

Seasonal weather outlook

(Jun-Aug, 2014)

Issued on Jun 09, 2014



Issued by:

Dr. Khalid M Malik (Director)

**NATIONAL AGROMET CENTRE (NAMC)
PAKISTAN METEOROLOGICAL DEPARTMENT
SECTOR H-8/2, ISLAMABAD**

Phone: [+92-51-9250592](tel:+92-51-9250592) Email: dirnamc@yahoo.com

<http://namc.pmd.gov.pk/>

1. Introduction

A variety of methods including dynamical models, statistical methods, regional expert judgments and combination of them have been used to generate long-range weather forecast by the different climate prediction centers around the world. National Agromet Center (NAMC), Pakistan Meteorological Department adopts an ensemble approach to formulate its seasonal weather outlook for Pakistan (on experimental basis), taking into consideration available products from major climate prediction centres and different Global Climate Models (GCMs).

Regional weather (precipitation and temperature) outlook is predicted from different global climate models by using persisted sea surface temperature on 0000 Jun 01, 2014. Model's output then tuned by applying Regional Correction Factor (RCF). RCF has computed by comparison of Long Range Averages (LRA) with model's simulation for the period (2004-2012) on monthly basis. That might be somewhat different from actual weather because of time to time variation in Sea Surface Temperature (SST) during the season. Accuracy of Outlook seasonal weather mainly depend upon SST used in global climate models. Even with use of accurate SST, still is uncertainty in the climate forecast due to chaotic internal variability of the atmosphere.

Acknowledgement: *NAMC is gratefully acknowledges the International Research Institute (IRI) for climate and Society for providing access of dynamical prediction of Global Climate Model ECHAM4P5, developed and operated by European Center for Medium-Range Weather Forecasts model's simulations and hindcast data to support the formulation of seasonal weather outlook of Pakistan. Output maps have been prepared by using IRI climate software.*

2. Synoptic situation

- Location of jet stream (U wind at 200 hPa) is at normal position with slightly higher than normal intensity over west. Most of the region including Pakistan, western Nepal and Sri Lanka may prevail below normal zonal winds at 200 hPa.

Probability outlook: Above normal intensity of jet stream is associated with above normal precipitation in the region and scenario indicates that below average rainfall will be country. The weather system will be focused towards northern region.

- A trough at 500 hPa is expected to be over west of the country. However a strong ridge may prevail over the country during the season which causes to reduce influence of monsoon over the country.

Probability outlook: Rainfall may be below normal over the country with significantly below normal over southern parts of the country.

- Surface temperatures are expected to be on higher side than normal all over the country with higher values over central parts.. However, northern and southern parts may prevail normal surface temperature.
- North Atlantic Oscillation (NAO) is in negative phase (-0.92) during May. As a result normal track of western disturbances will persist.
<http://www.cpc.ncep.noaa.gov/products/precip/CWlink/pna/norm.nao.monthly.b5001.current.ascii.table>

Probability outlook: Weather system approaching from west will be focused over central and northern parts of the country.

- ENSO-neutral continued during April 2014, but with above-average sea surface temperatures (SST) developing over much of the eastern tropical Pacific. The monthly SST indices were warmer than average in all regions, except for Niño-1+2. The model predictions of ENSO for this summer and beyond are indicating an increased likelihood of El Niño compared with those from last month. Most of the models indicate that ENSO-neutral (Niño-3.4 index between -0.5°C and 0.5°C) will persist through part of the remainder of the Northern Hemisphere spring 2014, most likely transitioning to El Niño during the summer. There remains uncertainty as to exactly when El Niño will develop and an even greater uncertainty as to how strong it may become. This uncertainty is related to the inherently lower forecast skill of the models for forecasts made in the spring. While ENSO-neutral is favored for Northern Hemisphere spring, the chance of El Niño increases during the remainder of the year, exceeding 65% during the summer. (http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/?enso_tab=enso-cpc_update)

Probability outlook: La Nina (1%), Neutral (30%) and El Nino (69 %) during May-Jun-Jul, 2014 season

Seasonal weather outlook (Jun-Aug, 2014)

- Arabian Sea Surface Temperatures are expected to be slightly above normal near western coastal belt of Pakistan.
- Caspian Sea surface temperatures expected to be slightly above normal over southern half and below normal over upper half.
- Mediterranean Sea surface temperatures are normal to slightly above normal.
- Bay of Bengal Sea Surface Temperatures are close to normal.

Probability outlook: Sea Surface Temperature trend is going towards normal leads to normal rainfall over the region.

3. Seasonal Weather Outlook Summary (Jun-Aug, 2014)

Synthesis of the latest model forecasts for Jun-Aug, 2014 (JJA), current synoptic situation and regional weather expert's judgment indicates that below normal precipitation is expected all over the country with average during Jun, extremely below normal during Jul and below normal during August. Above average day temperature is likely to occur during whole predicted month all over the country. The months of July and August likely to prevail much higher day temperature ($> 4^{\circ}\text{C}$) over central parts of the country. A neutral lead to El Nina condition is expected to persist throughout the predicted period.

3.1. Weather outlook

"Below average precipitation is expected during the season all over the country with above normal day temperature."

- I. Below average precipitation is expected during predicted season.
- II. In Jun, average precipitation is expected all over the country with average over central parts of the country while below average over extreme south and extreme northern parts of the country. Day temperatures are likely to be above normal all over the country with higher value over southern Punjab.
- III. The pre-monsoonal rain likely to start during last decade of June (21st - 30th) will less intensity.
- IV. **Onset of monsoon over Pakistan is likely to start from 27-28 June (insha-Allah).** First spell of monsoon will be focused over central and upper Punjab.

Seasonal weather outlook (Jun-Aug, 2014)

- V. Three to four rainy spells are expected during July with moderate intensity.
- VI. Very limited chances of flash flooding in the country.
- VII. Extremely below normal rainfall is expected during the month of July.
- VIII. Above normal day temperature are expected during July causes more discharge will be expected in rivers of the country.
- IX. Month of Ramadan will be hot and less than normal rain will be expected.
- X. Two to three rainy spells are expected during August with higher intensity rain is expected in mid of August.
- XI. Chances of flash flooding over Suleiman Ranges can't be ruled out during August.
- XII. Below normal rainfall is expected during the month of August.
- XIII. Expected Maximum temperature will be above normal during whole predicted month with higher values will be during August. Day temperature will be much higher (about 5 °C) from normal.

