

ALEXANDROS SAVVAIDIS, MSc, PhD - *Texas Seismological Network Project Manager*

CONTACT INFORMATION

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OVERVIEW

Project Manager and Seismology Research Team Lead of the Texas Seismological Network (TexNet). Extensive 20 years experience in Applied Geophysics and Engineering Seismology both through my research position as a Senior Researcher and collaboration with Industrial partners in multidisciplinary European funded projects. In addition, I am managing the largest Seismographic Network in Greece, numbering 100 real time accelerometers and 150 offline installations. My research activity and technical expertise is focused on, engineering seismology, Earth observation and disaster risk reduction, engineering and environmental geophysics. My research on Seismology includes the study of source characteristics, the wave path and site characterization in case of an earthquake event, the real time acquisition of ground motion data, for earthquakes of tectonic or volcanic activity, Shakemaps implementation and data fusion for disaster risk mitigation. Additionally in Applied Geophysics my attention is directed towards acquiring, processing, and modeling geophysical data using passive and active techniques in urban and free field areas to reveal 1D, 2D and 3D earth models and to improve the knowledge in archaeometric, mining and three dimensional basin structure using geophysical methods.

- Structural and geotectonic characteristics of Earth's crust by using different geophysical methods: Magnetotelluric, Direct Current, Time Domain Electromagnetic, Potential Field and Seismic.
- Application of geophysical techniques (Microtremor array, seismic, gravity, magnetics, resistivity, GPR, electromagnetics, etc.) for revealing shallow structure for geological, environmental, mining, geotechnical and archaeometric applications.
- Development and implementation of innovative techniques in the application of Microtremor Array Measurements for calculating the shear wave velocity with depth in both one and three dimensions. The Microtremor Array Method belongs into the group of seismic methods and in more specific in Surface Waves methods. This geophysical techniques is vastly used and is a critical point of evolution in Applied Geophysics for applications in Engineering Seismology, in Microzonation Studies, Studies of Soil Response and in general Engineering Geophysics and Geotechnical-Environmental Engineering for the urban and sub-urban environment.
- Studies on the radiation and attenuation pattern of seismic waves, using macroseismic and instrumental data.
- Study and simulation of the propagation of seismic waves, as well as their influence of the local site conditions in the strong ground motion using instrumental (earthquakes and ambient noise) and simulation data.
- Study of aftershock activity.
- Study of seismic signals and their automatic processing.

EDUCATION

**Aristotle University of Thessaloniki - AUTh.,
Department of Geology and Geophysics, Thessaloniki, Greece**

PhD Geophysics, July 1998

Savvaidis A., "*Geophysical investigation of the North-West part of the Chalkidiki Peninsula.*" PhD Thesis, pp.196, 1998

Advisor: Prof. Gregory Tsokas (AUTh), Prof. M. Fytikas (AUTh) and Prof. P. Lagios (University of Athens)

MSc., Geophysics, November 1997

Savvaidis A., "*Noise Analysis on the Magnetotelluric Data of the area of Epanomi.*" Master of Science Diploma Thesis, pp.117, 1997

Advisor: Prof. G. Tsokas (AUTh.), Prof. L. Pedersen (University of Uppsala), and Dr. C. Papazachos (AUTh)

BSc., Geology, October 1992

PROJECTS

Texas Seismological Network - TexNet (January 2016 - Present). The budget allocation for this project is 4.7M\$. In this project I am the Manager of the Texas Seismic Network and Co-PI in TexNet Research and Center of Integrated Seismological Research (CISR). In the 84th Legislative Session, the Texas Legislature tasked the Bureau of Economic Geology (BEG) with helping to locate and determine the origins of earthquakes in Texas, and where they may have been caused by human activity, helping to prevent them from occurring in the future. Through TexNet earthquake monitoring program we accomplish these goals, and place earthquake monitoring stations across Texas to gather information and study these events as they occur. The overall goals of TexNet and CISR Research are to conduct fundamental and applied research to better understand naturally occurring and potentially induced seismicity and its associated risks.

Permanent Greek Geohazard Supersite. I am the co-ordinator of the Greek Geohazard Supersite at the GEO GSNL Initiative in Geneva, Switzerland (Group of Earth Observation - Geohazard Supersite and Natural Laboratories). The main objectives of this project are: (a) to collect and provide in an open data policy all the in situ information for the supersite area of study and (b) manage the research of the Supersite group following data fusion of in situ and satellite imagery information: <http://www.earthobservations.org/gsnl.php>.

A Scientific Network for Earthquake, Landslide and Flood Hazard Prevention-SciNetNatHazPrev, funded by the European Union (EU) - Black Sea Cross Border Cooperation (2013-2015). The budget allocation is 100k€ for IESEE out of 700k€ total project budget. In this project I am working on the natural hazard assessment in both regional (transnational) and local scale due to earthquakes and landslides and its impact on the environment and risk mitigation for the local community.

Estimation of seismic vulnerability of building stock of the town of Serres, (2013-2015). The project is implemented through EU Funding (85k€). In this project until now I have worked on facilitating the seismic hazard assessment from rock, as it is originally calculated to the soil surface through earth models of the town of Serres, Greece. Further to that the seismic hazard model will be incorporated with the vulnerability of the structural environment for the final risk assessment.

INnovative multi-sensor network for DEformation and Seismic Monitoring of Urban Subsidence-prone Areas - INDES-MUSA, funded by EU Funds through the Greek-China co-operation program (2013-2015). The budget allocation is 131k€ for IESEE out of 473k€ total project budget. Through this project I have participated in the

design and implementation of a multi-sensor (accelerometers, GPS, tide-gauge, LiDAR and water level) network. This network is established in four different types of land use: (a) Urban, (b) Industrial, (c) Special (Oil Tanks) and (d) Free Field. Accelerometer data are acquired in both ground level (urban free field) and structural (top and center of the building) environment. After an earthquake event I provide for each station, further to acceleration, also displacements from both the accelerometer network and also the GNSS collocated permanent network. I am also working on the soil transfer functions for each area using geophysical data, ambient noise and earthquake recordings. Finally, I am involved in the design and development of a Web GIS platform for data demonstration.

Processing of Surface Wave Data and Tutoring in Surface Wave Data Analysis and Inversion funded by University of Uppsala (2,5k€) Uppsala, Sweden (2015).

