

Seasonal weather outlook for SAARC region

(Jan-Mar, 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 seasonal weather outlook for south Asian countries included in South Asian Association for Regional Cooperation (SAARC) (on experimental basis), taking into consideration available products from major climate prediction centres by using Global Climate Models (GCMs).

This Climate Outlook may be somewhat different from those used by the national meteorological services in the region. Thus, this product may differ from the official forecasts issued in those countries. Regional weather (precipitation) outlook is predicted from ECHAM4 global climate models by using persisted sea surface temperature on 0000 Jan 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. For further information concerning this and other guidance products, users are strongly advised to contact their National Meteorological Services.

Acknowledgement: *NAMC 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. Special acknowledge to Dr. M. Benno Blumenthal by providing guidance and assistance for using IRI climate software. All the output graphics have been prepared by using IRI climate software.*

Classification of average, below average and above average

- *Below Average (Blw. Ave) < -10 %,*
- *Average precipitation range (Ave) = -10 to +10 %,*
- *Above Average (Abv.Ave) > +10 %*

Note: Average precipitation is computed by using Global Precipitation Climatology Centre (GPCC) gridded data by resolution (0.5x0.5°) latitude by longitude

2. Synoptic situation

- Location of jet stream (U wind at 200 hPa) is at normal position with higher intensity with bigger convergence areas of high winds towards the west. Intensity of jet stream will be slightly above normal during predicted period.
- A ridge at 500 hPa is expected to be at same position as normal with less intensity. As a result, track of the western disturbances may be changed and tilted towards northward.
- Surface temperatures are expected to be on lower side than normal over central parts of the country as compared with normal (1981-2010). However, southern and northern parts with higher than normal temperature will be expected during January.
- North Atlantic Oscillation (NAO) is in positive phase (0.95) and may cause to shift western disturbances towards north during coming months. Data source: <http://www.cpc.ncep.noaa.gov/products/precip/CWlink/pna/nao.shtml>
- Most of the set of dynamical and statistical model predictions issued during late November and early December 2013 predict neutral ENSO conditions into early 2014, with a warming tendency during northern spring and summer 2014. Development of weak El Nino conditions appears possible by the middle of 2014. In the most recent week, the SST anomaly in the Nino3.4 region was 0.0C. Data source: http://iri.columbia.edu/climate/ENSO/currentinfo/SST_table.html

Probability outlook: La Nina (2%), Neutral (96%) and El Nino (2 %) during Dec-Jan-Feb, 2014 season

- Arabian Sea Surface Temperatures are expected to be slightly above normal near the coast of Pakistan.
- Caspian Sea surface temperatures expected to be slightly above normal.
- Mediterranean Sea surface temperatures are normal to slightly above normal.
- Bay of Bengal Sea Surface Temperatures are normal.

Seasonal weather outlook (Jan-Mar, 2014)

1. Summary (Jan-Mar, 2014)

“Below average precipitation is expected during the season (JFM)”

Synthesis of the latest model forecasts for Jan-Mar 2014 (JFM), current synoptic situation and regional weather expert’s judgment indicates that below average precipitation is expected during the predicted season. Above normal minimum temperature will persist almost all over the SAARC member countries except central parts of Pakistan, Nepal and upper parts of India during January. Below normal night temperature are expected most parts of the SAARC member countries during February and March. Neutral-ENSO conditions are expected to persist throughout the season.

Seasonal weather outlook:

As a whole, below average precipitation is likely to all over the region during the season. Extremely below average precipitation is expected over Sri Lanka during all the predicted months however, above average precipitation is likely to occur over Afghanistan.

However, Chances of extreme weather during predicted months are very limited.

Meteorological drought condition will prevail over Sri Lanka which may reduce water level in the region.

Chances of drought in western Pakistan can not be ruled out during winter season.

January, 2014: Average precipitation is expected during January all over whole SAARC region with significantly below average over Sri Lanka and above average over Afghanistan. High intensity precipitation is expected over northern and eastern parts of Afghanistan, upper parts of Pakistan and northeastern, northwestern parts of India. However, below normal precipitation is expected over Nepal, Bangladesh and most of Indian region.

Below normal night temperature will be expected over northern half of the region whereas above normal night temperature will be over southern half of the region.

February, 2014: As a whole below normal precipitation is expected all over the region with above normal over Afghanistan, average over Pakistan, Bangladesh, Bhutan, Nepal and India and extremely below over Sri Lanka. However, intensity of precipitation will be higher over Afghanistan, northern parts of Pakistan and northeastern India. Below normal precipitation will be expected over northern and eastern parts of India including Kashmir and Sri Lanka.

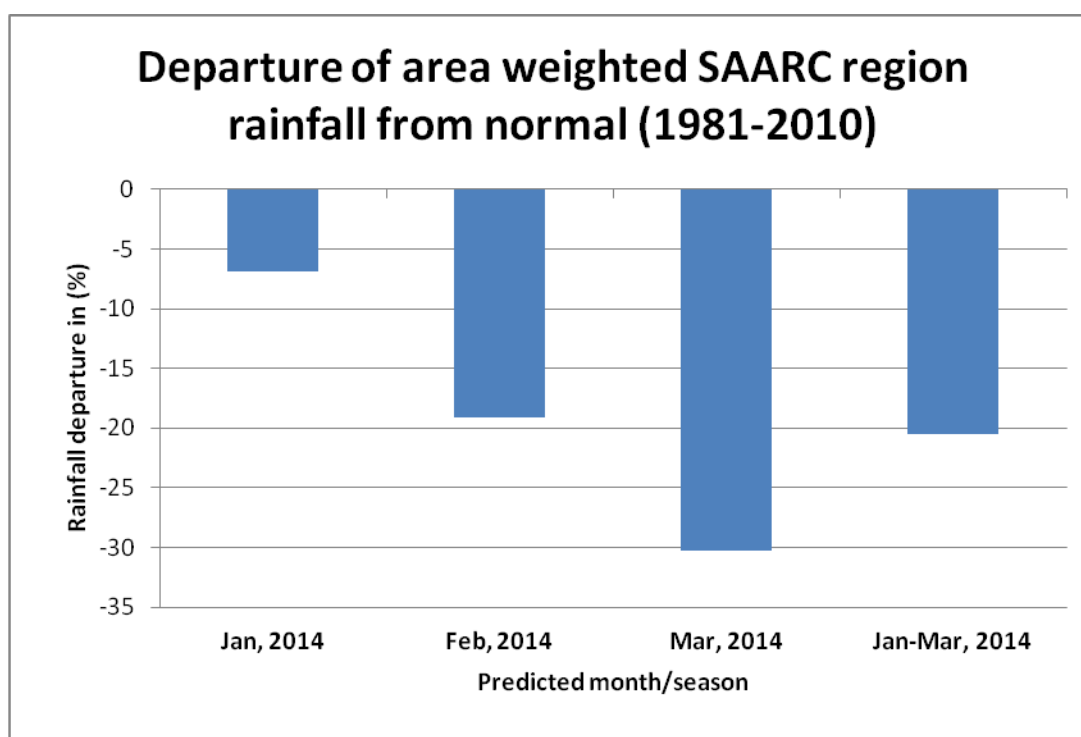
Below normal night temperature will be expected over central SAARC region with above average over southeast India and Afghanistan.

Seasonal weather outlook (Jan-Mar, 2014)

March, 2014: Below average (-30%) precipitation is expected all over the region as a whole with significantly below average over Sri Lanka and slightly below over Bangladesh and Nepal. Intensity of precipitation will be higher over Afghanistan, northern Pakistan, northeast and eastern belt of India. However, below average precipitation over northeast Pakistan including Kashmir, northeast India and Sri Lanka is expected during March.

Night temperature during March over all the SAARC member countries will be below normal. This month is expected to be colder month.

January-March: Below normal precipitation is expected over SAARC member countries. A chance of less dense fog in the region is expected. Normal weather phenomenon will be expected. Positive NAO indicates that weather pattern will be focused over northern region whereas southern parts will receive less than normal precipitation. Chances of drought in the region are more in later stages during the predicted months.

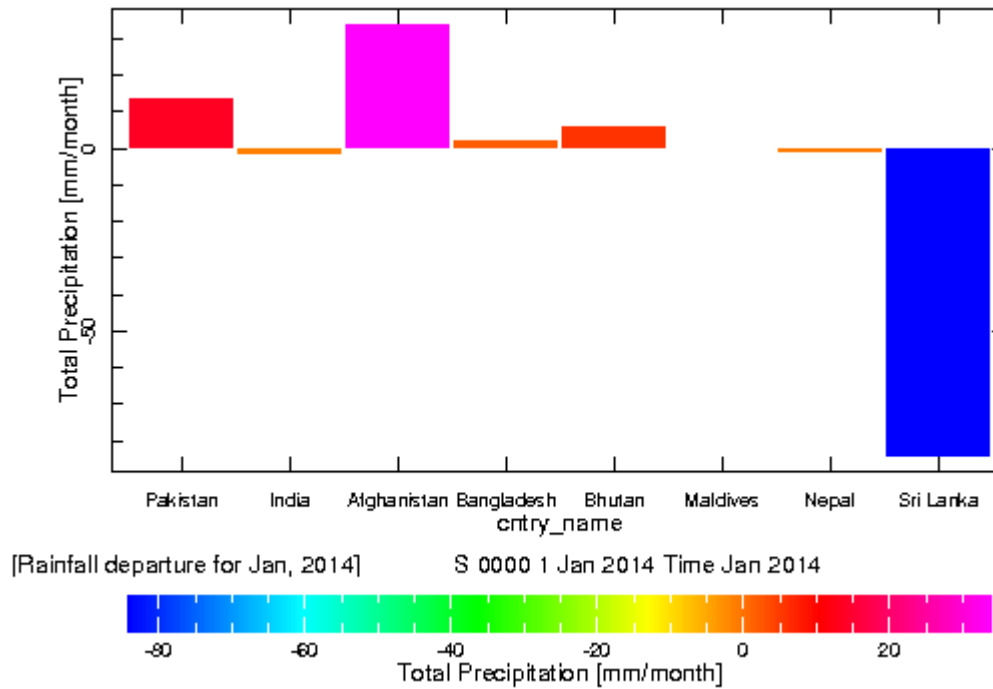


Note: Departure of Area-weighted rainfall of SAARC region has been computed by subtracting ECHAM predicted monthly/seasonally rainfall from GPCC of corresponding month/season.