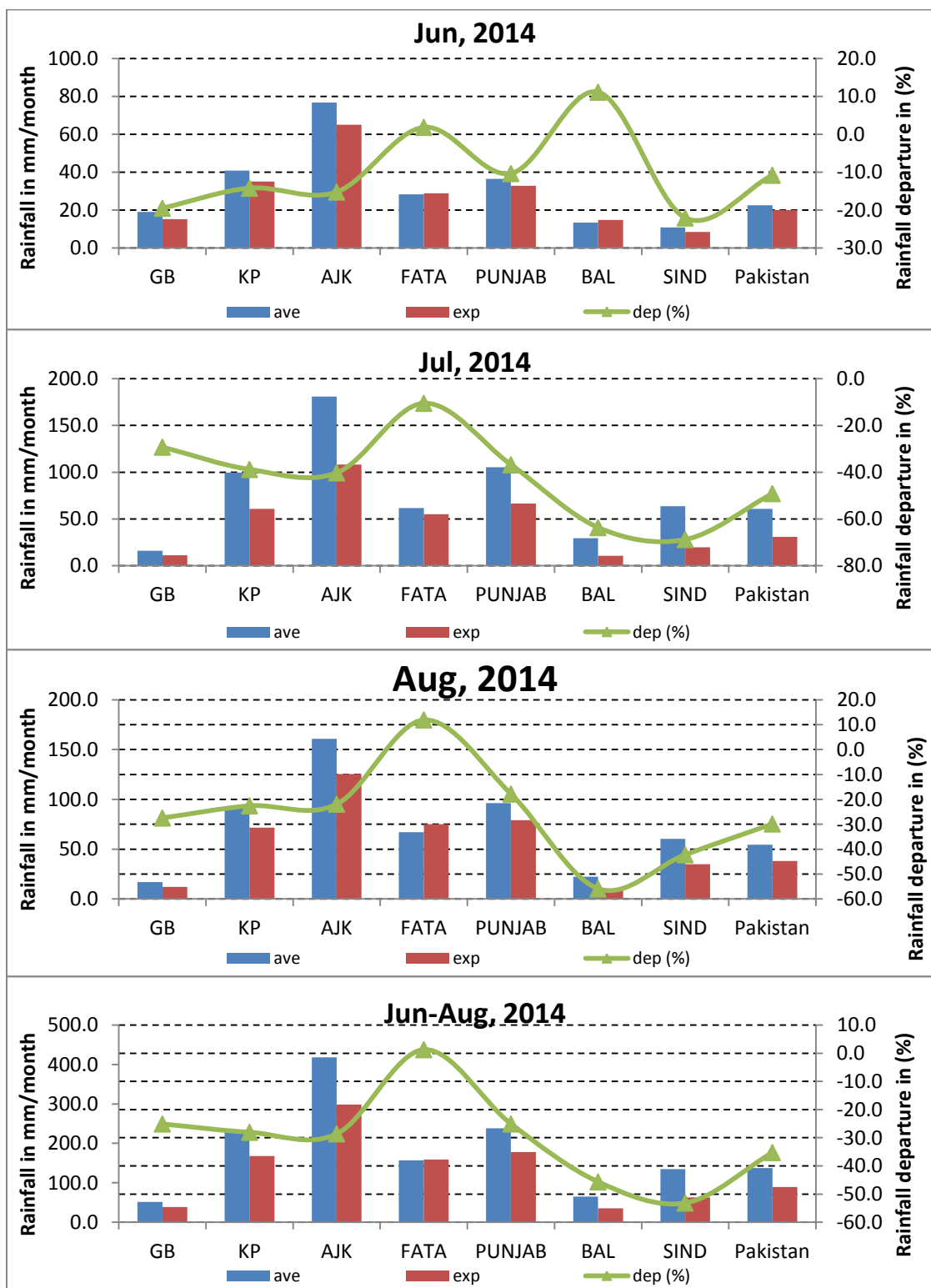
3.2. Monthly Quantitative Weather Forecast

	Jun, 2014		Jul, 2014		Aug, 2014		Jun-Aug, 2014	
	Ave	Exp	Ave	Exp	Ave	Exp	Ave	Exp
GB	19.0	Blw. Ave	15.9	Blw. Ave	16.8	Blw. Ave	51.7	BNw. Ave
KP	40.8	Ave	99.5	Blw. Ave	92.5	Blw. Ave	232.8	Blw. Ave
AJK	76.8	Blw. Ave	181.0	Blw. Ave	160.7	Blw. Ave	418.5	Blw. Ave
FATA	28.3	Ave	61.7	Ave	67.0	Ave	157.0	Ave
PUNJAB	36.5	Ave	105.3	Blw. Ave	96.1	Blw. Ave	237.9	Blw. Ave
BALUCHISTAN	13.4	Ave	29.5	Blw. Ave	22.2	Blw. Ave	65.1	Blw. Ave
SIND	10.8	Blw. Ave	63.5	Blw. Ave	60.2	Blw. Ave	134.6	Blw. Ave
Precipitation is in mm/month								
Pakistan	22.5	Ave	60.7	Blw. Ave	54.5	Blw. Ave	137.7	Blw. Ave

Ave.: average (1981-2010), **Exp.:** Expected rainfall, **Below Average** (Blw. Ave) < -15 %, **Average** precipitation range (Ave) = -15 to +15 %, **Above Average** (Abv.Ave) > +15 %

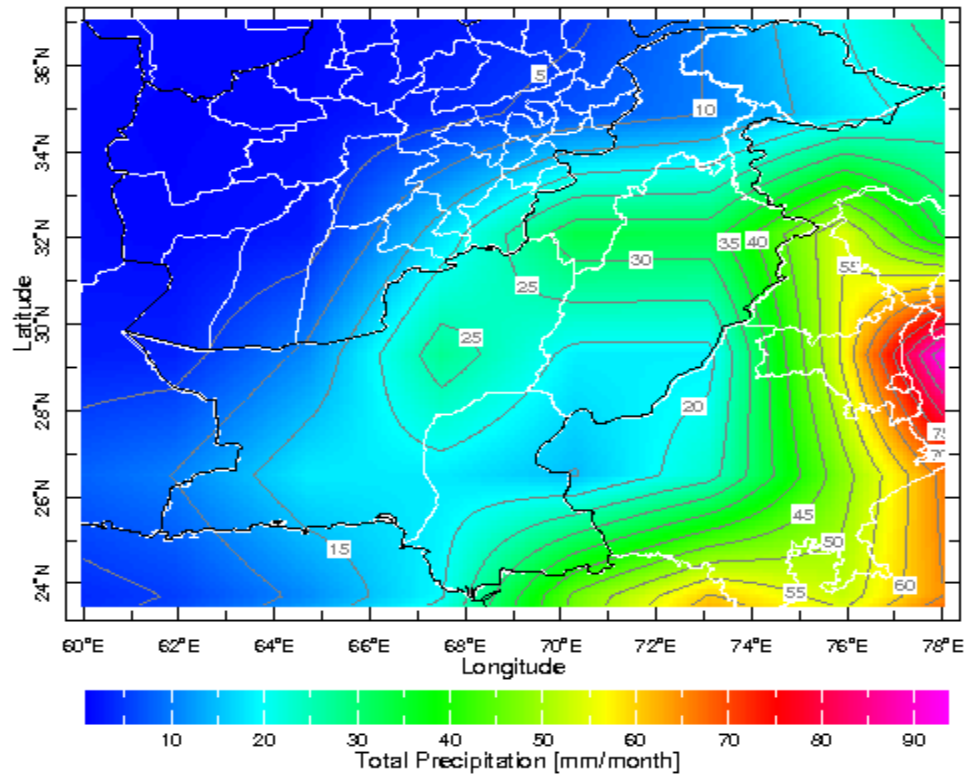
Seasonal weather outlook (Jun-Aug, 2014)

Note: Average precipitation is computed by using Global Precipitation Climatology Centre (GPCC) gridded data by resolution ($0.5 \times 0.5^\circ$) latitude by longitude. Ensembles of different climate models are used for computation of expected precipitation over the region.

