Annex

Country: Italy

Italian Contributing Institutions: , CNMCA (Italian Air Force Met Service), CNR-IBIMET, CNR-ISAC, CMCC, CRA-CMA, DPC

Name: Filippo Maimone

E-mail: maimone@meteoam.it

Assessment of the seasonal forecast for the winter season

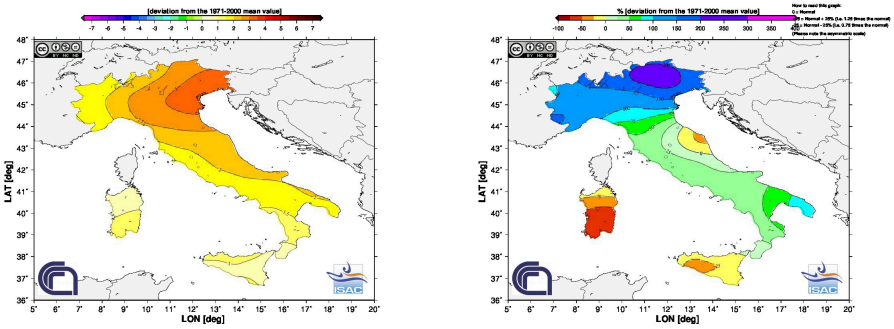
DJF 2013-14

1. MedCOF-1 Climate outlook for the 2013-14 winter season:

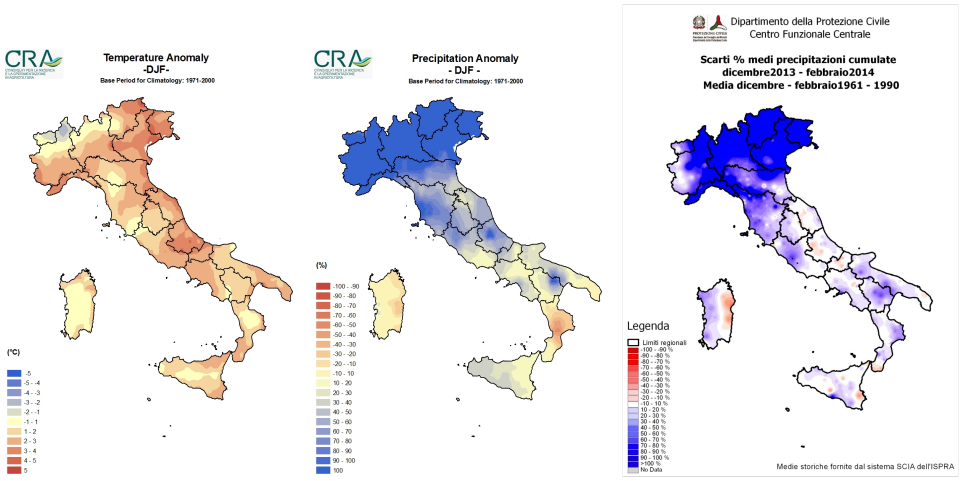
The MEDCOF-1 consensus statement for the 2013-2014 winter season reported a significant probability for temperature higher than average throughout Italy and most of the surrounding seas, except for the Adriatic basin where the forecast signal was very weak. For what regards precipitation, uncertainties on the forecast were much larger for the Mediterranean domain as a whole, and climatology had been assigned to the vast majority of the country. Though, due to the high sea surface temperatures predicted for the Sicilian Channel and Ionian Sea, the winter was expected to be wetter than normal because of possible heavy precipitation events.

