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Tools for mussel farming and seabream farming tested on Adriatic farm sites

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Mussel farming



Use

Screening

EIA/monitoring

Carrying capacity

assessment

Tool

Mediterranean mussel

Individual Based Model

MERAMOD (modified version)

MGCC Reaction-Transport Model



Seabream farming



Use

Screening

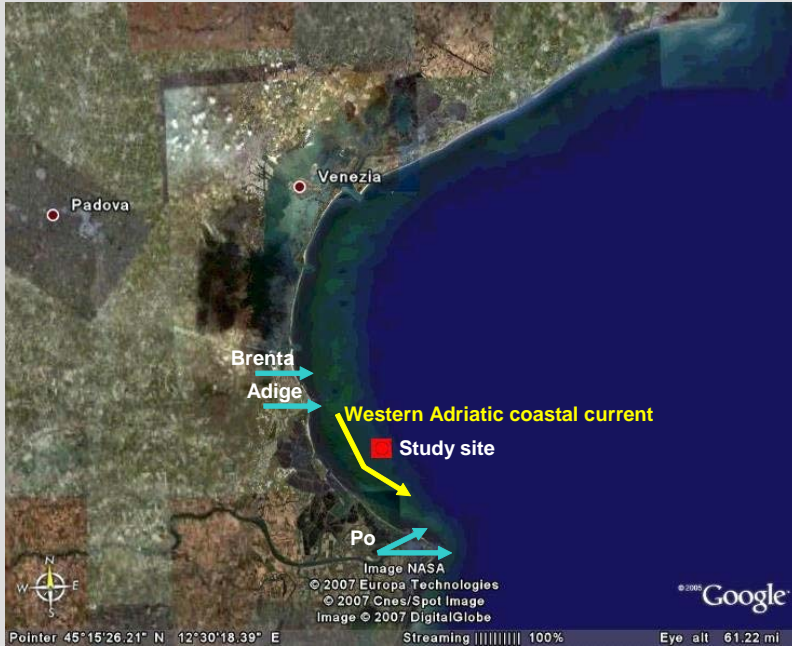
Tool

Seabream Individual Based Model



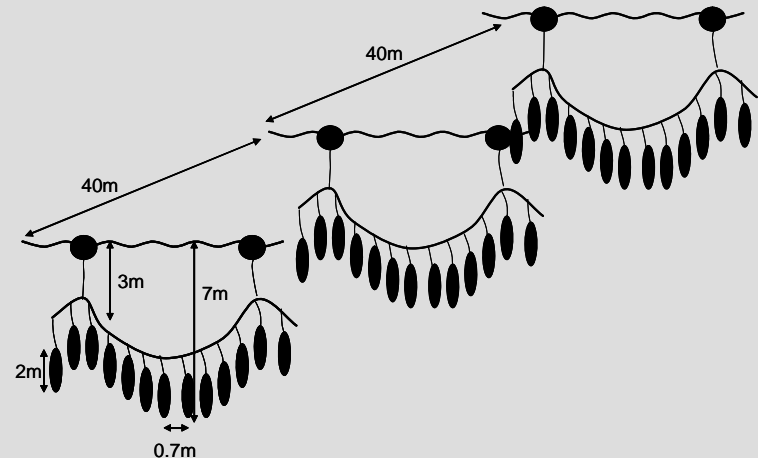
The tools were developed in collaboration with: SAMS and ICRAM

Shellfish tools were tested at Vi.S.Ma. mussel farm, Chioggia (Northern Adriatic, Italy) in collaboration with ICRAM:



Cultivated species: Mediterranean mussel
(*Mytilus galloprovincialis*)

- Type of gear used: longline;
- Location: 3 miles off-shore;
- Water depth: 20-24m;
- Mean current velocity in the area: 10 cm sec^{-1} ;
- Water quality: generally good, affected by river plumes at time.



MG-IBM: *Mytilus galloprovincialis* Individual Based Model

The model is based on an energy balance equation



Input

Time series of:

1. Particulate Organic Carbon
2. Chlorophyll a
3. Water temperature



Output

Time series of:

