IOC Circular Letter No. 2268
(Available in English, Spanish and French)

To: ICG/CARIBE EWS Tsunami Warning Focal Points (TWFP) and Tsunami National Contacts (TNC)
ICG/CARIBE EWS Chair and Vice-Chairs

cc.: Official National Coordinating Body for liaison with the IOC Member States
Permanent Delegates/Observer Missions to UNESCO of IOC Member States

Subject: RANET Alert Watcher (RAW) abbreviated messages via SMS to mobile phones, relaying
Pacific Tsunami Warning Center (PTWC) bulletins

Some Tsunami Warning Focal Points (TWFP) within the Caribbean and adjacent regions do have
limited access to tsunami bulletins issued by PTWC due to technology shortcomings and limited access
to the Global Telecommunication System (GTS).

Through this Circular Letter we are introducing a notification system handled by RANET, which is an
international collaboration supported by National Hydro-Meteorological Services, related national entities,
and development NGOs. This is not to replace official lines of communication, but to contribute to a larger
alert and notification system. Please be aware that all TWFP should utilize several redundant systems to
receive official warnings from PTWC, the current interim provider for CARIBE EWS.

Attached, please find details on RANET Alert Watcher (RAW), including subscription mechanism
information.

Sincerely,

Patricio Bernal
Assistant Director-General, UNESCO
Executive Secretary, IOC
RANET Alert Watcher (RAW) – SMS

Overview and Background
RANET is an international collaboration of meteorological services and related organizations working to improve access to weather, climate, and other earth science information. Following the December 26, 2004 Indian Ocean tsunami, RANET developed a small application intended to deliver alert and notification summaries to the mobile phones of national emergency managers and other key officials. The RANET Alert Watcher (RAW) broadcasts an abbreviated message via SMS to mobile phones. This short message lets the recipient know that an official, lengthier message has been issued by a warning authority, such as the Pacific Tsunami Warning Center (PTWC).

The service provided by RANET is meant as a ‘heads-up’ notification to augment other alert and notification systems. The intent is not to replace official lines of communication, but rather contribute to a larger alert and notification system by utilizing effective and inexpensive solutions. Any national warning infrastructure should utilize several redundant systems to receive official warnings from watch providers and other warning authorities. These systems should be layered in order to utilize a variety of networks and devices which posses diversified strengths and vulnerabilities. The RAW is therefore operated as a best effort system in order to provide additional communication capacity.

How do I subscribe to the RAW-SMS service?
The RANET Alert Watcher is NOT a mass public alert and notification solution. Due to inherent limitations of mobile networks, as well as respect for national and local warning authorities, the RAW service is available only to national officials and disaster managers, or members of international organizations, who need to be notified of message releases from regional centers.

To participate in the RAW, send an e-mail to: l.kong@unesco.org or raw@ranetproject.net. Applicants may be required to demonstrate or confirm their affiliation with a national government, regional organization, or UN entity. For the RAW-SMS service to be of use, participants will of course need to be in areas with mobile phone coverage, need to posses a mobile phone or similar device, and the service plan for their mobile device must support SMS – text messaging. At this time the RAW only carries messages from the PTWC, so participants will need to be in one of the covered regions.

Once a service request is received and the applicant’s affiliation is confirmed, RANET will send several test messages. First and foremost these tests confirm that the RANET mobile-hub to SMS gateway can communicate with the applicant. The applicant should note the test numbers received and reply back (via e-mail) to RANET. RANET utilizes these numbers to determine which network carriers and modems are best matched for the subscriber’s phone. Similarly, RANET load balances outgoing messages across a number of modems and services to ensure quick messaging.

What happens if during the registration tests, I fail to receive a message?
The vast majority of subscribers will receive one or more test messages out of seven tests. In some cases, however, none of the test messages will reach the participant. The reason for this typically relates to how your local service provider configures its network and/or its agreement with foreign carriers. If there is a complete test failure, then RANET will work with you to determine if there are other carriers it can utilize to send a message to your mobile phone. If, however, no other carriers are found, then RANET may seek to deploy some equipment inside your country – typically within a national government office. This equipment consists of GSM modems attached to a computer that is connected to the internet. In effect the equipment expands the RANET mobile hub onto a wireless network provider inside your country.
What messages will I receive?
Currently, all publicly posted PTWC messages are distributed to all recipients. By June 1, 2008 RANET hopes to be able to differentiate messages by region, thereby enabling subscribers to determine which messages to receive.

SMSs sent by RAW contain the following information, which is automatically taken from the PTWC messages.

