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## Improving Tsunami Resilience in Europe — ASTARTE

### ASTARTE aims:

Assessment of generation mechanisms, evaluation of uncertainties, development of new numerical and experimental techniques for propagation, coastal amplification and inundation, networking in detection and warning, and building structural and social resilience against tsunamis by 26 partners from 16 countries.

### ASTARTE at the 3rd UN World Conference on Disaster Risk Reduction in Sendai

ASTARTE was presented at the Third UN World Conference on Disaster Risk Reduction (WCDRR) in Sendai, Miyagi, Japan held on 14–18 March, 2015. Bringing together over 6,500 participants from 187 Member States, the conference adopted the [Sendai Framework](#) for Disaster Risk Reduction: 2015–2030.



The title of the ASTARTE presentation was entitled "Assessment, Strategy And Risk Reduction for Tsunamis in Europe – New Directions for Tsunami Research in Europe" (by Maria Ana Baptista and the ASTARTE Team). It was presented on March

15, 2015 by Dr. Kenji Satake who works at the Research Institute, The University of Tokyo, Japan — one of the partners in the ASTARTE consortium.

### ASTARTE SSC Meeting at EGU 2015 in Vienna

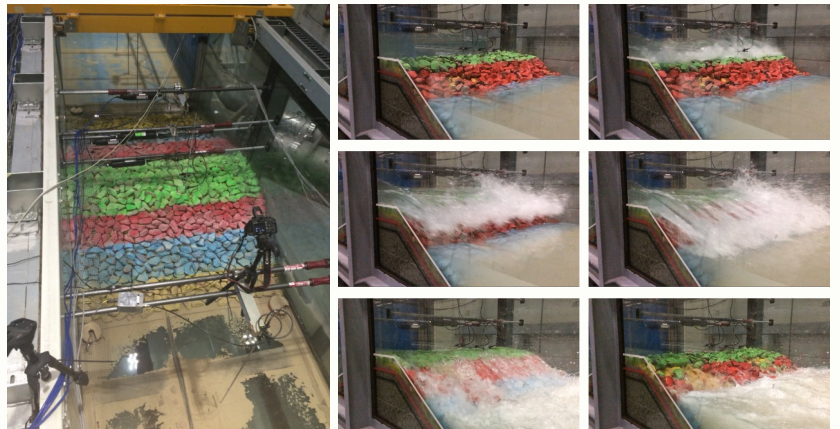
The Scientific Steering Committee (SSC) of ASTARTE met for the second bi-annual project meeting at EGU 2015 in Vienna on April 15th. The purpose of the meeting was to review the progress of the project and review the planning for the next six months. The meeting was moderated by the Project Coordinator Maria Ana Baptista (IPMA). The Project Management Board as well as the work package leaders (and/or alternate leaders) were all in attendance. The activities of research WPs were presented by Pedro Terrinha (WP2), Carl Harbitz (WP3), Joern Behrens (WP4), David Fuhrman (WP5), Ocal Necmioglu (WP6), Alex Rudloff (WP7), Stefano Tinti (WP8), Franck Lavigne (WP9), and Ahmet Yalciner (WP10). It was verified that the project was on schedule, with no delay in the deliverables of the months 12–18.



### WP5 Meeting in Santander, Spain

On March 30, 2015 the second annual meeting of the ASTARTE Work Package 5 (Tsunami-Coastal Impacts) took place in Santander, in the facilities of IH Cantabria. This meeting was organized by UC and attended by 12 project partners from eight institutions and universities (DTU, METU, CNRS, TUC, USC, UCD, UC, and UB). During this meeting, each partner had the chance to show their advances on each task of the WP. Additionally, a global overview of the month 17 deliverable (D5.11 involving boundary layer processes and tsunami-induced sediment transport and morphology) was given. The next deliverables (D5.21 and D5.22), to be submitted in month 24, were likewise discussed. Finally, the group visited the UC flume to see a demonstration of the lab tests being carrying out as part of Task 5.1.

Top view of the UC laboratory experiment involving tsunami impact on a rubble mound breakwater is shown on the left (pre-impact). The photos on the right shows the wave evolution during the experiment.



