

Amid the rapid increase in the world's population, the number of people living in "megacities" with populations of 10 million or more is expected to increase from the current 3.2 billion to 5.0 billion by 2030. While urbanization brings abundance and convenience to people and prosperity to cities, it also invokes a variety of problems, including environmental issues such as air pollution, waste, noise, and energy shortages, traffic issues such as congestion and accidents, and shortages of housing and medical facilities.

In Japan and overseas, Fujitsu is using the big data generated by the activities of people in cities to advance safer and more comfortable future urban development, based on the needs of people in local communities.

### Comprehensive Agreement with Kawasaki City on Sustainable Community Development

Over half of the world's population lives in cities at present, a percentage expected to increase to 60% by 2030. Resolving urban issues involving traffic congestion, the environment, energy, and other concerns is vital to the achievement of global-scale sustainability.

Kawasaki City, which has a population of over 1.45 million people, is an industrial city that boasts advanced manufacturing technology paired with globally leading environmental technology that has overcome pollution. Fujitsu has developed in step with Kawasaki City since the company's founding in the city in 1935, and has come to embrace 16,500 Group company employees in Kawasaki. Kawasaki City, which is working to create itself as the "Most

Successful and Happiest City in Japan," and Fujitsu, which is aiming to build a society where people can live peacefully through "the power of ICT," have

concluded a comprehensive agreement as a form of globally-leading community engagement, and are working together toward promoting a sustainable community for Kawasaki.

The partnership seeks to implement advanced initiatives that will make mutual use of the local resources and human resources held by Kawasaki and the global technology and expertise of Fujitsu. The partners also envision deploying their achievements throughout Japan and international society. Based on the comprehensive agreement, both parties will leverage big data concerning changes in the socioeconomic environment and trends among residents, and will strengthen a variety of initiatives including industrial promotion and international environmental contribution through cutting-edge technology.



President Yamamoto (left) and Mayor Fukuda of Kawasaki City

#### Areas of Collaboration

1. Community development using ICT
2. Cultivating the next-generation of human resource talent that will flourish globally
3. Forming a vibrant community
4. Creating an environmentally friendly community
5. Promoting contributions to the international community and industrial development with cutting-edge technology

Case of Human Centric Innovation 1 Responding to Urban Issues

# Sustainable Urban Development to Resolve the Issues of Congested Cities



## Aiming to Create a "Most Successful and Happiest City, Kawasaki"

Norihiko Fukuda

Mayor of Kawasaki City



Kawasaki City is honored to enter into a comprehensive agreement with Fujitsu, a partner and leading representative of industry. Since taking office as Mayor in November of last year, I have come to keenly appreciate the importance of dialog. This is because the expression of concerns by people is what leads to the gathering of solutions and knowledge. I would like to break through "can't-do" thinking by using new technology and tackle all sorts of issues together with Fujitsu, to make Kawasaki the most successful and happiest city in Japan.

In the 1960s and 70s, Kawasaki City joined hands with companies to refine environmental technology for the resolution of pollution issues. I believe that this success story will set a positive example for China and Southeast Asian nations that continue to undergo rapid growth. Fujitsu's advanced initiatives even include the export of an ICT-based environmental monitoring system to Saudi Arabia.

From here on out, I hope to utilize Fujitsu's technology for big data and consider long-term policy measures based on population trends, as we continue to formulate new general plans for Kawasaki City. Taking the comprehensive agreement as an opportunity, I look forward to consultations with Fujitsu on urban development using ICT, resolution of issues, and many more things. As we create results together with Fujitsu, we will communicate these to other cities as the "Kawasaki model," and will contribute to the happiness of people the world over.

