Flood Risk Management
Lessons from Recent Flood Events in Europe
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Introduction

- Floods Directive Requirements
- The role of EWA in the Floods Working Group (WGF)
- Thematic Workshops
- European Context for Flood Risk Management
- Lessons from Recent Events
  - Preparedness, Resilience and Adaptation
- Implications for the Water Environment
- Framework for Resilience
The European Floods Directive

- **Stages**
  - Preliminary Flood Risk Assessment
  - Flood Risk Mapping
  - Flood Risk Management Plans
  - 6 year cycle

……covers **all types of flooding**

- Fluvial Floods
- Coastal Floods, Tidal Surge and Tsunami
- **Pluvial (Surface Water) Flooding**
- Flash Floods
- Sewer Exceedance (due to rainfall)
- Infrastructure – Dambreak and Canal Breach

Boscastle flood courtesy the Environment Agency and Marc Hill. Isla flood (top) courtesy SEPA
Floods Working Group (WGF) and EWA’s Role

- WGF responsible for **technical review and guidance on implementation** issues arising from the Floods Directive
- Representatives from all **28 Member States** plus invited NGOs including **European Water Association** (60+ attendance)
- European Water Association represented as a stakeholder
- Two meetings per year at various locations including Brussels
- **Diversity** of flood risk, but common themes allows knowledge sharing across MS
- Thematic Workshops held back-to-back with WGF meetings on **critical common issues**
WGF Thematic Workshop Topics have included...

- Directive requirements: PFRA, Flood Mapping, FRMP
- Catchment Approach to Flood Management
- Flash Floods and Pluvial Flooding
- Floods and Economics
- Stakeholder Involvement in Flood Risk Management
- Climate Change and Flood Risk Management
- Trans-boundary Issues
- Flood Preparedness, Resilience and Adaptation (March 2015)
- Coastal Flood Mapping / Planning (October 2015)

Future Workshops:

- Review of 1st 6 year implementation cycle (April 2016)
- Pluvial flooding (October 2016)
- E.g. Critical Infrastructure; Planning; Communication; Governance; Green Infrastructure; Economics etc.
European Context – Risk and Economic Losses

- Flooding causes more damage than any other natural hazard
- National Risk Assessments to be reported by Dec 2015
- 20 out of 21 MS (March 2015) report flooding as a major risk

### Table 2.1 Disasters caused by natural hazards in Europe in 1998–2009 as recorded in EM-DAT

<table>
<thead>
<tr>
<th>Hazard type</th>
<th>Recorded events</th>
<th>Number of fatalities</th>
<th>Number of people affected (million)</th>
<th>Overall losses (billion EUR (¹))</th>
<th>Insured losses (billion EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storm</td>
<td>155</td>
<td>729</td>
<td>3.803</td>
<td>44.338</td>
<td>20.532</td>
</tr>
<tr>
<td>Extreme temperature events</td>
<td>101</td>
<td>77,551</td>
<td>0.005</td>
<td>9.962</td>
<td>0.186</td>
</tr>
<tr>
<td>Forest fires</td>
<td>35</td>
<td>191</td>
<td>0.163</td>
<td>6.917</td>
<td>0.097</td>
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<tr>
<td>Drought</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>4.040</td>
<td>0.000</td>
</tr>
<tr>
<td>Flood</td>
<td>213</td>
<td>1,126</td>
<td>3.145</td>
<td>52.173</td>
<td>12.331</td>
</tr>
<tr>
<td>Snow avalanche</td>
<td>8</td>
<td>130</td>
<td>0.01</td>
<td>0.742</td>
<td>0.198</td>
</tr>
<tr>
<td>Landslide</td>
<td>9</td>
<td>212</td>
<td>0.007</td>
<td>0.551</td>
<td>0.206</td>
</tr>
<tr>
<td>Earthquake</td>
<td>46</td>
<td>18,864</td>
<td>3.978</td>
<td>29.205</td>
<td>2.189</td>
</tr>
<tr>
<td>Volcano</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0.004</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>576</td>
<td>98,803</td>
<td>11.112</td>
<td>148.831</td>
<td>35.739</td>
</tr>
</tbody>
</table>

