Message from the Director-General

The Research Institute for Humanity and Nature (RIHN) was established in 2001 by the Government of Japan to promote 'integrated cooperative research toward the solution of global environmental problems' and to create the field of global environmental studies. RIHN's objective is to define, conduct and debate integrative research capable of describing the true dynamism of earth phenomena and humanity's place in it. To this end, RIHN solicits funds and hosts fixed-term research projects on key areas of interactions between humanity and nature.

This prospectus introduces RIHN's approach to environmental studies, one based in nuanced appreciation for past human success and failure, present social and biophysical processes, and their inevitable change and unknown future. We use the concept of futurability, a word coined in Japan as a translation of the ideographs for 'future' and 'potentiality,' to express the wide range of possibility in future development. Human societies must think boldly, and yet with humility, about their individual and collective futures in the midst of dynamic, changeable earth environments.

The year 2011 marks the opening of the RIHN's second decade. I would like to congratulate RIHN's many talented researchers on their impressive accomplishments to date. RIHN is also continually enriched through many individual and institutional academic collaborations and an emerging international network for transdisciplinary environmental studies. I should note the recent publication of "*The RIHN Encyclopedia of Global Environmental Studies*", a formidable synthesis of current environmental thought in Japan and a fitting commemoration of RIHN's first decade. The entire RIHN research community can take pride in such accomplishments, and yet much work remains. RIHN's intellectual goals and research structure continue to evolve as we consider how to enable the future potential in, and enhanced design of, interactions between humanity and nature.

This prospectus describes many of RIHN's endeavors and introduces the innovations to be adopted in its second decade. I hope the reader is impressed with the quality and breadth of RIHN research and will join us in our efforts to improve it. I invite your warm understanding and support, as well as your critical assessments, of this prospectus and all RIHN activities.

TACHIMOTO Narifumi

Integration

Integration entails the assimilation of multiple knowledge traditions – those stretching back millennia as well as those of the contemporary natural and human sciences – into a single framework. In contemporary terms, the challenge is not just to link knowledge of complex natural processes with that of the lifestyle and culture of different regional communities, but to build holistic knowledge frameworks that allow for qualitative leaps in the human ability to solve environmental problems. RIHN is developing the transdisciplinary field of *Environmental Humanics of the Earth System*, to describe this merging of cognitive and design sciences.

International Networking

RIHN research projects are based on networks of Japanese and international scholars and research institutions. At both the project and institute level, RIHN establishes complementary partnerships in order to conduct fieldwork, address local problems, organize symposia, or to focus or strengthen academic communication within specific research fields. Our home research community is also enriched by the presence of many foreign visiting professors and researchers.

Leadership

Each research project is housed within one of five research domains, which is overseen by a director who is responsible for describing the domain's key theoretical, empirical and methodological components, and for encouraging synergies between individual projects. As RIHN now enters its second term, a new Core Research Hub has been established in the Center for Coordination, Promotion and Communication. Its role is to focus discussion between the Director-General, Deputy-Director Generals and Domain Directors on RIHN's long term research trajectory, to strengthen synergies between the five domains, and so to establish RIHN as a center in global environmental studies.

Fluidity

At RIHN, professors, associate professors, and assistant professors work through fixed-term appointments, as do project researchers and administrative staff involved in project and institute support. This structure is unique within Japan, and it encourages personal and intellectual exchange with individuals and partner institutes in Japan and abroad. In addition, the phased flow of project research, from Incubation Study (IS) to Full Research (FR), allows for the flexible guidance and evolution of each project.

RIHN research projects are organized through five research Domains: Circulation, Diversity, Resources, Ecohistory and Ecosophy. As RIHN enters its second decade, we seek greater integration both within and between Domain-based research projects and have developed a new set of initiatives, the Futurability Initiatives, in order to accomplish this task.

