



## B R E E Z E

The newsletter of  
INDIAN METEOROLOGICAL SOCIETY, CHENNAI CHAPTER

Editor : Dr. Y.E.A. Raj  
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This is the maiden issue of "BREEZE," the newsletter of Madras Chapter of Indian Meteorological Society. It is proposed to have BREEZE published twice a year, during January - June and July - December. The Secretary of IMS Chennai Chapter will be the Editor of the newsletter. There also will be an Editorial board consisting of 4 to 5 members. Copies of BREEZE are supplied free to members of the Madras Chapter and to the other Chapters of IMS. Contributions and suggestions for improvements are welcome. Contributions could be in the form of articles, papers, reviews, updates, anecdotes etc in meteorology and allied sciences. The next issue of BREEZE will be published in October 1998. Contributions may kindly be sent to Dr. Y.E.A. Raj, Regional Meteorological Centre, 50, College Road, Chennai - 600006 by 31 August 1998.

INDIAN METEOROLOGICAL SOCIETY

CHENNAI CHAPTER

Local Committee (1997 - 99)

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## CREDIBILITY OF THE METEOROLOGIST

S. RAGHAVAN

Retd. DDGM, Chennai

About 20 years ago R.K. Lakshman's famous cartoon made its appearance. A man in jacket and tie, but without a raincoat, is standing drenched in pouring rain at a Bombay (Mumbai now) bus stop along with two others who are using their raincoats and umbrellas. He tells them "Yes, I work at the Meteorological Office, but how did you know?" Jokes about our profession are abundant, but *now* there is an increasing **awareness** among the public of the value of the Weather Services. This is partly due to the perceived improvement in our forecasts and warnings on occasions of severe weather. The satellite which has contributed a lot to this improvement, has also made the weather bulletins more attractive. Now there are numerous TV channels putting out weather bulletins with very good computer graphics.

But has this awareness significantly improved the **image** of the meteorological community? What can we, as a community, and as individuals do to improve that image. We shall examine some areas of dissemination and application of weather information.

Many are impressed by the weather news on BBC TV and conclude that it gives better forecasts. No doubt BBC's presentation is good but it has no responsibility for weather forecasts in our region; so it can make statements of a general nature and get away with them. In December 1997, BBC bulletins (and some other TV channels too) said that Tropical Cyclone Linda would affect our East Coast. Our colleagues in IMD discounted that possibility and they were right. But they did not get any credit.

The same is true of other TV bulletins where the dazzling graphics are mistaken for the substance. One TV channel puts out a weather chart with several closed isobars even for a low pressure area. Of course, the pressure interval between the isobars is not stated. If they are at intervals of 0.01 hpa there can be tens of closed isobars in a low pressure area!

Media tend to make their news items attractive to their viewers, listeners or readers. This is natural, but the problem is that the information is distorted *at the expense of the meteorologist's image*. A low pressure area is often described as a cyclone and creates a false alarm. We meteorologists are partly responsible because we use complicated and ambiguous terminology. The word "cyclone" and the phrase "cyclonic circulation" are prime examples of terminology confusing the public. And why should we talk of a "severe cyclonic storm with a core of hurricane winds"?

This effect is magnified several fold by loose translation into Indian languages.

There is a common impression that weather forecasts are much more accurate in the "developed" countries. This is partly true e.g. in the case of extra tropical weather systems which can be traced over a period of days. But it is not generally realised that even in the USA with its vast resources, forecasts in tropical areas in

respect of small scale weather systems is not significantly better than in India. Nowcasting of severe weather has been successful in the USA because of the excellent communications. From experience, the present author can say that we can give useful short period forecasts of severe weather at our major cities using radar and satellite information, if only we could communicate with the public several times a day. The thrice-a-day AIR local weather bulletins (to which few people listen anyway) are not adequate for this purpose. It may not be prudent to use the Cyclone Warning Dissemination System for local severe weather.

Besides forecasts, the public is not aware of the numerous applications to which weather information is being put or can be put. E.g. there is no easily available handbook of climatological information in respect of our various cities. Except for one of our colleagues who was putting out such information in a newspaper, none of us have taken any effort to make this available. As for the serious researcher who needs meteorological data the procedures for getting them are too complicated. Even if some one asks for data it is often not available in a suitable form. This should not be the case in these days when some countries are able to put weather data and even latest radar and satellite imagery on the Internet.

