

Progress in National Water Quality
Monitoring and Disclosure

BLUE CITY WATER QUALITY INDEX

2018 Blue City Water Quality Index

Institute of Public & Environmental Affairs

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Preface

Water quality is connected to public health, ecological balance, and social and economic development. In China, local ecology and environment departments and local water and natural resource departments provide the long-term monitoring of surface water and groundwater quality. They continue to expand and optimize their monitoring networks to improve overall management.

In 2016, the number of water quality monitoring points across China increased from 967 to 2,767. In 2018, China constructed a national automatic monitoring network for surface waters and completed a national groundwater monitoring project, for which 10,169 specialized groundwater monitoring points were constructed to be monitored at the national government level. In 2017, the responsibilities for sampling and testing local water quality were separated such that third-party monitoring agencies now report testing results directly to the central government, rather than through city or provincial governments. This direct reporting system further guarantees the accuracy and authenticity of surface water monitoring data.

The transparency of water quality information is also gradually increasing. More cities actively and regularly disclose water quality data, and the scope of disclosures has expanded: local departments now publish data not only from monitoring points managed by the national government, but also from those managed by provincial, municipal and county-level governments. The content of these disclosures has also increased in detail, from general descriptions of local water quality conditions to the full disclosure of comprehensive monitoring data.

On May 7, for the first time, the Ministry of Ecology and Environment (MEE) published rankings for 30 of the best and worst performing cities according to the surface water quality monitoring results of 2,050 monitoring points managed by the national government. This new comparative system will undoubtedly motivate the transformation of China's water management system, with the primary goals of improving water quality and accelerating national water and environmental protection.

The Institute of Public and Environmental Affairs (IPE) has collected water quality data issued by government departments across China since 2016, sorting and standardizing data that is then displayed on the Blue Map mobile app. The aggregate data illustrates changes in China's environmental water quality. As the number of app users grows, more people are able to follow these trends. However, the original data may still be difficult for the public to understand due to its specialized nature.

In 2019, therefore, IPE developed the Blue City Water Quality Index (BCWQI) and scored 337 municipal cities and 25 counties on their overall water quality in 2018. The analysis is based on 600,000 water quality data points gathered the same year. The results produced the Blue City Water Quality Map, now available on the Blue Map app, which helps the public better understand regions with good water quality and those in need of improvement across the country.

Data Sources

- *Surface Water*

This data is primarily based on surface water quality monitoring data published in 2018 by ecology and environment bureaus at all levels of government.¹ It also refers to monitoring data published by local departments of water resources.

- *Drinking Water Sources*

This data is primarily based on 2018 monitoring data for centralized drinking water sources published by ecology and environment bureaus at the provincial, municipal and county level, combined with water source remediation progress reports.

Centralized drinking water sources (水源地) refer specifically to water bodies that support communities of 1,000 people or more in both urban and rural areas.

- *Groundwater*

This data is based on groundwater monitoring data disclosed by ecology and environment bureaus at all levels across the country, as well as groundwater quality status reports listed in the Water Pollution Prevention and Control Action Plan.² It also refers to recent academic articles on urban groundwater research.

¹ Some regions lack data from 2018, in which case data from 2017 or earlier was used instead.

² Some regions have not published data on their present status, in which case 2020 water quality targets were used instead.

Score Breakdown

Surface water scores account for 50% of the total score, drinking water scores account for 30% and groundwater scores account for 20%. The distribution reflects the quality and availability of recent data, as well as each water source's direct influence on the public.

BCWQI (IPE) and CWQI (MEE) Evaluation Comparison

MEE national surface water quality rankings are based on the City Water Quality Index (CWQI). The difference between the Blue City Water Quality Index outlined in this report and the CWQI published by MEE may be understood as follows:

	CWQI by MEE	BCWQI by IPE
<i>Evaluated Cities</i>	333 cities at the municipal level	337 cities at the municipal level, as well as 25 counties
<i>Evaluation Scope</i>	Surface water	Overall water quality, including surface waters, groundwater and centralized drinking water sources
<i>Data</i>	Surface water quality monitoring points managed by the national government	Surface water monitoring points managed by national, provincial, municipal and county-level departments; groundwater monitoring points; centralized drinking water sources at the municipal and county level; and drinking water source rectification progress reports
<i>Evaluation Method</i>	First, calculate the average concentration of individual surface water monitoring indicators to calculate their score, then calculate the total CWQI value.	<p><i>Surface water and groundwater quality:</i> Each water quality classification is given a quantitative value, then annual scores for each monitoring point are calculated by taking the average of the monthly values. The city score is the average of all monitoring points.</p> <p><i>Drinking water source quality:</i> Sources are comprehensively evaluated based on water quality classifications, transgressions of pollution standards and the progress of environmental rectifications.</p>

National Blue City Water Quality Map



Figure 1. 2018 Blue City Water Quality Map

The 2018 surface water, drinking water and groundwater quality of 337 municipal level cities and 25 counties are illustrated in the Blue City Water Quality Map.³ Regional colors represent different levels of water quality, from dark blue to dark purple, with dark blue representing the highest quality.

Excellent (dark blue): The total score (equivalent to the local water quality average) met or surpassed the requirements of Class II water quality, according to MEE environmental quality standards.⁴ Any problems with centralized drinking water sources were rectified.

Good (light blue and green): The total score (equivalent to the local water quality average) met or surpassed the requirements of Class III water quality. All water sources met the legal standards throughout the year and any environmental problems with centralized drinking water sources were rectified.

³ Including counties under provincial jurisdiction and the Xinjiang Production and Construction Corps.

⁴ MEE classifies surface water and groundwater quality into five standards, with Class I as the highest quality. For more details, please refer to the MEE documents:

http://kjs.mee.gov.cn/hjbhzb/bzwb/shjhb/shjzlbz/200206/t20020601_66497.shtml

http://kjs.mee.gov.cn/hjbhzb/bzwb/shjhb/shjzlbz/199410/t19941001_66500.shtml

Moderate (yellow and dark yellow): The total score (equivalent to the local water quality average) met or surpassed the requirements of Class IV water quality. Water source pollutants exceeded legal standards once during the year and any environmental problems with centralized drinking water sources were rectified.

Relatively Poor (orange and orange-red): The total score (equivalent to the local water quality average) met or surpassed the requirements of Class V water quality. Water source pollutants exceeded legal standards three times during the year and not all environmental problems with centralized drinking water sources were rectified.

Poor (dark pink and purple): The total score (equivalent to the local water quality average) met or surpassed the requirements of Class V water quality. Water source pollutants exceeded legal standards more than three times throughout the year and not all environmental problems with centralized drinking water sources were rectified.

Overall Analysis

- Regions with the best water quality are primarily concentrated in the Qinghai-Tibet Plateau and its surrounding areas, especially in the first and second steps of China's elevation above sea-level.
- Pollution levels in the plains are high. Water quality is relatively poor in the North China Plain, the Northeast China Plain, the middle and lower reaches of the Yangtze River and the Pearl River Delta.
- Water quality to the south of the Yangtze River is better than water quality to the north of the Yangtze River.

