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Form 2 (FR1→FR2)

Year 1 Report

Project Title	Long-term Sustainability through Place-Based, Small-Scale Economies: Approaches from Historical Ecology
Abbreviated Title	Small-Scale Economies
Project Category	Individual Collaboration Project
Project Leader	HABU, Junko
Homepage	http://rihnhpsv.chikyu.ac.jp/rihn_e/project/R-09.html http://rihnhpsv.chikyu.ac.jp/fooddiversity/en/index.html
Keywords	Small-Scale Economy; Diversity; Networks; Local Autonomy: Long-term Sustainability; North Pacific Rim
Proposed project period	X☐ 3 years Full Research ☐ 4 years Full Research ☐ 5 years Full Research

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EXECUTIVE SUMMARY

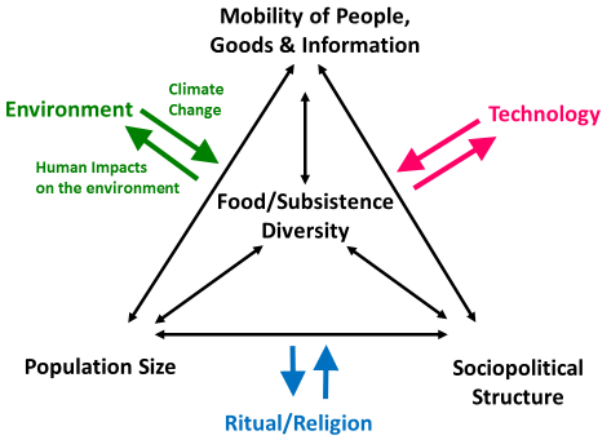
(1) OBJECTIVES

This project examines the importance of place-based, small-scale and diversified economies, particularly the importance of small-scale food production, circulation and consumption, for the long-term sustainability of human societies. Long-term sustainability can be defined as "the capacity of humans to create, test out, and maintain abilities to adapt to environments" (Walker and Salt 2006) over a span of from several hundred to several thousand years. The following working hypothesis begins our research:

> Highly specialized subsistence (food production) strategies can support a larger community for a short period, but a decrease in subsistence and food diversity makes the production system and its associated community more vulnerable in the long-run.

Archaeological, historical and paleoenvironmental studies are used to test this hypothesis or examine the long-term impacts of the loss of subsistence/food diversity in relation to other environmental and cultural factors. To link these studies with the current discussion of the scale and methods of alternative food systems, ethnographic and ecological studies of contemporary small-scale food systems and communities are conducted. In combination, studies of the past and present point to the future, as the research process also involves collaborative design of ecologically sound and equitable food systems.

Figure 1. Mechanisms for Culture Change



The theoretical genesis of this project is the approach of historical ecology (Balée 1998, 2006, 2010, Balée and Erickson 2006, Crunley 1994, Erlandson and Rick 2008, Kirch and Hunt 1997, Thomson and Wagner 2013), which conducts comprehensive research into long-term and short-term cultural change while emphasizing the impact of human activities on the environment. In particular, this project proposes that **diversity, network** and **scale** are three key concepts to understand long-term sustainability of socioeconomic systems. By integrating case studies on food diversity, the mobility of people and flows of goods and information in relation to the scale and resilience of societies and economies, this study aims to advance theories on the interrelationship between culture and environment. Other cultural factors, including technological developments, sociopolitical structure and rituals/religion, are also taken into consideration (see Figure 1). We plan to publish the results of our research as peer-reviewed articles as well as volumes for the general public in both English and Japanese.

(2) BACKGROUND

This research aims to construct strategies for tackling global environmental problems associated with the rise of large-scale economic systems. These problems include soil and water contamination, loss of biodiversity and long-lasting damage to ecosystems caused by large and homogenized food production. In the case of agriculture, the development of large-scale monoculture with applications of a large amount of pesticides and chemical fertilizers has resulted in serious soil contamination, water pollution, loss of

biodiversity, and even the destruction of whole ecosystems. The predominant measures to deal with these global environmental problems are top-down regulations enacted by national/local governments and international agencies. However, these regulations may not be sufficient when we consider long-term environmental effects on a time-span of hundreds or thousands of years. As an alternative approach, this project examines the past and present practice of place-based, smaller-scale food production systems, evaluates their advantages and limitations, and explores their future potentials (see also Capra 1997, 2002).

(3) GEOGRAPHIC FOCUS

Our regional focus is the North Pacific Rim. In particular, we have identified northern Japan, with its solid archaeological record and its importance to contemporary food production in Japan, as the core area of our field research. The west coast of North America, with rich traditions of ethnographic and ecological investigation as well as active contemporary food/agriculture movements, will provide main comparative case studies. These two regions share a number of characteristics in common, including climate, vegetation, fauna, and a high level of seismic activity. There are also cultural ties with historical depth as a result of the migration of anatomically modern humans after the late Pleistocene. Historically, the abundance of small-scale economies supported by marine food exploitation and intensive nut-collecting also characterize these two regions.

(4) RESEARCH METHODS AND ORGANIZATION

The project consists of three research groups, each with several sub-projects:

1) *Longue-Durée* Group: Archaeological, historical, and paleoenvironmental studies are used to test our working hypothesis listed above. Because of the long time span, these studies are capable of addressing the relationships between the factors shown in Figure 1. These relationships include long-term consequences of the loss of diversity and associated expansion of the scale of production, the importance of networks, and changes in community and population size.

2) Contemporary Society Group: Ethnographic and sociological studies of small-scale food production systems and their associated communities are conducted to understand the complex inter-relationships among cultural and natural contributors in contemporary urban and rural settings. Due to the lack of long time span, this group cannot directly test our working hypothesis. Nevertheless, when compared to archaeological case studies, the increased depth of our observation provides an opportunity to evaluate the importance of small-scale food production with wide food diversity in relation to other factors listed in Figure 1. Chemical and biological analysis of soil, water and food will provide direct evidence to evaluate the degree of human impacts on the environment.

