Intergovernmental Oceanographic Commission
Technical Series

107

UNESCO

TSUNAMI PUBLIC AWARENESS AND EDUCATION STRATEGY FOR THE CARIBBEAN AND ADJACENT REGIONS

UNESCO

TSUNAMI PUBLIC AWARENESS AND EDUCATION STRATEGY FOR THE CARIBBEAN AND ADJACENT REGIONS

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariats of UNESCO and IOC concerning the legal status of any country or territory, or its authorities, or concerning the delimitation of the frontiers of any country or territory.

TABLE OF CONTENTS

ANNEX

Executive Summary

The Tsunami Public Awareness & Education (PAE) Strategy for the Caribbean and Adjacent Regions forms part of the Enhancing Resilience to Reduce Vulnerability in the Caribbean (ERC) initiative, funded by the Italian Development Cooperation (Government of Italy). The project's core outputs include the establishment of a sustainable network of real-time decision support centres to facilitate early warning and post-disaster recovery; strengthened national disaster mechanisms to incorporate best practices in volunteerism; enhanced institutional capacities; and enhanced public awareness and education programmes for tsunamis and other coastal hazards.

This Tsunami Public Awareness and Education Strategy focuses on building long-term education and awareness on how to prepare and respond to tsunamis for countries in the Caribbean and adjacent regions[1]. It concentrates on planning and preparedness rather than providing guidelines to manage crisis communications during a disaster.

Earthquakes[2] and other coastal hazards are also addressed since many countries are affected by hurricanes, coastal flooding, storm surges and landslides. Indeed, long-term success of this strategy will require strong correlation between public awareness and emergency responses to tsunamis, earthquakes and other coastal hazards.

This is the first time that a tsunami awareness and educational strategy of this scope and magnitude has been developed for this region. It is the result of over seven months of extensive research, analysis and consultation with over 30 stakeholders during 2012 and 2013.

Once this communications strategy is validated, a harmonized approach to tsunami public awareness and education can be used by countries and territories from the Caribbean and adjacent regions. Long-term implementation results of this framework are expected to standardize messaging, increase information flow, strengthen cooperation, and bring regional continuity amongst countries and partners.

Tsunami education and awareness are made within the context of broader disaster risk reduction (DRR) initiatives including the establishment of a Caribbean Tsunami Information Centre (CTIC), and building and sustaining disaster resilience as a shared responsibility across the region. It is also expected to complement other public awareness and education (PAE) work being done in each of the countries.

Global initiatives that underpin this framework include several priorities in the Hyogo Framework for Action (HFA), the Post−2015 Framework for DRR, and the Post−2015 Development Agenda that will supersede the Millennium Development Goals (MDGs). Regional initiatives that also affect this document are the sustainable development agenda for the 2014 International Conference of Small Island Developing States, and the Regional Stakeholder Consultation on the Comprehensive Disaster Management (CDM) Strategy Beyond 2012 of the Caribbean Disaster Emergency Management Agency (CDEMA).

This document uses as a starting point the 2009 Tsunami Smart® PAE Strategy initially drafted by CDEMA with input from several stakeholders, including the Seismic Research

---

[1]   This includes the extended region from Mexico, the Caribbean, Central America and the shores of South America.   See Annex I for a list of 32 Member States and 16 Territories in the region.

[2]   Data from the National Geophysical Data Center (NGDC), part of the National Oceanic and Atmospheric Administration (NOAA) of USA, that indicate that about 85 percent of tsunamis in the Caribbean and adjacent regions are caused by earthquakes. Of the 84 probable/definite tsunamis in this area between early 1500's to present day, 12 were of volcanic origin, while the remainder (72) were associated with earthquakes.

Centre (SRC). The Tsunami Smart® Strategy remains a good "How-To" manual for PAE Officers.

The current strategy takes into account lessons learned from recent disasters, and integrates feedback from PAE practitioners in all relevant regions, particularly from Central and South America. It also incorporates lessons learned and best practices from the early warning component of the implemented Regional Risk Reduction Initiative (R3I) of the United Nations Development Programme (UNDP) for 11 English and Dutch Overseas Countries and Territories (OCTs) and the US National Tsunami Hazard Mitigation Program (NTHMP).

This communications strategy proposes that certain target audiences are more in need of public awareness and education than others. The following four areas were chosen so as to generate the highest potential public awareness impact which consequently would lead to the highest possible return on investment. These four communication approaches are listed below followed by the intended audience(s), in brackets:

- Curriculum integration (education sector);

- Specialized training (media, teachers, first responders, PAE professionals);

- Community participation and input (multiple stakeholders);

- Country/community designation or recognition by a program such as Tsunami Ready®. Communities could also become designated as "Marine and Coastal Hazards Ready". If designation or recognition is not possible, at a minimum, install unaffiliated tsunami or other coastal hazard signage on key public beaches (tourism and private sectors, residents).

Some of the strategic concepts discussed in this document include:

- The changing role of a communicator from 'implementer' to 'leverager' and the resulting need for more partnerships, coordination of existing resources, and sharing information effectively, efficiently, and with the least cost.

- The need for resource utilization that can be achieved through leveraging and content iteration rather than duplication.

- The need to advocate for citizens to share the responsibility and take accountability for their own awareness. It is more than just the responsibility of the National Disaster Office (NDO) or PAE officers /governments.

- The need for buy-in. PAE cannot work in isolation. It needs support from the National Disaster Office authorities, Ministers and Cabinet, elected officials, other key departments and from the media. Strong and exercised standard operating procedures (SOPs), policies and legislation are required to guide communications, particularly during emergencies.

- The acknowledgement that this strategy focuses on long-term awareness and education on tsunamis to a variety of stakeholders rather than providing guidelines on doing crisis communications during a disaster.

- The need to measure progress on projects and activities and take the pulse of the community at regular intervals.

The strategy is not prescriptive because a one-size-fits-all formula that will work best for all countries does not exist. Each island/country is unique with unique economic, political, cultural factors that guide in the implementation of PAE. This strategy provides each country and territory with overall guidance and a range of options. It is then incumbent upon each

jurisdiction to do the due diligence using environmental and national analyses[3] to adapt this framework to regional/local experiences and realities. This allows flexibility to prioritize target groups, approaches and tools/processes according to available resources.

This Tsunami PAE Strategy identifies key areas that are common to all and which could have powerful multiplier effects when adapted and utilized by a majority of countries and territories in the region.

It is acknowledged however that changing public perception and behaviour takes time. Behavioural communication guidelines show that real change requires about five years to begin to notice differences, and close to ten years for sustainable change. This could also be approximately the same number of years it could take to add or change a country's educational curriculum. This reinforces the need to undertake continuous evaluation of the PAE already completed and to update this Tsunami PAE Strategy every two to three years.

---

[3]   As a comprehensive diagnostic tool, a PESTLE analysis identifies key **P**olitical, **E**conomic, **S**ocial, **T**echnological, **L**egal and **E**nvironmental factors that provide a context for the organisation's/individual's role in relation to the external environment. SWOT is another analysis often used in the private sector to identify the organization's **S**trengths, **W**eaknesses, **O**pportunities and **T**hreats. This is further discussed under *National Context* in "The World Around Us" section 2.

1. INTRODUCTION

1.1 PURPOSE

The Tsunami Public Awareness and Education Strategy for the Caribbean and Adjacent Regions is part of Output 2 of the Enhancing Resilience to Reduce Vulnerability in the Caribbean (ERC) Project. The output of the core activities include strengthening institutional capacities, and enhancing public awareness and education programmes for tsunamis and other coastal hazards.

The ERC Project also expects to strengthen the civil protection mechanisms in the region through capacity development for early warning systems (EWS) through the DEWETRA platform and the Caribbean Tsunami Information Centre (CTIC); to coordinate information dissemination; and to build linkages for disaster management and response across existing and planned Caribbean institutions consistent with the Hyogo Framework for Action (HFA) and the Comprehensive Disaster Management (CDM) Strategy of the Caribbean Disaster Emergency Management Agency (CDEMA)

The ERC Project provides direct benefits to Barbados and the countries of the Organization of Eastern Caribbean States (OECS), and represents a strategic and integrated partnership initiative involving international, regional and national entities. The establishment of the Caribbean Tsunami Information Centre through this project is also expected to benefit the Caribbean and adjacent regions.

1.2 PARTNERSHIPS

The Government of Italy has committed funding and overall coordination support to the initiative through the CIMA (International Center on Environmental Monitoring) Research Foundation of Italy and the Italian Civil Protection Department.

The Project is being implemented by the Caribbean Institute for Meteorology and Hydrology (CIMH) with the United Nations Development Programme (UNDP) in Barbados and the OECS, the Intergovernmental Oceanographic Commission (IOC) of United Nations Educational, Scientific and Cultural Organization (UNESCO), as well as CDEMA providing technical and management support. Also critical to the success of the ERC Project are the numerous linkages that it will seek to forge with various other initiatives and regional partners in sharing experience and achieving common objectives.

The Tsunami Public Awareness and Education Strategy for the Caribbean and Adjacent Regions is being drafted in the context of the above international and regional partnerships. The success of this regional strategy will involve the support and cooperation of the following regional partners:

- Coordination Centre for the Prevention of Natural Disasters in Central America (CEPREDENAC)[4];

- Caribbean Disaster Emergency Management Agency (CDEMA)[5];

- Seismic Research Centre (SRC);

---

[4] CEPREDENAC has 7 members: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama. Dominican Republic and SICA are Associate Members; and Spain, Mexico and Taiwan, China are Observers.
[5] CDEMA has 18 Participating States: Anguilla, Antigua, Bahamas, Barbados, Belize, British Virgin Islands, Dominica, Grenada, Guyana, Jamaica, Haiti, Montserrat, St Kitts and Nevis, Saint Lucia, St Vincent and the Grenadines, Suriname, Trinidad and Tobago, Turks & Caicos Islands.

