United Nations
Educational, Scientific and
Cultural Organization

Intergovernmental
Oceanographic
Commission

Humanitarian Aid
and Civil Protection

Tsunami Information Centre for the North-Eastern Atlantic and Mediterranean (NEAMTIC)

Raising awareness on tsunami and other sea-level related hazards

SUMMARY OF ACHIEVEMENTS 2010-2013

Acknowledgements:
This brochure presents the results of the NEAMTIC project coordinated by IOC/UNESCO. We would like to acknowledge the contribution of the partners to the final NEAMTIC achievements, François Schindelé (Commissariat à l'Énergie Atomique), Maria Ana Baptista and Luís Manuel Matias (Fundação da Faculdade de Ciências da Universidade de Lisboa), Nikolaos Melis (National Observatory of Athens), Marzia Santini and Pierluigi Soddu (Presidenza del Consiglio dei Ministri Dipartimento della Protezione Civile).

We would like also to acknowledge the contribution of the IOC interns Mathis Burnel and Thomas Bourg (Université Paul-Valéry Montpellier III)

This brochure has been produced with the support of the European Commission Directorate General for Humanitarian Aid & Civil Protection in the context of the NEAMTIC project (70401/2010/579078/SUB/C4)

Bibliographic reference:
Intergovernmental Oceanographic Commission of UNESCO 2013. Tsunami Information Centre for the North-Eastern Atlantic and Mediterranean (NEAMTIC), Summary of achievements 2010–2013. (IOC Brochure 2013-2)

Published in 2013
by the United Nations Educational, Scientific and Cultural Organization
7, Place de Fontenoy, 75352, Paris 07 SP

(IOC/BRO/2013/2)

Foreword

Following the disastrous 2004 Indian Ocean tsunami, the Intergovernmental Oceanographic Commission of UNESCO (UNESCO-IOC) was mandated by its Member States to facilitate the expansion of global coverage of Tsunami Warning and Mitigation Systems (TWS) and to co-ordinate the establishment of a TWS for the North-eastern Atlantic, the Mediterranean and Connected Seas. The need to develop NEAMTWS was recognized early on in European Council Conclusions of December 2007 (15473/07) on the development and establishment of Early Warning Systems in the EU, on the establishment of an Early Warning System for tsunamis in the North East Atlantic and the Mediterranean region, and the Council Conclusions on Reinforcing the Union's Disaster Response Capacity – towards an integrated approach to managing disasters of June 2008 (7562/08).

Tsunami warning systems must go hand in hand with awareness and preparedness of the general public. As part of this process, a Tsunami Information Centre (NEAMTIC) was established to provide information on warning systems, risks and good practices in respect of tsunamis and other sea-level related hazards for civil protection agencies, disaster management organizations, decision makers, schools, industries in the coastal zone and the general public. As such the NEAMTIC supports the development of the NEAMTWS.

Reducing the frequency of tsunami occurrences is not possible. For this reason, we need to ensure people in endangered coastlines are prepared and know what to do in case a tsunami warning has been issued by the national authorities. There is an ongoing need to better educate communities about tsunami threats, and we should all commit to continue the effort that has been started by NEAMTIC.

Wendy Watson-Wright
Executive Secretary of IOC
Assistant Director General, UNESCO

The NEAMTIC project: Objectives and approaches

The project objectives were to:

- Make citizens, especially youth, aware of risks of floods from the sea in coastal areas, such as tsunamis, storm surges and strong swells
- Acquire knowledge on and practicing safe behaviour;
- Identify, share and disseminate good practices in plans, methods and procedures to strengthen preparedness for sea-level related hazards, including mitigation through integrated coastal zone management approaches;
- Fostering linkages between the European Commission and the IOC on intergovernmental and transnational actions to develop the NEAMTWS.