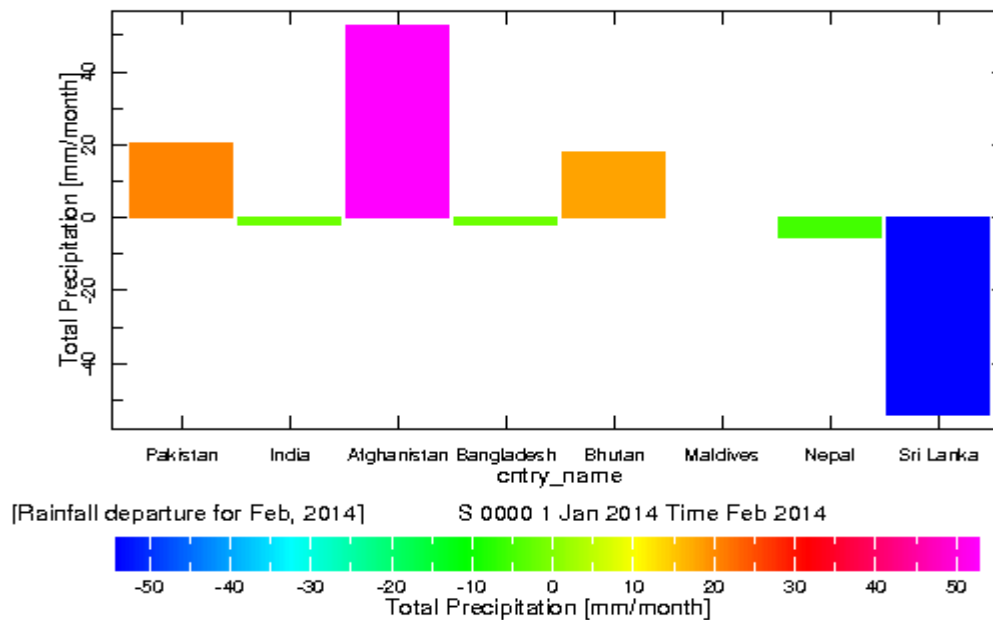
Seasonal weather outlook (Jan-Mar, 2014)

3. Country wise monthly and seasonal departure of precipitation from normal

a. Monthly (Jan, 2014)

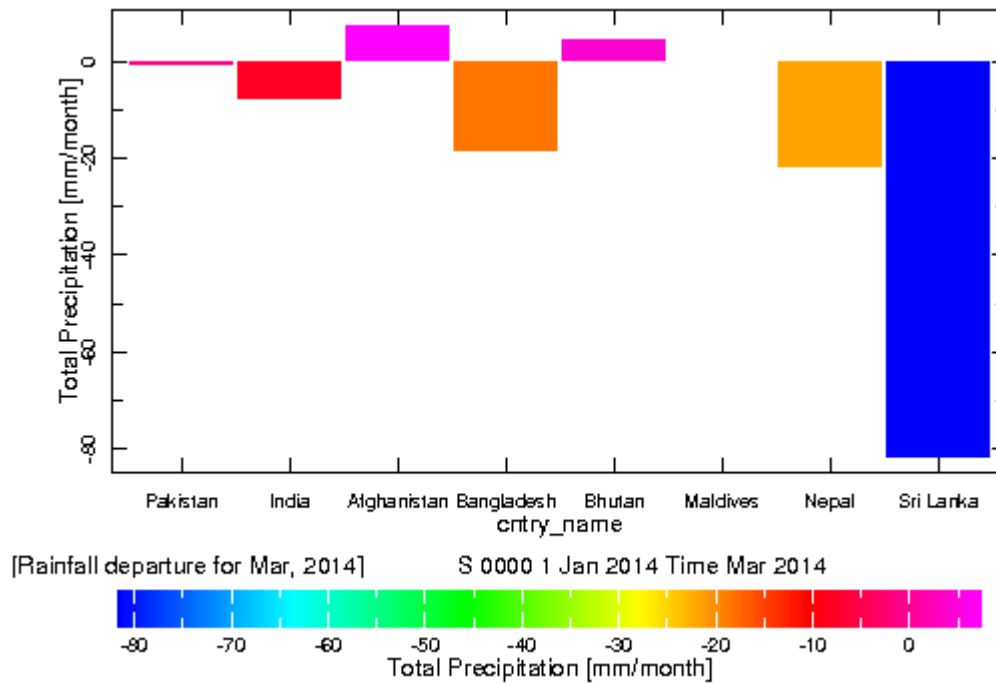


Monthly (Feb, 2014)

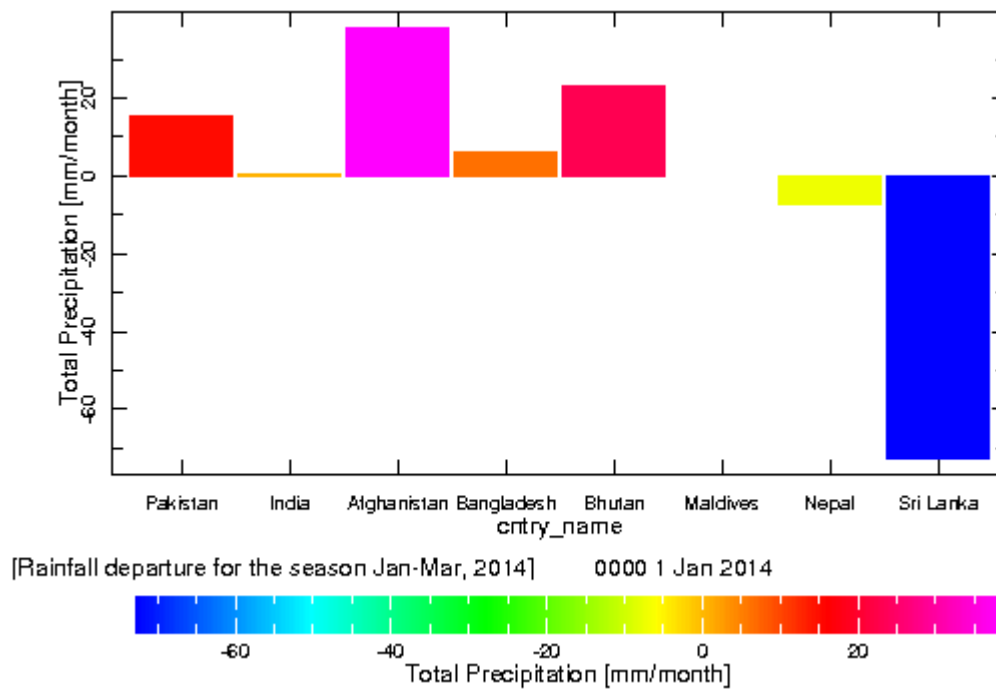


Seasonal weather outlook (Jan-Mar, 2014)

b. Monthly (Mar, 2014)



c. Seasonally (Jan-Mar, 2014)

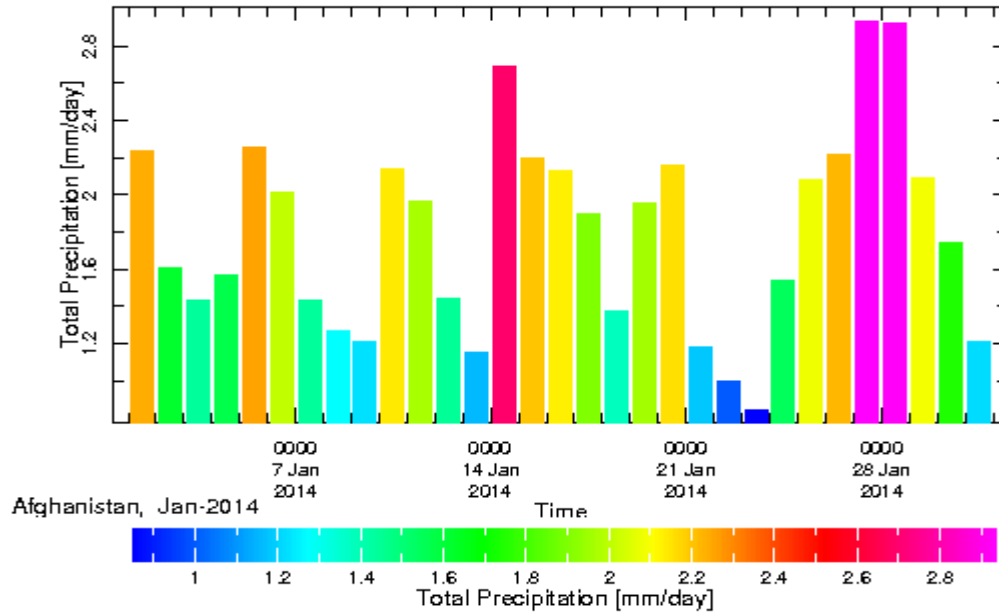


Seasonal weather outlook (Jan-Mar, 2014)