BCWQI Results

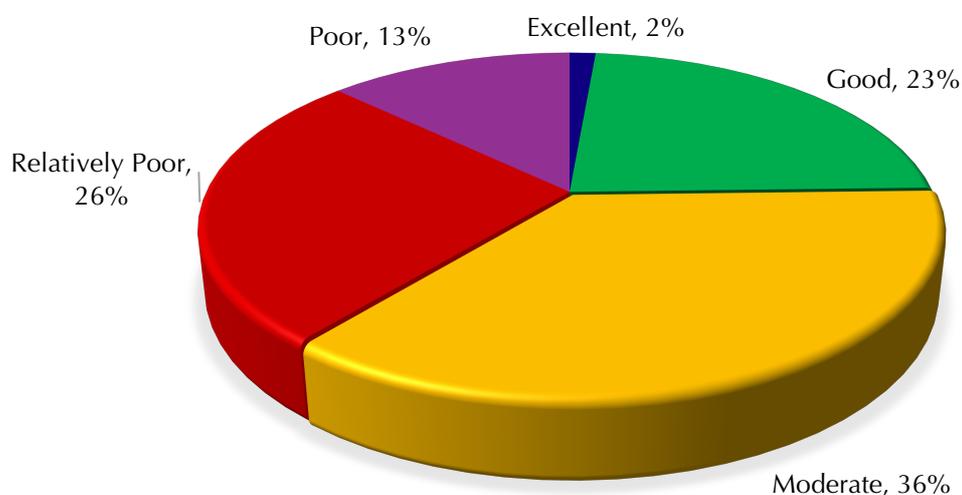


Figure 2. Blue City Water Quality Distribution

- Excellent overall water quality: 0.00-4.79 points, five cities in total
- Good overall water quality: 4.79-10.28 points, 85 cities in total
- Moderate overall water quality: 10.28-16.85 points, 133 cities in total
- Relatively poor overall water quality: 16.85-24.74 points, 97 cities in total
- Poor overall water quality: 24.74-50.00 points, 46 cities in total

Best National Water Quality

Table 1. 2018 Blue City Water Quality Index Top 30

Rank	Province	City	Score	Level
1	Qinghai	Hainan	4.04	Excellent
2	Sichuan	Ganzi	4.11	Excellent
3	Sichuan	Aba	4.42	Excellent
4	Qinghai	Haibei	4.58	Excellent
5	Qinghai	Guoluo	4.72	Excellent
6	Qinghai	Yushu	4.91	Good
7	Sichuan	Guanyuan	4.96	Good
8	Qinghai	Huangnan	5.26	Good
9	Xinjiang	Tacheng	5.62	Good
10	Sichuan	Panzhihua	5.75	Good

11	Hunan	Zhangjiajie	5.99	Good
12	Tibet	Changdu	6.14	Good
13	Xinjiang	Bo'ertala	6.19	Good
14	Xinjiang	Yili	6.28	Good
15	Gansu	Jiayuguan	6.66	Good
16	Sichuan	Liangshan	6.71	Good
17	Guizhou	Qiandongnan	6.74	Good
18	Xinjiang	Akesu	6.85	Good
19	Xinjiang	Changji	6.93	Good
20	Tibet	Ali	7.05	Good
21	Sichuan	Bazhong	7.20	Good
22	Hunan	Chenzhou	7.20	Good
23	Tibet	Linzhi	7.21	Good
24	Gansu	Jinchang	7.21	Good
25	Guangdong	Shaoguan	7.23	Good
26	Zhejiang	Zhoushan	7.28	Good
27	Jiangxi	Shangrao	7.28	Good
28	Gansu	Jiuquan	7.29	Good
29	Guangdong	Yunfu	7.36	Good
30	Guizhou	Anshun	7.46	Good

Lowest National Water Quality

Table 2. 2018 Blue City Water Quality Index Bottom 30

Rank	Province	City	Score	Level
1	Shanxi	Yangquan	41.92	Poor
2	Inner Mongolia	Tongliao	40.81	Poor
3	Guangdong	Shenzhen	39.42	Poor
4	Hebei	Hengshui	38.54	Poor
5	Heilongjiang	Suihua	37.44	Poor
6	Inner Mongolia	Hulunbei'er	35.93	Poor
7	Jilin	Siping	34.59	Poor
8	Liaoning	Anshan	34.43	Poor
9	Shandong	Rizhao	32.91	Poor
10	Hebei	Cangzhou	32.75	Poor
11	Jilin	Changchun	32.42	Poor
12	Inner Mongolia	Wulanchabu	32.39	Poor
13	Liaoning	Yingkou	31.50	Relatively Poor
14	Guangdong	Guangzhou	31.15	Relatively Poor
15	Heilongjiang	Jiamusi	30.99	Relatively Poor
16	Hebei	Langfang	29.97	Relatively Poor

17	Shaanxi	Tongchuan	29.86	Relatively Poor
18	Guangdong	Dongguan	29.42	Relatively Poor
19	Ningxia	Wuzhong	28.90	Relatively Poor
20	Liaoning	Shenyang	28.57	Relatively Poor
21	Shandong	Liaocheng	28.25	Relatively Poor
22	Shandong	Heze	27.93	Relatively Poor
23	Shaanxi	Weinan	27.90	Relatively Poor
24	Shandong	Binzhou	27.66	Relatively Poor
25	Guangdong	Huizhou	27.65	Relatively Poor
26	Hebei	Xingtai	27.60	Relatively Poor
27	Shandong	Dezhou	27.03	Relatively Poor
28	Shandong	Weifang	26.83	Relatively Poor
29	Shanxi	Datong	26.47	Relatively Poor
30	Shanxi	Taiyuan	26.44	Relatively Poor

