Central Region Climate Outlook and Summary for February 2012 and the Spring of 2012

Pacific Ocean Sea Surface Temperatures & Anomalies

During the past month, equatorial **s**ea **s**urface **t**emperatures (**SST**s) were more than 0.5°C below average between 160°E and 105°W, and more than 1°C below average in most of the central Pacific between 165°E and 130°W. The weekly SST Index values are currently near -1.0°C in the Niño-3.4 (-1.0°C) and Niño-4 (-0.9°C) regions. Meanwhile, the SSTs are warming across the eastern part of the equatorial Pacific basin (Niño 1+2 is currently at -0.4ºC). A horseshoe pattern of above-average SSTs extended from the Maritime Continent into the middle latitudes of the Pacific Ocean (Figure 1). This is very consistent to what is typically observed during a La Niña. The latest (NDJ) Oceanic Niño-3.4 is (-0.9°C) which indicates a weak to moderate La Niña.

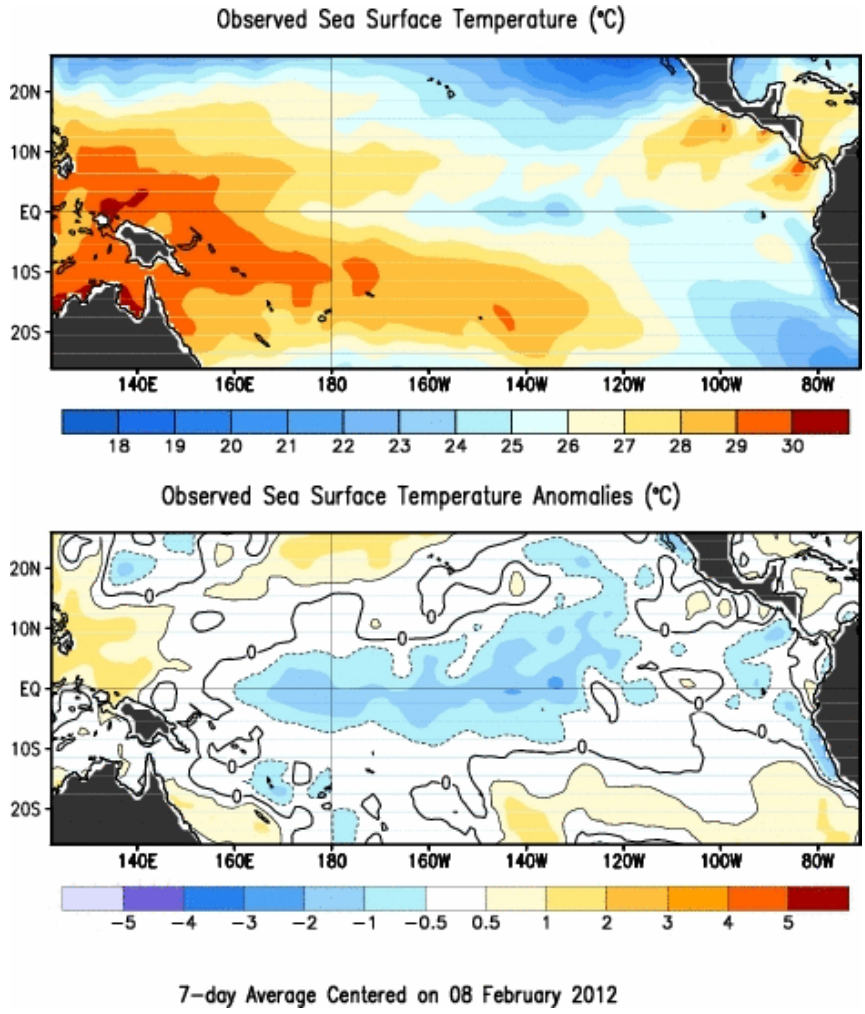


Figure 1: Sea Surface Temperature Anomalies across the equatorial Pacific Basin

From January through mid-February of 2012, negative subsurface temperature anomalies (100-300 meters) weakened across the equatorial Pacific near 160°W. The image below illustrates how the subsurface water temperature anomalies have changed from December 19, 2011 through February 2, 2012 (Figure 2).

