

Seasonal weather outlook

(May-Jul, 2014)

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Issued by:

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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 May 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 higher than normal intensity. The region may prevail above than normal winds strength. The movement of higher strength winds may cover wider area than normal over the region.

Probability outlook: Above normal intensity of jet stream is associated with above normal precipitation in the region and it seems that weather systems will be focused towards northern parts of the country.

- A trough at 500 hPa is expected to be over upper and lower parts of the country. As a result, weather system influenced by local weather phenomenon will have effects in these regions.

Probability outlook: Precipitation is likely to occur over upper and lower parts of the country due to local development.

- Surface temperatures are expected to be on higher side than normal over central parts of the country as compared with normal (1981-2010). However, northern and southern parts may prevail normal surface temperature.
- North Atlantic Oscillation (NAO) is in positive phase (0.31) approaching towards neutral phase. 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: Normal precipitation over all parts of the country will be expected. The focus of weather tracks may be towards central of the country.

- The model predictions of ENSO for this summer and beyond are indicating an increased likelihood of El Niño this year compared with 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 much of the remainder of the Northern Hemisphere spring 2014, with many models predicting the development of El Niño sometime during the summer or fall. Despite this greater model consensus, there remains considerable uncertainty as to when El Niño will develop and how strong it may become. This uncertainty is amplified by the inherently lower forecast skill of the models for forecasts made in the spring. While ENSO-neutral is favored for Northern Hemisphere spring, the chances of El Niño increase during the remainder of the year, and exceed 50% by the summer. (http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/?enso_tab=enso-cpc_update)

Probability outlook: La Nina (2%), Neutral (53%) and El Nino (45 %) during May-Jun-Jul, 2014 season

- Arabian Sea Surface Temperatures are expected to be slightly above normal near western coastal belt of Pakistan.

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- 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 (May-Jul, 2014)

Synthesis of the latest model forecasts for May-Jul, 2014 (MJJ), current synoptic situation and regional weather expert's judgment indicates that slightly normal precipitation is expected all over the country with average during May, above normal during June and below normal during June. Below average day temperature is likely to occur during May, average during June and above average during July in most parts of the country. A neutral lead to El Nina condition is expected to persist throughout the predicted period.

3.1. Weather outlook

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

- I. Slightly below average precipitation is expected during predicted season.
- II. In May, average precipitation is expected all over the country with average over central parts of the country while below average over extreme south and north parts of the country. Day temperatures are likely to be below normal all over the country with higher value over central parts of the country.
- III. The month of June will be wet month during predicted period.
- IV. Pre-Monsoon rain starts from second week of the June.
- V. **Expected date of monsoon in the country will be from 21-23rd June (Insha-Allah)**
- VI. Good rainy spell will be occurred during first two week from its start i.e. from Jun-21 to July- 07.
- VII. Monsoon currents will be slowdown after one-two spell.

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- VIII. Month of July will be hot and less wet causes harder month of Ramadan.
- IX. In June, above average precipitation is expected over central and lower parts and average over upper parts of the country. Surface day temperature will be normal all over the country.
- X. In July, slightly below average precipitation is expected over the country. Day temperature will be above normal all over the country.
- XI. Two to three rainy spells (pre-monsoon) are expected in last decade of June (21-30 June).
- XII. Expected Maximum temperature will be below normal during May and it further tilted towards higher side from last decade of June. As a result, July will be hotter month with respect long range normal with a value of 2 degree over central parts of the country.

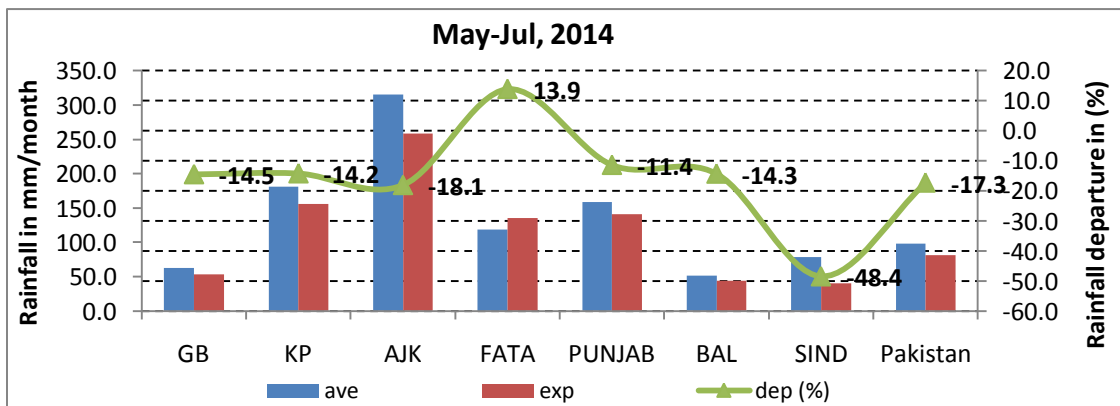
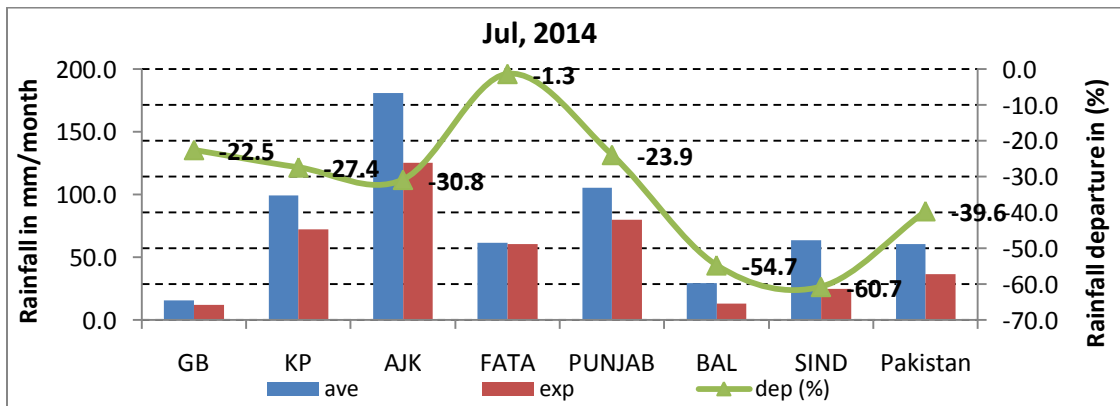
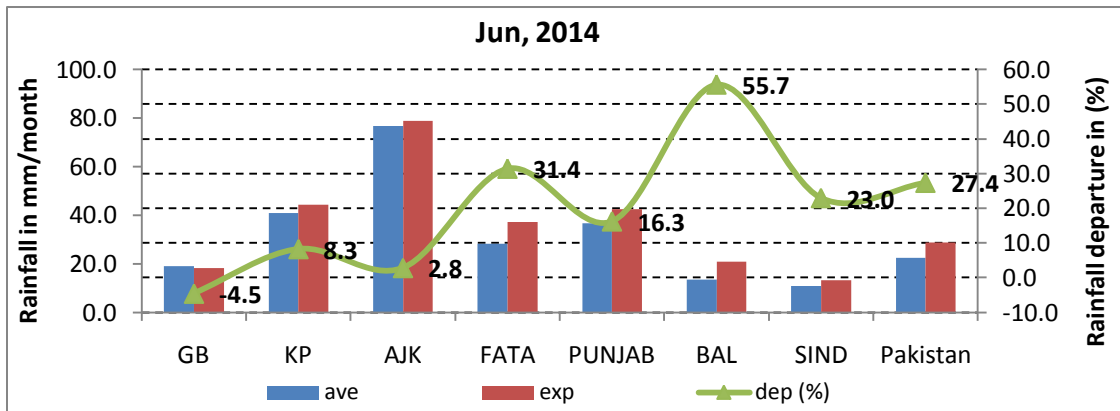
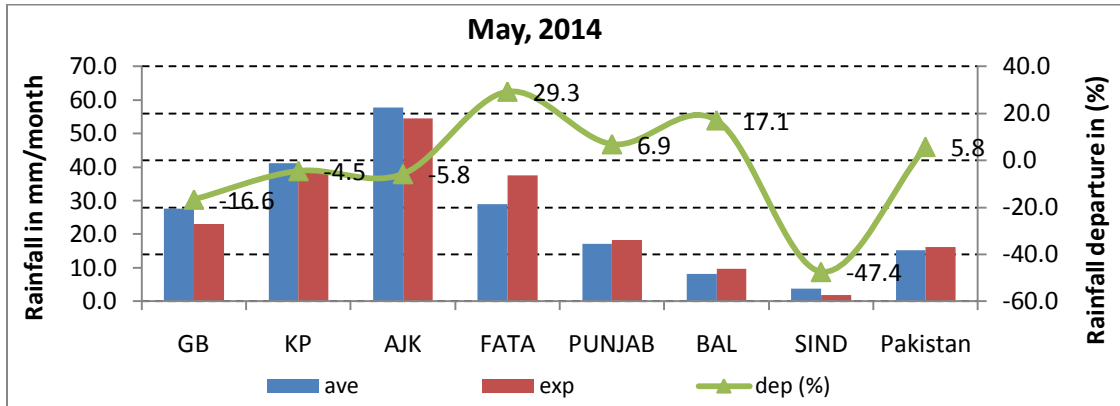
3.2. Monthly Quantitative Weather Forecast

