

Centre for Hydrology and Informatics (CHI)
Annual Report 2015

Water Services 2015



Research Group, Laboratory of Hydrology and Water Resources Management, School of Civil Engineering, National Technical University of Athens (NTUA)

Scientific activities for the year 2015

This leaflet aims to provide information about our activities to a wide community of researchers and academics, and to create stronger links for co-operation on water and environmental issues in the future. Since water and environment are indispensable parts of our life, new research areas are considered necessary to tackle present and future problems.

More information at www.chi.civil.ntua.gr

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FLIRE: 'Floods and Fire Risk Assessment and Management'

Aim

The aim of the FLIRE Project is the development of an online system alerting the user on risks of floods and forest fires. The system will become available to local authorities and key stakeholders in order to support the combined, effective and efficient management of both natural hazards

Objectives

The FLIRE Project aims to:

- ◆ Minimize the impact of floods and forest fires on human lives, ecosystems and properties
- ◆ Reduce the level and occurrence of flooding

- ◆ Improve the mitigation of flash floods
- ◆ Improve the forest fires' prevention level and forests' protection
- ◆ Raise awareness on both hazards of flash flood & forest fire and their combined effects in environmental and socio-economic aspects of Eastern Attica and Athens city.



The FLIRE's key conceptual innovation is that it addresses fires and floods at the same time, through the same system and data flow and brings significantly increased efficiency and economy by taking into account the often under-utilized links between them, including their interaction.

FLIRE

Project's code. **LIFE11ENV/GR/975**

Budget: €1.617.734 (50% co-financed by LIFE + financial instrument of the European Union)

Duration: 01/10/2012 – 30/09/2015

Consortium

Coordinating Beneficiary

National Technical University of Athens,
Centre of Hydrology and Informatics
(NTUA)

Project Coordinator: Prof. Maria
Mimikou

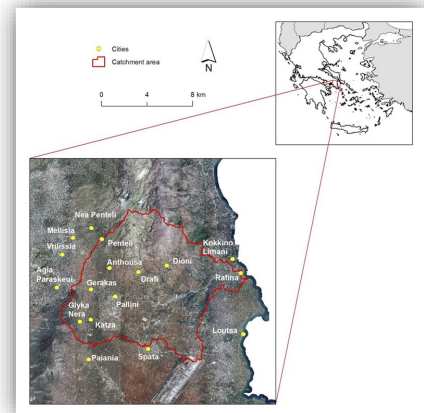
Associated Beneficiaries

- Imperial College London (ICL)
- Research Institute for Geo-Hydrological Protection, Italian Research Council (IRPI-CNR)
- National Observatory of Athens (NOA) – Institute of Environmental Research
- ALGOSYSTEMS S.A. (ALGO)
- Foundation for Research and Technology – Hellas, Institute of applied and computational Mathematics (FORTH)



Study Area

The study area of the FLIRE Project is Rafina catchment, a periurban area in the greater southeast Mesogeia region in Eastern Attica, Greece. The area covers approximately 123km² and geographically extends east of Hymettus Mountain to the coastline of Evoikos Gulf. The area is prone to both flash floods and fires resulting in its gradual ecological degradation with significant consequences on its population.



The Rafina catchment

FLIRE's Key Deliverable

FLIRE's key deliverable is an integrated Decision Support System (DSS) for both flash floods and forest fires risk assessment and management. The DSS tool will help the key stakeholders, municipalities, civil protection and the relevant authorities to make decisions about the management of both natural disasters.

MARS: 'Managing Aquatic Ecosystems and Water Resources under Multiple Stress'

MARS

Project's code: **FP7-ENV-2013-two stage**

Budget: €8.996.781,93/€359.500,00 (NTUA)
(financed by DG Research FP7-ENV-2013)

Duration: 01/02/2014 – 01/01/2018

Consortium

Coordinating Beneficiary

University of Duisburg-Essen (UDE)

Scientific Responsible for NTUA: Prof.

