





ANNUAL REPORT

2022



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Foreword



2022 was the year when we finally turned the page on COVID and all the obstacles that went with it, as the global economy regained its buoyancy. Two major meetings of UN world leaders were held: the COP 15 on biodiversity in Montreal (Canada) and the COP 27 on climate change in Sharm el-Sheikh (Egypt). The Institute was present at both conferences, most notably at the biodiversity conference, where it also represented the Belgian Federal Government.

But for us, 2022 shall mostly be remembered as the year when a “friendly” power used brutal military force to invade a European neighbour. The first direct and distinctly human consequence of this invasion was a stream of millions of Ukrainian refugees, a significant share of whom came to Belgium. A second blow was economic in nature and immediately nipped recovery in the bud. The economic landscape was transformed by a new energy crisis, with gas and oil prices going through the roof, and galloping inflation of a kind not seen since the 1970s. Like all Belgian and European companies and organisations, the RBINS was hit financially and economically by the fallout from this first European war since World War Two.

Yet despite these uncertain and sobering circumstances, 2022 was not a bad year for the RBINS. Quite the opposite in fact. After the COVID crisis subsided, the public returned to our Museum in large numbers, resulting in the third highest annual visitor numbers this century. The associated educational and events-related activities showed the same trend. Our two temporary exhibitions, T. rex and Luminopolis, certainly played a large part in this success. Our scientific collections were visited more frequently, although to a considerable extent these were virtual visits, as largely developed at the time of the COVID travel restrictions. This virtual access to our collections, including to our newly designed 3D scans, will certainly remain available for our collection visitors and is destined to make a major

contribution to the further development of the DiSSCo research infrastructure, the virtual pan-European natural history collection. Belgium and the RBINS in particular are playing an important role as pioneers in this field. The COVID effect is also gradually fading in our scientific research. However, although the total number of scientific publications is up on previous years, the number of presentations at scientific conferences and symposia is below the pre-COVID years. The landscape of scientific meetings, whether virtual or physical, seems to be in search of a new balance.

The end of 2022 saw my departure from this organisation, one which I have headed with pride and conviction during these past years. I have every confidence that a wonderful future awaits this unique institute, and that it shall continue to have a positive impact on society thanks to relevant and policy-supporting research, collection management at local, European and global level, as well as exciting museum activities.

Patricia Supply

Newly appointed as head of the RBINS on 15 March 2023, it was only logical for me to leave it to my predecessor Patricia Supply to preface this 2022 annual report.

I should like to express my gratitude to Thierry Backeljau, who took the helm for an interim period from January to March, and to Patricia Supply for having headed the organisation during these past years, doing a magnificent job, especially when faced with the challenge of COVID-19.

My thanks also to all my new colleagues for their very warm welcome. I have no doubt that together we will continue to build on the legacy left by my predecessors.

Michel Van Camp

2022 at a glance



23.02

A study published in *Nature* in which some of our scientists took part shows that the meteor responsible for the disappearance of the dinosaurs crashed on the Earth in spring.

18.03

After the success of Halloween Night, the first Dino Night is sold out too. Twenty-seven children investigate and take part in a big role-playing game before falling asleep at the feet of our iguanodonts.



27.03

Vincent Van Quickenborne, Minister for the North Sea, and Thomas Dermine, Secretary of State for Science Policy, visit the research vessel *Belgica* in Zeebrugge.



07.04

"Falcons for All" spread their wings in Brussels Cathedral, but also in Uccle, the ULB and Woluwe St-Pierre. Many internet users will once again follow the hatching and flight of the falcons in real time and in HD.



12.04

Playing an important role in climate regulation, the Southern Ocean is at the heart of an international [Action Plan](#) launched by more than 400 scientists, policy makers and others, including researchers from the Institute.



21.04

During a short sea voyage, His Majesty King Philippe talks to the crew and shows a real interest in the scientific research on board the *Belgica*. The ship then sets sail for the Mediterranean.



19.05

This new edition of the Brussels Museums Nocturnes takes visitors behind the scenes in the laboratories and conservatories to meet the scientists and focuses on research at the poles.



20.05

The symposium "Towards a revised Neogene stratigraphy of Belgium" organised at our Institute concludes the work of numerous research teams for a complete revision of the stratigraphic interval between 23 and 2.6 million years ago.

09.06

The book "Petite et grande histoire du Service géologique de Belgique" is presented at the event organised to celebrate the 125th anniversary of this service that is part of our Institute.



19.06

The Institute brings participants of the European Archaeology Days behind the scenes and explains its archaeozoological, archaeobotanical and anthropological research, based on archaeological material excavated in the Brussels-Capital Region.

23.06

What links the impact of the asteroid that led to the dinosaurs' extinction and a European Space Agency spacecraft heading to a binary asteroid system in 2024? All is explained at a public event at the Institute.



24.06

Belgian artist Rocio Alvarez's fresco in homage to biodiversity is inaugurated on our walls for the 50th anniversary of Greenpeace. It represents 4 ecosystems: the ocean, the jungle, the mountain and the continental forest.



25.06

Princess Elisabeth, godmother of the research vessel, christens the *Belgica*, docked in the port of Ghent. The ceremony takes place during an inaugural weekend that invited the general public to discover the ship.



07.07

The assessment report on the sustainable use of wildlife species is adopted by 139 member states of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).



13.07

Twenty-two new plant and animal species are added to the list of invasive alien species of concern for the EU. The National Scientific Secretariat on Invasive Species is based at our Institute.



15.07

A one-week summer course at the Museum, to discover a different scientific field every day: this is the formula that has fascinated French and Dutch-speaking 10-12 year-olds for the past two years, who are curious about discoveries.



22.07

The open-air photo exhibition "Into the Garden – The hidden life of the Massart Garden", to which the Institute contributed, shows the links between varied flora, habitat diversity, good management practices and urban biodiversity.



23.07

Oysters from the Gilson collection on display at the Belgian Royal Palace for *Sciences et Culture au Palais*. The theme "Preserving the future" links the unique knowledge provided by the collection with initiatives to restore marine ecosystems.



22.08

The *T.rex* exhibition closes its doors: more than 123,000 visitors in the exhibition hall, 59,000 on our website page, and 65,500 people reached on social networks. The *T.rex* is still as fascinating as ever!



19.09

The Institute brings together experts from 13 countries from 5 continents at the tri-annual international symposium on aquatic oligochaetes to discuss the latest research results on their taxonomy, phylogeny, evolution and ecology.

19.09

The Biodiversity Focal Point participates in the discussions on the One Health approach and the absolute necessity to include prevention at source in the new WHO instrument to strengthen prevention, preparedness and response to pandemics.



22.10

In the Museum's galleries, more than 3,000 visitors responded to the call of the Karys Dance Center and vibrated to the rhythm of the Jurassic Jazz of the students of the Royal Conservatory of Brussels during this 15th edition of Museum Night Fever.

29.10

As the skeletons wake up and the shadows of the animals creep up behind them, 50 little visitors discover the secret corridors of the Museum and shiver before falling asleep at the foot of the dinos: Halloween Night is sold out.

26.11

The Biology Masterday brings together all the Belgian universities, as it has done every year for the past 12 years, to present their masters in biology to future students.



28.11

Morris the Camarasaurus, a young Jurassic sauropod found in Wyoming (USA), arrives in our laboratories. The fossil bones, which are about 155 million years old, will be prepared by our team.



15.12

The Belgian pilot of the UNITED project, in which the Institute is participating, won the Blue Innovation Swell Award. The aim is to optimise the combination of offshore wind, aquaculture and the recovery of flat oysters and cultured algae.



22.12

The Institute publishes in [free access](#) the first volume of the monograph devoted to the malacological work of Joseph Charles Hippolyte Crosse, which is a biography, a complete bibliography and a catalogue of the 850 molluscs he described.

31.12

After 25 years of collaboration with Brussels Environment, numerous travelling exhibitions (Water!eau, Classific'Action or BrusZenne) and nearly 85,000 visitors, a page is being turned for our Nature Education Centre. A new page will soon be written.



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Sounding the alarm on biodiversity and climate

When it comes to the global climate and biodiversity emergency, our Institute takes an active role. From policy to research, this issue is at the heart of our mission.



Our role in the COP 15: the most ambitious biodiversity plan ever

If we are going to stop biodiversity loss and restore natural ecosystems, we need to work together and act now. And this year marked a crucial success at the United Nations Biodiversity Conference (COP 15), where the Kunming-Montreal Global Biodiversity Framework was adopted, including four goals and 23 targets for achievement by 2030. This ambitious framework means the nations of the world have agreed to protect 30% of Earth's land and sea and restore 30% of degraded ecosystems, reduce annual harmful government subsidies by \$500 billion and cut food waste in half. Our Institute is proud to have played a particularly key role in the negotiations. We host the National Focal Point to the Convention on Biological Diversity which coordinated Belgium's contribution to the COP 15. Several of our teams were part of the Belgian delegation in Montreal, working closely with

European partners to develop a common position. And it is our Institute's unique status that makes us particularly well-placed for this job: as hosts of BIOPOLS, the Belgian Biodiversity Policy Support Group, our team is constantly working on the science-policy interface.

The challenge of tackling biodiversity loss and climate change are closely linked, and both require urgent action from governments. To bridge the gap between the COP 15 on biodiversity and the subsequent COP 27 on climate change, our Institute hosted a reception where key policymakers came together to discuss a joined-up approach. It was co-organised by our Belgian Biodiversity Platform alongside two global organisations: The Nature Conservancy and the Wildlife Conservation Society, and eminent speakers included the European Commission's Director General for Environment.

Assessing the risks of sea level rise on the Belgian coast

For a "plattys" like Belgium, global heating poses a direct threat. As the ice caps continue to melt, we see the North Sea slowly rising over the years. Sea level rise is studied at our Institute by our Suspended Matter and Seabed Monitoring and Modelling team, who use mathematical models to predict how sediment is transported around the seabed. This year they worked directly to support government policy, forecasting the risks for our region.

The report, Sea Level Rise for Flanders, was commissioned by the Flemish government's Flanders Hydraulics institute. It drew on research from a range of sources and applied it to our measurements of the North Sea to make forecasts. These predictions included figures for sea level rise, wind over the North Sea, waves and storm events. The report showed that the rise in the level of the North Sea by 2100 is likely to remain within 20% of the global average. That global average could be 38 cm if our governments meet the 1.5°C target of the Paris agreement. But it could be a 77 cm rise if we double CO2 emissions by 2050.



A whelk's-eye-view on climate change

One of the Institute's great strengths in our climate research is our vast collection that tells the story of how our climate has changed over time. Thanks to studies published this year in partnership with the University of Cambridge, we found one small marine mollusc has a particularly interesting tale to tell. The dogwhelk (*Nucella lapillus*) is a sea snail that can be found on the rocky shoreline of the North Sea where it feeds on mussels and barnacles. And our collection is home to specimens from over 130 years. As carbon emissions increased and our oceans became more acid, you might imagine the dogwhelk's shells could become thinner over the years – in acidic conditions, it is harder for the calcium carbonate shells to form. But looking at the dogwhelks, the opposite is true. Our study shows that as sea water temperature increased due to global heating, dogwhelks produced thicker shells. The explanation? As the North Sea grew warmer, phytoplankton thrived. This eutrophication may actually have resulted in more filter feeders like mussels, meaning dogwhelks had a better food supply and more energy to invest in forming thicker shells. The study was published in *Communications Earth & Environment*.



Powering our future: the resources of tomorrow

2022 was a year when Europe's supply of energy and resources faced unprecedented challenges. Research at our Institute is constantly working towards solutions, helping to develop renewable energies and rethinking the way we manage raw materials.



Exploring Wallonia's potential geothermal hotspots

Geothermal energy has huge potential for Belgium: by digging wells, we can capture heat from beneath the earth's surface and use it for heating or electricity in a renewable way. By 2050 it could represent over 10% of our country's renewable energy supply. But first we need to understand the geology of the layers of rock under our feet: how thick are they, and how permeable? Where are the reservoirs of water at a high enough temperature?

Our Institute leads [GEOCOND2022](#), a project funded by the European Commission, the Walloon government and our Institute in the framework of the North-Western European Interreg DGE-Rollout. In December 2022, the team conducted a huge prospecting campaign across two areas in Wallonia, from Spy to Onhaye and from near Andenne to Marche-en-Famenne. Every 20 m, three trucks stopped and sent strong vibrations into the earth. By studying these vibrations as they are reflected back, we can understand the geological structure of the subsoil as deep as 6,000 m below the surface. The results will help paint a picture of Wallonia's potential to supply geothermal energy in the future.