There is a lot of information put out in the general press as well as in the electronic media which are misleading or even false. Such information comes often from people with no credentials to do so but sometimes even from scientific or academic people and therefore gains credence. A recent example was an article by a *psychologist* about the influence of the colour of the land on rainfall. It was pointed out by two knowledgeable Members of our Society that the article was full of wrong and misleading statements. The author replied with even more misleading statements!

Other recent examples are of *prophets of doom*. University scientists with reputation in fields *other than Meteorology* have made claims such as "This year there will be more destructive tropical cyclones because of global warming", or "The monsoon will fail because of El Nino". Some of these have been rebutted by our colleagues, but the rebuttals come in small print in some interior page and go unnoticed. El Nino is, of course, being blamed in the media for all the ills of the world including the recent tornado in Orissa and West Bengal. For some one who wants to be in the limelight, it makes good sense to prophesy disasters. If you predict a disaster without specifying its exact nature or location, the laws of mathematical probability will ensure that some disaster will occur somewhere and you can say, 'I told you so'. Besides keeping you in the limelight it may improve your finances too. It is suspected that even the effects of global warming are being exaggerated by some for this purpose.

There can, of course, be genuine disagreement among scientists about the effects of, say, Global Warming or El Nino or any other phenomenon. These are discussed in scientific journals. For example, some scientists of ISRO published a finding that the Gulf oil well fires in 1990 could cause a deficiency in the subsequent Indian monsoon rainfall, but they were careful to add the clause "unless compensated by other factors". IMD scientists thought that the monsoon would be normal. It was, except for minor deficiencies in some areas well within the range of normal variability.

But such a healthy scientific debate gets distorted once the general media publish the findings out of context.

What can the Indian Meteorological Society or its individual Members do in these areas? There are certain things which can be done only by the official weather service i.e. IMD. An example is forecast terminology. This article will *not* go into those although it may be possible for the society to take up some issues with the IMD. But the Society and its Members can do many things which the IMD may not find convenient to do. E.g.

(1) The Society or individual Members can arrange to process and publish climatological information in forms suitable for the public or for special interests. E.g. a Guidebook on climates of various cities or regions of the country will be of interest to tourists. (We need not go into the economics of such publication, perhaps sponsors can be found). Although basic data may be available in IMD, analysis of distribution of high winds, low visibility, heavy rainfall, lightning/thunder etc., in specific areas can be made and presented in userfriendly forms.

(2) The Society may bring out, periodically, position papers on specialised topics such as weather forecasts, El Nino, Global Warming, future scenarios in Meteorology and so on. The Society may have thinktanks for each subject, not necessarily confined to its Members. It is important to ensure good publicity for such papers. The same thinktank can, when necessary, rebut misleading reports.

(3) Material on Meteorological subjects should be made available in Indian languages. Individual Members can take initiative. A scheme for bringing out standardised Glossaries can be initiated.

(4) The Society can initiate (perhaps with the cooperation of TV establishments) a training and certification scheme for weathercasters.

(5) The Society may establish liaison with Educational Institutions to try for inclusion of Atmospheric Science topics in their curricula.

(6) Vayu Mandal was originally intended to be a popular journal suitable for non-meteorologist readers. It can be recast with popular articles suitable for a wide readership.

The author hopes that this article will stimulate some debate within the Society and concrete ideas will come up before TROPMET-99.

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## RANDOM THOUGHTS ON GLOBAL WARMING

C.Ranganathan,  
Retd. Director, IMD, Tiruchi.

According to the World Meteorological Organisation, the average global temperature has risen by about one degree celsius in the recent past. The 'Green House Effect' caused by the accumulating carbon-di-oxide in the atmosphere due both to the extra-ordinary consumption of hydrocarbon fuels during the last few decades and the depletion of huge forest reserves (capable of absorbing the carbon from the

atmosphere by transpiration) every year are attributed as the cause for the warming of the globe. It is predicted that the rise may go up to 3 or 5 Deg C in the coming next 50 years or so if the state of affairs go unchecked. The catastrophic effects of the warming up of the globe by this proportion have been stressed in all communication media and no further emphasis appears necessary here.

By going through all such reports that paint a gloomy picture in a scenario where people of one country could hardly be expected to be concerned about the welfare of another country, despite the existence of a UNO, there appears to be some hope that the mankind, the vegetation and the animal kingdom may not suffer much, though they may have to cope up with extra-ordinary changes in the world and realign themselves to live a different life. In a book GENESIS (Origin of life and universe) by John Gribbin, published by Oxford University Press, the author argues that all the hydrocarbon fuels that we know of, after all originate from the vast and thick forests that once occupied the expanses of the earth, supporting many forms of life, some millions of years ago. If they could grow and support life before disappearing in an upheaval, how could they make life extinct when recycled into the atmosphere? May be the Maldives, the coastal islands of Bangladesh or even a part of Bangladesh, some coastal areas of India, as well as the coastal areas of some other countries may be submerged under the sea water. We have to be very concerned about it and see that this sort of calamities, if they can be prevented by some effective steps, are prevented. There can be no two opinions about it. But what is stressed here is the scientific point of view that the life in the world will go its way, survive, just as it has survived world wars, and finally emerge victorious however long the struggle may be.

