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Research on Architecture, Applications, and Performance Evaluation using Wireless Sensor Networks for Environmental Surveillance

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Abstract: *Wireless Sensor Networks (WSNs) have emerged as a powerful tool for environmental monitoring, offering scalable and cost-effective solutions for tracking environmental parameters such as air quality, soil moisture, and temperature. This paper presents a comprehensive overview of WSNs, highlighting their architecture, key components, applications, and performance metrics. A case study is included, presenting experimental results that evaluate the effectiveness of WSNs in various environmental settings. The paper discusses energy efficiency, scalability, and data accuracy, while also addressing challenges and proposing future directions for WSN technology in environmental monitoring..*

Keywords: Wireless Sensor Networks, Energy efficiency, Scalability, and Data accuracy