



GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
INDIA METEOROLOGICAL DEPARTMENT

Upper Air Climatological Atlas of India

ISSUED BY
UPPER AIR SECTION
OFFICE OF THE
ADDITIONAL DIRECTOR GENERAL
OF METEOROLOGY (RESEARCH)
INDIA METEOROLOGICAL DEPARTMENT
PUNE - 411 005



GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
INDIA METEOROLOGICAL DEPARTMENT

Upper Air Climatological Atlas of India

Issued by
UPPER AIR CLIMATOLOGICAL SECTION
Additional Director General of Meteorology (Research)
INDIA METEOROLOGICAL DEPARTMENT
Pune

P R E F A C E

Upper Air Climatological Atlas gives at a glance information of spatial distribution of weather parameters (Height/Pressure, Temperature and Upper Winds etc.) over India. Last time, Upper Air Atlas was published in 1972, utilizing data for the period 1951 to 1965. This publication “Upper air Climatological Atlas of India” has been updated utilizing Upper Air data for the period 1971 to 2000.

This publication “Upper air Climatological Atlas of India” contains analyzed charts (0000 and 1200 UTC) on Height(gpm), Temperature($^{\circ}$ C) and Upper Winds for six standard Pressure levels 850, 700, 500, 300, 200 and 100 hPa for four representative months of the season (January, April, July and October). Besides, it contains Height / Pressure of Freezing level. The upper wind chart exhibits Streamlines, Cyclonic(C) and Anticyclonic(A) circulations, Isotachs and Jet Streams of the season.

The contours of Height for all representative months from 850 to 500 hPa have been analyzed for the interval of 20 gpm except 40 gpm at 500 hPa of January and from 300 to 100 hPa for the interval of 80 gpm except 40 gpm at 300 hPa of July. The contours of height have been analyzed for freezing level with the interval of 250 gpm except 500 gpm of January. The isobars for all representative months for freezing level have been analyzed with the interval of 20 hPa except 40 hPa of January. The isotherms for all representative months from 850 to 200 hPa have been analyzed for the interval of 2 $^{\circ}$ C except 5 $^{\circ}$ C at 300 hPa of January and for 100 hPa the isotherms have been analyzed for the interval of 5 $^{\circ}$ C except 2 $^{\circ}$ C of July.

This publication has been prepared by the Upper Air Section, O/o ADGM(R) under the supervision of Shri. I.J. Verma, Scientist-E and the overall guidance of Dr. Krishnaiya, LACD of ADGM(R) and Shri. B. Mukhopadhyay, DDGM(C). The entire work has been done by Shri. N. D. Sabale,

Shri. R. V. Ghoge and Shri. S. H. Bhagwat. The help rendered by the staff of Rota Print unit in printing of this publication and the help of Shri. A. Philipose during the preparation of this Atlas is also acknowledged.

I appreciate the efforts of entire team of officers and staff members of Upper Air Section, O/o ADGM(R) for bringing out this useful publication. It is hoped that the information generated would prove to be useful to the scientific community, operational, research and educational institutes and many other individual users.

New Delhi
2013

Dr. L.S. Rathore
Director General of Meteorology

LOCATOR MAP OF RSRW STATIONS IN INDIA



C O N T E N T S

Observation Time 0530 IST

| SN. | MONTH | CHARTS | PAGE NO. |
|-------------------------|--------------|-------------------------|-----------------|
| 1. | JANUARY | 850 hPa Height | 1 |
| | | 850 hPa Temperature | 2 |
| | | 700 hPa Height | 3 |
| | | 700 hPa Temperature | 4 |
| | | 500 hPa Height | 5 |
| | | 500 hPa Temperature | 6 |
| | | 300 hPa Height | 7 |
| | | 300 hPa Temperature | 8 |
| | | 200 hPa Height | 9 |
| | | 200 hPa Temperature | 10 |
| | | 100 hPa Height | 11 |
| | | 100 hPa Temperature | 12 |
| | | Freezing level Height | 13 |
| Freezing level Pressure | 14 | | |
| 2. | APRIL | 850 hPa Height | 15 |
| | | 850 hPa Temperature | 16 |
| | | 700 hPa Height | 17 |
| | | 700 hPa Temperature | 18 |
| | | 500 hPa Height | 19 |
| | | 500 hPa Temperature | 20 |
| | | 300 hPa Height | 21 |
| | | 300 hPa Temperature | 22 |
| | | 200 hPa Height | 23 |
| | | 200 hPa Temperature | 24 |
| | | 100 hPa Height | 25 |
| | | 100 hPa Temperature | 26 |
| | | Freezing level Height | 27 |
| | | Freezing level Pressure | 28 |

C O N T E N T S

Observation Time 0530 IST

| SN. | MONTH | CHARTS | PAGE NO. |
|-------------------------|--------------|-------------------------|-----------------|
| 3. | JULY | 850 hPa Height | 29 |
| | | 850 hPa Temperature | 30 |
| | | 700 hPa Height | 31 |
| | | 700 hPa Temperature | 32 |
| | | 500 hPa Height | 33 |
| | | 500 hPa Temperature | 34 |
| | | 300 hPa Height | 35 |
| | | 300 hPa Temperature | 36 |
| | | 200 hPa Height | 37 |
| | | 200 hPa Temperature | 38 |
| | | 100 hPa Height | 39 |
| | | 100 hPa Temperature | 40 |
| Freezing level Height | 41 | | |
| Freezing level Pressure | 42 | | |
| 4. | OCTOBER | 850 hPa Height | 43 |
| | | 850 hPa Temperature | 44 |
| | | 700 hPa Height | 45 |
| | | 700 hPa Temperature | 46 |
| | | 500 hPa Height | 47 |
| | | 500 hPa Temperature | 48 |
| | | 300 hPa Height | 49 |
| | | 300 hPa Temperature | 50 |
| | | 200 hPa Height | 51 |
| | | 200 hPa Temperature | 52 |
| | | 100 hPa Height | 53 |
| | | 100 hPa Temperature | 54 |
| | | Freezing level Height | 55 |
| | | Freezing level Pressure | 56 |

C O N T E N T S

Observation Time 1730 IST

| SN. | MONTH | CHARTS | PAGE NO. |
|-------------------------|--------------|-----------------------|-----------------|
| 1. | JANUARY | 850 hPa Height | 57 |
| | | 850 hPa Temperature | 58 |
| | | 700 hPa Height | 59 |
| | | 700 hPa Temperature | 60 |
| | | 500 hPa Height | 61 |
| | | 500 hPa Temperature | 62 |
| | | 300 hPa Height | 63 |
| | | 300 hPa Temperature | 64 |
| | | 200 hPa Height | 65 |
| | | 200 hPa Temperature | 66 |
| | | 100 hPa Height | 67 |
| | | 100 hPa Temperature | 68 |
| | | Freezing level Height | 69 |
| Freezing level Pressure | 70 | | |
| 2. | APRIL | 850 hPa Height | 71 |
| | | 850 hPa Temperature | 72 |
| | | 700 hPa Height | 73 |
| | | 700 hPa Temperature | 74 |
| | | 500 hPa Height | 75 |
| | | 500 hPa Temperature | 76 |
| | | 300 hPa Height | 77 |
| | | 300 hPa Temperature | 78 |
| | | 200 hPa Height | 79 |
| | | 200 hPa Temperature | 80 |
| | | 100 hPa Height | 81 |
| | | 100 hPa Temperature | 82 |
| | | Freezing level Height | 83 |
| Freezing level Pressure | 84 | | |

C O N T E N T S

Observation Time 1730 IST

| SN. | MONTH | CHARTS | PAGE NO. |
|-------------------------|--------------|---------------------|-----------------|
| 3. | JULY | 850 hPa Height | 85 |
| | | 850 hPa Temperature | 86 |
| | | 700 hPa Height | 87 |
| | | 700 hPa Temperature | 88 |
| | | 500 hPa Height | 89 |
| | | 500 hPa Temperature | 90 |
| | | 300 hPa Height | 91 |
| | | 300 hPa Temperature | 92 |
| | | 200 hPa Height | 93 |
| | | 200 hPa Temperature | 94 |
| | | 100 hPa Height | 95 |
| | | 100 hPa Temperature | 96 |
| Freezing level Height | 97 | | |
| Freezing level Pressure | 98 | | |
| 4. | OCTOBER | 850 hPa Height | 99 |
| | | 850 hPa Temperature | 100 |
| | | 700 hPa Height | 101 |
| | | 700 hPa Temperature | 102 |
| | | 500 hPa Height | 103 |
| | | 500 hPa Temperature | 104 |
| | | 300 hPa Height | 105 |
| | | 300 hPa Temperature | 106 |
| | | 200 hPa Height | 107 |
| | | 200 hPa Temperature | 108 |
| | | 100 hPa Height | 109 |
| | | 100 hPa Temperature | 110 |
| Freezing level Height | 111 | | |
| Freezing level Pressure | 112 | | |

C O N T E N T S

Observation Time 0530 IST

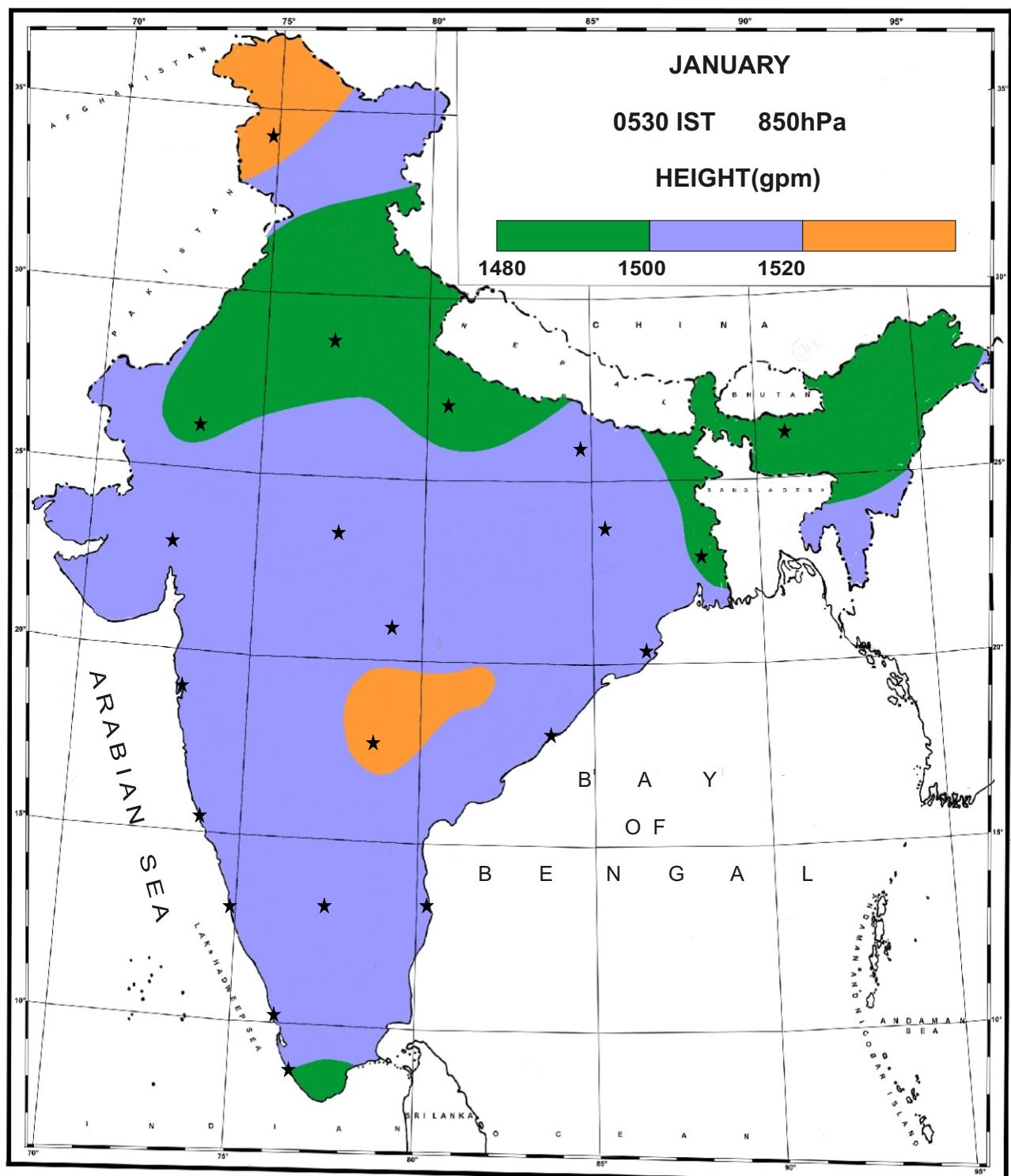
| SN. | MONTH | CHARTS | PAGE NO. |
|------------|--------------|---------------------|-----------------|
| 1. | JANUARY | 850 hPa Upper winds | 113 |
| | | 700 hPa Upper winds | 114 |
| | | 500 hPa Upper winds | 115 |
| | | 300 hPa Upper winds | 116 |
| | | 200 hPa Upper winds | 117 |
| | | 100 hPa Upper winds | 118 |
| 2. | APRIL | 850 hPa Upper winds | 119 |
| | | 700 hPa Upper winds | 120 |
| | | 500 hPa Upper winds | 121 |
| | | 300 hPa Upper winds | 122 |
| | | 200 hPa Upper winds | 123 |
| | | 100 hPa Upper winds | 124 |
| 3. | JULY | 850 hPa Upper winds | 125 |
| | | 700 hPa Upper winds | 126 |
| | | 500 hPa Upper winds | 127 |
| | | 300 hPa Upper winds | 128 |
| | | 200 hPa Upper winds | 129 |
| | | 100 hPa Upper winds | 130 |
| 4. | OCTOBER | 850 hPa Upper winds | 131 |
| | | 700 hPa Upper winds | 132 |
| | | 500 hPa Upper winds | 133 |
| | | 300 hPa Upper winds | 134 |
| | | 200 hPa Upper winds | 135 |
| | | 100 hPa Upper winds | 136 |

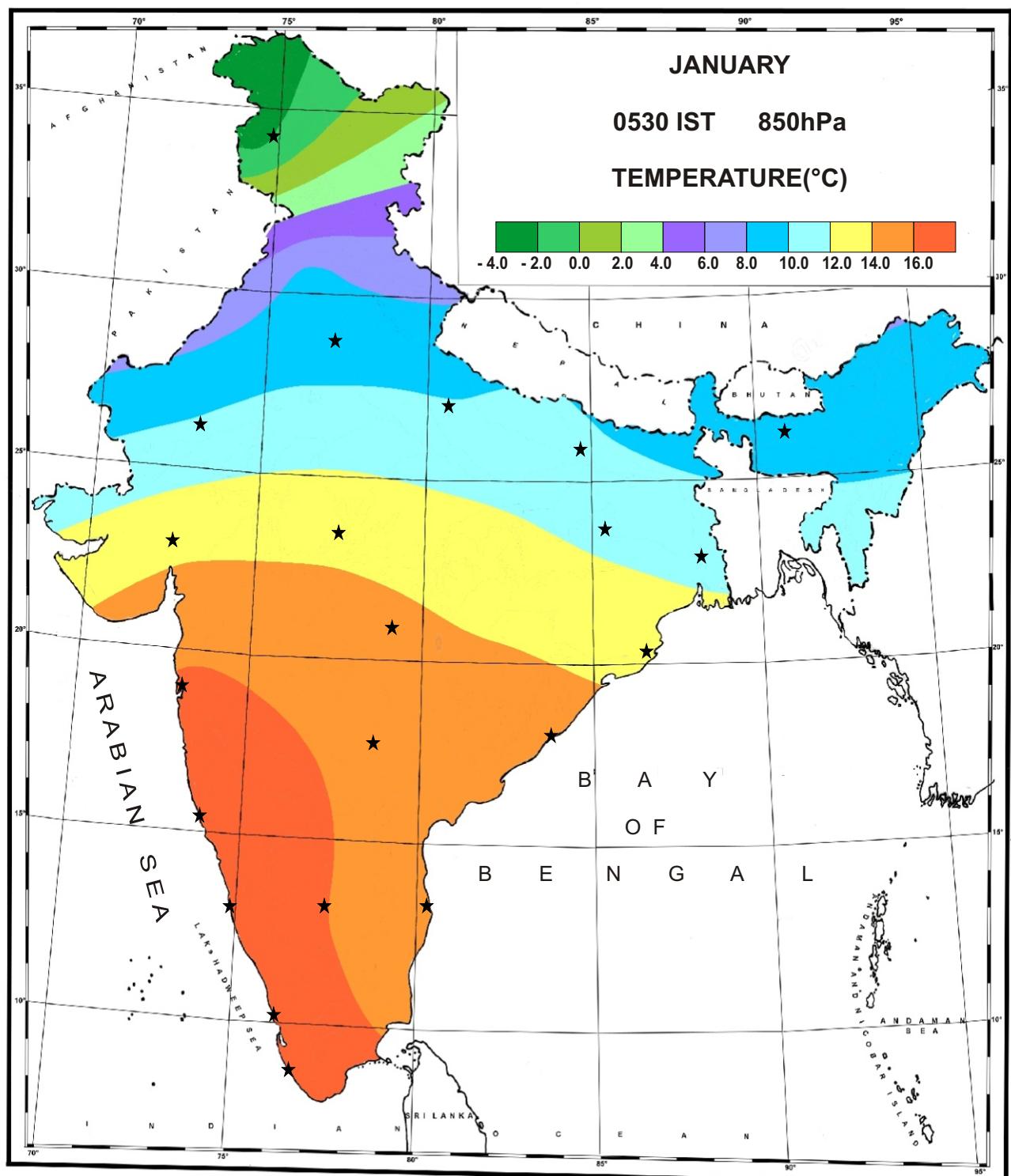
C O N T E N T S

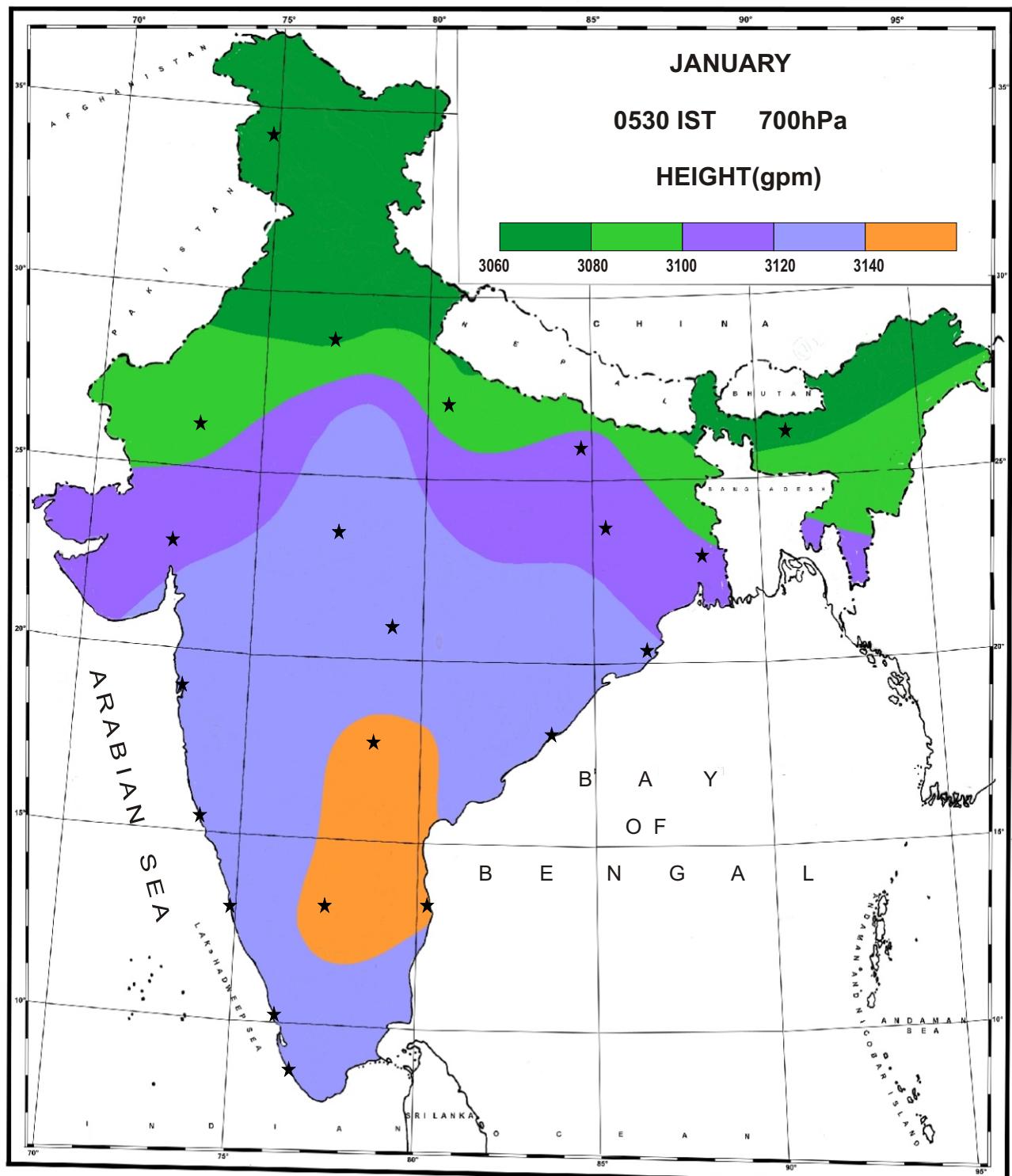
Observation Time 1730 IST

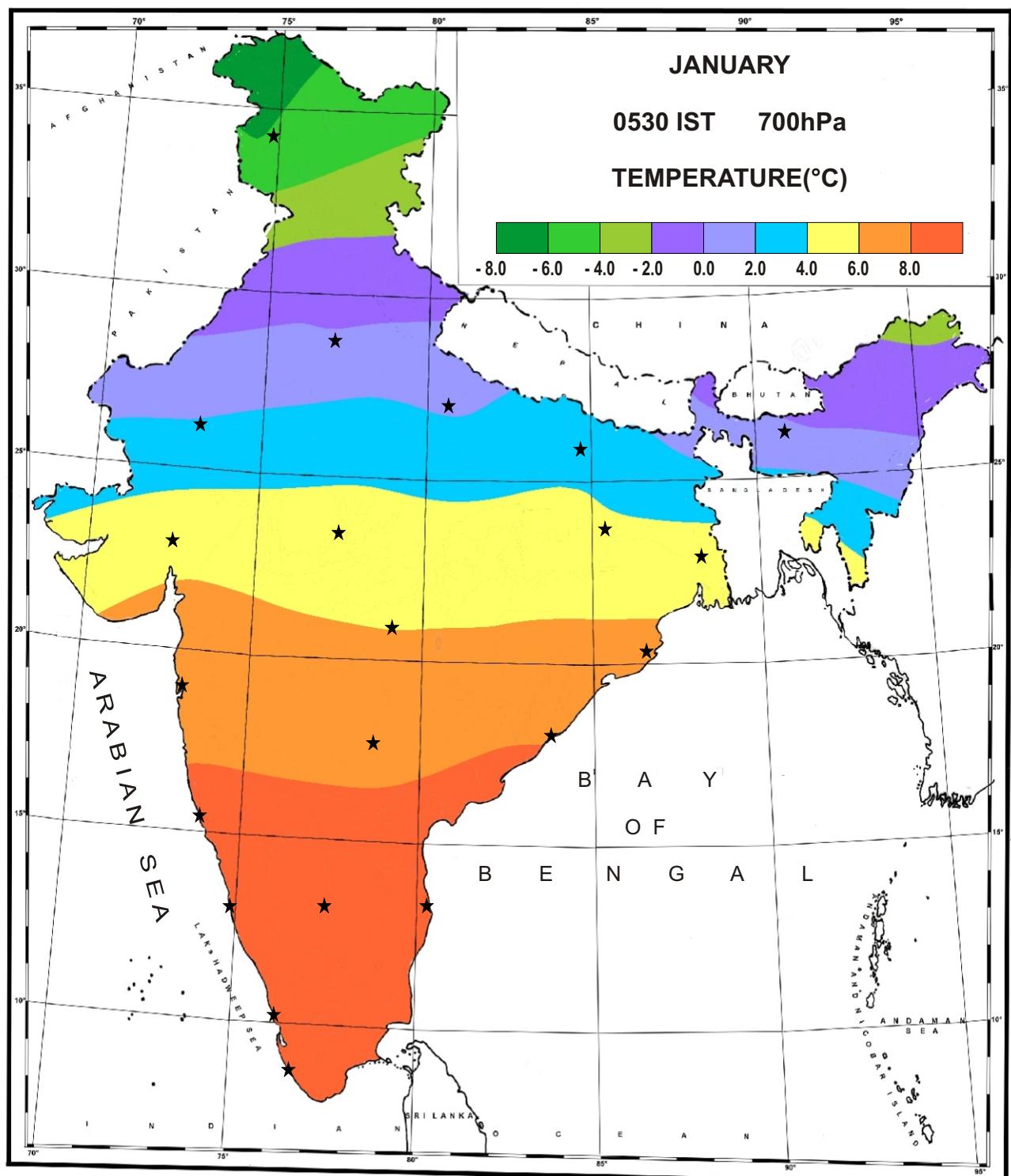
| SN. | MONTH | CHARTS | PAGE NO. |
|------------|--------------|---------------------|-----------------|
| 5. | JANUARY | 850 hPa Upper winds | 137 |
| | | 700 hPa Upper winds | 138 |
| | | 500 hPa Upper winds | 139 |
| | | 300 hPa Upper winds | 140 |
| | | 200 hPa Upper winds | 141 |
| | | 100 hPa Upper winds | 142 |
| 6. | APRIL | 850 hPa Upper winds | 143 |
| | | 700 hPa Upper winds | 144 |
| | | 500 hPa Upper winds | 145 |
| | | 300 hPa Upper winds | 146 |
| | | 200 hPa Upper winds | 147 |
| | | 100 hPa Upper winds | 148 |
| 7. | JULY | 850 hPa Upper winds | 149 |
| | | 700 hPa Upper winds | 150 |
| | | 500 hPa Upper winds | 151 |
| | | 300 hPa Upper winds | 152 |
| | | 200 hPa Upper winds | 153 |
| | | 100 hPa Upper winds | 154 |
| 8. | OCTOBER | 850 hPa Upper winds | 155 |
| | | 700 hPa Upper winds | 156 |
| | | 500 hPa Upper winds | 157 |
| | | 300 hPa Upper winds | 158 |
| | | 200 hPa Upper winds | 159 |
| | | 100 hPa Upper winds | 160 |