From another point of view, if nature, as it always does, resists the change, the warming up of the globe may result in more EL Nino years, or more warming of other oceans, in addition to the equatorial east Pacific, and a lot more clouds may develop than at present all over the globe cooling down the earth to a great extent. More rains and cyclonic storms may occur bringing floods to places hitherto known as deserts like the Rajasthan, the Somalia or the Sudan -- that is a different aspect -- welcome or not welcome as the case may be. Natural calamities created by weather may increase. Even so will nature bring a balance to downgrade the warming of the globe. This is a point to ponder over.

From Rio De Janeiro there is a news item (THE HINDU, DT. 11.3.98) that belching cows are a main source of gas emissions that cause the green-house effect, raising the earth's average temperature. According to Brazilian Agency of Agriculture and Farming Research and the Brazilian Science and Technology Ministry, 93 per cent of the methane produced by agriculture originate from the ruminants left in the stomach of cattle, left behind after digestion, by bacterial action. It would appear that in India our cows require more protection in the light of this news.

May be the changes that are about to come due to the indifference of the developed nations towards the developing and underdeveloped nations in the consumption of oil may in the long run of a few decades prove more beneficial to the latter than the former. Let us live on hopes if that is the only choice.

# CROSS WORD ON METEOROLOGY

I. N. JAYANTHI, DIRECTOR, M.O MADRAS

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II. B. AMUDHA, R.M.C, MADRAS

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## CROSS WORD ON METEOROLOGY

I. N.Jayanthi, Meteorological Office, Madras.

II. B.Amudha, Regional Meteorological Centre, Chennai.

### Clues 'MET' CROSS WORD - I

#### CLUES - ACROSS

1. Is our economy a gamble on this? (7)
6. Spin of a vortex which is also a service club of society's elites (6)
7. The first 'three axes stabilised' Geo stationary satellite which made India proud (5).
12. A soaked concession given to abbreviated 2nd order polynomial (3)
13. Greeting precipitation (4)
14. TORNADO misses the centre and sheds the fuss at the end to meet the hill (3)
15. Violet ray in extremity heats up the stratosphere (3)
16. Combination. Is it of world organisation and electrically charged particle?
17. Nothing significant for impending landing (5)
19. The confused GRAD is a hindering force for fluid motion (4)
20. Unit of Work but for people in Sahara it is an area of shifting sand dunes (3)
23. Fixed telecommunication network abbreviated for aviators (3)
25. The region between Cancer and Capricorn which is fervidly hot (6)
28. Anger for abbreviating Infra Red Emission (3)
29. Cyclone alert is issued at this stage in acronym (2)
30. Maritime states are specially dreaded by their visitations (8)
31. The hole in it causes concern for environmentalists (5)
33. Recurving cyclones often move in this direction (3)
34. The study of science of clouds. Does it sound like science of functions of kidneys with start of rain in the central area? (9)
37. Not analogue system (2)
38. EL Nino-Southern Oscillation acronym is totally in confusion (4)
39. Disorganised man requires this knotted wire for securing antenna masts.

#### CLUES - DOWN

1. Relative humidity depends on this (8)
2. Abbreviated synthetic aperture radar is improperly placed (3)
3. It is pass in a mountain range? No it is between two anti cyclones for weatherman(3)
4. Palindrome observational aid in plural (6)
5. Are they first biblical creations of vortices or generation of cyclones (12)
8. Midday when sun is at the zenith (4)
9. Jumping season (6)
10. CB Clouds sure produce this aviation hazard (7)
11. The heat content of a unit mass (8)
18. Observing system abbreviated (2)
21. Radioactive inert gas having daughters as tracers (6)
22. When lifted to this height air becomes saturated (3)
23. All welcome this weather of punishment (4)
24. Routine aviation observation is appended with this short period forecast (5)
25. The lowest sphere where most of the weather occurs (5)
26. Veritable storehouse of moisture giving birth to cyclones (5)



