

## **Photosynthesis and respiratory acclimation in *Quercus rubra* L. along an urban-to-rural gradient**

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The role of the terrestrial biosphere as a carbon sink or source is a critical and still poorly understood component of predicting global climate change. In particular, the response of plant respiration ( $R$ ) to temperature remains a major uncertainty in current prediction models. Using a natural temperature gradient from New York City to surrounding rural areas, we investigated  $R$  rates in common red oak (*Quercus rubra* L.). Oaks were grown from seed at four sites along an urban to rural gradient as well as in growth chambers. We measured rates of photosynthesis and  $R$  in five one-year-old seedlings at each site. Photosynthetic rates did not differ significantly between sites.  $R$  was lowest in NYC and progressively higher at increasing distances from the city, indicating respiratory acclimation along the gradient. In contrast, growth chambers exhibited opposite results with higher rates of  $R$  in plants grown at elevated temperatures. While there is some evidence to suggest the occurrence of respiratory acclimation to temperature along the gradient, more research is required before a definitive conclusion can be made.