

GEOINFORMATICS

Forest Fires & Forest management

There's nothing we can't handle on Forest Fires (FF) & Forest Management (FM); from forest sensors-, UAV-, aircraft- and cameras-monitoring, to accurate real-time estimation & prediction of wind-field and fire propagation, to soil fuel classification- & fire ignition risk-mapping, to decision support systems for management and Firebrigade guidance, up to the establishment and operation of a C4I Control Command Center, and turn-key forest defense.

With the rise of forest fires in recent years and climate change becoming a permanent and unpredictable reality, the need for turn-key solutions is growing. Imperative for this prevention & preparedness are Forest Fires & Forest Management Systems, whereby forests are reliably protected. This task is essential for preparedness-, prevention-, risk estimation-, management-, and lessons learned, both before and after the outbreak of a forest fire, as well as for better coordination of the firefighting resources.

In the FF & FM Sectors EPSILON offers:

Engineering, consulting, contract research, legal and regulatory support, training, educational and capacity building services aimed to assisting and addressing the challenges of forest fire management and monitoring. EPSILON has been active in Forest Fires & Forest Management since 1990 and our diverse group of engineers, scientists and professionals provide technical solutions in the fields of:

- **Forest monitoring via UAV**, aircraft, sensors and cameras communicating with a C4I/CCC center and relevant authorities.
- **Forest Fire Management** as prevention, automated fuel mapping, sensors management, fire alert and ignition estimation, simulation of fire behaviour/propagation, civil evacuation emergency plans, and other actions.
- **Environmental risks** monitoring and development of field monitoring telemetric systems including UAV/UAS technologies coupled to sensors and Geoinformation technologies.
- **National Risk Assessment and Risk Management** Plans & Mapping with prevention, preparedness and risk and mitigation strategies.
- **Awareness/Emergency technology** with pre-emptive methods for assessing and reducing forest fire risks, ground units & tracking, dynamic rooting/evacuation according to fire front propagation, and web-mapping services to mobile users.
- **GIS technologies** for recording & evaluation of fire risk indicators, flammability of vegetation, meteorological parameters, characteristics of a potential fire, in relation to the effects of these parameters on the natural environment, and data (INSPIRE) and metadata with statistical records.
- **Satellite image processing** for socio-economic and probabilistic analyses for forest fire pre- and post-fire impact analyses for optimal management.
- **ICT/IST Integrated systems of sensors, networking and computing infrastructure** detecting, monitoring, predicting and assisting in crisis management at "wildland-urban interfaces" (WUI) with homes and infrastructures.
- **Metadata** creation and **data** transformation (INSPIRE) in accord with Directive 2007/2/EC
- **Public Participation** and **Consultation** support, including **capacity building**.
- **R&D/RTD** technologies, including mathematical modelling and FF life-cycle assessments.

Recent Projects on FF & FM:

The **EPSILON Group** track record includes several projects at European-, national-, regional- and local-levels. The years of experience of our Group partners and staff guarantees high quality services for multiple **Forest Fires & Forest Management services and solutions**.