27. Acronym for International Civil Aviation organisation (4)  
 32. Last Alphabet in U.S.  
 35,36. Weather Codes which stand for time and data (2, 2)

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**Clues for 'MET' CROSS WORD - II**

**ACROSS**

1. Farthest point of Earth from the sun in the earth's orbit (6)  
 4. One closed isobar can indicate this (3)  
 6. A type of medium Cloud (in short form) (2)  
 7. Red planet (4)  
 8. It also means 'equal' (3)  
 9. Shooting star falling to the earth (6)  
 13 Thin mist (4)  
 14. A jet stream over the peninsula during Indian monsoon (3)  
 16. One of the polar orbiting satellites used in weather forecasting (4)  
 17. Extension of a high pressure area (5)

**DOWN**

1. Instrument used to measure altitude (9)  
 2. Temperature decreases at the rate of 6.5 deg. Celsius per kilometre (3)  
 3. Accretion, of this material in an aircraft may be hazardous (3)  
 5. Headquarter is at Geneva (3)  
 10. Calm winds, cloud free sky within a cyclonic storm (3)  
 11. Protective layer is depleting (5)  
 12. Instrument using the principle of radio echoes (5)  
 15. A type turbulence experienced by an aircraft while flying (3)

( Solution to the cross word is given elsewhere)  
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**NORTH EAST MONSOON OCT - DEC 1997**

During the year 1997 the north east monsoon set in over Tamilnadu and adjoining subdivisions on 13 October. The north east monsoon was active on several days leading to excess rainfall in most of the subdivisions. However cyclogenesis was almost absent over the Bay of Bengal. Tamilnadu received rainfall in excess of 70% of normal during Oct-Dec 1997. If this figure gets retained after updating 1997 will be the year of highest rainfall for north east monsoon during 1901-1997, the previous high being 66% in 1946. In Tamilnadu, 20 out of 23 districts received excess rainfall, ie. rainfall in excess of 20% of normal. Madras city received record rainfall of 157 Cm during Oct-Dec 1997 the previous high was in 1946 (155 Cm). The subdivisions Kerala (31%), Rayalaseema (26%) and Coastal Andhra Pradesh (0%) also received normal to excess rainfall. The north east monsoon withdrew on 31st. December.

STATISTICAL FORECASTING IN WORLD WAR II

In the summer of 1942, Hitler's Headquarters, aptly code-named Wolfsschanze (meaning Wolf's lair) wanted a weather forecast for central and eastern Europe for the winter of that year, for obvious reasons.

The Head of the Weather Centre of the German Air Force, Dr. Kurt Diesing, had no means of making a long range forecast. So he decided to try some simple statistics.

He found that of the three preceding winters two had been very cold - far below the norms established by the climatic records of 150 years. The third was not warm either. Three very cold winters had never occurred within 4 consecutive years. He therefore suggested that the winter of 1942-43 would be relatively warm.

A severe winter followed, with disastrous consequences for the German Military. The wolf (Hitler) was certainly not amused.

---- from Weather, April 1998, Vol.41.No. 4, pp 129-133

THE LIGHTER SIDE OF EL NINO

S.Rengarajan & R.Suresh  
RMC, Chennai.

Of late lot of material has appeared in the print media about EL NINO. It has become almost an intellectual fashion to correlate EL NINO with any abnormal weather activity happening anywhere in the world and lot has been debated about effect of EL NINO on the global climate. Meteorologists all over the globe had taken pains to explain the abnormal EL NINO of 1997. This has probably left the layman bewildered.

In this context, it will not be out of place to bring out a report on the lighter side of EL NINO, which appeared in a recent edition of a national English daily.

"Storm hits Mr. Nino"

A man called Al Nino is being plagued by telephone calls from people blaming him for the El Nino storms.

Alfonso Nino, 75 a retired Navy pilot from California, usually hears callers out before sympathising with them and hanging up. But recently he slammed down the phone after one woman called at 2 a.m.

The El Nino ocean circulatory system is giving California one of its stormiest winters in years.

I have had more than 100 calls most of them from people asking me why I am causing such bad weather and wanting to know when the storms will end," said Mr.Nino. "They just want to blame somebody."

He tries to appease callers by telling them that sunshine is on the way. " I try to cheer them up," he said. Sometimes if they are rude I tell them I will make it keep raining."

One caller told him that he was responsible for his daughter unable to get home one night after a storm had blocked the road. "I said I was sorry," he said.

His wife now refuses to answer the telephone but Mr. Nino has not considered changing his number, Like the storms, he says, "it will all blow over."

