wetland restoration projects. Encouraging results were obtained from the Napa Marsh area, the site of some of the most extensive wetland restoration activities in the watershed, including projects initiated in 1995, 2002, and 2006. Biosentinel fish collected in 2006 from a Napa Marsh salt pond that was opened to tidal action earlier that year had the lowest mercury observed for the indicator species across the entire watershed. Fish from other locations in this area also had low concentrations in both 2005 and 2006. These findings indicate that some restoration projects may be associated with reduced, rather than increased, mercury accumulation in the food chain. Other significant findings from the biosentinel work to date include the observation that seasonal variation in mercury uptake seems associated with episodic flooding of normally dry soils, documentation of significant year-to-year variation, and an improved general understanding of the spatial pattern of accumulation across the watershed.

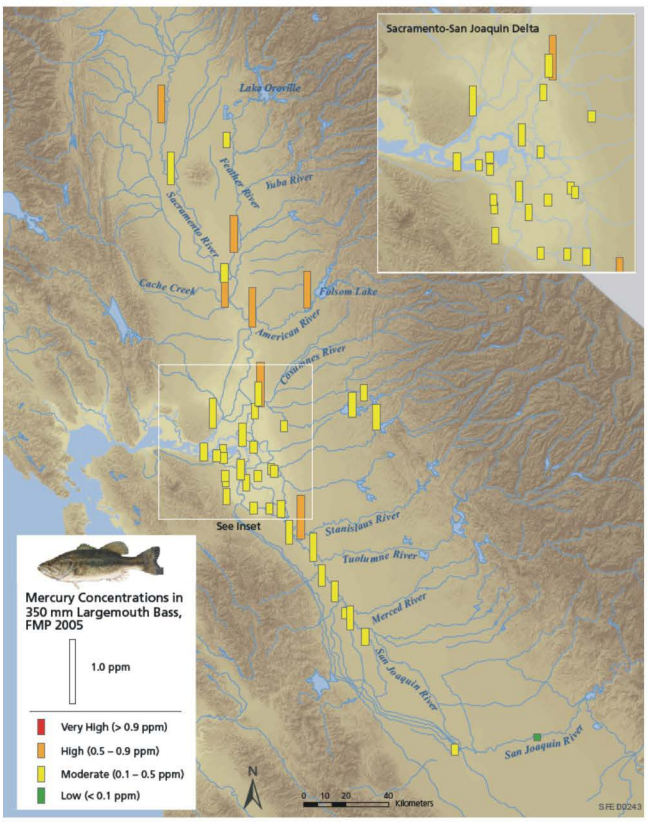

Fig. 1 Mercury concentrations in largemouth bass in the study area in 2005

Increased eutrophication in the northern coastal waters of the South China Sea revealed by sedimentary records

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The sedimentary organic matter in coastal areas mainly originates from primary and secondary production within the ecosystem, terrestrial inputs and bacterial production in the water and sediments. The relative significance of these sources is determined by local environmental factors, such as climate, hydrodynamic conditions and nutrient supply. Changes in any of these factors will result in the change of sedimentary organic matter. Algal blooms or/and red tides caused by eutrophication occurred at some given environmental condition and may imprint markers in the sedimentary records.

The total organic carbon (TOC), total nitrogen (TN) and stable isotope values (^{13}Corg and ^{15}N) from the dating sediment cores were analyzed. The profiles of TOC, TN, C/N, $^{13}C_{org}$ and ^{15}N indicate that terrestrial organic matter downs from 50% to 20% of TOC in the Pearl River estuary while Dapeng Bay has no obvious terrestrial organic matter input. The highest TOC occurred in middle part of the estuary because of high precipitation of terrestrial organic matter. Algal-derived organic carbon content increases with the time in Dapeng Bay. This kind of increase is caused by enhancement of primary marine productivity due to more nutrient input.

