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Proceedings of The Joint Japanese-Finnish Seminar on Northern Environmental Research Hokkaido University, Sapporo 16-18 November 2009

Organized by
Hokkaido University: University of Helsinki:
University of Oulu:
Arctic Centre, University of Lapland:
The Finnish Institute in Japan

Hokkaido University Sustainability Weeks 2009

Hokkaido University Sustainability Weeks 2009

Joint Finnish-Japanese Seminar on Northern Environmental Research

16-18 November 2009

Conference Hall, Hokkaido University, Sapporo, Japan

http://www.sustain.hokudai.ac.jp/sw2009/jp/event/finnish (Japanese)
http://www.sustain.hokudai.ac.jp/sw2009/event/finnish (English)

Organized by Hokkaido University; University of Helsinki; University of Oulu; Arctic Centre, University of Lapland; The Finnish Institute in Japan

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Program

Time & Place of the Seminar: Conference Hall, Hokkaido University, Sapporo
Monday, 16 November: The First Meeting Room
Tuesday, 17 November: The Third Meeting Room
Wednesday, 18 November: The Second Meeting Room

Purpose of the Seminar:
- to disseminate information on the themes which are relevant to the northern areas both in Finland and Japan
- to exchange and increase scientific expertise on northern issues
- to initiate concrete research projects
- to initiate preparation of funding applications for co-operation project
- to increase student and scientist exchange

Timetable:

Day 1: 16 November (Mon) 09:00-17:30 <The First Meeting Room>

09:00- Registration:

09:30- Opening of the Seminar:

- The Joint Finnish-Japanese Seminar on Northern Environmental Research - The Present Status and Prospects - (Kunio Shirasawa)
- The cooperation between Hokkaido and Oulu Universities (Lauri Lajunen, Rector of University of Oulu)
- Greetings from Department of Physics, University of Helsinki (Matti Leppäranta)
- Greetings from University of Lapland (Juhani Lillberg)
- Arctic Graduate School (ARKTIS) (Päivi Soppela, Paula Kankaanpää)
- Northern environmental sciences at University of Oulu (Kari Laine)
- Greetings from the Finnish Institute in Japan (Heikki Mäkipää)

11:30- Lunch

13:30- Session: Cryosphere and Boreal Forests (Chairs: Shirasawa & Leppäranta)

Presentations of ongoing programs and present status:

- Ice Climatology in the Baltic and Okhotsk Seas (Matti Leppäranta, Kunio Shirasawa)
- Baltic Sea and Okhotsk Sea ice dynamics (Annu Oikkonen, Matti Leppäranta, Kunio Shirasawa)
- Lake ice investigations in Finland (Matti Leppäranta, Kunio Shirasawa, Anniina Kiiltomäki, Elina Jaatinen, Masao Ishikawa, Toru Takatsuka)
- Wintertime experiments of physical processes at Saroma-ko Lagoon (Mika Mäkelä, Kunio Shirasawa, Matti Leppäranta)

14:50- Break

15:10 - Sea-ice field courses at Tvärminne in the Baltic Sea, at Saroma-ko Lagoon in the Sea of Okhotsk and at Barrow in the Chukchi Sea – An educational program for graduate students - (Kunio Shirasawa, Matti Leppäranta, Hajo Eicken)

Presentations of new proposals:

- Developing an integrated terrestrial model of vegetation dynamics, energy and carbon exchanges and biogeochemical cycles in cool-temperate forest ecosystems (Motomu Toda)
- Hydrometeorological processes in Northern Eurasia (Yuji Kodama)

16:15- Session: Landscape, Land Use Changes (Chairs: Aikoh, Shoji & Laine)

Presentations of new proposals:

- Designating and zoning issues of the natural park system in Japan (Tetsuya Aikoh, Kazushige Yamaki)
- Determining visitor preferences for maintenance and repair of alpine trails by applying photographic techniques and choice experiment (Yasushi Shoji, Tomoya Hashizume, Koichi Kuriyama, Takahiro Tsuge)
- Information rents in conservation contracting for biodiversity: An empirical examination of Finnish pilot programme (Artti Juutinen, Erkki Mäntymaa, Markku Ollikainen)

18:30- Dinner

Day 2: 17 November (Tue) 09:00-17:30 <The Third Meeting Room>

09:00- Session: Landscape, Land Use Changes (Chairs: Aikoh, Shoji & Laine)

- Valuation of recreational services of a national park: A choice experiment study in Oulanka National Park, Finland (Erkki Mäntymaa, Artti Juutinen, Yohei Mitani, Yasushi Shoji, Pirkko Siikamäki, Rauli Svento)
- Spatial overlap between tourist attractions and biodiversity (Pirkko Siikamäki, Stuart Cottrell, Katja Kangas, Susanna Schroderus)
- Changes (?) in northern nature: Facts from a LTER site in Finnish Lapland (Antero Järvinen)
- Environmental health in contex of climate change and land use change (Arja Rautio)
- Vulnerability assesment of ecosystem services for climate change impacts and adaptation as an example of Finnish LTSER-network activities (Kari Laine)
- From conflict to consensus: The Vatnajökull National Park, Iceland (Harald Schaller)

11:00- Break

11:20- Session: Human-Environment Relations (Chairs: Stammler & Maruyama)

Presentations of ongoing programs and present status:

- Introduction to session (Florian Stammler, Hiroshi Maruyama)
- The social significance of animals in the Arctic, Central Asia and Africa: A joint Japanese-Finnish research network. Report, publication status, future plans (Florian Stammler)

12:00- Lunch

13:30 - Traditional ecological knowledge and biological diversity in light of place: How Sami reindeer herders perspective biodiversity of places in Utsjoki, Finland (Masumi Tanaka)

- Ainu and indigenous studies in Japan after the recognition of Ainu indigenous status in 2008: Prospects and research agenda (Martina Tyrisevä)
- Human-environment relations among the Dukha, Mongolia (Martina Tyrisevä)
- Community adaptation and vulnerability in Arctic region: case studies from the Russian North (Anna Stammler-Gossmann)
- Efforts to conserve the Ainu cultural environment – Things to preserve and restore - (Hideki Yoshihara)
- A role of local Ainu residents in Struggling for culture through two dams projects in Biratori Town, Hokkaido, Japan (Hiroshi Maruyama)

15:30- Break

15:50 - *Iwor* and *Siida* as the basis of nature-based culture (Takashi Matsuna)

- On the environmental and cultural conservation research in Biratori in terms of handing down Ainu culture to younger generations (Koichi Kaizawa)
- Climate change, and environmental and human security – from a northern point of view – (Lassi Heininen)

Presentations of new proposals:

- Local/indigenous people, hydroelectric power, and displacement: A research and book proposal (Florian Stammler, Hiroshi Maruyama and colleagues)

Day 3: 18 November (Wed): 09:00-11:00 <The Second Meeting Room>

Reporting of the Seminar:

Summaries of the Sessions by Session Chairs & Organizing Committee

Session: Cryosphere and Boreal Environments

- Ongoing programs:
  - A long-term Japanese-Finnish cooperative program 'Ice Climatology in the Baltic and Okhotsk Seas'
  - Field experiments at Saroma-ko Lagoon, Hokkaido, Finnish lakes and Baltic Sea
  - Sea-ice thermodynamics and dynamics modeling in the Baltic and Okhotsk Seas to verify the models with measured data.
  - Sea-ice field courses at Saroma-ko Lagoon, Tvärminne and Barrow (?)
- Possibility of new programs:
  - (Land) water cycles, seasonal and inter-annual variability in snow and ice in boreal forests, and monitoring of forest ecosystem.

