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Toxicosphere is a unique publication created by a group of students and alumni of the Master's program in Environmental Contamination and Toxicology (ECT+) One Health. Meet the dedicated voices behind Toxicosphere team and discover the expertise driving our mission!

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Intro

From the programme representative

It is with great excitement that we present the second edition of Toxicosphere Magazine, a continued effort of the Students and Alumni Board (SAB) community.

What began as a simple idea to connect to our students, alumni, and mentors through shared knowledge has now grown into a meaningful tradition. This year's edition dives deeper into the spheres that define our interdisciplinary identity, One Health.

Building on the success of our first edition, this year's Toxicosphere reflects our shared passion for environmental sciences. Within these pages, you will find a wealth of perspectives from emerging contaminants to invisible threads linking human and environmental well-being. Perhaps, a glimpse as well from the current activities of our alumni. Such stories will remind us that our work extends beyond laboratories and lectures; instead, it shapes the way we understand and care for our planet.

We thank all contributors for their creativity and dedication, and we warmly invite everyone in our community to continue sharing their voices, ideas, and experiences in the issues to come.

Let this second edition remind us that while the Toxicosphere continues to evolve, our unity as learners, researchers, and changemakers remains the driving force behind its success.

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ONE HEALTH

The One Health concept highlights the intricate connections between human, animal, and environmental health. This year, we explore how the well-being of ecosystems directly shapes community resilience. Then, we turn to the Southern Ocean, where iron emerges as an essential nutrient driving marine productivity and influencing global biogeochemical cycles. Finally, we examine the intersection of climate change and human governance, using the catastrophic landslide in Donja Jablanica to show how extreme weather and corruption together magnify risks for communities and ecosystems.

DELIVERING METROPOLITAN AND RURAL WASTEWATER MICROPOLLUTANT TREATMENT EQUITY

Prepared by
ABRISHAM VINCENT

Why do we need to consider metropolitan-rural equity for wastewater treatment?

The issue of emerging pharmaceutical pollution is of similar concern in rural areas as Boxall et al., 2024 research shows concerning levels found in ecologically important conservation sites. The European Union is moving to reduce these risks with the European Wastewater Directive (EU) 2024/3019. It requires that industries which produce micropollutants fund quaternary treatment at 150,000 and above person equivalent wastewater treatment plants by 2045. Those rural areas with 10,000 population equivalents and above can advocate for technology based on a sensitive environment however those below appear likely to miss out on treatment.

Indeed, quaternary treatment technology needs to become cheaper, more circular and more open source to innovate and provide for rural areas. But there is another issue I will address in this article. The difference in illness and pharmaceutical use between rural and metropolitan areas.

Take for example New South Wales, Australia. When we compare mental health rates between regional and metropolitan areas, regional mental health rates are at least 1.7 times greater ($p < 0.01$) (Vincent, 2025). In fact, mental health and substance use is the highest burden of disease for the first half of life course from 0 to 44 years in Australia (Australian Institute of Health and Welfare, 2024a). Furthermore, in regional areas the government spends more per-capita on pharmaceuticals than metropolitan areas (Australian Institute of Health and Welfare, 2024b).

Creating an open science and open source innovation and implementation ecosystem based on circular economy principals for quaternary treatment will certainly help the pollution problem. However, will it assist with higher mental health issues facing regional communities? I suggest that a transformational action should include benefits for both industry, rural and metropolitan communities. This could be done with a program for nature-based pharmaceutical treatment systems. A program with a framework to implement preventative care in communities, deliver integrative medicine and fund a support network for the research and design of drugs based on their harms-and-benefits of individual, social and environmental over the short-term and long-term.

Nature-based projects which increase public green space would likely benefit mental health since green space is associated with reduced development of psychotic conditions in children (Engemann et al., 2019). However, these benefits require the public green space is safe, otherwise Orstad et al., (2020) shows they deliver no mental health benefits (Orstad et al., 2020).

Encouraging routine community activities with capable guardians in these spaces can act to prevent motivated offenders committing crimes of violence and harassment (Cohen, Lawrence and Marcus, 1979). When people feel safe in green public spaces they can form friendships with others, create circles of trust and are less likely to have a mental health condition (Stafford et al., 2007). The potential contamination issue of nature-based projects requires consistent management and monitoring since while wetland treatment can reduce many pharmaceutical concentrations others remain (Al-Mashaqbeh et al., 2024). Pharmaceuticals that remains at elevated levels could present short-term and long-term risks to people and native species using those green spaces (Hale et al., 2015). Improving effective removal is one way to reduce the risk. The study of fungal species is a promising area of research to improve nature-based treatment efficacy (Harms et al., 2011).

The micropollutant problem demands a holistic approach that delivers pollution-free water for both metropolitan and rural communities. The recent EU regulation is welcome but the strategy to deliver for rural communities should combine nature-based water treatment projects with a framework. However to be more effective that framework needs to encourage open source for innovative and affordable quaternary treatment technologies. In the case of pharmaceutical design, production and distribution, both industry and government can improve evidence based short-term and long-term benefits and harms evaluation for individuals, society and environment framework (Nutt et al., 2010).