- Organisation for Eastern Caribbean States (OECS)[6];

- Non-OECS islands;

- OCTs, through the Association of the Overseas Countries and Territories of the European Union (OCTA)[7];

- The Caribbean Community (CARICOM)[8];

- Along with consultation and approval from members of the Caribbean Tsunami Warning Program (CTWP), the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS), the International Tsunami Information Centre (ITIC), the United Nations Development Programme (UNDP), and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

1.3   METHODOLOGY[9]

This strategy has been developed through extensive research, analysis and consultation. Once this communications strategy is validated, it is expected that a more harmonized approach to tsunami public awareness and education – taking in consideration earthquakes and other coastal hazard – will occur over time by countries and territories in the Caribbean and adjacent regions. The following methodological steps were followed in drafting this strategy:

- Research & Analysis (from November 2012 to January 2013).
  Research began with an in-depth review of the *Tsunami Smart*® Communications Strategy and supporting documents; including six interviews in addition to feedback from over 30 PAE professionals from the region (see section below).

- Consultation of the Draft Tsunami PAE Strategy (from January to March 2013).
  Stakeholders included regional representation from: CEPREDENAC, CDEMA, SRC, OECS, non-OECS islands, OCTs through OCTA, ICG/CARIBE-EWS, ITIC, UNDP and UNESCO.

- Strategy Validation and Approval (from March to April 2013).
  Through Working Group 4 at the Eighth Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS-VIII) held in Port of Spain, Trinidad and Tobago, from 29 April to 1 May 2013.

1.4   REGIONAL PAE WORKSHOP FINDINGS

An integral part of the research for this strategy included feedback received from over 30 tsunami public awareness and education professionals during the Tsunami Public Awareness and Educational (PAE) stakeholders consultation meeting, a two-day workshop held in Bayahibe, Dominican Republic, on 19 and 20 November 2012. Hosted by

---

[6] OECS has 9 members: Antigua and Barbuda, the Commonwealth of Dominica, Grenada, Montserrat, St. Kitts and Nevis, Saint Lucia, and St. Vincent and the Grenadines, Anguilla and the British Virgin Islands.

[7] OCTs has 9 English and Dutch Overseas Countries and Territories in the Caribbean region: Anguilla, Aruba, Cayman Islands, Curacao, Montserrat, Sint Maarten, Turks and Caicos, Virgin Islands, and the Caribbean Netherlands/BES Islands (Bonaire, Saba and St. Eustatius); and includes several French territories: St. Martin, Martinique, Saint Barthélémy, French Guiana, Guadeloupe, and Réunion.

[8] CARICOM has 15 nations and dependencies: Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago. Association Members include: Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Turks and Caicos Islands.

[9] An initial draft of this document was delivered and consultations were performed by Ms Judith Szabo, under a consultant contract with UNDP/ERC.

UNESCO/IOC and UNDP Barbados and the OECS through the ERC project, the goals of the meeting were to share best practices and to help define the requirements towards drafting a Tsunami PAE Strategy for the Caribbean and adjacent regions.

Responses were considered and surprisingly consistent. Participants expected the regional communications strategy for tsunamis to be helpful in three main ways:

(i)   To share best practices, knowledge, successful experiences, and products;

(ii)   To develop a simple, common strategy for the extended region that can be adapted, with clear guidelines and without duplication for each country; and

(iii) To ensure the strategy uses consistent messages.

Participants expected the Strategy's uniform methodology and harmonized response approach to stimulate a unified response, increase information flow, and strengthen cooperation and regional continuity amongst countries and partners.

Participants also wanted to be honest with each other, be their brother's and sister's keeper and stay in contact. On a professional level, they wanted to share best practices, existing material and lessons learned; and develop more partnerships to review and translate existing products and those being developed; refine and adapt successful Standard Operating Procedures (SOPs); look for mutually beneficial funding opportunities; and share human and financial resources.

2.   THE WORLD AROUND US

Public awareness and education initiatives for tsunami, earthquakes and coastal hazards tie into global environment and disaster risk reduction (DRR) initiatives leading to building and sustaining disaster resilience as a shared responsibility across the region[10]. Conclusions reached at the Conference on Disaster Risk Reduction in the Education Sector in Latin America and the Caribbean held in Panama City, from 12 to 14 October 2011, stated that it is necessary to prioritize the DRR approach in the educational sector, and to develop national level (ministerial) educational policies on DRR[11].

Global factors that affect this strategy are the overall decrease in funding due to an economic contraction on several continents, coupled with a marked rise in the number of global disasters and hazards due to climate variability and change[12]. Increased demand for results now have many donors and organizations requiring better monitoring systems with clear and simple impact measurements that form part of a multi-year results-based management work plan.

---

[10]   One international research report produced after the 2004 Indonesia tsunami stated that since tsunamis on this scale are extremely rare and that other natural risks, such as earthquakes or tropical cyclones, pose a greater threat in that region, that more generic disaster preparedness would be a better investment than investment specifically for tsunami risks. The Active Learning Network for Accountability and Performance in Humanitarian Action (ALNAP) - Tsunami Evaluation Coalition: *Synthesis Report: Expanded Summary. Joint Evaluation of the International Response to the Indian Ocean Tsunami* by John Cosgrave, London, 2007, p. 27. ALNAP members number over 70 institutions including 15 donor organizations, UN agencies, network/umbrella groups, NGOs, research organizations and those from the Red Cross movement.

[11]   *Current Situation on Disaster Risk Reduction in the Educational Sector: The Caribbean Region*. Conferencia Internacional para la Reducción del Riesgo de Desastres en el Sector Educativo en América Latina y El Caribe, Del 12 al 14 de octubre de 2011, Panamá, Ciudad de Panamá.

[12]   According to the World Meteorological Organization, the ten year period (2001-2011) was among the warmest on record with unprecedented Arctic Sea ice melt, multiple climate extremes and high temperatures. *Record Arctic Sea Ice Melt, Multiple Extremes and High Temperatures* (Press Release). World Meteorological Organization, November 28, 2012. http://www.wmo.int/pages/mediacentre/press_releases/index_en.html

Tsunami PAE is also associated with the third and fifth priorities in the Hyogo Framework for Action (HFA), a 10 year plan ending in 2015 adopted by 168 UN Member States to build the resilience and safety of nations and communities to disasters.

In a process managed by the United Nations Office for Disaster Risk Reduction (UNISDR), priorities for the Hyogo Framework for Action include:

- Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation.

- Identify, assess and monitor disaster risks and enhance early warning.

- Use knowledge, innovation and education to build a culture of safety and resilience at all levels.

- Reduce the underlying risk factors.

- Strengthen disaster preparedness for effective response at all levels.

Four other international and regional processes are currently taking place that will also likely affect the iteration of this regional tsunami public awareness and education strategy:

- Led by UNISDR, an online dialogue and regional consultations towards a new post–2015 framework for Disaster Risk Reduction. The plan was presented in the fourth Session of the Global Platform for Disaster Risk Reduction (GPDRR) in Geneva, Switzerland, from 19 to 23 May 2013. Consultations will culminate in 2015 at the World Conference on Disaster Risk in Japan where the new instrument will be agreed and put forward to the United Nations General Assembly for endorsement.

- An assessment of the post–2015 Development Agenda, and what should replace the internationally-agreed Millennium Development Goals (MDGs) as the 2015 target date fast approaches. According to the UN High-level panel, the post–2015 Development Agenda will reflect new development challenges and is linked to the outcome of Rio+20 (United Nations Conference on Sustainable Development) that took place in Rio de Janeiro, Brazil, from 20 to 22 June 2012.

  - The Third International Conference of Small Island Developing States that will be held in Apia, Samoa, from 1 to 4 September in 2014 will address the 20 year review of the United Nations Barbados Programme of Action (BPOA+20) on the Sustainable Development of Small Island Developing States (SIDS).

- Led by CDEMA, consultations and online dialogue towards reviewing and redefining a Comprehensive Disaster Management Strategy Beyond 2012. Priorities include determining the status of implementing the Enhanced CDM Strategy and Programming Framework 2007-2012; addressing gaps at the national level; strengthening cross-cutting issues; elaborating an implementation plan to support the achievement of the CDM Strategy Beyond 2012; and developing a Performance Monitoring Framework.

At the 7th Caribbean Conference on Comprehensive Disaster Management held in Jamaica from 3 to 7 December 2012, the need for more private sector involvement was mentioned in both the opening and the closing remarks. A Vice-President of the Caribbean Development Bank stated that traditional modes of communications need to be revisited to include the private sector. Closing remarks by CDEMA reiterated the need for more communication of risk and risk information and increasing levels of engagement and buy-in, including more private sector engagement for CDM programmes of resilience.

Gender and Vulnerable Groups: Integrating gender considerations in DRR remains a major challenge internationally. Gender aspects are taken into account by less than 27 percent of

countries in risk reduction policies and only 39 percent of countries have dedicated provision for women in relief, shelter and emergency medical facilities[13]. This is evidenced in lessons learned during the 2011 tsunami in Japan which found that culturally appropriate services and social safety nets for vulnerable groups were lacking during the emergency and during reconstruction. Two-thirds of the deaths occurred among people over the age of 60, who accounted for just 30 percent of the population in the affected areas. Privacy and security for women and the disabled at evacuation centres were not fully met.

2.1 REGIONAL CONTEXT

Some of the following regional information was researched by ICG/CARIBE-EWS and ICG/PTWS. The region has:

- Geo-political diversity with varying levels of country development and state capacities;

- Population diversity based on multilingual nature (English, Spanish, French, Creole Dutch, Papiamento, etc.), regional/local cultures, beliefs and practices, and knowledge of community and societal structures;

- Considerable variations in demography (culture, racial, colour, ethnic and religious diversity). Roughly 64 percent of the CARICOM population are youth under 30 years old[14].

- Diverse education systems – US American, British, Dutch, French, Caribbean, Spanish;

- 91 percent literacy in Latin America and the Caribbean; of those illiterate, more than half are women[15];

- Strong dependency on coastal resources;

- Varying economic resources;

- Most countries (areas of tsunami impact) are tourism-based economies, with hotel and shipping industries;

- Highly dependent on maritime port operations (for imports of food staples);

- Tsunamis in this extended region are low frequency, but an extremely high impact (comparable to Indian Ocean, unlike Pacific Ocean).

