

Ecologist research profiles

Here a few of the ecologists involved in the Biodiversity and Ecosystem Service Sustainability (BESS) research programme explain their work and their passion for science. These profiles are aimed at early secondary school students and intend to highlight both the relevance of ecological science to human wellbeing and research as a possible career option.



www.nerc-bess.net



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Dr Ambroise Baker

Ambroise is a post-doctoral researcher at University College London who works on the [Lake Biodiversity and Ecosystem Service Sustainability](#) project.

Lakes provide us with many benefits, such as recreation, fish, flood prevention, water purification and carbon storage to prevent climate change. Unfortunately lakes also face many threats, such as nutrient pollution. I'm studying how loss of biodiversity changes the way that shallow lakes function. These changes might affect the different benefits we receive from these lakes in different ways.

We need to know how to keep lakes healthy and how best to restore unhealthy lakes, so that we can keep getting benefits from them. We know that animals and plants can move easily between some lakes, but not between others. I'm interested in finding out whether or not lakes that are more connected to each other are less likely to lose biodiversity and change than lakes that are more isolated. You can read more about the lake BESS project at <http://lakebess.wordpress.com/>

Before I worked on lakes, I did research on what the European landscape looked like before humans arrived. How many large herbivores like bison and horses were there and how densely did trees grow? I did this partly by looking at fungal spores from fossilised dung. Some people want to 're-wild' parts of our landscape by re-introducing animals that went extinct and are now only found in other countries. Others argue that we should be aiming for fewer large herbivores.



I'm a botanist and have been interested in plants since I kept my first cactus as a child. I was particularly inspired by a trip to South Africa, where there are some truly amazing plants! I'm currently learning more about identifying different species of mosses. You can take a look at some of the plants I've found at <http://ambroisebaker.wordpress.com/>



*Carl Sayer and Tim Grapes during fieldwork in Northern Ireland.
Photograph by Helen Bennion.*

Arjan Gosal

Arjan Gosal is a BESS funded PhD student at Bournemouth University.

I'm interested in the benefits that people get from nature. One of the main ways I research this is by using maps. I build up layers and layers of different types of information, like where different types of habitat are and what people's opinions are about different places. This is a really useful tool for understanding and looking after the places that matter to us. I also collect information and data from the natural world by doing surveys from places like forests to rivers! To do this work I have to be good at biology, geography, computing and statistics, but perhaps most importantly I also have to be good at working with people.



One of my favourite places is the New Forest in Dorset; despite the name it is actually very old and the landscape includes lots of beautiful heathland as well as the trees! At the moment I'm running an online survey asking people who visit, live in or work in the New Forest what habitats or benefits are most important to them.

I've also spent time in Tanzania, Kenya and Mexico doing biodiversity surveys and I enjoy running workshops and teaching students about research outside.

Dr Briony Norton

Briony is a postdoctoral researcher at the University of Sheffield working on the [F3UES](#) BESS project.



Looking for invertebrates in winter, using a 'pooter' and a sieve.

I am an urban ecologist. Ecologists study plants, animals and how they interact with their environment. I do this in 'urban' areas, so in cities and towns, which is where most of us live. I am particularly interested in invertebrates in cities and towns. Most invertebrates are insects, for example bees, flies and beetles. Some other small creatures such as millipedes and spiders are also invertebrates. There are more invertebrates in the world than any other kind of animal, so we're interested in how well they are surviving in cities,

why some things are coping well and others aren't, and also what they're doing in the city that we really need. For example, bees and butterflies are pollinators, which means they help plants reproduce and survive into the future. People need plants for food in particular but for lots of other reasons as well, so that means we really need the help of bees, butterflies and other pollinators.

One of the reasons I like my job is that I get to do lots of different things. In summer, we spend lots of time outdoors, looking at bugs, collecting insects, identifying and measuring plants and taking lots of other measurements, for example about temperature and air quality. Then we spend time in the lab, identifying things we've collected using a microscope. Finally, I spend lots of time at the computer entering data, doing analysis, writing about what we've done, and then planning our next trip out into the field. I get to work with lots of really interesting people and I get to wear jeans to work!

