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. To this end, RIHN solicits, funds and hosts three- to five-year fixed-term research projects on key areas of interaction between humanity and nature.

Until recently, much environmental study has been undertaken by researchers operating largely within the natural sciences. For us, natural science is one branch extending from the broader stem of human knowledge. We strive for comprehensive, integrative research capable of describing the true dynamism of earth phenomena and humanity's place in it. In this sense, our subject is humanity in the midst of nature.

At RIHN, we call this study of the human experience in a dynamic, changeable nature *humanics*; it offers a rich research framework, 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 translation of a Japanese term that combines the ideographs for "future" and "potential", to express the wide range of possibility in future development.

The year 2010 marks the end of RIHN's first decade as an institute and the beginning of its second planning phase. RIHN has made steady progress, having attracted many talented researchers from Japan and around the world. Yet both 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 RIHN's endeavors to date and introduces the innovations to be adopted in our second phase. 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. RIHN investigates global environmental problems at a regional level—a level at which it is possible to resolve both macro-level and micro-level processes. We emphasize basic research, i.e., field surveys and data collection, conducted within multidimensional research frameworks that illuminate the interconnections of biophysical phenomena and human systems, thought and action.

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.

Mission and Goals: Developing Consilience

RIHN research projects are organized through five research domains: circulation, diversity, resources, ecohistory, and ecosophy. In concept, the domains are complementary but to date they have operated largely as separate fields. In order to describe how their findings may achieve a higher level of integration—to form the field of 'global environmental studies' and achieve a qualitative improvement in human ability to address global environmental problems—the institute must further elicit and develop synergies between projects and domains. As we open RIHN's second phase, we are developing a new set of initiatives to accomplish this task.

First phase research projects

In the first phase, individual projects conducted multidisciplinary research on key areas of environmental concern, including water circulation, atmosphere, climate, oceans, subsurface environments, islands, ecosystem and landscape change, food production systems, disease ecology, and environmental history.