3) Implementation, Outreach and Policy Proposal Group: Our emphasis on food diversity, network, and locally autonomous, small-scale production are used to develop academic and public outreach programs for instigating and promoting place-based, small-scale and diversified food production. In collaboration with educational programs, NPOs, NGOs and local community organizations, these programs develop alternative strategies to overcome problems and vulnerabilities of currently dominant large-scale, homogenous productions. Our ultimate goal is to make actionable contributions to local/national policies of rural/urban developments and food policy.

1. ACHIEVEMENTS IN THE FIRST YEAR OF FULL RESEARCH

(1) *LONGUE-DURÉE* GROUP

Seven research teams in this group test our working hypothesis or examine the long-term impacts of the loss of subsistence/food diversity in relation to other environmental and cultural factors. In total, results of our first year research are consistent with our initial hypothesis and are likely to produce substantial results in the coming years of research.

A. Japan

1) Northern Japan Team: This team represents the flagship sub-project of our research. The main focus of this team is to understand the mechanisms of the growth and decline of the Middle Jomon culture in prehistoric Japan in relation to changes in subsistence and food diversity. Previous studies indicated the possibility of a significant decrease in subsistence diversity and a rapid population increase between 5500 and 5000 years ago, followed by a drastic population decrease at around 4500 years ago (e.g., Crema 2013, Habu 2004, 2008, Habu and Hall 2013, Imamura 1995, Koyama 1978, 1984). Research this year focused on collecting data to address the following five key themes: 1) Examining the evidence for changes in in subsistence/food diversity through the analysis of lithic assemblage data, macro floral and faunal remains data, analysis of plant and insect impressions on pottery, and stable isotope analysis of human skeletal remains; 2) Examining the types of major food items and their changes over time through residue analysis and starch grains analysis; 3) Establishing chronological framework on the basis of AMS radiocarbon dating; 4) Extrapolating changes in local and regional population size by compiling site data base and simulation studies; and 5) Identifying the patterns and timings of climate change through pollen analysis and alkenon sea surface temperature analysis. For Themes 1), 2) and 3), multiple journal articles and an excavation report will be submitted for publication by the end of this academic year. Data collection is in progress for Themes 4) and 5).

B. Comparative Studies

In order to expedite comparative research, we are collaborating with existing projects that have completed their excavation and fieldwork.

2) California Team: Preliminary analysis indicates that, unlike the Middle Jomon case, prehistoric and early historic hunter-gatherer cultures in California did not show evidence of a drastic population decline until the European contact. Team analysis suggests that California hunter-gatherers relied on a wide variety of food resources and successful landscape management. To examine the validity of this interpretation, faunal and floral remains analysis and settlement data analysis at the archaeological site in Año Nuevo State Park are in progress.

3) Northwest Coast Team: This is another area where maintaining wide food diversity seems to have functioned positively for long-term sustainability of past hunter-gatherer cultures. Two sub-teams are formed: **3a)** lithic assemblage data and faunal/floral data from the **Lower Columbia River** are being analyzed and demographic simulations are in progress on the basis of settlement data. **3b)** Paleoenvironmental reconstruction is underway in the **Gulf Islands** area.

4) Kurils/Eastern Hokkaido Team: Our case study on the Kuril Islands and eastern Hokkaido seems to indicate that, in addition to food diversity and climate change, social network may have been a key factor for understanding the resilience of socioeconomic systems. This academic year, human skeletal samples for stable isotope analysis to examine food diversity were obtained.

5) Canadian Arctic Team: Preliminary studies indicate that too much specialization on bowhead whale

hunting among the prehistoric Thule people made their socioeconomic system vulnerable. To establish fine-grained time-scale, AMS dating of faunal remains is being conducted.

6) Baikal (Eastern Siberia) Team: Human skeletal remains from middle Holocene sites is being studied to better understand hunter-gatherer subsistence during this period of time.

7) Isotope Ecology Team: This team has collaborated with the regional groups discussed above to identify temporal/spatial variability in food diversity and to establish absolute chronology. Results include carbon, nitrogen and strontium isotope data of Jomon skeletal remains.

(2) CONTEMPORARY SOCIETY GROUP

As corollaries of our main hypothesis, this team addresses the questions of 1) the positive role of small-scale and diversified production systems in relation to the environment, and 2) whether social networks associated with small-scale and diversified production increase the resilience of local communities, especially in time of disaster. The latter includes the examination of responses to the Great Tohoku Earthquake in Japan.

A. Japan

1) Northern Japan Team: This team include**s** a group of scholars who have conducted fieldwork in Akkeshi (Hokkaido), Hirosaki (Aomori Pref.), Joboji, Otsuchi, Tsugaruishi and the Hei River Valley (Iwate Pref.), Ishinomaki (Miyagi Pref.), Minami-Soma, Iwaki, Nihonmatsu, and Aizu-Wakamatsu (Fukushima Pref.). Communities examined here can be broadly classified as those dependent on small-scale fishing, farming and the production of non-food commodities such as *urushi* lacquer sap. Interviews and participant observations have revealed that social networks and non-cash exchanges are important to residents' everyday life, and were critical in mitigating damage at the time of the March 11 Earthquake. Project research continues on the role of social networks in coping with the effects of the Fukushima nuclear accident.

B. Comparative Studies

2) California Team: Research to assess the significance of small-scale urban and peri-urban farming to local food security is in progress by a group of scholars at University of California, Berkeley. Ethnographic and experimental research on traditional environmental knowledge in relation to environmental change and the scale of subsistence activities has begun with several indigenous groups, including the Amah Mutsun and the Wukchumni Yokuts people.

