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Water Lives: scientific horizons for biodiversity and water policy

A SCIENCE POLICY SYMPOSIUM for Freshwater Life

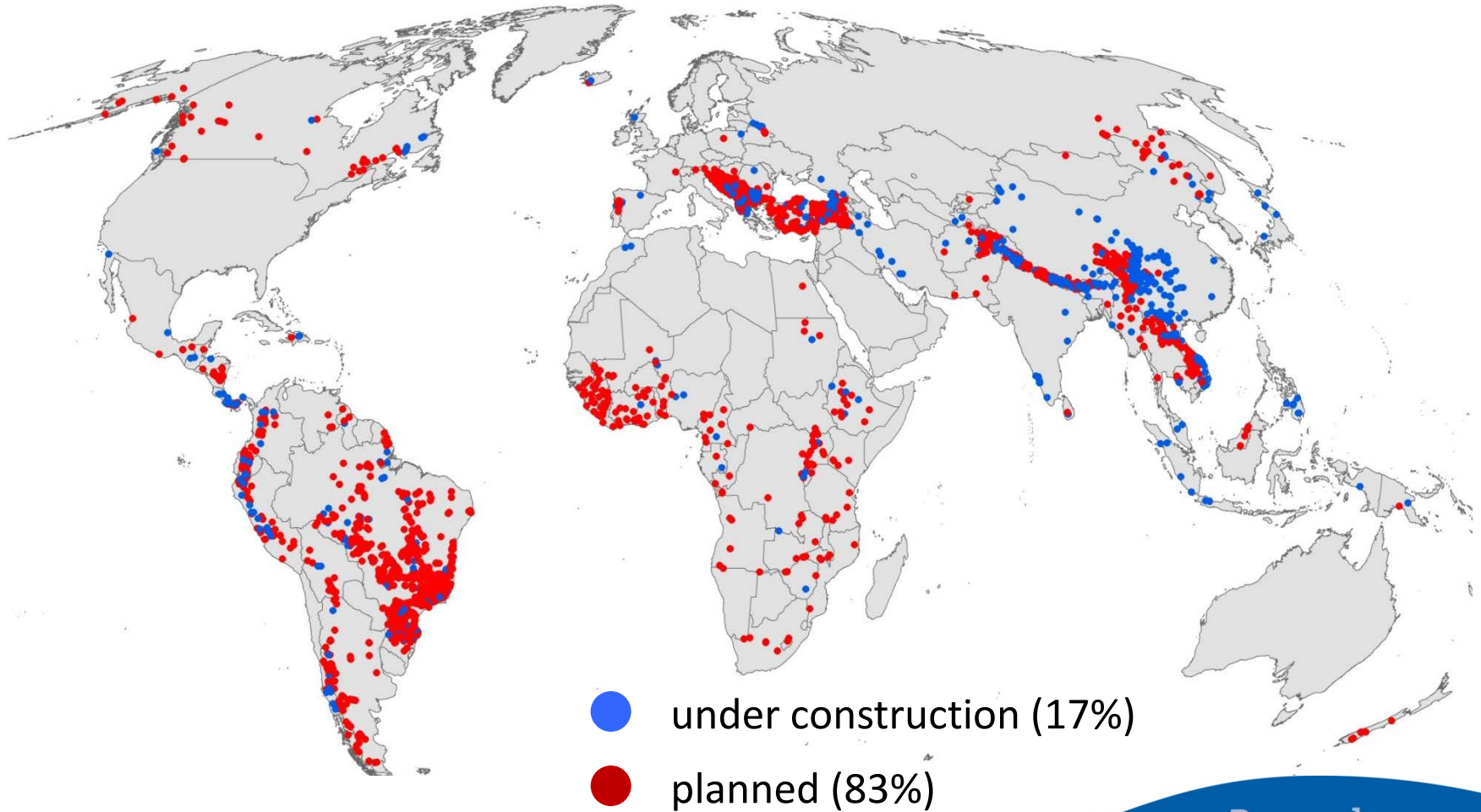
Royal Belgian Institute of Natural Sciences
Brussels, Belgium
29-30 January 2014



