Welcome...

and thank you for taking the time to catch up with some of our recent activities. As with the earlier editions of the newsletter, this issue highlights a range of stories to provide a window into the School.

Our Director of Research provides a recap of a successful event in December that brought much of the school community together to celebrate our research activities. Also, we hear from the team at Aberdeen Biodiversity Centre about an innovative partnership with Aberdeen City Council.

Issues related to equality and diversity continue to be in the news, and you'll find the theme in our newsletter as well. We are proud of our recent achievement with Athena SWAN and the School's commitment to promoting the equality and diversity that it represents.

Our alumni continue to play an important role in enriching the experience of our current students. One notable approach is through the provision of endowments, set up to support student development. In 2016-17 we were able to award 16 small grants to undergraduate and postgraduate students to support conference attendance, research costs, external training events, summer placements and field course participation. In this edition you will find articles from four of the students, reporting back on conferences. We are fortunate to have these funds to extend and enrich our student experience.

This issue also marks a change in staffing. Wendy Wilson, our Editor, left the School in January 2018 to apply her talents to starting up a new well-being business, Unwind. Wendy has worked in the School for the past 12 years as a key member of our Administration Team. Wendy's insights, initiative and enterprising nature have underpinned many of the successes we've had in the school and we wish her all the best in her new venture.

Michelle A Pinard
Director of Teaching

Photos above taken by Jean-Paul Schmit
Athena SWAN Bronze Award

DR LESLEY LANCASTER

As many of you have already heard, our department has successfully applied for and won an Athena SWAN bronze award. For us personally, on a more practical level, this award means two things.

First, if you (yes, you) are in any underrepresented group and you feel that there are any issues negatively affecting your ability to function and thrive in our workplace, then the Athena SWAN self-assessment team is established and here to help. Please don’t be a stranger if you are facing an issue which the Athena SWAN team can take on.

Second, winning the Athena SWAN award is a recognised national honour which we can advertise to incoming students and staff, and which indicates to external bodies such as REF (the UK’s Research Excellence Framework) that we are committed to a fair workplace.

We discovered that, numbers wise, we are doing well in terms of gender equality.

We recruit and retain large numbers of qualified female students at all levels (undergraduate to PGR), and females perform well in our courses.

We also hire and retain women into academic staff positions at very good rates (female hiring rates are equal to male hires, and female retention is even higher than male academic staff retention).

We have developed an action plan to address the following issues identified:

- Over the past several years, however, there has been a lag in success rates for female promotions applications, and this is a key issue in our department that the team has identified and will seek to remedy over the coming years.

- In terms of staff experience, there is still a sense that we need to work on work-life balance issues. For instance, parental and caring responsibilities could be better accommodated, and pathways between full-time and part-time working could be more clear-cut.

As we move ahead with our efforts to support a diversity of staff and students, we have recently established a school equity and diversity committee, which will deal with issues of inclusion, fairness, access, and balance for individuals representing a wider range of diversity criteria, beyond gender.

We will also begin to collate data and experiences for SBS staff in administrative and technical roles, in preparation for the next stage of the Athena SWAN award [Silver].

The Green Heart of Guyana

BEN DRIVER (LEVEL 3, BSc ZOOLOGY)

When I was given the opportunity to travel to Guyana in South America during the summer after my first year at university, I was excited for the chance to make a short film about the country itself and the conservation work being done there to preserve the pristine rainforests.

As I found with my encounters here in Scotland, the country and its inhabitants are widely unknown. Primarily there as a research assistant, I had a hand in surveying all kinds of fauna in Iwokrama, a government-run reserve in the heart of the country. Mist-netting for understory birds had us up early in the morning while reptile surveys and bat mist-netting kept us late into the night.

My limited knowledge of the area and wildlife made planning the film difficult. During the first week I shot on my compact bridge camera, while trying to think about how it could serve a wider purpose in the context of a film. By our second week, and arrival at the camp by the foot of Turtle Mountain, I had been talking a lot with the native Makushi rangers and expedition scientists and started more intentional filming. I conducted interviews with those who knew a lot more than me and filmed people at work when there were enough hands that I could step back and film.

I always had my camera on me, but filming in tropical rainforest isn’t without its difficulties: little light penetrates the canopy forcing you to use a slower shutter speed and the consistently intense humidity meant a fogged-up lens and ever-present danger of equipment water damage. Despite this, 3 weeks and a pile of mouldy clothes later, I managed to fill four memory cards of video and even find a name for my film, The Green Heart of Guyana, a nickname for the conservation reserve and the name of one of the majorly exported hardwood trees from the reduced-impact logging schemes, green heart.

