

Spatial and temporal patterns of coral black band disease in relation to a major sewage outfall

Ross Jones^{1,*}, Rodney Johnson², Tim Noyes², Rachel Parsons²

¹Australian Institute of Marine Science, The UWA Oceans Institute (M096), 35 Stirling Highway, Crawley, Western Australia 6009, Australia

²Bermuda Institute of Ocean Sciences (BIOS), 17 Biological Lane, St Georges, Bermuda GE01

*Email: r.jones@aims.gov.au

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Supplement. Additional data further describing the hydro-meteorological studies at the sewage disposal site, including deployment of current meters and the release of surface and sub-surface drogues

Currents in the vicinity of the Seabright Point sewage were examined using an Aanderaa, RCM 9 MkII acoustic doppler current meter deployed 30 m SE of the outfall in 10 m water depth. Studies were conducted from 1 to 20 October 2004 (Deployment 1) and 20 October to 11 November 2004 (Deployment 2).

During the deployments of the current meter, a series of storms and gales provided a good spectrum of winds (see Fig. S1C,D), providing stable low energy and varying high-energy conditions, and allowed for reasonable examination of both tide and wind forcing. Based on observations of the flow direction (Fig. S1B), it is clear that the flow direction does not always rotate at regular periods as expected for flows dominated by tidal forcing. For example, during the first deployment, there was a period of ~2 d where flow direction to the SW remained relatively constant (see Days 282 to 284 in Fig. S1A), and thus, the sea level rose and fell, but the tide ebbed and flooded in the same direction. Over this period, winds came from the NE and gradually increased from ~5 to 15 cm sec⁻¹ (Fig. S1C,D). This sequence was broken as winds dropped and rotated around to the SW following the passage of the weather front. Opposite patterns also occur, where moderate SW winds causes the tides to ebb and flood in a NE direction (Fig. S1B).

Currents in the vicinity of the Seabright Point sewage outfall were examined using drogues released near the end of the outfall. Drogues were released at 1, 3 and 9 m depth and allowed to drift, and their positions were fixed after 1 h and 2 h. Studies were conducted over several days under different combinations of tide and wind direction, including ebbing and flooding tides and offshore and onshore winds.

