Weather Satellites and Cloud Pattern Reading

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Hello welcome to the lectures about the clouds. In the previous lectures we were just talking about what are all the different; different rainfall conditions possible then rainfall is related to the clouds how we ourselves can watch the cloud and then assess whether it is going to rain or not which is essential for the agriculture practices now this is what you can do it on the ground conditions now for a region whether the cloud formation is happening or not for that purpose what we need to do is we have to use the weather satellites and what are the different crowd pattern reading can be done which is to be done on an organization basis not by the individuals.

Now the we are talking about in the GIS one among the subject which we talked about is the remote sensing application that is nothing but the satellite data which orbits the earth surface at a regular interval which records what are the changes on the Earth's surface.

Now there is other kind of satellites which are meant for weather satellites that is what is known as a weather satellites. These weather satellite our meteorological satellites they are positioned at a particular place covering the earth surface and here the clouds and cloud movements from that particular place that is what is called as they are geostationary positioned at one place and they are more than that is 5,000 kilometers about Earth's surface.

So what is the advantages it will be able to; the clouds and the land portions below it continuously so that we will be able to monitor the cloud patterns and its dynamics; now they are polar orbiting satellites what do you understand by the polar orbiting satellites; it's a circles north to south that is how does it moves whereas the other satellites they move along with the Sun so that means it will be moving from the east-west direction. Now there are these satellites can record the cloud patterns in a different bands; one is a visible band that is 52.9 micrometer then there; it has got a infrared band a two infrared bands one is a 3.5 and another is for micrometer third one is 10.5 to 20.5. This 11.5 to 12.5 this portion it is called as a atmospheric windows whereas the observations are reflected sunlight in the daytime and the brightness is at the night time this is what you will be able to see it from this wavelength bands and in the water band it is 6.5 to seven micrometer wavelength band so what you will be able to observe is you will be able to see what is the water content in those cloud patterns that is the previous one is the brightness and it gives you about the temperature variations by this is how does it do and what we will be able to see is the images so what we are interested in the visible image is it is the reflectance reflectants from the cloud surfaces are studied.

Then whereas which will tell you about what type of cloud pattern it is and one thing is a pattern structure and how much droplet is raindrops are there in this clouds. Now the texture is here we are talking about the stratiforme structure or whether we are it is a convective cloud which is rugged and uneven is these textures can be easily observed by the; when the sunlight is hit this clay cloud top obliquely. So this is this picture is the picture from the Kalpana Satellites and taken in 23 November 2015 around 14:14. So this is the visible band

which will be able to tell you about the cloud tech texture and the type of droplets which we are likely to have it up.

So where do I get this cloud pictures is the I am the Indian meteorological department has a site and you will be able to go and then watch this type of pictures every time how do I watch it is you know where you are suppose if you are there around Hyderabad so you look at Hyderabad and the surrounding areas whether they are clouds or no clouds that is how this GIS information can be synergized with the satellite data and you can read the cloud patterns cloud picture and you can assess on the ground whether there will be a rain or no rain another picture is another information you can get from here is from the infrared images this infrared images they give something information about the temperature distribution can be found out and also water vapour to this extent can also be it.

Now when you look at it these are all the; this is the boundary of India and these are all the different stage and these are all done with the geographical information in mind and these are all the cloud patterns the core clouds and the surrounding clouds which are there. So when you look at it whether the clouds are circular or not circular that will be tell you about whether is there a cyclonic pattern; pattern cloud pattern is formed or not this can be observed here also this is same day of the previous slides.

Now this is another picture to show you what is the cloud pattern size which you will be able to see. One is the thicker top clouds and another thing is the peripheral we will be able to do some grey scale analysis and then assign values how much is the water content in this type of cloud pattern then that is one thing that is the pattern we will be able to assess.

Then another thing which you are able to see it up over here is the big cloud pattern in this type of areas. Every three hours this cloud patterns either they move from one place to another place are the thick junk of clouds which is there either they may be dissipated they will be disintegrated and moves from places this type of dynamic changes which are happening in the cloud section or in the atmospheric sections that could be observed by this satellite pictures.

