

Flotsam and jetsam on Westernport Bay

People don't usually like their beaches being fouled by oil, or littered with bits of wood and other trash that washes out from urban storm-water drains. No doubt holiday-makers using the beaches of Westernport Bay are no exception. Yet to some extent such pollution probably must be the price that will have to be paid for the proposed Westernport industrial complex.

A great deal can be done to keep the adverse effects of such a development to a minimum, and in its Westernport Bay Environmental Study, the Victorian Department of Conservation is looking into many aspects of how this project will affect

the surrounding land and sea.

As a part of its study, the Department asked Dr Kevin Spillane at the CSIRO Division of Atmospheric Physics to investigate how floating bric-a-brac emanating from the proposed development may move around the Bay, and where it may wash up. Planning decisions on where storm-water drain outlets should be located have yet to be made, and it may be possible to place these outlets so that the material they discharge will cause a minimum of nuisance.

Two factors would affect the movement of anything floating on the Bay's waters—the tidal currents and the wind. Dr Spillane and his

two colleagues, Dr Richard Robinson and Dr Dale Hess, have concentrated on the effects of winds, since not enough information is yet available to be able to predict what effects the tidal currents will have. Further calculations will be made once enough is known.

The scientists began by studying the wind records from 10 stations close to Westernport Bay. They concluded that the readings taken by the Victorian State Electricity Commission at Crib Point were most representative of the winds in the Bay. Analysis of the Crib Point records indicated that in winter (April to September) north-westerly winds are most common, while in summer the prevailing winds normally blow from the south or south-east. At night during summer some winds may also come from the north-north-east, or the west.

Using the Crib Point records, the researchers calculated how the prevailing winds would make surface material drift. They also checked these calculations experimentally.

With the assistance of the Ports and Harbours Branch of the State Department of Works, and vacation students, they released into the Bay small amounts of diesel oil, and batches of drift cards supplied by the CSIRO Division of Fisheries and Oceanography. Observers followed the oil and cards in a small boat. The slick of diesel oil was easy to see from some distance, so the observers used it to locate the drift cards.

Every 10 or 15 minutes they positioned their boat in the middle of the group of cards, and two shore-based theodolites coordinated by radio gave exact fixes on the boat. Dr Spillane and his fellow researchers then related the drift to the winds recorded at the time at Crib

Point. The results of these drift experiments confirmed their theoretical calculations remarkably well.

Most of the industrial development at Westernport will probably be carried out on the western coast of the Bay between Long Island Point and Crib Point. Wharf facilities for a cold-steel rolling mill, crude oil storage, and a refinery already exist on these two points.

The three scientists' calculations indicated that most of the oil or other trash released between these two points will be washed back onto the coast close to where they originated. Nevertheless, a fairly large amount will be washed onto the western shore of French Island opposite, and a considerably smaller amount will accumulate on the north-eastern coast of Phillip Island—most of it landing in the region between Cowes and Rhyll. Much of the drift onto Phillip Island will occur in winter.

