

Dr Loveday E.T Jenkin and Dr
Dave C Watkins

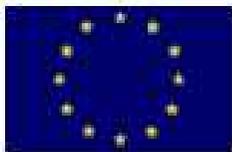
Cornwall County Council
CYCLEAU PROJECT



**‘Working together for the future of
our rivers, estuaries and coasts’**



www.cycleau.com



I N T E R R E G I O N A L
N O R T H W E S T E U R O P E

Community Initiative Programme funded by the European Union



nwe eno

Integrating research and decision-making for whole river basin management



- Introduction to Cycleau
 - Overview of the Project
 - Main actions in Cornwall
- Distributed modelling
- Habitat action
- Lessons for Water Framework directive delivery

The Cycleau venture: an overview...



Driving force is the Water Framework Directive

- Project life - 3.5 years (2003 - 2006)
- Programme funded by NWE Interreg IIIB
- Budget - 13.1m€, ERDF funding 7.8m€
- Common, transnational, holistic approach
- Innovative ways of managing whole water catchments
- Involving local communities

The Partnership

- 3 states: UK, France, Ireland.
- 11 Legal Partners
- Many other local partners



ENVIRONMENT
AGENCY



CONSEIL GENERAL
FINISTERE
Penn-ar-Bed



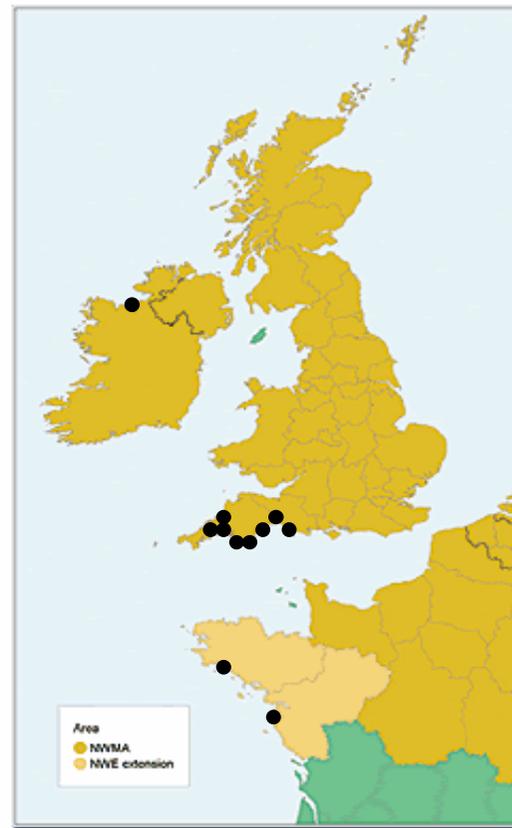
COCO PAQ



Cycleau Demonstration Sites



- 11 sites - 8 in South West of UK, 2 in France, 1 in Ireland.
- Project Site = the whole catchment, from source to estuary mouth



**Red River
Fowey
Fal & Helford
Teign
Slapton Ley
Axe & Char
Exe
Dart
Moy
Belon
Le Payré**

Cycleau Project Philosophy

- The Cycleau Project aims to produce a 'route map' methodology for communities wishing to use best practice environmental management.
- Information
↓
- Participation
↓
- Action

Cycleau



Information



- **Catchment Profiling** - to identify, collate and analyse what information is available on each catchment.
- **Risk Assessment** - to assess the impact and likelihood of events and activities that could prevent the achievement of Cycleau objectives within the catchment.
- **Targets** - to identify targets which are realistic, relevant, achievable and measurable - linked to the information collated in Catchment Profiling and Risk Assessment.

Participation

- What do people think about catchment or water management?
- How can they become more involved?
- Development of tools to raise public awareness

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Action



- **Physical Processes** - to understand how river and estuary dynamics work (e.g. sedimentation).
- **Diffuse Pollution** - to develop methods to mitigate pressures from agricultural, maritime and industrial activities.
- **Acute Pollution** - to develop a methodology for planning the control and management of acute pollution incidents (e.g.oil spills).
- **Habitats** - to mitigate the impacts of development and increase environmental carrying capacity (ecosystem functioning).

