INFORMATION GUIDEBOOK

TSUNAMI EARLY WARNING FOR BROADCASTING INSTITUTIONS IN INDONESIA

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United Nations
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INFORMATION GUIDEBOOK
TSUNAMI EARLY WARNING FOR BROADCASTING INSTITUTIONS IN INDONESIA

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PREFACE AND INTRODUCTION

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PREFACE

UNESCO

This is the second edition of the "Information Guide: Tsunami Early Warning for Broadcasting Institutions in Indonesia". The first edition was publised in Bahasa Indonesia by Jakarta Information Center with support of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) under a joint project implemented by UNESCO and the Indonesian Institute of Sciences (LIPI).

In Indonesia, broadcasting companies especially television and radio are an integrated part of the tsunami early warning system. Therefore, they must fully incorporate the system as part of their standard operation procedures. Broadcasters are one of the key links in the warning chain given their responsibility to inform the tsunami early warning messages directly to the public as quickly as possible.

The tsunami that occurred on the island of Mentawai in 2010, Sendai - Japan in 2011 and north Sumatra in 2012 showed that several of the Indonesia broadcasting company has taken their role in informing the general public in Indonesia of the potential tsunami disaster. However, recommendation of the 11 April 2012 tsunami response evaluation stated that improvement is still needed, especially on the broadcasters' understanding of the tsunami early warning messages issued by the Meteorology, Climatology and Geophysics Agency (BMKG). The guidebook was revised for that purpose and use the messages issued at the April 2012 as its case study.

We would like to extend our thanks to staff at the Meteorology, Climatology and Geophysics Agency (BMKG), the Indonesian Institute of Sciences (LIPI), the National Disaster Management Agency (BNPB), the Communications and Information Ministry (KEMENKOMINFO), the Indonesian Broadcasting Commission (KPI), German International Cooperation (GIZ) and representatives of broadcasting companies who have supported in finalizing the second edition of this guidebook.

We hope this edition will strengthen the role of the broadcasters in Indonesia and eventually reduce the number of victims and casualties from tsunamis disaster in the future.

Hubert Gijzen, PhD
Director UNESCO Regional Science Bureau for Asia and the Pacific
UNESCO Representative to Brunei Darussalam, Indonesia, Malaysia, the Philippines, and Timor Leste

LIPI

Up until now, the media has tended to focus more on the role it can play in helping all parties after a natural disaster has occurred whereas, in the time leading up to a disaster, the public needs useful information on how they should respond to signs of an impending disaster including, for instance, steps they can take to ensure their survival in the event of an earthquake that may have the potential to cause a tsunami. In a situation such as this, the role of the media is crucial. Information about the natural signs indicating an impending disaster, including official early warnings from the government via the BMKG, can help the public take precise and swift action in protecting themselves.

We extend our deep appreciation to the BMKG, the Communications and Information Ministry, the BNPB and those media colleagues who have already begun to cooperate closely with disaster management institutions. Indeed, such disasters indirectly make us aware of the need to support one another and to work together to reduce disaster risk. The compiling of this book is concrete evidence of this new-found awareness, and the support from UNESCO in enabling the preparation of this book is in itself a key role.

Reducing disaster risk cannot be achieved without first raising awareness among the public about disaster preparedness. Community education is a long-term process that requires consistency from all relevant parties to support it. One manifestation of such efforts is the formulation of this book. May it prove useful in reducing disaster risk in Indonesia.

Disaster-prone Indonesia, Let us be Prepared!

Dr. Iskandar Zulkarnaen
Deputy Head of Earth Sciences
Indonesian Institute of Sciences

BMKG

Tsunami Disaster Risk Reduction (DRR) is a collective responsibility of the central and local government, communities, and private sector including the mass media.

To implement Tsunami DRR, several efforts need to be done, such as the improvement of community awareness and preparedness, preparation of evacuation places, and establishment of early warning. Regarding the latter one, the BMKG is now able to issue tsunami warnings in 5 minutes after an earthquake occurred. The next step is to make sure that the communities receive and understand the content of the warning, and react in the right way to save their lives.

Electronic media, especially television and radio stations play an important role in disseminating tsunami warnings to communities as well as building awareness and knowledge about tsunami hazard and the measures to avoid/minimize casualties. This turns into a significant contribution in the implementation of Tsunami DRR.

The Tsunami Early Warning Information Guidebook for Broadcasting Institutions in Indonesia, which is a collective effort of a number of institutions and organizations, is expected to support the media in fulfilling their tasks as part of the dissemination system for tsunami early warning.

We would like to express our gratitude to UNESCO, JTIC, GIZ-PROTECTS and ESCAP as well as other parties that have been participating in the development and the finalization of the guidebook.

Dr. P. J. Prih Harjadi
Deputy for Geophysisc
Meteorological Climatological and Geophysical Agency

KEMENKOMINFO

The early warning system, as a mechanism for the dissemination of important and urgent information utilising the latest information technology, needs to be well managed, integrated and reliable. Television and radio broadcasters with technological devices play a special and important role in the early warning system by informing the public about potentially imminent disasters.

The Communications and Information Ministerial Decree No. 20/P/M.KOMINFO/8/2006 on Tsunami Early Warning via broadcasters throughout Indonesia stipulates that "The media is obliged to broadcast information on a potential disaster as a STOP PRESS item within the shortest possible time and without delay after receiving the information from the BMKG".

This regulation also states that the media has an important role to perform and is an integral part of the mechanism for disseminating tsunami information to the public. It is also expected that the media will convey disaster warnings appropriately, accurately and without interpretation.

Drs. Freddy H Tulung, MUA
Director General for Information and Public Communication
Ministry of Communication and Information Technology

BNPB

The media is one of the links in the early warning chain and is at the forefront of disseminating information to the public. There are four stages in early warning, namely understanding disaster risk, monitoring and delivering early warnings, dissemination and communication, and the response by the public upon receiving early warning information.

The Operations Control Center (Pusdalops) at the BNPB, which acts as a control center overseeing coordinated, integrated and unified disaster relief efforts, needs to work in cooperation with various parties, including the media, so that disaster mitigation can be implemented quickly, precisely and accurately for the public. It is hoped that this guide will strengthen the cooperation that already exists between the media and disaster management agencies in Indonesia.

Dr. Sutopo Purwo Nugroho
Head of Data Information and Public Relations
National Disaster Management Agency

GIZ IS PROTECTS

Dissemination of tsunami warnings to the communities at risk is still a big challenge all over Indonesia. From case studies and assessments in communities along the shorelines of Sumatra, Java and Bali we learned that for many, if not most, people in the tsunami prone areas the public media is still the most important way to access tsunami warnings issued by BMKG. Experiences from other countries also confirm the key role of media in the tsunami warning chain. A very impressing example has been provided by the Japanese broadcaster NHK during the 3/11 tsunami hitting Japan last year.

Understanding the importance of media involvement in InaTEWS, we highly welcomed the initiative by UNESCO and LIPI to develop a handbook for public media at national level in Indonesia. Therefore we were not hesitating at all to support the publication of a second edition of the Media Handbook, which was required to accommodate changes in the warning sequence and products due to the introduction of the new warning scheme by BMKG in early 2012. Additionally, we jointly agreed to produce an English language version to make this Handbook available to other countries as a contribution to exchange experiences and good practices in the region.

We are sure that the Media Handbook will contribute to achieve a better understanding of InaTEWS and its warning services by all actors involved.

Harald Spahn
PROTECTS - Project for Training, Education and Consulting for Tsunami Early Warning Systems
German International Cooperation - GIZ

KPI

We are thrilled about the release of this guidebook on tsunami early warning. Hopefully, this guidebook will prove to be very beneficial for the public at large. Disasters often occur immediately and unexpectedly, anywhere and at any time. And so it is with natural disasters. Earthquakes, volcanic eruptions, floods, tsunamis, droughts, severe storms and various other disasters can occur at any moment. And, sadly, such disasters often cause loss of life.

The number of fatalities in a given disaster varies depending on a number of factors, including warning information about the impending disaster. Sometimes, the number of casualties is high because there is no information about the imminent disaster or there is no way for people to avoid the disaster. In order to reduce loss of life, therefore, warning information must be disseminated quickly and it must be easily accessible by the public.

Therefore, we support this initiative of a guidebook that can be used by broadcast media to disseminate early warning information to the public. Broadcasters have the wherewithal to make a substantial impact upon the public in Indonesia. Almost all Indonesians access information via broadcast media stations. Indonesian broadcasts are easily accessible, inexpensive and can release information quickly to the wider public. This potential must be utilised as appropriately as possible in the best interests of the Indonesian people. Broadcasting institutions, whether radio or television services, need to be aware and socially responsible - especially in the event of natural disasters and accompanying mitigation efforts - by providing air time for verified information that can be accessed by the public along with public service advertisement programmes.

The launch of this book is one of the steps that can be harnessed by broadcast media in providing tsunami early warning information. We hope that broadcast media stations will also use the information in this guidebook to provide early warning information on other natural disasters. Moreover, we hope that broadcast media will participate in educating the public about the things they need to do when facing a disaster.

We hope this book will be utilised by people throughout Indonesia, but primarily broadcasting stations.

Mochamad Riyanto
Chairman
Indonesian Broadcasting Comission

INTRODUCTION

The Meteorology, Climatology and Geophysics Agency (BMKG) is an institution tasked with issuing early warning information about tsunamis caused by earthquakes in Indonesia. Since the official launch of the Indonesia Tsunami Early Warning System (InaTEWS) on November 11, 2008, the BMKG has continued to develop its capacity and services in providing tsunami early warnings.

In March 2012 BMKG started to operate the new advanced warning scheme. Now, the BMKG issues four levels of warning, which are more complete and will help local governments make decisions that are appropriate to the level of threat affecting their areas.

Considering conditions in Indonesia, where the threat of a tsunami can occur in a very short space of time, the tsunami early warning reports issued by the BMKG must be conveyed to local governments and at-risk communities as quickly as possible. The BMKG has already established a system that can send out early warnings very quickly to various relevant institutions including the National Disaster Management Agency (BNPB), local governments, the Indonesian Military (TNI), the National Police (Polri) and the media.

The media possesses a unique and very important role. The media's special quality is in the speed and breadth of scope with which it can forward tsunami early warning reports to the public. This fact has already been proven based on a number of natural disasters both in Indonesia and abroad. Thus, the role of the media is not only to report the occurrence of a disaster but also to help reducing the number of victims in a disaster by forwarding early warnings as and when they are received.

This requires that the media needs to alter its orientation from conveying information about an earthquake to disseminating early warning for the public so that those at risk can take the necessary action to ensure their safety.

This guidebook has been compiled primarily for use by the media. Its aim is to help the media distinguish between and understand different types of tsunami warning. These different warnings are disseminated by the BMKG using various modes of communication.

This book is structured in five sections. The first section comprises introductions from the institutions that have collaborated in the production of this guidebook, and the

foreword. The second section offers a blueprint of the course of action that the media should take in relation to tsunami early warning announcements. The third section contains examples of the different types of tsunami warning issued by the BMKG together with explanations how to interprete the information in the media reports. The fourth section offers concise overview about the tsunami early warning system. The final section is a reference containing the legal and regulatory foundation upon which the tsunami early warning system rests. This section ends with a list of relevant experts and institutions at both national and regional levels. The content of this guidebook is in based on information publised in the 2nd edition of the InaTEWS Tsunami Early Warning Service Guidebook, which was published by the BMKG.

Bearing in mind the importance of conveying tsunami early warnings to the public, the compilers expect this book to become a guide in facilitating the work of the media. To that end, this guidebook should be placed in broadcasting studios or a similar place where it can easily be located for the purpose of consultation.

In order to expedite the media's work at the time of an emergency, every broadcaster in every institution must participate in regular exercises to develop their attention and perception.

FLOW CHART FOR MEDIA PERSONNEL

DISSEMINATION OF TSUNAMI EARLY WARNING FOR MASS MEDIA

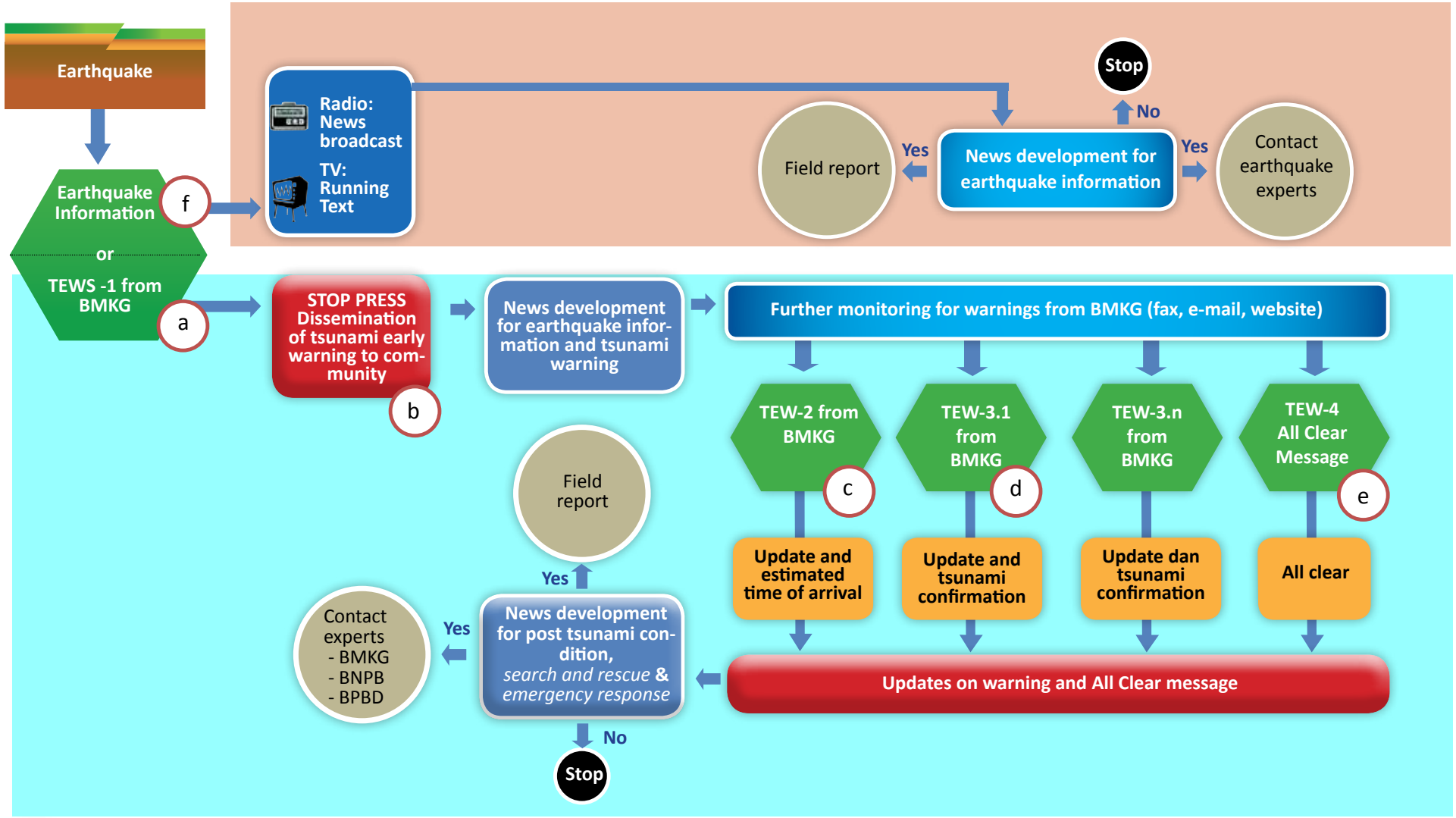
How to Read the Flow Chart for Media Personnel

- Start from the symbol labelled “earthquake” on the upper left. The following steps will be implemented only if appropriate to the given conditions. It must be remembered that an earthquake may not be physically felt by the media personnel themselves. The media will know about an earthquake from a BMKG announcement or from a correspondent in the field. The BMKG will only issue information about earthquakes that have a magnitude of more than 5 on the Richter scale (RS). The BMKG will issue an earthquake report or tsunami early warning within five minutes of the quake occurring.
- At the moment the media receives a report from the BMKG, the first step is to confirm whether the report consists of “earthquake information” or whether it is a “tsunami early warning”.
- When the report contains earthquake information and indicating that there is no tsunami threat, the media can follow up by broadcasting information or running text across the television screen. An example of this approach and its meaning can be seen in part “f”.
- When the report is a tsunami early warning, the media must follow up by presenting a Stop Press news alert, in accordance with legal requirements that are in force (see section 5, page 79). The presentation of a Stop Press on television uses information received via the Warning Receiver System (WRS). This is the first tsunami early warning (TEW-1). An example of a TEW-1 and its interpretation can be seen in part “a”, while an example of a STOP PRESS alert can be found in part “b”.
- Furthermore, the media can begin to develop news reports by accessing more detailed TEW-1 reports via email/fax or the BMKG website. A TEW-1 that is received via email or fax entails detailed information about the warning status in the region threatened with a tsunami. There are three levels of warning status, namely Major Warning (Red), Warning (Orange) and Advisory (Yellow).
- In developing news reports, the media is expected to provide suggestions to those at risk on how to avoid tsunami hazards. To that end, the media can try to contact their regional contributors/correspondents in order to ascertain the directives of local governments.
- While continuing to develop their news reports, it is expected that the media will continue to monitor for upcoming second-stage tsunami warnings (TEW-2) issued by the BMKG. An example of a TEW-2 and its meaning can be found in part “c”. A TEW-2 report offers up-to-date information with more accurate figures on the earthquake’s parameters, any changes in regional warning status levels as well as estimated arrival times of the tsunami (information via email/fax).
- At the moment a TEW-1 or TEW-2 is received, it is not advisable to confirm the reports directly with the BMKG, considering how busy BMKG staff will be with analysing and monitoring the imminent tsunami.
- Media personnel are advised to continue giving advice and tips to the public about how to avoid the tsunami threat, and to continue directing them to remain calm and follow the directions provided by local government.
- The BMKG will issue a third tsunami early warning (TEW-3) in line with developments and information it receives. A TEW-3 will contain more accurate information on the parameters of the earthquake, information from regions already hit by the tsunami and the latest information on the regional warning status. TEW-3 messages can be sent out several times in accordance with updated information on tsunami observation and are marked as follows: TEW-3.1, TEW-3.2, and so on. An example of a TEW-3 report and its interpretation can be seen in part “d”.
- When the situation is revealed to be safe from the threat of a tsunami caused by the earthquake, the BMKG will issue a fourth announcement (TEW-4), which states that the tsunami early warning has ended. An example of a TEW-4 announcement and its meaning can be found in part “e”.

