

Mesozooplankton, a key transporter of anthropogenic nutrients from headwaters to the coastal ocean in a highly urbanized drowned river valley estuary.

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I will present the results of a 12 month study in which we sought to elucidate the relationship between anthropogenic nutrient inputs and mesozooplankton community structure in an urbanized, temperate, drowned river valley estuary system. Sydney Estuary on the East coast of Australia receives pulsed nutrient inputs primarily through storm water runoff from its highly urbanized (80%) catchment, with the majority of loading introduced through three head waters. Despite the relatively short distance from headwaters to mouth (15-30km) little of the introduced nutrient is transported directly to the coastal ocean. Instead the majority of the nutrient is assimilated into the estuarine food web exerting bottom up control on zooplankton community size structure and abundance. Our results using stable isotope analysis indicate the role of mesozooplankton in assimilation of anthropogenic nutrients and carbon varies on a gradient from the estuarine headwaters to the coastal ocean. It has been previously hypothesized that the coastal ocean acts as a source of mesozooplankton, supporting the productive fisheries and biodiversity of the lower harbour. We show the inverse to be true, in the more impacted upper estuary nutrients are incorporated into phytoplankton biomass which is eventually consumed by mesozooplankton in the middle and lower estuary. As zooplankton abundance greatly exceeds demand from predation within the harbor, the mesozooplankton provide a significant transport of N & C to the coastal ocean, presumably contributing to the diet of coastal ocean zooplanktivores.

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