Royal Academy of Engineering

THIS IS ENGINEERING

OUR EXISTENCE CASE STUDY

INGRID HALLIN

INGRID is a post-doctoral Research Fellow in the School of Geography, Earth and Environmental Sciences, currently researching how microorganisms influence soil hydrophobicity.

"The project I'm working on right now is a group project between Plymouth University, Swansea University, Rothamsted Research and associated with the Met Office. We are looking at soils from Wales and England and trying to understand the role that microorganisms might play in making soils either repel or accept water.

When we understand how microorganisms influence soil hydrophobicity, we can use the information to help us predict when soils will behave in a hydrophobic manner, or when they will be hydrophilic. We hope to use this information to help us predict when and where flooding is more likely to take place, which is why we have teamed up with the Met Office."

WHEN ASKED what she likes about her job Ingrid said:

"I like lots of things about my job. I've worked with wonderful people, I've been able to travel all over the world, I get to play with dirt and call it work and most of all I feel that I'm making a little bit of a difference in the world.

Soil is a finite resource and under immense pressure, so anything I can do to help us understand how we can reduce erosion and flooding and manage our soils better is, in my mind, a great thing."

Ingrid grew up in Canada and was always really interested in science, maths and English. She went to the University of British Columbia planning to be a doctor. However she discovered that whilst she loved her science classes, she was not as interested in the classes required for medicine.

Ingrid ended up taking a physical geography course and realised very quickly that her real passion was in soil and environmental sciences. Ingrid graduated with a BSc in physical geography. She went on study land reclamation at the University of Alberta. Ingrid then moved to Wales to complete a PhD in chemical engineering at Swansea University.

Ingrid's PhD was a joint project between the chemistry, geography and engineering groups at Swansea University. The project examined the physical and chemical reasons behind the effect that biochar (biomass burned at very high temperatures) has on soils that repelled water. The aim was to make water repellent soils more wettable. Water repellent soils are found all over the world in every climate and in all sorts of soil types. Understanding how to manage these soils better and improve wettability could prevent, or at least reduce, the erosion of these water repellent soils.

WHAT DOES engineering mean to you?

"I see myself more as a Soil Scientist, however in my mind; engineering is the ability to see a problem as a sum of smaller parts rather than a giant obstacle. Engineers seem to have this fantastic ability to break a problem apart into many pieces and then solve each piece to provide an overall solution.

Engineers are also able to look at problems from an academic, scientific perspective but apply solutions that work in real world conditions, which is a very great skill indeed."