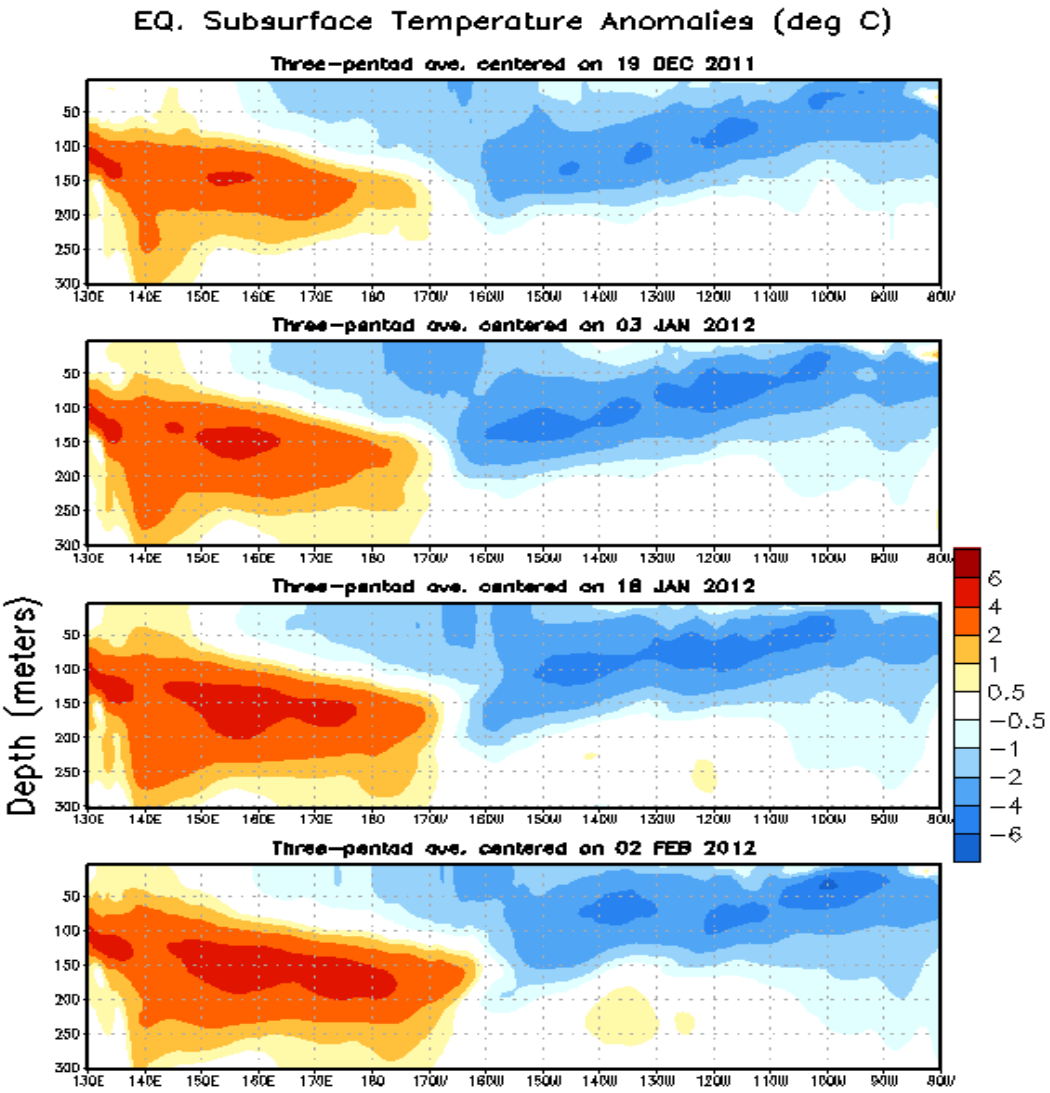


Figure 2: Equatorial Subsurface Water Temperature Anomalies from December 19, 2011 through February 2, 2012

During the past month, negative **O**utgoing **L**ongwave **R**adiation (**OLR**) anomalies (enhanced convection and precipitation) were observed over Malaysia, Indonesia, and to the southeast of Papua New Guinea. Positive OLR anomalies (suppressed convection and precipitation) were located over the western and central tropical Pacific. Low-level (850-hPa) easterly anomalies continued to be observed over the central and western tropical Pacific. Upper-level (200-hPa) westerly anomalies were observed over the eastern half of the tropical Pacific. Finally, cyclonic circulation anomalies were

present in the subtropics of both hemispheres. All of these are consistent with a La Niña, so there remains a connection between what is being observed in the ocean and the atmosphere.

ENSO Model Predictions

Most of the dynamic and statistical climate models (Figure 3) continue to indicate that the La Niña will continue to weaken through the boreal (Northern Hemisphere) spring. This normally occurs during most La Niña episodes. Then a majority of the models suggest neutral conditions from the summer of 2012 into the early winter of 2012-13. According to Dr. Klaus Wolter, this would be very unusual. In his historical analysis, there has not been a neutral winter following a "double-dip" La Niña winter. All eleven cases have either been followed by either an El Niño (1916-18, 1921-23, 1949-51, 1961-63, 1970-72, and 2007-09) or La Niña (1892-95, 1908-11, 1954-57, 1973-76, and 1998-2001) winter.