BCWQI Provincial Average Ranking

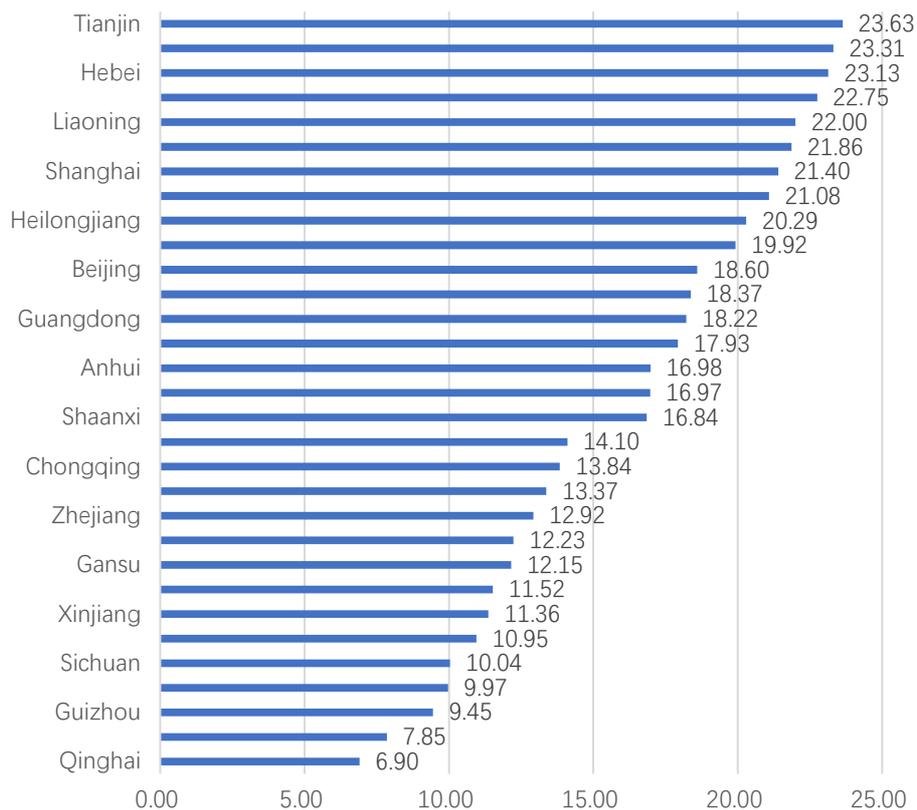


Figure 3. BCWQI Provincial Average Ranking

According to the average BCWQI scores of provincial jurisdictions, the worst water quality is in Tianjin, Shanxi and Hebei, and the best is in Qinghai, Tibet and Guizhou.

National Surface Water Quality Map

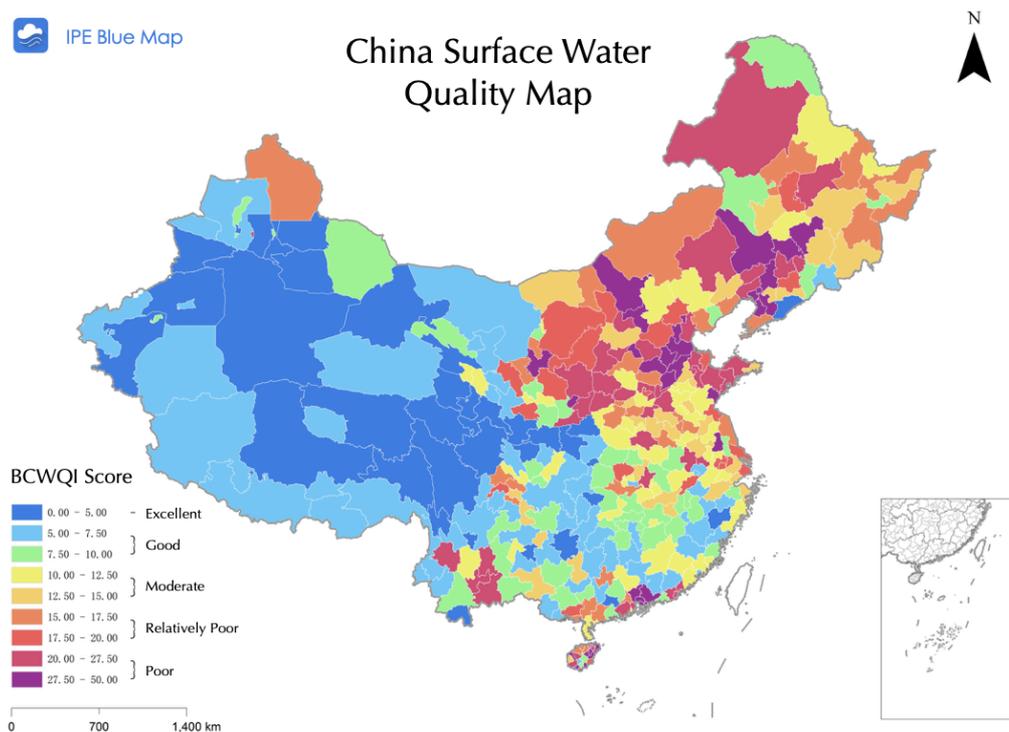


Figure 4. National Surface Water Quality Map

Surface Water Quality Levels

- **Excellent (dark blue):** The average local surface water quality met or surpassed the requirements of Class II water quality.
- **Good (light blue and green):** The average local surface water quality achieved Class III water quality.
- **General (yellow and dark yellow):** The average local surface water quality achieved Class IV water quality.
- **Relatively Poor (orange and orange-red):** The average local surface water quality achieved Class V water quality.
- **Poor (dark pink and purple):** The average local surface water quality did not achieve Class V water quality.

BCWQI Surface Water Quality Results

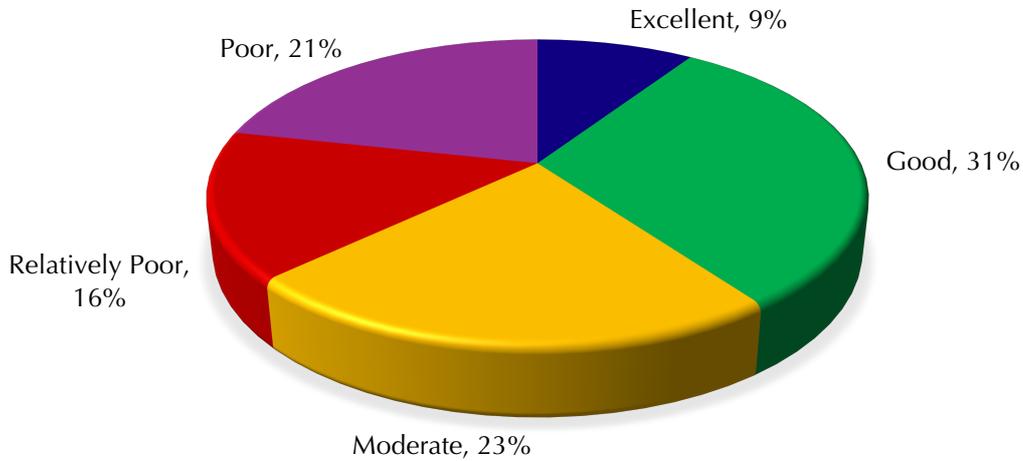


Figure 5. Surface Water Quality Distribution

Cities with excellent or good surface water quality comprised 40% of all cities this year, while 21% of cities comprised the lowest rankings.

