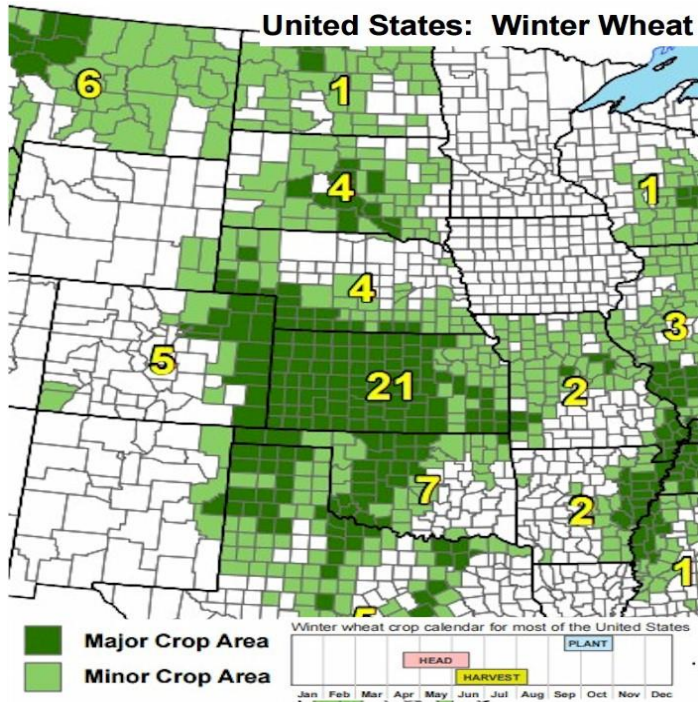


WINTER WHEAT WEATHER 12/13/17

USA UKRAINE/ RUSSIA/ CHINA/ AUS

MBN= Much Below Normal BN= Below Normal NN= Near Normal AN= Above Normal MAN= Much Above Normal

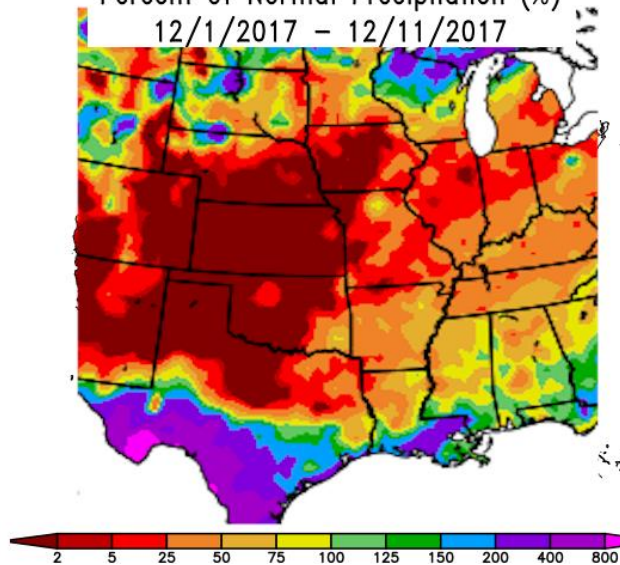
| WINTER WHEAT AREA SUMMARY | | |
|---------------------------|--|--|
| | WEEK 1 | WEEK 2 |
| USA | PRECIP – MBN all areas TEMPS - MAN North AN south | PRECIP- BN over Upper Plains .AN over southern Plains & INCREASE snow chances TEMPS- NN north MBN south |
| EUROPE | PRECIP –AN or MAN all areas Except eastern GER / POL see NN precip TEMPS – NN western/ central areas AN over POL ROM HUNG | PRECIP- an over FR GER early then dry ...NN over eastern Europe TEMPS- NN southern Europe AN northern Europe |
| UKRAINE | PRECIP –NN west BN eastern some snow west areas TEMPS - AN west –MAN eastern areas | PRECIP- AN western Ukraine NN eastern.. increase snow chances most of Ukraine TEMPS- AN all areas |
| RUSSIA | PRECIP –BN Southern western Volga NN Upper Volga – Good snow chances Central Dist TEMPS - AN all areas MAN over southern & Volga districts | PRECIP- AN Central District BN Southern and Volga districts TEMPS- AN all areas |
| CHINA | PRECIP -Dry all areas TEMPS - AN south MAN north | PRECIP- Dry northern areas It rain under 0.50"12mm 50% coverage south TEMPS- AN south MAN north |
| AUSTRALIA | PRECIP -Dry all areas TEMPS - BN over southeast Southern Aus Tetty and SE Aus | PRECIP- Dry northern areas It rain under 0.50"12mm 50% coverage south TEMPS- AN south MAN north |



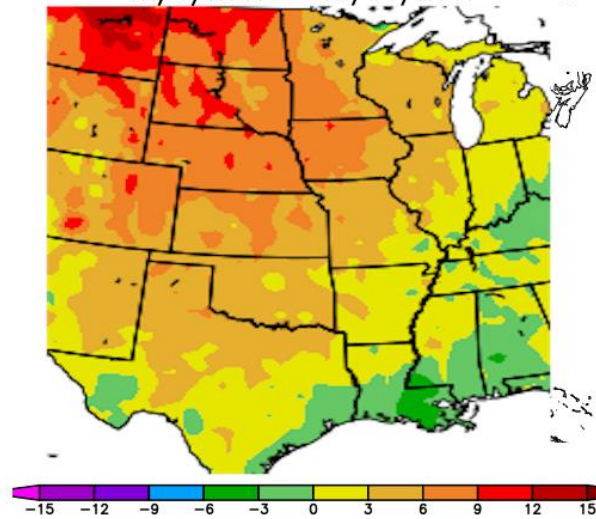
US WINTER WHEAT

The rather dry weather pattern we have seen for most of November continues into the first 12 days of December. Only far southwestern Texas has seen Above Normal rainfall. The heart of the HRWW areas in the U.S. have seen Much Below normal rainfall since NOV1. In addition the only cold air in the CONUS since the 1st of December has been well east the Mississippi River. West of the Mississippi river temperatures have ranged from +3 to +9° F above normal.