Notes:

Even after the BMKG issues a TEW-2, there is a possibility that a tsunami will not occur. In this situation, the BMKG will wait for around two hours following the earthquake before issuing a TEW-4 announcement, without issuing a TEW-3.

Flow Chart of Dissemination of Tsunami Early Warning for Mass Media



represents a Stop Press that the media must implement

description of contents of the respective TEW message

represents a TEW message from the BMKG

describes the sequence of steps if an earthquake does not have the potential to cause a tsunami

describes the sequence of steps to be taken in case of a tsunami warning

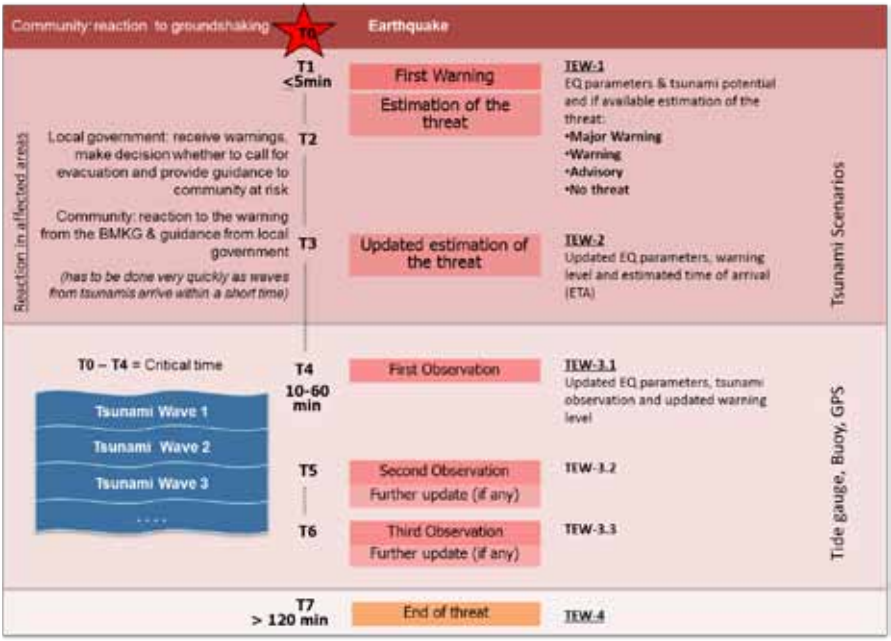
describes the suggested steps the media can take in developing news reports

process completed/terminated

NOTES

EARLY WARNING PRODUCTS

Tsunami early warning timeline for near field tsunami



From the time an earthquake happens until the tsunami threat ends, the BMKG will issue four types of warnings:

1. TEW-1: Disseminated based on earthquake parameters and the estimated impact of the tsunami reflected by warning level (Major Warning - Awas, Warning - Siaga or Advisory - Waspada) for every affected district.
2. TEW-2: Contains updated earthquake parameters and, in addition to the warning levels in Warning 1, also the tsunami wave's estimated time of arrival (ETA) on shore.
3. TEW-3: Contains tsunami observation information, updated warning levels and tsunami arrival times, which may be disseminated several times depending on the tsunami observations at the tide gauge stations, the buoys, the CCTVs, and the tsunami radars.
4. TEW-4: Announces that tsunami early warning has ended (end of threat).

Following is an explanation of the sequence and types of tsunami early warning messages that are issued and the expected reaction by local governments and communities at risk.

T0 – T1: When an earthquake occurs (T0), all the earthquake recording sensors at the seismic stations around the earthquake source region will record earthquake data and transmit the data to the NTWC at the BMKG for processing. For earthquakes in Indonesia, this takes less than 5 minutes (T0-T1).

At the BMKG's NTWC (National Tsunami Warning Center), the automatic seismic-data processing system calculates earthquake parameters. The SeisComP3 operator then checks the results of the automatic processing and applies corrections interactively to increase the accuracy of the earthquake's parameters. At that time, the earthquake parameters are ready for dissemination and are sent to the dissemination system as well as to the DSS (Decision Support System). The DSS will process the data and generates a proposal which has to be reviewed and confirmed by the DSS operator. The result is either a tsunami warning proposal or an earthquake information proposal that will be sent by the dissemination system.

If the earthquake is powerful and can be felt very strongly, (or is less powerful but lasts for a long time), people in risk areas must take immediate action themselves without waiting for an early warning message.

T1: Dissemination of earthquake information and/or tsunami early warning (T1 ≤ 5 minutes). For any earthquake of M ≥ 5 RS, information will be disseminated simultaneously via SMS, e-mail and fax to local governments, relevant officials and the owners of mobile phones whose numbers are on the list of recipients for the BMKG's earthquake information.

If the earthquake parameters indicate a tsunami threat (an earthquake of M ≥ 7 RS with a depth of ≤ 100 km and an epicenter located at sea or in coastal areas), Warning 1 is disseminated based on the output of the Decision Support System (DSS), using the tsunami model in the tsunami database. TEW-1 contains the earthquake parameters and, if available, information about the estimated impact of the tsunami reflected by a warning level (Major Warning - Awas, Warning - Siaga or Advisory - Waspada) for every district that might be affected.

T2: Depending on the warning level, local governments need to react to TEW-1 by taking the decision whether or not to evacuate and informing the community of the required action to be taken using the equipment available, such as sounding sirens, mosque loudspeakers, kentongan (gong-like equipment) and other devices. People must be able to understand the warning signals and to follow the guidance from the local government to immediately evacuate to a designated safe location.

T3: TEW-2 is issued to provide updated earthquake parameters and warning levels, and additional information about the tsunami's estimated time of arrival on shore.

T4: TEW-3 contains tsunami observation information and updated warning levels, which may be disseminated several times depending on the tsunami observations at the tide gauge stations and the buoys.

T5 – T6: The BMKG meanwhile continues to monitor the propagation of the tsunami

waves and provides tsunami information updates via the updates provided with TEW-3 (T6 – T7). TEW-3 can be issued more than once (with updates).

T7: TEW- 4: The announcement"The tsunami threat is over" will be disseminated after the retrieval of supporting data from the tide gauges and/or information from the community which can confirm there was no subsequent tsunami. TEW-4 will be sent out at the earliest 2 hours after the announcement of the initial tsunami warning (T1).

Warning level and advice to local government by the BMKG

Warning Level	Saran dari BMKG pada PEMDA
AWAS (Major Warning)	Provincial/District/City governments that are at "Major Warning" level are expected to pay attention to this warning and immediately guide their communities for full evacuation.
SIAGA (Warning)	Provincial/District/City governments that are at "**Warning**" level are expected to pay attention to this warning and immediately guide their communities for evacuation.
WASPADA (Advisory)	Provincial/District/City governments that are at "**Advisory**" level are expected to pay attention to this warning and immediately guide their communities to move away from beaches and river banks.

The BMKG provides earthquake information and tsunami warnings to BNPB, local governments and the media. Local governments are responsible for guiding their communities' reaction to this information and for deciding whether or not to call for evacuation.

NOTES

TEW-1

Via WRS for TV Stations

HOW TO READ THE MESSAGE

TSUNAMI WARNING FROM BMKG.

AN EARTHQUAKE WITH A MAGNITUDE OF 8.9 ON THE RICHTER SCALE WITH A DEPTH OF 10 KILOMETRES OCCURRED ON 11 APRIL 2012 AT 15:38:33 WESTERN INDONESIA TIME (WIB), EPICENTER IN THE REGION OF SOUTHWEST SIMEULUE REGENCY ACEH PROVINCE AND HAS THE POTENTIAL TO CAUSE A TSUNAMI. THE COMMUNITY IS URGED TO FOLLOW DIRECTIONS FROM THE AUTHORITIES OR THE LOCAL GOVERNMENT.

EARTHQUAKE PARAMETERS ARE TEMPORARY AND WILL CONTINUE TO BE UPDATED BY THE BMKG.

COMMUNITIES HAVING **WARNING** OR **MAJOR WARNING** STATUS, INDICATED IN THE MAP BY ORANGE OR RED COLORS, ARE ADVISED TO IMMEDIATELY EVACUATE TO A SAFE PLACE OR HIGHER GROUND. COMMUNITIES WITH **ADVISORY** LEVEL INDICATED BY YELLOW COLOR ARE ADVISED TO STAY AWAY FROM BEACHES AND WATERWAYS INCLUDING RIVERS.

Via WRS for Radio Stations

PERINGATAN DINI TSUNAMI

BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA

Magnitude 8.9

Waktu : 11-Apr-12 15:38:29 WIB
Lokasi : 2.31 LU - 92.67 BT
Kedalaman: 10 Km

Keterangan lokasi gempabumi :

382 km BaratDaya KAB-SIMEULUE-NAD
431 km BaratDaya KAB-ACEHJAYA
453 km BaratDaya KAB-ACEHBARAT
460 km BaratDaya BANDAACEH-NAD
1829 km BaratLaut JAKARTA-INDONESIA

Berpotensi TSUNAMI untuk diteruskan pada Masyarakat

Berpotensi terjadi Tsunami di wilayah

SUMBAR	Kota-Padang	SIAGA
SUMBAR	Kota-Padang Bagian Selatan	SIAGA
SUMBAR	Kota-Padang Bagian Utara	SIAGA
SUMBAR	Padang-Pariaman Bagian Selatan	SIAGA
SUMBAR	Padang-Pariaman Bagian Utara	SIAGA
SUMBAR	Kepulauan-Mentawai	SIAGA
SUMBAR	Pesisir-Selatan Bagian Selatan	SIAGA
SUMBAR	Pesisir-Selatan Bagian Utara	SIAGA
BANTEN	Lebak	WASPADA
JABAR	Cianjur Sukabumibarang	WASPADA
LAMPUNG	Lampung-Selatan Kep. Krakatau	WASPADA
LAMPUNG	Lampung-Selatan Kep. Sebesi	WASPADA

Keterangan Warna :

Siaga Tsunami (0.5m <= h < 3m)

Waspada Tsunami (h < 0.5m)

HOW TO READ THE MESSAGE

TSUNAMI WARNING FROM BMKG.

AN EARTHQUAKE WITH A MAGNITUDE OF 8.9 ON THE RICHTER SCALE WITH A DEPTH OF 10 KILOMETRES OCCURRED ON 11 APRIL 2012 AT 15:38:33 WESTERN INDONESIA TIME (WIB), EPICENTER IN THE REGION OF SOUTHWEST SIMEULUE REGENCY ACEH PROVINCE AND HAS THE POTENTIAL TO CAUSE A TSUNAMI.

EARTHQUAKE PARAMETERS ARE TEMPORARY AND WILL CONTINUE TO BE UPDATED BY THE BMKG.

PROVINCIAL/REGENCY/CITY GOVERNMENTS THAT HAVE THE STATUS **MAJOR WARNING** (RED) ARE EXPECTED TO MONITOR EVENTS CLOSELY AND TO IMMEDIATELY DIRECT THEIR COMMUNITIES TO EVACUATE AREAS AT RISK ENTIRELY. THIS APPLIES FOR FOLLOWING DISTRICTS:

BENGKULU	:	Bengkulu-Selatan, Bengkulu-Utara Bagian Utara, Bengkulu-Utara Pulau Enggano, Kaur, Kota-Bengkulu Pantai-Panjang, Mukomuko, dan Seluma
LAMPUNG	:	Lampung-Barat Pesisir-Selatan, Lampung-Barat Pesisir-Tengah, dan Lampung-Barat Pesisir-Utara
NAD	:	Aceh-Barat, Aceh-Barat-Daya, Aceh-Besar Bagian Barat, Aceh-Besar Bagian Utara , Aceh-Besar Pulau Breueh, Aceh-Besar Pulau Penasi, Aceh-Jaya, Aceh-Selatan Bagian Selatan, Aceh-Selatan Bagian Utara, Aceh-Singkil, Aceh-Singkil Kepulauan Banyak, Aceh-Timur, Aceh-Utara Bagian Barat, Aceh-Utara Bagian Timur, Bireuen, Kota-Banda-Aceh , Kota-Lhokseumawe, Kota-Sabang Pulau Rondo, Kota-Sabang Pulau Weh, Nagan-Raya, Pidie, dan Simeulue Pulau Simeulue
SUMBAR	:	Kepulauan-Mentawai Kep. Pagai, Kepulauan-Mentawai P. Siberut, dan Kepulauan-Mentawai Pulau Sipora
SUMUT	:	Kota-Sibolga, Mandailing-Natal Bagian Selatan, Mandailing-Natal Bagian Utara, Nias Bagian Barat, Nias Bagian Timur, Nias-Selatan Pulau Nias, Nias-Selatan Pulau Pini, Nias-Selatan Pulau Tanabala, Nias-Selatan Pulau Tanahmasa, Tapanuli-Selatan, Tapanuli-Tengah Bagian Selatan,Tapanuli-Tengah Bagian Utara, danTapanuli-Tengah Kep. Mursala.

PROVINCIAL/REGENCY/CITY GOVERNMENTS THAT HAVE THE STATUS **WARNING** (ORANGE) ARE EXPECTED TO MONITOR EVENTS CLOSELY AND TO IMMEDIATELY DIRECT THEIR COMMUNITIES TO EVACUATE AREAS AT RISK. THIS APPLIES FOR FOLLOWING DISTRICTS:

BANTEN : Pandeglang Bagian Selatan, Pandeglang Pulau Panaitan.

BENGKULU : Bengkulu-Utara Bagian Selatan

JABAR : Sukabumi Pelabuhan-Ratu dan Sukabumi Ujung-Genteng.

LAMPUNG : Lampung-Selatan Bagian Barat, Tanggamus Bagian Barat, Tanggamus Bagian Timur, Tanggamus Pulau Tabuan

SUMBAR : Agam, Kota-Padang, Kota-Padang Bagian Selatan, Kota-Padang Bagian Utara, Padang-Pariaman Bagian Selatan, Padang-Pariaman Bagian Utara, Pasaman-Barat, Pesisir-Selatan Bagian Selatan, dan Pesisir-Selatan Bagian Utara.

PROVINCIAL/REGENCY/CITY GOVERNMENTS THAT HAVE THE STATUS **ADVISORY** (YELLOW) ARE EXPECTED TO MONITOR EVENTS CLOSELY AND TO IMMEDIATELY DIRECT THEIR COMMUNITIES TO STAY AWAY FROM BEACHES AND RIVERBANKS. THIS APPLIES FOR FOLLOWING DISTRICTS:

BANTEN : Lebak

JABAR : Cianjur Sindangbarang

LAMPUNG : Lampung-Selatan Kep. Krakatau dan Lampung-Selatan Kep. Sebuku

THE PUBLIC SHOULD FOLLOW INSTRUCTIONS ISSUED BY THE AUTHORITIES:

TEW-1

Via Fax / e-mail

::::BMKG::::::::::::BMKG::::::::::::BMKG::::::::::::BMKG::::::::::::BMK ::

Indonesian Tsunami Early Warning System (InaTEWS)
METEOROLOGICAL CLIMATOLOGICAL AND GEOPHYSICAL AGENCY
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P.O. Box 3540 Jkt, Website : http://www.bmkg.go.id

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Issued date: 11 April 2012, 15:43:05 WIB (UTC=WIB-7)
Bulletin-1
No.:103/warning/InaTEWS/IV/2012

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS:

Magnitude	:	8.9 RS
Date	:	11-Apr-2012
Waktu Origin Time	:	08:38:29 UTC
Latitude	:	2.31 N
Longitude	:	92.67 E
Depth	:	10 Km

Earthquake parameter

Location	:	Off West Coast of Northern Sumatra
Remarks	:	434 km SOUTHWEST of Meulaboh
		463 km SOUTHWEST of Banda Aceh
		493 km SOUTHWEST of Sabang
		497 km SOUTHWEST of Sigli
		550 km SOUTHWEST of Bireun

Distance from epicenter

Evaluation:

THERE IS THE POSSIBILITY OF A TSUNAMI IN THE FOLLOWING AREAS:

Province	Location	Warning Level
BENGKULU	Bengkulu-Selatan	MAJOR WARNING
BENGKULU	Bengkulu-Utara Bagian Utara	MAJOR WARNING
BENGKULU	Bengkulu-Utara Pulau Enggano	MAJOR WARNING
BENGKULU	Kaur	MAJOR WARNING
BENGKULU	Kota-Bengkulu Pantai-Panjang	MAJOR WARNING
BENGKULU	Mukomuko	MAJOR WARNING

Warning Level for Affected Areas
(Warning segments are usually equal to district borders, although there are exceptions)

BENGKULU	Seluma	MAJOR WARNING
LAMPUNG	Lampung-Barat Pesisir-Selatan	MAJOR WARNING
LAMPUNG	Lampung-Barat Pesisir-Tengah	MAJOR WARNING
LAMPUNG	Lampung-Barat Pesisir-Utara	MAJOR WARNING
NAD	Aceh-Barat	MAJOR WARNING
NAD	Aceh-Barat-Daya	MAJOR WARNING
...	...	...
...	...	...
...	...	...
LAMPUNG	Tanggamus Pulau Tabuan	WARNING
SUMBAR	Agam	WARNING
SUMBAR	Kota-Padang	WARNING
SUMBAR	Kota-Padang Bagian Selatan	WARNING
SUMBAR	Kota-Padang Bagian Utara	WARNING
SUMBAR	Padang-Pariaman Bagian Selatan	WARNING
SUMBAR	Padang-Pariaman Bagian Utara	WARNING
SUMBAR	Pasaman-Barat	WARNING
SUMBAR	Pesisir-Selatan Bagian Selatan	WARNING
SUMBAR	Pesisir-Selatan Bagian Utara	WARNING
BANTEN	Lebak	ADVISORY
JABAR	Cianjur Sindangbarang	ADVISORY
LAMPUNG	Lampung-Selatan Kep. Krakatau	ADVISORY
LAMPUNG	Lampung-Selatan Kep. Sebuku	ADVISORY

Advice:

Province/District/City governments that are at “Major Warning” level are expected to pay attention to this warning and immediately guide their communities for full evacuation.

Province/District/City governments that are at “Warning” level are expected to pay attention to this warning and immediately guide their communities for evacuation.

Province/District/City governments that are at “Advisory” level are expected to pay attention to this warning and immediately guide their communities to move away from the beach and river banks.

Guidance for local government

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HOW TO READ THE MESSAGE

TSUNAMI WARNING FROM BMKG.