---

[13] United Nations: *Global Assessment Report on Disaster Risk Reduction: Revealing Risk, Redefining Development* (GAR 2011), 2011, p. 94-96
[14] A Caribbean Network for Youth Development http://www.youth-in.com/
[15] UNESCO Institute for Statistics, Data Centre, http://stats.uis.unesco.org
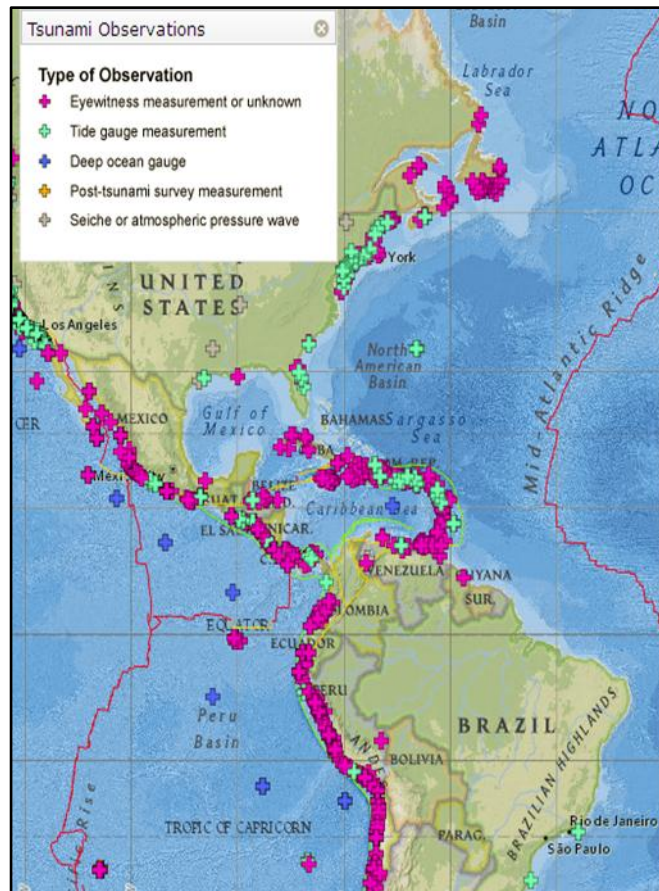
Figure 1. Tsunami Observations.
Source: ICG/CARIBE-EWS, 2012

2.2   NATIONAL CONTEXT

Every island/country is unique with unique economic, political, cultural factors that guide in PAE implementation. The Tsunami PAE Strategy is not prescriptive and requires each country to do its own due diligence and communications priority setting. There is no one-size-fits-all formula, nor is it likely that many countries would want this.

To receive the maximum benefit from any long-term communications strategy, it is suggested that each country conduct an environmental and program analysis using PESTLE (Political, Economic, Sociological, Technological, Legal, Environmental) and SWOT (Strengths, Weaknesses, Opportunities, and Threats) to adapt this tsunami PAE framework to regional/national/local experiences and realities.

A PESTLE analysis identifies key external or public environment issues whereas the SWOT analysis is an audit tool to analyze the National Disaster Office's competitive position in the marketplace and looks at internal value-creating (or destroying) factors such as assets, skills, or resources relative to its partner agencies or offices doing the same type of work in other countries.
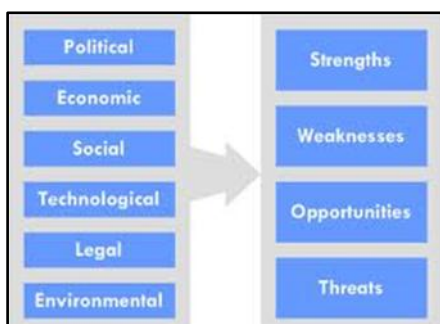

Figure 2. PESTLE and SWOT analysis

2.3   CHANGING ROLE OF THE PAE OFFICER

Lessons learned in public outreach and education (POE) activities for early warning systems in the Regional Risk Reduction Initiative (R3I), indicate that dedicated POE managerial and administrative capacity is needed to identify, leverage and coordinate stakeholder involvement and special events/campaigns.

Given the rapidly shifting field of communications and stakeholder engagement and the increased breadth and the range of public awareness and education needed in the context of DRR, the current and future role of a PAE officer is changing. While the need for advanced technology skills continues, there is a shift away from relying on the size of one's toolkit of diverse products and tools, towards managing the more crucial role of coordination, mechanisms and community/national and regional connections to adapt and share information effectively, efficiently and with the least cost.

The shift is from being a 'PAE implementer' who primarily creates and disseminates products to becoming a 'PAE leverager', who uses partnerships, alliances and contacts to leverage information, resources, processes and tools to instigate, manage, challenge, inspire and motivate the community and stakeholders.

Some of the suggestions made by regional PAE officers at the Tsunami Public Awareness and Educational (PAE) stakeholders consultation meeting held in Bayahibe, Dominican Republic, on 19 and 20 November 2012, included looking for more partnerships within the group to:

- Review and translate existing products and those being developed;
- Refine and adapt successful Standard Operating Procedures;
- Look for mutually beneficial funding opportunities; and
- Share human and financial resources.

It was also suggested that Disaster Agencies (PAE officers) could retain and improve their credibility by making alliances with countries and islands in the region so as to provide fast, accurate scientific information about seismic events.

In this global world, there is even more of an imperative not to be limited by national or regional borders so as to be free to share information, build partnerships, alliances and contacts that span the extended region.

2.3.1 Communities of Practice

As 'PAE leveragers', officers could also join informal or formal communities of practices to exchange information, best practices and work together across regions and countries.

One community created could begin with the Tsunami Workshop participants; another is ISDR's Global Media Network for Disaster Risk Reduction. As one of the few international disaster repositories, documents and products could be shared on the web of PreventionWeb of ISDR although reports indicate that it is not widely used and the search engine is weak. However, the success of this type of system also relies on the participation of each PAE officer to submit products to add to the database.

There are also several regional databases in which products can be added and shared such as the site of:

- CDEMA: www.weready.org/tsunami

- DIPECHO: http://www.cpps2-int.org/tsunamidemo/

- CRID: http://www.cridlac.org/esp_recursos_unesco_docs_tecnicos.shtml

And organization sources such as:

- the tsunami site of the French Red Cross:
  http://pirac.croix-rouge.fr/catalogue/index.php?lang=en

- and the sections of Awareness and Education of ITIC :
  http://itic.ioc-unesco.org/index.php?option=com_content&view=category&layout=blog&id=1075&Itemid=1075&lang=en

3.   STRATEGIC CONSIDERATIONS

Strategic considerations identify issues that could be influenced or affected by the communications process.

- Lessons learned from the 2011 Japanese tsunami and the 2010 Chilean tsunami show that public awareness and education is effective in providing the public with the information and the actions needed to save lives. However, the needs of women and other vulnerable groups were not fully met. The Japanese tsunami – which went six miles (9.6 km) inland – also changed the paradigm to create a "new normal". Many countries are now focusing PAE on a wider coastal catchment area, six miles (9.6 km) inland instead of the one mile (1.6 km) range that was generally accepted.

- This regional tsunami PAE strategy needs to meet national needs and accommodate the interests of at least three regional organizations: CDEMA, OECS, CEPREDENAC within the context of 40 Caribbean islands (including sovereign and dependent territories and Overseas Countries and Territories).

- The region has an increasing mobile population, with many people – particularly tourists and undocumented immigrants – moving from island to island, country to country.

- There may be relative differences between small and large islands and between islands and continental states. Whether real or perceived, persons in the region feel more vulnerable to sea level hazards, and smaller islands feel more vulnerable than larger islands. Continental states that share a border might also share similar coastal characteristics.

- There are varying levels of standardization of nomenclature, protocols, procedures and standards throughout the extended region for the exchange of data, bulletins, and alerts on the urgency and risk levels of meteorological hazards.

  o Misunderstandings have taken place due to the different definitions of alert categories (e.g.: Watch, Warning, Advisory, Information Statement etc.) issued by tsunami warning centres based in Alaska, Pacific and Hawaii [16]. The misunderstandings could, and have led countries to inadvertently issue false alerts and have subsequently caused public confusion. Should this situation continue, it could lead to a loss of credibility of National Disaster Offices and the international warning centres.

  o Translating nomenclature across territorial and linguistic boundaries is also at issue. There are, for example, different Spanish translations and meanings for

---

[16]   NOAA NWS West Coast and Alaska Tsunami Warning Center (WCATWC) alerts the west coast of North America, US, Puerto Rico and the Virgin Islands; while NOAA NWS Pacific Tsunami Warning Center (PTWC) alerts the rest of the Caribbean, Central and South America.

the terms *alerta* and *alarma*. The PAE solution has been to develop products with more graphics than words however this does not solve the problem for media and the information sector who might inadvertently report false information due to lack of understanding.

- Resources and PAE capacity are limited. The financial downturn in Europe and in the United States of America has affected international development financing, tourism, the economy and consequently, national budgets. This situation will likely continue affecting PAE budgets in the medium-term. Limited PAE capacity in many countries requires partnership-based approaches and a 'scaling up' of PAE activities to maximize outreach.

- Regional PAE professionals indicate a regional weakness in evaluation and quality control, and long-term planning is not a priority. The failure to measure behavioural progress on PAE messaging and activities will almost always result in reinventing the PAE wheel and inefficient use of the PAE budget.

- The changing face of technology has increased the speed of communications, the quantity of information available and the mediums by which information is accessed. Multiple, often competing or false information sources obfuscate the message; while studies show that before they act, people seek consensus and want validation from many sources, such as friends, experts, public authorities, respected community leaders, radio, television and web sites. The proliferation of communication technologies also will make it challenging to maintain and/or build the credibility of the National Disaster Office and must be seen as the single authoritative "voice" for all hazards.

- Cultural and communication barriers include the thinking that tsunamis happen to other countries, not ours; the long intervals between earthquake, tsunami and other coastal hazard impacts; the growing need and the expense of providing PAE material in multiple languages; national sovereignty and regional alliances.

