Special issue for the second anniversary of the opening of the NIES Fukushima Branch

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Special feature for the second anniversary of the opening of the NIES Fukushima Branch

# What Miharu Town expects from the NIES Fukushima Branch


Interview with

## Yoshinori Suzuki,

Mayor of Miharu Town

Profile

Born in Miharu Town in 1939. After serving as a member of the Miharu Town Council, he took office as the mayor in 2003. His mottos are "a fair field and no favor," and "Endurance makes you stronger."

Fukushima Prefectural Centre for Environmental Creation with the NIES Fukushima Branch is located in Miharu Town. Two years after the Fukushima Branch's opening, we interviewed Yoshinori Suzuki, the mayor of Miharu Town about the future of the town and our Fukushima Branch.

### From the time of the Great East Japan Earthquake (GEJE) until the launch of the Miharu Misho Project in Miharu Town

**—— What was the situation in Miharu Town like at the time of the Great East Japan Earthquake (GEJE)?**

**Mayor Suzuki** I had never imagined that such a disaster would occur in the Tohoku region. Fortunately, Miharu Town had little damage from the earthquake, and we were able to accept refugees from the second or third day after the disaster. What was more problematic, however, was radioactive contamination due to the Fukushima Nuclear Accident. At that time, we, including town officials, didn't know much about radioactivity or radioactive substances, and thus we were not exactly sure what to do. Anxious town residents fled far away because they didn't know how much radioactive substances were in the air.

One of the town residents, a former teacher, had a radiation measuring instrument, and provided us with the data obtained by the instrument. An official who evacuated from Okuma town had been in charge of work related to nuclear power for 20 years. Using the Internet, he investigated how the experts around the world judged the situation, and provided us with information every day. While doing this, we found ourselves obliged to collect solid data. So together with Akutagawa Prize-winning author Genyu Soukyu and professors at Tohoku University, we set up the Miharu Misho Project, and started measuring radiation. In the project, we conducted activities such as measuring the radiation dose on the playing fields of kindergartens, nursery schools, and elementary and junior high schools in the town with the instruments we possessed.

Soil contamination survey of elementary and junior high schools in the town by researchers at Tohoku University
(photo: courtesy of the Miharu Town Office)

The inaugural meeting of the Miharu Misho Project
(photo: courtesy of the Miharu Town Office)

In the Miharu Misho Project, dosimeters were distributed to elementary and junior high school students in the town.
(photo: courtesy of the Miharu Town Office)

## A sense of security due to the proximity of the research facility

**——Two years have passed since the Fukushima Prefectural Centre for Environmental Creation in Miharu Town went into full-scale operation. Please let us know if there is any memorable work of the Centre.**

**Mayor Suzuki** Before the location of the Fukushima Prefectural Centre for Environmental Creation had been decided, I heard that the Centre was mainly to develop technologies for decontamination of radioactive substances. Since there was unoccupied space in the Tamura West Industrial Park in our town, I submitted a request to the then-governor to build the Centre there. Consequently, the Centre was established in the Industrial Park close to the town residents, creating a strong sense of security among us. It is most wonderful that research information can be sent from this familiar Centre to our area, prefecture, and everywhere in and outside Japan. I feel even more secure in knowing that the Centre conducts not only the decontamination research but also a wide range of research on the environment since the environment is the most important resource for life.

## This is not just about Fukushima

**——Is there anything that you feel about what your residents are concerned about or the information they require while having contact with them every day?**

**Mayor Suzuki** Here there is nothing specific about radioactivity to tell the town residents today. Regarding residential areas, etc., decontamination works have been completed, and the removed soil and waste have been securely stored in temporary storage sites. Additionally, we regularly measure the radiation doses around the temporary storage sites, and make the results available to the public.

We also provided land lots for temporary housing units upon request from evacuees whom we accepted. Miharu Town is convenient for shopping, has medical facilities, and is close to Koriyama City. I'm confident that they came to think after a while, "Miharu is a nice town," or "I wasn't aware that Miharu is such a convenient place to live." Hoping to live in Miharu Town in the future, a large number of evacuees bought land to build their houses here. Upon request, we also constructed restoration public housing in two districts in the town. Evacuees have built a good relationship with local residents through exchanges in senior citizens' clubs and women's associations. Some evacuees might go back to Katsurao Village or Tomioka Town where they come from, even if they now live in the restoration public housing. I think, however, there are others who will settle down in our town. The reconstruction is far from finished. Looking at the evacuees, however, I feel that things are calming down.

