JBA Trust Limited

Annual Report 2020-21

Charity Number: 1150278

Company Number: 07840801

JBA Trust is a charity that aims to help people improve resilience to environmental risks through research, education and knowledge exchange

We work with leading academic researchers, NGOs, charities and the JBA Group of companies in four key areas:

Providing training and education in schools and in the water management community

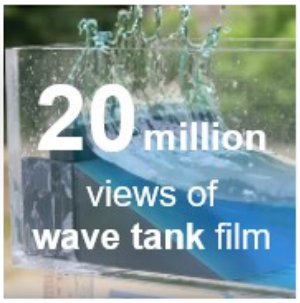
Facilitating collaboration between academia and industry to deliver high quality scientific research

Supporting post-graduate education by providing technical expertise and financial bursaries for MSc and PhD studentships

Publishing and disseminating research outputs, enabling knowledge exchange and sharing good practice

12 scholarships and bursaries with funding

8 peer-reviewed papers published


20 million views of **wave tank** film


New **weather** and **climate** learning resources

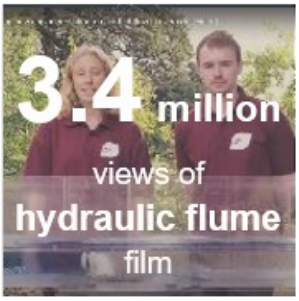
7 MSc projects, and placement students

20 flood risk & STEM education events

50k YouTube subscribers


New **weather station** film


4 new PhD projects


3.4 million views of **hydraulic flume** film

10 physical models

Water safety partnership with Fire & Rescue Services

5 short films 'Careers for our future environment'

Director's Report

On behalf of the Trustees, I am pleased to present the JBA Trust annual report for the year November 2020 to October 2021.

This year saw continued impacts of the Covid-19 pandemic, which affected our ability to run in-person meetings and events. We have been able to adapt to the challenges by continuing to develop our digital content, along with the use of online systems to hold "live" engagement events remotely. Despite the benefits of online technology, in-person events are still our preferred way to engage with groups using our physical models. Thankfully, we were able to resume some activity during the summer and to begin planning future events.

We are primarily a knowledge-sharing charity, and so partnerships are vital to our work. We were able to continue building both existing and new partnerships during the year, including support for the inaugural Institution of Civil Engineers David Butler Award and CityZen competition for students aged 16-18 years. Another highlight has been our links with the Fire and Rescue Service that are helping to develop new water safety resources.

Our support for scientific and engineering research continued to grow through our programme of sponsorship and in-kind assistance for postgraduate researchers, and our collaborative projects with universities. Investment in supporting doctoral researchers delivers public benefit through the knowledge that they publish, and through the professional research skills and training that they acquire. This year, one of our sponsored PhD students graduated and another is about to compete her thesis. Meanwhile, we continue to contribute to peer-reviewed journal papers in collaboration with our university partners, and to develop a pipeline of future projects. As in the previous year, it has been inspiring to see how our sponsored students and academic partners have adapted to the challenges of the pandemic.

We have continued to support students on taught programmes through online work placements and technical assistance with dissertation projects. Working with industry partners, we also provided financial help for 12 new postgraduate students entering taught courses related to water or environmental management and engineering.

As ever, I am grateful to the JBA Group of companies for their continuing commitment to fund and host the JBA Trust, and to individual colleagues for giving their time and energy. We also thank the many partners we work with collaboratively, helping us to deliver on our charitable objectives.

Professor Rob Lamb, Managing Director

Contents

1 Our purpose and activities

Our aim is to enhance resilience through better understanding and management of risks in the environment. We do this by enabling research, education and training.

Our activities for the year reflect the Trustees' consideration of the Charity Commission's guidance on public benefit. The major areas of activity are:

- Providing water management training and education in schools and in the flood risk management community;
- Support for post-graduate education through provision of technical expertise and financial bursaries for MSc and PhD studentships;
- Facilitating collaboration between academia and industry to deliver scientific research that improves society's understanding and management of environmental risks and resources;
- Publication and dissemination of research outputs, enabling knowledge exchange and sharing best practice;
- Sponsorship of relevant conferences to enable students in higher education or early career professionals to attend.

