

## South American Monsoon Time Scale

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**Abstract:** Many researches are being conducted by me on the global monsoon systems from 1980 to till date with an ideal to invent the mysteries of the world global monsoon system and formulating the basics of the Global Monsoon Time Scales to predict the weather changes and natural calamities in advance. In 1991, I submitted a research report on the world global monsoon systems along with a special report on Indian Monsoon Time Scale to Sri G.M.C. Balayogi, Member of Parliament (Lok Sabha). Sri G.M.C. Balayogi recommended that research report to the India Meteorological Department for implementation in the services of the people. In 1994, The Cabinet Secretariat of India recommended the Global Monsoon Time Scales to the Ministry of Science & Technology, Govt of India for implementation. In 1996, Many consultations were made with the Parliament House, President of India and other VVIPs. In 2005, Consultations were made with the India Meteorological Department about the Global Monsoon Time Scales for further research and development in the services of the people. In 2009, The Secretary, Minister of Science and Technology was also recommended the Global Monsoon Time Scale to the Indian Institute of Tropical Meteorology for further research and development.

I have conducted many scientific researches on the Global Monsoon Time Scales and as a part these researches, I invented the South American Monsoon Time Scale which can help to study the past, present and future movements of the South American Monsoon.

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**Key words:** Global Monsoons Time Scales, South American Monsoons Time Scale.

### Introduction:

Monsoon means a seasonal reversing wind accompanied by its corresponding weather changes and natural calamities in precipitation. We cannot be said that a monsoon especially to be relevant to a particular continent, region or country. Each and every continent or region or country has its own monsoon winds. By establishing the Monsoon Time Scale and maintain, a country can be estimated the impending weather conditions and natural calamities such as rains, floods, landslides, avalanches, blizzard and droughts, extreme winter conditions, heavy rainfall, mudflows, extreme weather, cyclones, cloud burst, sand storms, hails and winds etc all climatological, meteorological and weather related weather conditions & natural calamities in advance. Surface water resources can still be found.

### Global Monsoon Time Scales:

I have conducted many researches on the world global monsoon systems and invented the Global Monsoons Time Scales, Regional Monsoons Time Scales, Sub-Regional Monsoons Time Scales, Country-wise local Monsoons Time Scales, Northern Monsoons Time Scales, Southern Monsoons Time Scales, Summer Monsoons Time Scales, Winter Monsoons Time Scales including the South American Monsoons Time Scale which can help to study the past's, present and future movements of Global

Monsoons and its relationship with rainfall and other weather problem and natural calamities. We can make separate monsoon time scales per each and every individual country.

### South American Monsoon:

The South American Monsoon System (SAMS) is one of the major monsoon systems of the Southern Hemisphere. SAMS wet season in tropical South America begins in early October over the Brazilian Highlands and spreads northward. The mature phase of SAMS prevails between December and February and demise in April. The annual cycle of precipitation is most pronounced in Southern Amazon, where some of the largest seasonal rainfall occurs. Moisture for the SAMS has its origin in the easterly trade wind circulation rooted in the Atlantic Ocean. On inter-annual scale the SAMS is significantly influenced by the variability associated with the El Nino Southern Oscillation, Pacific Decadal Oscillation, Atlantic Multi-decadal Oscillation and the Atlantic variability.

### Construction:

Keeping in view of study of the aforesaid Keeping in view of study of the aforesaid South American Monsoon thoroughly, I have prepared the South American Monsoon Time Scale South American Monsoon Time Scale is a Chronological sequence of events arranged in between time and weather with the help of a scale for studying the

past's, present and future movements of South American monsoon and its relationship with rainfall and other weather problem and natural calamities. Prepare the South American Monsoon Time Scale having 365 horizontal days from March 21<sup>st</sup> to next year March 20<sup>th</sup> of a required period comprising of a large time and weather have been taken and framed into a square graphic scale.

**Collection of data:**

The monsoon pulses in the form of low pressure systems main weather events if any of the South American monsoon region have been taken as the data to prepare this scale.

**Maintanance:**

The main weather events if any of the South American monsoon have been entering on the Indian Monsoon Time Scale as per date and month of the each and every year. If we have been managing this scale in this manner continuously, we can study the past, present and future movements of South American monsoon.

**Indian Monsoon Time Scale:**

In order to make the South American Monsoon Time Scale, I prepared a model scale for the Indian monsoon named Indian Monsoon Time Scale it is a compelling scale to prepare the South American Monsoon Time Scale. Take Indian Monsoon Time Scale as an example to develop the South American Monsoon Time Scale.

**Construction:**

Keeping in view of study of the aforesaid Indian Monsoon thoroughly, I have prepared the Indian Monsoon Time Scale. The Indian Monsoon Time Scale – a Chronological sequence of events arranged in between time and weather with the help of a scale for studying the past's, present and future movements of monsoon of a country and its relationship with rainfall and other weather problems and natural calamities. From where to wherever to be taken the time and weather to analyse, the researcher can decide on his discretion according to available data. I have prepared the Indian Monsoon Time Scale having 365 horizontal days from March 21<sup>st</sup> to next year March 20<sup>th</sup> or from 1<sup>st</sup> April to next year March 31<sup>st</sup> of 139 years from 1888 to 2027 of/or a required period comprising of a large time and weather have been taken and framed into a square graphic scale. An accurate scale is available if we can collect and analyse the exact weather data. For example, I did not get comple te data from the year of 1964. However, I will try to collect the weather data hardly and complete the scale.

Fixed type scale: Prepare the Indian Monsoon Time Scale having 365 horizontal days from March 21<sup>st</sup> to next year March 20<sup>th</sup> or from 1<sup>st</sup> April to next year March 31<sup>st</sup> of 139 years from 1888 to 2027 of/or

a required period comprising of a large time and weather have been taken and framed into a square graphic scale. All 365 days and 189 years to be analysed in a single and fixed type scale. It can be fixed on a wall or Table.

Parts type scale: The fixed type scale is to be long. So that it is divided into four parts easy to carry and keep and suitable for publication. I designed to make it into 4 parts and then pasted it into one scale.

The first part is beginning from 1<sup>st</sup> April to July 12<sup>th</sup>.

The second part is from 13 July to October 23<sup>rd</sup>.

The third part is from 24<sup>th</sup> October to February 3<sup>rd</sup>.

And the fourth part is 4<sup>th</sup> February to March 31<sup>st</sup> ending.

These separate scales can be pasted into one scale as explained below.

Cut along the edges of dates on the rightside of the first part and paste it to along the edges of date of 13th July on leftside of the second part.

Cut along the edges of dates on the rightside of the second part and paste it to along the edges of date of 24<sup>th</sup> October on leftside of the third part.

Cut along the edges of dates on the rightside of the third part and paste it to along the edges of date of 4<sup>th</sup> February on leftside of the fourth part.

When paste this manner, we get long full scape Indian Monsoon Time Scale.

Further the scale has been prepared in three types.

**Basic Scale:**

The first one is preliminary basic scale, it explains the structure of the scale.

**Filled Scale:**

The second one is filled by data scale, it explains how to fill or manage the scale.

**Analyzed Scale:**

And the third one is filled and analyzed by data, it explains monsoon patterns of the scale.

**Computer Graphic Scale:**

Besides the above manual scale, I have prepared a computer graphic scale generated by the system from the year 1888 to 1983 for the period of 1<sup>st</sup> June to September 30<sup>th</sup>. If we are able to create this scale by computer which to be the most obvious scale.

**Collection of data:**

The monsoon pulses in the form of low pressure systems over the Indian region have been taken as the data to the construction of this scale. For this, a lot of enormous data of low pressure systems, depressions and cyclone has been taken from many resources just like Mooley DA, Shukla J (1987); Charecteristics of the west ward-moving summer monsoon low pressure systems over the Indian region and their relationship with the monsoon rainfall. centre for ocean-land

atmospheric interactions, university of Maryland, college park, MD., and from many other resources.

