

Ecosystem-Science & -Engineering Approach toward Conservation of Biodiversity



**An Appeal to COP10 Nagoya
from the Ecology and Civil Engineering Society (ECES)**

October, 2010

This appeal was finalized through International workshop on “Ecosystem -Science & -Engineering Approach toward Conservation of Biodiversity” on 13-14th May, 2010.

1. Significance of Pursuing Biodiversity Conservation

Along with resource depletion and global warming, “loss of biodiversity” is a factor threatening the sustainability of humankind. Providing for sound ecosystems in order to conserve biodiversity facilitates the conversion to an eco-harmonious society that benefits from ecosystem services (the use of biological resources). Another benefit, along with contributing to coping with resource depletion and to mitigating and adapting to global warming, is the ethics and happiness of coexisting with other living things.

2. Structure and Function of Ecosystem

We recognize ecosystem as follows in order to maintain a healthy ecosystem. Ecosystem structure is composed of three subsystems; (A) physical basement by fluvial hydraulics, (B) biotic community and (C) material cycle with particular reference to biophilic elements. And, ecosystem functions are corresponding to the interactions among the subsystems, such as habitat provision and provision of appropriate space for peculiar elementary process in material cycle. The national land must be recognized as a set of scattered landscapes (habitat mosaics) linked by water/material flux networks, and ecosystem at larger scale is postulated there.

3. Focus on “River Basin Complex”

A “river basin” is a region where various landscapes (local ecosystems consisting of the interactions among their physical underpinning and material cycles, plus the various biological workings upon them) are linked by water/material cycles. The evolutionary processes of living things are based on units which are aggregates of multiple river basins that include geology, topography, and climate, as well as their changes throughout geological history. The human activities carried on in river basins have linked together multiple river basins in order to address population increases and improve economic efficiency. A “river basin complex,” which is an aggregate of multiple river basins, is a representative scale shared by the activities of both humans and other organisms. And a river basin complex forms a fate with a bay surrounding multiple river basins. Precisely by focusing on the river basin complex, we can find a strategy for biodiversity conservation that pertains to the sustainability of humans and other living things.

4. Awareness of Biodiversity Degeneration

Human activities have expanded in river basin complex and disturbed the health of ecosystems, as seen in the loss of biodiversity, and have become a threat to sustainability, including that of human society. At the same time, human activities, mainly in cities, have brought together pleasant living, wealth, knowledge, and technology.

5. Conservation Strategy Actors

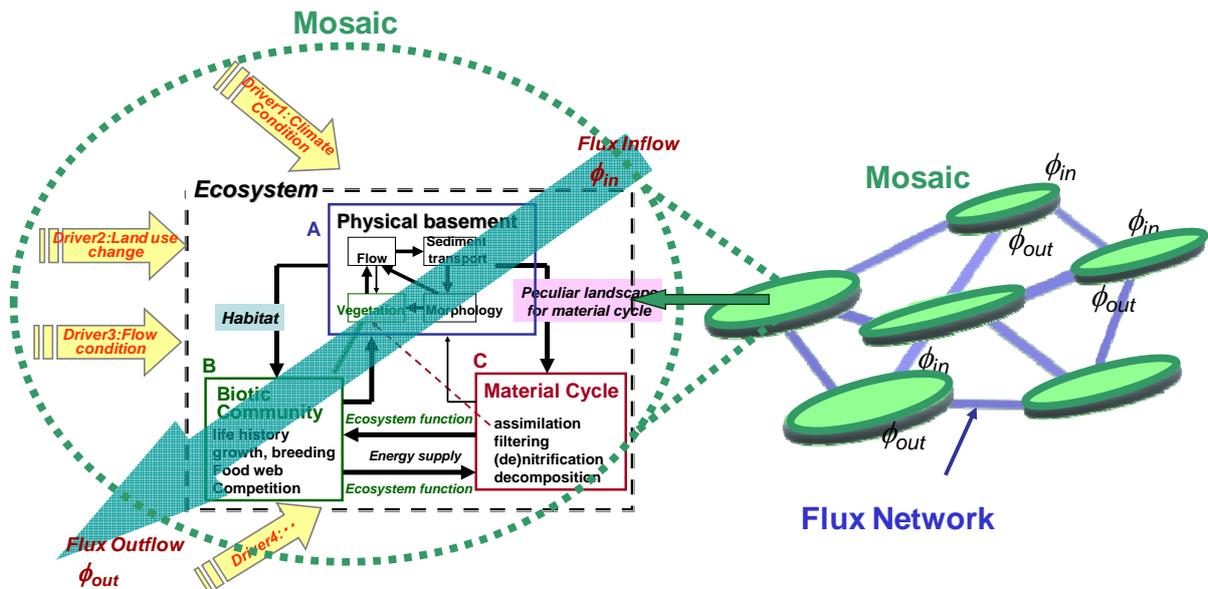
Cities and their citizens, particularly metropolitan, which enjoy the benefits of knowledge, technology, and economic power, stand at the forefront in mitigating the threat to sustainability (responsibility of metropolitan). It is essential to understand the structure and functions of river basin complex through the collaboration and melding of different scientific disciplines, and to have management framework and its practice by means of cooperation among diverse academic disciplines and solidarity among citizens, academics and public administrators. The Ecology and Civil Engineering Society, which has achievements in the collaboration and melding of sciences, mainly ecosystem-science and engineering, will be the motive force that expedites our understanding of the scientific mechanism of river basin complex, and the development of management methods which strive for harmony with nature.

