AP1.21 PREDICTING ORGANISMAL RESPONSES TO EUTROPHICATION AND CLIMATE WARMING IN TANDEM

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Anthropogenic eutrophication is the world's most widespread form of aquatic habitat degradation and the frequency and intensity of eutrophication events are predicted to surge under climate warming. Yet, it remains unknown how aquatic species, particularly fish, will respond to and recover from simultaneous exposure to elevated temperatures and eutrophication. We investigated how an ecologically valuable fish species, European grayling (*Thymallus thymallus*), responds to and recovers from combined exposure to heat wave conditions (+4 °C) and nitrate pollution. A 2 × 3 factorial experimental design was implemented, with fish exposed to one of two temperatures (control: 18°C or a heat wave scenario: 22°C) and one of three ecologically-relevant levels of nitrate pollution (0, 50 or 200 mg/L) for 4 weeks. Following treatment exposure, a range of performance metrics (swimming performance, aerobic scope, growth, blood oxygen carrying capacity, critical thermal maxima, and hypoxia tolerance) were assessed to disentangle the interaction between elevated temperatures and nitrate pollution. Stressors were then removed (either a lowering of temperature or removal of nitrate) to mimic conservation actions, and the rate and efficacy of recovery was assessed using the same performance metrics. Together, these findings will shed light on the interaction between eutrophication and climate warming, and guide conservation efforts by understanding the time-course and extent of recovery following stressor removal.