Percent of Normal Precipitation (%)
12/1/2017 - 12/11/2017



Departure from Normal Temperature (F)
12/1/2017 - 12/11/2017

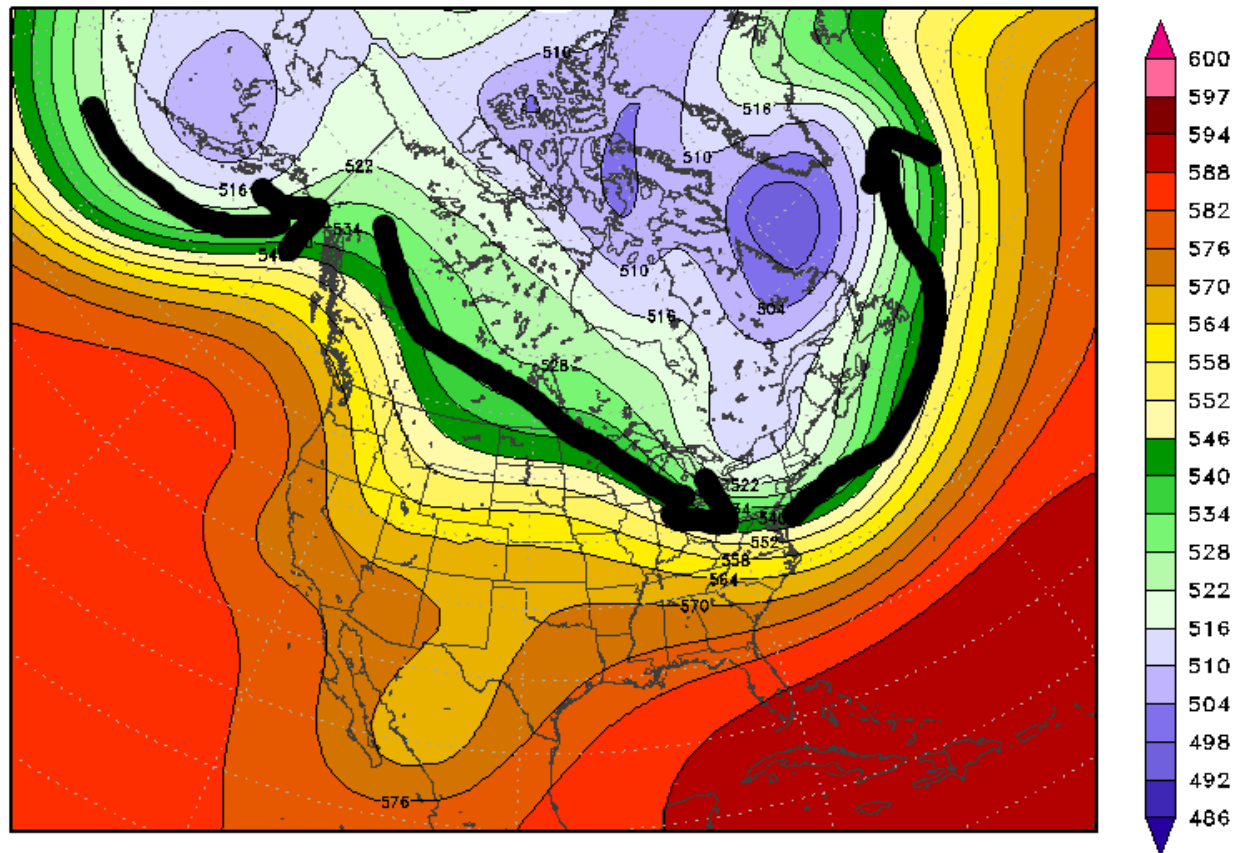


WEEK 1

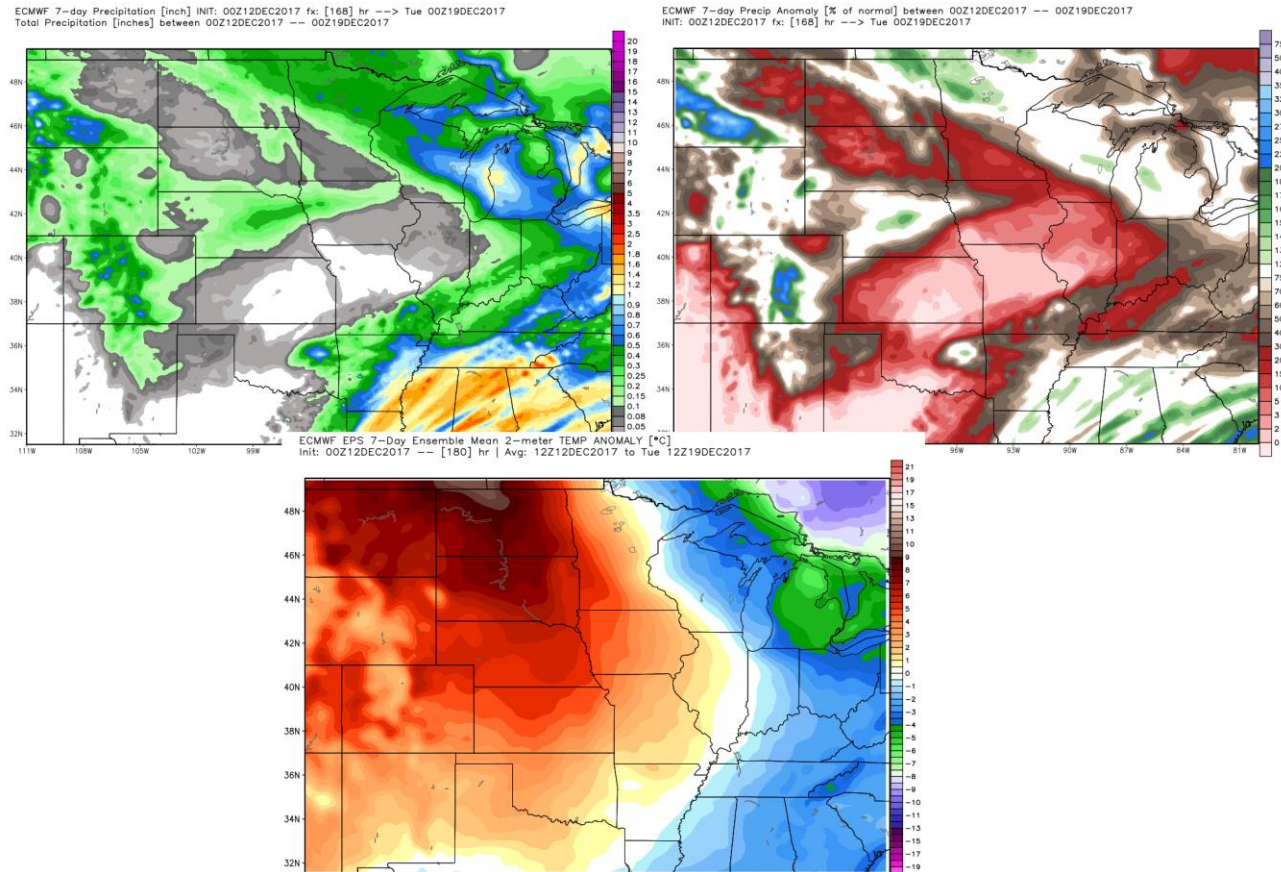
The Jet stream pattern this week will feature a persistent trough over the eastern third of the CONUS with temperatures east the Mississippi River generally running Below Normal while west of Mississippi River temperatures are either Normal or somewhat Above Normal. There are signs this is going to change in week two however.

500 mb Height
Valid: 12z Sat 16 Dec 2017

ECMWF-EP
Hour: 96



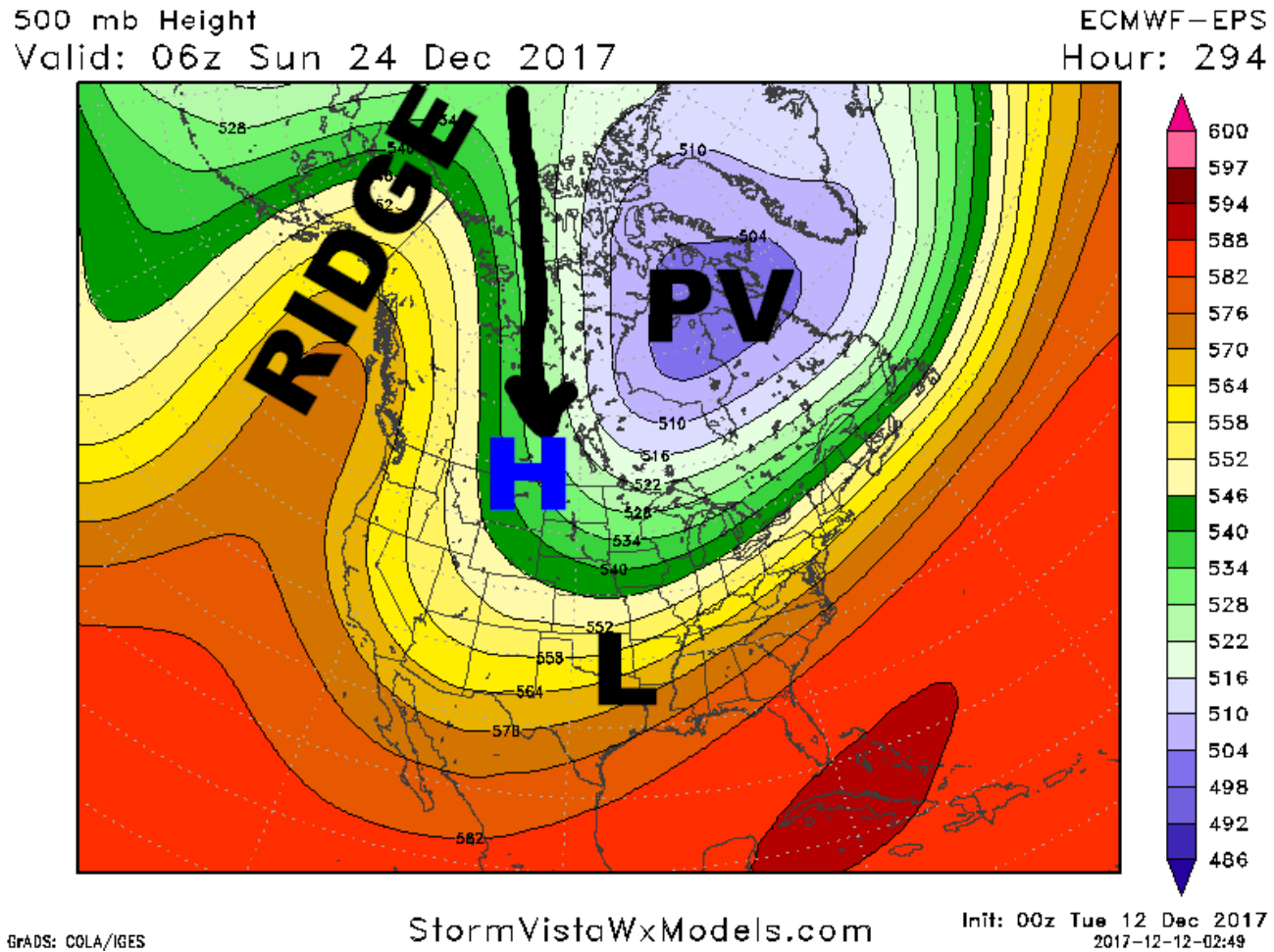
Over the next 7 days precipitation will be sparse over the HRWW with only some light to moderate rain showing up Day 5 and Day 6 over Nebraska. The rainfall anomaly map shows the dry pattern will continue but most areas of seeing rainfall amounts well below 25% of normal. And the temperatures reflect the current jet stream pattern with the only cold readings occurring east the Mississippi River while the Dakotas and Nebraska see temperatures well above normal.



WEEK 2 RAINS

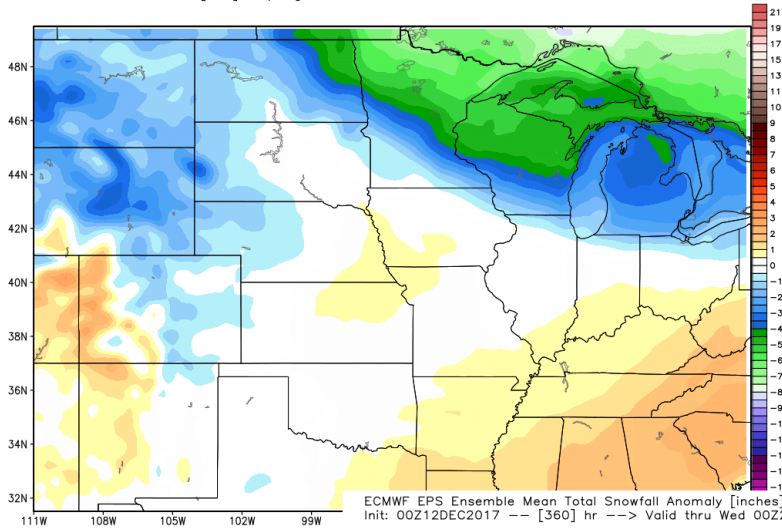
In week 2 the jet stream pattern undergoes a massive change. A strong ridge is going to redevelop over the West Coast which will establish a deep trough over the Rockies and the plains and a bit of a ridge over the Southeastern states. This is going to drive an arctic air mass deep

into the Plains for the first time this year and the Arctic cold front is likely to stall over the Lower Plains during the Christmas weekend. Low pressure is likely to form on the front and it could be significant snow across a good portion of the HRWW areas during the Christmas week.

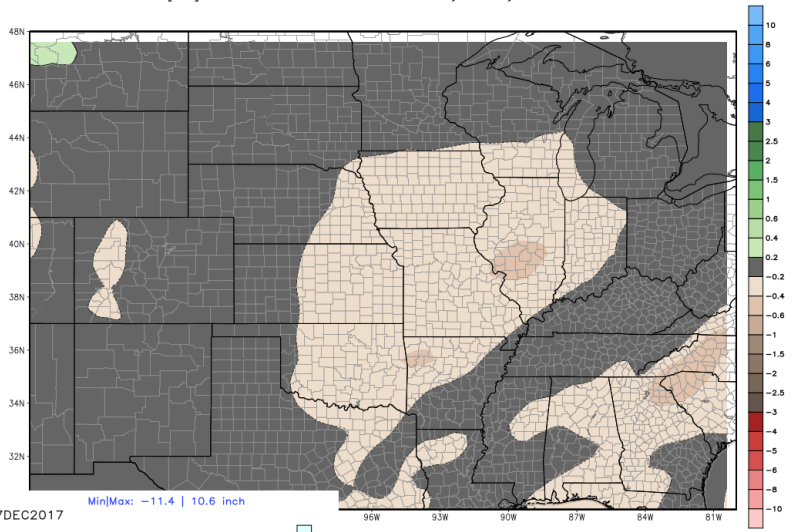


Temperatures for WEEK 2 are not nearly as warm and in fact we do see some weak areas of Below Normal temperatures appearing over the Dakotas Montana and Wyoming. However the precipitation anomalies continue show Below Normal precipitation over the heart of the WCB and the eastern portions of the central Plains. Indeed the snowfall anomaly map also shows Much Below Normal however there are indications that this is changing