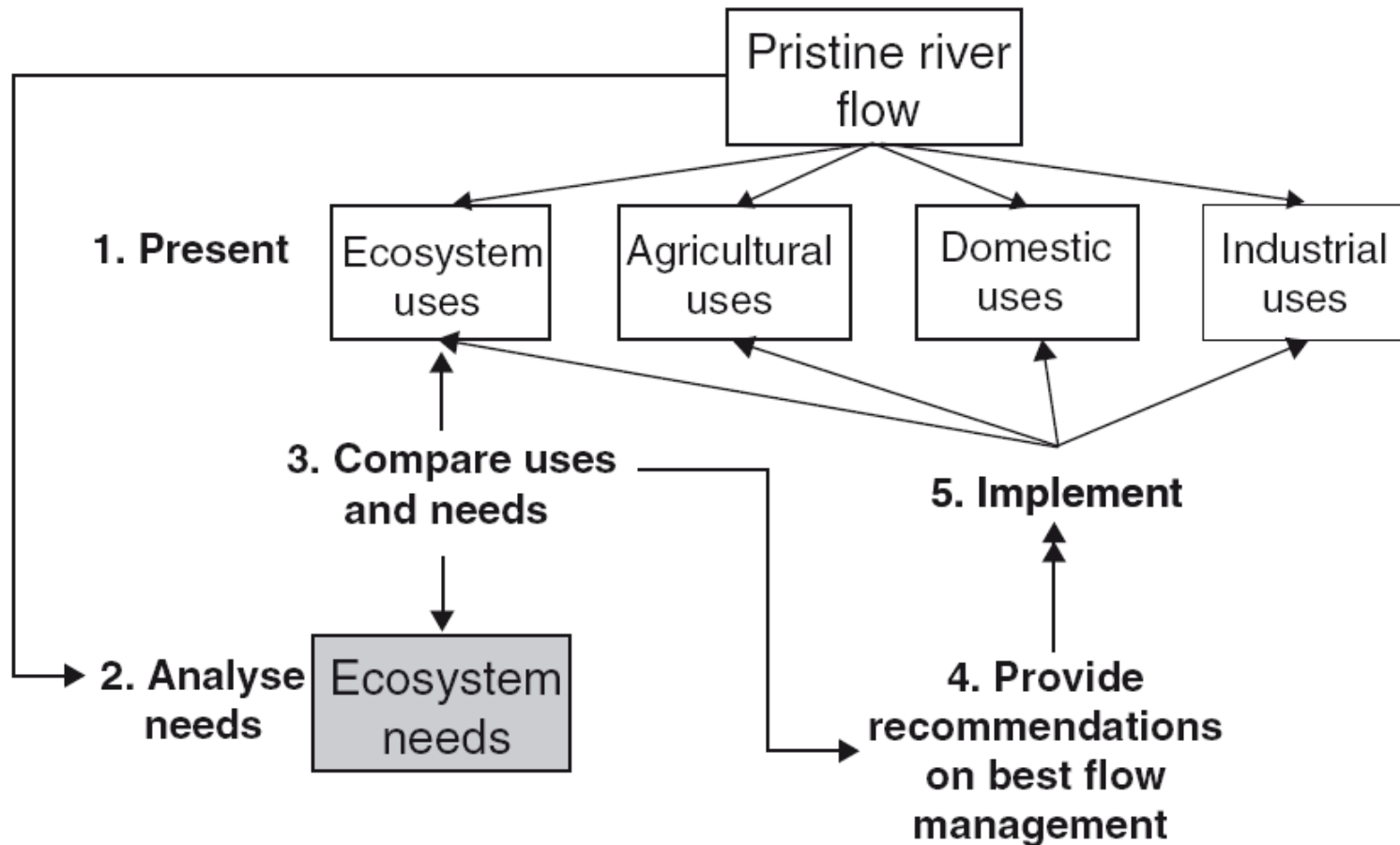
BioFresh (Co. 226874) and REFRESH (Co.244121) are funded by the European Commission under the 7th Framework Programme

