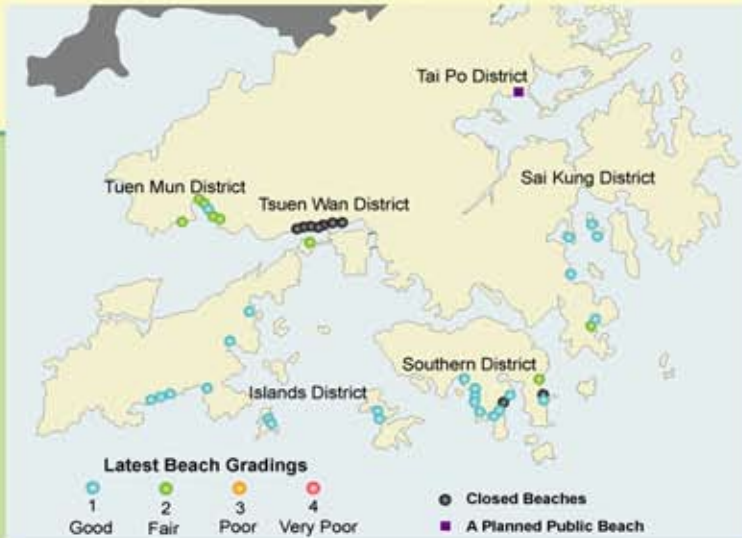


香港泳灘水質

Beach Water Quality

in Hong Kong

2008



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



At the beach: Fun and exercise for all ages



Introduction

The objective of the Beach Water Quality Monitoring Programme is to monitor beach water quality and protect the health of the bathers. The background and details of EPD's monitoring activities can be found on [the website](#).



Blue sky, bright sunlight and clean water at Lower Cheung Sha Beach

This report summarises the beach monitoring data collected in 2008, and the gradings of the beaches and their compliance with the Water Quality Objective (WQO). In 2008, the EPD monitored 41 gazetted beaches and three non-gazetted beaches located in different parts of the territory. The monitoring frequency was at least three times a month during the bathing season from March to October. During monitoring, the EPD staff made field observations, took measurements such as water temperature and dissolved oxygen, and collected samples for further laboratory tests for the faecal bacteria *E. coli* and other water quality parameters (pH, salinity and turbidity).

Hong Kong's beaches are assessed using a dual system: annual ranking and weekly grading based on the *E. coli* level in beach water, which indicates potential health risks associated with swimming. The annual ranking reflects the overall water quality of the beach in the 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”, and those ranked “Good” and “Fair” meet the WQO for bathing waters.

Annual Beach Ranking in 2008

The beach water quality in 2008 was generally good despite the summer being exceptionally wet, especially when compared with the particularly dry summer of 2007. The rainfall of 2,940 mm during the bathing season from March to October 2008 was much higher than the 1,650 mm in the corresponding period in 2007. It is worth-mentioning that the monthly total rainfall of 1,350 mm in June 2008 is a new monthly rainfall record for Hong Kong since record began in 1884.

As pointed out in our previous reports, heavy rainfall can lower beach water quality, in cases where it washes pollutants from beach hinterlands and causes septic tanks and soakaway sewerage systems to overflow and run into the sea. Despite of the exceptionally high rainfall in 2008, most beaches remained open and water quality was by and large good. Twenty-four (or 59%) out of 41 gazetted beaches were ranked as “Good”, slightly down from 25 last year. Ten other beaches (24%) were ranked as “Fair”, seven (17%) as “Poor”, and none as “Very Poor”. In terms of WQO compliance, thirty-four (or 83%) of the 41 gazetted beaches in Hong Kong complied with the WQO, the same as in the previous five years (2003 to 2007).



Repulse Bay Beach offers respite from busy city life

The beaches with “Good” water quality ranking were mainly located in the Southern District (Hong Kong Island South), Sai Kung area, and Outlying Islands. Eleven out of 12 beaches in the Southern District were ranked as “Good” in 2008, only Big Wave Bay Beach was ranked as “Fair”. Of the nine beaches monitored on the Outlying Islands, eight were “Good” while Silver Mine Bay Beach was rated as “Fair”. The ranking of Pui O Beach improved from “Fair” in 2007 to “Good” in 2008. The cleanest gazetted beach in Hong Kong in 2008 in terms of overall *E. coli* levels was Hung Shing Yeh Beach on Lamma Island. In the Sai Kung area, five of the six beaches were “Good” with Silverstrand Beach being the only one ranked as “Fair”; however, the *E. coli* levels of this beach



have been decreasing in the last few years, indicating a steady improvement in water quality. On the western side, all six beaches along the Tuen Mun coast received a “Fair” ranking in 2008. In the Tsuen Wan area, seven beaches had “Poor” water quality rankings and were closed to swimmers. Ma Wan Tung Wan Beach ranked as “Fair” in 2008 and was the only beach open to the swimmers in the Tsuen Wan area. The Government is currently taking active [measures to improve the water quality of Tsuen Wan beaches](#).

The EPD also monitored three non-gazetted beaches in Hong Kong: Discovery Bay (a popular beach on Lantau Island), a sandy beach adjacent to Kiu Tsui Beach in Sai Kung, and a planned artificial beach in Lung Mei, Tai Po. While Discovery Bay and the beach adjacent to Kiu Tsui Beach were ranked “Good” in 2008, Lung Mei was ranked “Poor”. Drainage diversion and pollution control measures will be implemented to improve water quality in Lung Mei area in the coming few years.

To sum up, the broader picture of beach rankings has remained consistent over the past couple of years: the compliance of bathing WQO remains steady at 83%, and it has not been affected by the fluctuations of the exceptionally dry and wet summers of 2007 and 2008 respectively. It demonstrates that continued improvements of sewage infrastructure and enforcement of environmental legislation have lessened the effect of polluted surface runoff on Hong Kong beaches even under heavy rain storms.

Weekly Beach Grading in 2008

The EPD issues weekly gradings for gazetted beaches which are open for swimming. The information is disseminated to the public on [the EPD’s website](#), the beach hotline, beach noticeboards and through [weekly press releases](#). The EPD’s website was significantly enhanced in 2008 to make it more user-friendly.

In 2008, the water quality of Southern District beaches was highly satisfactory. All ten gazetted beaches received mainly “Good” or “Fair” gradings in the bathing season, except on a few occasions when Big Wave Bay, Deep Water Bay and Shek O Beaches were rated as “Poor” after heavy rain storms. South Bay and Turtle Cove Beaches had the best water quality, achieving a “Good” grading in over 80% of the rating occasions. The water quality of Sai Kung beaches was also very good. Hap Mun Bay Beach achieved “Good” grading over 90% of the rating occasions, while the other beaches were mostly “Good” or “Fair”. The water quality of the beaches in the Tuen Mun area was mostly graded as “Fair”. The gradings of the only open beach in Tsuen Wan (Ma Wan Tung Wan Beach) were mostly maintained at “Fair”, while it occasionally also fluctuated between “Good” and “Poor”. The beaches on the Outlying Islands were generally ideal for swimming, with Hung Shing Yeh Beach on Lamma Island having a “Good” grading over 95% of the rating occasions.



廈門灣泳灘
Hap Mun Bay Beach



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蘆鬚城泳灘 *Lo So Shing Beach*



Photo by EPD

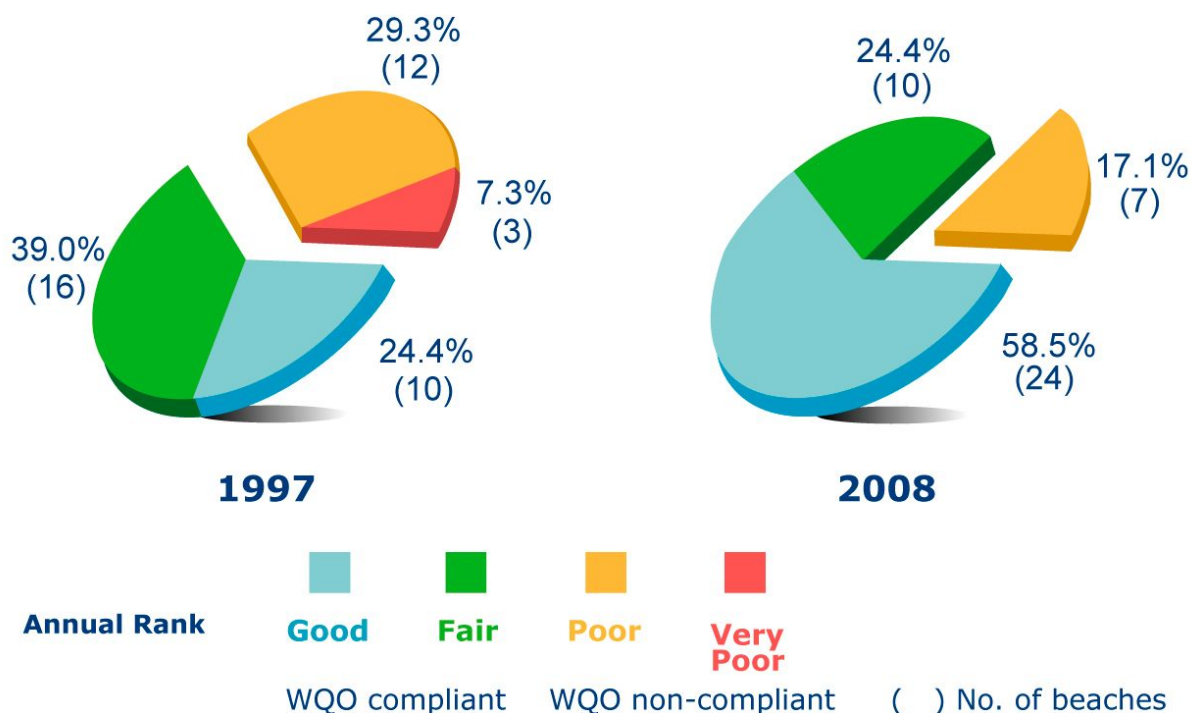
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Water quality trend

There has been a steady improvement of beach water quality in Hong Kong in the last decade. Out of the 41 gazetted beaches, those complying with the WQO have increased from 26 to 34 (63% to 83%) between 1997 and 2008. In the same period, the number of “Good” beaches has more than doubled from 10 to 24.

Annual beach ranking of 1997 and 2008 compared



The overall WQO compliance rate has been maintained at above 80% since 1999. The improvement made at Silver Mine Bay and Tuen Mun beaches was most noticeable as they have consistently complied with the WQO in recent years. The improvement was attributed to the enforcement of environmental legislation, extension of the sewerage network and enhanced sewage treatment facilities in the beach hinterlands.

Water quality trend lines of individual beaches over the last two decades (since 1986 when the monitoring programme began) are also included in this report to show the changes over the years. Background and details of the beach monitoring programme are available at the EPD’s website, and from the report “[20 Years of Beach Water Quality Monitoring in Hong Kong](#)” issued in 2006 (also accessible through [the website](#)).



Measures to improve Tsuen Wan Beaches

Seven gazetted beaches in Tsuen Wan remained closed to swimmers in 2008 due to poor water quality. They were Anglers', Approach, Casam, Gemini, Hoi Mei Wan, Lido and Ting Kau Beaches. Their annual rankings remained the same as 2007, while the overall water quality in the area was still unsatisfactory. The absence of beaches being rated as "Very Poor" in two consecutive bathing seasons was, however, an encouraging sign. The poor water quality was due to pollution in the unsewered hinterlands and high background bacterial levels in the marine waters off Tsuen Wan coast.

To improve the water quality of Tsuen Wan beaches, the Government is implementing the next stage of the Harbour Area Treatment Scheme ([HATS Stage 2A](#)), and aims to disinfect effluent from the Stonecutters Island Sewage Treatment Works by the end of 2009. Moreover, the extension of the public sewers and connections to unsewered villages along Castle Peak Road is on-going. With the proposed sewerage works and continuous pollution control efforts, the water quality in the area is expected to improve substantially in the next few years. This would pave the way for the re-opening of Tsuen Wan beaches to the public for swimming.

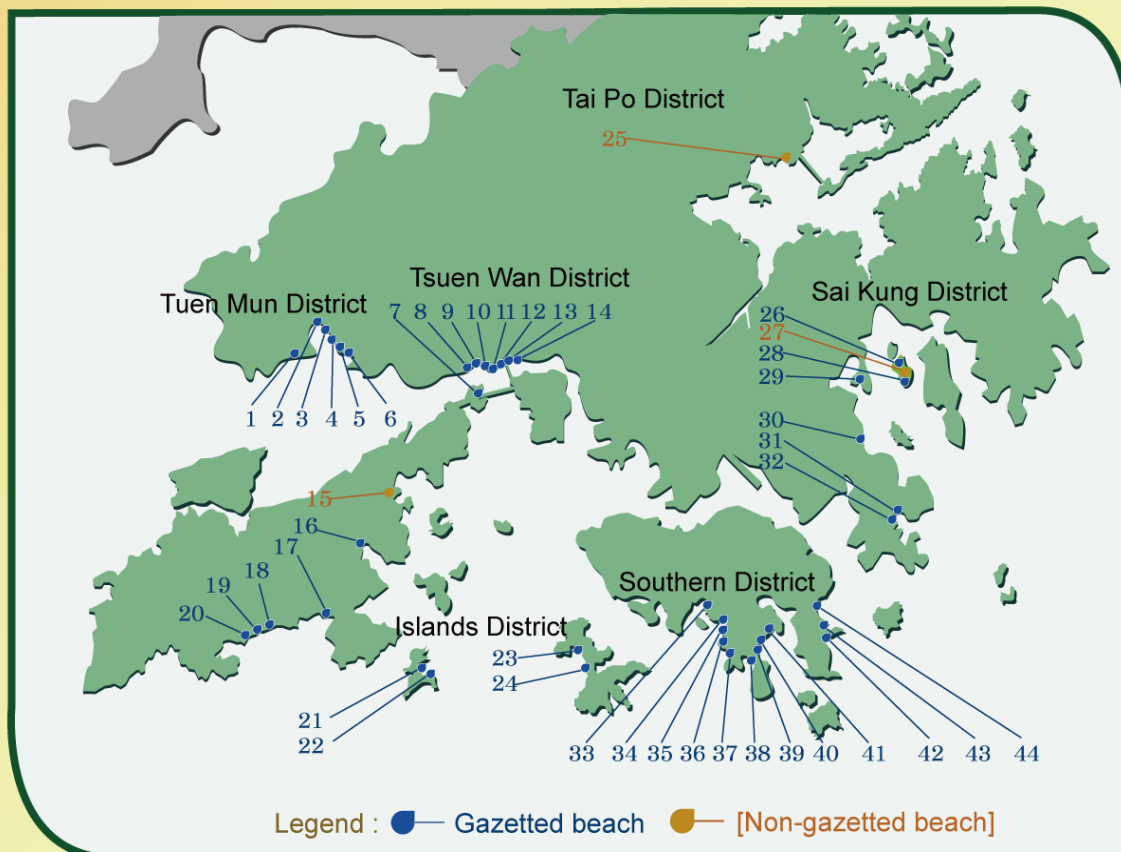


Approach Beach along the Tsuen Wan coastline



The Monitoring Programme

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 frequencies

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

Water Sampling and Field Data Recording

Water sampling



On-site measurements

- Record beach conditions, dissolved oxygen and water temperature



Samples kept at 4°C and tested within 6 hours



Laboratory Testing

Bacteriological Analysis



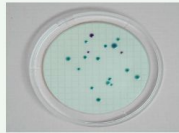
Membrane filtration

Water sample is filtered to retain bacteria on membrane



Incubation

Membranes are incubated with culture medium at 44.5°C in aerobic conditions for 18 - 24 hours



Counting of bacteria

Greenish blue colonies - *E. coli*

Physical Parameter Analysis



Measurement of pH, salinity and turbidity



Data Collation



Data processing

Calculating beach gradings and annual rankings



Information Dissemination





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

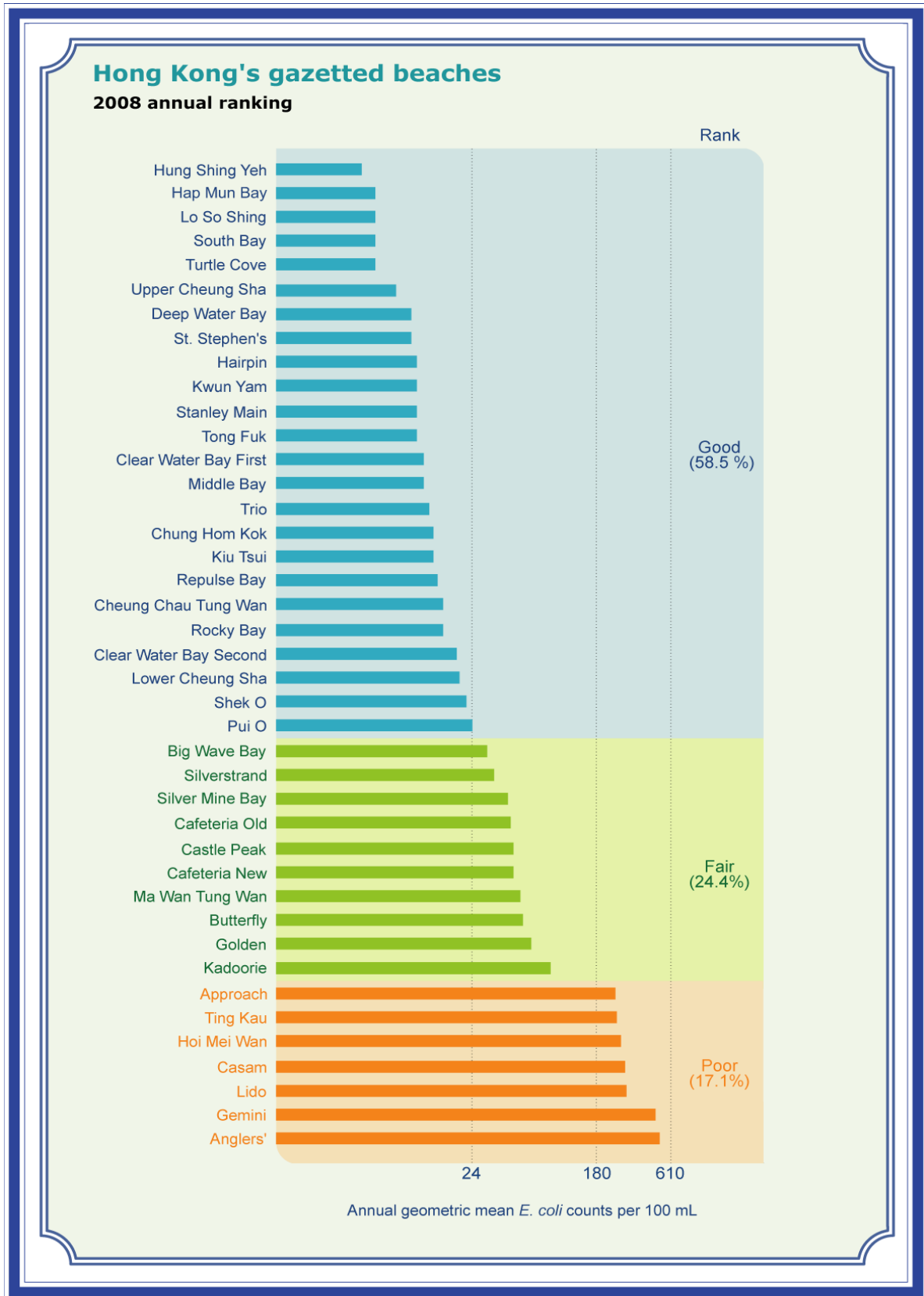
* Unless otherwise indicated, the *E. coli* count represents the geometric mean of the 5 most recent sampling occasions.