1. Dry weight
2. Length
3. Wet weight

MG-IBM: USER FRIENDLY INTERFACE

Pagina iniziale

SIMULAZIONE DELL'ACCREScimento DI *Mytilus galloprovincialis*



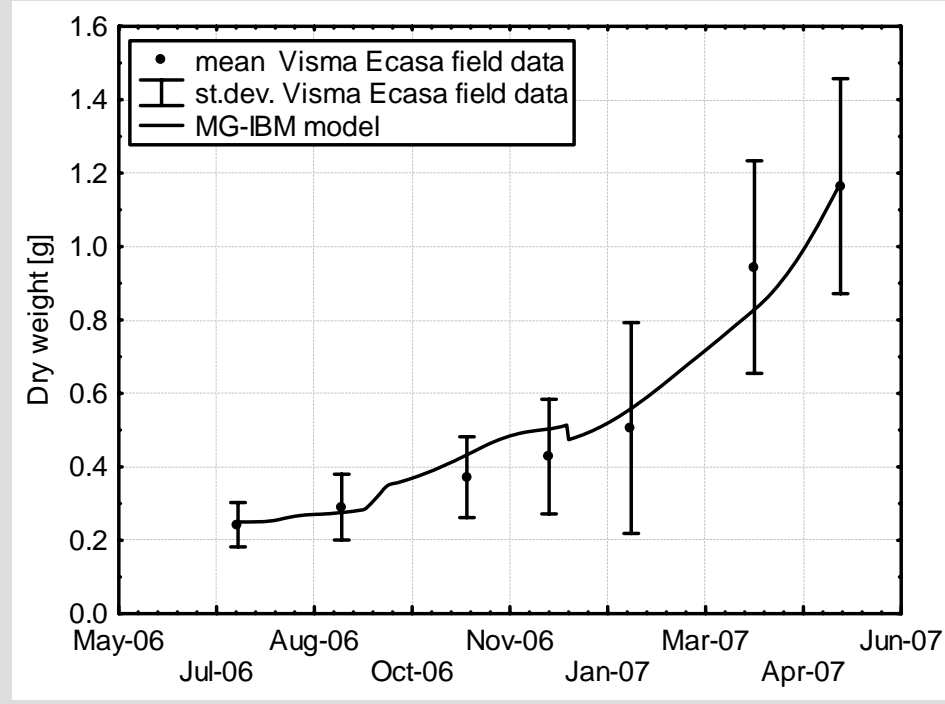
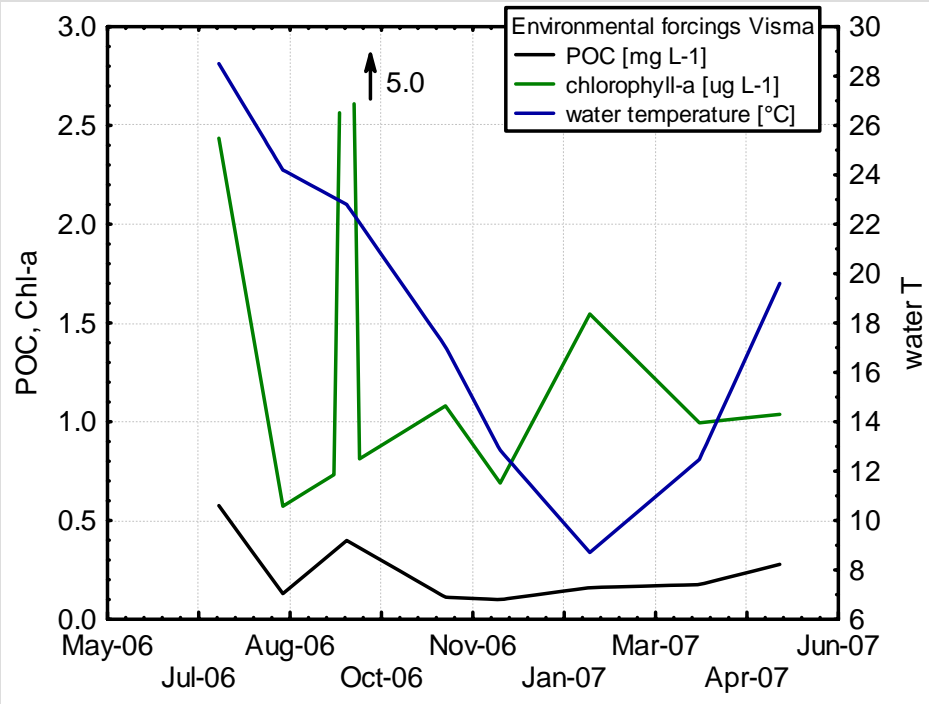
Con questo programma è possibile visualizzare l'andamento del peso secco di un individuo di *Mytilus Galloprovincialis* inserito in un ambiente marino a scelta. Tale ambiente può essere selezionato tra quelli predefiniti o può essere inserito dall'utente.
E' possibile impostare il peso secco iniziale del mitilo, o a scelta il suo peso umido o la lunghezza della sua conchiglia, in modo da valutarne l'effettiva crescita nell'arco di un anno.
Infine è disponibile il riassunto delle equazioni che costituiscono il modello di accrescimento utilizzato.