Maria Mimikou

Associated Beneficiaries

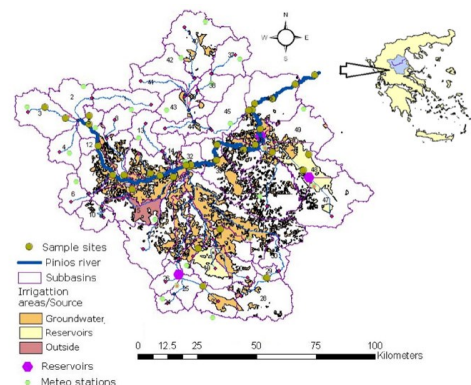
- Aarhus University (AU)
- AZTI-Tecnalia (AZTI)
- University of Natural Resources and Life Sciences (BOKU)
- Czech Hydrometeorological Institute (CHMI)
- Cardiff University (CU), United Kingdom
- Danube Delta National Institute for Research and Development (DDNI)
- Stichting DELTARES (DELTARES)
- Estonian University of Life Sciences (EMU)
- Leibniz-Institute of Freshwater Ecology and Inland Fisheries (FVB-IGB)
- National Research Institute of science & Technology for Environment & Agriculture (IRSTEA)
- European Commission Joint Research Centre (JRC)
- Middle East Technical University (METU)
- Natural Environment Research Council (NERC)
- Norwegian Institute for Water Research (NIVA)
- **National Technical University of Athens (NTUA)**
- Finnish Environment Institute (SYKE)
- University of Ljubljana (UL)
- Technical University of Lisbon (UTL)
- Portuguese Environment Agency (APA)
- Federal Ministry of Agriculture, Forestry, Environment & Water Management (BMLFUW)
- Environment Agency of England and Wales (EA)
- International Commission for the Protection of the Danube River (ICPDR)
- National Administration Romanian Waters (NARW), Romania

The **FP7 MARS** project entitled 'Managing aquatic ecosystems and water resources under multiple stress', started in 2014 with more than 20 partners across Europe (<http://mars-project.eu/>). In MARS scientists try to address multi-stress conditions in waters at the small (field), catchment or river basin, and the wider continental (EU) scale using contemporary methods and tools.

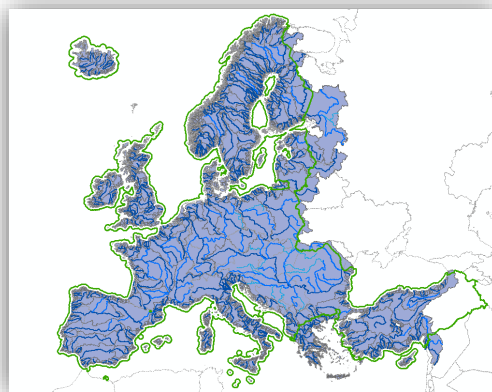
Several general research questions, common to all scales, have been defined: a) which multi-stressor combinations are most prominent in each case study basin, region or Europe, b) which stressor (i.e. pressure and state) variables reveal notable interactions, c) are these interactions comparable among basins or regions and are they interpretable, d) what form do these interactions take, e) do multiple stressors affect ecosystem functions and/or services?

At a catchment scale, the 'CHI' team has linked the process-based SWAT model, benchmark indicators and risk assessment to appraise how multiple stressors affect water quality and quantity, ecological functions and ecosystem services, under contrasting scenarios of water resources management, land use and climate change in Pinios river basin, Central Greece. Moreover, to harmonize the methodologies and analytical tools to link abiotic state variables (stressors) to biotic state (biotic indicators) our team has prepared a cook-book with clear steps of storylines implementation.

At the European scale, the main objective is to examine the relations between multiple stressors and the responses of ecological status and ecosystem service in future storylines. Our team has contributed to: a) the compilation and integration of European-level data in a European geo-database and b) the review of multi-stressor classification methodologies and methods relating e-flows with ecological status.



The Pinios river basin, one of the 16 MARS case studies



Extent of MARS- geo-database extent (solid blue)

More specifically we will analyse the relations between multiple-stressors and ecological status in water bodies by developing cumulative stress indices at European scale. Finally, we work on the analysis of large scale time series data of daily stream flow in order to determine the relation between low flows and ecological status measured by Biological Quality Elements (BQEs).