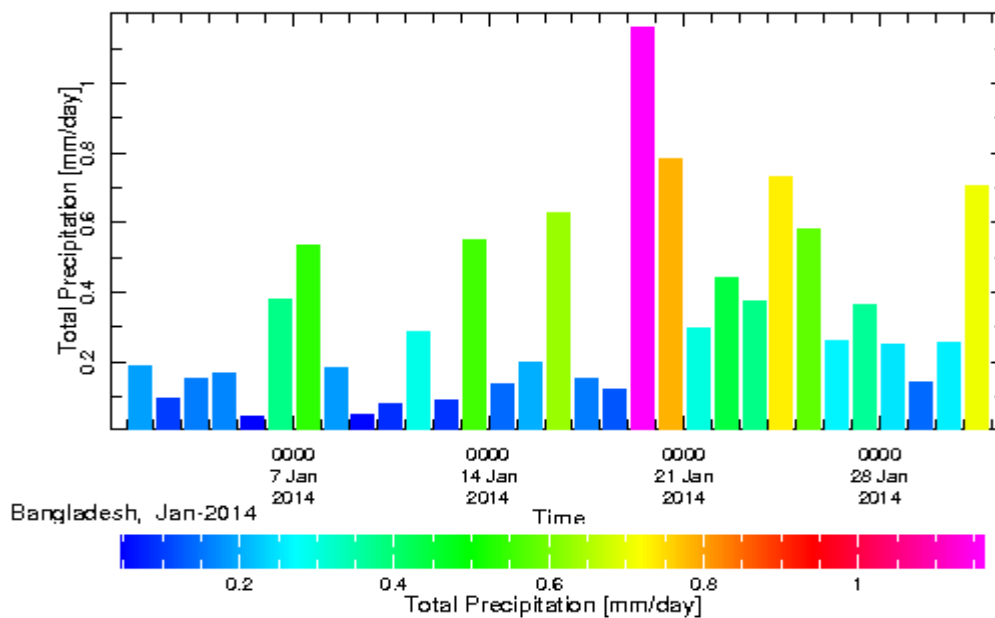
4. Daily country wise precipitation prediction for current month (January, 2014)

Note for daily weather prediction: 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.

Afghanistan

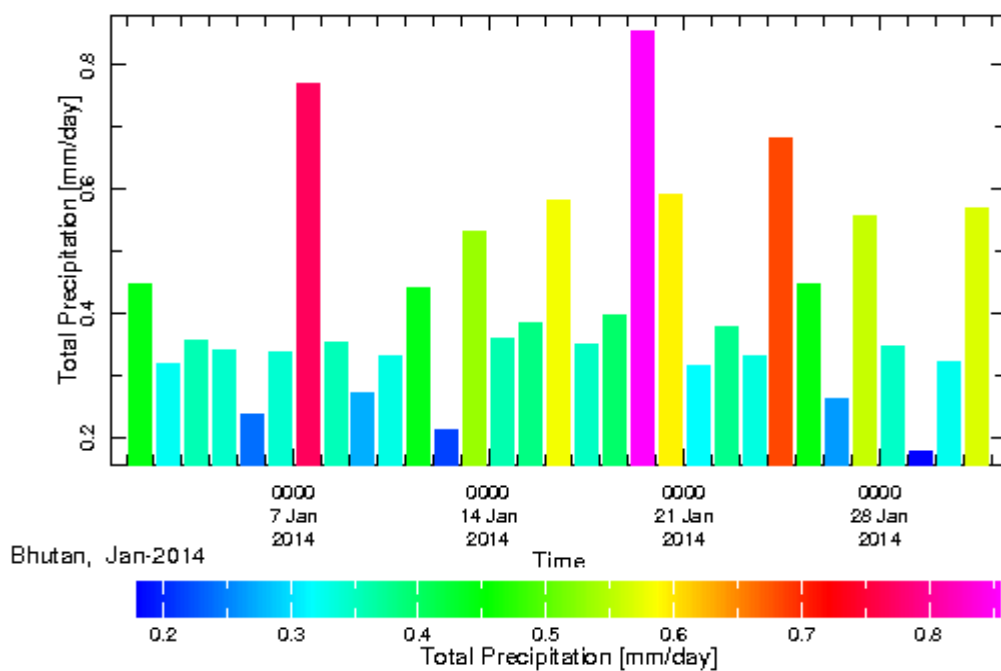


Bangladesh

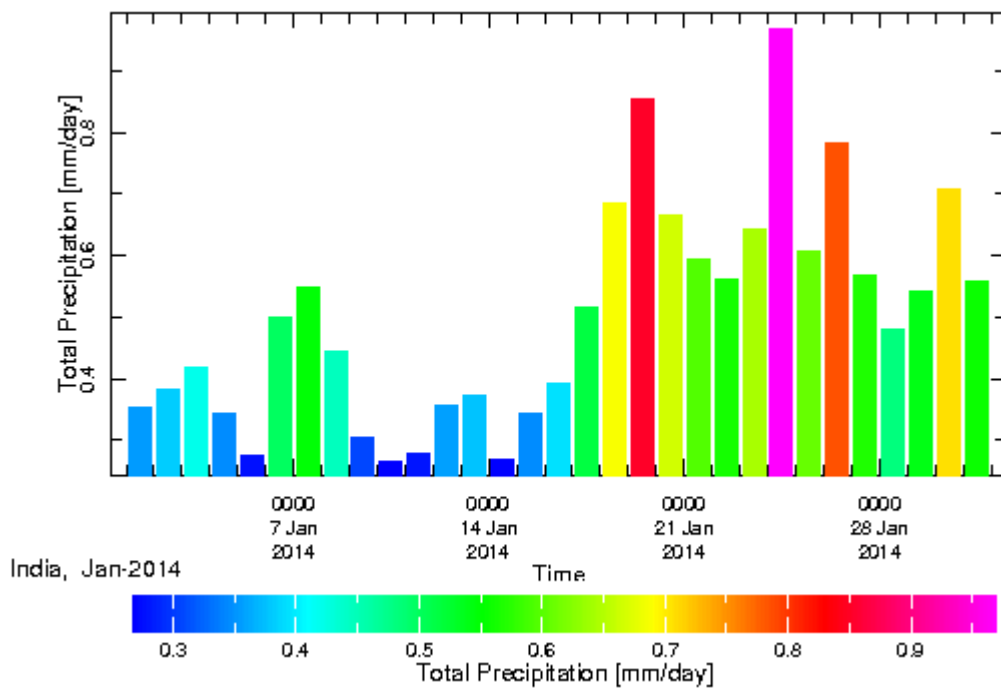


Seasonal weather outlook (Jan-Mar, 2014)