In this project I coordinated the processing of different active and passive Surface wave data acquired in Sweden. Additionally, I delivered a one week workshop at Uppsala University on Introducing Surface Wave Data Analysis and Inversion Techniques.

Geotechnical Characterisation of selected sites in Crete Island by Using Geophysical and Geotechnical Methods funded by EU Funds (2012-2015).

As a principal investigator for this project, out of the total project budget of 600k€ I negotiated a total contribution of 125k€ to be directed towards the IESEE. Through this project I have acquired, processed and modeled the geophysical data for site characterization, evaluated the theoretical and experimental site effects in the ground motion stations in the Island of Crete and compared the normalized elastic spectra with seismic codes. Both shallow (normal and thrust faults) and deep subduction zone earthquake recordings were used. I am currently working on an empirical relation between geophysical and geotechnical data for engineering purposes. Finally, I co-ordinate the design and development of a GeoDatabase with ground motion recordings, geo (geological, geophysical and geotechnical data) and building information.

Comparative evaluation of Surface Geophysical Methods for the Specification of the Dynamic Properties of Soil at Sites of Earthquake recordings and Utilization for the Ground Motion Prediction Equations, funded by EU Funds (85k€) (2012-2015).

As a principal investigator for this project I was responsible for the acquisition, processing and modeling of geophysical data at strong motion sites. Moreover, I have calculated the theoretical and experimental soil transfer function utilizing both dedicated geophysical models and ground motion earthquake data.

EuroseisTest Verification and Validation Project Phase 2 (2012-2015) implemented through funding (68k€) by the CEA (French Alternative Energies and Atomic Energy Commission).

In this project using the GoCad Software and based on all available geological, geophysical and geotechnical data for the Mygdonian basin (Northern Greece) I have incorporated a synthesis of a 3D geo-model. An updated model is re-constructed along with its uncertainties. This basin geo-model is to be used in 3D ground motion simulation.

INspired GEOdata CLOUD Services INGEOCLOUDS, (2012-2014) supported through EU funding.

As a principal investigator for this project, out of the total project budget of 1.5M€ I negotiated a total contribution of 135k€ to be directed towards the IESEE. In this work I have incorporated the framework, for running the service of Shakemaps for the broader Aegean Region (Greece) using the real time ground motion data (100 accelerometer stations) of the IESEE. Through this framework local information on Ground Motion Prediction Equations (for different type of faults, and soil conditions), and proxies of site characterization (based on geology, slope and terrain) are integrated. I have participated as a Senior Researcher in a group of interdisciplinary researchers for developing local proxies for site characterization.

Network of European Research Infrastructures for Earthquake Risk Assessment and Mitigation NERA, (2011-2014) funded by the EU. Out of the total project budget of 12M€ a total contribution of 106k€ was directed towards the IESEE. In this project I have applied different engineering geophysical methods (active and passive seismic wave data) for the calculation of the earth model in the test area of study in Koutavos Basin, Cephalonia, Greece .

Geophysical and Geotectonic properties of the Upper Crust using the Magnetotelluric Sounding Method in the area of Delvino, Albania (2013). As the principal coordinator of this project I negotiated a budget of 30k€ for the total duration of the project which was funded by the SEISMOTECH Company. In this project I have coordinated the acquisition and processing of more than 300 sounding data acquired in order to reveal the three-dimensional resistivity structure of the area. Additionally, I have proposed a strike analysis model that reveals the regional and local tectonic features along with 2D geophysical modeling of the area. Furthermore, the implementation of the proposed model provided valuable information on the crustal structure.

Efficient high-frequency surface wave tomography for seismological site characterization funded by National Funds (5k€) under the Greek-German Co-operation DAAD-IKYDA (2011). For this project I was the coordinator in addition to participating as a lead scientist. In this project we established a novel measurement strategy and modeling for efficient structural imaging of shallow and medium depth sedimentary environments using noise correlation tomography. This strategy is one of the few developed and applied for shallow depths producing a 3D earth model through the use of ambient noise data.

International Transfer of Seismological Advanced Knowledge and Geophysical Research (ITSAK-GR), supported by EU funds of total budget 1M€, (2006-2010). I have coordinated this project funded by a Marie Curie Actions European Funding Initiative. On a technical level, in this project I had the opportunity to focus on all aspects of seismic-hazard assessment such as spatiotemporal seismicity patterns and earthquake interactions, geotectonic properties of the Earth's crust. In addition, I studied in detail earthquake source properties, seismic-wave propagation and attenuation as well as local site effects on strong-ground motion, deterministic and stochastic assessment of strong-ground motion, earthquake scenarios and shake maps. This research project had eight co-operating partners, from which six are located in Europe and two in the United States of America . During the same project I have co-operated with a group of fourteen incoming researchers and I have visited three of the co-operating partners for a total period of 12 months.

Cost Effective Geophysical Technology for Petroleum Exploration in non-seismic areas (2001) implemented by European Union funds. Out of the total project budget of 464k€ I negotiated a total contribution of 211k€ to be directed towards the AUTH. Through this project as a principal investigator I have participated in testing of advanced processing techniques of magnetotelluric data in areas of high industrial noise. In addition, I applied improved subsurface imaging on near-vertical structures with a strong degree of three-dimensionality. Finally, I have contributed the final geo-model of the area of study incorporating different geophysical data.

VISITING
RESEARCHER -
TRAINING

University of Uppsala, Department of Geophysics, Sweden

November 1995 - July 1996

I have worked with the processing of Magnetotelluric Data as well with signal processing of electromagnetic waves under the supervision of Prof. Laust Pedersen. Working with the group of electromagnetic induction methods at Uppsala University that is one of the excellent research groups worldwide on electromagnetic methods I was fully engaged in the application of electromagnetic methods in Geophysics.

University of Copenhagen, Denmark

May - June 1996

Worked with Prof. Thybo on revealing the Earth's crustal structure with geophysical methods. At the same time I followed a workshop organized by the BABEL Project Working Group.

Potsdam University, Institute of Geosciences, Germany

November 1996

Followed a workshop on Magnetotelluric Software called Geotools <http://geotools.com/>.

CNRS, Geophysical Laboratory of CNRS, Orleans, France

November - December 1996

Identification of electric and magnetic precursory phenomena of earthquakes in South Thessaly region in Central Greece.

University of Potsdam, Institute of Geosciences, Berlin, Germany

June - July 2002

Software development for geophysical properties analysis of the shallow Earth's structure by using Microtremor Array Data.

