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River and Marine Water Quality in Hong Kong in 2015

INTRODUCTION

The Environmental Protection Department (EPD) conducts long-term monitoring of river and marine water quality and publishes the annual reports in the following year. The 2015 river and marine water quality reports are now available for the public's reference at the EPD's website (<http://www.epd.gov.hk>)¹. This paper summarises the state of rivers and marine waters in Hong Kong in 2015 for Members' information.

RIVER WATER QUALITY

2. The overall water quality of Hong Kong's rivers in 2015 continued to perform well. In terms of compliance with the statutory Water Quality Objectives (WQOs), the compliance rate for the year was 89%, compared with 90% in 2014.

3. With regard to the Water Quality Index (WQI) which indicates the general health of the inland water courses, 48% of the river monitoring stations were graded "Excellent" and 34% "Good" in 2015. These stations are mainly located in Lantau, eastern and southwestern New Territories, and Kowloon.

4. The good compliance rates (**Figure 1 of Annex**) were the result of implementation of pollution control legislation, including the Water Pollution Control Ordinance and the Livestock Waste Control Scheme introduced under the Waste Disposal Ordinance, and the extension of the sewerage network to local villages under the Sewerage Master Plans and the gradual connection of village houses to the new sewers.

¹ EPD ceased producing CD-ROMs since 2007, and only web-based versions of the reports are available.

5. In spite of the improving water quality trend, 39% of the 82 monitoring stations still contained high (over 10,000 cfu/100mL) to very high (over 100,000 cfu/100mL) levels of *E. coli* bacteria. These stations are mostly located in the northwestern part of the New Territories (for example Yuen Long Creek and Kam Tin River), and some in North District (for example River Indus and River Ganges) and Eastern New Territories (for example Lam Tsuen River). The water quality will further improve when public sewers are extended to more villages in the unsewered areas in these areas as recommended in the North District Sewerage Master Plan (SMP) and Yuen Long and Kam Tin SMP.

MARINE WATER QUALITY

6. The overall WQO compliance rate for 2015 was 84% compared with 78% in 2014 (**Figure 2 of Annex**). Improvement in compliance rate was mainly due to higher compliance rate with the dissolved oxygen (DO) objective which rose from 64.5% in 2014 to 88.2% in 2015. On the other hand, the compliance rate with the total inorganic nitrogen (TIN) objective dropped from 65.2% in 2014 to 58.0% in 2015, within the normal range of fluctuations.

7. Six Water Control Zones (WCZ) had higher overall compliance rate in 2015, while two WCZs had lower overall compliance rate. The improvement in overall compliance rate in the Tolo Harbour and Channel (79%), Port Shelter (100%), Victoria Harbour (90%), Western Buffer (92%) and North Western (67%) WCZs, was mainly due to an increase in compliance rate with the DO objective. The improvement in the Deep Bay WCZ (53%) was due to higher compliance with the unionised ammonia-nitrogen (NH₃-N) objective.

8. The slightly lower compliance rate for the Mirs Bay (96%) and Southern (69%) WCZs in 2015, as compared with 98% and 71% respectively in 2014, was mainly due to a slight drop in compliance with the DO objective and the TIN objective respectively.

9. The compliance rate for the other two WCZs in 2015 remained unchanged, 100% for both the Eastern Buffer WCZ and Junk Bay WCZ,

10. The water quality in Victoria Harbour has shown some improvement after the implementation of the Harbour Area Treatment Scheme (HATS) Stage 1 in end 2001 (**Figure 3 of Annex**). After the commissioning of HATS Stage 2A in end 2015,

which intercepts and collects the remaining 25% of sewage from direct discharge for treatment at the Stonecutters Island Sewage Treatment Works, we observe early sign of improvement in terms of *E. coli* level which has dropped by 74%. We will continue to closely monitor the changes in water quality of Victoria Harbour.

11. A total of nine red tide incidents were reported in the territory in 2015, as compared with 23 incidents in 2014. Of these, two occurred in the Mirs Bay WCZ, two in Tolo Harbour and Channel WCZ, two in Port Shelter WCZ, two in Southern WCZ and one in North Western WCZ. As most incidents were reported in the eastern waters which have relatively low nutrients levels, the occurrence of red tide in recent years was largely related to changes in climatic and/or hydrodynamic conditions (such as light intensity, temperature, stratification of the water column, water currents, wind speed, etc). One fish kill was recorded in Hong Kong waters (Yim Tin Tsai Fish Culture Zone) in 2015. The fish kill was caused by *Karenia mikimotoi*.

CONCLUSIONS

12. In 2015, the river water quality in Hong Kong continued to perform well with 82% of the monitoring stations achieving a “Good” or “Excellent” WQI grading. However, *E. coli* levels in excess of 10,000 cfu/100ml were still found in 39% of the monitoring stations located mostly in the northwestern part of the New Territories, and some in North District and Eastern New Territories.

