

Learning from Europe: review of first cycle of implementation of Floods Directive

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U.S. and the EU have different flood risk management contexts (governance, history, geography, culture, etc.) However there are still some significant lessons that can be learned which are directly applicable to the US context.

EU Floods Directive (1st round of implementation) required Member States (MS) to prepare

- preliminary flood risk assessments by December 22nd, 2011
- flood hazard and risk maps by December 22nd, 2013
- flood risk management plans by December 22nd, 2015

Question: Should the process in Europe be viewed as being more proactive than that achieved by NFIP arrangements in US?

EU Floods Directive operational cycle

FLOODS DIRECTIVE (2007)

Goal: To reduce and manage the risk that floods pose to human health, the environment, cultural heritage and economic activity

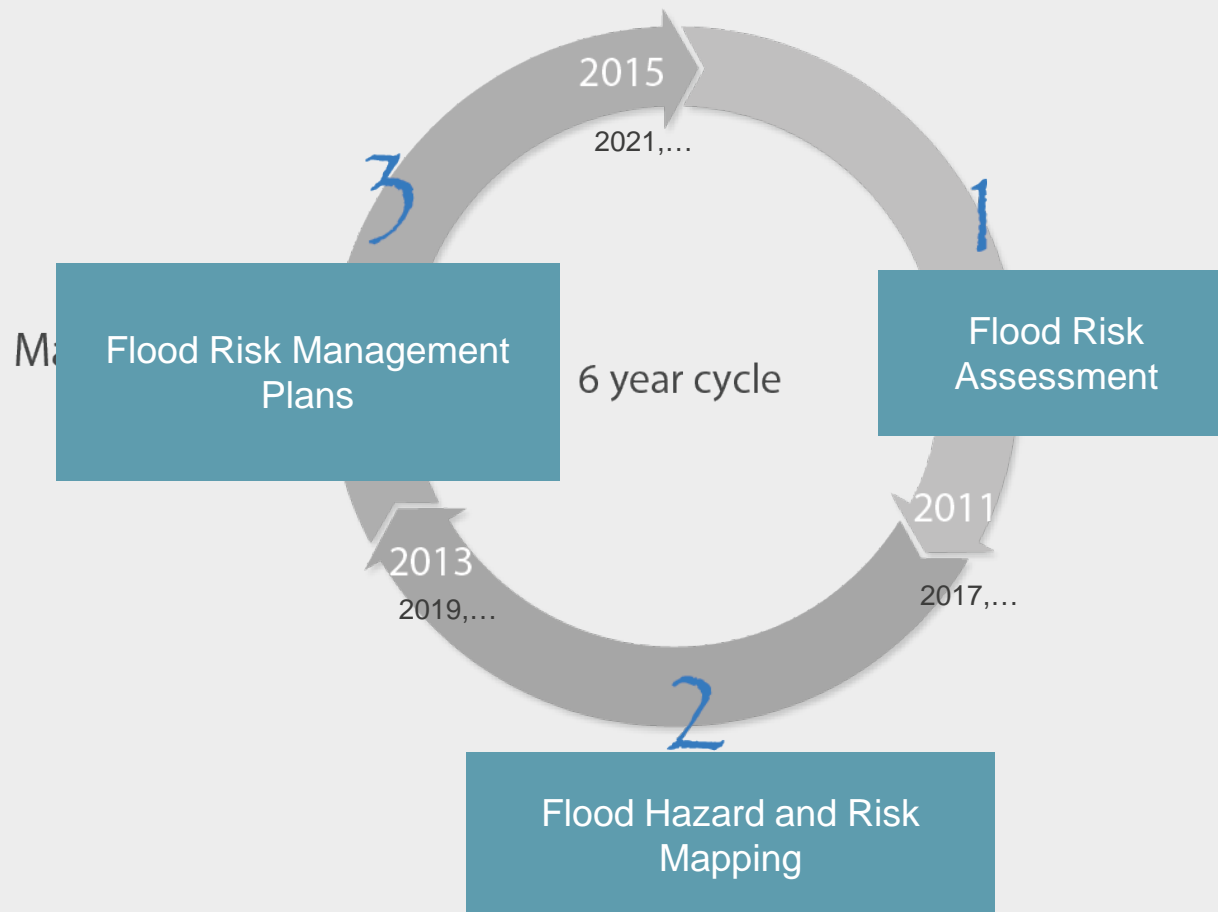


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Anna Serra Llobet

Now that the first cycle of implementation of the 2007 EU Floods Directive is complete, it is possible to identify some of these lessons.

