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River and Marine Water Quality in Hong Kong in 2017

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 2017 river and marine water quality reports are now available for the public access at the EPD's website (http://www.epd.gov.hk). This paper summarises the state of rivers and marine waters in Hong Kong in 2017 for Members' information.

RIVER WATER QUALITY

2. The overall water quality of Hong Kong's rivers continued to perform well in 2017. In terms of the key Water Quality Objectives (WQOs), the overall compliance rate has maintained on par with the average compliance level of 90% over the past five years. The overall compliance rate has improved significantly when compared to the compliance rate of 48% in 1987, considering that population has doubled over the 30 years in the New Territories, where most of our rivers lie (see **Figure 1 in Annex**).

3. With regard to the Water Quality Index (WQI) which indicates the general health of the inland water courses, 87% of the river monitoring stations were graded "Excellent" or "Good" in 2017, slightly above the average level of 85% over the past five years, and much higher than 26% in 1987. These stations are mainly located in Lantau, eastern and southwestern New Territories, and Kowloon.

4. The high WQO compliance rates and WQI gradings 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, progressive extension of the sewerage network to villages in the New Territories under various Sewerage Master Plans and gradual connection of village houses to public sewers.

5. In spite of the overall improvement in inland water quality, some rivers in the western part of the New Territories such as Yuen Long Creek and Kam Tin River stayed below 60% in WQO compliance and recorded "High" to "Very High" levels of *E. coli* bacteria, i.e. over 10 000 counts/100mL. The main pollution sources in these areas include runoff from unsewered village houses, expedient connections in the old districts and illegal discharges from livestock farms. To improve the situation, the Government will make further enhancement in the sewerage infrastructure in the districts concerned by upgrading the sewage treatment facilities and expediting the extension of existing sewerage network to unsewered villages in consultation with the local community. Other pollution abatement options including possible installation of dry weather flow interceptors will also be considered, and vigilant enforcement against illegal discharges will continue.

MARINE WATER QUALITY

6. In 2017, the overall WQO compliance rate for marine water was 85%, compared with 86% in 2016 and 84% in 2015 (see **Figure 2 in Annex**). Among the four key water quality parameters that this overall rate was compiled from, the yearly compliance rates of unionised ammonia nitrogen (NH_3-N) and *E. coli* bacteria maintained at 100% as the previous year and dissolved oxygen (DO) remained unchanged at 93%, with only that of total inorganic nitrogen (TIN) dropped from 59% in 2016 to 55% in 2017.

7. Among the ten Water Control Zones (WCZ), the WQO compliance rates of seven of them, namely, Eastern Buffer (100%), Junk Bay (100%), North Western (72%), Port Shelter (100%), Southern (69%), Tolo Harbour and Channel (79%) and Western Buffer (100%) WCZs remained the same as in 2016. The Deep Bay WCZ exhibited a higher overall compliance rate of 60% in 2017 while that of the Mirs Bay WCZ dropped slightly to 98%, both owing to fluctuations in the compliance with the DO objective.

8. Because of high background TIN level under the influence of Pearl River discharges and annual variations of surface run-off, the WQO compliance rate of the Victoria Harbour WCZ fluctuates over a range from year to year as a result of the TIN variations, and recorded a mild drop to 83% in 2017 (from 87% in 2016). Despite

that, the water quality parameters of Victoria Harbour continued to show noticeable improvements along with the progressive implementation of the Harbour Area Treatment Scheme (HATS), with Stage 2A commissioned in 2015 (see **Figure 3 in Annex**). A summary comparison of the situation in 2017 to that before the introduction of HATS (1997-2001) is as follows:

a) *E. coli* bacteria reduced by 94%;
b) NH_3-N reduced by 51%;
c) TIN reduced by 7%; and
d) DO increased by 16%.

9. In 2017, the total number of red tide incidents reported in Hong Kong waters was 15, which is the same as the average in the past ten years (2007-2016) (see **Figure 4 in Annex**). These 15 red tide incidents were caused by 14 red tide species. Most of them are non-toxic species commonly found in Hong Kong waters. No fish kill was recorded in these incidents.

CONCLUSION

10. In 2017, the river and marine water quality in Hong Kong continued to perform well, with overall WQO compliance rates achieving 90% and 85% respectively, while 87% of the river monitoring stations achieved a "Good" or "Excellent" WQI grading. As mentioned above, these are the results of sustained implementation of pollution control legislation, extension of the sewerage infrastructure, gradual connection of village houses to public sewers and progressive implementation of HATS in the past two decades. Nevertheless, there are still challenges ahead. We will continue to address the local pollution problems at some inland waters in the New Territories through further pollution abatement works and law enforcement efforts, as well as to strive for enhancement of the water quality of Victoria Harbour through mitigation of near-shore pollution and vigilant monitoring.