## WP9 - Building Tsunami Resilient Societies - Progress

**Syracusa Test site** Field works were performed in March 2015 by CNRS-LGP, UNIBO, and the local Civil Protection. The goal was threefold: 1) to assess the hazard knowledge, risk awareness and perception of the local people, the national people, and the foreign tourists in Syracuse, through a questionnaire (Task 9.2); 2) to assess the earthquake and tsunami risk management through interviews to local stakeholders (Task 9.3); 3) to provide information about the tsunami hazard and risks in the Syracuse Test site to the population (Task 9.5).

**Haydarpaşa Test site** A field survey was performed in February 2015 by CNRS-LGP. A series of meetings with representatives of ASTARTE partners (METU and KOERI), and other institutions (Technical University of Istanbul, IFEA, etc.) aimed to prepare the future WP9 activities in Istanbul (e.g., assessment of time-dependent vulnerability, evacuation modeling). In addition, a documentary film is under preparation in close collaboration between CNRS-LGP, METU, and KOERI, in the frame of the Task 9.5 (Contributing to tsunami awareness and preparedness). This film will present the earthquake and tsunami hazard in Istanbul, the past events, the present issues, as well as the risk management.

**Gulluk Test site** A field survey was performed on February 27, 2015 by METU, CNRS-LGP and Mugla Sıtkı Kocman University. The participants were Ahmet Yalciner, Franck Lavigne and Ersen Aksoy. During the survey the critical structure and aquaculture region have been visited. Furthermore the paleotsunami sites have been visited and logistical information are gathered for paleotsunami survey. The potential survey site is selected as Guvercinlik Bay region at South of Gulluk Bay.



**Nice Test site** The first investigations related to the Task 9.4 (Large scale accessibility mapping and evacuation simulations) using Agent-Based Model are currently performed in Nice by the CNRS-LGP and its partner CNRS-Géographie Cités). In parallel an ongoing assessment of time-dependent vulnerability of people located close to the shoreline has been also performed by the CNRS-LGP. This study is based on geolocation apps that run on mobile devices, in partnership with one of the biggest telephone operator in France (Orange).

## WP6-7-8 Joint meeting in Athens, Greece

On 16–18 February 2015 a joint meeting of WP6–7–8 was hosted in the premises of NOA at Athens. The meeting, started with a workshop dedicated to methodologies and applications on operational level for earthquake magnitude and moment tensor –focal mechanism determination. The Workshop was organized by Nikolaos Melis (WP6 co-chair). Five 30 min presentations were given and followed by a round table discussion on issues related and results achieved so far.

**WP6** KOERI presented its work on the preliminary assessment of the HF radar systems for their use in Tsunami warning Systems. KOERI also presented its work on the deterministic attempt for creating a comprehensive tsunami scenario database composed of 2415 scenarios. GFZ presented the state of progress in the preparation of the Mediterranean and North-east Atlantic sources database for the evaluation of tsunamigenic potential of individual sources in the study region. The future direction is to conclude the compilation of input files, possibly integrating with contributions from other partners and WP3; start with massive modeling of deformational patterns and tsunamigenic behavior of compiled sources; present results. KOERI presented its work concerning the Tsunami Analysis and Message Dissemination Tool-TWM Composer.

**WP7** Partners involved in this WP (Early Warning System and Forecast) presented their progress, shared the updates, and discussed the future work in the framework of ASTARTE and beyond.

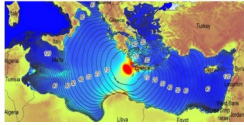
**WP8** Presentations and discussions were particularly focused on the Task 8.2 "Exposure and Vulnerability Assessment Approaches" with the active participation of people from IPMA, METU, NOA and UNIBO. The progress achieved in the several ASTARTE test-sites were reviewed while the next methodological steps were determined. It was adopted that the PTVA-3 model and the SCHEMA tool for the vulnerability of buildings to tsunamis should be the ones that are most appropriate to

## Announcements

ASTARTE is on social media! You can follow our Facebook page and join the LinkedIn group from the links <https://www.facebook.com/astartefp7> and <https://www.linkedin.com/groups/ASTARTE-8162283>, respectively.

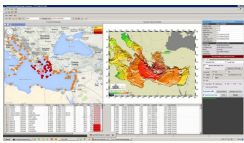


## The International Workshop on Tsunamis in the World & 2nd ASTARTE GA in Heraklion, Crete, Greece



The International Workshop on Tsunamis in the World: from Source Understanding to Risk Mitigation will be held on October 14–15, 2015, in Heraklion, capital city of Crete Island, Greece, with the participation of experts, young scientists and representatives of international organizations. More information can be found at <http://www.gein.noa.gr/itw2015/>. The Workshop will take place back-to-back with the 2nd ASTARTE GA which will be held after the workshop on October 16, 2015.

