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DEVELOPMENT OF METEOROLOGICAL STATIONS IN CENTRAL AMERICA: SATELLITE
COMMUNICATION AND EARLY WARNINGS FOR NATURAL DISASTER MANAGEMENT

Abstract

In a world increasingly affected by natural disasters, the implementation of advanced weather monitoring systems becomes essential. This project focuses on the design and development of weather stations capable of collecting accurate data and communicating with satellites to send information in real time. The integration of satellite technology allows for global coverage and constant communication, significantly improving monitoring capacity and response capacity to extreme weather events.

The proposed weather stations are equipped with a variety of sensors that collect crucial data, such as temperature, humidity, atmospheric pressure, wind speed and direction, as well as precipitation levels. This data is processed locally using advanced algorithms to provide accurate weather forecasts and early warnings of potential natural disasters, such as floods and wildfires. The ability to anticipate these events ahead of time is critical to minimizing the impact on infrastructure and human life.

Two-way communication with satellites allows not only the sending of data in real time, but also the receipt of additional updates and alerts that can influence decision making. This guarantees a robust monitoring network adaptable to different geographical and climatic environments.

In addition to their ability to provide early warnings, these weather stations are also essential for collecting long-term data that can be used to analyze climate trends and improve understanding of extreme weather events. This project represents a significant step toward building more robust and effective weather monitoring systems, with the potential to save lives and protect infrastructure around the world.