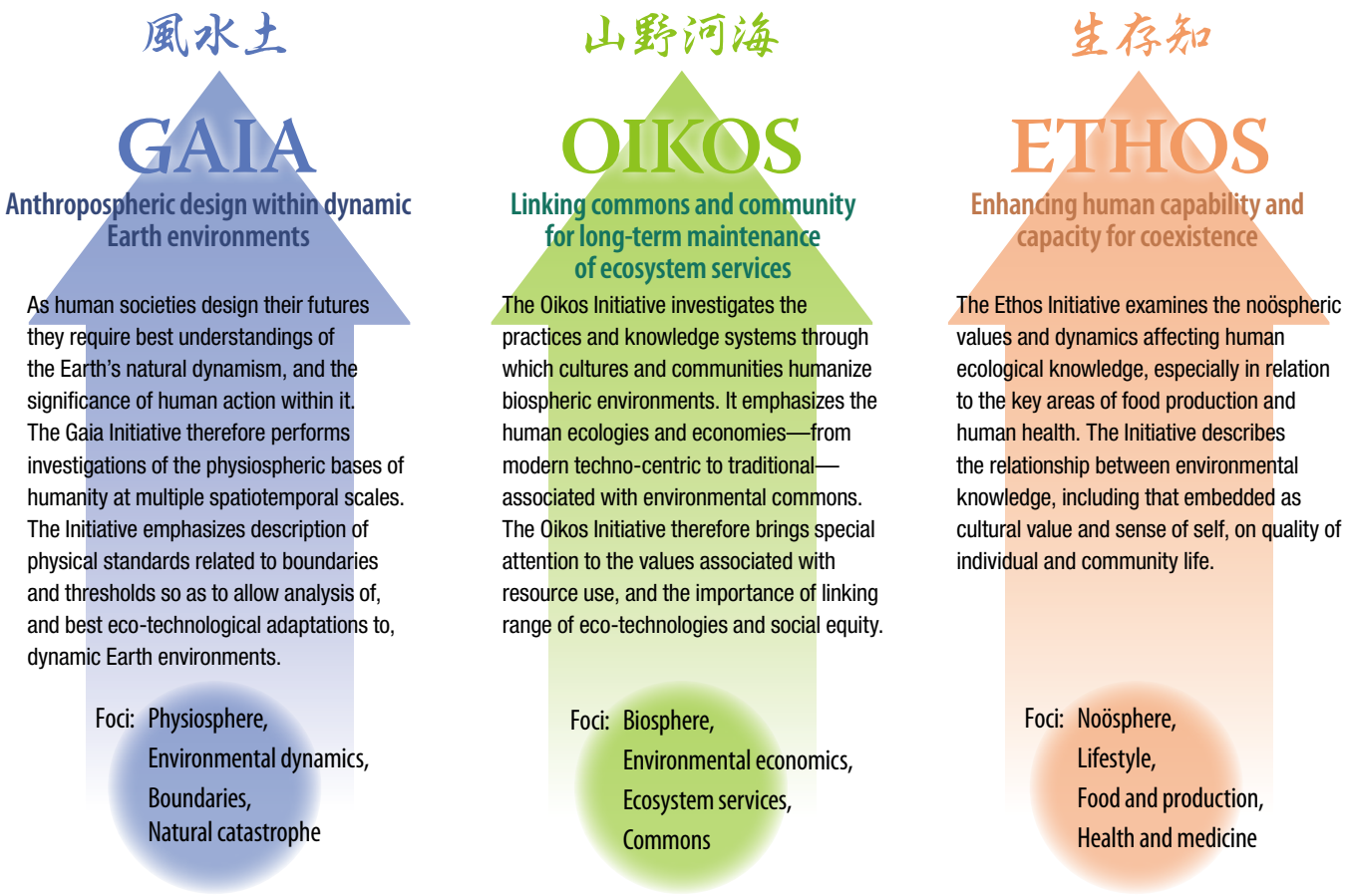
First phase research projects

In the first phase, individual projects conducted multidisciplinary and interdisciplinary research on key areas of environmental concern, including hydrological cycles, climate, variability, subsurface environments, ecosystems and landscape change, food production systems, disease ecology, and environmental history.