Session: Landscape, Land Use Changes:

- Comments and proposals:
  - Need more participants from other universities.
  - Long-term monitoring is important.
  - Japanese colleagues related to Session: Landscape, Land Use Changes have organized other symposium at the same time as this seminar going on. But they will organize this session in cooperation with Finnish colleagues next time.

- Network of land use can be useful to monitoring, but more concrete relation for monitoring is necessary at least at every two years.

Session: Human-Environment Relations:

- Comments and Proposals:
  - This theme was new, and the session was very successful. There will be possible collaborative programs with Ainu and Sami people in the future. But, we need to know each other more and more. A book is planned to publish on local/indigenous people, hydroelectric power, and displacement.

Possible Funding Applications and Future Programs:

- Bilateral programs of the JSPS/Academy of Finland; the deadline is at the end of Jan. 2010? for 4 year programs?
- Educational programs; Master programs in the Network (University of Oulu, Arctic Centre/University of Lapland), joint field courses by Hokkaido and Helsinki Universities, by field stations etc.
- Sasagawa foundation
- JSPS Alumni Club in Finland; funding to organize a colloquium in Finland, and specially encouraged for young scientists and graduate students (http://www.jsps-sto.com).
- Possibility to organize Ainu-Sami relations; important topics as visiting professors, and possibly in cooperation with Muroran Institute of Technology.
- A series of the Joint Finnish-Japanese Seminar on Northen Environmental Research will be held in Northern Lapland in October or November 2010 by organization of University of Oulu?
- Hokkaido University Sustainability Weeks 2010 (from 25 October 2010 to xxx), Hokkaido University, Sapporo; one possible meeting.
- Finnish-Japanese international conference on human-animal relations 2010?

Half-day excursion in Sapporo: 11:00-19:30

The schedule: Hokkaido University (11:00) -> Historical Village of Hokkaido (11:45-Lunch- 13:45) -> Chitosetsuru Sake Museum (14:15-15:00) > Sapporo Winter Sports Museum/Ohkurayama Ski Jump (15:30-17:00) -> Sapporo Beer Garden (for Banquet) (18:00-19:30)

18:00-19:30 Banquet at Sapporo Beer Garden

Days 4-5: 19-20 November (Thu-Fri): *Excursion to Shikotsu-Toya National Parks*

19 Nov. (Thu): JR Sapporo Station (09:00) -> Shiraoi Ainu Porotokotan (10:30-12:00) > Lunch (Shiraoi Kani Goten; 12:15-13:15) -> Noboribetsu Jigokudani (14:00-15:00) > Lake Toya Visitor Center (16:00-17:00); overnight stay at Toya-ko Manseikaku Hotel (Tota-ko Onsen).

20 Nov. (Fri): Toya-ko Manseikaku Hotel (09:30) -> Nishiyama Sansaku (09:35-10:45) -> Showashinnzan/Usu Volcanos/Lunch (11:00-13:30) -> Ohtaki Village (14:15-14:30) -> Lake Shikotsu Visitor Center (15:00-16:15); stay overnight at Marukoma-onsen Ryokan (Shikotsu-ko Onsen).

Departure:

Option 1:

21 Nov. (Sat): Marukoma-onsen Ryokan (6:45) -> Chitose AP (7:40) by jumbo hire > Chitose/Sapporo (08:10) -> Nagoya (10:00) AY5814*/(11:00) -> Helsinki (15:10) AY080
*AY5814: Connecting flight to AY080

Option 2:

21 Nov. (Sat): Marukoma-onsen Ryokan (6:00) -> Chitose AP (6:50) by jumbo hire > Chitose/Sapporo -> Tokyo by air; stay overnight in Tokyo
22 Nov. (Sun): Narita/Tokyo (11:00) > Helsinki (15:20) AY074

Option 3:

21 Nov. (Sat): Marukoma-onsen Ryokan (10:00) -> Sapporo (12:00) by hotel bus

Abstracts

Opening of the Session

Hokkaido University Sustainability Weeks 2009
The Joint Finnish-Japanese Seminar on Northern Environmental Research
16-18 November 2009
Conference Hall, Hokkaido University, Sapporo, Japan

The Joint Finnish-Japanese Seminar on Northern Environmental Research - The Present Status and Prospects -

Kunio Shirasawa
Institute of Low Temperature Science, Hokkaido University

Environmental and socio-economic change in the northern regions has resulted in an urgent need for information on climatic changes covering large regions as well as local areas. In fact, Northern Finland and Hokkaido are neighboring areas with the northern Russia between them, and the climate change and increase of the use of natural resources create pressure to the sensitive cold climate environment and traditional cultures both in Hokkaido and in Finland. Both regions have lots of similarities in the climate such as snowfall and seasonally freezing waters in the Sea of Okhotsk and the Baltic Sea at least partly every winter. The annual average precipitation in Hokkaido is 1150 mm and about 650 mm in Lapland. The forests of both areas belong to the northern boreal forest zone.

Finland and Hokkaido have been investigating various research fields in the cold climate and environment, and they have well rich expertise in boreal environment research to be able to solve difficult problems in sensitive cold climate environment.

The Finnish-Japanese Seminar on Northern Environmental Research will provide information on the themes which are relevant to the northern areas both in Finland and Japan. Informational exchanges on scientific expertise, initiatives and ongoing research projects, preparation of funding applications for co-operation projects, and increases in student and scientist exchanges**,** are topics that especially students and young scientists will be interested in.

I hope we would create concrete joint research projects in those research fields between the two countries through fruitful discussions.

Greeting from Department of Physics, University of Helsinki

Matti Leppäranta, professor
Department of Physics, University of Helsinki, Box 48, FI-00014 Helsinki, Finland

The Department of Physics of University of Helsinki and The Institute of Low Temperature Science of Hokkaido University have had long-term and successful collaboration since 1995. First, the co-operative research programme "Ice climatology of Okhotsk and Baltic Seas" was initiated. The principal investigators were associate professor Kunio Shirasawa and professor Matti Leppäranta. This programme focused on the Okhotsk and Baltic seas and the topics were (1) Long-term variability of ice seasons, (2) Ice melting process, (3) Sea ice remote sensing. The work progressed through mutual visits in research laboratories and through mutual participation in field programmes in both seas. In 2001 the programme was revised. Topic (2) was extended to sea ice thermodynamics while topic (3) was focused into radar remote sensing of ice kinematics. Also lake ice research was included in the programme, as a natural extension of the work in the coastal zone. In 2001 a joint seminar “Sea Ice Climate and Marine Environments in the Okhotsk and Baltic Sea - The Present Status and Prospects”, was held in Nauvo, Finland.

After 2001 an extensive lake research programme has been performed, and sea ice research has more focused on the sea ice kinematics and dynamics in the Okhotsk and Baltic Seas. In addition, joint field courses have been held in Hokkaido and in Finland in field stations. In addition to own funding by the partners, financial support has been obtained from Japan from The Japan Society for the Promotion of Science and Ministry of Education, Science and Culture and from Finland from the Ministry of Trade and Industry and the Academy of Finland.

The present collaboration has been regarded most valuable in external reviews, e.g. in the evaluation of the research of the University of Helsinki. In 2007–2009 an extensive programme *International Polar Year (IPY)* was arranged, with field campaigns in polar regions, university courses, conferences, etc. Our collaborative efforts were also sharpened in the IPY period.