Global boom in hydropower dam construction

(Zarfl, Lumsdon, Tydecks, Berlekamp, Tockner. In progress)

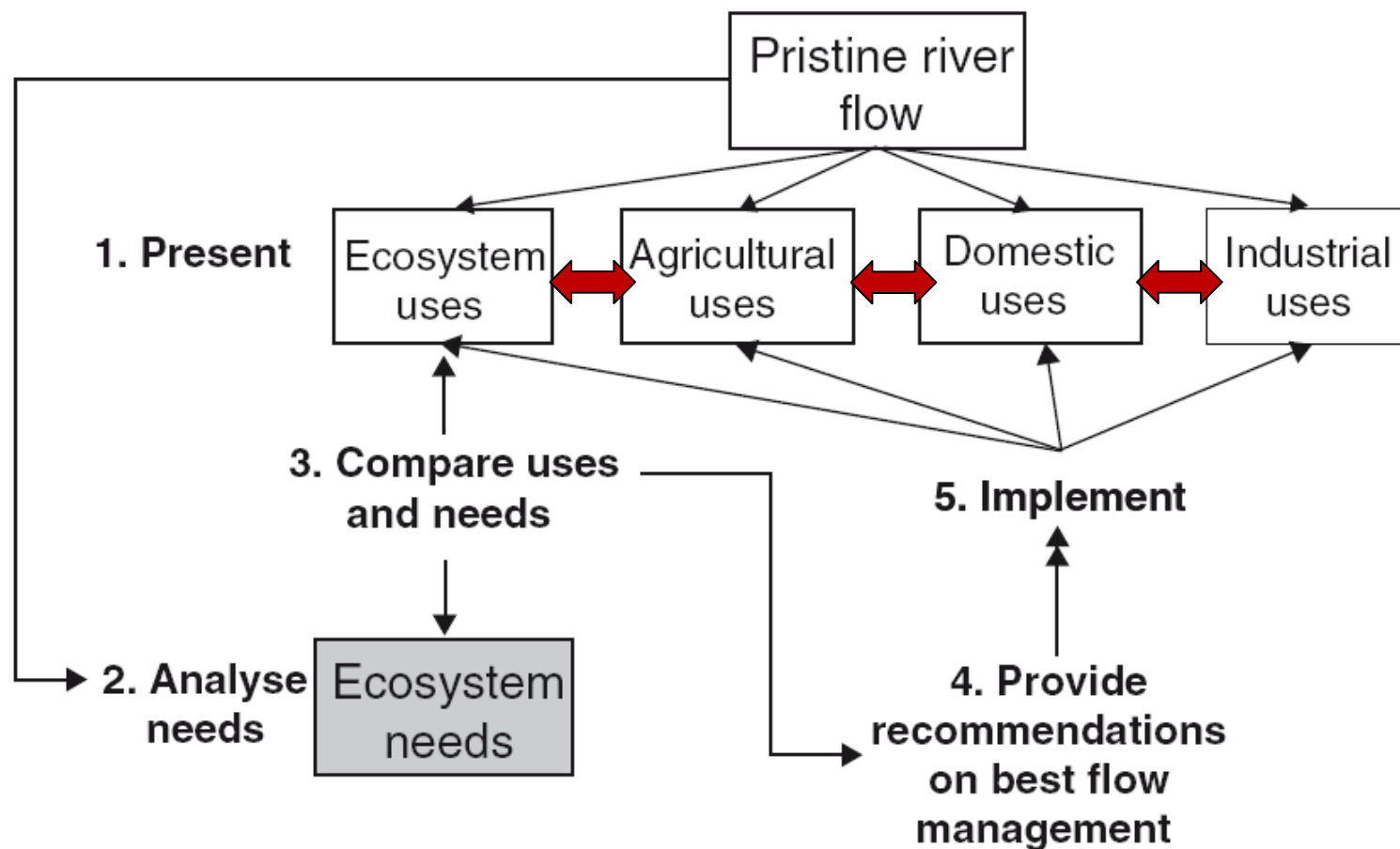


Adaptive management to allocate water for ecosystems



Adaptive management to allocate water for ecosystems

From trade-offs to synergies





Intergovernmental Platform on Biodiversity & Ecosystem Services

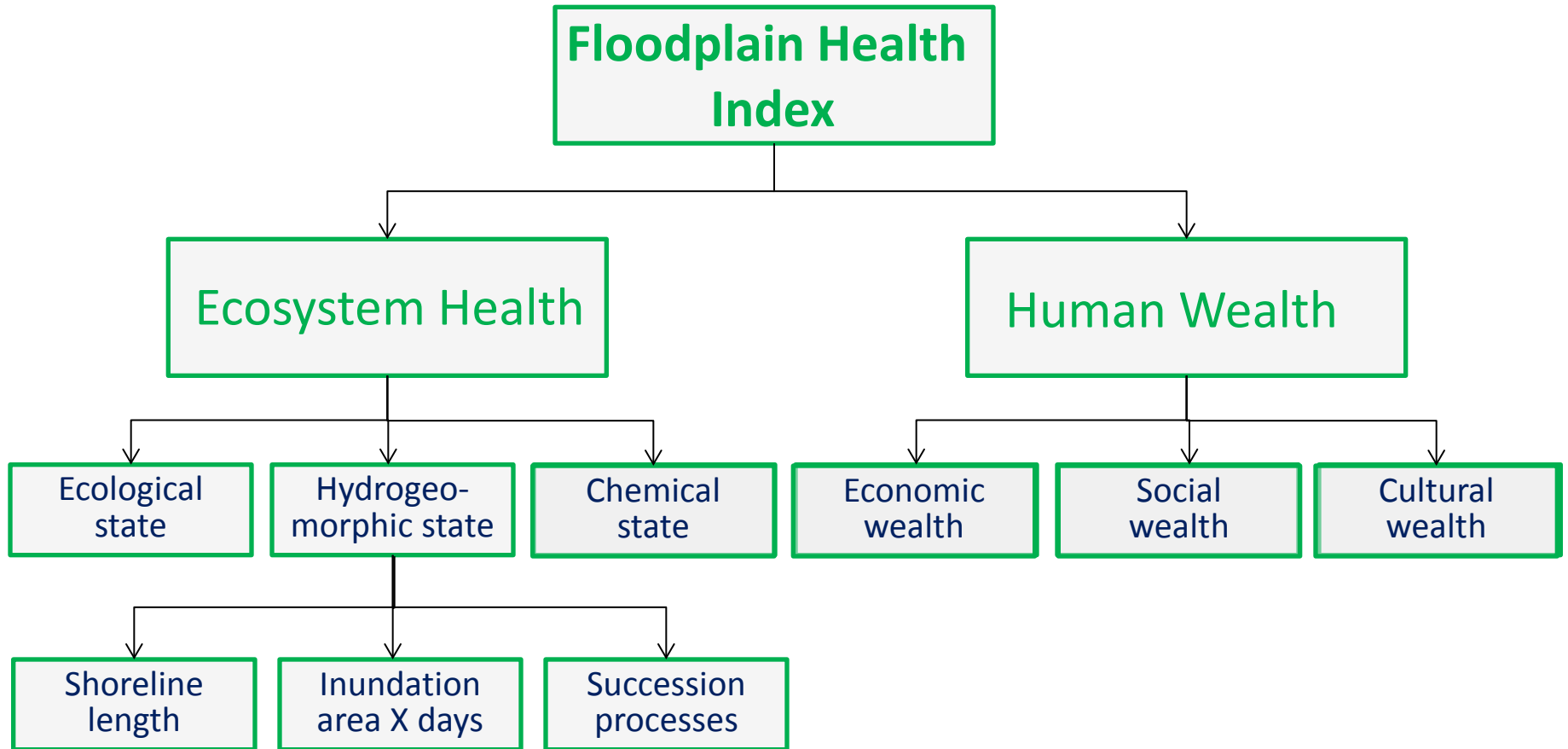


