

1. INTRODUCTION

In recent years, flood management has shifted from protection against floods to managing the risk of floods. To support the transition from traditional flood defense strategies to a flood risk management approach at the basin scale in Europe, the EU has adopted a new directive (2007/60/European Flood Directive) at the end of 2007. The European Flood Directive sets out the requirement for the Member States to develop three products, (1) a preliminary flood risk assessment, (2) flood mapping comprising of flood hazard maps and flood risk maps and (3) the development of flood risk management plans.

Due to the European Flood Directive there is a need for the establishment of a preliminary flood risk assessment until 2011. The aim of this assessment is the identification of areas with major flood threats.

In order to achieve this goal, risk analyses have to be undertaken on a regional scale showing potential adverse consequences to humans and the environment. In risk analysis, risk is expressed as a function of the probability of occurrence of a hazardous process, the exposed elements at risk and their vulnerability

The assessment shall include (1) maps of the river basin district (coastal areas, topography and land use) and (2) information about previous and future floods and their probabilities and consequences.

2. INFORMATION ABOUT PREVIOUS FLOODS

An organized flood record is not available in Greece, for this reason a database has been created based on data from newspapers, previous studies and a digital record, as well as from the Civil Protection Authority and the Greek Observatory of Athens.

A total of 284 flood events has been identified in Greece for the period 1887 - 2010.

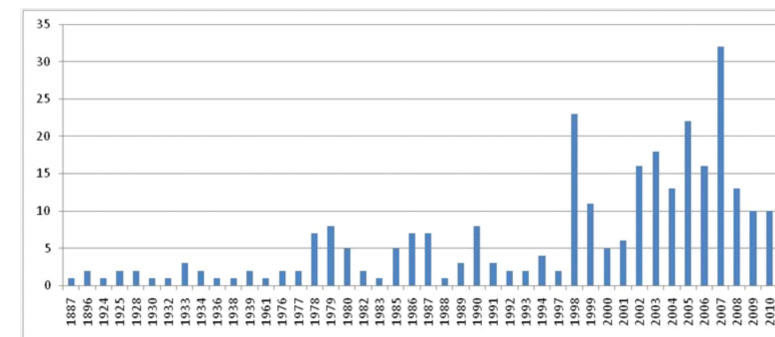


Fig. 2.1 Annual distribution of flood events for the period 1887 - 2010

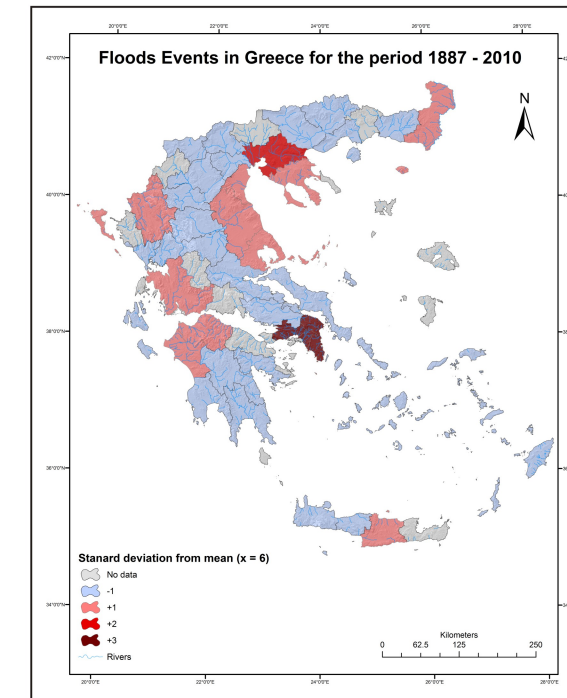


Fig. 2.2 Distribution of flood events in Greece

3. TEST SITE

The test site of "Rafina" was chosen to study the challenges of the implementation of the European Flood Directive. The test site is located in the district of Attica. The catchment size is 129km² and reaches from 0 to 915m a.s.l. The Rafina region suffered from severe flood events during recent years, i.e. in 1989, 1997 and 2004 and is characterized by a variety of elements at risk.



Fig. 3.1 Topographic map of the Rafina watershed

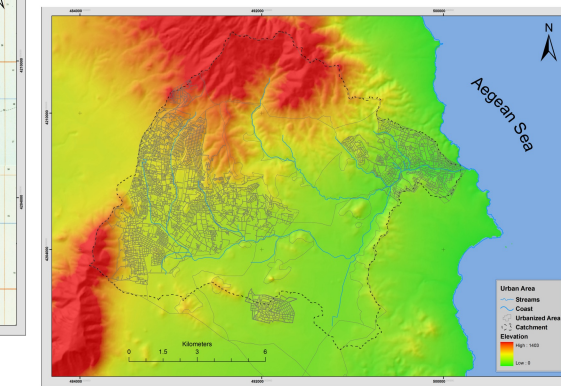


Fig. 3.2 Urbanized area of the Rafina watershed

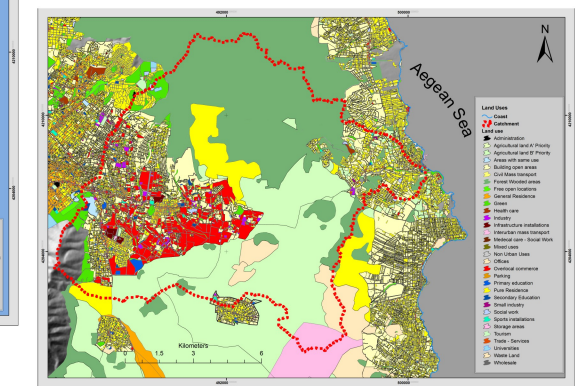


Fig. 3.3 Land use of the Rafina watershed

4. INFORMATION ABOUT FUTURE FLOODS

Information on possible future floods scenarios was obtained by creating a model which was based on two parts, the quantification of flood hazard via hydrologic and hydraulic calculations and the evaluation of flood intensity for various flood scenarios.