6. Action Plan

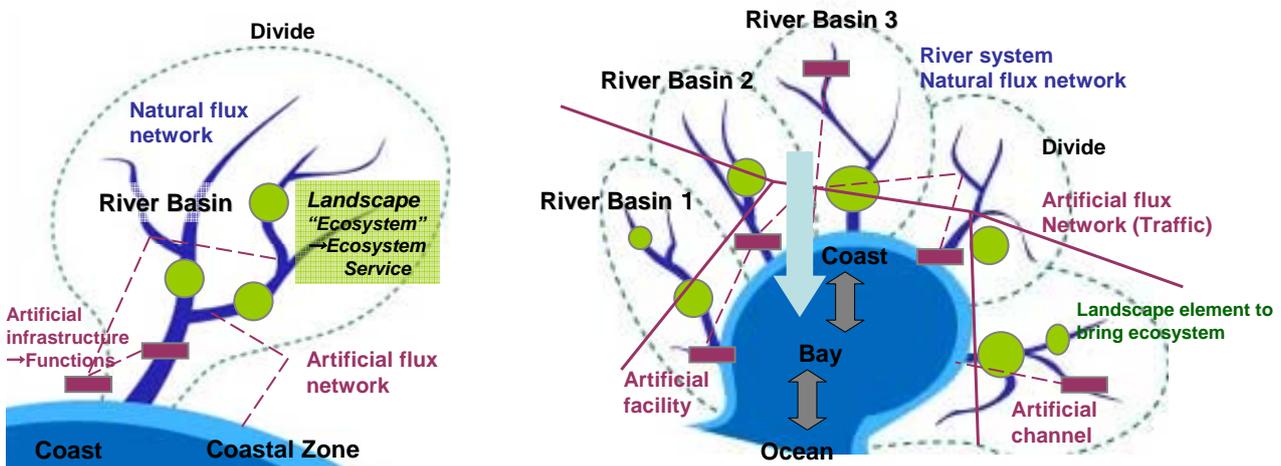
We strive to carry out action aimed at conserving biodiversity through achieving river basin complex in harmony with nature around three core elements: conservation and restoration of habitat mosaics where critical ecosystem drivers influence their composition, distribution and maintenance; evaluation and rehabilitation of water/material flux networks that link them; and the system (governance) that implements them and the “responsibility of metropolitan leadership” to support them.

7. Ise Bay River Basin Complex

We take as our model the Ise Bay river basin complex. This region has characteristics that are valuable in terms of geology and the evolutionary history of life as well as ecology, and the region supports cities that are the nucleus of human activities. These human activities have concentrated economic power, knowledge, and technology in the cities particularly in the metropolis and, at the same time, caused ecosystem degradation such as the loss of biodiversity. With a core comprising the three elements of conserving and restoring landscapes, rehabilitating water/material flux networks, and exercising the responsibility of metropolitan, we will implement action meant to achieve river basin complex in harmony with nature through a challenging approach from ecosystem-science and -engineering and disseminate the results.



Mosaics and Flux network



River basin and River basin complex

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Action Plan

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