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

2 Environmental education and training

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 education and training activities also extend to the wider community, and to flood risk management professionals.

Digital learning resources

We created a package of online learning resources to support the STEM (Science, Technology, Engineering and Maths) curriculum in response to the restrictions of the first COVID-19 UK lockdowns in early 2020, when our normal educational outreach activities in schools and to the wider community were significantly limited. This put us in a good position to be able to continue our educational support activities during the subsequent lockdowns in this reporting year (Nov 2020 to Oct 2021) and also enabled us to reach a much wider audience.

Our digital learning resources have elements of engineering, maths and geography included in each topic in the context of flood risk and water management. They are packaged by age group (for schools) and include videos, worksheet activities, puzzles, case studies and exercises. In 2020-21, we developed and published new learning material on weather and climate change. The resources focus on understanding the principles of weather monitoring, why it is important and how this links to weather hazards and our changing climate.

We also developed maths resources in partnership with the North Yorkshire STEM Hub, supported the Mathematics Teacher Training Scholarship scheme and the Coastal Alliance Science Network events, and plan to continue to work with these organisations to highlight how maths is used in a wide variety of careers, including flood risk management, civil engineering and hydrology, and to support teachers and STEM/careers activities in schools.

The learning resources can be accessed and downloaded at www.jbatrust.org/how-we-help/learning-resources/.

Careers for our future environment

This year we have focused on creating video content to help inspire young people and to provide an insight into a variety of environmental science and engineering career opportunities.

Our series of five short 'Careers for our Future Environment' videos can be viewed on our YouTube careers playlist.

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. At the beginning of 2020-21, the COVID-19 restrictions limited in-person events and we responded by delivering live 'virtual' demonstrations for schools to support the school STEM curriculum and highlight careers in environmental risk management. However, as restrictions eased, we were able to meet the significant increase in demand from primary and secondary schools for engaging and interactive demonstrations using the physical models.

Our suite of physical models includes four different sized hydraulic flumes, four wave tanks, an AR (Augmented Reality) sandbox and a PARM (Projection Augmented Relief Model). During 2020-21, the models were used at 20 events, including a secondary school session for 120 students on how maths is used to understand and mitigate coastal flood risk; and a primary school session for 90 students on river engineering and flood risk management.

An overview of our physical models is provided below.

Hydraulic flumes

Our hydraulic flumes all show the flow of water in a simple channel, driven by a system of re-circulating pumps. Scale models of typical engineered structures such as weirs, bridges, culverts and debris screens show how different structures interact with the flow and affect flood risk.

The sectional flume (shown below) is the latest addition to our collection and is built in sections which can be clipped together in different combinations. It is specifically designed to demonstrate culvert and debris screen hydraulic behaviour and also includes models of pipes, arched culverts, service crossings and weirs.

The flume collection comprises:

- Trailer flume – our first mobile river flume
- Free-standing flume – our largest single section flume
- Mini flume – a portable flume for use in the classroom
- Sectional flume – our most versatile flume

In partnership with the North Yorkshire Fire and Rescue Service and Hydrotec Consultants, we have also started to develop a new river flume to demonstrate water safety. We plan to co-create learning resources on water safety around river features and engineered structures, including weirs, waterfalls and strainers (culvert screens and debris).

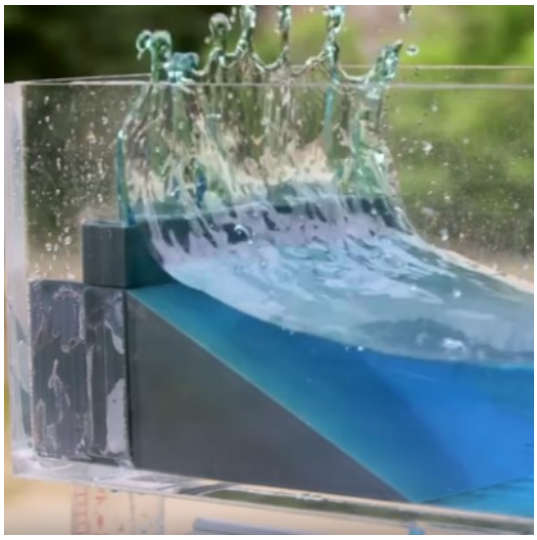
The current video of the mini flume has a comprehensive commentary on how engineered structures affect flow in rivers and has had 3.3 million views on YouTube.

