JBA Trust Limited

Annual Report 2024-25

Charity Number: 1150278

Company Number: 07840801

Our highlights in 2024-25

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PhDs completed

NFM literature map

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Postgraduate Scholarship

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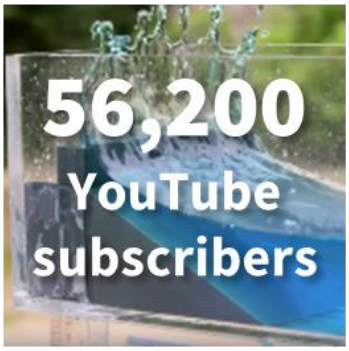

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STEM partnerships

Director's Report

It has been a productive year for the JBA Trust, with new and continued collaborations across research, learning and practice. We continue to build our community of practice for physical models, helping educators and practitioners share ideas and resources that bring water and climate resilience concepts to life. Demand for interactive models is still high, reinforcing the importance of shared learning and open access to technical expertise.

We have deepened several partnerships with universities and research centres, supporting doctoral training and specialist skills development in areas critical to climate risk management. Research training through doctoral programmes takes time, and so it was very satisfying to celebrate the successes of early career doctoral candidates who have received our support through sponsorship and knowledge exchange placements. Our long-term commitment to doctoral training continues, and we were delighted to start new projects exploring flood risk modelling, community resilience and changing weather patterns. We also maintained our bursary and scholarship programmes to help postgraduate students access advanced training.

Our research outputs reflect a strong year with peer-reviewed papers, new tools to map evidence on nature-based solutions, and a Maths for Humanity knowledge exchange catalyst to connect mathematicians and hydrologists. Artificial Intelligence remains a major theme, with contributions to studies on model transparency and the behaviour of large language models, and through initiatives exploring AI's role in adaptive pathways for environmental decisions.

Engagement activities reached large communities of learners and educators through projects such as Future Climate Engineers, TeenTech, and the Morecambe Bay Curriculum. We co-created resources for schools, delivered water safety workshops with fire and rescue teams, and supported science festivals with dedicated volunteers. These efforts, alongside new digital resources like the Coastal Resilience Challenge game, reflect our commitment to inspiring the next generation and encouraging participation.

I am grateful for the continued support and guidance of our trustees, for the funding and in-kind support donated by the JBA Group of companies, and for the many contributions made by our colleagues.

Rob Lamb, Managing Director

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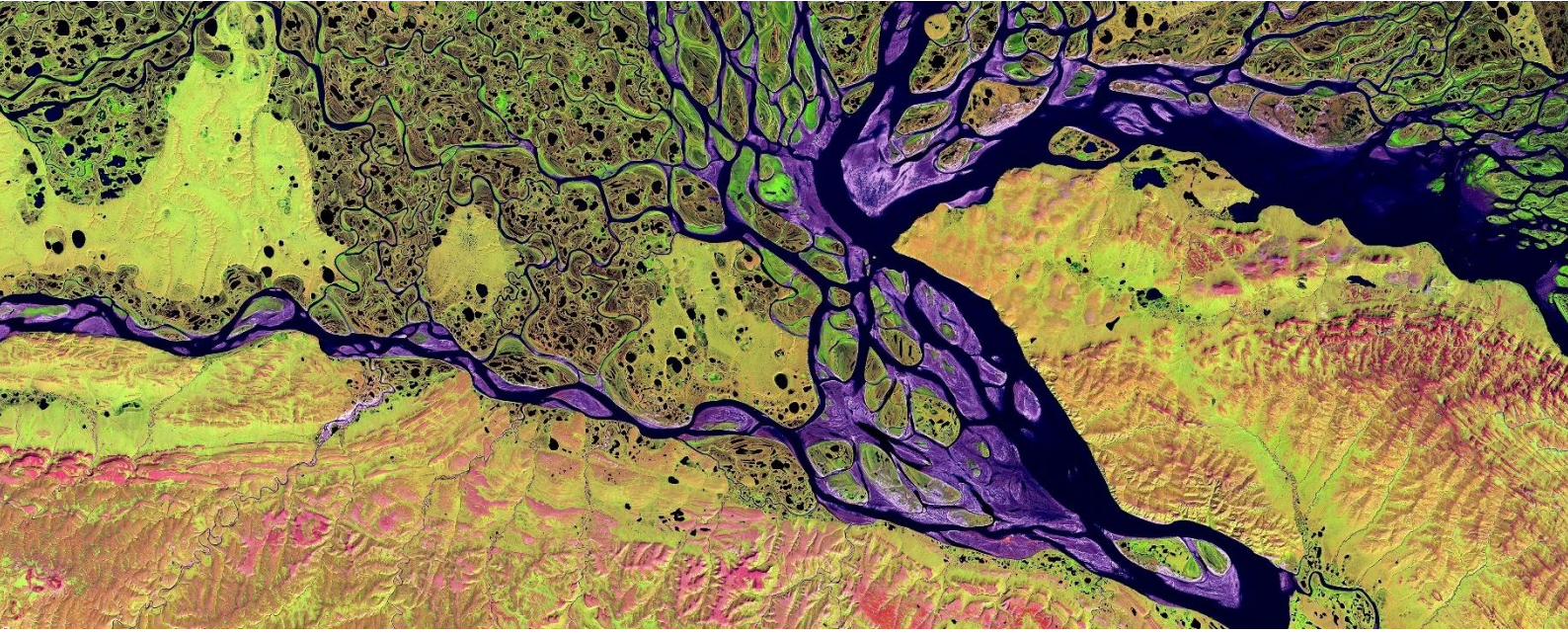
Page 10: Bangladesh coastline on the Bay of Bengal. The Sundarbans mangrove forest, a protected UNESCO area, appears as dark green on the left side of the image. The right side of the image shows agricultural lands and urban areas as light tan and grey. Landsat 9 natural colour image *((United States Geological Survey on Unsplash)*