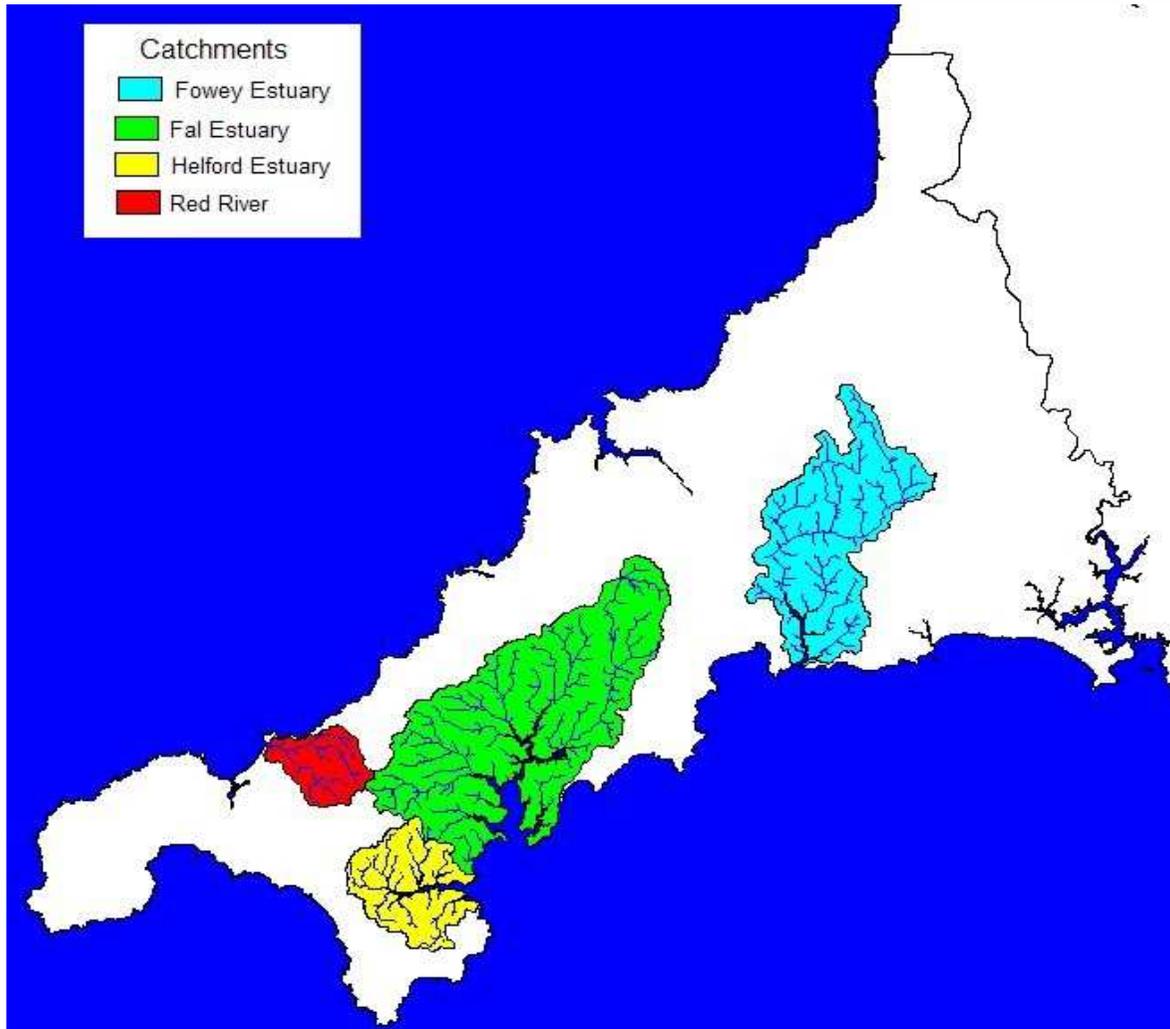
Cycleau methodology

- Checklist



- **Catchment Profiling** – what have we got? what is it like?
- **Risk Assessment** – how and where is it under threat?
- **Target Setting** – how do we measure changes?
- **Stakeholder Participation** – is everyone involved?
- **Physical Processes** – what is happening and where?
- **Acute Pollution** – how do we manage the risks?
- **Diffuse Pollution** – can we reduce the risks?
- **Habitat Action** – can we improve ecosystem functions?

