



Real-time Water Quality Data from Dubai Creek

Dubai Municipality has installed a YSI water quality monitoring buoy at a sensitive area within the Dubai Creek.

Redha Hassan Salman, Head of the Environment Protection and Safety Section of the Municipality's Environment Department, is responsible for the system and says that "the buoy is located toward the end of the creek, close to Jaddaf and the Ras Al Khawr Sanctuary. This location was chosen because of the many ongoing projects in nearby areas, the proximity of the sanctuary, and the potential environmental threat presented by drainage water released into the creek nearby."

The Ras Al Khawr Sanctuary is particularly important because it hosts some 67 species of birds, nine of which occur in internationally important numbers, in that they represent greater than one per cent of the world's population for those species.

Describing the monitoring system, Redha Hassan Salman reveals "The entire process of water quality real-time monitoring is carried out through an Environmental Monitoring Module, which consists of a buoy, multi-parameter water quality sensor probes, Data Acquisition System, Cellular mobile connection, solar panel and Windows based software running on a base station computer located at the main building of Dubai Municipality."

The project's objective is the automation of marine water quality monitoring in the creeks and coastal environments.

The buoy is moored to a heavy anchor and is able to take readings from a YSI multiparameter sonde fitted with sensors for temperature, pH, salinity, dissolved oxygen concentration, and Chlorophyll A.

Chlorophyll is the pigment that allows plants—including algae—to convert sunlight into organic compounds in the process of photosynthesis. Chlorophyll A is the predominant type found in algae and cyanobacteria (blue-green algae), and its abundance is a good indicator of the amount of algae present in water.

Excessive quantities of chlorophyll A can indicate the presence of algae blooms. These usually consist of a single species of algae, typically a species undesirable for fish and other predators to consume. Unconsumed algae decay, using up the oxygen required by other organisms to survive. The presence of too many nutrients, such as nitrogen and phosphorus, can stimulate algal blooms and result in reduced water quality and clarity.

Algal blooms can also limit light penetration and thereby damage ecosystems in shallow water.

Real-time data for pH, temperature, salinity and dissolved oxygen will quickly reveal any incidents of point source pollution, and chlorophyll measurements will reveal any trends that may take place as a result of diffuse or longer term pollution.

The base station computer at Dubai

Municipality is connected to a modem that periodically dials up the cell phone modem on the buoy in order to download the data that has been collected. Mr Salman believes that real time data is essential "in order to understand the changes in water quality chemistry," adding "the entire monitoring process is automatic and just needs periodic maintenance for calibration and cleaning the equipment"

The buoy mounted equipment in Dubai Creek is one example of Endeco/YSI's ability to build a system to precisely match the needs of both the customer and the application.

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Buoy Facing Dubai Creek.