	May, 2014		Jun, 2014		Jul, 2014		May-Jul, 2014	
	Ave	Exp	Ave	Exp	Ave	Exp	Ave	Exp
GB	27.6	Blw. Ave	19.0	Ave	15.9	Blw. Ave	62.5	Ave
KP	41.1	Ave	40.8	Ave	99.5	Blw. Ave	181.4	Ave
AJK	57.8	Ave	76.8	Ave	181.0	Blw. Ave	315.6	Blw. Ave
FATA	29.0	Abv. Ave	28.3	Abv. Ave	61.7	Ave	119.0	Ave
PUNJAB	17.1	Ave	36.5	Abv. Ave	105.3	Blw. Ave	158.9	Ave
BALUCHISTAN	8.2	Abv. Ave	13.4	Abv. Ave	29.5	Blw. Ave	51.1	Ave
SIND	3.7	Blw. Ave	10.8	Abv. Ave	63.5	Blw. Ave	78.1	Blw. Ave
Precipitation is in mm/month								
Pakistan	15.2	Ave	22.5	Abv. Ave	60.7	Blw. Ave	98.5	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 %

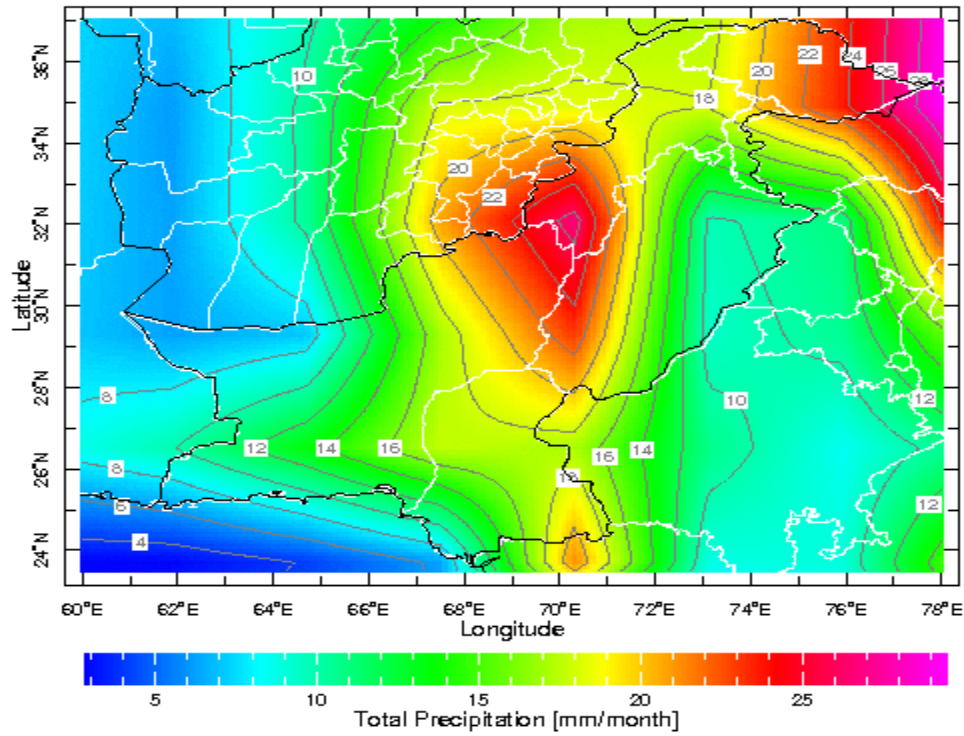
Note: Average precipitation is computed by using Global Precipitation Climatology Centre (GPCC) gridded data by resolution (0.5x0.5°) latitude by longitude. Ensembles of different climate models are used for computation of expected precipitation over the region.

