

FoAM Kernow selected activities 2017

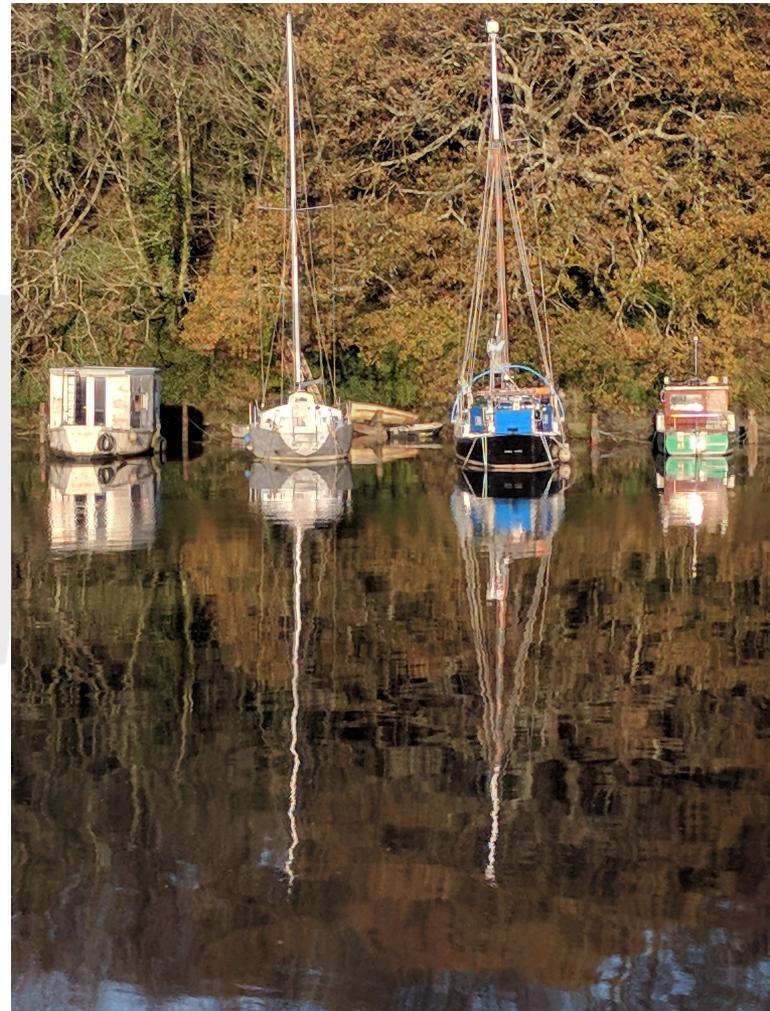
<http://fo.am/kernow>

kernow@fo.am

This review shows selected projects from the FoAM Kernow studio in 2017.

FoAM is a network of transdisciplinary labs at the intersection of art, science, nature and everyday life. FoAM's members are generalists - people who work across disparate fields in an entangled, speculative culture. Research and creative projects at FoAM combine elements of futurecrafting, citizen science, prototyping, experience design and process facilitation to re-imagine possible futures.

We live in chaotic times with no obvious answers to complex issues such as climate change, social inequality and economic uncertainty. 2017 has finally brought many of these issues to the forefront of people's attention globally. Our approach is to foster a sense of agency for people from all walks of life, guided by the motto 'grow your own worlds'.



Science for citizens

One of our core activities is enabling people to develop creative and confident relationships with science and technology. We address the severe societal problem of knowledge inequality by researching and developing new approaches to broaden participation and champion the open access movement.

Science for citizens

Do you need help finding scientific evidence?

ACCESS
} { LAB

My house is low down - should I be worried about sea level rise?

How can I persuade my neighbours that recycling is worth the effort?

Do fishing quotas work?

What's the evidence for how to protect cattle from TB?

My brother's got cancer. Where can I find evidence showing whether the medicines work?

Free event for politicians, councillors, campaigners and community groups.

24 Nov 2017, Redruth Cornwall.
Email kernow@fo.am to secure a place.

[foam]

BRITISH SCIENCE ASSOCIATION

AccessLab

<http://fo.am/accesslab/>

Recent world events and concern over 'fake news' and 'post-factualism' have highlighted the difficulties encountered when trying to find trustworthy sources of information. The ability to judge the reliability of different sources of information is a skill that can be learned. The AccessLab project aims to improve access to and the judgement of information, through direct citizen-scientist pairings.

In 2017 we ran two pilot workshops, and formed a new partnership collaborating with the British Science Association to develop this project further.

