

Challenges for Implementation

UNESCO

Centre for

Water Law

Policy

and Science

Professor Chris J
Spray.



The New Bill – how do we make it work for ALL of us?

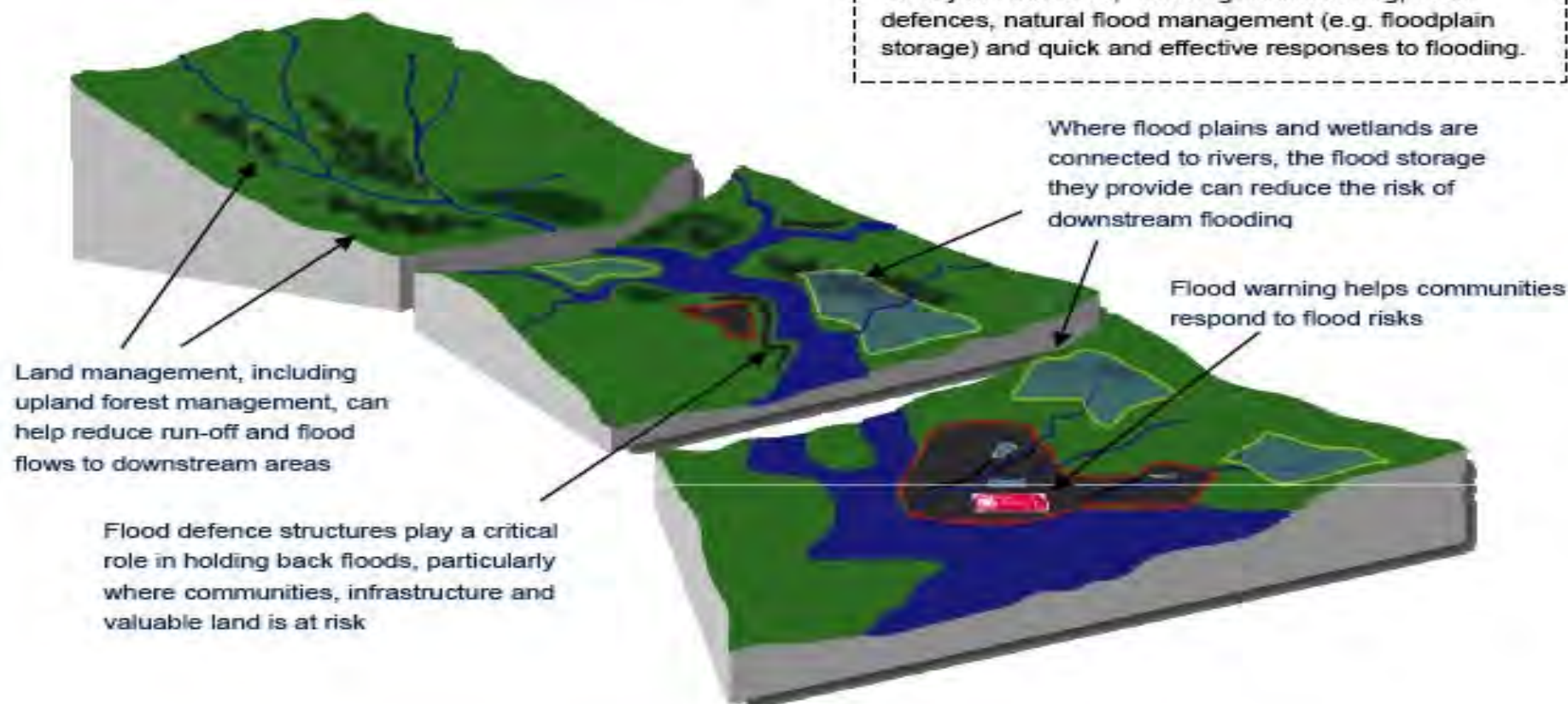
- **Context** - the need for a Systems Approach
- **Environmental Change** – climate impacts
- **The Challenges** themselves



Sustainable Flood Management

Sustainable flood management is an approach to planning and delivering measures to reduce flood risk.

Increasing resilience to flood risk is an important component of sustainable flood management. Resilience to flooding can be increased through a variety of measures, including flood warning, flood defences, natural flood management (e.g. floodplain storage) and quick and effective responses to flooding.



Integrated Water Resource Management (IWRM) - GWP

“promotes the **co-ordinated development and management of water, land and related resources**, in order to maximise the resultant **economic and social welfare** in an **equitable** manner without compromising the **sustainability of vital ecosystems**”.



Ecosystem Approach (CBD)

“a strategy for the **integrated management of land, water and living resources** that promotes **conservation and sustainable use** in an **equitable way**”.