**Maintanance:** The monsoon pulses in the form of low pressure systems over the Indian region have been entering on the scale in stages by 1 for low, 2 for depression, 3 for storm, 4 for severe storm and 5 for severe storm with core of hurricane winds pertaining to the date and month of the each and every year. If we have been managing the scale of a country in this manner continuously, we can study the past, present and future movements of monsoon of a country.

**Analysis:**

The Indian Monsoon Time Scale reveals many secrets and mysteries about the relationship in between the Global monsoons and astronomical bodies just like movement of axis of the earth around the sun in the universe & its influences on the earth's geophysical atmosphere. Let's study the mystery of the south-west monsoon and discuss the rest of other features of the Indian Monsoon Time Scale later.

**Monsoon Path-lines:**

When examine the scale notice that several passages or path-ways of monsoon pulses it have been some cut-edge paths and splits passing through its systematic zigzag cycles in a systematic manner in parallel and stacked next to each other in ascending and ascending order clearly seen on the Indian Monsoon Time Scale. By reason of travel of these passages, heavy rains & floods in some years and droughts & famines in another years according to their travel. The path of monsoon when travelling over four months from june to september good rainfall or heavy rains and floods can occur. And the path when travelling over last months i.e july or august or sepetember, low rainfall and droughts can occur. Particularly, there are two main passages. The first one is main path or passage of the south-west monsoon and the second one is path or passage of the north-east monsoon. The first one is on the left side over the months of june, july, august, september (South-west monsoon) and another path on the rightside over the months of october, november, december (north-east monsoon) are visible in the Indian Monsoon Time Scale

**Description;**

Keep track the Indian Monsoon Time Scale carefully. During 1871-1900's the main path-way of the Indian monsoon was rising over June, July, August. During 1900-1920's it was falling over August, September. During 1920-1965's, it was rising again over July, August, September. During 1965-2004's it was falling over September. From 2004 it is now rising upwards and estimated traveling over the months of June, July, August by the 2060.

By 1888 the line of path of the Indian Monsoon was started over the month of june and travelled to

1900's in steep descending direction. During this 4 months period of (june, july, august, september) of indian monsoon season. the line of path of the monsoon was travelled over all these four months. As a result, there were heavy rains and floods in most years.

From 1900 to 1920, the line of path of the indian monsoon was travelled over the months of August and September in the shape of concave direction. In this 4 months monsoon season, the line was travelled just over two months only. That means june and july rain was lost during the period, as a result it rained only two months instead of four months monsoon season and causing low rainfall in many years,

From 1920 to 1965, the line of path of the indian monsoon was travelled over the months of july, august and september in the shape of convex direction. In this 4 months monsoon season, the line was travelled over three months. That means one month june rain was lost during the period, as a result it rained only three months instead of four months monsoon season. and resulting good rainfall in more years.

From 1965 to 2004, the passage of the indian monsoon was travelled over the months of august to mid-august in the shape of deep sloping direction, In this 4 months monsoon season, the line was travelled just over two months for a shord period only. That means two months i.e june and july rain was lost during the period, as a result it rained only two months instead of four months monsoon season. and causing low rainfall and droughts in many years.

From 2004, the line of path of the indian monsoon seems likely rising over the months of july and june in future in the shape of upper ascending direction and will be resulting heavy rains & floods in coming years during 2004-2060.

**Studies:**

During the period 1871-2015, there were 19 major flood years:1874, 1878, 1892, 1893, 1894, 1910, 1916, 1917, 1933, 1942, 1947, 1956, 1959, 1961, 1970, 1975, 1983, 1988, 1994.

And during the period 1871-2015, there were 26 major drought years: 1873, 1877, 1899, 1901, 1904, 1905, 1911, 1918, 1920, 1941, 1951, 1965, 1966, 1968, 1972, 1974, 1979, 1982, 1985, 1986, 1987, 2002, 2004, 2009, 2014, 2015. Depending on the data mentioned above, it is interesting to note that there have been alternating periods extending to 3-4 decades with less and more frequent weak monsoons over India.

For example, the 44-year period 1921-64 witnessed just three drought years and happened good rainfall in many years. This is the reason that when looking at the Indian Monsoon Time Scale you may note that during 1920-1965's, the passage of the indian monsoon had been rising over July, August,

September in the shape of concave direction and resulting good rainfall in more years.

During the other periods like that of 1965-87 which had as many as 10 drought years out of 23, This is the reason that when looking at the Indian Monsoon Time Scale you may note that during 1965-2004's the path of the Indian monsoon had been falling over the September in the shape of convex direction and causing low rainfall and droughts in many year.

The Indian Monsoon Time Scale reveals many secrets of the monsoon & its relationship with rainfall & other weather problems and natural calamities. Some bands, clusters and paths of low pressure systems clearly seen in the Indian Monsoon Time Scale, it have been some cut-edge paths passing through its systematic zigzag cycles in ascending and ascending orders which causes heavy rains & floods in some years and droughts & famines in another years according to their travel. And also we can find out many more secrets of the Indian monsoon such as droughts, famines, cyclones, heavy rains, floods, onset & withdrawals of south west monsoon and north-east monsoon etc. by keen study of the Indian Monsoon Time Scale. The passages clearly seen in the Indian Monsoon Time Scale are sources of monsoon pulses. The tracking date of main path & other various paths such as south-west monsoon and north-east monsoon etc., of the Indian Monsoon denotes the onset of the monsoon, monsoon pulses or low pressure systems. These observations can mean that pulses of the monsoon are repeatedly determined by the number of repeats.

These are just some of the analyzes in the study of the Indian monsoon. There are many more secrets in the Indian monsoon. Indian scientists should get rid of them.

**Principle:**

This is an Astrogeophysical/ Astrometeorological phenomenon of effects of astronomical bodies and forces on the earth's geophysical atmosphere. The cause is unknown however the year to year change of movement of axis of the earth inclined at 23½ degrees from vertical to its path around the sun does play a significant role in formation of clusters, bands & paths of the Indian Monsoon and stimulates the Indian weather. The inter-tropical convergence zone at the equator follows the movement of the sun and shifts north of the equator merges with the heat low pressure zone created by the rising heat of the sub-continent due to direct and converging rays of the summer sun on the India Sub-Continent and develops into the monsoon trough and maintain monsoon circulation.

**Climate detection methods:**

The tracking date of main path & other various paths such as south-west monsoon and north-east monsoon etc., of the Indian Monsoon denotes the

onset of the monsoon, monsoon pulses or low pressure systems, storms and its consequent secondary hazard Sand Storms etc. And also we can find out many more secrets of the Indian monsoon such as droughts, famines, cyclones, heavy rains, floods, real images of the Indian Monsoon, and onset & withdrawals of south west monsoon and north-east monsoon etc. by keen study of the Indian Monsoon Time Scale.

For example, the date of tracking ridge of path is the sign to the impending cyclone and its secondary consequent hazard floods, storm surges etc.,

Another example, the thin and thick markers on the upper border line of the Indian monsoon time scale are the signs to the impending heavy rains & floods and droughts & floods. The thick marking of clusters of low pressure systems on the Indian monsoon time scale is the sign to the impending heavy rains and floods and the thin marking of clusters of low pressure systems on the Indian monsoon time scale is the sign to the impending droughts and famines.

Furthermore example, the main passage of line of monsoon travel from June to September and September to June are also signs to impending weather conditions of a country. For example, during 1871-1990's the main path of the Indian Monsoon was rising over June, July, August and creating heavy rains and floods in most years. During 1900-1920's it was falling over August, September and causing low rainfall in many years. During 1920-1965s, it was rising again over July, August, September and resulting good rainfall in more years. During 1965-2004's it was falling over September and causing low rainfall and droughts in many years. At present it is rising upwards over June, July, August, and will be resulting heavy rains & floods in coming years during 2004-2060 in India.

These are some examples only. We can find out many more secrets of a country weather conditions by keen study of its monsoon time scale.