Now this will tell you about cloud motion and these are all the different units; how much it is possible and this is this is about and these are all the pressure conditions in all these things are given; when you look at it this type of circular pattern it will tell you then when you see a cyclonic wind or cyclonic formation we will have here this type of wind cloud pattern will be possible. So if you see something similar to that that means in that area there is a cyclonic formation or there is a circular movement is possible and that is being reflected by this type of some of the cloud but it is not totally a developed by the cyclonic wind. It has got a tendency towards that. So if there is a cyclonic pattern then what happen is there will be related rainfall is also possible. So what is this colour picture is the visible information then is temperature information all these three separates band they are all laid one over then the colour composite is generated using the computer system that will differentiate.

Now we were not able to mark out clearly whereas now we will be able to see this is one set of one patch of cloud pattern this is another patch of cloud pattern having a different picture and the different thing; the different aspect so this is the third one; like that we would be able to classify the cloud pattern into so many classes and those classes can be assigned weather what is the potentiality ore the probability of a rainfall could be assigned to them for our making use of it in the agriculture activities.

Now this is water wafer how the water wafer is in the this is the water wafer areas what are the different kinds of water wafer information on the same day it is the same day which you are able to see this is and this is the wind pattern and this type of information will be if there is going to be wind pattern is going to be in a bigger way then the cloud movements will be faster when compared to the rest of the years.

Now there is in that same say side what you will be able to have is certain geophysical parameters as well as the rainfall in areas. So these are all the high rainfall, low rainfall regions that which is a processed data image processing processed data. Satellite data is given in this format. So they have got a rainfall, rainfall per day is also given over here. Now if you are somewhere in this part of the country. So there is the probability of a rainfall is very less whereas when you are there somewhere in this part of the country then the probability of the rainfall is on a small; to some extent there may be some rains depending upon the skill variations.

So this is the type of information which you will be able to see it at the same information; this is about the humidity upper tropospheric humidity is also given over here. So these are all the different kinds of information which satellite-based information which will from where we will be able to identify different cloud patterns having under the probability of a rainfall over a region can be ascertained and that is how that information is used and given in your accuweather information about; then what they give here is they take about your lat-lon and then or the cities in mind and then they try to give whether what is the cloud pattern; what is the probability of rain is given over there whereas for a rural areas if we have to do it then it has to be done extrapolated and then you have to arrive at it whether there will be a rainfall or not for that particular area.

So this is another set of; another set of satellite pictures which is you will be again you will be able to see the movements here and there. This is the continuous pattern; yes, this is the same thing and based on that if you are looking for that that is the input for this weather interpretation weather forecast based on this satellite information which is available if the 6, 9, 12, 15 like that every three hours the same satellite data is available and that will tell you about what is the cloud pattern and how it is smooth or from one time from six o’clock to nine o'clock how it is move and this type of dynamic information forecasting is used in our weather forecast which we get it.

So this is when you want to lead this; what do they meant by that is if you see a cloud, this is the cloud. In this particular picture what it shows is the place where ever you are that place if you will be observing the cloud pattern whereas when you see here there will be amidst the

cloud there will be some amount of sunshine is possible whereas here there is a dark clouds the probability of rainfall is available.

So this is based on the satellite cloud information which they are able to derive at it. So it is between day and night; if this type of differences you are able to get it because of the dynamic information which you get it from the satellite data. So previously the same thing when you look at it over a week over a week. Saturday, Sunday for another three days forecast. So they try to see whether at this particular day even there is a moving cloud pattern whether it will pass through that or weather will come and stay on the next 24 hours depending upon the rate of movement or the speed at which it moves towards the true your area that is be used for giving you either the temperature or the rainfall pattern which is the cloud cover is 92 percentage which is say here that means when you look at the horizon 92% only eight percentage of the sky is visible to you whereas when it comes down hear; the cloud coverage is 100 percentage that means it is totally cloud whether it is a white cloud or whether it is a glare out whether it is a cumulus cloud or a statiform cloud whatever which we have learnt.

Based on that we will be able to say whether it is going to rain or not rain. Rain is there but we are not sure about the quantity of the rainfall unless it falls over there then only the quantity of rainfall is possible and the forecast always they say what type of the rainfall is expected plus minus is always there; that is how that is this type of weather forecast is based on the satellite information which I have shown it to you. So what type of information which you can take from this cloud whether reading cloud pattern reading is weather will there be a cloud in my area if that is the case what type of cloud it is; whether it has got a rainfall potential or not if there is a rainfall potential then you can wait for one more day for your irrigation or starting a pump; if cloud is white in nature and if it is the potential is nil for rainfall then you may have to start your pump; so that your crop can be saved. This is the advantages of this type of satellite cloud pattern reading. Thank you.