Cycleau in Cornwall



Cycleau



The Cycleau Cornwall team

- Loveday Jenkin – Project Manager
- Dave Watkins – Information Officer
- Community Facilitators:
 - Jacque Merrick – Red River (KCC)
 - Sangeeta Taylor – Fal and Helford (CCC)
 - Annabel Keast – Helford (FWAG)
 - Jane Richards – Fowey (FHC)



Red River



The **Red River** has been associated with tin and copper mining for centuries. Its waters are heavily contaminated with metals and for much of its length it has been canalised.

Red River Actions 1

Diffuse pollution

Use of a pilot passive treatment plant to demonstrate removal of metals (Zn, Cu) in the River from diffuse sources using iron-rich mine water (with the Environment Agency).



Red River Actions 1

Habitat creation

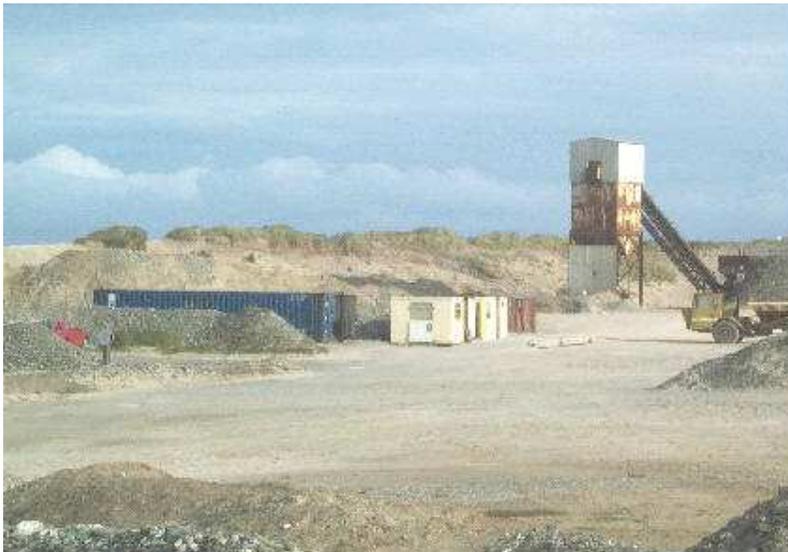
The project has enabled spin-off habitat improvements, much to the delight of the public / stakeholders.



Red River Actions 2

Habitat creation

Regeneration of a coastal sand quarry as a mosaic of sand dune and wetland habitats. Enhancement of adjacent floodplain wetland.



River Fowey



The **River Fowey** originates high on Bodmin Moor and flows across the uplands of the moor descending through farmland and scattered villages to the important commercial port of Fowey at the mouth of the estuary.

Fowey Actions 1

Physical processes

Removal of sand and reducing the rate of sand input into the upper catchment (with the Environment Agency).



Before



After

Fowey Actions 2

Physical processes



Two year study of rate and quantity of sediment inputs into the estuary from the upper catchment, both suspended solids and base load (with Fowey Harbour Commissioners).

River Fal



The **River Fal** catchment starts at Goss Moor and passes through farmland, heathland and china clay mining areas before emptying into the Fal Estuary, a Special Area of Conservation (Natura 2000).

Fal Actions 1

Physical Processes



Analysis of distribution of TBT contaminated sediments.
Identification and demonstration of novel clean-up technologies.