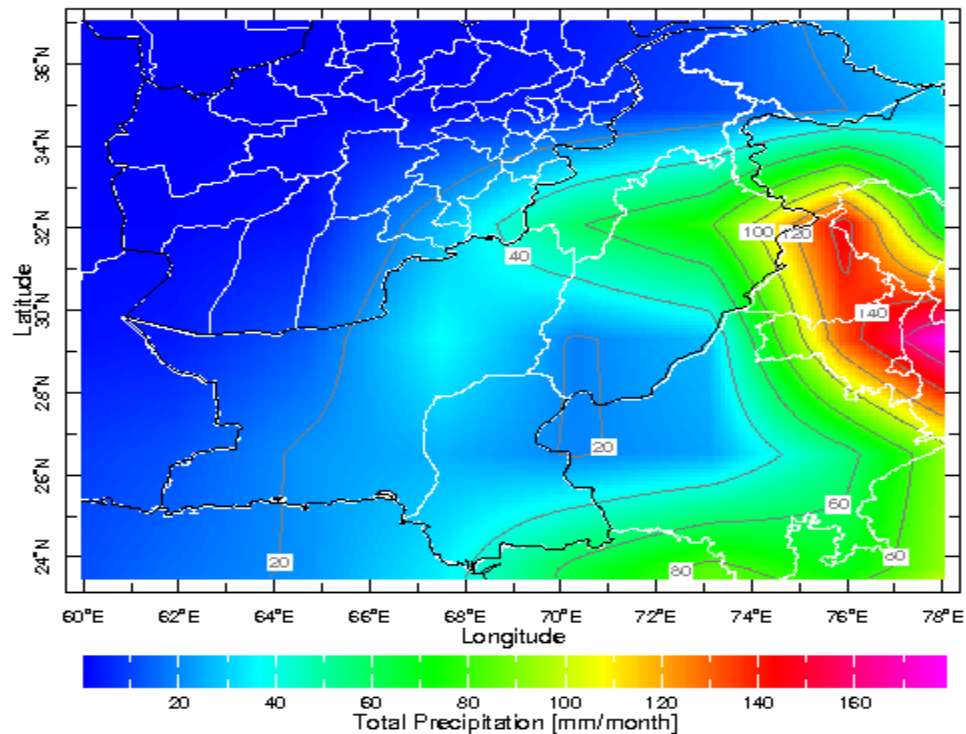


4. Spatial distribution of expected rainfall during coming season (GCM-ECHAM)

Monthly expected Precipitation for Jun, 2014

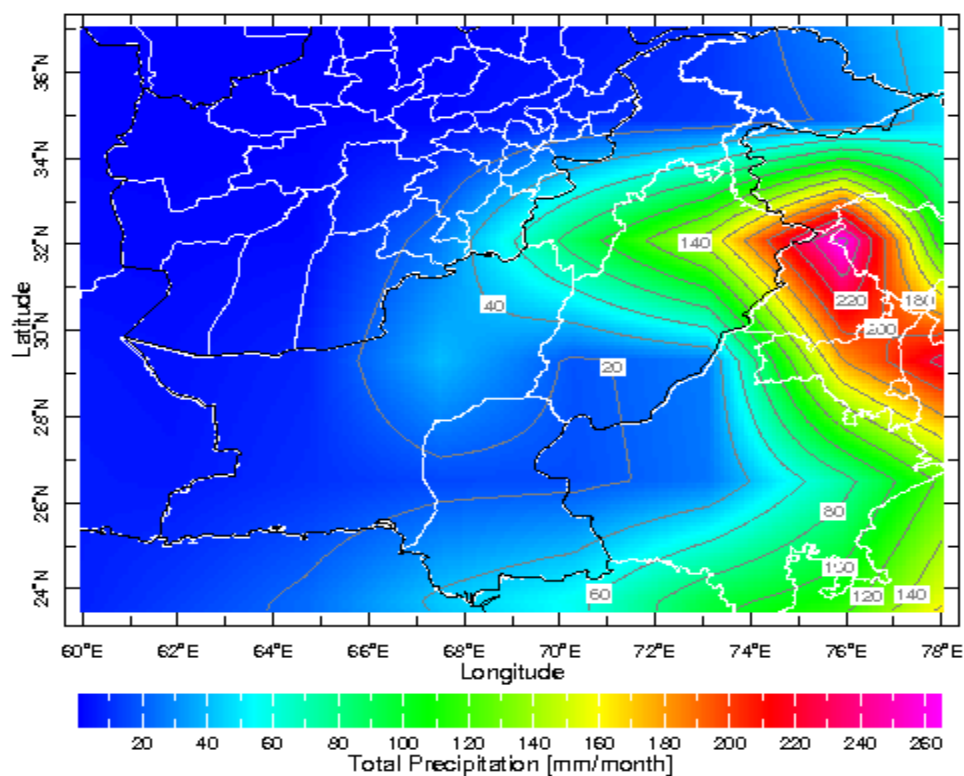


Monthly expected Precipitation for Jul, 2014

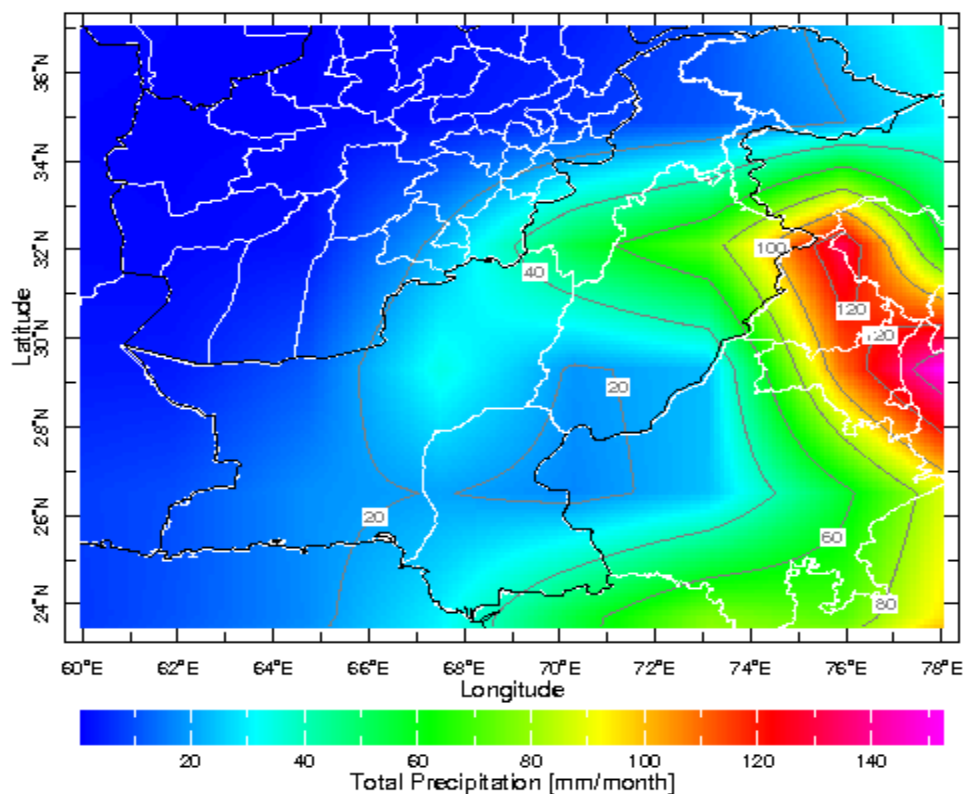


Seasonal weather outlook (Jun-Aug, 2014)