**Uses:**

South American Monsoon Time Scale used to forecast the weather changes and natural hazards of the South American Monsoon in advance. All other weather related natural hazards such as avalanches, cyclones, damaging winds, droughts and water shortage, floods, thunderstorms, tornados, tropical cyclones, typhoons etc pertaining to this South American Monsoon can be predicted.

By establishing the South American Monsoon Time Scales can help to study the movements of the one's country's monsoon and its monsoon related weather changes and natural hazards.



**Conclusions:**

We can make many more modifications thus bringing many more developments in the South American Monsoon Time Scales.

**Acknowledgements:**

In this research, I have consulted many Professors of several Universities and Scientists of various Research Institutes for their valuable suggestions and advices. There was also taken some information from the Wikipedia. I am grateful to all of them.

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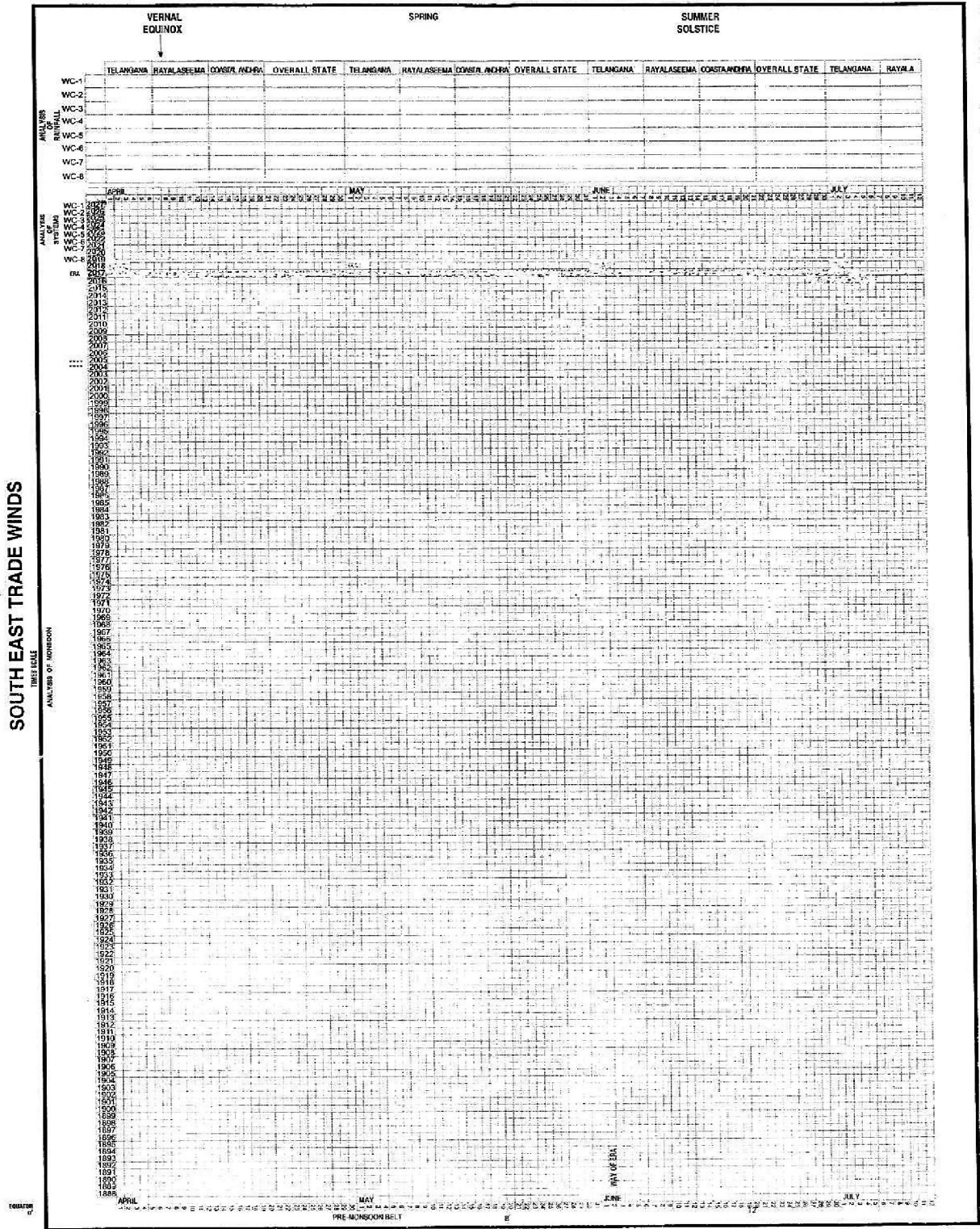
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1. Mooley DA, Shukla j (1987); Characteristics of the west ward moving summer monsoon low pressure systems over the Indian region and their relationship with the monsoon rainfall.
2. The world's 7 Tropical Cyclone seasons around the world.
3. Monsoon (n.d.). Retrieved from <http://en.m.wikipedia.org/wiki/monsoons> etc.

**Phonological Appendes:**

The Appendes that describe the contents are enclosed.

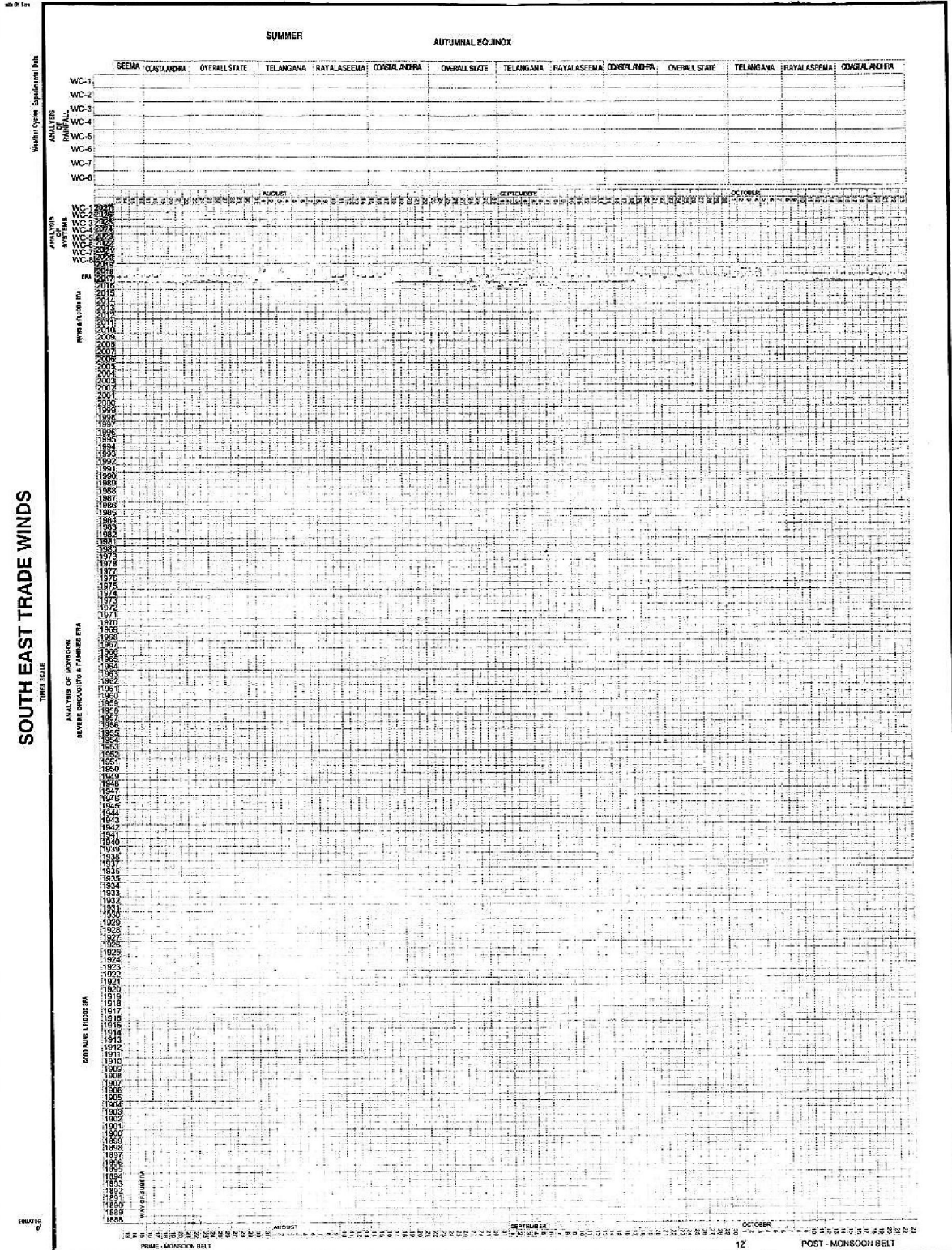
Appendices:



