



British
Geological
Survey

BGS INTERNATIONAL

Our partnerships in Latin America



Acknowledgements

Our international work would not be possible without the collaboration of our partners in the Latin American region and beyond, and the British Embassy network.



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Global partnerships for a connected future

The British Geological Survey (BGS) is the oldest geological survey in the world. We are proud to work globally alongside governments, industry and research institutions to deliver scientific knowledge, innovative approaches and a commitment to shared success.

We are a trusted global partner helping decision makers understand the vital role of the subsurface in shaping resilient economies, sustainable environments and thriving societies. As a leading provider of geological data, insight and expertise, we work across borders to address some of the world's most pressing challenges, from climate resilience to resource security.

I am delighted to introduce this prospectus of BGS operations in Latin America, showcasing the exciting opportunities that are being delivered in partnership with local stakeholders. As director of BGS International Geoscience, it is my pleasure to highlight these collaborations delivering tangible outcomes across the region.

The following examples demonstrate this commitment to shared success in practice and highlight opportunities for future collaboration.

Thank you for your time and consideration.

Dr Maggy Heintz
Director of BGS International Geoscience



Bringing value to the region

As an expert, impartial and effective partner, BGS delivers regionally informed programmes that cross borders and unlock shared geological potential. Our authoritative, science-led advice helps strengthen investment environments and build local capability through scalable activities structured across available timeframes.

Our impact

BGS is recognised for its ability to deliver long-term partnerships based on cross-cutting geological and technical expertise. These partnerships deliver outcomes that include:

- providing host governments with greater understanding of available mineral resources in the effort to secure high-quality investment

- reducing uncertainty in investor assessments and strengthening investment pipelines through clearer geological and technical parameters
- supporting robust governance and regulatory frameworks for sustainable energy development and environmental risk mitigation
- introducing best-in-class technologies to host survey capabilities to support long-term sector development
- supporting greater strategic engagement with both UK and international partners through greater insight into global priorities and political framework

Our offer

Through scalable activities structured across available timeframes, we can offer:

- scoping studies that align national priorities with geological potential and investment landscapes, strengthening governance, encouraging responsible commercial investment and supporting resilient critical mineral sectors
- supporting our partners to develop modern, interoperable, digital geological infrastructure by

combining modern hybrid-mapping approaches, advanced digital workflows and multidisciplinary data integration to develop national databases, digital mapping platforms and web-based services that are accessible to policymakers, investors and wider stakeholders

- integrating diverse datasets into coherent geological models that expand national geological frameworks, including the digitisation of legacy and paper-based datasets for use in modern systems and technologies such as Earth observation, 3D subsurface modelling, artificial intelligence and machine learning
- enhancing in-country geological mapping and minerals geoscience expertise to support robust mineral development underpinned by credible geophysical and geochemical surveys — an essential framework for identifying and characterising mineral-bearing systems and enabling faster, better investment decisions

Our guarantee

BGS is committed to collaborative partnerships that empower stakeholders through actionable strategies, shared best practices and the application of advanced geoscience data systems.

Our work at a glance

DISASTER RISK AND CLIMATE RESILIENCE

1 Geoscience shaping regional development

BGS is supporting the development of Peru's Northern Territorial Corridor by embedding geoscientific evidence into planning and decision making, which are central to creating a diversified economy supported by mining, agriculture and improved infrastructure.

Our work is directly contributing to the creation of a corridor that will deliver long-term, resilient and equitable benefits for communities, industry and the environment.

CASE STUDIES

Enhancing water security in Mexico

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Geoscience shaping regional development in Peru

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ENERGY TRANSITION

2 Understanding environmental, social and governance (ESG) issues in the Lithium Triangle

BGS is at the forefront of advancing a regional, science-based approach to ESG issues within the Lithium Triangle, which hosts over half of the world's lithium resources, as projects advance rapidly and place the unique ecosystem under increasing pressure.

Our work is central to the creation of a more responsible, transparent and sustainable future for lithium production, addressing systemic risks across the wider landscape.