Japan is one of the leading countries in the science of snow and ice and the Institute of Low Temperature Science is one of the leading snow and ice laboratories in the world. The Japanese tradition in this field goes also a good distance into the past. Snow and ice is also a natural scientific discipline in Japan since Hokkaido and mountains in Honshu possess a seasonal snow cover, sea ice occurs every winter on the northern coast of Hokkaido. The snow and ice have a major influence on the life in Japan. This influence of snow and ice is also true in Finland. This country is located far more north but due to Gulf Stream the climate is relatively mild. Hokkaido and southern Finland are in fact quite similar in the climatic conditions. Snow and ice science has also on Finland a long history and the snow and ice conditions have similar influence in the life as in Japan. Due to the long tradition and the practical experience the present collaboration has beneficial to both parties, Japan and Finland, and is now progressing very strong.

Arctic Graduate School (ARKTIS)

Päivi Soppela and Paula Kankaanpää
Arctic Centre, University of Lapland, P.O. Box 122, FIN-96101 Rovaniemi, Finland

The University of Lapland's Arctic Centre is a national and international research centre and a centre of Arctic expertise and science communication. Arctic Graduate School (ARKTIS) is a multidisciplinary graduate school coordinated by the Arctic Centre (2003-). The school studies social and environmental impacts of modernisation and global change in the Arctic. ARKTIS is financially supported by the Ministry of Education in Finland and the Academy of Finland. ARKTIS will write a new application for its continuation next spring and seeks partners from other graduate schools for international networking. The Arctic Centre and ARKTIS are interested in Japanese partners and PhD students studying environmental and socio-economic changes in the Northern regions.

There is a growing need of high-level experts in Arctic issues in both public and private institutions in the rapidly changing far North, including Lapland. The ARKTIS educates doctors who are familiar with Arctic issues in their own disciplines; who have a broad view and understanding of the social, economic and ecological issue of the Arctic, and who are capable of applying their knowledge for promoting sustainable development in the North in cooperation with different stakeholders, and local and indigenous people. The disciplines of the school are environmental politics, economy and justice, cultural studies, international relations, sociology, biology and geography. ARKTIS organises annual research seminars, tailored short courses, method studies and public lectures, supports students' international mobility and forms a national and international network of Arctic research. International collaboration in research education and exchange is one of the key focuses of ARKTIS. International collaborators of the school include University of Arctic and the graduate schools with related themes in other Northern and Arctic countries.

PhD students of ARKTIS are selected by an international competition. The school has 5 fully-funded four-year student posts and altogether 20 PhD students enrolled at the University of Lapland, University of Oulu, University of Joensuu and University of Helsinki. Six new fully-funded student posts will be filled from the beginning of 2010. ARKTIS has produced 5 PhD's and 5 are expected to earn their PhDs by the end of 2010. The graduate school has a large group of supervisors and scientific advisers from numerous institutions in the Nordic countries, UK, USA, Canada and Russia. In 2007, ARKTIS initiated the Barents Arctic Network of Graduate Schools (BANG) which brings together PhD students and senior scientists from the Barents region.

Further information: www.arcticcentre.org/arktis

Session: Cryosphere and Boreal Forests

Ice Climatology in the Baltic and Okhotsk Seas

Matti Leppäranta[1] and Kunio Shirasawa[2]

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Co-operative research programme "Ice climatology of Okhotsk and Baltic Seas" between Institute of Low Temperature Science, Hokkaido University and Department of Physics, University of Helsinki was initiated in 1995. The results of this work will be mostly useful not only for the further sea ice research and applications in the Baltic and Okhotsk Seas but the general understanding of the seasonal ice cover in marginal and mediterranean seas. In particular, this work is closely connected with the global change research and gives understanding to how future the ice season may be affected in the seasonal sea ice zone.

The Okhotsk and Baltic Seas belong to the seasonal sea ice zone of the world ocean where ice occurs annually. The length of ice season is 4–6 months in both seas. Scientific as well as many practical ice problems in these two seas are highly similar. Consequently, the exchange of knowledge and expertise between Japan and Finland is very fruitful in this field. To achieve the goals of this collaboration, joint field campaigns, data analyses and model development are performed. A common model for the growth and decay of snow-covered sea ice has been developed and calibrated with field data. A new feature in this model is a good description of snow, with snow metamorphosis and snow-ice formation. In areas as these two seas the snow accumulation is large as compared with the sea ice thickness and the snow has a very important role in the sea ice thermodynamics. Both Baltic and Okhotsk Seas have long, more than 100 years, time series of the ice conditions, and they have been used for joint climatological data analyses. The primary ice season quantities of interest are the dates of freezing and breakup, and their statistical individual characteristics and interrelationships have been examined.

The seasonal sea ice zone covers the outer boundary of the polar sea ice caps and a few subarctic mediterranean and marginal seas. The ice conditions in these subarctic seas are highly sensitive to regional climatology and consequently excellent climate indicators. Also long ice time series exist since the ice season characteristics are easily observable and are very significant to the local everyday life, such as freezing and breakup dates, length of ice season, and maximum ice thickness. To extend the work on the Baltic and Okhotsk Seas to the whole seasonal sea ice zone, data collection is ongoing and some preliminary results have been obtained.

Baltic Sea and Okhotsk Sea Ice Dynamics

Annu Oikkonen, Matti Leppäranta, Kunio Shirasawa

Data

This study bases on the ice drift observation made with drifting ice buoys in the Sea of Okhotsk during winters 2004 and 2005, and with the ship moored into the drifting ice floe in the Baltic Sea in March 2009.

In the Sea of Okhotsk there were three drifting buoys both in 2004 and 2005, and location of the buoys was recorded every hour. Data from year 2004 cover a period of only 5-6 days in February, while in 2005 two of three buoys collected data almost two months (15th of February - 4th of April). In the Baltic Sea data was collected during the cruise of Research Vessel Aranda in March 2009. The ship was moored into a large ice floe in three different stations, each lasting from 1.5 to 3 days. The GPS coordinates were recorded with a high frequency (every 10 seconds), but here the ice drift was calculated using a time step of 30 minutes.

During the Baltic Sea ice drift experiment meteorological observations were made onboard the RV/Aranda with the time interval of 10 seconds. For the wind forcing estimations we used 30 minutes averages of wind speed and direction. In the Sea of Okhotsk there were no meteorological observations from the exact locations of drifting buoys, so wind measurements from the Abashiri station on the coast of Hokkaido were used. Ice drift in the Sea of Okhotsk was compared with sea level observations (from Japan Oceanographic Data Center) and with the tidal component of sea level variations, which was obtained from the tide predictions offered by Japanese Coast Guard.

Results

During the Baltic Sea ice drift experiment data collected in three drifting ice stations represented three very different drifting conditions. During the first ice station (S1) wind was mild, ice field was very compact and maximum drift velocity reached only few cm/s. In the second ice station (S2) stronger wind caused faster drift, but also a lot of ice deformations. Fastest ice drift (22 cm/s) was observed in the third ice station (S3), where ice drift was very close to free drift: drifting speed was about 2% of wind speed and drift direction was deviating right from the wind direction. In S1 and S3 power spectrums of wind and ice drift correspond well over the whole frequency span, while in S2 correspondence in higher frequencies is clearly weaker.

In the Sea of Okhotsk ice was drifting generally much faster than in the Baltic Sea. Drift velocities averaged over the observation periods of each buoy were all over 20 cm/s, i.e. the average drift speed in Sea of Okhotsk exceeded the maximum observed in the Baltic Sea. In addition to the wind forcing, tidal forcing is also significant factor in the Sea of Okhotsk. Although in these cases the ice drift power spectrums do not show very clear tidal peaks, cross wavelet and wavelet coherence analyses show the importance of tides. In the cross wavelet transforms of ice drift and sea level variations there is significant common power in tidal bands of about 12 h and 24 h, and the common power varies with varying maximum tide amplitude.