THE ITCZ SET FORTH OVER EQUATOR Trade Winds Converge at the ITCZ of i.e. a low pressure region at the equator The ITCZ Moves north wards over the Indian region The ITCZ passing over the Andhra Pradesh



# INDIAN MONSOON

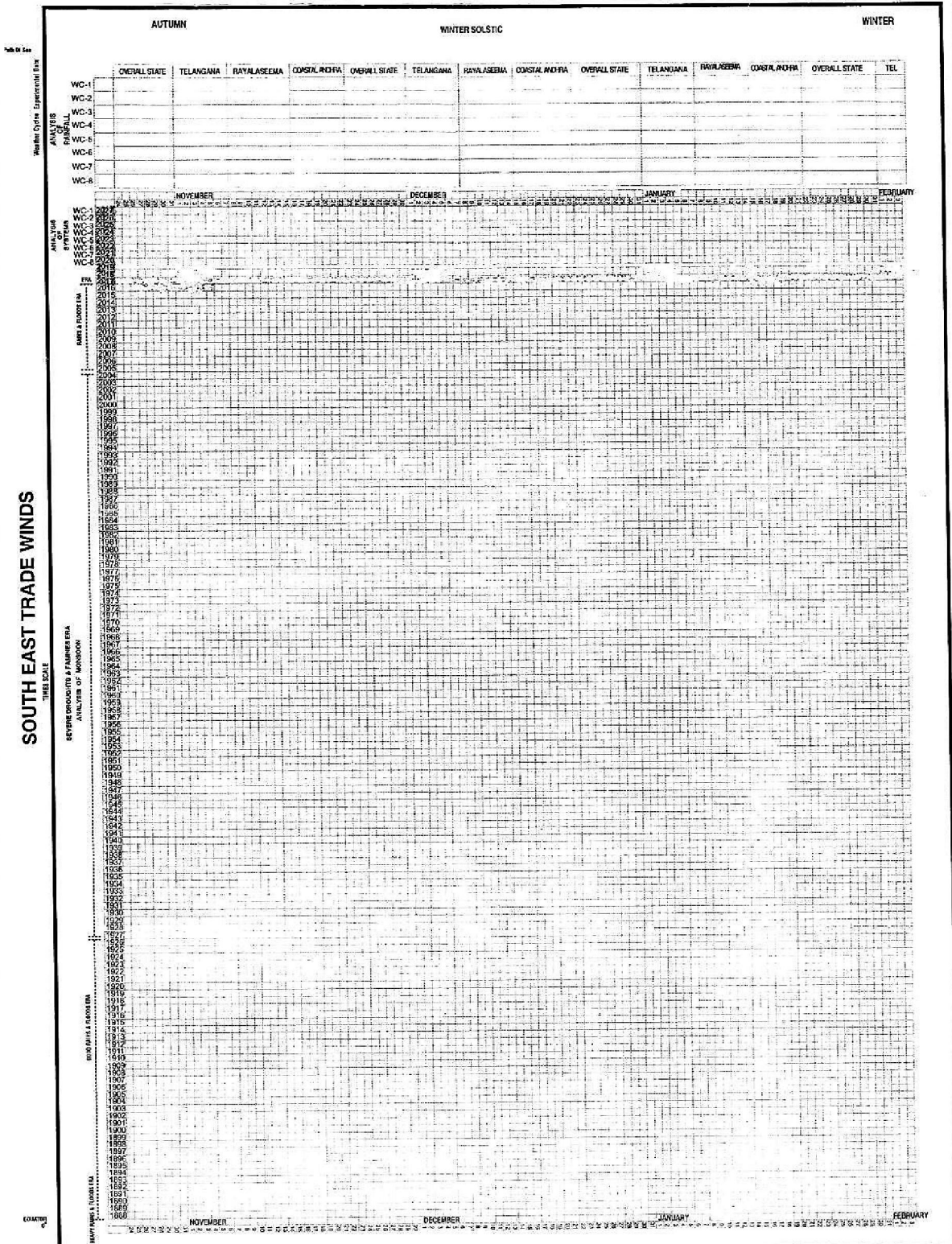


SOUTH EAST TRADE WINDS