Integrated Flood Management

- **Associated Programme on Flood Management – World Water Forum, Istanbul 2009**
- **IFM HelpDesk – World Meteorological Organisation and wide network of Support Partners (incl UNESCO Centre, Dundee University)**

launch 17th June Geneva.

to support flood management policy,
strategy and capacity building

- See www.floodmanagement.info

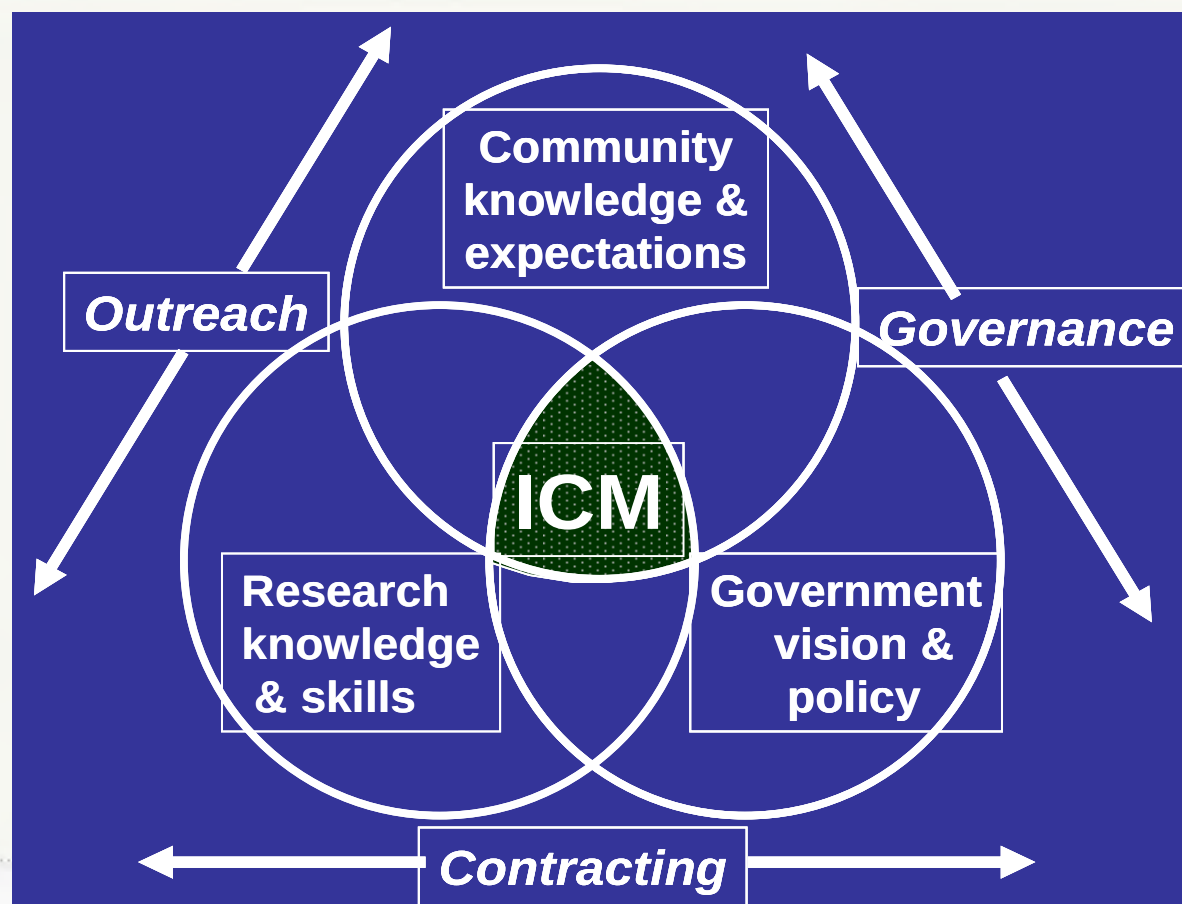


Integrated Catchment Management – Systems Approach

The relationship
between the different
components and key
stakeholders for
Integrated
Catchment (flood)
Management

UNESCO HELP
Basins (incl Tweed)