Wave tanks

In the wave tanks, different types and combinations of coastal defences can be demonstrated, and their effectiveness at preventing overtopping and flood risk tested. It is portable and easy to set up in a classroom.

Our wave tank video shows the rates of overtopping for a beach during a storm surge, vertical and recurved sea walls, stepped and sloped revetments, rock armour and submerged near-shore breakwater.

The video has had 20 million views across various social media platforms, including the JBA Trust YouTube channel, and is also being used as a resource to support the Geography GCSE AQA curriculum.



PARM

PARM (Projection Augmented Relief Model) tools use a 3D printed landscape based on remotely sensed terrain data to create an accurate model that is then augmented with projected images, for example of areas at risk of flooding.

PARM technology can make complex spatial information about landscape and the environment much easier to understand and can be used to support engagement with a variety of audiences including communities, schools and flood risk professionals.

We are continuing our collaboration with Dr Gary Priestnall at the University of Nottingham to investigate how effectively PARM technologies can communicate flood risk concepts and support decision making, compared to using traditional paper map-based imagery.

Augmented Reality Sandbox

The sandbox is a very interactive visualisation tool that shows how topography affects water moving through a catchment. Participants can shape the sand to create their own river catchments and valleys which are then 'augmented' in real time by a projector which shows a coloured elevation map and contour lines. Virtual rain can be introduced to explore how catchment management and river engineering can affect the flow of water.

The sandbox was used at various events, including at Great Ouseburn Primary School to help primary school pupils learn about water cycle processes in June 2021, and at the community launch event for the Skell Valley Project hosted by the National Trust in September 2021.

Weather station

We installed a wireless Davis Vantage Pro 2 automatic weather station and manual rain gauge at our Broughton Park office near Skipton, North Yorkshire.

The weather station measures air temperature, humidity, wind speed and direction, rainfall and pressure. In addition, a manual rain gauge is read at 09:00 GMT each day for calibration purposes.

Data recorded from this weather station is freely available for use by schools, universities and communities. It can be used for a variety of educational projects, for example weather reporting, understanding meteorological measurements and data handling. Real time weather information is available on our weather station dashboard.

Flow meter

Our Valeport 'Braystoke' Model 001 flow meter is an easy to use and reliable method of measuring water velocity in a variety of open channel environments, including salt, fresh and effluent water, from shallow streams to tidal waterways, and is ideal for field study use and hydrometric work.

The portable flow meter and display unit are particularly useful for education and outreach activities, research and monitoring projects and flow gauging technique training.

This year, we have been developing resources to support its use by students, professional groups and communities. The resources are freely available on our flow meter webpage.

3 Science and research

One of our aims is to facilitate collaboration between academia and industry and deliver scientific research that improves society's understanding and management of environmental risks. We publish and disseminate the resulting research outputs, enabling knowledge exchange and sharing best practice.

Collaborative research

In 2020-21 we worked with universities, research institutions, public sector and charitable organisations. We are pleased to report on the good progress of the following collaborative research projects.

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 has been developed with inputs from more than 270 individuals from 50 organisations working in hydrology, flood management and related topics. The Environment Agency led and coordinated the roadmap's development on behalf of the wider flood hydrology community in the UK, which includes government organisations, academia and industry.

We have supported the roadmap project since it started in 2018 by participating in its steering group to provide advice, direction and peer review throughout the project.

During this reporting year we also co-presented a British Hydrological Society webinar to provide an update on the roadmap and to outline the delivery plan for its first 7 years.

Watch:
Flood hydrology roadmap

DRIFT Future Leaders Fellowship

Partners: **University of Oxford**

We are supporting Professor Louise Slater's Future Leaders Fellowship "Dynamic Drivers of Flood Risk (DRIFT)", which aims to develop a more comprehensive and holistic understanding of flood non-stationarity. It will support stakeholders in making the best planning decisions to manage flood risks while achieving other co-benefits.

This 4-year UKRI funded Fellowship has been co-designed with key partners including the Environment Agency, Flood Forecasting Centre, European Weather Centre (ECMWF), UK Centre for Ecology and Hydrology, Met Office, JBA, and United States Geological Survey.

