

Water and Sustainability: A Very Necessary Alliance

Jack O'Sullivan

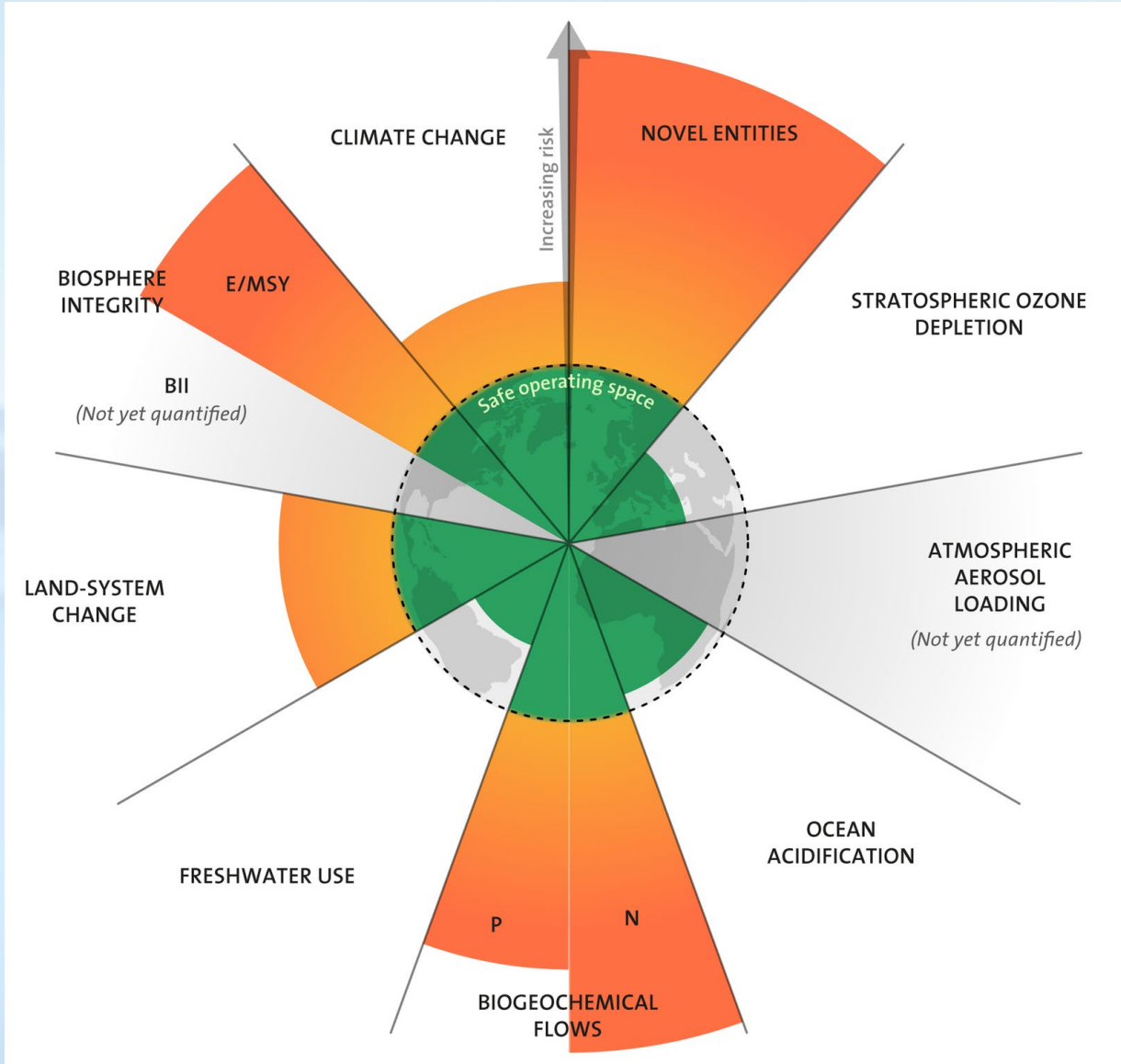
Zero Waste Alliance Ireland



All Ireland Water & Wastewater Expo and Conference
23 November 2022

What does “sustainability” really mean?

- Improving the **quality of human life** while living within the carrying capacity of the Earth's **supporting eco-systems** (*From Caring for the Earth: a Strategy for Sustainable Living*, IUCN/UNEP/WWF (1991))
- Sustainable Development is about **raising our quality of life** by establishing **sympiotic relations** within and between our **diverse human cultures and between those cultures and the biosphere**
- We do **not** use the definition produced by the Brundtland Commission:
“**development which meets the needs of the present without compromising the ability of future generations to meet their own needs**”
- **Not breaching planetary boundaries** is also very important – if we breach any of these boundaries, we are living unsustainably!



“The planetary boundaries” concept presents a set of **nine** planetary boundaries within which humanity can continue to thrive for generations to come.

Six of these are exceeded.

In April 2022, a reassessment of the planetary boundary for freshwater indicates that it has now been transgressed, due to the inclusion of “green water” – water available to plants - into the boundary assessment for the first time.