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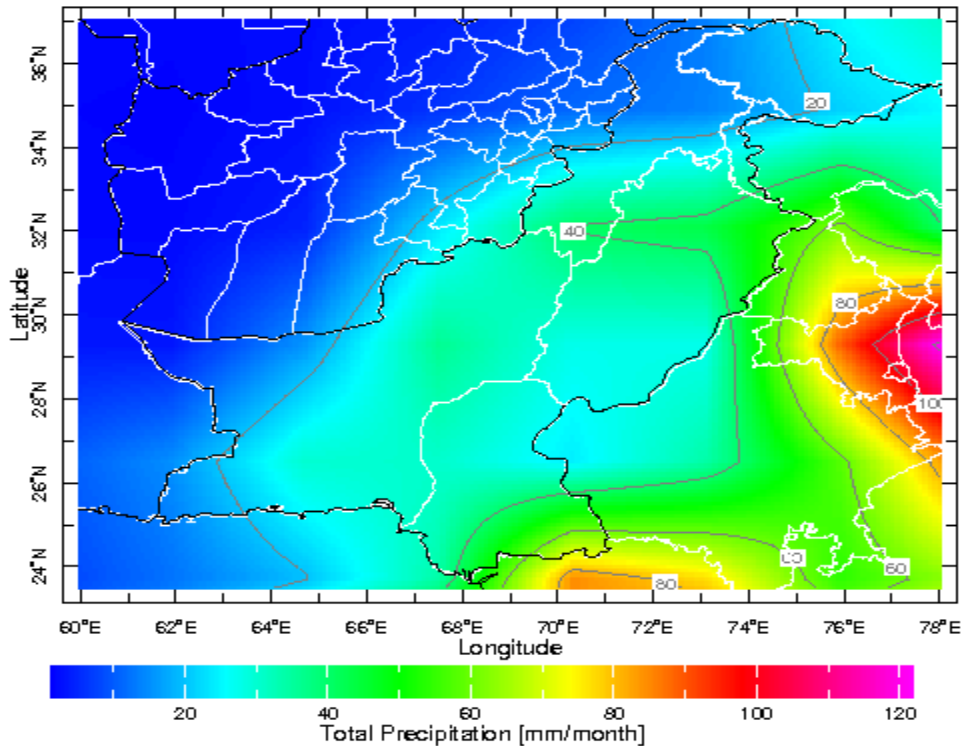


4. Spatial distribution of expected rainfall during coming season (GCM-ECHAM)

Monthly expected Precipitation for May, 2014

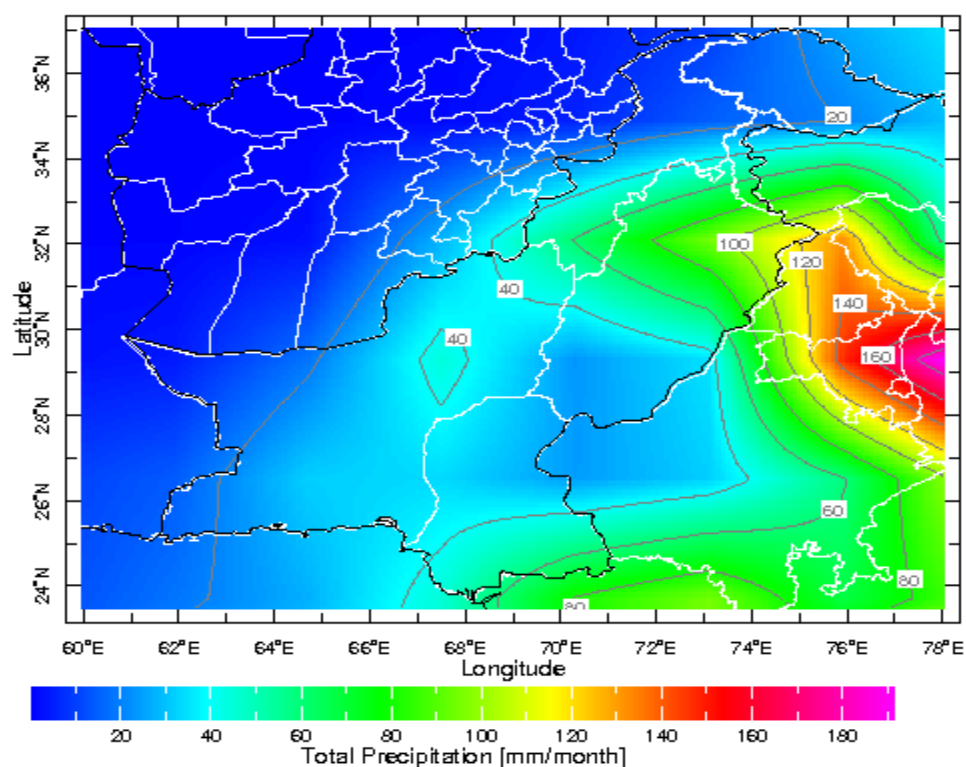


Monthly expected Precipitation for Jun, 2014

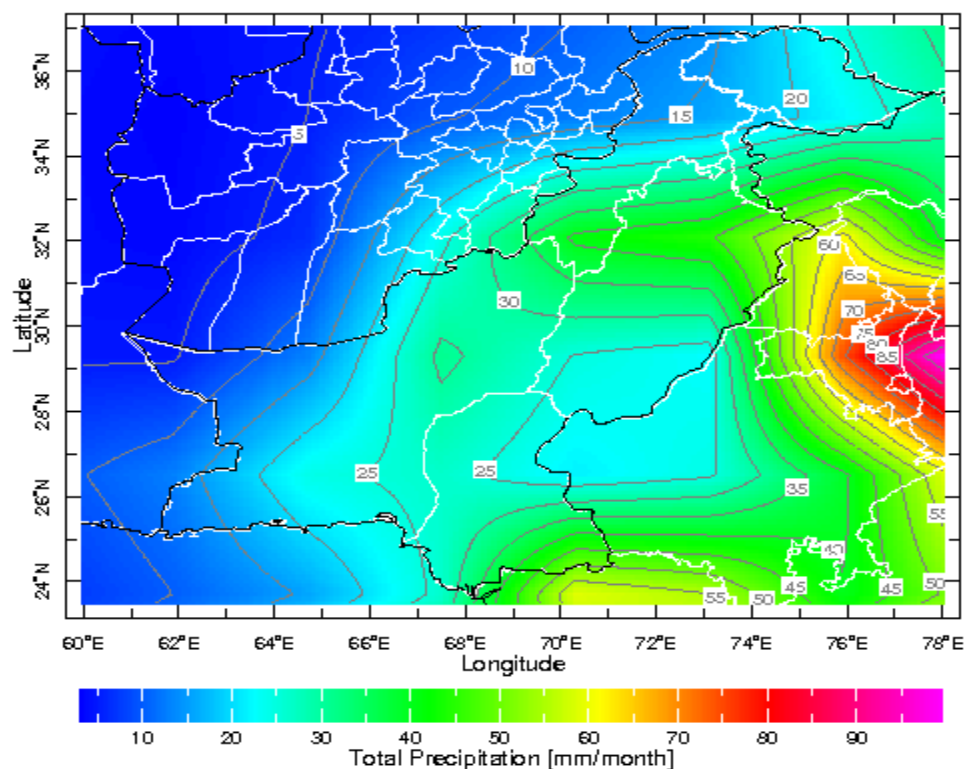


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Monthly expected Precipitation for Jul, 2014



