## ATMOSPHERIC EMISSIONS FROM FOREST FIRE DURING 2005-2014 IN GREECE

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### Abstract

Forest fires are major sources of harmful gases and particulate matter in the atmosphere. These emissions are believed to be a significantly influence to the chemical composition of the atmosphere and the earth's climate system. The wide variety of pollutants released by forest fires includes greenhouse and other gases (CO<sub>2</sub>, CO, NH<sub>3</sub>), volatile organic compounds (VOCs) photochemically reactive compounds, and fine and coarse particulate matter (PM<sub>2.5</sub> & PM<sub>10</sub>). Through direct emissions and secondary chemical and physical processes, forest fires can have a significant impact on tropospheric chemistry and serve as a major source of air pollution.

In this paper, the publications related to the emission productions caused by forest combustion were collected and reviewed, mainly focus on the six emission products (including NO, NO<sub>2</sub>, CO, O<sub>3</sub>, PM<sub>2.5</sub> & PM<sub>10</sub>).

With respect to forest fires, Greece faces one of Europe's most severe problems during summer. In the framework of the present work, a number of issues concerning forest fires happened in Greece during the period 2005-2014 were investigated. It also analyses the meteorological and air quality data collected by the Hellenic National Meteorological Service and the Ministry of Environment, Energy and Climate Change during the forest fire events.

It is found that during certain forest fire events a significant increase of the measured concentrations of both particulates and ozone was regarded in the majority of the cases, while prolonged dry periods were also regarded before forest fire events.

Keywords: Air quality, forest fire events, smoke dispersion, aerosols, PM<sub>10</sub>, PM<sub>2.5</sub>, O<sub>3</sub>, VOCs.

## SECOND LEVEL PRE-EARTHQUAKE ASSESSMENT FOR MASONRY BUILDINGS – PILOT APPLICATION

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### Abstract

Masonry is one of the oldest building materials. However, knowledge about the mechanical behaviour and the response of masonry buildings is relatively limited. In every medium or large earthquake in Greece and worldwide, masonry buildings are highly vulnerable due to several reasons such as the brittleness of unreinforced masonry, insufficient diaphragm action of the floors and roof, aging of materials, poor maintenance, inadequate connection of the horizontal and vertical elements of the supporting structure etc.

The range of buildings of masonry construction as found throughout Greece is enormous. Many buildings are public gathering places while a significant number have been declared as listed buildings.

Addressing the problem requires an initial inventory and hierarchical evaluation of the building stock in order that financial resources are optimally mobilised for the seismic strengthening of the buildings.

The hierarchical evaluation of the existing building stock is performed through a three level assessment. The corresponding methodologies are developing by special scientific committees of EPPO. In this presentation we focus in the implementation of the second level of pre earthquake assessment in selected masonry buildings, in order to evaluate the method and propose improvements, if necessary. For each masonry building the 'relative seismic risk index'is calculated which enables priority ordering for the State before the third stage of the process.

The inspection of the buildings, the gathering of information and the relevant calculations of the indices were carried out by the scientific staff of EPPO, in the cities of Athens and Nafplio, in Greece. Through the process several conclusions were derived which can be included in a future update of the methodology used.

## BERTISS PROJECT - BALKAN-MEDITERRANEAN REAL TIME SEVERE WEATHER SERVICE

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#### Abstract

The present investigation aims to describe the main objectives, activities and expected results of the research project BeRTISS (Balkan-Mediterranean Real Time Severe weather Service) funded by the European Territorial Cooperation Programme "Interreg V-B Balkan-Mediterranean 2014-2020". BeRTISS targets to establish the first transnational operational service for monitoring severe weather events in the Balkan-Mediterranean area by exploiting Global Navigation Satellite Systems (GNSS) tropospheric products. GNSS signals transmitted from satellites to the ground reference stations are delayed by ionosphere and water vapor in troposphere. Ionospheric propagation delay can be easily removed, while tropospheric delay needs to be calculated with the aid of surface pressure and temperature variables. By knowing the tropospheric delay, the Precipitable Water Vapour (PWV) is easily assessed. GNSS derived PWV has been proved to be a valuable data source for Numerical Weather Prediction (NWP) models forecasting. BeRTISS real-time service, is the extension of the existing European GNSS network of tropospheric products,

will provide continuous information for nowcasting and forecasting for PWV over Greece, Bulgaria and Cyprus using the GNSS derived tropospheric products and WRF (Weather Research and Forecasting) model. For this purpose, the following activities have been planned and already started to be implemented: 1) establishment of a new GNSS data Analysis Center at Frederick Research Center in Cyprus, 2) installation of 15 new GNSS stations and 25 new accurate meteosensors in Bulgaria, Cyprus and Greece, 4) development of a user-friendly web-platform for monitoring weather conditions that will serve as an early warning information system.

## SEISMIC ASSESSMENT OF REINFORCED CONCRETE BRIDGES – PILOT APPLICATION

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### Abstract

The purpose of carrying out a seismic assessment analysis of an existing bridge is to determine the level of risk associated with loss of serviceability, severe damage, or collapse. With this risk quantified, rational decisions can be made as to whether the bridge should be retrofitted or to accept the risk and leave the bridge in the existing state.

A good bridge inspection reporting system is essential to document bridge conditions and to protect the public's safety and investment in bridge structures. A uniform reporting system all over the nation is essential to evaluate the condition of a structure correctly and efficiently. It is a valuable aid in establishing maintenance priorities and replacement priorities, and in determining structure capacity of the nation's bridges.

The hierarchical evaluation of the existing bridges, according to the methodology that has been developed in EPPO byspecial scientific committee, can be performed through a two stages seismic assessment. The first stage involves a general screening and prioritization studyin order to determine the bridges at the greatest risk. The second stage involves a more detailed analysis. In this presentation we focus in the implementation of the two stages seismic assessment in a selected bridge, in Greece. The seismic assessment was carried out under the supervision of EPPO, in order to evaluate the existing methodology and propose further improvements. Additionally, a performance based analysis of the bridge followed the second stage assessment. As a conclusion the existing methodology needs to be updated.