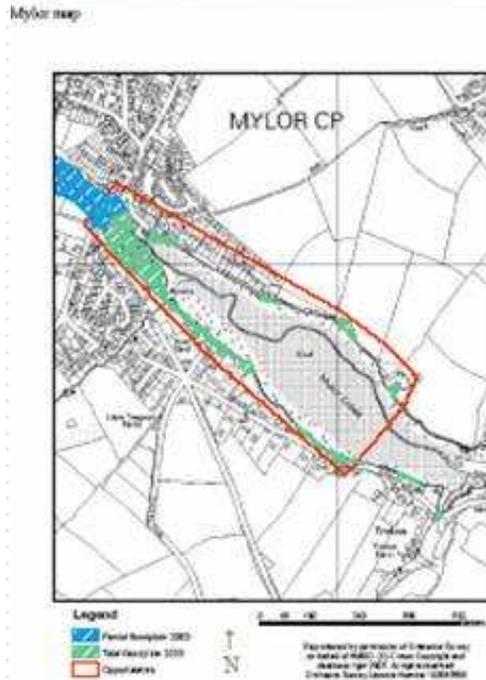
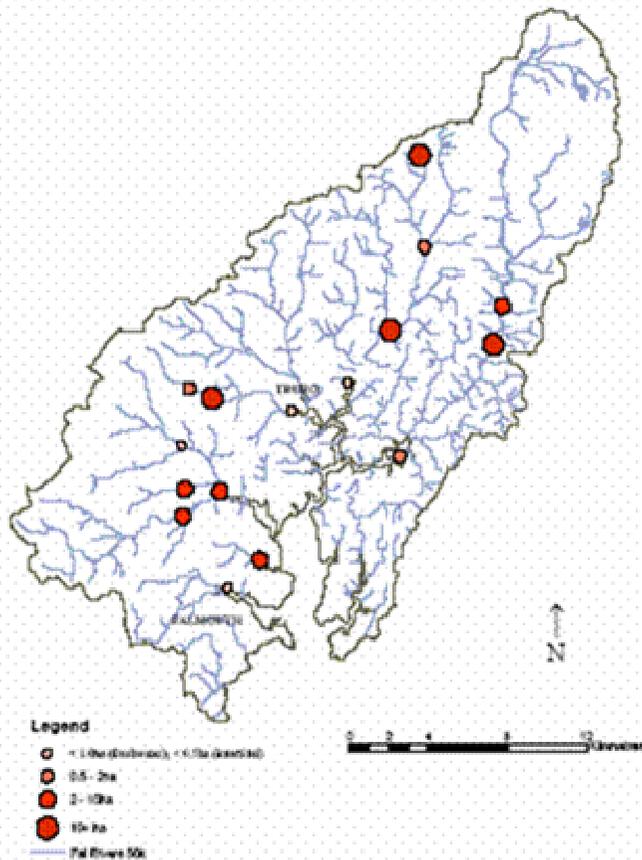
Fal Actions 2

Acute Pollution



Trial of novel movable moored boom system to allow removal of floating oil and avoid its deflection onto sacrificial beaches.

Fal Actions 3 Habitats



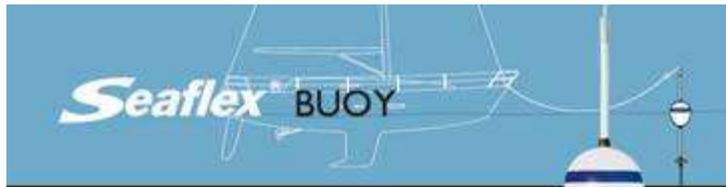
Audit of opportunities for habitat enhancement, restoration and re-creation to improve biodiversity and ecosystem functioning.

Fal Actions 4 Habitats

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2 year trial of new mooring system aimed at reducing impact on marine benthic habitats.



The Seaflex buoy tackles every strain

The Seaflex buoy is a ready-for-use mooring device that provides safe mooring in limited marina spaces. A boat moored to a Seaflex buoy demands less security distance and stays in position regardless of tide and wave movements.