First phase: Domain-specific project structure

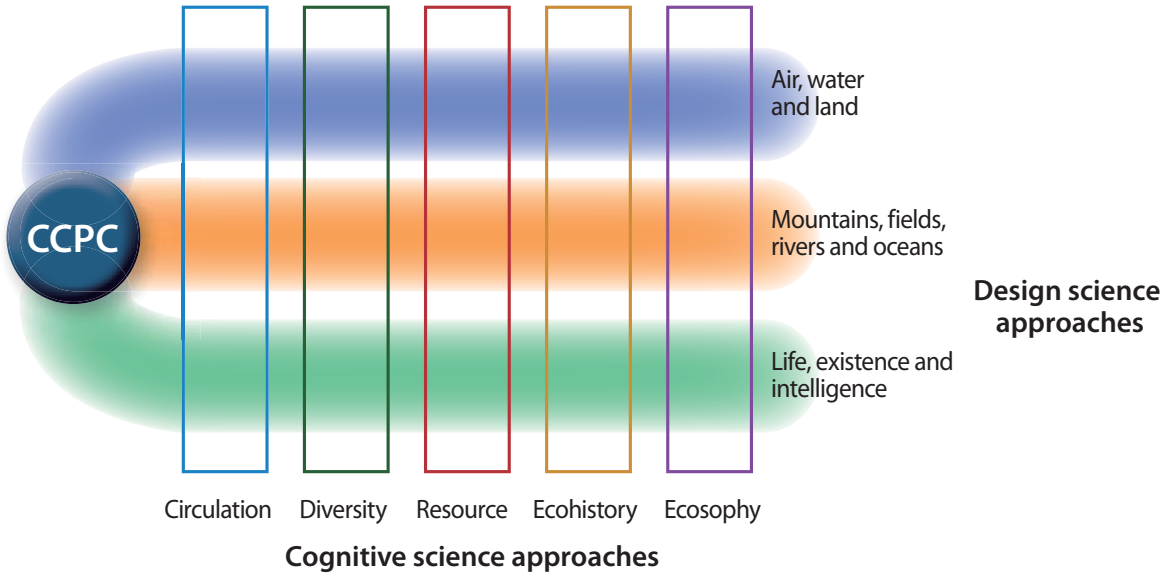
Second phase initiatives

Beyond description, *consilience* entails "a jumping together of knowledge…across disciplines to create a common groundwork for explanation" (E.O. Wilson 1998). To this end, we now focus our efforts on conjoining the existing domain-based programs through a new set of cross-cutting initiatives. The goal of the initiatives is to elucidate the sources and essential qualities of the problems under study, and so to enable new consideration of the future potential in, and enhanced design of, interactions between humanity and nature, or what we call "futurability".

The Futurability Initiatives

風水土	山野河海	生存知
Fu-sui-do Air, water and land	**San-ya-ka-kai** Mountains, fields, rivers and oceans	**Sei-zon-chi** Life, existence and intelligence
This initiative emphasizes empirical investigation of the biophysical bases of social life in regional and global scale and in past, present and future.	This initiative describes the practices by which cultures and communities humanize nature, ecosystems and landscapes.	The quality of individual and community life depends on the integrity of the collective wisdom concerning life and environment.
↓ Building flexible societies in dynamic earth environments	↓ Linking commons and community for long-term maintenance of ecosystem services	↓ Enhancing human capability and capacity for coexistence

Second Phase Initiative Structure



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.

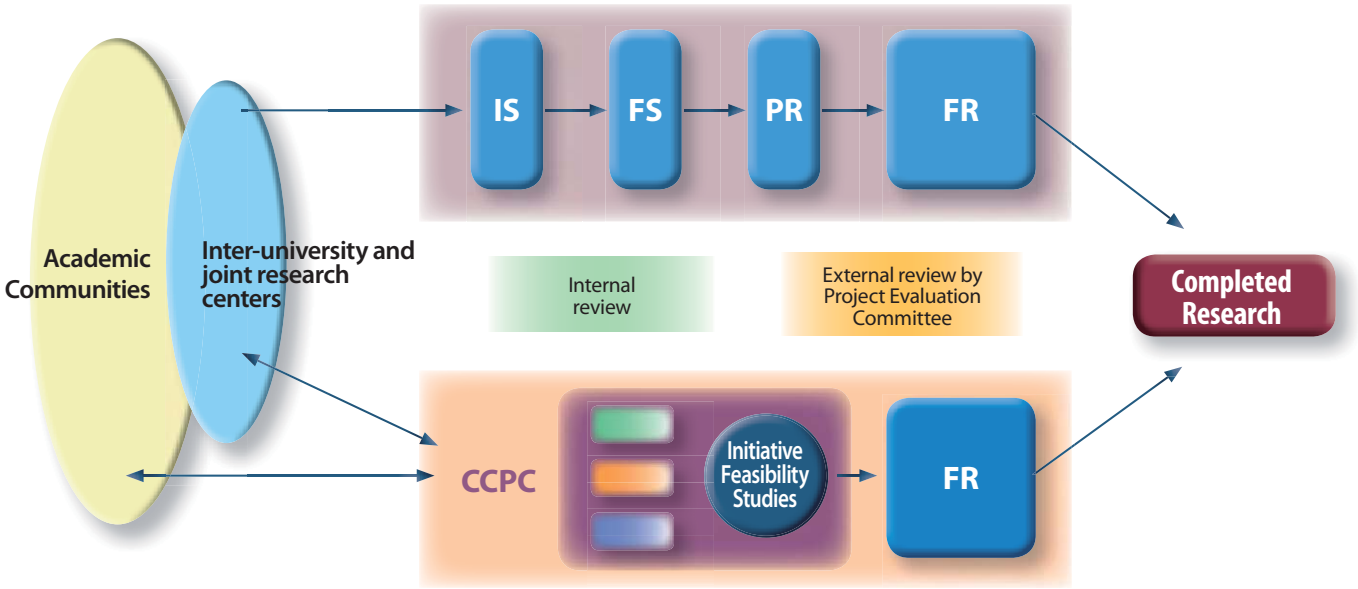
Domain-based Projects

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. FS can be repeated once.