The calculations of Dr Spillane and his colleagues

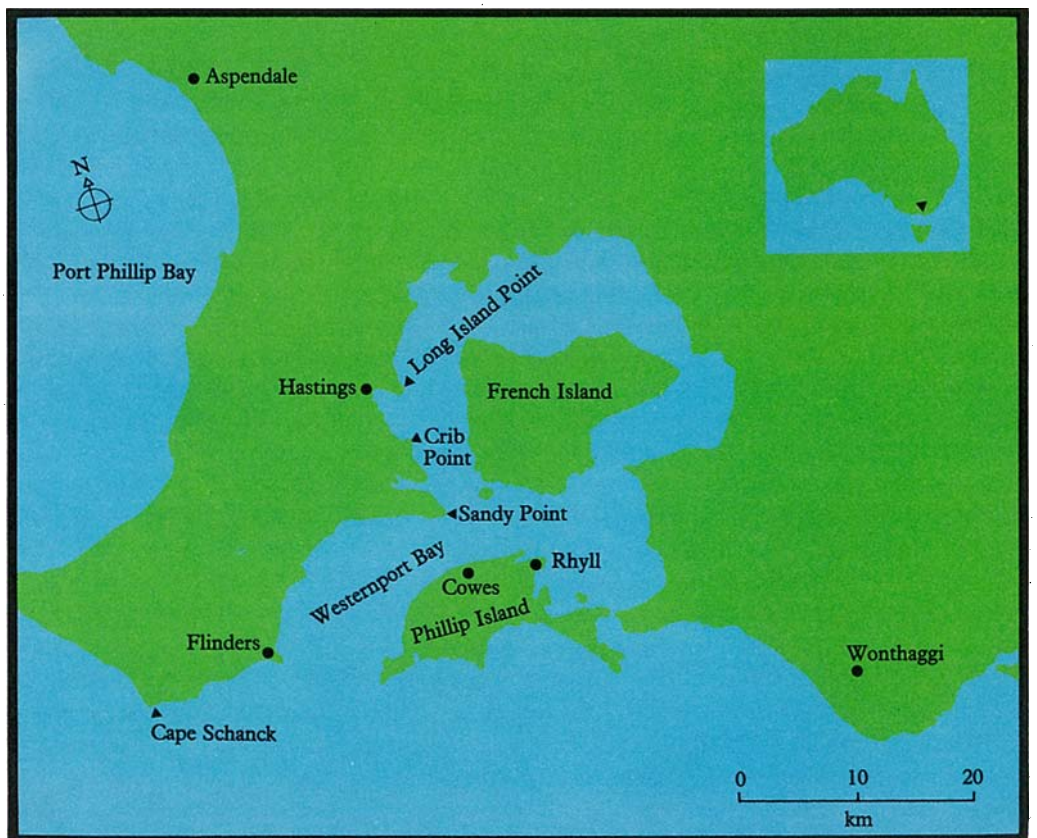


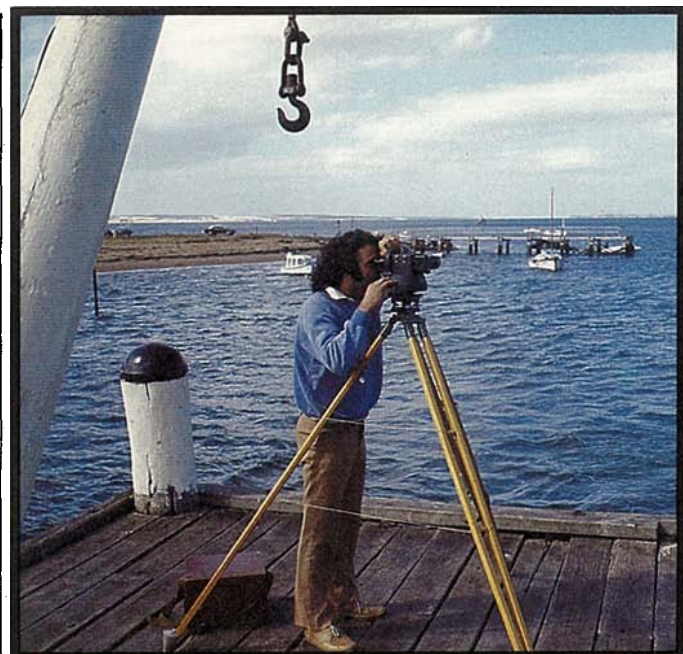
Drift cards: these were released from a boat in batches of 20, and then followed.

suggested that locating storm-water outlets further south between Crib Point and Sandy Point would increase the amount of debris reaching Phillip Island. The bathing beaches between Sandy Point and Flinders would remain free unless the outlets were located to the south-west of

Sandy Point.

Placing the storm-water outlets north of Long Island Point would almost completely eliminate any threat to Phillip Island—the further north they were the smaller the threat would be. Moving the outlets northwards from the development would also





Two shore-based theodolites fix the boat's position when Dr Spillane gives the signal from on board.

tend to reduce the amount of floating material that would accumulate on the shores of French Island.

Incidentally, Hastings is sheltered by Long Island and Crib Points. Placing storm-water outlets near here

would greatly reduce debris build-up on both Phillip Island and French Island. The major proportion would be deposited on either side of the outlets on the mainland coast between Long Island and Crib Points.

Of course, the CSIRO calculations do not show where an oil slick released as a result of major accident would go—this would depend on the weather conditions on the particular day it happened.

Surface wind and drift of surface-residing materials on Westernport Bay. K. T. Spillane, R. M. Robinson, and G. D. Hess. *CSIRO Division of Atmospheric Physics Technical Paper* (in press).