

# 香港泳灘水質

## *Beach Water Quality in Hong Kong*

# 2016

為更佳泳灘水質而努力

*Strive for better beach water quality*



環境保護署

香港特別行政區政府

Environmental Protection Department

The Government of the Hong Kong Special Administrative Region



*Our Mission :*

*To safeguard the health and welfare of the community and meet conservation goals by working to achieve and maintain the Water Quality Objective for bathing beaches*



The coastline of Hong Kong was embellished with white sand and clear water beaches





## Introduction

Hong Kong boasts beautiful beaches with fine sands and clean water along its extended coastline. These beaches attract millions of beach-goers to enjoy their seaside leisure time every month during the summer.

The objective of the Environmental Protection Department (EPD)'s Beach Water Quality Monitoring Programme is to monitor beach water quality and protect the health of bathers. This report summarises the beach monitoring data collected in 2016, the gradings of the beaches and the annual compliance with the Water Quality Objective (WQO) for bathing beaches.



Charming beaches for bathers to enjoy their leisure time

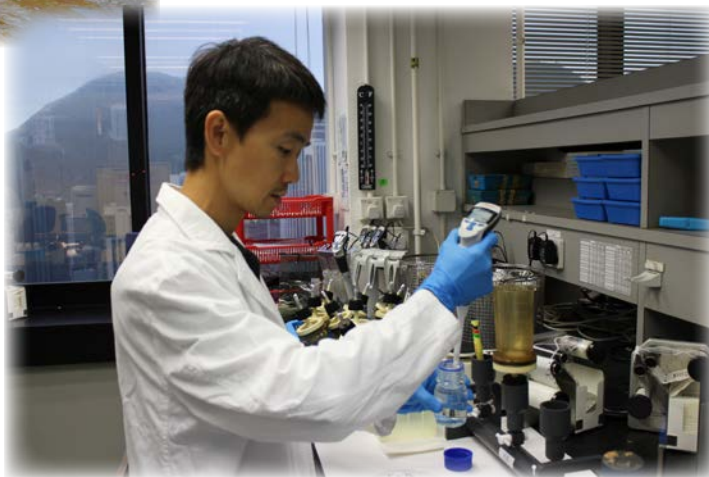




In 2016, the EPD monitored 41 gazetted beaches and three non-gazetted beaches in different parts of the territory. The gazetted beaches were monitored weekly during the bathing season from March to October, and EPD staff conducted field observations and collected samples for laboratory analyses of *Escherichia coli* (*E. coli*) as the bacteriological water quality indicator. EPD staff also took measurements of dissolved oxygen, pH, salinity, temperature and turbidity of beach water.



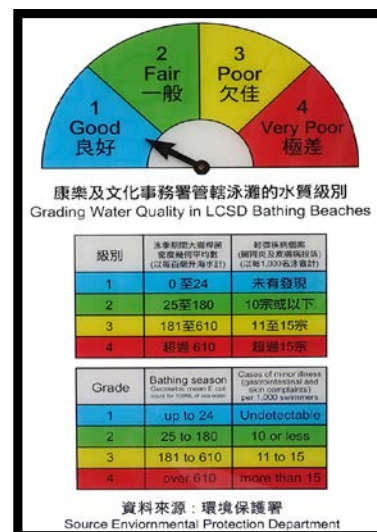
EPD staff conducting water sampling and field data recording



Analysis of beach bacteriological water quality at EPD's environmental microbiology laboratory



Hong Kong's beaches are assessed using a dual system: annual ranking and weekly grading which are both based on the *E. coli* level in beach water to indicate potential health risks associated with swimming. The annual ranking reflects the overall water quality of the beach over the entire bathing season, while the weekly grading denotes the recent water quality of the beach. Under the dual rating system, beaches are categorised into “Good”, “Fair”, “Poor” and “Very Poor”. Those ranked “Good” or “Fair” meet the WQO for bathing waters.



Water quality grading board  
displayed at the gazetted  
beaches

## Annual Beach Ranking in 2016



The tranquil Tong Fuk Beach  
in Lantau Island

All 41 gazetted beaches in Hong Kong complied with the WQO in 2016. Compared with the ranking in 2015, the number of beaches ranked as “Good” has decreased from 25 (or 61 %) to 18 (or 44 %) and the number of beaches ranked as “Fair” has changed from 16 (or 39%) to 23 (or 56%). This was mainly due to the combined effects of more rainfall and less bright sunshine in the bathing season of 2016. The cumulative rainfall recorded in

the bathing season of 2016 was 17% higher than the average in the past 30 years (1986 - 2015) while the number of bright sunshine hours was 13% lower than that in the same period. Although the annual ranking of seven beaches have changed from “Good” to “Fair” in 2016, the changes in *E. coli* levels were within the normal range of fluctuation of the bacteriological water quality and had no overall adverse impact on the health of swimmers. No beach was ranked as “Poor” or “Very Poor” in 2016.





The beaches with “Good” water quality ranking were located in the Southern (Hong Kong Island South), Islands and Sai Kung Districts. Nine of the 12 beaches in the Southern District were ranked as “Good” in 2016, including Chung Hom Kok Beach, Deep Water Bay Beach, Hairpin Beach, Middle Bay Beach, Repulse Bay Beach, South Bay Beach, St. Stephen's Beach, Stanley Main Beach and Turtle Cove Beach. Shek O Beach and Rocky Bay Beach continued to receive a “Fair” ranking, while the ranking of Big Wave Bay Beach has changed from “Good” to “Fair”. Of the nine beaches on the Outlying Islands, six were ranked as “Good”, including Cheung Chau Tung Wan Beach, Hung Shing Yeh Beach, Kwun Yam Beach, Lo So Shing Beach, Tong Fuk Beach and Upper Cheung Sha Beach. Silver Mine Bay Beach remained to be ranked as “Fair”, while Lower Cheung Sha Beach and Pui O Beach have changed from “Good” to “Fair”. Three of the six beaches in Sai Kung District were rated as “Good” in 2016 including Hap Mun Bay Beach, Kiu Tsui Beach and Trio Beach, while Clear Water Bay First Beach, Clear Water Bay Second Beach and Silverstrand Beach have changed from “Good” to “Fair”. On the western side, all eight beaches in Tsuen Wan District and all six beaches in Tuen Mun District received a “Fair” ranking in 2016, among them Ma Wan Tung Wan Beach has changed from “Good” to “Fair”.



Dynamic and lively Shek O Beach on a beautiful sunny day



The relaxing Ma Wan Tung Wan Beach

The water quality of Tsuen Wan beaches continued to be satisfactory and suitable for swimming after the commissioning of Harbour Area Treatment Scheme Stage 2A in December 2015. The seven beaches along Castle Peak Road had once been closed due to poor water quality before 2010. Since the completion of sewerage along Castle Peak Road in

the beach hinterland and the commissioning of the Advanced Disinfection Facilities of the Harbour Area Treatment Scheme in March 2010, the water quality of these seven beaches has improved and met the WQO for bathing beaches. This has led to the gradual re-opening of all these beaches during 2011 – 2014 and maintained open since then.

EPD also monitored three non-gazetted beaches in Hong Kong: Discovery Bay (a popular beach in Lantau Island), a sandy beach adjacent to Kiu Tsui Beach in Sai Kung, and a planned artificial beach in Lung Mei, Tai Po. In 2016, Discovery Bay has changed from “Good” to “Fair”, largely due to occasional deterioration in water quality after heavy rain. The beach adjacent to Kiu Tsui Beach continued to be ranked as “Good”, and Lung Mei as “Fair”. Most of the village houses in the Lung Mei area have been connected to the public sewerage network, and the remaining connection work is still ongoing. Together with the pollution abatement measures to be implemented, the water quality at Lung Mei will continue to improve.



## Weekly Beach Grading in 2016

To keep the public informed of the latest beach water quality condition, the EPD issues weekly gradings of all open gazetted beaches and one non-gazetted beach (i.e. Discovery Bay) through weekly press release, EPD's websites, the beach enquiry hotline, GeoInfo Map of the GovHK website and noticeboards at the beaches.



South Bay Beach embraced by  
green mountains

In 2016, the water quality of beaches in the Southern District was largely satisfactory. All ten open gazetted beaches received “Good” or “Fair” grading most of the time in the bathing season. Deep Water Bay Beach and Middle Bay Beach were once rated as “Very Poor” in early September and late July respectively after heavy rain, while Big Wave Bay Beach was rated as “Very Poor” in mid-June due to a series of rain events. South Bay Beach had the best water quality, achieving “Good” grading 97% of the occasions.

The beaches on the Outlying Islands generally had decent water quality. Hung Shing Yeh Beach and Upper Cheung Sha Beach achieved “Good” grading on all rating occasions, while Cheung Chau Tung Wan Beach, Kwun Yam Beach, Lo So Shing Beach and Tong Fuk Beach were graded as “Good” over 90% of the time. Lower Cheung Sha Beach was rated as “Very Poor” twice in early May and early August respectively after heavy rain. After Silver Mine Bay Beach was rated as “Poor” or “Very Poor” in the rainy month of April, its water quality continued to improve starting from early summer, and was rated as “Good” toward the end of the bathing season.







Trio Beach – an escape from the hustle and bustle of the city

The Sai Kung beaches were generally suitable for swimming, mainly with “Good” or “Fair” weekly grading. Clear Water Bay First Beach, Clear Water Bay Second Beach and Silverstrand Beach were rated as “Very Poor” on one to three occasions, which were mostly associated with heavy rain. Hap Mun Bay Beach had the best water quality achieving “Good” grading on all rating occasions.

The water quality of the beaches in Tuen Mun area was comparable to that in the previous years, with usually “Good” or “Fair” weekly grading. Butterfly Beach was graded as “Very Poor” on three occasions in July after heavy rain, and improved to “Fair” grading since mid-August.

The water quality of the beaches in Tsuen Wan was mostly satisfactory. Ma Wan Tung Wan Beach was either rated as “Good” or “Fair” grading. The other Tsuen Wan Beaches maintained mostly at “Fair” grading, in which Casam Beach, Hoi Mei Wan Beach and Lido Beach were improved to “Good” grading toward the end of the bathing season. Ting Kau Beach was once rated as “Very Poor” after heavy rain in mid-August.



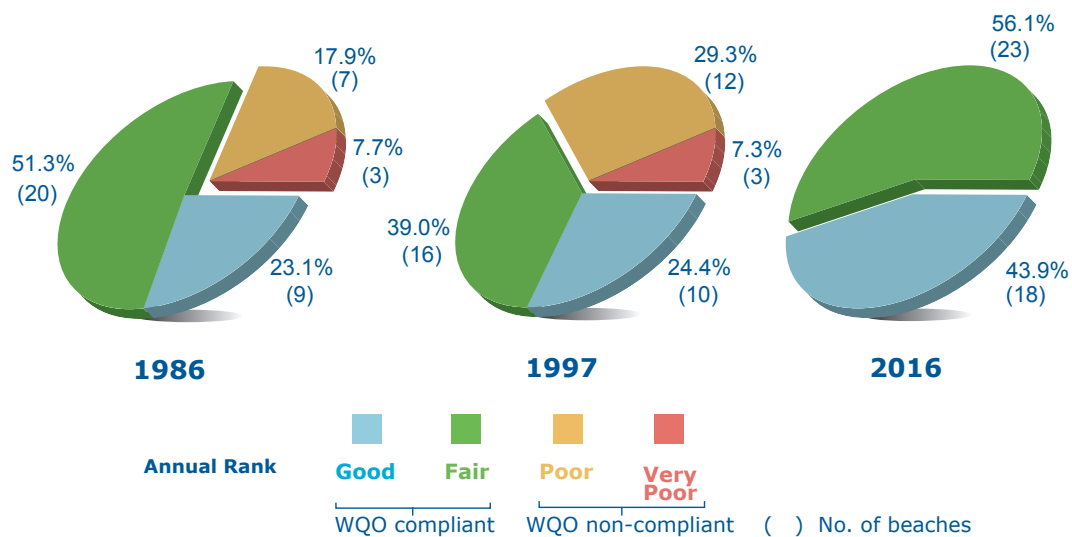
Casam Beach - water quality steadily improving in recent years



## Water Quality Trend

The beach water quality in Hong Kong is able to fully comply with the WQO, and suitable for swimming, for the last seven years. The percentage of beaches complying with the WQO had changed from 74% in 1986 (29 of 39 beaches) to 63% (26 of 41 beaches) in 1997, and then increased to 100% since 2010 for all 41 gazetted beaches.

## Comparison of annual beach ranking of gazetted beaches in 1986, 1997 and 2016



Note: Two beaches degazetted in 1995 were excluded from all the statistics above

Back in the 1980s, many beaches were closed, such as Cafeteria Old Beach, Castle Peak Beach and Silver Mine Bay Beach, or on the verge of being closed (e.g. Middle Bay Beach and Repulse Bay Beach) due to poor water quality. There was a further drop in compliance rate in the mid-1990s due to population growth particularly in the new town areas. In the last decade, there has been progressive improvement as a result of enforcement of environmental legislation, extension of the sewerage network, provision of new sewage treatment facilities across the territory including the beach hinterland, as well as implementation of the Harbour Area Treatment Scheme. Major improvement measures implemented in the past are summarized in the following table.



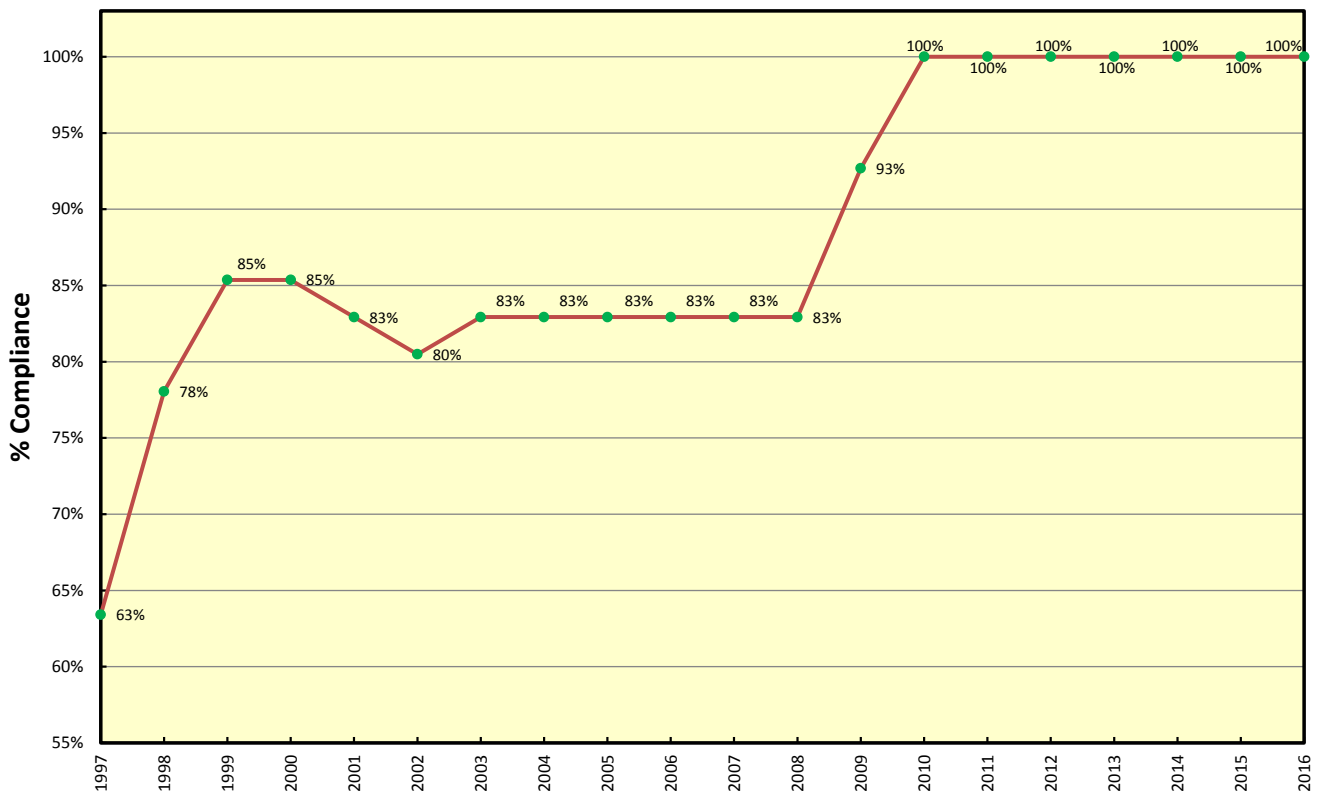


| Major improvement measures for the beaches since the implementation of beach water quality monitoring programme in 1986  |  |
|--|--|
| 1986 – 1990  | Beaches with Water Quality Improvement           |
| <ul style="list-style-type: none"> <li>Implementation of the Livestock Waste Control Scheme under the Waste Disposal (Livestock Waste) Regulation.</li> </ul>                          | Most beaches, particularly Silver Mine Bay Beach |
| <ul style="list-style-type: none"> <li>Declaration of the Southern Water Control Zone (WCZ) under the Water Pollution Control Ordinance (WPCO) for legislative enforcement.</li> </ul> | Southern beaches                                 |
| <ul style="list-style-type: none"> <li>Interception and diversion of polluted storm drains at beaches in Southern District.</li> </ul>   | Southern beaches                                 |
| 1991 – 1995  |  |
| <ul style="list-style-type: none"> <li>Implementation of chemical waste control.</li> </ul>  | All beaches                                      |
| <ul style="list-style-type: none"> <li>Declaration of the North Western WCZ under the WPCO for legislative enforcement.</li> </ul>   | Tuen Mun beaches                                 |
| <ul style="list-style-type: none"> <li>Diversion of polluted storm water drains away from Castle Peak Beach.</li> </ul>  | Castle Peak Beach                                |
| <ul style="list-style-type: none"> <li>Provision of public sewers for So Kwun Wat and Sam Shing Estate.</li> </ul>   | Tuen Mun Beaches                                 |
| <ul style="list-style-type: none"> <li>Commissioning of Stanley Sewage Treatment Works (STW).</li> </ul>   | Stanley Main Beach                               |
| 1996 – 2000  |  |
| <ul style="list-style-type: none"> <li>Full implementation of the WPCO in all WCZs.</li> </ul>   | All beaches                                      |
| <ul style="list-style-type: none"> <li>Commissioning of the Shek O Sewage Screening Plant and diversion of polluted storm water drains at Shek O Village .</li> </ul>                  | Shek O Beach                                     |
| <ul style="list-style-type: none"> <li>Completion of all major works under the Southern Sewerage Master Plan.</li> </ul>   | Southern beaches                                 |
| <ul style="list-style-type: none"> <li>Commissioning of the new 2 km long Pillar Point sewage submarine outfall.</li> </ul>  | Tuen Mun beaches                                 |
| 2001 – 2005  |  |
| <ul style="list-style-type: none"> <li>Completion of Harbour Area Treatment Scheme Stage 1.</li> </ul>   | Big Wave Bay, Shek O, Rocky Bay Beaches          |
| <ul style="list-style-type: none"> <li>Provision of public sewers in the Silverstrand area.</li> </ul>   | Silverstrand Beach                               |
| <ul style="list-style-type: none"> <li>Full operation of the Sham Tseng STW.</li> </ul>  | Beaches along the Tsuen Wan coast                |
| 2006 – 2016  |  |
| <ul style="list-style-type: none"> <li>Commissioning of the Advance Disinfection Facilities at the Stonecutters Island STW.</li> </ul>   | All Tsuen Wan beaches                            |
| <ul style="list-style-type: none"> <li>Extension of the public sewerage network to the beach hinterland along Castle Peak Road.</li> </ul>   | Beaches along the Tsuen Wan coast                |
| <ul style="list-style-type: none"> <li>Full operation of the Harbour Area Treatment Scheme (HATS) Stage 2A.</li> </ul>   | Beaches along the Tsuen Wan coast                |



Through continuous efforts of the government to implement pollution abatement measures, there was significant improvement in water quality at the beaches in various districts over the years, and the beaches have consistently complied with the WQO in recent years. With significant improvement of water quality at beaches in Tsuen Wan since 2010, all of Hong Kong's gazetted beaches have now achieved the required standard for swimming for the seventh consecutive year.

## Compliance with WQO at gazetted beaches, 1997 - 2016







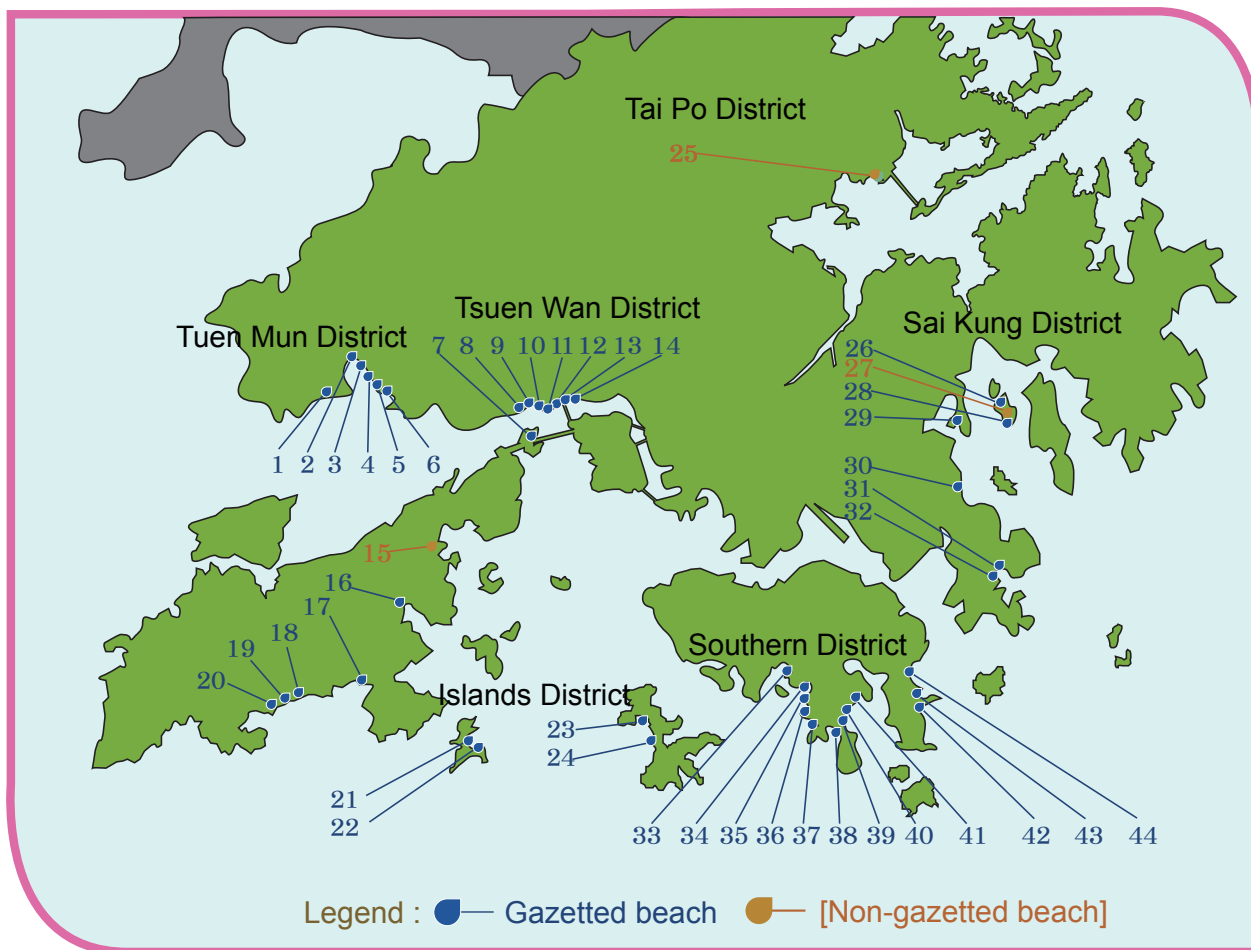
Water quality trend lines of gazetted beaches over the last 31 years are included in this report to show the changes over the years. More in-depth background and details of the beach monitoring programme are available at the EPD's [Hong Kong Water Quality Resource Centre thematic website \(http://wqrc.epd.gov.hk\)](http://wqrc.epd.gov.hk) or its [beach water quality thematic website \(http://www.beachwq.gov.hk\)](http://www.beachwq.gov.hk), which provides user-friendly access to the annual beach reports as well as data published since 2000.