2. Analysis of the 2013-14 winter season in Italy:

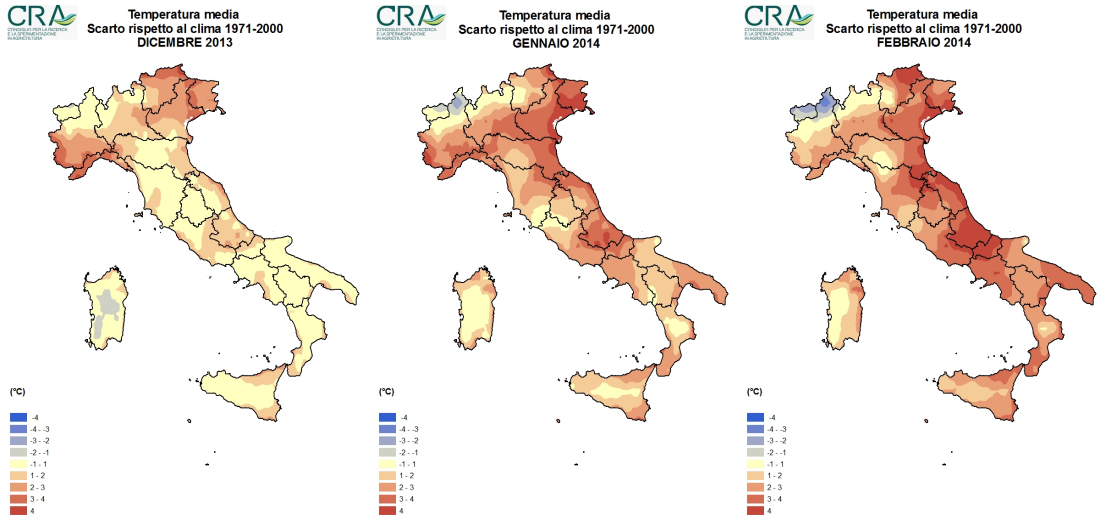
- In DJF 2013-2014, positive temperature anomalies, between 1°C and 3°C with respect to 1981-2010 reference period, were registered over almost the whole Italian peninsula. Some exceptions concerned Veneto and part of Emilia Romagna, with higher than +3°C anomalies, and Southern Sicily together with northern and western Sardinia, characterized by weak anomalies ranging from: -1°C to +1°C.
- Precipitation was observed higher than normal, between 150% and 400% with respect to climate normals over Northern Italy and over the interior part of the Central-Northern regions; Central-Southern Adriatic coast, Central Tyrrhenian coast, Sardinia and Southern regions (with the exception of Sicily) recorded below than normal precipitation (between 50% and 100% of climatic normals).



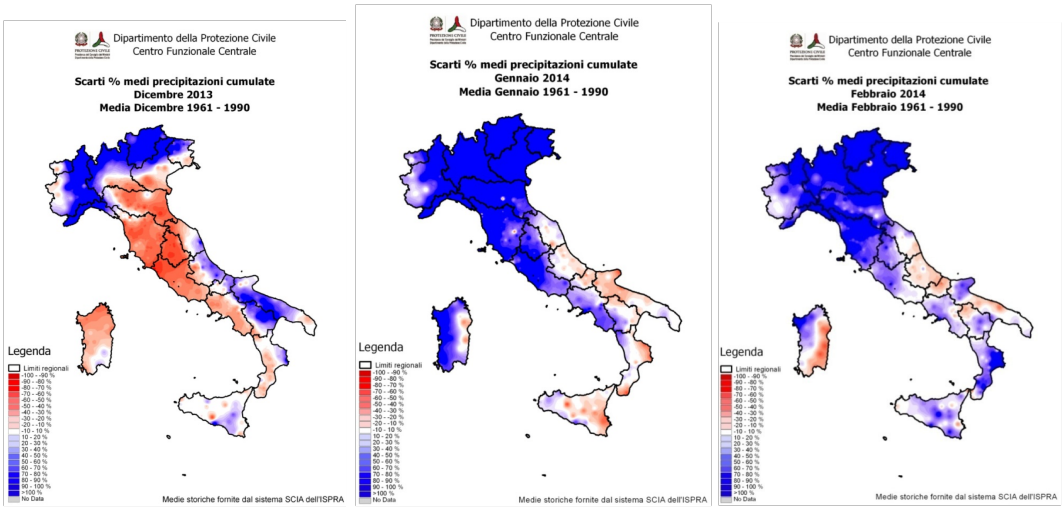
In particular winter 2013-2014 shown a +1.80°C positive temperature anomaly (relative to 1971-2000) which represents the 2nd warmest year on record (1800-2013), and a +62% precipitation positive anomaly which represents the 15th wettest year on record (1800-2013) (source CNR – ISAC (http://www.isac.cnr.it/~climstor/climate_news.html).



Similar patterns for this anomalous winter were highlighted by the CRA-CMA dataset (source CMA - Research unit for Climatology and Meteorology applied to Agriculture - http://cma.entecra.it/homePage_EN.htm) and by the National Civil Protection Department dataset (source DPC - http://www.protezionecivile.gov.it).



Monthly mean temperature anomalies for December to February (source CMA - Research unit for Climatology and Meteorology applied to Agriculture - http://cma.entecra.it/homePage_EN.htm).



Monthly accumulated precipitation anomalies for December to February (source DPC - http://www.protezionecivile.gov.it).

Monthly meteorological evolution:

DECEMBER 2013

December was characterized by maximum temperatures higher than climatic values with respect to the 1961-90 period. Total precipitation were observed within the normal variability of the period. During the month some synoptic disturbances passed over Italy producing local heavy precipitation events in the Northern areas and large amount of snow along the Alps.