The first workshop was for artists, and the second was for local councillors and community group leaders. In each workshop we covered the basics of how to find sources of scientific information, and how to judge the reliability of these sources – then paired the participants with science researchers to co-research a topic of their choice. Instead of focusing on the dissemination of subject-specific information, we support participants to understand how they can find reliable information on topics that are relevant to them. This model also helps to improve the societal awareness of science researchers, as they are exposed to the difficulties others encounter when trying to access and use research findings. Our aim is to reduce knowledge inequality - where some have access to better information than others.

Science for citizens

Sonic Kayaks

<http://fo.am/kayaks/>

The Sonic Kayak is a musical instrument with which to investigate nature. Kayaks rigged with underwater environmental sensors generate live music from the marine world, providing the paddler with an extra dimension of senses with which to explore the underwater climate, while enabling citizens to gather fine-scale geo-referenced climate and environmental data.

The project was presented during our 2017 keynote talk at the Exploring Research in Cornwall conference, where it caught the eye of Dr. Jo Garrett from the University of Exeter. Jo then joined us for a residency where she further developed the system to enable it to record and produce fine-scale maps of underwater sounds – something that had never previously been possible using off-the-shelf research equipment.

We published our research and development on the Sonic Kayaks in one of the top science journals, PloS Biology, and received coverage in a wide range of media – including The Verge, Naked Scientists, The Seattle Star, The Earther and PBS NewsHour. The publication includes instructions to build the system – and we look forward to seeing how it is developed by others.

The Sonic Kayaks were made in collaboration with sound artist Kaffe Matthews and marine researcher Dr. Kirsty Kemp. This project was funded by FEAST Cornwall and the British Science Association.



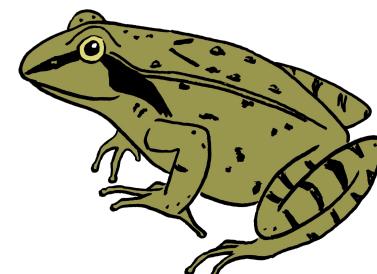
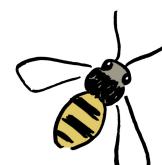
Allotment Lab

<http://fo.am/allotment-lab/>

Working with Duchy College and Rothamsted Research, we have prototyped and released a new system for allotment owners and gardeners.

The allotment system is a 'pocket lab', with walkthrough experiments for working out the soil type and how to improve compost. The system will be developed further to include tests for soil pH and rainfall. The nutrient values of compost are calculated automatically based on what is added to it each day.

Once these experiments are completed, the system will make suggestions for the best crops and companion plants, compost application rates and timings, and crop rotations. Our aim is to make it easier for people to grow their own food, and also to understand the environmental conditions that affect plant growth.



Carrier 12:27 PM

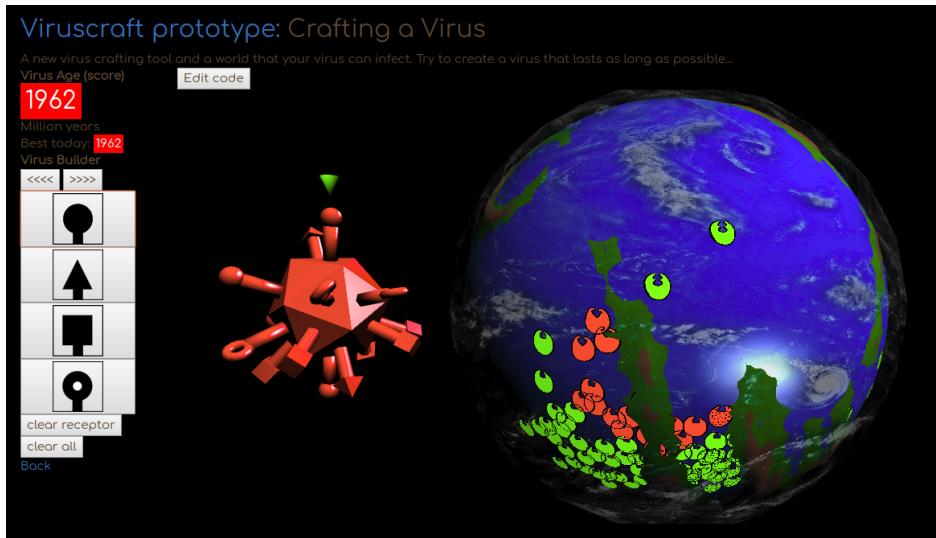
Becky's allotment

A colorful illustration of a garden plot divided into three sections. The top section has carrots, the middle section has onions, and the bottom section has beets. A small beehive and a bee are on the right. A pencil icon is in the bottom left corner.