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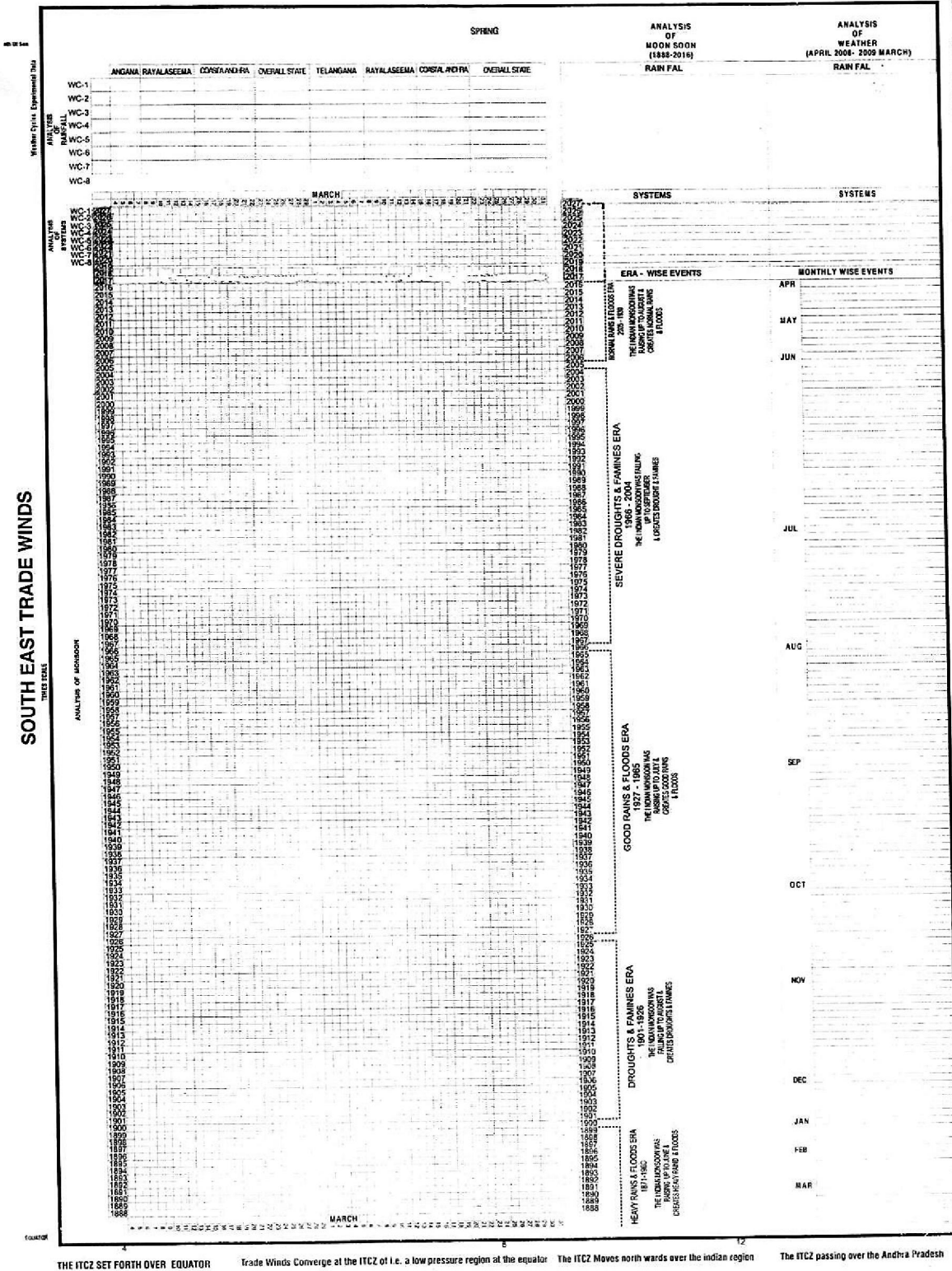
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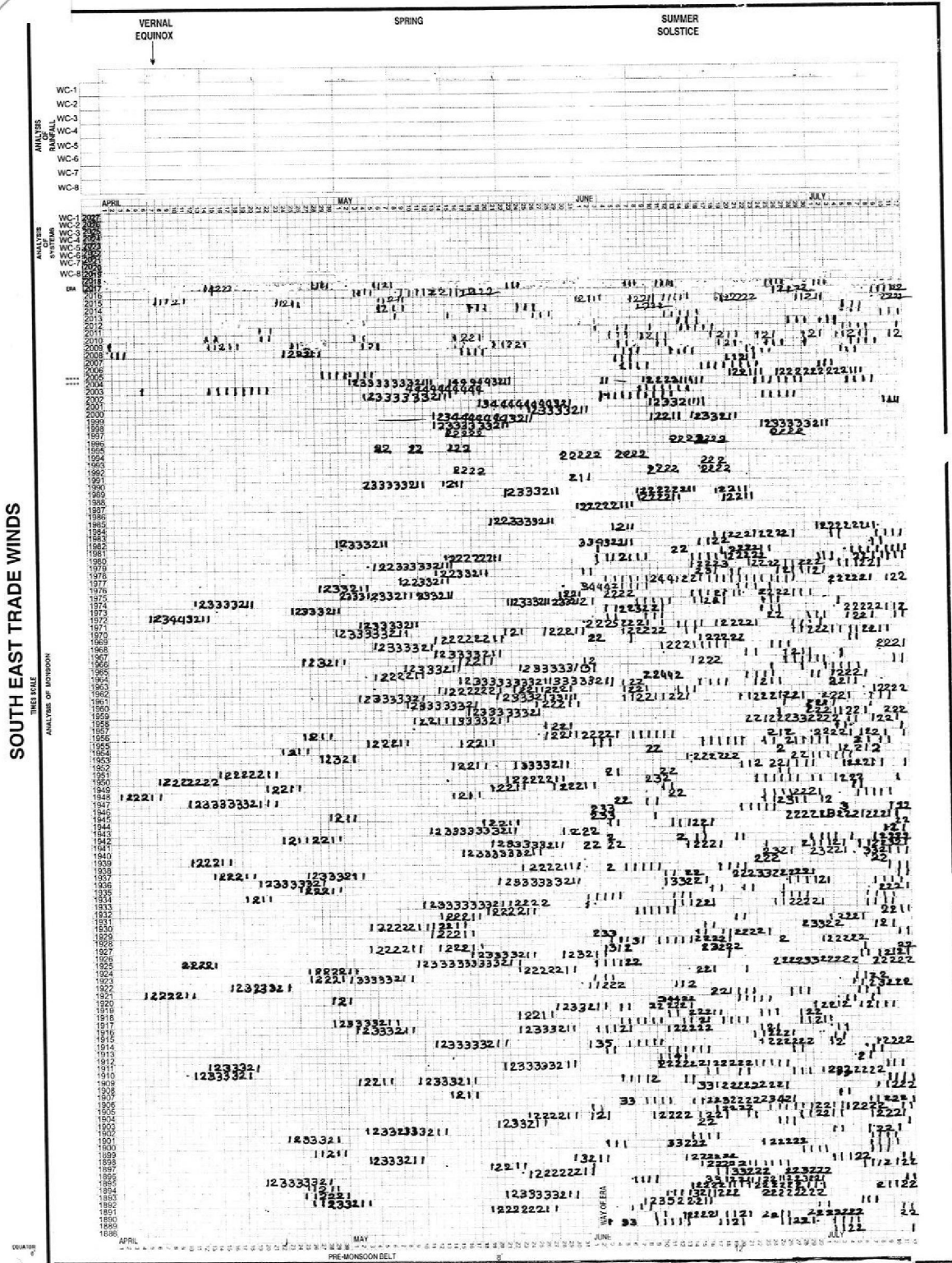


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TIME SCALE

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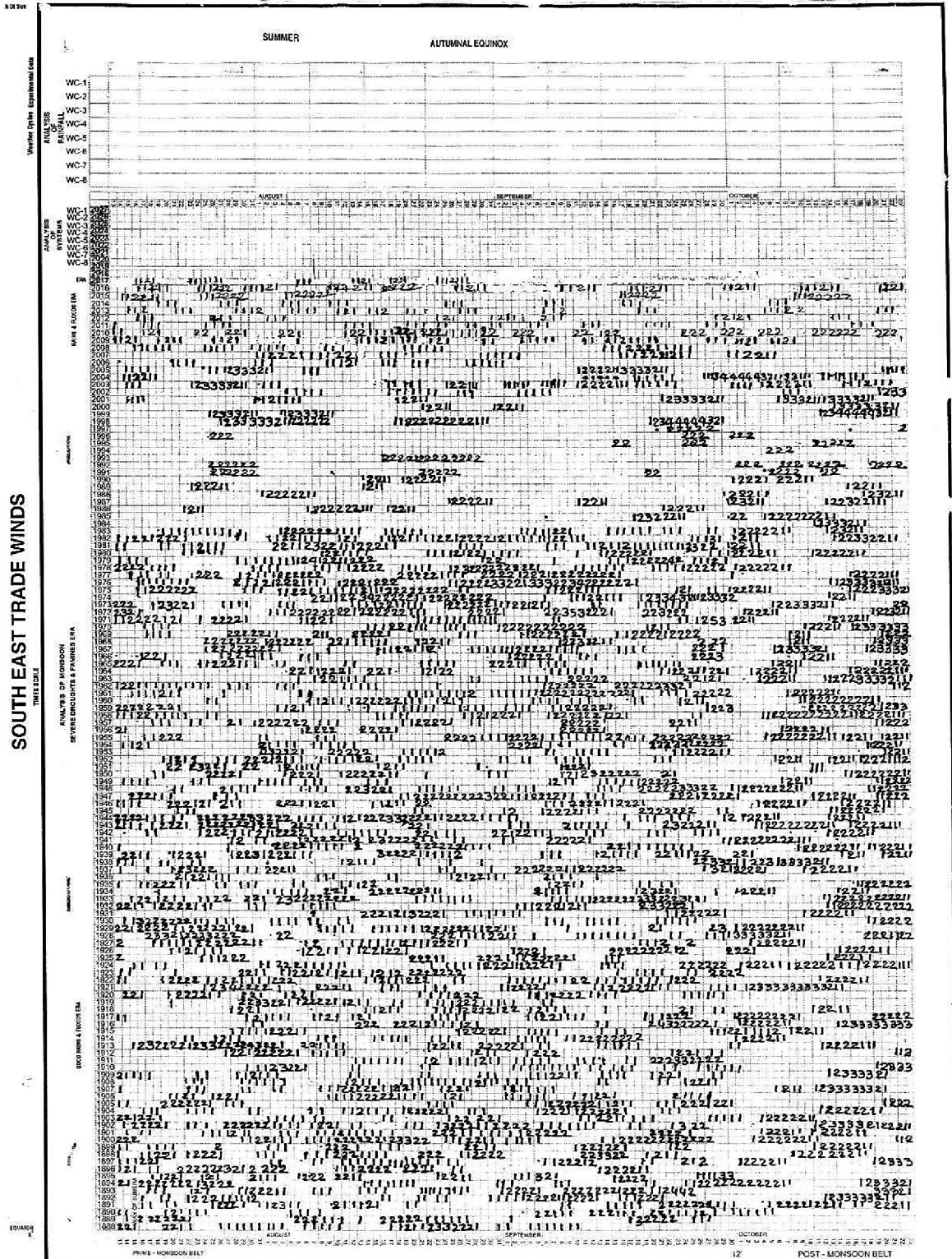