- 1. Hero20-FF:** NewGen recoverable low cost UAS for forest fire management (2015). Hero20-FF delivers a platform to: predict wind-field & other parameters along an erupted FF, forecast fire rekindling & fate, deliver a FF management plan guiding resources & evacuating endangered people. www.epsilon.gr/projects/198
- 2. GrecoRisks:** Hellenic Natural-Hazards Risk-Management System of Systems (2015). A Multi-Risk geointelligent web platform integrating risk modules for: geohazards, forest fires (FF), flash-floods, extreme weather, industrial accidents. It delivers combined & aggregated surface risks as demanded by Civil Protection Agencies, insurance companies & other organizations. www.grecoRisks.com
- 3. BRISEIDE:** BRIdging SErvices, Information and Data for Europe, Information society and media Directorate (2013). A Civil Protection Multi-Hazard Platform for operators & Public Administrations, engaged in urban & river basin planning, resource & environmental management, with spatio-temporal processing of GI to support decision-making. www.briseide.eu
- 4. ENV PLUS:** eEnvironmental Services for Advanced Applications with INSPIRE (2015). eENVplus integrates a large amount of environmental data provided by EU-, National-, Regional- Environment Authorities & other stakeholders; necessary to answer to the requests for environmental monitoring & reporting. www.epsilon.gr/projects/62
- 5. ArcFUEL:** Mediterranean Fuel Maps Geodatabase for Wildland & Forest Fire Safety (2015). A web-technology for Fuel Classification Mapping (FCM) operated by readily available data, harmonized, accessible & interoperable according to INSPIRE principles, for the Mediterranean Region. It delivers fuel maps at high accuracy & resolution, updated after every summer. www.arcfuel.eu
- 6. ArcFIRE:** A Forest Fires Management Platform (2010). A state-of-technology Wildland & FF Management Web-Platform since 1990. It captures the vital dynamics demanded by Planers & Decision Makers engaged in the FF Life Cycle, used in Greece, Italy, Spain, & other countries. www.epsilon.gr/geoinformatics/products
- 7. Seix-Sou:** Forestry and Forest Fire Management of the Seix-Sou Northern Greece Forest (2014). An integrated system for FF management & monitoring aimed to consider: (a) Awareness phase prior to the Fire, (b) Emergency phase during Fire, (c) Impacts phase after Fire, (d) Dissemination phase best practices. www.seixsou-forest.gr
- 8. SCIER:** Sensor & Computing Infrastructure for Environmental Risks (sensor technology in FF management) (2010). SCIER embodies technologies & structures from different Fields: Wireless Sensor Networks, Environmental Engineering & Modeling, Grid Computing for parallel processing. All applied to combined FF emergencies whilst offer services to local administration & regional governments. www.scier.eu
- 9. TAXIARCHIS:** Design, Development and Operation of a Natural Disasters System for Fires Prevention and Monitoring, Chalkidiki, Greece (2008). Prevention & monitoring of natural disasters & FF for Taxiarchis Forest: Production of fuel maps, development of a tool to recording & monitoring effects of fires in natural environment, development of a risks indicators methodology for fire spread. www.epsilon.gr/projects/197

- 10. ATHENS-2004:** The Olympic Games National Forest Fire Management System (2004). Controlling of the security partial sectors of Olympics Games ATHENS2004. It involved real time security monitoring & actions for athletes, population, city-administration-, visitors-, and organizations security. A DSS was developed for FF management.
- 11. EC/DGENV:** Assessment & management of Risks in Urban Areas (2006). Consideration of: natural & human made disasters (floods, earthquakes, FF, etc.); technological risks (explosions, fires, etc.); other risks (threats on infrastructure i.e. water supply, etc.). Scientific studies & projects on: assessing & managing urban risks, collection & description of best practices, proposal for an EU Urban Risks Management Plan.
- 12. FOMFIS:** Forest Fire Management & Awareness System (2000). A computerized system aimed to forecasting and managing FF with several modules: fuelling, ignition, risk mapping, fire propagation & behavior, resources allocation to tackle fires.

Our Services FF & FM are supported by:

- **Flight & UAV/UAS operations** also supported by our associated company www.aviontek.com
- **Flight & UAV/UAS operations** also supported by our associated company www.aviontek.com
- **GIS/GPS/GSM/GPRS/IST** and field mapping technologies also offered by Epsilon Italia srl, www.epsilon-italia.it
- **Statistics & GIS database** products for Greece and Cyprus
- **Research & development** for products
- **Training & capacity building** also offered by Epsilon Bulgaria ood, <http://epsilon-bulgaria.com>
- **Hardware, software, middleware** integration supported by PC-Systems SA, www.pcsystems.gr
- **Management Consulting** also offered by Epsilon Consulting Ltd., Cyprus, www.epsilon-cyprus.com.cy

We address cross-sectoral and institutional issues at EU-, international-, national- and local- levels to ensure the sustainable use of technologies that offer financially viable solutions for **Forest Fires Management**. Our multidiscipline approach aims at protecting the environment, ensuring economic development, increasing public awareness, understanding uncertainties, managing risks and supporting policy adaptation.

EPSILON is certified according to **ISO 9001:2008** by TUV-NORD for: civil & environmental engineering consulting, design & development of information technology applications in the fields of Geoinformatics-, GIS-, surveying-, navigation-, collection and production of geodata, remote sensing & photogrammetry services all applied to **Forest Fires Management**.



ATHENS - GREECE
T: +30-2106898610
F: +30-2106842420
e: central@epsilon.gr



8

Number of
EPSILON Group
offices in Europe

35

Number of countries
where EPSILON has
significant presence

120

Number of large RTD projects conducted
during last decade

www.epsilon.gr