PhD Case Study – Dr Lera Miles

Climate Change and Biodiversity, UN Environment Programme - World Conservation Monitoring Centre

Lera Miles' PhD on the impact of climate change in tropical forests led to authorship on a paper in *Nature* that has been cited more than 1700 times, and a job offer from her examiner. She now leads work on the forest carbon payment initiative REDD+ (reducing emissions from deforestation and forest degradation) at the United Nations Environment Programme World Conservation Monitoring Centre, helping to ensure that this delivers not only carbon savings but also benefits for wildlife and local people.

After a first degree in biology and an MSc in conservation, Lera spent a couple of years designing a species recording and mapping tool for a university in Portugal, and then working on a database of Sites of Special Scientific Interest for Friends of the Earth.

Her PhD, funded by NERC, focused on a hot topic - the impact of climate change on tropical forest plants in the Amazon. This involved applying a climate model to data on species distribution across the whole Amazon basin. "I wanted to apply my conservation skills on a broad scale - not to look just at one small place, but to have a wider impact," she says.

Unexpectedly, the results from her PhD and from similar studies in other regions were included in a landmark Nature paper, which estimated that 15-37 per cent of species were at risk of extinction under a medium climate-change scenario.[1] This has been widely cited, and was included in the fourth assessment report of the Intergovernmental Panel on Climate Change in 2007 – a key source of information for policy-makers.

"The paper stimulated debate about how we might do things differently, which was very exciting," she says. "For the first time we could say how climate change might affect species extinction risks."

Another bonus ensued when Lera's PhD examiner offered her a job at the World Conservation Monitoring Centre in Cambridge, which is run jointly by the United Nations Environment Programme and a UK charity. The job used her PhD skills in GIS (geographic information systems) and climate change. "I was taken on as someone who could combine spatial analysis and conservation thinking – then I expanded to look at other pressures on biodiversity as well," she explains.

Lera now leads the Centre's work for the UN-REDD Programme, which helps developing countries to prepare for REDD+, an initiative under negotiation in the UN Framework Convention on Climate Change. Its aim is to provide financial incentives for developing countries to leave forests standing in order to avoid carbon emissions, and to conserve and enhance forest carbon stocks. This has a huge potential to save carbon as well as protecting biodiversity, but there are risks as well as benefits. Without safeguards, REDD+ could include payments for commercial plantations grown on cleared

[1] Thomas et al (2004) Extinction risk from climate change. *Nature* 427:145-148
http://www.nature.com/nature/journal/v427/n6970/full/nature02121.html

Red-bellied Macaw, Brazil
Photo by A C Moraes

forest land, or lead to forests being seized by governments and businessmen, denying access to local people.

Broad-brush safeguards have now been agreed under the climate convention to avoid these problems, and Lera's work includes developing systems to ensure that these safeguards are respected, as well as supporting countries as they prepare to implement REDD+ more widely.

"We are preparing the groundwork for when more funds become available," she says. "Countries need to have a plan in place, a good understanding of how REDD+ works, and to have done some demonstration activities so they know their plan will be successful."

The potential benefits are huge. Tropical forests are disappearing rapidly, along with precious ecosystem services including biodiversity, clean air and water, and forest products such as natural medicines.

"The point of a national-scale initiative like REDD+ is to avoid leakage," Lera explains. "If you save just one forest, the deforestation is likely to spring up somewhere else, or savannah gets converted to pasture. So the idea of REDD+ is that it's a country-scale approach – the country demonstrates that it's reduced its deforestation emissions overall, which you may not manage with a series of little projects on their own."

Lera's PhD training and the connections she made have been essential for her career. "I wouldn't be in this position without the PhD," she says. "I think it gives you a certain sort of authority – it's like a passport to having credibility as a scientist."

"It helped me think more critically, which is invaluable in this kind of work, and it helped to develop my technical skills, which is very important even when you are just managing other peoples' work. A lot of what WCMC does is synthesising the science that others have done – so you need to understand what is meaningful out of a bunch of scientific papers, and what can be communicated into policy."

Career timeline

1991-94	BSc, Biology, University of Bristol
1994-95	MSc, Conservation, University College London
1996-97	University of Évora, Portugal, designing and setting up a database and GIS for recording and mapping species distribution
1997	Research Volunteer, Friends of the Earth, designing a database of threats to Sites of Special Scientific Interest (SSSIs)
1997-2002	NERC-funded PhD, University of Leeds, 'Impact of global climate change on tropical forest plant species in Amazonia'
2002-today	Senior Programme Officer, Climate Change and Biodiversity Programme, at the UN Environment Programme World Conservation Monitoring Centre