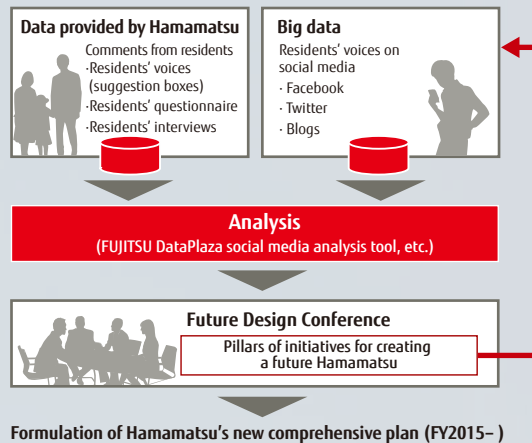
## In Hamamatsu, Shizuoka Prefecture

### A big data analysis project to envision the city 30 years from now

Amid increasing attention on the use of big data, the city of Hamamatsu in Shizuoka Prefecture is taking the lead among municipalities in the use of big data for future urban development.

From September 2013 to March 2014, Fujitsu worked with Hamamatsu to augment the public data held by the city by collecting residents' comments through questionnaires and interviews and through comments directed at the city in online articles and social media. Through the use of analytical tools, Fujitsu was able to uncover the expectations and thoughts of residents toward the city. While making use of this information in day-to-day municipal governance, Hamamatsu also put it to use in the Hamamatsu Future Design Conference that set forth a vision for the city 30 years from now.

#### Overall Image and Process of the Analysis



## In China

### Providing vehicle maintenance service in partnership with a telecommunications carrier

In China, which accounts for approximately 23% of the number of new cars sold globally, there is widespread public concern about air pollution and frequent traffic accidents—especially in urban areas—resulting from an increase in the number of vehicles.

Fujian Fujitsu Communication Software Co., Ltd. is collaborating with telecommunications carriers in China to provide major logistics companies with a one-stop, smart-vehicle management service for eco-driving and vehicle safety. This service has improved fuel efficiency by more than 20% and reduced the number of accidents by approximately 50% in some cases.

Fujitsu will continue to make contributions to improving the urban traffic environment and safety in China and in countries around the world through the use of ICT.



Urban traffic in China (image)

# Toward the Construction of ICT Environments to Support Advanced Medicine, and toward New Services to Care for Mental Health

In 2030, seniors aged 65 or older are expected to account for 31.6% of the population of Japan. Limiting the accompanying increase in social security, including medical, expenses has become an urgent issue. Achieving a society in which people can live healthy and long lives requires that regions come together to nurture the health and medical industry and the medical partnerships that support the health of every citizen. At the same time, maintaining and enhancing mental health is a key issue, with companies called upon to boost their efforts to check on employees' mental health burdens.

Amid this, Fujitsu is aiming to provide diverse ICT solutions to support preventive medicine and individualized medicine. An example is digital medical records, with which Fujitsu has a wealth of experience. Fujitsu is also taking up challenges such as support for drug discovery using supercomputers, and the creation of services to sustain mental health in disaster-stricken areas.

## Establishment of the Next-Generation Healthcare Innovation Center for Medical Innovation and the Creation of a Healthy Society

In December 2013, Fujitsu established the Next-Generation Healthcare Innovation Center to tackle diverse medical-related issues facing Japanese society. The mission of the Center is to create new business in health promotion, early disease detection, prevention of disease exacerbation, new drug creation, and individualized medicine by taking full advantage

of ICT and working with progressive research institutions and medical facilities.

In particular, Fujitsu will leverage its track record and expertise in electronic medical record systems, in which we hold the leading share of adoption in Japanese medical institutions. We aim to achieve individualized medicine and to construct next-generation electronic record systems that are integrated with genome data and daily lifestyle information, in addition to existing treatment information. In partnership with Japanese and foreign pharmaceutical companies and research institutions, Fujitsu is also engaged in "In Silico drug discovery" using supercomputers. By using simulations, this enables significant reduction in the time required to identify compounds that work to curtail the outbreak of diseases.

From here on out, Fujitsu aims to leverage the advanced technology and expertise we have built up through our business, and to contribute to the realization of innovative medicine and the formation of a society that supports people's health.

