

IRIDeS Report

Transmitting Practical Disaster Prevention
Studies from Tohoku to the World

International
Research
Institute of
Disaster
Science



04
2016.03

A new IRIDeS to make leaps forward

Close Up

① Tokio Marine & Nichido Fire Insurance x IRIDeS

Disaster risk reduction enabled by the coordination of industry and academia and conducting research at risk management sites

② Reconstruction Agency, Miyagi Regional Bureau of Reconstruction x IRIDeS

Aiming for a new Tohoku and advancing together for recovery



Promoting the new developments of IRIDeS by properly sending out information and conducting analysis for more concrete results

Fumihiko Imamura

Director of IRIDeS
Professor of Tsunami Engineering Research
at the Hazard and Risk Evaluation Research Division



Enriching the outcome for identifiable results

IRIDeS enters a new stage of its life five years after the Great East Japan Earthquake. I believe there are three main things that we must focus on from now. One is the "input." In addition to assimilating the latest research, it is important to understand and collect information on the regional situation without being held back by preconceptions. The second is the "output." We must transmit results in formats such as theses and information releases. The third is the "outcome." This involves analyzing how the research results we have transmitted have affected society. We must conduct analysis from various perspectives to see what has helped, in what way, and what we have been able to change from the citizen's point of view.

IRIDeS has been focusing on these three things up until now, but in the future I believe we must link more closely with the local community and discover how to output results that enable IRIDeS to be identified.

One method we are considering is opening up the research wing of IRIDeS to the general public. We plan to conduct various events relating to disaster prevention and reduction about once every two months, and proactively receive visitor tours.

Placing emphasis on educating the next generation that will be in charge of disaster prevention and risk reduction

For the next generation of children, the researchers that belong to IRIDeS provide guidance to the younger generation at graduate and undergraduate schools. This involves conducting lectures at basic seminars, and we also conduct seminars about practical disaster prevention research at The Program for Leading Graduate Schools, which aims to cultivate leaders in global safety studies. This lead to the development of specific products such as a "Disaster Risk Reduction Action Card Game." This game was developed by seniors of the seminar who then handed it over to their juniors for utilization in the local community. Being able to produce something that lasts more than a year was a great achievement. After the earthquake, more and more students began to take an interest in disaster prevention and reduction, those studying both humanities and the sciences. I hope we can assist these enthusiastic students.

Cooperating with the disaster studies at the new Tagajo High School opening in April 2016 is one important part of this. We offered advice from the preparation stages by conducting lectures and workshops. It is very important to learn about disaster prevention and reduction, which is a field that continues to evolve on a daily basis. We will continue to cooperate with the school and respect the motivations of those students so that they can gain knowledge to give back to their community. I hope we can provide guidance to enable the power of youth to support the future of disaster prevention and reduction.



Copying the materials of precious ancient documents and interpreting them against the historical background in which they were written.

A comprehensive disaster research institute

IRIDeS researches all facets of natural disasters, including their occurrence, damage caused, response, restoration/reconstruction, and future preparedness. It focuses on disaster site issues, propose solutions, and tries to assist in preventing or reducing the effect of disasters in society and people's actual lives.

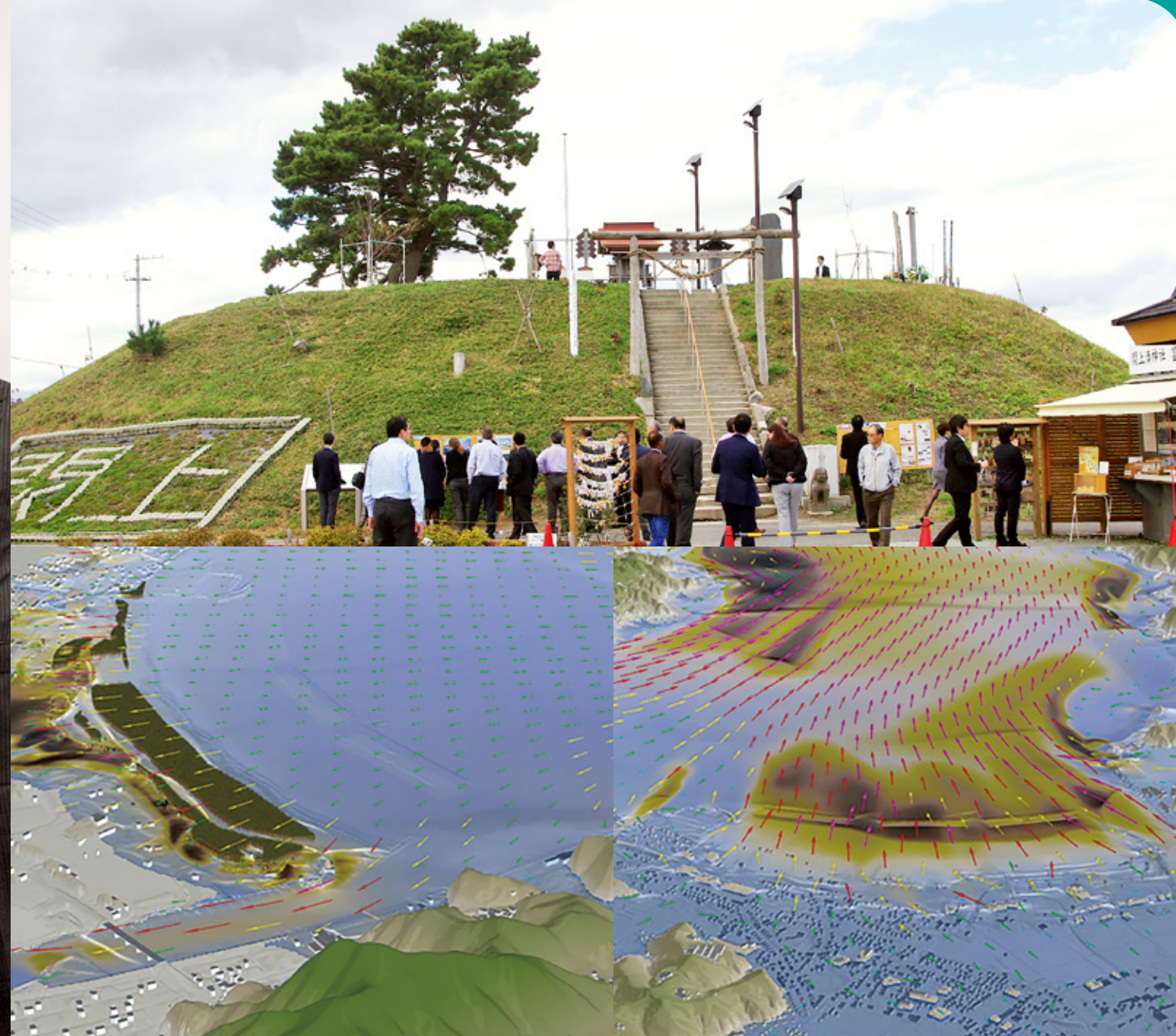




Close up
01

Tokio Marine & Nichido Fire Insurance × IRIDeS

Since its inauguration, IRIDeS has been coordinating with the Tokio Marine & Nichido Fire Insurance Co., Ltd., with a special department established to realize coordination between industry and academia. IRIDeS and the Tokio Marine & Nichido Fire Insurance Co., Ltd. got together to discuss how to address earthquakes and disaster risk reduction from the perspective of an insurance company and a research institute, and talk about their past results and hopes for the future.



(Above) Site visits in Yuriage area, Natori City. (below left and right) Numerical simulation of Large-scale sediment transport in Iwate Prefecture Rikuzentakata occurred by the Great East Japan Earthquake and Tsunami in 2011. (A part of this results has been funded by MEXT Strategic Programs for Innovative Research (SPIRE), and is obtained by using the K computer at the RIKEN Advanced Institute for Computational Science. (Proposal number hp150216))

An unprecedented disaster Industry and academia cooperate to research risk

-What was the background behind establishing the Earthquake induced Tsunami Risk Evaluation Endowed Research Division (Tokio Marine)?

Fumihiko Imamura, Director, IRIDeS (hereinafter "Imamura"): The Great East Japan Earthquake caused great damage over an extremely wide area. We had been surveying the risk of a tsunami and the damage that one could cause since before the earthquake occurred, but felt deeply ashamed that our risk evaluation was insufficient. I thought that it would be good to conduct research on what to do

after a disaster together with Tokio Marine & Nichido, who have a large amount of hands-on experience.

Nobuhito Fujiwara, General Manager, Sendai branch of Tokio Marine & Nichido Fire Insurance Co., Ltd. (hereinafter "Fujiwara"): The staff at Tokio Marine & Nichido and group companies were dispatched to the disaster area the day after the earthquake to make sure that insurance money could be paid out as soon as possible.