To fulfill its objectives NEAMTIC has undertaken the following actions:

1. Development and distribution of multilingual education, awareness and preparedness materials;
2. Identification and exchange of good practices and assist civil protection authorities in the establishment of national and regional warning systems on coastal inundation, and the reduction of risks from tsunamis and other sea-level related hazards through comprehensive mitigation programmes, including Integrated Coastal Zone Management; and
3. Provision of information on warning systems for tsunamis and other sea-level related hazards to civil protection authorities

The NEAMTIC partnership

NEAMTIC is coordinated by the Intergovernmental Oceanographic Commission (IOC) of UNESCO and in partnership with:

Commissariat à l'Énergie Atomique (CEA), France

National Observatory of Athens (NOA), Greece

Presidenza del Consiglio dei Ministri Dipartimento della Protezione Civile (DPC), Italy

Fundação da Faculdade de Ciências da Universidade de Lisboa (FFCUL), Portugal

Support for translation of NEAMTIC products have also been provided by:

The Islamic Scientific, Educational and Cultural Organization (ISESCO)

Boğaziçi University Kandilli Observatory Earthquake Research Institute (KOERI), Turkey

Development and distribution of multilingual education, awareness and preparedness materials

Aim of the activity

The aim of this task was to raise European citizens awareness of risks from tsunami and other sea –level related hazards and to promote their safe behavior to minimize possible damages and losses. This has been addressed through the preparation of education and information materials

Web portal on tsunamis and other sea-level related hazards in Europe, targeting the general public

The NEAMTIC website concept has been developed to be as user-friendly as possible, and to facilitate the access to the different products for the different users. The main messages conveyed by the web portal are the following ones:

NEAMTIC:

- Is a regional information centre (specificities of Mediterranean and North East Atlantic), in the context of global UNESCO/IOC activity on tsunami early warning systems;
- Is an information centre and not an operational centre;
- Is for tsunami and for other related sea-level hazards; and
- Is thought for awareness raising, and preparedness;

http://neamtic.ioc-unesco.org

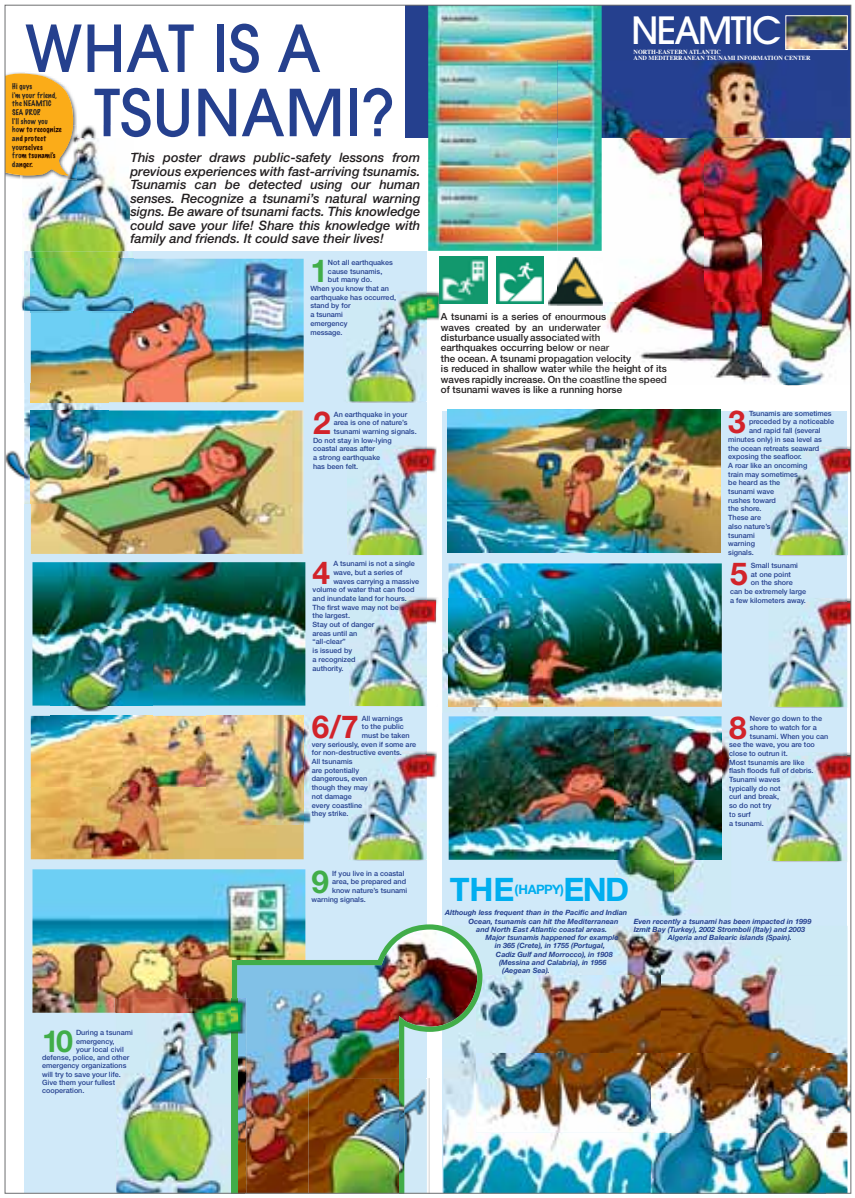
The website is intended for the public and in particular the following user groups

