

2015

Toward
Sustainable Campus



Connecting and Working toward the Future



Sustainability Report



北海道大学
HOKKAIDO UNIVERSITY

Connecting and Working toward the Future

Hokkaido University Environmental Policy

September 5, 2005

Policy Statement

Hokkaido University is a national establishment with a central role in Japan's academic research and human resource development (targeting areas such as researcher capabilities), and supports the country's knowledge foundation for the 21st century. In this role, it is committed in all its activities to protecting the environment on local and global scales and to building a sustainable society.

Basic Principles

Hokkaido University shall establish an Environmental Management System to implement the goals of its Policy Statement, and shall set and achieve environmental objectives as outlined below in conjunction with university staff, students and everybody else on campus. The university shall also make efforts to ensure that ongoing environmentally friendly activities take root by publicizing them on campus and providing relevant information to the public.

1 Consideration for the global and local environment via education and research

Hokkaido University shall foster the development of individuals with high degrees of specialization through the promotion of a wide variety of educational and research activities relating to global and local environments, and shall produce outstanding research achievements.

2 Social contribution via the provision of information on the environment

Hokkaido University shall help to raise awareness of the need for environmental consideration in local communities and society as a whole through efforts to educate and to make people aware of environmental education and research program results.

3 Reduction of the university's environmental footprint

Hokkaido University shall make efforts to reduce its environmental footprint via the promotion of energy and resource conservation, cyclical resource usage and green purchasing along with thorough implementation of chemical substance control and other measures.

CONTENTS

Hokkaido University Environmental Policy	01
Opening Feature Article: Interview with the President	02
Future Strategy for the 150th Anniversary of Hokkaido University and the Hokkaido Universal Campus Initiative	06
Feature Article 1 Education for Sustainable Development (ESD)	07
Feature Article 2 Hokkaido University Center for Ainu & Indigenous Studies	09
• Unique researchers at the Hokkaido University Center for Ainu & Indigenous Studies	11
Feature Article 3 University Research Administrator (URA) Station	13
■ Campus Master Plan and Three Task Forces	
• Master Plan Realization Task Force	15
• Management of Ecological Environment Task Force	17
• Historic Property Utilization Task Force	19
■ Updates	
Energy and Resources	21

Cover: Hokkaido University Ginkgo Avenue and individuals featured in this publication

Keizo Yamaguchi, President, Hokkaido University
Maki Ikegami, Office for a Sustainable Campus (OSC)

Hokkaido University: helping to resolve global and local issues



Coordinator, Office for a Sustainable Campus (OSC),
Hokkaido University

■ Maki Ikegami

Maki Ikegami completed a program at Tohoku University Graduate School of Science's Department of Physics and earned a Master of Science Degree before going on to complete a Ph.D. at the university's Graduate School of Environmental Studies. She served as an assistant professor at the graduate school before assuming her present post in April 2012. She has worked hard to help reduce the university's environmental footprint, and in 2013 developed an assessment system that serves to clarify the sustainable campus concept in terms of university functions and roles.

President, Hokkaido University

■ Keizo Yamaguchi

Keizo Yamaguchi graduated from Kyoto University's Faculty of Science before earning a Master's Degree at Nagoya University's Graduate School of Science, then went on to complete the Doctoral Program at Kyoto University's Graduate School of Science. He specializes in differential geometry. Before becoming the 18th President of Hokkaido University in 2013, he served as an Advisor to the President of Hokkaido University in 1999. He also became an Executive (in charge of education, student affairs and other matters) and Vice president of the university in 2011. In the same year, he was also made Executive Director of the Institute for the Advancement of Higher Education, Director of the Admission Center, and Director of the Front Office for Human Resource Education and Development.

As part of its response to demand for the publication of an environmental report illustrating the present and future situations of Hokkaido University (HU), the Office for a Sustainable Campus (OSC) interviewed the President of HU in May 2015. A publication titled *Sustainability Report 2015* features this interview, which replaced the annual (sometimes tripartite) discussion with the President and is made available for the enjoyment of HU researchers, faculty members, administrative staff and students, as well as local residents.

The role of sustainability awareness among researchers in the course of studies

Ikegami: HU launched the Future Strategy for the 150th Anniversary of Hokkaido University in 2014, clearly underlining its commitment to supporting the resolution of global issues. Which global issues are you particularly concerned with?

Yamaguchi: One is global warming in light of today's ongo-

ing extreme climatic conditions. Another is the issue of nuclear power generation in the wake of the March 2011 tsunami. It strikes me that more and more issues today require the direct involvement of university researchers in society.

Ikegami: In last year's Environmental Report, you stated that scientific development no longer guaranteed a rosy world, suggesting its relationship with the spread of the sustainability concept.

Yamaguchi: Yes. It's been pointed out over the past 10 to 20 years that oil resources are being depleted. Although the day when oil runs out has been postponed thanks to the discovery of shale gas reserves, the problem is still pressing. Industrial development has caused a rise in CO₂ emissions, which has in turn accelerated environmental destruction in various ways. In this sense, it can't be claimed that all advances in science and technology since the Industrial Revolution have led to societal improvement. That's how the question of how to create a sustainable society arose, and it's an important consideration for university researchers and other people.

Ikegami: When I studied renewable energy at the doctoral level, we considered how the use of common forest and common land, Satoyama, could be revived. People stopped using these areas around 1965. When we consider how to promote the use of fuelwood and other forms of wood biomass, local issues take priority over global issues. With this in mind, I feel that global issues are actually conglomerations of local issues.

Yamaguchi: About three years ago, the vice-president of the University of Saskatchewan in Canada attended HU's



Sustainability Weeks program. He's a mathematician, so we're kind of in the same field. He said something that struck me: "Even mathematics is related to sustainability. In fact, the work of all university researchers relates to

sustainability in a sense. How they view it and whether they're aware of it in relation to their fields of specialization affects the directions of their studies." We consider global issues, but I think these also have a local element because they encompass everyday problems that directly affect everybody. In this sense, sustainability is really how people view it. I think university researchers' awareness of it will determine the directions of their studies.

Ikegami: Lots of philosophical books are published in your specialist field of mathematics. Is it becoming more common for mathematicians to make recommendations to society?

Yamaguchi: I don't think so. I believe the vice-president is entitled to his opinions as deputy leader of the university. Historically speaking, however, lots of ideas that led to real innovations in society have been developed by pure math-

ematicians. One is the binary numeral system in the development of computers. This is a computational principle involving the use of ones and zeroes, or positive and negative values). It is trivial in mathematics, but its use in society is wholly different. People originally used mathematics to support thought when they became aware of natural science, but I don't think mathematicians are aware of how mathematics is used in society.



Ikegami: In mathematics, do you try to find a truth based on certain conditions or a hypothesis?

Yamaguchi: Mathematics

began as a means of recognizing natural phenomena and God. In Euclidean geometry, it was seen as a way of recognizing the physical world or real space. However, with the introduction of non-Euclidean geometry, the concept of space became an issue of perception. In the 19th century, axiomatism was introduced and mathematics was seen as a tool for setting up laws based on logically affirmed axioms. Gauss, Riemann and other mathematicians built fundamental structures, and mathematics provided a conceptual background for Albert Einstein's Cosmological Considerations of the General Theory of Relativity. In the 20th century, mathematics became flexible – while finding theorems, mathematicians came to think freely. Mindset shifts have occurred, and while it may be difficult to accept certain theories, once you accept them you'll have broader horizons. When we were students, it was hard to accept certain things, but today's students can readily embrace ideas on a conceptual basis because they expect clarity later.

Ikegami: Generations respond differently, don't they? Do you mathematicians consider how the results of your research will be used in society?

Yamaguchi: No, we don't think about it.

Ikegami: I see. Actually, such research results combine to influence society considerably. Science, which includes mathematics, is always on neutral ground in terms of how it changes society. However, when man-made technology is involved, research results can be divided into two categories – those that will lead to improvements in society and those that will cause deterioration.

Yamaguchi: It's the same with theoretical physics. Atomic

bombs were developed from pure research on atomic nuclei and elementary particles. Their development transformed the world of theoretical physics. Today, the phenomena that need to be elucidated are so complex that society probably won't be transformed simply by the advancement of physics or mathematics. I used to think my research would be useful for society some day in the future, but researchers today can't be confident that this will be the case.

Potential activities of HU in its role as a university in Hokkaido

Ikegami: HU runs unique courses like the Communication in Science and Technology Education & Research Program [CoSTEP, see p. 34], which aims to foster the development of future professionals in fields that fall between society and science or society and science/technology. I believe these professionals will contribute to society in the future.

Yamaguchi: Indeed. CoSTEP played an important role around the time when Dr. Akira Suzuki won the Nobel Prize in Chemistry in 2010. Program staff worked to present his studies on the cross-coupling reaction in layman's terms. When the public's simple faith in science began to collapse, I realized that communication in relation to science and technology was extremely important in outlining things clearly.

Ikegami: One of the CoSTEP instructors has researched ways to support farmers in Fukushima, which has had radiation hotspots since the nuclear disaster, and to guarantee the safety and reliability of farm products for consumers. The roles played by this kind of instructor are...

