

WEBINAR

Nature as BluePrint: Planetary intelligence and Human Innovation

 30.06.2026  17:00 PM CET  Host: SYNYO GmbH

OneAquaHealth 

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AGENDA

Key information

Time	Topic	Presenter
17:00 – 17:05 (CET)	Welcome and introduction to the webinar	Sónia R. Q. Serra Marine and Environmental Sciences Centre / Aquatic Research Network, University of Coimbra, Portugal
17:05 – 17:15	Part I: The illusion of separation	
17:15 – 17:30	Part II: What nature already solved	
17:30 – 17:38	Part III: Observe before you build	
17:38–17:45	Part IV: From nature to your project	
17:45–17:50	Closing + Resources	
18:00	Q&A session	All participants
18:30 (CET)	END OF THE WEBINAR	

HOUSEKEEPING RULES



The session will be **entirely recorded** and published on the OneAquaHealth Open Information Hub.



All participants except speakers and moderators will be **muted by default**.



Feel free to post your questions in the **chat**.



If you would like to **speak, raise your hand** and wait for the moderator to give you the floor.

...

**Has any technology we have ever
built outperformed life itself?**

If you want to share, just leave it in the chat

...

Has any technology we have ever built outperformed life itself?



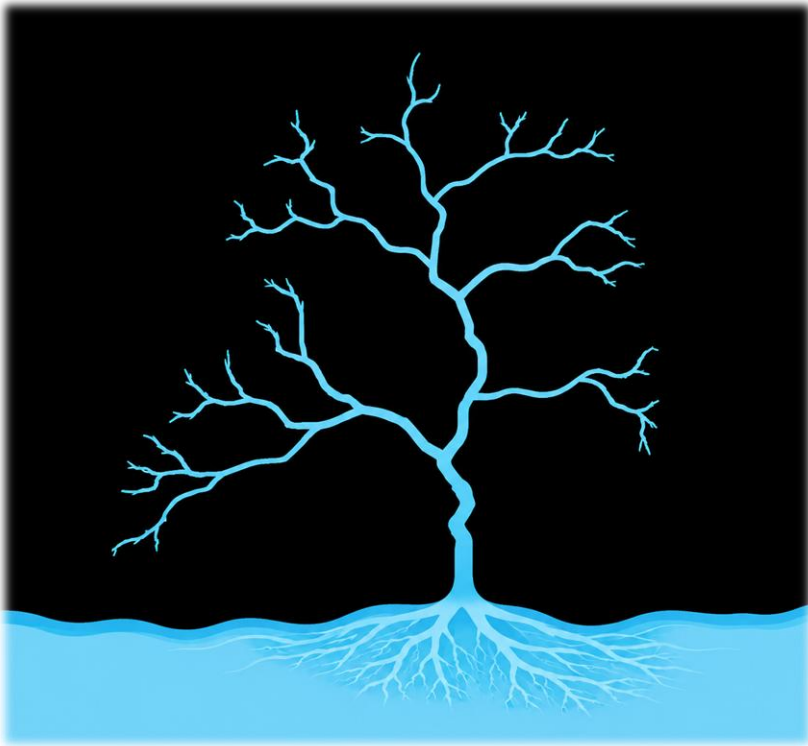
Spoiler... 3.8 billion years of R&D

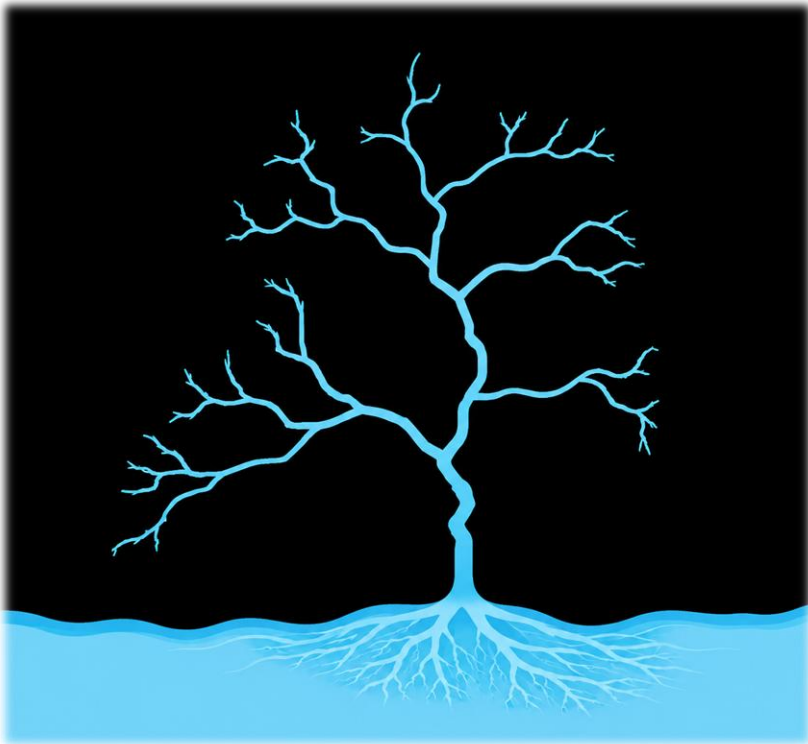
No patents. No waste. No planned obsolescence.

Life is not one solution. It is the condition for all solutions.

The stream or river as a teacher

Introduction



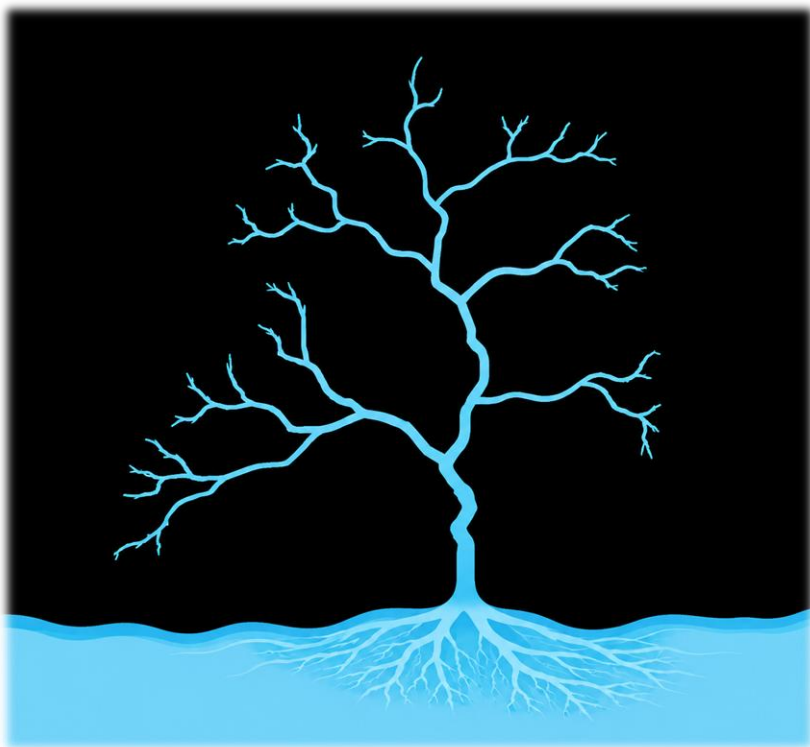


- ◆ **The same “form”, reinvented by evolution, again and again:**
 - River basins. Lungs. Tree roots. Fungal networks. Blood vessels.
- ◆ **One “form” → many solutions:**
 - When unrelated systems find the same solution, nature is telling you something.
 - This is not coincidence, but **convergent intelligence**.

It integrates. It connects. It responds.

The stream or river as a teacher: intelligence

Introduction



It doesn't monitor. It reads.

- ◆ A stream is an **information-processing network**: it integrates signals from the entire catchment, silently, continuously, for millennia. No sensor network on Earth does this at scale.
- ◆ A mayfly larva tells you **more about water quality** than any single chemical test. **Life reads life.**
- ◆ There is **no central processor**. Intelligence here is distributed, redundant, and context-aware.
- ◆ The most important thing I learned: **the stream/river always knows something I don't.**

It integrates. It connects. It responds.

The dominant story

Technology liberates us
from nature.

*We no longer need the river.
We no longer need the soil.
We have machines and we control a lot.*