Happy youngsters having fun at the beach



## Beaches monitored by the EPD



### Tuen Mun District

1. Butterfly
2. Castle Peak
3. Kadoorie
4. Cafeteria Old
5. Cafeteria New
6. Golden

### Tsuen Wan District

7. Ma Wan Tung Wan
8. Anglers'
9. Gemini
10. Hoi Mei Wan
11. Casam
12. Lido
13. Ting Kau
14. Approach

### Islands District

15. [Discovery Bay]
16. Silver Mine Bay
17. Pui O
18. Lower Cheung Sha
19. Upper Cheung Sha
20. Tong Fuk
21. Cheung Chau Tung Wan
22. Kwun Yam
23. Hung Shing Yeh
24. Lo So Shing

### Tai Po District

25. [Lung Mei]

### Sai Kung District

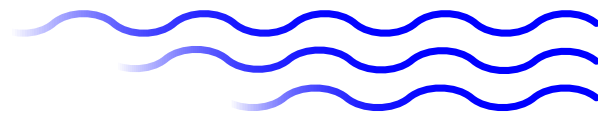
26. Kiu Tsui
27. [Kiu Tsui (New)]
28. Hap Mun Bay
29. Trio
30. Silverstrand
31. Clear Water Bay First
32. Clear Water Bay Second

### Southern District

33. Deep Water Bay
34. Repulse Bay
35. Middle Bay
36. South Bay
37. Chung Hom Kok
38. St. Stephen's
39. Stanley Main
40. Hairpin
41. Turtle Cove
42. Shek O
43. Rocky Bay
44. Big Wave Bay







## Beach monitoring frequency

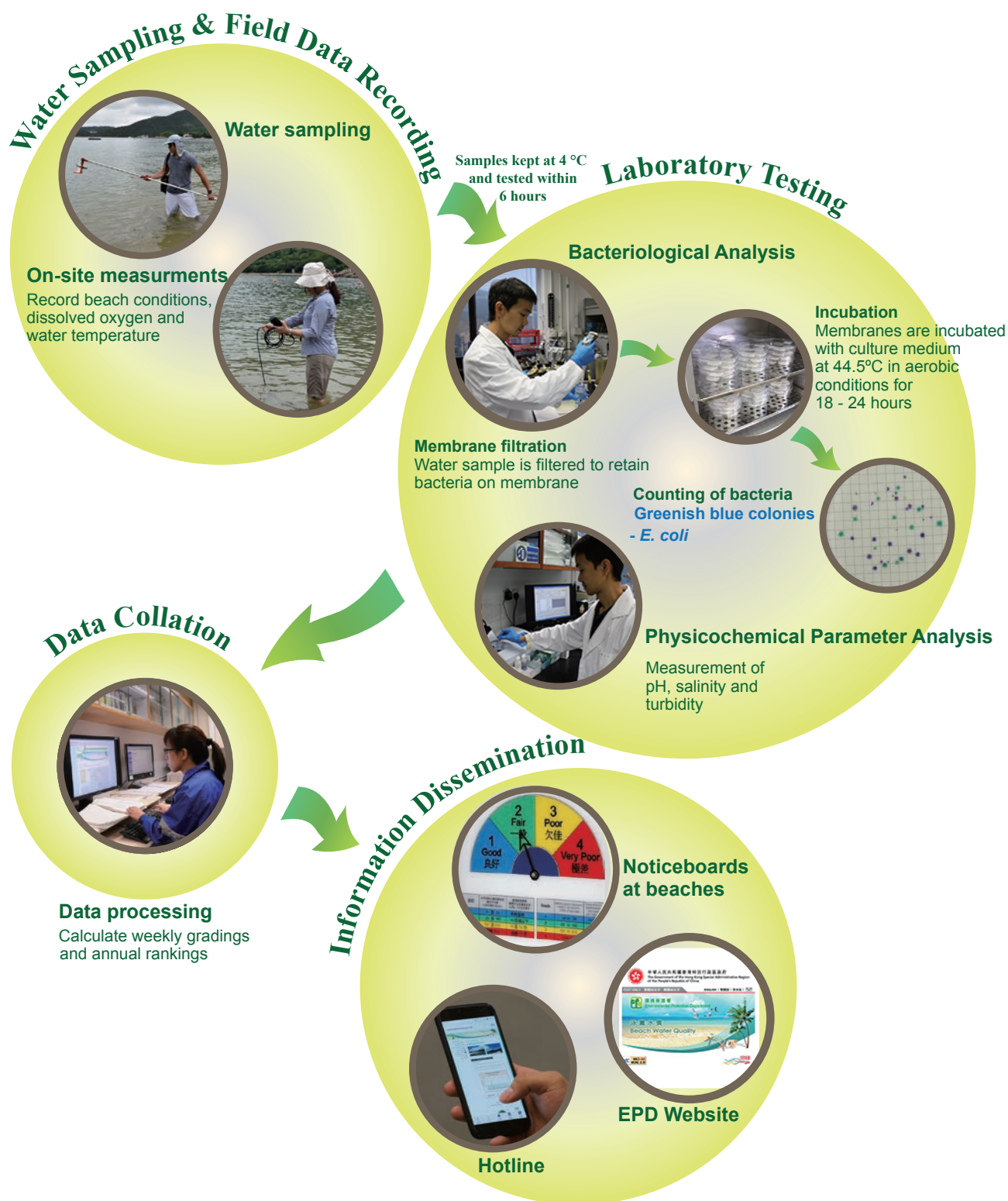
| Beach                                   | Monitoring frequency per month |                    |
|---|--------------------------------|--------------------|
|   | Bathing season*                | Non-bathing season |
| Gazetted beaches open all year round ** | at least 3 times               | at least 3 times   |
| Other gazetted beaches                  | at least 3 times               | once               |
| Non-gazetted beaches                    | at least 3 times               | once               |

\* March to October

\*\* Clear Water Bay Second, Deep Water Bay, Golden and Silverstrand Beaches



## Overview of various stages of the Beach Monitoring Programme







## Hong Kong's annual beach ranking system

| Rank      | <i>E. coli</i> counts per 100 mL* | Minor illness rate**<br>(Cases per 1,000 swimmers) | WQO Compliance |
|-----------|-----------------------------------|--|----------------|
| Good      | ≤24                               | Undetectable                                       | Compliant      |
| Fair      | 25-180                            | ≤10  |                |
| Poor      | 181-610                           | 11-15  | Non-compliant  |
| Very Poor | >610                              | >15  |                |

\* Geometric mean *E. coli* count calculated based on all data collected between March and October

\*\* Skin and gastrointestinal illnesses

## Hong Kong's weekly beach grading system

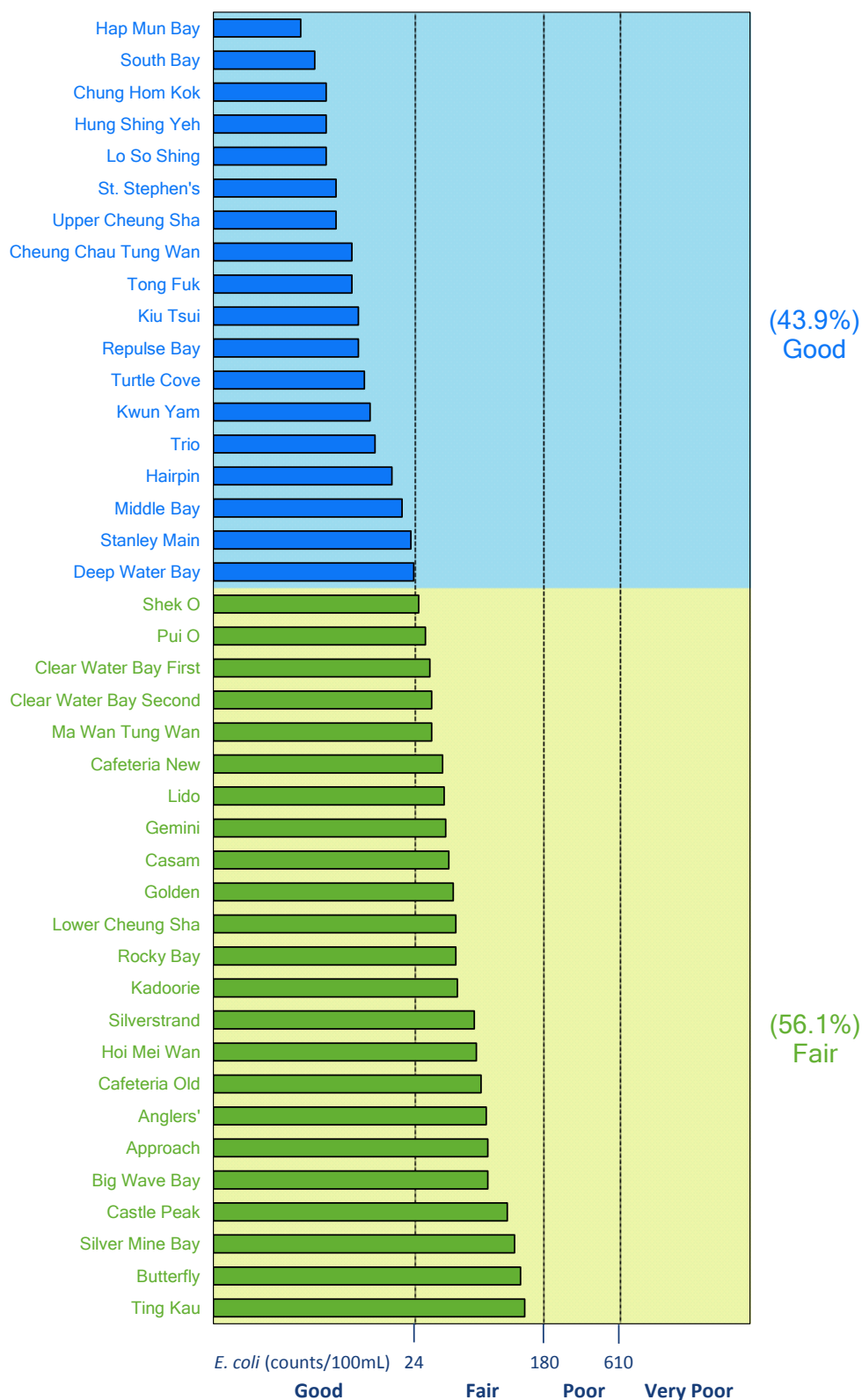
| Grade | Beach water quality | <i>E. coli</i> counts per 100 mL* | Minor illness rate**<br>(Cases per 1,000 swimmers) |
|-------|---------------------|-----------------------------------|--|
| 1     | Good                | ≤24                               | Undetectable                                       |
| 2     | Fair                | 25-180                            | ≤10  |
| 3     | Poor                | 181-610                           | 11-15  |
| 4     | Very Poor           | >610<br>or last reading >1,600    | >15  |

\* Unless otherwise indicated, the *E. coli* count represents the geometric mean of the 5 most recent sampling occasions

\*\* Skin and gastrointestinal illnesses



## 2016 Annual ranking and bathing season geometric mean *E. coli* levels of Hong Kong's gazetted beaches



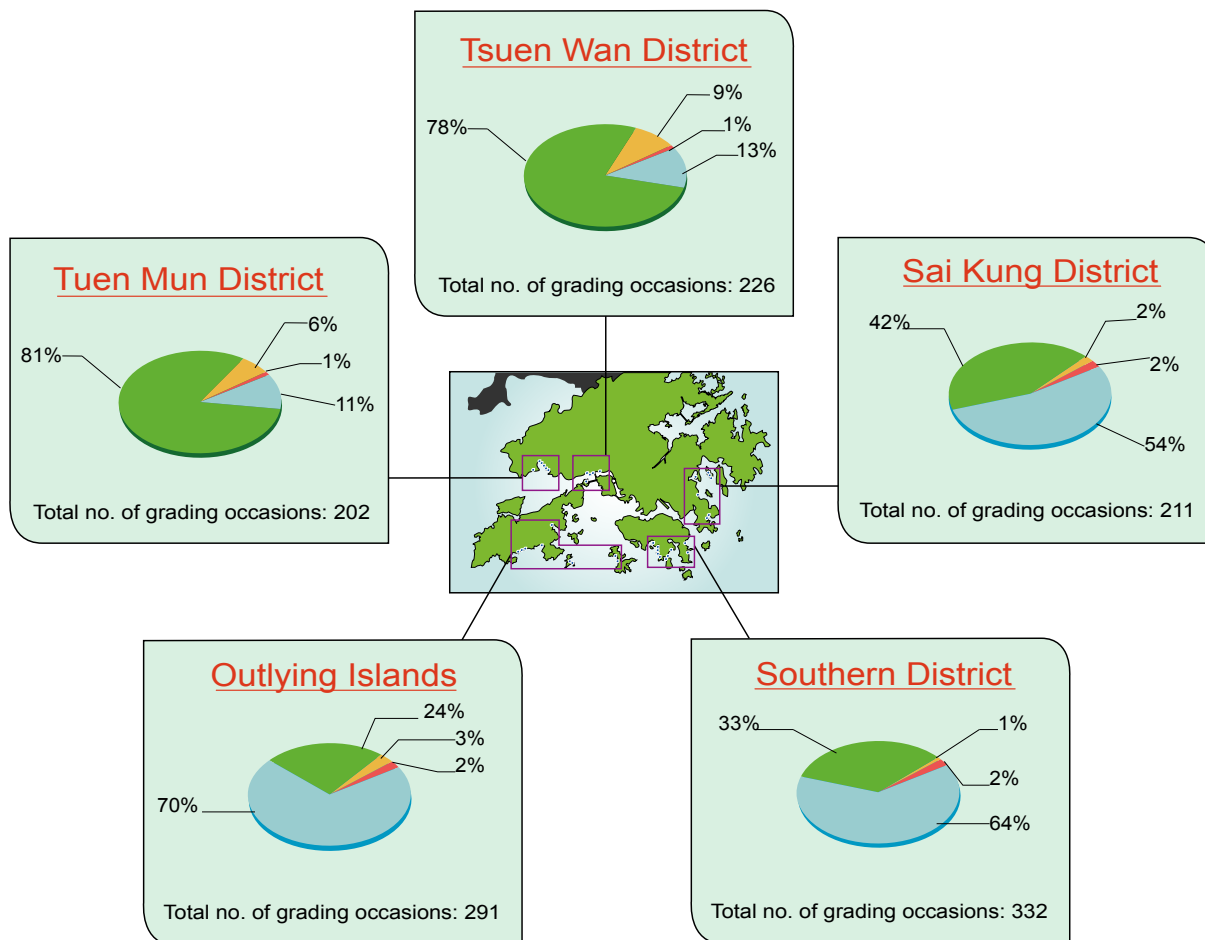




## Annual ranking of gazetted beaches at a glance in 2016



## Weekly beach grading summary of open gazetted beaches by district in 2016



Note: Figures may not add up to 100% due to roundings

| Beach Grade | 1    | 2    | 3    | 4         |
|-------------|------|------|------|-----------|
|             | Good | Fair | Poor | Very Poor |





## Southern District beaches

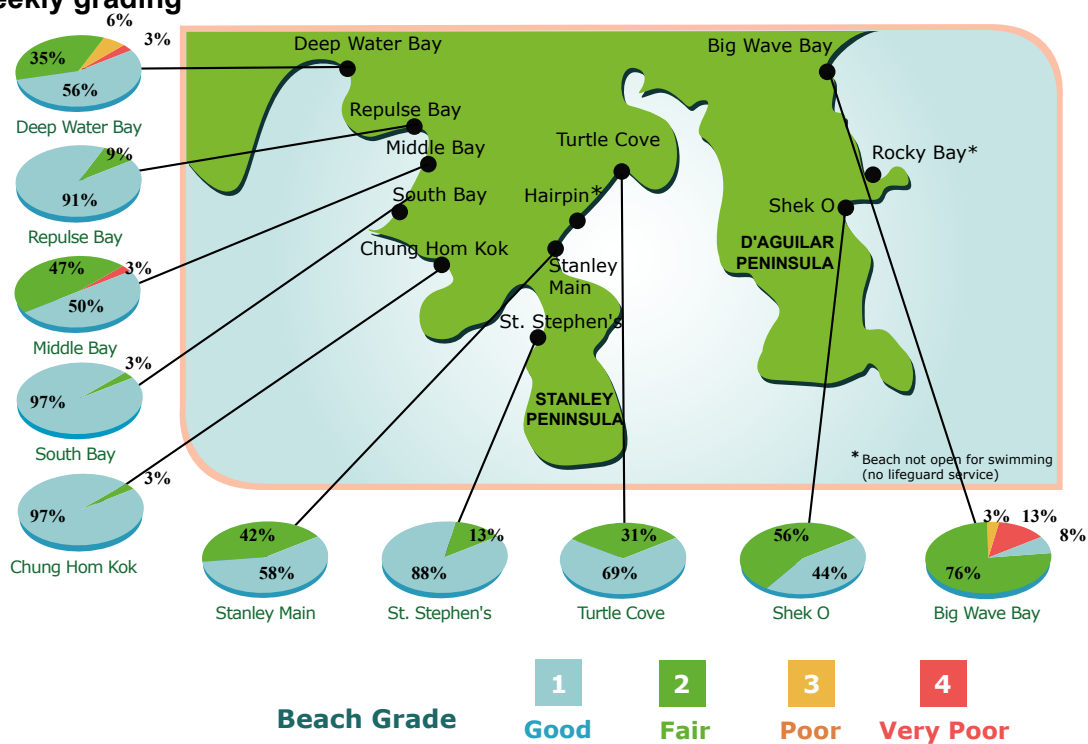
### Annual ranking



**Annual Rank**

Good Fair Poor Very Poor

### Weekly grading

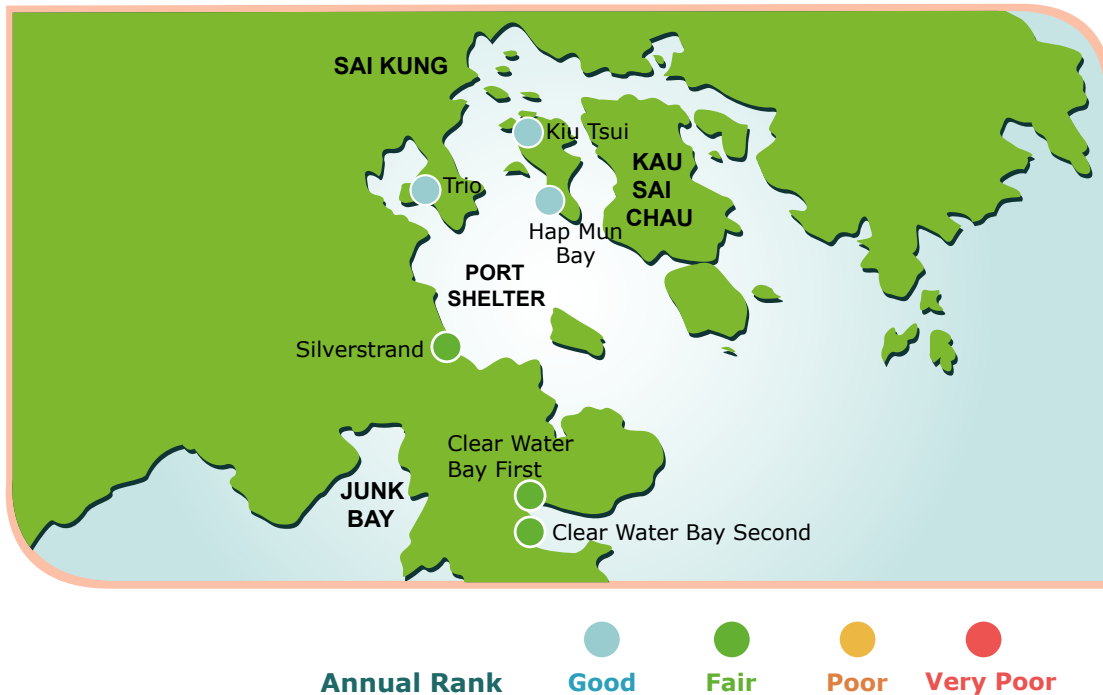


Note: Figures may not add up to 100% due to roundings; "\*" Beach not open for swimming. No grading was provided

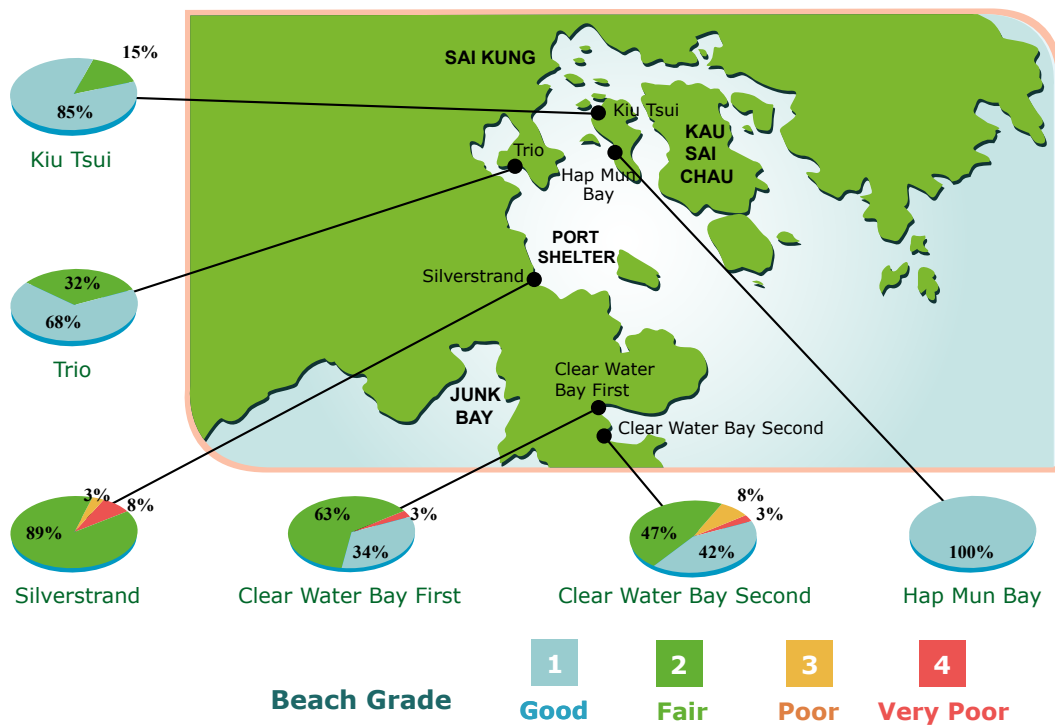


## Sai Kung beaches

### Annual ranking



### Weekly grading

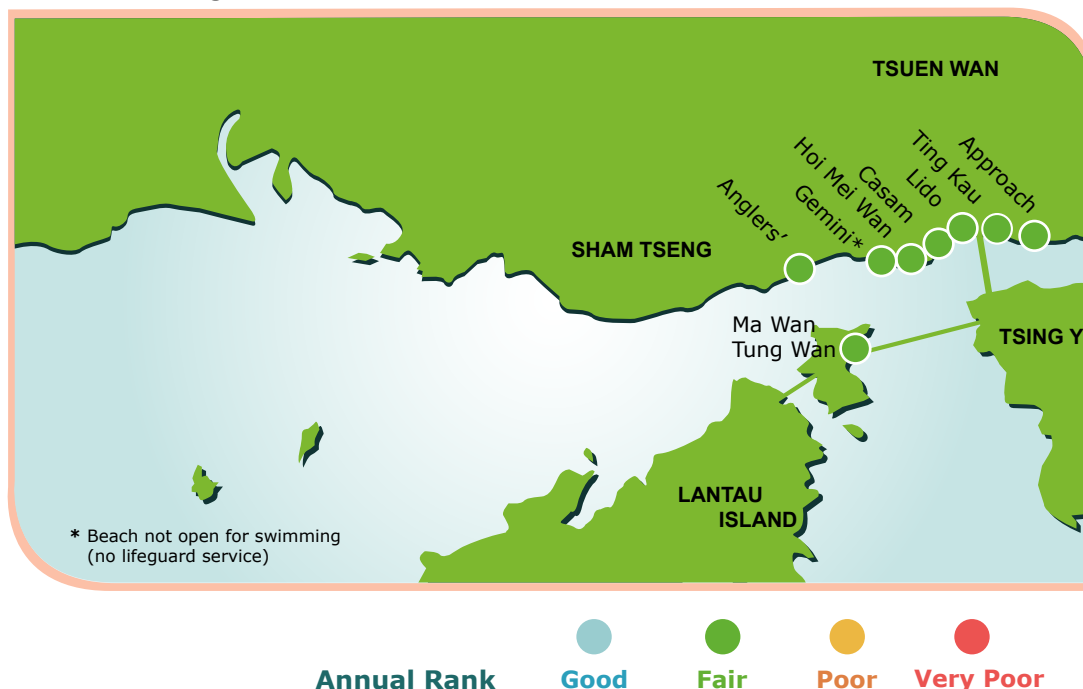


Note: Figures may not add up to 100% due to roundings

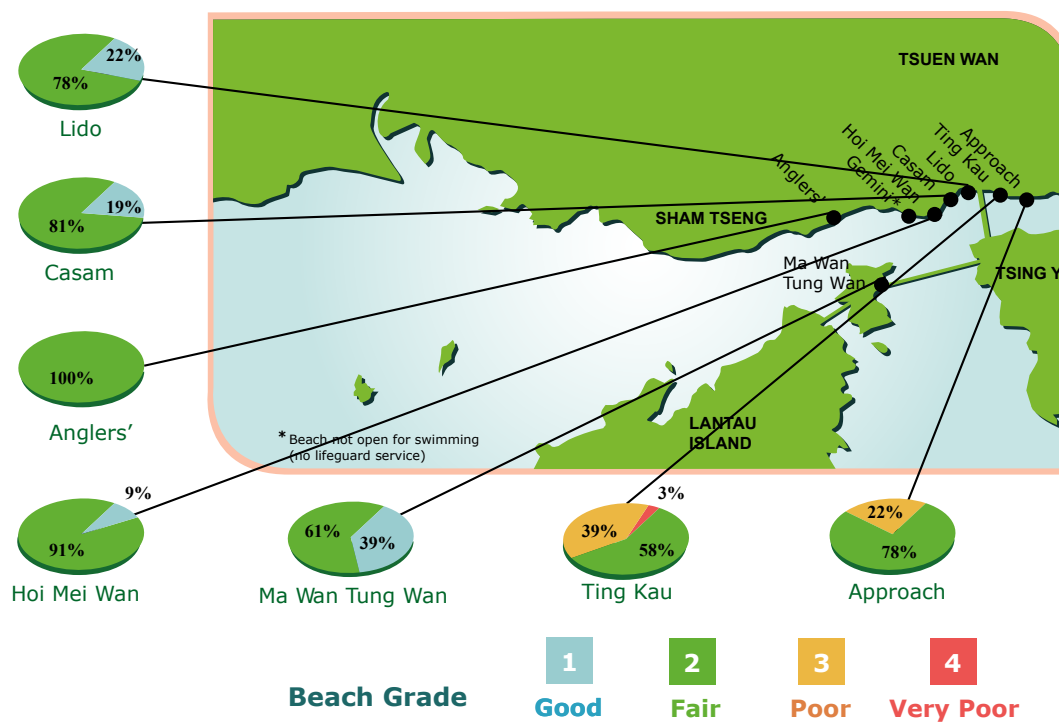


## Tsuen Wan beaches

### Annual ranking



### Weekly grading

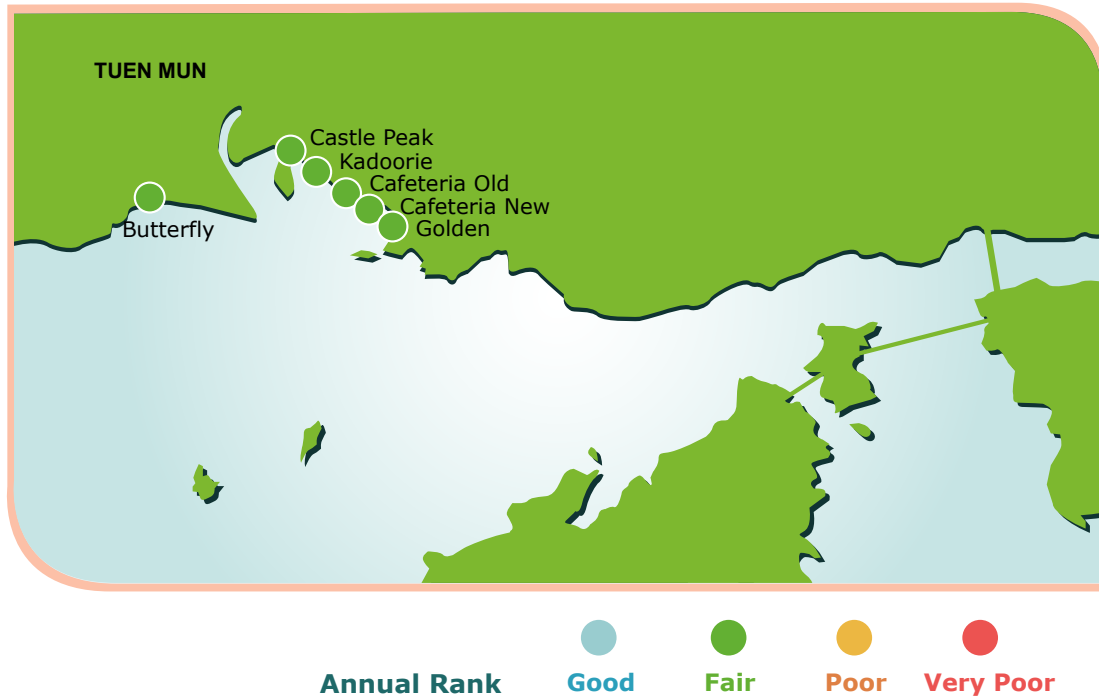


Note: Figures may not add up to 100% due to roundings; "\*" Beach not open for swimming. No grading was provided.