AN EARTHQUAKE WITH A MAGNITUDE OF 8.9 ON THE RICHTER SCALE WITH A DEPTH OF 10 KILOMETRES OCCURRED ON 11 APRIL 2012 AT 15:38:33 WESTERN INDONESIA TIME (WIB), EPICENTER IN THE REGION OF SOUTHWEST SIMEULUE REGENCY ACEH PROVINCE AND HAS THE POTENTIAL TO CAUSE A TSUNAMI.

EARTHQUAKE PARAMETERS ARE TEMPORARY AND WILL CONTINUE TO BE UPDATED BY THE BMKG.

PROVINCIAL/REGENCY/CITY GOVERNMENTS THAT HAVE THE STATUS **MAJOR WARNING** (RED) ARE EXPECTED TO MONITOR EVENTS CLOSELY AND TO IMMEDIATELY DIRECT THEIR COMMUNITIES TO EVACUATE AREAS AT RISK ENTIRELY. THIS APPLIES FOR FOLLOWING DISTRICTS:

BENGKULU	:	Bengkulu-Selatan, Bengkulu-Utara Bagian Utara, Bengkulu-Utara Pulau Enggano, Kaur, Kota-Bengkulu Pantai-Panjang, Mukomuko, dan Seluma
LAMPUNG	:	Lampung-Barat Pesisir-Selatan, Lampung-Barat Pesisir-Tengah, dan Lampung-Barat Pesisir-Utara
NAD	:	Aceh-Barat, Aceh-Barat-Daya, Aceh-Besar Bagian Barat, Aceh-Besar Bagian Utara , Aceh-Besar Pulau Breueh, Aceh-Besar Pulau Penasi, Aceh-Jaya, Aceh-Selatan Bagian Selatan, Aceh-Selatan Bagian Utara, Aceh-Singkil, Aceh-Singkil Kepulauan Banyak, Aceh-Timur, Aceh-Utara Bagian Barat, Aceh-Utara Bagian Timur, Bireuen, Kota-Banda-Aceh , Kota-Lhokseumawe, Kota-Sabang Pulau Rondo, Kota-Sabang Pulau Weh, Nagan-Raya, Pidie, dan Simeulue Pulau Simeulue
SUMBAR	:	Kepulauan-Mentawai Kep. Pagai, Kepulauan-Mentawai P. Siberut, dan Kepulauan-Mentawai Pulau Sipora
SUMUT	:	Kota-Sibolga, Mandailing-Natal Bagian Selatan, Mandailing-Natal Bagian Utara, Nias Bagian Barat, Nias Bagian Timur, Nias-Selatan Pulau Nias, Nias-Selatan Pulau Pini, Nias-Selatan Pulau Tanabala, Nias-Selatan Pulau Tanahmasa, Tapanuli-Selatan, Tapanuli-Tengah Bagian Selatan,Tapanuli-Tengah Bagian Utara, danTapanuli-Tengah Kep. Mursala.

PROVINCIAL/REGENCY/CITY GOVERNMENTS THAT HAVE THE STATUS **WARNING** (ORANGE) ARE EXPECTED TO MONITOR EVENTS CLOSELY AND TO IMMEDIATELY DIRECT THEIR COMMUNITIES TO EVACUATE AREAS AT RISK. THIS APPLIES FOR FOLLOWING DISTRICTS:

BANTEN : Pandeglang Bagian Selatan, Pandeglang Pulau Panaitan.

BENGKULU : Bengkulu-Utara Bagian Selatan

JABAR : Sukabumi Pelabuhan-Ratu dan Sukabumi Ujung-Genteng.

LAMPUNG : Lampung-Selatan Bagian Barat, Tanggamus Bagian Barat, Tanggamus Bagian Timur, Tanggamus Pulau Tabuan

SUMBAR : Agam, Kota-Padang, Kota-Padang Bagian Selatan, Kota-Padang Bagian Utara, Padang-Pariaman Bagian Selatan, Padang-Pariaman Bagian Utara, Pasaman-Barat, Pesisir-Selatan Bagian Selatan, dan Pesisir-Selatan Bagian Utara.

PROVINCIAL/REGENCY/CITY GOVERNMENTS THAT HAVE THE STATUS **ADVISORY** (YELLOW) ARE EXPECTED TO MONITOR EVENTS CLOSELY AND TO IMMEDIATELY DIRECT THEIR COMMUNITIES TO STAY AWAY FROM BEACHES AND RIVERBANKS. THIS APPLIES FOR FOLLOWING DISTRICTS:

BANTEN : Lebak

JABAR : Cianjur Sindangbarang

LAMPUNG : Lampung-Selatan Kep. Krakatau dan Lampung-Selatan Kep. Sebuku

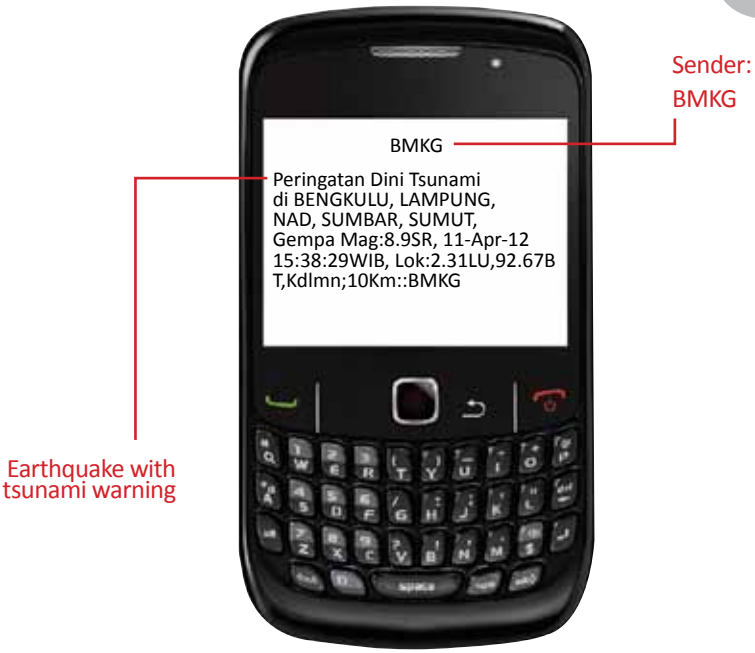
THE PUBLIC SHOULD FOLLOW INSTRUCTIONS ISSUED BY THE AUTHORITIES.

NOTES:

TO REGISTER YOUR E-MAIL ADDRESS TO BMKG, SEND AN INQUIRY ADDRESSED TO:

HEAD OF EARTHQUAKE AND TSUNAMI MITIGATION
BMKG HEAD OFFICE
PHONE/FAX: 021 - 6546316

Via SMS



HOW TO READ THE MESSAGE

TSUNAMI WARNING FROM BMKG.

TSUNAMI EARLY WARNING FOR THE AREAS OF BENGKULU, LAMPUNG, ACEH, WEST SUMATRA, AND NORTH SUMATRA AS A RESULT OF AN 8.9-MAGNITUDE EARTHQUAKE AT A DEPTH OF 10 KILOMETRES OCCURRING ON 11 APRIL 2012 AT 15:38:33 WIB.

NOTES:

SMS MESSAGES ONLY LIST UP TO 5 PROVINCES WITH TSUNAMI WARNING STATUS BUT NO WARNING LEVELS. THIS IS NOT SUFFICIENT FOR PUBLIC INFORMATION PURPOSES. THEREFORE MEDIA NEED TO IMMEDIATELY CONSULT LONG VERSION MESSAGES (AS DISTRIBUTED BY E-MAIL OR FAX).

TEW-1

a

Via Website

This field displays early warning information. At the moment of a tsunami early warning, this field contains the same information that can be obtained via email/ fax

This field displays the parameter of the most recent earthquake that has occurred

NOTES:

THE MEDIA CAN ALSO GET INFORMATION VIA THE WEBSITE. THERE IS A POSSIBILITY THAT DUE TO THE HIGH NUMBER OF PEOPLE TRYING TO ACCESS THE INFORMATION ONLINE, THE INTERNET MAY BE SLOW OR THE WEBSITE MAY NOT FUNCTION WELL. THE MEDIA MUST ENSURE THAT THE INFORMATION CAN BE OBTAINED VIA EMAIL.

b

VIA TELEVISION

VISUAL TV, HIGH TONE ALERT WITH A 30-SECOND FREEZE PANE

STOP PRESS

FOR AREAS ON MAJOR WARNING AND WARNING

b

AN EXAMPLE OF RUNNING TEXT FOLLOWING A STOP PRESS TELEVISION ALERT

a. Example of Running Text for a TEW-1 Report :
BMKG TSUNAMI EARLY WARNING::: AREAS ON MAJOR WARNING STATUS IN ...,...,... AND WARNING IN ....,...,.... THE PUBLIC MUST FOLLOW DIRECTIONS FROM AUTHORITIES.

b. Example of Running Text to Follow:
IF A TSUNAMI OCCURS, WAVES CAN ARRIVE ON SHORE MORE THAN ONCE. MEMBERS OF THE PUBLIC ARE URGED TO STAY IN A SAFE PLACE UNTIL THE AUTHORITIES ISSUE INFORMATION THAT THE TSUNAMI THREAT HAS PASSED.

EXAMPLE OF A RADIO ANNOUNCEMENT

TSUNAMI THREAT.

A TSUNAMI EARLY WARNING HAS BEEN RELEASED BY THE BMKG. AREAS ON MAJOR WARNING STATUS ARE ……,……,……..AND THOSE ON WARNING ARE …., ….., ……. THE PUBLIC IS URGED TO FOLLOW DIRECTIONS FROM THE AUTHORITIES.

COMMUNITIES IN AREAS WITH **MAJOR WARNING** *AND* **WARNING** *STATUS ARE INSTRUCTED TO IMMEDIATELY GO TO A SAFE PLACE OR HIGHER GROUND, STAY AWAY FROM BEACHES, WATERWAYS AND RIVERS.*

BE CAREFUL OF SUBSEQUENT WAVES. A TSUNAMI CAN STRIKE THE SHORE MORE THAN ONCE.

MEMBERS OF THE PUBLIC ARE ADVISED NOT TO RETURN TO AREAS NEAR THE COAST OR RIVERBANKS UNTIL OFFICIAL INFORMATION HAS BEEN RELEASED BY THE AUTHORITIES THAT THE TSUNAMI THREAT HAS ENDED. FOLLOW THE DIRECTIONS ISSUED BY THE LOCAL AUTHORITIES. STAY IN A SAFE PLACE UNTIL YOU RECEIVE INFORMATION FROM THE AUTHORITIES THAT THE TSUNAMI THREAT HAS PASSED

STOP PRESS

b

FOR AREAS ON ADVISORY

AN EXAMPLE OF RUNNING TEXT FOLLOWING A STOP PRESS TELEVISION ALERT

a. Example of Running Text for a TEW-1 report:
BMKG TSUNAMI EARLY WARNING::: AREAS ON ADVISORY STATUS ARE ....., ..., ... COMMUNITIES SHOULD FOLLOW INSTRUCTIONS FROM THE AUTHORITIES.

b. Example of Running Text to Follow:
ADVISORY STATUS MEANS THERE IS A POSSIBILITY THAT WAVES CAN BE LIFE-THREATENING. THE PUBLIC IS ADVISED TO STAY AWAY FROM BEACHES, WATERWAYS AND RIVERS.

c. Example of Running Text to Follow:
IF A TSUNAMI OCCURS, TAKE CARE AS TSUNAMI WAVES CAN STRIKE MORE THAN ONCE. WAIT UNTIL INFORMATION HAS BEEN RELEASED BY THE AUTHORITIES THAT THE TSUNAMI THREAT HAS PASSED.

EXAMPLE OF A RADIO ANNOUNCEMENT

TSUNAMI THREAT.

A TSUNAMI EARLY WARNING HAS BEEN ISSUED BY THE BMKG. FOR AREAS ON ADVISORY STATUS IN ....., ..., ... WAVES CAN BE LIFE-THREATENING.

MEMBERS OF THE PUBLIC MUST FOLLOW INSTRUCTIONS FROM THE AUTHORITIES, AND STAY AWAY FROM BEACHES, WATERWAYS AND RIVERS. BE CAREFUL AS TSUNAMI WAVES CAN STRIKE MORE THAN ONCE.

WAIT UNTIL INFORMATION HAS BEEN ISSUED BY THE AUTHORITIES THAT THE TSUNAMI THREAT HAS ENDED.

THE PUBLIC IS ADVISED NOT TO RETURN TO AREAS NEAR WATER OR RIVERBANKS UNTIL OFFICIAL INFORMATION IS RECEIVED FROM THE AUTHORITIES THAT THE TSUNAMI THREAT HAS PASSED. FOLLOW THE DIRECTIONS OF LOCAL AUTHORITIES

NOTES

C

Via WRS for TV Stations

Pay attention for the possibility of updates to the earthquake's parameters

Pay attention for the possibility of changes of warning levels as indicated by the colour grading (red, orange or yellow)

Look out for the word "Update"; if this word appears, it means that the message contains updated information and replaces the information sent previously.

HOW TO READ THE MESSAGE

TSUNAMI WARNING FROM BMKG.

UPDATED INFORMATION ON THE EARTHQUAKE, WHICH OCCURRED ON 11 APRIL 2012 AT 15:38:33 WIB, WITH A MAGNITUDE OF 8.5 ON THE RICHTER SCALE AND A DEPTH OF 10 KILOMETRES, EPICENTER IN THE SOUTHWEST REGION SIMEULUE REGENCY ACEH PROVINCE AND WITH THE POTENTIAL TO CAUSE A TSUNAMI. FOLLOW INSTRUCTIONS FROM AUTHORITIES:

COMMUNITIES HAVING **MAJOR WARNING** OR **WARNING** STATUS, INDICATED IN THE MAP BY ORANGE OR RED COLORS, ARE ADVISED TO IMMEDIATELY EVACUATE TO A SAFE PLACE OR HIGHER GROUND. COMMUNITIES WITH **ADVISORY** LEVEL INDICATED BY YELLOW COLOR ARE ADVISED TO STAY AWAY FROM BEACHES AND WATERWAYS INCLUDING RIVERS.

C

Via WRS for Radio Stations

PERINGATAN DINI TSUNAMI

BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA

Magnitude 8.5

Waktu : 11-Apr-12 15:38:33 WIB
Lokasi : 2.40 LU - 92.09 BT
Kedalaman: 10 Km
Keterangan lokasi gempabumi :

346 km BaratDaya KAB-SIMEULUE-NAD
396 km BaratDaya KAB-ACEHJAYA
417 km BaratDaya KAB-ACEHBARAT
431 km BaratDaya BANDAACEH-NAD
1804 km BaratLaut JAKARTA-INDONESIA
[Prematikan]

Berpotensi TSUNAMI untuk diteruskan pada Masyarakat

C

HOW TO READ THE MESSAGE

TSUNAMI WARNING FROM BMKG.

UPDATED INFORMATION ON THE EARTHQUAKE, WHICH OCCURRED ON 11 APRIL 2012 AT 15:38:33 WIB, WITH A MAGNITUDE OF 8.5 ON THE RICHTER SCALE AND A DEPTH OF 10 KILOMETRES, EPICENTER IN THE SOUTHWEST REGION SIMEULUE REGENCY ACEH PROVINCE AND WITH THE POTENTIAL TO CAUSE A TSUNAMI. FOLLOW INSTRUCTIONS FROM AUTHORITIES:

COMMUNITIES HAVING **MAJOR WARNING** OR **WARNING** STATUS, INDICATED IN THE MAP BY ORANGE OR RED COLORS, ARE ADVISED TO IMMEDIATELY EVACUATE TO A SAFE PLACE OR HIGHER GROUND COMMUNITIES WITH **ADVISORY** LEVEL INDICATED BY YELLOW COLOR ARE ADVISED TO STAY AWAY FROM BEACHES AND WATERWAYS INCLUDING RIVERS.

TEW-2

C

Via Fax / e-mail

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Indonesian Tsunami Early Warning System (InaTEWS)
METEOROLOGICAL CLIMATOLOGICAL AND GEOPHYSICAL AGENCY
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P.O. Box 3540 Jkt, Website : http://www.bmkg.go.id

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Issued date: 11 April 2012, 15:47:45 WIB (UTC=WIB-7)
Bulletin-2
No.:104/warning/InaTEWS/IV/2012

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS:

Magnitude	:	8.5 RS
Date	:	11-Apr-2012
Origin Time	:	08:38:33 UTC
Latitude	:	2.40 N
Longitude	:	92.99 E
Depth	:	10 Km
Location	:	Off West Coast of Northern Sumatra
Remarks	:	398 km SOUTHWEST Meulaboh
		433 km SOUTHWEST Banda Aceh
		464 km SOUTHWEST Sabang
		465 km SOUTHWEST Sigli
		515 km SOUTHWEST Bireun

Pay attention for the possibility of updates to the earthquake's parameters

Evaluation:

THERE IS THE POSSIBILITY OF A TSUNAMI IN THE FOLLOWING AREAS:

Province	Warning Segment	Warning Level	ETA [UTC]	Date [YYYY-MM-DD]
NAD	Simeulue Pulau Simeulue	MAJOR WARNING	09:00:13	2012-04-11
SUMUT	Nias Bagian Barat	MAJOR WARNING	09:16:58	2012-04-11
SUMUT	Nias-Selatan Pulau Nias	MAJOR WARNING	09:22:03	2012-04-11
...	...	...	...	...