**This story is dangerous.
Not just philosophically, mainly
functionally.**

The (ecological) reality

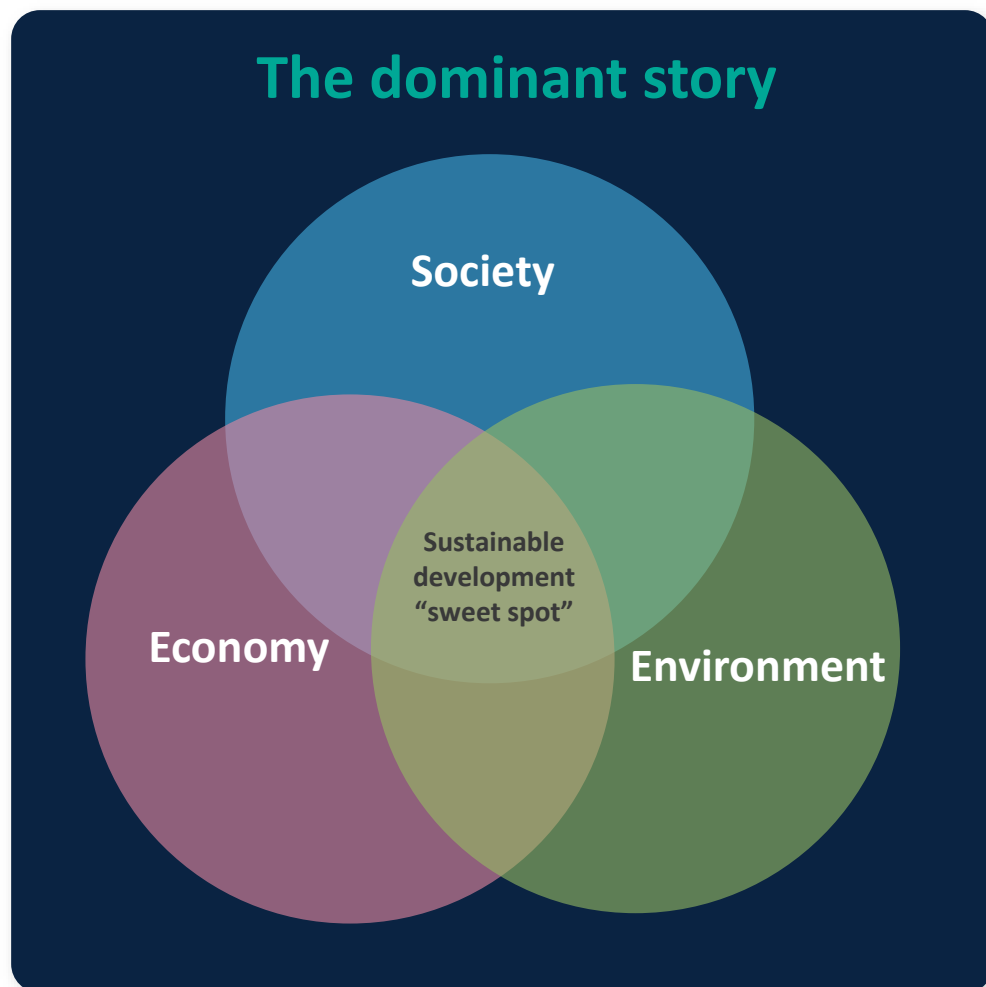
We are embedded
in nature.

*Every breath. Every sip of water.
Every heartbeat depends on
systems we did not build.*

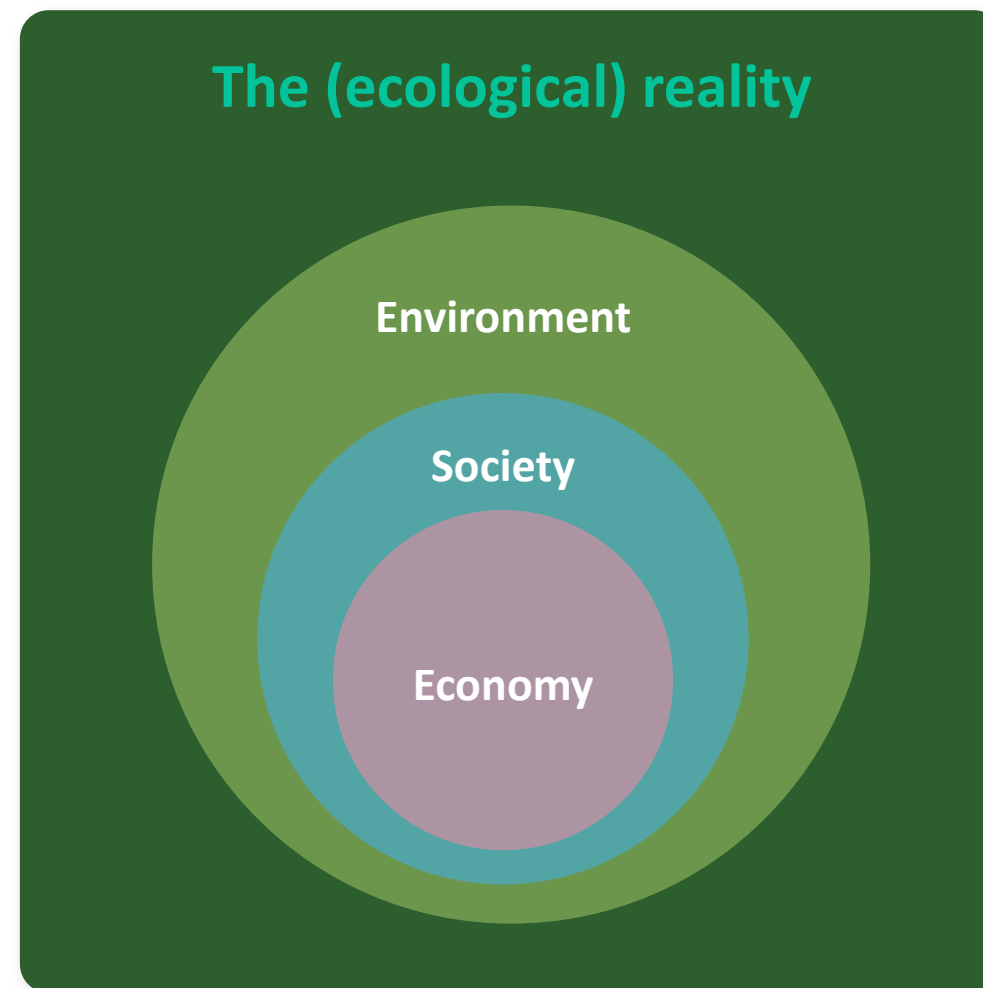
**Separation is not liberation.
It is a very expensive
illusion.**

What's the reality?

