[MUSIC PLAYING]

KAREN FOLEY: Hello, and welcome back to the Student Hub Live. Well, at the Open University we have lots and lots of -ologists. And I have one now with me. I have Hazel Rymer in the studio. And in addition to being the Pro Vice Chancellor (Learning and Teaching Innovation), you are a volcanologist.

HAZEL RYMER: I am.

KAREN FOLEY: And you research volcanoes, which I know from previous experience at the Student Hub Live is something people are very, very interested about. So in this session we're going to be talking about your research and what you do and how you actually got into this in the first place. So when did you first realise that this was something you wanted to do? I mean, did the idea of volcanoes come before being an -ologist of sorts, or did you think, no, I'm going to be really bright and study something, and then accidentally got into volcanoes?

HAZEL RYMER: The latter, which is a bit boring really. So I'm sure that's what you want me to say is that from the age of three or something I knew I was going to study volcanoes. And that's absolutely not the case, so no.

I did a physics degree, and then I wondered what to do. And various ways I managed to then get a Ph.D. on geophysics, which was about applying some of the physics that I knew to a geological situation, so measuring the earth - that's what geophysicists do - and I happened to measure volcanoes, so I really got into it that way. And I first visited a volcano during my Ph.D. student-ship. And I just fell in love with the whole thing, and I decided that's what I was going to do for the rest of my academic -

KAREN FOLEY: The rest of your dying days.

HAZEL RYMER: Yeah, something like that. I was just going to say for the rest of my life. That's a bit drastic, isn't it? But I just absolutely loved volcanoes. I just thought they were so awesome, so special, so uncontrollable, all of that stuff. And so I just wanted to study them, I just wanted to be on them actually.

[LAUGHTER]

KAREN FOLEY: So you do a lot of fieldwork, I guess, than doing, so it's something quite practical as well as, obviously, academic. What do you go around doing then?

HAZEL RYMER: It does sound a bit weird to say you do fieldwork, doesn't it? And what does fieldwork actually mean? Well, you have to go and make the measurements. Now, these days, of course, when I started we didn't have all this satellite technology and ability to collect measurements that way. So now, actually it's a bit boring. You can stay in Milton Keynes and do some of it that way.

KAREN FOLEY: Remote measurements.

HAZEL RYMER: Remote measurements, yes. But you always need something called ground-truth, which is going into it, actually on the ground itself. But you can measure all sorts of things, so it could be temperature, it could be the amount of gas coming out, could be the gravity field, magnetic field, oh, electrical pulses within the Earth, all sorts of stuff that you can measure.

That's what geophysicists do. They measure stuff, measure physical properties. And some of those, as I say, you can now do remotely or you can do from space. But the best ones you can do actually there on the ground. Actually, the very best ones are a mixture of the two.

So going, doing fieldwork involves literally that. You go out to the volcano. You set up a series of measurements. You make them, and then you spend the rest of the year figuring out what they mean.

KAREN FOLEY: Wow. So who pays for all of this? Why do people sort of say, come to this volcano, come and have a measure and see what's going on? I mean, what's the point?

HAZEL RYMER: What is the point?

[LAUGHTER]

Oh, really!

[LAUGHTER]

Well, let's get to the nitty-gritty. What is the point? Well, there's the academic point of view, which is, scientists just want to understand how things work. And so in the case of volcanoes, how do they work? Why do they erupt when they erupt?

And actually the real point about that is that you can start to make predictions and you can

start to help people who live near volcanoes. You can also look at things like the environmental impact of volcanoes, both locally and globally. Bigger eruptions have more significant global impacts. So it's a combination of all of those sorts of things.

So then, who pays? That's a very interesting question. Why would the British taxpayer pay for you to study a volcano on the other side of the world? Well, partly, as I say, from the academic point of view, and partly because there is a global impact when volcanoes erupt significantly. Everybody, I think, will now remember the 2010 Eyjafjallajokull. And although people weren't actually in Iceland when that erupted, many people were, sadly, stuck at their holiday destinations for longer.

KAREN FOLEY: I remember that. Slight delays. Terrible.

HAZEL RYMER: Terrible, terrible. So pretty much everybody in some way was impacted, whether or not it meant you couldn't fly where you wanted to out, or you couldn't get back to the UK, or you couldn't buy certain fresh fruit and veg that were being flown in from wherever.