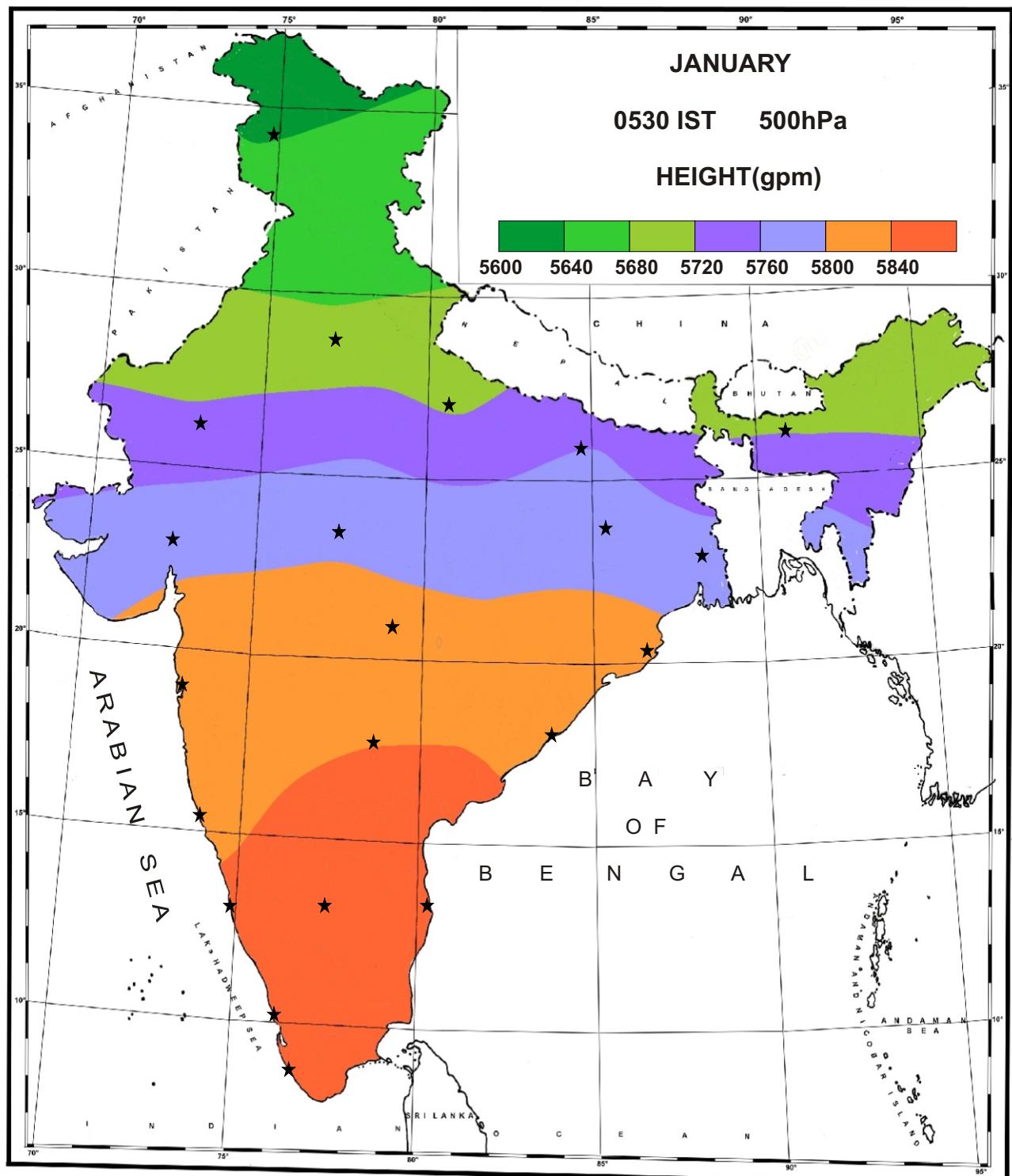
**HEIGHT
AND
TEMPERATURE**

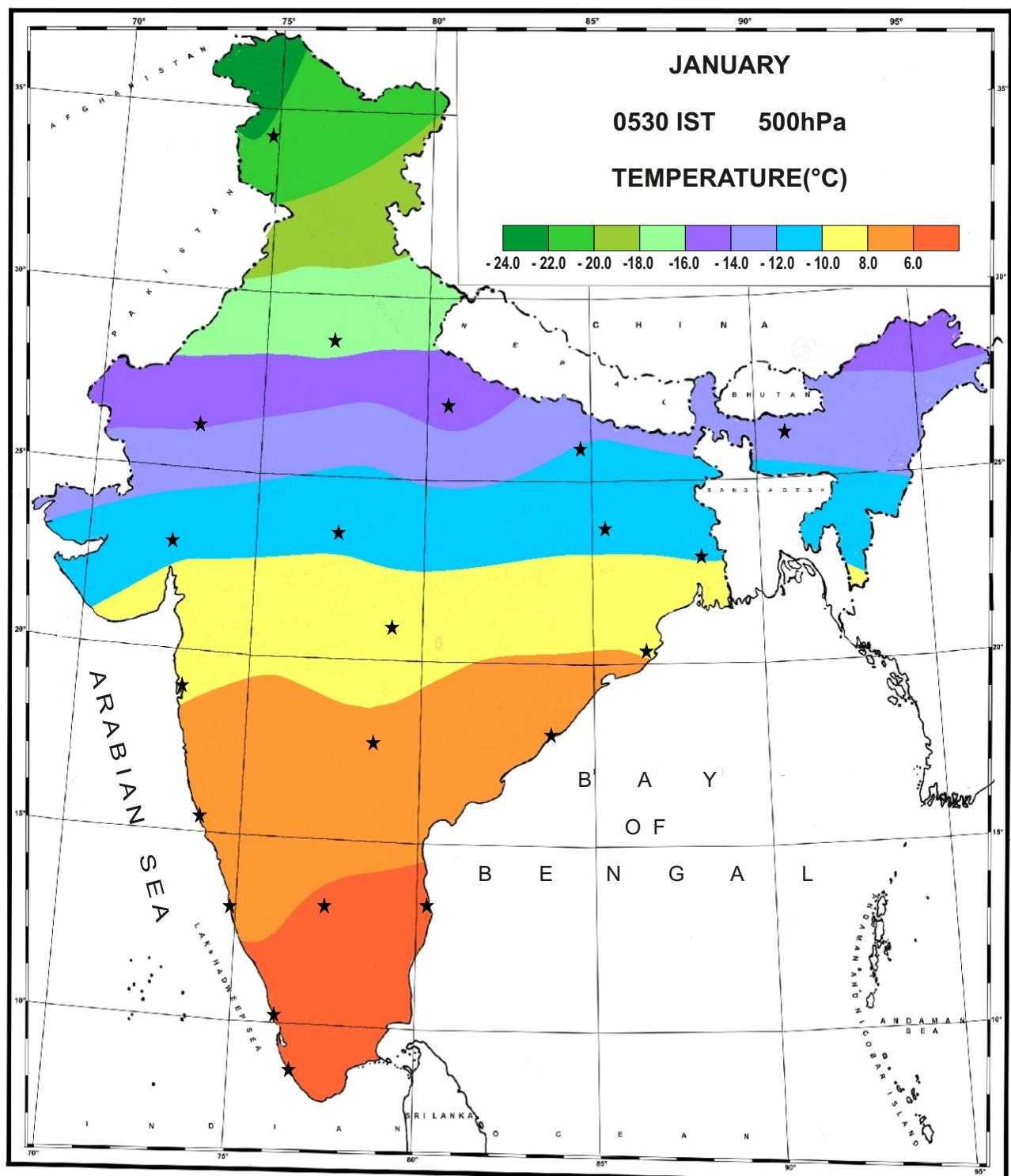


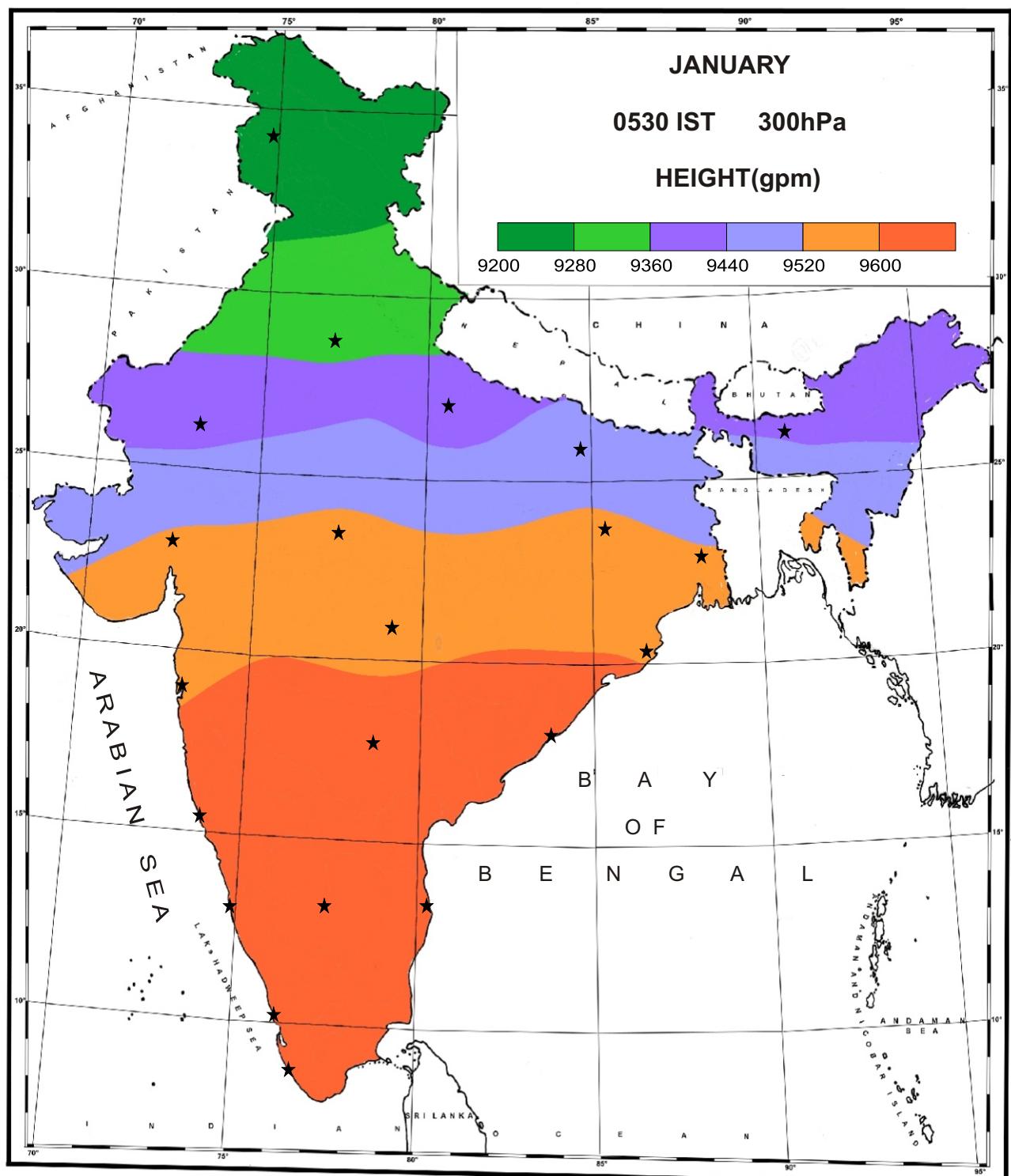


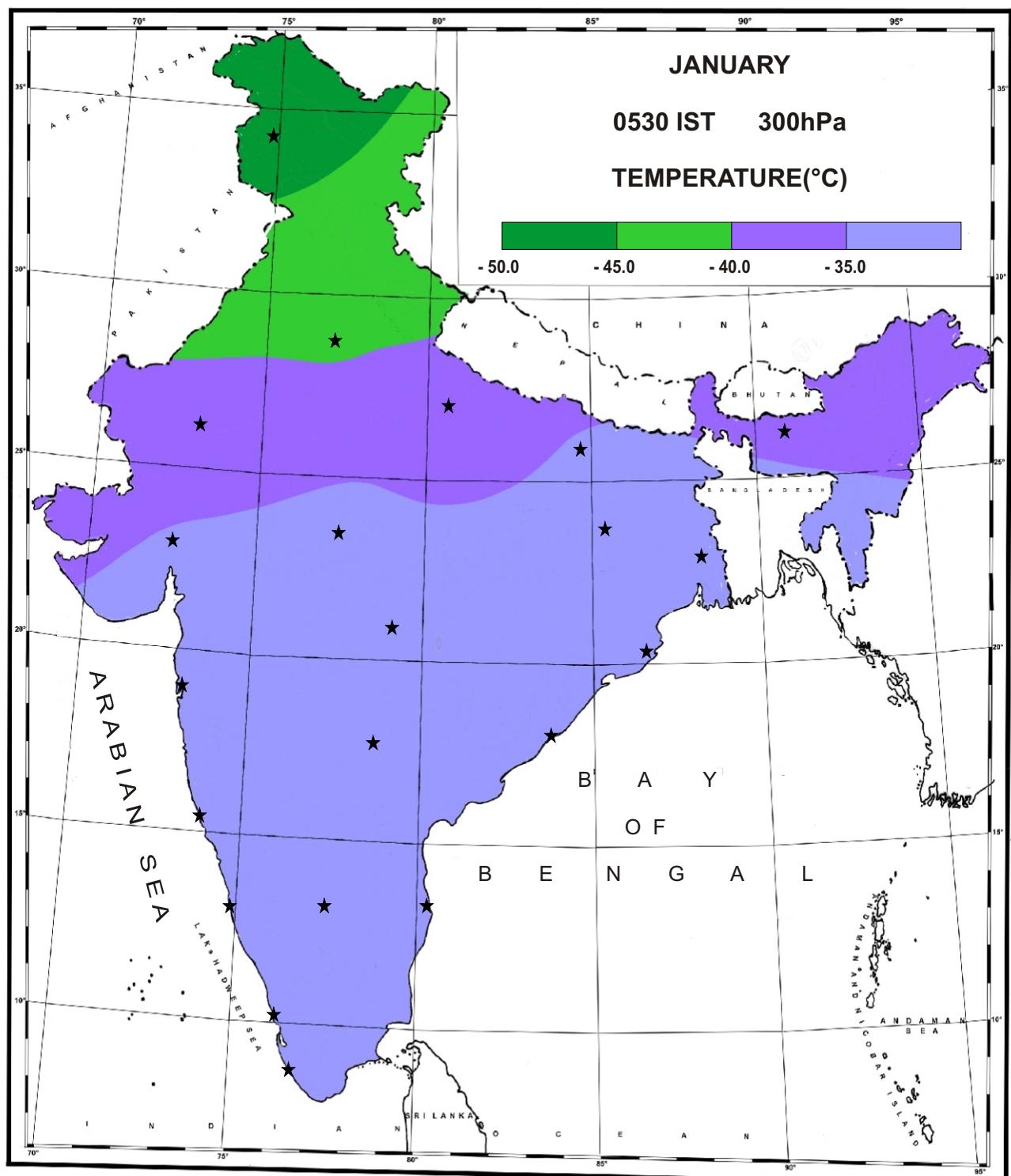


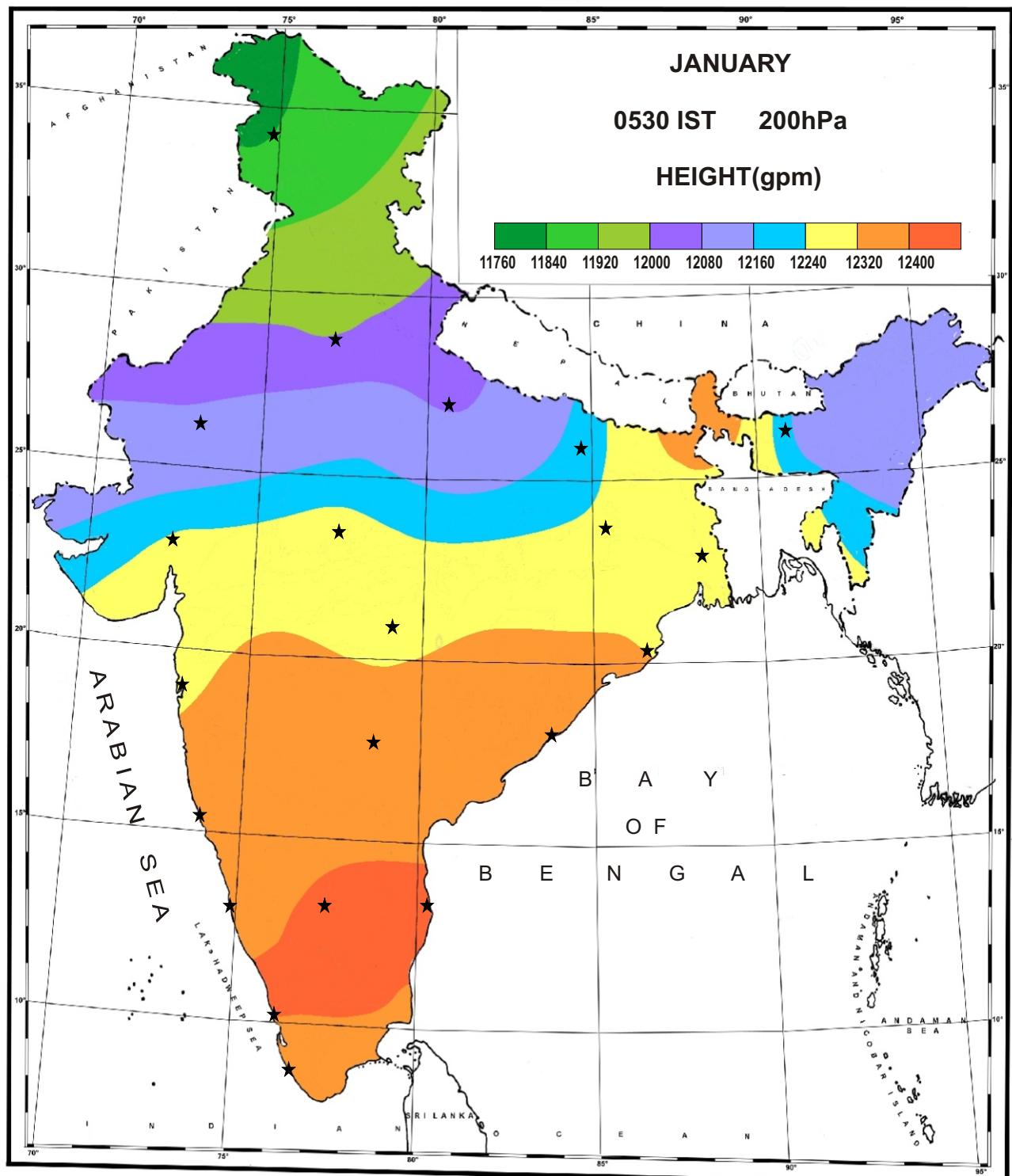


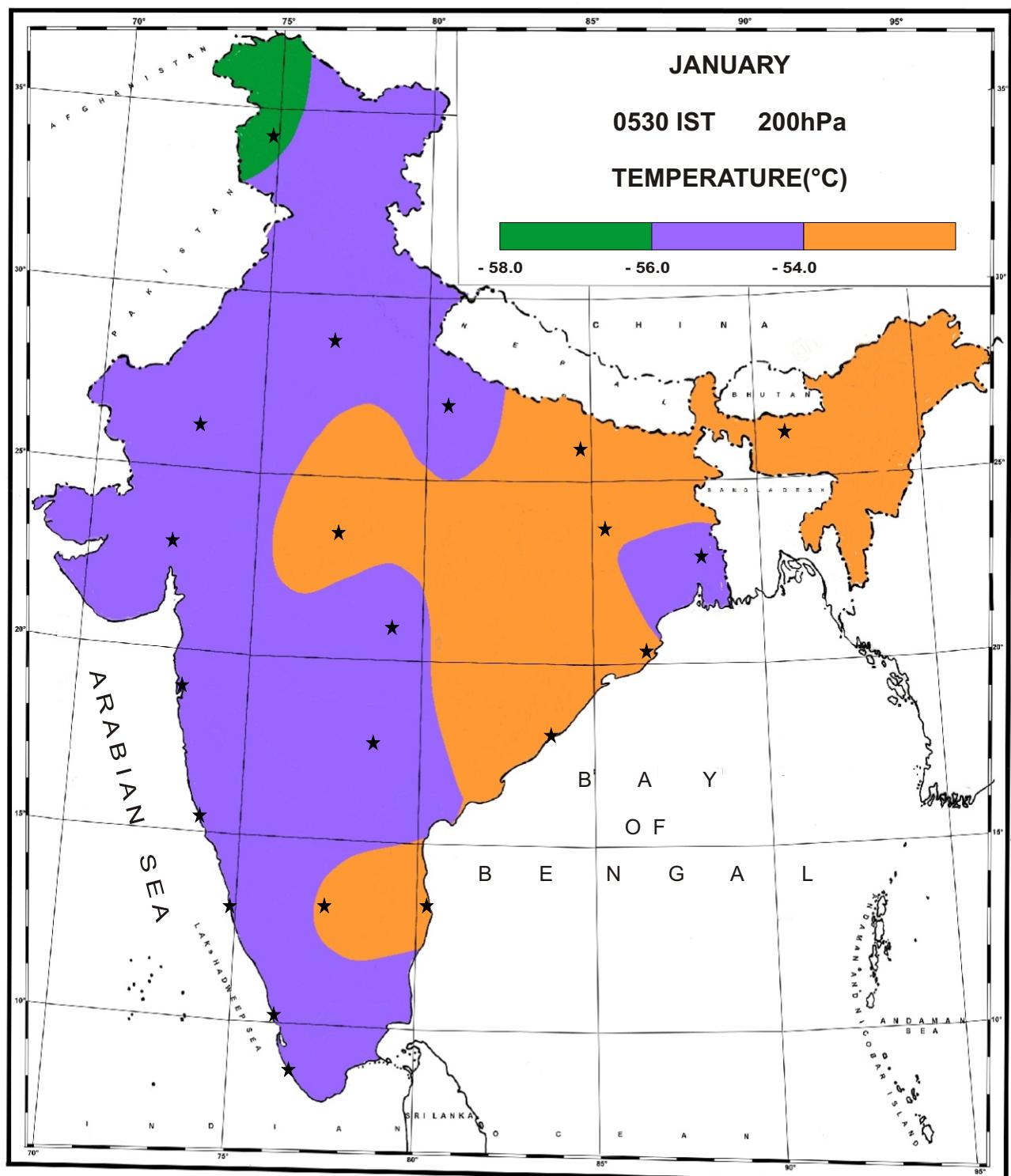


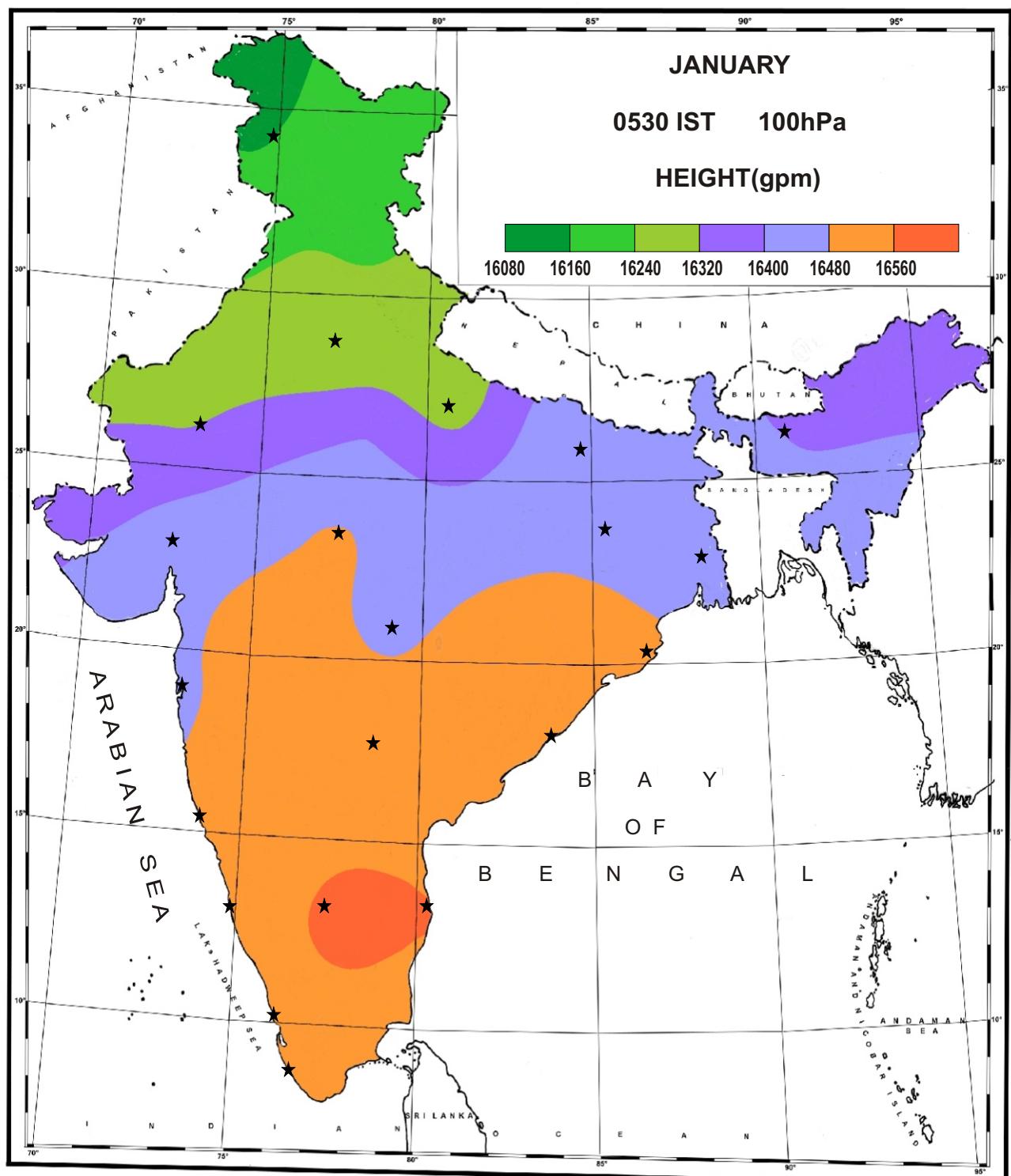


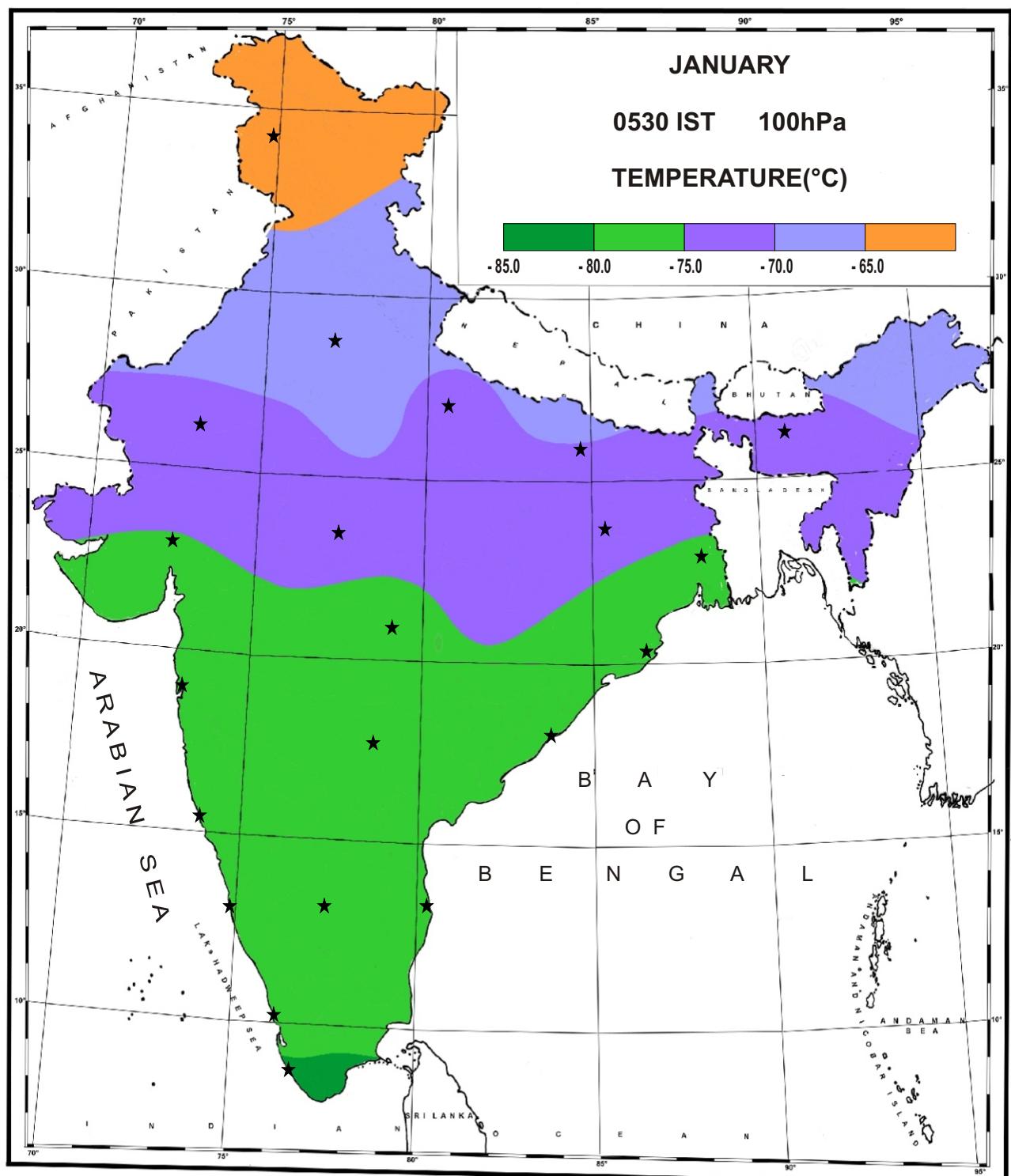


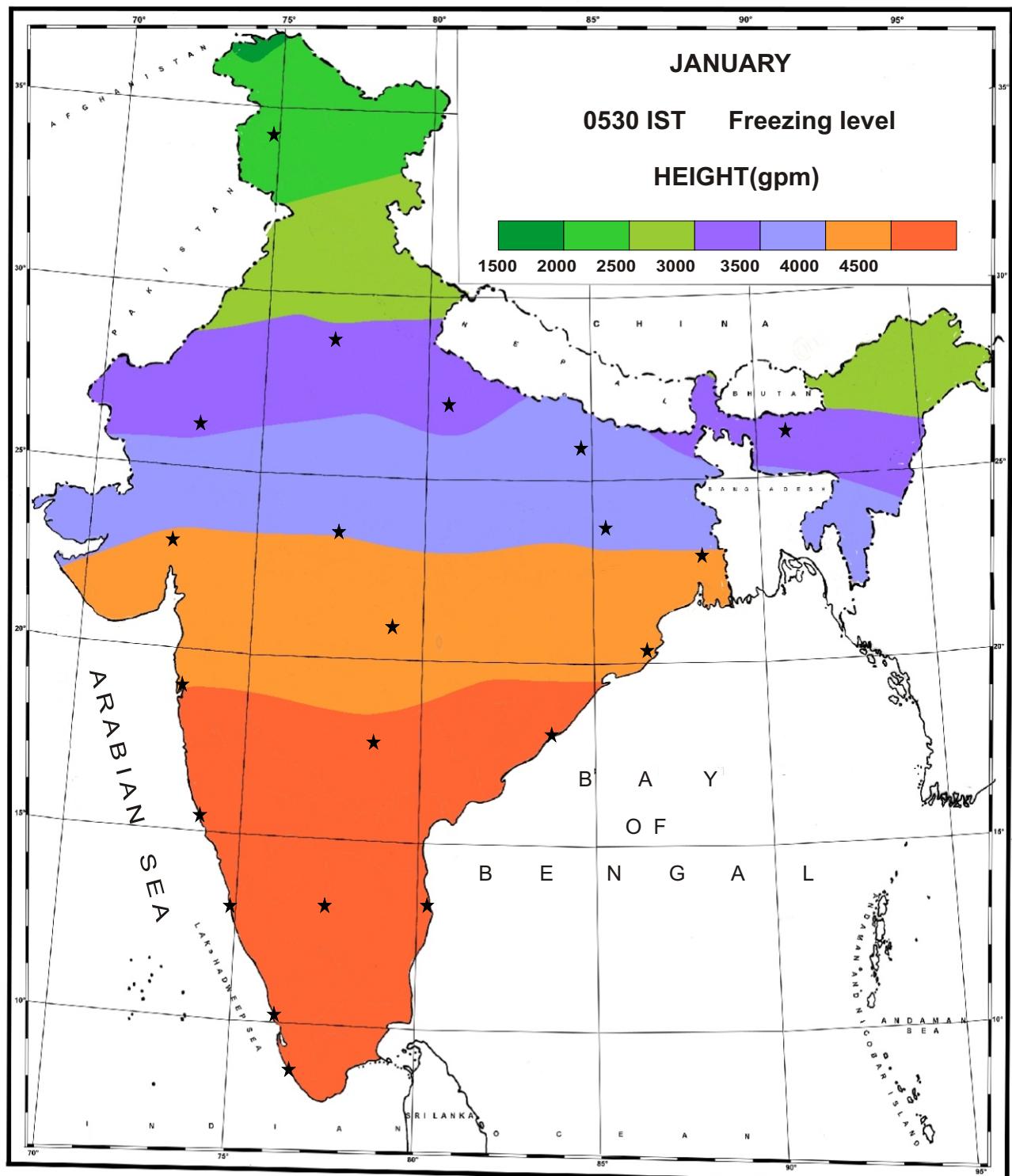


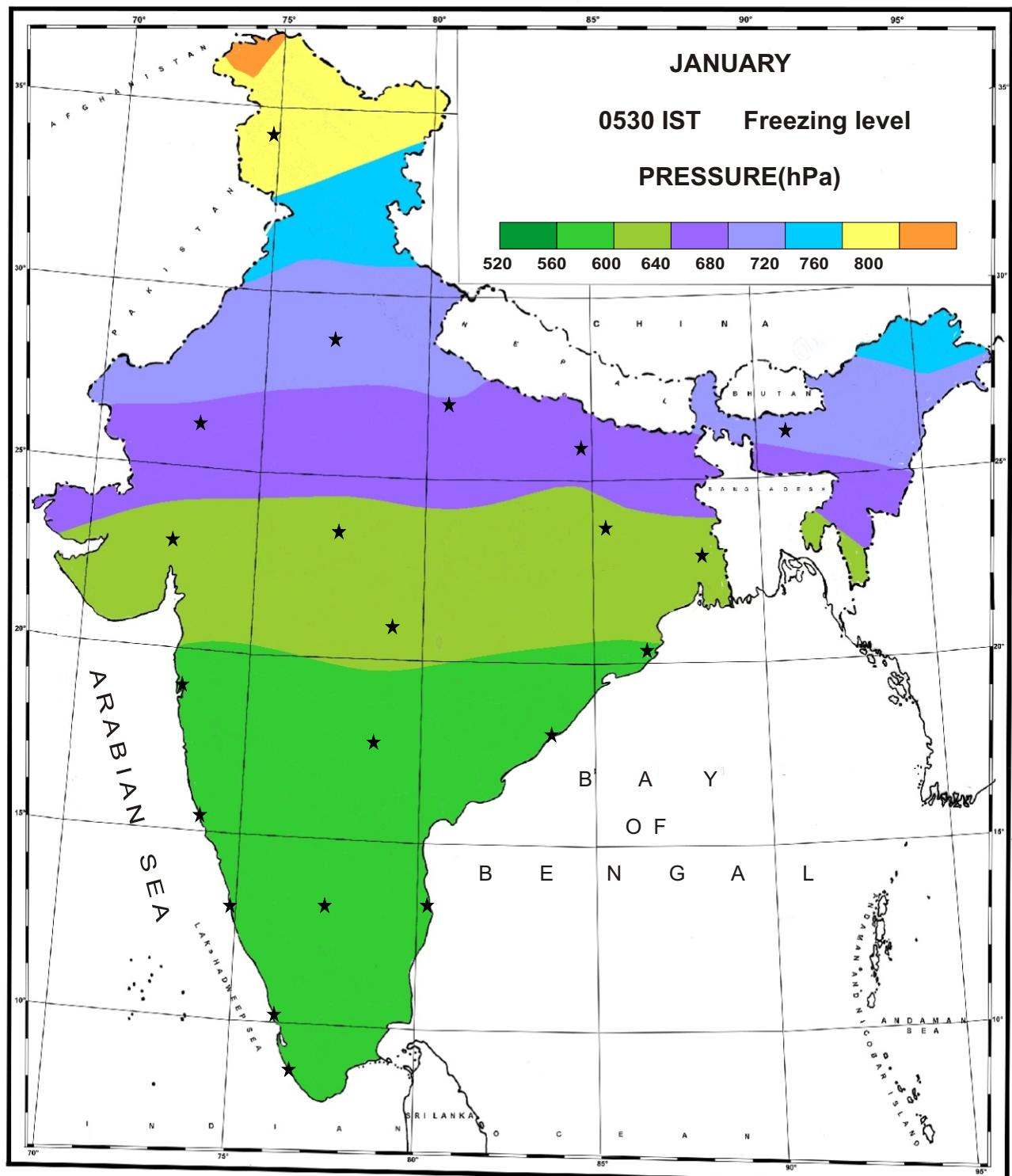


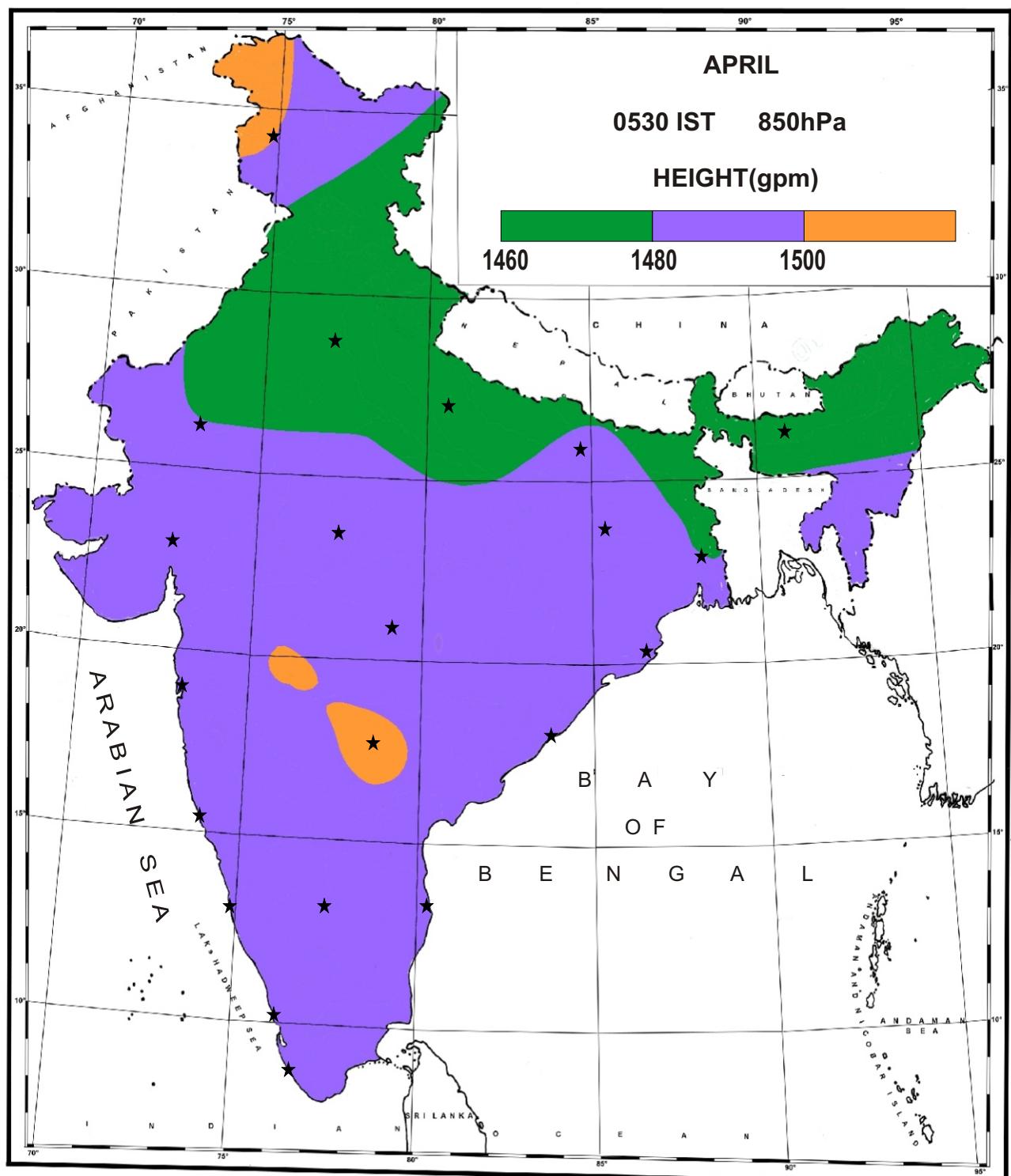


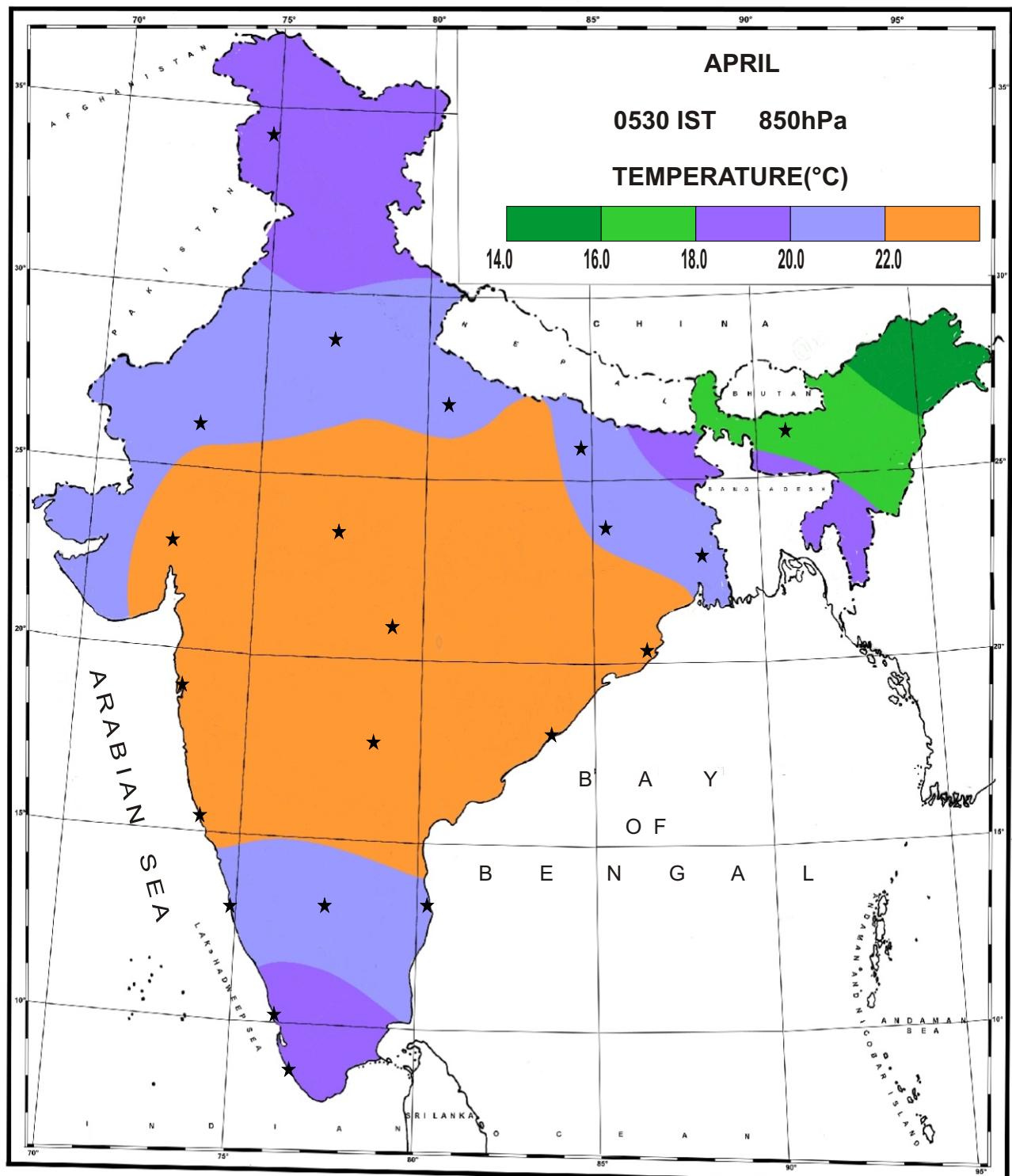


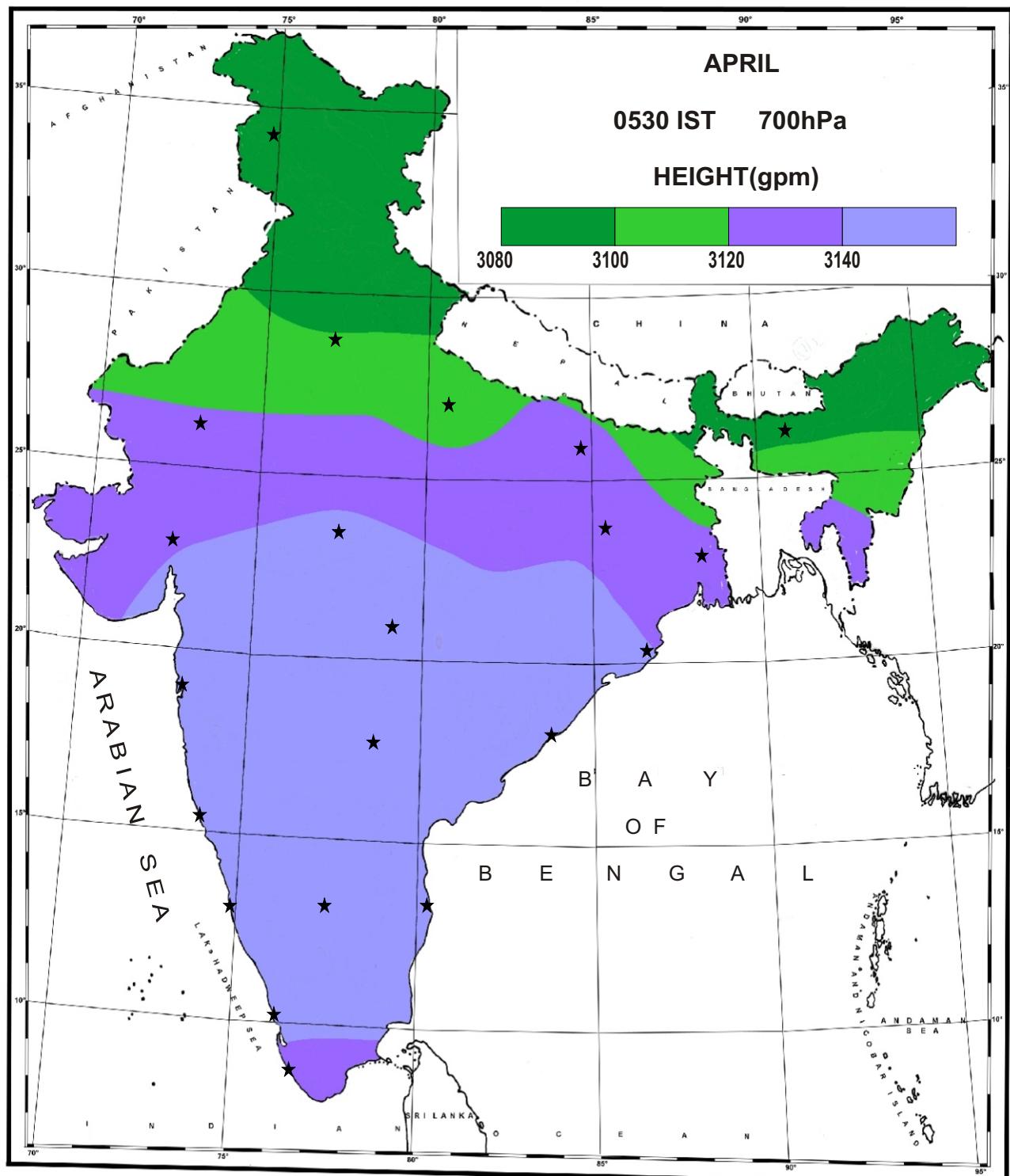


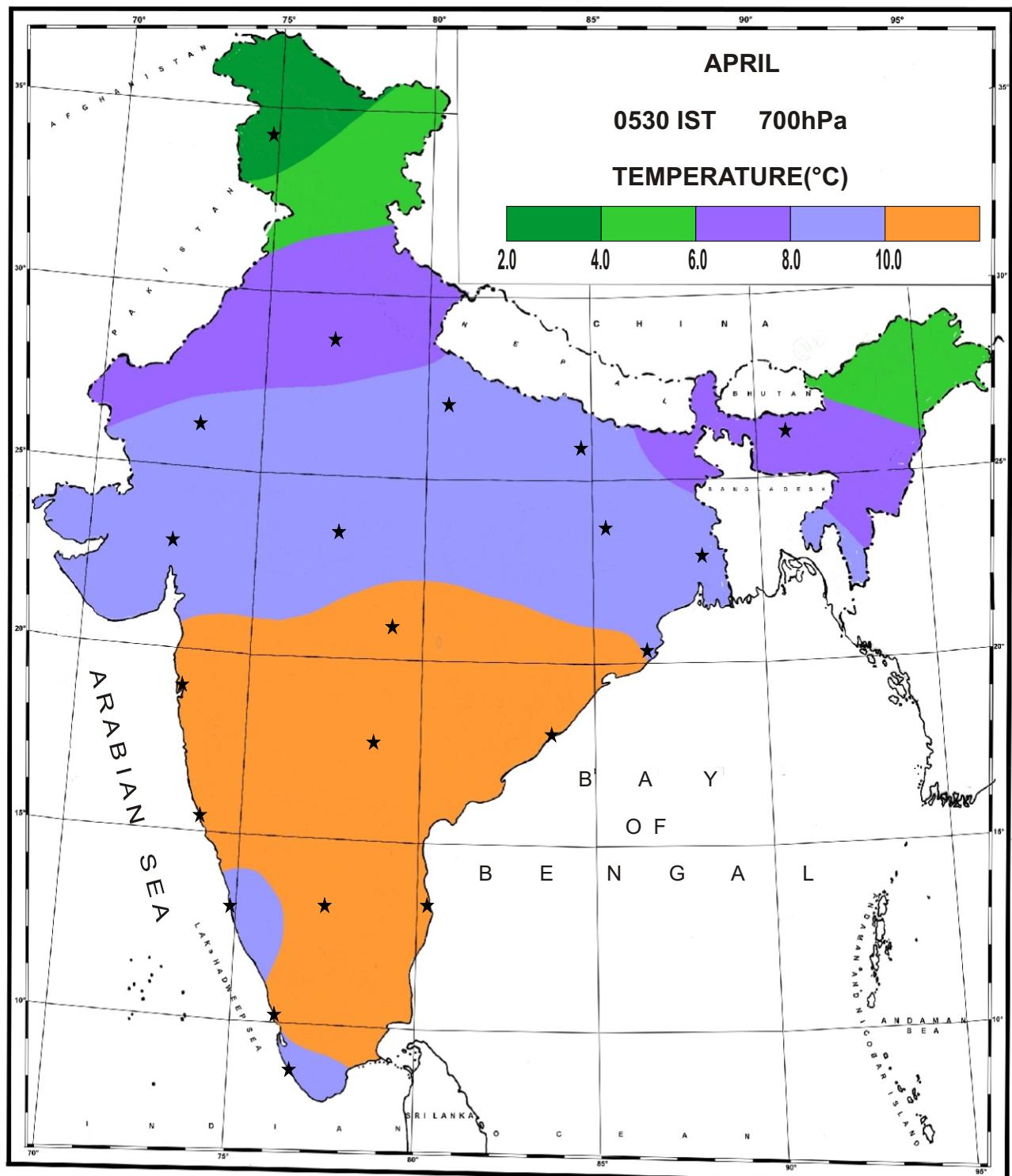


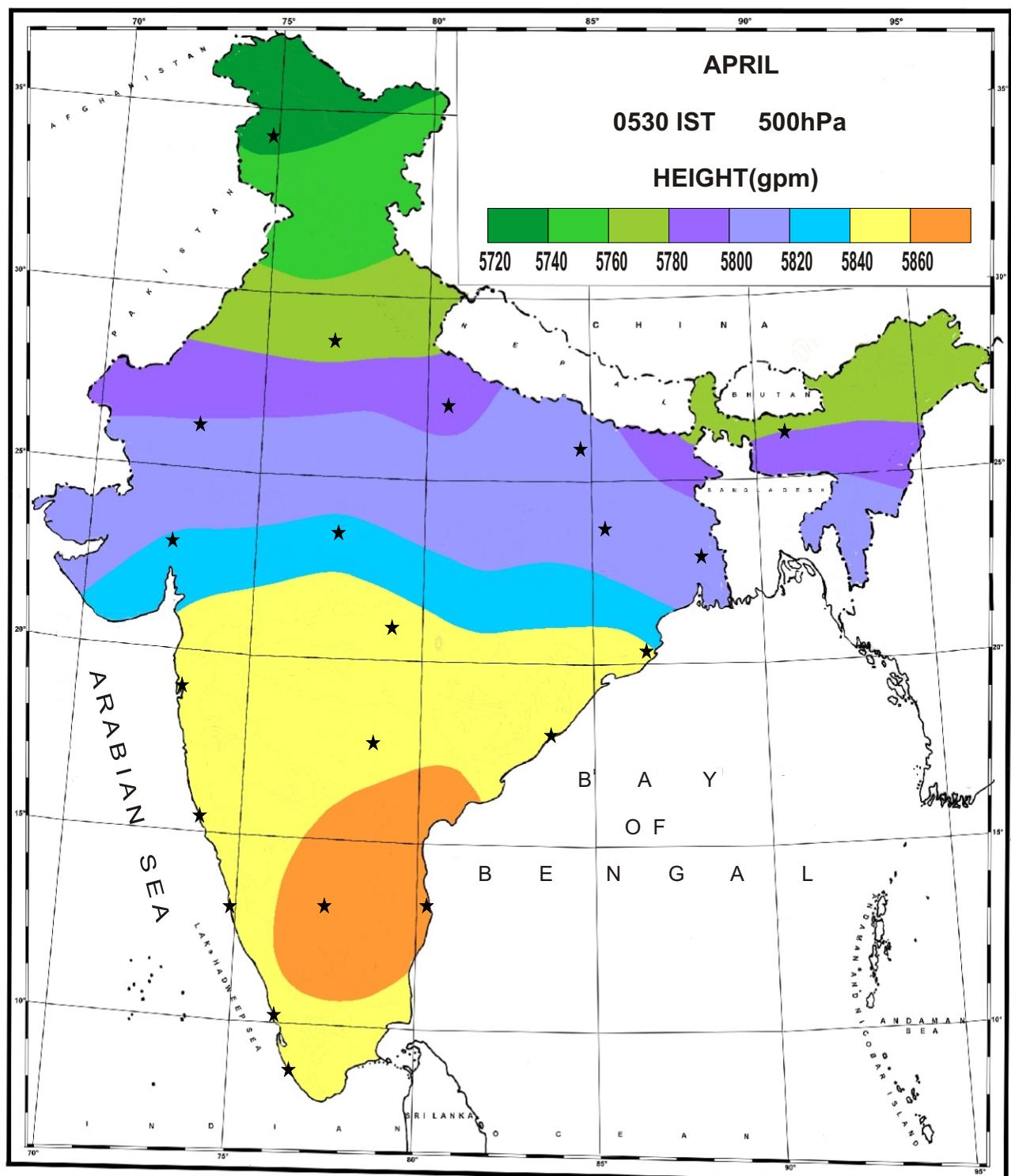


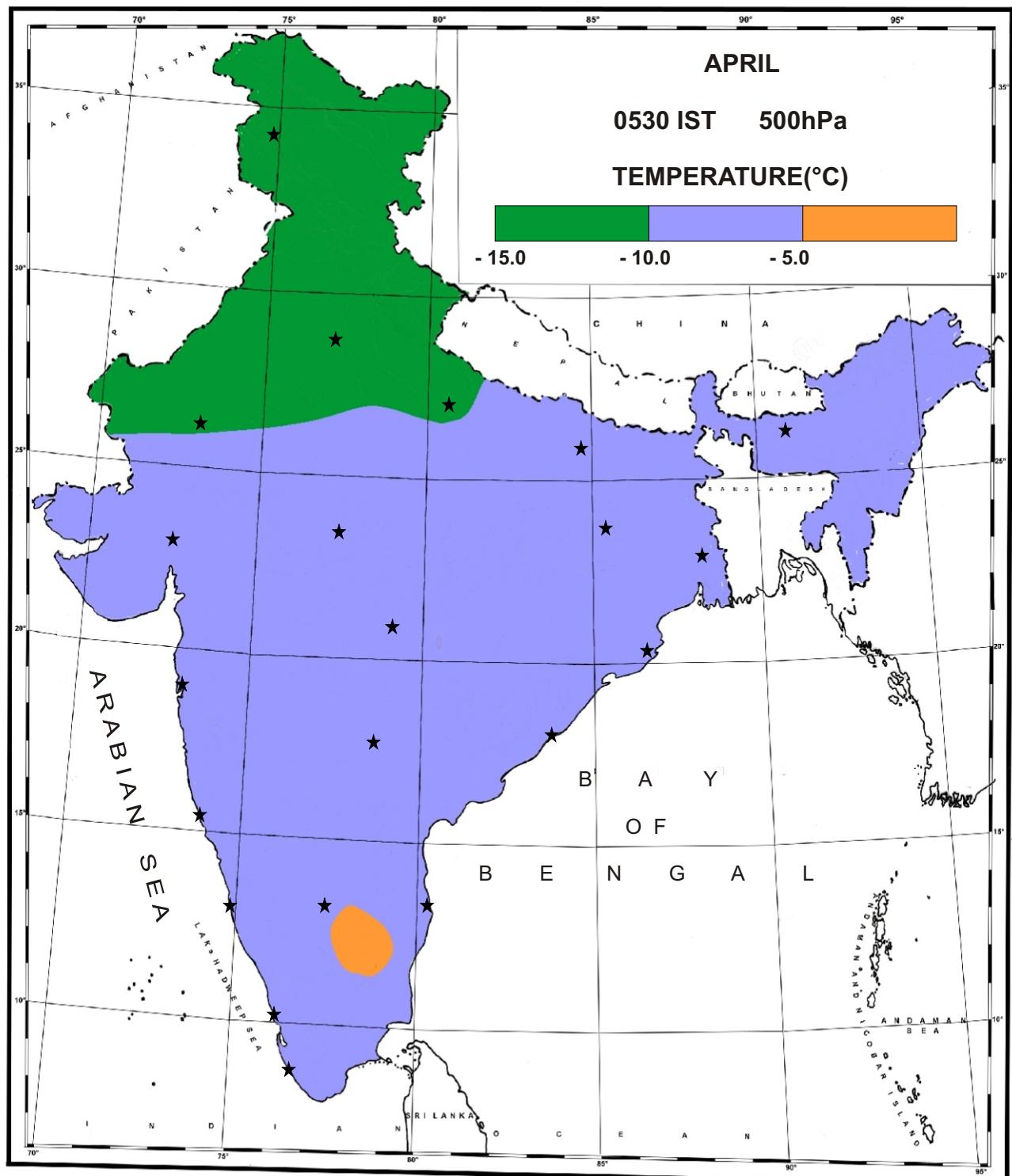


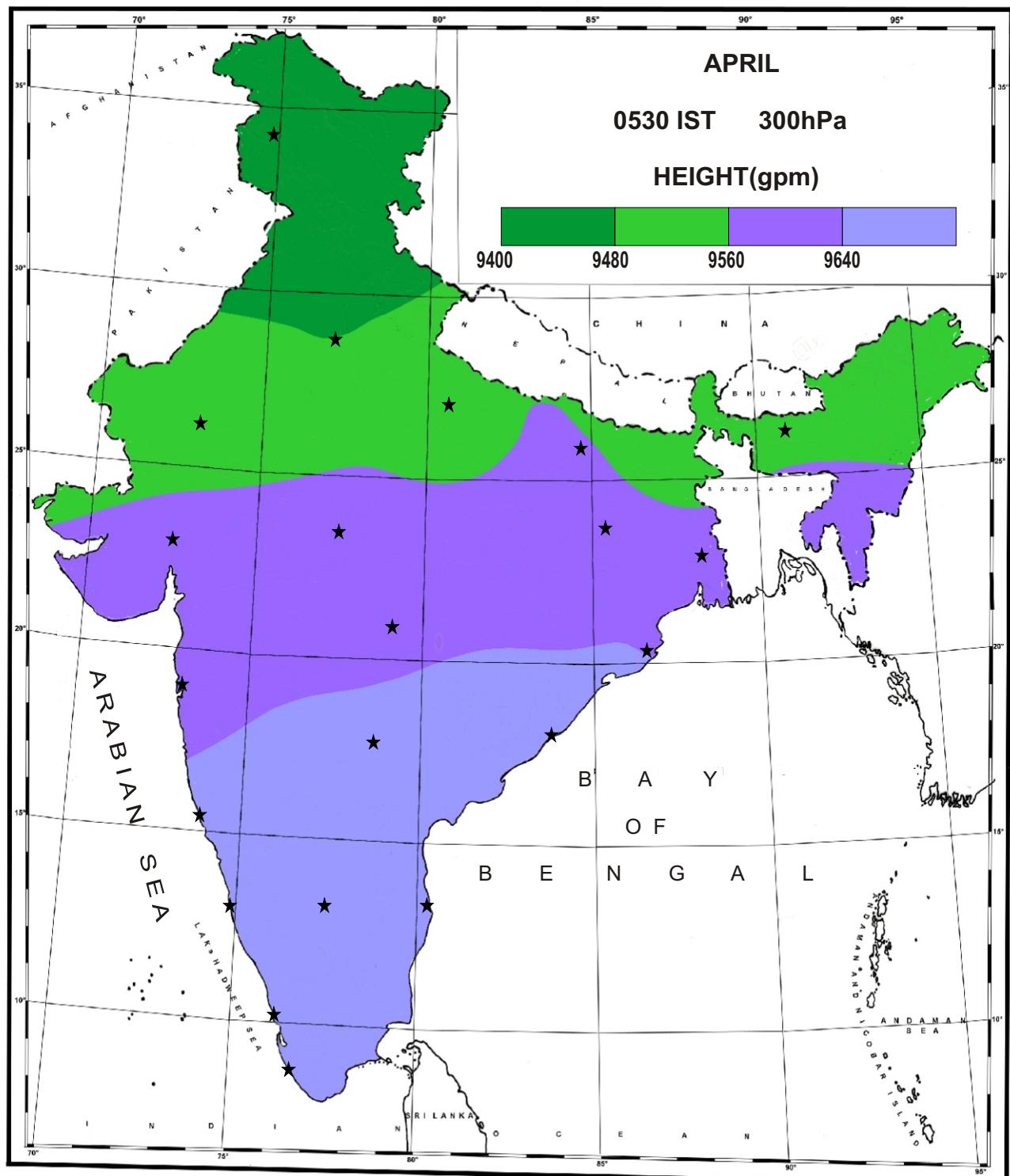


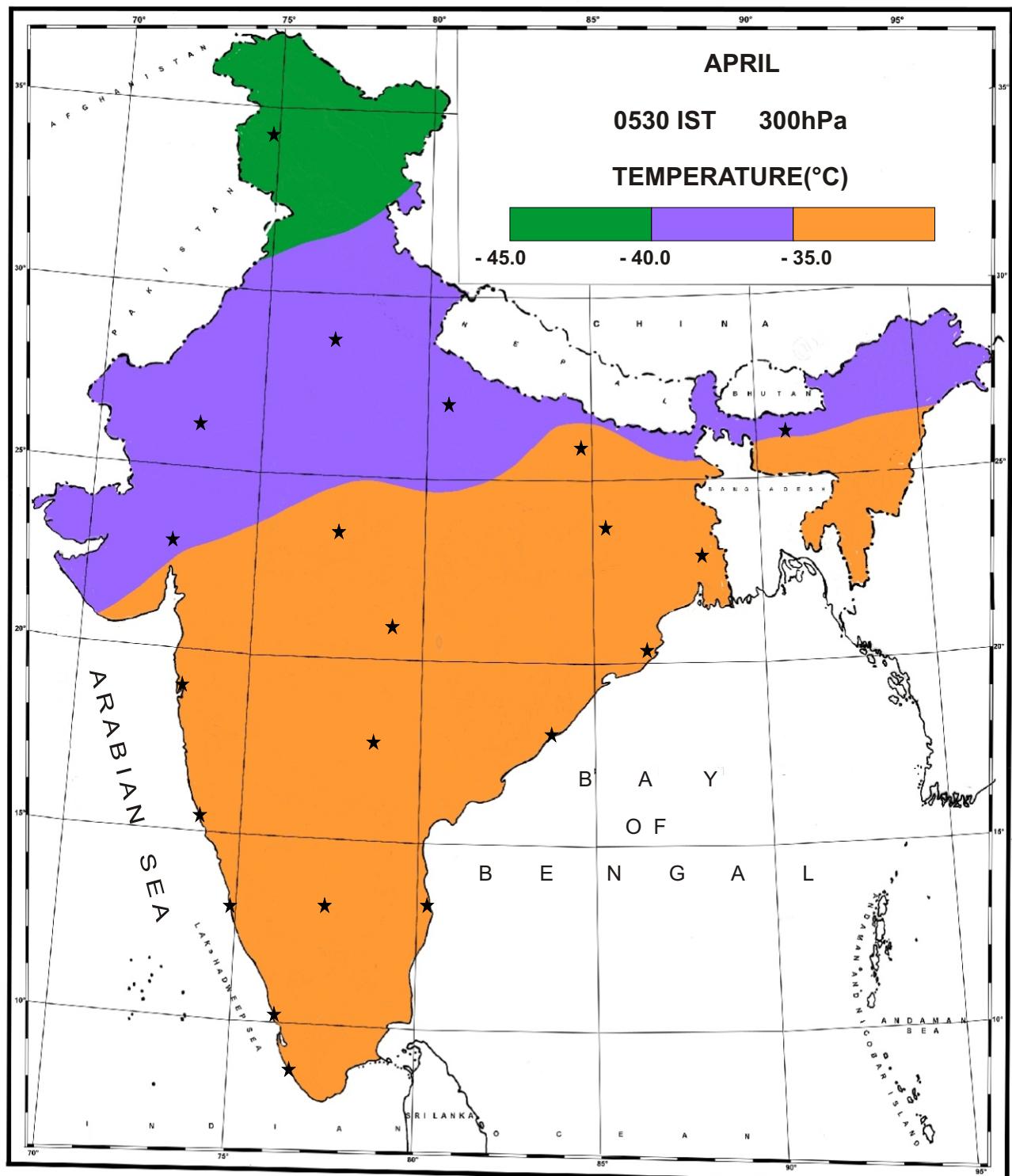


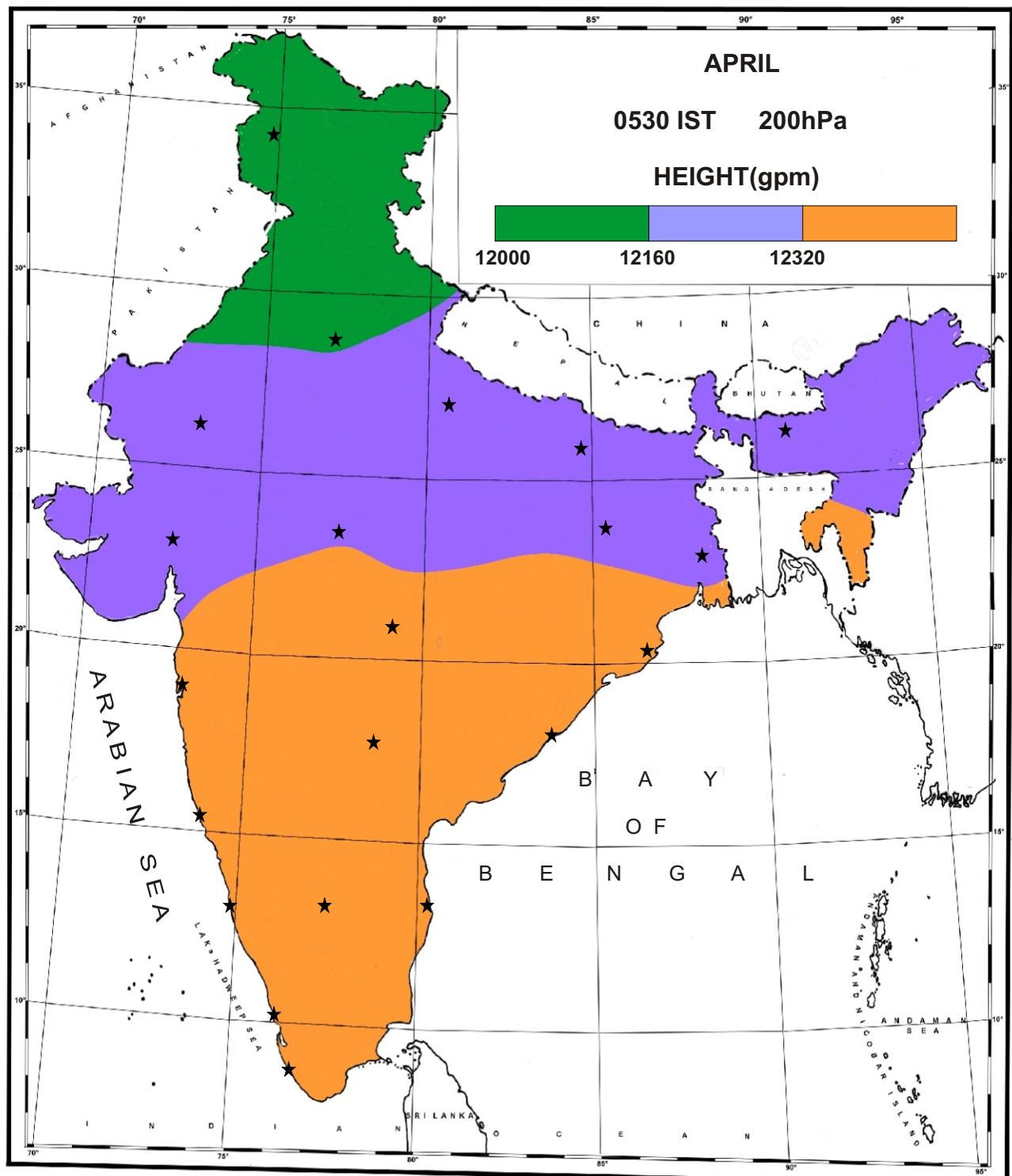


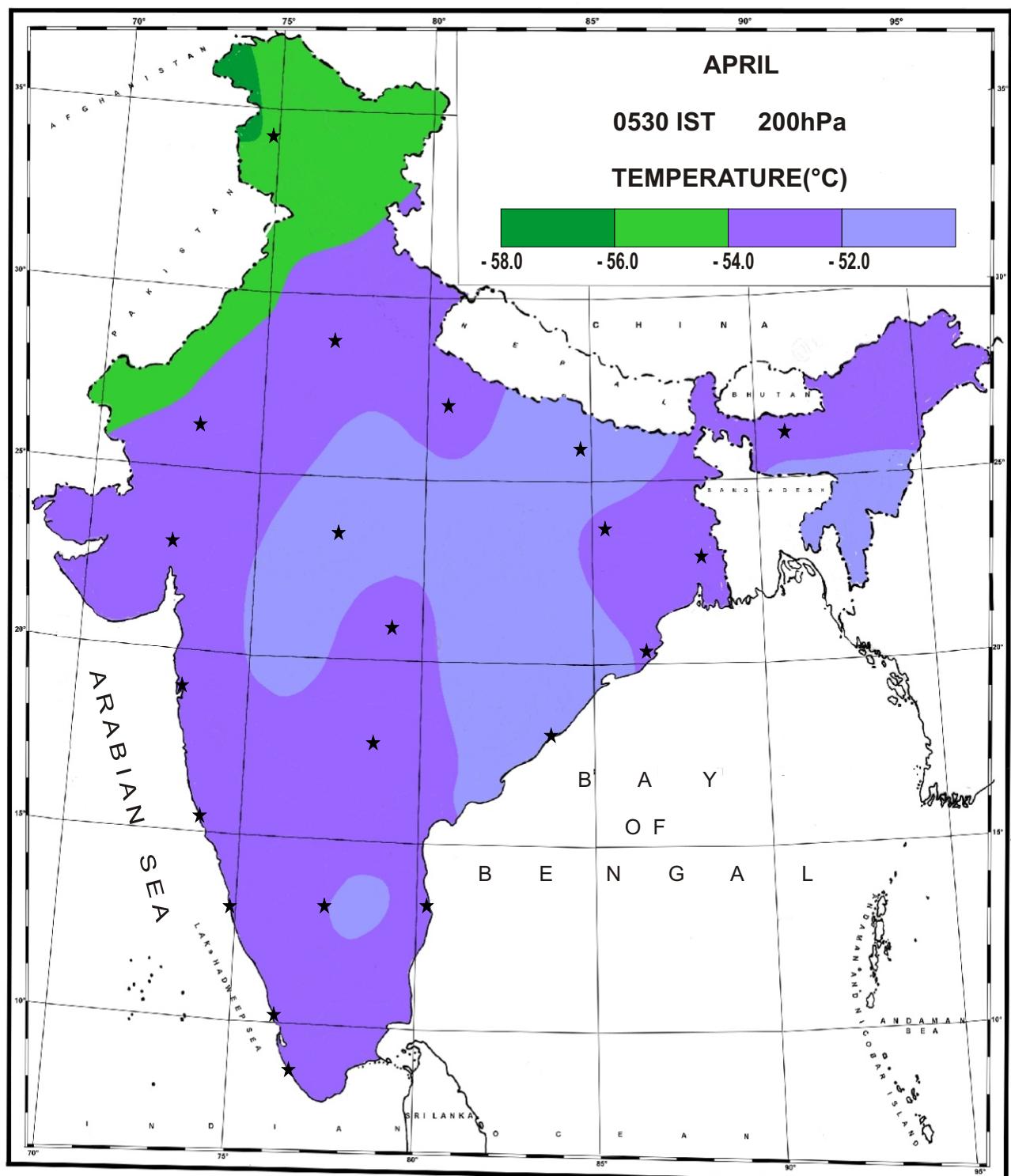


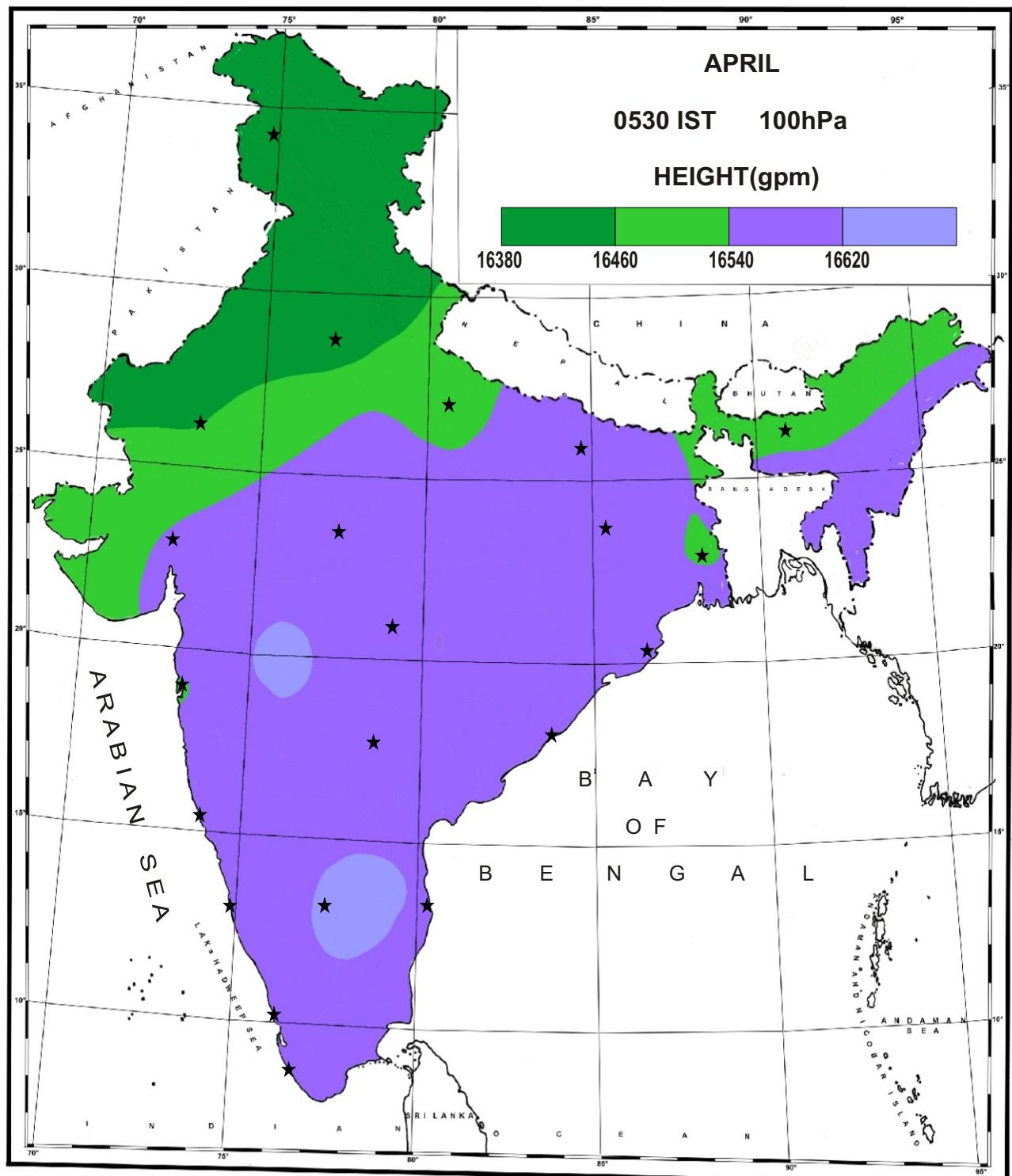


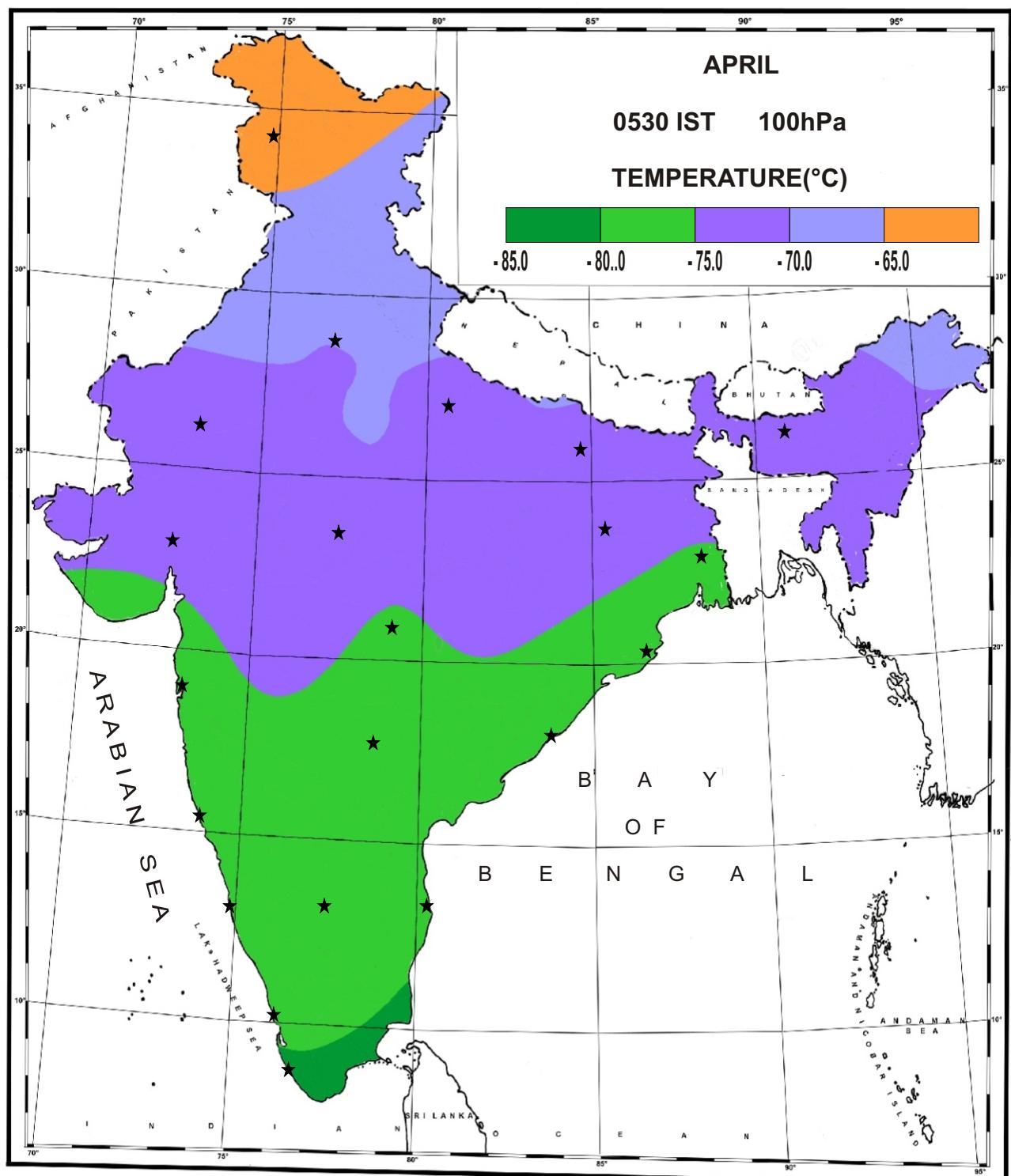


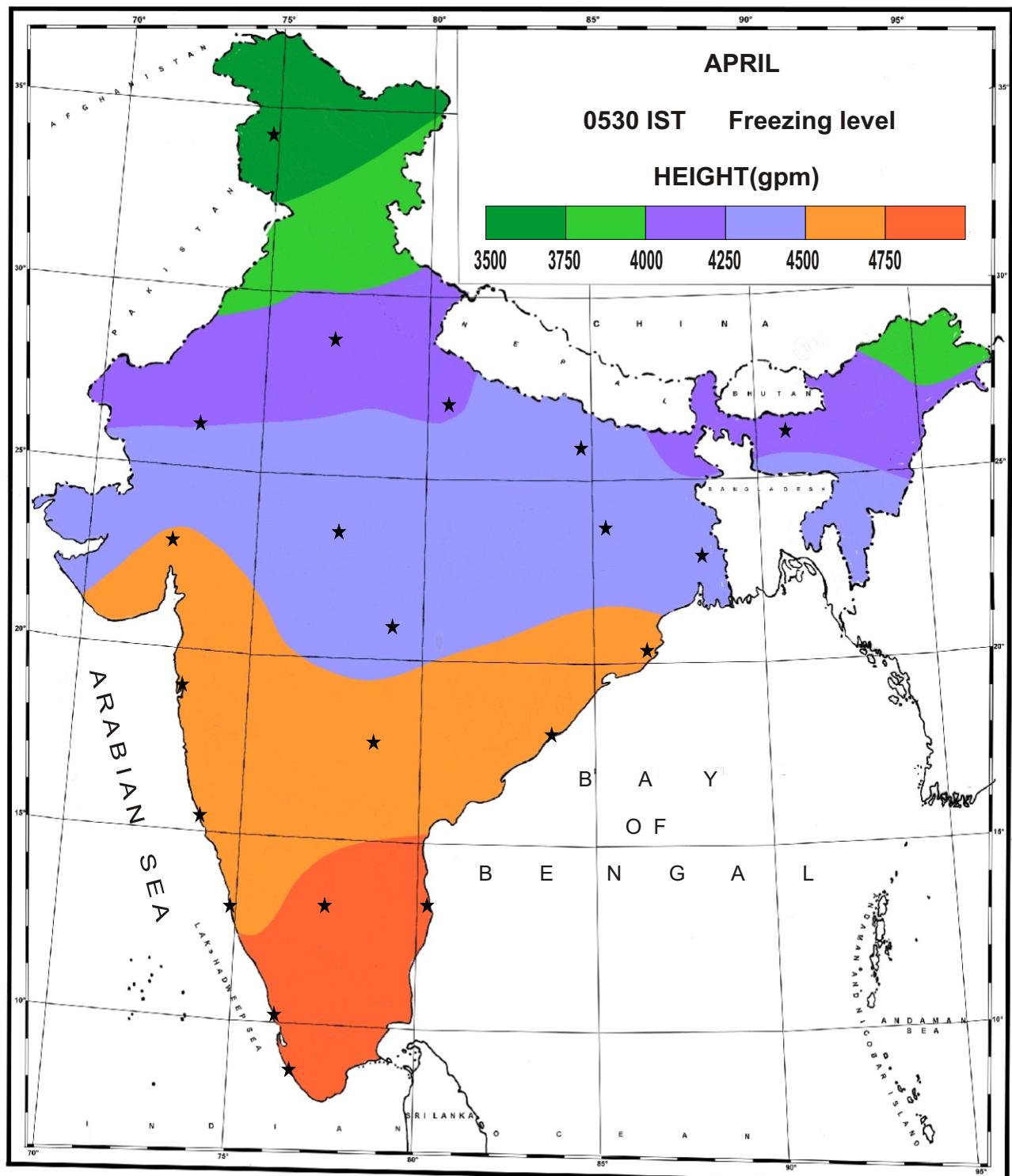


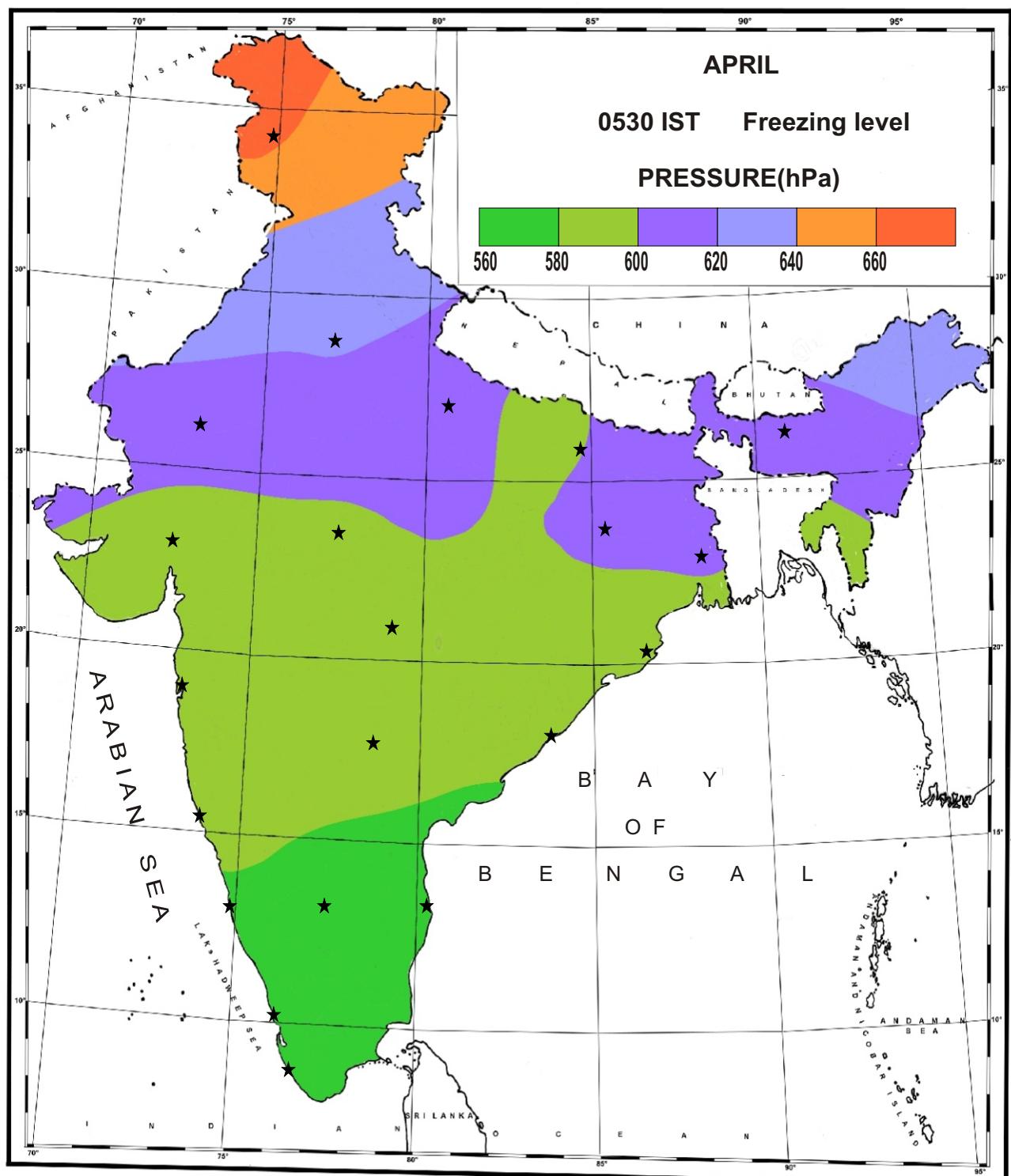


