

Trace the history of offshore bars from 1968 to 2008 along the coast of the Tottori Sand Dune, southwest Japan

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Offshore bars along the coastline can be identified as white bands in air photos. Along the coast of the Tottori Sand Dune, Kodama (2002) identified the shrinking of offshore bars over 30 years (1968-1998) and discussed its possible connections to weed growth in the Tottori Sand Dune. Objectives of this study are to trace the history of offshore bars from 1968 to 2008 along the coast of the Tottori Sand Dune and to consider causes for the change.

Our study area stretches 8km, extending in a north-east-ward direction from the mouth of the Sendai River. Nine sets of aerial photos taken at 5 year intervals from 1968 to 2008 were used for surveying the offshore bars. These photos were cross checked with sounding data in 1988, 1997, 2003 and 2007. We also studied flood discharge data of the Sendai River from 1979 to 2008.

The aerial photos and sounding data basically indicated that 3 rows of offshore bars existed including inner bars situated near the shoreline. The offshore bars were shrinking from 1968 until 1998, then expanded rapidly from 1998 to 2003, and have maintained their size up until 2008. The frequency and size of flood discharges from the Sendai River match the observed changes in offshore bar size well. The 2 large floods in 1998 and the 2 others in 2004 supplied a huge amount of sediment to the coast, which caused the phase change of the offshore bars from shrinking to expanding along the coast of the Tottori Sand Dune. This knowledge is important in considering coastal erosion and weeding activity at the Tottori Sand Dune.