



*Fifth International Tsunami Symposium  
(ISPRA-2012)  
Tsunami Society International  
3-5 Sept. 2012, Joint Research Centre, Ispra, Italy*



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## **Summary of Opening Address by Dr. George Pararas-Carayannis**

President, Tsunami Society International

**Chairman, 5<sup>th</sup> International Tsunami Symposium**

**EC-JRC**

**Tsunami Society International**

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Dr. Delilah Al Khudhairy, Director of the Global Security and Crisis Management Unit of EC-JRC,

Ladies and Gentlemen,

It gives me great pleasure to make these opening remarks of the 5<sup>th</sup> international Tsunami Symposium at this prestigious research Institution, the European Commission's Joint Research Centre. Your presence here and the support of this Centre in hosting this gathering testifies to the importance of this Symposium in advancing international cooperation for research and actions that will result in better management of Tsunami Hazards around the world. On behalf of Tsunami Society International and of the Symposium co-chairman Dr. Tad Murty, and the Society's officers, I wish to state that we are very grateful of your support and we thank you for your warm hospitality. I wish to thank in particular, Dr. Delilah Al Khudhairy, the Head of the Global Security and Management Unit of EC-JRC and the Chairman of the local organizing committee Dr. Alessandro Anunziato, as well as Ms. Barbara Secreto and the rest of the EC-JRC staff who contributed so generously in helping with the logistical arrangements and facilitating our meeting in this wonderful region of Italy.

This is the 5<sup>th</sup> International Tsunami Symposium. As many of you remember, we held our last Symposium in 2010 in Toronto, Canada, in conjunction with the Earthquake Engineering Groups of USA and Canada. Our previous three symposiums were held at the East West Center, at the University of Hawaii in Honolulu.

A lot has happened since our last gathering in Toronto in 2010. In fact in the last few years we have witnessed very anomalous occurrences of great earthquakes and destructive tsunamis that have resulted in immense and unprecedented destruction and loss of life directly and through collateral hazards as well. We had several great tsunamigenic earthquakes in Indonesia, Tonga and Samoa, Chile and Japan – all within a relatively short period of time. In addition to the 2004 tsunami, one of the most destructive tsunamis was the one that occurred on 11 March 2011 in Japan – a country that is one of the best prepared for this type of disaster. Japan suffered greatly from this disaster, which was of an extraordinary scale that even previous great planning was not adequate.

We are particularly concerned about this great Japan Tsunami and Earthquake and the collateral damage caused by the destruction of the Fukushima-Daichi nuclear plant. This

collateral disaster could have been avoided if the designers of the plant had taken into consideration the impact of the 1896 and 1933 tsunamis along the same coastlines. The collateral damage should not have been a surprise. This is why for this Symposium, we plan to focus on this event and also on the tsunami safety of nuclear power plants. There are dozens of similar nuclear power plants in vulnerable coastal areas around the world – a number of them in the USA, UK, France, Germany, China, India and elsewhere.

In brief, the unprecedented and devastating tsunami disasters in Japan, Chile, Indonesia and elsewhere, raise important questions that need to be answered. Questions like, how can we better manage tsunami risk and how can we better prepare for the yet unpredictable that is going to happen again and again. Another great tsunamigenic earthquake in Japan is very possible in the near future. Also, there are many other regions around the Pacific where the next great tsunamigenic earthquake may strike. Great earthquakes with Pacific-wide tsunami impact are statistically overdue in the Kuril Islands, Kamchatka, the Komandorsky and Andreanof Islands, the Aleutians and Alaska.

In Chile, another great tsunamigenic earthquake as that of 1960 near Valdivia, or one as that of 1868 near Arica, are also long overdue. Local destructive tsunamis can be expected again along the Peruvian coast and along Ecuador and Colombia. Another tsunamigenic earthquake along Central America – similar to the 1992 Nicaragua event is very possible. A repeat of the 1933 tsunami in Guerrero, Mexico is also very possible. Vanuatu, the Solomon Islands, the Moro Gulf in the Philippines and many other regions in the Southwest Pacific can expect local destructive tsunamis in the future.

In the Indian Ocean we can expect another great tsunamigenic earthquake as the one of 1945 to occur along the Makran subduction zone in the North Arabian Sea. Such an event will impact greatly Pakistan, India, Iran and many other countries. A repeat of the 1941 tsunamigenic earthquake in the Andaman Sea is also statistically overdue and so is one north of the 2004 event along the segment of the Great Sunda Trench, nearer to Myanmar. More locally destructive tsunami can be generated near Java and Sumba and Sumbawa of the Lesser Sunda Island group, as in 1977. Papua – New Guinea may also have another destructive tsunami in the near future.

In the Caribbean Sea, we may have another devastating tsunami as the 1918 event near Puerto Rico and the Island of Hispaniola. Another large earthquake as that of 1867 near the Virgin Islands could cause extensive destruction. Any given day of a year, two or three cruise ships are in the harbors of St. John or St. Thomas and thousands of visitors are on coastal areas. Many of the volcanoes of the Caribbean can also cause pyroclastic flows to the sea and generate local tsunamis. The ones that occur at Monserrat Island are examples of what can happen elsewhere in the Caribbean. The 1902 destruction of the town of St. Pierre on the Island of Martinique and the killing of the entire population by nuees ardentes and tsunami waves, should be a reminder that such catastrophes are indeed possible to occur again.

