CURRENT WEATHER AND CLIMATE CONDITIONS

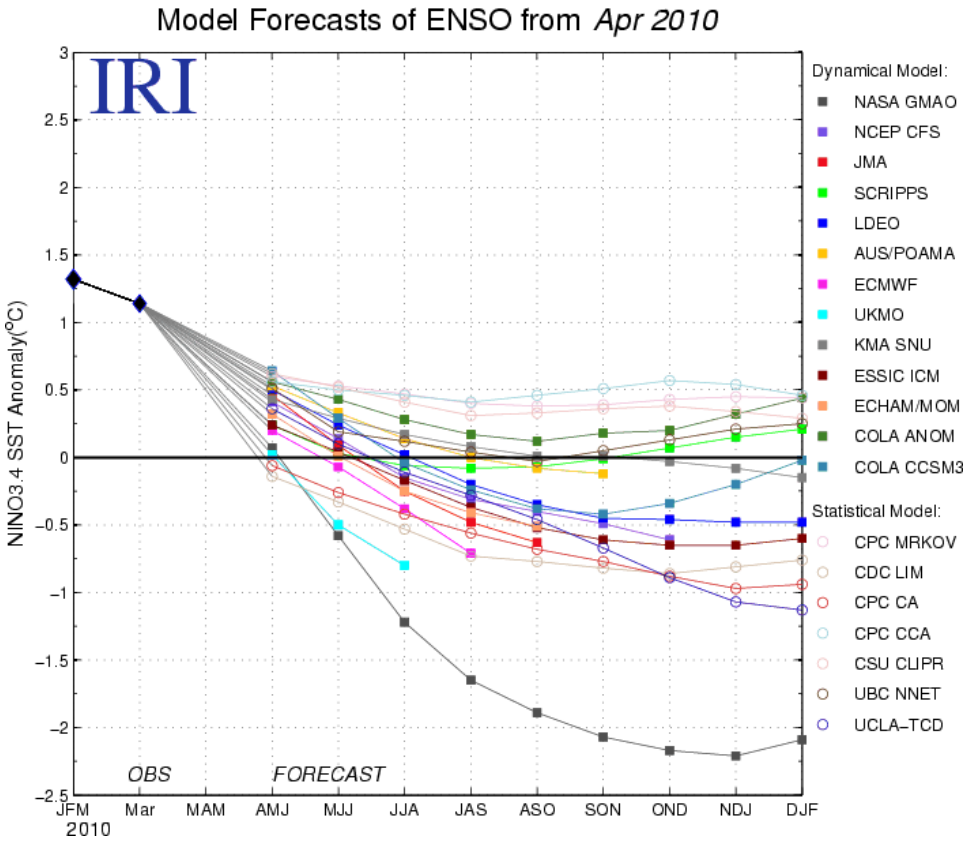
Among the variety of current circulation structures and surface anomalies we limited this brief review to several features that might be relevant to the European region in the forthcoming summer season.

Sea surface temperature

The spring of 2010 is a season of the El Niño decay. Although El Niño is still ongoing, and sea surface temperature (SST) anomalies near the coast of South America even increased up to 2º, the part of equatorial basin with positive anomalies and the average anomaly continue to decrease. Observed temperature decrease in the Humboldt current reduces the heat supply from the Southern Hemisphere.

According to forecasts El Nino will persist for 2–5 months, but the ocean influence on atmospheric circulation will weaken. Both dynamical and statistical model forecasts for summer (see the figure from IRI web-site) predict near neutral ENSO conditions.

