PhD project	**Ecosystem based-fisheries management** (from 1st September, 2008 to 31st August, 2011)
PhD Candidate	**Nguyen Viet Thanh** (email: nvt@sam.sdu.dk , web: http://www.sdu.dk/staff/nvt.aspx)
Supervisor	**Professor Niels Vestergaard** (email: nv@sam.sdu.dk , web: http://www.sdu.dk/staff/nv.aspx)

1. Background information

The collapses of many fisheries is widely believed the result of a mismanagement which is not only because of poor enforcement, but also because fisheries management traditionally focuses on managing a single target species and often ignores habitat, predators, and the prey of the target species and other physical components of ecosystems. The conventional single species fisheries management has failed and new approaches are needed (Hilborn 2004; Beddington, Agnew et al. 2007). A major element of the proposed new approaches is a move from conventional single species management to ***ecosystem-based fishery management,*** which seeks to include in the management plan not only all affected species but also abiotic factors such as water pollution, the effects of weather and climate on the ecosystem, and the effects of fishing activity on the habitat itself (Fluharty, Aparicio et al. 1998).

Although there are many themes and definitions, the concept of ecosystem-based fishery management is still unclear and there is no agreed standard approach (Brodziak and Link 2002). Regarding to ecological economic aspects, fishery models also mainly ignore the linkages to lower trophic levels of the ecosystems. In particular, environmental data and other bottom up information are widely disregarded (Fennel and Neumann 2004). There are few economic models dealing with the ***eutrophication*** phenomenon, which caused by excess inputs of nutrients to ecosystems (Carpenter, Ludwig et al. 1999; Smith and Crowder 2005). In cases of eutrophication, the water becomes turbid because of dense populations of phytoplankton, and large aquatic plants are outcompeted and disappear along with their associated invertebrate populations. Moreover, decomposition of the large biomass of phytoplankton cells may lead to low oxygen concentrations (hypoxia and anoxia), which kill fish and invertebrates. The outcome is a productivity community, but one with low biodiversity and low esthetic appeal (Begon, Townsend et al. 2006).

2. Key research questions

Given the problems related to ecosystem-based fishery management, the concept of ecosystem-based fishery management is still unclear and there is no agreed standard approach. Most fishery models ignore the linkages to lower trophic levels of the ecosystems. In particular, environmental data and other bottom up information are widely disregarded. The following key research questions will be discussed and answered:

- ***What does ecosystem-based fishery management mean in the economics point of view?***
- ***How we can include environmental factors such as water pollution and habitat degradation in the general ecological economic model of an ecosystem?***
- ***What are implications of the model for fisheries management?***
- ***How we can apply the model for the Baltic Sea case study?***

3. Credentials:

I am a Vietnamese nationality. I got a Master degree (MSc) in International Fisheries Management (University of Tromso, Norway) in June, 2006. In the program, I was trained familiar with concepts and practical issues related to fisheries management. I also learnt a lot of experience of modeling the dynamic of exploited fish population when I worked with my master thesis. My previous job includes five years working in the Ministry of Fisheries of Vietnam. This job has given me experience on analyzing fisheries data as well as interacting with the local fishers.

References:

Beddington, J. R., D. J. Agnew, et al. (2007). "Current Problems in the Management of Marine Fisheries." Science **316**: 1713-1716.

Begon, M., C. R. Townsend, et al. (2006). Ecology: From Individuals to Ecosystems, Blackwell Publishing.

Brodziak, J. and J. Link (2002). "Ecosystem-based fishery management: what is it and how can we do it?" Bulletin of marine science **70**(2): 589-611.

Carpenter, S. R., D. Ludwig, et al. (1999). "Management of Eutrophication for Lakes Subject to Potentially Irreversible Change." Ecological Applications **9**(3): 751-771.

Fennel, W. and T. Neumann (2004). Introduction to the modelling of marine ecosystems. Amsterdam, Elsevier

Fluharty, D., P. Aparicio, et al. (1998). Ecosystem-based fishery management. Washington, Ecosystem Principles Advisory Panel, National Marine Fisheries Service, National Oceanic and Atmosphareric Administration, U.S Department of Commerce**:** 54.

Hilborn, R. (2004). "Ecosystem-based fisheries management: the carrot or the stick?" Marine Ecology Progress Series **274**: 275-279.

Smith, M. D. and L. B. Crowder (2005). Valuing Ecosystem Services with Fishery rents: A lumped-Parameter Approach to Hypoxia in the Neuse River Estuary, The Nicholas School of Environment and Earth Sciences at Duke University**:** 56.