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Tidal/Tsunami Data Collection using the Data Collection System (DCS)

This paper reports on the collection of tidal/tsunami data using Data Collection System (DCS) of JMA's geostationary meteorological satellite, MTSAT-1R and the introduction of JMA's operational tidal/tsunami data collection system.

Tidal/Tsunami Data Collection using the Data Collection System (DCS)

1. Tidal/Tsunami data collection using DCS of JMA's meteorological satellite

The Indian Ocean Tsunami caused by the earthquake off Sumatra Island on 26 December 2004 brought about a devastating damage in many countries, and has called worldwide attention to the importance of monitoring tidal/tsunami data. Consequently, positive role of tidal/tsunami data collection, using DCS of Multifunctional Transport Satellite (MTSAT DCS), is now more important than ever.

During the UN World Conference on Disaster Reduction (WCDR), held from 18 through 22 January 2005, in Kobe, Japan, the Japan Meteorological Agency (JMA) announced that it would actively push forward with acquisition of tidal/tsunami data in the Indian Ocean region through MTSAT DCS as part of JMA's supportive actions toward the establishment of the international tsunami early warning system in the Indian Ocean region. Attachment 1 shows conceptual image of the tidal/tsunami data collection system using MTSAT DCS.

In preparation for the early establishment of the tsunami early warning system in the Indian Ocean, JMA is willing to make effort in collection of tidal/tsunami data using MTSAT DCS for closer watch of tsunami in the region. As a first step, JMA had already allocated eight new addresses, time-slots, and WMO headers to tidal/tsunami DCPs after the Indian Ocean Tsunami. Moreover, JMA started collecting data from DCP at Colombo, Sri Lanka operated by the University of Hawaii using MTSAT DCS and distributing them to the Pacific Tsunami Warning Center (PTWC) via the Global Telecommunication System (GTS) of WMO in January 2005. JMA also started collecting and distributing tidal/tsunami data from DCP at Sibolga, Indonesia in April 2005. Table 1 shows tidal/tsunami DCPs of MTSAT DCS as of September 2005.

Besides, JMA had shortened the collecting intervals of Yap DCP and Malakal DCP from 60 minutes to 12 minutes in May 2005 in response to the request made by the University of Hawaii.

2. Transmission of tidal/tsunami data at 300bps

JMA started operating a tidal/tsunami DCP to observe sea level at Minami Torishima Island (24º17' N, 153º 58' E) in 1996 in order to detect tsunamis caused by earthquakes and to issue tsunami warning with sufficient lead time before tsunami's striking. In 2002, JMA upgraded the tidal/tsunami DCP on the island, with the transmission rate of 300bps and installed new function of collecting seawater temperature data in addition to sea level. Data transmission rate of 300bps has shortened the transmission time from 50 seconds to 20 seconds. Both 300bps DCP as well as 100bps DCP are available in MTSAT DCS.

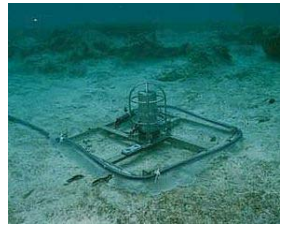
DCP Station Name	Location	Country	Operating Organization/Country
Willis Is.	16º 17' S, 149º 58' E	Australia	BoM/Australia
Yap	09º 31' N, 138º 08' E	FSM *	NWS (NOAA)/USA
Malakal	07º 20' N, 134º 28' E	Palau	NWS (NOAA)/USA
Legaspi	13º 09' N, 123º 45' E	Philippines	NWS (NOAA)/USA
Minami Torishima	24º 17' N, 153º 58' E	Japan	JMA/Japan
Severo-Kurisk	50º 40' N, 156º 07' E	Russia	Russia
Ust-Kamchatsk	56º 14' N, 162º 28' E	Russia	Russia
Pohnpei	06º 59' N, 158º 12' E	FSM	BoM/Australia
Colombo	06º 58' N, 79º 51' E	Sri Lanka	Univ. of Hawaii/USA
Sibolga	01º 33' N, 98º 53' E	Indonesia	Univ. of Hawaii/USA
Cocos Is. **	12º 30' N, 96º 50' E	Australia	NTF/Australia

* FSM: Federated States of Micronesia
** Planned

Table 1 List of tidal/tsunami DCPs in MTSAT DCS

Acoustic gauge

Basic Concept of the Tidal Data Collection System using the Geostationary Meteorological Satellite of Japan



Pressure sensor