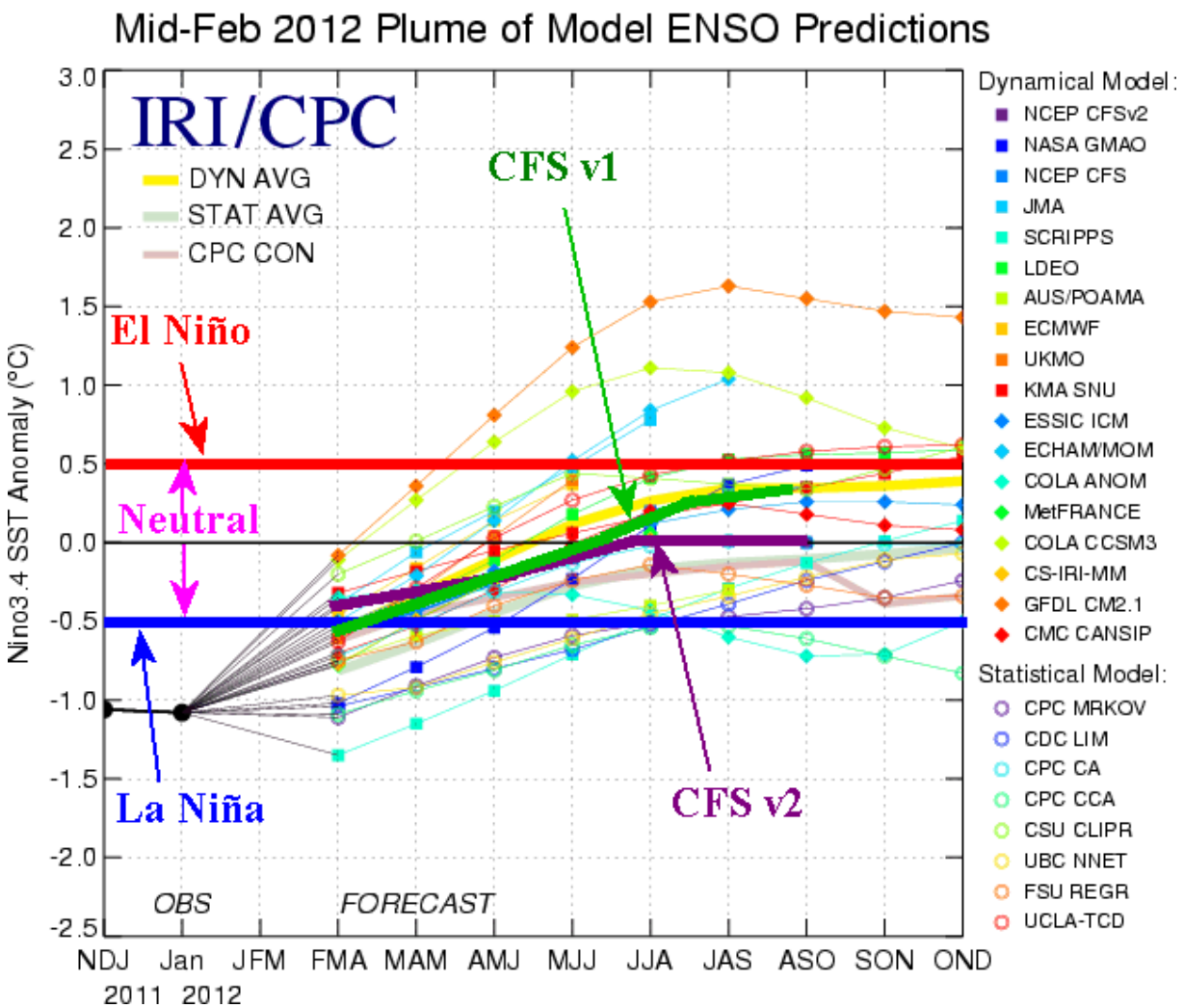
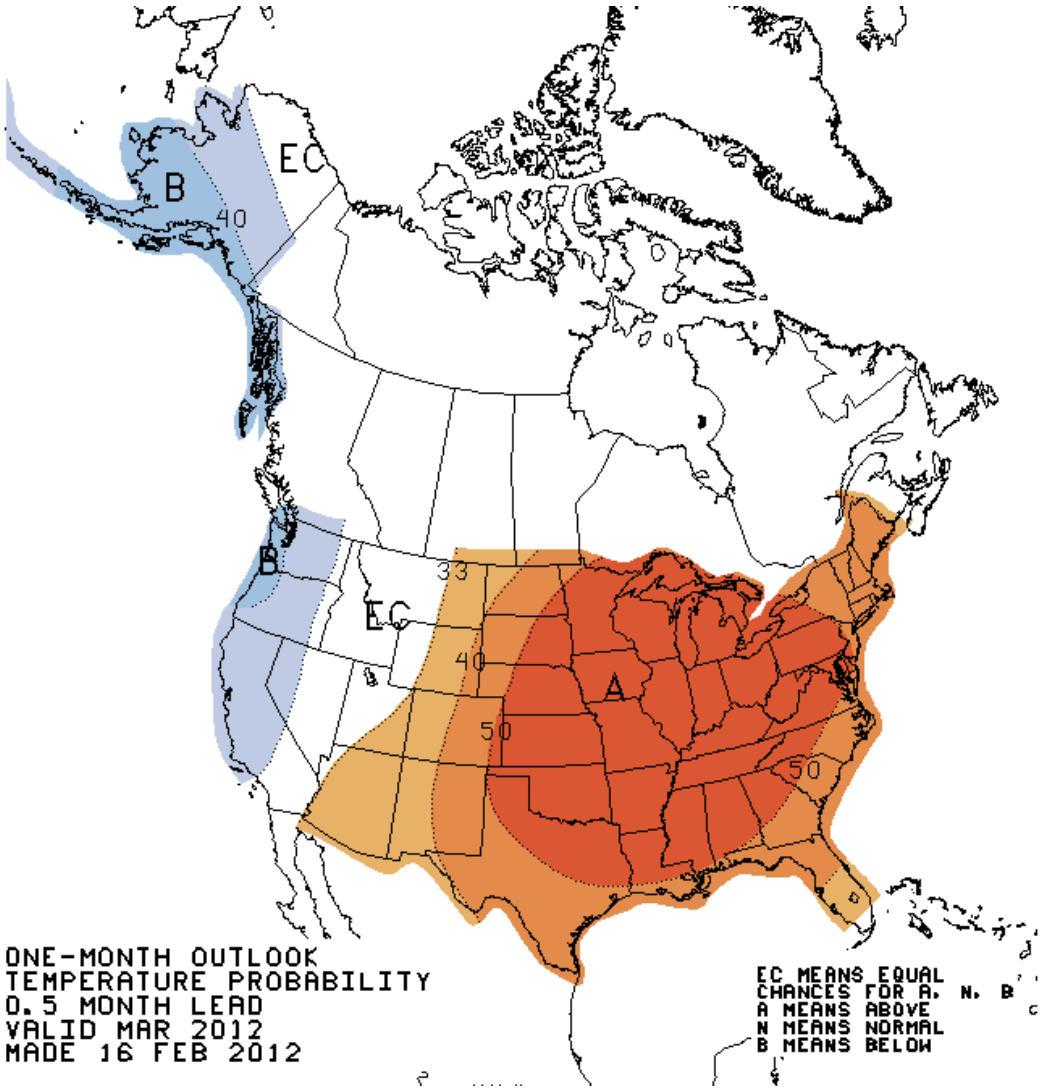