# COPERNICUS SENTINEL SAR DATA AS AN OPERATIONAL TOOL FOR OIL-SPILL DETECTION AND MONITORING: THE CASE OF SARONIKOS GULF (SEPTEMBER OF 2017)

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### Abstract

When oil spills are approaching shorelines, not only is the marine and coastal ecosystem affected but the social life of the nearby inhabitants too. The present study deals with the detection and monitoring of the oil spill, after the sinking of an oil-tanker in the Saronic Gulf on 10 September 2017. For this research, SAR GRD images from satellite Sentinel-1 are used in order to detect the oil spill, covering the period of September 2017. SAR image processing is based on open source ESA's software SNAP, and mapping based on free and open source QGIS. In addition, OCN data from Sentinel-1 are used in order to get information about the direction and the speed of the air at the sea surface. PlanetScope Optical images are also used to identify oil spills, whenever feasible. The main objective of the study is to detect and monitor the migration of the oil spill to assess the magnitude of the environmental pollution in the area and to identify the factors leading to its spreading. Finally, the operability of the Copernicus data is assessed by modeling the migration of the oil spill, in order to manage similar environmental disasters in the future. The findings from this study are that wind plays an important role in the movement of the oil spill on the surface of the sea and for the most reliable detection it is necessary to use SAR and optical data that regularly cover the area of interest.

# DELINEATING FLOOD BOUNDARY USING UNMANNED AERIAL VEHICLE (UAV)-DERIVED IMAGERY AND GROUND OBSERVATIONS: THE CASE OF THE 2017 MANDRA FLASH FLOOD IN GREECE.

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### Abstract

On November 15 2017, a high intensity storm, reaching 300mm in 13 hours, hit the western part of the region of Attica in Greece, causing a catastrophic flash flood in the town of Mandra and Nea Peramos, inducing 24 fatalities and extensive damages in property and infrastructure. The research team surveyed the area during and after the flood using a combination of systematic ground and aerial observations with the aid of an unmanned aerial vehicle (UAV). Based on collected imagery the team identified different types of flood extent indicators, including mudlines, debris lines and others, which were recorded and lead to flood boundary delineation across the inundated area.

This study shows how aerial observations can improve flood extent definition accuracy that in turn is very useful for future risk mitigation efforts, including prevention, evacuation and emergency management planning and other civil protection purposes, as well as impact assessment and flood hazard assessment in data-poor regions, such as the Eastern Mediterranean.

# COMPLETE SEISMIC HISTORY OF SOUTHERN AND SOUTHWESTERN PELOPONNESE (GREECE) AND RESPECTIVE ESI 2007 INTENSITIES

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#### Abstract

The complete and detailed knowledge of the historical earthquakes, the past earthquake environmental effects (EEE) and the respective seismic intensities serves as a valuable tool for revealing subareas of significant earthquake-related hazards where no macroseismic damage data are available, testing the susceptibility of the affected area to the same EEE and improving preparedness to cope with and overcome the changes that an earthquake induces on the affected area. Although other efforts have been made to record the EEE of individual earthquakes in Greece and evaluate their ESI 2007 seismic intensity, no one has ever focused on the complete seismic history of an area and the respective intensities based on the induced EEE. The southern and southwestern Peloponnese, one of the most active areas in the Eastern Mediterranean, was considered appropriate for this approach.

Based on historical and recent seismicity data, the area has been often struck by destructive earthquakes. Taking into account various sources, the complete catalogue of destructive historical earthquakes from 550 BC to 1899 AD is presented for the first time with all induced EEE. Based on the application of the ESI 2007 scale, the most susceptible areas to EEE are the Kalamata basin followed by Sparta basin, the eastern slopes of Taygetos Mt, the Ionian coast of Messinia and the Kyparissia Mts. The maximum assigned local environmental seismic intensities are  $X_{ESI 2007}$  for Sparta basin, VIII-IX<sub>ESI 2007</sub> for Kalamata basin, VIII<sub>ESI 2007</sub> for the Ionian coast of Messinia and VII<sub>ESI 2007</sub> for Kyparissia Mts.

## THE 2018 FOREST FIRE OF MATI, GREECE: CHARACTERISTICS AND IMPACTS

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Abstract

Although forest fires are an integral part of the Mediterranean region and its ecosystems, human presence in the forests exposes infrastructure, socio-economic activities and human lives to a high level of risk. Despite the advances in firefighting and planning, fire-related fatalities and damages record significant numbers every year in the region and elsewhere, highlighting the need for further enhancement of protection. On 23 July 2018, one of the deadliest wildfires of this century, devastated the small towns of NeosVoutzas and Mati in Greece, burning thousands of houses and businesses and taking the lives of at least 98 individuals. The research team used a combination of ground and aerial observations, derived from a UAV, to examine fire characteristics, mortality and impacts of the disaster and studied the local weather conditions.

The analysis showed a rapid rate of spread eastwards and downslope, that gave only limited time for the local population to evacuate, through the narrow streets of Mati. Fatalities occurred mostly near the coast where people were eventually trapped, due to difficult access to the beaches.Fire-induced damage was observed in all building types. Buildings with light timber framing system and plasterboards suffered the most. Collapse of burnt wooden roofs, decomposition of exterior and interior wall materialsalmost into powder due to extreme temperatures, extensive cracking of load-bearing walls and subsequent partial or total collapse of the structure were mostly observed in these buildings. On the contrary, the affected well-designed and constructed reinforced-concrete buildings behaved relatively better and suffered non-structural damage.

## BIG DATA ANALYSIS FOR NATURAL DISASTER MANAGEMENT THROUGH SOCIAL MEDIA

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### Abstract

The impact of climate change has radically increased the amount and magnitude of natural disasters. Despite the development of specialized IT/GIS tools, there are unpredictable factors during an emergency which are too complex to be evaluated. Social mediain formation regarding the disaster collected from individuals located near the area of the disaster can provide useful information when dealing with specific disaster situations. Unfortunately, this data is hard to find and evaluate within the wide pool of social media postings related to the disaster. From the perspective of public authorities, the main challenge for using social media is the lack of control over the lineage of the information, and thereby an unknown reliability and trustworthiness.

Since social media come from autonomous users, they may contain false information. As a result, most public agencies have been more unwillingin adopting social media information for natural disaster management.

This article presents an approach towards the effective and accurate enhancement of decision support tools for natural disaster management with social media. A 'big data'- oriented approach is proposed, in order to cope with challenges of huge amounts of data, in a variety of formats and quality that must be processed quickly. Then ovelty of the approach lies in the enhancement of geospatial contentretrieved from predictions imulations with real-time disaster-related information from tweet messages during an emergency. The methodology is based on the enrichment of geospatial content retrieved from Geographic Information Systems (GIS) modeling out comes with real-time disaster-related information from social media during an emergency incident. Instead of solely relying on social media sources or 'a posteriori' analysis through classification or machine learning approaches, the applied methodology is based on the combination of spatial danger rating models with geo-social tweet messages .The findings show that social media content encloses potentially useful information and can act as an additional communication channel for citizens who have been affected by a disaster. The article aims to highlight the role of geospatial big data such as geo-located tweet messages in the effective confrontation of natural disasters.