Date ————— Dec '15 Apr '16 Nov '16

Soil Texture	Soil pH
Choose Units	Rainfall

Science for citizens



Viruscraft

<http://fo.am/viruscraft/>

In this project we ask - what determines the ability of a virus to infect some hosts but not others? Working with evolutionary biologist Ben Longdon, we're developing a citizen science project using visual programming, craft, tangible interfaces and games to explore virus host shifts – where a virus jumps from one host species to another.

We held a workshop for craft professionals and virologists to thrash out ideas for the project, and since then have developed some of the outputs into playable prototypes and test interface builds. Changing shapes on the outside of an icosohedral virus structure means players can infect and jump to new hosts on a spherical world – interacting directly with host-pathogen co-evolution simulations.

In early 2018 we'll be running a second development workshop for anyone interested in games testing and interface design.

As with our Penelope project – we place great emphasis on developing physical technology that is transparent (people can understand how it is made), fixable, and recyclable at the end of its life.

Arts and music

Our arts and music projects provide critical perspectives on technology and everyday life. We are developing methods for more transparent fabrication – allowing the things we make to be understood, fixed, and recycled. The division between arts and sciences quickly becomes nonsensical as we draw from a tangle of disciplinary approaches.

Arts and music

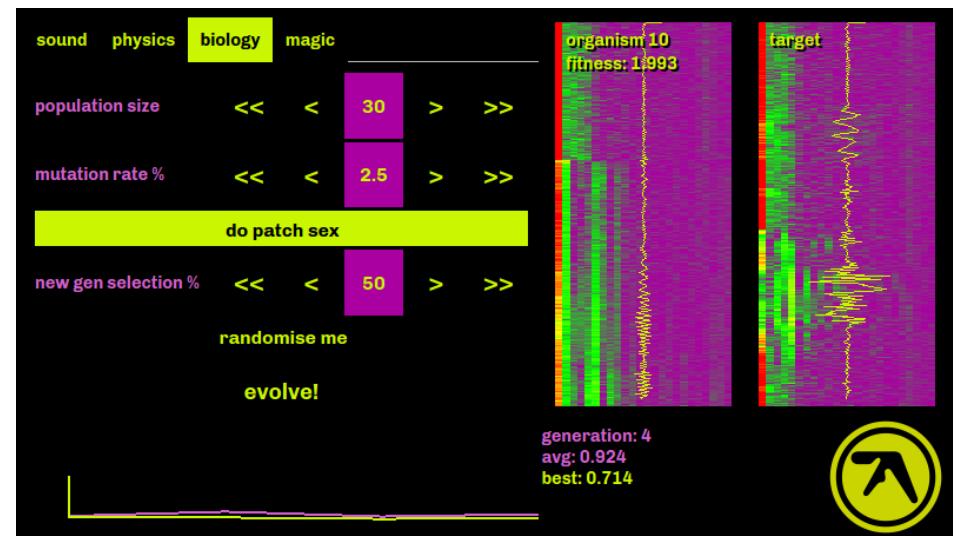
Midimutant

<http://fo.am/midimutant/>

Made in collaboration with Aphex Twin, the midimutant learns how to program your DX7 synth so you don't have to. Richard James initially mentioned this project in his interview with synth designer Tatsuya Takahashi.

Equipped only with a microphone input and midi output, the midimutant runs on a Raspberry Pi and uses artificial evolution to grow new sounds on hardware synthesisers that mimic an example sound you provide.

Working with Richard James continues a long history at FoAM Kernow of collaborating with musicians, such as Kaffe Matthews, Alex McLean and Shelly Knotts. Richard's particular perspective on technology gives us a unique chance to try out some unusual things that bring together threads across the work that we do, in this project employing biologically inspired computation to 'grow' new sounds for retro synthesisers. We've previously used similar techniques for projects such as 'Egglab' where we automatically generated camouflage eggs with the help of thousands of online citizen scientists. This was also our first chance to prototype forms of sustainable fabrication, which we have continued to explore with Viruscraft and Penelope.