To address pharmaceutical micropollutants we need focus on both quaternary treatment and to improve the quality of individual, social and environmental well-being. In both metropolitan and rural communities.

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Figure 2
Local photographer documenting African bird in Tanzania

CLIMATE CHANGE AND CORRUPTION:

WHO REALLY KILLS?

BY ADALETA OMERBASIC (2ND COHORT ECT+ 2021-2023)

On the 4th of October 2024, a disaster struck Donja Jablanica in Bosnia and Herzegovina. A massive landslide buried homes, took over 20 lives, and left a scar on the landscape. There are two main culprits: extreme weather driven by climate change and an illegally placed quarry above the village. But while nature followed its course, those responsible for the quarry, those who ignored warnings, bypassed regulations, and put profits over peoples' lives, remain free of accountability.

Scientific data shows that temperatures in Bosnia and Herzegovina are increasing from 0,3 to 0,6 °C annually [2]. But climate alone did not cause this catastrophe. The illegal quarry above the village had already destabilised the land. Years of uncontrolled exploitation had loosened the rock, leaving millions of tons of material vulnerable to a catastrophic landslide once extreme rain hit. And when a powerful supercell jet stream thunderstorm swept over the Adriatic and raced along the Neretva River valley, it unleashed an unprecedented downpour: over 300 litres of rain in just 24 hours according to the Agency for the Water Area of the Adriatic Sea [3].

Supercells are discrete, powerful thunderstorms which almost always result in severe weather. [4]
The huge amount of rain poured water into the fractured limestone of unstable quarry terrain and released a massive landslide of heavy rock. The sheer scale of the event was almost unimaginable; millions of tons of rock were moved, an unstoppable force of destruction.
The extreme weather events will become the norm in the Balkans and not an exception. Bosnia and the entire Balkans are now in the red zone, facing an increase in catastrophic events such as droughts, floods, and landslides.

Experts predict that by 2050, desertification will begin, pushing Balkan climate patterns further north, while the region itself will experience conditions similar to those in North Africa today.[6]

One thing is clear, as rainfall patterns shift and temperatures rise, traditional urban planning and construction methods are no longer viable. Floods and landslides that used to occur once every 50–100 years are now happening almost annually.

If we could go back in time to prevent the quarry landslide, what could we have done?

- Rethink hillside construction. Many buildings in Bosnia and Herzegovina stand on unstable slopes without adequate reinforcement. In a landscape increasingly exposed to heavy rainfall and seismic activity, stricter construction standards are essential.
- Protect vegetation as a natural barrier. The constant removal of vegetation for construction, which plays a crucial role in holding soil together, must have been stopped. Places where tree roots used to hold the soil in place have been cleared and covered with pavement, making landslides more likely.
- Invest in water management systems, including reservoirs and collection systems. Agriculture, a key sector in Bosnia and Herzegovina, may not survive without serious adaptation measures.

As experts like Professor Dresković, dean of the Faculty of Natural Sciences and Mathematics from the University of Sarajevo, emphasise, the old approaches are no longer sufficient for new challenges. The government faces an enormous responsibility to act—reacting from crisis to crisis is no longer an option [7].

The Donja Jablanica disaster should serve as a wake-up call to each and every one. Without serious scientific research, policy changes, and infrastructure improvements, Bosnia and Herzegovina risks facing even worse scenarios in the years to come.

The question here is: who is responsible when people die?

Picture: A village that disappeared over night [1]

Climate change may increase extreme weather, but it does not approve illegal projects, ignore regulations, or silence scientists. Those choices are made by people, by governments, corporations, and those who profit from destruction while leaving others to suffer the consequences.

Nature does what it wants. It will not wait for corrupt politicians to take responsibility or for industries to prioritise safety over profit. While we struggle to protect our planet, nature will continue to punish us all for our collective failures. And as always, the ones who suffer most will be those who did the least to cause the damage.
But this story doesn't have to end in disaster. If we listen to science, protect our ecosystems, and care for the land in new and innovative ways, we can reduce suffering for everyone.

The future of our countries and our planet depends not only on what nature does next, but also on what we choose to do now.

And what about your country? Is corruption eroding your landscapes too? Is profit still valued more than people and the planet?

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AQUA SPHERE

Aquasphere dives into the effects of water pollution, a topic of critical importance in environmental toxicology. While one article explores the essential role of iron in fuelling Antarctic phytoplankton and sustaining the biological pump at the heart of the global carbon cycle, the other confronts the rising risks of deep-sea mining and its potential to disrupt fragile ecosystems we barely understand. Together, these perspectives reveal how the deep ocean is both a cradle of life and a frontier under pressure, reminding us that even the most remote waters depend on delicate processes that can be altered in an instant. Safeguarding these systems requires not only scientific insight but also a commitment to protecting the unknown.

NOT TOXIC - BUT ESSENTIAL

FE FERTILISES OCEANS

BY MAI-BRIT SCHULTE

Let us embark on an imaginary expedition to Antarctica. Picture yourself aboard RV Ecotox, leaning onto the railing, feeling a bit queasy due to the rough sea. You can observe icebergs, some Southern Ocean islands, and the occasional penguin (and no polar bears - wrong hemisphere, remember!?).