Table 3. 2018 Top 30 Cities of the National Surface Water Index

Rank	Province	City	Score	Level
1	Qinghai	Yushu	2.96	Excellent
2	Hunan	Zhangjiajie	3.32	Excellent
3	Liaoning	Dandong	3.37	Excellent
4	Qinghai	Hainan	3.41	Excellent
5	Xinjiang	Bayinguoleng	3.60	Excellent
6	Xinjiang	Kashen	3.60	Excellent
7	Sichuan	Panzhuhua	3.77	Excellent
8	Yunnan	Xishuangbanna	3.79	Excellent
9	Guizhou	Anshun	3.81	Excellent
10	Qinghai	Guoluo	3.83	Excellent
11	Guangdong	Yunfu	3.83	Excellent
12	Yunnan	Diqing	3.85	Excellent
13	Gansu	Jiuquan	3.93	Excellent
14	Qinghai	Haibei	3.98	Excellent
15	Sichuan	Guangyuan	4.05	Excellent
16	Sichuan	Ganzi	4.24	Excellent
17	Shaanxi	Shangluo	4.30	Excellent
18	Guizhou	Qiandongnan	4.31	Excellent
19	Gansu	Longnan	4.32	Excellent
20	Xinjiang	Tulufan	4.36	Excellent

21	Xinjiang	Changji	4.43	Excellent
22	Sichuan	Aba	4.55	Excellent
23	Tibet	Changdu	4.75	Excellent
24	Xinjiang	Yili	4.76	Excellent
25	Shaanxi	Ankang	4.79	Excellent
26	Xinjiang	Wulumuqi	4.80	Excellent
27	Zhejiang	Lishui	4.82	Excellent
28	Shaanxi	Hanzhong	4.84	Excellent
29	Xinjiang	Akesu	4.95	Excellent
30	Gansu	Jiayuguan	4.95	Excellent

Table 4. 2018 Bottom 30 Cities of the National Surface Water Index

Rank	Province	City	Score	Level
1	Guangdong	Shenzhen	53.41	Poor
2	Jilin	Siping	42.99	Poor
3	Inner Mongolia	Wulanchabu	42.71	Poor
4	Shandong	Rizhao	40.54	Poor
5	Guangdong	Guangzhou	39.12	Poor
6	Hebei	Hengshui	37.92	Poor
7	Shaanxi	Tongchuan	35.83	Poor
8	Liaoning	Anshan	35.79	Poor
9	Jilin	Changchun	35.71	Poor
10	Liaoning	Shenyang	35.24	Poor
11	Shanxi	Yangquan	33.47	Poor
12	Inner Mongolia	Tongliao	32.97	Poor
13	Hebei	Xingtai	32.69	Poor
14	Guangdong	Huizhou	32.65	Poor
15	Guangdong	Dongguan	32.65	Poor
16	Shanxi	Datong	32.47	Poor
17	Shandong	Liaocheng	32.31	Poor
18	Hebei	Langfang	31.88	Poor
19	Hebei	Cangzhou	30.67	Poor
20	Liaoning	Yingkou	30.02	Poor
21	Ningxia	Wuzhong	28.83	Poor
22	Shandong	Dezhou	28.51	Poor
23	Hainan	Sanya	28.48	Poor
24	Jiangsu	Yangzhou	27.96	Poor
25	Liaoning	Panjin	27.79	Poor
26	Shanxi	Taiyuan	27.46	Poor
27	Shanxi	Yuncheng	27.15	Poor
28	Shanxi	Luliang	27.04	Poor
29	Guangdong	Shantou	26.84	Poor
30	Shandong	Weifang	26.84	Poor

Surface Water Quality Analysis

Since the Action Plan for the Prevention and Control of Water Pollution was issued in 2015, China has implemented rigorous water pollution control and national surface water quality has improved each year. In 2018, among the 1,935 surface water quality monitoring points managed at the national level, locations that achieved Class I to Class III water quality comprised 71% of all monitoring points, up 3.1% from 2017. The proportion of Class V poor water quality points fell to 6.7%, down 1.6% from 2017.⁵

In contrast, however, comprehensive data including 9,514 national and non-state-controlled surface water quality data points collected in the Blue Map Database in 2018 indicate that monitoring points that achieved Class I to Class III water quality comprise only 51.6% of all monitors, while Class V monitors account for 15.2% of the total. It follows that water quality in non-state-controlled areas (mainly in shorter and smaller tributaries and lakes) may be generally inferior to state-controlled sections.

National Drinking Water Quality Map

The water quality index calculations also include 3,708 centralized drinking water sources monitored at the municipal and county level.



Figure 6. National Drinking Water Quality Map

⁵ 2018 China Report on the State of the Environment <http://www.mee.gov.cn/hjzl/zghjzkgb/lzqghjzkgb/>

Drinking Water Source Quality Levels

Excellent (dark blue): The total score (equivalent to the local water quality average) met or surpassed the requirements of Class II water quality and all environmental problems have been rectified.

Good (light blue and green): The total score (equivalent to the local water quality average) meets all legal standards and all environmental problems have been rectified.

General (yellow and dark yellow): The total score (equivalent to the local water quality average) exceeded pollutant standards once during the year and all environmental problems have been rectified.

Poor (orange and orange-red): The total score (equivalent to the local water quality average) exceeded pollutant standards three times throughout the year, and at least 50% but less than 100% of environmental problems have been rectified.

Poor (dark pink and purple): The total score (equivalent to the local water quality average) exceeded pollutant standards four or more times throughout the year, and less than 50% of environmental problems have been rectified.



Figure 7. Drinking Water Quality Level Distribution

Table 5. 2018 Top 30 Cities of the National Drinking Water Quality Index

Rank	Province	City	Score	Level
1	Tibet	Changdu	0.57	Excellent
2	Xinjiang	Tacheng	1.00	Excellent
2	Tibet	Ali	1.00	Excellent
2	Tibet	Linshi	1.00	Excellent
5	Hunan	Zhangjiajie	1.57	Excellent
6	Gansu	Jiayuguan	1.87	Excellent
7	Sichuan	Aba	1.92	Excellent
8	Xinjiang	Bayinguoleng	1.93	Excellent
9	Qinghai	Haibei	1.98	Excellent
10	Qinghai	Huangnan	2.11	Excellent
11	Gansu	Linxia	2.20	Excellent
12	Guangdong	Yunfu	2.32	Excellent
13	Yunnan	Xishuangbanna	2.34	Excellent
14	Sichuan	Ganzi	2.36	Excellent
15	Qinghai	Guoluo	2.43	Excellent
16	Sichuan	Guangyuan	2.44	Excellent
17	Yunnan	Nujiang	2.51	Excellent
18	Gansu	Jinchang	2.69	Excellent
19	Sichuan	Panzhihua	2.93	Excellent
20	Xinjiang	Yili	2.96	Excellent
21	Qinghai	Hainan	3.03	Excellent
22	Xinjiang	Akesu	3.18	Excellent
23	Yunnan	Lijiang	3.18	Excellent
24	Xinjiang	Bo'ertala	3.32	Excellent
25	Guizhou	Qiandongnan	3.49	Excellent
26	Guangdong	Meizhou	3.60	Excellent
27	Xinjiang	Changji	3.93	Excellent
28	Gansu	Gannan	4.02	Excellent
29	Zhejiang	Lishui	4.10	Excellent
30	Xinjiang	Wulumuqi	4.21	Excellent