17/06/2009



Environmental change - precipitation

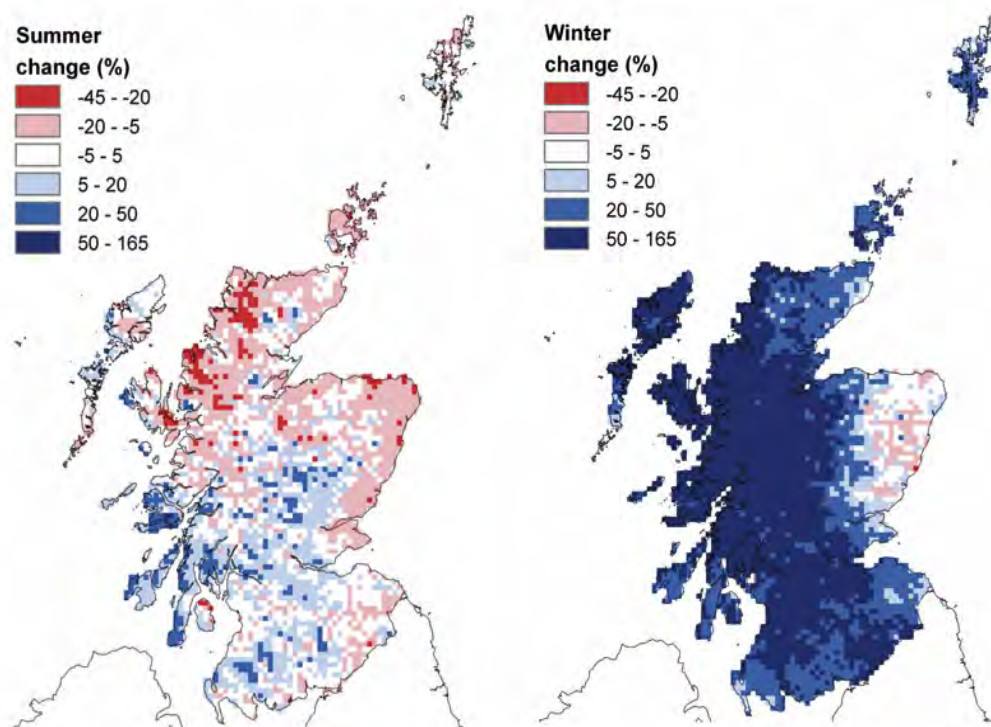
Change in precipitation (%) based on a linear trend, 1961–2004

**Summer
change (%)**

Red	-45 - -20
Light Red	-20 - -5
White	-5 - 5
Light Blue	5 - 20
Dark Blue	20 - 50
Very Dark Blue	50 - 165

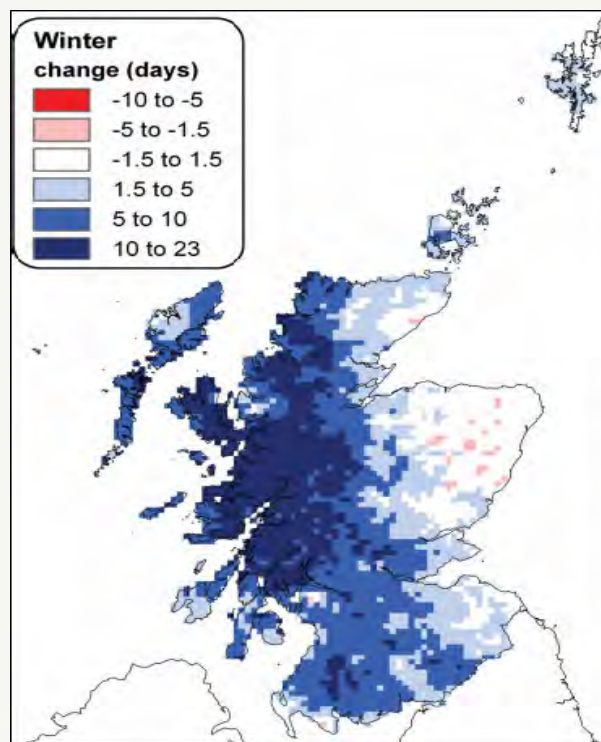
**Winter
change (%)**

Red	-45 - -20
Light Red	-20 - -5
White	-5 - 5
Light Blue	5 - 20
Dark Blue	20 - 50
Very Dark Blue	50 - 165