Figure 3: Plume of Model ENSO Predictions

One of the things learned from the La Niña of 2011-12 was that the dynamical (this includes the NCEP **C**oupled **F**orecast **S**ystem (**CFS**) model version 2) and statistical models were far too slow at showing its development. The only model which caught onto the La Niña was the ESSIC **I**ntermediate **C**oupled **M**odel (**ICM**). The CPC Ocean Monitoring Group recently looked into why the other models may have failed. They theorize that it was caused by an unrealistic response to a positive heat content anomaly in the tropical Pacific and a failure to capture the persistent easterly wind anomalies in the central Pacific. Although the tropical Pacific returned to ENSO-neutral conditions during May to July of 2011, the persistence of easterly wind anomalies in the western-central Pacific and the enhanced (suppressed) convection in the northwest Pacific (south-central Pacific) probably related to the horse-shoe pattern of negative **s**ea **s**urface **t**emperature **a**nomalies (**SSTA**). They feel that in order to forecast the onset of La Nina from the previous spring, models need to maintain the horse-shoe SSTA and eastern wind anomalies.

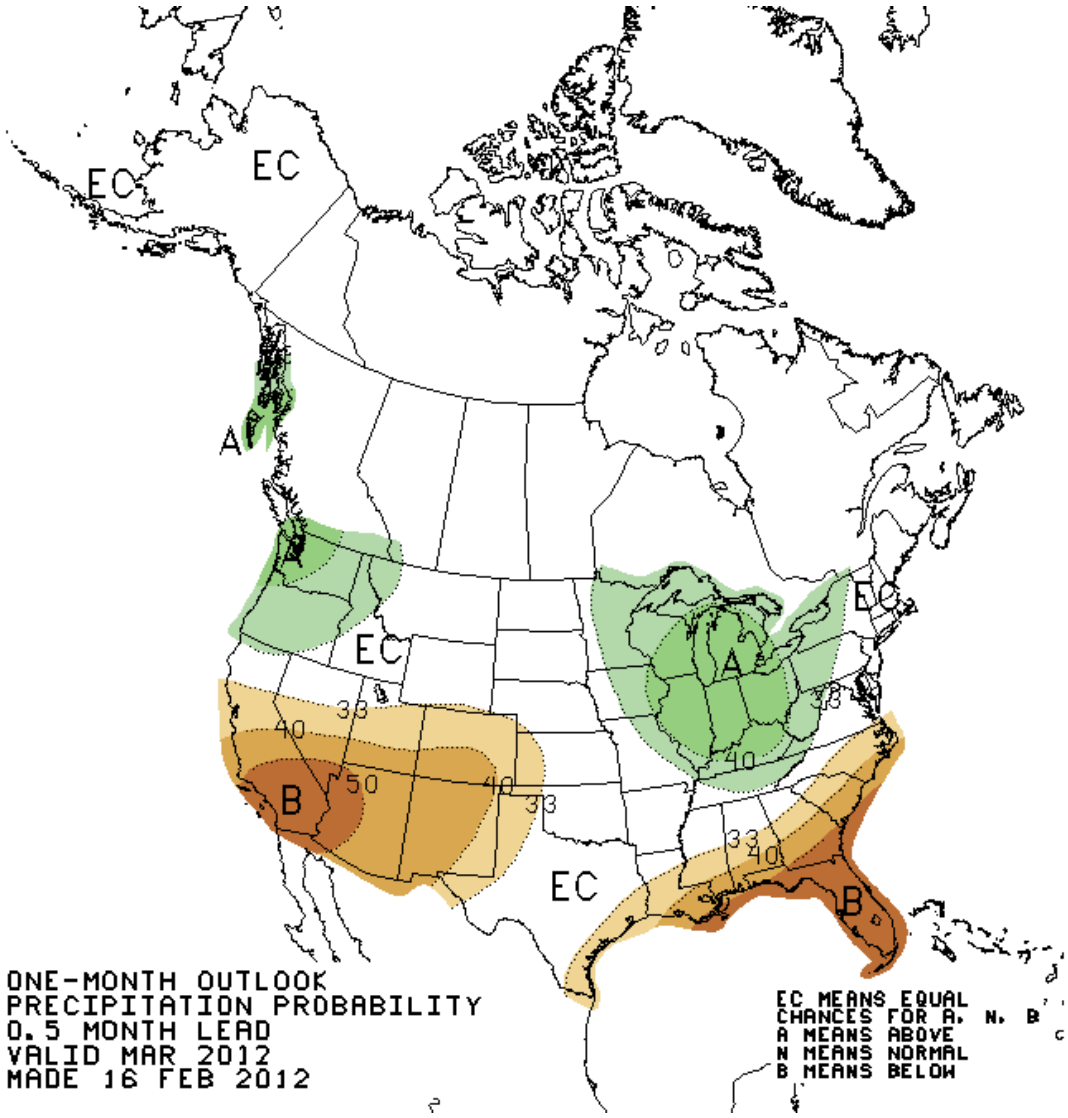
March 2012 CPC Temperature Outlook

