Ballast water exchangeable seas identified by ocean color satellite

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The paper describes the identification of ballast water exchangeable seas with MODIS/Aqua-derived diffuse attenuation coefficient (K(490)) along the LNG carrier's routes between Japan and Qatar during the period from 2002 to 2005. Study areas include the northwestern Pacific Ocean, the East China Sea, the South China Sea, the Bay of Bengal and the Arabian Sea. Based on the relationship between K(490) and corresponding number of in situ plankton cell densities, ballast water exchangeable seas are identified to meet the regulation of ballast water performance standard imposed by International Maritime Organization (IMO). Furthermore ballast water exchangeable seas are extracted from MODIS-derived K(490) images overlaid with the depth and the distance from shore to meet the IMO regulation of ballast water exchange area. As a result the Bay of Bengal is identified as an suitable ballast water exchangeable sea except an anomalously high K(490) area off the coast of Sri Lanka during the northeast monsoon in 2005. Seasonal and annual variations of K(490) along the LNG carrier's routes are also discussed in order to implement an early routing system for suitable ballast water exchangeable seas.