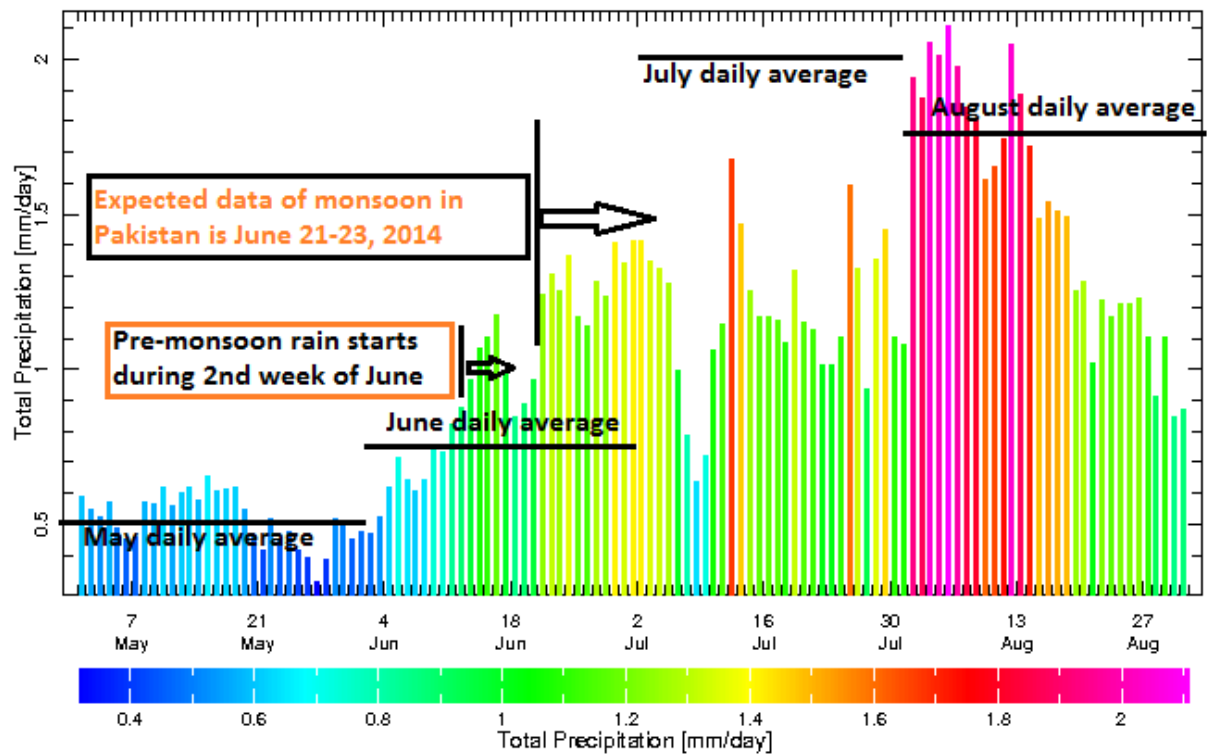
Seasonal Precipitation Outlook (May-Jul, 2014)



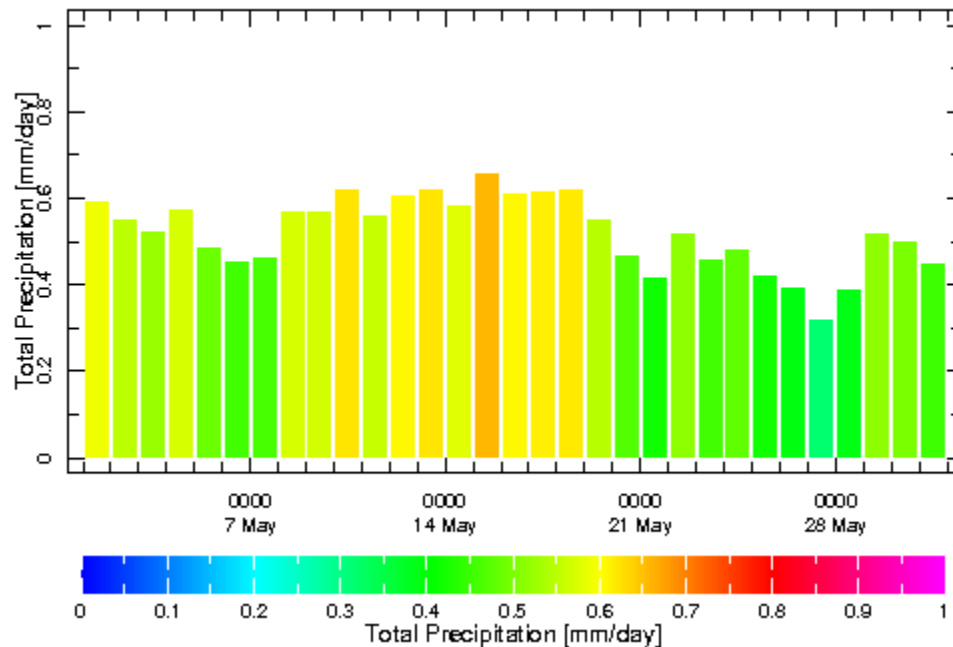
Seasonal weather outlook (May-Jul, 2014)