3) Northwest Coast and Alaska Team: With a herring egg harvest as a starting point, interviews were conducted to understand how diverse food resources are harvested and distributed among a coastal Sitka Tlingit community and beyond, under various socio-cultural customary rules.

(3) IMPLEMENTATION, OUTREACH AND POLICY PROPOSAL GROUP

This group identifies, proposes and implements social and environmental activities consistent with, and complementary to, research conducted by the groups described above. In cooperation with NPOs, NGOs, local public organizations, indigenous tribes and other stakeholders, it has implemented the following programs: 1) Eco-literacy educational program with a focus on cherry salmon at the Hei River area, Iwate Pref., Japan, 2) Urban agriculture program in California in collaboration with educational programs at UC Berkeley, 3) Phytoremediation program in California using fern plants to remediate soil contamination by arsenic, 4) Environmental education program about traditional environmental knowledge of the Tlingit people, Northwest Coast, and 5) Traditional environmental and resource management (TERM) program in collaboration with the Amah Mutsun Tribe, California.

2. AMENDMENTS TO RESEARCH OBJECTIVES AND METHODS AS NECESSARY.

We made adjustments to address all the general comments and questions addressed by PEC (see our Response to Reviewers' Comments). Also, following the comment from the 2013 project presentation meeting, we clarified the concept of small-scale economy as the following:

> Our definition of "small-scale economy" addresses the range of networks that enable food production, distribution, and consumption in a given locality, without precluding links to the outside economy. This concept is based on existing research in numerous fields, including economic anthropology, examining links between local and external (colonial, or even global) economic systems. Such studies indicate that, while external economic systems may override local ones, this pattern is not inevitable or uniform, as, in many cases, external economic logics may be integrated into local forms of production, distribution, exchange, and consumption in complementary ways.

3. RESEARCH PLAN

(1) *LONGUE-DURÉE* GROUP

Many sub-projects in this group will move on to the write-up stage, and a series of journal articles are expected to be submitted during 2015/16. Some teams will continue to analyze archaeological remains and collect environmental data, the results of which will be published in 2016/17.

A. Japan

1) Northern Japan Team

During 2015/16, we expect to complete all the data collection and analyses that are necessary to test our hypothesis and examine the correlations between food diversity, population size, climate change and other cultural and natural factors during the Early to Middle Jomon periods. Expected publications in 2015/16 and 2016/17 include the excavation report of the Goshizawa Matsumori site and a series of journal articles on changes in food diversity on the basis of lithic assemblage data from multiple sites, floral remains from Goshizawa Matsumori and Sannai Maruyama No. 9, faunal remains from Sannai Maruyama, and plant and insect impressions on Middle and Late Jomon pottery. Our Jomon site database for the study area will be completed, on the basis of which a revised version of Koyama's (1978, 1984) Jomon population estimates will be calculated. AMS dates from the Goshizawa Matsumori, Sannai Maruyama, and a series of sites in Hakodate will be used to refine the absolute chronology for the study area. Results of our pollen analysis from Lake Ogawara and alkenon sea surface temperature analysis of a marine core near Hakodate, together with AMS dates from these cores, will provide us with the climate change data on a fine-grained time-scale, against which the timing of the changes in food diversity and population size will be compared. Results so far seem to indicate evidence of the reduction of food diversity in the first half of the Middle Jomon period, followed by the decline in population size by the end of the Middle Jomon period. The timing of the cooling event seems to have occurred after the reduction of food diversity in the study area.

B. Comparative Studies

Of the comparative case studies listed on pages 4-5, research in **3a) the Lower Columbia River area of the Northwest Coast, 5) Canadian Arctic** and **6) the Baikal region** will complete data analysis by the end of 2015/16. Research on **2) California, 3b) the Gulf Islands area of the Northwest Coast,** and **4) Kurils/Eastern Hokkaido** will continue through to the end of 2015/16. By the end of the 2015/16 academic year, all the analyses of these regional teams will be completed. Preliminary results from California and the Northwest Coast point to successful management of the environment by complex hunter-gatherer populations with a wide diversity of food, whereas our example from the Canadian Arctic indicates a rapid

population decline after the loss of food diversity. Data from the Kurils/Eastern Hokkaido and the Baikal region needs to be further examined after we obtain results of stable isotope analyses.

7) Isotope Ecology Team: Carbon and nitrogen isotope analyses of Early to Late Jomon human skeletal remains from the Kanto and Tohoku regions will be completed. Strontium and other trace element analyses of samples from Japan, the Kurils/eastern Hokkaido, and the Baikal region will also be completed.

(2) CONTEMPORARY SOCIETY GROUP

As discussed above, this group examines the positive role of small-scale and diversified production systems in relation to the environment, and with an emphasis on the importance of social networks. Field research and data analysis will continue in this research group, and some of the sub-projects will start publishing results in the form of journal articles.

A. Japan

1) Northern Japan Team

Field research plans for 2015/16 include investigations into small-scale fishing communities, farming communities including organic and no-till farmers, and communities associated with other forms of small-scale economies including forestry and traditional craft production. Interviews and participant observations, as well as biological and chemical analyses of products, soil and water, will be conducted. Preliminary results seem to indicate diverse variations, depending on the region and local culture, in the junction between the global market economy and individual/local economic systems. The homogenization of economies due to globalization is not self-evident, along with the use of currency for transactions, local forms of distribution and gift exchange work in a multi-layered and complementary manner. Furthermore, the development of communication networks such as the Internet allows for an increased possibility for local systems to connect to the global information network without losing their identities. Through these analyses, we expect to find common characteristics among successful small-scale communities in the study area, as well as to outline major problems that these communities are facing in the age of globalization.