NOMOTELEIA: “Combining NOvel MOdeling TEchniques and Socio-economic Considerations for Effective, Efficient, and Acceptable Best Management Practices in Agricultural River Basins”

Aim

The aim of NOMOTELEIA project is to develop a novel methodology and a decision support tool, capable of assisting water and agricultural policy makers to optimise the planning of Best Management Practices (BMPs) in agricultural river basins.

- ◆ Inform policy makers, local authorities and farmers on the cost-efficiency of various BMPs.
- ◆ Support the development of the Programmes of Measures (PoMs) embedded in the national River Basin Management Plans (RBMPs).

Objectives

The objectives of NOMOTELEIA project include:

- ◆ Design of effective, efficient and acceptable Best Management Practices to combat water scarcity & drought and nutrient pollution in agricultural river basins.



NOMOTELEIA

Project's code: **NOMOTELEIA/2950**

Budget: € 135.000 (ARISTEIA I – GRST)

Duration: 27/09/2012 – 27/10/2015

Coordinating Beneficiary

National Technical University of Athens,
Centre of Hydrology and Informatics
(NTUA)

Scientific Coordinator: Prof. Maria
Mimikou



Study Area

The Pinios river basin constitutes a major agricultural area in central Greece, where a significant share of the Greek crop production for food, feed or industrial purposes takes place. The main environmental issues in the catchment are water scarcity & drought and nutrient pollution. According to the 1st RBMP in the region, the ecological status of the majority of the water bodies was found to be below good condition. The main drivers in the region are climate variability, extensive cultivation of water intensive crops (e.g. cotton, corn and alfalfa) and utilization of low-efficiency irrigation infrastructures and methods.

NOMOTELEIA's Key Features

- ◆ Combination of state-of-the-art techniques in data acquisition with distributed hydrological modelling.
- ◆ Review of Best Management Practices (BMPs) in agriculture and parameterization in hydrological models.
- ◆ Optimization of spatial allocation of BMPs by performing efficient and timewise optimization algorithms.
- ◆ Translation of specific policy goals into model parameters to seek optimal solutions under multiple environmental and economic criteria.
- ◆ Consideration of future climate change and socio-economic development.

The European Topic Centre on Inland, Coastal and Marine Waters

The European Topic Centre on Inland, Coastal and Marine waters (ETC/ICM) is an international consortium (17 partners) brought together to support the European Environment Agency (EEA) in its mission to deliver timely, targeted, relevant and reliable information to policy-makers and the public for the development and implementation of environmental policies in the European Union and other EEA member countries.

The **Centre of Hydrology and Informatics** is a key partner of this international consortium since 2007 with several important contributions including;

- ◆ Simulations of physical and anthropogenic systems
- ◆ Assessments on the implementation of EU environmental policies in the fields of water quantity, water resources efficiency
- ◆ Data management and software consultation for the Water Information System for Europe (WISE) - State of the Environment (SoE) Water Quantity data flow
- ◆ Active participation and technical support in European Commission's technical and working groups as well as in the EIONET community workshops.

Water accounts and water resources efficiency

ETC

Project's code: **EEA/NSV/12/002-ETC/ICM**

Budget: €400.000 NTUA (90% co-financed by EEA+ 10%national contribution)

Duration: 01/01/2014 – 31/12/2018

Consortium

Coordinating Beneficiary

The Helmholtz Centre for Environmental Research (UFZ)

Scientific Responsible for NTUA: Prof. Maria Mimikou

Associated Beneficiaries

- National Technical University of Athens (NTUA)
- Czech Environmental Information Agency (CENIA)
- Hellenic Centre for Marine Research (HCMR)
- The International Council for the Exploration of the Sea (ICES)
- Office International de l'Eau
- Finnish Environment Institute (SYKE)
- Thematic Center for Water Research, Studies and Projects development (TC Vode)
- Federal Environment Agency (Umweltbundesamt)
- Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)
- Institute within the legal entity Stichting Dienst Landbouwkundig Onderzoek (IMARES)
- Italian National Institute for Environmental Protection and Research (ISPRA)
- Institute for Water of the Republic of Slovenia (IWSR)
- Joint Nature Conservation Committee (JNCC)
- Norsk Institutt for Vannforskning (NIVA)
- Stichting Deltares (DELTAIRES) NL
- Ecologic Institute, DL

The CHI ETC team is responsible for implementing the framework of water accounts - United Nations System of Environmental-Economic Accounting for Water (UN SEEA-W) - in pan European scale and delivering regular updates of the quantitative status of inland freshwaters.

