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The XIOM. Oceanographic measurement network

F. Jerez (2), J. Gómez Aguar (1), M. Espino (1), J. Puigdefàbregas (1), J . Cateura (1), and J. López (1)

(1) Laboratorio de Ingeniería Marítima, Universidad Politécnica de Cataluña, Jordi Girona, 1-3 Edif. D-1. 08034 Barcelona. Spain. Tel: +34934016468 e-mail: info.lim@upc.edu, (2) Centre internacional de Recusos Costaners. Jordi Girona, 1-3 Edif. D-1. 08034 Barcelona. Spain Tel: +34934011864 federico.jerez@upc.edu

DESCRIPTION
The XIOM network for oceanographic and coastal meteorological measurements (Xarxa d'Instrumentació Oceanogràfica I Meteorològica) is owned by the Catalan regional government. His deployment is to better understanding of processes that take place in the Spanish Catalan coast, in the NW Mediterranean.

The XIOM sea measurement network is formed by the following equipment:
3 directional buoys.
1 scalar buoy.
4 meteo-oceanographical buoys (providing the currents measurements).
2 tide gauge stations.

INSTRUMENTATION
Wave buoys sends a HF radio signal to a receiver station at the coast and are equipped with ARGOS allocators to allow recovery in case on drift. The receiver stations area composed by antenna, A/D signal converter and the computer. The signal is processed ant the spectral and statistical parameters are sent through internet connection to the main computer.
Meteo-oceanographical buoys sends data by satellite (ORBCOMM system) and it
ś received by e-mail directly in the main computer.
Tidal gauges are locally connected to internet connection and sends the data to a main computer.
A vast amount of data is collected. In case of waves the main parameters are Hs (significant wave height) spectral and statistical, Tp (peak period), and mean direction of waves in the peak of spectrum.
Another parameters are: Tz (mean period), main directional spread, spectral width, and up to 25 different parameters obtained from spectral moments and statistical calculations.
In case of meteo-oceanographical buoys, the parameters are velocity of the current, direction of the current and temperature, all of them at -1 m and -15 m. The buoys are equipped also with a standard meteorological station in its upper part that measures parameters like wind velocity and its direction.
Tidal gauges measure sea level and water temperature.

DATA FLOW
In Xiom network, one ftp server centralizes all the directional and scalar buoy's data. It's located at the UPC (Universitat Politècnica of Catalunya). Then this server makes a simple validation of the data and sends it to another ftp server. So, we use a extended star net topology. This final server makes the upload of data in the RDBMS (sqlserver v.2005) and the data is finally published.
On the other hand, the four meteo-oceanographical buoys transmit the data through a satellite system (orbcomm) and the mesurements are received packaged in a email message. One computer (pc windows based), located also in the UPC's offices, reads these mails, prepares the data and upload the data to the DB on the web server. Again, the net topology used in this case is an extended star.
Drawbacks and benefits of this approach will be discussed in the full article.

DATA AVAILABILITY

All the data received from the Xiom's instruments are placed in public domain through the website: www.xiom.cat. or www.boiescat.org, both domains are the same. The non-filtered data of all the instruments are published in real time, hourly. Then, monthly, it

ś applied a complete filter series on the data, and the filtered data is published. The kind of filter to apply depends on the kind of variable measured. The real time data from the DB is deleted and the new data, called history data, replace the real one through a backoffice section in the web.

Web users can obtain the last transmitted data of each instrument in real time. Also, users can select an instrument and date interval, so time series tables of data are provided. Plus, the user can create the graph of any variable of any instrument, one variable at a time, at the moment. The non-registered users can access to one month of data, and the registration for non-profit, scientists or researchers is free. Annual reports, and half-yearly gazettes containing data briefs and graphics in pdf format can be downloaded too in the public web area.

We will study this in detail in the complete article.