Table 6. 2018 Bottom 30 Cities of the National Drinking Water Quality Index

Rank	Province	City	Score	Level
1	Heilongjiang	Jiamusi	50.00	Poor
1	Inner Mongolia	Hulunbei'er	50.00	Poor
1	Heilongjiang	Suihua	50.00	Poor
1	Shanxi	Yangquan	50.00	Poor
5	Inner Mongolia	Tongliao	47.33	Poor
6	Anhui	Bozhou	35.32	Poor
7	Liaoning	Huludao	34.19	Poor
8	Jilin	Jilin	30.03	Poor
9	Heilongjiang	Daqing	29.36	Poor
10	Shandong	Zaozhuang	27.55	Poor
11	Inner Mongolia	Xilinguolei	26.74	Poor
12	Heilongjiang	Qiqiha'er	26.26	Poor
13	Ningxia	Wuzhong	23.96	Poor
14	Ningxia	Guyuan	22.49	Poor
15	Hebei	Hengshui	21.65	Relatively Poor
16	Anhui	Suzhou	21.30	Relatively Poor
17	Liaoning	Liaoyang	21.07	Relatively Poor
18	Heilongjiang	Qitaihe	20.93	Relatively Poor
19	Liaoning	Fushun	19.98	Relatively Poor
20	Heilongjiang	Heihe	19.89	Relatively Poor
21	Jiangxi	Xinyu	19.70	Relatively Poor
22	Zhejiang	Jiaxing	18.56	Relatively Poor
23	Qinghai	Haixi	17.31	Relatively Poor
24	Anhui	Huainan	16.04	Relatively Poor
25	Guangdong	Dongguan	15.82	Relatively Poor
26	Xinjiang	Kashen	15.81	Relatively Poor
27	Guangxi	Laibin	15.62	Relatively Poor
28	Heilongjiang	Mudanjiang	15.62	Relatively Poor
29	Shanxi	Linfen	15.52	Relatively Poor
30	Shandong	Jining	15.28	Relatively Poor

Drinking Water Quality Analysis

The BCWQI scores of drinking water sources comprehensively examine their water quality classification, the number of times they exceeded pollutant standards, and if they received any environmental remediation.

Judging from the general compliance of drinking water sources, the annual water quality compliance rate of centralized drinking water sources at the county level or above in 2018 (referring to all monitoring up to the standard in 2018) was 91.79%. Some water sources have not completely rectified their environmental problems or have not released the overall improvement in time, which has affected their scores.

National Groundwater Quality Map



Figure 7. National Groundwater Quality Map

The groundwater quality in the Northeast, Northwest, North and Central regions of China was relatively poor.

Groundwater Quality Results

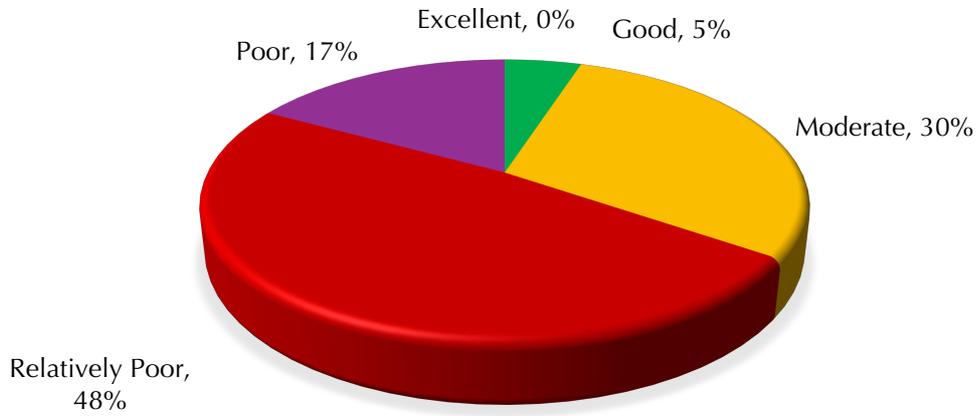


Figure 8. Ground Water Quality Level Distribution

National Groundwater Quality

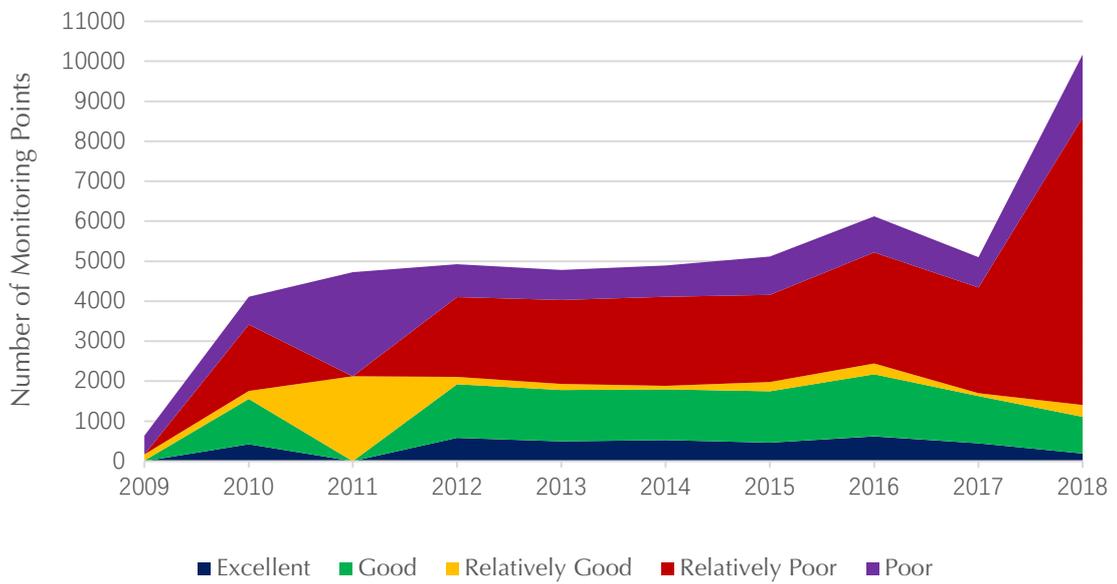


Figure 9. National Groundwater Quality Annual Statistics
(Source: 2018 China Report on the State of the Environment)

Groundwater Quality Analysis

China's Report on the State of the Environment began disclosing groundwater conditions in 2009. The first publication included only results from only 641 monitoring points in eight provinces. In 2018, however, the report included statistical results from 10,168 monitoring points, demonstrating the gradual improvement of information disclosure and the government's present emphasis on groundwater quality issues. According to China's Report on the State of the Environment over the years, groundwater quality in the country shows a deteriorating trend. Monitoring points classified as Good or Excellent have declined in both quantity and proportion, while those with Poor or Relatively Poor water quality have increased year by year.

Due to the complex nature of groundwater pollution and the influence of natural environmental factors, most groundwater monitoring projects with pollution above the legal standard may simply have high mineral content near the bottom of the water body. However, some human influence may be seen in indicators such as ammonia nitrogen, which are already deemed major water pollutants alongside iron and manganese, evidencing how manmade pollution has spread to China's groundwaters.

Because most cities have not developed disclosure systems for groundwater quality information, the groundwater quality map for 2018 involved a comprehensive analysis of official information published over the years, relevant data from academic research, and information for which IPE applied and obtained from multiple management departments. The data from these sources may vary by record year, the depth at which monitors were placed within the groundwater, and the type of groundwater.

Due to the fact that existing groundwater data must be gathered from multiple sources with various record years, depths of monitoring points, and types of groundwater, this first edition of the BCWQI is far from complete. However, as the first map to display groundwater quality for every city, we hope that it can help the public understand the severe status of groundwater pollution and encourage the improvement of groundwater quality monitoring and disclosure platforms.