After the expedition, I sought the help of tropics professors from SBS to proof read my script, and later I gave a rough edit and very little direction to a friend from the music department to write a score for me.

A year after returning from the expedition, the film was finally completed and has reached nearly five thousand people, including schools in Guyana. It has gone further than I ever expected and fulfilled my goal in educating people about Guyana’s incredible wildlife.
SBS Research Day
PROFESSOR STUART PIERTNEY

The School came together for our annual SBS Research Day on the 18th December 2017. This was a wonderful showcase event to celebrate both the breadth and depth of research excellence across the School.

The day was introduced by the University’s Vice Principal for Research and Innovation, Professor Marion Campbell, who emphasised the School’s international profile and reputation for leading-edge research across Biological Sciences, and how this can be leveraged to exploit funding opportunities around societal and environmental grand challenges.

In addition to the research day, a workshop and discussion session explored the opportunities for using emerging DNA sequencing technologies for the School, and how ongoing projects in this area by key research groups are leading our understanding of how mobile DNA sequencing can be exploited to provide real-time biodiversity assessment and enhance our understanding of genome architecture, diversity and dynamics.

Perhaps the most obvious take-home message from across the Research Day was that the overall strength of the School is built around the combined activity of everyone within it.

The day highlighted how the School dovetails pure, applied, theoretical and empirical research that impacts environmental policy and practice.

The remainder of the research day was structured around a set of outstanding talks from members of the postdoctoral research community, and flash presentations from our new PhD students who introduced their project goals and aims. Sandwiched in between (both literally and figuratively) was an open poster session over lunch that was a great opportunity for all staff and students to network and discuss ongoing research.

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The objectives of my internship were to help the team with ground data collection in several crop fields and to work on my personal research project. Using our field and satellite data, I aimed to analyse the correlation between satellite parameters and crop parameters of barley (Hordeum vulgare L.). Due to the rising number of earth observation satellites, remote sensing is becoming a rather practical solution to monitor the vegetation and soil conditions over vast geographic areas. In addition, satellite-based remote sensing is more accurate and less time consuming than traditional methods of crop yield estimation, especially on a landscape scale. Thus, satellites could be used to monitor crop parameters related to yields.

My summer research project contributed to the team’s project by providing preliminary results. I also presented a poster about my project entitled “Could satellites monitor crop parameters and predict yields to ensure sustainable food security?” at a Gatsby networking event in Oxford. Completing my internship at Rothamsted Research was a golden opportunity for me as a future graduate in Plant and Soil Science. I have benefitted from the expertise and academic experience from leading scientists in the field and it was one of the best academic experiences I have had.

During the summer of 2017, I had the fantastic opportunity to undertake an internship at Rothamsted Research. The institute focuses its research on sustainable intensification of grazing livestock and arable systems in Britain and worldwide. Although my internship was sponsored by the Gatsby studentship, I was very fortunate to be the recipient of the Roy Scott Lamb Scholarship, as it enabled me to attend a training week in April at the institute prior to the internship. From May to July, I joined Dr Goetz Richter’s team. They were working on a project seeking to delineate marginal from high quality soils by calibrating and evaluating satellite derived remote sensing images against field data.

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Pumps & Pump-Priming in Bangladesh
ADAM PRICE, GARETH NORTON & GEAROID MILLAR

SBS academics Gareth Norton and Adam Price teamed up with Gearoid Millar from Social Science to get a “pump-priming” grant from the University of Aberdeen to visit Bangladesh to discuss the barriers to Alternate Wetting and Drying (AWD), so as to better write a more substantial Global Challenges Research Fund Grant.

You could say it’s a mystery why rice farmers in Bangladesh do not use a water saving management technique called AWD. For nearly 10 years AWD has been heavily promoted across the globe as a method to reduce water use and sometimes yields. In Bangladesh, groundwater aquifers are being used unsustainably and the energy resources required to irrigate rice mean power cuts for urban electricity consumers. Papers show AWD also reduces methane emissions, a significant global benefit given this feature of rice fields represents one of the biggest components of the agricultural contribution to global warming.

Research in Aberdeen established that rice grains can represent a major source of arsenic contamination, particularly if the population eat a lot of rice and if the irrigation water is contaminated. In Bangladesh, it’s common to eat rice three times a day, and the contamination of Bangladesh groundwater has been described as the biggest mass poisoning in human history. Several papers, including our own, have demonstrated that AWD will reduce grain arsenic by 10-30%.