KAREN FOLEY: So the impact is a lot more significant than just a volcano erupting.

HAZEL RYMER: Absolutely. Yes, yes. So the better we understand volcanoes and what their impact is the better we can mitigate some of the effects.

You can't switch volcanoes off. This has been tried. You can't stop them erupting, but what you can do is understand better what the precursors are, what the signals are before a volcano erupts.

KAREN FOLEY: Which must put you in a very difficult position, I guess, because there must be a threshold whereby, you know, there's certain ones, I guess, that are more active than others. There are certain riskier areas, especially where populations are involved. And so there must be people making decisions, I guess, about when to evacuate, when it's safe and when it's not, when you're at a higher risk. How does all that work then, and is that something you've been involved with?

HAZEL RYMER: I've been a little bit involved in that. But the really important factor is that you don't have international scientists breezing in and saying, oh, yes, that's a volcano, I can confirm that's a volcano and it's going to erupt next Tuesday afternoon. Absolutely you do all this in collaboration with the local scientists and local civil defence and other people because you have to have some continuity there on the ground. You can't just have people popping in. You

can have people invited to make some measurements that perhaps the local scientists don't have access to, that kind of thing, but not sort of breezing in saying it's going to erupt and then doing a runner quickly.

[LAUGHTER]

Because, actually, predicting when a volcano is going to erupt is one thing. In many ways what's at least as important and arguably more difficult is saying when it's going to stop, because once you have evacuated people, knowing when it's safe to go back and to start normal life again and all the services and that associated with normal life, when you can actually understand that that is safe to do is actually harder.

KAREN FOLEY: Yeah, no, absolutely. Sylvia wants to know whether there's a lot of practical work in some of the stuff that you're teaching. So I guess for students then, some people who might be studying some of these areas, what is the practical side? You've mentioned some of the remote stuff. And in fact, on the Student Hub Live we're going to be talking about some of the remote laboratories in the sessions tomorrow, which will be very interesting. But in terms of your side of things, what practical work is there for students to do?

HAZEL RYMER: Well, for the students looking at the geoscience courses, geology courses, there are field trips to go on, some of them with your tutor and some of them associated with your courses. So that's how everybody starts in the geological sciences. And I would encourage everybody to get out and be involved in those if you possibly can. So that's how you start, identifying rocks and in some cases making some measurements.

KAREN FOLEY: And are these practical field trips?

HAZEL RYMER: Yes.

KAREN FOLEY: Real ones that people go on and meet up with other students in real life?

HAZEL RYMER: Real life.

KAREN FOLEY: Like the Comic Con thing that everyone is going to.

HAZEL RYMER: Real life. Real people. Real rocks, yes. There are, smaller, but still some opportunities to go and get involved with field trips internationally if that's what people want to do as well.

KAREN FOLEY: To erupting volcanoes?

HAZEL RYMER: To erupting volcanoes, should you wish to. It's not everybody's cup of tea. We do have to recognise that.

KAREN FOLEY: Yeah, yeah, yeah. But I guess it must be really exciting actually going out with people, meeting them, and having that experience of doing a field trip. What sort of things would you do? I mean, you've talked about measuring things. So what sorts of things might people expect to do on one of these first field trips?

HAZEL RYMER: Well, there's all sorts of things that we use our volunteers to do. Actually, most of it, people always say to me, what's it like being a scientist? And I say, just like every other job, you spend most of the day doing emails and things.

What's it like doing field trips and fieldwork on an active volcano? Actually, you spend most of time walking around, lugging heavy backpacks and carrying stuff from here to there. But having carried your heavy equipment to wherever it is you're going to go and make your measurements, well, you sit there. You put your gas mask on because there might be some fumes and things coming towards you.

And you sit or stand or whatever you need to do to make your measurements. You can be there for anything from five or 10 minutes to half an hour or longer in a particular place making the measurements. And then you pack it all up and put it back on your back and go traipsing off somewhere else. So there's a lot of hiking. There's a lot of tricky scrambling sometimes, ups and downs.

KAREN FOLEY: I bet.

HAZEL RYMER: But it's sort of making, in some cases, quite detailed and careful measurements in quite tricky circumstances. I think that's one of the most important things about the fieldwork, is quite often, well always, these instruments are developed in laboratories. And companies make them. And they work really, really well in the lab before you go into the field.

