Getting animated about the other CO_2 problem

Schoolchildren in the coastal city of Plymouth have just discovered that the world's oceans are becoming more acidic. **Kelvin Boot** follows them as they make a cartoon to communicate this to the wider world.

It is not often that a small group of schoolchildren get a real opportunity to make a big difference. So when students at Ridgeway School in Plymouth were approached to do just that by marine scientist Dr Carol Turley from Plymouth Marine Laboratory (PML), there was no question they would take part.

Carol Turley has been studying the phenomenon of ocean acidification for several years and is one of the world's leading authorities on what she refers to as 'the other CO_2 problem'.

Most people will have heard of climate change and the fact that increasing amounts of carbon dioxide and other greenhouse gases have been pumped into the atmosphere by a whole range of human activities including burning fossil fuels like coal and oil in power stations and cars.

Normally the oceans mop up the naturally-produced CO_2, it's part of the carbon cycle and essential for life on Earth. Now the oceans are absorbing some of the extra CO_2 produced by us, and we have just recently realised that this additional CO_2 is making the oceans more acidic.

The chemistry is relatively simple: add CO_2 to water and you get carbonic acid. The consensus amongst researchers is that by the end of the century the oceans could be more acidic than they have been for over 20 million years.

As Carol Turley explained to the Ridgeway students, 'Many marine animals such as snails use calcium carbonate to make their shells and corals use it to make massive coral reefs that support a diverse ecosystem.'

But acidity and calcium carbonate do not go together as small changes in pH can hamper the building of shells and skeletons and affect their development. It is this that concerns marine scientists, and it's not just the obvious shell-makers and skeleton bearers. Even the tiniest plants and animals floating at the surface of the sea suffer. Planktonic organisms in the ocean's upper layers are like a bouillabaisse – a rich soup of microscopic plants and animals, fish eggs and larvae of marine creatures. It is the nursery of the sea, the base of most ocean food chains and the source of half the oxygen we breathe. Mess with this and the whole ocean is in trouble.

Carol spends much of her time explaining to politicians and policy-makers across the world what 'the other CO_2 problem' means. She wanted an accessible way of grabbing their attention, and in true evangelical style she also wanted the wider public, especially the young generation who will inherit the problem, to know as well.

This is where the idea for an animation project to explain ocean acidification came in. Ridgeway teacher Karen Findlay is always on the lookout for innovative ways of engaging pupils. She recognises that science isn't always fun, so when this opportunity came along she embraced it with open arms.

'We'd already made a prize-winning film about climate change so we knew what was involved and how important it was.'

The project needed to be completed in a single week. It became a real team effort and began with a trip to the National Marine Aquarium in Plymouth for background research and most importantly, getting to meet some of the animals that might be affected by ocean acidification.

Amongst the stars of the film are King Poseidon, Doctorpus, Britney Star and Squid Marley.

The University of Plymouth College of St Mark and St John provided space for the workshops and transport to and from school. Film-makers Stuart Moore and Kayla Parker of Sundog Media had worked on the previous film and so were under no illusions about what the students were capable of. Were they proved right?

'With a tight deadline, a complex subject and an age range between 11 and 15 they have to work as a team, and they did,' said Stuart. The students were central to all stages of making this important film.

'We helped with technical backup and advice, but it is very much their film, with their ideas and their emphasis,' said Stuart.

'The approach they used', added Kayla, 'combined low-tech

> As only children can, the young animators combine delightful humour with a sense of awe at the huge challenge facing life in the ocean. This is a powerful way of enabling the next generation of scientists to appreciate their future responsibility for the planet."
>
> ***John Nixon (Member Royal Institution)***

"Brilliant... This is one of the clearest communiques about the problems that the ocean faces from acidification. If only all of us scientists could be this clever at getting the message across! Well done students of Ridgeway School! I thought the video was so impressive that I have featured it on my blog www.climateshifts.org/. Well done!"

Ove Hoegh-Guldberg – University of Queensland, co-author of the Royal Society report on ocean acidification.

Pupils of Ridgeway School making the plasticine models which will eventually be filmed for the animation.

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clay modelling to form the "stars" of the film and sophisticated computer-based animation to bring them to life.'

The students watched the film develop before their eyes, giving them immediate results for the work they put in.

'The whole process was very rewarding for all of us. It was like watching thought happen as the students collaborated as a team, evolved the story, created the models and captured it on film through animation,' said Kayla.

Amongst the stars of the film are King Poseidon and his team of advisors Doctorpus, Britney Star and Squid Marley. Each 'agent' reports back to the king about how acidification is affecting his ocean world and his subjects. The film ends with a plea from Poseidon to the humans on land to stop producing the CO_2 that is slowly but surely killing Planet Ocean.

Fifteen-year-old student Merryn Hunt summed up the students' feelings, 'We were shocked; we hadn't heard of this before and we felt we had to do something. We had heard of climate change, but now there are two threats and we have a chance to make a difference.'

Merryn is adamant that working on the film had made a real difference to her own outlook, 'I've told friends and family, and everyone is shocked. We can all make a difference by simple things like turning lights off, it all adds up.'

Fellow students Ruth Blake-Lobb and Daniel Finnerty were equally enthusiastic. 'Working with the younger kids was a bit strange at first but we soon realised that for some things like model-making they were better than us. After a while we didn't notice any age difference. We were all doing what we were best at, a real team,' said Daniel. 'We've learned to work together, we've learned new skills such as animation, film-making, storyboarding and script writing, we've learned that science can be really fun and important.'

Ruth added, 'We know that this film will make a difference. It's important and it has a real message. Above all it's in our language for our age group. It makes me feel really proud to know that someone like a Prime Minister might see it and think a bit more – it would be great if Barrack Obama gets to see it.'

If Carol Turley has her way that's exactly what will happen: the preview of the film was at the Copenhagen Climate Change Congress earlier this year, followed by a showing at a meeting of the Royal Institution, in London, in March. The verdict from scientists at both meetings has been unanimous and very positive (see box).

Carol is determined that even more scientists and politicians will share the same reaction as she takes it from conference to workshop to briefing group.

'I want these people, people who make decisions, to realise that the upcoming generation is concerned. They have made it clear through this short film that they want something done. This year is going to be important for new climate change negotiations and this little film is going to be crucial in bringing the other CO_2 problem to the forefront of the minds of policy-makers.'

The film has attracted a large amount of press and media interest, featuring on *Newsround*, and BBC network news; for all concerned it has been a great success and continues to do its job – telling people about ocean acidification and its effects, but in an easy-to-understand and enjoyable way. ❖

MORE INFORMATION

Kelvin Boot is a communicator and media consultant, working with Plymouth Marine Laboratory, email: kelota@pml.ac.uk
Funding to help the film become a reality has been provided through the European Project on Ocean Acidification (EPOCA).

The film is available through the Plymouth Marine Laboratory website www.pml.ac.uk, YouTube: www.youtube.com/watch?v=kvUsSMa0nQU and www.planetearthonline.nerc.ac.uk