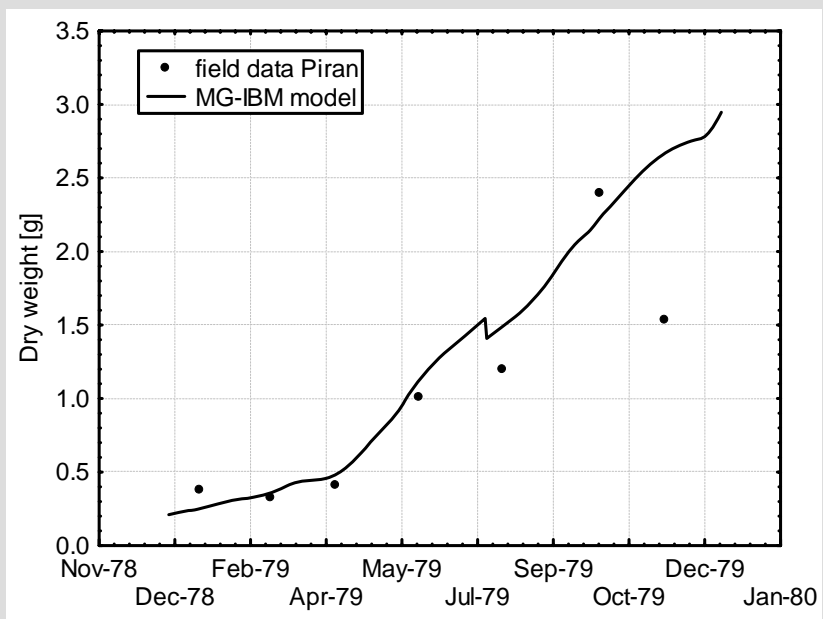
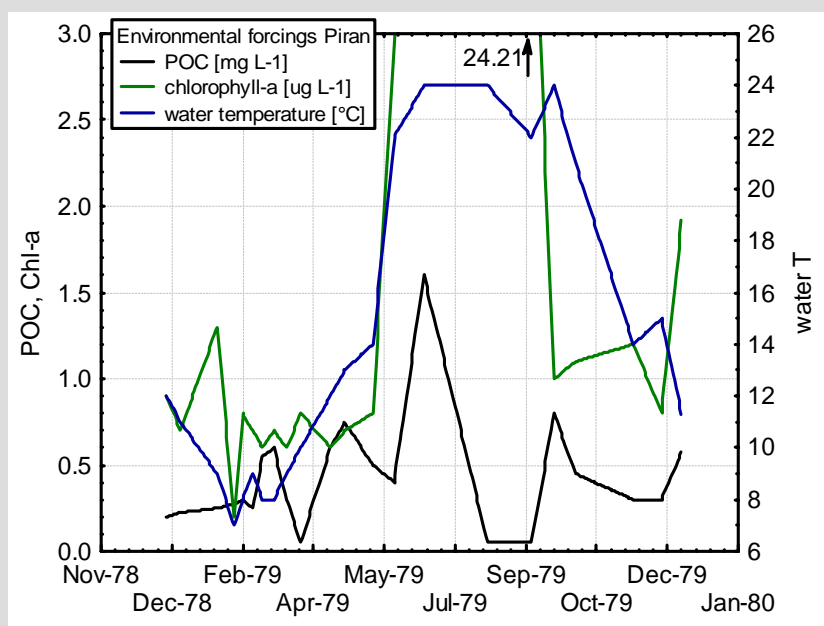
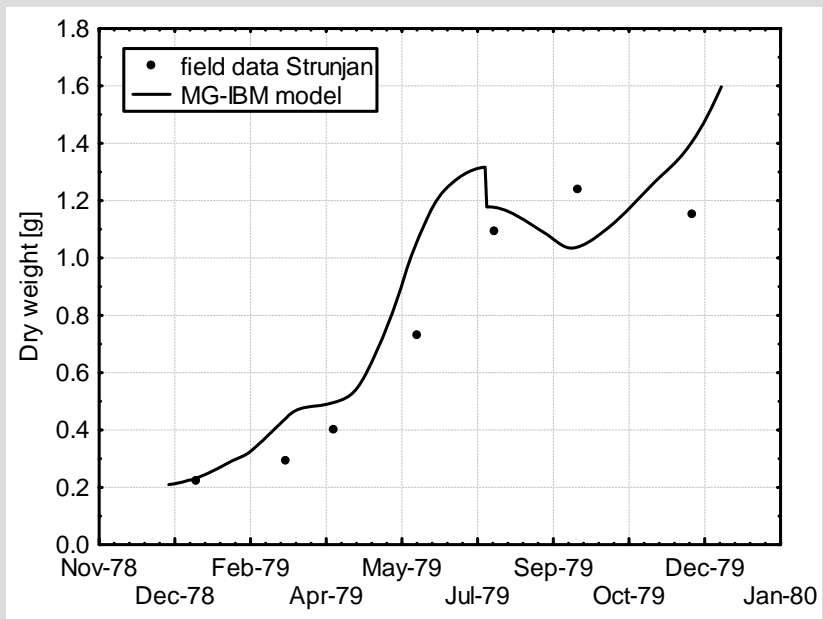
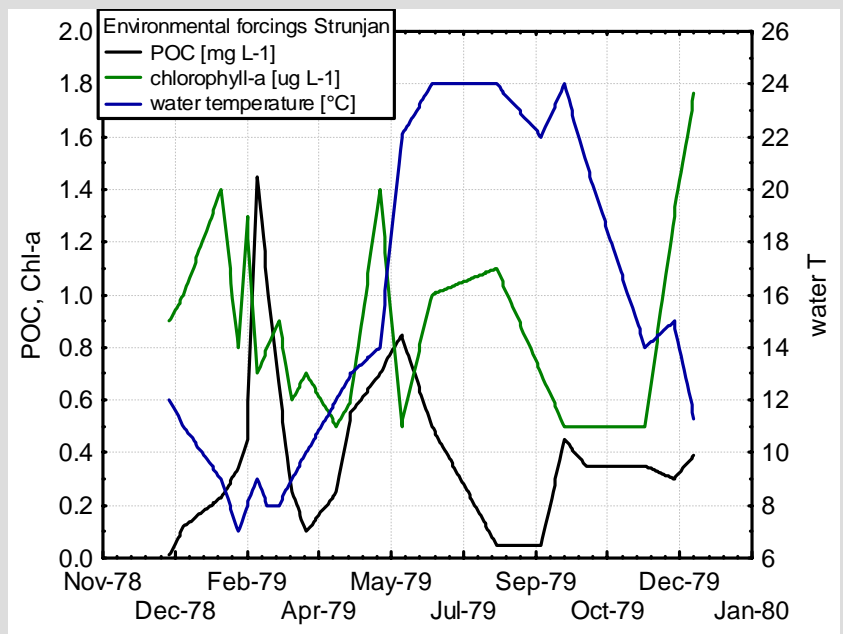
[Credits](#) [Visualizza equazioni](#) [Esci](#) [Avanti](#)