JANUARY 2014

This month was characterized by temperatures higher than average (reference period 1961-90). Total precipitation greatly exceeded climate values in Central and Northern Italy. The atmospheric circulation was characterized by a prevalent westerly flow during the first ten days and by a prominent cyclonic anomalous pattern in the remaining period.

FEBRUARY 2014

In this period the atmospheric circulation over central Mediterranean Sea was characterized by several well organized frontal systems producing a cyclonic prevalent pressure pattern, especially during the first and third ten-day periods. The moist air advection, mainly maritime, brought abundant rainfall whose monthly amounts were higher than normal over a large part of the country, especially on the Northern-East areas where the observed anomalies were quite large.

3. High Impacts Events:

Among a large number of heavy rainfall events all over the Italian Peninsula, which provided the anomalous patterns shown above, two major severe precipitation events occurred in Italy between January 31st and February 6th. A long lasting deep convective system hit the city of Rome in the January 31st with an accumulated rainfall amount exceeded 190mm (max values in 24h, with a return period of 50 – 100 years). The second severe event occurred over a large portion of the Northern –East country (Veneto and Friuli regions) with total accumulated amount of more than 360mm in a few days (between January 31st and February 6th) and an estimated return period between 10 and 50 years. Many areas, in the country, experienced river floods, with inundated areas, dendritic landslides, broken river embankments.

In particularly in January the highest daily and monthly mean values of the maximum temperatures, referred to the period 1951-2014, were exceeded, although for a few tenths of a degree, respectively in 1 and 7 Air Force/ENAV meteorological stations. The monthly rainfall totals presented values higher than the climatic reference on the Northern-East and central Tyrrhenian areas. Extreme values of cumulated precipitation in 24 hours were exceeded respectively in 7 and 17 Air Force/ENAV meteorological stations. On 31 January, for example, Vigna di Valle (RM) station measured the new record of 125 mm, compared with the previous record of 107 mm dating back to the 31/01/1986, and Rome Fiumicino station measured the new record of 164 mm, compared with the previous 76 mm dating back to the 15/01/1980.

Furthermore in February the analysis of ten-day averages of the maximum temperatures shown that, during this month, values well above the climate average were recorded over most of the northern regions, with values mainly within the range of +1.0 / +7.0 °C. Over the central and southern Italian regions. The first and the second ten-day periods were characterized by high maximum temperatures. During this warm spell, new maxima in both the monthly and historical series were recorded in many places.

The highest daily value of February was detected in Catania Sigonella where, on 17th February, a daily maximum temperature of +26.0 °C was observed.

The monthly rainfall amounts were higher than average for the period over most of the Northern part of Italy, especially in the Northern-East areas where total quantities exceeded the previous extremes of precipitation amounts accumulated in 24 hours in 1 and 7 AM/ENAV stations, respectively. As an example on 16th February the station of Passo Rolle (TN) registered a new daily record equal to 108 mm against 87.9 mm dated on 4th February 1966, and a record of the cumulative monthly precipitation equal to 401.8 mm against 167.9 recorded in 1951.

4. Verification of the MedCOF-1 climate outlook for the 2013-14 winter season:

Country	*Seasonal temperature (DJF)*		*Seasonal precipitation (DJF)*	
	Observed	*MedCOF-1 climate outlook for temperature*	*Observed*	*MedCOF-1 climate outlook for precipitation*
Italy	Overall above normal.	Overall above normal, apart from Northern Italy.	Well above normal over Northern regions and over interior central regions. Above normal over Sicily, while below normal over most of Calabria and over central and Northern Sardinia. Normal conditions elsewhere.	Climatological expectations over most of Italy; Above normal over Sicily.

5. Users' perceptions of the MedCOF-1 outlook

Dissemination of products from our web-sites (http://clima.meteoam.it) of MedCOF outlooks will be activated in the next days.

MedCOF-1 winter outlook was disseminated during the December meeting at the "Technical-scientific board for monthly and seasonal forecast at National scale" managed by the Italian National Civil Protection Department (Rome 04.12.2014) in the framework of their operational water management activities.

Acknowledgements

Data and maps were provided by Military Air Force Met Service (www.meteoam.it), Institute of Atmospheric Sciences and Climate (www.isac.cnr.it) of the National Research Council (www.cnr.it), Research unit for Climatology and Meteorology applied to Agriculture (http://cma.entecra.it) and the National Service of the Civil Protection (http://www.protezionecivile.gov.it).