13. For marine waters, the overall WQO compliance rate for 2015 was 84%, compared with 78% in 2014. The increase in overall compliance rate in 2015 was mainly due to higher compliance with the DO objective observed in many parts of Hong Kong’s waters. After the commissioning of HATS Stage 2A in end 2015, we observe early sign of improvement in terms of *E. coli* level which has dropped by 74%. We will continue to closely monitor the changes in water quality of Victoria Harbour and report in due course the improvement brought about by HATS 2A.

Environmental Protection Department
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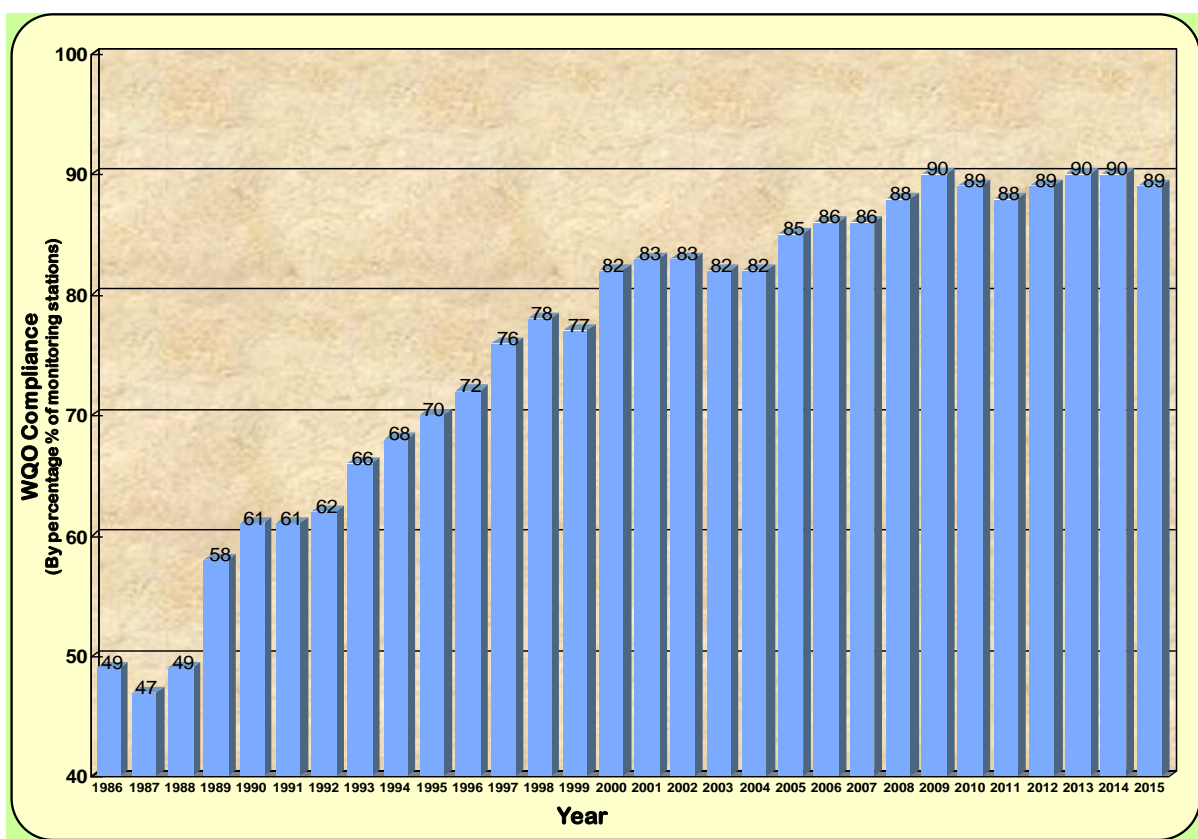