[¹] Assuming made for calculations
Workshop - Preparedness, Resilience and Adaptation

- Thematic Workshop organised by UK, SE and EWA (March 2015)

- Preparedness
  - Emergency Plans, Flood Forecasting and Warning, Mobilisation, Seasonal maintenance

- Resilience (system and assets)
  - Ability to recover quickly – multi-faceted

- Adaptation
  - Flexible pathways, “no regrets”
Learning from Recent Events

- Workshop preparation – questionnaire
  - Preparedness, Resilience and Adaptation
  - Each MS to provide information on 3 different flood events

- Workshop Session – Learning from Recent Events
  - Topic 1: Floods Directive tools/actions for preparedness and resilience
  - Topic 2: Lessons for communications – Government and Communities
  - Topic 3: Lessons for community awareness and involvement
  - Topic 4: Lessons for protecting vital societal functions
UK – Coastal Flooding - 5 Dec 2013

- Highest tidal surge in 60 years since 1954 East Coast Flood (300 fatalities – 24,000 properties flooded)
- 2013 East Coast Floods - 1600 properties flooded......estimated 800,000 properties at risk not flooded
- Flood Emergency Plan worked well.....new defences held though considerable damage to them
- An example of Climate Adaptation in action?
Spain – Coastal Flooding, Basque Country 2014
Flood Risk Management – Lesson from Europe

Iain Blackwell Nov 2015

UK - London and Thames Valley Flooding - Temporary Flood Defences – Jan / Feb 2014

- River Thames at flood threat level for **longest ever recorded period** (24 Dec 2013 – 7 March 2014)
- Flood peak from 9 to 19 February
- Many hundreds of properties flooded over 50miles from London to Oxford
Croatia - Fluvial Flooding – May 2014

- Worst since the flooding of Zagreb by Sava River in 1964
- Made worse by 2 major dike breaches
- 3 casualties and 9000 evacuated
- 230 million Euro damages
Sweden - Pluvial Flooding – 20 to 31 August 2014

Kristinehamn, August 20
All photos: MSB

Getinge, August 17 - 18

Kristinehamn 20 aug,
60 mm for one station -
but most likely much
more in some hours

Hällum 20 aug,
134 mm,
83 mm during 4 h

Getinge 17-18 aug,
138 mm during 48 h

Malmö 30-31 aug,
107 mm,
71 mm during 3 h
France – Pluvial Flooding October 2015

- Flooding 3-4 October 2015
- Direct runoff (pluvial) flooding and small watercourses
- 32 municipalities declared Natural Catastrophe - “CatNat”
- 20 deaths
- €550 – 650M estimated damages
Learning from Recent Events

- **Principal Conclusions and Recommendations**
  - There is a need for *enhanced flood forecasting and flood warning systems* for short duration pluvial flood risk
  - *Effective communication* across a wide range of flood risk management issues and associated aspects of climate change is critical
  - *Spatial planning and development control* needs to be strengthened to prevent inappropriate development on flood plains or in other flood risk areas
  - The “*cascade*” effects of a flood event affecting critical infrastructure in one location leading to significant impacts beyond the boundary of the asset affected should be integral to flood risk management solutions

- All of these have implications for the water environment and water infrastructure
Implications for the Water Environment

- Location of principal water/wastewater assets
  - Vulnerability to different forms of flooding
- How resilient are assets?
  - Individual assets; system resilience
  - Need for strategic and site-based understanding of vulnerability/resilience
- What are implications of extreme flood events?
  - Combined sewer overflows
  - Discharge consents breached and pollution incidents
  - Damage to assets and inability to get “up and running” again quickly
  - All aspects potentially impacted - supply, quality, distribution, wastewater collection/pumping/treatment
- Cascade impacts
  - Power supply/fuel supply – electrical power and back up generator loss
  - Access to sites – key transport routes disrupted
  - Supply chain disruption – replacements parts, chemicals
Framework for Resilience

- Framework for Resilience
  - TO BE DEVELOPED...
  - Stage 1 – Resilience Risk Screening and Assessment
  - Stage 2 – Detailed Resilience Assessment
  - Stage 3 – Implementation of Resilience Solutions
Thank you

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