# Natural History Museum’s innovative sensors turn gardens into climate-responsive urban biodiversity laboratory



The Natural History Museum in London has launched an innovative project by installing a network of 25 environmental sensors across its recently transformed gardens to monitor how urban wildlife is responding to changing climatic conditions. This move is part of a broader initiative to turn the museum’s gardens into a "living laboratory," providing real-time data on urban biodiversity and microclimatic shifts in the heart of the city.

The sensors, which track temperature, humidity, sound, and other atmospheric conditions, are strategically placed within the Nature Discovery Garden. They capture a wide range of natural sounds including insect wing vibrations, bird calls, and pond underwater noises, alongside urban background sounds like traffic. According to Ed Baker, an acoustic biology researcher at the museum, the activation of these sensors represents a significant leap forward in understanding urban nature dynamics. With support from Amazon Web Services (AWS), the museum aims to collect, process, and share this data rapidly, enabling more responsive and science-driven conservation actions within urban spaces.

This project forms part of a multi-year partnership between the Natural History Museum and AWS, aiming to create a sophisticated data platform known as the Data Ecosystem. Built using AWS cloud technologies, this platform is designed to store, enrich, and analyse vast quantities of biodiversity and environmental data. It will integrate live sensor feeds with other datasets including historical wildlife observations dating back to 1995, environmental DNA samples, and community science contributions from over 96,000 participants studying noise pollution impacts on insects. Hilary Tam, AWS’s Europe, Middle East, and Africa sustainability leader, highlighted how the cloud infrastructure enables secure data storage and scalable processing power, turning collected information into actionable insights to support urban nature recovery.

The gardens themselves, encompassing five acres around the museum's South Kensington site, reopened to the public last year following a £25 million transformation. They feature a blend of recreational and scientific facilities, including a nature activity centre that doubles as a training space for emerging urban ecologists and a hub for school workshops. The installation of sensors and the resulting data collection effort are key components of the museum’s Urban Nature Project, which seeks to empower cities and their residents across the UK with tools and knowledge to protect and enhance biodiversity.

Environmental monitoring is enhanced by acoustic and environmental DNA technologies, allowing researchers to detect species and gauge their responses to environmental change with unprecedented precision. The project team is also incorporating community science data, encouraging widespread public participation to capture a more comprehensive picture of urban biodiversity. This inclusive approach aims to democratise biodiversity data collection, enabling evidence-based conservation efforts driven by both scientists and local communities.

The data harvested by the sensors is projected to accumulate a substantial volume, with estimates suggesting up to 20 terabytes of audio data alone in the first year. This rich dataset will power sophisticated research on how various species—from insects and frogs to microscopic organisms—interact with their urban environment. Ultimately, the museum envisions the gardens as a model for urban nature recovery, forging a deeper understanding of biodiversity trends and informing practical strategies for building urban resilience against climate change.

The Natural History Museum’s project stands as a pioneering example of how cultural institutions can harness technology and public engagement to foster scientific discovery and environmental stewardship within cities. By bridging cutting-edge sensor technology with cloud computing and community involvement, the museum hopes this initiative will galvanise similar efforts nationwide, helping safeguard urban wildlife and ecological health amid a rapidly changing climate and expanding urban footprint.

### 📌 Reference Map:

* Paragraph 1 – [[1]](https://www.irishnews.com/news/uk/natural-history-museum-turns-on-sensors-in-high-tech-gardens-to-monitor-nature-RNC27NAR3NL3ZEOPRSP5LE7G3Y/), [[6]](https://www.maxfordham.com/practice-people/journal/the-natural-history-museums-reimagined-gardens-open-to-public), [[7]](https://news.sky.com/story/hi-tech-gardens-at-natural-history-museum-to-track-how-wildlife-reacts-to-climate-12711114)
* Paragraph 2 – [[1]](https://www.irishnews.com/news/uk/natural-history-museum-turns-on-sensors-in-high-tech-gardens-to-monitor-nature-RNC27NAR3NL3ZEOPRSP5LE7G3Y/), [[6]](https://www.maxfordham.com/practice-people/journal/the-natural-history-museums-reimagined-gardens-open-to-public), [[2]](https://www.nhm.ac.uk/press-office/press-releases/The-Natural-History-Museum-partners-with-Amazon-Web-Services-to-transform-and-accelerate-scientific-research.html?sc_channel=sm)
* Paragraph 3 – [[1]](https://www.irishnews.com/news/uk/natural-history-museum-turns-on-sensors-in-high-tech-gardens-to-monitor-nature-RNC27NAR3NL3ZEOPRSP5LE7G3Y/), [[2]](https://www.nhm.ac.uk/press-office/press-releases/The-Natural-History-Museum-partners-with-Amazon-Web-Services-to-transform-and-accelerate-scientific-research.html?sc_channel=sm), [[4]](https://www.nhm.ac.uk/about-us/urban-nature-project.html/)
* Paragraph 4 – [[1]](https://www.irishnews.com/news/uk/natural-history-museum-turns-on-sensors-in-high-tech-gardens-to-monitor-nature-RNC27NAR3NL3ZEOPRSP5LE7G3Y/), [[4]](https://www.nhm.ac.uk/about-us/urban-nature-project.html/), [[6]](https://www.maxfordham.com/practice-people/journal/the-natural-history-museums-reimagined-gardens-open-to-public)
* Paragraph 5 – [[1]](https://www.irishnews.com/news/uk/natural-history-museum-turns-on-sensors-in-high-tech-gardens-to-monitor-nature-RNC27NAR3NL3ZEOPRSP5LE7G3Y/), [[4]](https://www.nhm.ac.uk/about-us/urban-nature-project.html/), [[2]](https://www.nhm.ac.uk/press-office/press-releases/The-Natural-History-Museum-partners-with-Amazon-Web-Services-to-transform-and-accelerate-scientific-research.html?sc_channel=sm)
* Paragraph 6 – [[1]](https://www.irishnews.com/news/uk/natural-history-museum-turns-on-sensors-in-high-tech-gardens-to-monitor-nature-RNC27NAR3NL3ZEOPRSP5LE7G3Y/), [[6]](https://www.maxfordham.com/practice-people/journal/the-natural-history-museums-reimagined-gardens-open-to-public), [[7]](https://news.sky.com/story/hi-tech-gardens-at-natural-history-museum-to-track-how-wildlife-reacts-to-climate-12711114)
* Paragraph 7 – [[1]](https://www.irishnews.com/news/uk/natural-history-museum-turns-on-sensors-in-high-tech-gardens-to-monitor-nature-RNC27NAR3NL3ZEOPRSP5LE7G3Y/), [[4]](https://www.nhm.ac.uk/about-us/urban-nature-project.html/), [[2]](https://www.nhm.ac.uk/press-office/press-releases/The-Natural-History-Museum-partners-with-Amazon-Web-Services-to-transform-and-accelerate-scientific-research.html?sc_channel=sm)