** Skin and gastrointestinal illnesses



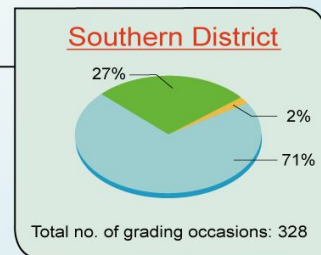
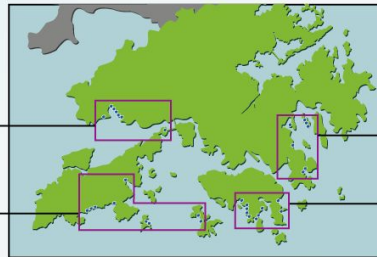
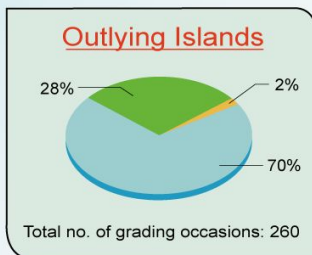
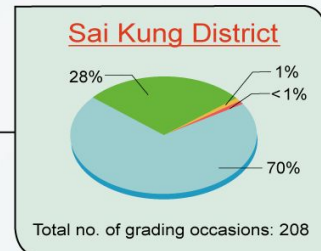
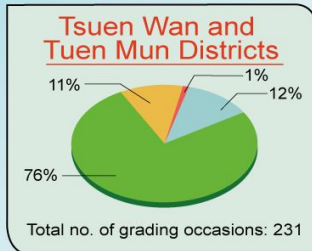
Beach Water Quality in Hong Kong 2008

The 2008 Findings





Beach grading summary by district in 2008

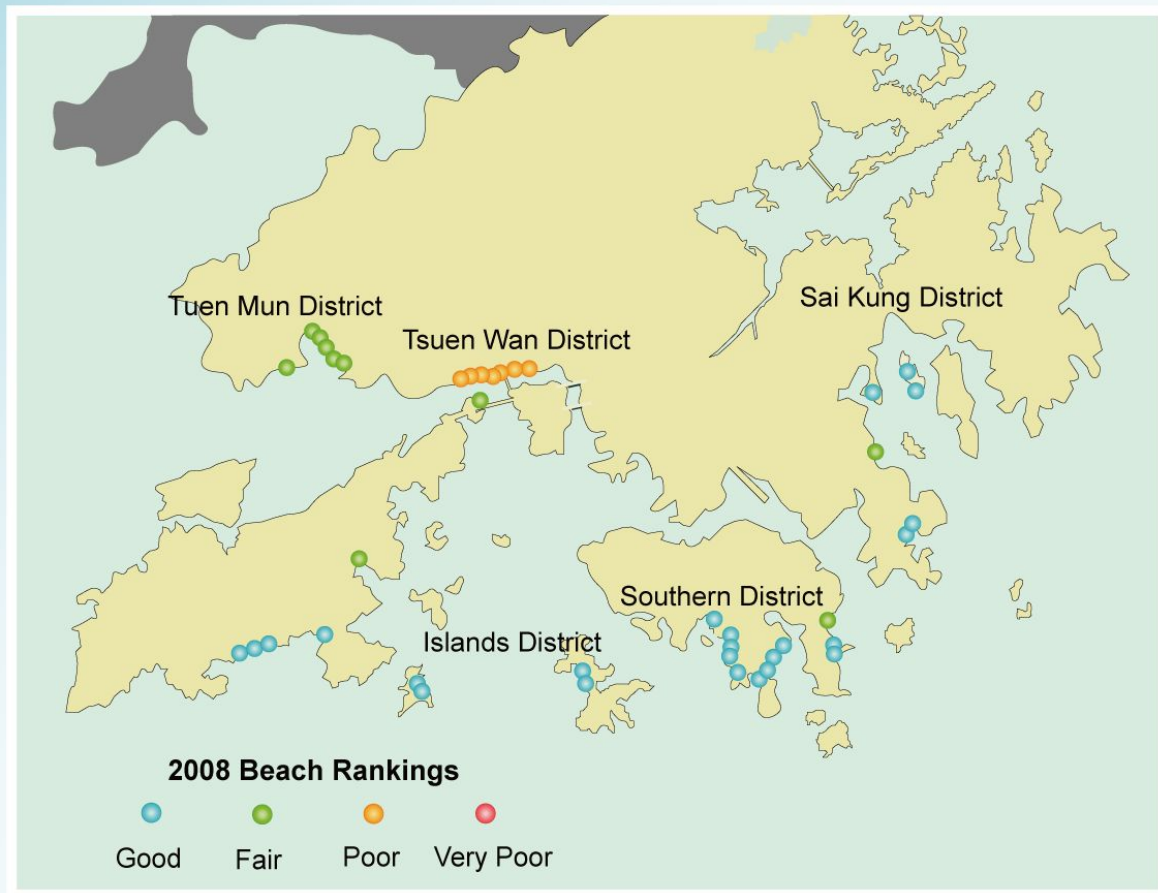




Ranking and Grading Summary

(in 2008 Bathing Season)

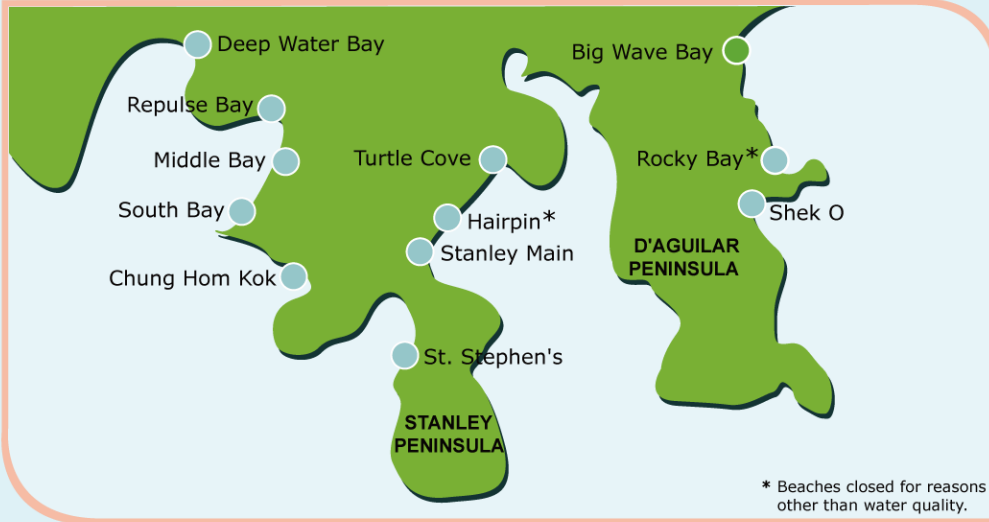
Annual Ranking of gazetted beaches at one glance



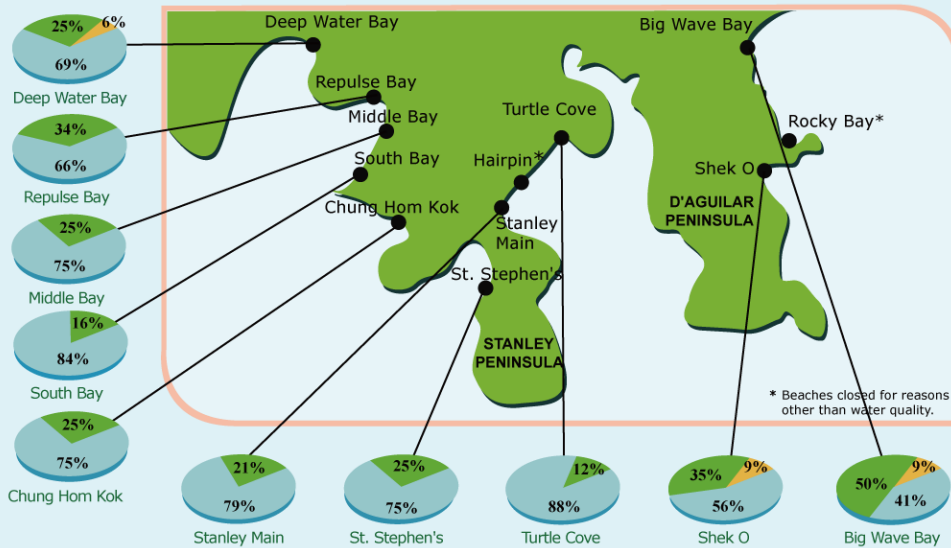


Southern District beaches

Annual ranking



Weekly grading



* Closed beaches. No grading was made.

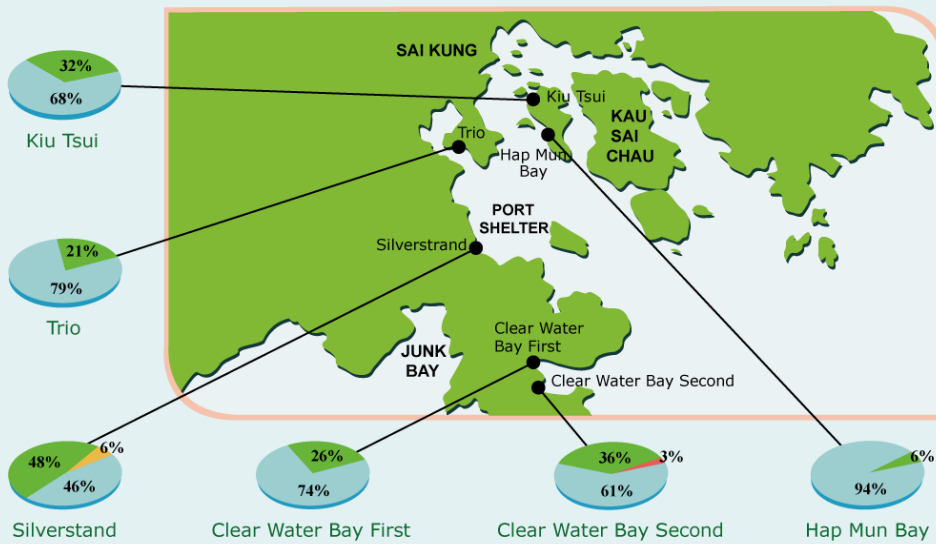


Sai Kung beaches

Annual ranking



Weekly grading



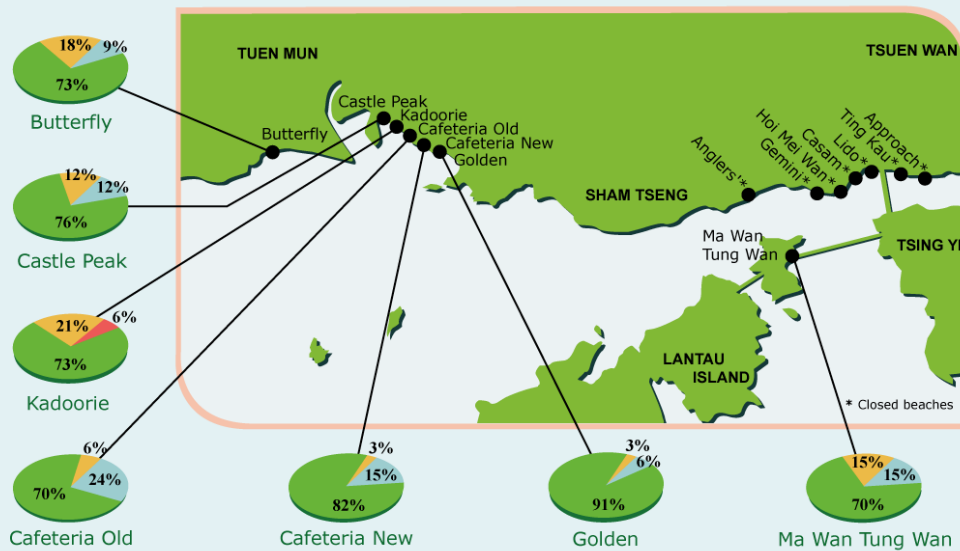


Tsuen Wan and Tuen Mun beaches

Annual ranking



Weekly grading



* Closed beaches. No grading was made.

