

Integrated regional on-line monitoring system



In Summary:

Regional on-line monitoring system was launched in 2006 including environmental, traffic and visitor counting sub-systems. The objective was to provide region specific information on the environment and identify links with the load resulting from traffic, tourism and natural forces. Further it provides management alternatives where possible with the option of immediate response.

Target groups:

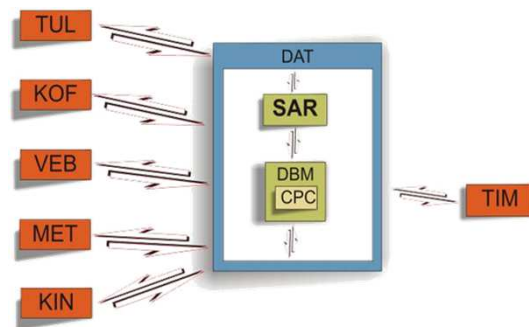
Experts, citizens, decision makers of local, regional and national level, institutions, universities

The **Lake Balaton Integrated Monitoring System** is the prototype of a monitoring system, which was established in the framework of a territorial cooperation of regional partners in 2006. The monitoring system has continuously been operating since then.

The prototype assists to derive long-term simulations in order to work out strategies, scenarios and management options. In addition, key information can be viewed on-line on traffic, visitor rates and water quality. The system can be used for everyday management to avoid unnecessary loads.

The prototype can easily gauge the state of the environment with real-time data and later with historical data. With this information, future forecasting can be carried out to understand what will occur in the area and to plan ahead for the future. The system also contributes to ameliorating the environmental condition of the region in that it gives stakeholders a good understanding of the situation at hand. The system is fully upgradeable through the addition of new monitoring equipment and latest technologies.

The data (measured by variety of sensors) are connected to a central database by wireless GPRS, for storage and processing. The central database is hosted on an "always-on" server. The server runs data collection, data structure management subsystem, data processing, data serving and controller applications. It also distributes data to other sources and organisations.



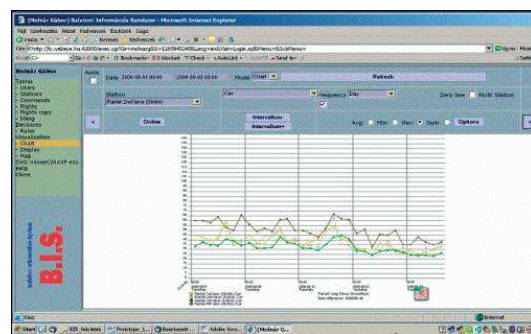
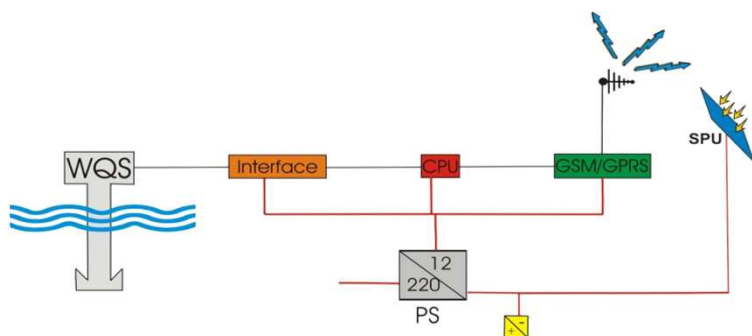
Key elements of the system

TUL: visitor counting module
KOF: road traffic counting module
VEB: water quality, quantity observing module
MET: meteorological module
KIN: external data importing module
SAR: system management module
CPC: central processing and data store unit
DBM: database management module
TIM: dissemination and information module
DAT: data transfer module

Objectives and goals of the good practice:

The main goal of the monitoring system is to collect quantitative data useful for not only academics and professionals but also for the general public and tourists. The system manages information on environmental factors for better regional decision making.

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System Components

- **Environmental Monitoring Equipments**
 - Water Quality Stations (in-lake)
 - Water-level and inlet monitoring stations
 - Hydro-meteorological stations
 - Meteorological stations
 - Information stations at beaches
 - Manual storm-signal units
- **Vehicular Traffic Measuring Units**
 - In-road traffic detection units
 - Speed monitoring units
 - Traffic hazard signals
- **Tourist Counting Units**
 - Rotating gates and ticket booking system at beaches
 - Infrared gates
 - Ferryboat traffic registry
 - Video visitor estimating system
- **Additional Module: Visualisation and information**
 - Web (WAP, optimised for web)
 - Interactive Web-terminals
 - Road-side screens (LED signs that can display different messages)

Specific examples of the impacts on environmentally significant issues

1) Direct utilization of meteorological data for public information and management

The public is informed through 30 storm warning light towers around the lake, as well as at beaches and through the internet.

2) Water pollution

Monitored parameters by the prototype that are suitable for the monitoring of pollution incidents are: pH, conductivity and dissolved oxygen concentration. These parameters can indicate chemical spills (such as chemical spills at road accidents); organic pollutants (sewage, septic tank sludge, wine processing sludge, etc.) and pollution during flash flood events.

3) Traffic control and GHG Emissions

The traffic control module of the prototype contributes to the reduction of environmental load, such as GHG emissions in the following: In part, by offering alternative routes the traffic is more fluent and continuous, thus less energy is used, resulting in less emissions.

4) Algae and suspended sediment concentration

The water quality is of concern primarily due to (potentially toxic) algal blooms in concentrated areas. Algal concentration (chl-a) is measured bi-weekly through the standard (manual) monitoring system. High suspended solids concentration in itself is not a problem, but it is important because it has a strong influence on chl-a concentration due to reducing transparency and increasing light limitation. The model has been developed using input data collected by the prototype: wind, air and water temperature, turbidity and solar radiation.

5) Water balance

Flood warnings can be issued through the system, especially in cases of large seiche. Strong unidirectional wind may cause large water level displacement. This is more dangerous than a level rise due to inflow.

6) Water Quality Control

Water quality control measures can be classified as short-term or emergency actions and long-term (planned) measures. The short-term pollution incidents can be detected through the on-line system while it is highly improbable that such incidents are detected through standard bi-weekly (or monthly) sampling.

MORE INFORMATION

<http://www.balatonregion.hu>
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