Bhutan

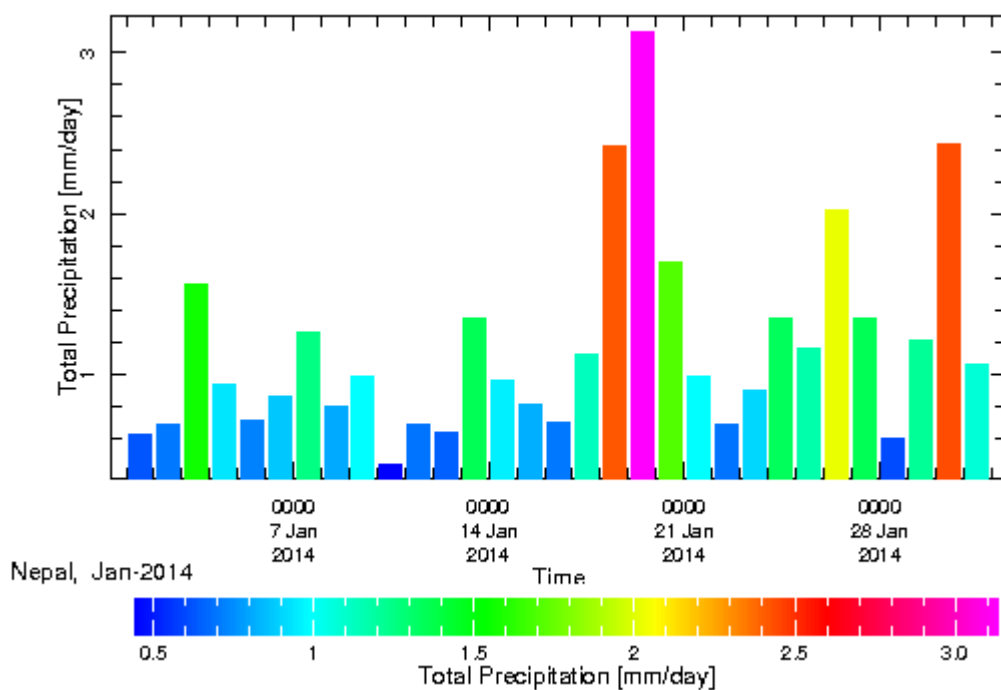


India

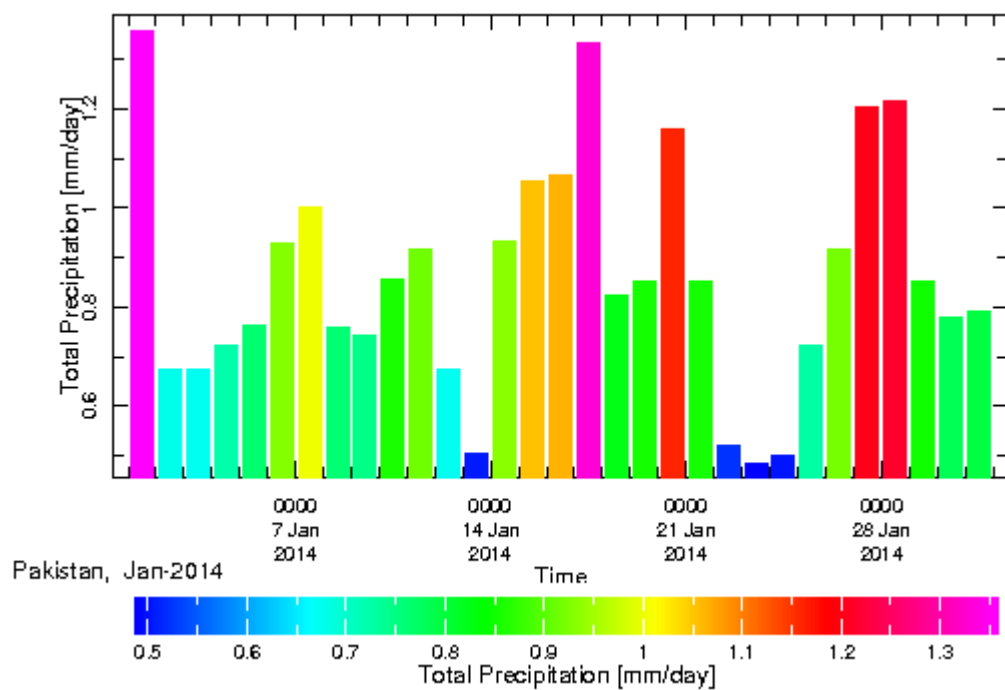


Seasonal weather outlook (Jan-Mar, 2014)

Nepal

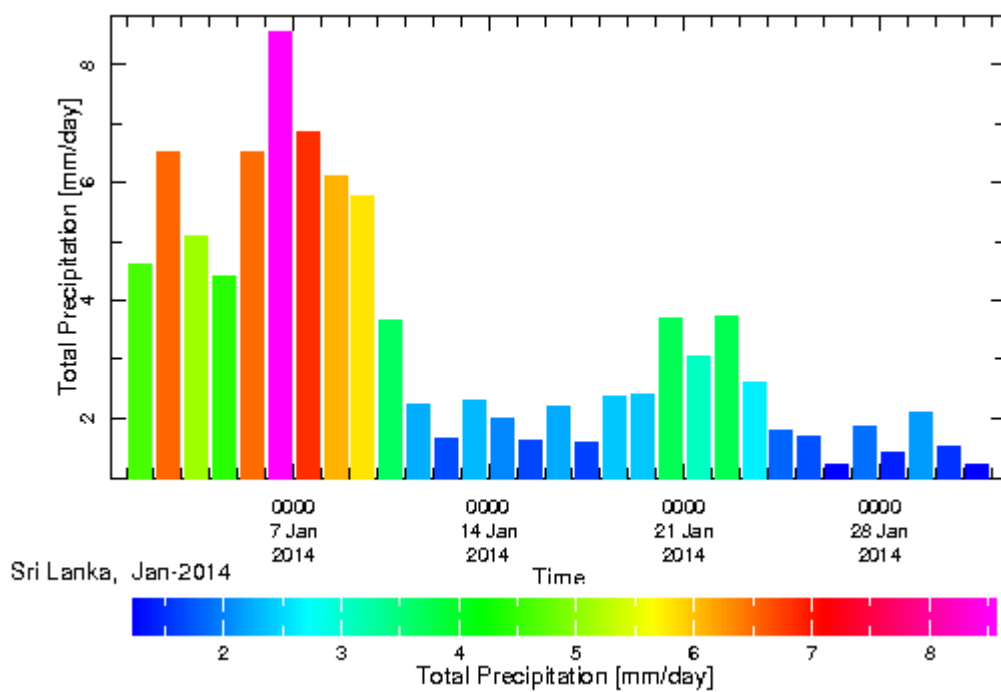


Pakistan



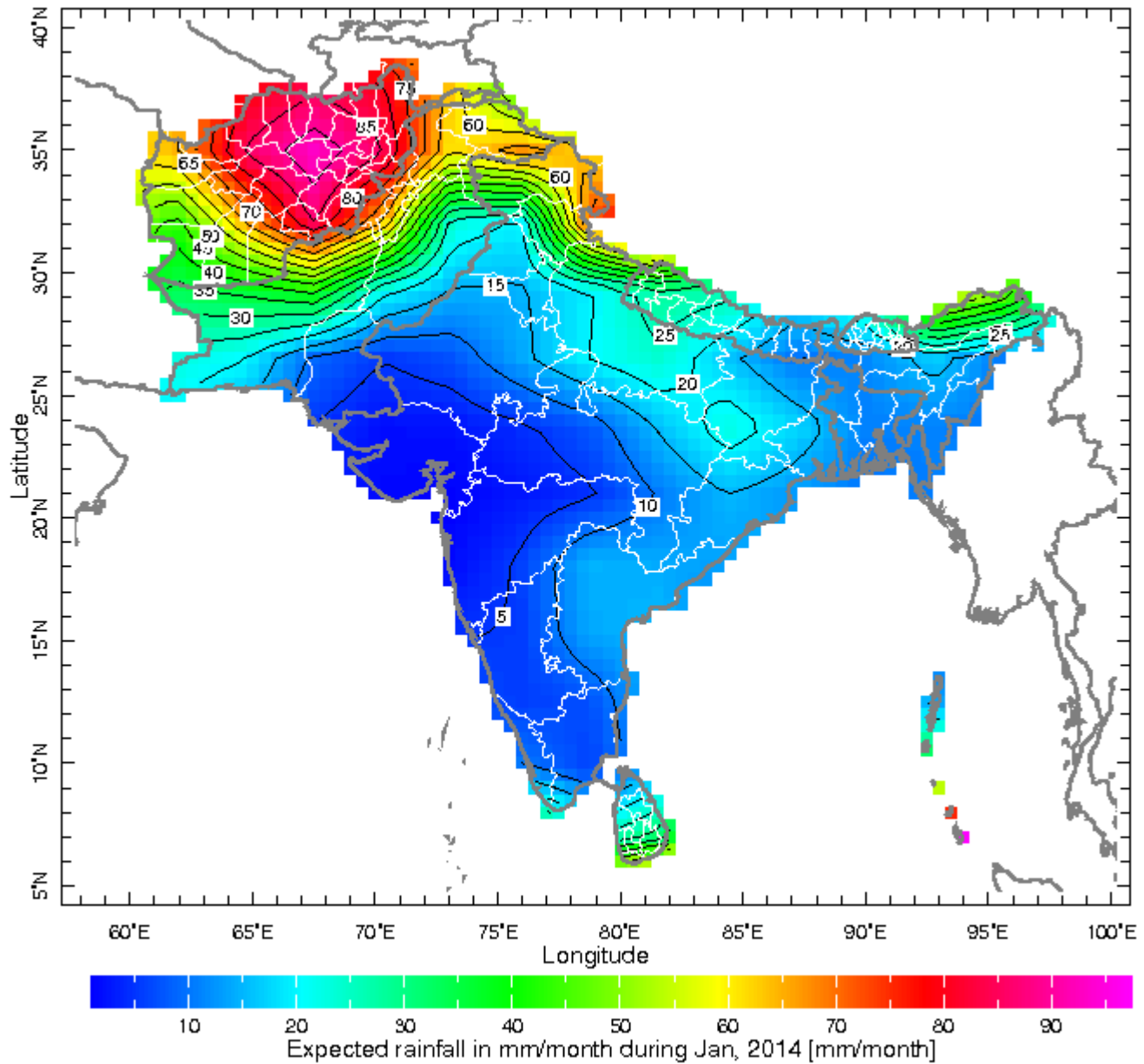
Seasonal weather outlook (Jan-Mar, 2014)