In April, employees from all over the country got together and vowed to help the people in the disaster area overcome their predicament.

Luckily we were able to prepare a lot of insurance money by the end of May, but visiting the disaster area made us keenly

aware of our failure to appreciate the risk of a tsunami occurring. Our company also has an institute that researches natural disaster risk, but I thought that by conducting research by coordinating industry and academia, we would be able to develop better risk evaluation methods. **Imamura:** I feel that coordinating our risk research has made it easier for us to perform more concrete actions. Making it easier to notify the general public of our research has been a major achievement. I often feel this in the lectures we conduct for the employees of Tokio Marine & Nichido and participation in local workshops, etc.

Disaster prevention and risk reduction education and advice for 30,000 employees

Fujiwara: Our group has just under 20,000 employees in Japan and approximately 10,000 employees overseas. We also have people working hard at insurance agents that are close to the local community. I believe that transmitting information within the company leads to quite a large amount of output. Even amongst our employees, there is quite a difference in their awareness regarding disaster prevention and risk reduction and risk management, depending on whether they experienced the earthquake or not. I hope that by participating in seminars

and events, etc. held in conjunction with IRIDeS, we can achieve a shared awareness of the lessons that were learned in the Great East Japan Earthquake. **Imamura:** I agree. Everyone always listens attentively. **Fujiwara:** We also visit elementary schools to give lessons. This is something that we conduct on our own based on advice from IRIDeS, but it also leads to rapid changes in our employee awareness. By receiving the training of IRIDeS professors in advance, the method of conducting these lessons has changed, and each of our employees has been able to conduct better and deeper lessons. **Ariga Mukai, Manager, Sendai branch of Tokio Marine & Nichido Fire Insurance Co., Ltd. (hereinafter "Mukai"):** We hope to be a

company that is close to the local community. That is why we feel it is very worthwhile to be able to contribute to the local society and community via disaster risk reduction education for children. I feel that properly learning what disaster risk reduction is in advance and showing the local people that this information is well backed up is something that is very meaningful. **Fujiwara:** I believe that the reason we are able to transmit better things based on scientific information and research is because of our links with IRIDeS.

Researching the disaster risk reduction effect of coastal forests Improving value in combination with the knowledge of IRIDeS

-I hear that you are also conducting efforts that relate to ecology and nature. **Akihiro Hayashi, Research Associate, Earthquake induced Tsunami Risk Evaluation Endowed Research Division (Tokio Marine), IRIDeS, Tohoku University. (hereinafter "Hayashi"):** I conduct research at IRIDeS as an employee dispatched from Tokio Marine & Nichido Risk Consulting Co., Ltd. I feel that it is meaningful that I am able to directly access various kinds of knowledge and I try to incorporate that knowledge in a meaningful way.

As one of these efforts, I have recently been focusing on research into the disaster risk reduction effect of planting coastal forests. "Eco-DRR: Eco Disaster Risk Reduction" that utilizes the natural power of trees, etc. instead of tide walls has recently become popular around the world. I am appropriately evaluating the disaster risk reduction effect of these coastal forests and investigating the idea of widely transmitting the results of this research to children around the country via the "green lessons" (see separate column) of the Tokio Marine group. **Imamura:** There was a report that said the force of the tsunami caused by the Great East Japan Earthquake was reduced by coastal forests, wasn't there? **Hayashi:** Yes. I believe that planting coastal forests is effective in various ways, such as

disaster risk reduction and ecology. These efforts are being conducted not only in Japan, but also in places such as South East Asia in conjunction with NPOs, and the knowledge of IRIDeS is indispensable in doing so. **Imamura:** We have researchers that specialize in coastal forests and also knowledge about their servicing and maintenance. I am very thankful that you are able to utilize our knowledge to increase the effectiveness and value of your efforts. **Hayashi:** I also participated in forest planting in Vietnam in July, and the knowledge of IRIDeS was very useful when explaining things to the local people. I was able to explain the benefits of planting coastal forests when talking about ecosystems, oxygen, carbon, and the disaster risk reduction effect.

Transmitting information and regional coordination are key. Links grow stronger as we enter our fourth year.



Data related to dialog

Tree planting activities in Vietnam



A Researcher of IRIDeS participated in tree planting activities to survey the local vegetation and collect information required for research.

Disaster risk reduction classes at Shichigo Junior High School



Researchers of IRIDeS conducted classes at junior high schools. Students listened to the remarkable specialized knowledge with great interest.

Conveying the experiences of the earthquake to retain memories for future generations

Fujiwara: I believe that our coordination also helps prevent people losing their memories of the earthquake. The Great East Japan Earthquake is already fading away in the memories of the people who were not in the disaster areas at the time. **Imamura:** The fading of memories is an unavoidable part of human life. I feel that by being involved with disaster related activities such as seminars and local workshops, lessons learned will come into play if another emergency should happen to occur. **Fujiwara:** s part of the employee training at

the Tokio Marine group for employees that will be in charge of the next generation of overseas subsidiaries, we make opportunities for our employees to visit the disaster areas of the Great East Japan Earthquake to listen to the stories of those who experienced it. Actually traveling to the area where something happened is quite important. We also make opportunities for our employees to hear from researchers at IRIDeS. **Imamura:** I hope that information can be transmitted to more and more people by those who hear what IRIDeS has to say. Retaining the memories of the earthquake also leads to further development in risk research. **Fujiwara:** I agree, and I think that getting people that experienced the disaster to

talk can help keep their stories alive. I also believe that it is very important to have opportunities in our company to share real interactions with our customers and talk about our awareness and sense of duty we felt at the time. **Imamura:** It is extremely important to be able to convey narratives, notes, and photos to the next generation. Universalizing stories and information and formatting them in a way that is easy to convey to the next generation will certainly become more important in the future. **Fujiwara:** We agree. We have to think about how we can retain the Great East Japan Earthquake in our minds and how we can transmit related information. I hope we can receive advice from IRIDeS on how to do so.

Column 01 Green Lesson: The Mangrove Story

The employees and agents of the Tokio Marine group volunteer to conduct lessons to promote environmental awareness. These lessons started in 2005, and by March 2015 they had taught approximately 47,600 children at about 690 schools over the country. These lessons feature beautiful videos of mangroves, actual viviparous seeds, and stories about planting mangroves, and in the latter half the children think about what can

be done to protect the Earth's environment. The goal is to create opportunities for raising the awareness of the next generation regarding environmental conservation. It is hoped that this will raise the environmental awareness among employees and agents that work as teachers and coordinators, and promote communication among them as well.



Strengthening links and transmitting various kinds of information

-In closing, please tell us about your hopes for the future.

Imamura: I believe that linking between industry and academia has achieved good results. I hope we can enrich these activities and further widen their scope. In regards to transmitting information, I am very grateful to Tokio Marine & Nichido for providing us with opportunities for utilizing our knowledge. I hope that we can continue our relationship together in various forms.

Fujiwara: I believe it is extremely important to prepare for customer emergencies

during normal times. The growth of the Tohoku region directly affects the growth of Japan as a whole. I believe that our mission is to support the growth of our customers and support new endeavors. I hope we can further strengthen our relationship with IRIDeS and continue to conduct comprehensive efforts together. Having opportunities such as this conversation will also be extremely important. Mukai: As an employee of the company, I hope that I can convey the realizations I have made during this coordination to my fellow employees and have opportunities to review my own job. The key concepts here are communities and transmitting information. I want each employee to contribute to the community by transmitting community-based information.

Hayashi: I would like to continue research into the disaster risk reduction effect of coastal forests, and conduct my research thinking various things such as the effects of such efforts, urban development, and evacuation plans. I want to transmit information relating to the effects of planting coastal forests from not only the aspect of ecology, but also the aspects of disaster prevention and risk reduction. Fujiwara: We believe that the cultivation of human resources is one of the most important things. I hope we can continue our missions through personnel exchanges and events, etc.



Moving forward into the future based on the results of previous coordination

Collaboration with Tokio Marine & Nichido announced at the World Conference on Disaster Risk Reduction



IRIDeS gives lectures for employee training at overseas subsidiaries of the Tokio Marine group



Disaster risk reduction lesson conducted by the Tokio Marine group and IRIDeS at Okada elementary school



Lectures for employee training at overseas subsidiaries of the Tokio Marine group



General Manager
Nobuhito Fujiwara
Sendai branch, Tokio Marine & Nichido Fire Insurance Co., Ltd.