Environmental Protection Department
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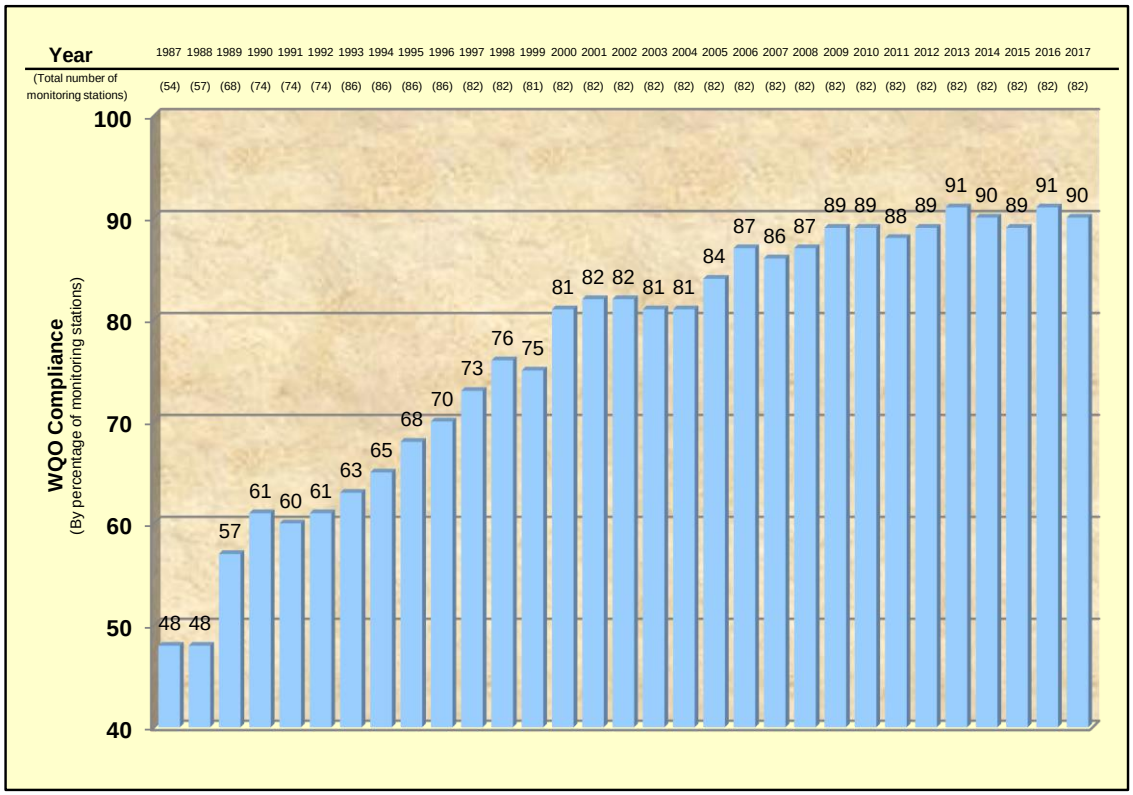