CASE STUDIES

Lithium in Bolivia

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Managing cumulative impacts of mining in the Lithium Triangle

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RESOURCE AND SECURITY

CASE STUDIES

Understanding glacier, groundwater and wetland contributions to water security in Peru

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Delivering geochronological solutions for mineral systems exploration

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-  Peru
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-  Mexico

3 Understanding and modelling complex groundwater systems

BGS applies advanced Earth observation, geoscience and modelling techniques to better understand how lithium forms, moves and accumulates within arid, closed basins where evaporation concentrates minerals into brines beneath salt crusts.

Our work across the Lithium Triangle ensures that the development of lithium resources is grounded in robust science, innovation and long-term sustainability.

4 Facilitating the scale-up of lithium supply

BGS analysis is at the heart of increased confidence in the resilience of the supply chain that feeds the world's increasing demand for lithium to drive the growth of clean technologies, informing policy, regulation and strategic investment decisions.

By combining geoscientific expertise with market intelligence, we help stakeholders navigate uncertainty and unlock opportunities across the supply chain.



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5 Using innovative techniques for resource exploration

The provenance of lithium in salars is still not well understood. The accumulation of lithium and other chemicals in the centre of a salar can take hundreds of thousands of years. BGS is working with colleagues in the international community to determine the mass balance of lithium in watersheds alongside contemporary recharge processes using geochemical and modelling techniques.

By combining innovation with geoscientific expertise, we are helping to unlock the potential of available lithium resources within the Lithium Triangle region more efficiently and sustainably.



THEME ONE

Energy transition

The subsurface has a major role in helping to deliver the transition to net zero. Unlocking this potential sustainably requires careful management of environmental and social risks. Secure, responsible supply chains depend on advanced geoscience approaches, including Earth observation, basin scale studies and ESG assessments that consider the wider impacts of extraction. This is particularly critical in mineral-rich but water-stressed, arid regions, where understanding and mitigating the effects of mining (for example, lithium or copper) on scarce water resources is essential, alongside addressing local social sensitivities.

BGS works in partnership with regional stakeholders to improve understanding of critical mineral resources. We support more sustainable extraction practices through integrated research and environmental impact assessments, and the resulting data and insights help inform policy, regulation and investment decisions while promoting responsible resource development that benefits and protects local communities.

ENERGY TRANSITION

Case studies

Lithium in Bolivia

The demand for battery raw materials such as lithium and cobalt is increasing rapidly as we transition to a low-carbon economy and work towards net zero. BGS and the Satellite Applications Catapult have been working in partnership with Yacimientos de Lito Bolivianos to apply innovative techniques to ensure lithium brine supply for the low-cost battery market, aiming to better understand the lithium resource in the salars (salt flats) of South America. The research aims to understand not only the sources of lithium in the volcanic rocks of the Andes, but also how it is liberated from them and transported, by both surface water and underground water, to the salars.

Some of the key questions in Bolivia concern where the lithium originates and where it is most likely to be picked up by water to be transported to a salar. Satellite imagery and data play an important part in mapping the geology. Different rocks reflect different amounts of sunlight in different regions of the electromagnetic spectrum and the satellites record this information in infrared areas that the human eye cannot see. The imagery can highlight reflections that characterise different rocks and minerals, allowing geologists to see these subtle differences.

Understanding the geometric relationships between different geological formations is crucial to understanding their ages and position in the succession. High-resolution terrain models, when combined with the processed satellite imagery in the GeoVisionary 3D environment, allow these relationships to be easily understood.

We now have a better understanding of where lithium is in the Bolivian salars and how it got there, meaning BGS is well positioned to advise on how it can be used sustainably to enable the digital transformation.

PARTNERS

- Satellite Applications Catapult
- Yacimientos de Lito Bolivianos

We need lithium for batteries, but do we really know where and how sustainable the resource is?

LUKE BATESON, BGS SCIENTIST



BGS © UKRI



Managing cumulative impacts of mining in the Lithium Triangle

South America hosts abundant resources of energy transition metals such as copper and lithium. Numerous exploration projects are currently at various stages of development, with several expected to progress to production in the coming years.

