

PREFACE

Wildfires are increasingly recognized as one of the most complex and intensifying natural hazards, exacerbated by the impacts of climate change. Their frequency and severity have escalated notably in Mediterranean and temperate regions, posing significant threats to human lives, infrastructure, and ecosystems. In Portugal, the devastating wildfires of 2017 exposed critical vulnerabilities in emergency response systems and highlighted the pressing need for a more integrated approach to wildfire risk assessment, evacuation planning, and community resilience.

Against this backdrop, effective evacuation planning, coordinated territorial management, and informed community engagement have become essential elements of wildfire risk mitigation. This book provides a comprehensive approach to these issues, drawing on the EvacuarFloresta research project (2021–2025). By combining field research, spatial modeling, and behavioral studies, the book bridges the gap between academic knowledge and practical applications, focusing on effective evacuation planning, coordinated territorial management, and informed community behavior.

The chapters align with key tasks of the project, being Chapters 1 and 2 the introduction of the research. Chapter 3 reviews Portugal's Operational Management System (Sistema de Gestão de Operações - SGO) and evacuation decision-making, comparing strategies from countries like Spain, Greece and California, with case studies from Lousã, Sertão and Coimbra. Chapter 4 examines wildfire risk perception and preventive behaviors through interviews, surveys, and data analysis, exploring how past experiences and trust in institutions shape preparedness. Chapter 5 uses GIS tools to assess wildfire risk through hazard and vulnerability maps for selected municipalities, considering factors like topography and social indicators. The study also models evacuation travel times to improve emergency planning. Chapter 6 compares fire spread simulation tools (FireStation, Wildfire Analyst, Fire Dynamics Simulator) and introduces a methodology using satellite data (VIIRS) to enhance prediction accuracy. It *also* models evacuation using AnyLogic, integrating fire dynamics and road networks. Chapter 7 presents evacuation case studies, highlighting the importance of early warnings and identifying vulnerable

populations, especially in isolated areas and tourist destinations. Chapter 8 examines legal and institutional frameworks for evacuation, proposing a methodology for maintaining databases of vulnerable individuals using tools like Google My Maps.

This book is aimed at researchers, emergency planners, and students in fields such as geography, civil protection, and urban planning. It serves as both a scientific resource and a practical guide for improving wildfire risk management, contributing to safer, more resilient communities.