- Citizens
- Teachers
- Civil protection agencies
- Scientists
- Media
- Hotel managers
- Port authorities

Educational and awareness poster on tsunamis and other sea-level hazards

(for elementary school students)

The poster design is visual, containing simple messages on what is a tsunami, and on safety rules. Developed as a comic, the storyline conveys simple rules to help understand when a tsunami is being generated and, if so, what to do.



Virtual library (for the general public, the students, the researchers, and the emergency managers)

The virtual library comprises educational and awareness materials on tsunamis and other hazards related to sea-level, in multiple languages, for publication on the web portal. With this virtual library, different types of users, regardless of country and language, have access to a wealth of documentation. The virtual library is structured considering the objectives of the project, that is to make citizens aware of risks of tsunamis and other sea level hazards, and in response to acquire knowledge on safe behavior.

Online course on tsunami and other sea-level related hazards (for middle school students)

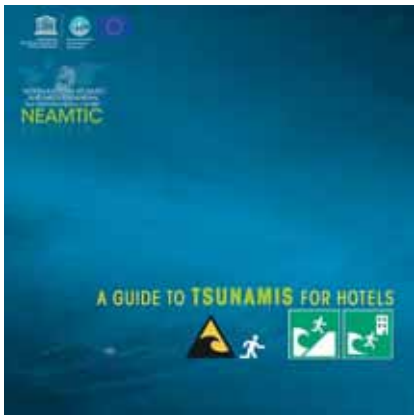
The online course can be displayed in a classroom via the NEAMTIC website, or it can be freely downloaded and displayed offline. An interdisciplinary approach was chosen so that the material is available for both geography and science curricula with possible linkages with middle school mathematics curricula and standards. A teaching hands-on approach has been explored to include exercises and simulations in the classroom. Through this course the students can become familiar with terminology and basic oceanography concepts, such

as ocean waves, wave height and wavelength and sea tides.

Moreover, the course stimulates discussion about how these phenomena are regionally dependent: storm surges and related consequences on a flat coastline could be perceived and managed in a totally different way than on a rocky cliff. The course is organized around three lessons: **Meteo oceanography; Coastline geography/geology; and Natural hazards**

Guidelines and poster for evacuation

(for hotel managers)



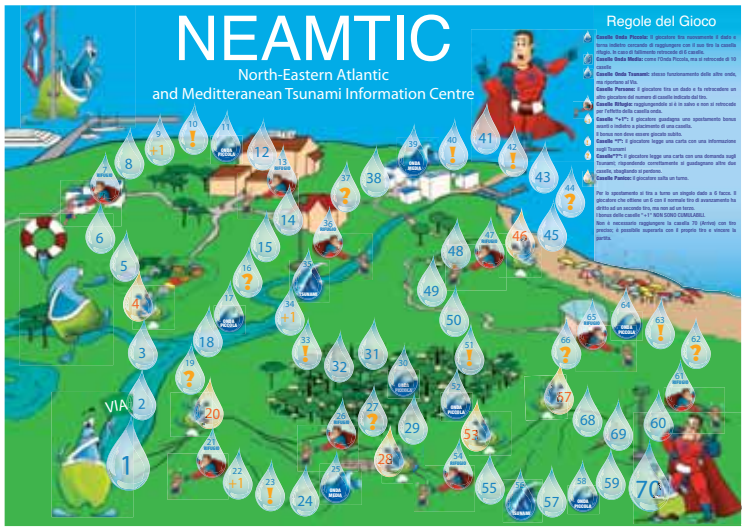
This guidebook is to be use by hotel managers. It is intended to guide them on how to build the hotel's capacity in evacuation planning for a tsunami emergency. The guidebook outlines the necessary steps to be undertaken, such as a preliminary preparedness assessment using a checklist from the "Tsunami Ready" Toolbox, understanding the warnings (natural and official warnings), deciding on an evacuation strategy, consideration for a hotel to be an evacuation area and the standard operating procedures for a tsunami emergency. This guidebook explains the steps in building tsunami preparedness.