## Tsunami Warning Message Composer (TWM Composer) software by KOERI



KOERI continued its work for the TWM Composer software that enables the user to produce and disseminate tsunami bulletins applicable for all phases associated. The software is capable of disseminating enhanced products, such as tsunami travel time, alert level at TFPs and alert level zonation maps based on the NEAMTWS definitions of local, regional and basin areas. Users can select among the ICT tools available, such as e-mail, fax, GTS and SMS and various levels of end-users can be identified to allow the use of the software for internal training purposes. The prototype software has been successfully used by KOERI during the 2nd Tsunami Exercise of NEAMTWS, NEAMWave14.

## UNESCO-ICG/NEAMTWS Meetings

- The 2nd Tsunami Warning and Communication Exercise (NEAMWave14) for the NEAM and connected seas region took place on 28–30 October, 2014. 21 out of the 39 involved in ICG/NEAMTWS participated in the Exercise bringing them the opportunity to test the efficiency of the communication systems in charge of transmitting tsunami alerts and, in some countries, to ensure that the authorities in charge of public safety are prepared to face such a threat.
- The 11th Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the NEAM and connected seas region (UNESCO-ICG/NEAMTWS-XI) was hosted by Cyprus in Nicosia, on 12–14 November 2014 at the University of Cyprus. The Executive Summary report of the session can be downloaded from [here](#).
- The Steering Committee meeting of UNESCO ICG NEAMTWS was held in Paris UNESCO on March 30, 2015.
- The meeting of NEAMTWS Task Team on Operations was held on March 31, 2015 in Paris UNESCO.



## Cruise by MARUM to the Ligurian Sea

MARUM will have a cruise together with IFREMER using R/V L'Europe to the Ligurian Sea to install a new instrument for long-term monitoring with alert capability. The cruise is planned for 29 April – 8 May, 2015.

## What is going on?

- April 8-9, 2015** ICG CARIBE EWS Tsunami Recognition Programme Task Team Meeting in Mayaguez, Puerto Rico (<http://www.ioc-tsunami.org>)
- April 12-17, 2015** European Geosciences Union (EGU) General Assembly 2015, in Vienna, Austria (<http://www.equ2015.eu/>)
- April 15, 2015** ASTARTE Scientific Steering Committee meeting (semi-annual project meeting) at EGU 2015 in Vienna, Austria.
- April 20-21, 2015** International Tsunami Symposium Commemorating 50th Anniversary of the Pacific Tsunami Warning and Mitigation System in Ford Island, Hawaii, U.S.A. (<http://www.ioc-tsunami.org>)
- April 22-24, 2015** 26th Session of the Intergovernmental Coordination Group for the Pacific Ocean Tsunami Warning and Mitigation System (ICG/PTWS-XXVI) in Honolulu, U.S.A. (<http://www.ioc-tsunami.org>)
- April 21-23, 2015** Seismological Society of America (SSA) Annual Meeting in Pasadena, California, U.S.A. (<http://www.seismosoc.org/meetings/2015/>)

## Upcoming Events

- May 28-29, 2015** ICT 2015: XIII International Conference on Tsunami (<http://www.waset.org/conference/2015/05/tokyo/ICT>)
- June 22-July 2, 2015** IUGG — XXVI General Assembly of the International Union of Geodesy and Geophysics in Prague, Czech Republic (<http://www.iugg2015prague.com/>)
- Nov 1-4, 2015** 7th international symposium on Submarine Mass Movements and Their Consequences (ISSMMTC) 2015 in Wellington, New Zealand
- 21-26 Feb, 2016** Ocean Sciences 2016: ASLO-AGU-TOS The 2016 Ocean Sciences Meeting, in New Orleans, Louisiana, USA (<http://osm.aqu.org/2016/>)
- 17-22 July, 2016** 35th International Conference on Coastal Engineering - ICCE 2016, in Istanbul, Turkey (<http://www.icce2016.com/en/>)