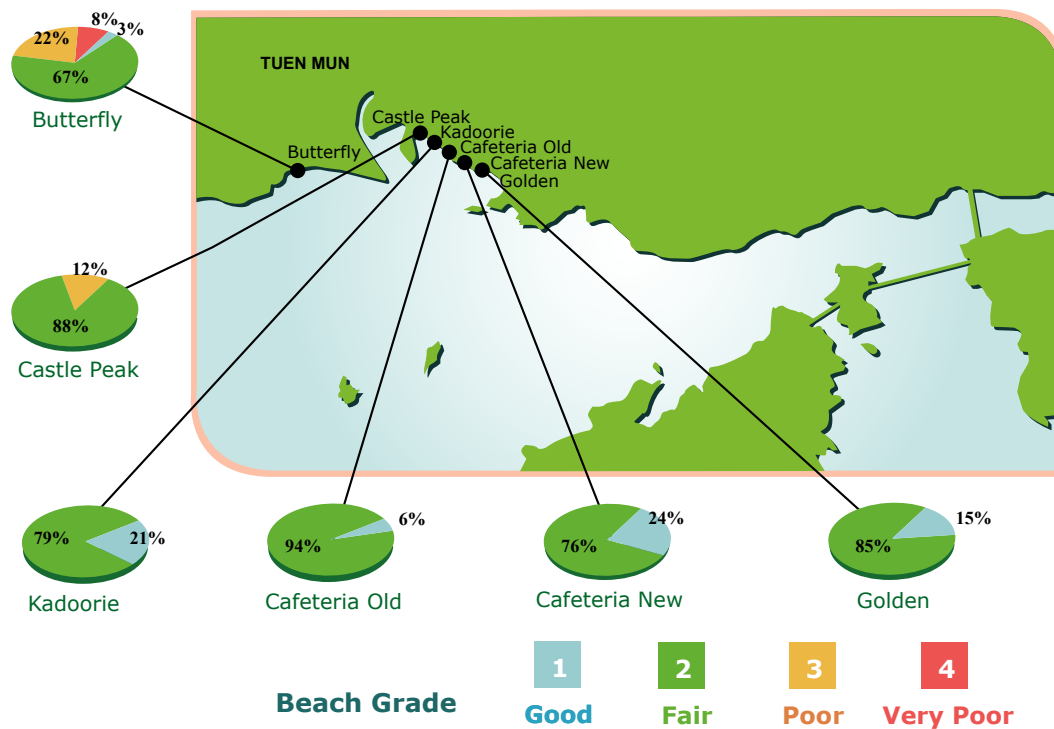


## Tuen Mun beaches

### Annual ranking



### Weekly grading



Note: Figures may not add up to 100% due to roundings



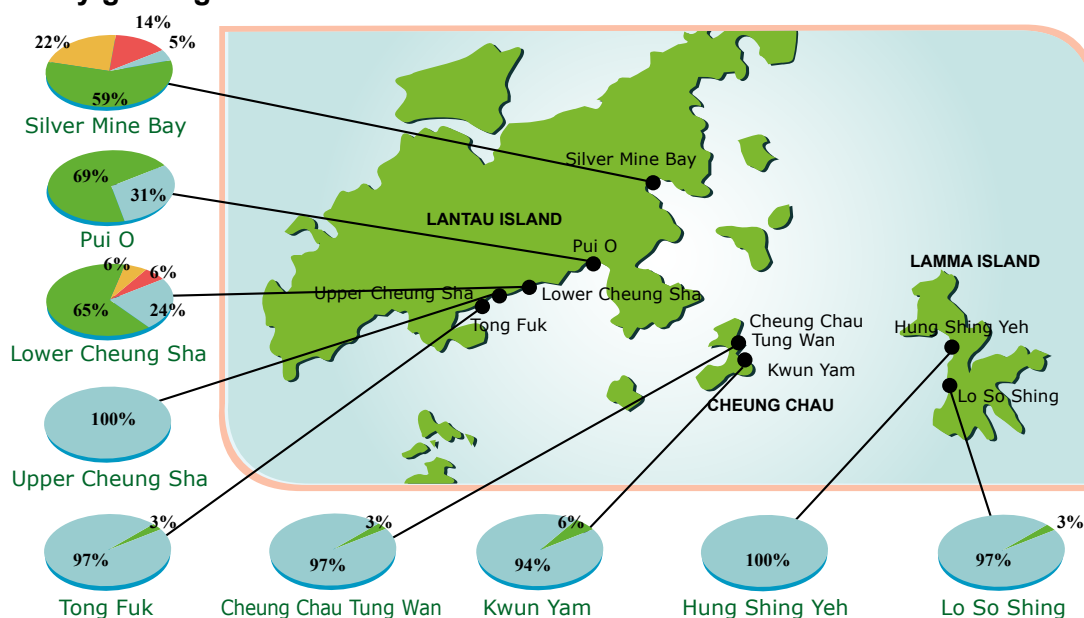


## Outlying Islands beaches

### Annual ranking



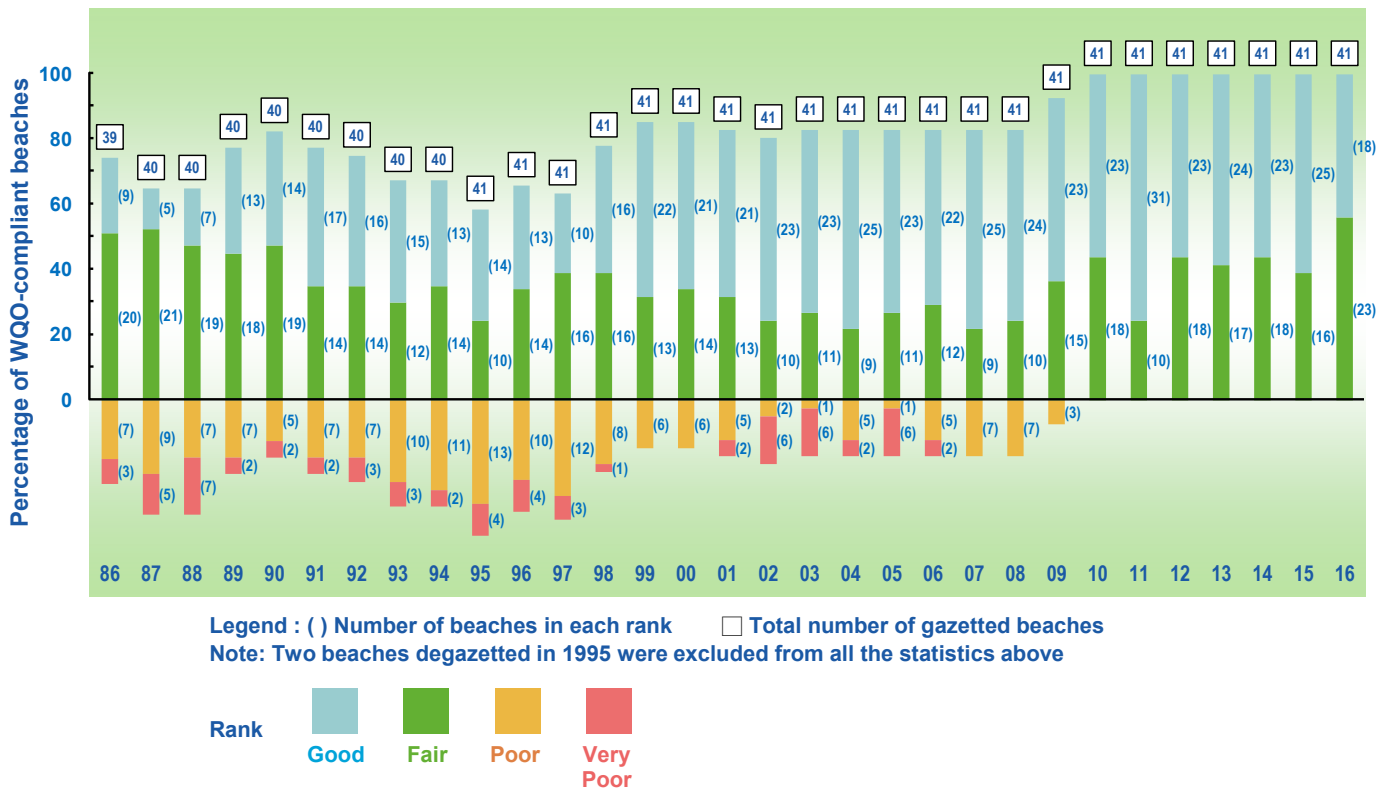
### Weekly grading



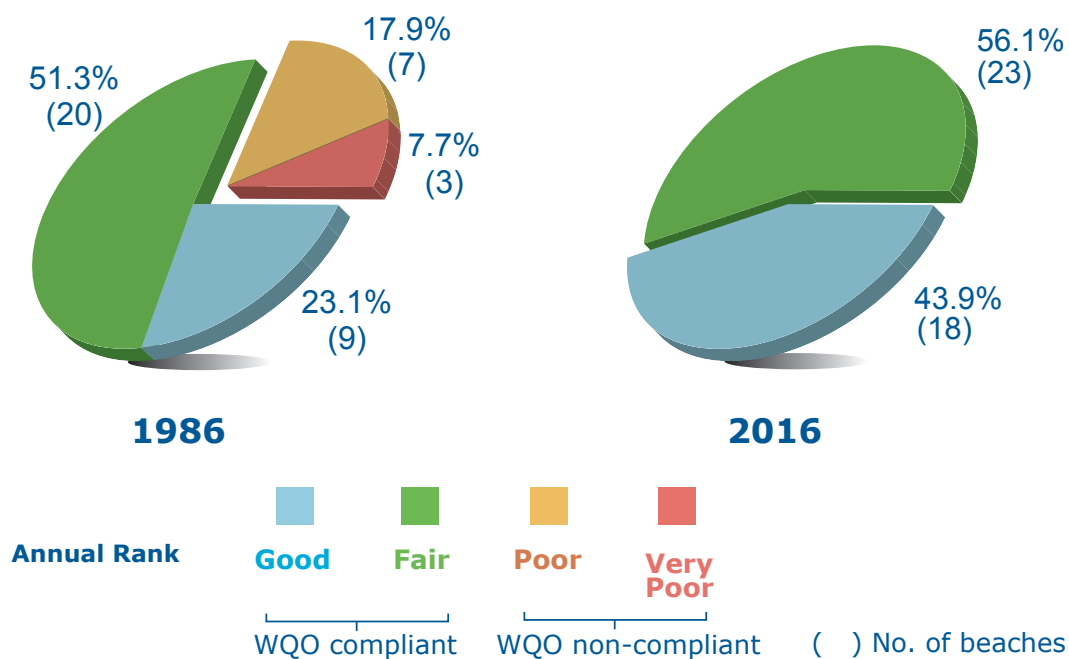
Note: Figures may not add up to 100% due to roundings



## Annual beach rankings of gazetted beaches from 1986 to 2016



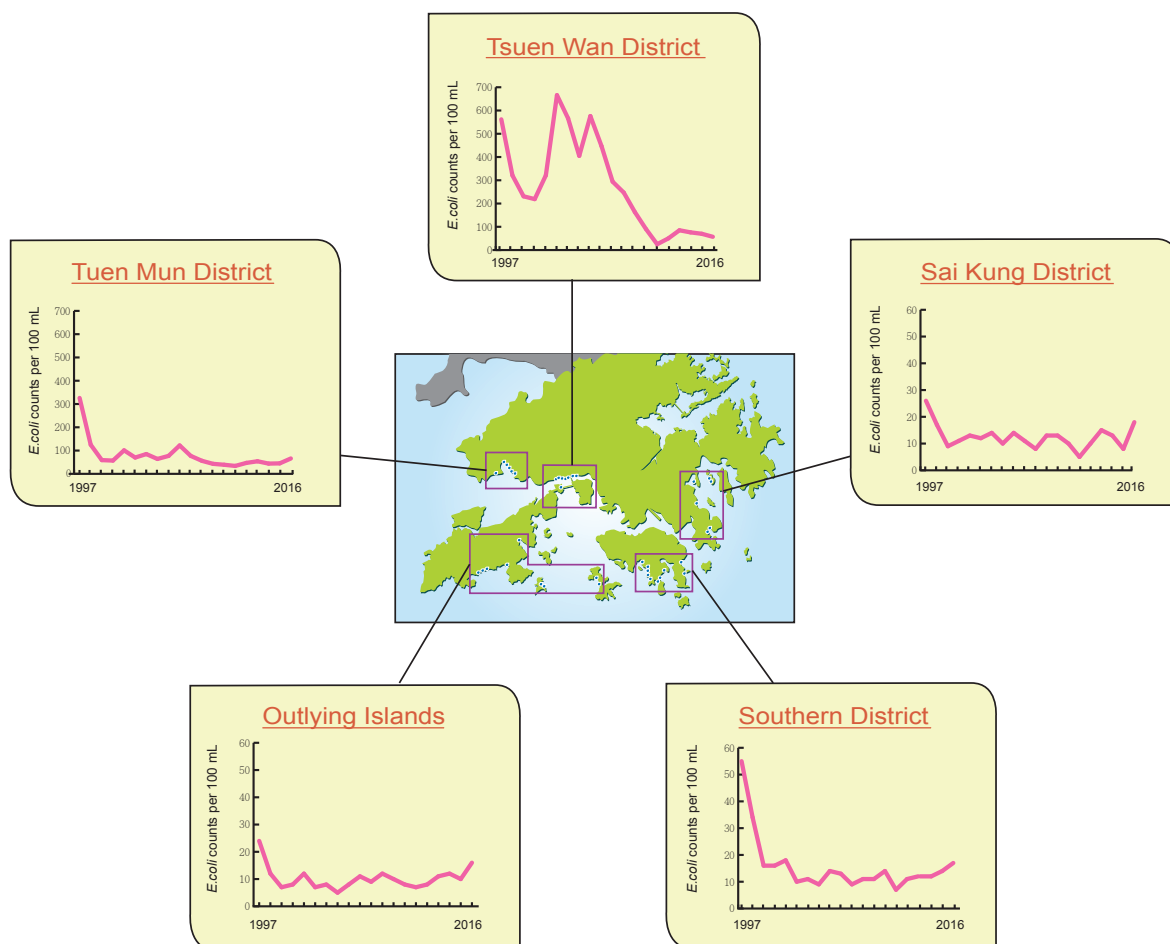
## Comparison of annual beach ranking of gazetted beaches in 1986 and 2016



Note: Two beaches degazetted in 1995 were excluded from all the statistics above



## Annual geometric mean *E. coli* levels of gazetted beaches by district, 1997 - 2016





## Appendix A - Annual geometric mean *E. coli* levels (1997-2016)

### Southern District Annual geometric mean *E. coli* levels

| Beach          | <i>E. coli</i> counts per 100mL |      |      |      |      |      |      |      |      |      |
|----------------|---------------------------------|------|------|------|------|------|------|------|------|------|
|                | 1997                            | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
| Big Wave Bay   | 179                             | 114  | 77   | 98   | 106  | 23   | 33   | 26   | 101  | 50   |
| Chung Hom Kok  | 22                              | 40   | 14   | 8    | 15   | 13   | 14   | 9    | 13   | 10   |
| Deep Water Bay | 55                              | 46   | 14   | 16   | 18   | 9    | 9    | 7    | 8    | 7    |
| Hairpin        | 44                              | 72   | 17   | 18   | 10   | 6    | 7    | 7    | 13   | 11   |
| Middle Bay     | 40                              | 16   | 11   | 11   | 8    | 9    | 14   | 12   | 20   | 18   |
| Repulse Bay    | 23                              | 11   | 8    | 9    | 13   | 9    | 12   | 4    | 8    | 12   |
| Rocky Bay      | 399                             | 223  | 72   | 80   | 118  | 43   | 28   | 19   | 30   | 33   |
| Shek O         | 102                             | 70   | 32   | 29   | 31   | 13   | 11   | 16   | 19   | 24   |
| South Bay      | 17                              | 6    | 4    | 7    | 5    | 5    | 11   | 9    | 7    | 7    |
| St. Stephen's  | 40                              | 26   | 11   | 6    | 7    | 5    | 9    | 4    | 12   | 11   |
| Stanley Main   | 72                              | 24   | 13   | 12   | 9    | 8    | 6    | 5    | 7    | 10   |
| Turtle Cove    | 40                              | 14   | 12   | 11   | 15   | 8    | 4    | 5    | 8    | 7    |

| Beach          | <i>E. coli</i> counts per 100mL |      |      |      |      |      |      |      |      |      |
|----------------|---------------------------------|------|------|------|------|------|------|------|------|------|
|                | 2007                            | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
| Big Wave Bay   | 17                              | 31   | 46   | 149  | 17   | 31   | 21   | 40   | 21   | 78   |
| Chung Hom Kok  | 9                               | 13   | 14   | 9    | 5    | 5    | 8    | 13   | 13   | 6    |
| Deep Water Bay | 7                               | 9    | 12   | 9    | 6    | 9    | 11   | 14   | 19   | 24   |
| Hairpin        | 19                              | 10   | 12   | 33   | 6    | 9    | 14   | 12   | 8    | 17   |
| Middle Bay     | 9                               | 11   | 12   | 12   | 6    | 15   | 14   | 13   | 13   | 20   |
| Repulse Bay    | 7                               | 14   | 11   | 7    | 6    | 7    | 10   | 11   | 14   | 10   |
| Rocky Bay      | 17                              | 15   | 13   | 50   | 23   | 30   | 22   | 16   | 35   | 47   |
| Shek O         | 18                              | 22   | 11   | 19   | 11   | 16   | 15   | 18   | 29   | 26   |
| South Bay      | 5                               | 5    | 4    | 4    | 4    | 5    | 4    | 5    | 9    | 5    |
| St. Stephen's  | 6                               | 9    | 6    | 4    | 4    | 4    | 10   | 5    | 6    | 7    |
| Stanley Main   | 9                               | 10   | 13   | 20   | 6    | 34   | 19   | 9    | 20   | 23   |
| Turtle Cove    | 5                               | 5    | 5    | 8    | 4    | 6    | 6    | 8    | 5    | 11   |

Note: Figure in red indicates that the beach was not opened for swimming that year



## Sai Kung District Annual geometric mean *E. coli* levels

| <i>E. coli</i> counts per 100mL |      |      |      |      |      |      |      |      |      |      |
|---------------------------------|------|------|------|------|------|------|------|------|------|------|
| Beach                           | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
| Clear Water Bay First           | 62   | 41   | 11   | 16   | 28   | 28   | 17   | 9    | 16   | 20   |
| Clear Water Bay Second          | 66   | 44   | 12   | 26   | 22   | 14   | 21   | 10   | 19   | 13   |
| Hap Mun Bay                     | 3    | 2    | 2    | 2    | 1    | 2    | 4    | 3    | 4    | 4    |
| Kiu Tsui                        | 5    | 4    | 4    | 5    | 5    | 4    | 5    | 17   | 14   | 11   |
| Silverstrand                    | 148  | 99   | 32   | 61   | 100  | 133  | 97   | 74   | 67   | 30   |
| Trio                            | 30   | 21   | 17   | 10   | 12   | 6    | 10   | 2    | 6    | 5    |

| <i>E. coli</i> counts per 100mL |      |      |      |      |      |      |      |      |      |      |
|---------------------------------|------|------|------|------|------|------|------|------|------|------|
| Beach                           | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
| Clear Water Bay First           | 14   | 11   | 15   | 10   | 7    | 8    | 24   | 15   | 14   | 31   |
| Clear Water Bay Second          | 9    | 19   | 27   | 13   | 5    | 18   | 15   | 18   | 17   | 32   |
| Hap Mun Bay                     | 3    | 5    | 3    | 3    | 2    | 2    | 7    | 4    | 2    | 4    |
| Kiu Tsui                        | 6    | 13   | 16   | 13   | 9    | 10   | 13   | 11   | 6    | 10   |
| Silverstrand                    | 33   | 35   | 51   | 28   | 18   | 30   | 39   | 40   | 18   | 63   |
| Trio                            | 2    | 12   | 5    | 6    | 2    | 9    | 8    | 10   | 4    | 13   |

## Tsuen Wan District Annual geometric mean *E. coli* levels

| <i>E. coli</i> counts per 100mL |       |       |      |      |      |       |      |       |       |      |
|---------------------------------|-------|-------|------|------|------|-------|------|-------|-------|------|
| Beach                           | 1997  | 1998  | 1999 | 2000 | 2001 | 2002  | 2003 | 2004  | 2005  | 2006 |
| Anglers'                        | 691   | 502   | 442  | 326  | 621  | 1 169 | 693  | 619   | 895   | 772  |
| Approach                        | 1 009 | 435   | 387  | 316  | 411  | 696   | 762  | 470   | 663   | 599  |
| Casam                           | 609   | 239   | 231  | 209  | 233  | 741   | 702  | 594   | 716   | 426  |
| Gemini                          | 458   | 399   | 350  | 258  | 323  | 1 155 | 875  | 1 102 | 1 042 | 853  |
| Hoi Mei Wan                     | 471   | 280   | 109  | 177  | 199  | 547   | 442  | 287   | 641   | 308  |
| Lido                            | 600   | 262   | 231  | 181  | 269  | 683   | 734  | 523   | 782   | 459  |
| Ma Wan Tung Wan                 | 110   | 92    | 51   | 39   | 133  | 201   | 159  | 101   | 132   | 171  |
| Ting Kau                        | 1 583 | 1 045 | 515  | 593  | 739  | 742   | 831  | 412   | 512   | 469  |

| <i>E. coli</i> counts per 100mL |      |      |      |      |      |      |      |      |      |      |
|---------------------------------|------|------|------|------|------|------|------|------|------|------|
| Beach                           | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
| Anglers'                        | 496  | 510  | 276  | 134  | 27   | 69   | 133  | 130  | 77   | 76   |
| Approach                        | 352  | 251  | 208  | 124  | 59   | 83   | 106  | 121  | 143  | 78   |
| Casam                           | 305  | 289  | 144  | 102  | 21   | 50   | 71   | 63   | 52   | 42   |
| Gemini                          | 566  | 481  | 410  | 137  | 19   | 40   | 135  | 110  | 56   | 40   |
| Hoi Mei Wan                     | 286  | 271  | 130  | 87   | 23   | 51   | 86   | 58   | 90   | 65   |
| Lido                            | 280  | 296  | 178  | 87   | 21   | 32   | 53   | 57   | 52   | 39   |
| Ma Wan Tung Wan                 | 78   | 53   | 60   | 17   | 10   | 24   | 41   | 31   | 20   | 32   |
| Ting Kau                        | 405  | 258  | 145  | 141  | 58   | 88   | 107  | 89   | 151  | 140  |

Note: Figure in red indicates that the beach was not opened for swimming that year