VOICE

### Without ICT, New Healthcare will Never Develop



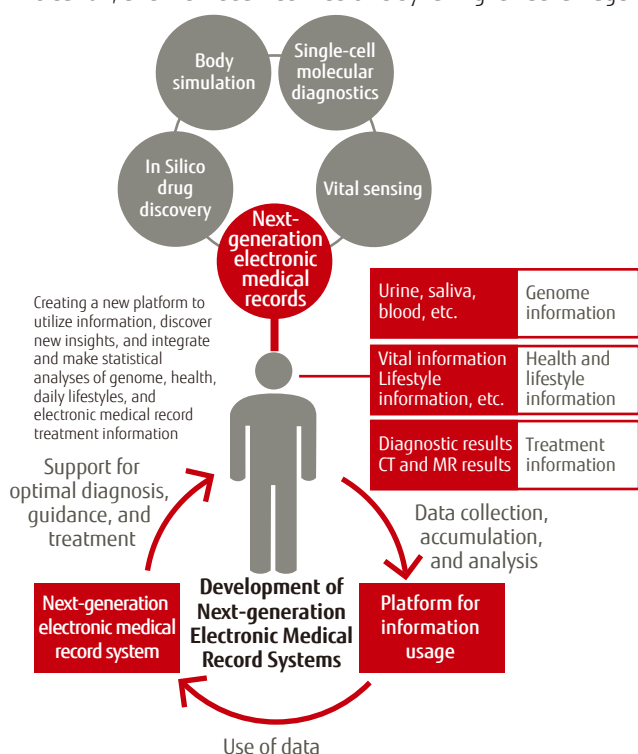
**Hiroshi Tanaka**

Ph.D. & Dr. Med., Professor,  
Medical Research Institute  
Tokyo Medical and Dental University

My research has centered on two fields: bioinformatics and medical informatics. For about two years now, I have been working with Fujitsu on a new integrated database in hopes of eventually reflecting genome and health-related information in electronic medical records and helping medical professionals diagnose and treat conditions in a "total" package that includes environmental and genetic (genome-related) factors. The Next-Generation Healthcare Innovation Center is instrumental in combining all the genome-related information that I have gathered over the years with Fujitsu ICT.

Why did I decide to pursue joint development with Fujitsu? I have plenty of relationships with many other companies, all of which have similar perspectives on and approaches to genome usage and other topics. Fujitsu, however, was the only one to start at the idea development step, put the project under the president's direct control, and work as quickly as possible to make something of it. In Fujitsu, I see the spirit of challenge and the flexibility it takes to accept change. The company also boasts an extensive ICT background and infrastructure in wide-ranging sectors of the healthcare field, including electronic medical record systems, regional healthcare integration, and supercomputer-powered organ simulation.

In that sense, I hope Fujitsu continues to blaze trails as the leader of genome medicine in Japan. There is no way to develop new healthcare without the aid of ICT. Fujitsu, I believe, is going to play a vital role in propelling Japanese healthcare forward.







## In Iwate Prefecture and Fukushima Prefecture

### Disaster reconstruction support: Disaster prevention and security systems, and guardian support systems for citizens living in temporary housing

In the process of reconstruction following the Great East Japan Earthquake, we recognized that, besides building infrastructure, preventing isolation through person-to-person communication is an important issue.

Fujitsu is addressing this issue by using ICT to allow local governments to enhance their information delivery capabilities, and for victims to receive mental health-care.

In Iwate Prefecture, we are cooperating with the city of Oshu to build up a mechanism for unified management of disaster prevention and security information, as well as for dissemination of information by mobile phones, SNS, and other means. In this way, we help local governments to make optimum decisions and to deliver information properly to residents.

In Fukushima Prefecture, we are partnering with the city of Iwaki and with Iwaki Meisei University to construct a guardian support system composed of health information management and stress checking functions, so that we may support the mental health of citizens living in temporary housing.



Temporary housing in Iwaki, Fukushima Prefecture

## In Ireland

### Using sensing technology to support safe and secure independent living in an aging society

The use of ICT is being investigated to address social issues brought about by the aging of society.