5. Expected daily rainfall

Daily expected Precipitation for May-Aug, 2014

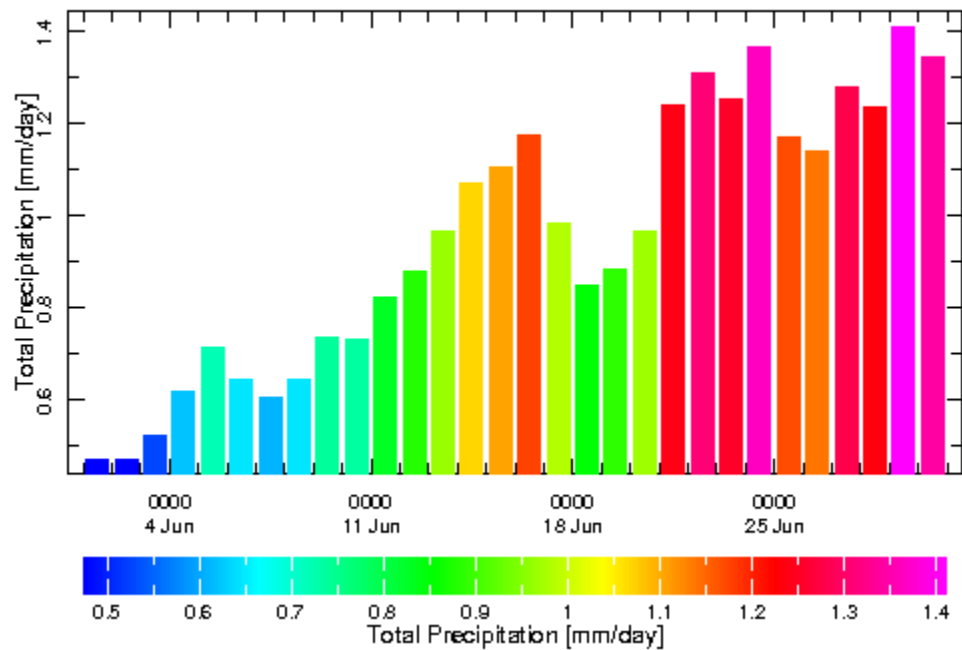


Daily expected Precipitation for May, 2014

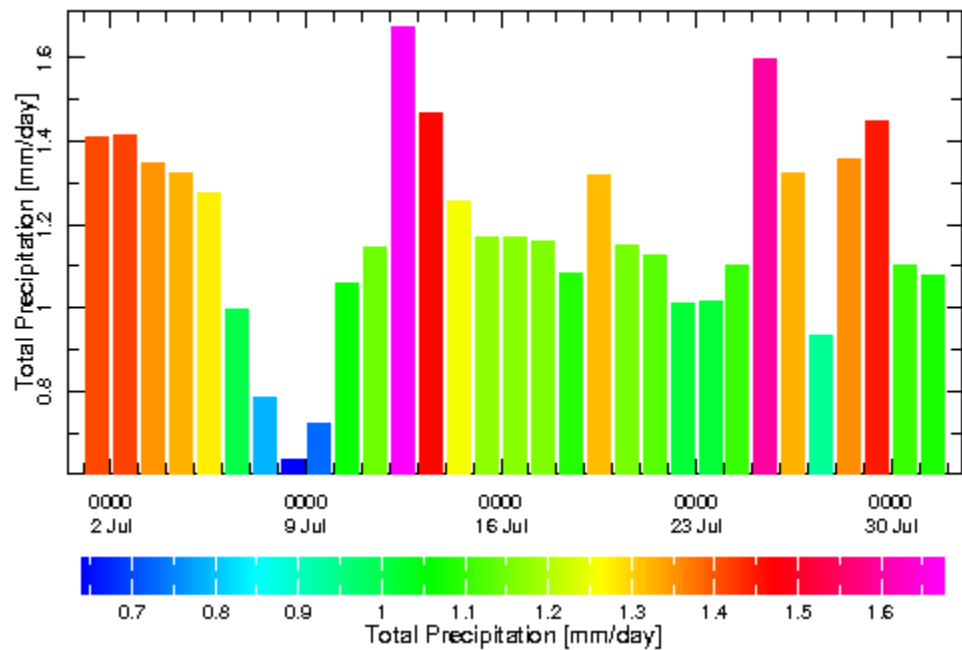


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Daily expected Precipitation for Jun, 2014



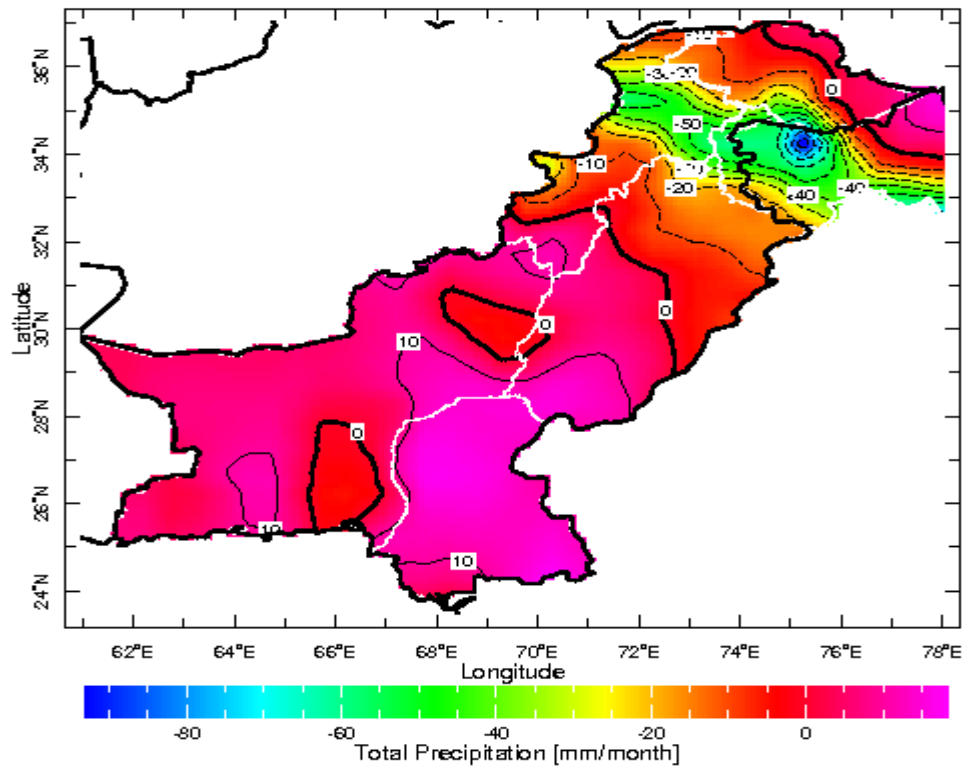
Daily expected Precipitation for Jul, 2014



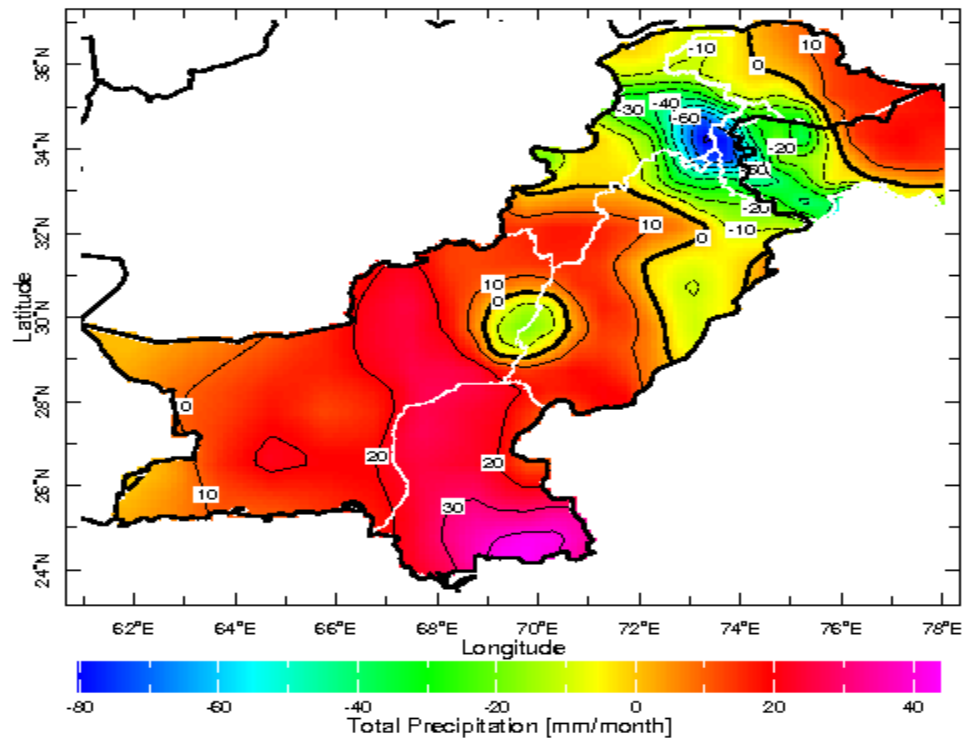
Note: It is ECHAM climate model prediction. The numbers of spell can be predicted from above graph. However, the exact data of start or end of spell can be varied and this can be in advance or delayed from the actual observation over the region.