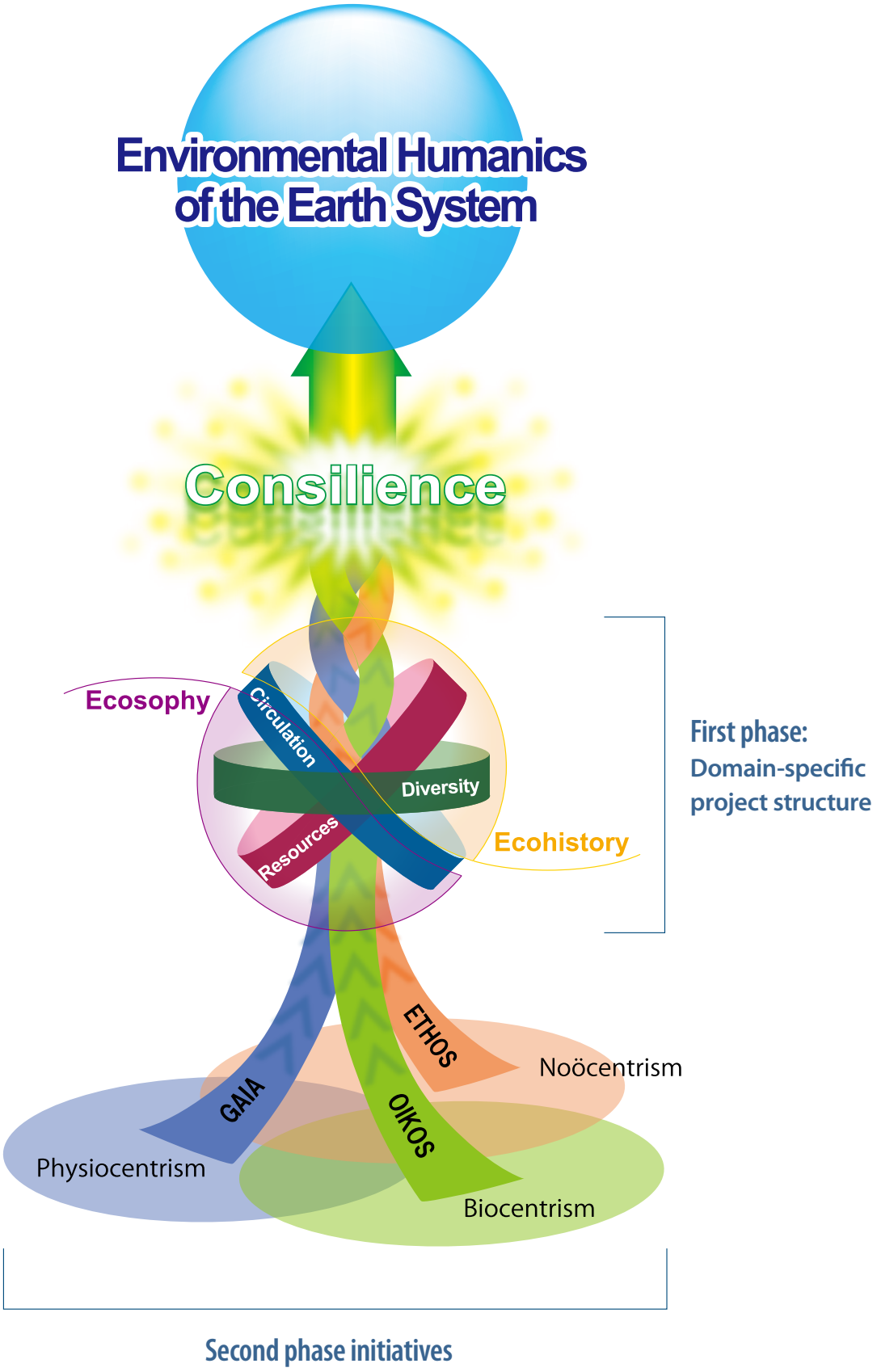
Second phase initiatives

We now focus our efforts on conjoining the existing Domain Programs through a set of cross-cutting initiatives. The Futurability Initiatives emerge from our conviction of the need for design-oriented science. Whereas cognitive science has conventionally been employed to describe 'what is', design science asks 'what ought to be' the character of interactions between of humanity and nature.