What you do hardly, or not all see, however, are vast algae blooms. Amongst the things algae require to grow is iron (Fe). And this trace metal is so remarkably scarce in the Southern Ocean that this is the largest High Nutrient Low Chlorophyll (HNLC) in the world's oceans - nutrients like nitrate are sufficiently available, and yet, primary production is low. Fe is a scapegoat. Or its absence, really. To tell the truth, I must not omit that there are some phytoplankton blooms. So there evidently is bioavailable iron in some areas of the Southern Ocean.
But where does it originate from? This is not quite clear to either me or the scientific community.

There are hypotheses, of course: atmospheric dust, hydrothermal vents, icebergs, resuspension of sediments, groundwater intrusion, porewater, etc. And, high up on the list of suspects: subglacial run-off from Southern Ocean islands, like South Georgia. The iron in the marine water is likely a mixture from different sources. It is my quest to inquire about this. And there is indeed a tool to do that.
Hold on to your hats now as we enter a niche realm of geosciences: stable isotope geochemistry. Iron has four stable isotopes (stable, as in: no, you cannot fuel a nuclear power plant with them because there is no radioactive decay). They differ in the number of neutrons (there are 54, 56, 57 or 58) in the atomic nucleus, and this teeny-weeny difference causes a mass difference that makes them both react differently in nature and measurable by mass spectrometry! It is still baffling to me and exceeds my imaginative power. Anyway, the isotopic composition of the Fe in a sample can point towards its origin. This is methodically quite challenging, and I have already encountered many frustrations in the 6 months of my PhD. I will not go into detail now.

Although I wrote quite some lines, I want to tell you just three things: 1) Fe is part of the global carbon cycle, by its essentiality for functionality of the biological pump. Thus, it plays a role in and is affected by Climate Change. Another factor to consider in the whole tipping-point and feedback loop business! 2) Geochemistry is cool!
3) Even in unfortunate situations you will always learn a lot.

If you want me to elaborate on anything I wrote, feel free to reach out to me!
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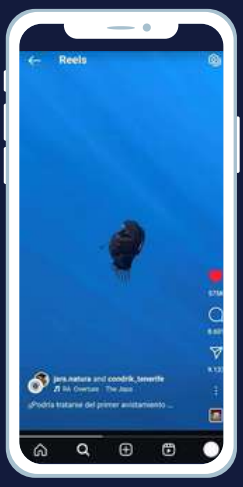
Deep-Sea Mining: A Threat to the Unknown

By Júlia Grinyó i Escuer

Do you remember that black deep-sea fish that went viral earlier this year? When the first videos surfaced on TikTok and Instagram, the Black Devil anglerfish, seen drifting in broad daylight off the coast of Tenerife, looked like a terrifying sea monster from the abyss. But as more details emerged, the truth was surprising: it wasn't a giant predator, but a delicate deep-sea fish, no bigger than a golf ball and completely harmless to humans.

This tiny anglerfish, a rare glimpse from the deep, is a reminder of how little we know about life in the ocean's depths. Yet, despite this mystery, human activity now threatens the fragile ecosystems of the deep sea. With deep-sea mining on the horizon, what consequences will this industrial activity have for creatures like the Black Devil and the other countless species that call the abyss home?



@jara.natura @condrik_tenerife

Black Devil anglerfish (*Melanocetus johnsonii*) off the coast of Tenerife, Canary Islands. Credit: Marc Martín Solà @vidamarina.tenerife

What's Deep-Sea Mining?

Deep-sea mining is the extraction of metals and minerals from the ocean floor, thousands of meters below the surface. Mining companies plan to collect metals such as nickel, cobalt, and rare earth elements from ancient seabed deposits that take millions of years to form. These deposits include the so-called polymetallic nodules, polymetallic sulfides and cobalt-rich crusts [1, 2, 3].

1. Polymetallic nodules are rock-like deposits scattered on the seabed like potato fields.
2. Polymetallic sulfides are found in chimney-like underwater hot springs (hydrothermal vents), formed where Earth's tectonic plates move apart in the deep ocean (mid-ocean ridges). Metals naturally accumulate there as hot fluids rise from within the ocean floor, carrying dissolved minerals that settle and form deposits.
3. Cobalt-rich crusts are firmly attached to rocky substrates on the slope of underwater mountains (seamounts).