  - Several cross-cutting dissemination and communication gaps identified at the *Global survey of early warning systems* by the United Nations in 2006 are also relevant when applied to long-term public awareness and education for tsunamis and other coastal hazards. Gaps include inadequate political commitment and responsibility; limited understanding of risk vulnerabilities; failure to address the public's values, interests and needs; ineffective engagement of the media and the private sector; lack of participatory approaches with over-reliance on centralised government direction and limited engagement of civil society, NGOs and the private sector; and a lack of integration of lessons learned from previous warnings[17].

- Preparedness is behaviour-based. Changing behaviours takes time (five to ten years) and requires consistent, sustained efforts. The same locally-based messages for behavioural actions must come from a variety of sources and will motivate people to do what they think others are doing in their communities.

4.   REGIONAL COMMUNICATION OBJECTIVES

The regional tsunami communication objectives below are tied to country DRR strategies, policies and legislation, as well as the multi-hazard disaster reduction strategy of the UNESCO/IOC. The goal of the IOC is to lead the global effort to strengthen the resilience of vulnerable coastal communities, their infrastructure and service-providing ecosystems by reducing risks from tsunamis, storm surges and other coastal hazards.

---

[17]   *Global Survey of Early Warning Systems*: An assessment of capacities, gaps and opportunities toward building a comprehensive global early warning system for all natural hazards; International Strategy for Disaster Reduction (ISDR) Secretariat, United Nations 2006. pp. 19-23.

Tsunami communication objectives by country and extended region are proposed as follows:

Country

- To create awareness of the vulnerability of country/regions to tsunamis and the potential impact on the economy, demographics and environment of the country.

- To educate, drill and reinforce behaviours and actions to take before, during and after an earthquake/tsunami.

Extended Region

- To use consistent messaging throughout the extended region.

- To strengthen PAE cooperation, sharing and information flow in the extended region.

5. TARGET AUDIENCES

Various target audiences have been identified for tsunami public awareness and education activities. Prioritization of these audiences in each country depends on many inputs such as identifying demographic, organizational and environmental strengths and weaknesses; taking into account previously targeted PAE campaigns and activities; availability of budget and resources; and current PAE strategic country imperatives.

The following target audiences are proposed:

- Community: Island residents; island and coastal communities (living from one to six miles [9.6 kilometres] from the coast), community/country leaders, key influencers (role models, sports figures, respected elders, teachers), event speakers, community associations, youth groups.
  - o Vulnerable Residents: Seniors, physically and mentally disabled, women, associations thereof.
  - o Women: Women's organizations, glee clubs, parents.

- Education Sector: Teachers, teachers-in-training, primary and secondary students, including those taking DRR/DRM courses, school principals, guidance counsellors, school facility managers.

- Media: Journalists/bloggers, citizen journalists, station and news managers, editors and media owners (internet-based and traditional media).

- Private Sector: Large corporations eg: refineries, harbour-bound companies, small business owners, business associations.

- Boating Sector: Lifeguards, watersports operators, fishermen and women, cruise ship terminals, port authorities, boating/fishing associations, boating community (coastal crafts, dive shops, marinas, yachters and sailors)[18].

- Tourist Sector: Tourism, hotel and condominium associations, small hotel, condo and holiday home owners, management companies, tourists, tour operators, service providers.

- Non-Profit Sector: NGOs and other non-profit organizations (international, regional, national, community).

---

[18] Also for consideration are for other partners in the sector to consider Tsunami Guideline Plan for Operators of Caribbean Ports available at http://www.srh.noaa.gov/images/srh/ctwp/TsunamiGuidelinePorts_August2011.pdf

- Government: National Disaster Organization (NDO), Disaster Managers, PAE Officers, other government departments (Ministry of Education, Justice, Health, coastal management, Meteorological Services, etc.)

- Political: Country Leader and Deputy Leader (President, Governor, Prime Minister), regional associations (CDEMA, CEPREDENAC, CARICOM, OECS, etc.)

- First Responders: Fire-fighters, police, coast guard, refinery's emergency personnel.

6. COMMUNICATIONS APPROACH

The following section is the core of the Tsunami PAE Strategy. It outlines several communication principles and key messages that are at the heart of all PAE activities and the four proposed communications approaches. This section also provides suggestions on communication channels and products.

6.1 FOUNDATION

Public awareness and education activities should be guided by three important principles: sustainability; scalability; and consistency and standard messaging. Credibility, or the quality of trusting or believing in the messages and the disaster management organization, is built upon the basis and long-term use of the above principles.

Sustainability

Lessons learned in public outreach and education activities for the early warning component of the R3I project, showed that consistent, long-term efforts provide the best results. Accompanied with financial resources for implementation and evaluation, consistent, sustained efforts in long-term public awareness and educational strategies achieve required behavioural changes in preparedness and actions. Understanding that sustainable change takes about 10 years to be noticeable and since one of the key barriers for effective tsunami communications is the long interval between tsunamis, a committed, sustained approach is needed.

Scalability or the 'One-to-Many Principle'

Limited resources (time, money, capacity) usually require PAE to reach more people with the least amount of effort and cost. Some ways to scale up impact is:

- to upload all tools for free on the web and make them available in multiple formats, and multiple languages;

- share costs by getting private-sector sponsors and local government to help print and distribute materials;

- train the trainers;

- negotiate for free public service airtime; and

- piggy back with other programmes, partners to expand the reach and cut costs.

Regional scalability for maximum impact could also take place. One tsunami PAE stakeholder group suggested that the timing of various campaigns and messages be harmonized with other regions. This could include promoting specific hazards at various times of the year or using an event such as International Day for Disaster Reduction (2nd Wednesday in October) to promote tsunami awareness and education. Depending on country priorities, this could be a one day event or be part of a week-long festival of activities on DRR, tsunamis, earthquakes, hurricanes and other coastal hazards. The theme for 2013

is 'People with Disabilities'. It was also suggested that a template be created for all countries to facilitate planning. Another regional initiative with good PAE scalability is the conduct of annual or semi annual drills or preparedness exercises.

<u>Consistency and Standard Messaging</u>

Consistent terminology, messaging, tone and branding are important to reinforce PAE messages and product continuity. Message consistency usually requires partnerships and cooperation. Research shows that people seek consensus and want validation from many sources before they act (e.g.: from friends, experts, public authorities, respected community leaders, radio, television and web sites). Moreover, people will go along with what they think others are doing in their communities. Therefore, if the same message comes from a variety of sources and is locally-based, correct behavioural actions are more likely to take place.

6.2   KEY MESSAGES

Clear, concise and precise messages for the Tsunami Public Awareness and Education Strategy for the Caribbean and Adjacent Regions are based on a combination of tsunami and earthquake preparedness actions layered on standardized behavioural responses that are applicable to multiple hazards.

A message overview is provided in Table 1 followed by a short explanation of each type of message.

MESSAGES	
Standardized Behavioural Messages	
SHELTER-IN-PLACE	
RESTRICTED AREA	
PREPARE TO EVACUATE	
EVACUATE	
ALL CLEAR	
Earthquake Messages	**Tsunami Messages**
DROP	FEEL (a 20 + second earthquake that made you fall)
COVER	SEE (the shoreline recede)
HOLD-ON	HEAR (the sea roar or make a loud noise)
	RUN
	If the sea leaves so should you.

<u>Table 1.</u> Key messages

Standardized Behavioural Messages: In the early warning component of the R3I project, one of the best practices − and original PAE elements − was the development and introduction of five standardized responses to use for the public in ANY emergency. These consistent messages are linked to common psychological behaviour patterns rather than specific disaster scenarios. The patterns would tell people what to do and how to act when an alert is issued, eg: shelter-in-place, restricted area, prepare to evacuate, evacuate, and all clear. Fact sheets were developed for four countries adapted to the local context in five languages. (Links to the fact sheets are available at the following websites:
http://kynthiaart.com/ews/anguilla/; http://kynthiaart.com/ews/aruba/;
http://kynthiaart.com/ews/montserrat/; http://kynthiaart.com/ews/sint-maarten/).

Long-term success will require consistent use of these five standardized messages so as to build a stronger correlation between public awareness and emergency responses to tsunamis, earthquakes and other coastal hazards.

Earthquake/Tsunami Messages: International research and regional consensus confirm that approximately 85 percent of local earthquakes in the Caribbean region generate tsunami events.[19] Given the association between the two hazards, tsunami messages cannot be divorced from earthquake messages. Other coastal hazards must also be addressed as many countries are affected by annual coastal flooding, storm surges and landslides. Therefore, long-term success will require consistent use of messages so as to build a stronger correlation between public awareness and emergency responses to tsunamis, earthquakes and other coastal hazards.

People must know what to expect and how to protect themselves from an earthquake (Drop, Cover, Hold-on to protect from falling objects) then find higher ground immediately because a tsunami is likely (Feel, See, Hear, Run).

Earthquake learning points and messages include:

- How infrastructural damage that is likely to occur in an earthquake may impact evacuation efforts;

- That earthquakes are unexpected and can happen at night when the natural signs associated with tsunamis may be missed; and

- That it is difficult to keep track of time during an earthquake.

Tsunami learning points and messages include:

- Identifying the natural signs of a tsunami;

- Do not wait for an official tsunami warning before running to higher ground. (It takes warning centres at least 3 minutes to send out an emergency alert, about 1 minute to receive it and 5 to 10 more minutes to activate local warning systems.);

- Many will wait to receive some type of confirmation that action should be taken[20];

- Tsunami triggers; and

- Overall/forecasted impact of tsunamis and other coastal hazards on communities, the country, the region (economic, demographic and environment).

---

[19] Data from the National Geophysical Data Center, part of the National Oceanic & Atmospheric Administration (NOAA), reveals that of 84 probable/definite tsunamis in the Caribbean and adjacent regions between early 1500s to present day, 12 were of volcanic origin, while the remainder (72) were associated with earthquakes.

[20] Conversely, some areas may not feel strong earthquakes yet still be impacted by an ensuing tsunami. In these cases, the only way people will know about the tsunami is if they receive a warning message (eg. Nicaragua 1992; scenario for the Exercise CARIBE WAVE/LANTEX13 [IOC/2012/TS/101 Vol.1]).

