

Can making soils more entertaining to encourage young people's interest in soils?

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Abstract

Soil is often ill-considered and attention to its importance has lagged behind that of air and water. It is a complex system, it is mostly unseen and in the everyday experience of some public can be even be seen as a nuisance that dirties their clothes and cars. This paper describes some novel approaches that have been developed in Scotland to increase public awareness of soils and aimed at young people. An underlying theme is to draw on similarities and contrasts between humans and soils and to use those relationships through a number of different communication mechanisms. Given that we are competing for their attention we have sought to entertain our audience through the use of interesting facts, glamour and humour whilst trying to ensure that the underlying scientific messages are robust and can be mapped to the science at different levels of understanding. Soil scientists do need to leave our comfort zone and engage in more novel techniques to ensure that societies are aware of the fundamental relevance of soils to their enduring existence.

Key Words

Public engagement, soil health, soil characters, soil forensics, games.

Introduction and Rationale

Soils provide the basis of life on earth underpinning many of the key provisioning and regulating ecosystem services but why is its importance not fully reconised? Is it because we have failed to engage? What motivate young people to engage in soils? Our experience is that young people want to be doing something important for the future as well as being interesting and it helps if it is also glamorous. So soils are important and we have no doubt but do they and how we tell me them about it?

There are a number of interconnected global issues such as food supply, population growth, climate change and energy provision; in all of these, soil plays a key role either directly or indirectly. The current generation of soil scientists have a responsibility to raise awareness of the importance of soils to young people to convince them that a career in soil science is not just interesting but also of fundamental importance to societies around the world. Novel approaches that employ different types of imagery and language interspersed with humour are likely to reach beyond that of conventional methods particularly for the younger generation.

Unlike many other science disciplines such as biology or chemistry, soil science can be a difficult subject to translate into publicly accessible material either through use of appropriate language, iconic imagery or through things that people see or use in everyday life. This issue is recognised widely and indeed is now finding its way into policy. For example the pending European Soil Framework Directive will require member states in the EU to have an awareness raising campaign (EC 2006). It is therefore an issue confronting soil scientists that is unlikely to go away and is relevant to all potential audience groups.

Guiding principles

Awareness raising and engagement with soils are beginning to become mainstream and there are a number of successful high profile initiatives such as the Smithsonian in Washington DC, the Soil Museum in Osnabruck in Germany and the Soil of the Year again from Germany and these are excellent examples of the type of activity needed. We have drawn on these examples and others that use non standard communication techniques (in the context of soil science) and with communication professionals we have been guided by some key principals in communication planning, objectives and techniques. These include

- Being aware of your key audiences and their specific needs;
- Appreciating the purpose of communicating i.e. what do we want the audience to do as a result of the communication?

- Making informed choices about the appropriate communication channels;
- Seeing communication as an opportunity for our own learning and improvement. We can learn what interests and stimulates the public and develop new ideas from that feedback.
- Creating interest and attention by being provocative, then relating and telling your story;
- Showing and not exclusively telling;
- It is their story, not yours, you want them to remember it so they need to understand;
- Tell your stories in the context of a bigger picture

We sought to apply the principles above as we developed a series of exhibits and materials built around the central theme of soil health and its varied characteristics. We attempted to relate soil to what interested people not what interested soil scientists. In this context we have also taken the opportunity to engage with the public on issues, such as crime investigation, that are also glamorous in the eyes of the young, have a wide public interest and profile and where soil is important.

Soils and human health: One of the same?

While there are many philosophical aspects to the relationships between soil and humanity as well as direct links between soils and human health, our approach was more pragmatic in that the more analogies to human health, condition and human self awareness we can make the more these similarities would be appreciated. For example similarities include:

- Just as there are many human personalities so there “is not one soil but many” each with their own personality and way of behaving.
- As humans breathe so do soils - “Soils are living, breathing things”
- Other analogies to body functions can be made e.g. as a human kidney filters toxins; soils perform this function for the environment
- As humans can become unwell and sometimes even die, so can soils so “soils need care and attention”
- As humans can be injured and can be repaired, so can “soil be made better by our actions”

We used these analogies between humans and soils to develop the theme of the “Dirt Doctor” (www.macaulay.ac.uk/news/dirtdoctors/index.php) in which a number of techniques to illustrate soil and human health have been developed. There are several demonstrations within this theme from x-rays (of soil DNA fingerprints) to health and fitness checks. We have also produced a small A5 booklet that expands on the similarities outlined above. One of our most successful components is the development of a ‘soil breathing kit’. In essence, this comprises a simple Infra-red gas analyser connected to a PC with appropriate software and a rubber tube to breathe into. A child (or willing adult!) is asked to blow into the tube to check they are breathing and their breath signal is then seen on the screen in just a few seconds. This immediately makes a personal connection to the experiment and at the same time proves the method to them. Next the tube is placed in a sealed Perspex cylinder containing soil and the respiratory pulse from the soil is recorded on the same graphical display on the PC screen. A relatively simple mechanism that illustrates a fundamentally important message about soils being living systems and which genuinely engages the public who try it out and lead into discussions of soil C release from soil and climate change.