Our support has included co-authorship of a paper on global changes in river floods, published in the journal Geophysical Research Letters.

The work showed that for floods with return periods of between 20 and 50 years, there is evidence of increased flood hazard in temperate climate zones, whereas there has been a decrease in flood hazard in arid, tropical, polar and cold zones.

Results for more extreme events (e.g. 100 years) were slightly different, with decreases in arid and temperate zones, mixed trends in cold zones, and increases at a small sample of tropical sites.

Access: **Global changes in 20-Year, 50-Year, and 100-Year River Floods**


AGU

Geophysical Research Letters

RESEARCH LETTER

Global Changes in 20-Year, 50-Year, and 100-Year River Floods

The role of Digital Technologies in understanding, mitigating and adapting to environmental change

Partners: Lancaster University

We have been supporting a 5-year EPSRC funded research project at Lancaster University led by Professor Gordon Blair, looking at three areas of innovation: the Internet of Things (IoT), cloud computing and data science. In the first year the team focused on utilising digital technologies to enhance flood modelling within a concentrated programme of agile development – a "Flood Modelling Sprint".

We co-hosted and participated in workshops with the Lancaster University team in 2017 and 2018 to identify industry drivers and technology needs in applications of flood risk modelling. A wide range of organisations were part of this process including the Environment Agency, ECMWF, United Utilities, Oxford University, CEH and JBA.

The outputs of the workshops have been incorporated into the following research papers:

- Digital technology for "Models of Everywhere" (Blair, G. et al.) published in Environmental Modelling and Software.
- "Rethinking data-driven decision support in flood risk management for a big data age" (Towe et al.) published in Journal of Flood Risk Management.
- "The Role of Digital Technologies in Responding to the Grand Challenges of the Natural Environment: The Windermere Accord" (Blair et al.) published in the journal Patterns.
- "A semantic approach to enable data integration for the domain of flood risk management" (Nundloll et al.) published in the journal Environmental Challenges.

JBA Trust director Rob Lamb summarised the findings of this partnership by exploring how digital technology can support flood risk management in a podcast called "Rethinking Flood Risk Data".

Listen:
Rethinking Flood Risk Data

DARE - Data Assimilation for the REsilient city

Partners: Reading University

We are working with Professor Sarah Dance at Reading University who was awarded a Fellowship (EPSRC Senior Fellow in Digital Technology for Living with Environmental Change) and is leading the DARE project - Data Assimilation for the REsilient city.

This project has led to the development of a PhD topic on data assimilation using Earth observation data for 2D flood modelling through the SCENARIO DTP (Doctoral Training Partnership) and with help from our sponsors we are supporting a doctoral research student, Helen Hooker.

Yorkshire iCASP

Partners: Led by Universities of Leeds, Sheffield and York, with the National Centre for Atmospheric Science. 16 additional 'springboard' partners (including industry, NGOs and government)

iCASP is a 5-year programme that will utilise £4.5m of NERC funding combined with in-kind and delivery support from partners to inform policy, investment decisions and new practice for regional and national agencies focusing on the Ouse catchment.

It aims to build on NERC-funded science in climate change, flooding, integrated catchment management, carbon storage in soils, water quality and water resources to generate economic, societal and environmental benefits in rural and urban areas of Yorkshire. JBA Trust are a 'springboard' partner and sit on the governance panel.

This year, our technical contribution supported the publication of a paper on "Enhanced Surface Water Flood Forecasts: User-led Development and Testing" (Birch et al.) in the Journal of Flood Risk Management.

This study developed and trialled new surface water flood (SWF) forecast products in a flood incident workshop and makes recommendations for the application of future forecast information and processes.