General learning points and messages include:

- Refer to the past and previous and modelled tsunamis/hazards in the area and elsewhere;

- The threat is real;

- Preparedness begins and ends with you. You must take responsibility for your own safety and security;

- This is the best advice that we can offer;

- Do not panic. Use common sense.

In all cases, PAE professionals can communicate more effectively by having access and understanding to scientific resources to inform and reinforce PAE messaging. This could include promoting awareness of the areas at risk, those areas that are considered safe, the most direct access route to high ground, and designated evacuation routes. Some useful resources include a well-researched past event catalogue; a list of local and regional scientists with tsunami expertise; a list of local residents who have lived through a previous tsunami or coastal hazard and can provide local knowledge and colour to a news story; a list of local and regional media contacts; and maps and diagrams to illustrate the tsunami threat including bathymetric maps, maps of communities at risk and tsunami wave (inundation) modelling.

Other information to convey in simple language without using absolutes or jargon (include 'how' and 'when'):

- Areas likely to be impacted

- How to respond to the warning signs

- Actions that will save lives

- Location of the meeting areas, evacuation points, routes

- Local emergency and evacuation plans

- Roles and responsibilities of individuals, groups

- What to do if caught in a tsunami

- Location of available resources

6.3   SUGGESTED APPROACHES

For long-term communications planning, the following four proposed approaches have been identified as being areas with the strongest needs and the highest potential public awareness impacts. They are:

- Curriculum integration.

- Specialized training.

- Community participation and input.

- Country/community designation or recognition by a programme such as Tsunami Ready®. Communities could also become designated as "Marine and Coastal Hazards Ready". If designation or recognition is not possible, at a minimum, install unaffiliated tsunami or other coastal hazard signage on key public beaches.

These approaches are broken down to their least expansive, lowest common denominator function, however they are also not mutually exclusive. Long-term public awareness and

education can also be achieved using other approaches, strategies and channels. Each country needs to find the best fit between purposes, target audiences, and their available strengths and resources. Successful programmes may use many approaches, settings and tools to repeat their messages for maximum impact.

APPROACHES	PURPOSE	WORKING WITH	POSSIBLE STRATEGIES/ACTIONS/ TOOLS
Curriculum Integration	A united, systematic, coordinated approach be developed to ensure that tsunami education is included in the official primary <u>and</u> secondary school curriculums within the larger context of DRR education. • A curriculum adoption cycle is typically between five and ten years. • Professional educators look at the scope and sequence of knowledge, competencies and skills for each subject area, aligning reading, problem solving, and discovery activities. They know that children learn by doing. • Curriculum subjects would be based on reliable scientific information.	Ministries of Education, schools, teachers, administrators, primary and secondary students. Possibly the Ministry of Justice, the country leader. Possibly NGOs and other non-profit organizations as partners	School-based curriculum integration takes three main forms, each appropriate to different contexts: • Standalone courses. • Integrating short modules (specific subjects and grade levels). • Information mixed throughout the curriculum (multi-subject, using readings, examples, problems, games, drills and activities). Standalone courses are easier for other stakeholders to contribute to, but harder to incorporate into the available curriculum time. All forms require roughly the same sequence of steps and leadership from skilled curriculum experts. Tools include: teacher training guide, curricula, textbooks, modules, case studies, exercises, hands-on learning materials and informal education tools (eg: publications, e-learning, performing and cultural arts, games and competitions, audio, video materials, web pages and activities and social media.) Countries have found many creative ways for long-term curriculum integration: • <u>Direct Route</u>: get NDO buy-in and work with MOE officials, teachers and students to build learning modules to fit into existing curriculum (DIPECHO &

APPROACHES	PURPOSE	WORKING WITH	POSSIBLE STRATEGIES/ACTIONS/ TOOLS
Curriculum Integration			others). • Popular Route*:* develop public awareness campaigns that are so popular with children and parents, they instigate the government/MOE to include the campaign in the curriculum (Belize). • Political Route : get NDO buy-in, then obtain support from the Country Leader so that curriculum development is fast-tracked at MOE. • Legislative Route: develop legislation to require DRR/hazard education in the MOE curriculum (some OCTs eg: Aruba, Sint Martin & others). • Committee Route*:* invite a MOE representative to be a member of DMO Committees to build MOE awareness and support (Barbados & others).
Training	To provide specialized training to specific stakeholders in: • tsunami/earthqua ke response • emergency communications & coordination • role of the media in disasters To ensure that consistent, standard messaging is taught to key target audiences. Each training is targeted to the audience to build awareness, work better together, develop new skills	Media & media owners (social & traditional). First responders. NDO & PAE stakeholders. Teacher colleges.	There are challenges with three main groups of stakeholders across the extended region: • Media & media owners (so as to improve understanding of their role, their accountability & journalism skills during an emergency to reduce public panic); • First responders (so as to reinforce emergency response (using SOPs) & improve understanding and use of standard messaging for tsunamis and earthquakes; • PAE stakeholders (so as to strengthen communication dissemination and coordination).

APPROACHES	PURPOSE	WORKING WITH	POSSIBLE STRATEGIES/ACTIONS/ TOOLS
Training	and perform at a higher level.		Targeting new teachers at Teacher Colleges can build awareness and enthusiasm .
			Tools include: guidance and training materials, games, case studies, drills, learning activities.
			Barrier: lack of regular, standardized instructor training and instructor accessibility.
Community participation, involvement and input	For education, awareness, outreach, feedback, sponsorship (with private sector partners) Important to amplify scalability and sustainability to make best use of limited time and resource options until local community capacities are built.	Private sector, executives of large industries (refineries, harbour-bound companies), children, students, community leaders, key influencers, stakeholder & community associations, media, event speakers. Best practices show that communities, more than decision-makers (who lack continuity), are pivotal to the success of long-term PAE initiatives, and with continuous preparedness training, are key partners during disasters.	Using campaigns, community participation, partnerships, and informal education. Ideas for Campaigns • Regional tsunami drills. • Launch. • Focal days, such as an anniversary or memorial day. • Annual Hazard or Disaster Risk Reduction (DRR) Week be created and promoted with a generic template useful to all. • International Day for Disaster Reduction (2nd Wednesday in October). 2013 focuses on People with Disabilities; 2014 is on the Aging Population (http://www.unisdr.org/we /campaign/iddr). • Weekly or monthly events or activities. • Awards or competitions. • Demonstrations. Ideas for Community Participation • Create a disaster committee in each school which could include students, teachers, facilities manager to become an instant focus group, work on drills, operations and lead DRR

APPROACHES	PURPOSE	WORKING WITH	POSSIBLE STRATEGIES/ACTIONS/ TOOLS
Community participation, involvement and input			campaigns. • Work with businesses on Business Continuity Planning and preparing workforces to respond to tsunami, earthquakes and other hazards. Ideas for External Partnerships with the private sector (for sponsorship), NGOs, media other government departments, tourist and hotel/condo, ports and cruise ship associations. Ideas for Informal Education shifts human behaviour and includes: • Publications: posters, guidelines, flyers, brochures, booklets, activity books, paper models, comic books, story books, colouring books, assembly kits. • E-learning: self-study curricula. • Performing and cultural arts: plays, dances, poems, songs, street theatre, puppet theatre. • Games and competitions: card games, board games, cooperative, activities role play, drawing competitions, writing competitions, tournaments, radio quizzes. • Audio and video materials: short videos, radio programmes, television programmes. • Web pages and activities: web sites, online games, online quizzes. • Social media and telecommunications: SMS, BBM, Facebook, early warning.

APPROACHES	PURPOSE	WORKING WITH	POSSIBLE STRATEGIES/ACTIONS/ TOOLS
Country /community designation or recognition as Tsunami Ready®® or "Marine and Coastal Hazards Ready" **If designation or recognition is not possible, at a minimum, install unaffiliated tsunami or other coastal hazard signs on key public beaches.**	• Provide confidence and a sense of well-being to residents and tourists that the country is concerned about safety and knows how to respond to a tsunami. • Provide economic confidence to country investors, the financial and private sectors that emergency plans have been made and drilled to respond to a tsunami/earthquake	Hotel, condo and tourist organizations, the private & financial sectors, executives of large industries (refineries, harbour-bound companies)	Would need National Disaster Office and government buy-in to develop a business case to be a designated tsunami-ready country. In 2011, Anguilla was the first non-US country to be certified. http://www.tsunamiready.noaa.gov/ UNESCO and the US National Weather Service have a pilot project and guidelines for joint Tsunami Ready® recognition. http://www.srh.noaa.gov/srh/ctwp/?n=ctwp_preparedness Do public, tourist and private sector baseline studies and/or surveys to identify the issue and gauge initial reaction. Puerto Rico has done a similar survey. Tsunami graphics and signage are available for use by other countries. This website of Tsunami Ready® hotels (mostly in Indonesia) also has some best practices that could be encouraged: http://www.tsunamiready.com/country/index.php?act=detail&p_id=1

Table 2. Suggested approaches

6.4   CHANNELS

In addition to traditional channels available to promote awareness and education such as broadcasting, print, the internet and video, current technology usage also requires any communications strategy to also address mobile communications and social media. The latter two channels have become the most prevalent for their speed and public expectation for immediate communications when a disaster or crisis occurs.

Use Mobile Phone Technology

Almost all island and regional stakeholders are linked by Blackberry Messenger or iPhone, Facebook, and in many cases have at least two mobile phones to accommodate different mobile phone providers. Demographic research in 2011 and 2012 is leading a trend in 2013

for consumers to use their mobile devices to maximize every micro moment through multi-if-not-hyper tasking[21].Therefore, simple direct marketing through mobile phone engagement can provide scalable benefits to any PAE strategy.

Tactics could include developing an automated mailing list for mobile phones (particularly Blackberry messenger), QR (Quick Response) codes, SMS (text messaging), MMS (multimedia messaging), Bluetooth, mobile advertisements (top of page web banner or bottom of page poster/banner), applications, and voice and mobile internet.