And you test the instruments. You test the batteries. And you test all the bits and bobs. And then you stick it into an airplane hold. It gets turned upside down and that. Anyway, you end up the other side of the world and you take it all out, and it doesn't work.

And so there's quite a lot of fixing stuff and trying to extricate bits of equipment from customs,

and all that sort of thing. So there's all that. There's a lot of practicalities before you can even actually get out and do the practical work that you've gone to do.

KAREN FOLEY: Oh, excellent. No, I can imagine that must be really technical. I'd like to see what people are talking about at home because somebody would like to know whether there's a Volcano Com that they could go to.

Everyone's getting ready to go on a trip, I believe. I mean, in New Zealand we used just to pour, like, soap powder down volcanoes, which is probably not what I should be saying out loud here. But what's going on on the Hot Desk? And what trips are you planning for your field trips?

[LAUGHTER]

HJ: Well, we're not too sure if Volcano Com has any cosplay. So we're not too sure what we should dress up for that one. But -

[LAUGHTER]

SOPHIE: Dress up as lava.

HJ: Yeah.

[LAUGHTER]

But we did have some questions in, I think.

SOPHIE: Yes. Thomas asked if you'd ever had any close calls whilst doing any fieldwork.

KAREN FOLEY: Near-death experience.

[LAUGHTER]

Come on, where's the drama?

HAZEL RYMER: Oh, dear. I've expunged all of those from my memory. Do you know, people often ask me how dangerous it is. And the answer is really very boring. It's more dangerous driving around the M25 to get to the airport. That's, in many ways, the highest risk. Having said that, of course, you've got to be very, very careful clambering down into active volcanoes, and so on.

I think that the most horrible experience I had in the last few years was when we had quite a

large earthquake struck the volcano. So that was sort of two nasty things in one place. And it was unexpected.

And we were just walking along the rim of the active crater, as you do, and this very large earthquake happened and we all fell over. It was that serious. And we looked down into the crater to see whether the volcano had been set off, which fortunately, it hadn't. And we left the area really quite rapidly. But I say left it rapidly. It took another two hours or so to get back to the car because it was quite a clamber back to it.

And as we drove back down the volcano, we could see the effect of the earthquake in the villages that we had to go past. I mean, flattened houses, electric pylons down on the ground, sparking. You know, I mean, that was quite exciting. So it wasn't actually the volcano itself, it's the stuff around it.

KAREN FOLEY: Yeah. And you managed to keep your eyebrows as well, which I bet is a bonus in that sort of circumstance. But, no, but seriously, that must be quite difficult. I mean, even though, obviously, the earthquake is not your job type thing to manage.

HAZEL RYMER: A different union -

KAREN FOLEY: Yeah. But that must have been quite difficult, especially with all this equipment and things as well to carry and manage around the place. So, yeah.

HAZEL RYMER: Well, it's just one of the natural hazards, you know?

KAREN FOLEY: Yeah. I guess it's a risk. So you're still going on a lot of this. It hasn't put you off, has it?

HAZEL RYMER: Certainly not, no.

KAREN FOLEY: So what's your next trip?

HAZEL RYMER: My next trip is to Masaya Volcano in Nicaragua. And I should be going there February/March-time next year.

KAREN FOLEY: And have you been there before?

HAZEL RYMER: Yes.

KAREN FOLEY: So a lot of the time you're going over, you're making measurements, and you're monitoring

things over time. But you mentioned instruments and you mentioned that there was changes in terms of how those were developing. And I guess in this sort of day and age of technology, you're both measuring things and also advancing our knowledge and understanding of some of the instruments. So what's new? What's hot right now in terms of what you're using to measure, and are there different things you're measuring as well as different ways of measuring things?

HAZEL RYMER: All of those. I guess the thing that I've been doing for quite a long time now is measuring gravity on volcanoes. So the acceleration due to gravity, little g, it's 9.8 per metres per second squared. Remember that one? That's what keeps us down on our seats.

That changes in different parts of the world, rather, it varies in different parts of the world, because the Earth isn't a perfect sphere, so there are variations because of that. But also through time the value of gravity changes a little bit. This is in the seventh and eighth decimal places. It's not very much, so don't worry. It's not, you need very delicate instruments to measure it.

But what we have found is that the value of gravity can change before an eruption. And it changes around a volcano in different ways. So what you can do is you can effectively monitor the magma coming up underneath you. And you can measure, you can identify where little pockets of gas are and where little pockets of magma are coming up.