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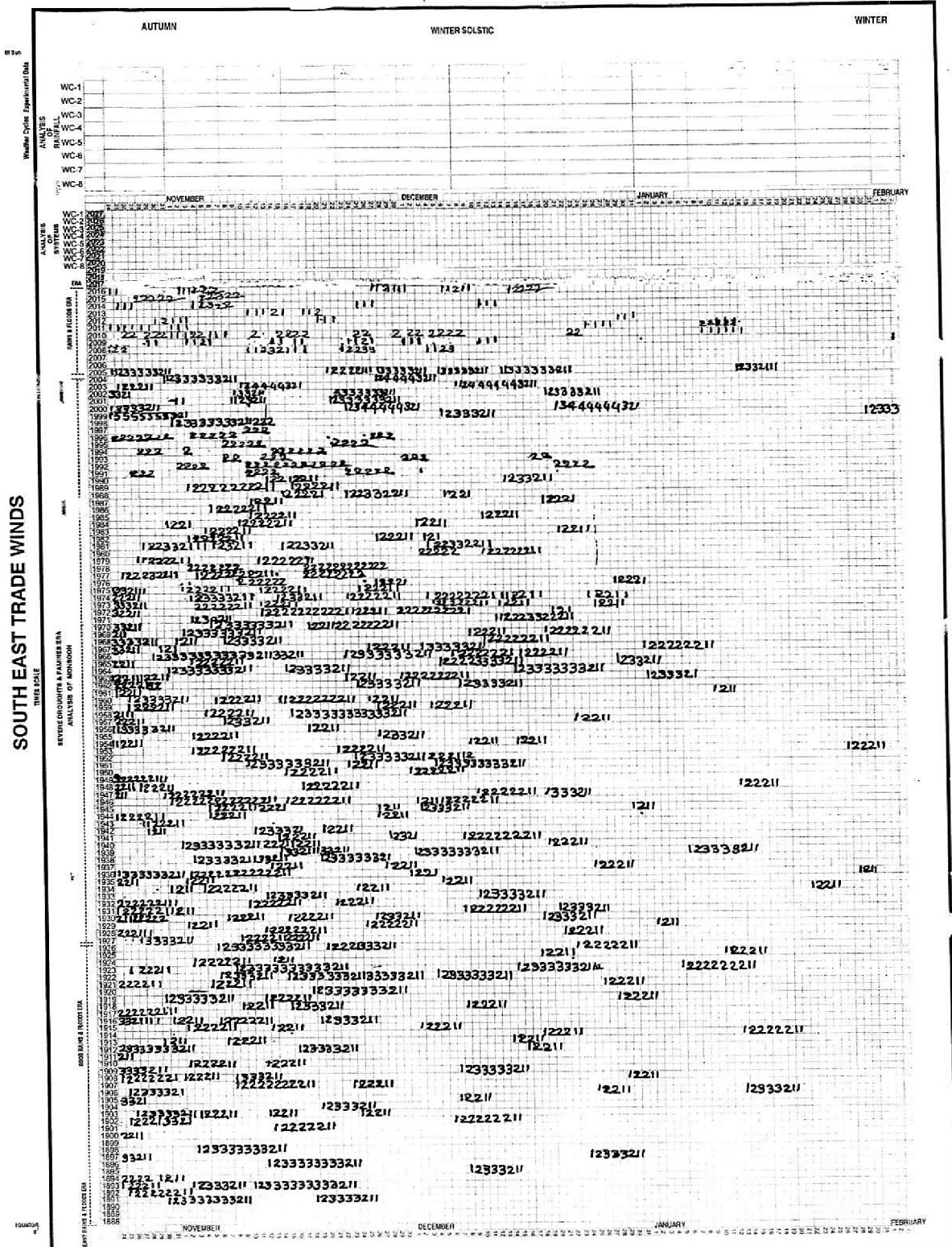


