

Safety Response to The Great East Japan Earthquake

–at School of Engineering, Tohoku University–

**P. Gaubert, A. Funayama and H. Moriya
(School of Engineering, Tohoku University)**

Multi-hazards - Mega Earthquake, Mega Tsunami and Nuclear Power Plant Accident

When did it happen?

March 11, 2011, at 14:46,

Where did it occur?

Epicenter area was located off the coast from Iwate to Ibaraki.

What happened?

Earthquake of magnitude 9.0

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Massive tsunami hit a wide area along the coast of the Pacific Ocean extending from Aomori to Chiba Prefectures (wave-height exceeding 40 m in some places). Tsunami caused devastating damage to coastal areas.

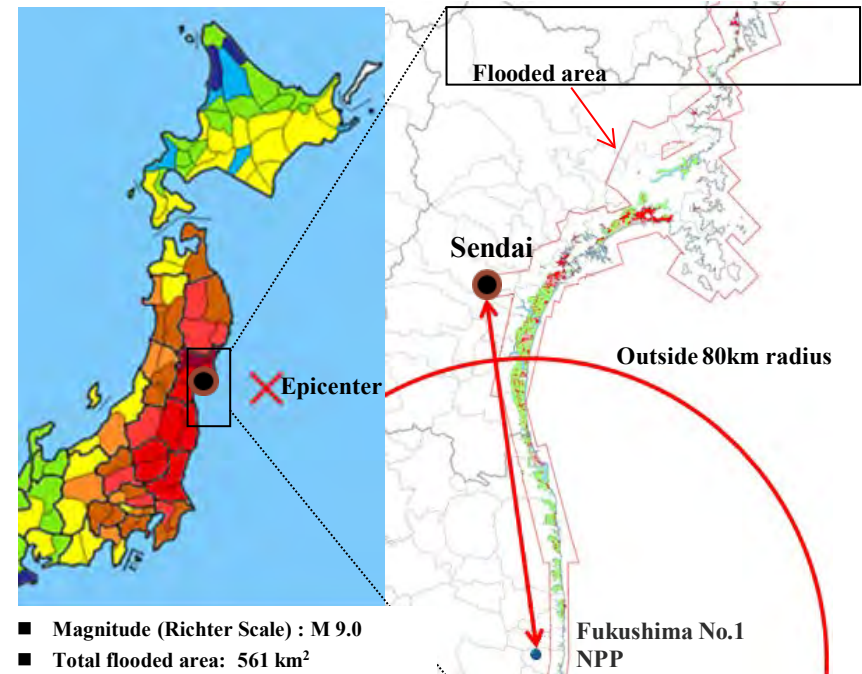
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In Fukushima, a nuclear power plant was destroyed by the earthquake and tsunami, cutting off the external power source and resulting in the failure of the cooling system. This eventually led to the meltdown of a number of reactors.

To what extend?

15,870 deaths (2,814 people still listed as missing)

394,356 buildings completely or partially destroyed



In Fukushima Prefecture, a nuclear power plant was hit by the tsunami, magnifying the disaster.



The disaster-affected areas have taken steps slowly toward recovery, Sep 15, 2012.

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Research and Education Organization. 4 Schools and 5 Institutes in Engineering Group