Restoration public housing was constructed in Egenokoshi and Hirasawa districts in Miharu Town.

The three lion dance that has been handed down in Katsurao village was performed in Miharu Jidai Gyoretsu (a procession of people in historical costumes)
(photo: courtesy of the Miharu Town Office)


Grand opening commemoration ceremony of the Fukushima Prefectural Centre for Environmental Creation

NIES public lecture for Miharu held in January, 2018

And then, when the decontamination waste in temporary storage sites is gotten rid of, I think, further reconstruction will progress. However, what I am worrying about the most is the future of decommissioning of the nuclear power plant. If radioactive substances are scattered into the surrounding environment again during the decommissioning work, the situation could return to the starting point, couldn't it?

I sometimes wonder that throughout Japan as a whole, the Fukushima Nuclear Accident is regarded as an issue only for Fukushima. Since Japan is said to be the most earthquake-prone country, we should realize that nuclear power plants everywhere in Japan have similar challenges. In addition to disposal costs, decontamination costs, compensation, and problems of the Interim Storage Facility (ISF) and transportation to the ISF in the days ahead, it is said that the decommissioning work takes 30 to 40 years, spending enormous amounts of money. In order to prevent this kind of accident from occurring again somewhere in Japan, we must not forget the lessons from the Accident by regarding it as an issue that only concerns Fukushima.

## Expectations for information dissemination from the area to the world

**——Please let us know what you expect from the NIES going forward based on the collaborative work with us up to this point.**


"Fukushima Prefectural Centre for Environmental Creation News" published in "News Miharu"

**Mayor Suzuki** A column "Let's take a look at the ongoing research!" in the "Fukushima Prefectural Centre for Environmental Creation News" published in the "News Miharu" is a meaningful opportunity for the town residents to know the results of your research. I want this column to continue and I believe the residents have large expectations for the research.

Also, I would like you to hold a NIES public lecture when a certain degree of progress is made. In Miharu Town, we regularly hold a meeting between the administration and residents. For this meeting, the personnel responsible proposes a topic which a resident group or organization wants to listen to. It is an opportunity for us to share town information with residents. Since I have always thought that provision of technical knowledge is also necessary in this kind of community building activity between the administration and residents, I would appreciate it if you could provide consultations and guidance, making the most of the opportunity of this meeting.

I would like you to disseminate the research results not only within the prefecture but also nationwide, especially, to the municipalities where nuclear power plants are located. Well, actually, it may be better to announce it to the world. Since this research should continue for a considerably long time, I would like to see you continue working hard.

Thank you for your valuable opportunity!

ShibuShibu-kun's advice!

# What is the Multimedia Environmental Dynamic Model?

**Yoshitaka Imaizumi, Senior Researcher, Strategic Risk Management Research Section, Center for Health and Environmental Risk Research; (concurrently) Environmental Impact Assessment Section, Fukushima Branch**

## To Understand and Predict the Movement of Chemicals in the Environment

Chemicals released into the environment move into and through air, water, soil, river sediment and many other environmental compartments, which are called "media." Chemicals released into air, for example, show various movements or behaviors. They may fall onto the ground, adhering to air particles; dissolve in rain, and then enter into rivers, or may get deposited with river sediments. Or they may enter into organisms, and eventually into human bodies when consumed as food. The Multimedia Environmental Dynamic Model is a computer-based system that analyzes and mathematically calculates the movements of the target substance in and between different media.

Each chemical has its own properties. Some are volatile; others are decomposable. Some stay in the air longer; others stay in mud. Some are easily absorbed or ingested by organisms. Using the Multimedia Environmental Dynamic Model, when the properties of the target chemical and the media into which that chemical enters are given, we can predict how much of the chemical may move or stay in the environment and for how long. In other words, we can predict "the fate" of the substance.

When there is already a specific medium to be focused upon, we may use an environmental dynamic model designed for that particular medium. There is a variety of environmental dynamic models around. Depending on the properties of the target chemical, types of media, and types of scenario, we will be choosing an appropriate model to get to a solution.