Applications must be targeted to platform (Android OS, Apple iOS, Palm Web OS, Blackberry OS, Symbian OS, Windows Phone 8, Nokia handsets, iPad), device type, application category and country. Build functionality in the app so that users can post messages on Facebook and Twitter. Surveys have shown that image mobile ads, which need to be consistent with branding efforts, have a higher conversion rate over text ads.

It is recommended that mobile and other technology strategies for long-term PAE include redundancy measures should there be a breakdown in these primary mechanisms during a disaster. Any strategy that only relies on technology (mobile, internet, broadcasting etc.) to disseminate messages is at risk should infrastructure fail during a hazard such as mobile phone towers going down, electricity being cut off or internet connection problems.

Use Social Media to Create a Community

Social media plays a role both in the operational, minute-by-minute response during an emergency as well as in the long-term goal of building social communities based on trust and information. Networking using social media has become a societal force to be reckoned with. Almost 40 percent of Americans socialize more online than they do face-to-face[22]. However, successful integration and ongoing engagement of social media into a PAE strategy requires dedicated resources, a social media policy, and in many cases, institutionalization of social practices within organizations.

- Operational.The use and monitoring of social media has now become an integral part of communication operations before and during emergencies and crises[23]. There are ad-hoc initiatives like the 15-year-old Chilean boy who after the 2010 earthquake added seismograph readings directly to his Twitter account and now has over 342,000 Twitter followers[24]. Other grassroots crowd-sourcing networks are created in response to individual emergencies. For example, Japan and Mumbai used the mapping platform http://www.ushahidi.com/ to bring together information, people and services in one location. A few large organizations including Gatorade, Dell and the

---

[21]   A) A survey of US adult smartphone owners found that 63% of female respondents and 73% of male respondents do not go an hour without checking their phone (Source: Harris Interactive, June 2012). B) Cell phone users between 18 and 24 exchange an average of 109.5 messages on an average day, more than 3,200 per month (Source: Pew Research Centre, September 2012). C) An academic study of Android users' app-habits revealed that while users spend nearly one hour on their devices a day, the average app session lasted only just over a minute.
(Source: DFKI, November 2011) http://www.trendwatching.com/trends/10trends2013/?mobilemoments
[22]   For a look at how social networking has permeated global society, 2012 statistics can be found here - http://visual.ly/100-social-networking-statistics-facts-2012
[23]   See A) *The Use of Social Media for Disaster Recovery,* Lessons learned while creating and managing Joplin Tornado Info (2011) on Facebook, Branson (Missouri) Tornado Info (2012), Missouri Flood Info (2011-12) and US Tornado Info (2012).
http://extension.missouri.edu/greene/documents/PlansReports/socia_media_in_disasters.pdf. And B) FEMA's online course on *Social Media in Emergency Management* . http://training.fema.gov/EMIWeb/IS/is42.asp
[24]   Meet the Chilean Teen Who Warns of Earthquakes on Twitter, Anna Heim, TNW: The Next Web: 18 July 2011. http://thenextweb.com/la/2011/07/18/meet-the-chilean-teen-who-warns-of-earthquakes-on-twitter/. The Twitter account is: https://twitter.com/AlarmaSismos

American Red Cross, now have permanent command centres that do continuous, real-time monitoring and analysis on a wide spectrum of social media.

In a joint venture with Dell computers, the American Red Cross opened its Digital Operations Center in Washington, DC on 7 March 2012. Social media analytical software aggregates social media posts from numerous platforms, including Twitter, Facebook, and blogs, analyzes that data and creates visualizations. This information is expected to provide the organization with a better understanding of what is happening on the ground during a disaster, detect and track trends, and connect affected individuals to resources they need. A training programme has also been developed for volunteers and staff via Webex to respond online to questions from the public and distribute disaster-related information.

One of the key challenges during any emergency is ensuring that official Government/Disaster Office messages are heard and respected above the fray of sometimes competing, contrary and voluminous information originating from the public, media and social media traffic.

- Creating a long-term community. Apart from the crucial role that social media has during emergencies, PAE strategies for DRR should include building a network of subscribers so that the National Disaster Office social media site becomes the default "go-to" information site to learn about emergency preparedness for tsunamis and other coastal hazards. By building relationships through online conversations, a community is developed in which participants can meet, talk, learn and have fun.

  Generally, an organization has about 15 online seconds to grab participant interest. One way to do this is to focus on engagement, not tactics. Multi-channel campaigns need to be designed to include between 5 to 10 contact points with which participants can engage, such as a landing page, content with humour, with facts, with information, discussion, prizes, and calls to action (eg: sharing, incentives). It is suggested that instead of focusing on tactics of how to get people to the landing page (whether it be a social media page or a webpage, etc.), it is more important to focus on what to do with them once they hit the page. Ultimately, the decision as to which among the many tactics to implement is dependent on best timing, available personnel and financial resources, and internal and external constraints.

  Another factor to consider is implementing a social media management tool (software) so that data can be aggregated, measured and analyzed. Social media metrics could include qualitative and quantitative analyses on content, word-of-mouth reach, and statistics on the number of subscribers, information shared, and links clicked through.

  Social media can be a low cost/high return engagement and awareness tool but there are both advantages and disadvantages to its use. Lists of the best and worst social media campaigns of 2012 follow and include two unsuccessful campaigns by Urban Outfitters and Hubspot who received failing marks by the public for exploiting Hurricane Sandy. (10 of the best social media campaigns from 2012: http://econsultancy.com/jm/blog/11244-10-of-the-best-social-media-campaigns-from-2012; and the top 10 social media fails of 2012: http://econsultancy.com/jm/blog/11056-the-top-10-social-media-fails-of-2012)

  Table 3 below provides a partial list of advantages and disadvantages of social media.

SOCIAL MEDIA	
ADVANTAGES	DISADVANTAGES
Good scalability (one-to-many option) • relatively simple and low cost channel shared with wider distribution channels eg: Facebook, Twitter.	Takes dedicated time and effort • Requires human resources, time and creativity.
Shareable • Engages people, uses word-of-mouth to go viral.	Needs to be constant and consistent • in monitoring activity, • in engaging users, • in updating content regularly.
Provides access to other channels • Can push traffic to other PAE tools eg: campaign & web sites, blogs, articles.	Needs a content strategy • What information will be posted, why and how to keep the site evergreen? How to generate stories from participants? • Develop deeper emotional connections to enable better storytelling.
Builds relationships • Through regular communication and engagement.	Needs a feedback system to engage with participants and take conversations offline if necessary.
Regular connection • Allows short messages to be pushed regularly, in bite-sized chunks.	Organization needs to put in place a social media policy to provide guidelines for the NDO and users of acceptable usage.
Regularly scheduled posts • New technology allows for scheduling posts on specific days and times for better click through (read) rates.	Needs to keep pace with technology.

Table 3. Advantages and disadvantages of social media

6.5   PRODUCTS AND CONTENT

Research conducted for this strategy indicates the availability of a multitude of tsunami, earthquake and other hazard awareness and education products in different languages, and in different formats, many copyright free and with organizations willing to share them.

As previously mentioned, the future of PAE is geared towards partnerships and coordination and is veering away from the size of one's toolkit of products/tools. Given tighter budgets for PAE in the region due to a global downturn in economic conditions, countries could be more strategic in resource development and utilization by taking inventory and consolidating current products, in order to share, adapt or iterate new ones.

Rather than develop new products annually, it is suggested that a suite or basic toolkit of tsunami products be created within the DRR concept. Tools could correspond to different

mediums and different target audiences which could then be mixed and matched, as needed. For example, a toolkit could include a video, a PSA, a brochure, website updates, a children's game, a flyer and would be used for a period of time.

This approach is consistent with the fact that each person learns and remembers differently, and that as long as the messages are consistent, there are multiple effective ways to convey public education messages.

For efficiency and to consolidate limited resources, one product could be recycled or changed every year. Generally, it is less expensive to modify an existing product than to create one from scratch. Partnerships and coordination with others in the region could identify already existing products and resources that could be adapted according to specific local culture, language and terminology. With the preponderance of free web-based document editing applications[25] (the most famous being GoogleDocs) it has become easier to work collaboratively with many people around the world.

Products could also be adapted through iteration of identifying the strengths of the original; the essence of which becomes the focus of a new improved version or, the next iteration. Adaptation and/or iteration could also include using and valuing survivor stories, stories about the past and local and community knowledge. The most memorable lessons are learned from stories that are simple, unexpected, concrete, credible and emotional.

New products could also be created in conjunction with the private sector which, for one US company, relies on ever-changing content to motivate and keep clients engaged in disaster preparedness activities[26].

It might also be possible to share translation and production costs with other countries and/or sponsors.

The following process could be used to evaluate the cost effectiveness of current content:

- Identify what products are needed in each country (by tools, audiences and languages);

- Identify all in-country tsunami/earthquake-related products (by tools, languages and messages);

- Identify products from other countries (by tools, languages, messages and accessibility);

- Identify and prioritize which can be modified to suit the country context;

- Obtain permission to modify them;

- Form a committee which includes students and teachers to help modify it and bring in outside advice; and

- Find sponsors and partners to adapt, translate and produce the products for the country(ies) in question.

---

[25] 10 Best Free Document Editing Applications, James, 10 June 2010. http://webtrickz.com/10-best-free-document-editing-applications/
[26] An online service based in San Francisco, USA, provides subscribed customers with disaster-relief goods of their choosing and keep them engaged over time. http://www.fastcodesign.com/1671515/an-ingenious-service-for-preparing-for-disaster?partner=newsletter#1

## 7.	EVALUATION

Ultimately, the effectiveness of the PAE strategy will be determined by how people respond when a tsunami alert message is issued by the authorities. PAE success will be measured by how fast the messages are delivered, how well they are understood, how the public reacts and the performance of the systems which have been developed to deliver these messages.

Given that one of the important barriers in tsunami PAE is the scarcity of tsunamis in the region, building sustainability and regularly taking the pulse within long-term PAE activities will allow for measurement of awareness progress. What is often overlooked is that behaviour change is not an overnight dynamic and that real community-driven change requires five years to begin to notice differences and close to ten years for sustainable change. As such, it is important to have clear achievable objectives (preferably community-led) that are placed within a realistic time frame to ensure that PAE is a cost-effective endeavour.