In the Atlantic Ocean, another tsunami like the one caused by the 1929 Grand Banks earthquake could be generated. Although statistically undeterminable, a repeat of the 1755 Lisbon earthquake and tsunami would cause havoc to Spain, Portugal, Morocco, England, France and the Caribbean Islands.

In the Mediterranean, a great earthquake and tsunami like the ones in 365 AD and the 1032 AD that destroyed Alexandria, Roman harbors and coastal cities of Greek islands and the

Greek mainland can be expected to again occur. A great tsunami in the Mediterranean is long overdue along zones of subduction of the African Plate with the Anatolian and the Eurasian plates. A locally destructive tsunami as that of 1956 is also possible to occur along a spreading sea basin in the Aegean Sea.

In brief, there are many more areas in the world where very destructive tsunamis may occur in the near future. The next destructive tsunami may strike anytime anywhere in the world and we are not adequately ready for it. Thus, the present Symposium provides a platform to share different perspectives, from both decision-makers and scientists. I can imagine no better place to meet than here, at the European Commission's Joint research Centre, a leading institution for policy research and debate.

We need to know as to what exactly happened in Japan? What has been learned so far? Where do we need to learn more? What should be done now and in the future to mitigate the destruction of tsunamis and the calamities of collateral disasters? The mandate and mission of Tsunami Society International requires that we ask such questions and that as a group of scientists and professional experts we have an obligation to promote the awareness and mitigation of tsunami hazards by the sponsorship of Symposiums such as this and by the dissemination of knowledge about tsunamis to scientists, officials, the media and the public through the publication of our journal known as "Science of Tsunami Hazards", a home page, and other venues. Our Society provides a focus for discussion and interactions among its members, government agencies and the public. Our primary objective is to mitigate the adverse impact of tsunamis on humanity. For those of you who may not be familiar with Tsunami Society International, let me briefly add some historical background on how the Society was started and for what purpose.

As some of you know, pioneering tsunami research in the U.S. begun at the University of Hawaii following the devastating 1946 tsunami in the Hawaiian Islands. Subsequent destructive tsunamis from earthquakes in Kamchatka in 1952, from Unimak Island of the Central Aleutian chain in 1957 and from Chile in 1960, reinforced the conviction that we needed a better tsunami warning in the Pacific – where such disasters were more frequent. Thus, after the 1960 tsunami disaster, we began at the University of Hawaii a systematic research on tsunamis and the development of an international tsunami warning system for the Pacific. When the 1964 Alaska tsunami struck, and under the sponsorship of the National Academy of Science and Engineering and of the US Geological Survey, we initiated a very comprehensive investigation and survey of the Alaska earthquake and of the tsunami and produced two massive volumes of scientific papers.

A year later in 1965, under the auspices of the Intergovernmental Oceanographic Commission and UNESCO, we held a meeting in Honolulu with six countries participating and established the Pacific Tsunami Warning System, the International Coordination Group, the International Tsunami Information Center (ITIC) and the World Data Center – A tsunami. Subsequently, I was appointed as Director for the World Data Center-A Tsunami and of ITIC located at the University of Hawaii and helped establish a visiting scientists training program with support from IOC, Unesco and UNDP. Subsequently, scientists at the Hawaii Institute of Geophysics, at the Pacific Tsunami Warning Center (PTWC) and at the International Tsunami Information Center (ITIC) contributed significantly towards the development of tsunami research, to improvements of the Tsunami Warning System in the Pacific and to tsunami preparedness around the world. Other prominent scientists from as far away as Alaska, other U.S. States and countries in Europe, Asia, Australia, Oceania and Central and South America, joined in

this effort.

Tsunami research papers during that period were published in miscellaneous journals that were difficult to find. Thus we decided that a journal devoted to tsunami research was needed and thus in 1982, myself and professors William Adams, Augustine Furumoto established and incorporated in Hawaii, Tsunami Society International as a professional Society and as a focal organization promoting research and supporting efforts to increase and disseminate knowledge about tsunamis and their hazards. At the same time we begun the publication of a journal entitled SCIENCE OF TSUNAMI HAZARDS, which we have published continuously for 32 years and archived at the Los Alamos National Laboratory, the US. Library of Congress, and more recently at the DOAJ European database at the University of Lund in Sweden and the European Library at the HAGUE as an open access journal – thus assuring global and free-of-charge distribution. More recently the Society signed contracts with Elsevier and EBSCO publishing companies for further worldwide dissemination. Our journal is now distributed to 90% of academic libraries in more than 70 countries around the world – thus we provide maximum exposure to readers.

In conclusion, this is all I want to say at this time about Tsunami Society International. I wish to welcome you again to the 5<sup>th</sup> International Tsunami Society and to thank again our gracious hosts at the EC-JRC for providing the logistical support that has made this Symposium possible.

At this time, I have the great pleasure of introducing Dr. Delilah Al Khudhairy, the Director of the Global Security and Crisis Management Unit of EC-JRC.