Figure 1 Overall compliance with the river WQOs in Hong Kong, 1986-2015

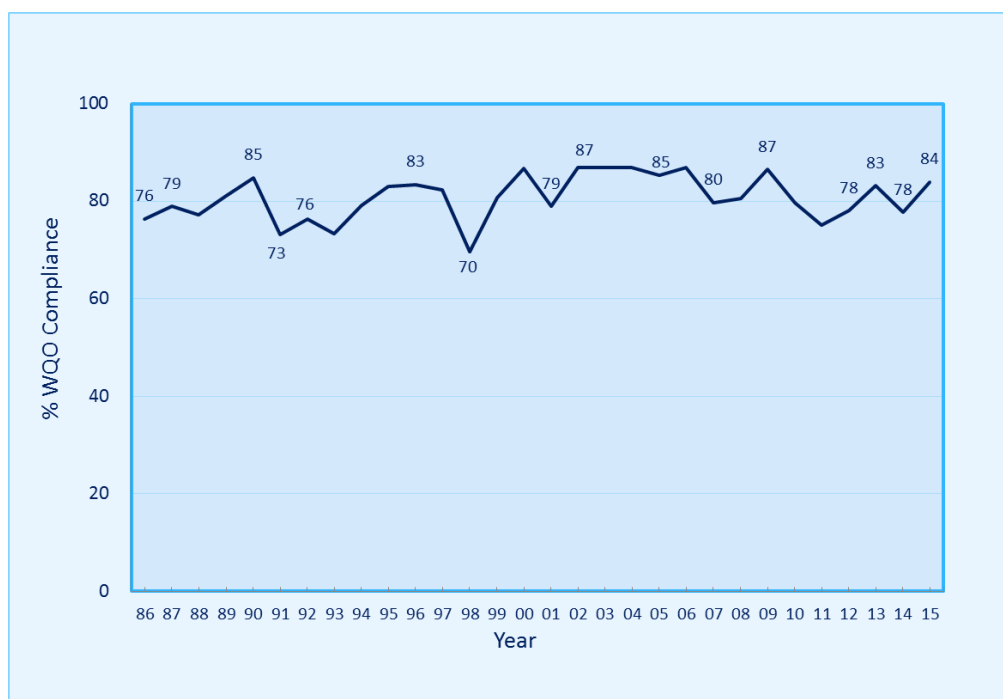


Figure 2 Overall compliance with the marine WQOs in Hong Kong, 1986-2015

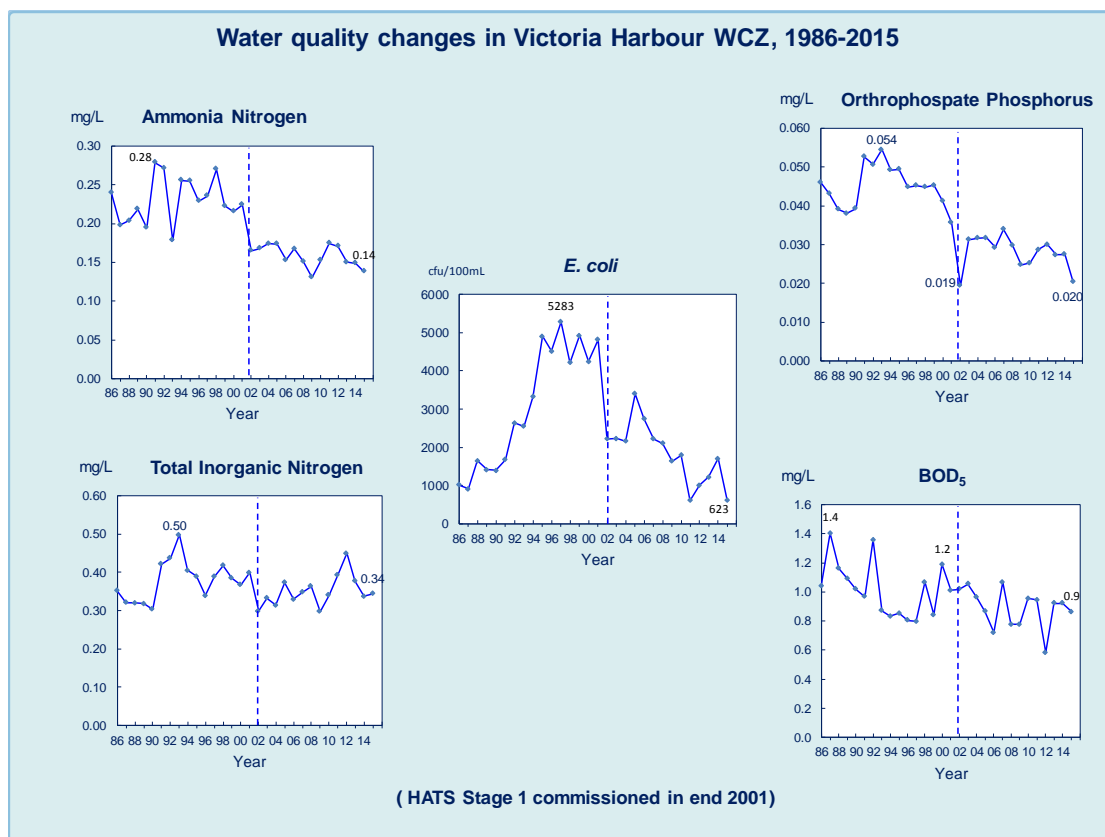


Figure 3 Water quality changes in Victoria Harbour WCZ, 1986-2015