Page 12: Working with North Yorkshire Fire and Rescue Services, the JBA Trust team deliver STEM and water safety sessions for primary schools at Settle College as part of Big Bang Primary Science Day 2025.

Page 15: Coastal artwork by local artist My Dog Sighs in Portsmouth *(photographed by Linley Hastewell as part of our Coastal Resilience StoryMap learning resource)*



Our purpose and activities

JBA Trust is a charity established and funded by the JBA Group of companies.

We support research and promote the shared learning and skills in climate resilience and risk management in the water cycle.

We work with academic researchers, NGOs, charities and public sector organisations to

- facilitate collaboration between academia and industry to deliver high quality scientific research
- publish and share knowledge
- enhance learning and skills by supporting specialist post-graduate training
- engage with educators, charities and voluntary groups to create, develop and share learning resources.

This annual report reviews the activities of the JBA Trust over the past year and how our work has delivered public benefit.

Science and research collaboration

We facilitate collaboration between the academic research and practice communities, connecting people and ideas. By publishing and sharing research outputs, we enable knowledge exchange and share emerging understanding of best practice.

This year, we continued to work with universities, research institutions, public sector and charitable organisations. Some of the highlights and outputs of our collaborative research projects are summarised here.

Mathematics Knowledge Exchange Catalyst

We have been working with Dr Phil Trinh from the Department of Mathematical Sciences at the University of Bath to bring together the mathematical and flood modelling communities to improve flood hydrology. The project ‘Upstream insights to downstream benefits’ aims to help both researchers and practitioners understand the role of mathematical analysis to support decision making in flood risk applications.

Over the year we have hosted Dr Trinh to share examples of real applications of mathematical modelling in hydrology and have explored how mathematics can be applied to provide insights about the behaviour, calibration and robustness of rainfall-runoff models.

The project has supported two student mathematics projects and in our reporting year 2024-25 we planned to connect the research and practice communities at a knowledge exchange and scoping workshop in Bath.

The collaboration has benefitted greatly from funding by the Knowledge Exchange Catalyst programme at the International Centre for Mathematical Sciences.

Explore: KE Catalysts for Humanity

Mapping scientific evidence about working with nature to reduce flood risk

Working with natural processes can help to protect, restore and emulate the natural functions of river basins, floodplains and coasts to reduce flood risk whilst providing other benefits. This concept of working with nature is sometimes also called Nature-based Solutions (NbS) or Natural Flood Management (NFM).

This year, we published a new database and interactive maps that show places that have been mentioned in research studies about working with nature published between 2017 and 2023.

Our aim was to build up a geographical overview of the literature that can be explored spatially, recognising that NbS are inherently place-based and that research findings may be specific to a particular locale or geography.

Explore: NbS NFM Research Literature Map

MARS: Mathematics for AI in Real-world Systems

MARS (Mathematics for AI in Real-world Systems) is a centre for research and teaching in mathematics underpinning applications of Artificial Intelligence (AI) to real-world systems.