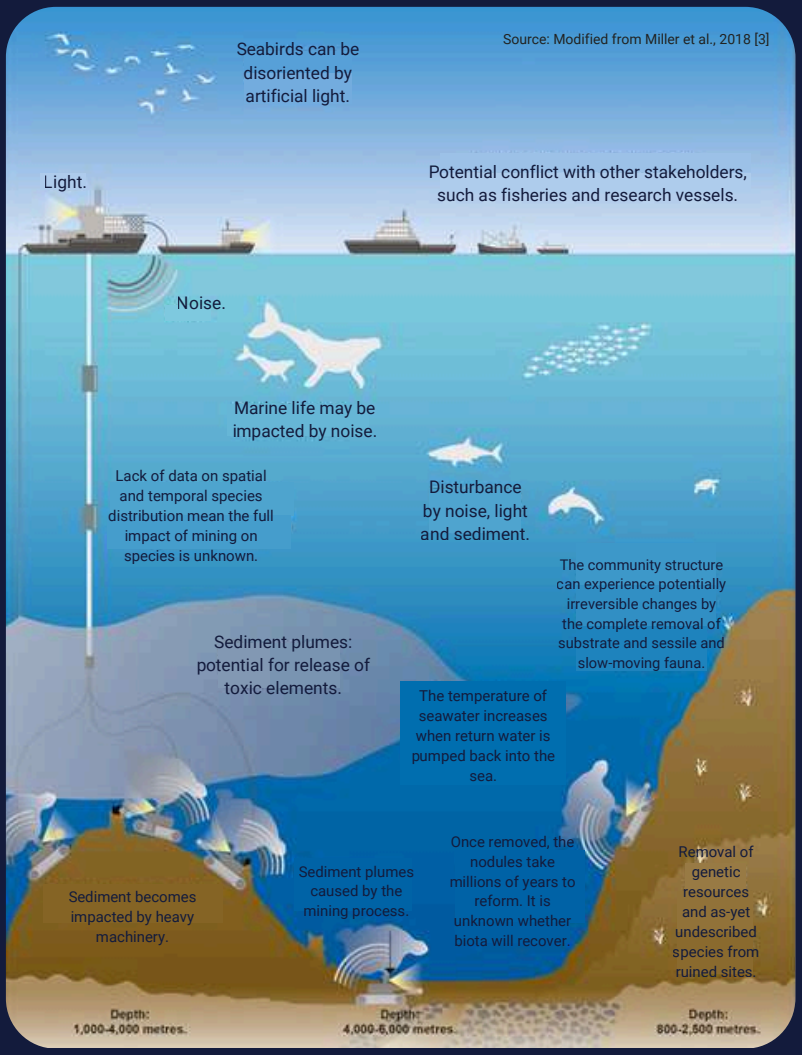
Supporters of mining the ocean (e.g. deep-sea mining companies like The Metals Company and certain governments with financial interests) argue that extracting these ancient seabed mineral deposits is essential to meeting the growing demand for metals used in technologies such as electric-vehicle batteries. These metals, they claim, are vital for the world´s transition to a low-carbon economy. Geopolitical dominance to secure stable supplies of metals like nickel, cobalt, and manganese further fuels interest in deep-sea mining. However, some energy and tech experts (e.g. [4]) suggest that advances in battery design, recycling, and consumer behavior could reduce the need for the targeted metals, challenging the main industry's justification [5]. At the same time, marine scientists and environmental groups like Greenpeace and Oceana warn that mining could cause irreversible harm to deep-sea ecosystems, which are some of the least explored ones on Earth [3, 6].

Environmental Impacts

While the potential environmental impacts of deep-sea mining have been identified, very few studies (e.g. [7, 8, 9]) have been able to assess its long-term effects, leaving many questions about the lasting consequences for deep-sea ecosystems unanswered.

Habitat destruction is one of the most visible impacts of deep-sea mining because removing natural structures like the nodules and hydrothermal vent chimneys leaves behind a more uniform and flattened seafloor. Considering these deposits take millions of years to form, the ecosystems depending on them may struggle to survive and to recover their full biodiversity and ecological functions within years or even decades after mining. For example, a study revisiting a 1989 disturbance and recolonization experiment in the Peru Basin found that seafloor tracks and reduced microbial activity persisted even after 26 years [9]. A broader meta-analysis of simulated deep-sea mining experiments, showed that many faunal groups had not returned to baseline conditions even after two decades [7].

Beyond direct habitat destruction, deep-sea mining is expected to generate sediment plumes when seafloor mining vehicles collect minerals and when surface vessels discharge the water used to clean the extracted resources. These plumes can spread fine particles and contaminants far beyond the mining site, disrupting filter-feeding organisms and reducing water clarity. Additionally, mining may introduce toxic substances into the water column by releasing bioavailable metals—chemical forms of metals that marine organisms can absorb—increasing the risk of heavy metals accumulating in food webs and commercially important fish [3, 6].

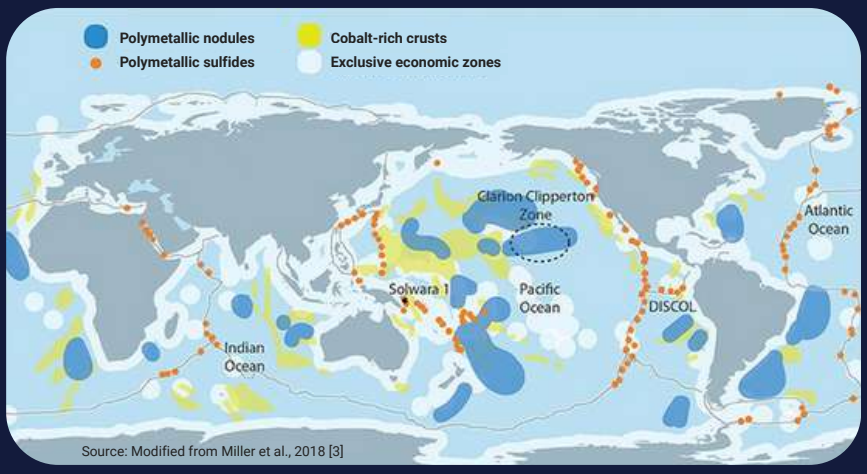


Moreover, mining operations will introduce continuous noise from vehicles and vessels, affecting species that rely on low ambient noise for communication and navigation. Artificial lighting from mining equipment and surface vessels could further disrupt deep-sea species adapted to complete darkness, altering their behaviors and life cycles [3, 6].