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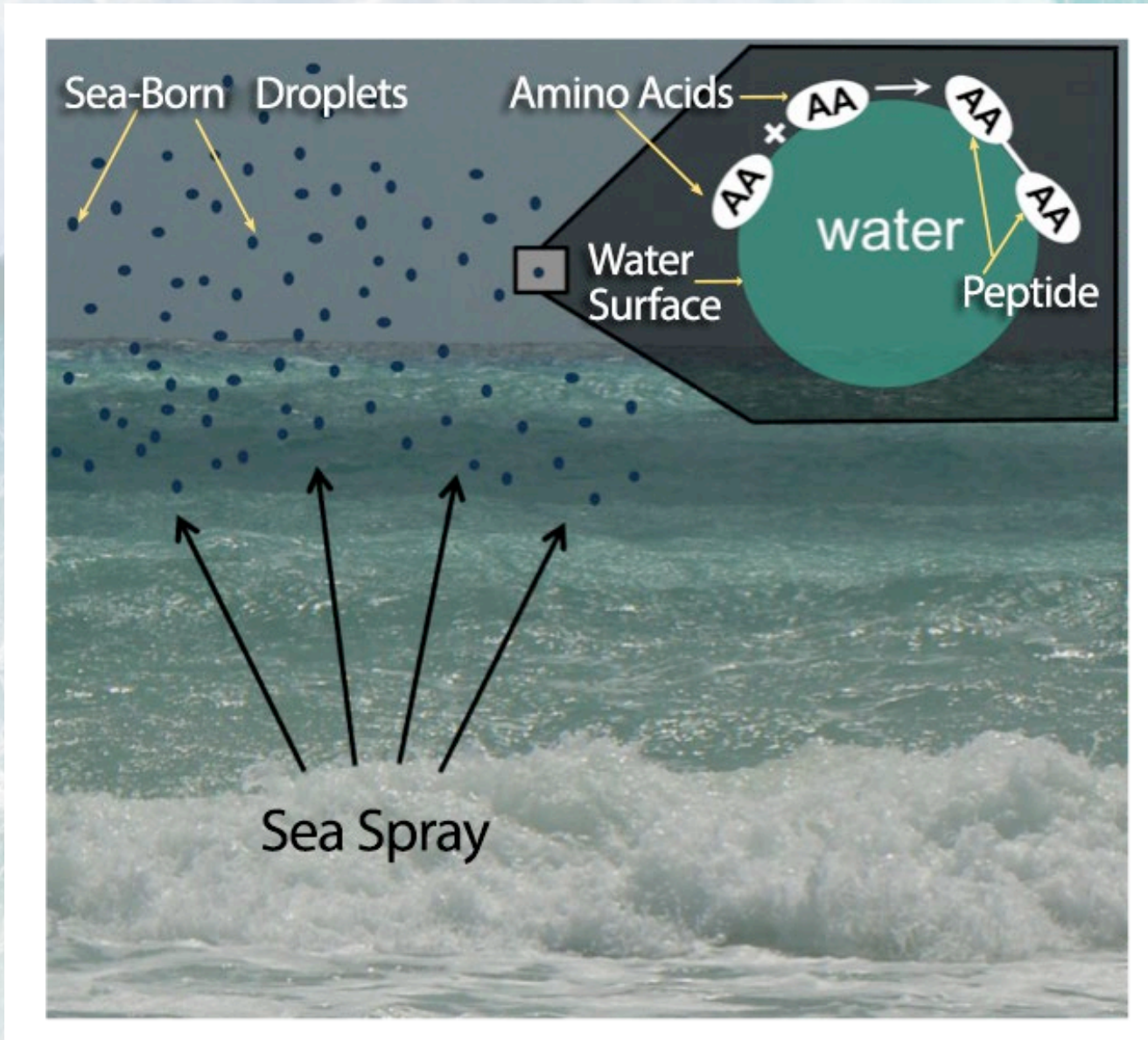
SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY 	2 ZERO HUNGER 	3 GOOD HEALTH AND WELL-BEING 	4 QUALITY EDUCATION 	5 GENDER EQUALITY 	6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY 	8 DECENT WORK AND ECONOMIC GROWTH 	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 	10 REDUCED INEQUALITIES 	11 SUSTAINABLE CITIES AND COMMUNITIES 	12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION 	14 LIFE IN & BELOW WATER 	15 LIFE ON LAND 	16 PEACE, JUSTICE AND STRONG INSTITUTIONS 	17 PARTNERSHIPS FOR THE GOALS 	

Water: An Inseparable Part of Life on Earth

Origin of water on Earth





The interface between water and air provides a site for the formation of simple proteins called **peptides**, one of the **key building blocks for life**.



■ Salt Water **96.5%**
■ Fresh Water **3.5%**

Breakdown of Earth's Water (%)