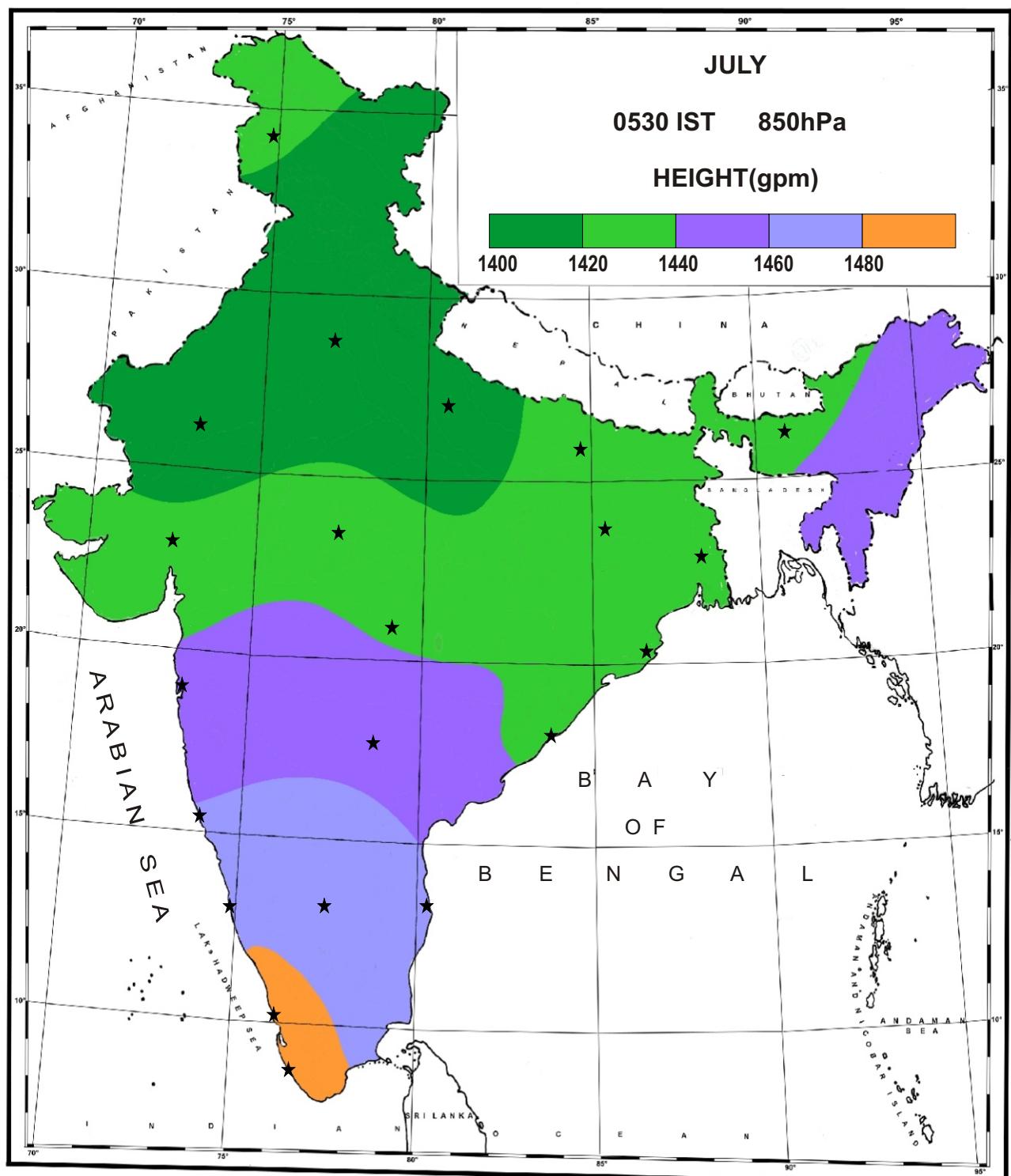


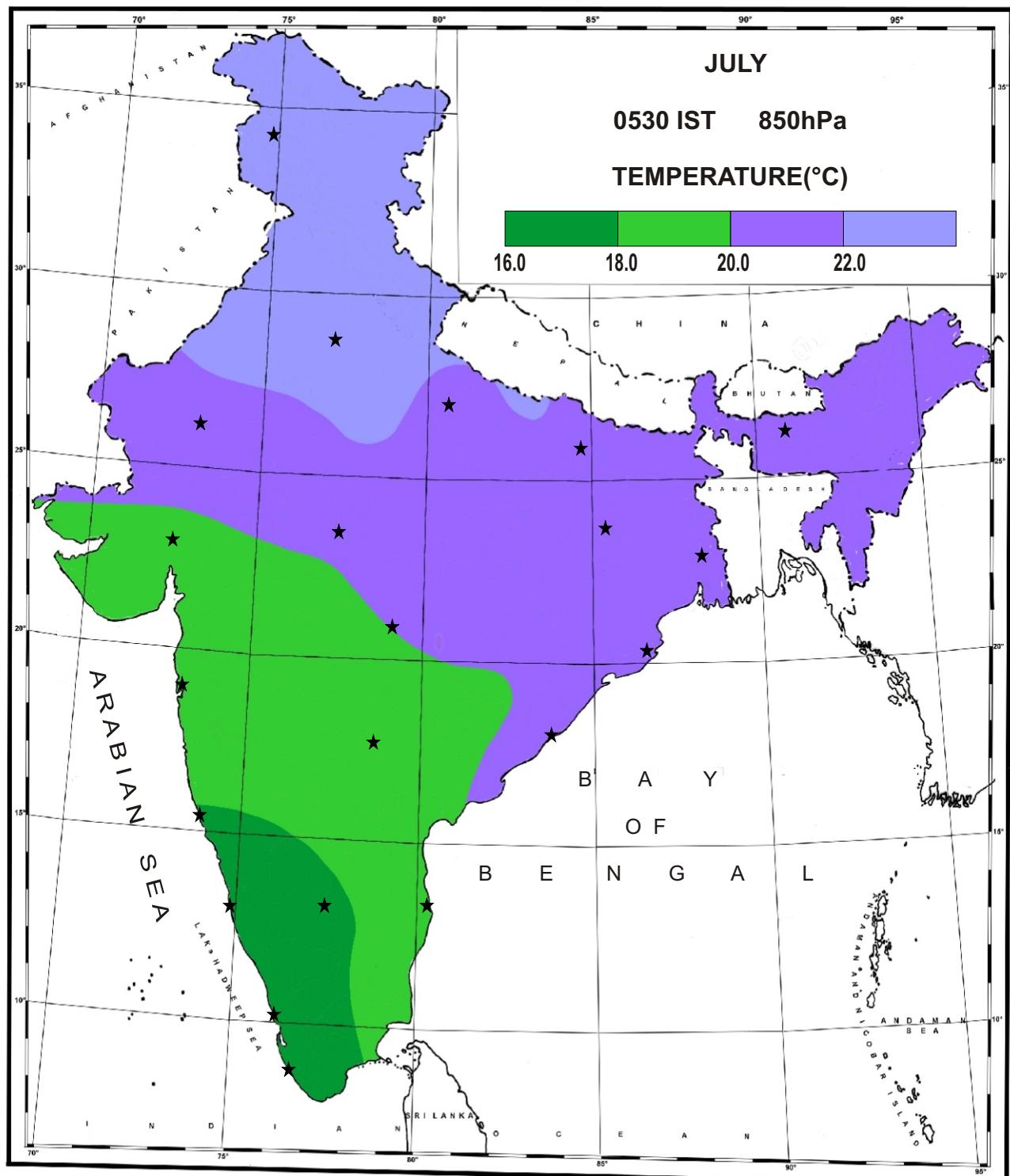


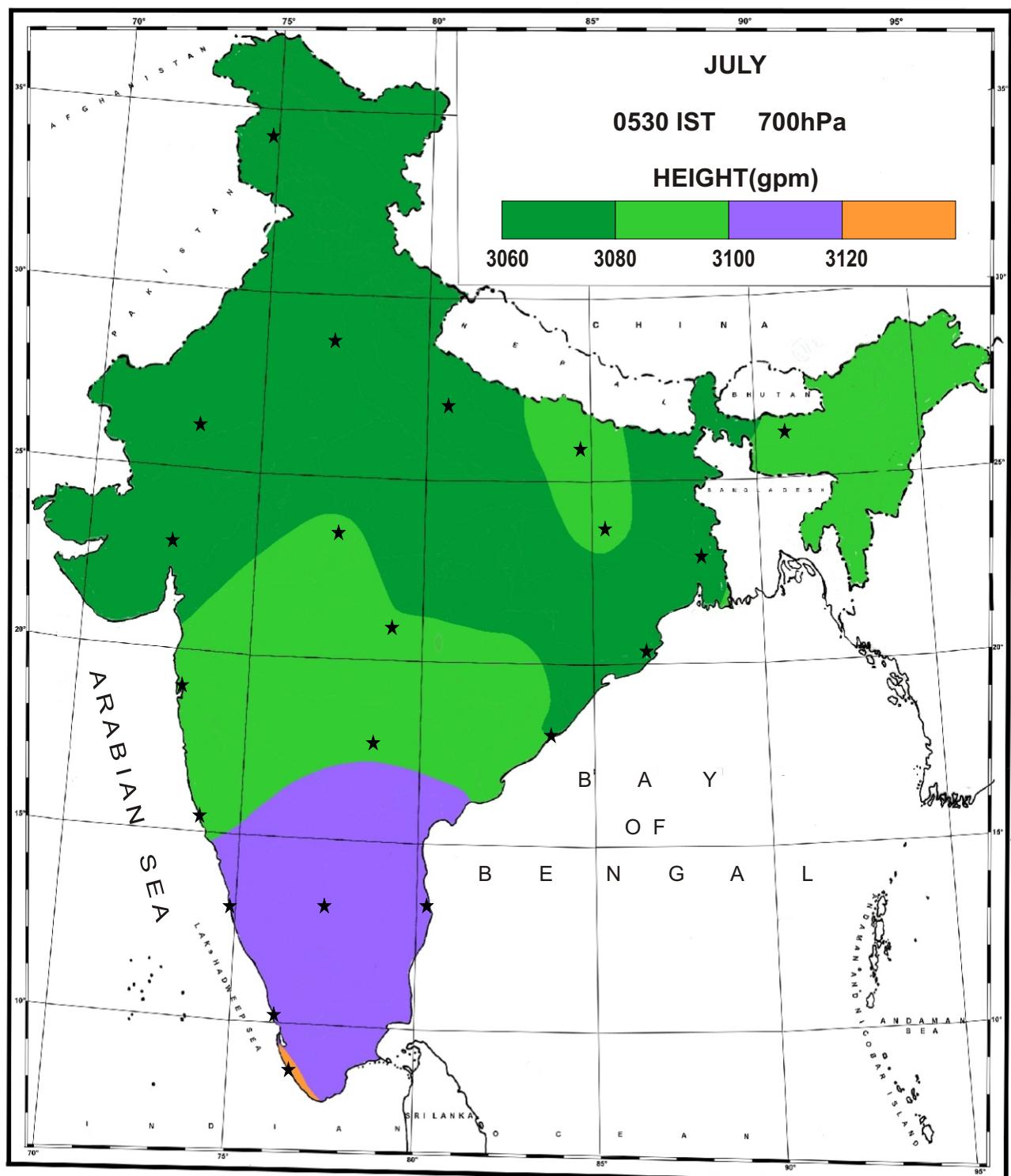


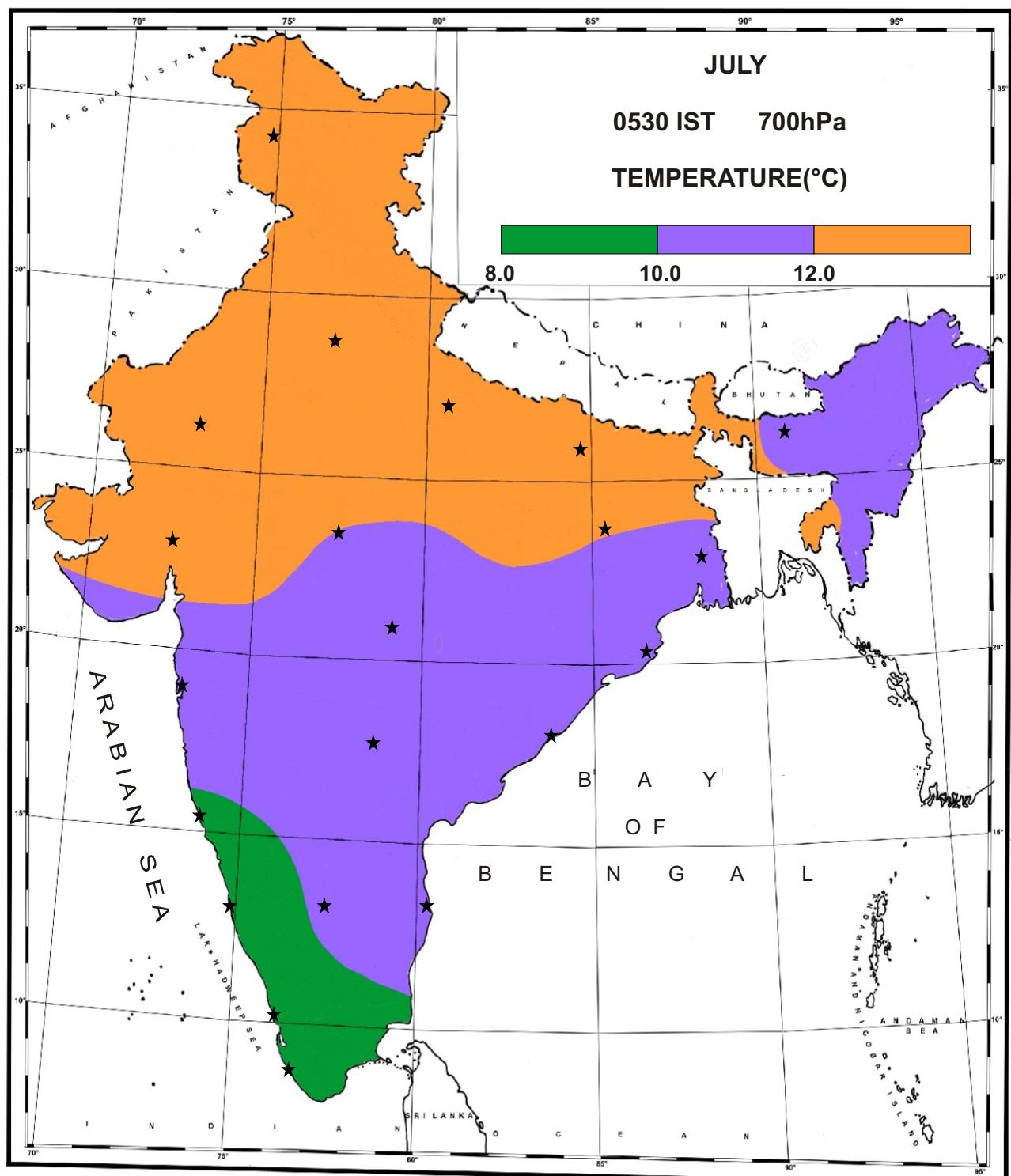


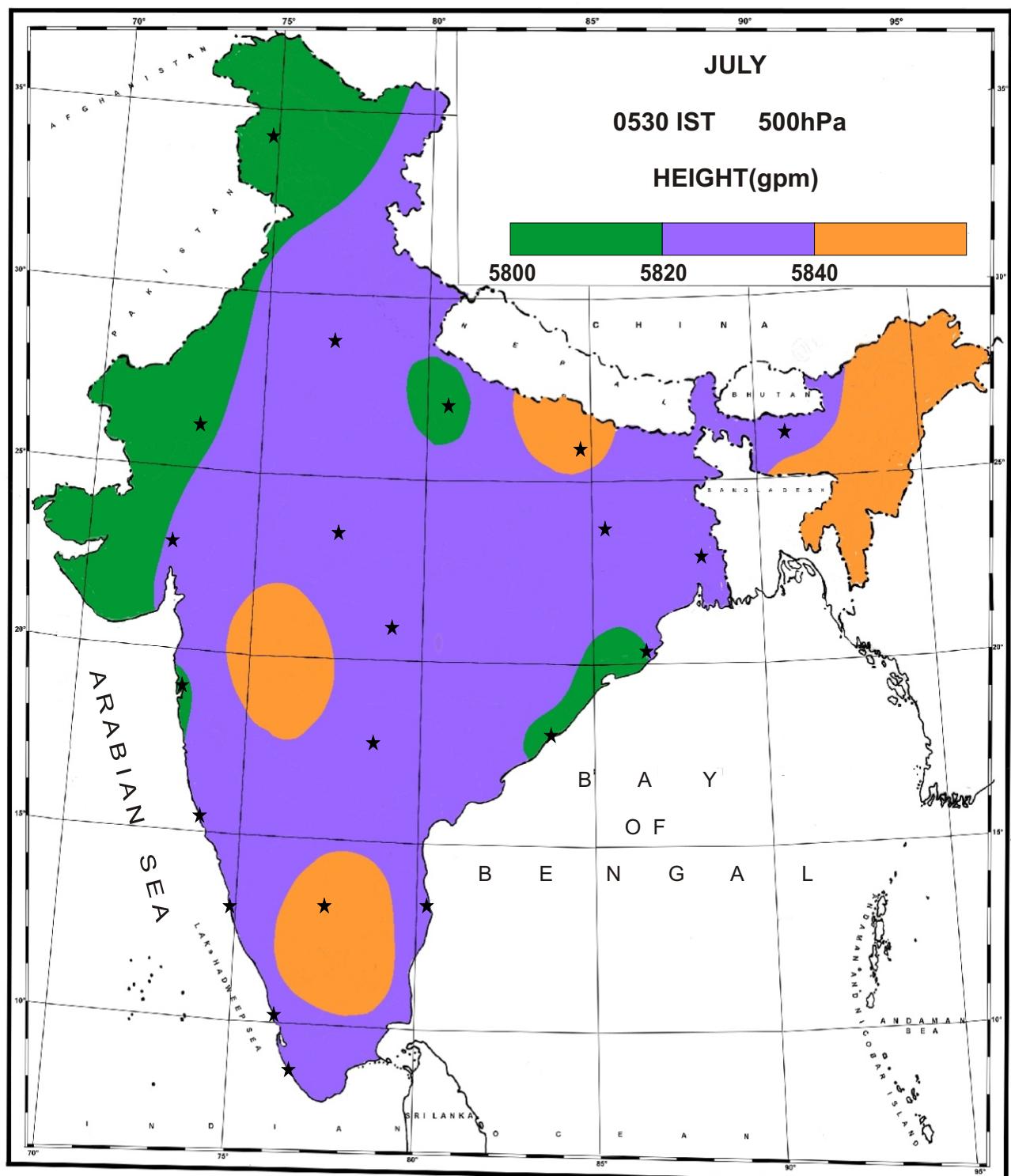


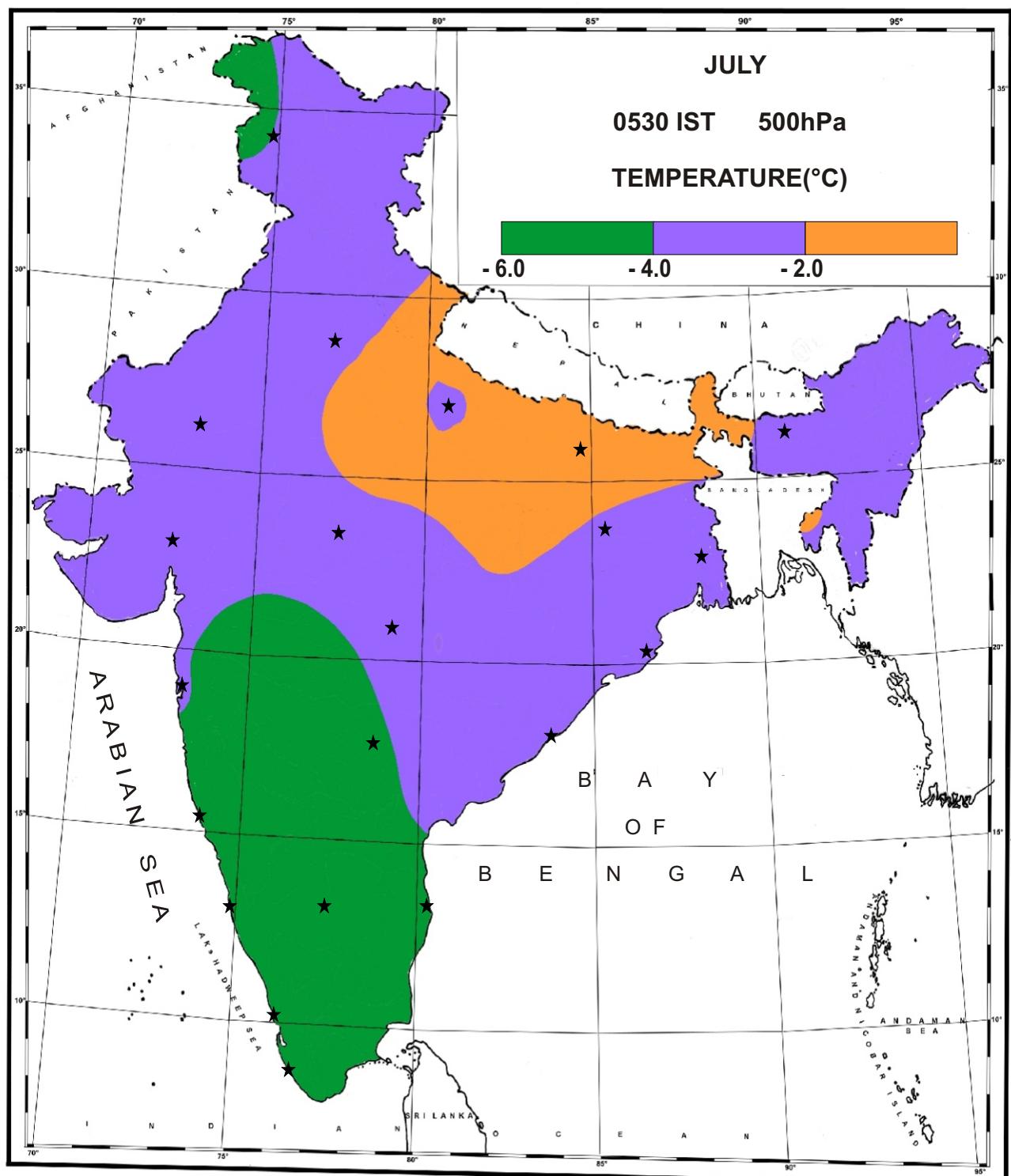


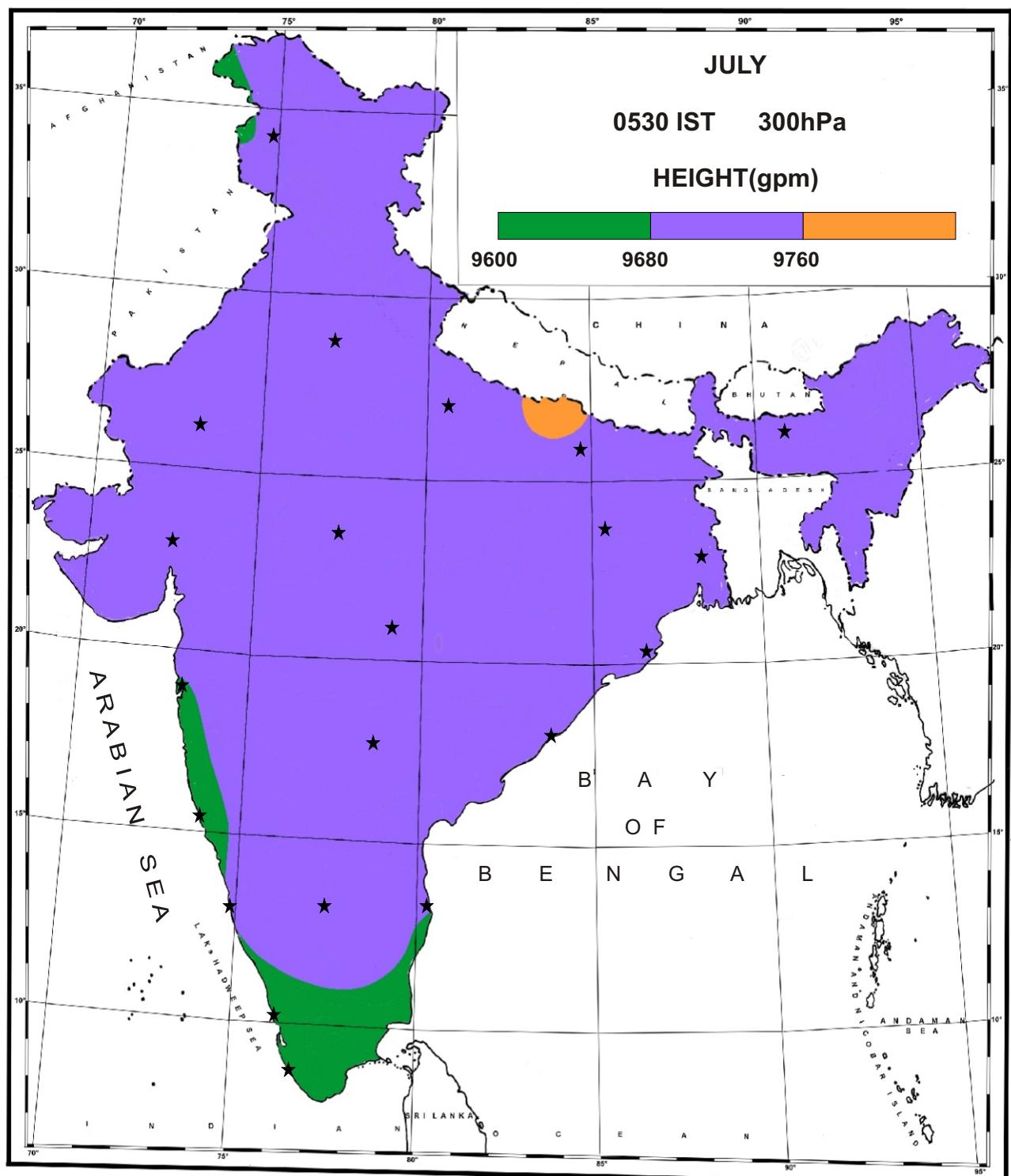


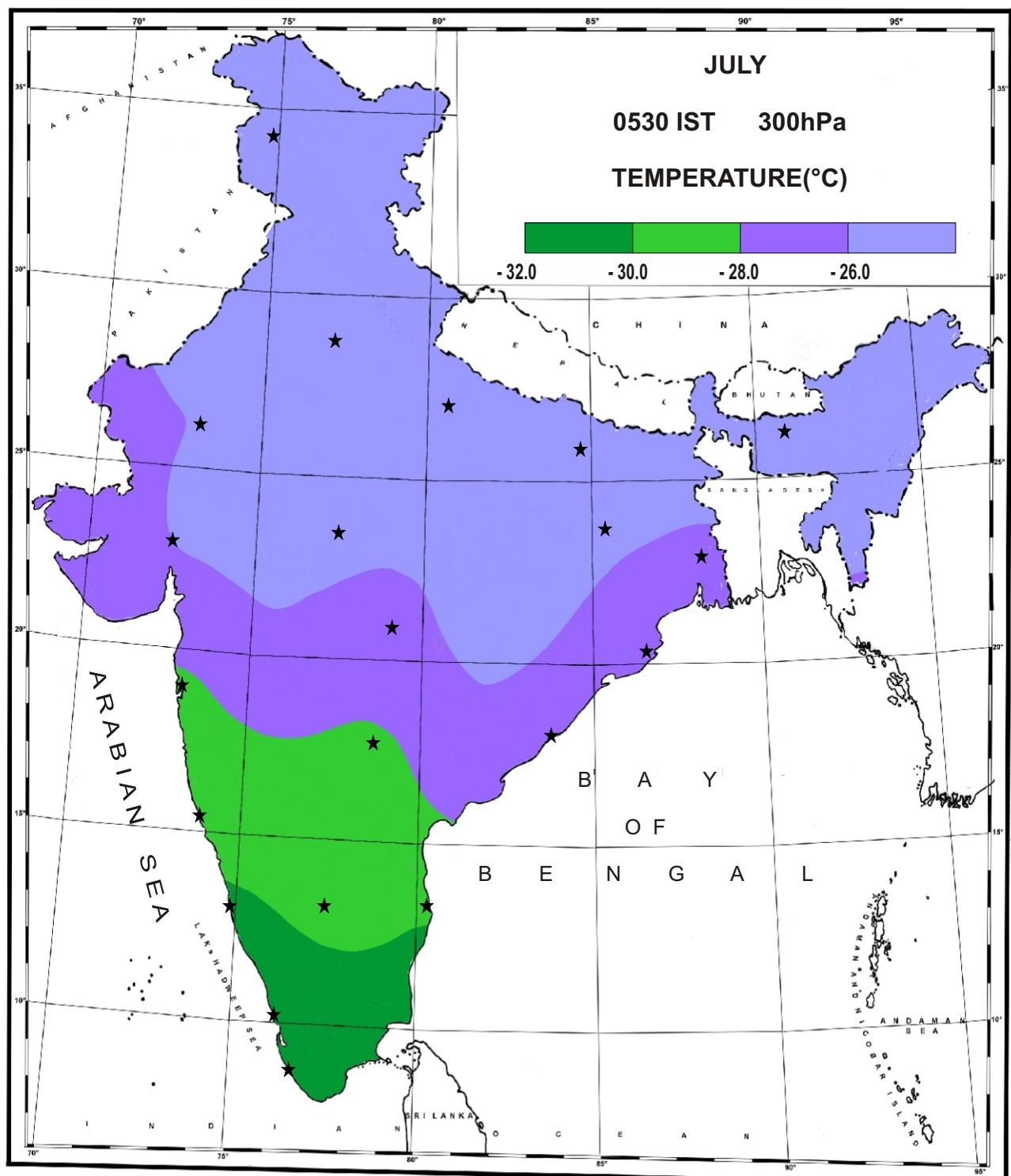


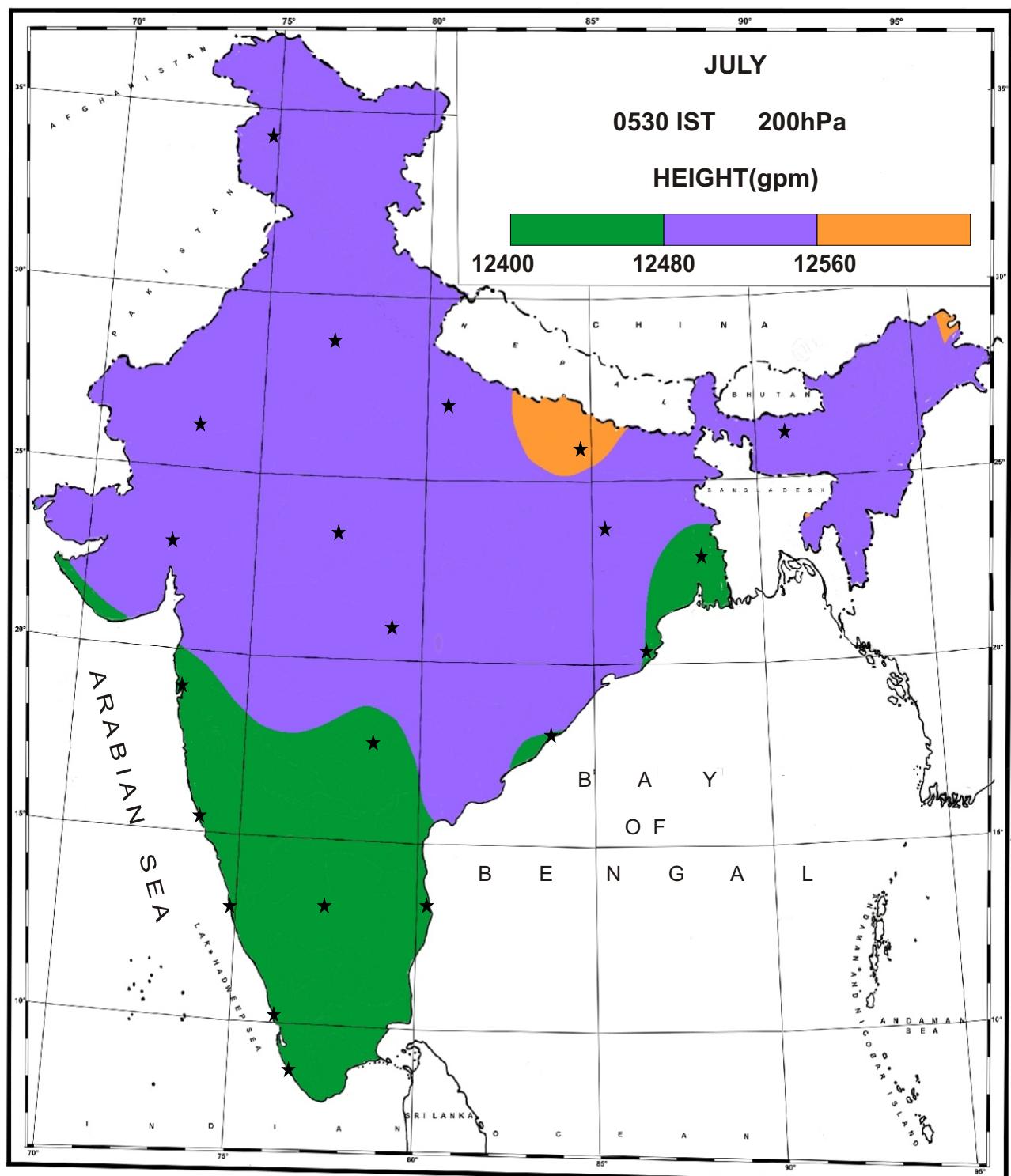


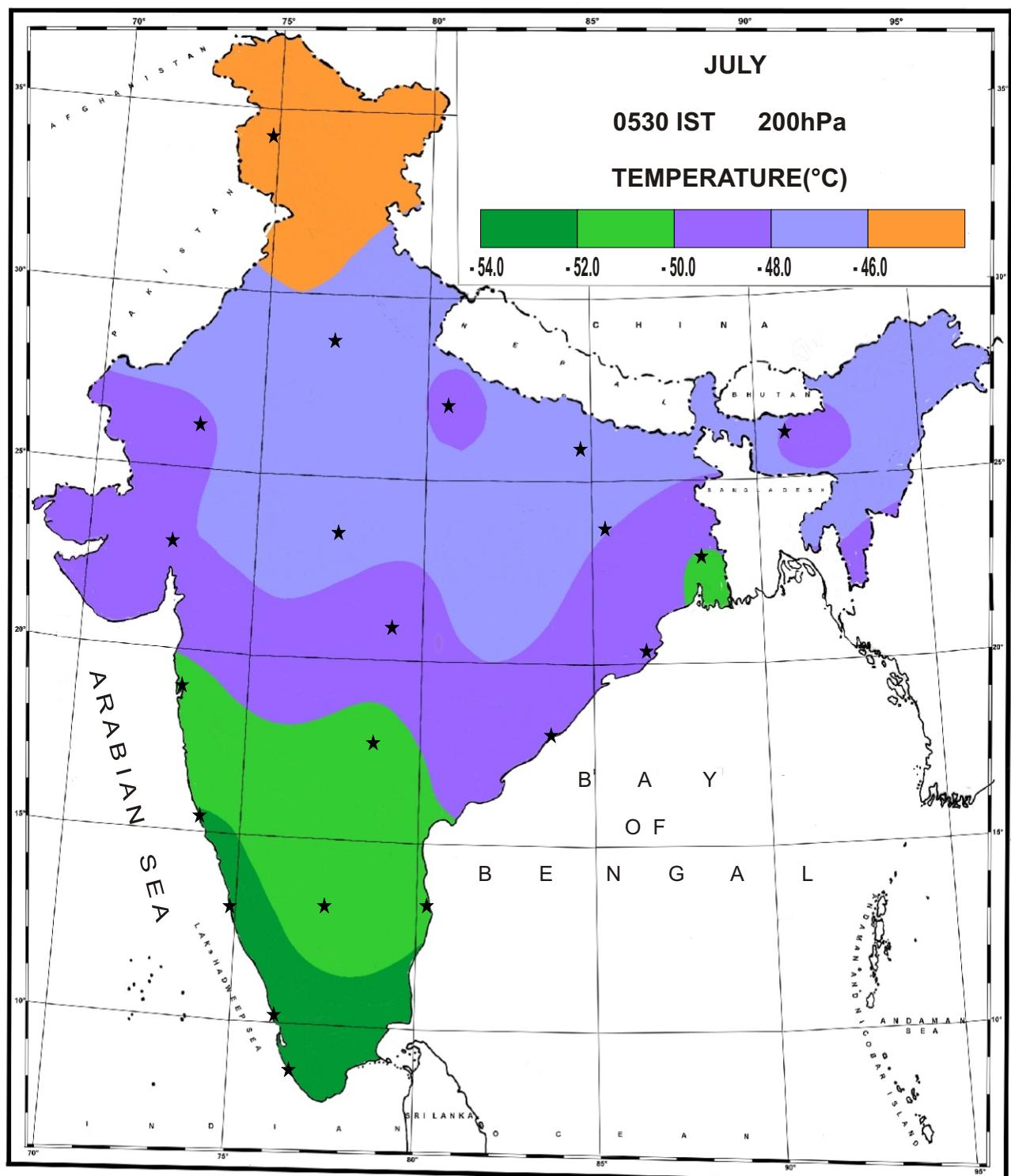


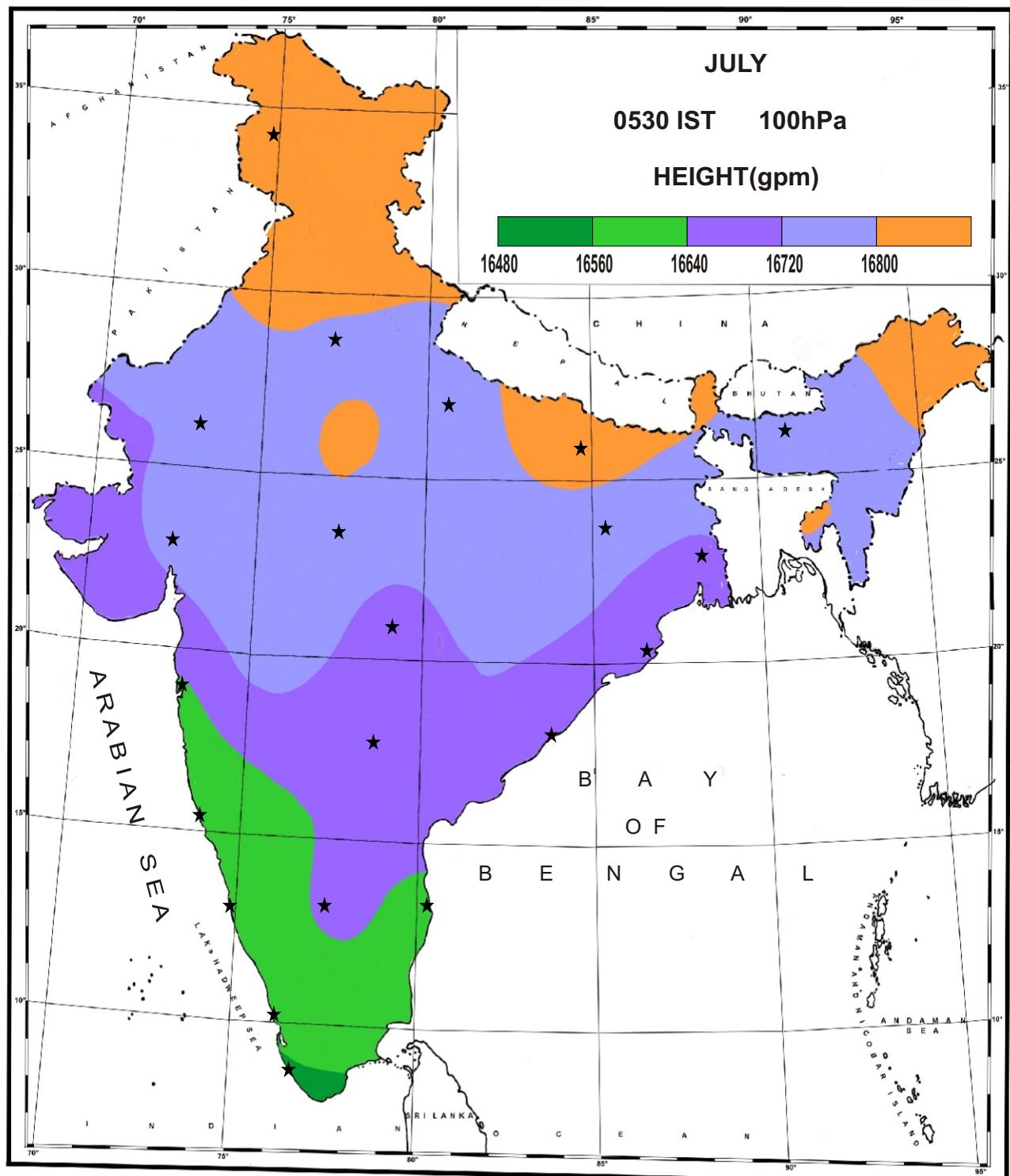


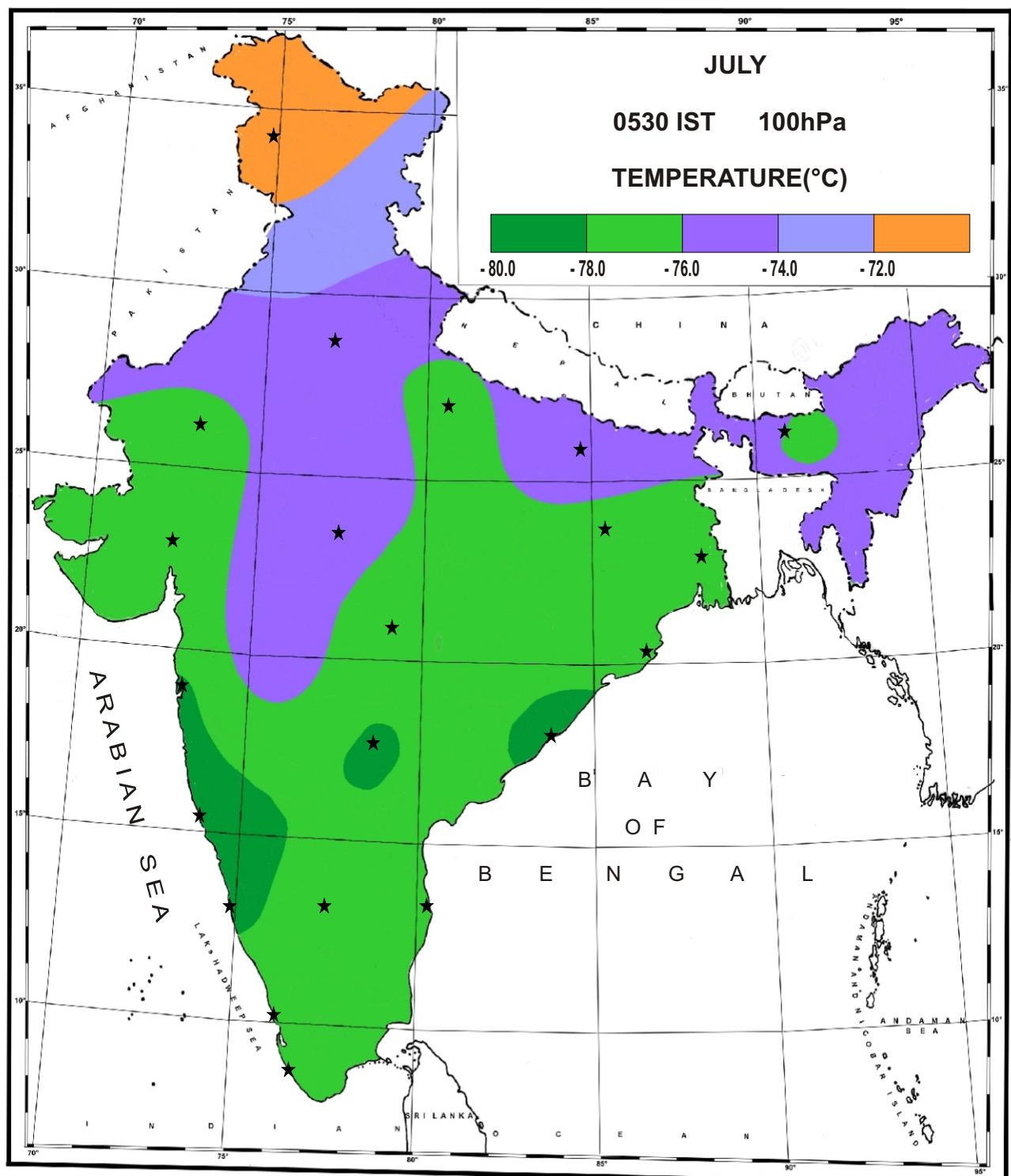


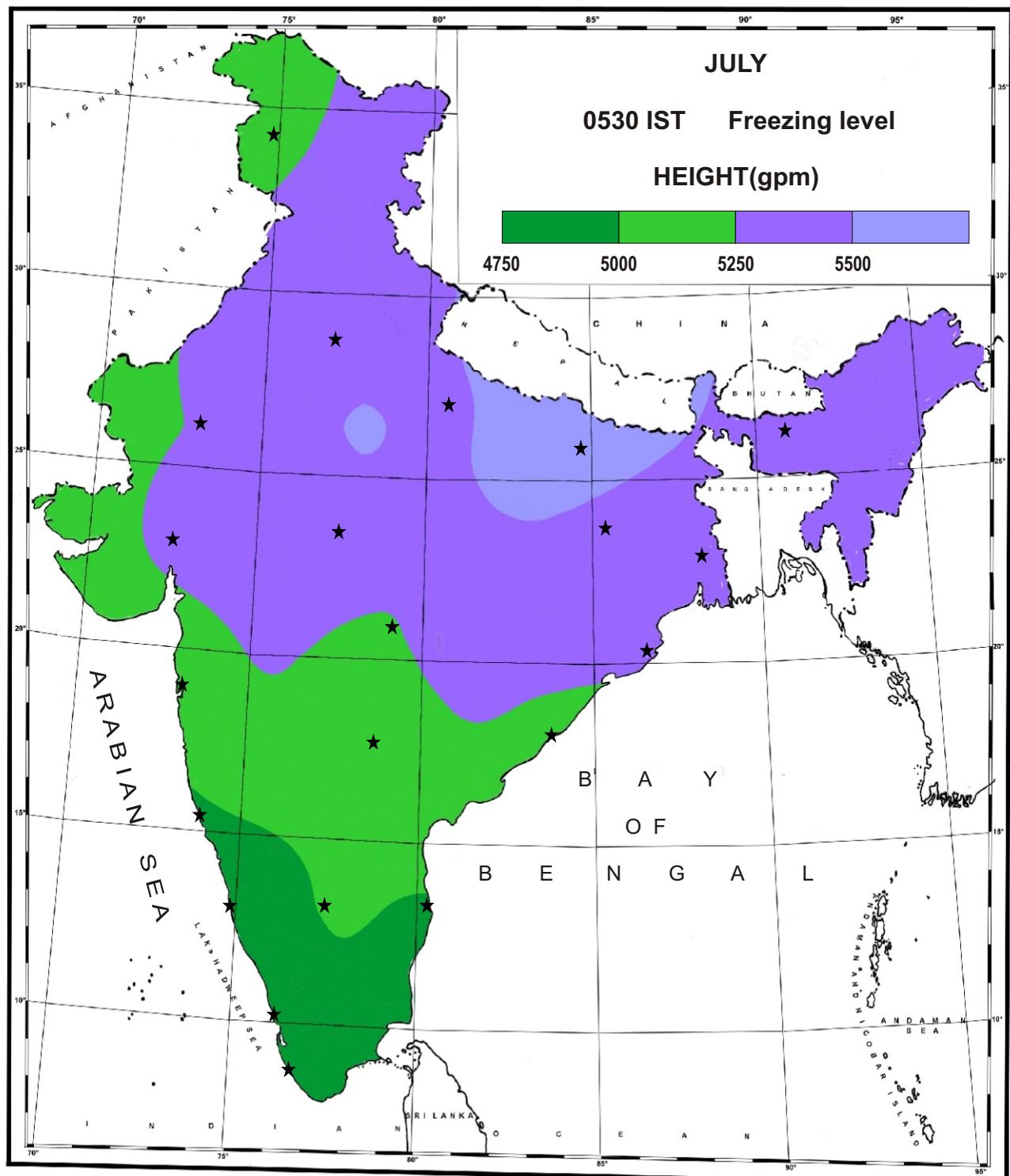


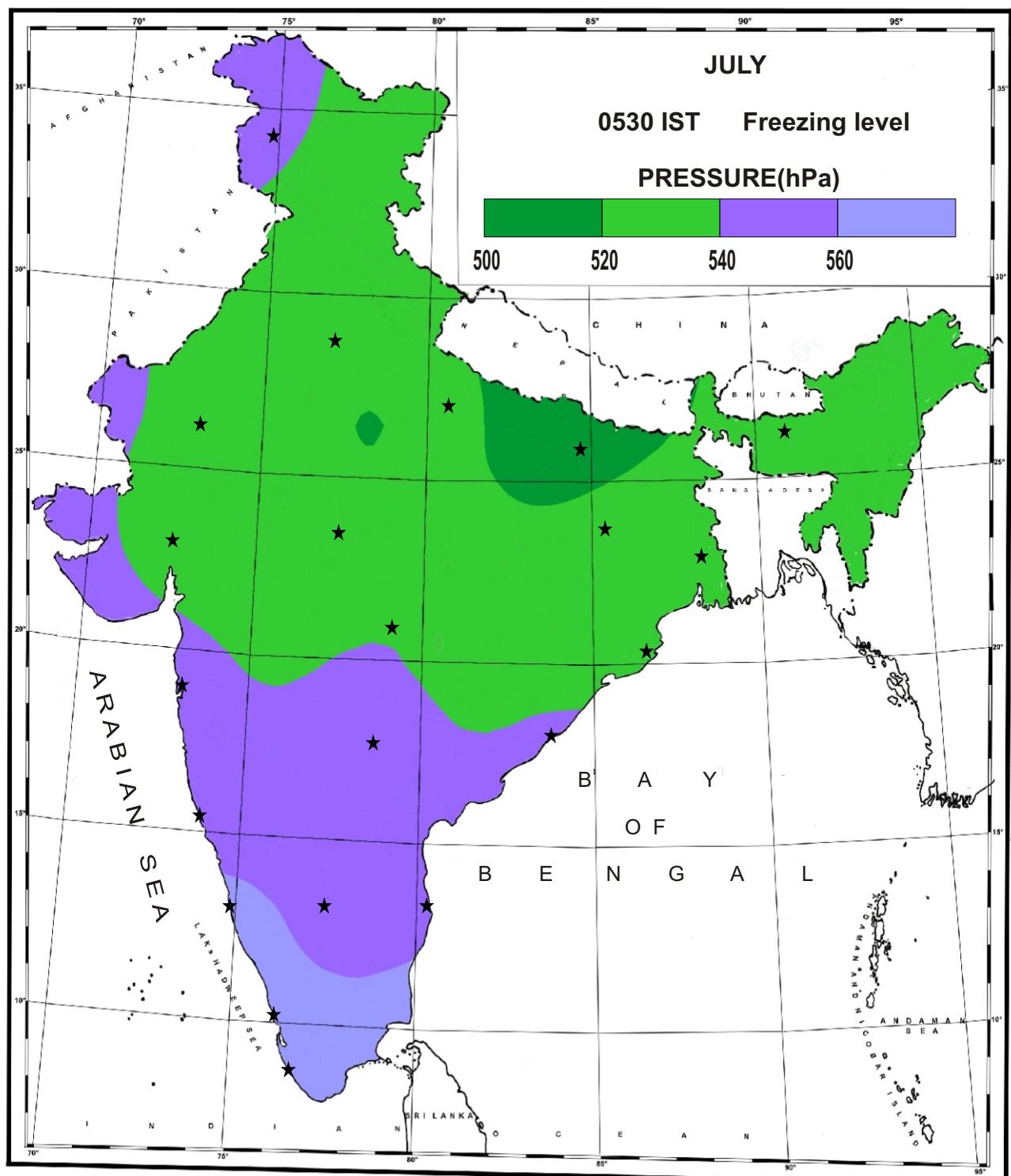


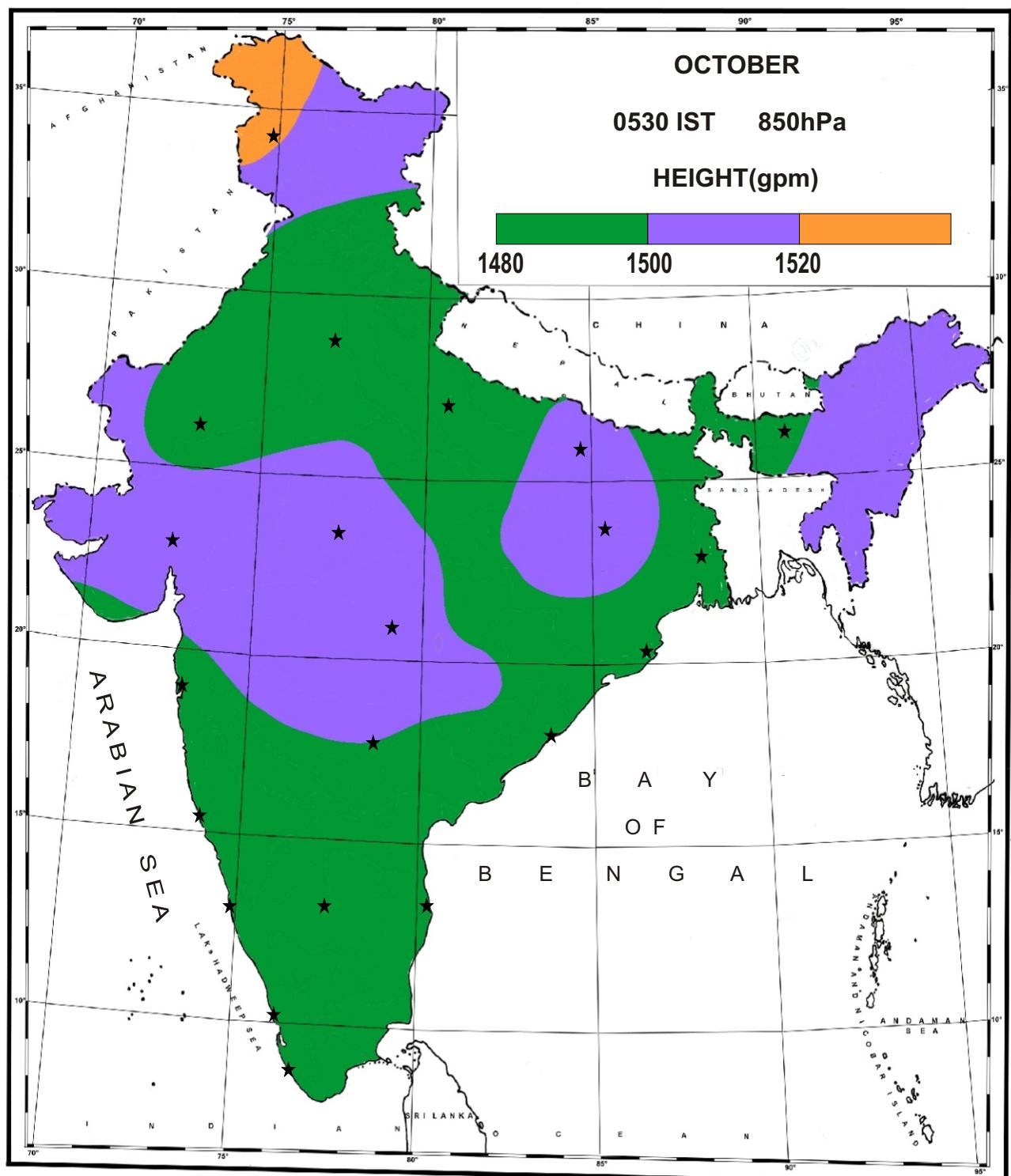


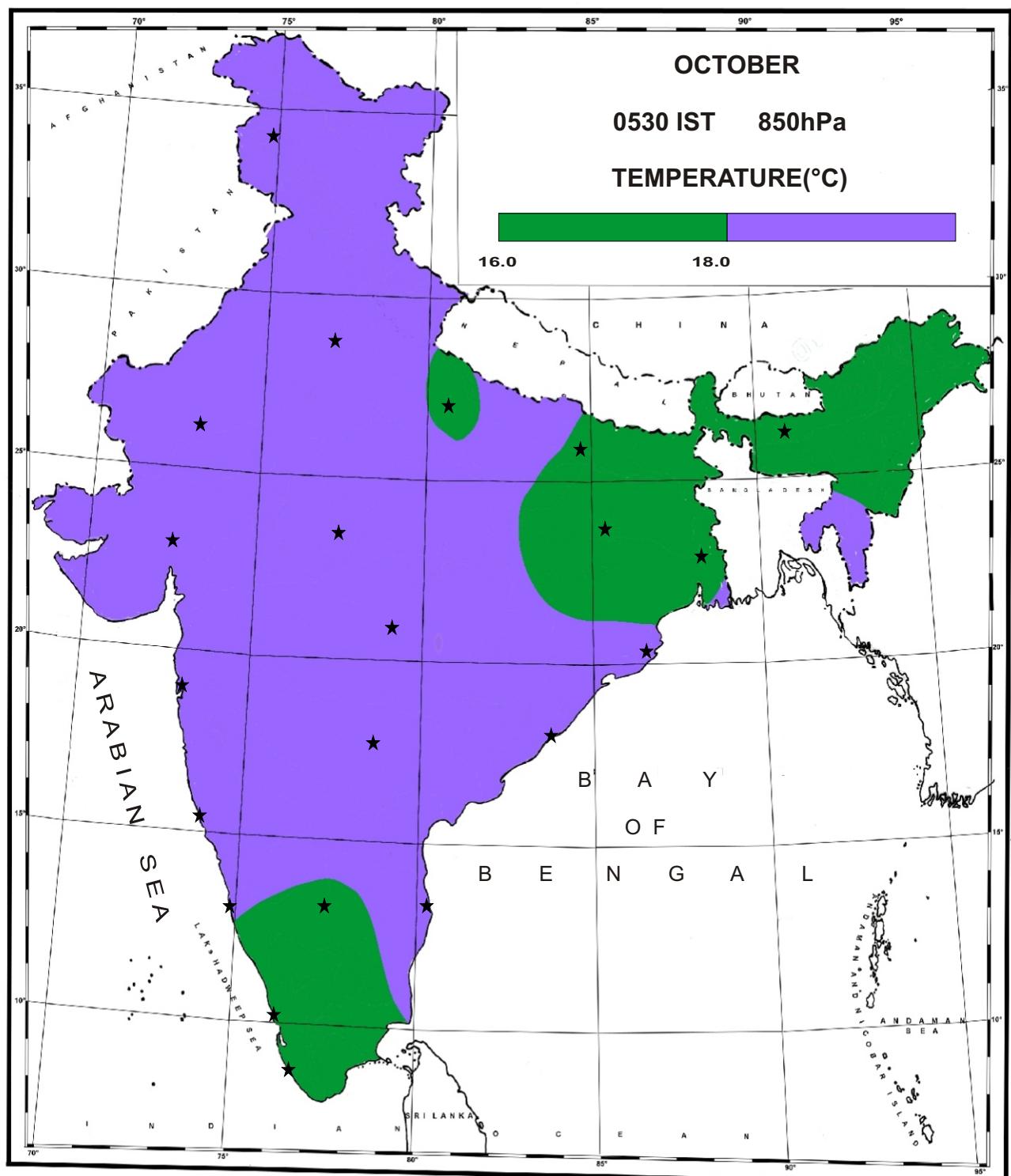


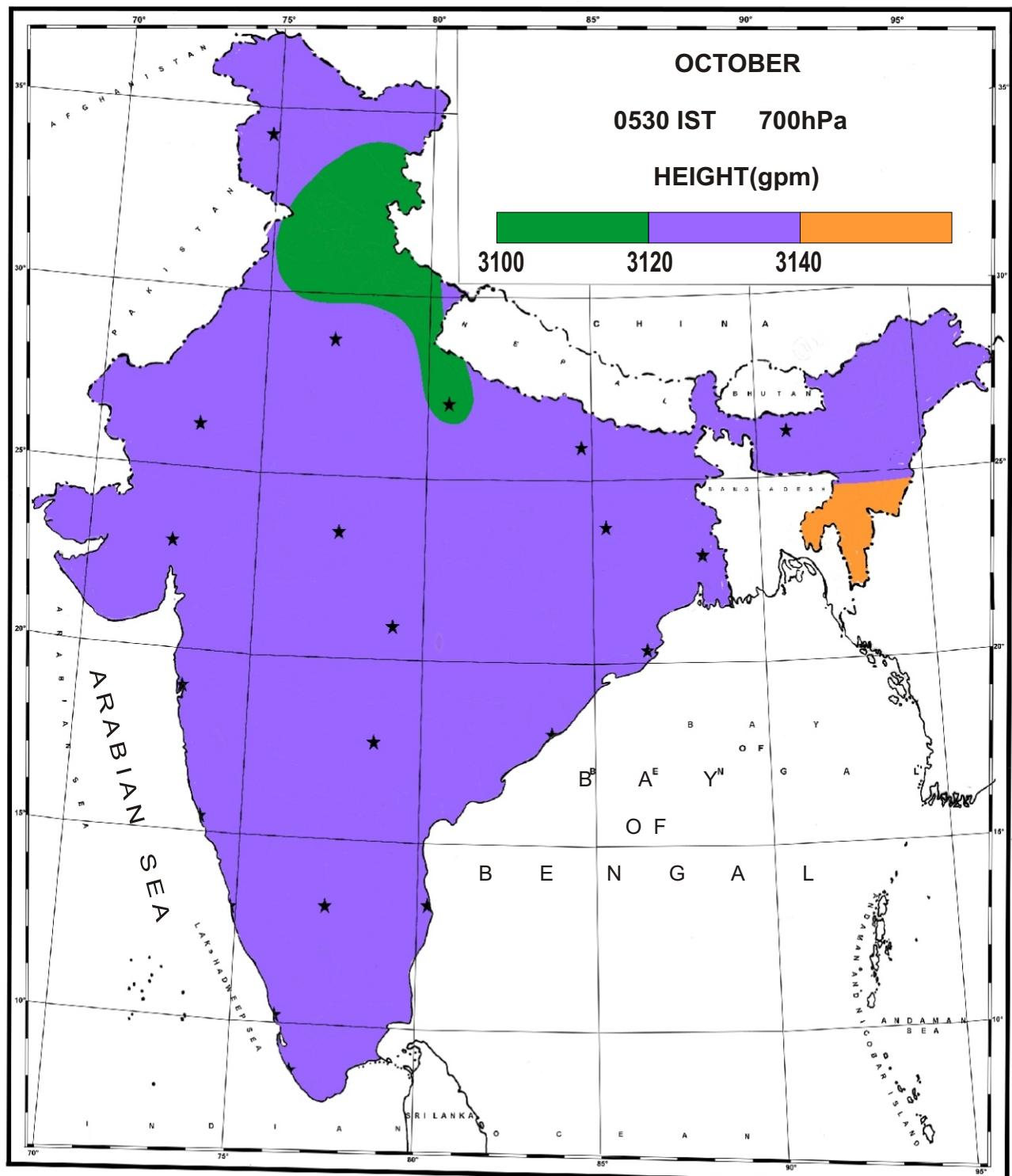


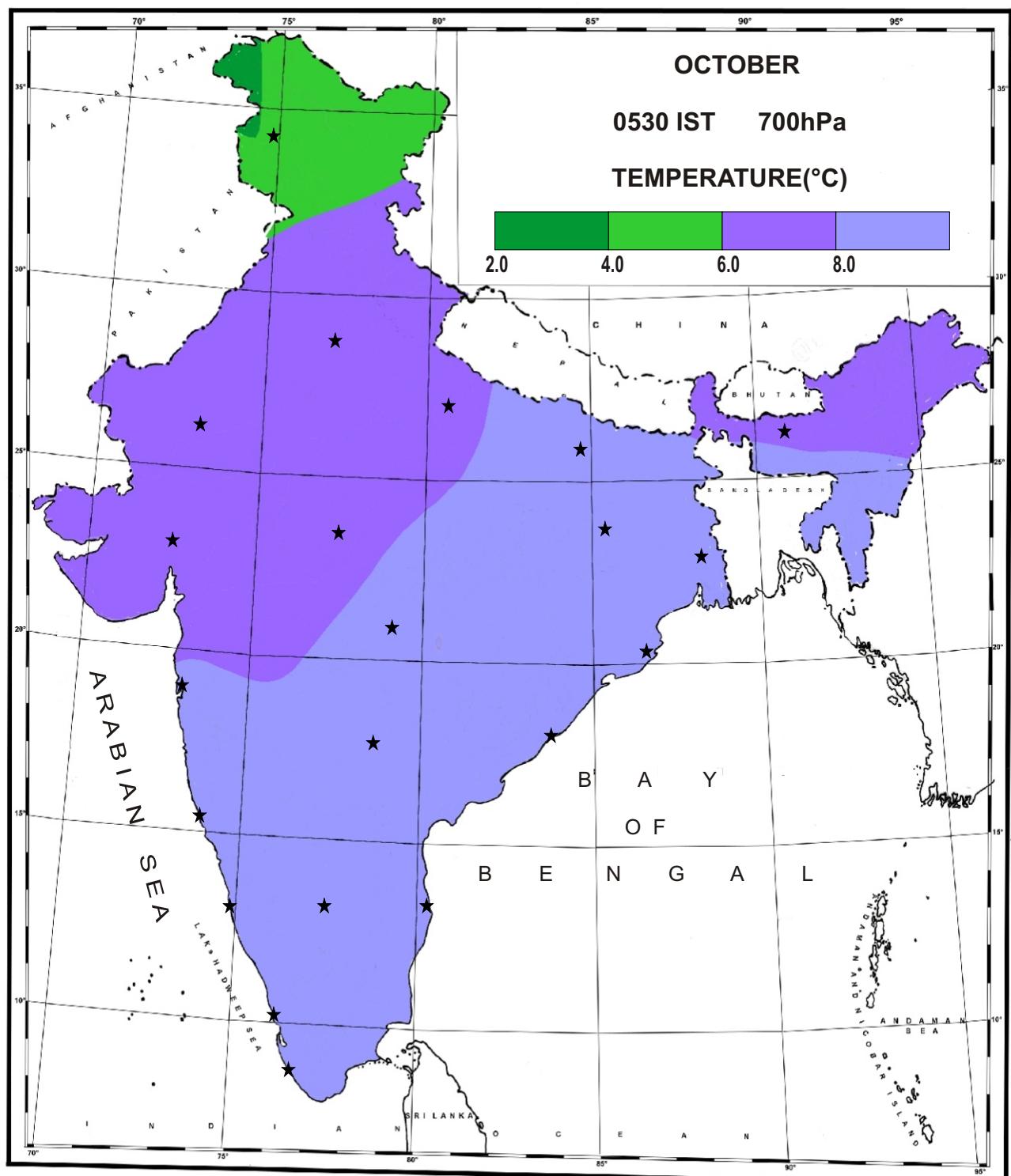


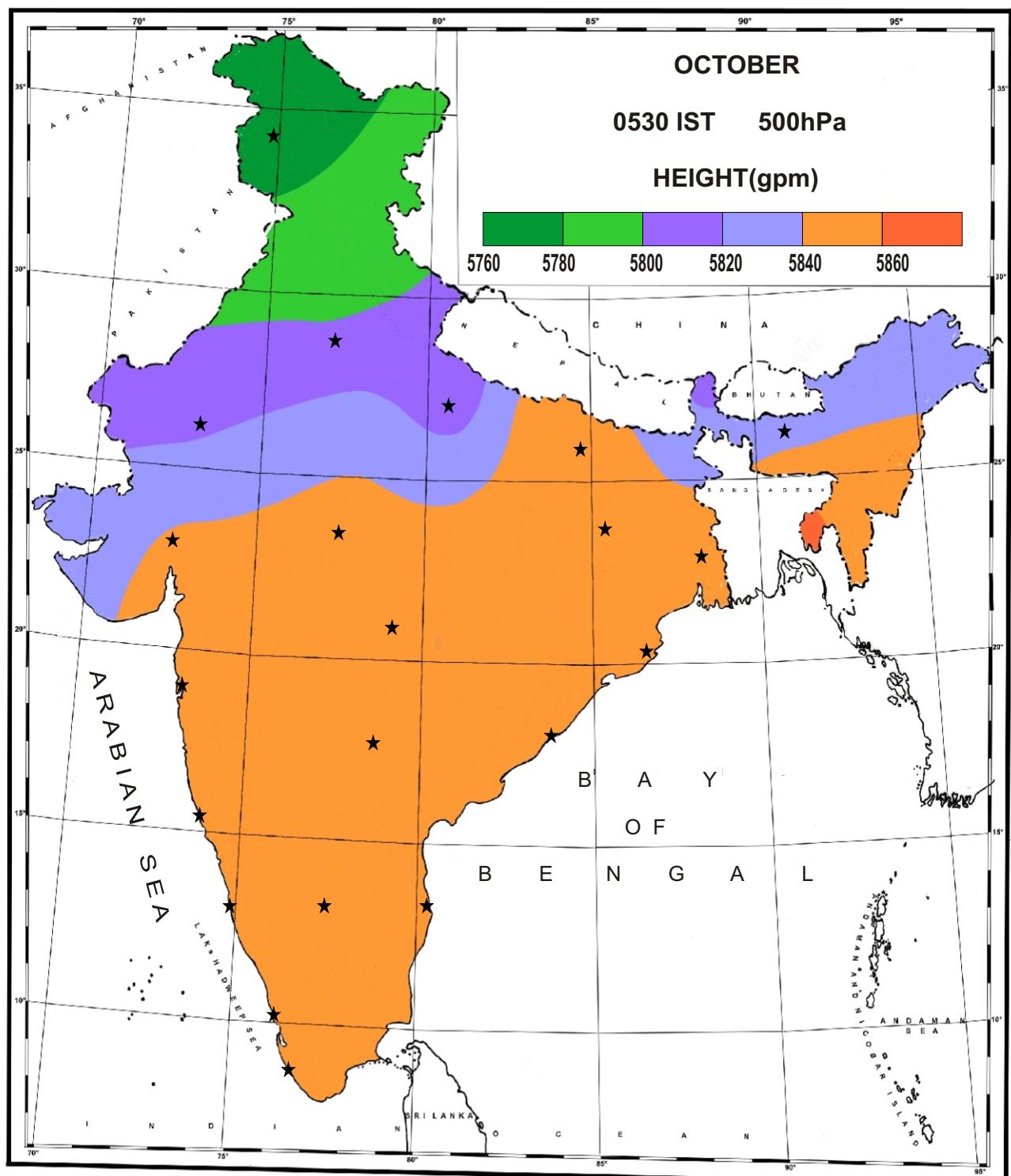


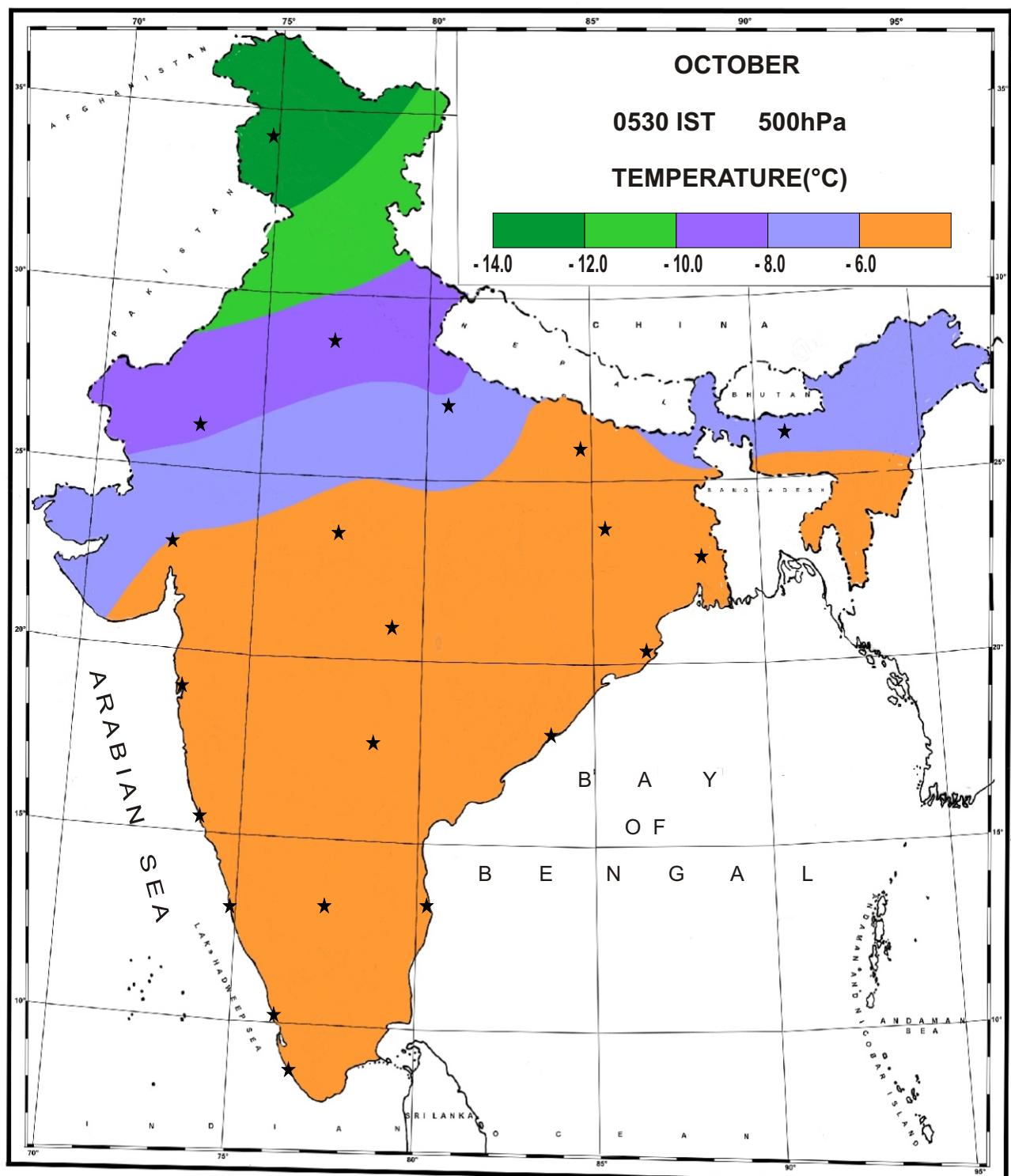


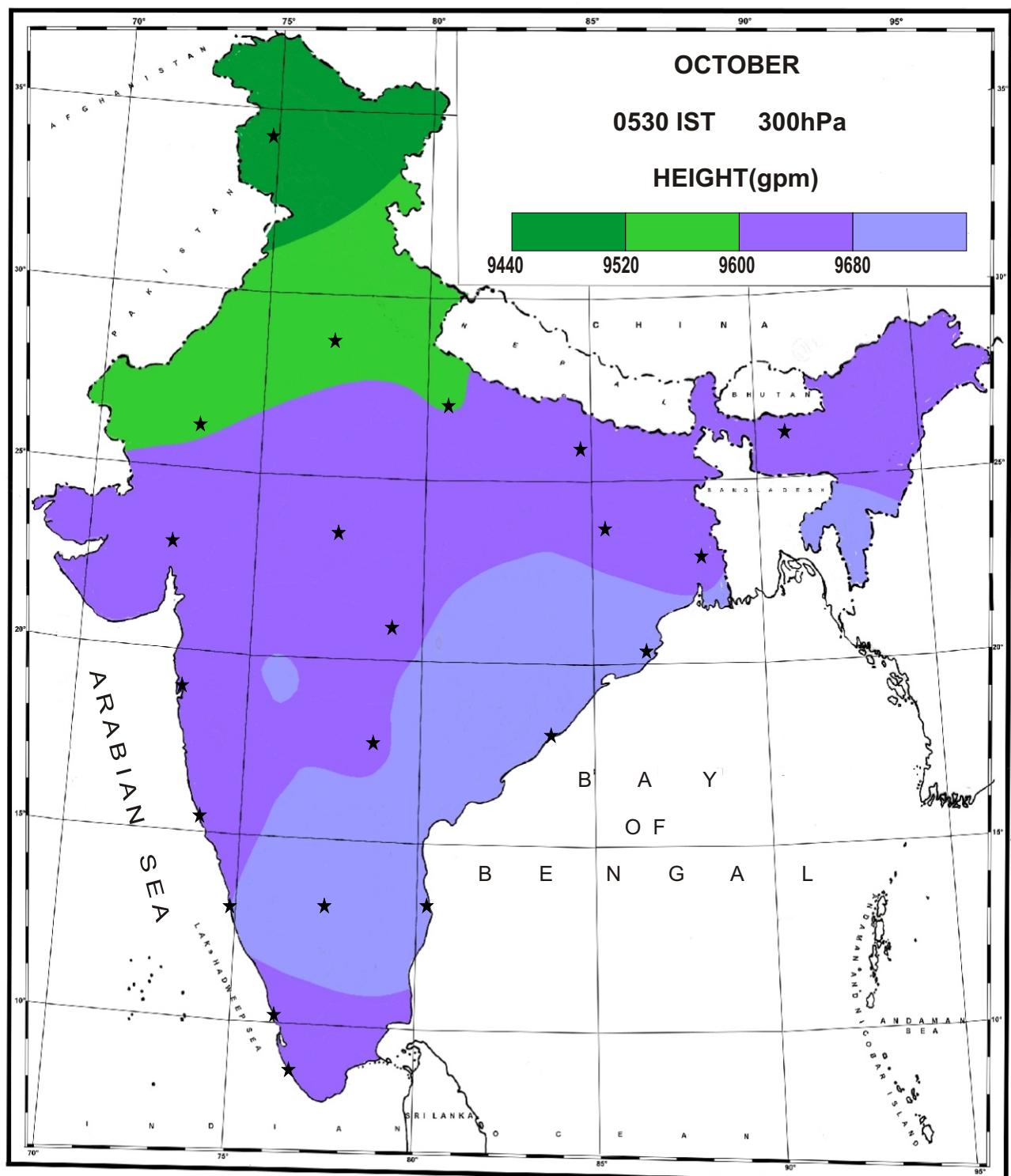


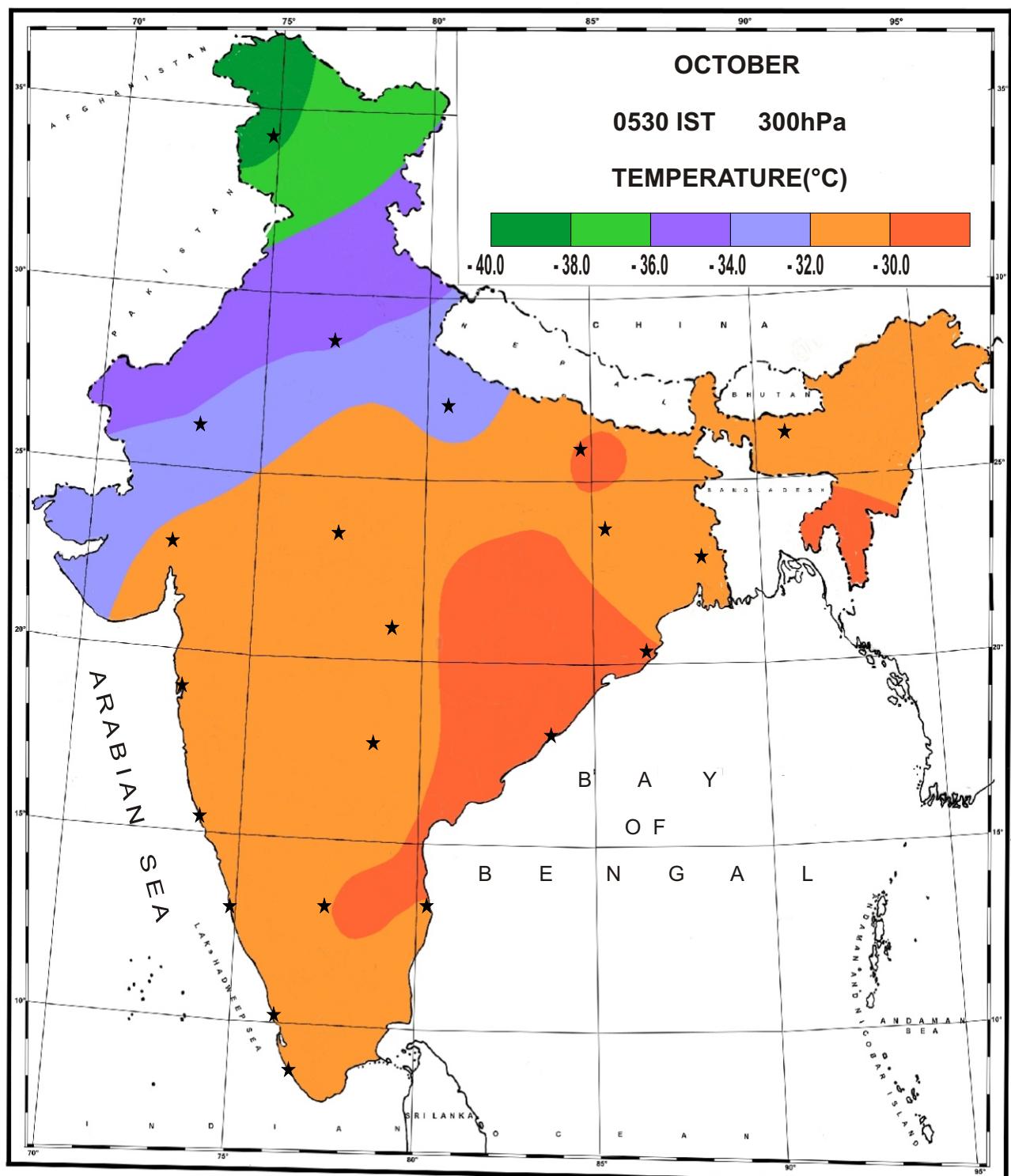


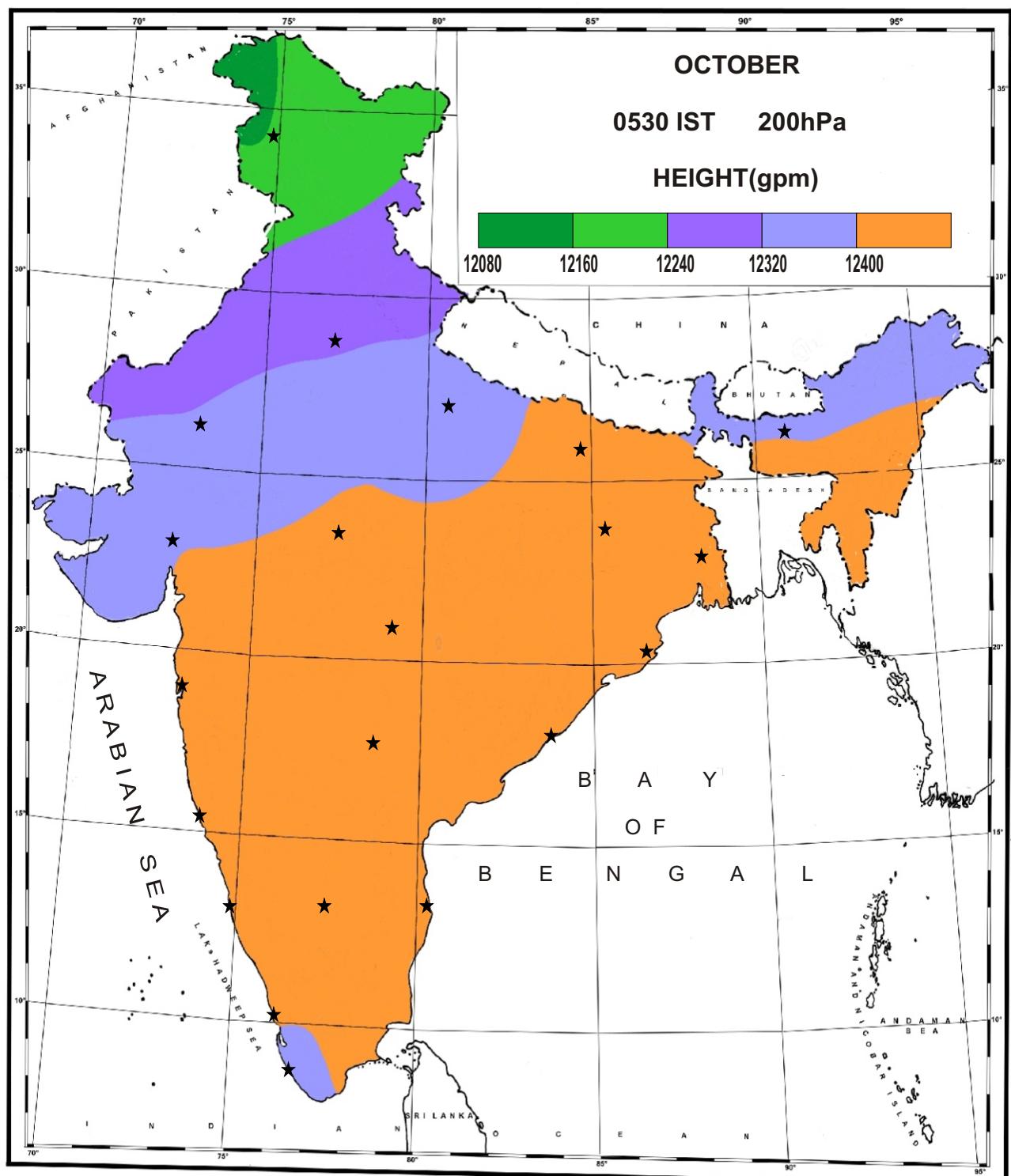


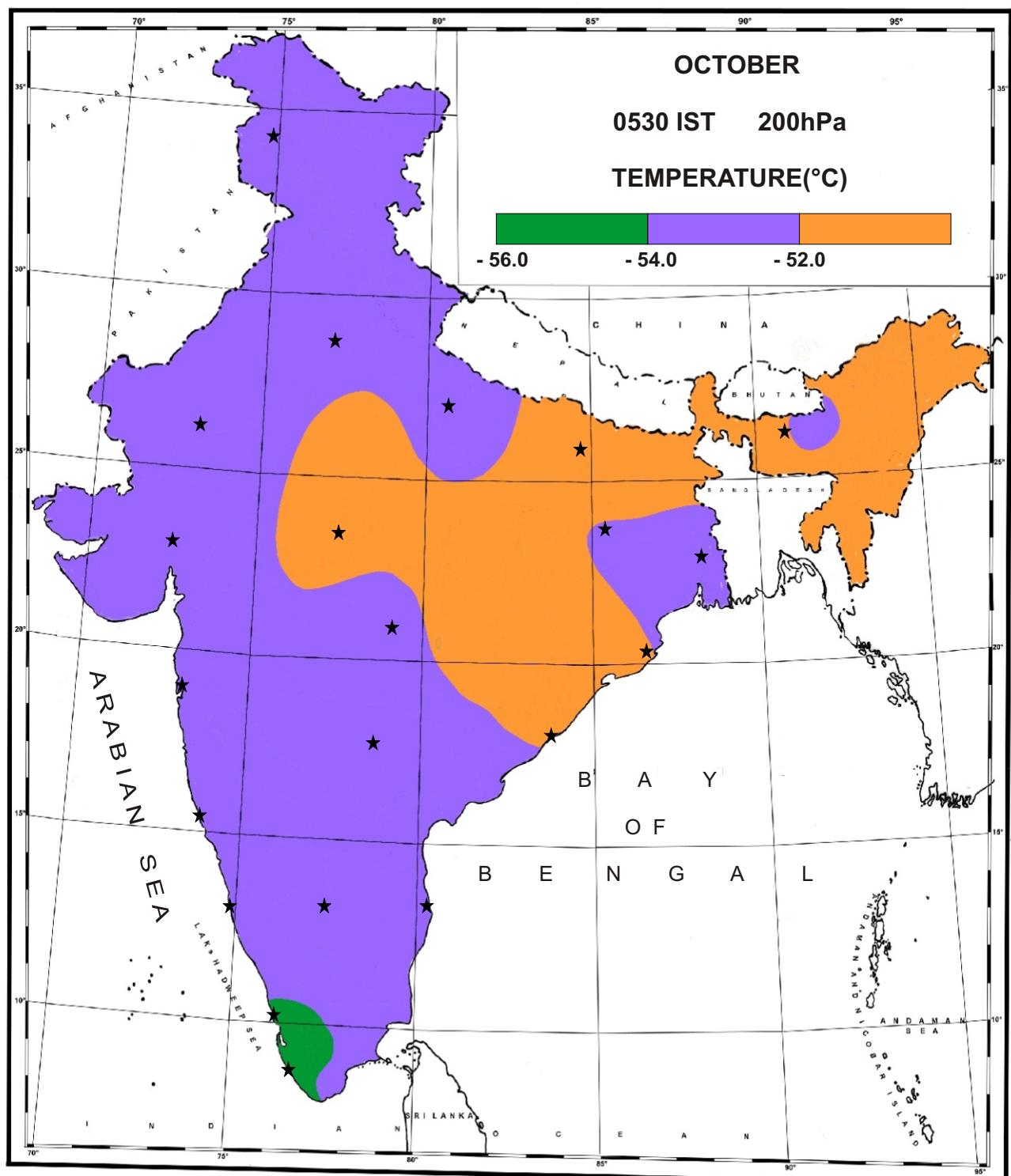