The **C**limate **P**rediction **C**enter (**CPC**) temperature forecast March of 2012 calls for enhanced probabilities of above-normal temperatures across the eastern two-thirds of the United States. The greatest shifts in the probabilities (greater than 50 percent) for above-normal temperatures are found across much of the eastern half of the United States. Meanwhile equal chances for above-, below-, and near-normal temperatures are found across western Wyoming. This forecast was based upon the **N**ational **M**ulti-**M**odel **E**nsemble (**NMME**)



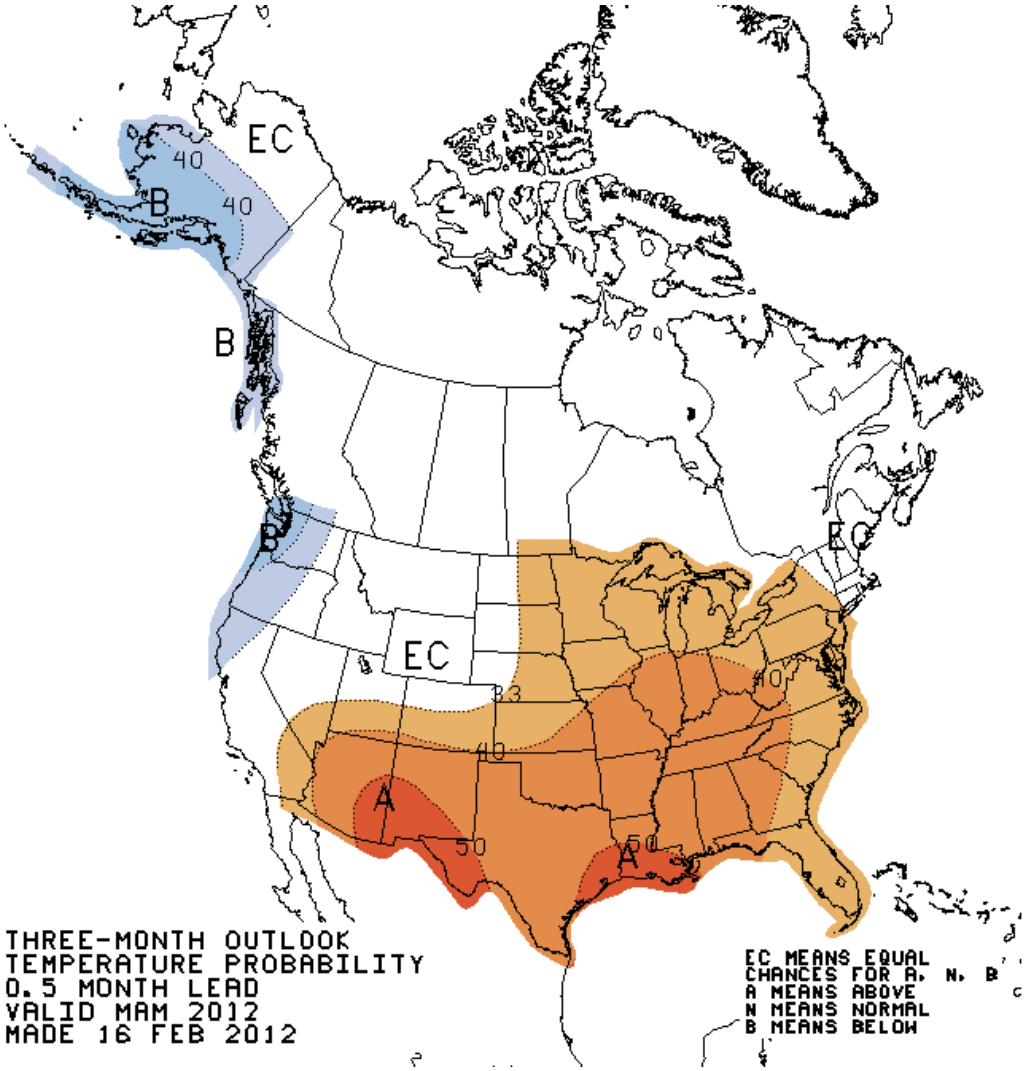
March 2012 CPC Precipitation Outlook

The **C**limate **P**rediction **C**enter (**CPC**) precipitation forecast for March of 2012 calls for enhanced probabilities of above-normal across the Mid and Upper Mississippi River Valleys, Ohio River Valley, and Great Lakes. The greatest shifts in the probabilities (greater than 40 percent) for above-normal precipitation are found across Lower Michigan, southern and eastern Wisconsin, eastern Iowa, Illinois, Indiana, and central Kentucky. Meanwhile the probabilities for below-normal precipitation are enhanced across Colorado and western Kansas. The greatest shifts in probabilities (greater than 40 percent) for below-normal precipitation are located across the southern half of Colorado. Meanwhile the remainder of the NWS Central Region has equal chances for above-, below-, and near-normal precipitation. This forecast was based primary on **N**ational **M**ulti-**M**odel **E**nsemble (**NMME**) and La Niña composites.