Lake ice investigations in Finland

Matti Leppäranta[1], Kunio Shirasawa[2], Anniina Kiiltomäki[1,3], Elina Jaatinen[1], Masao Ishikawa[2] and Toru Takatsuka[2]

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In winter ice cover plays a crucial role in the physics and ecology of boreal lakes. It forms a stationary, thin solid sheet, and it influences the transfer of momentum, heat, light and matter between the atmosphere and the lake water body. In large lakes the ice may drift but the mobility is restricted. In the recent years the research of wintertime lake processes has largely increased in Finland, to understand better both the ice physics and the processes in the water body beneath the ice. The motivation is first of all in lake ecology, since winter forms an important part of the annual cycle of lake life. Mathematical models have been developed for the growth and decay of the ice and the drift of ice in large lakes. This paper discusses the experimental design and results from our recent field.

In Finnish Japanese collaboration, three lakes have been investigated in Finland in 2003–2009 for the winter cycle of the physical conditions. These lakes are Lake Pääjärvi and Lake Vanajavesi from southern Finland and Lake Kilpisjärvi from the tundra area in Lapland. The research has been based on field data collection with an automatic ice station and specific expeditions with manual measurements and ice and snow sampling. The data include weather conditions, structure and thickness of ice and snow, atmospheric surface layer, solar radiation transfer through ice, ice temperature, and under-ice current and temperature. According to the data analysis, heat budget in winter is governed by terrestrial radiation losses of 20–35 W m^{-2} compensated by ice growth of 0.5–1.0 cm day^{-1}. In spring, albedo decreases from 0.8 to 0.1, and the mean ice melt rate is 1.5 cm day^{-1}. Internal melting and surface melting are about equal. The mean turbulent heat losses are small. The heat flux from the water to ice is about 5 W m^{-2} in winter, increasing to 10–15 W m^{-2} in the melting season. The light attenuation coefficient is about 1 m^{-1} for the congelation ice in winter, less than in normal lake water with (1.5 m^{-1}) and up to 3 m^{-1} for candled congelation ice in spring. Snow and snow-ice are opaque, the attenuation coefficient is about 10 m^{-1}. Gas bubbles are the main factor that reduces the transparency of ice. The radiation penetrating the ice heats the water body causing convective currents and horizontal heat transfer. This increases the temperature of the water body to about 3ºC before the ice break-up. After the snow has melted, the euphotic depth (corresponding to irradiance level of 1% of the surface value) is typically about one-third less than in summer.

Wintertime Experiments of Physical Processes at Saroma-ko Lagoon

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Abstract

In the earlier study on heat budget of the Saroma-ko lagoon, Hokkaido, Japan, between 1998-2009 (2009) it was found that the meteorological conditions have a remarkable effect on the yearly ice cover structure. In this study it was noted that in order to get a better view on the development of the ice cover, a longer data series should be used than the two weeks in-situ dataset which was utilized in this study.

In the current study, the heat budget throughout the whole ice covered period at the Saroma-ko lagoon was studied analyzing measurement data collected in Kimuaneppu Cape years 2003-2004, 2006-2007 and 2009. The data was used to estimate the heat budget terms in throughout the ice-covered period each year. In addition the effects of the heat budget and meteorological conditions to the ice structure at Saroma-ko was studied by modelling the ice growth and structure by Saloranta (2000) SIN (Snow influenced numerical) 1-dimensional ice growth model using Kimuaneppu data as a forcing data.

Both the results of the heat budget calculations as well as the ice structure modelling were compared and verified by using shorter time scale in-situ measurements at the Saroma-ko lagoon. These results were compared to the earlier similar studies at the same location in 1990-2000 by Shirasawa et al. (1998, 2005).

Sea-ice field courses at Tvärminne in the Baltic Sea, at Saroma-ko Lagoon in the Sea of Okhotsk and at Barrow in the Chukchi Sea – An educational program for graduate students –

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As much as one-tenth of the world's oceans are covered with sea ice at some point during the annual cycle. The role of sea ice in the natural environment and the global climate system cannot be underestimated. Planning for this sea-ice field course has been motivated by the importance of integrated, interdisciplinary studies that recognize the close coupling between ocean-ice-atmosphere and associated ecosystems in the seasonally ice-covered waters as well as in the Arctic and Antarctic Ocean. A thorough, penetrating analysis of ice variability and polar ocean and atmosphere processes requires the assimilation of knowledge gleaned from observing and understanding sea ice from a number of different perspectives. This can be achieved by combining field experience with an understanding of how sea-ice processes and features manifest themselves in remote sensing data and how models can help unravel the complexities of the sea-ice system. Finally, sea ice can be regarded as an exemplary or model system for modern, interdisciplinary approaches to complex environmental problems that integrate different field and laboratory tools as well as remote-sensing and modeling. It is hoped that students participating in the class will benefit from the course in a manner that extends well beyond the specific subject of study and might help them address other, complex environmental problems in an integrative fashion later in their careers.

The sea-ice field courses have been designed as a Japanese-Finnish collaboration through the Ice Climatology in the Baltic and Okhotsk Seas, and also as a Japanese-US collaboration through the vehicle of a Memorandum of Understanding and partnership between Hokkaido University and the University of Alaska Fairbanks. We hope to implement this course as a longer-term offering to a wider range of students, alternating every two or three years between Tvärminne, the Baltic Sea, Saroma-ko Lagoon, the Sea of Okhotsk and Barrow, Alaska. Such universities as Hokkaido, Helsinki and Alaska have a long history of outstanding sea-ice research but it also represent the near-southernmost limit of seasonally ice-covered waters in the northern hemisphere. Hence, if fully implemented, the course would span the entire width of the seasonally ice-covered waters and could address and introduce students to a number of important issues related to the expansion of the seasonal ice zone as a result of perennial ice shrinkage in the Arctic Ocean, latitudinal gradients in atmospheric and oceanic forcing and ice-associated ecosystems etc.

Under several years experience of organizing this field course, we realized that making a field course textbook would be necessary to further continue this course, and this idea was successful as quite newly publishing the first comprehensive resource on sea ice research methods, *'Field Techniques for Sea Ice Research'* and the accompanying DVD, published by University of Alaska Press (www.uaf.edu/uapress) in December 2009.

DEVELOPING AN INTEGRATED TERRESTRIAL MODEL OF VEGETATION DYNAMICS, ENERGY AND CARBON EXCHANGES AND BIOGEOCHEMICAL CYCYES IN COOL-TEMPERATE FOREST ECOSYSTEMS

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In the field of micrometeorological research flux tower measurements have been conducted worldwide to understand energy and carbon exchanges between atmosphere and biosphere. One can find numerous reports on near-surface energy and carbon exchanges between the atmosphere and terrestrial ecosystems on a stand scale over a decade and on a spatially large scale using meta-analysis in which flux data at multi-measured sites are utilized. One of current crucial issues is to predict accurately inter-annual variations in energy and carbon exchanges between the atmosphere and forest ecosystems under climate change in the future.