Further insights into Belgium's offshore wind farms

Offshore wind farms are an important part of Belgium's energy supply since their construction started 15 years ago. WinMon.BE, a partnership coordinated by our Institute, continues to study the environmental effects of these wind farms, gathering knowledge to help ensure future wind farms are designed in an environmentally friendly way. Recent findings in the [2022 annual report](#) show the great diversity and complexity of the fauna communities that accumulate on the artificial hard substrates and can cause degradation. It was also found that the impact on seabirds can be reduced by avoiding developments in certain designated areas, and by adapting the size of future turbines, resulting in a lower number of collisions. Data about the presence of harbour porpoises show that efforts to reduce the impact of underwater noise generated by wind farm construction should aim to limit not only the generated noise levels but also the overall duration of the construction period.

Of course, these wind turbines do not last forever. When they are eventually decommissioned, what can the impact be on biodiversity and offshore human activities? In 2022 our Institute [launched a cooperation](#) with the Federal Public Service Health, Food Chain Safety and Environment to develop an integrated vision for the end of the wind farms in the Belgian part of the North Sea, ensuring all stakeholder voices are heard and that marine biodiversity is protected.



Sourcing metals across Europe and the world

Want to build wind turbines? You need large quantities of iron and copper. Rechargeable batteries? Lithium and cobalt. Metallic resources are absolutely crucial for the transition to green energy and the demand is only increasing. To understand where these metals can come from, we need to have a clear picture of the geological processes behind them.

Two new books published in 2022 help shed light on those processes. *Ressources Métalliques 1 & 2* were edited by our Institute for publishers ISTE-Wiley. They bring together a selection of articles that look at the presence of key strategic metals across the world and how they can be studied. The first volume examines Europe's potential, with a focus on the rare earth elements, for example. The second looks further afield to the Americas and Africa, including, for instance, a look at the deposits of lithium and a study of the Leo-Man Shield in West Africa where gold is found. The books present the findings in their geopolitical and economic contexts, which is important to help ensure these resources are managed equitably.

How can we make sand extraction more sustainable?

Our society is built on sand: quite literally. As a resource, sand is vital for building materials like concrete as well as glass and electronics. It has become the world's second most extracted natural material after water. But the environmental and social impacts are forcing us to rethink how we manage sand. Impacts of extraction can include erosion, loss of storm protection and shifts in biodiversity. Our Institute contributed to [a new UN report](#) that makes expert recommendations on how to switch to better practices for the extraction and management of sand.

So what can be done? Our Institute drafted one recommendation in particular: sand resources must be mapped, monitored, and reported for transparent, science-based and data-driven decision-making. To understand the consequences of extraction, we need good data for modelling scenarios. In the long term, the report hopes to encourage policy makers to adopt relevant policies and standards and promote best practices in line with local needs. And to keep the conversation going, our Institute now hosts a [community platform on marine sands](#).

Back for a dig in the Cowboy State

“Morris” is the nickname of one of three dinosaur fossils from the late Jurassic that was discovered by our palaeontologists in a particularly impressive 2022 dig in Wyoming, US. Meanwhile on the other side of the state, another team of researchers from our Institute made even more paleontological discoveries from a more recent era.



A Jurassic teenager found in Wyoming

The atmosphere of the dig is captured perfectly on [YouTube](#): our Institute’s team are sprawled across a rocky outcrop, chiselling away in the heat. The camera pans to reveal two long femurs stretching out in front of them. These legs belong to a young *Camarasaurus*: a herbivore that measured 10 to 12 metres in total and walked these plains in the late Jurassic, between 150 and 155 million years ago.

This was our Institute’s third trip to the world-famous Morrison Formation, a hotspot for Jurassic dinosaurs. Many other specimens were unearthed there, including *Allosaurus* “Arkhane”, on display in our Gallery of Evolution, and *Diplodocus* “Dan”, now in preparation in our paleontology lab. And this year, the *Camarasaurus* “Morris” was not the only discovery. Our team also dug up a *Dryosaurus*, an early ancestor of our Institute’s Bernissart Iguanodons. A brachiosaur was localised too:

one of the biggest land animals ever at over 20 metres long. What is remarkable about the discoveries is how complete the skeletons are, and the quality of the fossils. They tell the story of the anatomy, evolution and diversity of these species in an ecosystem of 155 million years ago, a time when dinosaurs flourished.

And our onsite communications team took the opportunity to tell this story live, as the dig was underway. Six informative video reports or “vlogs” went out across social media, with over 15,000 views, while two short videos made for TikTok and Instagram were seen over 16,000 times. The story was all over the media, including RTBF, Radio 1, *EOS magazine* and *Science Connection*, reaching hundreds of thousands of people across the country.

Now back in Brussels, the long process begins to prepare, scan and study the fossils.

Resuming the search for the first modern mammals

North of the Morrison Formation, where Wyoming meets Montana, lies the Bighorn Basin: another fossil hotspot, where our Institute worked closely with the University of Michigan to study the first modern mammals on the American continent. After a 14-year hiatus, our Institute came back to explore a new site nearby: the Clarks Fork Basin.

Fish scales were the clue that gave away the presence of a geological layer containing fossilised bones. There, our team shovelled up bags of sediment and laid them out in the Wyoming sun. After washing off the clay, the rocky sediment went through a series of sieves to pick out the fossils: a process known as screenwashing.

And the results were plenty: hundreds of bone specimens from very small mammals, including primates, carnivores, and a partial skeleton of an extinct species. These bones date from the beginning of the thermal maximum at the Paleocene-Eocene boundary, around 56 million years ago: a major climatic event, not dissimilar to the global heating we see on Earth today. By studying these fossils, we can better understand how the first modern mammals evolved on our planet.



125 years of our Geological Survey of Belgium

On December 16th 1896, the Geological Survey of Belgium (GSB) was created. And while our celebrations came a little later in 2022, we made sure to mark the occasion.



125 years ago, geology was seen very differently in Belgium. The reason for the creation of a geological survey was very clear: Belgian industry was booming and our geological riches were there for the taking. Today, our geologists' mission has shifted drastically. They work tirelessly to provide us with the knowledge to manage natural resources in a sustainable way, slow down climate change and be more resilient in the face of natural disasters, helping us build a greener, safer society.

And a 125th birthday has to be celebrated. This took the shape of an international colloquium in June 2022. 130 participants joined us from all over the world, including representatives of Belspo, European Geological Surveys, universities, companies and regional governments. It was a chance to launch a 300-page book which tells the story of how the GSB became the definitive

knowledge centre for Belgian geoscience. We also took a moment to commemorate the incredible work of our team: the Van den Broeck Medal was awarded to former head of the GSB Dr. Michiel Duser for his lifetime contribution to the geology of Belgium.

The GSB worked closely with our educational service this year to ensure our Museum visitors didn't miss out on the anniversary. We ran a special series of our monthly "Saviez-vous?" workshops where visitors are explained about geological research and put their questions to one of the GSB's geologists. They proved to be particularly popular: participants were able to explore not only our Minerals Hall but also our vast geological collection behind the scenes, from Belgian marbles to meteorites.

The new RV Belgica takes to the waters

2022 was the year our brand new research vessel set off on its first campaigns. Bigger and better equipped than its predecessor, RV Belgica is now fully operational.



"I baptise you Belgica!"

It was none other than HRH Princess Elisabeth who smashed a bottle of champagne against the hull of our research vessel for its official inauguration in June 2022. And Belgica's royal godmother was in good company: Belgium's Deputy Prime Minister and Minister of the North Sea and the State Secretary for Science Policy were both present alongside numerous other political and military officials at the North Sea Port in Ghent. The federal government's departments of Science Policy, Defence and the North Sea not only worked closely together to realise the new RV Belgica, but are also major users and clients of the ship.

The new Belgica faces new challenges, including monitoring the effects of sand extraction, wind farms and the Paardenmarkt munitions dump. But it is well equipped to tackle them, with four times more laboratory space than its predecessor. It means that our Institute, as managers of Belgica's calendar, budget and scientific instrumentation, can continue to take a leading role in marine research and policy support, in the North Sea and across the world.

Belgica at work to secure the North Sea's status

To protect Europe's seas and oceans, we have to monitor and measure their status. But what does "good environmental status" mean for a massively complex ecosystem like the North Sea? In July 2022, a group of 20 scientists from Belgium, Italy, Malta, France and Norway set out on our brand new RV Belgica for a week-long observation campaign to explore just that, as part of a European initiative JPI Oceans, endorsed by the UN Ocean Decade.

The campaign was part of an action called Science for Good Environmental Status that brings together 11 countries to find new ways of measuring the environmental status of marine waters so that European policy can be enforced. It meant a week of sampling and measurements, from tracking the plankton community to following tidal cycles. And the atmosphere was captured by a resident artist on board whose sketches brilliantly portrayed the hard work of the research team. The scientific results will be analysed and compared with similar campaigns in marine regions across Europe.

Stopping the spread of zoonoses and parasites

To see how devastating a zoonotic disease can be, we don't have to look too far in the past. The COVID-19 pandemic put a spotlight on how diseases can be transmitted from animals to humans: a key topic in our Institute's research.



What we can learn from the site of the outbreak

A live pangolin blinks at the camera. We are deep in the vast tropical forests of DR Congo (DRC): Inkanamongo, a village at the heart of the 2014 Ebola outbreak. Our Institute's team tells a compelling story of their fieldwork in a short documentary they produced this year. We see how wild meat, including pangolins, bats and chimpanzees, provides an important source of protein for the villagers there. But they can carry viruses that can be passed on to humans. To prevent outbreaks of disease, we have to understand which species carry these pathogens and how they are affected by changes in the ecosystem. And it is in the identification of host species that our Institute contributes particular expertise.

In 2022 our researchers went back to DRC as part of [BIODIV-AFREID](#), a project funded by the EU-Biodiversa programs whose partners include the University of Kisangani, DRC. In the Bas-Uélé Province, the team collected approximately 4,000 samples of mammal wildlife including mainly rodents and bats, but also primates and antelopes to conduct studies on a range of viruses they may carry, with a focus on Ebola, coronavirus and mpox. By analysing the results, our work supports the teams working to prevent future outbreaks.

Our role in the fight against the illegal trade of wild meat

To find wild meat carrying viruses of zoonotic concern, we don't necessarily have to travel so far. In Belgium, wild meat is imported illegally for sale in shops and restaurants. And this meat can carry viruses too. This year our Institute launched INTERCEPT, a policy support project to help Belgian federal government agencies to combat the illegal import of exotic animals and wild meat. Samples from our collection, our BopCo DNA barcoding facility and our expertise in identifying vertebrates will now play an even greater role in supporting policy. The work is funded by Belspo through the programme BRAIN-be 2.0.

Our research also supports policy work at international level. In 2022 members of our Institute were chief investigators on a report for the WWF, providing the scientific basis for their work to end the illegal wild meat trade in Europe. Our report demonstrated how wild meat could cause outbreaks of zoonotic disease: one example from our collection was a sample of meat from a De Brazza's monkey (*Cercopithecus neglectus*) bought at a restaurant in Brussels. It was found to be carrying a strain of Arterivirus. Arteriviruses have spilled over across species to macaques, raising concern they could have potential to spread to humans. The WWF report makes key recommendations on how European policymakers can work to end the import of wild meat.

Little assassins with more parasites than expected

If you own an aquarium, you might be familiar with a small yellow and black assassin that keeps freshwater snails under control. A voracious predator, assassin snails of the genus *Anentome* are native to southeast Asia. But these snails can also host parasitic flatworms, including *Echistonomma* that can spread to humans and make us seriously ill. To further survey parasitic flatworms in assassin snails, our BopCo DNA barcoding facility worked with Chiang Mai University, Thailand.

The team investigated the occurrence of trematode parasites in two species of wild assassin snail in Thailand. By combining microscopic and DNA studies the study demonstrated for the first time that one of the species, *A. wykoffi*, can host echinostome parasites, flatworms that can cause diarrhoea and malnutrition in humans. It also showed that the other, *A. helena*, can host two more species of trematode than was previously thought. This information is valuable to monitor the spread of parasites to humans and other animals, since these snails are collected in Thailand and exported for aquariums through global trade. The results were published in the *Journal of Helminthology*.