Sri Lanka



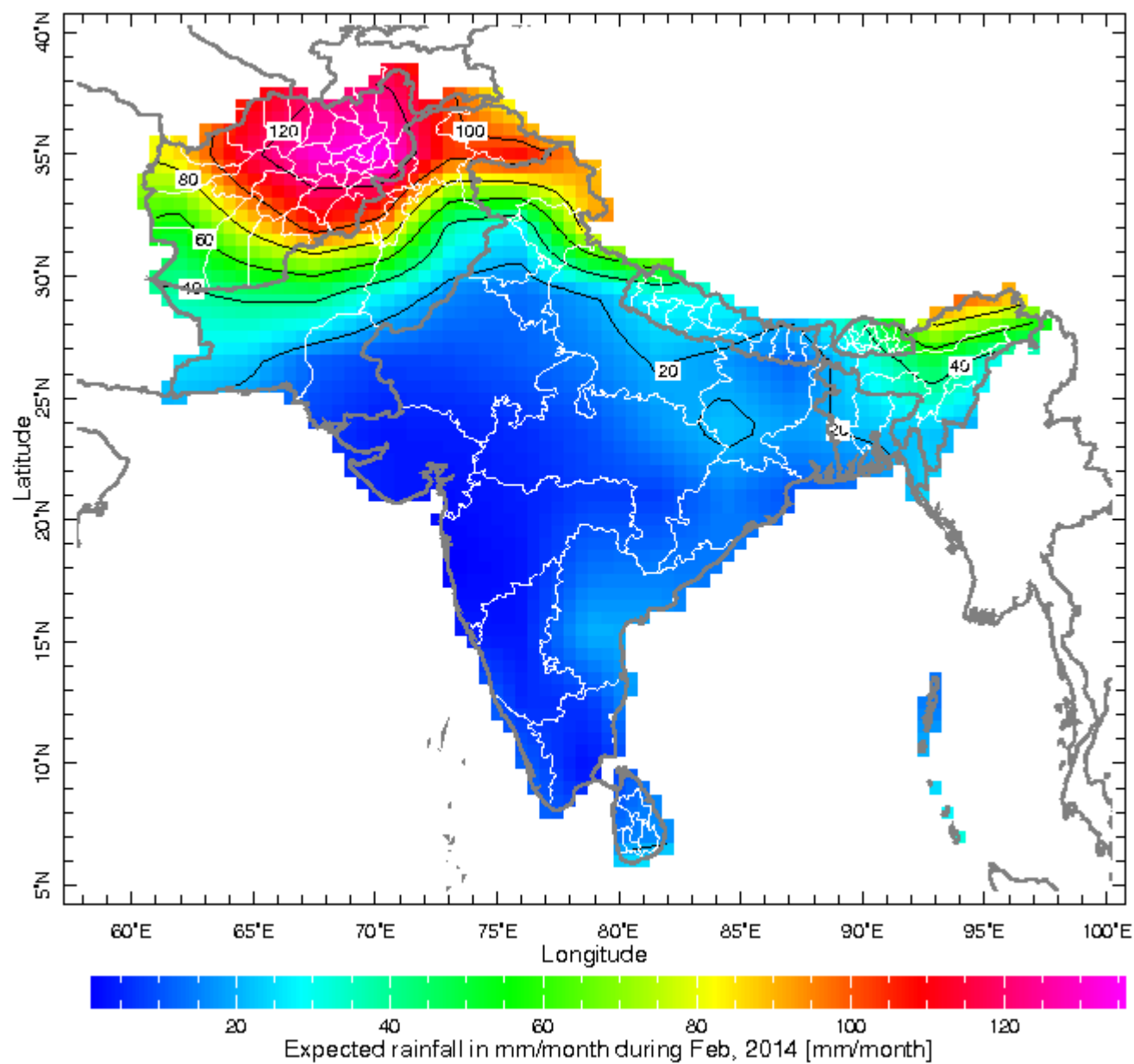
5. Spatial distribution of expected precipitation during coming season (GCM-ECHAM)

Jan, 2014



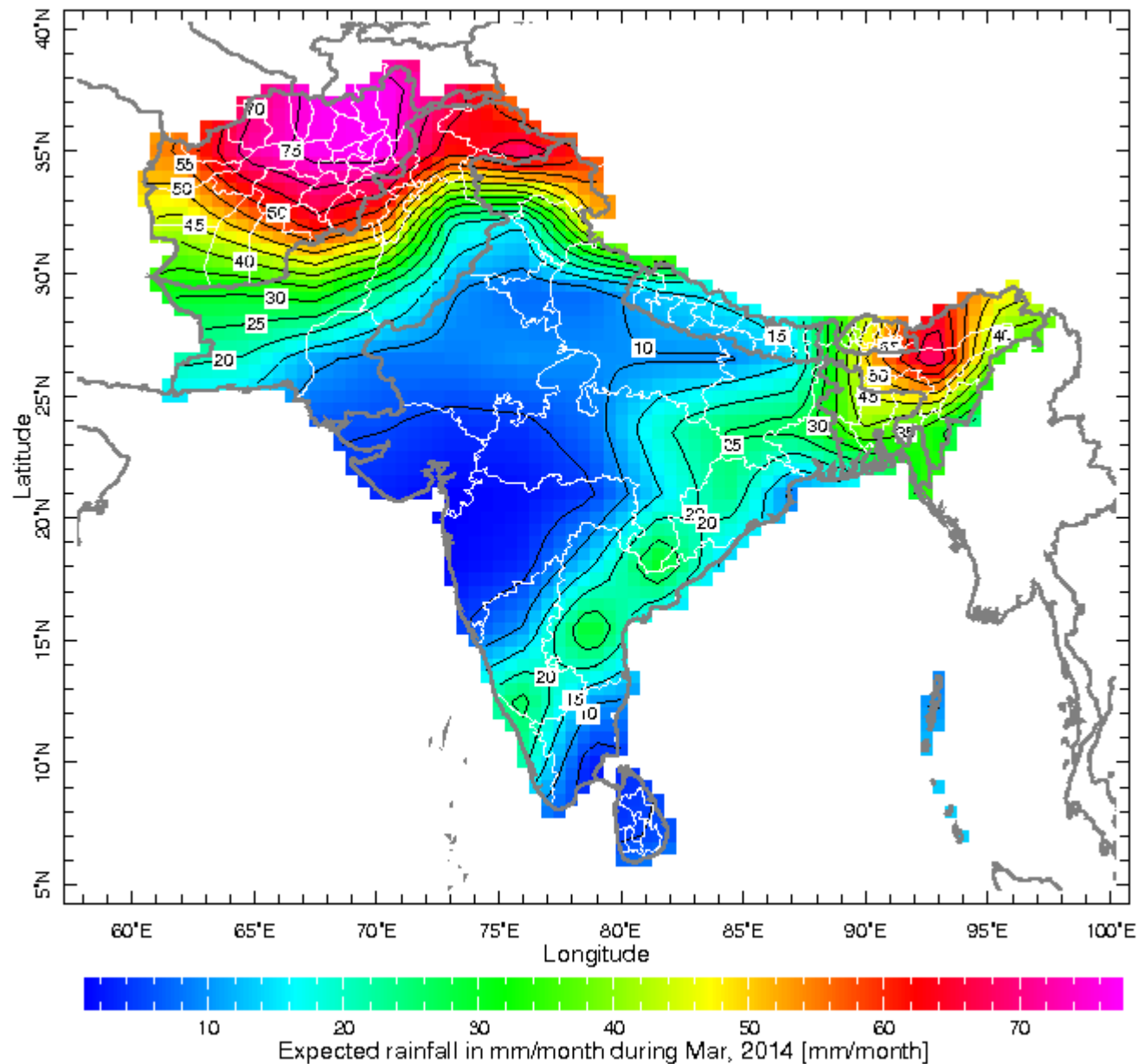
Seasonal weather outlook (Jan-Mar, 2014)

Feb, 2014



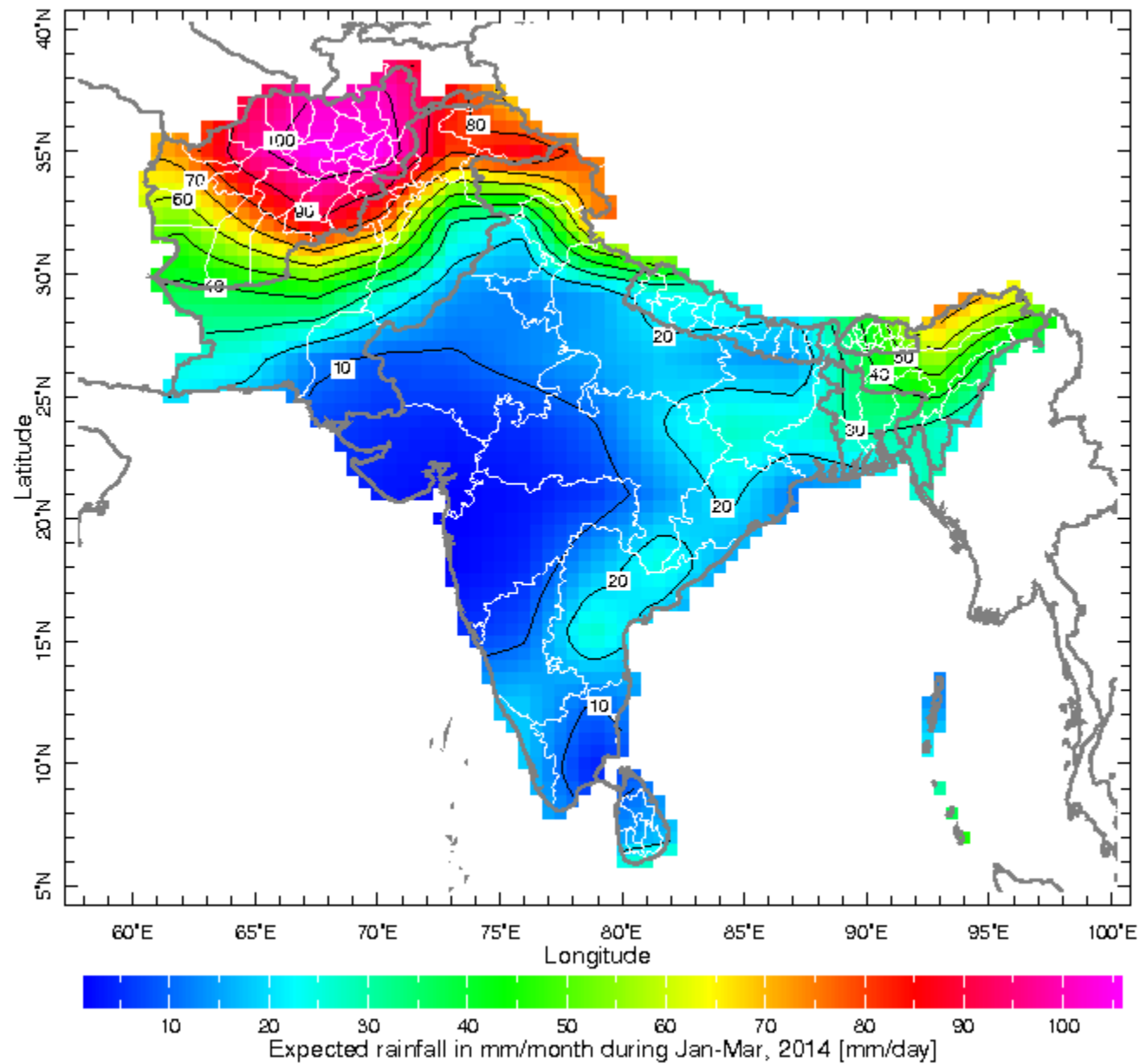
Seasonal weather outlook (Jan-Mar, 2014)