# CORRELATION OF FOREST FIRES AND DIFFERENTIATED HUMIDITY ON SLOPES (WINDWARD AND LEEWARD): CASE STUDY OF NOVA FRIBURGO, RJ, BRAZIL, 2017

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### Abstract

The Rio de Janeiro floods and mudslides event that occurred in January 2011 isperhaps the worst natural hazard that occurred in Brazil. It caused more than 900 fatalities and billions in damages. Nova Friburgowas among the affected areas with more than 2550Gravitational Mass Movement (GMMs) according to the Nova FriburgoCity Hall.

It is known that soil areas with no or low vegetation, either as a result of deforestation or wildfires are more susceptible to GMMs. According to the local Fire Department, just in September and November, 2017 there were 117 and 92 fire outbreaks in the region, respectively. For that reason, the Nova Friburgo City Hall established a partnership with the local Fire Department in 2018 aimingto reduce the number of wildfires.

The purpose of this study is to identify the South's aspect-oriented through a Digital Elevation Model (DEM) generated in the Quantum GIS 2.18 software. Specifically, this research investigates the direction of moist air masses originated from the Atlantic Ocean, as well as the satellite images provided by Planet Labs in order to crossfire the leeward side of the mountains and manage to detect a preponderance pattern of fires in the dry areas.

This study is still in progress and its conclusive results will be published in the future. Any significant outcome could contribute in the fire preparedness mechanisms and prevent catastrophic disasters such as the wildland urban interface fire event that occurred in Attica, Greece in 2018.

## A Database Development in Nova Friburgo, Brazil for the Analysis and Complementation of the Mapping Methodology proposed in the GIDES'S Project

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### Abstract

The Project for Strengthening National Strategy of Integrated Natural Disaster Risk Management – GIDES (3<sup>rd</sup>place in Sasakawa Prize, 2017) was developed from July, 2013 to November, 2017 with the objective of promoting the technical exchange between the governments of Japan and Brazil for the risk management of gravitational mass movements. The municipality of Nova Friburgo was included in the scope of this Project as a pilot city. The Geomatics Management sector received a letter of recognition of technical capacity from the Geological Survey of Brazil - CPRM to apply and disseminate the methodology of the GIDES Project. During this project, Brazil's lack of quantification and statistical analysis of mass movements linked to past events was evident. In order to complement the mapping methodology proposed in the GIDES' Mapping of Hazard and Risk to Gravitational Mass Movements Guide the sector through this work extracted data of 114 hills breaks of

planar landslides that destroyed about 57% of the lost buildings in Nova Friburgo in January 2011 resulting in 475 construction losses. The information generated for data development was: height, width and maximum slope of occurrences as well as type of material moved, maximum slope and verification of exposure of rocky outcrop after slides. The final verification of the reliability of the planar gliding methodology of this guide was carried out with field confirmations and use of high resolution aerial images to georeference destroyed buildings in the 2011 event. The final results are currently under development.

# RENEWABLE ENERGY GENERATED BY THE IMPACTS OF NATURAL AND ACCIDENTAL WATER-BASED DISASTERS

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#### Abstract

In 2018, Hurricane Florence in the Southeast US Coast and Typhoon Mangkhut (known as Typhoon Ompong in the Philippines) in South China Sea caused at least 20 and 62 fatalities respectively, as of September 16. Such events highlight that the magnitude of extreme water-based disasters (WDs) cannot always be accurately predicted at a local level, largely due to their scale and unpredictable nature. Most current weather forecasting models present generalized or large-scale solutions based on limited and/or inaccurate input data. As a result, incorrect or missed alarms frequently lead to property losses and human casualties, especially in remote and low income areas. Rural communities in riparian and deltaic areas are often affected, as they are unable to manage the WDs effectively. Furthermore, insufficient and unstable power resources in these regions also undermine disaster response capabilities, along with wider socio-economic growth. Hydropower could provide solutions, as it offers the potential of energy production autonomy to such communities. However, can hydropower systems provide warnings and 'smart'

evacuation routes during the WDs? This research introduces a pioneering plan for the use of potentially lost energy during the WDs to directly support emergency response. It investigates the conceptual model of a mini (or smaller-scale) hydropower generator that includes early-warning alarm systems appropriately designed to operate at the local level. In practice, this study focuses on units that support power needs to end-users under both normal and extreme conditions. Positive outcomes could lead to the direct integration of sustainable economic development and disaster preparedness within these communities.

# RENEWABLE ENERGY AND DRONES IN SEARCH AND RESCUE: AUTOMATED NETWORK FORAIR-SEA ACTIONS

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### Abstract

Human migration has become a major concern for the experts in search and rescue. In 2018 alone, more than 74,500 migrants entered Europe by sea (Mediterranean Sea), while 1600 others died trying, as of September 16. These numbers highlight that the early detection of the migrant boats and sea survivors is essential in order to minimize casualties, especially during extreme weather events. For that reason, unmanned aerial vehicles (UAVs) are widely used in air-sea rescue (ASR) missions. The UAVs surveil large areas in short periods of time; however, their power dependency limits their potential. The in situ recharge of the UAVs that surveil remote sea areas could be a possible solution to this problem. Tidal energy generators and platforms with solar collectors could recharge them. Moreover, pre-installed navigation systems could reduce the needs in recourses and overall costs. This study investigates those scenarios by presenting an automated network of multifunctional buoys and UAVs. The buoys are semisubmerged tidal energy generators that are capable of recharging one or more UAVs depending on the available energy. They are also equipped with mini solar collectors, meteorological sensors, warning systems and survival kits. The UAVs are equipped with thermal and color sensors in order to detect disturbances on the sea surface. By establishing this network in remote sea areas that include migrant sea lanes, this study aims to provide the coast guard with a reliable, automated and self-powered tool that could detect sea survivors or threats within sufficient given time.

## NATURE-BASED METHODS TO MITIGATE NATURAL DISASTERS: THE ECOMED PROJECT

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#### Abstract

Floods and landslides are common natural disasters that can cause major financial problems and in many cases lead to fatalities. The Mediterranean is susceptible to these disasters because of its natural characteristics that include the semi-arid climate, sparse vegetation, many dry lands, steep topography and natural and frequent wildfires. The forecasted changes in climate for the region are increased precipitation intensities along with prolonged droughts that should increase flood and landslide frequency and intensity. The adoption of soil and water bioengineering approaches (nature-based methods) to mitigate these disasters in the Mediterranean is the aim of the ECOMED project. Soil and water bioengineering involves the use of living plants or cut plant material in combination with inert structures. Utilizing nature-based methods appears to be a cost-effective and sustainable way to mitigate floods and landslidesthat are also more easily applicable at large scales. The ECOMED project is providing case studies of successful soil and water bioengineering works from the Mediterranean as examples to be used by other practitioners. Three protocols and template have been developed that are: a) Work Selection Criteria Protocol, b) Work Analysis Definition Protocol, c) Field Work Protocol and d) Case Study Report Template. Finally training material has been developed specific for the soil and water bioengineering sector in the Mediterranean. These tools will help develop the next generation of well-trained practitioners in soil and water bioengineering techniques in Mediterranean scenarios to increase their adoption and effective implementation in the region.