## Tuen Mun District Annual geometric mean *E. coli* levels

| Beach         | <i>E. coli</i> counts per 100mL |      |      |      |      |      |      |      |      |      |
|---------------|---------------------------------|------|------|------|------|------|------|------|------|------|
|               | 1997                            | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
| Butterfly     | 259                             | 121  | 44   | 61   | 74   | 60   | 74   | 55   | 55   | 94   |
| Cafeteria New | 309                             | 100  | 60   | 51   | 104  | 62   | 80   | 54   | 70   | 120  |
| Cafeteria Old | 435                             | 138  | 58   | 57   | 125  | 74   | 76   | 61   | 81   | 150  |
| Castle Peak   | 332                             | 199  | 57   | 58   | 105  | 58   | 64   | 80   | 90   | 139  |
| Golden        | 352                             | 98   | 44   | 50   | 87   | 66   | 84   | 46   | 62   | 117  |
| Kadoorie      | 290                             | 130  | 109  | 68   | 120  | 114  | 160  | 98   | 117  | 118  |

| Beach         | <i>E. coli</i> counts per 100mL |      |      |      |      |      |      |      |      |      |
|---------------|---------------------------------|------|------|------|------|------|------|------|------|------|
|               | 2007                            | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
| Butterfly     | 84                              | 56   | 49   | 30   | 41   | 42   | 71   | 38   | 98   | 131  |
| Cafeteria New | 68                              | 48   | 38   | 31   | 27   | 47   | 50   | 31   | 30   | 38   |
| Cafeteria Old | 67                              | 45   | 46   | 34   | 29   | 48   | 39   | 45   | 41   | 70   |
| Castle Peak   | 64                              | 47   | 35   | 63   | 49   | 48   | 78   | 91   | 71   | 106  |
| Golden        | 87                              | 63   | 42   | 37   | 26   | 62   | 45   | 39   | 31   | 45   |
| Kadoorie      | 101                             | 87   | 48   | 45   | 37   | 40   | 52   | 37   | 29   | 48   |

Note: Figure in red indicates that the beach was not opened for swimming that year

## Outlying Islands Annual geometric mean *E. coli* levels

| Beach                | <i>E. coli</i> counts per 100mL |      |      |      |      |      |      |      |      |      |
|----------------------|---------------------------------|------|------|------|------|------|------|------|------|------|
|                      | 1997                            | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
| Cheung Chau Tung Wan | 24                              | 19   | 11   | 12   | 16   | 17   | 11   | 12   | 14   | 37   |
| Hung Shing Yeh       | 5                               | 3    | 3    | 5    | 6    | 2    | 5    | 4    | 4    | 4    |
| Kwun Yam             | 32                              | 21   | 6    | 10   | 11   | 9    | 7    | 5    | 10   | 13   |
| Lo So Shing          | 3                               | 2    | 4    | 2    | 5    | 2    | 3    | 2    | 3    | 4    |
| Lower Cheung Sha     | 85                              | 23   | 10   | 12   | 22   | 10   | 14   | 7    | 12   | 11   |
| Pui O                | 36                              | 16   | 10   | 10   | 17   | 10   | 15   | 9    | 10   | 16   |
| Silver Mine Bay      | 481                             | 123  | 39   | 50   | 67   | 42   | 50   | 14   | 34   | 52   |
| Tong Fuk             | 14                              | 10   | 4    | 5    | 6    | 4    | 3    | 4    | 5    | 5    |
| Upper Cheung Sha     | 8                               | 3    | 2    | 3    | 5    | 3    | 3    | 3    | 3    | 4    |

| Beach                | <i>E. coli</i> counts per 100mL |      |      |      |      |      |      |      |      |      |
|----------------------|---------------------------------|------|------|------|------|------|------|------|------|------|
|                      | 2007                            | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
| Cheung Chau Tung Wan | 21                              | 15   | 17   | 12   | 6    | 13   | 10   | 14   | 19   | 9    |
| Hung Shing Yeh       | 6                               | 4    | 6    | 4    | 3    | 4    | 4    | 5    | 4    | 6    |
| Kwun Yam             | 9                               | 10   | 9    | 8    | 5    | 5    | 9    | 8    | 12   | 12   |
| Lo So Shing          | 3                               | 5    | 7    | 3    | 3    | 4    | 5    | 5    | 4    | 6    |
| Lower Cheung Sha     | 12                              | 20   | 13   | 11   | 9    | 10   | 17   | 21   | 17   | 47   |
| Pui O                | 30                              | 24   | 12   | 14   | 13   | 22   | 51   | 60   | 24   | 29   |
| Silver Mine Bay      | 22                              | 43   | 45   | 31   | 28   | 38   | 39   | 51   | 59   | 119  |
| Tong Fuk             | 4                               | 10   | 5    | 5    | 4    | 4    | 7    | 4    | 4    | 9    |
| Upper Cheung Sha     | 4                               | 7    | 5    | 4    | 3    | 4    | 4    | 5    | 3    | 7    |







## Appendix B - 2016 Beach visitor number

### Southern District

Visitor numbers during the 2016 bathing season

| Beach          | Daily average |                            | Peak day | Peak month | Total     |
|----------------|---------------|----------------------------|----------|------------|-----------|
|                | Weekdays      | Weekends & public holidays |          |            |           |
| Big Wave Bay   | 257           | 1 061                      | 2 200    | 23 000     | 125 730   |
| Chung Hom Kok  | 193           | 629                        | 1 400    | 12 530     | 81 215    |
| Deep Water Bay | 873           | 4 378                      | 15 000   | 110 000    | 487 350   |
| Hairpin        | 137           | 265                        | 500      | 7 240      | 43 640    |
| Middle Bay     | 198           | 392                        | 800      | 12 030     | 63 650    |
| Repulse Bay    | 11 523        | 14 243                     | 20 000   | 395 050    | 3 035 350 |
| Rocky Bay      | -             | -                          | -        | -          | -         |
| Shek O         | 2 914         | 6 107                      | 24 000   | 300 600    | 963 060   |
| South Bay      | 223           | 517                        | 2 500    | 16 440     | 77 490    |
| St. Stephen's  | 185           | 346                        | 800      | 10 400     | 57 900    |
| Stanley Main   | 653           | 2 777                      | 17 600   | 68 840     | 325 650   |
| Turtle Cove    | 57            | 476                        | 1 900    | 9 280      | 46 570    |

Note: Information provided by the Leisure and Cultural Services Department



## Sai Kung District

### Visitor numbers during the 2016 bathing season

| Beach                  | Daily average |                            | Peak day | Peak month | Total   |
|------------------------|---------------|----------------------------|----------|------------|---------|
|                        | Weekdays      | Weekends & public holidays |          |            |         |
| Clear Water Bay First  | 160           | 612                        | 1 390    | 13 500     | 74 410  |
| Clear Water Bay Second | 2 336         | 3 635                      | 20 500   | 203 600    | 673 650 |
| Hap Mun Bay            | 316           | 1 319                      | 4 200    | 46 300     | 155 660 |
| Kiu Tsui               | 236           | 796                        | 1 720    | 15 840     | 101 590 |
| Silverstrand           | 158           | 968                        | 5 300    | 32 430     | 101 980 |
| Trio                   | 328           | 1 036                      | 3 600    | 33 760     | 135 580 |

Note: Information provided by the Leisure and Cultural Services Department

## Tsuen Wan District

### Visitor numbers during the 2016 bathing season

| Beach           | Daily average |                            | Peak day | Peak month | Total   |
|-----------------|---------------|----------------------------|----------|------------|---------|
|                 | Weekdays      | Weekends & public holidays |          |            |         |
| Anglers'        | 143           | 575                        | 1 210    | 9 830      | 68 650  |
| Approach        | 159           | 325                        | 1 010    | 9 890      | 51 900  |
| Casam           | 65            | 211                        | 400      | 4 880      | 27 290  |
| Gemini          | 12            | 33                         | 50       | 610        | 4 480   |
| Hoi Mei Wan     | 49            | 134                        | 260      | 3 140      | 18 600  |
| Lido            | 358           | 1 043                      | 9 100    | 23 230     | 141 090 |
| Ma Wan Tung Wan | 543           | 2 241                      | 4 320    | 48 610     | 265 410 |
| Ting Kau        | 154           | 388                        | 1 100    | 10 040     | 55 940  |

Note: Information provided by the Leisure and Cultural Services Department





## Tuen Mun District

### Visitor numbers during the 2016 bathing season

| Beach         | Daily average |                            | Peak day | Peak month | Total   |
|---------------|---------------|----------------------------|----------|------------|---------|
|               | Weekdays      | Weekends & public holidays |          |            |         |
| Butterfly     | 768           | 1 439                      | 2 150    | 35 450     | 240 560 |
| Cafeteria New | 903           | 1 792                      | 3 600    | 66 550     | 290 620 |
| Cafeteria Old | 930           | 1 261                      | 1 950    | 40 000     | 253 610 |
| Castle Peak   | 420           | 1 340                      | 2 000    | 23 750     | 174 570 |
| Golden        | 1 941         | 4 438                      | 7 000    | 100 300    | 670 350 |
| Kadoorie      | 640           | 1 048                      | 1 850    | 33 250     | 188 645 |

Note: Information provided by the Leisure and Cultural Services Department

## Outlying Islands

### Visitor numbers during the 2016 bathing season

| Beach                | Daily average |                            | Peak day | Peak month | Total   |
|----------------------|---------------|----------------------------|----------|------------|---------|
|                      | Weekdays      | Weekends & public holidays |          |            |         |
| Cheung Chau Tung Wan | 599           | 1 742                      | 3 400    | 46 140     | 235 890 |
| Hung Shing Yeh       | 692           | 1 566                      | 3 350    | 48 120     | 237 600 |
| Kwun Yam             | 151           | 566                        | 1 220    | 13 330     | 69 410  |
| Lo So Shing          | 128           | 391                        | 820      | 9 480      | 51 910  |
| Lower Cheung Sha     | 351           | 1 316                      | 2 940    | 31 360     | 161 300 |
| Pui O                | 1 252         | 2 568                      | 6 000    | 92 400     | 409 420 |
| Silver Mine Bay      | 771           | 1 498                      | 3 250    | 44 600     | 245 610 |
| Tong Fuk             | 352           | 621                        | 2 450    | 25 710     | 107 180 |
| Upper Cheung Sha     | 517           | 747                        | 1 650    | 31 200     | 144 650 |

Note: Information provided by the Leisure and Cultural Services Department





## Appendix C - Physicochemical water quality data for gazetted beaches, 2016

### Southern District

#### Summary of physicochemical water quality data of gazetted beaches, 2016

| Beach          | pH                      | Salinity (psu) <sup>1</sup> | Turbidity (NTU) <sup>2</sup> | Temperature (°C)        | Dissolved Oxygen      |                    |
|----------------|-------------------------|-----------------------------|------------------------------|-------------------------|-----------------------|--------------------|
|                |                         |                             |                              |                         | (mg/L)                | (% Saturation)     |
| Big Wave Bay   | 8.31<br>( 8.02 - 8.48 ) | 27.7<br>( 6.3 - 32.6 )      | 3.19<br>( 0.52 - 10.20 )     | 25.9<br>( 16.2 - 31.4 ) | 7.0<br>( 5.8 - 9.6 )  | 97<br>( 82 - 120 ) |
| Chung Hom Kok  | 8.34<br>( 8.01 - 9.01 ) | 28.9<br>( 17.5 - 32.4 )     | 2.64<br>( 1.21 - 5.39 )      | 25.8<br>( 16.4 - 31.2 ) | 6.9<br>( 5.3 - 10.0 ) | 98<br>( 81 - 130 ) |
| Deep Water Bay | 8.31<br>( 7.87 - 8.93 ) | 27.7<br>( 16.8 - 32.3 )     | 4.79<br>( 1.26 - 17.80 )     | 25.9<br>( 16.4 - 31.2 ) | 7.0<br>( 5.3 - 10.0 ) | 99<br>( 78 - 130 ) |
| Hairpin*       | 8.37<br>( 8.15 - 8.80 ) | 28.8<br>( 17.1 - 32.7 )     | 2.49<br>( 0.50 - 11.00 )     | 26.4<br>( 16.3 - 32.3 ) | 7.0<br>( 6.0 - 8.3 )  | 99<br>( 83 - 127 ) |
| Middle Bay     | 8.35<br>( 8.08 - 9.01 ) | 28.9<br>( 19.1 - 32.3 )     | 3.96<br>( 1.65 - 11.10 )     | 25.6<br>( 16.1 - 30.6 ) | 6.9<br>( 5.6 - 10.0 ) | 98<br>( 80 - 130 ) |
| Repulse Bay    | 8.34<br>( 8.06 - 8.97 ) | 29.3<br>( 18.8 - 32.3 )     | 3.30<br>( 1.27 - 10.80 )     | 25.6<br>( 16.2 - 30.7 ) | 6.9<br>( 5.4 - 10.0 ) | 97<br>( 76 - 130 ) |
| Rocky Bay*     | 8.26<br>( 7.97 - 8.46 ) | 29.9<br>( 24.3 - 32.7 )     | 2.85<br>( 0.74 - 15.70 )     | 25.5<br>( 16.2 - 29.4 ) | 6.8<br>( 5.6 - 8.2 )  | 95<br>( 66 - 113 ) |
| Shek O         | 8.34<br>( 8.14 - 8.51 ) | 30.8<br>( 26.0 - 32.9 )     | 3.32<br>( 0.74 - 7.72 )      | 26.0<br>( 16.4 - 30.3 ) | 6.8<br>( 5.5 - 7.8 )  | 96<br>( 83 - 116 ) |
| South Bay      | 8.34<br>( 8.03 - 8.91 ) | 28.9<br>( 19.6 - 32.4 )     | 2.77<br>( 1.18 - 6.08 )      | 26.0<br>( 16.0 - 30.9 ) | 6.9<br>( 5.1 - 10.0 ) | 98<br>( 72 - 130 ) |
| St. Stephen's  | 8.31<br>( 8.04 - 8.97 ) | 29.0<br>( 16.5 - 32.5 )     | 2.82<br>( 0.86 - 7.07 )      | 25.9<br>( 16.3 - 31.3 ) | 6.8<br>( 5.6 - 9.6 )  | 98<br>( 83 - 130 ) |
| Stanley Main   | 8.38<br>( 8.19 - 8.82 ) | 29.0<br>( 17.5 - 32.4 )     | 3.11<br>( 0.63 - 17.30 )     | 26.3<br>( 16.4 - 32.4 ) | 7.0<br>( 5.7 - 8.3 )  | 98<br>( 80 - 122 ) |
| Turtle Cove    | 8.36<br>( 8.15 - 8.80 ) | 29.0<br>( 17.6 - 32.6 )     | 4.59<br>( 0.86 - 19.80 )     | 26.2<br>( 16.3 - 32.2 ) | 7.0<br>( 5.9 - 8.1 )  | 98<br>( 82 - 110 ) |

Note: Data presented are arithmetic means; figures in brackets are ranges

1. Practical Salinity Unit; 2. Nephelometric Turbidity Unit

\* Beach not open for swimming (no lifeguard service)





## Sai Kung District

### Summary of physicochemical water quality data of gazetted beaches, 2016

| Beach                  | pH                      | Salinity (psu) <sup>1</sup> | Turbidity (NTU) <sup>2</sup> | Temperature (°C)        | Dissolved Oxygen      |                    |
|------------------------|-------------------------|-----------------------------|------------------------------|-------------------------|-----------------------|--------------------|
|                        |                         |                             |                              |                         | (mg/L)                | (% Saturation)     |
| Clear Water Bay First  | 8.37<br>( 8.11 - 8.69 ) | 28.8<br>( 14.3 - 32.8 )     | 5.50<br>( 1.19 - 32.80 )     | 26.3<br>( 16.2 - 31.8 ) | 6.8<br>( 5.6 - 8.4 )  | 97<br>( 79 - 119 ) |
| Clear Water Bay Second | 8.36<br>( 8.14 - 8.65 ) | 29.9<br>( 17.3 - 33.4 )     | 6.40<br>( 2.14 - 24.20 )     | 26.1<br>( 16.0 - 32.3 ) | 6.6<br>( 5.3 - 7.8 )  | 95<br>( 79 - 119 ) |
| Hap Mun Bay            | 8.36<br>( 8.12 - 8.69 ) | 30.6<br>( 26.4 - 33.1 )     | 2.57<br>( 0.57 - 9.38 )      | 26.6<br>( 16.3 - 32.2 ) | 6.6<br>( 5.4 - 9.7 )  | 96<br>( 82 - 119 ) |
| Kiu Tsui               | 8.34<br>( 8.10 - 8.86 ) | 30.2<br>( 25.5 - 33.0 )     | 2.07<br>( 0.69 - 9.03 )      | 26.6<br>( 16.2 - 32.1 ) | 6.9<br>( 5.1 - 10.0 ) | 99<br>( 76 - 130 ) |
| Silverstrand           | 8.36<br>( 8.13 - 8.66 ) | 28.0<br>( 21.4 - 32.1 )     | 4.34<br>( 1.06 - 16.80 )     | 26.1<br>( 15.7 - 32.0 ) | 6.5<br>( 5.3 - 8.5 )  | 95<br>( 78 - 125 ) |
| Trio                   | 8.31<br>( 7.96 - 8.89 ) | 28.9<br>( 22.4 - 32.4 )     | 2.71<br>( 1.00 - 13.10 )     | 26.9<br>( 16.3 - 32.3 ) | 6.8<br>( 5.6 - 10.0 ) | 98<br>( 77 - 130 ) |

Note: Data presented are arithmetic means; figures in brackets are ranges

1. Practical Salinity Unit; 2. Nephelometric Turbidity Unit

## Tsuen Wan District

### Summary of physicochemical water quality data of gazetted beaches, 2016

| Beach           | pH                      | Salinity (psu) <sup>1</sup> | Turbidity (NTU) <sup>2</sup> | Temperature (°C)        | Dissolved Oxygen     |                    |
|-----------------|-------------------------|-----------------------------|------------------------------|-------------------------|----------------------|--------------------|
|                 |                         |                             |                              |                         | (mg/L)               | (% Saturation)     |
| Anglers'        | 8.17<br>( 7.89 - 8.48 ) | 27.1<br>( 16.6 - 32.4 )     | 3.92<br>( 1.68 - 10.30 )     | 25.5<br>( 16.7 - 29.9 ) | 6.6<br>( 4.4 - 9.2 ) | 93<br>( 65 - 115 ) |
| Approach        | 8.18<br>( 7.95 - 8.50 ) | 25.7<br>( 19.9 - 32.2 )     | 3.73<br>( 0.84 - 16.30 )     | 25.8<br>( 16.7 - 29.8 ) | 6.5<br>( 4.3 - 8.5 ) | 92<br>( 62 - 120 ) |
| Casam           | 8.19<br>( 7.90 - 8.46 ) | 26.2<br>( 21.0 - 32.3 )     | 3.01<br>( 1.38 - 6.17 )      | 25.8<br>( 16.7 - 29.6 ) | 6.8<br>( 5.5 - 9.4 ) | 96<br>( 80 - 129 ) |
| Gemini*         | 8.17<br>( 7.92 - 8.41 ) | 26.7<br>( 16.0 - 32.3 )     | 3.38<br>( 1.66 - 7.12 )      | 25.7<br>( 16.6 - 29.9 ) | 6.6<br>( 5.1 - 9.9 ) | 93<br>( 73 - 121 ) |
| Hoi Mei Wan     | 8.17<br>( 7.90 - 8.50 ) | 25.9<br>( 19.1 - 32.3 )     | 3.64<br>( 1.54 - 8.12 )      | 26.0<br>( 16.8 - 30.0 ) | 6.7<br>( 5.1 - 8.9 ) | 94<br>( 74 - 129 ) |
| Lido            | 8.17<br>( 7.98 - 8.45 ) | 26.3<br>( 20.7 - 32.3 )     | 3.73<br>( 1.56 - 12.60 )     | 25.8<br>( 16.6 - 29.7 ) | 6.7<br>( 5.0 - 9.1 ) | 94<br>( 72 - 116 ) |
| Ma Wan Tung Wan | 8.17<br>( 7.88 - 8.41 ) | 27.5<br>( 19.8 - 32.3 )     | 4.33<br>( 1.50 - 8.47 )      | 25.5<br>( 16.7 - 29.4 ) | 6.5<br>( 4.6 - 9.5 ) | 92<br>( 69 - 102 ) |
| Ting Kau        | 8.20<br>( 7.95 - 8.50 ) | 25.1<br>( 19.7 - 32.2 )     | 3.98<br>( 1.36 - 16.40 )     | 25.9<br>( 16.8 - 29.6 ) | 6.8<br>( 5.6 - 9.2 ) | 95<br>( 80 - 130 ) |

Note: Data presented are arithmetic means; figures in brackets are ranges

1. Practical Salinity Unit; 2. Nephelometric Turbidity Unit

\* Beach not open for swimming (no lifeguard service)



## Tuen Mun District

### Summary of physicochemical water quality data of gazetted beaches, 2016

| Beach         | pH                      | Salinity (psu) <sup>1</sup> | Turbidity (NTU) <sup>2</sup> | Temperature (°C)        | Dissolved Oxygen     |                    |
|---------------|-------------------------|-----------------------------|------------------------------|-------------------------|----------------------|--------------------|
|               |                         |                             |                              |                         | (mg/L)               | (% Saturation)     |
| Butterfly     | 8.16<br>( 7.96 - 8.53 ) | 21.9<br>( 12.5 - 32.3 )     | 8.69<br>( 2.32 - 32.80 )     | 26.5<br>( 16.3 - 30.2 ) | 6.6<br>( 4.8 - 8.9 ) | 93<br>( 71 - 105 ) |
| Cafeteria New | 8.18<br>( 7.97 - 8.45 ) | 21.6<br>( 11.8 - 32.3 )     | 8.85<br>( 2.94 - 21.50 )     | 26.2<br>( 16.8 - 30.0 ) | 6.6<br>( 5.6 - 8.9 ) | 93<br>( 79 - 103 ) |
| Cafeteria Old | 8.22<br>( 8.02 - 8.51 ) | 20.9<br>( 11.0 - 32.3 )     | 9.10<br>( 2.35 - 19.30 )     | 26.3<br>( 16.7 - 30.9 ) | 6.6<br>( 5.1 - 8.9 ) | 94<br>( 74 - 104 ) |
| Castle Peak   | 8.19<br>( 7.92 - 8.72 ) | 20.9<br>( 9.8 - 32.2 )      | 7.27<br>( 1.85 - 32.90 )     | 26.6<br>( 16.9 - 31.0 ) | 6.9<br>( 5.2 - 9.0 ) | 97<br>( 73 - 128 ) |
| Golden        | 8.17<br>( 7.94 - 8.51 ) | 21.8<br>( 11.9 - 32.2 )     | 11.35<br>( 3.05 - 53.10 )    | 26.0<br>( 16.6 - 30.1 ) | 6.6<br>( 3.2 - 9.5 ) | 94<br>( 80 - 105 ) |
| Kadoorie      | 8.17<br>( 7.93 - 8.54 ) | 21.4<br>( 10.9 - 32.3 )     | 5.91<br>( 2.28 - 13.70 )     | 26.3<br>( 16.8 - 30.3 ) | 6.6<br>( 5.0 - 9.2 ) | 94<br>( 78 - 103 ) |

Note: Data presented are arithmetic means; figures in brackets are ranges

1. Practical Salinity Unit; 2. Nephelometric Turbidity Unit

## Outlying Islands

### Summary of physicochemical water quality data of gazetted beaches, 2016

| Beach                | pH                      | Salinity (psu) <sup>1</sup> | Turbidity (NTU) <sup>2</sup> | Temperature (°C)        | Dissolved Oxygen      |                    |
|----------------------|-------------------------|-----------------------------|------------------------------|-------------------------|-----------------------|--------------------|
|                      |                         |                             |                              |                         | (mg/L)                | (% Saturation)     |
| Cheung Chau Tung Wan | 8.29<br>( 8.02 - 8.65 ) | 27.0<br>( 19.9 - 31.5 )     | 4.41<br>( 1.35 - 24.60 )     | 25.8<br>( 16.7 - 30.8 ) | 7.0<br>( 5.5 - 9.5 )  | 97<br>( 80 - 126 ) |
| Hung Shing Yeh       | 8.26<br>( 7.91 - 8.56 ) | 27.9<br>( 18.2 - 32.1 )     | 7.96<br>( 1.38 - 48.30 )     | 26.0<br>( 17.4 - 30.5 ) | 6.6<br>( 5.7 - 8.3 )  | 96<br>( 81 - 120 ) |
| Kwun Yam             | 8.28<br>( 7.95 - 8.64 ) | 26.7<br>( 20.8 - 30.8 )     | 3.17<br>( 1.16 - 11.10 )     | 26.1<br>( 16.9 - 31.3 ) | 6.9<br>( 5.6 - 8.4 )  | 96<br>( 81 - 122 ) |
| Lo So Shing          | 8.30<br>( 8.06 - 8.68 ) | 28.1<br>( 14.3 - 32.3 )     | 3.85<br>( 1.33 - 19.20 )     | 26.3<br>( 15.3 - 30.8 ) | 6.7<br>( 5.8 - 8.8 )  | 96<br>( 85 - 111 ) |
| Lower Cheung Sha     | 8.37<br>( 7.93 - 8.73 ) | 25.9<br>( 10.6 - 31.7 )     | 9.37<br>( 2.75 - 32.90 )     | 27.0<br>( 16.8 - 33.2 ) | 6.7<br>( 5.4 - 7.5 )  | 95<br>( 80 - 110 ) |
| Pui O                | 8.35<br>( 8.10 - 8.62 ) | 26.4<br>( 16.8 - 32.0 )     | 12.30<br>( 4.01 - 44.20 )    | 27.5<br>( 17.1 - 33.1 ) | 6.5<br>( 5.6 - 7.6 )  | 94<br>( 79 - 107 ) |
| Silver Mine Bay      | 8.21<br>( 7.78 - 8.64 ) | 22.0<br>( 10.4 - 31.9 )     | 10.36<br>( 1.84 - 49.50 )    | 26.7<br>( 16.1 - 32.1 ) | 6.9<br>( 5.2 - 10.0 ) | 96<br>( 68 - 129 ) |
| Tong Fuk             | 8.40<br>( 8.08 - 8.73 ) | 27.1<br>( 17.2 - 32.0 )     | 7.97<br>( 2.23 - 19.90 )     | 26.6<br>( 16.5 - 31.6 ) | 6.7<br>( 6.2 - 7.9 )  | 96<br>( 82 - 108 ) |
| Upper Cheung Sha     | 8.40<br>( 8.11 - 8.76 ) | 27.1<br>( 17.5 - 32.3 )     | 7.95<br>( 1.69 - 21.00 )     | 26.6<br>( 16.6 - 30.9 ) | 6.8<br>( 6.0 - 8.4 )  | 95<br>( 85 - 105 ) |