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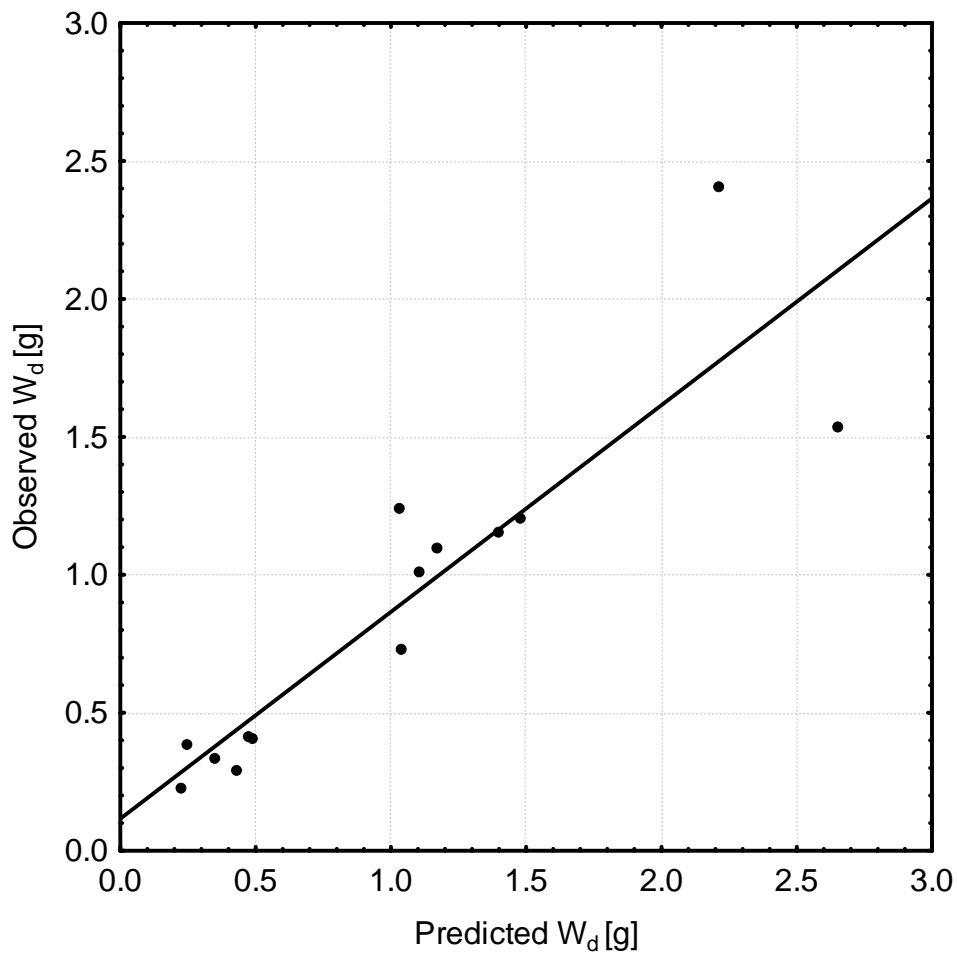
1. MODEL CALIBRATION: Chioggia study-site



MODEL VALIDATION: on historical data collected in Piran and Strunjan (Slovenia)