The biodiversity-ecosystem service dilemma



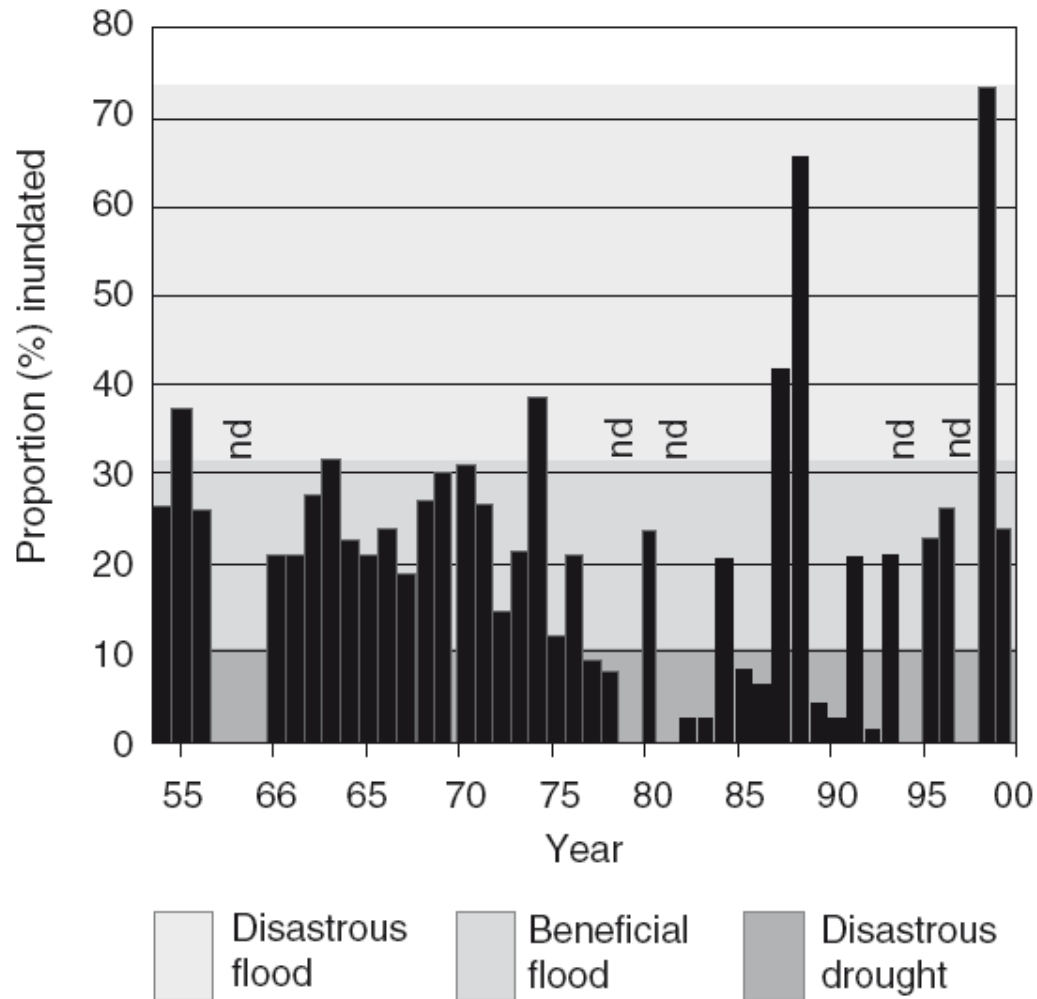
Research
for the future
of our freshwaters

Managing freshwaters as coupled social-ecological systems



Bangladesh: The double-edged face of floods

(Data: Mirza 2003)





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Obstacles to data access for research related to climate and water: Implications for science and EU policy-making

Martin Beniston^a, Markus Stoffel^{a,*}, Richard Harding^b, Martin Kernan^c,
Ralf Ludwig^d, Eddy Moors^e, Paul Samuels^f, Klement Tockner^g

Biodiversity research – A distorted view

	Publications	%
USA	16033	28.4
UK	6591	11.7
Australia	4695	8.5
Germany	4335	7.9
France	4115	7.3
Canada	3667	6.5
Spain	3033	5.4
Italy	2810	5.0
Netherlands	2132	3.8
Switzerland	1755	3.2
Sweden	1690	3.2
Summ	50856	91.9