Video on tsunami risk in the NEAM region and on NEAMTWS **(for the general public)**

This short video of 5 minutes is thought to inform the general public tsunami risk in the NEAM region, and about the NEAMTWS.

It also contains information about tsunami generation and tsunami characteristics as well as information about tsunamis happened in the NEAM region in the past.

Interactive educational board game **(for elementary school students)**



This educational board game provides the user with materials which help teach kids about disaster prevention in a fun way. Information and questions cards will inform them about tsunami characteristics and safe behavior to be adopted in case of an event.

Identification and exchange of good practices

Courtesy of Presidenza del Consiglio dei Ministri – Dipartimento della Protezione Civile

The aim of this activity was to provide civil protection authorities, coastal managers and planners with reference materials on preparedness for tsunamis and other coastal inundation, as a platform to strengthen cooperation and coordination.

Good practices in tsunami and coastal inundation preparedness (for emergency managers, civil protection authorities)

This document is primarily developed for Civil Protection authorities in the NEAM region. The apparent low-frequency of tsunamis led to low preparedness among population and authorities. However, recent events in the Pacific and Indian Oceans led to an increased awareness of the importance of tsunami hazard in coastal areas. A group of guidelines is summarized and proposed in this report to help civil protection authorities and coastal communities understand their exposure to tsunami hazards and to mitigate the resulting risk through awareness, preparedness information and land use planning.

These guidelines also provide critical elements associated with civil protection and emergency management such as:

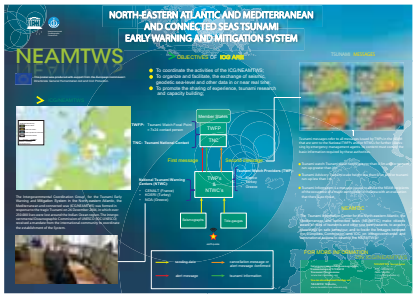
- Characteristics of timely and well-directed disaster prevention and management by the Civil Protection community;
- Individual, community awareness and preparedness policies;
- Strategic approaches and guidelines for a more effective development of tsunami risk awareness campaigns.

Case studies and good practices for coastal management approaches for sea level related hazards

Coastal Management Approaches for Sea Level Related Hazards
Case Studies and Good Practices
Published by UNESCO/IOC in 2012
54 pp., illus., ENG
IOC Manuals and Guides, 61
http://unesdoc.unesco.org/images/0022/002203/220397E.pdf (ENG)

Coastal communities around the world are experiencing unprecedented rates of change due to population growth, human induced vulnerability, and global climate change. The effects of this change are placing communities at increasing risk of inundation from coastal hazards including tsunamis, storm surges and shoreline erosion. The sustainable development of coastal zones relies upon effective management of the risk of inundation both now and in the context of increasing impacts of climate change. Improving risk management and mitigation by providing the tools to better inform planning policy is now a consensus view in light of the disastrous impacts on already pressurized coastal zones. The concept of risk management embodies prevention, preparedness, mitigation, response, relief and recovery and rehabilitation. This compendium aims to provide examples of good practice in preparedness for, and awareness of, tsunami and other sea-level related hazards, selected from the case-studies presented at a NEAMTIC workshop in Paris in December 2012 (UNESCO-IOC, 2012), complemented by experience gained from countries outside the NEAM region. It presents examples on how to prepare, respond to or mitigate/reduce such hazards. Short descriptions of these initiatives are given, highlighting interesting and innovative elements, approaches, tools, etc., that could be replicated, given similar conditions, or to provide a basis for the development of new approaches more appropriate for other areas. Also, it aims to stimulate new ideas and further action for mainstreaming coastal hazard preparedness and awareness in ICAM, in the hope of creating safer coasts in the future. The examples compiled here enhance awareness and preparedness and provide useful insights and lessons for coastal risk and climate change managers and policymakers, development planners, and practitioners at national and local levels. Case studies illustrating mismanagement and/or poor planning are also presented, raising important issues of awareness and preparedness. Finally, key recommendations are proposed for improving awareness of, and preparedness for, sea-level related natural hazards

