

DEVELOPMENT AND APPLICATION OF NETWORK OF GEOSENSORS FOR ENVIRONMENTAL MONITORING

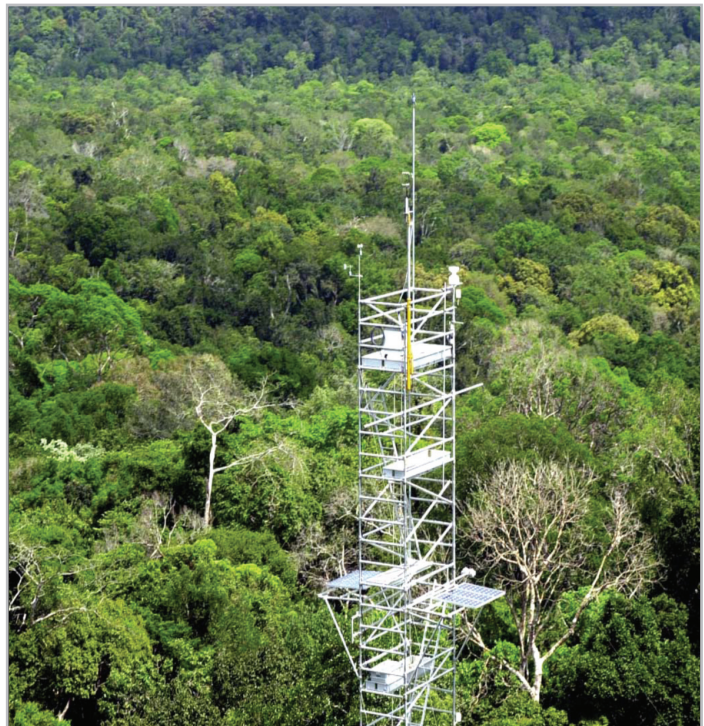
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This project proposes activities of research and technological development to test the use of a prototype of environmental sensors (geosensors) in a study site of tropical forest in Amazonia, Brazil, forming a sensor network with high spatial resolution, and to develop software tools for data quality control and integration. The main premise is that the geosensors should have relatively low cost, what enables the formation of monitoring networks with a large number of sensors spatially distributed.

The project is composed of three main components: 1) assembly and calibration of prototypes of geosensors of air temperature and humidity, with reproductive and reliable ceramic sensor elements that will adequately operate under the environmental conditions observed in the tropics; 2) development of software tools for management, quality control, visualization and integration of data collected in geosensor networks; and 3) realization of an experimental campaign, with the installation of the sensors in the Amazonian forest, with the objective of estimating the spatial variability of temperature and humidity complementing a flux tower in a complex terrain, to better describe the properties of the air flow and horizontal advection within and above the canopy near the tower.



Rain forest: image of the experimental area



MAIN RESULTS

Basic installed database/web server and development workstations with the following capabilities: a) The database can import and organize data collected from a network of sensors (since the sensor data for this project are not still available, it has been used data from a similar project to start building the database infrastructure); b) Basic reporting ability, including the ability to create time-series plots from each sensor/mote data; c) Basic data access through web services is under development and test.

Is has already started testing some analysis and visualization algorithms with the data. Since the sensor database that has been used contains only time series of measures of the temperature and humidity sensors, tools to visualize and highlight discrepancies in time series have been developed that should behave more or less the same.

Also under implementation is a generic selection and sampling tool that will create a subset of the dabatabe with the sensors' values selected accordingly to the users' criteria.

The next steps will be the creation of a more generic tool based on these concepts and its deployment through the project's web page.

PRODUCTS/PUBLICATIONS

INTERNATIONAL CONFERENCES

Von Randow C, Santos RDC, Rocha HR. Network of environmental sensors in tropical rain forests. Talk presented at *Microsoft Research Faculty Summit 2010*. Redmond, WA. July 12-13, 2010.

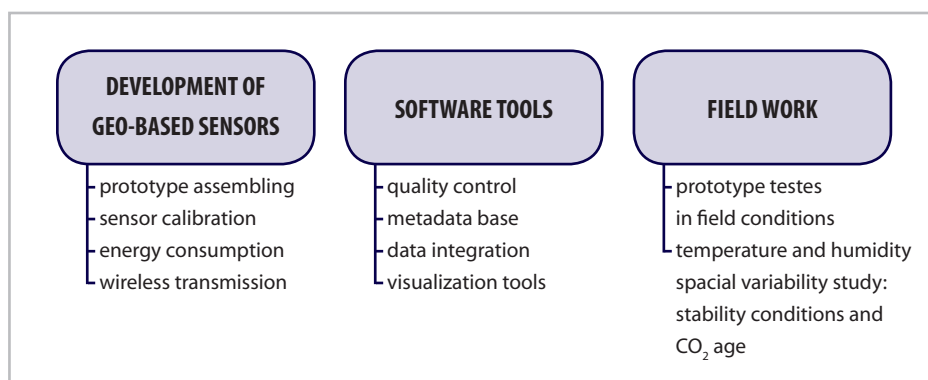
Santos RDC. Development and application of network of geosensors for environmental monitoring. Talk presented at *2010 Microsoft Research eScience Workshop*. Berkeley, CA. October 11-13, 2010.

Von Randow C, Santos RDC, Rocha HR. Network of environmental sensors in tropical rain forests. Paper accepted for presentation at *2010 AGU Fall Meeting*. San Francisco, CA. December 13-17, 2010.

NATIONAL/LOCAL CONFERENCES

Von Randow C. Tackling spatial variability in biosphere-atmosphere interaction studies. Talk presented at *Microsoft-FAPESP Environmental Science Workshop*. São Paulo, SP. November 11-12, 2010.

Rocha HR. The geosensor network experiment in the Atlantic forest. Talk presented at *Microsoft-FAPESP Environmental Science Workshop*. São Paulo, SP. November 11-12, 2010.



Project's main challenges diagram

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