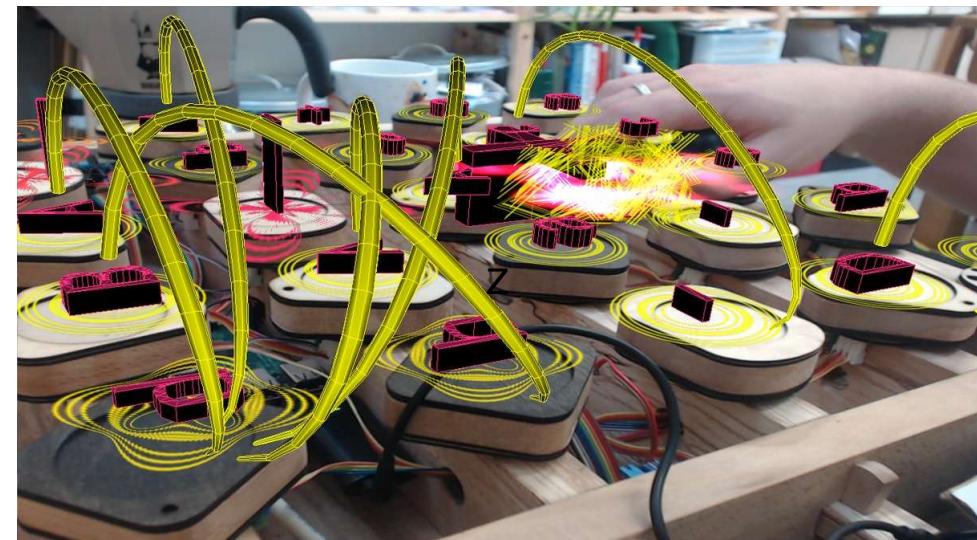
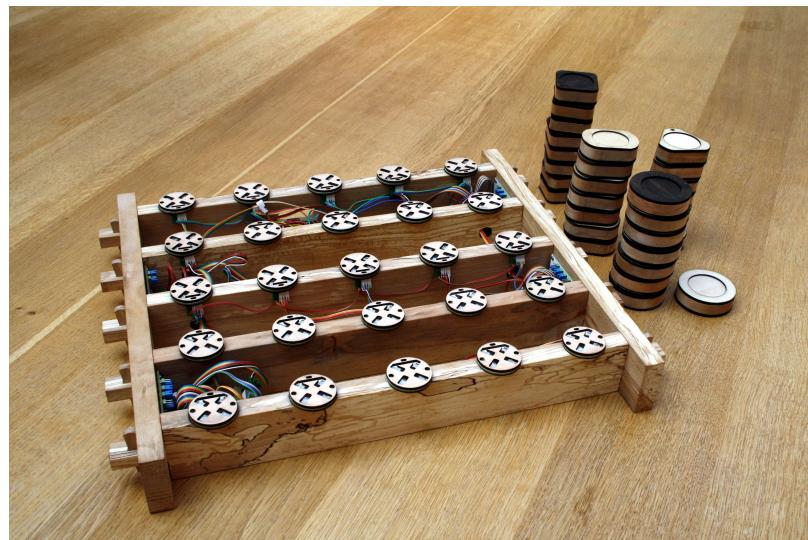
Arts and music

Penelope

<http://fo.am/penelope/>

How can we make tools that help understand the ancient weaver's mind? How they calculated and solved the first recorded mathematical proofs, embedding them in pattern. How do certain forms of technology define our relationship with the world? For the Greeks of antiquity, weaving was the fundamental link to the cosmos. Today we use computational structures to reason about ourselves and our society, our computers replicating the pattern manipulating circuits that link them with the textile technology they were originally built from.

The Penelope project is a 5 year European Research Council research project by Ellen Harlizius-Kluck with Flavia Carraro, Giovanni Fanfani and Alex McLean alongside FoAM Kernow. We are constructing citizen science exhibits for exhibition at the Deutches Museum in Munich, the world's largest science and technology museum, and the nearby Munich Museum for Plaster Casts of Classical Sculptures. Our mission includes designing and constructing tangible programming systems for livecoding looms, and new forms of robotic weavers that will be able to manipulate ancient loom technology. The first iteration of the Pattern Matrix tangible interface has been used to control complex information in the form of music – first at the British Science Festival 2017 in Brighton, and also at the Algomech festival 2017 in Sheffield.



Arts and music



Tanglebots

<http://fo.am/tanglebots/>

<http://fo.am/blog/2017/04/04/tanglebots-asd/>

The Tanglebots workshop was originally developed as part of a research project into weaving and coding. Together with Alex McLean, Ellen Harlizius-Klück and Lovebytes, we developed a workshop format for children and their families, forming a messy introduction into weaving, robotics and coding. Tanglebots are prototype/failed weaving robots (weaving is quite hard, so we start with tangles and see what patterns emerge). We combine harvesting components from e-waste toys (motors, gears, electronics), and using visual programming (Scratch) to control these components, to create robots that make tangles.

After our previous Tanglebots workshop, researchers from the Cultural Minds group at the University of Exeter got in touch to see if we could run a similar workshop for young people with autism and their families.

This time we were joined by autism service providers from the Cornwall Council Autism Team, Dreadnought Aspires, a Multi Academy Trust representing four specialist schools, the National Autistic Society, and Sensory Projects - each interested in whether our approach could help people with autism collaborate on a shared goal.

The workshop was funded by the Economic and Social Research Council and the British Science Association.