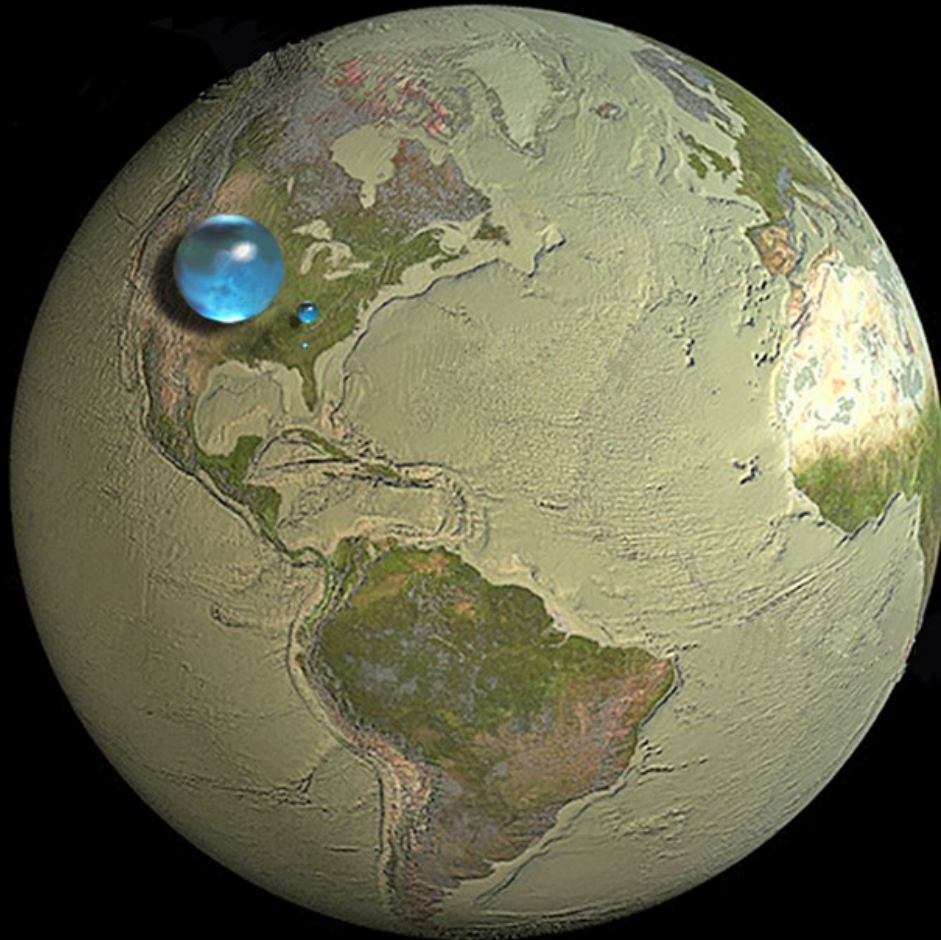
Oceans	96.5
Permanent Ice & Snow	1.7
Groundwater	1.7
Lakes & Rivers	0.014
Atmosphere	0.0001

Breakdown of Fresh Water (%)

Permanent Ice & Snow	68.7
Groundwater	30.1
Lakes & Rivers	0.3

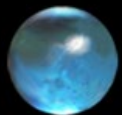
Source: USGS

The World's Water



The volume of the largest blue sphere, representing all water on, in, and above the Earth, is about 1,386,000,000 km³, and about 1,385km in diameter.

The smaller sphere represents Earth's liquid fresh water in groundwater, wetlands, rivers, and lakes; volume of this sphere is about 10,633,450 km³ and about 272.8km in diameter. Fresh water in all lakes & rivers on the planet is only 93,113 km³ – 56.2 km diameter.