Although deep-sea mining advocates emphasize the potential economic and technological benefits of it, the combined effects of habitat destruction, sediment plumes, toxic metal release, continuous noise, and artificial light could have profound and lasting consequences on deep-sea ecosystems.

Because scientists still know little about where species live, how they interact, and how they respond to disturbance, the full extent of mining remains uncertain. This uncertainty highlights the need for stronger scientific understanding before large-scale mining begins in international waters.

Where are the mineral deposits located?



Source: Modified from Miller et al., 2018 [3]

The Clarion-Clipperton Zone: The World's Deep-Sea Mining Hotspot

Location: a vast area of the Pacific Ocean floor (6 million km²) between Hawaii and Mexico, with an average depth of 5000 m (see Map on the left).

Importance: home to billions of tonnes of polymetallic nodules rich in cobalt, nickel, manganese and copper.

Biodiversity: hosts unique deep-sea species, many of which may not be found anywhere else on Earth. In 2023, scientists cataloged 5,578 species in the CCZ, with about 92% estimated to be new to science [10].

Mining and scientific activity: exploration licenses have been issued to companies like The Metals Company, Global Sea Mineral Resources (GSR), and COMRA. Commercial mining has not yet started. Most deep-sea mining experiments and scientific studies have been conducted in this area

Regulation: located in international waters, it is overseen by the International Seabed Authority (ISA), which is still finalizing a mining code before any commercial mining can begin.

A Call for Caution

Most of the seabed mineral deposits are located in international waters and are thus regulated by the International Seabed Authority (ISA), a specific UN-affiliated body. So far, the ISA has only issued exploration contracts to test equipment, and commercial deep-sea mining has not started yet.

Commercial mining cannot begin until the ISA finalizes a mining code, which remains under debate regarding environmental and legal regulations. While some mining companies push to have the code approved by 2025 and begin mining in 2026, growing numbers of countries, corporations and scientists are advocating for a precautionary pause [5].

Just as the Black Devil anglerfish offered us a rare glimpse into the deep ocean, deep-sea mining threatens to disrupt these fragile ecosystems before we fully understand their complexity, leaving us to wonder what we might lose in the process.

This time in history, we can protect before we destroy. We can still make our voices heard and pause deep-sea mining until science proves it can be done without leaving the ocean scarred for generations.

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AERO SPHERE

The Aerosphere chapter explores how air pollution shapes both human health and the wider environment through a deeper understanding of what pollution truly is. This year's article challenges the traditional image of smoke-filled skies and highlights the hidden reality of invisible airborne contaminants – from fine particles and chemicals to microorganisms carried across continents. It examines how air pollution connects with other environmental pressures, how natural ecosystems regulate pollutants, and why both systemic action and individual choices are essential for cleaner, healthier air.

Perspectives and Reality on Air Pollution – Why It Matters as a Matter of All Pollution

Ronny Zegarra

When we talk about air pollution, we usually think of dark fumes rising from factory chimneys or old cars emitting exhaust gases. These are the images we have been taught to associate with contamination: ugly, visible, and smelly. But the reality is much more complex.

Air pollution is not always visible, and it is not just an inconvenience. With new monitoring approaches, we are realizing that invisible pollutants affect us in critical ways – interfering with our health, our climate, and even our learning abilities.

Pollution, in simple terms, is the unnatural amount of a substance in an environment. Most of the time, we pay attention to pollution only when it directly affects human health. Yet air pollution is deeply connected with all other types of pollution: what is in the soil or water can evaporate, be lifted by the wind, and travel nearby, or even to the other side of the planet. Air pollution is not only smoke; it is also particles of different sizes carrying chemicals, and even living organisms such as bacteria, viruses, and fungi moving through the atmosphere. These can shape weather patterns and have influenced life on Earth long before we arrived.

So, what to do? The answer lies not only in new technologies but also in the processes shaped by evolution and the physics of our planet. Nature already has its own regulation systems.

From plants to rocks, every surface can act as a barrier, trapping pollutants in tiny cracks and hosting communities of bacteria and fungi that transform them into food while creating spaces for diversity.

Other natural elements, from small rivers to vast oceans, work through processes like osmosis, absorbing and redistributing substances from one place to another.

The key is not to rely on foreign species or overly complex engineered devices, but to support local ecosystems. Diversity in environments requires diversity in solutions; one single strategy cannot work everywhere.

Of course, the largest responsibility, and the greatest demand for innovation, lies with big developers and companies that control what is released into the environment. We must demand that they manage their waste and stop polluting our planet.

Still, as individuals, we are not powerless: by choosing wisely and demanding solutions, we also take part in reducing pollution.