Yamaguchi: ...important, aren't they? In the past, the term "science and technology" conjured up images of things that physics and math geeks were interested in. But in fact science and technology are related to much broader fields. Scientists aren't the only ones responsible for communicating with the general public in areas where science and technology are part of the real world. This kind of communication requires social science specialists, so in this sense universities have a significant role to play.

Ikegami: That's especially the case at universities like HU.

Yamaguchi: In contrast to colleges, universities allow people in science and sociology to collaborate. In the energy field, for example, HU has pointed out lots of issues to society.

Ikegami: HU was selected to take part in the Ministry of Education, Culture, Sports, Science and Technology's Top Global University Project, and works to promote world-class research and establish related networks. Its scientists also engage in research involving interaction with real people. Does HU need to promote both global and regional research?



Yamaguchi: Yes, we need both. HU recently established the Global Research Hub for Food and Medical Innovation (FMI) as a new industry-university collaboration initiative. We began with the theme of developing food and health experts as part of the national Center of Innovation (COI) program, which encourages universities and companies to work together toward innovation. Previously, food, health and medical studies at universities were implemented in individual fields of specialization. This new initiative is intended to connect these fields and promote work with companies to develop whatever it takes to maintain a healthy society. Specific experiments have already begun in Iwamizawa City, where the program is implemented. Iwamizawa was chosen because of its advanced state of aging in Hokkaido, where the number of people aged 65 or older as a percentage of the total population is high. Another reason for its selection is the availability of network infrastructure, as many households there have IT devices. The program involves more than 20 companies, some of which are planning to establish complexes in conjunction with universities. In this way, it provides a new form of social involvement by universities. I think this will contribute to the creation of a sustainable society. In fact, members of the program hope that related initiatives will ultimately spread to Sapporo, then across Hokkaido, then throughout Japan and finally around the world. The FMI is housed in a five-story building. The top three floors are for research, but the first and second are designed to promote local health awareness as highlighted in the building's opening ceremony. This means that HU now has a space where representatives from the corporate world, people from universities and the general public can freely engage in discussion.

Learning opportunities for local residents as well as students

Ikegami: On another topic, in 2008, when Prof. Hiroshi Saeki was HU's President, the Sapporo Sustainability Declaration was adopted at the G8 University Summit. I don't believe the concept of sustainability was easy to define in those days.

Yamaguchi: I was the dean of the Faculty of Science at the time. The most effective result of the declaration has been the annual Sustainability Weeks (SW) program. I believe engaging all graduate students in discussions with local

residents provides untold value to the students. We're planning to encourage all graduate and undergraduate students to be involved with the Hokkaido Summer Institute, which will be launched as part of the university's Top Global University Project to raise awareness of sustainability even further.

Ikegami: The Office for a Sustainable Campus (OSC) hosts an international symposium during the SW program, but the involvement of students is limited because they have classes to attend.

Yamaguchi: If it were held as part of the Summer Institute program, more graduate and undergraduate students would be able to attend. I'd like to see attendance at the symposium become a prerequisite for the award of credits.

Ikegami: I think the Summer Institute program will require a high level of campus quality because renowned researchers are brought from abroad to teach students from around the world. Are there any aspects of the campus that you think should be improved?

Yamaguchi: Visitors to the campus love it. It's open to locals and tourists alike, and most people first head to Poplar Avenue before visiting Hokkaido University Museum, which is currently under renovation. Lots of national universities established museums when they became corporate entities, but Hokkaido University Museum has a very high visitor count for a national university museum. It generally attracts students on school excursions as well as tourists and locals. As it's important to provide learning opportunities to students and locals alike, I hope the number of public participation events in the Sustainability Weeks program will increase. The campus has some issues with snow removal in winter, but it's maintained well in summer. If I had to pick a problem, it would be the issue of bicycles and other traffic. Student cyclists without a driver's license tend to have bad riding etiquette. They don't know the rules of the Road Traffic Act of Japan. Some of them even look at their smartphones while they're riding. This poor form is one of the most serious issues on campus.

Ikegami: Lastly, I believe all large research universities face the problem of incompatibility between quality and environmental friendliness on campus. These institutions need equipment and facilities to produce research results, and HU is disadvantaged in terms of energy reduction because of the cold local winters. What are your thoughts

on this? Everyone at HU seems to be making daily efforts to reduce power consumption.

Yamaguchi: Yes, they are. We've taken various steps to reduce power consumption, but the biggest problem is higher electricity rates. We've started an experiment on electricity consumption in the Faculty of Environmental Earth Science and other campus buildings. I hope to broaden this initiative across the campus.

Ikegami: The Faculty of Environmental Earth Science summarizes the results of the experiment, so we should provide it with more scope to supply this information through conference presentations and other opportunities. We'd like to promote exchanges of information beyond the boundaries

of departments because this is the key to reducing energy consumption across the campus. Thank you very much for your time today.



Future Strategy for the 150th Anniversary of Hokkaido University

Contributing to the Resolution of Global Issues

The year 2026 will mark the 150th anniversary of HU's establishment. In today's world of rapid social change, universities must contribute to the sustainable development of Japan and the rest of the world as centers of knowledge by producing human resources that will innovate and lead social reform. In consideration of the importance of universities' societal roles, HU established the Future Strategy for the 150th Anniversary of Hokkaido University in March 2014 to advance its reforms for contribution to the resolution of global issues.

Objectives:

1. Hokkaido University will promote world-class research to resolve a variety of issues and sustain future generations.
2. Hokkaido University will produce graduates capable of playing leading roles in the development of a global society. As specialists in their fields, such graduates will possess sound judgment and deep insight, along with the ability to understand and communicate with different cultures.
3. Hokkaido University will continue to teach and promote social advancement through outside collaboration, providing assistance to regions and communities in Japan and overseas by addressing and resolving issues that concern them.
4. Under the leadership of the President, Hokkaido University will reform its organizational, personnel and budget systems, establish an infrastructure by which members can carry out their work with a sense of pride and fulfillment, and implement administrative policies with a focus on sustainable development.
5. Hokkaido University will establish a global presence by actively publicizing the fruits of its education and research through strategic marketing.

The Four Basic Philosophies of Hokkaido University

- Frontier Spirit
- Global Perspectives
- All-round Education
- Practical Learning

Hokkaido Universal Campus Initiative

HU was selected for participation in the Top Global University Project of the Ministry of Education, Culture, Sports, Science and Technology. To support openness and collaboration worldwide, HU implements university-wide initiatives known as 1-4-4 Reform Plans. The Four Education Reform Plans are promoted as related business strategies, and the Four Support System Reform Plans are presented as functional strategies.

Four Education Reform Plans:

- ① Nitobe College & School
- ② Trans-disciplinary Graduate Schools and Programs
- ③ Learning Satellite
- ④ Hokkaido Summer Institute

Four Support System Reform Plans:

- ① Educational Management
- ② Personnel System
- ③ Human Resource Management
- ④ Public Relations



Education for Sustainable Development (ESD)

The Japanese National Commission for UNESCO at the Ministry of Education, Culture, Sports, Science and Technology defines education for sustainable development (ESD) as follows: "The world today faces a myriad of problems, such as environmental degradation, poverty, human rights violations, and issues in peace-building and development. The term ESD refers to teaching and activities intended to create new values and encourage behavior that will help to resolve these problems and ultimately create a sustainable society. To this end, students are prompted to consider today's societal issues for themselves and to begin tackling local problems (a concept referred to as think globally, act locally). In other words, ESD fosters the development of individuals who will create a sustainable society."

The ESD Campus Asia Project as turning Asia into a unified campus

Hokkaido University's School of Education launched the ESD Campus Asia Project in 2011, promoting international student exchanges with the

aim of turning Asia into a unified campus. Professor Masao Mizuno at the Faculty of Education described the program for this report.

"Global human resource development is a major pillar of HU's efforts to produce leaders who will

contribute to the resolution of global issues. Linguistic ability is important for effective communication, but the content of what people say is even more important. The School of Education launched the ESD Campus Asia Project to provide undergraduate stu-



Turning students into leaders of a sustainable society

Report guidance Masao Mizuno

Masao Mizuno is a professor in the Department of Human Developmental Sciences at the Faculty of Education. He served as an instructor at the University of Copenhagen's Faculty of Health and Medical Sciences and as the Director of the Research Unit at Denmark's Ribe County Hospital before assuming his present post in April 2006. He specializes in muscle physiology and physical fitness sciences. His publications include "Human Skeletal Muscle Training and Evaluation of Adaptation to Inactivity" and "Elucidation of Cardiopulmonary Function/Skeletal Muscle Response and the Mechanism behind Adaptation to Physical Exercise and Training in High-altitude and Low-altitude Hypoxic Environments."

dents with opportunities to engage in discussions with others in Asia on how a sustainable society can be built. Participants take lessons in English and are part of an interactive overseas study arrangement known as the Buddy Program. Each exchange is 10 days long, and begins when HU students meet 20 counterparts from elsewhere in Asia at the airport. During their stay, students are encouraged to consider the future through discussions on wide-ranging matters in day-to-day life rather than only in classrooms. A total of 20 students from HU's School of Education are subsequently dispatched to four Asian universities in autumn, meaning that 5 students go to each one."