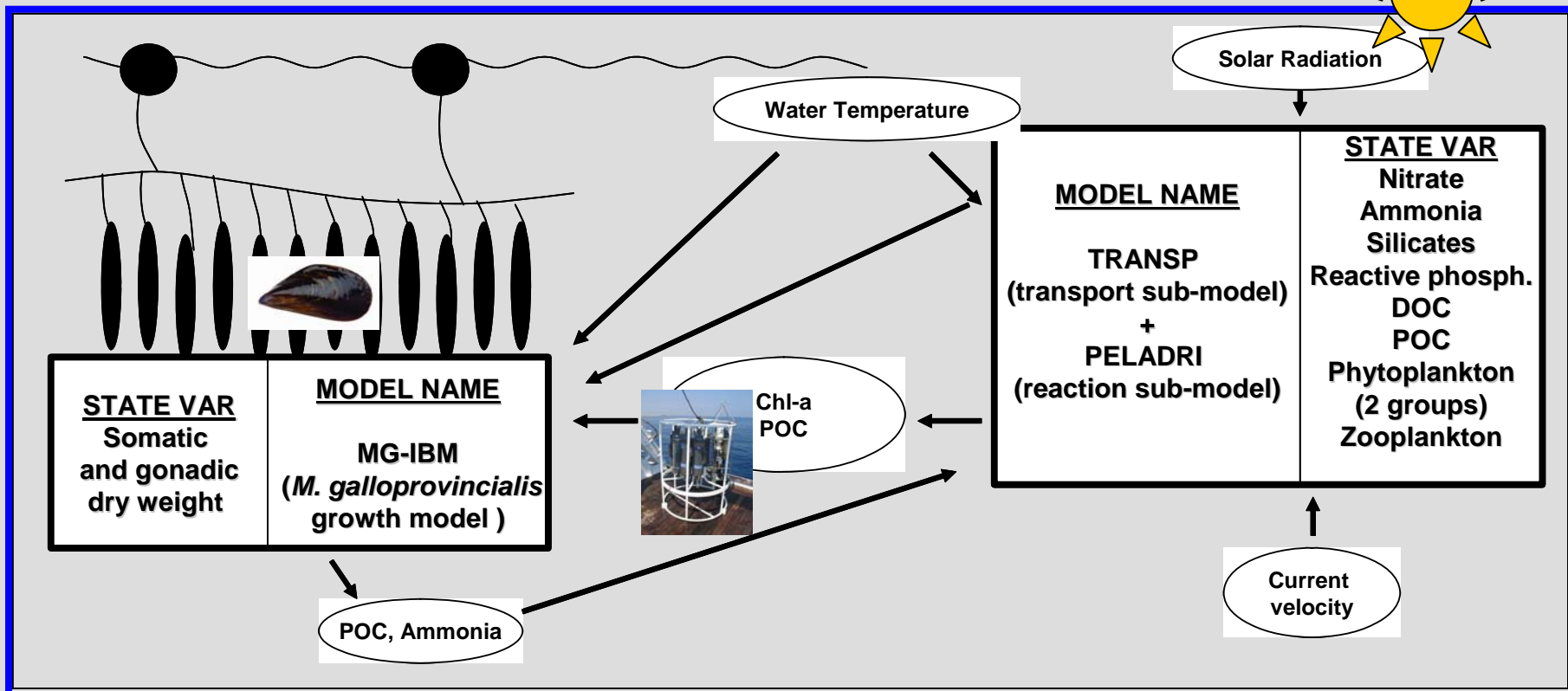
MODEL VALIDATION, statistics



r^2 , % of variance	0.81	p, on null hypothesis	$< 10^{-5}$ (F=51.3)
$\hat{\beta}_0$, regression intercept	0.12	$se_{\hat{\beta}_0}$	0.13
$t = (\hat{\beta}_0 - 0) / se_{\hat{\beta}_0}$	0.88	p	0.39
$\hat{\beta}_1$, regression slope	0.75	$se_{\hat{\beta}_1}$	0.1
$t = (\hat{\beta}_1 - 1) / se_{\hat{\beta}_1}$	-2.5	P	0.028

MGCC: *Mytilus galloprovincialis* Carrying Capacity Model

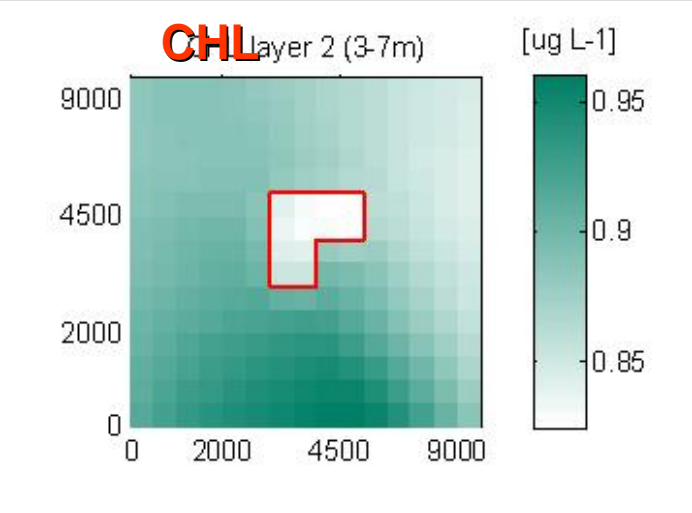
MODEL DESCRIPTION



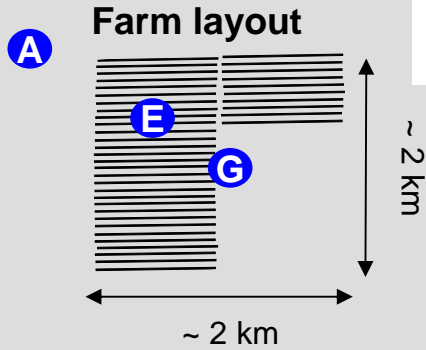
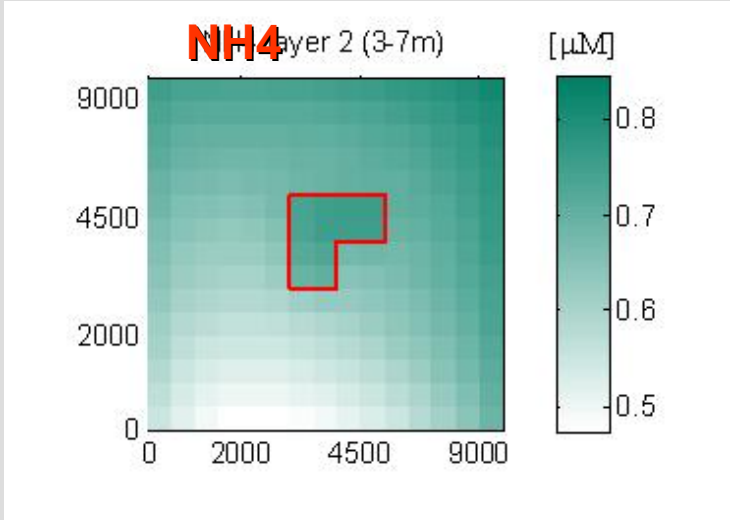
- The model was applied at Vi.S.Ma study site, in Chioggia, in order to study the impact of the mussel farm on the water column at a local scale