Appendix: 2018 Blue City Water Quality Index Ranking

Rank	Province	City	Score	Level	Rank	Province	City	Score	Level
1	Qinghai	Hainan	4.04	Excellent	41	Sichuan	Leshan	8.00	Good
2	Sichuan	Ganzi	4.11	Excellent	42	Gansu	Linxia	8.07	Good
3	Sichuan	Aba	4.42	Excellent	43	Hubei	Shennongjia	8.12	Good
4	Qinghai	Haibei	4.58	Excellent	44	Yunnan	Baoshan	8.14	Good
5	Qinghai	Guoluo	4.73	Excellent	45	Yunnan	Dehong	8.18	Good
6	Qinghai	Yushu	4.91	Good	46	Guangdong	Meizhou	8.19	Good
7	Sichuan	Guangyuan	4.96	Good	47	Tibet	Naqu	8.26	Good
8	Qinghai	Huangnan	5.26	Good	48	Yunnan	Zhaotong	8.26	Good
9	Xinjiang	Tacheng	5.62	Good	49	Jiangxi	Jingdezhen	8.26	Good
10	Sichuan	Panzhihua	5.75	Good	50	Guizhou	Bijie	8.37	Good
11	Hunan	Zhangjiajie	5.99	Good	51	Hunan	Xiangxi	8.44	Good
12	Tibet	Changdu	6.14	Good	52	Zhejiang	Lishui	8.46	Good
13	Xinjiang	Bo'ertala	6.19	Good	53	Tibet	Lasa	8.54	Good
14	Xinjiang	Yili	6.28	Good	54	Sichuan	Nanchong	8.67	Good
15	Gansu	Jiayuguan	6.66	Good	55	Yunnan	Diqing	8.67	Good
16	Sichuan	Liangshan	6.72	Good	56	Shaanxi	Shangluo	8.69	Good
17	Guizhou	Qiandongnan	6.74	Good	57	Guizhou	Qiannan	8.74	Good
18	Xinjiang	Akesu	6.85	Good	58	Tibet	Shannan	8.78	Good
19	Xinjiang	Changji	6.93	Good	59	Sichuan	Yibin	8.78	Good
20	Tibet	Ali	7.05	Good	60	Tibet	Rikaze	8.94	Good
21	Sichuan	Bazhong	7.20	Good	61	Guizhou	Tongren	8.96	Good
22	Hunan	Chenzhou	7.20	Good	62	Liaoning	Dandong	8.97	Good
23	Tibet	Linshi	7.21	Good	63	Yunnan	Pu'er	9.07	Good
24	Gansu	Jinchang	7.21	Good	64	Jiangxi	Yingtian	9.08	Good
25	Guangdong	Shaoguan	7.23	Good	65	Fujian	Nanping	9.27	Good
26	Zhejiang	Zhoushan	7.28	Good	66	Guizhou	Qianxinan	9.31	Good
27	Jiangxi	Shangrao	7.29	Good	67	Hunan	Huaihua	9.52	Good
28	Gansu	Jiuquan	7.29	Good	68	Sichuan	Guang'an	9.53	Good
29	Guangdong	Yunfu	7.36	Good	69	Fujian	Xiamen	9.55	Good
30	Guizhou	Anshun	7.47	Good	70	Zhejiang	Quzhou	9.57	Good
31	Zhejiang	Jinhua	7.48	Good	71	Hunan	Xiangtan	9.69	Good
32	Yunnan	Nujiang	7.51	Good	72	Hunan	Loudi	9.76	Good
33	Yunnan	Lijiang	7.57	Good	73	Qinghai	Xining	9.83	Good
34	Gansu	Longnan	7.59	Good	74	Xinjiang	Wulumuqi	9.83	Good
35	Gansu	Gannan	7.60	Good	75	Xinjiang	Tumushuke	9.87	Good
36	Shaanxi	Hanzhong	7.81	Good	76	Guangxi	Chongzuo	9.97	Good
37	Sichuan	Mianyang	7.81	Good	77	Guizhou	Zunyi	10.01	Good
38	Sichuan	Ya'an	7.82	Good	78	Hubei	Xianning	10.02	Good
39	Yunnan	Xishuangbanna	7.87	Good	79	Jiangxi	Ji'an	10.02	Good
40	Yunnan	Lincang	7.96	Good	80	Xinjiang	Tulufan	10.10	Good

Rank	Province	City	Score	Level
81	Jiangxi	Jiujiang	10.12	Good
82	Sichuan	Deyang	10.14	Good
83	Guangxi	Guilin	10.15	Good
84	Jiangxi	Yichun	10.18	Good
85	Anhui	Xuancheng	10.19	Good
86	Hunan	Yueyang	10.21	Good
87	Hubei	Shiyan	10.22	Good
88	Guangxi	Wuzhou	10.22	Good
89	Yunnan	Qujing	10.23	Good
90	Hunan	Yongzhou	10.23	Good
91	Inner Mongolia	Xing'anmeng	10.52	Moderate
92	Hunan	Zhuzhou	10.55	Moderate
93	Gansu	Dingxi	10.59	Moderate
94	Qinghai	Haidong	10.62	Moderate
95	Jiangxi	Pingxiang	10.65	Moderate
96	Hunan	Shaoyang	10.70	Moderate
97	Guangxi	Fangchenggang	10.71	Moderate
98	Xinjiang	Kelamayi	10.72	Moderate
99	Jiangxi	Fuzhou	10.74	Moderate
100	Xinjiang	Ala'er	10.74	Moderate
101	Heilongjiang	Daxing'anling	10.75	Moderate
102	Shaanxi	Baoji	10.77	Moderate
103	Ningxia	Shizuishan	10.80	Moderate
104	Hubei	Enshi	10.89	Moderate
105	Anhui	Huangshan	10.89	Moderate
106	Gansu	Wuwei	10.94	Moderate
107	Jilin	Baishan	10.95	Moderate
108	Yunnan	Chuxiong	10.95	Moderate
109	Hunan	Changde	10.95	Moderate
110	Yunnan	Wenshan	10.95	Moderate
111	Fujian	Sanming	10.96	Moderate
112	Guangdong	Zhaoqing	10.96	Moderate
113	Shaanxi	Ankang	11.08	Moderate
114	Hunan	Hengyang	11.09	Moderate
115	Sichuan	Dazhou	11.20	Moderate
116	Hubei	Xiangyang	11.23	Moderate
117	Qinghai	Haixi	11.24	Moderate
118	Fujian	Ningde	11.33	Moderate
119	Xinjiang	Wujiaqu	11.36	Moderate
120	Guizhou	Liupanshui	11.39	Moderate
121	Sichuan	Suining	11.41	Moderate
122	Jiangsu	Huai'an	11.51	Moderate