All water on, in, and above the Earth



Liquid fresh water



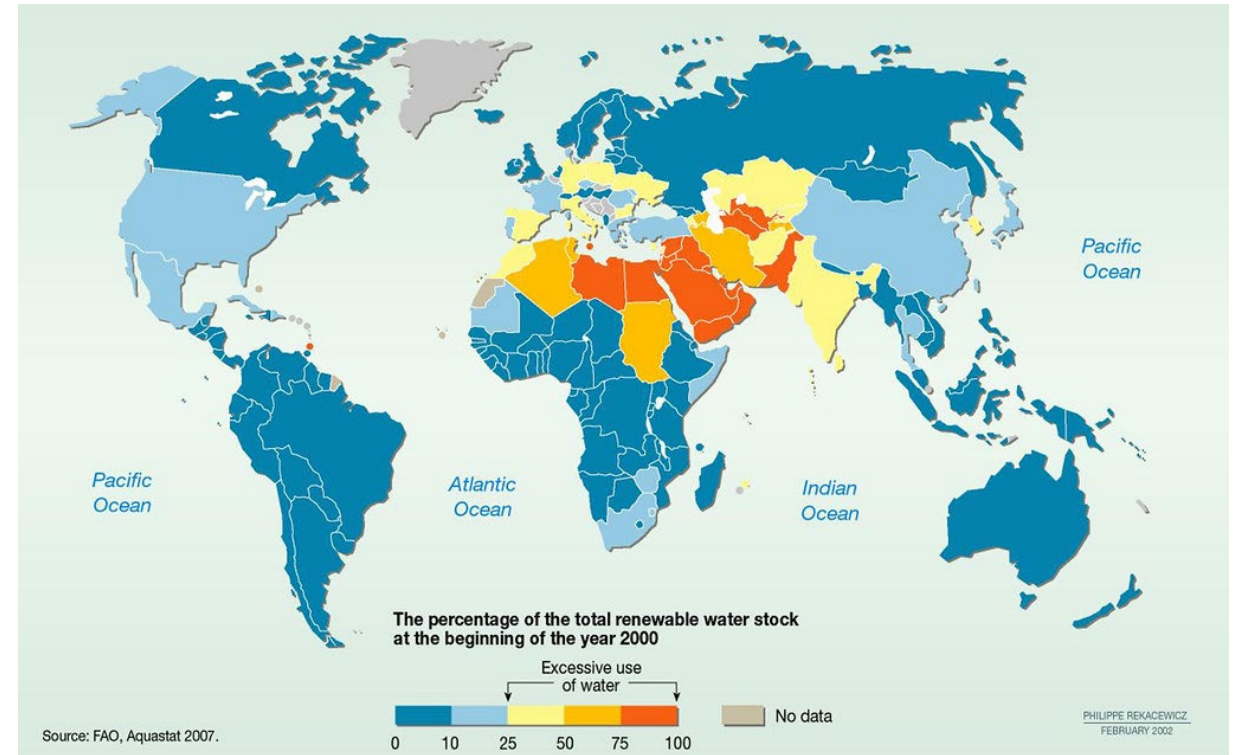
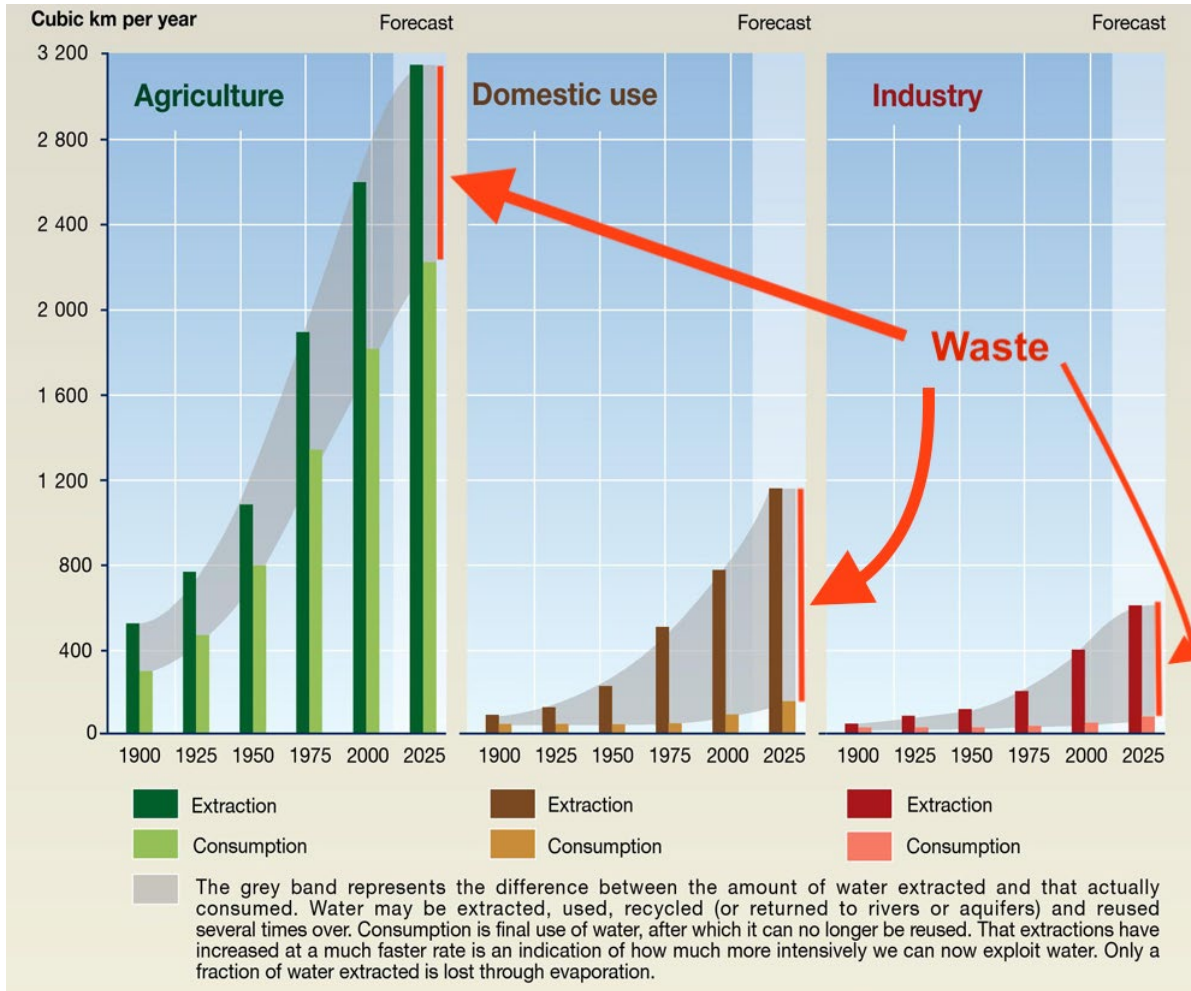
Fresh-water lakes and rivers

Howard Perlman, USGS,
Jack Cook, Woods Hole Oceanographic Institution,
Adam Nieman
Data source: Igor Shiklomanov
<http://ga.water.usgs.gov/edu/earthhowmuch.html>



How do we
currently use
water?

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Countries under water stress, year 2000

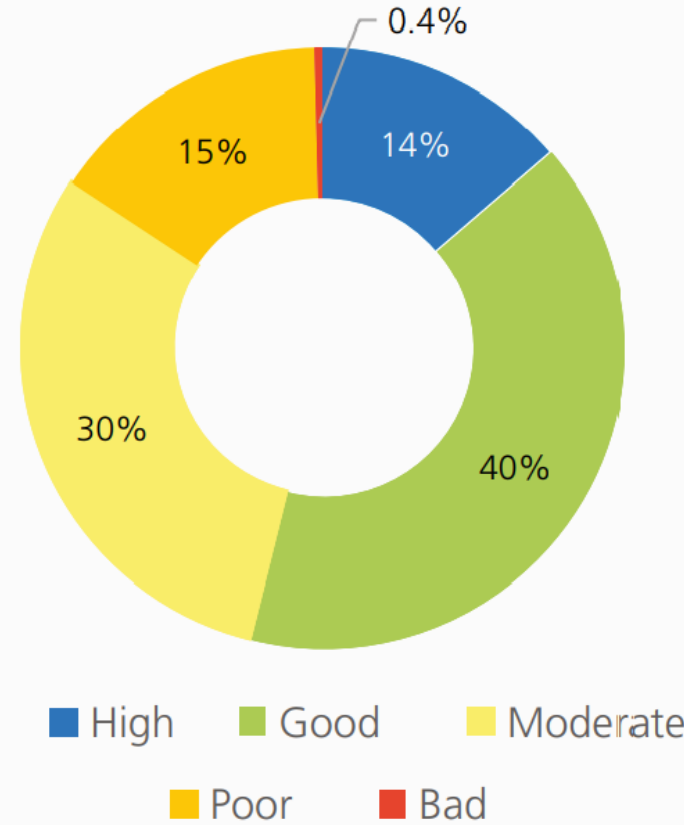
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River Tolka

Trends in Water Pollution in Ireland

Of the 1,836 (out of 2355) river water bodies assessed in 2019 and 2020, 345 improved in quality and 230 declined, resulting in a net improvement in quality in 115 river water bodies.