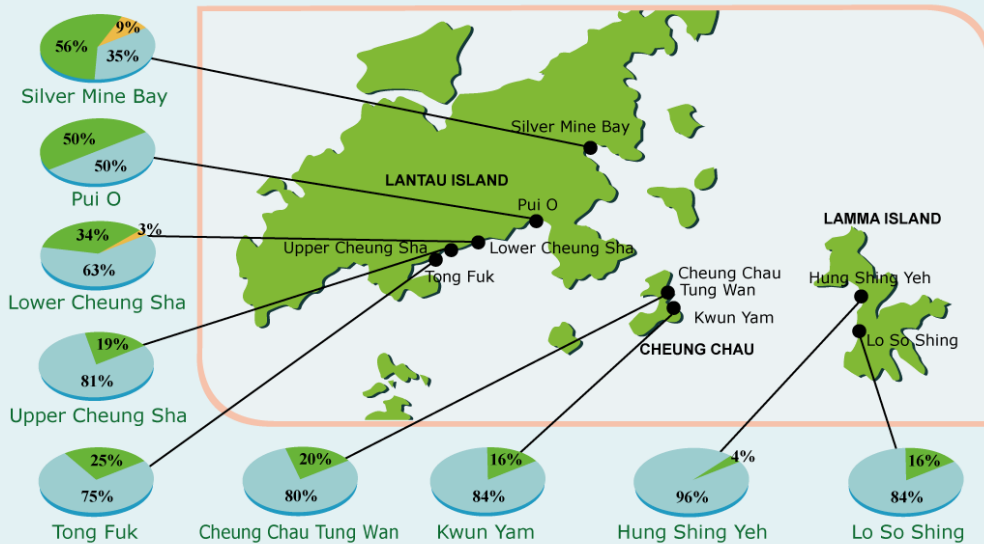


Outlying Islands beaches

Annual ranking

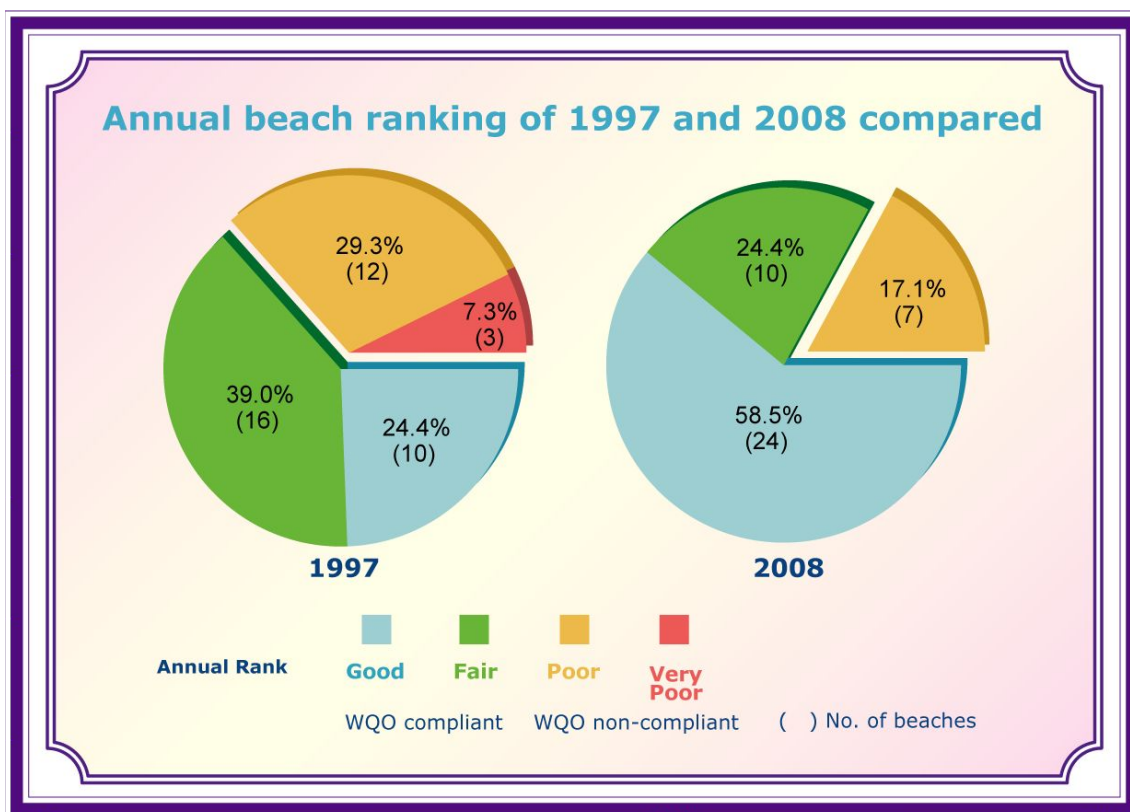
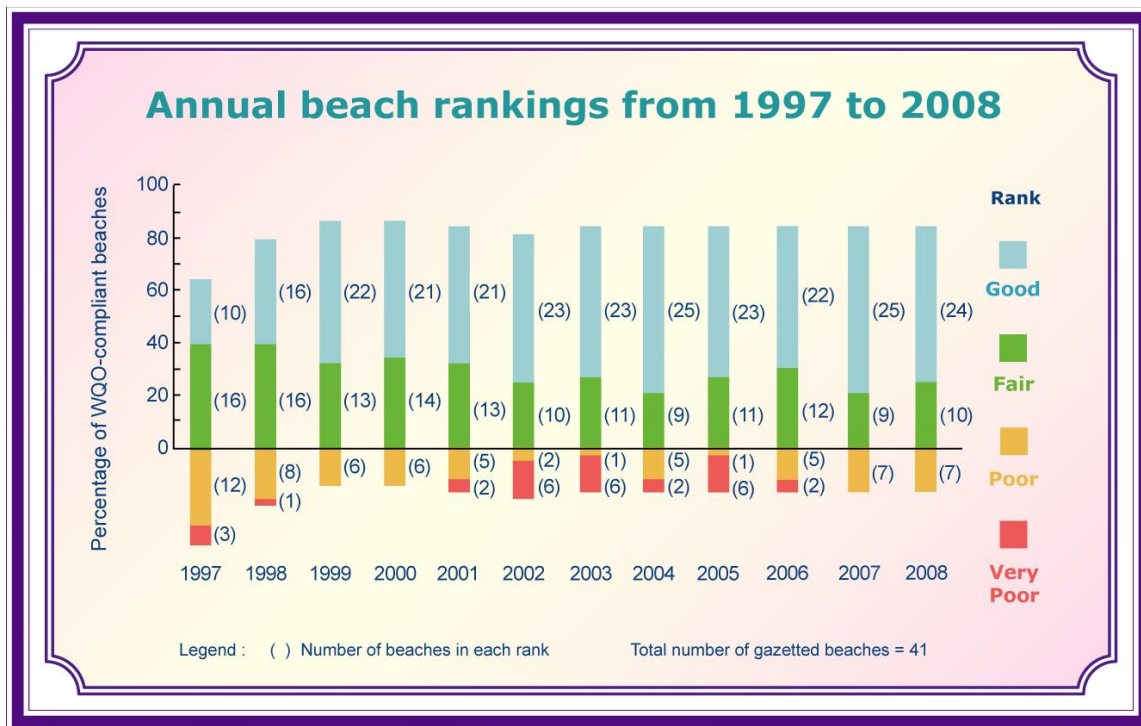


Weekly grading



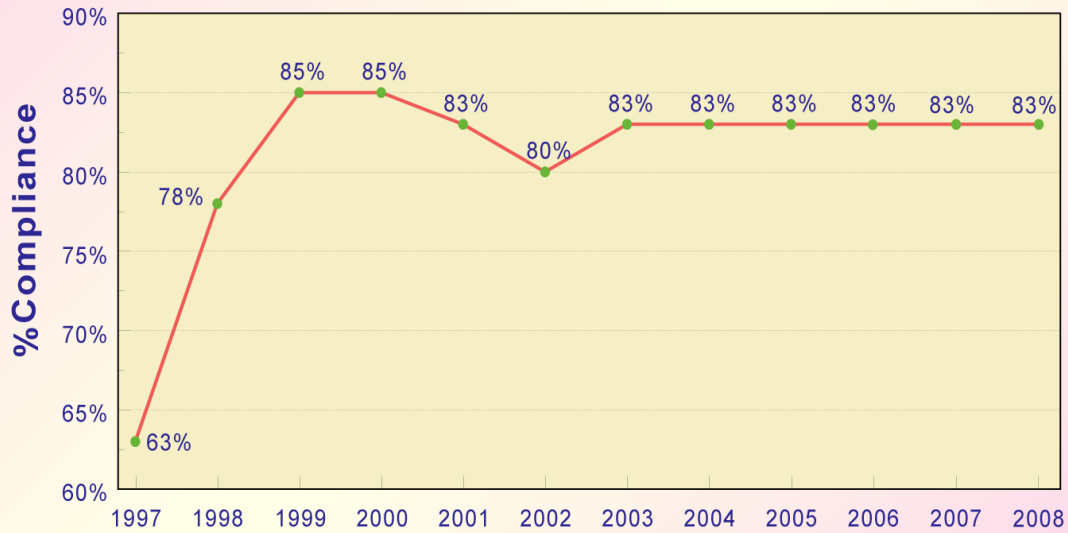


Water Quality Trend (1997 – 2008)

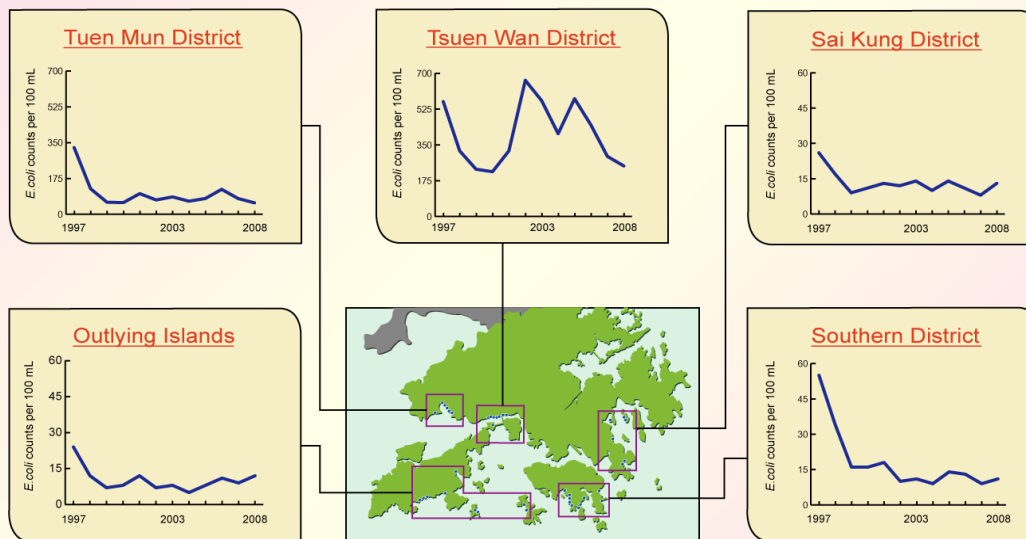




Compliance with the Water Quality Objective at gazetted beaches, 1997 - 2008



Annual geometric mean *E. coli* levels by district, 1997 - 2008





Appendix A – Annual geometric mean *E. coli* levels (1997 – 2008)

Southern District

Annual geometric mean *E. coli* levels

E. coli counts per 100 mL

Beach	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Big Wave Bay	179	114	77	98	106	23	33	26	101	50	17	31
Chung Hom Kok	22	40	14	8	15	13	14	9	13	10	9	13
Deep Water Bay	55	46	14	16	18	9	9	7	8	7	7	9
Hairpin	44	72	17	18	10	6	7	7	13	11	19	10
Middle Bay	40	16	11	11	8	9	14	12	20	18	9	11
Repulse Bay	23	11	8	9	13	9	12	4	8	12	7	14
Rocky Bay	399	223	72	80	118	43	28	19	30	33	17	15
Shek O	102	70	32	29	31	13	11	16	19	24	18	22
South Bay	17	6	4	7	5	5	11	9	7	7	5	5
St. Stephen's	40	26	11	6	7	5	9	4	12	11	6	9
Stanley Main	72	24	13	12	9	8	6	5	7	10	9	10
Turtle Cove	40	14	12	11	15	8	4	5	8	7	5	5

Note: Figure in red indicates that the beach was closed in that year

Sai Kung District

Annual geometric mean *E. coli* levels

E. coli counts per 100 mL

Beach	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Clear Water Bay First	62	41	11	16	28	28	17	9	16	20	14	11
Clear Water Bay Second	66	44	12	26	22	14	21	10	19	13	9	19
Hap Mun Bay	3	2	2	2	1	2	4	3	4	4	3	5
Kiu Tsui	5	4	4	5	5	4	5	17	14	11	6	13
Silverstrand	148	99	32	61	100	133	97	74	67	30	33	35
Trio	30	21	17	10	12	6	10	2	6	5	2	12



Tsuen Wan District

Annual geometric mean *E. coli* levels

E. coli counts per 100 mL

Beach	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Anglers'	691	502	442	326	621	1,169	693	619	895	772	496	510
Approach	1,009	435	387	316	411	696	762	470	663	599	352	251
Casam	609	239	231	209	233	741	702	594	716	426	305	289
Gemini	458	399	350	258	323	1,155	875	1,102	1,042	853	566	481
Hoi Mei Wan	471	280	109	177	199	547	442	287	641	308	286	271
Lido	600	262	231	181	269	683	734	523	782	459	280	296
Ma Wan Tung Wan	110	92	51	39	133	201	159	101	132	171	78	53
Ting Kau	1,583	1,045	515	593	739	742	831	412	512	469	405	258

Note: Figure in red indicates that the beach was closed in that year

Tuen Mun District

Annual geometric mean *E. coli* levels

E. coli counts per 100 mL

Beach	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Butterfly	259	121	44	61	74	60	74	55	55	94	84	56
Cafeteria New	309	100	60	51	104	62	80	54	70	120	68	48
Cafeteria Old	435	138	58	57	125	74	76	61	81	150	67	45
Castle Peak	332	199	57	58	105	58	64	80	90	139	64	47
Golden	352	98	44	50	87	66	84	46	62	117	87	63
Kadoorie	290	130	109	68	120	114	160	98	117	118	101	87

Note: Figure in red indicates that the beach was closed in that year



Outlying Islands

Annual geometric mean *E. coli* levels

E. coli counts per 100 mL

Beach	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Cheung Chau Tung Wan	24	19	11	12	16	17	11	12	14	37	21	15
Hung Shing Yeh	5	3	3	5	6	2	5	4	4	4	6	4
Kwun Yam	32	21	6	10	11	9	7	5	10	13	9	10
Lo So Shing	3	2	4	2	5	2	3	2	3	4	3	5
Lower Cheung Sha	85	23	10	12	22	10	14	7	12	11	12	20
Pui O	36	16	10	10	17	10	15	9	10	16	30	24
Silver Mine Bay	481	123	39	50	67	42	50	14	34	52	22	43
Tong Fuk	14	10	4	5	6	4	3	4	5	5	4	10
Upper Cheung Sha	8	3	2	3	5	3	3	3	3	4	4	7



Appendix B - Beach visitor number, 2008

Southern District

Visitor numbers during the 2008 bathing season

Beach	Daily average		Peak day	Peak month	Total
	Weekdays	Weekends & public holidays			
Big Wave Bay	199	1,265	3,900	27,455	134,047
Chung Hom Kok	286	1,021	2,300	20,220	128,910
Deep Water Bay	1,768	6,854	38,000	184,200	840,075
Hairpin	114	450	1,000	8,800	54,860
Middle Bay	53	405	1,400	11,000	41,100
Repulse Bay	6,924	10,978	19,000	302,695	2,020,773
Rocky Bay	-	-	-	-	-
Shek O	711	3,639	20,000	112,600	408,400
South Bay	109	861	3,700	20,917	86,981
St. Stephen's	185	459	1,380	11,435	67,264
Stanley Main	704	3,282	28,000	66,040	378,639
Turtle Cove	66	300	1,320	7,005	34,885

Note: Information provided by the Leisure and Cultural Services Department



Beach Water Quality in Hong Kong 2008

Sai Kung District

Visitor numbers during the 2008 bathing season

Beach	Daily average		Peak day	Peak month	Total
	Weekdays	Weekends & public holidays			
Clear Water Bay First	97	502	3,025	11,497	56,095
Clear Water Bay Second	2,297	9,451	37,500	303,000	1,135,150
Hap Mun Bay	517	1,413	5,580	58,852	198,381
Kiu Tsui	35	324	966	5,477	31,723
Silverstrand	218	560	2,113	18,790	80,788
Trio	246	854	4,020	30,450	108,995

Note: Information provided by the Leisure and Cultural Services Department

Tsuen Wan District

Visitor numbers during the 2008 bathing season

Beach	Daily average		Peak day	Peak month	Total
	Weekdays	Weekends & public holidays			
Anglers'	45	102	2,828	4,036	15,551
Approach	85	84	231	2,777	20,712
Casam	14	14	65	525	3,388
Gemini	5	6	20	202	1,368
Hoi Mei Wan	6	7	20	229	1,611
Lido	90	121	295	3,335	24,432
Ma Wan Tung Wan	221	1,212	3,568	23,780	133,424
Ting Kau	22	21	50	756	5,298

Note: Information provided by the Leisure and Cultural Services Department



Beach Water Quality in Hong Kong 2008

Tuen Mun District

Visitor numbers during the 2008 bathing season

Beach	Daily average		Peak day	Peak month	Total
	Weekdays	Weekends & public holidays			
Butterfly	789	1,506	3,400	37,800	250,745
Cafeteria New	818	1,827	4,520	62,890	281,130
Cafeteria Old	657	1,432	3,400	38,790	223,030
Castle Peak	428	1,353	1,800	23,850	178,800
Golden	1,750	5,748	11,500	122,800	748,540
Kadoorie	520	835	1,600	28,550	152,560

Note: Information provided by the Leisure and Cultural Services Department

Outlying Islands

Visitor numbers during the 2008 bathing season

Beach	Daily average		Peak day	Peak month	Total
	Weekdays	Weekends & public holidays			
Cheung Chau Tung Wan	124	357	2,000	12,470	49,050
Hung Shing Yeh	167	716	1,800	15,380	84,890
Kwun Yam	72	176	575	5,805	25,915
Lo So Shing	45	141	360	3,230	18,650
Lower Cheung Sha	66	172	470	5,580	24,620
Pui O	189	477	1,260	14,110	69,360
Silver Mine Bay	169	526	13,250	21,345	70,005
Tong Fuk	95	199	700	7,410	31,510
Upper Cheung Sha	71	100	250	3,430	19,680

Note: Information provided by the Leisure and Cultural Services Department



Appendix C – Physicochemical water quality data of gazetted beaches, 2008

Southern District : summary of physicochemical water quality data of gazetted beaches, 2008

Beach	pH	Salinity (psu) ¹	Turbidity (NTU) ²	Temperature (°C)	Dissolved Oxygen (mg/L) (% Saturation)	
<i>Big Wave Bay Beach</i>	8.4 (8.1 - 9.0)	28.4 (15.1 - 33.0)	6.4 (2.8 - 8.4)	25.4 (15.7 - 30.0)	7.1 (6.2 - 8.3)	98 (88 - 116)
<i>Chung Hom Kok Beach</i>	8.4 (8.1 - 8.7)	29.0 (17.8 - 32.9)	6.8 (2.5 - 20.8)	25.5 (16.7 - 30.8)	6.8 (5.3 - 9.0)	94 (70 - 122)
<i>Deep Water Bay Beach</i>	8.4 (8.1 - 8.7)	28.0 (13.8 - 33.0)	8.1 (2.9 - 15.8)	25.7 (17.4 - 30.8)	6.9 (4.5 - 8.9)	96 (75 - 123)
<i>Hairpin Beach [Closed]</i>	8.5 (8.2 - 9.0)	28.7 (13.5 - 33.3)	6.3 (1.6 - 13.6)	26.1 (16.1 - 30.1)	7.3 (5.5 - 9.7)	101 (84 - 126)
<i>Middle Bay Beach</i>	8.4 (8.2 - 8.7)	28.8 (17.0 - 32.8)	7.5 (2.4 - 19.2)	25.4 (17.1 - 29.5)	6.9 (5.3 - 8.9)	96 (75 - 122)
<i>Repulse Bay Beach</i>	8.4 (8.2 - 8.8)	28.8 (17.0 - 33.1)	6.7 (1.9 - 11.5)	25.3 (16.0 - 29.8)	6.9 (5.7 - 8.9)	98 (81 - 117)
<i>Rocky Bay Beach [Closed]</i>	8.3 (7.5 - 8.7)	29.9 (20.6 - 33.1)	6.5 (2.5 - 8.6)	25.3 (16.7 - 30.3)	7.1 (5.7 - 8.7)	98 (88 - 110)
<i>Shek O Beach</i>	8.4 (8.1 - 9.1)	29.7 (19.8 - 33.2)	6.8 (2.6 - 12.2)	25.6 (16.7 - 30.0)	7.1 (5.8 - 10.0)	99 (89 - 130)
<i>South Bay Beach</i>	8.4 (8.2 - 8.7)	28.8 (16.5 - 32.9)	6.7 (2.9 - 17.4)	25.5 (16.5 - 29.8)	6.8 (5.1 - 8.9)	95 (71 - 125)
<i>St. Stephen's Beach</i>	8.4 (8.2 - 8.9)	28.5 (17.1 - 33.1)	6.8 (1.5 - 28.5)	25.4 (15.9 - 30.4)	6.9 (5.3 - 9.3)	97 (74 - 124)
<i>Stanley Main Beach</i>	8.5 (8.1 - 9.0)	28.2 (13.3 - 33.0)	8.2 (1.5 - 43.2)	26.2 (16.7 - 30.4)	7.2 (5.6 - 8.8)	101 (85 - 126)
<i>Turtle Cove Beach</i>	8.5 (8.2 - 9.0)	27.9 (11.7 - 32.9)	9.6 (1.8 - 66.0)	26.1 (15.7 - 30.3)	7.1 (5.0 - 9.0)	98 (77 - 120)