Access: **Enhanced Surface Water Flood Forecasts: User-led Development and Testing**

RIGINAL ARTICLE

CIWEM Flood Risk Management WILE

Enhanced surface water flood forecasts: User-led levelopment and testing

Cathryn E. Birch | Benjamin L. Rabb | Steven J. Böing | Kay L. Shelton | tob Lamb | Neil Hunter | Mark A. Trigg | Adrian Hines | ndrea L. Taylor | Charlie Pilling | Murray Dale

Abstract

The risk of surface water flooding (SWF) in England is already high and its frequency and severity is projected to increase in the future. SWF generally occurs due to intense, highly localised rainfall, which is challenging to forecast with sufficient accuracy to take proactive action ahead of flood events. Being able to manage the risk effectively lies in improved rainfall and flood forecast products, better communication of uncertainty and building the capacity of local responders. This study utilises state-of-the-art high-resolution ensemble rainfall forecasts and hydraulic modelling tools alongside a novel post-processing method to develop and trial new SWF forecast products within an incident workshop attended by forecast producers and regional forecast users. Twenty-two of 24 workshop participants reported that the new information would be useful to their organisation but more product development and training in its interpretation is required. Specific recommendations to improve SWF forecast provision include increased support for local government through a single government organisation responsible for SWF, making more use of existing static SWF mapping in a real-time context and employing the process of user-based consultation, as outlined in this study, to guide the future development of future SWF forecast information and processes.

KEYWORDS

convective rainfall, engagement, ensemble forecasting, flood forecasting, intense rainfall, pluvial flooding, surface water flooding, user-led testing

1 INTRODUCTION

is estimated that over 3 million properties in England re at risk of surface water flooding (SWF), even more han the 2.4 million at risk from rivers and the sea Environment Agency, 2009). The majority of SWF events occur due to intense, highly localised convecti summertime rainfall, which is extremely challenging forecast (Houston et al., 2011). Rapid urban developme that is reliant on aging drainage systems and increasing intense rainfall as a result of climate change (Blenkinso Chan, Kendon, Roberts, & Fowler, 2015) means that t

Outputs from our other contributions to the Yorkshire Region Climate Change Forum, for example providing case studies and guidance to enable organisations to update existing planning and assessment processes using UKCP18 data, are available below.

Access: **iCASP resources and publications for UK climate projections**

Historical chronology of flash flood and hail events

Partners: David Archer, Newcastle University and Reading University

This year, we added a database to our website, produced by David Archer, that lists flash flood events in Britain derived from historical reports dating back over more than 200 years. The aim is to support improved assessments of flash flood risk for a given location and more generally of catchment vulnerability to flash flooding. Flash floods arising from intense rainfall are rare events at a specific location and there may be few if any recent records. A search of a chronology of more than 200 years provides a better basis for assessing the probability of occurrence than the limited observations currently available, especially for surface water floods.

We have also supported a student dissertation project at Leeds University by Sam Watkiss, who explored the spatial patterns of events within the flood chronology.

This chronology originated in the "SINATRA" (Susceptibility of catchments to INTense RAinfall and flooding) research project that we worked on with Newcastle and Reading universities, within the UK NERC Flooding from Intense Rainfall programme.

Access: **British Chronology of Flash Floods**

Doctoral research projects

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 environment. We support doctoral researchers through a variety of programmes including doctoral training centres funded by UK Research and Innovation (UKRI).

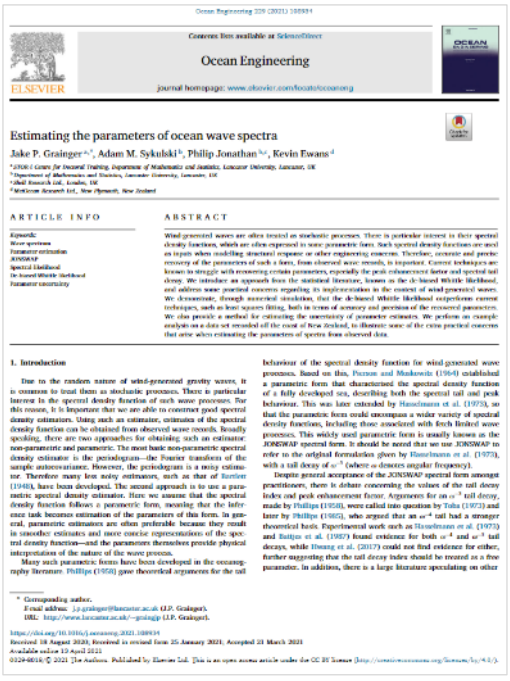
This year, we were delighted to see another one of our research students, Eleanor Pearson, successfully complete her PhD. We also welcomed four new PhD students to our programme. All of the projects will use modelling techniques and new sources of data to help improve our understanding and mitigation of environmental risks.