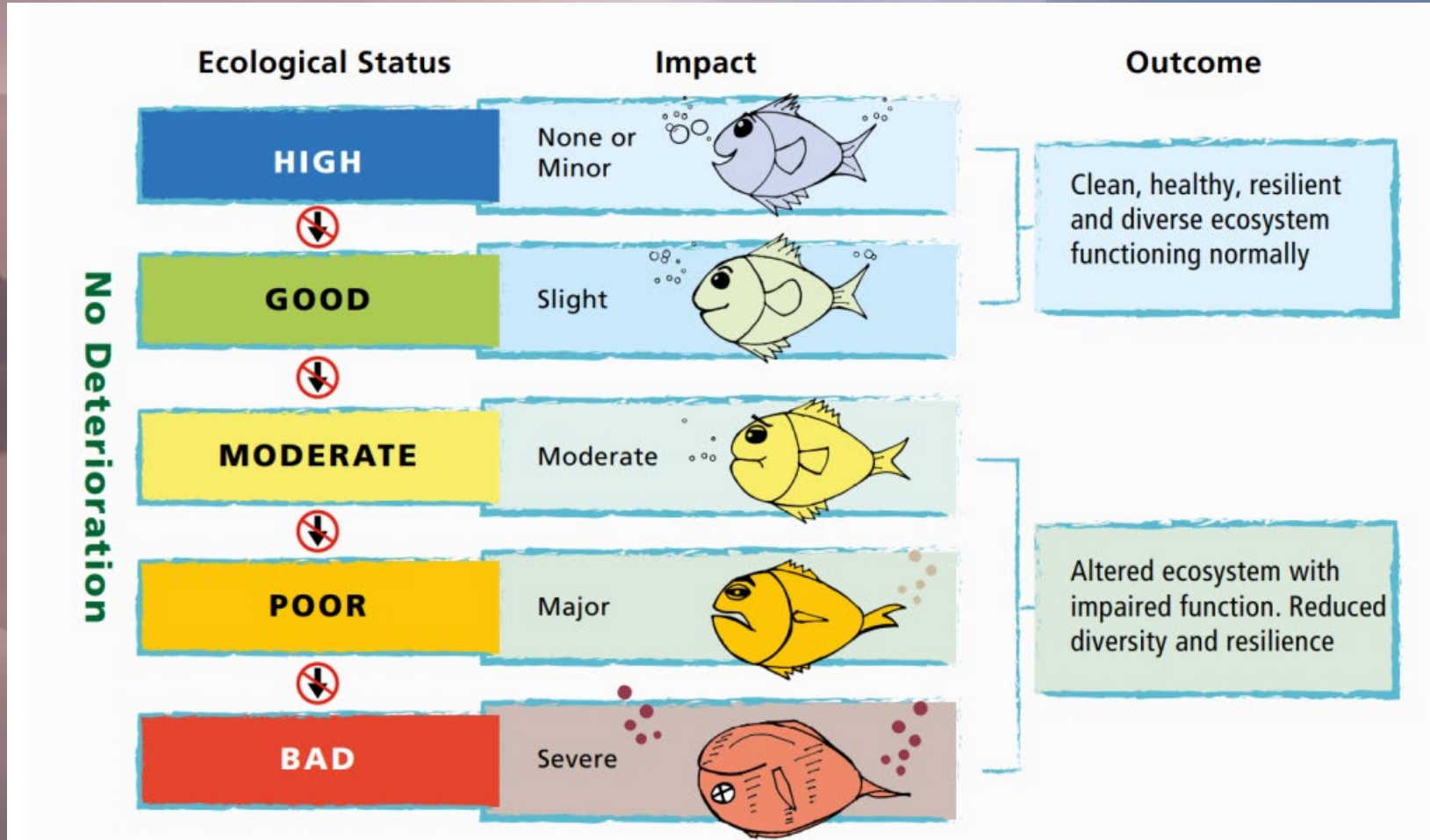


Could be sustainable, depending on the type of pollutant. But heavy metals, POPs and plastics bio-accumulate:
unsustainable.



What do these trends mean for ecosystem health and biodiversity?