This program began in 2011 with exchanges involving five students from HU's School of Education and five from Korea University. In 2012, Seoul National University in Korea and Beijing Normal University in China joined the program, and Chulalongkorn University in Thailand also joined in 2013. A total of 40 students (20 from HU and 5 each from the other Asian universities) have so far taken part in the program, which is improved annually. Participants in 2014 did fieldwork in the Hidaka region, where they learned about town revitalization initiatives amid decline caused by population aging. The students also visited a museum in Hidaka's Biratori Town and learned



about Japan's indigenous Ainu people. The program is expected to promote exchanges among students and faculty members alike, and will be further improved so that leading Asian schools can work together more to provide international joint education programs.

Consideration of next-generation strategic ESD

After the summer program of the ESD Campus Asia Project for students, faculty members from partner institutions are hosted at HU in autumn to discuss program improvements. On October 25, 2014, the 5th International ESD Symposium (theme: Strategic ESD in the Next Generation) was held during the opening part of the 2014 Sustainability Weeks program. Its Plenary Session featured keynote speeches on strategic ESD for the next decade by educators who had played active roles in Asia, and the Parallel Sessions included discussion

of regional activities and presentations by students.

The first ESD-related initiatives were implemented in Japan. Professor Mizuno remarked: "Knowing that Japan is the cradle of ESD initiatives, we should make conscious efforts and collaborate with high schools, public elementary and junior high schools, and others. Lots of teachers are doing everything they can within their own spheres, so I think universities must work with these leaders as part of collaborative efforts to think globally and act locally.

The ESD Campus Asia Project could ultimately be developed into an ESD Campus World Project with the removal of the Asian framework and additional collaboration with institutions in Hawaii, Sakhalin, Finland and elsewhere. Ideally, people in Asia will eventually come to collaborate more and act as one before a global scale is adopted for the project.



Hokkaido University Center for Ainu & Indigenous Studies

Established in April 2007 as Japan's only national research institution specializing in studies on Ainu and other indigenous peoples

Characteristics:

- 1) Interdisciplinary and international approaches
- 2) Emphasis on social contribution based on public sharing of research findings
- 3) Collaboration with the Ainu community in research and administration

Roles:

- 1) Public communication and education
- 2) Interdisciplinary research
- 3) Contribution to practical cultural inheritance and other considerations
- 4) Advice on Ainu policy promotion

<http://www.cais.hokudai.ac.jp>

Ongoing efforts to create a society in which Ainu people can live with pride



What need does the center fulfill at HU?

The 2007 adoption of the United Nations Declaration on the Rights of Indigenous Peoples finally prompted the Japanese government to recognize the Ainu as an indigenous people in 2008. In reference to HU's establishment of the Hokkaido University Center for Ainu & Indigenous Studies (CAIS) in 2007, Professor Kato remarked, "We're pleased that the center has been opened but regret that it wasn't done earlier." What was behind the need for the center's

establishment at HU? According to Professor Kato, "We must learn what actually happened in Hokkaido between the indigenous Ainu and the Wajin, who were Japan's dominant ethnic group from the main island of Honshu. We need to understand the issues at hand, and then establish an appropriate environment and direction for harmonious coexistence." That is, CAIS was established to encourage researchers to look at the past, present and future in their work.

The name CAIS includes the phrase "Indigenous Studies" for two reasons. First, it reflects the provision of information on the culture, history and present situation of the Ainu in English to other countries. Second, it clarifies that the center also conducts research on indigenous peoples in the form of global comparative stud-

Report guidance Hirofumi Kato

Hirofumi Kato is a professor at the Hokkaido University Center for Ainu & Indigenous Studies, a visiting fellow at the Oxford Centre for Asian Archaeology, Art and Culture of the University of Oxford, and an affiliate professor at Uppsala University's Department of Archaeology and Ancient History. Before assuming his current posts, he taught archaeology at Tsukuba University's Graduate School of Area Studies, at the University of Shimane's Institute for North East Asian Research, and at the Department of Northern Culture Studies in Hokkaido University's Graduate School of Letters. His research areas include the archaeology of the north, indigenous archaeology and indigenous cultural heritage.

ies based on information from New Zealand, Australia, Canada, the U.S., European nations and elsewhere regarding how indigenous peoples there have established legal systems and acquired rights.

In a CAIS pamphlet, Director Dr. Teruki Tsunemoto remarks, “We remain committed to our ongoing efforts to create a society in which Ainu and indigenous people can live with pride.” Professor Kato says the most serious problem with today’s society is that Ainu people are reluctant to identify themselves as such. He also says it is problematic that government subsidies are needed for Ainu people to be able to ensure the survival of the language and culture they have inherited from their ancestors. He further adds that while the national government must support cultural promotion, the need for such support is far from ideal; rather, he envisages a society in which Ainu people can naturally pass down their own culture to future generations.

Ainu studies as an international subject

In his specialist field of archaeology, Professor Kato has embarked on research to elucidate how man – a tropical species originating in Africa – proliferated as far as 70 degrees north into the Arctic Circle and developed its own history based on hunter-gatherer subsistence. Kato was employed by HU in 2001 to take charge of the Department of Northern Culture Studies in the Graduate School of Letters. Unable to find a suitable archaeologist to work at CAIS in the run-up to its establishment, he ended up moving to the center and working there himself. Once there, he added indigenous archaeology to the scope of his specialization and has since engaged in related research. The term indigenous archaeology (which was coined by Kato) refers to archaeological studies based on an indigenous viewpoint rather than a researcher perspective. Kato once

wrote an article on archaeologists’ involvement with indigenous peoples and their histories in the U.S., Canada, Northern Europe and Australia. The piece was favorably received in many places outside



Japan, but not necessarily so in Japan. He said his relationships with overseas researchers had widened dramatically since he began his studies on indigenous peoples, and that he had had more opportunities to work on the international stage.

Due to a lack of English-language literature on the situation of the Ainu and their history/culture, there is strong demand outside Japan for such information. Professor Kato’s message to young people is this: “No other university offers opportunities to learn Ainu culture this systematically. For Ainu studies, HU is the place to go. People engaging in Ainu studies assume the role of information provision to other countries, which involves frequent international exchanges, and will also have to learn about the situations of indigenous peoples outside Japan. Some may see Ainu studies as an area exclusive to Hokkaido, but in fact the field involves global issues.



Unique researchers at the Hokkaido University Center for Ainu & Indigenous Studies

Since its establishment in 2007 with just one full-time faculty member, the Hokkaido University Center for Ainu & Indigenous Studies has developed into an organization with seven full-time and thirteen part-time faculty staff (as of July 2015). At the center, experts in cultural anthropology, history, archaeology, linguistics, law, political science, sociology, tourism and other fields work closely on comprehensive research. For this report, three full-time faculty members talked about their research.

Exploration of government policy based on constitutional studies

Ken'ichi Ochiai

Associate Professor; research focus: potential of Ainu policy under the Constitution of Japan and its provision for equal treatment under the law

Toward the well-being of Japanese society as a whole

Consider two men in very different situations: Mr. A lives in a million-dollar home and drives a Ferrari. Mr. B lives in a tiny apartment and cannot even afford to eat. If the government refuses to help Mr. B on the grounds that the value of the two men as human beings is equal, should he simply accept the situation in the name of equality?

Associate Professor Ochiai studies how and why government policy exclusively targeting Ainu people can be implemented under the Constitution of Japan, whose Article 14 stipulates equality under



the law. He says, "Although we want Ainu people to be happy, we must also strive

for the well-being of Japanese society as a whole due to the nature of the Constitution. Accordingly, my role involves both providing advice to government officials and carefully explaining relevant matters to Ainu people so that they understand better." Ochiai goes to see places where Ainu people have lived, including Biratori, Shiraoi and Akan. He says with a laugh that he does an awful lot of fieldwork despite being a specialist in constitutional studies.

"The only way to make Ainu policy sustainable is to secure the understanding and support of the majority of the Japanese population. To achieve this, we have to talk with them. I lecture on the subject because explaining the issues, answering questions and engaging in detailed discussions helps people to understand the many issues involved," he said.

Pursuit of truths from historical science

Hideki Minoshima

The globalization of nor ancient times

In a scene from Murasaki Shikibu's epic novel *The Tale of Genji*, Prince Genji (Hikaru Genji) sees a presumably unattractive character called Suetsumuhana wearing a sable coat, and finds her choice of clothing unappealing. He tells her that although the coat is wonderful, it might not suit such a young woman. Associate Professor Hideki Minoshima believes it highly likely that sable pelts were produced in Sakhalin because Ainu people in those days extended the scope of their activities to Sakhalin, and Heian-period nobles would not have had such elegant lifestyles without materials from the northern region. He maintains that despite





Associate Professor; research focus: re-examination of Ainu historical images based on connections between the Eurasian continent and mainland Japan

Efforts to revive Ainu culture from museology

Koji Yamasaki

Associate Professor; research focus: present-day significance of Ainu material culture, related exhibition methods and art-related issues

thern society since

Ainu people's image of peace, simplicity and harmonious coexistence with nature, they in fact ventured to visit mainland Japan and continental Asia in order to trade commodities. Minoshima presents this as evidence that the northern world has been globalized since ancient times.