Biodiversity research – A distorted view

	Publications	%
Indonesia	364	0.6
Colombia	330	0.5
Tanzania	192	0.3
Ecuador	164	0.2
Sudan	8	0.01
Angola	2	<0.01




The BioFresh information platform

BioFresh Platform – The Network for Global Freshwater Biodiversity

 Welcome to the **Biofresh Platform**
The network for global freshwater biodiversity


[in](#) [t](#) [f](#)

BIOFRESH PROJECT




Biofresh
Research Project

BIOFRESH DATA PORTAL



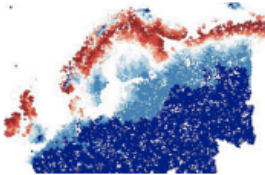
Distribution of
Freshwater Species

BIOFRESH ATLAS




Global Freshwater
Biodiversity Atlas

BIOFRESH RESOURCES



Research, Policy,
Education & Media Resources

BIOFRESH BLOG



Science, Policy &
Conservation Blog

WELCOME TO BIOFRESH – THE GLOBAL FRESHWATER BIODIVERSITY INFORMATION PLATFORM

Discover

- Science-policy information
- Species distribution data
- Biodiversity tools and models
- Maps and visualisations
- Who has what data (metadata)
- An engaging blog on the science, policy and enjoyment of freshwater life
- A online cabinet of freshwater curiosities

Introducing the BioFresh platform – a new community information resource

We offer a collection of resources and tools to support better science, policy and management of freshwater life. Whether you are a scientist, a policy maker, consultant, educator, activist or simply an interested citizen you are sure to find something on the platform that will enhance your work and impact or feed your curiosity. This may be a database, a species distribution map, a thoughtful article, an online training manual or an idea prompted by engaging with this knowledge product. Take a few moments to explore the platform and find what is useful to you.

This is a dynamic platform. If you have data, maps or other information to contribute please get in touch. If there is something important missing let us know at freshwaterbiodiversity@igb-berlin.de. We will be adding new content so please bookmark the site and visit again.

[A quick guide to the platform](#)


NEWS FROM THE WORLD OF BIOFRESH

BioFresh and Refresh organise a "Science Policy Symposium for Freshwater Life" on 29-30 January 2014 in Brussels. [Get more information and all the details on www.waterlives.eu](http://www.waterlives.eu)

In parallel with the Water Lives Science-Policy Symposium the **Global Freshwater Biodiversity Atlas** will be launched online! From this day on no login will be required.

BioFresh Newsletter No.7 out now: [read newsletter](#)

CURIOS FRESHWATER LIFE





Global Freshwater Biodiversity Atlas

BIOFRESH ATLAS



Global Freshwater
Biodiversity Atlas

- **Aims**

- **comprehensive map collection** representative of current/future state of freshwater biodiversity
- improve **discoverability, visibility** and **accessibility** of freshwater biodiversity related spatial information
- support **decision-making** and **policy development** through visualization of major research results

- **Features**

- interactive map interface
- maps created as web map services (WMS)
- detailed information on features
- accompanying article
- info on source, publication, base layers and citation
- link back to map contributors, increase visibility

- **highly collaborative initiative**






Global Freshwater Biodiversity Atlas

Explore

SHOW BIOFRESH PLATFORM MENU




Global Freshwater Biodiversity Atlas

The gateway to freshwater biodiversity maps


HOME ATLAS HOME PAGE	ABOUT ABOUT THE ATLAS	EXPLORE CONTENT AND SEARCH	MAPS MAP INTERFACE	CONTRIBUTE HOW TO PUBLISH MAPS	MANUALS FIND HELP HERE
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AA A Logout


You are here: [Chapters](#)




FRESHWATER BIODIVERSITY



FRESHWATER RESOURCES AND ECOSYSTEMS



FRESHWATER PRESSURES



FRESHWATER CONSERVATION AND MANAGEMENT

KEY WORDS

Africa alien species amphibians arthropods Asia **biodiversity** catchment climate change conservation contemporary ecoregion ecosystems endemic ephemoptera **Europe** extinction fish fragmentation **global** habitat HydroBASINS HydroSHEDS inundation IUCN Red List key biodiversity areas management plecoptera poverty **predictive pressures** protected areas research resources **river** **species richness** surface water **threatened** trichoptera trout vulnerability waterfalls wetlands