These lessons will be explained by exploring the following five themes:

1. types of floods and flood maps;
2. impacts of floods and risk assessment;
3. flood risk mitigation measures;
4. trans-boundary issues;
5. spatial/land-use planning.

The material presented is based on an HR Wallingford review.

The review was carried out for EU Working Group F, which oversees the implementation of the Floods Directive.

Types of floods and flood maps

■ Types of flood experienced

- Flash floods and debris flow (*issues: precipitation forecasting; mapping and predicting floods given morpho-dynamic uncertainty; warning times*)
- Pluvial flooding (*issues: areas at risk not always obvious; high intensity short duration events*)
- Groundwater flooding (*issue: difficult to predict and prevent*)
- Coastal flooding (*issues: joint probability; sea level rise*)
- Fluvial flooding

■ Wide variety of methods selected by MS for creating maps. Issues of note:

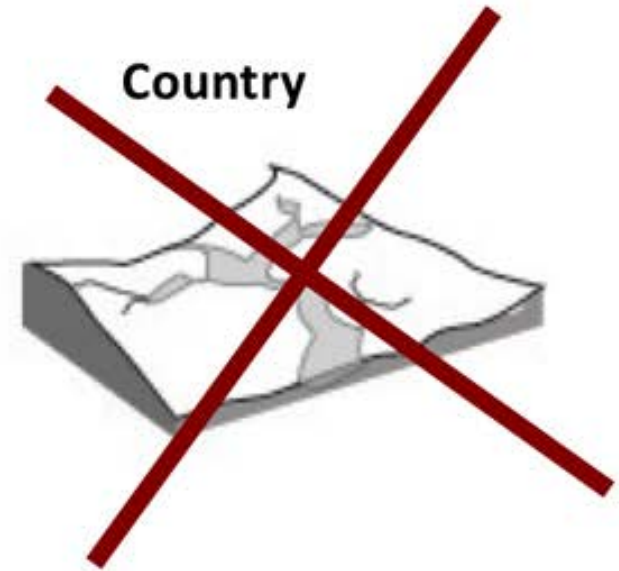
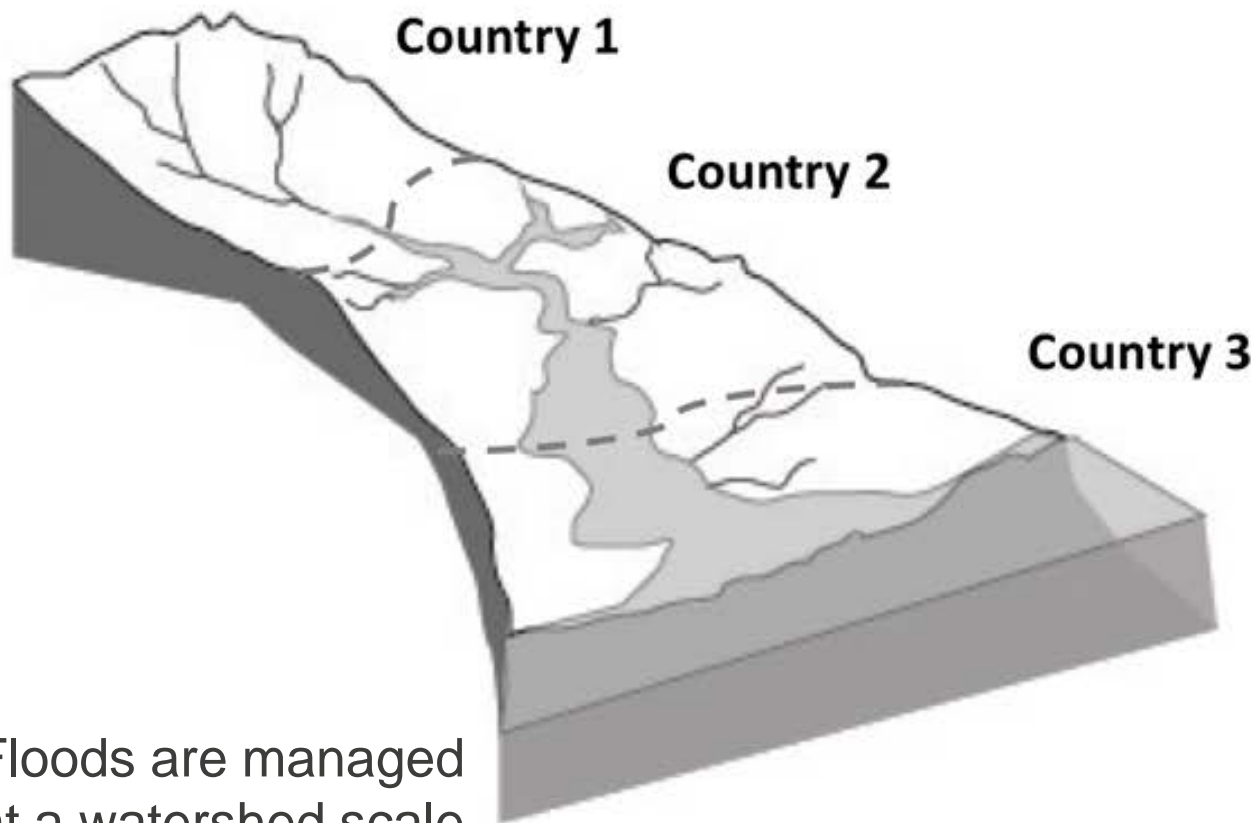
- benchmarking, calibration and validation;
- uncertainty;
- effects of blockage of culverts, bridges and other structures by debris;
- hydro-morphological effects;
- whether to include climate change on maps; scale of maps