MGCC: *Mytilus galloprovincialis* Carrying Capacity Model

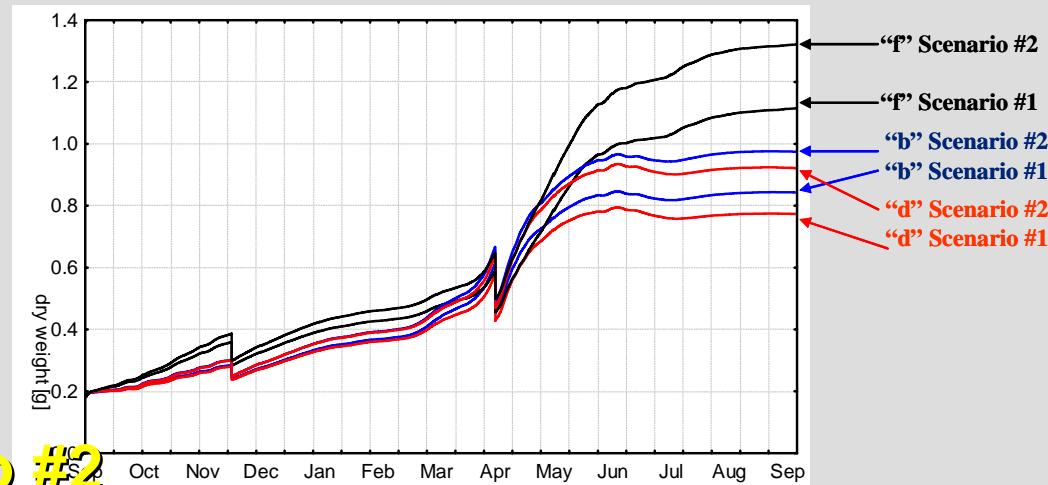
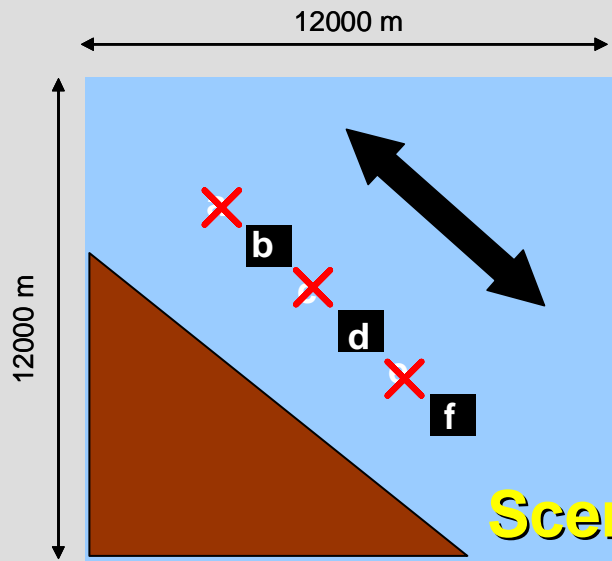
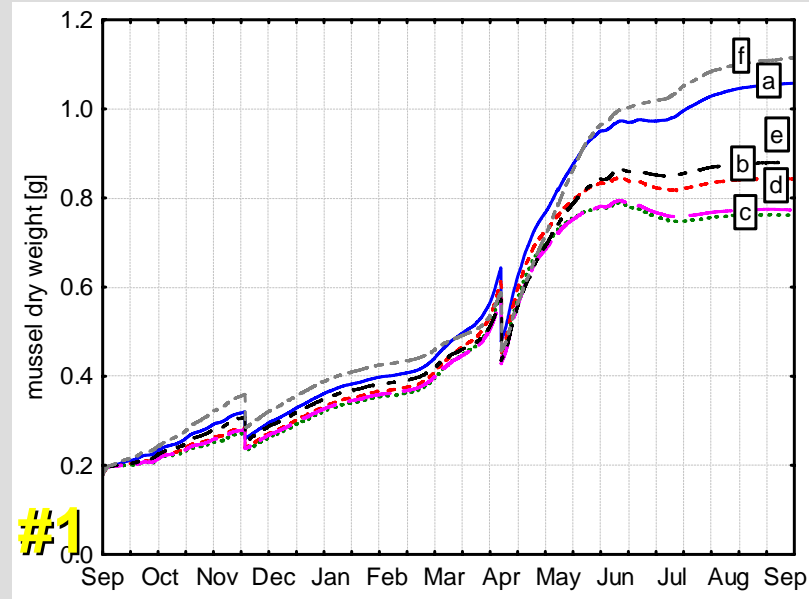
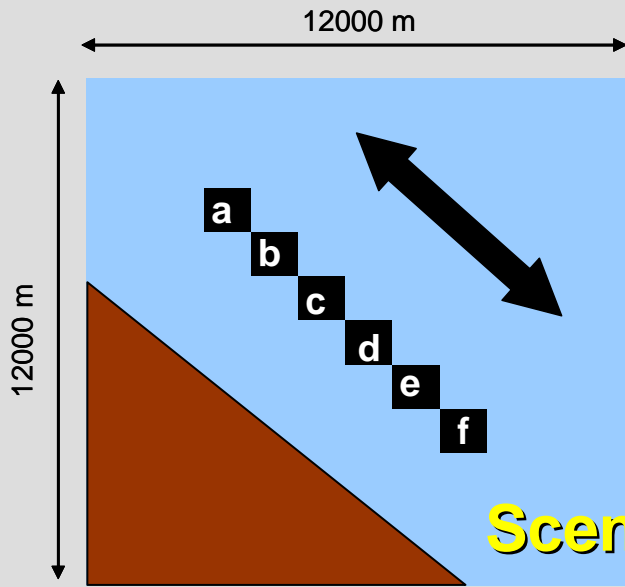
RESULTS