(Courtesy HINDU dated 5 March 1998)

This report probably shows that not only weather but also superstition is a Global phenomenon !.

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## **EL NINO AND NORTHEAST MONSOON RAINFALL OVER TAMILNADU**

N.Jayanthi & S.Govindachari

Meteorological Office, Airport, Meenambakkam, Chennai - 27.

Last year i.e.. in 1997 NE monsoon rainfall over Tamilnadu created an all time record which also happened to be one of intense EL Nino years where abnormal SST anomalies continued from the beginning of the year to the end nourishing a speculation linking the two.

Normally Tamilnadu gets rainfall in this season due to the weather systems like tropical cyclones, depressions, North-South trough activity and coastal convergence to mention a few. But during this year none of these factors affected Tamilnadu coast. However, the general wind flow in the lower levels were predominantly easterly with strong westerlies aloft. This situation generated a strong wind shear in this region which is an inhibitive factor for cyclone genesis. Apart from the significant strong easterly waves advecting moisture in the lower levels there was nothing indicative of this excessive rainfall over Tamilnadu.

An attempt is made in this study to relate the Tamilnadu rainfall activity with the El Nino intensity. For this purpose, the past 97 years (1901-1997) rainfall data i.e., departures from normal over Tamilnadu were compared with EL Nino instances . It was found that more than 80% of the EL Nino years recorded above normal rainfall (17 out of 22 EL Nino years) and even in the remaining 20% of the cases rainfall recorded was well within the departmentally accepted normal range of  $\pm 19\%$  . To statistically evaluate this relationship a correlation coefficient was also worked out based on the last 20 years annual SST anomaly data over the Nino 3.4 region for the

period 1978 to 1997. While doing so the maximum SST anomalies recorded during the period upto August of each year only is considered, vis a vis rainfall departures for these 20 years, given in tabular form. The cc works out to 0.66, which is significant at 1% level indicating a direct relationship between EL Nino and NE monsoon rainfall over Tamilnadu.

YEAR	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
A	33	32	-24	-8	-18	12	-38	5	-26	6
B	0.0	1.0	-0.1	-0.5	1.4	0.0	-0.8	-0.3	0.5	0.6
YEAR	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
A	-38	-18	-12	-1	-6	52	1	-46	20	70
B	-1.4	-0.4	0.2	0.1	0.4	0.4	0.4	0.0	0.2	2.5

A : % Departure from Normal (Rainfall)

B : SST anomaly 3.4 Nino region (4N - 5S, 170W - 120W)

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## PROCESSING & VALIDATION OF TOVS DATA AT HRPT GROUND STATION MADRAS