Keeping an eye on Belgium's mosquitoes

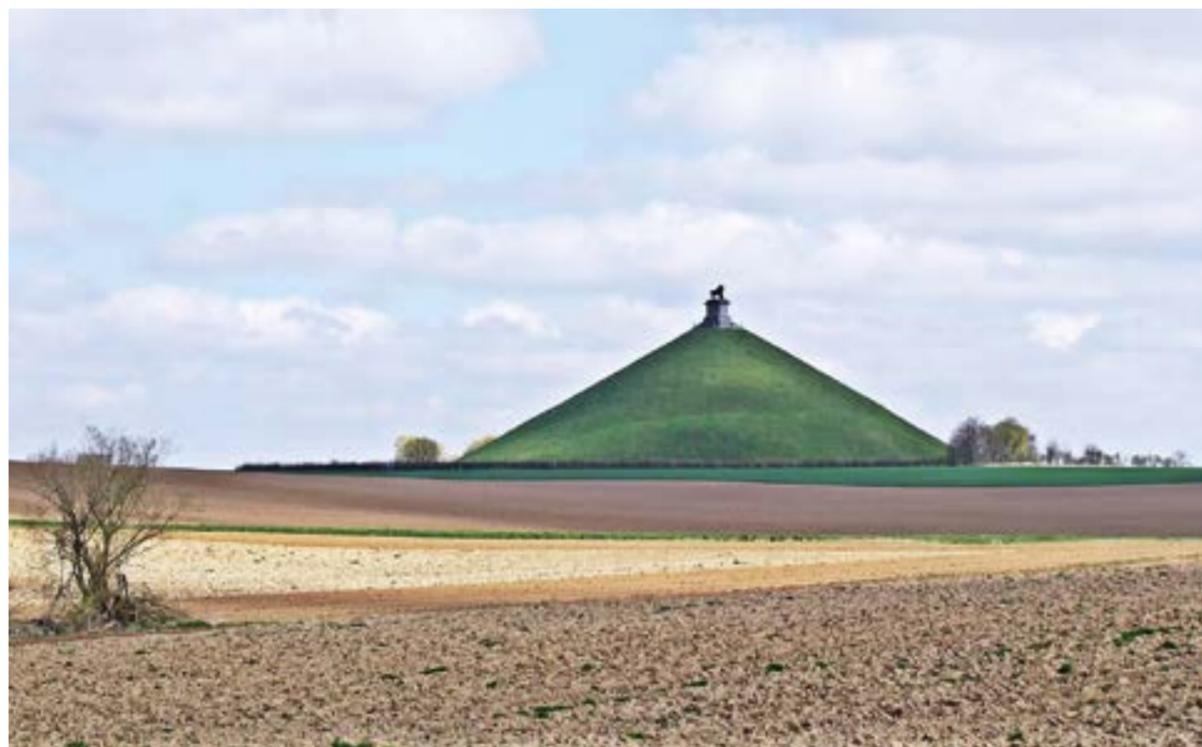
The West Nile virus is rarely found in Belgium but can cause a fatal neurological disease in humans. What is more, mosquitoes native to Belgium could spread it. Our BopCo DNA barcoding facility has been working to help monitor these mosquito populations as part of the National Environment and Health Action Plan, through the project MEMO funded by the federal and regional governments. This year they published key results about two native species of mosquito that could potentially infect humans.

Our researchers developed a DNA analysis pipeline to efficiently identify Belgian mosquitoes. Working with the Institute of Tropical Medicine in Antwerp, they used this pipeline to survey the occurrence and diversity of two species native to Belgium: *Culex pipiens s.s.* and *C. torrentium*. The results, published in *Diversity*, confirm that both are widespread in Belgium. Monitoring these species is important since *C. pipiens s.s.* is a vector for West Nile virus.



Uncovering our own species' history

Our research into the history of the natural world has much to tell us about how our own species used to live: the battles we fought, what we bought, and how we buried our dead. Our work this year was no exception.



Finding Waterloo's fallen soldier, two centuries on

This year saw a remarkable set of archaeological discoveries from one of our region's most famous historical events, and our Institute played a key role. The Mont-Saint-Jean farm was a military hospital during 1815's Battle of Waterloo where Napoleon was famously defeated. Our Institute worked with a team of researchers with the support of the charity Waterloo Uncovered on a dig there, which revealed a number of amputated limbs, but also the complete skeleton of a young man.

Once the skeleton had been carefully excavated, it was brought to our Institute for further analysis. It seems that the man was around 175 centimetres tall. He was in his twenties when he died. Isotope analysis will shed more light on his diet and where he lived. While it is known that 20,000 people died at Waterloo, this skeleton is only the second to ever be discovered at the site. It is thought that many victims were burnt on funeral pyres or even had their remains turned to fertiliser.

Surprising finds from Antwerp's Middle Ages

A dig on the quays of the Scheldt in Antwerp has uncovered a wealth of archaeological discoveries. The excavation of the former St Michael's Abbey by the department of archaeology of the city of Antwerp revealed previously unknown parts of the building and over 400 skeletal remains from the medieval and post-medieval periods. Our Institute provided expertise in archaeoanthropology to help the finds tell their story about life in the Abbey and the city in the Middle Ages.

St Michael's Abbey, once a medieval centre of power on the Scheldt, was completely destroyed in 1831 during the Belgian revolution. The team found stone remains that testify to the different construction phases of the Abbey since the 13th century, as well as remains of the Spanish ramparts that protected Antwerp in the 16th century. As well as monks, the excavated graves also contained secular individuals and inhabitants of the city. And one of the few known witnesses of early medieval Antwerp was discovered: a Merovingian coin, evidence suggesting there was a settlement there long before the abbey.



Did people in medieval Brussels shop local?

While strolling through Brussels' Marolles neighbourhood you might have walked down the Rue Notre Seigneur, a little cobbled street with a mural of Quick and Flupke. In the early 15th century, this street was home to a rare brass workshop, producing fashion accessories. And by analysing the clay and metals in specimens of these accessories, excavated there, we can learn more about where these materials might have come from.

Our Institute is a key centre for archaeological expertise in Belgium on how raw materials were sourced throughout history: an ongoing research focus that helps grow and enhance our collections and develop international networks for cooperation. In 2022 we published in the *Journal of Archaeological Science* the outcomes of a study into the 15th century Brussels brass workshop that explored the sources of the metals used there. The research showed that while most of the materials were sourced locally, much of the clay may have come from as far as 75 km south of the city.

A Welsh cave reveals Stone Age secrets

Pembroke Castle in south Wales is known as the birthplace of Tudor King Henry VII. But an archaeological dig in July 2022 revealed that the site of the castle may have discoveries for us from 30,000 years earlier. Our Institute was part of an international team that excavated Wogan Cavern, a cave on which the castle was built. And it was the first time in over a century that such ancient layers have been found in the UK, dating from the Aurignacian, over 26,000 years old.

The cave was formed in limestone during the lower carboniferous and is huge: around 400 m² and a ceiling height of 9 to 10 m. The dig revealed some exceptional finds including remains of Paleolithic fauna from the ice age: mammoths and reindeer, but also the remains of tools created in the Ice Age. Our Institute is responsible for all the fauna that comes out of this site and leading the zooarchaeological and palaeoecological analyses. The outcomes will shape our understanding of how modern humans replaced Neanderthals in northwestern Europe.

Innovations inside and outside our Institute

For our Institute, cutting-edge technologies are full of opportunities: new research methods, new perspectives on our collection, and new ways to cooperate. This year we unveiled new tools in house, as well as new ways to support innovation at sea.



Welcome to our eDNA lab: a new infrastructure for our Institute

What can a handful of soil tell us about the biodiversity of an ecosystem? To protect nature, we have to know what lives there. But monitoring is a complicated business and some species can go unnoticed. Now, thanks to a new lab at our Institute, we can find clues that organisms leave behind in their skin, mucus or excrement: samples of their DNA, that have become part of their environment. Our lab uses a technique known as environmental DNA, or eDNA, to sequence the strings of genetic material in a water or soil sample and identify the species that have passed by.

Our new lab was opened with a mini-symposium in the framework of the FWO project EVENET. 50 researchers came together to hear from international experts about how eDNA techniques could help monitor biodiversity in a range of contexts. We saw how flies could help to monitor diseases in tropical forests in Central Africa, and how to collect eDNA from ponds in the savannah to study the species on land. From the discussions, it was clear that the lab opens up a new realm of monitoring possibilities for researchers from both within and beyond our walls.

Putting our new lab to use on North Sea phytoplankton

Biodiversity monitoring is meant to help protect the North Sea, but the monitoring itself has an impact. Our research vessel Belgica has its own carbon footprint and when we take samples, we actively remove specimens from their ecosystem. Now, with our new eDNA lab, we can minimise this impact. As part of ZEROIMPACT, a project with the Flemish research institute ILVO, our Institute is developing an innovative method to detect marine species, disturbing the ecosystem as little as possible.

Not only is eDNA sampling more sustainable, it also tells us more about the biodiversity present in the North Sea. One sample of seawater is enough to identify a whole range of different organisms present, and patterns can be compared over time. The results of this year's sampling and eDNA analysis will be used to determine phytoplankton biodiversity but also to detect parasites and toxic algae near aquaculture facilities and to find out exactly when certain fish species spawn. This kind of information can also help us work towards reducing our environmental impact as well: helping us to fish more sustainably over a longer period, for example.

"Chemical fingerprinting" our geological collection

A laser pulse is fired into a sample of rock, exciting the material and creating a plasma. Energy is released as light and it is the wavelength profile of the light that tells us what elements are present. It is fast, cheap, accurate and barely damages the sample at all. This technology, now in house at our Institute, is known as Laser-Induced Breakdown Spectroscopy (LIBS). And thanks to a Belspo-funded project our Institute leads, LIBS-SCReeN, we are able to uncover even more of the secrets of our Institute's geological specimens.

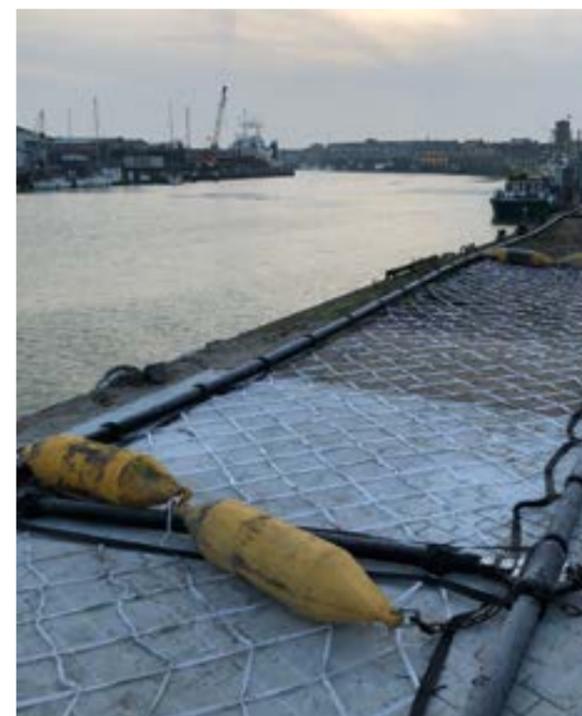
This year our team set up two operational LIBS tools in house and used them to screen over 400 Belgian zinc-lead samples from our collection to determine the presence of critical metals like germanium, a rare and valuable metal used for making electronic devices. And one setup is portable, meaning our team can take the tool out in the field. Their work is a big step towards building real knowledge and capacity in Belgium for screening raw materials in the shape of a LIBS research cluster.

Sea farms, but smarter

It wasn't only in house that our Institute supported innovation this year. Thanks to tools developed by our Institute, marine farm operators in the North Sea can use new baiting techniques that revolutionise aquaculture. The results of the three-year VLAIO project SYMAPA were presented this year in the presence of Minister for the North Sea Vincent Van Quickenborne.

In passive fishing, fish are caught in pots on the seabed: a sustainable way of fishing, but with low yields. Our research showed that capacity can be increased by using light, sound and even odour: by replacing the net of a standard cuttlefish pot with a fluorescent yarn, playing eating sounds in pots for roundfish and using the smell of banana in pots for flatfish, for example.

Our Institute collects the data used to monitor the health of fish stocks and the wider marine ecosystem, develops models to forecast the physical state of the sea and to assess the impact of the farm on the environment. For this project our researchers also designed tools for planning sea voyages and helped produce a modelling tool to predict the best period for installing spat collectors, so growers can collect stray seeds of mussels and oysters.



In citizen science we trust

Volunteer scientists are getting more and more involved in our research. This year the Institute, together with the Royal Museum for Central Africa (AfricaMuseum), appointed a Citizen Science Coordinator and launched a joint platform to map our activities. Here are just two of our highlights this year.



A rare cuttlefish discovery far from the beach

It's no surprise to spot a cuttlefish along the Belgian coast, their white internal shells gleaming on the beach. But citizen scientists recently discovered cuttlefish remains in a more unexpected location: two claypits in West Flanders, while looking for fossil shark teeth.

Back in time, cuttlefish were much rarer. With one exception: during the middle Eocene, a fairly warm period about 48 to 40 million years ago, now extinct cuttlefish (*Belosaepiidae*) were very common in our region. But we know of few fossils from the start of that period. That is what made the claypit discoveries all the more spectacular: they are even older, at 53 and 51 million years old, and very well-preserved. Micro CT imaging allowed our team to study the fossils inside out and create stunningly detailed images.

Our analysis shows that only one species of cuttlefish (*Belosaepia tricarinata*) was present in Belgium from about 53.5 to 51 million years ago. Afterwards they may have been absent for a while before numbers increased again in the middle Eocene. The results were published in open access in *Rivista Italiana di Paleontologia e Stratigrafia*.