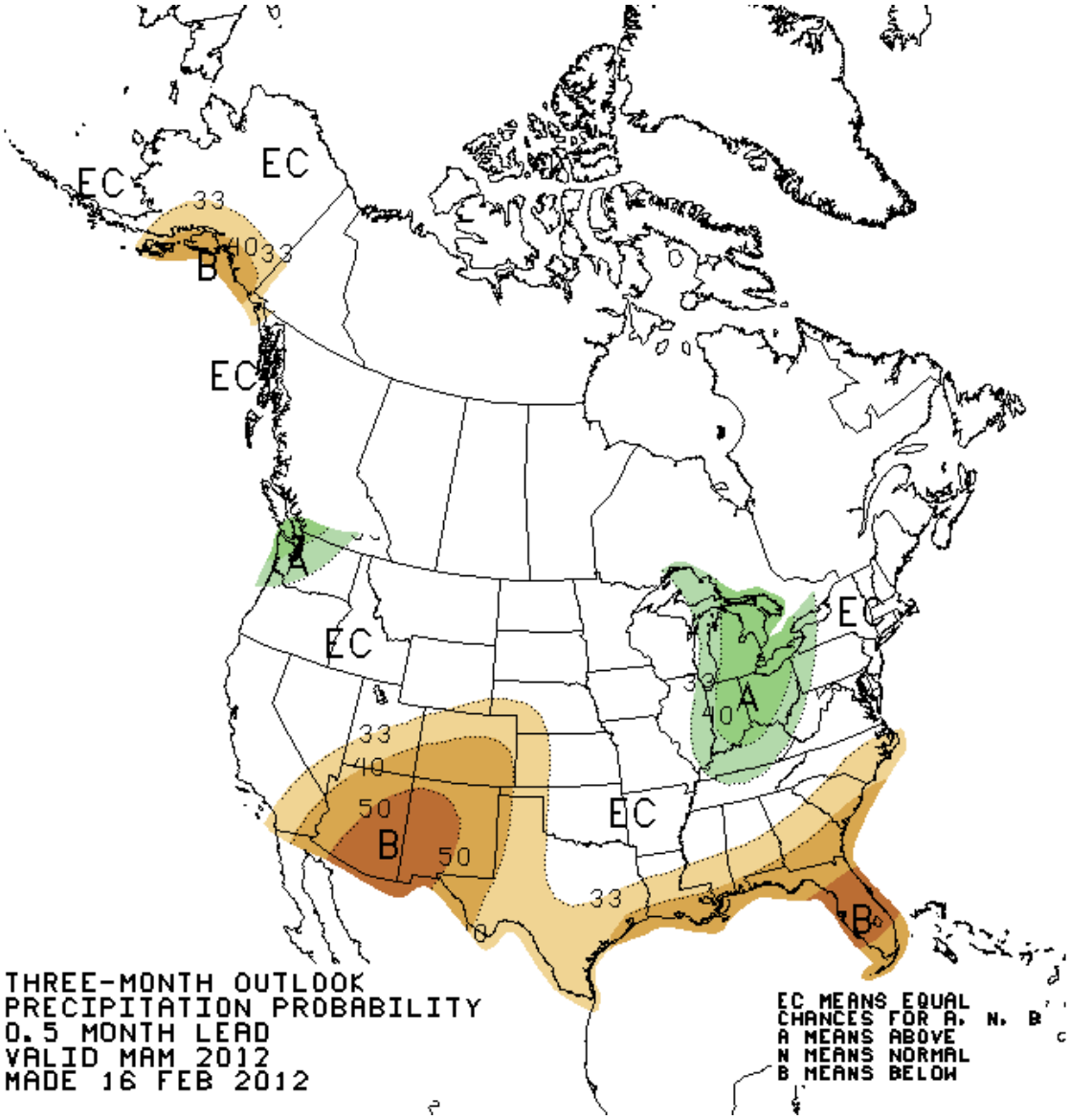
3-Month Temperature Outlook for the Spring of 2012

The **C**limate **P**rediction **C**enter (**CPC**) temperature forecast for the meteorological spring (March through May) of 2012 calls for enhanced probabilities of above-normal temperatures across a majority of the eastern and southern United States. The greatest shifts in the probabilities (greater than 40 percent) for above-normal temperatures are found across southeast Kansas, Missouri, Illinois, Indiana, and Kentucky. Meanwhile equal chances for above-, below-, and near-normal temperatures are found across the western Dakotas, western Nebraska, northern Colorado, and Wyoming. This forecast was based upon the agreement NCEP **C**oupled **F**orecast **S**ystem (**CFS**) model version 2 which has shown good skill across much of the country for this season, and two of three statistical forecast tools (**S**creening **M**ultiple **L**inear **R**egression – **SMLR** and **C**anonical **C**orrelation **A**nalysis – **CCA**).