1. Practical Salinity Unit ; 2. Nephelometric Turbidity Unit

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

Sai Kung District : summary of physicochemical water quality data of gazetted beaches, 2008

Beach	pH	Salinity (psu) ¹	Turbidity (NTU) ²	Temperature (°C)	Dissolved Oxygen (mg/L) (% Saturation)	
<i>Clear Water Bay First Beach</i>	8.5 (8.2 - 8.8)	28.9 (16.5 - 33.1)	7.8 (2.4 - 18.5)	25.9 (16.0 - 30.4)	6.7 (4.7 - 7.9)	94 (63 - 105)
<i>Clear Water Bay Second Beach</i>	8.5 (8.2 - 8.8)	29.3 (15.4 - 32.9)	7.4 (2.2 - 14.1)	26.2 (16.4 - 30.8)	6.7 (4.9 - 8.1)	94 (78 - 107)
<i>Hap Mun Bay Beach</i>	8.4 (8.2 - 8.8)	29.5 (19.2 - 32.9)	5.7 (1.2 - 9.5)	26.3 (15.4 - 31.1)	6.8 (4.9 - 8.4)	96 (70 - 123)
<i>Kiu Tsui Beach</i>	8.4 (8.2 - 8.8)	29.0 (19.9 - 32.7)	6.0 (1.4 - 14.2)	26.3 (16.1 - 31.2)	7.0 (5.1 - 8.7)	100 (71 - 130)
<i>Silverstrand Beach</i>	8.4 (7.7 - 8.7)	28.3 (16.6 - 32.6)	7.8 (1.6 - 34.9)	26.1 (16.0 - 30.6)	6.9 (5.7 - 7.9)	98 (86 - 124)
<i>Trio Beach</i>	8.4 (8.2 - 8.8)	27.9 (11.9 - 32.7)	5.7 (1.5 - 7.8)	26.6 (16.3 - 31.3)	6.8 (5.4 - 8.1)	96 (83 - 113)

1. Practical Salinity Unit ; 2. Nephelometric Turbidity Unit

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



Tsuen Wan District : summary of physicochemical water quality data of gazetted beaches, 2008

Beach	pH	Salinity (psu) ¹	Turbidity (NTU) ²	Temperature (°C)	Dissolved Oxygen (mg/L) (% Saturation)	
<i>Anglers' Beach [Closed]</i>	8.3 (7.9 - 8.5)	26.5 (10.5 - 31.3)	7.2 (3.1 - 11.2)	25.4 (17.0 - 30.0)	6.7 (5.3 - 8.0)	92 (73 - 113)
<i>Approach Beach [Closed]</i>	8.3 (8.0 - 8.5)	25.8 (13.3 - 30.6)	7.3 (5.1 - 14.5)	24.9 (16.0 - 28.1)	6.8 (5.0 - 9.6)	94 (68 - 129)
<i>Casam Beach [Closed]</i>	8.3 (8.0 - 8.5)	26.4 (14.4 - 31.1)	7.1 (4.2 - 10.6)	25.3 (16.0 - 29.0)	6.8 (5.3 - 8.5)	94 (73 - 118)
<i>Gemini Beaches [Closed]</i>	8.3 (7.9 - 8.5)	26.2 (10.7 - 31.2)	7.0 (3.3 - 18.5)	25.3 (16.0 - 31.0)	6.6 (5.3 - 8.2)	91 (72 - 104)
<i>Hoi Mei Wan Beach [Closed]</i>	8.3 (8.0 - 8.5)	25.9 (14.2 - 30.7)	6.5 (3.3 - 7.9)	25.5 (17.0 - 30.0)	6.6 (5.6 - 8.4)	91 (70 - 104)
<i>Lido Beach [Closed]</i>	8.3 (8.0 - 8.5)	26.5 (14.9 - 30.7)	6.9 (3.5 - 11.3)	25.3 (16.0 - 29.4)	6.6 (5.3 - 8.4)	92 (70 - 110)
<i>Ma Wan Tung Wan Beach</i>	8.3 (8.0 - 8.7)	27.3 (17.3 - 31.1)	9.7 (4.2 - 35.6)	26.5 (17.0 - 31.8)	7.0 (5.6 - 9.5)	97 (79 - 135)
<i>Ting Kau Beach [Closed]</i>	8.3 (8.0 - 8.5)	25.7 (14.3 - 30.7)	7.0 (3.6 - 19.5)	25.2 (16.0 - 29.0)	6.6 (5.1 - 8.2)	92 (75 - 111)

1. Practical Salinity Unit ; 2. Nephelometric Turbidity Unit
Note: Data presented are arithmetic means; figures in brackets are ranges.

Tuen Mun District : summary of physicochemical water quality data of gazetted beaches, 2008

Beach	pH	Salinity (psu) ¹	Turbidity (NTU) ²	Temperature (°C)	Dissolved Oxygen (mg/L) (% Saturation)	
<i>Butterfly Beach</i>	8.3 (7.9 - 8.8)	23.0 (6.2 - 30.0)	9.4 (3.7 - 37.5)	26.7 (17.7 - 30.1)	6.8 (5.2 - 8.8)	96 (78 - 136)
<i>Cafeteria New Beach</i>	8.3 (8.1 - 8.8)	22.6 (7.0 - 30.5)	12.0 (4.7 - 24.8)	26.3 (16.9 - 29.9)	6.9 (5.4 - 8.3)	98 (85 - 113)
<i>Cafeteria Old Beach</i>	8.3 (8.0 - 8.7)	22.5 (6.1 - 30.1)	10.1 (5.0 - 23.0)	26.3 (16.8 - 30.2)	6.9 (5.2 - 8.4)	97 (71 - 114)
<i>Castle Peak Beach</i>	8.3 (8.0 - 8.8)	22.4 (5.0 - 30.4)	8.8 (5.4 - 30.5)	26.8 (17.7 - 30.4)	7.0 (5.3 - 9.7)	100 (75 - 147)
<i>Golden Beach</i>	8.3 (8.0 - 8.8)	22.7 (7.2 - 30.6)	13.5 (5.2 - 29.6)	26.2 (16.8 - 29.8)	6.9 (5.7 - 8.1)	97 (81 - 113)
<i>Kadoorie Beach</i>	8.3 (8.0 - 8.8)	22.7 (6.8 - 30.3)	8.9 (2.7 - 32.3)	26.5 (16.9 - 30.3)	6.9 (5.2 - 8.4)	97 (78 - 124)

1. Practical Salinity Unit ; 2. Nephelometric Turbidity Unit
Note: Data presented are arithmetic means; figures in brackets are ranges.



Outlying Islands :

summary of physicochemical water quality data of gazetted beaches, 2008

Beach	pH	Salinity (psu) ¹	Turbidity (NTU) ²	Temperature (°C)	Dissolved Oxygen (mg/L) (% Saturation)	
<i>Cheung Chau Tung Wan Beach</i>	8.3 (8.0 - 8.8)	27.7 (15.2 - 31.4)	7.9 (4.4 - 20.1)	25.7 (17.0 - 29.6)	7.0 (6.0 - 8.3)	96 (78 - 118)
<i>Hung Shing Yeh Beach, Lamma</i>	8.4 (8.2 - 8.9)	27.5 (11.1 - 33.2)	8.0 (5.2 - 16.4)	26.0 (17.8 - 30.4)	7.0 (6.2 - 9.4)	97 (89 - 130)
<i>Kwun Yam Beach, Cheung Chau</i>	8.3 (7.9 - 8.8)	27.4 (15.0 - 31.4)	8.3 (4.1 - 32.0)	25.6 (17.0 - 29.3)	7.0 (6.0 - 8.5)	95 (78 - 120)
<i>Lo So Shing Beach, Lamma</i>	8.4 (7.8 - 9.0)	27.6 (9.7 - 33.1)	7.6 (2.1 - 22.0)	25.6 (16.0 - 31.0)	7.4 (6.4 - 9.2)	100 (91 - 128)
<i>Lower Cheung Sha Beach, Lantau</i>	8.4 (8.1 - 8.8)	26.0 (12.9 - 32.1)	11.8 (5.8 - 28.8)	26.6 (17.2 - 30.6)	6.8 (5.3 - 7.9)	94 (68 - 107)
<i>Pui O Beach, Lantau</i>	8.4 (8.1 - 8.9)	25.5 (8.8 - 32.4)	14.6 (5.7 - 30.0)	26.9 (17.3 - 30.5)	6.6 (5.1 - 7.9)	93 (68 - 103)
<i>Silver Mine Bay Beach, Lantau</i>	8.3 (8.0 - 8.9)	23.3 (7.0 - 31.5)	10.4 (3.6 - 39.3)	26.9 (17.6 - 30.4)	6.4 (3.0 - 8.8)	91 (41 - 130)
<i>Tong Fuk Beach, Lantau</i>	8.4 (8.1 - 8.7)	26.3 (12.5 - 32.1)	10.2 (3.4 - 23.6)	26.5 (16.9 - 30.4)	7.0 (6.3 - 7.9)	98 (84 - 109)
<i>Upper Cheung Sha Beach, Lantau</i>	8.4 (8.2 - 8.8)	26.0 (11.2 - 32.2)	12.3 (3.0 - 40.8)	26.5 (17.2 - 30.1)	7.0 (6.2 - 8.1)	97 (79 - 113)

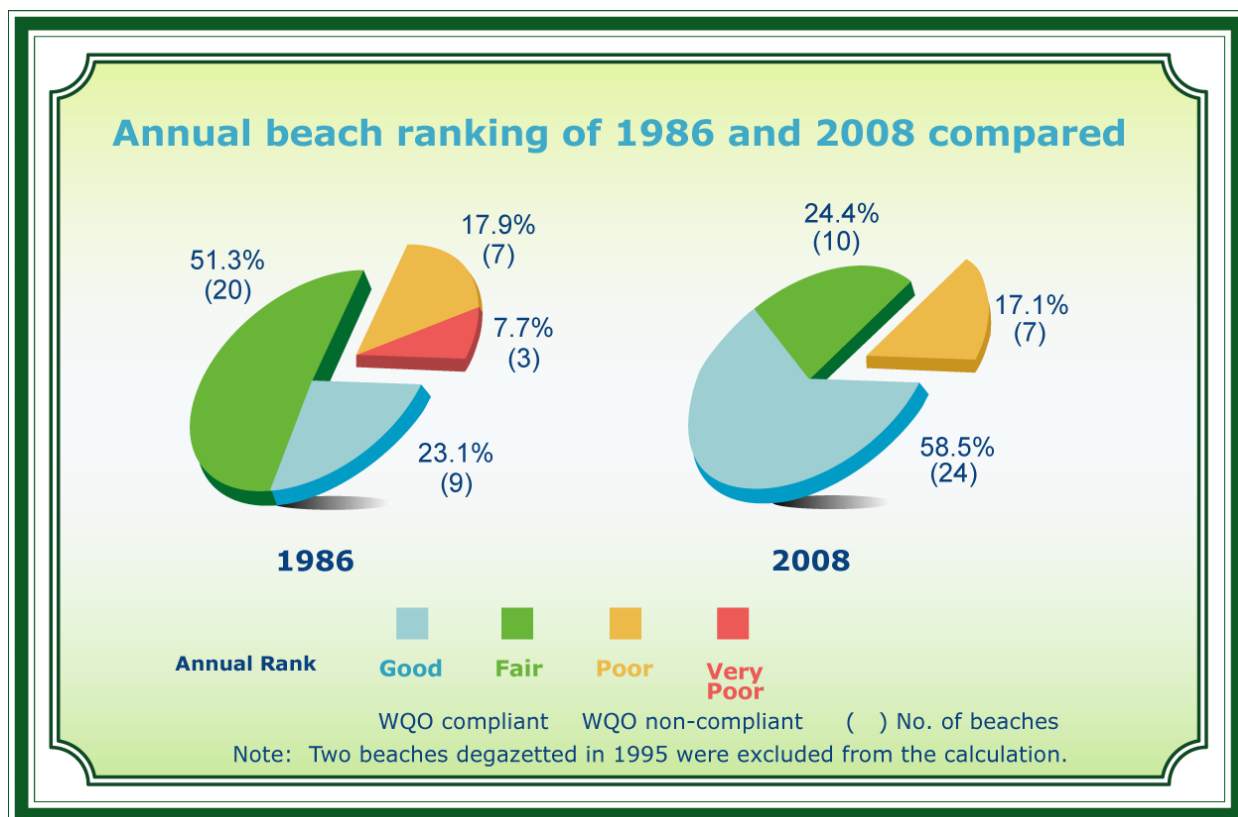
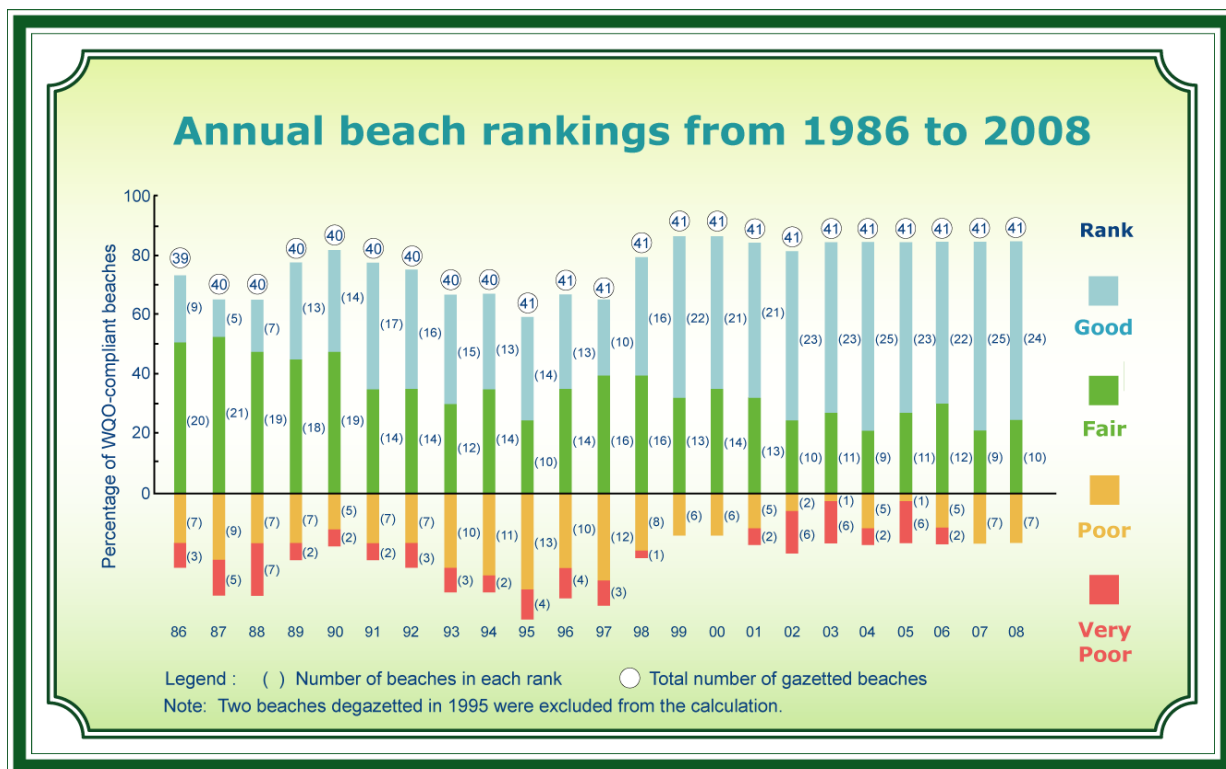
1. Practical Salinity Unit ; 2. Nephelometric Turbidity Unit