Air pollution is not just about what clouds our skies. It is a reminder that everything is interconnected. Opening our eyes to this bigger picture is the first step toward working together for cleaner and healthier environments.

TERRASPHERE

In Terrasphere, Tolulope examines the growing threat of agricultural soil contamination, exploring how pesticides, fertilisers, wastewater, and plastics introduce harmful pollutants into our food systems. She highlights the health risks linked to these contaminants and reviews ongoing global and community-based efforts to restore soils and promote safer, more sustainable farming practices.

TOXIC SOIL, TOXIC FOOD:
HOW POLLUTION AFFECTS YOUR PLATE

By Tolulope Okuselu

It is no longer news that humans continuously release harmful pollutants into the environment, either intentionally or unintentionally (Smith & Jones, 2020). Pollution of air, soil, and water has been found to cause serious harm to both human health and the ecosystem (WHO, 2021). While the effects of air and water pollution are often immediate and visible, agricultural soil pollution is less apparent (Brown et al., 2019).

Of serious concern is human exposure to contaminants through food. Even small amounts can accumulate over time, affecting health. The contaminant levels in crops directly reflect the pollution in the soil where they are grown. Before consuming your next meal, it is important to be aware of potential sources of contamination and their consequences for your health.

This article explores agricultural soil contamination, its health effects, and current actions taken to mitigate it.

Human systems introduce harmful chemicals that, even at very low levels, can exceed safe limits. These contaminants are the primary cause of soil pollution today (EPA, 2021). Pollutants include those directly applied to the soil, such as pesticides and fertilizers, but also those from deposition, flooding, and runoff (UNEP, 2022).

Pesticides–including insecticides, fungicides, herbicides, and plant growth regulators–boost crop yields but leave harmful residues (WHO, 2019; FAO, 2021; Gao et al., 2020).

Excessive nitrogen fertilisers acidify soils, contribute to eutrophication, and release hazardous aerosols (European Commission, 2020; Zhang et al., 2019; IPCC, 2021).

Organic fertilizers, such as manure and biosolids, carry nutrients but may also introduce PFASs, flame retardants, and other toxins (FAO, 2020; Schmidt et al., 2018).

About 310 million m^3 of wastewater is used for irrigation globally each year, much of it untreated, introducing pathogens and harmful chemicals into soils (UNESCO, 2021; WHO, 2020; Qadir et al., 2019; FAO, 2021).

Agricultural plastics that accumulate without proper disposal, along with poorly managed rural waste, release persistent organic pollutants (PCDDs and PCDFs) (European Environment Agency, 2020; PlasticsEurope, 2021; Li et al., 2020; de Souza Machado et al., 2018; UNEP, 2019; Stockholm Convention, 2020).

These pollutants degrade soil fertility, contaminate crops, and threaten food security (FAO & WHO, 2019; Lal, 2020; Xu et al., 2019).

In a 2018 Lancet review on pollution, Landrigan et al. estimated that soil pollution from toxic metals and hazardous chemicals contributes to about 500,000 premature deaths worldwide.
The review further revealed that active and abandoned mines, smelters, factories, and hazardous waste dumps are major sources of contamination, posing high risks to nearby populations–particularly children. It also highlighted that approximately 61 million people across 49 countries are exposed to contaminated soil sites, highlighting the widespread and often overlooked threat of soil pollution to human health.

Depending on the nature of contaminants, soil pollution can impact various organs, including the lungs, skin, gut, liver, and kidneys (Murray et al., 2019). It can also damage the immune, reproductive, nervous, and cardiovascular systems, increasing the risk of chronic illnesses and developmental disorders (Grandjean & Landrigan, 2021).

Everyone has a role to play in reducing soil pollution.

Beyond awareness, local action is essential. In parts of India and China, community-led projects have used phytoremediation, planting species such as Vetiver grass and sunflowers, to reduce heavy metal contamination and restore safe food production. Such science-based initiatives show that communities can take tangible steps to protect their food systems.

One global effort promoting this cause is World Soil Day, observed every December 5, to raise awareness and encourage sustainable soil management.

As consumers, we can also contribute by supporting sustainable farmers, minimising waste, and advocating for responsible soil practices. Small, collective actions can help ensure healthier soils, safer food, and a more resilient planet.

2025: A Year in Review for ECT+

☀️ MAY 2025 – WELCOMING NEW LEADERSHIP

This May, Lizlit Cabag officially took over as Programme Representative (PR) of the ECT+ Programme, succeeding the previous PR. She represented ECT+ at the EMA General Assembly, where she had the honour to:

- Join the official launch of the Erasmus Mundus Magazine
- Participate in brainstorming sessions with other programme representatives
- Present ECT+ to the global Erasmus Mundus community

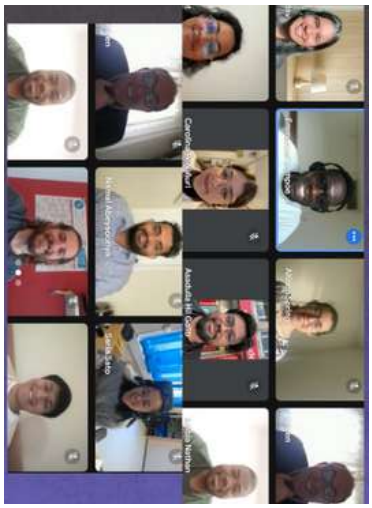
📰 ERASMUS MUNDUS MAGAZINE LAUNCH

Thanks to editor Adaleta Omerbasic and designer Lizlit Cabag, the ECT+ Programme was proudly featured in the inaugural edition of the Erasmus Mundus Magazine.
The cover celebrated the 2nd cohort's graduation 🎓.
The magazine includes insights from the EU Commission, programme founders, and "Mamma Erasmus," plus reflections on Desiderius Erasmus himself.

