

第6回地球研評価委員会中間評価報告資料

(平成18年3月2日、於：地球研講演室)



**Interim Report**  
**5-2 IDEA Project**

**Interactions between the environmental quality of a watershed and the environmental consciousness:**

With reference to environmental changes caused by the human use of land and water resources

reported by

5-2 IDEA project leader: Takahito YOSHIOKA

**Research axis 5**  
**Conceptual framework for global environmental issues**

Theoretical and empirical analysis for building conceptual framework of global environmental issues.

**5-2 IDEA project:**

**Environmental consciousness**

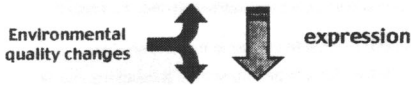
**Value Judgment of the environment**

Sense of value for the environment

Environmental valuation

**Hypothesis**

**Environmental consciousness**

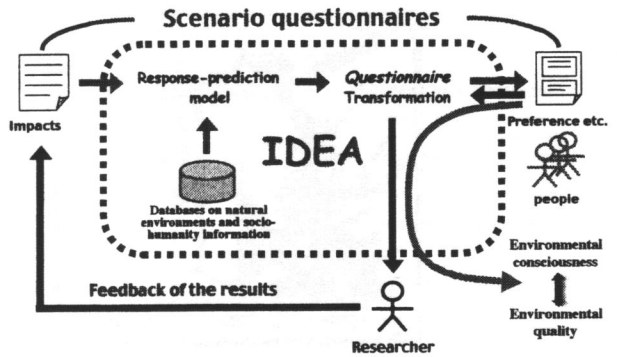


**Value Judgment of the environment**

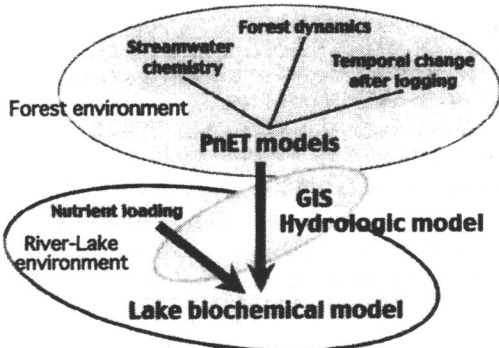


To understand this scheme is a key for fundamentally solving environmental issues.

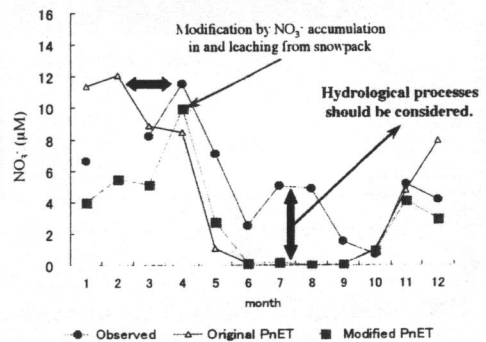
**Framework of the methodology**



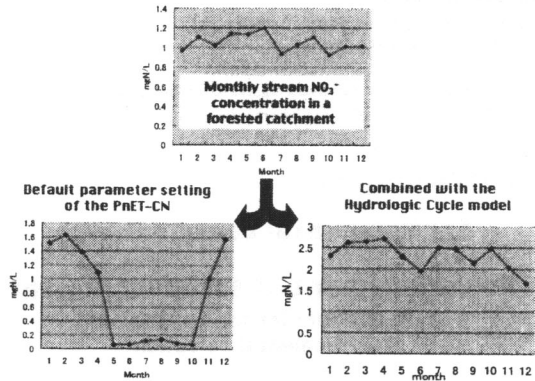
**Response-prediction model**



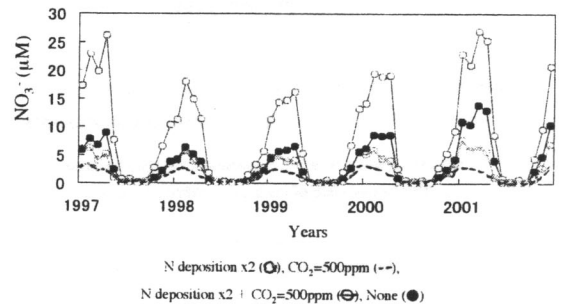
**Simulation of stream  $\text{NO}_3^-$  using PnET-CN model**



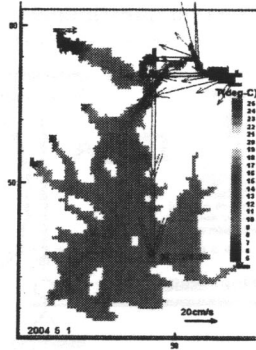
### Improvement with the hydrological sub model



### Responses of stream NO<sub>3</sub><sup>-</sup> to increases in atmospheric nitrogen deposition and atmospheric CO<sub>2</sub> concentration



### Simulations of water temperature and lake water flow



### Survey on people's interests in a forest-agricultural-aquatic ecosystem

#### Objectives:

1. To set virtual impacts used in scenario questionnaires
2. To obtain information for preparing scenario questionnaires
3. To understand the background of people's interests

#### Procedure of the survey

Preparation of the questionnaire was done using a traceable way, in order to assure a versatility and applicability to other environments and stakeholders.