4,000 arthropod species uncovered in Botanic Garden Jean Massart

It turns out that Brussels' Botanic Garden Jean Massart is more of an Entomological Garden. It may be home to 2,000 species of plant, but the biodiversity of insects and spiders is even greater. Over the last nine years, dozens of citizen scientists have made a huge contribution to our research, inventorying the arthropods in this garden. These volunteers brought a great deal of expertise to the project, sampling and identifying an enormous 4,003 arthropods species, mainly insects and spiders. The results were published across several articles, including in the *Journal of the Belgian Arachnological Society*, *Bulletin of the Royal Belgian Entomological Society*, *Phegea* and *Lambillionnea*.

The inventory included 1,370 species of beetles and 222 species of spiders, representing 30% of all known species in Belgium. More than 150 species were found for the first time in the country. There were some very rare species including several new for science in flies. Thanks to this decade of cooperation between professional and non-professional scientists, it is clear that this garden is a true hotspot for biodiversity in the city, and a reference site for insects and spiders in Belgium.

A global approach: building capacity for biodiversity research

Our Institute works closely together with other countries to build capacity for research into biodiversity, including through the [CEBioS](#) programme hosted at the Institute. This year was no exception, with partners across the Global North and South.



New networks of African taxonomists

The Global South has a wealth of scientific talent and experience. And when it comes to research on biodiversity in Africa, local scientists are playing an increasingly important role. In 2022, our Institute led two workshops to train 56 early-stage researchers from 13 countries across two regions of the continent: in Parakou, Benin and Rabat, Morocco.

The workshops focused on collection management, taxonomy, DNA barcoding and molecular phylogenetics. By sampling fish during the Benin workshop, researchers developed the basis for a new natural history collection of fishes. Participants exchanged on molecular techniques to identify the specimens, as well as collection management skills to conserve them. In Rabat, the team worked with scientists to explore the potential of a newly established molecular laboratory. The workshops highlighted the strengths and further potential of Africa's international networks of researchers and laboratory infrastructure to explore, document and protect the continent's rich biodiversity, as well as sparking new networks for future research.

Training Canadian and British students on archaeobotany

At the eastern end of Crete lies Palaikastro, one of the largest Bronze Age towns on the island. Close by, on the coastline, was a historic harbour now partly covered by the sea. Our Institute is working with the Greek Ministry of Culture, the University of Toronto, Canada, and the University of Oxford, UK, to further explore the harbour site and discover more about its history.

It was our expertise in archaeobotany that was of particular relevance to the project, with an eight-day mission to train students there on how to sample and sort archaeobotanical remains found at the site. The team used flotation techniques and sieving to recover the archaeological remains of plant and animal life. Students learned how to use a purpose-built flotation machine that recycles the island's precious fresh water seawater, minimising the ecological footprint of the excavation. They also discovered how to adapt their techniques to the windy summer conditions on Crete, wrapping the sieve rejects in thin cloth to ensure they didn't blow away. This research explored questions like: what did people eat and grow there? Was daily life similar to that in other parts of the city, or did the harbour area have a different culture? An analysis of the specimens of grain and fruit found there will help to shed more light.

Plot twist: surprising revelations

Our Institute's research is never without its twists and turns. This year had no shortage of surprises in store: at sea, on land, and up in the air.



A colourful discovery about pterosaurs

It wasn't only bird ancestors that had feathers of different shapes and colours. Pterosaurs, flying reptiles and close relatives of the dinosaurs, developed them too. This was proven in 2022 by a team from Brazil, Belgium, Ireland and France, led by our Institute.

The team of palaeontologists worked on a 115-million-year-old pterosaur fossil: *Tupandactylus imperator*, found in the Crato Formation in north-eastern Brazil. The specimen is a pterosaur skull that was topped by an enormous crest of soft tissue, as we can tell from the imprint that is preserved in the fossilised bone. Feathers were attached to the base of the crest: a spectacular discovery.

The study, published in *Nature*, also showed fossil melanosomes in the specimen: microscopic structures that contained the pigment melanin. They reveal colour variations in the feathers, which were probably used for visual communication. The fact that these pigmented feathers are found in both dinosaurs and pterosaurs suggests that their common ancestor in the Middle or Late Triassic (about 250 to 200 million years ago) was able to grow colourful feathers too.



The North Sea's hidden biodiversity hotspot

In 2022, scientists from our Institute explored a newly-discovered hotspot for underwater life in the Belgian part of the North Sea in one of the places you might least expect it: the middle of one of the region's busiest shipping lanes. The team on our research vessel *Belgica* found full-fledged colonies of long-living fauna there. They included ecologically important species such as the soft coral "dead man's fingers" (*Alcyonium digitatum*).

The discovery was made possible thanks to remote sensing and underwater photography, which led to the development of a new mapping technique developed by our Institute. It mixes underwater imagery with a specific type of modelling that leads to a detailed understanding of the habitat, pixel by pixel. This mapping revealed relatively pristine conditions on the sea bed – a rarity on the Belgian shelf which is frequently ploughed by trawlers. The discovery was noted by the Minister of the North Sea Vincent Van Quickenborne who stated that this gravel bed would be given extra protection as part of the Marine Spatial Plan: "We not only have to protect the ocean far away but also the special nature in our own North Sea."

Early mammals got beefier, not brainier

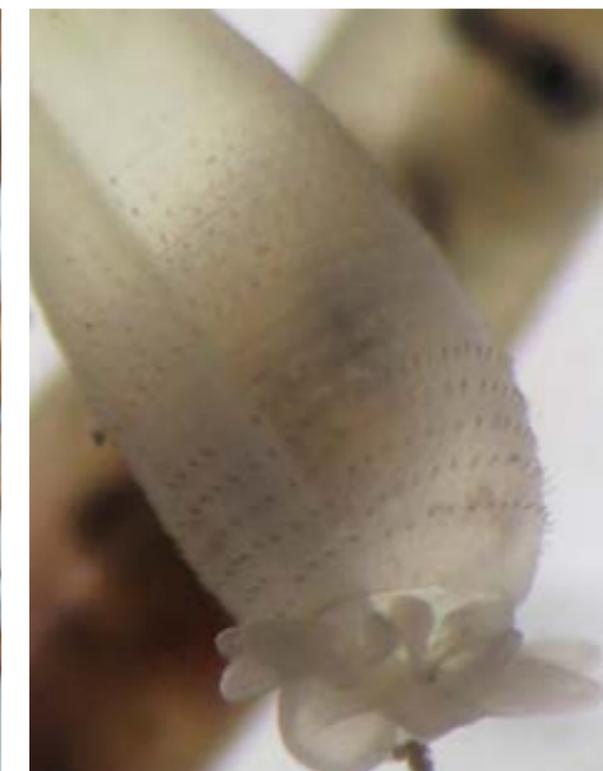
After the dinosaurs went extinct, mammals survived not by developing bigger brains, but by bulking up, according to new research from an international team including our Institute. And the skull of an archaic Paleocene mammal from our collections, *Arctocyon*, played a key role.

The study, published in *Science*, conducted CT scans on fossils from the 10-million-year period following the asteroid impact 66 million years ago that ended the reign of dinosaurs. The results show that the size of mammals' brains, compared with their body weight, decreased over time. This contradicts earlier theories that their brains got bigger compared to their total body mass, following the extinction of the dinosaurs. Results of scans also suggest the animals relied heavily on their sense of smell, and that their vision and other senses were less well developed. The study was supported by Marie Skłodowska-Curie Actions, European Research Council, Leverhulme Trust, US National Science Foundation and Belspo.

Unexpected stowaways on our North Sea monitoring equipment

Our researchers have ears deep in the North Sea. Our noise monitoring equipment checks the impact of offshore wind farms. To keep it in place, we install mooring blocks that sit on the seabed. And it was when removing one of these mooring blocks that our researchers on our research vessel *Belgica* made two discoveries.

Over three years, a hole in the mooring block filled up with sediment. In that sediment, researchers from our Institute found a new species for the Belgian waters: the peanut worm (Sipuncula) *Nephasoma rimicola*. The species is known from the northeastern Atlantic and has also been found in the English Channel, but was not previously observed in Belgium. What is more, a living European flat oyster, *Ostrea edulis*, of 2-3 years old, was found on the mooring block itself. Molecular techniques will be used to determine the origin of the oyster, which could prove to be a promising observation for possible oyster recovery projects in the future.





Collections

New light on our collections

- Belgium was home to Europe's oldest species of gecko
- Seeing the unseen: Belgian art from the Stone Age
- The X-ray that told the story of a rare snake skull
- Exploring echinoderm diversity in South Africa
- The Travelling Iguanodon returns for a scan

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New light on our collections

The specimens in our collections have no shortage of potential discoveries. Through further study of what we collected sometimes much earlier, our researchers continue to publish crucial findings that shed new light on what we thought we knew.



Belgium was home to Europe's oldest species of gecko

A fossil from our collection was this year used to describe a new extinct gecko species from Belgium. The lizard *Dollogekko dormaalensis* lived 56 million years ago, making it the oldest gecko species in Europe. The study was published in the journal *Royal Society Open Science*.

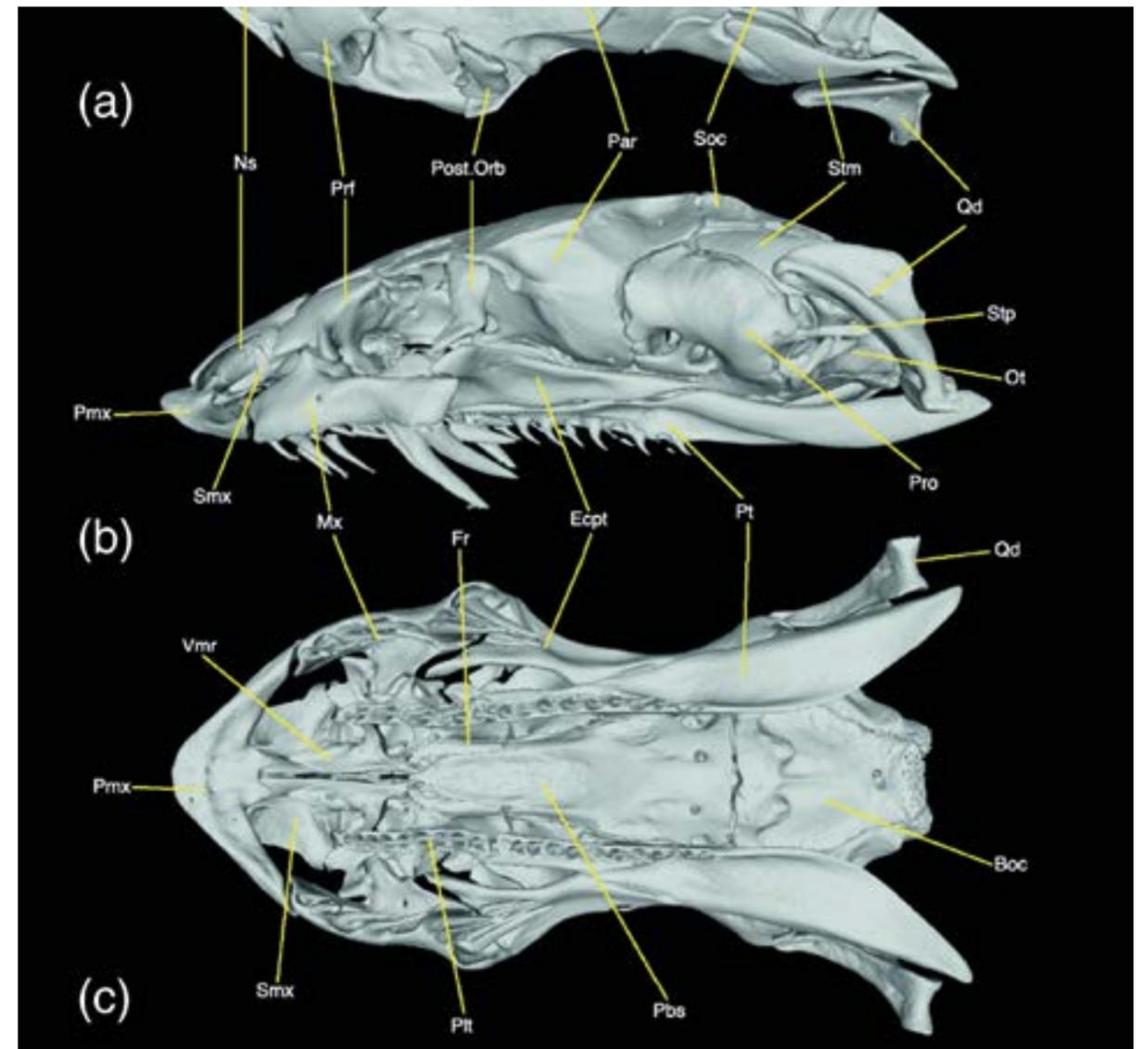
Living geckos are found worldwide in tropical and subtropical regions. But during the Eocene epoch, 56 to 34 million years ago, it was much warmer in our regions and geckos could be found further north than the tropics. Discoveries like this specimen help us to understand how climate change affected biodiversity in the past, helping us to make predictions about the future impacts of global heating.