Employing the water accounts standardized tables, the team is elaborating the common (established across EU countries) indicator, which assesses the water exploitation based on the agreed formula of [water exploitation index plus \(WEI+\)](#).



Natural water retention measures-forest retention

This [report](#) provides a European overview of the role of forests in water retention, based on the EEA's Water Accounts Production Database. The results represent 287 sub-basins across Europe. The impact of forests on water retention is measured according to three parameters: forest cover, types and the degree of management of the forests.

WISE SoE data flow and data management

Data on freshwater resources availability, abstraction and use at regional spatial scale are collected through the WISE-SoE data flow. These data are primarily used to formulate the EEA's Core Set of Indicators.

The CHI ETC team is working in the full life-cycle management of the WISE SoE Water Quantity data flow (data collection, data dissemination, quality and metadata management). Also, the team supports EEA by implementing data updates required for the EEA products and publications. At year 2015 a new data model was implemented for the WISE SoE Water Quantity data flow, as a result of a content revision and experiences taken from previous data reporting.

Framework Contract on Freshwater Policy (EC/DG ENV)

Aim

The aim of the framework contract is to provide services to DG Environment to support the development and implementation of EU freshwater policies.

Scope

The scope of the Framework contract includes:

- ◆ Consultation on scientific, socio-economic and technical issues related to the Common Implementation Strategy (CIS) of the Water Framework Directive (WFD) and Floods Directive.
- ◆ Technical assistance on various issues: Assessment and compliance checking of the implementation of EU water legislation; Assessment of the inter-linkages between WFD and other pieces of EU water legislation; Development of the Water Information System for Europe (WISE); New policy developments and specific areas of study as a follow-up to the Blueprint.



NTUA involvement in successful bids within the Framework contract (2015)

Framework Contract on Freshwater Policy (EC/DG ENV)

Project's code: **ENV.D.1/FRA/2012/0014**

Duration: 2012 – 2016

Consortium

Coordinating Beneficiary

Amec Foster Wheeler

Scientific Responsible for NTUA: Prof. Maria Mimikou

Associated Beneficiaries

- National Technical University of Athens (NTUA)
- ACTeon
- HR Wallingford
- Institute for European Environmental Policy (IEEP)
- Madrid Institutes for Advanced Research (IMDEA)
- Czech Environmental Information Agency (CENIA)
- Regional Environmental Center (REC)
- Institute for Environmental Studies (IVM)
- Cambridge Econometrics (CE)



◆ **Support to the Water Framework Directive Common Implementation Strategy (CIS) groups and website and CIRCABC support**

NTUA has provided support to CIS WG Data and Information Sharing (DIS) by keeping minutes in the two annual meetings held in Brussels, drafting support documents and assisting the Commission officers in the preparation of the meetings. NTUA has also drafted two reports on the review and update of the structure of the WFD CIRCA group on CIRCABC and the Europa website on water issues. In 2015 WG DIS focused on the preparation of the 2016 WFD and FD Reporting (2nd RBMPs and 1st FRMPs). Discussions also included the preparations for the assessment of the RBMPs/FRMPs, indicators to communicate progress towards good status, reporting under other directives and WISE SoE and compliance with INSPIRE. NTUA will continue supporting WG DIS in 2016 through a new contract ("Support to the Water Framework Directive Common Implementation Strategy groups").