Born in Aichi prefecture. Graduated from the Department of Economics, the School of Political Science and Economics at Waseda University. After joining Tokio Marine & Nichido Fire Insurance Co., Ltd. in 1986, worked in commercial lines production department and the investment department, before assuming his current position in 2013.



Manager
Ariga Mukai
Sendai branch, Tokio Marine & Nichido Fire Insurance Co., Ltd.

Born in Miyagi prefecture. Graduated from the School of Industrial Chemistry in the Faculty of Engineering at Tokyo Metropolitan University. After joining Tokio Marine & Nichido Fire Insurance Co., Ltd. in 1998, worked in the risk consulting department and sales planning/development department, before assuming his current position in 2015.



Research Associate
Akihiro Hayashi
Earthquake induced Tsunami Risk Evaluation Endowed Research Division (Tokio Marine & Nichido), IRIDeS, Tohoku University.

Born in Kanagawa Prefecture. Completed his Master's in the Department of Civil Environmental Engineering at the School of Engineering at Tohoku University. Joined Tokio Marine & Nichido Risk Consulting Co., Ltd. in 2014. Assigned to IRIDeS in 2015, where he assumed his current position.



(Top) "Kakeagare! Nippon" comprehensive disaster risk reduction training (Bottom left) SENDAI CAMP (Bottom right) Disaster prevention notebook of all

Miyagi Bureau of Reconstruction × IRIDeS

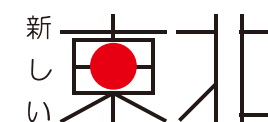
Miyagi Bureau is in charge of recovery and reconstruction from the Great East Japan Earthquake. IRIDeS has collaborated with diverse stakeholders and supported their efforts in various areas of recovery and reconstruction. Now that the fifth anniversary of the Earthquake is just around the corner, we take this opportunity to have a dialogue on our reconstruction efforts and how we should proceed in the future.

2015 became a mistune year for reconstruction with the designation of World Tsunami Day

-What kind of year do you think 2015 was?
Deputy Director Masahiro Maruta, Miyagi Regional Bureau of Reconstruction (hereinafter "Maruta"): 2015 was a memorable year for reconstruction, with the Sendai Declaration and the Sendai Framework for Disaster Risk Reduction 2015 - 2030 adopted after the World Conference on Disaster Reduction, the establishment of November 5th as "World Tsunami Day" as a common memorial day across the United Nations, the opening of the JR Senseki line, and the opening of the town of Onagawa, etc.
Director Fumihiko Imamura, IRIDeS (hereinafter "Imamura"): I feel there were many key events related to the creation of "New Tohoku."

ter "Imamura"): I feel there were many key events related to the creation of "New Tohoku." ("1) IRIDeS has also worked together with the Reconstruction Agency to pursue recovery and reconstruction efforts in disaster areas, via its "Kakeagare! Nippon" evacuation training program and its "Disaster prevention notebook of all."
Maruta: The UN World Conference on Disaster Risk Reduction and the designation of World Tsunami Day are examples of the efforts of IRIDeS paying off. I think that "Kakeagare! Nippon" and the notebook have also become very meaningful activities for raising the disaster risk reduction awareness of the general public.
Imamura: In reality, pursuing cutting-edge research and fulfilling our role within the local community are not contradictory actions.

"New Tohoku": The Reconstruction Agency assists reconstruction efforts with "hard" reconstruction of infrastructure and housing, etc. and "soft" reconstruction of human activities. This is done with restoring the liveliness of the town as the top priority, as this is the ultimate goal of disaster reconstruction. "New Tohoku" refers to each region solving their own respective problems and independently striving to build a sustainable regional society. Currently various parties such as local government, private corporations, universities, and NPOs are cooperating to realize the "New Tohoku" idea, and the Reconstruction Agency is also providing various forms of assistance.



A long distance has been covered steadily. What role IRIDeS is going to play here after?

-The "Disaster prevention notebook of all" is used not only in Miyagi prefecture, but also in Iwate prefecture

Maruta: The "Disaster prevention notebook of all" provides citizens with easy-to-understand information that is based on specialist knowledge. This information is versatile enough to be applicable to every area. I was previously in charge of Shizuoka, and I believe that the notebook could also play an important role in that region, which faces the fear of a Nankai Trough earthquake.

Chief Examiner Tomohiro Miyakawa, Miyagi

Regional Bureau of Reconstruction (hereinafter "Miyakawa"): I think the fact that an international research institute such as IRIDeS has created a practical notebook like this based on the philosophy of its foundation is extremely valuable. As recovery proceeds and the need for "soft" recovery and nationwide recovery in advance of a disaster grow, I believe that the scope of the roles of IRIDeS which aims to establish "practical disaster risk reduction studies" will dramatically increase.

Imamura: I want us to be prepared to conduct research that can give back to the community. I believe it is time for us to take another look at our role as a research institute.

-How do you feel about the reconstruction since the disaster?

Maruta: The Great East Japan Earthquake brought great damage to a wide area on an unprecedented scale. When compared to the situation immediately after the disaster, I am surprised at how well things are proceeding. I now hear from the heads of local government in disaster areas that things are finally starting to settle down. The Reconstruction Agency now moves on to a new stage while continuing reconstruction of disaster areas. In addition to "hard" reconstruction of infrastructure and housing, we have assigned a large budget for the "soft" reconstruction of things such as communities and mental health. We will focus all of our efforts on supporting new lives and livelihoods.

Experience-based disaster risk reduction and reconstruction education will be more important

-IRIDeS also conducted experience-based disaster prevention education using the disaster prevention notebook.

Imamura: The notebook has a compact size so that it can always be carried around in one's pocket. On the other hand, we want people to not only carry the notebook around, but also effectively utilize it. That is why we held a disaster risk reduction camp called the "SENDAI CAMP" in September 2014, which was attended by 25 people, who were mostly high school and university students. At the camp, we first determined everyone's "power to live" with a simple questionnaire. We then conducted disaster prevention education that

included eating survival food, pitching tents, and walking around the town. On the final day, we had another questionnaire to check what changes had occurred. The results were interesting, with the "power to live" increasing in some areas but also decreasing in others. It was a worthwhile effort that could be customized for further deployment.

Maruta: It is fantastic that disaster risk reduction education has been so widely spread. I hope that these efforts will encourage people to visit Tohoku. I also hope that such education will be conducted in various other areas outside of Tohoku.

Miyakawa: When exchanging ideas with local government employees of Shizuoka prefecture and Hamamatsu city, they told me that the knowledge on disaster risk reduction and reconstruction gained from the Great

East Japan Earthquake had not made its way there yet, and that they would like us to transmit more and more information. Of course it is important to transmit information from the Reconstruction Agency and the local government of disaster areas, but it is equally important to transmit information from university students and high school students. I want to cooperate with IRIDeS to arrange opportunities for interaction, such as the exchange between disaster studies at the Tagajo High School and high schools in Shizuoka.

Maruta: We also have an activity where junior high school students from Hamamatsu homestay in the Sanriku area to learn about the time of the disaster and gain knowledge about disaster risk reduction. I hope we can have more examples like this.

Pursuing "New Tohoku" from both government and academia Enhancing soft reconstruction efforts such as psychiatry and education



We need to enhance the 'visit' industry, taking foreign tourists into account

-IRIDeS has also been working on collecting archives. How do you wish to apply this to future reconstruction?

Imamura: We have been able to collect quite a large amount of materials over the past four years. How we will use this information is an important question. I want IRIDeS to utilize it in disaster risk reduction measures, disaster education, and the visit industry including tourism and observation.

Maruta: Stimulating tourism is also important from the perspective of regional reconstruction. When comparing figures

from before the Great East Japan Earthquake, rising numbers of foreign tourists mean that nationwide tourism has increased to 162%, but figures are at only 70% for the Tohoku region. Tourism is an integrated industry that involves not only tourist facilities such as hotels, but also the restaurant, agriculture, and fishing industries. The Reconstruction Agency has greatly increased the tourism recovery budget that was 500 million yen in 2015 to 5 billion yen in 2016. The archiving and research of IRIDeS has strong power to appeal to tourists, both domestic and foreign. I hope we can work together to utilize the merits of these materials.

Imamura: IRIDeS collects photos and images, etc. over a fixed time interval, such as before the disaster and just after

the disaster. I believe we can use 3D systems, etc. to show people these materials while generating a feeling of really being there. We have also incorporated research in the psychology of what kinds of stories are remembered by people and collect a large number of stories that are subjective and interesting. It could also be interesting to do something like using the newly opened Senseki line to travel by train while viewing video that shows what each point along the line experienced due to the disaster, to enable people to have a simulated experience.

Data related to dialog

Exhibition at SENDAI CAMP



The exhibition space featured various panels showing experiences of the earthquake. These showed how people had moved in a disaster in an easy-to-understand manner.