In today's society, incidents in one place cause ripples far away in others. There is much to be learned from Ainu culture, as these people managed to develop ways of life and ways of thinking that allowed a sense of awe for the gods and nature to coexist with a serious commodity economy without contradiction.

Belief in the revival of Ainu culture

Associate Professor Koji Yamasaki researches overseas collections of Ainu artifacts. He studies how Ainu culture can be revived by providing Ainu communities with information on Ainu artifacts found in the U.S., Europe and elsewhere. Although Ainu handicrafts produced as gifts tend to be standardized, Ainu designs were originally diverse and created freely by artisans. Yamasaki believes that examination of their regional characteristics and the individuality of artisans highlights the creativity of the people who made them. Ainu people often had no choice but to give up on their hopes of passing down inherited techniques and designs due to discrimi-

nation and the needs of the times. Yamasaki looks forward to future developments and hopes that Ainu descendants viewing Ainu artifacts in museums in the future will feel liberated from stereotypes.

Yamasaki implemented a project to create replicas of old Ainu artifacts. An exhibition held in 2009 as part of the project showcased reproductions of Ainu artifacts held by Botanic Garden Hokkaido University that were created by contemporary artisans. Replication involves creating artifacts as similar as possible to the originals left by Ainu ancestors, even though the results are technically new works of art created by contemporary artisans.



University Research Administrators (URAs)

The Ministry of Education, Culture, Sports, Science and Technology defines University Research Administrators (URAs) as individuals who plan and manage research activities and promote the application of related outcomes together with researchers at universities or other institutions. In addition to working on research-related administrative procedures, URAs also help to invigorate research activities at universities, strengthen R&D management, and engage in other support activities. HU views URAs as research promoters rather than research supporters, and an Executive of the university encourages such staff to produce rather than to simply coordinate.

URAs: supporting researchers and making HU a fun place

A new URA post was established at HU on April 1, 2015, and the URA Station was opened. What do URAs do, and how does their work benefit the university? HU Executive and Vice-president Kazushige Kawabata, who leads the station, answered questions on the subject.

Q.1

Why did HU establish the URA post?

National universities have self-

managed since becoming corporate entities, but lack management expertise because they consist of faculty members, who engage in research and education, and administrative staff, who specialize in institutional administration. The implementation of projects and collaborative programs was previously based on the establishment of administrative organizations, and managers were hired for individual missions.

Against such a background, a decision was made to develop URAs as professionals in university management.

Q.2

Are HU's URAs unique?

The URA post was created in Japan to ensure that researchers have enough time for their own studies by developing individuals capable of understanding and supporting research activities. Accordingly, the primary duties of URAs involve helping to acquire project funding and filling out research-related application forms. However, HU decided to train individuals capable of producing research projects and activities from a researcher viewpoint. HU's URAs therefore work in full-time positions with no specific term of office. Pay is performance-based, and positive results are recognized with promotions.

Report guidance Kazushige Kawabata

Kazushige Kawabata is an Executive and Vice-president of Hokkaido University, and also serves as a professor in the Faculty of Advanced Life Science. After graduating from HU's School of Science, he completed master's and doctoral courses in the Department of Physics at the university's Graduate School of Science. He began working for HU in 1994 after a period with the Central Research Laboratories at Idemitsu Kosan Co., Ltd. He served as an assistant professor and then as a professor at the Graduate School of Science and as a professor at the Faculty of Science before assuming his present post in April 2013. His research fields include biophysics and the physics of organisms. He is currently engaged in research on university management.

Q.3

Could you briefly outline the concept of the university's management?

HU's management incorporates the Future Strategy for the 150th Anniversary of Hokkaido University. In regard to research, the university's stance is that basic research should cover a wide range of fields. For the applied research that often follows basic research, the aim is to create what we call landmark establishments. Based on the university's strength in the four fields of medical drug discovery, food and health, materials, and field science, the goal is to designate these areas as priority fields and construct a variety of related landmark establishments.

Q.4

Could you give some specific examples of landmark establishments?

In the field of medical drug discovery, the Research Center for Zoonosis Control and Hokkaido University Hospital's Proton Beam Therapy Center are landmark establishments. Another is the Global Research Hub for Food and Medical Innovation (FMI), whose construction began in 2014. The hub is designed to support the creation of a healthy society based on collaboration between the food and medical sectors. It will involve a home-based health care system, and will be run as part of a

Center of Innovation (COI) project. URAs are involved here, serving as coordinators between medical and agricultural institutions.

Q.5

What landmark establishments are found in other fields?

In field science, efforts are under way to develop research related to the Arctic. As research in Japan was previously focused on the Antarctic, there were no research centers for Arctic studies. Some researchers at HU's Institute of Low Temperature Science previously worked in Russia, which helped to bring people and organizations together toward the establishment of the Hokkaido University Arctic Research Center in April 2015. This establishment advances research on global warming, snow ice, northern sea routes, mineral and fishery resources, and Arctic policy in collaboration with the National Institute of Polar Research and the Japan Agency for Marine-Earth Science and Technology (JAMSTEC).

Q.6

What future developments befitting of HU are expected?

Our next objective is to create a new landmark establishment involving connections between agriculture in Japan and science. Agricultural work includes not only seeding, cultivat-



ing and milking but also freezing, logistics and consumption. In recent years, value chains known as sixth-sector industrialization (involving value addition to the primary sector through food processing, distribution and sales) and seventh-sector industrialization (involving energy production based on local resources) have emerged. The target landmark establishment may foster the development of a new industry that will help to resolve issues with depopulation, which has caused Hokkaido towns to disappear one after another. We believe that the verification of research outcomes at the new landmark establishment in collaboration with local communities will support nationwide promotion of the initiative, which may eventually serve as a global model.



Hokkaido University
URA Station

HP

<http://www.cris.hokudai.ac.jp/cris/ura/index.html>

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@hokudai_ura

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At HU, the staff of the Executive Office on Campus and Environment Planning and the Administration Bureau's Facilities Department work as part of task forces and collaborate closely on developing the university's campuses.

Master Plan Realization Task Force	Matters concerning basic planning, facility planning, environmental planning, green space planning, traffic planning and historic property preservation planning under the Campus Master Plan and the Action Plan; investigation, examination and the like regarding other matters under the Campus Master Plan
Management of Ecological Environment Task Force	Matters concerning tree planting; conservation of the natural environment, opening of the natural environment to the general public, and related education/information provision to local communities; investigation, examination and the like concerning campus ecology
Historic Property Utilization Task Force	Matters concerning the conservation, renovation and utilization of historic properties; matters concerning enhancement of the value of such properties and promotion of their use; investigation, examination and the like concerning the maintenance of such properties

Master Plan Realization Task Force

Formulation of the Campus Master Plan 2006

In February 1997, HU formulated the Campus Master Plan 96 (defining the institution's basic policy on facility construction) ahead of other national universities in Japan. Incorporating the basics of this plan along with some new perspectives, the university went on to formulate an initiative called the Campus Master Plan 2006 in July 2007. The new plan focuses on: 1) sustainable development enabled by campus development in line with the university's roles and organizations; and 2) flexible facility/environmental management to support university administration.

Main points of the Campus Master Plan 96

- Positioning of the campus as a place for people engaging in research and education
- Development to create a campus that is relevant to society
- Positioning of the campus as an urban space
- Preservation of distinctive landscapes
- Preservation and development of historical campus composition
- Facility and environmental improvement to allow global research and competition

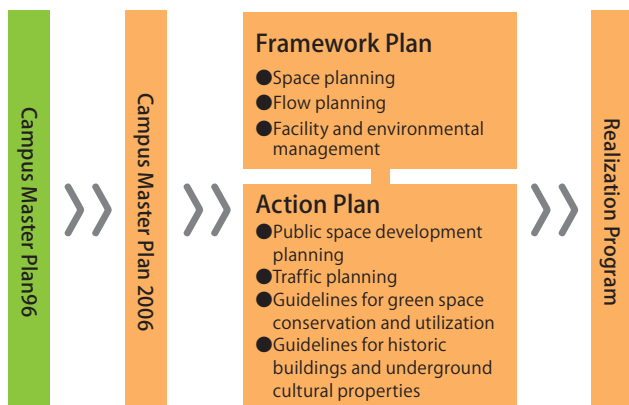


New perspectives of the Campus Master Plan 2006

- Sustainable development
 - Maintenance and management of the environment, including cultural resources
- Development of an environment supporting academic innovation
 - Development of foundations for outstanding academic research
 - Development of competitive facilities and environments for global research and education programs
- Facility and environmental management
 - Improvement of facility/environment quality in line with the policy for university administration and planned goals

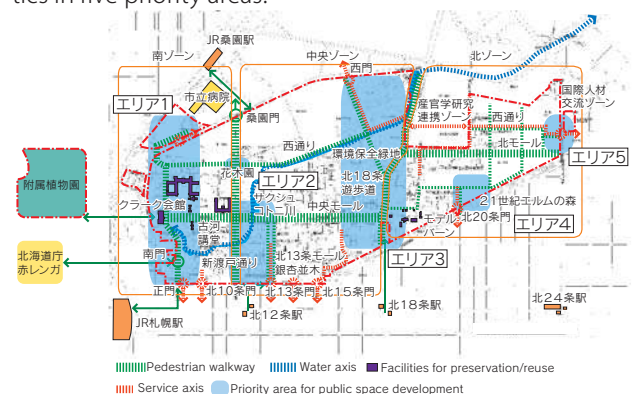
Realization of the Campus Master Plan 2006

The Campus Master Plan 2006 consists of a Framework Plan and an Action Plan. Specific matters are examined in a Realization Program.



