

# 香港泳灘水質 2018

## *Beach Water Quality in Hong Kong*

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*



▲ Beaches adorning Hong Kong's coastline



## **Introduction**

Bathing in coastal beaches is a popular leisure activity to local residents and tourists. Each summer, our beaches attract millions of bathers coming to enjoy the sun, the wave and the sand.

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 and the corresponding beach grading during the 2018 bathing season, and assesses the annual compliance with the bacteriological Water Quality Objective (WQO) for bathing waters.



▲ Beaches energized by bathers



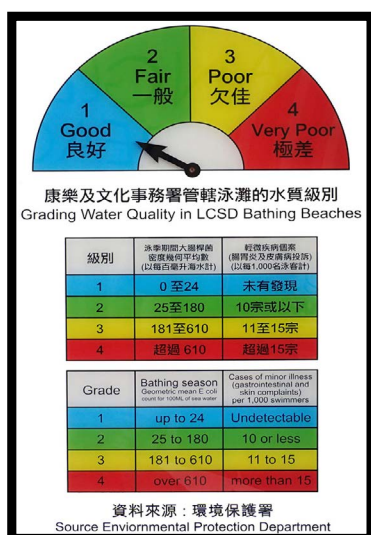
In 2018, the EPD monitored 41 gazetted beaches and three non-gazetted beaches in different parts of the territory. The gazetted beaches were monitored weekly during the bathing season from March to October, and EPD staff conducted field observations and collected water samples for laboratory analyses of *Escherichia coli* (*E. coli*) as the bacteriological water quality indicator. EPD staff also took *in-situ* measurements of dissolved oxygen, pH, salinity, temperature and turbidity of beach water.



◀ EPD staff collecting water samples and measuring field data at beaches on a weekly basis during the bathing season



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



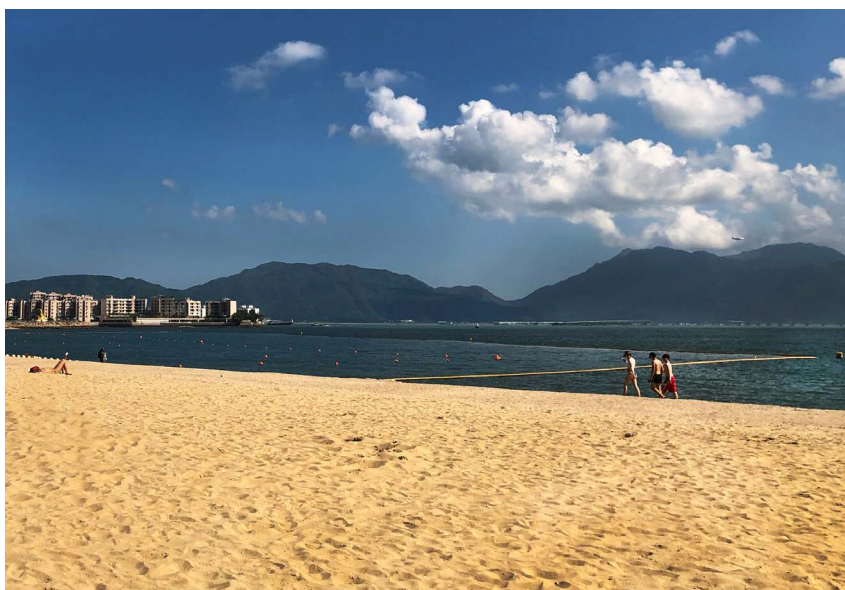
Hong Kong adopts a dual rating system to assess beach water quality: annual ranking and weekly grading which are both based on the *E. coli* level in beach water to indicate the suitability of the beaches for swimming. The annual ranking reflects the overall water quality of the beach over the entire bathing season, while the weekly grading traces the recent change in water quality. Under the dual rating system, beaches are categorised into “Good”, “Fair”, “Poor” and “Very Poor”. Beaches with “Good” or “Fair” annual ranking meet the bacteriological WQO for bathing waters.

▲ Water quality grading board displayed at the gazetted beaches

## Annual Beach Ranking in 2018

All 41 gazetted beaches in Hong Kong complied with the bacteriological WQO in 2018. When compared to 2017, the number of beaches ranked as “Good” has increased from 23 (or 56 %) to 26 (or 63 %), and the number of beaches ranked as “Fair” has decreased from 18 (or 44%) to 15 (or 37%). No beach was ranked as “Poor” or “Very Poor” this year.

The overall beach water quality was better in 2018 due to the very dry weather in the year. The cumulative rainfall in the 2018 bathing season was 44% lower than the same period in 2017, and 38% lower than the 1981-2010 climatological normal. Among all months, it was particularly hot and dry in May, with monthly rainfall and number of bright sunshine hours 81% lower and 69% higher, respectively, than the climatological normal.



▲ Cafeteria New Beach in Tuen Mun District receiving its very first “Good” annual ranking since 1986

Despite the fact that the overall water quality remained good, temporary fluctuations could be occasionally observed at individual beaches, especially when the weather condition deteriorated in August and September, such as the heavy rainstorm occasions brought by the Typhoon “Mangkhut” in mid-September. In general, the *E. coli* levels were still within the natural range of fluctuation of the bacteriological water quality, and returned to normal level in days.



Among all 41 gazetted beaches in Hong Kong, the beaches located in the Southern (Hong Kong Island South), Islands and Sai Kung Districts generally received better annual ranking, similar to previous years.

Ten of the 12 beaches in the Southern District were ranked as “Good”. Rocky Bay Beach has changed from “Good” to “Fair”, while Big Wave Bay Beach continued to be ranked as “Fair” for the third consecutive year. Among the nine beaches in the Islands District, Pui O Beach has improved ranking from “Fair” to “Good”, on par seven other beaches in the District. Silver Mine Bay Beach, on the other hand, continued to receive a “Fair” ranking. In the Sai Kung District, as Silverstrand Beach received an improved ranking from “Fair” to “Good”, all six beaches were ranked as “Good”.



▲ Silver Mine Bay Beach closed in 2017 for execution of improvement works and reopened in mid-2018.

All eight beaches in the Tsuen Wan District remained to receive a “Fair” ranking. Of the six beaches in the Tuen Mun District, four received a “Fair” ranking as in last year, while Cafeteria New Beach and Golden Beach has improved from “Fair” to “Good” for the very first time since monitoring started.



▲ Approach Beach meeting the bacteriological Water Quality Objective for bathing waters for the ninth consecutive year

The water quality of Tsuen Wan beaches continued to be satisfactory 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 works 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 bacteriological WQO for bathing waters. This has led to the gradual re-opening of all these beaches during 2011 – 2014.

EPD also monitored three non-gazetted beaches: Discovery Bay (a popular beach in Lantau Island), New Kiu Tsui (a sandy beach adjacent to Kiu Tsui Beach in Sai Kung), and Lung Mei (a planned artificial beach in Tai Po). In 2018, Discovery Bay and New Kiu Tsui Beach continued to receive a “Good” ranking. Lung Mei received its first “Good” ranking since its monitoring started. 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, consideration improvement in water quality at Lung Mei has been observed, and is expected to continue.



## **Weekly Beach Grading in 2018**

To make the public aware of the latest beach water quality, the EPD issues the latest grading of all open beaches through weekly press releases, EPD's website, the beach enquiry hotline, GeoInfo Map of the GovHK website and noticeboards at the beaches.

In 2018, the ten beaches in the Southern District had decent water quality in their open period in general, and received mostly “Good” or “Fair” grading over the bathing season. Four beaches, i.e. Chung Hom Kok Beach, Repulse Bay Beach, South Bay Beach and Turtle Cove Beach, achieved 100% “Good” grading. Shek O Beach however had once changed to “Very Poor” in mid-June after heavy rain.

The general cleanliness of beaches in the Islands District could be reflected by their weekly grading distribution. Cheung Chau Tung Wan Beach, Hung Shing Yeh Beach, Lo So Shing Beach, Tong Fuk Beach and Upper Cheung Sha Beach, a total of five beaches received “Good” grading for the entire bathing season, in which Upper Cheung Sha Beach has already maintained the “Good” record for four consecutive years. Only Kwun Yam Beach was once rated as “Very Poor” in early July after rainfall. Upon reopening of Silver Mine Bay Beach in mid-July 2018 after completion of the improvement works, the beach was largely graded as “Fair”.



▲ Upper Cheung Sha Beach achieving 100% “Good” weekly grading for four consecutive years



Beaches in the Sai Kung District continued to enjoy fine water quality. Hap Mun Bay Beach, Trio Beach and Kiu Tsui Beach achieved “Good” grading 100%, 97% and 92% of the occasions in this bathing season. Both Clear Water Bay First Beach and Silverstrand Beach changed to “Very Poor” once in September due to antecedent rainfall.

Most of the beaches in Tuen Mun District had better water quality when compared to last year, and usually received “Good” or “Fair” weekly grading. Butterfly Beach and Kadoorie Beach received a “Very Poor” grading in the first half of the bathing season after heavy downpours.



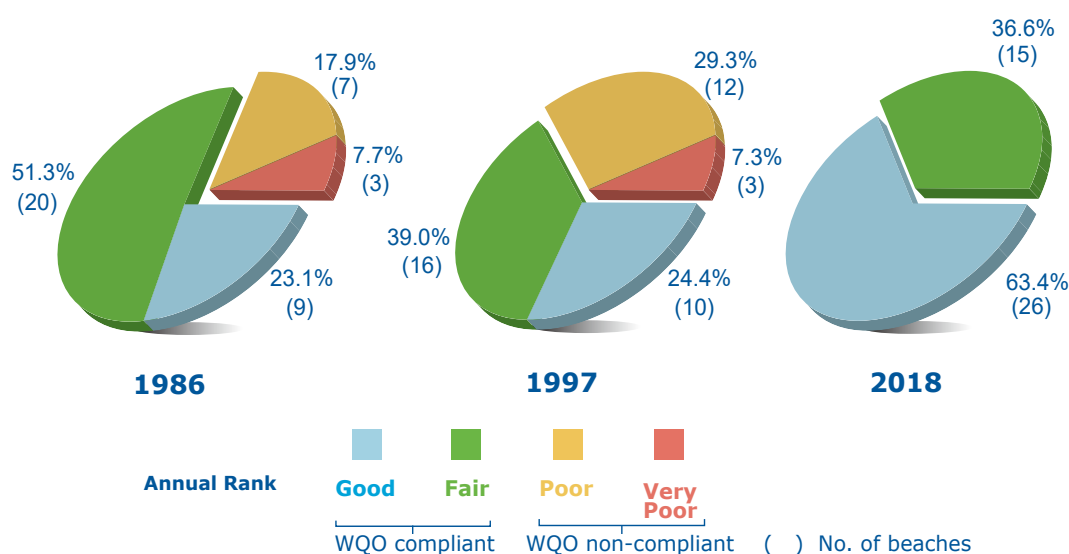
▲ Golden Beach receiving “Good” grading for more than a half of the 2018 bathing season

Water quality of Tsuen Wan beaches continued to be stable. For most of the time the beaches were graded as “Fair”, and occasionally changed to “Good” or “Poor”. Anglers’ Beach, Ma Wan Tung Wan Beach and Ting Kau Beach were rated as “Very Poor” one to three times, mostly associated with rainfall.

## Water Quality Trend

For the last nine years, Hong Kong beach water quality has been able to fully comply with the bacteriological WQO, and suitable for swimming. The WQO compliance rate had changed from 74% in 1986 (29 of 39 beaches) to 63% (26 of 41 beaches) in 1997, and then had achieved 100% (all 41 beaches) since 2010.

## Comparison of annual beach ranking of gazetted beaches in 1986, 1997 and 2018



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

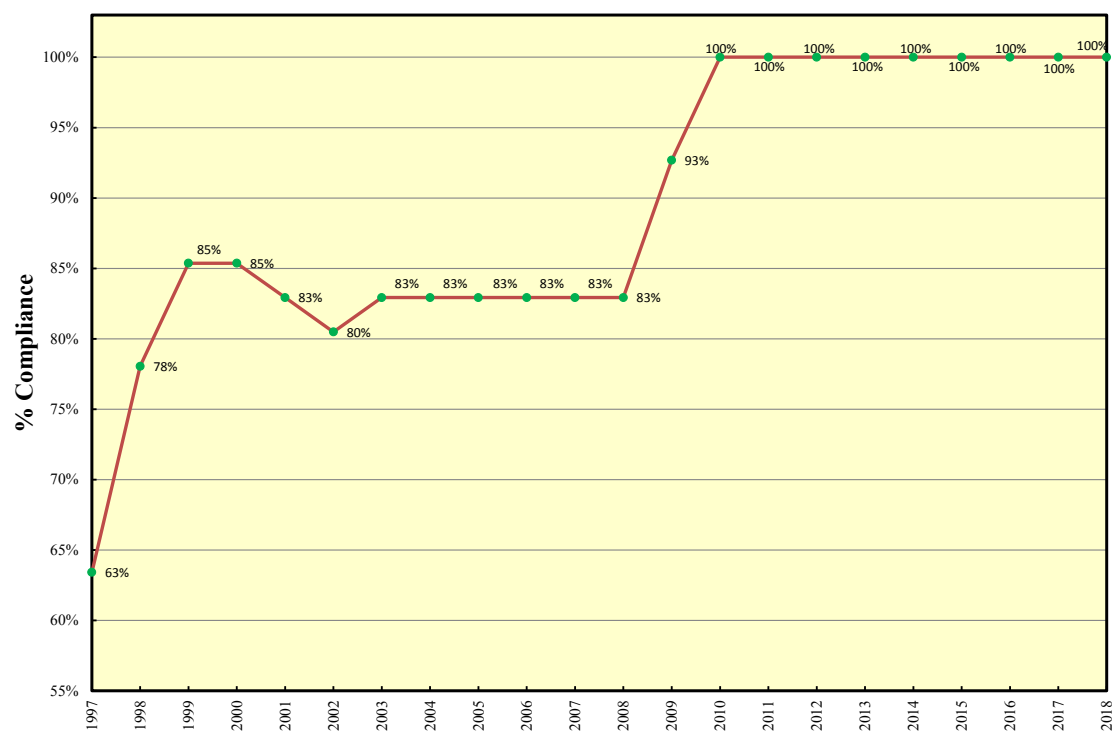
Looking back to the 1980s, many beaches were closed (e.g. Cafeteria Old Beach, Castle Peak Beach and Silver Mine Bay Beach) or on the verge of being closed (e.g. Middle Bay Beach and Repulse Bay Beach) due to poor water quality. There was a further drop in compliance rate in the mid-1990s due to population growth particularly in the new town areas. In the last decade, there has been progressive improvement in beach water quality which could be attributed to various proactive pollution abatement measures, including enforcement of environmental legislation, extension of the sewerage network and 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 and 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 – 2018	
<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 scale commissioning of all facilities of the Harbour Area Treatment Scheme (HATS) Stage 2A.</li> </ul>	Beaches along the Tsuen Wan coast

All of Hong Kong's gazetted beaches have now achieved the required standard for swimming for the ninth consecutive year. EPD will continue to closely monitor the beach water quality to support water quality management policy and as reference for beach users.

Compliance with WQO at gazetted beaches during 1997 - 2018



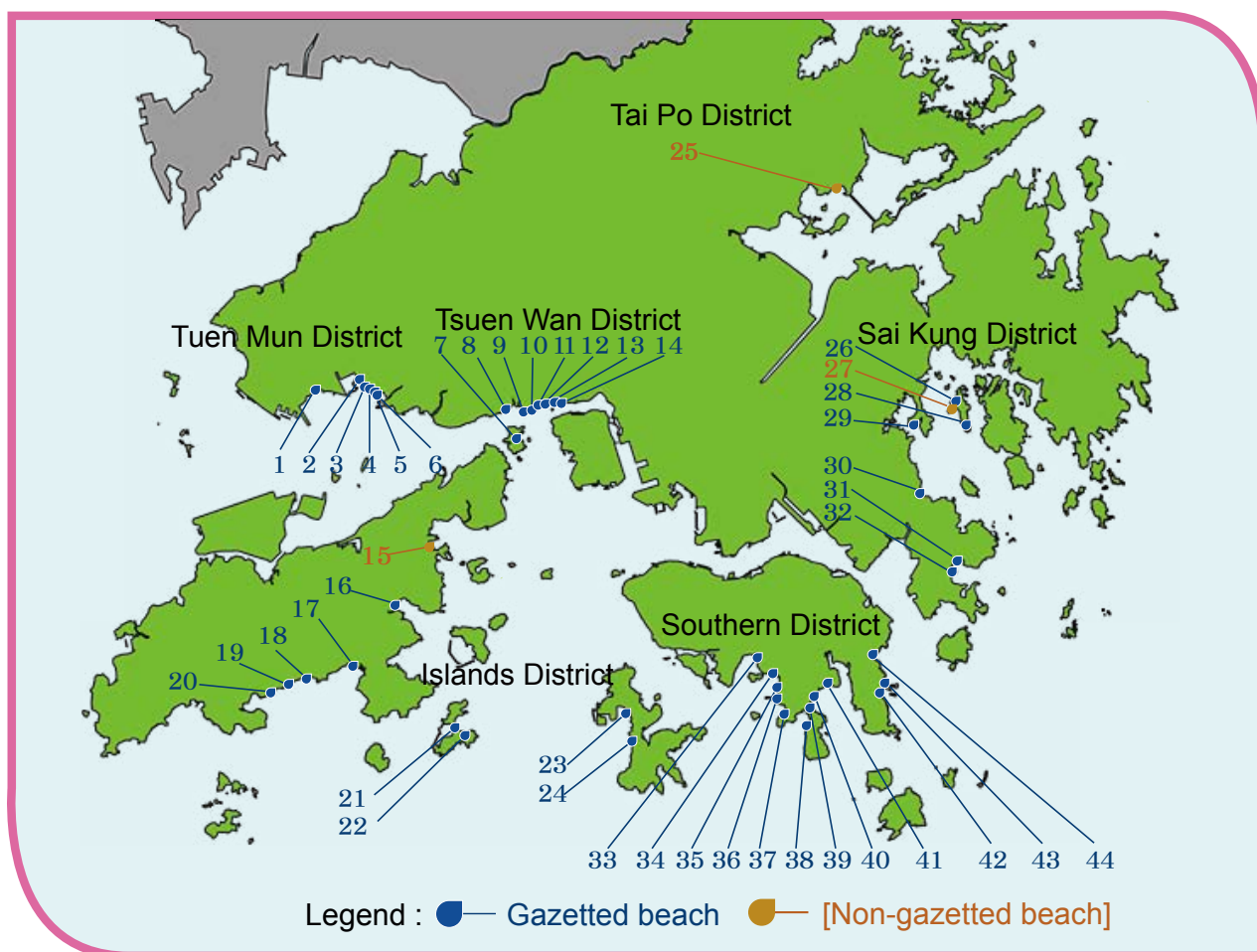


Water quality trend lines of gazetted beaches over the last 33 years are provided in this report. More in-depth background and details of the beach monitoring programme are available at the beach water quality thematic website (<https://www.epd.gov.hk/epd/beach>), which also provides access to the annual beach water quality reports and data published since 2000.



▲ Family fun

## 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

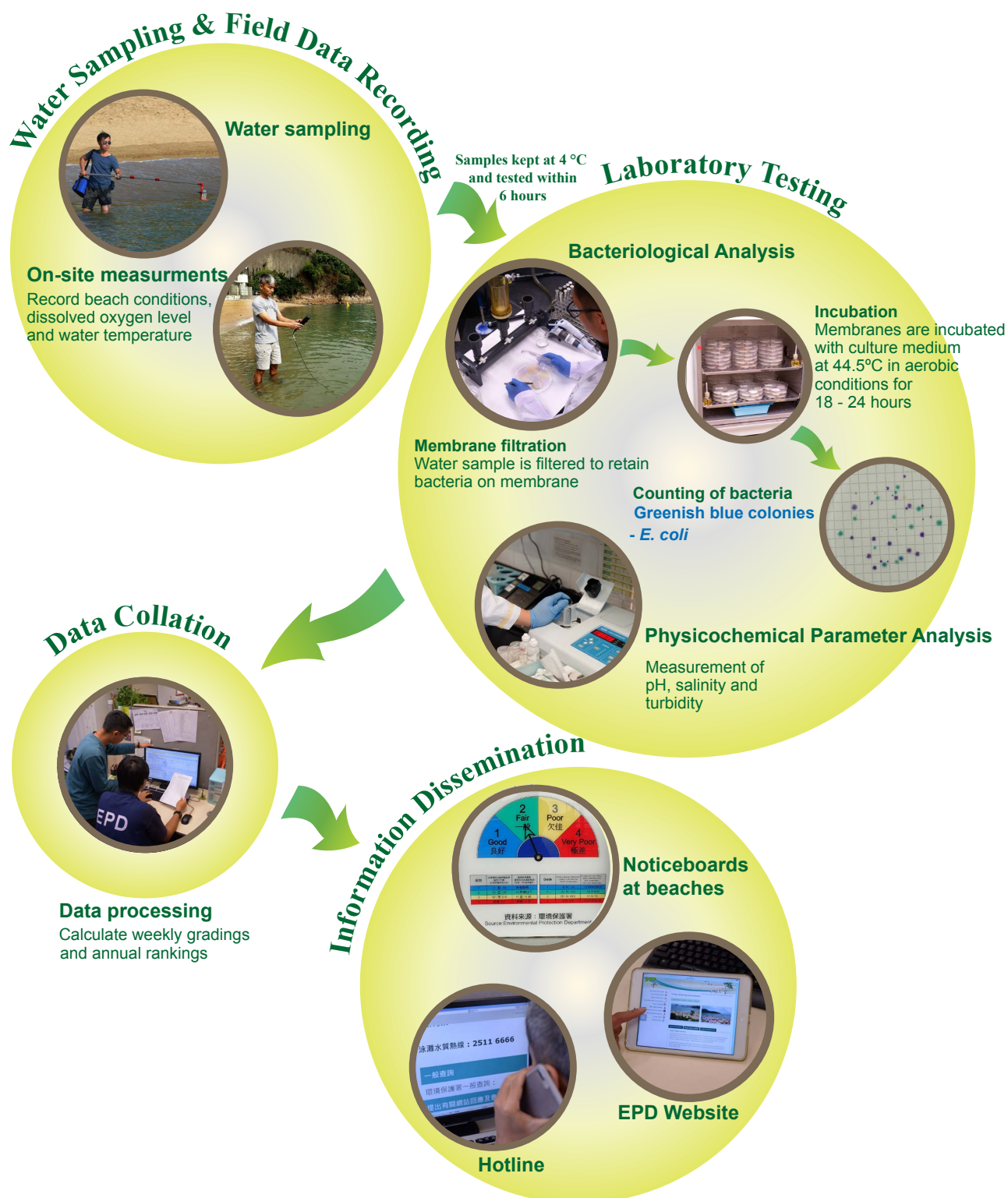


## Beach monitoring frequency

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

## 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** (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

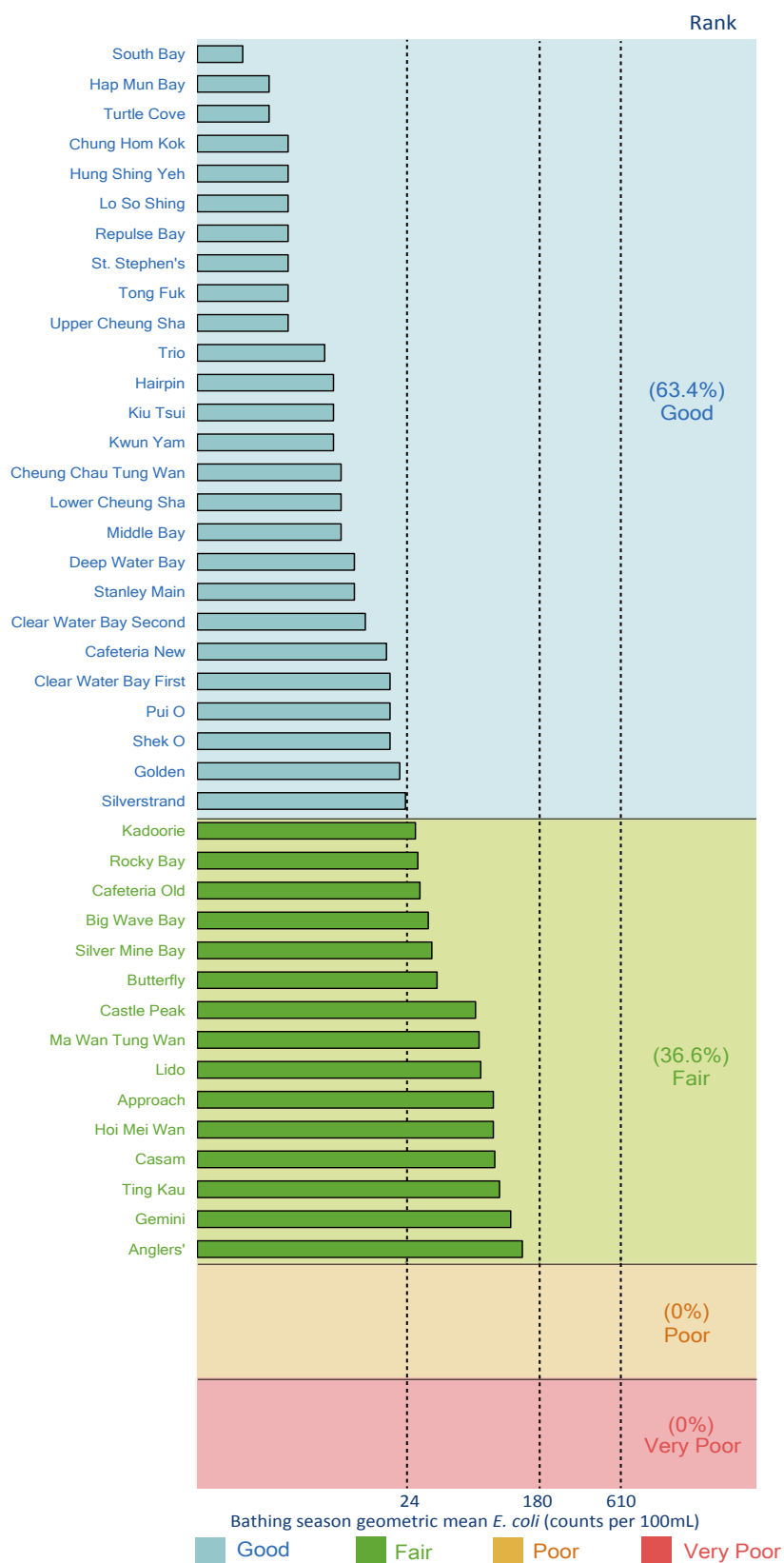
## Hong Kong's weekly beach grading system

