

DC-7B Weather Map Analysis

Department of Geography

CARTOGRAPHY AND SURVEYING (PRACTICAL)

Unit - IV

Topic: Study and Interpretation of Two Weather Maps of India

Weather and Climate

- Weather is an atmospheric condition of an area at a particular time while the Climate is the average weather conditions (atmospheric condition) of an area (i.e. 35 years or above).
- Weather is highly variable. It can change in an hour or in a day. On the other hand, Climate has static characteristics (constant). It will not change in a day or hour.
- Weather is uncertain and it can only forecast for a short period of time e.g. daily, hourly or weekly. Climate has high degree of accuracy and it is similar year after year.
- The atmospheric conditions which make up the climate or weather of a place are known as elements of Climate or elements of Weather. The Chief Elements of Climate/ Weather are Temperature, Atmospheric Pressure, Humidity, Sunshine, Winds, Cloud or Cloudiness, Precipitation.

Weather Map

A Weather map represents the weather conditions of the whole earth or part of it at a given time. There are generally six weather elements shown on the weather map of any country or region. These elements are temperature, rainfall, atmospheric pressure, wind direction, wind velocity, cloud cover and relative humidity. Isobars and weather symbols are used to depict these six elements on the weather map. These details are recorded at different weather stations at specified time. Meteorological Departments of a country forecast weather conditions by evaluating these weather elements shown on a weather map. This weather map is used in predicting weather conditions for a day, a week or a month in advance, which helps in taking precautions and safety measures. Weather forecasts help farmers, fishermen and crew of ships. It also helps air flights in predicting atmospheric condition a few hours ahead.

Importance of Weather Map

- A weather map is used to show weather facts about a specific place at a given time. It can show temperature, cloud coverage, rain or snow, wind, air pressure, humidity, and the direction a weather system is moving or expected to move.

- Weather map uses isotherms (a line connecting locations with like temperatures). Isotherms can help forecasters and researchers identify weather fronts
- Isotach weather maps show the jet stream's location.
- One of the more popular weather maps is the surface weather analysis map. It includes isobars (line of constant or equal pressure) which show areas of low pressure or high pressure.
- On a weather map a front occurs when two different air masses meet. A cold front is marked by the color blue and a warm front is marked by the color red. The meeting points of the warm and cold fronts are generally where major weather changes in the weather will take place.
- A cold or warm front is represented on a weather map with a line of teeth pointing in the direction that it is moving.
- The place on a weather map where warm and cold fronts meet indicate where some of the most dangerous weather phenomena can occur such as tornadoes and hurricanes. When these fronts meet, and other factors are combined such as strong winds, very large storms can occur. This makes weather maps extremely important in weather forecasting.
- Weather maps make a meteorologist's job much easier because they provide real time data to keep weather patterns and changes accurately reported and observed.
- Weather maps make it easier for weather reporters to alert the public of potentially dangerous weather in the forecast.
- Weather maps are often used on television during weather reports to show the public what they can expect in the coming hours and days in regards to rain, snow, heat, cold, wind, and potentially big storms that may pose a threat.
- Data used for weather maps can be derived from a variety of sources including weather satellites, radars, observing real weather, online data and real time reporting from weather stations.

Daily Weather Report of India

Indian daily weather report is prepared twice a day at 8:30 and 17:30 hours by the Indian Metrological Department with its working headquarter at Pune, Maharashtra. The report is based on the information gathered from observations set up all over India. In order to collect metrological information, the whole country has been divided into six zones having nearly 350 observatories. The zones are named as New Delhi, Chennai, Kolkata, Mumbai, Nagpur and Guwahati. These observatories have been divided into five classes.

(1) First Class Observatories: The first class observatories record data of temperature, pressure, wind velocity, wind directions, humidity and rainfall with the help of self-recording instruments including thermograph, barograph, anemograph, hygrograph and sainograph. The observatories listed under first class send weather report twice a day.

(2) Second Class Observatories: They have eye recording instruments only. These include maximum and minimum thermometer, wet and dry bulb thermometer, barometer, wind-vane anemometer and rain gauge. They also send weather report twice a day.

(3) Third Class Observatories: They have all those eye recording instruments which are found in second class observatories. The only difference is that they send weather report only once a day.

(4) Fourth Class Observatories: They have only temperature and rainfall recording instruments and do not send information daily.