Monthly expected Precipitation for Aug, 2014



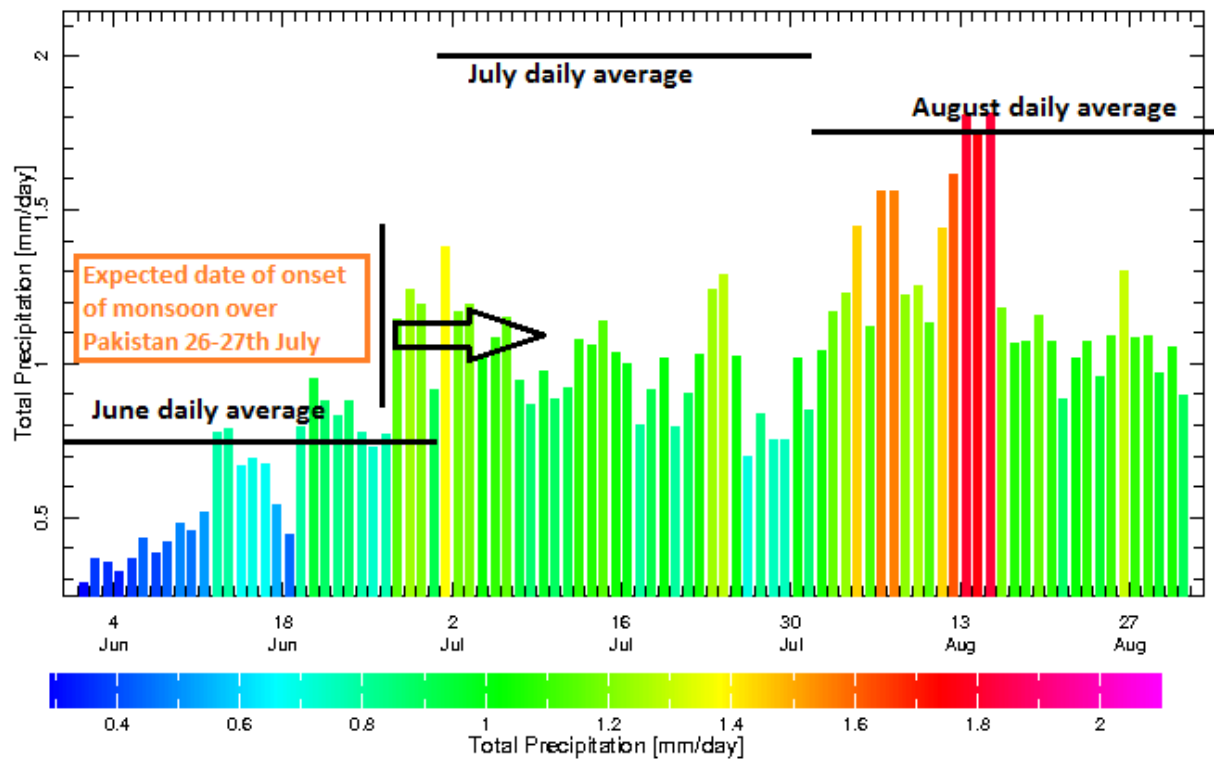
Seasonal Precipitation Outlook (Jun-Aug, 2014)



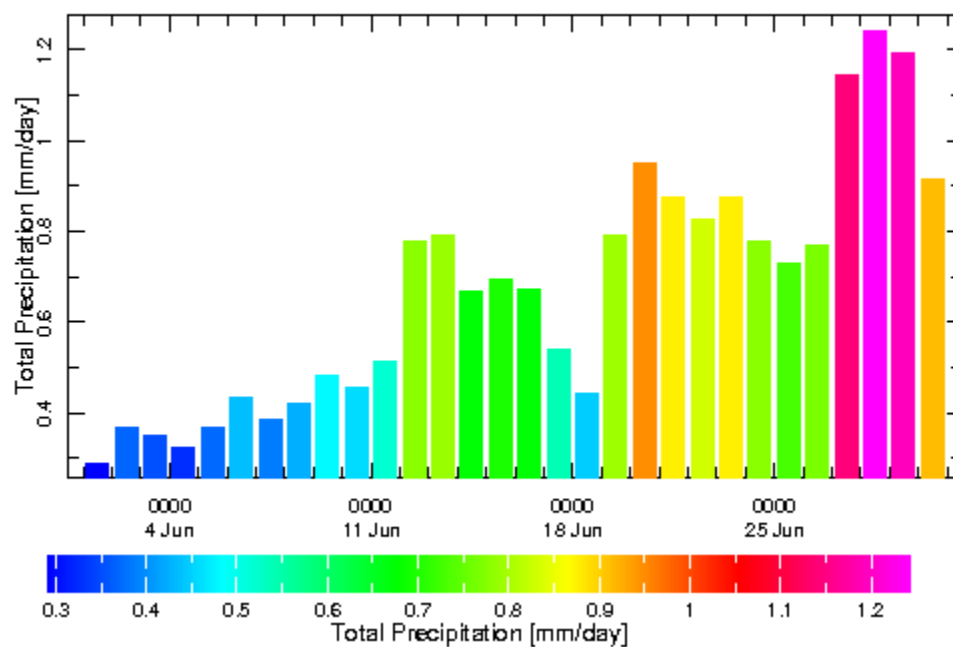
Seasonal weather outlook (Jun-Aug, 2014)

