The Estuary as Pollution Trap and Filter

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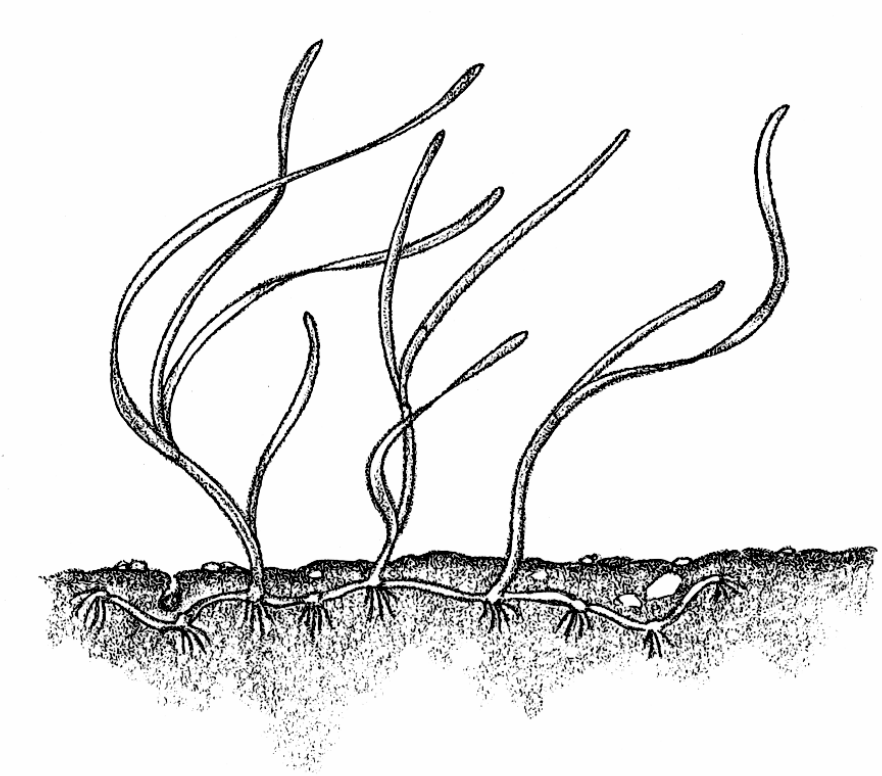

Much the same way estuaries trap nutrients and provide rich and productive nurseries and feeding areas for numerous organisms from the bottom to the top of the food chain, so do they trap pollutants that can harm estuarine residents and others dependent on them.

The wedge of salt water characteristically underlying the layer of fresher water in an estuary tends to move sediments in an unusual way. As the denser salt water moves along the bottom toward the head of the estuary to replace water carried away by freshwater surface flow, it takes with it some of the nutrients the river has brought downstream, thus dispersing them over a wider area in the estuary.

Some salt-marsh and tidal-flat plants are capable of filtering harmful pollutants from the water and storing them beneath the bottom sediments in their roots and systems of runners known as rhizomes.

Similarly, if the river is polluted, contaminants can be carried downstream in the fresh or brackish surface layer, then back toward the head of the estuary after they settle out and into the deeper salt water. Valuable nutrient-bearing sediments are also capable of carrying and dispersing a variety of dangerous pollutants, including pesticides and heavy metals, which some estuarine organisms are known to store and concentrate.

Some salt-marsh and tidal-flat plants are capable of filtering harmful pollutants from the water and storing them beneath the bottom sediments in their roots and systems of runners known as rhizomes. In this way they

function as valuable filters that cleanse the estuary's waters of contaminants.

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Some pollutants, however, such as mercury, the most hazardous of the heavy metals, make their way to the plants' leaves where they either directly return to the water or enter the food chain when plant-eating organisms consume the leaves or leaf particles called detritus.

Studies indicate that salt marshes can receive some sewage without adverse effects on the marsh environment. Additionally, some polluting substances that end up in the marsh sediments will break down and be rendered harmless.

In these investigations, nitrogen and phosphorus of which sewage contains large amounts had no apparent detrimental effects on the marsh. Phosphorus apparently did not retard plant growth, and the nitrogen fertilizer used in the experiments actually increased the growth of higher plants.

These and similar discoveries are leading to technologies that show promise for the future in ways we might come to deal with increasing sewage and pollution loads that overburden our treatment plants and waterways.

One fine example of such technology at work is located on the outskirts of Arcata, California. The college town lies west of U.S. 101, 92 miles south of the Oregon state line. Arcata Marsh and Wildlife Sanctuary, a lush wetland at the northern edge of the Humboldt Bay estuary, annually attracts more than 150 species of sea birds, shorebirds, and waterfowl.

First-time visitors to the marsh find it difficult to believe that the beautiful area, teeming with wildlife, is actually part of the city's sewage-treatment facility. Such created or improved wetlands might be ideal in many parts of the nation. Not only can they help us dispose of our wastes, but they also become valuable wildlife habitat in the process. Moreover, they represent one small way that humans can begin paying back their environmentally beleaguered planet.

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