2.1	-14.4	9.1	35.0
Belarus	38.0	43.9	6	1	-6.6	-24.3	-1.2	24.0
Switzerland	80.0	202.0	35	19	-	-	7.8	28.6
Cyprus	22.0	47.2	7	4	-	-	-	-
Czech Republic	32.7	61.4	10	3	-	-19.2	-	25.8
Germany	61.0	145.0	29	10	-14.6	-23.6	5.2	27.2
Denmark	-	-	-	-	-1.4	-9.8	2.4	18.7
Algeria	-	-	-	-	3.2	-1.1	21.8	37.7
Estonia	33.0	52.0	3	0	-8.4	-26.8	-0.1	17.7
Canar. Island	-	-	-	-	-	7.5	21.8	32.2
Spain	97.0	192.0	29	17	-2.1	-10.8	18.7	35.1
Finland	52.9	105.5	4	2	-17.3	-35.3	0.1	15.7
France	126.0	213.4	24	9	-4.7	-15.4	13.6	31.1
United Kingdom	50.0	89.2	20	8	0.4	-10.5	8.5	18.6
Greenland	-	-	-	-	-26.7	-38.3	-	1.1
Greece	29.0	56.0	5	1	1.9	-7.5	16.6	32.5
Croatia	159.0	242.3	29	16	-6.2	-15.8	11.2	27.1
Hungary	-	-	-	-	-1.9	-14.0	3.9	28.2
Ireland	36.0	72.5	16	4	2.1	-6.3	9.7	17.7
Israel	85.0	195.0	12	7	7.0	-1.9	23.7	39.6
Iceland	-	-	-	-	-0.4	-8.9	5.0	11.2
Italy	101.0	164.6	20	7	-7.4	-15.9	16.4	32.6
Kyrgyzstan	-	-	-	-	-5.7	-15.8	2.9	26.7
Kazakhstan	-	-	-	-	-21.5	-34.0	3.5	29.2
Liechtenstein	-	-	-	-	-	-	4.2	29.1
Lithuania	19.0	57.0	3	0	-6.3	-22.0	-1.0	18.1
Luxembourg	24.4	46.4	6	1	-0.9	-8.1	2.9	22.0
Latvia	28.5	65.3	3	1	-8.4	-25.0	-1.0	17.9
Moldova	22.5	28.9	7	0	-3.1	-12.4	1.2	27.1
Netherlands	50.2	76.1	12	2	-0.5	-15.0	5.6	22.9
Norway	84.5	229.8	19	12	-19.0	-41.3	4.2	17.4
Poland	34.0	51.1	5	0	-6.6	-22.8	2.1	24.4
Portugal	40.0	65.5	8	3	2.8	-5.1	15.5	31.0
Romania	42.0	104.0	10	4	-12.1	-26.1	6.5	32.6
Serbia	53.0	104.7	11	6	-4.7	-15.9	6.5	35.1
Russian Federation	200.0	212.6	5	1	-25.0	-43.0	1.4	29.6
Sweden	57.0	89.4	8	3	-22.2	-37.8	2.0	19.7
Slovenia	182.6	296.8	15	5	-4.7	-15.8	4.0	24.5
Slovakia	76.0	82.4	6	2	-7.5	-19.3	2.9	26.9
Tajikistan	-	-	-	-	-0.3	-11.9	11.4	30.6
Turkey	34.0	55.0	4	1	-4.0	-16.4	17.0	34.4
Ukraine	64.0	70.0	9	4	-6.3	-19.5	6.4	31.6
Uzbekistan	-	-	-	-	-7.0	-18.3	12.7	32.6