One of my favourite things in the world is a good story, especially one with a mystery in it. I studied lots of different things at school and university, but the stories I liked the best were the ones I learnt in my ecology classes. The best thing is that every story in science is a mystery – even the things we think we know the most about turn out to have hidden surprises for us. As a scientist, you get to help unravel some of those mysteries. When I was at school I mostly learnt about plants and animals on TV or in books, but you can get outside and start making your own observations as soon as you want.

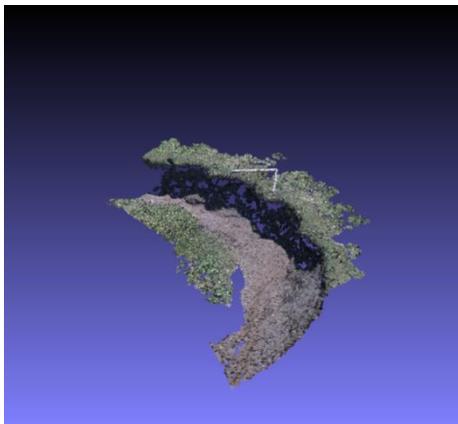


Measuring wind speed and air temperature

Cai John Tomos Ladd

Cai is a PhD student at Bangor University who works on the [CBESS](#) project.

Saltmarshes help us in clever ways – they stop coastal flooding, lock away carbon, and even clean our oceans! Sadly, saltmarshes get damaged by erosion, which is likely to get worse with climate change (causing more storms and increasing sea level). It is important for us to know how saltmarshes might change in the future and how easily they can recover from damage. I'm trying to answer this question: why do some saltmarshes recover from erosion, while others are permanently lost - even when they look the same?



Making a "point-cloud" – A little like Lego, this programme builds a 3D model of my saltmarsh (a creek here), so I can see exactly where erosion happens, and by how much.

I've been using old photographs and 3D models to see how different saltmarshes have been expanding or contracting over time. I'm then trying to find out what causes these changes; is it the plants or the environment that explains differences between saltmarshes? Some of my previous work makes me think that plants are important - having more types of plants on the saltmarsh makes it more likely to resist against and recover from erosion. I'm investigating whether this is because more plants mean more roots, and more roots means more help to bind and trap soil particles together. Larger chunks of eroded soil means more space for new growth and hence recovery of the marsh. My work so far has taken me to the dark vaults of map archives, to the virtual world of a supercomputer, and to one of the prettiest estuaries in the whole world - Glaslyn!

A skill that is important for me as a scientist is being adventurous. By adventurous, I mean adventurous in the way we look at the world. Thinking in this way has led me to spot new problems, and the need to find novel ways to solve them. By adventuring, I've met with amazing scientists, seen beautiful landscapes, and learned about techniques I'd have thought were too complicated for me. I was inspired to become a scientist because of the beauty in this Earth. It's just so amazing, who wouldn't want to find out how all the pieces fit together!

At school I studied Biology, Chemistry, Maths and Physics. I then came to University to study Marine Biology. I then did a masters in Saltmarsh Ecology, which let me to where I am today. I've not only stayed at School - during the summers, I worked in

an aquarium in Berlin, visited Virginia to learn about the ecology there, and worked as a Warden on Llanddwyn Island nature reserve in Anglesey.

In my free time I like to listen to and mix dance music, play guitar and walk the craggy slopes of Snowdonia. I'm currently working on a project to build my own remote control helicopter.



Photographing the marsh – at the top of that pole is a digital camera. It takes photos every 6 seconds and back at home, I can stitch the pictures together to create 3D models. The cubes are there as a reference, so I can see exactly how the marsh has changed over time, by how much.

