



## Environmental Science in the Field

### *Conducting a field study*

#### **Narrator**

Environmental science is all about taking increasingly closer looks at things but the first thing, even if you're studying the soil, the first thing you'll do when you get to a particular site, you'll sit down there and look about you.

#### **Man 1**

We're just now trying to get students to think about where they are in the bigger landscape, but then more importantly to actually look around and start to describe the landscape in terms of features they can see rather than in terms of things they know already. It's partly about using maps so they can get grid references so they can give a description to other people where they are, what sort of, does the map tell you about our immediate vicinity. We're using a GPS system to try and confirm the accuracy of their map readings.

#### **Man 1 (talking to students)**

Let's check where we are with your GPSs. I'll just explain how they work so if you want to get those out. Eventually you should be able to get a grid reference. I've got 890646 as my six-figure reference with an accuracy of about six metres. And the other thing we need is an altitude. Ok so we can work out where we are from the map. We can now name this site its Ewe Moor.

#### **Narrator**

What they're doing at the moment is the initial stage in what will be gathering a whole range of skills that an environmental scientist has.

#### **Man 1**

There's a whole range of skills really, from very broad descriptive skills to skills to do with much more with specific measurements of things. The first day is really about the big picture, trying to describe the big picture in terms of soils, geology, landscape, climate.

#### **Man 1 (talking to students)**

Okay, as we were coming across Caroline said 'How do you know its limestone. Wasn't that a big assumption?' but how do you know?

#### **Student**

Do an acid test.

#### **Man 1 (talking to students)**

Acid test, so we could drop some acid on, hydrochloric acid. Hand lens - and what would you expect to see under a hand lens? You'd be looking for fossils in there wouldn't you? Yep, what else would you expect to see in limestone? One other thing we could do as well, a fairly obvious one, it's got a blue cover on it that ends in something sounding a bit like ..eology map.

#### **Student - female**

It's all very well reading about things in a textbook but to actually see things and you can see how they've developed. Some things have different causes. They might look the same but when you get down and look at the evidence in the field you can see more what's gone on and why it's gone on.

**Man 1**

Some and limestone pavements have heather growing on them and we have plants, which are sort of associated with acid peat growing on limestone, so tell me about limestone paving. What can you see?

**Student**

Fissured

**Man 1**

Fissured, so we've got cracks. Are they clints or grykes? These are sort of typical limestone features. What's causing the erosion to take place and when did it happen? PH of rain is 5.6 roughly....rotting vegetation, as rotting vegetation decomposes it releases humic acids.

**Man 1**

It's probably good sort of practice to get into that when we actually stop, maybe one person in the group just get the GPSs out or use your maps or both and come up with a grid reference for where we care, because that field sketch you've got there has to relate to something and it could be anywhere in the country I guess.

**Narrator**

What the students are going at the moment is making a field sketch of the valley before us. The important thing here is that they have to use their observational skills. It may sound obvious but it's actually quite difficult for people to really see what's actually there. We tend to have preconceptions, which makes us jump to conclusions and only put certain things in the picture. So we're trying to get people to take a step back and look at it very objectively and actually draw what they can see.

**Student 1 - female**

I try and sketch sort of the main features and then after that I try and make sure I put on lots of notes and then as long as I know what it means and it's got a position where it is and the location and some directional finder and a scale I can take all the information I want from it after, so I would not really worry too much about the detail of how good your artwork is.

**Student 2 – female**

Drawing the landscape wasn't a problem, it's identifying what everything is, getting the technical terms right and everything, and some things that you think aren't really very important you do actually need to put down. It wouldn't even have crossed my mind to think of how old a wall was.

**Narrator**

You take things for granted. It's not supposed to be an artist's impression but just to highlight the main features and then they should annotate it with any comments on the sort of things that they are looking at and they think, feeling they might have about them, for instance, there's some limestone pavement there, so it's quite difficult to draw so they'd add a little label there. They're also going to get in the habit of making lots of very detailed field notes about where they are, what time of day it is, what the weather conditions are and anything else that may be of relevance for when they come back to look at their notes later.

**Student - female**

We looked at what appeared to be a 'u' shaped valley and then we thought it was a 'v' shaped valley and it turned out it was a bit of both which was quite interesting and we had to sort of work out how that could occur.

**Man 2**

And we're not dealing a situation where you're got rivers of ice. We had, there was, there were just big ice sheets to the north and west of here to maybe in cold spots it retained ice for longer, this particular ice action causing erosion. And the scree on top that's kind of masking what was left behind by the ice, its not forming rapidly now. You can tell where it's formed rapidly now where people have been walking up and down it you suddenly get yellow streaks.

**Student -female**

So we've also been looking at positional processes and erosional processes and how they affect the landscape.

**Man 1**

Why isn't there a stream there? Because it sunk! Why is there a stream there? Because it hasn't sunk! So it's suggesting something, which is stopping the water draining through into the cracks and crevices. So what possibilities have we got then for that? Changing rock formation. Cover over the rock. I guess if you've got those then there's very likely to be different soils on top as well. I guess this could be quite a nice opportunity to get your geological maps out and see whether we can pick up any evidence of this. So what we're suggesting is that the stream suddenly disappearing is an indication that we suddenly moving off an impermeable onto a permeable layer, and it either could be the rock itself or it could be a drift deposit on top of the rock, or a combination of both really couldn't it.

**Man 1**

We've got boulder clay over limestone. Would that explain the presence of the stream? Could do, couldn't it. So the boulder clay will contain...clay. Are there are other clues you could use to indicate some sort of change in what's underneath?

**Students**

Vegetation

**Man 1**

Vegetation. I've got a few plants actually we can look at in detail. This is the sweet vernal grass we saw earlier. Now sweet vernal grass is associated with soils which are sort of roughly neutral, yes, so we associate these with soils which are from I don't know, maybe, six to seven and a half, that sort of ph. But then if we just come a few centimetres this way, we've got this one here. This is called mat grass. That's an indicator of well-drained mineral but acidic soils so we generally associate with this soils of, I guess, what 5 maybe or less, 5.5 down to 4. So we're getting some evidence here that there is sort of a change in the nature of the soil underneath. We've got a very sort of localised pattern of hummocks which seem to be getting a rather more acidic vegetation and the hollows in between where we've got a slightly more sort of base rich vegetation and we sort of move further on from here we start to get more and more of the acid vegetations and that ties in with the idea of having a layer of till underneath doesn't it, so you're putting together all this evidence aren't you.