Types of floods and flood maps

- Capturing historical floods
 - Use of historical flood extents to calibrate or validate flood maps
 - Use of geological indicators of flooding (e.g. river alluvium, river terraces) to produce flood maps that complement maps produced by other methods?
- Communicating using maps
 - Recognising different types of users and perceptions of maps; showing defended and undefended areas on flood maps; raising awareness and preparedness
- Stakeholder/community engagement in creating maps
 - Increasing stakeholder participation; engaging politicians to deliver a more coherent / coordinated approach to flood risk management
 - Engaging communities with experience of flooding to raise awareness

Creating transboundary maps (> 1 MS) required by Water Framework Directive (2000)

- Can provide common basis for an integrated cross border approach and can assist with strengthening trans-national co-operation and information exchange
- Agreeing annual probabilities of floods in trans-boundary river basins for mapping
- Consistency of MS flood mapping of shared coastlines (coastal cells)



Floods are managed
at a watershed scale

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Anna Serra Llobet

Impacts of floods and risk assessment

- More than purely economic assessment of consequences of flooding?
 - Environmental consequences
 - Geomorphological
 - Health and social (loss of life, injury, community health; loss of critical social services ; mental health; collecting epidemiological data; mapping)
 - Cultural heritage (not easily re-built or reproduced; more predisposed to damage; relevance of cost-based approaches)
 - Critical infrastructure - transportation, water supply & sewerage, power, telecoms (understanding and mapping exposure in a consistent way)
 - Cascade effects (e.g. loss of power generation on water supply, wastewater and hospitals) – assessing and mapping these effects
 - Failure of artificial water retaining infrastructure (limited mapping, low probability but high consequence)
- Combining different consequences (monetising; using multi-criteria assessment consistently)
- Dealing with uncertainty (different receptors; climate change; seasonal populations)