In forest ecosystems, inter- or intra-specific competition for light, water and nutrients leads to dynamic spatial and temporal changes in size structure and distribution of trees (frequency distribution of individual plant size, such as height, stem diameter and biomass). The dynamic changes in the plant population produce varying micrometeorological environments, and consequently, varying energy and carbon exchanges of the plant population. In addition, the nutrient cycle is determined by a result of internal cycling and retention of past inputs in the terrestrial ecosystem and is largely regulated by plant uptake, loss from the system, litter-fall and death of plants due to competition between inter- or intra-specific individual plants. To predict long-term variations in energy and carbon exchanges, biogeochemical cycling in forest ecosystems with vegetation dynamics, therefore, it is necessary to integrate the models developed for micrometeorology-vegetation dynamics and biogeochemical cycling in forest ecosystems.

In the Joint F-J seminar, I report briefly observed results obtained from the flux tower measurement, ecological and biogeochemical researches that have been conducted in cool-temperate forested watershed in Northern Japan which closes to the southernmost area of sub-boreal terrestrial ecosystem. In addition, we introduce future perspectives for developing a coupled atmosphere-vegetation-nutrient dynamics model in high-latitude terrestrial ecosystems that may be vulnerable to abrupt changes in climatic conditions. This challenge would be one of the representatives for the joint research strategy between Finland and Japan to understand and predict the high-latitude terrestrial ecosystem responses to global climate changes.

The model development has been conducted as part of the primary research subjects of terrestrial research groups GCOE-IFES programs (PI: Dr. Yasuhiro Yamanaka), Field Science Center for Northern Biosphere and Institute of Low Temperature Science, Hokkaido University, Japan.

Session: Landscape, Land Use Changes

Designating and zoning issues of the natural park system in Japan

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The national park system of Japan was established in 1931. Currently, there are 29 national parks, 56 quasi-national parks and 309 prefectural natural parks. In an earlier stage of designation, popular tourism destinations and hot-spring resorts were designated as national parks. At that stage, most public lands within national park boundaries had been designated as national forests already, and there were some private lands. National parks have been managed by the Ministry of Environment, whereas national forests have been managed by the Forestry Agency. Therefore, Japanese national parks have been managed under two standards.

Determination of a park and its zoning boundaries was influenced by land ownership. There has been criticism that zoning is influenced by timber production or other commercial activities. For the current paper, case studies were conducted in Shikotsu Toya National Park and some protected areas. We overlaid maps indicating natural and cultural resources with park plan maps. We found several discrepancies between resource conditions and current zoning. In particular, the current zoning of national parks focuses insufficient attention on biodiversity conservation and the provision of diverse recreational opportunities. Furthermore, some valuable natural and cultural resources have been excluded from park boundaries. In addition, there are some resources that have been maintained through the traditional lifestyle of the local community. However, they have not been conserved well under the current policy of protected areas in Japan.

The lack of a reasonable planning and management framework is one of the reasons that park management is not effective. In North America, some planning and management frameworks have been developed to achieve sustainable management in natural recreational areas, including the concepts of Recreation Opportunity Spectrum, Carrying Capacity, Limit of Acceptable Change, Visitor Experience and Resource Protection. We discuss the necessity of a reasonable planning framework, and its application to our situation.

Determining Visitor Preferences for Maintenance and Repair of Alpine Trails by Applying Photographic Techniques and Choice Experiment

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ABSTRACT

The erosion of trails and the destruction of alpine vegetation alongside the trails in national parks in Japan have evolved into serious problems. The purpose of this study is to outline visitors' preferences regarding methods of maintaining and repairing the alpine trails, using a photographic technique and choice experiment. On-site sampling questionnaires were distributed to visitors in September 2004, and 471 (65.4%) out of 720 questionnaires were returned by mail. After removing respondents who did not answer main questions, and always chose the *status quo* profile in the choice experiment task, we were left with 393 completed responses. Conditional logit estimates demonstrate that constructing a boardwalk is the most popular approach to solving the problem, but mixed logit estimates indicated that the construction of the boardwalk may have a negative impact on some visitors. In conclusion, constructing a boardwalk will provide the maximum social welfare for visitors; however, it may be efficient to determine its effectiveness from a viewpoint of visitor consensus after employing less controversial measures like constructing wooden stairs and installing ropes.

Information rents in conservation contracting for biodiversity: An empirical examination of Finnish pilot programme

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Summary

Public policies encouraging sustained management and conservation on private lands have relied primarily on command and control instruments and uniform payments (Connor et al. 2008). Recent work on voluntary incentive mechanisms, such as conservation contracting by various types of auctions, has challenged the traditional environmental policies. Competitive bidding is the society's means to create a market-mimicking solution to the management of environmental amenities and negative externalities. It creates competition between landowners wishing to participate in the conservation program, which leads to partial revelation of conservation costs helping to allocate the conservation contracts in a more cost-efficient manner than command and control instruments.

Competitive environmental bidding systems outperform the traditional policies, provided that information rents rising from asymmetric information are not excessively high (see Latacz-Lohmann and Van der Hamsvoort 1997). The problem of asymmetric information is always present in the competitive bidding for environmental goods. Landowners know their conservation costs but the environmental authorities do not. Thus, the landowners have an incentive to require payments in excess their conservation costs. The wedge between the actual conservation costs and the bid is called the information rent.

The performance of competitive bidding systems depends crucially on how great information rents are in practise. Given that the number of actually applied conservation contract systems based on competitive bidding is still quite limited, real data available for empirical examination is scarce. Moreover, estimating the size of information rents is a difficult problem by definition, because of unobservable conservation costs. Most studies use simulations or laboratory experiments that may not capture landowners' strategic behaviour due their hypothetical nature. A few of these studies assess the size of information rents emerging in conservation contracting (Latacz-Lohmann and Van der Hamsvoort 1997, Schilizzi and Latacz-Lohmann 2007).

This paper contributes to the sparse literature on information rents by examining a real

competitive bidding system designed for biodiversity conservation in forestry. We use the actual data from the Finnish pilot program called Trading in Natural Values (TNV). Our data comprises 72 stands conserved in the program during 2003 and 2004. This data contains a full description of ecological properties of the stands, assessment of stand values and the actual rental payments paid to the forest landowners. Moreover, we utilize a mail survey made to all landowners who submitted their stands to the program to shed further light in the bid sizes. In assessing the information rents we distinguish between the landowners maximizing harvest revenue only (the Faustmann behaviour) and the landowners valuing forest amenity benefits in addition to harvest revenue (the Hartman behaviour). Regarding the former we develop profit functions of timber harvesting to calculate the conservation costs. In contrast, we employ the revealed preference approach to defining the conservation costs for the Hartmannian landowners.

We find (Note! Results are preliminary.) that for the Faustmann landowners the information rents amount to 33% on average. They tend to decrease in the age and value of the stands. However, for some most valuable old-growth stands information rents are negative indicating strong conservation motives. Allowing for amenity benefits along the Hartman model, the longer rotation age decreases the conservation costs and increases information rents; they amount to 97%. Econometric analysis supports strong conservation motives but also suggests that there are other factors involved concerning the role of authorities.

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Valuation of recreational services of a national park: A choice experiment study in Oulanka National Park, Finland

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Summary

Oulanka National Park is located in Northern Finland covering 270 square kilometres. It borders with Paanajärvi National Park, established in 1992 in Russia. Oulanka National Park is a unique and versatile combination of northern, southern and eastern nature. The landscape is made up of pine forests, river valleys with sandy banks and rapids, and in the north of vast mires. The area is rich in animal and plant species, even endangered ones.

Oulanka National Park was established in 1956, after which it has been expanded twice: in 1982 and 1989. The area has been known for its beauty from the late 19th century, when it was a popular stop for artists and naturalists. Oulanka is one of the most popular national parks in Finland. The most well-known Finnish trekking route, Karhunkierros (Bear's Ring), is located in the national park. Large and increasing number of visits, about 170 000 in 2008, means that the park manager, Finnish Forest and Park Service (Metsähallitus), has to examine the ways of organising and developing the services of visitors as well as protecting the sensitive nature.