Be aware of the possibility that the status levels in each area may change from Advisory to Warning or Major Warning, or vice-versa

...	...	...	...	...
...	...	...	...	...
BENGKULU	Bengkulu-Utara Bagian Utara	WARNING	10:48:22	2012-04-11
BENGKULU	Kaur	WARNING	10:48:43	2012-04-11
BENGKULU	Seluma	WARNING	10:49:43	2012-04-11
SUMUT	Mandailing-Natal Bagian Selatan	WARNING	10:51:43	2012-04-11
BENGKULU	Bengkulu-Selatan	WARNING	10:51:52	2012-04-11
LAMPUNG	Lampung-Barat Pesisir-Selatan	WARNING	10:54:28	2012-04-11
LAMPUNG	Lampung-Barat Pesisir-Tengah	WARNING	10:54:28	2012-04-11
LAMPUNG	Lampung-Barat Pesisir-Utara	WARNING	10:55:37	2012-04-11
BENGKULU	Kota-Bengkulu Pantai-Panjang	WASPADA	10:58:18	2012-04-11
BANTEN	Pandeglang Pulau Panaitan	WARNING	11:01:43	2012-04-11
BENGKULU	Bengkulu-Utara Bagian Selatan	ADVISORY	11:03:13	2012-04-11
BANTEN	Pandeglang Bagian Selatan	NO THREAT	11:03:52	2012-04-11
JABAR	Sukabumi Pelabuhan-Ratu	NO THREAT	11:05:18	2012-04-11
JABAR	Sukabumi Ujung-Genteng	NO THREAT	11:05:18	2012-04-11
LAMPUNG	Lampung-Selatan Kep. Krakatau	NO THREAT	11:05:22	2012-04-11
LAMPUNG	Lampung-Selatan Kep. Sebuku	NO THREAT	11:05:22	2012-04-11
LAMPUNG	Tanggamus Bagian Barat	ADVISORY	11:05:48	2012-04-11
LAMPUNG	Tanggamus Pulau Tabuan	ADVISORY	11:05:48	2012-04-11
LAMPUNG	Lampung-Selatan Bagian Barat	NO THREAT	11:06:22	2012-04-11
LAMPUNG	Tanggamus Bagian Timur	NO THREAT	11:06:22	2012-04-11
JABAR	Cianjur Sindangbarang	NO THREAT	11:06:33	2012-04-11
BANTEN	Lebak	NO THREAT	11:06:52	2012-04-11

(ETA: estimated time of arrival)

ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST.

Advice:

Province/District/City governments that are at “Major Warning” level are expected to pay attention to this warning and immediately guide their communities for full evacuation.

Province/District/City governments that are at “Warning” level are expected to pay attention to this warning and immediately guide their communities for evacuation.

Province/District/City governments that are at “Advisory” level are expected to pay attention to this warning and immediately guide their communities to move away from the beach and river banks.

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C

HOW TO READ THE MESSAGE

TSUNAMI WARNING FROM BMKG.

UPDATED INFORMATION ON THE EARTHQUAKE, WHICH OCCURRED ON 11 APRIL 2012 AT 15:38:33 WIB, WITH A MAGNITUDE OF 8.5 ON THE RICHTER SCALE AND A DEPTH OF 10 KILOMETRES, EPICENTER IN THE SOUTHWEST REGION SIMEULUE REGENCY ACEH PROVINCE AND WITH THE POTENTIAL TO CAUSE A TSUNAMI. FOLLOW INSTRUCTIONS FROM AUTHORITIES:

COMMUNITIES HAVING **MAJOR WARNING** OR **WARNING** STATUS, INDICATED IN THE MAP BY ORANGE OR RED COLORS, ARE ADVISED TO IMMEDIATELY EVACUATE TO A SAFE PLACE OR HIGHER GROUND COMMUNITIES WITH **ADVISORY** LEVEL INDICATED BY YELLOW COLOR ARE ADVISED TO STAY AWAY FROM BEACHES AND WATERWAYS INCLUDING RIVERS.

NOTES:

TO REGISTER YOUR E-MAIL ADDRESS TO BMKG, SEND AN INQUIRY ADDRESSED TO:

HEAD OF EARTHQUAKE AND TSUNAMI MITIGATION
BMKG HEAD OFFICE
PHONE/FAX: 021 - 6546316

C

Via SMS

HOW TO READ THE MESSAGE

TSUNAMI WARNING FROM BMKG.

UPDATED INFORMATION ON THE EARTHQUAKE, WHICH OCCURRED ON 11 APRIL 2012 AT 15:38:33 WIB, WITH A MAGNITUDE OF 8.5 ON THE RICHTER SCALE AND A DEPTH OF 10 KILOMETRES, EPICENTER IN THE SOUTHWEST REGION SIMEULUE REGENCY ACEH PROVINCE AND WITH THE POTENTIAL TO CAUSE A TSUNAMI.

NOTES:

SMS MESSAGES ONLY LIST UP TO 5 PROVINCES WITH TSUNAMI WARNING STATUS BUT NO WARNING LEVELS. THIS IS NOT SUFFICIENT FOR PUBLIC INFORMATION PURPOSES. THEREFORE MEDIA NEED TO IMMEDIATELY CONSULT LONG VERSION MESSAGES (AS DISTRIBUTED BY EMAIL OR FAX).

C

AN EXAMPLE OF RUNNING TEXT OF A TELEVISION

a. Example of Running Text with Updated Information on the Earthquake (TEW-2)

BMKG TSUNAMI EARLY WARNING::: UPDATED INFORMATION ON THE EARTHQUAKE TSUNAMI EARLY WARNING DATE 11-APR-12 TIME 15:38:33 WIB, IN ACEH, NORTH SUMATRA, WEST SUMATRA, BENGKULU, LAMPUNG: QUAKE MAGNITUDE: 8.5RS, LOCATION: 2.40 N, 92.99 E DEPTH: 10KM .

b. Example of Running Text to Follow:

FOLLOW INSTRUCTIONS FROM AUTHORITIES: STATUS MAJOR WARNING AND WARNING: TSUNAMI WAVES CAN DESTROY AND ENDANGER LIFE, THE PUBLIC IS ADVISED TO GO TO A SAFE PLACE OR HIGH GROUND, STAY AWAY FROM BEACHES, WATERWAYS AND RIVERS.

c. Example of Running Text to Follow:

IF A TSUNAMI OCCURS, THE WAVES CAN STRIKE MORE THAN ONCE. STAY IN A SAFE PLACE UNTIL INFORMATION IS ISSUED BY THE AUTHORITIES THAT THE TSUNAMI THREAT HAS PASSED.

EXAMPLE OF A RADIO ANNOUNCEMENT

UPDATED INFORMATION ON THE EARTHQUAKE THAT OCCURRED ON 11 APRIL 2012 AT 15:38:33 WIB WITH A MAGNITUDE OF 8.3 ON THE RICHTER SCALE AND A DEPTH OF 10 KILOMETRES, EPICENTER IN THE REGION OF SOUTHWEST SIMEULUE REGENCY ACEH PROVINCE WITH ESTIMATED ARRIVAL TIME OF TSUNAMI WAVES.

AREAS ON MAJOR WARNING STATUS ARE …….,……,……..AND THOSE ON WARNING ARE …., ….., ……. THE PUBLIC IS URGED TO FOLLOW DIRECTIONS FROM THE AUTHORITIES.

COMMUNITIES IN AREAS WITH MAJOR WARNING AND WARNING STATUS ARE INSTRUCTED TO IMMEDIATELY GO TO A SAFE PLACE OR HIGHER GROUND, STAY AWAY FROM BEACHES, WATERWAYS AND RIVERS.

C

Via Website

This field displays early warning information. At the moment of a tsunami early warning, this field contains the same information that can be obtained via email/ fax

This field displays the parameter of the most recent earthquake that has occurred

NOTES:

THE MEDIA CAN ALSO GET INFORMATION VIA THE WEBSITE. THERE IS A POSSIBILITY THAT DUE TO THE HIGH NUMBER OF PEOPLE TRYING TO ACCESS THE INFORMATION ONLINE, THE INTERNET MAY BE SLOW OR THE WEBSITE MAY NOT FUNCTION WELL. THE MEDIA MUST ENSURE THAT THE INFORMATION CAN BE OBTAINED VIA EMAIL.

NOTES

Via WRS for TV Stations

Pay attention for the possibility of updates to the earthquake's parameters

Pay attention for the possibility of changes of warning levels as indicated by the colour grading (red, orange or yellow)

HOW TO READ THE MESSAGE

TSUNAMI WARNING FROM BMKG.

UPDATED INFORMATION ON THE EARTHQUAKE, WHICH OCCURRED ON 11 APRIL 2012 AT 15:38:33 WIB, WITH A MAGNITUDE OF 8.5 ON THE RICHTER SCALE AND A DEPTH OF 10 KILOMETRES, EPICENTER IN THE SOUTHWEST REGION SIMEULUE REGENCY ACEH PROVINCE AND WITH THE POTENTIAL TO CAUSE A TSUNAMI. FOLLOW INSTRUCTIONS FROM AUTHORITIES.

COMMUNITIES HAVING **MAJOR WARNING** OR **WARNING** STATUS, INDICATED IN THE MAP BY ORANGE OR RED COLORS, ARE ADVISED TO IMMEDIATELY EVACUATE TO A SAFE PLACE OR HIGHER GROUND COMMUNITIES WITH **ADVISORY** LEVEL INDICATED BY YELLOW COLOR ARE ADVISED TO STAY AWAY FROM BEACHES AND WATERWAYS INCLUDING RIVERS

Via WRS for Radio Stations

PERINGATAN DINI TSUNAMI

BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA

Magnitude

Waktu : 11-Apr-12 15:38:35 WIB
Lokasi : 2.33 LU - 93.05 BT
Kedalaman: 10 Km

Keterangan lokasi gempabumi :

340 km BaratDaya KAB-SIMEULUE-NAD
398 km BaratDaya KAB-ACEHJAYA
416 km BaratDaya KAB-ACEHBARAT
434 km BaratDaya BANDAACEH-NAD
1794 km BaratLaut JAKARTA-INDONESIA
(Prematurkoreksi)

Berpotensi TSUNAMI untuk diteruskan pada Masyarakat

Keterangan Warna :

HOW TO READ THE MESSAGE

TSUNAMI WARNING FROM BMKG.

UPDATED INFORMATION ON THE EARTHQUAKE, WHICH OCCURRED ON 11 APRIL 2012 AT 15:38:33 WIB, WITH A MAGNITUDE OF 8.5 ON THE RICHTER SCALE AND A DEPTH OF 10 KILOMETRES, EPICENTER IN THE SOUTHWEST REGION SIMEULUE REGENCY ACEH PROVINCE AND WITH THE POTENTIAL TO CAUSE A TSUNAMI.

BASED ON OBSERVATIONS OF THE SEA'S SURFACE, TSUNAMI WAVES HAVE BEEN DETECTED IN THE FOLLOWING AREAS:

1. SABANG AT 17:00 HOURS AT A HEIGHT OF 0.06 METERS

2. MEULABOH AT 17:04 HOURS AT A HEIGHT OF 0.8 METERS

THE COMMUNITY IS URGED TO FOLLOW DIRECTIONS FROM THE AUTHORITIES OR THE LOCAL GOVERNMENT.

COMMUNITIES HAVING **MAJOR WARNING** OR **WARNING** STATUS, INDICATED IN THE MAP BY ORANGE OR RED COLORS, ARE ADVISED TO IMMEDIATELY EVACUATE TO A SAFE PLACE OR HIGHER GROUND COMMUNITIES WITH **ADVISORY** LEVEL INDICATED BY YELLOW COLOR ARE ADVISED TO STAY AWAY FROM BEACHES AND WATERWAYS INCLUDING RIVERS.

TEW-3...n

Via Fax / E-mail

::::BMKG::::::::::::::BMKG::::::::::::::BMKG::::::::::::::BMKG::::::::::::::BMKG::::

Indonesian Tsunami Early Warning System (InaTEWS)
METEOROLOGICAL CLIMATOLOGICAL AND GEOPHYSICAL AGENCY
Address:Jl. Angkasa I no.2 Kemayoran, Jakarta, Indonesia, 10720
Telp.: (+62-21) 4246321/6546316 , Fax: (+62-21) 6546316/4246703
P.O. Box 3540 Jkt, Website : http://www.bmkg.go.id

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Issued date: 11 April 2012, 18:15:03 WIB (UTC=WIB-7)
Bulletin-3
No.:113/warning/InaTEWS/IV/2012

UPDATING OF EARTHQUAKE PARAMETERS::

Magnitude	:	8.3 RS
Date	:	11-Apr-2012
Origin Time:	:	08:38:35 WIB
Latitude	:	2.33 N
Longitude	:	93.05 E
Depth	:	10 Km
Location	:	Off West Coast of Northern Sumatra
Remarks	:	396 km SOUTHWEST Meulaboh 435 km SOUTHWEST Banda Aceh 465 km SOUTHWEST Sigli 467 km SOUTHWEST Sabang 514 km SOUTHWEST Bireun

Evaluation:

Based on sea level observations, tsunami has detected in the following areas:

Location	Latitude	Longitude	Time[UTC] [HH:NN]	Date [YYYY-MM-DD]	Height
SABANG	05.80	95.00	10:00	2012-04-11	0.06 meter
MEULABOH	04.32	96.22	10:04	2012-04-11	0.8 meter

Information that tsunami waves had been observed indicating location, wave height and arrival time

BERPOTENSI TERJADI TSUNAMI DI WILAYAH:

Province	Warning Segment	Warning Level	ETA [WIB]	Date [YYYY-MM-DD]
NAD	Simeulue Pulau Simeulue	MAJOR WARNING	16:00:20	2012-04-11
SUMUT	Nias Bagian Barat	MAJOR WARNING	16:16:50	2012-04-11
SUMUT	Nias-Selatan Pulau Nias	MAJOR WARNING	16:21:54	2012-04-11

Be aware of the possibility that the status levels in each area may change from Advisory to Warning or Major Warning, or vice-versa

…	…	…	…	…
…	…	…	…	
…	…	…	…	…
SUMBAR	Kota-Padang	ADVISORY	17:31:20	2012-04-11
SUMBAR	Kota-Padang Bagian Selatan	ADVISORY	17:31:20	2012-04-11
SUMBAR	Padang-Pariaman Bagian Selatan	ADVISORY	17:31:20	2012-04-11
BENGKULU	Bengkulu-Utara Pulau Enggano	WARNING	17:32:20	2012-04-11
SUMUT	Kota-Sibolga	WARNING	17:34:05	2012-04-11
SUMUT	Tapanuli-Tengah Bagian Selatan	WARNING	17:34:05	2012-04-11
BENGKULU	Mukomuko	WARNING	17:35:00	2012-04-11
NAD	Aceh-Timur	WARNING	17:39:30	2012-04-11
SUMUT	Mandailing-Natal Bagian Utara	WARNING	17:41:54	2012-04-11
SUMUT	Tapanuli-Selatan	WARNING	17:41:54	2012-04-11
SUMBAR	Pasaman-Barat	ADVISORY	17:42:09	2012-04-11
BENGKULU	Bengkulu-Utara Bagian Utara	WARNING	17:48:20	2012-04-11
BENGKULU	Kaur	WARNING	17:48:39	2012-04-11
BENGKULU	Seluma	WARNING	17:49:39	2012-04-11
SUMUT	Mandailing-Natal Bagian Selatan	WARNING	17:51:45	2012-04-11
BENGKULU	Bengkulu-Selatan	WARNING	17:51:50	2012-04-11
LAMPUNG	Lampung-Barat Pesisir-Selatan	WARNING	17:54:20	2012-04-11
LAMPUNG	Lampung-Barat Pesisir-Tengah	WARNING	17:54:20	2012-04-11
LAMPUNG	Lampung-Barat Pesisir-Utara	WARNING	17:55:30	2012-04-11
BENGKULU	Kota-Bengkulu Pantai-Panjang	ADVISORY	17:58:15	2012-04-11
BANTEN	Pandeglang Pulau Panaitan	WARNING	18:01:35	2012-04-11
BENGKULU	Bengkulu-Utara Bagian Selatan	ADVISORY	18:03:09	2012-04-11
LAMPUNG	Tanggamus Bagian Barat	ADVISORY	18:05:39	2012-04-11
LAMPUNG	Tanggamus Pulau Tabuan	ADVISORY	18:05:39	2012-04-11

(ETA: estimated time of arrival)

ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST.

Advice:

Province/District/City governments that are at “Major Warning” level are expected to pay attention to this warning and immediately guide their communities for full evacuation.

Province/District/City governments that are at “Warning” level are expected to pay attention to this warning and immediately guide their communities for evacuation.

Province/District/City governments that are at “Advisory” level are expected to pay attention to this warning and immediately guide their communities to move away from the beach and river banks.

::::BMKG::::::::::::::::::::::BMKG::::::::::::::::::::::BMKG::::::::::::::::::::BMKG::::::::::::::::::::::BMKG::::

HOW TO READ THE MESSAGE

TSUNAMI WARNING FROM BMKG.

UPDATED INFORMATION ON THE EARTHQUAKE, WHICH OCCURRED ON 11 APRIL 2012 AT 15:38:33 WIB, WITH A MAGNITUDE OF 8.5 ON THE RICHTER SCALE AND A DEPTH OF 10 KILOMETRES, EPICENTER IN THE SOUTHWEST REGION SIMEULUE REGENCY ACEH PROVINCE AND WITH THE POTENTIAL TO CAUSE A TSUNAMI.

BASED ON OBSERVATIONS OF THE SEA'S SURFACE, TSUNAMI WAVES HAVE BEEN DETECTED IN THE FOLLOWING AREAS:
1. SABANG AT 17:00 HOURS AT A HEIGHT OF 0.06 METERS
2. MEULABOH AT 17:04 HOURS AT A HEIGHT OF 0.8 METERS

THE COMMUNITY IS URGED TO FOLLOW DIRECTIONS FROM THE AUTHORITIES OR THE LOCAL GOVERNMENT.

COMMUNITIES HAVING **MAJOR WARNING** OR **WARNING** STATUS, INDICATED IN THE MAP BY ORANGE OR RED COLORS, ARE ADVISED TO IMMEDIATELY EVACUATE TO A SAFE PLACE OR HIGHER GROUND COMMUNITIES WITH **ADVISORY** LEVEL INDICATED BY YELLOW COLOR ARE ADVISED TO STAY AWAY FROM BEACHES AND WATERWAYS INCLUDING RIVERS.

NOTES:

TO REGISTER YOUR E-MAIL ADDRESS TO BMKG, SEND AN INQUIRY ADDRESSED TO:

HEAD OF EARTHQUAKE AND TSUNAMI MITIGATION
BMKG HEAD OFFICE
PHONE/FAX: 021 - 6546316

EXAMPLE OF RUNNING TEXT TO FOLLOW

a. Example of Running Text for Update (TEW-2)

TSUNAMI WARNING FROM BMKG. UPDATED INFORMATION ON THE EARTHQUAKE, WHICH OCCURRED ON 11 APRIL 2012 AT 15:38:33 WIB, WITH A MAGNITUDE OF 8.5 ON THE RICHTER SCALE AND A DEPTH OF 10 KILOMETRES, EPICENTER IN THE SOUTHWEST REGION SIMEULUE REGENCY ACEH PROVINCE AND WITH THE POTENTIAL TO CAUSE A TSUNAMI.