A scene at SENDAI CAMP



The SENDAI CAMP disaster training program conducted at Kotodai park with the theme of "let's raise our power to live!"

Column 02

Disaster prevention notebook of all

A notebook that includes information on lessons from the earthquake and preparations for the future. It is based on enriching eight types of "power to live" (A) the ability to organize people B) the ability to deal with problems C) the ability to care about people D) the ability to keep faith E) the ability to live well F) the ability to calm down G) the ability to make life meaningful H) the ability to enrich one's life) and is designed to make the required information easy to find at such

times. It contains information about what to do before a disaster and 10 hours, 100 hours, 1,000 hours, and 10,000 hours after a disaster occurs, and also stories from people who experienced the disaster.

In addition to distribution in Miyagi prefecture and Miyazaki prefecture, the notebook has been distributed to approximately 410,000 households in 21 inland municipalities of Iwate prefecture.



Enabling the people living in disaster-affected areas to feel that recovery and reconstruction have been achieved

-Some people in disaster areas say that they cannot feel that recovery has been achieved. How would you like to pursue reconstruction efforts in the future?

Imamura: At IRIDeS we believe that reconstruction that focuses on people's minds will become important in the future. A feeling of recovery. We believe that this feeling is generated as local people converse with each other. Reconstruction is based locally. What is it that leads people to feel that their community has recovered, that their community has been

reinvigorated? This has always been important, but I believe that it should be focused on even more in the next five years.

Maruta: Since about 50% of the permanent public disaster housing, etc. was completed by the end of 2015 and about 80% will be completed in 2016, psychological care and community rebuilding will become extremely important from now on. The budget assigned to assist people affected by the disaster was 5.9 billion yen in 2015, but will be increased to 22 billion yen in 2016. I believe that in the various missions we must accomplish for these people, we must develop a system that can respond to individual needs. We are considering implementing more detailed measures. For example when assisting job

hunting, if someone has been unemployed for a long period of time, we could provide them with intermediate employment experience so that they can live their lives independently.

-With the aging population of the disaster areas, the question is how to build a lively society.

Maruta: The coastal regions that were struck by the disaster were already experiencing a low birth rate and aging population even before the earthquake. This is a challenge facing the disaster areas as well as the whole of Japan. There will be no future for the region if it returns to the way it was before the disaster. In order to achieve the idea of "New Tohoku," we need to perform reconstruction in a way that can become a model for a future

Japan. I believe that we must understand the weak points and limitations of each area and build a society that makes up for its weak points and brings out new strengths. We will pursue efforts that encompass more than just recovery and reconstruction.

Imamura: At IRIDeS, our ideal for reconstruction is "build back better," or in other words, creating a better society than what existed before the disaster. We are researching how we can help communities to flexibly recover from a disaster and lead them to a state where they can function.



Efforts to strengthen bonds and connections in the community so that people can feel a “sense of recovery”

The psychological recovery work of the Reconstruction Agency



Residents of the largest disaster-related public housing in Miyagi prefecture making a giant sushi roll. The prime minister himself encourages the support of community building for citizens that moved from temporary housing to permanent housing.

Preparations for land for private housing proceeding in Minamisanriku



Group disaster risk reduction relocation housing land under construction in Isatoma, Minamisanriku, which was gravely damaged by the disaster (January 2016). The housing land will be transferred in March 2016, and then the survivors will begin reconstruction of their own houses.

Minister for Reconstruction Takagi holding a silent tribute at the Crisis Management Office in Minamisanriku



A 12 m high Crisis Management Office was constructed after the Chile earthquake tsunami, but a 15.5 m high tsunami struck. Apart from the 11 people including the mayor who managed to survive by clinging to antennas and being stuck in the staircase, 43 people passed away. Miyagi prefecture decided to temporarily preserve the building as a memorial of the earthquake, as it would have similar value to the Atomic Bomb Dome in Hiroshima.

Towards a society that maximizes the potential of people and industries in the region

Maruta: As exemplified by the utilization of natural energy, I believe that we must build a cultured local community while utilizing regional resources such as people and local industries. IRIDeS has been involved in identifying these regional resources, but we must accelerate these efforts together in the future. The perspective of inbound marketing will also be required. It might also be important to think about what merits the resources in

disaster areas such as Miyagi prefecture will have for people overseas.

Imamura: Since we have been continuing our research in disaster areas from immediately after the earthquake occurred, we have knowledge about how those resources can be utilized. It is essential that we closely cooperate with local government and the Reconstruction Agency. I hope that we can move forward while sincerely considering what we can do for disaster areas in the future.



Deputy Director General
Masahiro Maruta
Miyagi Bureau of Reconstruction,
Reconstruction Agency

Joined the Ministry of Agriculture, Forestry and Fisheries in 1985. Promoted infrastructure development for the agricultural industry and farming villages and regional stimulation based at the Rural Development Bureau. Appointed three times in the Tohoku region as the section manager of the Agricultural Land Planning Section for Agriculture, Forestry, and Fishery Division in Fukushima prefecture, the head of the Agricultural Land Development Division at the Tohoku Regional Agricultural Administration Office, and head of the Industry and Economy Division of Ozaki city in Miyagi prefecture. Assumed his current and fourth position in Tohoku in October 2015.



Unit Chief
Tomohiro Miyakawa
Miyagi Bureau of Reconstruction,
Reconstruction Agency

Joined the Ministry of Education, Culture, Sports, Science and Technology in 2012. Having been involved the establishment sports basic plan and other works related to the Japan Sports Agency at the Sports and Youth Policy Planning Division (currently the Policy Division of the Japan Sports Agency), he promoted research and development into renewable energy, energy saving, and global warming at the Environment and Energy Division. He assumed the current position in April 2015.

Professor

Makoto Okumura

Human and Social Response Research Division
Disaster Area Support

Studying human movement is essential for resilience. Research that assists reconstruction plans and evacuation plans.

Born in 1962. Graduated from the School of Engineering and Graduate School of Engineering at Kyoto University. Worked as an assistant professor at the Faculty of Engineering at Hiroshima University and as a professor at the Center for Northeast Asian Studies at Tohoku University before assuming his current position. Specializes in regional/urban planning, transport planning, transport interruption/regional isolation problems, and regional planning for Siberia and Bolivia.

Each individual one of us humans makes up a community. Of course it is also up to each individual one of us to achieve reconstruction. What movements did these humans in charge of the future of the region make after the earthquake? One researcher is using statistics and big data to solve this mystery.

Numerically clarifying how people move

When a dramatic shock such as a disaster occurs, people make various kinds of movements. Although it may seem that each person is moving differently, when we take an overview of the situation, we find that they are moving according to a fixed pattern.

Professor Makoto Okumura of Disaster Area Support in Human and Social Response Research Division researches human movement according to various timelines. He researches three major things; short-term evacuation movements directly after a disaster, medium-term movements including recovery of urban functions, and long-term movements over several years.

Of these, urgent research into the long-term movements related to reconstruction are of particular importance. "The population along the Tohoku coast greatly diminished with the Great East Japan Earthquake in 2011. What was the reason for this? Of course many people died, but emigration was an even bigger factor. Numbers of emigrants were from two to ten times

that of numbers of deaths," says Prof. Okumura.

The significant reduction in population in Fukushima prefecture also points to the influence of emigration. After the Great Hanshin-Awaji Earthquake in 1995, although emigration temporarily increased after the earthquake, people came back when housing was rebuilt. Some areas even had a bigger population than before the earthquake. However, after the Great East Japan Earthquake the population has not returned and is instead decreasing. This has not changed five years after the disaster.

"A decreasing population leads to regional declination. If the natural increase is large enough or it is certain that the population will return, then by implementing reconstruction measures that improve on the original situation before the disaster, a community can return to what it was before, but otherwise other measures must be implemented. The possibility of a population not recovering in the trend of a natural decrease is being seen for the first time with the Great East Japan Earthquake. Comparative research on situations that will recover the population and those that will not is required."

The relationship between employment and recovery, and how much a population will recover

A common method for analyzing a change in population is the "difference in differences" method.

A population does not decrease simply due to a disaster. With the current aging population and low birthrate, populations were already decreasing. This method is optimal for numerically clarifying the rate in population decrease and identifying the influence that cannot be determined with figures alone.

"As a result of performing research using this method, I found that in the 35 years

since 1979, fewer people were moving out and more people were moving in after disasters, but populations were not returning to the areas hit by the Great East Japan Earthquake as expected. Then, what is the reason that a population can recover even if people have died, and what is the reason that a population cannot recover in other cases?"