The Seaflex tower is made of a homogeneous rubber core, armed with a specially braided cord. The unique construction gives a progressive resistance that dampens motion from the water and works as a secure shock absorber even in the harshest weather conditions.

FORGET ANNUAL INSPECTIONS

The rubber towers will never be subject to damaging UV rays, fittings and shackles in stainless steel fight corrosion and deterioration and an age resistant polyester rope has the capacity to handle immense amounts of strain and stress. A Seaflex buoy demands minimal maintenance and successfully reduces the need for inspection.

Light in handling - Seaflex mooring buoy is easily handled by one person



THE ENVIRONMENTAL MOORING

Seaflex is 100% environmentally safe and avoids disturbing sensitive sea bed vegetation. The great flexibility of Seaflex is extended even further through its capacity to adapt to extensive water fluctuations.

BOAT LENGTH	SEAFLEX	ACM	ANCHOR EYELET	BOTTOM ANCHOR
24 ft	1 000	3/8 in	3/8 in	1200 lb
27 ft	1 000	3/8 in	3/8 in	4000 lb
33 ft	3 000	1 in	3/4 in	4800 lb
47 ft	4 000	1 in	3/4 in	5800 lb



Fal Actions 5

Habitats



Demonstration of an outdoor wintering area for cattle with linked wetland treatment system for nutrient and sediment reduction.

Helford River

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The **Helford Estuary** is about 9km long and has numerous creeks running off it, many of which dry to mud at low tide.



Helford Actions 1

Diffuse Pollution / Participation



Employment of a catchment farm advice officer to work with farmers to find ways to reduce diffuse pollution, including the trial of a small value farm grant scheme.

Helford Actions 2

Diffuse Pollution



Sediment budget monitoring and assessment. Quantification of the sources, stores and fluxes of fine sediment in the whole basin (University of Exeter).

Helford Actions 3

Diffuse Pollution



DNA testing of pathogens (*E.coli*) to identify sources: animal, human, avian. Linking to sediment study and determining impacts on shellfisheries (University of Exeter and Environment Agency).

Distributed modelling and GIS



- Begins with catchment delineation from the Digital Elevation Model

- DEM



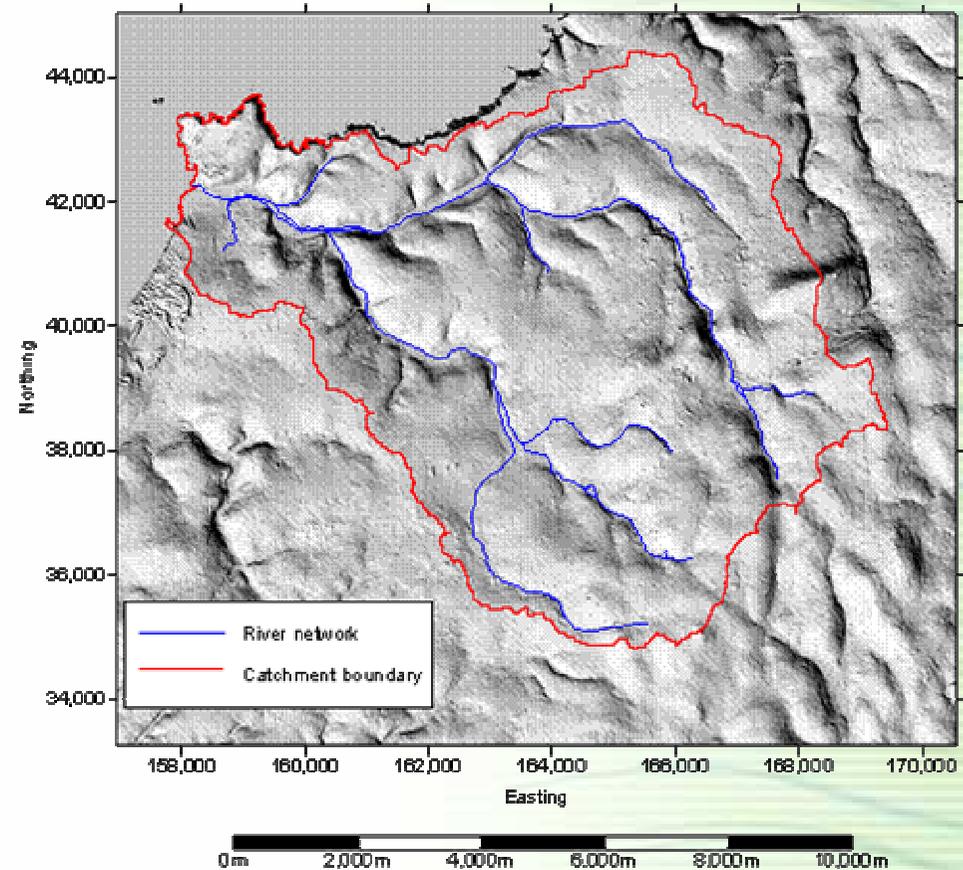
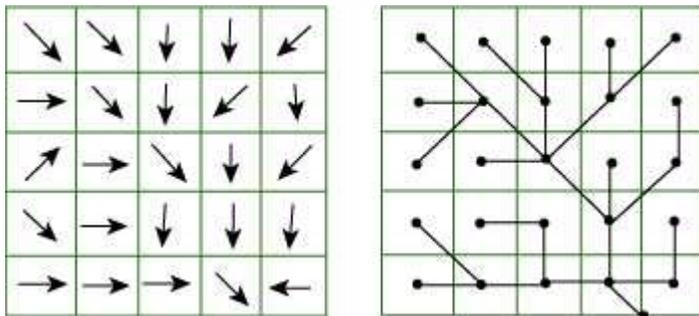
- runoff map