B. Comparative Studies

2) California Team: This team consists of two sub-teams: 2a) scholars working on small-scale farming that are tied to alternative food movements in California, and 2b) those working on Native American communities. In the San Francisco Bay Area, through a series of experiments, we are assessing the potential for food production and the limiting factors (disease, insect and soil chemistry) of urban farming. In collaboration with scholars at the University of California, Berkeley, interviews and surveys on urban and peri-urban farming in central California will also be conducted. Along the Central California Coast, we will continue to collaborate with several Native American communities, including the Amah Mutsun community and the Wukchumni Yokuts tribe, to understand landscape management, biodiversity an the importance of traditional environmental knowledge.

3) Northwest Coast and Alaska Team: In southeast Alaska, our study explores the herring network of the Tlingit people. We are in the process of identifying one or more locations for additional case studies.

(3) IMPLEMENTATION, OUTREACH AND POLICY PROPOSAL GROUP

Five current programs listed on page 5 will continue their activities in 2015/16. In addition, some of the research teams in Groups 1 and 2 plan to develop their own implementation and outreach programs. They range from collaborations with NPOs that cultivate oil crops in the areas affected by the Fukushima Nuclear accident, to educational programs that activate local environmental knowledge among Native American and Native Alaskan communities.

4. RESPONSE TO REVIEWER COMMENTS

(1) The concerns the PEC voiced last year have only been partially addressed: In this FR1 report, we addressed all the concerns or adjusted the report following the general advice and comments section from the PEC reports 2013 and 2014.

(2) The contemporary relevance of the historical work needs to be established more firmly. It is necessary to show at this initial stage how transfer of insights from history to present will be happening. Therefore, the project needs to develop a conceptual framework that bridges the gap historical and contemporary cases as well as across the contemporary cases. This framework is needed now, to guide data collection and analysis: We addressed this by focusing on three themes, food diversity, network and scale of economy and its associated community, and their inter-relationships the case studies of both the past and present. In the *Longue-durée* group, the working hypothesis is being tested by the seven sub-project teams listed above. As indicated in the fourth section (RESEARCH METHODS AND ORGANIZATION) of the Executive Summary, we have expanded the existing framework for past case studies to examine if the results of case studies in the Contemporary Society Group are consistent with our main hypothesis. Only by the collaboration between the two research groups, it is possible to evaluate both short-term stability and long-term sustainability.

(3) Operationally, the integration of the three groups in terms of substantive exchange needs to be addressed: Research activities on all of the sub-projects are conducted under the concepts of (1) diversity, (2) scale, and (3) network, and the mutual relationships among them as well as their commonalities. Through discussions at symposia and conferences held to date, environmental problems and background societal problems associated with specialized and intensified use of resources have been extracted as the vulnerability common in large-scale economic systems through archaeological and contemporary examples. In addition, common awareness was reached regarding the resilience of small-scale economic systems in terms of the importance of (1) diversity of resources used, (2) local autonomy based on local production and local consumption, and (3) social networks making possible the flexible distribution and consumption of resources.

(4) The second assumption in our previous report (overspecialization often causes serious negative impacts on the environment, which are likely to make the system unsustainable in the long-run) needs to be clarified: We stopped treating this as an assumption, and currently multiple case studies are addressing this question.

(5) It is doubtful that the concept of subsistence applies to the present, with market integration in large-scale societies: The fact that the world is connected in an open economic system is a different matter from the smallness of the scale of food production and consumption in individual communities. It is possible to prove that even in contemporary society there are services and resource uses implemented on a local level that cannot be directly converted to the real economy, and we consider it to be definitely possible to understand these through the concept of "subsistence".

5. SPECIFIC ACHIEVEMENTS TO DATE

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d) Newspapers/Magazine Articles

Yoneda, Minoru. 2014. Dietary ecology and adaptive ability of the Jomon people inferred from new methods. *Shukan Asahi*, p. 18. (in Japanese)

Yoneda, Minoru. In press. Diet of the Jomon people from carbon and nitrogen isotopes: Temporal change from the Middle to Late Jomon at the Keiyo region. A separate volume of *Archaeology Quarterly*. Yuzankaku, Tokyo. (In Japanese)

Yoneda, Minoru. 2014. The power of human culture and diversity inferred from diet of the Jomon period. Kondo, O. (Ed.), *Bessatsu Takarajima*: *The origin of Japanese*. Takarajimasya, Tokyo, pp. 130-133. (In Japanese)

e) Videos/Photographic Works

N/A

f) Field Research

- Preliminary field research of plant use of the Wukchumni Yokuts people in Northern California, USA (Habu, Hosoya, and Oishi)
- Preliminary field research in Minami-Soma-shi, Nihonmastu-shi, Aizu-wakamatsu-shi, and Kitakata-shi, Fukushima Prefecture, about urban agriculture and land development (N. Goto, Y. Goto, and Habu)
- Urban agriculture project in California (Altieri and Capra)
- Laboratory research of faunal and floral remains analysis excavated from the Goshizawa Matsumori and Sannai Maruyama sites (conducted primarily at the East Asian Archaeology Laboratory of UC Berkeley, USA) (Habu, Ito, Crawford, Schechner, Komiya, and Owens)
- Preliminary field research on lacquer gathering at Joboji, Ninohe-shi, Iwate (W. Balee, S. Weber, Y. Ito, S. Hamada, T. Oishi)
- Preliminary field research on small-scale fishery of herrings at Sitka, Alaska (S. Hamada)
- Preliminary field research on post disaster reconstructions of fishery communities at Ibaraki, and Miyagi (S. Takahashi)
- Preliminary field research on the impact of 311 earthquake on the kelp and abalone collecting at Yamada, Iwate (K. Ikeya)
- Preliminary field research on plant remains from Jomon sites at Shinano-Chikuma river basin, Nagano (S. Kaner and L. Janik)
- Field action research on aquatic environmental education at Miyako, Iwate (T. Sasaki)
- Field research at the Shitsukari Abe Site & Survey by the Replication Method of Seed and Insect Impressions on Pottery from the Nakanodaira site and the Tsukinoki (1) site, Aomori (K. Adachi)
- Preliminary field research on radiation, food safety, and small scale farmers at Fukushima (T. Yamaguchi)
- Field research on traditional resourse use related to indigenous environmental management at the central California coast (K. Lightfoot and R. Cuthrell)

g) Symposia/Conferences/Workshops

Kaner, Simon. 2014. Organised workshop on 'Radiocarbon dating in Japanese archaeology'. Sainsbury Institute for the Study of Japanese Arts and Cultures, Norwich, April 8-9, 2014.