The Futurability Initiatives are organized by the Core Research Hub of the Center for Coordination, Promotion, and Communication.The Initiatives will allow academic researchers to identify and develop key ideas, topics and fields of study arising within and between past and present Domain-based research projects. The Initiatives are therefore dedicated to consilience, "a jumping together of knowledge ... across disciplines to create a common groundwork for explanation" (E.O. Wilson 1998) and intended to enhance design-oriented, problem-solving approaches to contemporary environmental problems. Each Initiative focuses on a major field of thought roughly analogous to the ancient Greek realms described by Gaia, Oikos and Ethos.



The Futurability Initiatives


Environmental Humanics
of the Earth System
Consilience
Ecosophy
Circulation
Diversity
Resources
Ecohistory
First phase:
Domain-specific
project structure
GAIA
ETHOS
OIKOS
Noöcentrism
Physiocentrism
Biocentrism
Second phase initiatives

Research Project Structure in the Second Phase

In its second phase, RIHN will continue to accept research projects within each of the five domains; they will progress in the established manner indicated in the top half of the figure below. Domain-based projects focus on description in the traditional manner of cognitive science.

In addition, beginning in 2010, the Core Research Hub will be able to directly launch projects within the Futurability Initiatives. Based on the findings of the Domain-based projects, Initiative-based projects will emphasize expanding the range of possibility in future development through design science approaches.

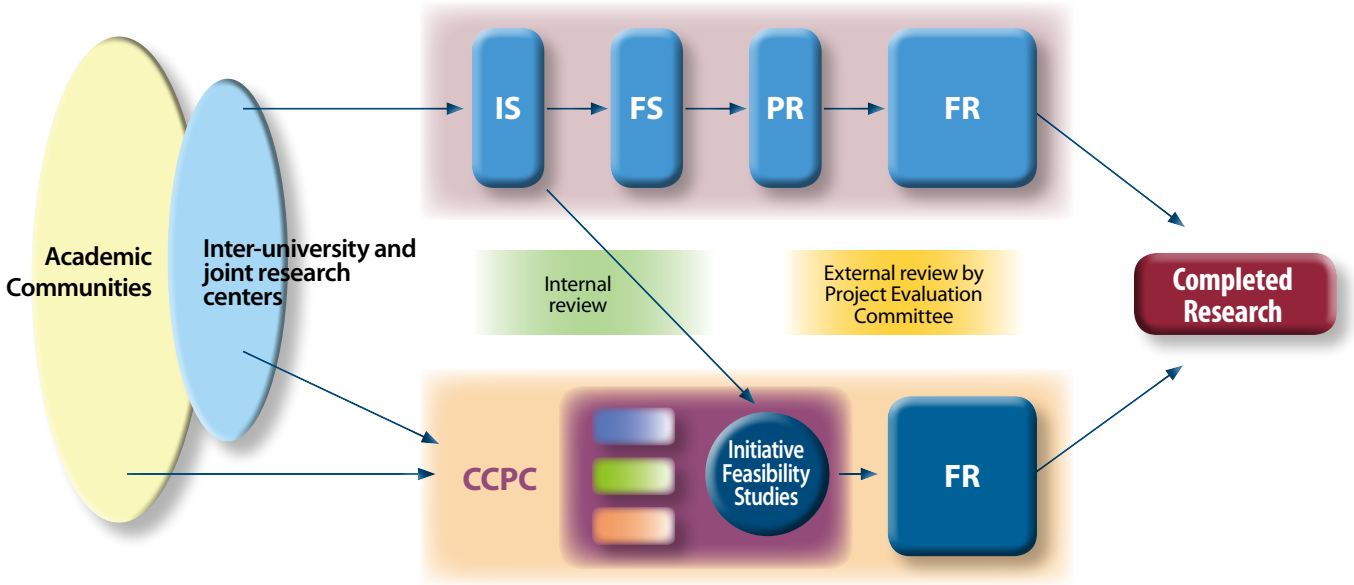
Domain-based Projects

Incubation Studies (IS) are proposed by individual researchers to the RIHN Project Review Committee. If approved, the researcher is granted seed money to prepare a proposal for Feasibility Study.

Feasibility Studies (FS) allow the study leader a period to develop a proposal for Full Research.

In the transitional **Pre-Research (PR)** period, the project leader formally assembles the team, establishes MoUs necessary for collaboration with other institutions and makes other preparations to enable Full Research.