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

Departure of rainfall from normal May-2014

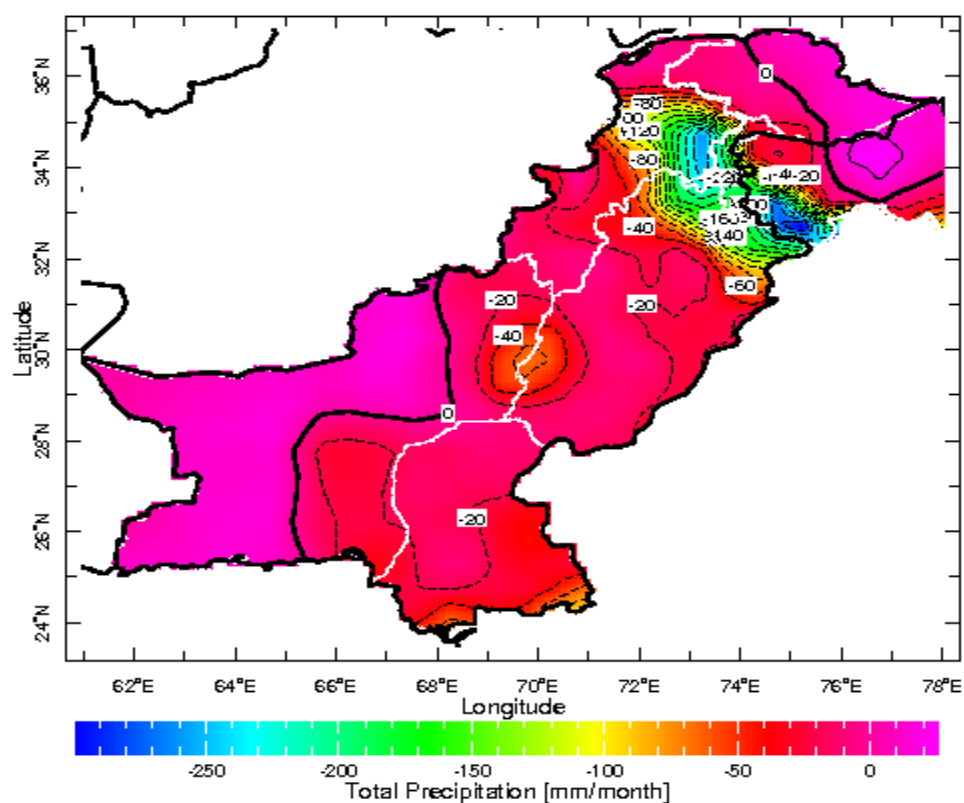


Departure of rainfall from normal Jun-2014

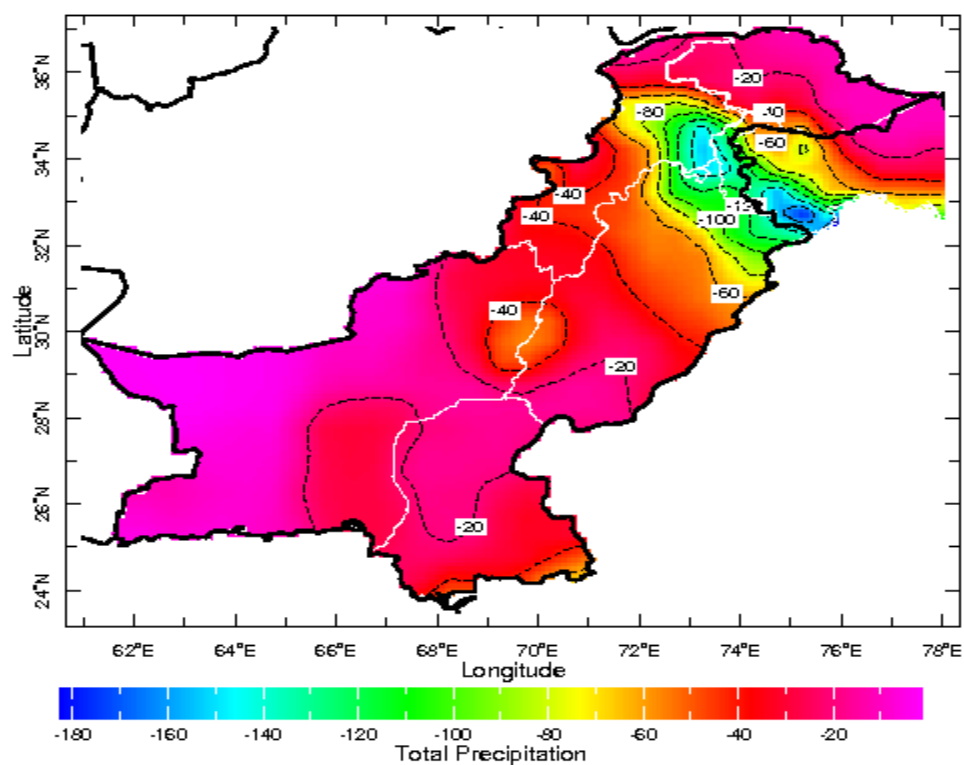