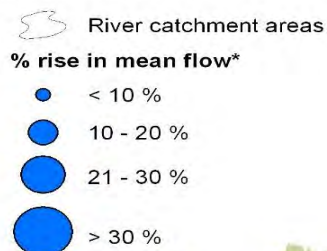
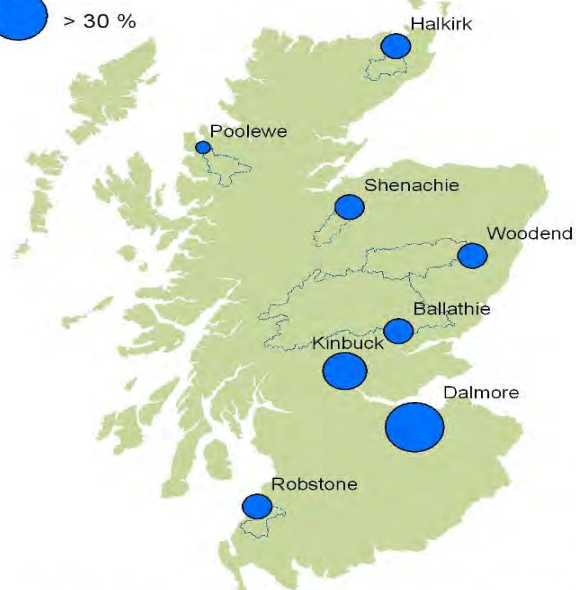
Source: *Patterns of Climate Change Across Scotland: Handbook*. Project code CC03, Scotland and Northern Ireland Forum for Environmental Research (SNIFFER), 2006.

•Heavy Rain - >10mm/day
(Change Days of 1961 – 2004)



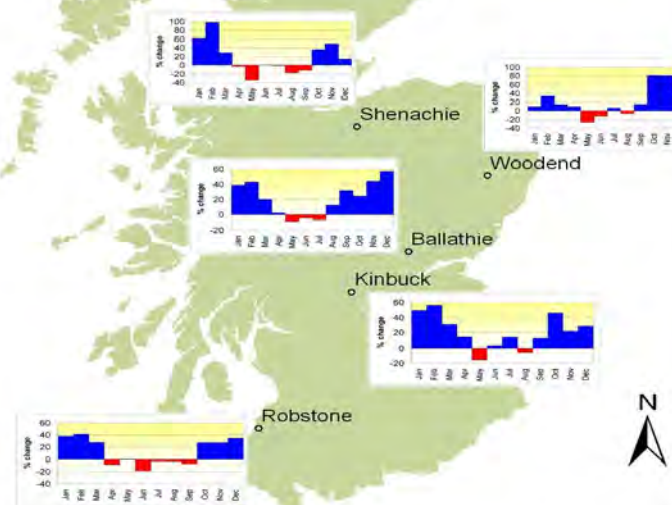
Environmental Change – river flows

Changes in annual mean flows
from 1972 to 2006



* this figure shows the percentage rise in mean flow between the periods 1972-1981 and 1997-2006

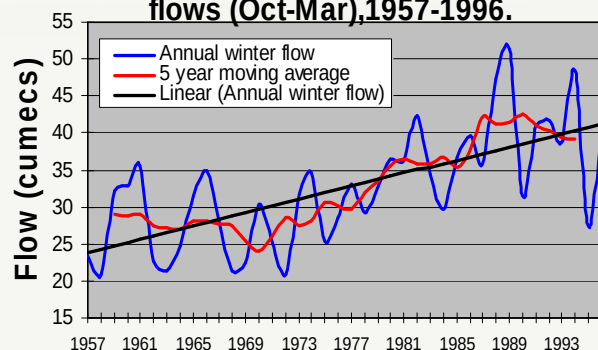
Changes in mean monthly flows
from 1964 to 2006



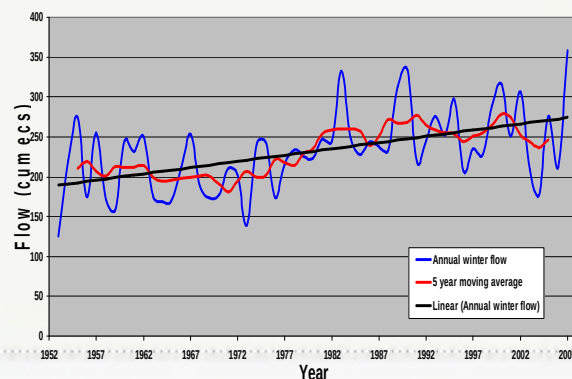
* this figure shows the percentage rise in mean monthly flow between the periods 1964-1973 and 1997-2006

Changing Patterns of River Flows

R.Teith at Bridge of Teith winter flows (Oct-Mar),1957-1996.