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



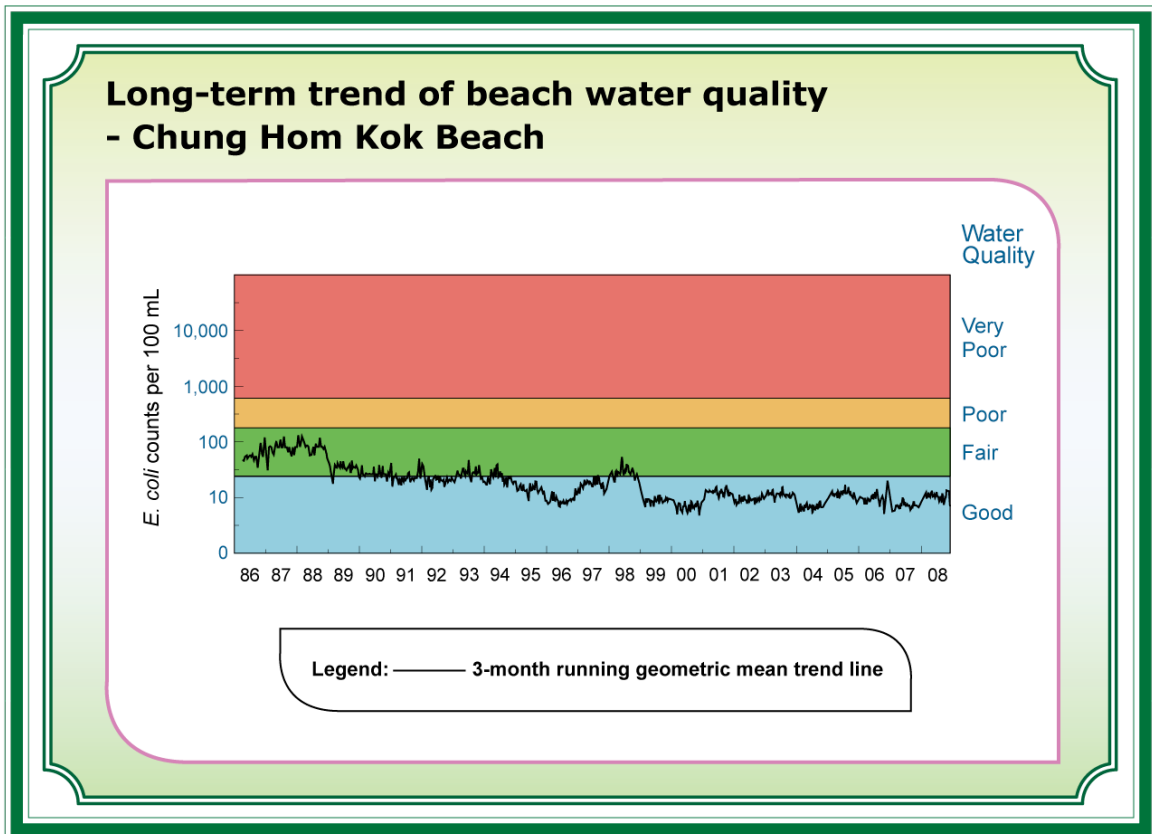
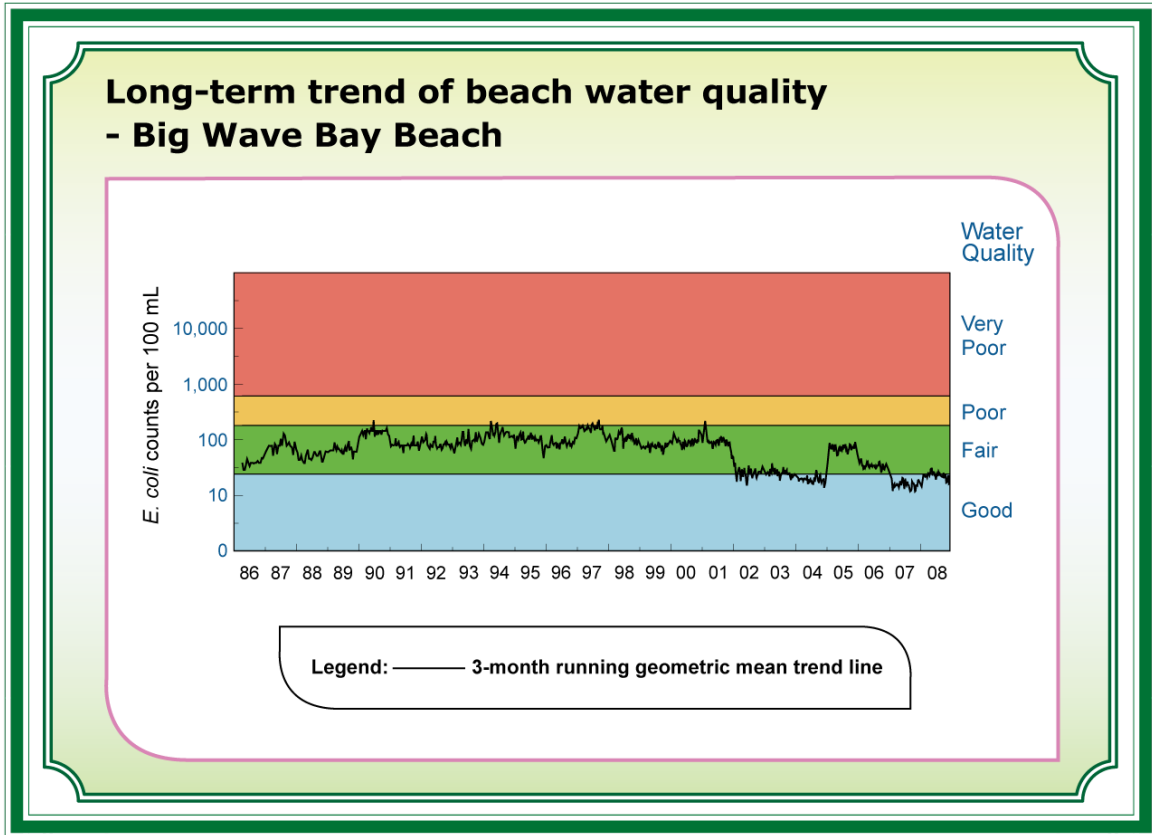
Beach Water Quality in Hong Kong 2008

Appendix D – Long-term trend of beach water quality (1986-2008)



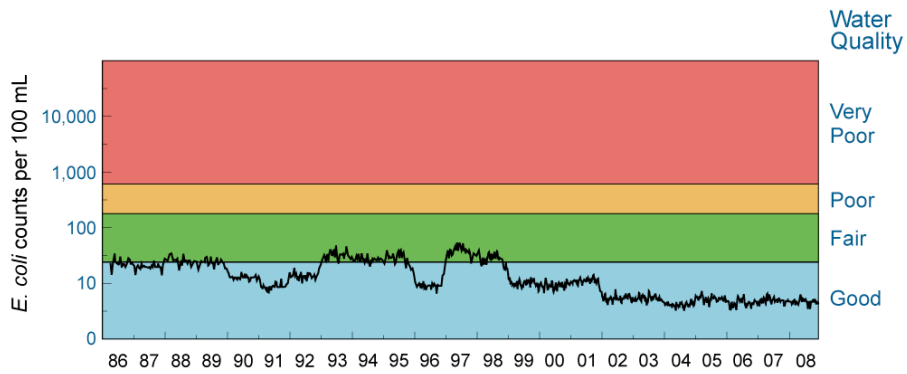


- Southern District



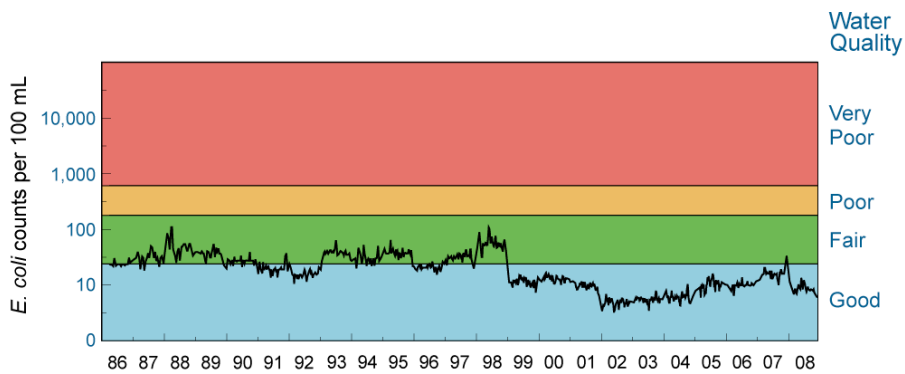


Long-term trend of beach water quality - Deep Water Bay Beach



Legend: — 3-month running geometric mean trend line

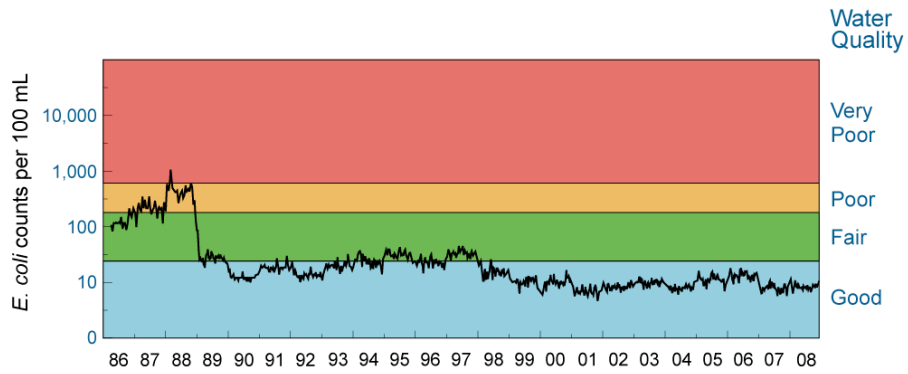
Long-term trend of beach water quality - Hairpin Beach



Legend: — 3-month running geometric mean trend line

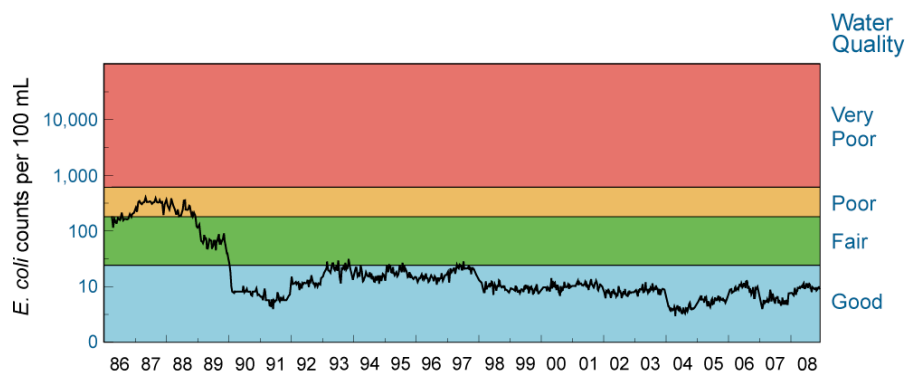


Long-term trend of beach water quality - Middle Bay Beach



Legend: — 3-month running geometric mean trend line

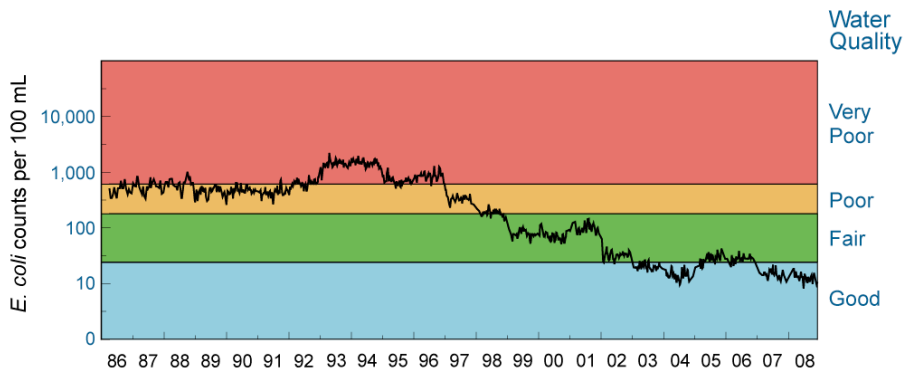
Long-term trend of beach water quality - Repulse Bay Beach



Legend: — 3-month running geometric mean trend line

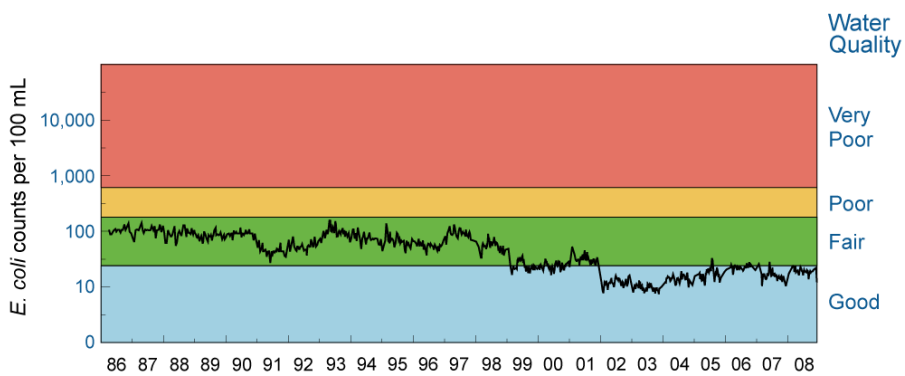


Long-term trend of beach water quality - Rocky Bay Beach



Legend: — 3-month running geometric mean trend line

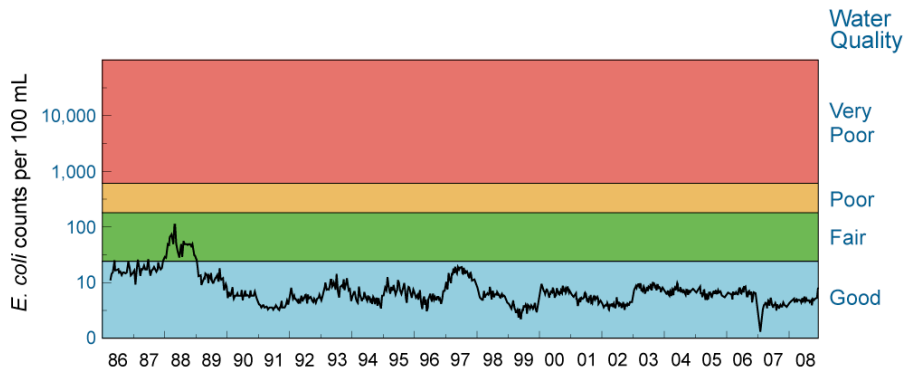
Long-term trend of beach water quality - Shek O Beach



Legend: — 3-month running geometric mean trend line

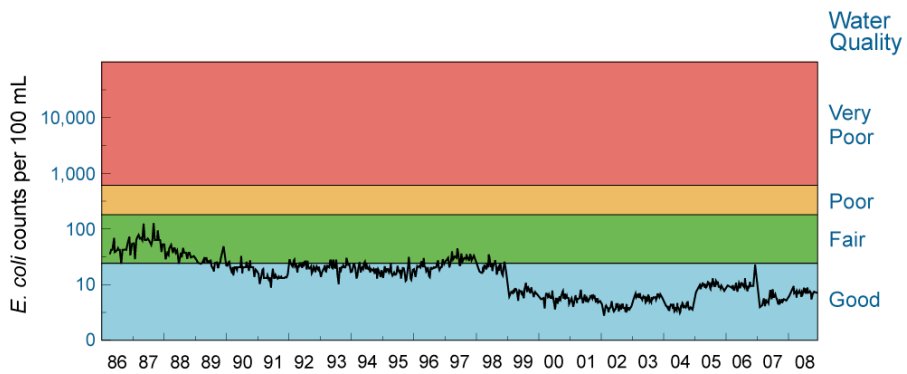


Long-term trend of beach water quality - South Bay Beach



Legend: — 3-month running geometric mean trend line

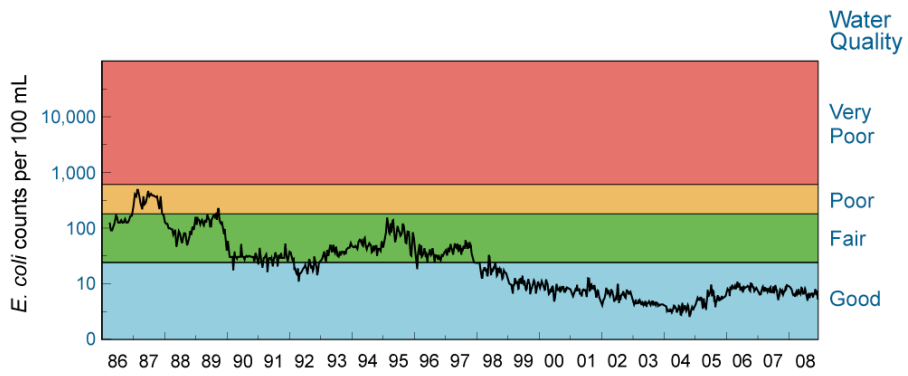
Long-term trend of beach water quality - St. Stephen's Beach



