



1995 Season Report

BEACHWATCH

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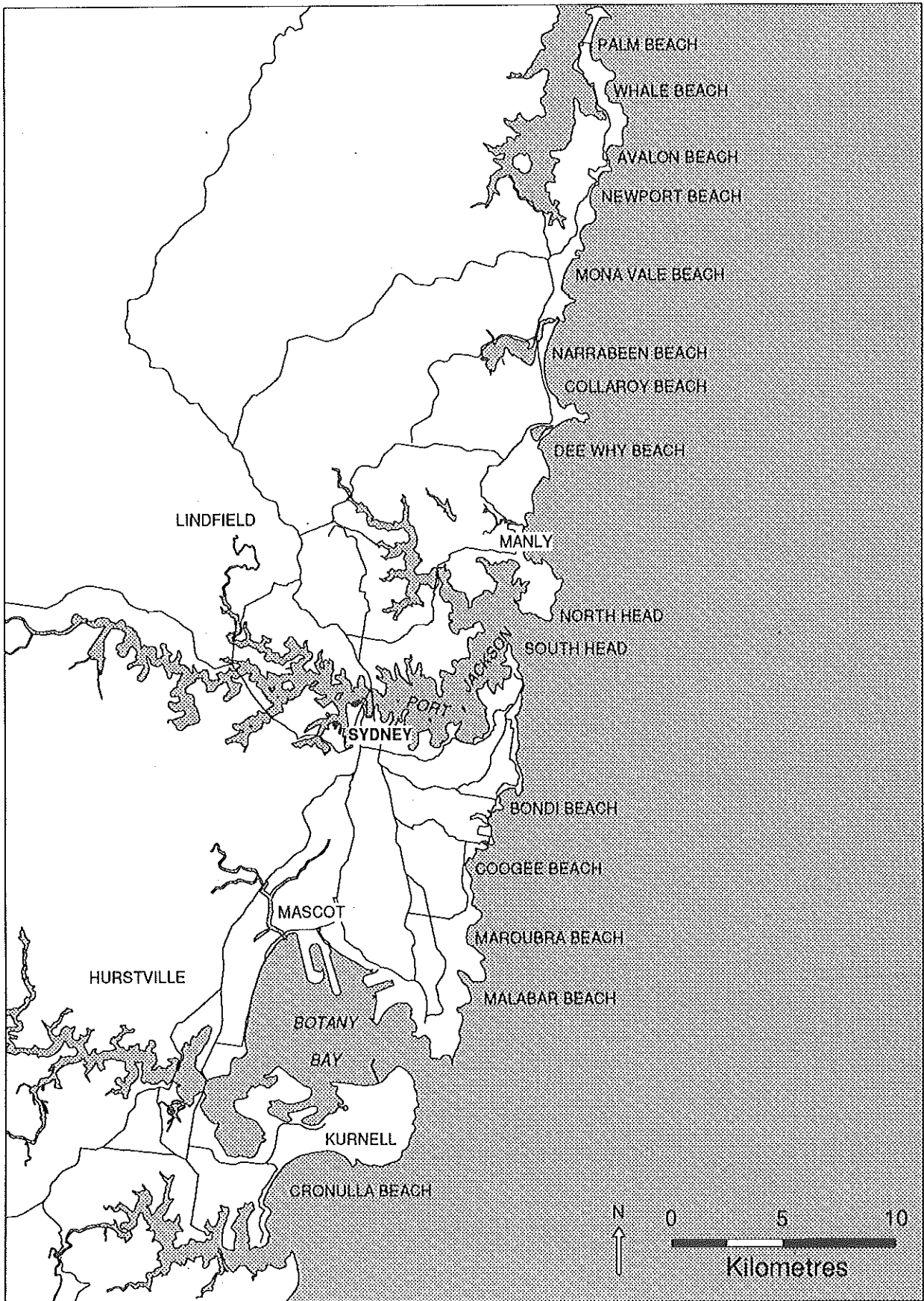
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Sydney's ocean beaches

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ABBREVIATIONS

ANZECC	Australian and New Zealand Environment and Conservation Council
APHA	American Public Health Association
BPM	Beach Pollution Monitoring Program
cfu	colony forming units
E. coli	Escherichia coli
GMFC	Geometric mean faecal coliform
ML	megalitres
µm	micrometre (micron)
NH&MRC	National Health and Medical Research Council
STP	Sewage Treatment Plant
USEPA	United States Environment Protection Agency

SUMMARY OF FINDINGS

This report describes the monitoring and reporting activities at Sydney's ocean beaches during the summer season 1994/95, which covers the period from 1 October 1994 to 30 April 1995.