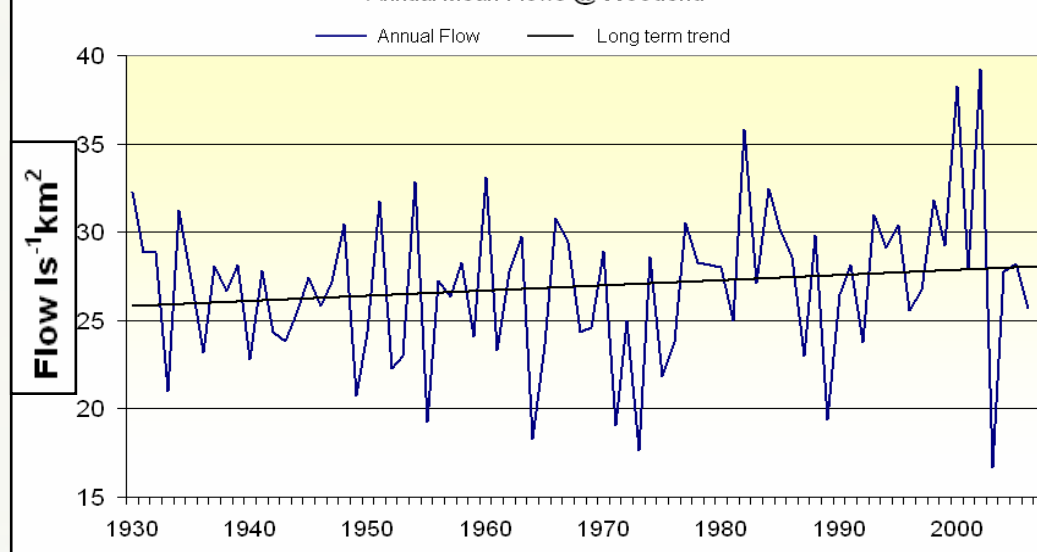


River Tay at Ballathie
Winter Flow (Oct - Mar) 1953 to 2007



Wetter winters, drier summers,
less snow, lower spring flows

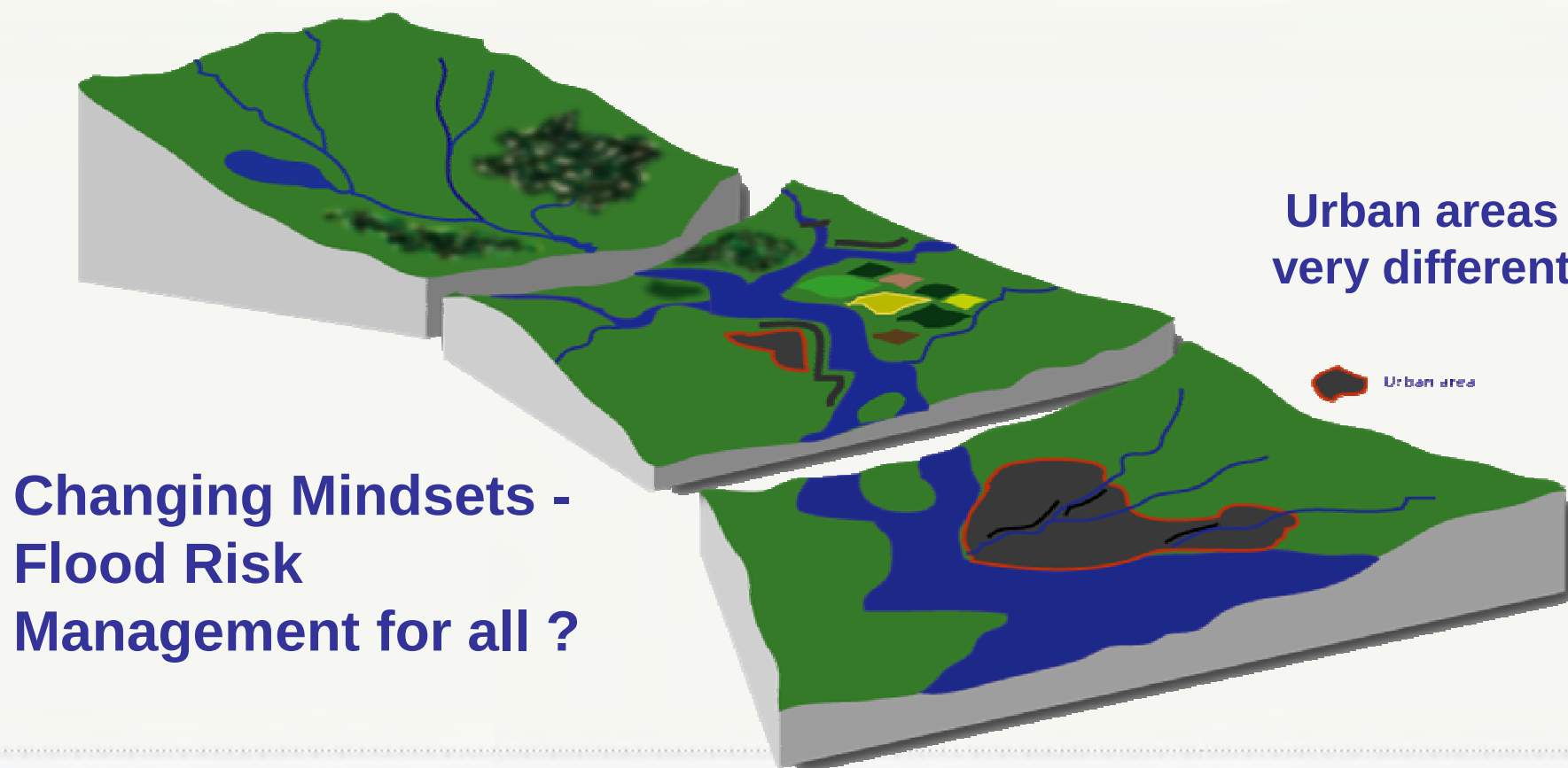
Annual Mean Flows @ Woodend



The Challenges for Implementation

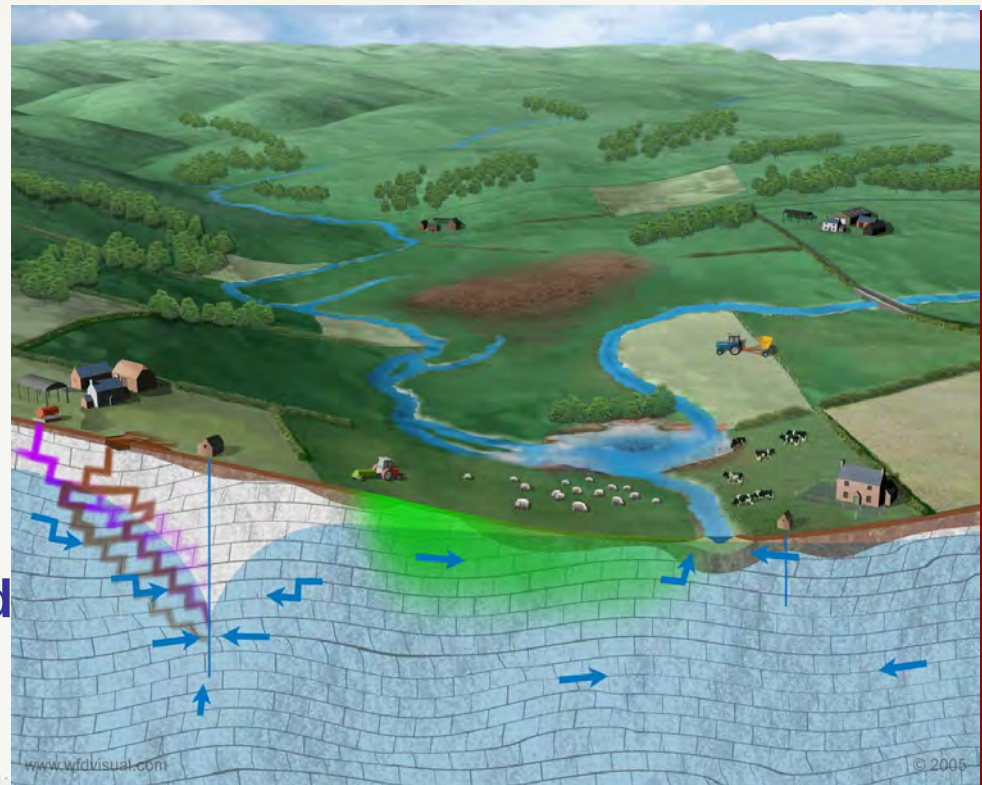
- Changing mindsets for delivery of integrated solutions
- Geographical scale
- Timescales for sustainability
- Skills and Capacity to deliver
- Avoidance as opposed to Defence
- Silos and Multiple Benefits (and costs!)
- Cultural challenge – partnership working and public participation
- Funding – alignment and resources
- The science and technical evidence base
- Rural valleys vs Urban population centres

Flooding in an integrated Catchment context: Source – Pathway - Receptor



Geographical Scale

- Catchments can be BIG!
- Relevant Authority boundaries overlapping
- Decision-makers: individual land managers vs the “common good”
- Downstream beneficiaries unaware of source/pathway management and costs (and vice-versa)
- Scale not just horizontal



Timescales for Sustainability

- Long term sustainable Vision and strategy essential.....
-but Public want action on the ground NOW
- Environmental “solutions” will take time to develop effectiveness
- Uncertainty over continuing effectiveness over time?
- Long-term maintenance of structures and landscapes?



Skills and Capacity

RAE Committee 2009 Report

Resource implications

Hydrologists and other specialist staff

Recommendation 33: Given the extent of the existing staffing shortage, the additional numbers of skilled staff required and the likely high demand for specialists across Europe, the Committee is not at all convinced by the Minister's reassurance that the steps being taken to recruit and retrain will "ensure future supply".