University of Potsdam, Institute of Geosciences, Berlin, Germany

June - August 2002

Field experiment in Italy and Greece to acquire Microtremor Array Data in order to reveal the shear wave velocity of the shallow Earth structure.

University of Uppsala, Department of Geophysics, Sweden

May 2004

During my stay I presented a workshop on "The Microtremor method in engineering geophysics: The case studies from Thessaloniki urban area and Mygdonia-Volvi basin". During my stay I collaborated with the geophysics group on calculating a two-dimensional geoelectric model from Magnetotelluric data for mapping the tectonic model of the Atalanti Normal Fault.

University of Potsdam, Institute of Geosciences, Berlin, Germany

November 2007, January 2008

I have worked on processing microtremor array data with different methods and also on revealing Earth's structure by applying inversion techniques.

GeoForschungs Zentrum, Potsdam, Germany

January - March 2008

I have worked on two dimensional Earth models using inversion techniques of Magnetotelluric Data.

**University Joseph Fourier, Laboratory of Geophysics and Tectonophysics
Grenoble, France**

January - March 2009, April 2010

I have worked on inversion of dispersion curve data of surface waves and parametrization of Earth models.

University of Uppsala, Department of Geoscience, Sweden

September - December 2009 and April 2010

I have worked on strike analysis of Earth structure using Magnetotelluric data along with applying inversion techniques in order to reveal two-dimensional models and compare with three dimensional geophysical models.

University of Potsdam, Institute of Earth and Environmental Science, Berlin, Germany

June, December 2011 and April, December 2012

Collaboration with the group in Potsdam on Applied Geophysics and Soil Dynamics, developing algorithms revealing three dimensional tomographic images of the Earth's subsurface by using ambient noise data.

**UNDERGRADUATE
TEACHING**

AUTh, Department of Geology, 3rd and 4th Year Undergraduate Students.

- **Applied Geophysics (II and III).**

Through these courses I have introduced the geophysical methods commonly used in applied geophysics, namely potential field methods (gravity and magnetics), resistivity (mapping, sounding, and tomography) and electromagnetic methods (VLF, AFMAG, Turam, Slingram).

- **Theory of Vibrations/Oscillations and Elastic Waves.**

Through these courses I have introduced vector calculus, mechanical oscillations, elasticity theory, and elastic waves.

- **Analysis and Interpretation of Geological Observations.**

Through those courses I have introduced, interpolation (in both one and two dimensions), prediction, smoothing, filtering, regression, auto and cross-correlation, uni variate statistics and FOURIER analysis.

**POSTGRADUATE
TEACHING**

- **Advanced Applied Geophysics - AUTh, Greece**

Introduction the Magnetotelluric method of Geophysical Prospecting.

- **Advanced Seismic Methods in Geophysical Exploration - AUTh, Greece:**

(a) Surface Wave Methods for Near-Surface Applications, (b) Array Processing Concepts, (c) The Relation between array response and array analysis, and finally (d) Surface Wave data Inversion.

- **Active and Passive Surface Wave Methods in Engineering Geophysics. -**

Uppsala University, Sweden (a) providing a fundamental introduction to these methods (b) familiarize the students with the use of the Geopsy open source software (c) deliver a set of practical exercises on synthetic and real data for analysis and inversion of Surface Wave Data.

**POSTGRADUATE
SUPERVISION**

During my Research Activities at the Institute of Engineering Seismology and Earthquake Engineering (IESEE), I have served in the advisory committee of several postgraduate students:

- Two postgraduate students (six months each) from the Department of Environmental and Natural Resources Engineering at the Technical Education Institute of Crete (TEI) in Chania, Greece.
- Three graduate students (2 months each) from the Department of Geology of the AUTh, in Thessaloniki, Greece.
- One MSc student (Mr. M. Anthymidis) and three PhD students (Dr. A. Panou , Dr. I. Papadopoulos , and Mr. M. Anthymidis).
- Three visiting postdoctoral researchers during the period 2006-2010 (Dr. Marcus Gurk, Dr. Heloise Cadet and Dr. Maria-Daphne Mangriotis).