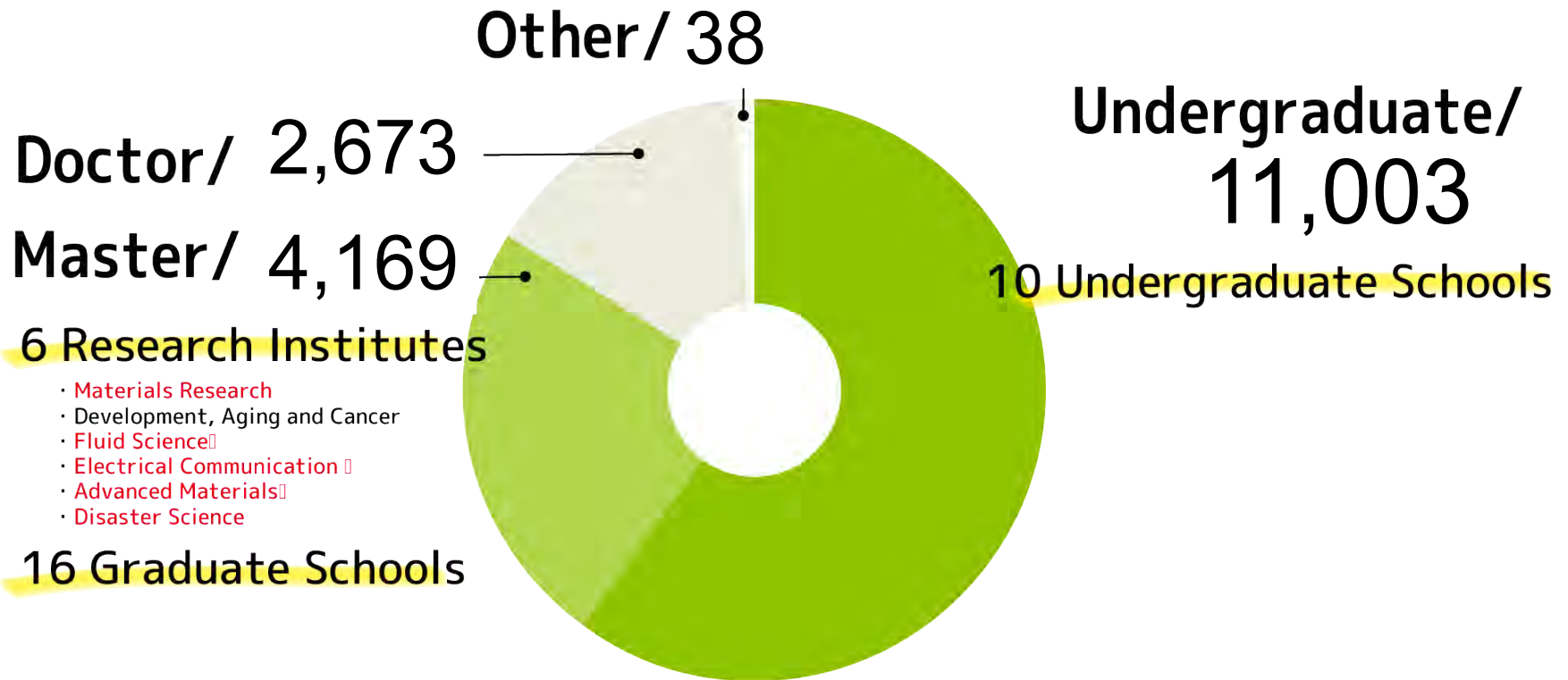


東北大学

平成24年5月1日現在



The Number of Students



6 Research Institutes

- Materials Research
- Development, Aging and Cancer
- Fluid Science
- Electrical Communication
- Advanced Materials
- Disaster Science

16 Graduate Schools

Graduate Students: **39 %**

Engineering: **30 %**

Total: 17,883 Students
(Including 1,533 international Students)

Altitude: 150m



**Dormitory
(2km NE)**

Downtown
→

Campus for School of Engineering

Situation before the earthquake

Most students were not in the campus.

1. Undergraduate(below 3 grade) → Spring vacation
2. Undergraduate(4th grade)
→ Just after submission of thesis
3. Graduate students
→ After submission of thesis and most of students were engaged in research works.
4. International students (1,600) and researchers
→ Most of graduate students and researchers were engaged in research works
5. Exchange students → Spring vacation

Earthquake hits Sendai city

2:46pm Earthquake occurred

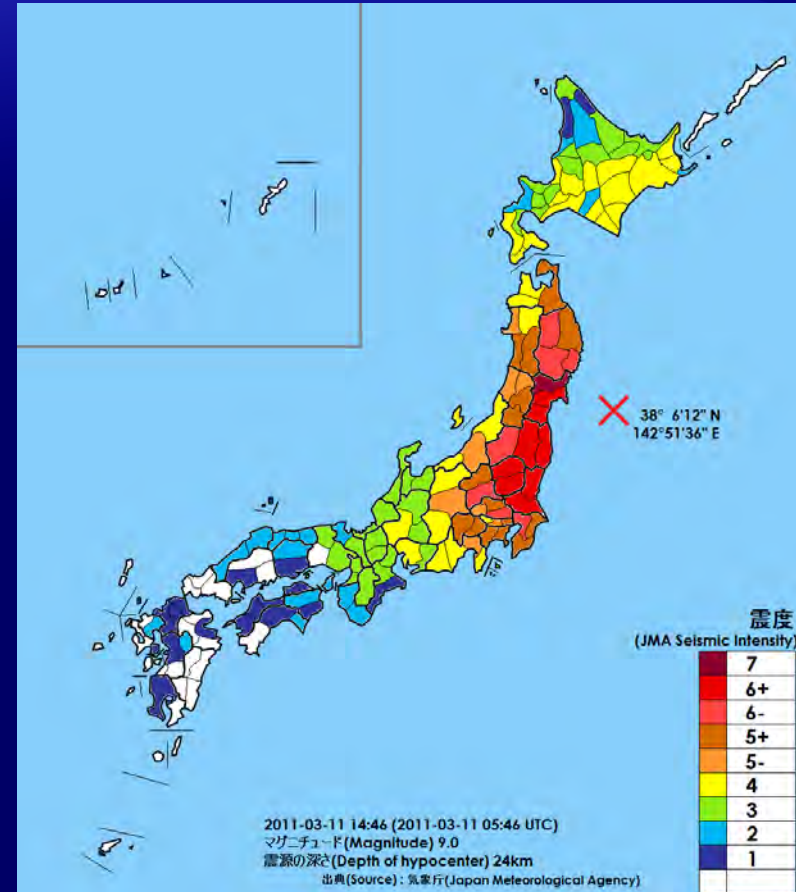
(Magnitude 9.0, intensity = 6+)