Prof. Okumura says the key lies in the recovery of employment. "Traditionally the people of Japan have made a living off the land. Even if people die in a disaster, siblings and relatives would come back to make a living on the remaining land. Even if the country is destroyed, mountains and rivers remain," says Prof. Okumura.

However with the Great East Japan

Earthquake, the land that people had to return to was greatly damaged by the tsunami and nuclear accident. In addition, with group relocation and raising of land, people were unable to find their land.

Another cause was changes to people's livelihoods. With the decrease in people working off the land in agriculture and fishing, the skilled labor of company employees, etc. increased.

Therefore, after the disaster people were not required to return to where they used to live in order to make a living. "When analyzed by time, we find that the trend of people returning has been weakening recently. With changes to livelihoods, the driving force behind regional reconstruction has decreased," analyzes Prof. Okumura.

Combining various forms of data to predict detailed human movements

"Up until now the scope of disasters was counted in numbers of lives lost, and changes to the population recovery rates had not been researched much. I believe that research into population movement after a disaster is extremely important when thinking about how to rebuild a society," says Prof. Okumura.

Accurate surveying and data are important for researching population movement.

Up until now, analysis was conducted on national census data conducted every five years. "Census data is extremely accurate

and enables detailed data such as age, gender, occupation, and residence to be used. However, unless a disaster is huge, its influence is made up in a few years and does not show up in the census data of five year intervals."

In recent years there have been great advances in technology for calculating the annual changes over five years by combining population movement data based on the basic resident register, which contains less surveyed items but is updated every year. "Thanks to advance in calculation technology, population data can now be used more effectively."

By understanding changes to detailed population data by year, I hope to predict how much a region will recover."

This research will help reconstruction work in the future. Reconstructed housing based on the results of questionnaires and estimates may now be able to be planned based on more logical reasons. Hopefully this will lead to fewer examples of situations where restoration housing has been constructed but remains unoccupied.

"Of course it is also essential to listen to what local people have to say when making plans. However on the other hand, creating plans based on academic knowledge enables plans to be more persuasive. I think this will be extremely useful when it is necessary to create new towns, such as with this earthquake," says Prof. Okumura

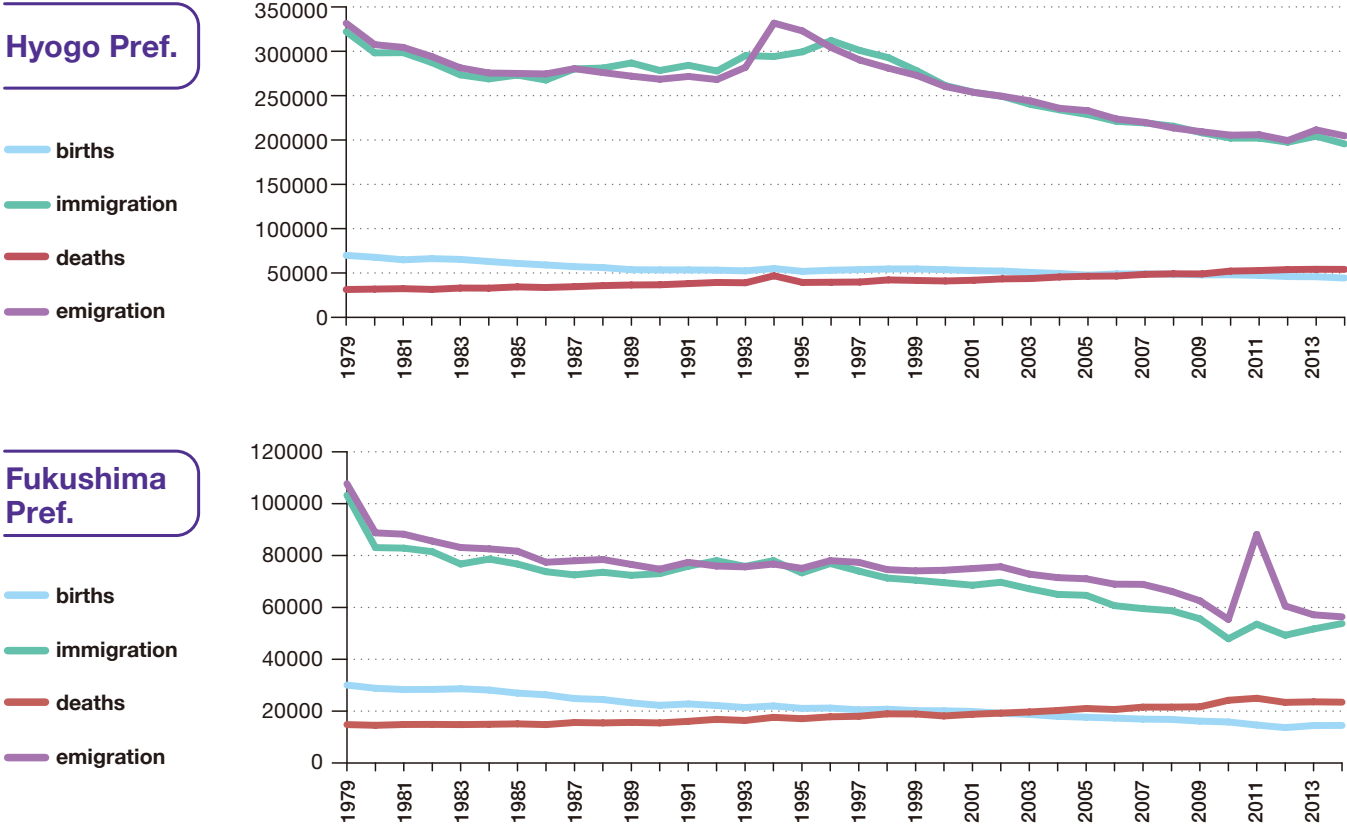
A decreasing population is deeply related to employment

Data related to research...

Population dynamics during 1979-2014 FY

Immigration did not increased in Fukushima Prefecture after 2011.

(source: Basic Resident Register Statistics in Japan)



Return a boat on the sea (Rikuzen-Takata, May 2011)

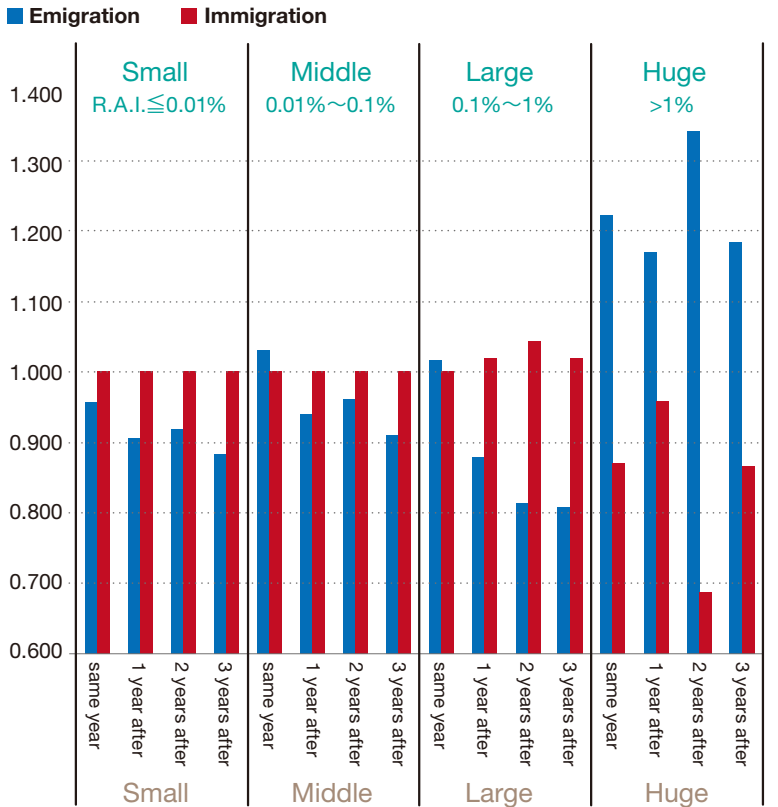


Temporary housing complex (Taro, Miyako-city, May 2014)



Migration after a disaster of different level of the ratio of affected inhabitants

Magnification of emigration and immigration, after a different size of disasters in a Prefecture, measured by Ratio of Affected Inhabitants. For example, emigration in the same year becomes 0.95 times of original value if little size disaster (R.A.I. =0.01%) is happen in a prefecture.



How and when did people move in the 50 days after the Great East Japan Earthquake

Medium-term population movements are also being researched.

The laboratory of Prof. Okumura analyzed where people in Sendai were everyday at 2 PM after March 14th, 2011, three days after the earthquake. This was to research how populations recover after a disaster.