Mar, 2014



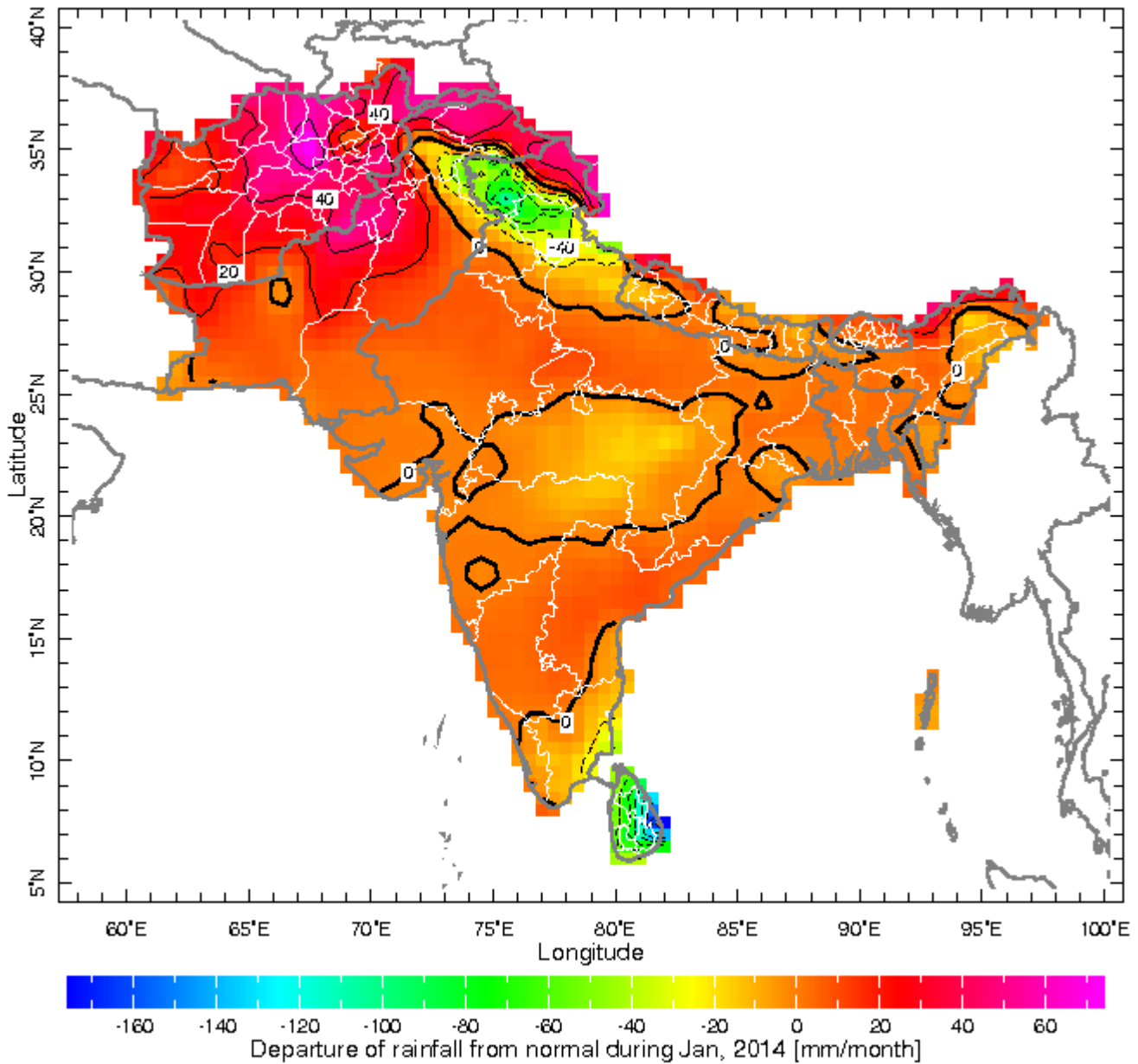
Seasonal weather outlook (Jan-Mar, 2014)