On the face of it, AWD offers considerable benefits to the farmer, the local community, the country and the planet. So why are people not doing it? We wanted to find out what people researching AWD in Bangladesh thought were the reasons. The eight day visit comprised 11 meetings with 32 people from II research or development institutions in Dhaka, Gazipur and Mymensingh. We also had the chance to talk at length to one group of farmers.

The visit was mostly organised by former PhD students of SBS, most notably Dr Tarvir Chowdhury of Dhaka University (2016 graduate) and Dr Mahmud Sumon of Bangladesh Agricultural University (BAU- 2012 graduate). We also met many high ranking academics who passed through Aberdeen, including the current Vice Principal of BAU (Prof Md Ali Akbar- PhD graduate), former Pro Vice Chancellor of Dhaka University (Prof Shahid Hossain- postdoctoral fellow) and Head of Department of Soil, Water and Environment, University of Dhaka (Prof Sirajul Hoque- PhD graduate).

What did we find? - The most likely barriers to AWD adoption are only partly about biological sciences, and more substantially about socio-economics. Probably the most important issues are related to the ownership of the irrigation pump and how farmers pay owners to use them, as well as the geographic relationship between each farmer, their fields and pump location. We suspect there is also a strong soil chemistry and physics component which merits more investigation. It is clear that any future project trying to examine the barriers to AWD needs much more detailed research on both the science and the social science of rice agriculture in Bangladesh conducted in a holistic manner. We have certainly found a very important global challenge and met the right people to work with.

The Aberdeen Study Group
FRANCESA MANCINI (PHD ECOLOGY)

A modern biologist needs computational skills just as much as lab or field skills. Here at SBS we are lucky to have undergraduate and postgraduate courses to start developing these skills, but many students start their research degree with very little training in computational methods.

As a PhD student in Ecology I don’t spend much time outdoors; instead, I spend 99% of my time at my computer cleaning, visualising and analysing data. Even my colleagues with the most field-based projects spend more than 50% of their time at a computer. Programming is becoming essential for a biologist. It will not only allow you to work more efficiently but is also the best way to ensure your research is transparent and reproducible.

However, learning how to code can be very frustrating and isolating. That’s what inspired the Aberdeen Study Group. a fun, informal meetup of colleagues to share skills and ideas on using code for research, and exploring open research practices. We are a group of SBS students, researchers and academics who code. We all work in different fields, but we are all passionate about biology, open and reproducible research and sharing skills.

This group is for everyone who uses code in their research and for those who would like to, but don’t know how to code yet. It is a group for everyone who wants to share their skills and those who want to learn something new. It is the place to ask questions, get help on your coding problems and share your successes.

We meet regularly. sometimes someone will show us how to use a new tool, or we just work together on our own projects asking each other questions. We always work in a collaborative and friendly way, trying to learn from each other and occasionally we just go to the pub!

We strive to make science collaborative, transparent and available to everyone, because this is the only way science can advance knowledge and help overcome the challenges of a fast changing world.

We have developed a lot of teaching material on different software and programming languages (R, python, QGIS), all open source and available for everyone to read and reuse - to access these visit https://aberdeenstudygroup.github.io/studyGroup/lessons/

Xin Shu
PHD PLANT & SOIL SCIENCES

In October 2017, I attended and presented my PhD research “Resistance and resilience of soil nitrogen cycling to environmental stress” at the International Annual Meeting “Managing Global Resources for a Secure Future” in Tampa, USA. I did an oral presentation on the significance of soil nitrogen resistance and resilience in maintaining ecosystem quality, improving soil productivity and human health. I valued the thought-provoking feedback from my peers, which broadened my horizon and enriched my knowledge.

Presenting at this conference was a golden opportunity for my personal development. I was also beneficial for enhancing the reputation of the University of Aberdeen in soil science and agriculture. The results from my study demonstrated the excellent agriculture and ecology research undertaken by the University of Aberdeen, and their use of world-leading research technologies. I also had the chance to network with worldwide researchers and professionals which provided me with opportunities for potential collaborations with other international institutions and industries. I have to admit that without the support from Charles Sutherland Scholarship, I would not have been able to attend such an informative conference.

STUDENT PROFILE
The team at Aberdeen Biodiversity Centre were delighted to host an evening celebration event recently for a group of pupils to receive their John Muir Discovery Award, which was delivered in Gaelic. Although we have been running the award scheme since 2015, this was the first time we have delivered it in a different language, which was a challenging and rewarding experience for all involved.