1. Rovithis, Em., Kirtas, Em., Bliziotis, D., Maltezos, E., Pitilakis, D., Makra, K., **Savvaidis, A.**, Karakostas, Ch. Lekidis, V., *A LiDAR-aided urban-scale assessment of soil-structure interaction effects: The case of Kalochori residential area (N. Greece)*. submitted to Bulletin of Earthquake Engineering, 2016.
2. **Savvaidis, A.**, Makra, K., Klimis, N., Zargli, E., Kiratzi, A., Theodoulidis, N., *Comparison of Vs30 using measured, assigned and proxy values in three cities of Northern Greece*. submitted to Engineering Geology, Elsevier, 2016.
3. Papadopoulos, I., Papazachos, C., **Savvaidis, A.**, Theodoulidis, N., Vallianatos, F., *Seismic Response of the Broader Chania Basin Area (Southern Greece) from the Joint Evaluation of Ambient Noise and Earthquake Recordings*, Bulletin of Earthquake Engineering, 15, 3, p. 861-888, 03/2017.
4. Autio, U., Smirnov, M. Yu., **Savvaidis, A.**, Soupios, P., Bastani, M., *Combining electromagnetic measurements in the Mygdonian sedimentary basin, Greece*, Journal of Applied Geophysics, Elsevier, Volume: 135 Special Issue, p. 261-269, DEC 2016.
5. Theodoulidis, N., Karakostas, Ch., Lekidis, V., Makra, K., Margaritis, B., Morfidis, K., Papaioannou, Ch., Rovithis, Em., Salonikios, T., **Savvaidis, A.**, *The Cephalonia, Greece, January 26 (M6. 1) and February 3, 2014 (M6. 0) earthquakes: near-fault ground motion and effects on soil and structures*, Bulletin of Earthquake Engineering, 14, 1, p. 1-38, 2016.
6. Cherevatovaa, M., Smirnov, M.Yu., Jones, A.G., Pedersen, L.B., Becken, M., Biolik, M., Cherevatova, M., Ebbing, J., Gradmann, S., Gurk, M., Hbert, J., Jones, A.,G., Junge, A., Kamm, J., Korja, T., Lahti, I., Lwer, A., Nittinger, C., Pedersen, L.B., and **Savvaidis, A.**, *Magnetotelluric array data analysis from north-west Fennoscandia*, *Tectonophysics*, 653, 6, 1-19, June 2015
7. Stewart, J., Klimis, N., **Savvaidis, A.**, Theodoulidis, N., Zargli, E., Athanasopoulos, G., Pelekis, P., Mylonakis, G. and Margaritis, B., *Compilation of a Local VS Profile Database and its Application 5 for Inference of VS30 from Geologic and Terrain-Based Proxies*, BSSA, 104, 6, p.2827-2841, 2014
8. Hannemann, K., Papazachos, C., Ohrnberger, M. **Savvaidis, A.**, Anthymidis, M., Lontsi, A., *3D shallow structure from high-frequency ambient noise tomography: New results for the Mygdonia basin-Euroseistest area*, Northern Greece, J. Geoph. Res. 10.1002/2013JB010914, 2014
9. **Savvaidis, A.**, Margaritis, B., Theodoulidis, N., Lekidis, V., Karakostas, Ch., Loupasakis, C., Rozos, D., Soupios, P., Mangriotis, M.-D., Dikmen, U., Tsangaratos, P., Kokinou, E., Vafidis, A., Rondoyanni, Th., Kalogeras, I., Koutrakis, S., Sarris, A., Papadopoulos, N., *Geo-Characterization at selected accelerometric stations in Crete (Greece) and comparison of earthquake data recordings with EC8 elastic spectra*, C. Europ. J. of Geosciences, March 2014, Volume 6, Issue 1, pp 88-103 (DOI: 10.2478/s13533-012-0163-2). Erratum to: Geo-Characterization at selected accelerometric stations in Crete (Greece) and comparison of earthquake data recordings with EC8 elastic spectra (DOI 10.1515/geo-2015-0010)
10. Margaritis, B., Kalogeras, I., Papaioannou, Ch., **Savvaidis, A.**, and Theodoulidis, N., *Evaluation of the national strong motion network in Greece: deployment, data processing and site characterization*, Bull. Earth. Engin, 12:237-254, 2014. DOI 10.1007/s10518-013-9580-y
11. Hobiger, M., Cornou, C., Wathelet, M., Di Giulio, G., Knapmeyer-Endrun, B., Renalier, F., Bard, P.-Y., **Savvaidis, A.**, Hailemikaël, S., Le Bihan, N., Ohrnberger, M., Theodoulidis, N., *Ground structure imaging by inversions of Rayleigh wave ellipticity: sensitivity analysis and application to European strong-motion sites*, Geophysical Journal International, 192:1, 207-229, (2013) doi: 10.1093/gji/ggs005

12. Anthymidis, M., Theodoulidis, N., **Savvaidis, A.**, Papazachos, C., *Constraining site response and shallow geophysical structure by ambient noise measurements and 1D numerical simulations: The case of Grevena town (N. Greece)*, Bull. Earth. Engin, 10:1685-1716, 2012. DOI 10.1007/s10518-012-9378-3 (2012)
13. **Savvaidis, A.**, Smirnov, M., Tranos, M., Pedersen, L., and Chouliaras, G., *The seismically active Atalanti fault in Central Greece: a steeply dipping fault zone imaged from magnetotelluric data*, Tectonophysics, 554-557 (2012) 105113
14. Di Giulio, G., **Savvaidis, A.**, Ohrnberger, M., Wathelet, M., Cornou, C., Knapmeyer-Endrun, B., Renalier, F., Theodoulidis, N., and Bard., P-Y., *Exploring the model space and ranking a best class of models in surface-wave dispersion inversion: Application at European strong-motion sites*, GEOPHYSICS, 77, 3, B147 - B166, 2012
15. Cadet, H., and **Savvaidis, A.**, *Comparative application of dispersion curve inversion strategies. Case study of noise arrays in the Euroseistest site*, Greece, Near Surface Geophysics, 9, 571-583, 2011, doi: 10.3997/1873-0604.2011043
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20. Bard, P-Y., Cadet, H., Endrun, E., Hobiger, M., Renalier, F., Theodoulidis, N., Ohrnberger, M., F D., Sabetta, F., Teves-Costa, P., Duval, A.M, Cornou, C., Guillier, B., Wathelet, M., **Savvaidis, A.**, Khler, A., Burjanek, J., Poggi, V., Gassner-Stamm, G., Havenith, H.B., Hailemikaël, S., Almeida, J., Rodrigues, I., Veludo, I., Lacave, C., Thomassin, S., and Kristekova, M., (2010). *From Non-invasive Site Characterization to Site Amplification: Recent Advances in the Use of Ambient Vibration Measurements*, Earthq. Engin. in Europe (eds: Ansal A. Garevski M.), Springer Sc. & Buss. Media, Vol 17, Ch. 5, 105-123, DOI 10.1007/978-481-9544-2-5
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22. Theodulidis, N., Roumelioti, Z., Panou, A., **Savvaidis, A.**, Kiratzi, A., Grigoriadis, V., Dimitriou, P., and Xatzigogos, Th., *Retrospective Prediction of Macroseismic Intensities Using Strong Ground Motion Simulation: The Case of the 1978 Thessaloniki (Greece) Earthquake (M6.5)*, Bulletin of Earthquake Engineering, 4, 101-130, 2006
23. Panou, A.A., Theodulidis, N., Hatzidimitriou, M., **Savvaidis A.**, and Papazachos, C.B., *Reliability tests of horizontal-to-vertical spectral ratio based on ambient noise measurements in urban environment: The case of Thessaloniki city (Northern Greece)*, Pure and Applied Geophysics, 162, 891-912, 2005
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CONFERENCE
PRESENTATIONS

1. **Savvaidis, A.**, Ohrnberger, M., Wathelet, M., and Cornou, C. (2017), *Ground Model Ensemble selection based on Information Theory and global inversion of surface wave dispersion data*. 16th World Conference on Earthquake (16WCEE), 9-13 January 2017, Santiago, Chile.
2. **Savvaidis, A.**, Young, M., Tinker, S., Rathje, E., Frohlich, C., Walter, J., DeShon, H., Gale, J., Hennings, P., Eichhubl, P., Olson, J., Olson, H., Markman, A., and Kahlor, L. (2016), *TexNet: A new, integrated seismic monitoring program in Texas*, Annual Meeting of the Seismological Society of America, 20-22 April 2016, Reno, Nevada.
3. Pelekis, P., **Savvaidis, A.**, Kayen, R., Vlachakis, V., and Athanasopoulos, G. (2015), *A comparative study of Surface waves Inversion Techniques at strong motion recording sites in Greece*. Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP), 22-26 March 2015, Austin, Texas USA.