Provision of information on warning systems for tsunamis and other sea-level related hazards



Brochure and posters have been prepared to inform the public and important stakeholders about the recent developments in the implementation of the Tsunami Early Warning System for the NEAM region. There are currently three National Tsunami Warning Centres functioning as Candidate Tsunami Watch Providers (CTWPs) for the entire region, the Centre d'alert aux tsunami in France, the Kandilli Observatory and Earthquake Research Institute in Turkey, and the National Observatory of Athens in Greece. The Tsunami Watch Providers (TWPs) are in charge of: the observation and the detection of the phenomenon, the analysis of the data received in real time or quasi-real data, and sending warning messages to Tsunami Warning Focal Points (TWFP). During the NEAMTIC project there were a number of messages issued by the National Tsunami Warning Centers, which are operating in the present phase as Candidate Tsunami Watch Providers (CTWPs) to the NEAM TW System. The vast majority concerned communication tests. There were communication test exercises during 2010 – 2012 and two enlarged communication test exercises in 2011. The latter involved all registered to NEAMTWS partners. In 2012, the exercise with the name NEAMWAVE12 was executed, involving scenarios in the Atlantic, the Mediterranean and the Aegean regions. NEAMWAVE12 was the first attempt to put on extended trial the NEAMTW System, with the CTWPs involved with specific scenarios and try the dissemination of messages to a first phase, while the second phase including the last mile was not involved in all cases. Important lessons learned during and after NEAMWAVE12 execution will be taken into account to improve further the NEAMTWS and plan similar exercise for the near future.

Conclusions

"The fast transmission of warning messages and the rapid response of the national authorities are crucial for the efficiency of all tsunami warning systems, in particular in the Mediterranean Sea where tsunamis propagate at very short time "
(F. Schindelé, ICG/NEAMTWS Chairperson).

An effective early warning system must include monitoring networks to accurately detect an emerging tsunami and also a public notification system through which the population can be timely warned by the local government and other sources. Tsunami readiness involves two key components: **awareness**, which may be improved by educating key decision-makers, emergency managers and the public about the nature (physical processes) and threat (frequency of occurrence, impact) of a hazard; and **mitigation,** which may be improved through pre-event planning. An effective early warning system must be an integral part of disaster risk reduction strategies and require cooperation amongst many partners at local, national and international levels (UN ISDR, 2006).

The NEAMTIC experience reinforced the acknowledgment that the NEAM region has many specificities. The Mediterranean is the first touristic destination in the world, the population density in the Euro-Mediterranean coastal zone is very high, many activities including heavy industries and some of the biggest ports in the world can be found in the coastal areas of Europe and of North-Africa. Although less frequent than in the Pacific Ocean, tsunami can hit the Mediterranean and the North-eastern Atlantic coastal areas causing extensive loss of lives and properties. Unfortunately the level of awareness on the risk and on the possible consequences for the region, as well as the level of preparedness is still very low. Although a rare phenomenon tsunamis rank among the most life-threatening of all natural disasters, and Europe lags behind in disaster preparedness when compared to other tsunami-prone regions. NEAMTIC is contributing to enhance the capacity of EU Member States to be equipped for such a risk, and also to strengthen the European Commission contribution to the ongoing work of the IOC-UNESCO in the NEAM region.

Some priorities and objectives can be set for the future activities:

Objective 1: Increase awareness & improve knowledge

The effectiveness of any early-warning system ultimately depends upon an educated and trained population that is aware of the risks and is able to adopt the appropriate responses.

The population plays a decisive role in the evacuation. That is why it must be informed and prepared to adopt the appropriate behavior. Awareness of the risk of tsunami disaster can reduce impacts and loss of lives. Psychological and sociological aspects should be taken into consideration in developing education and awareness material. Continual tsunami disaster education in schools and at the community level is essential to facilitate effective community response. Local tsunami hazard maps should be developed in order to enhance the residents' tsunami disaster awareness and response during an event. There is an ongoing need to better educate communities about the tsunami threat and the associated risk to help manage expectations about what warning systems can do and what the communities themselves must take responsibilities for (UNESCO/IOC, 2012).