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

## 2018 Annual ranking and bathing season geometric mean *E. coli* levels of Hong Kong's gazetted beaches

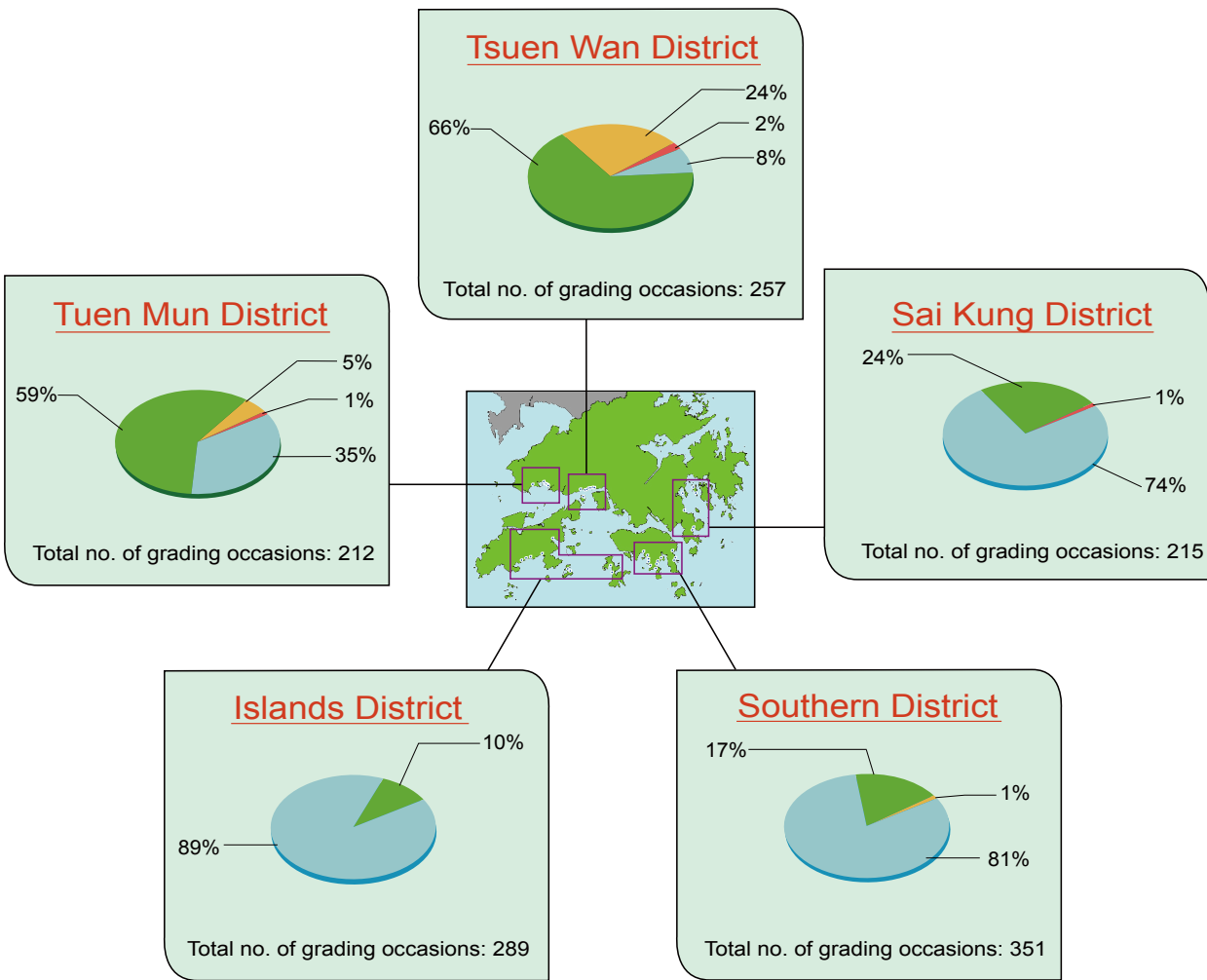




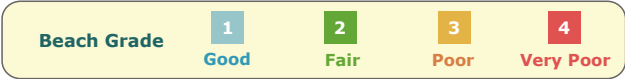
## Annual ranking of gazetted beaches at a glance in 2018



Weekly beach grading summary of open gazetted beaches by district in 2018



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





## Southern District beaches

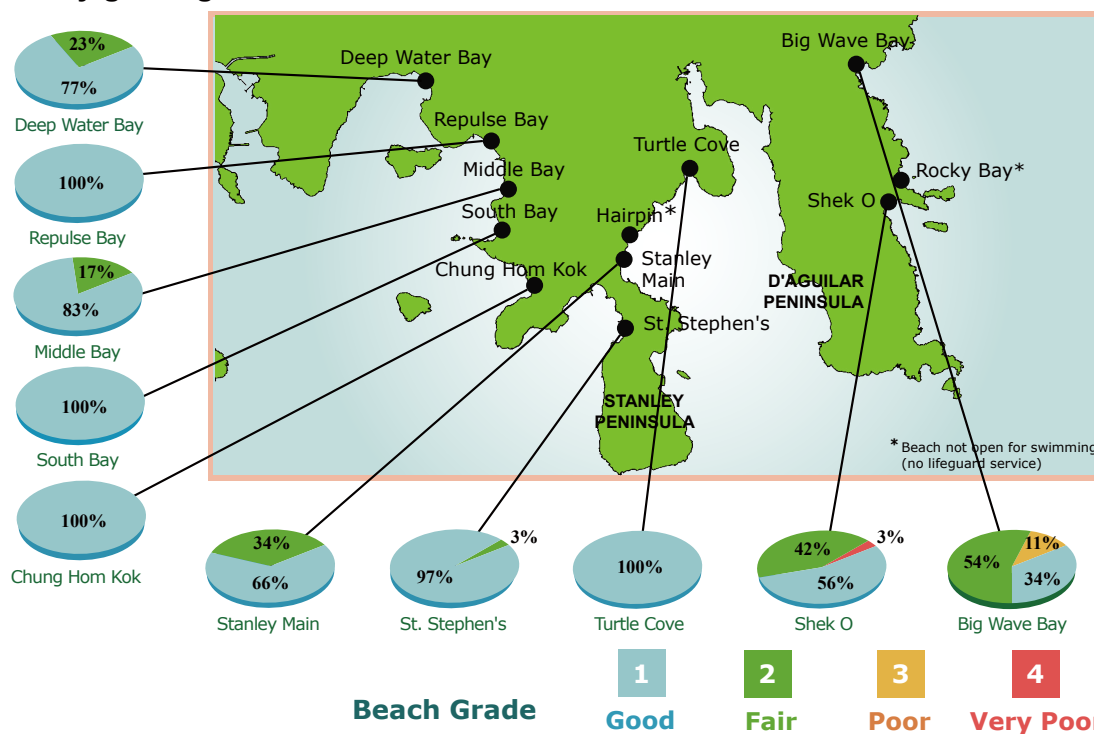
### Annual ranking



**Annual Rank**

Good Fair Poor Very Poor

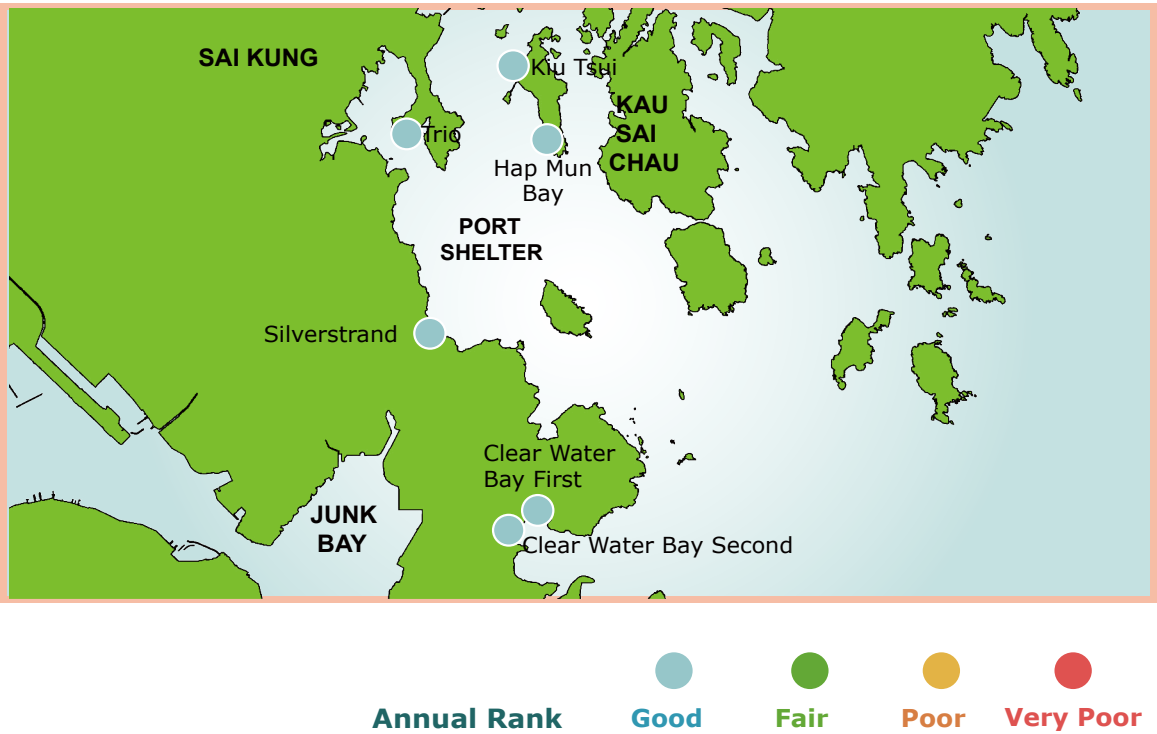
### Weekly grading



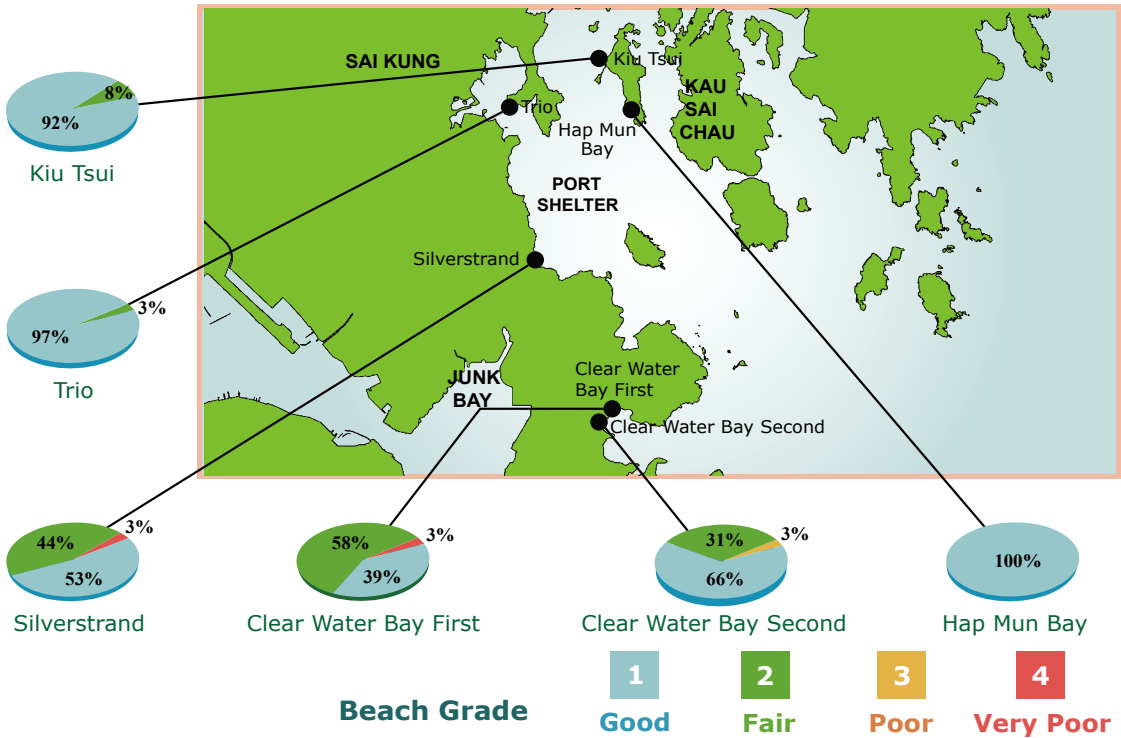
Note: Figures may not add up to 100% due to roundings; "\*" Beach not open for swimming. No grading was provided

Sai Kung District beaches

Annual ranking



Weekly grading



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

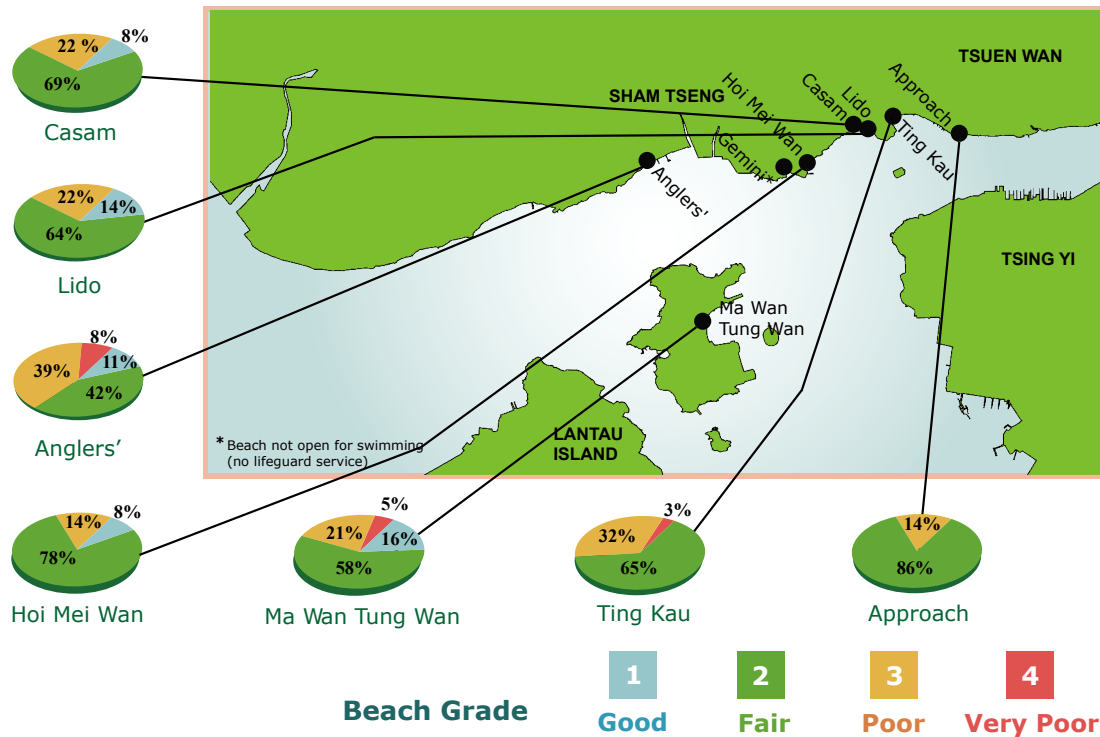


## Tsuen Wan District beaches

### Annual ranking



### Weekly grading



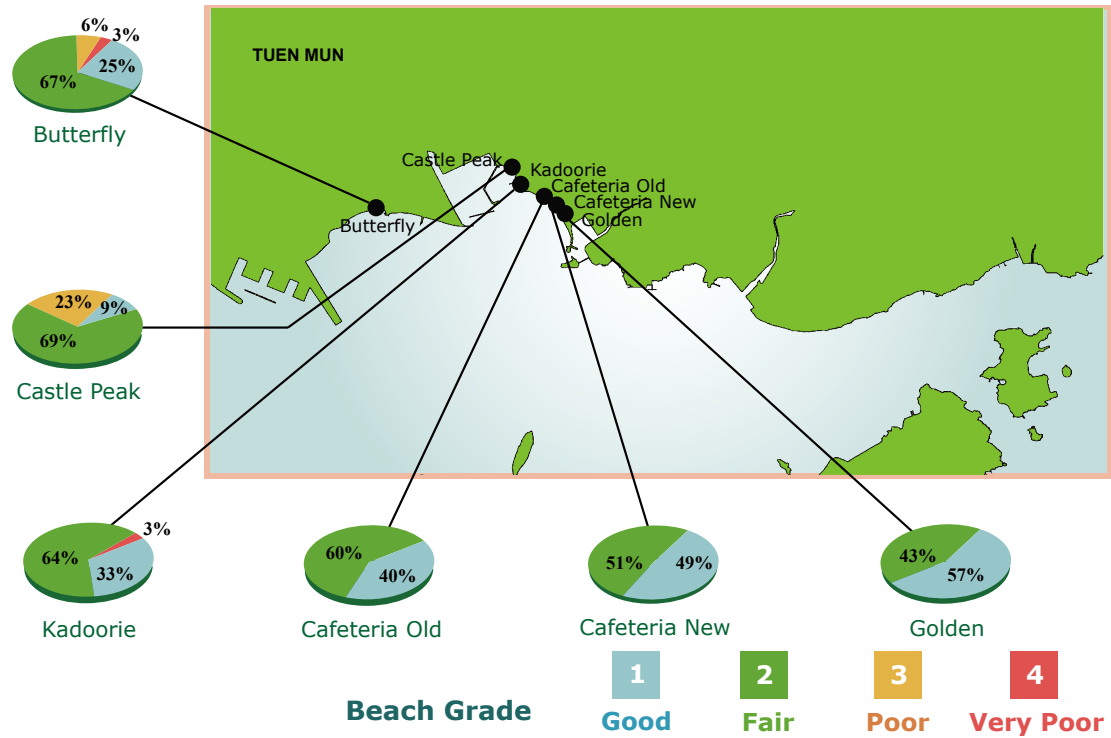
Note: Figures may not add up to 100% due to roundings; "\*" Beach not open for swimming. No grading was provided.