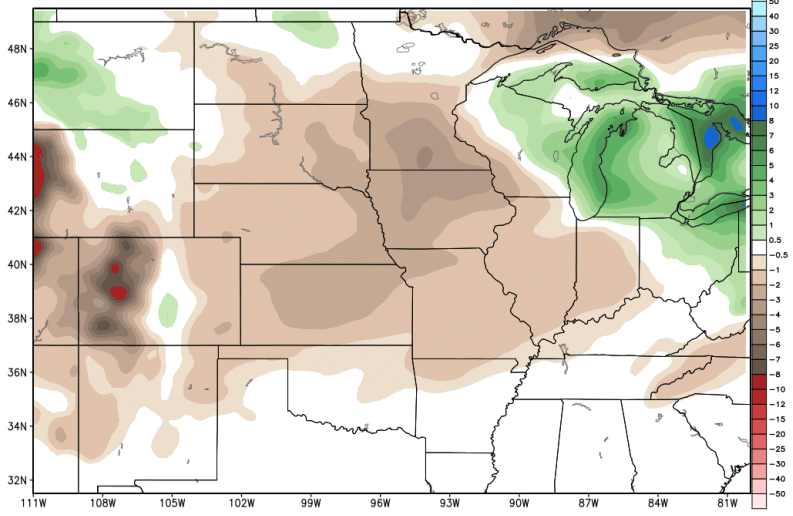
ECMWF EPS 7-Day Ensemble Mean 2-meter TEMP ANOMALY [°C]
 Init: 00Z12DEC2017 -- [360] hr | Avg: 00Z20DEC2017 to Wed 00Z27DEC2017



ECMWF EPS Ensemble Mean 7-day Avg Precipitation Anomaly [inch]
 Init: 00Z11DEC2017 -- [336] hr --> Valid on Mon 00Z25DEC2017 Day 7 - Day 14
 Min|Max Anom: -0.7 | 0.3 inch



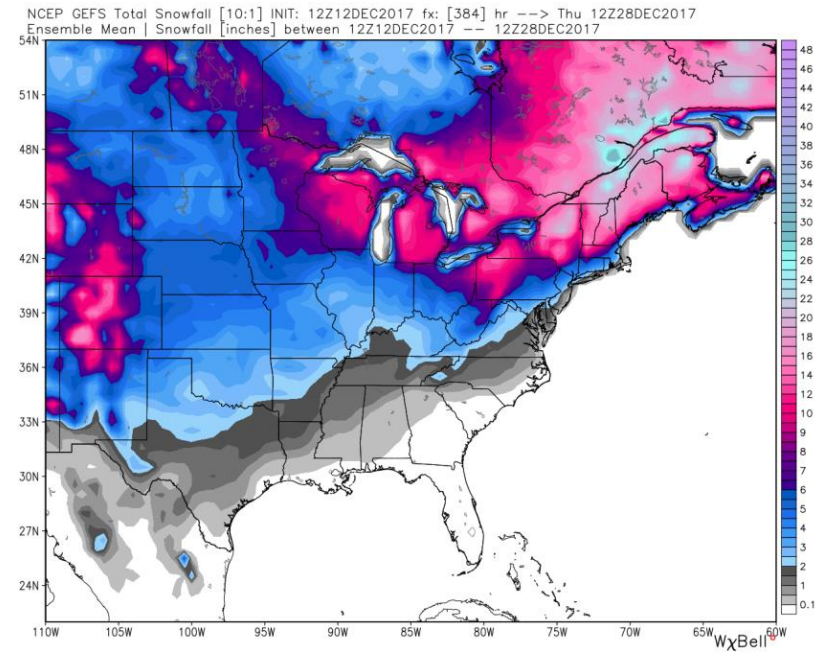
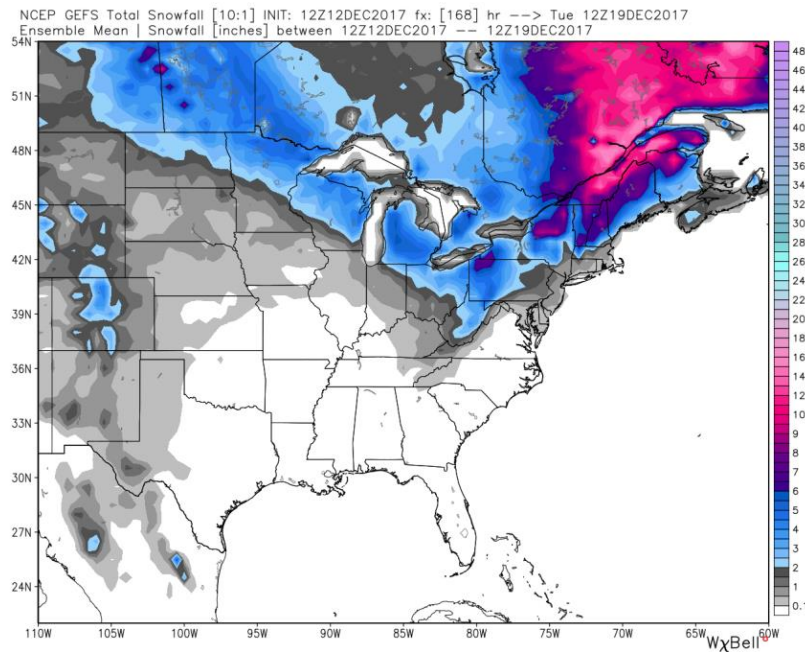
ECMWF EPS Ensemble Mean Total Snowfall Anomaly [inches]
 Init: 00Z12DEC2017 -- [360] hr --> Valid thru Wed 00Z27DEC2017
 Min|Max: -11.4 | 10.6 inch



ECMWF EPS 1997-2016 Hindcast Climatology

Total Snowfall Anomaly between 00Z12DEC2017-00Z27DEC2017

This map shows snow fall the next for the next week (left) and for week number 2 (right). While week1 shows no snow over any of the Plains and most of the Midwest in week 2 there is going to be a significant expanse of the snow cover over much of the Plains and the Midwest.



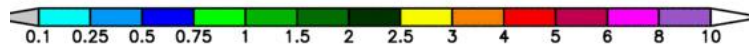
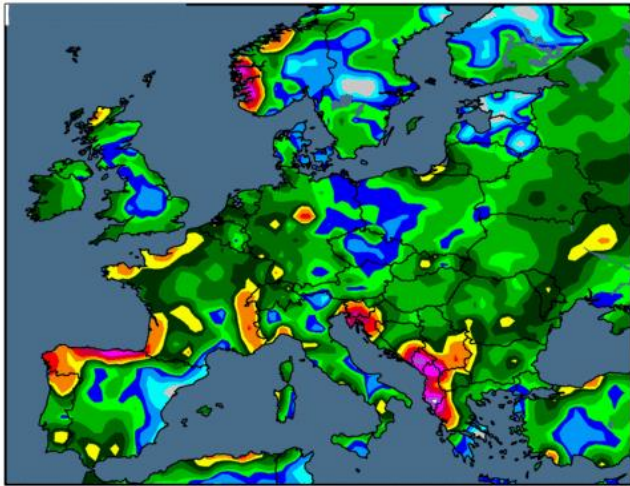
EUROPE

Rainfall has been Above Normal and Much Above Normal over much of Europe in the past two weeks. Only the eastern portions of Germany ...western Poland ..Italy and Austria have seen rainfall anomalies near normal. Generally rainfall amounts have been significantly above normal over most of France ..western Germany and across one Romania Bulgaria and Serbia. Spain has also seen pretty good rain relative to normal with northern Spain has seen rainfall amounts up to 5"/ 125mm.

Temperatures have run below normal over Italy... Spain ...and southern France but above normal over Poland...Hungary... and Romania.

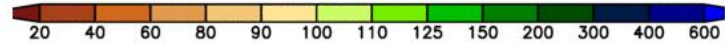
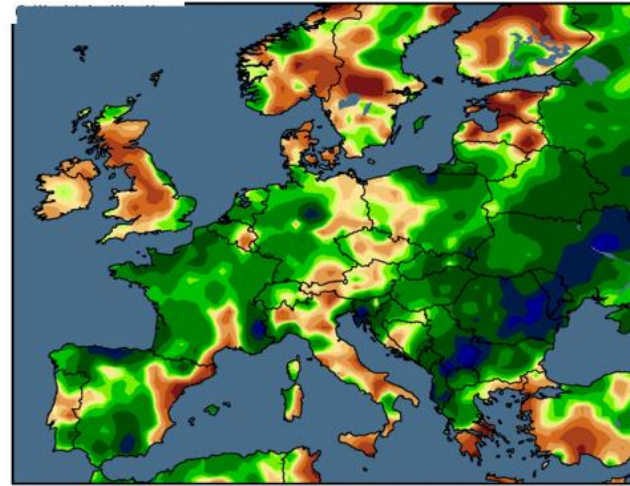
14-day Precipitation Analysis

