ISSN: 2469-4134
Journal of Remote Sensing & GIS

OPEN ACCESS Freely available online

Perspective

Application and Analysis of Satellite Data for Monsoon Climate

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DESCRIPTION

In response to the keen interest in space observations of the earth and its atmosphere, several countries have launched or are planning to launch their own ocean and land observing satellites. The United States and Russia are no longer the spacefaring nations. At present, geostationary weather satellites are operated by United States, the European Space Agency, Japan and India. During the next few years, Canada, France, Japan, India and European Space Agency are considering to deploy ocean-land observing satellite. Prediction of Weather and climate over India is an important aspect for the economy of the country. As such, sustained efforts are being made to understand the meteorological phenomena in order to develop suitable techniques for their prediction. For this purpose, basic meteorological data at the surface of the earth (land and ocean) and at higher levels in the troposphere have to be obtained from variety of observational platforms.

Thus, development in meteorology is closely linked with the advances in observational systems. Indian meteorology has passed through different stages of development over more than hundred years such that today we use surface-based, ocean-based and space-based sophisticated measuring devices to monitor the ocean atmosphere system for weather forecasting. Space-based platform in the form of weather satellites have contributed a lot in the field of monsoon meteorology. Importance of weather satellite to monsoon understanding and prediction has led India to join the exclusive club of geostationary weather satellite operators. Today we have three INSAT satellites over the Indian region. These satellites provide wealth of information on weather condition during different seasons of the year.

The potential use of weather satellite for analysis, understanding and prediction of monsoon systems. Rockets were fitted with different instruments and cameras. While in flight they recorded data and took cloud photographs that were sent back to the earth. Unbelievable clear cloud pictures suggested that artificial satellites could be used as observing platforms in the space. The successful launch of TIROS-1 satellite in April 1960 immediately confirmed these opinions. First generation satellite contained TIROS, NIMBUS and ESSA series. Geostationary satellite era began in December 1966 with the launching of Application Technology Satellite (ATS) series by United States of America. This made the meteorologist possible to see at a glance weather pattern covering almost one third of the Earth's surface.

CONCLUSION

Satellite imagery has been used to locate weather systems. With the advent of the geostationary satellite in mid 1960s, real time satellite observations have become possible. During the 1970s, very active research quickly led to operational applications. These covered identification of severe storm signatures, convective rainfall estimates for flash flood situations, and techniques for estimation of intensity of cyclonic storms. Since that time major advances have resulted in the ability to interpret satellite imagery and apply the result to weather and flood forecast problems. As forecasters became more knowledgeable about satellite imagery and convinced of its value as a forecast tool, research continued to produce abundance of new applications and techniques. Based on satellite-derived Outgoing Long Wave Radiation (OLR), Highly Reflective clouds (HRCs), Cloud Motion Vectors (CMVs), visible and infrared cloud imagery and radiation budget estimates a number of different algorithms have been developed in this study to make use in wind analysis, for obtaining relative humidity profiles and rainfall over oceanic region.

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Received: 03-Oct-2022, Manuscript No.JGRS-22-18828; **Editor assigned:** 05-Oct-2022, Pre QC No. JGRS-22-18828 (PQ); **Reviewed:** 20-Oct-2022, QC No JGRS-22-18828; **Revised:** 25-Oct-2022, Manuscript No. JGRS-22-18828 (R); **Published:** 03-Nov-2022, DOI: 10.35248/2469-4134.22.11.257.

Citation: Tory S (2022) Application and Analysis of Satellite Data for Monsoon Climate. J Remote Sens GIS. 11:257.