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5. **Savvaidis, A.**, Konstantinidou, K., Margaritis, B., Papaioannou, Ch., Theodoulidis, N., Triantafyllidis, P., and Kementzetzidou, D., (2014), *Shakemap Implementation Using Strong Motion Data for the Broader Area of the Aegean Sea*. 2nd European Conference on Earthquake Engineering and Seismology, Istanbul, Turkey, 25-29 August 2014.
6. Theodoulidis, N., Klimis, N., **Savvaidis, A.**, Margaritis, B., Chatzipetros, A., Papathanasiou, G., Roumelioti, Z., Makra, K., Anthymidis, M., Diamantis, I., Mimidis, K., Petala, E., Lazaridis, Th., Zargli, E., Kiratzi, A., Christaras, V., Kontoes, S., and Sapountzi, S., (2014), *Defining shallow structure properties by composing ambient noise and geological data for site response analyses: the case of Xanthi town (NE greece)*. 2nd European Conference on Earthquake Engineering and Seismology, Istanbul, Turkey, 25-29 August 2014.
7. **Savvaidis, A.**, Kritikakis, G., Papadopoulos, I., Papadopoulos, N., Dikmen, U., Mangriotis, M.D., Soupios, P., and Vafidis, A, (2014), *Different processing and inversion methods for resolving Vs profiles in engineering geophysics using Surface Wave data*. 20th European Meeting of Environmental and Engineering Geophysics, EAGE Near Surface Geoscience, 14-18 September 2014, Athens, Greece.
8. Soupios, P., Barsukov, P., Gurk, M., and **Savvaidis, A.**, Tectonic regime of the southern, central part of the Mygdonia basin by applying 3D TEM modeling, 20th International Geophysical Congress Exhibition of Turkey, 25-27 November 2013, Antalya, Turkey.
9. Bastani, M., **Savvaidis, A.**, and Pedersen, L., CSRMT measurements in the frequency range of 1-250 kHz to map a normal fault in the Volvi basin, Greece, 19th Workshop of IAGA WG 1.2 on Electromagnetic Induction in the Earth, Beijing, China, 23-29 October, pp 77-82, 2008.
10. Gurk, M., Smirnov, M.-Yu, **Savvaidis, A.**, Pedersen, L.B., and Ritter, O., A 3D magnetotelluric study of the basement structure in the Mygdonian Basin (Northern Greece), 4th International Symposium on Three-Dimensional Electromagnetics Freiberg, Germany, September 27-30, 189-192, 2007.
11. Gurk, M., **Savvaidis, A.**, and Bastani, M., Tufa Deposits in the Mygdonian Basin (Northern Greece) studied with RMT/CSTAMT, VLF Self-Potential, 22nd Elektromagnetische Tiefenforschung (EMTF), Decin, Czech Republic, 1-5 October 2007, 231-238.
12. **Savvaidis, A.**, Tsokas, G., Tsourlos, P., Vargemezis, G., Chrysostomou A., and Chrysostomou, P. A Geophysical Survey in the Archaeological Site of Archontiko, Yannitsa, 9th International Congress of the Geological Society of Greece, Athens, 26-28 September, XXXIV/4, 1379-1383, 2001.
13. Zargli, E., Liodakis, S., Kyriakidis, P., **Savvaidis, A.**, (2013). *Classification of topography using DEM data and its correlation with the geology of Greece*. First International Conference on Remote Sensing and Geoinformation of the Environment (RSCy2013). 8-10th of April 2013, Paphos, Cyprus. Proc. of SPIE Vol. 8795 87950S-1
14. **Savvaidis, A.**, Margaritis, B., Theodoulidis, N., Lekidis, V., Karakostas, Ch., Mangriotis, M-D., Kalogeras, I., Koutrakis, S., Vafidis, A., Steiakakis, M., Agioutantis, Z., Rozos, D., Loupasakis, C., Rondoyanni, Th., Tsangaratos, P., Dikmen, U., Papadopoulos, N., Sarris, A., Soupios, P., Kokkinou, E., Papadopoulos, I., Kouli, M., and Vallianatos, F. (2013), *Geo-characterization according to recent advances of Eurocode (EC8)*, First International Conference on Remote Sensing and Geoinformation of the Environment (RSCy2013). 8-10th of April 2013, Paphos, Cyprus. Proc. of SPIE Vol. 8795 879513-1