Legend: — 3-month running geometric mean trend line

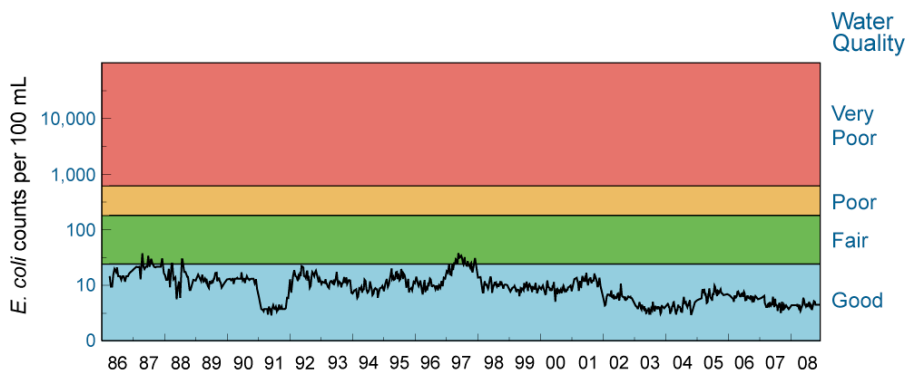


Long-term trend of beach water quality - Stanley Main Beach



Legend: — 3-month running geometric mean trend line

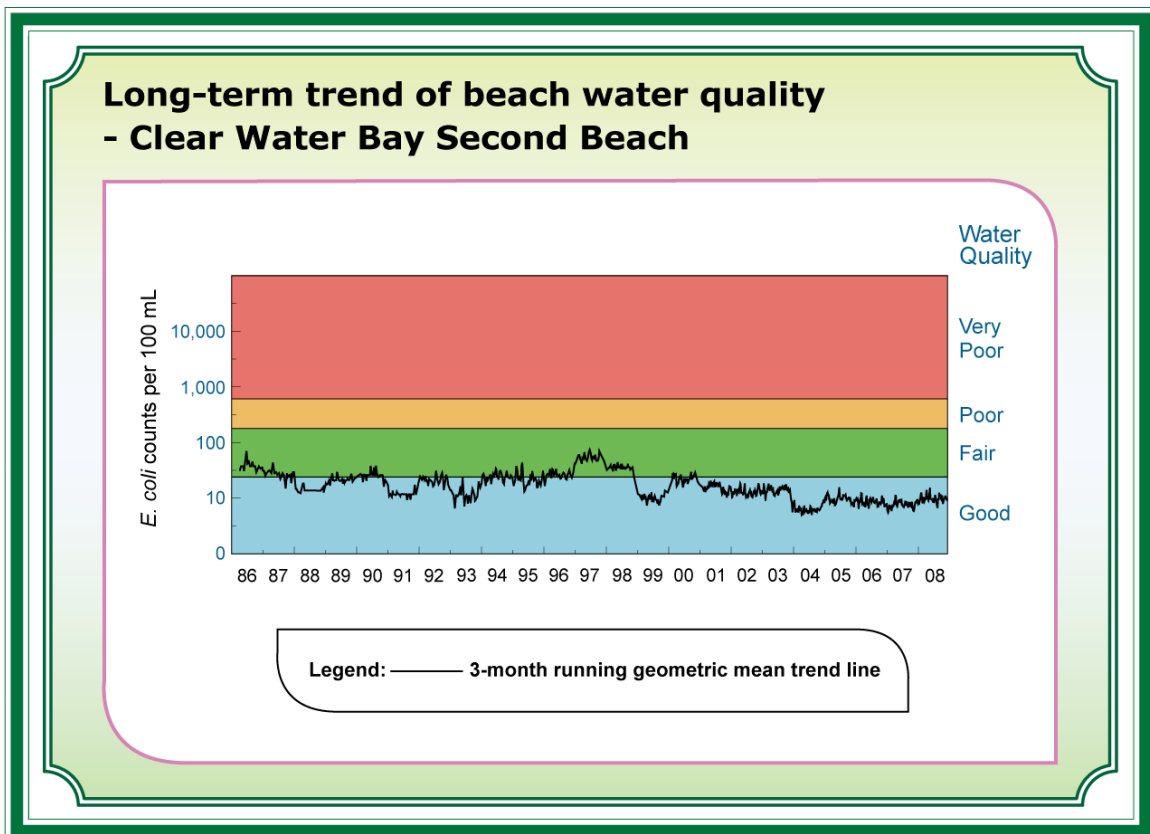
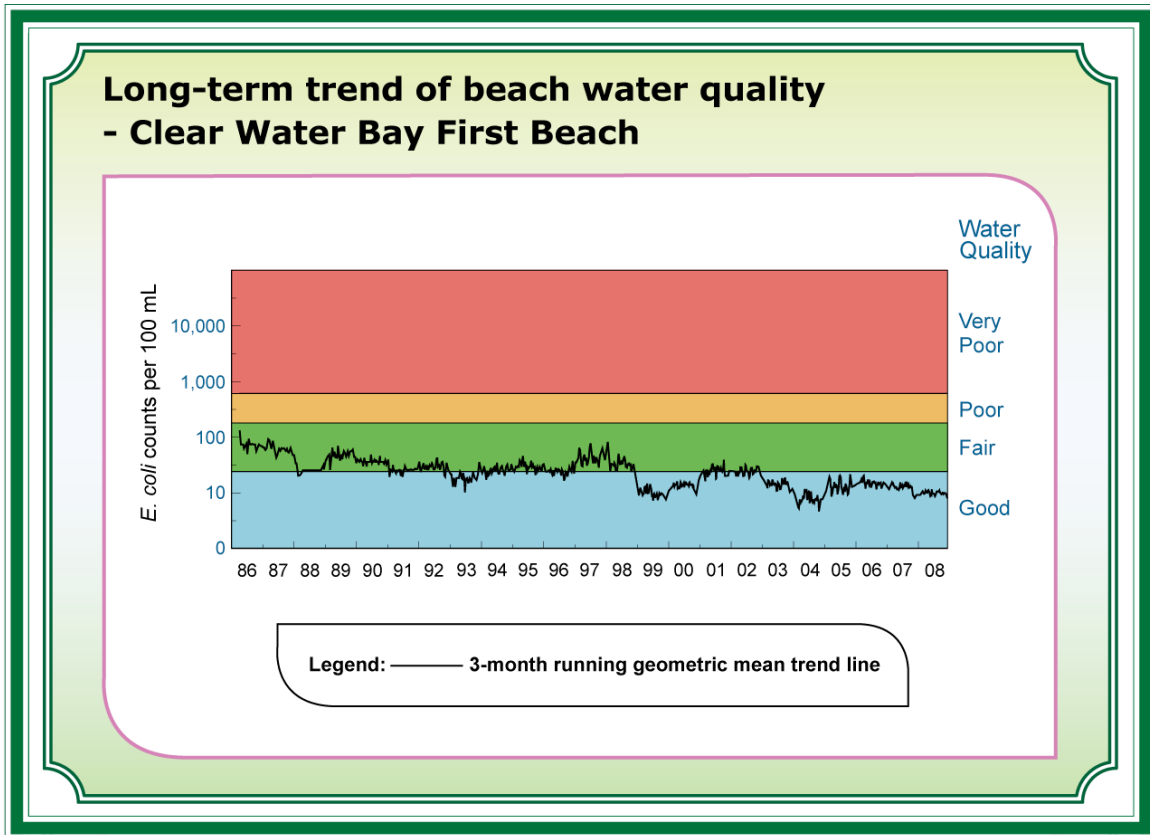
Long-term trend of beach water quality - Turtle Cove Beach



Legend: — 3-month running geometric mean trend line

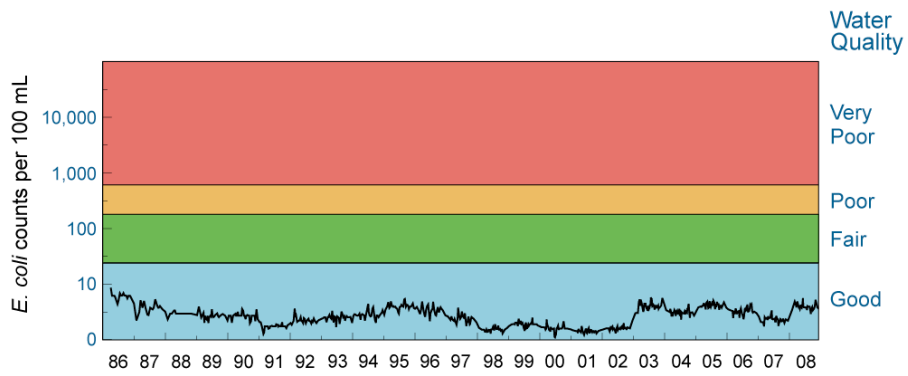


- Sai Kung District



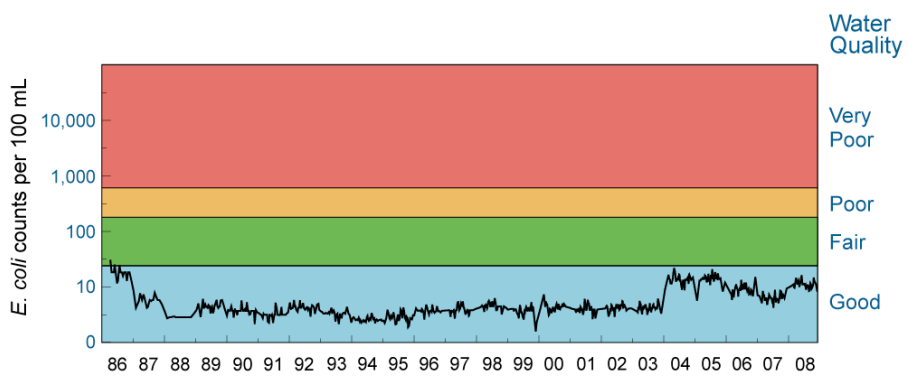


Long-term trend of beach water quality - Hap Mun Bay Beach



Legend: — 3-month running geometric mean trend line

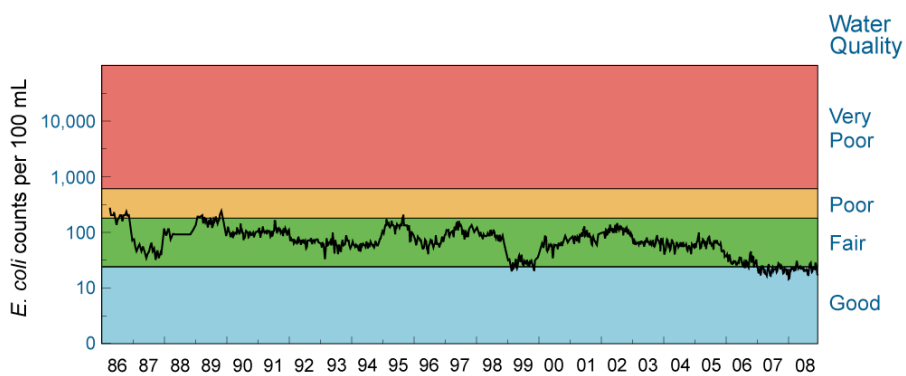
Long-term trend of beach water quality - Kiu Tsui Beach



Legend: — 3-month running geometric mean trend line

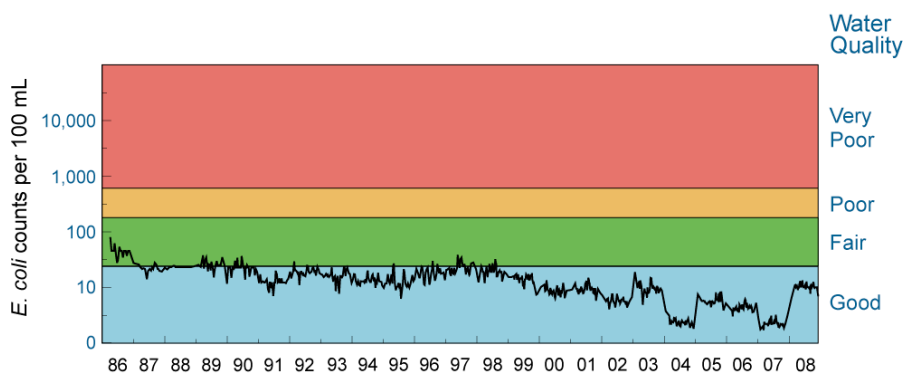


Long-term trend of beach water quality - Silverstrand Beach



Legend: — 3-month running geometric mean trend line

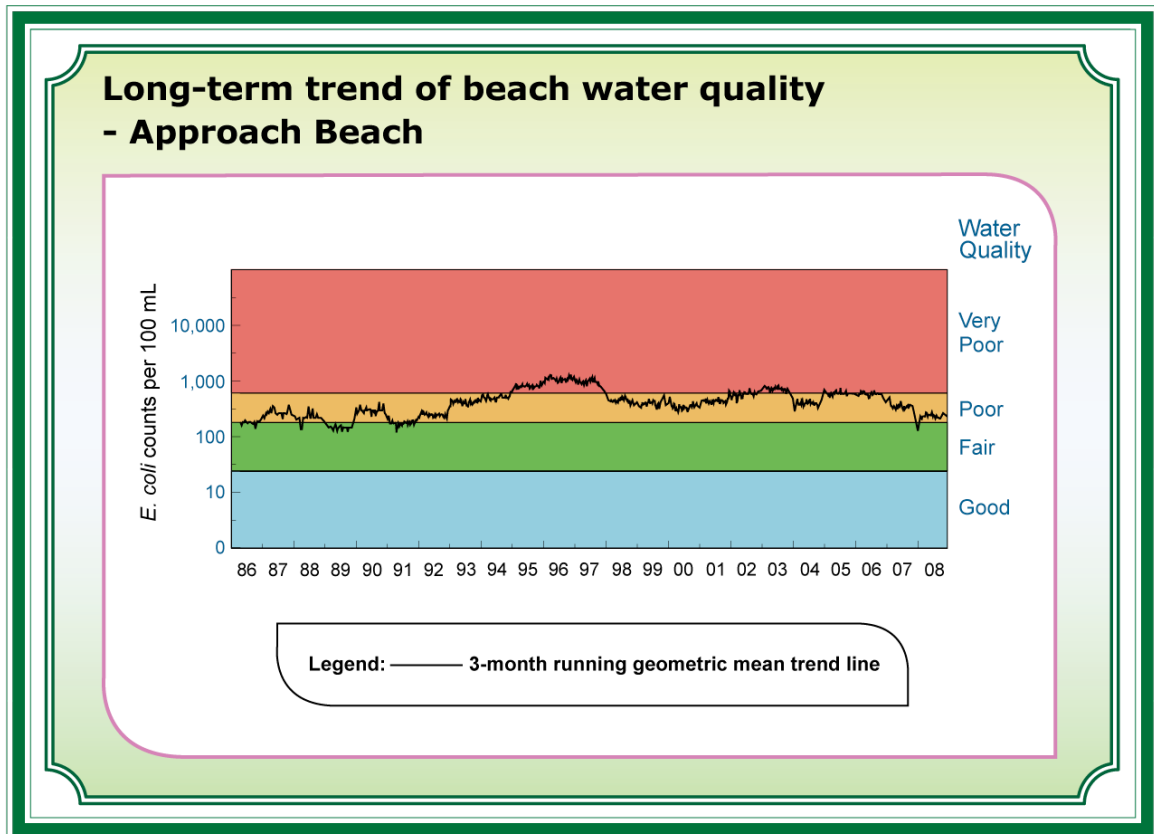
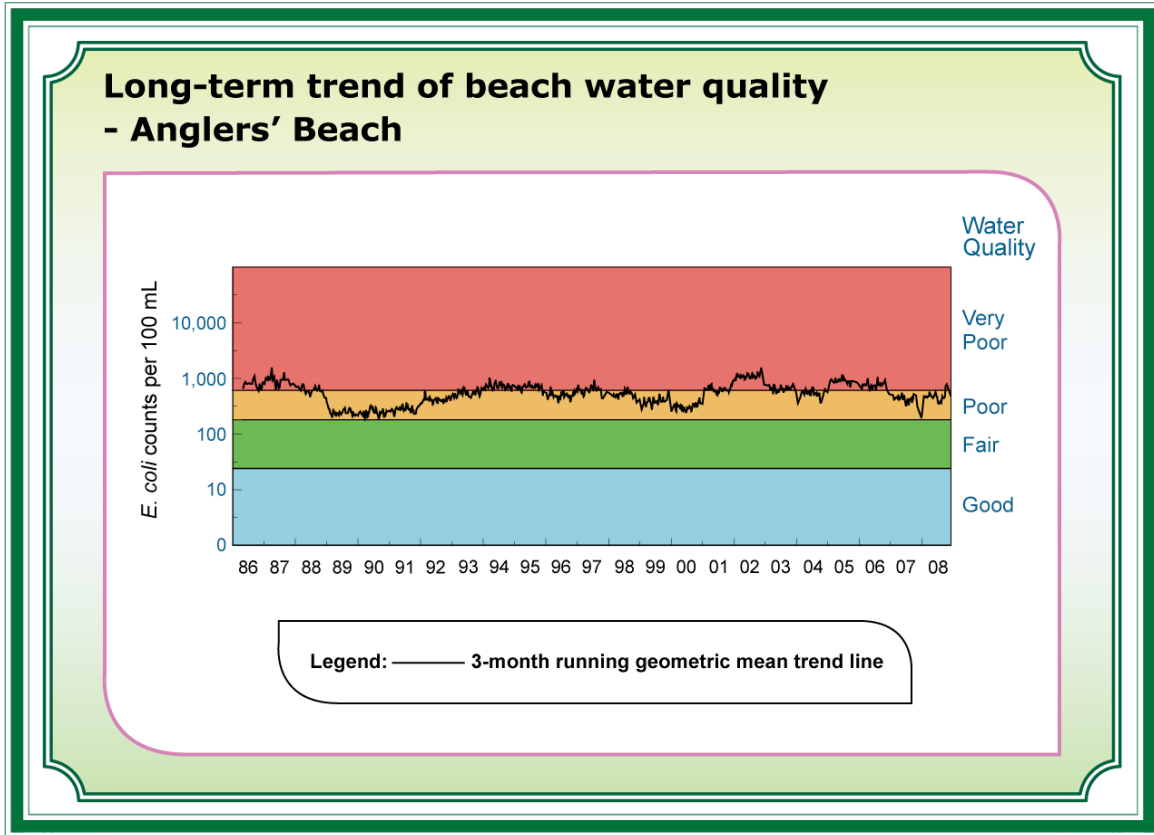
Long-term trend of beach water quality - Trio Beach