(5) Fifth Class Observations: They send information about the amount of rainfall recorded during the last 24 hours. This information is being sent every day at 8 hours.

The Indian daily weather map is a political map of India, which also includes Pakistan, Afghanistan, part of China, Nepal, Bhutan, Myanmar and Sri Lanka with weather symbols indicating recorded weather data, isobars and keys for symbols.

Study and Interpretation of Weather Maps of India [EXAMPLES]

Indian Daily Weather Report

Weather Map at 8:30 Hours I.S.T., Friday, 6 January, 1995 (16 Pausa, 1916 Saka)

Introduction

The given weather map represents the weather conditions prevailing in India and her neighboring countries (including Pakistan, Sri Lanka, Bangladesh, Nepal, Bhutan and Myanmar) at 8:30 hours I.S.T. (3:00 hours GMT). There are three maps and each map show different atmospheric condition. The main weather map at the top shows atmospheric pressure, wind direction, wind velocity, sea condition, cloud amount, precipitation and other related weather phenomenon. Two maps are shown at the bottom of the main maps which show the departure of temperature from the normal (left side map – departure of maximum temperature from normal; right side map - departure of minimum temperature from normal).

(2) Atmospheric Pressure

The weather map shows that the atmospheric pressure increases from south to north. It increases from 1012 mb in Arabian Sea and Bay of Bengal to 1024 mb in north-east India, Myanmar and Pakistan and to 1028 mb in Afghanistan.

- a. Location of Bar High:** Two areas of high atmospheric pressure are well marked and are indicated by the letter 'H' (high pressure). One is in N-W where isobar of 1028 mb runs parallel to the boundary between Pakistan and Afghanistan. Another area of high pressure is marked by the isobar of 1024 mb running in N-W to S-E direction from N-E part of India across Myanmar.

- b. Location of Bar Low:** Two areas of low pressure are marked by the letter 'L' and surrounded by the isobar of 1012 mb. One of them is in the south Arabian Sea to the west Lakshadweep Islands. The other is in the southern part of Bay of Bengal to the east of Sri Lanka.
- c. Trend of Isobars:** Isobars is running in almost east to west direction, more or less parallel to one another, in Arabian Sea and Bay of Bengal. But their direction is changed from n-w to s-e in the peninsular India. The sharp change in the direction of isobars indicates that there is sudden change in the pressure as we move from sea to land.
- d. Pressure Gradient:** Isobars are widely located between each other which indicate that pressure gradient is gentle throughout the area except a small position in Kerala. The pressure gradient is very gentle throughout the Indo-Gangetic Plain and most of the Himalayan region where not even a single isobar is seen.

(3) Wind direction and Wind Velocity

Most part the wind blow in the east to west direction. But along the Kerala coast, the winds flow from west to east. The wind velocity is low due to gentle pressure gradient and widely spaced isobars. It varies from 5 to 10 knots (exceeds 10 knots only at few places).

(4) Sky Condition

- a. Cloud Cover:** In most parts of Punjab, Haryana, H.P, J&K, Rajasthan, Gujarat, Western U.P. and N-E Sates, sky is almost clear of cloud except at Srinagar where sky is overcast. In the remaining parts the cloud cover varies from 1/8th to 7/8th.
- b. Nature of Cloud:** High clouds prevail over Chennai and low or medium over Bihar and U.P.

(5) Precipitation

It is winter and dry season and no rainfall has been reported from any part of the country.