And so we've been monitoring this at a few volcanoes. Masaya Volcano in Nicaragua is one in particular that we've been looking at. And if you keep going back and making the same measurements year on year on year, and then you, obviously, look at how the volcano is behaving over that long period of time, eventually you can see, often with hindsight you can say, well, OK, my measurements went up like that, and I didn't know what that meant at the time, so it's over a period of time, but this is what I observed the volcano doing.

Then you know that next time that you observe something like that, say, the gravity increasing, then you can predict that the effect will be something similar to what you saw the previous time. So it's a long haul, but that's the purpose of continuing to make measurements at the same place. And then, of course, once you've learned those techniques and developed them in one place you can apply them to another one.

But the instruments that we use are really, I should have brought one, really, shouldn't I, the most unimpressive, sort of spring, a box, box of tricks. Like most geophysical equipment it's a

box with knobs on and batteries and things attached and some flashing lights and stuff.

But they're really fancy because if you measured gravity on the floor here and then measured it up on this table, you would easily be able to measure that gravity is less here on the table than it is on the floor because you're closer to the centre of the Earth when you're on the floor there. So that's a tiny, tiny change in gravity. And so if your volcano is sitting there and it expands a little bit, it goes up as new magma comes up underneath you, so the value of gravity will decrease and you can measure that at the top there.

So the ideas haven't really changed but the instrumentation has improved a lot through time. And it's getting better and better, more user-friendly and a bit less temperamental. You know, I was talking earlier about you spend a lot of time making the equipment and charging your batteries and all this sort of stuff, that all gets better and better as technology improves, thank goodness.

KAREN FOLEY: But can the prediction improve? I mean, in science there's this whole cause and effect thing. And I guess you're measuring one thing, other people are measuring other things. You're probably saying, yes, well, we can predict x, y, and z. And then someone says, no, it's this that you need to keep an eye on. Has the prediction improved then in terms of what you're able to measure?

HAZEL RYMER: Yes, it's improved in that it's becoming easier to measure gravity and various other things on the volcano. What we know for sure is that it doesn't do you any good to just measure one thing. It's a case of measuring lots of things and putting them all together.

And the real tragedy, actually, is that there are so many active volcanoes on the planet, and the vast majority are not monitored. They can't be. It's just too expensive.

So increasingly, these days with technology we're able to make satellite measurements and we can look at things like the heat flow, bit late by then because it's already coming out, gas flux in some cases. So you can measure gas plumes coming out of volcanoes. And you can even measure the deformation. So as a volcano swells or even collapses down a little bit, you can see that from space as well. So that is quite a good way of monitoring lots and lots of volcanoes.

But you have to be looking at all of that data. So we're looking to automate that now so that there are ways of, effectively, just a computer programme keeping an eye on all the volcanoes

and say, yup, that one's gone up a little bit or it's gone down a little bit, or whatever. But the more detailed measurements are those that you've physically got to go out there and make, and it's really, really labor-intensive. But that is where you get the most amount of information.

KAREN FOLEY: Brilliant. I want to ask some more questions, but I want to, I know there's a question on the Hot Desk.

HJ: Kerry's got a great question. How do you measure volcanoes under the sea? That's what we'd like to know.

[LAUGHTER]

HAZEL RYMER: Well, that is a really great, great question, especially since that's where most volcanoes are. And well, how do you measure them? With great difficulty I think is probably the best answer. So we can send down submersibles that can measure the flux of material coming out of them. But the sorts of measurements that I'm talking about, the gravity, the ground deformation, magnetics, and so on, are not made on those volcanoes, sadly.

KAREN FOLEY: No. So how do you then choose, who gets to say which volcanoes are monitored? Is there some more interesting than others? You say not all of them, and there's some really interesting ones that I guess you could look at. Who's making that choice and how does that all work in terms of what is actually monitored and measured?

HAZEL RYMER: It depends on what country you're talking about and how active the volcano is, and so on. So originally I was talking about the academic reason for studying volcanoes, so in that case, you have an academic problem that you're trying to solve and that's how you would choose where to go and do your work. Logistics come into it as well, obviously. So somewhere that's easy to get to, relatively safe, and so on. All of those things will drive that.