The big data of a major telecom company was utilized for this research. Using the position data of mobile devices has enabled researchers to infer how many people were in particular areas.

As a result, it was found that people moved according to a fixed pattern.

On March 14th, half of the people living in the disaster area were in their normal place (at work, etc.) during the day, and the other half were at the place they would normally be at midnight (at home).

Three weeks after this, 80% of the people were at their normal place during the day, and only about 20% were at home. In April, the remaining 20% also starting moving to the place that they would normally be during the evening, such as the local shopping center or the local station area.

This research makes clear the level of damage due to limitations on activities immediately after a disaster occurs, and

the required amount of food and aid materials.

Up until now, there was hardly any research into how many people would return at what time. "One of the reasons why we have become able to conduct this kind of research is the dramatic increase in telecommunications technology, and the fact that various types of data can now be obtained via a wide range of methods.

Researchers are now facing the question of how to accurately handle data and provide the information that is required."

Mapping the relationship between areas and recovery rates

Furthermore in recent years, Prof. Okumura started research into which areas had people return quickly and which areas people have not been returning to, using urban function distribution data from before the earthquake and big data. "I am utilizing population and statistics data to research whether it is possible to see the relationship between human movements and regional characteristics. By mapping this data to visualize it, I hope it can be used widely in a more general manner," says Prof. Okumura.

This research found that even in the

same city, areas related to work and school commuting such as train stations and office streets recovered quickly, while areas mostly used for leisure such as shopping centers were found to be areas that people did not return to as quickly.

"Population movements immediately after a disaster were mostly unknown until now, but this research using big data will enable us to estimate human movement in a more logical manner, which can be utilized for selecting the locations where aid materials and aid operations should be focused. I think that the results of this research may also be valuable overseas."

Prof. Okumura wants to understand regional changes after a disaster by utilizing population movements and

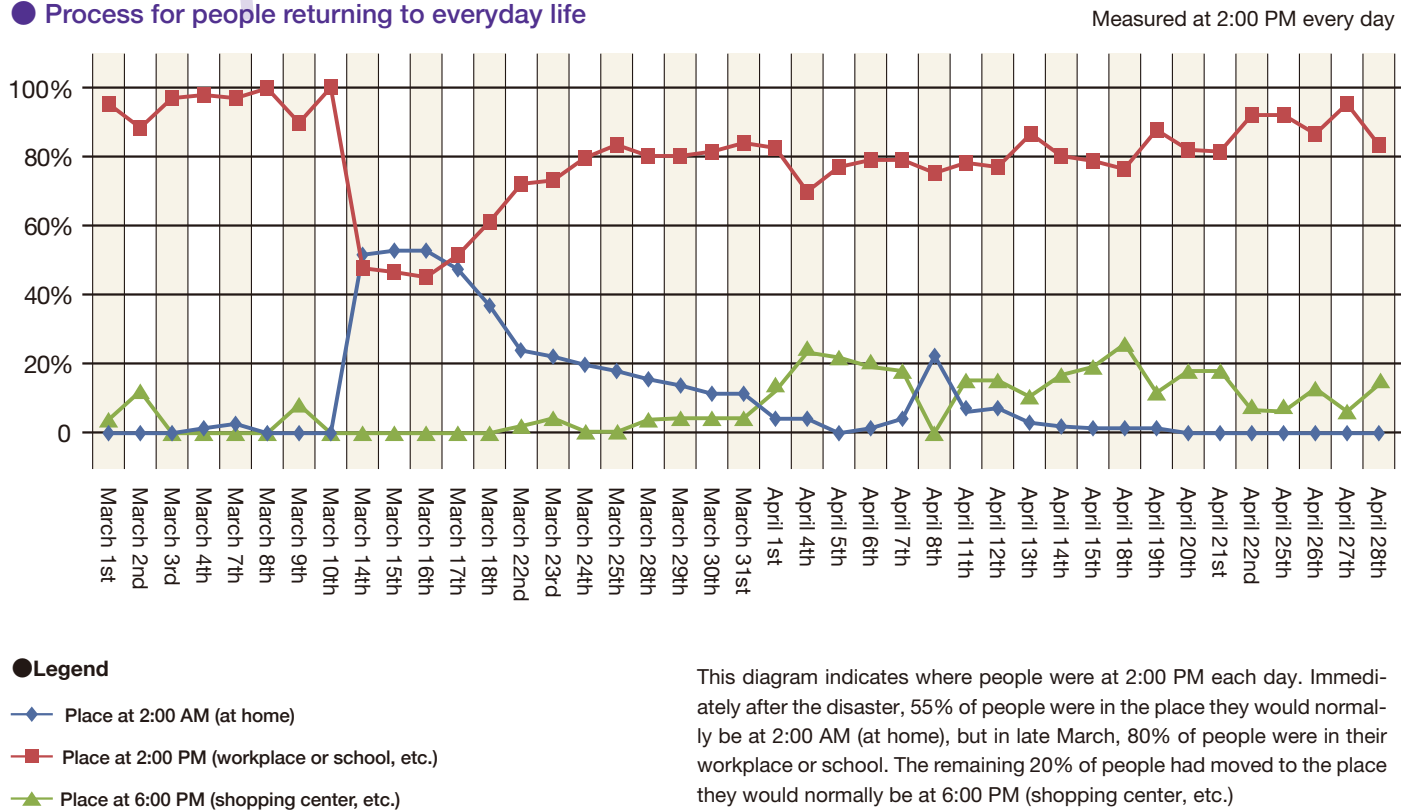
statistics. "Things that were unknown up until now can be understood using the power of statistics. Human beings are intrinsically mobile. Understanding their movements is an essential element of reconstruction after a disaster," says Prof. Okumura.

In recent years, "resilience" has come to attention as being important for societies to be able to handle disasters. That is, the ability of a society to not collapse after a disaster, and be able to flexibly recover. The research of Prof. Okumura holds important meaning for how such a society can be created.

Mapping human movements after the earthquake by time and area

Data related to research

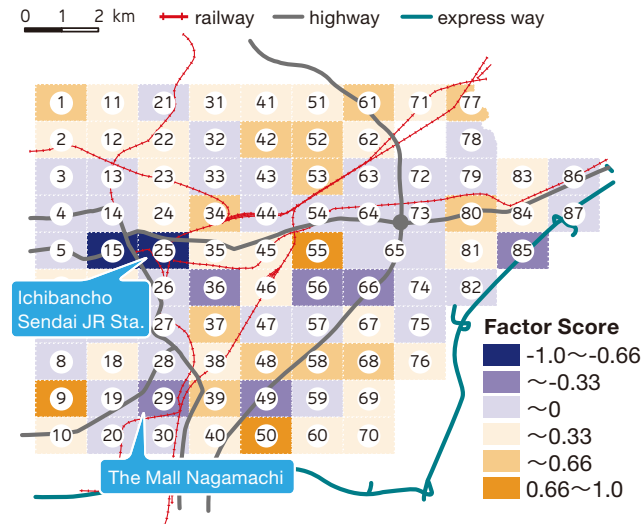
Process for people returning to everyday life



Data related to research

Spatial factor of suppressed activities in evening hours

Negative score values are found in shopping places such as Ichibancho, Sendai JR Station, and the Mall Nagamachi.



How do tsunami monuments and place names influence evacuations?

Research is also being conducted into short-term human movement during evacuations. This research was conducted in coordination with researchers in the field of sociology and it analyzed how forms of tradition related to tsunamis affect the movement of people.

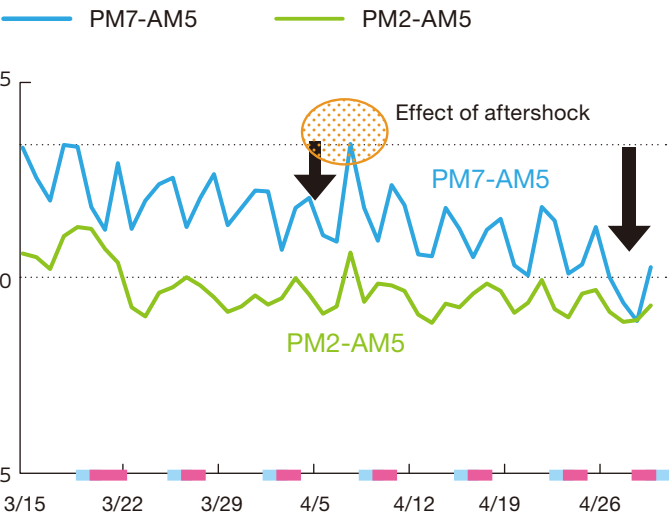
There are many local legends related to

tsunamis in the Tohoku region. Stone monuments built in areas reached by a tsunami and place names related to tsunamis such as "Namiwake and Funa-koshi" are examples.