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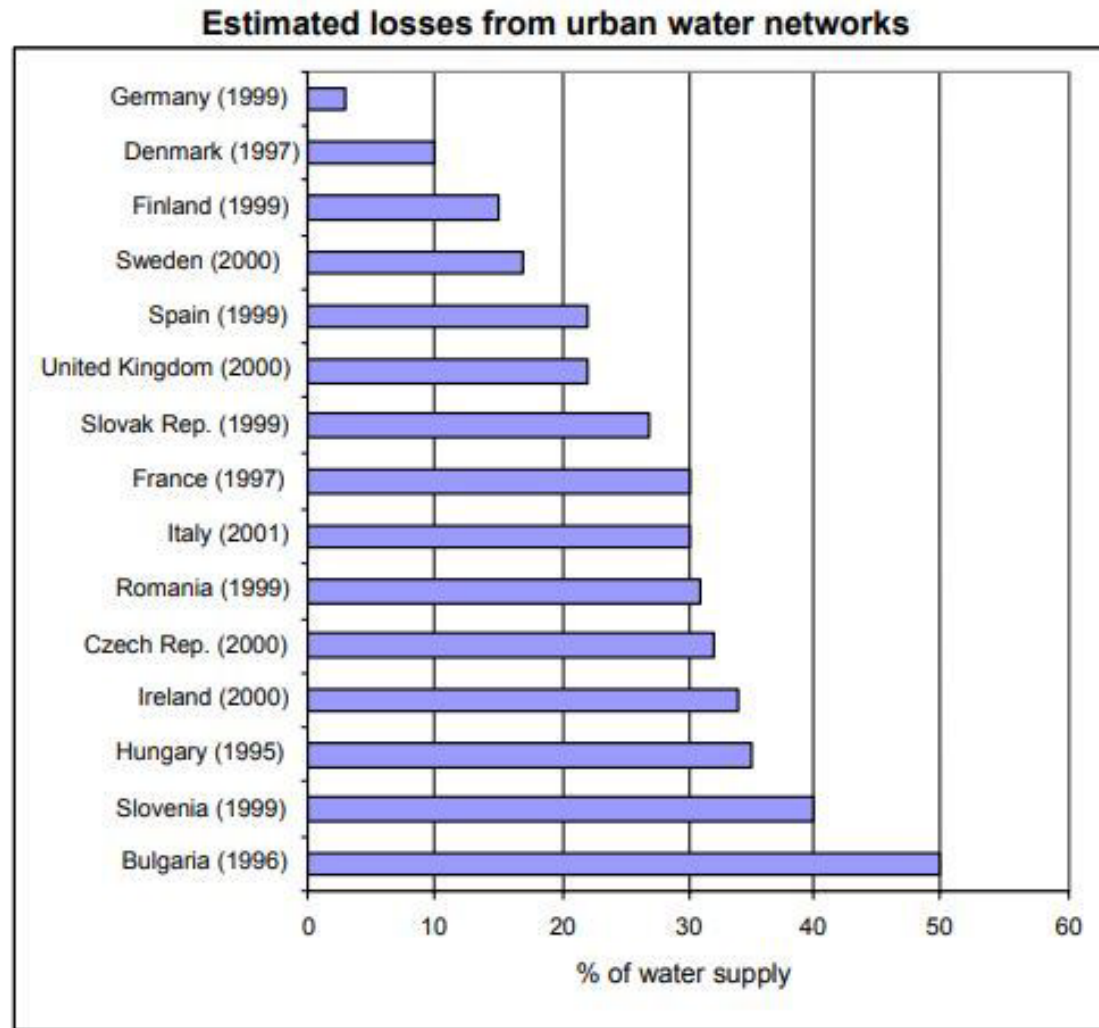
- Unsustainable water use and water pollution damage both biodiversity and **human health**, plus adverse effects on **human well-being**.
- Land uses have major impacts on our use of water, and on water quality. Much of our agriculture in Ireland is **inherently unsustainable**.
- **Climate change** is making these problems increasingly worse.

According to the Environmental Protection Agency (EPA):

*“If the current level of progress continues, Ireland will **fail to meet the EU and national goal of restoring all waters to good, or better, status by 2027.**”*

*“The scale of the declines in our estuaries and coastal waters is alarming. In recent years the EPA highlighted that nutrient levels in our rivers and groundwaters are **too high** and that trends were going in the wrong direction. We are now seeing the impact of these emissions on our estuaries and coastal waters. Areas such as Cork Harbour, Wexford Harbour and the Slaney, Suir and Nore estuaries have **lost their good water quality status**. This directly impacts the **marine biodiversity and ecological value** in these areas”.*

Is the situation unsustainable? Yes!



Source: EEA, from different sources

In addition to damaging water quality, we also **waste** water.



- Around **38%** of the water in our public supplies is lost through leakages **every day**, despite **half a billion Euro** being spent by Irish Water since 2018, to reduce the leakage from **43%**.
- Irish Water intends to **reduce the leakage rate to 25%** by 2030, in 8 years !
- In Germany and the Netherlands, municipal water supply leakage rates are as low as **6% or 7%**.



Do these high leakage rates affect the sustainability of our public water supply system ?

- Yes, the more water we leak, the **more we have to abstract from our rivers and lakes**, and while these abstraction rates continue, they are having an increasingly detrimental effect on biodiversity, especially as climate change which has begun to cause more frequent and longer periods of drought.
- The treatment of water to make it potable, and the pumping of water over long distances, also requires considerable energy.
- A very large percentage of the high quality water piped to our buildings **is used for toilet flushing**; we do not use grey water for this purpose, **nor do we harvest rainwater to any significant extent**.
- **Phosphate** needed for agriculture has become a **critical raw material**, increasingly difficult to obtain and expensive; yet we waste large amounts by not recovering it from our wastewater.



How can we extract ourselves from this unsustainability spiral – like we are being sucked down into a vortex with no end!



Like this?



Or like this?

We Need to Re-think How we use Water

A paradigm shift ?

Some historical enquiry might be appropriate –
So therefore let's see how we looked at water
in previous centuries and how we see water now ...

