

## A UK perspective on river management: future challenges. Une perspective britannique sur la gestion des rivières : les défis futurs.

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### RÉSUMÉ

Une bonne gestion des rivières (régulation, restauration, résilience) est la clé d'une bonne gestion des bassins versants. Cela est particulièrement important dans le contexte du changement climatique, de la sécurité alimentaire et énergétique et de l'évolution des politiques environnementales.

Cet article présentera la situation en Angleterre comme étude de cas pour éclairer la discussion sur la gestion future des rivières.

Il décrira certains des principaux défis rencontrés en Angleterre, notamment

- Comprendre l'ampleur du problème. Nous manquons de données géospatiales complètes sur les pressions géomorphologiques. Nous présenterons le défi et quelques exemples de la manière dont nous cherchons à le surmonter.
- L'importance pour la société de valoriser les rivières naturelles saines. Nous expliquerons la complexité de la valorisation de l'environnement naturel, en particulier la géomorphologie, et les outils que nous utilisons pour vous aider.
- Transformer la science en outils pouvant être utilisés à l'échelle d'un bassin versant ; et
- L'évolution de la politique environnementale en Angleterre et la manière dont la science géomorphologique est utilisée pour éclairer la politique future.

### ABSTRACT

Good river management (regulation, restoration, resilience) is the key to good catchment management. It is especially important in the context of changing climate, food and energy security, and evolving environmental policy.

This paper will outline the situation in England as a case study to inform discussion on future river management. It will describe some of the key challenges faced in England including

- Understanding the scale of the problem. We lack comprehensive geospatial data on geomorphological pressures. We will outline the challenge and some examples of how we are aiming to overcome them.
- The importance of society valuing healthy natural rivers. We will explain the complexity of valuing the natural environment especially geomorphology, and the tools we are using to help.
- Turning science into tools that can be used at a catchment scale; and
- Evolving environmental policy in England, and how geomorphological science is being used to inform future policy.

### KEYWORDS

Catchments, geomorphology, river, health, resilience.

Bassins versants, géomorphologie, rivière, santé, résilience.

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## 1 INTRODUCTION

Good river management (regulation, restoration, resilience) is the key to good catchment management. It is especially important in the context of changing climate, food and energy security, and evolving environmental policy.

This paper will outline the situation in England as a case study to inform discussion on future river management. It will describe some of the key challenges including:

- Understanding the scale of the problem. Although physical modifications are one of the most significant pressures on the water environment in England, causing 41% of all water bodies to fail to reach good ecological status or potential (Environment Agency, 2021a), we lack comprehensive geospatial data on geomorphological pressures. We will outline what we know from current approaches, and give examples of how we are aiming to improve on what we are doing already.
- The importance of society valuing healthy natural rivers. We will explain the complexity of valuing the natural environment especially geomorphology, and the tools we are using to help, looking at natural capital approaches.
- Turning science into tools that can be used at a catchment scale. We know a lot about how river and floodplain systems operate, but scaling that knowledge up from academic insight to something that can be used by land owners, policy makers, and funders, is more difficult. We will outline some of the challenges (e.g, Environment Agency, 2021b); and work to overcome challenges.
- Evolving environmental policy in England, and how geomorphological science is being used to inform future policy.

## 2 KEY CHALLENGES

### 2.1 Challenge 1 : geomorphology baseline

Understanding the true scale of the problem. Catchments are complex, with multiple pressures on water quality, flows, geomorphological processes and ecosystem health. Physical modification is one of the greatest challenges to tackle because it is everywhere, yet it is often unseen, or ignored. We will summarise existing geospatial datasets and what they tell us about the gaps we face.

### 2.2 Challenge 2 : societies that value healthy rivers and catchments

In order to drive healthy rivers and catchments, we need to get greater societal support for better river management. People are at the heart of good river management: members of the public, politicians, businesses, land owners and decision-makers such as regulatory agencies need to understand the value of healthy natural catchments in order to be persuaded to manage catchments better. We will outline this challenge, and explain some of the ways we are tackling this challenge.

### 2.3 Challenge 3 : scientific tools

Science often gives us powerful insight, but scaling the scientific understanding into useable tools and outputs that can be shared with key decision-makers is a challenge. We will outline some challenges for researchers, and describe new open, catchment-scale geospatial data based on LIDAR and other information to support better river management, building on existing concepts (eg Belletti et al., 2018, Roux et al., 2015) to ask: what can – and should – we do next?

## 2.4 Challenge 4 : evolving environmental policy

We will look at how environmental policy has developed since the UK left the EU, and efforts to embed geomorphic concepts into the heart of public policy and funding for river, floodplain and catchment restoration. England's new Environmental Land Management schemes include ambitious catchment-scale projects and local incentives for farmers. We now have a legal duty to improve biodiversity when building houses, factories or roads, where fluvial geomorphology concepts are at its heart (Gurnell et al., 2020). We will explore how these policies are shaping catchment management.

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