Part I: The illusion of separation

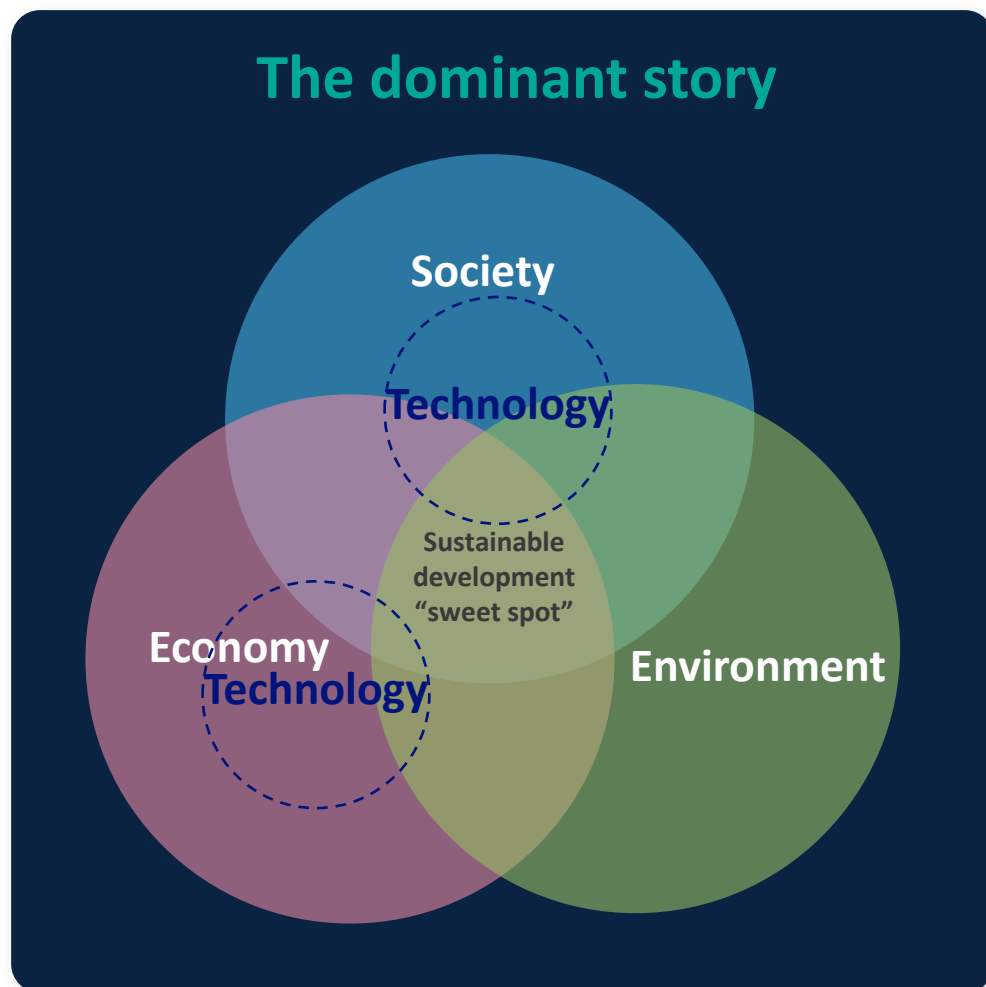


Adapted from: Locke *et al.* 2026

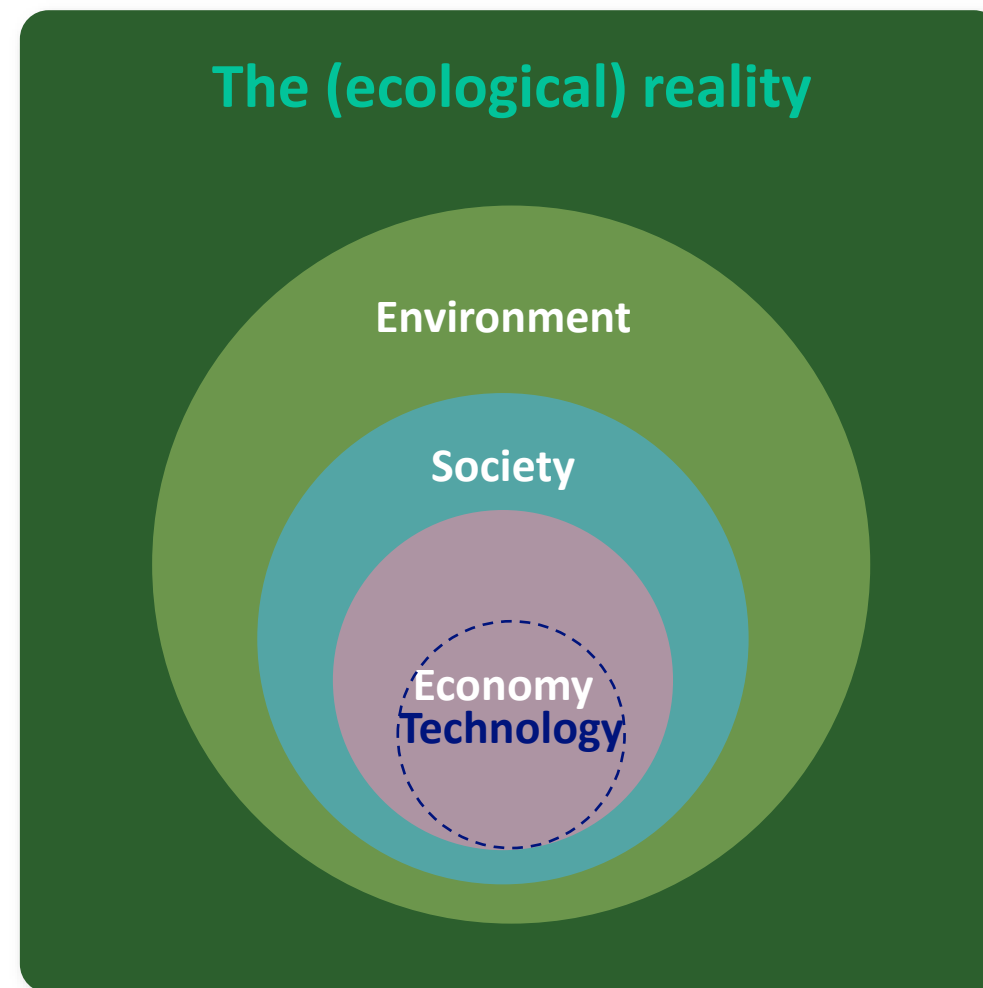


What's the reality?

Part I: The illusion of separation

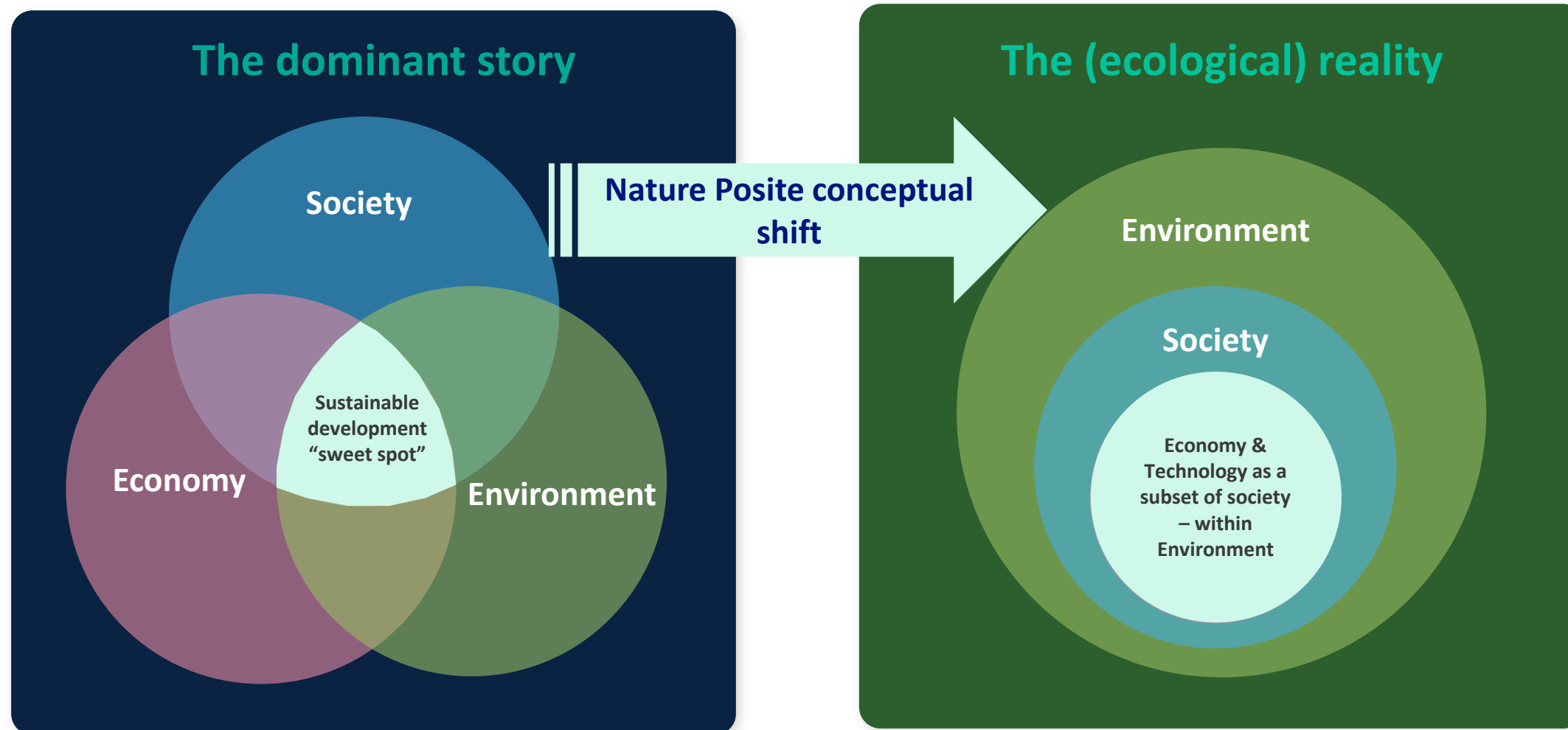


Adapted from: Locke *et al.* 2026



We need a conceptual shift... really

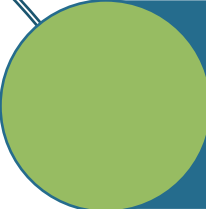
Part I: The illusion of separation



Adapted from: Locke *et al.* 2026

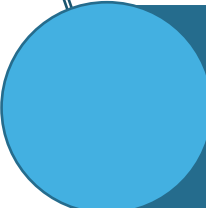
By disconnecting and without this shift...

Part I: The illusion of separation



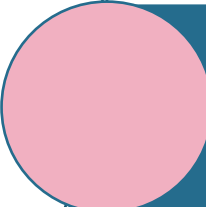
Biodiversity loss

Species are disappearing 100–1000× faster than background extinction rates. Every species lost is a function lost: a solution evolved over millions of years, gone.



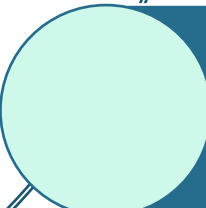
Freshwater disruption

Urban rivers are now among the most degraded ecosystems on Earth. Channelised, flashy, polluted, disconnected. They have lost their intelligence.



Climate instability

16 tipping points identified where self-reinforcing feedback loops drive irreversible state shifts. The planet's resilience is not infinite, and we are testing its limits.



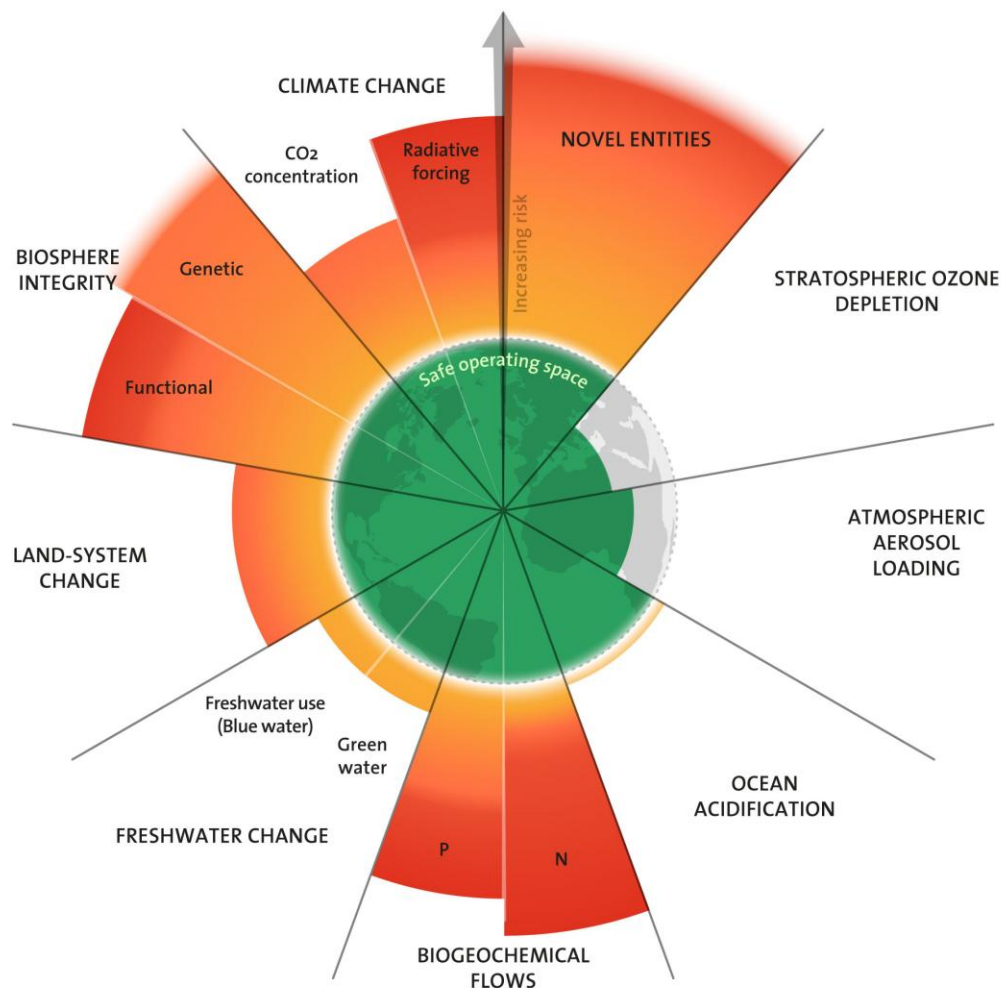
Novel entities

Micro/Nanoplastics, PFAS, pharmaceuticals: substances with no evolutionary precedent in water systems. Aquatic organisms have no response for these. Neither do we.

