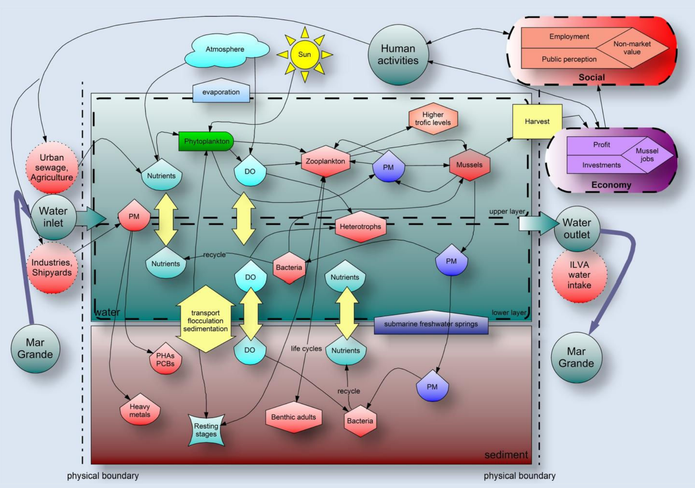
SSA14 - Mar Piccolo of Taranto

The Policy Impact is:
The reduction of the productivity and the quality of the mussel culture

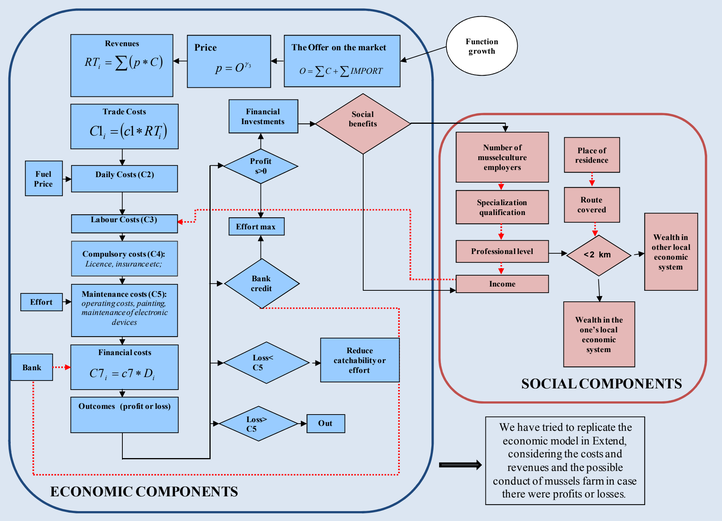
The Taranto marine area consists of different basins with peculiar ~~geo-morphological and ecological features~~. Mar Grande and Mar Piccolo are strongly impacted by an intensive mussel commercial fishery, a fishing fleet, the largest Italian Navy base, a major port and the activities of a large heavy industry site.
These activities constitute the main employers at Taranto, and they all influence the environmental quality and the ecosystem productivity (e.g. the local mussel farms).

Formulation pathway

1. The Conceptual Model



The VS has been conceptualized in its Environmental Component (left) and its Social and Economic Components (right)



Key
C = Catch
C1= Trade Cost (fisherman's association taxes, labour taxes, local taxes ,etc)
c1 = All costs that are possible to express as a percentage of total revenues
C2= Daily Cost (fuel, excluding labour cost)
c2= % effort
C3 = Labour cost
c3 = Share of MM
C4 = Compulsory cost (fixed costs: license, insurance)
C5 = Maintenance cost (flexible costs)
C6 = Opportunity cost
c6 = Public Debts
C7 = Financial cost (interest and capital return on bank loans)
c7 = Banking interest rates
= Individual debt incurred
E = Effort
i = Mussels farm index
I = Total investment
= External investment (subsidies)
= Internal investment (profits in the model are totally reinvested)
N = Mussels farm
P = Price
RT = Total revenues
= Offer –price modifier, parameter in the price model

To overcome difficulties linked to data availability and the complexity of the ecosystem, Mar Piccolo has by now considered a unique environment. Anyway this Conceptual Model contains all the inputs, variables and processes to be utilized in Extend simulations

The socioeconomic dimension of SSA 14 is based upon the reduction of the productivity and the quality of the mussel culture. In order to include the socioeconomic dimension in the model, we are measuring the effects of the reduction of the productivity and the quality of the mussel culture in the market. In particular the economic model was inspired by a bioeconomic model for Mediterranean fisheries and it was revised for the mussels farms and the social model is a feedback loop diagramme based of quality life of musselculture employers linked to the musselculture market.

2. The Scenarios

From stakeholders' participant group came the necessity to include mussel culture in a management plan for a sustainable use of the Mar Piccolo resources. We have revised the system definition of the NC and EC and we have choosen the "mussel culture employment" as the social linkage between NC and EC.
Stakeholders agreed on identifying some scenarios, to be used in Extend simulations:

A.Evaluating the environmental conditions controlling Mussels growth

B.Evaluating the measures and costs needed to sustainable Mussels growth

C.Evaluating human health effects from exposure to hazardous levels of contaminants or microrganisms

A1. To what extent would optimal environmental conditions reduce the costs of mussel culture and increase socio-economic benefits?
A2. What kind of indicators can we use to estimate the mussels growth based on different types of food?
A3. What would be nutrients target ratio in order to optimize MP productivity?
A4. To what degree are contaminant substances or organisms inhibiting or endangering the mussels growth?