- **Swaying just after early warning email.
Shaking started and electricity failed.
Shaking continued for 4 minutes.**



Our action and conditions

- **Excavation to safer places after the swaying**
- **Communication by mobile phone defected.**
- **Getting information using radio and mobile TV.**



After the earthquake

- March 11** **Opening of excavation place**
Starting safety check
(using Safety confirmation system, etc.)
- March 14** **Opening headquarter for disaster control**
Opening Help desk for international students
arriving of relief supplies from other universities
- March 30** **Safety confirmation completion**
(staff and all students)
- April 18** **It had confirmed that 82% of international**
students excavated to home countries.
- May 1** **1,532 international students (92%) returned**
to Tohoku University.



Action of international students

- **Students in campus**
 - excavated with Japanese teachers and students to safer places in the campus
- **University houses**
 - excavated to elementary school (public excavation area)
- **March 13**
 - Indonesian students left Sendai by charter bus (managed by embassy)
- **March 15**
 - Chinese students left Sendai by charter bus (managed by embassy)



Special help desk

The consulting desk for international students was prepared at the same time of establishment of the headquarter for disaster control.

Desk for international students

- ✓ **Extension of certificate of eligibility**
- ✓ **Re-entry permission**
- ✓ **Signature for receiving scholarship**
- ✓ **Gathering information from immigration office and uploading the information to WEB site such as extension of procedures of VISA, etc..**

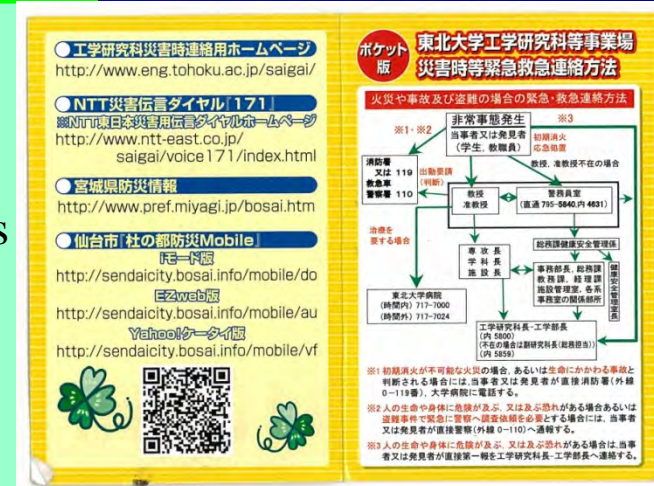
We also used website, e-mail, etc. to provide the information to students.



Disaster prevention activity (School of Engineering)

Before

1. Distribution of manual for disasters
 - Contact network list, etc.
2. Distribution of helmet for all the staff and students
3. Distribution of pocket card for disasters
4. Preparation of foods, water, blankets, etc.
5. Disaster drill
 - Twice per year
6. Operation of Safety confirmation system accessible from mobile phone



Pocket card for disaster

After

Informing Safety confirmation system
at orientation for international students

Food and water storage

Disaster drill



Helmet for students
and staff

Pocket card for disaster

URL for
safety
confirmation

V About Safety Confirmation System

① Safety Confirmation System checks the safety of the students and staff and contacts in an emergency to support the students and teacher/staff when a disaster (earthquake, flood damage, heavy snow, etc.) occurs using a cellular phone and/or PC.

② For various procedures, such as to register your email address with the Safety Confirmation System, and change your registered information, please go to the following URL or use the QR code.

