**Integrate, Consolidate and Disseminate**

**European Flood Risk Management Research**

**ERA-NET CRUE Funding Initiative**

**Effectiveness and Efficiency of Early Warning Systems for Flash Floods**

**Objectives**
- Evaluate the reliability of flood forecasts as a function of lead time for effective warning
- Assess the vulnerability and avoidable damages within the framework of a socio-economic analysis
- Compare the benefits and the costs of early warning systems in the context of flood risk management strategies

**Study basins**
- Besòs catchment, near Barcelona (Spain)
  - Elevation: 0 – 1350 m
  - Mediterranean climate
  - A0: 1024 km²
  - hP: 660 mm/a
  - MQ: 5 m³/s
  - HQ100: 2500 m³/s

- Traisen catchment, north east Austria
  - Elevation: 200 – 1800 m
  - Alpine/Pannonian climate
  - A0: 920 km²
  - hP: 700 – 1500 mm/a
  - MQ: 13.5 m³/s
  - HQ100: 725 m³/s

**Findings**
- Flood forecasts reliability beyond the response time of the basin largely depends on the capability to anticipate future rainfall, the application of alternative simulation models provides complementary information
- Stakeholder awareness has a high impact on the efficiency of early warning systems
- The combination of early warning and local protection measures are the most efficient of flood protection strategies

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