Tuen Mun District beaches

Annual ranking



Weekly grading



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



## Islands District beaches

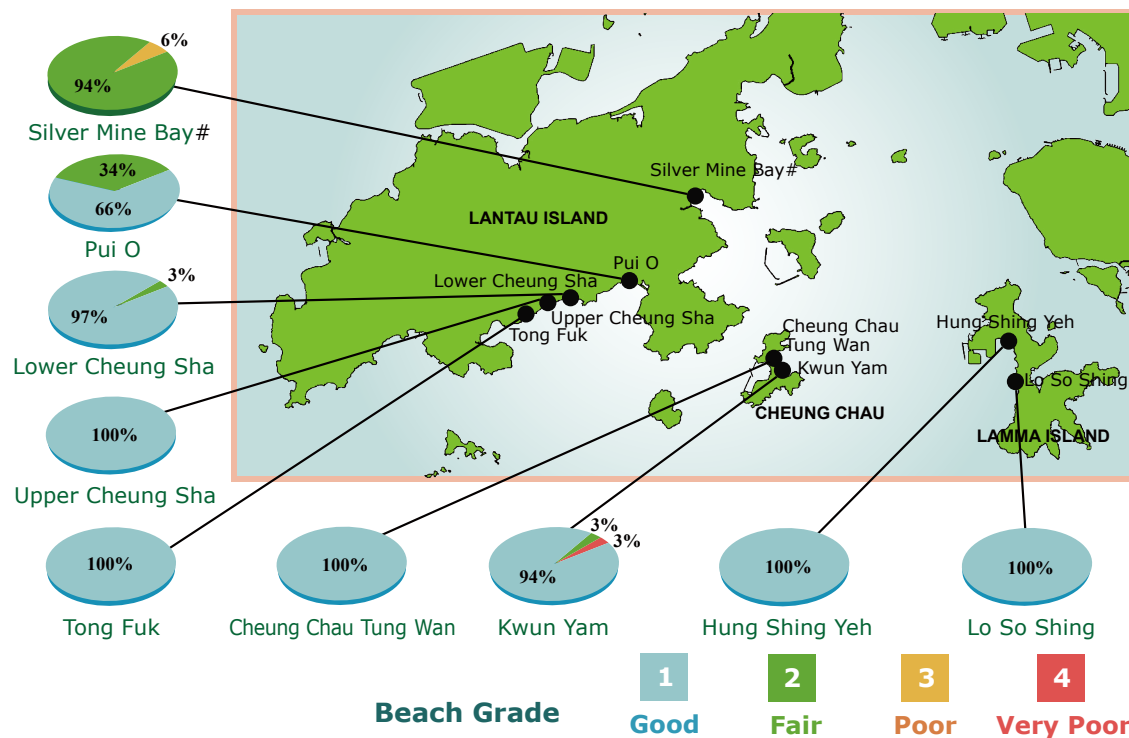
### Annual ranking



Annual Rank

Good	Fair	Poor	Very Poor
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### Weekly grading

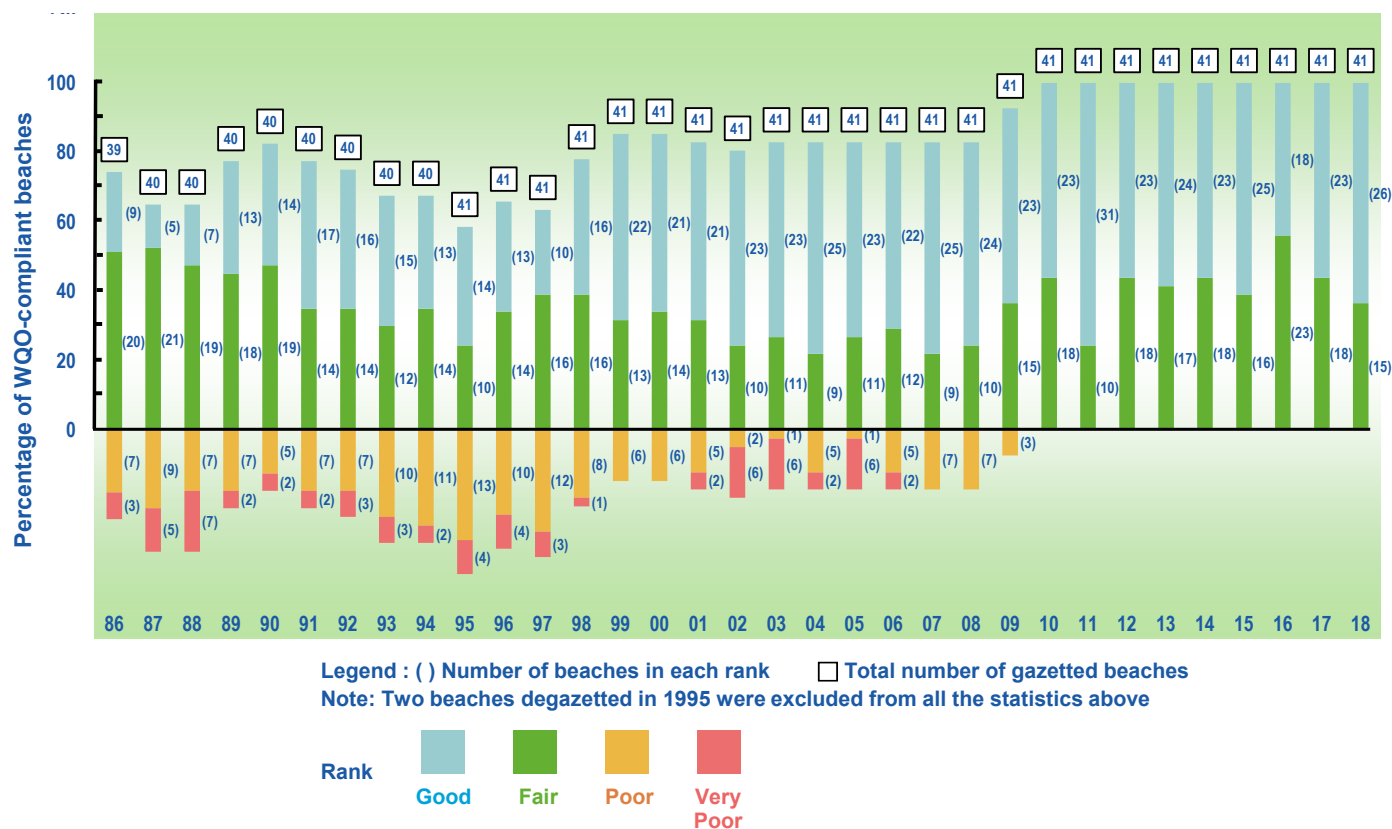


Beach Grade

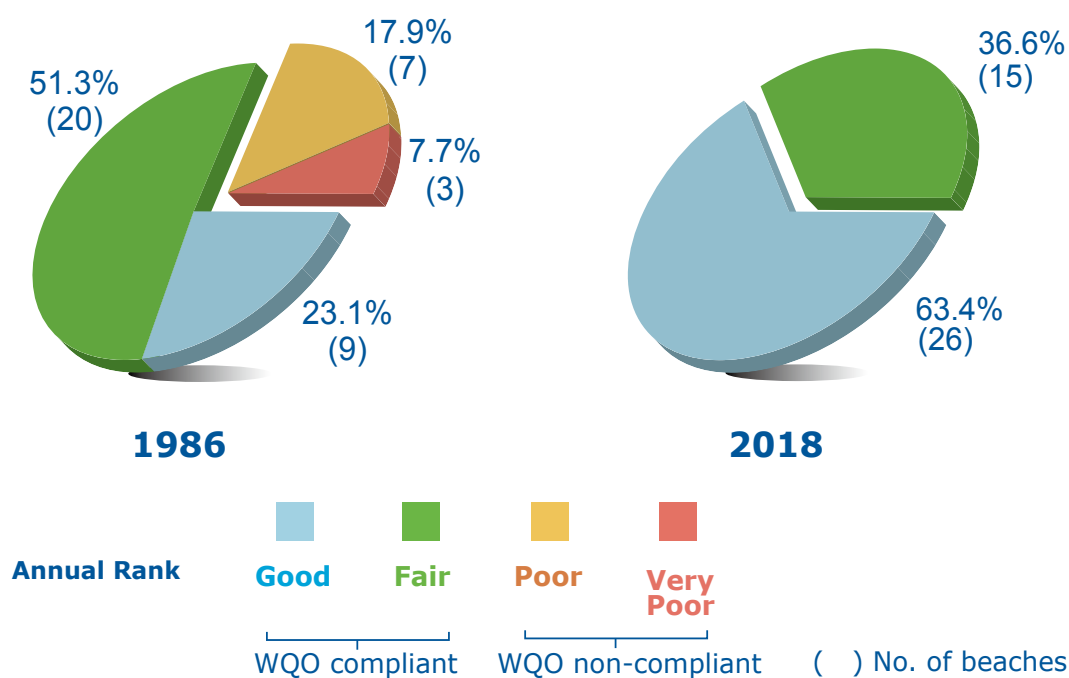
1	2	3	4
Good	Fair	Poor	Very Poor

Note: Figures may not add up to 100% due to roundings;  
 # Reopened on 18 July 2018 after completion of improvement works

## Annual beach rankings of gazetted beaches from 1986 to 2018



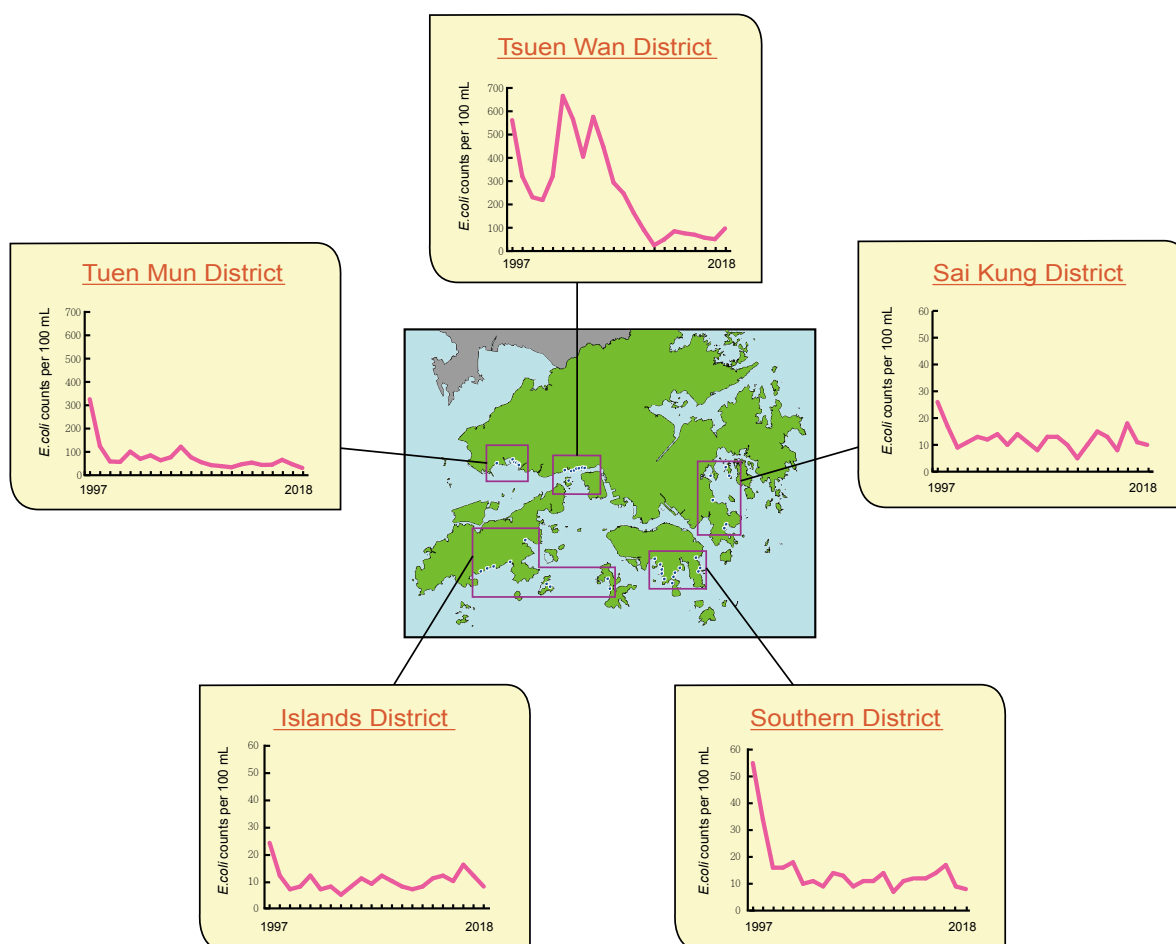
## Comparison of annual beach ranking of gazetted beaches in 1986 and 2018



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 - 2018



## Appendix A - Annual geometric mean *E. coli* levels (1997-2018)

### 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	2007
Big Wave Bay	179	114	77	98	106	23	33	26	101	50	17
Chung Hom Kok	22	40	14	8	15	13	14	9	13	10	9
Deep Water Bay	55	46	14	16	18	9	9	7	8	7	7
Hairpin	44	72	17	18	10	6	7	7	13*	11*	19*
Middle Bay	40	16	11	11	8	9	14	12	20	18	9
Repulse Bay	23	11	8	9	13	9	12	4	8	12	7
Rocky Bay	399*	223*	72*	80*	118*	43*	28*	19*	30*	33*	17*
Shek O	102	70	32	29	31	13	11	16	19	24	18
South Bay	17	6	4	7	5	5	11	9	7	7	5
St. Stephen's	40	26	11	6	7	5	9	4	12	11	6
Stanley Main	72	24	13	12	9	8	6	5	7	10	9
Turtle Cove	40	14	12	11	15	8	4	5	8	7	5

Beach	<i>E. coli</i> counts per 100mL										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Big Wave Bay	31	46	149	17	31	21	40	21	78	36	34
Chung Hom Kok	13	14	9	5	5	8	13	13	6	6	4
Deep Water Bay	9	12	9	6	9	11	14	19	24	14	11
Hairpin	10*	12*	33*	6*	9*	14*	12*	8*	17*	5*	8*
Middle Bay	11	12	12	6	15	14	13	13	20	14	9
Repulse Bay	14	11	7	6	7	10	11	14	10	5	4
Rocky Bay	15*	13*	50*	23*	30*	22*	16*	35*	47*	18*	29*
Shek O	22	11	19	11	16	15	18	29	26	16	19
South Bay	5	4	4	4	5	4	5	9	5	3	2
St. Stephen's	9	6	4	4	4	10	5	6	7	4	4
Stanley Main	10	13	20	6	34	19	9	20	23	8	11
Turtle Cove	5	5	8	4	6	6	8	5	11	5	3

Note: \* Beach not open for swimming that year



## Sai Kung 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	2007
Clear Water Bay First	62	41	11	16	28	28	17	9	16	20	14
Clear Water Bay Second	66	44	12	26	22	14	21	10	19	13	9
Hap Mun Bay	3	2	2	2	1	2	4	3	4	4	3
Kiu Tsui	5	4	4	5	5	4	5	17	14	11	6
Silverstrand	148	99	32	61	100	133	97	74	67	30	33
Trio	30	21	17	10	12	6	10	2	6	5	2

Beach	<i>E. coli</i> counts per 100mL										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Clear Water Bay First	11	15	10	7	8	24	15	14	31	20	19
Clear Water Bay Second	19	27	13	5	18	15	18	17	32	16	13
Hap Mun Bay	5	3	3	2	2	7	4	2	4	3	3
Kiu Tsui	13	16	13	9	10	13	11	6	10	5	8
Silverstrand	35	51	28	18	30	39	40	18	63	56	24
Trio	12	5	6	2	9	8	10	4	13	7	7

## Tsuen Wan 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	2007
Anglers'	691*	502*	442*	326*	621*	1 169*	693*	619*	895*	772*	496*
Approach	1 009*	435*	387*	316*	411*	696*	762*	470*	663*	599*	352*
Casam	609	239	231	209	233	741	702*	594*	716*	426*	305*
Gemini	458	399	350	258	323	1 155	875*	1 102*	1 042*	853*	566*
Hoi Mei Wan	471	280	109	177	199	547	442*	287*	641*	308*	286*
Lido	600	262	231	181	269	683	734*	523*	782*	459*	280*
Ma Wan Tung Wan	110	92	51	39	133	201	159	101	132	171	78
Ting Kau	1 583*	1 045*	515*	593*	739*	742*	831*	412*	512*	469*	405*

Beach	<i>E. coli</i> counts per 100mL										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Anglers'	510*	276*	134*	27*	69*	133	130	77	76	45	143
Approach	251*	208*	124*	59	83	106	121	143	78	114	92
Casam	289*	144*	102*	21	50	71	63	52	42	43	94
Gemini	481*	410*	137*	19*	40*	135*	110*	56*	40*	39*	120*
Hoi Mei Wan	271*	130*	87*	23	51	86	58	90	65	63	92
Lido	296*	178*	87*	21	32	53	57	52	39	34	76
Ma Wan Tung Wan	53	60	17	10	24	41	31	20	32	29	74
Ting Kau	258*	145*	141*	58*	88*	107*	89	151	140	75	101

Note: \* Beach not open 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	2007
Butterfly	259	121	44	61	74	60	74	55	55	94	84
Cafeteria New	309	100	60	51	104	62	80	54	70	120	68
Cafeteria Old	435	138	58	57	125	74	76	61	81	150	67
Castle Peak	332*	199*	57*	58*	105*	58*	64*	80*	90	139	64
Golden	352	98	44	50	87	66	84	46	62	117	87
Kadoorie	290	130	109	68	120	114	160	98	117	118	101

Beach	<i>E. coli</i> counts per 100mL										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Butterfly	56	49	30	41	42	71	38	98	131	81	39
Cafeteria New	48	38	31	27	47	50	31	30	38	31	18
Cafeteria Old	45	46	34	29	48	39	45	41	70	50	30
Castle Peak	47	35	63	49	48	78	91	71	106	65	70
Golden	63	42	37	26	62	45	39	31	45	37	22
Kadoorie	87	48	45	37	40	52	37	29	48	31	28

Note: \* Beach not open for swimming that year

## Islands 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	2007
Cheung Chau Tung Wan	24	19	11	12	16	17	11	12	14	37	21
Hung Shing Yeh	5	3	3	5	6	2	5	4	4	4	6
Kwun Yam	32	21	6	10	11	9	7	5	10	13	9
Lo So Shing	3	2	4	2	5	2	3	2	3	4	3
Lower Cheung Sha	85	23	10	12	22	10	14	7	12	11	12
Pui O	36	16	10	10	17	10	15	9	10	16	30
Silver Mine Bay	481	123	39	50	67	42	50	14	34	52	22
Tong Fuk	14	10	4	5	6	4	3	4	5	5	4
Upper Cheung Sha	8	3	2	3	5	3	3	3	3	4	4

Beach	<i>E. coli</i> counts per 100mL										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cheung Chau Tung Wan	15	17	12	6	13	10	14	19	9	18	9
Hung Shing Yeh	4	6	4	3	4	4	5	4	6	5	4
Kwun Yam	10	9	8	5	5	9	8	12	12	9	8
Lo So Shing	5	7	3	3	4	5	5	4	6	6	4
Lower Cheung Sha	20	13	11	9	10	17	21	17	47	19	9
Pui O	24	12	14	13	22	51	60	24	29	34	19
Silver Mine Bay	43	45	31	28	38	39	51	59	119	141*	36
Tong Fuk	10	5	5	4	4	7	4	4	9	3	4
Upper Cheung Sha	7	5	4	3	4	4	5	3	7	3	4

Note: \* Beach not open for swimming that year



## Appendix B - 2018 Beach visitor number

### Southern District

#### Visitor numbers during the 2018 bathing season

Beach	Daily average		Peak day	Peak month	Total
	Weekdays	Weekends & public holidays			
Big Wave Bay	312	1 026	2 500	18 680	107 760
Chung Hom Kok	110	618	2 200	10 580	54 390
Deep Water Bay	877	5 170	17 000	106 150	449 200
Hairpin	127	251	400	6 670	33 250
Middle Bay	145	276	450	6 510	37 260
Repulse Bay	11 603	13 860	32 000	408 050	2 453 370
Rocky Bay	---	---	---	---	---
Shek O	2 521	7 308	25 000	195 900	808 100
South Bay	92	430	900	9 400	39 910
St. Stephen's	244	419	800	13 800	59 700
Stanley Main	617	2 900	17 400	68 980	268 880
Turtle Cove	56	435	1 400	7 920	35 400

Note:

(1) Information provided by the Leisure and Cultural Services Department

(2) Note: As all the beaches were temporarily closed after the strike of typhoon Mangkhut on 16 September, statistics are only upto 15 September

## Sai Kung District

### Visitor numbers during the 2018 bathing season

Beach	Daily average		Peak day	Peak month	Total
	Weekdays	Weekends & public holidays			
Clear Water Bay First	149	667	1 920	15 460	62 835
Clear Water Bay Second	2 395	4 460	22 000	202 000	608 780
Hap Mun Bay	338	1 347	5 300	41 100	129 470
Kiu Tsui	507	818	1 910	35 000	118 170
Silverstrand	131	689	4 240	17 480	61 720
Trio	170	601	2 600	15 170	61 050

Note:

(1) Information provided by the Leisure and Cultural Services Department

(2) Note: As all the beaches were temporarily closed after the strike of typhoon Mangkhut on 16 September, statistics are only upto 15 September

## Tsuen Wan District

### Visitor numbers during the 2018 bathing season

Beach	Daily average		Peak day	Peak month	Total
	Weekdays	Weekends & public holidays			
Anglers'	480	1 707	3 520	36 410	174 090
Approach	142	562	890	9 500	55 070
Casam	105	183	360	4 990	25 810
Gemini	82	178	360	5 050	22 420
Hoi Mei Wan	20	56	190	1 130	6 270
Lido	35	138	670	3 340	13 540
Ma Wan Tung Wan	375	830	1 720	21 240	103 750
Ting Kau	131	335	1 190	7 300	39 150

Note:

(1) Information provided by the Leisure and Cultural Services Department

(2) Note: As all the beaches were temporarily closed after the strike of typhoon Mangkhut on 16 September, statistics are only upto 15 September



## Tuen Mun District

### Visitor numbers during the 2018 bathing season

Beach	Daily average		Peak day	Peak month	Total
	Weekdays	Weekends & public holidays			
Butterfly	791	1 456	2 100	36 350	199 950
Cafeteria New	979	1 780	3 600	66 550	246 020
Cafeteria Old	1011	1 434	1 990	40 900	228 290
Castle Peak	512	1 072	1 820	22 780	137 775
Golden	1 950	4 691	7 600	105 600	563 450
Kadoorie	665	830	1 400	31 050	142 950

Note:

(1) Information provided by the Leisure and Cultural Services Department

(2) Note: As all the beaches were temporarily closed after the strike of typhoon Mangkhut on 16 September, statistics are only upto 15 September

## Islands District

### Visitor numbers during the 2018 bathing season

Beach	Daily average		Peak day	Peak month	Total
	Weekdays	Weekends & public holidays			
Cheung Chau Tung Wan	489	2 320	4 100	46 000	214 480
Hung Shing Yeh	646	962	2 600	39 970	148 830
Kwun Yam	192	602	1 200	14 700	64 510
Lo So Shing	175	309	480	9 410	43 340
Lower Cheung Sha	367	1 403	2 500	31 500	139 300
Pui O	1 190	2 925	8 050	88 180	347 830
Silver Mine Bay	419	1 037	2 650	16 615	35 635
Tong Fuk	336	627	2 000	26 500	85 440
Upper Cheung Sha	520	786	1 600	29 330	120 450

Note:

(1) Information provided by the Leisure and Cultural Services Department

(2) Note: As all the beaches were temporarily closed after the strike of typhoon Mangkhut on 16 September, statistics are only upto 15 September

## Appendix C - Physicochemical water quality data for gazetted beaches, 2018

### Southern District

#### Summary of physicochemical water quality data of gazetted beaches, 2018

Beach	pH	Salinity (psu) <sup>1</sup>	Turbidity (NTU) <sup>2</sup>	Temperature (°C)	Dissolved Oxygen (mg/L) (% Saturation)	
Big Wave Bay	8.26 ( 8.04 - 8.43 )	30.1 ( 20.7 - 33.9 )	4.06 ( 1.04 - 13.10 )	26.3 ( 17.5 - 30.2 )	6.8 ( 5.6 - 8.6 )	99 ( 81 - 111 )
Chung Hom Kok	8.30 ( 8.13 - 8.61 )	30.5 ( 26.1 - 33.7 )	3.15 ( 0.80 - 8.16 )	26.8 ( 18.7 - 32.4 )	6.6 ( 5.3 - 8.1 )	97 ( 81 - 126 )
Deep Water Bay	8.26 ( 8.02 - 8.58 )	29.5 ( 22.5 - 33.6 )	3.91 ( 0.77 - 16.60 )	27.1 ( 19.4 - 32.3 )	7.0 ( 5.3 - 9.9 )	101 ( 72 - 130 )
Hairpin*	8.29 ( 8.19 - 8.50 )	30.5 ( 26.1 - 33.7 )	1.74 ( 0.64 - 4.86 )	27.0 ( 18.2 - 32.8 )	6.8 ( 5.3 - 8.8 )	101 ( 83 - 122 )
Middle Bay	8.29 ( 8.11 - 8.51 )	29.9 ( 23.4 - 33.6 )	4.36 ( 0.78 - 10.40 )	26.7 ( 18.7 - 31.7 )	6.7 ( 5.1 - 9.1 )	97 ( 80 - 130 )
Repulse Bay	8.30 ( 8.13 - 8.63 )	30.6 ( 25.8 - 33.7 )	4.24 ( 1.16 - 23.30 )	26.7 ( 18.3 - 32.2 )	6.8 ( 5.3 - 8.6 )	98 ( 79 - 125 )
Rocky Bay*	8.22 ( 8.02 - 8.36 )	30.7 ( 22.3 - 33.5 )	3.46 ( 1.05 - 13.40 )	26.0 ( 17.5 - 31.3 )	6.6 ( 5.3 - 9.1 )	95 ( 81 - 113 )
Shek O	8.28 ( 8.15 - 8.49 )	31.2 ( 26.1 - 33.8 )	3.95 ( 1.02 - 10.40 )	26.2 ( 17.5 - 31.2 )	6.7 ( 5.7 - 8.7 )	97 ( 85 - 117 )
South Bay	8.29 ( 8.11 - 8.61 )	30.5 ( 25.7 - 33.6 )	2.79 ( 0.52 - 7.62 )	26.7 ( 18.5 - 32.2 )	6.6 ( 5.3 - 8.8 )	96 ( 79 - 129 )
St. Stephen's	8.27 ( 8.08 - 8.56 )	30.5 ( 25.3 - 33.7 )	2.44 ( 0.83 - 4.33 )	26.8 ( 18.3 - 32.2 )	6.7 ( 5.3 - 8.3 )	97 ( 80 - 129 )
Stanley Main	8.30 ( 8.17 - 8.61 )	30.1 ( 24.6 - 33.8 )	3.34 ( 1.16 - 14.50 )	27.0 ( 18.4 - 32.0 )	6.9 ( 5.8 - 8.4 )	101 ( 90 - 126 )
Turtle Cove	8.31 ( 8.18 - 8.64 )	30.2 ( 22.7 - 33.8 )	3.99 ( 1.02 - 11.80 )	27.0 ( 18.2 - 33.1 )	6.9 ( 5.6 - 9.3 )	101 ( 83 - 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)