We worked with MARS to host a workshop in June 2025 on the topic “Can AI help us formulate adaptive pathways for decisions about the environment?”. We were delighted to contribute the keynote presentation at the first MARS showcase event in September 2025, discussing the role of AI in climate resilience.

Explore: MARS: Mathematics for AI in Real-world Systems

UK Flood Hydrology Roadmap

The flood hydrology roadmap is a 25-year vision and plan to advance all aspects of flood hydrology in the United Kingdom. It was developed with inputs from more than 270 individuals from 50 organisations working in hydrology, flood management and related topics. We have supported the roadmap project since it started in 2018 through membership of its steering group and by contributing to publications and presentations.

We have continued supporting the roadmap through contributions to the Science and Technical Advisory Group, and by providing specific advice for projects developing within the Environment Agency’s Flood Hydrology Improvements Programme.

Explore: UK Flood Hydrology Roadmap

Doctoral training and research

Our collaboration with universities across the UK enables us to support graduate researchers (research students) working on doctoral projects to develop advanced skills and deliver high quality research that helps enhance the understanding of a wide range of risks in the water environment. We support doctoral researchers through a variety of programmes including doctoral training centres funded by UK Research and Innovation (UKRI).

This year, we supported 11 PhD students and were delighted to see two of our graduate researchers successfully complete their PhDs:

- **Freya Muir**, studying at the University of Glasgow, developed an operational framework for predicting coastal change, using machine learning techniques that are trained with satellite observations.
- **Luke Jenkins**, studying at the University of Southampton, explored the impact that sequences of storm events have on the dynamic response of hard and soft coasts and the subsequent impact on communities living in the coastal zone.

Information about all our PhD projects can be found here: Early career researchers

PhD project outputs

We are pleased to be able to share this year's peer-reviewed publications from the projects.

Tharindu Manamperi, studying at Swansea University, published a paper in Coastal Engineering on *'Predicting shoreline changes using deep learning techniques with Bayesian Optimisation'.* Tharindu found that deep learning techniques have the potential to reliably predict shoreline change. Tharindu's research also highlighted the importance of data quality and resolution in improving the performance of the models.

The paper is available here: https://doi.org/10.1016/j.coastaleng.2025.104856

Luke Jenkins published a paper in Natural Hazards on "*Assessing the temporal clustering of coastal storm tide hazards under natural variability utilising a near 500-year model run*". Luke's research provides evidence for how often consecutive storms, big waves or high tide events occur over a short period of time (known as clustering) around the UK. For example, for storm surges and still sea levels, the North Sea has the lowest proportion of clustering, whereas the North Atlantic and Bristol Channel have the highest. This will help coastal stakeholders evaluate the threat of surges, waves, and sea levels clustering over short periods.

The paper is available here: https://doi.org/10.1007/s11069-022-05617-z

Support for Doctoral Education

We work closely with university partners to support the specialist doctoral-level research training in themes of climate resilience, uncertainty and risk, and the underpinning data science that supports evidence-led decision making about the environment.

As well as helping to identify knowledge gaps and needs within these themes, we actively engage with programmes funding doctoral research to support research students by providing co-funding, technical supervision and placements.

We have engaged with the following programmes:

- Fluid Dynamics CDT (University of Leeds)
- STOR-i: Statistics and Operational Research CDT (Lancaster University)
- FLOOD-CDT (Southampton, Loughborough, Bristol)
- UNRISK: Understanding Uncertainty to Reduce Climate Risks CDT (Leeds, UCL, Exeter)
- SAMBa CDT (University of Bath)
- ExaGEO DLA (Glasgow, Edinburgh, Lancaster)
- Scenario DTP (Reading)
- IAPETUS DTP (Durham, Heriot Watt, Glasgow, Newcastle, St Andrews, Stirling)
- INSPIRE DTP (Southampton)
- i-RISK DLA (Loughborough, Newcastle, Manchester, British Geological Survey)

Research publications

During the year, we supported and co-authored six studies published as papers in peer-reviewed scientific journals.