B1. Are there other uses preventing better environmental conditions for mussel culture?
B2. What technological options or policy strategies are available to mitigate these damaging effects?
B3. What are the socio-economic consequences of these options or strategies?

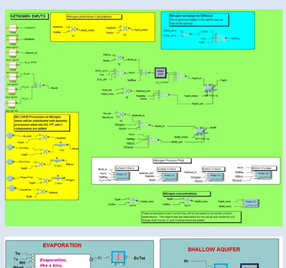
C1. What are the implications to human health due to mussels uptake of hazardous substances or microorganisms?
C2. What are the health costs projected from exposure to these contaminants?

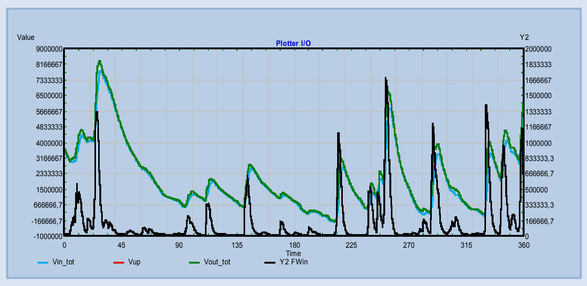
3. Extend

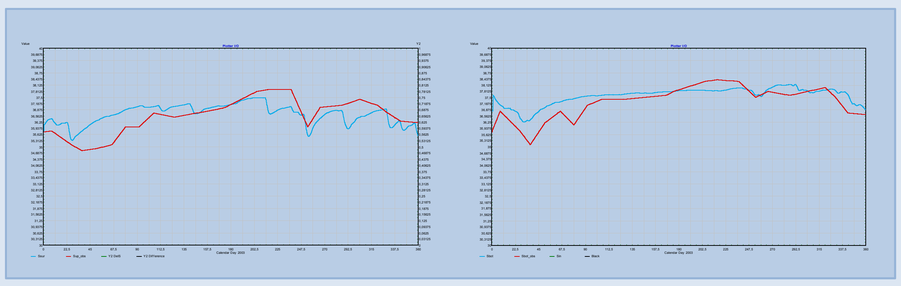
Extend Blocks:
•Ecologica Compartment:
- Salinity
- Water volume exchange
- Nitrogen budget
- Oxygen
- Phytoplankton
- Mussel population dynamics

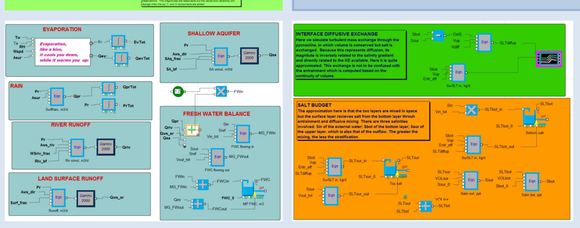
(actually, this bock is still a phantom)

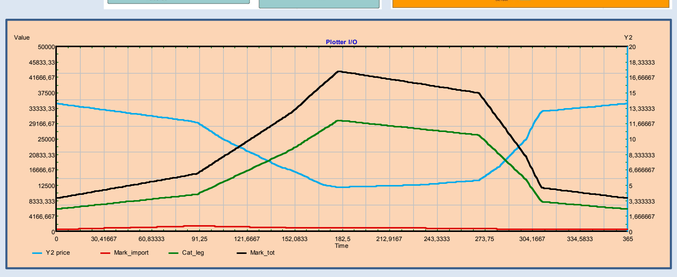
•Socio-Economic Compartment:
- Financial Management
- Costs
- Catch & Market
- Profits & Costs
- Loans

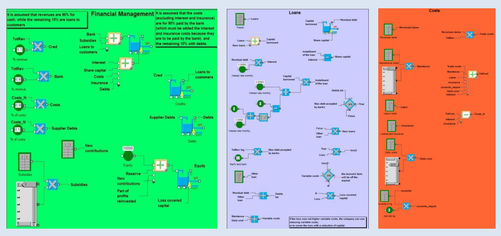












Natural Component BallPark Model. We have begun refinement with a tutorial Ballpark model for primary production and anoxia as a function of land runoff inputs. The present version contains refinements in the circulation, which are based on the Thermalhaline Exchange Method. Basically, the rain and land runoff change the density inside the Mar Piccolo, which causes a pressure gradients with Mar Grande that drive the two-way exchange. This exchange is approximated as being proportional to the FW accumulation inside the basin with respect to that outside. As seen, the exchange varies strongly with the total Fresh Water Input, but the balance dictated by continuity is preserved (water out = water in + FWin). In the salinity graphs, the observed and modeled values agree to a mean difference of 0.15 ppt for the surface layer and 0.49 ppt for the bottom layer. We expect these to improve with better input data and a differentiation between the two basins. We are currently refining the DO, N, and Pri Prod Components.

About data retrieval for Socio-Economic Components, in many cases the problems are related to lack of data and lack of time-series and in other cases to the presence of not updated data and to high presence of the underground economy. These data were mainly relative to the number of the employers and their job characteristics. In fact, the musselculture in Taranto is devolved upon cooperative societies that haven't the duty of registering all the employers.

SIXTH FRAMEWORK PROGRAMME
http://cordis.europa.eu/fp6/dc
CNR IAMC
Università del Salento
SZN
Università del Molise
http://ec.europa.eu/sustainable