- RANET (listed as title / subject to identify sender)
- PTWC (listed as first portion of message to identify source)
- <message type> (such as watch, bulletin, cancellation, etc.)
- <org. date/time> (date / time of event)
- <issue date/time> (date / time PTWC released message)
- <lat. / long>
- <country / geographic location>

Once per month RANET also conducts a system wide test to benchmark message throughput and confirm overall performance. This test is currently scheduled for the 28th of every month. Received messages are well marked as test messages to avoid confusion.

What are the subscription costs?
RANET provides the RAW-SMS service for free. Users are responsible for their own mobile messaging and service costs, as well as that of their mobile device. Many wireless plans do not charge for receipt of text messages (SMSs), but concerned users should check with their wireless provider to be sure. As part of the registration tests, users may be asked to send an SMS from their mobile device to RANET. This may result in $1-2 worth of mobile charges. In cases where the RANET mobile hub is extended inside a country (RANET provides equipment), the host institution will be asked to purchase one or two SIM cards, as well as to cover messaging fees. Generally, this is less than $50. Where necessary, RANET can provide assistance. Finally, RANET is working to provide a message confirmation feature. This will utilize SMS as well, and participating users will inevitably be charged by their wireless provider for sending a text message.

What are the reliability concerns and limitations of the RAW service?
First and foremost it is important to underscore that any individual involved in disaster and emergency response should utilize a number of communication solutions to receive alerts and notifications. To this end the RAW is simply a small addition to what should be a larger communications infrastructure. Additionally, the RAW is a best effort network, so no service contracts or guarantees are made with regard to performance; nonetheless it is the intent of RANET to provide effective, reliable, and secure service.

Most issues of reliability have less to do with RANET infrastructure and performance, but rather relate to mobile phone networks. Following the 2004 Indian Ocean tsunami, as well as other major disasters throughout the globe, many activities have been undertaken to utilize SMS as an alert service. With the philosophy that it is best to utilize every communications tool available, this is an appropriate use of the commercial networks. It is important to understand, however, that mobile phone networks have several vulnerabilities which limit their applicability in alert and notification applications. These limitations only underscore the need for layered communications in support of alert and notification services.

The first limitation relates to the capacity of mobile networks. Most communication services are designed to cope with an average peak load - often a communications network equivalent of ‘rush hour’. Network providers do not plan for situations that expect the average peak use to be exceeded, as the expense of maintaining infrastructure for extremely low probability and high demand events is too high. During disasters the public will often use mobile networks to communicate with family and other loved ones. As a result mobile networks easily become congested, thereby delaying communications significantly. In Indonesia during the 2004 tsunami,
mobile network traffic increased in some locations by 25-30%. The only reason networks remained largely operable (where not destroyed by the tsunami) is that the event occurred on a Sunday when traffic was significantly below that expected during weekday maximums.

Another limitation of SMS relates to the congestion issue articulated above. SMS is a store and forward method of communicating. This means that messages are queued in a system that does not assign priority. During periods of congestion, the queue will increase, thereby delaying the transmittal of text messages. Under normal circumstances messages are often received within 1-4 minutes of when RANET receives a message from the PTWC. Congested networks, however, can significantly delay receipt. Unfortunately, congestion is a carrier level issue, which RANET cannot directly address.

The dependence of mobile networks on terrestrial infrastructure does represent a reliability concern for alert and notification applications. Simply, quite often the hazard event (earthquake, storm, etc.) may disable or destroy the mobile infrastructure. Fortunately such damage is generally very localized, thereby allowing some portion of a network to remain functioning. While not useful for alert and notification purposes, wireless networks can be restored very quickly after the event. In parts of Indonesia, following the 2004 Tsunami, some mobile network capacity was restored the day after the disaster by deploying new towers and rerouting traffic.

As a final limitation of mobile phone devices in alert and notification services, user habits often affect whether or not a message is received. Simply, it is easy for a mobile phone to be accidently or purposefully turned off, quieted, or otherwise disabled.

With regard to RANET reliability, RANET has purposefully designed a highly redundant and distributed system. The RAW is an entirely automated system that receives messages from the PTWC on two servers located in different physical locations. Similarly, the RAW continually monitors the PTWC website and a communication gateway to look for outgoing messages. To send messages, RANET relies on a mobile hub to SMS gateway architecture. This architecture consists of several servers with GSM modems attached. These messaging servers are located in different locations as well, such that failure of one unit will not significantly impact the RANET mobile hub. While RANET prefers to rely on a distributed mobile hub for a variety of cost, reliability, and scalability reasons, RANET also maintains linkages to commercial SMS gateway services as a messaging service of ‘last resort.’ In short while RANET provides the RAW service for free and as a best effort activity, thereby not allowing it to make guarantees, the program does take issues of security and reliability serious.