The results presented in this report confirm earlier Beachwatch reports which show that the major source of pollution of Sydney's ocean beaches is now stormwater. The results indicate that there has been an improvement in beach water quality since the commissioning of the deepwater outfalls at North Head, Bondi and Malabar. These outfalls have reduced the number of sewage incidents to fewer than 1% of days in the 1994/95 summer season.¹

Microbiological Guidelines:

Beachwatch uses the National Health and Medical Research Council (NH&MRC) microbiological criteria for assessing the suitability of marine water for recreational use (NH&MRC, 1990). Marine waters are considered to be unsuitable for swimming when either:

- the median faecal coliform density calculated from a minimum of five samples taken at regular intervals over one month exceeds 150 colony forming units per 100 ml (cfu/100 ml), or;
- more than one in five samples in a month exceed 600 cfu/100 ml.

The NH&MRC guideline limit, based on faecal coliform densities, is considered to be the preferred Australian standard when assessing long-term trends in water quality with regard to health risk.

During the 1994/95 summer season all beaches except Warriewood, Queenscliff, Shelly (at Manly), Malabar and Boat Harbour complied with the guideline limits on faecal coliform levels on all sample days.

The NH&MRC guidelines, and guidelines drafted by the Australia and New Zealand Environment and Conservation Council (ANZECC), refer to the use of enterococci densities as a secondary indicator of water quality. Collaroy, Queenscliff, Shelly (at Manly), all the city ocean beaches (from Bondi to Malabar) and all the Sutherland beaches (from Boat Harbour to South Cronulla) fail the guideline limits for enterococci densities more than 10% of the time.

The guideline limits are a measure of the probability of swimmers developing illnesses derived from the water. But the actual risk is dependent on many factors including, in particular, the bacterial-indicator to pathogen ratio, which is usually unknown.

¹ Information on the effects of the deepwater outfalls can be found in EPA reports on the Deepwater Outfalls Environmental Monitoring Program.

The NH&MRC notes that "while the guidelines have not been developed for regulatory purposes, they attempt to provide a benchmark to ensure that recreational waters are safe to use". The findings provide a basis to establish priorities for councils, Sydney Water and the EPA to identify pollution sources and pollution control measures.

Visible Sewage Pollution:

Council lifeguards applied the Beachwatch Beach Pollution Assessment Guidelines (Appendix one) in a daily visual assessment of Sydney's ocean beaches during the summer season 1994/95.

Most beaches were classified as 'Clean' (i.e. only 'Nil' and/or 'Trace' levels of visible pollution recorded) with respect to visible sewage pollution for more than 99% of the summer season 1994/95 (see Table 2.1). There were twelve reports of 'Medium' or 'High' levels for the season. Only Long Reef (three occasions), Tamarama (two occasions) and North Cronulla (three occasions) had more than one incident.

Visible Stormwater Pollution:

Stormwater pollution is now the most common source of visible pollution affecting the suitability of Sydney's northern and city ocean beaches for recreation.

As a group the city ocean beaches (Bondi to Malabar) were the most frequently affected by visible stormwater pollution (Table 2.2). This was consistent with the findings in previous seasons. The Waverley and Randwick municipality beaches were on average 'Clean' (i.e. 'Nil' and 'Trace') 78% and 71% of the season respectively compared with 91% for Pittwater Beach, 86% for Warringah Beach, 87% for Manly and 94% for Sutherland. Malabar Beach recorded the most frequent levels of either 'Low', 'Medium' or 'High' visible stormwater pollution, followed closely by Maroubra, Coogee, Bronte and Clovelly. The most frequently affected northern beach was Freshwater.

The Accuracy of Visual Indicators as a Measure of Water Quality:

The visual indicators used by Beachwatch were refined before the beginning of the last summer season to improve consistency in the reporting of stormwater levels. In addition a detailed study of four beaches was undertaken to determine how good the visual indicators are at predicting water quality. The four beaches, North Curl Curl, Queenscliff, Bronte and Coogee, were known to have potentially large sources of pollution from lagoons or stormwater drains.