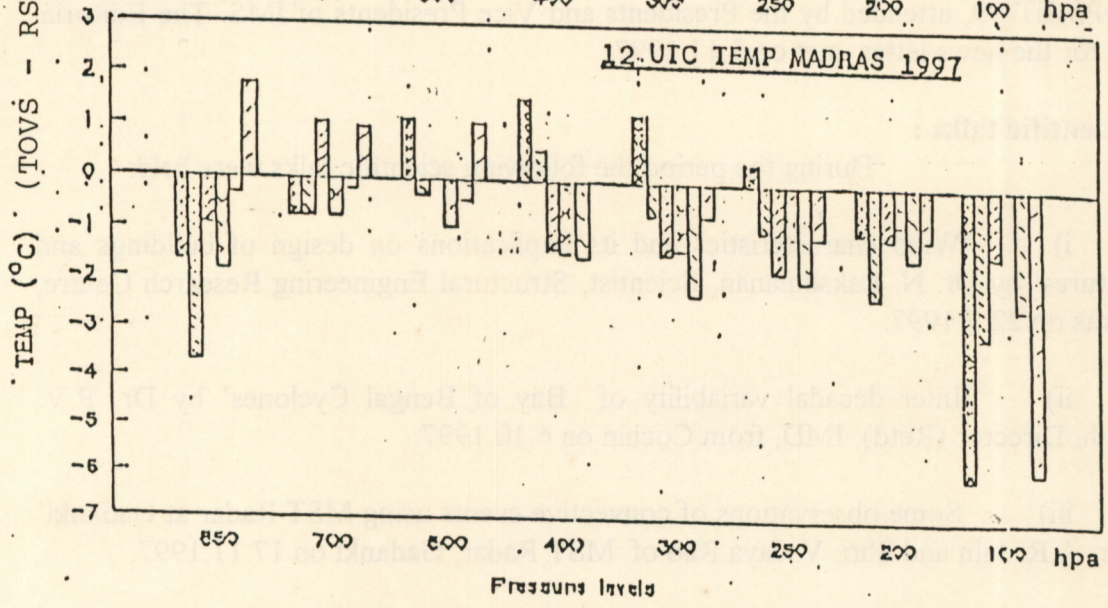
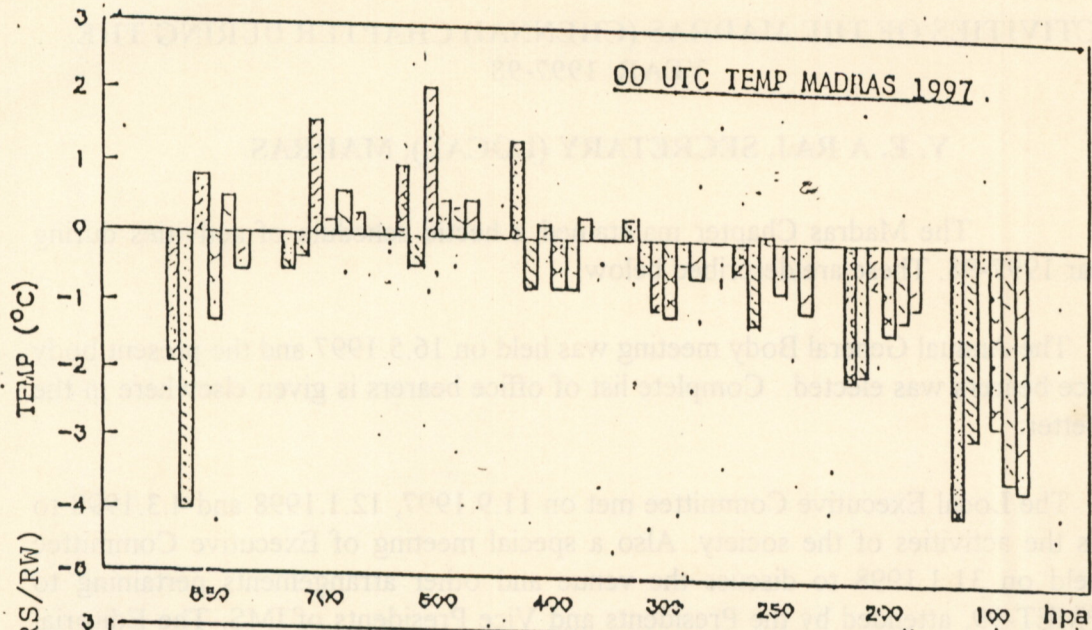
Details of HRPT Ground Station at Madras have been described by H.V.Gupta et al (Vayu Mandal 1996, 3 & 4).

Each NOAA pass gives TOVS (TIROS Operational Vertical Sounder) data of about 400 soundings of upper air temperature, dew point and geopotential at standard pressure levels from 1000 to 100 hPa besides Stability Index, total Ozone, precipitable Water Vapour and OLR for areas ranging from 10 Deg S to 40 Deg N and 60 Deg E to 100 Deg E depending on the satellite track. TOVS data are processed using the ITPP (International TOVS Processing Packages) software package developed by Wisconsin University. TOVS data of all the passes tracked at Madras are being processed and archived at HRPT Madras.

Results of validation of temperature of 00 UTC and 12 UTC of Madras for 1997 derived from satellite data have been compared with mean values of RS/RW data of Madras (1971 - 80).

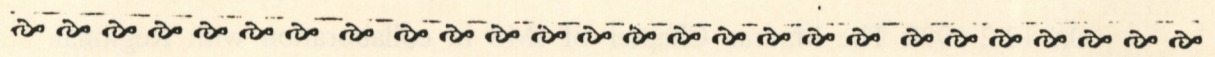
Results are represented graphically. For the sake of presentation January represents Winter, March - Premonsoon. August - Monsoon and entire Northeast Monsoon period (Oct, Nov, Dec.)

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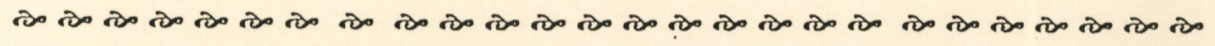
■ January   ■ March   ■ August  
 ■ October   ■ November   ■ December

Validation of TOVS data with RS / RW Data.



### TROP MET - 99

The TROP MET series of symposia organised by Indian Meteorological Society every year since 1992 will be held at Chennai during 1999 in February at Regional Meteorological Centre, Chennai. "Meteorology beyond 2000" will be the overlying theme of the symposium. Please await further details.