Naito, Daisuke, Sayre, Ryan, Swanson, Heather, Takahashi, Satsuki (Organizers) 2014. Book talk symposium of "*To see once more than stars: Living in a post-Fukushima world*", Tokyo International House, Tokyo, August 8, 2014.

CJS-JSPS Symposium. 2014. Long-term Sustainability through Place-based, Small-scale economies. UC Berkeley, USA, September 26-28, 2014.

RIHN. 2014. RIHN 9th International Symposium: Living in the Megacity: The Emergence of Sustainable Urban Environments. RIHN, June 25 - 27, 2014.

RIHN. 2015. RIHN 6th Tokyo Seminar: "Environmental Problems in the Past – Look the future from the past," Yurakucho Asahi Hall, Tokyo, January 16, 2015.

h) Individual Presentations

Adachi, Kaori. 2014. Society and subsistence during the Middle to Late Jomon period at the northern Tohoku area. Oral presentation presented at The annual meeting of the Japan Association for Quaternary Research. Chiba, Sept 6, 2014. (In Japanese)

Altieri, Miguel A. 2014. Oral presentation presented to Colloquium on the significance of urban agriculture to provide ecosystem services in urban environments, Stanford University, October 22, 2014.

Ames, Kenneth M. 2014. What's up on the Northwest Coast: Revising\Rethinking Complex Hunter Gatherers. Oral presentation presented at Parson's Lecture, University of Michigan, October 16, 2014.

Fitzhugh, Ben., and William W. Fitzhugh. 2014. Subsistence Ecology and the Development of North Pacific Maritime Cultures: Legacies of the Past, Prospects of the Future. Oral presentation presented at the "*International Symposium: Comparative Studies of Indigenous Cultures along the North Pacific Rim: Focusing on Indigenous Rights and Marine Resource Utilization."* National Museum of Ethnology, Osaka, January 13, 2014.

Fukunaga, Mayumi. 2014. Who manages the watershed?: Legitimacy building and competing uses of watershed space. Oral presentation presented at the International Union of anthropological and ethnological sciences, Makuhari Messe, May 18, 2014.

Grier, Colin. 2014. Actor Networks and Coastal Landforms in Precontact Coast Salish History: Formulating a New Approach to Some Key Issues in Northwest Coast Archaeology. Oral presentation presented at 79th Annual Meeting of the Society for American Archaeology, Austin, TX., April 23-27, 2014.

Hamada, Shingo. 2014. Science in Totemism: An Experimental and Multispecies Ethnography of Fisheries Science and Technology in Japan. Oral presentation presented at The Annual Meeting of American Anthropological Association. Washington, DC. December 6, 2014.

Kaner, Simon. 2014. 'Metastable ecosystems along the Shinano-Chikuma River, central Japan: challenges and potential'. Oral presentation presented at Workshop in Historical Ecology in northeast Asia, University of Oregon, September 2014.

Kusaka, So'ichiro., and Takanori Nakano. 2014. Carbon isotope analysis on tooth enamel to reveal relationships between diet and tooth ablation types of the Jomon in Japan. Oral presentation presented at the 83rd Annual Meeting of the American Association of Physical Anthropologists. Calgary, Alberta CANADA. April 8-12, 2014.

Hosoya, Leo Aoi. 2014. East Asian Grinding- Incidental or Fundamental?: Ethnoarchaeological Analyses of Japanese and Chinese Food Processing. Oral presentation presented at the 20th Congress of the Indo-Pacific Prehistory Association, Apsara-Angkor Resort and Conference Hotel, Cambodia, January 12-18, 2014.

Oishi, Takanori. 2014. "Small-scale economy as a counter-strategy in the time of Godzillas," Book talk Symposium "*To see once more than stars: Living in a post-Fukushima world*" Session3: Environment, Iwasaki memorial hall, International house of Japan, Minato-ku, Tokyo, August 8, 2014.

Takahashi, Satsuki. 2014. *Fukushima Future: Nukes, Renewables, and Temporal Momentums in Coastal*

Japan. Oral presentation presented to the Department of Anthropology Lecture Series, Tsukuba University, July 3, 2014.

Weber Andej.W. 2013. Eating fish makes you older: Carbon reservoir effects in middle Holocene Cis-Baikal, Siberia. Paper presented at the *Annual Meetings of the European Association of Archaeologists*, Pilsen, Czech Republic, September 4–8, 2013.

Yoneda, Minoru., and So'ichiro Kusaka. 2014. Maritime Adaptation of Jomon Hunter-fisher-gatherer of Prehistoric Japan. Oral presentation presented at International Scientific Meeting: Radiocarbon and Diet: Aquatic Food Resources and Reservoir Effect. Kiel, September 24, 2014.

i) Public/Social Activities

Iizuka, Noriko., 2014. Let's go to the forest in Kyoto! Chikyu tankentai 3. Environmental Learning Program cooperated with University.

Iizuka, Noriko., 2014. Traveling the world in Kyoto! Chikyu tankentai 3. Environmental Learning Program cooperated with University.

