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Bacterial Carbon Cycling in the plume-impacted coastal waters

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In summer 2016, the links between bacterial metabolic rates and community composition were examined in the plume-impacted coastal area, as well as potential mechanisms regulating bacterial growth efficiency. The two aspects of bacterial metabolism responded differently to the river discharge. The enhanced bacterial production was linked to shifts in bacterial community composition and changing partition between anabolic and catabolic pathways. Bacterial groups that grew fast and preferred high molecular weight dissolved organic carbon were responsible for the increase in bacterial production. However, bacterial respiration increased (< 4 fold) to lesser extent than bacterial production (up to 21 fold). Consequently, bacterial growth efficiency increased dramatically. Bacterial respiration was primarily dependent on environmental conditions, rather than bacterial community composition. The increased phytoplankton-derived organic matter modulated bacterial respiration in two contrasting ways, which not only improved bacterial abundance but also lowered cell-specific bacterial respiration because of mitigating energy limitation.