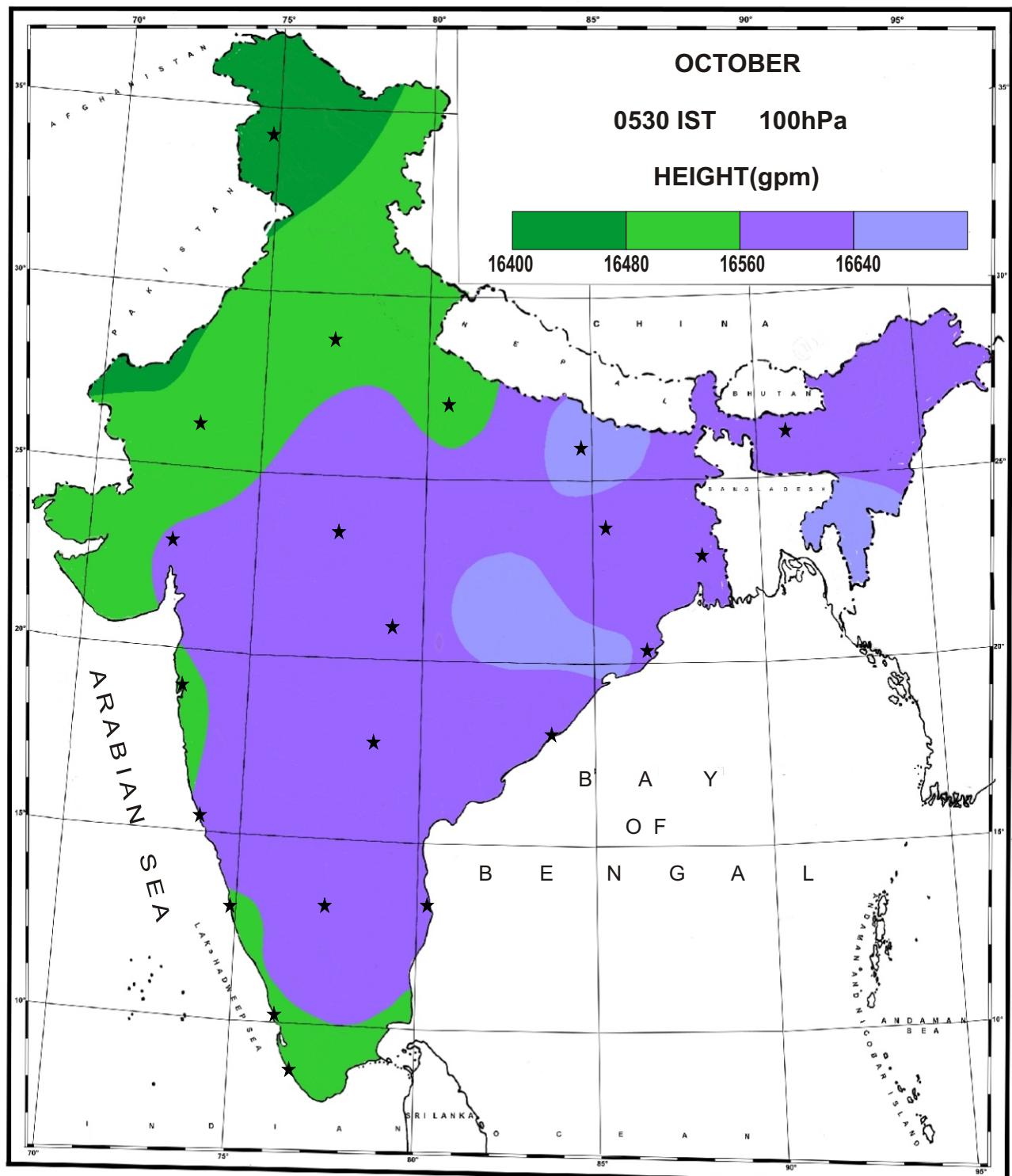


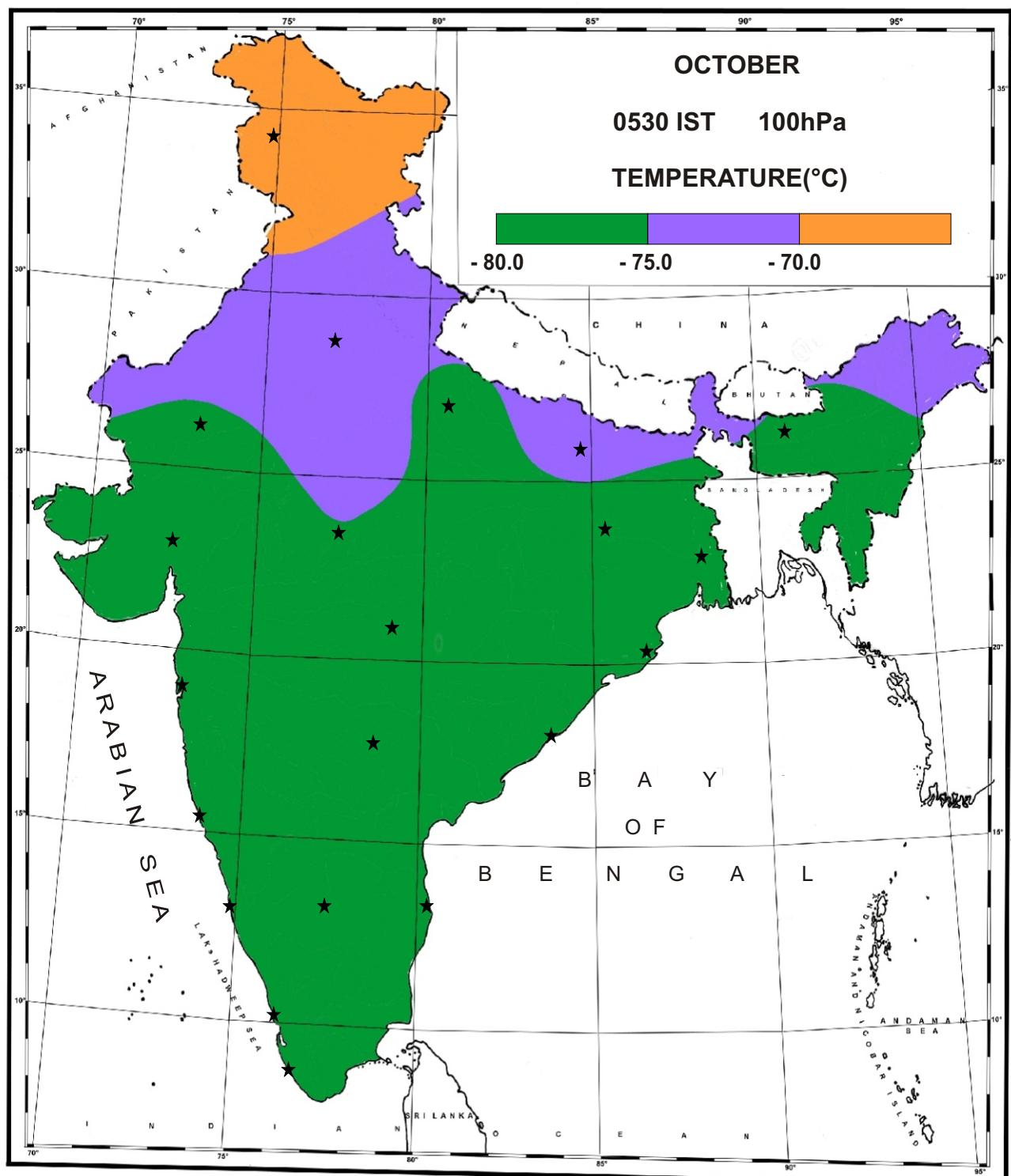


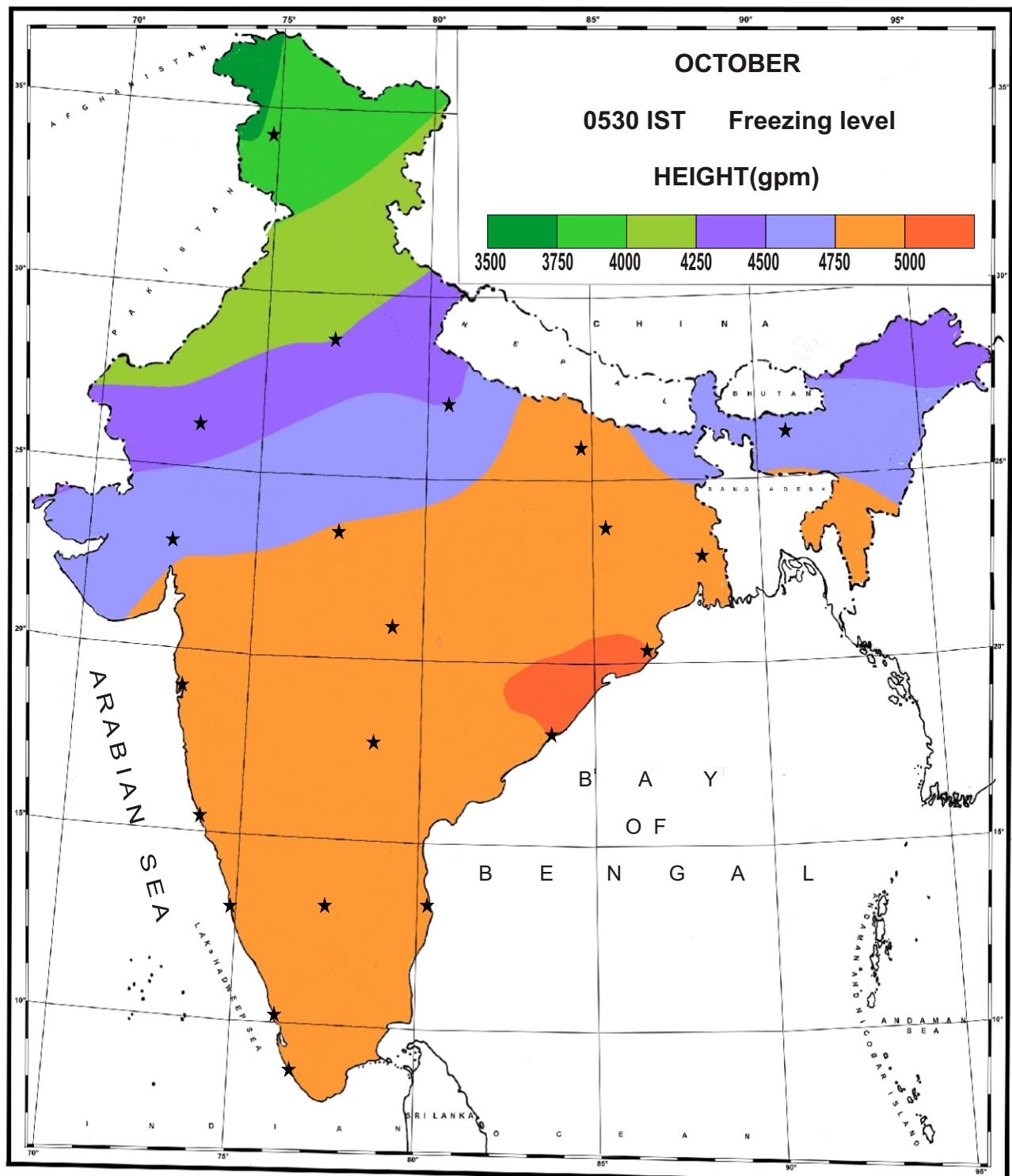


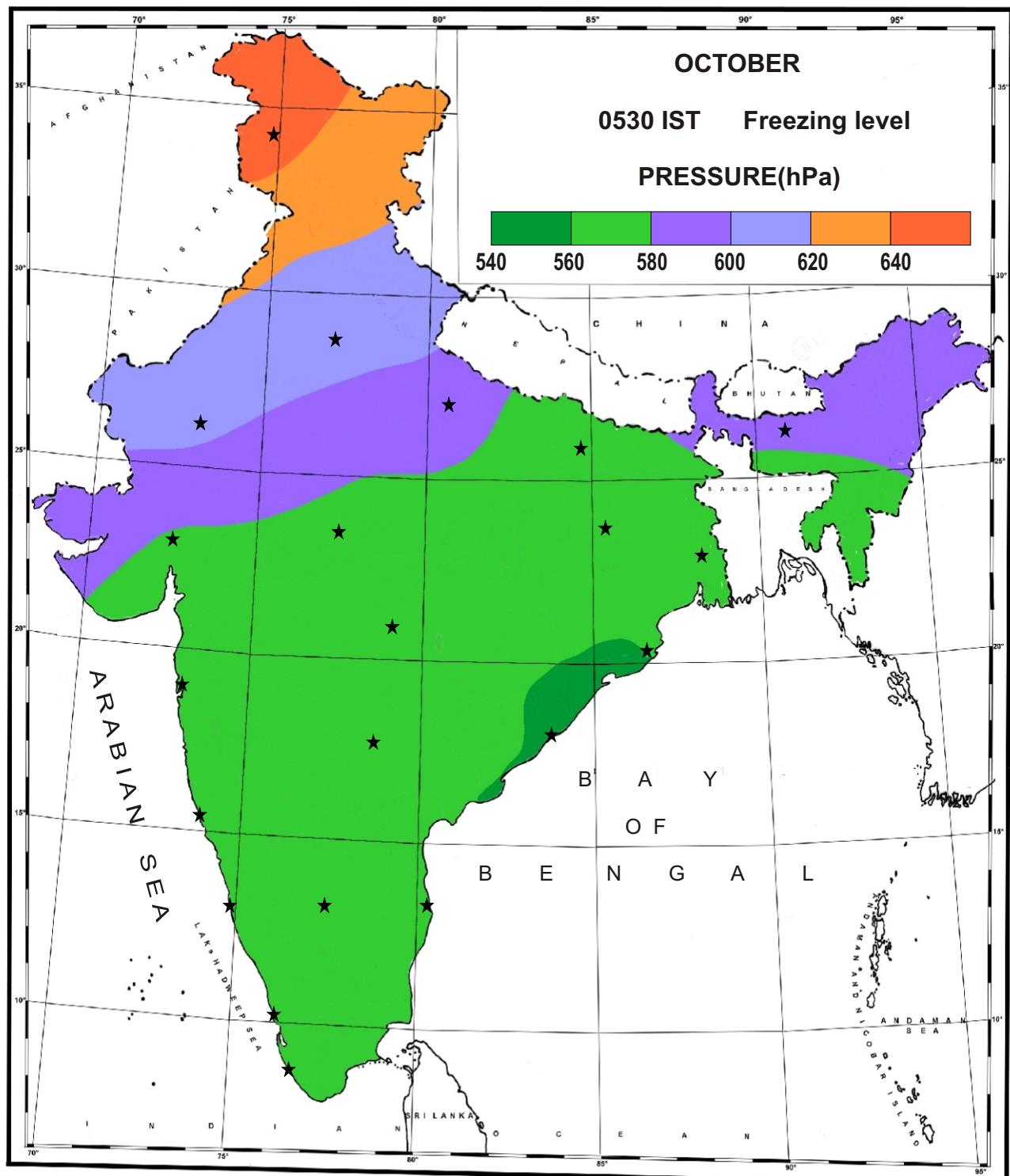


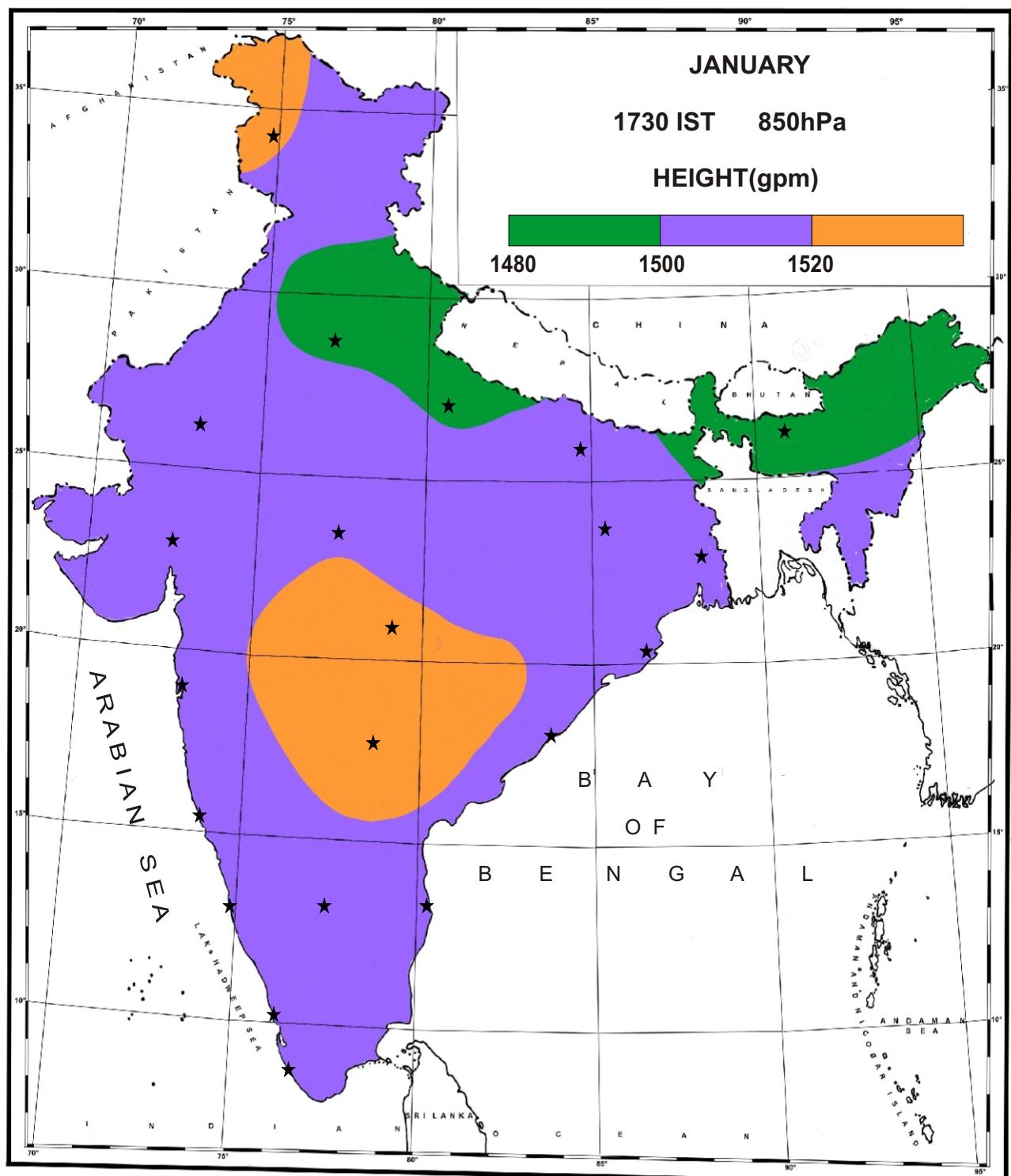


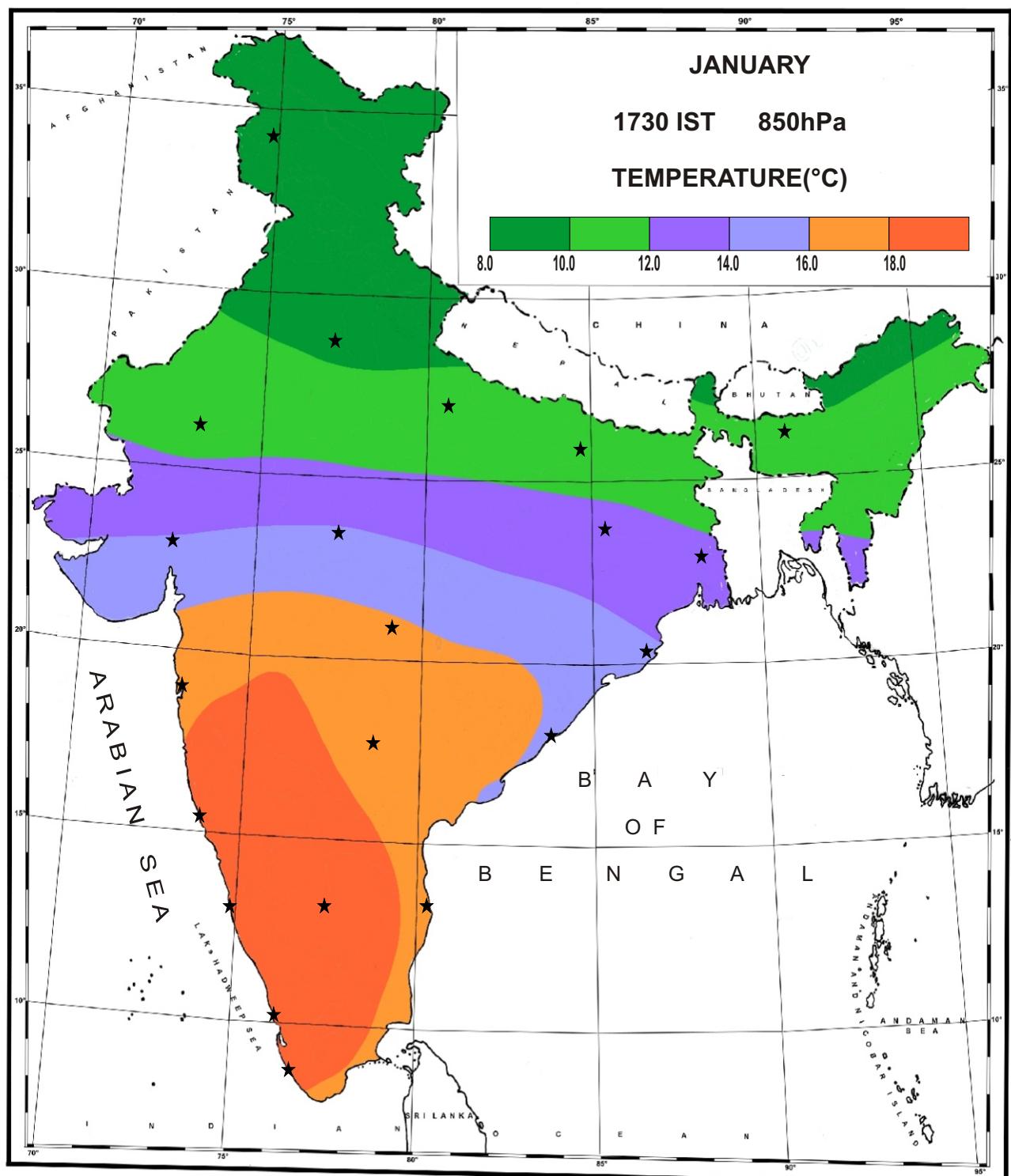


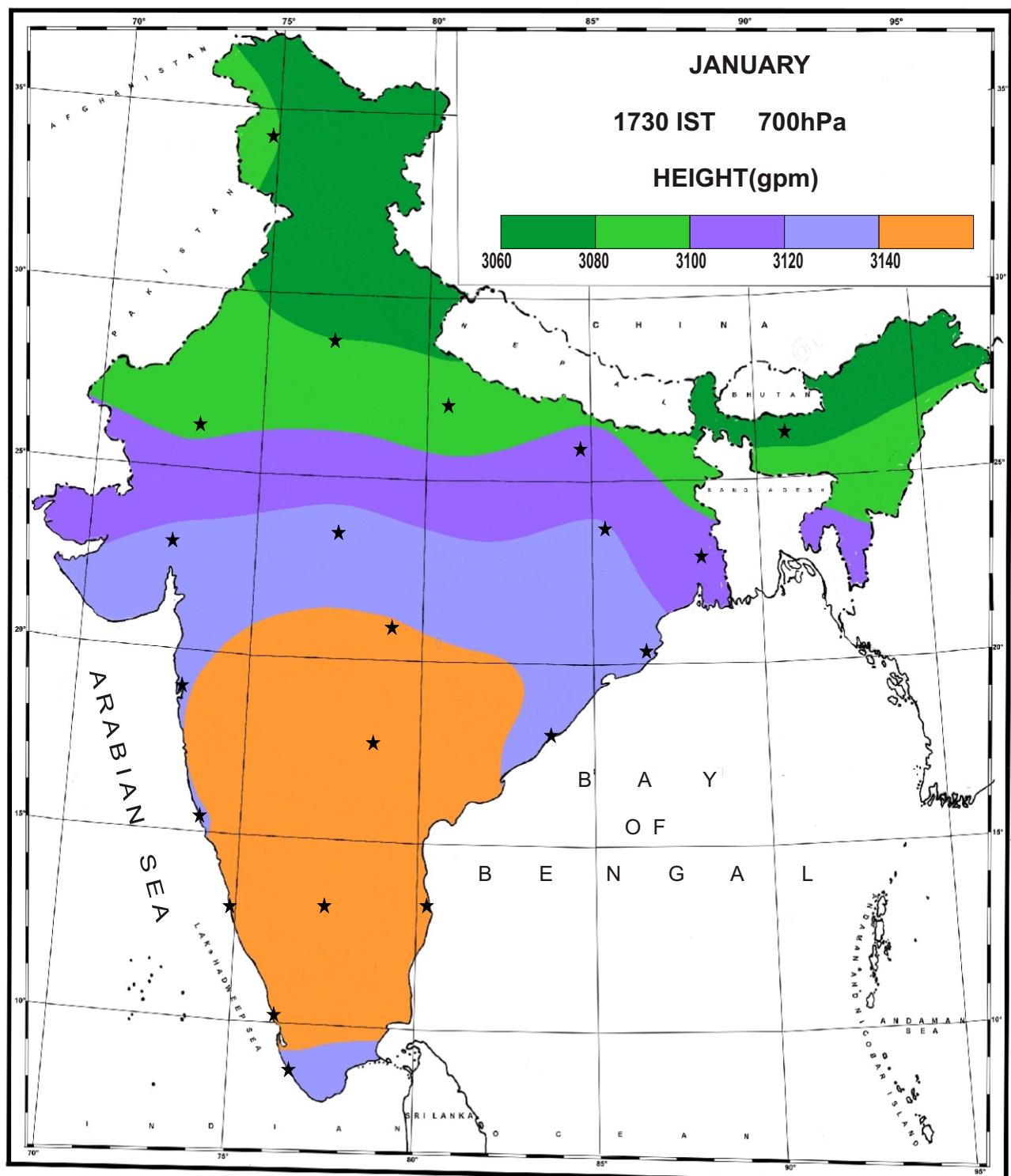


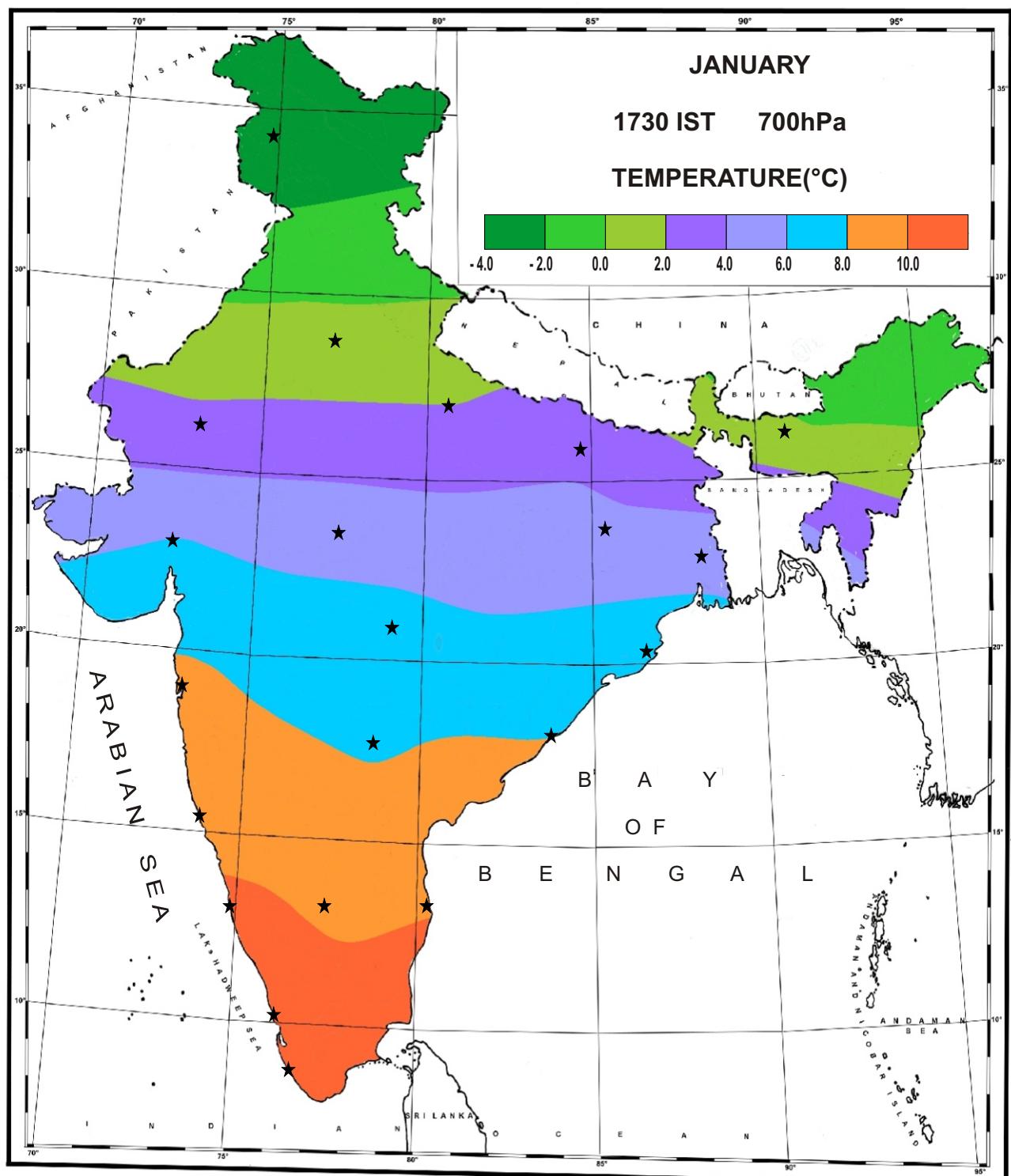


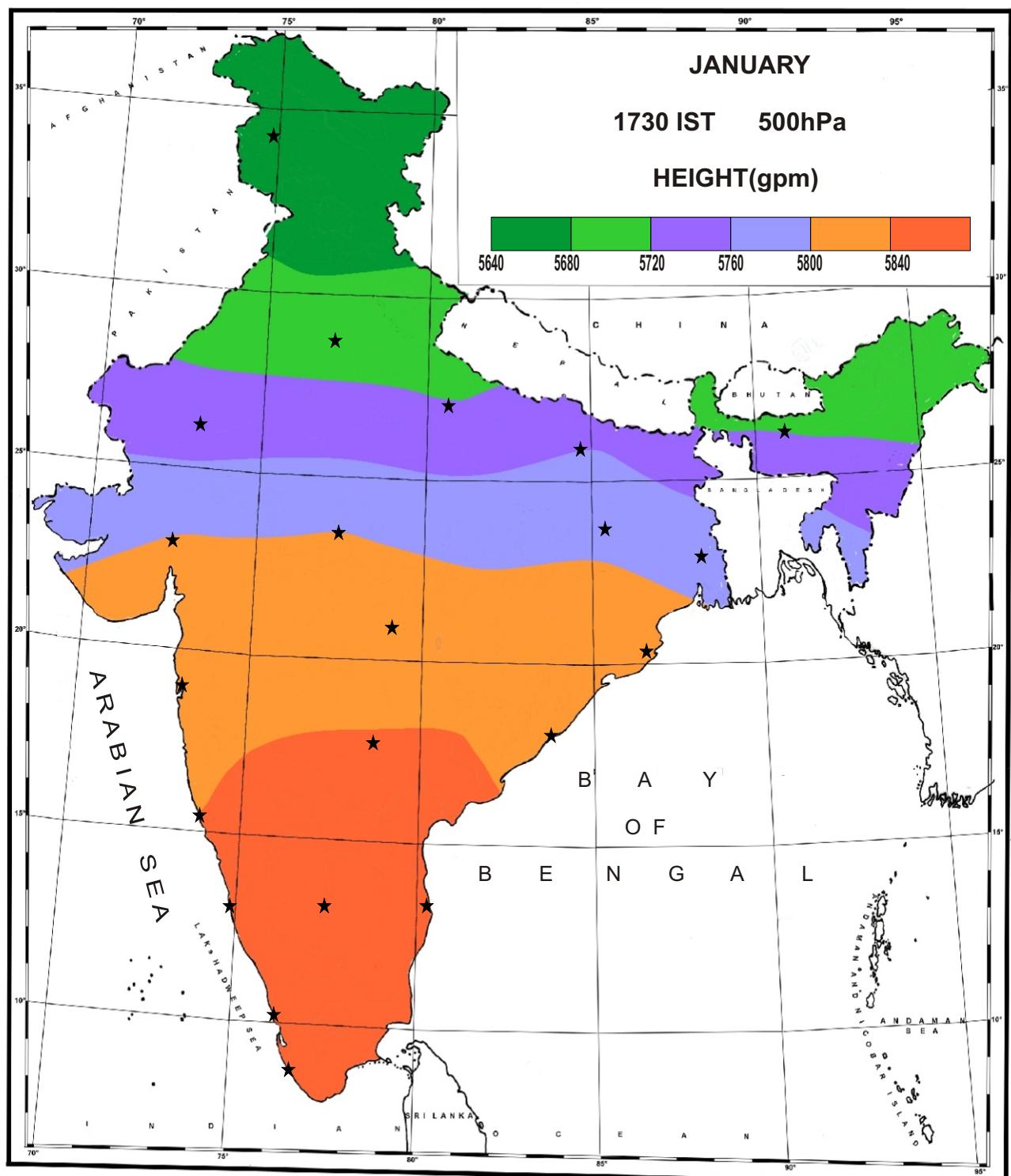


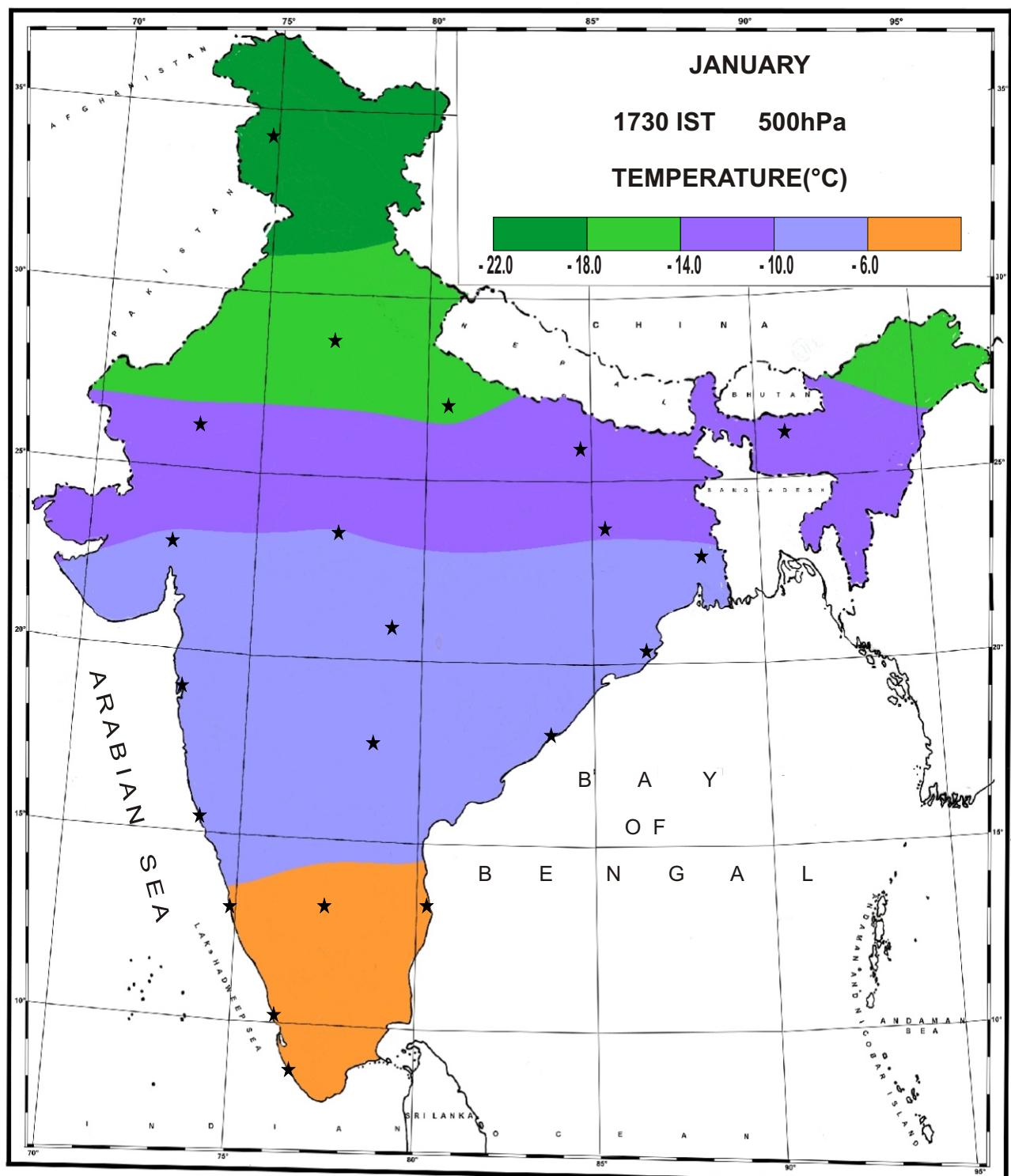


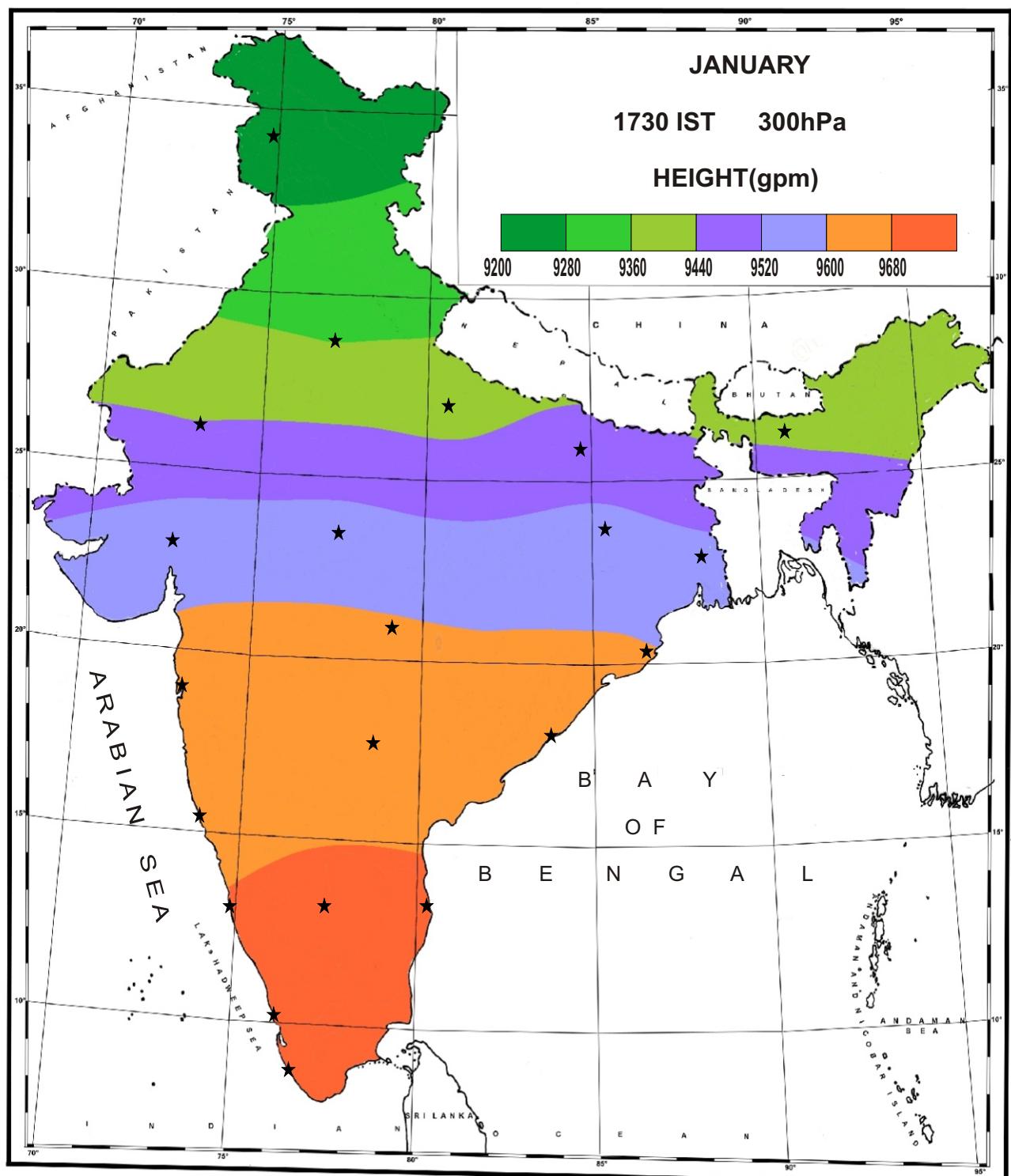


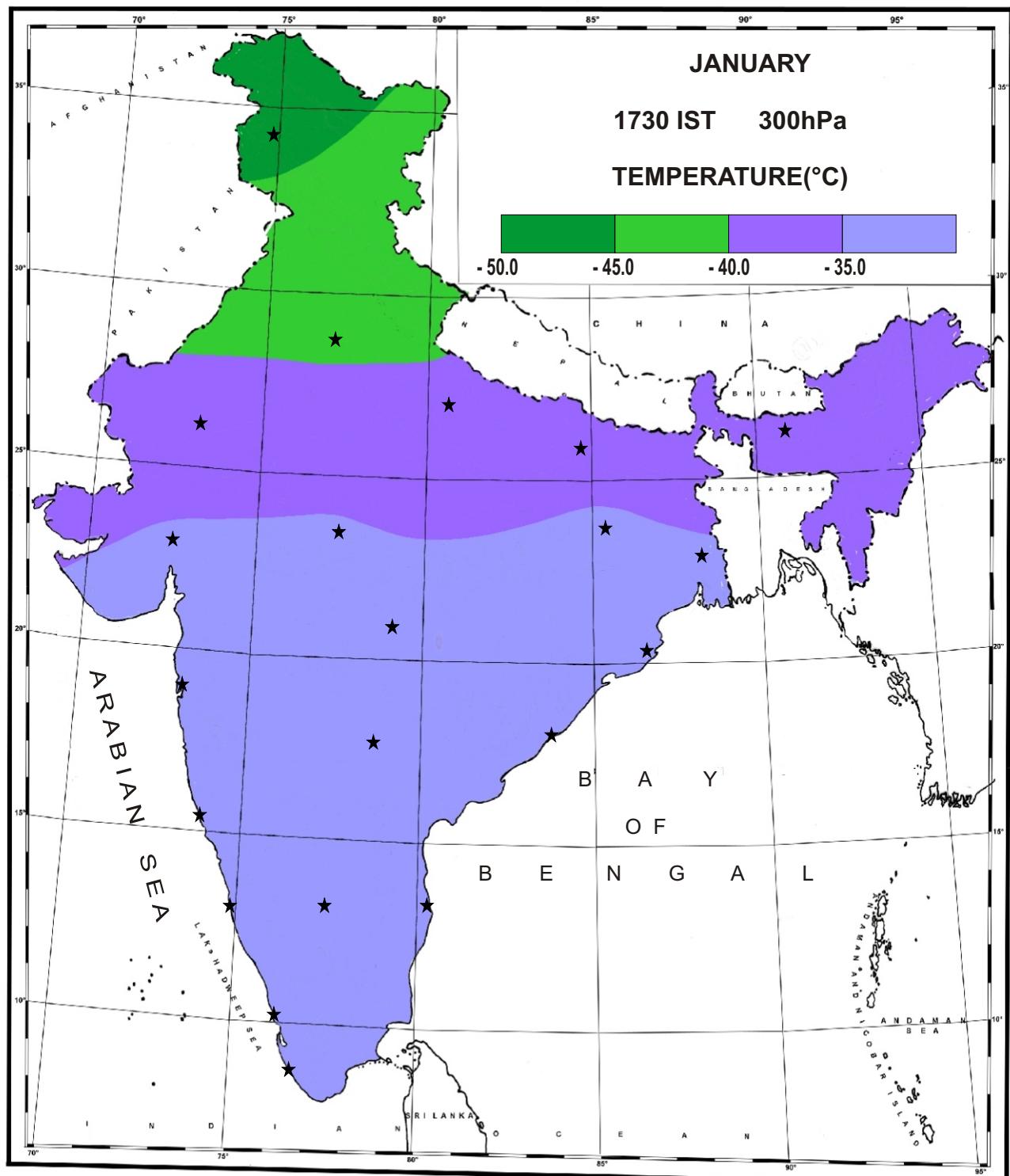


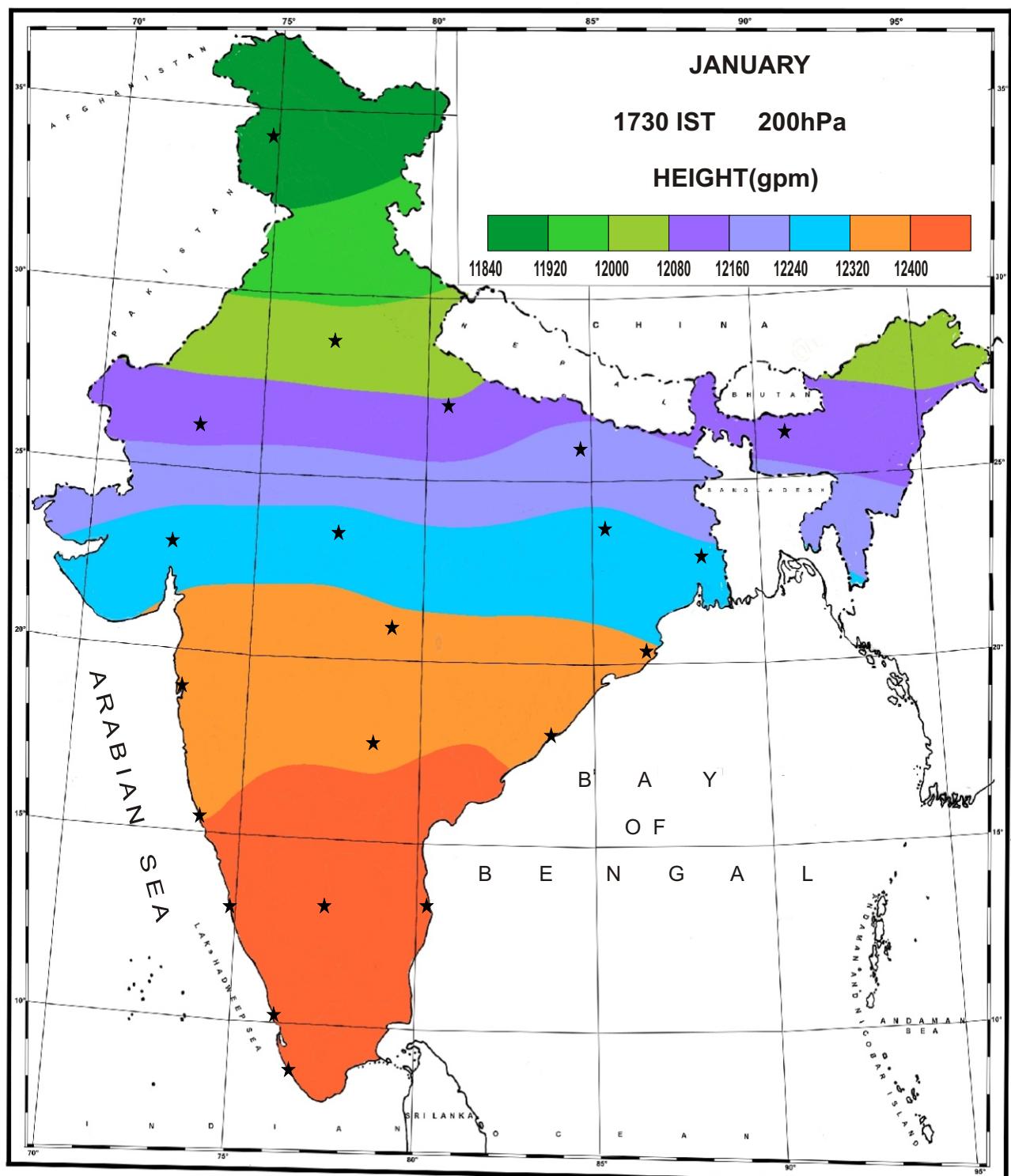


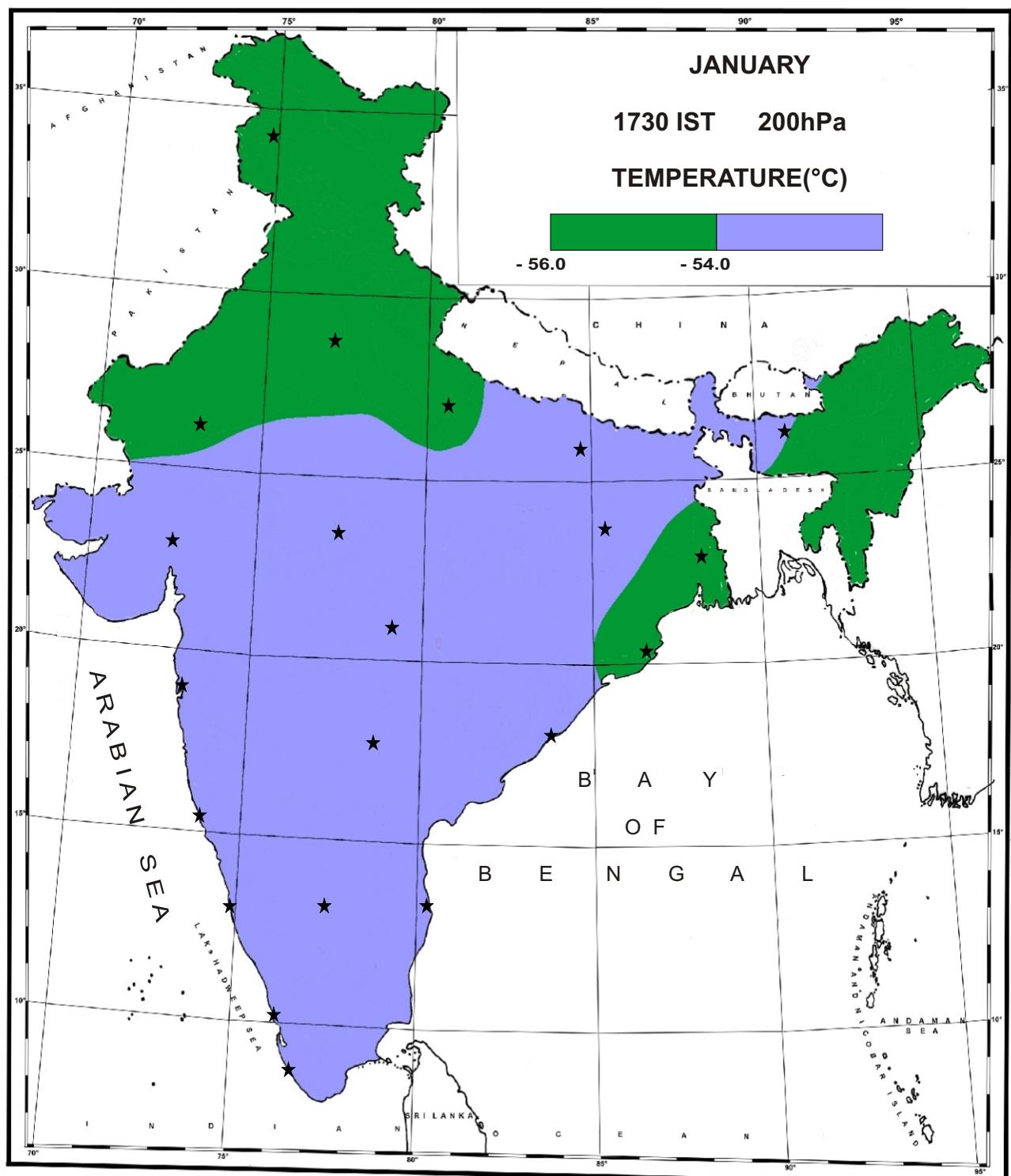


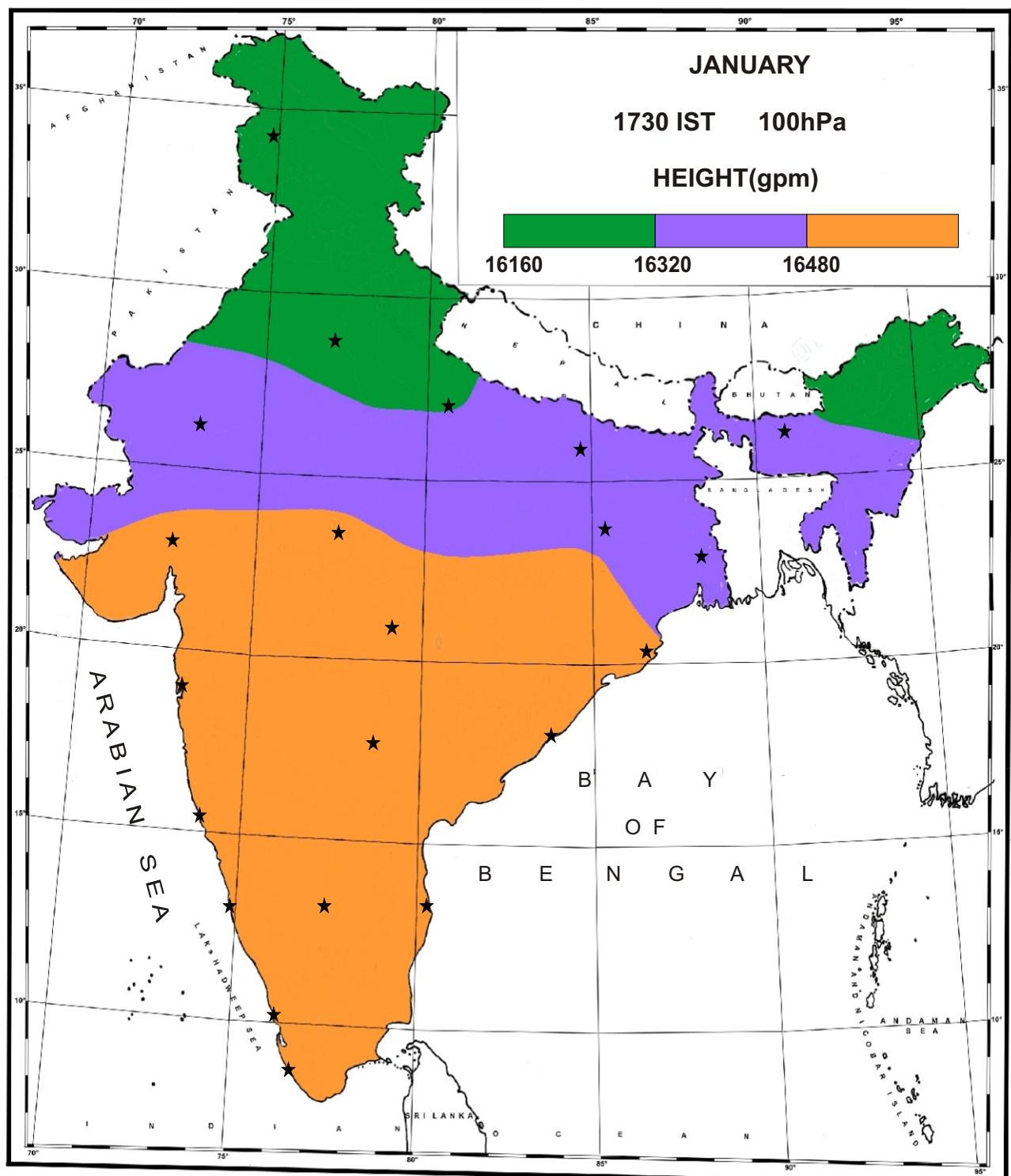


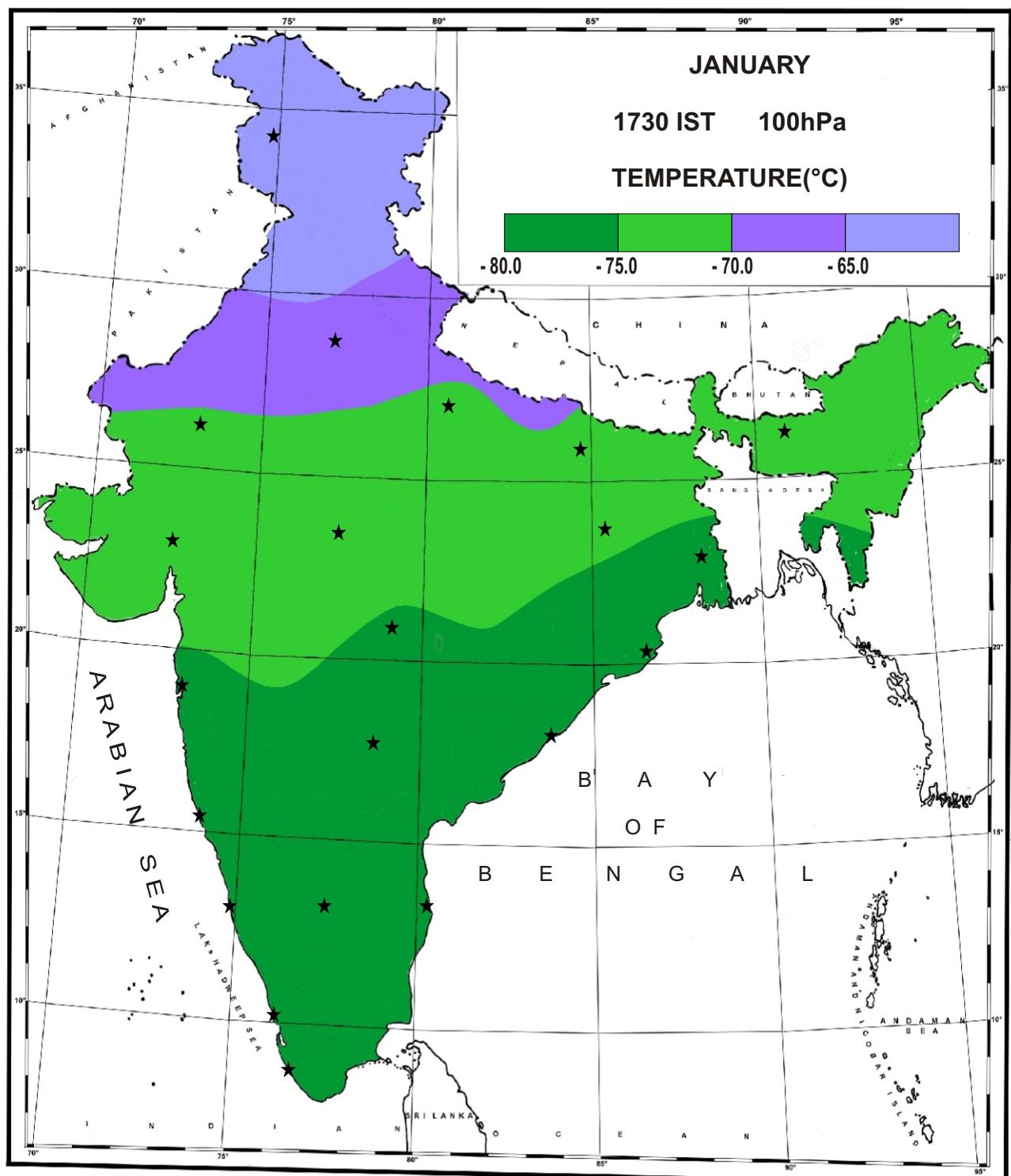


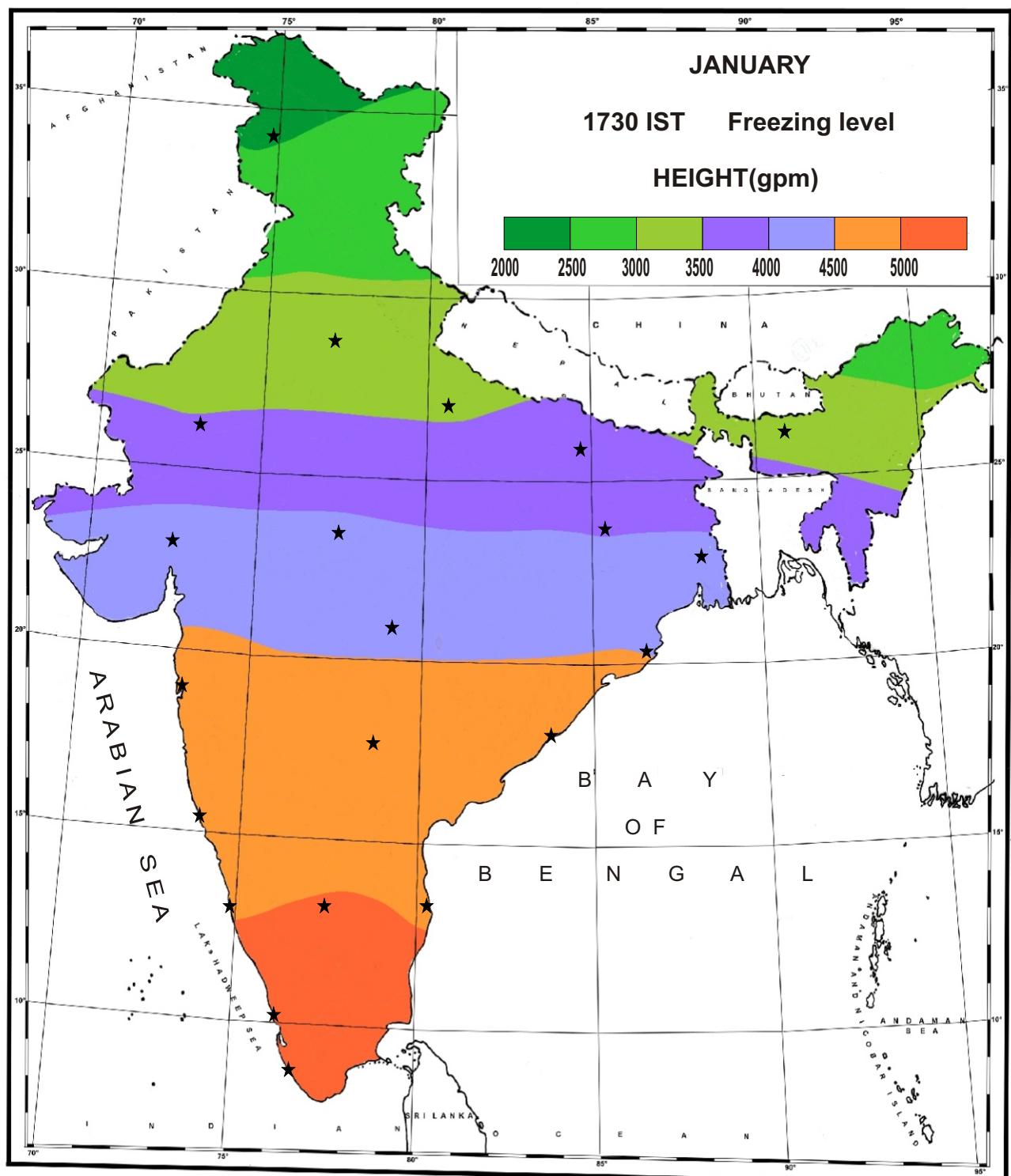


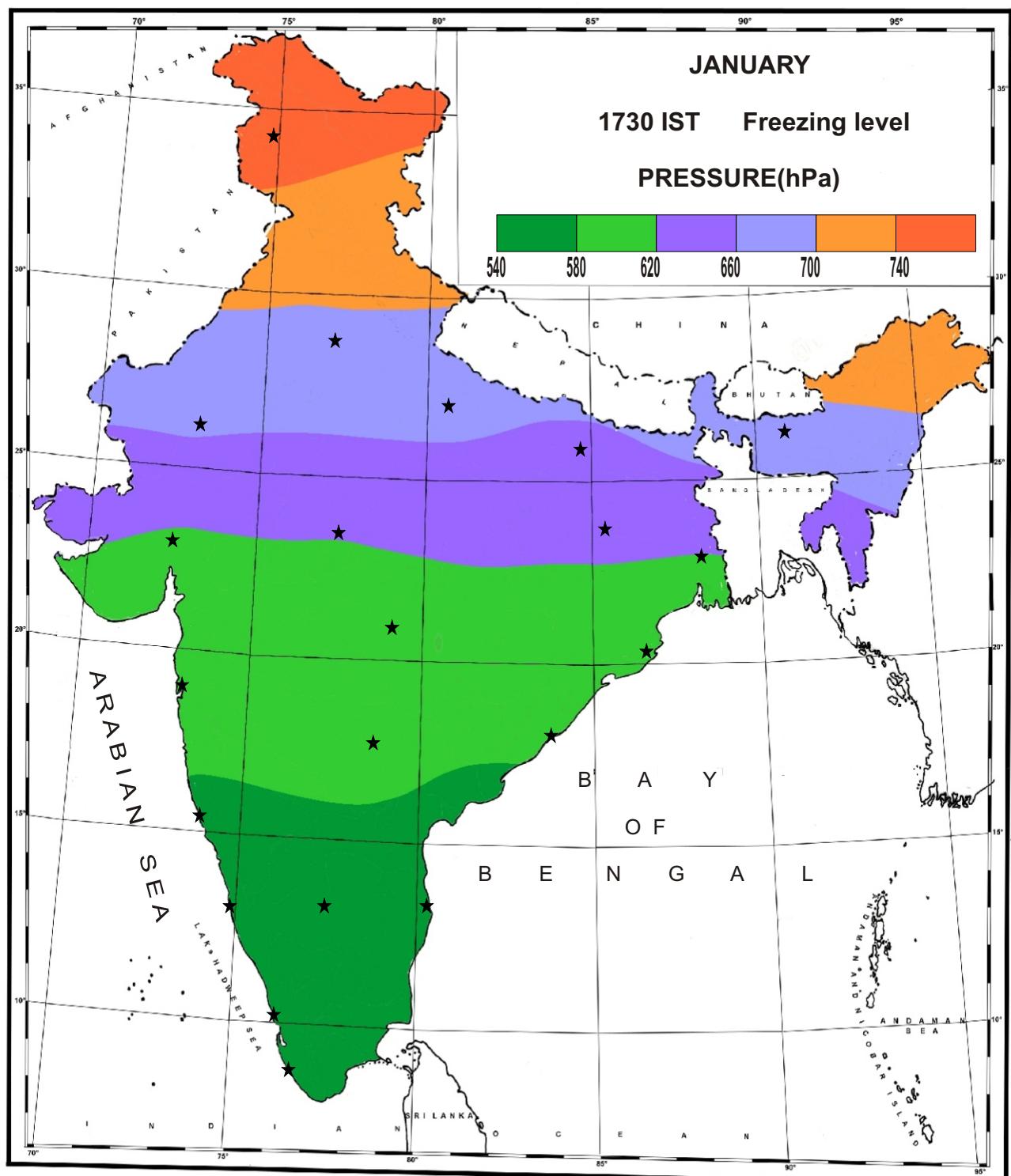


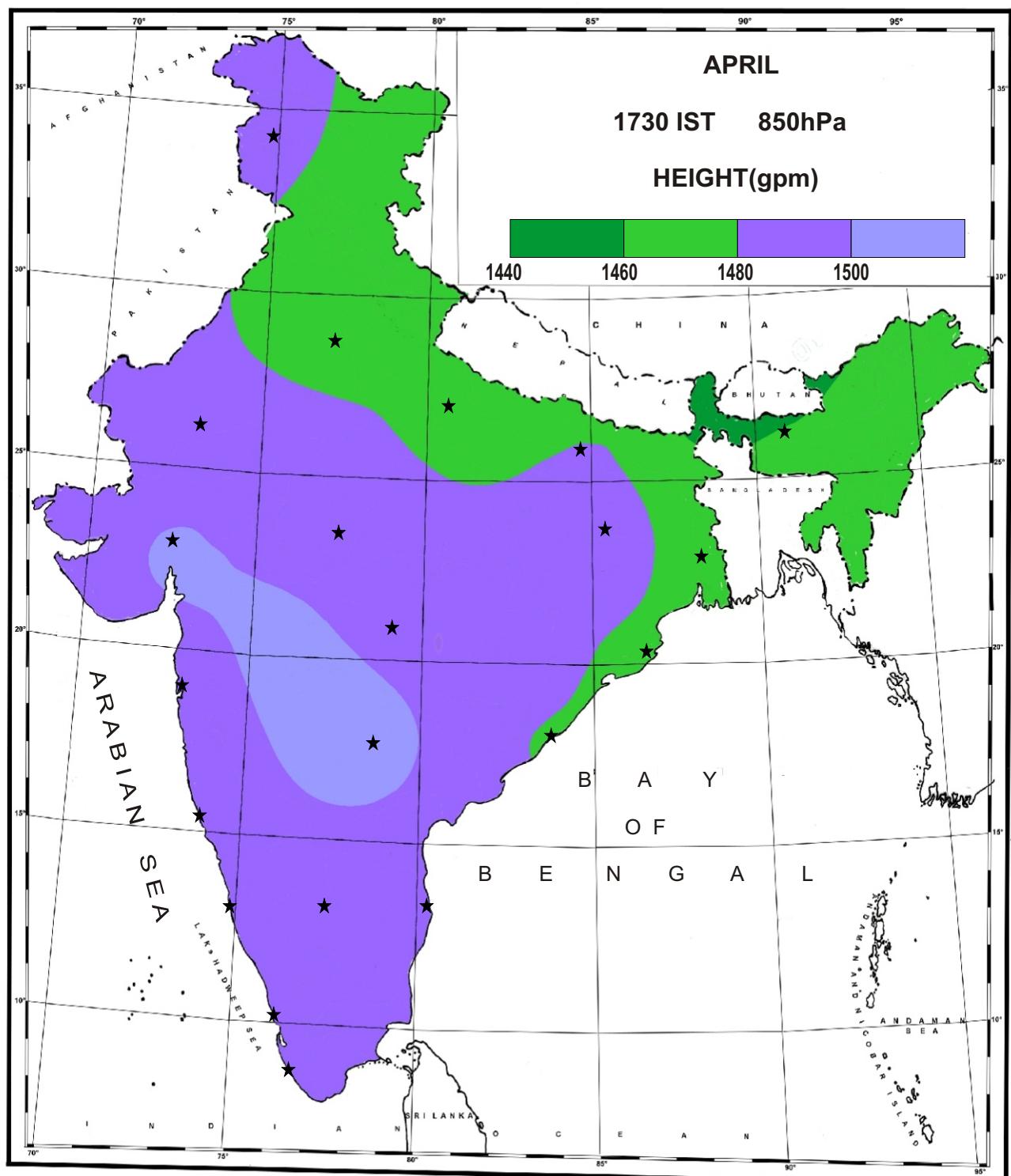


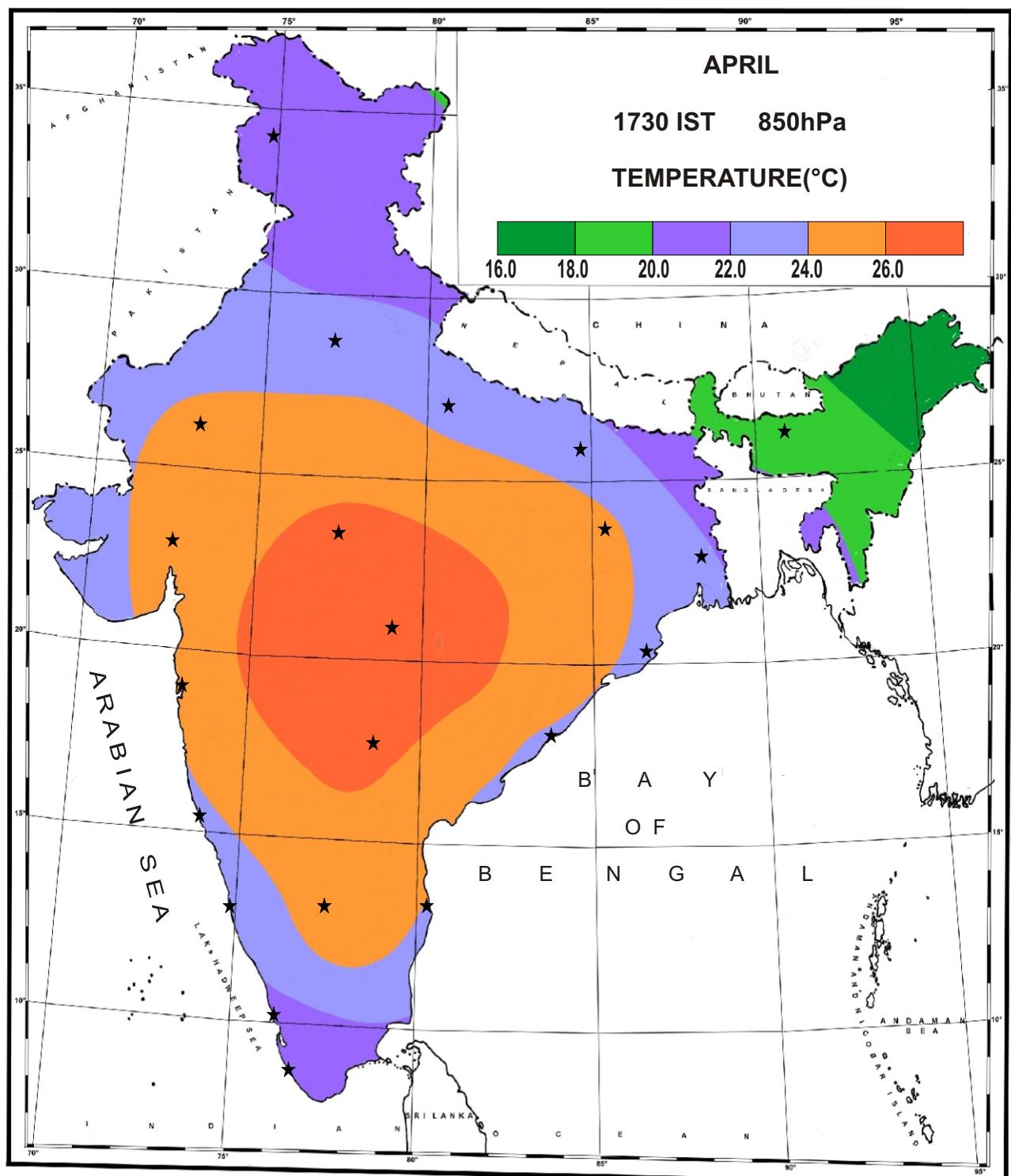


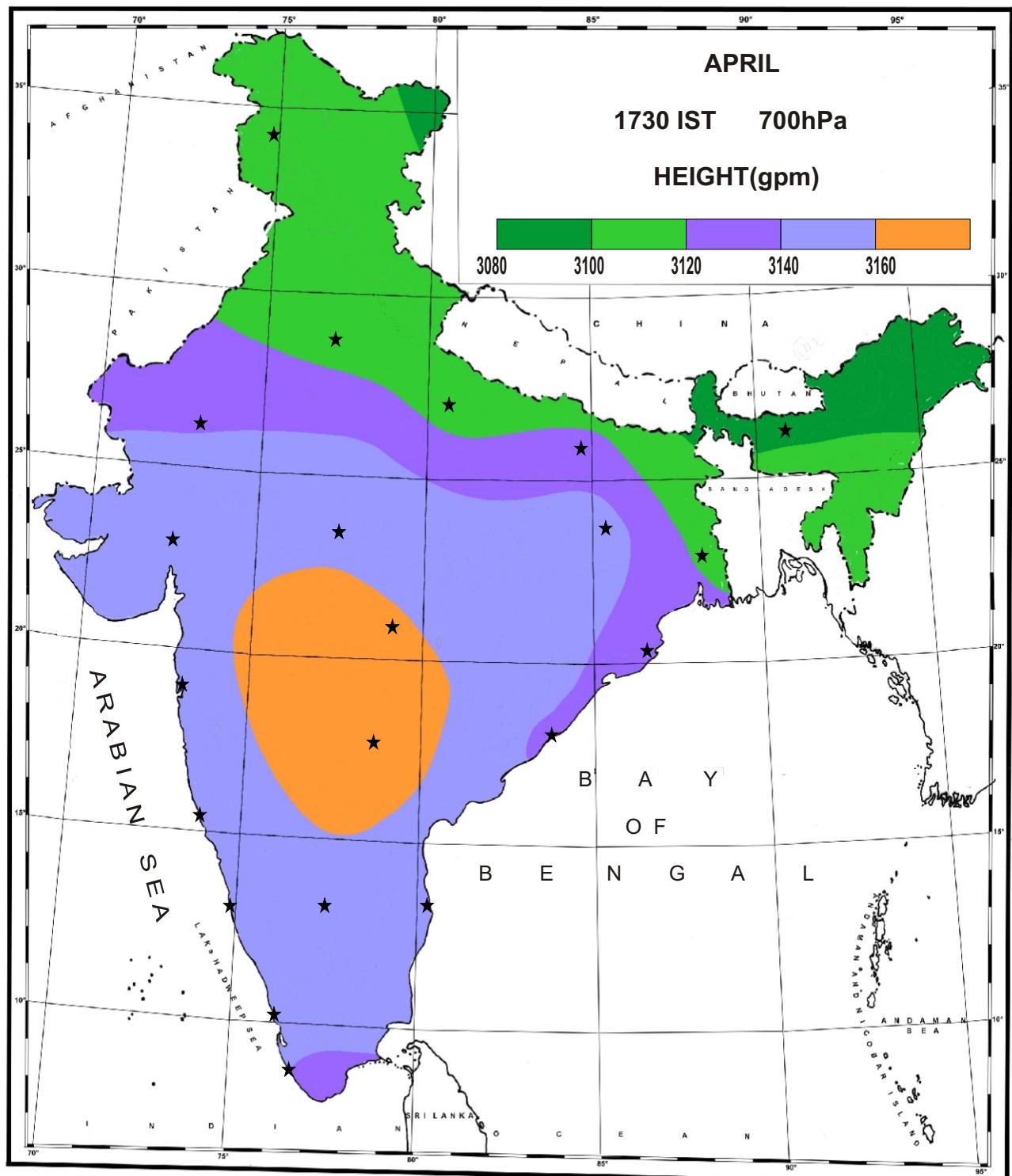


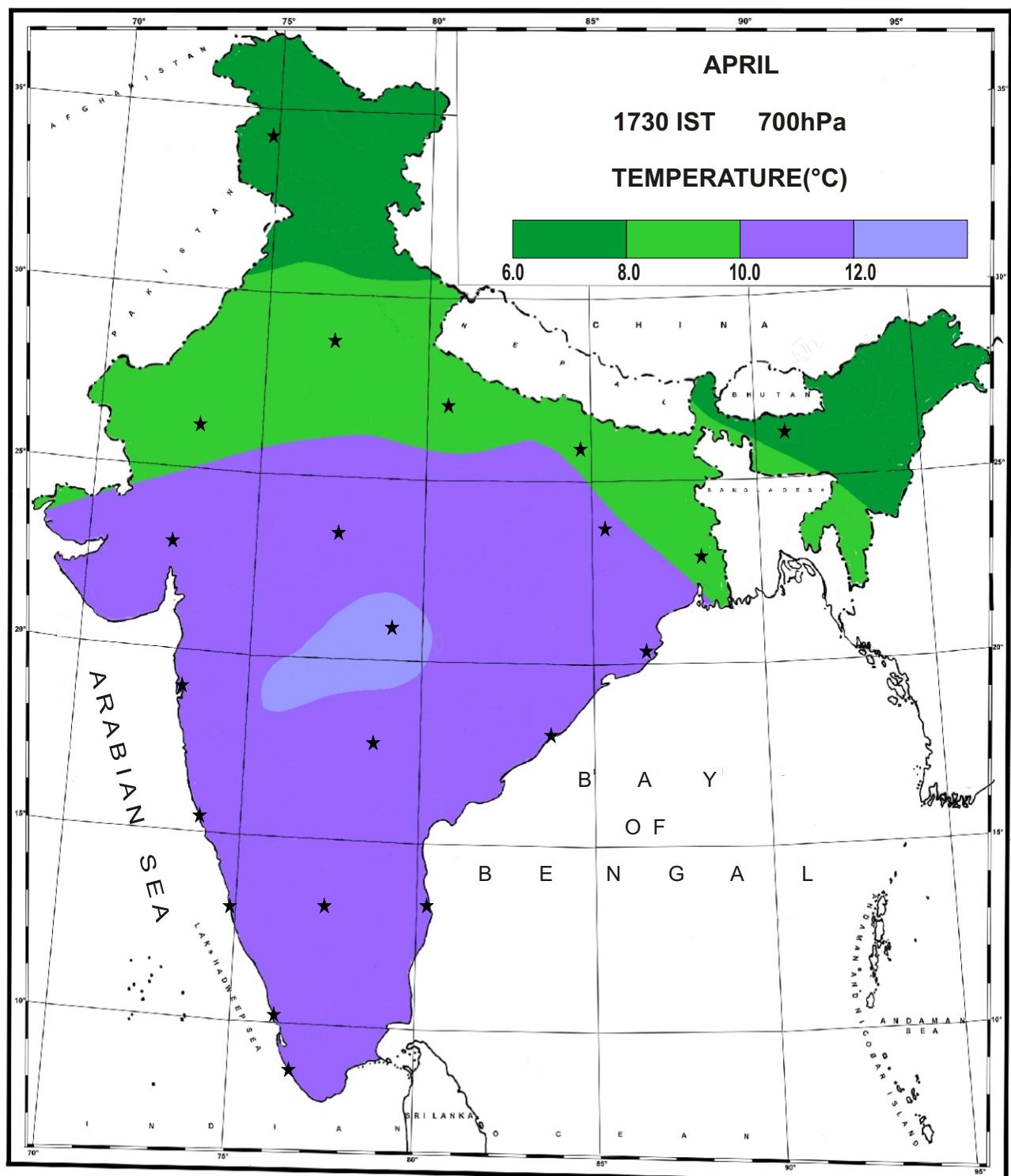


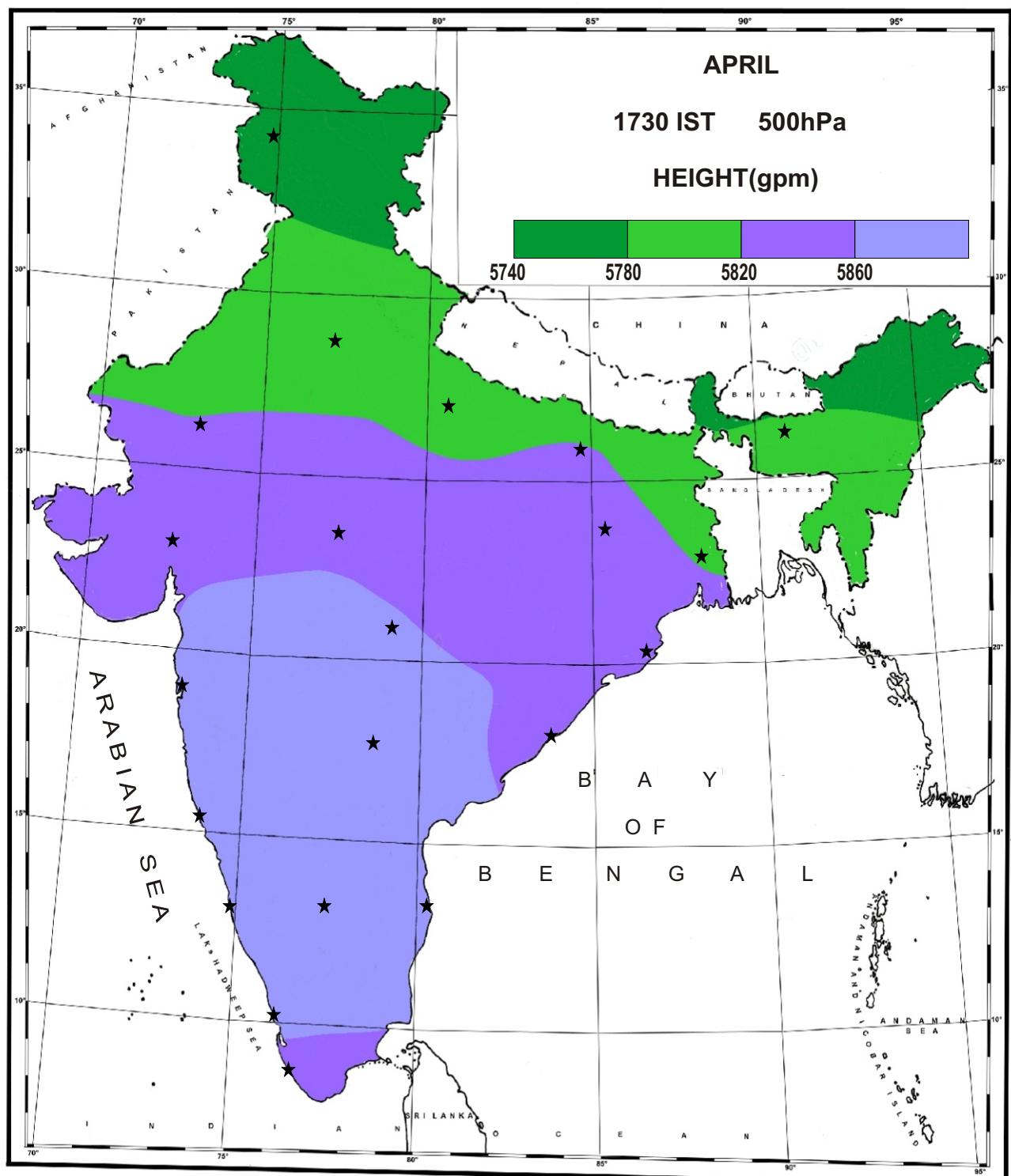


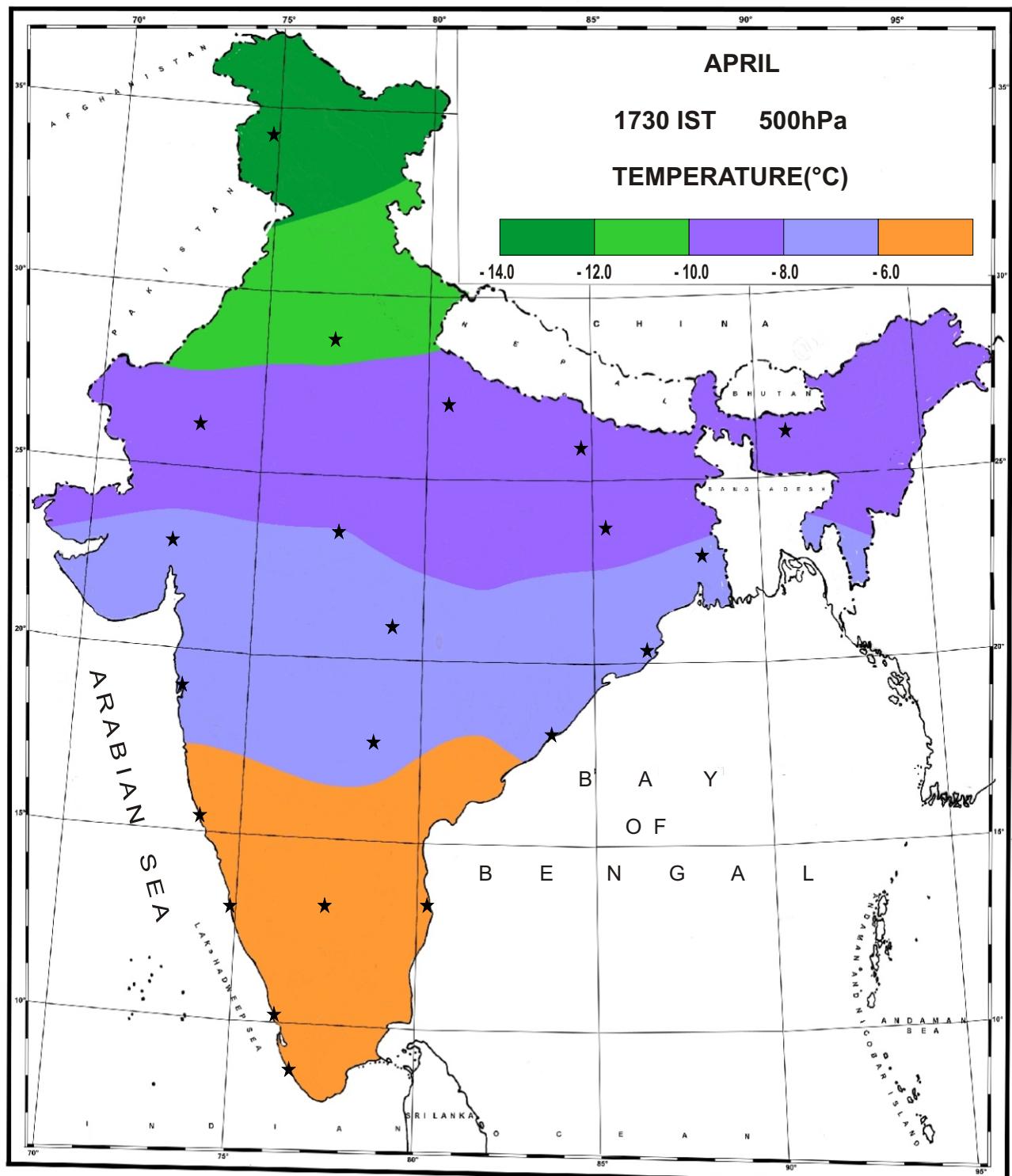


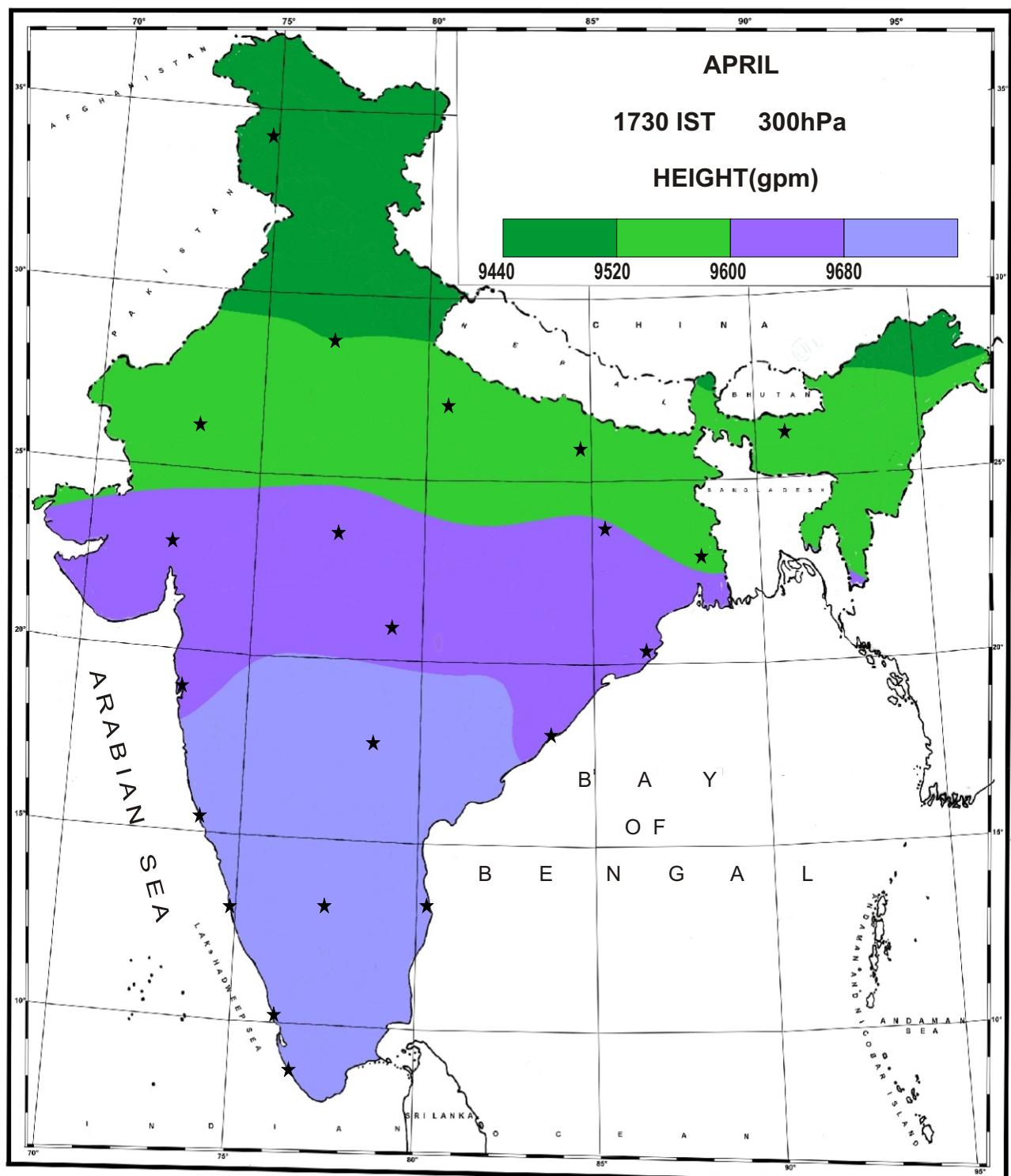