Source: Sakschewski *et al.* 2025, Richardson *et al.* 2023, Steffen *et al.* 2015, and Rockström *et al.* 2009

... Planetary boundaries framework

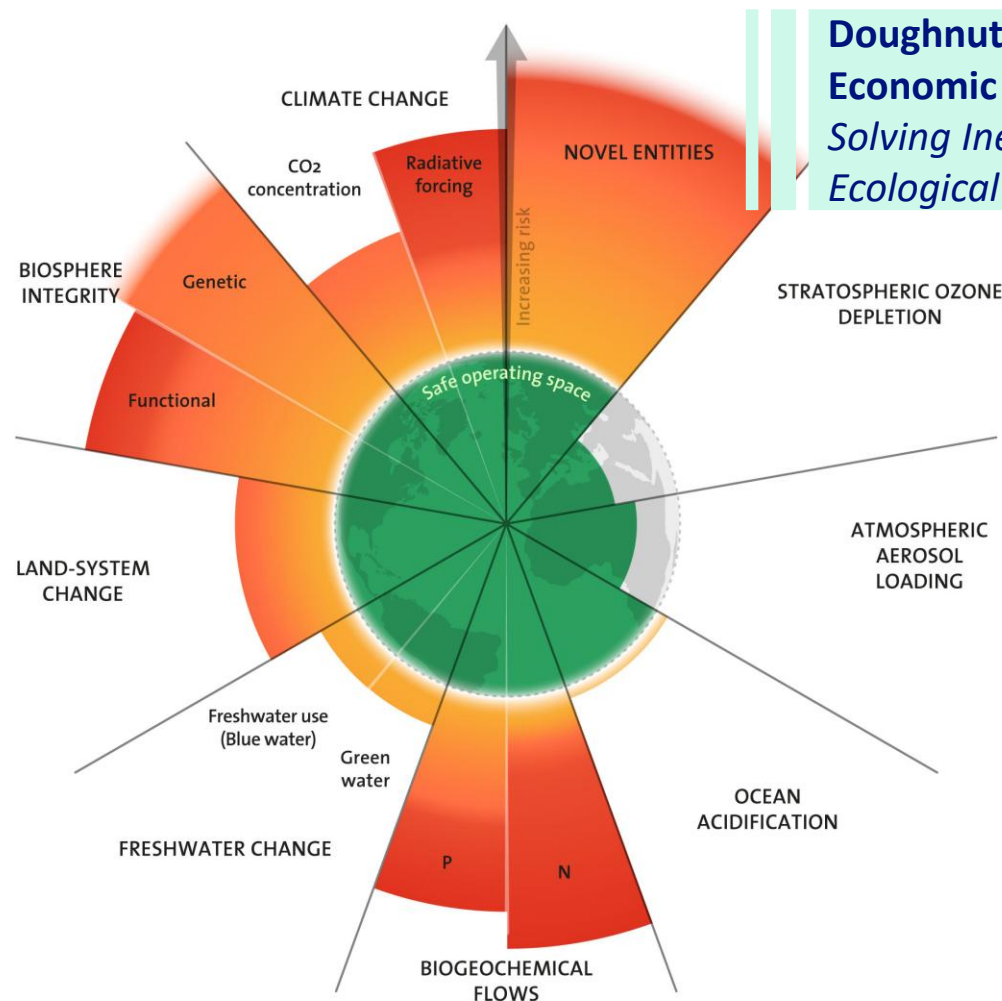
Part I: The illusion of separation



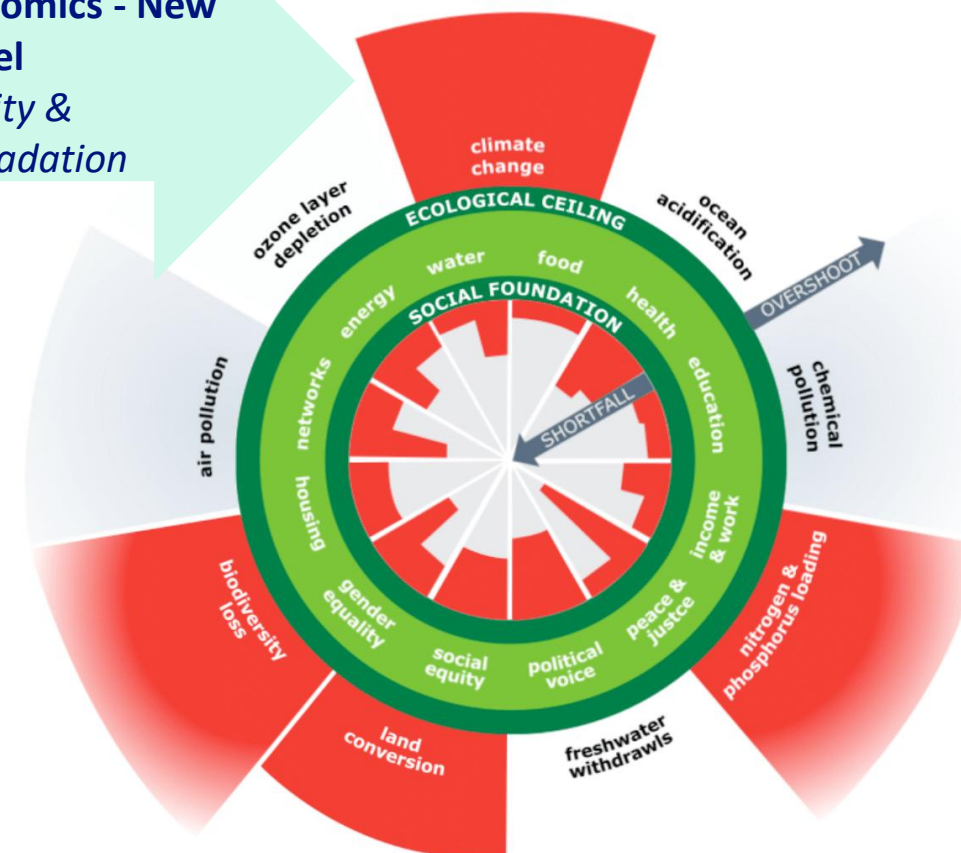
Source: Sakschewski *et al.* 2025, Richardson *et al.* 2023, Steffen *et al.* 2015, and Rockström *et al.* 2009.

... Planetary boundaries framework

Part I: The illusion of separation



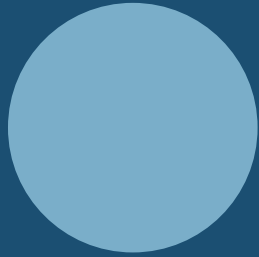
Doughnut Economics - New Economic Model
Solving Inequality & Ecological Degradation



Source: Sakschewski *et al.* 2025, Richardson *et al.* 2023, Steffen *et al.* 2015, and Rockström *et al.* 2009.

Raworth (2017) *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*, doughnuteconomics.org | illustration: bst-europe.eu.

One Planet · One Health · One Technology



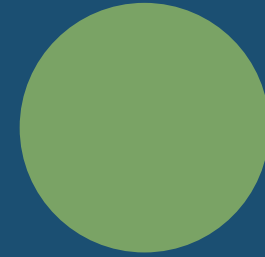
One Planet

The biosphere is not a backdrop to human activity; it is the condition for it. Climate, biodiversity, water cycles, soil. These are not 'ecosystem services'. ***They are us.***