# EXPLORING OMEGA VERTICAL VELOCITY PATTERNS DURING JULY 23 2018 WILD FIRES IN ATTICA, GREECE

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### Abstract

The Omega Vertical Velocity (VV) is an atmospheric parameter useful for exploring extreme atmospheric phenomena. The study of this parameter can help us to understand phenomena related to mesoscale meteorological patterns. In this short note, we explore the vertical and horizontal spatial distribution of this atmospheric parameter during July 23, 2018 wildfires in Attica – Greece. For this purpose we extract model results of the vertical velocity from NCEP/NCAR NOAA reanalysis database, ECMWF, Giovanni database and GFS archive charts. Furthermore we compare the values of Omega vertical velocity to the climatological ones over the Greater Athens Area, using the 1981 – 2010 ECMWF reanalysis data climatology. The results indicate the occurrence of unusual down to surface values of Omega vertical velocity for this time of year (constant values of VV are occurred during warm season of the year and elevated values during cold season of the year). This behavior of vertical velocity may was an additional factor contributed to the rapid expansion and spread of the devastating wild fires.

# DISASTER PREPAREDNESS & RESPONSE FOR VULNERABLE GROUPS OF POPULATION: EVACUATION PLANNING OF CRITICAL INFRASTRUCTURES IN CASE OF AN EARTHQUAKE OR A FIRE FOR PEOPLE WITH DISABILITIES

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### Abstract

This study examines the key aspects relevant to the evacuation of people with disabilities in emergency situations, e.g. in case of an earthquake or a fire; the latest also includes the need for evacuation due to emission of dense smoke in case of a wildland urban interface (WUI) fire. In that framework, a resume of existing work worldwide relevant to emergency preparedness and response of people with disabilities will be presented; existing legislation and standards for evacuation of buildings focusing on vulnerable groups of population will be presented. With the scope of enhancing self -protection against disaster risks and support training for minimizing them, a number of tips will be proposed for setting up "Personal Emergency Evacuation Plans (PEEPs)", focusing on vulnerable groups; people with disabilities, taking also into consideration thespecific type of disability, e.g. mobility impairment, visibility impairment (blind or low vision) etc. In light of the "Universal Design" concept, the newest egress signs specifically designed for people with disabilities will be introduced and integrated for the first time in a building's "Fire Escape

Plan" indicative paradigm. The education and training of people with disabilities in copying with disaster is vital, since they are considered vulnerable and potentially in danger. Taking into consideration that everybody may potentially encounter some type of temporary impairment during their lifespan, this is becoming a priority issue.

# THE IMPLEMENTATION OF THE ORIENTATION-TECHNIQUE BOTH IN THE AREAS OF THE FOREST-CONSERVATION AND WILDFIRE-SUPPRESSION

### SokratisPapageorgiou

Fire Major in Fire Branch-Regional Fire Administration of Central Macedonia

### Abstract

**Introduction:** The specification of the exact onset spot of the wildfire, constitutes the most crucial factor in wildfire-suppression. In order to locate and announce a wildfire, observatories (Fire-Outpost) are used from where fire-safeguards are able to directly perceive the bursting out of fire in their designated area of protection.

**Aim:** The specification of the exact onset spot of a fire with greater precision through incorporating the orientation-technique via a sophisticated google earth application.

**Materiel:** The living work-force serving in PE.K.E. (Regional Operative Base - 199) together with the fire-safeguards as well as the inanimate such as compasses, computers, google earth map.

**Method:** A simulation of the onset-spot is carried out with a discrete point - construction (summit, building, telephone antenna) is signaled wirelessly from the Operative Base to the fire-safeguards. Each of them calculates the azimouthio (degrees) of the spot in relation to his observatory. The specific degrees are declared to the Operative Base wirelessly again. The firefighter in PE.K.E.-199 draws in the google earth map straight lines where the start lines are the positions of the observatories and as for the angles these are equal to the degrees given by the fire-safeguards. Then he compares the cutting - points of the straight lines in comparison with the distinguishable point (claimed fire) in the google map and he calculates the divergence in metres.

**Results:** As for the positive ones, these are the speed of information, the defining precision of the onset - point and the reduction of the intervention time. The negative one is the difficulty of accepting this method by everyone.

**Conclusion:** The application had better be re-tested, the fire-safeguards should receive further training and we ought to improve it by introducing more précised devices of degrees - calculation, such as theodolicho and the binoculars equipped with a compass.

## SOFTWARE TOOLS TO THE RESCUE – **A**NOVEL APPROACH IN THE SERVICE OF CIVIL PROTECTION

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### Abstract

Information technologies have the potential to improve the way in which organizations handle Civil Protection issues in which they are involved in areas such as communications and information-gathering, in supporting critical decision-making, and addressing many other issues of a disaster.

However, there are particular problems in developing appropriate systems. Developers should consider: a. The limited skills-capabilities of the targeted user base. b. The fact that users should be effective under harsh conditions and time pressure; and c. The operational and legal framework of the unit that will use it.

Thus, at the Civil Protection Department of the Attica Region, instead of developing large monolithic systems using classical software development methodologies, we are using multiple available technologies for mobile and desktop platforms for the development of a series of "first line" and administrative management tools such as:

- On the Android mobile platform: a. A specialized app with critical service and contractor telephones including a list of available vehicles and machinery (Register of Personnel and Civil Protection Facilities) and b. An app with up-to-date information on weather and forest fire hazards.
- Web application for processing of spatial data (air-conditioned facilities, heated facilities, earthquake gathering zones etc) including maps (Google MyMaps).

• Web application for: a.Tracking the fleet of vehicles and machinery in emergency situations; and b. Automatic processing of tracking data for expense administration purposes (application under development).

## METEOROLOGICAL CONDITIONS AND THE EVOLUTION OF WEST NILE FEVER IN WEST ATTICA

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### Abstract

In this short note, we explore the possible link between precipitation patterns of summer 2018 in West Attica – Greece and the numeric evolution of confirmed cases of West Nile fever. All available data were adopted from the European Centre for Disease Prevention and Control. The results indicate the occurrence of unusual high values of precipitation for this time of year, which may have contributed to the rapid expansion and spread of the West Nile fever.

