Course introduction from the Lead Educators

[MUSIC PLAYING] Welcome to EUMETSAT. It's an important location for this course, because in the building just behind me here, a flood of satellite data is coming in from the sky and being diverted out to analysts and users. And with me are the two lead educators for this course, Rosemary Munro and Mark Parrington. Rosemary, tell me a little bit about your role in the satellite world?

Yes, I work here at EUMETSAT as the lead of the atmospheric composition team looking after all the science elements related to processing data from atmospheric composition missions here.

And Mark?

And I work at the European Center for Medium Range Weather Forecasts where we run atmospheric composition forecasts using the data that we get from EUMETSAT and other places.

And tell me a little bit about your view of the atmosphere. We're down here, we're breathing it, we all live in the atmosphere, but how do you see it?

Well, I have a view that is looking down from above because I come from the satellite world, but really what we're trying to get at is the part of the atmosphere that is relevant to us. And that could be here, what we breathe, what we see when we look out on a hazy day. Or it could be things happening higher up in the atmosphere. That's also important to what we have done here at the ground.

And what do you see when you look out at the sky?

Well, the work that we do in terms of modeling the chemistry and the composition of the atmosphere, we're looking at means of making the most use of those satellite observations and adding value to them and understanding where pollution plumes may be going from different sources.

But fundamentally, this affects people on the ground. Tell me a little bit about the different ways in which our society is affected by what's in our atmosphere and what it does.

Well, there's lots of different ways. I think if you're looking at really the impact on human health, human population, the obvious one is the ozone layer, which has been around a long time. That affects the UV that we're exposed to, it affects skin cancer rates which we all know. But then there's pollution that affects our respiratory health, effects our cardiovascular health. This is really very local and very immediate. And then the long term, we have the

greenhouse gases, which affect our climate change and are contributing to a changing atmosphere.

And part of your work is using this data to make a difference for people, isn't it?

Exactly, so as Rose says, we have that snapshot of where pollution is at a particular time from Earth observation data, and what we're trying to do is then look at how that changes into the future and how that could affect population and potentially the health and everything else associated with that.

On a sunny day like this, it's easy to forget that we're looking through something, that the atmosphere is made of stuff. So it's not just that we're breathing them in, but they're affecting our weather and our society. There's a lot on this course to learn, isn't there? What are you hoping people will take away from it?

If people come away with the sense of a very large, complex system where we have many contributing elements, where we have data, where we have models, where we have assimilating the two, so that's putting them together to make forecasts and make products that help the public, that help policymakers, and they get a sense of the complexity of it, that will be very good. That will be very nice to see.

And Mark, what do you hope people will take away about the future of satellite observation? More and more satellites are going up. This is becoming routine rather than just a special satellite once in a while.

In the world of big data, there's so much data now, we really need to be smart with how we use this. And developing applications for people to take our data, this data is being made free for everybody. There are real world applications for measuring these pollutants using satellites and then combining them with essentially a weather forecast model for understanding where that pollution gets distributed over the short term, because it can really, as Rose says, affect human health and other sectors at the surface.

And I would hope the same that people take away an understanding of the complexity of the observations and the modelling and bringing the two together and really having a complete end to end understanding of air quality and the atmosphere.

Pollution and air quality is obviously a big issue, but it's also affecting our weather, our health, our security, our businesses. It's not just a niche interest, is it? It's really, really broad.

What we shouldn't forget is that the whole system, if you like, is interconnected. And what happens in different activities at the surface affects the air quality, and this can feed back onto the weather. And so it really affects our day to day lives in many different ways.

Different levels of UV, for example, can affect productivity and agriculture. Aviation for example. When you have a volcanic eruption, you'll have ash. So that's an economic interest, because you may have to stop flights, so there's many different sectors we're looking at.

The key thing to take away from this course is that there's a whole lot of data out there that's free and open access that people can take away to do anything they want, but also to show them the applications of it and how it's used to produce a forecast which can help them to plan their daily lives and to understand how the atmosphere is changing.

So even though we look through the sky, we don't see anything directly, actually there is a huge amount to see up here, and that's what we're going to be learning about on this course.