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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 SSC Meeting at EGU 2016 in Vienna

The Scientific Steering Committee (SSC) of ASTARTE met for the second bi-annual project meeting at EGU 2016 in Vienna on April 20th. 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. Research activities conducted in the past six months as well as the planned work for the next months were discussed.

ASTARTE researchers presented their work at the European Geosciences Union 2016 General Assembly (17-22 April 2016). Abstracts of the presentations can be reached through this [LINK](#).



ASTARTE - PEARL - TANDEM Joint Summer School in Crete, Greece (3-7 June 2016)

The ASTARTE, PEARL & TANDEM Joint Summer School takes place from 3-7 June 2016 at the Technical University of Crete in Chania, Greece. The school will focus on coastal hazards, coastal management and resilience. It aims to answer the question: What can we do now and in the future to mitigate the impact of natural hazards? The school is a unique opportunity to put together three different research communities from three different running collaborative projects: ASTARTE, PEARL and TANDEM.

This joint summer school will bring together undergraduate, graduate students, early career scientists and/or professionals with different backgrounds, who work in the fields of coastal hazards (tsunamis, extreme rainfall, storm surge and sea level rise), flood risk management, climate change, forecasting and early warning and disaster risk reduction. This summer course will be a great opportunity for the participants to learn from distinguished scientists/professionals in lectures, and also from each other through field trips and discussion sessions. Further information on the program can be found [here](#).

The Joint Summer School is open to natural sciences and engineering graduates and PhD students, preferably from Geophysics, Oceanography and Civil Engineering. Students will get 6 ECTS for successful participation at the joint summer school. Enrolment is open from 10 Feb - 01 May 2016, students can enroll [here](#).



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World Tsunami Day

Japan introduced a draft resolution to a U.N. General Assembly committee aiming to designate November 5 as the World Tsunami Day to raise awareness of the threats posed by seismic sea waves around the world. More information can be found [HERE](#).

ASTARTE at the AGU Fall Meeting 2015 in San Francisco, USA

ASTARTE researchers presented their work at the American Geophysical Union Fall Meeting held in San Francisco, USA between 14 - 18 December 2015. The abstracts of the presentations can be reached through the links given:

- [Deep-water seamounts in the NE Atlantic, sources of landslides-induced tsunamis: Slope stability analysis and tsunami numerical modelling](#) R. Omira, I. Ramalho, D. Vales, M.A. Baptista, L. Matias, P. Terrinha
- [On The Source Of The 25 November 1941 - Atlantic Tsunami](#) M.A. Baptista, F. Lisboa, M. Miranda
- [Towards inclusion of dynamic slip features in stochastic models for probabilistic \(tsunami\) hazard analysis](#) S. Murphy, A. Scala, A. Herrero, S. Lorito, G. Festa, E. Trasatti, R. Tonini, I. Molinari, F. Romano
- [Worst-Case Scenario Tsunami Hazard Assessment in Two Historically and Economically Important Districts in Eastern Sicily \(Italy\)](#) A. Armigliato, S. Tinti, G. Pagnoni, F. Zaniboni, M.A. Paparo
- [Large Historical Tsunamiogenic Earthquakes in Italy: The Neglected Tsunami Research Point of View](#) A. Armigliato, S. Tinti, G. Pagnoni, F. Zaniboni
- [Leading Wave Amplitude of a Tsunami](#) U. Kanoglu
- [Benchmarking on Tsunami Currents with ComMIT](#) N. Sharghi vand, U. Kanoglu
- [Tsunami Induced Sedimentation in Ports: A Case Study in Haydarpasa Harbor, Marmara Sea](#) R. Kian, D. Velioglu, A.C. Yalciner, A. Zaytsev
- [Validation and Performance Comparison of Numerical Codes for Tsunami Inundation](#) D. Velioglu, R. Kian, A.C. Yalciner, A. Zaytsev
- [The ASTARTE Mass Transport Deposits database - a web-based reference for submarine landslide research around Europe](#) P.M. de Martini, G. Lastras, D. Voelker, A. Patera, J. Hunt, P. Terrinha, J. Noiva, M.A. Gutscher, S. Migeon
- [Mechanical Stability of Stratified Sediments along the upper continental Slope off Vesterålen, northern Norway - Insights from in situ CPTU Tests](#) S. Stegmann, D. Voelker, S. Kreiter, JS L'Heureux, M. Vanneste, NJ Baeten, S. Knudsen, L. Rise, O. Longva, J. Brendryen, H. Haflidison, S. Chand, T. Mörz, A. Kopf
- [Application and Validation of a GIS Model for Local Tsunami Vulnerability and Mortality Risk Analysis](#) C.B. Harbitz, R. Frauenfelder, G. Kaiser, S. Glimsal, K. Sverdrup-Thygeson, F. Lovholt, L. Gruenburg, B. McAdoo
- [Modeling tsunamis induced by retrogressive submarine landslides](#) F. Lovholt, J. Kim, C.B. Harbitz