Observed precipitation (inches) through 12 UTC 11 Dec 2017



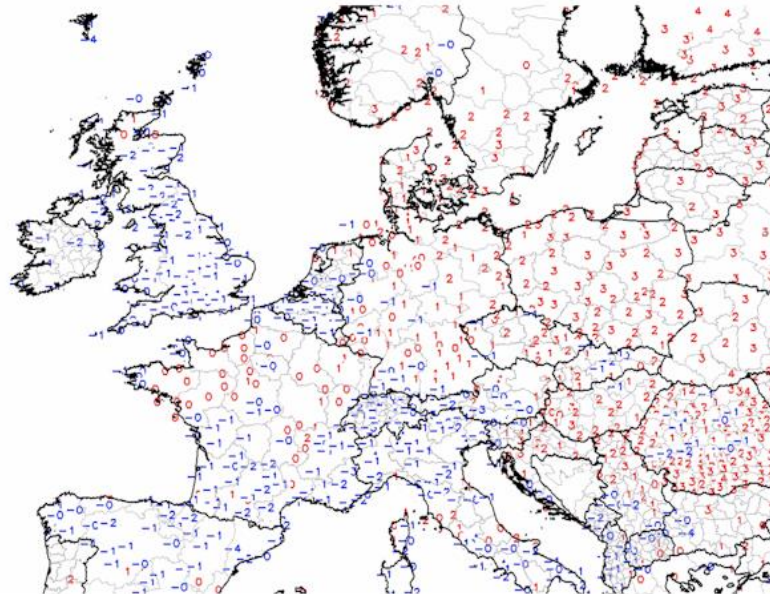
14-day Precipitation Analysis

Percent of normal through 12 UTC 11 Dec 2017

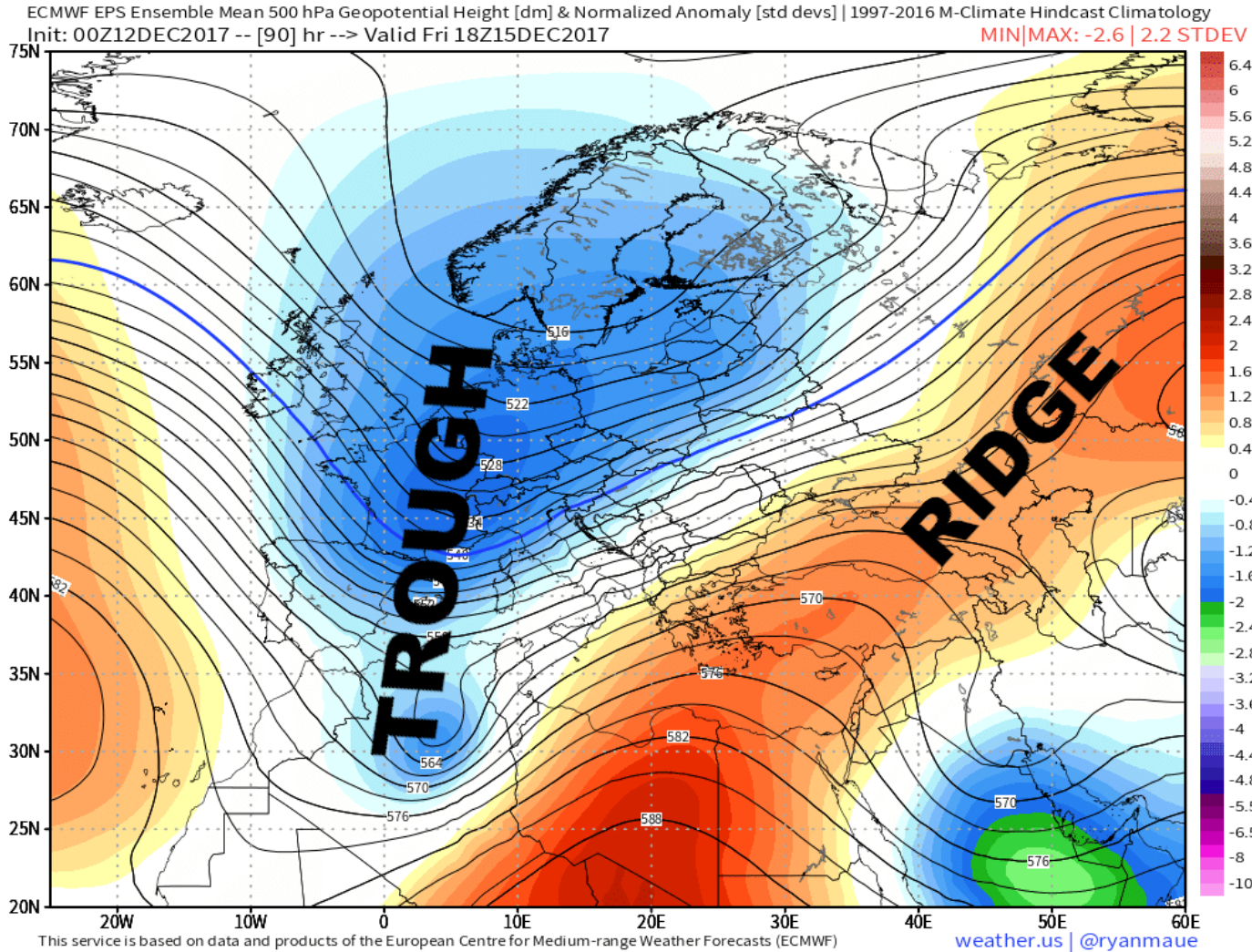


GTS Station Running 7-Day Average Temperature Anomaly (C)

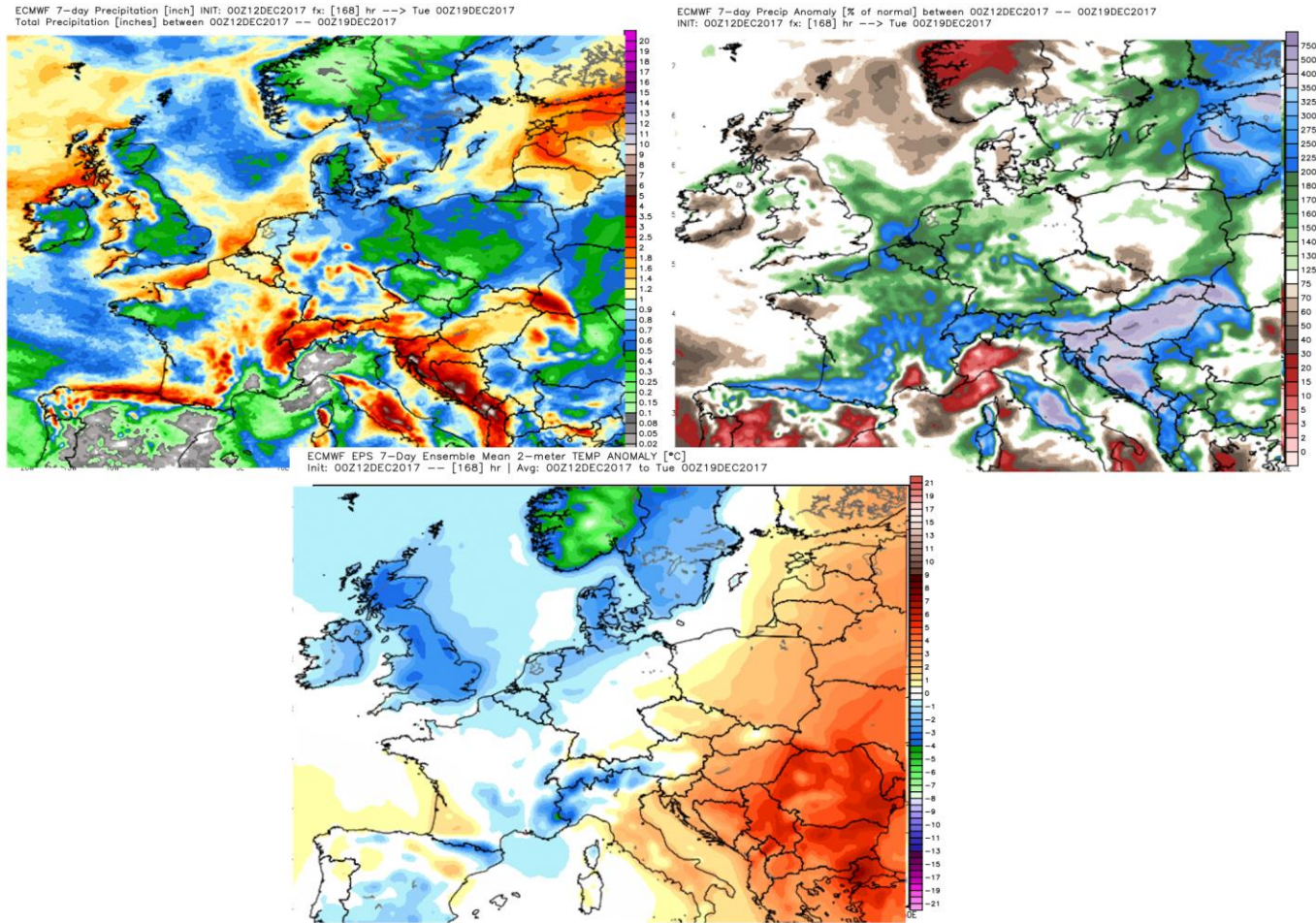
Period: 05Dec2017 - 11Dec2017

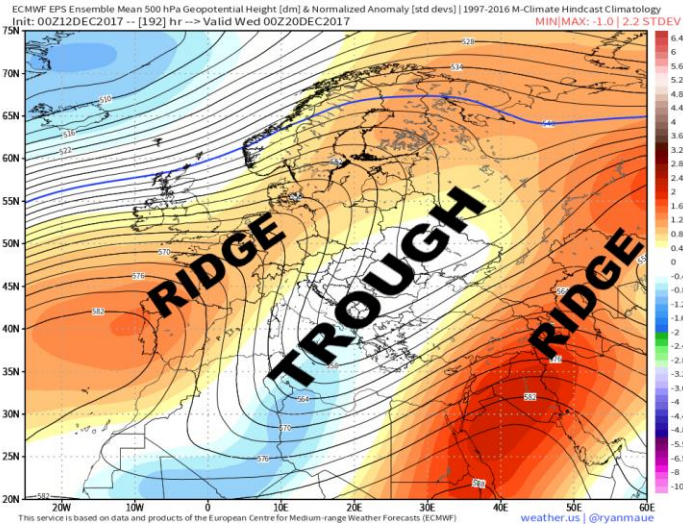


Over the next week the weather models show a deep trough moving in from the eastern Atlantic Ocean across the UK.. France ..Spain and eventually into Germany. At the same time a strong ridge will develop over Turkey and push into western Russia and the Caspian Sea and Kazakhstan area. This will allow temperatures to warm up and precipitation will run below are Much Below Normal



Over the next 7 days the rainfall maps show with large areas of significant rain over northern Spain... much of France ...western Germany ...Switzerland and into the Adriatic. Rainfall amounts are range from 1-3"/ 25-75mm over many these areas and this is significantly Above Normal for mid December over most of Europe. Only eastern Germany and western Poland will see Below Normal rainfall. Temperatures over next 7 days look to be close to normal over most of western and central Europe but Above Normal over Romania ...Serbia ...and Bulgaria.

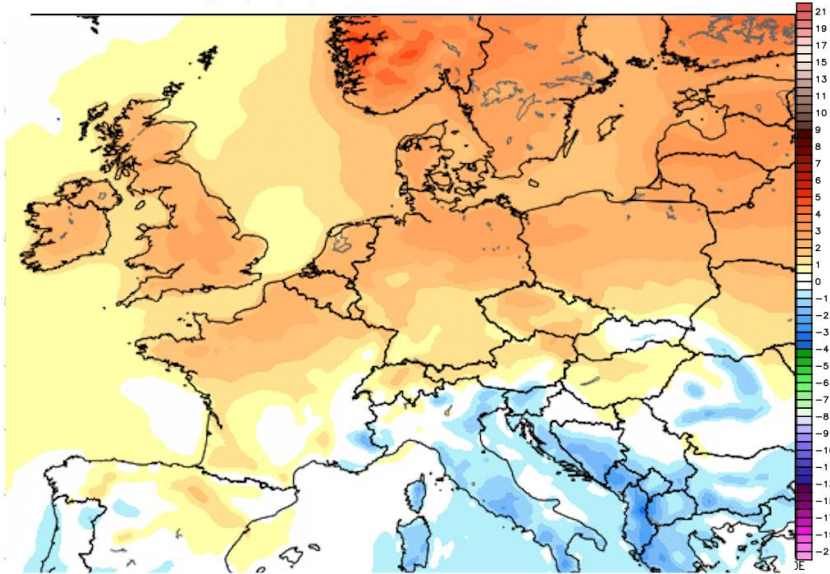




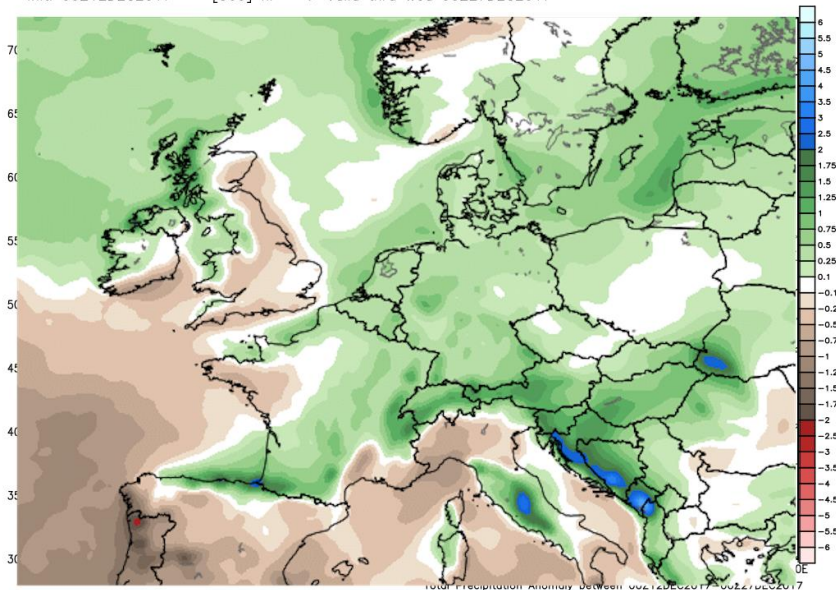
In week 2 the deep trough over the western portions of Europe moves into the central Mediterranean and into eastern Europe and the Ukraine. Behind this trough will be a new ridge developing from the Azores into Spain and western Europe while the strong ridge remains in place over the Middle East into the Caspian Sea ...Kazakhstan and into Western Russia.