## G-CIEMS: A Multimedia Environmental Dynamic Model

We have developed a multimedia environmental dynamic model named G-CIEMS, and have made it publicly available.[1] Using this model, we can predict the dynamic states of chemical substances throughout Japan. In the model, the Class A and B rivers are divided into 38,000 segments (we call them river segments). Data created from networking these river segments are used for calculation. Other than primary river flow, incorporating flow from lakes and marshes, analyzing watercourses during rain events based on the elevation data and computerizing geographic information of catchment areas, we get the model completed to determine the movements of chemical substances at ground level. To find out the movements and advective transport of chemical substances in air, we divide air into lattices. Dividing each medium this way into grids or lattices and calculating the movements of chemical substances, we can get a whole picture of movements and spatial distribution of chemical substances.

## To Predict the Movement of Radioactive Substance

Using this model, we have calculated the movements and behaviors of radiocesium in land areas (soil surface, rivers, lakes and reservoirs). The fallout of radiocesium in forested areas, however, is known for its highly migratory and mobile nature during heavy rains. The multimedia environmental dynamic model, being designed for calculation of the movements of chemical substances in an average state of the environment, is not good at simulating short term events lasting a few hours, such as rain. Currently, rather than in the overall radiocesium, the interest is growing in the radiocesium dissolved in water, which is easily taken up by organisms. We will continue our study to be able to address this kind of issue as well.

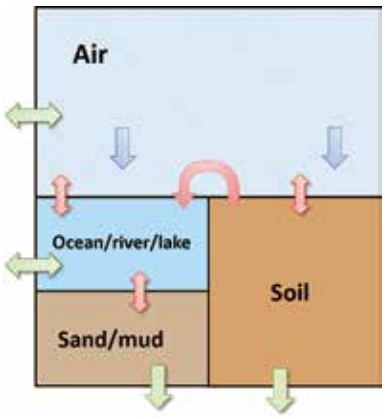



Figure 1: Movements of Chemicals in the Multimedia Environment

## Reference

(1) Suzuki N., Murasawa K., Sakurai T., Nansai K., Matsuhashi K., Moriguchi Y., Tanabe K., Nakasugi O., Morita M. (2004) Geo-referenced multimedia environmental fate model (G-CIEMS): Model formulation and comparison to the generic model and monitoring approaches. Environmental Science & Technology 38(21):5682-5693.

# Creation of A Community Hub Friendly to the Environment

**Takuya Togawa, Researcher, Regional Environmental Renovation Section, NIES Fukushima Branch**

## From Restoration to Revitalization

Seven years have passed since the Great East Japan Earthquake (GEJE). While the issues relating to disaster recovery and environmental restoration still remain in various places in Fukushima Prefecture, efforts related to the revitalization of a region with a view toward the future are beginning to take place. In particular, efforts on renewable energy in Fukushima Prefecture are top-class nationwide, and they are actively being introduced in areas where post-disaster recovery of communities is taking place. Also, unlike the time immediately after the earthquake, there have recently been many efforts to plan and commercialize energy systems mainly by local actors.

## Efforts in Mishima Town, Fukushima Prefecture

Here, I would like to introduce research that supports the creation of an environmentally-friendly community hub using renewable energy in Mishima Town. (Mishima Town and the National Institute for Environmental Studies have concluded an agreement on comprehensive cooperation in FY2017.) A challenge for Mishima Town, with 84% of its area covered with forests, has been to effectively use wood resources as energy and to connect that effort to the promotion of the area. Currently, the use is limited to pellet stoves and wood stoves, etc. in some public facilities and houses. Thus, we are studying the feasibility of introducing an energy system (Fig. 1) utilizing co-generation equipment that can generate electricity and heat from biomass and supplying them to facilities and houses. The following shows how this study is to be carried out:

・**Field survey:** At first, we carry out a survey on regional issues and needs in cooperation with the administration, local companies, residents and others. We hold regular meetings with local government officials in particular. Also, since networking is important, we held a symposium to let people know about the initiatives of the National Institute for Environmental Studies. After these events, we came to realize that in the local area, based on past experience, there is a high demand for an energy system that can be operated even in the event of a disaster.