The sediment core taken from Dapeng Bay reveals that diatom and dinoflagellate productivity which is reflected in the biogenic silica (BSi) and dinosterol concentrations respectively, increased gradually starting in 1940 and accelerated after 1965, especially between 1980 and 2000, indicating that algal blooms and/or red tides caused by eutrophication increased during this time. The abundance of coprostanol, which reflects domestic sewage discharge, and the terrestrial biomarkers (long-chain fatty acids and fatty alcohols and sitosterol) exhibit similar temporal changes with the primary production, showing that the enhanced eutrophication resulted from increased anthropogenic activities in the northern coastal waters of the South China Sea (SCS) in recent decades.

Studying on formation dynamic mechanism of the freshwater zone near the MeiMaoSha in the Changjiang Estuary

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The observation data confirms the existence of a longshore freshwater zone in Meimaosha area in the Changjiang Estuary during dry season. Used the three-dimensional numerical model ECOM and considered the multiple dynamic factors, this paper focuses on the formation dynamic mechanism of the freshwater ribbon zone. The calculated current velocity, direction, and salinity well match the observed data, and the phenomena of intermissive appearance of the freshwater zone at upper Meimaosha during ebb current in spring tide is produced. Validation results qualify the model of correctly simulating the hydrodynamic process in the Changjiang Estuary. As shown in the residual current field, the residual current in Meimaosha area in the south passage is mostly come into being the river discharge. Upriver freshwater passing here is the main cause of the formation of the Meimaosha freshwater zone. Under the interaction of river discharge and tidal current, the freshwater zone is temporal and spatial variation. As heavy saltwater intrusion from out sea during flood current, the freshwater zone disappeared. While the upper low salinity water is advected to the area during ebb current, the salinity reduces. The oscillation of tidal current during spring tide is much greater than the one during neap tide, it can easily bring freshwater from farther upper reaches into the area and the time interval freshwater appears. Although the saltwater intrusion from out sea is strengthened in spring tide and the salinity is serious increases during flood current, the minimum salinity during ebb current in spring tide is still lower than the one during ebb current in neap tide. The freshwater zone forms when the river discharge becomes larger, and disappears when the river discharge becomes smaller. The interaction of river discharge and tidal pump is the primary formation dynamic mechanism of the MeiMaoSha freshwater zone in the South Passage.

Reservoir de-siltation and rapid mud deposition in river and estuary - risks to ecosystem health and human uses

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The water in the estuarine portion of major river Periyar of Cochin backwater system experienced rapid changes to red in 2007. The discoloration, taste and smell changes along with high turbidity were resulted from the unprecedented action of empting a major reservoir and the running down of the decomposed bio-waste and sediments collected in the reservoir for 18 years. Pumping and distribution of the muddy water employing the traditional treatment methods using chlorine and alum seemed to be insufficient for human consumption. Though the present crisis occurred only on account of the negligence on the part of the officials to clean the reservoir once in two years- but cleaning was never done in the last 18 years; similar openings of dam shutters can occur due to the heavy precipitations associated with climate changes. It is worthy to examine the water quality changes in the river and estuary and the manner in which the 40 lakh people depending on this river for potable water reacted to the alarming situations of the spreading of waterborne diseases and also to look into the urgent precautionary measures taken by the authorities. The turbidity level in the river had varied between 58 and 68 ntu and after treatment with alum and lime, the water quality level returned to the acceptable limits (4 - 7) ntu. The local NGOs after waiting in vain for some help to come by from the authorities concerned had to approach the judiciary for the release of water from another dam to remove the muddy water and for a direction to the government to constitute a high-power monitoring committee to take appropriate action and for the release sufficient funds to meet the situation. Growing public discontent forced the Government to release water from two other dams to check the turbidity. To pre-empt eutrophication, the authorities were forced by NGOs to step up inflow to stabilize the pH factor and oxygen content in the estuary and authorities had diverted water from another reservoir. It is high time for authorities to device mitigation plans for dam shutter openings anticipated with heavier monsoons linked with global warming.

Origin of particulate organic matter in the Yura River, Japan

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