## ACTIVITIES OF THE MADRAS (CHENNAI) CHAPTER DURING THE YEAR 1997-98

### Y. E. A RAJ, SECRETARY (LOCAL), MADRAS

The Madras Chapter maintained a hectic schedule of activities during the year 1997-98. These are described below:

1. The Annual General Body meeting was held on 16.5.1997 and the present body of office bearers was elected. Complete list of office bearers is given elsewhere in the news letter.

2. The Local Executive Committee met on 11.9.1997, 12.1.1998 and 4.3.1998 to discuss the activities of the society. Also a special meeting of Executive Committee was held on 31.1.1998 to discuss the venue and other arrangements pertaining to TROPMET-99, attended by the Presidents and Vice Presidents of IMS. The Editorial band for the news letter met on 5.11.1997.

### 3. Scientific talks :

During the period the following scientific talks were held:

i) 'Wind characteristics and its implications on design of buildings and structures' by Dr. N. Lakshmanan, Scientist, Structural Engineering Research Centre, Madras on 22.7.1997.

ii) 'Inter decadal variability of Bay of Bengal Cyclones' by Dr. P.V. Joseph, Director (Retd), IMD, from Cochin on 6.10.1997.

iii) 'Some observations of convective events using MST Radar at Gadanki' by Dr. A.R. Jain and Shri. V. Jaya Rao of MST Radar, Gadanki on 17.11.1997.

iv) 'Tropical Cyclone Forecasting' by Prof. T.N. Krishnamurthy, Florida State University, USA and 'Thermal Convection' by Prof. (Mrs). Ruby Krishnamurthy on 10.12.1997.

### 4. Seminar :

On 12.2.1998 The Madras Chapter of IMS in collaboration with Regional Meteorological Centre, Chennai organised a half day seminar on 'North East monsoon - 1997'. The seminar held at the spacious conference hall of RMC, Chennai commenced at 1400 hrs with a welcome speech by Shri Julius Joseph, Chairman, IMS Madras Chapter and was inaugurated by Shri. A. K. Bhatnagar, DDGM, RMC Chennai. It had three scientific sessions, the first session which commenced at about 1420 hrs was chaired by Shri S. Raghavan, DDGM(Retd). Five talks were delivered in this session on the synoptic, surface, upper air features and hydrological aspects of NE monsoon-1997 by Shri S.K. Subramanian and S. Sridharan, Directors, RMC Chennai.

Shri. S. Ramakrishnan Hydro geologist, Metro water, Chennai, Shri, R. Subramanian and P.V. Sahadevan, Supdt. Engineers, PWD, Chennai. The first session ended at 1610 hrs and tea was served to all the participants.

The second session chaired by Shri. G.S. Ganesan, Director (Retd), IMD, commenced at 1630 hrs. Talks on "NE monsoon 1997" pertaining to visual media, global weather parameters, oceanographic parameters and seasonal prediction were delivered by Shri. C. Ranganathan , Director (Retd.), IMD, Smt. N. Jayanthi, Director M.O. Chennai, Shri Y. Ramachandra Rao, NIOT, Chennai and Dr. Y. E. A. Raj, Director, RMC Chennai, The second session ended at 1800 hrs. The concluding session chaired by Shri. Julius Joseph, Director, RMC Chennai consisted of brief discussions and expression of views from participants. The seminar closed at 1815 hrs with the Secretary, IMS, Chennai Chapter Dr. Y.E.A. Raj proposing a vote of thanks.

The seminar which was the first of its kind in the history of Madras Chapter of IMS was attended by more than 100 participants hailing from several scientific organisations of the city and received wide coverage in the press.

#### **5. Scientific Tour :**

A team of IMS members 21 strong visited the Vainu Bappu Observatory (VBO), Indian Institute of Astrophysics , Kavalur, located 220 Kms from Chennai during 7th and 8th of March 1998. The participants left RMC Madras at 0800 hrs of 7.3.1998 and reached VBO at 1500 hrs. The VBO located in the Javvadu hill range of the eastern ghats is spread over several acres of forest land of serene and tranquil ambience. It houses several large telescopes, the premier one being the giant 2.34 metre telescope which is the biggest in Asia, installed in 1985. The members were received by Dr.G.S.D. Babu, Resident Scientist of the VBO. The members observed planets, moon and stars during the 7th night and 8th early morning. The participants left VBO at 0900 hrs of 8th and reached Madras at 1500 hrs.

