

THE WEATHER CASE STUDIES

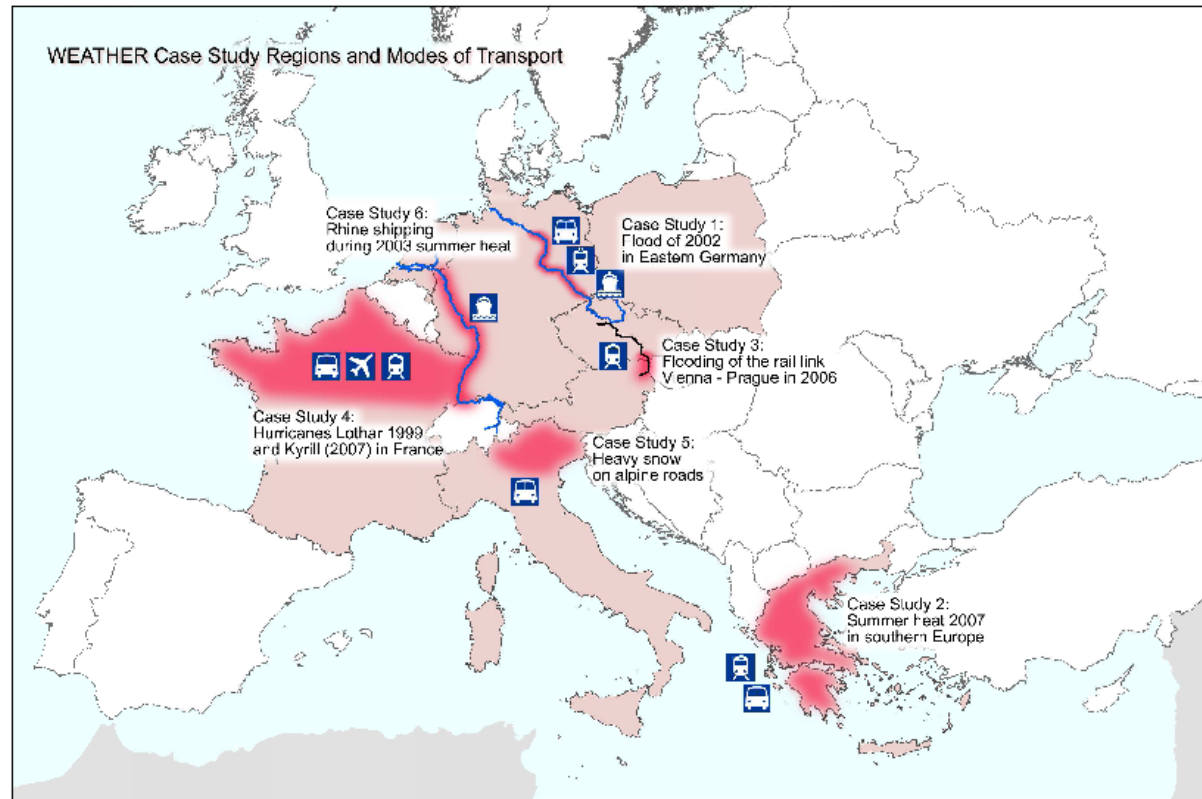
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Athens, 23.04.2012



Case studies, regions and modes

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Flood of 2002 in Eastern Germany



Dresden (Eastern Germany), 03.08.2002

Flood of 2002 in Eastern Germany

- **What happened?** Floodings due to a regional flash flood and long lasting intensive supraregional rainfalls (Czech Republic, Germany)
- **Which part of the transport were affected?** All modes apart from air: roads, rail, foot paths, bicycle paths, waterborne
- **What was the damage?** Floodings of road and rail infrastructure as well as vehicles including main station of Dresden and ferry terminals;
- **Recovery (immediate) measures:** closure of roads, bridges and railway tracks, set up of regional and central governmental emergency teams
- **(Long term) Adaptation strategies:** improve natural and technical flood protection measures
- **Lessons learned?** Learning curve between floods in Saxony of 2002, 2006 and 2010.
- **Recommendations?** Effective communication schemes are an important key to a fast recovery

Extreme summer heat in Southern Europe (Greece)

in 2007



Fire in progress at Parnitha Mount, outskirts of Athens,
Greece, on the night of 28 June 2007

Extreme summer heat in Southern Europe (Greece) ~~in 2007~~



Forest fire in the suburbs of Athens (view from Acropolis) on 16 July 2007

Source: VBerger

Extreme summer heat in Southern Europe (Greece)

in 2007

- **What happened?** Fire events in the Region of Peloponnese during the summer of 2007 after consecutive heat waves and low precipitation periods
- **Which part of the transport were affected?** The local and national road network
- **What was the damage?** 68 people died, more than 1.000 houses totally damaged, total burnt area of 10.196 km²
- **Recovery (immediate) measures:** Evacuation of people, road closures (4-5 days)
- **(Long term) Adaptation strategies:** Additional staff for fire prevention
- **Lessons learned?** The authorities and actors responsible for dealing with the event were found unprepared for an event of such scale
- **Recommendations?** Better implementation of action plans; overall better coordination of evacuation