Flood risk mitigation measures

- Importance of portfolios of both structural and non-structural measures
- Future-proofing of measures – valuing “real options” investments
- Financial, regulatory and behavioural barriers to the successful delivery of measures – e.g. delay to complex decisions with significant uncertainties
- Assessing effectiveness and priority of measures
 - multi-purpose measures (e.g. Natural Water Retention Measures)
 - Improvements to flood forecasting and warning
 - SMART (Specific; Measureable; Achievable; Relevant; Time-bound) objectives
- Social acceptability of measures
 - Socio-political acceptance; community acceptance; market acceptance of investments
- Natural water retention measures
 - Lack of empirical data; Guidance needs; agricultural policy inhibition of necessary changes in land use
- Choice of discount rate for analysis and prioritisation of measures

Other trans-boundary issues

Floods are managed at a watershed scale

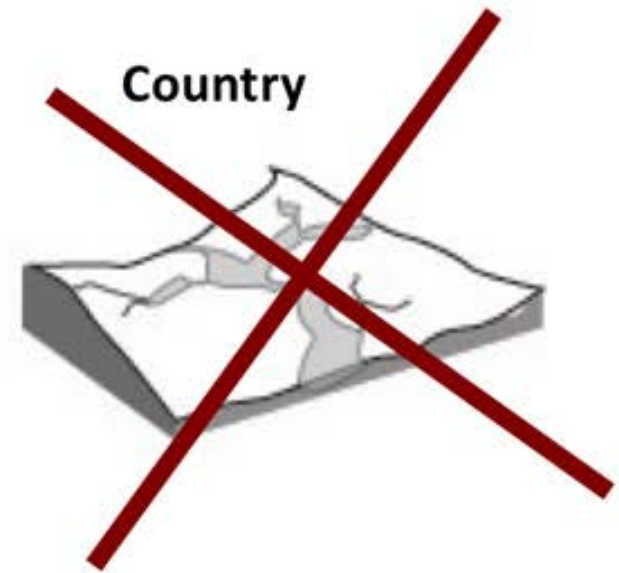
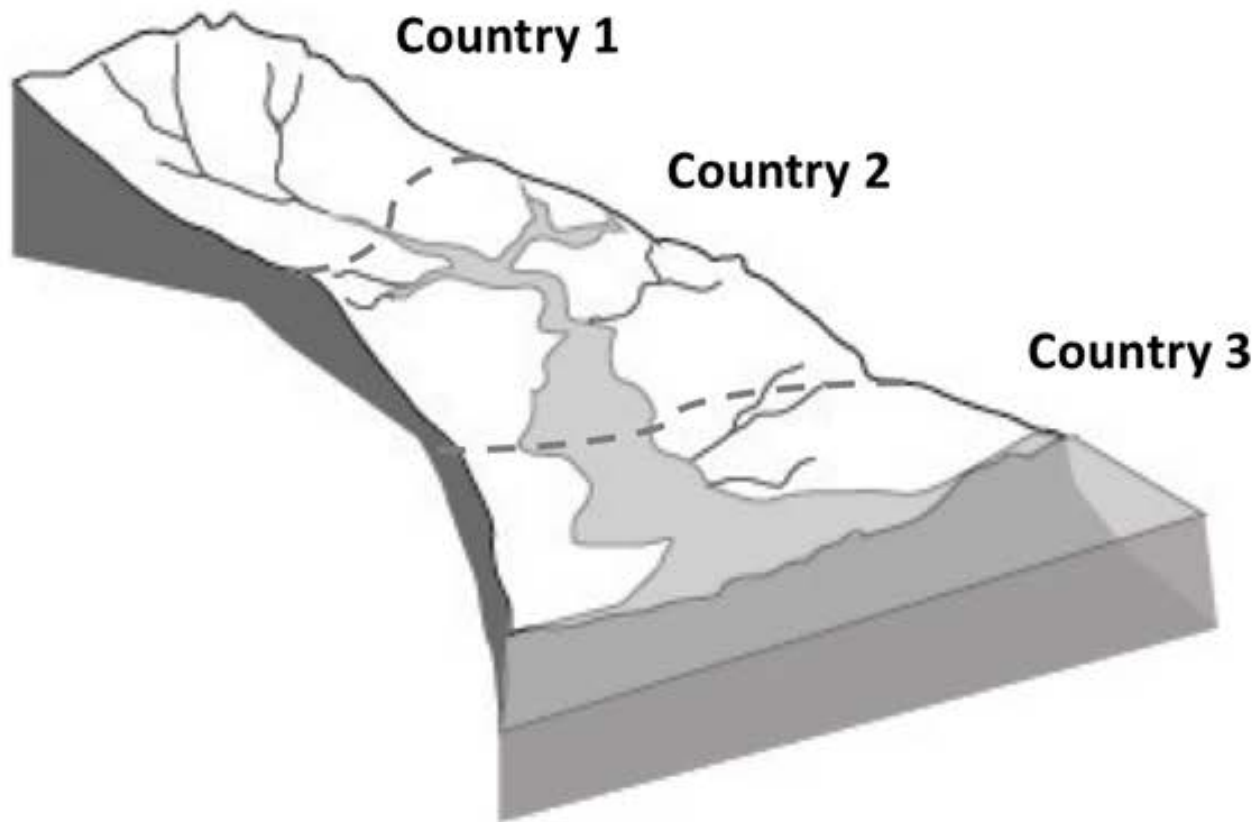