- Cellular phone <http://www.anpi.tohoku.ac.jp/anpi/mobile.jsp>
- PC <https://www.anpi.tohoku.ac.jp/anpi>

[How to register]

① Access from the URL or QR Code.

② Log in with your Tohoku University ID and password.

*If your cellular phone supports SSL protocol, please log in "For SSL communication (https)".

③ Register your E-mail address, family's E-mail address, etc.



Safety Confirmation System

VI Disaster prevention information

● Tohoku University Website

<http://www.tohoku.ac.jp/>

● Sendai "City of Trees Disaster Prevention Mobile" (Japanese text only)

iMode Version:

<http://sendaicity.bosai.info/mobile/do/>

Ezweb Version:

<http://sendaicity.bosai.info/mobile/au/>

Yahoo! Cellular Phone Version:

<http://sendaicity.bosai.info/mobile/vf/>

● NTT Disaster Emergency Message Dial

"171"

http://www.ntt-east.co.jp/saigai_e/voice171/index.html



Sendai
"City of Trees Disaster
Prevention Mobile"

Tel no.

Tohoku University Emergency Countermeasures

I Communications in an emergency, fire, and accident in the university

If there is no time to lose

Fire/Ambulance 119
Police 110

Emergencies
If you are injured or discover any damage

Your teacher or superior

*Write the telephone number.

Security Offices

- Katahira	North Gate	022-217-4935
- Kawauchi	Kita Campus	022-795-7577
	Minami Campus	022-795-6271
- Aobayama	School of Engineering	022-795-5840
	Faculty of Science	022-795-6360
- Seiryō	Tohoku University Hospital	022-717-7011
	School of Medicine	022-717-8020
- Amamiya		022-717-8630
- Divisions other than the above		-

(*Write the telephone number.) *Contact a nearby Security Office.

Health Administration Center 022-795-7829

① If you are injured or discover any damage, and there is no time to lose (when initial fire extinguishing is impossible, in a major accident, when it is judged that it is a more urgent situation) you should promptly dial 119 or 110.

② If you are injured or discover any damage, you should ask those around you to help, (dial 119, 110, and the Security Office,) and take emergency measures or make initial fire extinguishing efforts.

③ Contact a Security Office or other office.

④ Report the situation and the circumstances to your teacher or superior even if after the event.

Tohoku University Safety Confirmation System

(1) Registering e-mail addresses

This system contacts all users by email, so you need only register your e-mail address to receive messages from the university. You can register via the Student Affairs Information System (students) or Integrated Electronic Authentication System (staff).

*Your address for the Digital Campus Mail (DC Mail, implemented October 2014) will already be registered in the Safety Confirmation System

Students: How to register via the Student Affairs Information System

Safety confirmation messages will be sent to the addresses you enter in "E-mail address 1" and "Forwarding address."

The image displays two screenshots of the Tohoku University Student Affairs Information System. The top screenshot shows the main menu with 'Student Services' highlighted. A red arrow points from 'Student Services' to 'New Application'. The bottom screenshot shows the 'New Application' page with a red box around 'Change Student Information (学生情報変更届)'. A red arrow points from this box to the 'E-mail address 1' field in the 'Student Information Change' form. The form also includes fields for 'Domicile' (Miyagi), 'Email address 1', and 'Email address 2'. A red box highlights the 'E-mail address 1' field. A red arrow points from the 'E-mail address 1' field to the 'Student Services (学生支援) tab' in the bottom right corner. The bottom right corner also shows the 'New Application (新規申請) menu' and 'Change Student Information (学生情報変更届)'.

Student Services

New Application

E-mail address 1

Student Information Change

Change Student Information (学生情報変更届)