The fossil in our collection was found in Dormaal, Flemish Brabant. The only part of this individual that the scientists found was the fossilised frontal bone. But due to its unique shape, our researchers had enough information to conclude that it was a previously unknown species. This meant the forehead bone became the official type specimen – used to describe the species – and will continue to be preserved in the collections of our Institute.

Seeing the unseen: Belgian art from the Stone Age

One of our sandstone specimens does not look like much to the naked eye. Some fragments, discovered at the Trou du Frontal site near Dinant in 1865 by our former director Edouard Dupont, date from Paleolithic times and bear a few scratches. But a 3D scan shows that these “scratches” are in fact artwork: the hind legs of a deer or cattle ancestor, etched into the rock. We can even see that it had thick fur. Thanks to innovative scanning techniques we can virtually slice up specimens like this and colour code the depth of each engraving, showing just how deep the marks went.

Our digitisation team has been working to make high-resolution scans of our specimens for years now. For our most fragile specimens, this can save them from accidental cracks or even more serious damage while being manipulated. In 2022, we tested three new digitisation tools to explore what they could tell us about the Trou du Frontal specimen along with three others from our collection of Stone Age art. The results, published in the book *Archéologues Malgré Tout*, show these methods have much potential to see more than meets the eye across our collection.



The X-ray that told the story of a rare snake skull

The shape of a snake's skull can tell us a lot about how it evolved. But snake skulls are fragile, and with rare specimens, our researchers are reluctant to cut into them to get the full picture, knowing the damage it could do. Thanks to X-ray microtomography techniques, we can finally get a valuable look inside rare specimens without risking damage. In 2022 our team worked with researchers from the University of Helsinki to solve a scientific enigma dating back over a century.

Our collection includes three rare specimens of *Hypoptophis wilsonii* found in the DR Congo and preserved in ethanol for over a hundred years: a venomous burrowing snake whose evolutionary history was not well understood. In X-rays, our team could see clearly how its skull was adapted for burrowing into the ground. The thickness of the skull was a clear sign, as well as a large “ear stone”: a feature that helps them detect vibrations in the ground. The results, published in the *Journal of Morphology*, helped our scientists conclude *Hypoptophis* is a sister taxon to *Aparallactus*, a genus of rear-fanged snakes also found in Africa.

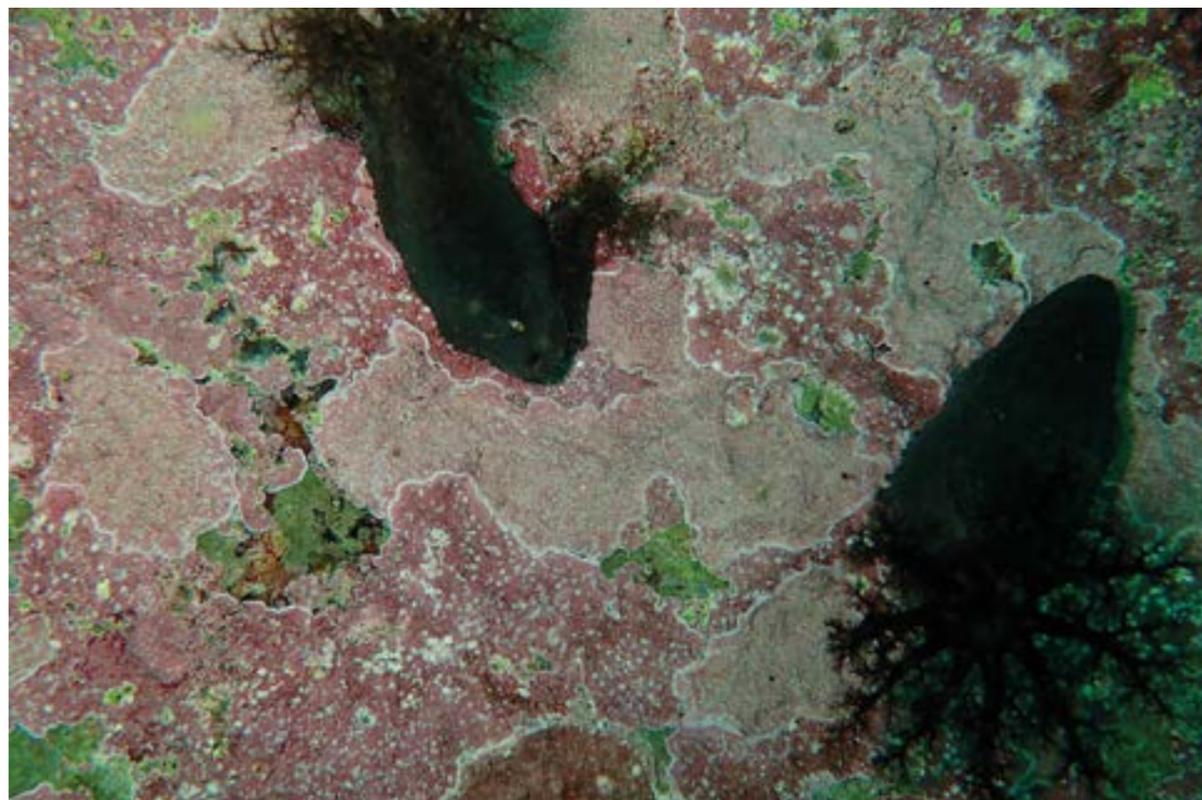
Exploring echinoderm diversity in South Africa

The waters of South Africa are full of hotspots for marine biodiversity. You might picture starfish, or sea urchins, but have you ever seen a sea cucumber? All three of these classes of species are part of a group of marine invertebrates called echinoderms, and in South African waters they can face threats like temperature rise and overfishing.

To protect this biodiversity that supports the whole ecosystem, we need to know what species are present. In 2022 our Institute examined 312 specimens from our collection, as well as from the Royal Museum for Central Africa (AfricaMuseum) and the University of KwaZulu-Natal, South Africa, and the Iziko Museums of South Africa, to help explore South African echinoderm biodiversity further.

The specimens, that had been collected in shallow waters off the east coast of South Africa, had already been identified morphologically. To check the identification, the specimens were analysed using DNA barcoding where a short fragment of their mitochondrial genome is studied and compared to DNA data of echinoderms collected worldwide.

Our team found over 100 different species, including 18 that were likely new to science. And even among the known species, they found quite some genetic diversity, showing that there is still a lot we don't know about how echinoderm species vary in their morphology and DNA. Thanks to open data, their morphological identifications and DNA sequences are now publicly available, published in the journal *PLOS One*, to be used as references for species identification in future taxonomical, evolutionary or ecological studies.



The Travelling Iguanodon returns for a scan

The Bernissart Iguanodons are the stars of our Dinosaur Gallery. But did you know one of them has made a home outside the walls of our Museum? Twenty years ago, one of our original iguanodon specimens moved back to the site of their original discovery: at the Iguanodon Museum in Bernissart. In 2022 the Bernissart Museum was renewing its collection which was the perfect opportunity to bring the specimen for a short holiday back at our Institute where it could be scanned as part of our work to digitise our collection.

The iguanodons in our Dinosaur Gallery were discovered 322 m underground in a coal mine in Bernissart at the end of the 19th century. In 2002, an agreement was made with the Iguanodon Museum that they could host one of the specimens, known to our palaeontologists as the Travelling Iguanodon, since it had also been exhibited in Japan and Spain.

Dismounting the specimen was no easy task, requiring a team of six people in total for the whole process. The specimen is fragile and extremely heavy: even just the skull weighs around 50 kg. And since the skull is suspended five metres off the ground, the moment of bringing it down it is always rather tense for the team.

Our Institute is one of the country's pioneers in 3D digitisation of museum collections. And so back in Brussels, it was time to scan the specimen bone by bone, as part of a project known as Iguanodon 2.0, supported by Belspo through the programme BRAIN-be 2.0, with the mission of digitalising our Bernissart giants. And it was in good shape, thanks to regular maintenance: a technician from our Museum visits Bernissart every year to support the management of the fossils and ensure they remain in a good state of preservation.

The Travelling Iguanodon is now the fourth of our collection to be immortalised digitally as a high-resolution 3D image, meaning scientists can study the specimens without ever needing to handle the specimens directly.

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High scores: excellent feedback from our Museum visitors

2022 was another great year for our Museum in terms of visitor satisfaction. This year we made some changes to help make the experience even more memorable for everyone who comes through our doors.



The Visitors Observatory of the Federal Scientific Institutes runs a survey every two years to collect the perspectives of hundreds of our visitors. On average, in 2022 visitors rated the Museum 8.49 out of 10, maintaining the high scores from 2020 and 2018, up from 8.34 in 2016. Focus group results shed more light on people's appreciation for the interactivity our Museum offers, and the way our work inspires young minds in particular.

Signposting within the Museum is a score that has seen improvement in 2022, with an average rating of 8.07 out of 10. This hints that our team's hard work finalising the tour around the Janlet wing may have paid off: this year we were able to unveil the complete version of our full signposted circuit throughout our galleries. Our newly refurbished MuseumShop also opened this year. Its new location, between the café and the exit, means it is more visible and accessible for people picking up a souvenir or two.

And it is not only our Museum infrastructure that we keep adapting to ensure satisfaction. Our educational services are constantly updated too. Since Autumn 2022, we doubled our number of "Ateliers voor de allerkleinsten" and "Tout-petits ateliers" with two sessions in French and two in Dutch every month. Toddlers aged 2-4 can explore six themes, including the world of creepy crawlies or woodland animals, in these playful workshops. Likewise, after the success of our sold-out Halloween Nights over the years, we launched a new "Dino Night": a sleepover for children aged 10 to 12 in our Dinosaur Gallery. And it comes with a twist: when a rare ammonite is "stolen", the children work with a private detective to track down the specimen! Our first edition was a big hit.

More than meets the eye at Luminopolis

Love escape rooms? Can't resist an immersive game? Then your eyes will have lit up when you read about our temporary exhibition this year that took a playful approach to exploring the theme of light.



Light is a topic we can explore from any angle. As a Museum of Natural Sciences we immediately think about its role in evolution, photosynthesis and bioluminescence, for example. But *Luminopolis* goes even further, exploring the physics of light but also its influence on our lives and how it shapes our societies. We know our teenage Museum visitors can't resist a good game, and this exhibition provided the perfect approach to some complex scientific ideas.

The first thing visitors notice walking into *Luminopolis* is, unsurprisingly, the lighting! People are invited to form teams, choose a difficulty level and grab a fluorescent tablet before setting off to tackle some of the 25 challenges that explore light from every perspective. The results are recorded on the tablet so they can track their progress. An optional one-hour deadline gives a fun, competitive edge to the team experience.

And the games in *Luminopolis* are serious fun, but also seriously challenging! Teams have to pit their wits against enigmas and riddles, reflecting on the role that light plays in their lives while also trying their hand at experiments. How can you get the beam of light to its target by moving only mirrors? Which way do you have to turn these strange objects to recognise the shapes hidden in their shadows? If you get the riddles right, you find a word that you upload to your tablet.

The exhibition's success was also down to the partnerships that went into it. We worked with Cap Sciences in Bordeaux, France to bring *Luminopolis* to Belgium. And it gained some extra local flavour thanks to Brussels artist Florence Geens who brought together art and science in her abstract works that she created in the exhibition itself, which our Instagram followers could see on our reels. The October launch was welcomed with great acclaim in media coverage across printed press, radio and online media, where the playful concept certainly lit up the imaginations of a broad audience.

Making a day of it: special events at the Museum

From festivals to conferences, our Institute has played host to countless events. In 2022 we upped our game with a brand new auditorium, in what was a particularly busy year.



Our Grand Auditorium has set the scene for hundreds of events over the years, and the programme is science-driven: from dialogue around the latest research results from the team at our Institute to workshops on the findings from new European-funded projects. But since the COVID-19 lockdowns, conferences are increasingly hybrid events, held in-person and online simultaneously.

In 2022 our freshly-refurbished auditorium unveiled its new technical setup, with audiovisual equipment allowing the possibility for Museum events to go fully hybrid, bringing its 150-person capacity together with many more participants online. This completed the renovation of the space, together with a full redesign of the interior, upholstery of the seating, new carpeting, furniture, artworks and lighting. And there was no shortage of activities in 2022 to take advantage of our newly-equipped spaces. We hosted 77 events: 57 organised by our own Institute and 20 from external organisations.

Event highlights this year also included activities organised outside our Museum's walls, and in one case, on the walls themselves. Bright Brussels is a festival that lights up the city in wintertime

with 300,000 visitors. For the 2022 edition, Liège-based studio Les 400 Coups created a unique video projection that brought our façade to life with an artistic interpretation of the magical potential of our collection. Visitors could marvel at the spectacle as they explored the Leopold Park.

The Museum burst out of its walls again in September for the Park Leopold Day, organised with our neighbour institutions including the European Parliament. Several hundred participants joined us in the Museum garden for workshops and activities from our education team with a particular focus on our youngest audiences.

