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Title: Climate change impacts on the water quality and functioning of Irish and New Zealand streams in a multi-stressor environment.

Abstract

Freshwater ecosystems are under continued pressure from multiple stressors. These can negatively impact freshwater communities and ecosystem processes and can interact to produce unexpected ecological outcomes. Predicted future climatic changes are expected to exacerbate the negative effects of stressors and place further pressure on freshwater ecosystems with an additional amalgam of stressors. This research aims to investigate the individual and combined effects of climate change (temperature variation, flow velocity variation [due to changes in precipitation], and increased CO_2) on streams in two temperate regions (New Zealand and Ireland) which either are, or are not, impacted by deposited fine-sediment. Using the ExStream System (an experimental stream mesocosm system) the individual and combined effects of these stressors on stream communities (fish, macroinvertebrates, algae, bacteria) and ecosystem functioning was examined in New Zealand between October and December 2019. A similar experiment will be conducted in Ireland between May and July 2020. Results from these experiments will help disentangle the individual and interactive responses of stream ecosystems to climate-change and deposited fine-sediment.