

3. JAXA activities as viewed by other institutions

3.1 JAXA-related media coverage

JAXA's response to the Great East Japan Earthquake (including emergency observation of afflicted areas using the Daichi satellite and provision of communication facilities using KIZUNA and KIKU No. 8) was widely covered in the media, as outlined in Table 3.1-1.

Table 3.1-1 Media coverage of JAXA activities

Date published	Media published	Type	Page no.	Headline/content	Satellite	
March 2011	15	Yahoo News	Web	-	Earthquake images of damaged areas from JAXA's Advanced Land Observing Satellite "Daichi" released	Daichi image provision
	16	goo News	Web	-	Additional emergency observations in the Tohoku region conducted using JAXA's Advanced Land Observing Satellite "Daichi"	Daichi image provision
		Yomiuri Online	Web	-	Tsunami-hit house drifts 20 km out to sea	Daichi image provision
		Yomiuri Shimbun	Newspaper/morning	7	Drifting caused by the Great East Japan Earthquake extends as far as 20 km out to sea	Daichi image provision
		goo News	Web	-	Great East Japan Earthquake: JAXA emergency observation shows crust shifted 3 m	Daichi image provision
	17	Nikkei BPnet ITpro	Web	-	JAXA releases online results of disaster-area crustal movement observation conducted using the Advanced Land Observing Satellite	Daichi image provision
		NHK News	Web	-	Trial satellite provides disaster-area news	KIZUNA disaster-area news provision
		Nihon Keizai Shimbun	Newspaper/evening	10	JAXA uses high-speed-data communication satellite for damaged areas	KIZUNA disaster-area news provision
		Kahoku Shimpo	Newspaper/morning	1	Daichi satellite captures Rikuzentakata's lost scenic site of Matsubara	Daichi image provision
	18	Nihon Keizai Shimbun	Newspaper/morning	30	Specialist analysis of satellite images reveals changes in Pacific coastline	Daichi image provision
		Iwate Nippo	Newspaper		Iwate University team identifies clear collapse and flooding in satellite images	Daichi image provision
		Iwate Nippo	Newspaper	4	Great East Japan Earthquake: Japan Aerospace Exploration Agency supports communications between Kamaishi City and prefectural government by satellite	KIZUNA disaster-area news provision
		Yahoo News	Web	-	Great East Japan Earthquake: JAXA opens KIZUNA communication system to damaged areas	KIZUNA disaster-area news provision
		Nikkan Kogyo Shimbun	Newspaper		Great East Japan Earthquake: JAXA installs antennas in Iwate to allow use of KIZUNA (internetworking satellite)	KIZUNA disaster-area news provision
		response.jp	Web	-	Great East Japan Earthquake: JAXA opens KIZUNA communication system to damaged areas	KIZUNA disaster-area news provision
		asahi.com	Web	-	Daichi satellite images show aftermath of tsunami along Fukushima coast	Daichi image provision
		Mainichi Newspaper	Newspaper/evening		Great East Japan Earthquake: Daichi satellite data show Oshika Peninsula shifted 3.5 m eastward	Daichi image provision
		Nikkan Kogyo Shimbun	Newspaper	19	Great East Japan Earthquake: JAXA dispatches five staff to install antennas in Iwate for KIZUNA (internetworking satellite)	KIZUNA disaster-area news provision
		Fuji Sankei Business i.	Newspaper	6	Great East Japan Earthquake: tsunami leaves mark over a wide area	Daichi image provision
		Denkei Shimbun	Newspaper	3	Ministry of Internal Affairs and Communications asks NTT Docomo and KDDI for 324 and 144 rental satellite phones	KIZUNA disaster-area news provision
	23	Nihon Keizai Shimbun	Web	-	JAXA uses KIZUNA (high-speed-data communication satellite) for damaged areas	KIZUNA disaster-area news provision
	27	TV Asahi's Sunday Front Line	TV	-	Massive tsunami engulfs huge embankment	Daichi image provision
	28	Nihon Joho Sangyo Shimbun	Newspaper	2	NICT provides broadband lines to support disaster countermeasures	KIZUNA disaster-area news provision
Denkei Shimbun		Newspaper	3	Tohoku Region Pacific Ocean Coastal Earthquake: JAXA supports damaged areas by providing engineering test satellite, terminal equipment for KIKU No. 8, to Ofunato City	KIKU No. 8 disaster-area news provision	