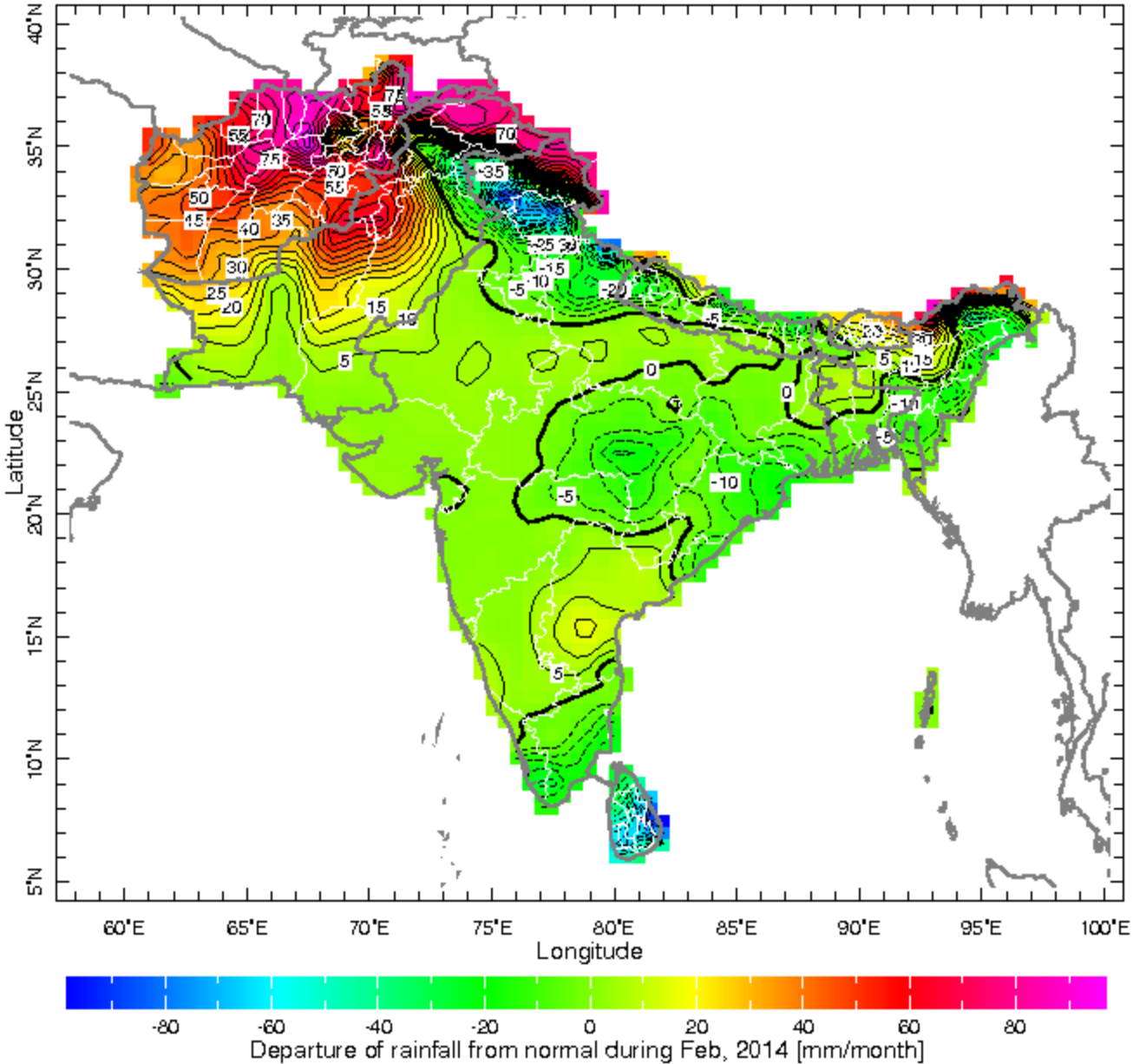
Jan-Mar, 2014



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

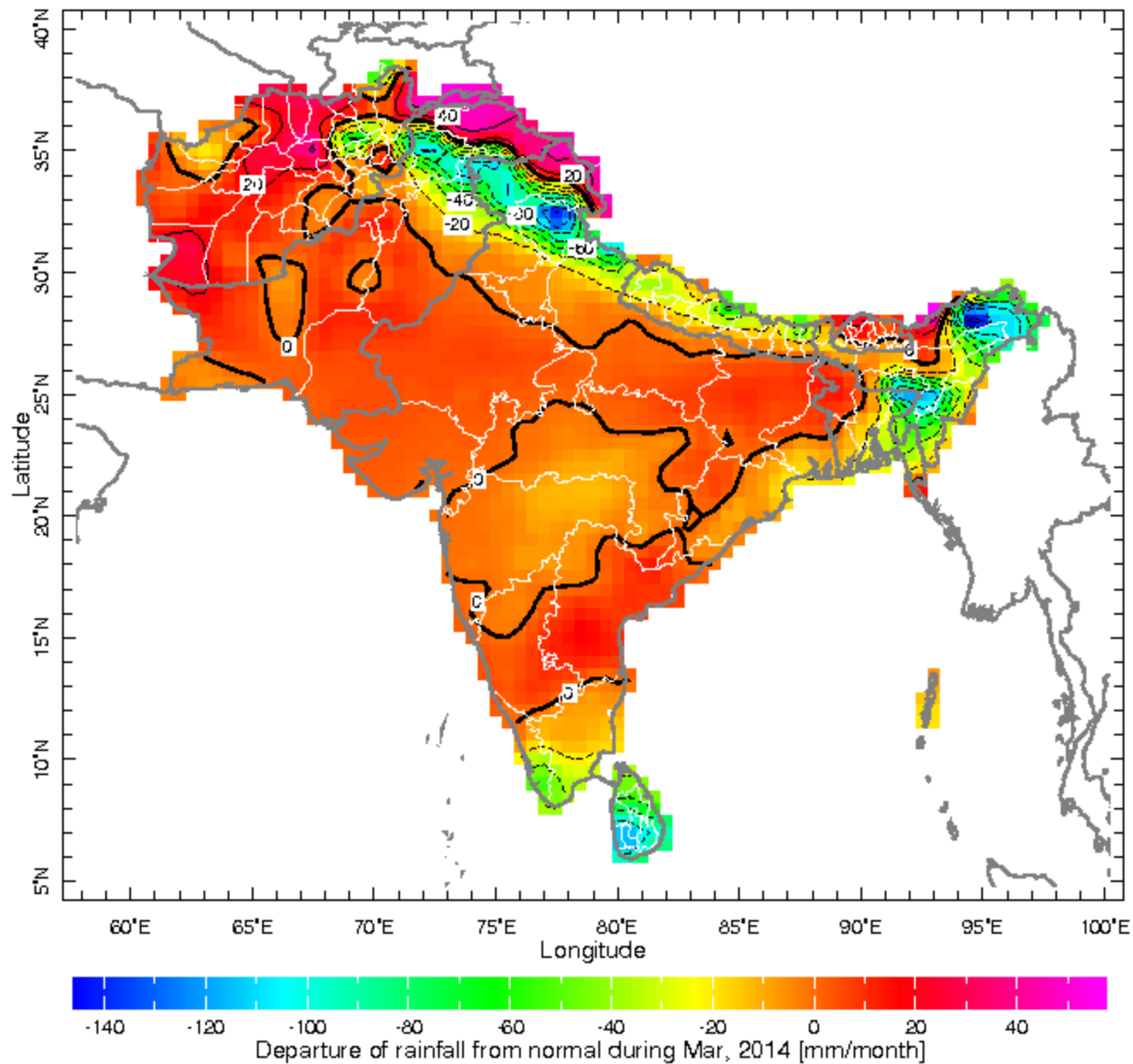
Jan, 2014



Feb, 2014

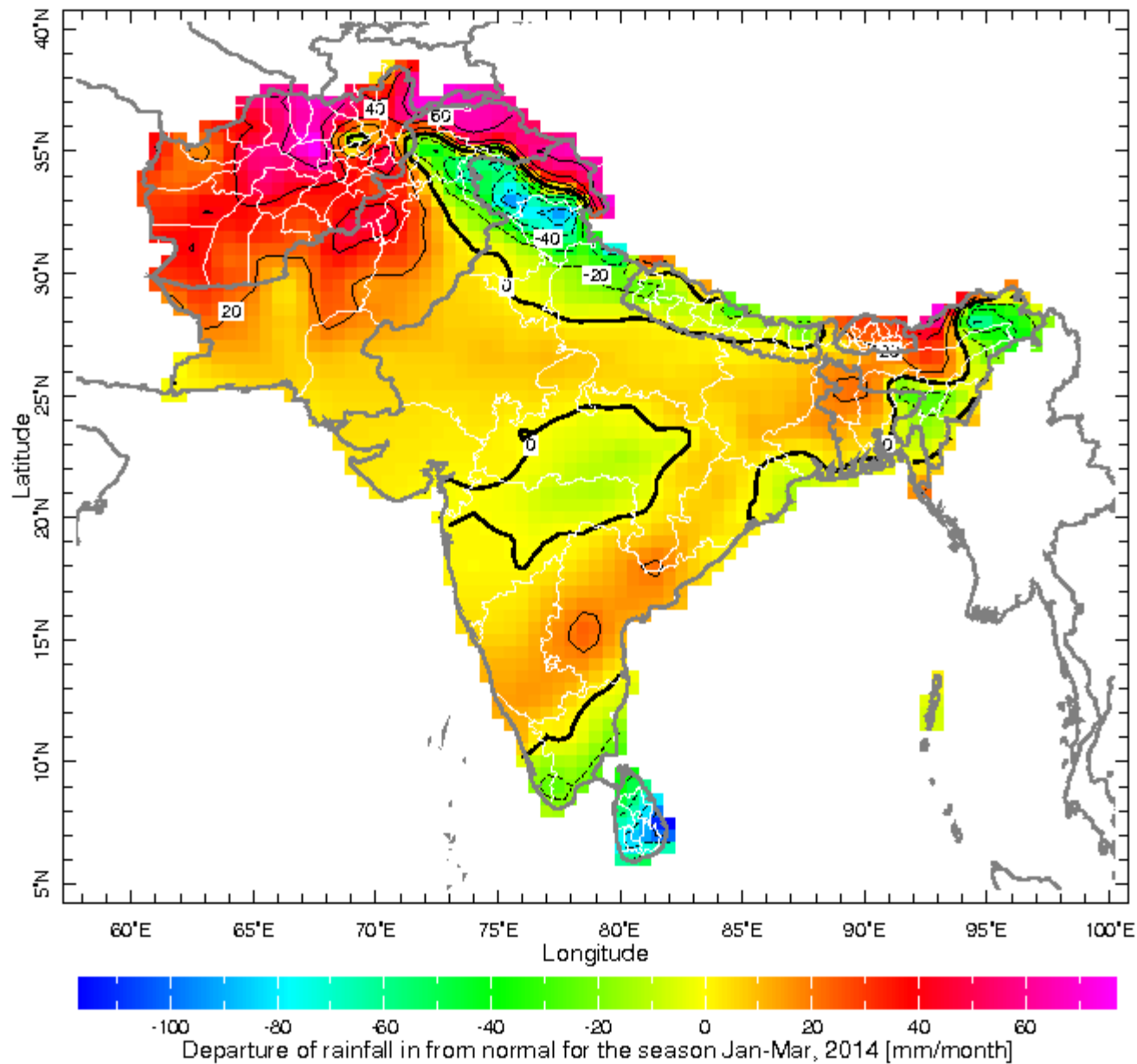
Seasonal weather outlook (Jan-Mar, 2014)