This research analyzed the influence that stone monuments and place names had on the death rates of surrounding people. It found that death rates were lower in areas with names relating to tsunamis. "This enabled us to statistically ascertain the relationship between local legends and evacuation behaviors. I think this must be

Decrease of activities at the place they would normally be in the evening

Evening activities were recovered halfly in 3 weeks, and fully in 7 weeks.



the first research of its type in the world. Phenomena that last over a long period of time called "traditions" influence the evacuation behaviors of people. I believe that quantitatively proving something that was talked about empirically after earthquakes is a great achievement."

Accurately understanding human movements, from the evacuation immediately after an earthquake until the recovery years later, would be a basement for various kinds of research. There are high hopes for future research.

Associate Professor

Kazuhisa Goto

Hazard and Risk Evaluation Research Division
Science and Technology for Low-frequency Risk Evaluation



An associate professor in Science and Technology for Low-frequency Risk Evaluation at the Hazard and Risk Evaluation Research Division of IRiDeS. Specializes in geology. Graduated from the School of Science at the University of Tokyo, then went to the School of Engineering at Tohoku University and the Planetary Exploration Research Center at the Chiba Institute of Technology, before assuming his current position.

Geological surveys and tsunami boulders to identify the recurrence interval of tsunami hazard

The Great East Japan Earthquake caused an unexpected amount of damage.

However recent research has shown that tsunamis of the same scale have been striking the Tohoku region at regular intervals for a long time.

There have always been traces of this tsunami damage in the ground under our feet.

Certain geologists conduct persistent and steady effort research that involves digging up the ground to discover these traces and investigate them scientifically.

Transmitting the information inside the ground via academic surveying

The ground under our feet contains many traces of past hazards. Associate professor Kazuhisa Goto of Science and Technology for Low-frequency Risk Evaluation at the Hazard and Risk Evaluation Research Division works on uncovering the mysteries lying therein. His mission is estimating the history and scale of past tsunamis. Although he specializes in geology, he cooperates with researchers in fields such as tsunami engineering, history, and archaeology to conduct interdisciplinary research. "The planet Earth acts by a different cycle to us humans. It has various time scales, such as 100 million years, 10 thousand years, and 1 thousand years. Large earthquakes such as the Great East Japan Earthquake are part of this flow. In geology, things are thought about at quite a different speed to us humans," says Prof. Goto.

Even if this research advances, it cannot immediately contribute to the lives of people living in disaster areas. However, Prof. Goto says that is the very reason why he feels that it is important to transmit information. "Based on what someone knows and does not know, the readiness and attitude of that person

regarding disaster prevention and risk reduction is completely different. I believe that our role is widely conveying the knowledge and warnings we read from underneath the ground."

The recent research of Prof. Goto can be divided into three major categories. The first is surveying the erosion and sedimentation of the tsunami caused by the Great East Japan Earthquake. The second is analyzing the recurrence interval of huge low-frequency tsunamis in the Japanese archipelago, such as the Nankai trough, Okinawa, and Hokkaido. The third is researching tsunami boulders.



"Large Tsunamis: Warning from Geological Strata" book written by Prof. Goto published in May, 2014. (Nikkei Publishing Inc.)

Linking persistent and steady effort surveys with various other fields for more detailed scientific research

The surveys of Prof. Goto start when he goes out into the field. First of all, he must perform desk research using topographic maps, etc. to decide the site to survey. He uses heavy machinery, etc. to dig a hole to expose the layers of sand. "It depends on the location, but one meter of geological strata can contain 1,000 years of disaster history. I survey what kinds of mud and sand are in each stratum and then investigate the reason why they have accumulated in that location. It is detailed work, but it is also interesting."

For example, the sand layer after the Jogan tsunami in 869. Above the layer of fine sand deposited by the tsunami, there is a layer of volcanic ash deposited by the eruption of the Towada volcano in 915. "Since they occurred in similar time periods, I think it is necessary to scientifically investigate whether the earthquake caused the eruption. By researching the topography, we can investigate whether similar things occurred in different time periods." On the other hand, geology has its limits. For example, just because there are traces of a tsunami, this does not prove that an earthquake occurred. There are various causes of tsunamis other than earthquakes, such as undersea volcanic eruptions and

landslides, or the influence of a distant earthquake, such as was the case with the Chile earthquake and tsunami. Another limit of geology is that traces of recent tsunamis may have been removed by human activity, such as crop cultivation. "To prove that an earthquake has occurred, we must also investigate whether the ground has subsided or uplifted in addition to surveying the topography. For recent history, we must also read historical documents. In order to conduct research to scientifically identify the earthquake cycle, it is essential to link with other fields."

Researching tsunami boulders in Okinawa raises the possibility of identifying new earthquake cycles

Another thing that the professor is focusing on is research into tsunami boulders discovered in places such as Okinawa. "The first time I saw a tsunami boulder was when I visited Thailand to survey the Sumatra earthquake. When I saw the huge boulder as tall as a person, I thought that similar boulders may exist in Japan. After that I heard that there were tsunami boulders in Okinawa, so I went to visit Ishigaki Island." Prof. Goto says that he was at a loss for words when he saw the size of the tsunami boulders in Okinawa for the first time. It was

strange to see the sight of a huge boulder suddenly appearing in a beach. "It was thought that this tsunami boulder was from the 1771 tsunami that brought great damage to Ishigaki Island. However, dating revealed that not only was there a tsunami in 1771, but huge tsunamis were also repeating in the past."The tsunami boulder was clearly proven to be from the sea due to the coral and barnacle fossils attached to it. "The 1771 tsunami is a famous Okinawan tsunami, but I discovered that Okinawa was hit by earlier tsunamis. Although it is unclear whether those previous tsunamis were caused by earthquakes, this boulder is important for analyzing the recurrence interval of large low-frequency earthquakes around Okinawa."

There are 220 tons of tsunami boulders in Okinawa. In 2013, the tsunami boulders on Ishigaki Island were selected as national natural monuments.

Scientific analysis linking geological surveys with various other fields

Data related to research

● A tsunami boulder on Ishigaki Island



A tsunami boulder nine meters in diameter. The boulder is composed of *porites* coral, and dating result indicates that it surfaced due to the 1771 Tsunami.

● Geological surveying by boring



● Strata excavated on the Sendai plain

Methods such as boring are used to conduct surveys. Layers of sand, mud, and ash, etc. create patterns like a sandwich. This contains a record of the disasters over the past 1,000 and more years.

Researching tsunami boulders is the key to identifying the cycle of earthquakes

Tsunami boulders are a field that has not been researched much in the past. Groups of boulders are found along the coasts of Japan, but many of those except the coast of Okinawa where Prof. Goto was conducting his research remain unsurveyed. Tsunami boulders were also found here and there after the Great East Japan Earthquake, but most of these were removed as reconstruction proceeded. However as opposed to sand strata, the history of tsunami boulders can be identified as long as the boulders

themselves remain. Prof. Goto believes that these boulders will become an important clue for discovering the frequency of tsunami damage. Prof. Goto wants to survey the distribution of tsunami boulders along the pacific coast, where tsunamis often occur. "I also want to research how these boulders moved to calculate tsunami run-up with a numerical model. It is important to use a scientific approach that does not rely on estimates alone. I would like to develop technology that limits the scope of past earthquakes and tsunamis." There is one more thing that the professor found while surveying and researching tsunami boulders. Although boulders deposited by the high waves of typhoons

are found all over the Ryukyu archipelago, tsunami boulders were only found on the Sakishima islands. This hints at two important things for discovering the history of huge earthquakes and tsunamis along the Ryukyu Trench. The first is that tsunamis may have struck the Sakishima islands on a periodic basis. The dates of the tsunami boulders indicate that such tsunamis occur on a time span from 150 to 400 years. The second is that there is no trace of a large tsunami on the Okinawa islands or Amami islands. At least, they have not been hit by a large tsunami for about 2,300 years.