BASED ON OBSERVATIONS OF THE SEA'S SURFACE, TSUNAMI WAVES HAVE BEEN DETECTED IN THE FOLLOWING AREAS:

1. SABANG AT 17:00 HOURS AT A HEIGHT OF 0.06 METERS
2. MEULABOH AT 17:04 HOURS AT A HEIGHT OF 0.8 METERS

b. Example of Running Text to Follow:

BE CAREFUL OF SUBSEQUENT WAVES. A TSUNAMI CAN STRIKE THE SHORE MORE THAN ONCE. MEMBERS OF THE PUBLIC ARE ADVISED NOT TO RETURN TO AREAS NEAR THE COAST OR RIVERBANKS UNTIL OFFICIAL INFORMATION HAS BEEN RELEASED BY THE AUTHORITIES THAT THE TSUNAMI THREAT HAS ENDED.

c. Example of Running Text to Follow:

T*HE COMMUNITY IS URGED TO FOLLOW DIRECTIONS FROM THE AUTHORITIES OR THE LOCAL GOVERNMENT.COMMUNITIES HAVING MAJOR WARNING OR WARNING STATUS, INDICATED IN THE MAP BY ORANGE OR RED COLORS, ARE ADVISED TO IMMEDIATELY EVACUATE TO A SAFE PLACE OR HIGHER GROUND COMMUNITIES WITH ADVISORY LEVEL INDICATED BY YELLOW COLOR ARE ADVISED TO STAY AWAY FROM BEACHES AND WATERWAYS INCLUDING RIVERS.*

EXAMPLE OF A RADIO ANNOUNCEMENT

TSUNAMI WARNING FROM BMKG. UPDATED INFORMATION ON THE EARTHQUAKE, WHICH OCCURRED ON 11 APRIL 2012 AT 15:38:33 WIB, WITH A MAGNITUDE OF 8.5 ON THE RICHTER SCALE AND A DEPTH OF 10 KILOMETRES, EPICENTER IN THE SOUTHWEST REGION SIMEULUE REGENCY ACEH PROVINCE AND WITH THE POTENTIAL TO CAUSE A TSUNAMI.

BASED ON OBSERVATIONS OF THE SEA'S SURFACE, TSUNAMI WAVES HAVE BEEN DETECTED IN THE FOLLOWING AREAS:

1. SABANG AT 17:00 HOURS AT A HEIGHT OF 0.06 METERS
2. MEULABOH AT 17:04 HOURS AT A HEIGHT OF 0.8 METERS
BE CAREFUL OF SUBSEQUENT WAVES. A TSUNAMI CAN STRIKE THE SHORE MORE THAN ONCE. MEMBERS OF THE PUBLIC ARE ADVISED NOT TO RETURN TO AREAS NEAR THE COAST OR RIVERBANKS UNTIL OFFICIAL INFORMATION HAS BEEN RELEASED BY THE AUTHORITIES THAT THE TSUNAMI THREAT HAS ENDED.

AREAS ON MAJOR WARNING STATUS ARE …….,……,……..AND THOSE ON WARNING ARE …., ….., ……. THE PUBLIC IS URGED TO FOLLOW DIRECTIONS FROM THE AUTHORITIES.

COMMUNITIES IN AREAS WITH MAJOR WARNING AND WARNING STATUS ARE INSTRUCTED TO IMMEDIATELY GO TO A SAFE PLACE OR HIGHER GROUND, STAY AWAY FROM BEACHES, WATERWAYS AND RIVERS.

Via SMS

There is an update on the earthquake parameter from the second Early Warning

THE MEANING OF INFORMATION

TSUNAMI WARNING FROM BMKG.

UPDATED INFORMATION ON THE EARTHQUAKE, WHICH OCCURRED ON 11 APRIL 2012 AT 15:38:33 WIB, WITH A MAGNITUDE OF 8.5 ON THE RICHTER SCALE AND A DEPTH OF 10 KILOMETRES, EPICENTER IN THE SOUTHWEST REGION SIMEULUE REGENCY ACEH PROVINCE AND WITH THE POTENTIAL TO CAUSE A TSUNAMI.

BASED ON OBSERVATIONS OF THE SEA'S SURFACE, TSUNAMI WAVES HAVE BEEN DETECTED IN THE FOLLOWING AREAS:

1. SABANG AT 17:00 HOURS AT A HEIGHT OF 0.06 METERS

2. MEULABOH AT 17:04 HOURS AT A HEIGHT OF 0.8 METERS

NOTES:

SMS MESSAGES ONLY LIST UP TO 5 PROVINCES WITH TSUNAMI WARNING STATUS BUT NO WARNING LEVELS. THIS IS NOT SUFFICIENT FOR PUBLIC INFORMATION PURPOSES. THEREFORE MEDIA NEED TO IMMEDIATELY CONSULT LONG VERSION MESSAGES (AS DISTRIBUTED BY EMAIL OR FAX).

Via Website

This field displays early warning information. At the moment of a tsunami early warning, this field contains the same information that can be obtained via email/fax

This field displays the parameter of the most recent earthquake that has occurred

NOTES:

THE MEDIA CAN ALSO GET INFORMATION VIA THE WEBSITE. THERE IS A POSSIBILITY THAT DUE TO THE HIGH NUMBER OF PEOPLE TRYING TO ACCESS THE INFORMATION ONLINE, THE INTERNET MAY BE SLOW OR THE WEBSITE MAY NOT FUNCTION WELL. THE MEDIA MUST ENSURE THAT THE INFORMATION CAN BE OBTAINED VIA EMAIL

NOTES

TEW-4

Via WRS for TV Stations

HOW TO READ THE MESSAGE

TSUNAMI WARNING FROM BMKG.

TSUNAMI EARLY WARNING DUE TO THE EARTHQUAKE ON DATE 11-APR-12 TIME 15:38:33WIB, IN ACEH, NORTH SUMATRA, WEST SUMATRA, BENGKULU, LAMPUNG WITH A MAGNITUDE 8.1SR, HAS ENDED. THE END OF THIS WARNING APPLIES TO ALL AREAS IN INDONESIA.

Via WRS for Radio Stations

TEW-4

Via Fax / E-mail

::::BMKG::::::::::::::BMKG::::::::::::::BMKG::::::::::::::BMKG::::::::::::::BMKG::::

Indonesian Tsunami Early Warning System (InaTEWS)
METEOROLOGICAL CLIMATOLOGICAL AND GEOPHYSICAL AGENCY
Address:Jl. Angkasa I no.2 Kemayoran, Jakarta, Indonesia, 10720
Telp.: (+62-21) 4246321/6546316 , Fax: (+62-21) 6546316/4246703
P.O. Box 3540 Jkt, Website : http://www.bmg.go.id

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Issued date : 04-Apr-2011, 05:10:45 WIB (UTC=WIB-7)
Bulletin - 4
No.:120/warning/InaTEWS/IV/2012

The Tsunami threat caused by the earthquake :
Magnitude : 7.1 RS
Date : 03-April-2011 20:06:39 UTC
is over.

This is the final message issued by the Indonesia Tsunami Early Warning System, unless new information becomes available.

Do not reply to this email, please address any inquiry to : info_inatews@bmg.go.id

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HOW TO READ THE MESSAGE

TSUNAMI WARNING FROM BMKG.

TSUNAMI EARLY WARNING DUE TO THE EARTHQUAKE ON DATE 11-APR-12 TIME 15:38:33WIB, IN ACEH, NORTH SUMATRA, WEST SUMATRA, BENGKULU, LAMPUNG: WITH A MAGNITUDE: 8.1SR, HAS ENDED. THE END OF THIS WARNING APPLIES TO ALL AREAS IN INDONESIA.

TEW-4

Via SMS

EXAMPLE OF NEWS

EXAMPLE OF RUNNING TEXT *& VOICE ON* RADIO:

TSUNAMI EARLY WARNING DUE TO THE EARTHQUAKE ON DATE 11-APR-12 TIME 15:38:33WIB, IN ACEH, NORTH SUMATRA, WEST SUMATRA, BENGKULU, LAMPUNG: WITH A MAGNITUDE: 8.1SR, HAS ENDED. THE END OF THIS WARNING APPLIES TO ALL AREAS IN INDONESIA. THE PUBLIC IS ADVISED TO CARRY OUT SAFETY PROCEDURES AS NEEDED AND TO REMAIN ALERT TO THE IMPACT THAT HAS ALREADY TAKEN PLACE

Via Website

This field displays early warning information. At the moment of a tsunami early warning, this field contains the same information that can be obtained via email/ fax

This field displays the parameter of the most recent earthquake that has occurred

NOTES:

THE MEDIA CAN ALSO GET INFORMATION VIA THE WEBSITE. THERE IS A POSSIBILITY THAT DUE TO THE HIGH NUMBER OF PEOPLE TRYING TO ACCESS THE INFORMATION ONLINE, THE INTERNET MAY BE SLOW OR THE WEBSITE MAY NOT FUNCTION WELL. THE MEDIA MUST ENSURE THAT THE INFORMATION CAN BE OBTAINED VIA EMAIL

NOTES

EARTHQUAKE INFORMATION

Via WRS for TV Stations

Map for Earthquake Information indicates location of epicenter but does not show warning segments

Information that there is no potential for a tsunami

HOW TO READ THE MESSAGE

AN EARTHQUAKE WITH A MAGNITUDE OF 5.1 ON THE RICHTER SCALE AT A DEPTH OF 12 KILOMETRES HAS TAKEN PLACE AND DOES NOT HAVE THE POTENTIAL TO CAUSE A TSUNAMI. THE EARTHQUAKE'S EPICENTER IS 115 KILOMETRES NORTHWEST FROM BINTUHAN-BENGKULU. MEMBERS OF THE PUBLIC ARE ADVISED NOT TO PANIC AND TO TAKE STEPS TO ENSURE THEIR SAFETY FOLLOWING THE EARTHQUAKE

EARTHQUAKE INFORMATION

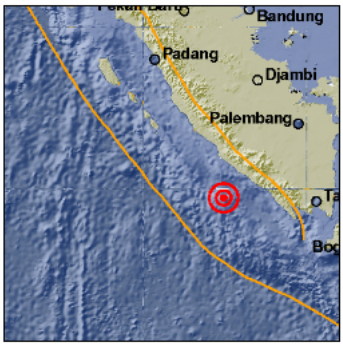
Via WRS for Radio Stations

BMKG

INFORMASI GEMPABUMI

BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA

INATEWS



Magnitude 5,1 Skala Richter

Waktu : 29-Mar-11 13:22:44 WIB

Lokasi : 5.27 LS - 102.46 BT

Kedalaman: 12 Km

Keterangan lokasi gempabumi :

115 km BaratDaya BINTUHAN-BENGKULU
163 km BaratDaya KRUI-LAMPUNG
165 km Tenggara BENGKULU-BENGKULU
181 km BaratDaya KEPAHIANG-BENGKULU
495 km BaratLaut JAKARTA-INDONESIA

Tidak berpotensi TSUNAMI

Waktu kirim: 29 March 2011, 13:27:27 WIB

HOW TO READ THE MESSAGE

AN EARTHQUAKE WITH A MAGNITUDE OF 5.1 ON THE RICHTER SCALE AT A DEPTH OF 12 KILOMETRES HAS TAKEN PLACE AND DOES NOT HAVE THE POTENTIAL TO CAUSE A TSUNAMI. THE EARTHQUAKE'S EPICENTER IS 115 KILOMETRES NORTHWEST FROM BINTUHAN-BENGKULU. MEMBERS OF THE PUBLIC ARE ADVISED NOT TO PANIC AND TO TAKE STEPS TO ENSURE THEIR SAFETY FOLLOWING THE EARTHQUAKE.

EARTHQUAKE INFORMATION

Moda Fax / E-mail

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Indonesian Tsunami Early Warning System (InaTEWS)
METEOROLOGICAL CLIMATOLOGICAL AND GEOPHYSICAL AGENCY
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P.O. Box 3540 Jkt, Website : http://www.bmkg.go.id

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Issued date: 01 August 2012, 7:24:56 WIB (UTC=WIB-7)
Earthquake Information
No.:1/infogempa/InaTEWS/VIII/2012

An earthquake has occured with these preliminary parameters:

Preferred Magniture	: 6.1 SR
Date	: 01-Aug-12
Origin Time	: 00:20:34 UTC
Latitude	: 1.51 N
Longitude	: 124.54 E
Depth	: 10 Km

Magnitudes : M:5.08 (preferred), MLv:5.05 , Mw(mB):4.82 , mB:5.38 , mb:5.30
Quality Control :

Number of Stations Used	: 17
RMS Residual	: 1.9 s
Azimuth Gap	: 180 deg

Location : Minahasa Peninsula, Sulawesi
Remarks : 36 km NorthWest TOMOHON-SULUT
49 km NorrtWest MANADO-SULUT
42 km SouthWest MANADO-SULUT
2147 km NorthEast JAKARTA-INDONESIA

Tsunami Information:
The earthquake does not generate TSUNAMI } Information that there is no potential to tsunami

This Information has been reviewed by Seismologist
Do not reply to this email, any inquiry addressed to : info_inatews@bmg.go.id

::::BMKG::::::::::::::::::::::BMKG::::::::::::::::::::::BMKG::::::::::::::::::::::BMKG::::::::::::::::::::::BMKG::::

HOW TO READ THE MESSAGE

AN EARTHQUAKE WITH A MAGNITUDE OF 6.1 ON THE RICHTER SCALE WITH A DEPTH OF 10 KILOMETRES HAS OCCURRED AND DOES NOT HAVE THE POTENTIAL TO CAUSE A TSUNAMI. THE EARTHQUAKE'S EPICENTER WAS IN MINAHASA PENINSULA, SULAWESI.

THE PUBLIC IS ADVISED NOT TO PANIC AND TO TAKE STEPS TO ENSURE THEIR SAFETY FOLLOWING THE EARTHQUAKE.

EARTHQUAKE INFORMATION

Via SMS

Information that there is no potential to tsunami

HOW TO READ THE MESSAGE

AN EARTHQUAKE WITH A MAGNITUDE OF 5.1 ON THE RICHTER SCALE WITH A DEPTH OF 10 KILOMETRES HAS OCCURRED AND DOES NOT HAVE THE POTENTIAL TO CAUSE A TSUNAMI. THE EARTHQUAKE'S EPICENTER WAS IN BANDA TERRITORIAL WATERS. THE PUBLIC IS ADVISED NOT TO PANIC AND TO TAKE STEPS TO ENSURE THEIR SAFETY FOLLOWING THE EARTHQUAKE.

EARTHQUAKE INFORMATION

Via Website

Field displays earthquake information and felt intensities in the affected areas

This field displays the parameter of the most recent earthquake that has occurred

HOW TO READ THE MESSAGE

AN EARTHQUAKE WITH A MAGNITUDE OF 4.5 ON THE RICHTER SCALE TOOK PLACE ON 31 MAY 2011, AT 06:33:33 WIB.

THE EARTHQUAKE'S EPICENTER WAS ON GROUND 5 KILOMETRES SOUTH EAST OF MUARALABUH, SOLOK SELATAN, WEST-SUMATRA.

IT IS THOUGHT THE QUAKE'S INTENSITY IN SOLOK WAS AS GREAT AS II TO III MMI, IN MUARALABUH AS GREAT AS II TO III MMI AND IN PADANG AS GREAT AS II MMI.

HOW TO READ THE MESSAGE

AN EARTHQUAKE WITH A MAGNITUDE OF 5.1 ON THE RICHTER SCALE WITH A DEPTH OF 10 KILOMETRES TOOK PLACE ON 10 JUNE 2011, AT 03:14:45 WIB.

THE EARTHQUAKE'S EPICENTER WAS 203 KILOMETRES NORTH WEST OF SAUMLAKI MALUKU.

THE EARTHQUAKE DOES NOT HAVE THE POTENTIAL TO CAUSE A TSUNAMI. THE PUBLIC IS ADVISED NOT TO PANIC AND TO TAKE STEPS TO ENSURE THEIR SAFETY FOLLOWING THE QUAKE.

EXAMPLE OF NEWS

EXAMPLE OF *RUNNING TEXT:*

BMKG INFORMATION.
AN EARTHQUAKE HAS OCCURRED ....RS, REGION …..,……,….
THE EARTHQUAKE DOES NOT HAVE THE POTENTIAL TO CAUSE A TSUNAMI.
THE PUBLIC IS ADVISED NOT TO PANIC. TAKE STEPS TO ENSURE YOUR SAFETY FOLLOWING THE EARTHQUAKE

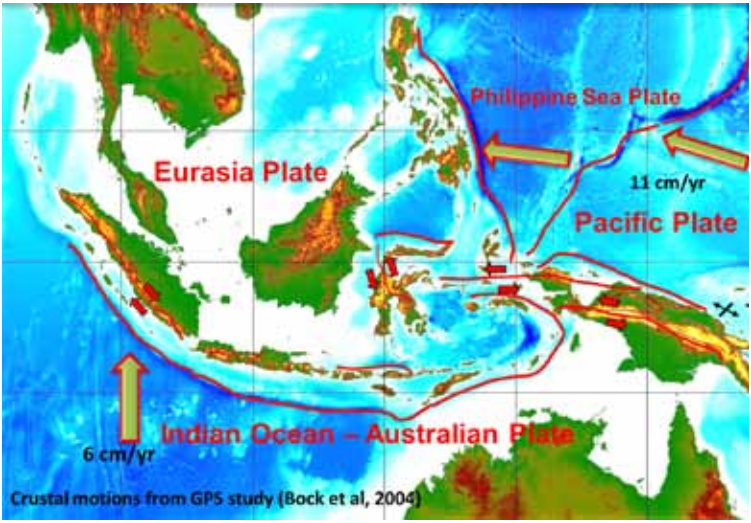
VOICE RADIO:

BMKG INFORMATION.
AN EARTHQUAKE HAS OCCURRED ....RS, REGION …..,……,….
THE EARTHQUAKE DOES NOT HAVE THE POTENTIAL TO CAUSE A TSUNAMI.
THE PUBLIC IS ADVISED NOT TO PANIC. TAKE STEPS TO ENSURE YOUR SAFETY FOLLOWING THE EARTHQUAKE

TSUNAMI EARLY WARNING SYSTEM IN INDONESIA

Tectonic Condition of Indonesia

Indonesia lies on the boundaries of four tectonic plates, which slide past each other. These four tectonic plates are: the Indo-Australian Plate to the south, the Pacific Plate to the east, the Eurasian Plate in the north (where most of Indonesia area lies), and the Philippine Plate. The figure below shows an illustration of the movement of these plates. The Indo-Australian Plate moves north, colliding with the Eurasian Plate. The Pacific Plate moves west, whereas the Eurasian Plate in relation to the other plate is not moving.



Movement of the main tectonic plates around Indonesia

The relative movement between these four tectonic plates causes an accumulation of pressure and mechanical stress where they collide. When the material's elasticity is no longer able to withstand this stress, the rock will break and spring back to something close to its original shape. This rebound, which generates strong seismic waves that radiate in all directions along the tectonic plate, is called a tectonic earthquake.