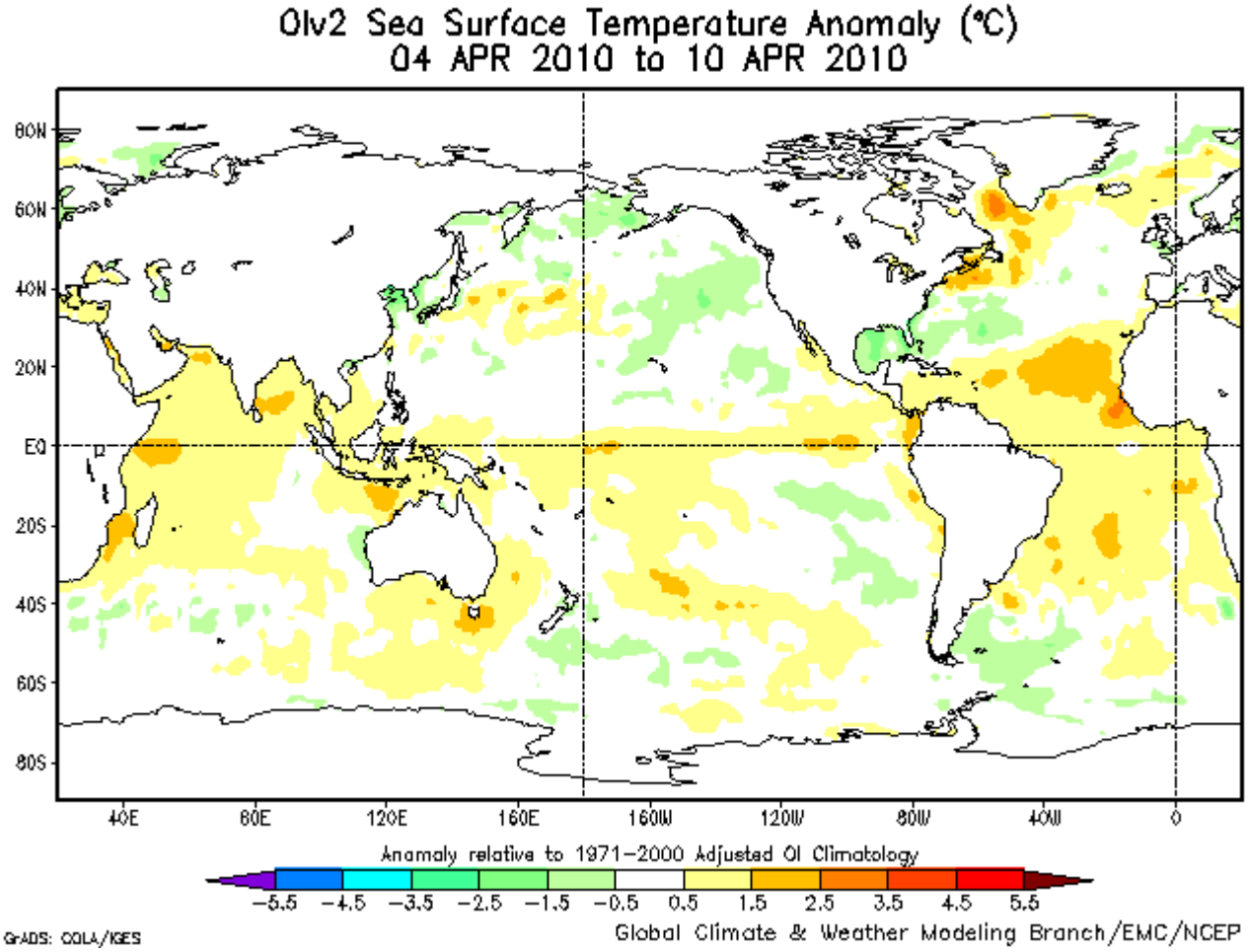
It is worth mentioning that in general clearly pronounced El Niño / La Niño events are associated with more skilful global seasonal forecasts. This might not be the case in the forthcoming summer.



From http://iri.columbia.edu/climate/ENSO/currentinfo/archive/201004/SST_table.html

The mean Northern Pacific SST anomaly continues to decrease mostly due to anomalously cold water in the ocean midlatitudes.

The equatorial latitudes are still anomalously warm in the Atlantic and Pacific Oceans. Positive SST anomaly persists also in the Greenland Sea, the Baffin Bay, and the Davis Strait. Near-normal SST or weak negative anomalies are observed in the midlatitudes. Below-normal SSTs are observed in the northernmost part of the ocean, in the Caribbian basin and in the seas to the north of Europe.



From http://www.emc.ncep.noaa.gov/research/cmb/sst_analysis/images/wkanomv2.png

It should be added that due to the decrease in temperature contrasts between atmosphere and ocean surface the impact of SST anomalies on atmospheric circulation in summer is less pronounced than in the cold season.

Atmospheric circulation

The eastern wind phase of the quasi-biennial oscillation is increasing in the equatorial stratosphere.

In the previous month the northeast of North America was under the influence of pressure ridge moving from the south. This resulted in positive geopotential anomalies up to +12 dam. The planetary

upper-level front was very unstable in recent weeks: abrupt deviations from its mean climate location and breaks were observed. The planetary upper-level front was substantially deviated to the south over the northeastern Pacific (by 10-12º), over European Russia (by 5-7º) and to the north over the Northern Atlantic (by 5-7º) and Canada (by 4-6º).