Full Research (FR) lasts from three to five years. It typically involves a research team at RIHN and concurrent activity with collaborators overseas, several periods of field study, workshops and presentations, and outreach or communication to relevant communities. FR projects are evaluated by the Project Evaluation Committee at several stages.

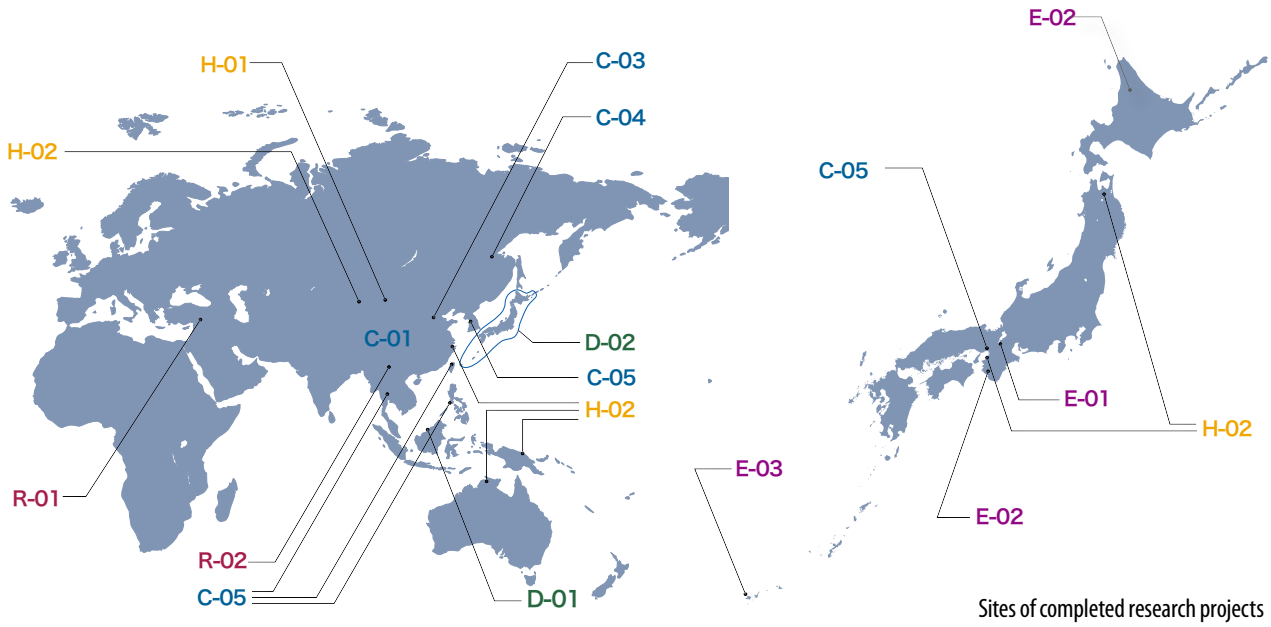


Initiative-based Projects

Core research projects will develop synergies based on existing RIHN research and complement RIHN's collaborations with universities and other research institutions around the world. They will be submitted directly as Feasibility Studies for review by the Project Evaluation Committee. If Initiative Feasibility Studies are adopted as Full Research, the schedule of evaluation is the same as that of Domain-based projects.

When a project moves to **CR (Completed Research)** status, the contract with RIHN is concluded. Research teams disperse to university research, teaching, and other duties. Project publications and other communications and contributions may follow for several years; they are assessed in the final post-evaluation, two years after formal project conclusion. At RIHN, however, each project forms part of the institute's heritage; project results and data are entered into the RIHN archives upon which future RIHN projects may be formulated.