If a country has a volcano that's misbehaving and perhaps they don't have sufficient people to be able to monitor it or to help them to investigate what's best to do in terms of mitigation and this is about evacuating people and so on, or even setting up a baseline set of measurements, then they might call in people from somewhere to go and make those measurements. So it depends, I think, is the answer to that one.

KAREN FOLEY: So are you happy with your volcanoes that you've got, or is there one out there that you think, oh, I wish I could get my hands on that one?

[LAUGHTER]

HAZEL RYMER: Well, right now I'm happy with Masaya Volcano. And the reason I'm happy with that volcano is that I've been measuring it now on and off since about, I think it was 1993 I first went there, which is an awful long time ago. And we set up a little network thinking, well, it would be nice if we manage to come back another time. And we went back the following year and the following year. And we've come back pretty much every year since then.

So what we have now is a really, really long time series of measurements that have been made there. And so when we're beginning to understand that volcano quite well, or so we thought. This year it did behave a little bit differently from how we had expected.

But actually, that's the whole point of volcanoes. They are unpredictable and that's why I really like studying them. But gosh, if I had more than 52 weeks in the year, I'd be really happy and I would study a lot more volcanoes. I have being to lots and lots, and I have had monitoring programmes on several.

But I'm happy with Masaya at the moment because it's great. It's quite active but not too active. And it's quite easy to get to. It's very good for the maturing volcanologist because you can drive right up to the top.

KAREN FOLEY: Easy access.

HAZEL RYMER: Yes, yes, yes. But some nice little hikes around but not too drastic. Not too far from civilisation, and somewhere to charge your batteries, and WiFi, and all of those other important considerations.

KAREN FOLEY: No, they are important. Kerry is watching in Kenya and she says that Kenya and Tanzania have some amazing volcanoes.

HAZEL RYMER: They most certainly do.

KAREN FOLEY: So, yeah. But it's all these considerations, I guess, that you have to bear in mind. Now, you mentioned the whole academic side of things and having an academic problem and trying to solve that. So you're obviously going to have to write papers and contribute to the body of knowledge about volcanoes. So you're out there, you're measuring things, what are you then going to come back and write about and how does that all link into what you're researching?

HAZEL RYMER: OK, well, usually a research project you would typically have an idea. You write a research proposal saying, I think that this might happen. If I went and made these measurements, I think I might be able to answer these various questions. And eventually you get your proposal funded and you go out and you make the measurements. And if you're really really, really lucky you've got some of the results that you're predicting and it fits in with your models and that's very nice.

In reality, obviously, it's a bit harder than that because you either don't make the measurements that you wanted to for all sorts of reasons, or you get the measurements but they don't show quite what you had expected them to. And actually, that is the fun of science, that it's about coming up with ideas and models and suggestions and then, well, either having them absolutely proven by your data or, more likely, having them modified sometimes quite considerably by your data.

And what you have to do is to take all of the information that you can, so that's your own data. That's previously published data. That's data that other people are collecting. Put it all together and try to improve the model.

So if, for example, your suggestion had been that you were going to make these measurements and they would tell you whether or not the amount of gas coming out of the volcano was going to increase over the next few months, you go out there - I mean, actually, it's kiss of death because so many times I've written a proposal and said, I'm going to do these measurements on this volcano that looks like it's getting more active - soon as I go out, switches off. No more activity.

[LAUGHTER]

That's why I like Masaya.

KAREN FOLEY: Soap powder

[LAUGHTER]

HAZEL RYMER: Soap powder is the answer. You're right.

KAREN FOLEY: Yeah, or it works a trick every time. Well, Holly says she thinks that she found some lava in Loch Ness, but Dave says that he thinks it could be Loch Ness monster poo. And Thomas wants to know, if you had the opportunity to go to Mars and study volcanoes, would you?

HAZEL RYMER: Would I in reality go to Mars? No, I wouldn't, for all the reasons that I quite like it here on Earth.

KAREN FOLEY: Those planetary scientists can be a little bit much, can't they, at times?

HAZEL RYMER: I couldn't possibly comment on that. They do have some pretty impressive volcanoes on Mars, but they're dead. I like active volcanoes.

KAREN FOLEY: OK. Excellent, excellent. HJ and Sophie, have you got any questions for us?

HJ: Well, you've answered some of our questions. But Sylvia seems really interested. She's got a lot of questions. But she wants to know more about the modules where she can study volcanoes and what type of things she would be doing, what type of assignments are involved in those modules.