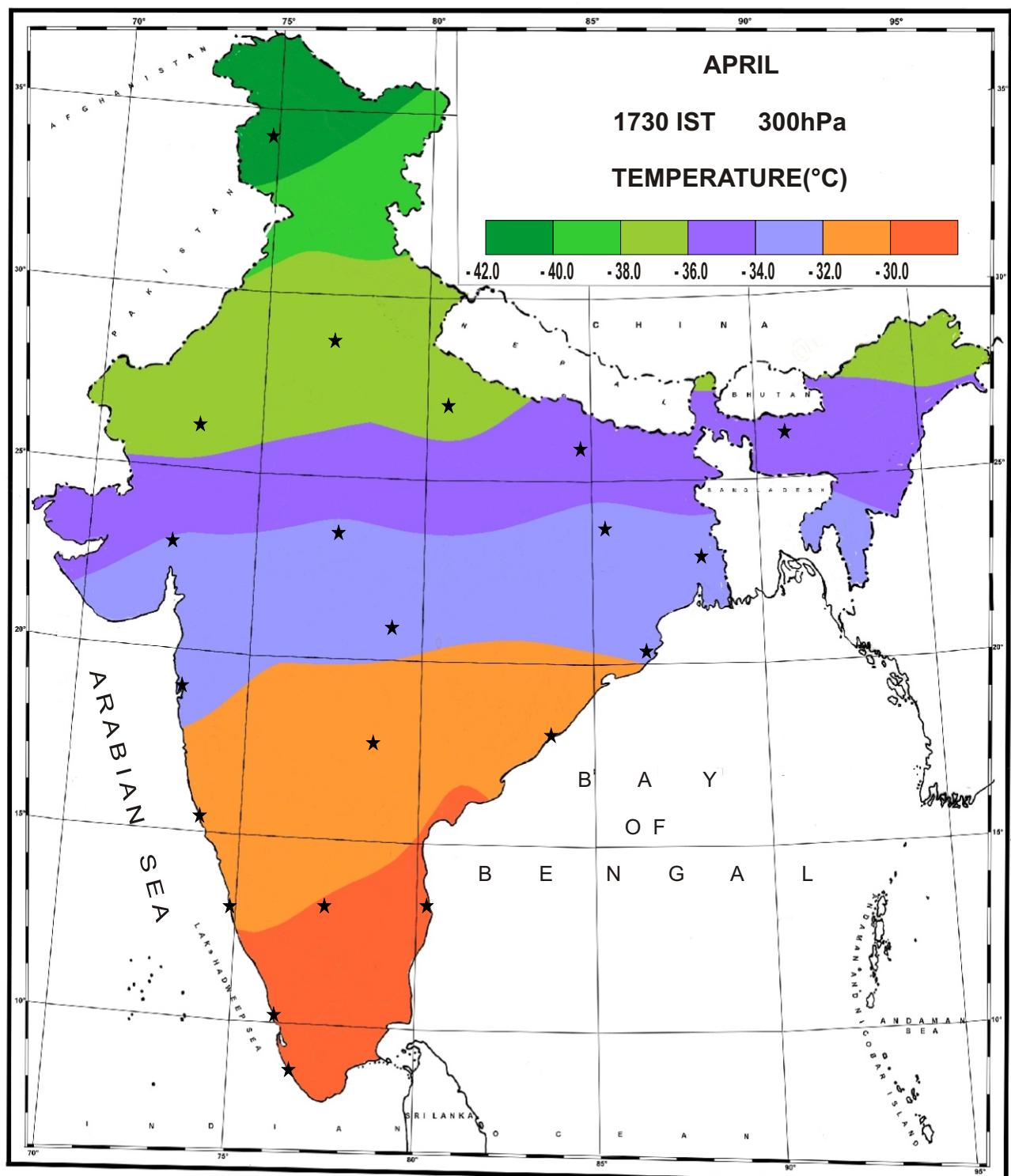


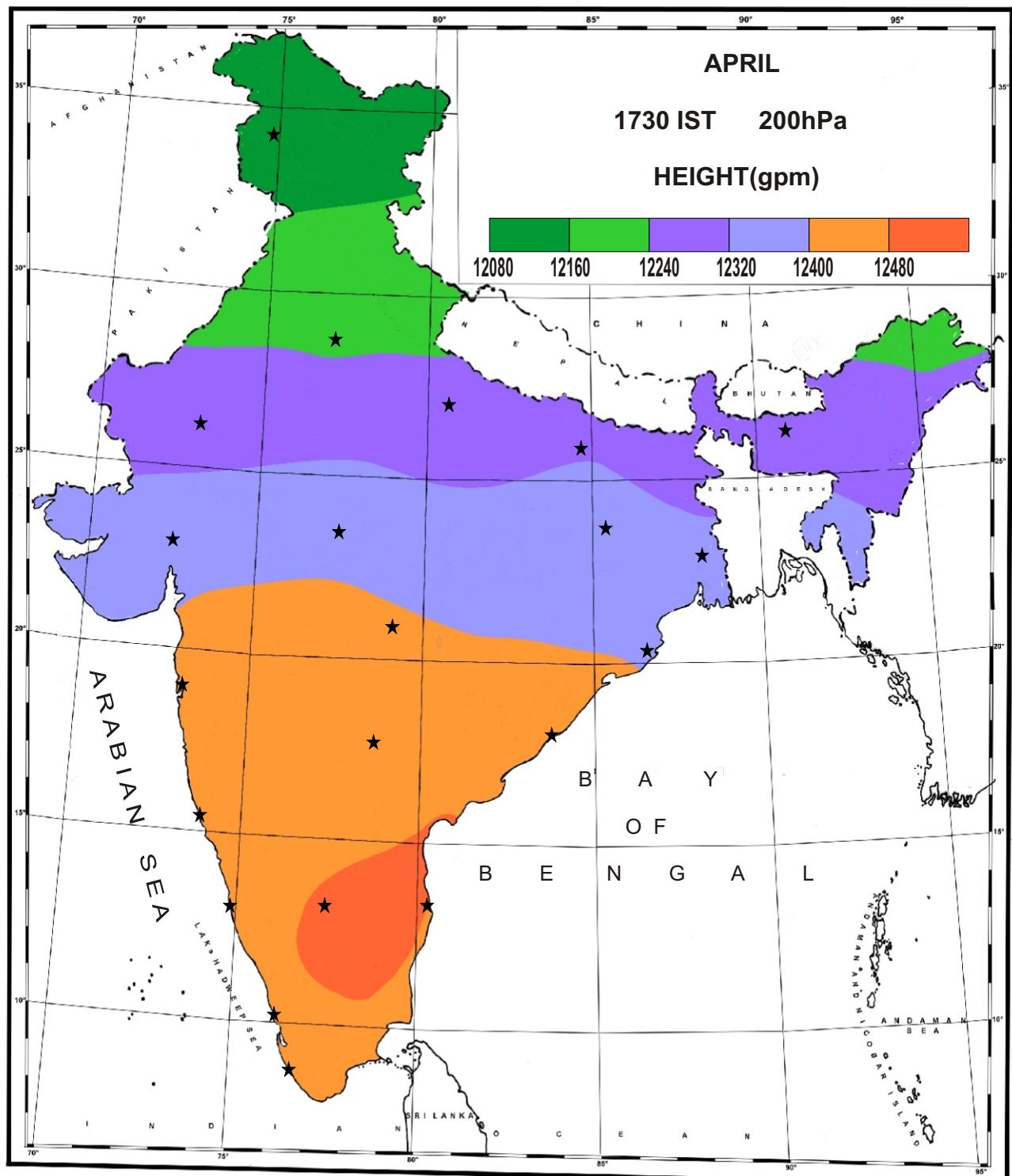


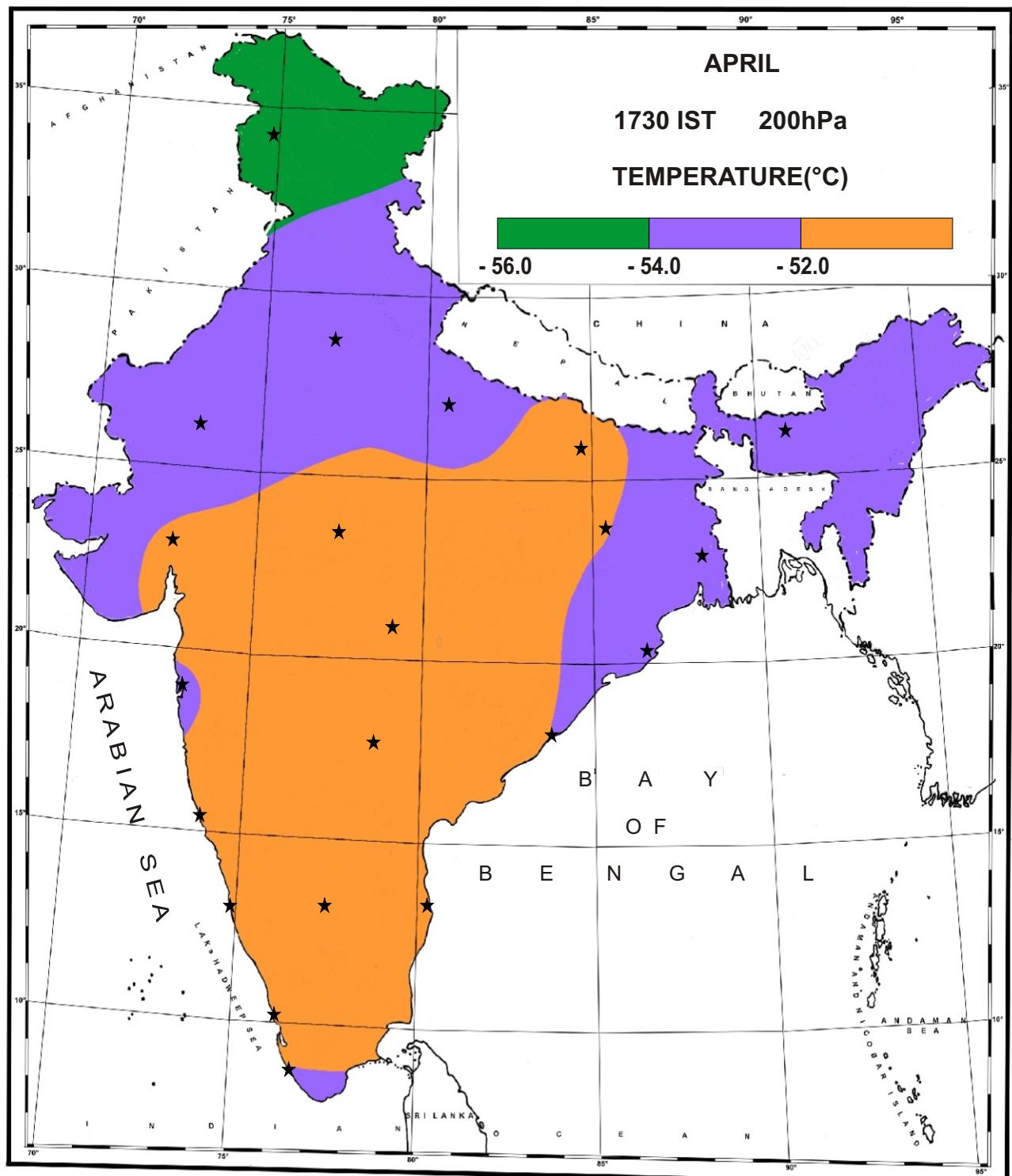


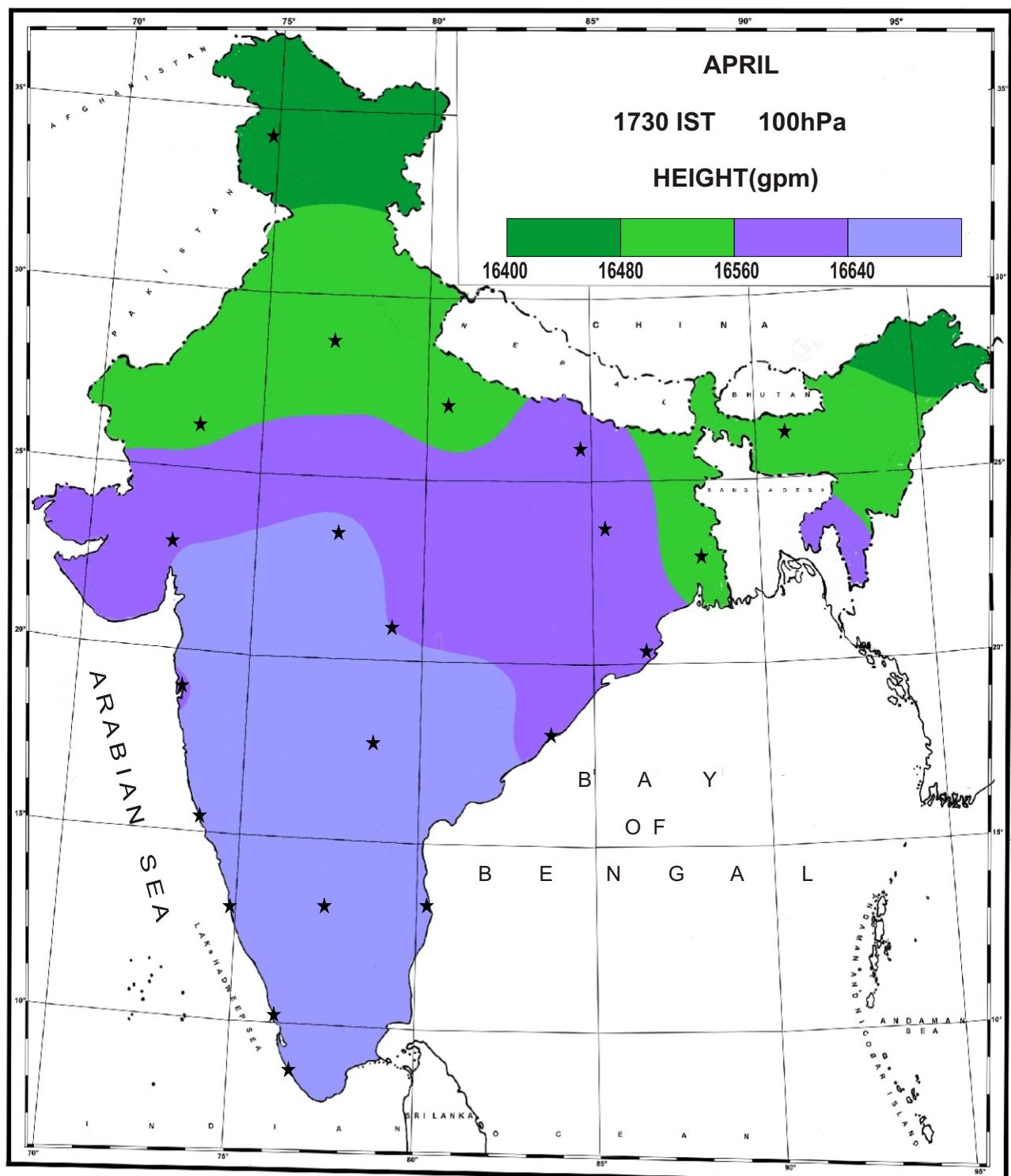


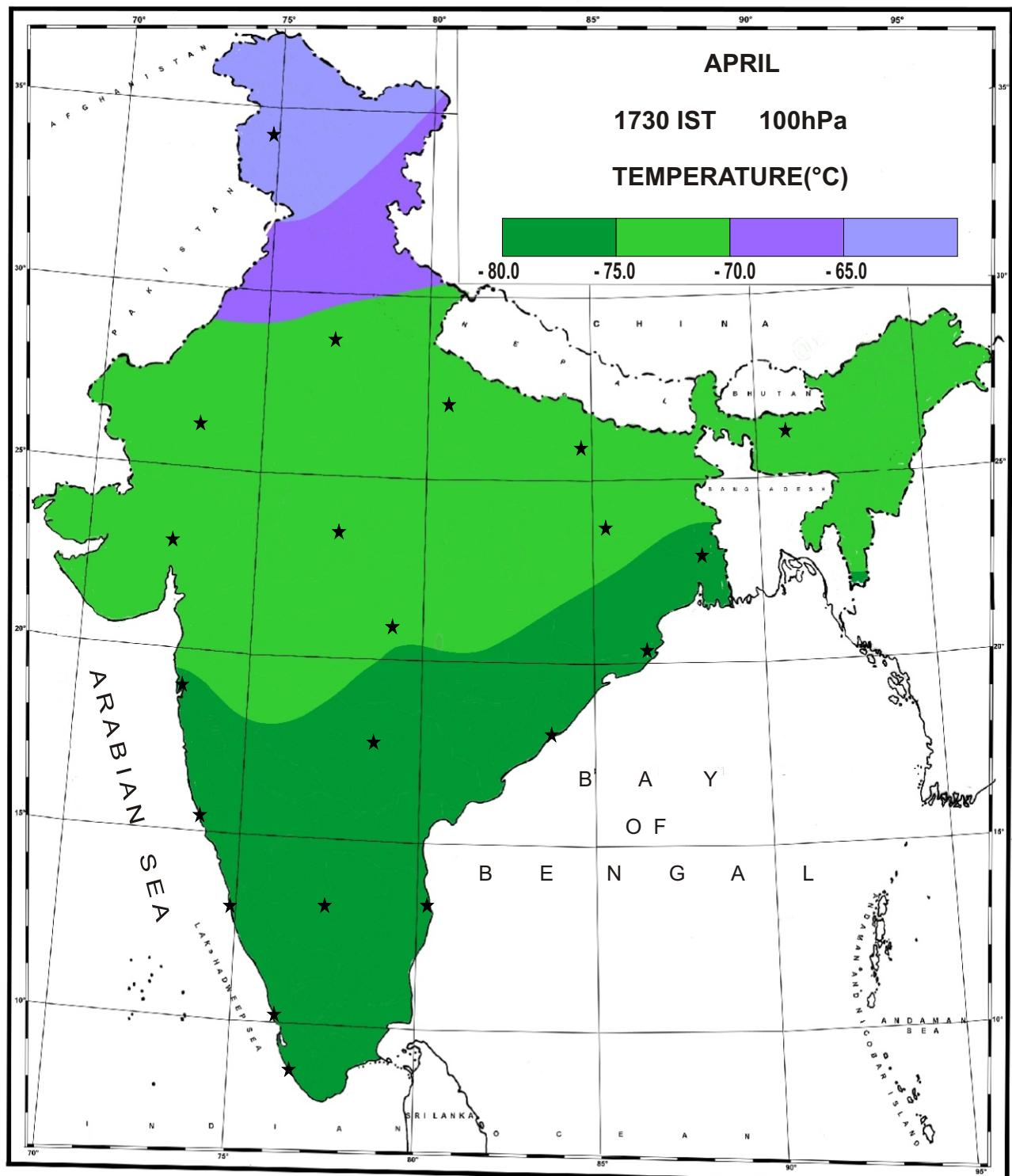


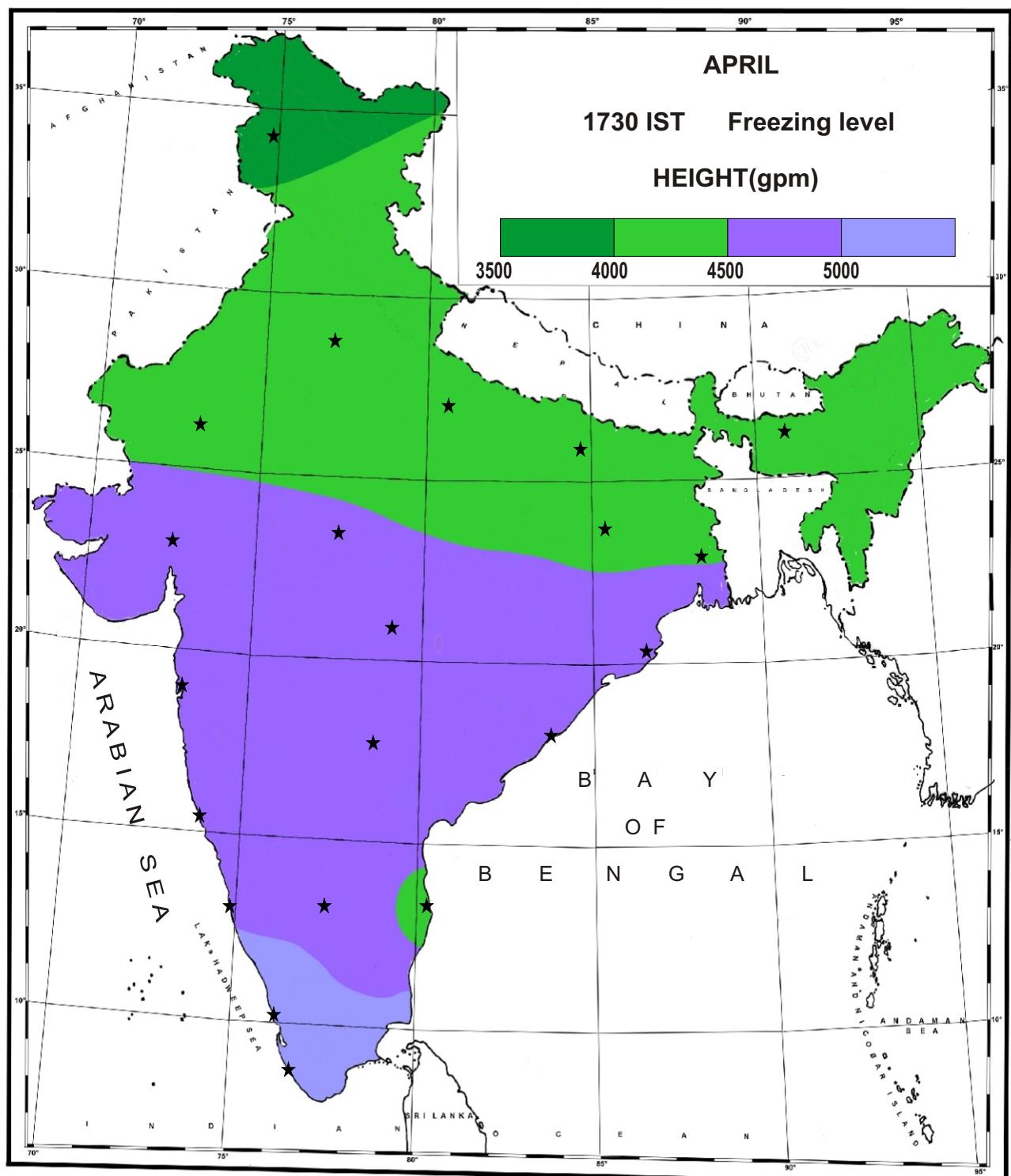


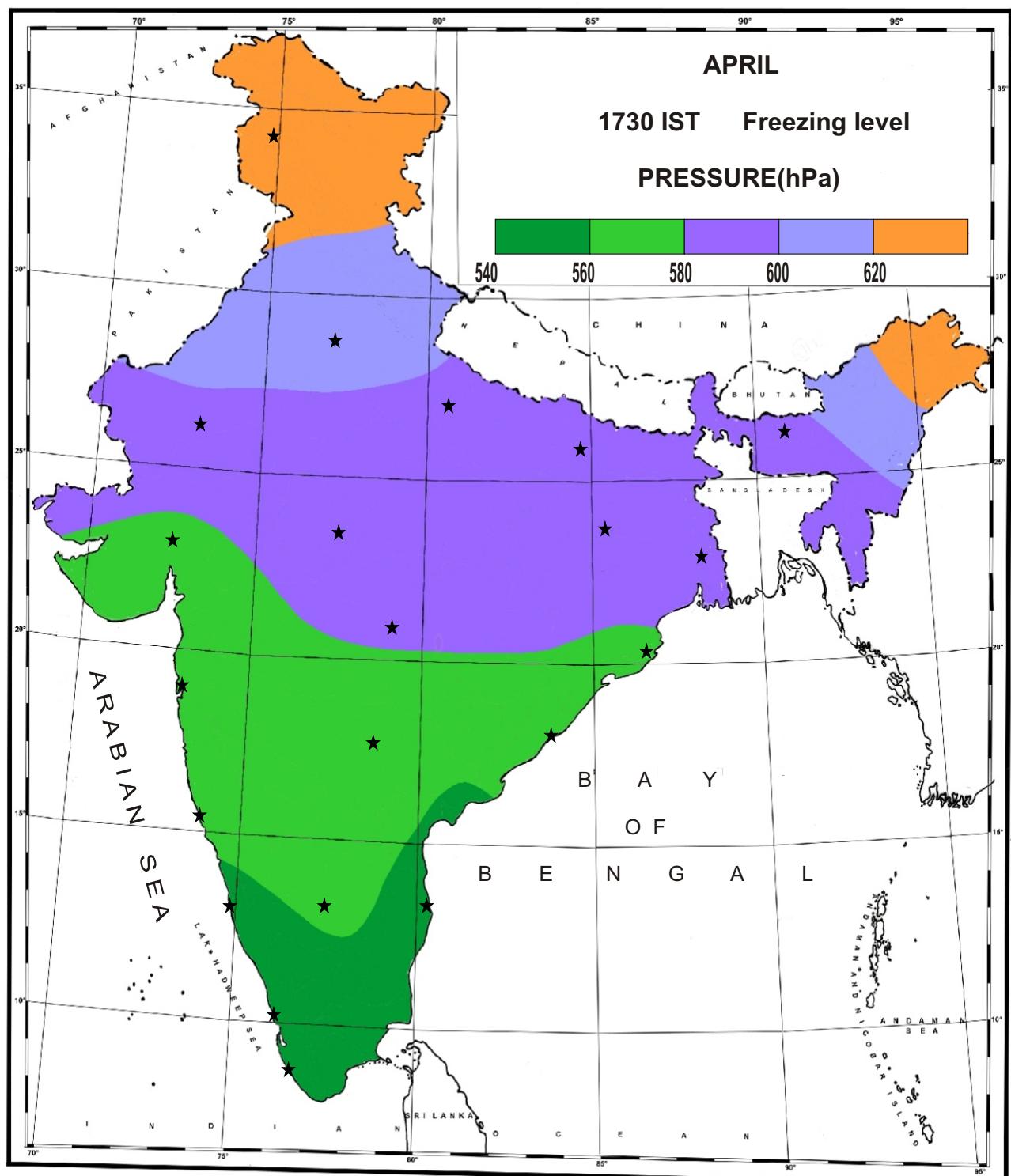


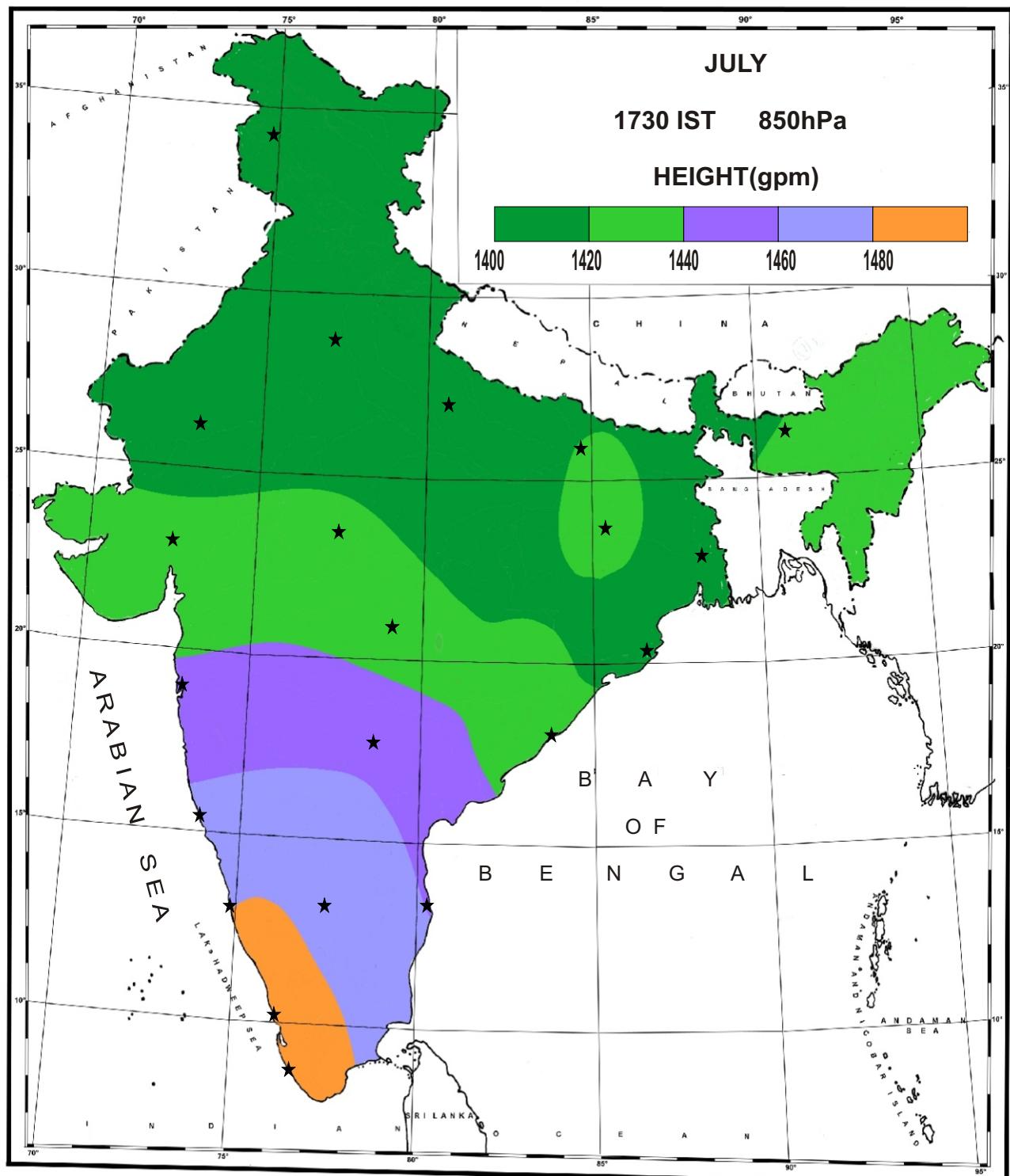


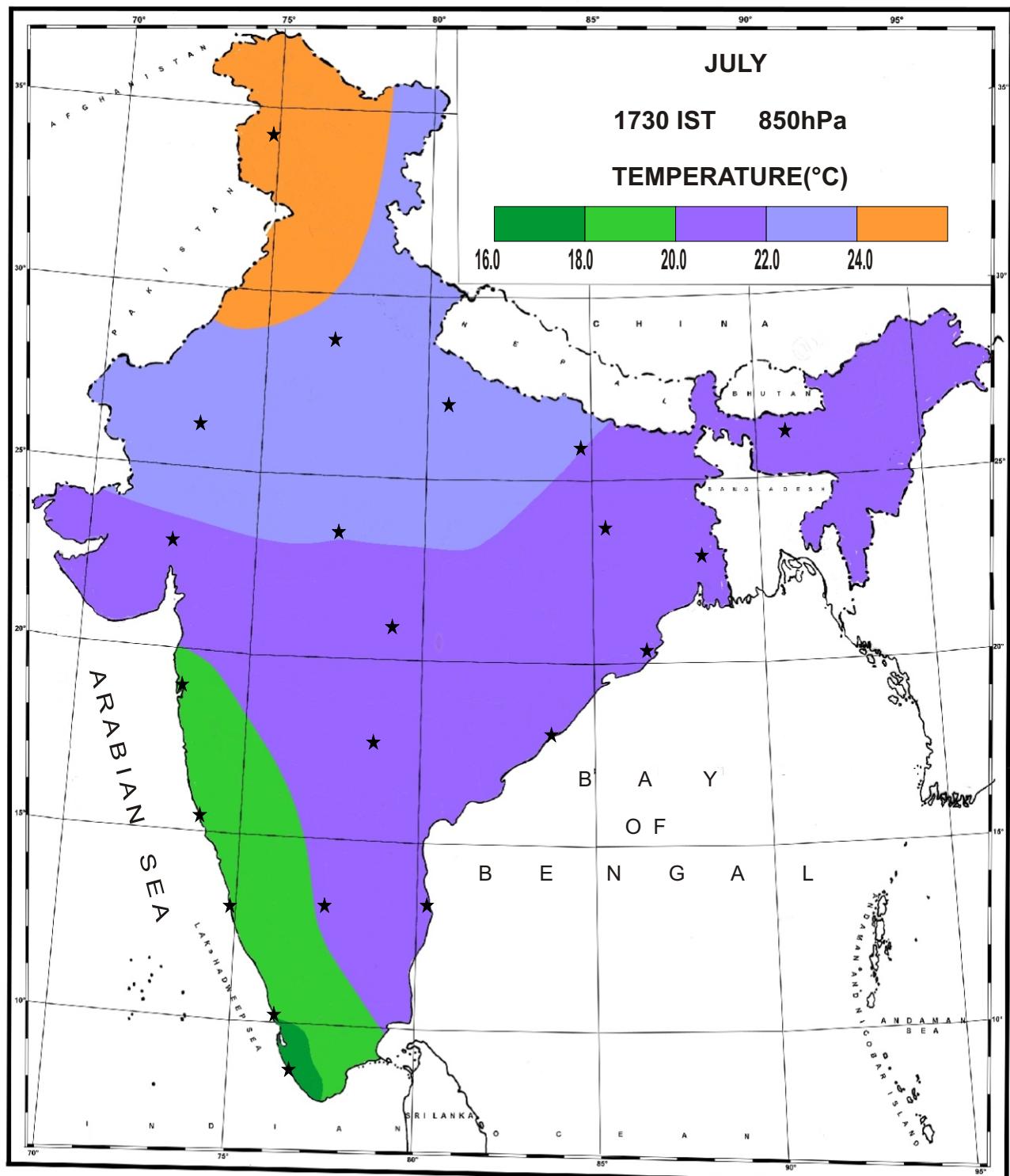


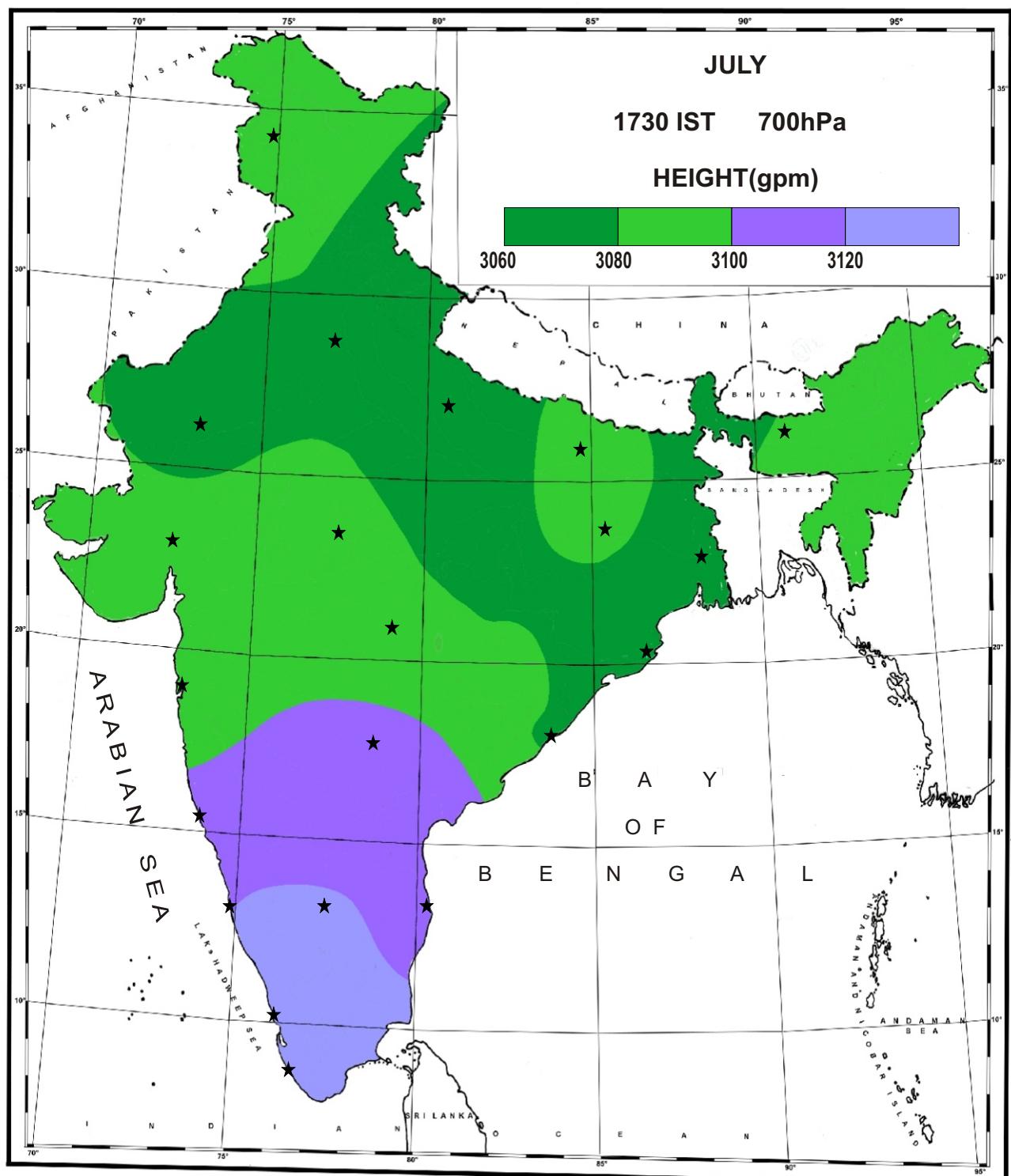


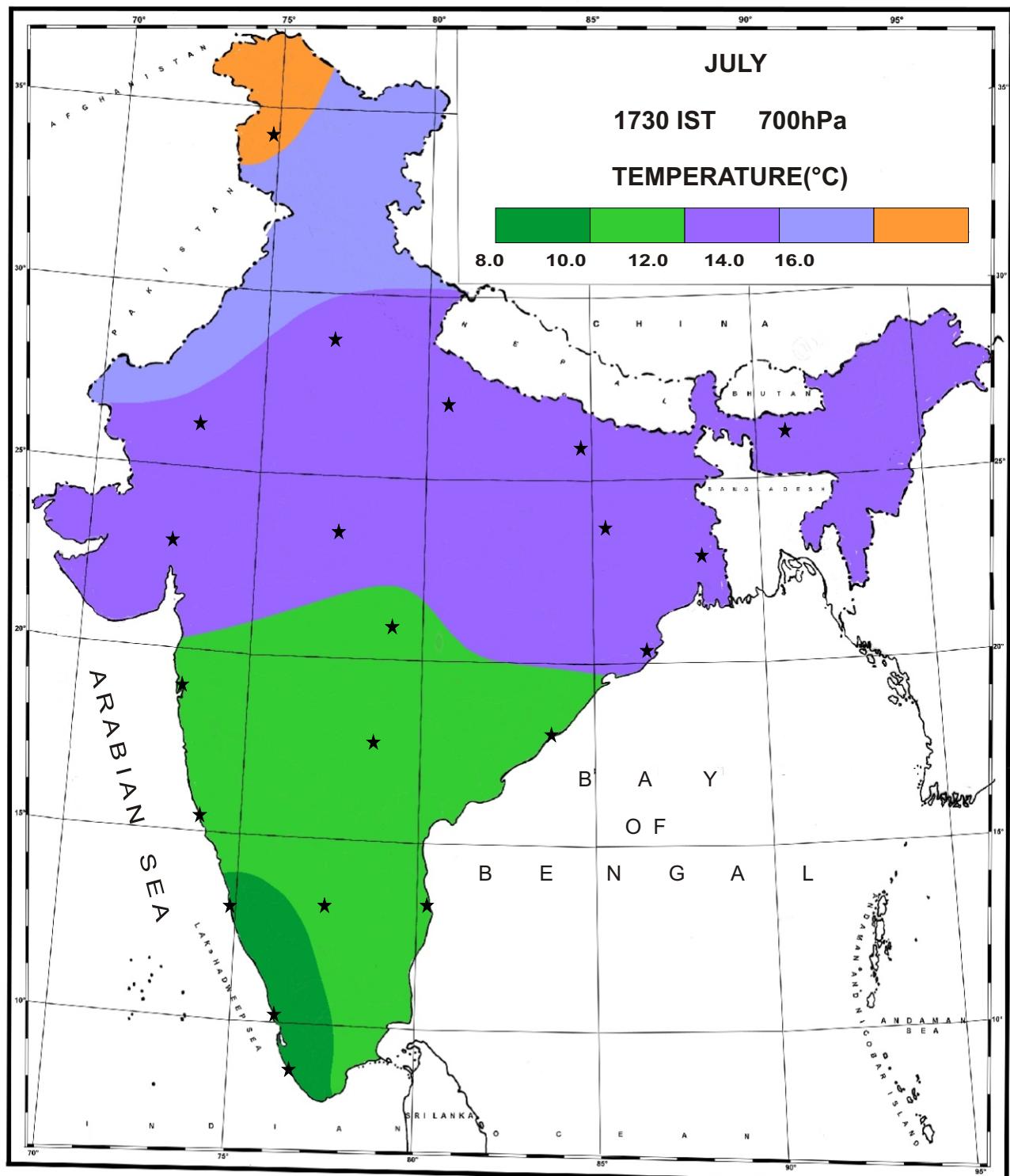


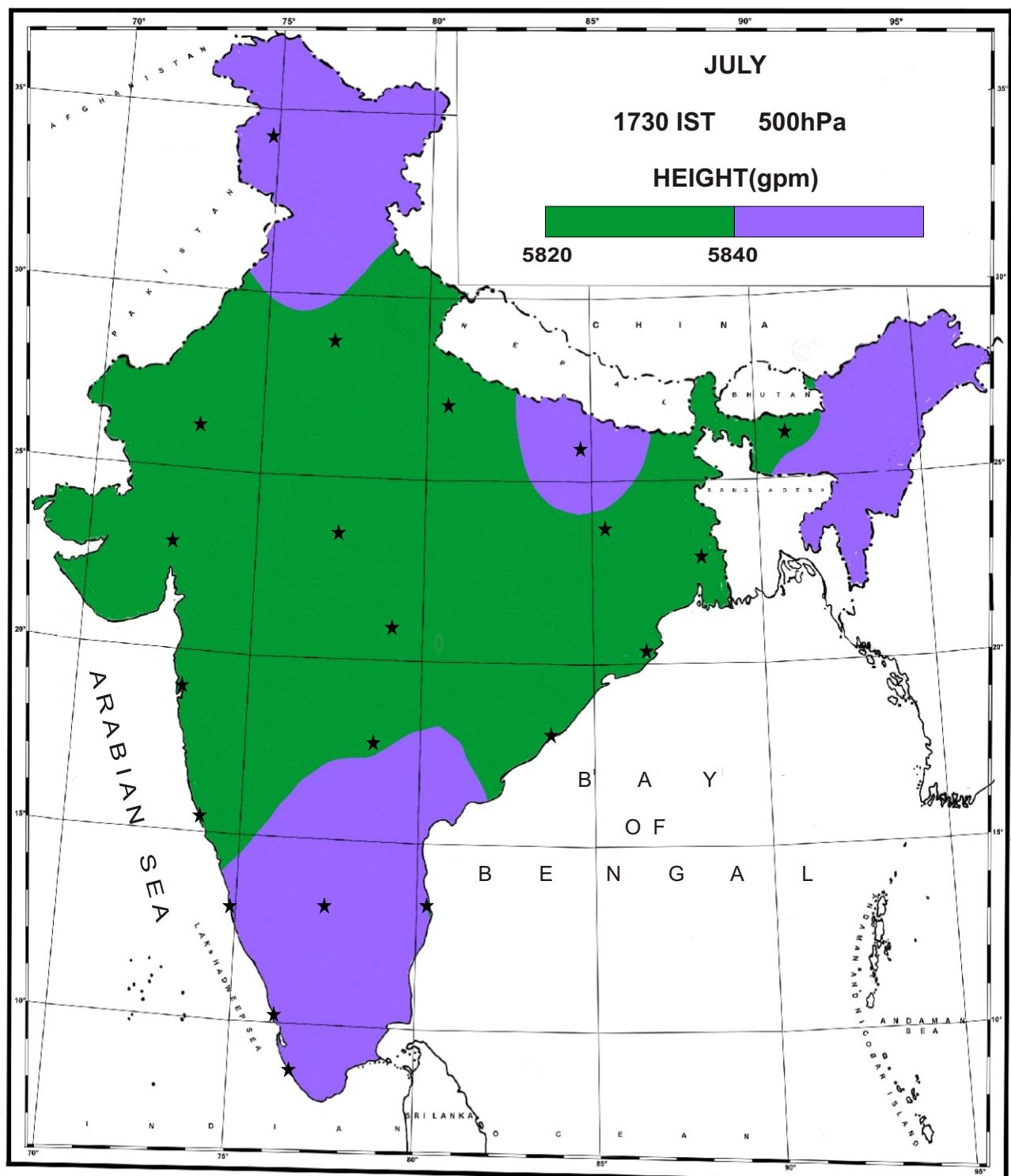


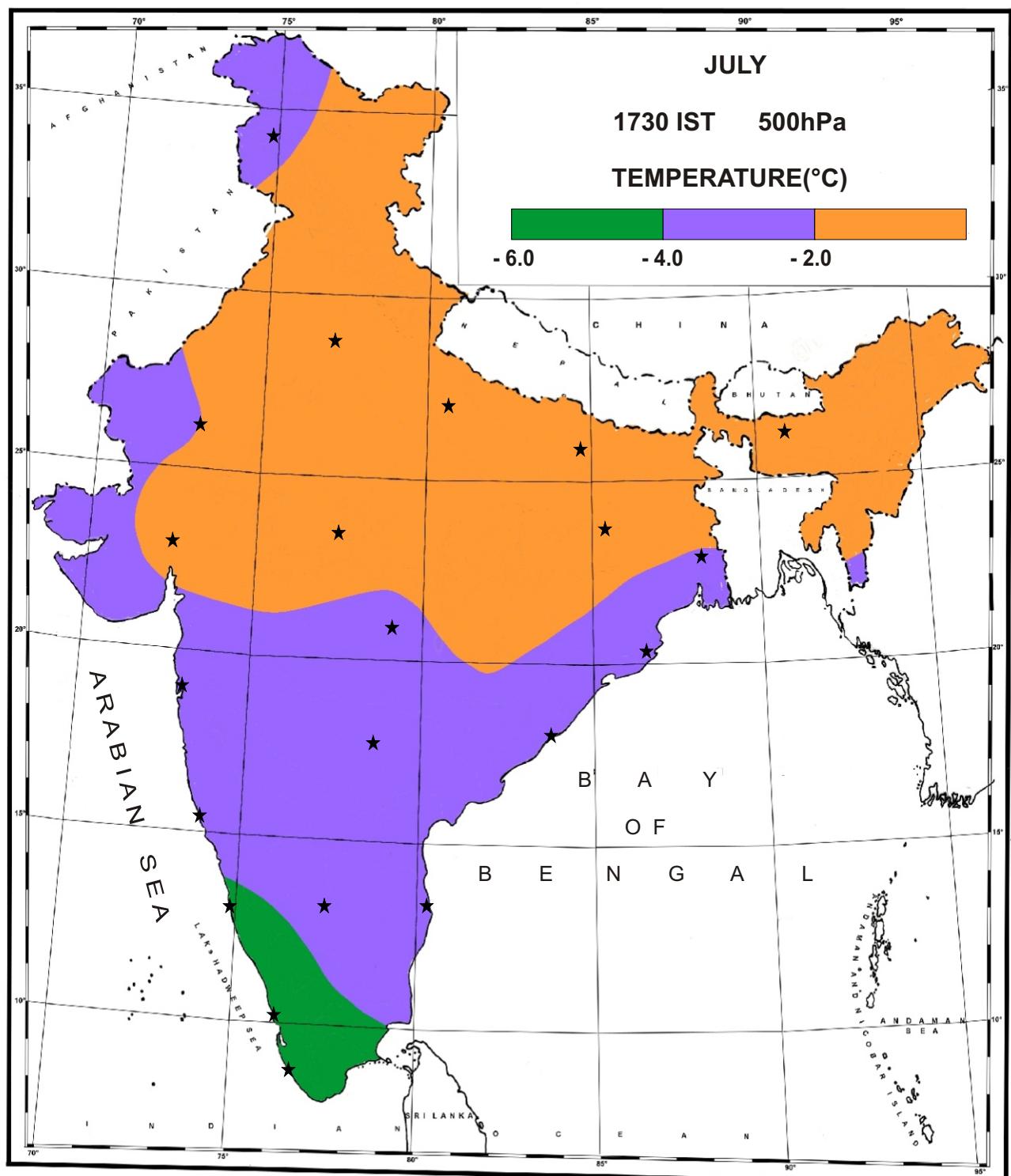


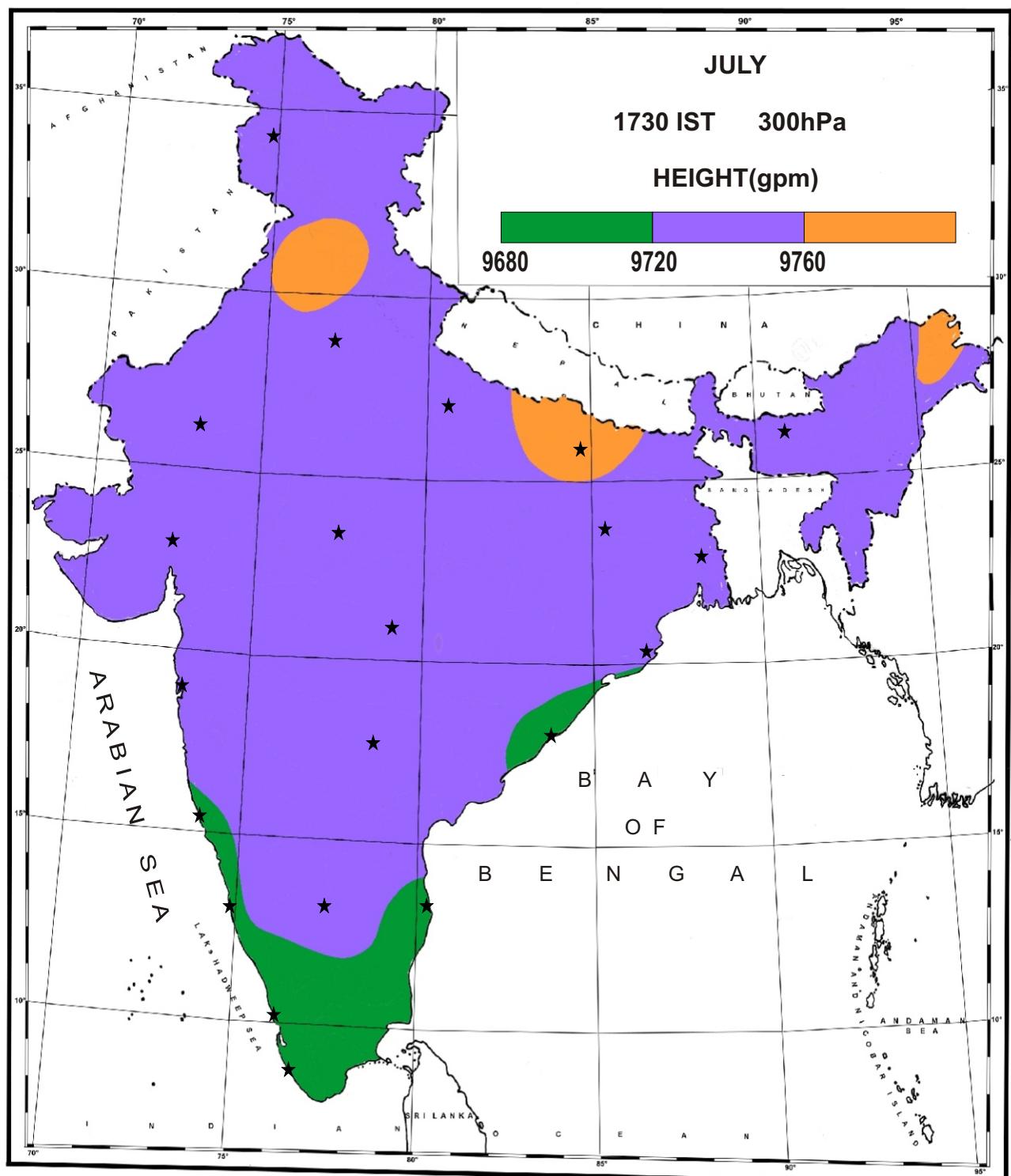


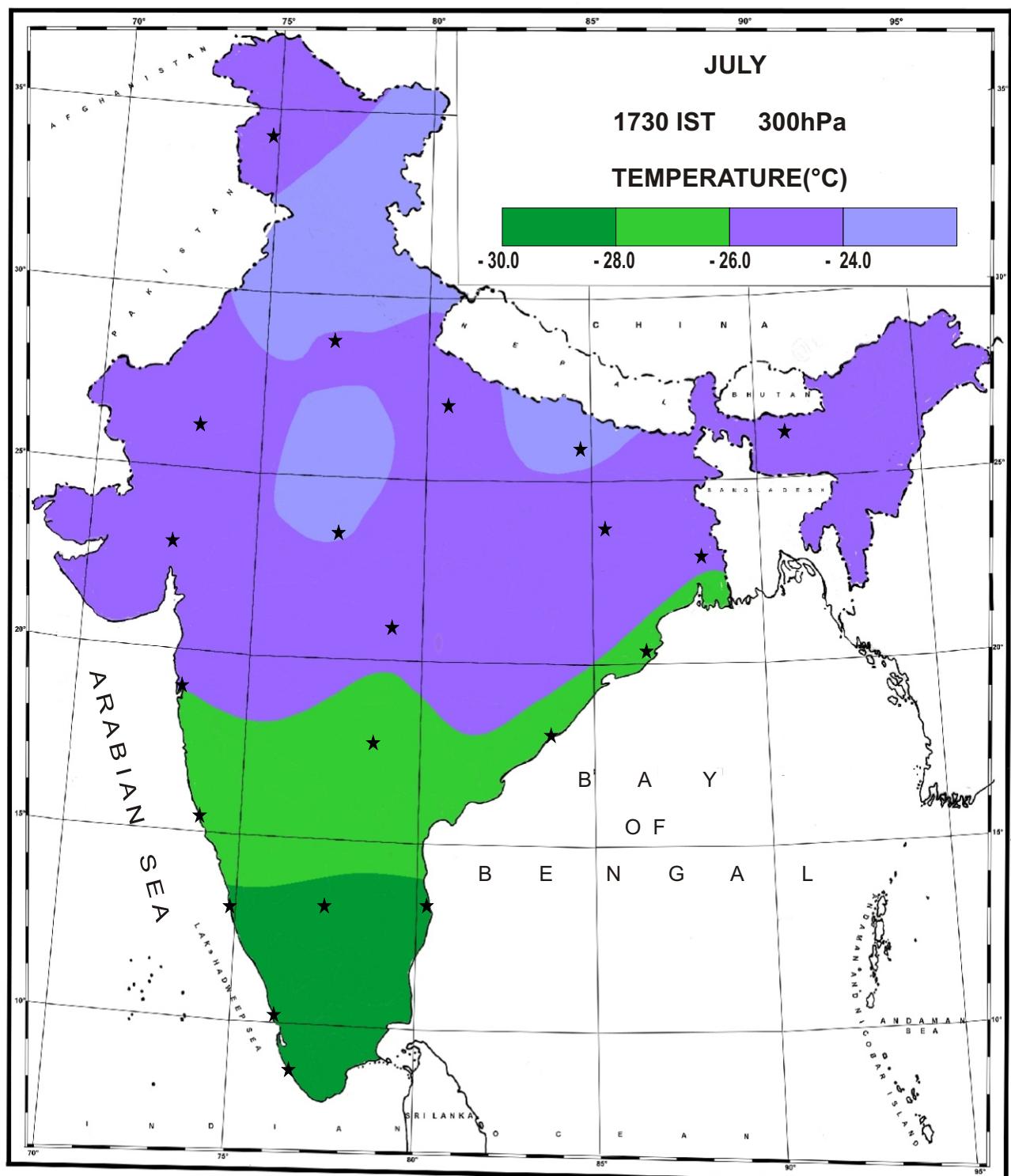


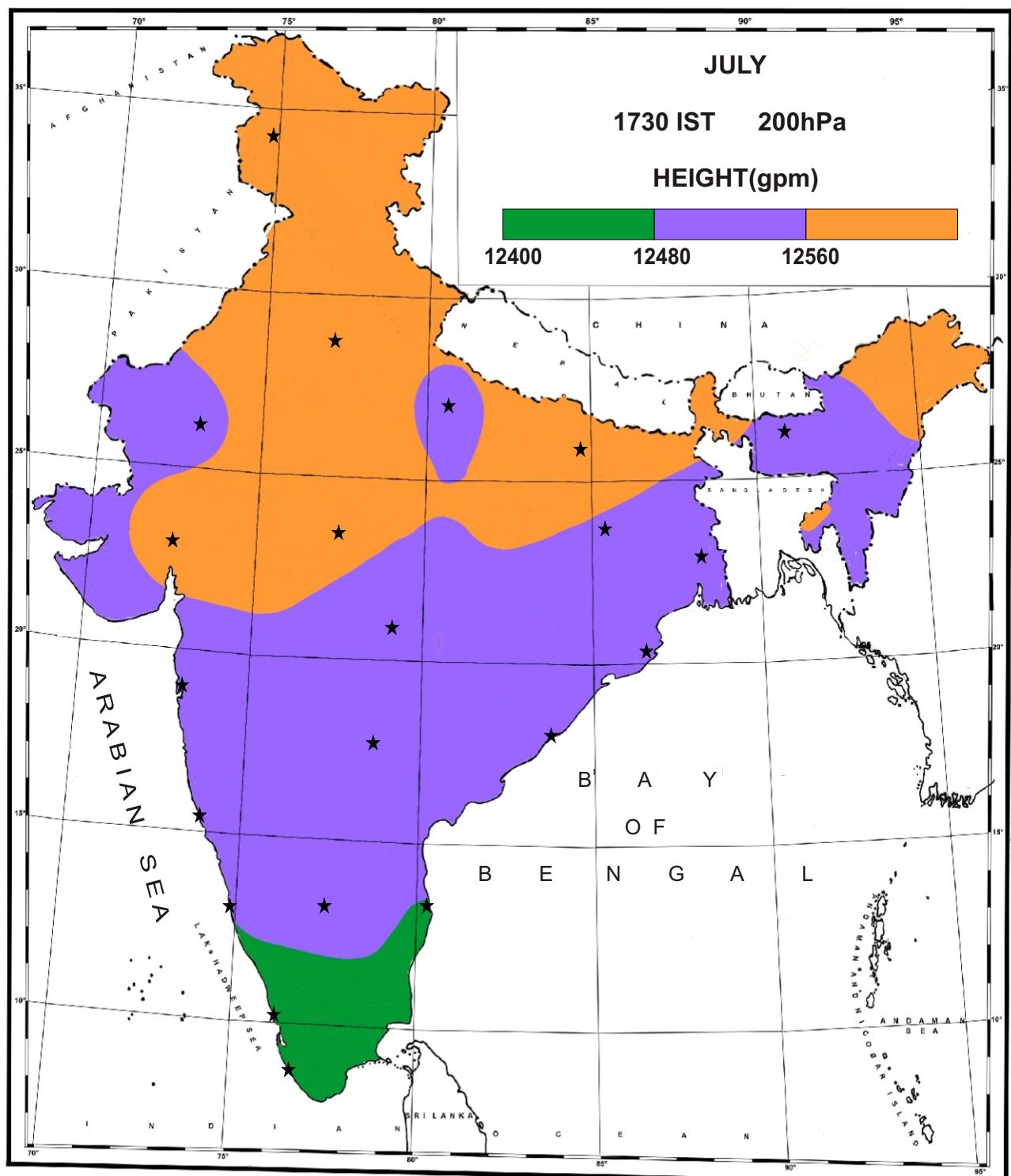


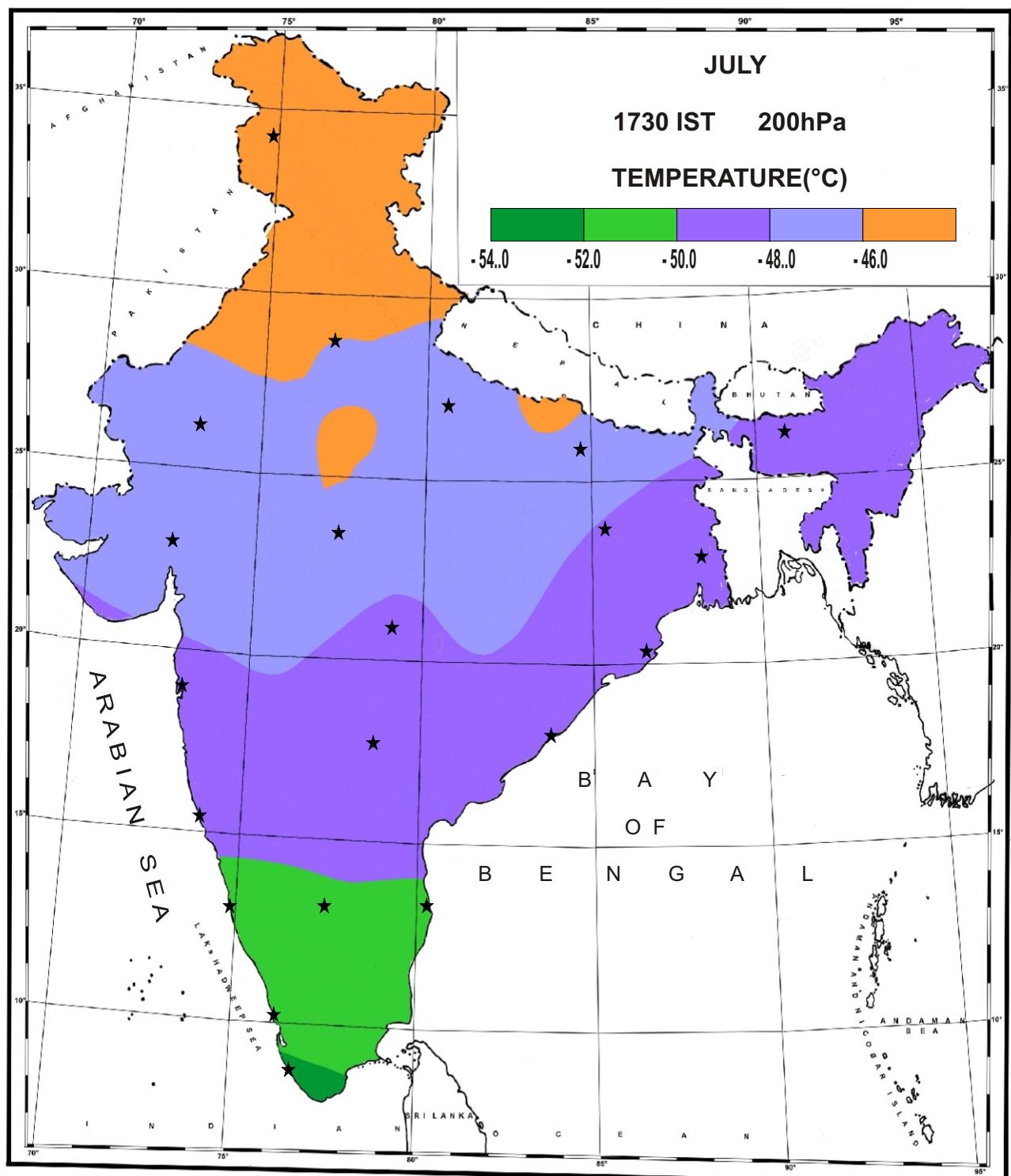


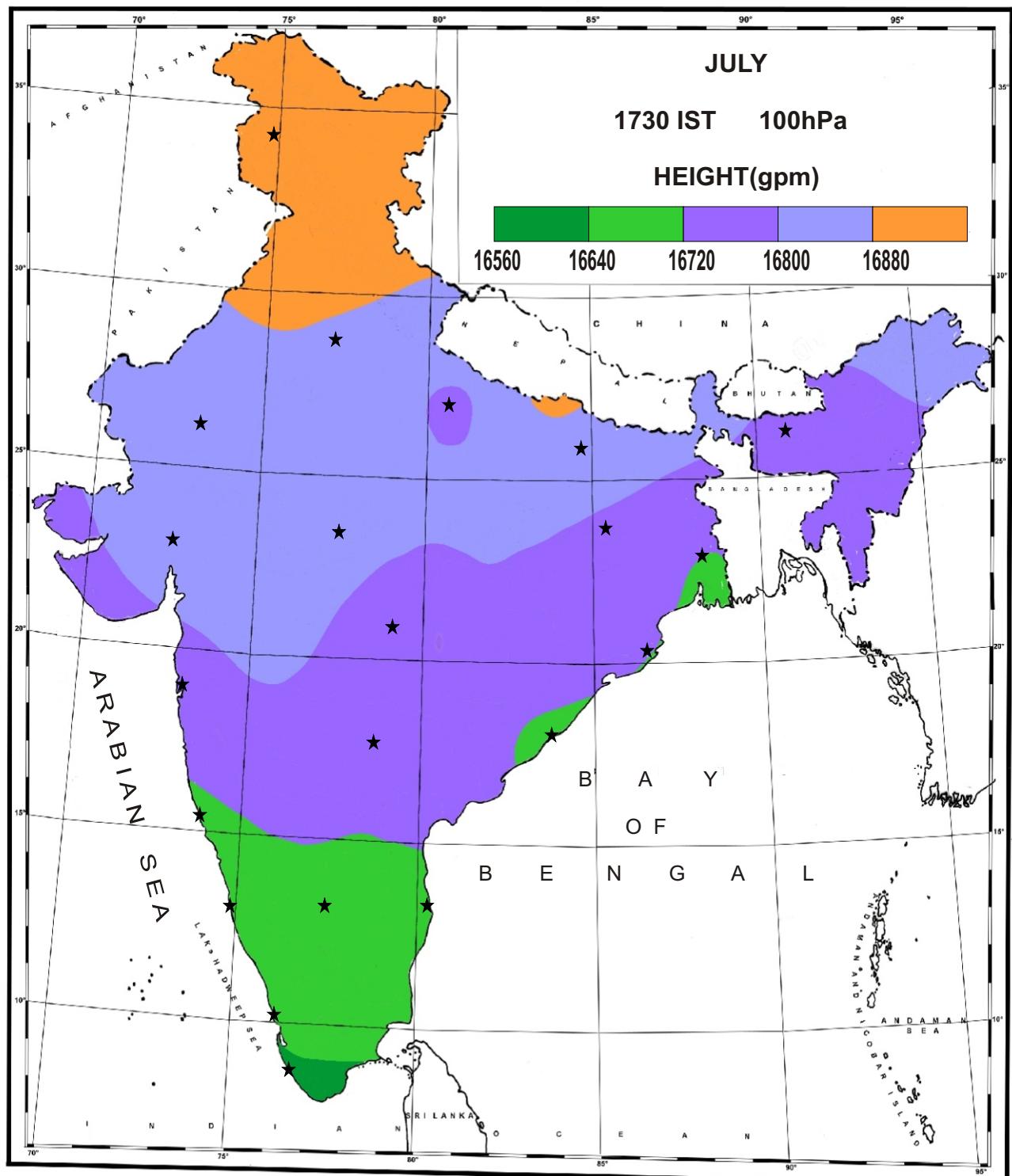


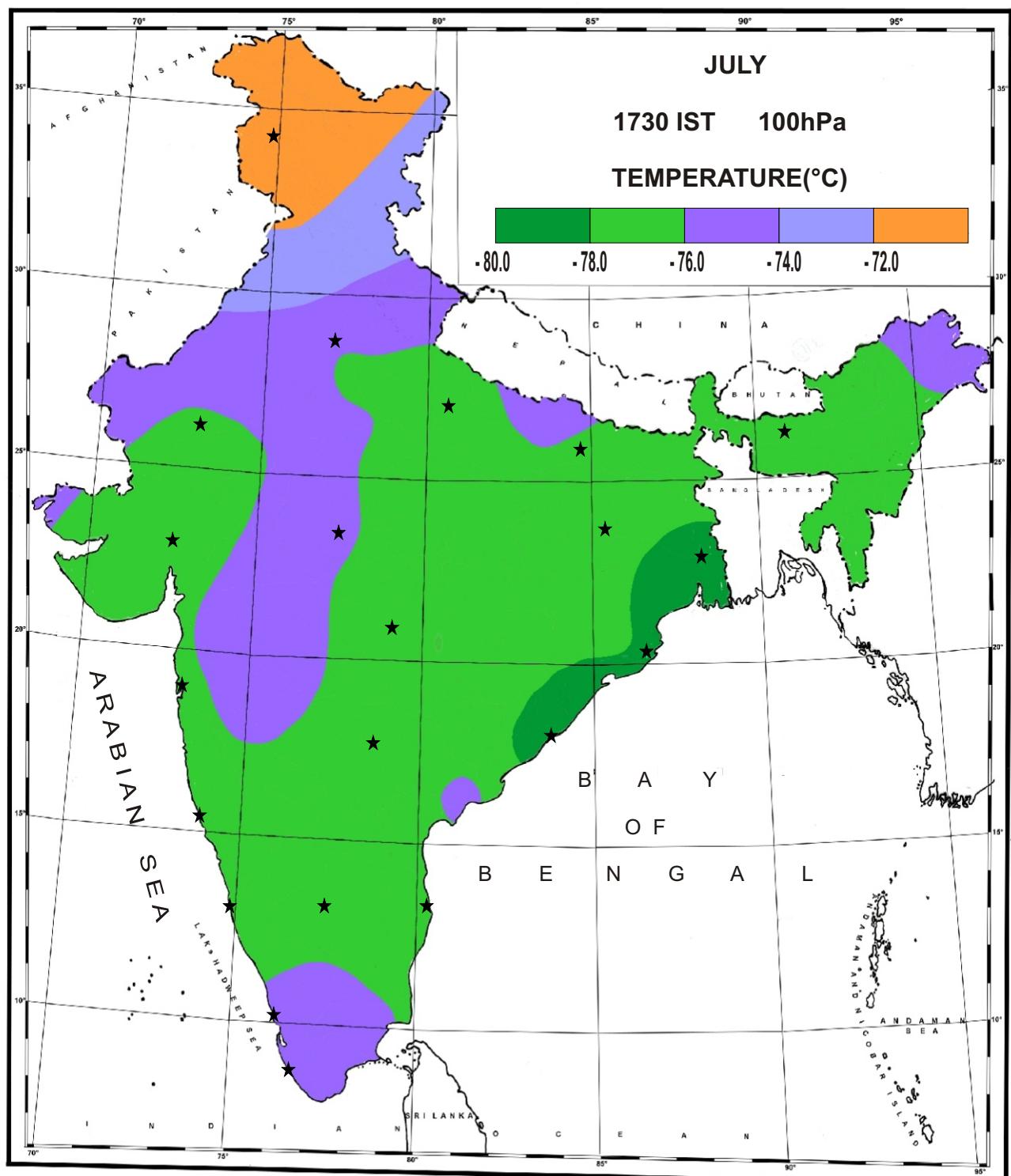


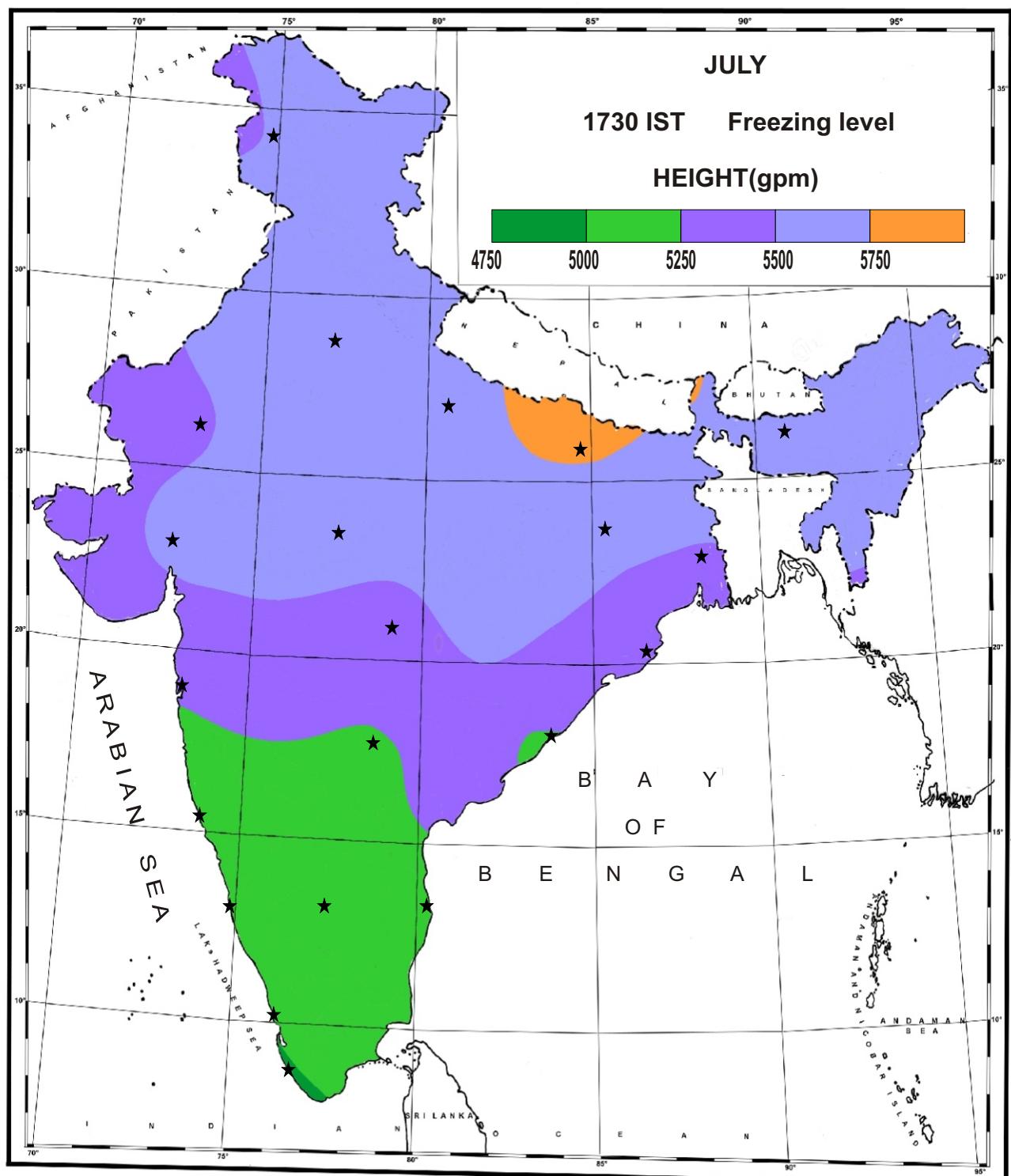


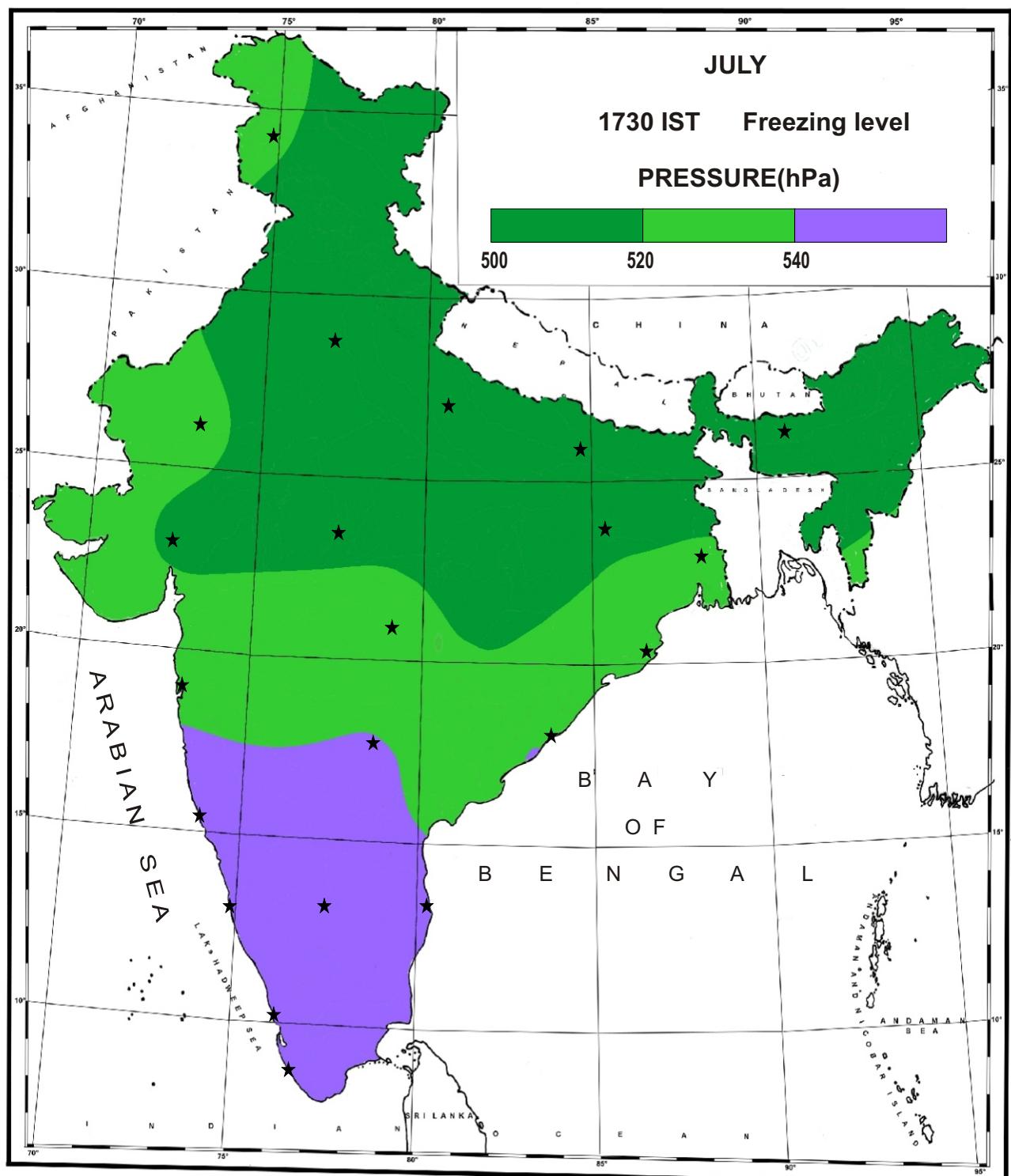


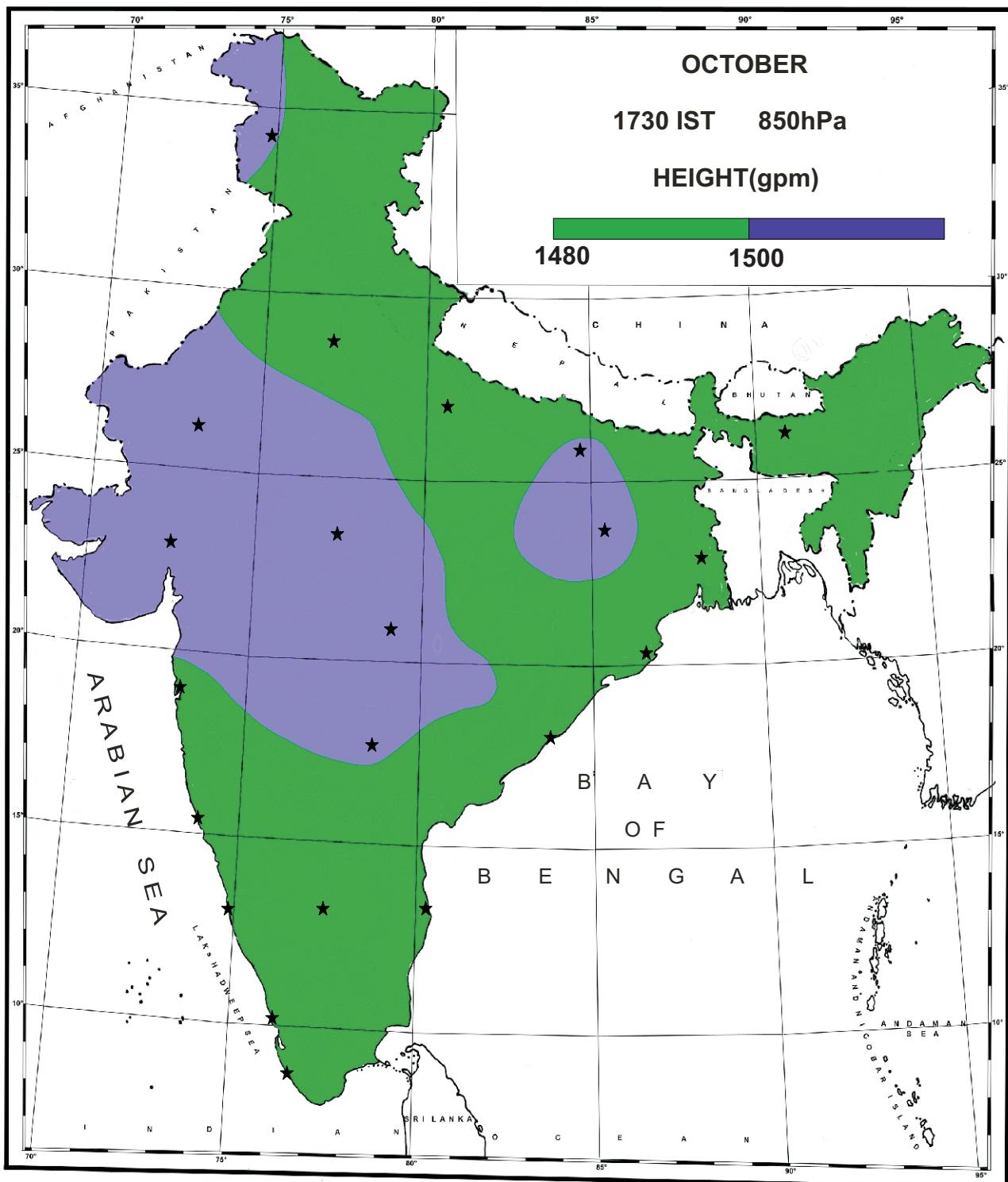


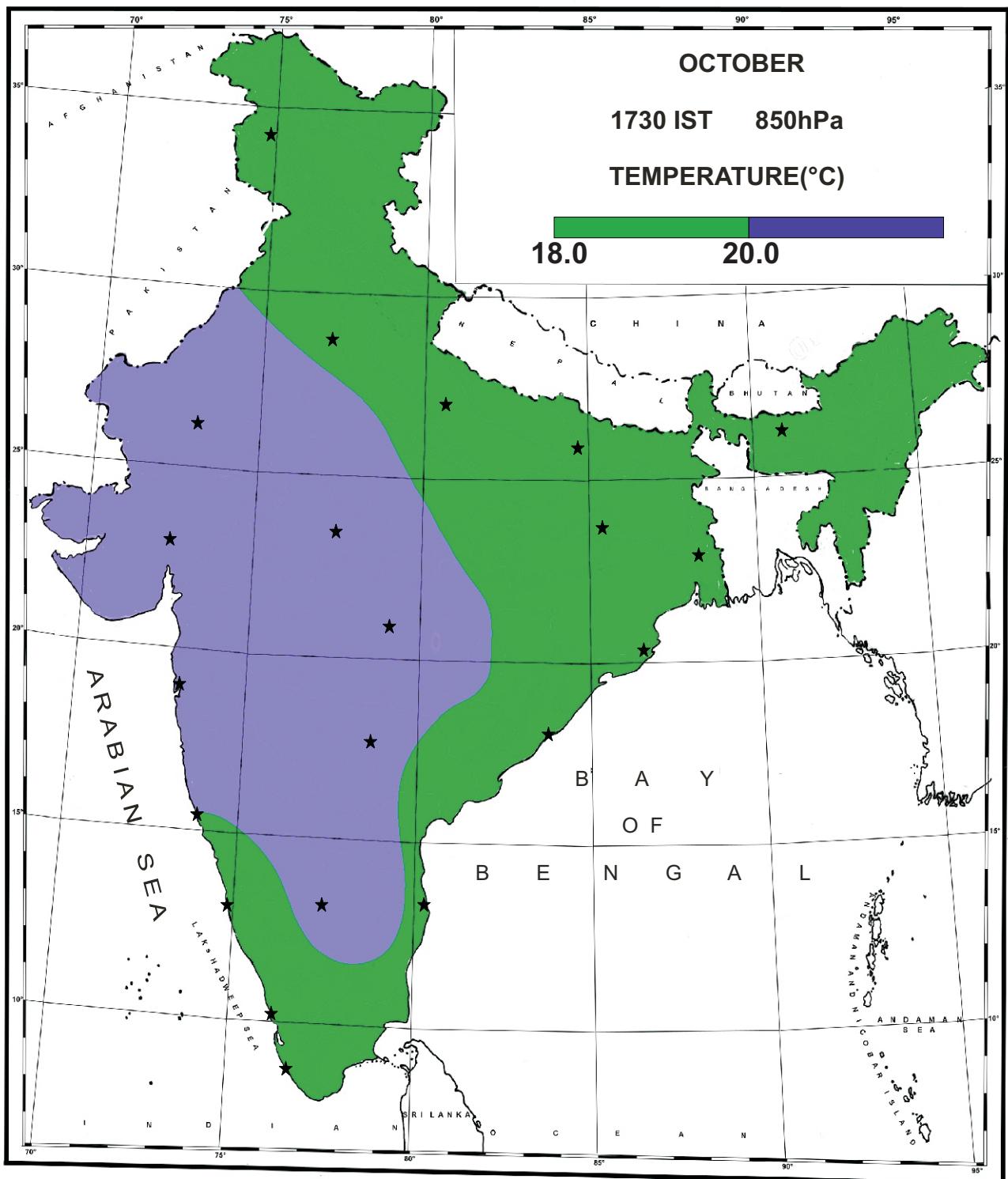


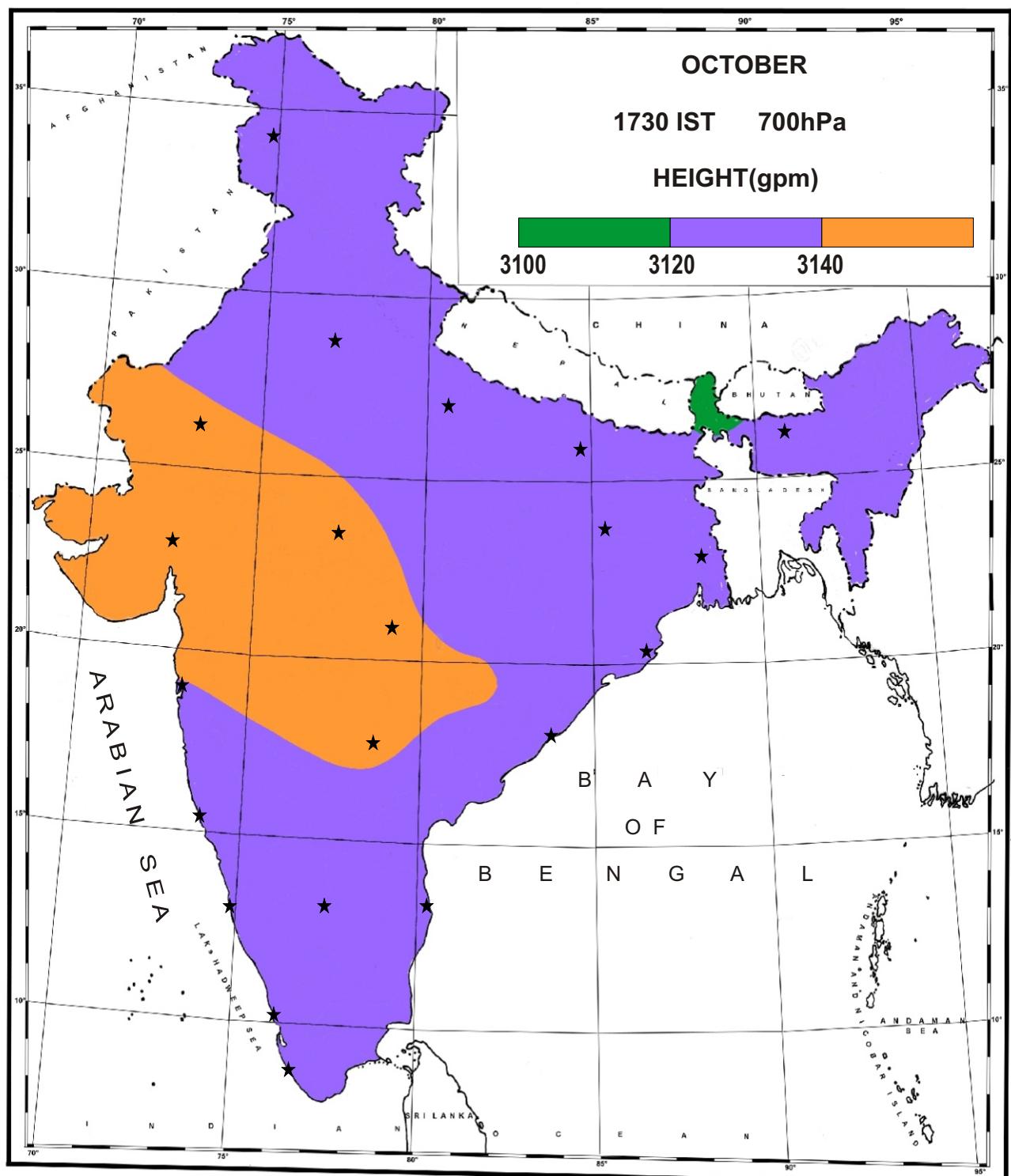