Figure 1 Overall compliance with the river WQOs in Hong Kong, 1987-2017

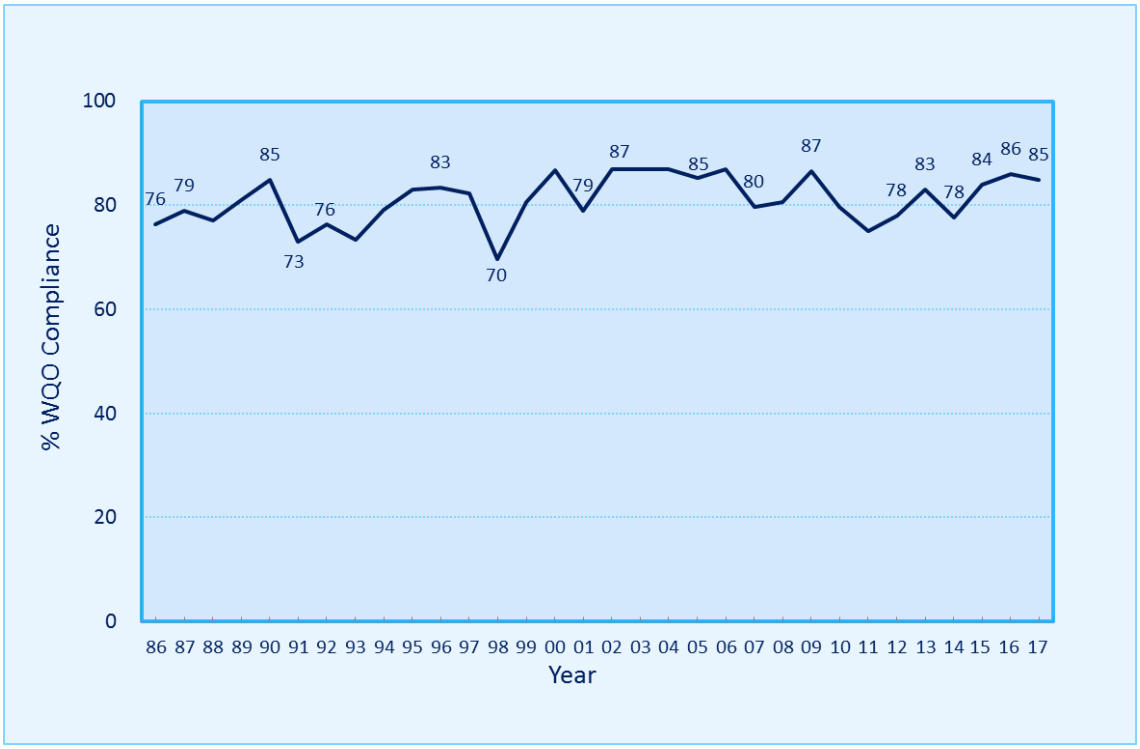

Figure 2 Overall compliance with the marine WQOs in Hong Kong, 1986-2017

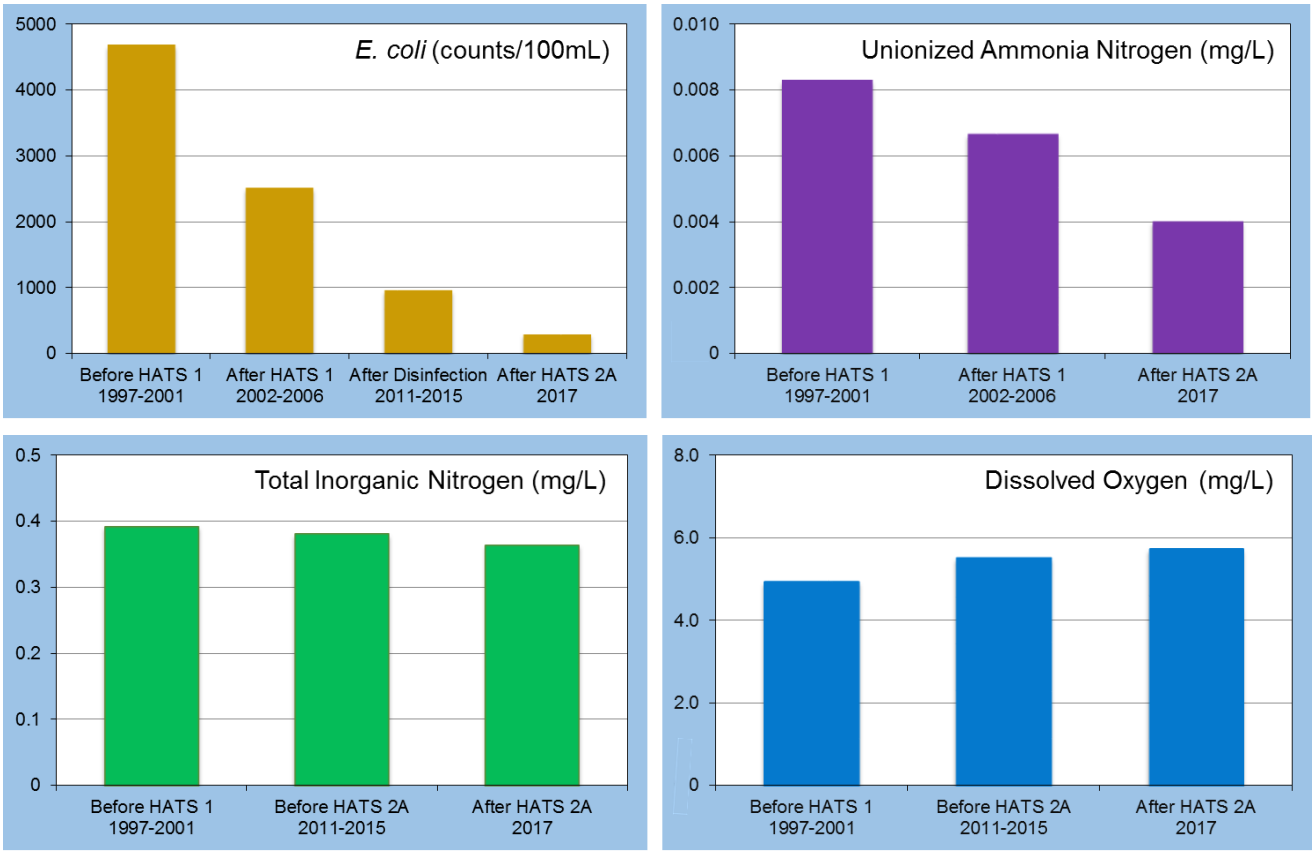