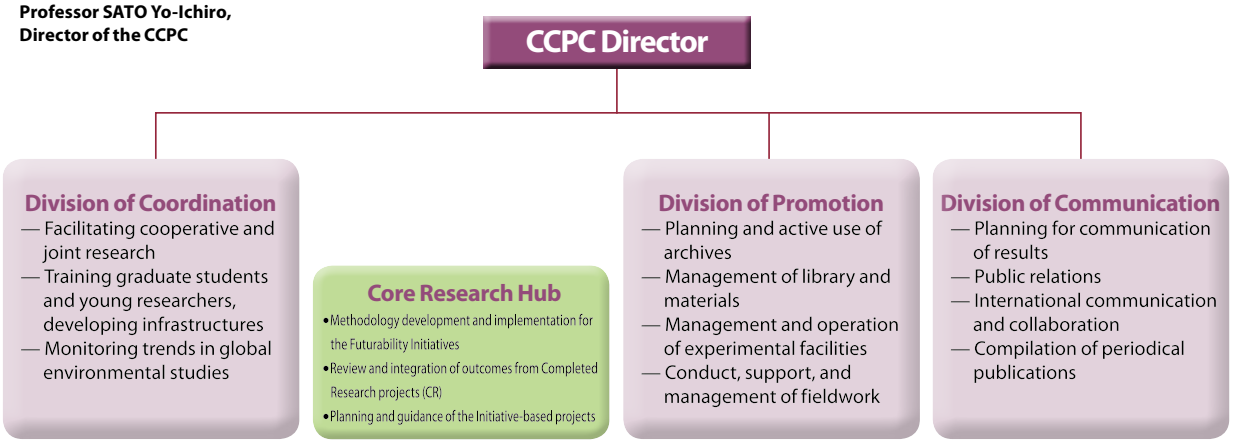
Fiscal Year Completed	Leader	No	Research Project
2006	HAYASAKA Tadahiro	C-01	Emissions of Greenhouse Gases and Aerosols, and Human Activities in East Asia
	KANAE Shinjiro	C-02	Global Water Cycle Variation and the Current World Water Resources Issues and Their Perspectives
	WATANABE Tsugihiro	R-01	Impact of Climate Changes on Agricultural Production System in the Arid Areas
	NAKAWO Masayoshi	H-01	Historical Evolution of the Adaptability in an Oasis Region to Water Resource Changes
	YACHI Shigeo	E-01	Multi-Disciplinary Research for Understanding Interactions between Humans and Nature in the Lake Biwa-Yodo River Watershed
2007	FUKUSHIMA Yoshihiro	C-03	Recent Rapid Change of Water Circulation in the Yellow River and Its Effects on Environment
	ICHIKAWA Masahiro	D-01	Sustainability and Biodiversity Assessment on Forest Utilization Options
	AKIMICHI Tomoya	R-02	A Trans-Disciplinary Study on Regional Eco-History in Tropical Monsoon Asia: 1945-2005
2008	SEKINO Tatsuki	E-02	Interaction between Environmental Quality of the Watershed and Environmental Consciousness
	TAKASO Tokushiro	E-03	Interactions between Natural Environment and Human Social Systems in Subtropical Islands
2009	SHIRAIWA Takayuki	C-04	Human Activities in Northeastern Asia and their Impact on Biological Productivity in the North Pacific Ocean
2010	TANIGUCHI Makoto	C-05	Human Impacts on Urban Subsurface Environments
	YUMOTO Takakazu	D-02	A New Cultural and Historical Exploration into Human-Nature Relationships in the Japanese Archipelago
	SATO Yo-Ichiro	H-02	Agriculture and Environment Interactions in Eurasia: Past, Present and Future