HAZEL RYMER: OK. Well, volcanoes turn up in lots and lots of modules, particularly, obviously, in the geosciences. Most volcanologists, I should tell you now, most volcanologists don't study geology as a first degree necessarily.

I started life as a physicist. Many volcanologists are chemists, biologists. There are actually social scientists who are volcanologists. Just because, as I was saying earlier, it's not only to do with making the measurements and predicting when the volcano is going to erupt but it's that there's a lot of social sciences associated with working out how and when it's best to communicate with the local population, what mitigation is best. And there are huge numbers of research projects just associated with that.

So volcanology isn't quite what you would necessarily expect. So actually you can become a volcanologist from all sorts of different areas. If you want to learn more about volcanoes, then you would probably do that within the geoscience modules. So start with S104 if you started last year, or S111 now is getting into the sciences.

But go and do some of the geoscience modules. As I said, there are opportunities to do fieldwork in this country as part of the modules. Lots and lots of online work. There are a virtual field trips, which are marvellous because you can do them from wherever you happen to be in the world.

And there are opportunities to volunteer and help on research trips. As I say, most people aren't going to want to do that. But those that do have a whale of a time, and we love working

with them.

KAREN FOLEY: Absolutely. No, I can see definitely the point of going on field trips. And that would be loads and loads of fun. But what's interesting about what STEM are doing right now is this remote laboratories and this whole idea I guess that when you've got loads and loads of students you can get a lot of data if you go and measure things. And that's really exciting because not only are you getting an experience of measuring something and doing something, often in a very real-life simulated way, but you are also then able to contribute to understanding about things and actually there's a point to it, isn't there?

HAZEL RYMER: Yes. So there's nothing more frustrating really than being asked in an assignment to go and measure something that you know is just an exercise in making a measurement for the sake of it. Who cares? So what STEM have tried to do is to make these measurements valuable.

And actually they've been really rather sneaky because in some of the astronomy modules, for example, OU students have been using the telescopes remotely, doing their work, doing their assignments and making new observations, and this has actually gone, fed into research. So there are far more opportunities to get involved in research than you might imagine, and you've got to learn how to make the measurements. But having done that, they're quite often valuable and actually used and published.

KAREN FOLEY: And we're going to do some of that tomorrow actually, because we're going to be looking at some moon rocks. So you can get a chance to use some of the remote laboratories and do some observation yourself. And in the evening session, we're going to have moons, Mars, and Mercury. And we're going to be talking about some of those instruments as well. So that'll be a good thing to do also.

HAZEL RYMER: Very good.

KAREN FOLEY: Real-life experience of all of that. OK, so what is the best thing about this job then. That you fell into?

HAZEL RYMER: That I carefully planned from the age of three.

KAREN FOLEY: Aside from the drama and excitement of near-death and lugging equipment.

HAZEL RYMER: You sell it so well. What's the best thing about it? Well, I think it's thinking that you might be able to make a difference. And that's really why I wanted to be a scientist, I think, originally. So

the volcano bit is a particular aspect of that. But by being a scientist, trying to find out more about the world we live in and to explain it to other people, I mean, that's always good. But to be able to do something to improve lives, I think that's quite cool.

KAREN FOLEY: Have you got an idea of what you would like to find or do in terms of, adding the million-pound question, is there something you're really working on that you think, oh, I really want to just nail this thing and then I'll feel like I've really added to the understanding?

HAZEL RYMER: Well, I don't think that you ever want to, I can't imagine saying, well, I'll just do this and then I'll hang up my boots, because I'm not going to do that. What we're trying to do at the moment is to develop ways to encourage school pupils and others that live near Masaya Volcano to make their own measurements and to participate. So rather than some other magical people called scientists going there and making measurements and sort of owning that part of the volcano, we want to engage the people who live there in it.

It's quite interesting really that when the volcano is erupting in such a way that it actually interferes with people's lives, they're very aware of it. And you get a large amount of gas coming out, and it destroys the crops, and that kind of thing. It's sort of in your face and there's something nasty happening.

But the point about that volcano and many, many others is they're what we call persistently active. They just sort of trundle away in the background. They're not throwing out loads and loads of lava. It's just a certain amount of gas and people get used to it and just don't notice it anymore.