One Health

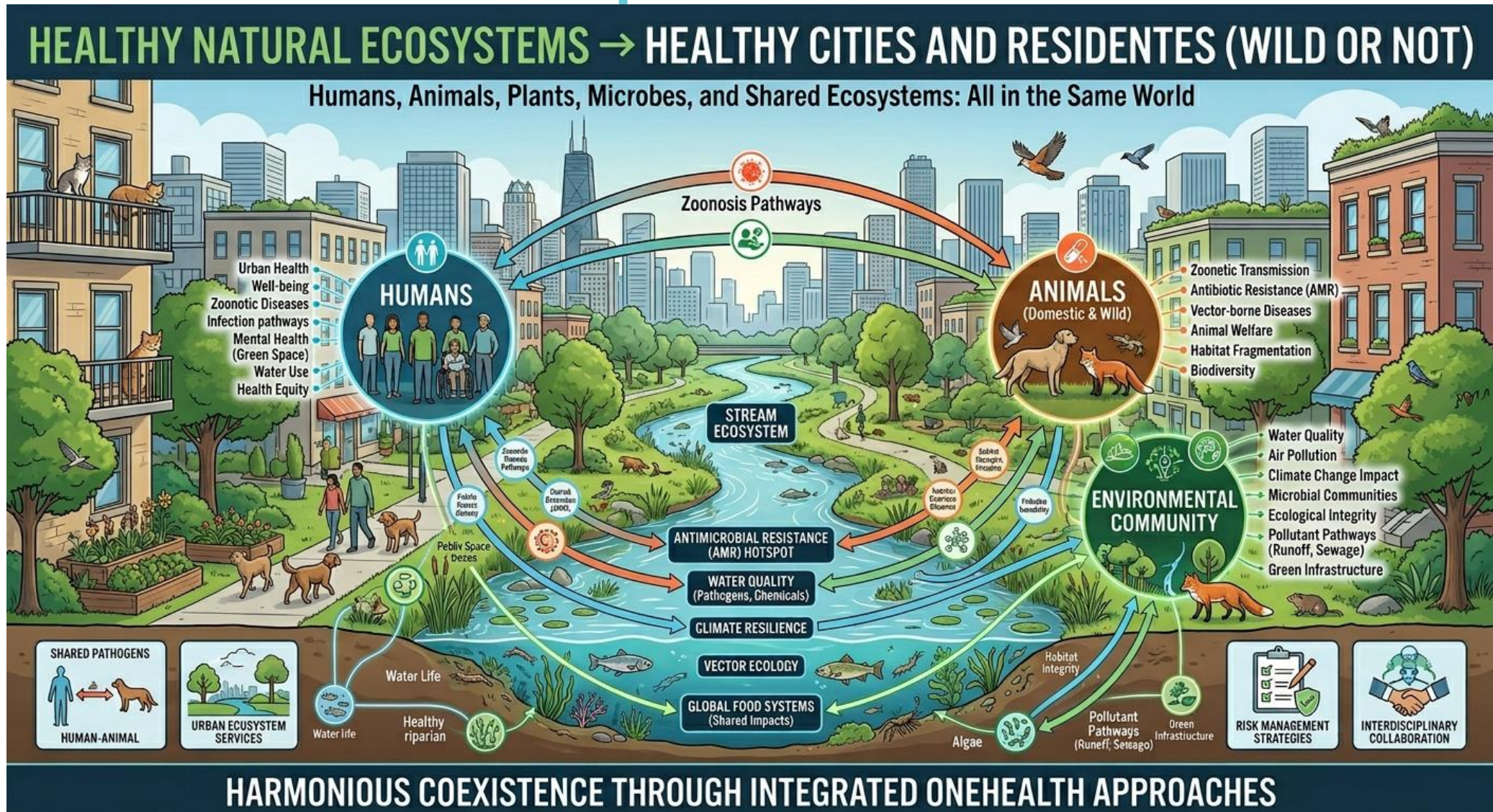
Human health, animal health, and ecosystem health are inseparable. A degraded river is not an environmental problem. It is a public health problem. A zoonosis problem. A food security problem.



One Technology

Every technology we build must answer to the whole system. Not just the human metric. Not just the dashboard. The test: ***does your solution make nature more possible, or less necessary?***

Does your solution make nature more possible, or less necessary?



Part II: What nature already solved

Ecosystems as information-processing networks.

Integrates

A river integrates signals from its entire catchment (rainfall, land use, soil chemistry, temperature, biological load) in real time. No sensor network on Earth does this at this scale.

Remembers

Communities encode cumulative environmental memory. A single macroinvertebrates kick-sample tells the story of months of water quality. Not a snapshot, a biography of the system.

Responds

When conditions change, ecosystems respond, not through central command but through distributed, redundant signals. Every species is both sensor and actuator.

Regenerates

Unlike our machines, **healthy** ecosystems produce the conditions for their own continuation. This is not efficiency it is something deeper: generativity.

Nature already solved it

Part II: What nature already solved

These are not metaphors; they are the originals.

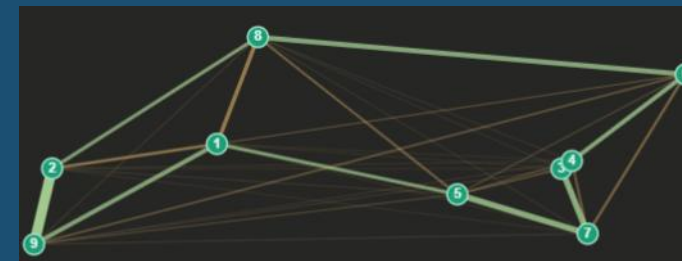
Engineering



Architecture



Computing & AI



Sources: Wikimedia Commons · Unsplash · Pexels, free for educational use. Ant simulation made by Claude Anthropic's AI.

These are not metaphors; they are the originals.

Engineering

Shinkansen bullet train

Kingfisher beak → train nose

- The bird enters water with near-zero splash.
- Engineers copied the geometry to solve sonic booms in tunnels.
- 15% energy saving.

Architecture

Termite ventilation

Termite mounds → shopping centre and office block

- Termites maintain 31°C (3°C to 42°C outside) with no technology.
- Eastgate Centre, Harare: built on this principle.
- 90% less energy than conventional HVAC.

Computing & AI

Ant colony optimization

Ant pheromones → delivery route algorithms

- Ants find the shortest path with no map and no leader, by accumulating stronger chemical trails.
- UPS routing uses the same principle
- Saving 100 million miles per year

Nature already solved it

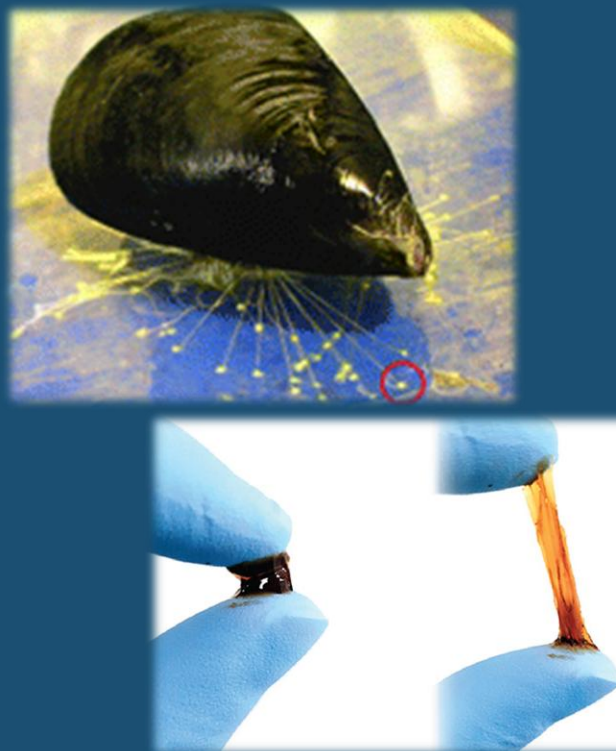
Part II: What nature already solved

These are not metaphors; they are the originals.

Aerospace



Medicine



Water



Sources: Wikimedia Commons. Wei et al. (2024), Bandara et al. (2012), Weiss Research Group/UCLA, asknature.org

These are not metaphors; they are the originals.

Aerospace

Owl serrated feathers

Owl feathers → efficient flight

- Owl wing edges have comb-like serrations that break up turbulence into micro-vortices.
- Applied to wind turbine blades and quieter aircraft wing designs.
- Silences flight, eliminates drag and maintains lift.

Medicine

Mussel adhesion

Mussel adhesion → surgical glue

- Mussels anchor in turbulence with DOPA-rich protein.
- Inspired wet-adhesive surgical sealants.
- It bonds in moist tissue where nothing else holds.

Water

Namib beetle

Fog → Water harvesting

- Fog collected passively with zero energy, using micro-surface geometry alone.
- Inspires low-tech, low-cost sensor deployment in water-scarce catchments.

The stream or river doesn't just carry water

Part II: What nature already solved

It processes. It filters. It remembers.