# AN APPROACH TO DEVELOP AN INTEGRATED DATABASE OF NATURAL DISASTERS IN THE REGION OF WESTERN MACEDONIA.

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#### Abstract

Natural disaster risk is a crucial factor in decision making for regional planning and design. It is also critical for insurance industry and investment returns. To get qualitative or quantitative indicators for disaster risk, previous catastrophes and their direct and indirect losses should be considered. Data and statistics are important in understanding the impacts and costs of disasters. The increasing number of catastrophes in the last years and climate change have made this even more urgent. Especially, the area of Western Macedonia, which is the heart of the energy sector in Greece, has suffered several times from natural disasters. However, all or most of the disastrous events and their losses haven't been included yet in an integrated database. The present study aims at the development of such a database for Western Macedonia as an approach to record and categorize natural hazards and their consequences. Data will be collected based on records available from literature, media and national authorities. The database includes hazard characteristics (intensity, frequency), socio-economic and environmental losses (human losses, infrastructure problems caused, agricultural losses). Emphasis is given to the spatial distribution of disasters and their distribution in time. When not all of the required characteristics are available assumptions are made based on similar disastrous events in other regions. The study also discusses how different hazards interact with each other and the effect of climate change on the intensity of natural hazards in the last years. Finally, the ultimate goal is to use this systematic disaster data collection to inform policy decisions to help reduce disaster risks and build resilience.

# SUSTAINABLE FOREST BIOMASSEXTRACTION AS A TOOL FOR FOREST FIRE RISK REDUCTION AND CLEAN ENERGY PRODUCTION

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#### Abstract

The importance that each nation and its authorities give to the primary stage of designing and preventing natural disasters is a qualitative indicator of its organization. The citizens' protection is ensured through the principles of the rule of law. However, the climate change seems to reinforce the problem of natural disasters like forest fires in Greece. Forest fires are one of the most common natural disasters in the Mediterranean zone with direct consequences for the society, the environment and the economy. Forest fires cause also subsequent natural disasters such as severe floods. The Principles of Prevention and Precaution are central to the General Principles of Environmental Protection. Sustainable management and the multifunctional role of forests contribute to Sustainable Development. In this context, the purpose of the present study is to highlight the idea of sustainable forest biomass extraction, which can effectively reduce forest fire risk by reducingfuelsource. Through research experience and literature review, the key issues of the ecological constraints on forest biomass extraction for the ecosystems' sustainability and the spatial constraints for the system's sustainability are presented. Possibilities for the utilization forest biomass parts for clean energy production in a decentralized scale, with adding economic value for local production are also explored.

## THE ECOLOGICALPRINCIPLES OF THE RESTORATION OF THE MEDITERRANEAN FOREST ECOSYSTEMS

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#### Abstract

Worldwide natural disasters are becomingincreasingly frequent and that is verified, especially in the Mediterranean region, by many recent severe forest fires and floods. When the primary stages of preventing and tackling the natural disasters fail, the restoration's strategic planningis significant for the ecosystem's recovery and for resilience to climate change. Thus, the present study presents restoration's ecological principles of the Mediterranean forest ecosystems. Particularly, it emphasizes onthekey principle of soil preservation. Through practices' review, erosion and flood control techniques in the field are presented. Some of them are conventional and temporal while others are modern and more innovative. All types of techniques with pros and cons are discussed. Therefore, the study shows a significant interdisciplinary approach through the two goals of Ecological Engineering, that of the disturbed ecosystems' restoration and that of the new sustainable ecosystems' developmentincluding both ecological and human values. As forest fires have major impacts on the forest floor and soil, the avoidance of the soil erosion and floods, knowledge of post-fire ecology and ecosystems' capacity of self-designare key issues for shapingthe framework of ecosystem's restoration, climate resilience and sustainable development.

## THE ROLE OF MEDIA IN DISASTER MANAGEMENT SYSTEM

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### Abstract

<u>Introduction</u>: The media are linked to the democratic system of the country. Through these, political information is provided to voters, with the public supporting its choices in SME's information material. At the same time, the identification of social problems is achieved through these and is a key tool to address these. Also, the media is seen as preserving democracy, as various mistakes and injustices and injustices come from the existing power. Consequently, SMEs operate at specific levels and standards, as defined by democratic society.

Purpose: The aim of the research is to help all those who are interested in developing the necessary skills to be able to deal effectively with critical situations. Our research has the sole purpose of optimizing existing logical practices and tactics to address and respond.

Method: As a method, design-based research and approach to living labs are adopted.

Material: It builds on the existing knowledge of the International Telecommunications Union and the European Broadcasting Union

Results: Through the media, topics are touched with an interesting story that is considered fascinating to the audience. These stories include human stories and conflicts. The fast and painless safeguarding of history serves the success of publication as long as it is based on a reliable source.

This information stems from the audience itself through the interview process, so each person reports on his experience how he lived and felt an event and describes it accordingly. However, these interviews push SMEs into conflict with crisis managers, as they provide a safe and honest picture of what they are describing. The conflict is, of course, due to the fact that, in addition to their personal experience of the event, the emotional reactions of the public, their subjective judgment, etc. are recorded .

The conflict, at the same time, is also due to the crisis managers. The managers, therefore, do not pay special attention to raising the awareness of critical media situations and events.

## MASS MEDIA MODELS AND THEORIES OF CRISIS MANAGEMENT

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### Abstract

<u>Introduction</u>: In the management of the crisis, there are some roles and responsibilities, as well as organizational requirements related to the process of a company. The reaction to catastrophic seizures involves action and specific reception crisis assessment, adequate crisis preparation, ensuring a rapid and adequate response to the crisis, keeping clear lines of reference and communication if crisis and agreement between the rules for eliminating the crisis occurs.

The techniques that could be used to manage the crisis relate to a variety of steps, namely understanding the fact that the crisis in the company influences, understanding prevention, alleviating and overcoming various types of the crisis.

<u>Purpose:</u> The aim of the research is to help all those who are interested in developing the necessary skills to be able to deal effectively with critical situations. Our research has the sole purpose of optimizing existing logical practices and tactics to address and respond.

Method: As a method, design-based research and approach to living labs are adopted.

<u>Material</u>: It builds on the existing knowledge of the International Telecommunications Union and the European Broadcasting Union

<u>Conclusions</u>: In conclusion, experience with both natural and man-made disasters highlights the simple truth that communications are useful only to the extent that they are accessible and usable by people in communities at risk. During disaster events, many vulnerable communities are often cut off from national response systems due to lack of appropriate communications that should have been in place before a disaster occurs.