The aim of this study is to analyze visitors' opinions and values related to development of Oulanka National Park. In this presentation I only show some very preliminary results of the study. We use Choice Experiment Method basing on the idea that people make choices comparing levels of different attributes and choose the combination that gives the highest utility for them. In the survey of the study we used five attributes: Biodiversity (number of endangered species of plants and animals in the park; 3 levels), Expected number of visitors on average on the most visited places (3 levels), Entrance fee (for adult visitors only; 5 levels), Size and number of resting places on the most visited places (3 levels), and Information boards by the side of hiking routes (3 levels). The final choice of the set of the attributes and their levels were based on discussions with representatives of the park manager, several test surveys, and an extensive pilot survey amongst the visitors in the park in 2007.

The data for the study was collected with an on-site survey in Oulanka National Park starting in the beginning of June and ending in the end of September, 2009. Visitors filled in a questionnaire independently but they had a possibility to ask questions if they had any. We had two versions of the questionnaire, one for Finnish speaking people and an English version for the rest of the visitors. The final data consists of answers from 602 individual persons including 478 from Finnish respondents and 124 from foreign visitors. Since every respondent had 4 choice sets we got 1912 observations from the Finnish sub sample and 496 observations from the foreign sub sample.

Preliminary results of a multinomial logit model of choices of Finnish speaking responses are given in Table 1.

Table 1. Parameter estimate of a choice model for Finnish speaking responses related to development of Oulanka National Park

Attributes and levels	**Coefficient**	**Standard Error**	**p**
Constant	0.346	0.126	0.0062
Attribute 1: Biodiversity**:** number of endangered species of plants and animals in the park			
Decreases: populations decrease so that 15 species extinct in the park	-1.017	0.102	0.0000
Increases: a 10 % increase in populations of endangered species	0.082	0.115	0.4737
Attribute 2: Expected number of visitors**:** on average on the most visited places			
Decreases: a visitor encounters 10 people during a 1 km walk	0.202	0.092	0.0272
Increases a lot: a visitor encounters 70 people during a 1 km walk	-0.710	0.138	0.0000
Attribute 3: Entrance fee**:** for adult visitors only			
Entrance fee € 2, 5, 10, or 20/ person/ visit.	-0.061	0.007	0.0000
Attribute 4: Size and number of resting places on the most visited places			
Extension of present resting places: 2 new camp fire places on the most crowded ones	-0.012	0.099	0.9038
Construction of new resting places: a resting place after every 1 km.	-0.425	0.124	0.0006
Attribute 5: Information boards by the side of hiking routes			
Few more boards: a board after every 3 km	0.177	0.101	0.0794
Far more boards: a board after every 1 km	0.015	0.110	0.8920
Choice sets	1904		
Log likelihood	-1582.99		

The parameter estimates of the coefficients seem to be logical, but not significant in every case, with respect to theory and preliminary expectations. The first level of Attribute 1, for example, has a negative sign indicating that decrease of biodiversity reduces respondents' probability to choose that alternative. Attribute 3, Entrance fee, also has a negative sign meaning that bigger fees degrease visitors' welfare.

With respect to management of the park, the last two attributes are interesting. The coefficients of the both levels of Attribute 4, extension of present resting places and construction of new ones, have minus signs meaning that an alternative including these levels decrease visitors' probability to choose it. The estimate of former level, however, is not significant. People seem to have more positive attitude to the Attribute 5, information boards, but again p-value of the latter level is high indicating that the result is not reliable. Overall, these results suggest that the visitors wish to limit construction of facilities in the park and protect the nature as much as possible. The non-significant coefficients indicate that the preferences of the respondents may be heterogeneous. This is one of the topics that will be analysed with more advanced methods, e.g. latent class models, in the future.

Spatial overlap between tourist attractions and biodiversity

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Keywords: Biodiversity, conservation, nature-based tourism, protected areas, recreation, spatial ecology

As the role of the primary production in peripheral areas has decreased during last decades with a simultaneous growth of nature-based tourism, national parks have become important tourist attractions and tools for regional development. Nature-based tourism and recreation in protected areas is indeed the most obvious means of creating revenues of biodiversity conservation. Paradoxically, outdoor recreation and tourism development is considered one of the important threats to biodiversity of protected areas. Therefore, it is essential to understand interrelationships between biodiversity and tourism to manage protected areas in a sustainable manner.

In this paper we explore the interrelationship between biodiversity and nature-based tourism by investigating if the visitor numbers of Finnish national parks are related to biodiversity of protected areas as measured by different indicators of biodiversity. There are 35 national parks in Finland with a total surface area of all national parks 8730 km^2 varying from 4.3 to 2850 km^2. National parks are managed by a state enterprise Metsähallitus (Finnish Forest and Park Services). The primary purpose of national parks is to protect original bio-physical features of the natural environment. In addition to the protective function of national parks, they are important for scientific research and environmental education. Nowadays, however, the role of national parks as destination for recreation and tourism is emphasised. Indeed, statistics from Metsähallitus indicate that the average number of visits to national parks doubled in the 1990s with continued growth in the 2000s. In 2008, there were almost 1.8 million visits to Finnish national parks

We obtained data on all 35 Finnish national parks from Metsähallitus. Data on parks included information on the number of annual visits per park (in 2007), on the recreational facilities

and services of parks and on the characteristics of natural features including the location of the park in relation to large cities and tourist resorts. As an indicator of species diversity we used the number of red-listed species and their occurrences, for habitat diversity the number Natura2000 habitats, and for landscape level richness a Shannon-Wiener diversity index calculated on the main components of the landscape. We analysed the relationships between the attractiveness of parks and the characteristics of parks in two steps with multiple regression modelling. First, it turned out that in relation to biodiversity indexes, the number occurrences of red-listed species and the number of Natura200 habitats were associated with the number of visits parks received annually, i.e. its attractiveness. Second, when the parks´ location and the measures of recreational services (length of trails within park, km) were added to regression model, the final model included the distance from the closest city with > 100 000 inhabitants, the length of trails as well as the number of occurrences of red-listed species within parks.

Thus, as obviously level of biodiversity was related to attractiveness of national parks, we further studied how the recreational use of national parks is spatially distributed within a park in relation to occurrences of endangered plant, moss and lichen species and Natura2000 habitat types. To study whether the trails and recreational services of national parks (n=17) were situated on more species-rich habitats we compared the number of red-listed species and Natura2000 habitats within 200 m wide buffers of each route to randomly picked control areas. We found that on average the number of red-listed species and habitat types were higher within the buffers as compared to control areas. Consequently, there is remarkable spatial overlap between biodiversity and recreational use within Finnish national parks. We conclude that habitats and locations with high biological values should be taken into account more carefully in the planning of protected areas to which new GIS-based tools gives a cost-efficient solution. If new trails or tourism service infrastructure is planned, areas with simultaneously high species richness and vulnerable habitats should be ideally avoided or otherwise taken into account.

Changes (?) in northern nature: facts from a LTER site in Finnish Lapland

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Abstract

At first sight, measuring changes in nature seems to be an easy task: you just go out and see what nature looks like: what plant and animal species are present, how many there are and how well or poorly they are doing. However, the first problem you meet is the fact that one or few years is not enough time to draw reliable conclusions: you have to work systematically for decades. For instance, to say with some certainty that there are signs of global warming in northern nature, requires tens of years and thousands of hours of hard field work.