Tsunami Workshop in Dublin, Ireland

The Geological Survey of Ireland and the Earth Institute at University College Dublin held a tsunami workshop on November 19, 2015 in Dublin, Ireland. The workshop followed the meeting of the Intergovernmental Coordination Group of the North-east Atlantic and Mediterranean Tsunami Warning System on 16-18 November 2015. The main focus of the workshop was on better definitions of realistic hazards, emergency events, inundation mapping and is aimed at members of the academia, industry and public agencies. The region of interest was Ireland and the North East Atlantic. Professor Frédéric Dias, from University College Dublin and a partner of ASTARTE, was among the organizers. Maria Ana Baptista, coordinator of ASTARTE was the guest speaker, as also François Shindelé, from CENALT, also a partner of ASTARTE. More information is [here](#).

IDSL Installation in Fethiye (Mugla), Turkey

Monitoring the sea level is one of the most essential activities of the tsunami warning systems in order to be able to confirm or cancel tsunami alert decisions along the coasts. To address this problem, the integration of available oceanography-meteorology data into the operational tsunami warning systems has been set as one of the aims of WP6. One of the four IDSLs (Inexpensive Device for Sea Level) developed and donated to KOERI by JRC has been installed in the boathouse of the Fethiye Municipality (Mugla), south-western Turkey in December 2015 using ASTARTE resources.

The installation was performed by Ceren Ozer Sozdinler, Ozkan Cok, Zafer Ogutcu and Suleyman Tunc from KOERI with the supervision of Alessandro Annunziato from JRC. The data of the station to flows to JRC server with very low latency and is accessible at the following web

page:http://webcritech.jrc.ec.europa.eu/tad_server/?id=88.



Left: The final position of IDSL with its sensor and pole. Right: The connection box between the sensor and the cable to the control panel including the temperature sensor inside.

Announcements

ASTARTE is on social media! You can follow our Facebook page and join the Linkedin group from the links <https://www.facebook.com/astartep7> and <https://www.linkedin.com/groups/ASTARTE-8162283>, respectively.



TSUMAPS-NEAM (Probabilistic TSUunami Hazard MAPS for the NEAM Region)

Tsunami risk assessments and warning systems need Probabilistic Tsunami Hazard Assessment (PTHA) as input and reference. The project will develop the first homogeneous region-wide long-term Probabilistic earthquake-induced Tsunami Hazard Assessment (PTHA) for the coastlines of the North East Atlantic, the Mediterranean, and connected seas, and trigger a common tsunami-risk management strategy in the region. Technical Kick-off Meeting of the project was held successfully at INGV in Rome, Italy on 10-11 February, 2016.

The coordinator of TSUMAPS-NEAM is the Istituto Nazionale di Geofisica e Vulcanologia (INGV, Italy). The partners are: Stiftelsen Norges Geotekniske Institutt (Norway), Instituto Português do Mar e da Atmosfera (IPMA, Portugal), Helmholtz-Zentrum Potsdam Deutsches Geoforschungszentrum (GFZ, Germany), Orta Dogu Teknik Universitesi (METU, Turkey), Universitat de Barcelona (UB, Spain), National Observatory of Athens (NOA, Greece), Centre National pour la Recherche Scientifique et Technique (CNRS, Morocco), and Institut National de la Meteorologie (INM, Tunisia).