Iizuka, Noriko., 2014. Project secretary of "Environmental education of next generation generated with social collaboration", Social collaboration of Japan consortium for area studies,

j) Media Interviews/Book Reviews

Iizuka, Noriko. 2014. What we are doing as a chikyutankentai? FM radio interview. Eco Machi life at Kyoto Sanjo radio café, May 26, 2014.

Ikeya, Kazunobu. 2014. "Considering the care for victims of the earthquake." Newspaper article. Iwate Nippo, September 15, 2014.

Kaner, Simon. 2014. Short Interview Article in Tokyo Shimbun, October 23.

Kaner, Simon. 2014. Interview on BBC Radio Norfolk about Japanese Archaeology, June 14, 2014.

Sasaki, Tsuyoshi., 2014. Newspaper articles. Iwate Nippo, May, 18, August 5, Mainichi Shimbun, September 14, 2014.

Takahashi, Satsuki. 2015. Review of *Precarious Japan* by Anne Allison (2013 Duke University Press). *The Australian Journal of Anthropology*. (Forthcoming)

k) Other Achievements

Kaner, Simon. 2014. Online Resource for Japanese Archaeology and Cultural Heritage (ORJACH) (with Nakamura Oki and Don Henson). www.ojach.org

Kusaka, So'ichiro. 2014. Cooperative Research Project using Isotope Ratio Mass Spectrometer (IRMS) at Center for Ecological Research of the Kyoto University.

Kusaka, So'ichiro (Ed). 2014. RIHN Small-Scale Economies Project Webpage. http://www.chikyu.ac.jp/fooddiversity/index.html

McGreevy, Steven., Mimura, Yutaka., Hamada, Shingo., Hayashi, Kengo., Uchiyama, Yuta. 2014. Perspectives for Talking the Megacity: History, Design, and Intuition. *Humanity & Nature Newsletter*, No. 50, pp.2-6.

Sasaki, Tsuyoshi., 2014. After the IPMEN. In. Monthry town Miyako. Town Joho sha., Iwate. (August, p.43, September, p.43, October, p.43, November, p.44-45).

Striplen, Chuck J. 2014. *A Dendroecology-Based Fire History of Coast Redwoods (SEQUOIA SEMPERVIRENS) In Central Coastal California.* Ph.D. Dissertation Department of Environmental Science, Policy and Management, University of California at Berkeley.

6. REFERENCES

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Habu, J., 2004. *Ancient Jomon of Japan*. Cambridge University Press, Cambridge.

Habu, J., 2008. Settlement growth and decline in complex hunter-gatherer societies: a case study from the Jomon period Sannai Maruyama site. *Antiquity* 82: 571-584.

Habu, J. and Hall, M.E., 2013. Climate change, human impacts on the landscape, and subsistence specialization: historical ecology and changes in Jomon hunter-gatherer lifeways. In V. D. Thompson and J. Waggoner (eds.), *The Historical Ecology of Small Scale Economies.* University Press of Florida: Gainesville, FL., pp. 65-78.

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Kirch, P. V., and Hunt, T. L., 1997. *Historical Ecology in the Pacific Islands: Prehistoric Environmental and Landscape Change.* Yale University Press, New Haven.

Koyama, S., 1978. Jomon subsistence and population. *Senri Ethnological Studies* 2: 1-65.

Koyama, S., 1984. *The Jomon Period*. Chuo Koron, Tokyo (in Japanese).

Thompson, V. D. and Waggoner, J. (eds.), 2013. *The Historical Ecology of Small Scale Economies.* University Press of Florida, Gainesville, FL.

Walker, Brian and D. Salt, 2006. *Resilience Thinking.* Island Press, Washington D.C.

7. PROJECT MEMBERS

NAME Family name first in capitals	**AFFILIATION**	**POSITION**	**SPECIALISED FIELDS**	**PROJECT WORKING GROUP** Specify the group leader.	**CONTRIBUTION TO THE PROJECT**	**CORE MEMBER/LEADER** **(PUT ○ FOR CORE MEMBER, PUT ◎ FOR THE LEADER)**	**DISCIPLINE** **N:** NATURAL SCIENCES **H:** HUMANITIES **S:**SOCIAL SCIENCES
HABU, Junko	Dept. of Anthropology, Univ. of California, Berkeley	Professor	Environmental Anthropology; Historical Ecology; East Asian Archaeology	Project Leader	Supervision of the three research groups	Project Leader	S
WEBER, Steven	Dept. of Anthropology, Washington State University, Vancouver	Associate Professor	Paleo-Ethnobotany; Environmental Archaeology	*Longue-Durée* Group (Group Leader)	Supervision of the group research	◎	S
HOSOYA, Leo Aoi	Centre for Global Human Resource Development, Ochanomizu University	Lecturer	Paleo-Ethnobotany; Cultural Anthropology	Contemporary Society Group (Group Leader)	Supervision of the group research	◎	S
OWENS, Mio Katayama	College of Natural Resources Univ. of California, Berkeley	Special Assistant to the Dean	Anthropology of Food; Applied Anthropology	Implementation, Outreach and Policy Proposal Group (Group Leader)	Supervision of the group research	◎	S
LIGHTFOOT, Kent	Department of Anthropology, Univ. of California, Berkeley	Professor	Archaeology, Historical Ecology, Cultural Ecology	*Longue-Durée* Group	Sub-project on California archaeology	○	S
FITZHUGH, Ben	Department of Anthropology, Univ. of Washington	Associate Professor	Archaeology, Historical Ecology, Evolutionary Ecology	*Longue-Durée* Group	Sub-project on Kodiak Archaeology	○	S