In spite of the urgent need for high-quality field data, until very recently most governments and scientific foundations were unwilling to fund long-term ecological research because such studies do not give immediate results. This is unfortunate since most ecologists now realize that the backbone of ecology is built on knowledge gained during long-term monitoring programs.

Therefore, at present, an inconvenient truth is that we have many hot theories of the effects of global warming on ecosystems, but too few cold facts. Science needs theories, but they cannot be tested without high quality data. Kilpisjärvi Biological Station of the University of Helsinki is famous for its exceptionally long data sets of many aspects of northern nature. These data can be used to test hot theories. In Kilpisjärvi our motto is: Theories may come and go, but facts go on forever.

First of all, how many years are enough, i.e. what is a long-term study? We often forget to consider the generation time of the organisms concerned. Do reproductive traits of organisms vary at random in time? Is there long-term stability or directional change (trend) in the traits? To answer these and other questions, data on trait values over many generations are needed. If the traits are unselected, they will vary independently of environmental factors.

Variation in the values of population parameters depends on the time scale used. Results obtained from short-term investigations are not necessarily comparable with those of long-term studies. However, “a long-term study” is a relative concept. The normal generation length may be a reasonable measure of the time scale needed for a long-term study of a particular species. For instance, ten years of study of a small 15-g passerine

with life expectancy of about 1.5 years (like the Pied Flycatcher, Ficedula hypoleuca) is equivalent in term of population dynamics to 24-245 years in gull species. If we use a shorter period for a gull, we are not studying population dynamics but individual dynamics.

The Pied Flycatcher population of the Kilpisjärvi area, northern Finnish Lapland (69°N), has been studied since 1966. Thus, this 44-year (1966-2009) study is apparently long enough to span the periodicity of the normal dynamics of the system. In addition to long-term dynamics and possible trends in the annual mean values of some essential reproductive traits of the Pied Flycatcher breeding near the northern and altitudinal distribution limit of the species, my presentation examines changes in northern nature and whether they are due to climate change (global warming) or not.

Finally, it is also important to realize that we have to consider the phase of the ”natural” climate cycle and the length of the data sets used. Assigning a straight line to a time series is a very dangerous thing to do. Data interpretation requires rational examination of the whole record rather than supporting a preconceived outcome through subjective choice.

Session: Human-Environment Relations

Hokkaido University Sustainability Weeks 2009
Joint Finnish-Japanese Seminar on Northern Environmental Research
Session: Human-Environment Relations (Chairs: Florian Stammler, Hiroshi Maruyama)

Traditional ecological knowledge and biological diversity in light of place: How Sami reindeer herders perceive biodiversity of places in Utsjoki, Finland

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Indigenous peoples' traditional knowledge and practices of sustainable use of natural resources for their survival are the keys to conserve biological diversity in their historical lands. In fact, the areas inhabited by indigenous peoples who sustain their own practices overlap those of highest biological diversity.

In 1987 the Bruntland Commision's report "Our Common Future" mentioned that traditional knowledge has a role to play in the conservation of global biodiversity and environmental sustainability. In 1992, Principle 22 of the Rio Declaration pointed out the vital role that indigenous peoples have in environmental management and sustainable development "because of their knowledge and traditional practices." Under these circumstances, Article 8 (j) of Convention on Biological Diversity (CBD), which explains how to implement in-situ conservation, was confirmed as an outcome of the recognition of the contribution that traditional knowledge can make to both the conservation and the sustainable use of biological diversity.

In the Arctic, indigenous peoples including the Sami people have been living since immemorial times. As far as the Sami is concerned, the traces of the Sami in the northernmost Europe date back to the Neolithic age. They hold an ecological knowledge that is rooted in their traditional way of life in order to survive the environment. Among the traditional economic activities of the Sami is Reindeer herding. To my knowledge, the Sami reindeer

herders of Kaldoaivi reindeer herding district in Utsjoki, Finland have maintained and applied their traditional ecological knowledge for their herding activities in the district.

My ongoing research for dissertation focuses on an understanding of the relationship between traditional ecological knowledge and biological diversity in the Sami reindeer herding area in Finland in light of places. In other words, this research aims at understanding how the Sami reindeer herders in Finland perceive biological diversity at various places of their activities based on their traditional ecological knowledge. Fieldwork associated with this dissertation has been already done at twice in Kaldoaivi reindeer herding district in Utsjoki. One reindeer herder and his family members have cooperated on my study. The aim of my fieldwork includes collecting basic information of conditions on biological diversity and grasping how and where the herder and his clan members keep their reindeers and what they know about ecosystem in places of their life activities.

The tentative findings and hypothesis based on them are; 1) there seem differences among the family members about perception on plant species diversity and value of reindeer. 2) one herder's memory of particular places can help other herders to understand ecosystem in those places, 3) two of major social factors which can effect herders' perception of biodiversity in their activity areas are regulations and policies for herding and herding area, and situations of the reindeer meat market.

Ainu and indigenous studies in Japan after the recognition of Ainu indigenous status in 2008: Prospects and research agenda

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On 6 June 2008, the Ainu were officially recognized as "an indigenous people with a distinct language, religion and culture"[1] by the Japanese government. The recognition of the Ainu marks a crucial point in Japan's and Ainu history. As a consequence a process of change occurs in political, socio-economical, and educational levels. How does it affect Ainu Studies in Japan? Focusing on the Centre for Ainu and Indigenous Studies of Hokkaido National University, the aim of this presentation is the analysis of the present situation of Ainu studies and the evolution of projects run at local, national and international levels.

Catherine Carlson (2009)

[1] Fogarty, Philippa (2008-06-06). "Recognition at last for Japan's Ainu". *BBC News* (BBC). http://news.bbc.co.uk/2/hi/asia-pacific/7437244.stm

Human-environment relations among the Dukha, Mongolia

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The purpose of this paper is to analyse the human-nature relationship of the southernmost reindeer herders in the world, the Dukha people of Mongolia. The reindeer, basis of Dukha culture, generates a tight relationship of the humans with nature. How is their culture and way of life connected to the environment? Through the analysis of land use and herding practices, this presentation will show Dukha's knowledge and perception of the nature and the way they interact with it. Moreover, it will present the change of practices that have occurred due to inbreeding among the herds and introduce to an international reindeer transfer project aiming to create sustainable living conditions for the Dukha.

O.M. Tyrisevä (2005)

A Role of Local Ainu Residents in Struggling for Culture through Two Dam Projects in Biratori Town, Hokkaido, Japan

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In March 1997 the Sapporo district court for the first time in the Japanese history concluded that the Ainu people fit its definition of an indigenous people on the basis of the two laws: Article 27 of the International Covenant on Civil and Political Rights (ICCPR) and Article 13 of the Constitution of Japan. With no appeal, the court's decision was immediately confirmed.

In fact, the 1997 court's decision of the Nibutani Dam Case has two aspects; one is worth praise for its approval of Ainu's indigenousness, while the other must be criticized for its acknowledgement of the public interest created by the completion of Nibutani Dam without fully examination.

The approval of Ainu's indigenousness became a reality by virtue of the strategy of the defense team and statements of three Ainu plaintiffs such as Tadashi Kaizawa, Shigeru Kayano and Koichi Kaizawa in court. The statements tell a marginalized history of Ainu people and the prohibited Ainu culture from the Ainu's viewpoint. In addition, the court's decision was followed by the enactment of three laws in 1997: the Act for Promotion of Ainu Culture and Dissemination of Knowledge Regarding Ainu Traditions (known as the New Ainu Law which replaced the Hokkaido Former Aboriginals Protection Law), the Environmental Impact Assessment Law and the Revised River Law.