Photo credits: Cai Ladd

Debbie Coldwell



Debbie is a BESS funded PhD student at the University of Sheffield.

We know that spending time outside in green spaces improves our physical health and also helps us to feel happy and relaxed. I'm trying to understand what particular aspects of spending time in parks and being out in the countryside helps us to feel better. For example, is it the wildlife, the view or the fresh air that is more important in

helping us to relax and recover from stress? The relative importance of different aspects of nature might vary from person to person. It might depend on how we were brought up, where we live and how much money we have.

We're losing a lot of our green spaces and biodiversity, so we really need to know how to benefit most from the green spaces we have left. We're also trying to get a better understanding of whether spending time in green spaces helps people to understand nature better and be more likely to support nature conservation.

Dr Hilary Ford

Hilary is a [CBESS](#) funded Post-Doctoral Researcher at Bangor University.



I'm interested in how the biodiversity of living things underpins the benefits we get from coastal habitats such as salt marshes e.g. flood protection, habitat for birds and carbon storage. I collect information on vegetation, soil, invertebrates (spiders and beetles) and greenhouse gases from different UK salt marshes. To do this you have to be good at digging, hammering in soil cores, getting muddy, avoiding cattle and working in the rain / wind / sleet whilst remaining enthusiastic and handing out spare clothing and chocolate bars to any-one who has agreed to help you!

As well as field work I get to do a lot of lab and office work, analysing and presenting my results and writing up scientific reports. To do this work I have to be good at Biology and Geography and it really helps to be enthusiastic enough to learn statistics even if pure Maths isn't your strong point. I also have to be very organised and enjoy working as a member of a team.

I enjoy helping Masters and PhD students with their research projects and teaching junior school children about flood protection using an interactive lego salt marsh activity!

Lydia Bach

Lydia is a PhD student at Queen's University Belfast who works on the [CBESS](#) project.

Coastal ecosystems are under a lot of pressure and I want to know how we can protect them into the future. We need to understand how ecosystems function so that we can predict how human impacts like climate change will affect them.

I'm finding out what animal eats what in coastal ecosystems. I have visited Morecambe Bay and the Essex Coast and am now working in Carlingford Lough, which I am visiting several times during the year to collect and identify invertebrates from the mud. I look at the stomach contents of fish and crabs to find out what they have been eating. I also use isotope analysis where you can use chemical signatures to indicate what animals have been eating over a long time. This helps me to decide where each species is in a food chain (e.g. herbivore, intermediate predator, top predator). Reading papers where other scientists describe what they have found out about coastal animals is also very important.

Putting together all of this information results in a food web showing how all the animals in an ecosystem are connected with each other through what they eat. I'm particularly interested in finding out how food webs change from place to place and at different times of the year.



Paul Richards

Paul is a Research Technician at the University of Sheffield who works on the [F3UES](#) BESS project.

I am helping to collect and identify the invertebrate animals that are using different green spaces in towns. The urban aspect of the BESS project (F3UES : <http://bess-urban.group.shef.ac.uk/>) is considering how the variety of plants and wildlife in urban areas effects people and their environment. We have used nets and big vacuum cleaners to extract the tiny animals that live, unseen, around us. We have taken hundreds of samples from around Bedford, Milton Keynes and Luton. We have also planted some meadows of our own with different types of grasses and flowers and these have been mown to give different heights of plants. I have been counting the bees and other insects that use the meadows to see how these pollinators use them.



I'm particularly excited by the BESS project because it gives me a chance to show how important the little animals are to people; even though they may never have even seen them.