5. Expected daily rainfall

Daily expected Precipitation for Jun-Aug, 2014

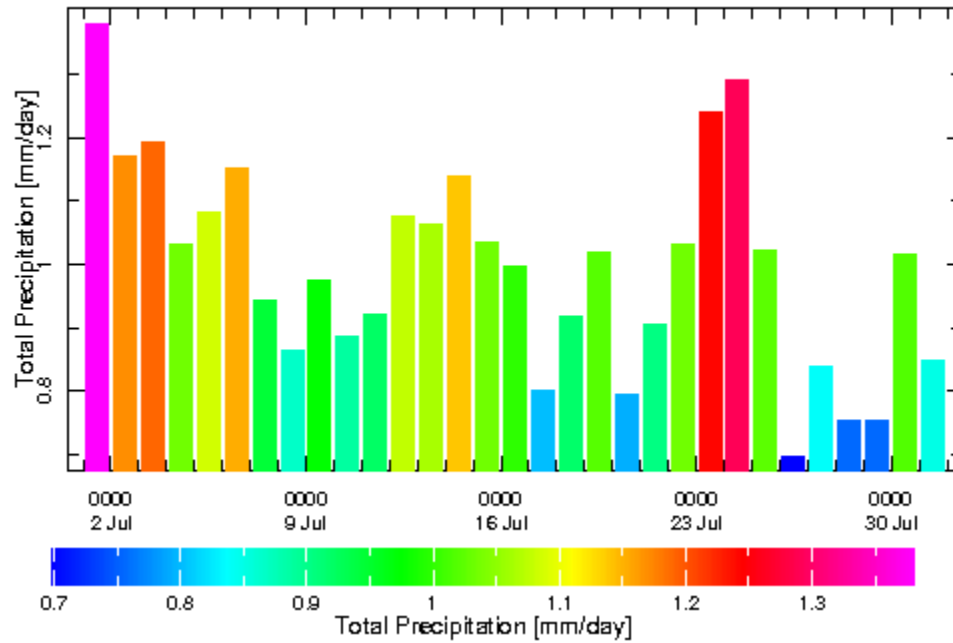


Daily expected Precipitation for Jun, 2014

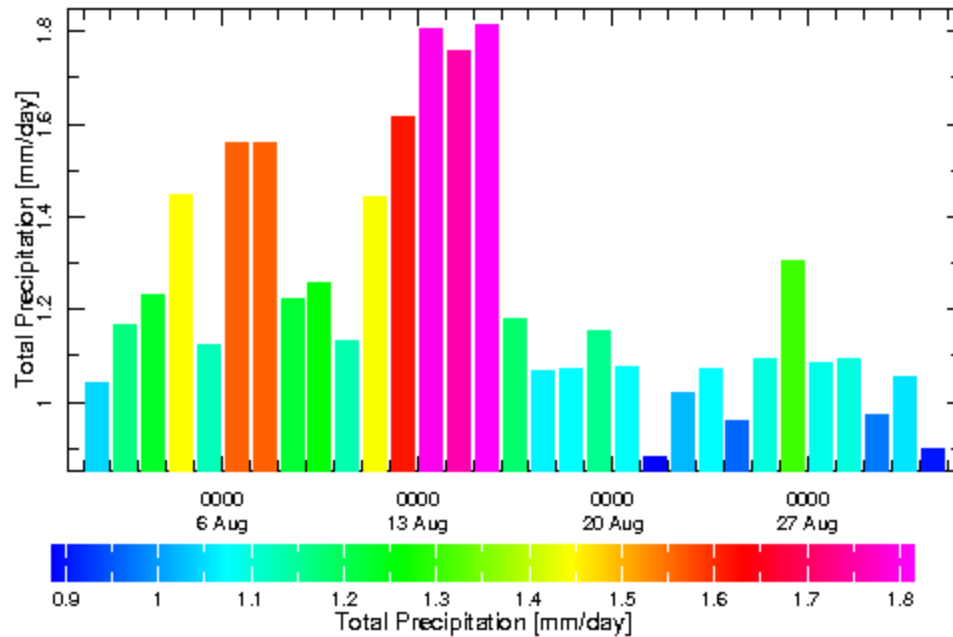


Seasonal weather outlook (Jun-Aug, 2014)

Daily expected Precipitation for Jul, 2014

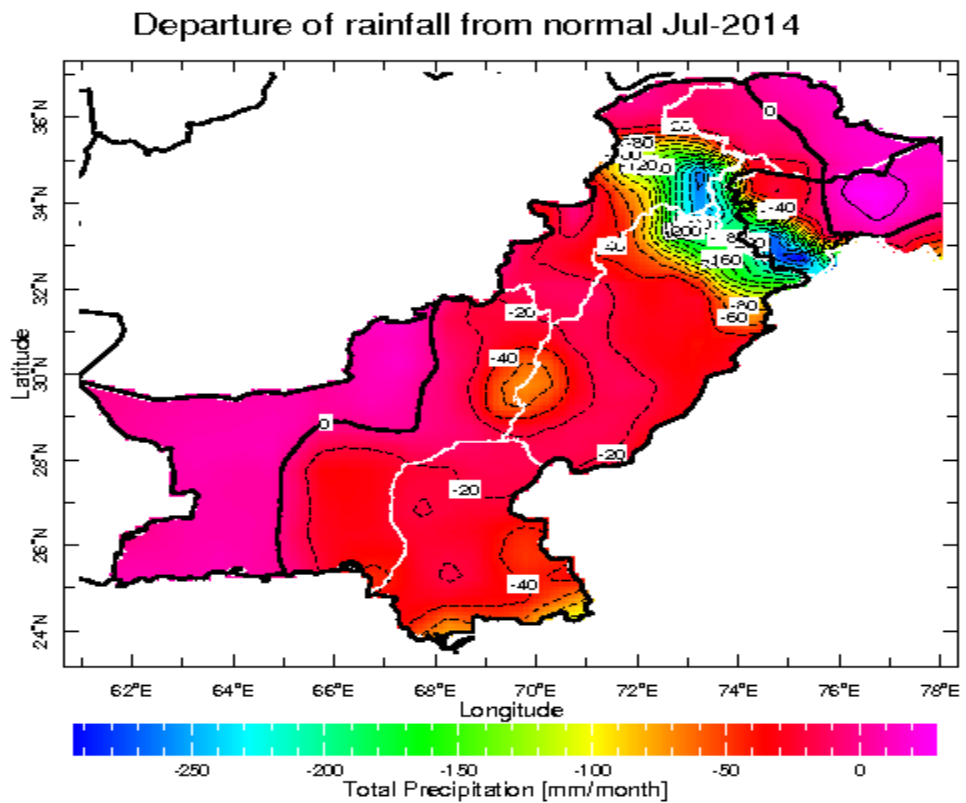
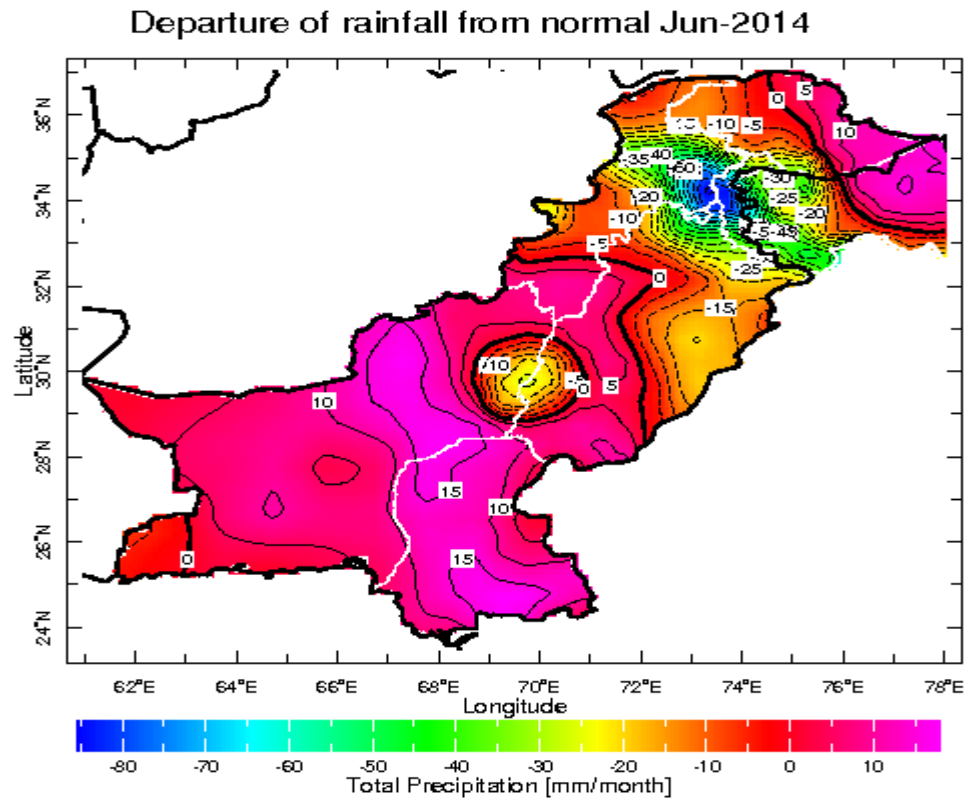