Note: Data presented are arithmetic means; figures in brackets are ranges

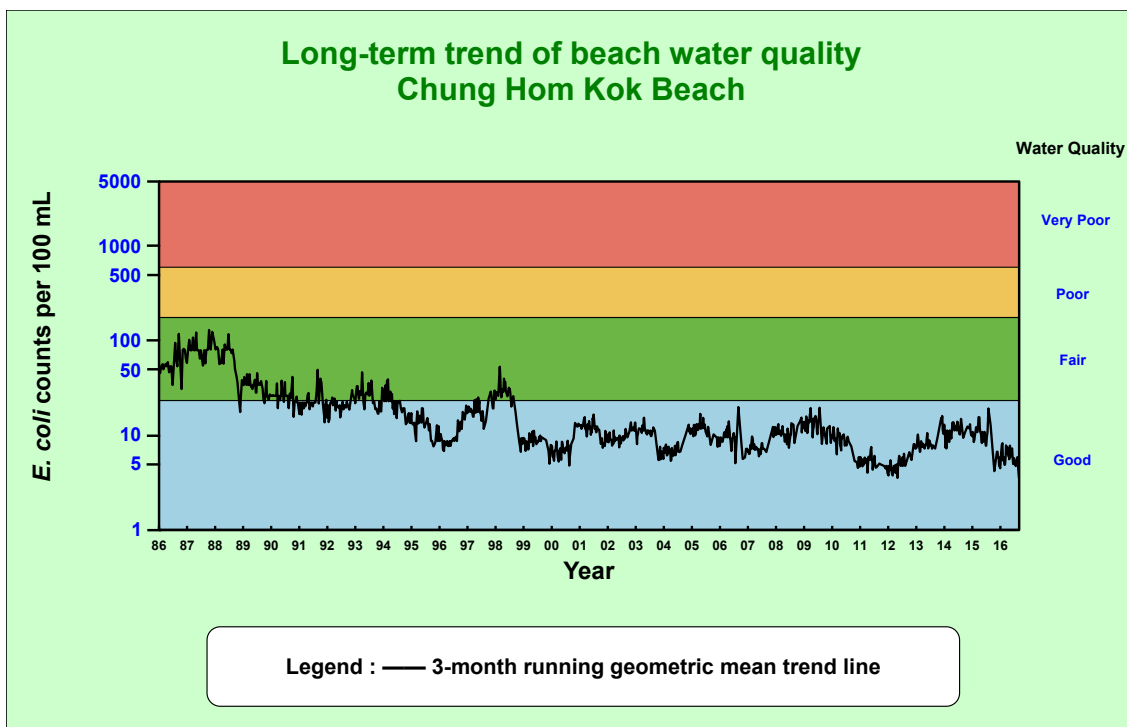
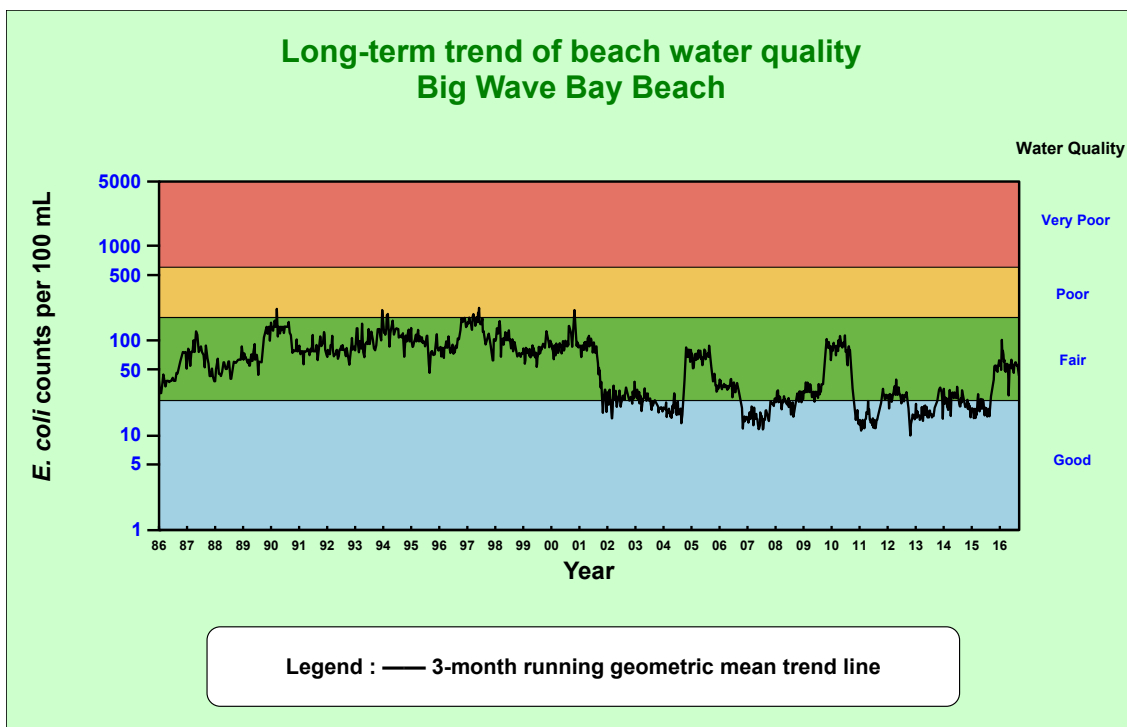
1. Practical Salinity Unit; 2. Nephelometric Turbidity Unit

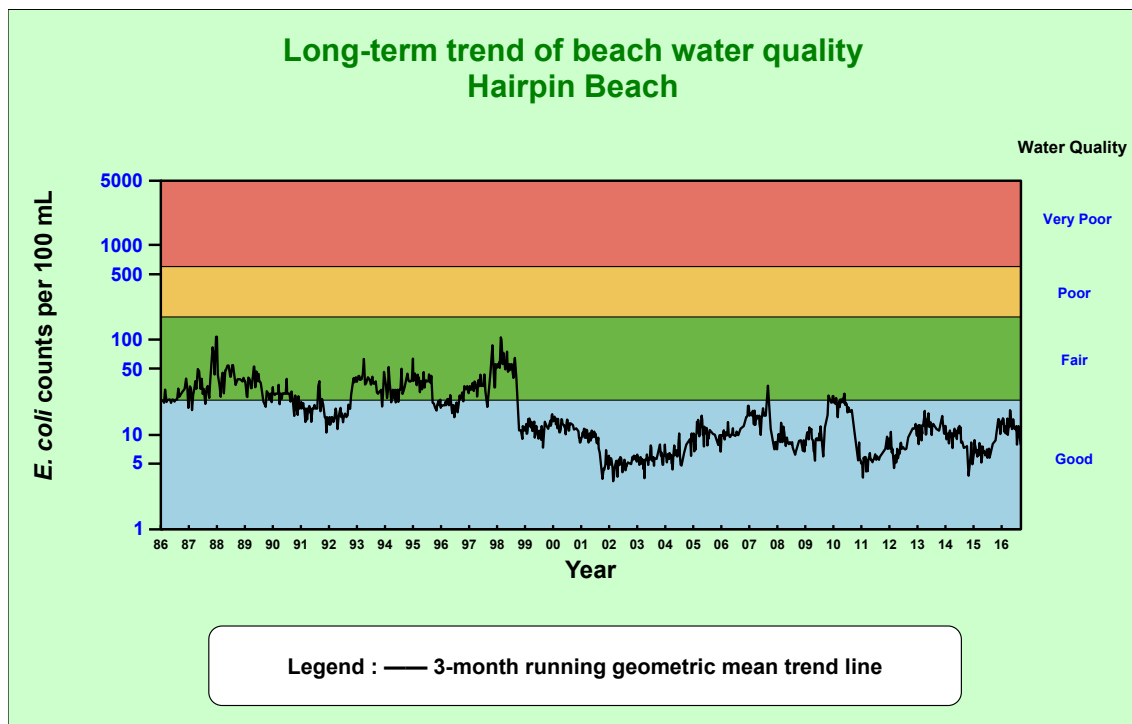
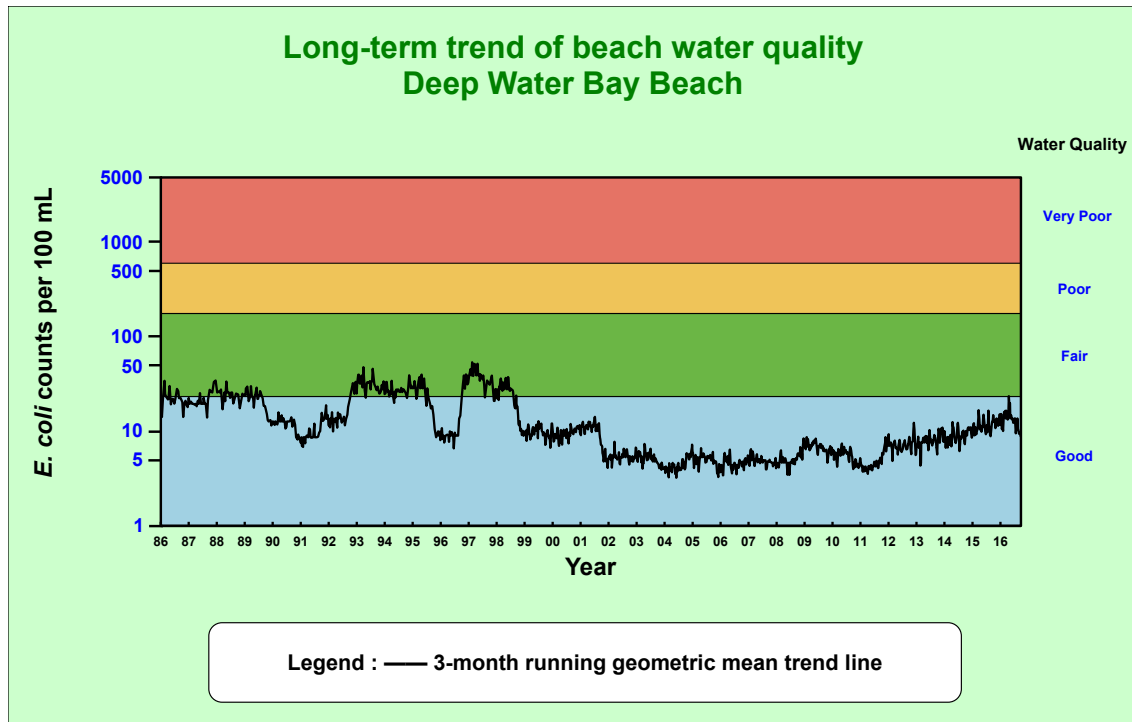


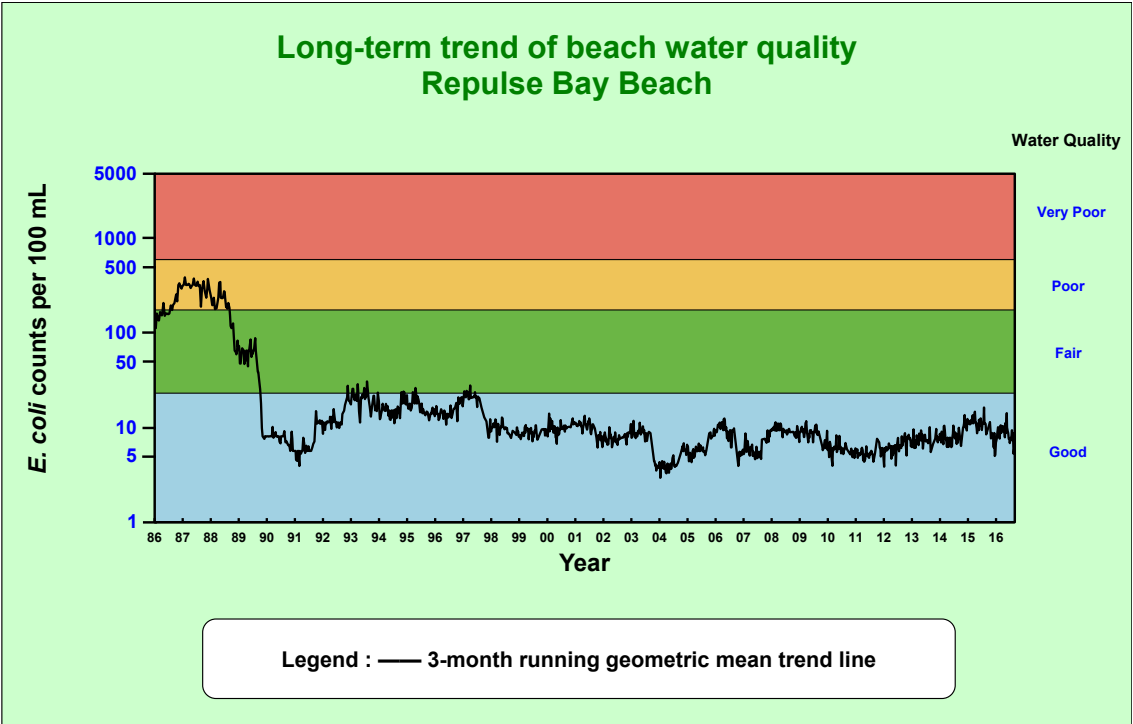
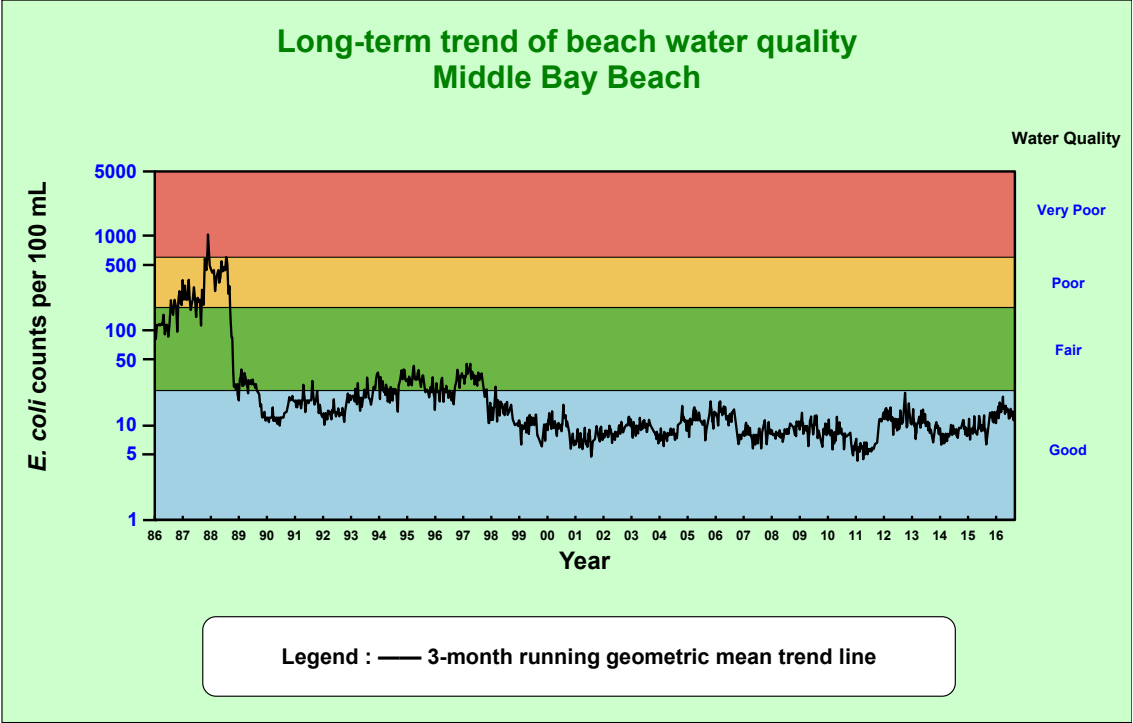




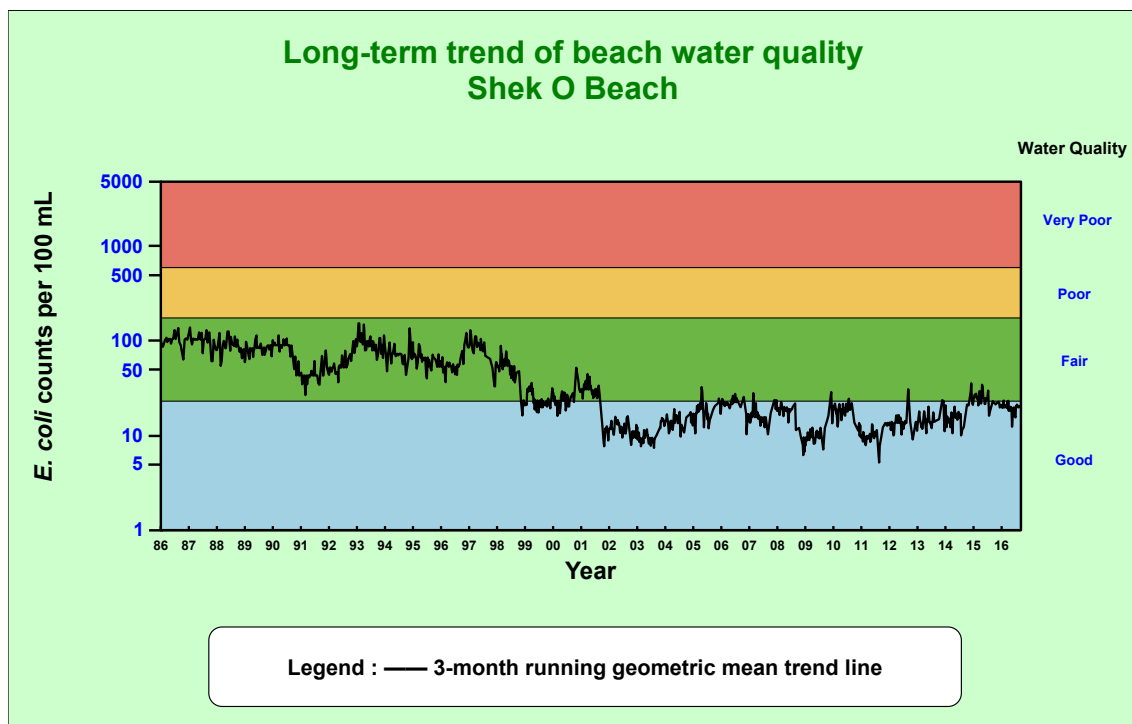
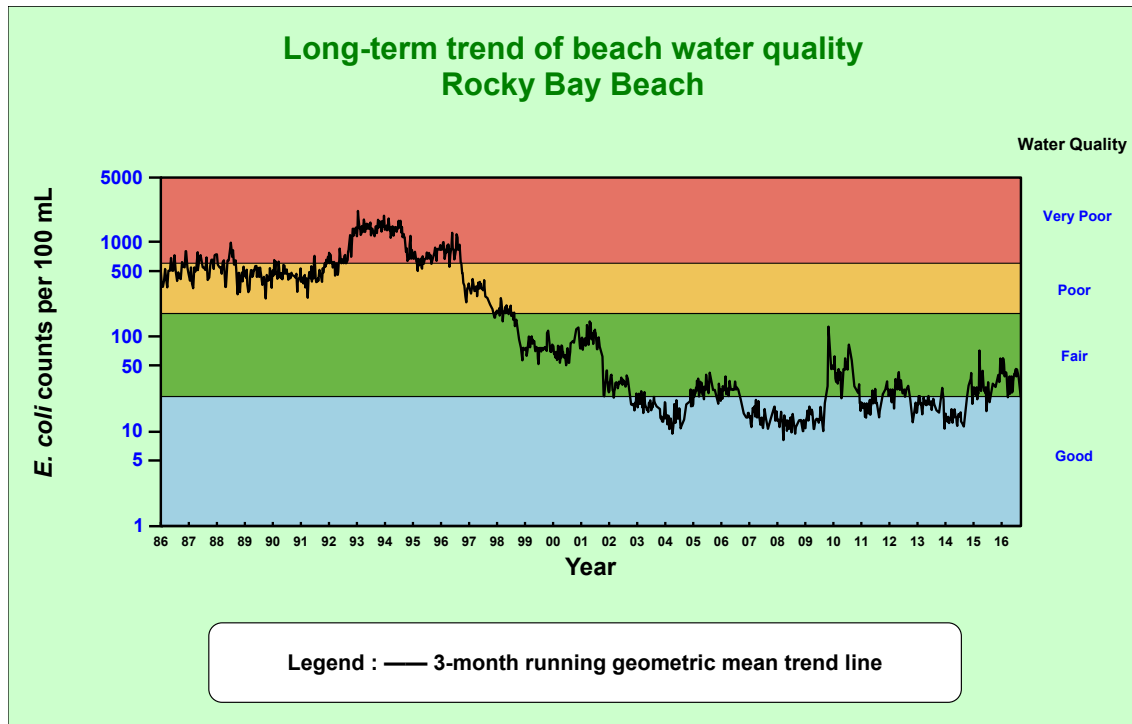
## Appendix D - Long-term trend of beach water quality (1986 - 2016) Southern District

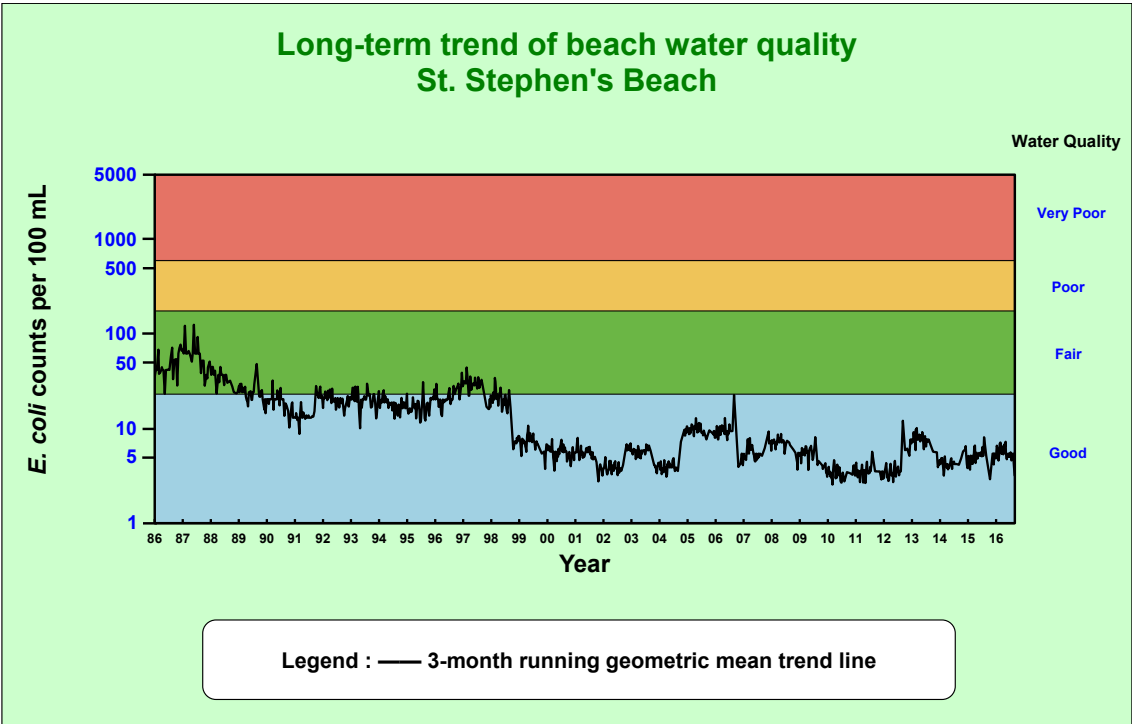
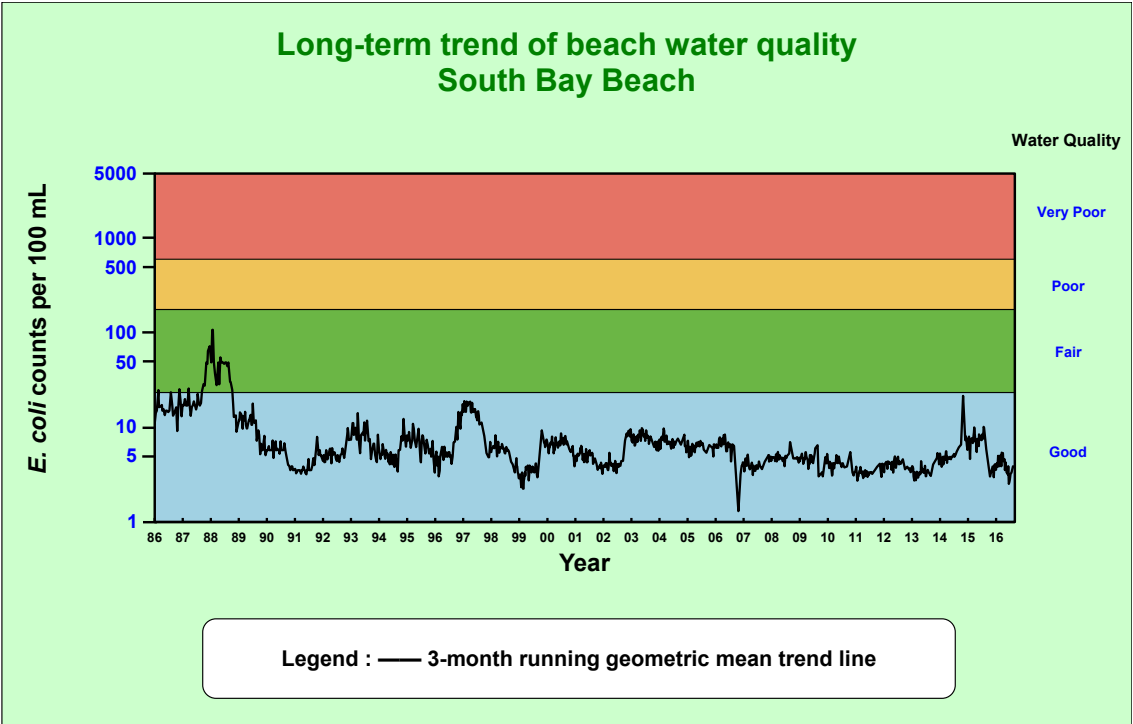