## Sai Kung District

### Summary of physicochemical water quality data of gazetted beaches, 2018

Beach	pH	Salinity (psu) <sup>1</sup>	Turbidity (NTU) <sup>2</sup>	Temperature (°C)	Dissolved Oxygen (mg/L) (% Saturation)	
Clear Water Bay First	8.32 ( 8.22 - 8.45 )	30.3 ( 22.7 - 33.5 )	5.54 ( 0.87 - 17.20 )	27.2 ( 18.6 - 32.3 )	6.7 ( 5.2 - 8.0 )	97 ( 78 - 117 )
Clear Water Bay Second	8.31 ( 8.15 - 8.44 )	31.1 ( 25.9 - 33.9 )	6.22 ( 1.54 - 17.40 )	27.4 ( 19.6 - 32.4 )	6.5 ( 5.0 - 7.9 )	94 ( 75 - 110 )
Hap Mun Bay	8.30 ( 8.19 - 8.46 )	31.6 ( 27.6 - 33.9 )	3.41 ( 0.69 - 13.40 )	27.3 ( 18.9 - 31.1 )	6.7 ( 5.5 - 8.4 )	99 ( 84 - 130 )
Kiu Tsui	8.27 ( 7.94 - 8.44 )	31.2 ( 25.5 - 33.9 )	3.11 ( 0.52 - 17.90 )	27.3 ( 19.3 - 31.8 )	6.6 ( 5.2 - 8.6 )	98 ( 83 - 130 )
Silverstrand	8.32 ( 8.17 - 8.45 )	30.1 ( 23.9 - 33.1 )	5.10 ( 0.81 - 26.90 )	27.0 ( 19.4 - 31.3 )	6.5 ( 4.1 - 8.5 )	94 ( 60 - 114 )
Trio	8.26 ( 8.08 - 8.40 )	30.0 ( 22.4 - 33.7 )	3.31 ( 0.79 - 17.60 )	27.6 ( 19.6 - 31.9 )	6.5 ( 5.1 - 8.6 )	97 ( 79 - 126 )

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, 2018

Beach	pH	Salinity (psu) <sup>1</sup>	Turbidity (NTU) <sup>2</sup>	Temperature (°C)	Dissolved Oxygen (mg/L) (% Saturation)	
Anglers'	8.13 ( 7.94 - 8.30 )	27.7 ( 14.3 - 32.1 )	4.68 ( 1.25 - 14.10 )	26.5 ( 18.3 - 31.4 )	6.5 ( 5.0 - 9.8 )	93 ( 69 - 130 )
Approach	8.15 ( 7.92 - 8.37 )	27.3 ( 18.1 - 31.7 )	5.05 ( 1.86 - 19.80 )	26.4 ( 19.0 - 30.8 )	6.5 ( 4.9 - 8.6 )	93 ( 69 - 114 )
Casam	8.15 ( 7.96 - 8.29 )	27.8 ( 19.5 - 31.9 )	3.67 ( 1.61 - 7.65 )	26.4 ( 19.0 - 31.2 )	6.5 ( 5.3 - 8.0 )	93 ( 67 - 115 )
Gemini*	8.11 ( 7.91 - 8.30 )	28.1 ( 14.9 - 32.1 )	3.86 ( 1.13 - 11.30 )	26.4 ( 18.3 - 30.6 )	6.5 ( 5.2 - 8.0 )	92 ( 78 - 105 )
Hoi Mei Wan	8.12 ( 7.94 - 8.34 )	27.5 ( 19.1 - 31.9 )	3.16 ( 0.95 - 10.30 )	26.5 ( 19.5 - 30.0 )	6.3 ( 4.8 - 8.0 )	91 ( 73 - 118 )
Lido	8.13 ( 7.95 - 8.32 )	27.8 ( 19.3 - 31.7 )	4.14 ( 1.21 - 13.60 )	26.5 ( 18.8 - 31.0 )	6.4 ( 5.2 - 7.8 )	91 ( 72 - 112 )
Ma Wan Tung Wan	8.12 ( 7.94 - 8.28 )	28.9 ( 22.4 - 32.3 )	6.93 ( 2.31 - 30.50 )	26.4 ( 18.3 - 30.1 )	6.5 ( 5.1 - 10.0 )	94 ( 75 - 120 )
Ting Kau	8.15 ( 7.93 - 8.32 )	27.0 ( 18.3 - 31.7 )	3.87 ( 1.59 - 13.90 )	26.5 ( 18.7 - 30.8 )	6.4 ( 5.0 - 7.8 )	92 ( 65 - 108 )

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, 2018

Beach	pH	Salinity (psu) <sup>1</sup>	Turbidity (NTU) <sup>2</sup>	Temperature (°C)	Dissolved Oxygen (mg/L) (% Saturation)	
Butterfly	8.13 ( 7.90 - 8.40 )	25.1 ( 14.5 - 31.2 )	6.22 ( 1.53 - 12.50 )	27.5 ( 20.4 - 31.4 )	6.4 ( 5.0 - 8.2 )	93 ( 74 - 109 )
Cafeteria New	8.13 ( 7.99 - 8.32 )	24.6 ( 12.7 - 31.2 )	6.79 ( 2.63 - 17.40 )	27.3 ( 19.7 - 31.1 )	6.5 ( 4.9 - 7.9 )	92 ( 75 - 108 )
Cafeteria Old	8.12 ( 7.97 - 8.36 )	24.5 ( 12.5 - 31.2 )	7.09 ( 2.02 - 18.90 )	27.2 ( 19.7 - 31.2 )	6.5 ( 4.7 - 8.0 )	92 ( 70 - 108 )
Castle Peak	8.12 ( 7.69 - 8.49 )	23.7 ( 10.6 - 31.2 )	5.49 ( 3.07 - 14.10 )	27.6 ( 20.3 - 31.1 )	6.8 ( 4.7 - 8.8 )	99 ( 70 - 129 )
Golden	8.12 ( 7.95 - 8.29 )	24.7 ( 12.5 - 31.2 )	7.50 ( 3.47 - 16.90 )	27.3 ( 19.5 - 30.7 )	6.5 ( 4.8 - 8.6 )	93 ( 73 - 115 )
Kadoorie	8.13 ( 7.95 - 8.40 )	24.1 ( 12.9 - 31.3 )	5.68 ( 2.52 - 11.50 )	27.4 ( 19.9 - 31.6 )	6.5 ( 4.9 - 8.1 )	93 ( 73 - 109 )

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

1. Practical Salinity Unit; 2. Nephelometric Turbidity Unit

## Islands District

### Summary of physicochemical water quality data of gazetted beaches, 2018

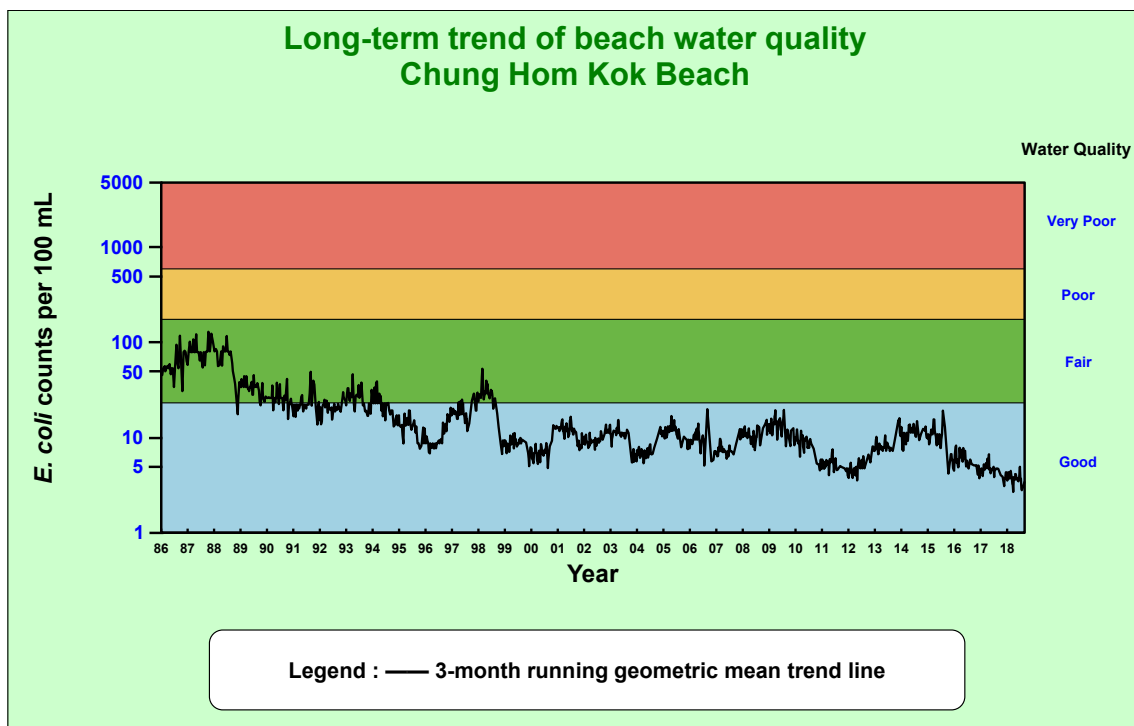
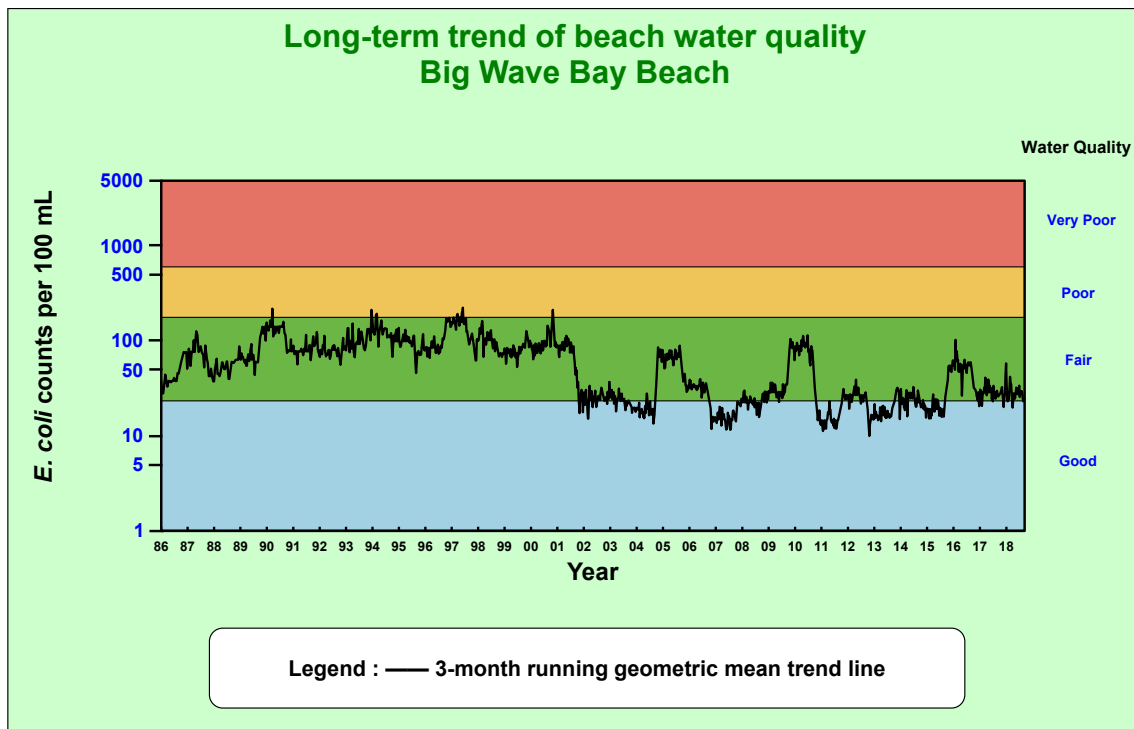
Beach	pH	Salinity (psu) <sup>1</sup>	Turbidity (NTU) <sup>2</sup>	Temperature (°C)	Dissolved Oxygen (mg/L) (% Saturation)	
Cheung Chau Tung Wan	8.20 ( 8.03 - 8.38 )	29.2 ( 25.1 - 32.2 )	3.53 ( 1.28 - 7.83 )	26.8 ( 18.6 - 31.4 )	6.8 ( 5.0 - 8.6 )	97 ( 76 - 129 )
Hung Shing Yeh	8.24 ( 8.10 - 8.49 )	29.5 ( 19.1 - 33.6 )	6.07 ( 1.31 - 18.50 )	26.8 ( 18.5 - 31.8 )	6.8 ( 5.3 - 9.8 )	97 ( 79 - 111 )
Kwun Yam	8.20 ( 7.99 - 8.49 )	28.6 ( 23.8 - 32.0 )	3.06 ( 1.36 - 8.52 )	26.6 ( 18.1 - 31.3 )	7.0 ( 5.0 - 9.6 )	100 ( 76 - 130 )
Lo So Shing	8.27 ( 8.12 - 8.42 )	29.8 ( 23.9 - 33.7 )	4.73 ( 1.33 - 29.50 )	27.0 ( 18.4 - 31.8 )	6.8 ( 5.9 - 8.9 )	99 ( 80 - 126 )
Lower Cheung Sha	8.30 ( 8.10 - 8.65 )	28.6 ( 20.4 - 32.6 )	11.25 ( 2.06 - 34.40 )	27.7 ( 19.5 - 33.8 )	6.6 ( 5.6 - 7.9 )	95 ( 84 - 103 )
Pui O	8.29 ( 8.11 - 8.50 )	28.2 ( 19.5 - 32.4 )	14.54 ( 4.21 - 54.90 )	28.4 ( 20.1 - 34.5 )	6.6 ( 5.5 - 7.5 )	97 ( 81 - 109 )
Silver Mine Bay	8.19 ( 8.03 - 8.53 )	25.6 ( 13.2 - 31.9 )	9.92 ( 2.76 - 56.90 )	28.2 ( 20.2 - 34.9 )	6.8 ( 4.3 - 8.8 )	97 ( 79 - 127 )
Tong Fuk	8.29 ( 8.12 - 8.61 )	29.0 ( 20.2 - 32.6 )	9.25 ( 1.35 - 32.30 )	27.6 ( 19.5 - 33.4 )	6.4 ( 5.4 - 7.6 )	96 ( 85 - 102 )
Upper Cheung Sha	8.29 ( 8.15 - 8.64 )	28.8 ( 16.7 - 32.7 )	8.42 ( 1.43 - 23.60 )	27.6 ( 19.7 - 32.9 )	6.6 ( 5.0 - 7.8 )	97 ( 85 - 108 )

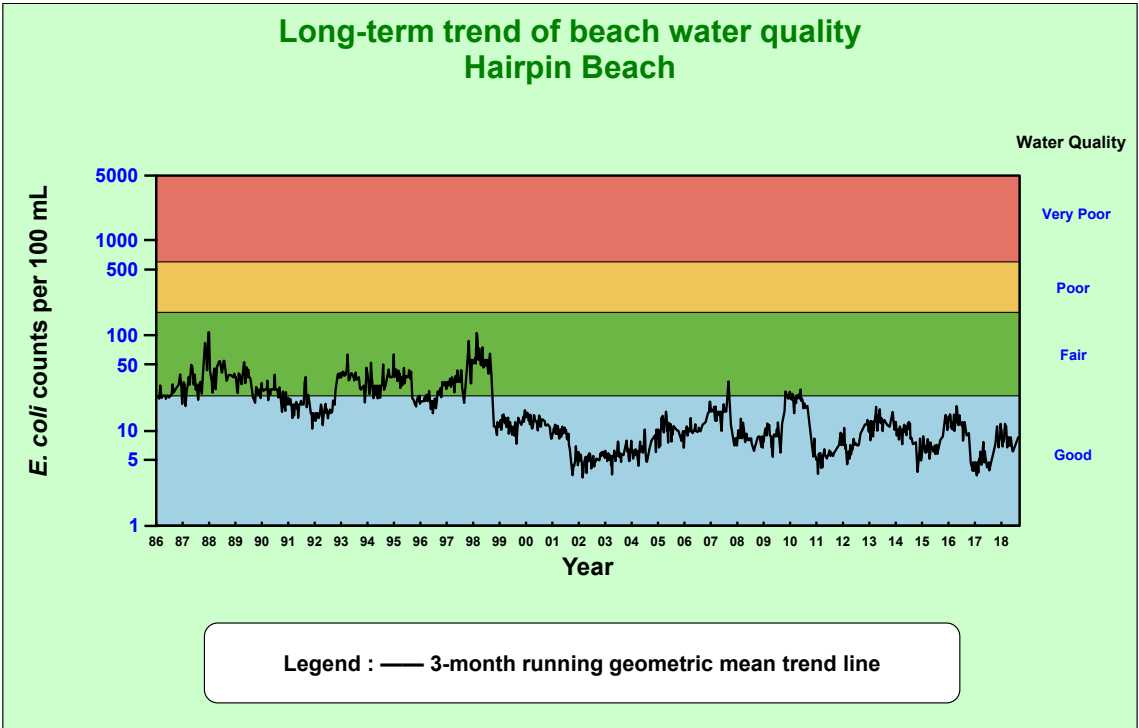
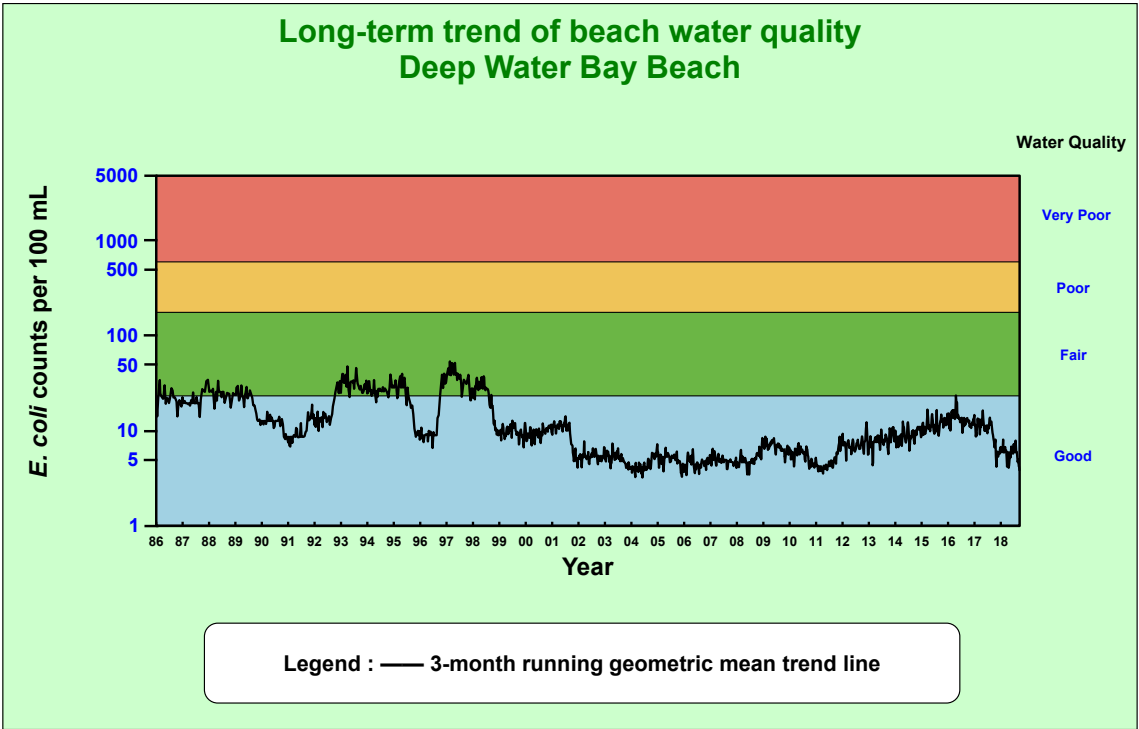
Note: Data presented are arithmetic means; figures in brackets are ranges

1. Practical Salinity Unit; 2. Nephelometric Turbidity Unit

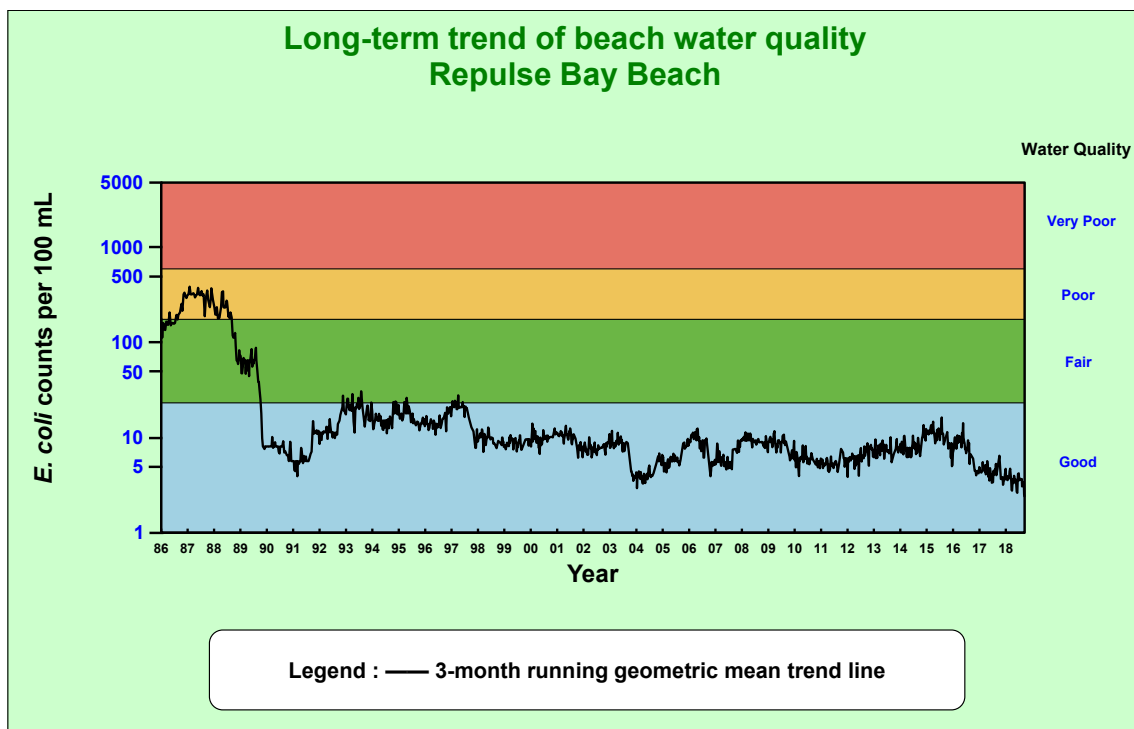
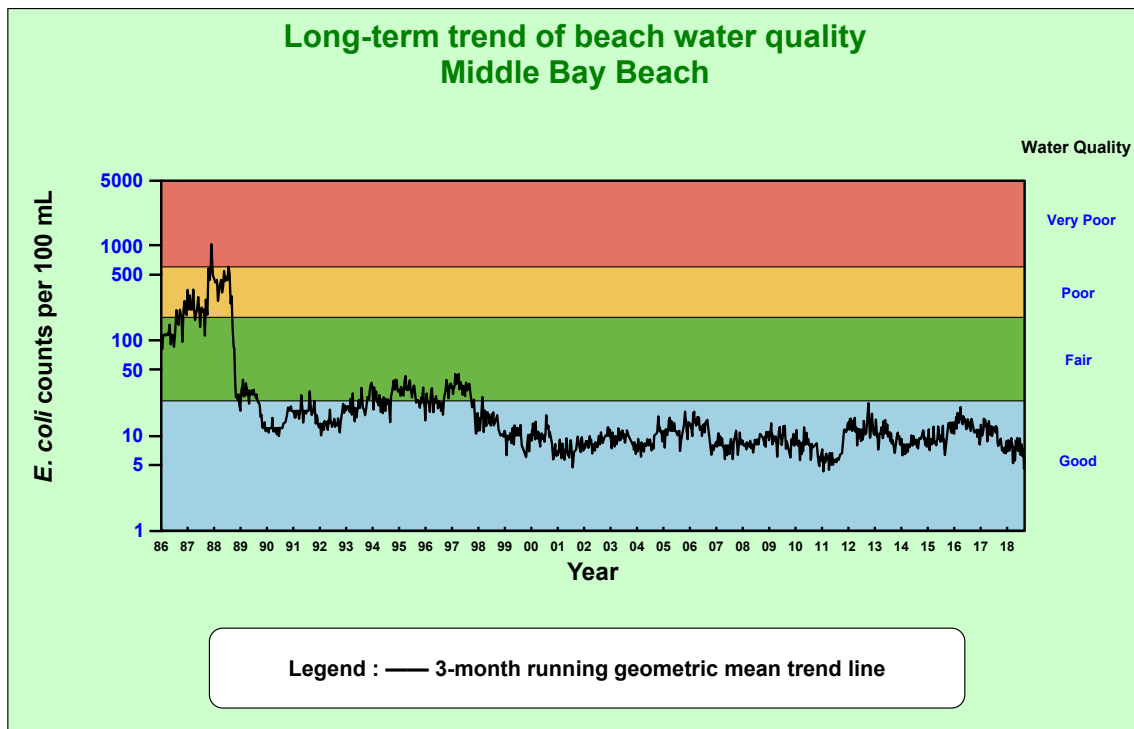
## Appendix D - Long-term trend of beach water quality (1986 - 2018)

