Editorial

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This issue of *Environmental Processes* first presents a collection of 14 papers initially presented at the 12th International Conference of the series “*Protection and Restoration of the Environment*,” held from June 29 to July 3, 2014, in Skiathos Island, Greece (www.pre12.prd.uth.gr). This is a series of conferences co-organized every 2 years by one Greek Institution (in the present conference the Department of Civil Engineering and the Department of Planning and Regional Development of the University of Thessaly, Greece) and Stevens Institute of Technology, USA. The conference seeks to encourage the exchange of ideas and knowledge between diverse groups of the scientific community concerned by current issues on protection and restoration of the environment.

This issue of *Environmental Processes* was organized by the Editor-in-Chief Vassilios A. Tsihrintzis and three Guest Editors: **Christina Emmanouil** (Aristotle University of Thessaloniki, Thessaloniki, Greece), **Theodoros Karakasidis** (University of Thessaly, Volos, Greece), **Antonios Liakopoulos** (University of Thessaly, Volos, Greece) and deals with articles under the general theme “*Modelling and Understanding of Environmental Processes across Scales*”.

The papers included in this issue are based on the initial presentations at the conference. However, they have been extended and revised having passed through the regular reviewing process of the journal. The topics dealt in the fourteen papers are briefly presented below:

Bompoti et al. (2015) present a geochemical characterization of Greek ophiolitic environments using statistical analysis, such as factor analysis, Pearson correlations and specialized diagrams, in order to determine the geological background in five areas in Greece with potential ultramafic presence. The emphasis is on the presence of elevated Cr and Ni levels which may be attributed to both anthropogenic sources and natural weathering processes of ultramafic rocks.

Charakopoulos et al. (2015) analyzed meteorological observations from seawatch buoys from two locations, one in the Aegean and one in the Ionian Sea. For each time series, non-linear

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measures such as mutual information combined with descriptive statistic measures, as well as other detectors such as the Hurst Exponent and Hjorth parameters, were used. The relationships between the variables were investigated using the cross-correlation method as well as Granger causality for identification of direction interactions among variables.

Zafirakou et al. (2015) deal with a concise presentation of the types of oil slick models applied in operational mode, and then present a numerical model which can simulate weathering of an oil spill in a coastal area, coupled with a 3D hydrodynamic model. The results indicate the usefulness of the models in either tracing the source of a spill or in predicting its path and spread, thus proving their value in real-time crisis management.

Tsoukala et al. (2015) discuss beach erosion due to the presence of harbours in sandy beaches along with the corresponding environmental and socio-economic impacts. Several cases are presented and discussed from Greece and Cyprus. Furthermore, the necessity of using physical and mathematical models in selecting the best location for placing a harbor, aiming to minimize beach erosion or to better design control measures, is emphasized with examples.

Ananiadou-Tzimopoulou and Nana (2015) refer to landscape changes that are caused by anthropogenic hydrological changes, particularly from the installation of large hydraulic engineering projects such as dams. They emphasize the necessity that the critical relationships concerning the ecosystem, the perception of the landscape and the socio-economic spatial values should be identified and marked.

Mellios et al. (2015) present mathematical modeling of the trophic state and nutrient flows of a lake using the PCLake model. Nutrient flow dynamics were simulated for the year 2012 on a trimester basis in Lake Karla, Greece, which is an important natural ecosystem under restoration, also operating as a reservoir.

Deligiorgis et al. (2015) use multicriteria analysis in water resources management in the basin of Nestos river (northern Greece) dealing with the problem of selecting the best location for the construction of a dam.

Theodossiou and Fotopoulou (2015) present research concerning delineating well-head protection areas under conditions of hydrogeological uncertainty. More specifically, the delineation of well-head protection areas is made with the aid of a mathematical model and the methodology is applied on the aquifer of Moudania in Chalkidiki (Greece), taking into consideration a number of equally probable realizations of the geological structure of the aquifer.