Under the theme of support for health in everyday lifestyles, Fujitsu has launched the KIDUKU Project<sup>\*1</sup> to provide monitoring and assistance for independent living by seniors and patients in smart houses in Ireland. The project is a collaboration between Fujitsu and two Irish research institutions, TRIL and CASALA.<sup>\*2</sup> Both of these institutions are engaged in advanced initiatives involving the use of sensing technology.

In this research, we collect data from the daily lives of seniors and patients through a variety of sensors. The aim is to develop a system and construct solutions for health management and daily living assistance that pairs expert medical knowledge with data visualization and analysis technologies. The system is expected to aid the optimization of treatment plans through ongoing observation of illness, and to facilitate communication among concerned parties.

Through the project, Fujitsu aims to make use of ICT in assisting independent living in an aging society.

<sup>\*1</sup> KIDUKU: The name of the project incorporates the meanings of Japanese words for *awareness* (of changes in conditions) and *building* (of good relations between Ireland and Japan).

<sup>\*2</sup> Two research institutions in Ireland:

• TRIL (Technology Research for Independent Living): A medical research institution engaged in applied research involving sensing technologies.

• CASALA (Centre for Affective Solutions for Ambient Living Awareness): Operates and conducts testing in experimental smart houses equipped with sensing environments.

# From Reduction of Environmental Impacts to Effective Use of Natural Energy and Renewal of Natural Capital

While economic globalization brings new abundance to the world, the emergence of global-scale environmental destruction, shortages of resources, energy, food, and water, and other worldwide issues threaten the sustainable development of global society. In order to resolve these issues, companies must take the lead in correctly understanding the negative environmental impacts of their own activities, and must strive to restrict these. At the same time, companies are being called upon to make effective use of renewable energy such as solar power and wind power, and non-depleting resources and wastes.

Fujitsu provides systems that use ICT to accurately assess environmental impacts and systems that optimize the use of natural energy. Together with universities and research institutions, Fujitsu is engaged in developing systems for water filtration and water circulation that make use of supercomputer-based simulation.

## Using Supercomputers to Create Sustainable Water Resources

By 2030, global demand for water is expected to exceed supply by 40% due to population increase and the progress of urbanization and industrialization. For this reason, securing supplies of water for households, industry, and agriculture needed to achieve and sustain a comfortable

living environment will be an important challenge.

To address this issue, Shinshu University is undertaking the development of water filtration membranes using nanocarbon and other innovative materials, as well as systemization technology that uses these materials for fresh water generation and water circulation.

## VOICE

### Aiming to Create Water that Contributes to Comfortable Living Environments around the World



**Morinobu Endo**

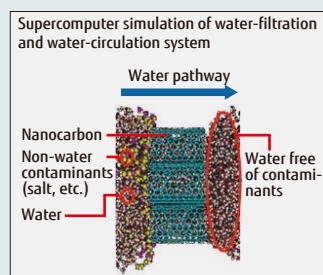
Distinguished Professor  
Institute of Carbon Science and Technology  
Shinshu University

Over 1.1 billion persons are unable to secure safe supplies of water, and lack access to safe drinking water. Over 2 million children lose their lives every year due to contaminated water. The "Global Aqua Innovation Headquarters for Increasing Water-sustainability and Improving Living Standards in the World" plan, proposed by Shinshu University and others to tackle these issues, was selected in October 2013 by the Ministry of Education, Culture, Sports, Science and Technology as a core COI (Center of Innovation) location.

Through a nationwide organization across Japan, this project is aiming for the commercialization of a revolutionary fresh water generation and water circulation system that can extract water from diverse water sources, contributing to the production of resources and preservation of the environment and providing safe and reliable water on a broad global scale. While water generation functionality has been achieved through carbon membranes in the past, the issue from here on out is the creation of innovative functionality. The adoption of Fujitsu's supercomputer for research in mechanism analysis is expected to enable dynamic analysis of water molecules, which had been impossible until now. I hope to build a site for the creation of local new industries and for social contribution through scientific research and practical applications that are compelling to and are needed by people around the world.



