Ecologists gain insight into the likely consequences of global warming

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A new insight into the impact that warmer temperatures could have across the world has been uncovered by scientists at Queen Mary, University of London.

The research, published in the journal Global Change Biology today (20 January), found that the impact of global warming could be similar across ecosystems, regardless of local environmental conditions and species.

The team, based at Queen Mary's School of Biological and Chemical Sciences, went to Iceland to study a set of geothermally-heated streams.

The streams provided scientists with a unique environment to conduct their research; they were able to isolate the effects of temperature from other confounding variables found in nature.

Lead author, Queen Mary's Dr Daniel Perkins, explains: "The streams in Iceland are all very similar, in terms of their physical and chemical environment, but maintain very different temperatures to each other all year round.

"This enabled us to explore how temperature, both past and present, affects the rate at which respiration responds to temperature in ecosystems".

Dr Perkins said that when the team exposed the organisms found in

streams to a range of temperatures "the rate at which carbon was respired increased with temperature as expected, but surprisingly, rate of increase was consistent across streams which differed in average temperature by as much as 20°C".

Co-author Dr Gabriel Yvon-Durocher, also from Queen Mary, said: "Our findings demonstrate that the intrinsic temperature sensitivity of respiration is the same across a diverse range of organisms, adapted to markedly different temperatures. This result is important because it will help us build more accurate models to predict how rates of carbon dioxide emission from ecosystem will respond to the temperature increases forecast in the coming decades".

Dr Yvon-Durocher concludes: "Our results shed light on the temperature sensitivity of respiration over time scales of days to weeks, real differences between ecosystems may be apparent over longer time scales (e.g. years to decades), and progress in understanding these long-term responses will be key to predicting the future feedbacks between ecosystems and the climate."

Provided by Queen Mary, University of London