*No waste.
No central command.
No engineer required.*

*This is not a metaphor
for intelligence
→ It is intelligence!*

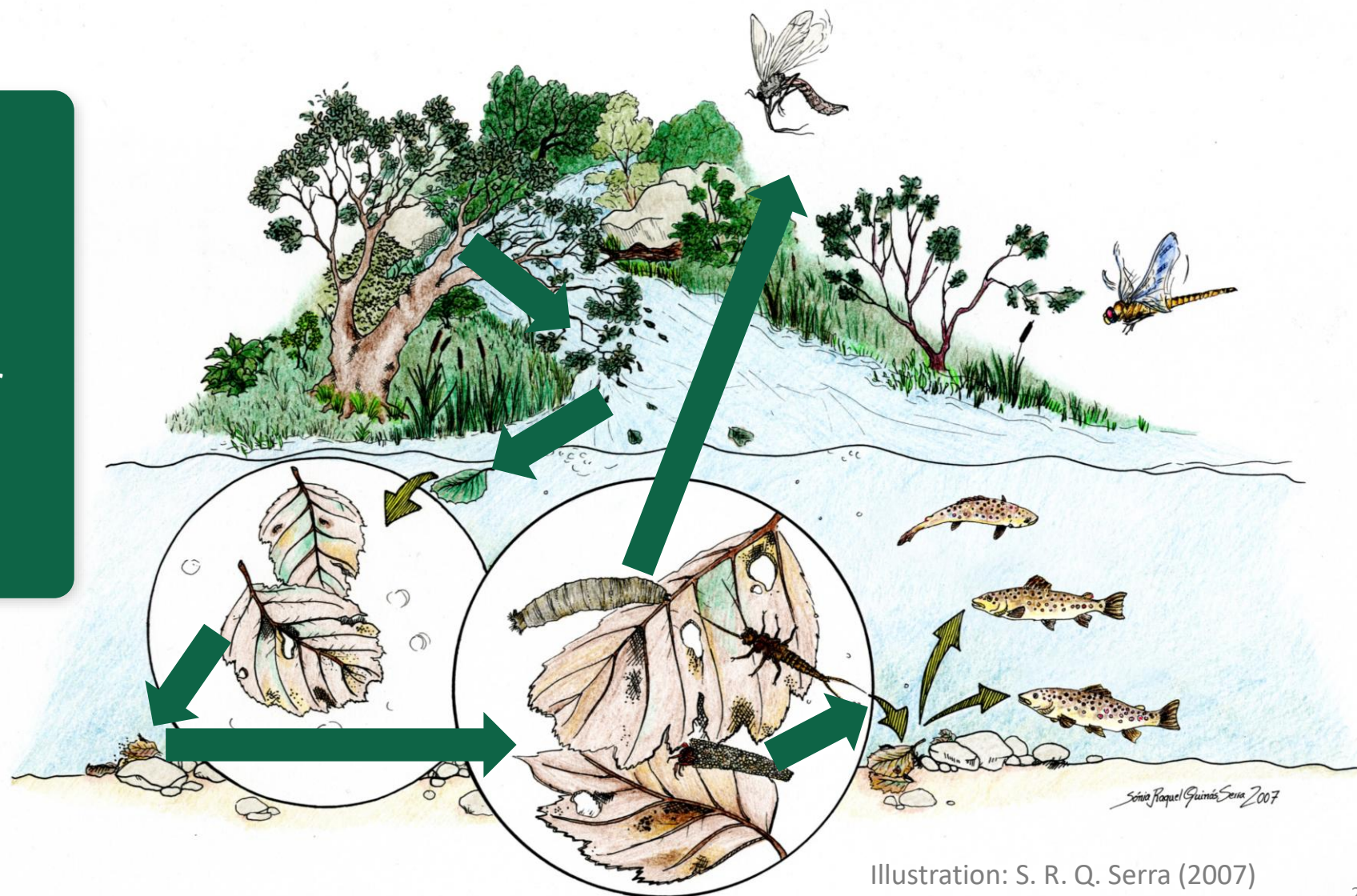


Illustration: S. R. Q. Serra (2007)

The surrogate trap

Part II: What nature already solved

When nature becomes an excuse not to conserve or restore

- The most well-intentioned technologies can make nature seem unnecessary.
- This is the surrogate trap, and it is dangerous.

 The surrogate approach	 The ecological approach
Copies what river does	Asks: what does the river need to do it itself?
Replaces the natural system	Restores the conditions for it
Technology as permanente solution	Technology as temporary scaffolding
Treats the symptom	Address the system

If your solution makes the stream less necessary → **you have failed.**
If it makes the stream more possible → **you have succeeded.**

What part of nature do you think would blow your mind to really understand?

*What living system does any of your past projects, and the one, most resemble?
A river, a mycelium, a swarm...?*

If you want to share, just leave it in the chat

What part of nature do you think would blow your mind to really understand?

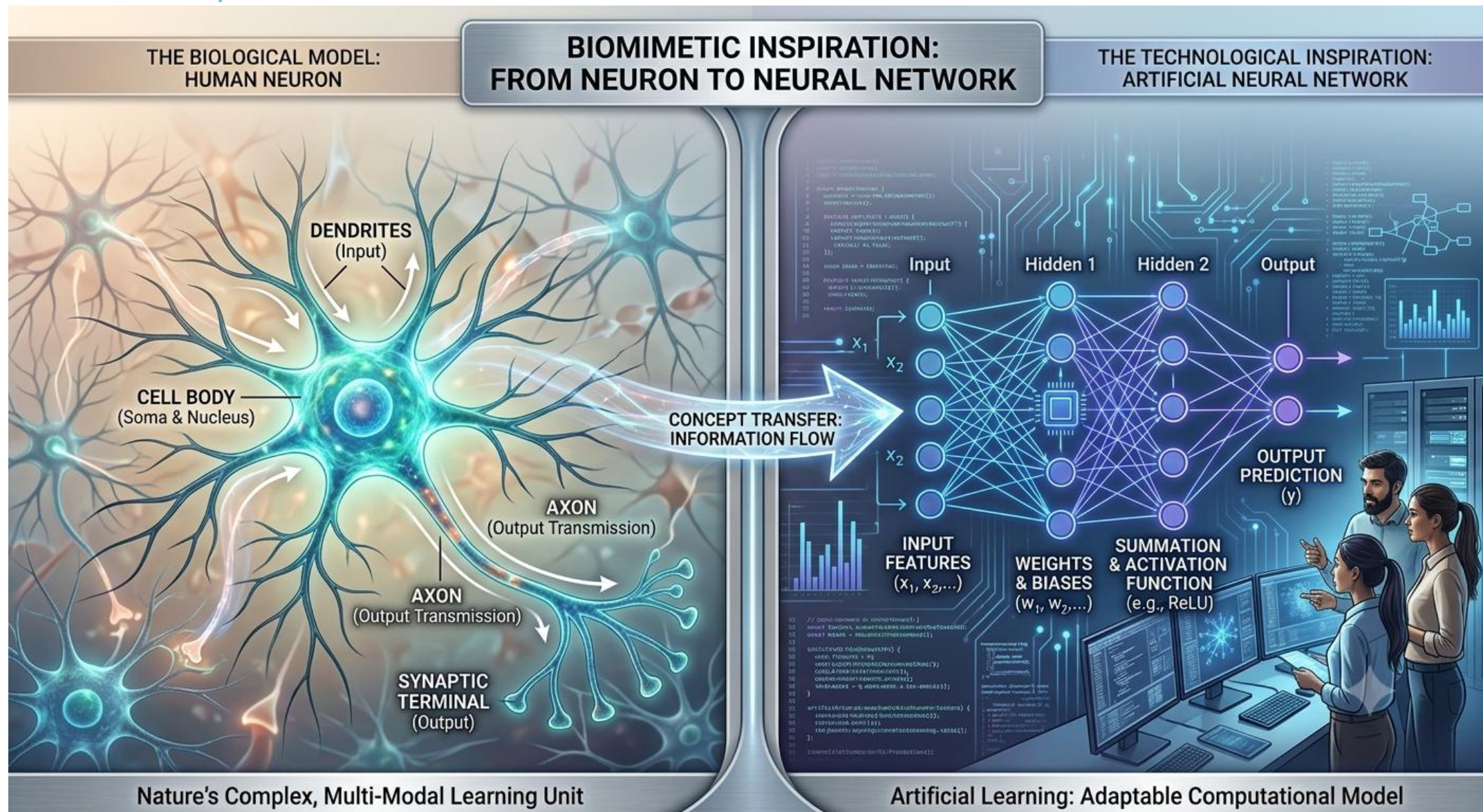
*What living system does any of your past projects, and the one, most resemble?
A river, a mycelium, a swarm...?*



**Spoiler... I'm sure you been doing it!
Even if you don't recognize it immediately.**

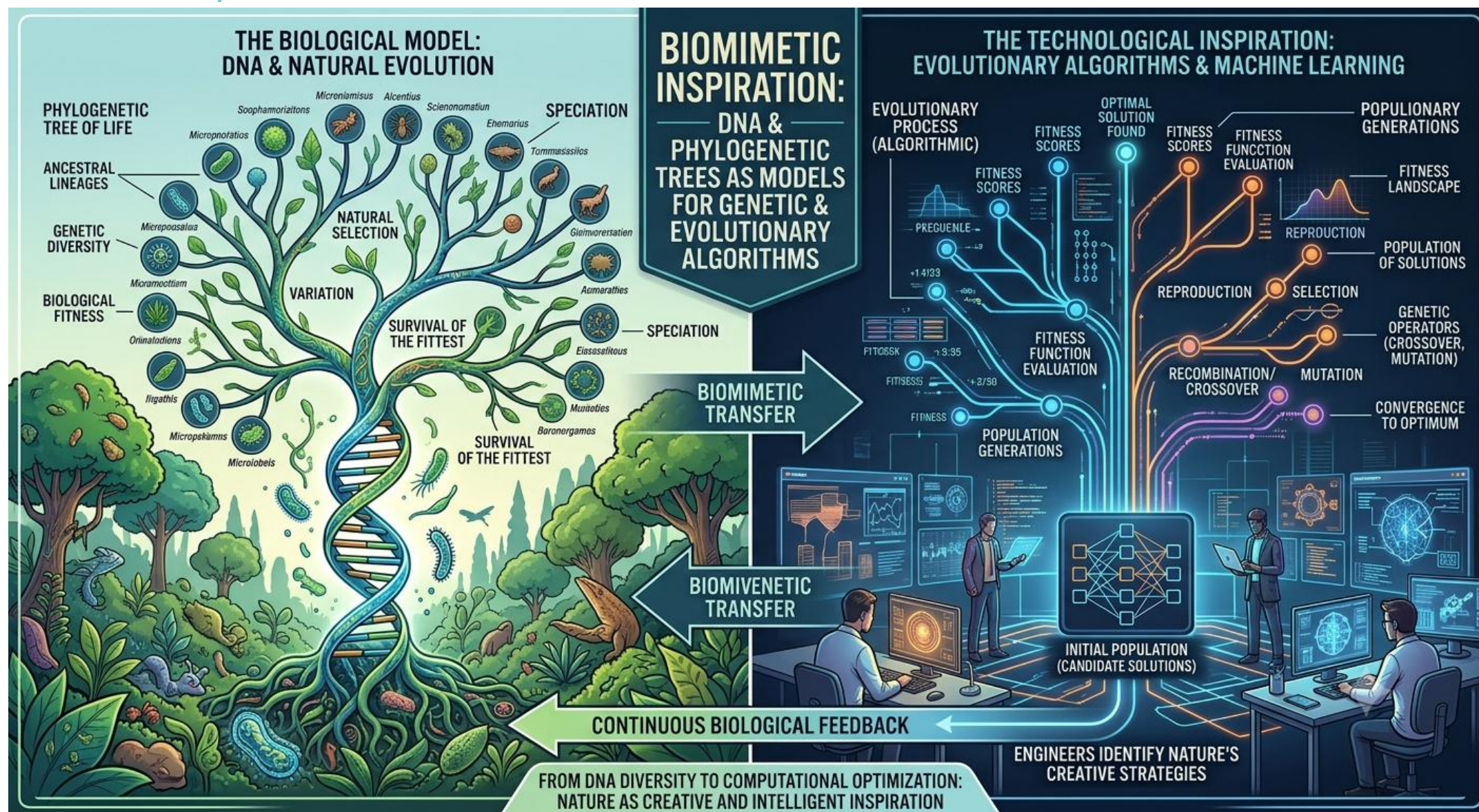
You've been doing it...