The John Muir Award is broken down into four main themes: Discover, Explore, Conserve and Share, and each participant has to complete a four day programme of activities in these categories in order to achieve their Discovery award. This included a conservation tour of the Cruickshank Gardens with the curator, Mark Paterson, building bird and bat boxes, a conifer tree trail and showcasing all their work at an event where they were also presented with certificates.

One of the great things about the John Muir award is the flexibility that it allows the leaders and participants; often we adapt our plans as the sessions progress in response to both interest and the unpredictable nature of working outdoors. This allows a lot of potential for academic researchers to become involved in future sessions and have the chance to communicate their research in a unique and enjoyable way.

“When Anne from Aberdeen City Council got in touch and asked if it would be possible for us to incorporate Gaelic into the John Muir Award programme, we were immediately up for the challenge. The scheme itself is fantastic to work on and we were pretty sure it would translate well into Gaelic. However, as myself and my colleague, Liz Campbell, don’t speak the language we were thrilled to have Frederic on board to help us. We are really pleased with how this partnership has worked out and I think everyone involved has got a lot from the project. The students particularly enjoyed visiting the University to explore nature and conservation in a unique way, and are keen to achieve the next level of the award.”

VICKY EVAN (ABERDEEN BIODIVERSITY CENTRE)

Oceanlab Business Unit

FIONA BARR

Established in 2001, Oceanlab is located in Newburgh on the site of the Culterty Field Station, founded by Professor Wynne Edwards in 1958 on the banks of the Ythan estuary overlooking Forvie National Nature Reserve.

Based here are Dr Stewart Chalmers, Technical Director, Fiona Barr, School Support Coordinator, Neil Gregge, BU Test Technician and John Polanski, Electronics Technician.

Oceanlab has always had strong links with the offshore industry and now specialises in subsea testing services and offshore environmental monitoring.

We provide a comprehensive range of testing equipment and bespoke services to clients from all over the UK and Europe.

OUR FACILITIES

Our facilities are housed in 300m² of hangar space with full coverage from a 2.5t overhead crane. A boat house, slipway and yard are situated on the banks of the River Ythan.

HYPERBARIC TESTING VESSEL

Mainly for large subsea housings, it replicates subsea pressure and temperature conditions to an equivalent of 7,000m depth.

ENVIRONMENTAL CHAMBER

Our large capacity chambers allow temperature testing from -40°C to +185°C, along with controlled humidity.

INDOOR IMMERSION TANKS

The 5m³ tank is an essential proving facility for subsea inspection equipment, ROVs and other subsea test simulations. A smaller saltwater tank, with acoustically neutral walls is available for calibration and testing of sonar.

CONSULTANCY SERVICE

Oceanlab developed and maintains subsea environmental monitoring platforms for BP at 1,450m depth off the coast of Angola. DELOS will provide scientific information on the deep sea environment for 15 years.
Ella Benninghaus  LEVEL 4, BSc MARINE BIOLOGY

A Marine Mammal Odyssey, eh... Last October, I had the opportunity to attend the 2017 Society for Marine Mammalogy 22nd biennial conference on the Biology of Marine Mammals in Halifax, Nova Scotia, Canada. I am very grateful to have received a travel grant from the School allowing me to attend this intense but incredible 5-day conference. I also volunteered at the conference, helping with a variety of tasks such as registration and room monitoring. Volunteering gave me the opportunity to meet other students and offered insights into how much work goes into organising a big conference like this.

The conference’s programme was jam-packed, never allowing for a boring moment. Talks and poster sessions covered an incredible variety of topics, such as behaviour ecology, acoustics, foraging ecology, conservation, genetics, etc. I managed to attend talks from almost all categories. I particularly enjoyed an outreach and education session which discussed how to engage local communities and students. One of my favourite talks was by Dr Richard Pace, who talked about the entanglement mortality of right whales. His study suggests that 50% of the decline of North Atlantic right whales is due to entanglement in fishing gear. Another of my favourite talks was by Dr Krista Hupman who spoke about the possibilities of automating cetacean photo-identification.

My whole week was filled with incredible experiences, however there are a few that have stuck with me the most. One is the student night, which was held in Halifax’s Maritime Museum. My whole week was filled with incredible experiences, however there are a few that have stuck with me the most. One is the student night, which was held in Halifax’s Maritime Museum. We viewed some amazing marine mammal footage and heard personal anecdotes – some funny, others touching – from a few researchers who have worked with a variety of mammals across the country.