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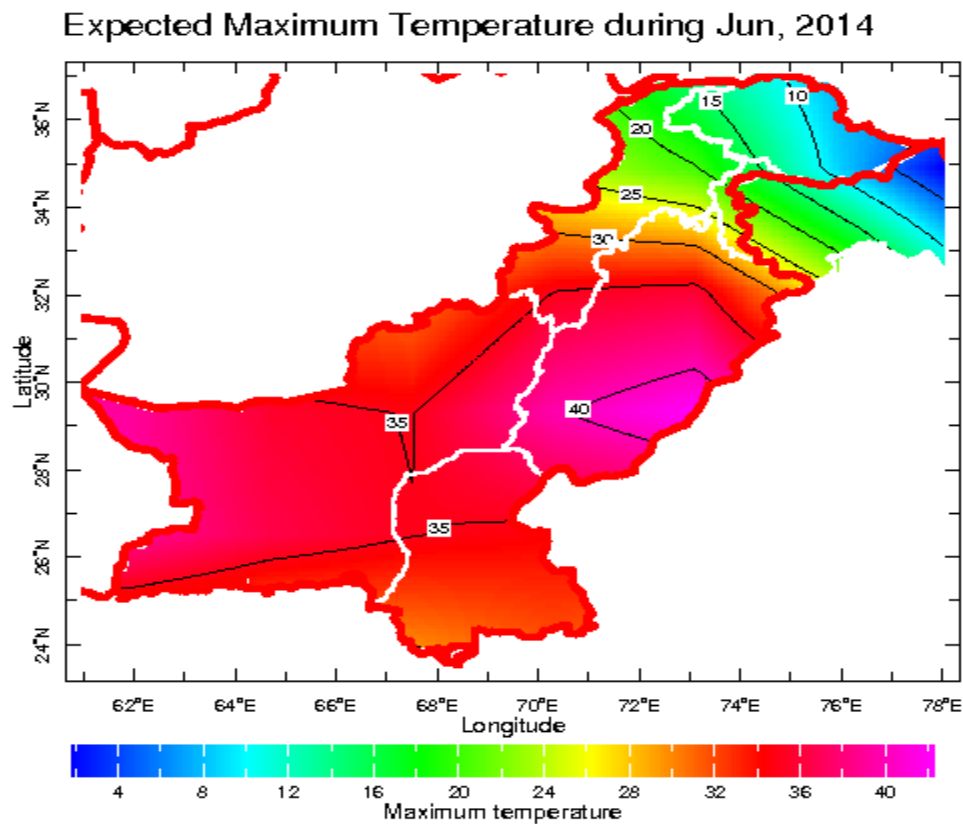
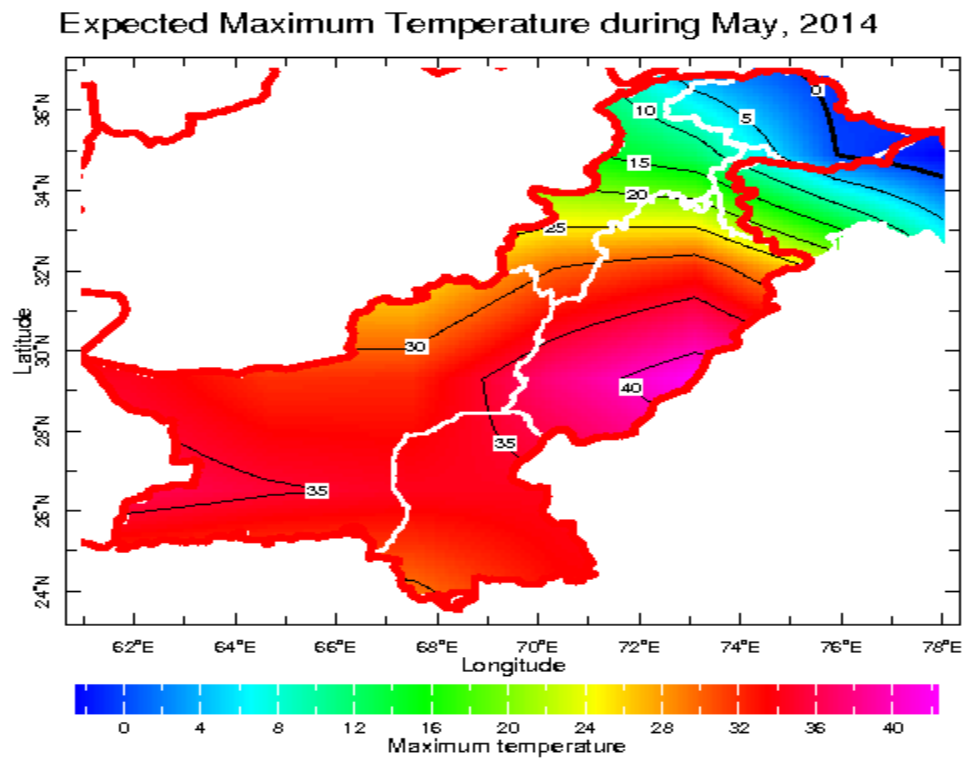
Departure of rainfall from normal Jul-2014



Departure of rainfall from normal (may-jul, 2014)