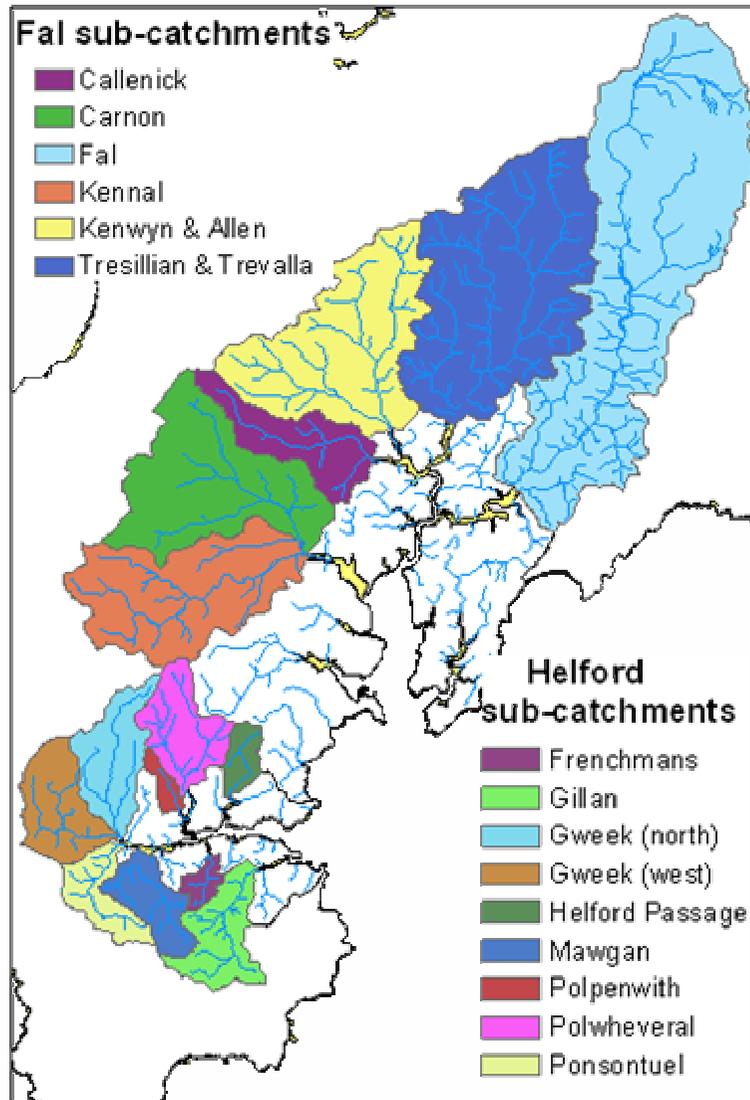
- river network



- watershed boundary



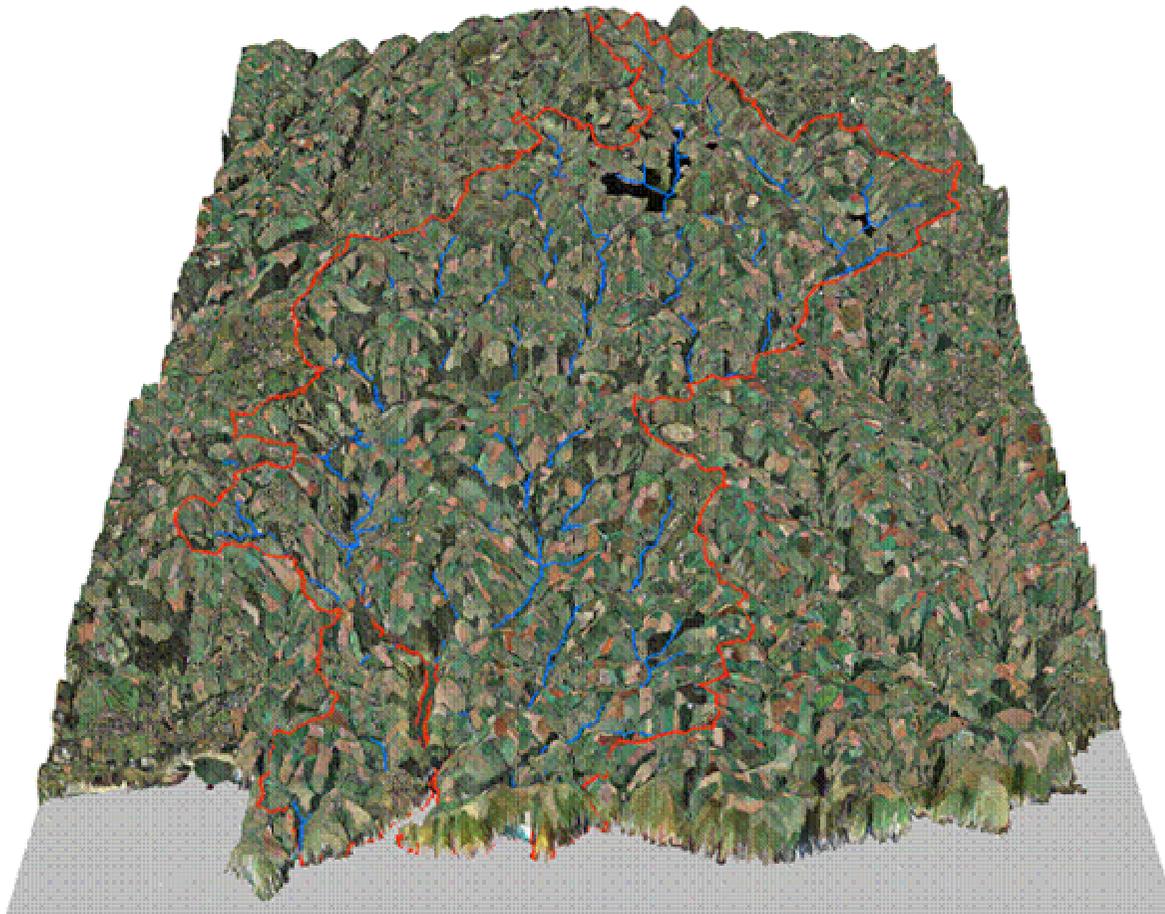
Catchments & sub-catchments



e.g.

- What land use is upstream of a particular monitoring point?
- What discharge consents are upstream of oyster beds?

