SPICOSA

E-NEWS

SPECIAL ISSUE

EXTENDSIM 4

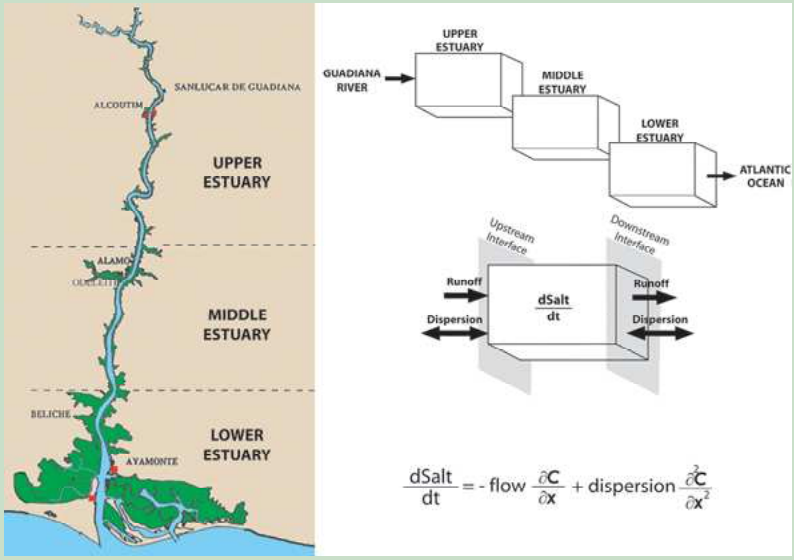
TABLE OF CONTENTS

NEW FROM THE EXTEND USER FORUM

- Modelling estuarine transport. The Guadiana study site has a functional estuarine transport model available.
- When is a model good? Some reflections from the Barcelona study site team.
- Linking sociology to ecology. Himmerfjarden brings light in the darkness.

Simulating the transport of salt or chemicals in the Guadiana estuary

Tiago Garcia, from the University of Algarve, spend a week at VITO, Belgium, working on his Extend Model. The challenge was to model the transport of nutrients in the Guadiana estuary. Estuaries receive input from rivers and transport it to the sea. Two important forces drive the transport of dissolved compounds: advection and diffusion. Advection is the downstream flow of freshwater to the sea. Diffusion is the redistribution of dissolved compounds as a result of a concentration gradient. Advective and diffusive processes were modelled in 1 dimension for the Guadiana estuary. The estuary was divided in three boxes, an upstream part, a middle part and a marine part and for each part, concentrations of sea salt and nitrogen were simulated and compared with field data. It is not too difficult to readapt this model to other European estuaries that are vertically well mixed. For questions, contact Tiago Garcia (tgarcia@ualg.pt, SSA11) or Joachim Maes (joachim.maes@vito.be, WP8)



The Guadiana salinity model simulates salinity in three estuarine boxes by implementing the 1D advection-diffusion equation.

When is a simulation model good?

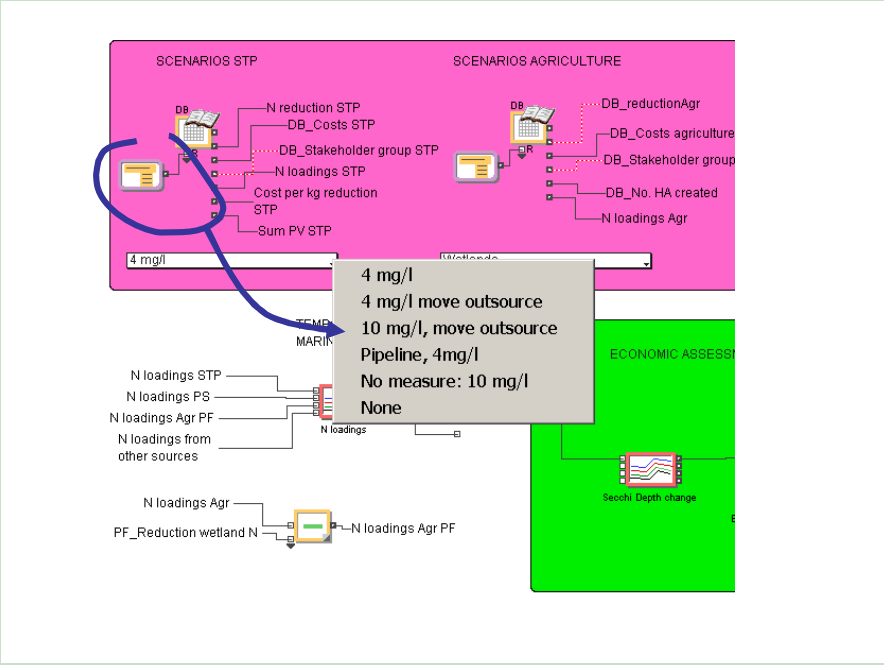
This might seem like a strange question, but how important is it that the models produce outputs that are similar to the observed data, Ben Tomlinson asked on the SPICOSA Extend forum. The particular problem of SSA12, Barcelona, is the poor quality of field data. In SPICOSA we make numerical simulations with for instance concentrations of a pollutant as output. But how to validate such a model if field observations have a much more qualitative nature. An observer may have collected

An integrated project under the EU´s 6th Framework Programme for Research (FP6) of the European Commission

data on water transparency by attributing only three classes to it: clear, turbid or very turbid. Careful consideration should be given when calibrating or validating the outputs of such models. It is more appropriate to model for instance the distribution of water transparency rather than the concentration of suspended sediments. What is also important is that you need to convince your stakeholders that your model simulates the right variables. So in stead of simulating concentrations, why not make your model output discrete and simulate a turbidity class. Other ideas on this topic are most welcome on the Extend Forum.

Coupling sociology to ecology. The Himmerfjarden study site model as a guide.

How do we link social sciences to natural sciences? How to model social behaviour? Can we überhaupt model social variables? These questions pop up each time at SSA meetings. Scientists from SSA 4, Himmerfjarden (Sweden), propose a very accessible way of coupling these different scientific domains. Key is a so called participation function. It is possible to make a statistical model that calculates the probability of farmers participating in a certain reduction scenario. Participation will result in an increased amount of riparian buffer zones so that direct nutrient runoff from fields to surface water is reduced. In their Extend model, SSA4 implemented a participation function with dummy data, represented by sliders. Users of the model can thus artificially increase or decrease the farmers willingness to participate and see in what effects this result. Their ballpark model in ExtendSim can be downloaded from the ftp site. Look under SSA4 models. Also nice in their model is the use op pop up blocks from the Extend utilities library, allowing easy selection of nitrogen reduction scenarios.



Screenshot of the Himmerfjarden ballpark model. The use of popup blocks facilitates scenario selection by a user.

COLOPHON

This EXTEND Special NEWS ISSUE has been prepared by Joachim Maes, WP8 (Model Support) Spicosa Partner 6 (VITO) joachim.maes@vito.be

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