Temperature anomalies with the Ridge developing over western and central Europe will run Normal or slightly Above Normal but the rainfall anomalies continue show a pretty wet pattern over most of the European continent in week two.

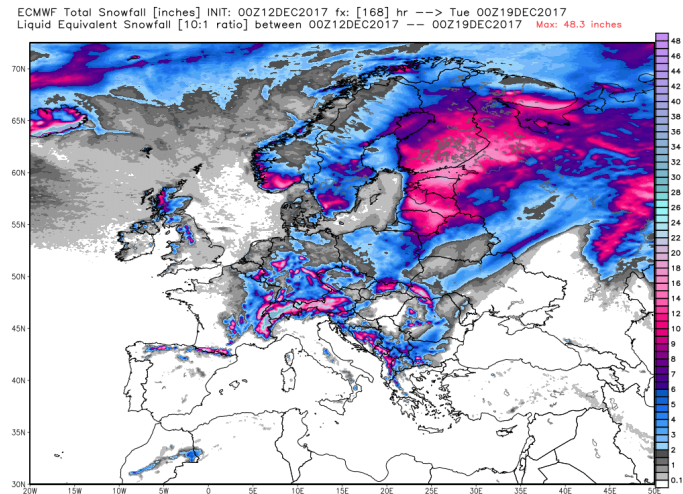
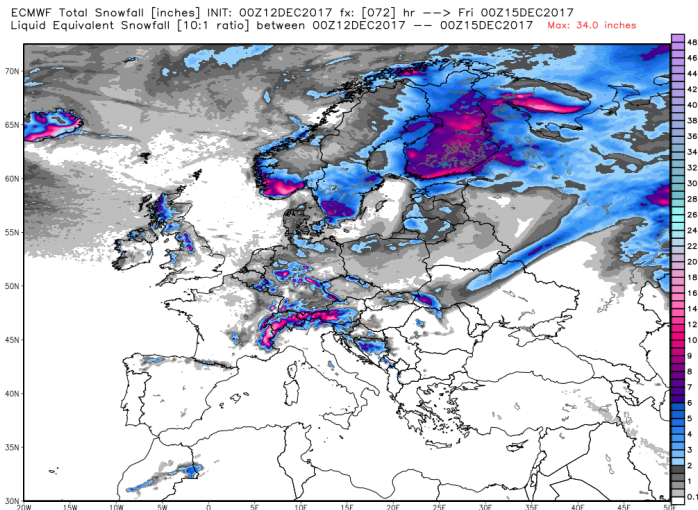
ECMWF EPS 7-Day Ensemble Mean 2-meter TEMP ANOMALY [°C]
 Init: 00Z12DEC2017 -- [360] hr | Avg: 00Z20DEC2017 to Wed 00Z27DEC2017



ECMWF EPS Ensemble Mean Total Precipitation Anomaly [inches]
 Init: 00Z12DEC2017 -- [360] hr --> Valid thru Wed 00Z27DEC2017 Min/Max: -2.5 | 6.0 inch

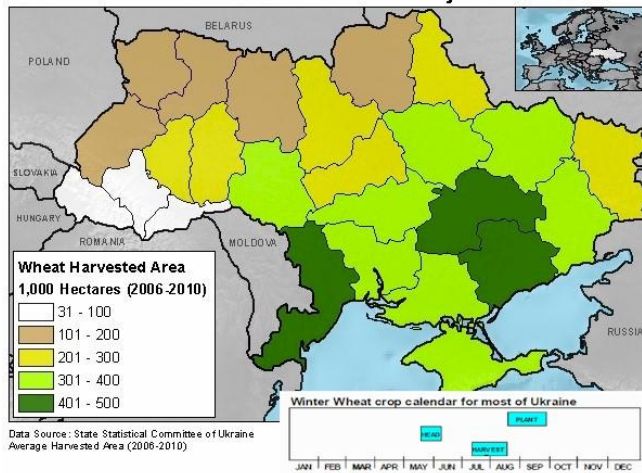


Over the next 7 days snowfall over most of Europe will be nonexistent in the grain areas but will show significant increase over portions of Ukraine ...Romania... and Germany as well as eastern France in week two.

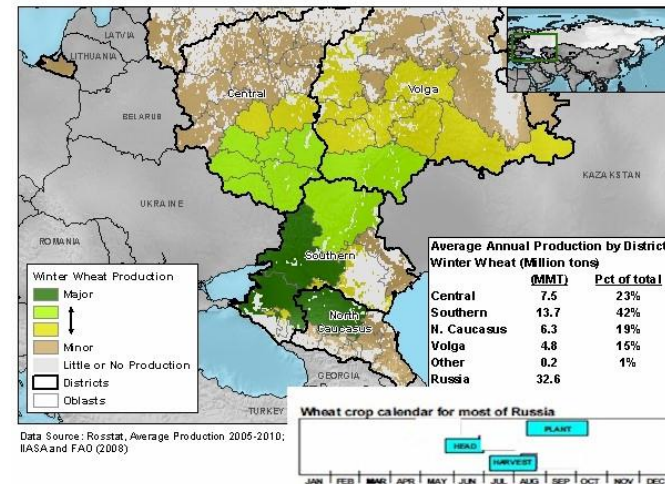


UKRAINE WESTERN RUSSIA

UKRAINE: Wheat Harvested Area by Oblast

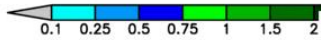
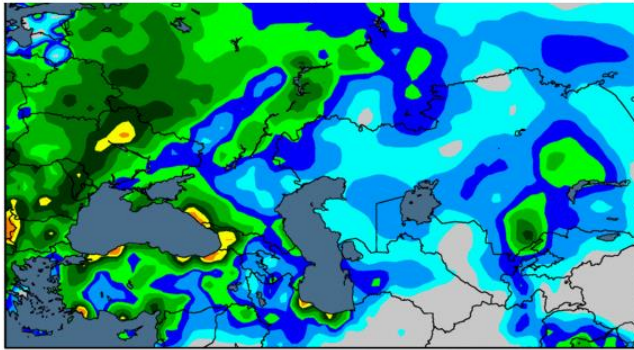


RUSSIA: Winter Wheat Production

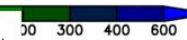
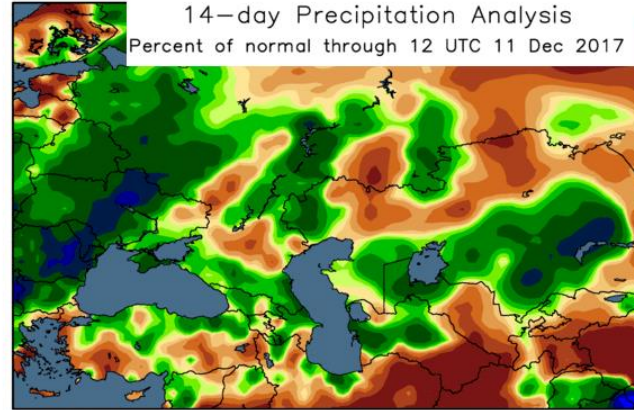


Over the last two weeks rainfall has continued to run Much Above Normal over most of Ukraine with rainfall amounts up to 2 -3"/ 50-75mm in many areas. This is significantly Above Normal for mid December-- as much as 300% Above normal. On the other hand the southern district of Russia has been quite dry while the Volga district has seen Near Normal rainfall. Temperatures over the past 7 days have featured Much Above Normal over all of the Ukraine ...the Southern District and the Volga district in the Western Russia running anywhere from +3 to + 6° C Above Normal

14-day Precipitation Analysis
Observed precipitation (inches) through 12 UTC 11 Dec 2017