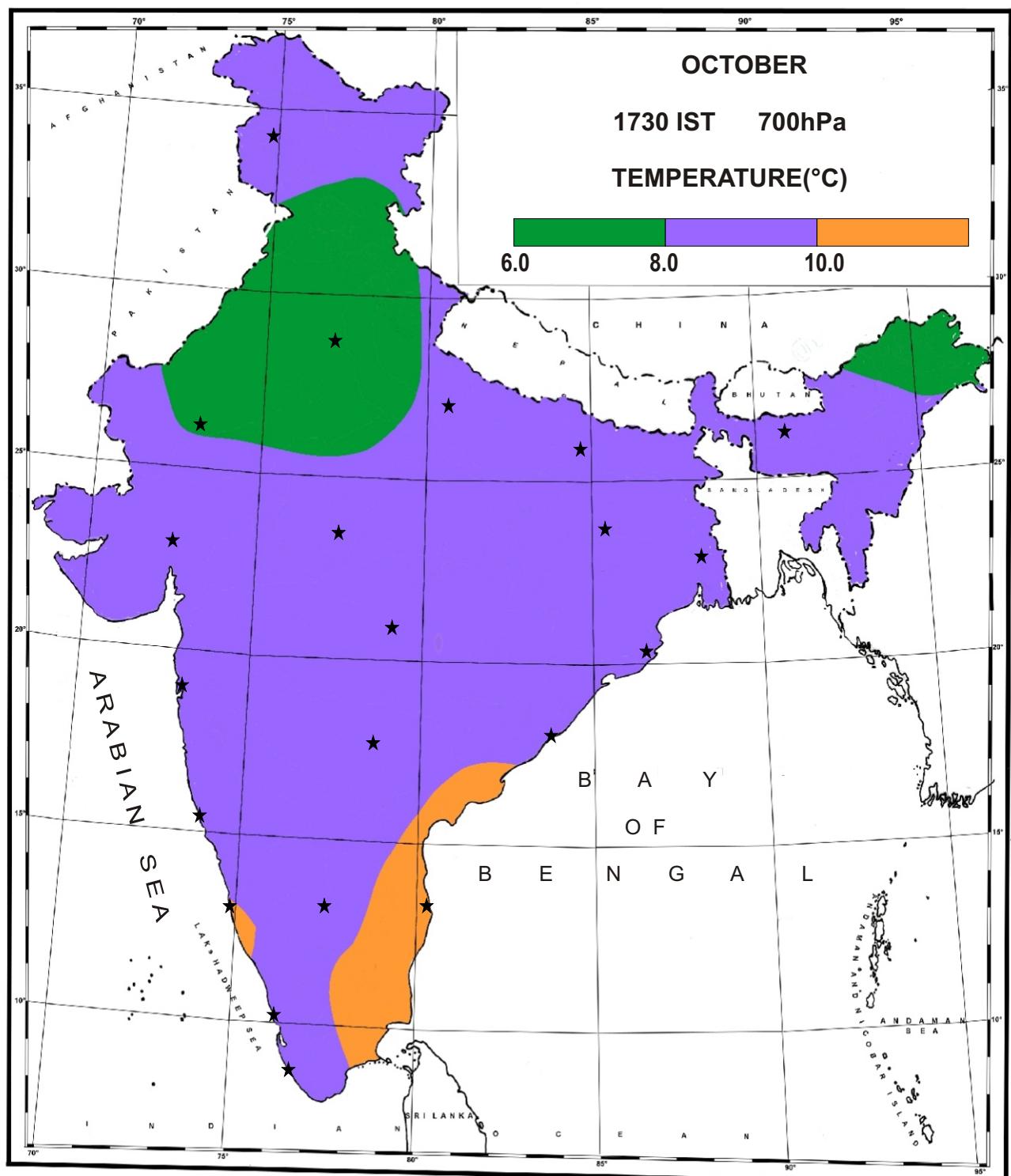


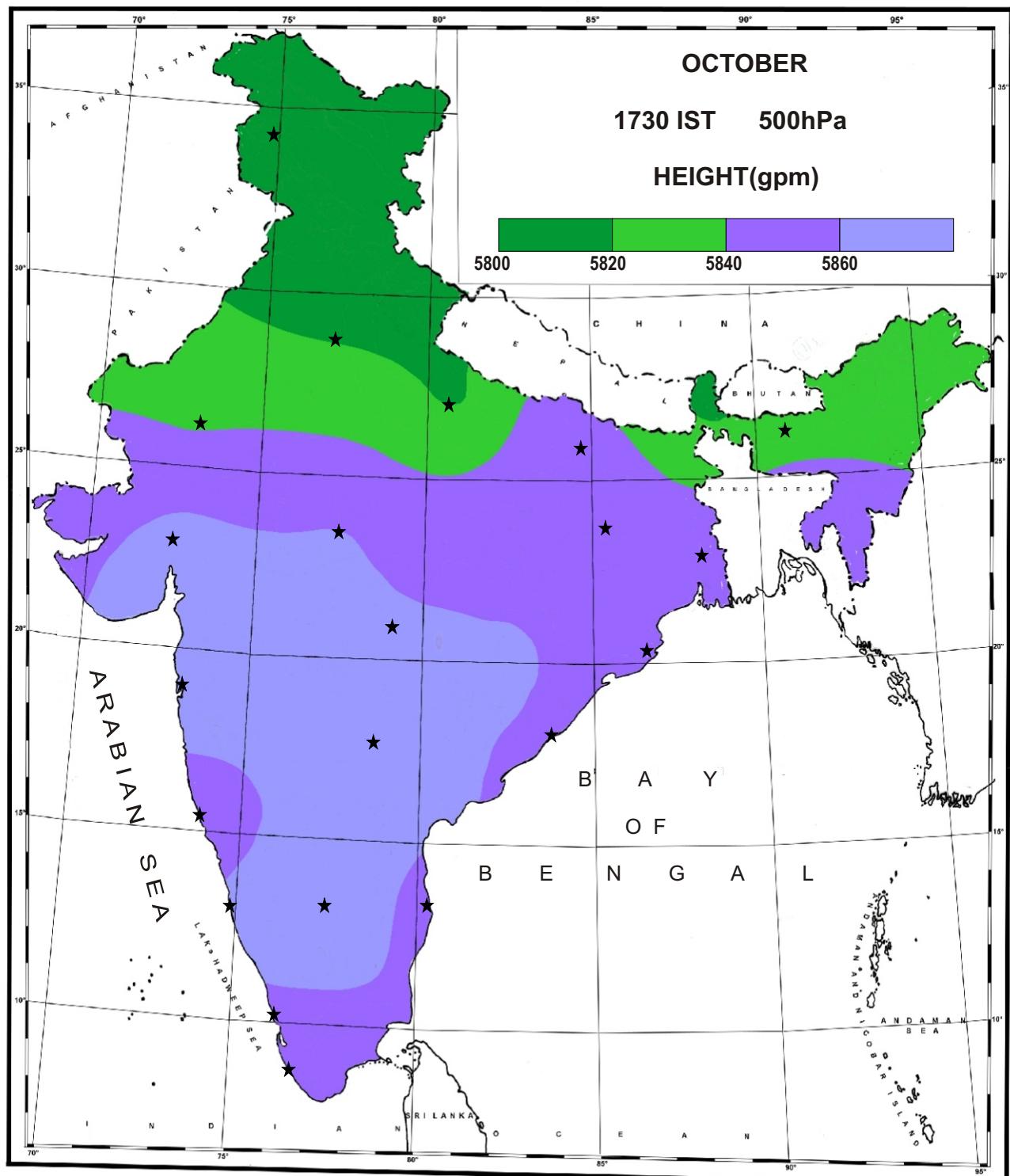


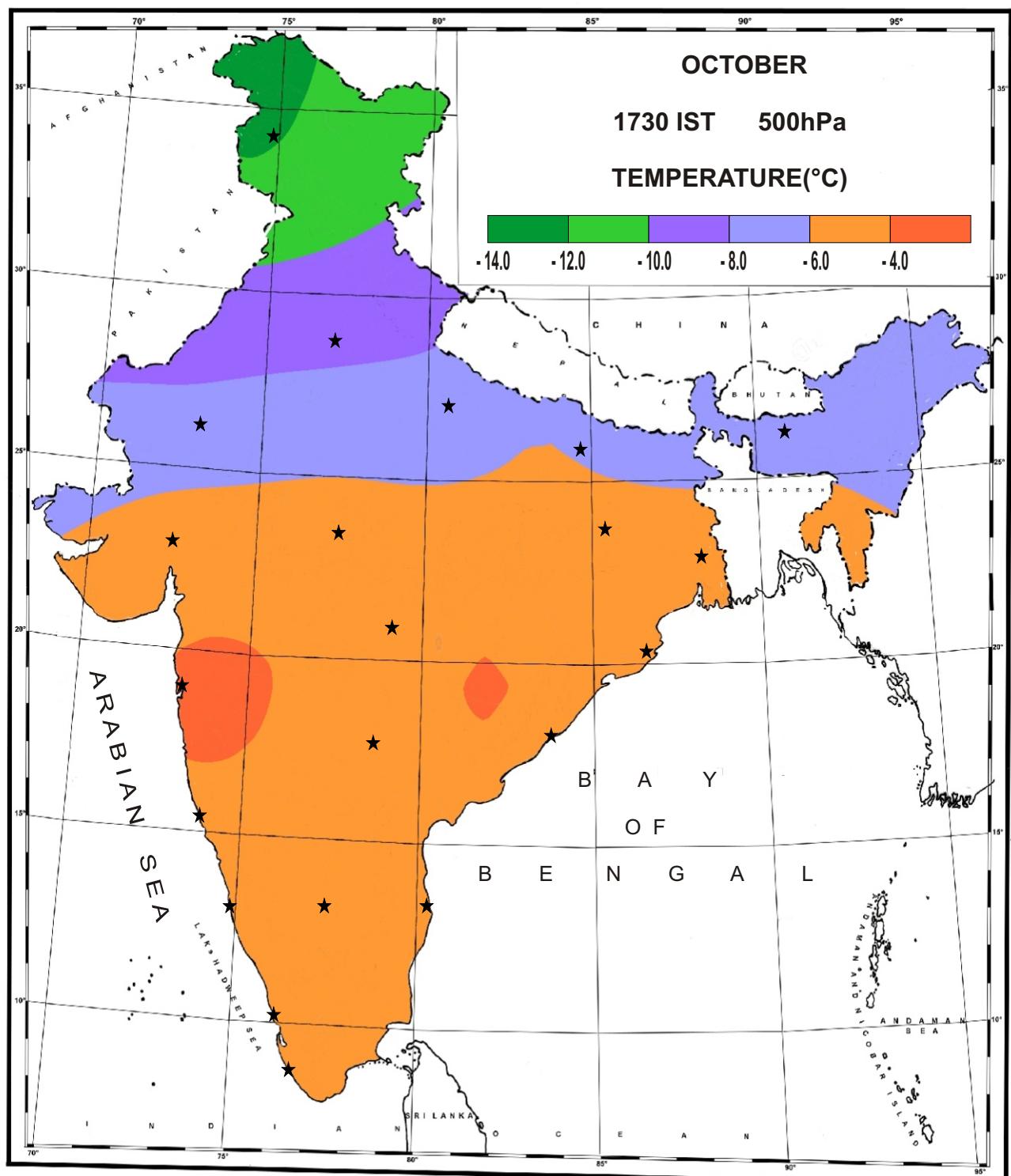


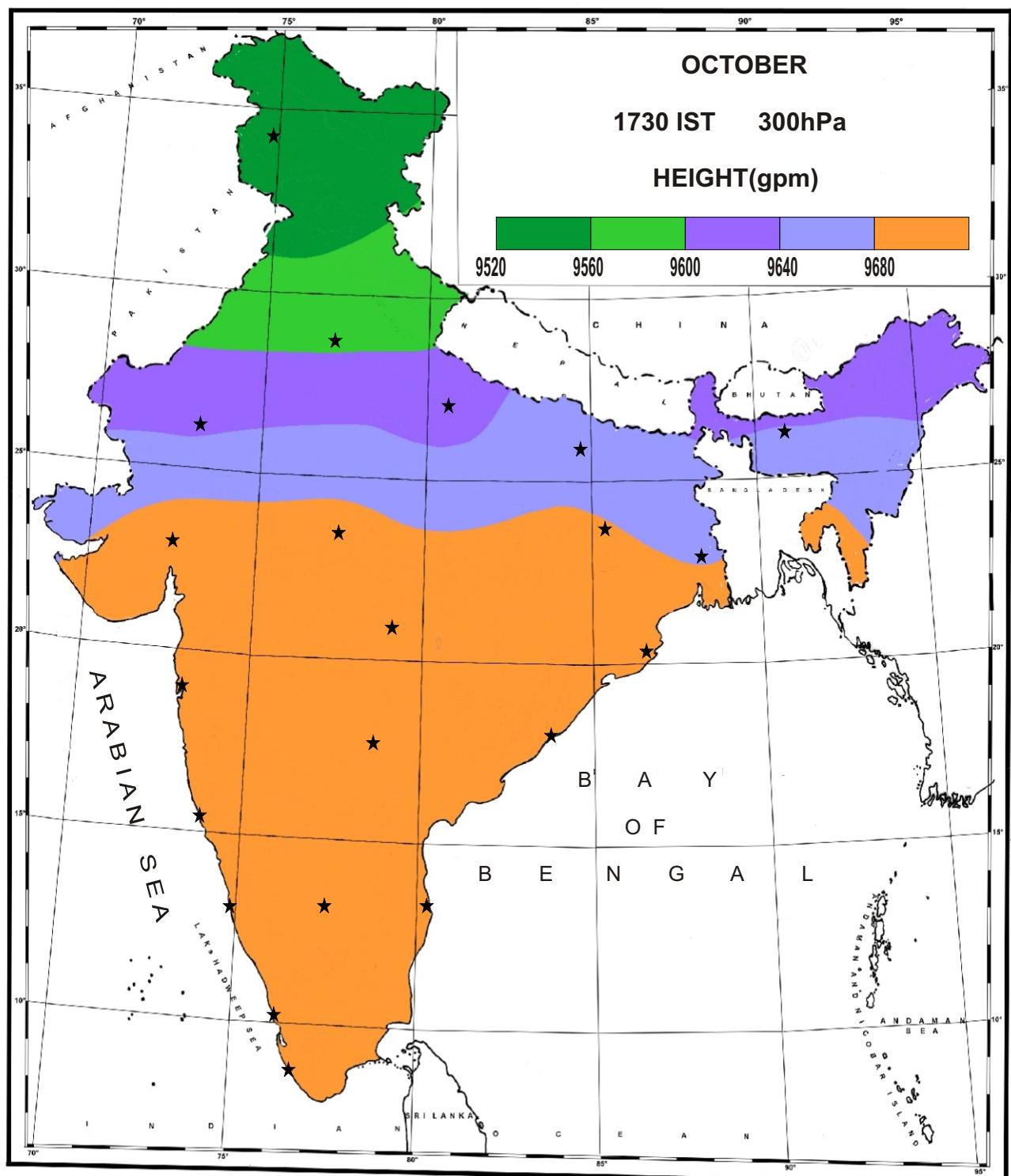


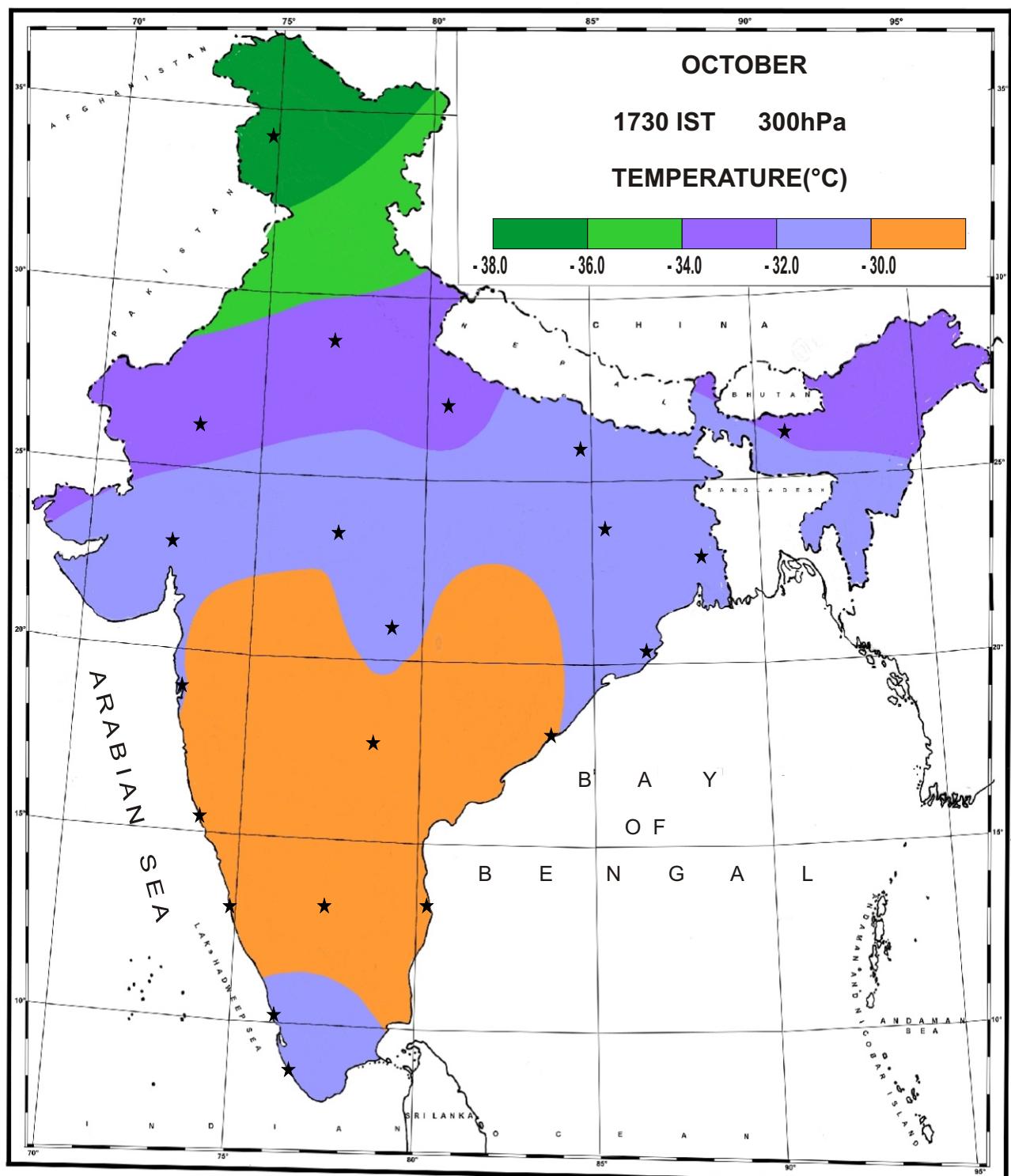


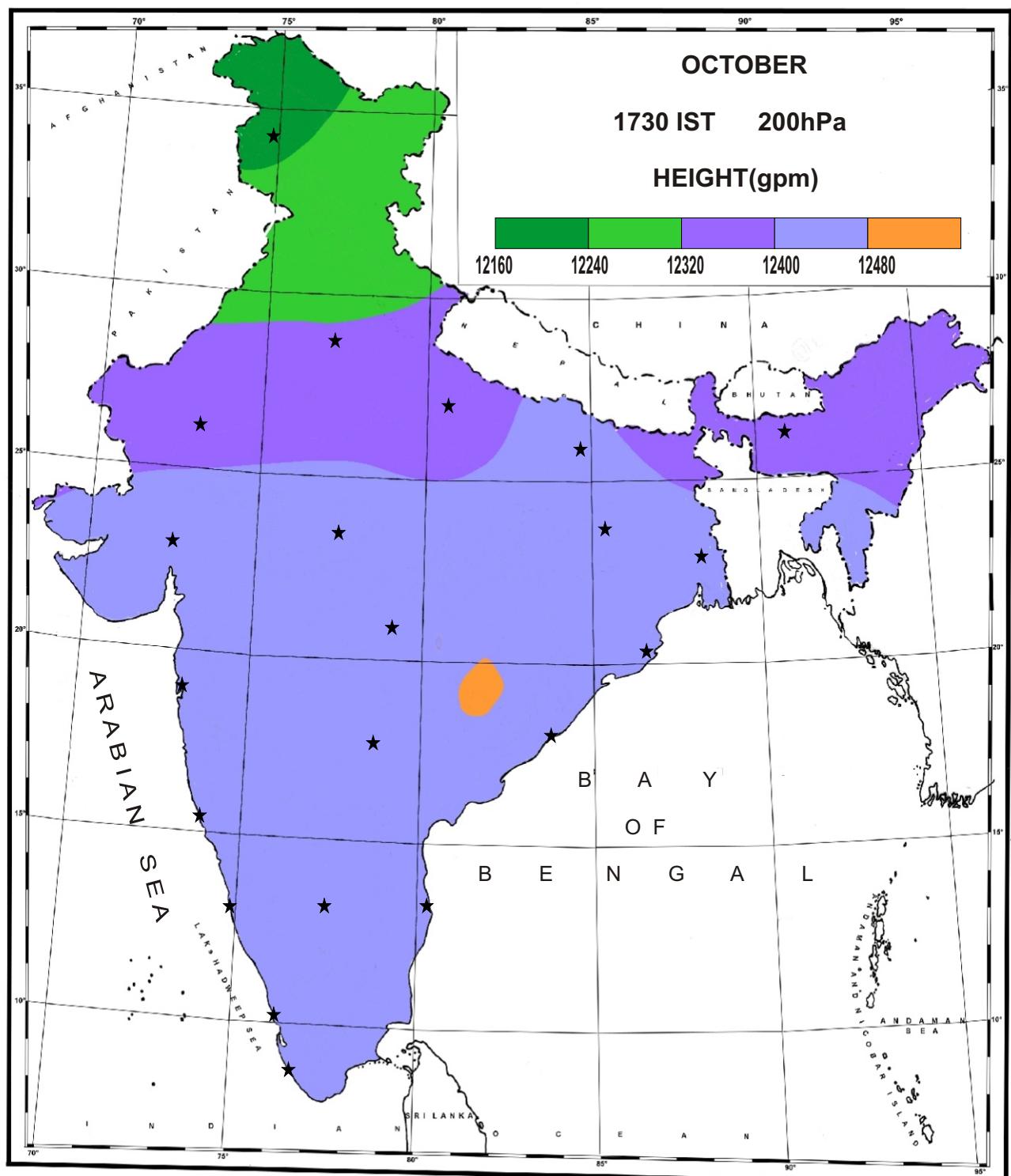


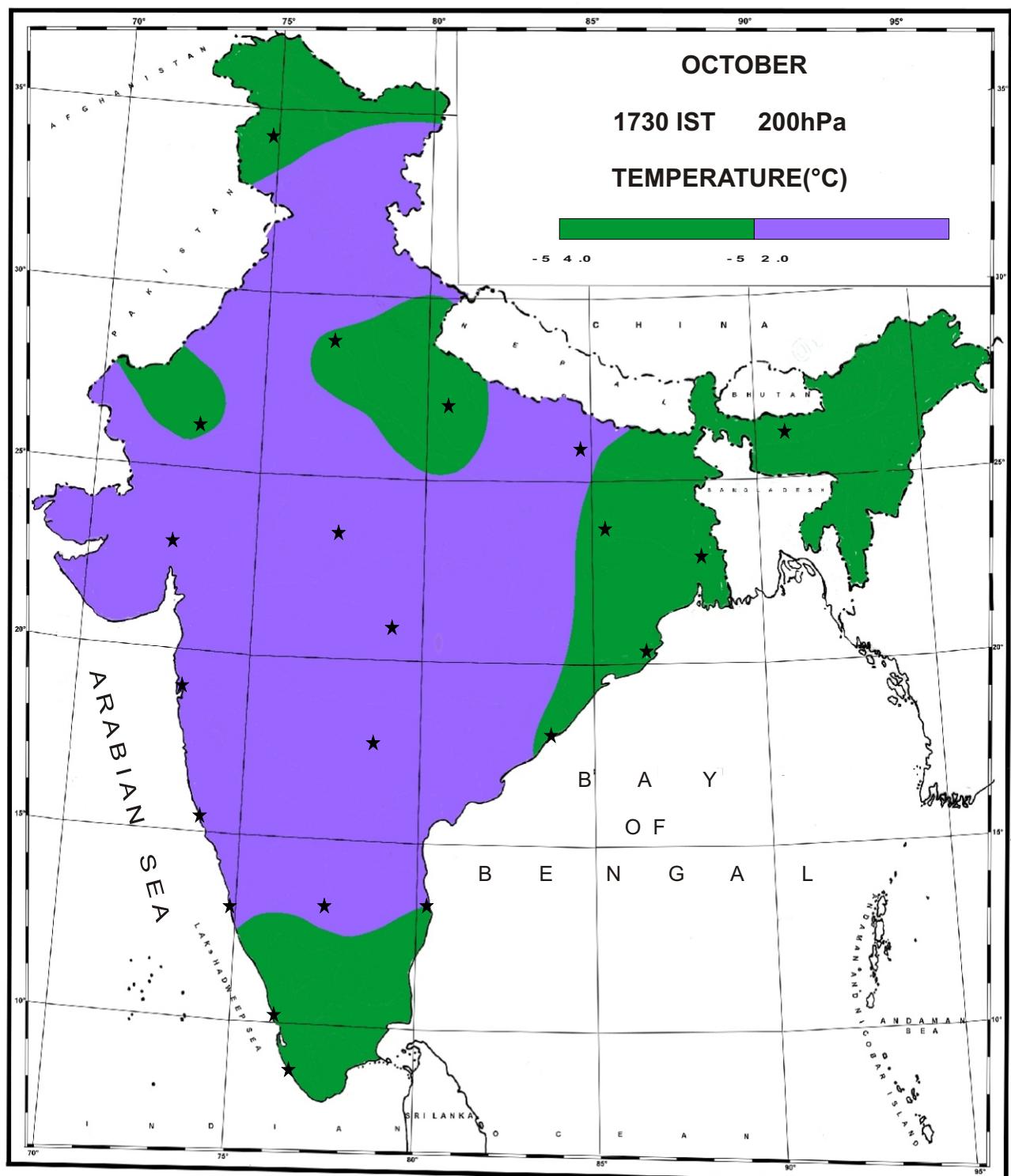


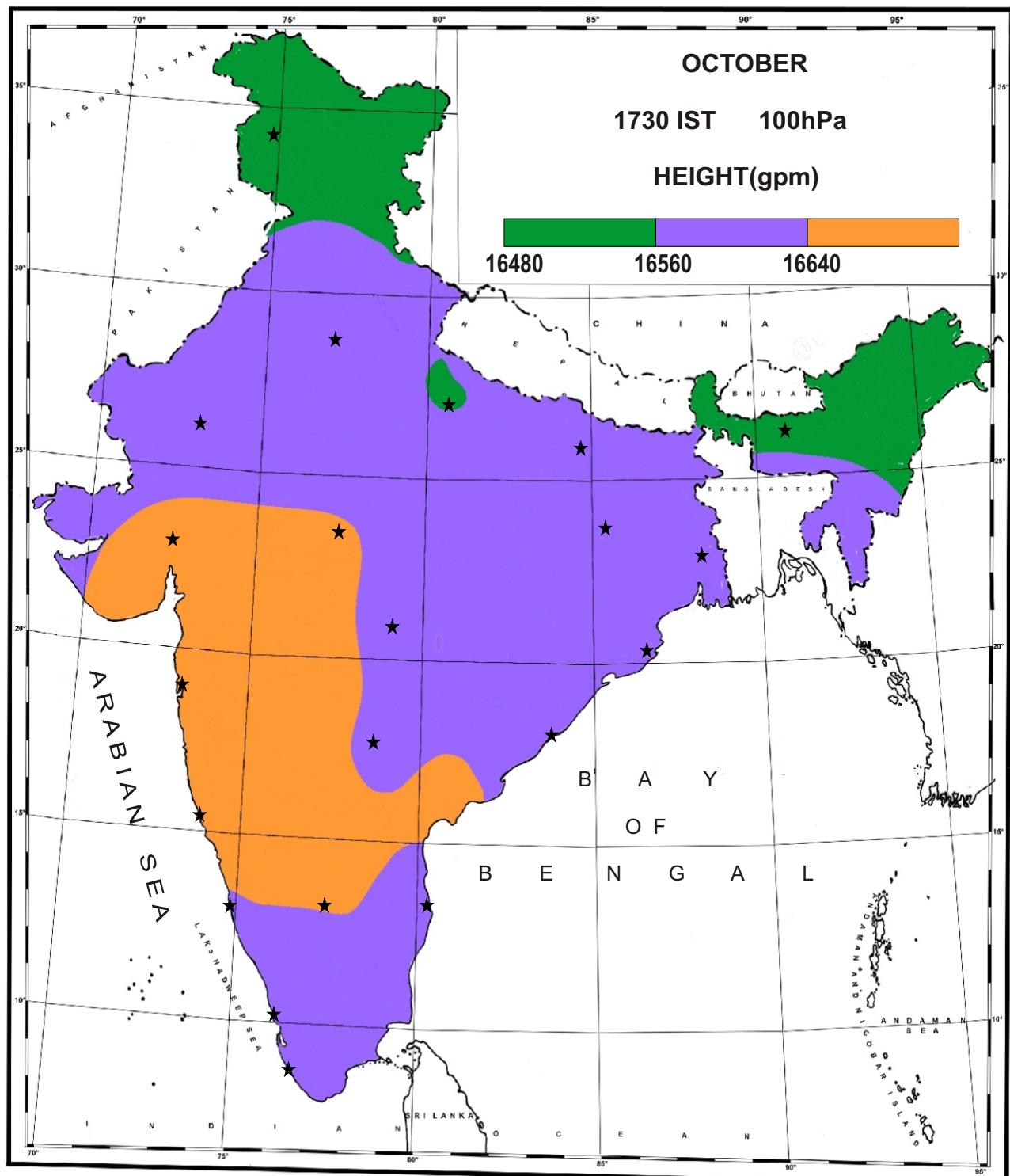


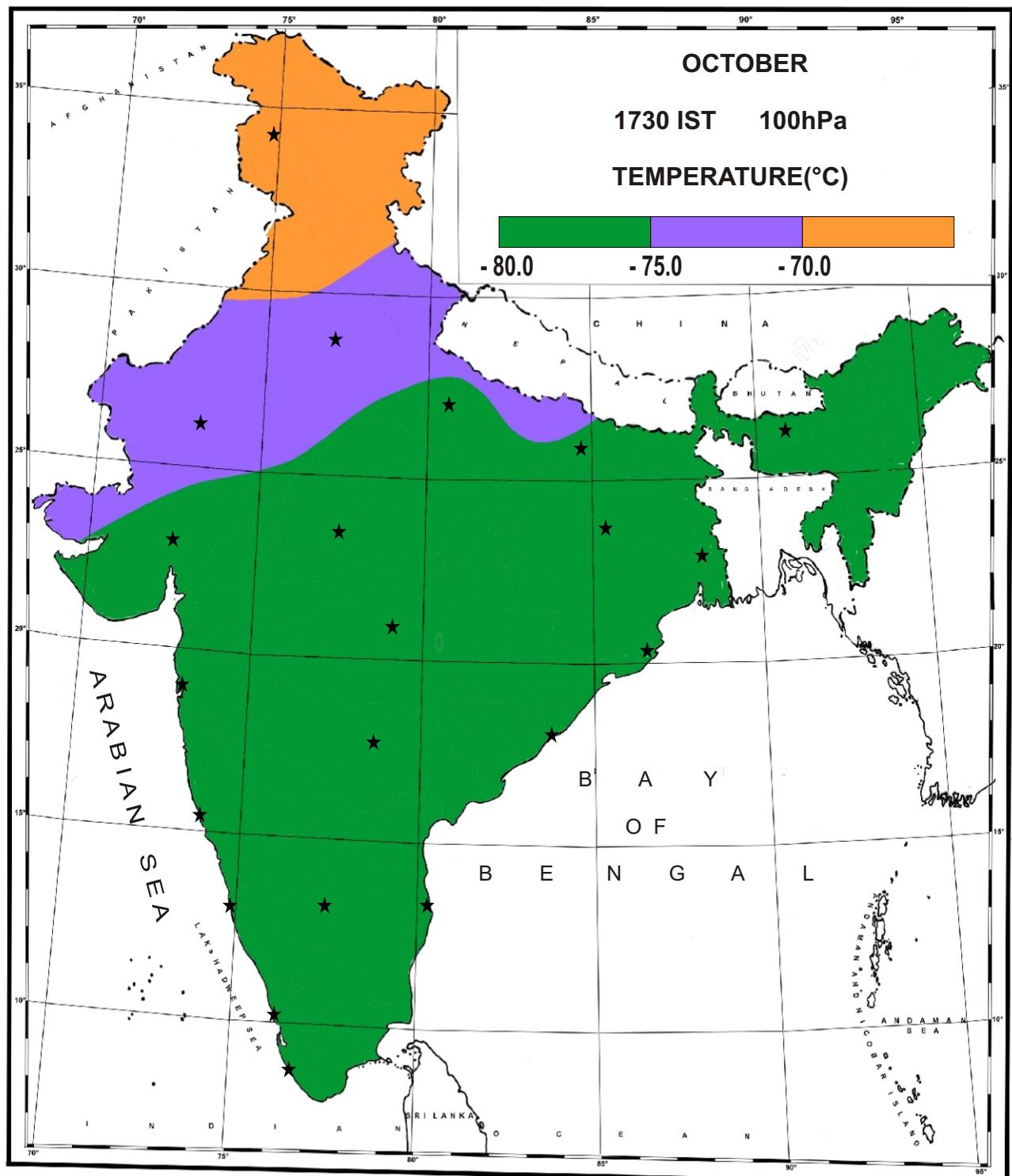


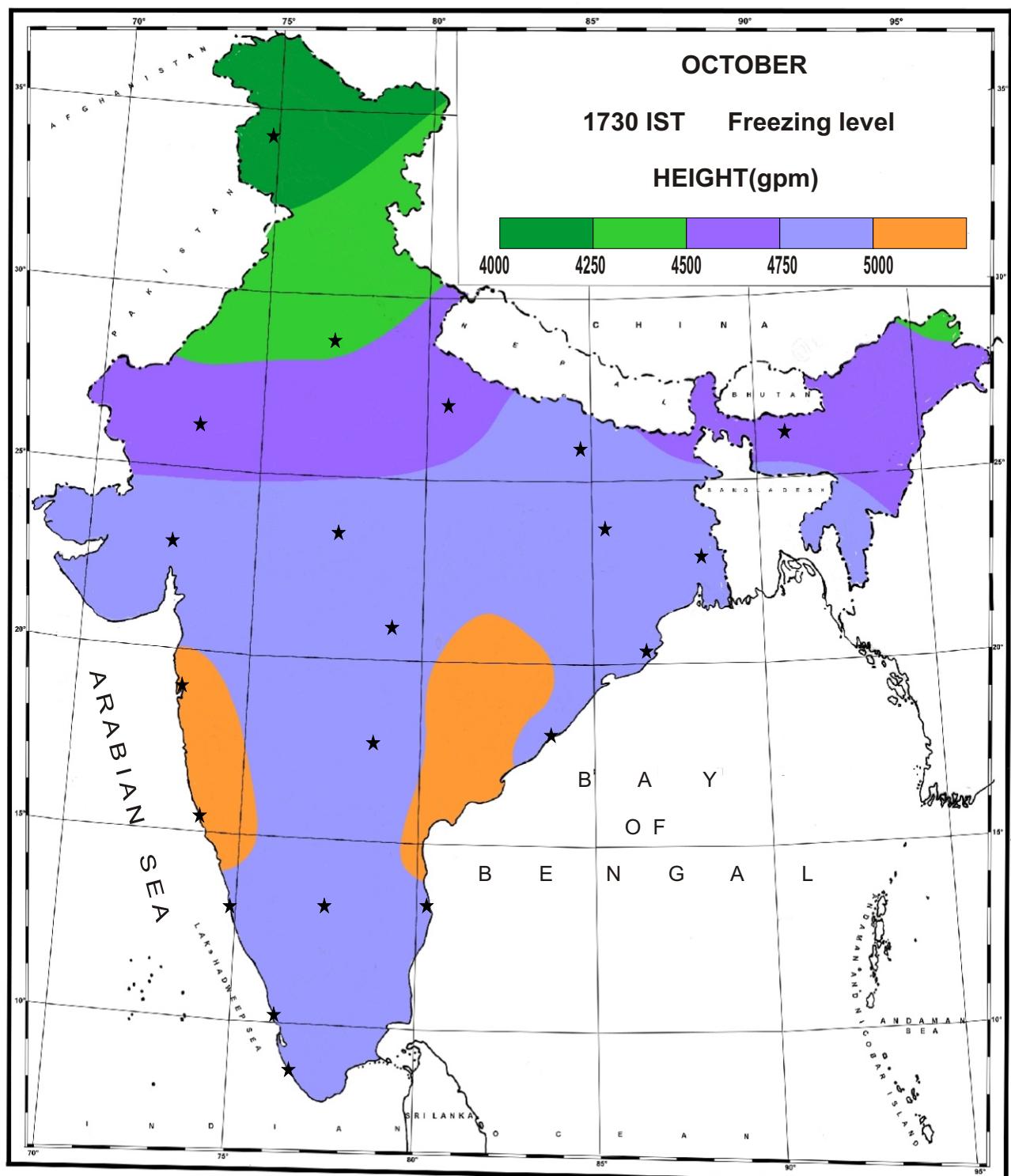


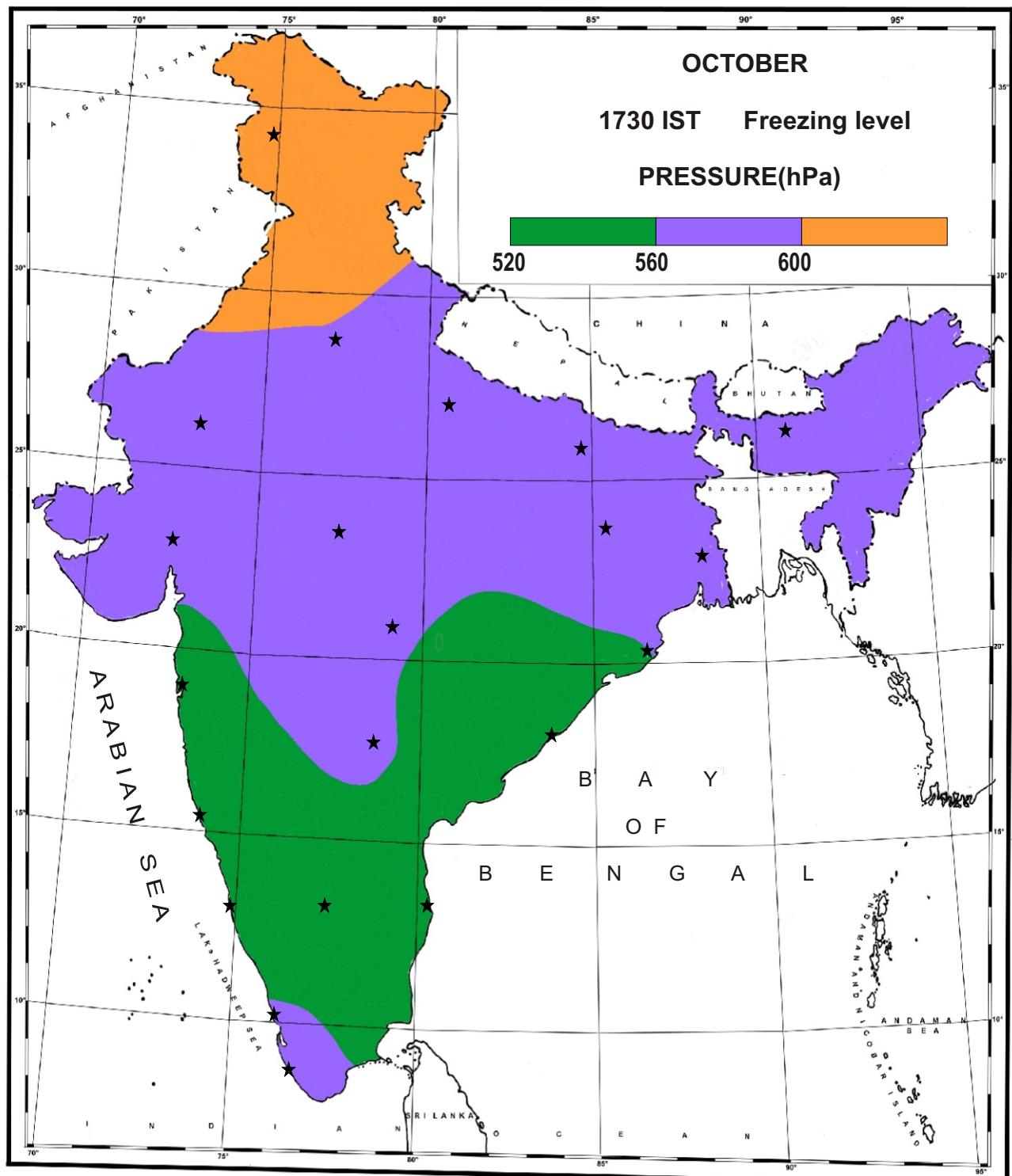












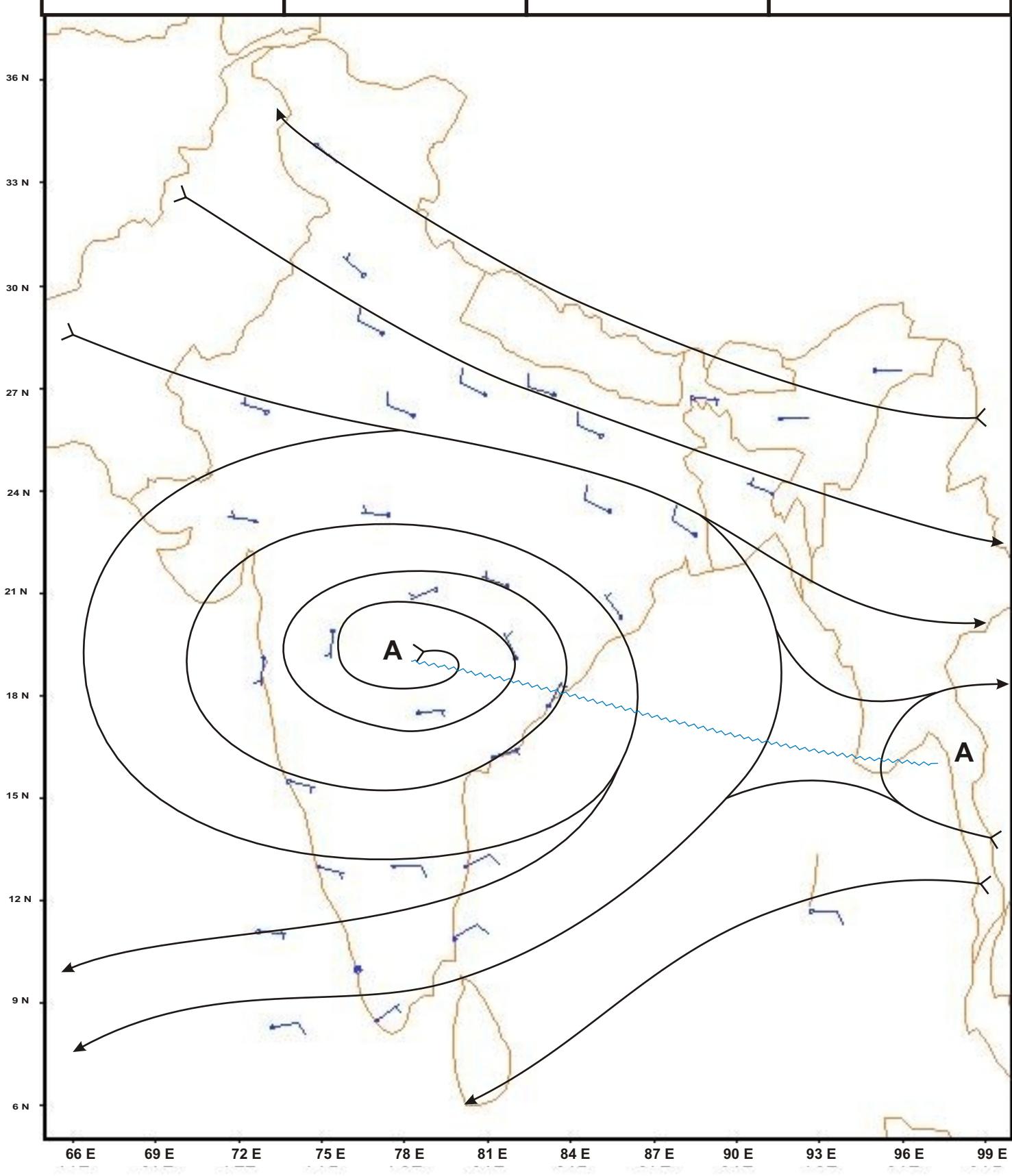
**UPPER
WINDS**

JANUARY

0530 IST

850 hPa

UPPER WINDS

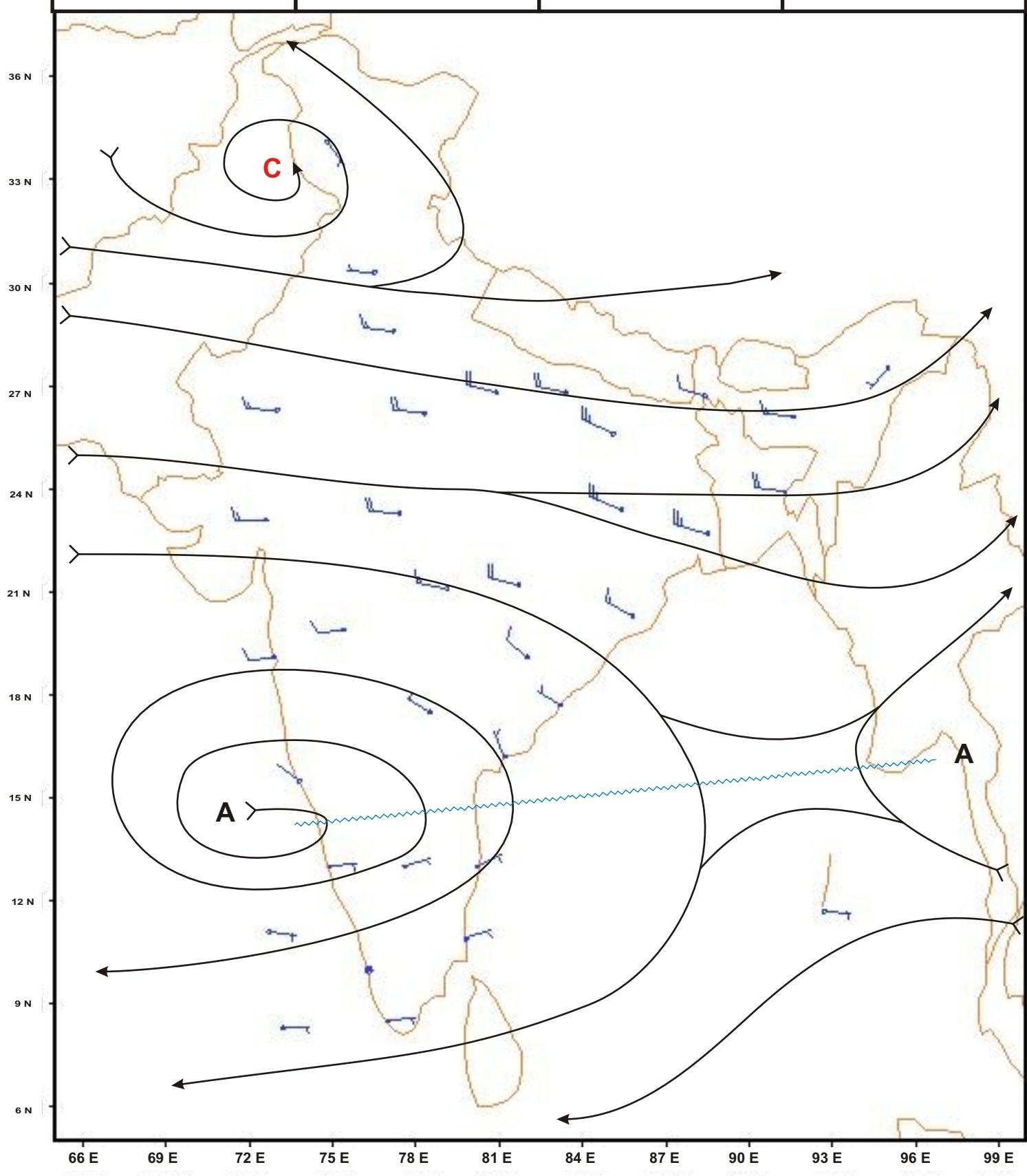


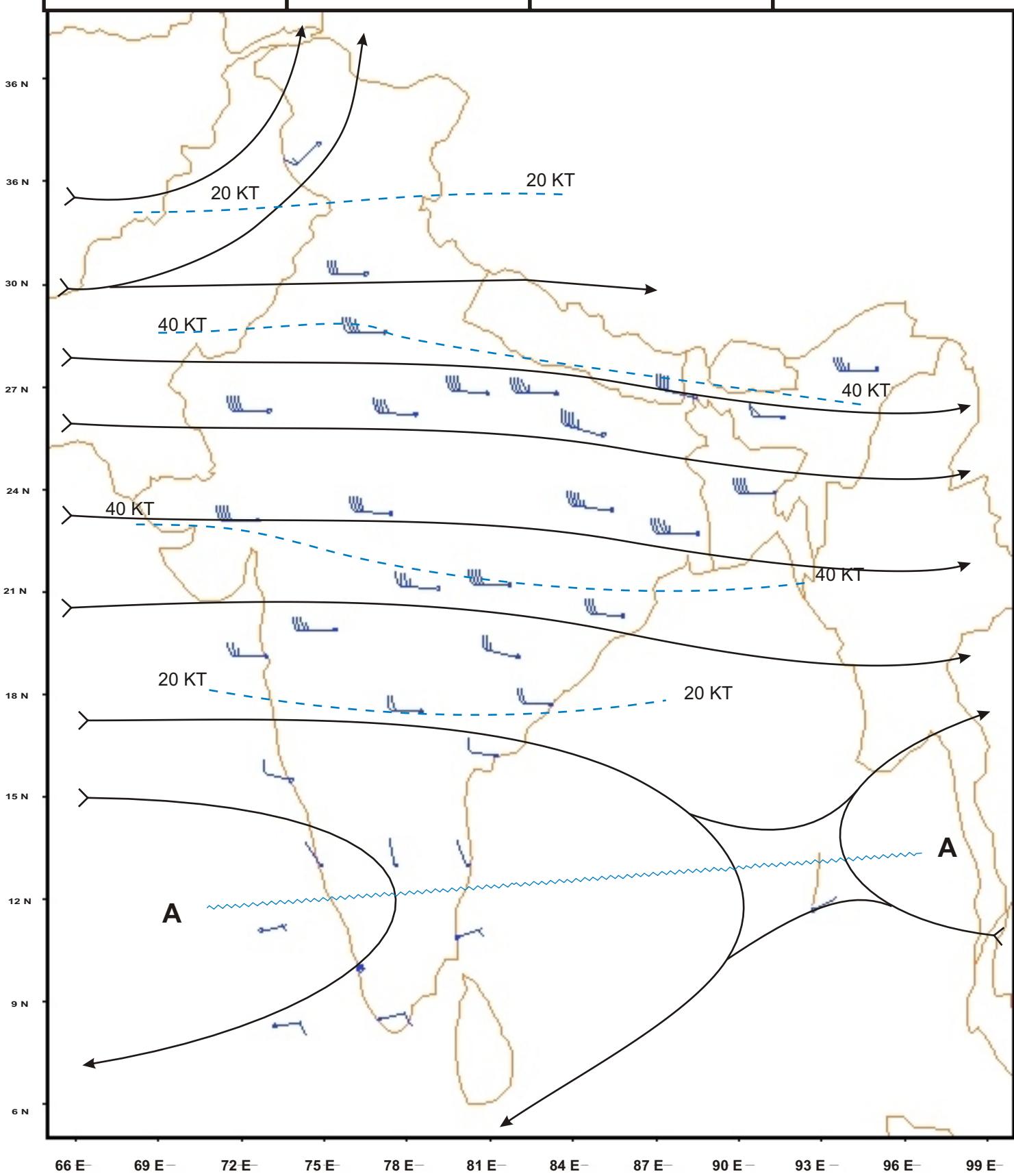
JANUARY

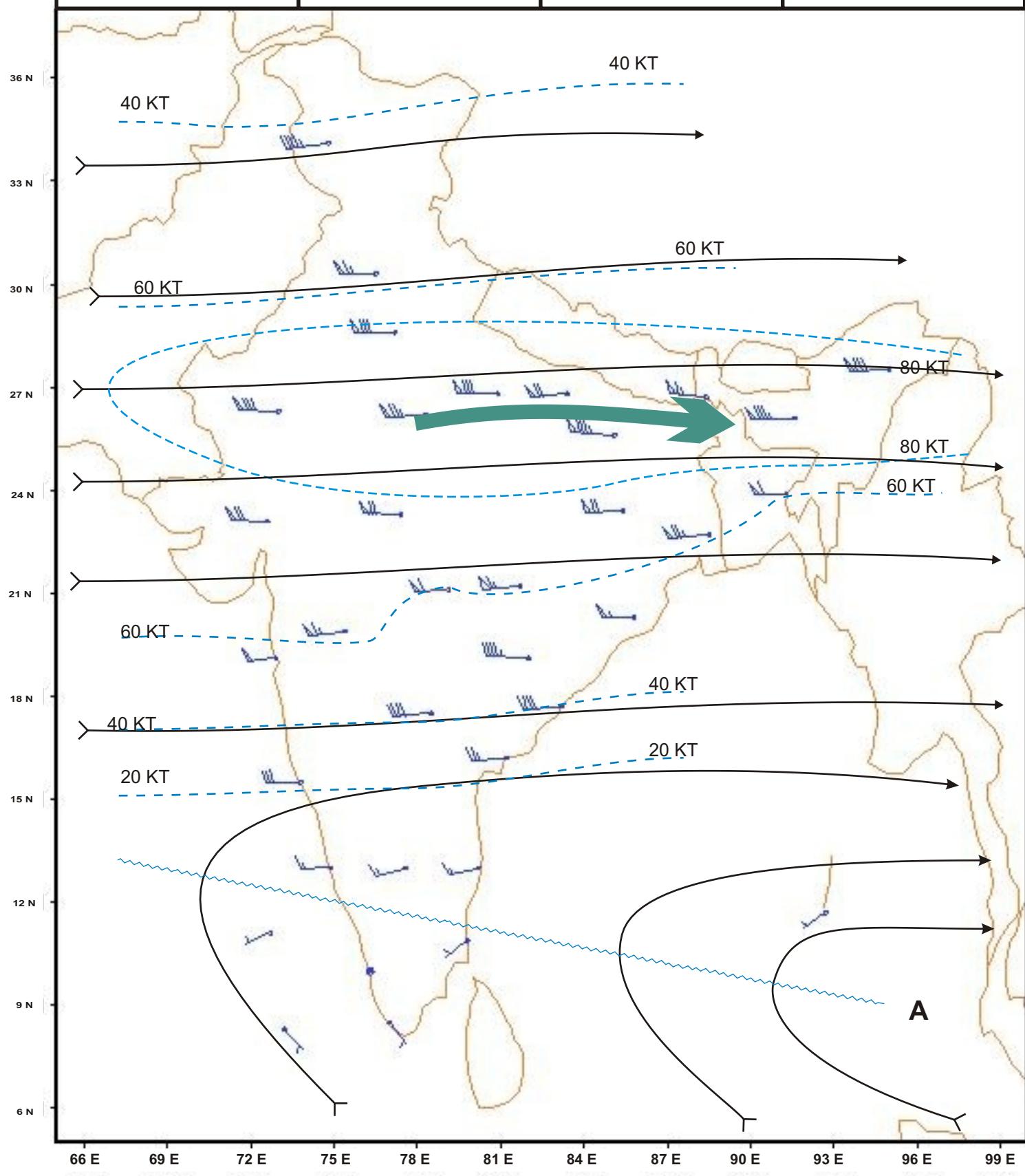
0530 IST

700 hPa

UPPER WINDS



JANUARY**0530 IST****500 hPa****UPPER WINDS**

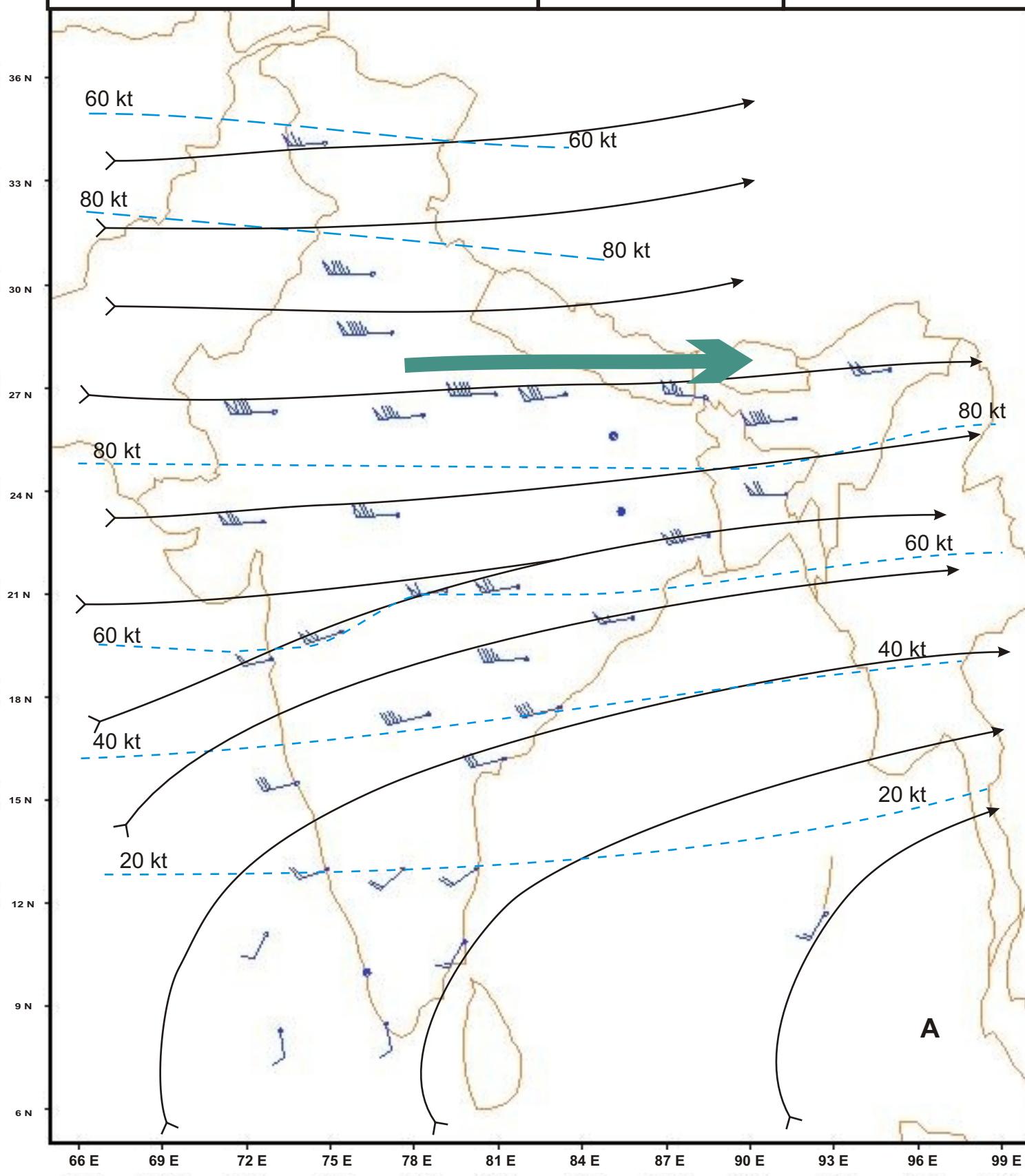
JANUARY**0530 IST****300 hPa****UPPER WINDS**

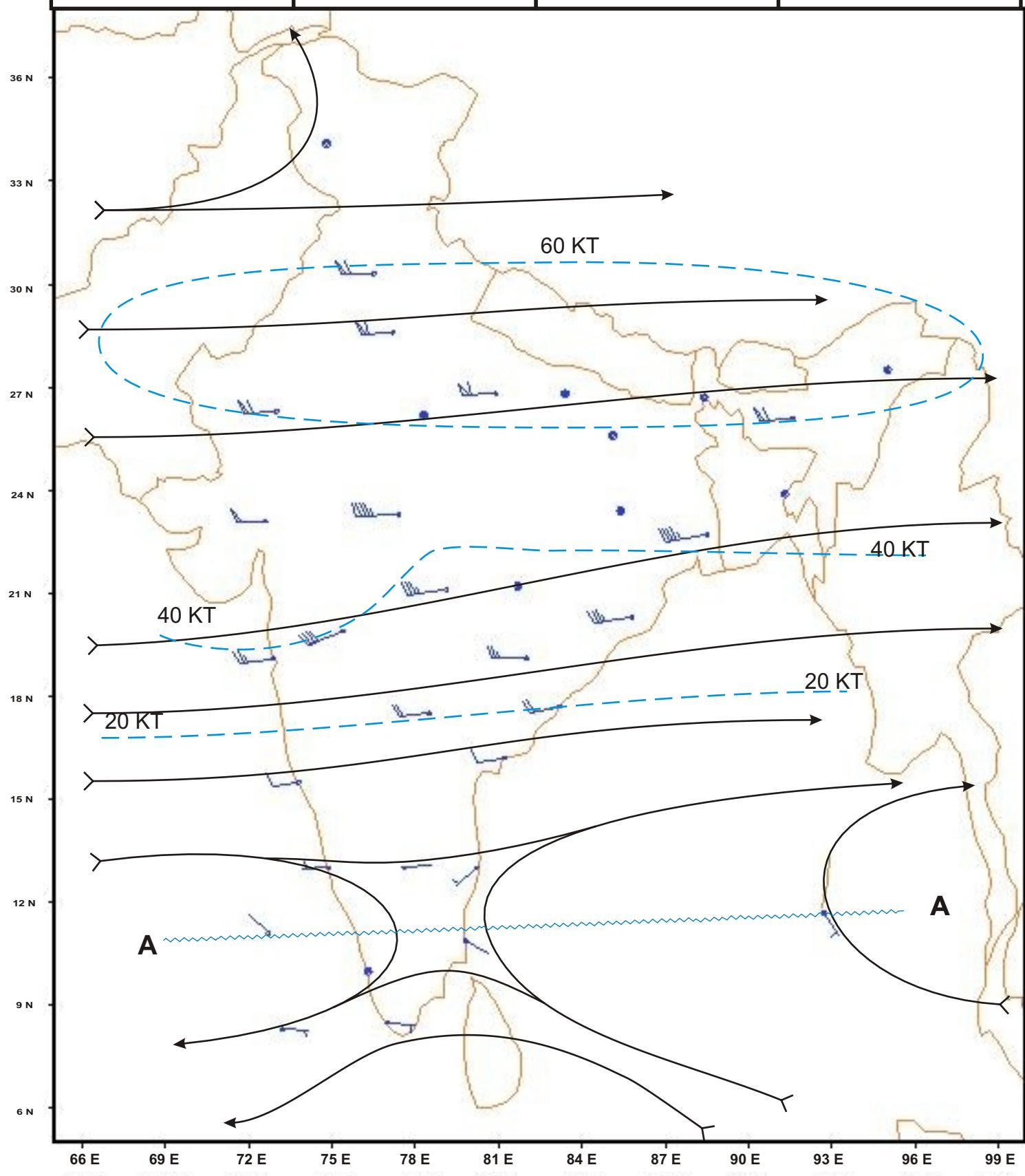
JANUARY

0530 IST

200 hPa

UPPER WINDS



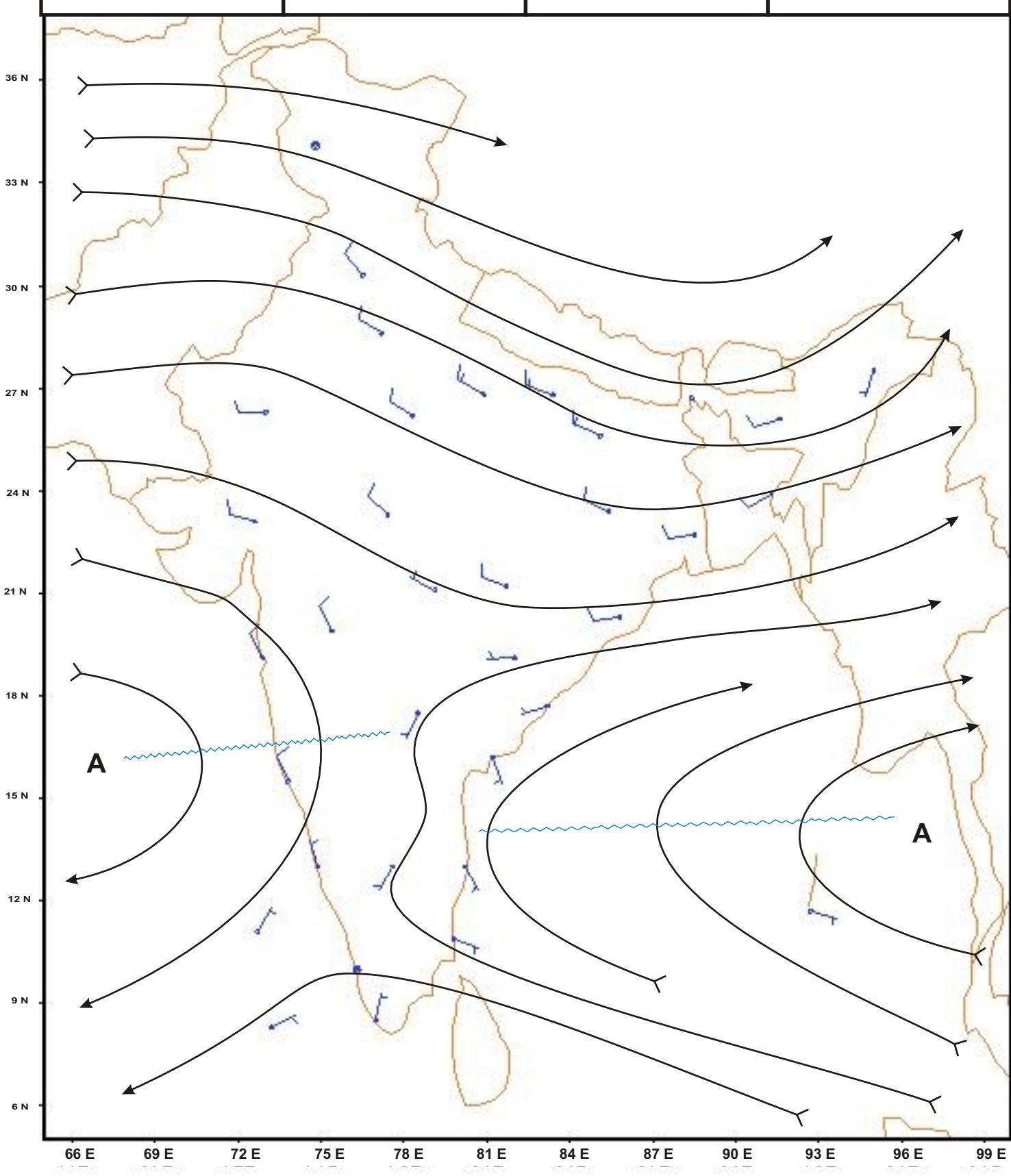
JANUARY**0530 IST****100 hPa****UPPER WINDS**