◆ **Analysis of the potential for growth and job creation through the protection of water resources, pack 2**

NTUA drafted an in-depth assessment for Greece focusing on the links between national water management and the economy. The analysis focused on quantifying the impacts on employment and growth from implementing EU water legislation and existing investment opportunities in the water sector. The current assessment updated and extended the work carried out by NTUA in a previous contract ("Potential for Growth and Job Creation through the Protection of Water Resources with a Special Focus on the further Implementation of the Water Framework Directive and Floods Directive"). The national assessments for the various MS were synthesized at European scale to produce a pan-European report.

◆ **EU-level instruments on Water Reuse**

NTUA has provided technical expertise in the completion of the Impact Assessment to support potential EU-level instruments on water reuse. In particular, NTUA contributed to the analysis of the environmental, social and economic impacts related to the implementation of WFD and UWWTD. The work of this project will continue in 2016 focusing on instruments for water reuse in irrigation and aquifer recharge.



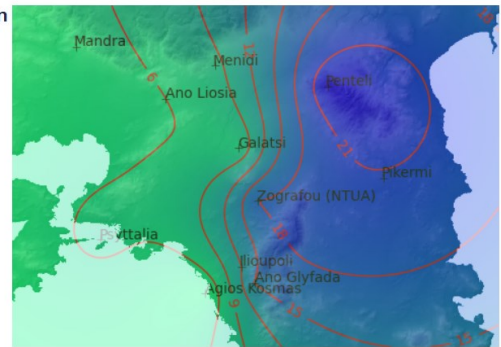
Hydrological Observatory of Athens

NTUA is operating the [Hydrological Observatory of Athens](#) (HOA), which includes a network of 11 fully-automated hydrometeorological stations, 3 conventional rain gauges and 4 fully-automated streamflow gauges in the broader Athens area (Attica) (~700 km²). HOA infrastructure includes 1 **weather radar** used for storm tracking, 1 **disdrometer** used for the investigation of rain drop size and 1 **mobile van** equipped with instruments used for on-site measurements (hydrometeorological, hydrological, water chemistry & biology).

The Rafina basin (127 km²) is a flood prone basin in Eastern Attica, which serves as an “operational catchment” used primarily for applied research, while the X-basin (15.18 km²) is a smaller catchment within the boundaries of the Rafina basin, which serves as an “experimental catchment” used for basic research. Both catchments are covered by the monitoring network of HOA.

Total rainfall per station

Ano Glyfada:	15.2
Zografou (NTUA):	18.0
Psytalia:	6.8
Pikermi:	20.8
Penteli:	23.2
Menidi:	8.2
Mandra:	5.0
Ilioupoli:	12.0
Galatsi:	6.6
Ano Liosia:	6.0
Agios Kosmas:	3.0



Total rainfall per station

The equipment of the Mobile Van is appropriate for:

- ◆ Determination of soil characteristics (infiltration capacity, hydraulic conductivity etc.)
- ◆ Determination of basic water quality parameters for both groundwater and surface water.
- ◆ Determination of hydrogeological parameters (pumping tests, drawing up of piezometric maps etc.)
- ◆ Measurements of water level (in rivers, streams, springs etc.)
- ◆ Measurements of groundwater level (levels up to 400m, depths of drillings)
- ◆ Measurement of hydrometeorological parameters (rainfall depth, humidity, air tempera-



The Weather radar system

The weather radar system is based on magnetron technology, and is used for enhanced measurement of precipitation intensity, real-time correction of rainfall attenuation, weather surveillance and tracking, severe weather indication and hydrological forecasting.

Some [remarkable points of 2015](#) are:

- ◆ The team received a weather radar system designed for the detection of rainfall intensity.
- ◆ The web application [HOA](#) served data and information for rainfall events of 2015.
- ◆ Flow measurements were taken by the properly equipped mobile van of the observatory.