15. Hobiger, M., Cornou, C., Le Bihan, N., Endrun, B., Renalier, F., Di Giulio, G., **Savvaidis, A.**, Wathelet, M., Bard, P.-Y., *Joint inversion of Rayleigh wave ellipticity and spatial autocorrelation measurements*. European Seismological Commission, 32nd General Assembly, 6-10 September 2010, Montpellier, France.
16. **Savvaidis, A.**, Ohrnberger, M., Wathelet, M., Cornou C., Bard P.Y., and Theodoulidis, N., *Variability analysis of shallow shear wave velocity profiles obtained from dispersion curve inversion considering multiple model parameterizations*, 2009 Annual Meeting of the Seismological Society of America, Monterey California, 8-10 April 2009 SSA Meeting 2009, Abstract in Seismological Research Letters, 80, no. 2, page 354.
17. Cornou, C., Renalier, F., Endrun, B., Di Giulio, G., Ohrnberger, M., **Savvaidis, A.**, Wathelet, M., Bard, P.-Y., *Derivation of Vs30 from dispersion curve: skipping the inversion step*, 32nd General Assembly, 6-10 September 2010, Montpellier, France.
18. Renalier, F., Endrun, B., Cornou, C., Ohrnberger, M., Wathelet, M., **Savvaidis A.**, and P.-Y. Bard,. *Comparison of dispersion curves derived from MASW and Ambient Vibrations at the 20 NERIES sites: capabilities for Vs30 estimation*. 2009 Annual Meeting of the Seismological Society of America, Monterey California, 8-10 April 2009.
19. Renalier, F., Jongmans, D., Wathelet, M., Cornou, C. Endrun, B., Ohrnberger, M., **Savvaidis, A.**, *Influence of parameterisation on inversion of surface wave dispersion curves and definition of a strategy of inversion*. EGU General Assembly 2009, held 19-24 April, 2009 in Vienna, Austria <http://meetings.copernicus.org/egu2009>, p.7799.
20. Margaritis, B., Skarlatoudis, A., **Savvaidis, A.**, Theodoulidis, N., Kalogeras, I. and Koutrakis, S. *Strong-Motion Networks in Greece and their efficient use in the derivation of regional ground-motion prediction models*, November 10-12, 2009, Ankara, Geotechnical, Geological, and Earthquake Engineering Book Series, 71-80, 2011 (http://dx.doi.org/10.1007/978-94-007-0152-6_6).
21. Anthymidis, M., Theodoulidis, N., **Savvaidis, A.**, and Papazachos, C., *Site Characterization Using Ambient Noise: The Case of Grevena Town (NW Greece)*, 31st ESC Gen. Ass., 7-12 September, Hersonisos, Greece, 2008.
22. Fah, D., Theodulidis, N., **Savvaidis, A.**, *Inversion of local S-wave velocity structure from average H/V ratios and comparison with cross-hole measurements*, Proc. 4th Inter. Conf. On Earthq. Geotech. Engin., Paper No. 1410, 2007.
23. **Savvaidis, A.**, Cadet, H., Gueguen, P., Panou, A., Michel, C., Theodulidis, N. and Kalogeras, I., *Accelerograph stations site characterization using ambient noise: Selected stations in Greece*, Proc. 3rd Int. Symp. Effects of Surface Geology on Seismic Motion, CD-Paper No. 64, 2006.
24. **Savvaidis, A.**, Theodoulidis, N., Panou, A., Papazachos, C. and Hatzidimitriou, P., *Geophysical Information from Ambient Noise Data in the Volvi Basin*, 10th Congress of the Geological Society of Greece, Thessaloniki, Greece, 15 - 17 April 2004.
25. Ohrnberger, M., Schissele, E., Cornou, C., Wathelet, M., **Savvaidis, A.**, Scherbaum, F., Jongmans, D., Kind, F., *Microtremor Array Measurements For Site Effect Investigations: Comparison of Analysis Methods for Field Data Crosschecked by Simulated Wavefields*, Procc. 13 WCEE, Vancouver, 2004.
26. Ohrnberger, M., Schissele, E., Cornou, C., Bonnefoy-Claudet, S., Wathelet, M., **Savvaidis, A.**, Scherbaum, F., Jongmans, D., *Frequency Wavenumber And Spatial Autocorrelation Methods For Dispersion Curve Determination From Ambient Vibration Recordings*, Procc. 13 WCEE, Vancouver, 2004.
27. Klimis, N., Theodoulidis, N., Anastasiadis, A., Dimitriou, P., and **Savvaidis, A.**, *Seismic Response of a Narrow Shape Valley: Numerical Analysis and Field Measurements*, 7th International Conference on Structures under Shock and Impact, Montreal CANADA, MAY 2002

28. Sherbaum, F., Ohrnberger, M., **Savvaidis, A.**, Panou, A., and Theodoulidis, N., *Determination of Shallow Shear Wave Velocity Profiles Using Ambient Vibrations at Selected Sites in Greece*, Eos Trans. AGU, 83(47), Fall Meet. Suppl., Abstract S72A-1138, 2002.
29. Saragiotis, C.D., Hadjileontiadis, L.J., **Savvaidis, A.S.**, Papazachos, C.B., and S.M.Panas. Automatic S-Phase Arrival Determination of Seismic Signals Using Nonlinear Filtering and Higher-Order Statistics, IEEE 2000 International Geoscience and Remote Sensing Symposium, Honolulu, Hawaii, 24-28 July, I, 292-294, 2000

BOOKS & EDITED VOLUMES

1. Margaris B., A. Skarlatoudis, **A. Savvaidis**, N. Theodoulidis, I. Kalogeras and S. Koutrakis, *Strong-Motion Networks in Greece and their efficient use in the derivation of regional ground-motion prediction models*, November 10-12, 2009, Ankara, Geotechnical, Geological, and Earthquake Engineering Book Series, 71-80, 2011 (http://dx.doi.org/10.1007/978-94-007-0152-6_6).
2. Roumelioti, Z., Kiratzi, A., Theodoulidis, N., Panou, A., **Savvaidis, A.** and C. Benetatos *Earthquake ground motion scenarios in urban areas: the case of the city of Thessaloniki (Northern Greece)*. In the Monograph: Geodynamics of Balkan Peninsula, Editor: G. Milev; (Special Issue of Reports on Geodesy, Warsaw Univ. of Technology Inst. of Geodesy and Geodetic Astronomy), pp. 15, 2006.

HONORS AND AWARDS

- Awarded the position of Geohazard Supersite Co-ordinator for the Greek Supersite in GEO GSNL (Group of Earth Observation - Geohazard Supersite and Natural Laboratories).
- Awarded the position of National Contact Point for the PEOPLE Work Program Marie Curie Actions funding, of the European Commission. Brussels, Belgium, December 2006 until December 2013
- I have been invited from the University of Oulu, to participate in the field campaign (June 2010) as well as in the processing of data under the framework of the project: "Three-dimensional structure and properties of the Fennoscandian lithosphere from electromagnetic magnetotelluric measurements. Multivariate analysis and three-dimensional inversion of synchronous electromagnetic array data".
- The paper Savvaidis et al. (2013) entitled: "Geo-Characterization according to recent advances of Eurocode (EC8)", Presented in the first Conference of Remote Sensing and Geoinformation of the Environment, (RSCy2013, 8-10th of April 2013, Paphos, Cyprus. Proc. of SPIE Vol. 8795 879513-1) received the title of Best Paper Award.
- I have been invited from the Swedish Geological Institute (SGU) to organise and acquire Magnetotelluric Measurements (2014) and to calculate geoelectrical models (2015) of the mining deposits of Kiruna mines. This project is a collaboration of SGU and LKAB Mining Corporation.
- I have been invited to participate in the project INTERPACIFIC (Intercomparison of methods for site parameter and velocity profile characterization) as an expert scientist in processing and inversion of active and passive surface wave data.
- As from 2005 I participate in the beta testing group of the Geopsy Software.
<http://www.geopsy.org/contributions.html>
This is an open source software that the user can process Microtremor, MASW and reflection data in order to reveal the Earth's structure.

