The Open University

Environmental Science in the Field

Measuring the rate of Evapotranspiration

Narrator
The most important readings we need to take if we're doing a study of evapotranspiration are the temperature, the amount of sunshine that we're getting, the wind speed and the humidity. Here in the pen we have a range of metrological equipment. In the Stevenson screen we have a maximum and minimum thermometer, the wet-dry bulb hygrometer. On the ground here we have a couple or rain gauges and we measure radiation using the radiometer.

Man 1
They're continual recording instruments, so as well as us doing the daily met readings there's a continual recording of things which is being done for The Environment Agency as part of their flood prediction system.

Man 2
Nought point one millimetres.

Man 1
Of all the factors which affect the distribution and development of vegetation then climate is a very important set of factors and in a situation like this, comparisons of rates of evapotranspiration between the top and the bottom of the slope might actually start to pick out reasons why we get different vegetation in the different areas.

Man 1 (talking to students)
What we need is a number of groups up at the top and a number of groups down here taking readings at exactly the same point in time. Each group is going to be doing at least two replicates to give us that sort of level of replication. Six at the top. Six at the bottom.

Man 1
So we've been collecting measurements on wind speed and humidity to try and build up a picture of the rate of evapotranspiration so we can then start to say something about whether perhaps the top of the site is more stressed environmentally than the bottom of the site is.

Man 1 (talking to students)
To look at the humidity we need? The easiest way to do it is wet and dry temperatures. We have this whirly hygrometer. You whirl it around 30 seconds and the amount of dry depends on the humidity of the air. The drier the air the bigger the evaporation taking place and the bigger the temperature which is going to be recorded by your dry bulb and your wet bulb temperature. Anemometer. A little ball joint with a wind vein inside. It takes like a running average over a ten, fifteen-second period.

Student – female
It was really nice to actually put some of the things you read about into practice, because its okay seeing a photograph of a whirling hygrometer and, but actually to get out there and use it, it was really really good to use.

Man 1
Once we've got the relative humidities we can add that in with our temperature data, from the, either the met station this morning which gives us a maximum for yesterday. We've got our sunlight hours for yesterday. We've got our wind speeds. We can get an overall picture of evapotranspiration.

Man 1 (talking to students)
When we get back in we've got quite a lot of number crunching to do, to work out average wind speeds, average humidities. Now we've then got quite a complex model. It's a computer model which we put all this data into, which will then give us various rates for evapotranspiration for the sites we're looking at. What else might we need to put into the equation to actually look at? What are other a's?

Man 1
Albido? So we can put in an albido for this particular type of vegetation called short grassland isn't it. Okay so we can put the data in and we can come up with a prediction that we're going to get. More evapotranspiration top than bottom? Are you going to accept that as a hypothesis?

Man 1
The thing which is of main interest I think to most other students is what it actually means in terms of, what's going on in the big picture. You know how does that relate. How does that relate to the distribution of real plants and animals, so we have to spend quite a lot of time analysing the data and trying to draw out those patterns and draw out the full set of information from it