(6) Sea Condition

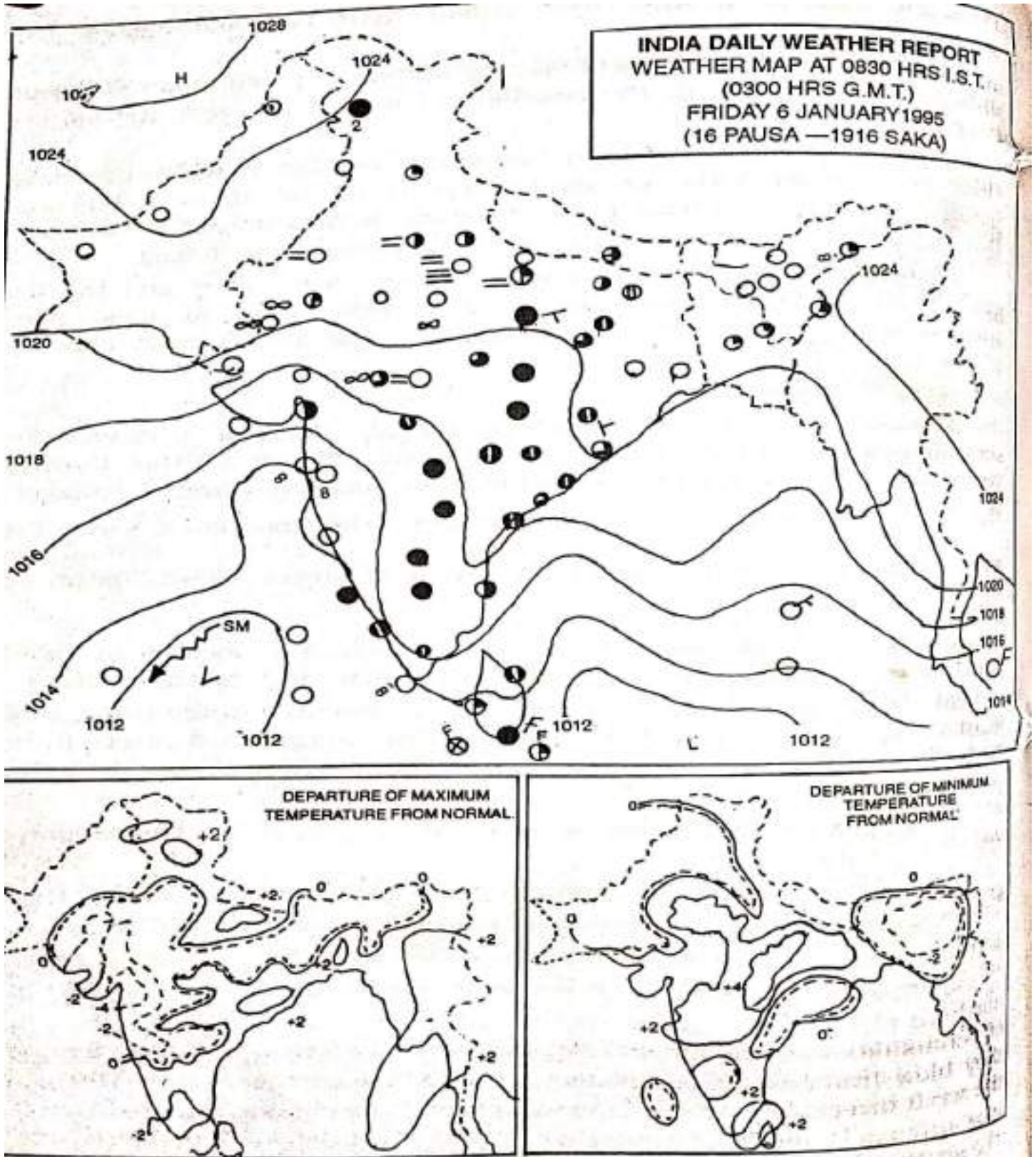
Smooth to moderate sea condition due to gentle winds over the sea. Nowhere, the sea is reported to be rough.

(7) Departure of Maximum Temperature from Normal

Maximum temperature is normal in most parts of the peninsular India and the northern plain. The main line of normal temperature runs across large parts of the Karnataka, A.P., South M.P., Chhattisgarh, Odisha, West Bengal, Bangladesh and extends up to N-E extremity of Arunachal Pradesh. Another line of normal temperature starts from north of Nepal and enters in Pakistan to terminate at Karachi. Maximum temperature is +2°C above normal in Kerala, T.N., Odisha, Bangladesh, U.P., H.P., and large part of Bay of Bengal over A& N group of islands. It is +4°C above normal in H.P. The maximum temperature is -2°C to -4°C below normal in Maharashtra and Gujarat.

(8) Departure of Minimum Temperature from Normal

Minimum temperature is normal in large parts of north-eastern India and adjoining parts of Myanmar, Odisha, A.P., T.N., Gujarat, Rajasthan, U.P., H.P., J& K and parts of Pakistan. A loop of normal temperature is seen near Lakshadweep Island. It is +2°C to 4 °C above normal in large parts of central India, Karnataka, Kerala, T.N., and n-w parts of Sri Lanka.