Title and link	Journal	Authors
Global sensitivity analysis of large-scale flood loss models	EGUsphere	Pianosi, F., Sarailidis, G., Styles, K., Oldham, P., Hutchings, S., Lamb, R., and Wagener, T.
Are LLM Belief Updates Consistent with Bayes' Theorem?	ICML 2025	Imran, S., Kendiukhov, I., Broerman, M., Thomas, A., Campanella, R., Lamb, R., & Atkinson, P. M.
Predicting shoreline changes using deep learning techniques with Bayesian Optimisation	Coastal Engineering	Manamperi, T., Rahat, A., Pender, D., Cristaudo, D., Lamb, R., Karunarathna, H.
Stress-Testing Road Network in Great Britain with Historical Flood Events between 1953-2024.	Transportation Research D	Li, Y., Pant, R., Russell, T., Thomas, F., Hall, J., Oldham, P., Lamb, R., Young, P.
Assessing the temporal clustering of coastal storm tide hazards under natural variability utilising a near 500-year model run	Natural Hazards	Luke Jenkins, Ivan Haigh, Hachem Kassem, Douglas Pender, Jenny Sansom, Rob Lamb, Tom Howard
Characteristics of gauged abrupt wave fronts (walls of water) in flash floods in Scotland	HESS	Archer, D. R. and Fileni, F. D. M. and Watkiss, S. A. and Fowler, H. J.

Support for postgraduate students

There are many academic subjects that generate the knowledge and understanding needed to tackle complex environmental challenges. Undergraduate courses are important and provide a strong foundation, however there is a greater focus on specialist skills and advanced knowledge at postgraduate level. We therefore prioritise funding and resources for students and projects at this stage.

The British Hydrological Society and JBA Trust Studentship Awards

In 2024-25 we continued our partnership established in 2011 with the British Hydrological Society (BHS) to support students working towards MSc (or equivalent level) qualifications in hydrology, water resources, catchment management and other related subjects. Graduates of master's courses play a vital part in the future management of the water environment.

We awarded five bursaries of £2,800 and have now made awards to 118 students at 25 different UK universities since 2011.

Flood and Coastal Risk Management Scholarships

The challenges of more frequent extreme weather and new flood risk responsibilities mean that there is a growing need for skilled water and environmental risk management professionals.

Since 2014, we have funded 19 scholarships for Lancaster University's Flood and Coastal Risk Management Postgraduate Certificate course. We continued our support this year to help individual recipients bring benefits to communities through third sector or public sector organisations.

We made one scholarship award to Emily Andre, a Flood Engineer in the Flood Risk Management Team at North Yorkshire Council. The scholarship will fully fund the course fees of £6,040.

Learning and engagement activities

We support a wide range of activities aimed at encouraging students at schools and universities to develop or enhance their interests in water and environmental management, which could also ultimately lead them to pursue careers in the field. Our learning and engagement activities also extend to the wider community, and to flood risk management professionals.

STEM partnerships

STEM is science, technology, engineering and maths. This year, we focused on developing partnerships with organisations that have strong relationships with local communities or have a well-established outreach and engagement track record. We worked with many different organisations to co-develop learning resources and deliver activities to support STEM engagement, enabling us to utilise our resources effectively and reach diverse communities.

Diversifying participation in STEM remains a key challenge within the water and environmental management sector, and we continued to use the ‘STEM Equity Compass’ tool in our outreach and engagement activities to help us improve the inclusivity and equity of our informal STEM learning offer.

We supported the ‘Plugging the Leaks’ project with the University of Southampton as part of NERC’s Opening up the Environment programme. The programme aims to support the environmental science community to increase diversity of representation and attract a wider talent pool to contribute to tackling environmental challenges. The project will develop and evaluate interventions that reduce barriers to studying environmental science degree subjects for underrepresented students as they progress from GCSEs to A-Levels (and equivalents), into university and beyond.

Future Climate Engineers

Future Climate Engineers is an engineering design challenge for Key Stage 3 (KS3) students to explore how flood risk can be managed in a changing climate. Over 60 students attended interactive workshops hosted at the University of Leeds to learn about fluid dynamics in the environment and flood risk management. We trained PhD students from the Fluid Dynamics CDT and water professionals to enable them to deliver wave tank and river flume outreach activities.

The KS3 students applied what they learnt in the workshops to develop their own designs for a flood risk demonstrator to be built at an outdoor education centre, Nell Bank, which welcomes over 24,000 children from the local area each year. The centre will use the model as part of their River Studies workshops to help primary age students learn about the water cycle and water risks.

We enjoyed supporting the KS3 design teams and, following mentoring and visits to the schools, awarded well-deserved prizes to the teams with the most sustainable and innovative designs.

Future Climate Engineers is led by the Leeds Institute for Fluid Dynamics with support from JBA Trust, Arup, the Environment Agency and Nell Bank. It is funded by the University of Leeds UKRI Higher Education Innovation Funding (HEIF) scheme.