TSUMAPS-NEAM will largely rely on input from the EU FP7 project ASTARTE, of the GAR15 (global risk quantification under the HFA), and national PTHAs like those of USA and Italy. TSUMAPS-NEAM will also promote an informed process of outreach, guidelines definition, and capacity-building initiatives especially targeted at EU Enlargement and Neighbourhood Policy countries involvement. The results will be transferred to the hazard governance system through the broadest possible involvement of relevant actors. The specific objectives can be described as a cascade of four consecutive actions: (1) State-of-the-art, standardized, updatable, Assessment, with full uncertainty treatment; (2) Review process with international experts; (3) Production of the PTHA database, with documentation; (4) Publicity through an awareness raising and education phase, and a capacity building phase. For more information please visit the [project website](#).

TROYO: A new Erasmus+ project on youth training for increasing preparedness against marine induced hazards



TROYO (Training Of Youth for Preparedness Against Marine Induced Hazards) is an Erasmus+ Project under the Strategic Partnership for Youth Action Programme of National Agency of Turkey which aims to combine scientific excellence of professionals in Coastal Engineering field with enunciable skills in marine hazards for youth to endeavor a better understanding of marine hazards and their effects of human life and manmade coastal structures and prepare guidelines and online tools for safety and preparedness. TROYO is organized to train youth on the marine hazards through innovative and scientific tools and methods. Youth to be trained by trainers, experts and professionals shall be from any disciplines even not necessarily from coastal or civil engineering fields. The training program will enhance knowledge and awareness of selected young people in the marine hazards and enable them to acquire new methods of preparedness against marine hazards and transfer the acquired knowledge directly to younger people through training activities. The project started on 1 January 2016 and will last for 32 months. Project partners are among the top European universities and institutions working on marine hazards and the main European players in the field where Middle East Technical University (METU) is the coordinator, and Instituto Portugues Do Mar E Da Atmosfera IP (IPMA), Special Research Bureau For Automation Of Marine Researches Far East Branch Russian Academy Of Sciences (SBR RAS), The Environmental Hydraulics Institute from the University of Cantabria (UC), and ECCO Consulting are the partners of the project. For further details, please visit TROYO web page <http://www.troyo.org/>.



The kick-off meeting of TROYO was held at METU in Ankara, Turkey on March 17, 2016.

What is going on?

- April 17-22, 2016 European Geosciences Union (EGU) General Assembly 2016, in Vienna, Austria (<http://www.egu2016.eu/>)
- April 20, 2016 ASTARTE Scientific Steering Committee meeting (semi-annual project meeting) at EGU 2016 in Vienna, Austria.
- April 20-22, 2016 Seismological Society of America (SSA) Annual Meeting in Reno, Nevada, USA (<http://www.seismosoc.org/meetings/ssa2016/>)
- June 3-7, 2016 ASTARTE - PEARL - TANDEM Joint Summer School at Technical University of Crete in Chania, Greece ([Link](#))
- June 8-11, 2016 15th Plinius Conference on Mediterranean Risks (EGU Topical Conference Series) in Giardini Naxos-Taormina (eastern Sicily), Italy (<http://www.plinius15.eu/home.html>)

Upcoming Events

- July 17-22, 2016 35th International Conference on Coastal Engineering (ICCE 2016) in Istanbul, Turkey (<http://www.icce2016.com/en/>)
- July 31-August 5, 2016 Asia Oceania Geosciences Society (AOGS) 13th Annual Meeting in Beijing, China (<http://www.asiaoceania.org/aogs2016/>)
- September 7-8, 2016 IOWave16 Exercise: Exercise Exercise Indian Ocean Wave 2016 ([Link](#)) ([The complete list of IOC/UNESCO events](#))
- Oct 17-21, 2016 3rd European Conference on Flood Risk Management in Lyon, France (<http://floodrisk2016.net/>)
- September 4-8, 2017 5th International Tsunami Field Symposium in Lisbon, Portugal (<http://itfs.campus.ciencias.ulisboa.pt/node/11>)

