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For information

River and Marine Water Quality in Hong Kong in 2007

Introduction

The Environmental Protection Department (EPD) conducts long-term monitoring of river and marine water quality and publishes the annual reports. The 2007 river and marine water quality reports are now available for public's viewing and downloading from EPD's website (http://www.epd.gov.hk)[1]. This paper summarises the state of rivers and marine waters in Hong Kong in 2007 for Members' information.

River Water Quality

2. The overall water quality of Hong Kong rivers in 2007 was similar to that in 2006. In terms of compliance with the statutory Water Quality Objectives (WQOs), the compliance rate in 2007 was at 86%, the same as in 2006 and up from 76% in 1997. This was the result of the implementation of pollution control legislation and abatement schemes, including the Water Pollution Control Ordinance, Livestock Waste Control Scheme and Sewerage Master Plans.

3. A similar trend was observed in the Water Quality Index (WQI) grading, which reflected the general health of the rivers. In 2007, 81% of river monitoring stations were maintained in the 'Excellent' or 'Good' grades and half of these stations were graded 'Excellent'. The majority of the river stations in Lantau Island, Eastern New Territories, Southwestern New Territories and Kowloon were in these categories. The number of river stations in the territory

[1] EPD ceased producing CD-ROMs in 2007 and only web-based versions of the reports were made available since then.

that remained 'Bad' or 'Very Bad' also decreased from 14% in 2006 to 10% in 2007. These watercourses were mostly found in the Northwestern New Territories. Early signs of water quality recovery were noted in this area, however, and they could be attributed to the effects of farm closures under the Voluntary Surrender of Poultry and Pig Farm Licence Scheme which saw a large number of farms closed towards the latter part of 2007.

Marine Water Quality

4. In 2007, the overall marine water quality in Hong Kong achieved an 80% compliance with the WQOs, lower than that in 2006 (87%). The decrease of the WQO compliance[2] in 2007 was mainly due to a decrease of compliance with the WQO for Dissolved Oxygen (DO) compared with 2006. The compliance with the Total Inorganic Nitrogen (TIN), Unionised Ammonia (NH_3) and *E. coli* bacteria objectives, however, remained the same between the two years.

5. There was a general and territory-wide decrease of DO in Hong Kong marine waters, most notable in the summer months of 2007. This decrease was most likely due to the fact that 2007 was an unusually warm year, the fifth warmest since record began in 1884, and the solubility of oxygen in sea water decreased with the increase in sea temperature. Nevertheless, this territory-wide decrease in oxygen level in 2007 was less than 10% (from around 6.5 to 6.05 mg O_2/L on average) and was still above the level to sustain the normal growth of most marine organisms and fish. Thus the decrease of DO should not have a major impact on the local biological communities nor the overall marine ecology. However, EPD would closely monitor the trends of water quality and the effects through our ongoing marine water quality programme as well as other chemical and biological monitoring works.

6. The Port Shelter and Mirs Bay Water Control Zones (WCZs) have good water quality in terms of having low levels of nutrients and *E. coli* bacteria, which are two pollution related parameters; however there was a decrease of compliance with the WQOs, from 100% compliance in 2006 to 89-90% in 2007 due to a reduction of DO in the water. In the Tolo Harbour WCZ, while nutrients and *E. coli* bacteria were low in 2007, its overall WQO compliance rate

[2] The WQO compliance rate is calculated based on the combined individual compliance rates of all stations in the territory for the four key marine Water Quality Objectives, namely Dissolved Oxygen, Total Inorganic Nitrogen, Unionised Ammonia and *E. coli* bacteria.

dropped to 64%, also due to low DO levels in the water. In the Victoria Harbour WCZ, the WQO compliance rate in 2007 was maintained at 90%. There was improvement in the water quality on the eastern side of the harbour, mainly due to the implementation of the Harbour Area Treatment Scheme (HATS) Stage 1. The Eastern Buffer and Junk Bay WCZs fully complied with the WQOs in 2007, the same as in the previous year. On the other hand, the *E. coli* bacterial levels in the central and western harbour remained high. The problem would be alleviated once the effluent from the Stonecutters Island Sewage Treatment Works (SCISTW) is disinfected starting at the end of 2009.

7. The Deep Bay WCZ had the lowest water quality in the territory. Its WQO compliance rate dropped from 40% in 2006 to 27% in 2007 largely due to a decrease of DO in the outer bay. The water quality in the Southern, Western Buffer and North Western WCZs was influenced by the Pearl River flow, and was largely stable with the WQO compliance rates ranging between 72% and 83% in 2007. In 2007, a total of 13 red tide incidents was reported in the territory, similar to the 14 cases reported in 2006. There was no record of any red tide-related fish kill during the year.

Conclusions

8. In 2007, the river water quality in Hong Kong was largely maintained at a level similar to that of 2006, with 81% of the monitoring stations achieving a "Good" or "Excellent" WQI grading. However, the major rivers in the Northwestern New Territories remained unsatisfactory due to pollution from livestock farms and the remaining unsewered villages.

9. For marine waters, the overall WQO compliance rate was 80% in 2007. In the Victoria Harbour WCZ, the water quality improvements resulting from the implementation of the HATS Stage 1 since 2002 were generally sustained. The overall WQO compliance rate in the Victoria Harbour WCZ remained at 90% in 2007. However, the central and western Victoria Harbour continued to have high *E. coli* bacterial counts. The *E. coli* problem is expected to be alleviated when the effluent from the SCISTW undergoes disinfection treatment starting at the end of 2009.

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