# Analysis of two proposals for syndromic surveillance in aquaculture

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## Summary

Syndromic surveillance in aquatic population should be based on significant production changes. A previous alert system had been developed for shrimp production in Ecuador (SAEMA). Based on SAEMA, two additional systems for fish farms were developed (VECA and SISPPiscicola). The approaches of epidemiological analysis are different, but in both cases the success depends on collaboration of fish farmers.

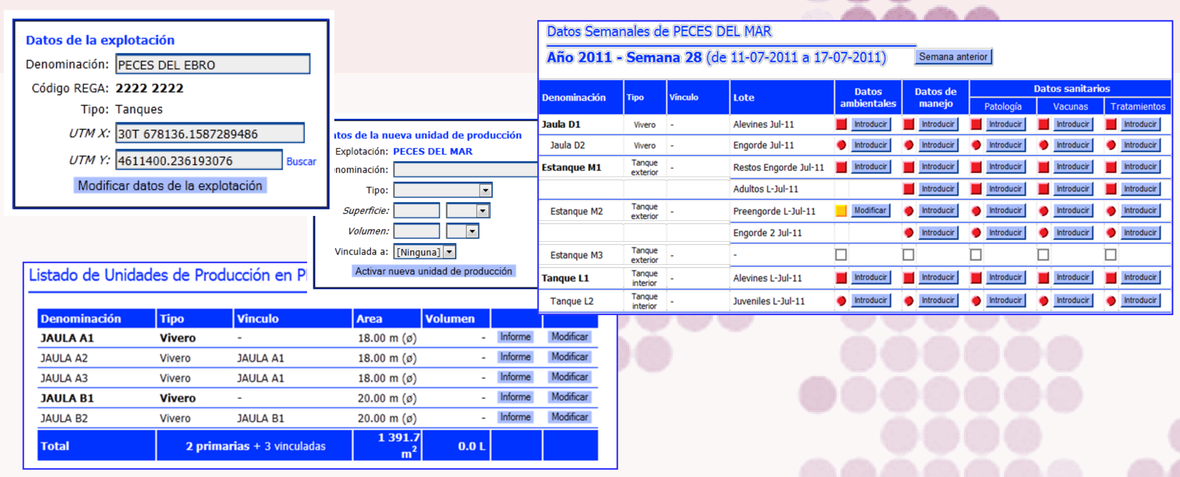
## Introduction

Nowadays, syndromic surveillance systems have become a powerful tool for early detection of emerging disease. However, it is difficult to establish the definition of syndrome in aquatic populations because most diseases show unspecific symptoms. Classically, the two parameters to define a disease outbreak are the detection of abnormal mortalities and a decrease of growth. Although the decrease of growth should be an earlier indicator of disease, the detection of abnormal mortalities is too late.

In addition, the growth is difficult to compare because it depends on multiple factors: species, age, water temperature, salinity, etc. so a normalized indicator of growth is needed.

In this sense SAEMA (Epidemiological Alert System and Aquaculture Management, http://www.saema.espol.edu.ec) developed in Ecuador for shrimp farms (Bayot et al, 2008) detects significant changes in an Index of Production and Management (IPM). IPM contains a standardization of the production dividing the yield by the stocking density and the shrimp growth rate during each production cycle.

Based on the philosophy of SAEMA, we developed two syndromic surveillance systems: VECA and SISPPiscicola.



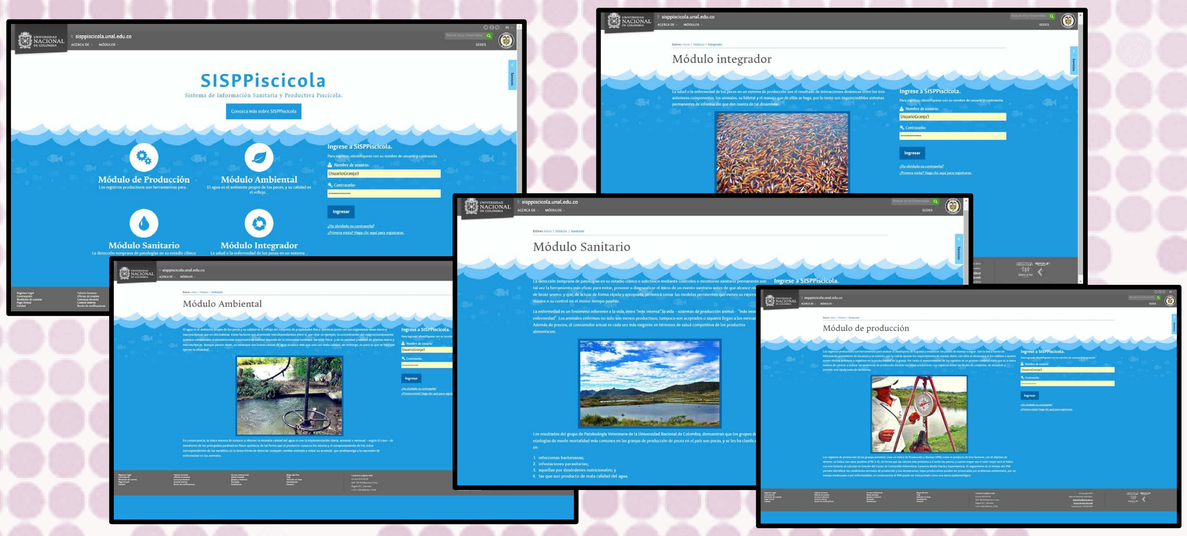

## VECA (http://veca.winepi.net)

In Spain, a collaborative platform for surveillance of fish populations called VECA has been developed to collect production and health data on fish farms of different species (sea bass, sea bream, turbot, trout…) and different production systems (nurseries, tanks, ponds...). Data are collected quarterly and users can carry out customized epidemiological analysis (using a wizard assistant) in order to estimate prevalances and incidences, to assess risk factors and to test the efficacy of applied treatments.

## SISPPiscicola

In Colombia, a program for early and permanent screening on health and production of tilapias called SISPPiscicola has been implemented in a web (access restricted yet, only available for authorized users). Every month data about dead animals, growth and feed intake are collected from different cages.

Then an IPM similar to SAEMA is calculated using the relative average daily growth, the estimated monthly mortality and an index for feed conversion ratio. The system can detect significant deviations of IPM for each cage and month.




## Conclusions

The main advantage of these surveillance systems is that they are able to collect data directly from users through web forms. This collaborative approach is the key factor for success of the systems.

However, when production cycles are long (as in tilapia, sea bass or sea bream) it is difficult to standardize an IPM that allows to compare populations with different characteristics.

Both systems, VECA and SISPPiscicola, are based on the data collected and the results of epidemiological analyses. Using this information it would be possible to set different levels of health warning, and then the producers and the staff responsible for aquatic animal health can take the right decisions.

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