How to prepare for a large tsunami that strikes when people have forgotten

Five years have passed since the Great East Japan Earthquake. Although this seems like a long time for us, it is only a brief moment on the scale of planet Earth, says Prof. Goto. "I feel that we are still at the stage of gathering data to find out what happened in the Great East Japan Earthquake. We need to proceed with long-term research while approaching areas where a disaster may occur in the future." Prof. Goto says that based on earthquake and tsunami traces, there is a high risk of earthquake occurring in a near future along

the Kuril Trench or the Nankai Trough. "I do not know exactly when one will occur, but I can certainly say that they are within the earthquake interval. This does not mean that there is no risk to other areas." A feature of large low-frequency tsunamis is that they occur just when people have started to forget about them. After the Great East Japan Earthquake, Japanese people realized that we need to urgently reevaluate that risk. However, research into tsunami sedimentation on the coastal areas of the Nankai Trough, etc. is not being well performed, despite a future disaster being expected to occur."Our research group is conducting surveys of tsunami sedimentation in various areas along the Ryukyu Trench, Nankai Trough, and Kuril Trench to

estimate the history of past tsunamis and the scope of inundation. Although this research takes time, I want to utilize numerical calculation technology to reevaluate the risks based on the results of these surveys in order to provide topographical data and numeric calculation data for disaster risk reduction and prevention measures." Prof. Goto says that researching geology is like deciphering a huge ancient document. The ground below us is warning of the danger of earthquakes and tsunamis. Although it will take a long time, identifying the history of tsunamis is expected to achieve results.

Analyzing tsunami rocks to discover the earthquake cycle of Okinawa

Data related to research

Possible tsunami deposit in Rikuzentakata



The layer of sand sandwiched between black soil layers may have been deposited by a past tsunami.

Trace height survey of historical tsunamis using advanced GPS



For historical tsunamis, height surveys are conducted based on historical records in addition to geological surveys.

Huge boulders on Amami Oshima



These boulders are thought to have been deposited by high waves caused by past typhoons rather than tsunamis, and are expected to be able to be used to evaluate the strength of those typhoons.



“We are thankful for the close support we receive and look forward to continue working together in the future.”

Major example of links between Watari and IRIDeS

- Research related to tsunami evacuation simulations
- Cooperating with regional tsunami evacuation plan workshops
- Holding lectures on disaster risk reduction culture

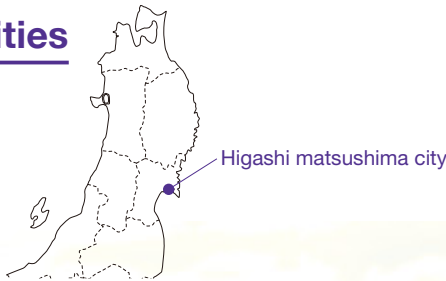
■For queries related to the case examples/collaborations, please contact IRIDeS at contact@irides.tohoku.ac.jp

Satellite office opened to strengthen links. Actively pursuing citizen participation.

"I have known the professors since before the earthquake, for many years now. I don't feel any barriers between us. I consider them to be our partners for thinking about the future of the city," says Mr. Yoshihiro Takahashi of the Kesennuma City Crisis Management Department, with a laugh. Researchers at Tohoku University first started visiting Kesennuma city at the time of the 1978 Miyagi Earthquake, which means almost 40 years of interaction. Immediately after the Great East Japan Earthquake, several groups visited Kesennuma to give advice on the initial handling of the disaster. After that, they participated in various projects such as evacuation training and community building. This built a

relationship where the city can ask advice from IRIDeS at any time. "We entered a comprehensive partnership in July 2013, which enabled us to clarify our relationship in written form. With the opening of our Kesennuma satellite office in October of the same year, I feel that we can communicate even more easily than before." IRIDeS conducts many efforts that involve citizen participation in Kesennuma. One of these is the formulation of an evacuation plan, which was conducted in areas such as Hashikami. First of all, IRIDeS conducted a workshop to discover a safe evacuation route with the local residents. The participants looked back on the earthquake and identified problems to create an evacuation plan that reflects local opinions. "At first professors proposed a framework for the workshop, and now we are running it ourselves. I think they proposed a great framework that enables citizens to participate."

Another ongoing effort is the holding of public lectures, which have been conducted nine times so far. IRIDeS holds lectures on various themes according to the status of reconstruction and local needs, such as people that need evacuation assistance, disaster history, and BCP. They are often attended by the general public, and seem to help increase awareness of disaster risk reduction. "City employees do not have clear background data, even if they have experience. I am extremely grateful that professors in various fields can provide us with advice based on specialist knowledge. I feel relieved when a professor comes during difficult times. With the increasing speed of reconstruction, I hope that we can strengthen our links even further," says Mr. Takahashi. IRIDeS will continue to deepen its practical research together with the local community.



Tohoku University International
Research Institute of Disaster Science
“Michinoku/Ima wo tsutaetai”

Officer in charge
of Higashimatsushima

Shigeo Oishi

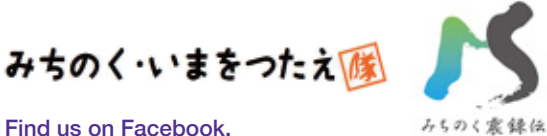


"I will continue to preserve people's memories
and the history of reconstruction."

Michinoku/Ima wo tsutaetai

This team works to collect various kinds of regional information to keep and convey, including records and evidence of the areas struck by the Great East Japan Earthquake, current lives of residents, and their thoughts and hopes for the future. It is currently active in 15 cities and towns on the coast of Miyagi prefecture. The team is made up of residents from the various regions, which are openly recruited. The activities of the team are part of the “Michinoku Shinrokuden” archive project of IRIDeS.

- Michinoku Shinrokuden <http://shinrokuden.irides.tohoku.ac.jp/>



Find us on Facebook.

- Michinoku Ima wo tsutaetai <https://www.facebook.com/imawo.tsutaetai>
- Michinoku Shinrokuden Earthquake Archive <https://www.facebook.com/MichinokuShinrokuden>

"When I started conducting interviews, this area was still a mountain of rubble. There were piles of broken down cars and there were even boats at the side of the road." Reflects Mr. Oishi, who is in charge of Higashimatsushima city for "Michinoku/Ima wo tsutaetai."

"Everyone's experiences were so painful that I was often left speechless. The hardest thing was listening to these stories objectively."

Mr. Oishi was born in Tagajo city. At the time, he was not familiar with Higashimatsushima, and would talk to people on the streets and refer to public magazines released by the city when searching for people to interview. "Since I used to work in sales, I did not have a problem with talking to people, but it got more and more difficult. It made me feel like I had experienced those things myself, and at times I couldn't actively conduct my interviews." What helped him during these times was the people of

Higashimatsushima. "Everyone gets along very well, and they warmly welcome outsiders such as myself. That kindness really helped me out."

At the moment, Mr. Oishi is concerned about the future of the town. Most of the areas in Higashimatsushima city that were affected by the disaster cannot have housing rebuilt. A major challenge is rebuilding the communities that link the various people living there, such as those subjected to mass relocation, those that rebuilt on their own, and those living in public housing. "Due to the closing down and relocation of schools, it is impossible to return everything back to the way it was. Many people are pleased with good news such as the opening of the Senseki line and the construction of elevated ground, but there are still many others who tell of their unease and discomfort. I want to keep watching to see how the new town

evolves."

Mr. Oishi conducted interviews with approximately 70 households during the period from November 2011 to December 2015. He also periodically takes photos and continues to conduct fixed-point observation. "This place will continue to change in a major way. I hope that the interviews and photos I am recording will help people look back on the past." With the changing state of the town and the dimming of memories, archiving will become even more important. The activities conducted by Mr. Oishi will continue in order to link the past of Higashimatsushima with its future.

Information Transmitted by IRIDeS

The institute holds periodic meetings for the purpose of transmitting information and achieving cooperation and integration.

1 Expanded general meeting

●IRIDeS Now

Shares information inside IRIDeS.

●Information on the IRIDeS Friday Forum

Shares information on the content of research activities.

●Great East Japan Earthquake Watcher

Follows the various activities in disaster sites and inside and outside of Japan, and social movements.

2 IRIDeS Friday Forum

This forum is held on the evening of the 4th Friday of each month as a place for periodic announcements and discussions for the purpose of sharing information related to the research and other activities conducted at IRIDeS and to foster cooperation and integration in research. For details, see the website (<http://irides.tohoku.ac.jp/event/irides-forum.html>).

Information is also published on the IRIDeS website.

●Activity announcements <http://www.irides.tohoku.ac.jp/topics/index.html>

●Future plans <http://shinrokuden.irides.tohoku.ac.jp/>

**Evolving disaster prevention and reduction.
Creating a society prepared for
large-scale disasters.**



Name: IRIDeS

Symbolizes the Iris sanguinea, Iris laevigata, and Iris ensata, as well as hope and nobility

Meaning of the logo: Reverses the Chinese character for "disaster", to symbolize the determination for overcoming disasters by promoting recovery and reconstruction, and creating a society that can intelligently handle disasters. The key color of the institute is the color of the Iris sanguinea, and comes from the logo of Tohoku University. This flower symbolizes hope and nobility.

IRIDeS Report 04

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