- Freya Muir is researching coastal erosion real time monitoring and forecasting. The project is based at the University of Glasgow and funded by the NERC IAPETUS doctoral training programme.
- Sohaib Imran is investigating how we can use Earth observation data to assess and visualise spatial climate risks to businesses or sectors. The project is funded by the European Regional Development Fund through the Centre for Global Eco-Innovation based at Lancaster University.
- Helen Hooker is working to improve real time flood forecasting models using data assimilation from Earth observation and point data sources. The project is based at the University of Reading and funded by the NERC SCENARIO doctoral training programme.
- Luke Jenkins is researching the impact that sequences of storm events have on coasts and the subsequent impact on communities living in the coastal zone. The project is based at the University of Southampton and funded by the NERC INSPIRE doctoral training programme.

As our doctoral research programme matures, we are pleased to be able to share outputs of the projects, including peer reviewed publications.

Jake Grainger's paper on "Estimating the parameters of ocean wave spectra" was published in the journal Ocean Engineering and explores statistical techniques to improve the understanding of estimated parameters of wind-generated waves to help oceanographers gain insights into their behaviour.

Access: **"Estimating the parameters of ocean wave spectra"**


Ocean Engineering

Estimating the parameters of ocean wave spectra

All of the projects we supported in 2020-21 are summarised below; more information about each project can be found on the PhD research pages of our website.

Table 1. Summary of doctoral research projects

Topic	Partners	Researcher
Coastal erosion real time monitoring and forecasting	Glasgow University	Freya Muir
Enterprise climate risk modelling	Lancaster University	Sohaib Imran
Storm clustering and its influence on coastal morphology and defences	University of Southampton, Environment Agency	Luke Jenkins
Enhancing forecasting flood inundation mapping through data assimilation	Reading University	Helen Hooker
Understanding and estimating uncertainty in global flood risk models	University of Bristol	Georgios Sarailidis
Modelling wave interactions over space and time	Lancaster University	Jake Grainger
Examining the role of habitat quality in determining river ecosystem resilience to extreme flood events	University of Leeds, Environment Agency	Andrew Johnson
Estimating flood frequency using documentary and floodplain sedimentary archives to extend flood series	University of Lincoln, Environment Agency	Josephine Westlake
Multi-scale sediment and debris impacts of Natural Flood Management (NFM) measures	University of Leeds	Eleanor Pearson
Impact of woody debris on hydro-geomorphological processes and flood risk	University of Leeds, Yorkshire Dales Rivers Trust	Zora Van Leeuwen

Publication summary 2020-21

During the year, we supported and co-authored studies published as papers in peer-reviewed scientific journals. The peer review process can be lengthy, and so some of these papers report on research activity carried out in previous years.

Table 2. Summary of papers published in 2020-21

Title	Journal	Authors	Status
Enhanced Surface Water Flood Forecasts: User-led Development and Testing	Journal of Flood Risk Management	Birch et al.	Published
Estimating the parameters of ocean wave spectra	Ocean Engineering	Grainger et al.	Published
A semantic approach to enable data integration for the domain of flood risk management	Environmental Challenges	Nundloll et al.	Published
Knowledge gaps in our perceptual model of Great Britain's hydrology	Hydrological Processes	Wagener et al.	Published
Global Changes in 20-Year, 50-Year, and 100-Year River Floods	Geophysical Research Letters	Slater et al.	Published
A history of TOPMODEL	Hydrology and Earth System Sciences	Beven at al.	Published
The Role of Digital Technologies in Responding to the Grand Challenges of the Natural Environment: The Windermere Accord	Patterns	Blair et al.	Published
Rethinking data-driven decision support in flood risk management for a big data age	Journal of Flood Risk Management	Towe et al.	Published
Invited perspectives: challenges and future directions in improving bridge flood resilience	Natural Hazards and Earth System Sciences	Tubaldi et al.	Published

4 Support for students in higher education

There are many academic subjects that touch upon our core interests in environmental risks and resources. Whilst undergraduate courses such as Geography and Environmental or Physical Sciences are important, the relevant specialist training often comes into greater focus at postgraduate (masters or doctoral) level. JBA Trust therefore emphasises support for students and projects at this level.