💼 SECOND ECT+ ALUMNI CAREER EVENT

The Students and Alumni Board (SAB) successfully organised the second edition of the ECT+ Alumni Career Event.
Over three sessions, current students engaged with alumni on:

- Session 1: EFSA careers, university teaching, PhDs in Ireland, and fecal DNA metabarcoding
- Session 2: Exposomics, biomarkers, and industrial PhDs (seaweed & packaging materials)
- Session 3: PhDs in France, yeast-based aviation fuels, and the CAREFree project



📚 MASTER'S THESIS SUPPORT FOR THE 4TH COHORT

In late June and early July, SAB hosted thesis preparation sessions for the 4th cohort. Students had the chance to: present their research projects, receive feedback from alumni, prepare confidently for their thesis defence. This initiative was a great success and strengthened collaboration between students and alumni.

🏆 ALUMNI ACHIEVEMENT SPOTLIGHT

One of our alumni, Namal, won the Best PhD Presentation Award in Environmental Science at the Research and Creative Inquiry Day 2025 (Tennessee Technological University, USA). The award-winning presentation: "Adsorptive Interactions of Organic Pollutants with Microplastics: Implications for Vector Transport in Aquatic Environments."

👨‍🎓 WELCOMING THE ECT+ ONE HEALTH COHORT

On July 5th, SAB held a Pre-Departure Orientation Event for the new ECT+ One Health cohort. This is our 6th Cohort!!!

- New Programme Manager Tamer Hafez joined this event and presented the programme structure to incoming students.
- This marks an exciting new chapter for the programme.

Welcome again to our new cohort!

🎓 CONGRATULATIONS TO THE 4TH COHORT GRADUATES – CLASS OF 2025

July also brought celebrations for the 4th cohort graduation! 🎉
Students from 18 nationalities defended their theses on cutting-edge topics, including:

- Environmental health of aquatic and terrestrial ecosystems
- Human environmental health
- Pollutant detection technologies and methodologies

The evaluation panels included 40+ professors, researchers, and professionals. Representatives from all six partner universities and associated partners attended. The closing lecture was given by Prof. Stefania Gorbi (Università Politecnica delle Marche), focusing on microplastics and their ecotoxicological effects.

🤝 SEPTEMBER 2025 – SAB ANNUAL HUDDLE

To wrap up the year, SAB held its Annual Huddle to: Analyse past events, plan Erasmus Days and future activities, prepare the next edition of the Toxicosphere Newsletter, discuss everyday challenges in volunteering. With this, we proudly close the year on a high note – ready for even more collaboration, research, and impact in 2026!