・**Study on innovative examples:** We investigate other areas where advanced systems have already been introduced. It is unclear whether biomass cogeneration can be utilized in Japan's climate and social system, because the technology of biomass cogeneration that we are focusing on this time is from overseas. Last year we visited the facilities in Akita Prefecture and discussed the issue with the stakeholders. We gained actual insights on fuel usage conditions, maintenance methods, etc. which we were unable to know through the catalogue alone.

・**Examination of the effect of introduction of a regional energy system:** We design an energy system by combining component technologies based on the state of resource allocation and demand of the area. The economic point of view is important, but in addition to that, we will finalize the system design from a comprehensive point of view, including $CO_2$ emissions, whether it can be used even in the event of a disaster, whether employment can be created in the area, and so on. Even with the current proposal, great environmental benefits can be expected, such as reducing $CO_2$ by about 60%.

・**Support for feasibility study and commercialization:** We examine feasibility of this system as an actual project and the organizational composition of business entities. In addition, it is also essential to coordinate with the comprehensive plan of local governments and the direction of the plans of the country/prefecture. For example, since it is necessary to secure a certain energy demand to introduce regional energy systems, it needs to consider the supply area linked with urban planning, such as arrangement of facilities.

・**Summary of results and dissemination of information:** We present the results of the study as academic reports and academic papers so as to disseminate information widely. In doing so, we review not only one case but also examine results from the viewpoint of organizing conditions and issues so that it can be introduced in various areas. We are conducting research to deepen the knowledge gained from actual events in the area through academic discussions and to make use of the results for the revitalization of the area.

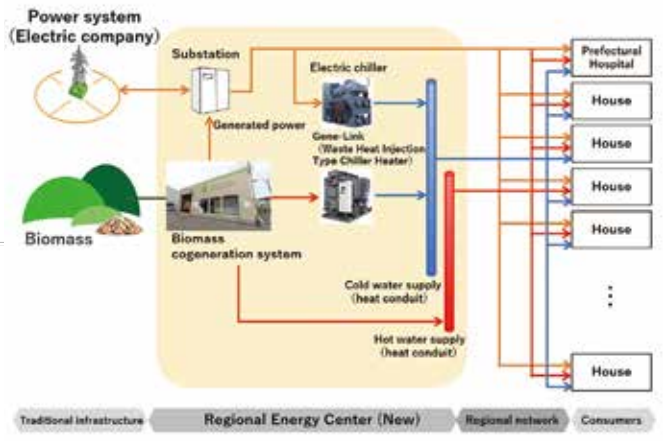



Figure 1 : Overview of Regional Energy System

## Reference

(1) Togawa T., YI D., Oba M., Nemoto K., Nakamura S., Fujii M. (2017), Design and Standards for the Introduction of Decentralized Energy System in Hilly Rural Areas, Journal of Japan Soc. of Civil Engineers, G (Environment), 73 (5). (in Japanese)

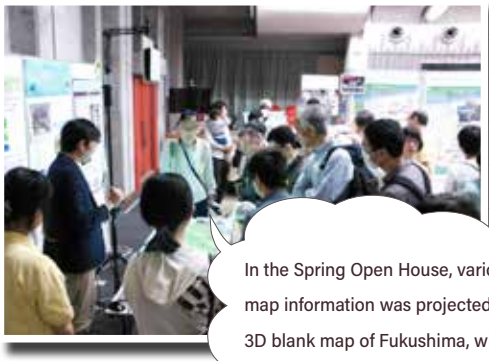
NIES Fukushima Branch

# Recent events

## April

**Apr. 3** 11 members of the Fukushima Council to Consider the Problem of Radioactive Waste Incineration visited NIES Fukushima Branch.

**Apr. 21** Spring Open House was held at the NIES' Tsukuba headquarters. The feature exhibition was on disaster related environmental research.



In the Spring Open House, various map information was projected on the 3D blank map of Fukushima, which gained the attention of many people.

## May

**May 15** A Ukrainian government delegation (18 members) toured our facility.

The Ukrainian government delegation toured our facility.

**May 22** Seven members of Toso Real Estate Company toured our facility.

**May 24** Takashi Tsuji, researcher, and Ryo Tajima, senior researcher, made presentations at the NIES Fukushima Branch Seminar.

Presentations on the involvement with municipalities were made at the NIES Fukushima Branch Seminar.

**From April to May, six researchers and staff joined us!**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ACCESS MAP


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