Figure 3 Improvement in water quality since the implementation of Harbour Area Treatment Scheme (HATS)

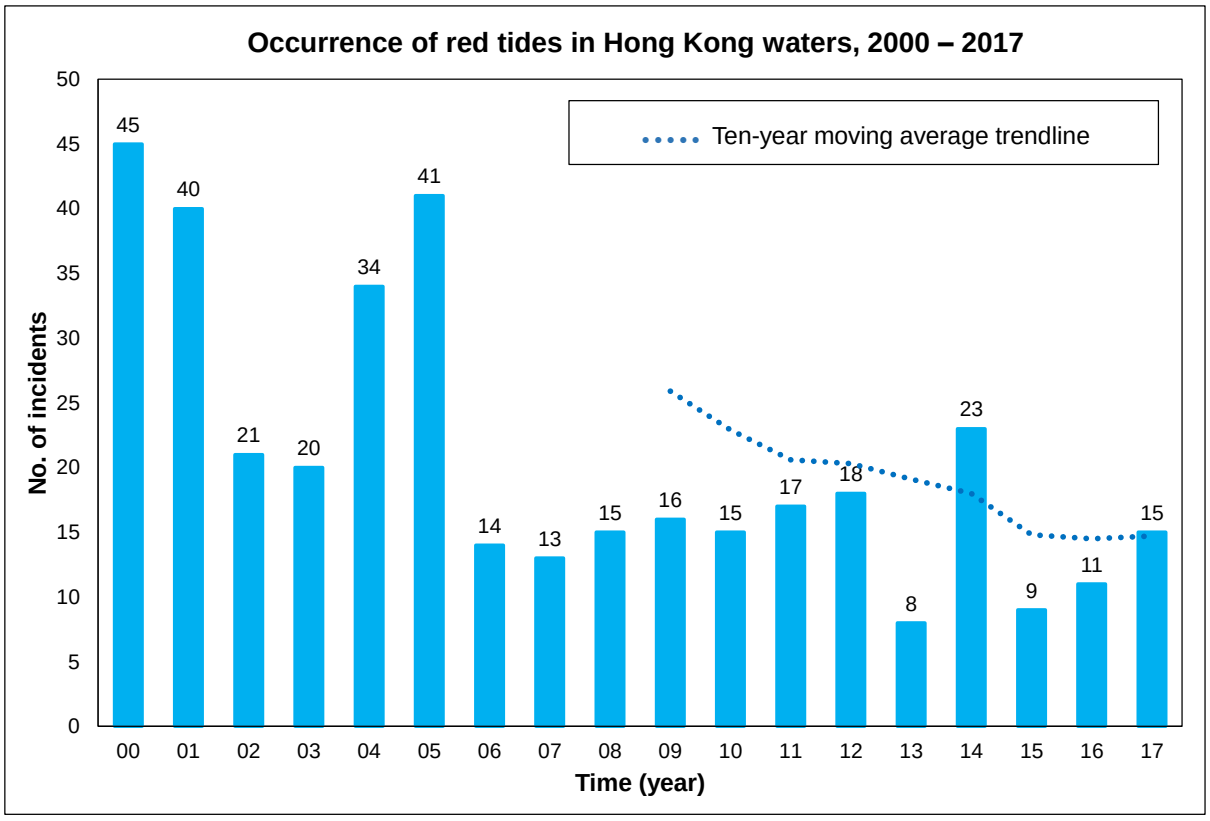

Figure 4 Occurrence of red tides in Hong Kong waters, 2000-2017