Part II: What nature already solved



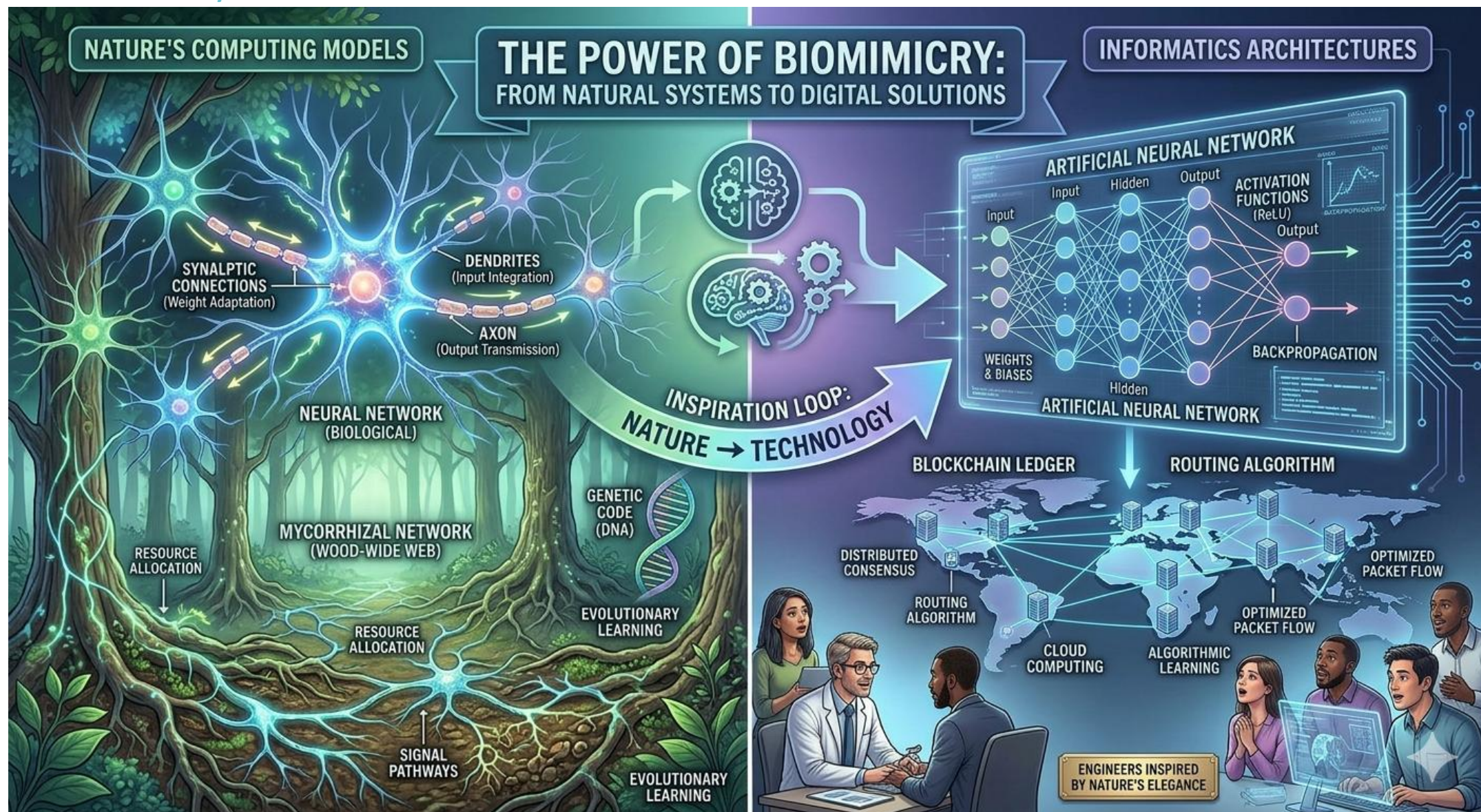
You've been doing it...

Part II: What nature already solved



You've been doing it...

Part II: What nature already solved



...

**How can the logic of an urban
stream ecosystem inspire the
architecture of One Health
technology?**

If you want to share, just leave it in the chat

*Culture pushes you: build fast, iterate fast.
Today I am asking the opposite...*

Observe first!

- The most resilient systems on this planet did not iterate fast.
- They evolved slowly, with total attention to context.
- And they have been running without crashes for millions of years.

How to observe, a simple protocol

Part III: Observe before you build

Before you open your laptop... Let nature be the first brief.

- 1** Go somewhere alive.
- 2** Sit still for 10 minutes. No photos. No notes.
- 3** Ask: what problem is nature solving?
- 4** Look for small things.
- 5** Connect what you see to what you do.
- 6** Visit the same place (if it makes you feel good) repeatedly.
- 7** Keep a nature notebook.

Stay amazed. Stay porous. Stay curious. Stay open...

Part IV: From nature to your project



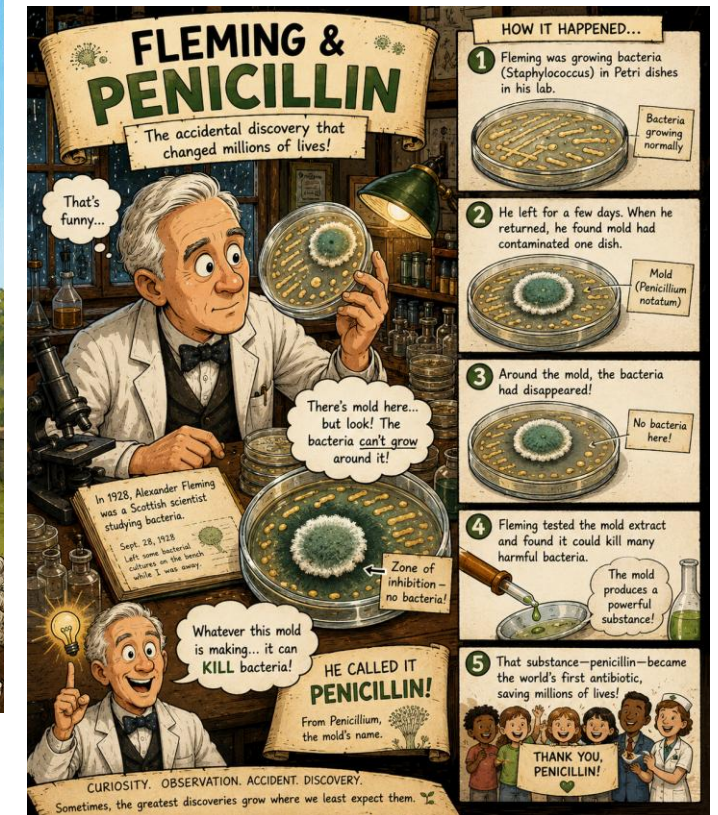
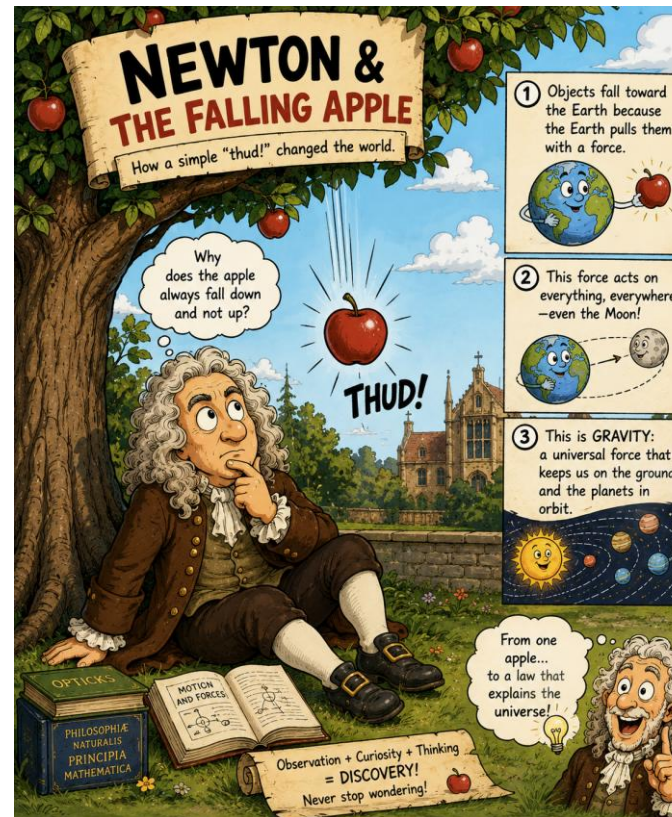


The pattern isn't (just) genius.

It's attention and openness.

Inspiration doesn't (just) live inside us...

... It passes through us!



*This is not a soft suggestion. It is the epistemological condition for genuine innovation.
You cannot learn from nature without first being willing to be astonished by it.
Amazement is not the opposite of rigor. It is its beginning.*

Any doubt?



Now build something the stream or river would recognize. Be “One”!

Resources:

Websites:

asknature.org
santafe.edu
iNaturalist.org
biomimicry.net
eol.org

Books:

Thinking in Systems, **Donella Meadows** (Legacy: donellameadows.org)
Braiding Sweetgrass, **Robin Wall Kimmerer**
Biomimicry, **Janine Benyus**
The Shark's Paintbrush, **Jay Harman**

Questions & Answers



Give yourself permission to say: I don't know!