FUJITSU Supercomputer  
PRIMEHPC FX10







Development of the water filtration membrane in particular calls for complex analytical work and simulation at the atomic level, requiring a supercomputer with powerful calculation ability. Fujitsu met Shinshu University's needs with a supercomputer system composed of a PC cluster of 16 PRIMERGY RX200 S8 units and a FUJITSU Supercomputer PRIMEHPC FX10. The research is expected to

yield results that will enable the extraction of household water, industrial water, and agricultural water from seawater or even water mixed with oil.

Through the power of ICT, Fujitsu will contribute to the resolution of water issues and other social transformation on a global scale.

#### In the Canary Islands

##### Achievement of optimal energy management and stable supply of energy to outlying islands

In the Canary Islands (autonomous region), with a population of 2 million people, abundantly available renewable energy, including sunlight and wind power, is widely used for power generation to benefit from the geographical features of the region. However, due to problems such as inaccuracies in weather forecasts and difficulties in power management, the Canary Islands have depended on Mainland Spain, which is 1,100 km away from the islands, for some of its power supplies.

Fujitsu has provided ITER\* with a system composed mainly of high-performance computers in order to solve these problems, thereby achieving an approximately 75% reduction in energy costs from the mainland.

Utilizing renewable energy is a basis for sustainable development. Fujitsu will continue to make effective use of ICT in order to support the Canary Islands' further economic growth.

\*ITER: The Technological Institute of Renewable Energies  
Natural energy research facility founded by the island Council of Tenerife in 1990



ITER Data Center



Wind power generation (image)

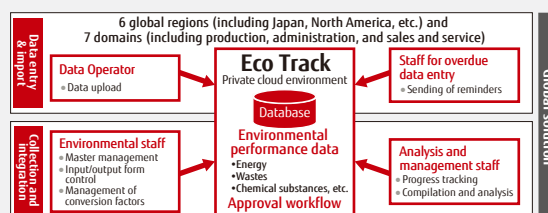
#### In the Six Global Regions of the World

##### Supporting the management of global environmental data through environmental management solutions

As global environmental issues deepen, the demands placed upon companies to disclose environmental-related information are increasing day by day. At the same time, the globalization of economies is accelerating, and the integration of environmental management across multinational workplaces has become an issue that companies must address.

Honda Motor Co. Ltd, which operates its various business in six regions of the earth, faced issues in the accurate collection and aggregation of environmental impact data. In response, Fujitsu provided Eco Track, a SaaS-based environmental management information system. This flexible, Excel-based solution simplifies form creation, the setting of request routes, and data aggregation work, as well as enables drastic improvements in data accuracy. With this system, Honda is beginning to achieve short-term data sharing and analysis. The company intends to switch from the use of SaaS to private cloud-based operation, and will further improve and strengthen the system's functionality.

Fujitsu will continue to support the environmental management of Honda Motor as it works to realize its vision of "the joy and freedom of mobility and a sustainable society where people can enjoy life."



The geographical characteristics of Japan and Southeast Asian nations place these countries at high risk for typhoons, floods, earthquakes, tsunami, and other natural disasters. In this region, a variety of data on past disasters is being used to create disaster readiness measures for strengthening embankments and other structures. It is impossible to build seabed-sited or land-sited breakwaters of two or three times the usual height in preparation for a once-per-millennium earthquake. After the Great East Japan Earthquake, the approach is increasingly being taken to minimize damage through life-saving disaster mitigation.

Fujitsu has developed systems that aggregate and use volumes of past data to aid disaster readiness. Together with this, we have proposed mechanisms for disaster mitigation that predict damage through sensors that assess weather conditions and changes in the natural environment in real-time.