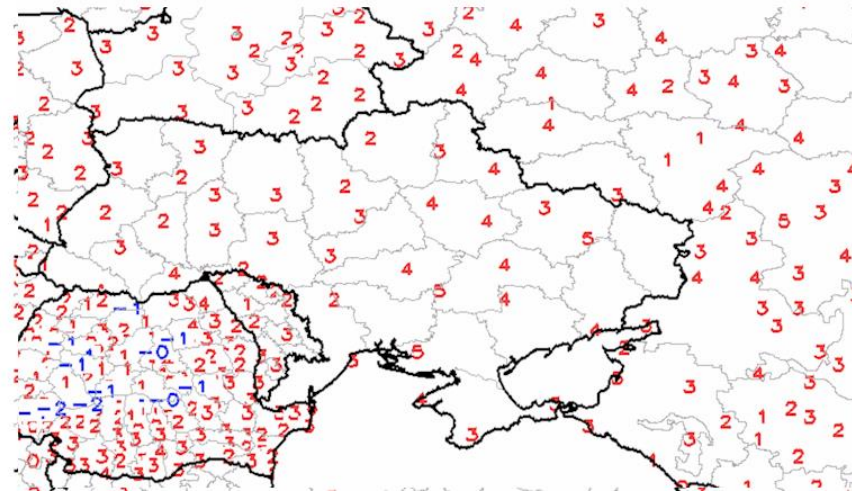


14-day Precipitation Analysis
Percent of normal through 12 UTC 11 Dec 2017



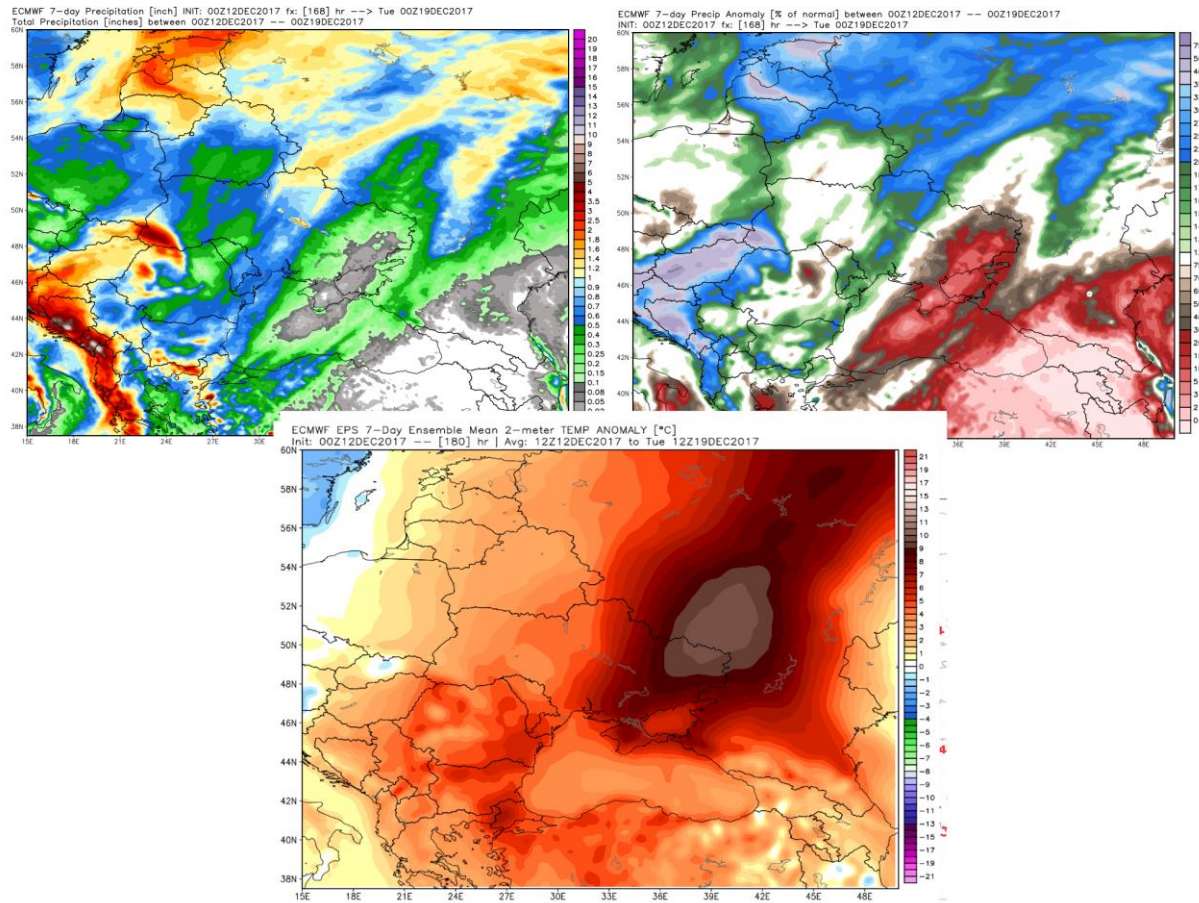
GTS Station Running 7-Day Average Temperature Anomaly (C)

Period: 05Dec2017 - 11Dec2017



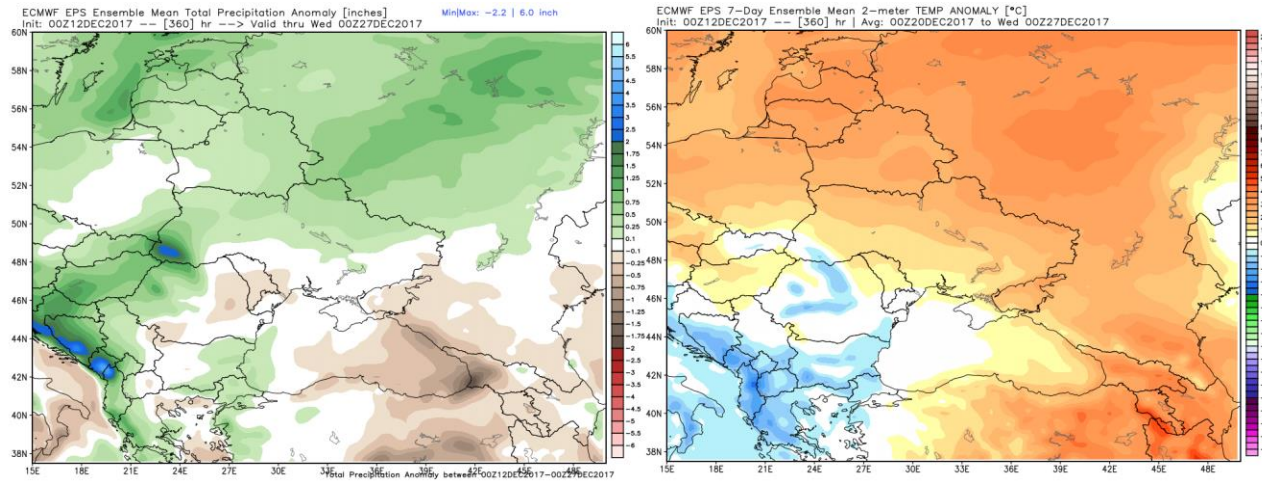
WEEK 1

Over the next 7 days much of Ukraine will see moderate rainfall Between 0.5-1.5"/ 12-38mm which is Near Normal for mid December. However the Southern district will see no significant rainfall while the Volga district see only sees 0.25-1.0"/ 6-25mm which is Near Normal rainfall for that area in mid December. Temperatures however will run Much Above Normal especially over the Eastern Ukraine ...the Southern district and all the Volga district. Some areas may see Max temperatures as much a +10 to +12 c /lower 50s F over the next several days

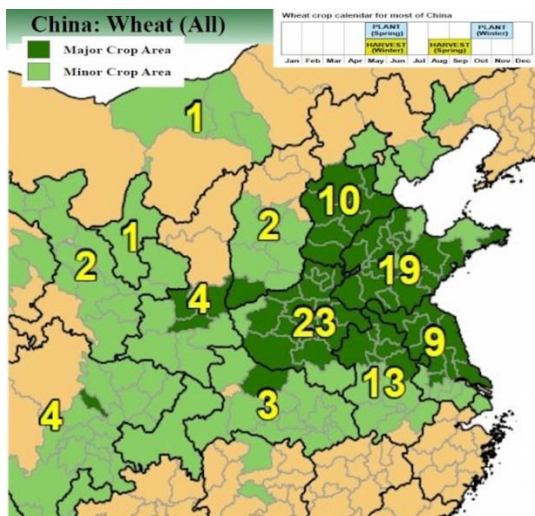


WEEK 2 RAINS

In Week number 2 the development of the strong Ridge over the Middle East into the Caspian Sea / Kazakhstan area will keep most of the Southern district /Kazakhstan dry. Temperatures will still run Above Normal over eastern Ukraine western Russia and all of Kazakhstan.

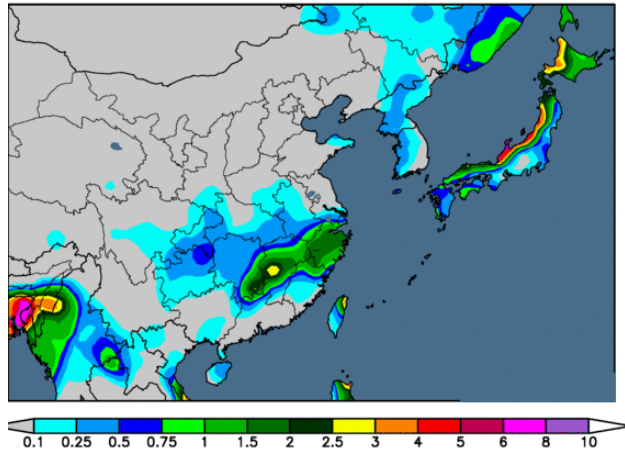


CHINA WINTER WHEAT

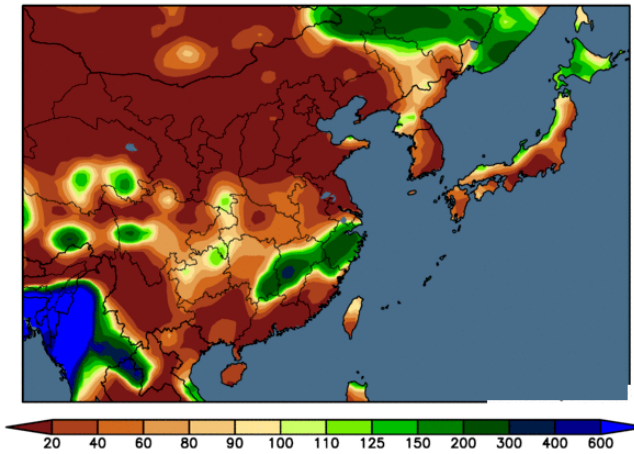


Rainfall continues to run Much Below Normal over the northern and eastern China with only far northern Manchuria seeing anything close to Normal rainfall.

14-day Precipitation Analysis
Observed precipitation (inches) through 12 UTC 11 Dec 2017

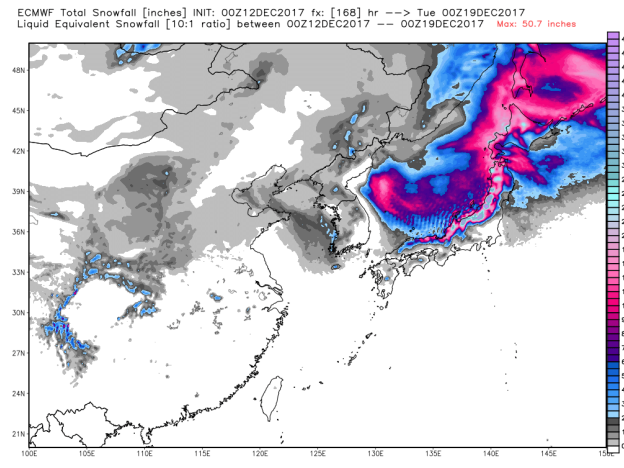
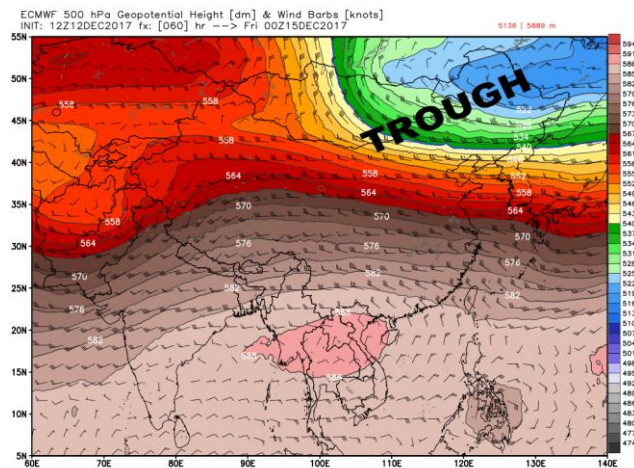