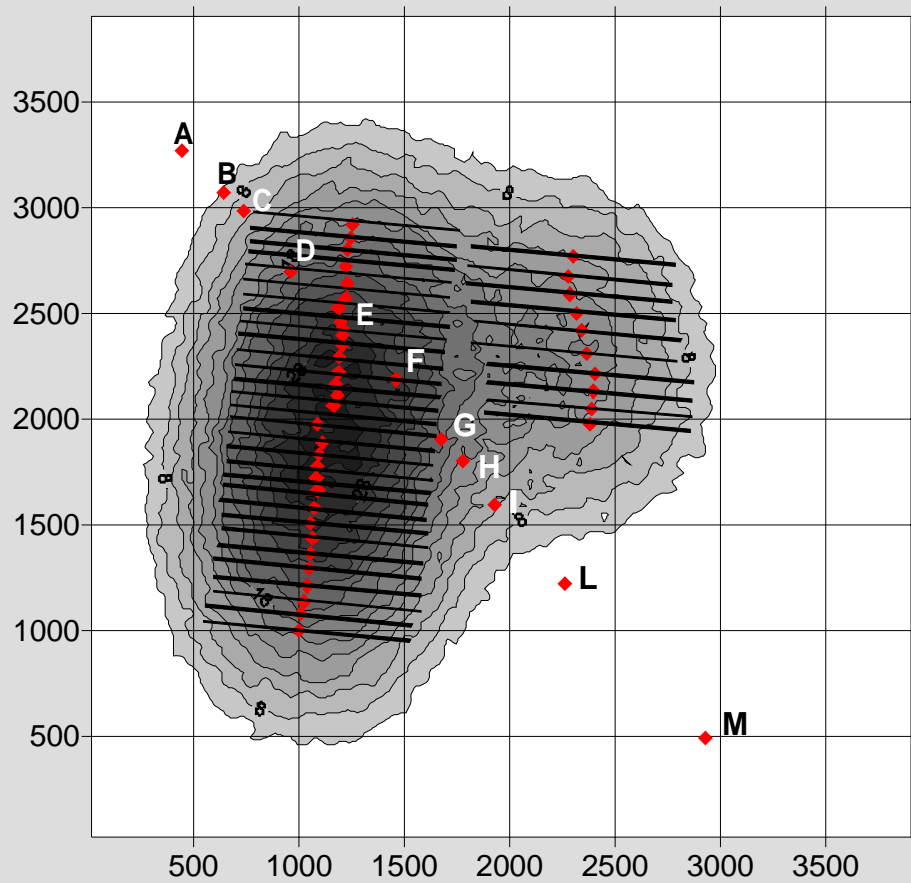


← **Model results** →



Spatial distribution of mussel farms along the Northern Adriatic coastline **may affect** their biomass yield