SELECT A CHAPTER

-- Select category --

SEARCH IN ALL CHAPTERS

Search



Global Freshwater Biodiversity Atlas

Global Freshwater Biodiversity Atlas



Global Freshwater Biodiversity Atlas

Global Diversity Patterns in Freshwater Systems

NAVIGATION

Chapters

- 1 FRESHWATER BIODIVERSITY
 - 1.1 Contemporary Freshwater Biodiversity
 - 1.1.1 Global Diversity Patterns in Freshwater Systems
 - 1.1.2 Global Distribution of Freshwater Dependent Amphibians
 - 1.1.3 Global Freshwater Fish Species Richness
 - 1.1.4 Threatened Freshwater Species per Country in Europe
 - 1.1.5 Species Richness and Endemism of Freshwater Fish in European Biogeographical Regions

Base Layers and Overlays

SOURCE

CITATION



Research Institute for Development (IRD), National Museum of Natural History (Paris, France) ([link](#))



Evolution and Biological Diversity Laboratory, University Paul Sabatier (Toulouse, France) ([link](#))

Map Article Copyright & Downloads

minimise

Global Diversity Patterns in Freshwater Systems

written by [Thierry Oberdorff](#), [Céline Jézéquel](#), [Pablo A. Tedesco](#) & [Clément Tisseuil](#)

article based on:

[Tisseuil, C., Cornu, J.F., Beauchard, O., Brosse, S., Darwall, W., Holland, R., Huguery, B., Tedesco, P.A. & Oberdorff, T. \(2013\). Global diversity patterns and cross-taxa convergence in riverine systems. *Journal of Animal Ecology* 82: 365-376.](#)

Introduction

Efforts to set global conservation priorities have largely ignored freshwater diversity due to patchy information on freshwater species, thereby mostly excluding, until now, some of the world's most specious, threatened, and valuable taxa. Confronted with the continuing extinction crisis, there is thus an urgent need to mitigating impacts and implementing conservation planning and restoration strategies for global freshwater biodiversity. To do so effective conservation planning should fulfil at least three main requirements: (i) defining the appropriate spatial grain for the design of freshwater reserve systems; (ii) describing diversity hotspots, and (iii) underlying causes responsible for the observed diversity patterns.