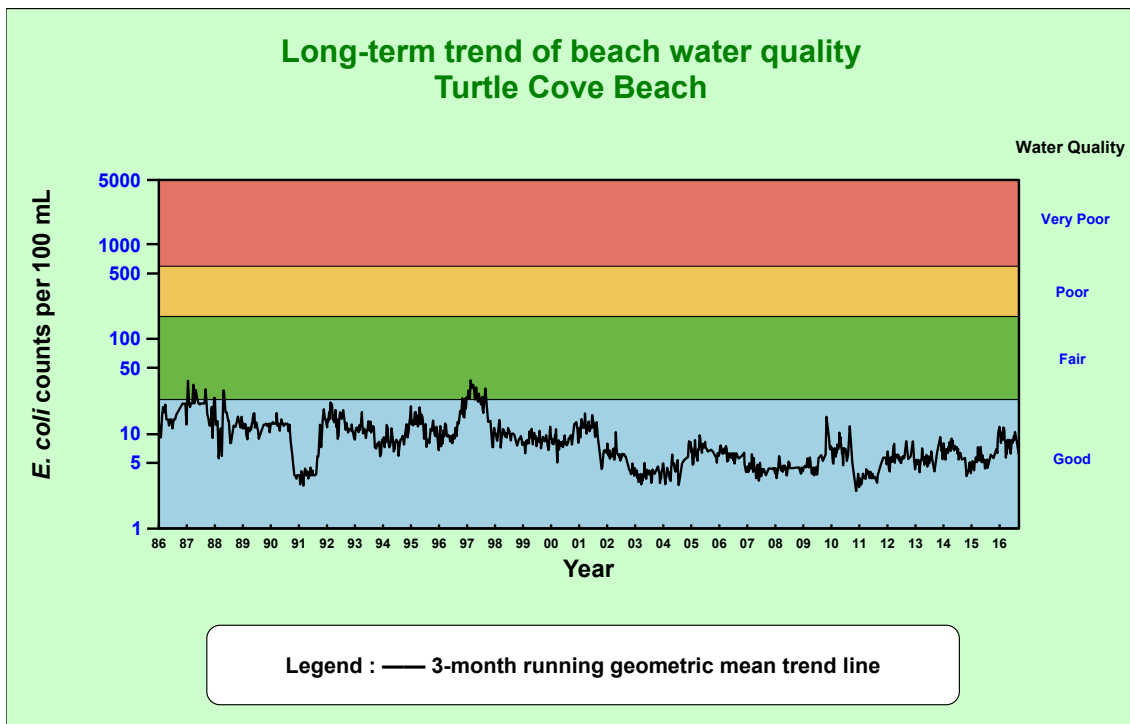
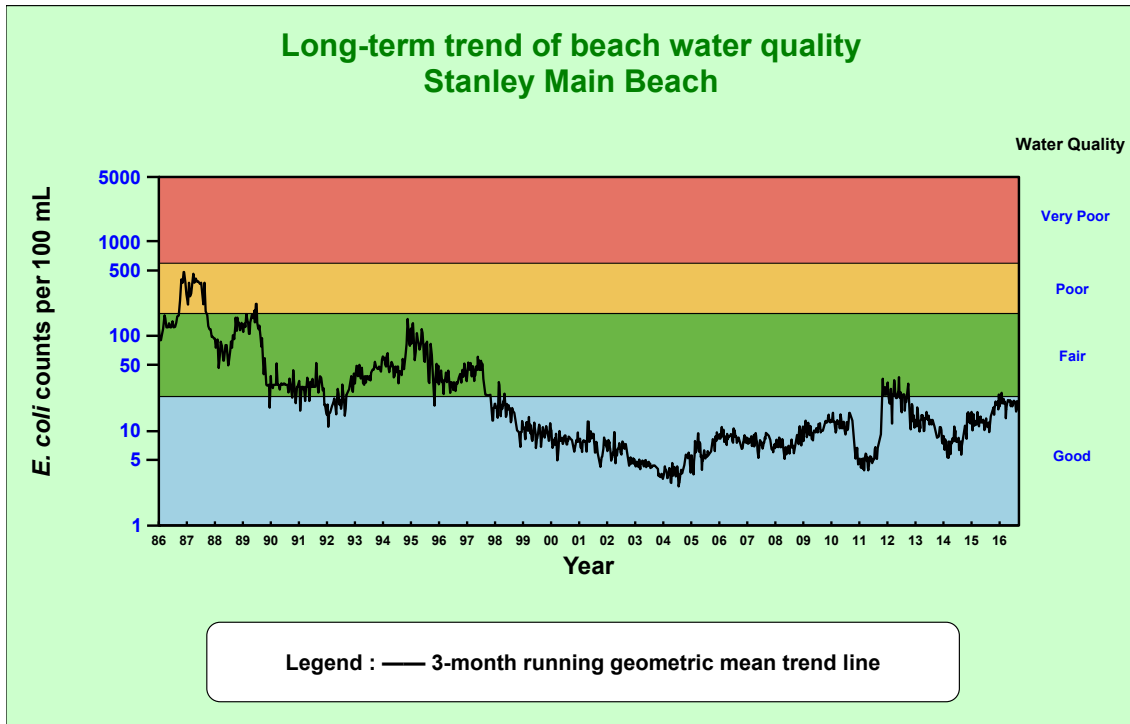








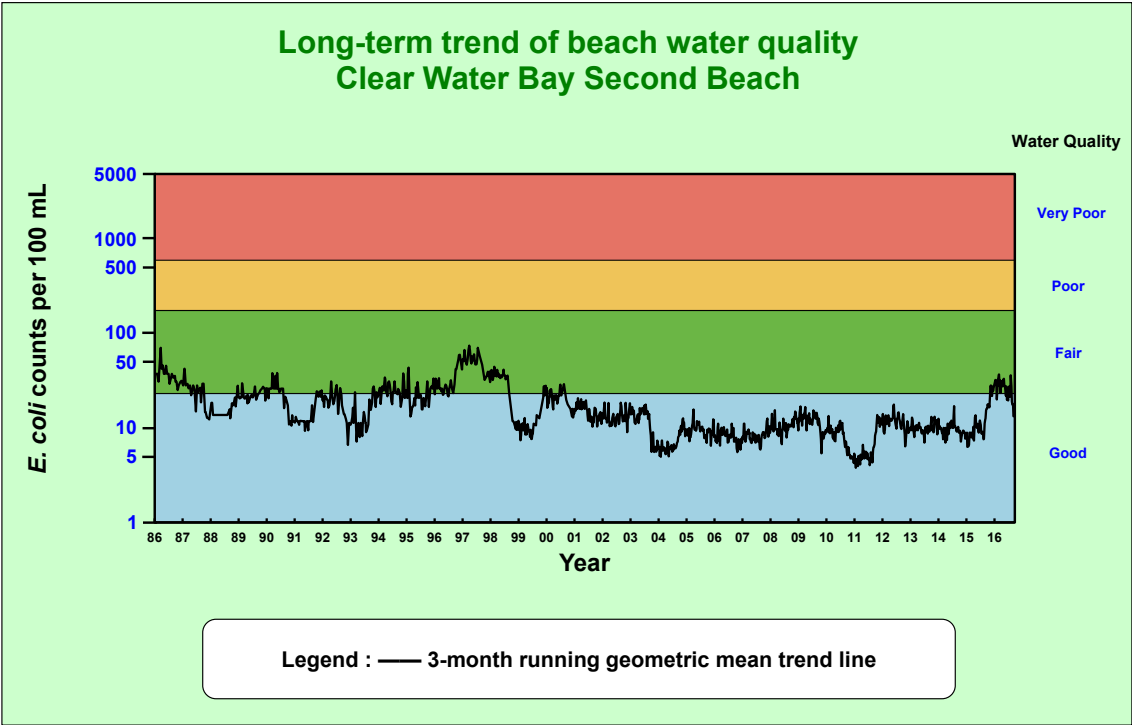
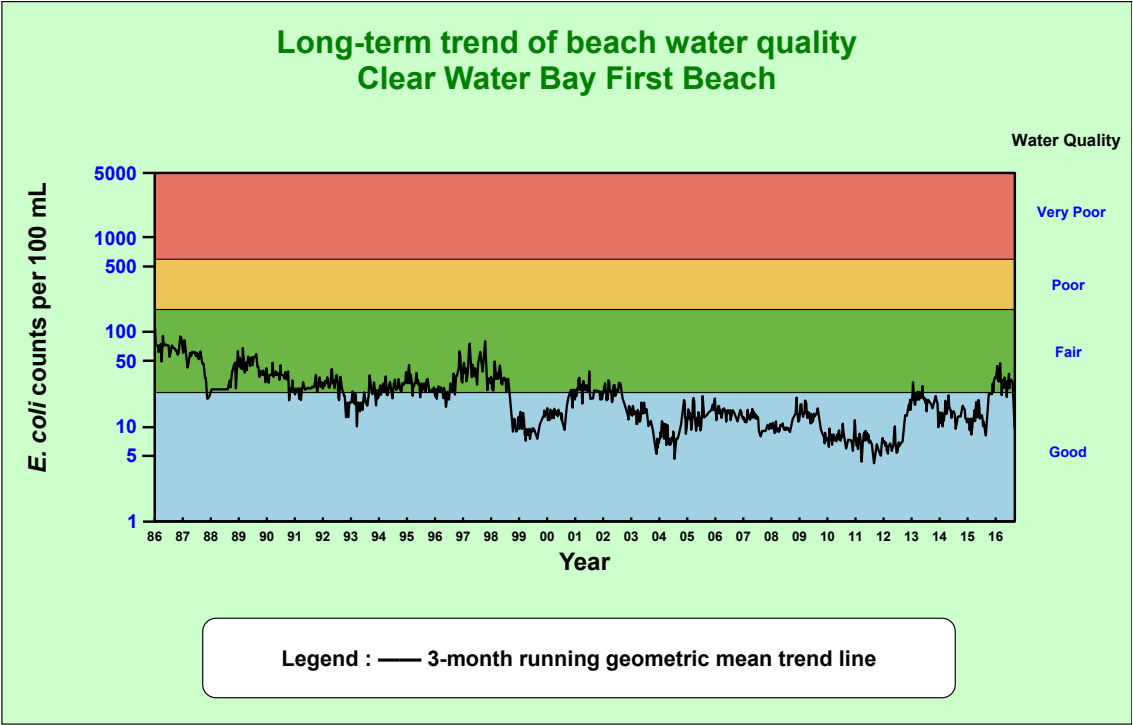


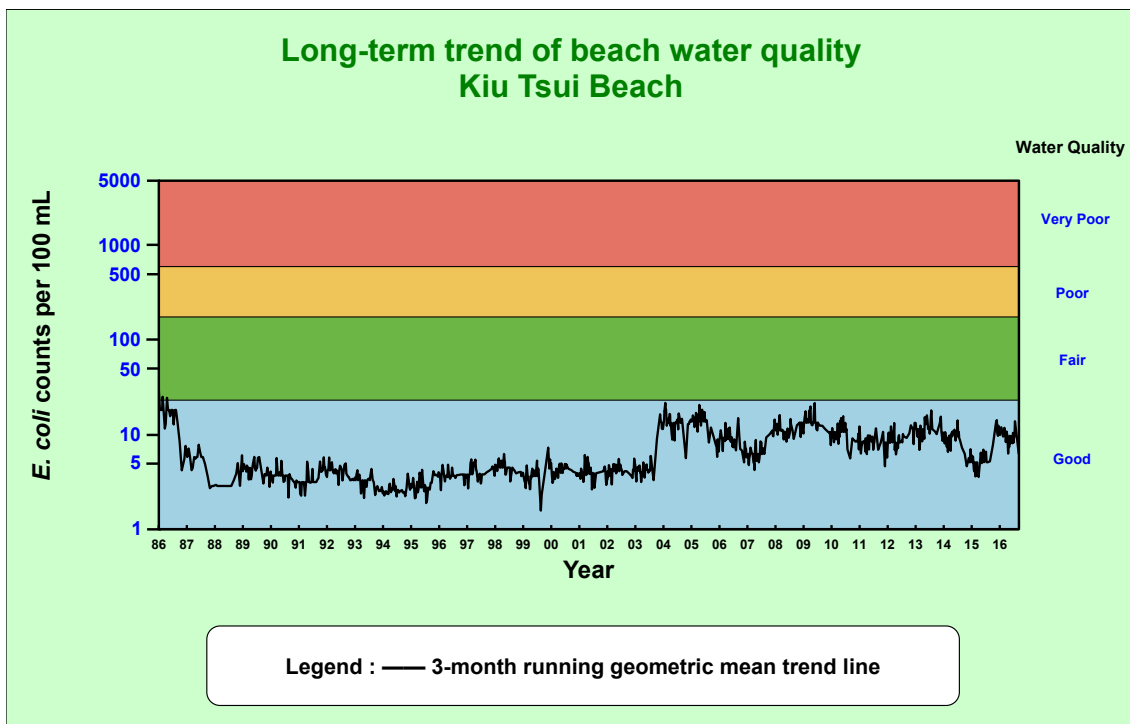
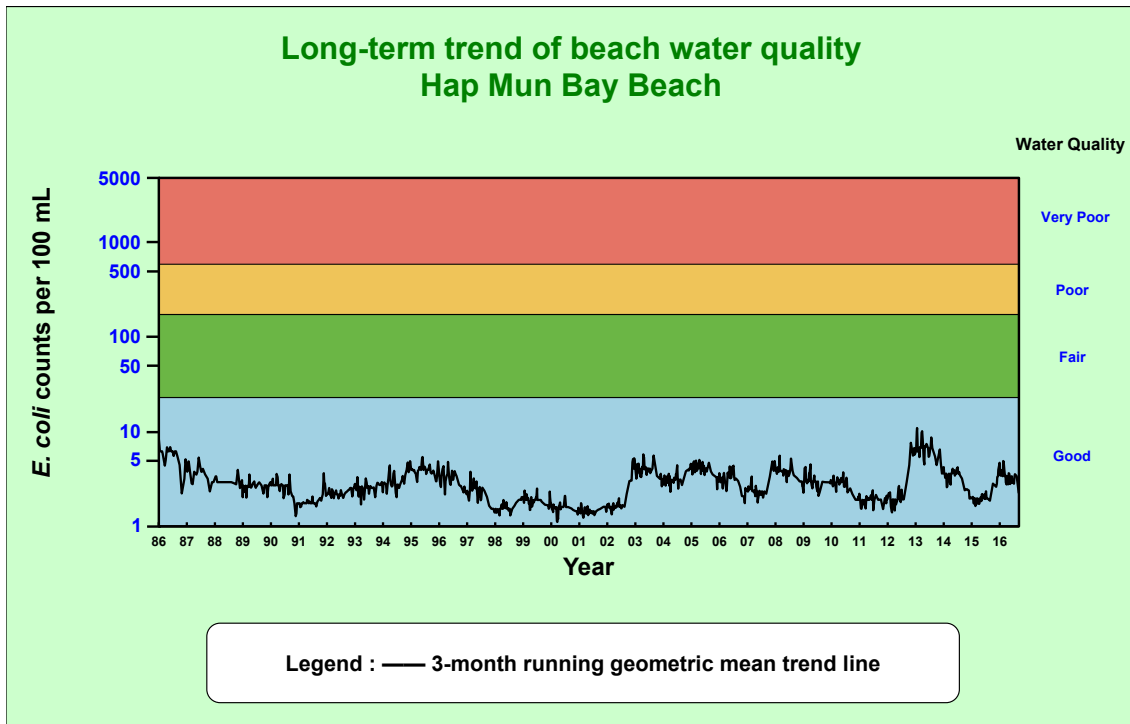


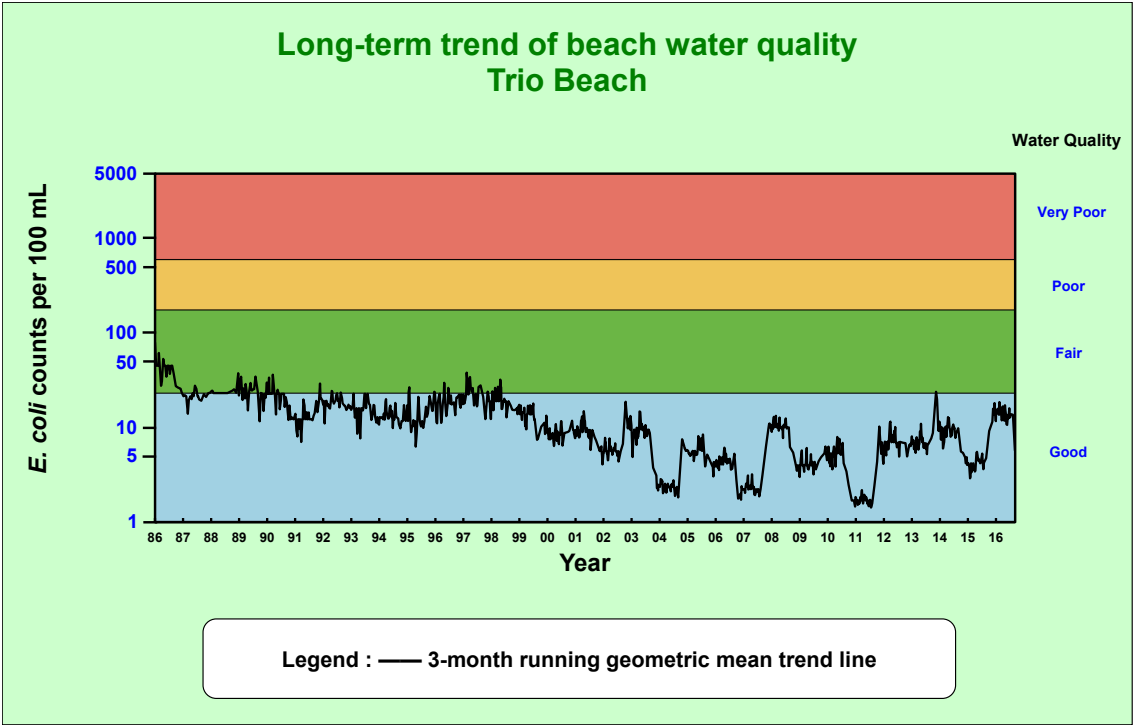
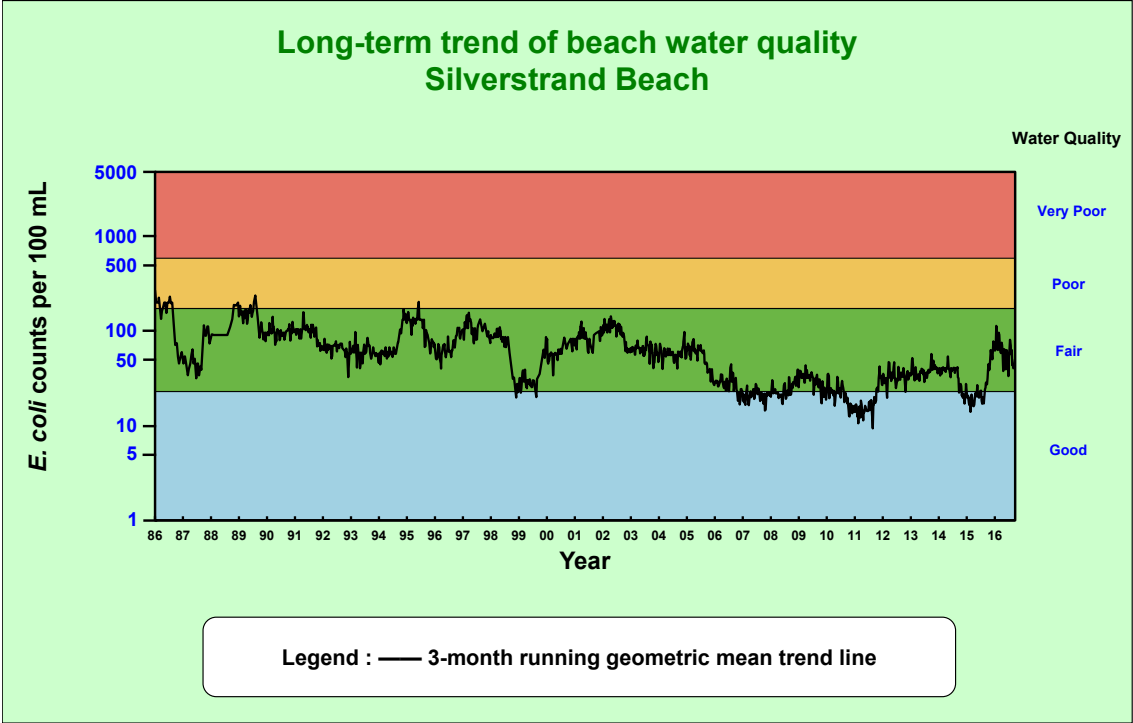




Sai Kung District



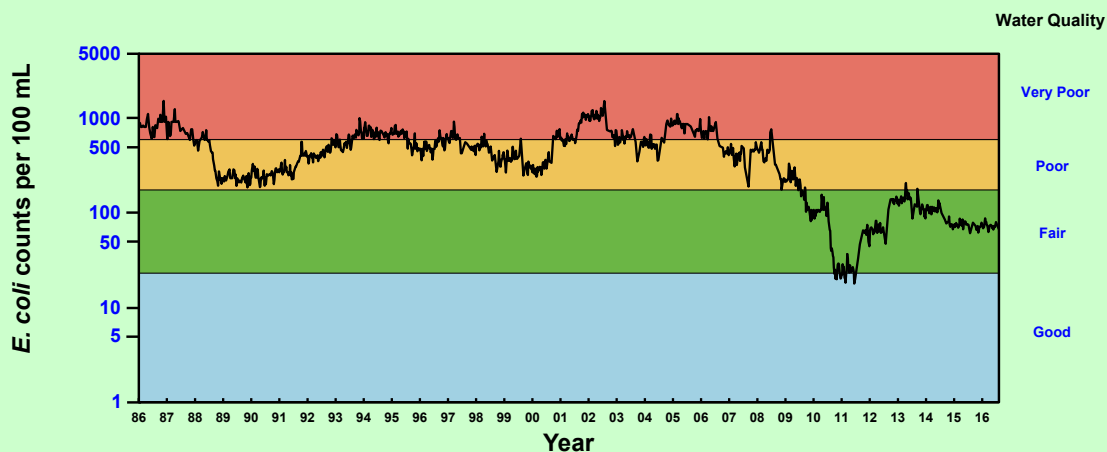






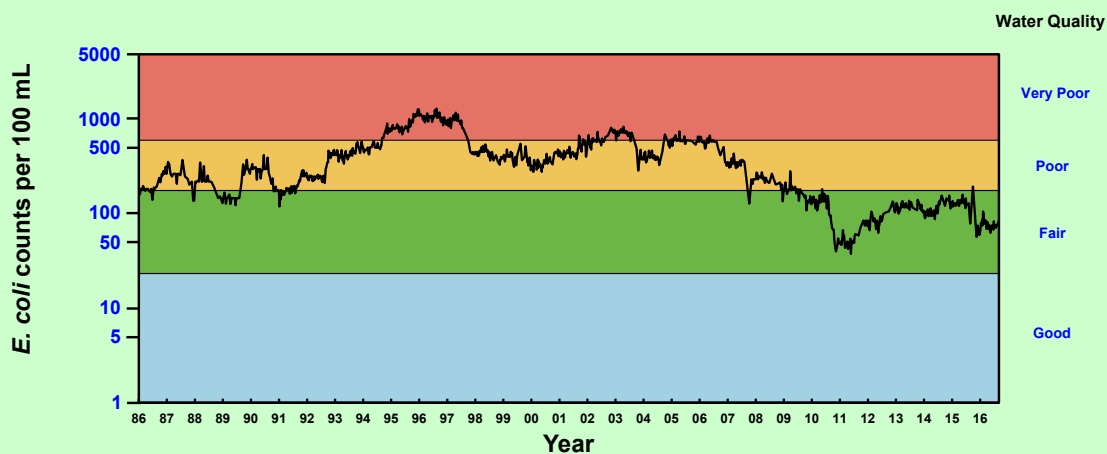
## Tsuen Wan District

Long-term trend of beach water quality  
Anglers' Beach

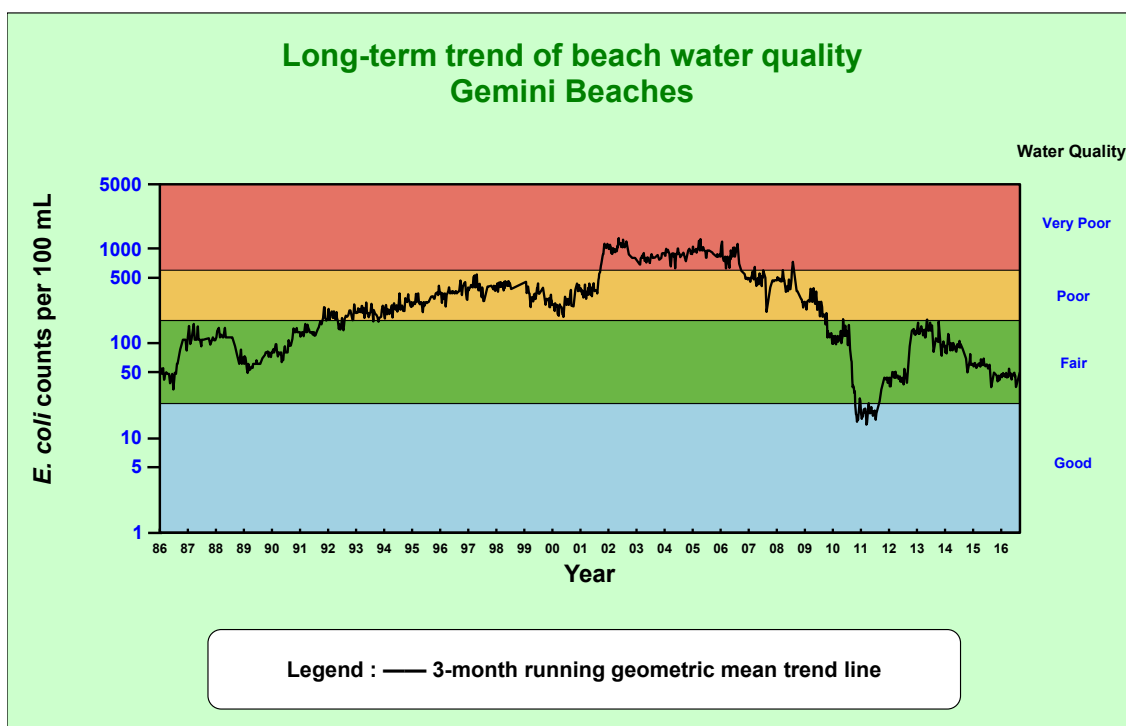
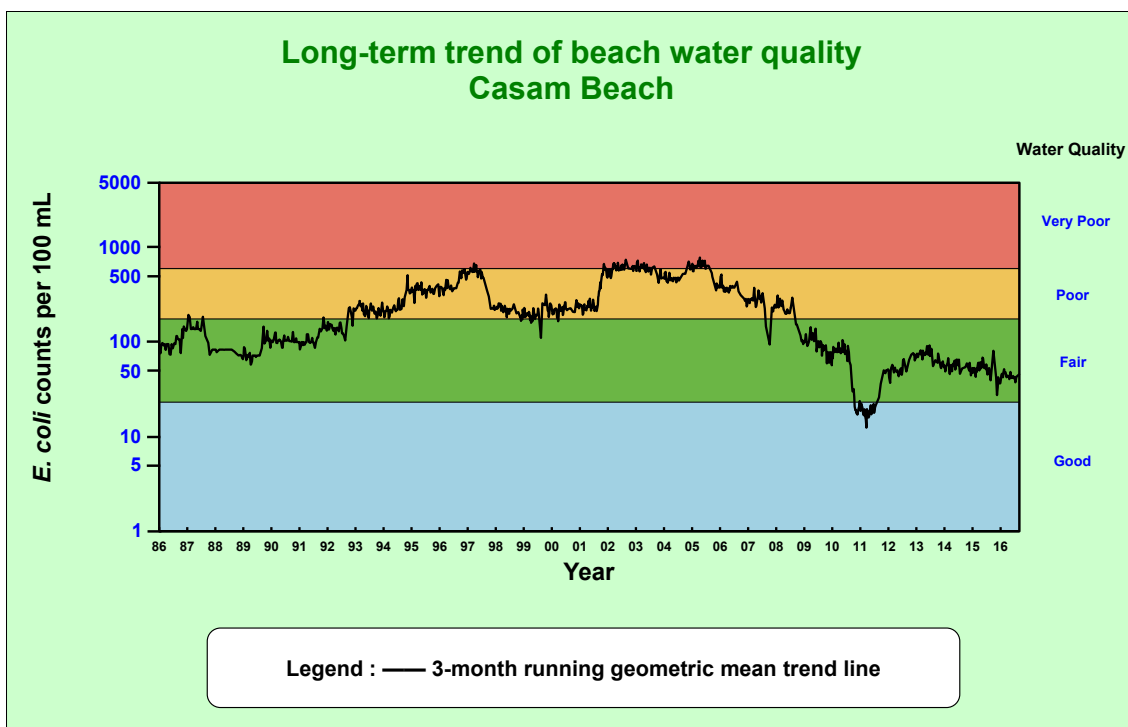