Another festival returned to the Museum for its second edition in the summer: Walden Festival, whose main stage is hosted in our garden. The festival closed with a very special concert in our Dinosaur Gallery where our Iguanodons were serenaded by soprano Annelies Van Gramberen and guitarist Sim Van Thienen who united 16th-century music by John Dowland with folk pop by Nick Drake.

Taking science to the streets

To achieve our mission of bringing nature into everyone's lives, it is not enough to welcome people into our Museum. By taking our activities outside our walls, we reach far beyond our usual visitors.



Inclusion is a challenge for any museum. As much as we strive to adapt and vary our exhibitions and activities to appeal to as broad an audience as possible, there will always be people who never set foot in our Museum. This is where outreach plays a key role: rather than hoping to bring the people to us, we can meet them on their own turf. In 2022 our outreach work came in many shapes and sizes.

Heritage Days and Science Days are a great outreach opportunity for us. Our online schools activity Studio Dino has been bringing our Museum into classrooms since the COVID lockdown. For Heritage Week 2022 our educational service offered three free sessions with a guide explaining everything there is to know about the stars of our Museum: the Bernissart Iguanodons. And for Science Day in November 2022, we went to Texture in Kortrijk to talk about our research into the archaeobotanical remains of dye and textile plants from the medieval period. Visitors took to the microscopes to get a closer look at archaeobotanical finds and even dyed their own textiles.

Festivals were another key location for our team to reach new audiences this year. And where better than the perfectly-named Nerdland? We pitched our tent "The Real Jurassic Park" and showed the many visitors how fossils are prepared. Our Augmented Reality sandbox was a chance to play with relief and landscapes. Next door was our insect tent, bringing our collections to the masses with our vivarium and microscopes. Plus one of our paleontologists gave a show for no fewer than 1,800 people. Later in the year, in October our science truck XperiLAB joined the "I Love Science" festival in Brussels where 600 visitors had the chance to run their own experiments in its nine mini labs.

And after a two-year absence, Science & Culture at the Belgian Royal Palace was back in 2022 for its 15th edition, initiated by Belpo and entitled "Ensuring the Future". Our Institute introduced their Majesties the King and Queen as well as the Palace visitors to our new research vessel Belgica and explained our work monitoring offshore wind farms in the North Sea, ensuring we power our future as sustainably as possible.

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Finances

2022 is notable for an upturn in activity to a level comparable to that of the pre-COVID period. This total resumption of activity coupled with a rate of inflation not seen for many years generated a sharp increase in both income and expenditure.

The 2022 budget shows income of 40,607,898.93 euros and expenditure of 40,350,420.95 euros. Despite the economic situation, the RBINS closed the financial year with a slight positive balance of 257,477.98 euros.

It is difficult to compare the 2022 budgetary execution with that of previous years, as the years 2020-2021 were marked by COVID and 2022 was dominated by soaring energy prices and inflation. The combination of these two elements resulted in wage indexation on repeated occasions and an indexation of the general grant. The latter is now 17,960,351 euros, or 7.1% up on 2021.

In addition to the general grant and specific provisions, the RBINS benefitted from an endowment of 1,932,379 euros. This served both to meet the increased energy costs and to lessen the impact of the operating costs of scientific research vessel Belgica.

Research activities as a whole generated 13,610,455.30 euros, representing a 6.4% increase on 2021. Research grants from Belspo remain almost identical. A significant increase should be noted in other federal funding, increasing from 1,391,668 euros in 2021 to 2,226,130 in 2022.

The importance must be stressed of income generated by the various scientific services, increasing by 16.9% to 4,047,820.18 euros.

On the expenditure side, staff costs remain the largest item (59.8%). A sharp increase in ordinary expenditure (5,405,379.45 euros) is evident compared to 2021. The major causes of this increase are energy costs and the operating costs of the Belgica.

Every item on the expenditure side in fact shows an increase compared to previous years, except for expenditure by the science library and the collections, which fell by 37%. This decrease is because the Luminopolis exhibition is interactive and IT rather than collection oriented. The Museum did not therefore have reasons to acquire new collection pieces.

Despite the economic situation, the 2022 financial year showed a record number of Museum visits and of newly signed research contracts.

Breakdown of expenses (in €)

	2020	2021	2022
● Staff	21,397,830	21,668,610	24,141,778
● Ordinary operational expenses	5,592,824	8,253,932	13,659,311
● Investment	1,013,198	1,483,314	1,581,410
Scientific	309,589	698,664	880,016
Museum	141,328	460,027	109,908
Others	562,291	324,623	591,486
● Library and collections	269,486	249,846	158,146
● Transfers to research partners	403,489	1,545,156	675,424
● Transfer to Defence for the Belgica	2,580,951	0	0
● Other transfer	113,469	101,883	134,351
Total	31,371,247	33,302,741	40,350,421



2022

Sources of income (in €)

	2020	2021	2022
● General grant	16,681,872	16,764,000	18,706,351
● Specific grant	4,327,436	4,859,323	4,672,046
● Museum: own income	1,665,010	2,665,665	3,505,589
● Research: own income	10,301,587	12,793,633	13,610,455
● Various: own income	140,820	182,166	113,458
Total	33,116,725	37,264,787	40,607,899



2022

Breakdown of specific grants (in €)

	2020	2021	2022
● Belgica	3,177,876	2,998,000	3,060,000
● JEMU	279,252	279,252	284,362
● Public Observatory (all federal Museums)	137,000	138,748	141,287
● Interdepartemental provision	733,308	1,443,323	1,186,397
Total	4,327,436	4,859,323	4,672,046



2022

Breakdown of income of the Museum (in €)

	2020	2021	2022
● Museum renovation grant	0	304,678	0
● Ticket sales	943,012	1,486,772	2,341,992
● Exhibition hire and sales	205,043	0	64,388
● MuseumShop	334,345	522,393	506,818
● Donations - sponsorship - grants	65,869	95,462	29,225
● Education	49,741	177,133	216,789
● Events	54,106	79,227	296,276
● Dinocafé	12,894	0	50,100
Total	1,665,010	2,665,665	3,505,589



2022

Breakdown of research income (in €)

	2020	2021	2022
● Belspo	2,125,139	3,258,427	3,255,160
● Federal administrations (excl. Belspo)	20,700,856	1,391,668	2,226,130
● European Union	1,279,106	2,500,467	1,800,911
● Belgian federated entities	1,822,422	1,625,160	1,530,705
● Private sector	2,418,989	0	0
● Outside the EU	585,075	557,362	749,730
Services			
Public sector	0	1,332,163	1,594,087
Private sector	0	1,988,121	2,392,712
Outside the EU	0	140,265	61,021
Total	10,301,587	12,793,633	13,610,456



2022

Staff

2022 was a year of change for the RBINS staff. The switch to PersoPoint services (from FPS Policy and Support) was completed and new employment regulations were approved and implemented from 1 September 2022. These employment regulations should offer our staff greater flexibility in balancing their work and private life.

2022 also brought a further general increase in staff numbers, principally due to the increase in contracted scientists. Other staff categories remained stable compared to 2021. Since 2020, we have seen an increase in the percentage of female staff within the organisation, a trend that continued

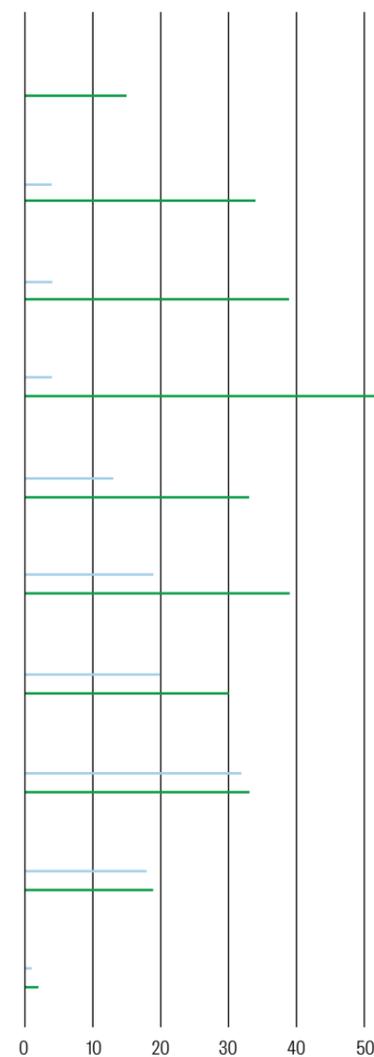
in 2022, with women now representing 47.33% of staff. This increase is particularly evident in scientific posts and level A administrative and technical positions.

In 2022 we saw a slight 1% increase in absenteeism to 5.85%, compared to 4.84% last year.

Our voluntary staff regained full access to our offices and collections in 2022, the total number of voluntary scientific staff again standing at 121. These voluntary staff are of inestimable value and provide invaluable assistance in the services where we currently face staff shortages.

Age distribution of the staff

		● Statutory	● Contractual
18-25	SW	0	6
	A	0	0
	BCD	0	9
26-29	SW	0	20
	A	1	1
	BCD	3	13
30-34	SW	0	31
	A	0	4
	BCD	4	4
35-39	SW	0	40
	A	2	6
	BCD	2	7
40-44	SW	5	20
	A	2	0
	BCD	6	13
45-49	SW	4	19
	A	4	2
	BCD	11	18
50-54	SW	8	13
	A	3	2
	BCD	9	15
55-59	SW	12	9
	A	3	1
	BCD	17	23
60-64	SW	11	5
	A	1	0
	BCD	6	14
65+	SW	1	2
	A	0	0
	BCD	0	0

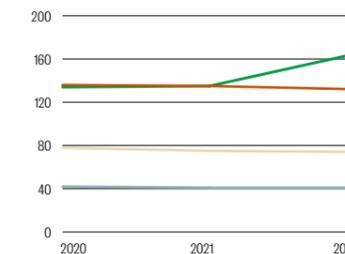


SW = Scientists | A = Level A (Master) | BCD = Levels B (Bachelor), C (secondary education) and D (no degree)

Staff breakdown by statute

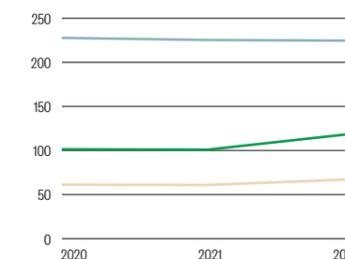
	2020	2021	2022
● Statutory Scientists	42 / 39.20	41 / 39.50	41 / 38.10
● Statutory administrative and technical staff	78 / 70.86	75 / 71.60	74 / 69.10
● Contractual scientists	134 / 123.95	135 / 120.25	165 / 151.63
● Contractual administrative and technical staff	136 / 121.10	135 / 122.40	132 / 118.05
Total	390 / 355.11	386 / 353.75	412 / 376.88

The first number refers to the number of employees, the second to the number of full-time equivalents (FTE).



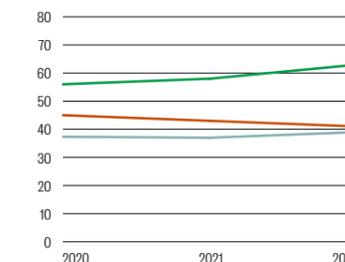
Sources of staff financing (number of persons / in FTE)

	2020	2021	2022
● General grant	228 / 207.36	225 / 210.70	224 / 210.55
● Ordinary income	61 / 54.90	60.5 / 54.40	68 / 61.90
● External projects	101 / 92.85	100.5 / 88.65	120 / 109.80
Total	390 / 355.11	386 / 353.75	412 / 382.25



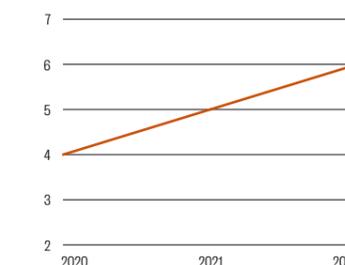
Percentage of female staff (%)

	2020	2021	2022
Statutory staff	30.83	31.03	31.30
● Scientists	26.19	26.83	26.83
● Level A	50.00	53.33	56.25
● Levels B, C and D	32.20	28.33	27.59
Contractual staff	53.33	53.70	53.54
● Scientists	48.51	48.15	50.91
● Level A	62.50	62.50	68.75
● Levels B, C and D	57.50	57.14	55.17
Total	46.41	46.89	47.33



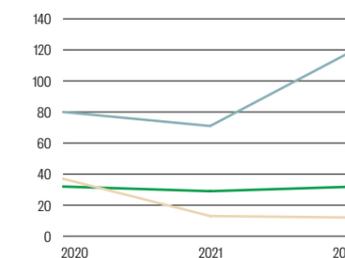
Absenteeism and work accidents

	2020	2021	2022
Work accidents	16	3	3
Accidents on the way to work	2	8	7
● Absenteeism RBINS	4.20%	4.84%	5.85%
Absenteeism federal level	6.23%	5.93%	6.92%



Volunteers

	2020	2021	2022
● Research volunteers	80	71	121
● Collections volunteers	37	13	12
● Museum volunteers	32	29	32
Total	149	113	165



Environment

The beginning of 2022 was still marked by the COVID crisis, with a slow return to normality. The employment regulations were also modified in 2022, permitting remote working for a significant proportion of staff. This naturally had an impact on the RBINS environmental policy and environmental indicators.