Millions of these earthquakes have occurred over hundreds and millions of years on the geological time scale. Evidence of these past earthquakes is recorded in natural geological phenomena (paleo-seismology). Today, earthquakes can be recorded using seismometer networks, which calculate an earthquake's location and focal depth (hypocenter) and measure its magnitude.

Catgories of tsunami

Tsunamis are classified by distance into two categories:

- Near-field / local tsunamis

  Near-field tsunamis are tsunamis that occur within 200 km of the epicenter of an earthquake. A local tsunami can be caused by earthquake, landslide, or volcano eruption.

- Far-field tsunamis

  A far-field tsunami is a tsunami originating from thousands of kilometres from the affected areas. Usually starting as a near-field tsunami that causes extensive destruction near the source, these waves continue to travel across entire ocean basins with sufficient energy to cause additional casualties and destruction on shores more than 1000 km from its source (ITIC, Tsunami Glossary).

The following table shows that the arrival times of tsunamis in Indonesia are generally between 10 and 60 minutes. This indicates that these are near field tsunamis.

Since the earth was formed, a number of tsunamis have been happening all over the world. Paleotsunami research on the west coast of Sumatra and Thailand indicates that major tsunamis hit Aceh and Thailand 600 years ago (Yulianto E. and Atwater B., 2008). This shows that tsunamis occurred in the past and will occur again in the future.

No	Date	Time (UTC)	EQ Mag	Epicenter	Arrival time (min)	Location	Wave Height (meter)	Casual-ties	Ref.
1	12/12/1992	05:29:26	7.8	Flores Sea (Back arc thrust)	12	Alor	26.2	2500	BMG 1992
2	3/6/1994	18:17:34	7.8	South of East Java (Indian Ocean, Mega-thrust)	38	Banyu-wangi	13.9	238	
3	17/2/1996	05:59:31	8.2	North of Papua (Pacific Megathrust)	20	Biak	7.68	110	BMG 1996, ITST
4	29/11/1998	14:10:32	7.7	Taliabu island, Maluku	18	Taliabu	2.75	34	Imamura et al.2000
5	4/5/2000	04:21:16	7.6	Banggai, Sulawesi	35	Banggai	6	46	BMG 2000
6	26/12/2004	00:58:53	9	North West Aceh (Indian Ocean, mega-thrust)	33	Meulaboh	50.9	227.898	BMG, BAKOR-NAS-PB
7	28/3/2005	16:09:37	8.7	North of Nias island, North Sumatera (Megathrust)	43	Padang Sidem-puan	3	10	BMG, NGDC-NOAA
8	17/7/2006	08:19:29	7.7	Pangandaran, West Java(Java trench)	42	Panganda-ran	10	664	BMG
9	12/9/2007	11:10:27	8.4	Bengkulu, Sumatera	35	Bengkulu	3.6	-	BMG
10	25/10/2010	14:42:22	7.2	North West Mentawai (Sumatera trench)	7	Mentawai	12	456	BNPB

Destructive tsunamis, 1990 – 2010 (Tsunami Katalog-BMKG 2010)

Tsunami Early Warning System

Early warning is a mechanism which provides advance notice of some impending event or development of hazards that comes early enough for you to prepare for it. Early warning can consist of natural signs that are out of the ordinary. In the event of a tsunami, the first natural sign is an earthquake that produces either strong ground-shaking or is perceived as lasting longer but being weaker; thereafter, there may be a drop in sea levels at the coast for hundreds of metres out to sea (although this sign does not always occur); a pungent smell of salt that is out of the ordinary, and so forth. All these things can occur as indications that a tsunami will strike shortly thereafter.

These natural signs throw up some questions, however:

- Is a tsunami actually going to happen?
- How long until the tsunami arrives on the shore?
- How powerful will the tsunami be?

The fact that these questions remain to be asked means that natural warning signs are difficult to measure. The best course of action, if we witness or experience any of the above signs, is to immediately move away from the coast and make for higher ground. Unfortunately, natural warning sign are not always clear and people might misinterpret or miss them, as they will not be able to monitor for natural signs in every moment.

For that reasons an early warning system is required, as it continuously monitors and measures the most important precursors to forecast an impending tsunami threat. It was for that reason that the Indonesia Tsunami Early Warning System (InaTEWS) was developed. InaTEWS is the official (and only) tsunami early warning system that exists in Indonesia, requiring all areas in the country must conform to the system. In accordance with Law No. 31/2009, only the BMKG is designated to announce tsunami early warnings. Warning from BMKG need to be follow by local government disaster management agencies (BPBD), which are also in charge to develop and implement related preventative/anticipatory measures.

Early warning is a combination of technology and community capacity that responds to information provided by the technology. As a component of disaster risk reduction, early warning requires not only the production of timely, technically accurate warnings but also an understanding of risk, a reliable link between providers and users of warnings and the capacity, on the part of communities and authorities, to respond appropriately to warnings. A failure in any one of these elements can mean failure of the whole warning system.

Tsunami Early Warning Chain

The BMKG operates the National Tsunami Warning Center and is the only government institution appointed and responsible for issuing tsunami warnings in the Indonesia territory. The warnings have two aims, namely to trigger evacuations and to mobilize emergency assistance. Besides tsunamis, the BMKG also provides information relating to meteorology, climatology and geophysics (seasons, weather forecasts, earthquakes, air quality, and so on).

The BMKG publishes earthquake and tsunami early warning information within five minutes of an earthquake occurring, which is followed by several news updates and/or a news report that the threat has ended. Early warning messages contain tsunami threat levels for regencies based on three status levels “Major Warning”, “Warning” and “Advisory”:

- Wave height ≥ 3 meter resulted in MAJOR WARNING status
- Wave height ≥ 0.5 meter and < 3 meter resulted in WARNING status
- Wave height < 0.5 meter resulted in ADVISORY status

The BMKG provides earthquake information and tsunami warnings to BNPB, local governments and the media. Local governments are responsible for guiding their communities’ reaction to this information and for deciding whether or not to call for evacuation.

The tsunami early warning communication chain allows for the dissemination of prompt and effective tsunami early warnings and guidance. These warnings and guidance are issued by recognised

agencies using the agreed channels of communication to allow the community exposed to the tsunami risk to react appropriately and, if necessary, to evacuate the area at risk and save themselves before the tsunami reaches the shore. This chain links the National Tsunami Early Warning Center to communities at risk along the tsunami-prone coasts of Indonesia

The agencies that play a role in the InaTEWS tsunami early warning communication chain are:

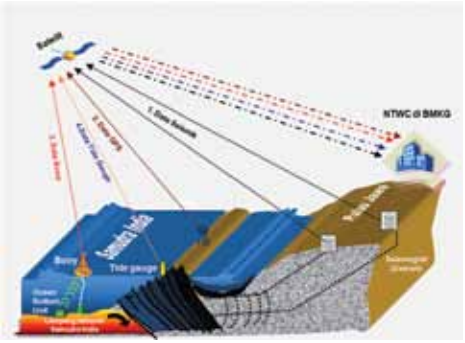
- The Meteorological, Climatological and Geophysical Agency (Badan Meteorologi, Klimatologi dan Geofisika – BMKG), with its head office in Jakarta, which hosts the National Tsunami Warning Center,
- Local governments at provincial, district and municipal levels,
- National and local television and radio stations (public and commercial),
- The National Disaster Management Agency (Badan Nasional Penanggulangan Bencana – BNPB),
- The Indonesian Military,
- The National Indonesian Police,
- Communities at risk,
- Cellular service providers,
- Managers of hotels/tourist sites

Detection and Analysis Instruments for Early Warning

InaTEWS has two monitoring systems, namely:

1. Land monitoring system comprising the broadband seismometer network and GPS
2. Sea monitoring system consisting of tide gauges, buoys, CCTV, tsunami radar and under-the-sea cable (the last two are currently at development stage). The observation results are sent to BMKG mainly using satellite-based communication system.

BMKG operates the network of seismometers, accelerometers, CCTV and, in the future, tsunami radars. The National Survey and Mapping Coordination Agency (BAKOSURTANAL/ BIG) operates the network



Disain InaTEWS

of GPS and tide gauges. The Agency for the Assessment and Application of Technology (BPPT) operates the network of buoys and under-the-sea cable. The Ministry of Fisheries and Marine Affairs (KKP) operates tsunami radars. Until now the tsunami early warning is issued by BMKG within 5 minutes after the earthquake based on the network of broadband seismometers and accelerometers, combined with modeling results. In the future, the GPS network can possibly improve the accuracy of seismic results. Meanwhile the sea monitoring network is used to confirm the occurrence of tsunami, its movement as well as its height.

Instruments for earthquake observation

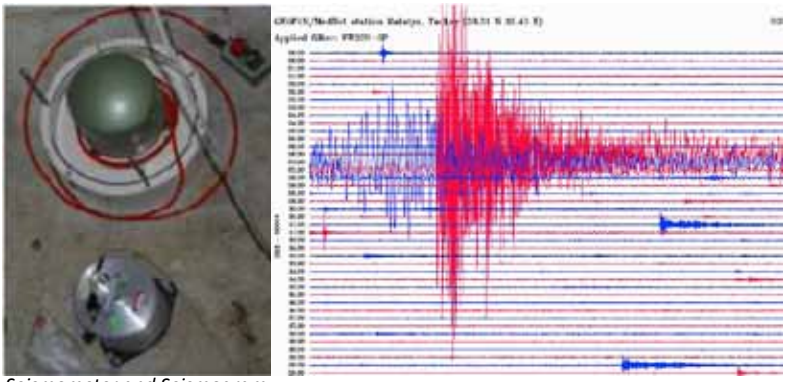
The main instruments of InaTEWS to observe earthquake are the seismometer network and SeisComP3 software. Both these two instruments are used to gather and process initial data of earthquake parameter which serve as the main data to generate tsunami warningsi.

Seismometer network

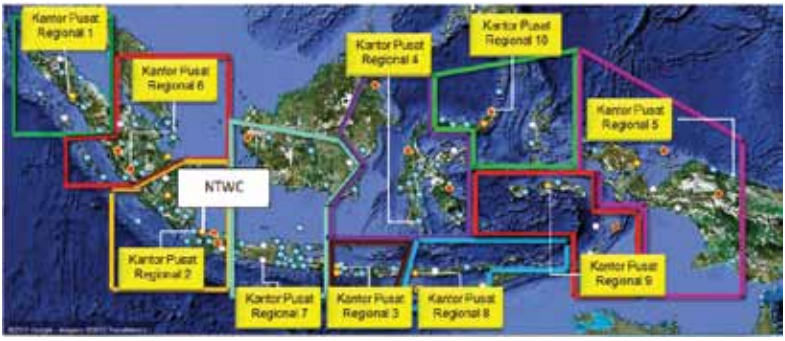
More than 90% of tsunamis are triggered by strong, shallow earthquakes. Therefore, earthquake observation plays the main role in the tsunami early warning system. However, not all earthquakes trigger tsunamis. Earthquakes have the potential to trigger tsunamis if they are located under the sea at a depth of less than 100 km and of a magnitude of 7 or more on the Richter Scale and are associated with a vertical movement of the surface of the earth. The last criterion is currently not yet considered when BMKG issues tsunami warnings.

This is why it is important to determine an earthquake's parameters (location, magnitude, and depth) quickly and accurately. This is done by using seismometers, which are able to measure movements of the earth by recording seismic waves that are produced when an earthquake occurs.

Data from several seismometers are processed using special software to determine the location, time, depth and magnitude of an earthquake. The denser the network of seismometers, the faster and more accurate will be the identification of the source of an earthquake. In Indonesia, the BMKG currently operates 162 seismic stations.



Seismometer and Seismogram

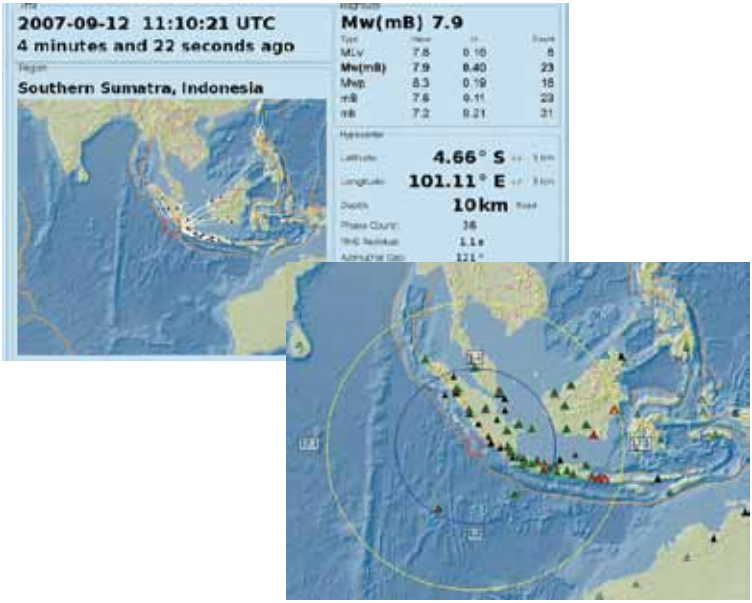


Network of seismc stations in Indonesia

SeisComP3 software

To calculate an earthquake's location and many other parameters, special software is used by the BMKG. SeisComp3 has been developed to process all incoming seismic data and calculate earthquake source parameters as quickly as possible (Figure 13). The SeisComP3 software is supported by the JOPEN software as redundant backup system. The BMKG now has the capability to provide reliable earthquake information within five minutes after an earthquake has occurred. Seismic activity is monitored constantly, 24 hours a day, seven days a week.

If an earthquake of magnitude 5 or greater is located, the BMKG disseminates earthquake information in several communication modes, one of which is via short message service (SMS) or text message (Figure 14). Dissemination of earthquake and tsunami information will be discussed in Principle 6. Earthquake information can also be accessed from the BMKG website at www.bmkg.go.id.



Screenshoot of SeiscomP3

As explained previously, not all earthquakes trigger tsunami waves. The criteria for an earthquake capable of triggering a tsunami are:

a. Large magnitude earthquake, usually of M > 7 RS

b. Undersea earthquake with a shallow depth (< 100 km)

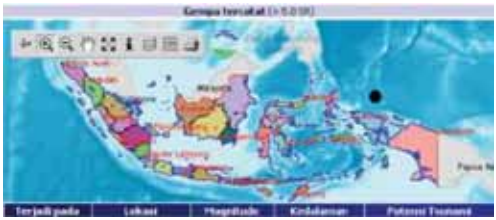
c. Deformation or uplift of the sea floor, which is evident from a normal fault or thrust fault earthquake mechanism

d. Distance from the earthquake epicenter to the shore sufficient to allow a tsunami wave to form. If an earthquake occurs close to the shore, the likelihood of it triggering a tsunami is small, although the impact of the earthquake may be large. The depth of water plays a pivotal role.

When an earthquake's parameters match the criteria for an earthquake that could potentially trigger a tsunami, the earthquake information will be followed by a tsunami warning. However, even if an earthquake meets the parameters (location, depth and magnitude) that could potentially trigger a tsunami, it does not necessarily mean that a tsunami will occur.

So, a second component of InaTEWS is designed to monitor the surface of the sea to confirm the formation of a tsunami. Several instruments are used for this, including buoys, which monitor changes in the surface of the sea water; tide gauges, which monitor changes in

the water's surface at the shore; CCTV which observe tsunami arrival in the beach; and tsunami radar which expected to be able to detect tsunami waves 150km away from the beach (where the instrument is placed).



Earthquake information disseminated via SMS and Internet

Instruments for tsunami observation

Buoy

Buoy Network

A buoy is an instrument that measures the height of tsunamis offshore. It is also known as a tsunameter (Figure 15). It consists of two separate parts, one of which, called an Ocean Bottom Unit (OBU), is positioned on the ocean floor. This unit is able to detect changes in water pressure when a tsunami wave passes. When it detects a tsunami wave, the OBU sends data to the buoy floating nearby on the surface. This buoy is the other component of the tsunameter and measures fluctuations in the level of the water's surface. It also sends data from the OBU via satellite to the control center at the BPPT to be forwarded to the BMKG. In addition, the buoy is fitted with a high-precision GPS unit, which measures movements on the surface of the sea and is able to detect passing tsunami waves.

When a tsunami occurs, this instrument will simultaneously record the tsunami wave and transmit the data. The data from the buoy is used to determine that a tsunami has been generated. The BPPT operates the research vessel Baruna Jaya for the installation, maintenance and relocation of buoys. So far, the buoy system in Indonesia still faces a lot of challenges in the field.

Ocean Bottom Unit (OBU)

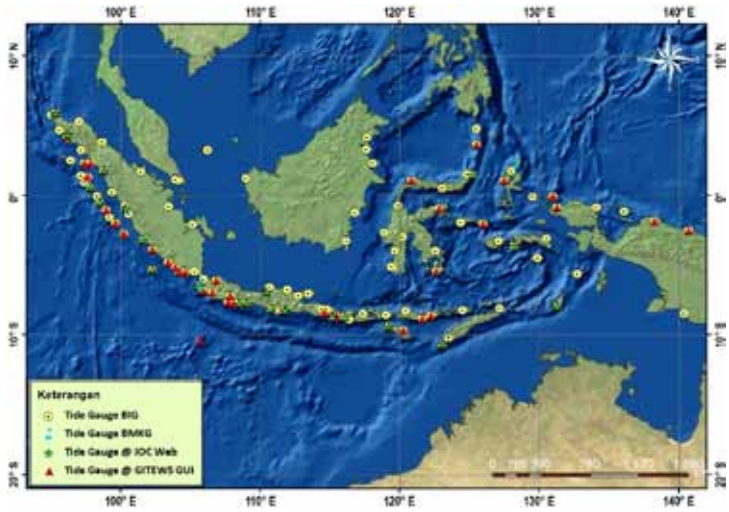
Tide gauge network

A tide gauge is an instrument for measuring ocean tides. A tsunami causes an anomalous change on the surface of the sea water, which is recorded on a tide gauge. This instrument is positioned on the shore confirming that the tsunami has arrived onshore or that the tsunami has subsided.

The tide gauges are operated by the National Survey and Mapping Coordination Agency (BAKOSURTANAL / BIG) but real-time data is also directed to the BMKG, where the information is analyzed to verify

that a tsunami has arrived on the shore. BAKOSURTANAL/ BIG is responsible for the installation and operation of tide gauges and the GPS networks.