Rank	Province	City	Score	Level
123	Xinjiang	Hetian	11.65	Moderate
124	Xinjiang	Hami	11.78	Moderate
125	Guangdong	Shanwei	11.81	Moderate
126	Guangxi	Guigang	11.83	Moderate
127	Hubei	Xiantao	11.86	Moderate
128	Inner Mongolia	Alashan	11.89	Moderate
129	Guangxi	Nanning	11.89	Moderate
130	Anhui	Chuzhou	11.93	Moderate
131	Henan	Sanmenxia	11.99	Moderate
132	Guangdong	Heyuan	12.01	Moderate
133	Anhui	Tongling	12.08	Moderate
134	Hunan	Changsha	12.11	Moderate
135	Jiangxi	Ganzhou	12.20	Moderate
136	Guangxi	Hechi	12.20	Moderate
137	Henan	Nanyang	12.22	Moderate
138	Guangdong	Zhuhai	12.26	Moderate
139	Fujian	Longyan	12.30	Moderate
140	Guangdong	Yangjiang	12.34	Moderate
141	Hebei	Chengde	12.36	Moderate
142	Guangdong	Zhanjiang	12.39	Moderate
143	Anhui	Liu'an	12.41	Moderate
144	Shanxi	Changzhi	12.57	Moderate
145	Gansu	Zhangye	12.65	Moderate
146	Zhejiang	Shaoxing	12.66	Moderate
147	Heilongjiang	Hegang	12.66	Moderate
148	Jilin	Yanbian	12.67	Moderate
149	Sichuan	Luzhou	12.71	Moderate
150	Guangdong	Qingyuan	12.71	Moderate
151	Hubei	Suizhou	12.75	Moderate
152	Hainan	Wuzhishan	12.77	Moderate
153	Hubei	Huanggang	12.81	Moderate
154	Xinjiang	Bayin'guoleng	12.83	Moderate
155	Zhejiang	Taizhou	12.89	Moderate
156	Shandong	Linyi	12.97	Moderate
157	Inner Mongolia	Wuhai	13.00	Moderate
158	Shanxi	Zhangzhou	13.01	Moderate
159	Hunan	Yiyang	13.09	Moderate
160	Henan	Pingdingshan	13.10	Moderate
161	Guangxi	Laibin	13.19	Moderate
162	Shaanxi	Xianyang	13.20	Moderate
163	Fujian	Fuzhou	13.42	Moderate

Rank	Province	City	Score	Level
164	Jiangsu	Suqian	13.53	Moderate
165	Jilin	Tonghua	13.60	Moderate
166	Hebei	Zhangjiakou	13.64	Moderate
167	Shandong	Tai'an	13.74	Moderate
168	Fujian	Quanzhou	13.76	Moderate
169	Anhui	Wuhu	13.78	Moderate
170	Hubei	Yichang	13.80	Moderate
171	Jiangsu	Xuzhou	13.81	Moderate
172	Chongqing	Chongqing	13.84	Moderate
173	Gansu	Lanzhou	13.86	Moderate
174	Henan	Xuchang	13.89	Moderate
175	Hubei	Tianmen	13.95	Moderate
176	Hubei	Qianjiang	13.96	Moderate
177	Guizhou	Guiyang	14.02	Moderate
178	Jilin	Baicheng	14.11	Moderate
179	Zhejiang	Huzhou	14.12	Moderate
180	Sichuan	Neijiang	14.23	Moderate
181	Heilongjiang	Shuangyashan	14.29	Moderate
182	Guangxi	Liuzhou	14.36	Moderate
183	Hainan	Qiongzong	14.45	Moderate
184	Fujian	Zhangzhou	14.51	Moderate
185	Shandong	Laiwu	14.51	Moderate
186	Shandong	Jinan	14.51	Moderate
187	Sichuan	Chengdu	14.62	Moderate
188	Sichuan	Zigong	14.66	Moderate
189	Guangxi	Yulin	14.74	Moderate
190	Henan	Luohe	14.74	Moderate
191	Jiangsu	Nanjing	14.81	Moderate
192	Zhejiang	Wenzhou	15.00	Moderate
193	Fujian	Putian	15.01	Moderate
194	Liaoning	Chaoyang	15.01	Moderate
195	Hainan	Baoting	15.02	Moderate
196	Hubei	Huangshi	15.04	Moderate
197	Anhui	Anqing	15.08	Moderate
198	Ningxia	Yinchuan	15.19	Moderate
199	Jiangsu	Zhenjiang	15.22	Moderate
200	Shandong	Jining	15.27	Moderate
201	Hubei	Ezhou	15.34	Moderate
202	Jiangxi	Xinyu	15.44	Moderate
203	Guangxi	Baise	15.45	Moderate
204	Guangxi	Hezhou	15.52	Moderate
205	Henan	Jiaozuo	15.70	Moderate
206	Hubei	Xiaogan	15.72	Moderate

Rank	Province	City	Score	Level
207	Heilongjiang	Jixi	15.81	Moderate
208	Inner Mongolia	Bayannao'er	15.83	Moderate
209	Liaoning	Benxi	15.92	Moderate
210	Hainan	Dongfang	16.10	Moderate
211	Anhui	Huainan	16.21	Moderate
212	Hebei	Qinhuangdao	16.21	Moderate
213	Jilin	Songyuan	16.26	Moderate
214	Gansu	Pingliang	16.33	Moderate
215	Shaanxi	Yulin	16.34	Moderate
216	Sichuan	Meishan	16.38	Moderate
217	Jiangxi	Nanchang	16.45	Moderate
218	Henan	Zhengzhou	16.45	Moderate
219	Inner Mongolia	Huhehaote	16.46	Moderate
220	Xinjiang	Kezileisu	16.48	Moderate
221	Henan	Shangqiu	16.51	Moderate
222	Ningxia	Zhongwei	16.53	Moderate
223	Shandong	Weihai	16.79	Moderate
224	Inner Mongolia	Chifeng	16.79	Moderate
225	Hainan	Danzhou	16.91	Relatively Poor
226	Henan	Zhoukou	16.91	Relatively Poor
227	Henan	Xinyang	16.92	Relatively Poor
228	Xinjiang	Kashen	16.99	Relatively Poor
229	Heilongjiang	Yichun	17.07	Relatively Poor
230	Zhejiang	Ningbo	17.12	Relatively Poor
231	Xinjiang	Aleitai	17.23	Relatively Poor
232	Anhui	Bangbu	17.35	Relatively Poor
233	Heilongjiang	Qitaihe	17.37	Relatively Poor
234	Henan	Xinxiang	17.51	Relatively Poor
235	Anhui	Huaibei	17.61	Relatively Poor

Rank	Province	City	Score	Level
236	Jiangsu	Taizhou	17.70	Relatively Poor
237	Inner Mongolia	Baotou	17.84	Relatively Poor
238	Henan	Luoyang	17.95	Relatively Poor
239	Inner Mongolia	E'erduosi	17.97	Relatively Poor
240	Gansu	Baiyin	18.07	Relatively Poor
241	Henan	Zhumadian	18.08	Relatively Poor
242	Guangxi	Beihai	18.16	Relatively Poor
243	Ningxia	Guyuan	18.23	Relatively Poor
244	Yunnan	Yuxi	18.27	Relatively Poor
245	Anhui	Fuyang	18.36	Relatively Poor
246	Zhejiang	Hangzhou	18.43	Relatively Poor
247	Heilongjiang	Heihe	18.49	Relatively Poor
248	Beijing	Beijing	18.60	Relatively Poor
249	Henan	Jiyuan	18.63	Relatively Poor
250	Hainan	Lingao	18.76	Relatively Poor
251	Yunnan	Dali	18.77	Relatively Poor
252	Guangxi	Qinzhou	18.82	Relatively Poor
253	Guangdong	Foshan	18.85	Relatively Poor
254	Jiangsu	Suzhou	18.88	Relatively Poor
255	Henan	Hebi	18.90	Relatively Poor
256	Zhejiang	Jiaxing	19.09	Relatively Poor