Example from the Action Plan: public space development policy

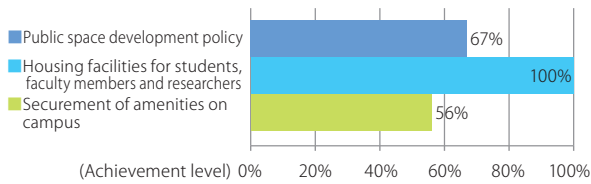
HU develops public spaces with appealing characteristics in five priority areas.



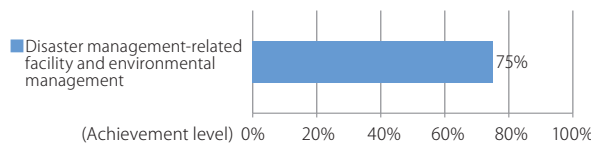
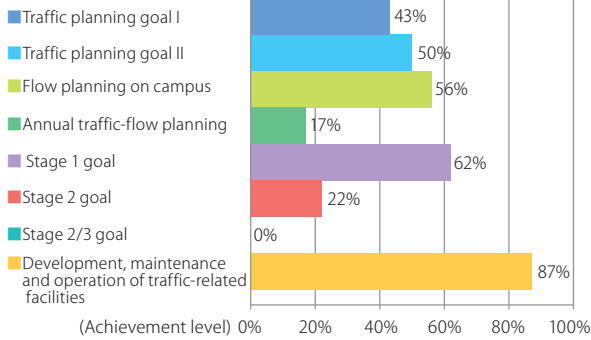
Activities of Hokkaido University's Executive Office on Campus and Environment Planning and its Facilities Department

Action Plan Achievement Evaluation

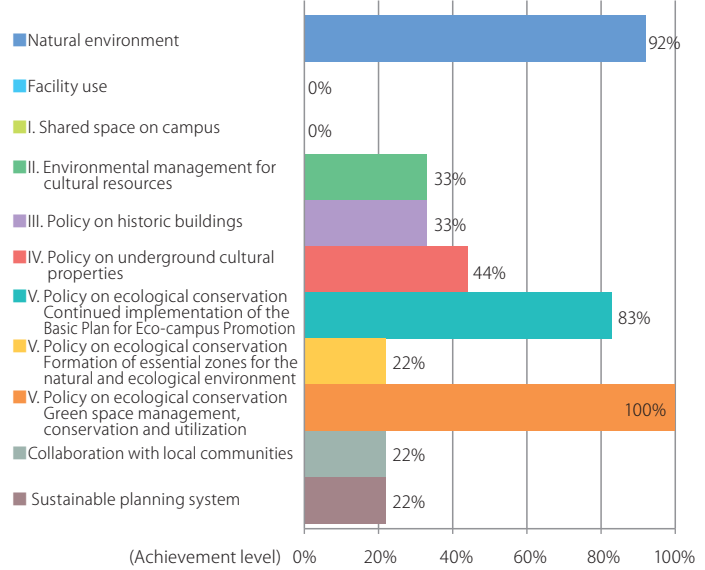
Since the formulation of the Campus Master Plan 2006, the state of the Action Plan's implementation has been checked every year. The graph below shows results of achievement evaluation as of March 2015.



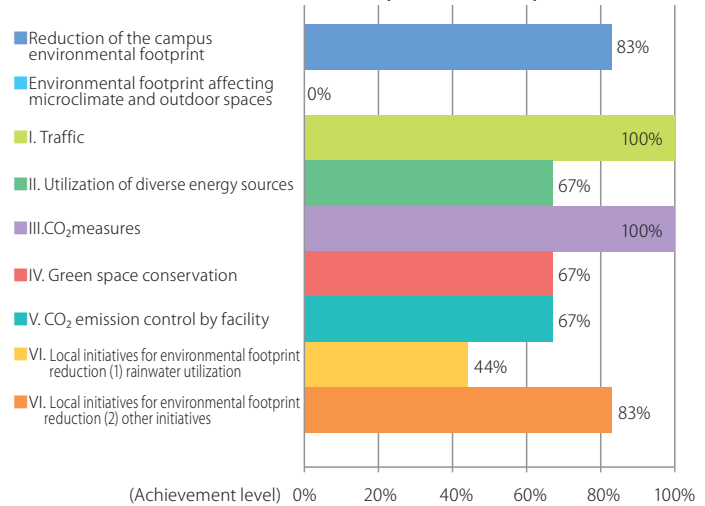
Flow planning



Campus environment quality and performance

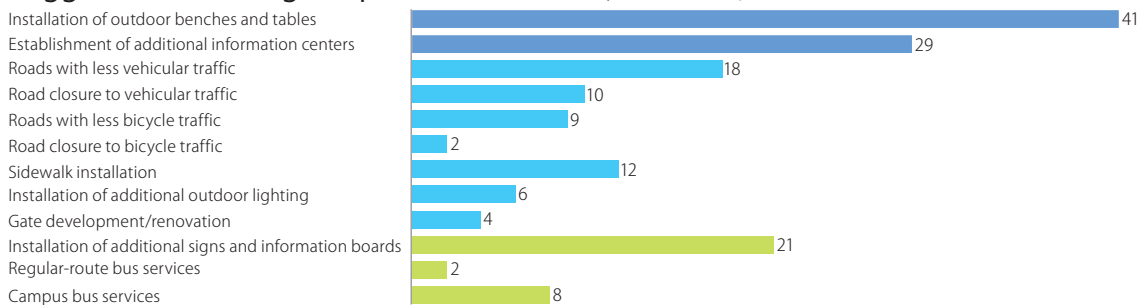


Reduction of environmental footprint on campus



Results of on-campus questionnaire surveys

Suggestions for image improvement (February 2015, multiple answers allowed)



Formulation of a new master plan

The formulation of a new master plan is now under consideration in light of developments including the release of the Future Strategy for the 150th An-

niversary of Hokkaido University and the adoption of HU for the Top Global University Project (both in 2014). The new plan will be finalized by 2017 in line with HU's policy of keeping up to date with campus development.

Management of Ecological Environment Task Force

Field surveys on the state of hazardous trees, lawn areas, the Sakushukotoni River and other considerations, and responses to problems

HU values the maintenance of the green spaces and natural environment of its campus and the provision of safe, pleasant surroundings. To these ends, surveys are conducted to clarify the state of hazardous trees, lawn

areas, the area near the Sakushukotoni River (a habitat for ninespine sticklebacks (*pungitius pungitius*) and Ezo salamanders) and invasive alien species. Issues are addressed on the basis of the results.

Field survey on local ecological and other conditions along the Sakushukotoni River and elsewhere on August 27, 2014 (7 participants)

① Keiteki-no-mori Forest (near the monument): evaluation of Blue Listed goutweed (*aegopodium podagraria*) community conversion to create a native vegetation zone



② Site of Old Village: checking of invasive alien plant species, such as cutleaf coneflower (*rudbeckia laciniata*), tree of heaven (*ailanthus altissima*) and false acacia (*robinia pseudoacacia*)



③ Sakushukotoni River near the Experimental Farm: checking of mowing conditions and Sakushukotoni River organisms/water quality



④ Flowering Tree Garden: checking of boardwalk damage



⑤ South of Chuo Shokudo (cafeteria): checking of Japanese cardocrinum (*Cardocrinum cordatum* var. *glehnii*) conservation



⑥ Ono Pond: checking of trees of heaven near the pond and organisms in the pond, and water quality surveying



⑦ Sakushukotoni River near the Japanese archery range: checking of water quality and sludge accumulation



⑧ Sakushukotoni River near the tennis court area: checking of invasive tree species (tree of heaven, boxelder maple (*acer negundo*), etc.) and the previous site of a Japanese white birch felled due to decay



⑨ Sakushukotoni River on the Central Lawn: checking of a walnut tree hosting a fungus colony and the previous site of a willow felled due to decay



⑩ Science Building No. 3: instruction for the removal of tree of heaven seedlings (due to invasive alien species status)



Yearly Plan for the Conservation of Green Spaces and Other Areas (five-year planning)

October 2013

Yearly Plan for the Conservation of Green Spaces and Other Areas on Campus Excluding Management Work – Five-year Planning (Draft) Sustainable Campus Promotion Division

