

## ECASA - Model description template

<b>NAME of model:</b> <i>MOM (fish model)</i>	<b>Reporter/institute (a):</b> <i>Carina P. Erlandsson, Address: University of Gothenburg, Box 450, 405 30 Gothenburg, Sweden Phone no: +46317862854 Email: caer@gvc.gu.se (b)Ander Stigebrandt Address: University of Gothenburg, Box 450, 405 30 Gothenburg, Sweden Phone no: +46317862851 Email: anst@gvc.gu.se</i>
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### Short DESCRIPTION of model (b)

general description: *The fish model is one of four sub-models in the MOM model. Oxygen consumption due to fish respiration and the emission of various dissolved substances (ammonium, phosphorus) from the fish are computed on the basis of size and number of fish, feed composition, feeding rate, and temperature. The release of particulate organic matter (uneaten feed and faeces) from a farm is also calculated. In the fish model energy and matter are conserved. Fish and feed are described by their contents of protein, fat, carbohydrates, ashes and water and their contents of phosphorus and nitrogen.*

main state variables (c): *Fish growth, phosphorus and nitrogen (ammonium) emission, oxygen consumption fish weight, and faeces.*

scale to which applicable (d): *Local ( A)*

forcing data needed (e): *composition of the fish specie (protein, fat, carbohydrates, ashes), start weight, water temperature (monthly means), salinity, feed composition (protein, fat, carbohydrates, ashes).*

### possibly relevant INDICATORS (f)

driver:  
pressure:

state: *oxygen consumption, emission of substances, faeces, and fish feed (organic matter)*

impact:  
response:

### STATUS of model (g)

origin(ator), present development state (has been tested, under development, etc)  
present use, claimed robustness and scientific basis of this:

*The fish model was originally developed for Salmon (Stigebrandt, 1999), but the model will be adapted to a number of new fish species during the ECASA-project and another ongoing EU project (SPEAR). A mussel model for long line farming to be implemented in MOM will also be developed during the project.*

### **IMPLEMENTATION OF MODEL**

state of implementation (*h*): *The implementation of new fish species are under progress and the implementation of a mussel model will soon begin.*

state of documentation: *The fish model is described in Stigebrandt et al. (2004), and in more detail in Stigebrandt (1999).*

intellectual property concerns (*i*): *All equations and constants included in the original version are available in Stigebrandt (1999).*

### **TESTING**

summary of conditions and measurements needed - including critical forcing data (*j*)  
criteria for model rejection

### **OTHER models**

Used with this model (*k*): *The MOM model*

Similar models (*l*): *none*

### **REFERENCES cited**

*Stigebrandt, A., 1999. Turnover of energy and matter by fish-a general model wth application to Salmon Fisken och havet No. 5, Institute of Marine Research, Norway, 26 pp.*

*Stigebrandt, A., Aure, J., Ervik, A, Kupta Hansen, P., 2004. Regulating the environment impact of intensive marine fish farming III. A model for estimation of the holding capacity in the Modelling-Ongrowing-fish farm-Monitoring system. Aquaculture 234: 239-261.*