

ORGANIC CARBON IN THE DELTA: AN ECOLOGICAL PERSPECTIVE

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Organic carbon supply to the Delta was estimated for a variety of different sources. Autochthonous (internal) sources evaluated include phytoplankton, aquatic vascular plant, and benthic microalgal productivity. Allochthonous (external) sources evaluated include river-borne loading, agricultural drainage, tidal marsh export, sewage treatment plant discharge, and urban runoff. Other sources could not be evaluated quantitatively but are negligible. On an average annual Delta-wide basis, river-borne loading, phytoplankton productivity, and agricultural drainage account for about 90% of the total. Dissolved organic matter (DOM) from river-borne loading and drainage, however, is not comparable to phytoplankton productivity. DOM must first be biodegraded and then assimilated into microbial cell biomass before it can be compared as a food source. The conversion process results in significant losses of the initial DOC, depending on the hydraulic residence time, biodegradation rates, and assimilation efficiencies; typically, 90% may be lost in the Delta. Taking into account DOC availability, phytoplankton productivity is probably the main organic matter source in spring and summer. Refractory DOC most likely to form DBPs is least likely to participate in the food web. These results are preliminary and are undergoing further refinement by water year type, season, and Delta subregion.