The Committee is deeply concerned that a marked shortage in skilled staff may impact both on the effectiveness of Scotland's new flood risk management process, and the time taken for implementation.

- **SEPA Dundee & Stirling Universities Msc Programmes**
- **Local Authorities? Other Partners?**



Avoidance (or warning) as opposed to “just” static Defence

- Settlement Patterns of two, three or more Centuries ago may now be “in the wrong place”
- Enhanced Flood Warning may be the best option in some areas
- Insurance premiums?
- Can we ensure tight alignment of future Development Plans with Flood Risk Management Plans ?
- No Building in Flood Plains?
- What role for Managed Retreat?

Building in the
Flood Plain!



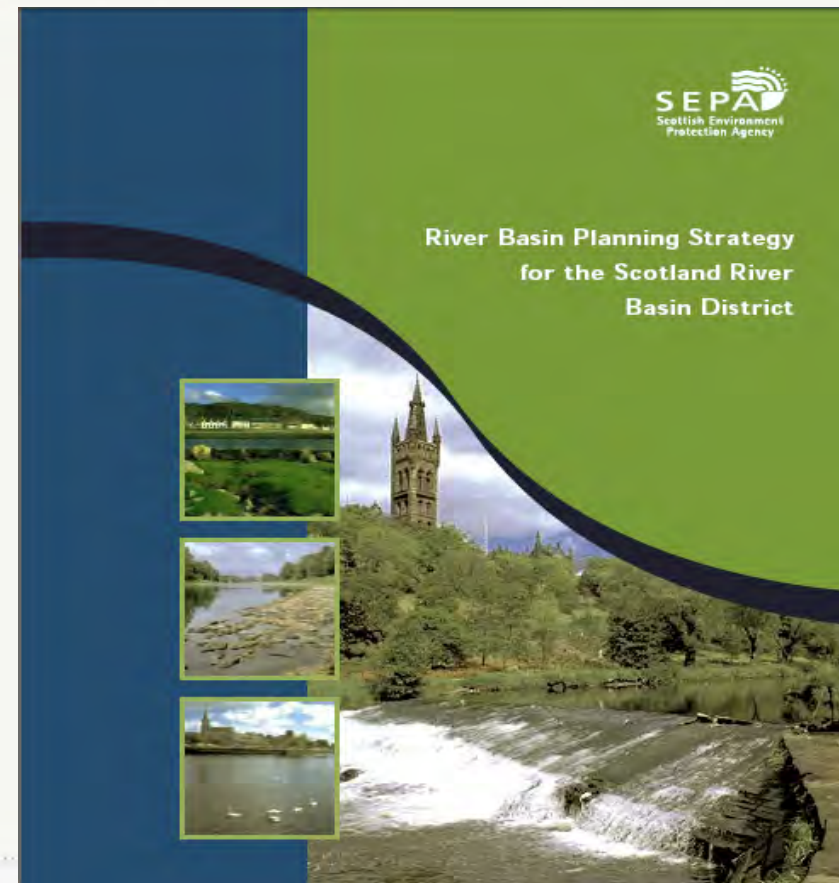
Silos, Multiple Benefits and Costs

- Policy alignment across disciplines – agriculture, planning, flooding, water management, emergency resilience, conservation, etc.
- Valuing more than just flood risk:
 - biodiversity, water quality, river restoration, fisheries, landscape, recreation, access, carbon storage
- Economic values are not everything! Ecosystem Services
- Insurance and Peace of Mind
- Local vs national priorities