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 PEC at several stages.



Initiative-based Projects

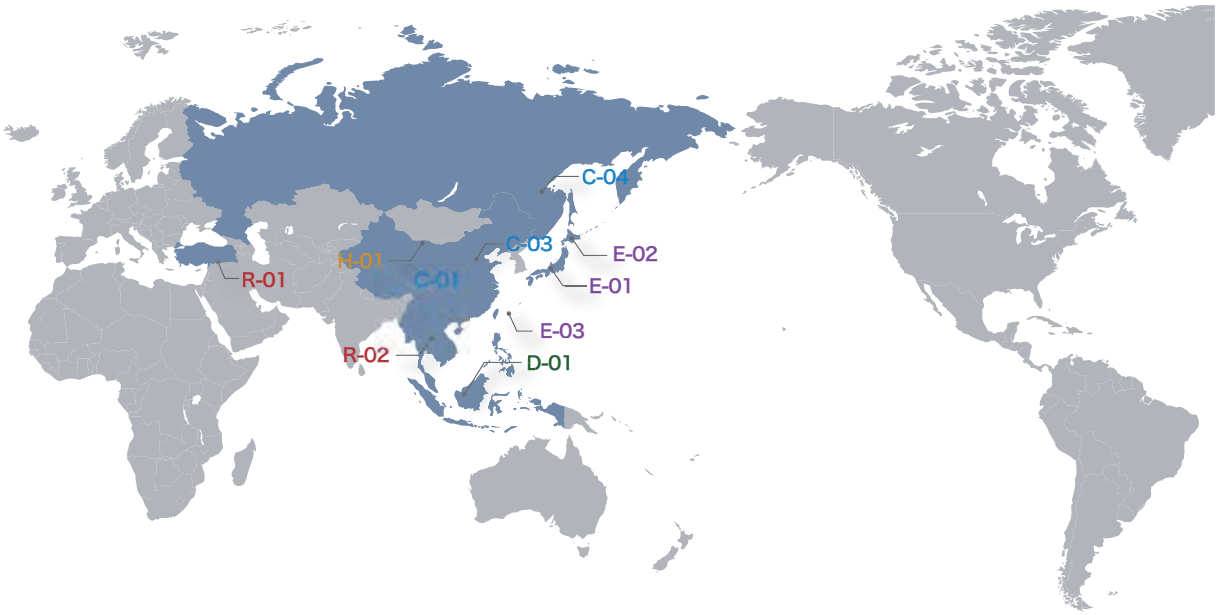
Core research projects will develop synergies based on existing RIHN research and complement RIHN's collaborations with universities and other research institutions around the world. They will be submitted directly as Feasibility Studies for review by the Project Evaluation Committee. If Initiative Feasibility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

Completed Research

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.

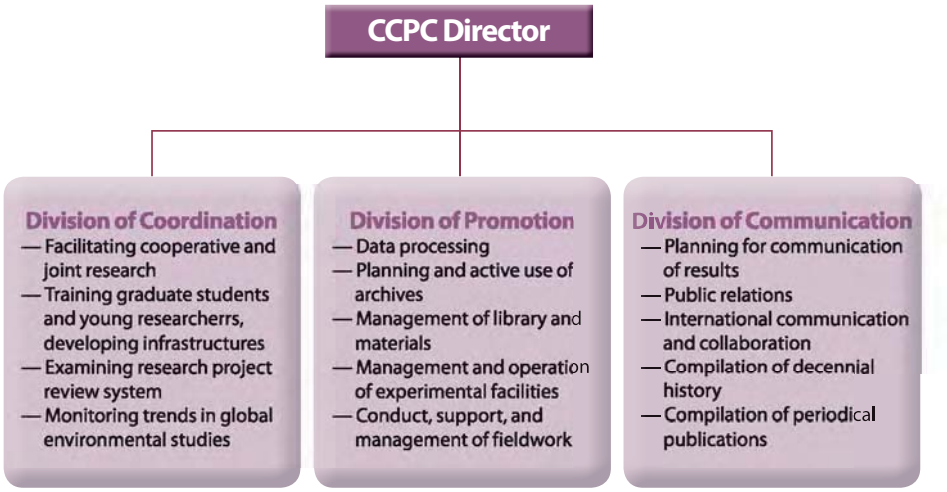
Fiscal Year Completed	Leader	No	Research Project
2006	HAYASAKA Tadahiro	C-01	Emissions of Greenhouse Gases and Aerosols, and Human Activities in East Asia
	KANAE Shinjiro	C-02	Global Water Cycle Variation and the Current World Water Resources Issues and Their Perspectives
	WATANABE Tsuguhiro	R-01	Impact 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 the Biological Productivity in North Pacific Ocean