Daily expected Precipitation for Aug, 2014



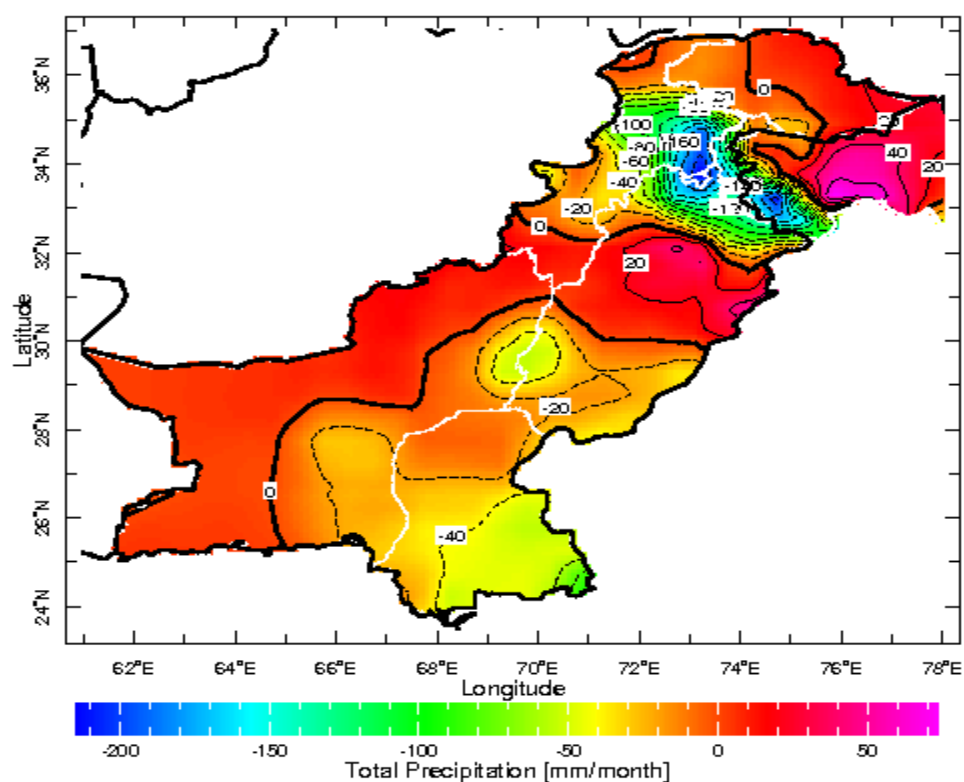
Note: It is ECHAM climate model prediction. The numbers of spell can be predicted from above graph. However, the exact data of start or end of spell can be varied and this can be in advance or delayed from the actual observation over the region.

6. Monthly departure from normal (precipitation) during coming season

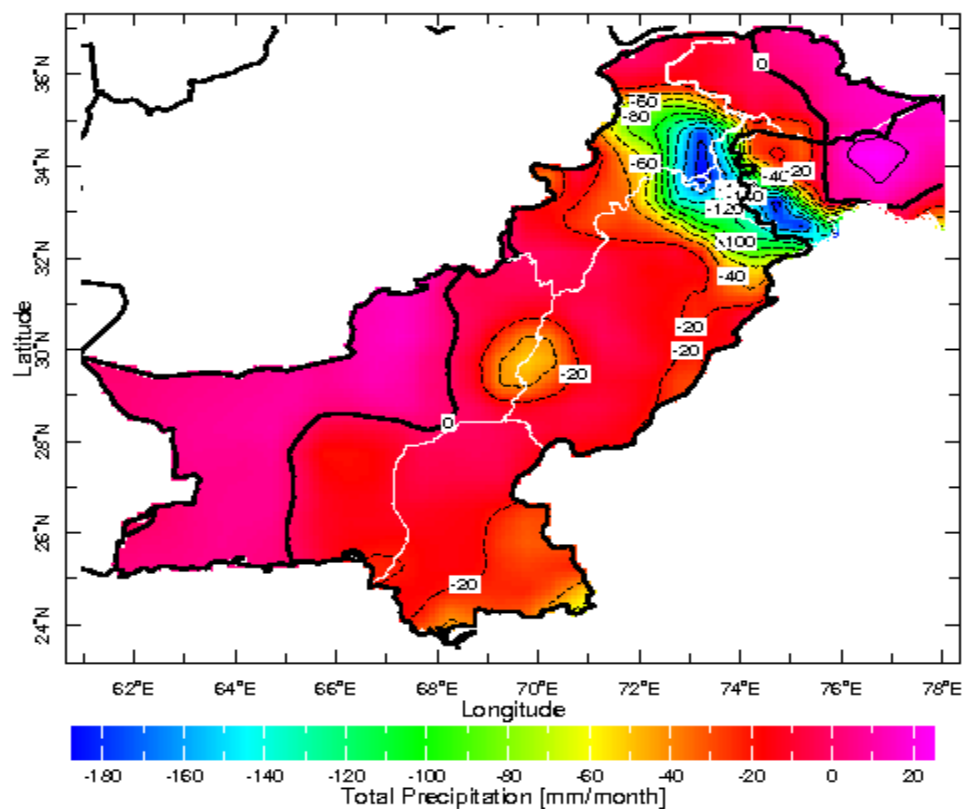


Seasonal weather outlook (Jun-Aug, 2014)