Morecambe Bay Curriculum

The Morecambe Bay Curriculum (MBC) project is a community-curated, place-based approach to learning about sustainability. MBC is supported and delivered by teachers, early years practitioners, researchers, health professionals and community leaders working together to improve resilience to climate change and create opportunities for young people.

Following a successful collaboration with Myerscough College in 2024, we started a new project to co-design specialist learning resources that focus on coastal resilience. We are working with Shakespeare Primary School in Fleetwood and look forward to co-creating resources that incorporate the innovative work being delivered by Our Future Coast to test how natural coastal habitats, like salt marsh and sand dunes, can help protect the coast. The project is supported by widening participation funding from Lancaster University and Our Future Coast.

Big Bang Primary Science and Water Safety

In partnership with the North Yorkshire Fire and Rescue Service, we delivered 20 interactive sessions to over 120 primary pupils with our river flume and wave tank models as part of Primary Big Bang Science Day at Settle College. The event aimed to inspire a lifelong interest in science and STEM subjects and is part of the ongoing collaboration and knowledge exchange between primary and secondary science leads to help improve science provision in schools. As part of Drowning Prevention Week 2025 we also shared key messages about water safety in rivers and at the coast.

CityZen

Led by the Institution for Civil Engineer's Engagement and Inspiration team, the CityZen competition aims to engage school students with civil engineering and help them develop skills such as problem-solving, teamwork, critical thinking and communication. Student teams develop the infrastructure for a town within the context of climate change, flood risk and sustainability.

We supported the judging and awarded the 'JBA Trust Prize for People and Nature Positive Innovation' to an all-female team from Rochdale who designed a city concept that balanced urban growth with environmental protection, integrated green spaces, biodiversity, and sustainable infrastructure to create a nature-friendly urban environment.

SOTSEF25

As part of British Science Week, we worked with the University of Southampton's Public Engagement with Research unit (PERu) to support Science and Engineering Day 2025. This free festival was attended by over 5000 people, and through our wave tank activity we talked with people about climate change resilience on our coastlines and explored engineering for adaptation.

TeenTech

We attended the Cardiff and Lancashire TeenTech Festivals along with over 1000 students between ages 10-14 and their teachers. We delivered multiple hands-on sessions with our wave tank to help explore careers, skills and challenges in environmental engineering. TeenTech Festivals aim to help young people understand the range of opportunities across digital, science, technology and engineering.

Enabling knowledge exchange

Our website (www.jbatrust.org) enables people to access our publications and educational resources, as well as find information about JBA Trust and our research projects. It continues to help us deliver our charitable objectives of sharing knowledge and supporting engagement and learning.

JBA Trust's YouTube channel hosts all our video resources and we now have over 56,000 subscribers. We also use social media platforms like LinkedIn to publicise research outputs, new resources, publications, scholarships and awards.

Interactive physical models

Our physical models of catchments, rivers and coasts enable us to bring to life topics including flood risk, coastal and river engineering and nature-based solutions. The collection includes hydraulic river flumes, wave tanks, a rain model, an augmented reality sandbox, and a Projection Augmented Relief Model (PARM).

You can find out more about our models here: Physical models

Community of Practice

We maintain an online map to support a 'Community of Practice' for people who use physical models of water to support education and engagement. We created the maps to show where and how interactive models are being used across the globe to help educators share ideas, knowledge and inspiration to support outreach activities.

You can explore our map here: Community of Practice Map: Interactive models of water

Digital learning resources

Our digital learning resources have elements of engineering, maths and geography included in each topic in the context of flood risk, water management, weather and climate. They include videos, worksheet activities, case studies, maps and exercises.

All our learning resources are freely available on our website: Digital learning resources

Sharing experience

In 2024-25 we responded to over 66 direct enquiries about our interactive maps, data, publications and tools as well as research support, bursaries and scholarships, physical models and support for STEM activities.

Of these enquiries, there were 42 requests from around the world for support and assistance from people who, having seen our physical model and weather station resources, would like to build their own or set up their own educational project.

We have responded to schools, universities, environmental charities and emergency services, from the UK, Italy, Denmark, Netherlands, Canada, USA, Germany, Spain, France, Philippines, India, Belgium, France, Australia, India and UAE. By sharing factsheets and detailed specifications for our models, as well as sharing our learning resources and experiences of delivering STEM engagement, we aim to enable people to create their own educational resources to support their communities and raise awareness of flood risk management.