Arts and music

FoAM as an experimental business

<http://fo.am/blog/2015/04/07/how-to-make-an-organisation-like-foam/>

<http://fo.am/blog/2017/12/14/futurecrafting-cornwall/>

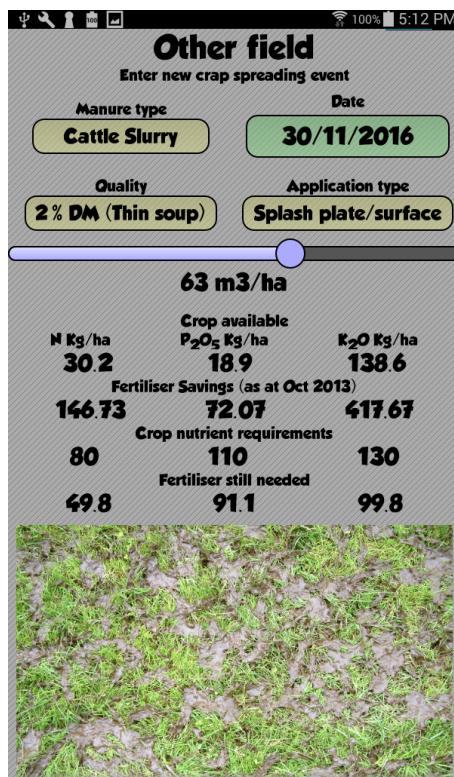
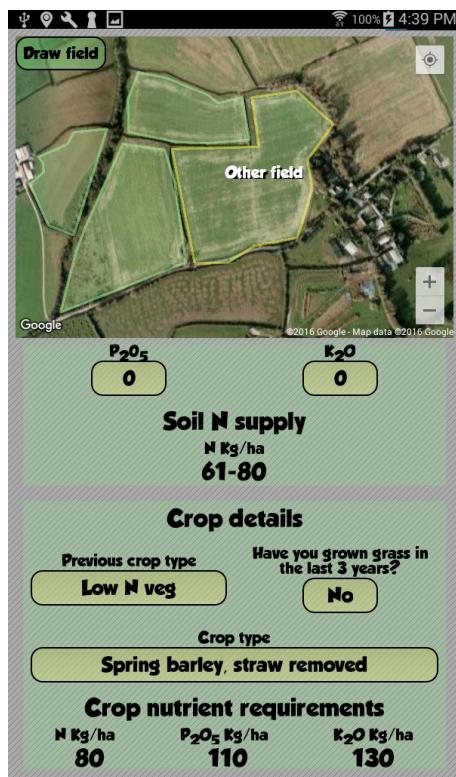
We see FoAM (both our studio and the wider network) as an experiment in its own right. With the continued drive for profit and growth that we all know is at odds with the limits set by our planetary resources, we trial alternative modes of research and development, business and economics. 2017 has been a year of discovering that our current model sits between almost all existing legislation, meaning a great deal of time poring over tax documents – we continue to openly document the process of making an organisation like FoAM so others can see what may be possible.

In 2017 the newly inaugurated nomadic FoAM Earth studio was founded by Maja Kuzmanovic and Nik Gaffney (who started FoAM back in 2000). FoAM Earth moves between the other studios, acting as a connector and invigorator. One of the central parts of FoAM's research for some time has been future preparedness. Over several projects Maja and Nik have been building up a collection of methods that allow an individual or organisation to picture itself in the future under a range of conditions called scenarios. Scenarios are designed to be extremes, or caricatures of the possible – if you can describe them well enough, you can envisage how you or your organisation would adapt to them. The goal is to reach a point where change is something that can be reasoned about in advance, rather than reacted to as it happens. During FoAM Earth's visit in 2017, we took FoAM Kernow through a scenarios exercise, exploring our place in four extreme possible futures. The process was documented on our blog and will help us shape our research directions in the coming year.



Ecological technology

While much technology harvests our time, personal data, and promotes increased consumption, we are instead interested in developing systems to better understand the planet we live on, encourage more sustainable behaviours, and reduce inequalities. These projects often use solutions with an eye to more international issues, such as technology use in developing countries.