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Success factors

- Good working relationships between the relevant authorities. Coordination can be informal, focus on substance, arrangements should be flexible to reflect likely evolution of approaches, methods & available information. Key issues:
 - Understanding each other problems;
 - Common or comparable goals, strategies, policy, structure and discourses;
 - Harmonisation is not required to achieve effective coordination (coordination & information exchange will be sufficient to achieve joint goals)
- No “one-size-fits-all” solution or best practice for trans-boundary coordination. The most appropriate approaches and degree of coordination will vary according to the individual context of each situation where coordination is needed.
- Identifying economic benefits from trans-boundary cooperation in implementation.

Issues

- How can measures that have a positive impact across a trans-boundary river basin be assessed effectively?
- How can measures that are effective in more than one Member State in a trans-boundary river basin be efficiently co-financed?
- What methods are available to help to strengthen River Basin Commissions to assist them to tackle trans-boundary issues?
- Do International River Commissions act as the best platform for the exchange of information and cooperation in trans-boundary river basins?
- Will current trans-boundary agreements need to be revised in the context of climate change?

Spatial/land-use planning (and coordination with other EU directives)

Issues

- Coordination of strategies and policy instruments across a range of national regional and local scales
- Policy and decision-making interactions between land use planning for urban development and flood risk
 - Influence of defining Areas of Potential Significant Flood Risk on spatial planning in different Member States
 - avoiding locating unnecessary new development in areas of high flood risk.
 - mitigating the surface water run-off impacts of new development on downstream areas.
 - acceptable flood risk (and its interface with planning)
 - opportunities and barriers for the integration of land use planning within the Preliminary Flood Risk Assessment and Flood Risk Management Plans
- Allowing for future scenarios (including climate change) in land use planning

Implications for US (for discussion)

- Mapping issues
 - Multiple types of flooding and how to show these on maps (c.f. e.g. the US urban flooding discussion);
 - De-politicised mapping process (Different maps for different end-users?)
 - Stakeholder involvement in mapping – beyond a purely technical process?
- Drive for multiple benefit assessment and delivery
- Suites of measures, not just reliance on levees
 - Community involvement (Community Rating System approach in US offers hope?)
 - Use of natural flood management measures (NNBF approach being promoted in US by Engineering with Nature initiative by USACE and others)
 - Role of flood warning
 - Interagency cooperation (c.f. Silver Jackets)
 - Regulatory road blocks
- Inter-state cooperation and international (Rio Grande, Columbia) cooperation
- Role of land-use planning. (Currently highly variable in US)