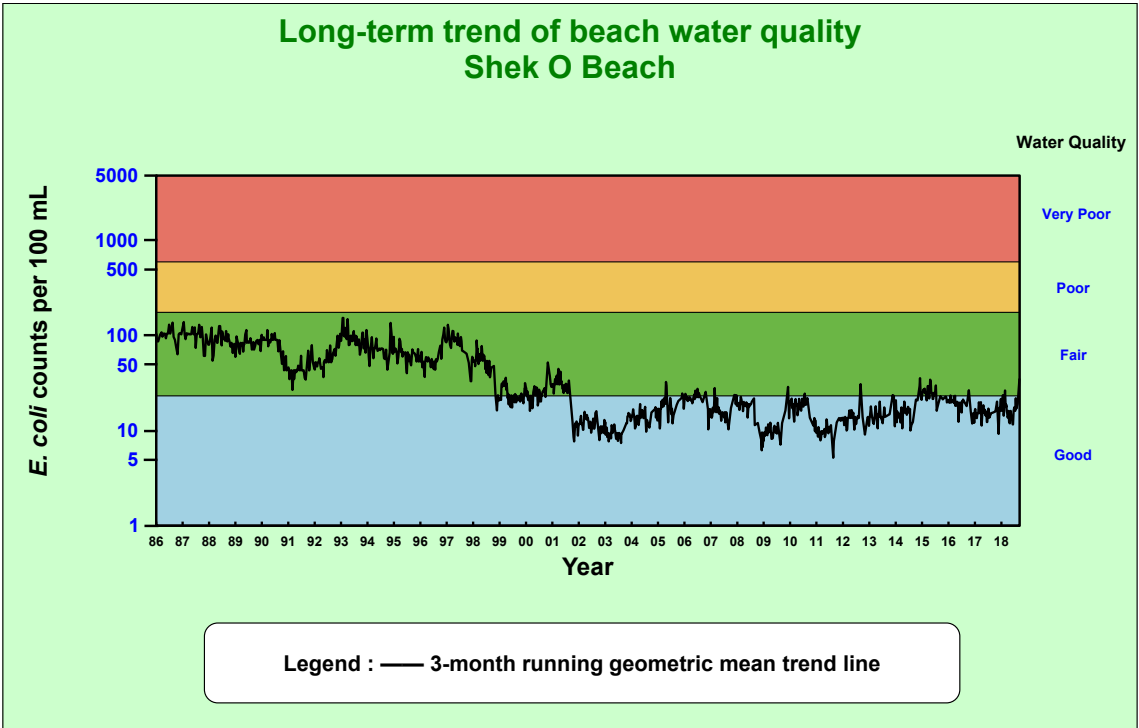
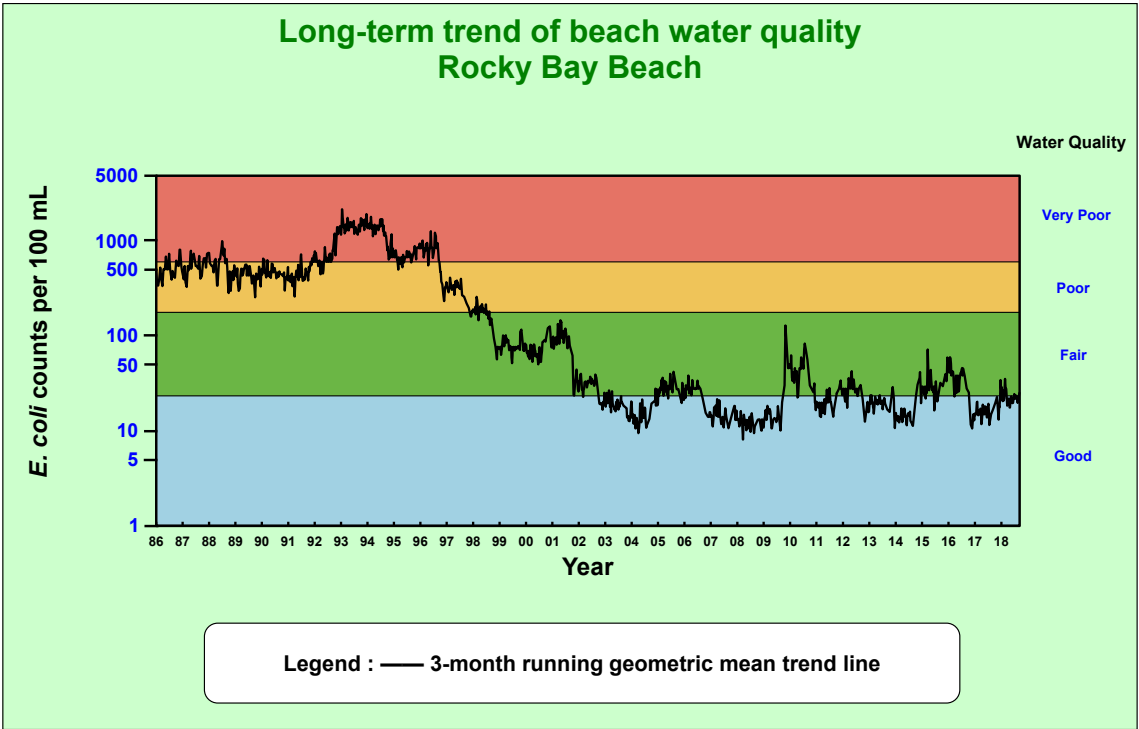
### Southern District

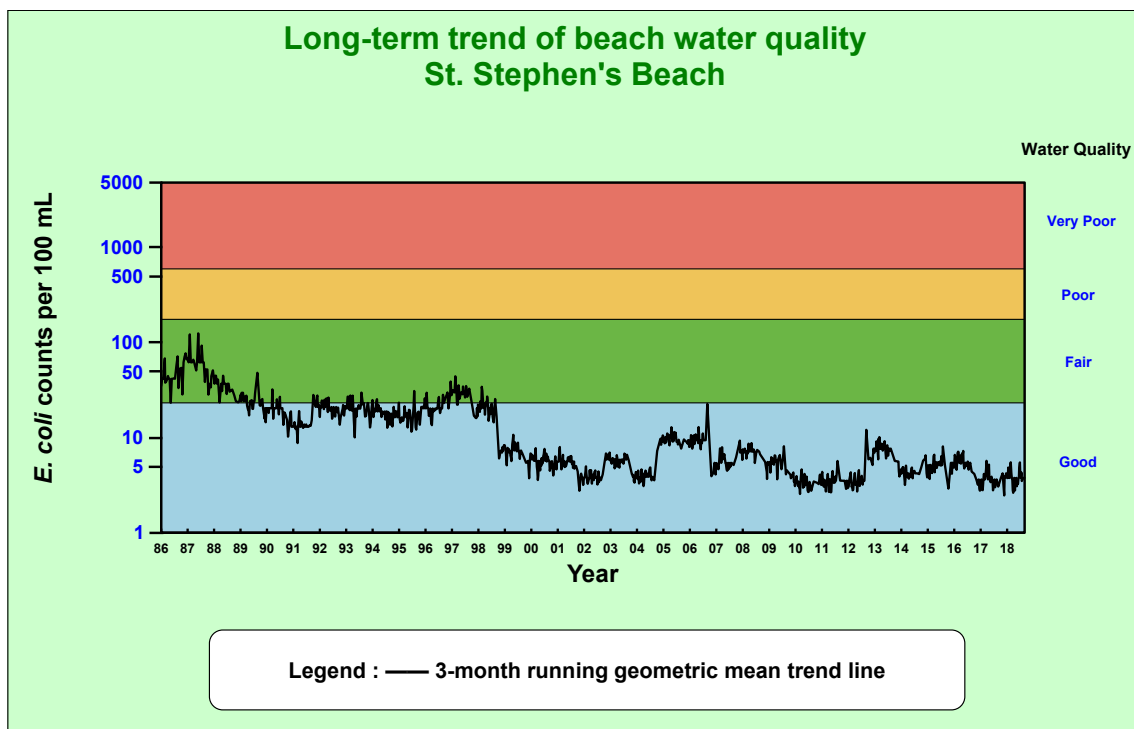
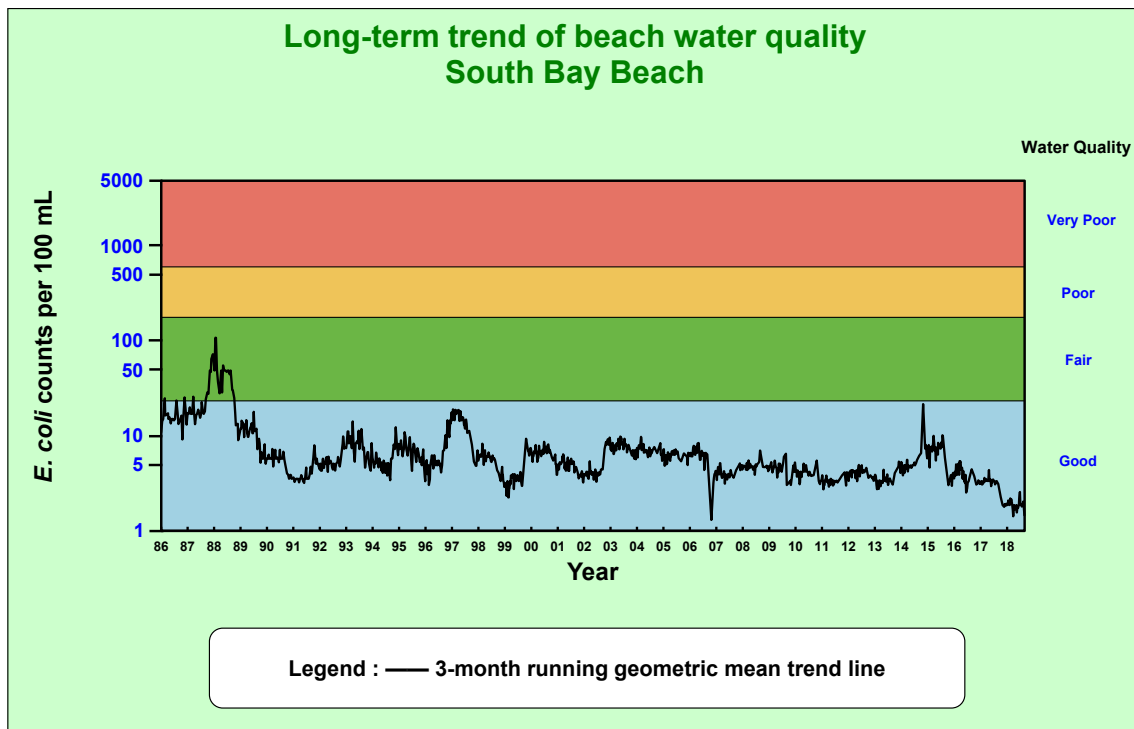




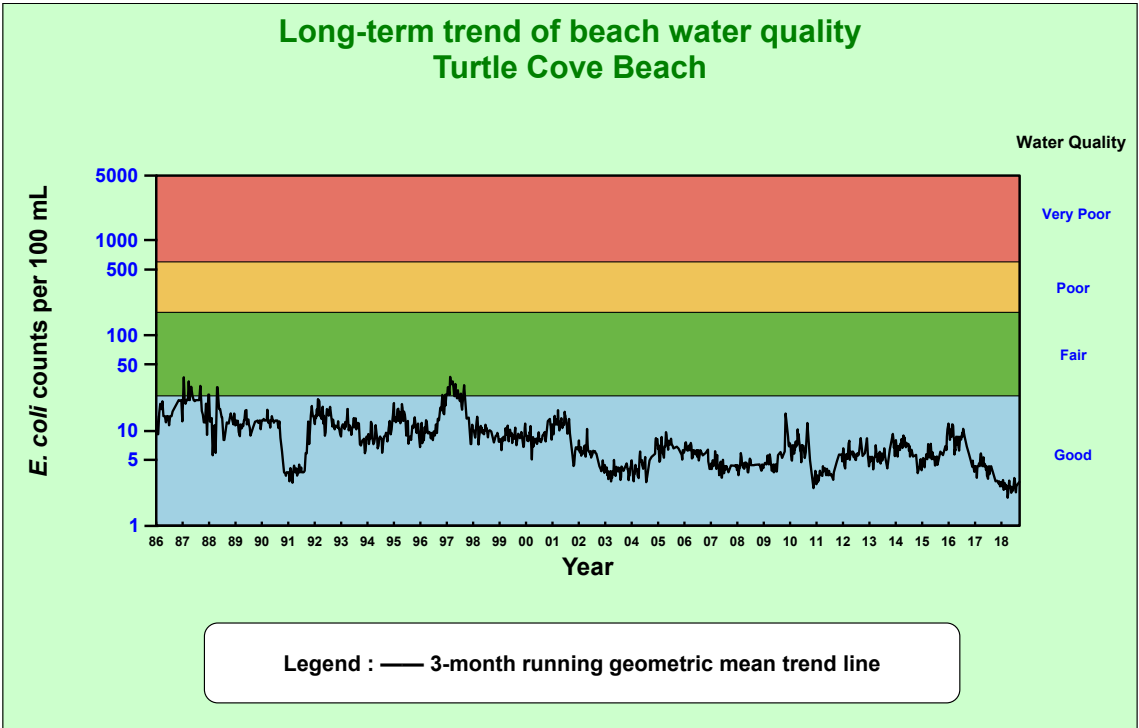
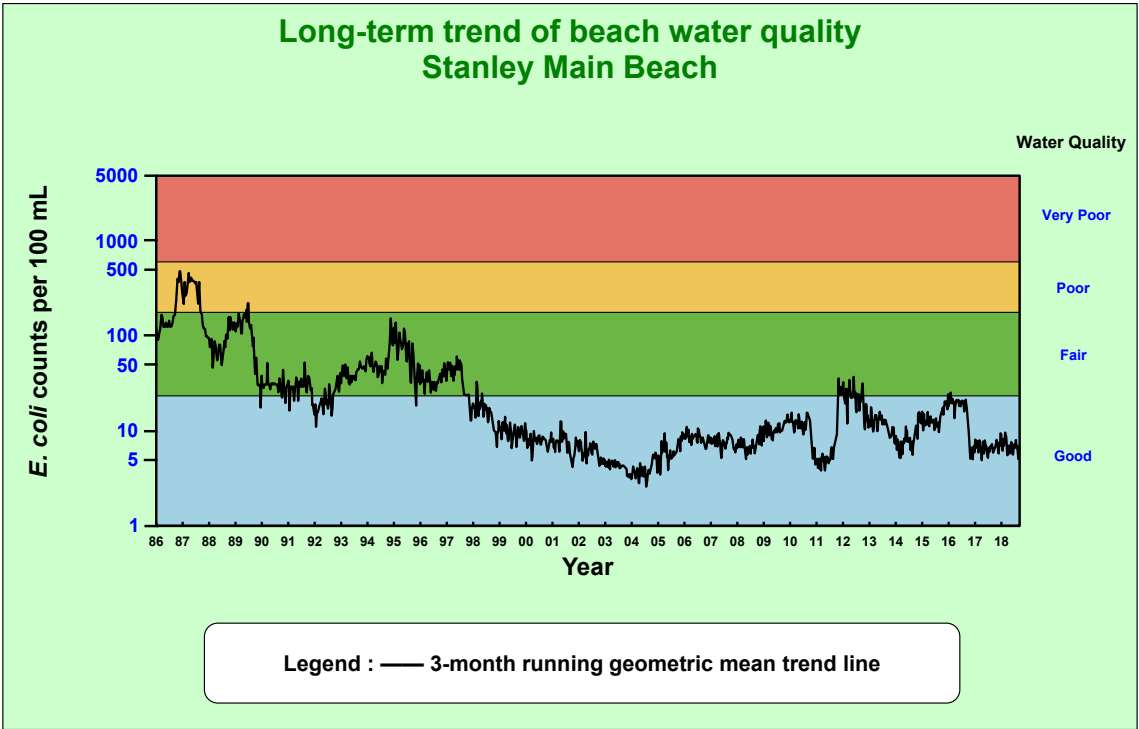




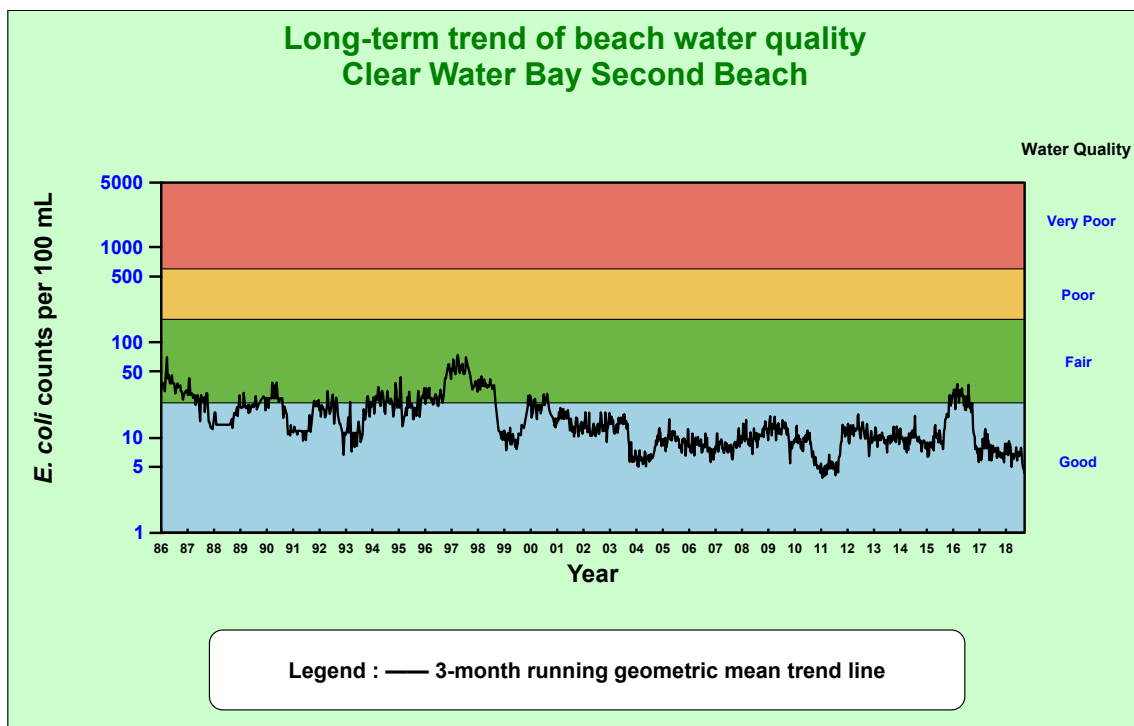
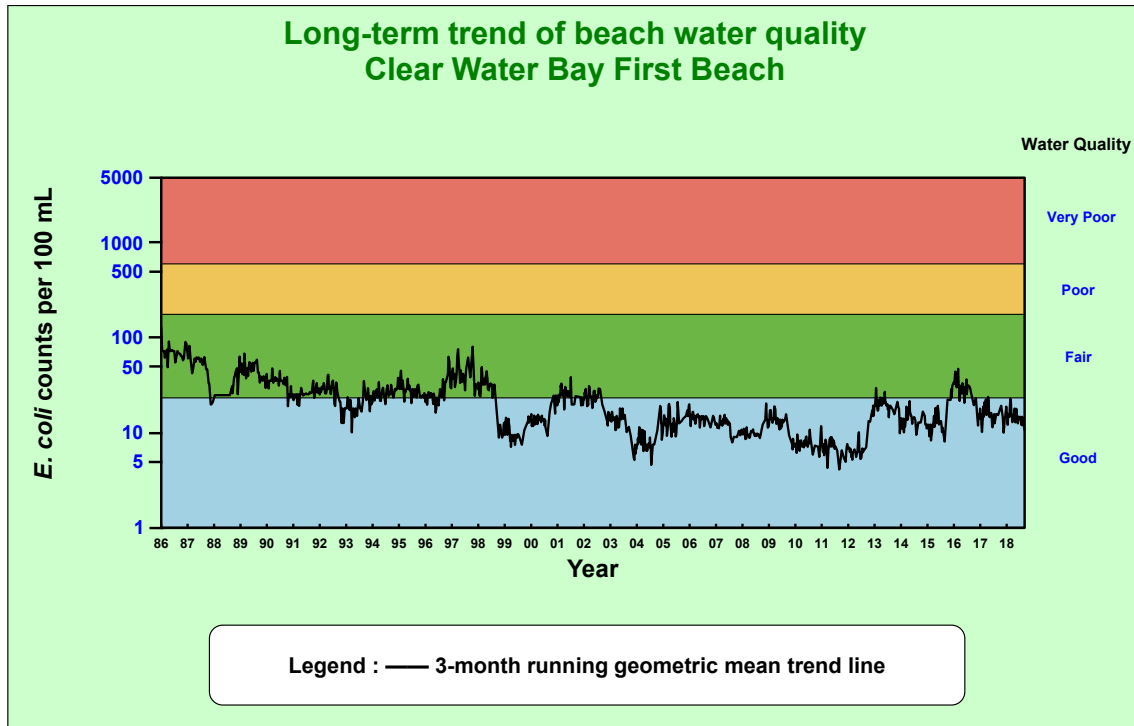