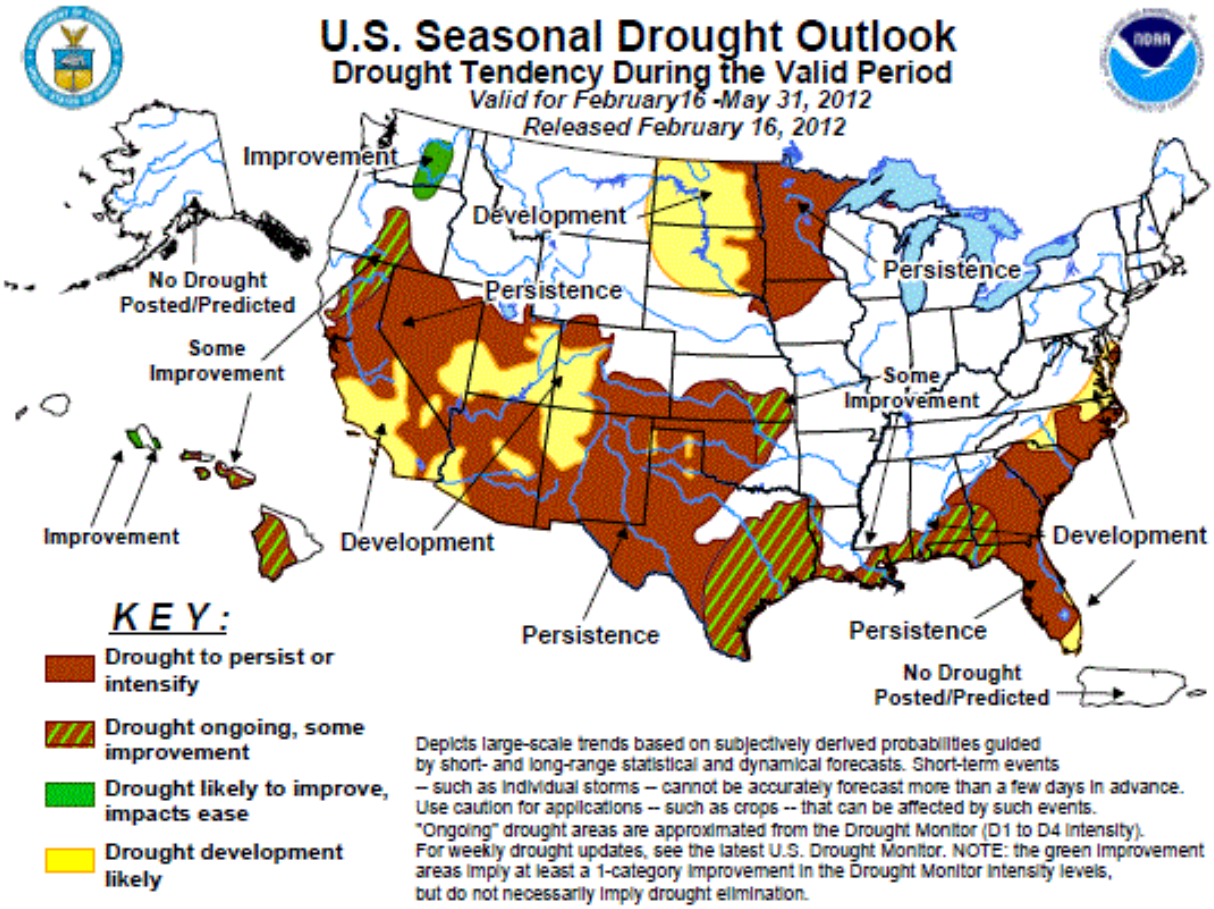
3-Month Precipitation Outlook for the Spring of 2012

The **C**limate **P**rediction **C**enter (**CPC**) precipitation forecast for the meteorological spring (March through May) of 2012 calls for enhanced probabilities of above-normal precipitation from Michigan south into Kentucky. The greatest shifts in the probabilities (greater than 40 percent) for above-normal precipitation are found across Lower Michigan and Indiana. Meanwhile the probabilities for below-normal precipitation are enhanced across southeast Wyoming, southwest Nebraska, western Kansas, and Colorado. The greatest shifts in probabilities (greater than 40 percent) for below-normal precipitation are located across the southern half of Colorado. Meanwhile the remainder of the NWS Central Region has equal chances for above-, below-, and near-normal precipitation. Much of this forecast was based mainly on La Niña composites and to a smaller extent the NCEP **C**oupled **F**orecast **S**ystem (**CFS**) model version 2.



Seasonal Drought Outlook for the Spring of 2012

The most recent U.S Seasonal Drought Outlook valid through the end of May 2012 indicates that the drought is expected to continue across Minnesota, eastern quarter of Dakotas, northern and eastern Iowa, extreme northeast Nebraska, south-central and southwest Kansas, and southeast Colorado. Drought is expected to develop across the western three-fourths of the Dakotas, and western Colorado. Meanwhile some improvement is expected in the drought areas of southeast Kansas.



Seasonal Outlook Interpretation Guide

The National Weather Service Seasonal Climate Outlooks predict the probability of conditions being among the warmest/coldest or wettest/driest (Table 1) terciles of years compared to the period of 1981-2010.

The outlooks indicate probability of being in three specific categories in reference to the 30-year climatology from 1981-2010 (Table 2). Remember, CPC outlooks are made at the scale of climate megadivisions (Fig. 1).