AMES, Kenneth	Dept. of Anthropology, Portland State Univ.	Professor Emeritus	Archaeology, Environmental Anthropology	*Longue-Durée* Group	Sub-project on Northwest Coast Archaeology	○	S
SAVELLE, James	Dept. of Anthropology, McGill Univ.	Associate Professor	Archaeology, Environmental Anthropology	*Longue-Durée* Group	Sub-project on Alaska and Canadian Arctic	○	S
MATSUI, Akira	Archaeological Operation Center, Nara National Cultural Properties Research Institute and Kyoto Univ.	Director of the Center/ Professor	Zoo-archaeology, Anthropology	*Longue-Durée* Group	Analysis of archaeological materials from Japan and Northwest Coast	○	S
SASAKI, Tsuyoshi	Tokyo University of Marine Science and Technology	Associate Professor	Marine Science, Ecoliteracy	Implementation, Outreach and Policy Proposal Group	Restoration of fishing industry in coastal Iwate	○	N
ERTL, John	Foreign Language Education Center, Kanazawa Univ.	Associate Professor	Cultural Anthropology	Contemporary Society Group	Ethnography of agricultural communities in Northern Tohoku		S
FAWCETT, Clare	Dept. of Sociology and Anthropology	Associate Professor	Cultural Anthropology	Contemporary Society Group	Ethnography of fishing communities on the Northwest Coast		S
IKEYA, Kazunobu	National Museum of Ethnology	Professor	Cultural Anthropology	Contemporary Society Group	Comparative ethnography of hunter-gatherers	○	S

ABE, Chiharu	Board of Education of Hakodate City	Counsellor	Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from Jomon sites in Hakodate		
CRAWFORD, Gary	Dept. of Anthropology, Univ. of Toronto	Professor	Paleo-Ethnobotany	*Longue-Durée* Group	Human impacts on the environment in Hokkaido, including plant domestication		S
WEBER, Andrzej	Dept. of Anthropology, Univ. of Alberta	Professor	East Asian Archaeology	*Longue-Durée* Group	Prehistoric and protohistoric hunter-gatherer subsistence and settlement in Hokkaido and Russia		S
AGARWAL, Sabrina	Dept. of Anthropology, Univ. of California, Berkeley	Associate Professor	Bio-Archaeology	*Longue-Durée* Group	Life history of prehistoric and historic people in Japan		N
ONISHI, Tomokazu	Dept. of Humanistic and Cultural Science, International Univ. of Kagoshima	Professor	Archaeology	*Longue-Durée* Group	Lifeways of Kofun period people in northern Japan		S
INANO, Yusuke	Former member of the Board of Education of Kitakami City		Archaeology	*Longue-Durée* Group	Subsistence and rituals during the Jomon period in northern Japan		S
SCHECHNER, Grant	Group in Asian Studies, Univ. of California, Berkeley	MA student	Archaeology	*Longue-Durée* Group	Subsistence and settlement during the Kofun period in northern Japan		S

FUKUNAGA, Mayumi	Research Institute of Eco-Science, Osaka Prefectural University,	Associate Professor	Cultural Anthropology	Contemporary Society Group	Environmental ethics for polyphony in northern Tohoku		S
LI, Liu	Dept. of East Asian Languages and Cultures, Stanford Univ.	Professor	Paleo-ethnobotany, East Asian Archaeology	*Longue-Durée* Group	Starch grain analysis of Jomon stone tools		S
IIZUKA, Noriko	Graduate School of Policy and Management, Doshisha Univ.	Ph.D. Student	Environmental Policy and Management	Implementation, Outreach and Policy Proposal Group	Children's perspectives on the environment among Native Alaskans		S
YONEDA, Minoru	University Museum, Univ. of Tokyo	Professor	Isotope Ecology	*Longue-Durée* Group	Changes in food diversity from prehistoric to historic Japan	○	N
KAWAHATA, Hodaka	Atmosphere and Ocean Research Institute, Univ. of Tokyo	Professor	Marine Geochemistry	*Longue-Durée* Group	Climate change in the prehistoric and historic periods in Japan		N
GOTO, Yasuo	Dept. of Economics, Fukushima Univ.	Professor	Political Economy	Implementation, Outreach and Policy Proposal Group	Restoration of small-scale agriculture in Fukushima		S
GOTO, Nobuyo	Dept. of Economics and Management, Fukushima Medical Univ.	Lecturer	Political Economy	Implementation, Outreach and Policy Proposal Group	Restoration of small-scale agriculture in Fukushima		S

ALTIERI, Miguel	Dept. of Environmental Science, Policy and Management, Univ. of California, Berkeley	Professor	Agroecology	Implementation, Outreach and Policy Proposal Group	Implementation of urban agriculture	○	N
KANEKO, Nobuhiro	Grad School of Environment & Information Services, Yokohama National Univ.	Professor	Soil Ecology	Contemporary Society Group	Chemical and biological study of agricultural soil	○	N
SLATER, David Hunter	Faculty of Liberal Art, Sophia Univ.	Associate Professor	Cultural Anthropology	Contemporary Society Group	Ethnography of agricultural communities Fukushima, Miyagi, and northern Japan	○	S
POPOV, Alexander Nikolaevich	Scientific Museum, Far Eastern Federal University	Director	Archaeology	*Longue-Durée* Group	Sub-project on Russian Maritime Archaeology		S
NILES, Daniel	RIHN	Assistant Professor	Human Environmental Geography	Implementation, Outreach and Policy Proposal Group	Implementation of urban agriculture in California and Japan	○	S
NAITO, Daisuke	RIHN	Assistant Professor	Political Ecology	Contemporary Society Group	Environmental damage and forestry in northern Japan	○	S
CAPRA, Fritjof	Center for Ecoliteracy	Chair of the Board of Directors	Physics	Implementation, Outreach and Policy Proposal Group	Advisor	○	N