I have been interested in insects since I was at primary school where I started off by rearing caterpillars. Since then I have photographed and tried to identify any small creatures that I've seen. I wanted to take my love for wildlife further, so studied Biology, Chemistry and Art & Crafts at A' level before obtaining a degree in Zoology. At that time I also started volunteering in museums, working on insect collections and developing my identification skills. I undertook many technical tasks including taxidermy and model making, for which my A' level art proved helpful. Having found work in that field, I remained as a Curator of natural history, for over 25

years. I now split my time between research and field ecology where I survey for protected species such as bats, reptiles and newts. My passion for unseen invertebrates is now expressed through identifying, mapping and publishing and I have the privilege of passing on my knowledge by teaching courses to anyone who will listen! <https://www.flickr.com/photos/invertimages/>

Dr Rosalind Shaw

Ros is a post-doctoral researcher at the University of Exeter who works on the [Wessex BESS](#) research project.



I have always been fascinated by the natural world and like nothing better than being in the great outdoors. Studying Biology and Geography really helped develop this. I am interested in how different parts of the world are all linked together, so I have worked on lots of projects that connect how people manage or change their environment and the natural world. These projects have all been based around plants and the animals that eat or use them! I have worked on rare mountain willows that are eaten by sheep and deer and how that affected both the willows themselves but also the insects that eat and pollinate them.

At the moment I am working on farmland looking at whether having high biodiversity chalk grasslands in the landscape changes the amount of insects that help farmers. I am looking at both pollinators who can increase crop yield of insect pollinated crops such as strawberries and oilseed rape, and natural enemies of insect crop pests. There are lots of insects that eat other insects that can damage crops! By learning about how biodiversity in the grasslands changes the number of beneficial insects in crops hopefully we can support both farmers and plants and insects.



The practicalities of my job mean that I get to spend a lot of time out counting plants and insects in the summer followed by a lot of time in the lab spent identifying insects in the winter, combined with analysing data and designing experiments.



Photo credits: Ros Shaw.

Stephen Watson

Stephen is a BESS funded PhD student at the Plymouth Marine Laboratory.



I study coastal ecosystems and the benefits we get from them, such as recreation, food, flood prevention and nutrient cycling. We know that climate change will affect these ecosystems and might also change these benefits.

I'm gathering information about fish, invertebrates and the environment in two UK estuaries. I'm using this information in computer simulations to predict how biodiversity and benefits we get from coastal ecosystems will change. I'm also looking at how these changes are likely to affect local people and the economy.

Tom Holmes

Tom is a BESS funded PhD student at the University of York.

I'm finding out how storms affect coastal ecosystems and the benefits that we get from them. Coastal ecosystems like saltmarshes are important for wildlife and help to protect us from flooding. They can also help to reduce climate change because they lock away carbon instead of it being in the atmosphere as carbon dioxide.

I collect tubes of soil, called soil cores, from saltmarshes at the Humber Estuary and Morecambe Bay (see picture). Soil cores allow you to look back in time and find clues about what the environment was like then, with the deepest part of the soil core being the oldest. By measuring the size of grains from different depths in my soil cores I can see when there were big coastal storms over the last 100 years.

This is because the storms washed sand onto the saltmarsh. I also analyse the chemicals in the soil and look at the pollen grains to see if and how the saltmarshes changed following each storm.

This work helps me to understand how well and how quickly saltmarshes recover if they are damaged by storms. This is important because climate change is likely to make coastal storms worse and happen more often. I am also interviewing people who live and work at the coast to find out what they think about how the coastal environment is changing and how storms affect them.



Zoe Holden

Zoe is a BESS funded PhD student at Cranfield University.



My main interest in science is in the environment. Most of my work is based around how we use the world around us, and how we use nature to help us in our day to day lives. Bees help us grow food and flowers, trees help us have clean air to breath and soil can help us get clean drinking water. I am interested in how we can protect the environment, so that it can keep benefiting us!

My project is looking at the different ways that people make laws and plans about how we should look after nature in order for it to be able to keep helping us forever. I'm finding this out by talking to the people that look after the environment, and the people that make the laws and rules about the environment. A lot of my work I do from my desk, but as my work is part of a large project I like to get out and help my work friends with their work too. You can read more about what I do in my blog at <http://zoeholden.blogspot.co.uk/>