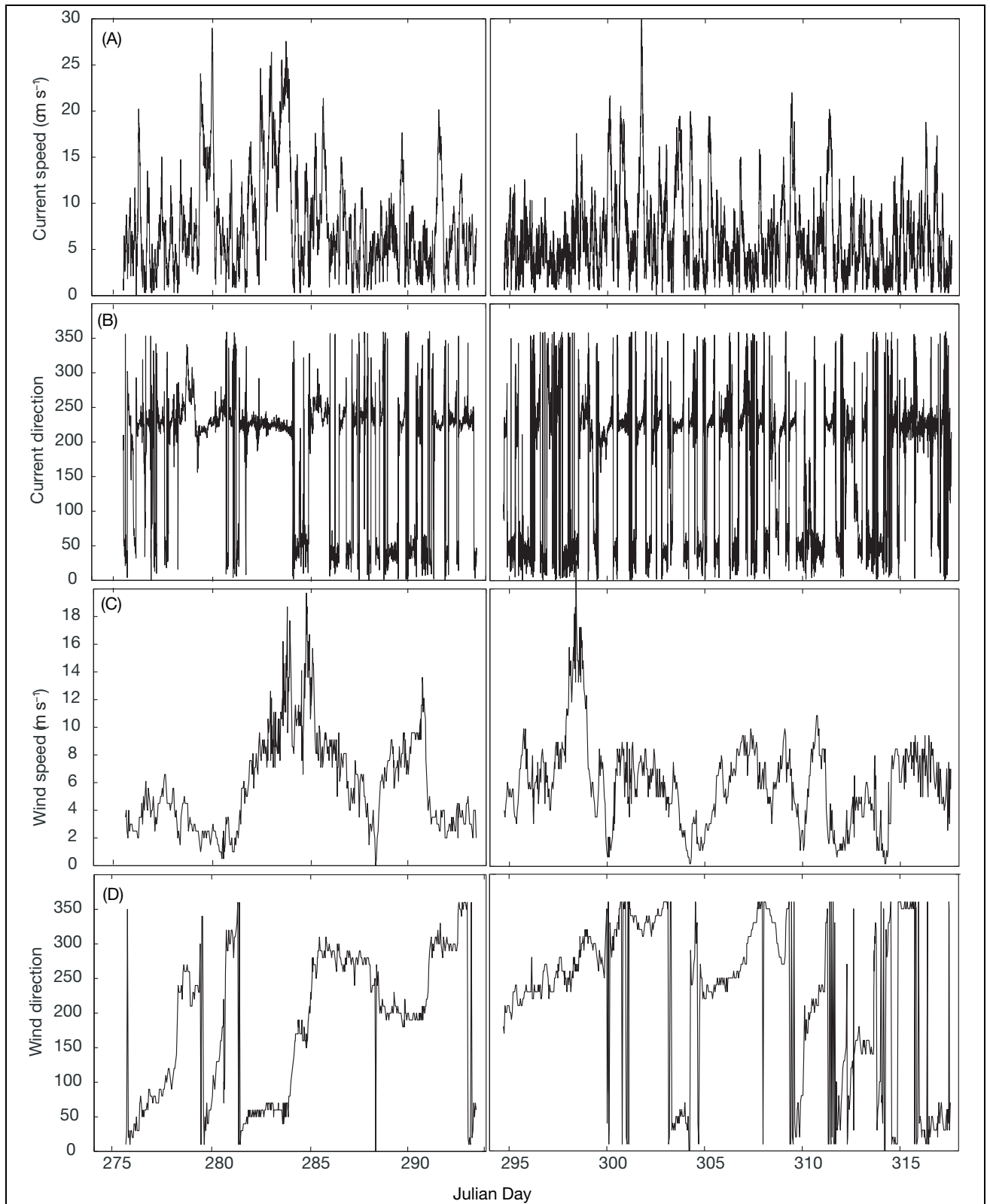


Fig. S1. Time series plots of (A) current speed and (B) direction measured at the Seabright Point sewage outfall and concurrent (C) wind speed and (D) direction measured at the Bermuda International Airport

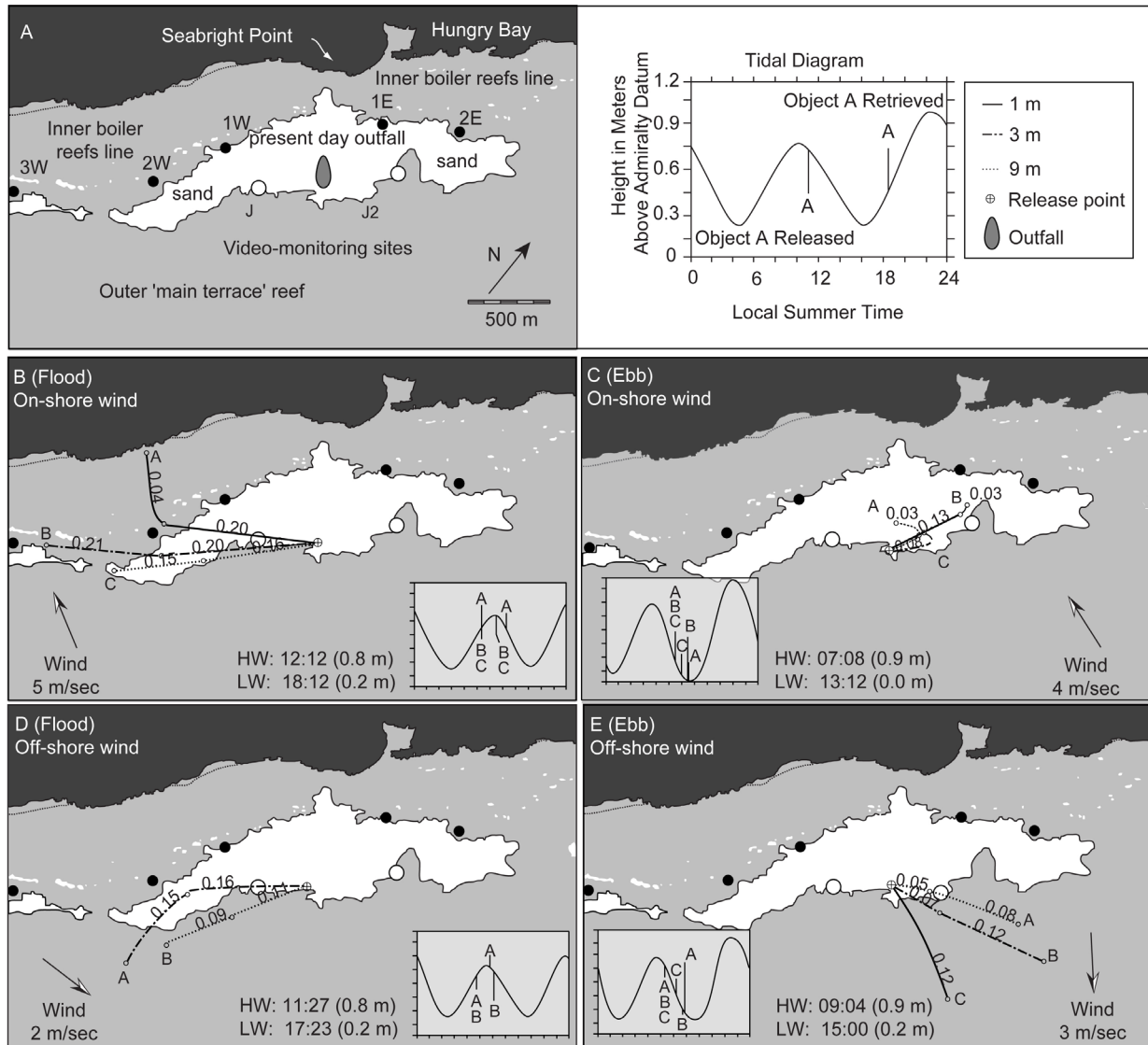


Fig. S2. Drogue tracking studies showing the movement of drogues deployed at 1 m (i.e. surface), 3 m and 9 m depth at various points in the tidal cycle (see inset graphics) and during different wind speed and direction (divided for the purpose of analysis into onshore and offshore winds). •: the various monitoring sites (see Fig. 1 and Panel A). Numbers above the drogue tracks represent average speed (m s^{-1}) travelled by the drogue over ~ 1 h intervals. HW: high water, LW: low water