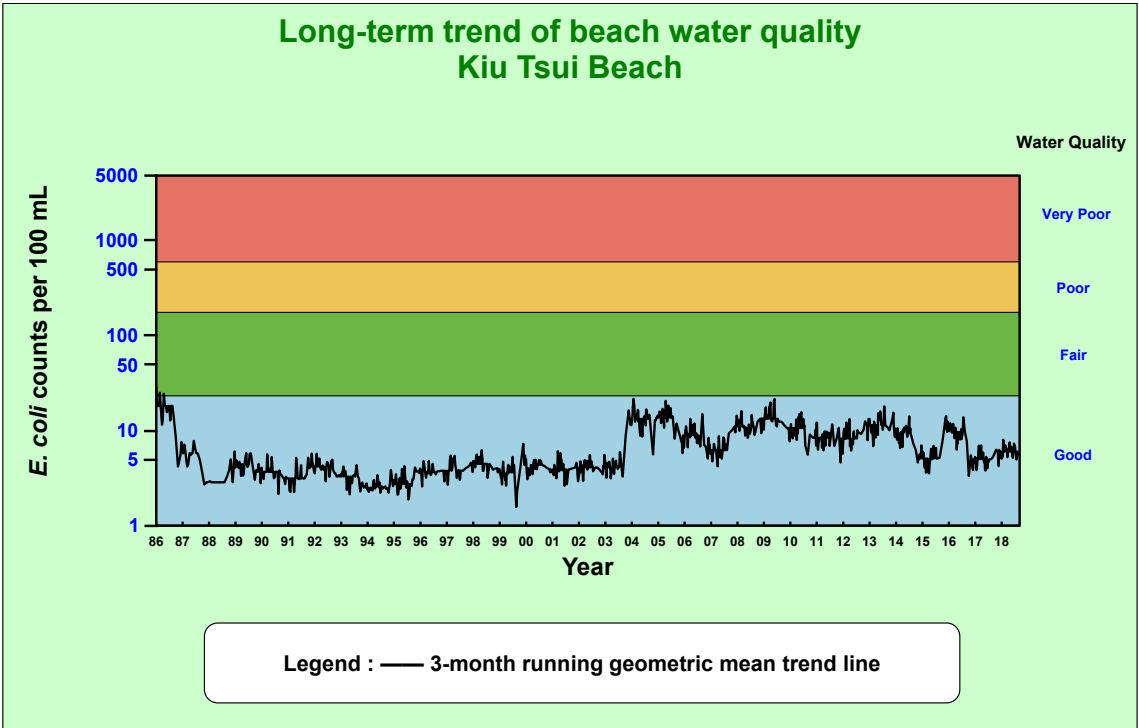
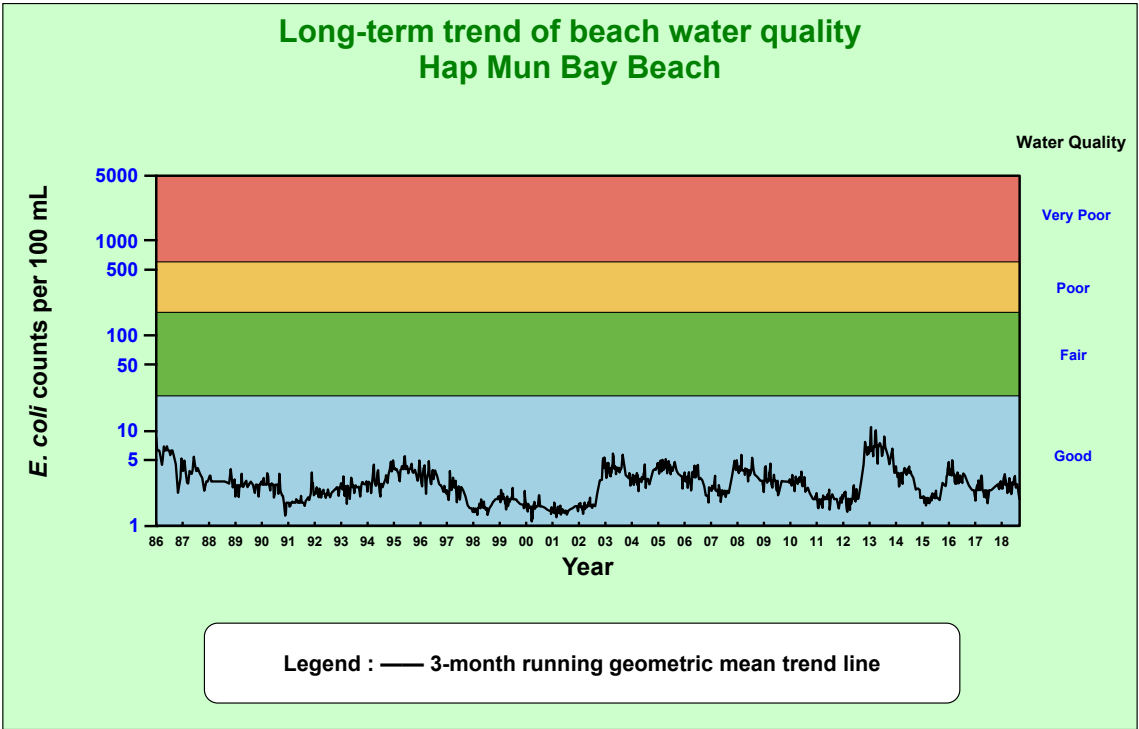




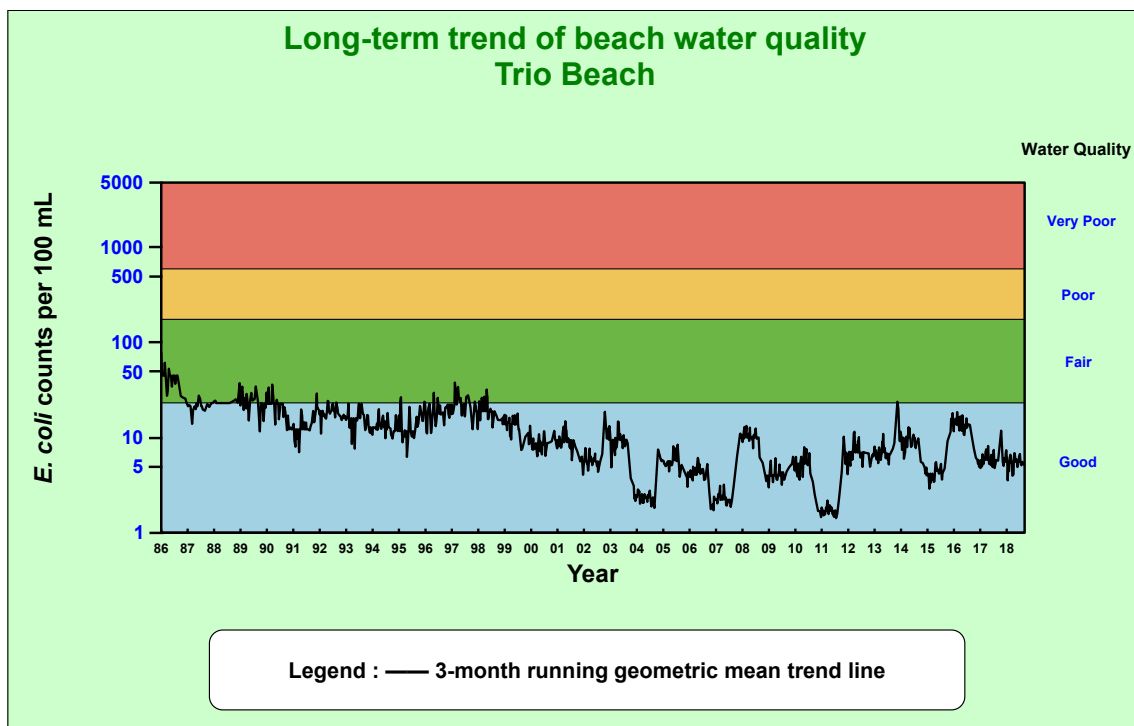
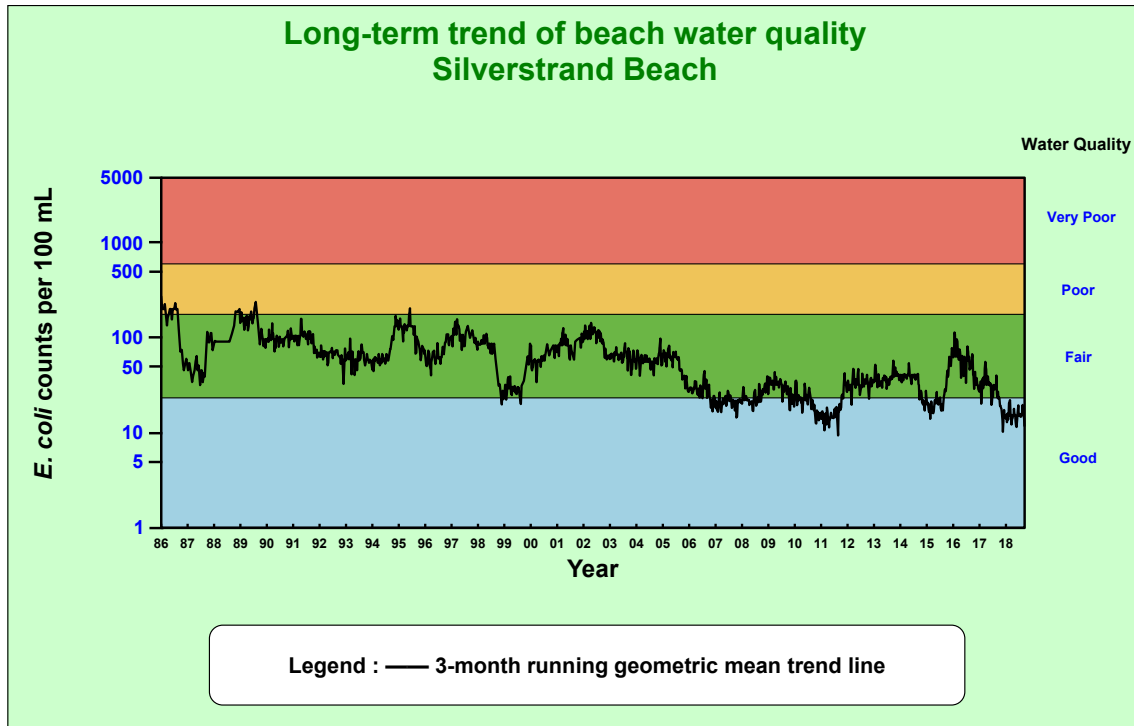


Sai Kung District



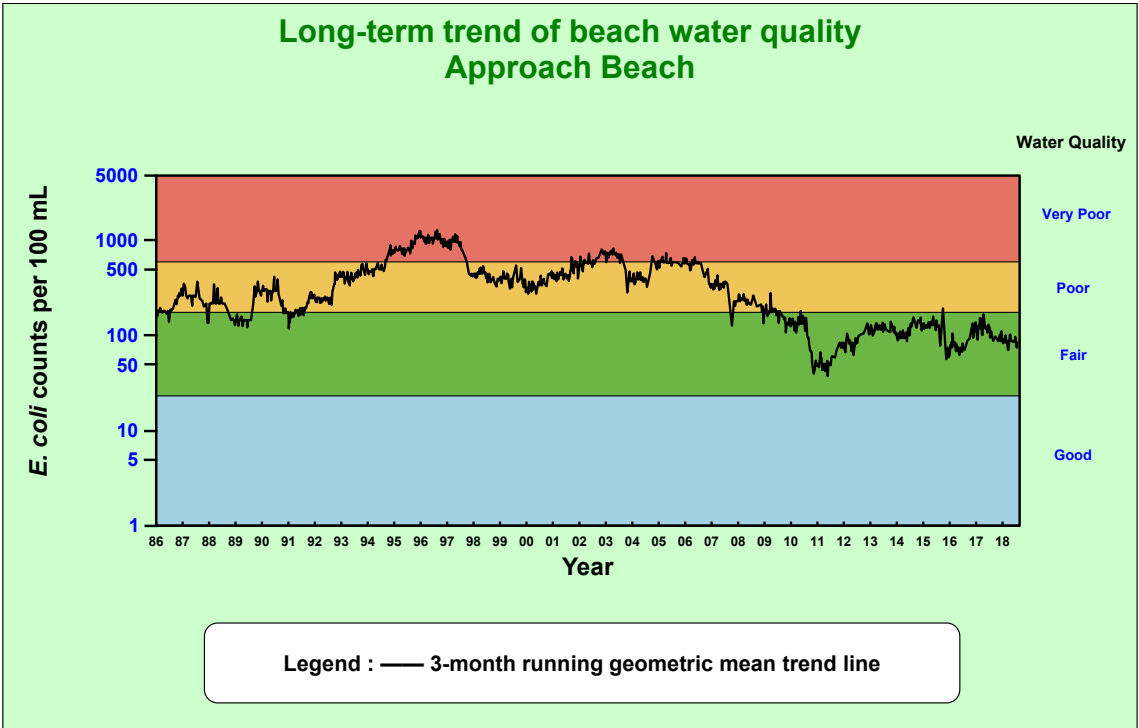
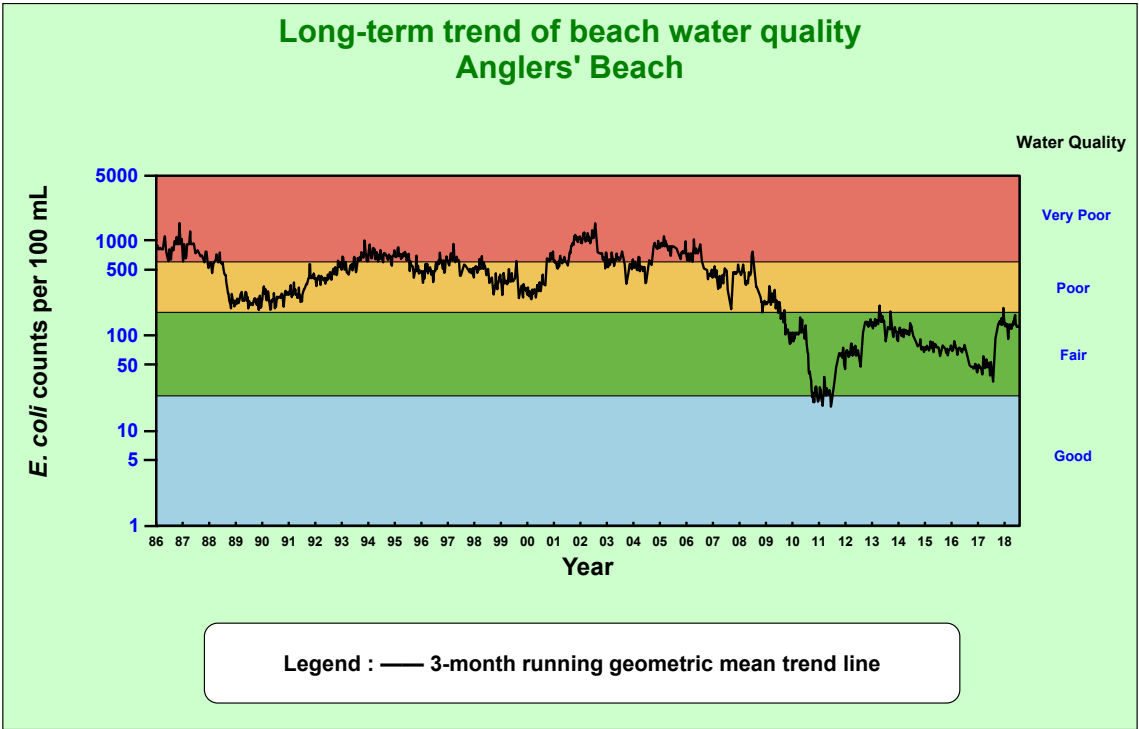


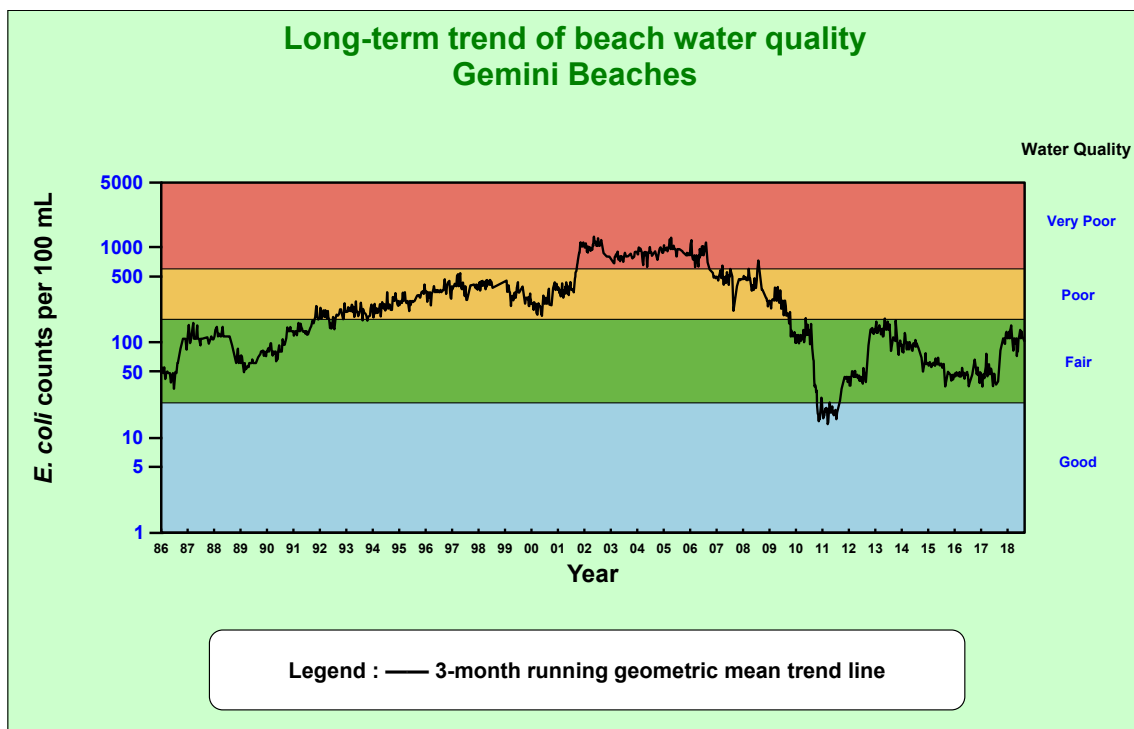
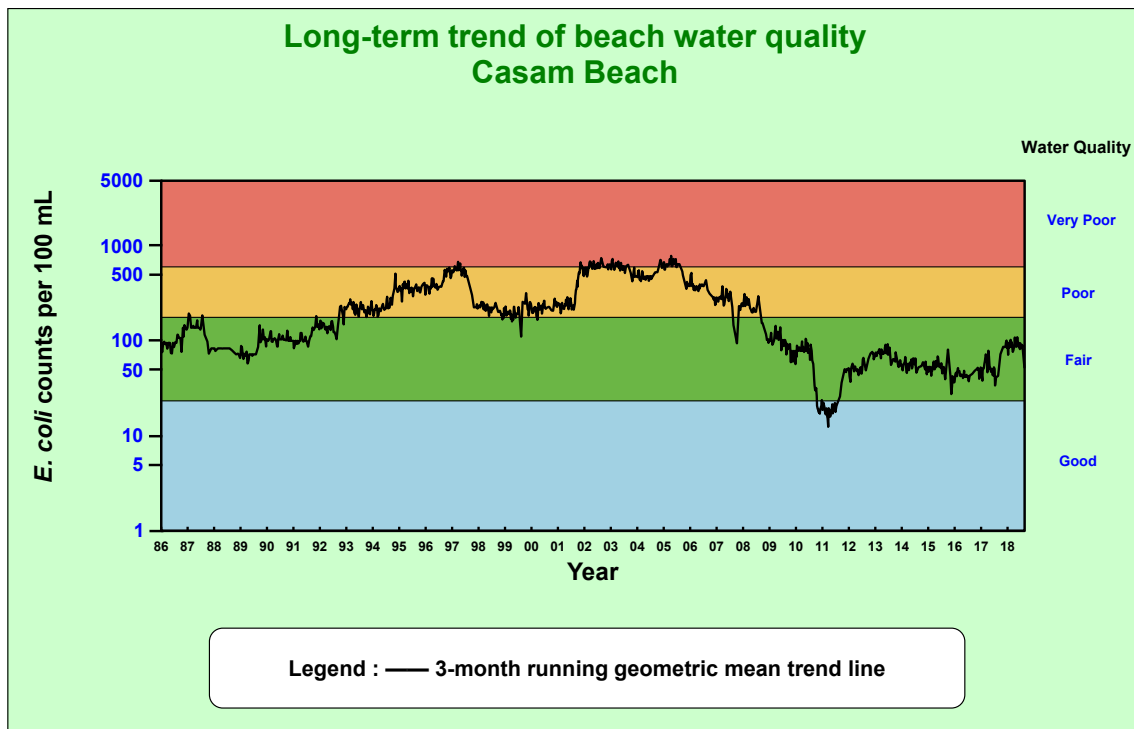




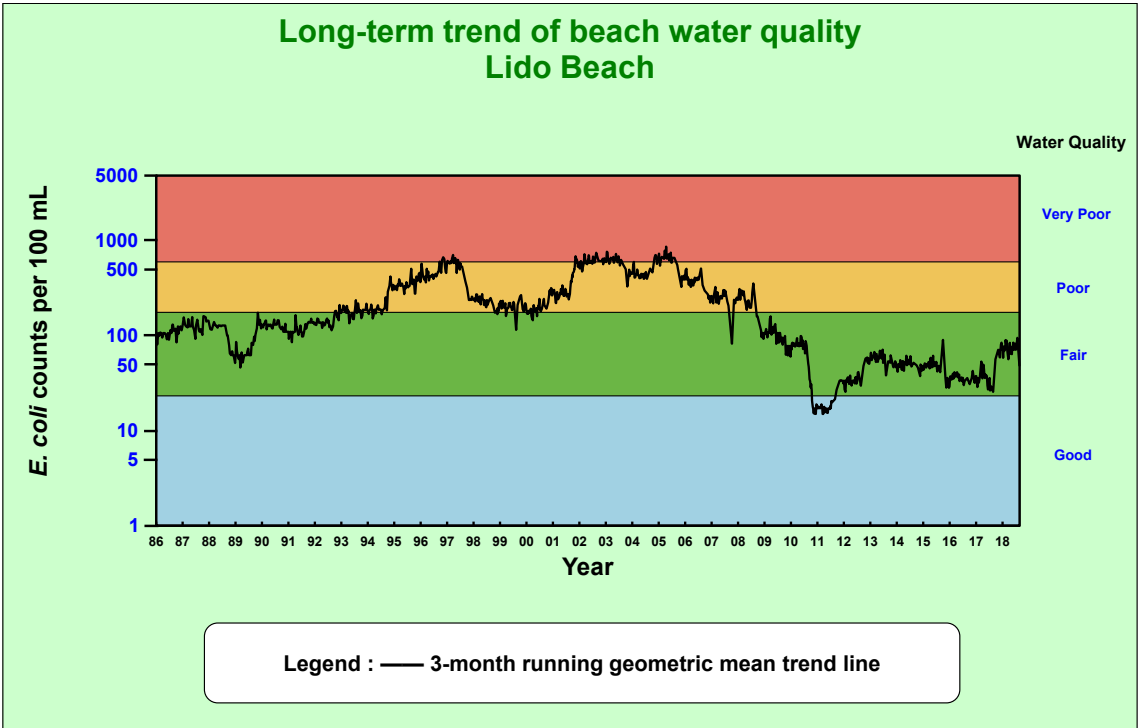
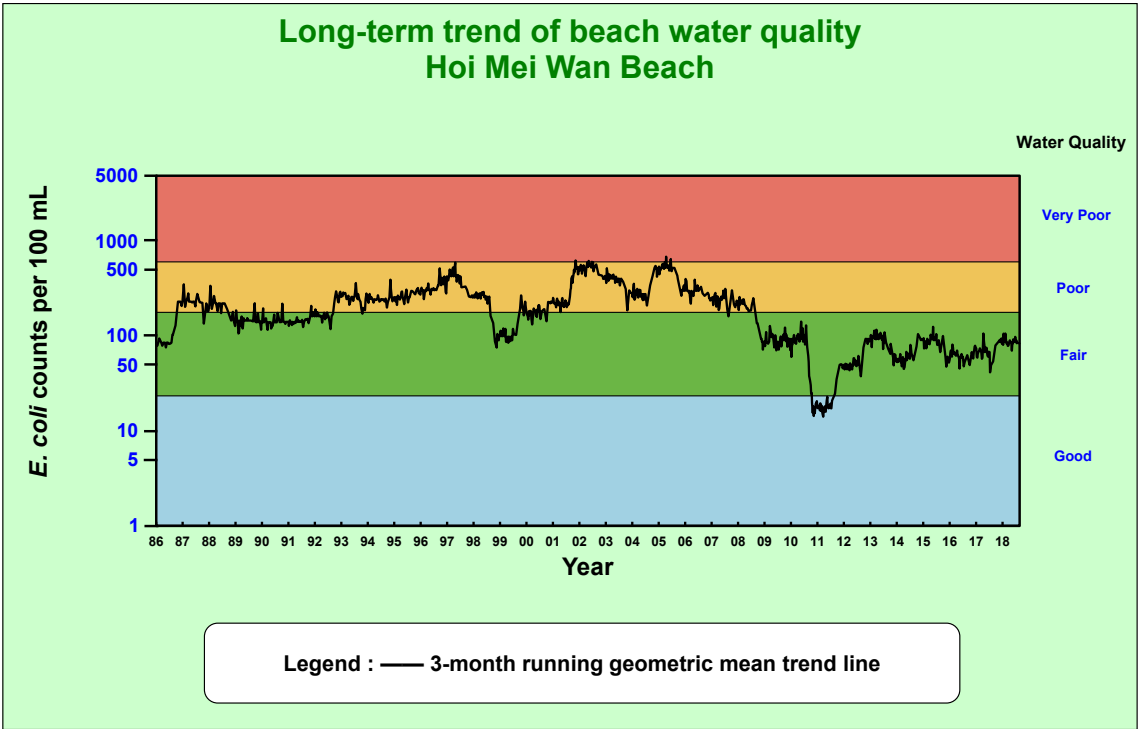
Tsuen Wan District