Publications:

Reports:

- ◆ Nihat Zal (EEA), Annemarie Bastrup-Birk (EEA), George Bariamis (NTUA), Mathias Scholz (UFZ), Anastasia Tekidou (NTUA), Hans D. Kasperidus (UFZ), Evangelos Baltas (NTUA), Maria Mimikou (NTUA), Beate Werner (EEA), Wouter Vanneuville (EEA), Blaz Kurnik (EEA), Peter Kristensen (EEA) and Ronan Uhel (EEA)(2015). Water-retention potential of Europe's forests: A European overview to support natural water-retention measures, EEA Technical report, No. 13/2015
- ◆ Pierre Strosser (ACTeon), Gloria De Paoli (ACTeon), Gonzalo Delacámara (IMDEA), Chris Fawcett (Amec Foster Wheeler), Alexander Psomas (NTUA), Aggelos Tsakanikas (NTUA), Ivan Zayas (ACTeon), Verena Mattheiss (ACTeon), Olga Mashkina (ACTeon), Ilona Kierhensteine (Amec Foster Wheeler), William Small (Amec Foster Wheeler), Natalia Zglobisz (Amec Foster Wheeler), Victoria Cherrier (Amec Foster Wheeler), Mojca Hrabar (REC), Gorana Ćosić-Flajsig (REC), Hana Prchalova (CENIA), Tomáš Volek (CENIA), Frans Oosterhuis (IVM), Milkana Mochurova (Free-lance consultant, Bulgaria), Galia Bardarska (Free-lance consultant, Bulgaria), Daiva Semenienė (AAPC), Sandra Oisalu (BEF) (2015). Analysis of the potential for growth and job creation through the protection of water resources, pack 2, Final Report, Framework Contract ENV.D.1/FRA/2012/0014

Publications in Journals:

- ◆ Stefanidis K., Y. Panagopoulos & M. Mimikou (2015). Impact assessment of agricultural driven stressors on benthic macroinvertebrates using simulated data. Science of the Total Environment, Vol. 540, pp. 32-42
- ◆ Papathanasiou, C., Makropoulos, C., Mimikou, M., (2015). Hydrological modelling for flood forecasting: Calibrating the post-fire initial conditions, Journal of Hydrology, Elsevier, Vol. 529, No 3, pp.1838-1850
- ◆ Baltas, E., Panagos D., Mimikou, M., (2015). An Approach for the Estimation of Hydrometeorological Variables Towards the Determination of Z-R Coefficients, Environmental Processes, Vol. 2, No 4, pp. 751-759

Workshops:

- ◆ 2nd MARS Data Analysis Workshop, 13-17 July 2015, Tulcea, Romania
- ◆ 3rd MARS Workshop, 7-11 December 2015, Lisbon, Portugal
- ◆ WFD CIS Water Accounts Working Group, 19 March 2015, European Commission , Brussels
- ◆ WFD CIS Data and Information Sharing Working Group, 28-29 April 2015, European Commission , Brussels
- ◆ WFD CIS Data and Information Sharing Working Group, 13-14 October 2015, European Commission , Brussels
- ◆ Freshwater Eionet Workshop, 18-19 June 2015, European Environment Agency, Copenhagen
- ◆ 2nd ETC WFD Assessment Workshop, 16-17 November 2015, Ecologic Institute, Berlin
- ◆ Data Team Meeting of ETC/ICM, 3 - 4 March 2015, European Environment Agency, Copenhagen, Denmark
- ◆ Training in Common Workspace, 24 - 28 August 2015, European Environment Agency, Copenhagen, Denmark
- ◆ WssTP Brokerage and Working Groups Event, 23-24 November 2015, Brussels, Belgium
- ◆ EurAqua Management Board Meeting, 11-12 November 2015, Koblenz, Germany
- ◆ European Geosciences Union General Assembly 2015, 12-17 April 2015, Vienna
- ◆ 4th European Water Conference, 23-24 March 2015, Brussels, Belgium

Books & Book Chapters:

- ◆ Kossida M., Mimikou M., (2015). A methodological framework for assessing drought hazard using operational indicators. Book Chapter in: Advances in Watershed Hydrology, Water Resources Publications, LLC, Colorado 80163-0026, USA
- ◆ Mimikou, M., Baltas, E. and Tsihrintzis, V. (2015) Hydrology and Water Resources System Analysis, (in press), CRC Press, Taylor and Francis Group.

