UTILIZATION OF SATELLITE COMMUNICATION NETWORKS FOR URBAN AMBIENT AIR FORECASTING

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ABSTRACT

Satellite data are being used qualitatively to provide the air quality index values. It also used as a environment quality forecaster for a regional view of pollutants and to help assess the impact of events such as biomass burning or dust transport from remote sources. The amount of satellite data available is going to increase by many orders of magnitude for the future years including an abundance of information about pollutant concentrations not well-measured previously. It is essential to plan now to procure the capability to acquire, display and assimilate these valuable sources of data. Weather can change from day to day or even from hour to hour. So it is necessary is make satellite communication linked information regarding the weather available to the public byway of giving information about air quality. A key tool in this effort is the Air Quality Index or AQI. Air quality index is a scheme that transforms the weighted values of individual air pollution related parameters into a single number or a set of number. This paper elucidates the aerospace communication systems that can provide air quality information and some related research (Satellite Detect Air Quality) and provides a view of the future generation of National Polar-orbiting Operational Environment Satellite System.

Key Words : Air Quality Index, Satellite Data, Air Pollutants, Satellite Communication

INTRODUCTION

Air quality index values are very useful as they indicate day-to-day changes in air quality. Further, air quality levels observed in urban areas are also of interest to the nation as a whole because they provide an indication of the nation’s march towards cleaner air. Also, it facilitates comparison of air pollution problems in different areas of the city. Such information is of vital importance to national decision makers with respect to prevention and control of air pollution. Air quality index measures values for
- A particular area over a number of months in a year
- A particular area over a number of days in a month.

The software used in this study automatically calculates the AQI value using the algorithm developed here by the author and gives the AQI value values and the corresponding remarks adhering to different colourscheme. The computational results can
also be given in the form of tables and graphs for their interpretation using specific colour schemes given in the software. The observed AQI data and the aerospace assists the air force in the transition of remote sensing, data assimilation and numerical weather prediction technologies in the operations at the air force weather agency.\textsuperscript{2,3}

**Communication of AQI data network architecture**

The air quality indexer is a microcontroller based device. Nowadays, microcontrollers are widely used in television, computers, washing machines, air conditioners, telephone caller ID, remote sensors and so on. In the present work, the microcontroller is used in the circuit for calculating the value of air quality index (Fig. 1 and Fig. 2). The user will get the value of AQI for any particular month or day based on the concentration of pollutants by following the series of guidelines displayed on the LCD screen.\textsuperscript{4,5}

![Air Quality Indexer Kit](image1.jpg)

**Fig. 1:** Photograph of Air Quality Indexer Kit
Data transfer through Satellite Communication

Earth observing satellites are designed specifically to measure troposphere trace gases. There are numerous satellite sensors with some type of aerosol-detection capability and the detection of smoke plumes from fire. The Block diagram of transmitting data through satellite communication with AFTN (Aeronautical Fixed Telecommunication Network) is explained in Fig. 3.

Fig. 2: Photograph of Various Integrated Circuit Components used in AQI Kit

Fig. 3: Block diagram of transmitting data through satellite communication
RESULTS AND DISCUSSION

The satellite network for monitoring airspace, exchanging mission critical data and providing high quality voice communication between the airports and relay stations. A central Faraway hub in the capital connects to solar-powered remote. Each system integrates with various installed systems to create a comprehensive system. The Integrated network maintains high voice quality for local, domestic and International class, effective data transfer and supplementary services such as telex on a single platform. The combination of measurements from current and planned environmental satellite sensors that measure the troposphere will play an increasingly important role in explaining transport processes. Satellite imagery has used to characterize land cover to estimate biogenic emissions and to provide frequent data refresh and rapid downlink. The maximum use of this valuable satellite resource is to benefit the air quality forecasting mission.

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REFERENCES


DECLARATION BY THE AUTHOR(S)

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