Ecological technology

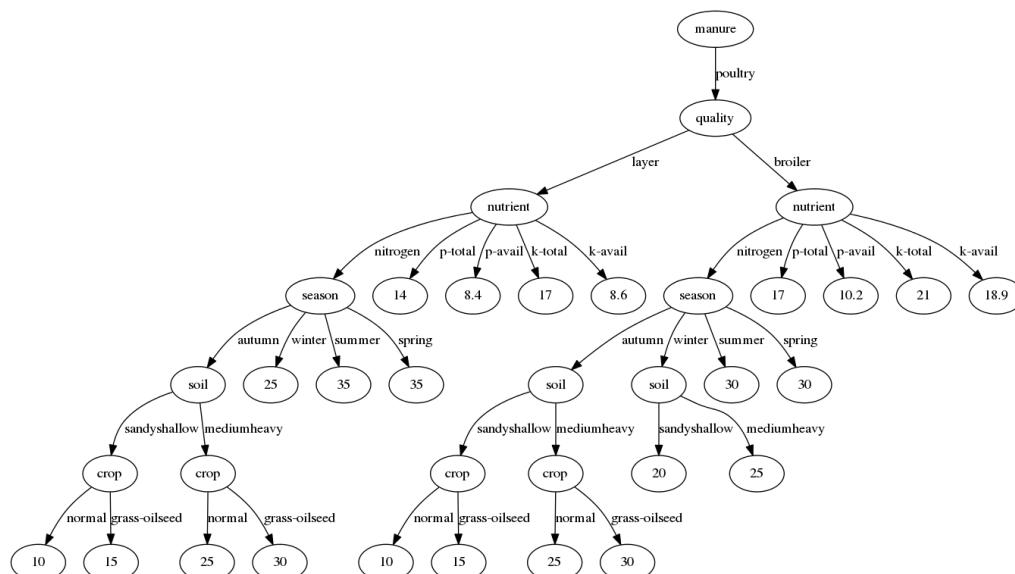
The Farm Crap App Pro

<http://fo.am/farm-crap-app>

This year we released the Crap App Pro – an extension of a tool we made for encouraging sustainable agriculture commissioned by the Duchy College and Rothampstead Research. The app is based on DEFRA data to promote the use of natural fertiliser, and won the Soil Association Innovation Award back in 2014.

Farmers have to report the nutrients they spread on their fields to the Government – this is made easier by buying commercially produced fertiliser with the nutrient values printed on the bag. Meanwhile, farm manure goes to waste because the nutrients are less straightforward to quantify. Our system means farmers can plug in manure, crop and spreading information to get the nutrient values quickly and freely, without needing to employ a consultant to decipher the Agriculture and Horticulture Development Board documentation.

We've added more crop types, more detailed nutrient information, more manure spreading methods, and farm maps to make the system useful for a wider range of farmers. We have received funding to complete the project in 2018, when it will cover all crops that manure should be used to fertilise.



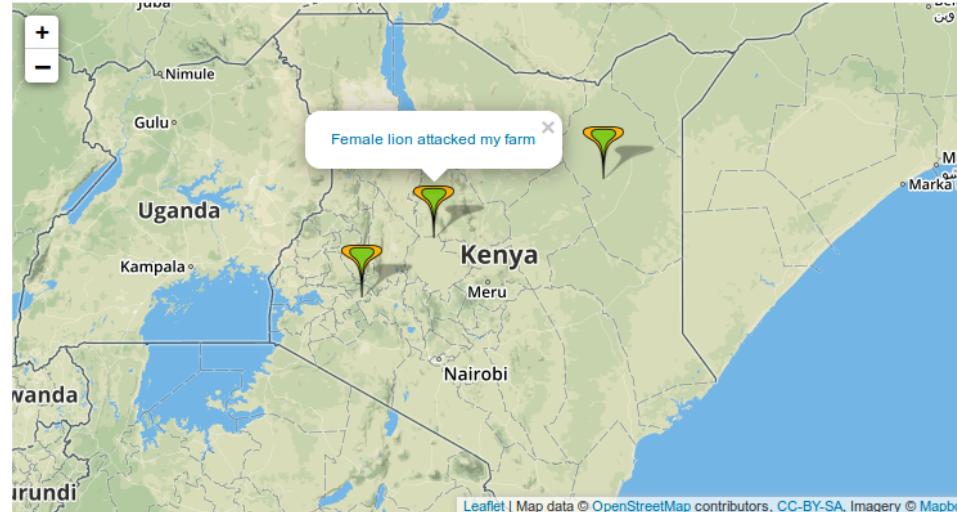
Ecological technology

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- [Home](#)
- [Report Incident](#)
- [My Reports](#)
- [Log out](#)

INCIDENT MAPPER

A free, open source tool for recording incidents of livestock being attacked in Kenya. Reports are verified twice, by village heads and researchers, before appearing on the map below.



[Report Incident](#)

[My page](#)

[Logout](#)

Human-wildlife conflict mapping

<http://fo.am/carnivore-mapper/>

We have begun development of a free, open source tool for recording incidents of livestock being attacked in Kenya, in collaboration with Dave Hodgson and Enoch Mobisa at the University of Exeter. Compensation is awarded by Kenyan authorities when livestock are attacked by big cats, in an attempt to reduce poaching of lions. However in reality it is difficult to prove a lion attack so compensation is rarely successfully obtained. This system allows reports of livestock lost to lions to be submitted by anyone, and then verified - first by village heads/elders, and second by the team working on this project. After two verifications the incidents appear on the openly available map, adding weight to people's compensation claims. The system will be made available in Swahili and English.