## THE COMMUNICATION BETWEEN THE MEDIA AND THE MANAGERS OF THE CRITICAL SITUATION / EVENT

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### Abstract

<u>Introduction</u>: Research points that can improve the relationship between SMEs and crisis managers, which are listed below:

- Control accessibility of SMEs to the critical situation.
- The interview of each person is oriented towards the media. Interviewers should refer to the key points of an issue. This is feasible by repeating the question in a different way.
- The answers of the interviewers are comprehensive, so in case of editing, not to alter the content of the interview.
- Regarding the body language and the emotional intelligence of the interviewees, they appear to be honest and honest when referring to really actual events rather than fantastic.

Method: As a method, design-based research and approach to living labs are adopted.

Purpose: Television, radio and the press, as well as the internet, are the mainstream media through which information is made available to the public about crises. The central idea of these instruments is the absolute freedom of the press, with reasonable constraints imposed by the media during the crises, of course. In particular, these restrictions are set by the National Council for Radio and Television. The key role of SMEs in crises is the collection and distribution of information at a rapid pace and with precision. People must rely on the media to reveal the mistakes and injustices of those who exercise power.

<u>Results:</u> During a crisis, it is important for the media to be free and free from checks of unjustified acts of those exercising political authority. Otherwise, politicians would be unchecked. Every democratic state can not afford not to give the proper value and to recognize the media. However, SMEs are required to be efficient and functionally operational, based on the democracy of society.

## ROLE OF THE RADIO STATION IN CRISIS MANAGEMENT

### **Stavros Kalogiannidis**

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### Abstract

<u>Introduction</u>: So far, by going through the radio stations, they are trying, when it comes to a crisis, to provide as realistic and realistic as possible information that will be useful for listeners.

According to previous research, it has been found that these instruments are fully in harmony with the crisis environment and serve the public in the face of the crisis. While they are vulnerable to disasters, at the same time they know how to maneuver in the situations of the crisis.

<u>Method:</u> A list of all broadcast AM and FM radio stations in the United States was obtained from the Federal Communications Commission (FCC). A list of the flooded counties in the Midwest along the Mississippi River was obtained from the National Oceanic and Atmospheric Administration National Weather Service. Using these two lists, a determination was made regarding which radio stations would have broadcast directly to affected communities during the flood. To be selected, a radio station had to possess a current FCC licence and be licensed in a county that was categorized as in a state of emergency, or that received a Federal Disaster Declaration. This produced a total of 124 radio stations<sup>1</sup>.

<u>Conclusion:</u> This study, along with previous investigations, indicates that local radio can play a particularly critical role in a community-based response to a crisis. Disaster researchers often note that all disasters are local in their impact, and that the first response to a crisis comes from the community itself. Local radio stations, given their resilience, flexibility and accessibility, play a critical role in informing the public, coordinating response and recon-stituting community connections. In a somewhat alarming turn, the replication of previous findings in the current investigation suggests that smaller-market stations more fully understand and embrace that role.

<sup>&</sup>lt;sup>1</sup>FCC.: "Radio and Television Broadcast Rules", 47 C.F.R. § 73 2016.

## URBAN PLANNING AND RESILIENCE TO FLOODS. CASE STUDY HOLLAND

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### Abstract

Resilience to natural hazards is defined as the ability to handle, by adapting a system, the pressures caused by the hazards. Resilience depends on the preparedness towards any possible dangers and the spontaneous or preplanned reactions after the event, including relief and rescue. Such a system could be an urban one. Thus, urban planning is a very important factor of an urban system in order to ensure city's readiness to a flood. Floods are considered as the most destructive type of natural disasters. This hazard is decoming more dangerous by the fact of the oncoming climate changes as also the possible increase of the sea level. After all, planning an urban system in order to protect it from floods is considered to be a very important stage which contributes to the elimination of the flood hazards effects caused by the urbanism expansion.

This paper examines the urban planning issue and its importance in the matter of floods' hazards by using as case study The Netherlands. The Netherlands are considered as a very good example of a country that has taken fully in mind flood's hazards, as well as the country's ability to be dynamically adapted to the new data and hazards by adopting new innovating ideas.

The Netherlands' government has already started examining new, alternative ways of protecting the country from floods by using new urban plans. Thus many risk researching issues are in progress in order to decide the way that these new techniques are going to be applied.

In addition to the above, a plan to build houses has den in progress. New projects are managed as far as they concerned the development of floating villages or town (hypermetropole). In this way, based on the general idea of creating new space for the water (take room for the river). Nederland gives new sense to the mixed ways of land using, as water and human are going to harmonically coexist.

Keywords: Urban planning, resilience, Holland case study

## CLIMATE PROOFING IN A FRAMEWORK FOR IMPROVING THE RESILIENCE OF INFRASTRUCTURE AND NATURAL DISASTER RISK REDUCTION

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### Abstract

Recent disasters show the vulnerability of infrastructure to unexpected or difficult-to-predict extreme events. Sea level rise, severe hurricanes and flooding events are only a few examples of climate change. Since all aspects of "safety" are threatened, returns on investment in infrastructure are vulnerable to these shifts in climate. Experts and policy-makers need to develop long-term policies that can anticipate these uncertain changes rather than merely react to the undesired events they bring about. To achieve this, professionals in these fields need innovative tools and methods to cope with uncertainties and enable them to design adaptive plans. In the present study a framework of novel system – based approaches for long term planning considering unexpected future changes (i.e. climate change) is discussed. Worldwide innovative tools have been developed that identify better and cope with uncertainties, design adaptation pathways to anticipate change and monitor the implementation of such pathways. These tools combined contribute to future planning for resilient and climate proofing infrastructure. Case studies (i.e. managing flood risk) are used to demonstrate the applicability, the novelties that such planning presents, the resulting increased resilience of infrastructure and the potential reduction of disaster risk. The "new generation" planning is compared with conventional planning methods and their differences are discussed. Finally, further improvements to be explored and developed in the near future by the academic and planning community are highlighted. The discussion on novel and conventional planning methods shows the significance of embodying innovative tools in infrastructure planning.