On the basis of these studies, it is now believed that the current visual assessment program, although useful, is a poor predictor of bacterial contamination and in many cases is more conservative than necessary. Many beaches which have high levels of visible stormwater pollution do not have levels of bacteria high enough to pose a health risk, either because of the variability in catchment characteristics or the variability of water quality from known sources such as lagoons and drains.

The 1995/96 Monitoring Program:

The results from the above studies have been used to develop a refined monitoring program for the summer season 1995/96. The new program will use a simplified approach to collect baseline information on pollution but will continue to study in more detail beaches where stormwater impacts remain of concern. The beaches of concern are primarily the city ocean beaches with intensive development and older sewer infrastructure that has the potential for increased discharge of sewage to the stormwater system.

A number of initiatives to improve communication of data and the understanding of potential health risks have been developed for the summer 1995/96 season:

- bacterial data will be provided to local councils as soon as it is available
- intensive (other day) monitoring will be undertaken at the Manly beaches, the city beaches from (Bondi to Malabar) and Sutherland beaches (from Boat Harbour to Oak Park) and Gunnamatta Bay in Port Hacking
- the study of pollution sources will be extended to include all drains known or suspected to contribute to bacterial contamination of bathing waters.

1. INTRODUCTION

The Beachwatch Program:

The Beachwatch program is conducted by the Beachwatch Branch of the EPA. The program has the following objectives:

- to provide the public with daily assessments of pollution levels on the beaches;
- to provide regular information to the public generally on status of the beaches and pollution sources and incidents;
- to collect scientific data to assess effectiveness of pollution control measures.

The program of beach pollution monitoring involved both visual assessments of beach pollution twice daily in summer months and once daily in winter. Beachwatch Branch staff then check, collate and summarise assessment reports from 34 ocean beaches to produce a daily bulletin which is recorded on a telephone information line (9901 7996) and faxed directly to relevant authorities and most major print, radio and television media. In addition, the Branch undertakes a Beach Pollution Monitoring (BPM) Program to ensure consistency of reporting by the different council officers and to provide on-going liaison and training.

Bacterial Water Quality Analyses:

The water quality program is based on guidelines developed by the National Health and Medical Research Council (NH&MRC, 1990) to assess the potential risk resulting from contamination. Water quality samples are collected from the ocean water between the bathing flags, or at the most frequently used part of the beach if there are no flags, at least five times during the month. These samples are analysed for the presence of bacteria which indicate that sewage pollution is present in the water. As the analyses take up to 48 hours to complete, results of the water quality monitoring are not available for inclusion in the Beachwatch daily bulletin. A report at the end of each month summarises the results from visual assessment and water quality analyses.

The Beachwatch annual reports provide a comprehensive summary of the visual assessment and water quality analysis results for each summer season (October to April) and for each winter season (May to September).

Structure of This Report:

This report describes the monitoring and reporting activities at Sydney's ocean beaches during the summer season 1994/95, which covers the period from 1 October 1994 to 30 April 1995.

Chapter two presents results and discussions of the daily visual assessment and ocean water quality tests at Sydney's beaches. This report adopts a new format which integrates all data and information for each beach on a single page. The water quality

data is presented as both raw data and a 'rolling' median which provides an overview of water quality throughout the season. In addition, summary graphs and tables allow comparison of water quality at different beaches.

Chapter three describes the quality assurance programs undertaken by Beachwatch for both the visual assessment and water sampling programs.

Chapter four describes additional studies undertaken by Beachwatch to improve our understanding of pollution of the surf and to identify ways to improve reporting and prediction of potential risk. A detailed investigation of water quality at four beaches was designed to provide data suitable for answering basic questions about the reliability and use of the visual assessment program and the impacts of different pollution sources on beach water quality. This study has been useful in reviewing the Beachwatch program and designing the studies for the coming summer. This chapter also summarises studies undertaken by Sydney Water of the remaining near-shore outfalls which have an identified impact of beach water quality. There is ongoing public concern about the impacts of these outfalls.

Appendix one describes the Beach Pollution Assessment Guidelines. Appendix two outlines microbiological assessment procedures.