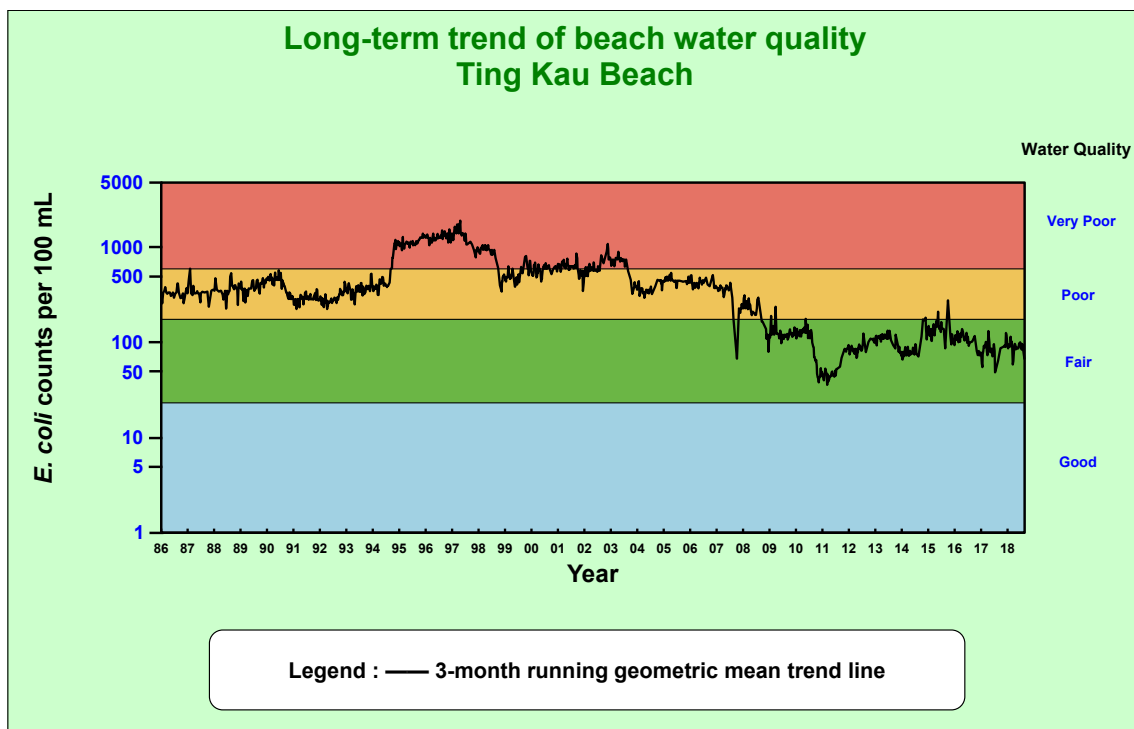
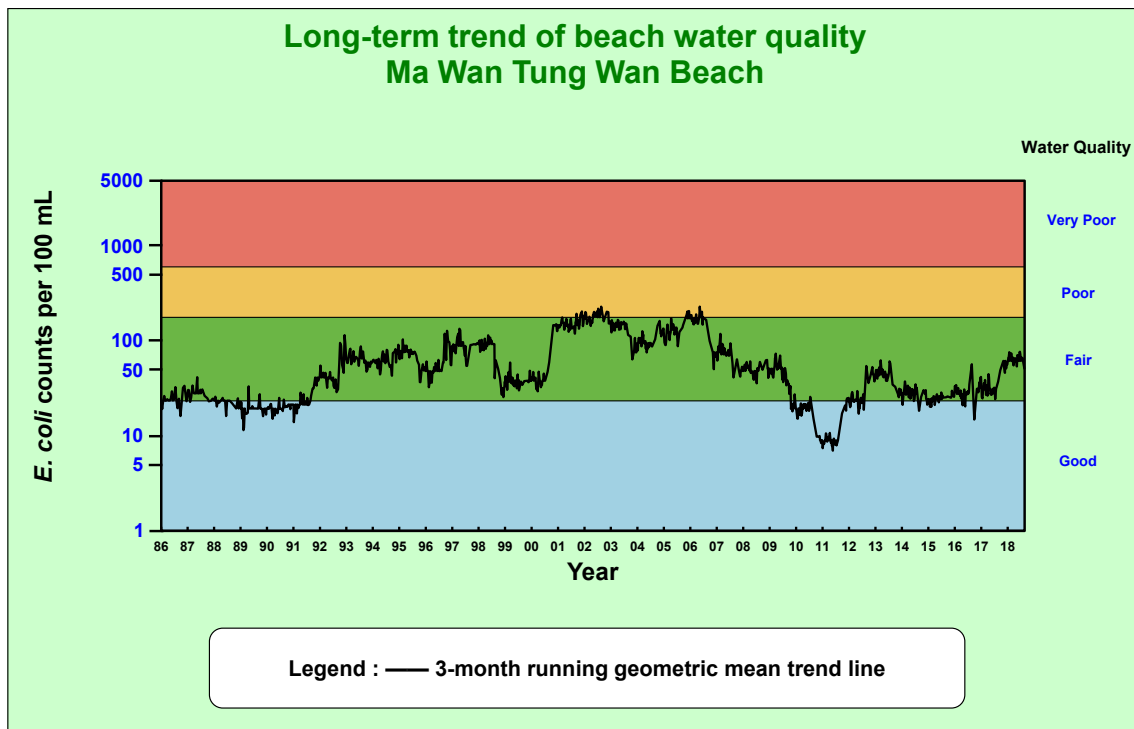
Appendix D





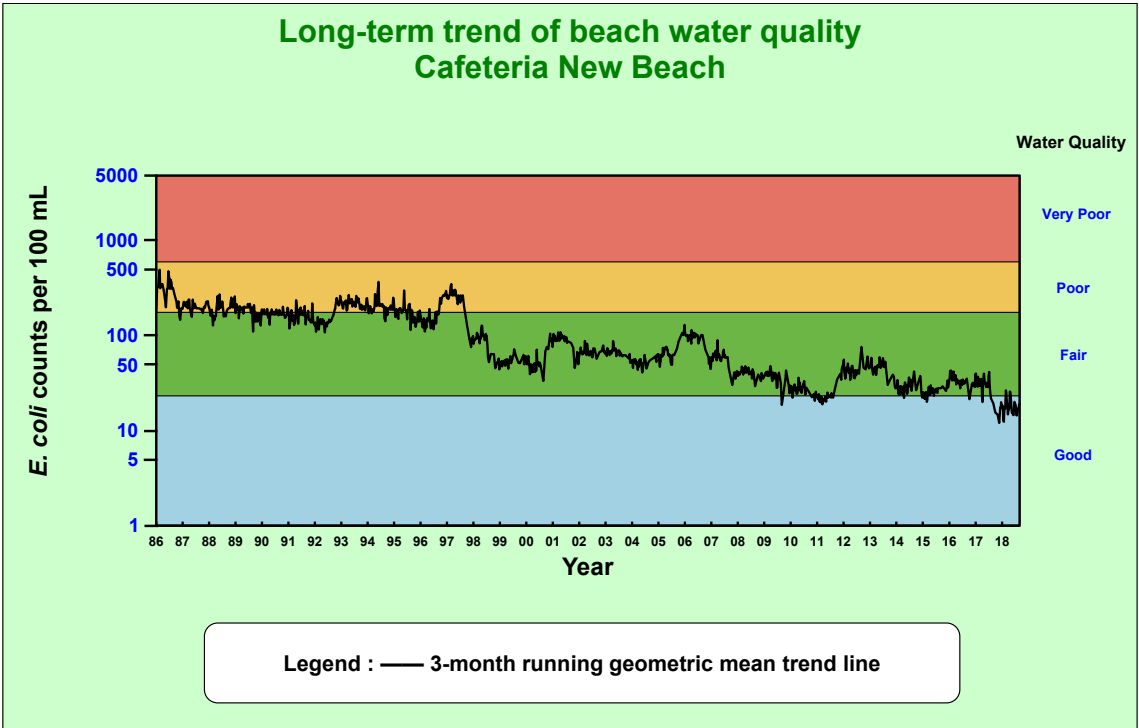
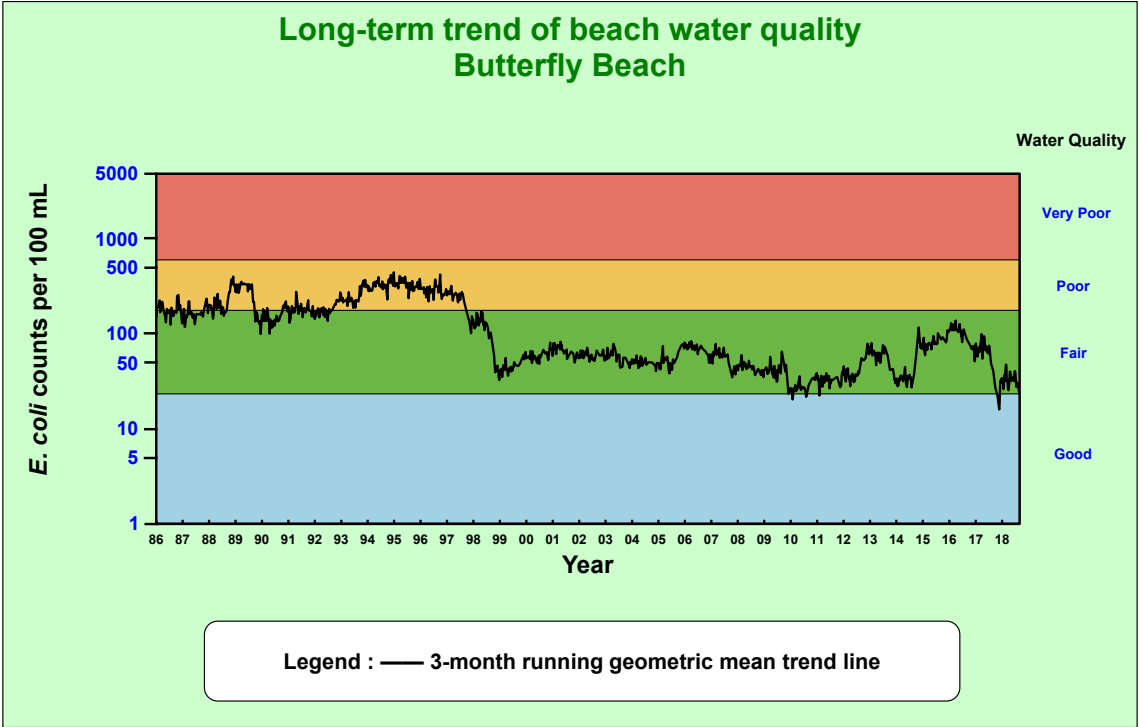




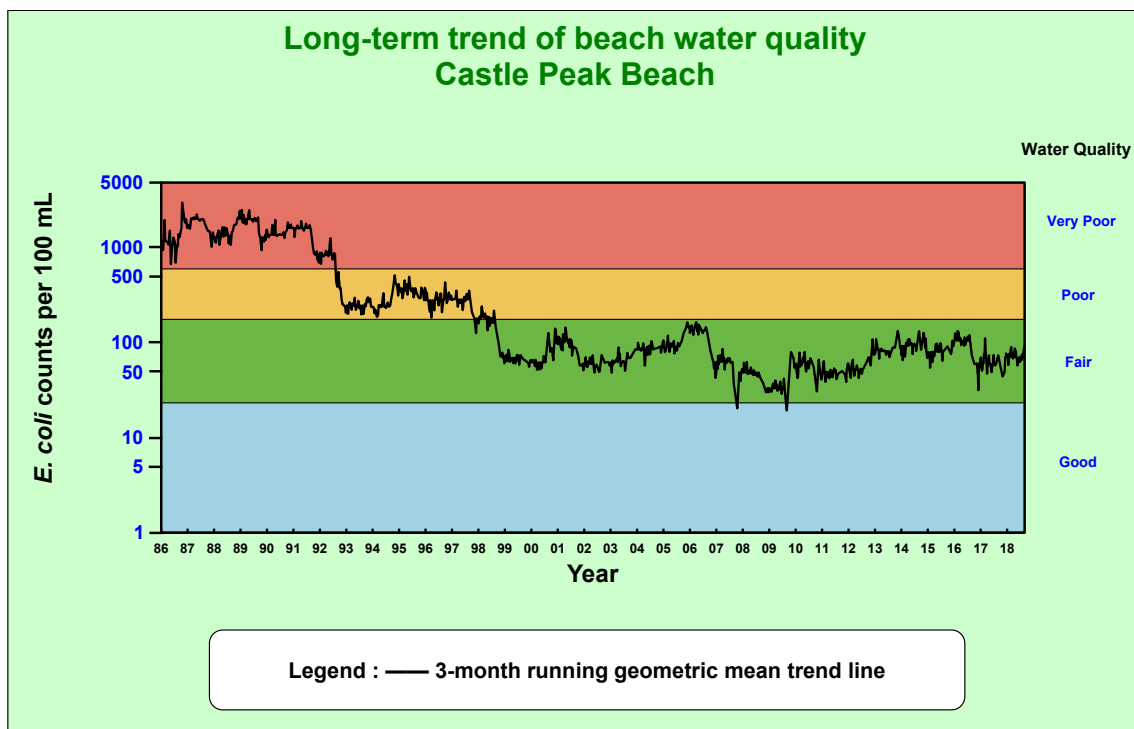
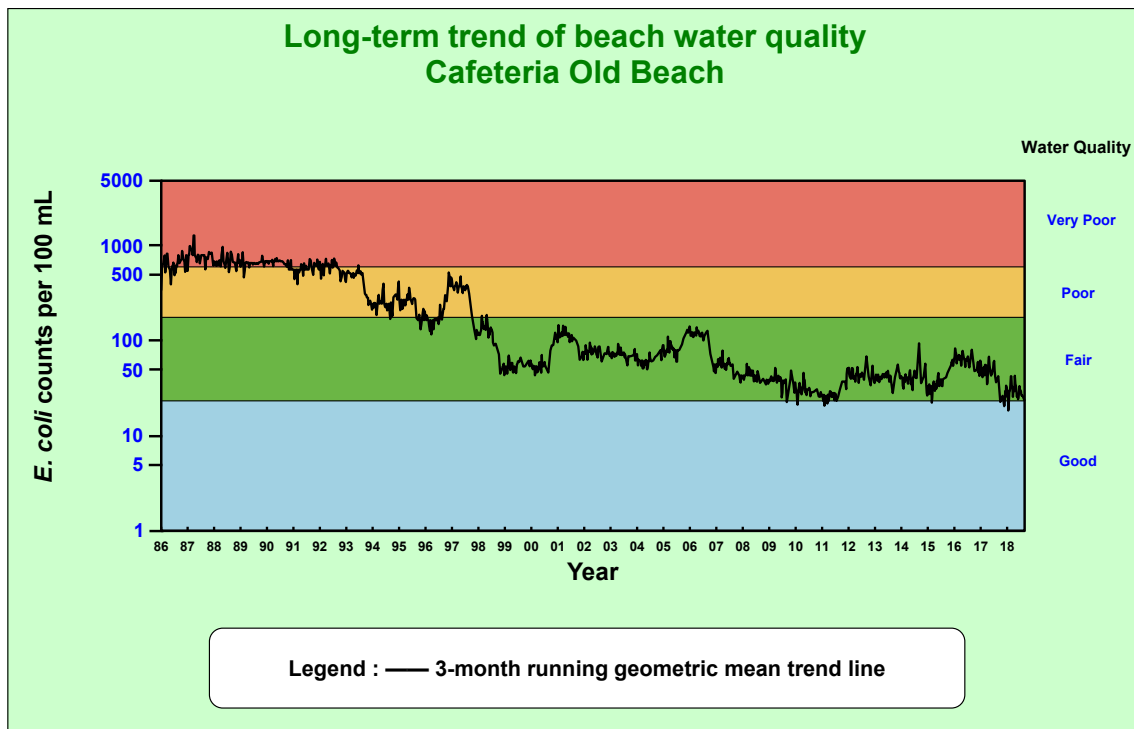


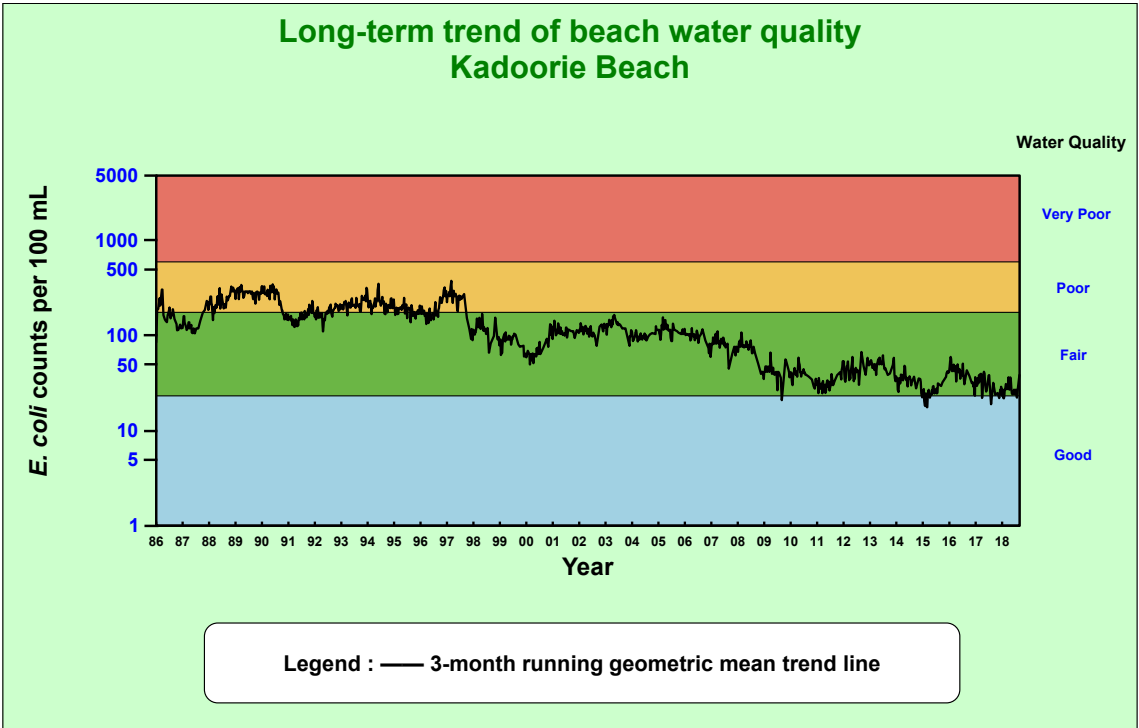
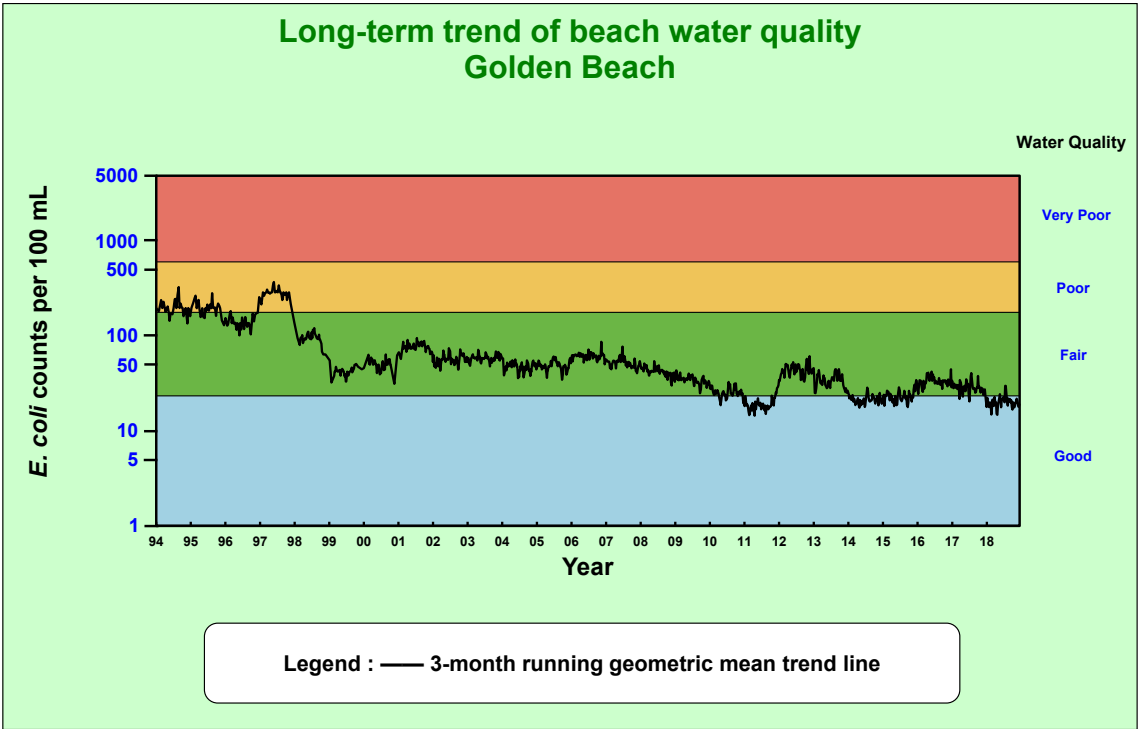
Tuen Mun District