14-day Precipitation Analysis
Percent of normal through 12 UTC 11 Dec 2017

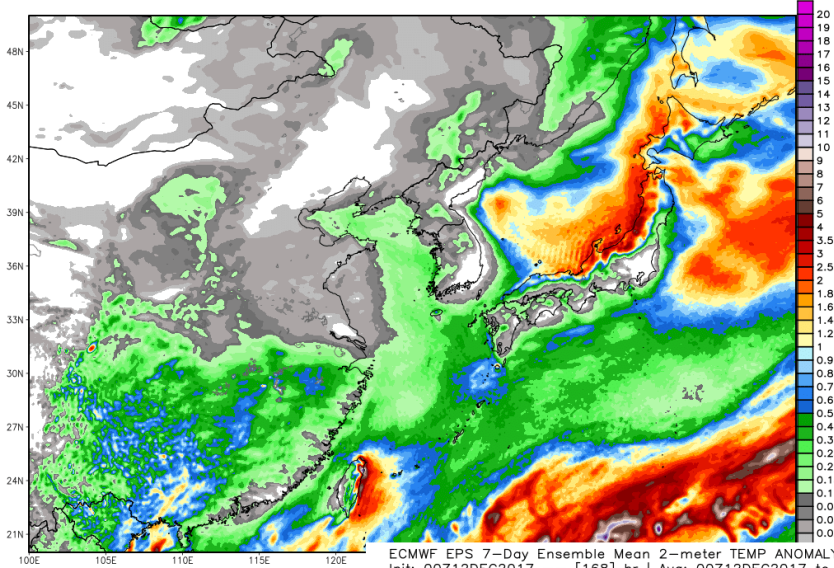


WEEK1

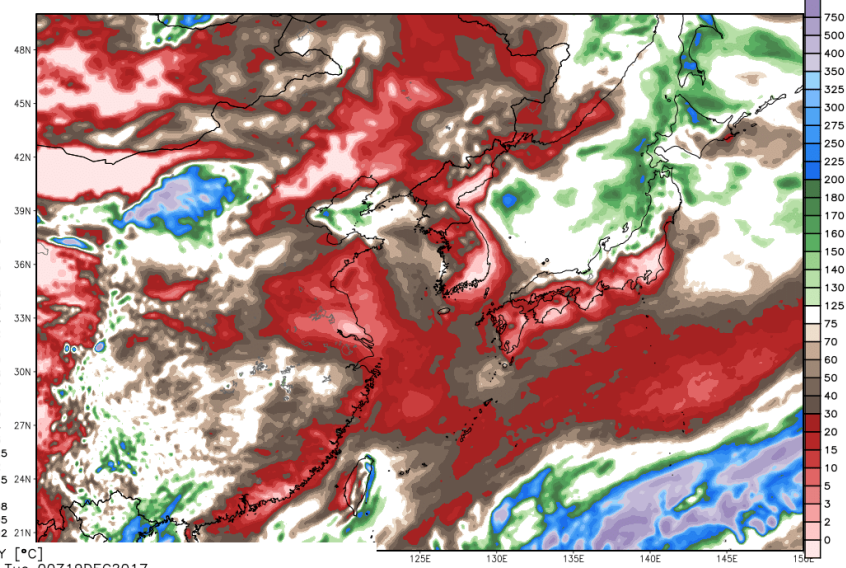
Over the next 7 days a persistent trough over Manchuria will send through a couple of fast moving cold fronts. However these cold fronts will not have a lot of moisture with them. As a result most of Manchuria and the North China Plains (NCP) will see Below Normal precipitation and temperatures will turn sharply colder over all of central and northern China. Snow cover will be non-existent over the next 7 days over all of eastern and northern China.



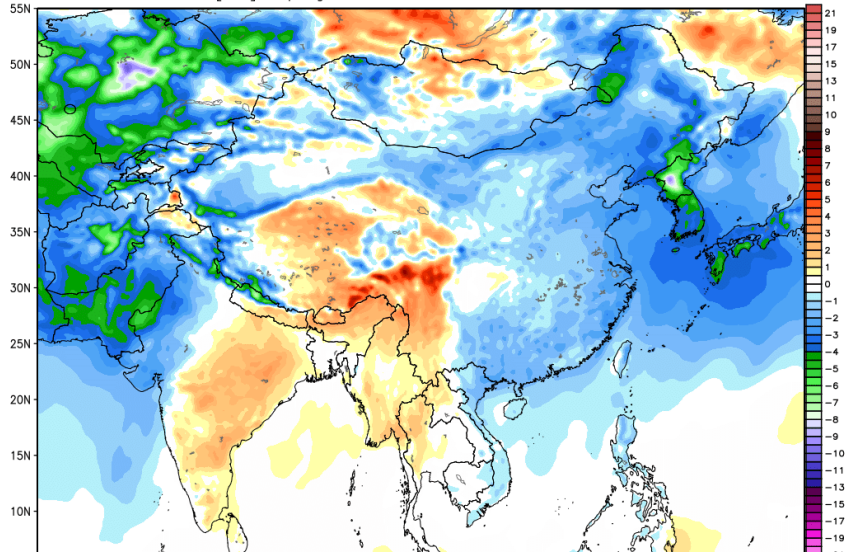
ECMWF 7-day Precipitation [inch] INIT: 00Z12DEC2017 fx: [168] hr --> Tue 00Z19DEC2017
Total Precipitation [inches] between 00Z12DEC2017 -- 00Z19DEC2017



ECMWF 7-day Precip Anomaly [% of normal] between 00Z12DEC2017 -- 00Z19DEC2017
INIT: 00Z12DEC2017 fx: [168] hr --> Tue 00Z19DEC2017

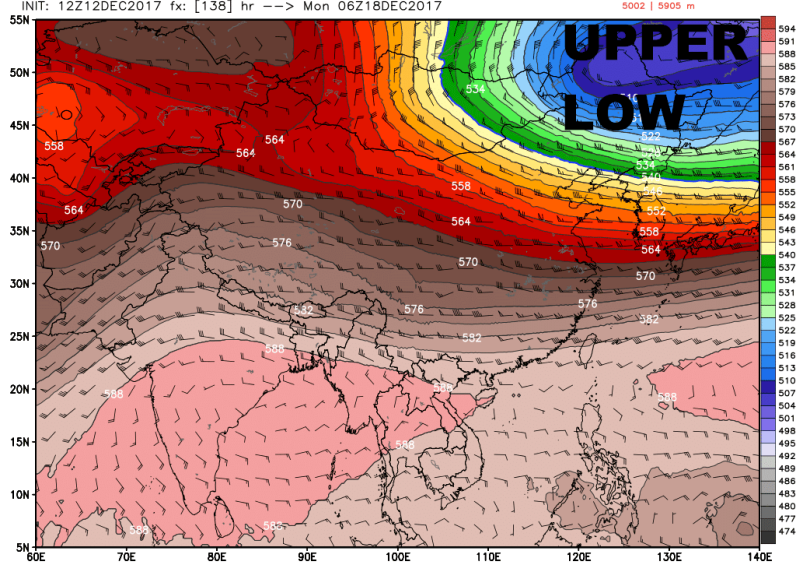


ECMWF EPS 7-Day Ensemble Mean 2-meter TEMP ANOMALY [°C]
Init: 00Z12DEC2017 -- [168] hr | Avg: 00Z12DEC2017 to Tue 00Z19DEC2017



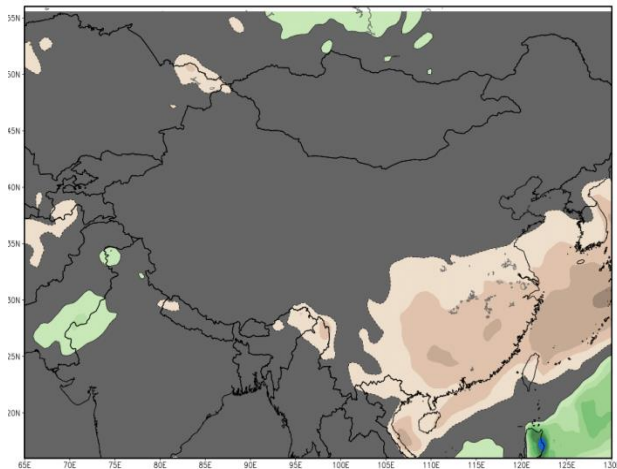
WEEK 2 RAINS

ECMWF 500 hPa Geopotential Height [dm] & Wind Barbs [knots]
 INIT: 12Z12DEC2017 fx: [138] hr --> Mon 06Z18DEC2017



In week 2 the pattern does not change much. There will be a large very strong Upper Low over eastern Siberia and northern Manchuria. Temperatures may recover to Near Normal levels but it could turn colder again as we approach the Christmas week. Rainfall will be below normal over most of central and southeastern China.

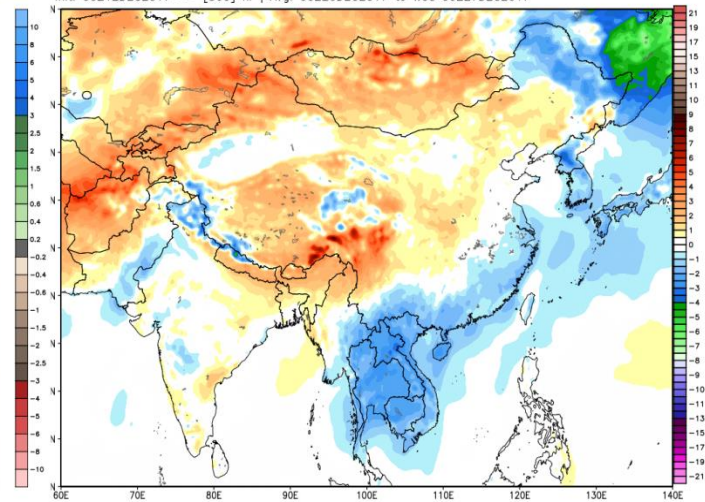
ECMWF EPS Ensemble Mean 7-day Avg Precipitation Anomaly [inch]
 Init: 00Z11DEC2017 -- [336] hr --> Valid on Mon 00Z25DEC2017 Day 7 - Day 14



Accumulation between 00Z18DEC2017-00Z25DEC2017 | ECMWF EPS 1997-2016 Hindcast Climatology

Min/Max Anom: -1.1 | 10.1 inch

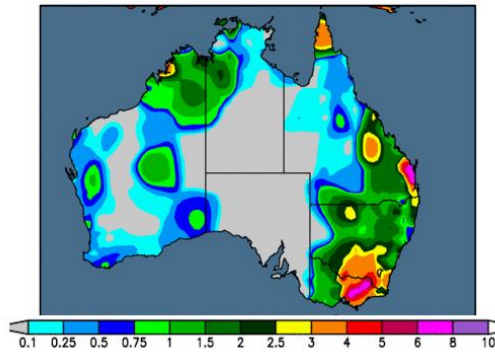
ECMWF EPS 7-Day Ensemble Mean 2-meter TEMP ANOMALY [°C]
 Init: 00Z12DEC2017 -- [360] hr | Avg: 00Z20DEC2017 to Wed 00Z27DEC2017



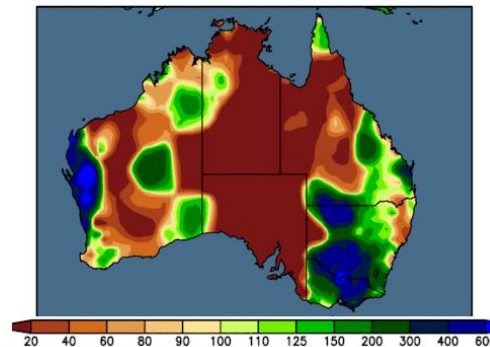
AUSTRALIA WINTER WHEAT

Over the past 2 weeks Australia has seen Much Above Normal Rainfall over 75 to 80% of Victoria ...New South Wales ...and southeastern third of Queensland. Rainfall amounts have ranged from 1.5 -5.0"/ 38-125mm which is 150 to 350% Above Normal. Temperatures over most of eastern Australia have been below normal because the heavy clouds cover and rains.