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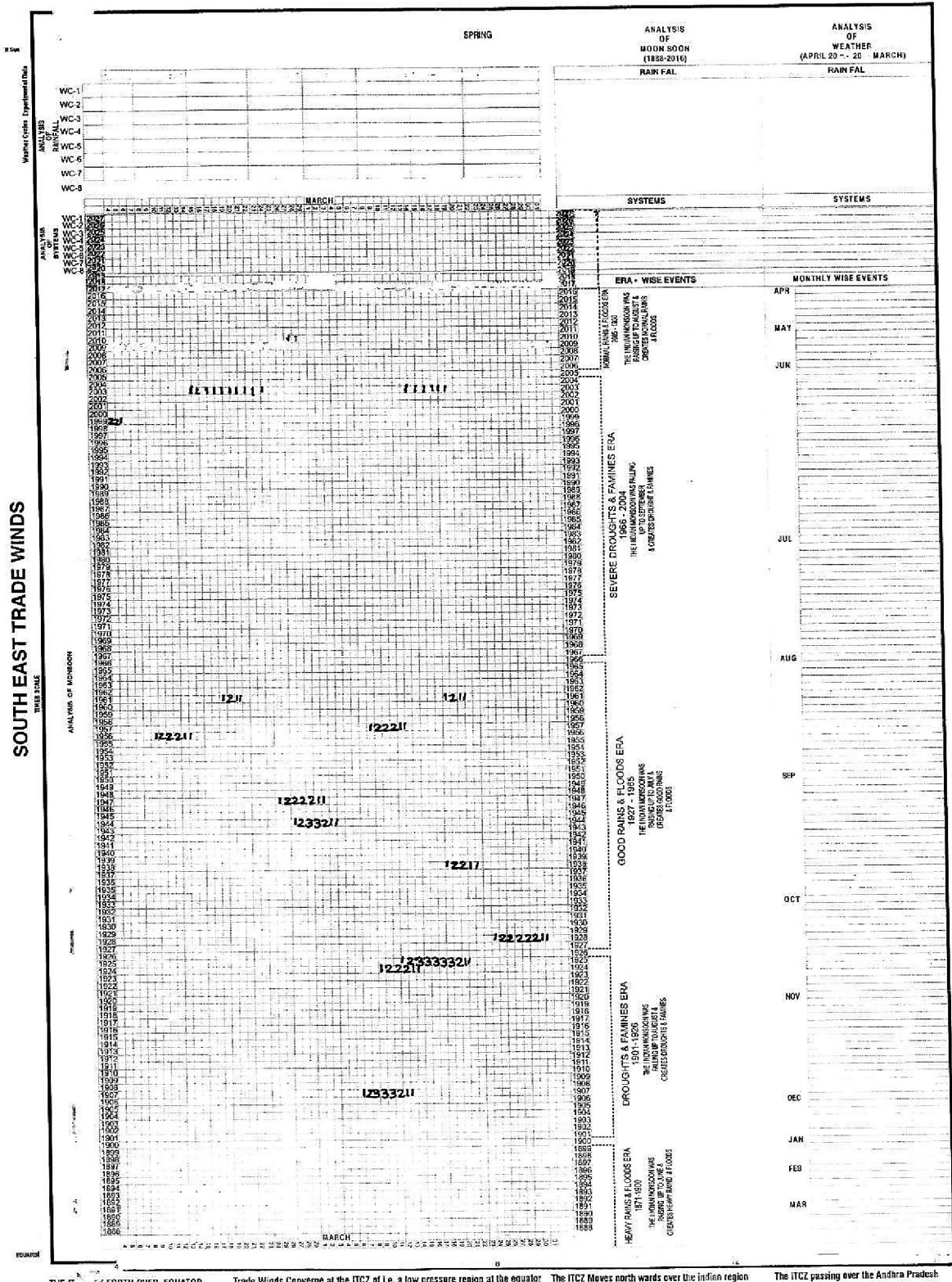
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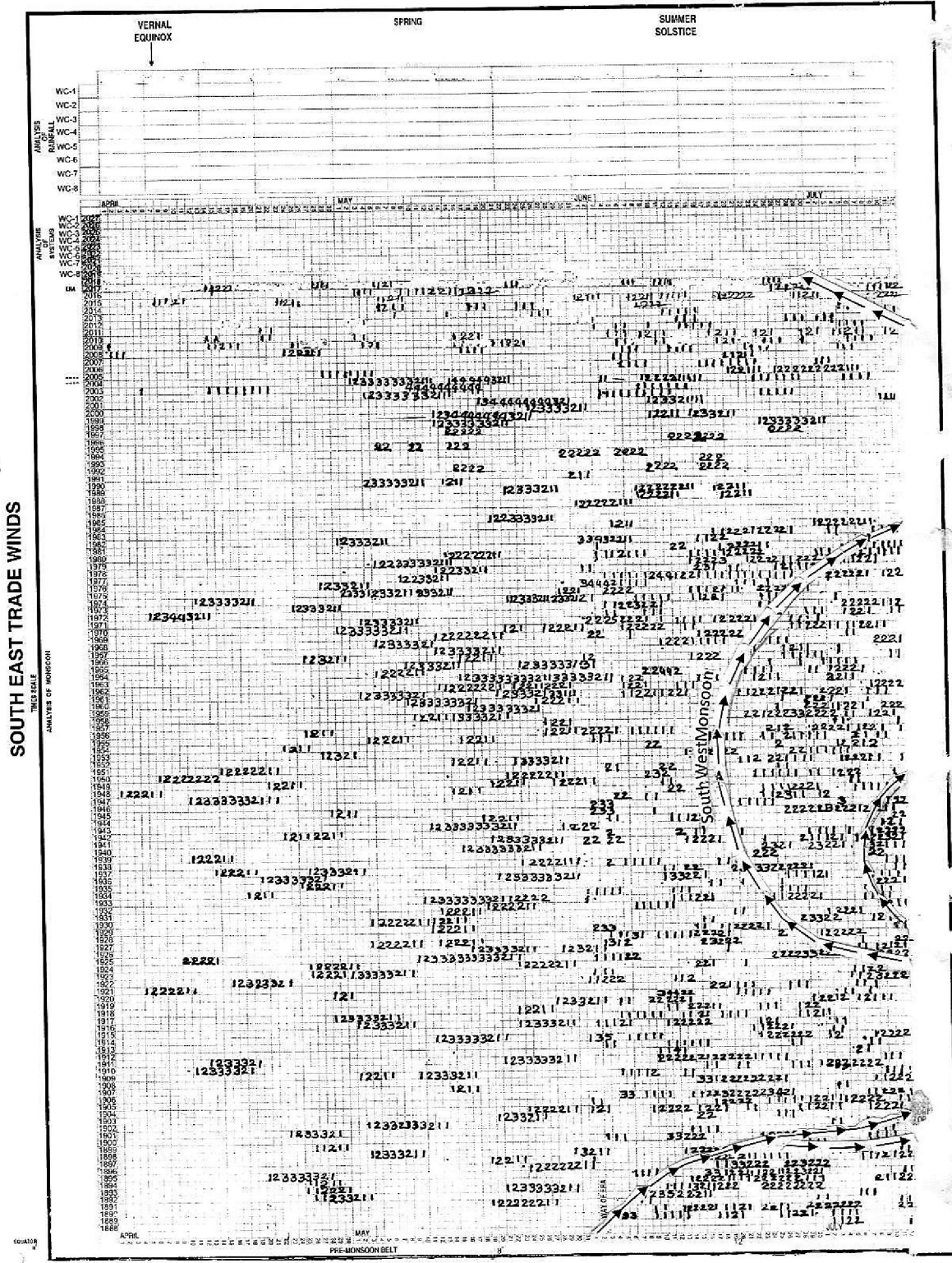
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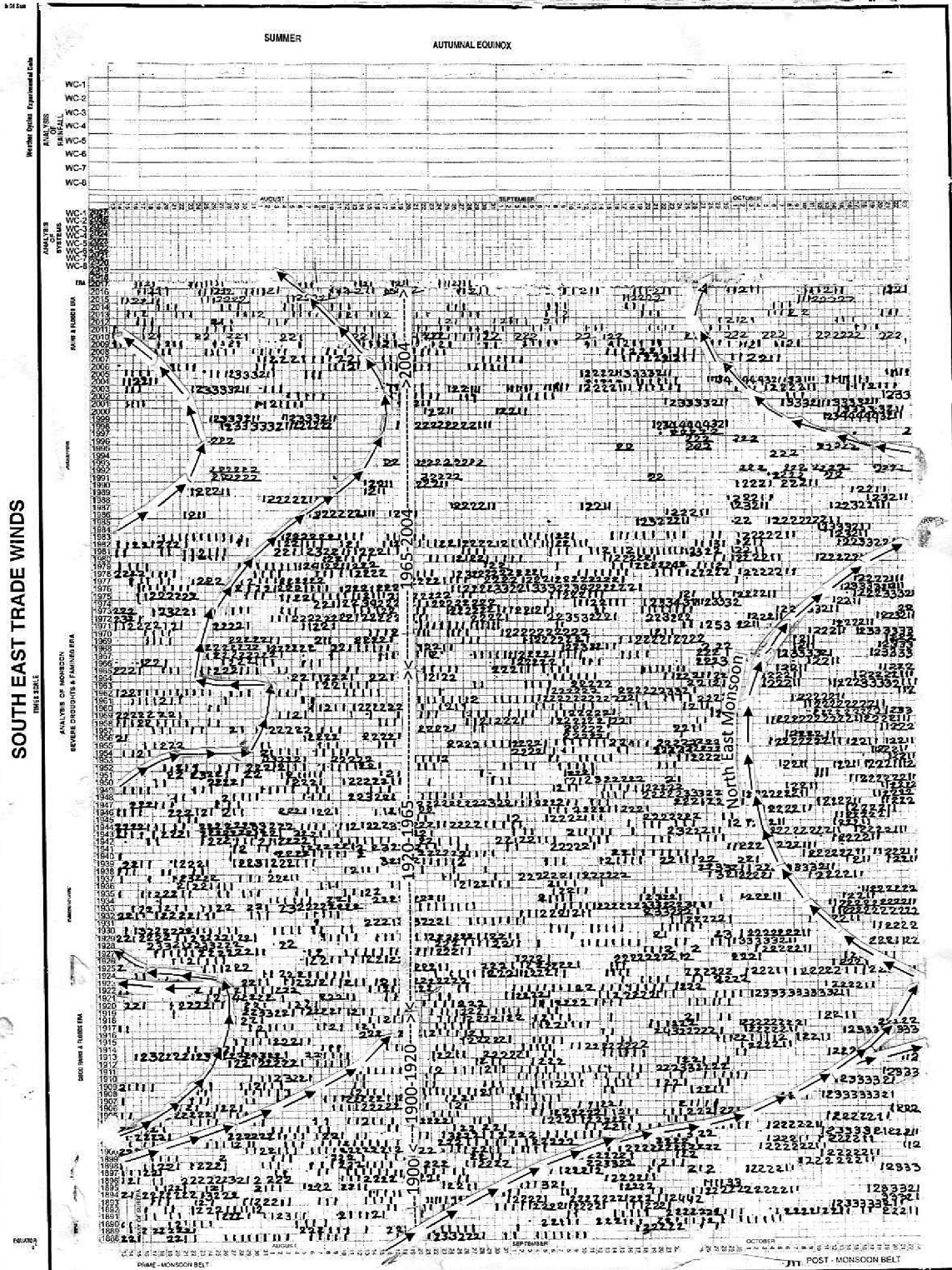




