



## CANSEE 2013 Conference: "Sustaining the Commons: Ideas and Actions for a Green Economy"

Takuro Uehara (presented by Jeffrey Weih) - An I/O Systems Dynamic Approach to Ecological Economic Modelling

Jeffrey Weih's presentation focused on the implications of linking input-output and system dynamics analysis. Input-output analysis is widely used in environmental analysis, but it uses linear representations of flows and therefore does not capture systems' feedback loops. System dynamics analysis allows us to analyze complex dynamic systems, but it does not capture the structural details of an economy. However, input-output and system dynamics analysis may be complementarily integrated to create a model of an environmentally extended input-output model using system dynamics.

The presented model captures a complex environmental situation in the Seine Estuary where nursery areas have been decreasing due to economic activities such as dykes and harbour extensions. Combining input-output and system dynamics analysis has allowed developing three simulation scenarios for impact of restoration on the condition of the nursing area over the period of 2018-2028. Preliminary results show that no restoration of eroded areas results in a steady decline in the nursing area and in the final demand for sole; 2% restoration leads to the nursing area increasing steadily and demand increasing less stably; while 10% restoration leads to nursing area increase followed by a slight decrease, and a slight increase of demand above the 2% restoration scenario.

Future areas of research could include studying feedback loops between economic and ecological systems, including the impact of economic activity on the destruction of the nursing area; collecting soft data through expert meetings; addressing possible scale mismatches between economies and ecosystems; stochastic optimization; and analysis of policy space using numerical approaches.