Soil characters

The theme of connecting soils and humans in a practical sense was continued in the development of soil characters. We are all well aware we all have different personalities, strengths and weaknesses, live in different preferred places, do different jobs, and need to be managed differently to ensure that the best is brought out of each of us. It is innate in us that we are very diverse and belong to different races, creeds, families and even though we possess similarities we are fundamentally unique at different levels.

We have developed this idea into the development of different soil characters. We have given eight important Scottish soil types human names that reflect their personalities and appearance e.g. colour (for example, Rusty, a brown earth), their texture (Sandy, a regosol), what grows on them (Heather (*Calluna vulgaris*), a humus-iron podzol, see Figure 1), where they are found (Monty, an alpine podzol of Scottish mountains) or some other pedological feature (for example Rocky, a ranker).

We have described them against a set of common criteria and derived a soil “health profile” for each of them. The criteria are age, address, preferred occupation height/weight, personality, notes and health advice. Clearly these are attributes that are normally used to describe people but they are equally suited to soils.



Figure 1 Heather, one of our soil characters.

The soil characters have been successful at a number of levels, primarily, we believe, because we have incorporated humour. We also specifically adopted a ‘Pixar’-like of approach in which the character cartoon captures the children’s attention and imagination whereas the text is more subtle and is designed to appeal to the inevitable accompanying parent, elder sibling or grand-parent. This conforms with the principles of provoking, relating and revealing outlined above. In this way the adult is used hopefully to reinforce the child’s understanding through dialogue because they have understood it on a different level and want to engage in the fun and education of the child..

The characters have also been introduced to hard-bitten scientific peers and politicians and been well received showing that simplifying the message and making it fun works at more than one level.. The education sector, both in Scotland and Ireland, have recognised that this approach is a valuable teaching tool as the health profiles have been designed to describe soils in a consistent way to that required by the curricula in both countries. Teachers have also told us that it is much more fun teaching soils using the characters. Interestingly, modern education curricula (for example in Scotland, <http://www.ltscotland.org.uk/curriculumforexcellence/index.asp>) are looking for this cross-curricular topics, not just in the sciences and can also address connected learning outcomes such as looking after our environment, community stewardship and even promoting entrepreneurship though local food marketing initiatives.

Soils, crime and forensics (exploiting the “CSI factor”)

This initiative is different from those examples relating soil and human health to each other, rather than relating soil to a topic that in which there is high public interest – death, crime and mystery. Crime, fiction and fact pervade the media and is also amongst the most popular topics in film, novels and television. We have recently been evaluating the use of soil evidence in crime situations and this lead to a successful research programme (SoilFit, www.macaulay.ac.uk/soilfit) with several partners in the UK and worldwide through a network initiative (GIMI, www.macaulay.ac.uk/geoforensic).

Based on this experience we developed the “Murder, Mystery and Microscopes” initiative which seeks to ‘Unearth the Science behind the Crime Fiction’ (<http://www.macaulay.ac.uk/mmm/techfest09.php>) Institute scientists have appeared on stage with well-known Scottish crime writers who read excerpts out of their crime novels and along with other forensic experts reveal the science behind these stories. It has been highly successful and the Institute has won further funding to visit venues across Scotland. Engaging with high profile UK crime writers such as Ian Rankin has helped raise awareness of the initiative and we have had full houses (up to 250 paying public) at all our events. An interesting aspect of this engagement has been that the crime writers (and there are many) are keen to engage not only because they can promote their own work but they are also looking for new ideas and sound science to illustrate future stories. The place a body is buried, soil on the murder weapon or spade used for concealment or found on a vehicle wheel arch are all examples of soil evidence and the science is fundamental to ensuring the right verdict is reached. By describing how soils vary in the landscape due to vegetation and depth it is possible to build a story that illustrates soil properties and differences. This approach has been very successful winning prizes but one of the main audience groups interested has been young undergraduates who are very attracted the topic as it combines

science with high profile problem solving with a glamorous image. In offering project for MSc projects our soil forensic projects are always the first to be taken up.

Concluding remarks

Knowledge exchange and awareness raising activities such as those described are a very important part of modern science. A number of our colleagues remain uncomfortable with these approaches and clearly one of our key audiences must still be our scientific peers. However we all benefit from raising awareness as long as we ensure we stick to sound scientific principles and benefit from the experience of communication professionals. There is an even more fundamental reason for doing this type of outreach; we are duty bound to make society aware of the global issues that we face and more importantly the place that soil plays within them. It is at times difficult to engage the public and young people in particular in soils but this is often our problem and not theirs and more importantly we can do something about it. Whilst we still produce more conventional material in our outreach activities, we have learned that we have to think a little more radically about public engagement; work with communication professionals; innovate and experiment with novel approaches and seek to entertain people in making the all important initial connection. Only when that connection has been made will they be willing to listen to the serious messages. In our experience this type of work has added a new dimension to our own thinking, forced us to think about what we are doing in a different way and what we are contributing to society and its understanding of global issues as well as being a lot of fun, satisfying and fulfilling.

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References

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