Masters projects

JBA Trust helps provide students with placements, technical expertise and access to software resources and case study data, as well as offering a platform for them to share highlights from their research projects. The students we help have gained insight into how methodologies and techniques are applied in industry and have an opportunity to see how they will be able to use their skills in a future career.

In 2020-21, the JBA Trust helped seven students from the Universities of Leeds, Hull, Sheffield, Nottingham and Lancaster. The students worked with support from our colleagues in the JBA Group of companies on the following MRes, MSc and BSc projects:

- Education and training for building flood resilience capacity in the UK
- Investigating public perceptions and engagement relating to managed realignment
- Natural Capital Valuation for Broughton Hall Estate (MSc and BSc)
- Approaches to Climate Change Risk Assessment
- Development of the Skipton PARM
- Drought resilience assessment using UKCP18

We also support the dissemination and publication of the students' research. Poster summaries of the MSc projects are available on our MSc Research webpages.

The British Hydrological Society, JBA Trust and Environment Agency Studentship Awards

In 2020-21 we continued our partnership with the British Hydrological Society (BHS) and the Environment Agency to support students working towards MSc qualifications in hydrology, water resources, catchment management and other related subjects.

Ten bursaries of £1,500 were awarded and we have now supported 87 students since 2011.

Applications for these bursaries were managed using the web-based system that we developed in 2014 and have maintained since.

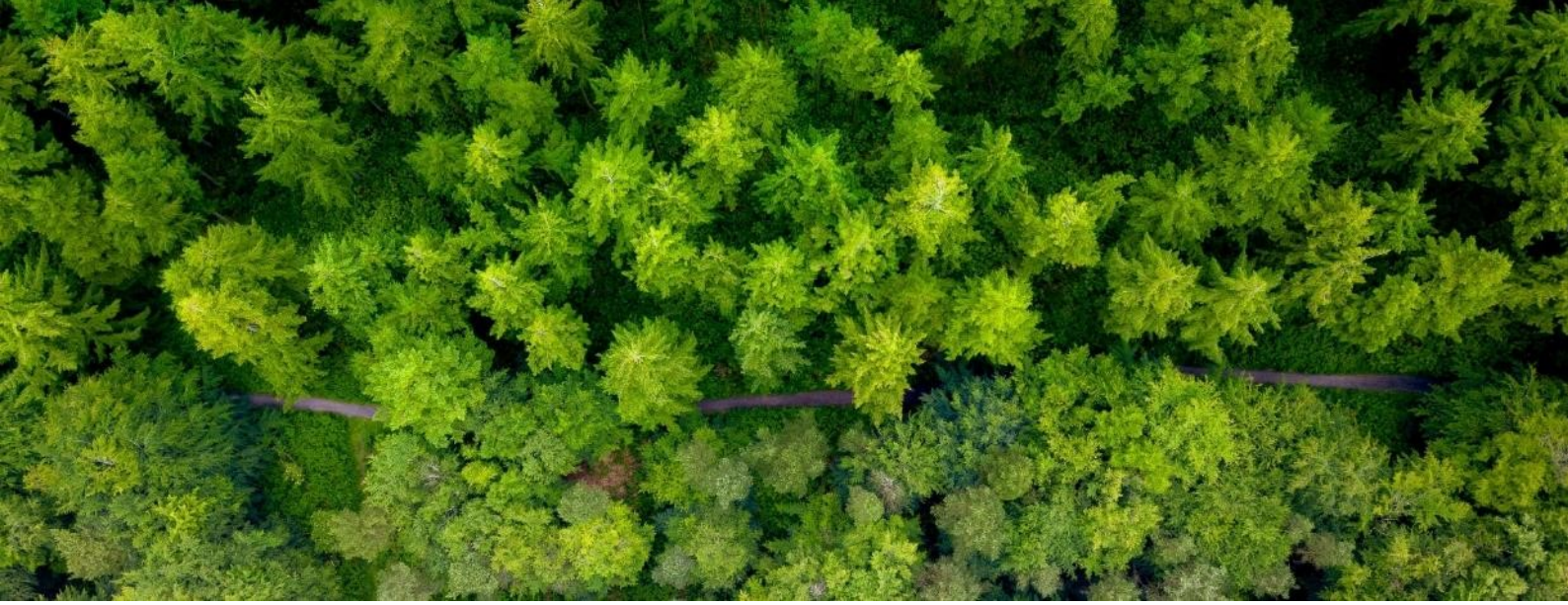
This continued to work well and enabled us to coordinate the assessment process with the BHS and Environment Agency effectively.

