

UNESCO-IOC International Training Course on Tsunami Numerical Modeling: Course I: Tsunami Propagation

The 2004 tsunami tragedy highlighted the need to develop technical capabilities on tsunami modeling as a highly-needed capability in the field of tsunami hazard assessment. Very few institutions in Southeast Asia, the Pacific, and the Indian Ocean are presently skilled in conducting their own tsunami modeling. Modeling results can estimate tsunami height, inundation and arrival time information, and are thus important for tsunami warnings and for planning realistic evacuation routes. In order to address the immediate need to develop the capability for conducting tsunami modeling, the IOC will be conducting a series of Training Courses on Tsunami Numerical Modeling in 2006. The Course build upon the advanced International Training- Workshop on Numerical Modeling of Tsunami for Developing Countries in Southeast Asia, the Pacific, and the Indian Ocean, held 9-19 November 2005, by providing more comprehensive and basic training to develop national capacities to undertake numerical modeling of tsunamis to improve mitigation.

Towards those ends, the Training will be conducted through two Courses with Course I concentrating on providing the background in geology and geophysics, seismology, oceanography and tsunami science to understand the problem to be solved, and training in the numerical propagation of tsunami waves from a number of different source configurations to understand the effects of initial boundary conditions on the different models used for computation. Tsunami propagation covers the numerical simulation of tsunamis from the source to a depth offshore of coasts, and can be simulated using publicly-available bathymetric databases such as ETOPO2. The Training will include hands-on computer work to calculate the tsunami wave effect from a number of different plausible sources with the goal of contributing to the creation of a Regional Tsunami Hazard Map for the Indian Ocean based on several worst case scenario earthquakes and tsunamis generated off of Indonesia and Pakistan. The map product will be presented at the ICG/IOTWS-III in August, 2006 in Bali, Indonesia.

Course II will concentrate on tsunami inundation modeling in which tsunami propagation results are continued on to shore using detailed local bathymetry and topography. The result of a tsunami modeling study will be an inundation map that is the result of the propagation of the tsunami wave from the source to offshore using linearized, deep-water numerical methods, followed by the propagation onshore to calculate inundation and runup using non-linear shallow-water numerical methods. Properly parameterizing the problems for both components is essential for obtaining realistic results that can be reliably used by government officials to develop evacuation maps used to ensure public safety from tsunami.

The Trainings are being sponsored by the UNESCO Intergovernmental Oceanographic Commission, and organized by its International Tsunami Information Centre (ITIC). The ITIC has engaged a Group of Experts to design, build, and teach the Courses. Two 2-week classes of Course I are being offered:

- 8-19 May 2006 in Kuala Lumpur, Malaysia, hosted by the Malaysia Ministry of Science, Technology & Innovation
- 5-16 June 2006 in Oostende, Belgium, hosted by the IOC IODE Project Office

The learning format will involved a series of lectures and hands-on computer exercises based on the software that the tsunami modeling experts have developed. All lecture and hands-on materials will be copied in the CD for future use at the home institution. Software developed by the experts will be distributed among the participants at the end of the workshop. Course II:

Tsunami Inundation, is planned to be conducted between September and December, 2006, and will require participants to carry out activities in the interim in order to come prepared to conduct a numerical inundation study that will be the focus of Course II.

The International Training will bring together different people from many countries all over the world involved in tsunami hazards and mitigation studies. The Training is designed in such a way that when the participants go back to their respective countries, they should be able to start numerical modeling of tsunami with very minimal resources. Due to the high mathematical and analytical requirement of the course, prospective participants should have a strong mathematical capability and skills. Additionally, the participant should have a good command of the English language.

The Training is targeted at young research scientists in government institutions and universities who have an active role in tsunami risk mitigation and research in their respective countries. Attendees should be nominated by their government institutions or universities for attendance at the Training.

The class size is limited to 25 participants. Financial assistance (airfare and daily subsistence allowance) is available primarily to Indian Ocean scientists.

The Group of Experts will screen the participants based on the following criteria:

1. must possess high level of mathematical and analytical skills;
2. good command of the English language;
3. graduate of any of the following courses: Math, Physics, Earth Sciences, Oceanography, Computer Science and Engineering Sciences;
4. must be actively involved in tsunami risk mitigation efforts in their home countries.

Accepted participants are required to bring their own laptop computers, which will be used during the exercises. It should have at least Windows 2000 or Windows XP Pentium III operating system and must be equipped with LAN card or Ethernet card for networking.

A Training Announcement will be issued on 20 March 2006 and applications along with Curriculum Vitae will be accepted through 7 April 2006. Selectees will be notified by 14 April 2006. The course is open to all qualified individuals globally. Further details, including the Application Form, can be downloaded from the IOC Indian Ocean Tsunami Web Site <http://ioc3.unesco.org/indotsunami/>. The availability of Training will be made known to Indian Ocean Tsunami Focal Points. Nominated scientists may submit a completed Application Form and their Curriculum Vitae (CV) to the ITIC Director and Group of Experts at l.kong@unesco.org, FAX: <1> 808 532 5576.

The following Group of Experts are helping to design, build and teach the Courses:

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Dr. Modesto Ortiz
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Dr. Yuichiro Tanioka
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