- A new "**culture of water**" cannot grow without memory. Memories, whether they are sensory or emotional, short-term or long-term, material or immaterial, are **fundamental to our existence** as individuals and as collective societies.
- Water, says Ivan Illich (in his book "*H₂O and the Waters of Forgetfulness*"), is not just the H₂O produced by burning gases, nor is it the liquid that is metered and distributed by public authorities – it is "***the fluid that drenches the inner and outer spaces of the imagination***".
- What we do with water reflects **the fashion of each age**. In our present time we have transformed water from a spiritual substance (think of the Holy Wells all over Ireland) that could baptize the newborn and purify the dead and the living, into a **scarce** resource in need of technological management, a kind of cleaning fluid that **has lost the ability to excite our imagination, especially in the urban areas where most of us live**.
- We need to ask what we are doing with water – from **where do we obtain it**, how are the natural reservoirs of water **maintained and safeguarded**, what happens when we **use water**, and how we, as a society and as individuals, choose to **deal with liquid wastes**, i.e., human excreta, wash waters and the products of our domestic and social cleansing activities.

- For most of humanity's existence on this planet, our excreta and food wastes served as nourishment for other animals, or were returned directly to the soil in rural areas.
- The cycle was closed, though imperfectly, and the nutrients which we removed in the form of cereals, vegetable crops and cattle were put back as biodegradable organic wastes.
- How do we make the necessary paradigm shift – from our current unsustainable use of water, to using water as nature uses water, as part of nature's "circular economy“.

First task: We must raise peoples' awareness of the unique nature of water, its historical, social and cultural dimensions.

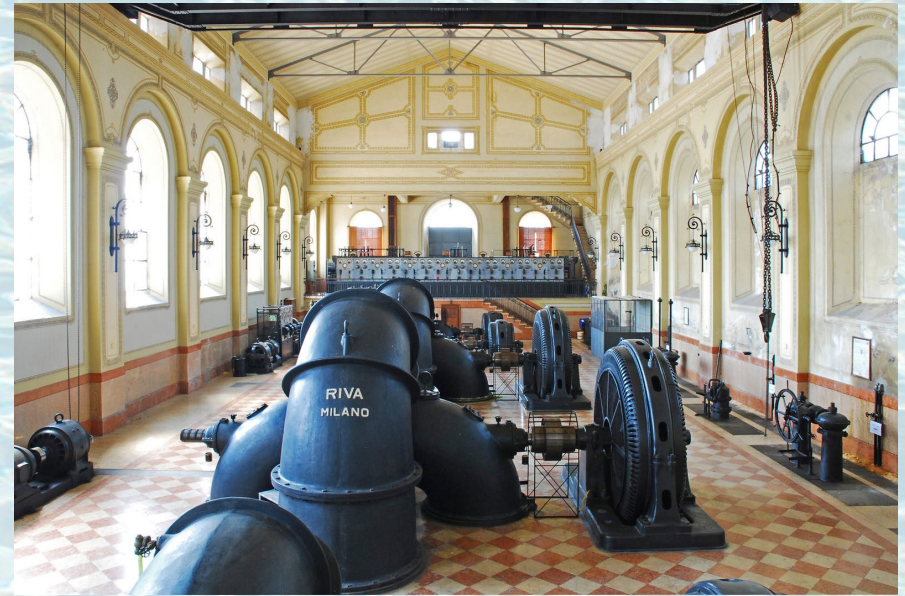
The **Global Network of Water Museums** aims to re-connect people with water and to all forms of water heritage (both natural and cultural heritages). It was established to promote water awareness education and foster **holistic and inter-disciplinary approaches** aimed at valuing any kind of water assets and legacies for their **natural, social, cultural, artistic, and spiritual dimensions**. <https://www.watermuseums.net/>



These centres exist all over the world; none are in Ireland, but we have, in Cork, an ideal location for creating such a centre, in the old Cork waterworks.

Europe celebrating water

Aquapic Water Museum
Timisoara, Romania



AGBAR – Museu de les Aigües
Barcelona, Spain

The water-pumping plant
'Travata', Mantua, Italy, built
1925-29

Awareness Raising, and Action at Local Level

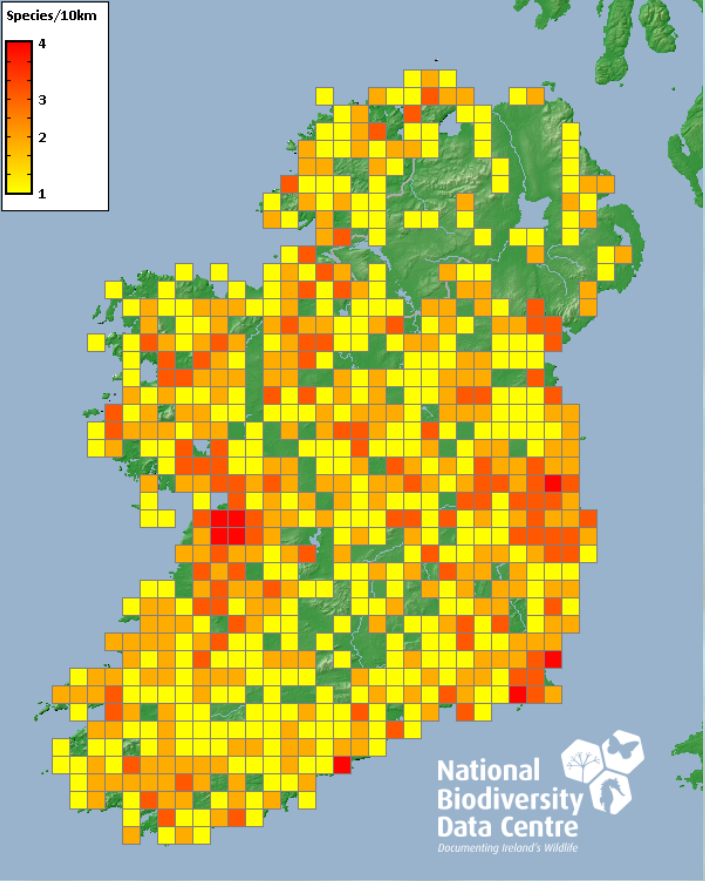
Secondly, we must urge the Government to continue and expand the work being done by **catchments.ie** and the **Local Authority Waters Programme (LAWPRO)**