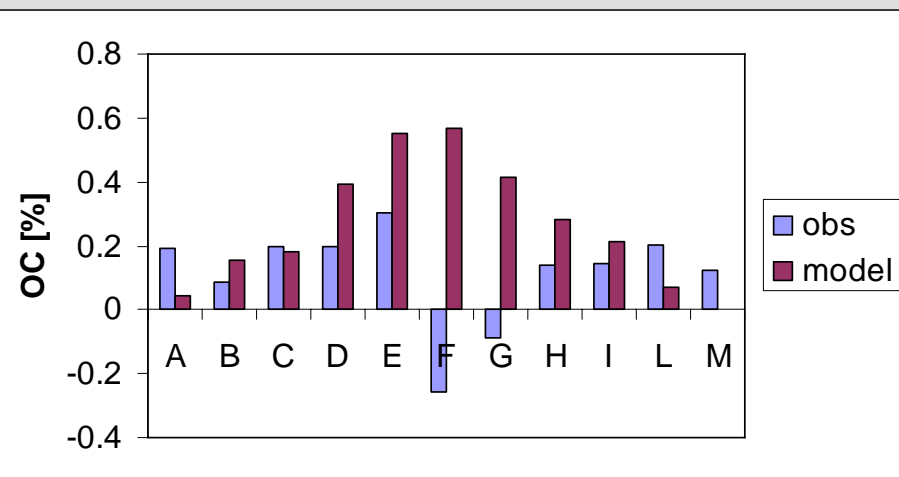
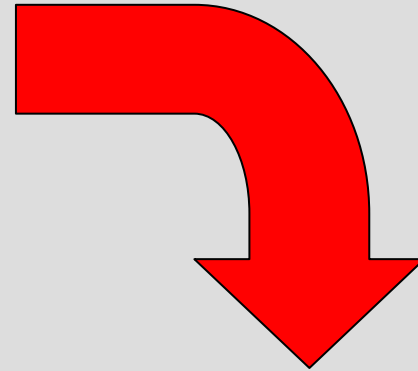
gC m⁻² yr⁻¹



MERAMOD application to mussel farming

In collaboration with SAMS

RESULTS



BREAMOD: *Sparus aurata* individual based model

The model is based on an energy balance equation

The model was developed in collaboration with ICRAM



Input

Time series of:

1. Food supply
2. Water temperature

+

Food composition



Output

1. Wet weight
2. Wasted food and faeces produced

BREAMOD: USER FRIENDLY INTERFACE

Pagina iniziale

SIMULAZIONE DELL'ACCRESIMENTO DI *Sparus*



Con questo programma è possibile visualizzare l'andamento del peso di un individuo di Sparus Aurata inserito in un ambiente marino a scelta. Tale ambiente può essere inserito. E' possibile impostare il peso iniziale dell'orata, in modo da valutarne l'effettiva crescita a tempo stabilito.



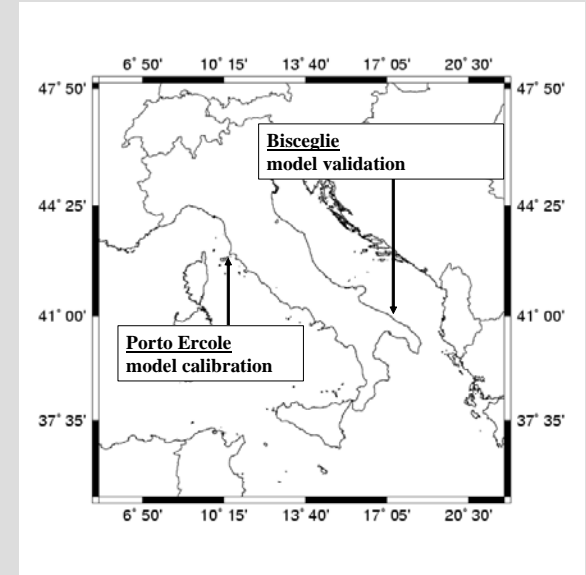
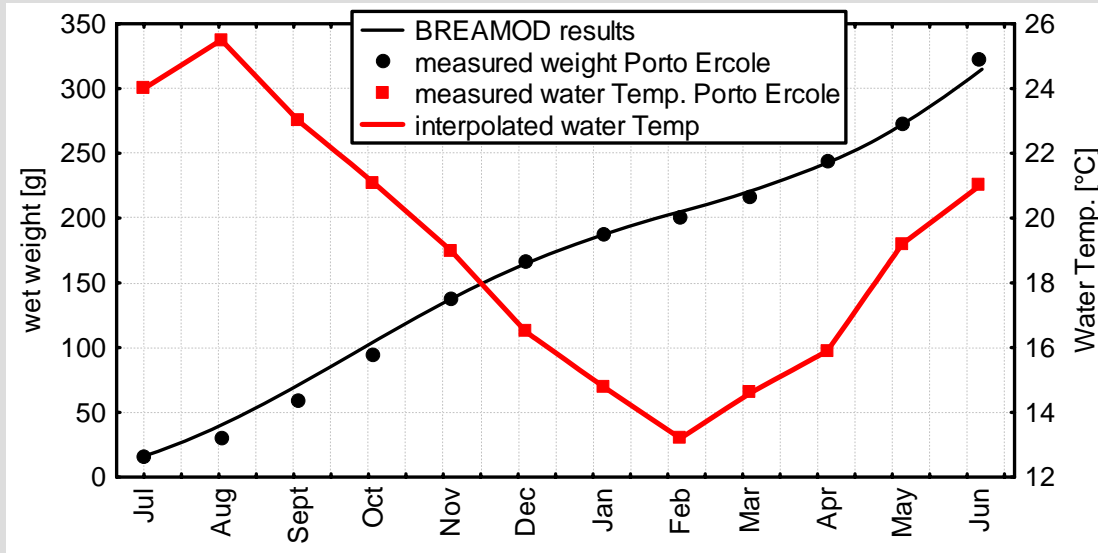
Risoluzione problemi di visualizzazione

Credits

Esci

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1. MODEL CALIBRATION: Porto Ercole (Thyrranian)



2. MODEL VALIDATION: Bisceglie (Adriatic)