BRIDGING CONTINENTS THROUGH SCIENCE: AN ECT+ ALUMNI COLLABORATION IN THE PHILIPPINES

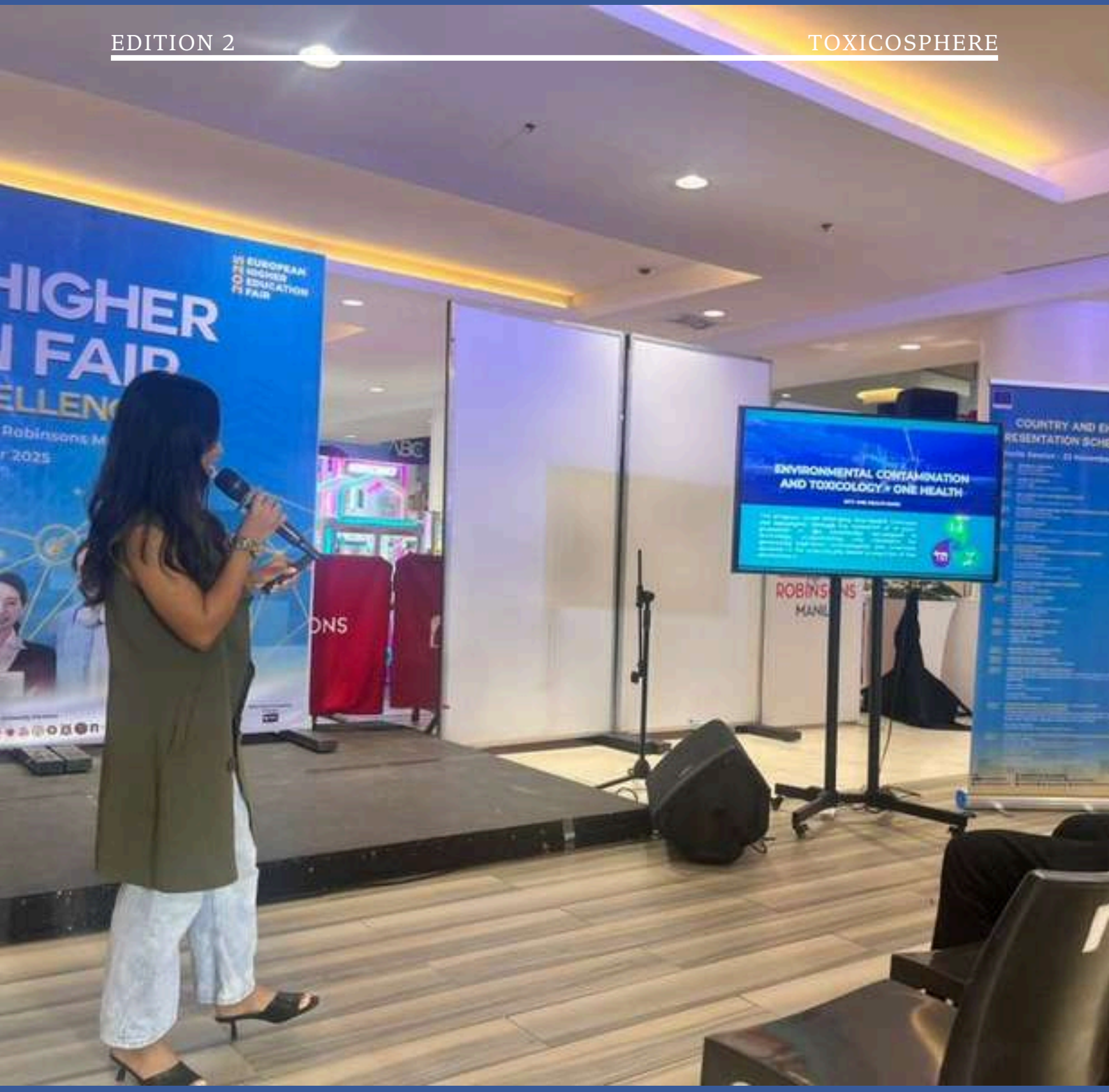
BY LIZLIT C. CABAG, ECT+ PROGRAMME REPRESENTATIVE

The summer of 2025 was unlike any other for two ECT+ alumni. After completing their master's program two years earlier, Olatz Ortega Vidales from the Basque Country reunited with Lizlit Cabag in the Philippines. What began as Olatz's first vacation in Asia quickly evolved into an opportunity to build a meaningful academic collaboration with Lizlit's home institution, Caraga State University (CSU).

Liz, now a faculty member at CSU, was working on a university-funded project when the idea of a joint research venture emerged. Together, the team proposed a research collaboration with the Faculty of Science at the University of the Basque Country (UPV/EHU). The project, titled Trace Metal Contamination in the Fishery Resources of Butuan Bay, aims to investigate the presence of heavy metals in commonly consumed seafood in the region.

UPV/EHU will support the initiative by conducting advanced tissue sample analyses, strengthening the scientific depth of the study.
During her visit in July, Olatz joined one of the field sampling campaigns and later participated in a courtesy call with CSU President, Dr. Rolyn Daguil.

The collaboration also brought together both research teams in virtual meetings, where they discussed technical details of sample preparation and laboratory requirements. Belen González, who leads the UPV/EHU team, plays a key role in steering the partnership from Spain.
This initiative stands as a testament to the friendships and professional networks forged through the ECT+ program—connections that extend far beyond the master's journey and continue to inspire cross-border collaboration in science and research.



ECT+ One Health Ambassadors

Lizlit, representing the ECT+ programme, proudly fulfilled her ambassadorial role at EHEF Philippines 2025, the European Higher Education Fair. Joining the event onsite and online, she introduced ECT+ One Health to Filipino students and researchers, highlighting opportunities for study, mobility, and scientific collaboration in Europe.

EHEF 2025 gathered 99 exhibitors from 15 EU Member States and featured sessions on Copernicus, EURAXESS, and Erasmus+ Capacity Building for Higher Education (CBHE), strengthening EU–Philippine academic ties.

Recap: Detecting Image Anomalies in Environmental Science with Dr. Mu Yang

Scientific sleuth

This October, our community had the privilege of hosting Dr. Mu Yang, an internationally recognized scientific sleuth whose work has led to the retraction of over 260 scientific papers. Joining us online, Dr. Yang delivered an insightful and eye-opening session that went far beyond image forensics. During her presentation, she demonstrated how to identify falsified or manipulated images, walked us through common red flags in published research, and explained the pressures and patterns behind scientific misconduct. She also introduced the key digital tools and techniques she uses to uncover inconsistencies, empowering young scientists to critically evaluate research before citing or building upon it.

Participants gained skills, sharper awareness, and a deeper understanding of how integrity shapes the future of environmental science and toxicology. A big thank-you to Dr. Yang for an exceptional session that strengthened our community's commitment to responsible and transparent science.

"The 'control of nature' is a phrase conceived in arrogance, born of the Neanderthal age of biology and philosophy"

- Rachel Carson

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Toxicosphere Newsletter