Legend: — 3-month running geometric mean trend line

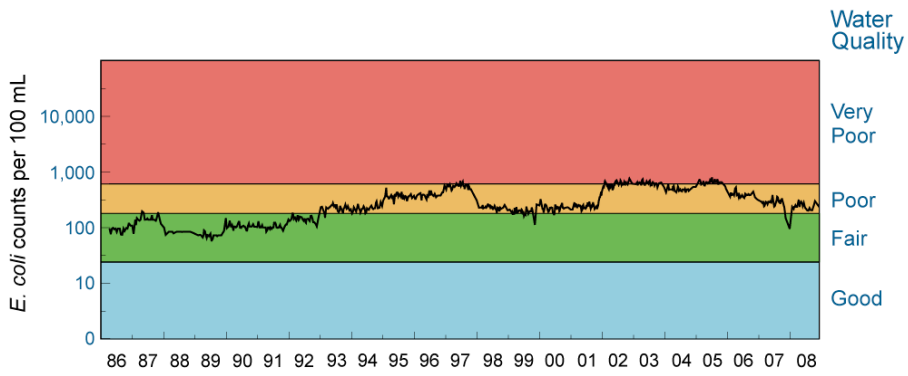


- Tsuen Wan District



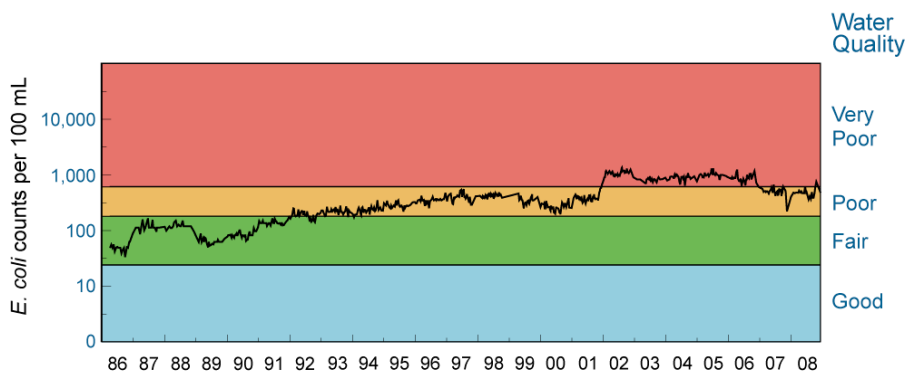


Long-term trend of beach water quality - Casam Beach



Legend: — 3-month running geometric mean trend line

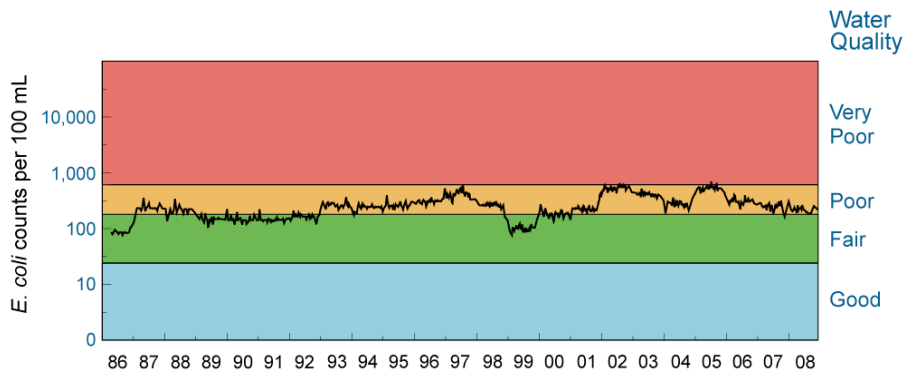
Long-term trend of beach water quality - Gemini Beach



Legend: — 3-month running geometric mean trend line

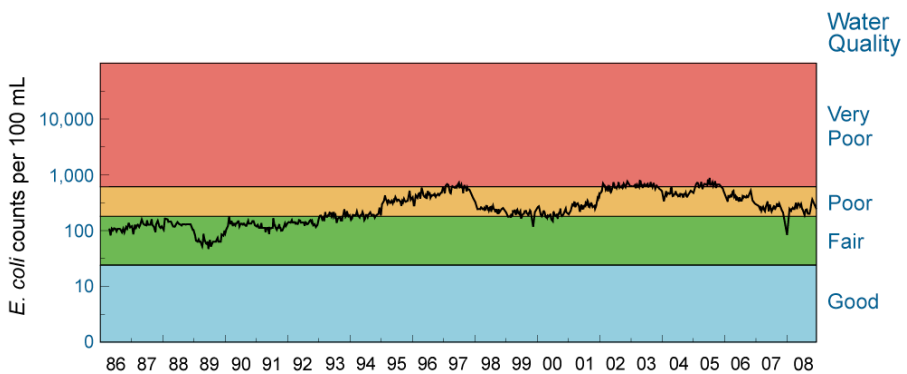


Long-term trend of beach water quality - Hoi Mei Wan Beach



Legend: — 3-month running geometric mean trend line

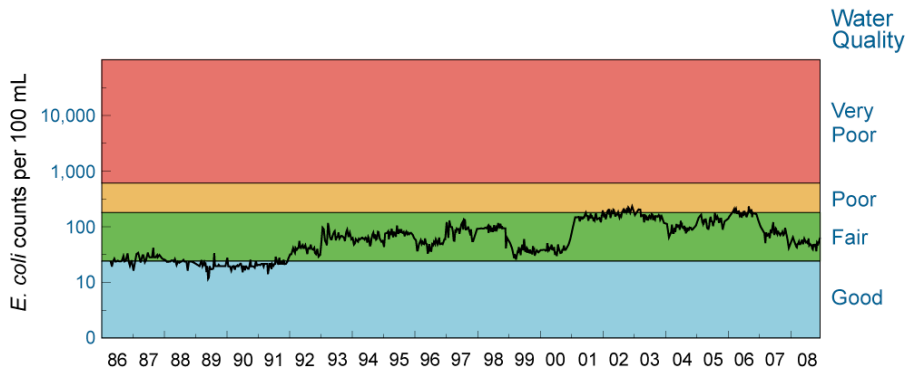
Long-term trend of beach water quality - Lido Beach



Legend: — 3-month running geometric mean trend line

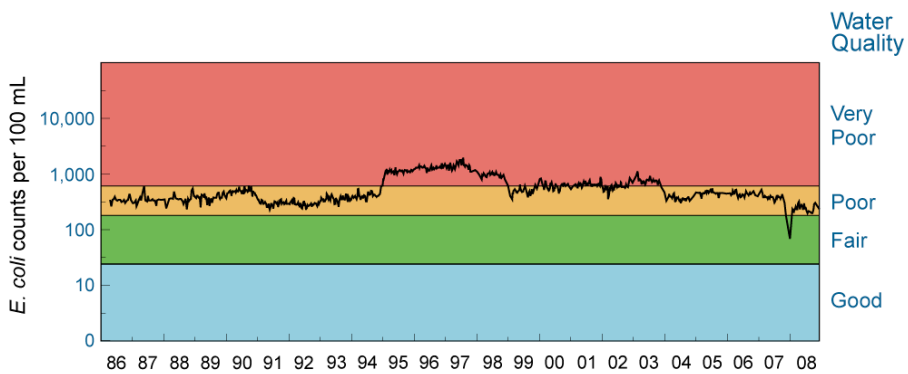


Long-term trend of beach water quality - Ma Wan Tung Wan Beach



Legend: — 3-month running geometric mean trend line

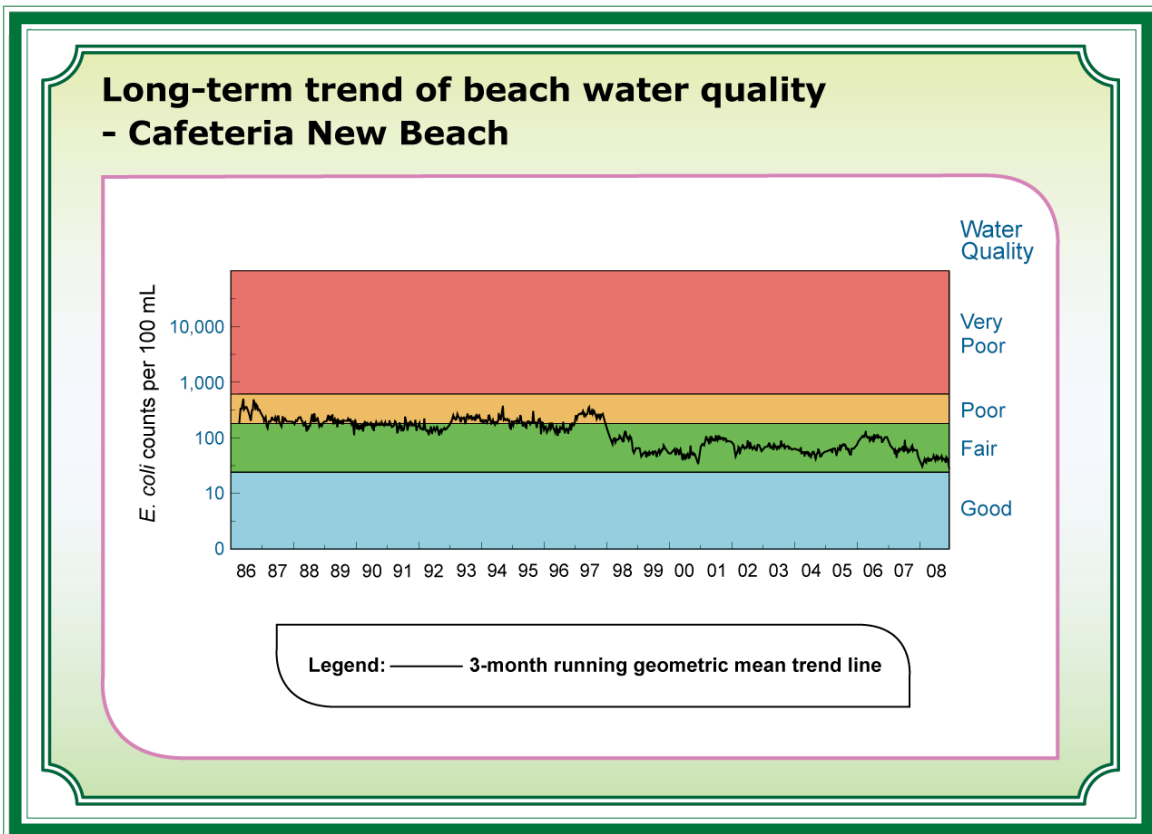
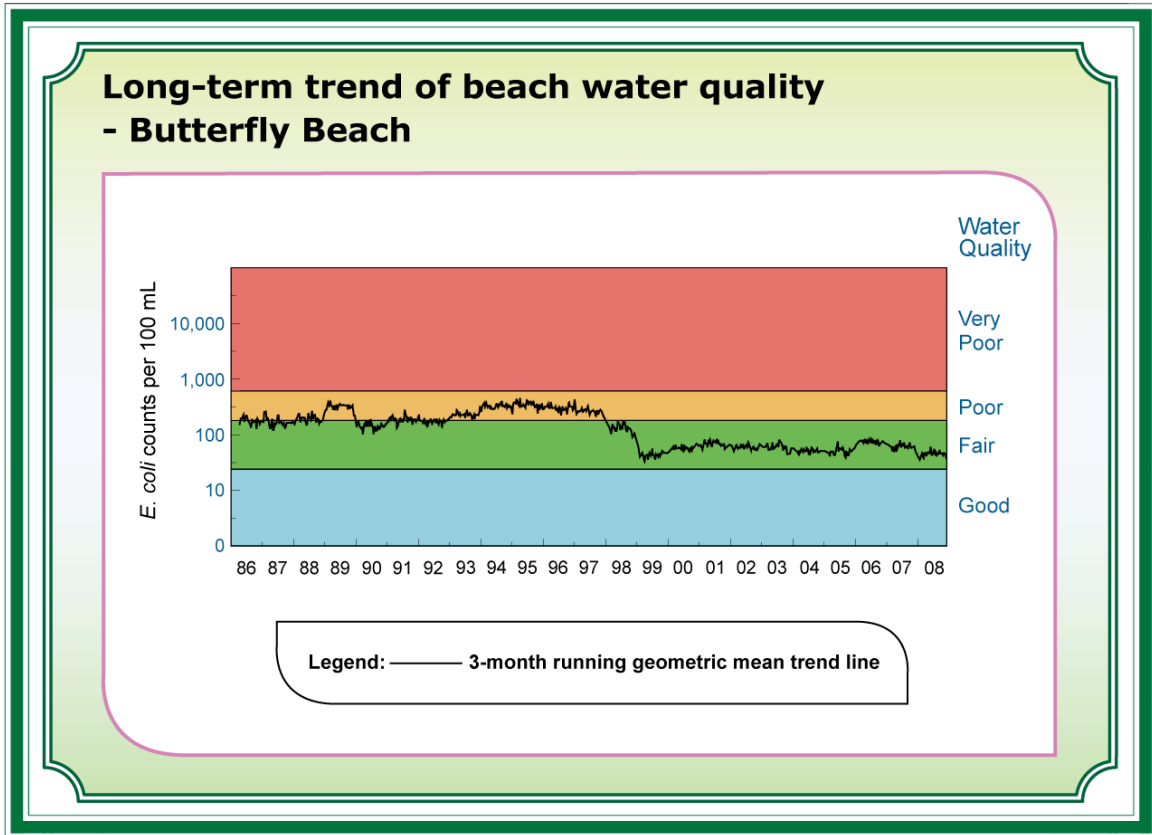
Long-term trend of beach water quality - Ting Kau Beach



Legend: — 3-month running geometric mean trend line

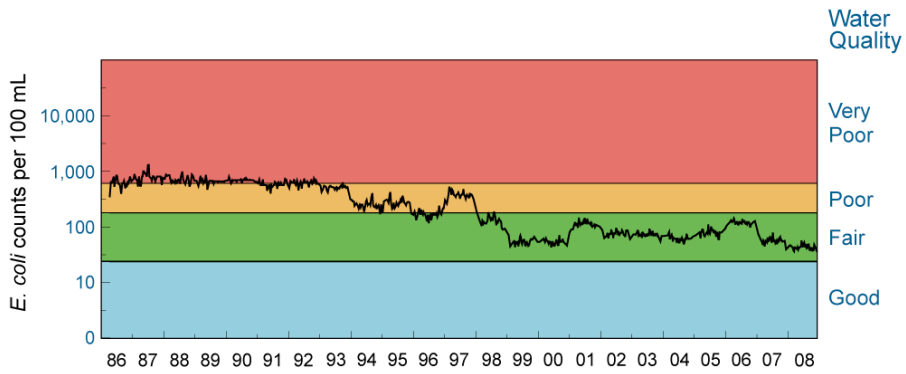


- Tuen Mun District



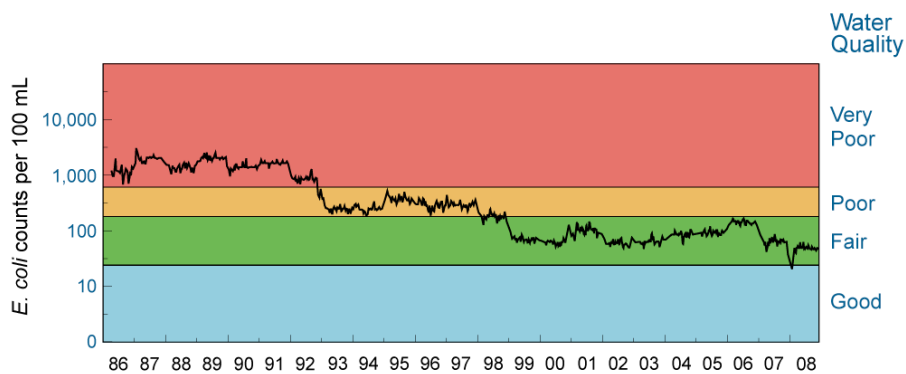


Long-term trend of beach water quality - Cafeteria Old Beach



Legend: — 3-month running geometric mean trend line

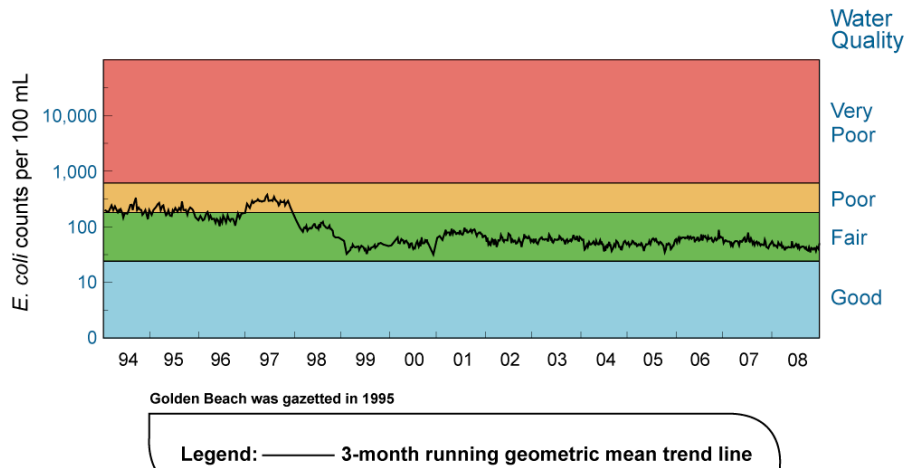
Long-term trend of beach water quality - Castle Peak Beach