Visualisation



Useful for involving stakeholders.

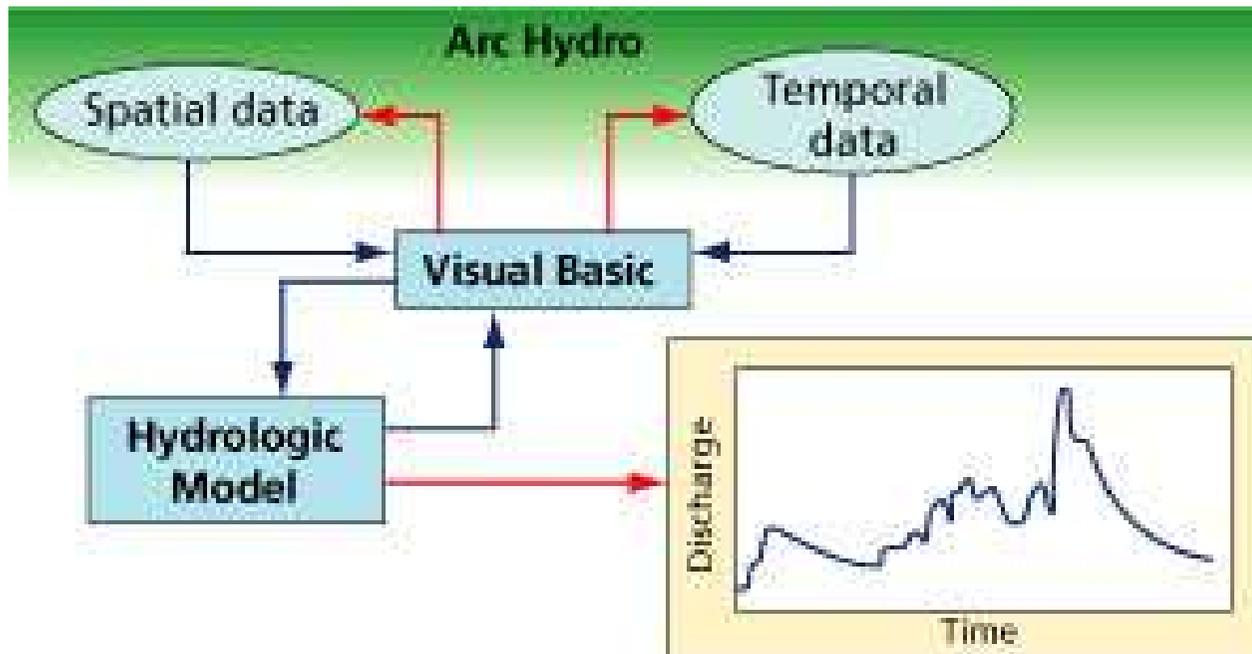
e.g. "I can see my farm from here!"

Data integration and GUI for hydrologic modelling

- Linking to other software
- Risk assessment



- HEC RAS
- HSPF
- SIMCAT



Habitat Action

Leading the Theme



Development of
Cycleau methodology

Using experience in
Natural Environment
Service, CCC

And Theme Group
Workshops and
Meetings



HABITAT ACTION PRINCIPLES

– the 8 key principles



1. **Maintain existing levels of biodiversity**
2. **Ensure long-term stewardship**
3. **Public awareness, understanding and involvement**
4. **Broad vision for the catchment**
5. **Incorporate all key stakeholders and best scientific thinking**
6. **Create clear, site specific, measurable, long-term targets**
7. **Natural processes should be pre-eminent**
8. **Adaptive management should be employed**

Lessons for WFD delivery



- Good science and research is not enough
- Linking information to decision-makers is essential to strategic delivery of actions
- Participation of the community will influence decision-makers
- Interpretation of the science is essential
- Action requires good research, participatory planning and time to do it

Information => Participation => Action

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“Bridging the Strategic Gap:
Case studies from Cycleau”

Falmouth, Cornwall, United Kingdom

22 & 23 September 2005