Date published	Media published	Type	Page no.	Headline/content	Satellite	
	29	Ibaraki Shimbun	Newspaper	18	Land shifts 3.5 m eastward	Daichi image provision
		Fukushima Minyu Shimbun	Newspaper	3	Tohoku shifts up to 3.5 m eastward; Date area moves 1 m	Daichi image provision
		TV Asahi, Yajiuma TV!	TV	-	Victims' beacon of hope: single pine tree survives	Daichi image provision
	30	Nikkan Kogyo Shimbun	Newspaper	25	Ofunato Internet service restored with JAXA's KIKU No. 8.	KIKU No. 8 disaster-area news provision
	31	Nihon Keizai Shimbun website	Web	-	Nikkei Shimbun homepage displays animated images taken by Daichi satellite	Daichi image provision
April 2011	1	Tokai Shimpo	Newspaper	3	JAXA supplies 3 PCs to joint government with ultra-high-speed network service free of charge	KIZUNA disaster-area news provision
	3	Jiji.com	Web	-	Underutilized data with overly tight secrecy; specialists request release and use of information	Daichi image provision
	8	Yomiuri Shimbun	Newspaper/morning	11	Immediate relief for communication-network protection requested	KIZUNA disaster-area news provision
	19	Nikkei Sangyo Shimbun	Newspaper	1	Toward disaster recovery: on-site research and efforts by stronger universities required	Daichi image provision
	21	Space News (TV Tokyo)	TV	-	JAXA HQ supports Great East Japan Earthquake recovery, astronaut Furukawa reveals details of space training (appearance by Futoshi Takiguchi, Manager, Disaster Management Support Systems Office)	Daichi, KIZUNA and KIKU No. 8
	22	MYCOM Journal	Web	-	Electrical abnormality found on Advanced Land Observing Satellite "Daichi" — an important part of efforts to analyze damaged areas after the Great East Japan Earthquake	Daichi, KIZUNA and KIKU No. 8
	29	Friday	Magazine	-	Observing Satellite Daichi captures earthquake's effects — shocking images of land sliced off	Daichi image provision
May 2011	15	Space News (TV Tokyo)	TV	-	Daichi after the Great East Japan Earthquake; last shot to finish operations	Daichi image provision
	18	Nikkei BP Online	Web	-	JAXA team operates KIZUNA (high-speed-data satellite) to support Internet services from space	KIZUNA disaster-area news provision
	24	Yomiuri Shimbun	Newspaper/morning	11	Great earthquake and space technology — a practically invisible Japanese satellite; secrecy constitutes a barrier to Daichi's provision of rough images	Daichi image provision
June 2011	12	Nihon Keizai Shimbun	Newspaper/morning	12	Daichi, KIZUNA and KIKU No. 8 contribute to GPS and other types of private use	Daichi, KIZUNA and KIKU No. 8
	15	Fuji TV's Mezamashi TV	TV	-	Daichi observation images show geomorphic changes and subsidence after March 11 earthquake	Daichi image provision
	30	Kahoku Shimpo	Newspaper/morning	4	Daichi before/after disaster photos to be released on the Internet tomorrow	Daichi image provision
July 2011	2	Asahi Shimbun	Newspaper/morning		Space School, do you support earthquake disaster reconstruction even from space?	Daichi, KIZUNA and KIKU No. 8
	28	Weekly Shincho	Magazine	-	Science Delivery Service — an unseen rising sun; hidden space development	Daichi, KIZUNA and KIKU No. 8
August 2011	2	Wirelesswire News	Web	-	ICT specialists from a range of fields publish report entitled The Great Earthquake and Information Communication, its Roles and its Future	Daichi, KIZUNA and KIKU No. 8
	25	Japanese Government Internet TV	Web	-	Tokumitsu & Kisa's Learn about Japan! Saving the earth — space science technology to save lives	Daichi image provision

3.2 Usage of JAXA satellite by other institutions

Images of disaster-stricken areas captured by Daichi were also used by institutions other than JAXA in response to the disaster. Examples of Daichi observation data usage by non-JAXA institutions are outlined below.