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In October I attended the 2017 Society for Marine Mammalogy 22nd biennial conference on the Biology of Marine Mammals in Halifax, Nova Scotia, Canada. The conference brought together over 1,700 people involved in marine mammal research, conservation, management, tourism, etc. from around the world. With over 500 posters and four concurrent sessions of over 300 talks and speed talks, it was impossible to see everything at the conference, but I gave it a good go! I caught up on the latest research into marine mammal habitat use, distribution, conservation, abundance assessment, behavioural ecology, acoustics and also the impacts of renewables and methods of mitigating bycatch. I presented some of my PhD research on harbour porpoise at a density surface modelling workshop before the conference, and also as a poster during the conference. Both of these were well-received, sparking discussion. I met preeminent researchers, made new contacts, and reacquainted myself with old friends. I am grateful for the award I received from the Development Trust Student Support Fund, which made my participation in this conference possible.
Grants awarded to School of Biological Sciences
1ST JULY 2017 TO 31ST DECEMBER 2017

Dr Paul Fernandes
SCOTTISH FISHERMANS FEDERATION, £10,617
Assessing the Proportions of Certain Commercial Fish Stocks Present in UK Waters

Dr Cecilie Gubry-Rangin
NERC, £519,259
Evolution of Thaumarchaeotal Metabolism Under Contrasting Oxygen Conditions

Prof Paul Hallett
NERC, £1,000
NERC Event Exhibit 2017

Prof Paul Hallett, Prof David Burslem, Dr Laura Kruitbos, Prof Adam Price & Dr Yit Teh
SCOTTISH ALLIANCE FOR GEOSCIENCES ENVIRONMENT & SOCIETY (SAGES), £1,000
NERC Event Exhibit 2017

Prof David Lusseau & Dr Alexander Douglas
SOUTH CAROLINA AQUARIUM, £80,505
Assessing Harbor Deepening on Bottlenose Dolphins in Charleston

Dr Daniel Macqueen
MARINE SCOTLAND, £8,000
New Approaches to Characterise Viral Diseases Affecting Atlantic Salmon (Studentship)

Prof Samuel Martin, Dr Alexander Douglas, Dr Daniel Macqueen & Prof Christopher Secombes
SCOTTISH AQUACULTURE INNOVATION CENTRE, £284,093
Clinical Nutrition & the Treatment of Atlantic Salmon Gill Diseases

Prof Samuel Martin & Prof Christopher Secombes
RESEARCH COUNCIL OF NORWAY, £27,135
Development of Tools for Assessment of the Immune Competence of Atlantic Salmon Smolts & Growers

Prof Samuel Martin & Dr Daniel Macqueen
£14,000
The Role of Functional Amino Acids as Regulators of Metabolic Pathways in Atlantic Salmon (salmo salar) & Rainbow Trout (anchoyarchus mykiss) (Studentship)

Prof Stephen Redpath
INLAND NORWAY UNIVERSITY OF APPLIED SCIENCES, £1,234
Travel Grant for Zara Morris-Trainor to Attend Conference for Conservation Biology in Columbia

Prof Jane Reid & Prof Justin Travis
NERC, £441,811
Linking Demographic Theory & Data to Forecast the Dynamics of Spatially-Structured Seasonally-Mobile Populations

Prof Stephen Woodward
COCOA RESEARCH, £21,500
Verticillium Wilt of Cocoa in Democratic Republic of the Congo & Uganda

Prof Christopher Secombes & Prof Pieter Van West (PI) (School of Medicine, Medical Sciences & Nutrition)
SCOTTISH FUNDING COUNCIL, £63,476
Risk Factors for Escalating Saprolegniosis Outbreaks in Salmon Farms (RIFE-SOS)

Prof Peter Smith, Dr Jonathan Hillier & Prof Jennifer Macdiarmid (Rowett Institute of Nutrition & Health)
WELLCOME TRUST, £359,072
Sustainable & Healthy Food Systems

Dr Yit Teh, Prof Elizabeth Baggs, Prof David Burslem, Prof David Johnson & Prof Peter Smith
NERC, £18,190
Biodiversity & Land-Use Impacts on Tropical Ecosystem Function (BALI)

Prof Rene Van Der Wal
JAMES HUTTON INSTITUTE, £33,542
Digital Technologies & Human-Nature Interactions - The Users’ Perspective (Studentship)

Photo taken by Jean-Paul Schmit