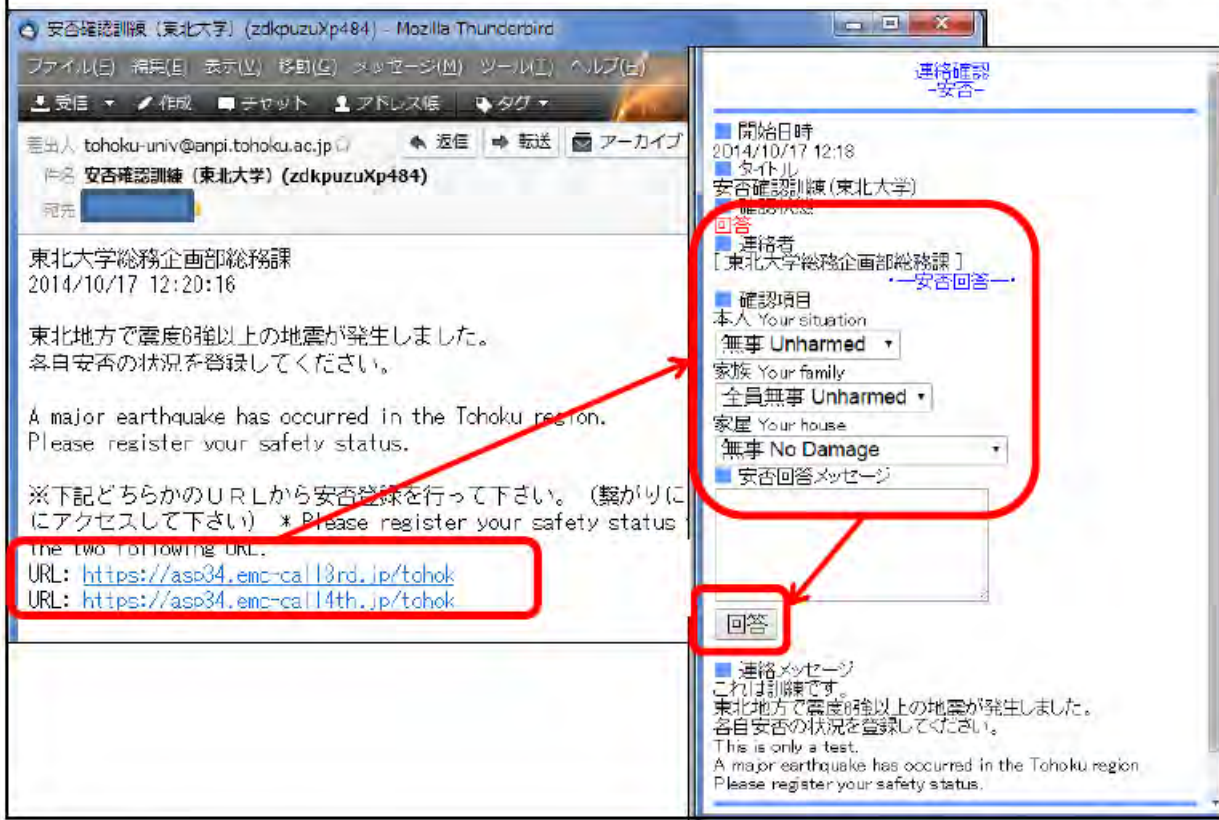
Student Services (学生支援) tab

New Application (新規申請) menu

Change Student Information (学生情報変更届)

Tohoku University Safety Confirmation System

(2) How to respond to e-mailed safety confirmation messages (example)



Click URL in the message's text.

↓
Select responses for each item.

↓
Click the Respond (回答) button.

**Safety confirmation
response is complete**

Basic operations also same for
mobile/smart phones.
You can respond through the official app
too.

(3) Other

1. The sender's address will appear as tohoku-univ@anpi.tohoku.ac.jp
Adjust your mail settings so you can receive messages from this domain.
2. If you receive no messages:
 - Is your in-box full? → Free some space in your in-box.
 - Is the message still on the mail server? → Run "Check for new messages" etc. on your mail client.
 - Do you have a mail filter? → Add the domain to your filter's whitelist.