Despite its importance, barriers to having regular evaluations of PAE activities include a regional reluctance to undertake evaluation, quality control, and long-term planning. Insufficient disaster agency capacity, political buy-in and support and understanding of the communications process could also attribute to the challenge. However, the real failure of not measuring progress or results is having insufficient information to know how or where to focus on the next iteration of the strategy. Lurching from project to project without taking time to evaluate the results of previous efforts is short-sighted and unsustainable.

A well-designed baseline evaluation <u>before</u> activities begin (even if informal) will provide enough information to design a realistic, achievable PAE programme using small achievable outcomes at the beginning and larger more complex objectives to build on successes.

Building in testing and feedback mechanisms to measure output and evaluate the success of programmes, campaigns, activities, tools, and ultimately the communications strategy will help determine future POE direction and budget. There is no need to reinvent the wheel again and again, from one country to the next. Build on previous campaigns (iteration).

The communications strategy should also be evaluated and updated according to the lessons learnt and to ensure that the NDO organisational priorities, PAE communication objectives and target audience needs are being met.

Other common evaluative markers to monitor and evaluate the progress/success of PAE approaches include:

Quantitative evaluation examples:

*	Tracking mechanisms such as number of newsletter email signups;

*	Web analytics and metrics including the number of web page views;

*	Number of public awareness and education products produced and disseminated;

*	Media monitoring: Number of interviews and stories printed/broadcast, etc.

Qualitative evaluation examples:

*	An active network participating in the campaign;

*	Engaged local/regional multiple stakeholders;

*	The number of partnerships developed;

*	Stronger working relationships with XX etc.;

- The "buzz" created by people talking about the campaign;

- Deeper evaluation and analysis can be obtained by studying and monitoring behavioural changes, and conducting Knowledge, Attitude and Practice (KAP) studies; and

- Surveys of key stakeholders to determine whether there have been any changes in communication practices; the level of up-take of supplied information, and products, whether products are being used effectively and if goals are being met.

Social media evaluation examples:

- Aggregated data using social media management software to measure and analyze social media engagement. Social media metrics could include qualitative and quantitative analyses on content, word-of-mouth reach, and statistics on the number of subscribers, information shared, and links clicked through.

ANNEX I

LIST OF COUNTRIES
IN THE CARIBBEAN AND ADJACENT REGIONS

As of February 2013, a total of 32 Member States and 16 Territories.
Source: ICG/CARIBE-EWS

1.   Aruba
2.   Antigua and Barbuda
3.   Bahamas
4.   Barbados
5.   Belize
6.   Brazil
7.   Colombia
8.   Costa Rica
9.   Cuba
10. Curaçao
11. Dominica
12. Dominican Republic
13. France (Martinique, Guadeloupe, St Martin, Guyane, St. Barthelemy)
14. Grenada
15. Guatemala
16. Guyana
17. Haiti
18. Honduras
19. Jamaica
20. Mexico

.

21. Netherlands (Bonaire, Saba, Sint Eustatius)
22. Nicaragua
23. Panama
24. Saint Kitts and Nevis
25. Saint Lucia
26. Saint Vincent and the Grenadines
27. Sint Maarten
28. Suriname
29. Trinidad and Tobago
30. United Kingdom (Anguilla, British Virgin Islands, Bermuda, Cayman Islands, Montserrat, Turks and Caicos)
31. United States (Puerto Rico, US Virgin Islands)
32. Venezuela (Bolivarian Republic of)

Other Active Member States:

- Canada
- Peru
- Sri Lanka

ANNEX II

LIST OF ACRONYMS

ALNAP	Active Learning Network for Accountability and Performance in Humanitarian Action
BPOA	Barbados Programme of Action
CARICOM	The Caribbean Community
CDEMA	Caribbean Disaster Emergency Management Agency
CDM	Comprehensive Disaster Management
CEPREDENAC	Coordination Centre for the Prevention of Natural Disasters in Central America
CIMA	International Center on Environmental Monitoring
CIMH	Caribbean Institute for Meteorology and Hydrology
CTIC	Caribbean Tsunami Information Centre
CTWP	Caribbean Tsunami Warning Program
DIPECHO	European Commission Humanitarian Aid Department's Disaster Preparedness Programme
DRR	broader disaster risk reduction
ERC	Enhancing Resilience to Reduce Vulnerability in the Caribbean initiative
GPDRR	Global Platform for Disaster Risk Reduction
HFA	Hyogo Framework for Action
ICG/CARIBE-EWS	Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions
IOC	Intergovernmental Oceanographic Commission (UNESCO)
ISDR	International Strategy for Disaster Reduction
ITIC	International Tsunami Information Centre
KAP	Knowledge, Attitude and Practice
MDGs	Millennium Development Goals
NDO	National Disaster Office
NDO	National Disaster Organization

NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration (U.S.A.)
OCT	Overseas Countries and Territories
OECS	Organization of Eastern Caribbean States
PAE	Public Awareness & Education
PESTLE	Political, Economic, Social, Technological, Legal and Environmental
R3I	Regional Risk Reduction Initiative
SIDS	Small Island Developing States
SOP	standard operating procedures
SRC	Seismic Research Centre
SWOT	Strengths, Weaknesses, Opportunities and Threats
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNISDR	United Nations Office for Disaster Risk Reduction

IOC Technical Series

No.	Title	Languages
1	Manual on International Oceanographic Data Exchange. 1965	(out of stock)
2	Intergovernmental Oceanographic Commission (Five years of work). 1966	(out of stock)
3	Radio Communication Requirements of Oceanography. 1967	(out of stock)
4	Manual on International Oceanographic Data Exchange - Second revised edition. 1967	(out of stock)
5	Legal Problems Associated with Ocean Data Acquisition Systems (ODAS). 1969	(out of stock)
6	Perspectives in Oceanography, 1968	(out of stock)
7	Comprehensive Outline of the Scope of the Long-term and Expanded Programme of Oceanic Exploration and Research. 1970	(out of stock)
8	IGOSS (Integrated Global Ocean Station System) - General Plan Implementation Programme for Phase I. 1971	(out of stock)
9	Manual on International Oceanographic Data Exchange - Third Revised Edition. 1973	(out of stock)
10	Bruun Memorial Lectures, 1971	E, F, S, R
11	Bruun Memorial Lectures, 1973	(out of stock)
12	Oceanographic Products and Methods of Analysis and Prediction. 1977	E only
13	International Decade of Ocean Exploration (IDOE), 1971-1980. 1974	(out of stock)
14	A Comprehensive Plan for the Global Investigation of Pollution in the Marine Environment and Baseline Study Guidelines. 1976	E, F, S, R
15	Bruun Memorial Lectures, 1975 - Co-operative Study of the Kuroshio and Adjacent Regions. 1976	(out of stock)
16	Integrated Ocean Global Station System (IGOSS) General Plan and Implementation Programme 1977-1982. 1977	E, F, S, R
17	Oceanographic Components of the Global Atmospheric Research Programme (GARP) . 1977	(out of stock)
18	Global Ocean Pollution: An Overview. 1977	(out of stock)
19	Bruun Memorial Lectures - The Importance and Application of Satellite and Remotely Sensed Data to Oceanography. 1977	(out of stock)
20	A Focus for Ocean Research: The Intergovernmental Oceanographic Commission - History, Functions, Achievements. 1979	(out of stock)
21	Bruun Memorial Lectures, 1979: Marine Environment and Ocean Resources. 1986	E, F, S, R
22	Scientific Report of the Interealibration Exercise of the IOC-WMO-UNEP Pilot Project on Monitoring Background Levels of Selected Pollutants in Open Ocean Waters. 1982	(out of stock)
23	Operational Sea-Level Stations. 1983	E, F, S, R
24	Time-Series of Ocean Measurements. Vol.1. 1983	E, F, S, R
25	A Framework for the Implementation of the Comprehensive Plan for the Global Investigation of Pollution in the Marine Environment. 1984	(out of stock)
26	The Determination of Polychlorinated Biphenyls in Open-ocean Waters. 1984	E only
27	Ocean Observing System Development Programme. 1984	E, F, S, R
28	Bruun Memorial Lectures, 1982: Ocean Science for the Year 2000. 1984	E, F, S, R
29	Catalogue of Tide Gauges in the Pacific. 1985	E only
30	Time-Series of Ocean Measurements. Vol. 2. 1984	E only
31	Time-Series of Ocean Measurements. Vol. 3. 1986	E only
32	Summary of Radiometric Ages from the Pacific. 1987	E only
33	Time-Series of Ocean Measurements. Vol. 4. 1988	E only