## Project deliverables

Deliverable No	Deliverable title	W P	Delivery date	Partner in charge
D2.9	Recurrence rate of tsunamis of earthquake, volcanic and landslide origin	2	Month 14 (Dec 2014)	CNRS
D3.12	Risk-driving tsunami sources for other WPs – parameters, sensitivity, and uncertainties	3	Month 17 (March 2015)	INGV
D4.13	Report on inverse tsunami problems, sensitivity computations, and sensor location optimization	4	Month 17 (March 2015)	UHAM
D5.3	Lessons From Recent Tsunamis Impacts on Coastal and Marine Structures and Coastal Utilities, and Performance of Mitigation Strategies	5	Month 12 (Oct 2014)	METU
D5.10	Interaction of the tsunami with the seabed. Implications for wind farms, aquaculture, coastal ecosystems and marine protected areas	5	Month 15 (Jan 2015)	DTU
D5.11	Boundary layer processes, sediment transport, and near-shore morphological change under breaking and non-breaking tsunami waves	5	Month 17 (March 2015)	DTU
D6.4	Database of the existing Tsunami Early Warning relevant infrastructure in the NEAM Region	6	Month 12 (Oct 2014)	NOA
D6.6	Report on the integration of submarine sensor data	6	Month 12 (Oct 2014)	BOUN
D8.8	Tsunami hazard assessment methods: application in the NEAM region and in the ASTARTE test sites	8	Month 13 (Nov 2014)	UNIBO
D9.7	Report on preparedness skills, resources and attitudes within the communities	9	Month 12 (Oct 2014)	CNRS
D10.34	ASTARTE Newsletter	10	Every 6 months	METU

## Publications

- Baptista, M. A. and Selva, J. (2015) FP7 ASTARTE: Assessment, Strategy And Risk Reduction for Tsunamis in Europe. *European CIIP Newsletter*, 9(1), 9–10.
- Baykal, C., Sumer, B. M., Fuhrman, D. R., Jacobsen, N. G., and Fredsøe, J. (2015) Numerical investigation of flow and scour around a vertical circular cylinder. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 373(2033), 20140104, DOI: 10.1098/rsta.2014.0104.
- Hermanns, R.L. et al. (2014) Earthquake-triggered subaerial landslides that caused large scale fjord sediment deformation: combined subaerial and submarine studies of the 2007 Aysén Fjord event, Chile. *Engineering Geology for Society and Territory*, 4, Marine and Coastal Processes (G. Lollino, A. Manconi, J. Locat, Y. Huang and M. Canals, editors), Springer International Publishing AG, Cham, Switzerland, p. 67–70. DOI: 10.1007/978-3-319-08660-6\_19.
- Iglesias, O., Lastras, G., Souto, C., Costa, S., and Canals, M. (2014) Effects of coastal submarine canyons on tsunami propagation and impact. *Marine Geology*, 350, 39–51. DOI: <http://dx.doi.org/10.1016/j.margeo.2014.01.013>.
- Kânoğlu U., Synolakis C. E. (2015) Chapter 2 – Tsunami Dynamics, Forecasting, and Mitigation. In *Hazards and Disasters Series: Coastal and Marine Hazards, Risks, and Disasters*. Series Ed. John F. Shroder; volume Eds. Jean T. Ellis and Douglas J. Sherman, Elsevier, pp. 15–57. DOI:10.1016/B978-0-12-396483-0.00002-9.
- Lorito, S., Selva, J., Basili, R., Romano, F., Tiberti, M. M., and Piatanesi, A. (2015) Probabilistic hazard for seismically induced tsunamis: accuracy and feasibility of inundation maps. *Geophysical Journal International*, 200(1), 574–588, DOI: 10.1093/gji/ggu408.
- Løvholt, F., Vanneste, M., Harbitz, C.B., De Blasio, F., Urgeles, R., Iglesias, O., Canals, M., Lastras, G., Pedersen, G., and Glimsdal, S. (2014) Modeling potential tsunami generation by the BIG'95 landslide; In S. Krastel et al. (Eds.): *Submarine Mass Movements and Their Consequences*, Springer, Series "Advances in Natural and Technological Hazards Research", 37: 597–515.
- Zaniboni, F., Pagnoni, G., Armigliato, A., Tinti, S., Iglesias, O., and Canals, M. (2014) Numerical simulation of the BIG'95 debris flow and of the generated tsunami. *Engineering Geology for Society and Territory*, 4, Marine and Coastal Processes (G. Lollino, A. Manconi, J. Locat, Y. Huang and M. Canals, editors), Springer International Publishing AG, Cham, Switzerland, p. 97–102. DOI: 10.1007/978-3-319-08660-6\_19.

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