Rank	Province	City	Score	Level
257	Hainan	Chengmai	19.10	Relatively Poor
258	Guangdong	Maoming	19.24	Relatively Poor
259	Hubei	Jingzhou	19.33	Relatively Poor
260	Shaanxi	Yan'an	19.38	Relatively Poor
261	Liaoning	Tieling	19.41	Relatively Poor
262	Liaoning	Liaoyang	19.42	Relatively Poor
263	Hainan	Wanning	19.43	Relatively Poor
264	Hebei	Handan	19.57	Relatively Poor
265	Guangdong	Jiangmen	19.58	Relatively Poor
266	Hebei	Baoding	19.81	Relatively Poor
267	Anhui	Chizhou	19.86	Relatively Poor
268	Jilin	Liaoyuan	19.94	Relatively Poor
269	Heilongjiang	Ha'erbin	20.06	Relatively Poor
270	Shanxi	Jincheng	20.11	Relatively Poor
271	Shandong	Yantai	20.46	Relatively Poor
272	Yunnan	Honghe	20.50	Relatively Poor
273	Liaoning	Dalian	20.53	Relatively Poor
274	Shanxi	Jinzhong	20.54	Relatively Poor
275	Guangdong	Zhongshan	20.60	Relatively Poor
276	Henan	Kaifeng	20.65	Relatively Poor
277	Hubei	Jingmen	20.67	Relatively Poor

Rank	Province	City	Score	Level
278	Jiangsu	Yancheng	20.83	Relatively Poor
279	Henan	Anyang	20.89	Relatively Poor
280	Jiangsu	Lianyungang	20.95	Relatively Poor
281	Jiangsu	Changzhou	21.13	Relatively Poor
282	Shanghai	Shanghai	21.40	Relatively Poor
283	Yunnan	Kunming	21.43	Relatively Poor
284	Hebei	Tangshan	21.48	Relatively Poor
285	Gansu	Qingyang	21.48	Relatively Poor
286	Heilongjiang	Qiqiha'er	21.49	Relatively Poor
287	Liaoning	Fuxin	21.50	Relatively Poor
288	Heilongjiang	Mudanjiang	21.52	Relatively Poor
289	Shandong	Dongying	21.56	Relatively Poor
290	Sichuan	Ziyang	21.63	Relatively Poor
291	Hainan	Baisha	21.71	Relatively Poor
292	Gansu	Tianshui	21.76	Relatively Poor
293	Liaoning	Jinzhou	21.98	Relatively Poor
294	Anhui	Ma'anshan	22.05	Relatively Poor
295	Shandong	Zibo	22.28	Relatively Poor
296	Jiangsu	Wuxi	22.32	Relatively Poor
297	Hebei	Shijiazhuang	22.53	Relatively Poor
298	Anhui	Suzhou	22.58	Relatively Poor

Rank	Province	City	Score	Level
299	Hainan	Sansha	22.67	Relatively Poor
300	Liaoning	Fushun	22.79	Relatively Poor
301	Shanxi	Luliang	22.81	Relatively Poor
302	Guangdong	Shantou	23.10	Relatively Poor
303	Xinjiang	Shihezi	23.10	Relatively Poor
304	Shanxi	Shuozhou	23.12	Relatively Poor
305	Guangdong	Jieyang	23.12	Relatively Poor
306	Guangdong	Chaozhou	23.19	Relatively Poor
307	Jiangsu	Nantong	23.26	Relatively Poor
308	Shanxi	Linfen	23.32	Relatively Poor
309	Shaanxi	Xi'an	23.41	Relatively Poor
310	Liaoning	Panjin	23.43	Relatively Poor
311	Inner Mongolia	Xilinguolei	23.54	Relatively Poor
312	Shandong	Zaozhuang	23.63	Relatively Poor
313	Tianjin	Tianjin	23.63	Relatively Poor
314	Hubei	Wuhan	23.97	Relatively Poor
315	Hainan	Haikou	24.26	Relatively Poor
316	Henan	Puyang	24.34	Relatively Poor
317	Liaoning	Huludao	24.48	Relatively Poor
318	Jilin	Jilin	24.74	Relatively Poor
319	Jiangsu	Yangzhou	24.85	Poor
320	Shandong	Qingdao	25.27	Poor
321	Hainan	Sanya	25.41	Poor

Rank	Province	City	Score	Level	Rank	Province	City	Score	Level
322	Anhui	Hefei	25.55	Poor	344	Hebei	Langfang	29.97	Poor
323	Anhui	Bozhou	25.71	Poor	345	Hainan	Wenchang	30.08	Poor
324	Heilongjiang	Daqing	25.83	Poor	346	Hainan	Qionghai	30.78	Poor
325	Shanxi	Yuncheng	26.10	Poor	347	Heilongjiang	Jiamusi	30.99	Poor
326	Shanxi	Taiyuan	26.44	Poor	348	Guangdong	Guangzhou	31.15	Poor
327	Shanxi	Datong	26.47	Poor	349	Liaoning	Yingkou	31.50	Poor
328	Hainan	Ledong	26.50	Poor	350	Inner Mongolia	Wulanchabu	32.39	Poor
329	Shandong	Weifang	26.83	Poor	351	Jilin	Changchun	32.42	Poor
330	Shandong	Dezhou	27.03	Poor	352	Hebei	Cangzhou	32.75	Poor
331	Hainan	Lingshui	27.14	Poor	353	Shandong	Rizhao	32.91	Poor
332	Hainan	Changjiang	27.48	Poor	354	Liaoning	Anshan	34.43	Poor
333	Hebei	Xingtai	27.60	Poor	355	Jilin	Siping	34.59	Poor
334	Guangdong	Huizhou	27.65	Poor	356	Hainan	Tunchang	35.01	Poor
335	Shandong	Binzhou	27.66	Poor	357	Inner Mongolia	Hulunbei'er	35.93	Poor
336	Shaanxi	Weinan	27.90	Poor	358	Heilongjiang	Suihua	37.44	Poor
337	Shandong	Heze	27.93	Poor	359	Hebei	Hengshui	38.54	Poor
338	Shandong	Liaocheng	28.25	Poor	360	Guangdong	Shenzhen	39.42	Poor
339	Liaoning	Shenyang	28.57	Poor	361	Inner Mongolia	Tongliao	40.81	Poor
340	Hainan	Ding'an	28.64	Poor	362	Shanxi	Yangquan	41.92	Poor
341	Ningxia	Wuzhong	28.90	Poor					
342	Guangdong	Dongguan	29.42	Poor					
343	Shaanxi	Tongchuan	29.86	Poor					

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