Appendix D

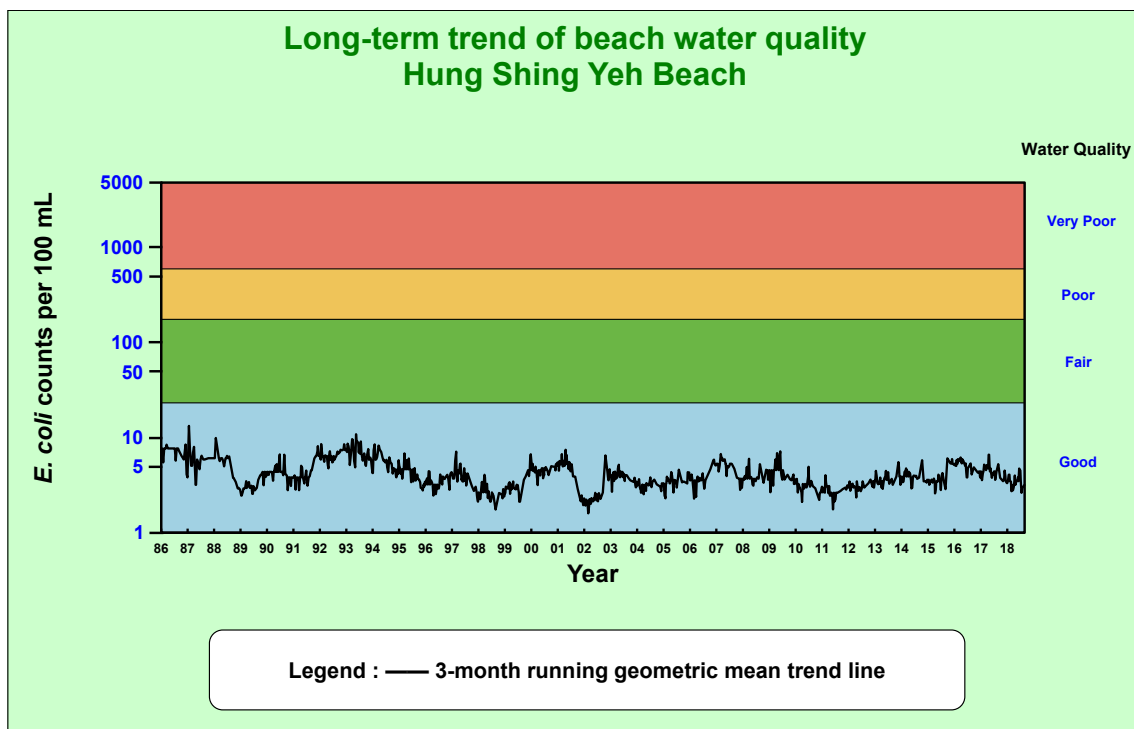
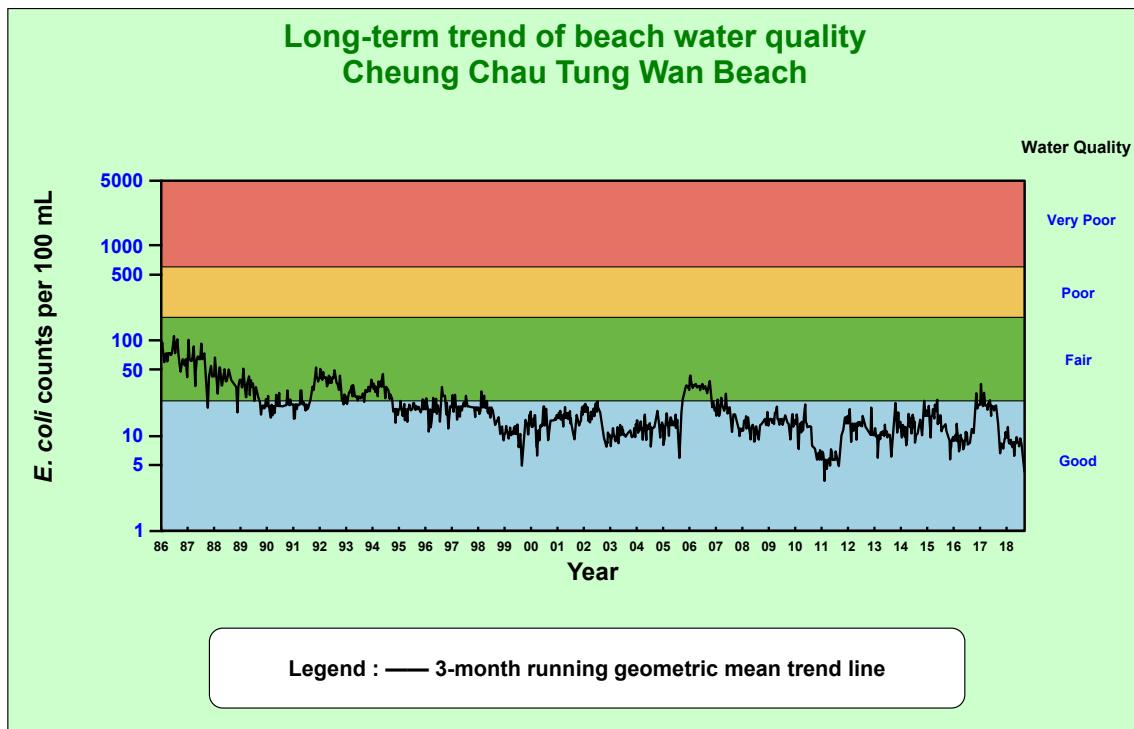




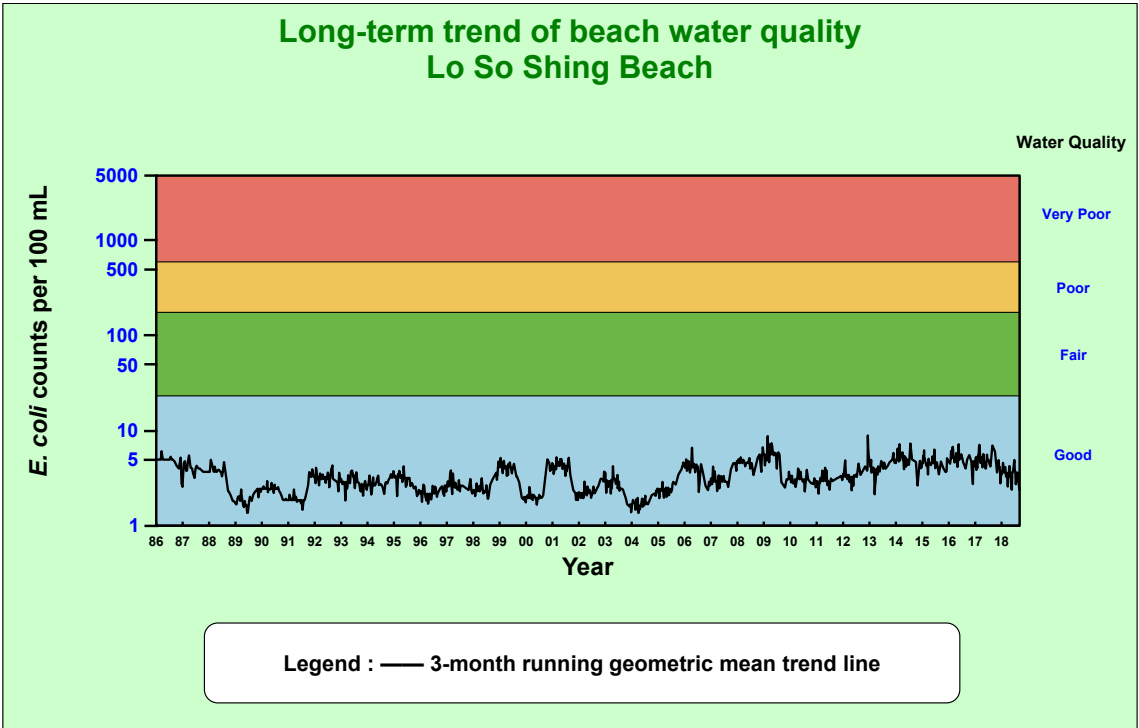
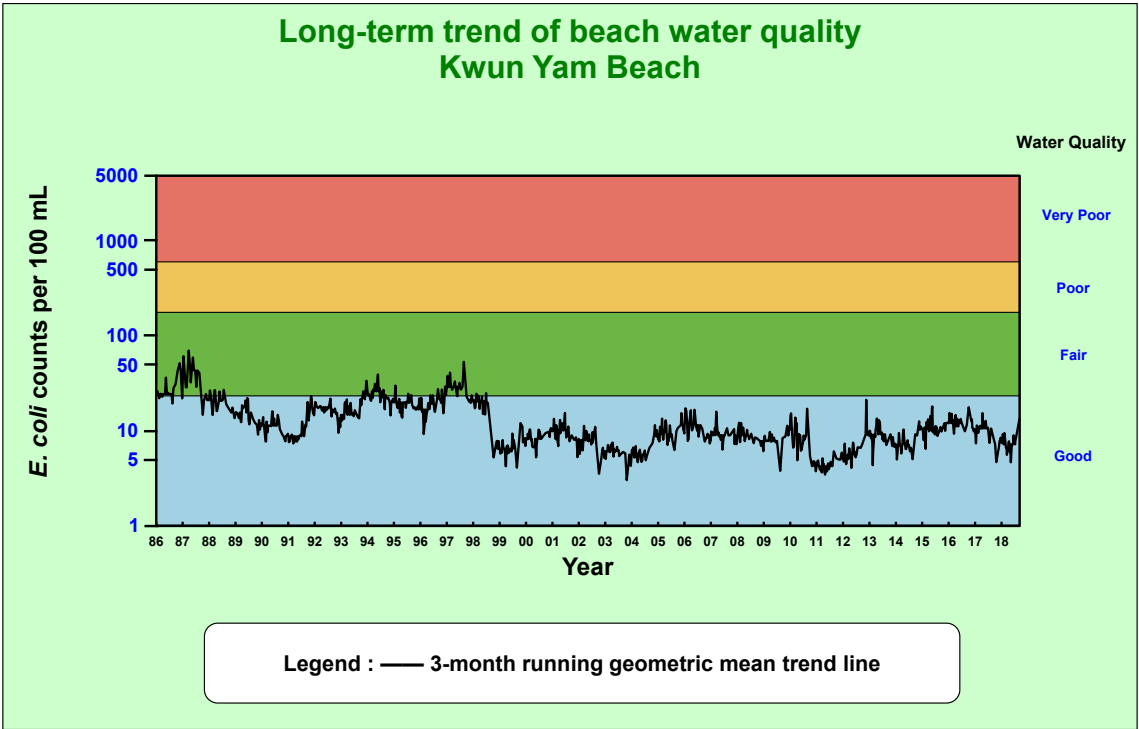


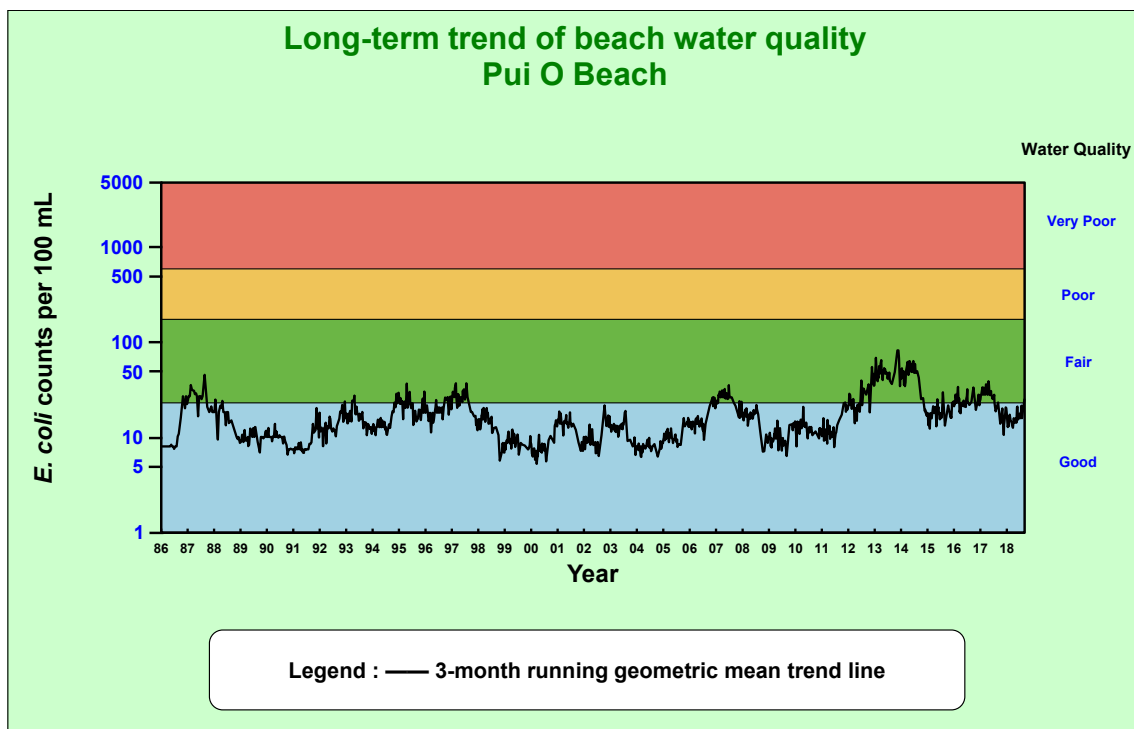
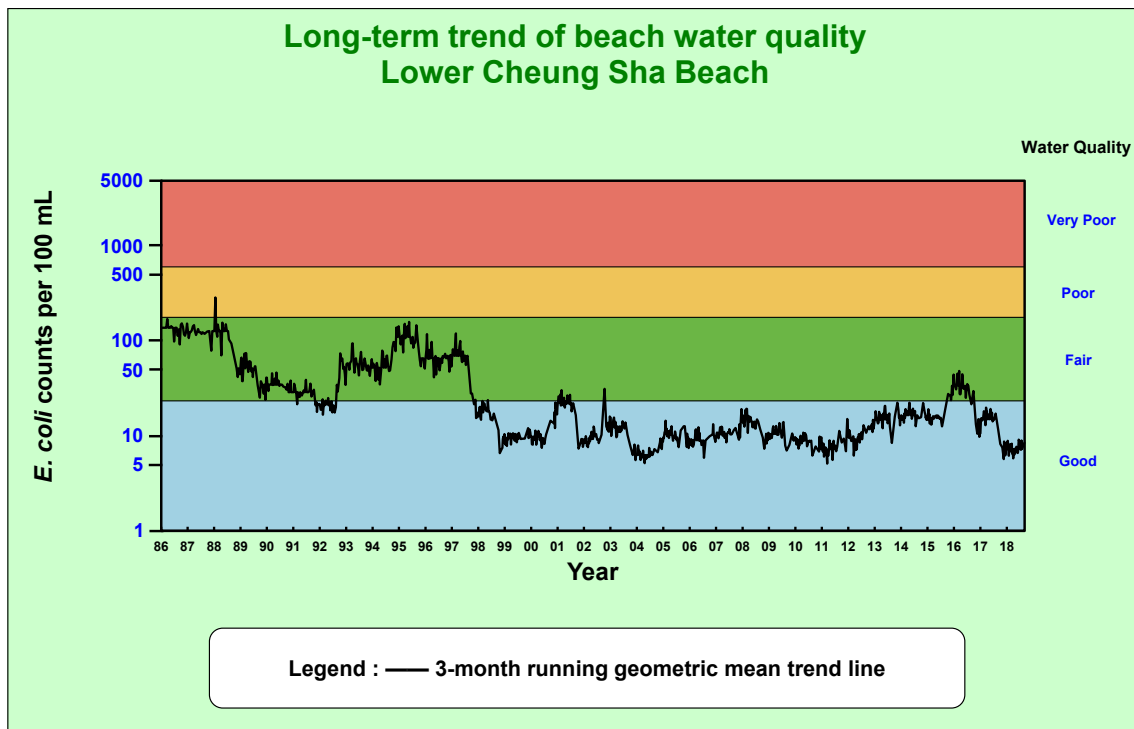


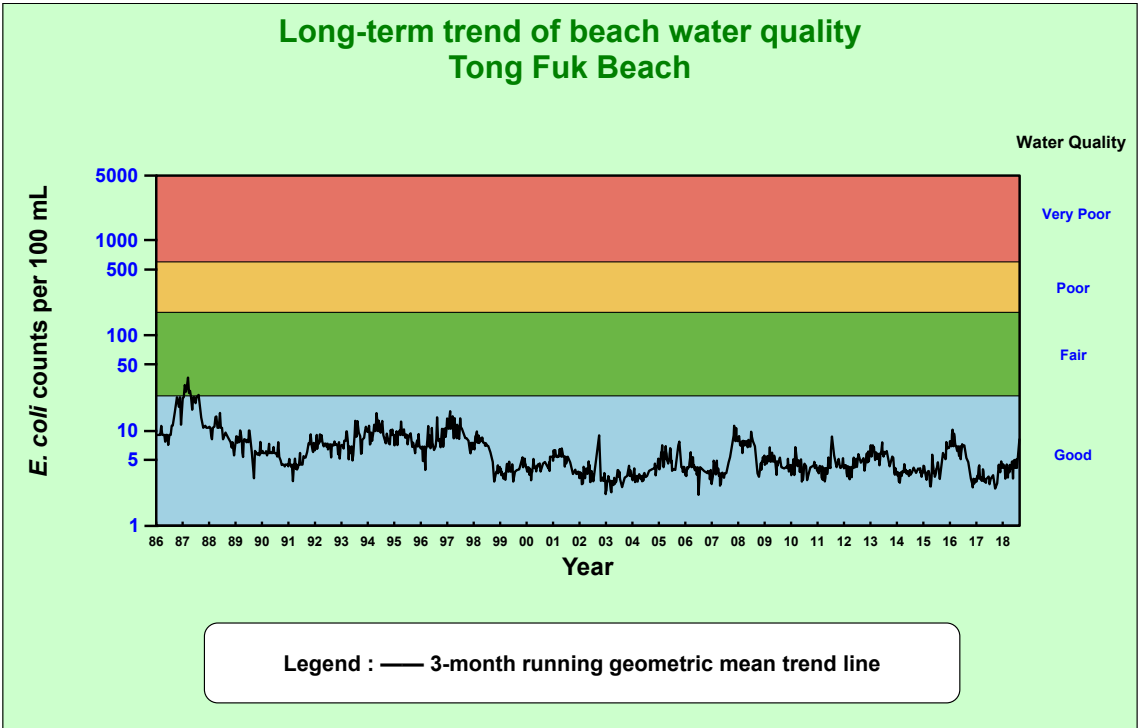
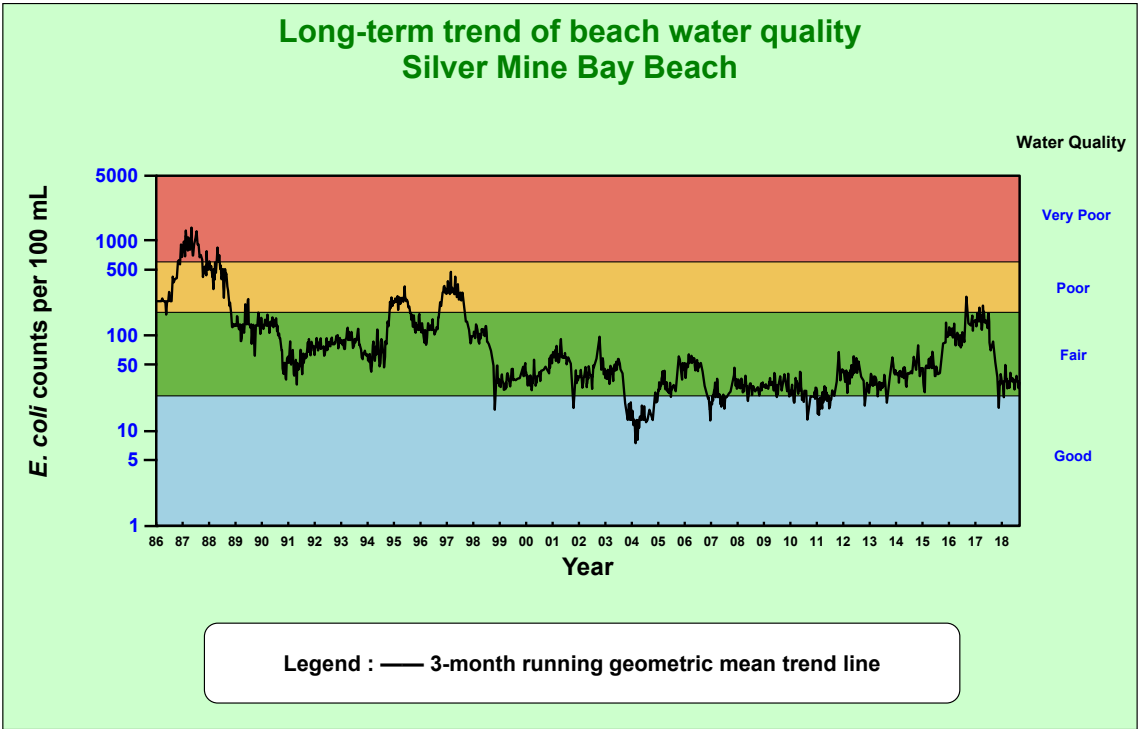
Islands District



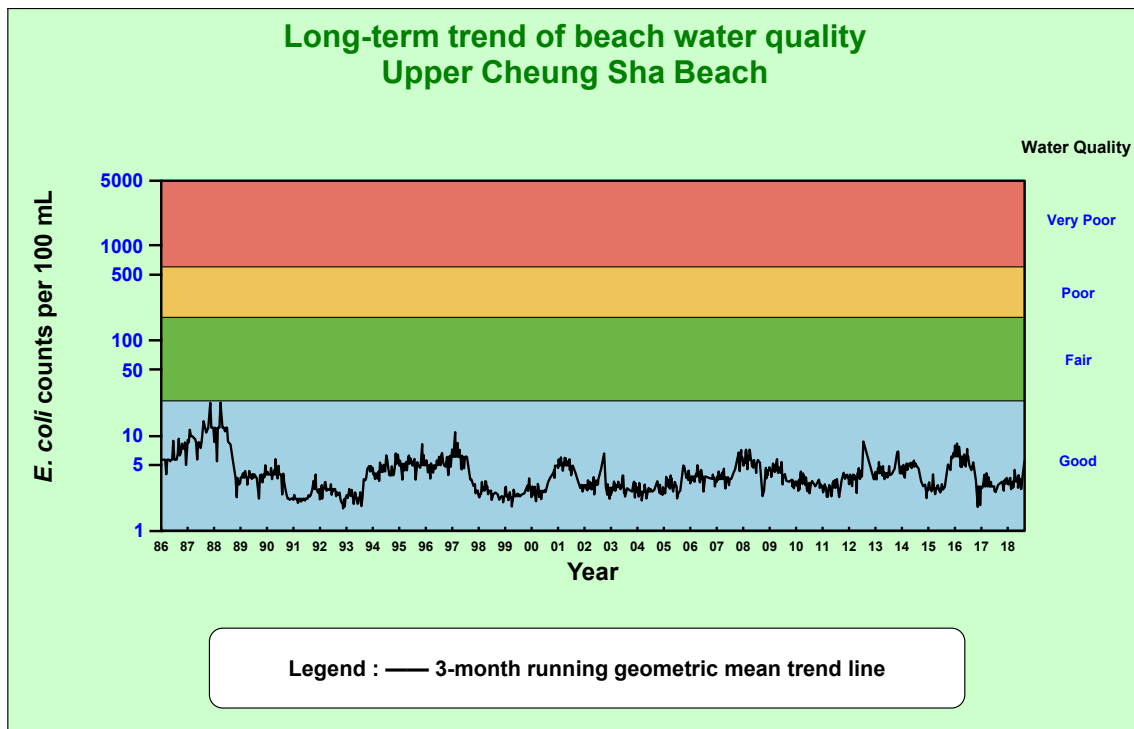














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