### Leveraging Japan's Knowledge of Disaster Countermeasures to Build a Disaster Information Management System for Indonesia

Like Japan, the island nation of Indonesia is geographically prone to natural disasters. Disaster countermeasures are a pressing issue especially in the capital region of Jakarta, the political and economic center of the country.

The Regional Disaster Management Agency of Jakarta's

local government investigated the adoption of a system to improve disaster information management, which had been a time-consuming manual system. Fujitsu built a Disaster Information Management System (DIMS) for the agency by leveraging expertise that had been built up in supporting disaster countermeasures in Japan.

Fujitsu developed SMS-based information broadcasts matched to the local conditions of Jakarta, as well as a portal site, based on functions provided in Japan. DIMS enables centralized management of river level information, automated warnings, real-time information collection from disaster sites and unified display of the information, which helps the agency make rapid decisions such as issuing evacuation orders during disasters.

Fujitsu continues to contribute to disaster countermeasures in Jakarta through efforts to enhance the system, such as information sharing with other agencies, and to improve system operation and maintenance support.



Disaster readiness center

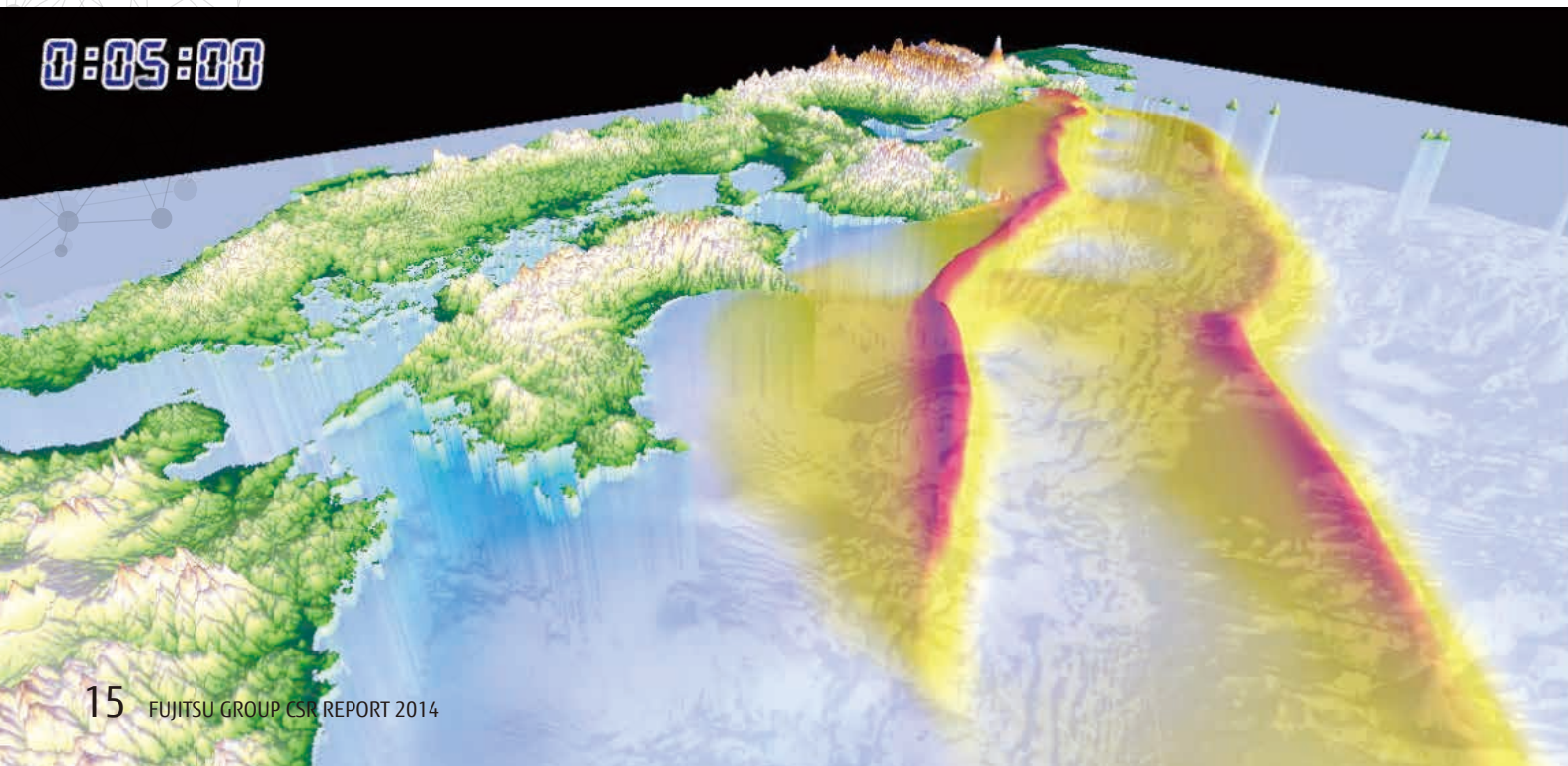


Urban area during flooding

#### Case of Human Centric Innovation 4 Responding to Natural Disasters

## Toward a Safe and Secure Society that Combines Disaster Readiness and Disaster Mitigation Perspectives

0:05:00





## Toward Sure and Effective Disaster Mitigation Activities

The solution from Fujitsu has helped us in accelerating information management during disaster mitigation process, particularly during the great flooding that hits DKI Jakarta. Back when we still used manual systems during the 2012 flooding, it took five days to receive integrated data, such as flood points and inundated areas. Meanwhile our web portal, which should provide information to the public, did not function effectively. In the January 2014 floods, however, with the support of Fujitsu's disaster management information system, we were able to obtain real time information, and distribute it on time, to ensure effective coordination in the whole disaster mitigation process.



**Bambang Surya Putra**  
Head of Informatics Section  
BPBD DKI Jakarta

### In Japan

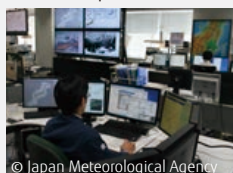