The Northern Hemisphere zonal transport in the previous month 18% more intense than usually.

There was a ridge in both the mean surface pressure field and the 500-hPa height field directed from Greenland to the Taimyr Peninsula with positive pressure anomalies of +7…+12 hPa. Therefore, the western center of the Icelandic Low was considerably weakened, and the eastern one was shifted eastward to the Barents Sea determining negative pressure anomalies up to -10 hPa over the north of European Russia. The Azores high was weakened during most of March due to cyclones passing over the central Atlantic (anomalies of -5 … -6 hPa), which moved over the Mediterranean Sea in the first ten-day period of the month, and over Northern Europe in the second and third ten days, atmospheric pressure being increased (anomaly of +4 hPa) in Central Europe. By April the intensity and location of the Azores high became normal.

The NAO index had large negative values from December 2009 to mid-March 2010. (http://www.cpc.ncep.noaa.gov/products/precip/CWlink/pna/nao.shtml). Therefore, the Azores high was weakened, and the trade wind was not intense. Consequently, surface waters did not mix with lower colder layers, surface evaporation was weak, and surface water between 10°N and 20°N in the Atlantic became stably warmer than the multiyear normal. In the tropical Atlantic, SST remained also high, and this positive anomaly is likely to persist during the whole summer. As a result, an increased cyclogenesis is expected in the tropical Atlantic, including higher-than-normal number of tropical cyclones.

Table of Teleconnection Indices in CPC version, with the latest being dated back to March 2010, is shown below (From http://www.cpc.noaa.gov/products/CDB/CDB_Archive_html/bulletin_032010/Extratropics/table3.shtml
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Table of Teleconnection Indices

MONTH	NAO	EA	WP	EP-NP	PNA	TNH	EATL/WRUS	SCAND	POLEUR
MAR 10	-0.9	1.4	2.1	-1.5	2.0	---	0.8	-0.5	-1.4
FEB 10	-2.0	1.3	0.7	-0.1	0.6	-1.2	-0.7	1.1	-1.9
JAN 10	-1.1	0.9	0.8	-0.7	1.3	-1.2	-0.6	1.2	-0.1
DEC 09	-1.9	1.1	-0.9	---	0.3	-0.6	-0.8	0.5	-1.6
NOV 09	0.0	1.9	1.4	-1.5	0.2	---	-0.2	0.7	-0.7
OCT 09	-1.0	1.4	-2.4	0.7	0.4	---	-0.1	-0.9	-2.6
SEP 09	1.5	0.9	-0.7	-1.7	1.3	---	-0.5	-0.8	0.9
AUG 09	-0.2	2.6	0.3	-2.3	0.6	---	-0.5	-0.5	0.2
JUL 09	-2.2	1.0	0.5	1.4	1.2	---	0.3	-1.0	-0.5
JUN 09	-1.2	-1.0	-1.6	-0.1	0.4	---	0.7	-0.1	0.2
MAY 09	1.7	1.5	-1.2	1.6	-0.6	---	0.2	0.2	-0.8
APR 09	-0.2	0.7	-0.1	0.6	0.2	---	1.4	-0.2	1.8
MAR 09	0.6	-0.9	0.4	-1.0	-1.0	---	0.1	-0.7	-0.9

TABLE E1. Standardized amplitudes of selected Northern Hemisphere teleconnection patterns for the most recent thirteen months (computational procedures are described in Fig. E7). Pattern names and abbreviations are North Atlantic Oscillation (NAO); East Atlantic pattern (EA); West Pacific pattern (WP); East-Pacific - North Pacific pattern (EP-NP); Pacific/North American pattern (PNA); Tropical/Northern Hemisphere pattern (TNH); East Atlantic/Western Russia pattern (EATL/WRUS-called Eurasia-2 pattern by Barnston and Livezey, 1987, *Mon. Wea. Rev.*, **115**, 1083-1126); Scandanavia pattern (SCAND-called Eurasia-1 pattern by Barnston and Livezey 1987); and Polar Eurasia pattern (POLEUR). No value is plotted for calendar months in which the pattern does not appear as a leading mode.

It should be noted that persistency of the circulation patterns is quite low and they can't be extrapolated into summer. Furthermore, the whole set of the modes explains about a half of the variance, with circulation in summer playing not so crucial role as in winter.