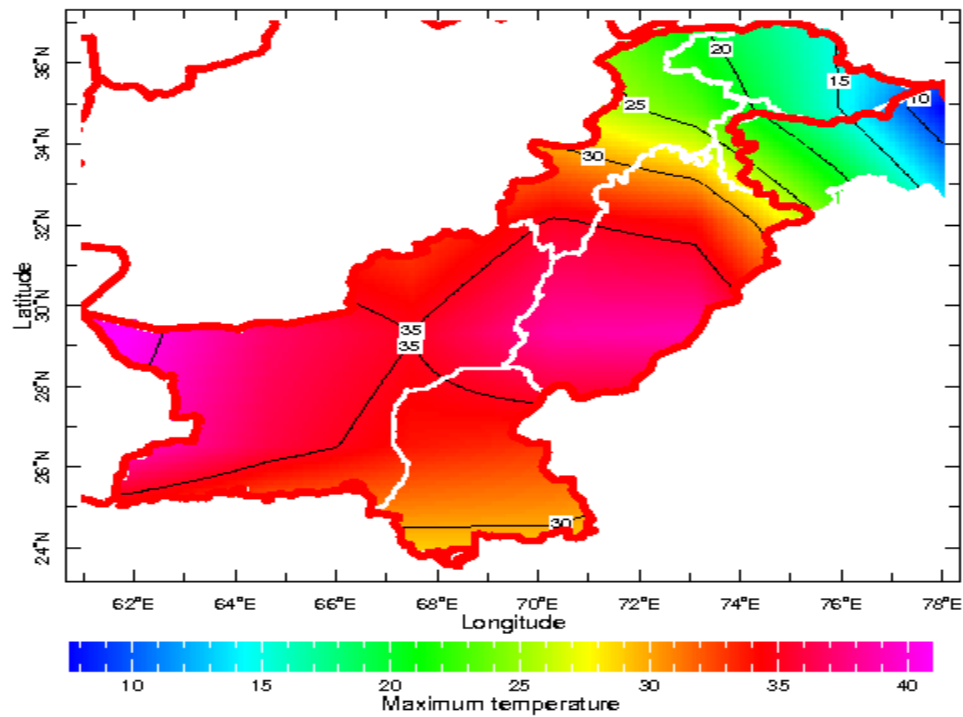


7. Spatial distribution of expected maximum temperature during



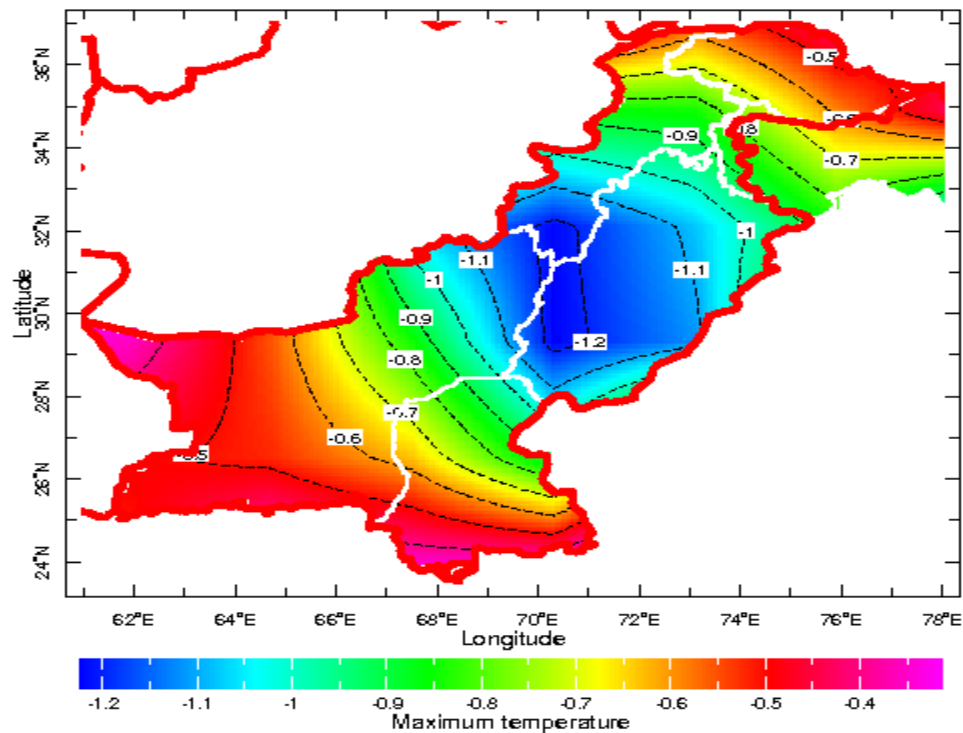
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Expected Maximum Temperature during Jul, 2014



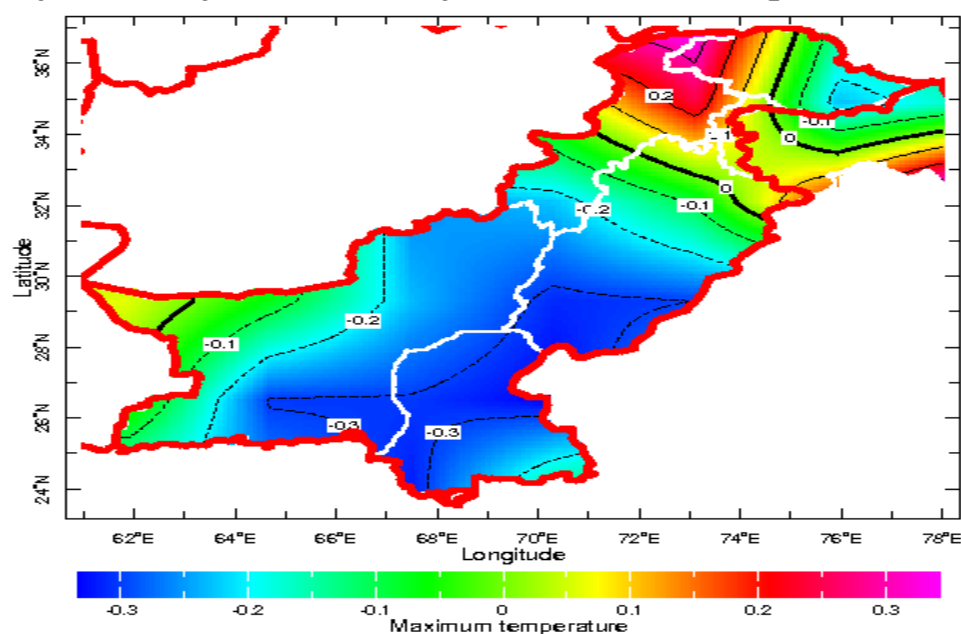
8. Departure of expected maximum temperature from normal

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

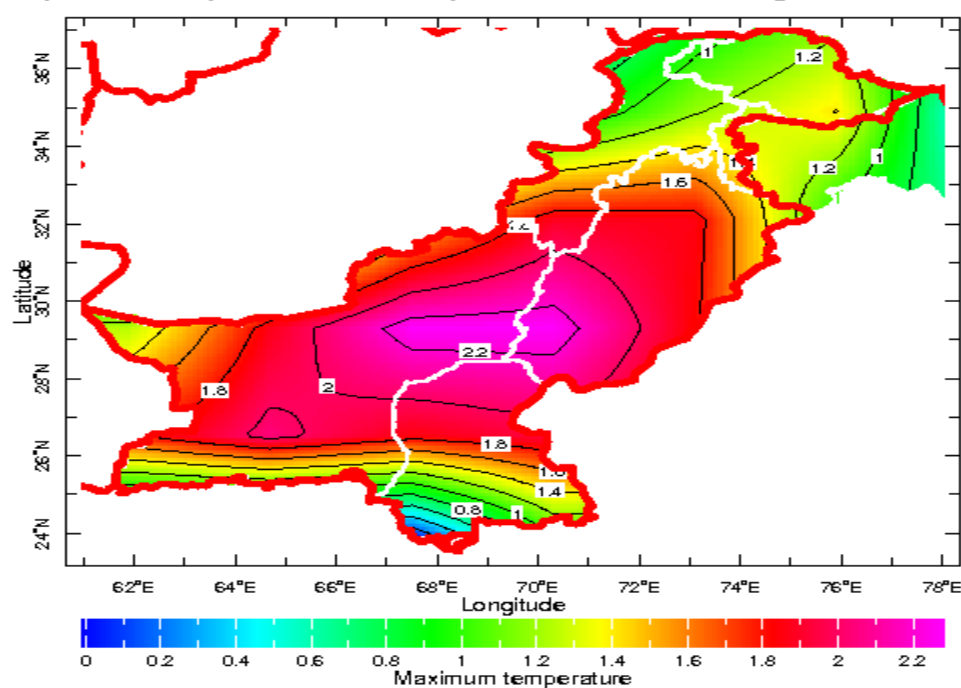


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Expected Dep. of Max. Temp. from normal during Jun, 2014



Expected Dep. of Max. Temp. from normal during Jul, 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/>