If we look at consumption indicators, we see a marked 21% increase in paper use. However, when compared to pre-COVID consumption we see a continued reduction over the long term, with a 16% drop compared to 2019. Despite the increased occupancy, there was a slight reduction in electricity consumption (4%). A possible explanation for this is greater awareness of electricity consumption due to increased energy prices.

In response to the increased prices, in September the Cabinet approved an energy-saving plan for government buildings, one of the measures being a reduction in temperature inside the buildings. This resulted in a 19% decrease in gas consumption compared to 2021 at the RBINS.

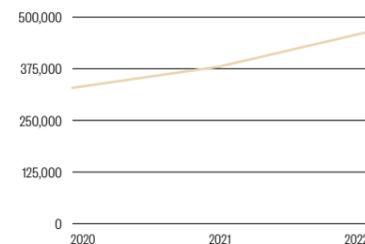
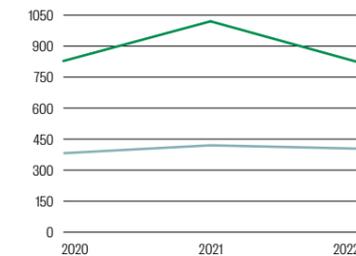
A number of awareness-raising campaigns were also launched in 2022. During mobility week, for example, there was extra focus on safe cycling in the city with the distribution of promotional material. There was also a focus on greater awareness of our energy consumption. Finally, during waste reduction week, the basic principles of waste sorting were explained with an emphasis on the different recycling processes.

Environmental indicators

	2020	2021	2022
● Electricity consumption in equivalent tonnes of CO₂ emissions	382.4	420.4	404.5
Electricity consumption in kWh	1,692,023	1,860,318	1,789,793
● Gas consumption in equivalent tonnes of CO₂ emissions	827.6	1020.8	823.2

	2020	2021	2022
● Pages of paper printed	328,734	380,459	463,456

	2020	2021	2022
● Percentage of commutes using public transport	-	63%	63%



Research

The number of scientific projects increased significantly, by more than 60%. In 2022 we thus had 174 ongoing projects, 38 of them coordinated by the RBINS. Projects funded by Belspo saw a particularly sharp increase.

The total number of publications has stabilised after the sharp drop in 2020 compared to 2019. The COVID-19 effect is starting to disappear.

The number of abstracts – resulting from presentations at scientific meetings; not shown in the tables below – in 2022 (97) has increased since 2020 (33) but is still much lower than the pre-COVID year 2019 (160). Also in 2021 and 2022, several meetings were postponed or cancelled, so that fewer abstracts have been published.

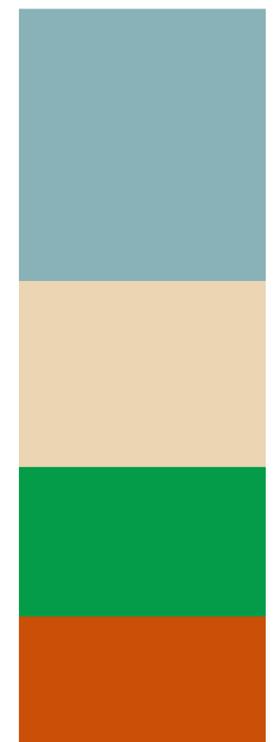
The number of A1 papers – papers in journals with a Journal Impact Factor and an important metric of scientific excellence – published in 2022 remains high (183) and is comparable to figures for 2021 (179) and 2020 (173). This number has thus stabilised and is even higher than in the pre-COVID years 2019 (160) and 2018 (133).

When looking at average publications per scientist, we see that for all publications per FTE active scientists the KPI is only slightly lower than for 2021, and this is more related to the fact that there were more active FTE scientists in 2022 (141) than in 2021 (123). The number of A1 papers divided by the number of publishing researchers is slightly higher than in 2021, mostly because here the numbers of publishing scientists were slightly lower in 2022 (71.5) than in 2021 (77.2).

In addition, both in popular publications and in the number of expert reports, 2022 was a far more productive year than the previous two. In all, both in absolute and in relative numbers, our scientists maintained, or even increased, the publication output of our institute in 2022.

Funding of current scientific projects

	2020	2021	2022	2022
	Number	Number	Number	Amount (in €)
● Belspo	58	44	88	3,255,160
Number of projects coordinated by RBINS	42	28	27	1,176,435
● Federal funding from other sources	11	3	16	2,226,130
Number of projects coordinated by RBINS	11	0	4	666,872
● European Union	34	30	38	1,800,911
Number of projects coordinated by RBINS	1	1	3	211,892
● Federated entities	25	20	19	1,530,705
Number of projects coordinated by RBINS	15	10	2	280,106
● Private sector	9	0	0	0
Number of projects coordinated by RBINS	9	0	0	0
● Outside the EU	8	8	13	749,730
Number of projects coordinated by RBINS	8	8	2	57,266
Total	145	105	174	9,562,636
projects coordinated by RBINS	86	47	38	2,392,571



2022

Publications

	2020	2021	2022
Scientific publications	388	490	543
● in Open Access	93	152	132
● in journals with impact factor	173	179	183
● Popular works	20	20	31
● Expert reports	47	37	67

As the Biblio4Plone database, where all RBINS publications are collected, is a living database, people can add papers at any time, also after the publication of the annual reports. Therefore, numbers of publications for 2020 and 2021 might differ from those in previous annual reports. / Total of scientific publications (first row) is not the sum of the next two rows, as rows 2 and 3 have some overlap (some papers in journals with Impact Factor can also be in Open Access), while several other types of papers (abstracts,...) are not listed here.

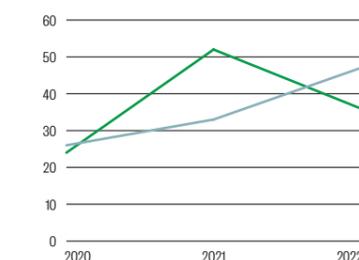
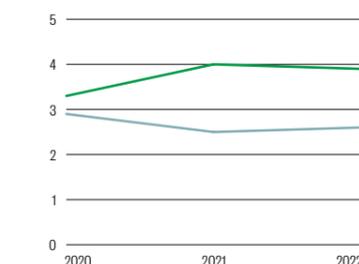
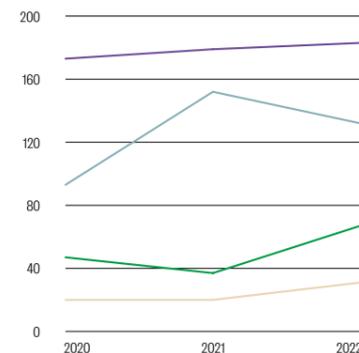
Average number of publications per scientist (in FTE)

	2020	2021	2022
● All publications per scientist	3.3	4.0	3.9
● All publications with impact factor per researcher	2.9	2.5	2.6

Average number of publications per FTE scientists: using all types of publications, and FTE of all RBINS scientists, both those actively publishing primary research (Type I) and those working for scientific services (Type II) / Average number of A1 papers per FTE researchers: using only A1 type papers (=published in journals with Impact Factor) and FTE of RBINS researchers who are actively publishing primary research (Type I). Individual scientists can be, for example, 70% of Type I and 30% of Type II, which is why we use cumulative FTE

Supervision of students

	2020	2021	2022
● PhD	26	33	47
● Master	24	52	36
Total	50	85	83



Library and Collections

2022 saw a normalisation of the situation following the COVID-19 period.

We saw a return of scientific visits to the collections, even if the number of physical visits remains below the pre-COVID period. The virtual access to the collections developed during COVID has now become common practice. This further confirms the strategy of including our collections in the ESFRI DiSSCo infrastructure, a project that aims to bring together European natural science collections within a coherent virtual collection.

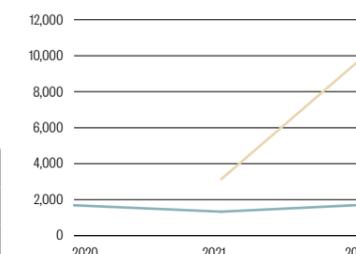
The number of loan files is stable compared to 2021 but the number of specimens is lower. This indicator nevertheless always varies greatly from year to year.

The number of new additions to the collections is comparable to the pre-COVID period (> 200,000 new additions). Most of these additions are the result of manual donations in entomology from private collections, which explains why the growth of collections was limited during the COVID crisis and the associated restrictions.

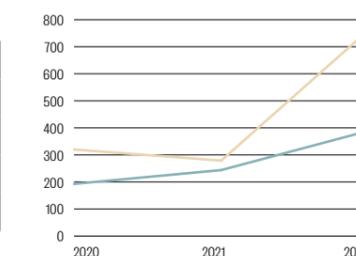
The digitisation of the collections and of the library is also continuing at a regular rate and in proportion to the resources allocated. The number of digitised type specimens is down slightly, but 74,000 new specimens were added to our DaRWIn database, plus almost 5,000 in palaeontology. The databases now contain more than 3,500,000 specimens representing more than 140,000 species. The bibliographic database for the geology collections contains almost 27,000 bibliographic entries.

Consultations

Library	2020	2021	2022
● Paper documents	1,687	1,332	1,726
● Electronic documents	/	3,139	10,180



Collections	2020	2021	2022
● Number of scientist visits	193	244	389
● Duration of scientific visits (days)	320	279	761
Number of loans from the collections	229	291	299
Number of loaned specimens	15,885	32,764	19,026



Size

Library	2020	2021	2022
Size of the library	430,222 items*	446,743 items*	462,505 items *
Growth of the library	Total growth of 2.4 %	Total growth of 3.6%	Total growth of 3.5%

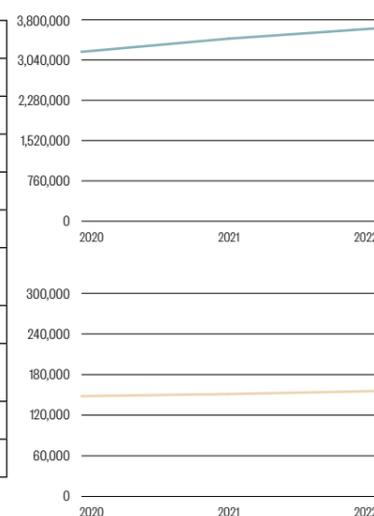
*item=physical unit

Collections	2020	2021	2022
Number of collections acquisitions	+46,408	+98,063	+200,562

Digitisation

Library	2020	2021	2022
Back-cataloguing	9,005	18,237	17,268
New inventory entries	-	1,507	2,275
Number of digitised pages	32,010	8,325	43,257

Collections	2020	2021	2022
Type specimens	4,332	4,202	2,980
Non-type specimens	800	797	628
Boxes & drawers	251 + 980	2,889 + 1,660	9,931
The new registrations in the databases	47,889	54,697	79,764 + 26,856
The number of new types	5,633	5,313	3,744
The total of digitised specimens (metadata)	3,194,226	3,442,585	3,636,534
The total of digitised type specimens	148,122	151,246	155,625
The total of digitised species (all specimens)	112,189	131,400	139,556
Scientific archives	72,061	48,961	36,285
Pictures	21,747	57,397	6,908



Museum

2022 – Goodbye COVID... or almost. This year the public returned to the Museum in large numbers, with 342,908 visitors, making it the third best year this century!

The two temporary exhibitions, *T.rex* and *Luminopolis*, made a significant contribution to this success, while educational activities (46,000 participants), events (77) and sales at our MuseumShop (more than 28,000 customers and a turnover of over half a million euros) also played their part.

However, a closer look at this great result shows that the school activities of the Educational Service remain below normal levels, due to COVID-related restrictions that still applied during the first quarter. By contrast, activities aimed at the general public and at families in particular attracted close to 10,000 participants, a record figure.

A number of “special” events organised this year by our Events & Partnerships Service proved remarkably successful. These included the spectacular Bright Brussels evening, when thousands of walkers admired our illuminated façade, the Walden Arts Festival concerts and the now traditional

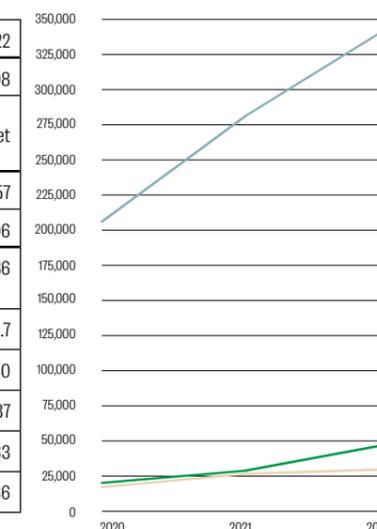
Museum Night Fever, which attracted more than 3,000 night owls.