Sites of completed research projects

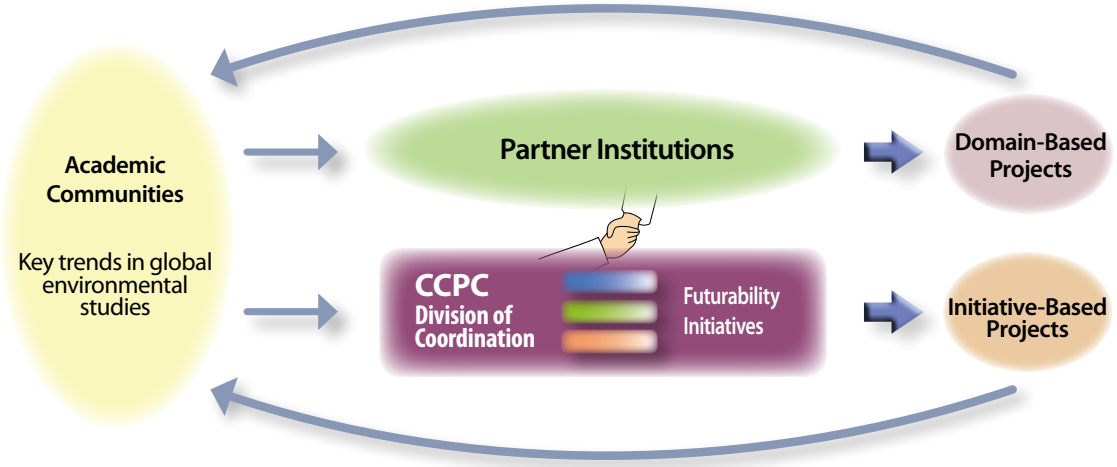
The Center for Coordination, Promotion and Communication (CCPC) is responsible for a wide spectrum of cross-project, cross-domain investigations, research, and supports that concern the entire institute. It has three divisions. The **Division of Coordination** maps out RIHN's mid- and long-term research trajectory and facilitates the cooperative arrangements necessary for its realization. The **Division of Promotion** develops and maintains the laboratory facilities necessary for research and fieldwork, and builds the databases and archives supporting past and ongoing research. The **Division of Communication** decides how the fruits of research may be best communicated in appropriate academic and popular fora. Several recent activities are described in the pages on Science Communication (pages 58-59). The CCPC also collaborates with the RIHN Research Department and Administrative Office to coordinate the task forces, working groups and administrative units involved in RIHN's day-to-day operation.

Professor SATO Yo-Ichiro, Director of the CCPC



Key Research Tasks

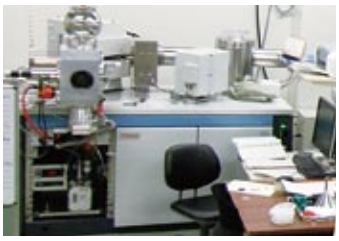
In RIHN's second phase, the Core Research Hub will be established within the CCPC. Its tasks are the realization of the Futurability Initiatives introduced on pages 4-6, review of Completed Research projects, and facilitation of the Initiative-based projects adopted within them. These tasks will require it to maintain a high level of coordination with RIHN's many partner institutes and to draw upon the collective wisdom of the wider environmental research community.



Building Research Data Networks

The CCPC plays a key role in facilitating RIHN's environmental networking and communication, especially between academic institutions, cultural institutions, and the general public. It is involved in the creation and maintenance of Asian environmental databases and project archives. It also supports the development of environmental studies curricula in Japan's public elementary, junior high and high schools. The CCPC promotes cooperation between RIHN and research institutes both at home and abroad. One such activity is the Regional Environmental Information Network, a project to create environmental information networking nodes among twenty-four research centers at nineteen universities in the greater Asian region.

Facilities and Equipment



Thermal-ionization mass spectrometer

Double-focusing high precision ICP multi-collector mass spectrometer

The Division of Promotion maintains eighteen laboratories in the ground level of RIHN's main building, including specialized facilities for DNA and stable isotope analysis and mass spectrometry, as well as several rooms for chemical and biochemical analysis, microscopy, incubation, hazardous materials, fieldwork preparation, sample preparation and cold storage (please also see pages 62-63).

Environmental Poster Contest

The RIHN archive holds about 200,000 posters created by children from around the world and submitted since 1991 to the United Nations' Environmental Poster Contest. Posters are evaluated by a UN-appointed council and especially notable contributions are exhibited at the UN Building and published as calendars and postcards.

Peer-to-peer environmental education

RIHN has also incorporated these posters into the traditional Japanese memory game "karuta" and held karuta-playing workshops in elementary schools in Japan and the US. As the posters reflect the child-artists' geographic area, culture, age, and perception of nature and environment, playing the game gives children insight into the environmental experiences of their peers around the world. Workshops have been held in Aichi, Nara and Kyoto prefectures, and at Atorium Elementary School in Cambridge and the Boston Children's Museum in the United States.

RIHN booth at COP10 (Nagoya, Oct. 2010)

Ecology Education Program: Karuta workshop using UN children's environmental art (Atrium Elementary school, Boston, USA, Jan. 2011)