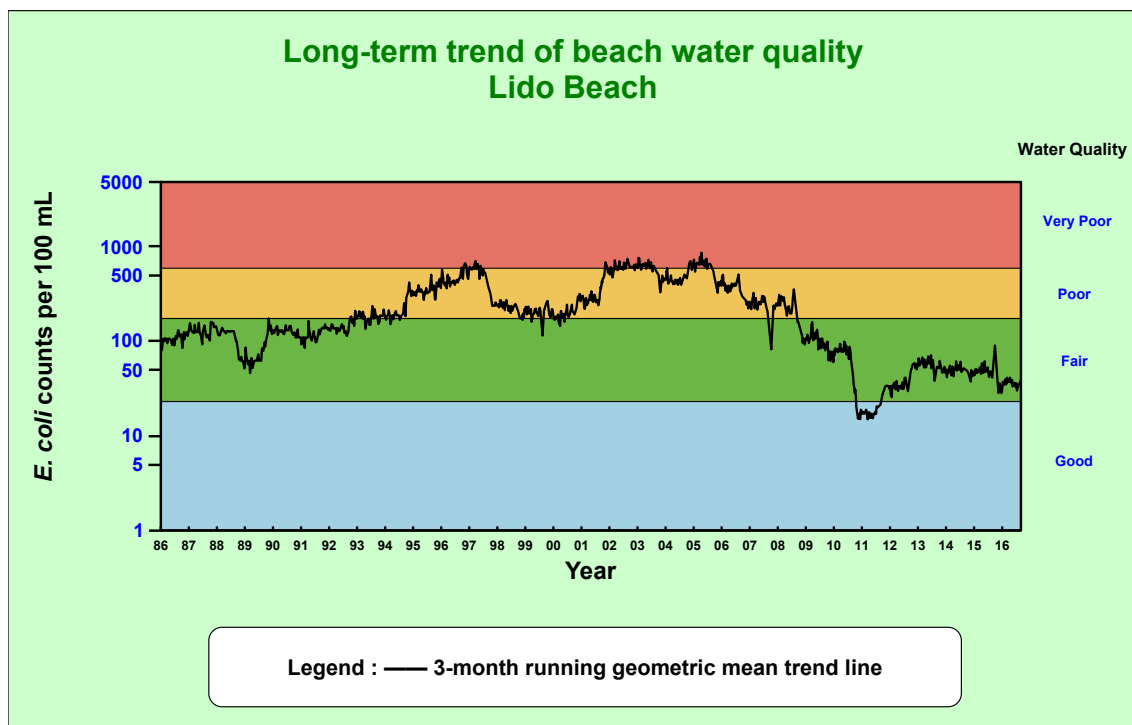
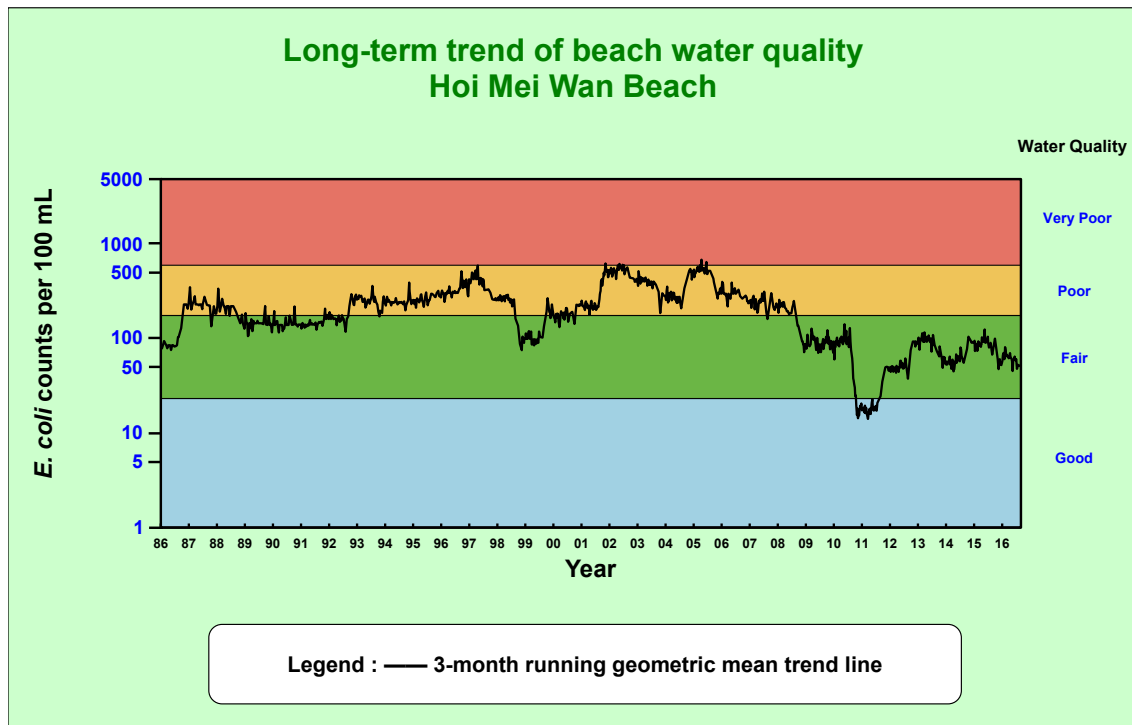
Legend : — 3-month running geometric mean trend line

Long-term trend of beach water quality  
Approach Beach

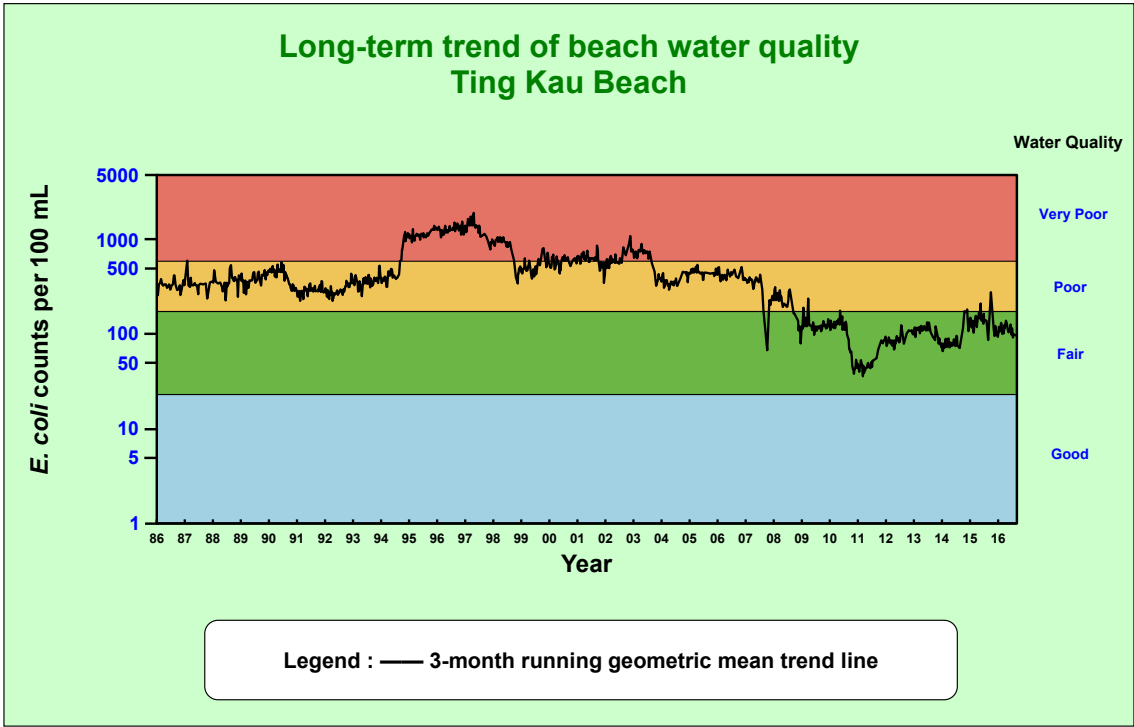
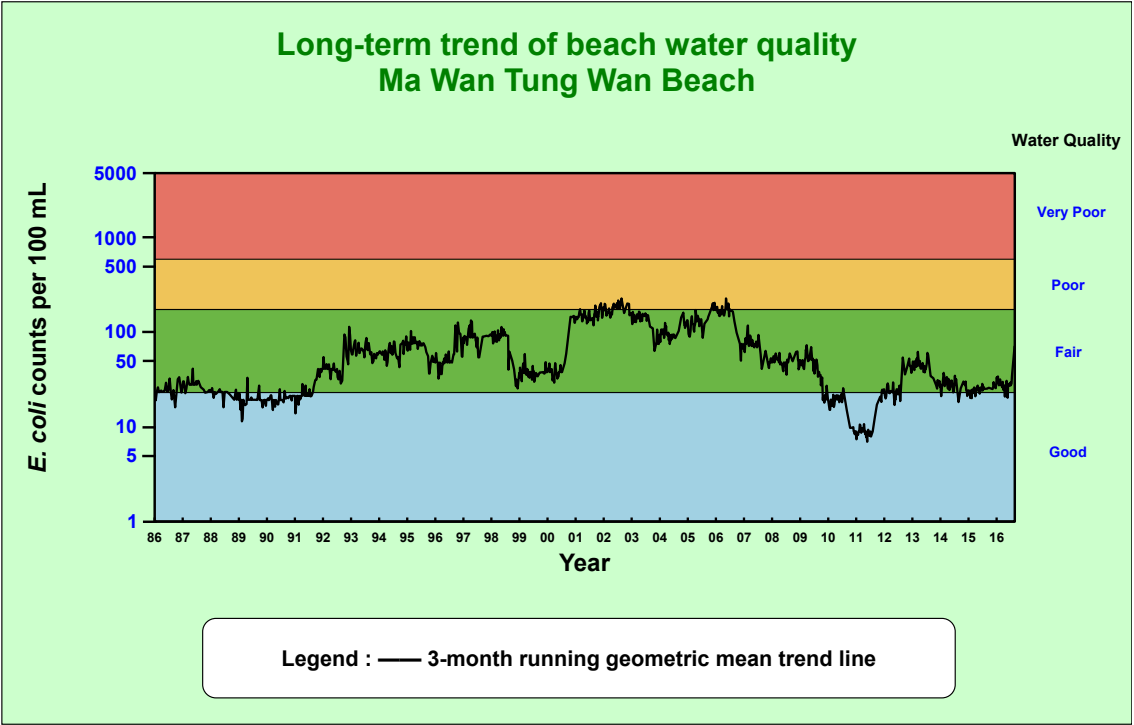


Legend : — 3-month running geometric mean trend line



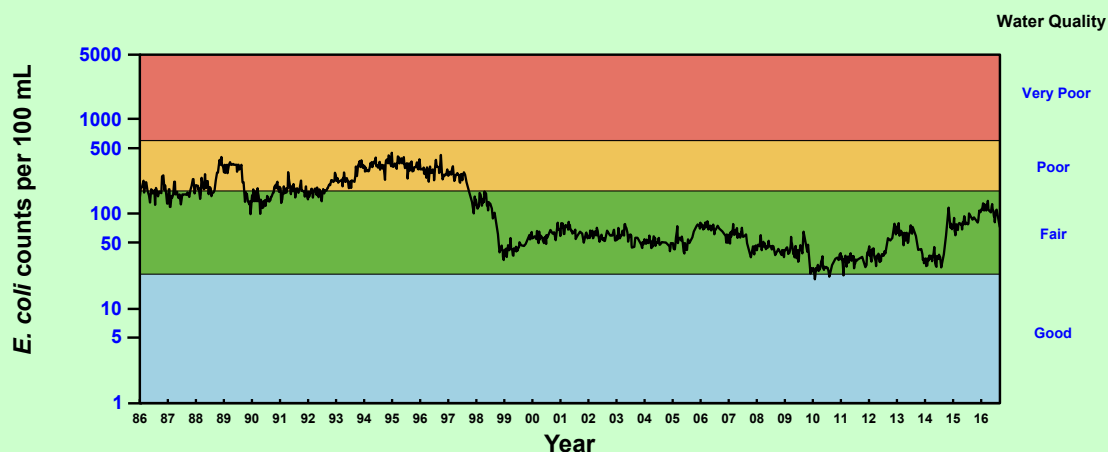






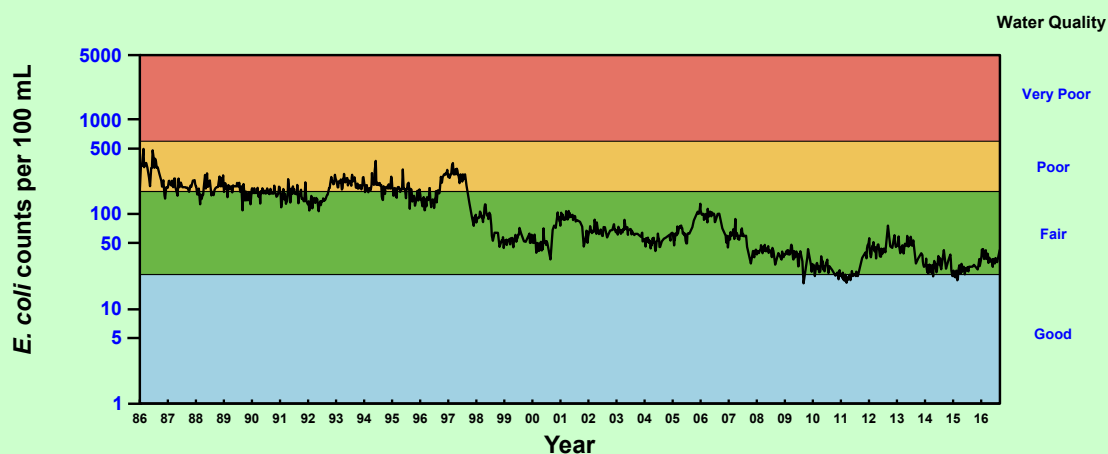
## Tuen Mun District

### Long-term trend of beach water quality Butterfly Beach



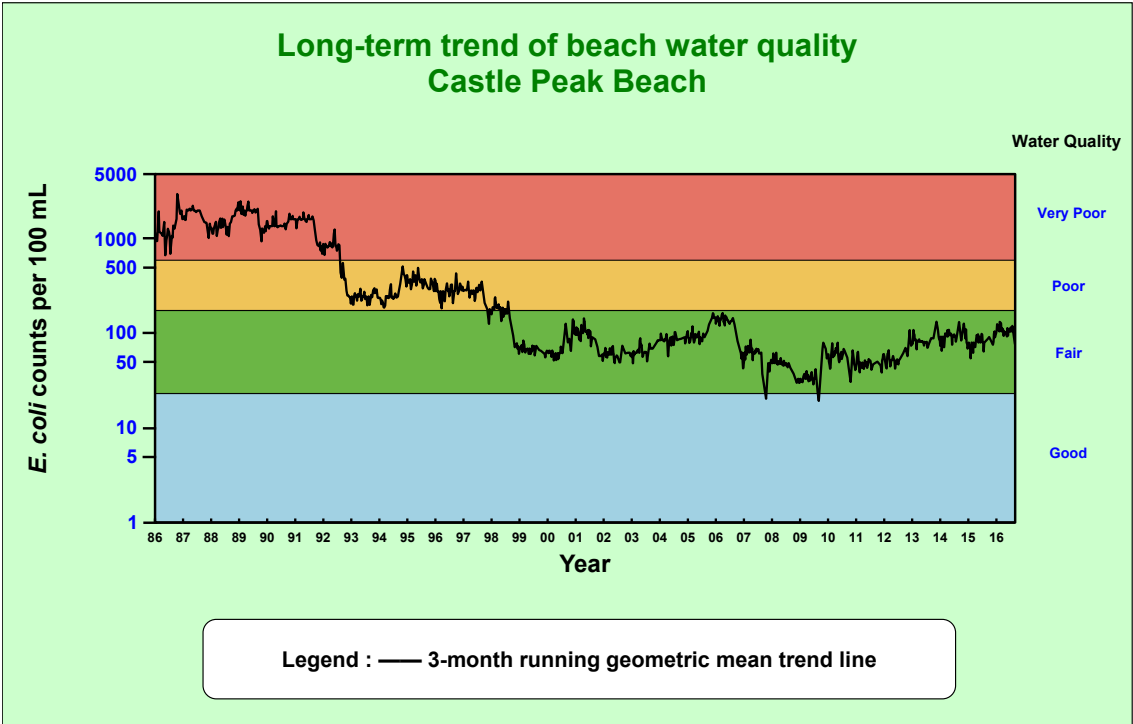
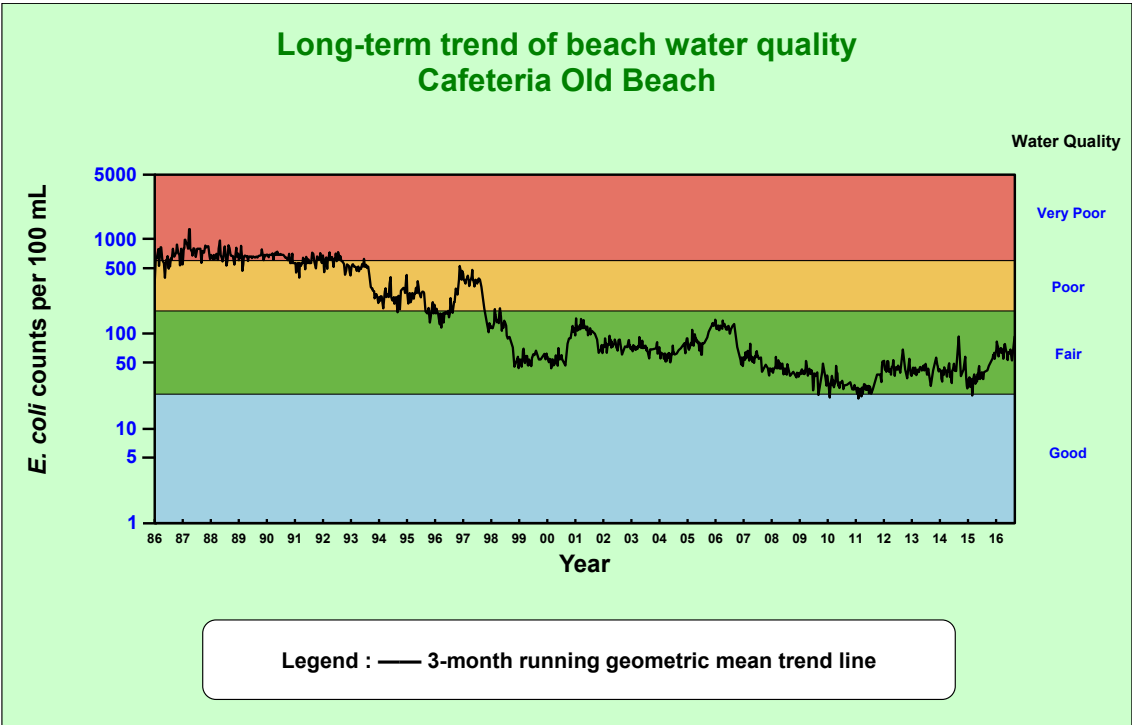
Legend : — 3-month running geometric mean trend line

### Long-term trend of beach water quality Cafeteria New Beach

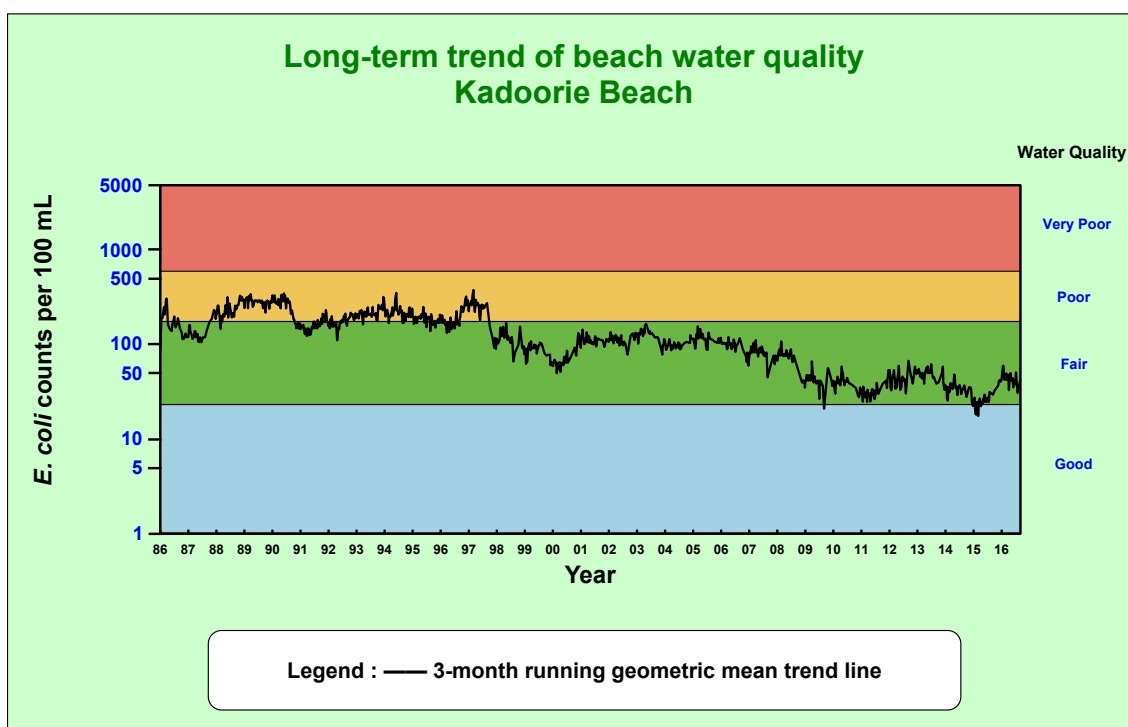
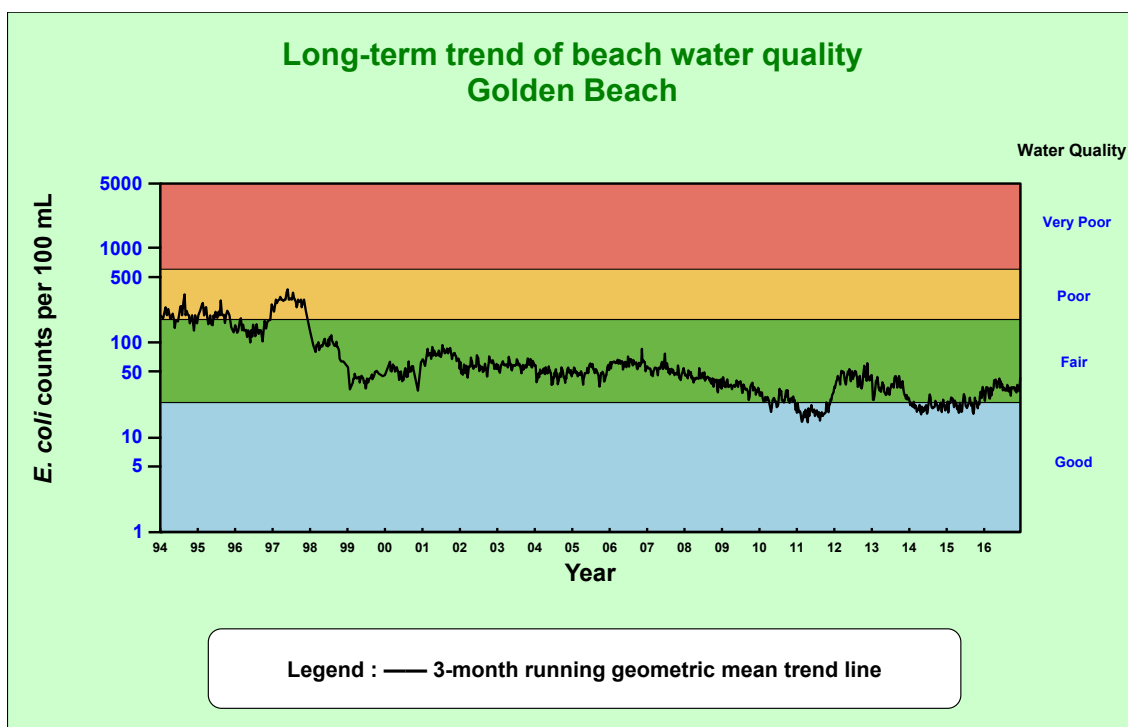