Participation at Conferences:

- ◆ C. Papathanasiou, V. Pagana, C. Makropoulos, C. Massari, S. Barbetta, L. Brocca, M. Mimikou and T. Moramarco. (2015) Automating flood hazard mapping in a typical periurban area Le Giornate Dell'Idrologia, 6-8 October 2015, Perugia, Italy.
- ◆ D. Poursanidis, G. Kochilakis, N. Chrysoulakis, V. Varella, V. Kotroni, K. Lagouvardos, G. Eftychidis, C. Papathanasiou, C. Makropoulos and M. Mimikou (2015) FLIRE: an EO-based DSS for combined flood and fire risk assessment in peri-urban areas, Mapping Urban Areas from Space (MUAS), 4-5 November 2015, ESA/ESRIN, Frascati, Rome, Italy
- ◆ C. Papathanasiou, V. Pagana, C. Macropoulos and M. Mimikou (2015) Examining the sensitivity of flood modelling in periurban areas in rainfall input of variable accuracy, 14th International Conference on Environmental Science and Technology (CEST 2015), 3-5 September 2015, Rhodes, Greece.
- ◆ D. Poursanidis, G. Kochilakis, N. Chrysoulakis, V. Varella, V. Kotroni, G. Eftychidis, K. Lagouvardos, C. Papathanasiou, G. Karavokyros, M. Aivazoglou, C. Makropoulos and M. Mimikou, (2015) Hydrological modelling for flood forecasting: calibrating the post-fire initial conditions, FLIRE DSS, A web service system for the management of wildfires and floods in urban and periurban areas, 13th International Symposium on Geo-disaster Reduction, Prague 09-11 August 2015.
- ◆ D. Poursanidis, G. Kochilakis, N. Chrysoulakis, V. Varella, V. Kotroni, G. Eftychidis, K. Lagouvardos, C. Papathanasiou, G. Karavokyros, M. Aivazoglou, C. Makropoulos and M. Mimikou, (2015) Web service systems for the management of natural disasters – The case study of the FLIRE DSS in urban and rural areas, SafeChania 2015, Chania – Greece 10-12 June 2015
- ◆ I. Mitsopoulos, G. Eftychidis, C. Papathanasiou, C. Makropoulos and M. Mimikou, (2015) Post Fire Debris Flow Potential in a Fire Prone Mediterranean Landscape, II International Conference on Fire Behaviour and Risk. Alghero, Sardegna – Italy, 26-29 May 2015.
- ◆ I. Mitsopoulos, G. Eftychidis, C. Papathanasiou, C. Makropoulos, M. Mimikou., (2015) Assessing post fire flood risk potential in a typical Mediterranean Wildland – Urban Interface of Greece, International Conference on Changing Cities 2. Porto Heli, Peloponnese – Greece 22 – 26 June 2015
- ◆ V. Kotroni, K. Lagouvardos, N. Chrysoulakis, C. Makropoulos, M. Mimikou, C. Papathanasiou, D. Poursanidis (2015) Weather monitoring and forecasting over eastern Attica (Greece) in the frame of FLIRE project, European Geosciences Union, General Assembly 2015, Vienna, Austria, 12 – 17 April 2015.
- ◆ Poursanidis D., Kochilakis G., Chrysoulakis N., Varella V., Kotroni V., Eftychidis G., Lagouvardos K., Papathanasiou C., Karavokyros G., Aivazoglou M., Makropoulos C. and Mimikou M., (2015), The FLIRE DSS, A web service SYSTEM for the management of natural disasters in urban and rural areas, RSCy2015 – Paphos, Cyprus, 16-19 March 2015

Personnel:

Researchers & PhD Candidates

[Maria Mimikou](#) Professor/ Research Coordinator
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Kostas Stefanidis Biologist, Post Doc
Ioannis Konstantinou Computer Engineer, Post Doc
Yiannis Panagopoulos Agricultural Engineer, Post Doc

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Chrysoula Papathanasiou Civil Engineer, PhD Candidate
George Bariamis Civil Engineer, PhD Candidate
Vaso Pagana Rural Engineer, MSc
Dimitris Panagos Civil Engineer, MSc

Collaboration with Faculty Members

Evangelos Baltas Professor (ETC/HOA)
Christos Makropoulos Assistant Professor (FLIRE)

Consultants

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