

Oceans Extras: The detail revealed by models

On the globe here behind us, we've got something showing us surface currents in the ocean. And you're interested in this bit up here.

Well, yes. This is a nice image of the Gulf Stream getting into the North Atlantic Current, and this is a model. This is the output of some code running on a computer. This is the NEMO model we run over here.

And the important thing is that in order to make these models good, you need to compare them with reality. And the kind of picture that we get from satellites is very similar to what you see here. I can show you a map that we get by processing altimeter data, and it really has all these features that you get from the models.

So scientists will compare models with the reality measured from altimetry and other devices that we've got in the sea, like floats and data from oceanographic campaigns, measurements that you get from the ships, in order to make the models better and better. And that way, they can use the models then to predict how the ocean is evolving.

I love looking at this image because it shows all of this detail. We have this picture-- textbooks have a big arrow that goes that way, and it just looks as though all the water is moving in the same direction. And as soon as we start to get satellite images, a lot of conflicting data started to make sense. People had seen warm bits up here, and then a bit of cold water, and a bit more warm water. And now we can see where that comes from.

Yeah, exactly. And the combination of different satellite techniques, like putting altimetry together with the data that we will get in the future from GNSS reflectometry, for instance, will give us a higher resolution image from space of the currents in the real ocean. So we put together data from different platforms to see things in a sharper focus.

There's details on here. We can see there's the mainstream, sort of, of the North Atlantic Drift here and these lovely little rings above and below it.

And these are really very important globally. For instance, for climate in Europe, this moves a lot of heat towards Europe and keeps northern Europe nice and warm and cosy. And of course, all these eddies are very important for the biology. A lot of things happen over there-- mixing of water, upwelling of nutrients-- that sustain production and, finally, life in the ocean.

So these little details aren't just a trivial-- they're not just pretty. They're actually very important to how the dynamics of the ocean functions.

No, from space, you get a full picture of the ocean and you look at different components. You look at ecology. You look at the temperature. You look at the shape of the surface and the currents. You put them all together, and you get a full knowledge of what's going on in the ocean.