APRIL

0530 IST

850 hPa

UPPER WINDS

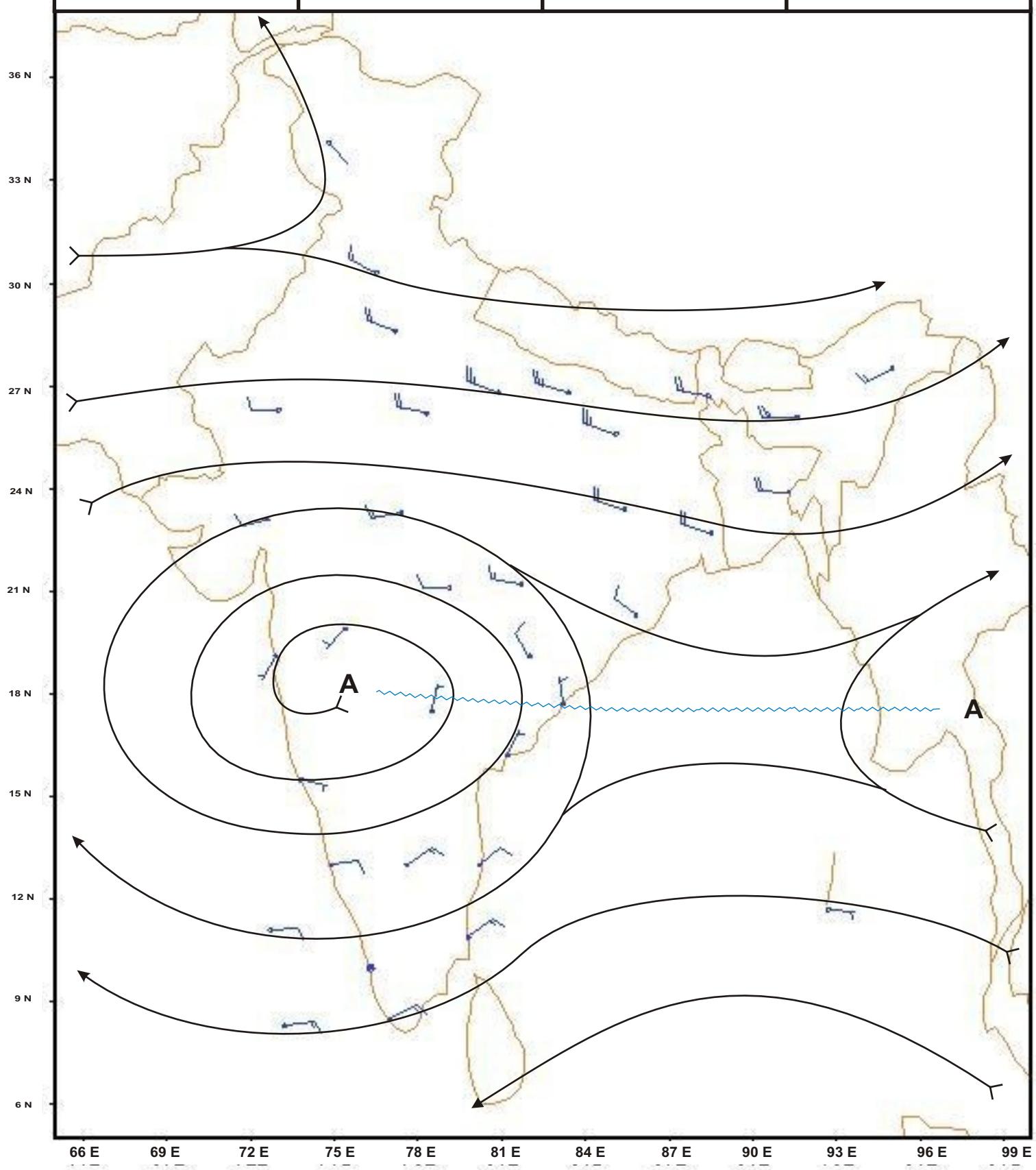


APRIL

0530 IST

700 hPa

UPPER WINDS

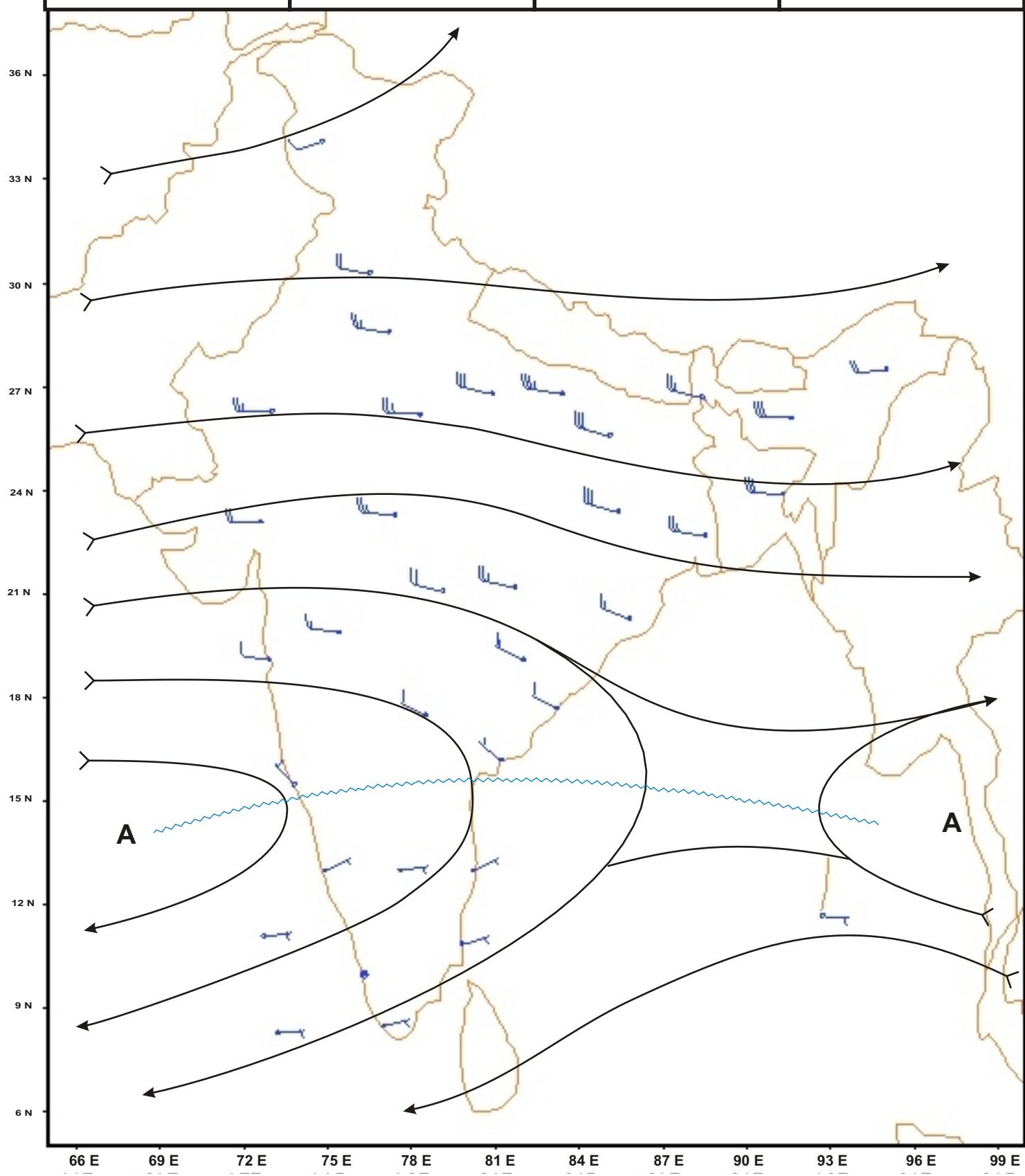


APRIL

0530 IST

500 hPa

UPPER WINDS

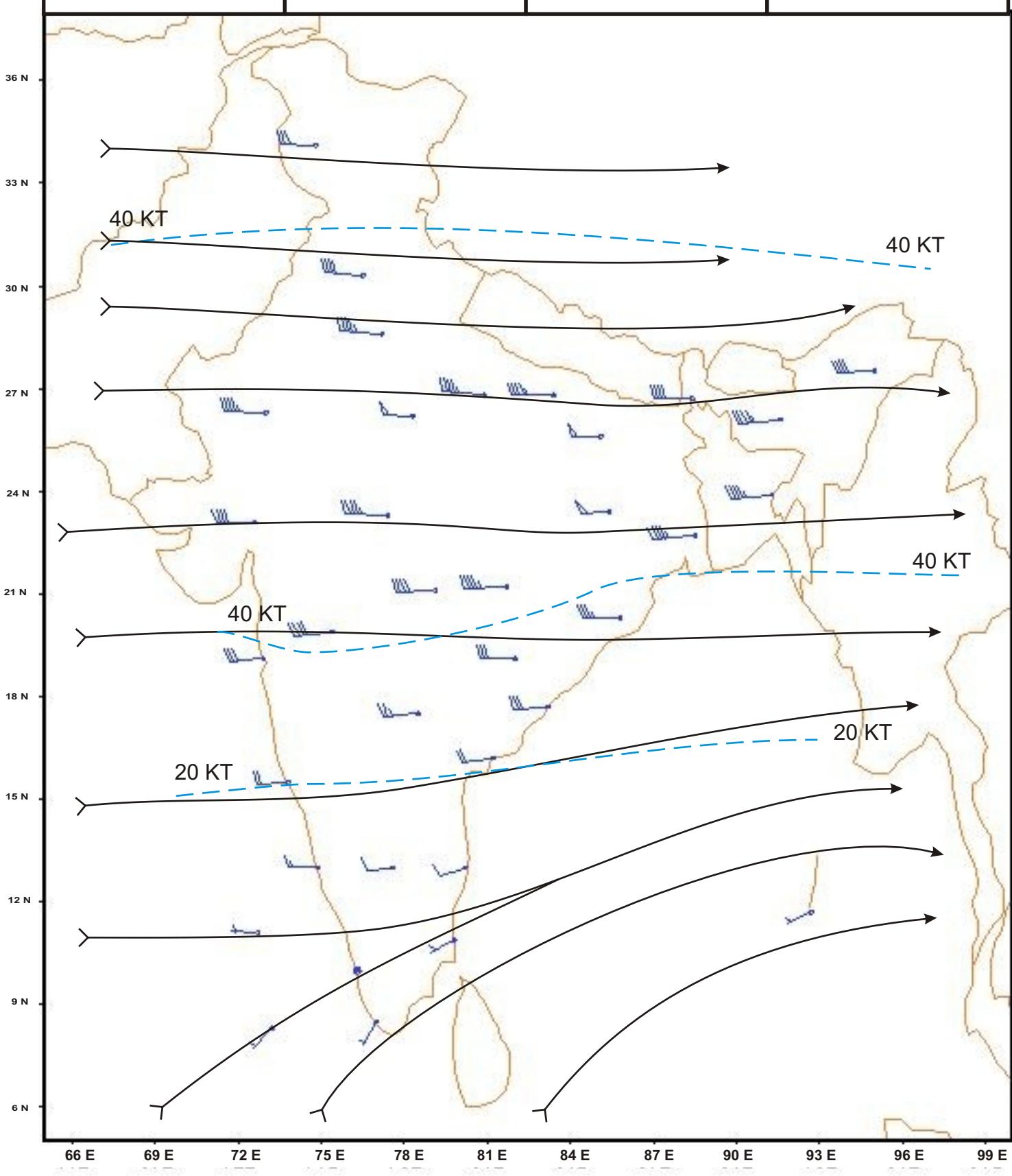


APRIL

0530 IST

300 hPa

UPPER WINDS

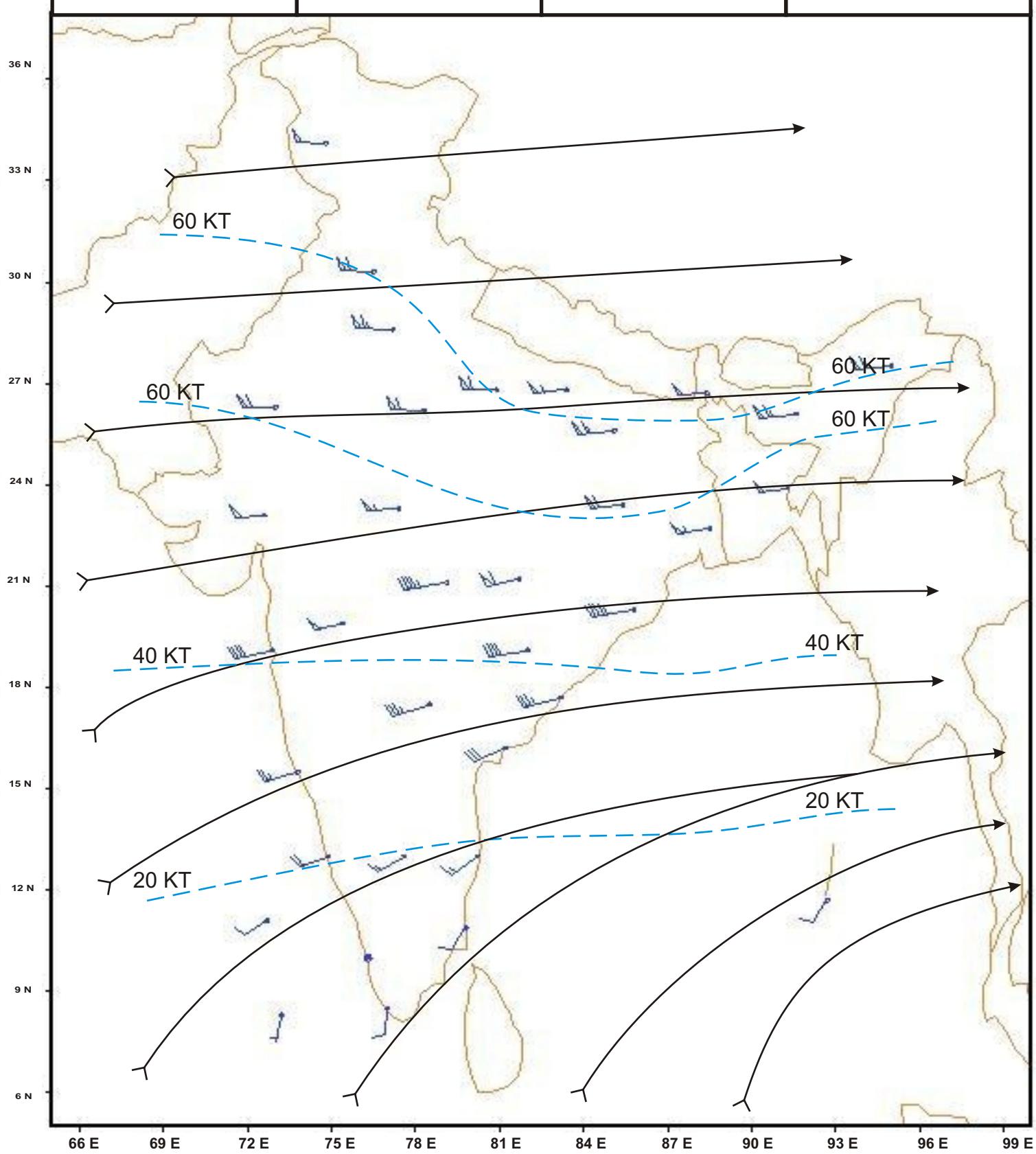


APRIL

0530 IST

200 hPa

UPPER WINDS

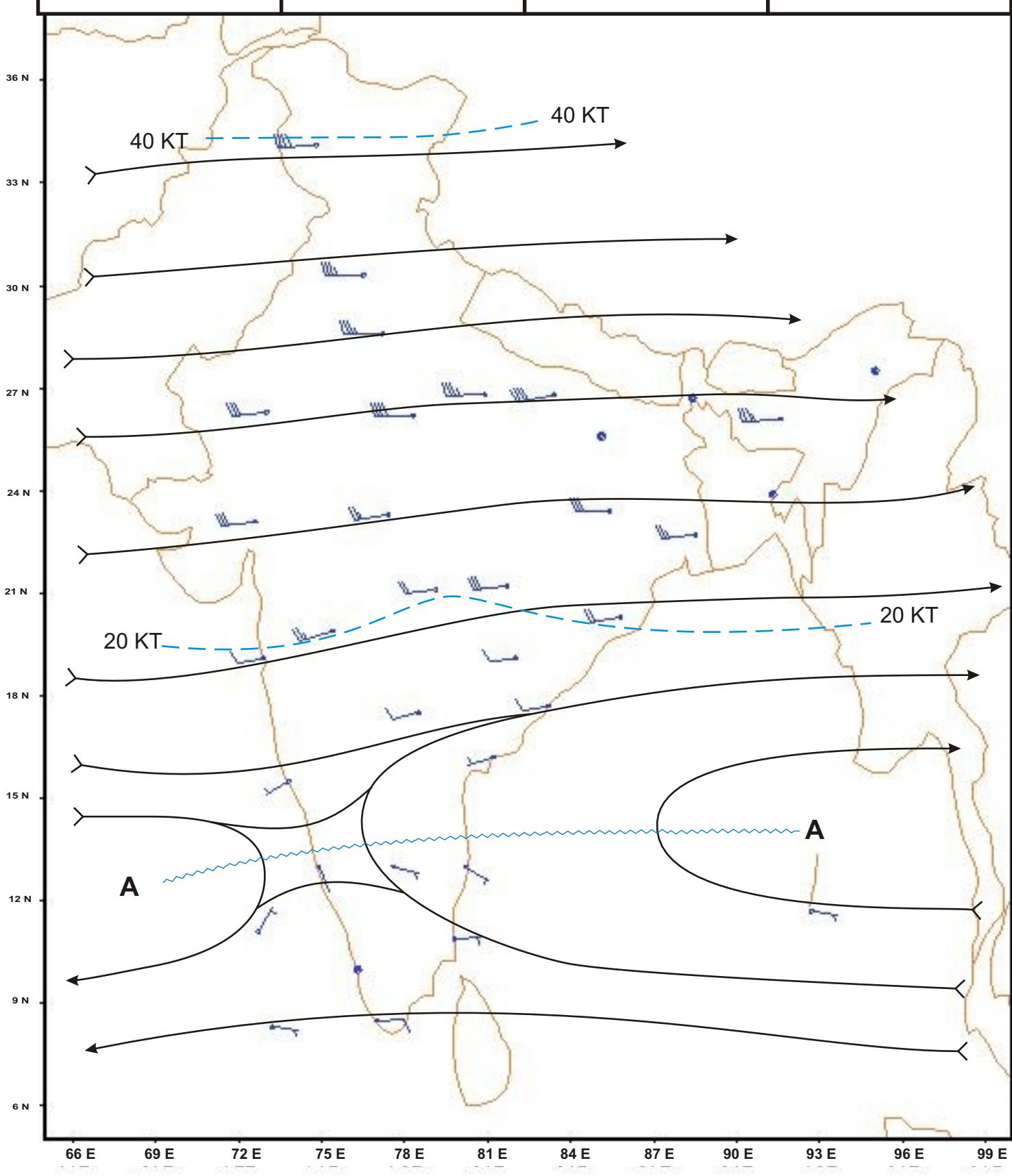


APRIL

0530 IST

100 hPa

UPPER WINDS

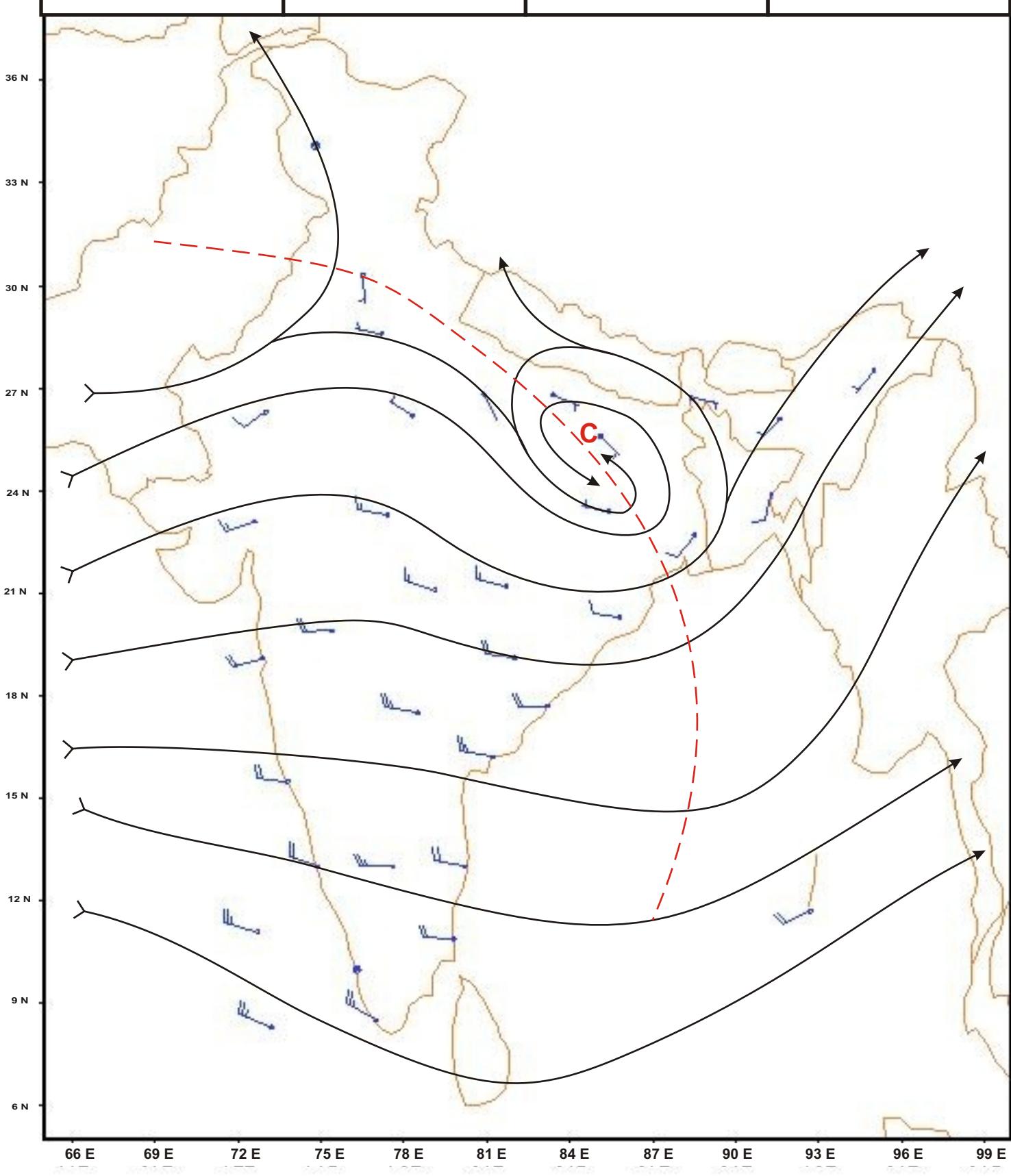


JULY

0530 IST

850 hPa

UPPER WINDS

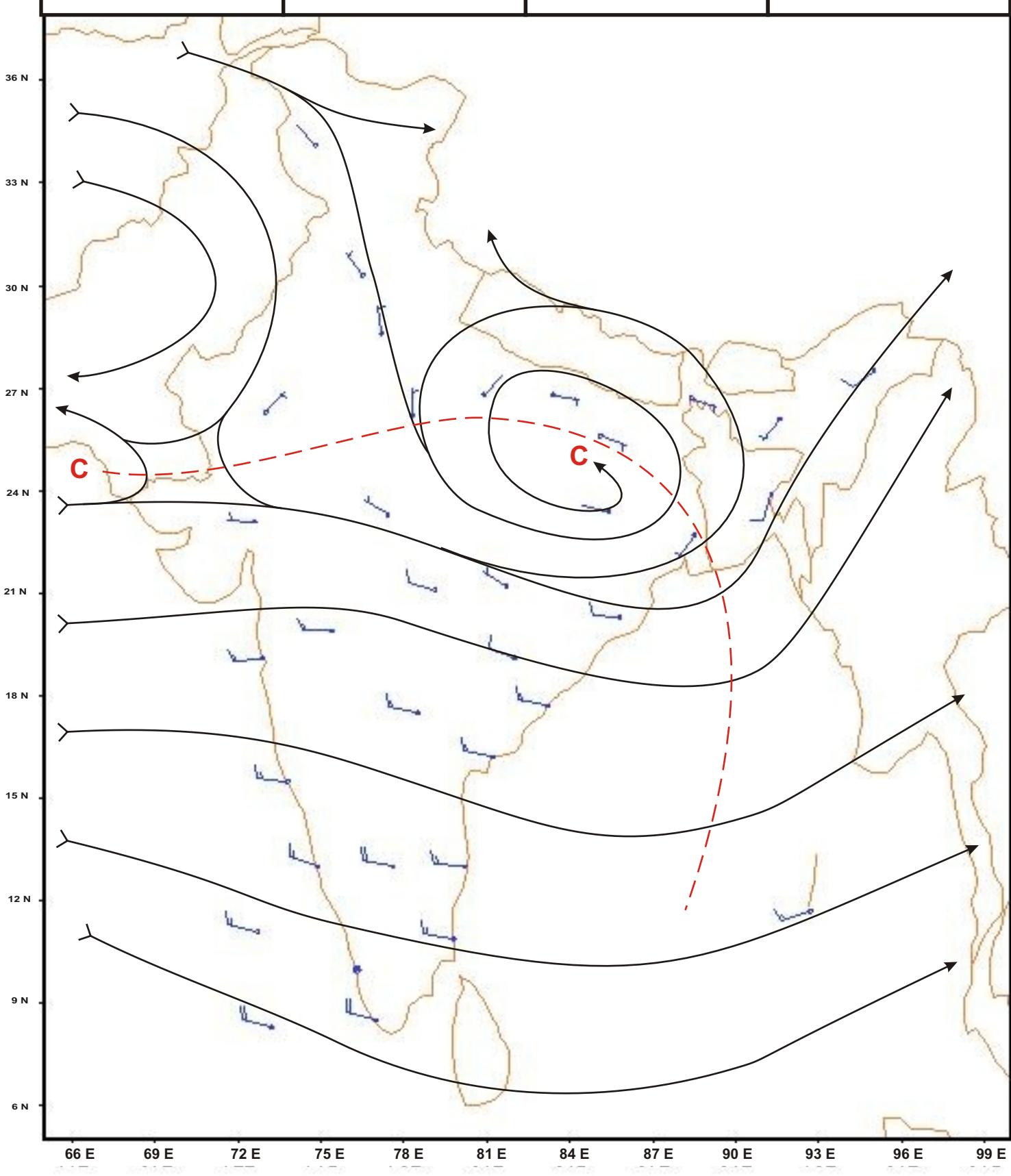


JULY

0530 IST

700 hPa

UPPER WINDS

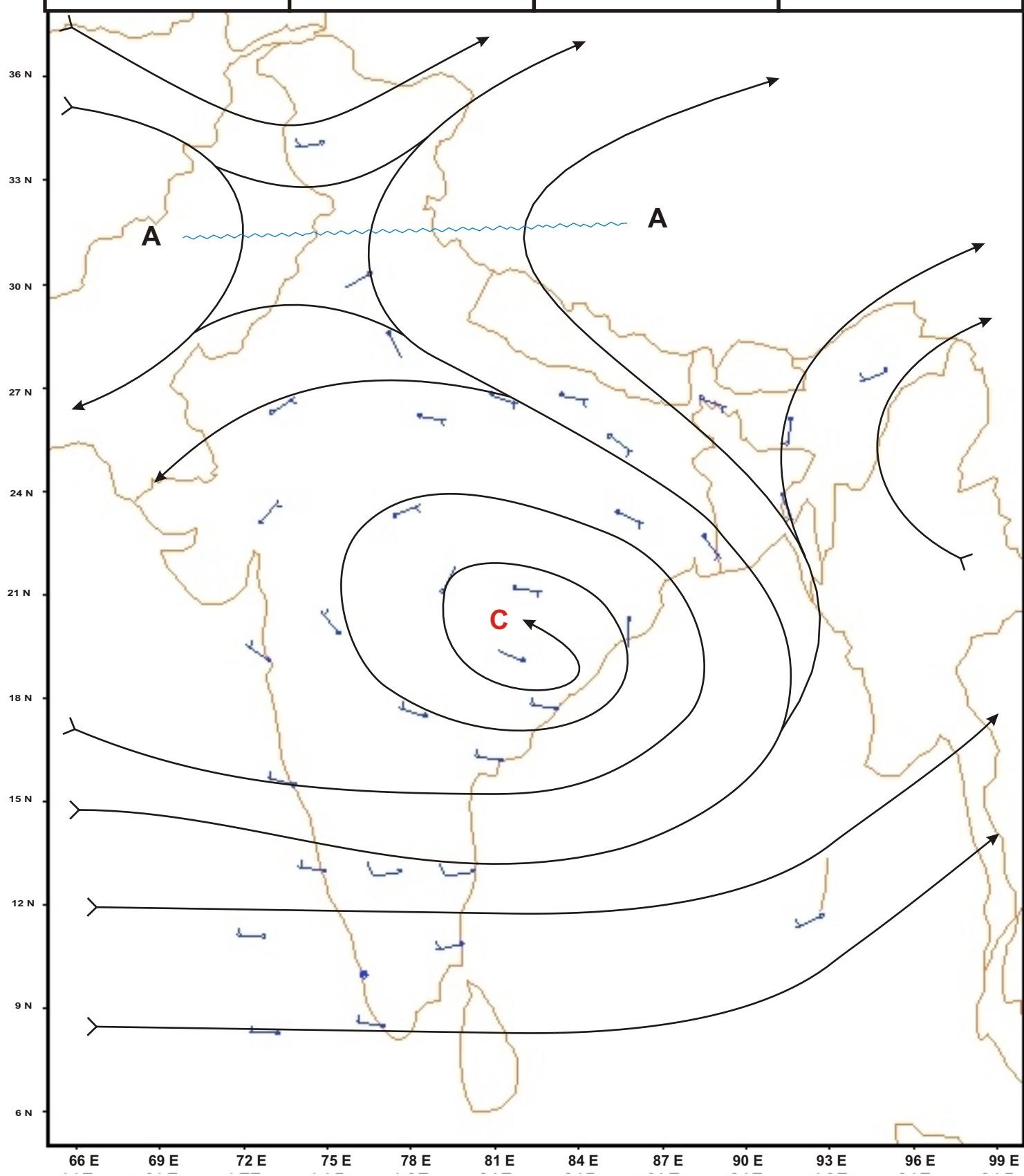


JULY

0530 IST

500 hPa

UPPER WINDS

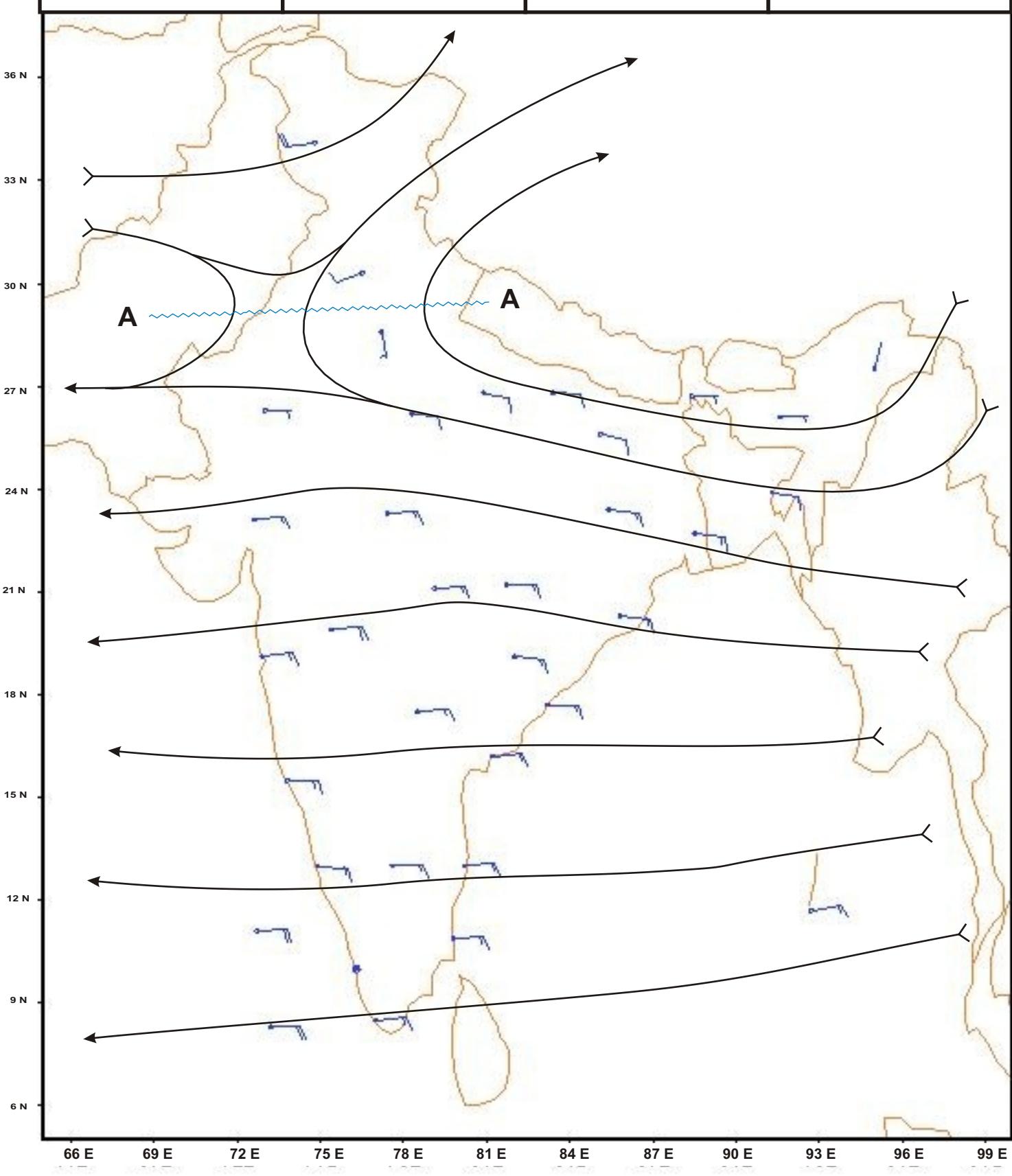


JULY

0530 IST

300 hPa

UPPER WINDS

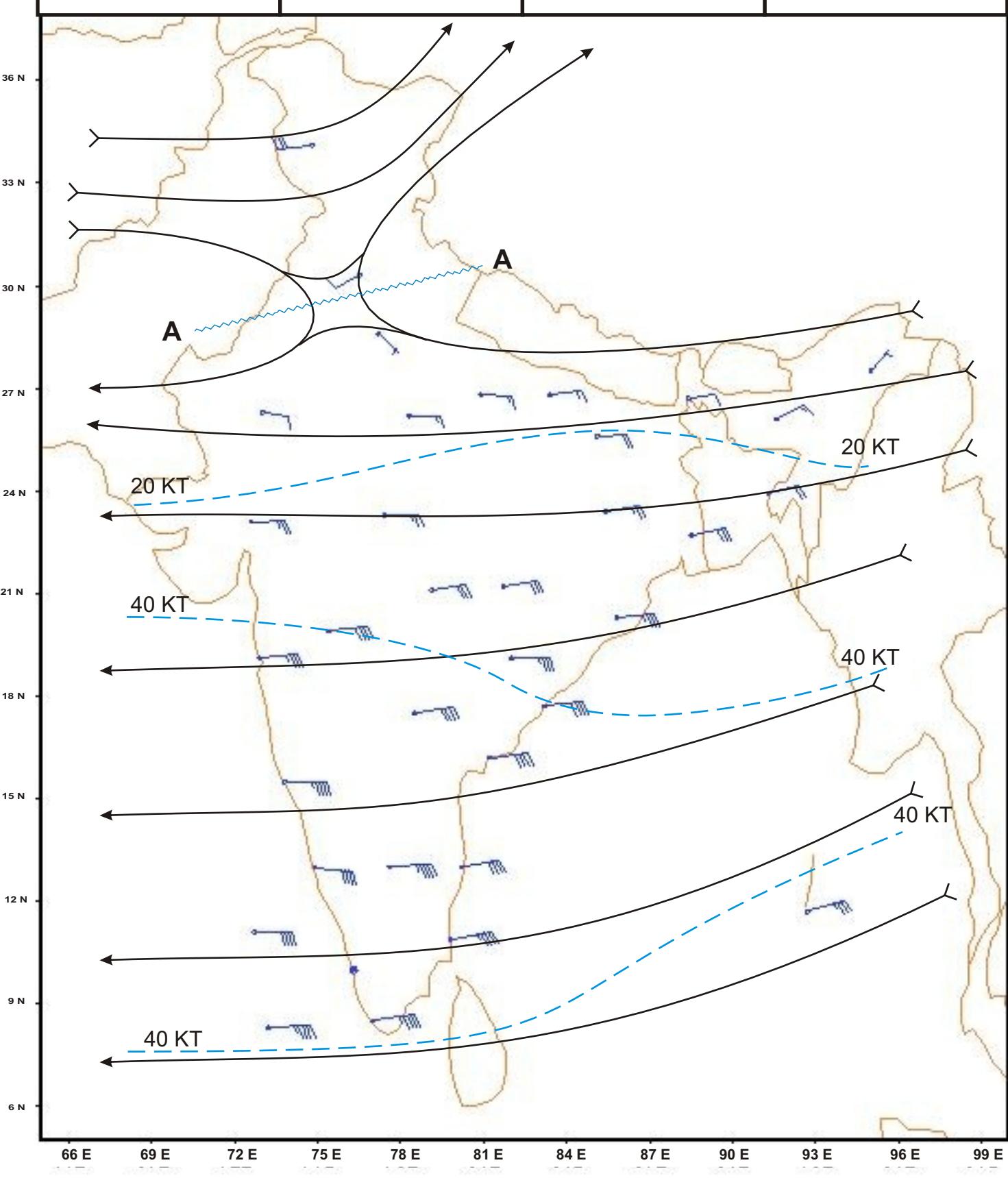


JULY

0530 IST

200 hPa

UPPER WINDS

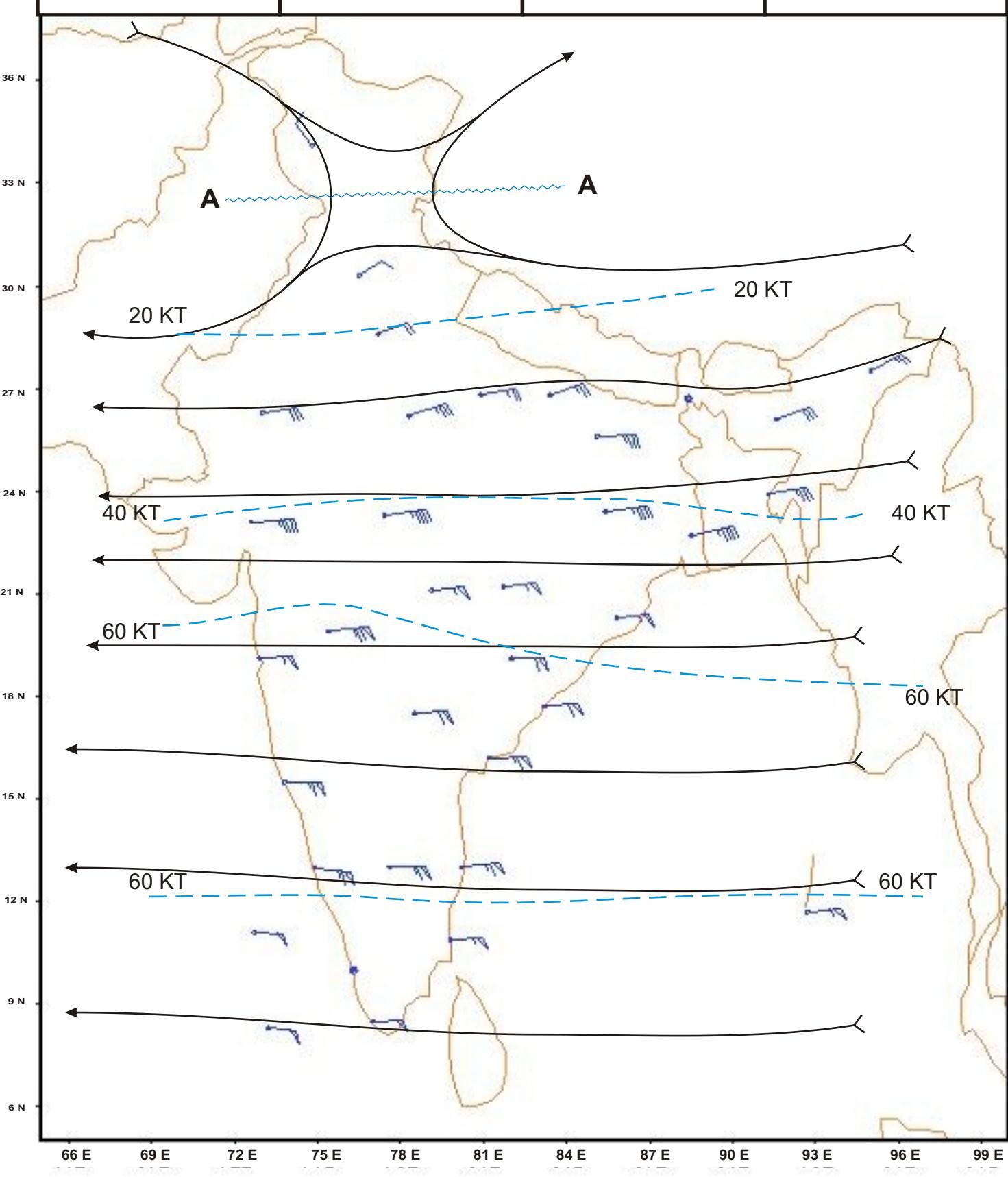


JULY

0530 IST

100 hPa

UPPER WINDS

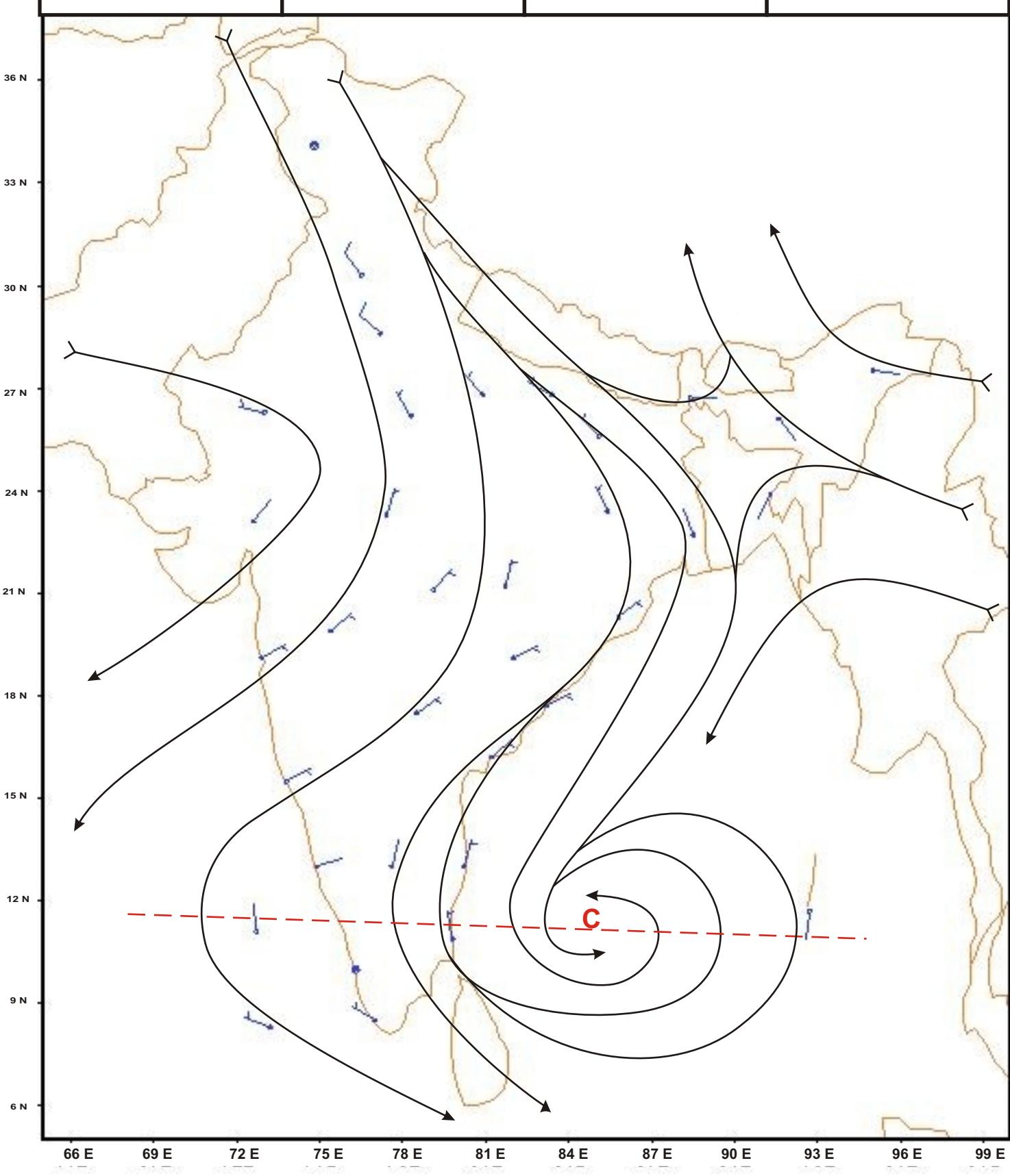


OCTOBER

0530 IST

850 hPa

UPPER WINDS

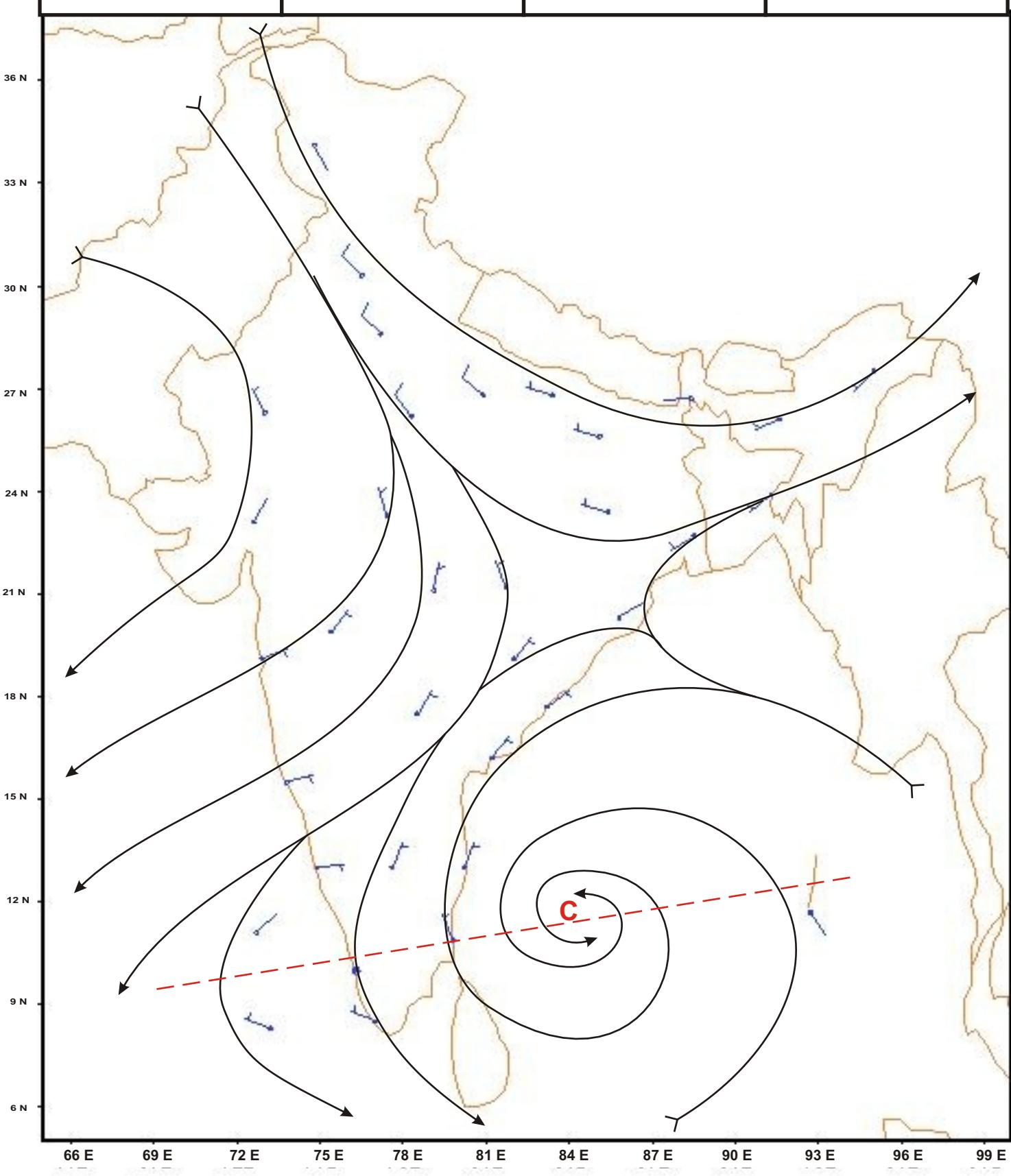


OCTOBER

0530 IST

700 hPa

UPPER WINDS

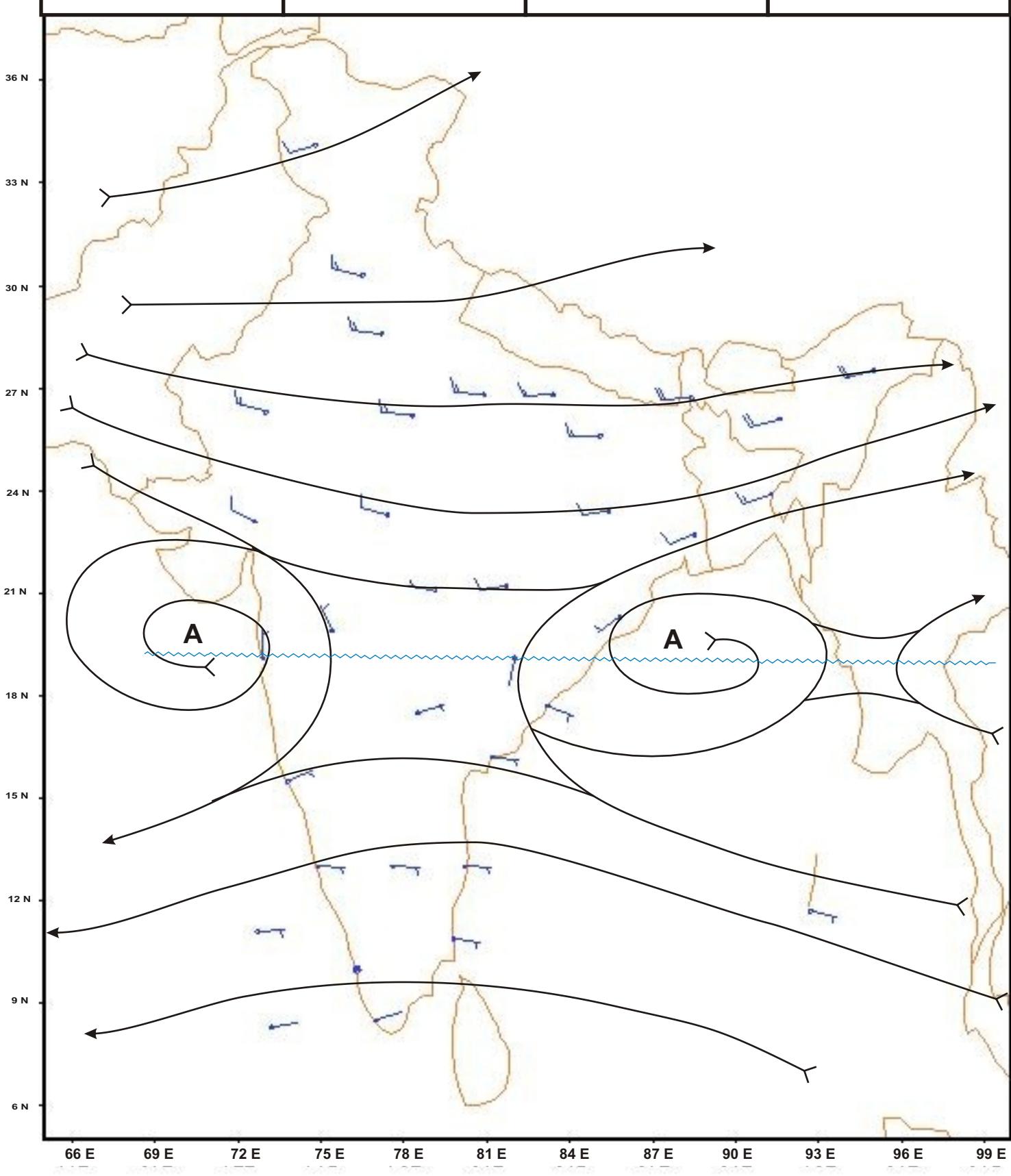


OCTOBER

0530 IST

500 hPa

UPPER WINDS

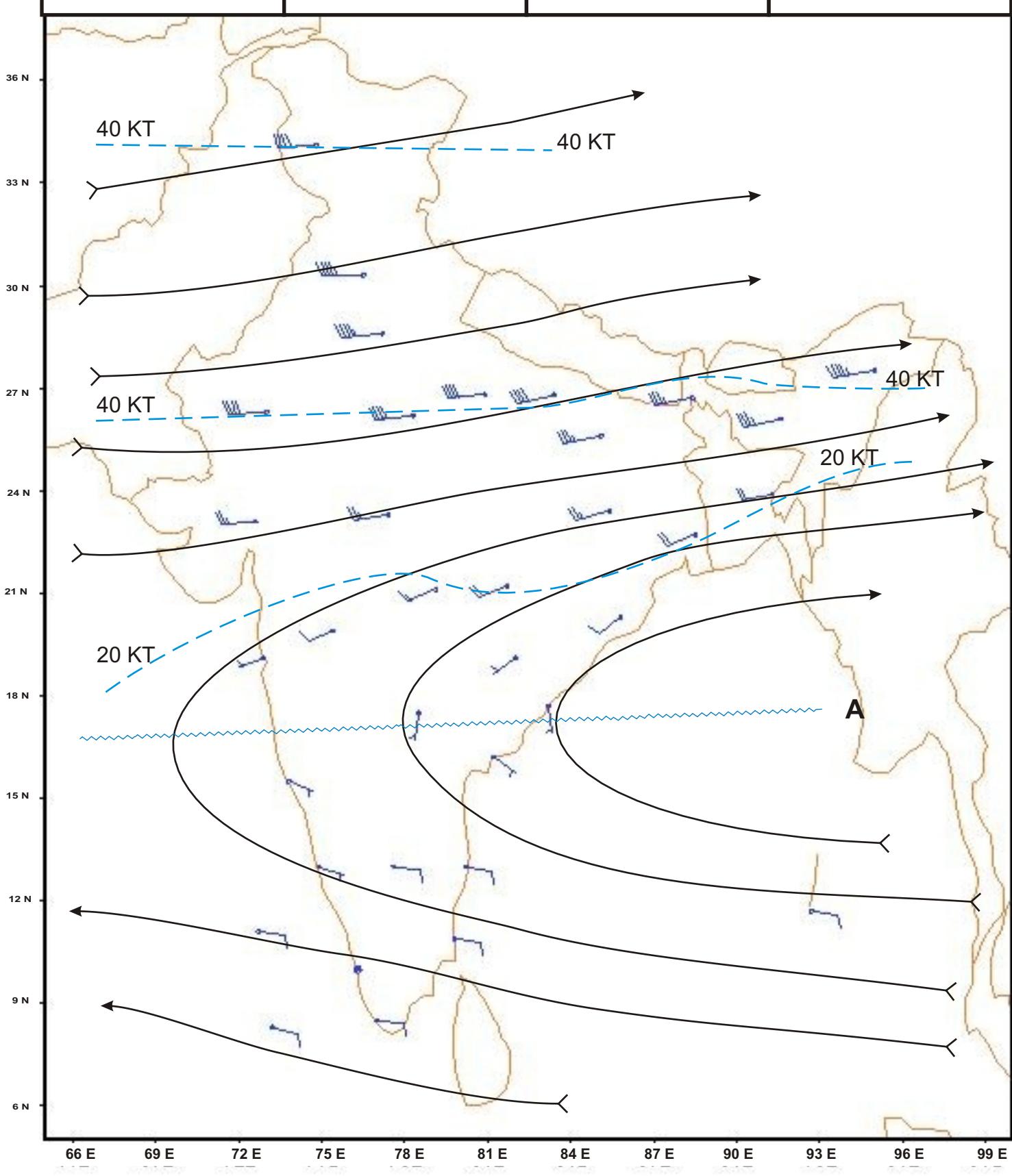


OCTOBER

0530 IST

300 hPa

UPPER WINDS

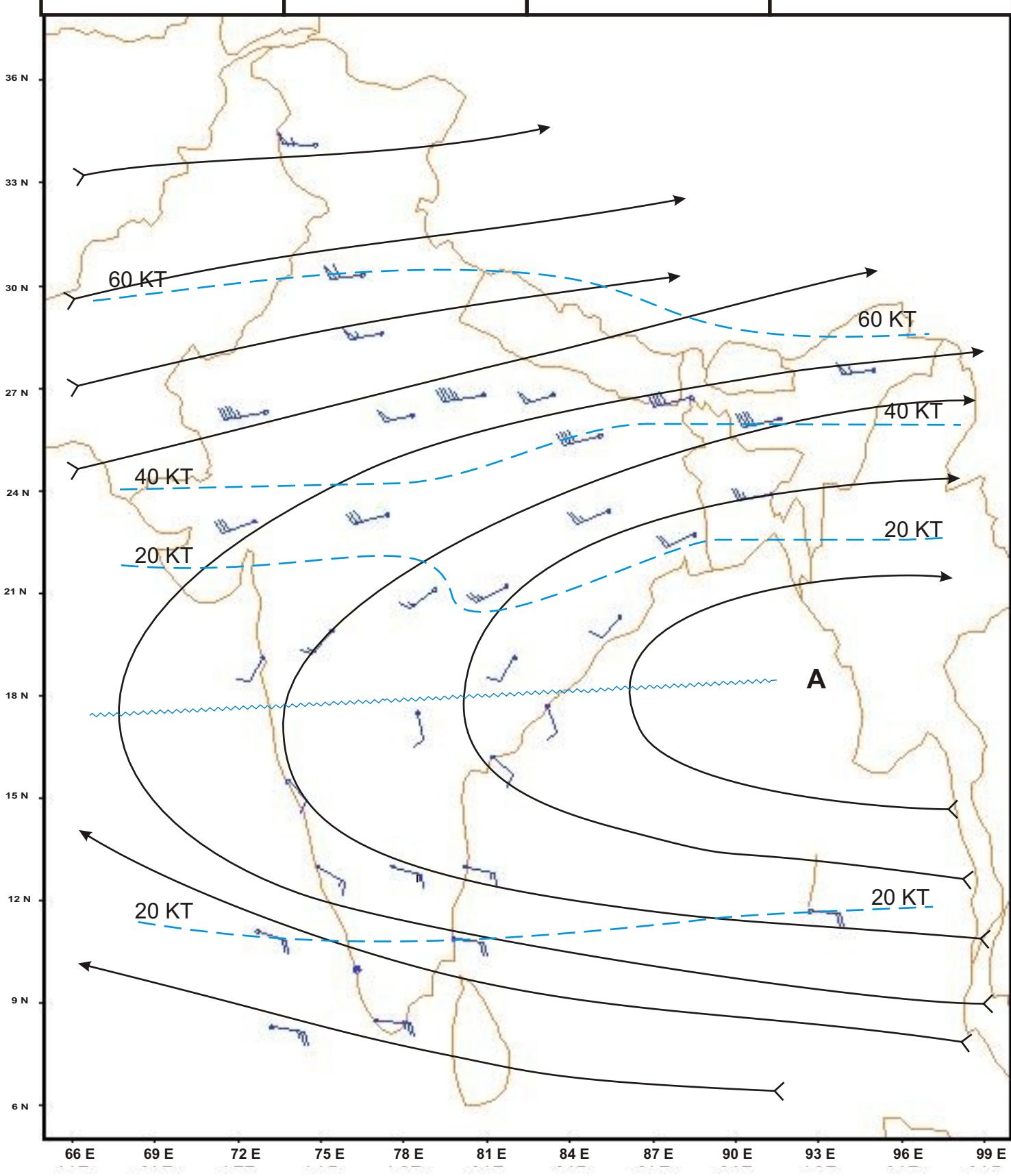


OCTOBER

0530 IST

200 hPa

UPPER WINDS

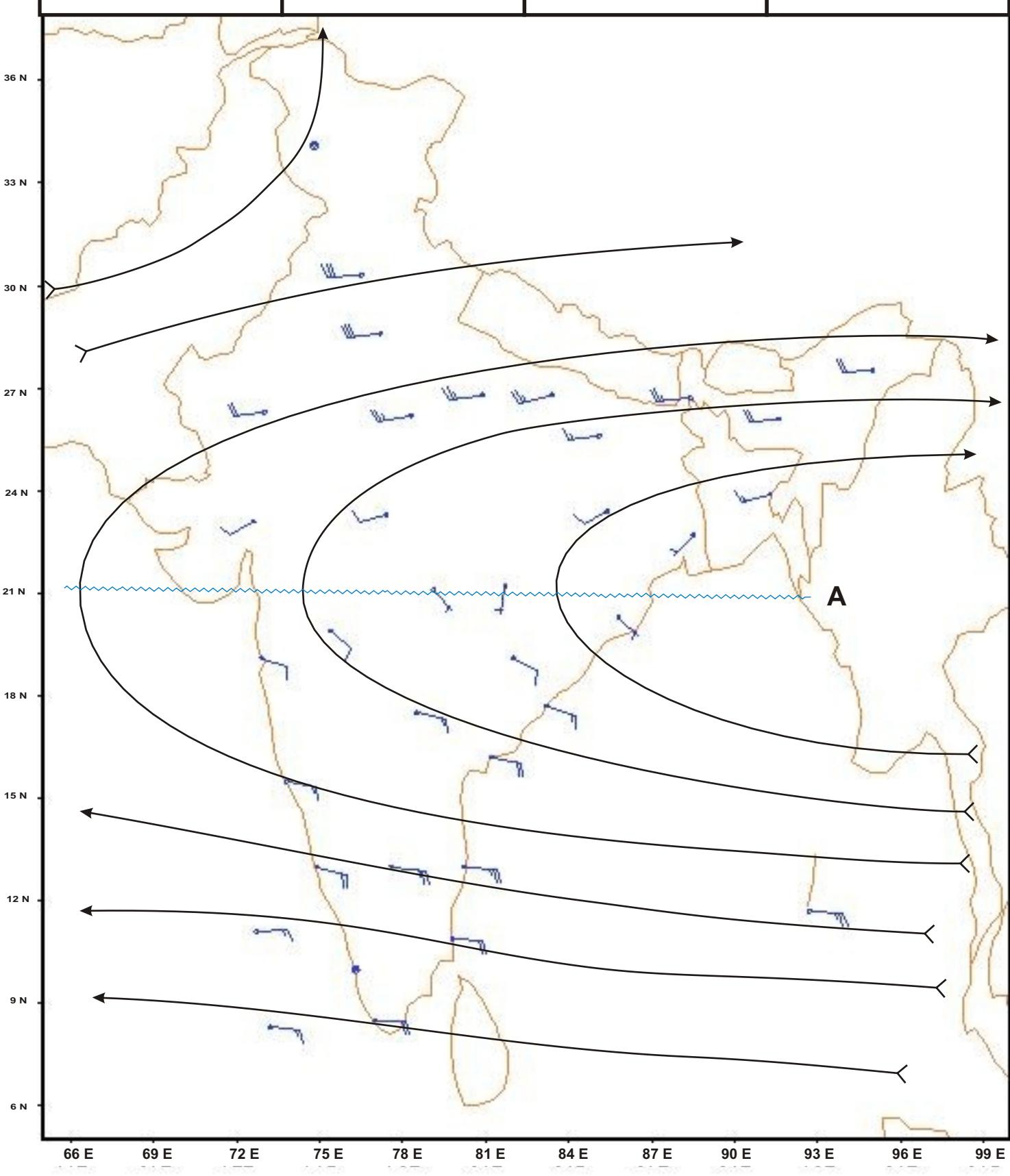


OCTOBER

0530 IST

100 hPa

UPPER WINDS

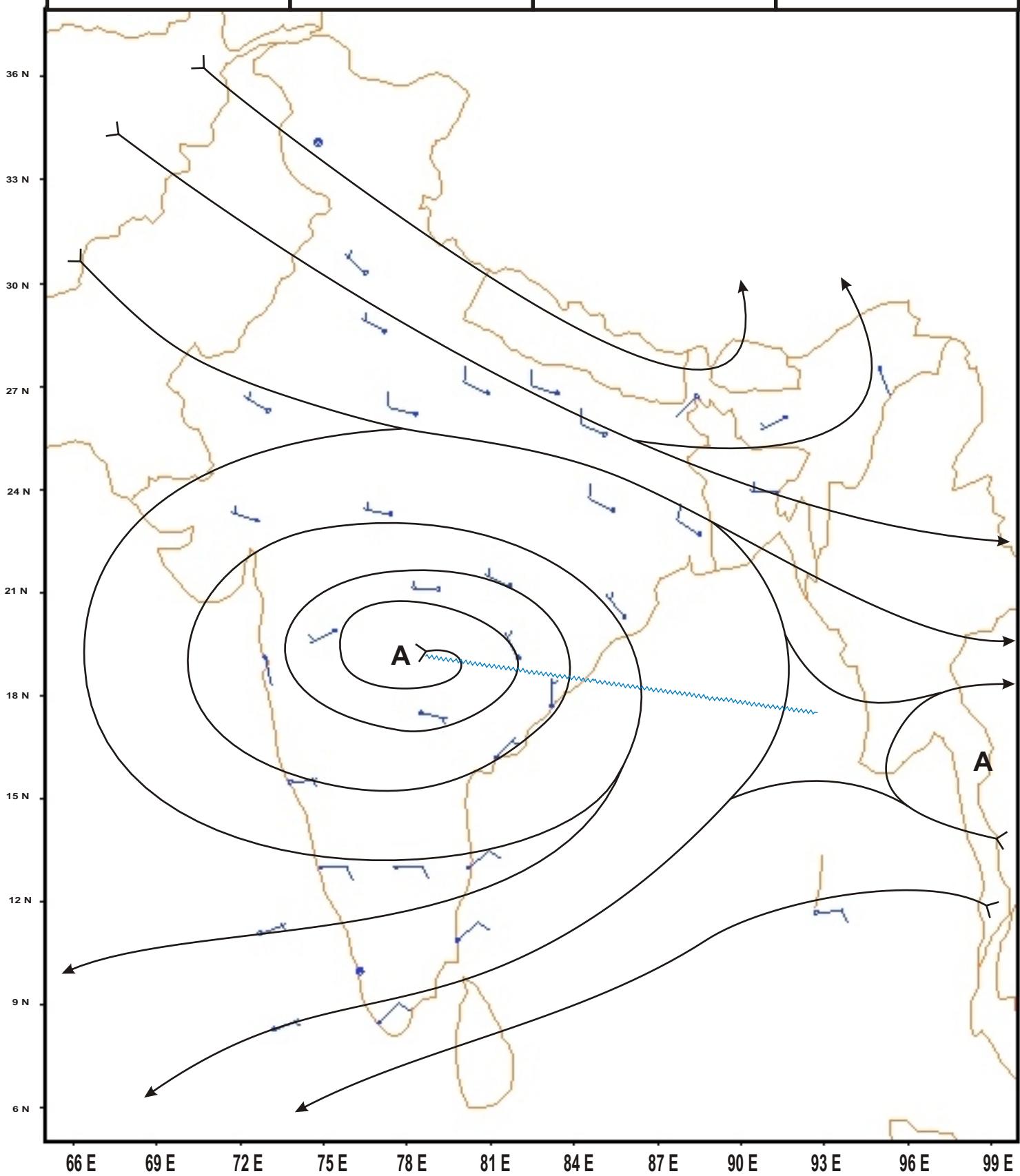


JANUARY

1730 IST

850 hPa

UPPER WINDS

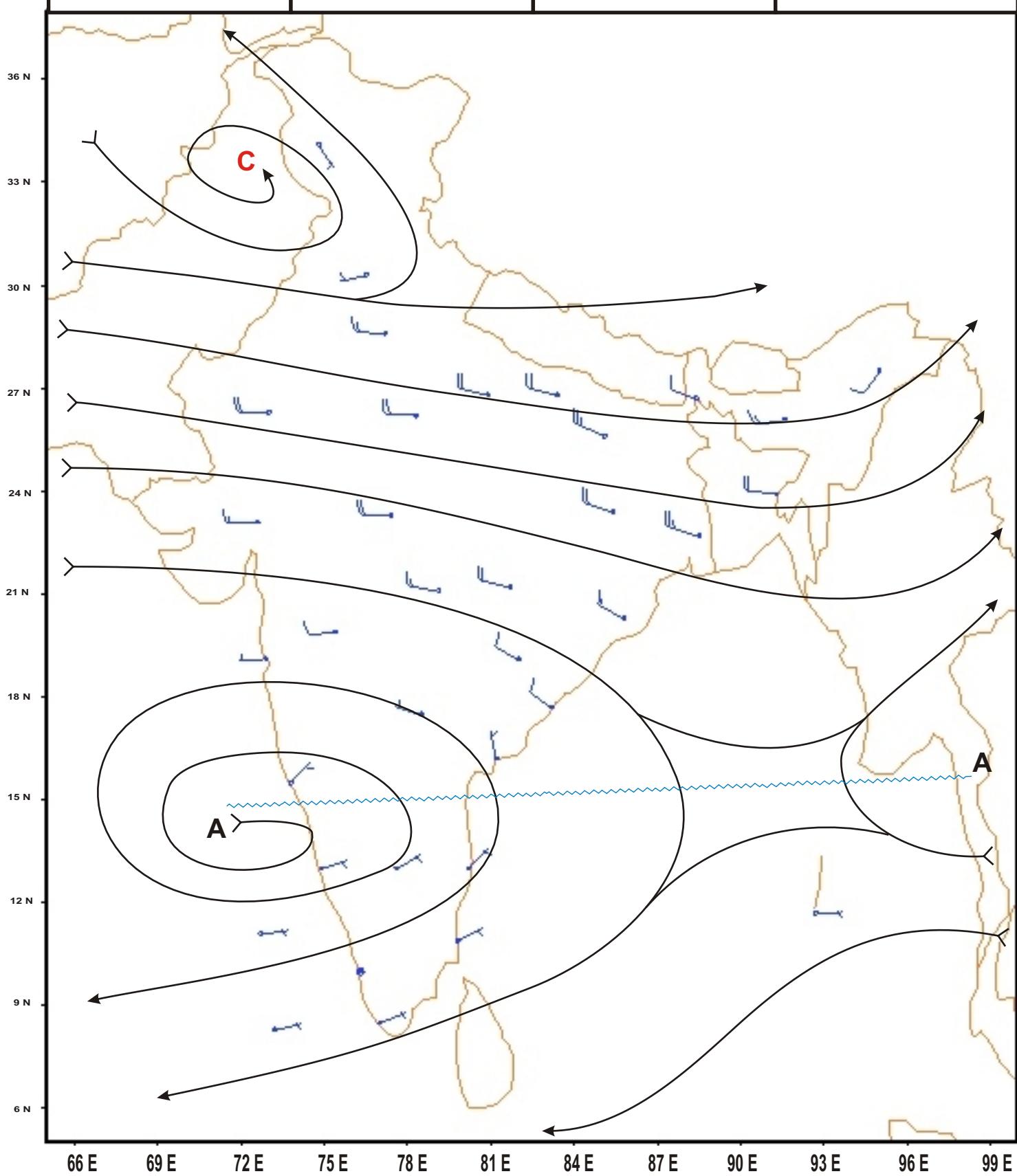


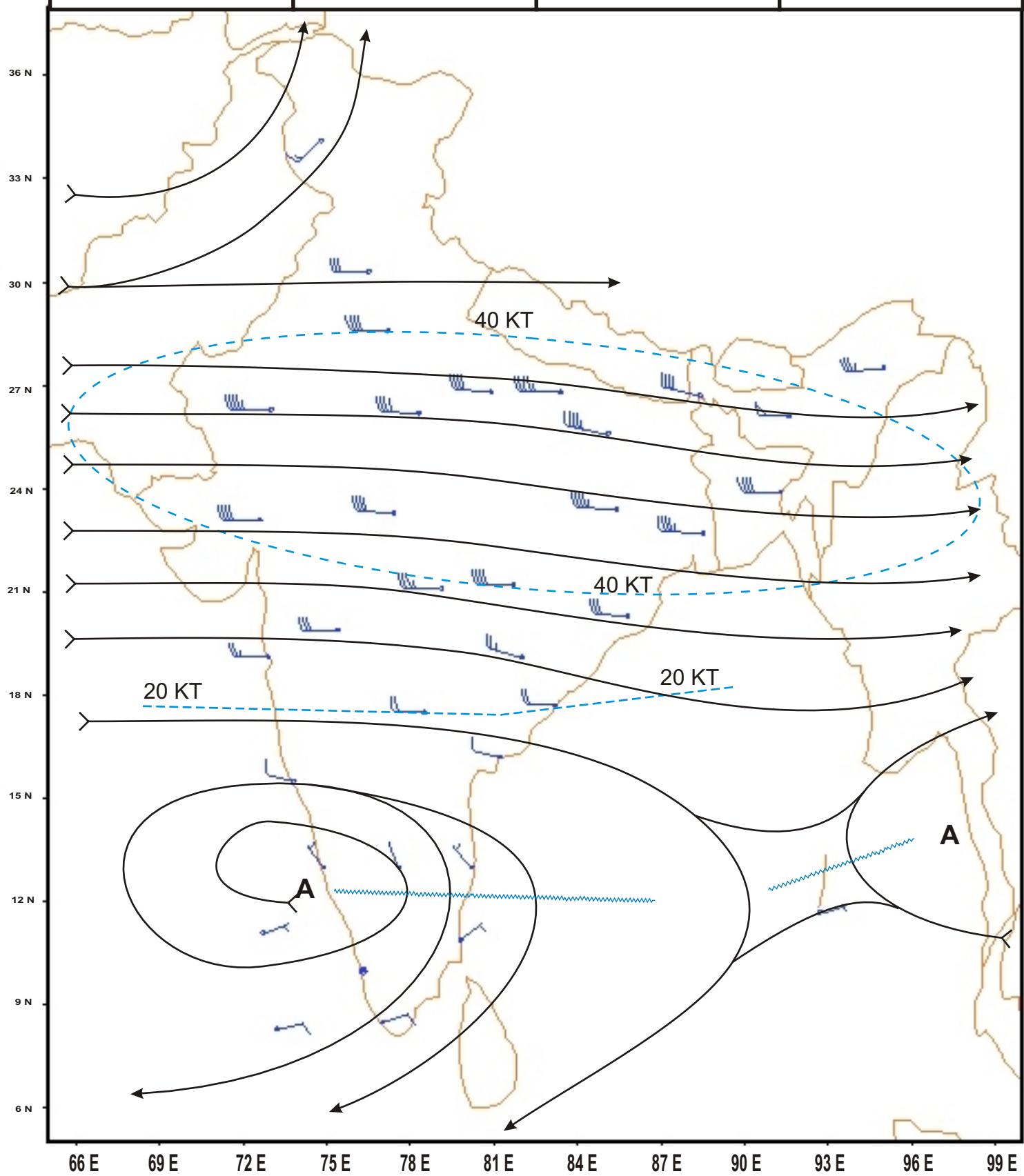
JANUARY

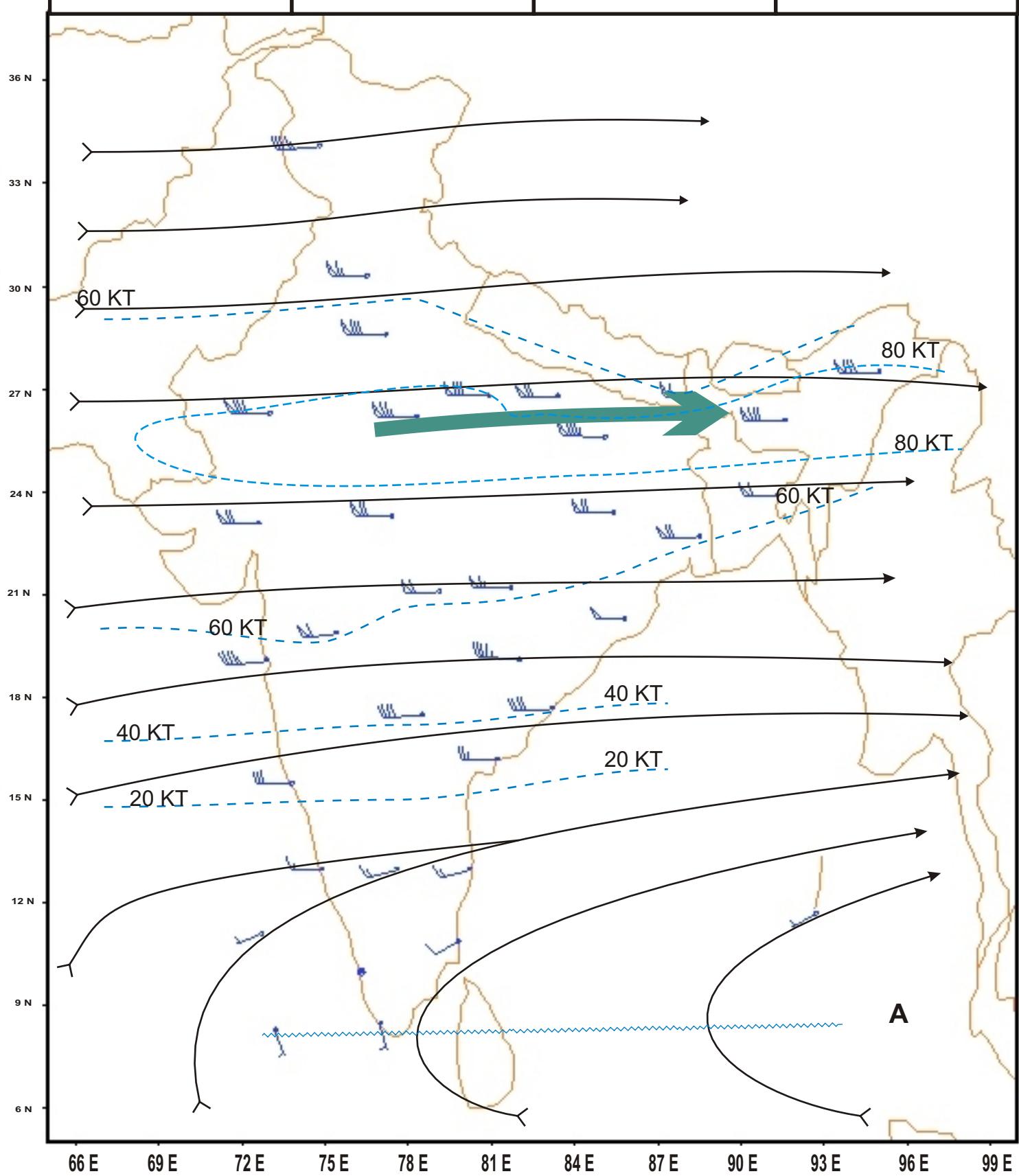
1730 IST

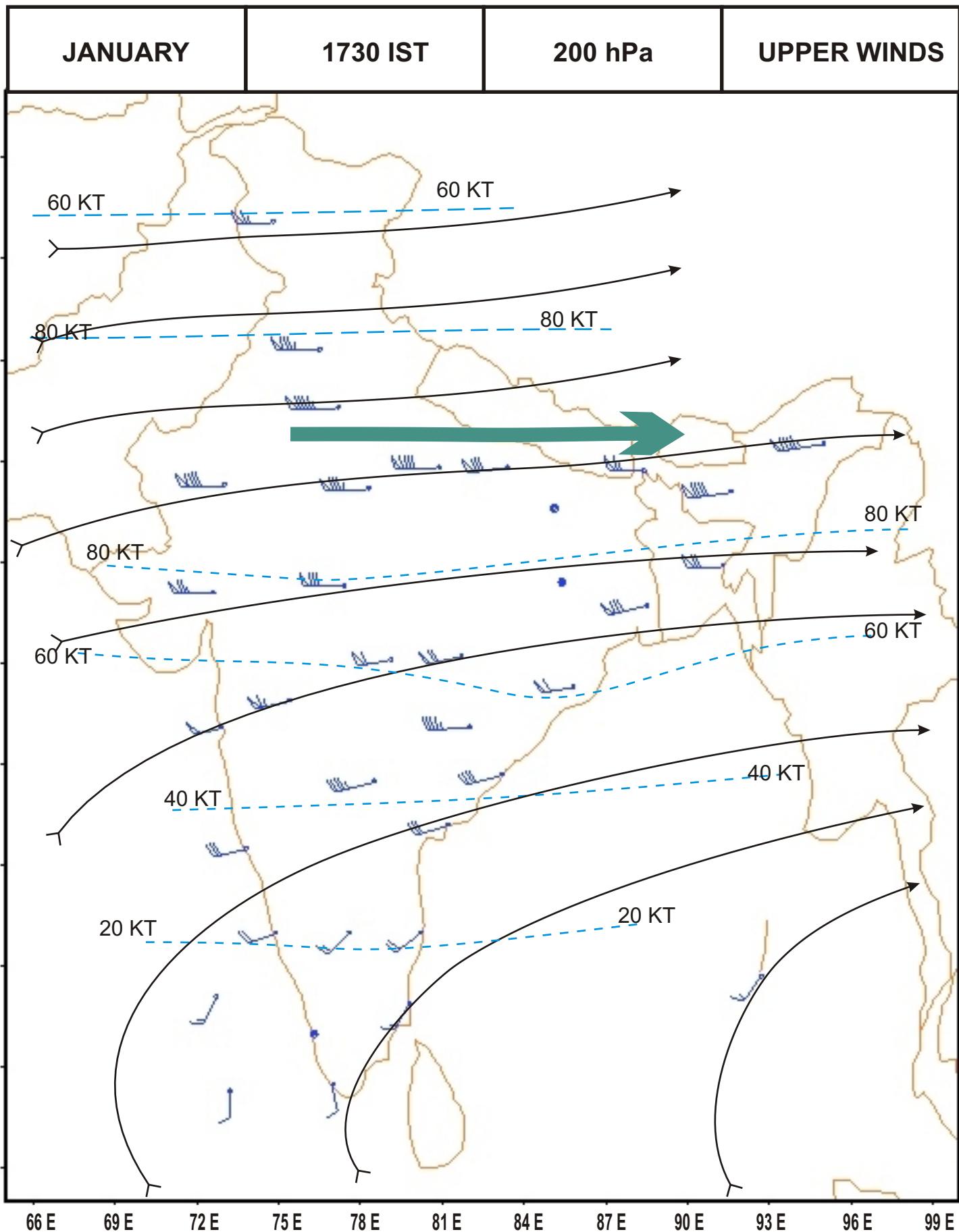
700 hPa

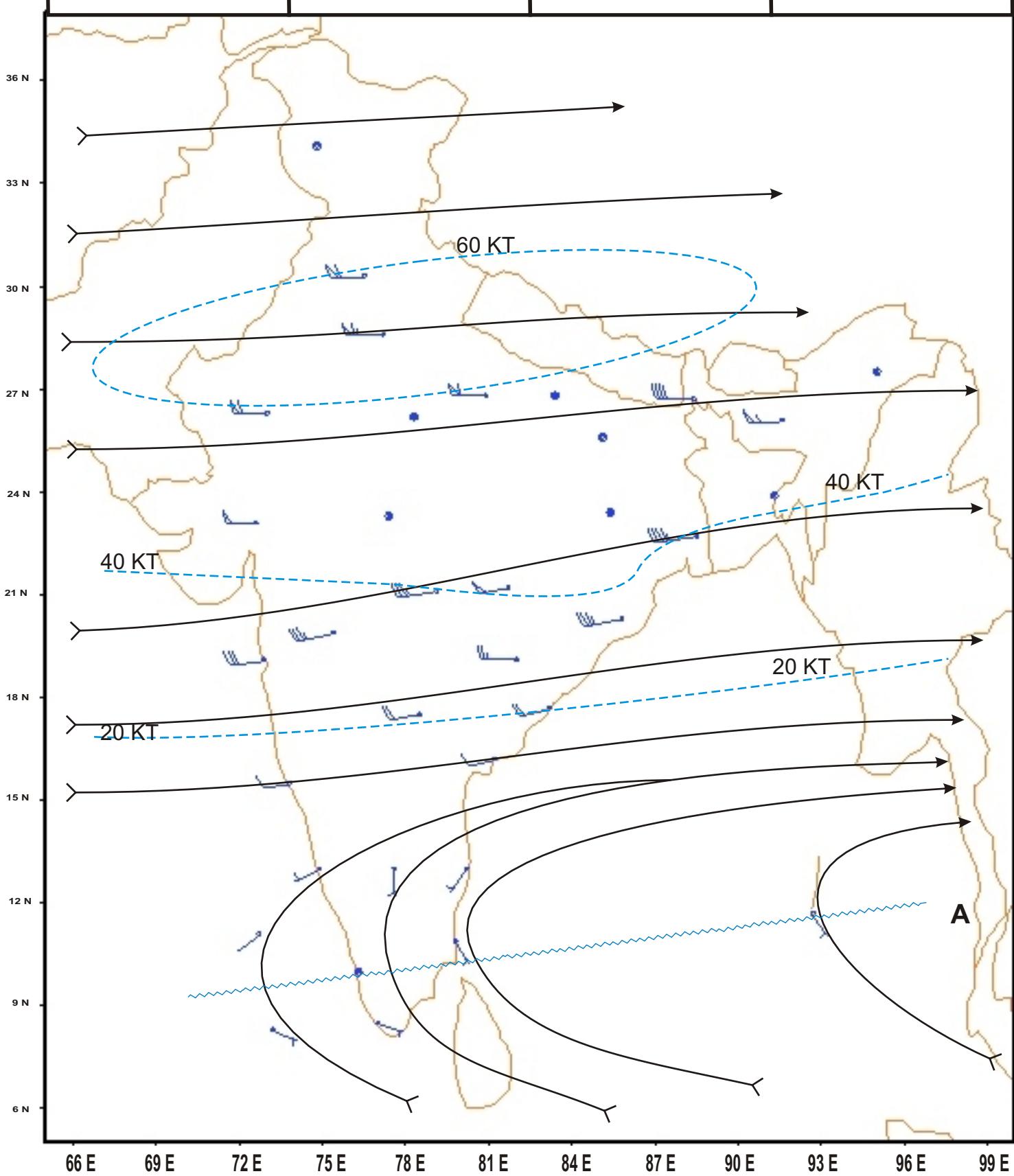
UPPER WINDS