No.	Title	Languages
34	Bruun Memorial Lectures, 1987: Recent Advances in Selected Areas of Ocean Sciences in the Regions of the Caribbean, Indian Ocean and the Western Pacific. 1988	Composite E, F, S
35	Global Sea-Level Observing System (GLOSS) Implementation Plan. 1990	E only
36	Bruun Memorial Lectures 1989: Impact of New Technology on Marine Scientific Research. 1991	Composite E, F, S
37	Tsunami Glossary - A Glossary of Terms and Acronyms Used in the Tsunami Literature. 1991	E only
38	The Oceans and Climate: A Guide to Present Needs. 1991	E only
39	Bruun Memorial Lectures, 1991: Modelling and Prediction in Marine Science. 1992	E only
40	Oceanic Interdecadal Climate Variability. 1992	E only
41	Marine Debris: Solid Waste Management Action for the Wider Caribbean. 1994	E only
42	Calculation of New Depth Equations for Expendable Bathymerographs Using a Temperature-Error-Free Method (Application to Sippican/TSK T-7, T-6 and T-4 XBTS. 1994	E only
43	IGOSS Plan and Implementation Programme 1996-2003. 1996	E, F, S, R
44	Design and Implementation of some Harmful Algal Monitoring Systems. 1996	E only
45	Use of Standards and Reference Materials in the Measurement of Chlorinated Hydrocarbon Residues. 1996	E only
46	Equatorial Segment of the Mid-Atlantic Ridge. 1996	E only
47	Peace in the Oceans: Ocean Governance and the Agenda for Peace; the Proceedings of *Pacem in Maribus* XXIII, Costa Rica, 1995. 1997	E only
48	Neotectonics and fluid flow through seafloor sediments in the Eastern Mediterranean and Black Seas - Parts I and II. 1997	E only
49	Global Temperature Salinity Profile Programme: Overview and Future. 1998	E only
50	Global Sea-Level Observing System (GLOSS) Implementation Plan-1997. 1997	E only
51	L'état actuel de 1'exploitation des pêcheries maritimes au Cameroun et leur gestion intégrée dans la sous-région du Golfe de Guinée *(cancelled)*	F only
52	Cold water carbonate mounds and sediment transport on the Northeast Atlantic Margin. 1998	E only
53	The Baltic Floating University: Training Through Research in the Baltic, Barents and White Seas - 1997. 1998	E only
54	Geological Processes on the Northeast Atlantic Margin (8th training-through-research cruise, June-August 1998). 1999	E only
55	Bruun Memorial Lectures, 1999: Ocean Predictability. 2000	E only
56	Multidisciplinary Study of Geological Processes on the North East Atlantic and Western Mediterranean Margins (9th training-through-research cruise, June-July 1999). 2000	E only
57	Ad hoc Benthic Indicator Group - Results of Initial Planning Meeting, Paris, France, 6-9 December 1999. 2000	E only
58	Bruun Memorial Lectures, 2001: Operational Oceanography – a perspective from the private sector. 2001	E only
59	Monitoring and Management Strategies for Harmful Algal Blooms in Coastal Waters. 2001	E only
60	Interdisciplinary Approaches to Geoscience on the North East Atlantic Margin and Mid-Atlantic Ridge (10th training-through-research cruise, July-August 2000). 2001	E only
61	Forecasting Ocean Science? Pros and Cons, Potsdam Lecture, 1999. 2002	E only

No.	Title	Languages
62	Geological Processes in the Mediterranean and Black Seas and North East Atlantic (11th training-through-research cruise, July- September 2001). 2002	E only
63	Improved Global Bathymetry – Final Report of SCOR Working Group 107. 2002	E only
64	R. Revelle Memorial Lecture, 2006: Global Sea Levels, Past, Present and Future. 2007	E only
65	Bruun Memorial Lectures, 2003: Gas Hydrates – a potential source of energy from the oceans. 2003	E only
66	Bruun Memorial Lectures, 2003: Energy from the Sea: the potential and realities of Ocean Thermal Energy Conversion (OTEC). 2003	E only
67	Interdisciplinary Geoscience Research on the North East Atlantic Margin, Mediterranean Sea and Mid-Atlantic Ridge (12th training-through-research cruise, June-August 2002). 2003	E only
68	Interdisciplinary Studies of North Atlantic and Labrador Sea Margin Architecture and Sedimentary Processes (13th training-through-research cruise, July-September 2003). 2004	E only
69	Biodiversity and Distribution of the Megafauna / Biodiversité et distribution de la mégafaune. 2006 Vol.1 The polymetallic nodule ecosystem of the Eastern Equatorial Pacific Ocean / Ecosystème de nodules polymétalliques de l'océan Pacifique Est équatorial Vol.2 Annotated photographic Atlas of the echinoderms of the Clarion-Clipperton fracture zone / Atlas photographique annoté des échinodermes de la zone de fractures de Clarion et de Clipperton Vol.3 Options for the management and conservation of the biodiversity — The nodule ecosystem in the Clarion Clipperton fracture zone: scientific, legal and institutional aspects	E F
70	Interdisciplinary geoscience studies of the Gulf of Cadiz and Western Mediterranean Basin (14th training-through-research cruise, July-September 2004). 2006	E only
71	Indian Ocean Tsunami Warning and Mitigation System, IOTWS. Implementation Plan, 7–9 April 2009 (2nd Revision). 2009	E only
72	Deep-water Cold Seeps, Sedimentary Environments and Ecosystems of the Black and Tyrrhenian Seas and the Gulf of Cadiz (15th training-through-research cruise, June–August 2005). 2007	E only
73	Implementation Plan for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (NEAMTWS), 2007–2011. 2007 *(electronic only)*	E only
74	Bruun Memorial Lectures, 2005: The Ecology and Oceanography of Harmful Algal Blooms – Multidisciplinary approaches to research and management. 2007	E only
75	National Ocean Policy. The Basic Texts from: Australia, Brazil, Canada, China, Colombia, Japan, Norway, Portugal, Russian Federation, United States of America. (Also Law of Sea Dossier 1). 2008	E only
76	Deep-water Depositional Systems and Cold Seeps of the Western Mediterranean, Gulf of Cadiz and Norwegian Continental margins (16th training-through-research cruise, May–July 2006). 2008	E only
77	Indian Ocean Tsunami Warning and Mitigation System (IOTWS) – 12 September 2007 Indian Ocean Tsunami Event. Post-Event Assessment of IOTWS Performance. 2008	E only
78	Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (CARIBE EWS) – Implementation Plan 2013–2017 (Version 2.0). 2013	E only

No.	Title	Languages
79	Filling Gaps in Large Marine Ecosystem Nitrogen Loadings Forecast for 64 LMEs – GEF/LME global project Promoting Ecosystem-based Approaches to Fisheries Conservation and Large Marine Ecosystems. 2008	E only
80	Models of the World's Large Marine Ecosystems. GEF/LME Global Project Promoting Ecosystem-based Approaches to Fisheries Conservation and Large Marine Ecosystems. 2008	E only
81	Indian Ocean Tsunami Warning and Mitigation System (IOTWS) – Implementation Plan for Regional Tsunami Watch Providers (RTWP). 2008	E only
82	Exercise Pacific Wave 08 – A Pacific-wide Tsunami Warning and Communication Exercise, 28–30 October 2008. 2008	E only
83.	*Cancelled*	
84.	Global Open Oceans and Deep Seabed (GOODS) Bio-geographic Classification. 2009	E only
85.	Tsunami Glossary	E, F, S
86	Pacific Tsunami Warning System (PTWS) Implementation Plan *(under preparation)*	
87.	Operational Users Guide for the Pacific Tsunami Warning and Mitigation System (PTWS) – Second Edition. 2011	E only
88.	Exercise Indian Ocean Wave 2009 (IOWave09) – An Indian Ocean-wide Tsunami Warning and Communication Exercise – 14 October 2009. 2009	E only
89.	Ship-based Repeat Hydrography: A Strategy for a Sustained Global Programme. 2009	E only
90.	12 January 2010 Haiti Earthquake and Tsunami Event Post-Event Assessment of CARIBE EWS Performance. 2010	E only
91.	Compendium of Definitions and Terminology on Hazards, Disasters, Vulnerability and Risks in a coastal context	*Under preparation*
92.	27 February 2010 Chile Earthquake and Tsunami Event – Post-Event Assessment of PTWS Performance (Pacific Tsunami Warning System). 2010	E only
93.	Exercise CARIBE WAVE 11 / LANTEX 11—A Caribbean Tsunami Warning Exercise, 23 March 2011	
	Vol. 1 Participant Handbook / Exercise CARIBE WAVE 11 —Exercice d'alerte au tsunami dans les Caraïbes, 23 mars 2011. Manuel du participant / Ejercicio Caribe Wave 11. Un ejercicio de alerta de tsunami en el Caribe, 23 de marzo de 2011. Manual del participante. 2010	E/F/S
	Vol. 2 Report. 2011	E only
	Vol. 3 Supplement: Media Reports. 2011	E/F/S
94.	Cold seeps, coral mounds and deep-water depositional systems of the Alboran Sea, Gulf of Cadiz and Norwegian continental margin (17th training-through-research cruise, June–July 2008)	*Under preparation*
95.	International Post-Tsunami Survey for the 25 October 2010 Mentawai, Indonesia Tsunami	*Under preparation*
96.	Pacific Tsunami Warning System (PTWS) 11 March 2011 Off Pacific coast of Tohoku, Japan, Earthquake and Tsunami Event. Post-Event Assessment of PTWS Performance	*Under preparation*
97.	Exercise PACIFIC WAVE 11: A Pacific-wide Tsunami Warning and Communication Exercise, 9–10 November 2011	
	Vol. 1 Exercise Manual. 2011	E only
	Vol. 2 Report. 2013	E only
98.	Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and connected seas. First Enlarged Communication Test Exercise (ECTE1). Exercise Manual and Evaluation Report. 2011	E only

No.	Title	Languages
99.	Exercise INDIAN OCEAN WAVE 2011 – An Indian Ocean-wide Tsunami Warning and Communication Exercise, 12 October 2011 Vol. 1 Exercise Manual. 2011 Supplement: Bulletins from the Regional Tsunami Service Providers Vol. 2 Exercise Report. 2013	E only
100.	Global Sea Level Observing System (GLOSS) Implementation Plan – 2012. 2012	E only
101.	Exercise Caribe Wave/Lantex 13. A Caribbean Tsunami Warning Exercise, 20 March 2013. Volume 1: Participant Handbook. 2012	E only
102.	*(In preparation)*	
103.	Exercise NEAMWAVE 12. A Tsunami Warning and Communication Exercise for the North-eastern Atlantic, the Mediterranean, and Connected Seas Region, 27–28 November 2012, Volume I: Exercise Manual. 2012	E only
104.	Seísmo y tsunami del 27 de agosto de 2012 en la costa del Pacífico frente a El Salvador, y seísmo del 5 de septiembre de 2012 en la costa del Pacífico frente a Costa Rica. Evaluación subsiguiente sobre el funcionamiento del Sistema de Alerta contra los Tsunamis y Atenuación de sus Efectos en el Pacífico. 2012	Español solamente (resumen en inglés y francés)
105.	Users Guide for the Pacific Tsunami Warning Center Enhanced Products for the Pacific Tsunami Warning System. 2013	E, S
106.	Exercise Pacific Wave 13. A Pacific-wide Tsunami Warning and Enhanced Products Exercise, 1–14 May 2013. Vol. 1 Exercise Manual. 2013	E only
107.	Tsunami Public Awareness and Educations Strategy for the Caribbean and Adjacent Regions. 2013	E only