Mar, 2014



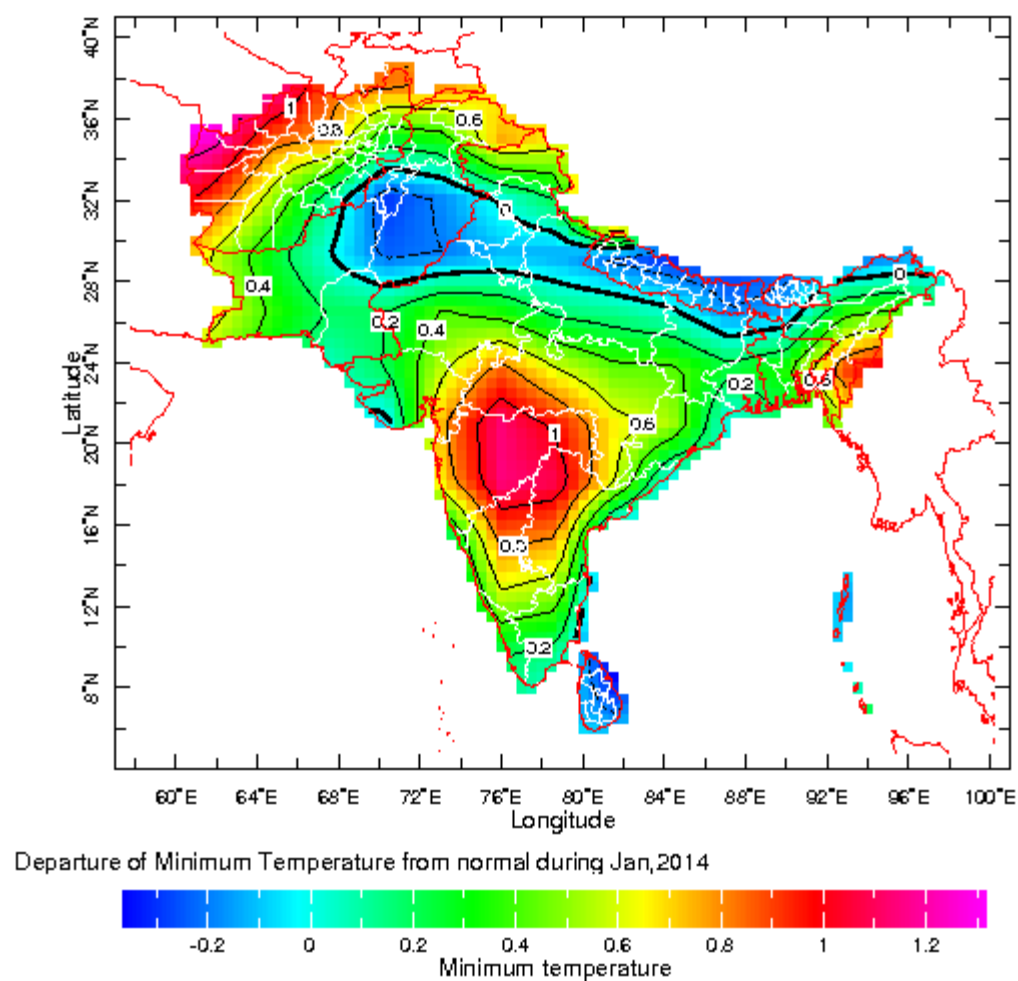
Seasonal weather outlook (Jan-Mar, 2014)

Jan-Mar, 2014



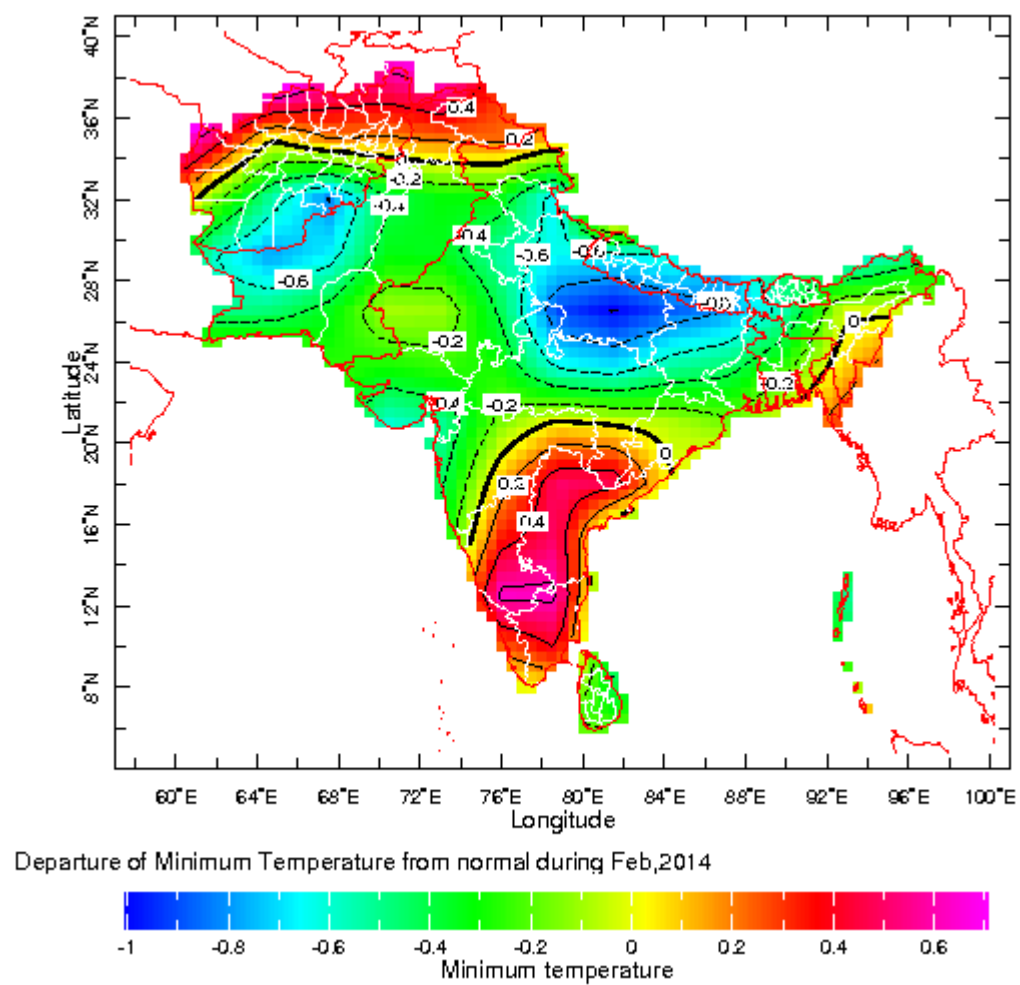
Seasonal weather outlook (Jan-Mar, 2014)

Departure of Minimum temperature from Normal during Jan, 2014



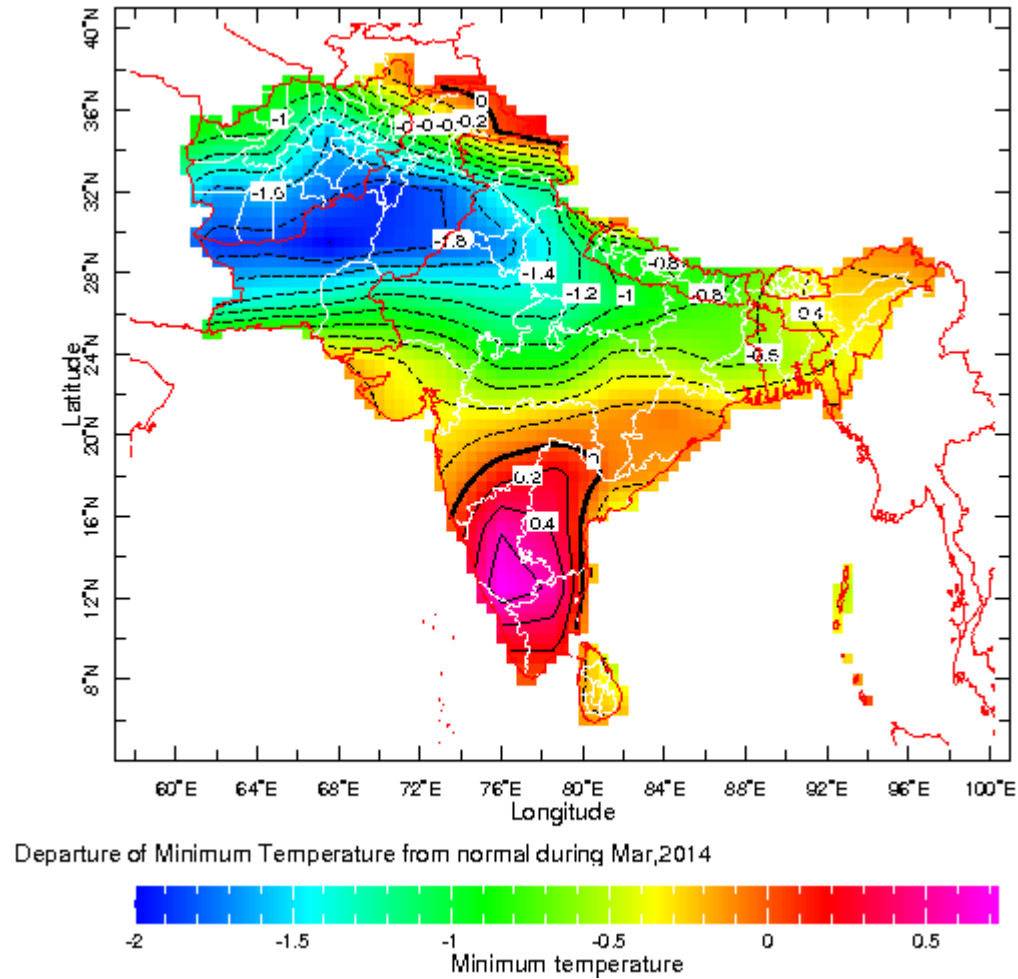
Seasonal weather outlook (Jan-Mar, 2014)

Feb, 2014



Seasonal weather outlook (Jan-Mar, 2014)

Mar, 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 for SAARC region will be issued 10th of every month with three months in advance weather outlook. Latest seasonal weather summary can be downloaded from NAMC web site mentioned below: <http://namc.pmd.gov.pk/>