A validation of the results obtained was undertaken.

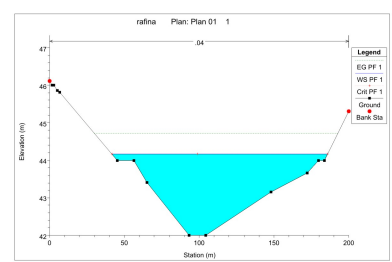


Fig. 4.1 Cross section for a return period of 50 years

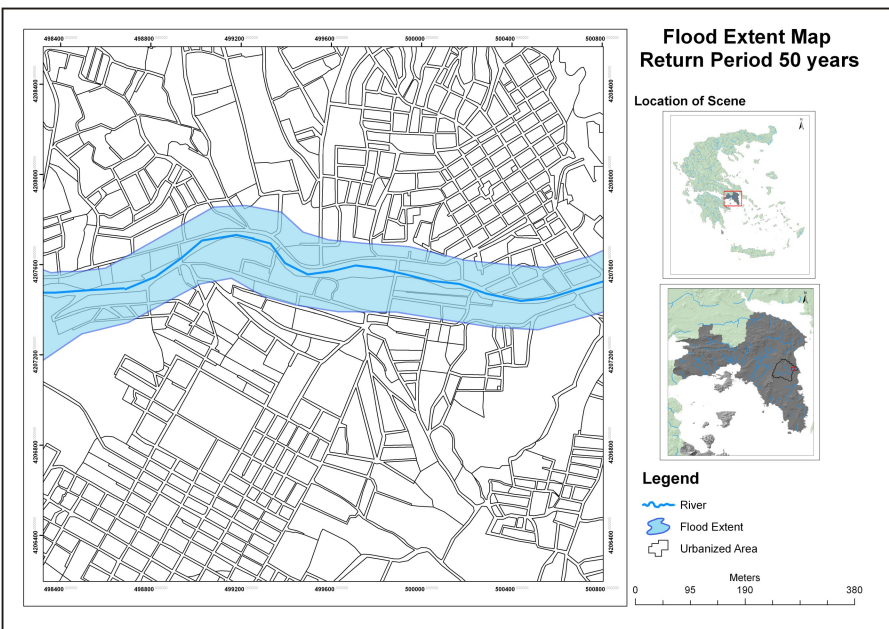


Fig. 4.2 Flood extent map for a return period of 50 years

5. CONSEQUENCES OF FUTURE FLOODS

The European Flood Directive requires to take into consideration the potential adverse consequences on

- Human health
 - o Number of people
 - o Number of critical services
- Economic activity
 - o Number of properties
 - o Infrastructure network
 - o Area of agriculture land
- The environment
 - o Special areas of conservation
 - o Special protection areas
 - o Ramsar sites
 - o Sites of special scientific interest

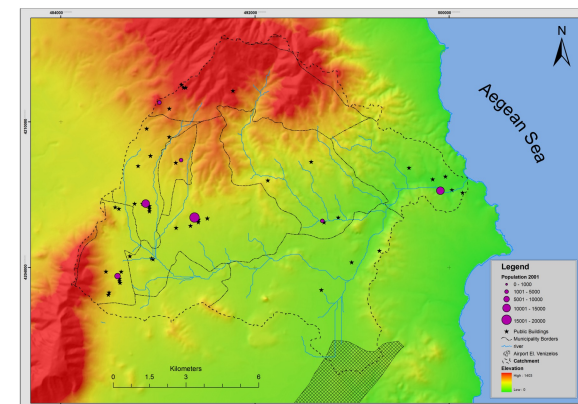


Fig. 5.1 Population map of Rafina watershed

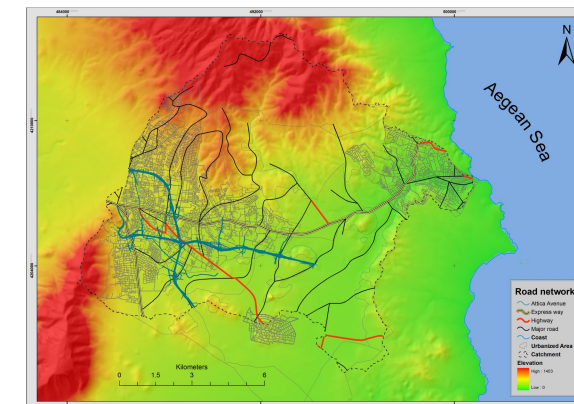


Fig. 5.2 Road network map of Rafina watershed

6. CONCLUSIONS

The aim of this study is to provide guidelines of how to implement the first step of the European Flood Directive (flood risk assessment) and to show challenges and limitations resulting from the availability of information.

The preliminary flood risk assessment is based on information on past (historic) and future (potential) floods which is very data sensitive.

The preliminary flood risk assessment provides the evidence for the identification of flood risk areas and will therefore provide a useful reference point for subsequent local flood risk management strategies.

The preliminary flood risk assessment needs strong support from flood mapping methods, which is also a useful experience for the implementation of large scale flood risk maps.

The preliminary flood risk assessment provides a framework to assess and manage the flood risks in order to reduce adverse consequences for human health, the environment and economic activity.



Further Informations

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