OUTREACH

- Oklahoma Workshop, Seismicity in Oklahoma, Oklahoma City, Oklahoma. Texas Seismological Network: A Contemporary Approach for Monitoring the Earthquake Activity in Texas, September 2016
- Presentation of TexNet to the Pecos City Council, January 2017.
- Presentation of TexNet Seismic Network Operations and Products to the Industrial Associates, of the Centre of Integrated Seismicity Research, March; December 2016.
- Presentation of TexNet status and plan to the TexNet Advisory Committee, June; September; October; November 2016.
- Presentation of TexNet into the RailRoad Commission, March; November 2016.
- Presentation of TexNet into the Texas Department of Emergency Management, November 2016.
- Interview in NPR Radio presenting TexNet, October 2016.
- Presentation of TexNet into the Texas Commission of Environmental Quality, May 2016.

MEASUREMENT TECHNIQUES

- Magnetic, Gravity, Resistivity Mapping
- DC Resistivity Sounding
- Magnetotelluric (MT), Control Source MT Soundings, Radio MT, Time Domain Electromagnetic Soundings
- Electrical Resistivity Tomography
- Seismic (Reflection, Refraction, Surface wave)
- Seismic Monitoring of Induced Seismicity
- Seismometer and Accelerometer Network Installation
- Cross-correlation tomography of surface wave data

EQUIPMENT

- Scintrex CG-5 Gravity meter
- Geometrics G-857 Land Magnetometer
- Geometrics Strataview
- IRIS SYSCAL
- ABEM WADI
- Pulse Ekko GPR from Sensors Software
- EarthData Logger PR6-24 with Metronix MFS-06 Induction Coils
- Metronix ADU-06
- Phoenix Geophysics MTU-5 with MTC80H magnetic sensors
- CityShark I , II by Leas
- Guralp CMG6TD (seismometer), CMG5TD (accelerometer)
- Guralp DM24 data logger
- Kinematics Etna Strong Motion Accelerograph
- Reftek 130S Seismic Recorder, 130-SMA Strong Motion Accelerograph

COMPUTER SKILLS

- **Geophysical Software:** Geopsy (<http://www.geopsy.org>), WinGLink, Geotools, GOCAD, Phoenix Geophysics MT Processing Software, RES2DINV, IPI2WIN MT, FDSim (Fortran95/OpenMPI), GEOSOFT OASIS montaj
- **Programming:** FORTRAN, C, Perl, OpenMPI, Unix shell scripts
- **Applications:** ArcGIS, MATLAB, Microsoft Office - \LaTeX , database, spreadsheet, and presentation software
- **Operating Systems:** Unix/Linux, Windows, MacOS

PROJECT MANAGEMENT

- **Texas Seismological Network - TexNet** (January 2016 - Present).
- **Permanent Greek Geohazard Supersite** (May 2015 - Present).
- **Processing of Surface Wave Data and Tutoring in Surface Wave Data Analysis and Inversion** (2015)
- **Geotechnical Characterisation of selected sites in Crete Island by Using Geophysical and Geotechnical Methods** (2012-2015).
- **Comparative evaluation of Surface Geophysical Methods for the Specification of the Dynamic Properties of Soil at Sites of Earthquake recordings and Utilization for the Ground Motion Prediction Equations**(2012-2015).
- **INspired GEodata CLOUD Services INGEOCLOUDS** (2012-2014).
- **Geophysical and Geotectonic properties of the Upper Crust using the Magnetotelluric Sounding Method in the area of Delvino, Albania** (2013).
- **Efficient high-frequency surface wave tomography for seismological site characterization** (2011).
- **International Transfer of Seismological Advanced Knowledge and Geophysical Research (ITSAK-GR)** (2006-2010).

PROFESSION AND ADMINISTRATIVE SERVICE

I have participated in different groups that have formed different proposals to the European Union and to National funding agencies. These groups functioned through co-operations with Universities and Polytechnique Schools of the Country (AUTH, UoA, NTUA, Univ. of Patras), Technical Universities (Crete, Serres, Athens) as well as Research groups of the Institute of Engineering Seismology and Earthquake Engineering (IESEE), of FORTH and other organizations in Greece and Worldwide. Those proposals correspond to research in the disciplines of Applied Geophysics, and Seismology, desining and development of data bases, new technologies in education, co-operation of the Commercial Sector with the Research Organizations.

I was a member of the organizing committee for the 29th International Conference of IASPEI (International Association of Seismology and Physics of the Earth Interior that took place in Thessaloniki in 18-28 August 1997. In this conference I was responsible for the management and the electronic abstract submission as well as for the information technologies necessary for all the sections of the conference.

Through 1994-1998 I was responsible for the computer center of the Geophysical Laboratory of Aristotle University of Thessaloniki (network, infrastructure, software). During the period 1998-1999 I have been a member of the Computer Network Committee and also the Web Site Committee of the Department of Geology, AUTH.

Following my work at IESEE I have been a member of the following committees:

Year Committee

- 2002 Member of the Committee of Research Personnel
Member of the Committee of the Computer Centre
- 2003 Member of the Committee of Research Personnel
Member of the Committee of the Computer Centre
Member of the Committee for Signing for Material and Supplies without a bid
Member of the Committee for repairing and maintenance of cars
Member of the Committee for the configuration of the premises of IESEE
Substitutional Member for the Committee of open bid for renting premises of IESEE
- 2004 Member of the Committee of Research Personnel
Member of the Committee of the Computer Centre
Member of the Committee for Signing for Material and Supplies without a bid
Member of the Committee for repairing and maintenance of cars
- 2005 Member of the Committee of Research Personnel
Member of the Committee of the Computer Centre
Member of the Committee for the outreach of IESEE
Member of the Committee for repairing and maintenance of cars
- 2006 Vice President of the Committee of Research Personnel
Member of the Committee of the Computer Centre
Member of the Committee for the outreach of IESEE
Member of the Committee for repairing and maintenance of cars
- 2007 Vice President of the Committee of Research Personnel
Member of the Committee of the Computer Centre
Member of the Committee for the outreach of IESEE
Member of the Committee for repairing and maintenance of cars
- 2008 Member of the Committee of Research Personnel
Substitutional Member for the Committee of open bids
- 2009 Member of the Committee of Research Personnel
Substitutional Member for the Committee of open bids
- 2010 Member of the Committee of Research Personnel
Chair of the Committee of Data-Instrumentation-Computer centre
Member of the Committee for the outreach of IESEE
- 2011 Member of the Committee of Research Personnel
Chair of the Committee of Data-Instrumentation-Computer centre
Member of the Committee for the outreach of IESEE
- 2013 President of the Committee of Research Personell representing the Researchers of
to the National Association of Researchers
- 2014 President of the Committee of Research Personell representing the Researchers of
to the National Association of Researchers

Savvaidis, A., Ohrnberger, M., Wathelet, M., and Cornou, C. (2017), *Ground Model Ensemble selection based on Information Theory and global inversion of surface wave dispersion data*. 16th World Conference on Earthquake (16WCEE), 9-13 January 2017, Santiago, Chile.