On the other hand, the acknowledgement of the public interest contributed to the go-ahead on the Biratori Dam Project close to the Nibutani Dam on the same Saru River. In other words, this aspect of the court's decision allowed the authorities to believe that appropriate measures to minimize the negative impact of the dam on Ainu culture could give the green light to the Biratori Dam Project. The authorities have taken the initiative in the discussion by proposing an original plan and selecting members of an organ of consultation as desired under the Revised River Law. However limited the influence of local opponents was, they had an influence over the decision making process to shape the Project.

In April 2003 a research project on Ainu culture in the planned site of Biratori Dam and its vicinities was launched on the premise of the dam construction. In March 2006 the board of research hesitated to propose measures on how to protect Ainu culture in the probably affected area by the dam construction. The research center under the board of research obtained valuable findings with regard to environmental damages caused by the Nibutani Dam and the connection between the Ainu and their land through interviewing Ainu elders.

The interviewees were willing to cooperate on the research because the interviewers were the younger generation of Ainu led by Koichi Kaizawa. It is likely that the inconsistency between above-mentioned findings and the Biratori Dam Project will be publicly noticed, and the youth of Ainu who have worked for the research center will shoulder a burden of struggling for their own culture in future.

In case of the Alta Affair, the Sami opposed the dam plan through demonstration and hunger strike, while no Ainu but the plaintiffs of the Nibutani Dam Litigation objected to the dam project on the Saru River. Nevertheless, the Alta Dam proceeded under the judgment of the Supreme Court of Norway in February 1982. Although the dam affairs in Norway and Hokkaido reached the same goal, Norway and Japan took different steps toward indigenous peoples' self-determination.

Norway made striking progress in terms of Sami's self-determination after the Alta Affair by ratifying the ILO Convention 169 in Jun 1990 compared with Japan which belatedly approved the Ainu's indigenousness in Jun 2008. In Norway the Sami and the government were conscious of the international upsurge of indigenous people before the Alta Affair, while the Japanese government hadn't kept such an international movement of indigenous people and the Ainu missed enlisting the international organizations of indigenous peoples to favor them.

Ainu people's movement in Hokkaido toward self-determination seems to be slow compared with the Sami who faced the Alta Affair in Norway. However, as far as some young people of Ainu inherit the struggle for their own culture, the Ainu themselves are moving forward to self-determination.

Iwor and *Siida* as the Basis of Nature-Based Culture

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In September 2007, the United Nations eventually adopted ’United Nations Declaration on the Rights of Indigenous Peoples’ after having been discussed for more than ten years. The Japanese government also approved the Declaration, though it has not admitted the status of the Ainu as indigenous people until recently.

Among others, the Article 26 of the Declaration is of great significance in terms of this paper’s main theme. It provides that:

1. Indigenous peoples have the right to the lands, territories and resources, which they have traditionally owned, occupied or otherwise used or acquired.
2. Indigenous peoples have the right to own, use, develop and control the lands, territories and resources that they possess by reason of traditional ownership or other traditional occupation or use, as well as those which they have otherwise acquired.
3. States shall give legal recognition and protection to these lands, territories and resources. Such recognition shall be conducted with due respect to the customs, traditions and land tenure systems of the indigenous peoples concerned.

As clearly shown here, it exactly acknowledges the right of indigenous peoples to the lands which they occupied or have occupied as the basis of their subsistence and demands their governments’ recognition of the right.

It should also be noted that the article implies that indigenous peoples’ traditional cultures are closely united with the lands or the nature surrounding them. In this respect, the Ainu right of enjoying their traditional culture, which was admitted in the judgment of the so-called ‘Nibutani Dam Case’ concluded in 1997, is not yet fully realized.

In addition, the ‘Program for the Restoration of *Iwor* (Traditional Living Sphere of the Ainu)’, which has already started, is of no substantial significance at all in the sense that it is not a program which admit the Ainu right to their traditional *iwor*, which means that the real restoration of *iwor* cannot be accomplished with the program.

In this presentation, therefore, the true and original sense of *iwor* will be discussed in relation to the Ainu history and their nature-based culture, along with the comparison with the Sami nature-based culture, on which basis was *siida* positioned. The notion of traditional ecological

knowledge, which should develop that of nature-based culture, will also be discussed.

Concluding remarks are as follows:

1) Both the Ainu and the Sami can/could co-live with nature by putting themselves in food chain in the whole ecosystem of iwor or siida where they kept on their subsistence.
2) Unfortunately, however, they are different from each other in that the Sami still maintain their traditional nature-based culture, coping with climate change, whereas the Ainu, as seen above, were deprived of their nature-based culture more than a hundred years ago. Therefore,
3) It is most vital to get back the deprived lands on the ground of ’United Nations Declaration on the Rights of Indigenous Peoples’ adopted in 2007.

On the Environmental and Cultural Conservation Research in Biratori in Terms of Handing Down Ainu Culture to Younger Generations

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In 1997, the Sapporo District Court ruled in the Nibutani Dam Case, in which I was one of the plaintiffs with the late Dr. Shigeru Kayano, that the Ainu should be regarded as an indigenous people in Hokkaido and so their right of enjoying their traditional culture should be respected. Following this sentence, in this presentation I will examine the environmental and cultural conservation research in Biratori, and illustrate the importance of preserving the researched area in terms of handing down Ainu culture to younger generations.

In the sentence above, it is said that 'the main characteristic of Ainu culture is that it originated in their lifestyle of coexisting with nature, hunting, gathering and fishing while worshipping the grace of nature as gods. Therefore, Ainu culture in a region in question and nature including places which nurtured the culture are inseparable from each other.' Despite that, since Nibutani Dam was completed in the year before the sentence, the existence and operation of the dam was admitted in the case. As a result, half of the residential and harvesting area of Nibutani was sunk under the water. It means that the place for handing down Ainu culture was lost. For the Ainu who were once a hunting people, place including flora and fauna is indispensable for handing down Ainu culture.

With regard to the Ainu right of enjoying their traditional culture, it is also said in the sentence that 'For minority peoples, their ethnically proper culture is essential to maintain their ethnicity without being assimilated to majority peoples. So for an individual belonging to a certain people, the right of enjoying their proper culture is so important as to be equal to the right of existence as a personality. To guarantee this right, therefore, is to respect an individual substantially, and it is also fit for the ideal of democracy that the majority should understand and respect the position of the socially weak people.' In spite of this epoch-making sentence, the Japanese government went on a project to build Biratori Dam in the upper stream of Nibutani Dam. In this process, I determined to join the environmental and cultural research of the project area of dam construction as an Ainu and the leader of research team, and confirm myself the importance of the area in terms of handing down Ainu culture along with the interviews with Ainu elderly people who have much memory as to the area and Ainu culture linked to it.

The research started in May, 2003, and lasted for three years. Then its results were brought together as a report paper in March, 2006. As I illustrate in the presentation, the projected dam construction area is a place which was deeply linked with Ainu culture including

chinomisir (a sacred area for prayer), and it is expected that constructing a dam in the area can damage the place for handing down Ainu culture, thus violating the right of enjoying Ainu traditional culture.

While the Nibutani Dam Case was on trial, I founded an NPO:National Trust Chikornay, following the last will of Tadashi Kaizawa, my father, who passed away in 1992. The NPO is aimed at handing down Ainu culture by restoring and preserving old broad-leaved forests which the Ainu once utilized for their subsistence and shared with the wild life. In the presentation, I will refer to this activity in connection with the research above.