Project deliverables

Deliverable No	Deliverable title	WP	Delivery date	Partner in charge
D4.20	Suite of new simple to complex benchmark problems	4	Month 24	METU
D4.29	Statistical emulator for tsunamis	4	Month 30	NUID ICD
D5.22	Recommendations on cost effective solutions and mitigation measures to reduce adverse effects and increase resilience in post tsunami harbor operations	5	Month 24	METU
D5.30	Performance of different types of breakwaters and coastal protection structures under tsunami attack	5	Month 30	UC
D6.31	Definition of optimum sensor locations	6	Month 30	GFZ
D6.32	Report on Data Communication Infrastructure Improvements	6	Month 30	NOA
D8.33	Tsunami risk assessment methods: guidelines for tsunami hazard, vulnerability and risk assessments methods in the NEAM region and in the ASTARTE test sites	8	Month 30	UNIBO
D9.27	Report on institutional plans, operative response capacities and needs for crisis management and capacity building	9	Month 24	METU
D10.35	Smart phone application (second release)	10	Month 30	FFCUL
D10.34	ASTARTE Newsletter	10	Every 6 months	METU

Announcements

- ASTARTE Project is extended 6 months until April 30, 2016.
- Stakeholders meeting of ASTARTE in Milas and Bodrum Towns in Turkey for Gulluk test Site will be held on May 24, 2016 at Kocacik Herodot Cultural Center in participation of Governorship of Mugla Province and Local Authorities and all stakeholders.
- In October 2016, a one day technical and administrative meeting will be held in Copenhagen, Denmark in participation of ASTARTE Work Package Leaders and Principle Investigators of the partners .
- The final scientific workshop of ASTARTE will take place in Mallorca – Colonia Saint Jordi (organized by Miquel Canals and Maurizio Gonzales) in April 2017.

Publications

- Roch, J., Duperray, P., Schindel el, F. (2016) "Very Fast Characterization of Focal Mechanism Parameters Through W-Phase Centroid Inversion in the Context of Tsunami Warning". *Pure and Applied Geophysics*, 1-13, DOI:10.1007/s00024-016-1258-3.
- Larsen, B.E., Fuhrman, D.R., Sumer, B.M. (2016) "Simulation of wave-plus-current scour beneath submarine pipelines". *Journal of Waterway, Port, Coastal, and Ocean Engineering*, 04016003, DOI: 10.1061/(ASCE)WW.1943-5460.0000338.
- Lorito, S., Romano, F., Lay, T. (2016) "Tsunamigenic earthquakes (2004-2013): Source processes from data inversion", R.A. Meyers (ed.), *Encyclopedia of Complexity and Systems Science*, Springer Science+Business Media New York 2015, DOI: 10.1007/978-3-642-27737-5_641-1.
- Madsen, P.A., Schaffer, H.A., Fuhrman, D.R. Toledo, Y.T. (2016) "Uniform asymptotic approximations for transient waves due to an initial disturbance". *Journal of Geophysical Research: Oceans*, 121: 60-84, DOI: 10.1002/2015JC011155.
- Omira, R., Baptista, M.A., Lisboa, F. (2016). "Tsunami Characteristics Along the Peru-Chile trench: Analysis of the 2015 Mw8.3 Illapel, the 2014 Mw8.2 Iquique and the 2010 Mw8.8 Maule Tsunamis in the Near-field". *Pure and Applied Geophysics*, 173(4): 1063-1077, DOI: 10.1007/s00024-016-1277-0.
- Selva, J., Tonini, R., Molinari, I., Tiberti, M.M., Romano, F., Grezio, A., Melini, D., Piatanesi, A., Basili, R., and S. Lorito (2016) "Quantification of source uncertainties in Seismic Probabilistic Tsunami Hazard Analysis (SPTHA)". *Geophysical Journal International*, 205(3): 1780-1803, DOI: 10.1093/gji/ggw107.
- Williams, I.A. & Fuhrman, D.R. (2016) "Numerical simulation of tsunami-scale wave boundary layers". *Coastal Engineering*, 110: 17-31, DOI: 10.1016/j.coastaleng.2015.12.002.

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"Love: Bigger than a tsunami, stronger than any fear." — Bethany Hamilton (Soul Surfer)