Keramaris et al. (2015) investigate the impact of a half-separated gravel and vegetated bed in an experimental open channel using 2D Particle Image Velocimetry (PIV). Results show that the presence of a half-separated gravel and vegetated bed influences significantly the velocity distribution in comparison to a simple permeable bed.

Farsirotou and Kotsopoulos (2015) report on a laboratory study that was performed in an experimental flume where the water surface profile variation was significant. The objective of this experimental and numerical study was to investigate the effects of river bottom sills on flow depth for the control of river protection against floods.

Fragkou et al. (2015) present spatiotemporal time series analysis methods for the study of turbulent magneto-hydrodynamic simulated flows in a channel. The authors compare the situation with and without magnetic field using the nonlinear method of Cross Recurrence Plots and Cross Recurrence Quantification Analysis. The results indicate very well the

spatiotemporal extension of the effect of the applied magnetic field on the flow and are in very good agreement with the detailed analysis obtained by other methods.

Zorpas et al. (2015) discuss the new Waste Framework Directive (2008/98/EC) which sets clear waste prevention procedures including reporting and reviewing, monitoring and evaluating. The authors then present a case study in Cyprus which focuses on the Development and Demonstration of a Waste Prevention Support Tool for Local Authorities.

Psomopoulos et al. (2015) present the primary differences in the usage and results of three major free software packages, i.e., Photovoltaic Geographical Information System (PVGIS), PVWatts and RETScreen, which are used for quick estimations and calculations relevant to photovoltaic (PV) electricity production.

Yannopoulos et al. (2015) present the implementation of the requirements of the European Flood Directive (FD) 2007/60/EC, which introduces a framework for the assessment and management of flood risks. They first present the effect of uncertainty, derived from lack of data, on the estimation of the peak discharge based upon which the flooded areas will be identified. Then, a methodology of peak discharge estimation is presented in an ungauged small catchment followed by hydraulic calculations using HEC-RAS and HEC-GeoRAS software packages. The results demonstrate the great variability of the estimated flood extent and the effect of it on the decision-making of the proposed flood measures.

This issue of *Environmental Processes* also contains three additional papers presented at the *International Conference on Integrated Management of Environment* (<http://www.icime.net/>), held from September 25 to 28, 2014, in Hammamet, Tunisia. The conference covered the following aspects: water management and treatment, waste management and recycling, pollution control, protection of the natural environment and landscape, protection of species and biodiversity conservation, erosion and desertification, watershed and natural resources management, coastal areas, sustainable development.

The organizers selected a number of papers which were extended and revised, and then were submitted to the journal and passed through the regular reviewing process. Among the submitted paper, the following three papers were finally accepted for publication and are briefly presented below:

Gmar et al. (2015) applied the electrodialysis (ED) technique to remove fluoride from tap water. Experiments were carried out using a pilot unit as a conventional ED in batch recirculation mode. Removal rate of fluoride tended to 92 % and resulting concentrations in treated water were below WHO recommended standards for drinking water. The authors conclude that ED is an efficient technique to remove fluoride and to reduce salinity of tap water.

Xing et al. (2015) experimentally investigated the potential use of poplar sawdust as replacement material of sand in semi-dry concrete, manufactured by vibrocompaction and used in concrete masonry block construction. The study proposes the substitution of 50 % of sand by poplar sawdust in masonry concrete blocks manufactured by vibrocompaction, which results in similar mechanical strength to that of the conventional manufacture of masonry concrete blocks.

Bouras et al. (2015) present a computational investigation of the thermodynamic irreversibilities generated by the combustion process in a cylindrical combustor using Fluent-CFD software package. They numerically evaluate the contribution of friction, heat conduction, species diffusion and chemical reaction in entropy generation. The results show that the chemical reaction and the heat conduction are the major sources of entropy production, and that fuel preheating reduces significantly the thermodynamic irreversibilities in the combustion chamber, while the air factor has a negative effect.

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