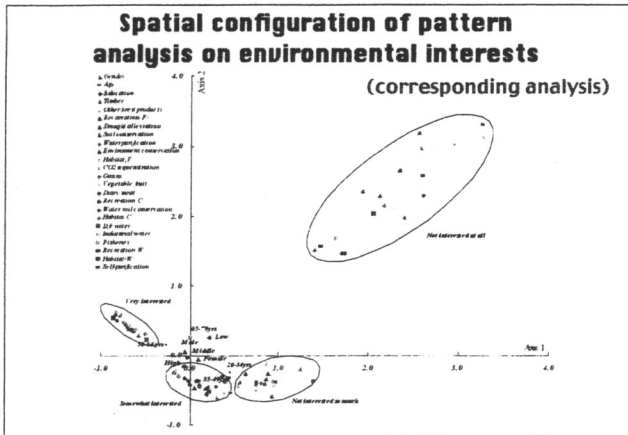
### A matrix of land cover/use, values and human activities for preparation of interest survey

Value	Environment complex		
	Forest	Agriculture	Aquatic
Direct use values			
Indirect use values ecosystem functions			
Human activities			
Physical environment	Forest vegetation	Forest vegetation	Forest vegetation
Management activities	Management activities	Management activities	Management activities
Social environment	Population	Population	Population
Human activities	Human activities	Human activities	Human activities

**Preparation of the questionnaire**

### Overview of the interest questionnaire

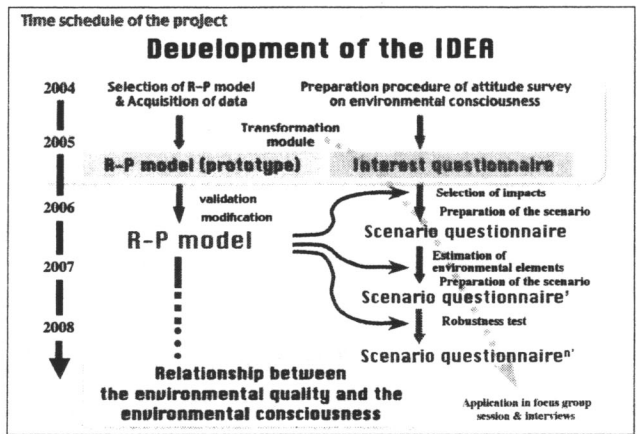
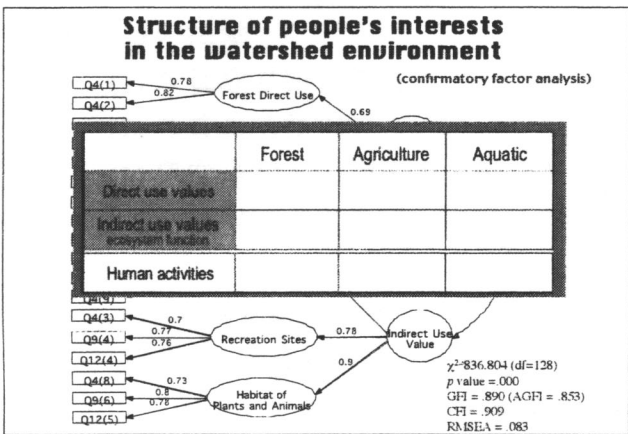
- Survey Area: Japan
- Subject: Interests in watershed environments
- Number of questions: 30 (95 items)
- Samples: Japanese nationals between 20 and 79 years old
- Sample size: 1,800
- Sampling: Two-stage stratified sampling
- Frame of sampling: Basic resident register and electoral register
- Mode of survey conduction: Face-to-face interview method
- Survey period: From 2005/10/14 to 2005/11/14
- Number of completed responses: 886 (Response rate: 49.2%)



### Structure of people's interests in the watershed environment (exploratory factor analysis)

Item*	Factor loading					
	(1)	(2)	(3)	(4)	(5)	(6)
Forest: Purification of water [Q4(6)]	.84	.01	.03	-.04	.06	-.05
Forest: Prevention of landslides and floods [Q4(5)]	.64	-.03	.00	.14	.08	.00
Forest: Ease of drought [Q4(4)]	.63	.03	.03	.21	.04	.00
Forest: Protection of living environment [Q4(7)]	.60	-.05	.13	.03	-.06	-.07
Forest: CO <sub>2</sub> sequestration [Q4(9)]	.49	-.04	.01	.03	.01	-.30
Crop field: Production of grains [Q9(1)]	-.04	.89	-.06	.08	.05	.02
Crop field: Production of vegetables or fruits [Q9(2)]	.05	.88	.02	.03	-.01	.04
Crop field: Production of dairy products or meat [Q9(3)]	-.06	.86	.14	.01	-.01	-.15
Crop field: Conservation of water and soil quality [Q9(5)]	.38	.86	.07	-.03	.24	-.02
River: Providing scenery and recreation sites [Q12(4)]	-.03	.08	.78	-.01	.18	-.04
Crop field: Providing scenery and recreation sites [Q9(4)]	.06	.19	.71	-.02	-.07	.01
Forest: Providing scenery and recreation sites [Q4(3)]	.21	.01	.81	.21	-.13	-.04
Forest: Production of forest products [Q4(2)]	-.05	-.06	.01	.90	-.03	.02
Forest: Timber production [Q4(1)]	.09	.01	-.01	.65	.07	-.04
				.49		-.01
				.45		-.03
				.37		-.19
Forest: Habitat of plants and animals [Q4(8)]	.28	.03	-.02	.10	-.13	-.68
River: Habitat of plants and animals [Q12(5)]	-.11	.00	.17	.06	.32	-.89
Crop field: Habitat of plants and animals [Q9(6)]	.02	-.25	.07	.02	.08	-.56

\* All item is Reverse-scored.



### Future activities

- Using the Response-Prediction model, environmental changes will be estimated base on various impact scenarios. The refinement of the Response-Prediction model and the collection and management of measured dataset of the environment will be continued.
- Results of the interest questionnaire will be analyzed within this fiscal year to create the type and scale of impacts to be used as model input.

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- Scenario questionnaires