Weather Map at 8:30 hours I.S.T., Thursday, 20th July, 1995 (29 Asadha, 1917 Saka)

Introduction

The present weather map shows the weather conditions prevailing in India and her neighboring countries (Pakistan, Sri Lanka, Bangladesh, Myanmar, Nepal and Bhutan). The weather conditions pertain to 08:30 hours I.S.T. (0300 Hours GMT) on Thursday, 20th July, 1995 (20 Asadha, 1917 Saka). The main weather map at the top shows atmospheric pressure, wind direction, wind velocity, sea condition, cloud amount, precipitation and other related weather phenomenon. Two maps are shown at the bottom of the main maps which show the departure of temperature from the normal (left side map – departure of maximum temperature from normal; right side map - departure of minimum temperature from normal).

(2) Atmospheric Pressure

The pressure is low in the western extremity of Pakistan and rises in all directions from there. It rises sharply from 996 mb in Gujarat and Rajasthan to 1010 mb near Andaman and Nicobar Islands and Myanmar.

- a. **Location of Bar High:** One area of high pressure is shown by letter 'H' and is marked by 1002 mb isobar. It spreads over northern parts of J&K, Pakistan and over large area of Afghanistan. Another area of high pressure is seen in the extreme south-eastern corner of the area. This is marked by 1010 mb isobar which runs along the A& N islands. It is also shown by letter 'H'.
- b. **Location of Bar Low:** A well-marked low pressure area is found in the western extremity of Pakistan. This is marked by letter 'L' and is surrounded by 992 mb isobar. Another low pressure area is seen in the north of Gulf of Katch. It covers a small part of Gujarat and Sindh of Pakistan.
- c. **Pressure Gradient:** Isobars are located close to each other which mean that pressure gradient is very steep. However, pressure gradient is comparatively gentle in low pressure area (especially in M.P. where distance between isobars of 996 mb and 998 mb is sufficiently long).

(3) Wind Direction and Wind Velocity

July is the month of summer monsoon when winds blow from sea to land. Keeping in tune with this tradition, winds blow from west to east almost all along the west coast and at the few places in the Arabian Sea. They maintain this direction for most parts of eastern coast also. In the northern plain, the winds are influenced by Himalayan orography and they blow from east to west. In the central part of peninsular India the winds blow in easterly or north-easterly direction. Winds blow with sufficiently high velocity because the pressure gradient is steep. Wind velocity varies from 5 to 10 Knots but somewhere it exceeds 50 Knots.

(4) Sky Condition

- a. **Cloud Cover:** Since July is the month of summer monsoon season i.e. rainy season, it is natural that sky is overcast with cloud especially in the peninsular India which is closer to sea. However, in the

northern parts of the country, the cloud cover varies from 1/2 to 7/8th. Nowhere, we find that the sky is overcast throughout the Ganga –Satluj Plain and in the Himalayan region.

b. Nature of the Cloud: No specific information is given on the map regarding the nature of the cloud.

(5) Precipitation

As expected, wide- spread rainfall has been recorded throughout the peninsular India. Heavy rainfall has been reported from a number of places (e.g. Pune and Sunderbans have received 24 cm and 22 cm rainfall respectively). The other stations with reasonably good amount of rainfall are Dwarka (9 cm), Pendra in M.P., Nagpur and Karachi (7 cm each) and Jabalpur (6 cm). Several places have received one-three cm rainfall during the past 24 hours.

(6) Sea Conditions

No information regarding the sea condition is available in the map.

(7) Departure of Maximum Temperature from Normal

Maximum temperature is normal in T.N. and all along western coast (north of Kerala), Pakistan, Afghanistan, Jammu and Kashmir, U.P., Bihar, W.B., and Odisha. It is normal in parts of Bay of Bengal near A&N islands and in the Malaysian Peninsula. It is -2°C to -4°C below normal in most part of the plateau region. Along the western border of Pakistan, the departure of maximum temperature from normal is as much as -10°C. Maximum temperature is +2°C above normal in Sri Lanka, in and near the coast of Kerala and large parts of north eastern states.

(7) Departure of Minimum Temperature from Normal

Minimum Temperature is normal in most parts of the country, in Pakistan and also in the Bay of Bengal. It is -2°C below normal in parts of M.P, Chhattisgarh and Odisha. It is +2°C in H.P., J&K and neighboring areas of Pakistan.

LOW in easterly or north-easterly

INDIA DAILY WEATHER REPORT
WEATHER MAP AT 08.30 HRS I.S.T.
(0300 HRS G.M.T.)
Thursday, 20 July 1995 (29 Asadha, 1917 Saka)

