



## XVII<sup>th</sup> World Congress of the International Commission of Agricultural and Biosystems Engineering (CIGR)

Hosted by the Canadian Society for Bioengineering (CSBE/SCGAB)  
Québec City, Canada June 13-17, 2010



### MODELLING BAFFLES IN WATER ACQUACULTURE PONDS

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#### CSBE100995 – Presented at Section I: Land and Water Engineering Conference

**ABSTRACT** The following article details the use of hydraulic characterization of waste water movement within phytotreatment ponds, collecting water coming from an intensive fish farm, located in the Orbetello area, before returning the water to the Orbetello lagoon (Grosseto, Italy) with the aim of increasing residence time and water quality. The problem analyzed through an experimental approach with trials on a physical model, to scale, of the pond. Visualization techniques, through the use of a tracer added at the entrance of the physical model, allowed the determination of the efficiency of the system, tested under different conditions. In particular, baffles have been used to improve the system efficiency, reducing recirculation areas which are not involved in the water movement within the pond. Results from trials conducted on baffles, by modifying their position and their length, were able to characterize the influence of the forced paths established by the baffles on the reduction of the recirculating areas and the lengthening of the residence time. Moreover, different tests on the influence of the water input and output position have been carried out to characterize the preferential paths in the water movement and the consequent effect on dead zones creation and extensions.

**Keywords:** baffles, residence time, hydraulic models, similitude