Food testing



Newly developed
non destructive and
very fast radioactive
testing equipment

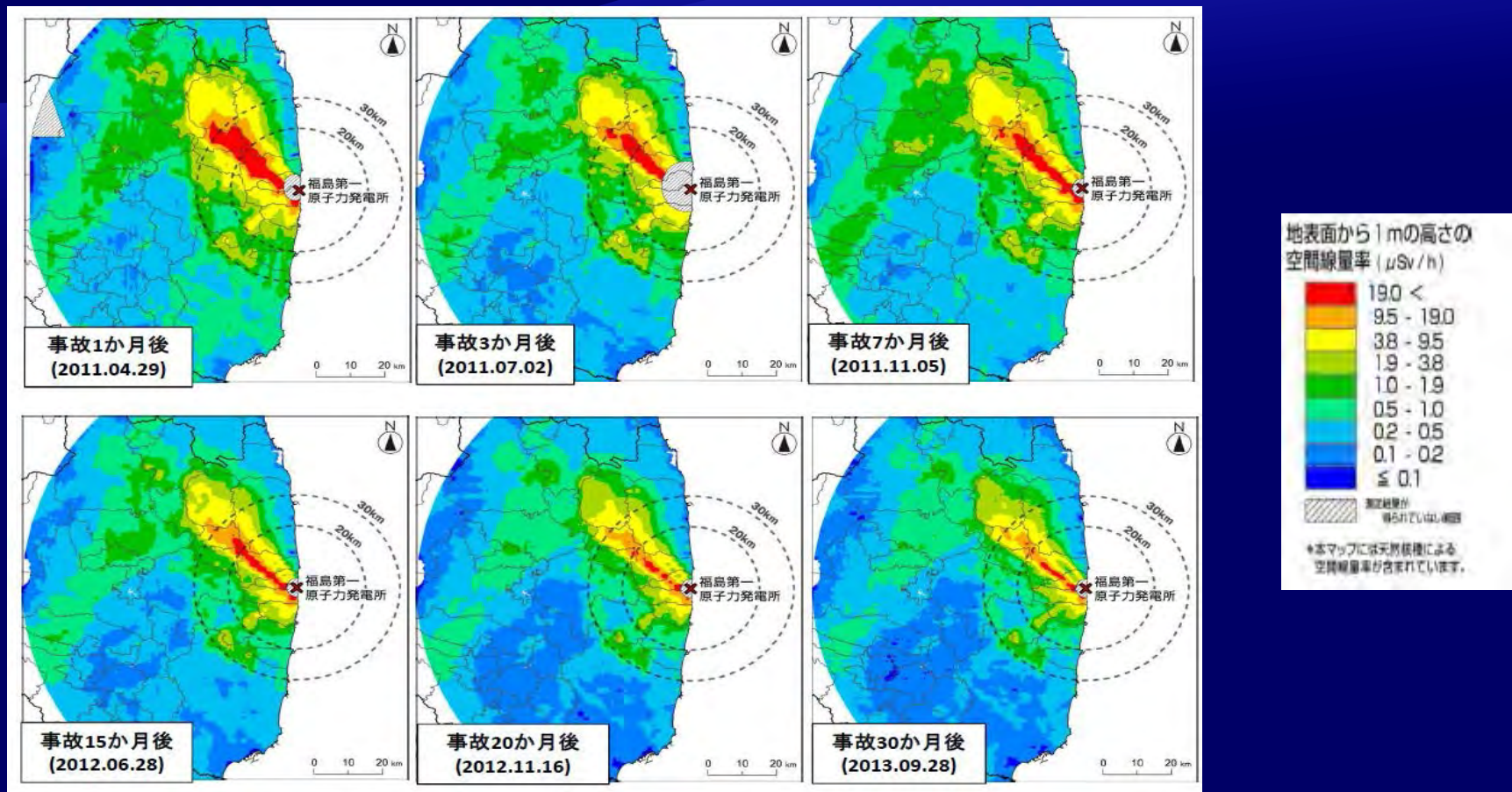


Soil decontamination



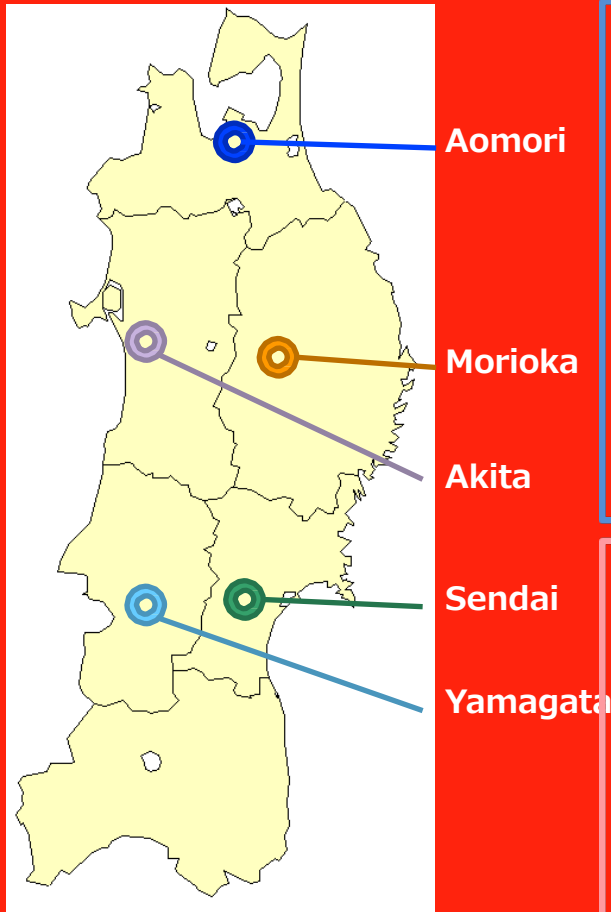
Newly developed decontamination processes allowing the restoration of 98 out of 100 tons of contaminated soil

