

## ECASA - Model description template

<b>NAME of model:</b> <i>MOM (water quality 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 model calculates  $TPF_{O_2}$ , the maximum fish production that keeps the oxygen concentration in the cages above a critical value, and  $TPF_{NH_4}$ , the maximum fish production that keeps the ammonium concentration in the cages below a critical value, with the estimated flushing rate. The water quality model is one of four sub-models in the MOM model.*

main state variables (c): *Oxygen and ammonium concentrations.*

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

forcing data needed (e): *farm layout, natural oxygen and ammonium concentrations in the water surrounding the farm, lowest mean surface current based on current observations during at least 2 weeks, the reduction factor for through-flow, and the lowest/highest acceptable concentration of oxygen/ammonium. The MOM fish model calculates the oxygen consumption and the ammonium emission in the cages.*

### possibly relevant INDICATORS (f)

driver:

pressure:

state: *oxygen concentration and ammonium concentration in the cages, fish growth.*

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 water quality model was described in Stigebrandt et al. (2004). This sub-model of MOM will not be further developed during the ECASA project, since it is not fish specie dependent.*

### IMPLEMENTATION OF MODEL

state of implementation (h):

state of documentation: *The water quality model was described in Stigebrandt et al.*

(2004).

*intellectual property concerns (i): none*

### **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: fish model, water quality model, dispersion model, benthic model, and FjordEnv*

Similar models (l): *none*

### **REFERENCES cited**

*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.*