No.	Item	Benefit	Category	Work by academic year							
				2014	2015	2016	2017	2018	2019	2020	
①	Pruning of trees on the Faculty of Agriculture lawn	•Maintenance of safety against branch falls and other possible hazards •Securement of sunlight for lawn growth	A	●						●	
②	Pruning of trees on the School of Science lawn	•Maintenance of safety against branch falls and other possible hazards •Securement of sunlight for lawn growth	A	●						●	
③	Pruning of trees on the Central Lawn	•Maintenance of safety against branch falls and other possible hazards •Securement of sunlight for lawn growth	A	●						●	
④	Pruning of trees south of the Conference Hall	•Securement of sunlight for lawn growth •Removal of branches growing beyond the boundary	B C	●						●	
⑤	Pruning of trees along the trans-campus road and dredging of side ditches	•Recovery of drainage function lost as a result of mud deposits in side ditches •Visibility maintenance, security improvement	C E	●						●	
⑥	Pruning of trees south of the Clark Memorial Student Center	•Removal of branches growing beyond the boundary	C		●						●
⑦	Pruning of trees east of the Administration Bureau	•Removal of branches growing beyond the boundary	C		●						●
⑧	Pruning of trees east of the Kita 13-jo joint parking area	•Removal of branches growing beyond the boundary	C		●						●
⑨	Pruning of trees east of Hokkaido University Hospital	•Removal of branches growing beyond the boundary	C		●						●
⑩	Pruning of trees north and east of the gymnasium	•Removal of branches growing beyond the boundary •Visibility maintenance, security improvement	C		●						●
⑪	Pruning of trees north and east of Sapporo Agricultural College Model Barn	•Recovery of drainage function lost as a result of mud deposits in side ditches •Removal of branches growing beyond the boundary	C E		●						●
⑫	Pruning of trees along the tree belt around the campus perimeter	•Prevention of tree felling by strong winds or other severe weather conditions	D		●						●
⑬	Dredging of the Sakushukotoni River and facility maintenance	•Recovery of ecological conditions lost as a result of mud deposits in the river •Maintenance of river banks and other parts	A			●					
⑭	Pruning of trees along Poplar Avenue	•Prevention of tree felling by strong winds or other severe weather conditions •Maintenance of safety against branch falls and other possible hazards	D					●			
⑮	Pruning of trees along the walking trail over Elm Tunnel, and facility maintenance	•Maintenance of safety against branch falls and other possible hazards •Maintenance of benches and other installations	C					●			
⑯	Pruning of trees around the tennis courts south of the School of Veterinary Medicine building	•Removal of branches growing beyond the boundary onto the walking trail over Elm Tunnel	G						●		
⑰	Pruning of trees east of Sapporo Agricultural College Model Barn	•Removal of branches growing beyond the boundary	C					●			
⑱	Pruning of trees near the North 7 West 10 intersection	•Removal of branches growing beyond the boundary	C						●		
⑲	Pruning of trees south of Poplar Hall	•Removal of branches growing beyond the boundary	C						●		
⑳	Pruning of trees along Heisei Poplar Avenue	•Prevention of tree felling by strong winds or other severe weather conditions •Maintenance of safety against branch falls and other possible hazards	D						●		
㉑	Pruning of trees east of the Faculty of Environmental Earth Science building	•Removal of branches growing beyond the boundary	C						●		

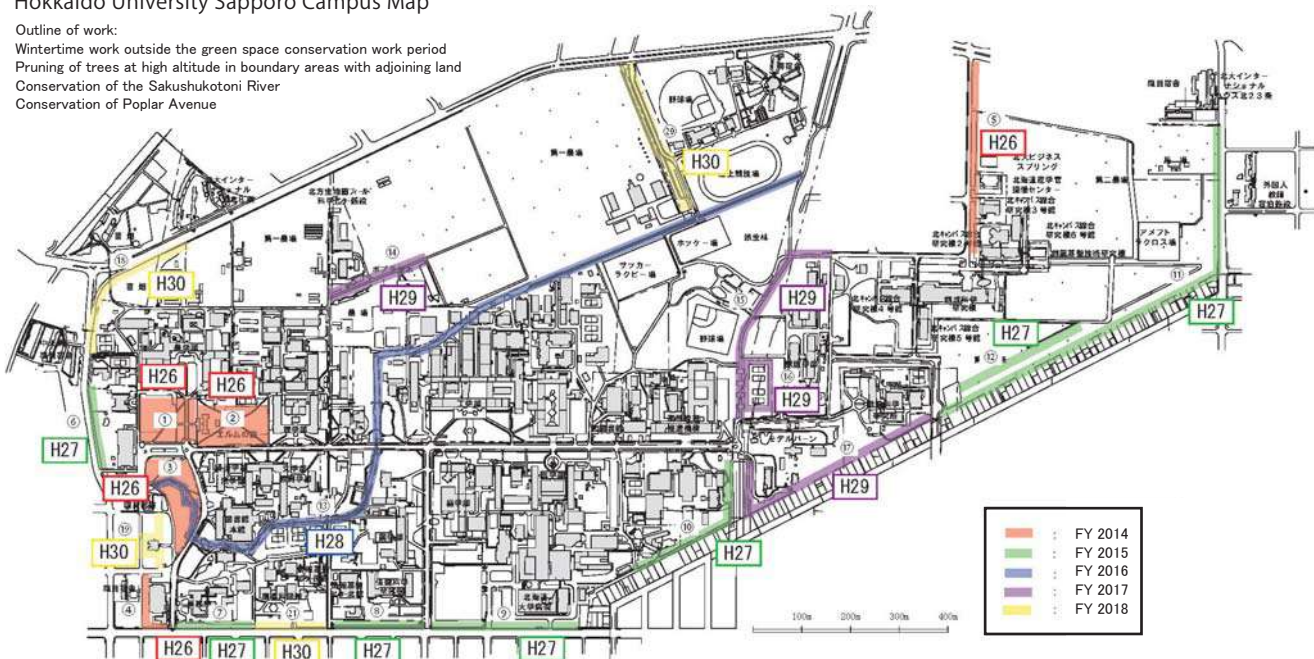
*The above table does not include non-scheduled work for the removal of hazardous trees.

- A: Conservation deemed necessary from a campus survey by the Campus Ecology Task Force
- B: Conservation deemed necessary from a hazardous-tree survey by the Campus Ecology Task Force
- C: Conservation deemed necessary in response to complaints from local residents

- D: Conservation deemed necessary to preserve historic and other property
- E: Conservation deemed necessary to maintain drainage functionality

Hokkaido University Sapporo Campus Map

Outline of work:
 Wintertime work outside the green space conservation work period
 Pruning of trees at high altitude in boundary areas with adjoining land
 Conservation of the Sakushukotoni River
 Conservation of Poplar Avenue



Historic Property Utilization Task Force

State of Historic Properties at HU

● Historic properties adding to the caliber of the university

In line with the Campus Master Plan 2006, HU uses land, buildings and ecological environments as campus resources, and positions the maintenance and utilization of cultural properties (such as historic buildings, underground cultural properties and ecological environments) as a strategy for enhancement of the university's caliber. The second phase of the university's Medium-term Goals includes 1) promotion of advanced campus development to support world-class education and research, and 2) promotion of environmentally friendly campus development.

*Period of the Medium-term Goals second phase:

April 1, 2010 to March 31, 2016

● Seismic retrofitting of important cultural properties and other work

The Historic Property Utilization Task Force held a series of discussions on historic properties with focus on: 1) renovation for preservation, related policy and related matters; 2) utilization policy; 3) institutional improvement and related matters; and 4) value enhancement. Based on discussions held to date, the task force implemented intensive seismic retrofitting and other work for major HU historic buildings (i.e., the Model Barn and important cultural properties in

the Botanic Garden Hokkaido University) in academic 2013 and 2014. Work on a total of 15 buildings was completed. In seismic retrofitting, a reinforcement method was adopted to minimize the use of new structural components while meeting seismic performance requirements and maintaining the value of the buildings as cultural properties. Every effort was made to ensure that people would be able to distinguish newly installed structural components from existing ones at a glance. To strengthen the foundations of the buildings, a novel construction method that minimizes damage to possible underground cultural properties was adopted.

● From preservation to utilization of historic properties

Following the completion of seismic retrofitting and other work for important cultural properties, the Historic Property Utilization Task Force will shift the focus of its discussions from 1) renovation for preservation, related policy and such matters to 2) utilization policy and 4) value enhancement. The task force members will examine, in conjunction with those of other task forces, the establishment of a mechanism for the utilization of various historic properties on campus during the period of the third phase of the Medium-term Goals. Ways to enhance the value of these properties will also be discussed.

Symposium on the Preservation and Utilization of Historic Properties at Hokkaido University

■Date: June 13, 2015 ■Venue: Hokkaido University Enyuu Gakusha building

To mark the completion of seismic retrofitting for the Model Barn and the Hokkaido University Natural History Museum, which are important cultural properties, a public event was held as a platform for discussion and consideration of ideal ways to preserve and utilize historic properties at HU based on a range of perspectives.