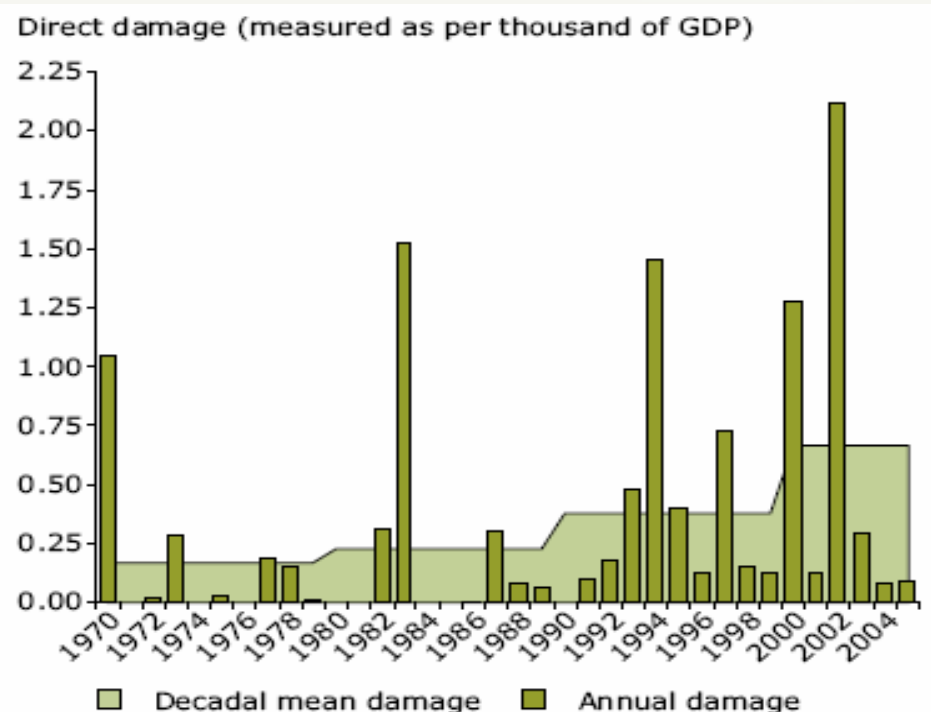
Cultural challenges: - Partnerships and Public participation

- **ALL the Relevant Authorities need to work together on:**
a common vision and understanding of sustainable flood management;
aims and objectives;
priorities and timescales;
organisation and delivery structures;
- **Duty to Implement – or not?**
- **What are the best methods for stakeholder engagement? - how to inform the Public AND capture their local priorities?**



Funding: alignment and resources

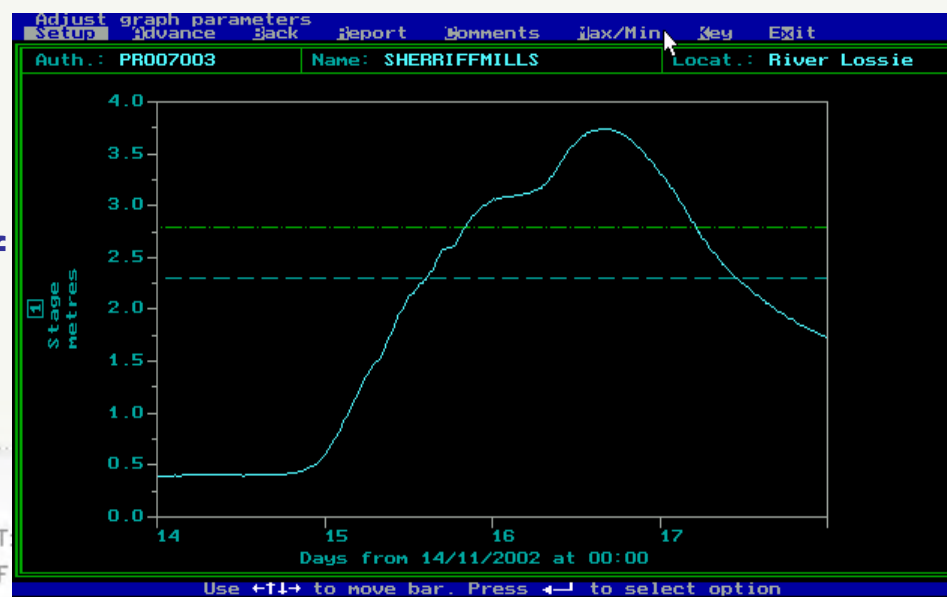
- Different funding cycles for the key organisations involved: - Local Authorities, SEPA, Scottish Water
- Different funding streams, policies and sources (e.g. SRDP)
- Ring fenced vs devolved Local Authority flood funding
- Alternative (more pressing) local funding opportunities
- Risk based approach
- Current economic situation



Source: Barredo, 2007.

Science and Technical Evidence Base

- Uncertainty in the science evidence base – environmental, engineering, social, economic
- Gaps in hydrometric networks and models – urban catchments, coastal flooding, small watercourses, pluvial, sewer and groundwater flooding
- Interactions between flood generating processes – sources and pathways in different flood conditions
- Empirical data on effectiveness of “natural” measures in real flood conditions
- Improvements in Flood Warning



Rural Valleys vs Urban Population Centres?

- How do we link the “down stream” urban beneficiaries with the “upstream” rural communities?
- Where should we prioritise expenditure at the start of the process?
- Most financial and human damage is done in urban areas – river flooding is NOT the primary cause.....



17/06/2010

**Flood Risk Management – challenges for
implementation before the day after
tomorrow...**

Over to you for discussion and feedback

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