

Ecosystem effects of warming in lakes by environmental change

Dr Piet Verburg¹

¹*Niwa*

Water temperatures and warming affect ecosystem function in lakes in various ways, depending for instance on lake depth and other factors. Many lakes have probably become warmer in New Zealand over the past century, but only for a few there are sufficient long-term data to show warming. Surface temperatures in other lakes, notably those in the Taupo Volcanic Zone, have not increased in recent decades, or in some cases may even have declined. In this talk I will describe the effects of climate warming on ecosystem processes such as, mixing, nutrient recycling and phytoplankton production in New Zealand lakes, with special attention to deep lakes. The role of geothermal heat inputs in ecosystem function in deep lakes will be examined as well. Management to improve ecological function in lakes must adapt in the face of ongoing environmental change. But the direction of change in ecosystem function and adaptation to change will not only depend on the character of the environmental change but also on the nutrient status of individual lakes, their dissolved oxygen dynamics, sediment nutrient legacy loads, and their potential to sequester nutrients.