So what we want people to do is to make measurements in the schoolyard, in their back gardens, places like that, the sorts of things that environmental science students at the OU are doing as well as part of their modules, making these measurements and see how things are changing through time. And just begin to get their own appreciation of what they can do, what sort of measurements that they can do, which when you have just one spot measurement made once a year or whatever, it is difficult. When you've got a whole area of regular measurements, you can do so much more. So it's all about empowering people and engaging them into helping us, it's becoming citizen scientists.

KAREN FOLEY: Yeah, well, that sounds a bit and I guess you're building up a real community. Like you say, you know, you're going back every year. You must be seeing things change and seeing

people change and society change. What sort of impact then is this having on people and their ability to live, I guess, in this environment?

HAZEL RYMER: Well, people are becoming more aware of the volcano and the threats that it poses. And I think that's really important because if and when the threat of a larger eruption comes they're going to be much better prepared and ready to respond to whatever it is that the government tells them to do. So if they're told that they have to evacuate to 10 kilometres away, 20 kilometres away, whatever it happens to be, then they will understand why and what sort of eruption to expect and that sort of thing, rather than questioning it and saying, well, no, nothing's happening right now. They'll have a much better idea because they will have been part of the build-up and seen the build-up to it. So as I say, it's about empowering people.

KAREN FOLEY: Yeah, excellent. Now, I'd like to finish by asking, is being a volcanologist better or worse than being a panellist on the wheel of -ologies quiz? Which I know you enjoyed very much.

HAZEL RYMER: Oh, I had a marvellous time. We won. Did you know?

KAREN FOLEY: Oh.

HAZEL RYMER: Just, just.

[LAUGHTER]

Oh, they're both fun in their own ways, but I think volcanology is easier.

KAREN FOLEY: Yeah. Well, the home team are very pleased that they won it, at home. They always win, though, to be fair. But yes, no, very, very, very rewarding.

I'd like to just go to the Hot Desk. Are there any final questions there? So I've been hogging this, haven't I? But it's so interesting. Any final questions for Hazel?

HJ: I don't think so. But I think we just thought it was a brilliant session. And a lot of people are going to look up all these materials, and they've been sharing links for the, I think it's either the OpenLearn or FutureLearn things on volcanoes, so I think we're going to be off doing those as well. But I think we've had a really good time with this session. It's very interesting to hear about being an -ologist.

HAZEL RYMER: See you on a volcano somewhere.

HJ: Yeah.

[LAUGHTER]

We'll have a Student Hub Live meet-up on the side of a volcano.

KAREN FOLEY: Hey, that's cool. How will we recognise each other when we get there?

HJ: Well, we'll all have our laptops. And I think someone pointed out, that I was talking to Sophie, without actually talking to her, through the chat.

SOPHIE: Oh, yeah.

HJ: We'll just do that. We'll bring our laptops and chat like normal.

KAREN FOLEY: We should wear a Jaffa Cake, and then we'll recognise each other.

HJ: I like it. Very good one.

KAREN FOLEY: Won't look hot in the slightest. Hazel Rymer, thank you so much. That's been a really, really interesting session. I know everyone's enjoyed it, and thank you for answering all my rather random questions. But I now feel I know what you do, and I think it's brilliant. So thank you for coming in.

HAZEL RYMER: Thank you.

KAREN FOLEY: And thank you, everybody at home. I hope you've had a good evening. There's been a lot of fun.

But tomorrow we have got a whole sensible programme lined up for you. We're going to start off with what to do first when you're a new student. And we're going to have some maths challenges.

We're going to hear more from the library. We're going to hear about the four nations and what's going on throughout the Open University. We're going to look at Group Tuition Policy. And we've got a cocktail policy with the Open Programme, which I'm really looking forward to. So we've got a jam-packed programme.

Do check out the website. And in the afternoon, if you've missed any of the boot camps that we've been doing, we're going to be rerunning those, and the chat will be open so you can

keep talking to each other. But overnight, if you do want to email us a selfie, of your study buddy, or your desk space all nice and organised, or even a picture of you watching the Student Hub Live, please do.

We've got studenthub@open.ac.uk or our Twitter hashtag is #studenthublive16. So do send those through to us. We'll be back open at 10:30 tomorrow and live on air at 11:00.

I'll see you then. And thank you very much, everybody, for participating. And that's all from us here at the Student Hub Live. We'll see you tomorrow.

[MUSIC PLAYING]