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. This year we continued to provide support through our scholarships to fully fund the tuition fees for Lancaster University's Flood and Coastal Risk Management Postgraduate Certificate course.

Congratulations to Will Barber, Flood Risk Engineering & Strategy Officer, Coventry City Council, who successfully completed his PGCert this year. Recipients of the scholarship since 2014 are:

- Rebecca Croft, Assistant Flood & Coastal Erosion Risk Management Officer, Northumberland County Council
- Chloe Langley, Principal Flood Risk Management Officer, Nottingham City Council
- Will Barber, Flood Risk Engineering & Strategy Officer, Coventry City Council
- Michelle Fitzpatrick, engineer at the Vale of Glamorgan Council
- Vikki Teasdale, Senior SuDS Officer at Buckinghamshire County Council
- Allison Chapman, Flood Risk Engineer at Wirral Council
- Daniel Turner, Project Officer at the Yorkshire Dales Rivers Trust
- Peter Burrows, Development Engineer (SuDS) at Gateshead Council
- Faye Tomalin, Engineering Assistant in Flood and Coastal Risk Management at the Vale of Glamorgan Council
- Robin Gray, Pennine Prospects
- Stuart Edwards, North Yorkshire County Council



5 Building our reach and enabling knowledge exchange

Website

Our website enables people to easily access all our publications and educational resources, as well as find information about the Trust and our research projects. Our present website (www.jbatrust.org) launched in April 2016. It continues to help us deliver our charitable objectives of sharing best practice and supporting training and education.

There were over 18,000 pageviews of the website in 2020-21 and we received an average of between one and two enquiries a week through the website about research support, our physical models, bursaries and scholarships and support for educational activities and events.

Social media

We use Twitter to publicise research outputs, new resources, publications or scholarships and awards. The number of **@JBATrust** followers is steadily growing and by the end of 2020-21 we had 892 followers. We also have a Twitter account that shares updates from the weather station based at Broughton Park **@JBATrustWeather**.

YouTube channel

JBA Trust's YouTube channel hosts all our video resources and we now have nearly 50,000 subscribers.

This year we focused on creating video content to help inspire young people and to provide an insight into environmental science and engineering career opportunities including:

- Marine and coastal risk management analyst (Fay Luxford)
- Hydraulic modelling and flood mapping assistant (Conor Cunningham)
- Flood risk science analyst (Heather Forbes)
- Senior flood forecaster (Matt Cowdell)
- Engineer and flood risk specialist (Rebecca Alexandre)

Our most popular video continues to be the wave tank video with 8.1 million views on YouTube, followed by our video of the hydraulic flume which has had 3.3 million views. It has a comprehensive commentary on how engineered structures affect flow in rivers and is also available as seven separate chapters.

Global reach

This year we responded to over 60 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. The contacts came through social media or our website contact us pages.

By sharing factsheets and detailed specifications for our models, we aim to enable people to create their own educational resources to support their communities and raise awareness of flood risk management. In some cases, we have established an on-going dialogue with people who have approached us to help them with their own projects. We have helped high school and college students, university researchers, teachers and private individuals.

6 Directors and trustees

The Trustees serving during the year were as follows:

Trustees	Rob Lamb, JBA (Managing Director of JBA Trust)
	Jeremy Benn, JBA
	Jim Hall, Oxford University
	Keith Beven, Lancaster University
	Nick Russell, Independent financial consultant
Secretary	Craig Robson

7 Structure, governance and 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.

The trustees review the activities of JBA Trust every six months to ensure that they are focussed 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; Energy Use; Environment; Sustainability; Social Responsibility; Equality and Diversity.

8 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 Innovate UK or Research Councils. We also generate a small amount of additional income from hiring out our physical models to commercial organisations (no charges are made for educational or charitable activities). 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 April 2022