## THE SOCIAL PERCEPTION OF SEISMIC RISK ASSESSMENT

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### Abstract

Community response on a seismic disaster depends highly on the characteristics and the preparedness of the community and the characteristics of the disaster like the size, duration frequency, ability to predict and the severity of potential losses. However, the most significant issue is the individual responses of anxiety, panic and anti-social behavior. Risk assessment, in social terms, can be a useful tool for those who have the responsibility to respond as coordinators in such situations. Since Greece is an earthquake prone area, seismic hazard mitigation and preparedness in all aspects, technical and socioeconomic, are crucial. The present study focuses on estimating the social perception of seismic risk. Psychometric and economic approaches are combined to analyze risk. In the psychometric approach main factors determining individual attitudes and behaviors of individuals are pointed out. The aim is to produce a mental model for seismic risk with the help of which we can explain how individuals assess dangerous situations. The economic approach considering what people expect to gain from a situation is used in a modified form, from the perspective of people experiencing dangerous situations. The two approaches are used to analyze perceptions and attitudes regarding alternative seismic risk scenarios. Synthesis of the outcomes and conclusions on social seismic perception are based on the comparative study of existing policies internationally and on guidelines from national authorities. Therefore, the study results can be a useful tool for policy makers and for decision making for reducing seismic disaster risk.

# ZONATION FOR MITIGATION OF LANDSLIDE RISK AND RESPONSIBLE TOURISM DEVELOPMENT IN THE IONIAN ISLANDS' BEACHES (WESTERN GREECE)

## Spyridon Mavroulis<sup>1</sup>, Nafsika-Ioanna Spyrou<sup>2</sup>, Ioannis Kopanas<sup>3</sup>, Efthymios Lekkas<sup>4</sup>

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### Abstract

The Ionian Islands comprise one of the most seismically active parts in the Mediterranean. Their evolution is defined by active faults and a dense net of joints, which form geotechnically unstable areas with high and steep slopes, highly fractured and brecciated formations as well as suitable geometry of beds and discontinuities. The synergy of endogenic and exogenic processes contribute to formations loosening resulting in frequent failures along steep coastal slopes.

This is the case in the western coastal part of the Ionian Islands, where slope failures are often generated along some of the most beautiful and visited beaches in the Mediterranean. The most characteristic events occurred in Myrtos beach (Cephalonia) during the 2014 earthquakes, in Egremnoi and Porto Katsiki beaches (Lefkada) during the 2015 earthquake and in Navagio beach (Zakynthos) in September 2018.

In similar cases worldwide, medium- and long-term approaches are adopted for landslide risk assessment and mitigation requiring no beach access until completion of protection measures with adverse effects in the economic activity of the affected areas.

Taking into account all the aforementioned, the most suitable approach for the study area is the beach zonation after landslide hazard identification and risk assessment based on morphological, geological and geotechnical data. Three zones of (a) high, (b) medium and (c) low risk are usually defined and correspond to (a) prohibited, (b) restricted and (c) free access. This approach can be valid for a short time period and may vary in time depending on the prevailing conditions affecting risk level.

## SEISMICITY AND SEISMIC HAZARD ASSESSMENT OF KASTORIA (NW GREECE)

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### Abstract

The area of Kastoria is characterized by low seismicity. The distribution of epicenters, regarding both the historical and the instrumental era, is sparse due to the lack of intense earthquake sequences. This was also the case for the wider region of Western Macedonia until 1995, when the destructive and unexpected  $M_s$ =6.5 Kozani - Grevena earthquake occurred. Probabilistic seismic hazard assessment was performed for the town of Kastoria utilizing the extreme values method, in terms of earthquake magnitude, peak ground acceleration (PGA), velocity (PGV) and displacement(PGD) for a return period of 475 years, i.e. 90% probability of non-exceedance for the next 50 years. The maximum expected magnitude for the broader region, including the epicentral area of the 1995 earthquake, is 7.0. The obtained PGA value of 0.17g is in full agreement with the current Greek Building Code (0.16g). The current urban design of Kastoria makes apparent the need of an operational plan in the case of a large earthquake. To this goal, population assembly points and protected areas, as well as routes that ensure safe access, have been defined in the framework of the present study.

### FLOOD EARLY WARNING SYSTEMS

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#### Abstract

Flood early warning systems concerns a network of meteorological and hydrological stations, collecting real time data regarding stormwater runoff. These data afterwards are used as input to hydrological and hydraulic mathematical simulation models. Specifically, at the level of catchment of a river's entire hydrographic network after implementing agrometeteorological zoning the number of stations needed and the referring areas of each station is recognized. As it concerns the installation points of stations measuring water flow, these are recognized where fixed cross sections are existing. Measurement of floodwater is achieved by installing instruments that measure indirectly the floodwater with the latest measurement techniques, such as Doppler Systems and Radar. Moreover, cameras are placed, with night vision capability to make real-time monitoring of phenomena at selected critical points. All the aforementioned stations are connected via a GPRS connection to a base station, where data quality monitoring is taking place and alarms are given if the datasets are incorrect. The approved data, are input for hydrological and hydraulic simulations, in order to early identify hydrological events downstream. In this way the necessary technical and administrative measures can be taken, in order either to eliminate the phenomenon or to evacuate the area of interest. In this work an attempt is made to present the EU and the Greek Legislation provisions, concerning the flood management schemes, the construction or not of such networks and also to identify the reasons that such networks aren't installed in great scale.

### **CIVIL PROTECTION AND EDUCATION**

## Olympia Papaevaggelou<sup>1</sup>, Stavros Kalogiannidis<sup>2</sup>

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### Abstract

As has been shown by the deadly natural disasters that have recently hit Greece (fires and floods in Attica), it is a fact that in our country there is a complete lack of civil protection education at all levels of education. Unfortunately, there are no such lessons in either elementary or high school, but also in the university and the military.

Citizens should be educated through the country's education system to become useful and active citizens and at the same time be equipped to cope with times of crisis. In Europe, America, but especially in Japan, civil protection has been increasing for years in their education system. Our country does not just have to copy faithfully foreign systems and traditions, but to get more new ideas from them, and to adapt them to the Greek needs and the tradition of our people.

The education of young people on civil protection and natural disaster relief should begin early on from elementary school (ages 7-12) and be graduated in high school (ages 13-18). In all above levels the courses will necessarily be accompanied by:

- special books for teachers and students,
- instruments in the classroom,
- day school events,
- visits to disaster prevention centers and fire stations,
- Special group activities and work and student research on disasters and preparedness to deal with them,
- prepared food and survival in a disaster,
- rescue and first aid exercises,
- voluntary activities in times of disasters

# SELECTIVITY PATTERNS OF WILDLAND FIRES DURING THE PERIOD 1984-2015 IN SELECTED PLACES IN GREECE

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#### Abstract

The aim of this study is to assess wildlandfire selectivity patterns in selected places inSouth Greece including eleven NUTS-3 counties of which two are islands, from 1984 to 2015. Fire scar perimeters within the time window 1984-2015 were delineated from freely available Landsat images from USGS and ESA archives and maps of fire frequency and fire return interval were finally created. Derived from eight different Landsat scenes (path/row), almost six thousands satellite images processed and more than five thousand and eight hundred fire perimeters were extracted, in order to reconstruct the fire history of South Greece, in a thirty two years' period. Fire perimeters within each year of fire occurrence were compared against the available to burn under complete random processes to identify selectivity patterns over (i) CORINE land use/land cover, (ii) fire frequency and (iii) time since last fire maps.