3.2.1 Earth observation satellite-based activities

3.2.1.1 Tohoku Region Pacific Ocean Coastal Earthquake Emergency Mapping Team (EMT)

To promote uniform understanding of the situation nationwide, a group of volunteers from the Research

Center for Disaster Reduction Systems at Kyoto University's Disaster Prevention Research Institute and others formed the Emergency Mapping Team (EMT) and began mapping activities in collaboration with officials in charge of disaster management at the government's Cabinet Office. The maps were made available on the EMT website (Figure 3.2-1).

The EMT engaged in the activities outlined below to promote uniform understanding of various types of damage and responses nationwide.

- Visualization of the situation over a wide area based on information mapping
- Visualization based on information mapping for prefectural coordination of related activities
- Visualization based on information mapping to support activities at major disaster sites requiring immediate response

As part of its activities, the EMT developed and published maps based on images captured by Daichi.



Figure 3.2-1 EMT map-distribution website
(<http://www.drs.dpri.kyoto-u.ac.jp/emt/>)

3.2.1.2 Tohoku Regional Environmental Office (Ministry of the Environment) and Yokoyama Spatial Information Research Center

From July 1, 2011, to March 31, 2012, the Ministry of the Environment's Tohoku Regional Environmental Office used its website to publish post-disaster images taken by Daichi during six individual periods after the Great East Japan Earthquake and pre-disaster images in collaboration with partner institutions on an industry-academia-government program to support the use of Daichi images in the Tohoku region. This initiative was coordinated by the Tohoku Regional Environmental Office with the Yokoyama Spatial Information Research Center in charge of planning and project management, and enjoyed the collaboration and partnership of the Ministry of the Environment, JAXA, the Tohoku Construction Association, the Iwate University Center for Regional Collaboration in Research and Education, and NEC Software Tohoku, Ltd.

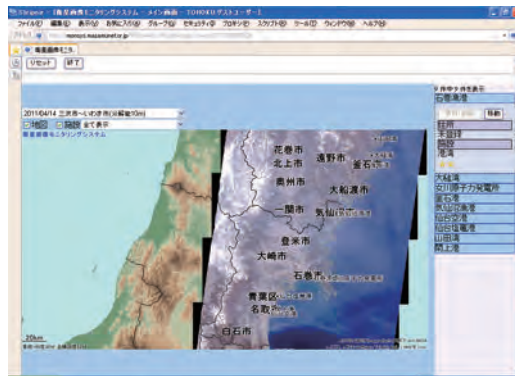


Figure 3.2-2 Tohoku Regional Environmental Office website showing images of disaster areas
(Access requires guest login from http://tohoku.env.go.jp/to_2011/0701a.html.)

3.2.1.3 Sinsai Info

Sinsai.info is a collaborative platform developed to support reconstruction in the aftermath of the Great East Japan Earthquake. The website was built using Ushahidi (a crowdsourcing tool also adopted in a variety of fields when a major earthquake struck New Zealand in 2011), and is managed by volunteer developers, data managers and contributors from OpenStreetMap Japan and OpenStreetMap Foundation Japan.

Moderators in charge of incident report content received via the web, e-mail and Twitter check submissions and post them to the site.

When a request for help with printing satellite image maps created from Daichi data on A0-size paper was posted on the sinsai.info website, Hewlett-Packard Japan Ltd. and Tezukayama Gakuin University's Faculty of Liberal Arts provided support.



Figure 3.2-3 The Sinsai Info website
(<http://www.sinsai.info/>)



Figure 3.2-4 Report on large-format printing of satellite image maps made from Daichi data on the sinsai.info website

3.2.1.4 NTT Data Corporation and RESTEC

NTT Data Corporation and the Remote Sensing Technology Center of Japan (RESTEC) collaborated on the creation of satellite image maps of Iwate, Miyagi and Fukushima prefectures to help reconstruct areas devastated by the Tohoku Region Pacific Ocean Coastal Earthquake. The maps have been published on websites and elsewhere since March 31, 2011 (shown on the left of Figure 3.2-5).

