

Restoration and assessment of carbon sink potential for aintertidal oyster reef in the Yangtze River estuary, China

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Abstract: With the adoption of Kyoto Protocol to the United Nation Framework Convention of Climate Change in 2005, carbon sink fishery becomes the hotspot among the fishery science and technology of China. Oyster reefs are very important marine habitats in temperate estuaries and coasts, providing large number of services and goods such as fishery production, water purification, fish habitat, maintenance of biodiversity, erosion control etc. So far, little information is available on the carbon sink potential of oyster reefs. The present study aimed to assess the restoration and carbon sink potential of a created intertidal oyster reef was n the Yangtze River estuary, China. The oyster (*Crassostrea* sp.) population rapidly increases with reef development, and its mean density and biomass reached the highest at approximately one year after restoration (in June 2005). Thereafter, the mean oyster density decreased with the increasing in the mean size of the oyster. The species richness, density and biomass of resident macro-benthos (exclusive of oyster and barnacles) in the restored oyster reef showed a gradually increasing trend. The study recorded total of 47 macro-benthos species, the mean density of 941 ind·m⁻² and biomass of 44.51 g·m⁻² in 2010. The restored intertidal oyster reef has a strong carbon sink potential of about 2.70 kg·m⁻², can lock up 3.33×10^4 t carbon per year through calcification process, and produced ecological value of approximately 8,370,000 RMB per year, which was equivalent to restore 1,110 hm² tropical forest .

Key words: oyster reef; restoration; carbon sink; assessment; Yangtze River estuary