Flooding of the rail link Vienna – Prague in 2006



Jedenspeigen/Dürnkrot (Northern Austria), 03. April 2006

Flooding of the rail link Vienna – Prague in 2006



Jedenspeigen/Dürnkrot (Northern Austria), 03. April 2006

Flooding of the rail link Vienna – Prague in 2006

- **What happened?** Floodings after heavy permanent rainfalls from 26th to 28th of March 2006; thaw due to inflow of warm air up to 2000m, twice as much snow than in average winters
- **Which part of the transport were affected?** Rail (freight and passenger transport) and road
- **What was the damage?** 12.8km of railway line and railway station Dürnkurt and infrastructure of further railway stations completely destroyed
- **Recovery (immediate) measures:** closure of rail link Vienna – Prague (8 weeks); rerouting of passenger and freight long distance trains
- **(Long term) Adaptation strategies:** railway control centre on pillars, complete new flood protection dams, emergency plan
- **Lessons learned/ Recommendations?** Maintenance of protections systems, In time communication to customers, Simple protections measures (regarding flood) for high value equipment

Hurricane Xynthia 2010 in France



Flooded houses and cars are seen in La Faute sur Mer, South Western France on the Atlantic coast, Monday, March 1, 2010

Hurricane Xynthia 2010 in France

- **What happened?** A violent windstorm named Xynthia crossed Western Europe, with high speed wind until 160 km/h between 27th February and 1st March 2010.
- **Which part of the transport were affected?** Roads, ports, and railways were destroyed or heavily damaged.
- **What was the damage?** deaths of 59 people in Europe. Storm property damage: 157.7 million Euros, damage estimated by the farming community is close to 50 million Euros
- **Recovery (immediate) measures:** closure of streets, highways, ports and railways; emergency rescue and evacuation of people
- **(Long term) Adaptation strategies:** Sea walls and dykes reconstruction, emergency plans, Policies of destruction of houses in endangered zones (black zone)
- **Lessons learned/Recommendations?** Rethinking coastal urbanization, maintenance of dikes and obsolete warning systems.

Heavy Snow on Apennines roads (2004)



Heavy Snow on Apennines roads (2004)

- **What happened?** Heavy snowfall
- **Which part of the transport were affected?** Traffic circulation (main regional roads and highways)
- **Damage:** Traffic disruption in the main regional roads and highways. People trapped for many hours (more than 5) in the A1 highway. Closure of the A1 highway due to the presence of stationary trucks standing across the roadways (about 16 km queue). Small crashes.
- **Recovery (immediate) measures:** Highway closure
- **(Long term) Adaptation strategies:** Improvement of planning in case of snowfall, especially for highways
- **Lessons learned/Recommendations?** Precautionary closure of highways before heavy traffic problems take place or road circulation allowed only to vehicles with snow chains or winter tyre.

Rhine Shipping during 2003 Summer Heat



Rhine river during 2003 summer heat

Rhine Shipping during 2003 Summer Heat

➤ **What happened?** High temperatures and scarce precipitation in the region throughout a longer period led to record low water levels in the river Rhine

➤ **Which part of the transport were affected?** Inland shipping

➤ **What was the damage?** Economic damage, accidents, transport service interruptions

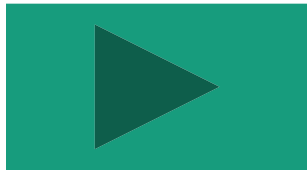
Recovery (immediate) measures: Ban on passing of the ships, on/off one-way navigation scheme, Measures taken by ship operators on the operational level on a daily basis, given the extreme low water situation, were: Do not sail, wait and sail later, chose another route, sail partially loaded

➤ **(Long term) Adaptation strategies:** Traffic management, logistics, ship-building, infrastructure design and building

➤ **Lessons learned/Recommendations?** The reliability of the Rhine route needs to be improved, in order to meet the goals of sustainable navigation on the river. (see adaptation strategies)

Recommendations from the case studies

- **Effective communication schemes** are an important key to fast recovery
- The development of a **Decision Support System** to capture the complexity of the dynamic character of such extreme weather events and respond according to real-time information.
- Maintenance of **protections systems**
- Impose **precautionary closure**, e.g. of highways
- Better **traffic management, intelligent logistics, new vessel designs, and improved infrastructure design and construction**



**Better communication, greater preparation,
and more foresightfulness!**

Thank you for your attention!

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