Radioactivity level

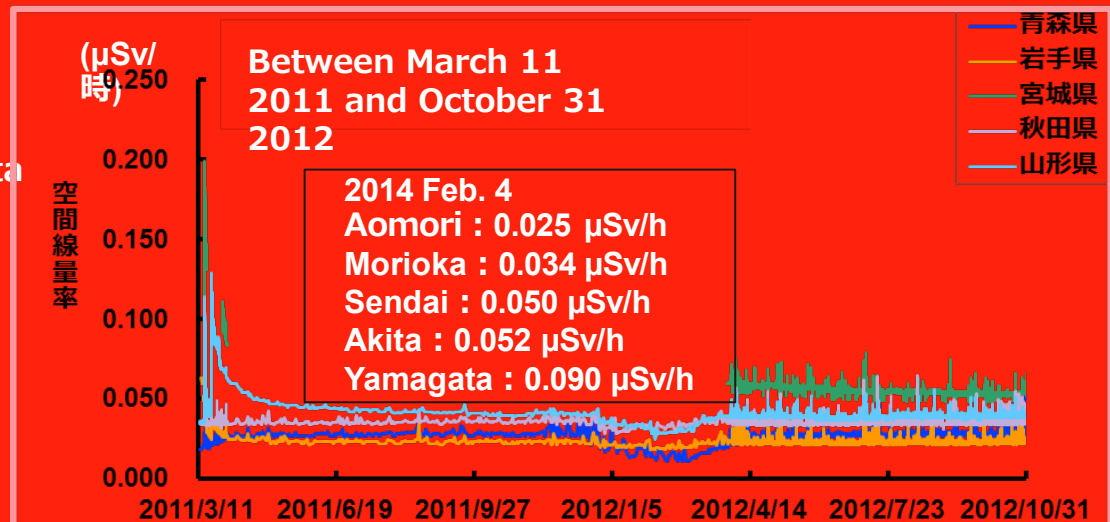
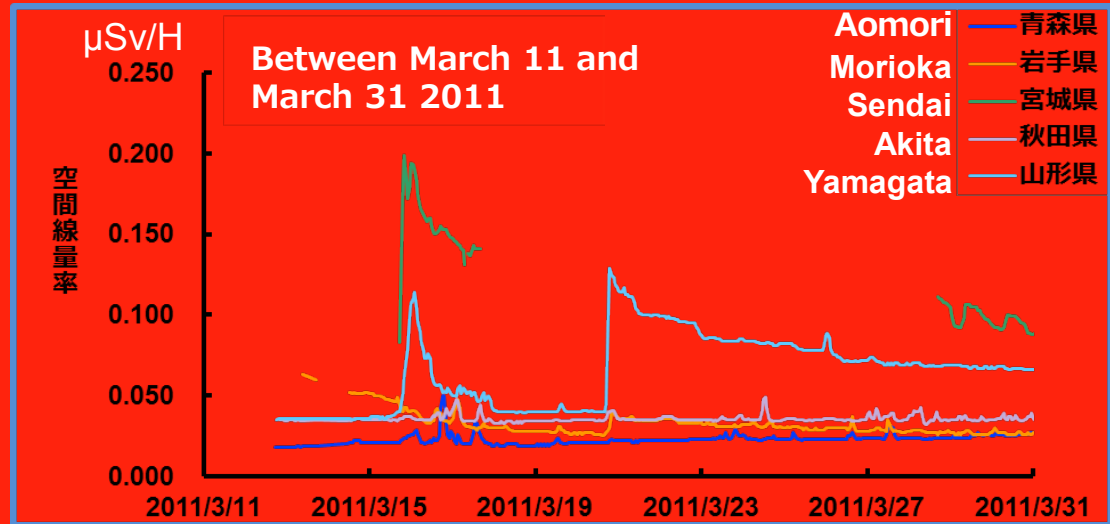