Special thanks are due to Dr.G.S.D. Babu for the hospitality extended during the team's stay at VBO and for the interest and diligence he displayed in explaining the various details of the telescopes and heavenly bodies to the participants. The tour to VBO was the third one in the sequence of scientific tours organised by the Madras Chapter in recent years. The first one was conducted in September 1994 to MST Radar, Tirupathi and second one was in October 1996 to IGCAR, Kalpakkam.

6. The IMS Madras Chapter has enrolled 36 members during the current year. The membership at present stands at 115 including 9 life members. The complete list of members is separately given.

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SOLUTION TO CROSSWORD - I

1	M	O	N	2	S	O	O	N		3	C		4	R		5	C
	O			T					6	R	O	T	A	R	Y		
7	I	8	N	9	S	A	10	T		11	E		L		D		C
12	S	O	P		H		N					13	H	A	I	L	
14	T	O	R		15	U	L	T	R	A			R		O		
16	U	N	I	O	N		H			17	N	18	O	S	I	G	
	R		N		19	D	R	A	G		S						E
20	E	21	R	G		E		L		22	L		23	F	24	T	N
	A			25	T	R	26	O	P	27	I	C		28	I	R	E
29	D	D			R		30	C	Y	C	L	O	N	E	S		
	31	32	O	Z	O	N	E		A				33	E	N	E	
	34	N	E	P	H	A	L	O	35	G	36	Y		37	D	S	
38	N	S	E	O		N				39	G	Y	U				

SOLUTION TO CROSSWORD - II

1	A	P	O	G	2	E	E		3	I	
4	L	O	5	W		L		6	A	C	
	T		7	M	A	R	S		E		
8	I	S	O								
9	M	10	E	T	E	11	O	R		12	R
	E	Y	13	H	A	Z	E		A		
14	T	E	J			O		15	C	D	
	E					16	N	O	A	A	
17	R	I	D	G	E				T	R	

CROSSWORD DRAFTING BY M.Bharathiar, R.M.C



LIST OF MEMBERS OF INDIAN METEOROLOGICAL SOCIETY  
MADRAS (CHENNAI) CHAPTER AS ON 1-5-1998

Members who have not paid their subscription for the year 1997-98 may kindly remit the same early. Any change of address may be communicated to the Secretary to enable us to keep you in the mailing list. Please help us to enroll new members to the society.

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1	Shri.K.S. Achari
2	Kum. B. Amudha
3	Kum.S. Anila
4	Shri.V. Anandan
5	Shri.A.C. Aruljothi
6	Shri.P.P. Baburaj
7	Kum.M.G. Bharathi
8	Shri.M. Bharathiar
9	Shri.A.K. Bhatnagar
10	Shri.R. Dasasatyan
11	Shri.V. Elango
12	Shri.D. Gajapathy
13	Smt.B. Geetha
14	Shri.T. Govindaraju
15	Shri.M.V. Guhan
16	Shri.R.C. Gupta
17	Shri.A.A. Iqbal
18	Smt.S. Jagannathan
19	Shri.V.P. Jayachandran
20	Smt.J. Jayapal
21	Shri.J. Joseph
22	Shri.P. Karthikeyan
23	Shri.G.V. Kumar
24	Shri.A.K. Kumararaja
25	Shri.R. Madhavan
26	Smt.G.C. Meenakshi
27	Kum.A.J. Murikan
28	Shri.A. Muthuchami
29	Smt.P. Nageshwari
30	Shri.A. Nallasamy
31	Shri.N.V.S. Namboodhri
32	Smt.O.M.M. Nandakumar
33	Shri.P. Nandakumar
34	Shri.S. Natarajan
35	Shri.V. Natarajan
36	Kum.P.J. Nirmala
37	Shri.K. Perumal
38	Shri.P. Perumal
39	Shri.A.S. Ponnuswamy
40	Shri.S.W. Premkumar
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42	Dr.Y.E.A. Raj
43	Shri.K. Rajarajan
44	Shri.K. Rajendran
45	Shri B. Ramakrishnan
46	Shri.V.K. Raman
47	Shri.K. Ramesh
48	Shri.M.S. Ranganathan
49	Shri.S.C. Rao
50	Shri P.C.S. Rao
51	Smt.M. Revathi
52	Shri.P.V. Revikumar
53	Shri.S. Rengarajan
54	Shri.P.V. Bankaran

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(Contd in outside back cover, pto)

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 56 Shri.N. Selvam  
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 58 Shri.S. Sridharan  
 59 Smt.P.A. Subhadra  
 60 Shri.S.K. Subramanian  
 61 Shri.E.R. Sukumar  
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