PARTNER SEARCH FORM

DATE: 06.12.2010

PROJECT INFORMATION

TITLE: Monitoring systems with electronic smart sensors for environmental data acquisition in coastal water of Black Sea

ACRONYM: SensBlackSea

SUMMARY: Development of monitoring system bae4d on wireless smart sensors that can be anchored to the sea bed, moored to buoys, or towed behind vessels to collect data on light, temperature, salinity, depth, clarity. The aim of this research consists in adapt inexpensive, off-the-shelf sensors like inductive sensors for salinity, resistive temperature sensor, piezoresistive pressure depth sensor and turbidimeter sensor for clarity water, to withstand the aquatic environment, and will be developing and implementing new tools that ensure real-time processing of data. The sensors will send the data they collect to a centralized server that will "make it available, essentially immediately, online. The data collected will be used by the biologists for the influence analysis about marine ecosystem .

KEYWORDS*:smart sensor salinity, temperature, pressure depth smart sensor, turbidimeter electronic monitoring coastal sea water

CALL: BS-ERA.NET 2010

NAME(S) of the PARTNER(S) INVOLVED: National institute for Electrical Engineering ICPE-CA, Bucharest, ROMANIA
Germany
Turkey

SCIENTIFIC AND TECHNOLOGICAL EXPERTISE OFFERED*:
The parameters of water sea like salinity, temperature, depth pressure and turbidimeter have a large influence in the marine water habitat. The salinity content of water, streams and coastal bays can have a drastic impact on local agriculture, aquaculture and animal habitats. Changes in salinity are important in these areas where marine life could potentially be harmed by rapid changes of salt in the water supply. Extremely high or low salinity can cause mortality, depending on organism specific tolerances, but it also has sub lethal effects in terms of reduced growth rate, unseasonable reproduction or susceptibility to pathogens. Normally, the salinity of Black Sea water about 18 g/l. The aim of this project consists in development of monitoring system based on smart sensors for salinity, temperature, turbidimetry and pressure depth. The salinity sensors consists in inductive sensors based on two coil which measure the conductivity water. The salinity can be calculated from the conductivity data and temperature and pressure depth . The coil were covered with a special resin for prevent the strong corrosion of marine water. This type of sensor present a series of advantages against other type sensors like conductive and sound sensors is inexpensive, long term submersion, data logging capability and resistance to biofouling.
The sensors were placed in 2,3 up to several meter depth.. The salinity sensor will be taking measurements and storing data every 15 minutes intervals for 2 weeks.

The control of the salinity sensor is governed by a microcontroller which provide an interface for the exterior measurement devices (temperature and conductivity sensors) and is used to calculate the salinity based on the measurements provided by the sensors. The data collected by the sensor is stored on non volatile flash memory. The sensor software control is designed for three primary modes: data collection, transportation (or deep sleep mode), and user mode. The salinity module is designed to be entirely submersible and self-contained. Once a module is constructed, its electronics cannot be accessed. Thus to uploaded the data, it needs to be transmitted over a wireless configuration. This wireless system consists in radio frequency transmission which utilize a 434 MHz TX CI transmitter and a 434 MHz RX-B1 receiver. The temperature measurement is conducted by a Zener diode in the breakdown region of operation .which operate from -40…+100°C. The pressure sensor is piezoresistive type and consists in two components: a diaphragm and resistors. Silicon is used because it combines well-establish electronic properties with excellent with excellent mechanical properties. A GPS device will be used to record the locations of the sensors when they are placed in the water.

PARTNER SOUGHT

SCIENTIFIC AND TECHNOLOGICAL EXPERTISE REQUESTED:

Wireless system for smart sensors, salinity influence in biological factors

EXPECTE D CONTRIBUTION TO THE PROJECT:

The behaviour of the marine biotope in coastal region about the change of the physical and chemical parameters, because of global heater. System of long distance data transmission about the sensors signals. The equipotential drawing maps of salinity in the coastal region of Black Sea. Other competences in the proposal project field.

ORGANISATION TYPE*:

☒ Higher Education ☒ Research Institute

☐ R&D Company ☒ SME ☐ Other

HOW MANY PARTNERS ARE REQUIRED? 3 partners

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*** mandatory fields**