Tide Gauge Stations

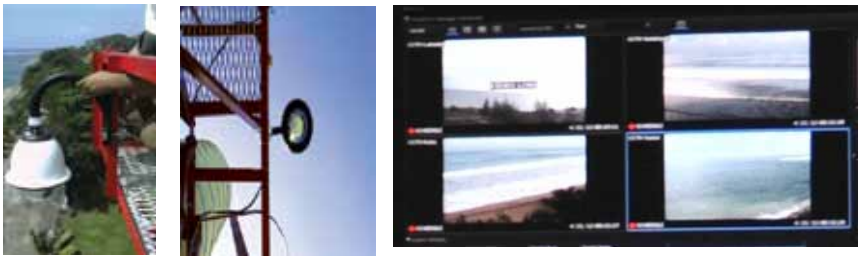


Jejaring Stasiun Tide Gauge

CCTV Network

CCTV (Closed Circuit Television) is a digital video camera that is used to send signals to a display monitor in a room or predetermined place. CCTV is often used to observe public areas, such as train stations, roads, town squares, shops and buses, banks, hotels, airports, military storerooms, factories and warehouses. Nowadays, CCTV is also used to protect people's homes.

InaTEWS uses CCTV to monitor the arrival of a tsunami. Once CCTV has been fitted in areas exposed to tsunamis, an incoming tsunami can be detected by pictures that are sent real time. Currently, five online CCTV cameras have been installed, which send pictures to the Tsunami Early Warning Center in Jakarta. Four of these cameras are located in Bali at Benoa Beach, Kuta Beach, Sanur Beach and Seminyak, while the fifth camera is in Simpang Layang, Banda Aceh (NAD)



CCTV cameras fitted for tsunami monitoring

Radar Tsunami

While preparing this document, the tsunami radar is not yet a part of InaTEWS. In 2013, it is planned to have the tsunami radars installed in Banten (2), Bali (1) and West Sumatra (1). Tsunami radar is an equipment system that has the capacity to detect the arrival of tsunami starting the distance of 150km from and approaching the coast. The radar, which transmits high frequency (HF) electromagnetic wave, will surely improve the accuracy and speed of InaTEWS' confirmation on tsunami occurrence.

Radar Tsunami

GPS Network

A GPS, or Global Positioning System, is a system for determining an exact position on earth, expressed as longitude, latitude and height. By placing a GPS device at a point on the earth's surface, the exact position will be determined. Changes to that position are recorded constantly. Rapid changes in the position are then transformed into relative movement vectors, from which deformation of the earth's surface can be detected and displayed. A GPS can provide useful information to scientists about the relative movement of tectonic plates and can support the analysis of plate movements to determine whether they have the potential to create earthquakes. A GPS also measures changes in the position of the earth's plates after an earthquake occurred. The GPS stations are also operated by BAKOSURTANAL / BIG.

GPS Station

Processing and analysis - Decision Support System (DSS)

Aside from the SeisComP3 software, another instrument being used in InaTEWS is the Decision Support System (DSS). DSS is a computer system that assists operators at the National Tsunami Warning Centre in issuing an accurate tsunami early warning in a very short period of time, and also assists them in advising on the affected areas, level of warning and arrival times.

DSS – Decision Support System

As explained previously, the SeisComP3 software is used to process data from seismometersto determine earthquake parameter in a quick time, while for the following analysis BMKG applies another software, which is called the Decision Support System (DSS).

The DSS aggregates all the information from the sensor groups to evaluate whether or not a tsunami has been generated. To assess which areas will be affected, and to determine the respective warning levels, a simulation system with pre-calculated scenarios is used.

The simulation system compares the incoming data from the sensor network with the scenarios stored in a database. The system selects

the scenarios with the best match and provides the officer on duty with information on the expected travel times of the tsunami waves, the affected areas and the expected wave heights on the coast.

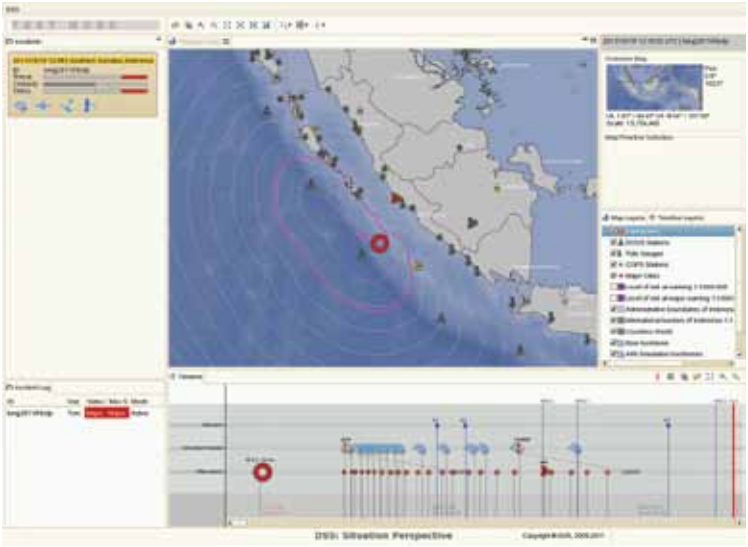
The DSS shows information on four monitor screens:

The Decision Support System is activated upon receiving the earthquake parameters sent by SeisComP3 containing information on location (latitude, longitude, depth) and earthquake magnitude. The location of the epicenter will determine what happens next. If the epicenter is in Indian Ocean ranging from the southwest of Sumatera, via the south of Java to the south of Sumbawa, the DSS will compare the parameters with the existing tsunami database. If the epicenter is at a different location, it will use EasyWave (a real-time estimation software) to create a tsunami threat scenario if the criteria of earthquake with potential for tsunami are met. The result of the DSS is a proposal with two possibilities, namely:

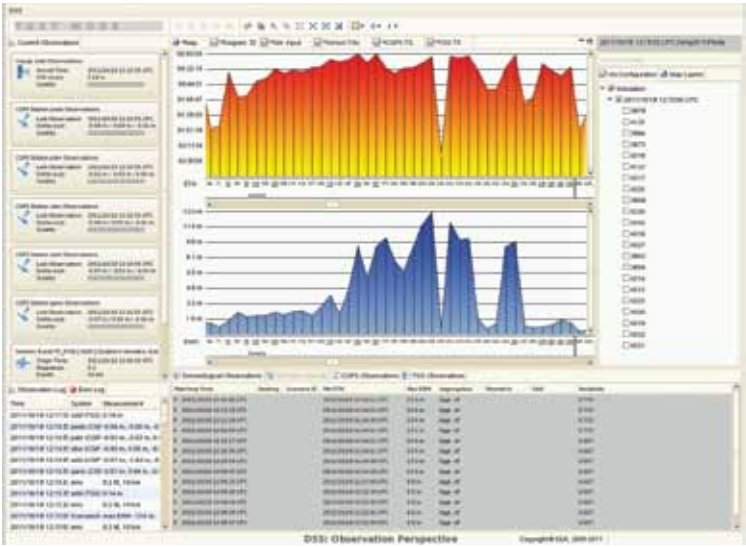
a. “Tsunami warning proposal” if the DSS provides a scenario of tsunami occurrence based on modeling and estimation results. There will be a map and a list of areas with tsunami potential along with level of warning and estimated times of arrival.

b. “Earthquake information proposal” if the DSS identifies the earthquake as not having the potential to trigger a tsunami.

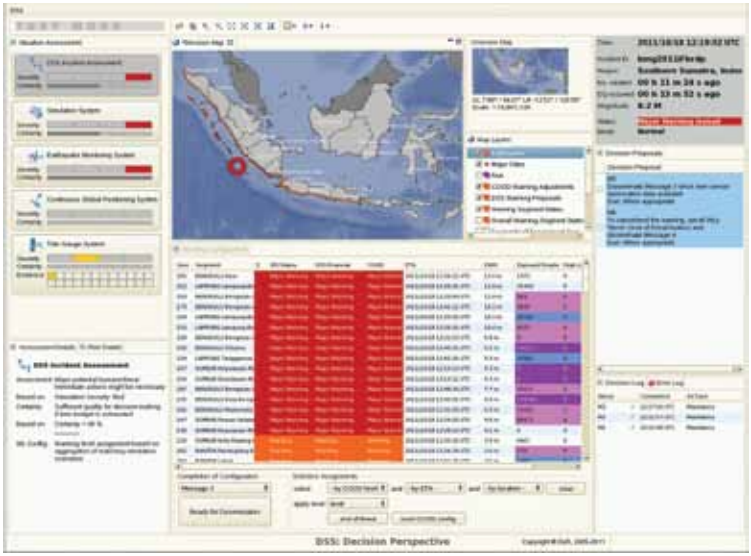
The DSS operator will then send the proposal further to the dissemination system. It is the dissemination officer that spreads the tsunami warning proposal or the earthquake information proposal after verifying the content of the information.



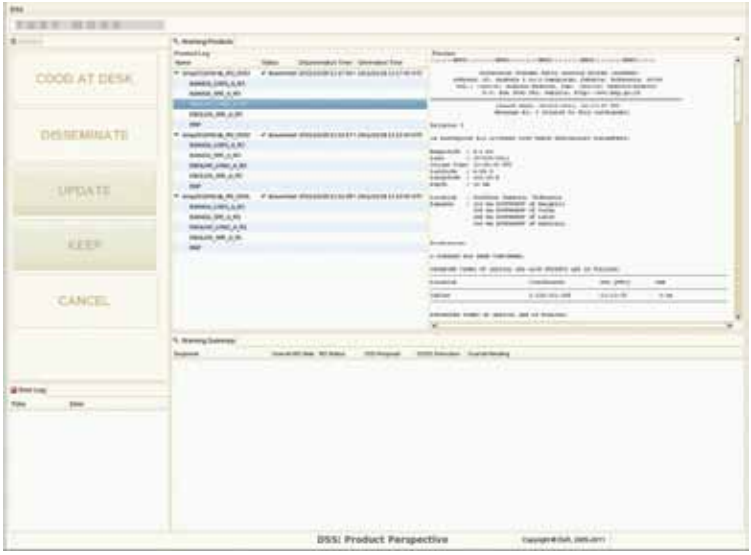
The first screen is the situation perspective of the geographical situation and timeline. A map shows the expected propagation of the tsunami waves according to a pre-calculated scenario, and also indicates the location of buoys and tide gauges that are in the range of the tsunami waves



A second screen provides more detailed information from incoming measurements of the different sensors as well as simulation data



An evaluation of the situation is displayed on a third screen. The DSS assigns a warning level for each of the affected districts and proposes options for decision making



Besides the dissemination control buttons, the fourth screen provides a summary of the warning and a preview of the warning messages

Modes of Dissemination of Early Warning Messages

The media will receive earthquake information and tsunami early warnings from the BMKG via various modes of communication. These comprise:

1. Warning Receiver System-WRS
2. Fax
3. E-mail
4. SMS
5. BMKG Website

Warning Receiver System

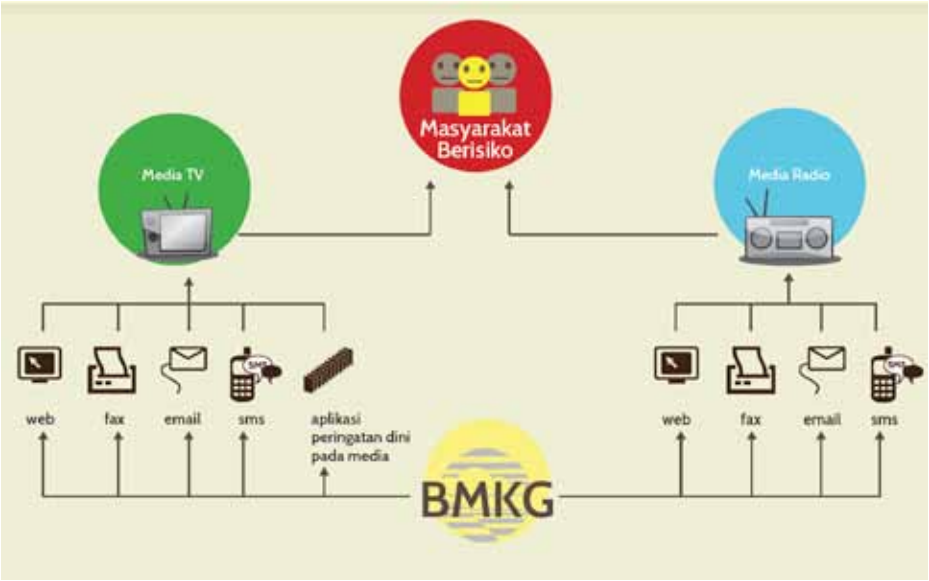
Receiving information via the Warning Receiver System (WRS) is prioritised for television broadcasters, and for those who have already installed the application from the BMKG. Television media will get a message via this application consisting of a map image and the parameters of the quake that has occurred. Radio stations that are interested in acquiring this application can submit a request (according to certain requirements) to the BMKG (hotline number: 021-6546316 or tel/fax: 021-65867045).

Fax

Earthquake information and tsunami early warnings can also be received via fax with a long-sentence format. Only certain groups receive faxed information; the total number of fax recipients is far smaller than those receiving information via SMS. The contents of fax information are the same as for E-mails. Prioritised recipients are those involved in disaster management and decision-makers at national and local levels (Relevant institutions, Governors, Regents, Mayors, Police, Military, Pusdalops, experts etc.

E-mail

If there is an earthquake with a magnitude greater than 5 RS and tsunami warning information, the warning system at the BMKG will send the warning information to those individuals and agencies whose e-mail addresses are registered with the BMKG. The information is sent to those involved in disaster management and decision-makers at national and local levels (Governors, Regents, Mayors, Police, Military, Pusdalops, experts etc).



SMS

SMS messages are sent out for all earthquakes with a magnitude greater than 5 RS and state whether there is a tsunami threat. Earthquake and Tsunami Warning Information is sent to mobile phone numbers that are registered in the BMKG's database, which allows for a limited number.

BMKG Website

The BMKG offers a broad service to the general public via its website (www.bmkg.go.id), so that people can be informed of earthquakes and tsunami threats. Besides that, the website also offers the public additional information, such as weather forecasts, sea levels, floods, etc.

Radio and television stations that want to receive tsunami early warning information via e-mail, fax and SMS must register their telephone and fax numbers, and e-mail addresses with the BMKG. The website is available for anyone who has an Internet connection.

Format of InaTEWS Tsunami Early Warning Messages

There are three formats of tsunami warning messages: short-text format (text message/SMS), long-text format (fax, e-mail and GTS) and media format (website and WRS).

1. Short-text format.

   Used to disseminate warnings via text message (SMS). The number of characters is limited to 160.

2. Long-text format.

   Contains more complete information and is disseminated via e-mail, fax and GTS. The outline

   of the long-text format includes:

   a. Header, indicating the source of the information, i.e., the BMKG as the official provider ofwarning messages under InaTEWS.

   b. Information content, which consists of three components:

      i. First, the earthquake parameters

      ii. Second, tsunami observation data, if already available

      iii. Third, the warning level, estimated tsunami arrival time, and affected locations.

   c. Advice, containing recommendations to local governments regarding the appropriate response

3. WRS format for interface institutions and the media

   Contains information regarding EQ parameters, tsunami threat, affected areas, warning levels and estimated time of arrival. It also includes a map indicating the EQ location. The format is designed to be displayed on monitor screens and has a graphic user interface. Additionally, a special graphic is provided to TV media.

4. Website format

   BMKG website (www.bmkg.go.id) displays information on earthquake (date and time) and provinces with tsunami potential.

Roles and Responsibilities of Institutions and Communities in the Tsunami Early Warning Communication Chain

The tsunami early warning communication chain allows for the dissemination of prompt and effective tsunami early warnings and guidance. These warnings and guidance are issued by recognised agencies using the agreed channels of communication to allow the community exposed to the tsunami risk to react appropriately and, if necessary, to evacuate the area at risk and save themselves before the tsunami reaches the shore. This chain links the National Tsunami Early Warning Center to communities at risk along the tsunami-prone coasts of Indonesia.

The agencies that play a role in the InaTEWS tsunami early warning communication chain are:

- The Meteorological, Climatological and Geophysical Agency (Badan Meteorologi, Klimatologi dan Geofisika – BMKG), with its head office in Jakarta, which hosts the National Tsunami Warning Center
- Local governments at provincial, district and municipal levels
- National and local television and radio stations (public and commercial)
- The National Disaster Management Agency (Badan Nasional Penanggulangan Bencana – BNPB)
- The Indonesian Military
- The National Indonesian Police
- Communities at risks
- Cellular service providers,
- Managers of hotels/tourist sites

These institutions that play a role in the early warning chain are obliged to immediately confirm (manually) that they have received early warning messages sent by BMKG.

Each of these institutions has specific roles and responsibilities in the tsunami early warning communication chain.

The National Tsunami Warning Center (NTWC) at the BMKG Head Office

The NTWC is the provider of tsunami early warnings in Indonesia. The BMKG provides information on earthquakes, tsunami early warnings and advice on reaction in areas exposed to tsunami risk and to other actors in the tsunami early warning communication chain.

The BNPB

The BNPB is required to follow up on earthquake information and tsunami early warnings and advice received from the BMKG. The BNPB supports the dissemination of tsunami early warnings and advice to local disaster management institutions. The BNPB is also responsible for the preparation of an appropriate emergency response (search and rescue and assistance on land) as soon as the tsunami threat has passed.

Local governments

Local governments are required to act on earthquake information and tsunami early warnings and advice issued by the BMKG. Local government is the only actor in the tsunami early warning communication chain that has the authority and responsibility to make the decision on, and to officially announce, an evacuation status based on information from the BMKG. Pursuant to Articles 46 and 47 of Law 24/2007, Article 19 of Government Regulation 21/2008, and Chapter 2 of the Decree by the Head of the BNPB 3/2008, local governments are responsible for issuing immediate public announcements containing clear directions and instructions to help the inhabitants of, and visitors to, an area react quickly and appropriately to a tsunami threat.

The Indonesian Military

The Indonesian Military is required to follow up on earthquake information and tsunami early warnings and advice received from the BMKG. The military has a role in disseminating earthquake information and tsunami early warnings at the local level. If an evacuation is announced, the military can help to evacuate people. The military is required to make preparations for an emergency response (search and rescue and assistance on land) as soon as the tsunami threat has passed.

The National Indonesian Police

The Indonesian Police are required to follow up on earthquake information and tsunami early warnings and advice received from BMKG. The police have a role in disseminating earthquake information and tsunami early warnings at the local level. If an evacuation is announced, the police can help to evacuate people. The police are required to make preparations for an emergency response (search and rescue and assistance on land) as soon as the tsunami threat has passed.