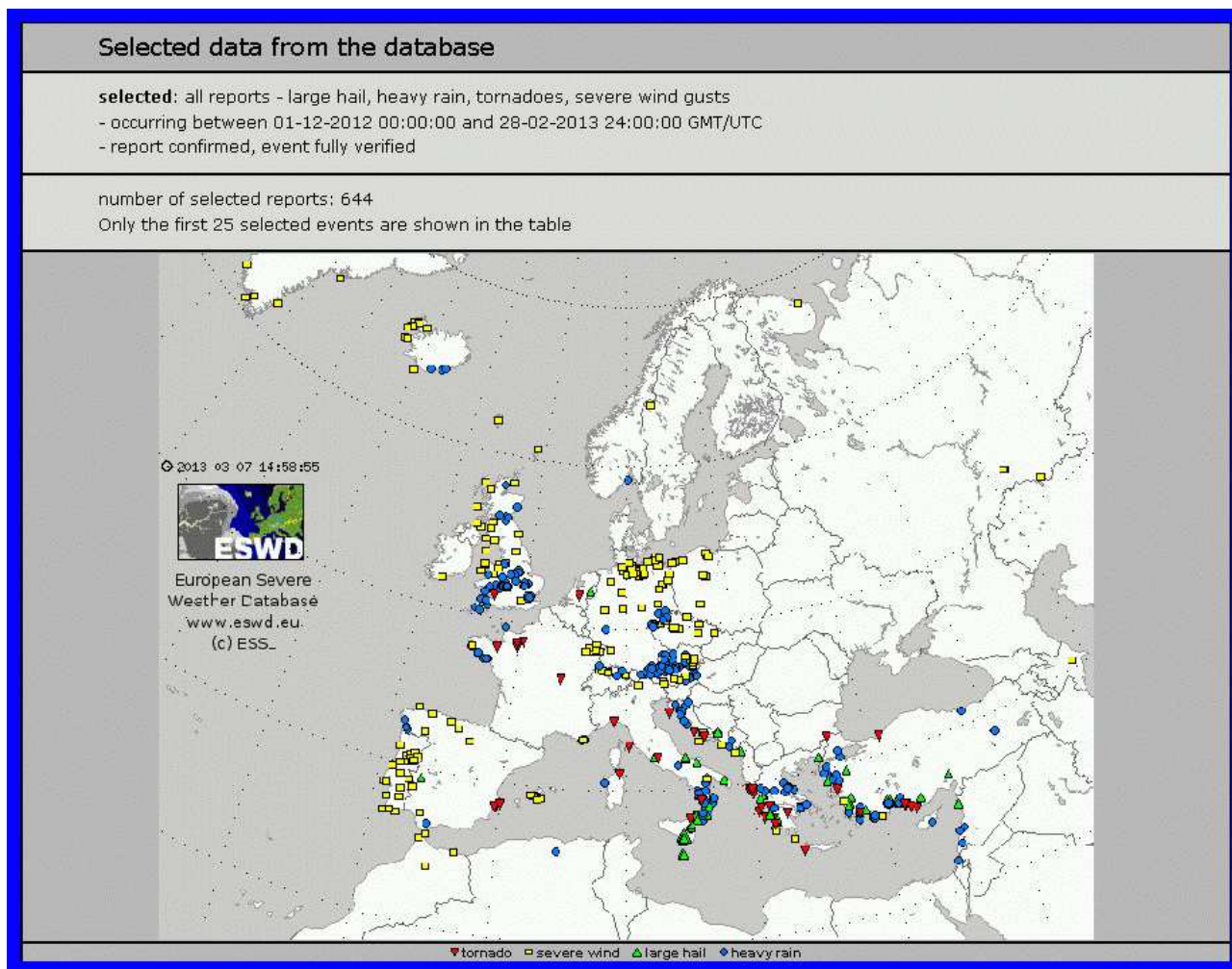
Climate Extremes and Severe Weather Events:

Map of Climate Extremes and Events of the Season:

Event map winter 2012/2013 / Ereigniskarte Winter 2012/2013



Map of reported Severe Weather Events of the Season:



Map of reported Severe Weather Events of the Season, Source: <http://essl.org/cgi-bin/eswd/eswd.cgi>

Web-available seasonal summaries in RA VI:

[2012-2013 WINTER SEASON ASSESSMENT REPORT of TURKEY](#)

[Air temperature anomalies and Precipitation amounts for Croatia in Winter 2012/2013](#)

[Vejret i Danmark - vinteren 2012-2013](#)

[Bilan de l'hiver 2012-2013 \(France\)](#)

[The weather in Germany in the winter 2012/13](#)

[ZHMS\(Montenegro\): Analiza temperature vazduha i količine padavina za zimu 2012/2013](#)

[Winter 2012/2013: Vrij koud, normale hoeveelheid zon en neerslag \(Netherlands\)](#)

[Vintersesongen : desember 2012 - februar 2013 \(Norway\)](#)

References:

(Links to Analyses of Extreme Climate Events or special papers of interest)

[RCC-CM 10 January 2013: Cold and Snowstorm in the Middle East](#)

Jaiser,R. et.al. (2012): Impact of sea ice cover changes on the Northern hemispere atmospheric winter circulation

Tellus Sereis a - Dynamic Meteorology and Oceanography 64.

doi:10.3402/tellusa.v64i0.11595

Liu, JP. et.al. (2012): Impact of declining Arctic sea ice on winter snowfall

Proceedings of the National Academy of Sciences of the United States of America 109 (11);4074-4079

doi:10.1073/pnas.1114910109

Petoukhov,V. Semenov, V.A. (2010): A link between reduced Barents-Kara sea ice and cold winter extremes over northern continents

Journal of Geophysical Research - Atmospheres 115

doi:10.1029/2009jd013568