Legend : — 3-month running geometric mean trend line



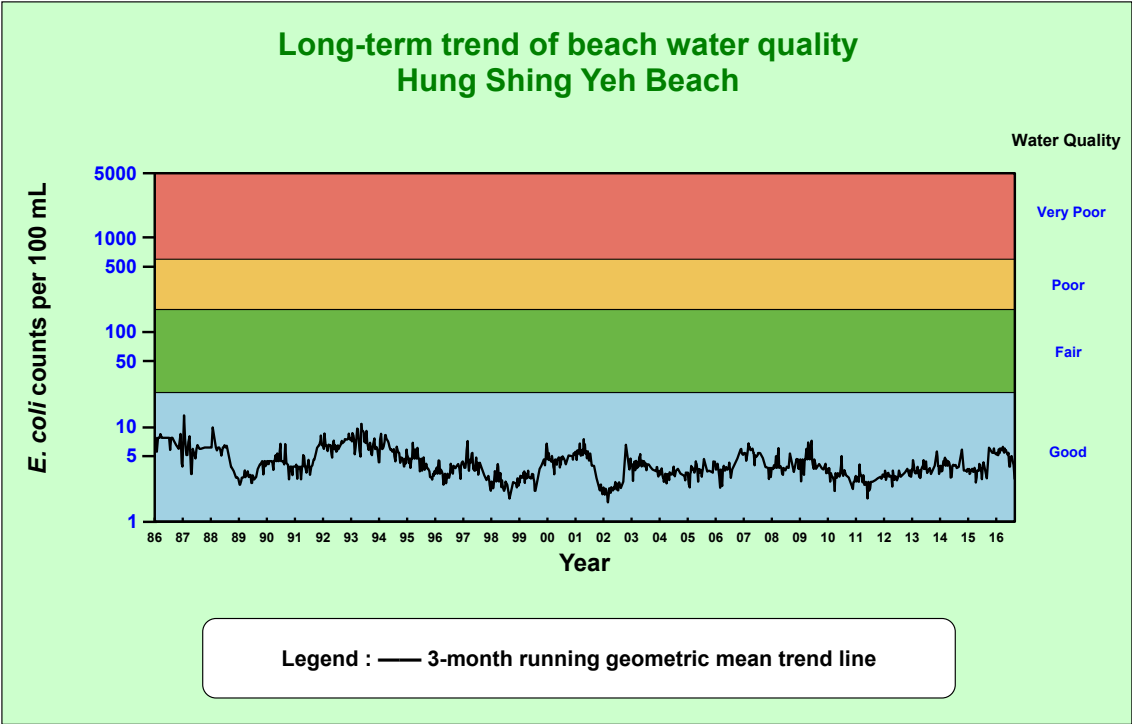
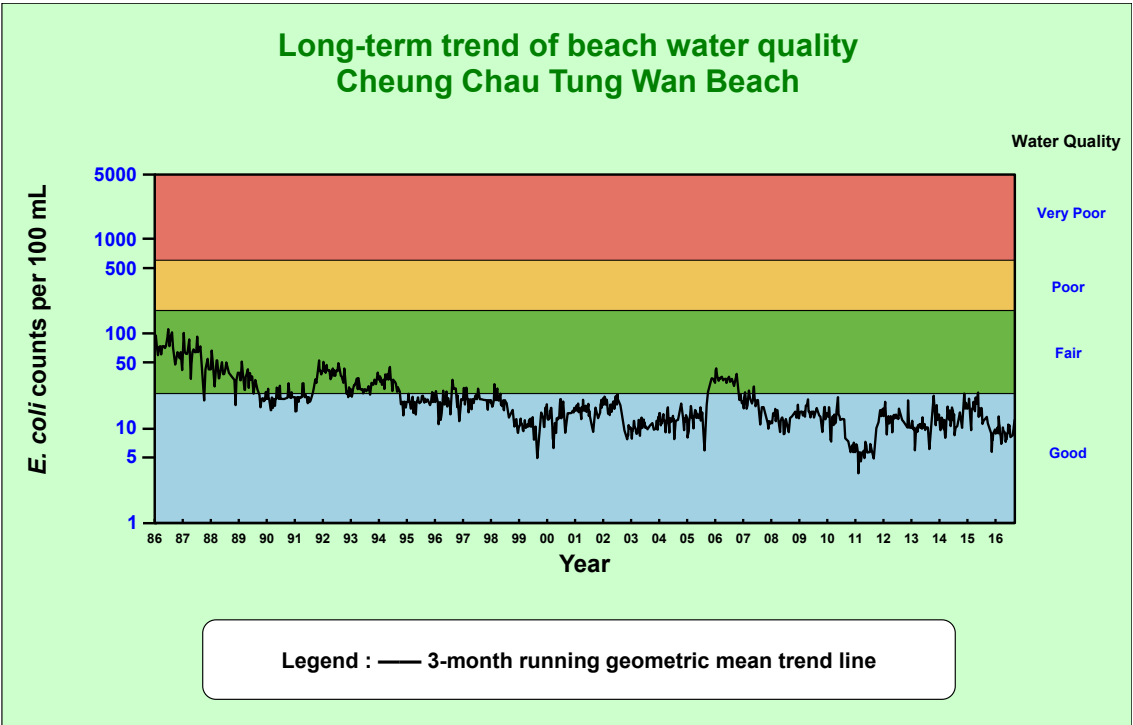


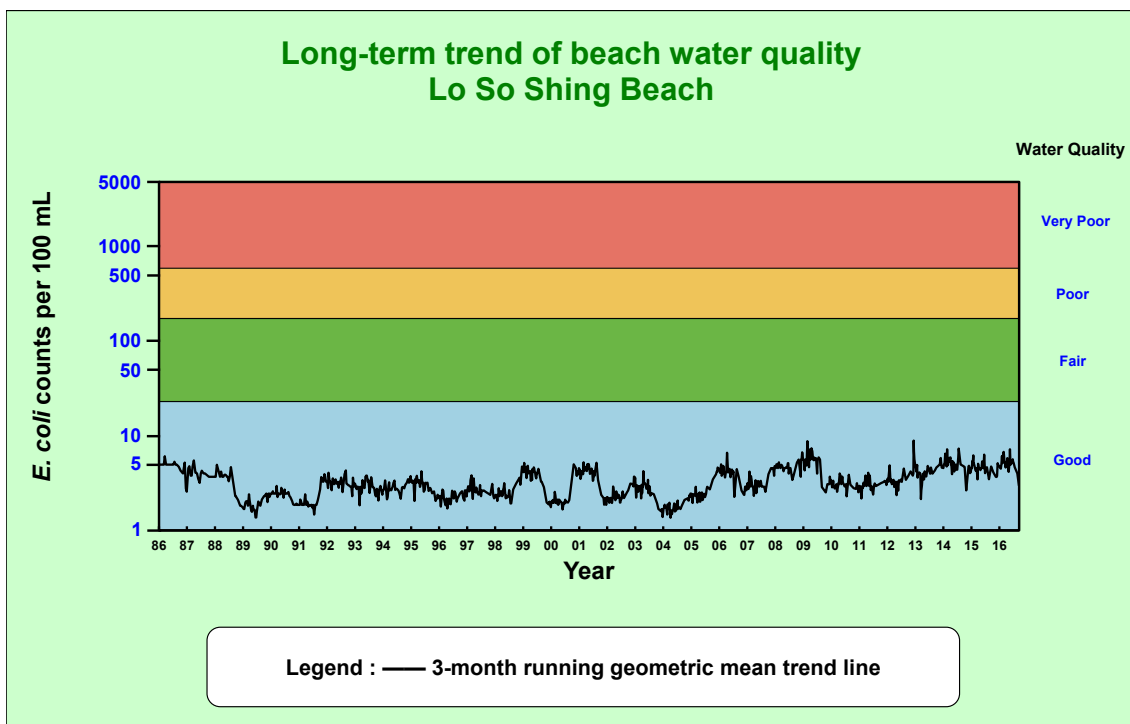
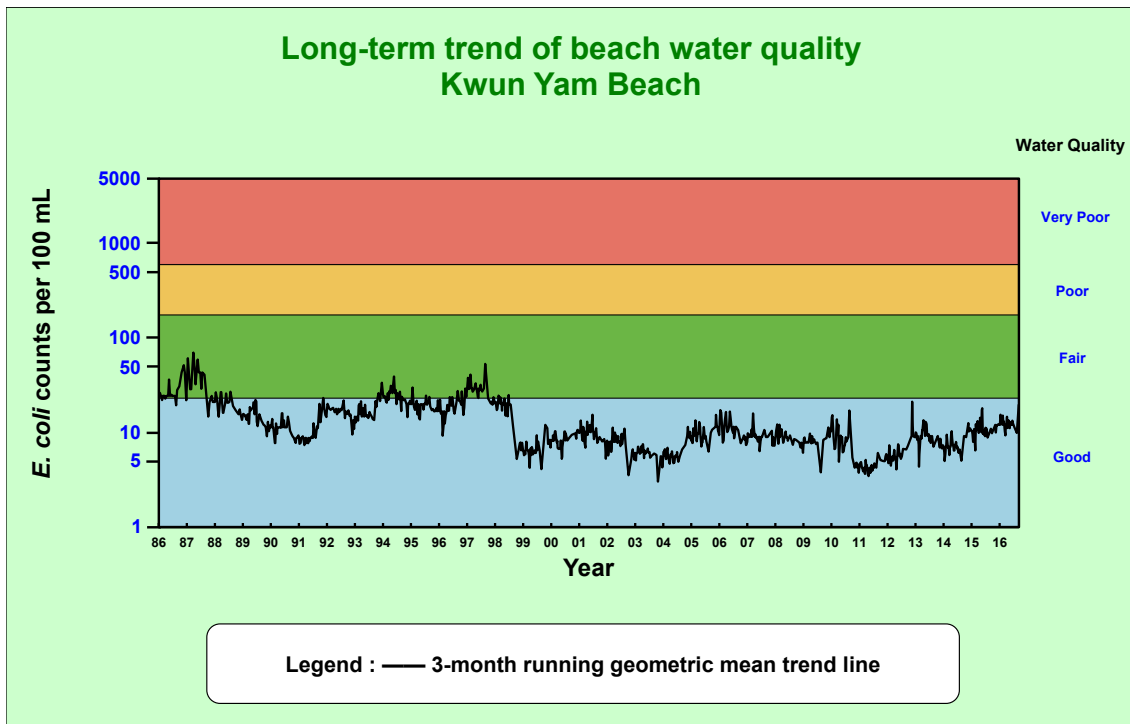


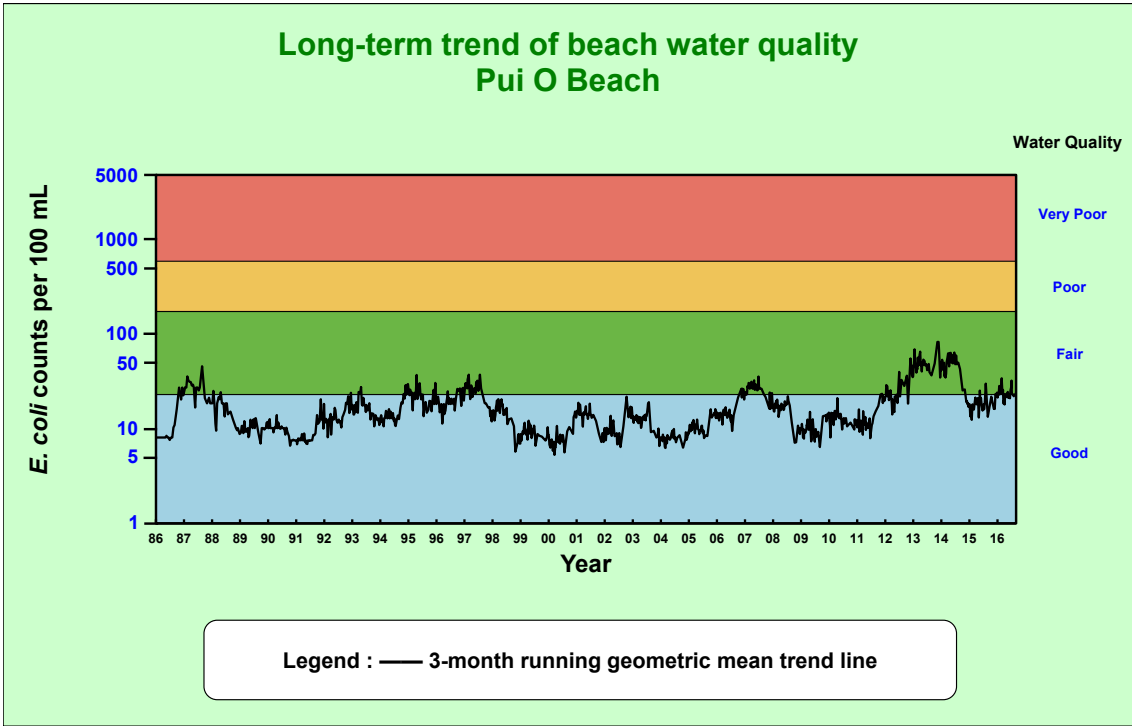
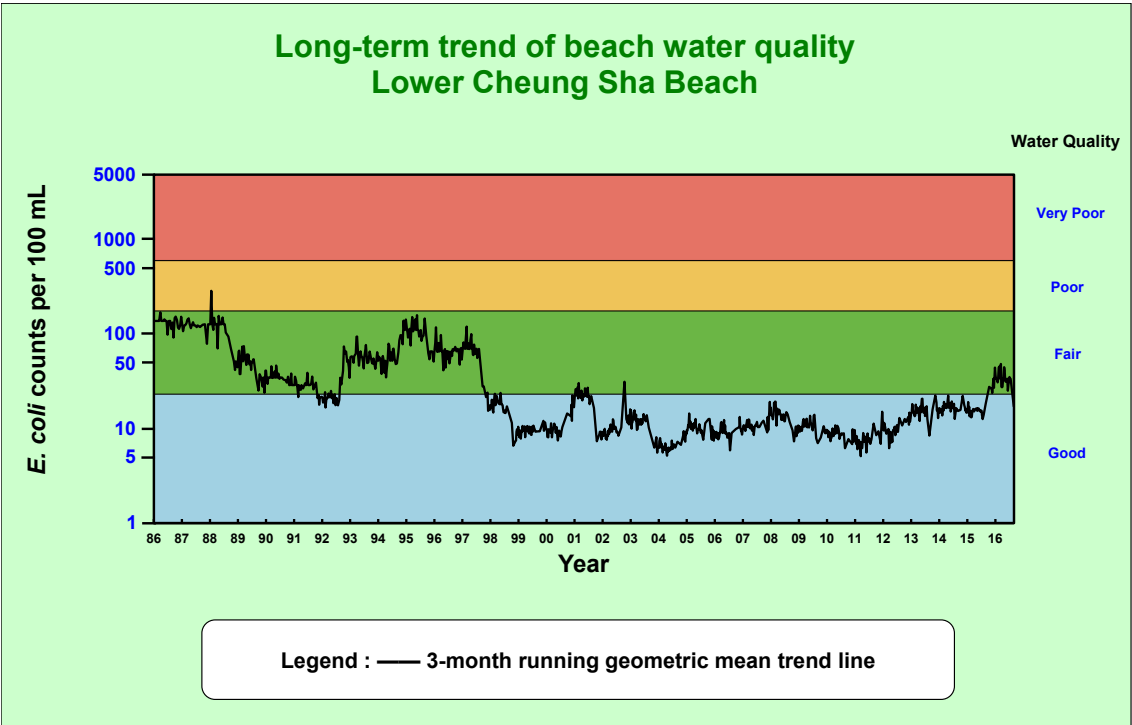




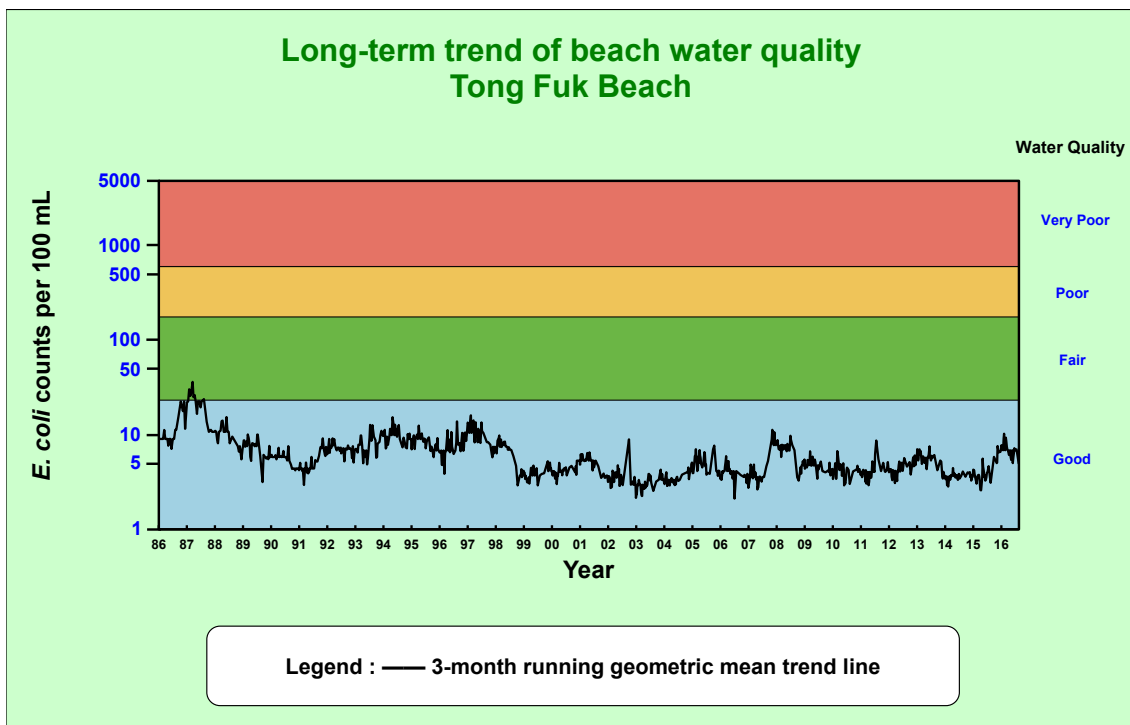
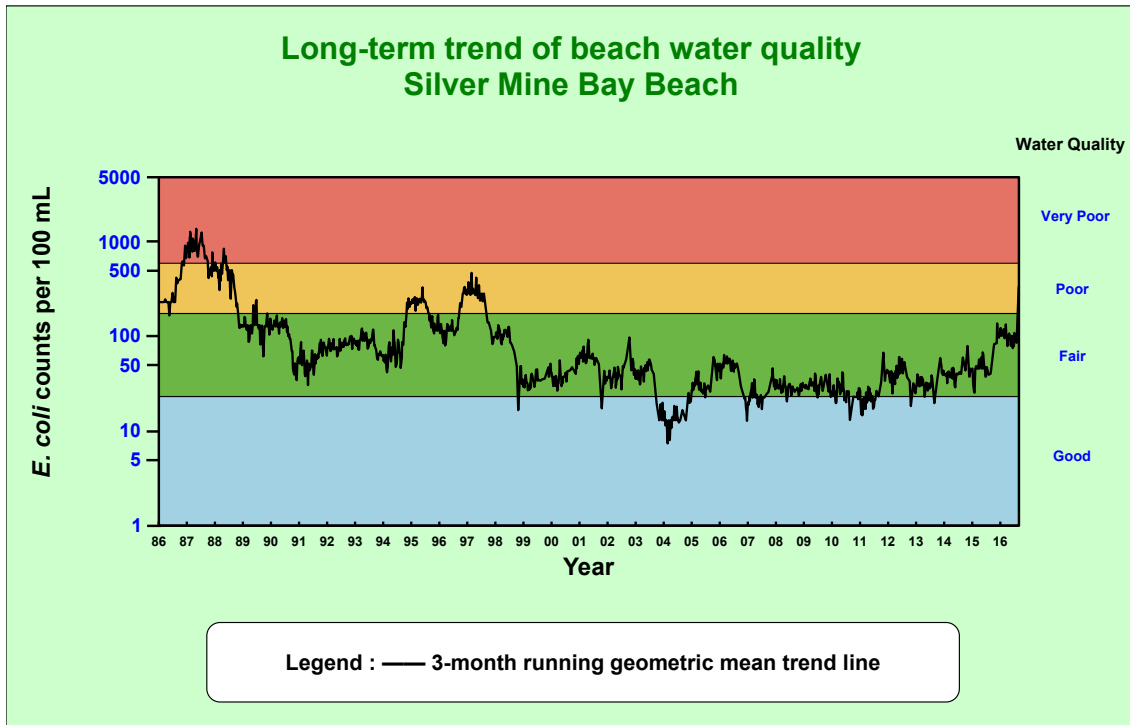
Outlying Islands

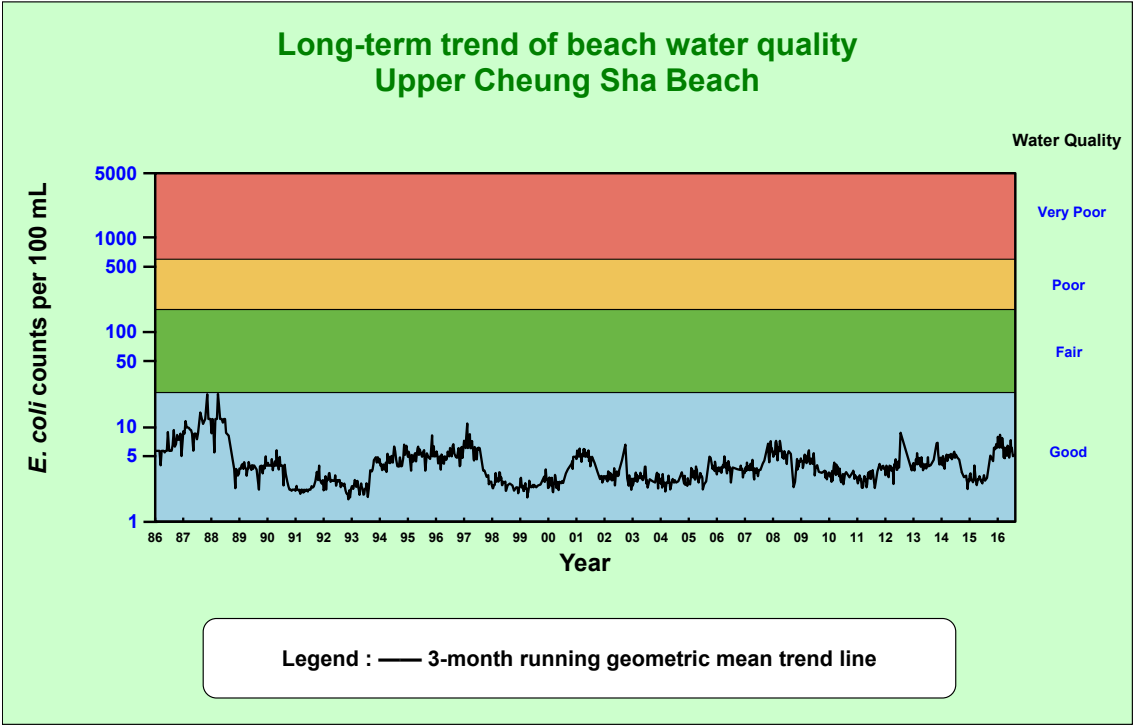












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## Contact us:

**Water Policy and Science Group**  
**Environmental Protection Department**

48/F Revenue Tower,  
5 Gloucester Road,  
Wan Chai, Hong Kong

Tel: (852)2838-3111

Fax: (852)2827-8296

Email: [enquiry@epd.gov.hk](mailto:enquiry@epd.gov.hk)