Ecological technology

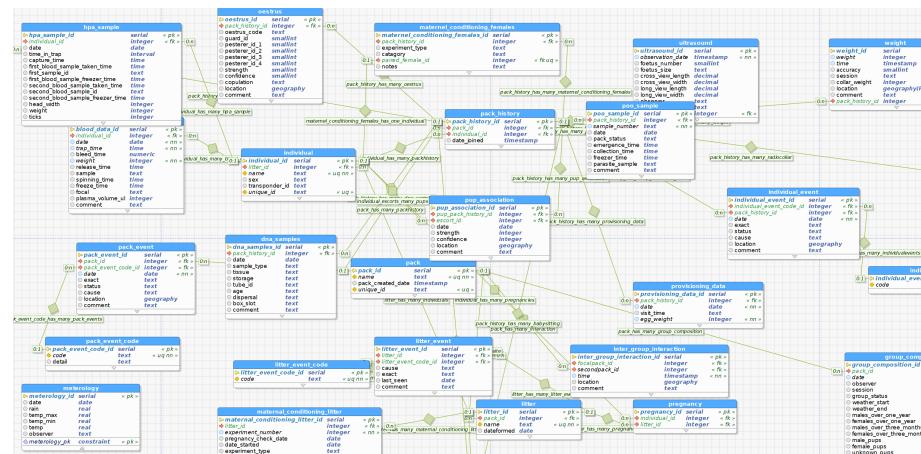
Mongoose 2000

<http://fo.am/mongoose-2000/>

Mongoose 2000 is a behavioural research tool for use in remote areas lacking reliable internet connectivity or power. Developed for the Banded Mongoose Research Project at Exeter University for use in their field site in Uganda, Mongoose 2000 uses a Raspberry Pi to synchronise behavioral observation data across multiple Android tablets used for daily recording of mongoose behaviour.

In 2017 Aidan Weatherill joined FoAM to further develop this system. We have been transferring the research group from using Access to SQL for data storage and querying. This means the whole research system is now open-source, and global collaboration is more straightforward. In the picture you can see the moment the first data went from a tablet to a Raspberry Pi and then into the new database automatically – reducing data entry time and human error in critical wildlife research.

Together with the researchers from the University of Exeter, we have written a paper outlining how the system works and how it improves behavioural research on wildlife – this will come out as an open-access publication in PloS One in early 2018.



Familiar Faces

As well as project collaborators, we enjoy a flow of ideas and disruption through the studio with our regular cross-project collaborators, Humans in Residence, and PhD students. It's impossible to list everyone who comes through the doors – but on the next pages you can see some our longer-term guests and co-conspirators.

Familiar Faces

This year we've been lucky to meet and work with three new cross-project collaborators. Each has improved our projects and events through bringing their own wealth of experience and imagination, and we thank them for being a joy to work with:

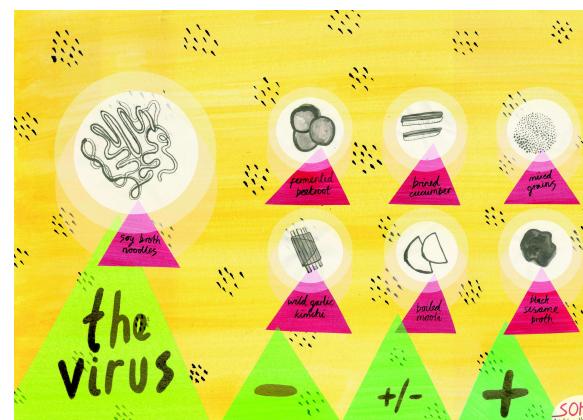
Hoon Young Kim

Hoon is a mathematician/musician/chef who runs his own pop up restaurant, Sohn Kitchen. He is currently focusing on using traditional Korean methods of preserving with local foraged plants, and has worked with us to create delicious meals for our workshops – helping to nourish the participants and invigorate the atmosphere.



Elizabeth Fortnum

Elizabeth is an illustrator interested in effective visual communication for practical and educational use. She specialises in printmaking and problem solving, using collage, ink and typography. Liz designed menus to complement and explain the food offered at several of our workshops. Her work can be found under the guise of 'studio Kathleen'.



Aaron Moore

Aaron runs a rural non-profit makerspace in Cornwall. He has built his own open-source large CNC machine, 3D printer and laser cutter, spent a decade training people to make hand-tools, and written influential books on woodworking. Aaron has been teaching us basic wood skills and together we have been designing and building new tangible interfaces.