And ask nature! → [\[asknature.org\]](https://asknature.org)

OneAquaHealth

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Protecting Urban Aquatic Ecosystems to Promote One Health

Background

Urban aquatic ecosystems are extremely relevant connectors between people, animals and plants, making cities more **bioresilient** and sustainable. Yet these ecosystems are often confronted with lack of space, cuts of vegetation, artificialization, and other **urbanisation processes**. This degradation can lead to numerous **disservices to humans** in regard to emerging pathogens, decreasing disease resistance, climate change impacts and other **health concerns** in cities.

Goal

OneAquaHealth aims to improve the **sustainability and integrity of freshwater ecosystems** in urban environments. By investigating the **interconnection** of ecosystem health and human well-being, the project will identify **early warning indicators** and enhance **environmental monitoring** with AI-assisted tools. As a result, the project will support decision-makers in finding **adequate and timely decisions** as well as **effective measures** to restore aquatic ecosystems health and promote **OneHealth**.

Concept

By filling knowledge gaps and by adopting the **One Digital Health (ODH)** principles, policy instruments for the management of urban aquatic sites can be improved substantially. The project will develop **digital tools** – an Environmental Surveillance System, a Decision & Support System and a CitizenScience App to **raise awareness** and to **engage all relevant stakeholders** to jointly achieve **thriving ecosystems and healthier communities** for the future.

Subscribe to our Newsletter!

Discover our latest updates and news about the OneAquaHealth project.

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SHINE

24 Apr

Role of SHINE 2Europe in OneAquaHealth

EDURRIO

20 Apr

The exhibition EDURRIO was opened in Coimbra, Portugal

OneAquaHealth

22 Mar

OneAquaHealth at International Women's Day 2023 Roundtable

OneAquaHealth

6 Mar

OneAquaHealth at Medical Informatics Europe 2023

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1 Mar

OneAquaHealth Kick-Off Meeting – February 1st and 2nd, 2022

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Twitter account | <https://twitter.com/OneAquaHealth>

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24 Tweets

Protecting Urban Aquatic Ecosystems to Promote One Health





Folgen

OneAquaHealth

@OneAquaHealth

Restoring urban aquatic ecosystems for animal, plant & human health @HorizonEU
#onehealth #urbanenvironment #aquaticecosystem #EUScienceInnov

Europe oneaquahealth.eu Seit Januar 2023 bei Twitter

OneAquaHealth @OneAquaHealth · 3. Mai

Stream ecologists in action 🌿💧

@OneAquaHealth project coordinator from #UCoimbra demonstrates how to monitor the wellbeing of urban stream ecosystems

#biodiversity #EcosystemMonitoring #OneHealth



OneAquaHealth @OneAquaHealth · 25. Apr.

Exhibition EDURRIO opened in Portugal! First stop, until 16 June: #Coimbra 🌟

Learn about the role of urban streams for the #sustainability of cities and #bestpractices to protect their #ecosystems 📖🌿

Organised by #UCoimbra researchers. Details: ineews.eu/universidade-d...





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OneAquaHealth @OneAquaHealth · 13. Apr.

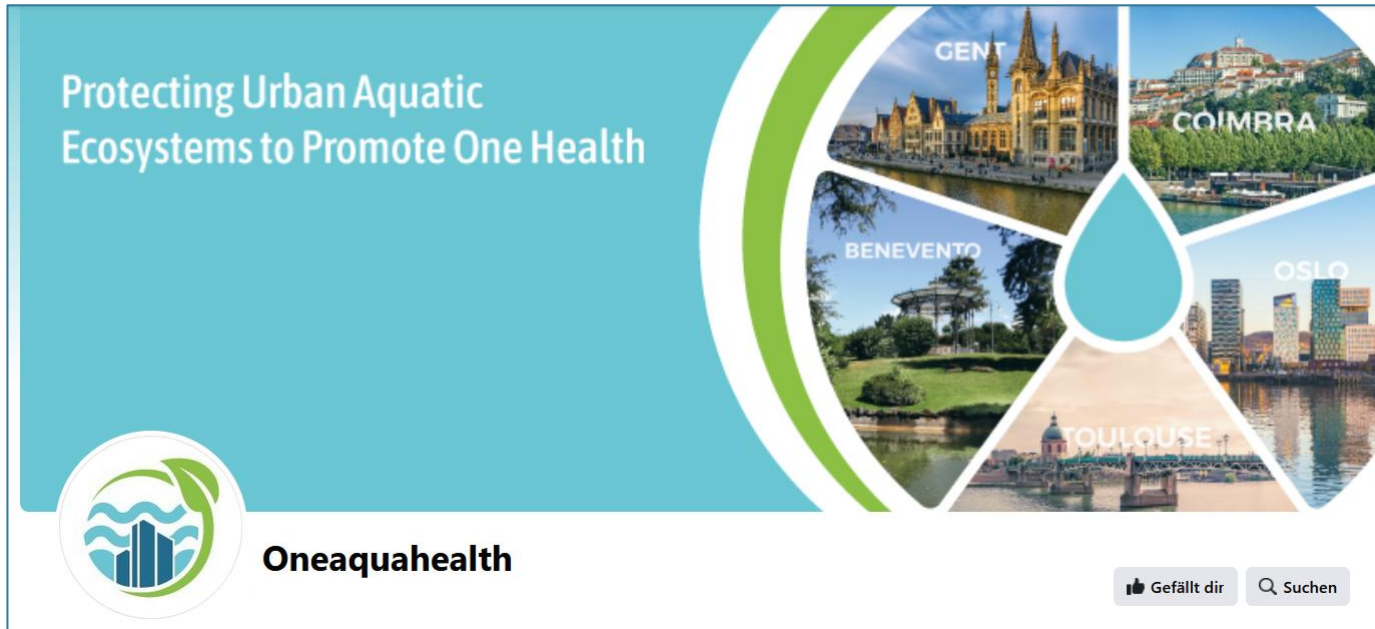
It's time to introduce our ambitious and multidisciplinary consortium - not only the brains but also the hearts of @OneAquaHealth

13 partners from 10 countries share their expertise and motivation 🙌 learn more about them here: oneaquahealth.eu/consortium/

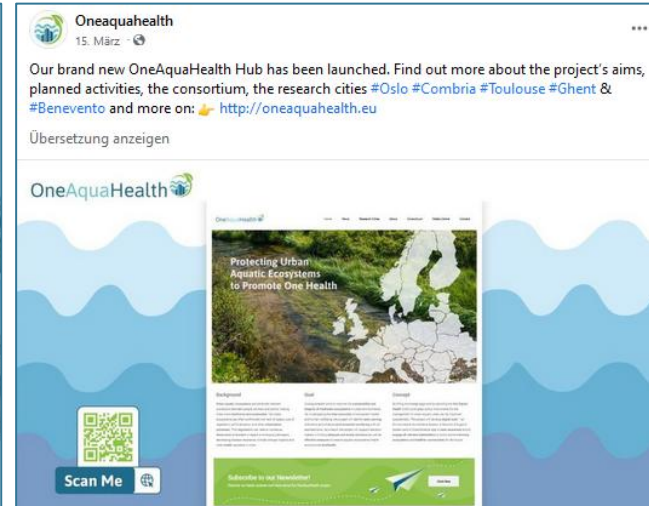


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Protecting Urban Aquatic Ecosystems to Promote One Health



OneAquaHealth Project

EU-funded project to protect #UrbanAquaticEcosystems to promote #OneHealth



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...

Register NOW!
07.12. 15–16:30 pm CET ONLINE Webinar (free of charge)
"Threats, challenges and innovation technologies for sustainable balance between health of freshwater ecosystems, human health and wellbeing in urban contexts" ...see more

WEBINAR

Threats, challenges and innovation technologies for sustainable balance between health of freshwater ecosystems, human health and wellbeing in urban contexts

07.12.2023 15:00 PM CET - 16:30 PM CET

Host: SYNYO GmbH



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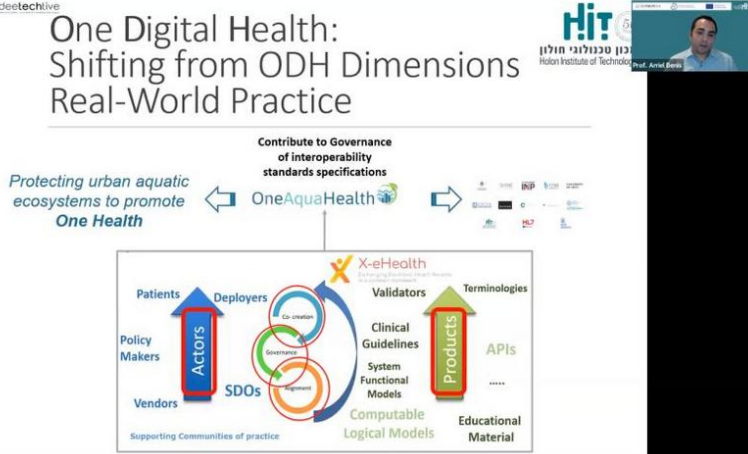
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Our partners from the **Holon Institute of Technology** presented the **OneAquaHealth Project** during a webinar organized by the **DEETECTIVE** project. ...see more

One Digital Health:
Shifting from ODH Dimensions
Real-World Practice





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...

Our partners of **Ghent University** conducted intensive field work in urban areas of and around Ghent to assess the status of freshwater ecosystems.

In Belgium, expanding urban, industrial and agricultural activities as well as the impacts of climate change are increasingly putting pressure on urban habitats and biodiversity. Read more about the great variety of indicators assessed in the **OneAquaHealth Project** for comprehensive **#environmentalsurveillance** to achieve **#OneHealth!**

<https://lnkd.in/dm6sR46t>





OneAquaHealth

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Contact us, get involved, stay updated:



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