We continue to share our designs for the water safety flume and learning resources with fire and rescue teams and have so far supported services in Leicestershire, London, West Yorkshire, South Yorkshire, Cheshire, North Cumbria, Surrey, Tees, Lancashire, Greater Manchester, Derbyshire, Bury, East Flanders (Belgium) and Oregon and Richmond (USA).

Structure, governance & management

JBA Trust is a company limited by guarantee and is governed by its Memorandum and Articles of Association. It was incorporated on 9 November 2011.

Directors and trustees

The Trustees serving during the year were as follows:

Trustees	Rob Lamb, Managing Director of JBA Trust (JBA)
	Jeremy Benn, Executive Chair (JBA)
	Jim Hall, Professor of Climate and Environmental Risks (Oxford University)
	Keith Beven, Emeritus Professor of Hydrology (Lancaster University)
	Nick Russell, Independent Financial Consultant (retired)
	Joanne Coles, Forecasting Manager (Environment Agency)
	Peter Jimack, Professor of Scientific Computing (University of Leeds)
Secretary	Craig Robson, Company Secretary (JBA)

Governance

The trustees review the activities of JBA Trust every six months to ensure that they are focused on supporting the purpose of the charity. The review also considers the strategic direction of the charity and considers how planned activities will contribute to public benefit.

We have referred to the guidance contained in the Charity Commission's general guidance on public benefit when reviewing our aims and objectives and in planning our future activities.

Appointment of trustees

On incorporation of the JBA Trust, the Board of Trustees was appointed by invitation.

To preserve independence of the JBA Trust from JBA Group companies, which provide part of its core funding, the JBA Trust's Articles of Association stipulate that the number of trustees connected to or employed by JBA Group shall always be less than half of the total number of trustees appointed at any given time.

The trustees are not remunerated (other than payment to cover travel and accommodation costs where required for JBA Trust business).

Trustee induction and training

Periodically, the trustees meet and are briefed on their legal obligations under charity and company law, updates to the Charity Commission's guidance on public benefit, the content of the Memorandum and Articles of Association and the JBA Trust business plan.

Organisation

The Board of Trustees meets every six months and is responsible for the strategic direction and policy of the charity. A Managing Director is appointed by the trustees to manage the day-to day operations of the charity and is supported by a Programme Manager.

Risk management

The trustees have a risk management strategy which comprises:

- An annual review of the risks the charity may face
- Policies and procedures in place to mitigate those risks
- Plans in place to minimise the impact of the risks should they materialise.

The principal risk to JBA Trust is financial sustainability. This is mitigated by having a robust reserves policy and a clear financial plan which is reviewed and subsequently approved by the trustees at the start of the financial year.

JBA Trust adopts policies and procedures from our host, the JBA Group, which are externally validated where applicable. These include policies on: Health and Safety; Sustainability and Environmental Management; Safeguarding; Equality and Diversity; Artificial Intelligence.

Association of Charitable Foundations

As a member of the Association of Charitable Foundations (ACF), we support their vision of diverse, vibrant and effective foundations, working together for social good. We utilise the ACF's Stronger Foundations Initiative resources, in particular the '10 pillars of stronger practice for smaller foundations', to inform our strategy and help enhance our effectiveness.

Financial review

The principal funding source for JBA Trust is JBA Group dividends. JBA Trust also aims to leverage funding for research projects by supporting partners in applying for funding from external organisations, for example UK Research and Innovation (UKRI) grants awarded to university partners for PhD studentships. We also generate a small amount of additional income from services such as hire of our physical models for use by commercial organisations. Personal donations are processed through an online giving platform that enables Gift Aid to be claimed efficiently.

Reserves Policy

Reserves are required to minimise the financial risks associated with the unlikely event of unplanned or unforeseen expenditure. The JBA Trust maintains sufficient reserves to cover all contractually committed expenditure or liabilities and operating costs for one year.

Plan for future periods

JBA Trust anticipates continued long-term funding from JBA Group. To ensure that the charity maximises the value of its income in carrying out its activities, the strategic plan focuses on continuing to seek match funding for research projects from funding bodies, including Universities and Research Councils. In the future JBA Trust may also wish to generate an income by licensing datasets, results or models generated by research.

The trustees declare that they have approved the Trustees Report above.

On behalf of the trustees

Rob Lamb, Managing Director of JBA Trust 23 December 2025