#### Creating a high-reliability system for weather information, emergency warnings, warnings, and advisories

Japan's geographical characteristics make it a country always under the threat of frequent typhoons, earthquakes, and other natural disasters.

Reducing the damage from such disasters calls for constant monitoring and prediction of phenomena that may lead to disaster – weather, the ocean, earthquakes, volcanoes, and more – and 24-hour, 365-day provision of accurate information.

By constructing the Automated Meteorological Data Acquisition System (AMeDAS) and the Automated Data Editing and Switching System (ADESS), Fujitsu is supporting the Japan Meteorological Agency's work of observation, monitoring, prediction, and reporting. The weather observation and the information, warnings, and advisories provided by AMeDAS and ADESS help enrich daily life, and are used broadly as information that contributes to disaster prevention and mitigation, traffic safety, and industrial development.

Fujitsu will continue to support the growth of the system with high reliability, and will contribute to the realization of a safe and secure society through advanced ICT.



© Japan Meteorological Agency  
Forecast operations room

### In China

#### Constructing a water resource management system to support flood and drought countermeasures in China

The direct economic losses due to natural disasters in China average over 200 billion yuan (about 3 trillion yen), with flood- and drought-related damages particularly severe.

In addition to provincial water resource management, the Water Resources Department of Jiangsu Province was faced with the priority issue of readying an information system for flood and drought countermeasures. In response, Fujitsu worked with the Water Resources Department to construct a system for water resource monitoring, control, and early warning. Through this system, Fujitsu is meeting the province's need for water resource security and for accurate and rapid transmission of water level information to water resource departments and other government bodies during floods or droughts.

From here on out, Fujitsu will contribute to natural disaster initiatives for which international cooperation is considered necessary, and will contribute to safety and security worldwide through ICT.



Lower reaches of the Yangtze River



Drought

Simulation of tsunami caused by a massive earthquake in the Nankai Trough  
Image source: Toshitaka Baba, Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

0:33:30