Television and radio stations

National and local television and radio stations (commercial and public) are required to broadcast earthquake information and tsunami early warnings from the NTWC and guidance from local government, pursuant to Article 34 of Law 31/2009 and Articles 1 to 6 of the Decree by the Minister of Communications and Information 20/2006. Television and radio stations form the actor in the tsunami early warning communication chain that has direct, rapid and nationwide access to the public. Television and radio stations are required to immediately interrupt programs to broadcast tsunami early warnings and advice from the NTWC to viewers and listeners.

Communities at risk

Masyarakat berisiko berhak mendapatkan informasi tentang ancaman tsunami serta arahan instruktif yang memungkinkan orang-orang yang terancam bencana bertindak secara tepat dan cepat. Masyarakat bertanggung jawab untuk siap menyelamatkan diri dari ancaman gempabumi dan tsunami. Individu dan lembaga masyarakat wajib meneruskan informasi serta arahan yang benar kepada orang lain. Lembaga Swadaya Masyarakat seperti Organisasi Amatir Radio Indonesia (ORARI), Radio Antar Penduduk Indonesia (RAPI) dan Search and Rescue (SAR) ikut beperan dalam penyebaran informasi gempabumi, peringatan dini tsunami, serta saran yang disampaikan oleh BMKG.

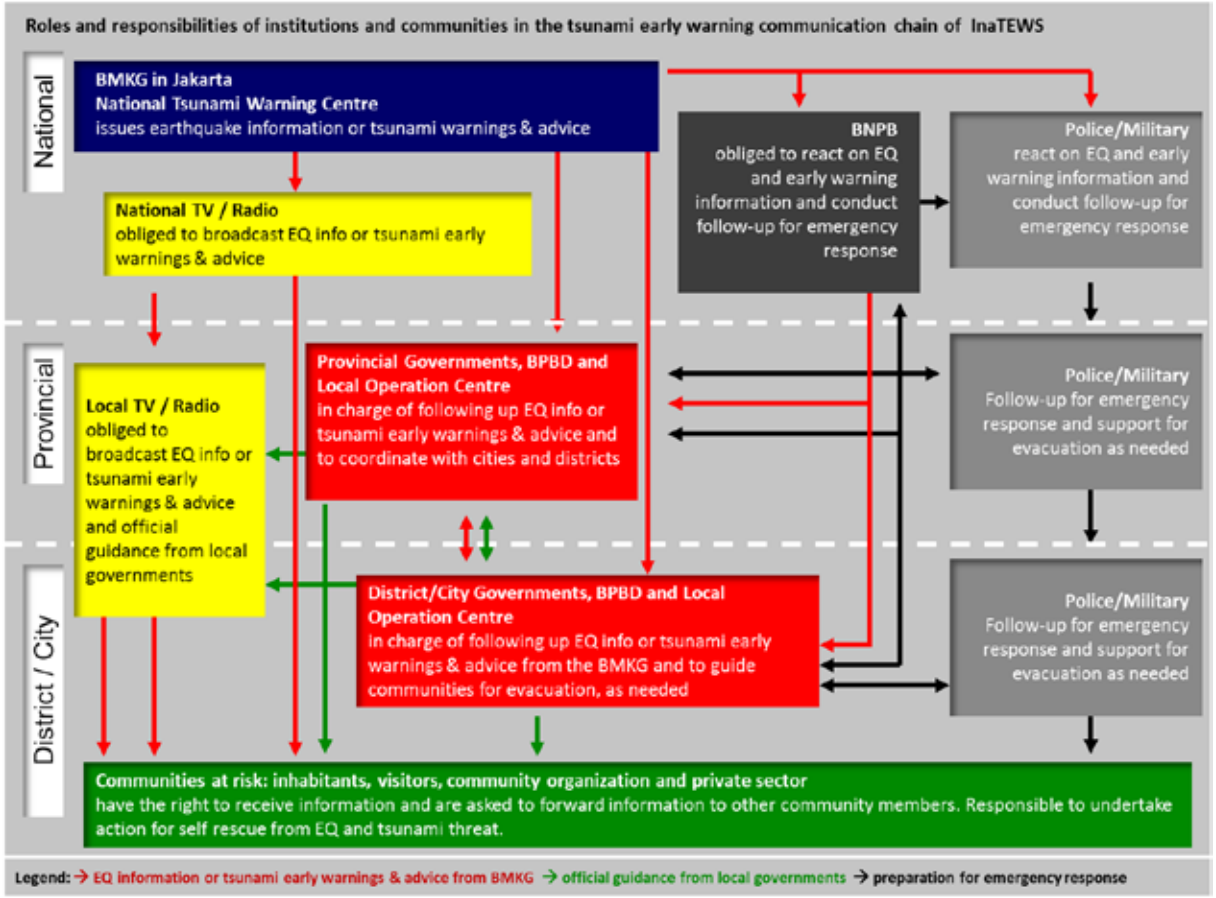
Cellular service providers

Cellular service providers comprise one part of the earthquake information and tsunami early warning dissemination chain using the mode of short message service (SMS). Cellular service providers are

obliged to forward information on earthquakes and tsunami early warnings from the BMKG to the selected and previously registered handphone users. These cellular service providers give higher priority to the delivery of SMS from the BMKG as opposed to general SMS, such as individual/personal SMS. In a situation where the traffic of SMS message is high, SMS-es from the BMKG are given precedence in the queue for sending to registered users. In addition, cellular service providers must keep their service operating in good condition. All these services are provided free of charge.

Hotel managers

The managers of hotels are obliged to protect the guests staying in their hotels,visitors to their hotels and are encouraged to care for the members of the public located around the hotels. Hotel managers have the responsibility to prepare all procedures and action plans for earthquake and tsunami emergencies via the following steps: create a receiving mechanism for early warnings from the BMKG, Pusdalops or the BPBD; provide complete information to guests on the steps that must be taken in the event of a tsunami emergency; prepare a temporary evacuation site together with evacuation route signs both inside and outside the hotel building. (If evacuating inside, a hotel must meet the requirements of earthquake- and tsunami-resistant structures and it must be on higher ground than the estimated height of tsunami waves in the given area). When hotel guests have to evacuate to a place outside the hotel, the manager is obliged to provide guests with detailed information on the location of the temporary evacuation site and he/she must guide them to the evacuation site at the time of a tsunami emergency.



Roles and responsibilities of organizations and communities in the tsunami early warning communication chain

REFERENCES

REFERENCE ON LEGAL BASIS

Following is a list of some of the statutes that form the legal foundation for the implementation of tsunami early warning in Indonesia. This list will change in accordance with changes to the prevailing statutes in Indonesia.

Laws

- Law 24/2007 on Disaster Management:
    - Article 1: (Definition of Early Warning).
    - Article 12(c): (The BNPB is responsible for transmitting information to communities).
    - Article 18: (Local governments set up local disaster management bodies Badan Penanggulangan Bencana Daerah - BPBD).
    - Article 21(b): (The BPBD is responsible for setting standards and identifying needs for the implementation of disaster management).
    - pArticle 21(c): (The BPBD is responsible for preparing, establishing and communicating disaster-risk maps).
    - Article 21(d): (The BPBD is responsible for developing and establishing disaster management procedures).
    - Article 27: (Everyone is required to provide accurate information to the public about disaster management).
    - Article 46: (Observation, analysis, decision-making, and dissemination of information).
    - Article 48: (In the event of implementing disaster management procedures during the emergency response phase, the government shall, among other things, perform rapid and accurate surveys of the location, damage sustained, and resources; declare a disaster emergency situation; and rescue and evacuate people affected by the disaster).
- Law 31/ 2009 on Meteorology, Climatology and Geophysics
    - Article 29, Clause 1: “The government is responsible for providing meteorology climatology and geophysic services,

including public information, early warning, and special information."

- Article 37: "In the event that a personnel of an observation station, offshore rig, ship, or aircraft becomes aware of the occurrence of an extreme meteorological, climatological or geophysical event, the person is required to immediately inform others and report to the relevant agencies pursuant to statutory provisions."
- Article 34, Clause 1: "Government- and local government run public information agencies and mass media sources must allocate time or slots every day to disseminate public information pursuant to statutory provisions."
- Article 44, Clause 1: "The Government, local governments, and other stakeholders are required to use meteorological, climatological and geophysical information in policy making in related sectors."
- Article 45: "The Government is required to meet the need for facilities and infrastructure for the implementation of meteorological, climatological, and geographical operations."

- Law 32/2004 on Local Governments:
  - Article 22: "In executing autonomy, regions have a responsibility to protect the people by providing adequate social facilities and public facilities."

Government regulations

- Government Regulation 21/2008 on the Implementation of Disaster Response
  - Article 19: (The BMKG is the institution that has the authority to convey analysis results to the BNPB and the BPBD to form the basis of subsequent decisions. The BNPB/ BPBD are tasked with coordinating action to save lives).
  - Article 19, Clause 2: "Early warning as referred to in Clause (1) involves:
    a. observing disaster signs;
    b. analysing data from observation;
    c. making decisions based on the result of analysis;
    d. disseminating the decisions;
    e. local communities taking action.

- Article 19, Clause 3: “Observation of disaster signs as referred to in Clause (2), Subclause (a), is undertaken by the appropriate institution/ agency responsible for that type of disaster risk, and by the public, to gather data on a possible disaster event, with due regard for local knowledge.”
- Article 19, Clause 4: “The institution/ agency responsible, as referred to in Clause (3), communicates the results of the analysis to the BNPB and/ or the BPBD according to the location and intensity of the disaster, as the basis for making early warning decisions and taking early warning action.

- Government Regulation No.50, Year 2005 on Broadcast Operations of Private Broadcasting Institutions
  - Article 17, Clause 10: “Private Broadcasting Institutions must disseminate early warning information from official government sources on the possibility of a disaster that could be life-threatening and cause damage to state property."
  - Article 17, Clause 11: “In the event of a national disaster, Private Broadcasting Institutions must disseminate information from official government sources relating to disaster management in the emergency response phase."

Ministerial regulations

- Regulation by the Minister for Communications and Information 20/2006 on Tsunami and other Disaster Early Warning through Broadcast Agencies across Indonesia
  - Article 1: (on the Obligations of Broadcast Agencies with regard to Broadcasting Disaster Early Warning).
  - Article 2: (on Disaster Early Warning Information).
  - Article 3: (on Television Broadcast Agency Broadcasting Procedures for Tsunami and Other Disaster Early Warning).
  - Article 4: (on Radio Station Broadcasting Procedures for Tsunami and Other Disaster Early Warning).
  - Article 5: (Early Warning Drills).
- Regulation by the Minister for Home Affairs 27/2007 on Disaster Management Facilities and Infrastructure
  - Article 2: “Local governments provide disaster management facilities and infrastructure in their regions in the effort

to prevent, control and manage disasters in their regions pursuant to statutory provisions."

- Article 3: "Facilities and infrastructure, as referred to above, include early warning systems appropriate to the condition and capacity of the region."

- Regulation by the Minister for Home Affairs 46/2008 on Guidelines for the Organisation and Work Procedures of a BPBD
  - Article 2, Clause 2: (the formation of a BPBD shall be established by a local regulation).
  - Article 2, Clause 1: (in each province a provincial BPBD shall be formed, and in each district/ municipality a district/municipal BPBD may be formed).
  - Article 20: (according to the need, workload, and financial capacity of the region).

Regulations by the Head of the BNPB

- Regulation by the Head of the BNPB 3/2008 on Guidelines for the Formation of a BPBD
  - Chapter 2 (explains that local governments are responsible for allocating and providing adequate disaster management funds in the regional budget for the implementation of disaster management in the pre-disaster, disaster response and post-disaster phases).
  - Chapter 2 (explains that local governments are responsible for implementing emergency response procedures, from rapid survey and establishing the intensity of the disaster, to rescue and evacuation).
  - Chapter 2: (the responsibilities of the Governor/ District Head/ Mayor include establishing the status and intensity of the disaster emergency situation pursuant to statutory provisions).
  - Chapter 3: (in executing his or her duties, the BPBD Head of Operations is required to form, among others things, Operations Control Center Task Forces)
- Regulation by the Head of the BNPB 4/2008 on Guidelines for Preparing Disaster Management Plans
  - Chapter 5: (on the choice of disaster response management procedures, one of which is readiness, which includes preparing and installing early warning-system instruments).

Decrees

- SDecree by the Coordinating Minister for Social Welfare as the Chair of the Disaster Management National Coordination Agency (BAKORNAS PB) 21/2006 on the Designation of Government Agencies as Focal Points and the Formation of an Indonesian Tsunami sEarly Warning System (InaTEWS) Development Team.

With the formation of the BNPB in 2008, pursuant to Law 24/2007, the Decree by the Coordinating Minister for Social Welfare 21/2006 should have been void. However, the InaTEWS Development Team continues. To replace this decree, a draft presidential instruction to strengthen InaTEWS is being prepared. This presidential instruction is expected to be issued this year.

Regulations by the Indonesian Broadcasting Commisision (KPI)

- Indonesian Broadcasting Commission (KPI) Regulation No. 01/R/KPI/03/2012 on Broadcasting Code of Conduct
    - Article 44, Clause 4: Broadcasting institutions must provide free advertisement slots, accounting for at least 50% (fifty per one hundred) of all public service advertisements broadcast per day, for public service advertisements that contain information on: public safety, natural disaster alertness, and/or community health, which is submitted by public agencies.
    - Article 44, Clause 5: Beyond the provisions referred to in Clause (4) above, broadcasting institutions are required to provide special discounts of at least 50% (fifty per one hundred) of the price of commercial broadcast advertising in other public service advertising slots.
- Indonesian Broadcasting Commission (KPI) Regulation No. 01/R/KPI/03/2012 No. 02/R/KPI/03/2012 on Broadcast Programme Standards
    - Article 51: Journalistic broadcast programmes on disasters are required to feature competent and reliable guest speakers who can explain disaster events in a scientific way.

NOTES

IMPORTANT INFORMATION

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	Tomohon	BPBD Tomohon	Steven L. Kussoy	0431-351411/ 08884552022
	Kolaka	BPBD Kolaka	Zulkifli Tahrir, SH, MM	0405-2323306, 2321083 / 081245906599
SULAWESI TEN-GAH	Poso	Bupati Poso		0452-21421
	Kolaka	BPBD Kolaka	Ir. Mohammad Idrus MSi	0450-21356
	Palu	BPBD Palu	Asnawir K Limpi	0451-422509/ 081341056298

	District/ City	Institution	Name	Phone / Mobile
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	Wajo	Bupati Wajo	Drs H Andi Burhanuddin Unru MM	0485-3238120
	Pinrang	BPBD Pinrang	Andi Nasrul S	085255433288
	Palopo	BPBD Palopo	Sunandar	0471-21007 / 08124283438
SULAWESI TENGGARA	Kolaka	Kesbangpol Kolaka	Bpk. Syerifudin	085241724776
	Konawe Selatan	BPBD Konawe Selatan	Doner	081341818880
	Bolang Mangindow	PU Bolang Mangindow	Naray Cornelius Dendeng	0431-3177737 / 081623345
	Minahasa Utara	BPBD Minahasa Utara	Moh. Irwan abdjulu	081244263777
	Minahasa Utara	BPBD Minahasa Utara	Petra marpaung	085240286577
GORONTALO	Kota Gorontalo	BPBD Kota Gorontalo	Drs Hj Anis Musa	04358-830911 085256268243
MALUKU	Maluku tengah	BPBD Maluku Tengah	Ibrahim Latuconsina	081354072463
PAPUA	Nabire	BPBD Nabire	Drs. Semuel Rihi	0984-23615 / 085255490999
	Nabire	Bappeda Nabire	Drs. SH Purwono, Msi	081382159186
	Keerom	BPBD Keerom	Hulman Sitinjak	0967-534278 / 081248391259
	Keerom	BPBD Keerom	Sugianto	085244726077

LIST OF ABBREVIATION

APBD	: Anggaran Perencanaan Belanja Daerah (Province Annual Budget)
BAKORSURTANAL	: Badan Koordinasi Survey Pertanahan Nasional (Coordinating Body for Survey and National Charting Development)
BHA	: Bali Hotel Association
BMKG	: Badan Meteorologi Klimatologi dan Geofisika (Meteorological Climatological and Geophysical Agency)
BNPB	: Badan Nasional Penanggulangan Daerah (National Disaster Management Agency)
BPBD	: Badan Penanggulangan Bencana Daerah (Regional Disaster Management Agency)
DEPDAGRI	: Departemen Dalam Negeri (Ministry of Home Affairs)
DSS	: Decision Support System
KEMENKOMINFO	: Kementerian Komunikasi dan Informatika (Ministry of Communication and Information)
LIPI	: Lembaga Ilmu Pengetahuan Indonesia (Indonesian Institute of Sciences)
FM	: Frequency Modulation
GIZ/GTZ	: German International Cooperation/ German Technical Cooperation
GPS	: Global Positioning System
GTS	: Global Telecommunication System
GSM	: Global System for Mobile Communication
HP	: Hand Phone
IFRC	: International Federation of Red Cross Societies
InaTEWS	: Indonesia Tsunami Early Warning System
ITIC	: International Tsunami Information Center
MMI	: Modified Mercalli Intensity Scale

NGDC	: National Geospatial Data Center
NOAA	: National Oceanic and Atmospheric Administration
NGO	: Non-Government Organization
NTWC	: National Tsunami Warning Center
OBU	: Ocean Bottom Unit
ORARI	: Organisasi Amatir Radio Indonesia (Amateur Radio Organization of Indonesia)
POLRI	: Kepolisian Republik Indonesia (National Police)
PUSDALOP	: Pusat Pegendalian Operasi (Operation Control Center)
PEMDA	: Pemerintah Daerah (local government)
RAPI	: Radio Antar Penduduk Indonesia (Inter-Population Radio of Indonesia)
SATKORLAK	: Satuan Kordinasi dan Pelaksana
SAR	: Search and Rescue
SMS	: Short Message System
SOP	: Standard Operating Procedure
SR	: Skala Richter
TNI	: Tentara Nasional Indonesia (National Army)
TV	: Television
UNISDR	: United Nation of International Strategy for Disaster
VHF	: Very High Frequency
VPN-MPLS	: Virtual Private Network-Multi Protokol Label Switching
VSAT	: Very Small Aperture Terminal
WRS	: Warning Receiver System
WMO	: World Meteorology Organization

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United Nations
Educational Scientific and
Cultural Organization

Jakarta Tsunami
Information Centre
Unesco Office, Jakarta

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