Familiar Faces

Human in Residence

<http://fo.am/humaninresidence/>

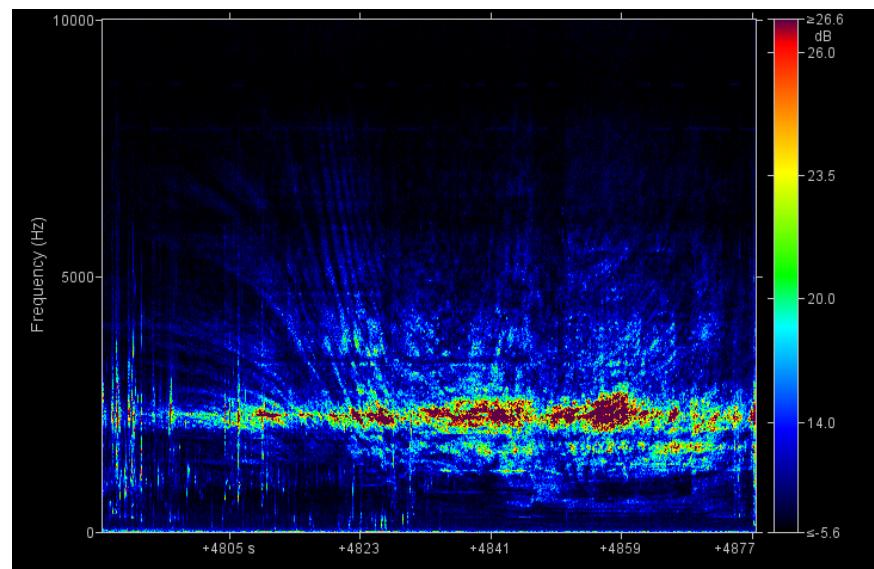
At FoAM Kernow we run a 'Human in Residence' scheme – providing an opportunity for people to develop their more ambitious transdisciplinary projects.

In 2017 we hosted two residents: Dr. Jo Garrett who joined us to develop our Sonic Kayak system to record and map underwater sounds, making new forms of environmental research possible. Dr. Shelly Knotts came to work on Molecular Soundscapes - a Leverhulme funded project bringing together computational chemistry, structural biology, scientific programming and sound art to generate an audiovisual installation and set of musical scores.

In 2018 we will continue to host residencies, and will be announcing a new paid collaborative residency scheme.

PhD Students

We formally supervise PhD students at FoAM. In November 2017, Lewis Campbell became Dr. Campbell, receiving his PhD for his work using field-based citizen science to look at how epidemic disease changes the behaviour of wildlife, in collaboration with the Zoological Society of London and the University of Exeter. We offer students a creative environment to work in, outside traditional educational institutions, and encourage them to draw from a greater breadth of inspiration and approaches.



Publications in 2017



Quipu by Alex McLean

Sonic Kayaks: Environmental monitoring and experimental music by citizens (2017) Griffiths AGF , Kemp KM, Matthews K, Garrett JK, Griffiths DJ. PloS Biology 15(11): e2004044

Data collection and storage in long-term ecological and evolutionary studies: the Mongoose 2000 system (2017) Marshall HH, Griffiths DJ, Mwanguhya F, Businge R, Griffiths AGF, Kyabulima S, Mwesige K, Sanderson JL, Thompson FJ, Vitikainen EIK, Cant MA. PloS One (in press)

An ecological role for assortative mating under infection? (2017) Campbell LJ, Head ML, Wilfert L, Griffiths AGF. Conservation Genetics, 1-12

Textility of code: a catalogue of errors (2017) Griffiths DJ, McLean A. TEXTILE: Cloth and Culture, 198-214

Disease mediated changes to life history and demography threaten the survival of European amphibian populations (2017) Campbell LJ, Garner TWJ, Tessa G, Scheele BC, Wilfert L, Griffiths AGF. bioRxiv, 178723

Coding with knots (2017) Rohrhuber J, Griffiths DJ. TEXTILE: Cloth and Culture, 143-157

Population genetic structure in European lobsters: implications for connectivity, diversity and hatchery stocking (2017) Ellis CD, Hodgson DJ, Daniels CL, Collins M, Griffiths AGF. Marine Ecology Progress Series 563, 123-137

All publications are fully accessible here: <http://fo.am/publications/>



Thank you to everyone we have crossed paths with in 2017 – without exception, you have been a great source of inspiration and a pleasure to work with.

We see that inequality and anthropogenic environmental disruption remain the biggest issues of our time and will continue to prioritise our work in these areas.

In 2018 the FoAM Kernow studio will be moving to a new, larger space – we hope this means we can welcome more of you in during the coming year.

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