Copper, lithium and other mining projects are frequently clustered in close proximity, particularly in the high Andes, an environment characterised by aridity, glaciers and highly fragile ecosystems. Despite differing extraction methods, these operations face shared challenges, including water-use pressures, environmental sensitivity and proximity to Indigenous communities.

Intensifying exploration and the expansion of future extraction projects risk amplifying existing environmental and social pressures. Current approaches to impact management and monitoring are often not fit for purpose, as traditional project-level Environmental Impact Assessments (EIAs) fail to capture the combined effects of multiple operations on shared water resources, ecosystems, infrastructure, supply chains and communities. As mining activity grows, these cumulative impacts can escalate.

Since 2019, BGS has been advancing a basin-scale approach to better understand and manage these risks. Our work focuses on:

- developing integrated hydrogeological understanding across shared basins

- promoting coordinated monitoring and shared data platforms (for example, salar observatories)
- supporting the adoption of Strategic Environmental and Social Assessments (SESAs) to complement project-level EIAs
- strengthening governance, planning and institutional capacity
- encouraging shared infrastructure solutions to reduce environmental footprint

Our research highlights the importance of coordinated planning across projects and provinces, transparent data and monitoring systems to identify risks, inclusive engagement with Indigenous communities and stakeholders, and equitable benefit sharing and participatory approaches.

By moving from fragmented assessments to a system-wide perspective, BGS is helping to ensure that copper, lithium and other mining development is more sustainable, efficient and socially responsible.

PARTNERS

- British Embassy network
- Geological surveys
- Multiple academic institutions in the region
- Multiple industry partners
- National government authorities (for example, mining and environment ministries)
- Regional academic Institutions
- Regional and local authorities
- The International Lithium Association (iLiA)

Our unique position enables us to undertake a holistic approach to environmental impact assessment and management.

EVI PETAVRATZI, BGS SCIENTIST





THEME TWO

Disaster risk and climate resilience

The Inter-American Development Bank identifies Latin America as one of the world's most disaster-prone regions. A wide range of natural hazards often intersect, compounding their impacts on communities, the economy and critical infrastructure. These pressures are further exacerbated by the intensifying effects of climate change, rapid population growth and urban expansion.

BGS supports pathways to resilience in Latin America by combining world-leading geological and hydrological modelling with advanced natural-hazard monitoring and forecasting. Through partnerships and targeted capacity-building initiatives, BGS works with local institutions to strengthen technical expertise, improve data-driven decision making and enhance preparedness and response capabilities. This collaborative approach helps to reduce risk, protect communities and support sustainable development across the region.

DISASTER RISK AND CLIMATE RESILIENCE

Case studies

Enhancing water security in Mexico

Mexico City, one of the world's largest urban centres, faces significant water challenges due to its growing population and ageing infrastructure, as well as climate change. These factors have placed immense pressure on the city's natural water reserves, increasing the risk of water crises and water poverty. To address these challenges, BGS and partners from the UK and Mexico have developed an innovative and transferable socio-hydrological resilience assessment tool.

The tool evaluates interactions between people and water, enabling decision makers to assess the effects of water management practices under various climate scenarios. Implementing household-scale constructed wetlands is a key solution. These small, engineered ecosystems use vegetation, soil and microorganisms to filter pollutants from waste water so it can be re-used, offering a sustainable, decentralised approach to water treatment, reducing disease and infrastructure maintenance costs and improving access to green spaces.

Mexico City's socio-hydrological resilience varies significantly across neighbourhoods. Central and

western areas are more resilient; eastern, northern and southern regions face greater vulnerability due to social and environmental stressors. Constructed wetlands could reduce water poverty for approximately six million people and significantly lower the number of highly vulnerable individuals.

Without intervention, water vulnerability is projected to worsen, with 70 per cent of the population at high risk of water insecurity by 2050. Alongside other green-blue infrastructure like rainwater harvesting systems, constructed wetlands could restore resilience to current levels, ensuring a more sustainable water future for Mexico City.

