FLOOD DAMAGE ASSESSMENT
IN URBAN AREAS

bushfire&natural HAZARDS CRC

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THE PRIMARY FOCUS OF THIS STUDY IS AN IMPROVED METHODOLOGY FOR QUANTIFYING FLOOD RISK. THE OUTCOME IS SUBSTANTIAL FOR DECISION-MAKERS DEALING WITH FLOOD RISK MANAGEMENT FOR PRIORITISATION OF RISK MITIGATION OPTIONS AND CHOOSING BEST PRACTICE.

INTRODUCTION:

Flood damage assessment is an important component of flood risk management since inaccurate damage estimation leads to wasted effort, money, and resources for the organisations involved in flood risk mitigation.

RESEARCH PROBLEM:

In Australia, floods are the most costly of all natural disaster types. While much effort has gone into emergency management and flood mapping, flood damage models are still crude, and understanding of the damage process is largely unknown.

RESEARCH AIMS:

This research focusses on quantifying flood risk and performing a flood damage assessment for a case study area within Australia. With this knowledge, mitigation of the risks could occur for future flood scenarios.

RESEARCH OBJECTIVES:

- Collect data from recent extreme events in Australia, data mining, and machine learning;

- Develop and calibrate some novel multi-parameter flood damage assessment functions;

- Develop tree-based models to explore the effects of different parameters on the extent of damage;

- Results comparison, model validation, and uncertainty evaluation;

The functions have been parameterized based on the most common types of buildings in Australia. Parameters include:
- ✓ Foundation height
- ✓ The number of stories
- ✓ The height of stories
- ✓ Percent of maximum damage
- ✓ The beginning elevation for damage

Importance & influence of the following factors have been explored:
Impact Parameters
- ✓ Flood depth
- ✓ Flood duration
- ✓ Flow velocity
- ✓ Water contamination
- ✓ Return period

Resistance Parameters
- ✓ Building characteristics
- ✓ Private precaution
- ✓ Early warning
- ✓ Emergency measures
- ✓ Socioeconomic factors