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## Bibliography

1. <https://www.irishnews.com/news/uk/natural-history-museum-turns-on-sensors-in-high-tech-gardens-to-monitor-nature-RNC27NAR3NL3ZEOPRSP5LE7G3Y/> - Please view link - unable to able to access data
2. <https://www.nhm.ac.uk/press-office/press-releases/The-Natural-History-Museum-partners-with-Amazon-Web-Services-to-transform-and-accelerate-scientific-research.html?sc_channel=sm> - The Natural History Museum has announced a multi-year partnership with Amazon Web Services (AWS) to create a 'digital twin' for UK biodiversity. This collaboration aims to build a data platform to store, enrich, and compare urban biodiversity and environmental data, providing scientists with unprecedented access to a wealth of information to support the discovery of solutions to the planetary emergency. The Data Ecosystem, built using AWS technologies, will help researchers build a deeper understanding of the UK's urban biodiversity, including its composition, how it relates to environmental conditions, and how it responds to direct conservation action.
3. <https://www.nhm.ac.uk/press-office/press-releases/natural-history-museum-announces-opening-date-of-transformed-gar.html> - The Natural History Museum has announced the opening date of its transformed gardens, which will serve as a living laboratory for scientists and volunteers to develop best practices to protect urban nature. The gardens will be home to scientific sensors gathering environmental DNA and acoustic data to monitor, understand, and protect urban nature. The data collected will be curated and combined within the Museum's new Data Ecosystem, built using Amazon Web Services (AWS) technologies, which is helping to scale up and accelerate the speed at which science can happen, making it easier and quicker to reach conclusions and practically support UK urban nature recovery.
4. <https://www.nhm.ac.uk/about-us/urban-nature-project.html/> - The Urban Nature Project is an initiative by the Natural History Museum aimed at giving people across the UK the motivation and tools to safeguard nature in towns and cities. The five-acre site in South Kensington has been transformed into a welcoming, accessible, and biologically diverse green space in the heart of London. The gardens serve as a hub for urban nature identification and field survey skills, piloting a range of technologies for monitoring change in urban environments, including environmental DNA (eDNA) and acoustic monitoring. The project also involves developing a new public-facing biodiversity and environmental monitoring data ecosystem to help capture, share, and interpret urban nature data.
5. <https://www.nhm.ac.uk/press-office/press-releases/ferntastic--natural-history-museum-reveals-latest-dinosaur-resid.html> - The Natural History Museum has revealed its latest dinosaur resident, a bronze sculpture named Fern, in its new gardens. The Museum is working in partnership with global cloud provider Amazon Web Services (AWS) to enrich and accelerate this vital work. The data collected from the gardens will be fed into the Museum's new Data Ecosystem, a data platform built using AWS cloud technologies. The Data Ecosystem helps the Museum's team of scientists to collect, enrich, and share multiple biodiversity data types alongside environmental data such as water chemistry, rapidly and accurately, from a range of sources.
6. <https://www.maxfordham.com/practice-people/journal/the-natural-history-museums-reimagined-gardens-open-to-public> - The Natural History Museum's reimagined gardens have opened to the public, featuring a network of 25 scientific sensors that gather environmental and acoustic data. These sensors monitor conditions such as underwater recordings in the pond, the buzz of insect wings, bird calls, and traffic noise to help understand how urban nature is changing and what can be done to support its recovery. Once fully installed, the network of sensors in the gardens will collect up to 20 terabytes of audio data in the first year. The gardens also include a nature activity centre that combines facilities for scientific work, a training space for future urban ecologists, and a hub for school workshops.
7. <https://news.sky.com/story/hi-tech-gardens-at-natural-history-museum-to-track-how-wildlife-reacts-to-climate-12711114> - The Natural History Museum is creating hi-tech gardens full of sensors to look at how wildlife reacts to changes in climate and can be better protected in urban environments. The gardens will allow researchers to look at the kind of life that makes these environments home, from insects and frogs to tiny microscopic organisms invisible to the human eye. Sensors installed across the site will monitor conditions like temperature, humidity, and sound as the climate changes. The gardens are set to open to the public towards the end of next year.