Non- irrigated arable lands, complex cultivation patterns and discontinuous urban fabrics were negative related with fires, while coniferous forests, sclerophyllous vegetation and transitional woodlands werepreferred by the fires. Additionally, it seems that fires prefer their old burnings (two and three times burned) and also places with different patterns of time since last fire depending on the time needed by the type of vegetation to recover and thus to re-burn. Interesting also findings were observed as far as fire selectivity patterns are concerned for the eleven NUTS-3 counties.

## PSYCHOSOCIAL VULNERABILITY AND DEMOGRAPHIC CHARACTERISTICS IN EXTREME FLASH FLOODS: THE CASE OF MANDRA 2017 FLOOD IN GREECE.

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### Abstract

Floods are one of the most common natural hazards leading to severe and long term social and economic impacts globally. On November 15 2017, 24 people were killed and hundreds were left homeless in the vicinities of the towns of Mandra and Nea Peramos, in Attica region, Greece as a result of a catastrophic flash flood triggered by extreme rainfall. The impact of such events has been the focus of studies for years consistently indicating adverse short and/or long term effects on post-disaster physical health and psychological wellbeing. This paper aims to explore the initial impact of of extreme flash floods on hit communities in terms of psychological and physical health, by means of a self-report questionnaire. Furthermore, findings are investigated in relation to demographic variables and vulnerability predictors.

The analysis conducted included descriptive statistics and non-parametric tests that explored differences in selfreported physical and psychological health, by demographic and social characteristics. Self-reports of physical and psychological health differed prior and after the flash flood, with participants reporting negative changes in both domains. .Results indicated statistically significant differences in both physical and physiological health by gender, age, marital and occupational status. According toSpearman's correlation coefficient, self-reported physical and psychological effects showed moderately positive correlations for most independent variables. Results from this study indicate a need to align prevention, aid and intervention strategies to the needs of the specific disaster recovery phase and potentially address issues such as the need for pre-disaster public awareness, adequate information provision and post disaster coping strategies.

### Keywords

Flashflood; Health impacts; Social vulnerability; Psychological health

# VULNERABILITY INDEX OF WATER INFRASTRUCTURE TO TERRORIST ATTACKS: A GREEK CASE STUDY

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### Abstract

In recent years, both in the developed world and in the developing world, the fear of terrorist attacks has increased. According to various scenarios processed by the secret services of various countries, water infrastructure is one of the most vulnerable infrastructures in the terrorist threat. Water infrastructure can quickly spread a potential infection to a large number of recipients, which significantly increases the potential number of potential victims. It is worth to note that nowadays except the physical network (i.e., reservoirs, tanks, and pump stations) there is also an increased risk for cyber-attack in the SCADA system that most water facilities used. Therefore cybersecurity issues maybe possess an additional threat. The present work aims to implement in Greece various indicators proposed in the literature to assess whether the existing infrastructure is at risk. These indicators aim to help managers and engineers to make the right decisions regarding the cost to increase security. This approach separates the system into smaller pieces and uses the Analytic Hierarchy Process to calculate the weights accordingly for each piece. Finally, the results are compared with countries like USA that are already many steps ahead to address similar threats.

## ENVIRONMENTAL RISK. I DO NOT WANT TO HEAR, I DO NOT WANT TO KNOW

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### Abstract

Communicating the results of a scientific research to the public and stakeholders is a difficult and complex issue, especially when it comes to Environmental Risk Assessment (ERA), either concerning human health or an ecosystem. That is, because, risk quantification is easily understandable and affects various socioeconomic aspects, i.e. the reputation of a tourist destination or the closure of an industry that is a source of income for hundreds of people, or the demolition of housing and other infrastructure. In many cases, stakeholders (residents, employees, public bodies etc.), including competent authorities, are facing with extreme skepticism or even with absolute denial (I do not want to hear, I do not want to know) the results of Environmental Risk Assessment, especially when the results require immediate action. The present study aims to provide an approach to address risk communication issues. Firstly, the parameters that affect risk perception are identified (sociological, anthropological, economic, etc). Then case studies from specific areas in Greece are demonstrated and risk communication issues and their consequences are discussed for each case study. Emphasis is given in the lack of trust with respect to both private and public sector that is met in several cases in Greece, which increases the difficulty of accepting risk. The discussion results indicate the significance of communicating risk in a manner that is widely accepted by the stakeholders not only quantifying it and how it can be a useful tool in the hands of decision makers.

### CHARACTERISTIC OF DISASTER SITUATION

### Evgenia Marneri<sup>1</sup>

<sup>1</sup>Professor of Informatics Ministry of Education, secondary education

### Abstract

A disaster is a serious disruption, occurring over a relatively short time, of the functioning of a community or a society involving widespread human, material, economic or environmental loss and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

In contemporary academia, disasters are seen as the consequence of inappropriately managed risk. These risks are the product of a combination of both hazards and vulnerability. Hazards that strike in areas with low vulnerability will never become disasters, as in the case of uninhabited regions.

Disasters have substantial social and psychological impacts, which reflect not only the impact characteristics (e.g., magnitude and severity), but the pre-existing social and economic vulnerabilities, which intensify the loss and disruption. Effective disaster management, therefore, needs to ensure that the diverse interests and priorities of communal life are integrated into planning and response, especially those of vulnerable persons and groups. At the same time, it is important to take into consideration the psychological effects of disasters, particularly in relation to response mechanisms and processes. The level of psychological distress generated by a disaster may be either diminished or intensified by planning and management decisions, which in turn can enhance or impede recovery and reconstruction. Providing psychosocial relief has been well exemplified. There is a need in the Indian scenario to have community mental health teams trained for such events.

## DISASTERS: DEFINITION, CRITERIA AND CLASSIFICATION

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#### Abstract

Developing countries suffer the greatest costs when a disaster hits – more than 95 percent of all deaths caused by hazards occur in developing countries, and losses due to natural hazards are 20 times greater (as a percentage of GDP) in developing countries than in industrialized countries. The development of mental health care faces special challenges in developing countries. There is a need for mental health professionals to shift from a clinical to a public health focus; the development of training materials, case records, information systems, and the availability of adequate numbers of mental health professionals to implement the plan. There is a need for training all those involved in disaster relief work. The importance of trained Community Level Workers (CLWs) to implement an organized effort aimed at providing psychosocial relief has been well exemplified. There is a need in the Indian scenario to have community mental health teams trained for such events.