Sites of completed research projects



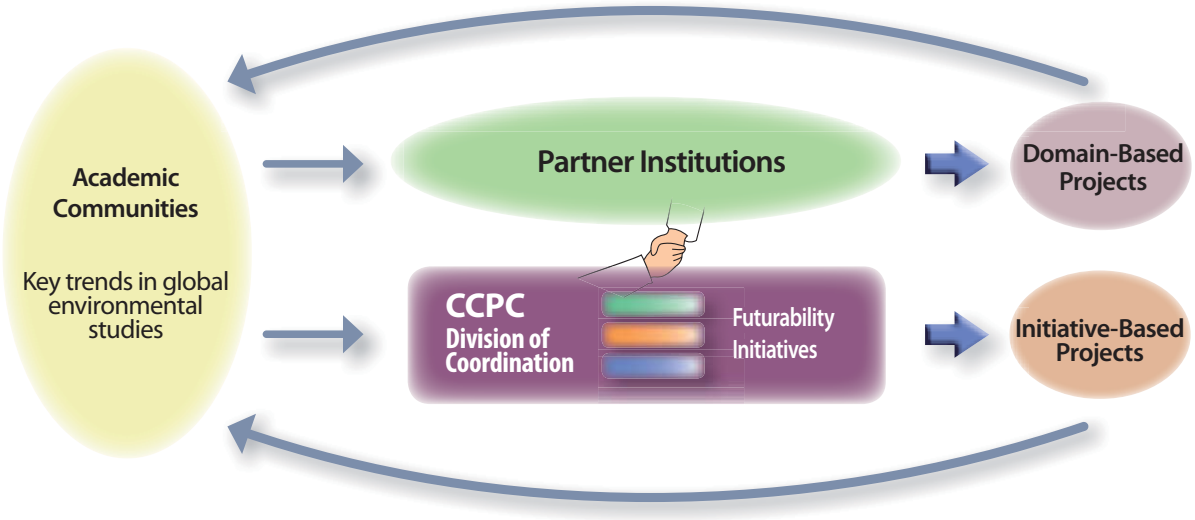
The Center for Coordination, Promotion and Communication (CCPC) is responsible for cross-project, cross-domain investigation, research and support that concerns the entire institute. It has three divisions. The **Division of Coordination** maps out RIHN's mid- and long-term research trajectory and facilitates 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 of 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 Research Communication (pages 57-58). The CCPC also collaborates with the research department and administrative office to coordinate the task forces, working groups and administrative units involved in RIHN's day-to-day operation.

Professor AKIMICHI Tomoya, Director of the CCPC



Key Research Tasks

In RIHN's second phase, the Core Research Hub will be established within the CCPC. Its immediate tasks are the continuing definition of the Futurability Initiatives introduced on pages 4-6, and facilitation of the research 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

Elementary students visit RIHN

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.

SEEDer, the newsletter of the Regional Environmental Information Network

Facilities and Equipment

The Division of Promotion maintains eighteen laboratories in the ground level of its 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 60-61).

Laboratory technicians in a "clean room"