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# INDIAN MONSOON



SOUTH EAST TRADE WINDS

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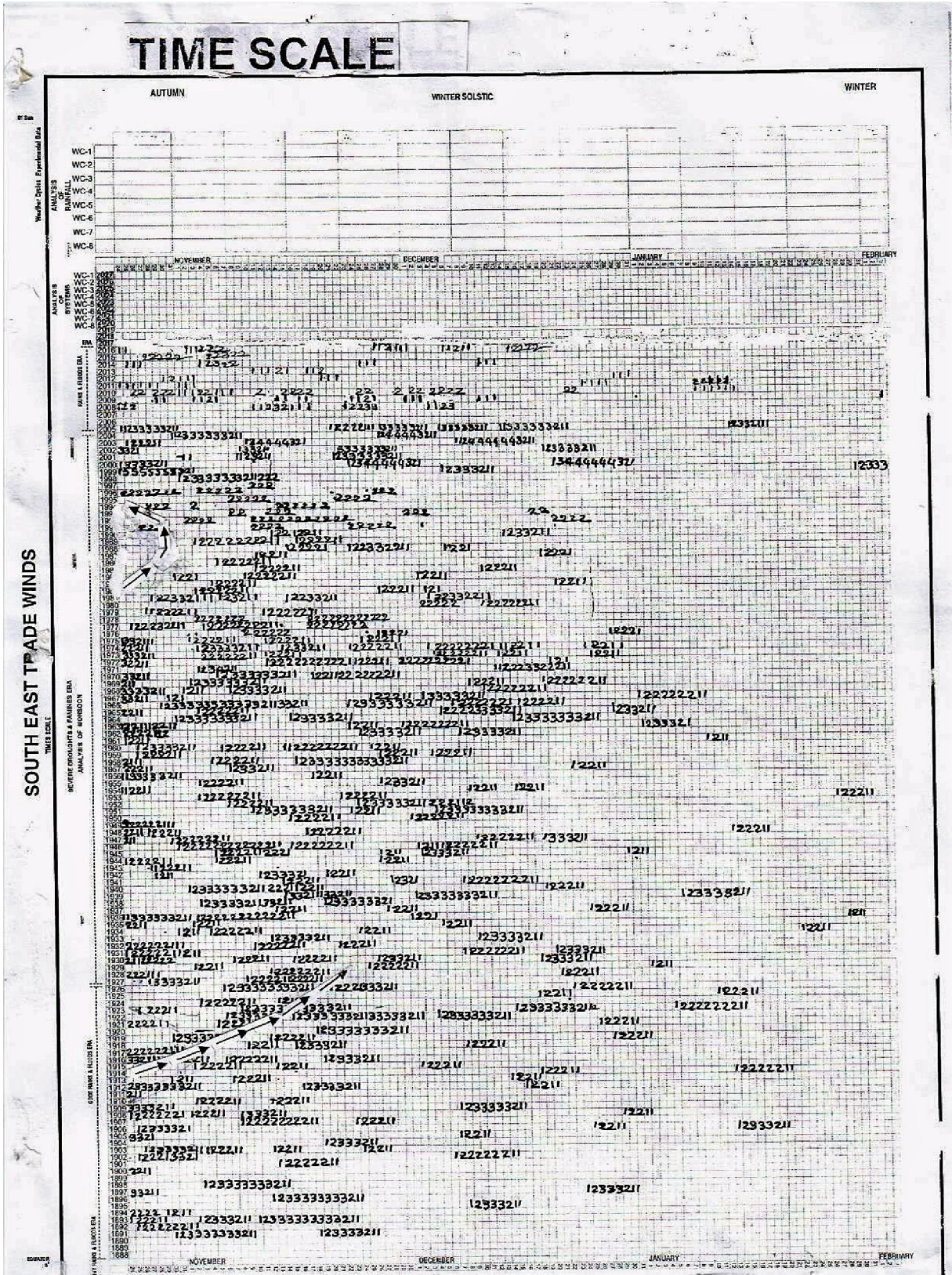
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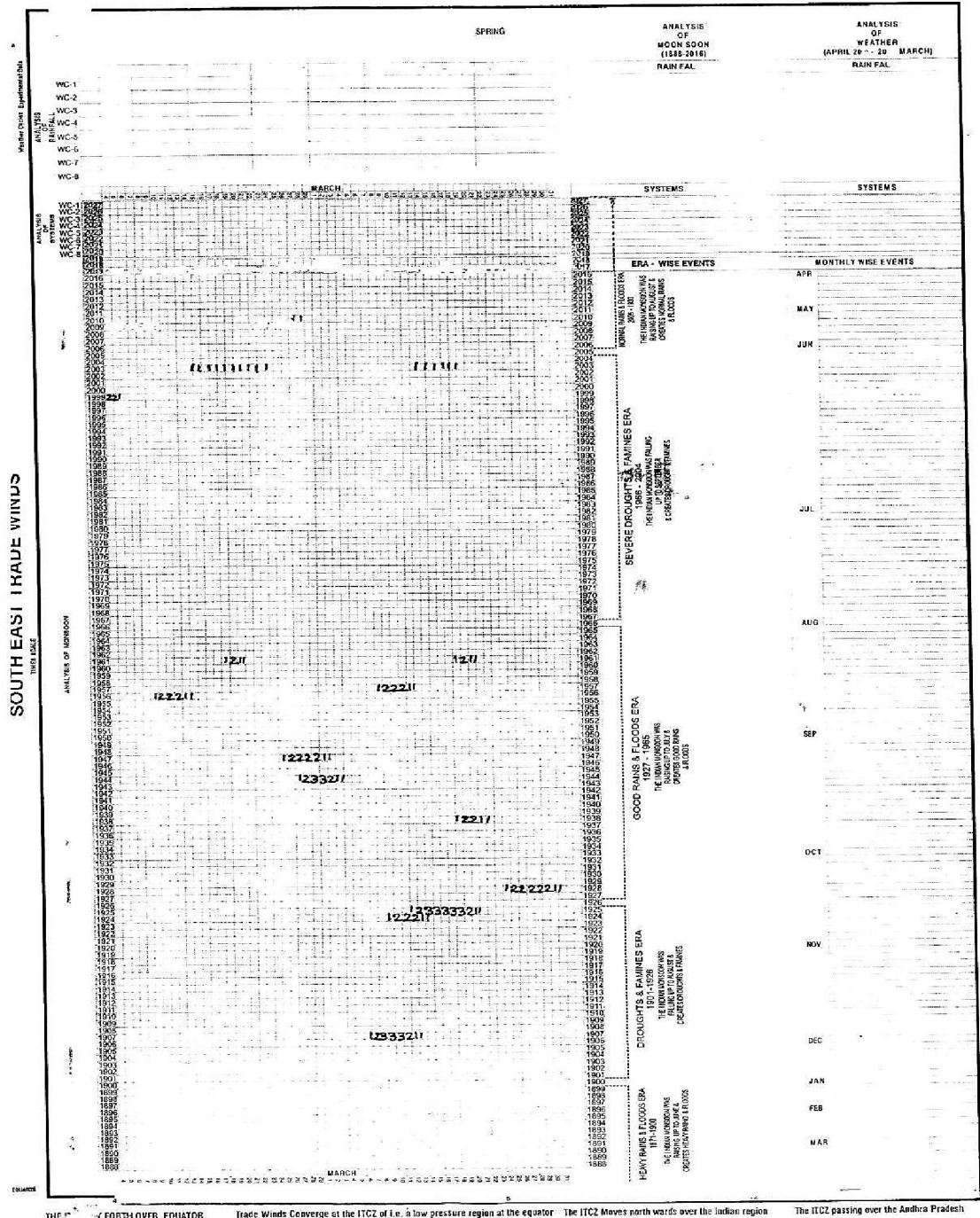
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4/25/2019