KANER, Simon	Centre for Japanese Studies Univ. of East Anglia	Director	Japanese Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from the Shinano River Area		S
SAWAGUCHI, Kayo	NPO APAST	Assistant Director	Media presentation	Implementation, Outreach and Policy Proposal Group	Role of media in public presentation on environmental issues		S
TABAREV, Andrei	Russian Science of Academy	Senior Research Scientist	Russian Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from the Russian Maritime area		S
ITO, Yumiko	Aomori Prefectural Museum	Senior curator	Paleo-Ethnobotany, Jomon archaeology	*Longue-Durée* Group	Analysis of macro-floral remains from Jomon sites		S
ADACHI, Kaori	RIHN	Project Researcher	Japanese Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from the Tohoku Area		H
OISHI, Takanori	RIHN	Project Researcher	Ecological anthropology	Contemporary Society Group	Application of Historical Ecology in northern Japan		S
KUSAKA, Soichiro	RIHN	Project Researcher	Physical Anthropology	*Longue-Durée* Group	Changes in food diversity from prehistoric to historic Japan		N
HAMADA, Shingo	RIHN	Project Researcher	Environmental Anthropology	Contemporary Society Group	Application of Historical Ecology in northern Japan		S

NISHIDA, Yasutami	Niigata Prefectural Museum	Manager	Japanese Archaeology	*Longue-Durée* Group	Changes in food diversity from prehistoric to historic Japan		H
KANNO, Tomonori	Archaeological Research Office, Tohoku University	Professional Staff	Japanese Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from the Tohoku Area		H
OKAWA, Takuya	Course of Marine Policy and Management, Tokyo University of Marine Science and Technology	Doctoral Student	Marine Policy and Management	Contemporary Society Group	Restoration of fishing industry in coastal Iwate		N
YOSHIDA, Yasuyuki	Center for Cultural Resource Studies, Kanazawa University	Visiting Associate Professor	Japanese Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from the Tohoku Area		H
YAMAMOTO, Naoto	Faculty of Literature, Nagoya University	Professor	Japanese Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from the Tohoku Area		H
NEGISHI, Yo	Center for Regional Sustainability Initiatives, Akita International University	Assistant Professor	Japanese Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from the Tohoku Area		H
SATO, Takao	Faculty of Literature, Keio University	Professor	Zoo-Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from the Tohoku Area		S

KOMIYA, Takeshi	Keio University	Part-time instructor	Zoo-Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from the Tohoku Area		S
MURASE, Risa	The Japanese Hub of Global Studies, Sophia University	Doctoral Student	Social Movement	Contemporary Society Group	Ethnography of agricultural communities Fukushima, Miyagi, and northern Japan		S
YOSHIDA, Akihiro	Center for Obsidian and Lithic Studies, Meiji Uiversity	Post-doctoral Researcher	Paleo-climatology	*Longue-Durée* Group	Climate change in the prehistoric and historic periods in Japan		S
YAMAGUCHI, Tomiko	College of Liberal Arts, International Christian University	Senior Associate Professor	Sociology	Contemporary Society Group	Ethnography of agricultural communities Fukushima, Miyagi, and northern Japan		S
KITAMURA, Sachi	International Christian University	Doctoral Student	Peace studies	Contemporary Society Group	Ethnography of agricultural communities Fukushima, Miyagi, and northern Japan		S
NARA, Takafumi	Faculty of Medical Technology, Niigata University of Health and Welfare	Professor	Physical Anthropology	*Longue-Durée* Group	Changes in food diversity from prehistoric to historic Japan		N
NAKAMURA, Oki	Ritsumeikan Global Innovation Research Organization Ritsumei University	Professional Researcher	Japanese Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from the Tohoku Area		H

MOTONO, Ichiro	Kyoto Seika University	Part-time lecture	Agriculture, Social Movement	Contemporary Society Group	Ethnography of agricultural communities Fukushima, Miyagi, and northern Japan		S
PALLUD, Céline	Dep.of Environmental Science, Policy, and Management, Berkeley, University of California	Associate professor	Environmental Ecology	Contemporary Society Group	Phytoremediation of arsenic-contaminated soils		N
MATZEN, Sarick	Dep.of Environmental Science, Policy, and Management, Berkeley, University of California	Post-doctoral Researcher	Environmental Ecology	Contemporary Society Group	Phytoremediation of arsenic-contaminated soils		N
GRIER, Colin	Dep. of Anthropology, Washington State University	Associate professor	North-Pacific Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from the North-Pacific Area		S
TAKAHASHI, Satsuki	Sociology and Anthropology, George Mason University	Assistant Professor	Environmental Anthropology	Contemporary Society Group	Ethnography of fishing communities Fukushima, Miyagi, and northern Japan		H
BALÉE, William Lockert	Tulane University	Professor	Historical Ecology	Contemporary Society Group	Application of Historical Ecology in northern Japan		S
CISTERNA, Nicolas Sternsdorff	Program on US-Japan Relations, Weatherhead Center for	Postdoctor	Food Culture, Seismology, Sociology	Contemporary Society Group	Ethnography of agricultural communities Fukushima, Miyagi, and northern Japan		S

	International Affairs, Harvard University						
OHKI, Saori	Educational Board of Niiza City	Specialist	Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from the Tohoku region		H
YUMOTO, Takakazu	Primate Research Institute, Kyoto Univ.	Professor	Ecology	Contemporary Society Group	Ethnography of agricultural communities in Tsushima Island, Japan		H
MAHER, Lisa	Dept. of Archaeology, Policy and Management, Univ. of California, Berkeley	Assistant Professor	Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from the North America		H
GIBBS, Kevin	Dept. of Archaeology, Policy and Management, Univ. of California, Berkeley	Researcher	Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from the North America		H
CUTHRELL, Rob	Dept. of Archaeology, Policy and Management, Univ. of California, Berkeley	Postdoctor	Archaeology	*Longue-Durée* Group	Analysis of archaeological materials from the North America		H
CREMA, Enrico R.	Pompeu Fabra University	Postdoctor	Archaeology	*Longue-Durée* Group	Analysis of archaeological population estimates		H