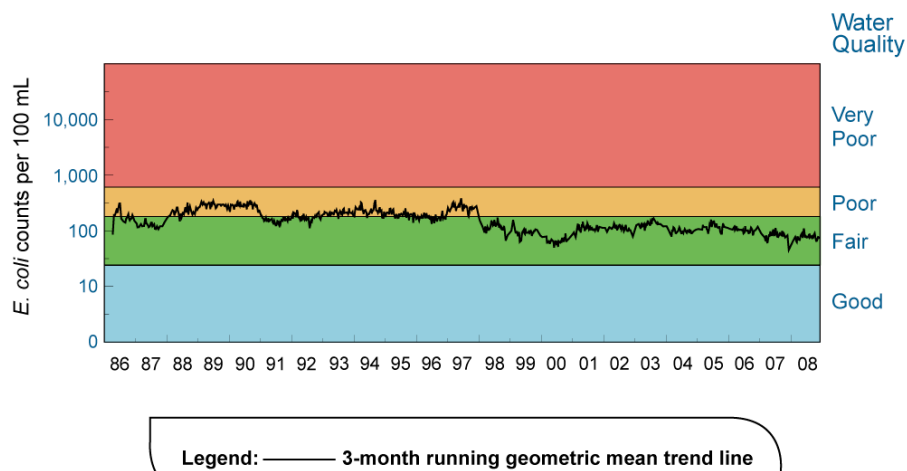
Legend: — 3-month running geometric mean trend line



Long-term trend of beach water quality - Golden Beach

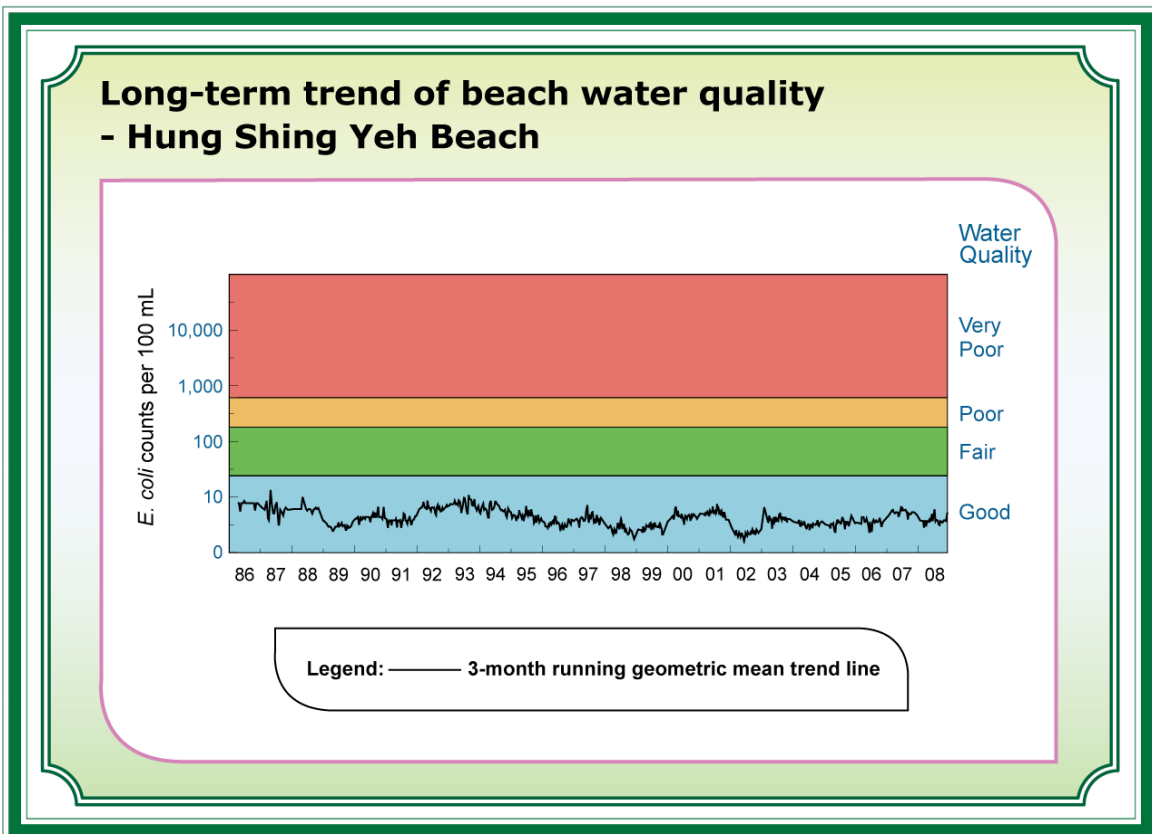
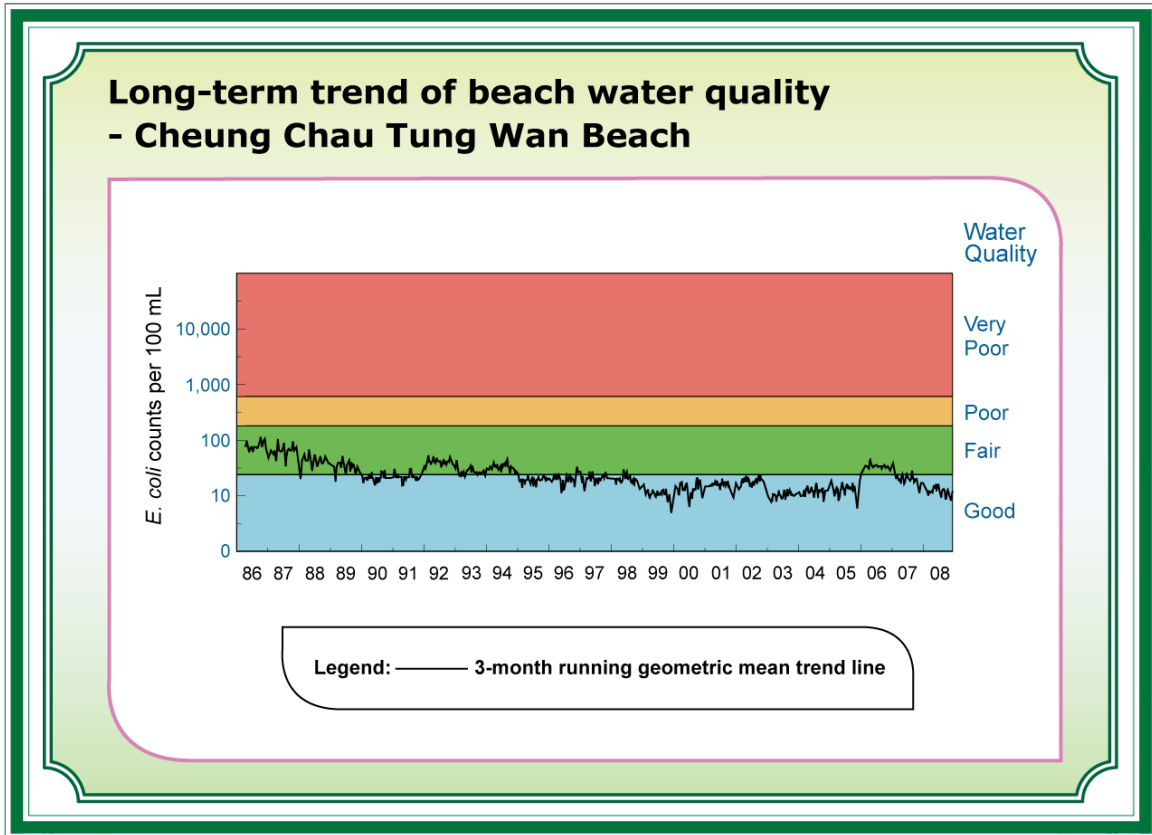


Long-term trend of beach water quality - Kadoorie Beach



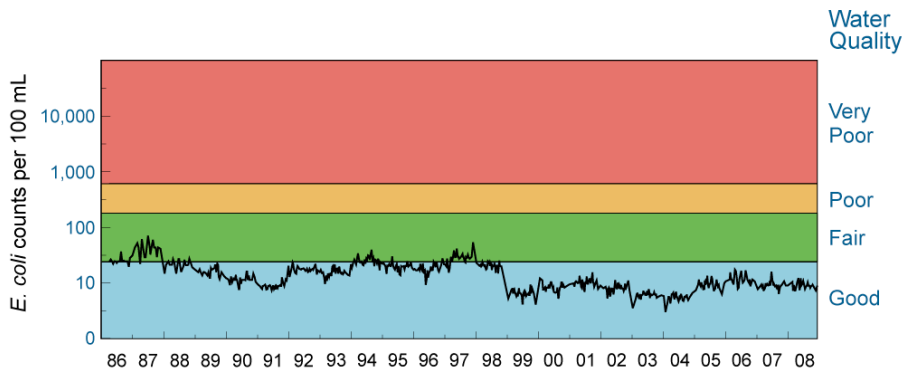


- Outlying Islands



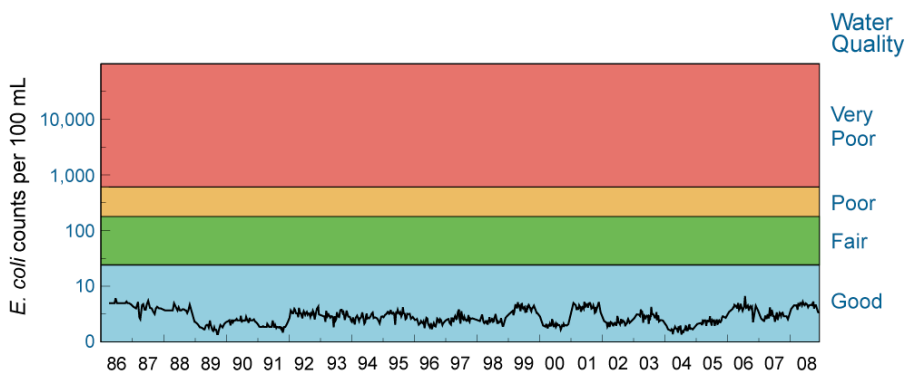


Long-term trend of beach water quality - Kwun Yam Beach



Legend: — 3-month running geometric mean trend line

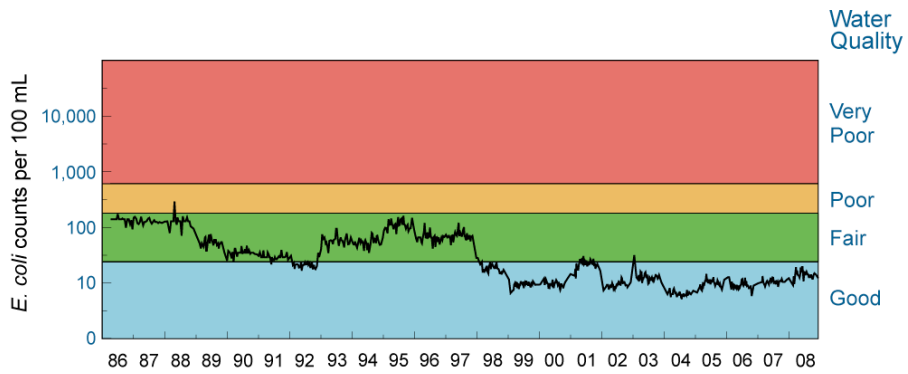
Long-term trend of beach water quality - Lo So Shing Beach



Legend: — 3-month running geometric mean trend line

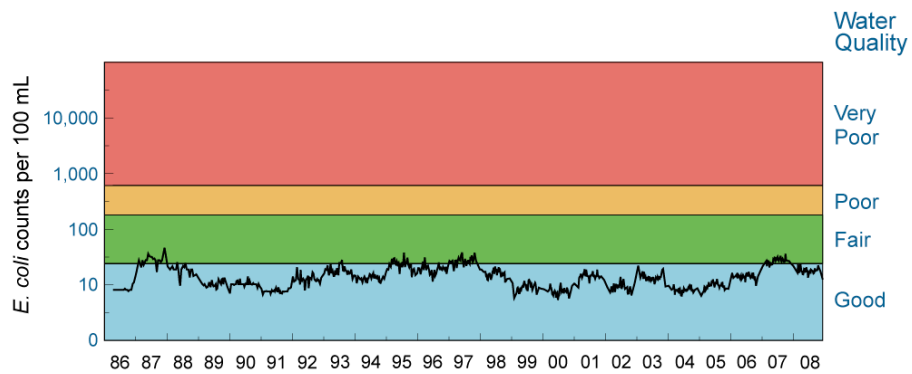


Long-term trend of beach water quality - Lower Cheung Sha Beach



Legend: — 3-month running geometric mean trend line

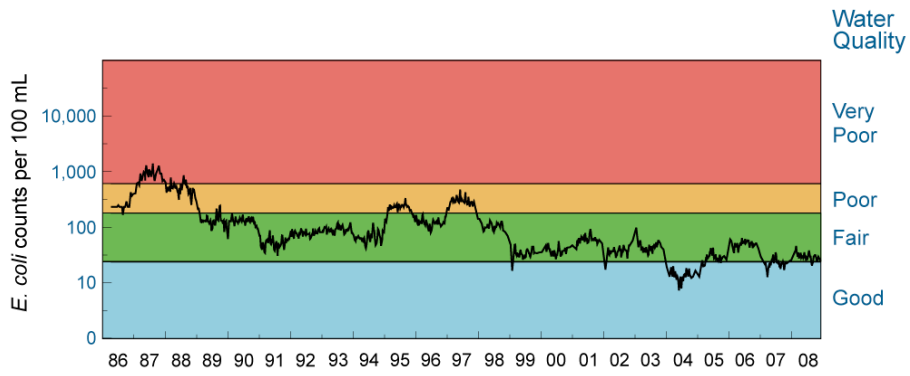
Long-term trend of beach water quality - Pui O Beach



Legend: — 3-month running geometric mean trend line

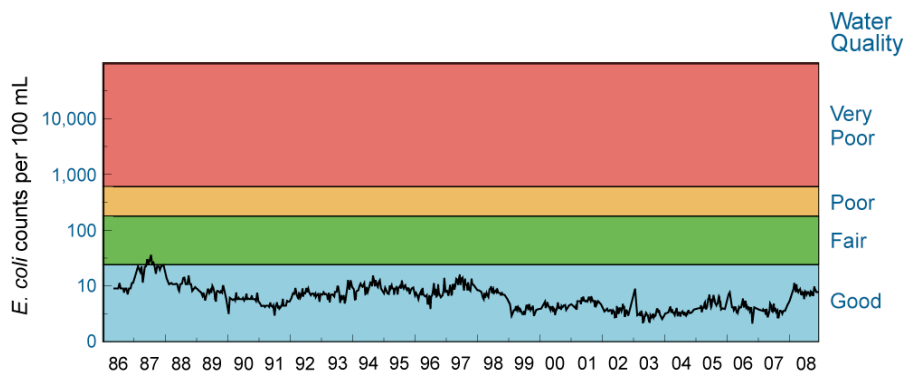


Long-term trend of beach water quality - Silver Mine Bay Beach

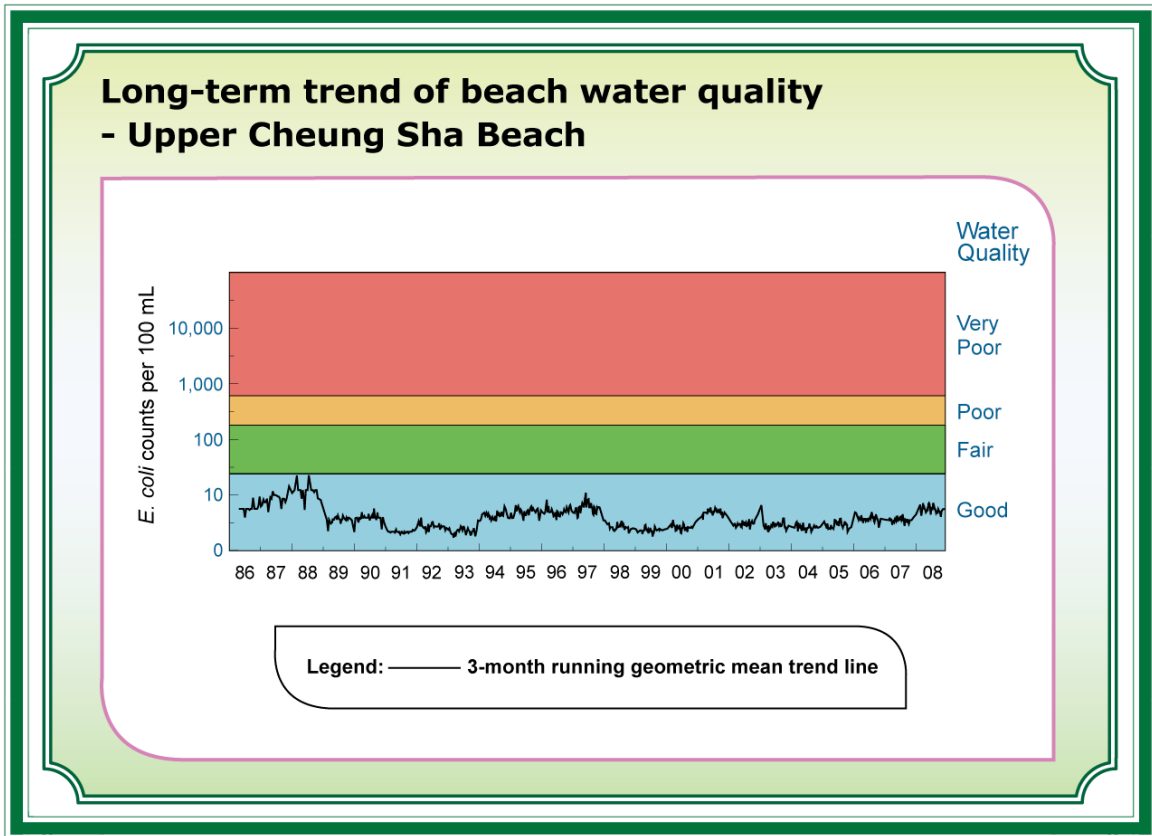


Legend: — 3-month running geometric mean trend line

Long-term trend of beach water quality - Tong Fuk Beach



Legend: — 3-month running geometric mean trend line





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