The satellite image maps created using pre- and post-disaster images captured by Daichi and the Thailand Earth Observation Satellite (THEOS) consist of coordinate data in Geo PDF format, and were developed by laying map information showing roads, public facilities and other data over satellite images (shown on the right of Figure 3.2-5).

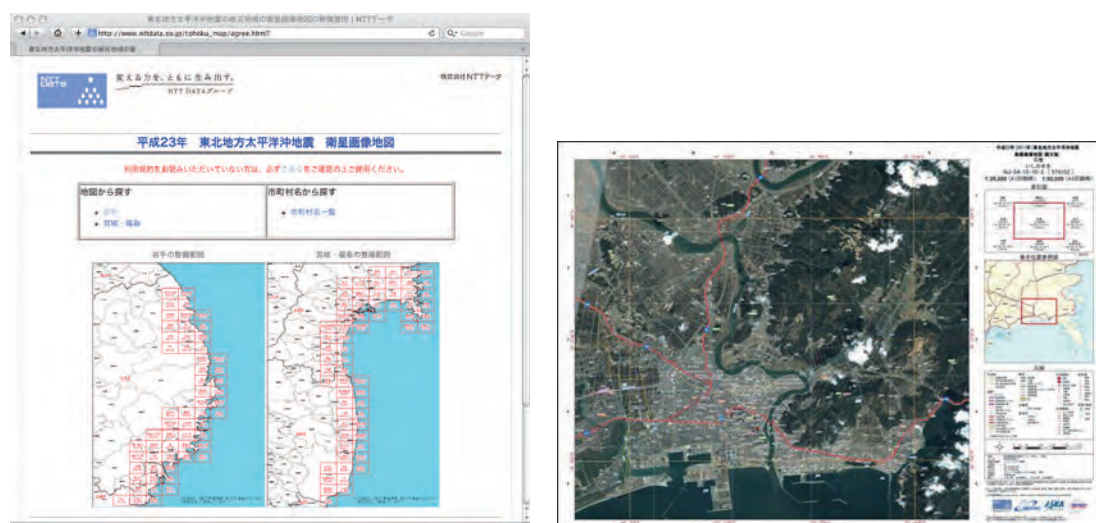


Figure 3.2-5 Satellite image map website (left) and one of the satellite image maps published (right) (http://www.nttdata.co.jp/tohoku_map/index.html)

3.2.1.5 PASCO Corporation

Immediately after the March 11 earthquake, PASCO Corporation began work to clarify the nature and extent of the devastation and provide related information. To achieve this, it engaged in multi-platform observation using various resources including TerraSAR-X (an earth observation satellite with an X-band SAR antenna), an optical satellite, airplanes and vehicles for ground-based evaluation (Figure 3.2-6). For the optical satellite platform, emergency observation images captured by Daichi were used.



Figure 3.2-6 Multi-platform response

- (1) Use of pre-disaster images
 - (a) Use of pre-disaster images as a base for superimposition of analysis results

PASCO superimposed the outcomes of analysis for various satellite images onto pan-sharpened ortho images developed using Daichi data, and provided the results to disaster countermeasures organizations and other institutions (shown on the left of Figure 3.2-7).

- (2) Use of post-disaster images
 - (a) Use of post-disaster images to draw up detailed tsunami flood hazard maps

PASCO drew up detailed tsunami flood hazard maps for wide areas stretching from Aomori down to Ibaraki using satellite images, including data captured by TerraSAR-X and Daichi, aerial photographs and other resources. The results were provided to the Prime Minister's Official Residence, the Ministry of Land, Infrastructure, Transport and Tourism, the Ministry of Agriculture, Forestry and Fisheries and other disaster countermeasures organizations, research institutions, academic societies, private enterprises, media and other organizations (shown on the right of Figure 3.2-7).

- (b) Use of images to clarify changes in coastal forests

Using AVNIR-2 images captured before the earthquake on February 27, 2011, and after it on March 14, 2011, PASCO confirmed that the earthquake-triggered tsunami had exerted a significant adverse effect on coastal forests in terms of both activity and density/area. The results were publicized at a meeting of the Japan Society of Erosion Control Engineering held from May 18, 2011.

