



## **Adaptive Wireless Ad-hoc Sensor Networks for Long-term and Event-oriented Environmental Monitoring**

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Ecosystems are often characterized by their high heterogeneity, complexity and dynamic. Hence, single point measurements are often not sufficient for their complete representation. The application of wireless sensor networks in terrestrial and aquatic environmental systems offer significant benefits as a better consideration to the local test conditions, due to the simple adjustment of the sensor distribution, the sensor types and the sample rate. Another advantage of wireless ad-hoc sensor networks is their self-organizing behavior, resulting in a major reduction in installation and operation costs and time. In addition, individual point measurements with a sensor are significantly improved by measuring at several points continuously. In this work a concept and realization for Long-term ecosystem research is given in the field monitoring of micrometeorology and soil parameters for the interaction of biotic and abiotic processes. This long term analyses are part of the Global Change Experimental Facility (GCEF), a large field-based experimental platform to assess the effects of climate change on ecosystem functions and processes under different land-use scenarios. Regarding to the adaptive behavior of the network, also a mobile version was developed to overcome the lack of information of temporally and spatially fixed measurements for the detection and recording of highly dynamic or time limited processes. First results of different field campaigns are given to present the potentials and limitations of this application in environmental science, especially for the monitoring of the interaction of biotic and abiotic processes, soil-atmosphere interaction and the validation of remote sensing data.