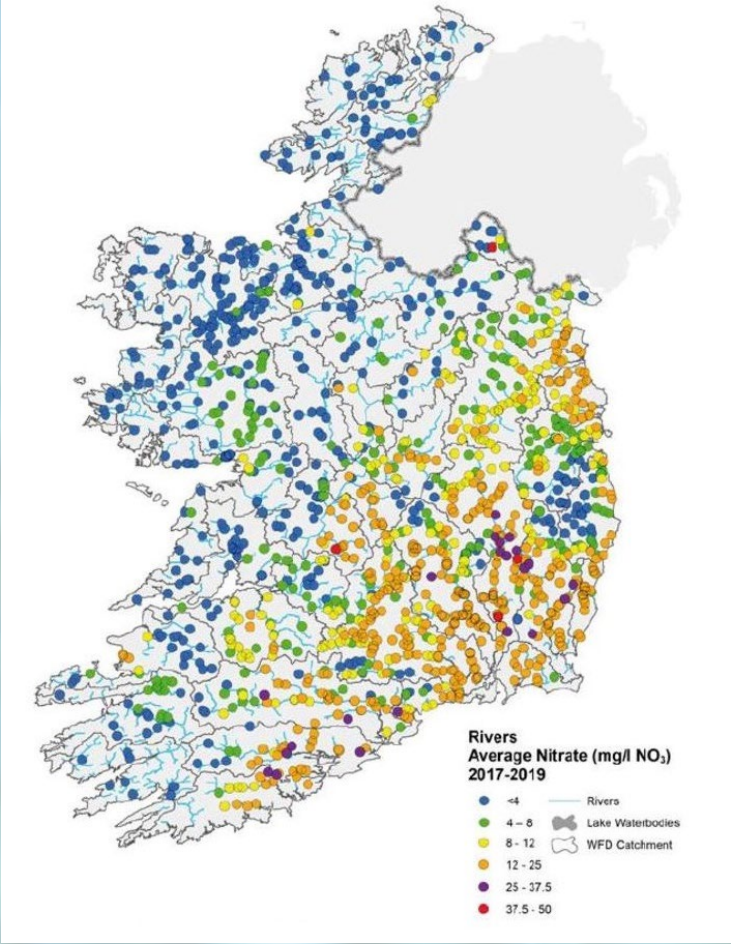
<https://www.catchments.ie/>
<https://lawaters.ie>



Awareness Raising, and Data Collection



Records of amphibians and reptiles



Ireland's Citizen Science



Number of biological records per county



Number of species recorded per county

AN FÓRAM Uisce
The Water Forum


epa
Environmental Protection Agency
An tAonacht an tAontas

Water

Educational Resources and Inspirational Stories

As an island nation the sea surrounds us, and our landscape holds an intricate network of natural waters. Our rivers, lakes and coasts are some of our most beautiful places, forever changing with the seasons.

Educational resources and stories



Our prose writers, poets, film-makers, visual artists, graphic artists, sculptors and designers have drawn inspiration from water, and have fired our collective imagination by their work

Raising awareness of the ecological, environmental, social and cultural dimensions of water



Now is the time to bring all of these ideas and activities together – and with scientists, engineers and technologists



*“I will arise and go now, for always night and day
I hear lake water lapping with low sounds by the
shore;
While I stand on the roadway, or on the pavements
grey,
I hear it in the deep heart’s core.”*

— Excerpt from *“The Lake Isle of Innisfree”* by W.B Yeats



*“I had come to the edge of the water,
soothed by just looking, idling over it
as if it were a clear barometer*

*or a mirror, when his reflection
did not appear but I sensed a presence
entering into my concentration”*

— Excerpt from *“I had Come to the Edge of the Water”* by Seamus Heaney



All Ireland Water & Wastewater Expo and Conference, 23
November 2022

So how can we Protect our Waters? **Through Legislative Action!**

- There is a strong need for new legislation to bring about a change in the way we think about water, the way we use water, to reduce or stop the waste of water.
- **Zero Waste Alliance Ireland** has been advocating and urging the following changes:
 - Changes in the building regulations requiring or encouraging the installation of **low water use toilets and rainwater harvesting**,
 - The requirement to install **urine-separating toilets** in all new buildings,
 - Supporting the revision of the EU **Urban Wastewater Treatment Directive** to require recovery of **nutrients from wastewater**, new standards for **micropollutants** (of which 66% are pharmaceuticals) and new monitoring requirements for **microplastics**, and,
 - a new **Extended Producer Responsibility** scheme will require producers of **pharmaceuticals** to pay for the cost of removing them from water.

Through legislation that protects our waters we can ensure the security of our waters

Will we achieve sustainability in our use of water ?

Only with a determined and multi-dimensional collective effort, led by our unbound imagination !

**Presentation by Jack O'Sullivan
Zero Waste Alliance Ireland**



**If you would like to discuss further,
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