Temperature		Precipitation	
Social Science	**Climate Science**	**Social Science**	**Climate Science**
Uncommonly Cold	Below Normal Tercile	Uncommonly Wet	Above Normal Tercile
Uncommonly Warm	Above Normal Tercile	Uncommonly Dry	Below Normal Tercile
Moderate (Neither Warm Nor Cold)	Normal Tercile	Moderate (Neither Wet nor Dry)	Normal Tercile

Table 2...Climate Science Statistical Terminology (Terciles)

Precip	Temp	Probability of Occurence: Above	Near	Below	Most likely category
		80.0%-90.0%	16.7%-06.7%	03.3%	"Above"
		70.0%-80.0%	26.7%-16.7%	03.3%	"Above"
		60.0%-70.0%	33.3%-26.7%	06.7%-03.3%	"Above"
		50.0%-60.0%	33.3%	16.7%-06.7%	"Above"
		40.0%-50.0%	33.3%	26.7%-16.7%	"Above"
		33.3%-40.0%	33.3%	33.3%-26.7%	"Above"
		33.3%-30.0%	33.3%-40.0%	33.3%-30.0%	"Near Normal"
		30.0%-25.0%	40.0%-50.0%	30.0%-25.0%	"Near Normal"
		33.3%-26.7%	33.3%	33.3%-40.0%	"Below"
		26.7%-16.7%	33.3%	40.0%-50.0%	"Below"
		16.7%-06.7%	33.3%	50.0%-60.0%	"Below"
		06.7%-03.3%	33.3%-26.7%	60.0%-70.0%	"Below"
		03.3%	26.7%-16.7%	70.0%-80.0%	"Below"
		03.3%	16.7%-06.7%	80.0%-90.0%	"Below"
		33.3%	33.3%	33.3%	"Equal Chances"

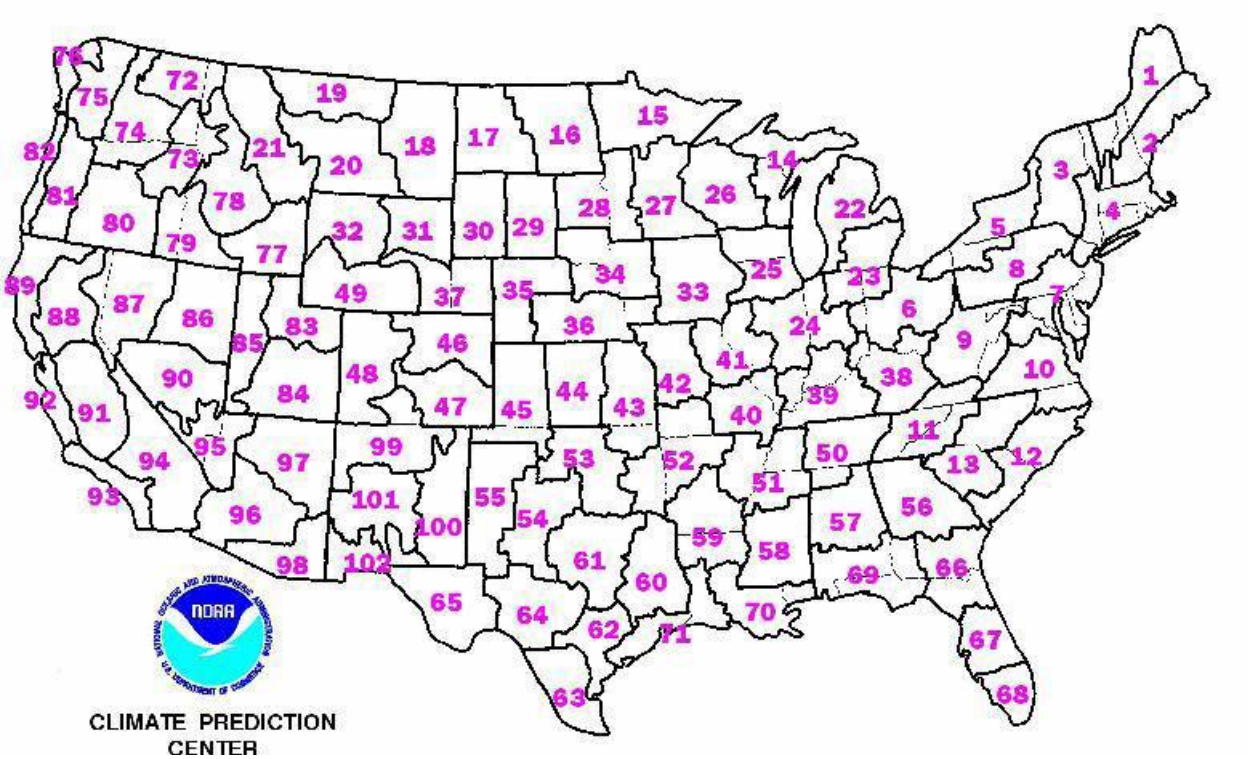


Figure 1…Mega Division Climate Forecast Map used by the Climate Prediction Center (CPC)

The following links show some of the ENSO composites that were used to make these forecasts.

CPC ENSO Box & Whisker Analysis:

http://www.cpc.ncep.noaa.gov/products/precip/CWlink/ENSO/box_whiskers/index.php

El Nino and La Niña-Related Winter Features over North America:

http://www.cpc.ncep.noaa.gov/products/precip/CWlink/ENSO/composites/EC_LNT_index.shtml

Winter Composites:

http://www.cpc.noaa.gov/products/analysis_monitoring/ensocycle/nawinter.shtml