Departure of rainfall from normal Aug-2014

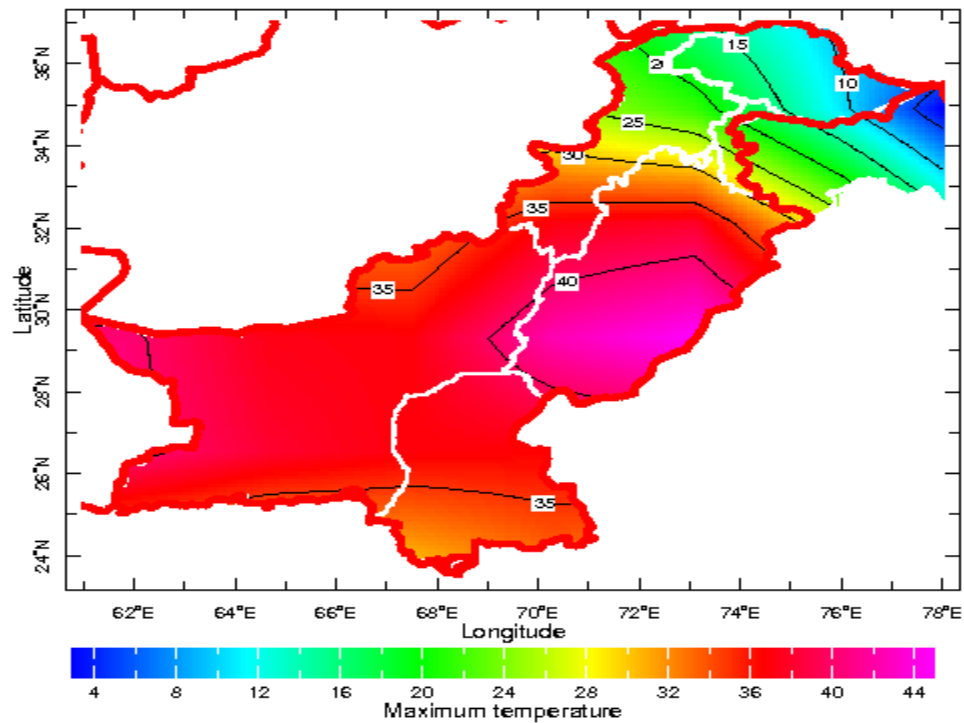


Departure of rainfall from normal (Jun-Aug, 2014)