14-day Precipitation Analysis
Observed precipitation (inches) through 12 UTC 11 Dec 2017

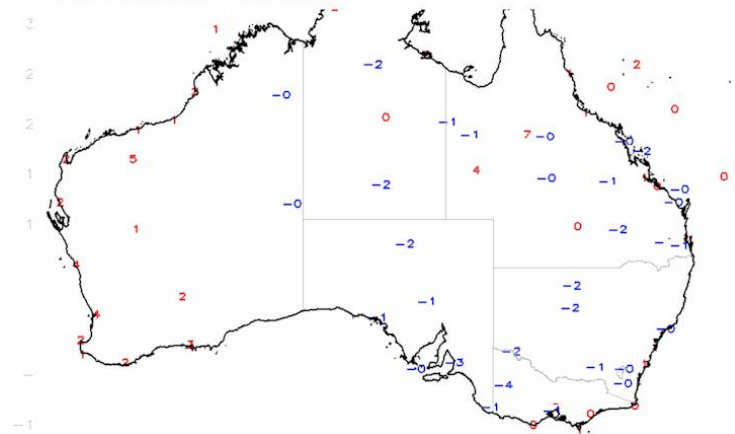


14-day Precipitation Analysis
Percent of normal through 12 UTC 11 Dec 2017

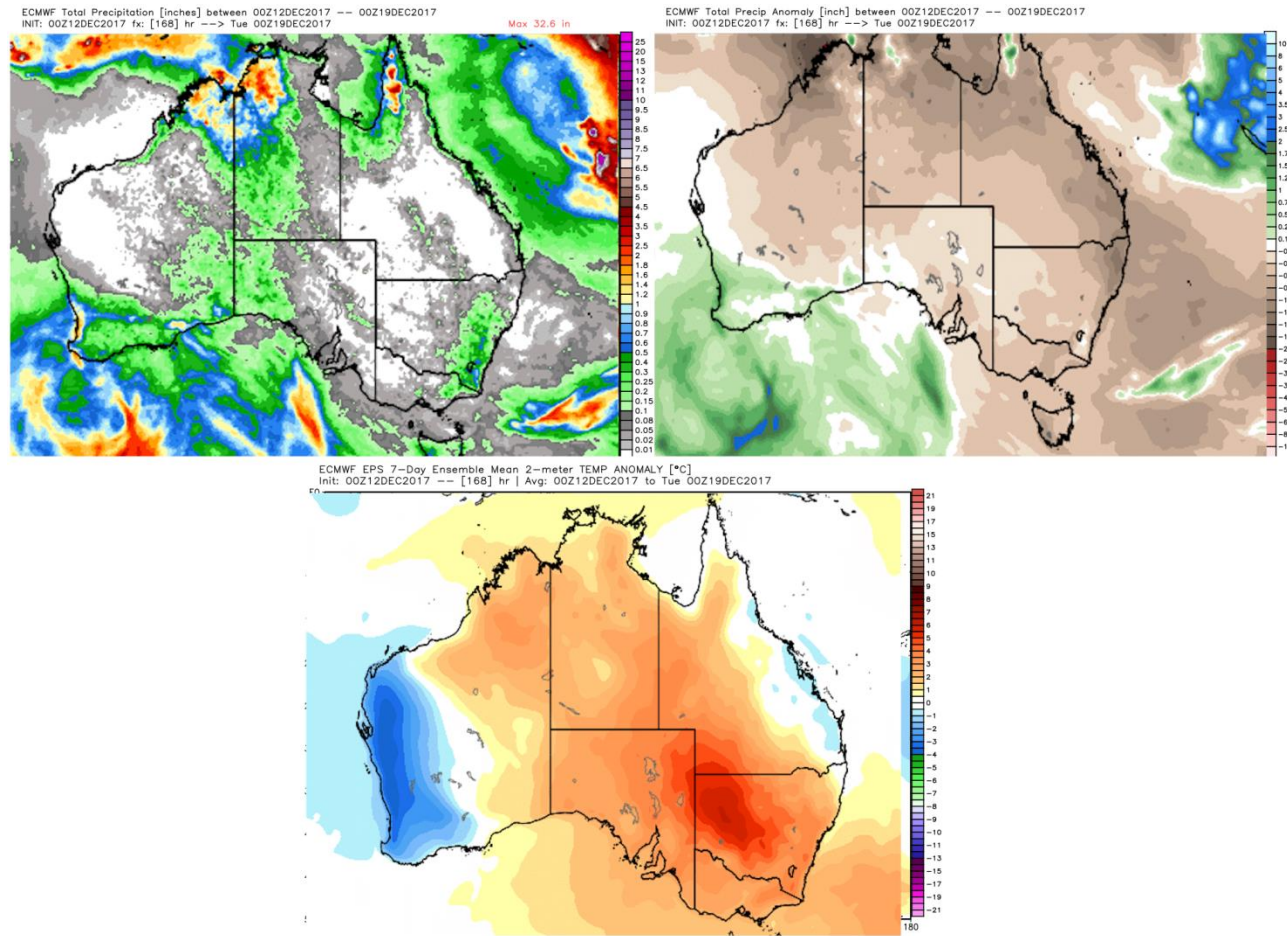


GTS Station Running 7-Day Average Temperature Anomaly (C)

Period: 05Dec2017 - 11Dec2017

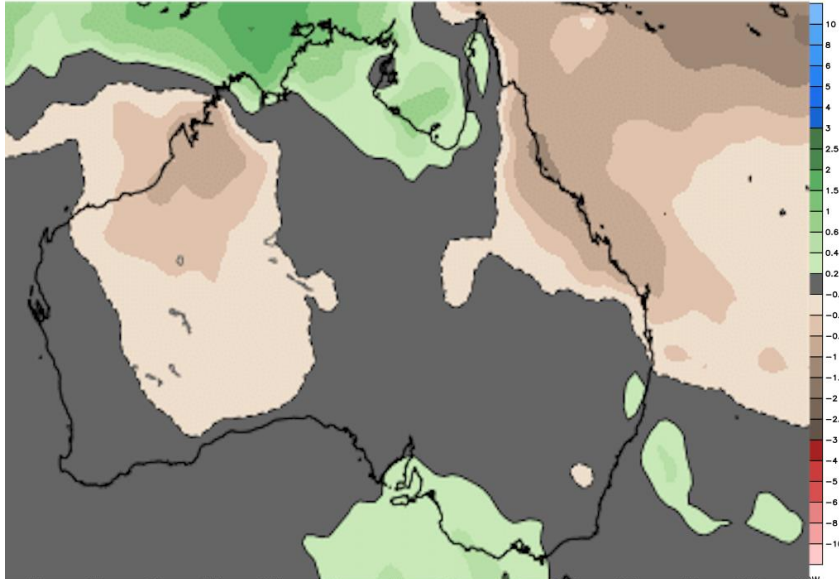


Over the next 7 days the pattern looks pretty dry and temperatures are warming up over eastern and southeastern Australia .



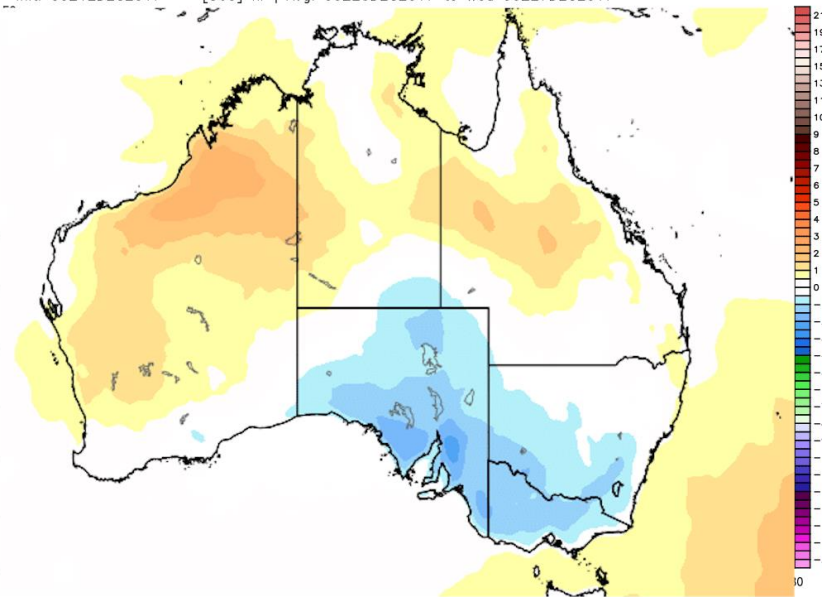
In week 2 temperatures turn cooler again over the Southern Australia Territory ...Victoria and the southern third of New South Wales. Most the grain areas will see Near Normal rainfall but over the western portions of Victoria and the southeast third of the Southern Australia Territory rainfall could be above normal

ECMWF EPS Ensemble Mean 7-day Avg Precipitation Anomaly [inch]
Init: 00Z11DEC2017 --- [168] hr --> Valid on Mon 00Z25DEC2017 Day 0 - Day 7
Min|Max Anom: -2.9 | 9.1 inch



Accumulation between 00Z18DEC2017-00Z25DEC2017 | ECMWF EPS 1997-2016 Hindcast Climatology

ECMWF EPS 7-Day Ensemble Mean 2-meter TEMP ANOMALY [°C]
Init: 00Z12DEC2017 --- [360] hr | Avg: 00Z20DEC2017 to Wed 00Z27DEC2017



DT wxrisk.com OFFICE 804 715 8330 CELL 804 307 8070