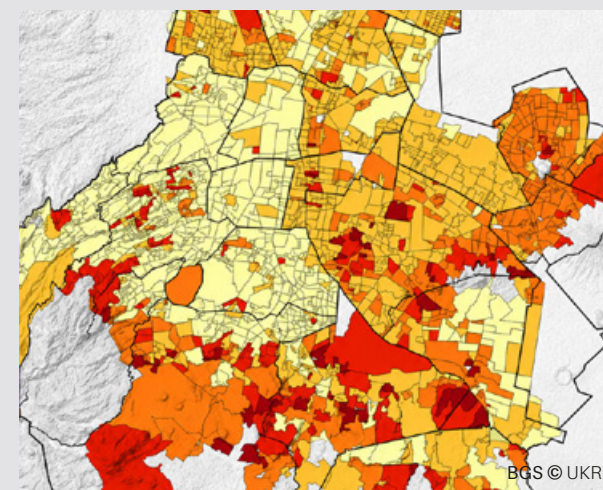
The approaches developed in the project could potentially transform approaches to water management, sustaining a resilient future where communities have reliable and equitable access to clean water and are empowered to adapt to the challenges of climate change.

PARTNERS

- Architectural Association School of Architecture
- Isla Urbana
- Universidad Autónoma Metropolitana
- University College London

This project created innovative and transferable approaches to assess and enhance water security in Mexico City, providing a pathway for reduced vulnerability, access to cleaner water and a greener, more adaptable future for millions.

ANDY BARKWITH, BGS SCIENTIST



Geoscience shaping regional development in Peru

Peru's Northern Territorial Corridor presents a major opportunity to deliver sustainable and inclusive regional growth by integrating mining, infrastructure, water security and community development.

The region has strong potential for a diversified economy, supported by mining, agriculture and improved infrastructure. However, challenges, including fragmented governance, social conflict, environmental risks and infrastructure gaps, must be addressed to unlock this potential.

BGS is supporting the development of the corridor by embedding geoscientific evidence into planning and decision making. Our work helps to:

- identify resource potential, geohazards and climate risks
- support integrated, system-wide planning
- highlight key bottlenecks for targeted action
- strengthen resilience through environmental and social mitigation

Our findings show that coordinated planning, shared infrastructure and inclusive stakeholder engagement are critical to success.

By placing geoscience at the heart of development, BGS is helping to ensure that the corridor delivers long-term, resilient and equitable benefits for communities, industry and the environment.



PARTNERS

- British Embassy
- Geological Mining and Metallurgical Institute of Peru (INGEMMET)
- Multiple industry, academic and non-governmental organisation partners
- National and local government authorities

BGS is working together with the British Embassy and local stakeholders to deliver geoscience expertise that will facilitate corridor development.

ANDREW HUGHES, BGS SCIENTIST



THEME THREE

Resource and security

Global concern is increasing over the long-term availability of secure and sufficient supplies of the minerals and metals required to support a fair and sustainable future. As demand accelerates, driven by the global transition to low-carbon technologies, pressures on these resources will only intensify. At the same time, climate-sensitive water systems are coming under increasing strain.

Improving how we understand and locate mineral resources is increasingly vital. Advanced approaches, such as three-dimensional geological mapping of deposits across different environments, enable stakeholders to better assess resource potential and make informed decisions about the sustainable development of supply chains. Future water security will depend on integrating hydrogeological knowledge into planning and policy in order to strengthen resilience, support adaptive water management and help communities better withstand the growing risks of drought and climate variability.

RESOURCE AND SECURITY

Case studies

Brazil's Jequitinhonha 'lithium valley'

Supply of lithium for batteries is a critical issue for the modern world as we move rapidly towards electrification of energy and transport. The Jequitinhonha Valley in Brazil is rapidly developing into one of the world's major lithium mining areas, with two active mines and many more exploration projects underway, earning it the nickname 'lithium valley'.

In contrast to the salars (salt flats) of Chile, Bolivia and Argentina, the lithium in Brazil is found in pegmatites, which can be mined through traditional techniques such as open pits or underground mines. To ensure sustainable and inclusive development of the Jequitinhonha Valley, it's important to understand not only which areas are prospective for mining, but also the potential environmental and social impacts of the expansion of mining in the region.