Part I

Report on the present situation of historic properties at HU and related initiatives
Five speakers gave presentations with titles including "Campus Master Plan and Historic Properties," "Preservation and Utilization of Underground Cultural Properties" and "Seismic Retrofitting Method for the Model Barn and Historic Structures in the Botanic Garden Hokkaido University."

Part II

Toward the utilization of historic properties at HU's Sapporo Campus
Presentations on historic properties at Osaka University and society-university collaborative activities were followed by related discussions by six attendees from HU and elsewhere.

Pre-opening of the Model Barn

Prior to the symposium, retrofitting work was described on a tour of the Model Barn.

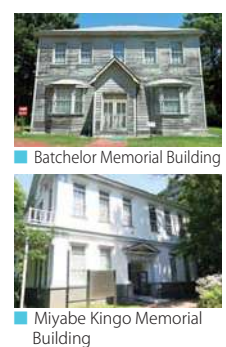
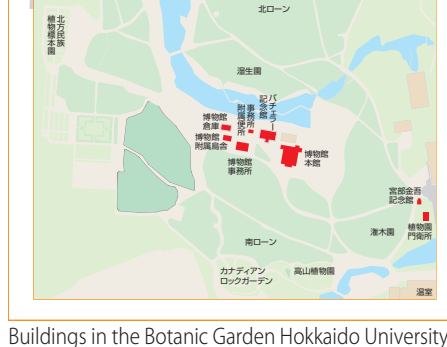
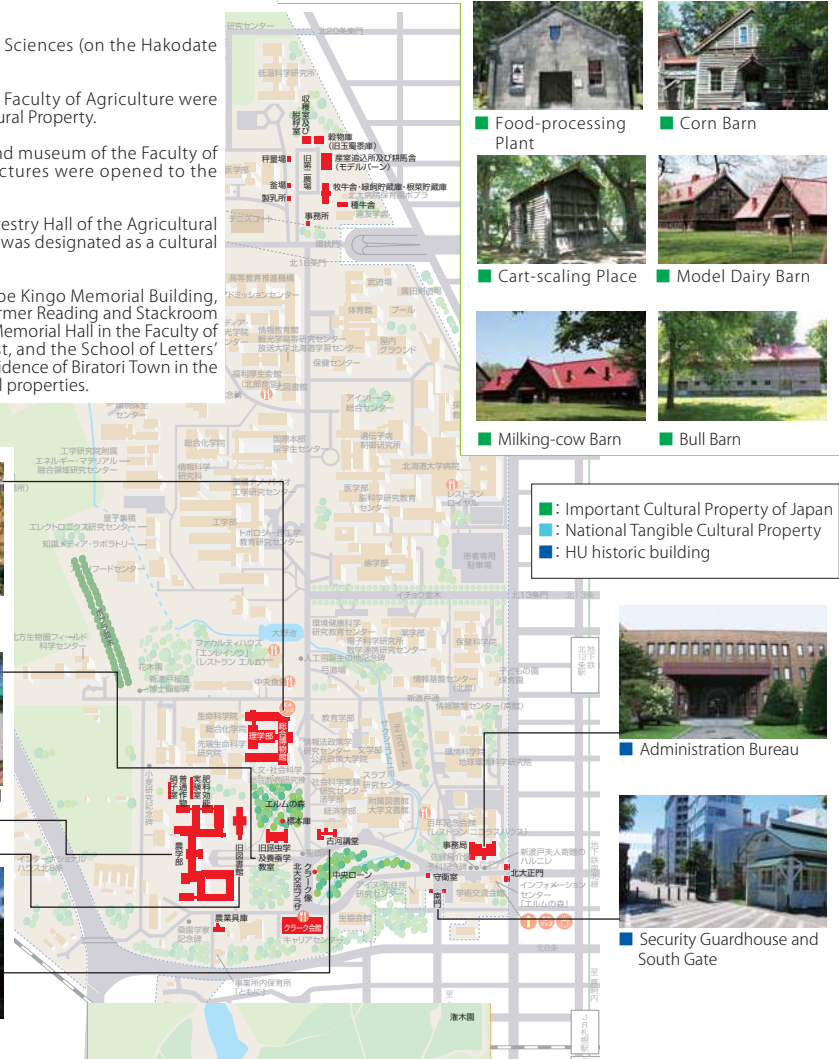
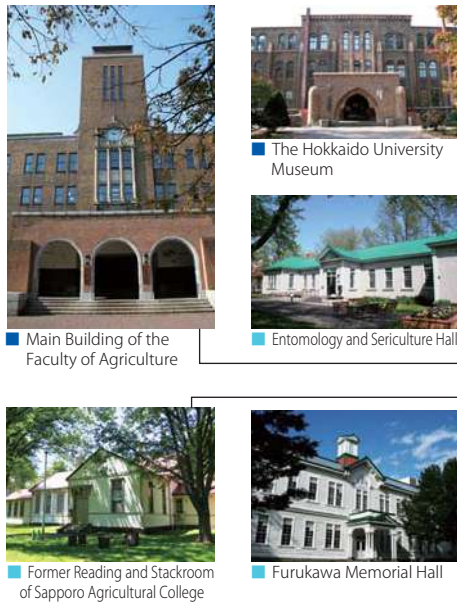
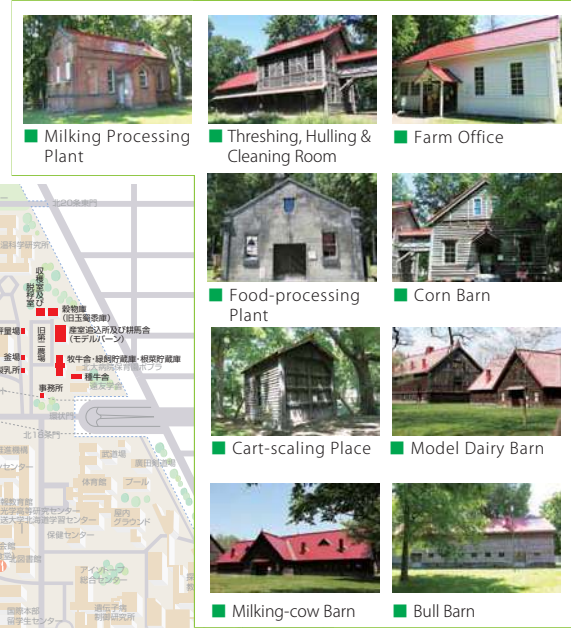


Chronological Table of Hokkaido University Architectural Monument Designation and Related Matters

Year	Date	Details
1968	Nov. 27	Six structures (the Model Dairy Barn, the Corn Barn, Furukawa Memorial Hall (previously the Forestry Hall of the Agricultural Department of Tohoku Imperial University), the Former Agricultural Economics Hall, the Former Reading and Stackroom of Sapporo Agricultural College, the Sapporo Agricultural College Entomology and Sericulture Hall) were designated as HU buildings for preservation.
1969	Aug. 19	The Model Barn buildings of HU's Faculty of Agriculture (the Former Agricultural Department of Tohoku Imperial University) were collectively designated as an Important Cultural Property.
1970	Jun. 17	The Former Sapporo Agricultural College Drill Hall (today known as the Sapporo Clock Tower) was designated as an Important Cultural Property.
1979	Apr.	The Former Agricultural Economics Hall was destroyed by fire.
1985		The Former Keiteki-ryo (student dormitory) was removed and reconstructed for preservation in the Historical Village of Hokkaido.
1986		The Former Arishima-ryo (student dormitory) was removed and reconstructed for preservation as the Former Takeo Arishima Residence in Sapporo Art Park.
1988	May 20	The Auditorium of the School of Fisheries Sciences (on the Hakodate Campus) was renovated.
1989	May 19	The buildings in the botanic garden of the Faculty of Agriculture were collectively designated as an Important Cultural Property.
1994	Jul. 1	Restoration work for the botanic garden and museum of the Faculty of Agriculture was completed, and the structures were opened to the public.
1997	Sep. 16	Furukawa Memorial Hall (previously the Forestry Hall of the Agricultural Department of Tohoku Imperial University) was designated as a cultural property.
2000	May 17	The Batchelor Memorial Building, the Miyabe Kingo Memorial Building, the Entomology and Sericulture Hall, the Former Reading and Stackroom of Sapporo Agricultural College, the Forest Memorial Hall in the Faculty of Agriculture's Tomakomai Experiment Forest, and the School of Letters' Nibutani House (the Former N. G. Munro Residence of Biratori Town in the Saru-gun region) were designated as cultural properties.

Hokkaido University Architectural Monuments

The Model Barn buildings



Power-saving efforts in summer 2014 (July - September)

1. Power-saving goals

Sapporo Campus

Receiving electricity from Hokkaido Electric Power Co., the Sapporo Campus set the upper limit of power consumption at 19,000 kW. This is 10% lower than the figure for summer of 2010 in terms of the maximum power consumption rate (kW/m²), which is calculated by dividing the maximum consumption by the total floor area.

Hakodate Campus

Receiving electricity from Hokkaido Electric Power Co., the Hakodate Campus set the upper limit of power consumption at 568 kW. This is a reduction of 7.1% on the maximum summertime power consumption of the past eight years (611 kW; recorded in July 2008).