Summary: On this study we present how to obtain a "reasonable ensemble" of one dimensional shear wave velocity models that explain an observed surface wave dispersion curve with its corresponding measurement errors. By "reasonable" we consider all the models that follow different parameterizations, follow the uncertainty of the data up to one standard deviation and also incorporate different degrees of freedom in the model space. The problem is approached by testing all perceived velocity depth model parameterizations until complexity (related to number of free parameters) doesn't allow the exploration of the model space (curse of dimensionality) and using a bias correction term (here AICc) for comparing the model fit to the data. The importance of this approach is providing a trans dimensional model ensemble using data uncertainties resulting in site characterization defined as a distribution of most likely models explaining our data.

Contributions: Savvaidis wrote the manuscript, performed the calculations and initiated the idea into the group. This work started during his visit in University of Potsdam in 2012 and due to being computationally intensive it was wrapped up on 2016. Matthias Ohrnberger and Marc Wathelet helped on developing the code and incorporating the information criteria approach. Cecile Cornou helped on formulating the results and the discussion.

Savvaidis, A., Margaris, B., Theodoulidis, N., Lekidis, V., Karakostas, Ch., Loupasakis, C., Rozos, D., Soupios, P., Mangriotis, M.-D., Dikmen, U., Tsangaratos, P., Kokinou, E., Vafidis, A., Rondoyanni, Th., Kalogeras, I., Koutrakis, S., Sarris, A., Papadopoulos, N., *Geo-Characterization at selected accelerometric stations in Crete (Greece) and comparison of earthquake data recordings with EC8 elastic spectra*, C. Europ. J. of Geosciences, March 2014, Volume 6, Issue 1, pp 88-103 (DOI: 10.2478/s13533-012-0163-2). Erratum to: Geo-Characterization at selected accelerometric stations in Crete (Greece) and comparison of earthquake data recordings with EC8 elastic spectra (DOI 10.1515/geo-2015-0010)

Summary: On this study different geophysical and geotechnical methods are combined in order to define the detailed ground conditions in selected sites of the Hellenic Accelerometric Network (HAN) in Crete. For this purpose, the geological information of the sites and shear wave velocity, calculated from surface wave measurements, is used. Additionally, ground acceleration data recorded through HAN have been utilized from intermediate depth earthquakes in the broader area of South Aegean Sea. Using the recorded ground motion data and the procedure defined in EC8, the corresponding elastic response spectrum is calculated for the selected sites. The resulting information is compared to the values defined in the corresponding EC8 spectrum for the seismic zone that includes the island of Crete. The comparison shows that accurate definition of ground type through geological, geotechnical and geophysical investigations is important. However, our current comparison focuses on the distribution of values rather than the absolute values of EC8-prescribed spectra.

Contributions: Savvaidis wrote the manuscript, coordinated and performed most of the field-work, and calculated the shear wave velocity models. Maria-Daphne Mangriotis helped on the inversion of the dispersion curve data. Pantelis Soupios and Unal Dikmen performed the acquisition and processing of the MASW data. Constantinos Loupasakis, Paraskevas Tsangaratos and Dimitris Rozos did the geological mapping. The rest of the group participated in the field deployments. Basil Margaris processed the Earthquake Data.

Stewart, J., Klimis, N., **Savvaidis, A.**, Theodoulidis, N., Zargli, E., Athanasopoulos, G., Pelekis, P., Mylonakis, G. and Margaris, B., *Compilation of a Local VS Profile Database and its Application 5 for Inference of VS30 from Geologic and Terrain-Based Proxies*, BSSA, 104,

Summary: On this study, we developed a local proxy based relationship for estimating shear-wave velocity in the upper 30 m for Greece. We started with compilation of a profile database (PDB) from published sources and engineering reports. ThePDB contains 314 sites; 238 have profile depths greater than 30 m and 59 are within 100 m of accelerographs. We propose relations for extrapolating a time-averaged velocity for depths less than 30 m to VS30 to over predict VS30. We then compiled proxies forPDB sites, including terrain type, surface geology, and surface gradients at 30 and 3 arcsec resolution (from radar-derived digital elevation models [DEMs]). When we compared DEMs against ground survey data, we find ground elevations from 3 arcsec DEMs to be more accurate relative to survey data than alternative 30, 9, and 1 arcsec DEMs. Also, we developed geologic categories based on age, gradation, and depositional environment and assign such categories to PDB sites. We find an existing 30 arcsec gradient-based global model to be biased relative to local VS30 data for gradients greater than 0.05 m per m. Bias relative to a California model is also found for four of the eight well-populated geomorphic categories, and new (local) values are provided. We find statistically significant effects of the 3 arcsec gradient on VS30 for Quaternary and Tertiary formations but no gradient effect for the Mesozoic ones. Among Quaternary sediments, Holocene, mapped Quaternary (age unspecified), and mixed/fine-gradation materials exhibit consistent VS30-gradient trends, whereas Pleistocene and coarse-gradation sediments have faster velocities. For the study region, we recommend use of the modified, terrain- and geology-based methods in combination for proxy-based VS30 estimation.

Contributions: Savvaidis has acquired, processed and provided VS30 values for 30 sites of the Profile Database using different geophysical methods. He computed the proxies based on the slope and terrain methodologies. He compiled the geology formations database with Ms Zargli. Mr Klimis provided VS30 values based on geotechnical data and developed the extrapolation relationships for areas with that shear wave velocities was available for less than 30m. Mr Pelekis, Mr Athanasopoulos and Mr Mylonakis provided the data for Peloponnesse. Mr Margaris and Mr Theodoulidis compiled the rest of the VS30 values. Mr Stewart developed the regressions analysis and provided the final equations. The manuscript was prepared from all the co-authors, Mr Stewart had a leading role.