Objective 2: Foster cooperation among institutions to increase technical cooperation and exchange of knowledge and good practices

Disasters know no boundaries, and it is for this reason that effective disaster risk reduction mechanisms need a high degree of international and multilateral cooperation.

IOC/UNESCO in cooperation with other institutions, and in particular with the European Commission for the NEAM region, must continue to lead the coordination of global tsunami warning systems based on its experience and responsibilities over more than five decades. There is a need to facilitate the exchange and sharing of information on all facets of end-to-end tsunami warning systems from tsunami detection to community education response and to support networking among scientists, emergency managers and policy and decision-makers. Moreover, all institutions must collaborate to provide information and data to all countries. Networks among coastal experts, managers and planners across sectors and between regions should be strengthened to create or improve procedures for using available expertise when agencies and other important actors develop local risk reduction plans. Dialogue and cooperation among scientific communities and practitioners working on natural coastal risk reduction should be promoted and partnerships among stakeholders, including those working on the socioeconomic dimensions of disaster risk reduction should be encouraged.

Objetive 3: Increase resilience

According to the Hyogo Framework for Action (HFA) of the UNISDR, resilience is 'The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions' (UNISDR 2007).

In the context of Disaster Risk Reduction (DRR) the expected outcome of building resilient societies is 'substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries'.

Key components of tsunami resilience should be studied in order to be able to answer the questions: what are the characteristics of a tsunami resilient society? What are the enabling conditions for its realization in the North-Eastern Atlantic, the Mediterranean and connected seas (NEAM)? Moreover, based on the answers to those questions, tools for building resilience in the tsunami context should be developed and tested.

Scientific and technical information should be translated in user-friendly planning and education products. These products should be developed together with the intended end-users (e.g. emergency managers, coastal managers, school teachers, media) in order to provide the best possible products for the users given the best available science, technology and planning methods.

List of NEAMTIC products

- Brochures and posters on NEAMTIC and NEAMTWS (English and French versions)
- Educational poster for kids (English, French, Arabic, Greek, Italian, Turkish versions)
- Online course for middle school students (English, Arabic, Greek, Italian, Turkish versions)
- Virtual library on tsunami and other sea-level related hazards
- Video on tsunami risk and on NEAMTWS (English, French, Arabic versions)
- Guidelines and poster for hotel evacuation (English, Greek, Italian, Arabic, Turkish versions)
- Good practices in tsunami and coastal inundation preparedness
- Case studies and good practices for coastal management approaches for sea level related hazards

All products are freely available and downloadable from the NEAMTIC webportal:
http://neamtic.ioc-unesco.org

List of acronyms

- **CEA** – Commissariat à l'Énergie Atomique
- **CENALT** – Centre d'alert aux tsunami
- **CTWP** – Candidate Tsunami Watch Provider
- **DPC** – Dipartimento della Protezione Civile
- **DRR** – Disaster Risk Reduction
- **EU** – European Union
- **FFCUL** – Fundação da Faculdade de Ciências da Universidade de Lisboa
- **HFA** – Hyogo Framework for Action
- **ICAM** – Integrated Coastal Area Management
- **ICG/NEAMTWS** – Intergovernmental Coordination Group for the North-eastern Atlantic, Mediterranean and connected seas Tsunami Warning and Mitigation System
- **IOC** – Intergovernmental Oceanographic Commission
- **ISESCO** – Islamic Scientific, Educational and Cultural Organization
- **NEAM** – North-eastern Atlantic, Mediterranean and connected seas
- **NEAMTIC** – North-eastern Atlantic, Mediterranean and connected seas Tsunami Information Centre
- **NOA** – National Observatory of Athens
- **KOERI** – Kandilli Observatory and Earthquake Research Institute
- **TWP** – Tsunami Watch Provider
- **TWFP** – Tsunami Warning Focal Point
- **UNESCO** – United Nations Educational, Scientific and Cultural Organization
- **UN ISDR** – United Nations International Strategy for Disaster Reduction

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1, Rue Miollis
75732 Paris Cedex 15, France
Tel: +33 1 45681010
Fax: +33 1 45685812
http://ioc.unesco.or