- (c) Use of images in materials showing examples of satellite use

PASCO developed large-format images (up to 2.8 m wide) by superimposing the flood hazard maps described above onto ALOS (Daichi) data captured on March 14, 2011, (showing areas from southern Aomori to northern Ibaraki) for distribution. The Daichi images in the materials showed the extent of tsunami damage, sea surface turbidity, tsunami-related flotsam and other features. The product was well received by

various groups, including disaster countermeasure organizations within the national government and elsewhere and the news media.

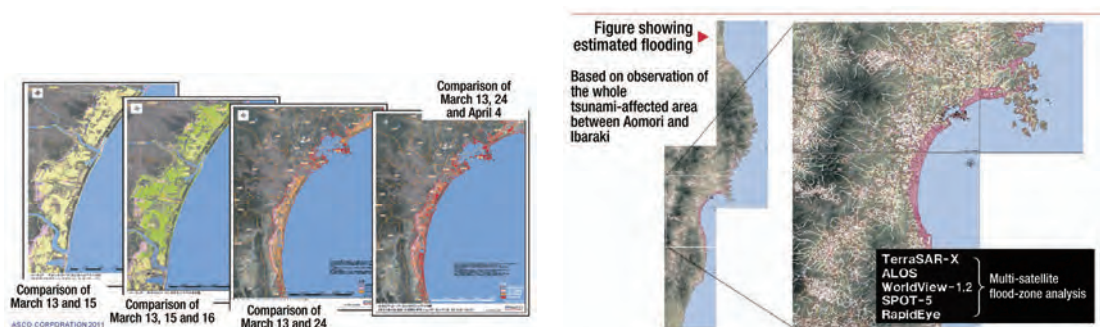


Figure 3.2-7 Use of pre-disaster images (left), flood hazard map (right)

3.2.2 Communication satellite-based activities

3.2.2.1 National Institute of Information and Communications Technology (NICT)

In response to a request for assistance from the Tokyo Fire Department on March 13, the National Institute of Information and Communications Technology (NICT) transported equipment and supplies, including a portable Very Small Aperture Terminal (VSAT), to Kesennuma City on March 14. Using KIZUNA, it subsequently began providing broadband network connections between the Emergency Fire Response Team Command Support HQ (local headquarters) in Kesennuma and the Tokyo Fire Department's Earthquake Preparation Section in Tokyo's Otemachi area on March 15. This allowed real-time two-way transmission of high-quality images, communication of information on the state of the devastation using high-definition images and so forth between the two groups. As a further advantage over telephone usage, the provision also supported the inspection of visual resources such as images and maps, thereby contributing to efficient sharing of information between the sites.

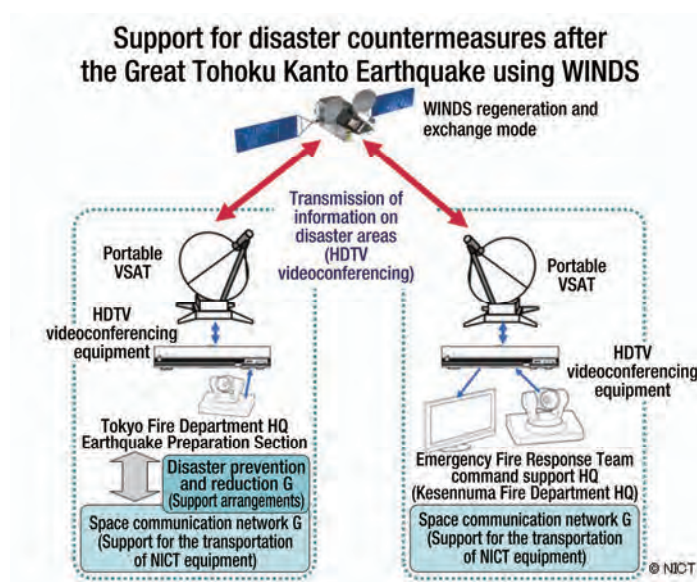


Figure 3.2-8 NICT support for disaster response activities using KIZUNA

(<http://www2.nict.go.jp/pub/whatsnew/press/h22/announce110316/index.html>)