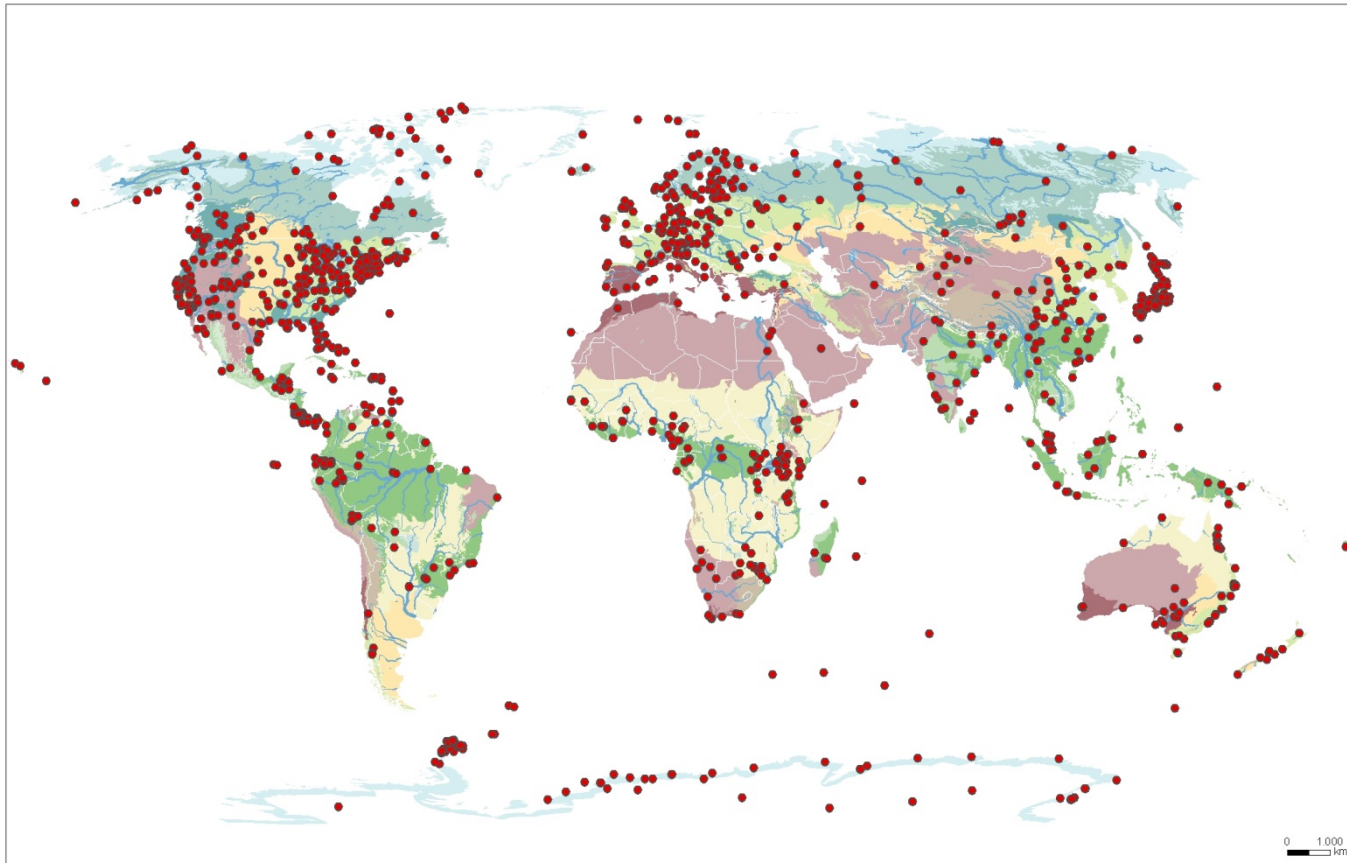
Methods

The database includes **819 river drainage basins** covering nearly 80% of Earth's surface. The river drainage basins were delineated using the HydroSHEDS database (Hydrological data and maps based on Shuttle Elevation Derivatives at multiple Scales; Lehner et al. 2008). For each drainage basin, a dataset was compiled based on the **global distributions of 13,413 freshwater species among five taxonomic groups** (i.e. 462 crayfish, 3,263 aquatic amphibians, 8,870 freshwater fishes, 699 aquatic birds, and 119 aquatic mammals). Species occurrence data on crayfish, amphibians and mammals, were collated and provided by the International Union for Conservation of Nature (IUCN 2011). Aquatic birds occurrences were collated and provided by Birdlife International (2011) (www.birdlife.org). Fish species occurrences were obtained from a global database of native freshwater fish species by river basin (Brosse et al. 2013).

These combined datasets represent the most up-to-date and comprehensive global coverage available for freshwater species distributions at this scale. Global patterns of freshwater species diversity are described using two diversity descriptors: **species richness** and **degree of endemism**. Species richness is a measure of the total number of native species present in a drainage basin. Endemism, estimated using the 'corrected weighted endemism' index defined by Crisp et al. (2001), is calculated as the sum of species present in a drainage basin weighted by the inverse of the number of drainage basins where the species



Global Database of Biological Field Stations



Terrestrial Biomes

tropical and subtropical moist broadleaf forests	temperate coniferous forests	flooded grasslands and savannas	deserts and xeric shrublands
tropical and subtropical dry broadleaf forests	boreal forests and taiga	montane grasslands and shrublands	mangroves
tropical and subtropical coniferous forests	tropical and subtropical grasslands, savannas and shrublands	tundra	lakes
temperate broadleaf and mixed forests	temperate grasslands, savannas and shrublands	mediterranean forests, woodlands and scrub	rock and ice



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