The succession of soil food webs in forest restoration sites across New Zealand

We are offering a Master’s thesis project that will focus on the succession of soil microbiota in forests undergoing restoration in urban areas throughout the entire latitudinal extent of New Zealand. Ecological restoration is vital for repairing human impacts on native biota and ecosystem processes. Networks of trophic interactions (food webs) determine the structure and function of communities; yet we know little about the successional development of soil food webs and almost nothing about how soil food webs reassemble during long-term restoration, despite their high biodiversity and importance for many key ecosystem processes. In more than 80 forest restoration sites spanning the complete latitudinal range of New Zealand’s main islands, this Master’s project will form part of a larger initiative to apply recently developed methods for linking food web structure with ecosystem functioning across an unprecedented age-range of restored urban forests.

Thesis project

The Master’s student has the possibility to join the research team (a PhD and one other Master’s student) in November 2019 to sample soil communities across a total of 81 forest restoration sites in New Zealand urban areas along with 6 other control sites (3 unrestored and 3 pristine forest sites). Depending on the student’s interests, there will be the opportunity to focus on a particular aspect of soil community responses to forest restoration, such as using phospholipid fatty acid analysis to understand shifts in functional groups of soil microbes over time.

This project provides the exciting opportunity to travel and conduct fieldwork throughout New Zealand as well as the chance to collaborate with students and researchers from around the world, develop skills in field and lab techniques relevant to soil ecology, and learn about exciting new methods in food web analysis and advanced statistical methods.

The student will be supervised by Prof. Dr. Nico Eisenhauer (iDiv) and all fieldwork will be carried out in New Zealand under the co-supervision of Dr. Andrew Barnes at the University of Waikato (www.waikato.ac.nz/staff-profiles/people/barnesa) and in collaboration with the People, Cities, & Nature project (www.peoplecitiesnature.co.nz). Soil samples will be analysed both at the University of Waikato in Hamilton, New Zealand, as well as in the lab at the German Centre for Integrative Biodiversity Research (iDiv) in Leipzig.

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