Drop of the radioactive level with time

Sendai



$\mu\text{Sv}/\text{H}$: Micro-sievert



New York: 0.25 $\mu\text{Sv}/\text{H}$

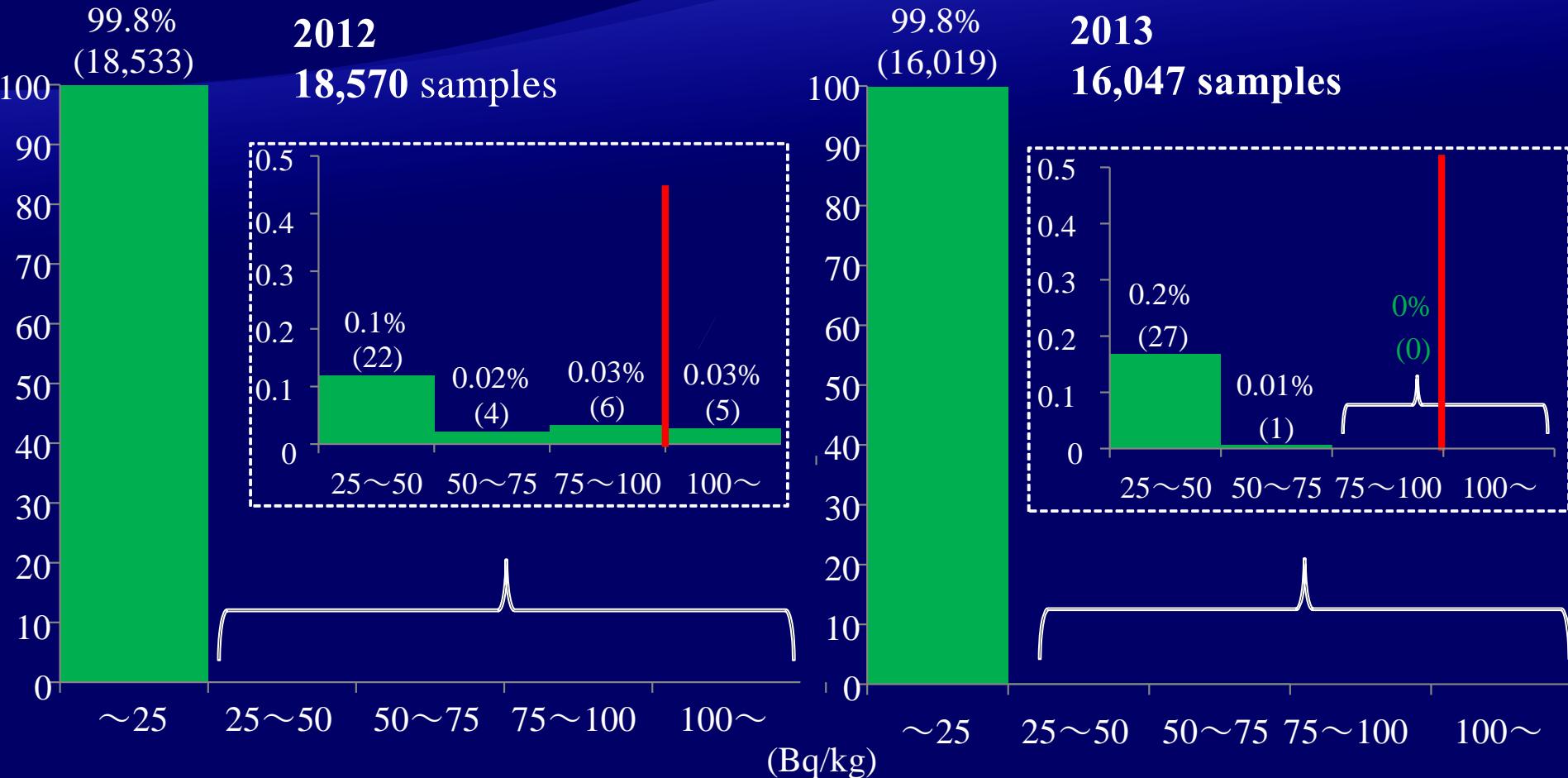
Paris: 0.065 $\mu\text{Sv}/\text{H}$

London: 0.25 $\mu\text{Sv}/\text{H}$

Guarapari (Brazil): 5.5 $\mu\text{Sv}/\text{H}$

Contamination level

Vegetables:



Same trend for meat, water, mushroom, tea...

Summary

1. Preparation of disaster manual and disaster drill are effective to know the action during disasters.
2. Preparation of communication network list in office and department is effective to confirm the safety.
3. Safety confirmation system is very effective to confirm the safety and condition of students.
4. Community of international students is important source of various information including safety and condition of students.
5. Sendai: a safe city