Over the last three years, BGS has developed a partnership with the Serviço Geológico do Brasil (SGB) and the British Consulate in Belo Horizonte. This team is working together to understand the region's geology, mineral prospectivity, hydrogeology and vulnerability to natural hazards,

including engaging with communities to understand the social and environmental sensitivities of the valley.

Working across geological, environmental and social sciences, BGS and SGB are developing ways to support the inclusive and sustainable development of the Jequitinhonha Valley as a fast-developing lithium-producing region.

PARTNERS

- British Consulate in Belo Horizonte
- Serviço Geológico do Brasil

The British and Brazilian geological surveys are working together to ensure sustainable development of Brazil's Jequitinhonha 'lithium valley'.

JON FORD, BGS SCIENTIST



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Understanding glacier, groundwater and wetland contributions to water security in Peru

Glacier-fed catchments in the Peruvian Andes are among the world's most climate-sensitive water systems, with rapid glacier retreat threatening dry-season water availability for hundreds of thousands of people. Our work, undertaken in collaboration with Imperial College London, the University of Birmingham and Peruvian partners including the Consortium for the Sustainable

Development of the Andean Ecoregion (CONDESAN) and the Geological Mining and Metallurgical Institute of Peru (INGEMMET), have developed new ways to understand how future water security will be shaped by shrinking glaciers and the landscape's natural buffering systems.

Focusing on the highly vulnerable Vilcanota-Urubamba Basin in southern Peru, we have applied advanced glacier-hydrology models to simulate the effect of future climate change on more than 500 tropical glaciers and meltwater supply to downstream water users and urban centres. We have also developed the first hydrogeological properties

maps of the region, facilitating new, integrated, hydrological modelling research to quantify how mountain aquifers help sustain dry-season flows and could potentially buffer the impacts of climate change and glacier retreat. Finally, we are using environmental tracers to reveal how mountain wetlands, locally known as bofedales, contribute to dry season flows — an essential natural buffer as glacier melt declines.

Together, these advances provide Peru with the scientific foundation needed to design resilient water-management strategies that will continue to support communities long after the glaciers have gone.



PARTNERS

- CONDESAN
- INGEMMET
- Imperial College London
- University of Birmingham

Our modelling and field research reveal how glaciers, groundwater and high Andean wetlands work together to sustain water supplies for vulnerable communities in Peru.

JONATHAN MACKAY, BGS SCIENTIST

Delivering geochronological solutions for mineral systems exploration

Quantifying geological time is a critical component in de-risking exploration for the next generation of mineral resources within increasingly complex and concealed geological environments. Mineral systems approaches require an integrated understanding of crustal evolution, from terrane assembly and magmatic and hydrothermal processes to deformation, exhumation and basin development.

To address these challenges, BGS works with academic, industry and geological survey partners

across Latin America. Using state-of-the-art analytical capabilities in radio-isotopic geochronology, we develop bespoke workflows and interpretation frameworks tailored to stakeholder needs, ensuring data is both robust and directly applicable to exploration decisions.

Our collaborative research has delivered key outcomes across the region. In northern and central Chile, we have reconstructed exhumation histories and applied isotope mapping to define lithospheric controls on porphyry copper systems, alongside refining high-resolution intrusive and hydrothermal timelines of major deposits. In Argentina and Brazil, carbonate geochronology has advanced

understanding of palaeohydrology, diagenesis and structural evolution in sedimentary basins.

Beyond analysis, we support partners in integrating geochronology into geological models and train the next generation of geochronology specialists, building long-term capability with organisations including Servicio Geológico do Brasil, Universidade Estadual Paulista (UNESP) and the University of São Paulo.

PARTNERS

- Industry collaborators
- Natural History Museum
- Servicio Geológico do Brasil
- UNESP
- University of Bristol
- University of London
- University of São Paulo



Sharing our expertise and technical capabilities with partners across the region has helped deliver novel and practical solutions, whilst building local capacity.

SIMON TAPSTER, BGS SCIENTIST





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