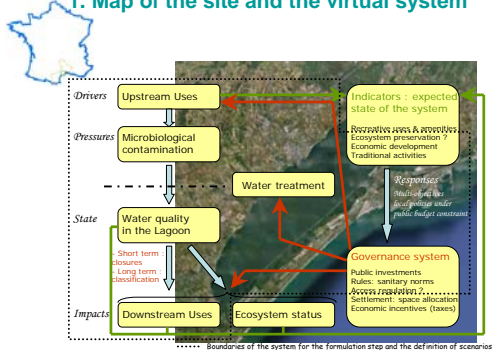


1. Map of the site and the virtual system



2. Policy issue

The local policy framework, which has been set up during the preparation of the Territorial Management Plan (SCoT) defines the general objectives of the lagoon management:

- economic development, including tourism and thermalism;
- environment preservation, including water quality and ecosystems protection;
- maintaining the cultural patrimony, including traditional activities (shellfish farming, fisheries activities in the lagoon, recreational activities).

NB: these objectives being in conflict.

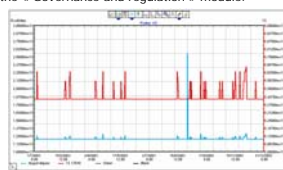
The local water management plan (SAGE) defines several specific objectives related to the environment policy. One specific objective is the reduction of microbiological contamination. The current political debate regards the ways it could be translated into an operational policy objective, which will combine the sanitary classification of the Lagoon (A or B) and the occurrence of commercial bans for the shellfish farming industry.

4. Model calibration

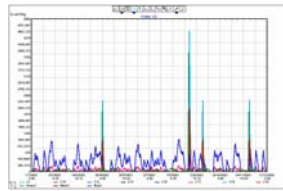
As some contamination sources are still missing in the model, it has not been calibrated yet. However, the interconnections between blocks have been tested. Hereafter are two examples of intermediate results of simulations, illustrating the interconnections between model blocks.

Example 1: outputs for the connection from the « Watershed bacterial transfer » module toward the « Lagoon bacterial contamination » module.

Example 2: outputs for the connection from the « Lagoon bacterial contamination » module toward the « Governance and regulation » module.



Example 1: pollutants at two watershed outlets



Example 2: E. coli contamination at REMI monitoring stations.

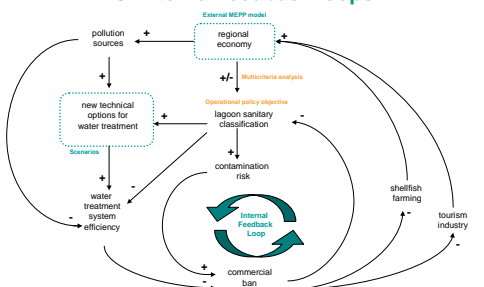
3. Extend simulation platform



The blocks and modules are organised in a user-friendly way. Graphical tools improve the visualisation of relevant indicators. Scenario, display and output blocks have been set to regroup all the model control panels.

Each module is linked to a corresponding database that records all model parameters and state variables. The model has been developed using Hierarchical and Custom blocks in ExtendSim ModL language.

5. Internal feedback loops



The above schematic represents the FBL by which the model is able to automatically update the lagoon classification after a given number of iterations, according to the frequency of contamination events due to exogenous drivers.

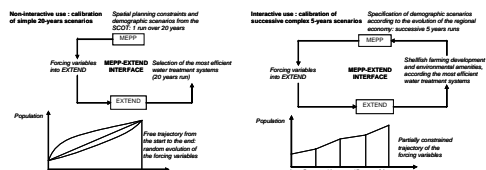
Our approach encompasses also FBLs which are not entirely included in the Extend model. FBLs put together the design of operational policy objectives, the choice of technical options and the integrated assessment of the evolution of the system.

7. Simulation results: output interface



6. Innovative socio-economic component: connection with the Regional Economy

The Extend model will be connected to a Model of the Regional Economy. The regional economy dynamics is represented using the outputs of a Prospective Macro-economic Model (MEPP) developed by LAMETA under the Excel® software.



The connection between Extend and MEPP will be twofold:

- from MEPP to EXTEND, MEPP outputs parameters for the calibration of the drivers of the microbiological contamination;
- from EXTEND to MEPP, MEPP will integrate the results of EXTEND simulations concerning the impacts of water quality on some activities, which may spread to the regional economy.

The simulation platform is able to explore the effects of operational policy objectives on the environment quality which lead to impacts on the regional economy. However, the MEPP model is connected but not included into the Extend model, and it is not dynamic per se. The dialog between the MEPP and the Extend model requires the intervention of the modellers.

8. Contribution to research and ICZM needs

The contamination of Thau Lagoon raises 4 basic questions:

- what are the main contamination sources?
- what is the efficiency of the current water treatment system as regards microbiological contamination?
- what are the impacts of microbiological contamination on shellfish farming and other human activities in the lagoon?
- which management options would reduce the impacts of microbiological contamination in a way which would be coherent with the more global local policy objectives?

 The OMEGATHAU research project has addressed the 2 first questions. Our approach for the SPICOSA SSA work is to rely on OMEGATHAU results in order to address questions 3) and 4), through a science and policy integration process. Our SSA team has entered into a partnership with the local public organisation in charge of the Thau lagoon water management (SMBT). The SPICOSA experiment is therefore expected to be one of the sources of scientific advises in the context of the implementation of the local water management plan (SAGE).