Our MuseumShop moved at the end of the year to (finally) occupy a site along the natural exit route taken by visitors, who are now visiting it in increasing numbers (+8.5%). It should nevertheless be noted that the average amount spent per purchaser has fallen by approximately the same extent (-8.52%). This could well be a consequence of the current cost of living crisis.

Among this year’s global projects, we continued with the painstaking development of the new ticketing system, helped define a CRM system to be shared between different organisations and launched a vast online survey to measure the satisfaction of our Museum users and visitors. Initial results show very good satisfaction levels (all global scores exceeding 8/10). There are nevertheless a number of weaker points such as the availability of reception staff and museum guards, technical problems linked to the building, and inconvenience relating to the maintenance of WCs and exhibitions (defective interactive devices).

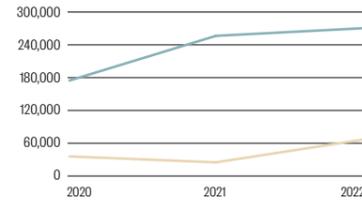
Museum visitor activities

	2020	2021	2022
Total Museum visitors	206,657	280,730	342,908
Permanent galleries	47,951	1 single ticket	1 single ticket
Temporary exhibitions indoor	158,706		
MuseumShop customers	17,533	25,918	28,057
Expenses per customer	€ 18.90	€ 20.16	€ 18.06
Participants in educational and cultural activities	20,562	28,208	45,936
Participant per activity (global)	21.8	24.7	18.7
Guided tours	4,068	4,392	12,150
Workshops	4,870	5,165	11,187
Other indoor activities	3,232	3,672	8,463
Outdoor activities	8,392	8,896	14,136



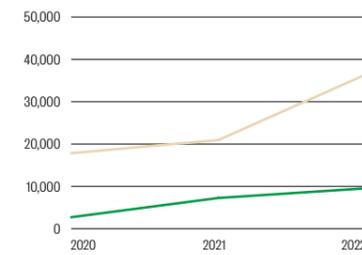
Profile of the Museum user

By type	2020	2021	2022
● Visitors in groups	35,445	23,071	70,537
● Individuals and families	171,212	257,659	272,371
Total	206,657	280,730	342,908



By age	2020	from 1/10/2021 2021	2022
Small children (0-5 years)	18.53%	0-4 / 14.76%	6.46%
Young people (6-17 years)	30.88%	5-17 / 28.29%	40.86%
Adults (18-59 years)	46.04%	18-64 / 49.25%	46.30%
Senoir citizens (60+)	2.73%	65+ / 16%	2.38%
Not known	1.82%	Unknown / 6.11%	3.99%

Participants in educational and cultural activities	2020	2021	2022
Total of participants	20,562	28,208	45,396
● Visitors in groups	17,849	20,946	36,405
● Individuals and families	2,713	7,262	9,531
Average participants per activity	21.8	24.7	18.7



Press and Internet

With 1,431 reports or articles - of which 20% concerned the Museum activities and 80% the activities of our Research Institute - we appeared in the media an average of four times a day in 2022. The audiovisual media, regional as well as national and international, reported regularly on our latest news.

At a national level, two scientific subjects and two museum events received particular attention: the marine world (beached animals, the new Belgica research vessel christened by Princess Elisabeth), palaeontology (especially the archaeological digs in Wyoming), the elephant tusk and the new Luminopolis exhibition.

At an international level, studies on the impact of offshore wind farms on marine biodiversity received major coverage in the media of neighbouring countries. The auctioning of dinosaurs and studies revealing the age of Neanderthals also drew media coverage around the world. Members of staff were cited in half of the radio and TV reports and in a quarter of the articles in the written press.

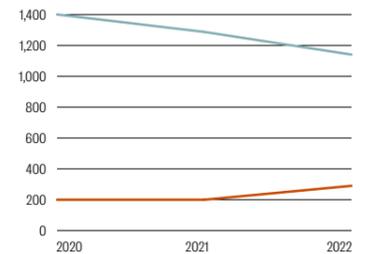
Our roughly 55 websites received 710,399 visitors in 2022, including 480,992 visitors to our main website naturalsciences.be, which is 110,000 fewer than in 2021 when all tickets had to be purchased online.

Our number of followers on Facebook increased by 1,300 to 20,009. Twitter (international professionals) is continuing to increase: + 328 followers in 2022, bringing the total to 13,944. Instagram again recorded a strong increase: 1,140 followers, bringing the total to 5,996.

The efforts in terms of museum and research communication through posts and stories is also bringing its rewards. Our guides experimented with TikTok for "edutainment" aimed at a younger audience and attracted 230 followers with videos receiving 2,000 views. Finally, with 3,789 followers (including more than 1,000 new followers in 2022), LinkedIn enables us to target (local) professionals with job vacancies as well as news and scientific communication.

In the media

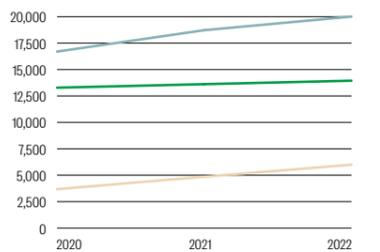
	2020	2021	2022
● Printed press	1,401	1,288	1,141
Of which research	903	1,046	945
Of which Museum	498	259	196
● Radio and TV	200	200	290
Of which research	104	127	205
Of which Museum	96	73	85
Total	1,601	1,488	1,431



Online and social media

Websites	2020	2021	2022
Website visitors	749,304	865,883	710,399
Website visits	1,324,252	1,493,720	1,359,301
Visited pages	3,394,558	3,898,989	3,063,695

Social media	2020	2021	2022
● Facebook followers	16,700	18,724	20,009
● Twitter followers	13,283	13,616	13,944
● Instagram followers	3,681	4,856	5,996



Note: These are the website figures without the streaming of Falcons for Everyone, because the streaming numbers appeared to be difficult to compare over the last few years. Just to give an idea: the streaming normally accounts for a million to several millions of visited pages.

The RBINS in brief

Missions

- RBINS has been entrusted with four major missions:
- Scientific research into natural sciences;
 - Scientific expertise at the service of the public authorities;
 - Conservation and management of scientific and heritage collections;
 - Dissemination of scientific knowledge in society.

Research & expertise

One out of every three people at the RBINS is a scientist. The scientific personnel includes mainly biologists, palaeontologists and geologists, but also oceanographers, anthropologists, prehistorians and archaeologists, as well as geographers, physicists, bio-engineers and mathematicians, which enables it to conduct multidisciplinary research.

Lines of Research;

- Biodiversity and geodiversity;
- Biological evolution and the history of life;
- Marine and freshwater ecosystems' management
- History of the human/environment relationship
- Applied geology.

Service Provision;

- The RBINS provides scientific expertise under Belgium's international commitments in relation to environmental protection.
- It develops tools and methods for monitoring natural land or marine environments.
- It also offers useful advice for the development of national and European policies for the protection and conservation of biotopes and biodiversity and the use of natural resources.

Collections

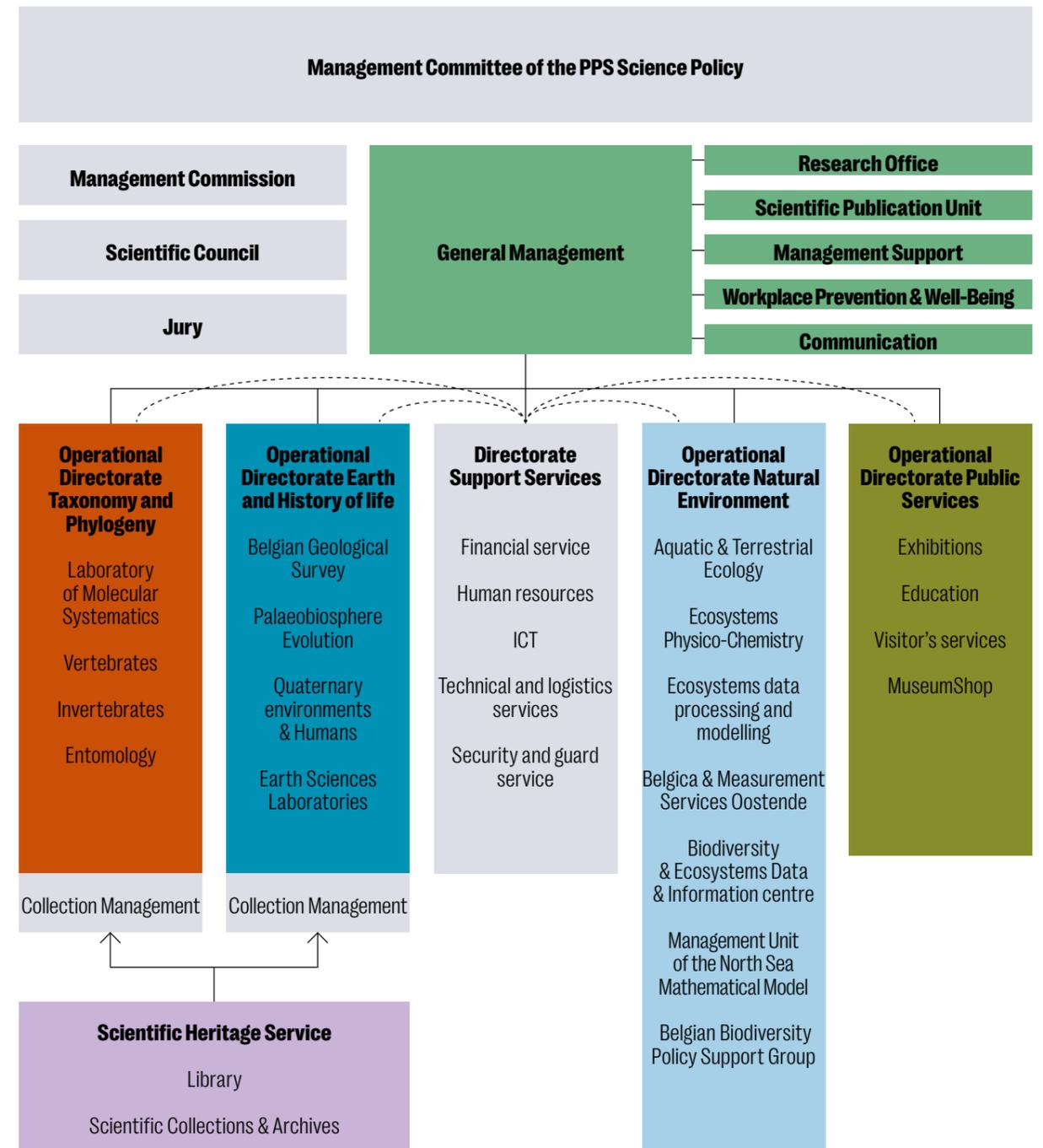
With their 38 million specimens conserved as Belgian heritage of universal significance, the RBINS's collections come just after London and Paris in the European classification, and belong to the top 10 largest collection in the world. They serve above all as reference and research tools and as such belong to the European 'major research infrastructure'. In this respect they are constantly being visited and studied by researchers from around the world. For several years now, the RBINS has been committed to an ambitious programme to digitise its collections and to do so has developed an open-source software, DaRWIn, which has made it possible to encode all the data on any collection of specimens, whatever their taxonomic group.

Museum

For the general public, the Natural Science Museum is the visible part of the RBINS. It has 16,000 m² of permanent galleries, temporary exhibition rooms and educational workshops, public spaces of all kind, enabling it to welcome more or less 325,000 visitors each year, approximately 25 % of whom are school groups. Its Dinosaur Gallery is world famous and the largest in Europe.

It plays a leading role in the promotion and dissemination of scientific culture, both within and beyond its walls, notably through travelling exhibitions and events. The RBINS is pursuing ambitious efforts to gradually renovate the premises, to make the Museum more convivial and better adapted to people's expectations. The Museum also takes a resolute position promoting a more respectful approach to nature.

Organisation



The Royal Belgian Institute of Natural Sciences is one of the ten federal scientific institutions that are governed by the Belgian Science Policy Office (Belspo).

The RBINS is a State service.

It is managed by three independent entities:

- The Scientific Council offers advice on issues of a scientific nature that have an impact on the accomplishment of the tasks of the Institute.
- The Management Commission is responsible for the financial and practical management of the RBINS. It is the same body for the RBINS and the Royal Museum for Central Africa.
- The General Director is responsible for the day-to-day

Institute's management. She/he is assisted by the Management Board.

Moreover the Jury for recruitment and promotion is responsible for recruiting the permanent scientific employees and monitoring their careers.

The Institute's General Director is also a full member of the Management Committee of the Belgian Science Policy Office.

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Websites and publications

All websites and publications mentioned in this report can
be accessed via links within the PDF version of the document,
available on our website:

www.naturalsciences.be/en/about-us/mission/annual-report