2. Assessment and challenges

(1) Reduction of maximum power consumption

On the Sapporo Campus, the average maximum power consumption on days when power consumption exceeded the upper limit increased by 183 kW (0.9%) as compared to summer 2013. The average minimum power consumption on such days also increased by 112 kW (1%). In July and August of both 2013 and 2014, the temperature in Sapporo was between 25 and 29° C on 49 days, and the specific enthalpy (kJ/kg) of the air at the highest temperature on days when power consumption exceeded the upper limit was approximately 5% (3 kJ/kg) less in 2014. The increase in power consumption can be attributed to a greater floor area and the use of advanced education and research equipment. Increased power consumption on the Hakodate Campus is expected due to the installation of new equipment.

(2) Effects of energy-saving efforts

A look at the basic units of power consumption at faculties, schools and other organizations on the Sapporo Campus for summer shows that 27 organizations witnessed a decrease in 2014 as compared to 2013, while 14 organizations experienced an increase. This indicates that efforts to reduce the maximum power consumption have taken root, which has resulted in energy conservation.

(3) Future measures

On-campus advice will be provided to reduce power consumption through machinery/equipment adjustment. Using meters installed in individual organizations or buildings, improvements will be examined with the involvement of organizations where experimental equipment accounts for a

high percentage of the floor area and those with high base load electricity due to special circumstances.

Appropriate management of chemicals

Efforts to ensure appropriate management of chemicals, ranging from the reduction of their release to safety education and training – are made in line with the Hokkaido University Regulations on the Management of Chemical and Other Substances.

1. Management of chemicals

Since academic 2004, HU has centrally controlled chemicals based on its Chemical Management System. The Office of Health and Safety is responsible for managing chemicals, including related systems, and the Environmental Preservation Center is responsible for treating waste liquid and managing sewerage among other duties. HU examined its chemical footprint based on the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (Law concerning Pollutant Release and Transfer Register, or PRTR). Based on the results, the university notified the national government of seven substances (acetonitrile, ethylene oxide, xylene, chloroform, dichloromethane, normal hexane and methyl-naphthalene) it had released or transferred into the environment in amounts exceeding a ton in academic 2014.

2. Sewage management

As wastewater other than that collected from experiments is discharged into the public sewerage system, HU voluntarily conducts twice-monthly water quality tests in on-campus wastewater discharge channels to monitor levels of mercury, cadmium, benzene and seven other chemicals.

3. Treatment of waste liquid from experiments

The final treatment of waste liquid from experiments is outsourced. Organic waste liquid is dewatered and incinerated, while inorganic waste liquid is subjected to precipitation treatment or similar. The sludge produced is calcinated before being deposited at a controlled landfill site. The Environmental Preservation Center examines processing facilities to ensure appropriate treatment of waste liquid from experiments.

Changes in environmental data

HU works to minimize its own environmental impacts in order to create green campus areas with zero emissions based on the use of natural, renewable and other green

energy sources. In the second phase of its Medium-term Goals, which covered academic 2010 to 2015, the university set the target of reducing annual greenhouse gas (GHG) emissions by around 2% from the amount recorded in academic 2005 (91,270 tons). The institution's medium- and long-term goals involve reducing emissions by 20% by 2020 and 35% by 2030. However, these targets now need to be reviewed due to the situation outlined below.

◇Energy consumption

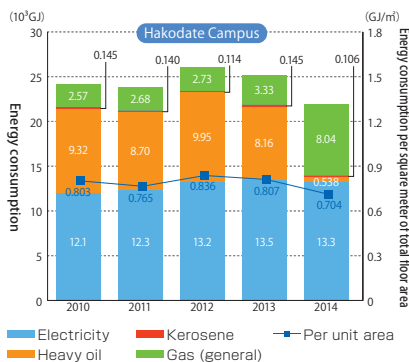
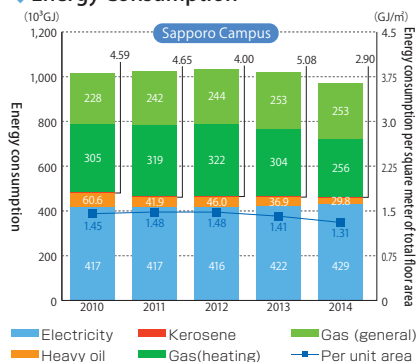
HU constructed new buildings, renovated existing structures and replaced/upgraded equipment across its campuses from academic 2010 to 2014. As a result, the total floor area of the Sapporo Campus had increased by 5.8% (or 39,662 m²) as compared to 2010 by May 1, 2014. As part of the renovation, building air-conditioning was changed from central heating based on the use of boilers in the power center to individual gas- and electricity-powered air-conditioning. Along with the addition of cooling functionality, this significantly increased consumption of gas for general purposes and electricity. On

the other hand, consumption of gas for heating purposes at the power center decreased, and overall energy consumption was lower in academic 2014 than in 2010 thanks to energy-saving efforts. Power usage also increased due to the academic 2013 introduction of the Proton Beam Therapy Center and the new outpatient building, which are medical facilities with large basic units of power consumption (measured in kWh per m² of total floor area).

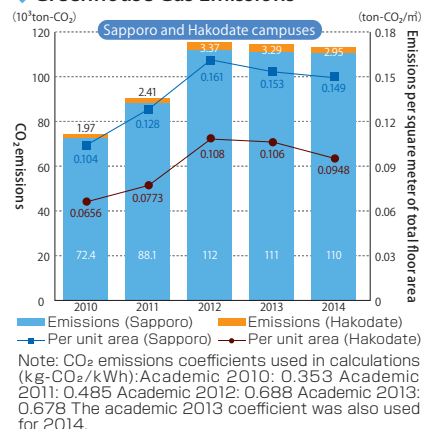
◇Greenhouse gas (GHG) emissions

Although GHG emissions in academic 2010 fell by 18.5% from those of 2005, thereby exceeding the reduction target, the figure has been above that of 2005 since the Great East Japan Earthquake of 2011. The rise is attributed to a significant increase in the CO₂ emissions coefficient for electricity in association with the shutdown of a nuclear power plant in Hokkaido. This has noticeably affected emissions because HU depends on electricity for more than 40% of its energy needs. Accordingly, new GHG emission reduction measures are needed at HU.

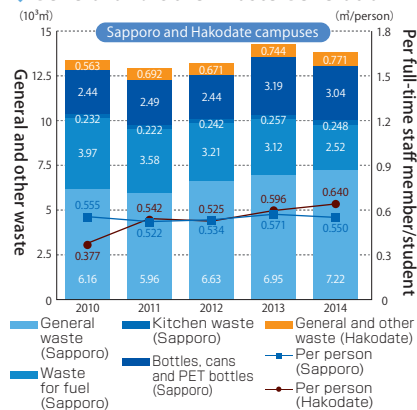
◇Energy Consumption



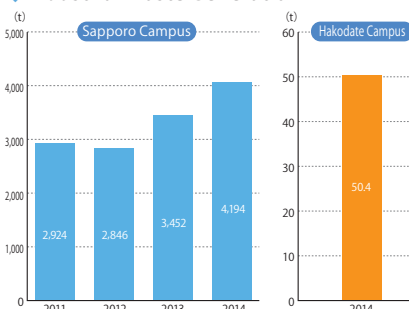
◇Greenhouse Gas Emissions



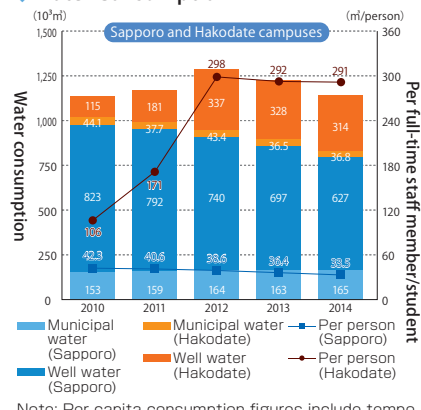
◇General and Other Waste Generation



◇Industrial Waste Generation



◇Water Consumption



Note 1: Kitchen waste is generated by the university hospital's food preparation facilities.
 Note 2: Full-time staff numbers include temporary staff.

Note: The figures for the Sapporo Campus exclude waste disposed of by individual departments and other organizations (e.g. electrical appliances). Those for the Hakodate Campus include electrical appliances but exclude mixed waste and waste plastic (measured per cubic meter).

Note: Per-capita consumption figures include temporary staff.



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Environmental Report Compilation

Editorial Policy

This Environmental Report was compiled in line with the Act on the Promotion of Business Activities with Environmental Consideration by Specified Corporations and Other Organizations Based on the Facilitation of Access to Environmental Information and Related Measures (also known as the Environmental Consideration Act) with reference to the Japanese Ministry of the Environment's Environmental Report Guidelines 2012.

Organizations Involved

Hokkaido University
Sapporo Campus
Hakodate Campus
(incl. contracted commercial operators on campus)

Period

April 2014 - March 2015

Field

Environment

Issuance

September 2015 (next issuance scheduled for September 2016)

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This Environmental Report is available on the Office for a Sustainable Campus website at
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