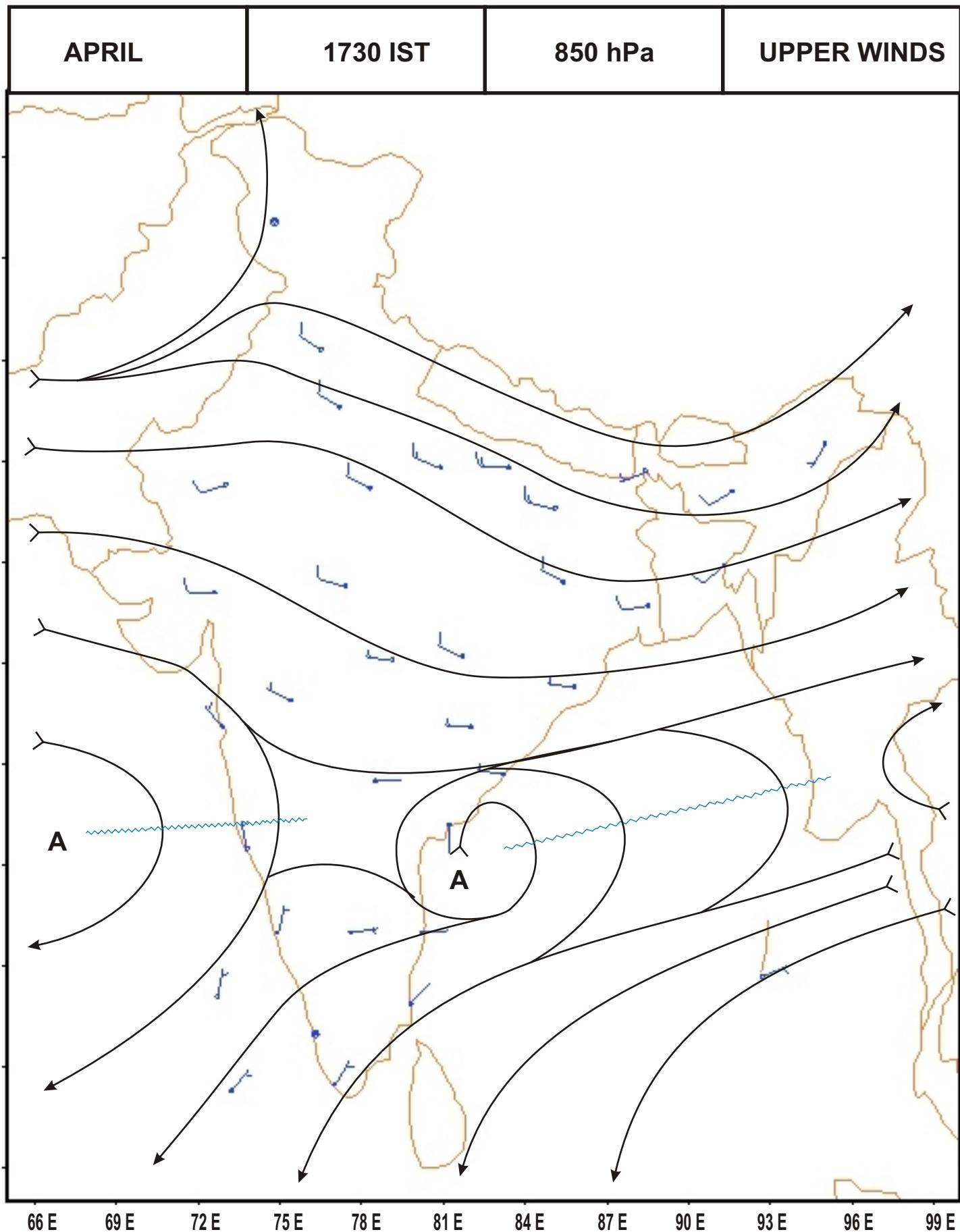


JANUARY**1730 IST****500 hPa****UPPER WINDS**

JANUARY**1730 IST****300 hPa****UPPER WINDS**



JANUARY**1730 IST****100 hPa****UPPER WINDS**

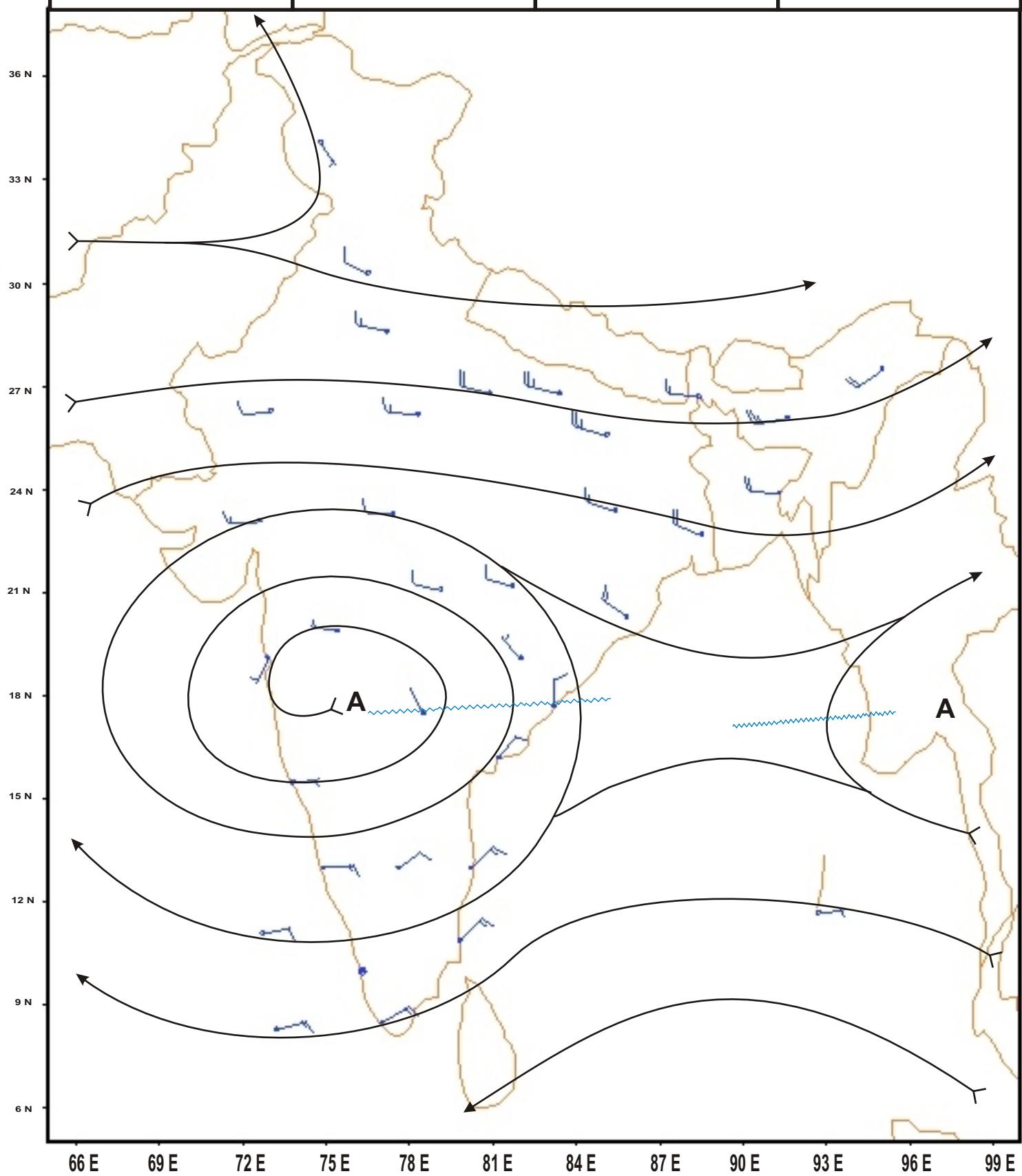


APRIL

1730 IST

700 hPa

UPPER WINDS

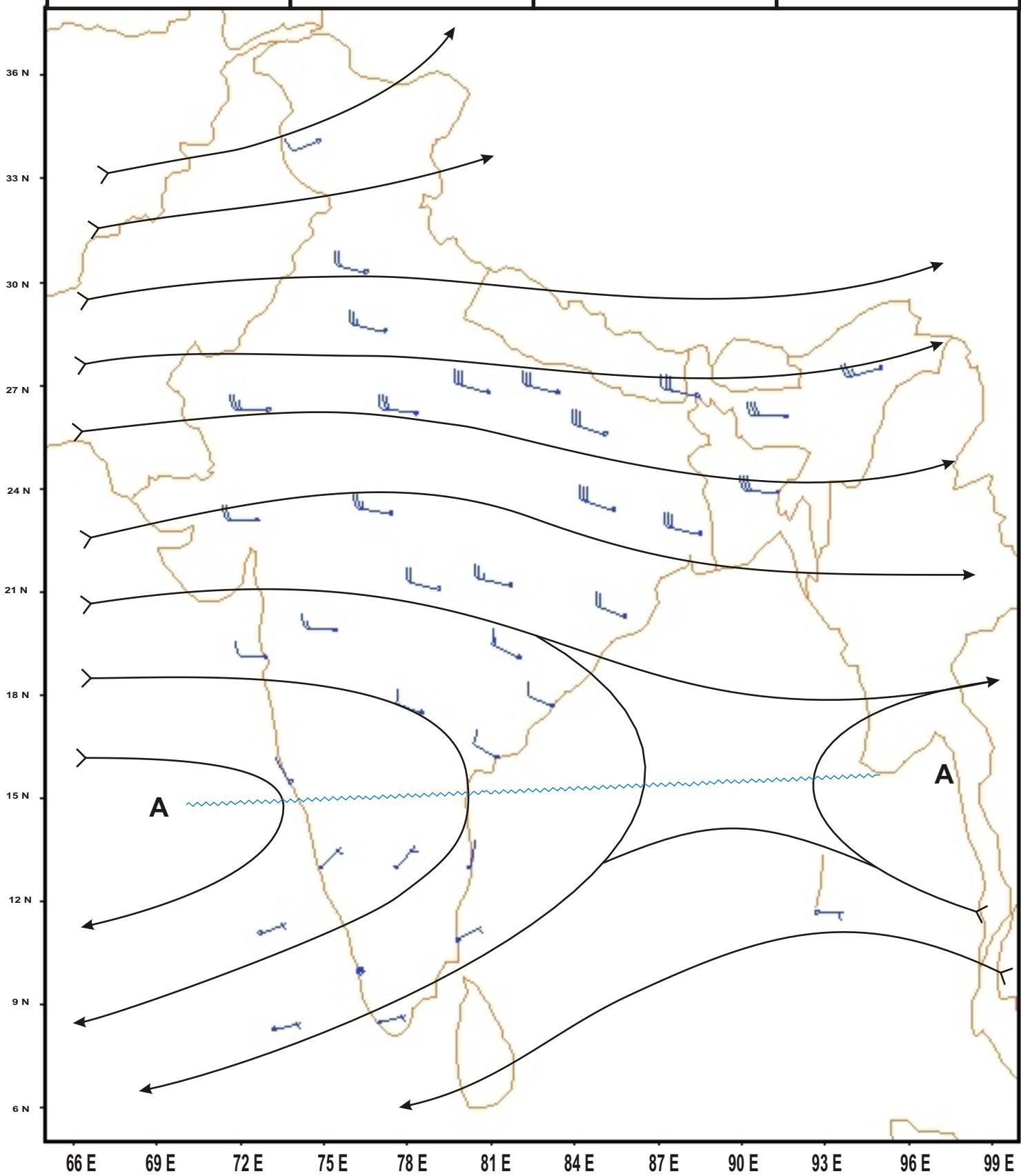


APRIL

1730 IST

500 hPa

UPPER WINDS

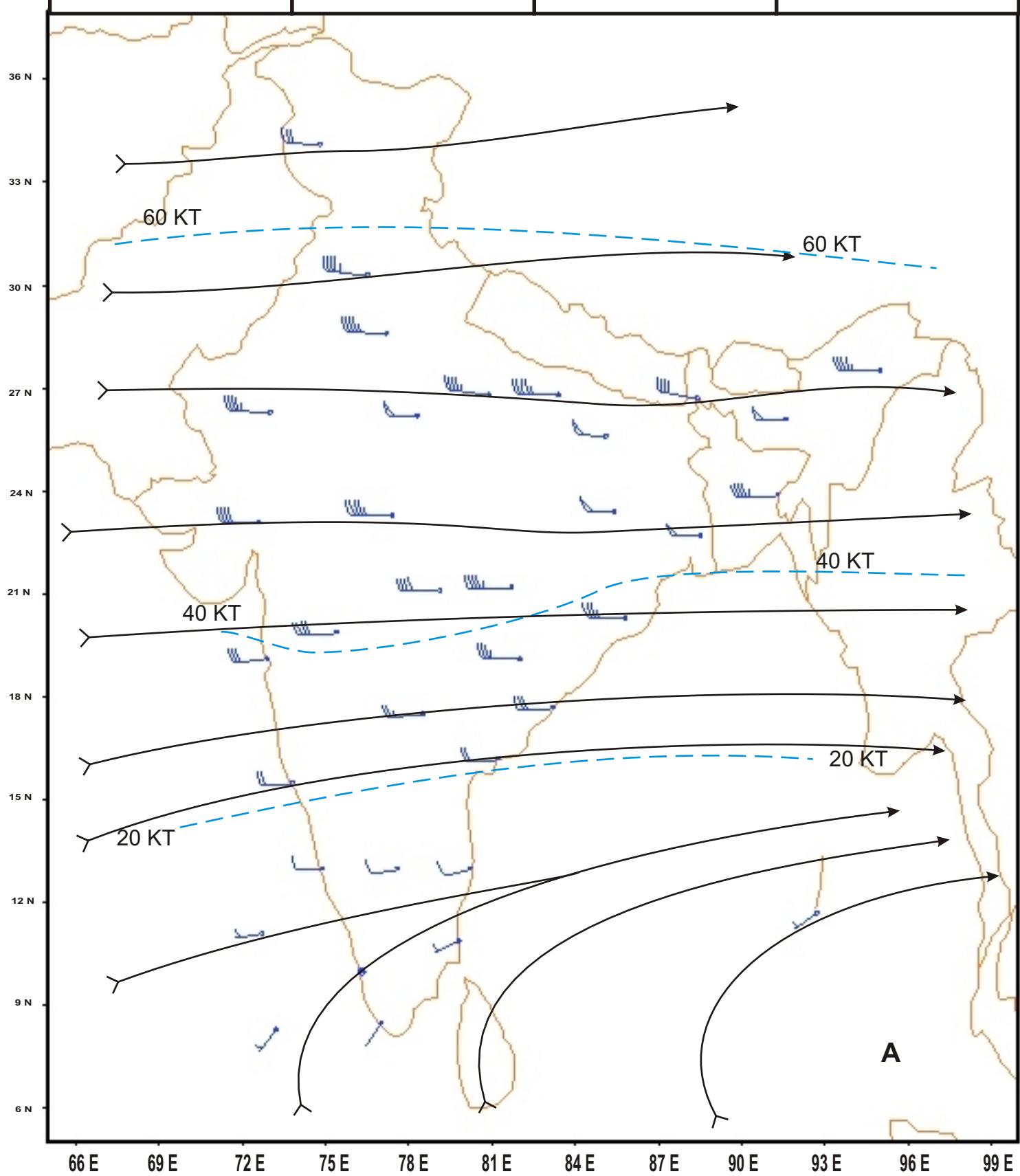


APRIL

1730 IST

300 hPa

UPPER WINDS

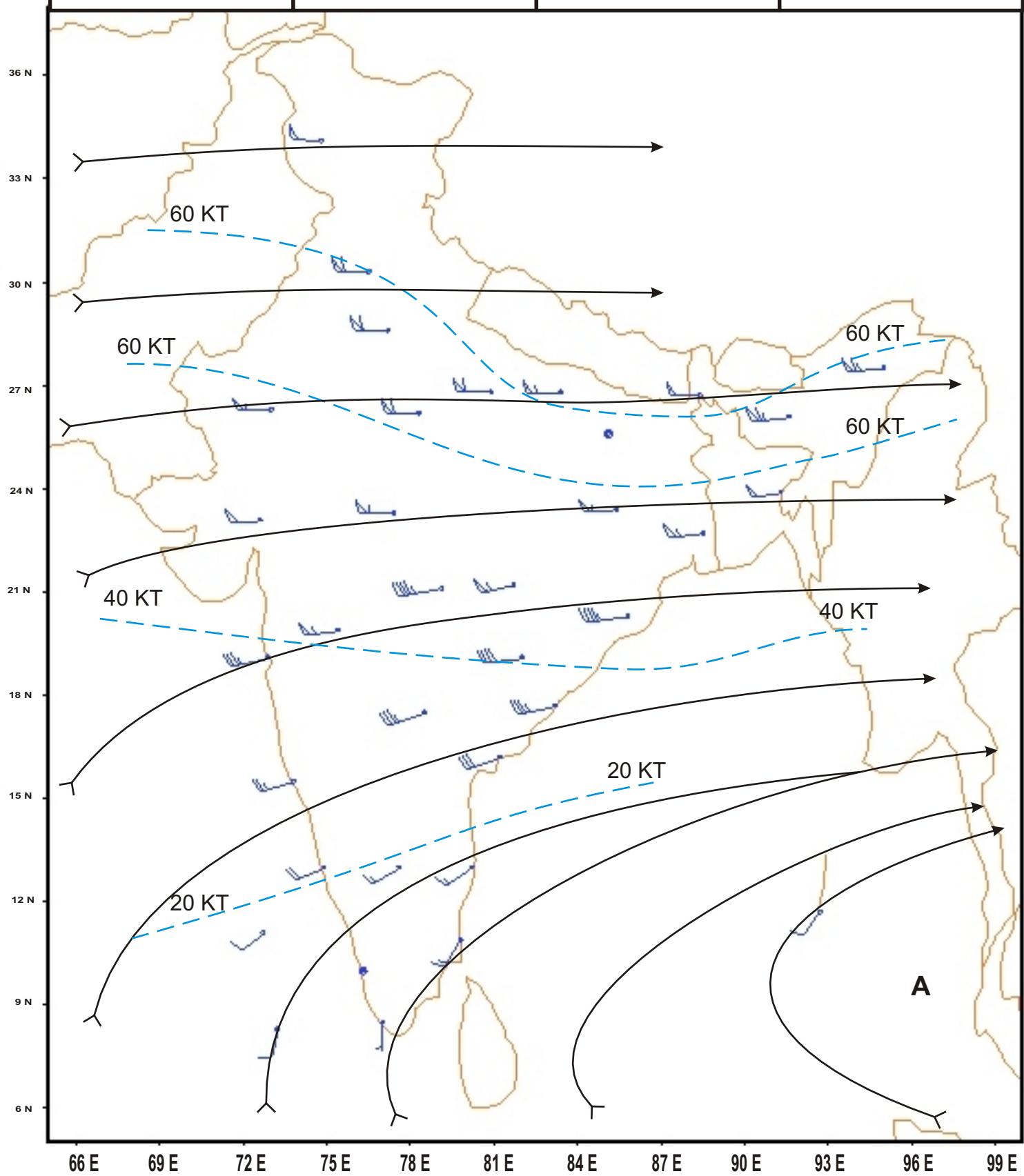


APRIL

1730 IST

200 hPa

UPPER WINDS

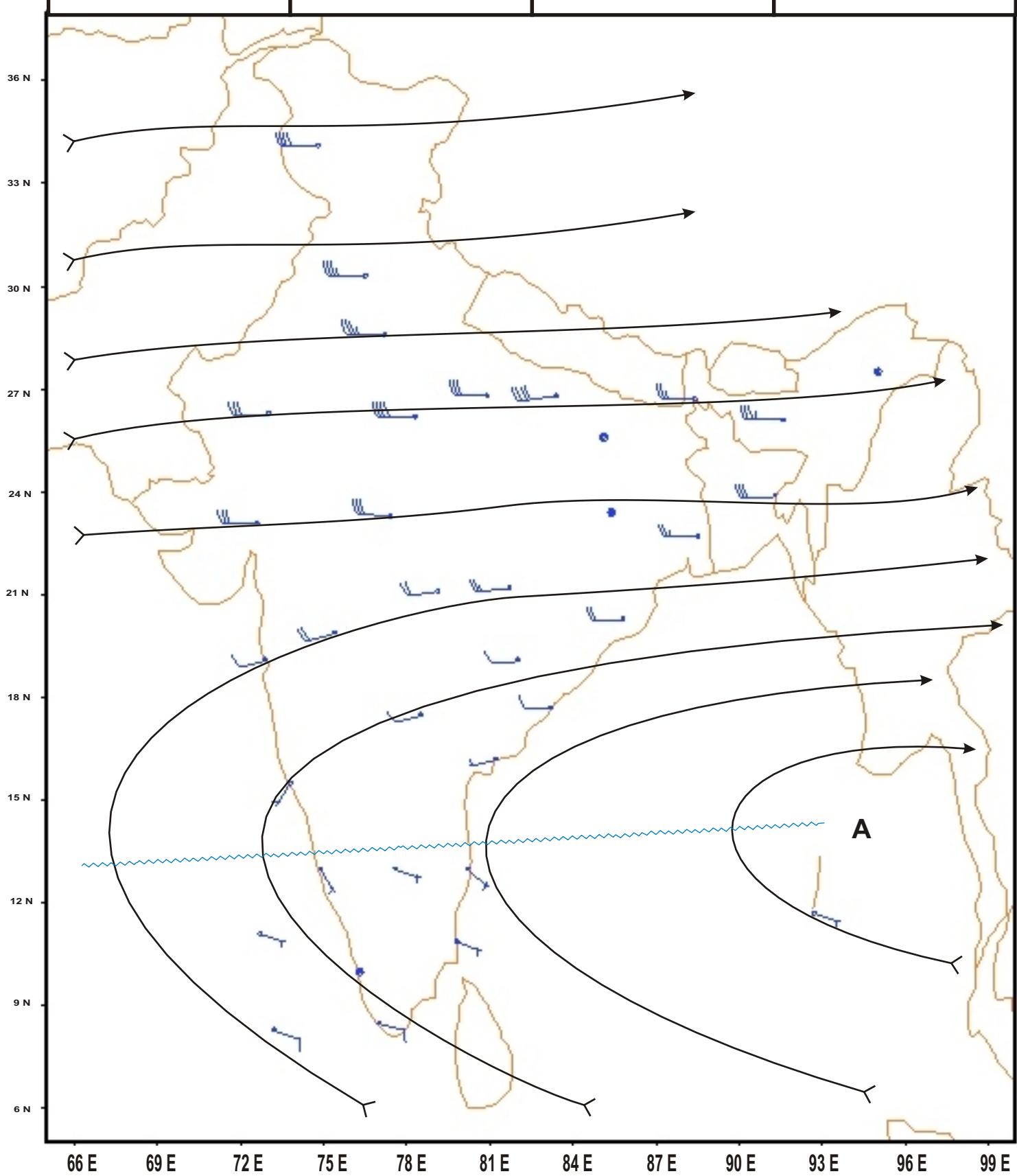


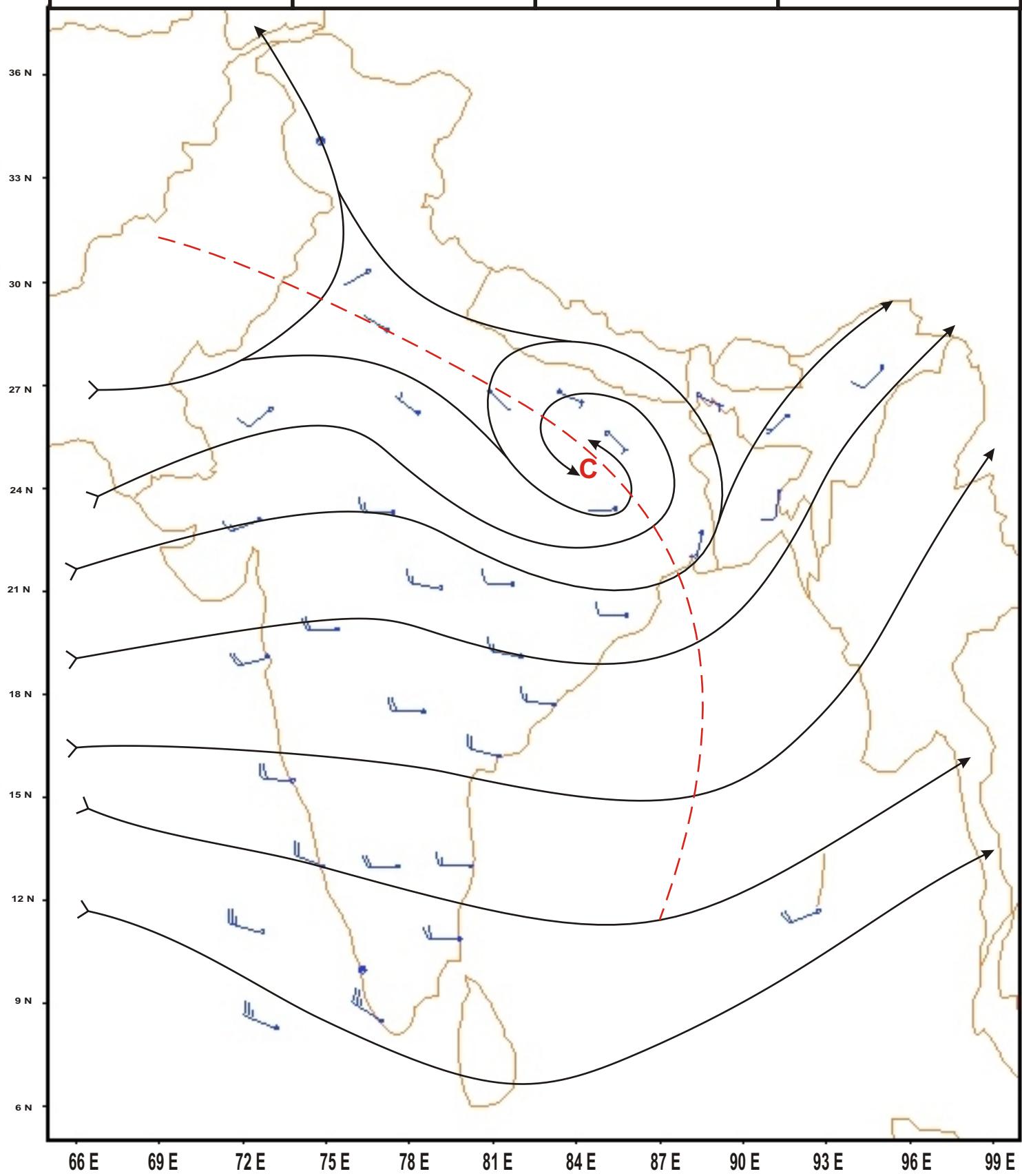
APRIL

1730 IST

100 hPa

UPPER WINDS



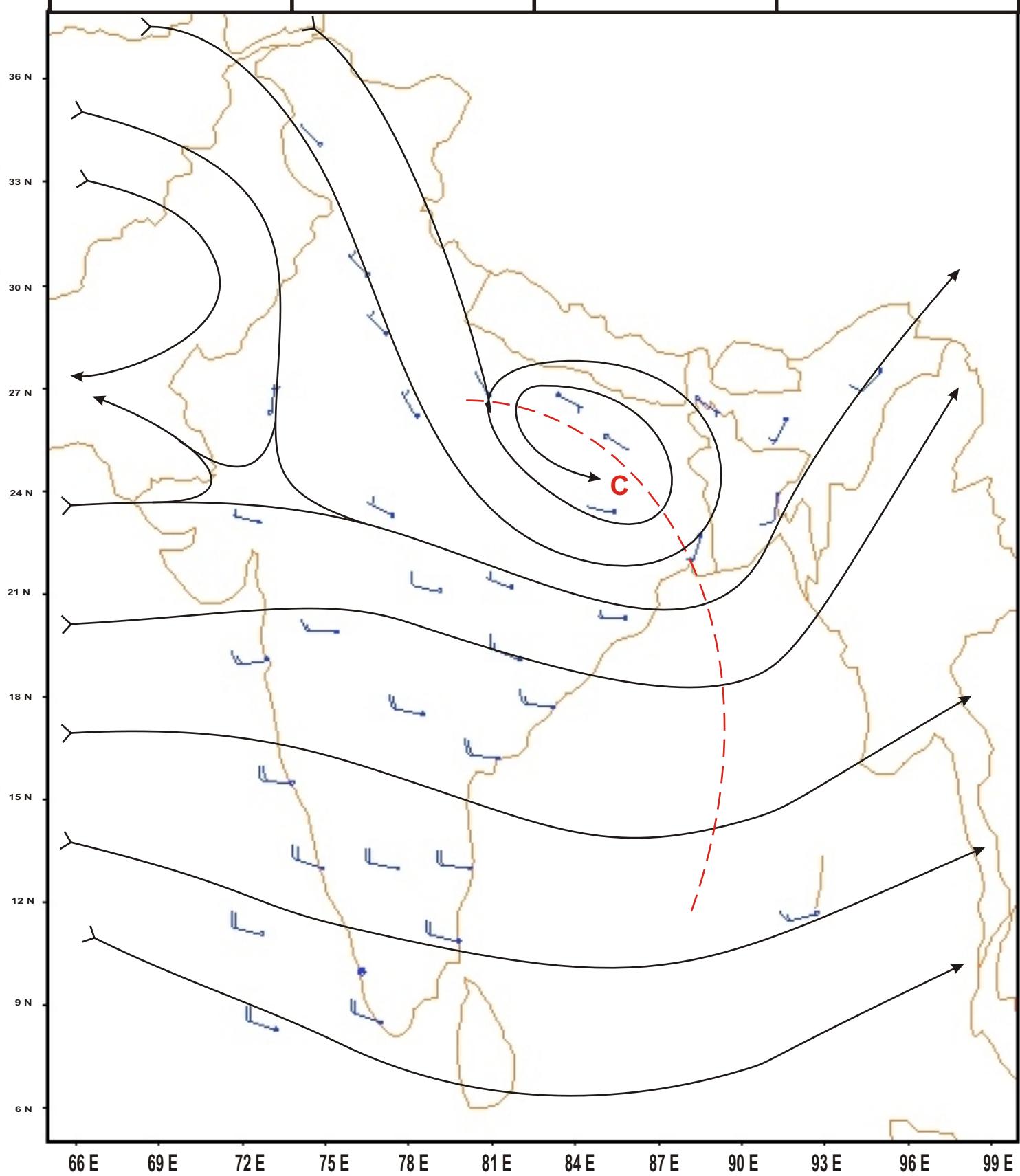
JULY**1730 IST****850 hPa****UPPER WINDS**

JULY

1730 IST

700 hPa

UPPER WINDS

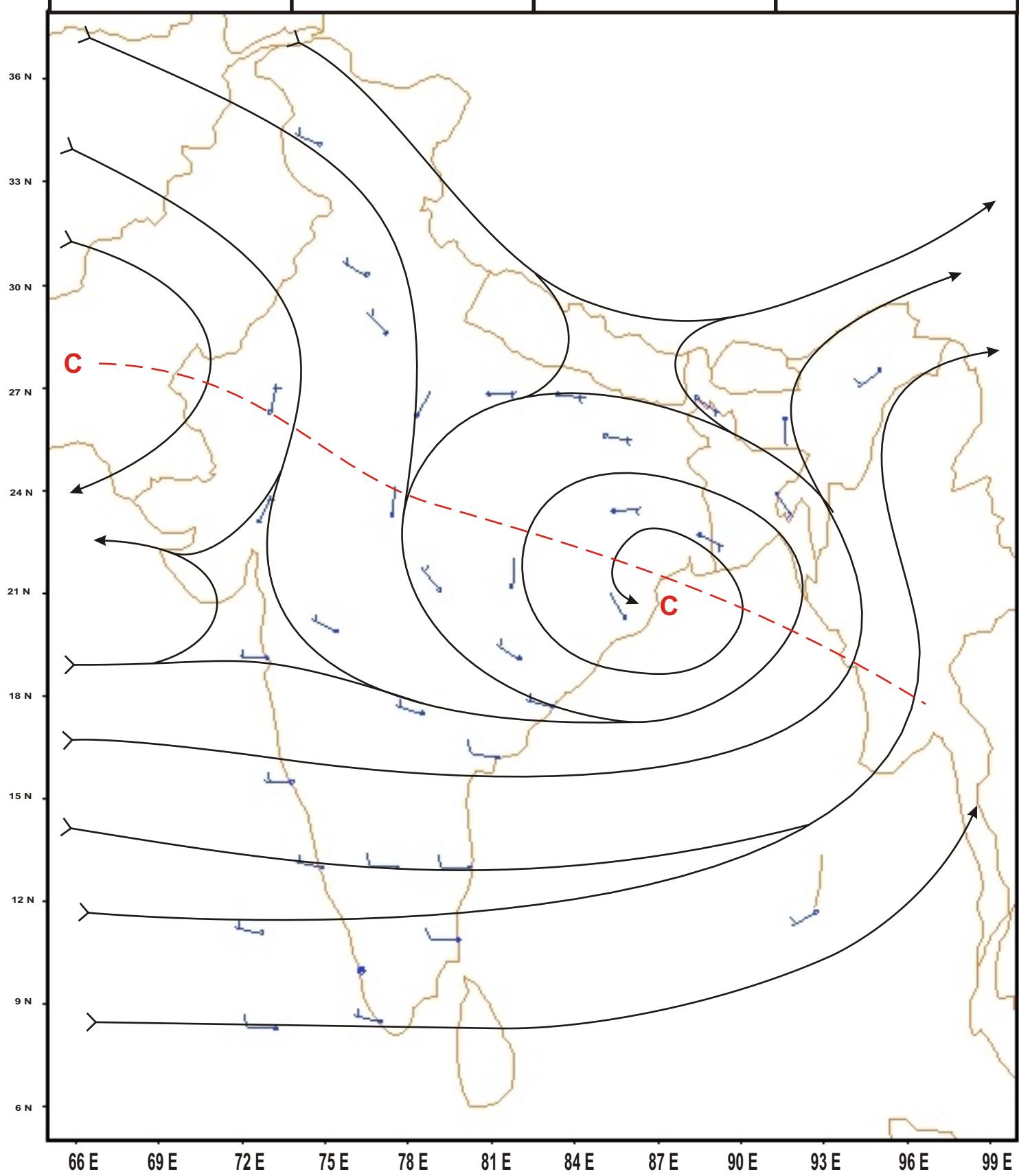


JULY

1730 IST

500 hPa

UPPER WINDS

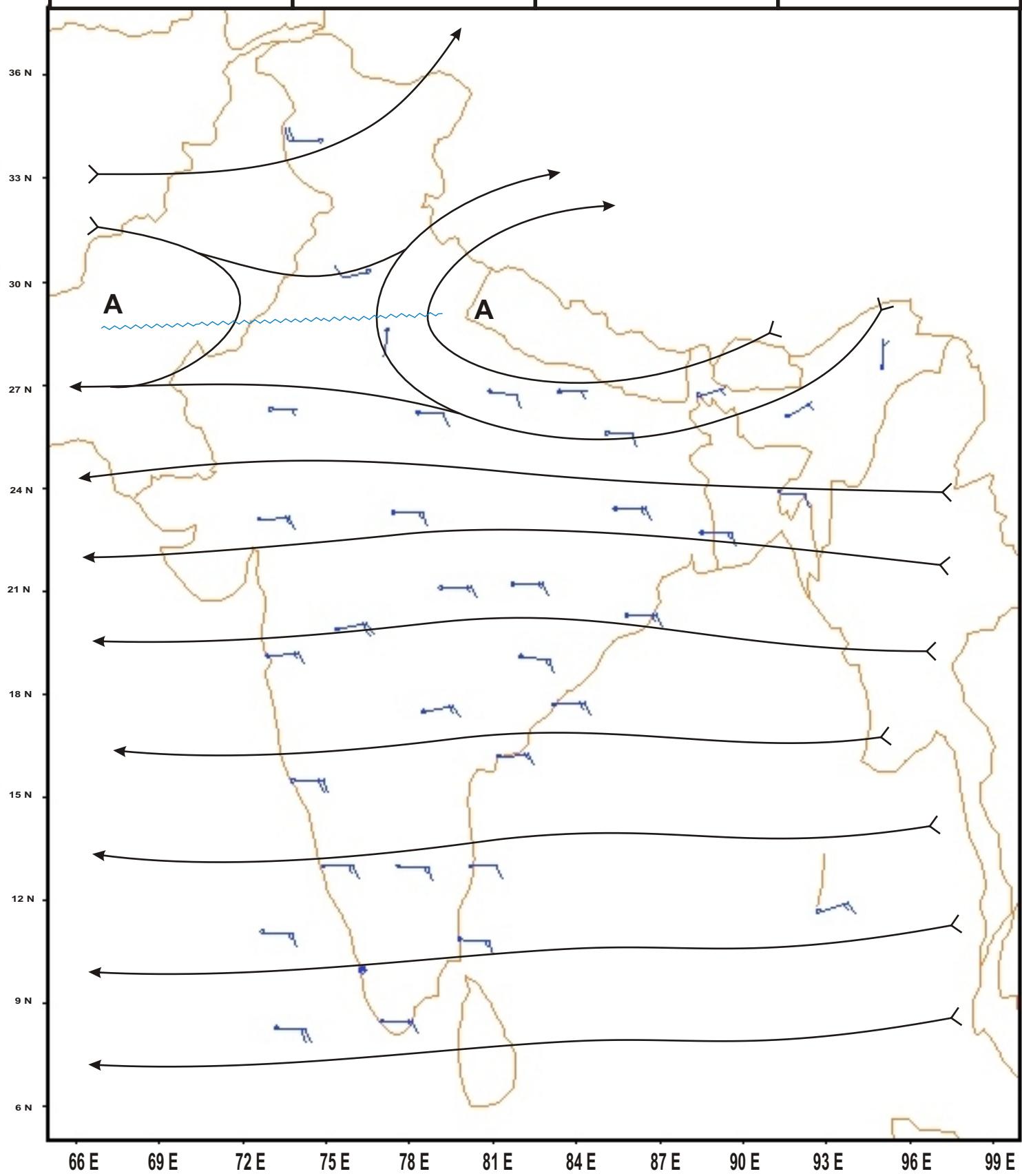


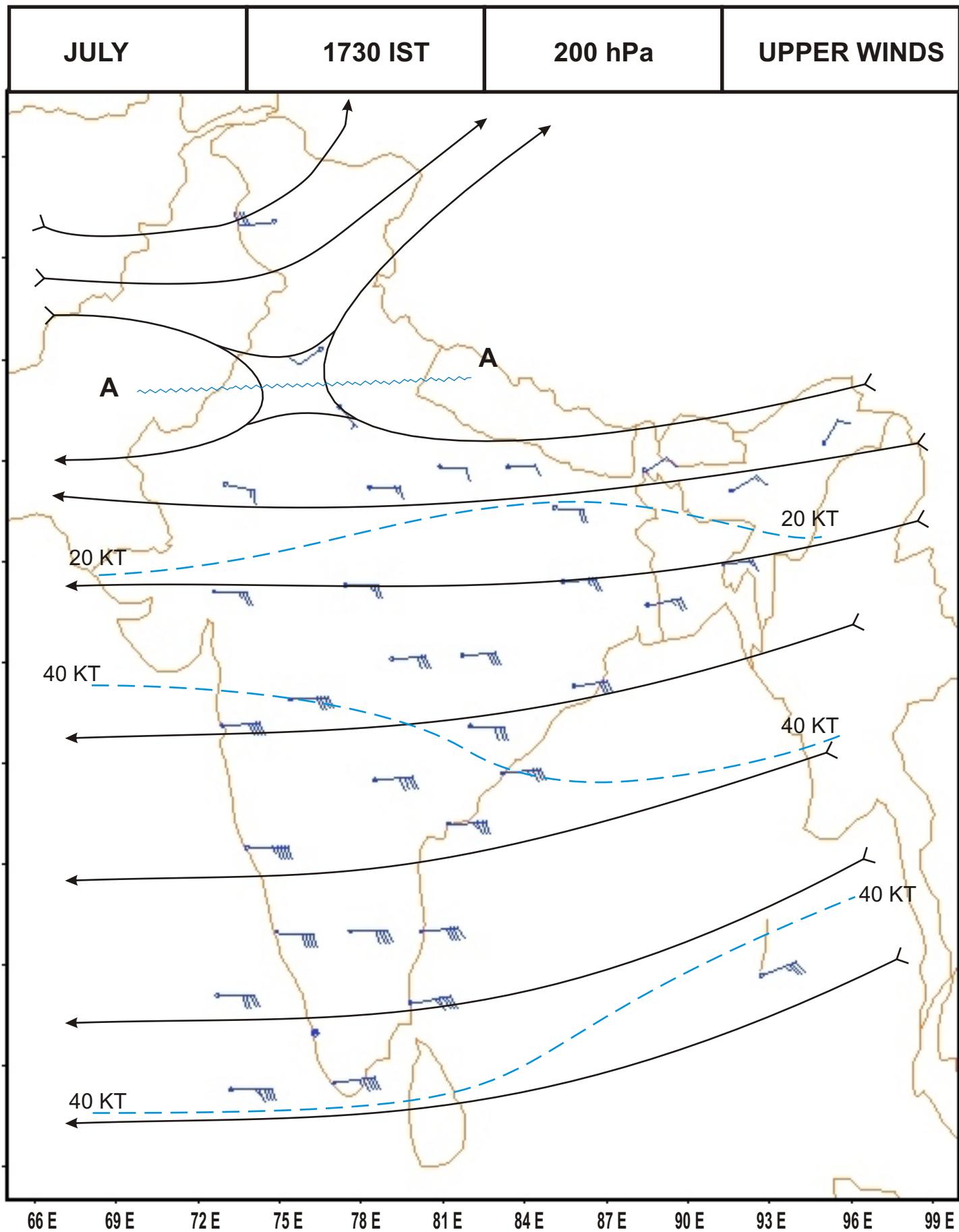
JULY

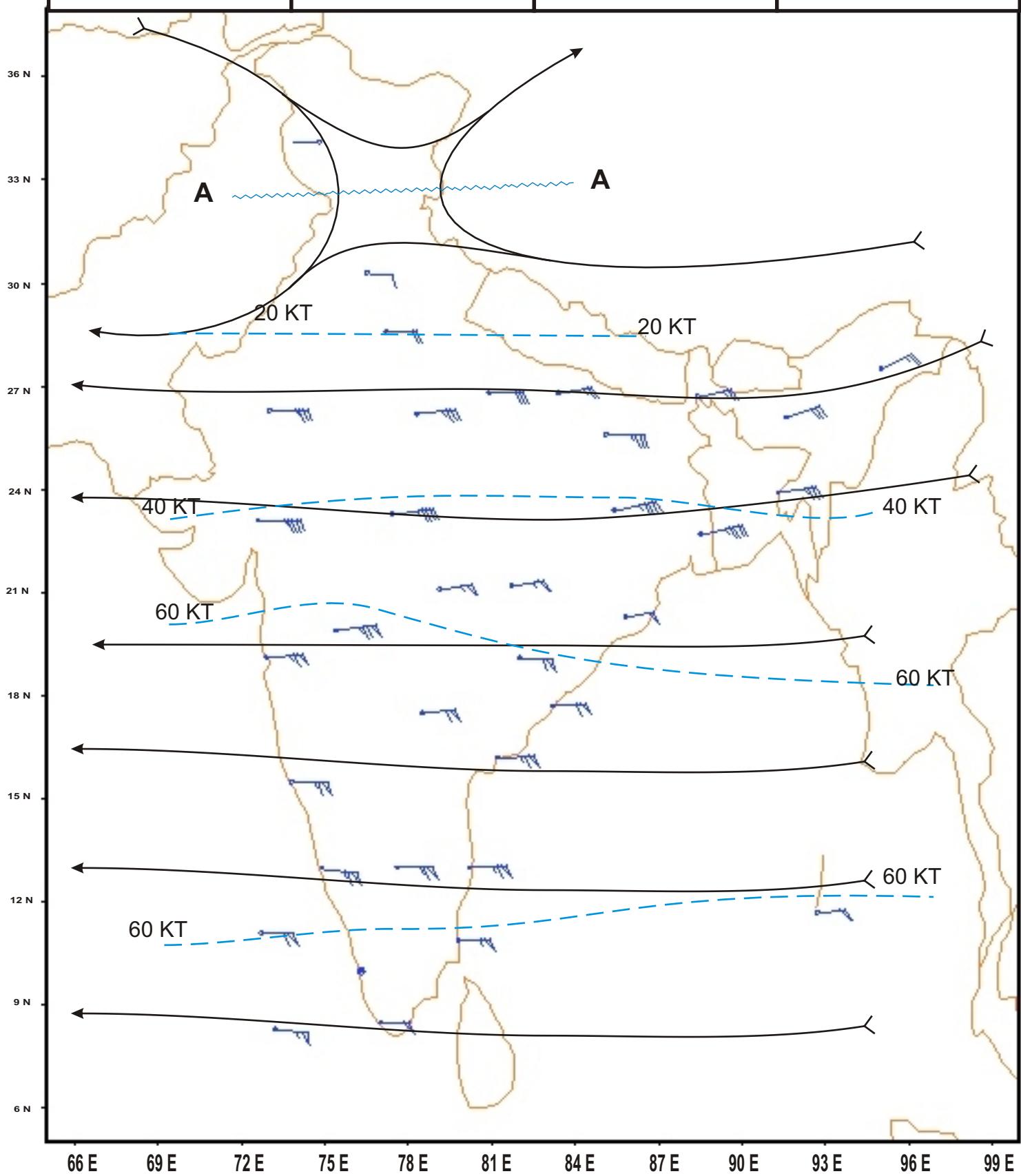
1730 IST

300 hPa

UPPER WINDS





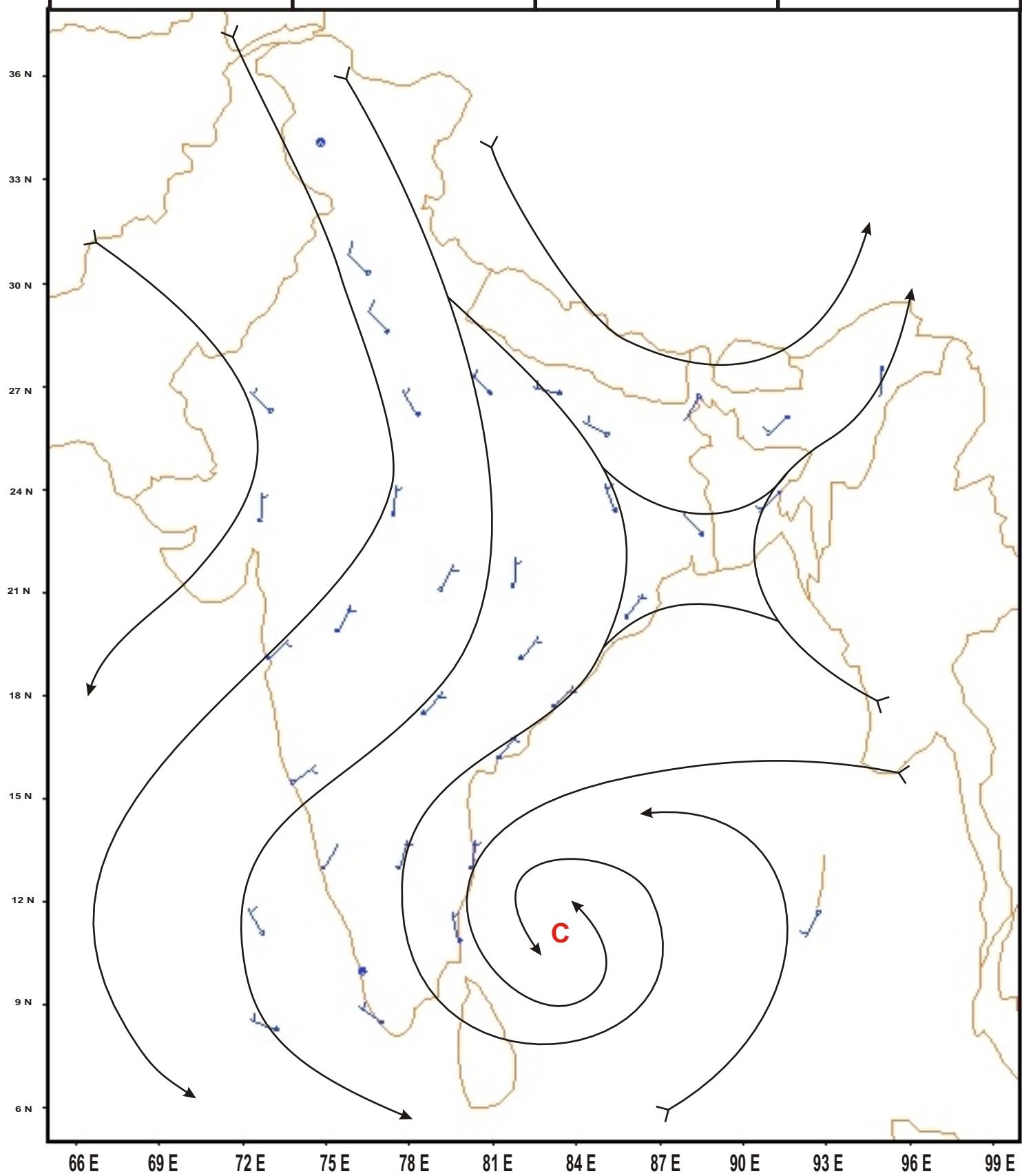
JULY**1730 IST****100 hPa****UPPER WINDS**

OCTOBER

1730 IST

850 hPa

UPPER WINDS

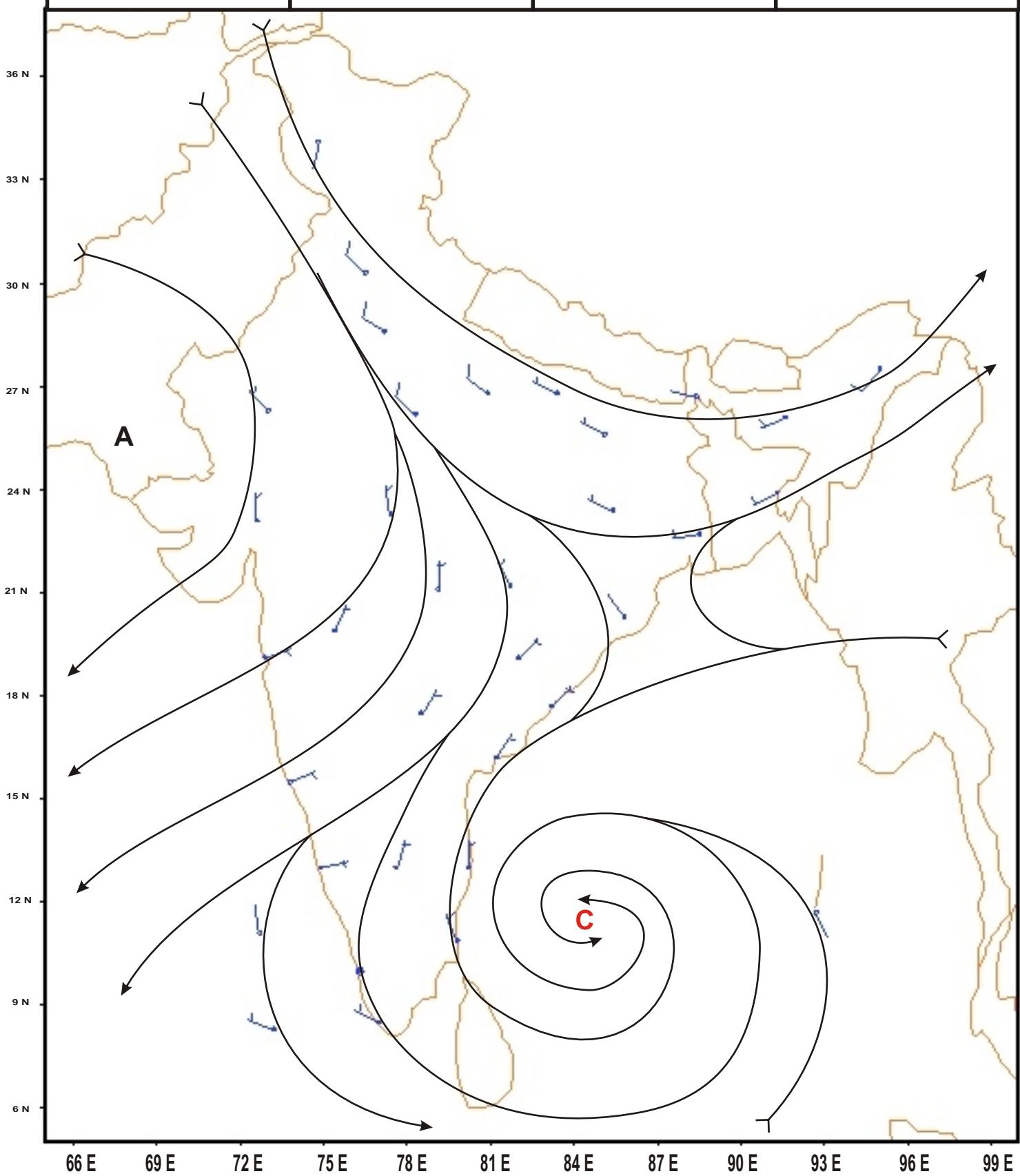


OCTOBER

1730 IST

700 hPa

UPPER WINDS

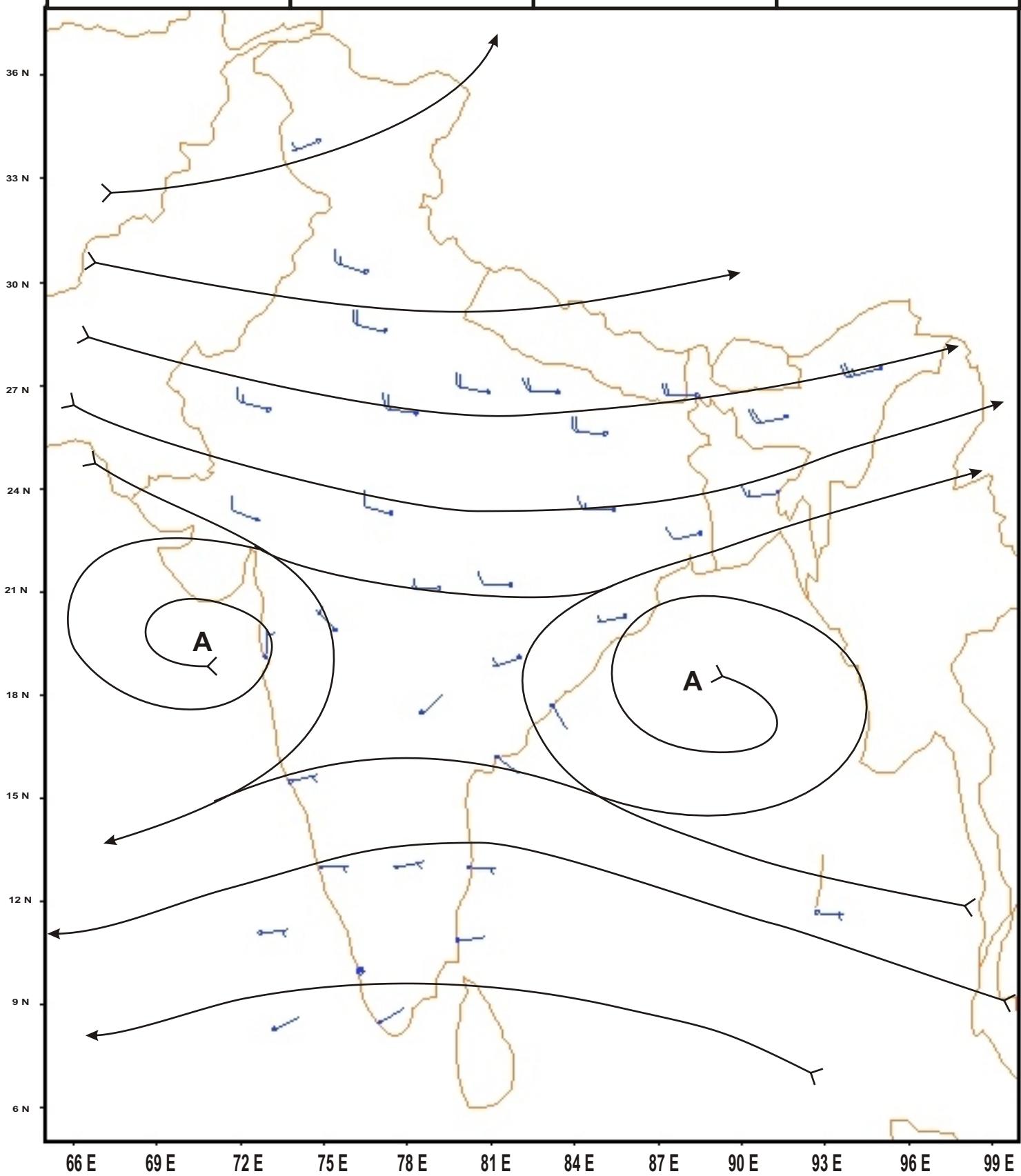


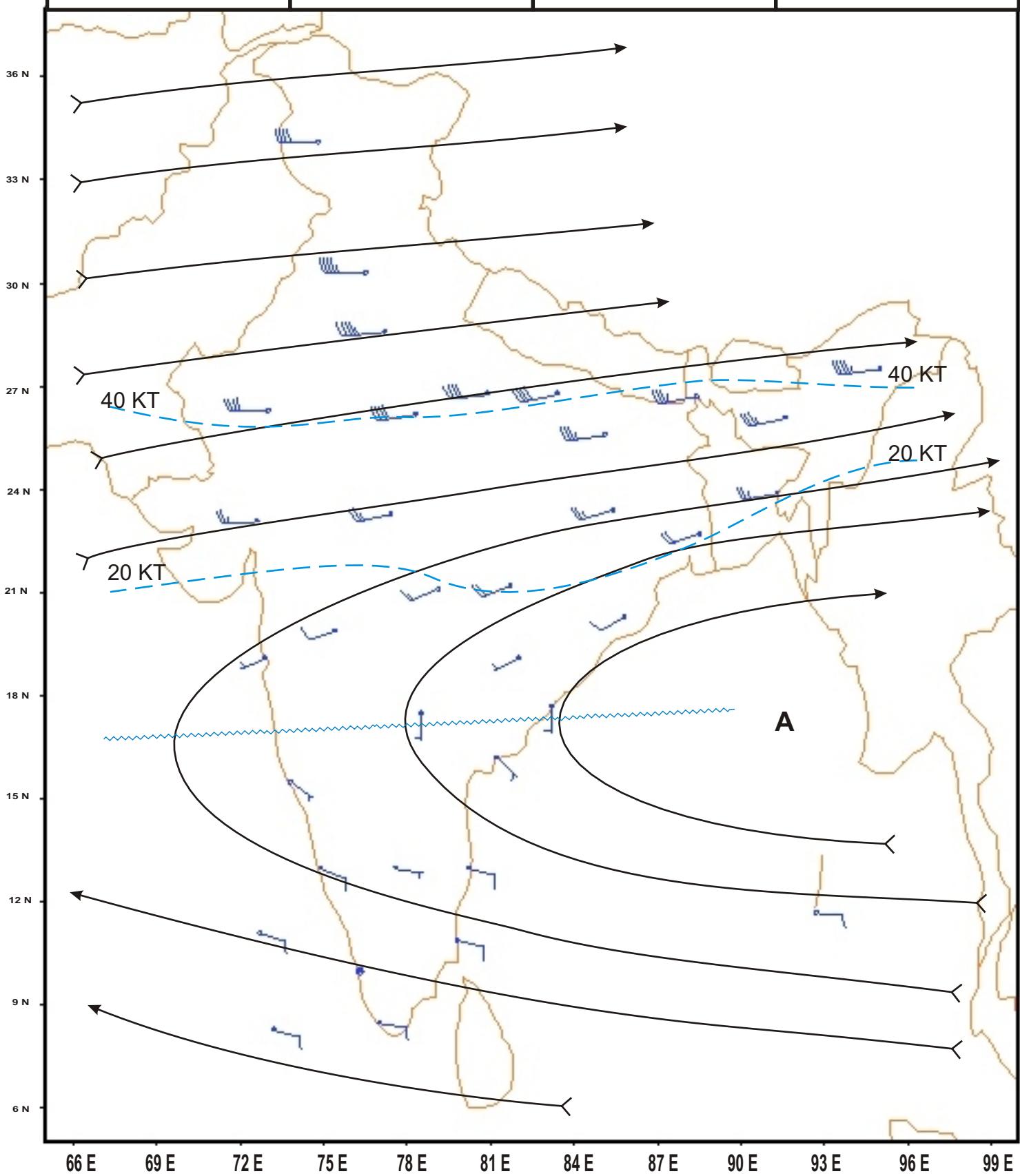
OCTOBER

1730 IST

500 hPa

UPPER WINDS



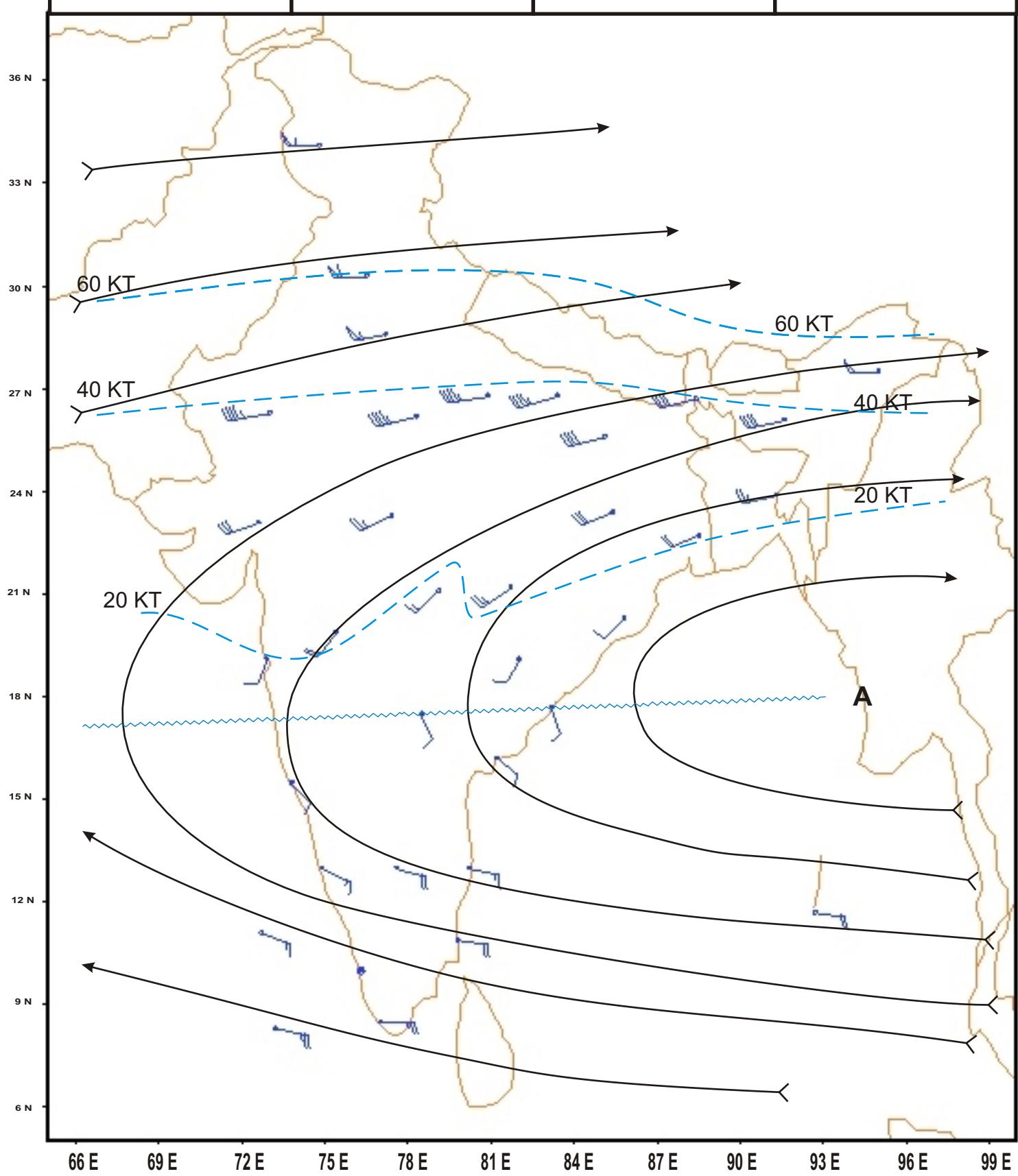
OCTOBER**1730 IST****300 hPa****UPPER WINDS**

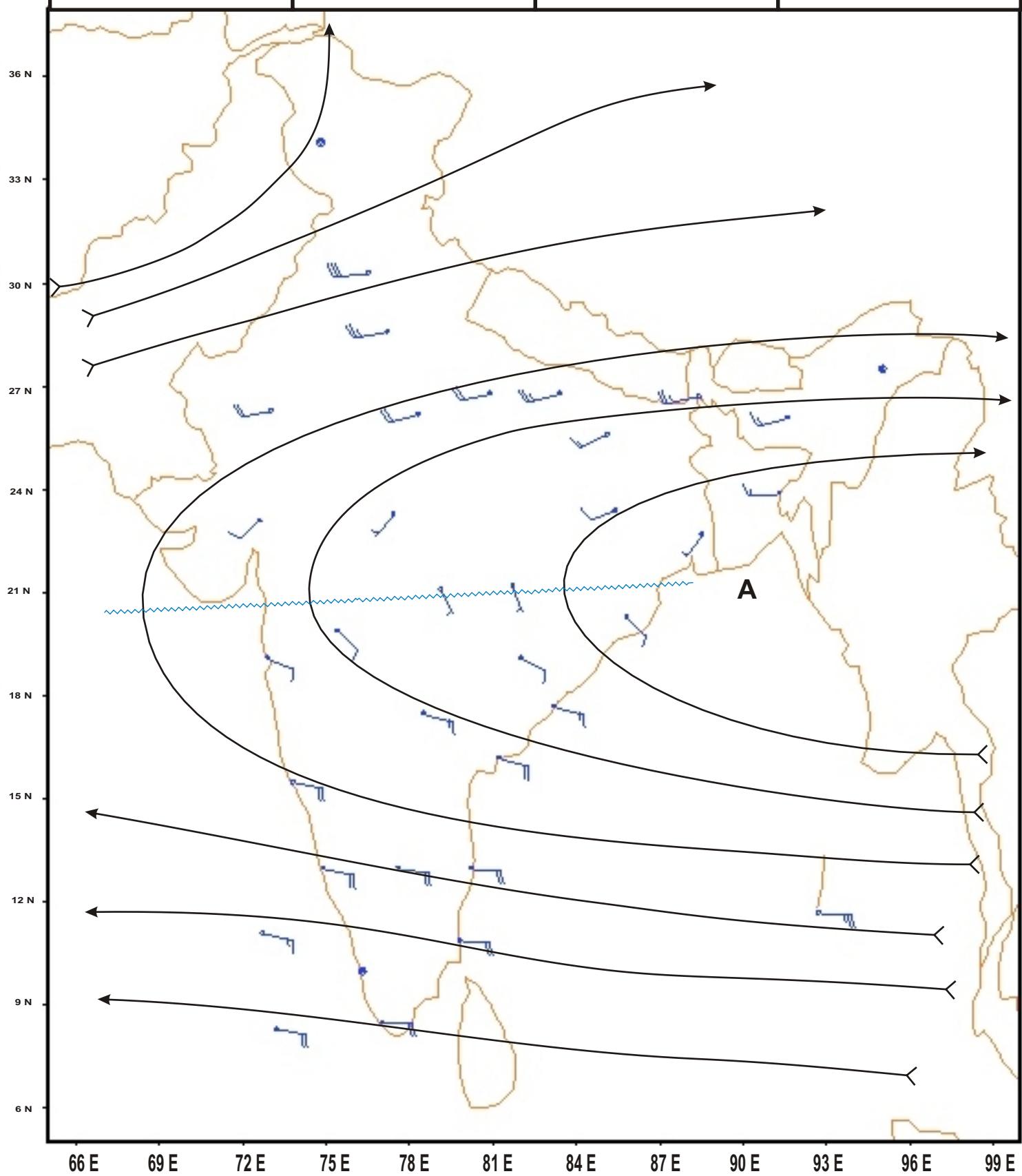
OCTOBER

1730 IST

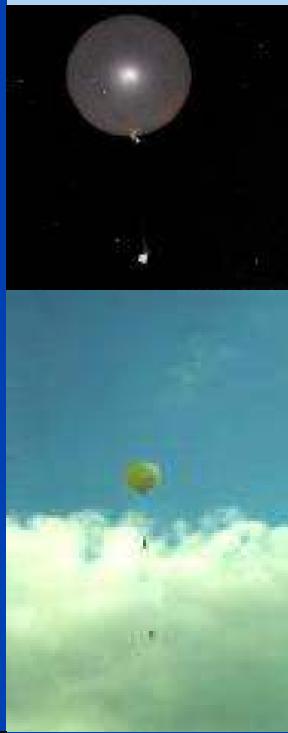
200 hPa

UPPER WINDS



OCTOBER**1730 IST****100 hPa****UPPER WINDS**

**Upper Air
Climatological Atlas
of India**



DESIGNED & PRINTED AT
THE METEOROLOGICAL OFFICE PRESS,
OFFICE OF THE
ADDITIONAL DIRECTOR GENERAL
OF METEOROLOGY (RESEARCH), PUNE