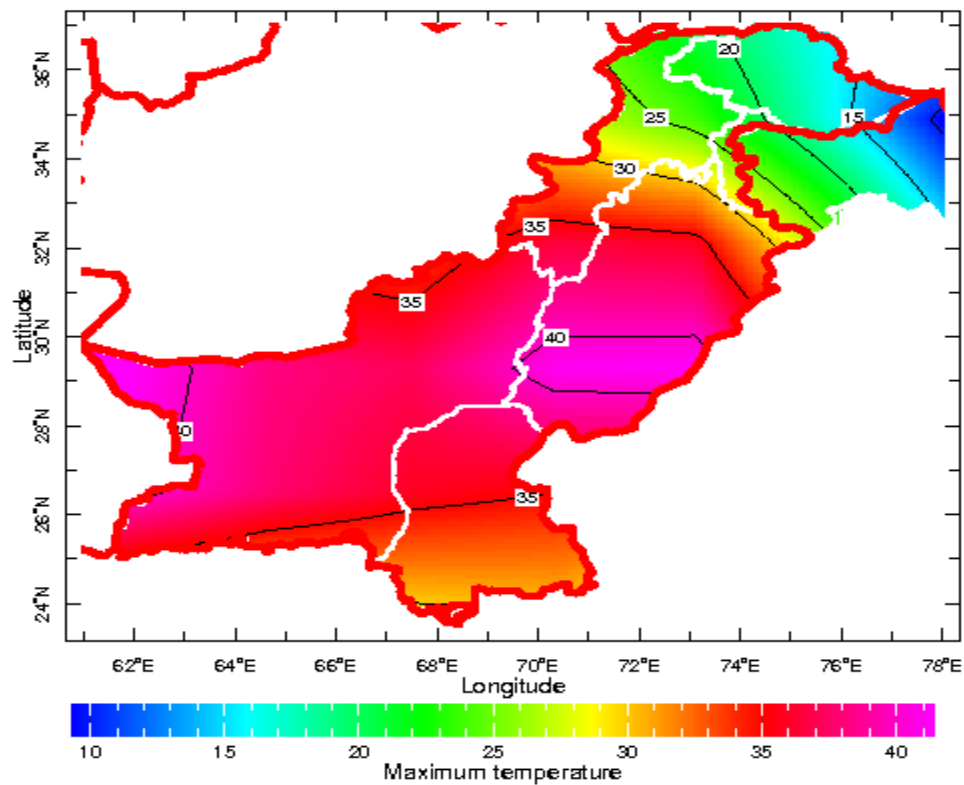


7. Spatial distribution of expected maximum temperature during

Expected Maximum Temperature during Jun, 2014

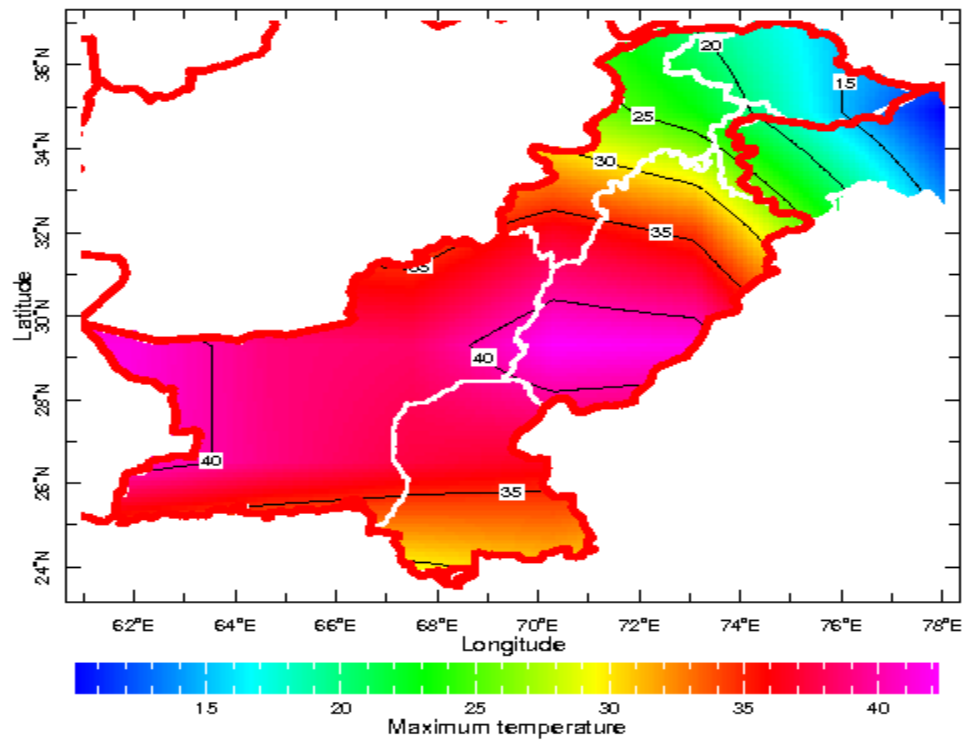


Expected Maximum Temperature during Jul, 2014



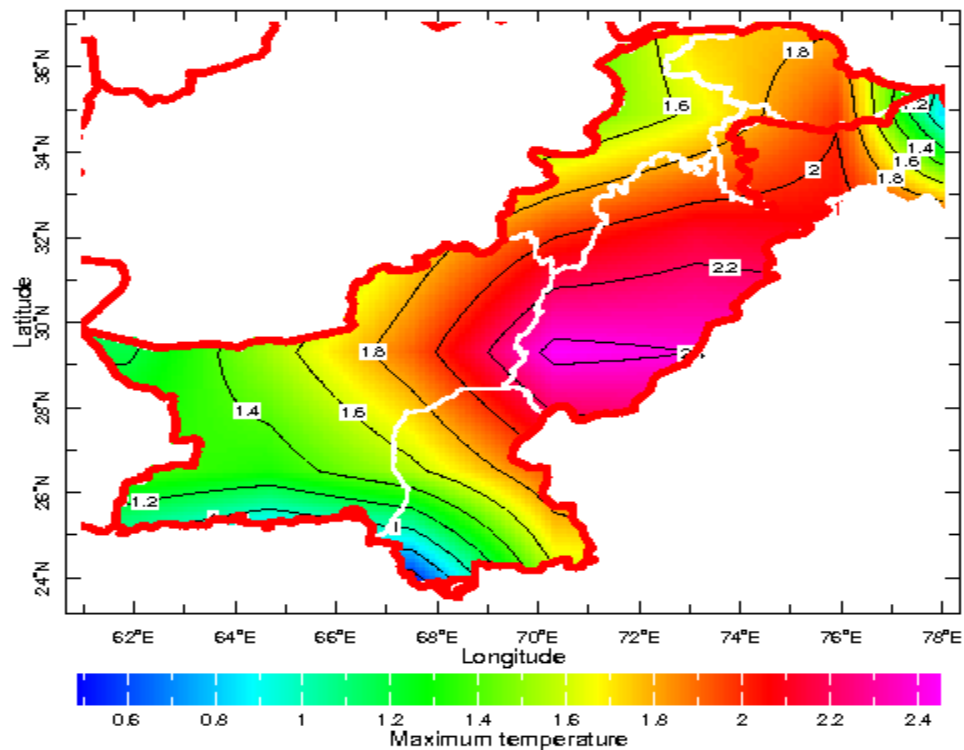
Seasonal weather outlook (Jun-Aug, 2014)

Expected Maximum Temperature during Aug, 2014



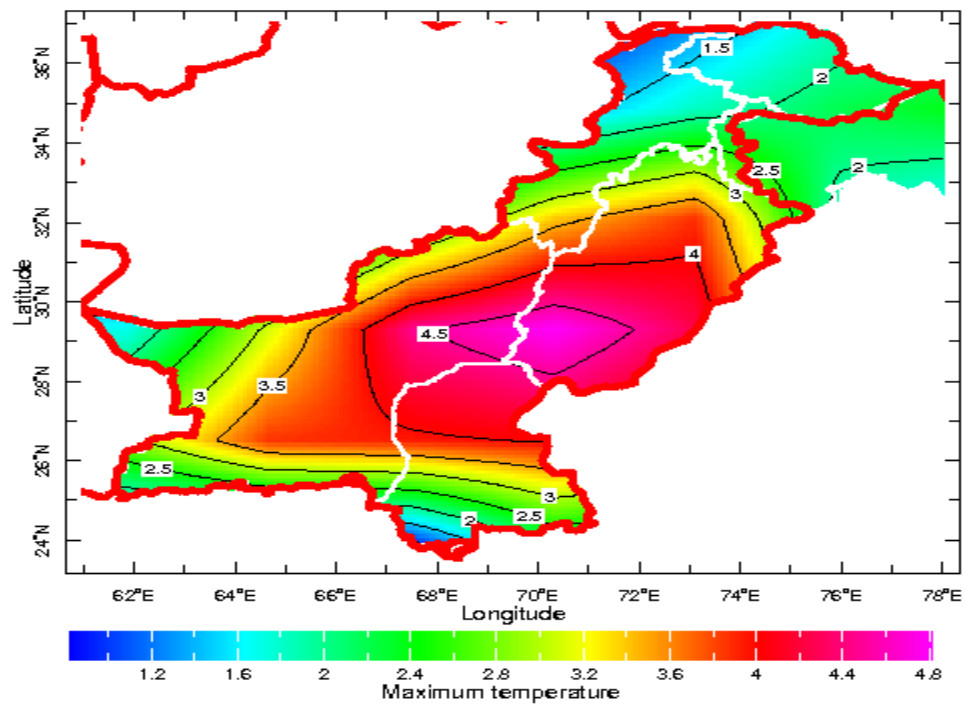
8. Departure of expected maximum temperature from normal

Expected Dep. of Max. Temp. from normal during Jun, 2014

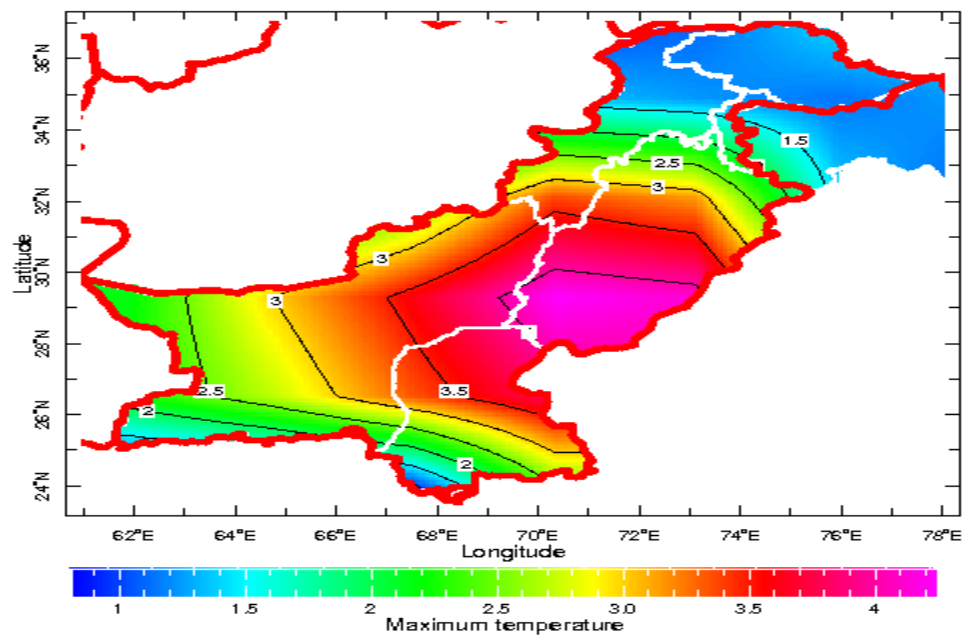


Seasonal weather outlook (Jun-Aug, 2014)

Expected Dep. of Max. Temp. from normal during Jul, 2014



Expected Dep. of Max. Temp. from normal during Aug, 2014



Note: Research wing of NAMC is regularly monitoring variation in synoptic situation of the globe and using different global climate models regional weather prediction data for preparation of this weather outlook. Seasonal weather outlook issues 10th of every month with three months in advance weather outlook. Lastest seasonal weather summay can be download from NAMC web site mentioned below: <http://namc.pmd.gov.pk/>